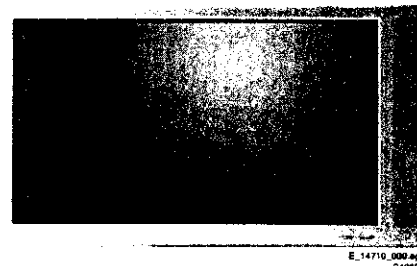


Service Service Service

LC4.9E

AA

For manual LGE plasma panel see: 3122 785 15590

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Service Manual

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PHILIPS

1. Technical Specifications, Connections, and Chassis Overview

Index of this chapter:

- 1.1 Technical Specifications
- 1.2 Connection Overview
- 1.3 Chassis Overview

Notes:

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

Power consumption		
- Normal operation (W)	:	≈ 450
- Stand-by (W)	:	< 2
Dimensions (WxHxD cm)	:	42 inch: 124x68x10.4
	:	50 inch: 141.5x78x10.4
Weight (kg)	:	42 inch: 42
	:	50 inch: 50

1.1 Technical Specifications

1.1.1 Vision

Display type	:	Plasma
Screen size	:	42" (107 cm), 16:9
Screen size	:	50" (127 cm), 16:9
Resolution (HxV pixels)	:	42 inch: 852 x 480
	:	50 inch: 1366 x 768
Contrast ratio	:	
- 42PF5320/10	:	10,000:1
- 42PF7320/10	:	13,000:1
- 50PF7320/10	:	10,000:1
Light output (cd/m ²)	:	1500
Viewing angle (HxV degrees)	:	160x160
Tuning system	:	PLL
TV Colour systems	:	PAL B/G, D/K, I
	:	SECAM B/G, D/K, L/L'
Video playback	:	PAL B/G; SECAM L/L'
	:	NTSC M/N 3.58, 4.43
Supported computer formats	:	VGA (640x480)
	:	VGA (720x400)
	:	VGA (720x480)
	:	MAC (640x480)
	:	MAC (832x624)
	:	SVGA (800x600)
	:	XVGA (1024x768)
	:	WXGA (1280x768)
	:	WXGA (1280x960)
	:	WXGA (1280x1024)
Supported video formats	:	640x480i - 11H
	:	720x576i - 11H
	:	640x480p - 21H
	:	720x576p - 21H
	:	852x480p - 21H
	:	1920x1080i - 21H
Presets/channels	:	100 presets
Tuner bands	:	VHF
	:	UHF
	:	S-band
	:	Hyper-band

1.1.2 Sound

Sound systems	:	FM-mono
	:	FM-sterio B/G
	:	NICAM B/G, D/K, I, L
	:	AV Stereo
Maximum power (W _{RMS})	:	2 x 15

1.1.3 Miscellaneous

Power supply:		
- Mains voltage (V _{AC})	:	220 - 240
- Mains frequency (Hz)	:	50 / 60
Ambient conditions:		
- Temperature range (°C)	:	+5 to +40
- Maximum humidity	:	90% R.H.

1.2 Connection Overview

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

1.2.1 Side I/O connections

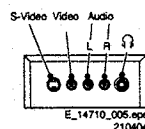


Figure 1-1 Side I/O connections

S-Video (Hosiden): Video Y/C - In

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

Cinch: Video CVBS - In, Audio - In

Ye - Video CVBS	1 V _{pp} / 75 ohm	⊖
Wh - Audio L	0.5 V _{RMS} / 10 kohm	⊖
Rd - Audio R	0.5 V _{RMS} / 10 kohm	⊖

Mini Jack: Audio Head phone - Out

Bk - Head phone	32 - 600 ohm / 10 mW	⊖
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1.2.2 Rear Connections

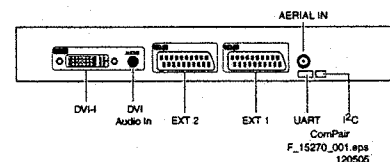


Figure 1-2 Rear I/O

Aerial - In

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

Mini Jack: Audio - In

1 - Ground	Gnd	+
2 - Audio L	0.5 V _{RMS} / 10 kohm	⊖
3 - Audio R	0.5 V _{RMS} / 10 kohm	⊖

Service connector (ComPair)

1 - SDA-S	I ² C Data (0 - 5 V)	⊖
-----------	---------------------------------	---

2 - SCL-S	I ² C Clock (0 - 5 V)	⊖
3 - Ground	Gnd	+

Service connector (UART)

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

DVI-I: Digital/Analogue Video - In

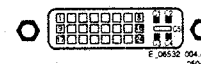


Figure 1-3 DVI-I connector

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

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

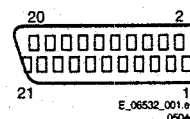


Figure 1-4 SCART connector

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

15 - Video Red	0.7 V _{pp} / 75 ohm	⊖
16 - Status/FBL	0 - 0.4 V: INT	⊖
	1 - 3 V: EXT / 75 ohm	⊖
17 - Ground Video	Gnd	+
18 - Ground FBL	Gnd	+
19 - Video Terr. CVBS	1 V _{pp} / 75 ohm	⊖
20 - Video CVBS/Y	1 V _{pp} / 75 ohm	⊖
21 - Shield	Gnd	+

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

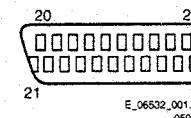


Figure 1-5 SCART connector

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

4. Mechanical Instructions

Index of this chapter:
 4.1 Cable Dressing
 4.2 Service Positions
 4.3 Assy/Panel Removal
 4.4 Set Re-assembly

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

4.1 Cable Dressing

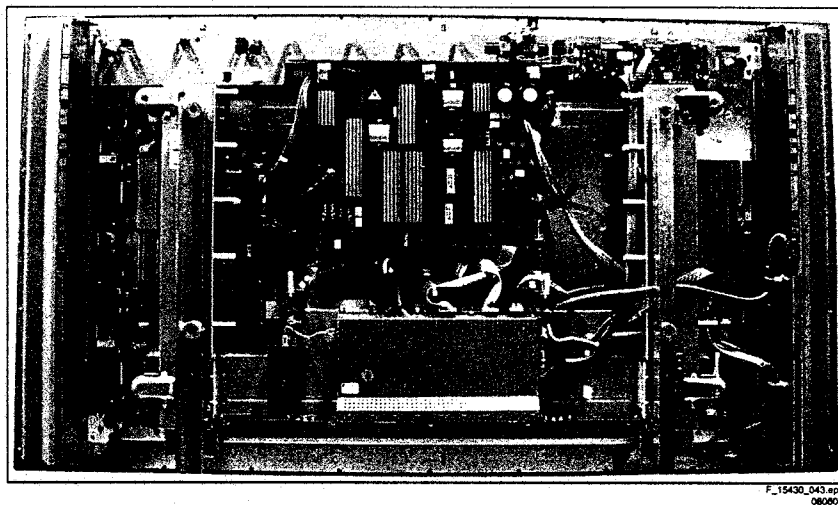


Figure 4-1 Cable dressing

4.2 Service Positions

For easy servicing of this set, there are a few possibilities created:
 • The buffers from the packaging (see figure "Rear cover").
 • Foam bars (created for service).
 • Aluminium service stands (created for Service).

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, you can monitor the screen.

4.2.2 Aluminium Stands

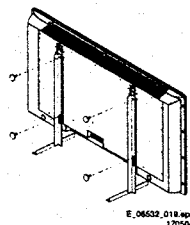


Figure 4-3 Aluminium stands (drawing of Mkl)

The aluminium stands (order code 3122 785 90480) can be mounted with the back cover removed or still left on. So, the stand can be used to store products or to do measurements. It is also very suitable to perform duration tests without taking much space, without having the risk of overheating, or the risk of products falling. The stands can be mounted and removed

quick and easy with use of the delivered screws that can be tightened and loosened manually without the use of tools. See figure above.

Note: Only use the delivered screws to mount the monitor to the stands.

4.3 Assy/Panel Removal

4.3.1 Metal Rear Cover

Caution: Disconnect the Mains/AC Power cord before you remove the rear cover!

1. Place the TV set upside down on a table top, using the foam bars (see part "Foam Bars").
 Caution: do not put pressure on the display, but let the monitor lean on the speakers or the Front cover.
2. Remove all T10 screws around the edges of the metal rear cover: "parker" screws around the outer rim, "tapping" screws around the connector plate.
3. Remove the four "mushrooms" from the rear cover.
4. Lift the metal rear cover from the set. Make sure that wires and flat foils are not damaged.

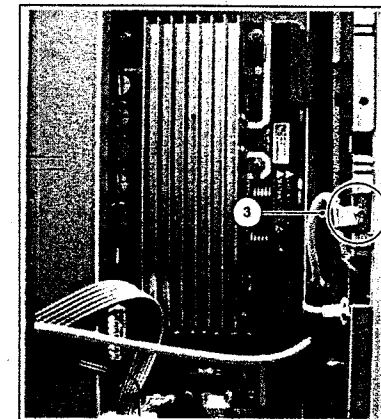


Figure 4-5 Grounding clamp

4.3.2 Speaker Compartment Cover

After removing the metal rear cover, you gain access to the Speaker Compartment covers.

1. Remove all T10 screws [1] around the outer rim of the cover (see Figure "Speaker compartment cover removal").
2. Remove the T10 screws [2] on top of the inner rim, including the one which secures the grounding clamp (3, see Figure "Grounding clamp").
3. Now, remove the plastic cable fixation noose (4, see Figure "Cable fixation noose").
4. After removal of all the screws, slightly push the top of the cover inwards. This will lift the outer rim slightly up so you can take the cover out.

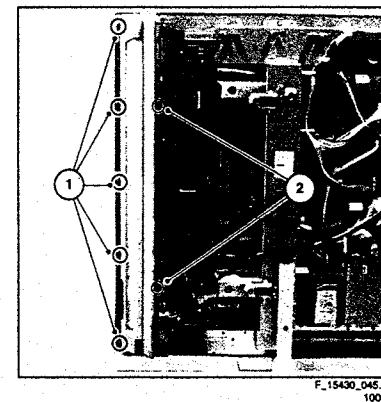


Figure 4-4 Speaker compartment cover removal

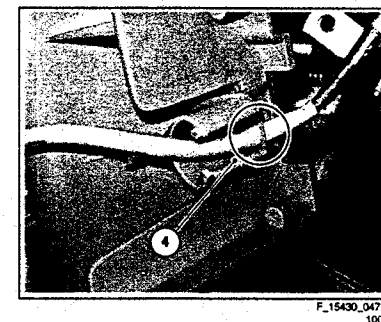


Figure 4-6 Cable fixation noose

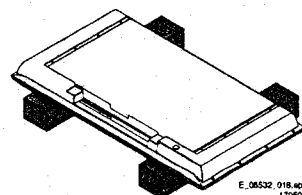


Figure 4-2 Foam bars

The foam bars (order code 3122 785 90580 for two pieces) can be used for all types and sizes of Flat TVs. By laying the TV

4.3.3 Side I/O Panel

After removal of the Speaker Compartment Covers, this panel is accessible.

1. Disconnect the cable (1) from the panel.
2. Remove the T10 mounting screws [2] that hold the assy.
3. Remove the panel from its bracket [3], by pushing against the front side of the side I/O cinch connectors.

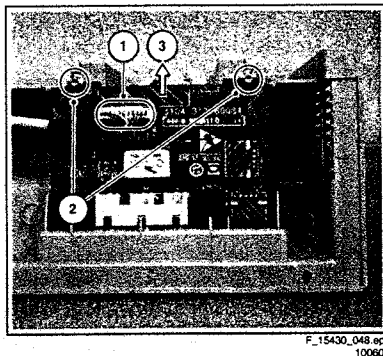


Figure 4-7 Side I/O panel removal

When it is defective, replace the whole unit.

4.3.4 LED Panel

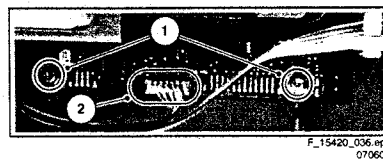


Figure 4-8 LED panel

1. Remove the fixation screws (1) and take the panel out of its brackets.
2. Disconnect the cable (2) from the panel.

4.3.5 Keyboard Control Panel

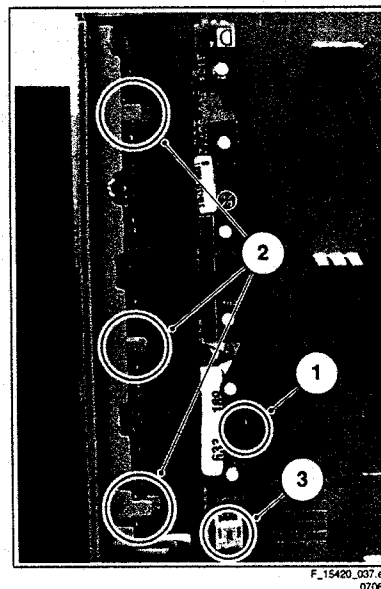


Figure 4-9 Keyboard control panel

1. Remove the panel (1) from its three brackets (2).
2. Disconnect the cable (3) from the panel.

4.3.6 SSB Board Cover Shield

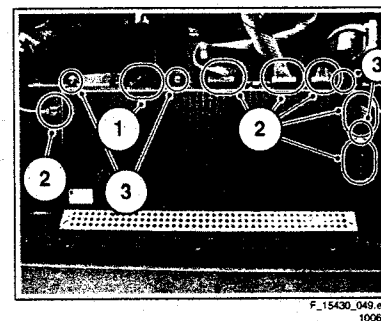


Figure 4-10 SSB board cover shield

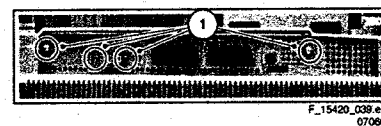


Figure 4-11 DVI-I connector and rear I/O panel screws

1. Very cautiously disconnect the LVDS cable (1) from the SSB panel (see Figure "SSB board cover shield"). Notice that this cable is very fragile.
2. Remove all other cables (2) from the SSB board (see Figure "SSB board cover shield"), including the grounding cable.
3. Remove the fixation screws (3), see Figure "SSB board cover shield" and remove the SSB shield with the SSB board inside, and the rear I/O panel still attached to it.
4. Remove the fixation screws (1) from the DVI-I connector and from the rear panel, see Figure "DVI-I connector and rear panel screws", and remove the rear I/O panel from the SSB board.
5. Remove the upper part of the shield from the SSB panel, by unhooking it from its brackets. Be careful not to damage the LVDS connector on the SSB board, see Figure "SSB board cover shield".

4.3.7 SSB Board

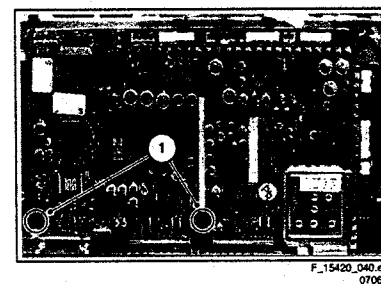


Figure 4-12 SSB board

1. Remove the two fixation screws (1) that secure the SSB board on the lower part of the SSB shielding, see Figure "SSB board".
2. Remove the SSB panel.

4.3.8 Power Supply Panel

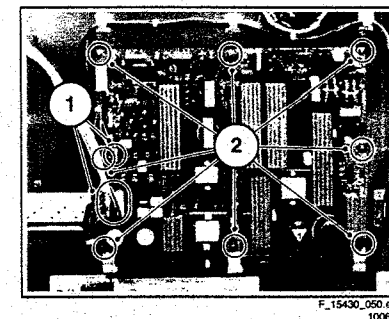
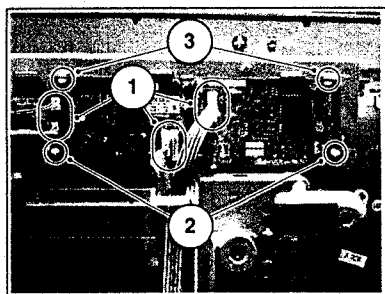


Figure 4-13 Power supply panel

1. Disconnect all cables (1) from the panel.
2. Remove the fixation screws (2) from the panel.
3. Take the panel out of its brackets.

4.3.9 Class D Audio Amplifier Panel



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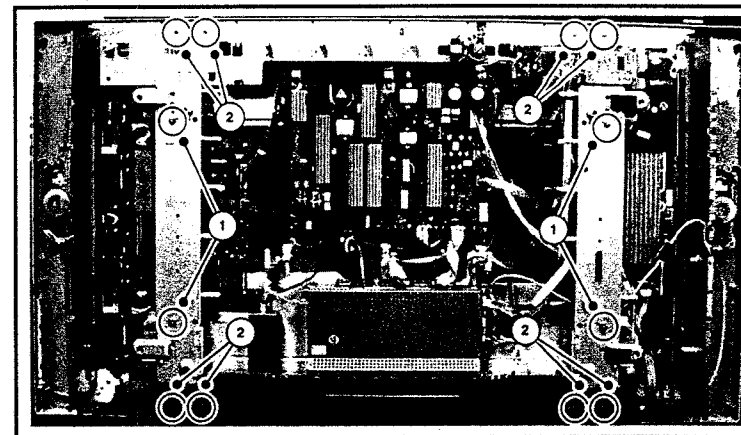
Figure 4-14 Class D audio amplifier panel

1. Disconnect all cables (1) from the panel.
2. Pinch the plastic fixation clamps (2) firmly between your fingers, and pull the panel upwards.
3. Take the panel out of its brackets (3).

4.3.10 Plasma Display Panel / Glass Plate

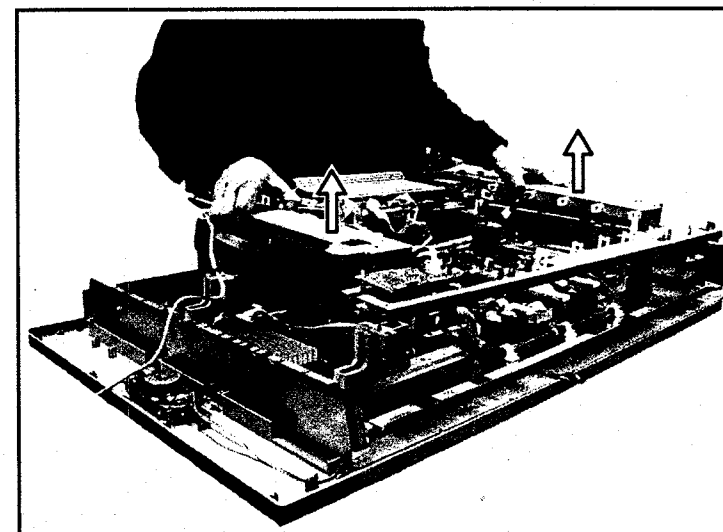
1. Remove the T20 display panel mounting screws [1].
2. Remove the T10 screws [2] from the mounting frame.
3. Unplug all cable(s):
 - LVDS cable at SSB side (fragile connector!).
 - SSB supply cables at the Main Supply board.
 - Mains cable at the Main Supply board.
 - Side I/O cable at SSB side (fragile connector!).

- Cable at LED panel.
 - Keyboard cable at SSB side.
 - Audio Amplifier supply cable at the Main Supply board.
 - Loudspeaker cables (incl. ferrites) at the Audio panel.
4. Lift the metal frame (together with all PWBs) from the display panel (see figure "Frame lift").
 5. After removal of the frame, lift the PDP from the set.



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200505

Figure 4-15 Display panel removal



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Figure 4-16 Frame lift

4.3.11 PDP Glass Plate

In order to remove/exchange the PDP glass plate:

1. Remove the PDP as described earlier.
2. Remove the T10 screws [1] from the mounting frame.
3. After removal of the frame, you can lift the glass plate from the set.

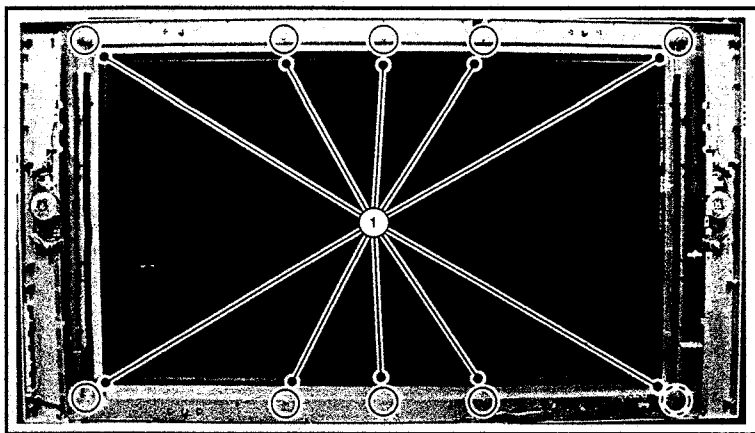
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Figure 4-17 Glass plate removal

4.4 Set Re-assembly

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

Notes:

- While re-assembling, make sure that all cables are placed and connected in their original positions. See Figure "Cable dressing". Be careful with the fragile LVDS cable.
- For a complete description of the Plasma panel, see the LGE plasma panel Service Manual (12nc is listed on the frontpage).

5. Service Modes, Error Codes, and Fault Finding

Index of this chapter:

- 5.1 Test Points
- 5.2 Service Modes
- 5.3 Problems and Solving Tips Related to CSM
- 5.4 Service Tools
- 5.5 Error Codes
- 5.6 The Blinking LED Procedure
- 5.7 Fault Finding and Repair Tips

5.1 Test Points

This chassis is equipped with test points in the service printing. In the schematics test points are identified with a rectangle box around Fxxx or Lxxx.

Perform measurements under the following conditions:

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

5.2 Service Modes

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

This chassis also offers the option of using ComPair, a hardware interface between a computer and the TV chassis. It offers the possibilities of structured troubleshooting, error code reading, and software version readout for all chassis.

Minimum requirements for ComPair: a Pentium processor, a Windows OS, and a CD-ROM drive (see also paragraph "ComPair").

5.2.1 Service Default Mode (SDM)

Purpose

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

Specifications

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

How to Enter

To enter SDM, use one of the following methods:

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

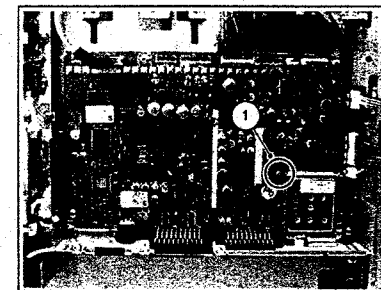
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Figure 5-1 Service jumpers

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

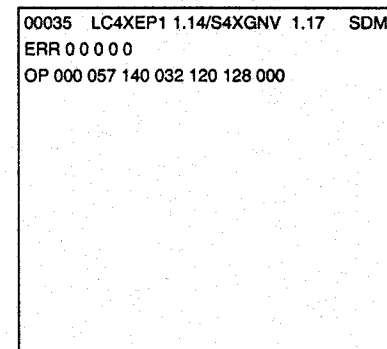
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080505

Figure 5-2 SDM menu

How to Navigate

Use one of the following methods:

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

How to Exit

Switch the set to STANDBY by pressing the mains button on the remote control transmitter or the television set.

If you turn the television set off by removing the mains (i.e., unplugging the television) without using the mains button, the television set will remain in SDM when mains is re-applied, and the error buffer is not cleared.

5.2.2 Service Alignment Mode (SAM)**Purpose**

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

Specifications

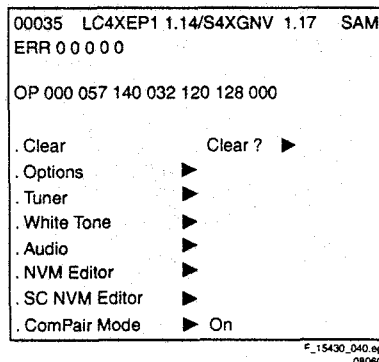
- Operation hours counter (maximum five digits displayed).
- Software version, Error codes, and Option settings display.
- Error buffer clearing.
- Option settings.
- AKB switching.
- Software alignments (Tuner, White Tone, Geometry & Audio).
- NVM Editor.
- ComPair Mode switching.

How to Enter

To enter SAM, use one of the following methods:

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

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

**Figure 5-3 SAM menu****How to Store SAM Settings**

To store the settings changed in SAM mode, leave the top level

Menu Explanation

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

How to Navigate

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

SAM menu by using the POWER button on the remote control transmitter or the television set.

How to Exit

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

5.2.3 Customer Service Mode (CSM)**Purpose**

The Customer Service Mode shows error codes and information on the TV's operation settings. The call centre can instruct the customer (by telephone) to enter CSM in order to identify the status of the set. This helps the call centre to diagnose problems and failures in the TV set before making a service call.

The CSM is a read-only mode; therefore, modifications are not possible in this mode.

How to Enter

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

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

```
1 00035 LC4XEP1 1.14/S4XGNV 1.17 CSM
2 CODES 0 0 0 0
3 OP 000 057 140 032 120 128 000
4
5
6 NOT TUNED
7 PAL
8 STEREO
9 CO 50 CL 50 BR 50
0 AVL Off
```

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Figure 5-4 CSM menu**Menu Explanation**

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

How to Exit

To exit CSM, use one of the following methods:

- Press the MENU, STATUS/EXIT, or POWER button on the remote control transmitter.
- Press the POWER button on the television set.

5.3 Problems and Solving Tips Related to CSM**5.3.1 Picture Problems**

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

Picture too Dark or too Bright

If:

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

Then:

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

White Line around Picture Elements and Text

If:

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

Then:

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

Snowy Picture

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

- Antenna not connected. Connect the antenna.

- No antenna signal or bad antenna signal. Connect a proper antenna signal.
- The tuner is faulty (in this case line 2, the Error Buffer line, will contain error number 10). Check the tuner and replace/repair the tuner if necessary.

Black and White Picture

If:

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

Then:

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

Menu Text not Sharp Enough

If:

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

Then:

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

5.4 Service Tools

5.4.1 ComPair

Introduction

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

- ComPair helps you to quickly get an understanding on how to repair the chassis in a short time by guiding you systematically through the repair procedures.
- ComPair allows very detailed diagnostics (on I²C level) and is therefore capable of accurately indicating problem areas. You do not have to know anything about I²C commands yourself because ComPair takes care of this.
- ComPair speeds up the repair time since it can automatically communicate with the chassis (when the microprocessor is working) and all repair information is

directly available. When ComPair is installed together with the Force/SearchMan electronic manual of the defective chassis, schematics and PWBs are only a mouse click away.

Specifications

ComPair consists of a Windows based fault finding program and an interface box between PC and the (defective) product. The ComPair interface box is connected to the PC via a serial (or RS-232) cable.

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

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

- Automatically (by communicating with the television): ComPair can automatically read out the contents of the entire error buffer. Diagnosis is done on I²C/UART level. ComPair can access the I²C/UART bus of the television. ComPair can send and receive I²C/UART commands to the microcontroller of the television. In this way, it is possible for ComPair to communicate (read and write) to devices on the I²C/UART buses of the TV-set.
- Manually (by asking questions to you): Automatic diagnosis is only possible if the microcontroller of the television is working correctly and only to a certain extent. When this is not the case, ComPair will guide you through the faultfinding tree by asking you questions (e.g. Does the screen give a picture? Click on the correct answer: YES / NO) and showing you examples (e.g. Measure test-point 17 and click on the correct oscillogram you see on the oscilloscope). You can answer by clicking on a link (e.g. text or a waveform picture) that will bring you to the next step in the faultfinding process.

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

How To Connect

This is described in the chassis faultfinding database in ComPair.

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

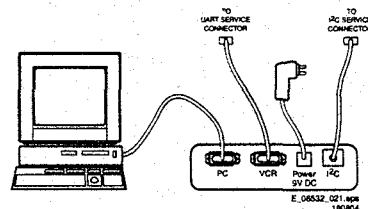


Figure 5-5 ComPair interface connection

How To Order

- ComPair order codes (EU/AP/LATAM):
- Starter kit ComPair32/SearchMan32 software and ComPair interface (excl. transformer): 3122 785 90450.
- ComPair interface (excl. transformer): 4822 727 21631.
- Starter kit ComPair32 software (registration version): 3122 785 60040.
- Starter kit SearchMan32 software: 3122 785 60050.

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

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

5.4.2 LVDS Tool

Introduction

This service tool (also called "ComPair Assistant 1") may help you to identify, in case the TV does not show any picture, whether the Small Signal Board (SSB) or the display of a Flat TV is defective.

Furthermore it is possible to program EPLDs with this tool (Byteblaster). Read the user manual for an explanation of this feature.

Since 2004, the LVDS output connectors in our Flat TV models are standardised (with some exceptions). With the two delivered LVDS interface cables (31p and 20p) you can cover most chassis (in special cases, an extra cable will be offered).

When operating, the tool will show a small (scaled) picture on a VGA monitor. Due to a limited memory capacity, it is not possible to increase the size when processing high-resolution LVDS signals (>= 1280x768). Generally this tool is intended to determine if the SSB is working or not. Thus to determine if LVDS, RGB, and sync signals are okay.

How to Connect

Connections are explained in the user manual, which is delivered with the tool.

Note: To use the LVDS tool, you must have ComPair release 2004-1 (or later) on your PC (engine version >= 2.2.05).

For every TV type number and screen size, one must choose the proper settings via ComPair. The ComPair file will be updated regularly with new introduced chassis information.

How to Order

- LVDS tool (incl. two LVDS cables: 31p and 20p): 3122 785 90671.
- Service Manual LVDS tool: 3122 785 00810.
- LVDS cable 20p (for Telra 14-inch): 3122 785 90810.
- LVDS cable 30p (for LC4.3): 3122 785 90820.
- LVDS cable 41p-to-31p for CA1 (dual -> single LVDS): 3122 785 90830.

5.5 Error Codes

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

5.5.1 How to Read the Error Buffer

You can read the error buffer in 3 ways:

- On screen via the SAM (if you have a picture).
- Examples:**

- ERROR: 0 0 0 0 0 : No errors detected
- ERROR: 6 0 0 0 0 : Error code 6 is the last and only detected error
- ERROR: 9 6 0 0 0 : Error code 6 was detected first and error code 9 is the last detected (newest) error
- Via the blinking LED procedure (when you have no picture). See "The Blinking LED Procedure".
- Via ComPair.

5.5.2 How to Clear the Error Buffer

The error code buffer is cleared in the following cases:

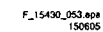
- By using the CLEAR command in the SAM menu:
 - To enter SAM, press the following key sequence on the remote control transmitter: "062596" directly followed by the OSD/STATUS button (do not allow the display to time out between entries while keying the sequence).
 - Make sure the menu item CLEAR is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

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

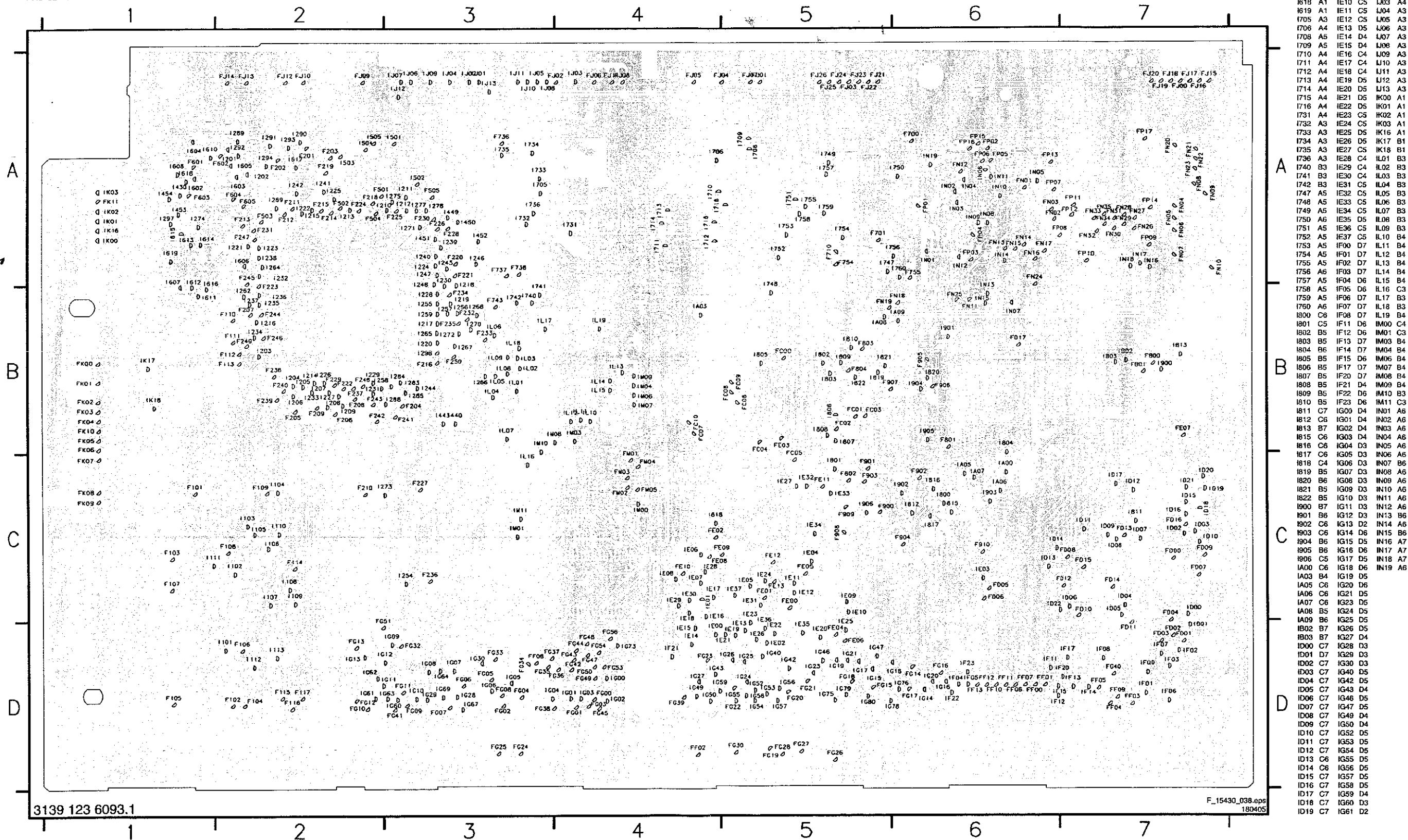
VIDEO



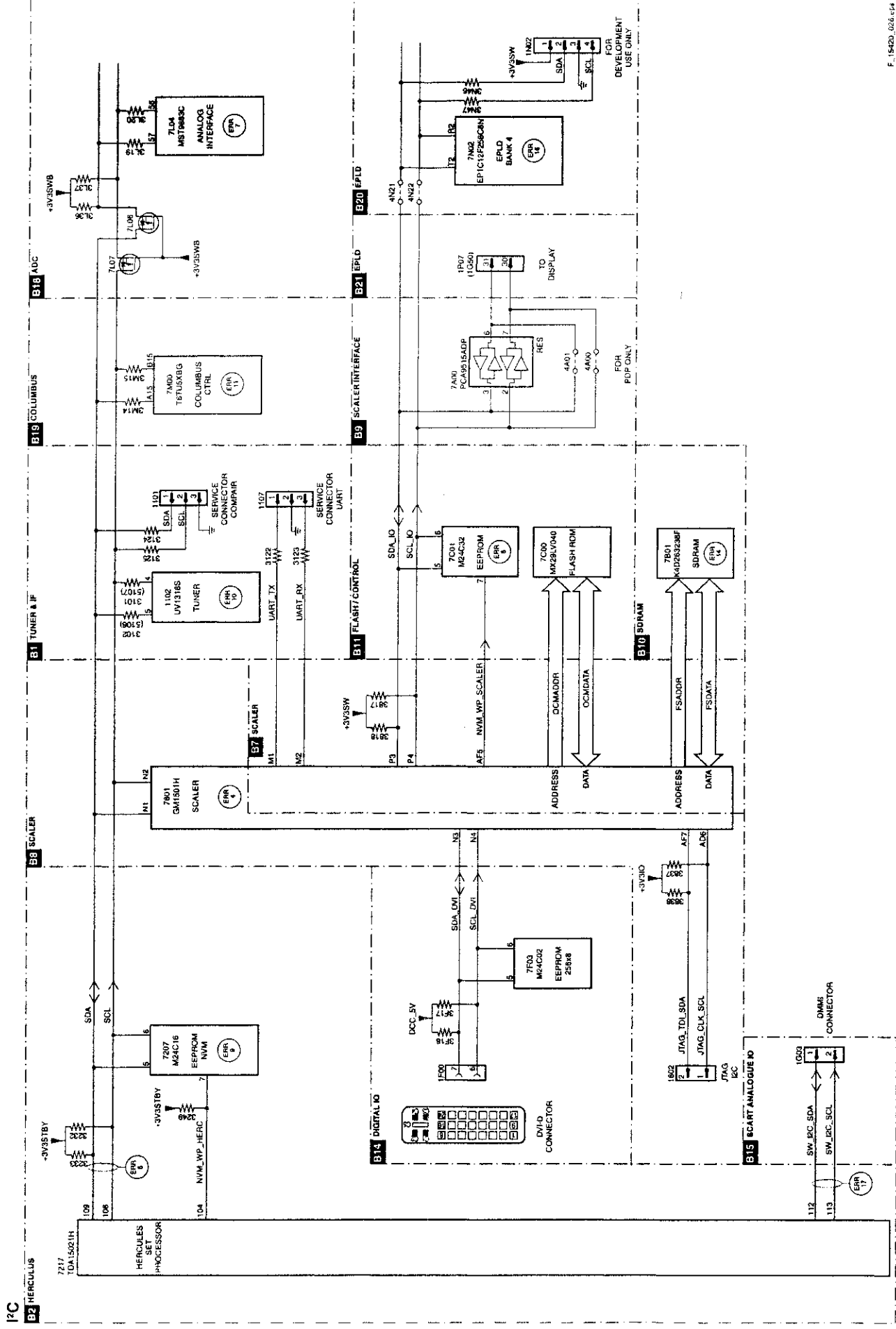
AUDIO



F101	C1	F114	C2	F210	C2	F224	A2	F237	B2	F250	B3	F710	A5	F901	C5	FQ82	B5	FD04	C7	FD17	B6	FE12	C5	FF11	D6	FG10	D2	FG23	D4	FG38	D3	FGS3	D4	FJ10	A2	FJ23	A5	FK09	C1	FN06	A7	FN19	B5	FN32	A7	FP10	A7	I106	C2	I206	B2	I219	B3	I232	A2	I246	A3	I267	B3	I285	B3	I449	A3	I604	A1	I020	C7	I662	D2
F102	D2	F115	D2	F211	A2	F225	A3	F238	B2	F501	A2	F736	A3	F902	C6	FQ83	B5	FD05	C6	FE00	C5	FE13	C5	FF12	D6	FG11	D2	FG24	D3	FG39	D4	FG54	D4	FJ11	A4	FJ24	A5	FK10	B1	FN07	A7	FN20	A7	FN33	A7	FP11	A7	I107	C2	I207	B2	I233	B3	I247	A3	I268	B3	I286	B3	I450	A3	I605	A2	I021	C7	I663	D3		
F103	C1	F116	D2	F212	A2	F226	A3	F239	B2	F502	A2	F737	A3	F903	C5	FQ84	B5	FD06	C6	FE01	C5	FF00	D6	FF13	D6	FG12	D2	FG25	D3	FG40	D7	FG56	D4	FJ12	A2	FJ25	A5	FK11	A1	FN08	A7	FN21	A7	FN34	A7	FP12	A7	I108	C2	I208	B2	I221	A2	I234	B2	I248	A3	I269	A2	I289	A2	I451	A3	I606	A2	I022	C6	I664	D3
F104	D2	F117	D2	F213	A2	F227	C3	F240	B2	F503	A2	F738	A3	F904	C6	FQ85	C5	FD07	C7	FE02	C4	FF01	D6	FG00	D4	FG13	D2	FG26	D5	FG41	D3	FJ00	A7	FJ13	A2	FJ26	A5	FM01	C4	FN09	A7	FN22	A7	FN35	A7	FP13	A6	I109	C2	I209	B2	I222	A2	I235	B2	I254	C3	I270	B3	I290	A2	I452	A3	I607	A1	I023	D6	I665	D3
F105	D1	F201	A2	F214	A2	F228	A3	F241	B3	F504	A2	F743	B3	F905	B6	FQ86	B5	FD08	C7	FE03	B5	FF02	D4	FG01	D4	FG14	D6	FG27	D5	FG42	D4	FJ01	A5	FJ14	A2	FK00	B1	FM02	C4	FN10	A7	FN23	A7	FN36	A7	FP14	A7	I110	C2	I210	A3	I224	A2	I236	B2	I255	B3	I271	A3	I291	A2	I453	A1	I608	A1	I024	C4	I666	D3
F106	D2	F202	A2	F215	A2	F229	B2	F242	B2	F505	A3	F754	A5	F906	B6	FQ87	B4	FD09	C7	FE04	D5	FF03	D7	FG02	D3	FG15	D6	FG28	D5	FG43	D4	FJ02	A4	FJ15	A7	FK01	B1	FM03	C4	FN11	B6	FN24	B6	FP02	A6	FP15	A6	I111	C1	I211	A3	I224	A3	I237	B2	I256	B3	I272	B3	I292	A2	I454	A1	I609	A1	I025	C4	I667	D3
F107	C1	F203	A2	F216	B3	F230	A3	F243	B2	F601	A1	F755	A6	F907	B5	FQ88	B6	FD10	C7	FE05	C5	FF04	D7	FG03	D4	FG16	D6	FG30	D5	FG44	D4	FJ03	A5	FJ16	A7	FK02	B1	FM04	C4	FN12	A6	FN25	B6	FP03	A6	FP16	A6	I112	D2	I212	A3	I225	A2	I238	A2	I257	B3	I273	C3	I293	A2	I455	A1	I610	A1	I026	D5	I668	D3
F108	C2	F204	B3	F218	A2	F231	A2	F244	B2	F602	A2	F900	B7	F908	C5	FC09	B5	FD11	C7	FE06	D5	FF05	D7	FG04	D3	FG17	D6	FG32	D3	FG45	D4	FJ04	A5	FJ17	A7	FK03	B1	FM05	C4	FN13	A6	FN26	A7	FP04	A6	FP17	A7	I113	D2	I213	A2	I226	B2	I239	A3	I258	B2	I274	A1	I294	A2	I456	A1	I611	B1	I027	C6	I669	D5
F109	C2	F205	B2	F219	A2	F232	B3	F245	A2	F603	A1	F901	B6	F909	C5	FD10	B4	FD12	D7	FE07	B7																																																

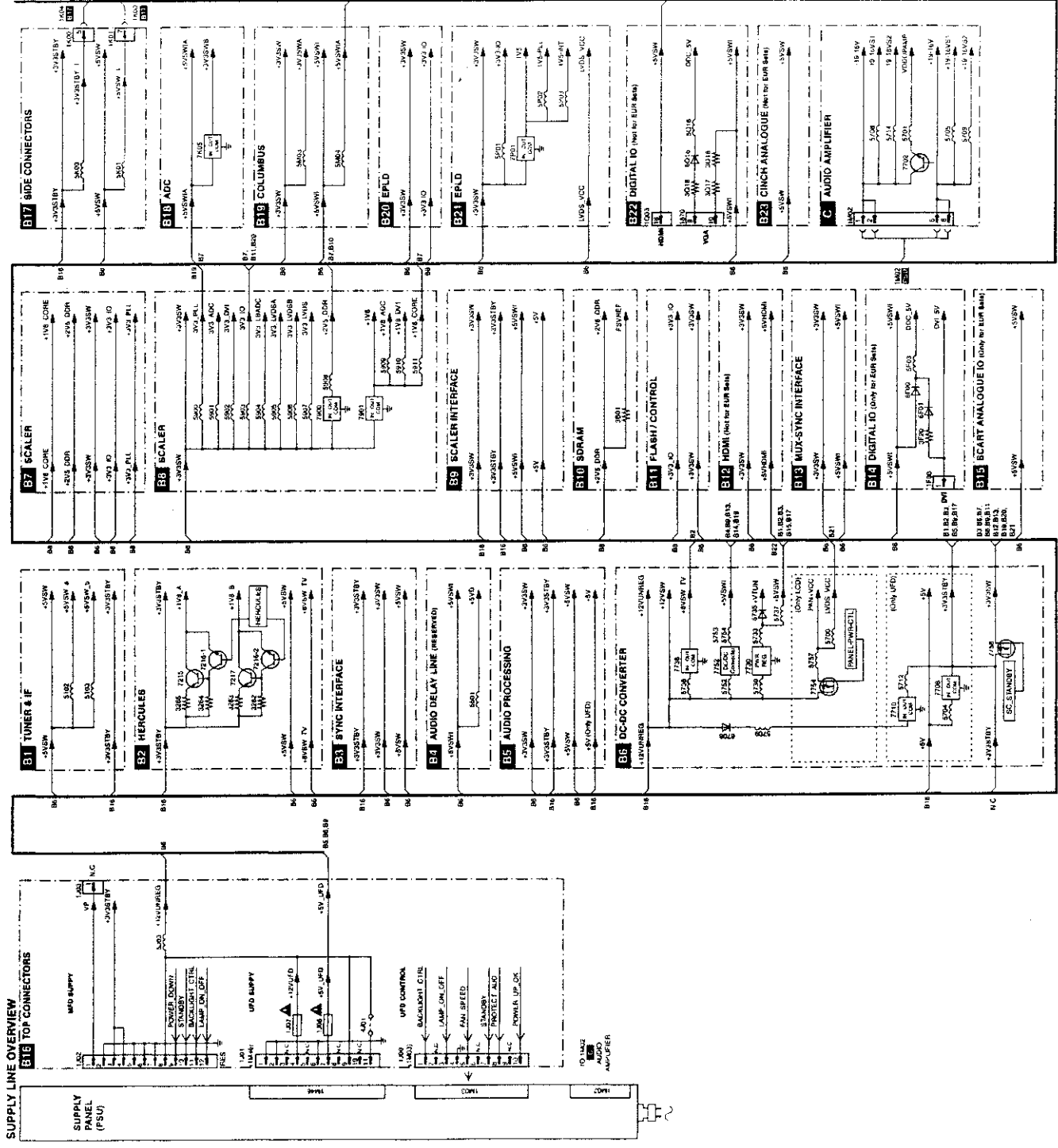


I2C IC Overview



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Supply Voltage Overview

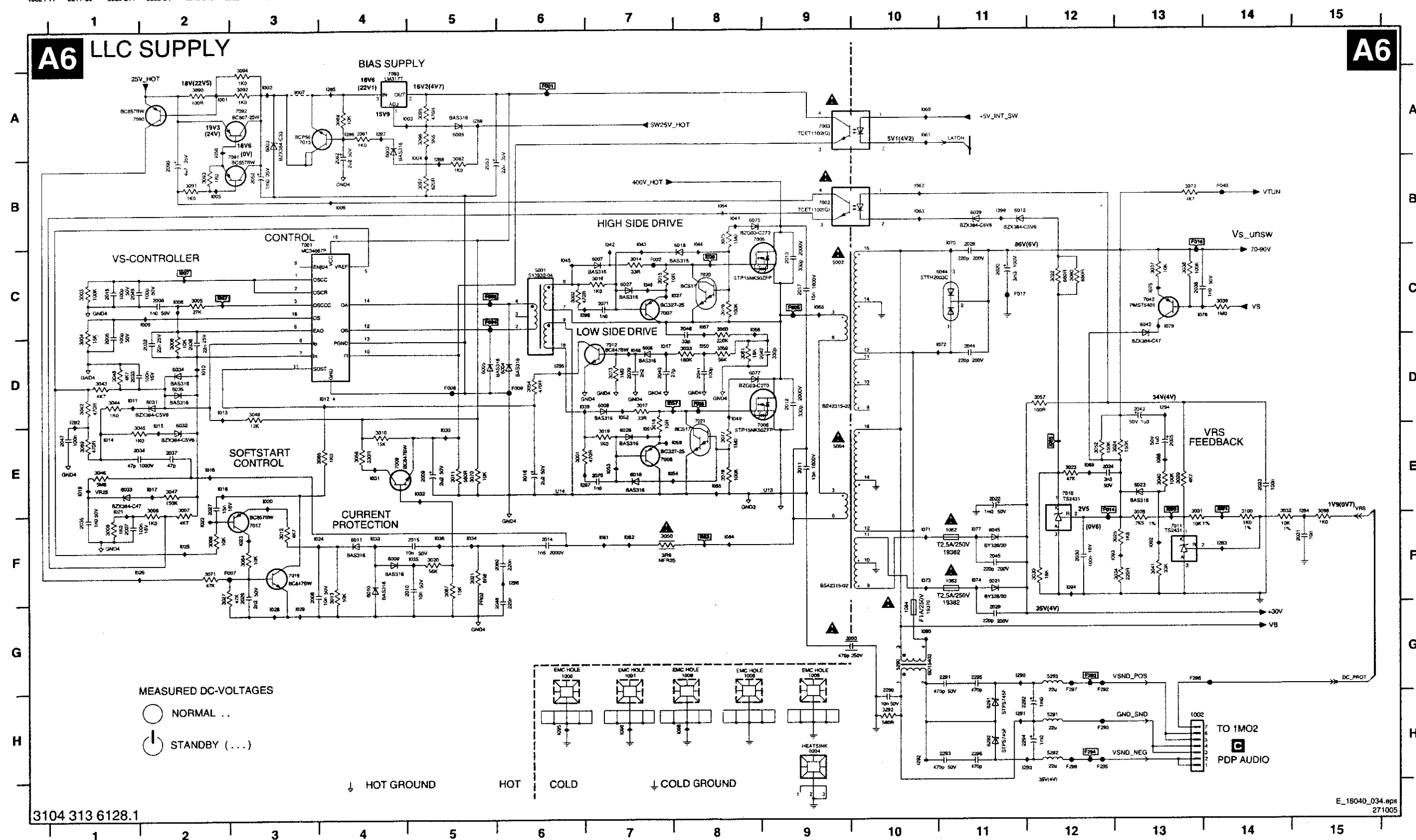


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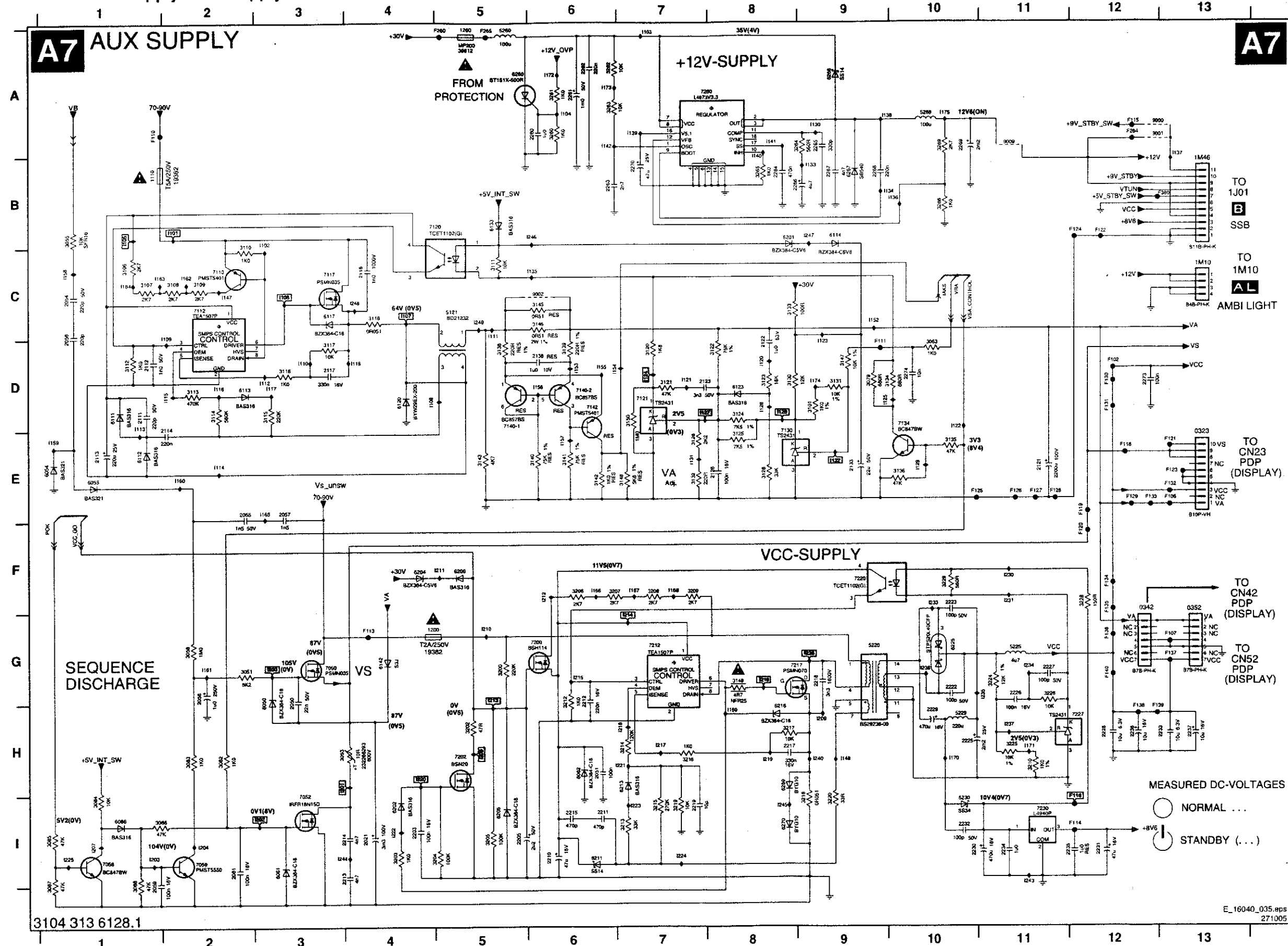


PDP FHP Supply: LLC Supply

U13 E9	1063 F11	2012 D9	2024 E12	2034 E1	2044 D11	2073 E7	3001 E5	3011 E5	3021 F5	3032 F14	3044 D1	3057 D12	3071 F2	3089 A4	3100 F14	6003 A3	6018 C6	6034 D2	7001 B3	7012 D7	7093 A4	F009 D6	F296 G13	I008 C2	I018 E2	I028 G3	I038 C8	I049 D8	I060 A10	I072 D11	I083 F8	I095 H6	I289 A5	I299 B11
U14 E6	1064 G10	2013 C9	2025 E13	2035 F1	2045 F11	2071 C7	3002 C6	3012 F3	3022 C12	3033 D8	3045 E2	3059 D8	3072 B13	3090 A2	3292 H10	6004 D6	6019 E7	6035 D2	7002 B9	7013 A3	7093 A3	F014 E12	F297 H12	I009 C2	I019 E1	I029 G3	I039 D6	I050 D6	I061 A10	I073 F10	I084 F8	I096 H7	I290 G11	
Q204 H9	2000 G9	2014 F6	2026 F3	2036 E2	2046 C8	2090 B2	3003 C1	3013 F4	3023 E12	3034 F13	3046 E1	3060 C8	3073 D7	3091 B2	5001 C8	6005 D5	6021 F11	6042 C13	7003 A9	7017 F3	F001 A6	F016 B13	F298 H12	I010 D2	I020 E3	I030 E5	I041 B8	I051 E7	I062 B10	I074 F11	I085 E12	I098 H8	I291 H11	
1000 G8	2005 C1	2015 F5	2027 E2	2037 E2	2047 E1	2290 H10	3004 C1	3014 C7	3024 E13	3037 C13	3047 E2	3061 D6	3075 B6	3092 A3	5002 C9	6006 D7	6023 E13	6044 C11	7005 B8	7018 F3	F002 C7	F017 C11	I001 A2	I011 D1	I021 E1	I031 E4	I042 B7	I052 D7	I063 B10	I075 C13	I086 E13	I292 D1	I292 H10	
1001 G7	2006 C2	2016 E6	2028 C11	2038 C13	2048 F6	2291 G11	3005 C2	3015 C7	3025 F13	3038 C13	3048 D1	3064 F3	3078 C8	3093 B2	5004 E9	6007 C7	6027 C7	6045 F11	7006 E8	7020 C8	F003 C5	F040 B14	I002 A3	I012 D4	I022 F2	I032 E5	I043 B7	I053 E7	I064 B8	I077 F11	I089 E12	I293 F14	I293 H11	
1002 H14	2007 F1	2017 C9	2029 G11	2039 D13	2049 C1	2292 H11	3006 D2	3016 C7	3027 F2	3038 C14	3049 D3	3065 E4	3077 E8	3094 A3	5290 G10	6008 D7	6028 E7	6075 B8	7007 C7	7021 D8	F004 C4	F299 H12	I003 A5	I013 D2	I023 F3	I033 F4	I044 B8	I054 E7	I065 C9	I078 C13	I090 E13	I294 E15	I294 D13	
1006 G8	2008 F3	2018 C1	2030 F12	2040 D7	2052 B3	2293 H11	3007 E2	3017 D7	3028 F13	3040 E13	3050 F7	3066 F2	3078 E8	3095 A5	5291 H12	6009 F4	6029 B11	6077 D8	7008 E7	7042 C13	F005 C9	F292 G12	I004 A5	I014 E1	I024 F3	I034 F5	I045 C6	I055 E8	I066 C8	I079 C13	I091 E14	I295 A4	I295 D6	
1008 G9	2009 E5	2020 C11	2031 F15	2041 D8	2053 B5	2294 H11	3008 E2	3018 D7	3029 F13	3041 F13	3052 E12	3067 F5	3080 C12	3096 A5	5282 H12	6010 F4	6031 D2	6095 A5	7009 E4	7090 A2	F006 D8	F293 G12	I005 B2	I015 D2	I025 F2	I035 F5	I046 C7	I056 A2	I067 C8	I080 G10	I092 F13	I296 A4	I296 F6	
1009 G8	2010 F5	2022 E11	2032 D2	2042 D9	2060 F8	2295 G11	3009 F1	3019 E7	3030 F12	3042 D1	3054 D6	3069 E1	3081 A4	3097 B5	5293 G12	6011 F4	6032 D2	6291 H11	7010 E12	7091 A3	F007 F3	F294 H12	I006 B4	I016 E2	I026 F1	I036 F5	I047 D7	I057 D7	I068 B1	I081 F7	I093 F12	I297 A4	I297 E7	
1062 F11	2011 E9	2023 E14	2033 D1	2043 D13	2062 A4	2296 H11	3010 E4	3020 F5	3031 F13	3043 D1	3056 E4	3070 E5	3082 B5	3098 F15	6002 A4	6012 B11	6033 E1	6292 H11	7011 F13	7092 A3	F008 D5	F295 H12	I007 C2	I017 E2	I027 C2	I037 C8	I048 D7	I058 E8	I071 F10	I082 F7	I094 F12	I298 B5	I298 C7	



A7 AUX SUPPLY

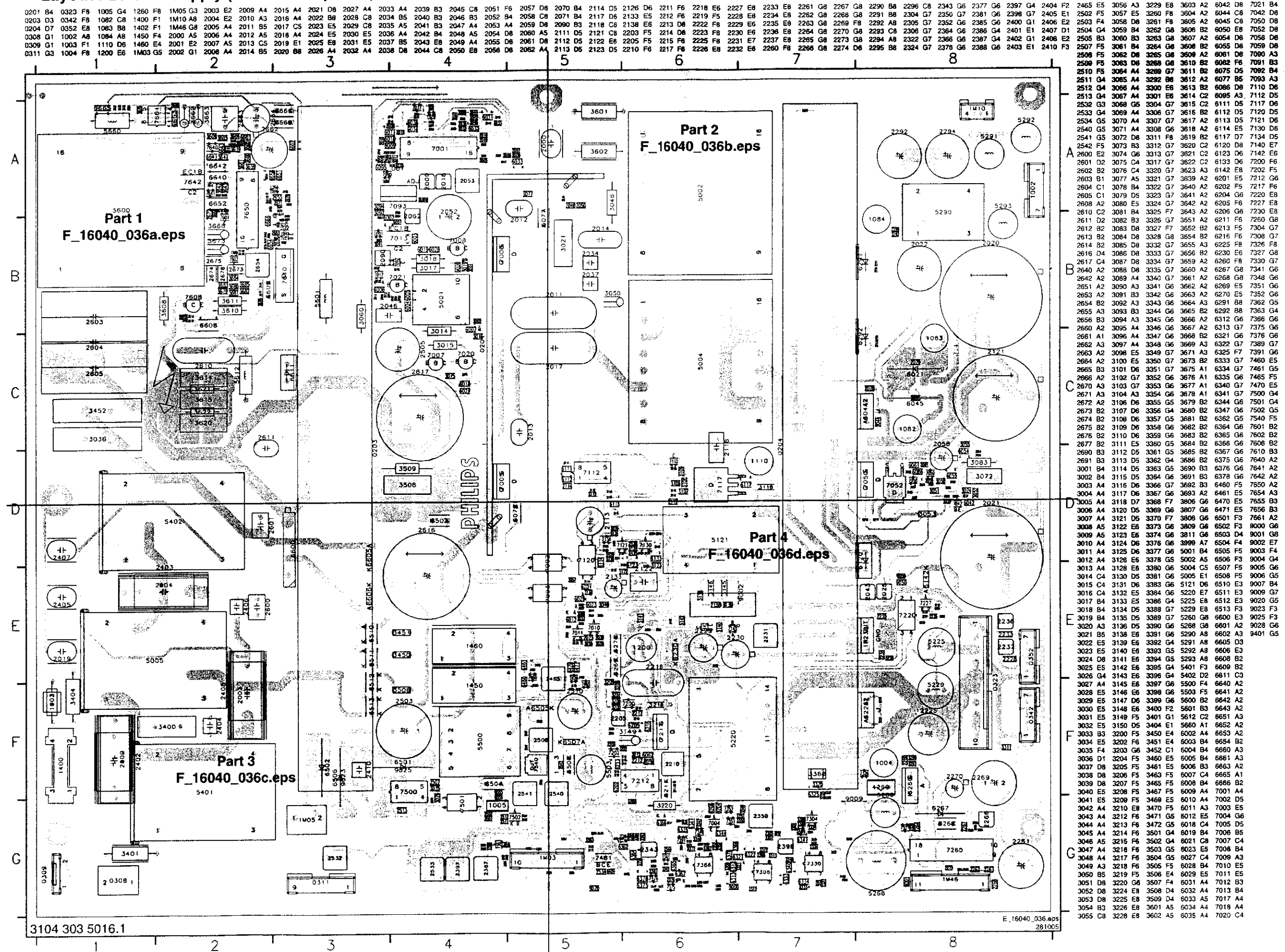


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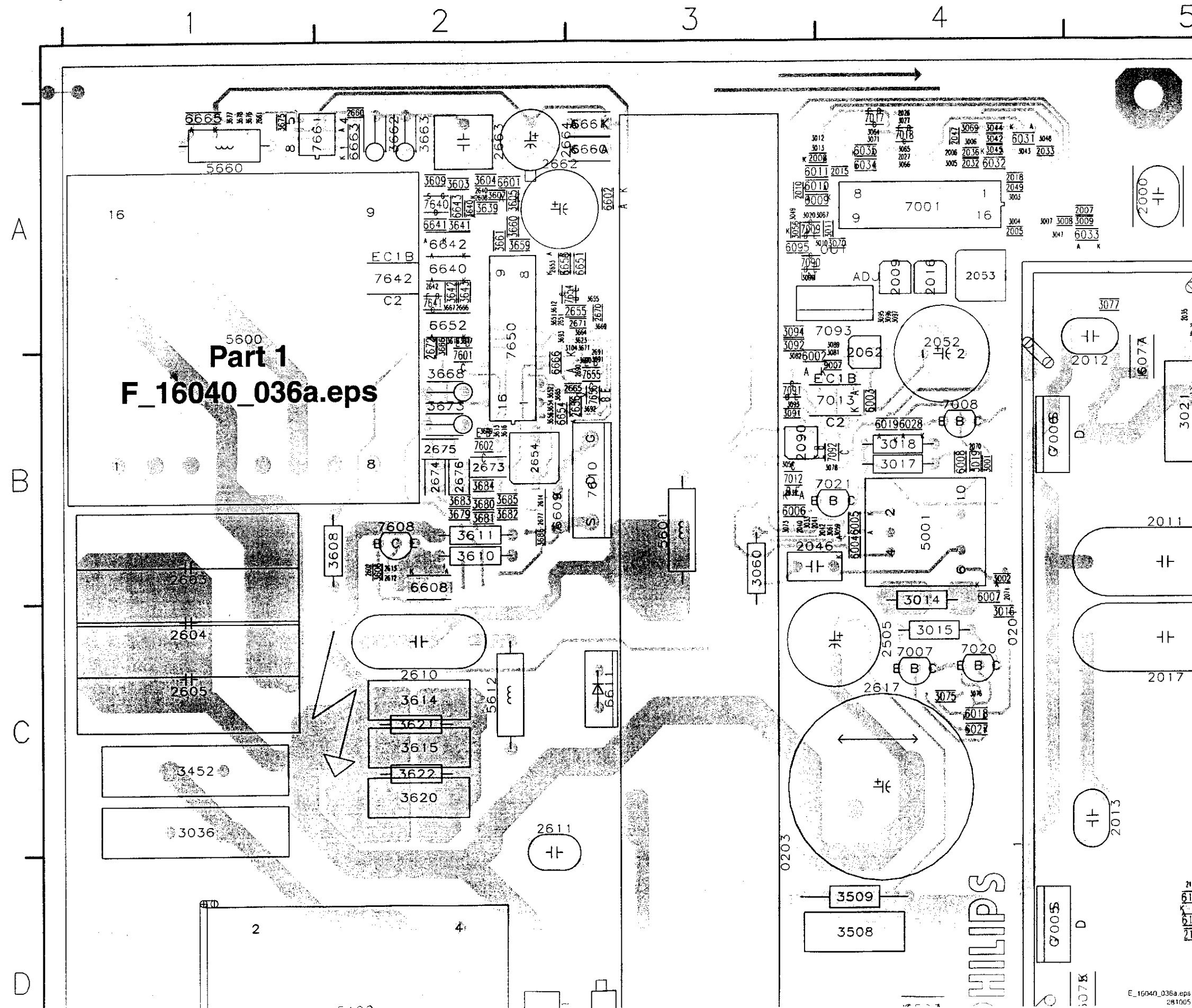
271005

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0342 G12	1357 D11	F137 G13
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1110 B1	1200 G5	F139 H12
1200 G4	3203 H4	F140 G12
1260	3202 H5	F280 A5
1300 C13	3203 F5	F280 B5
1446 G13	3205 F5	F285 A5
2021 W4	3206 F6	F380 B13
2050 G3	3207 F6	1101 B2
2051 H6	3208 F7	1102 B3
2052 H6	3210 F7	1103 A7
2055 E2	3210 H11	1104 A6
2058 C1	3212 G6	1106 B1
2057 E3	3213 I7	1106 C3
2058 G2	3214 H7	1107 C4
2061 H1	3217 F7	1108 C4
2061 E2	3216 H7	1109 C2
2111 D1	3217 H6	1110 D3
2112 E1	3218 I9	1111 C5
2113 D1	3219 I7	1112 D3
2115 E2	3220 H9	1113 D2
2117 D3	3224 G11	1114 E2
2118 C4	3225 H11	1115 D2
2121 E1	3226 G11	1116 D2
2122 D6	3228 F12	1117 D3
2123 D7	3229 F10	1118 D4
2124 H6	3230 A6	1200 D8
2133 E9	3261 A6	1217 D7
2138 D6	3262 A6	1222 D10
2203 J4	3263 A6	1232 D9
2205 J5	3264 A9	1242 D7
2210 H6	3265 A6	1243 D7
2211 W6	3268 B10	1248 D8
2212 G6	3269 A10	1247 D7
2213 J4	3121 C5	1248 D8
2214 J4	5220 G9	1249 E10
2215 H6	5221 H10	1250 E7
2217 H8	5222 H11	1317 E7
2218 G9	5260 A5	1312 E9
2219 I7	5268 A10	1333 B9
2222 G10	6050 G3	1314 B10
2223 H10	6050 E1	1315 D4
2226 G11	6061 I3	1317 B13
2227 G11	6062 H6	1338 A9
2228 H12	6086 I1	1339 A7
2229 H12	6100 E1	1353 C11
2231 H10	6112 E1	1411 B8
2231 I12	6113 D2	1412 A6
2232 H10	6114 B9	1417 C2
2233 H13	6117 C3	1418 B9
2234 H12	6120 A10	1419 D3
2235 H12	6123 D8	1425 C9
2236 H12	6133 B5	1454 D6
2237 H13	6142 G4	1455 D6
2260 A6	6201 S8	1456 D6
2261 A6	6202 J4	1557 E8
2262 A6	6203 E1	1558 C1
2263 H6	6205 B5	1559 E1
2264 S8	6206 F5	1560 E2
2265 A9	6211 H6	1611 G2
2266 H8	6213 H7	1622 C2
2267 H9	6218 H11	1653 C11
2268 B9	6225 G10	1654 C11
2269 A10	6230 B10	1661 C1
2270 S7	6260 A5	1666 F6
2273 D12	6267 S8	1668 F7
2274 H9	6268 A9	1669 H7
3051 C2	6269 H8	1669 H8
3053 H3	6270 I8	1710 H10
3055 B1	6271 E10	1711 H11
3056 G2	7050 G3	1712 A6
3057 H9	7052 B3	1713 A6
3063 D10	7053 B3	1714 D9
3069 D9	7059 E2	1715 A10
3083 H2	7060 B11	1716 B10
3064 H1	7060 B12	1717 B11
3065 H1	7061 C11	1718 B11
3066 H1	7110 E2	1719 B11
3067 H1	7112 C2	180 B11
3068 H1	7117 C3	1811 C11
3069 D9	7120 B5	1200 G3
3106 C1	7121 D7	2001 H3
3107 H1	7130 E9	2012 C3
3108 D10	7134 D10	2031 I1
3109 C2	7140 D15	2042 E2
3110 C2	7140 Z D6	2071 I1
3111 C5	7142 D6	2080 H5
3112 H9	7200 C6	2100 H9
3113 C3	7202 H5	2105 G5
3114 D2	7212 G7	2111 F5
3115 G3	7217 G8	212 E6
3116 C3	7220 F9	213 G5
3117 H12	7221 D7	214 G7
3118 C4	7220 H11	215 G6
3120 D7	7260 A6	216 G8
3121 D7	9000 A12	217 H7
3122 D8	9001 A5	218 H7
3123 D8	9002 C5	219 H8
3124 D8	9005 A11	220 H8
3125 E8	9009 A12	221 H7
3126 E7	F106 E13	222 J4
3128 E8	F107 C13	223 I7
3129 E8	F110 A1	224 I7
3130 E8	F110 D9	225 I11
3132 E7	F113 G4	230 F11
3133 C8	F114 I12	231 F11
3134 D10	F115 I12	233 G10
3135 E10	F116 I12	234 G11
3136 E10	F117 I12	235 G11
3138 D5	F119 E12	236 G9
3139 G6	F120 F12	237 H11
3140 E6	F122 E13	238 G10
3141 E8	F122 B12	240 H9
3142 E8	F123 E13	241 H11
3143 E5	F124 B12	244 B3
3145 E6	F125 E10	245 H8
3146 C6	F126 E11	246 B6
3147 D9	F127 E11	247 B9
3148 E8	F128 E11	248 C4
3149 E8	F129 E12	249 C5
3150 D7	F130 D12	
3151 B10	F131 D12	
3152 B11	F132 D12	
3153 B11	F133 D12	
3154 B11	F134 D12	
3155 C11	F135 F12	

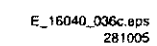
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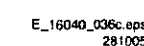
Layout PDP FHP Supply (Part 1 Top Side)



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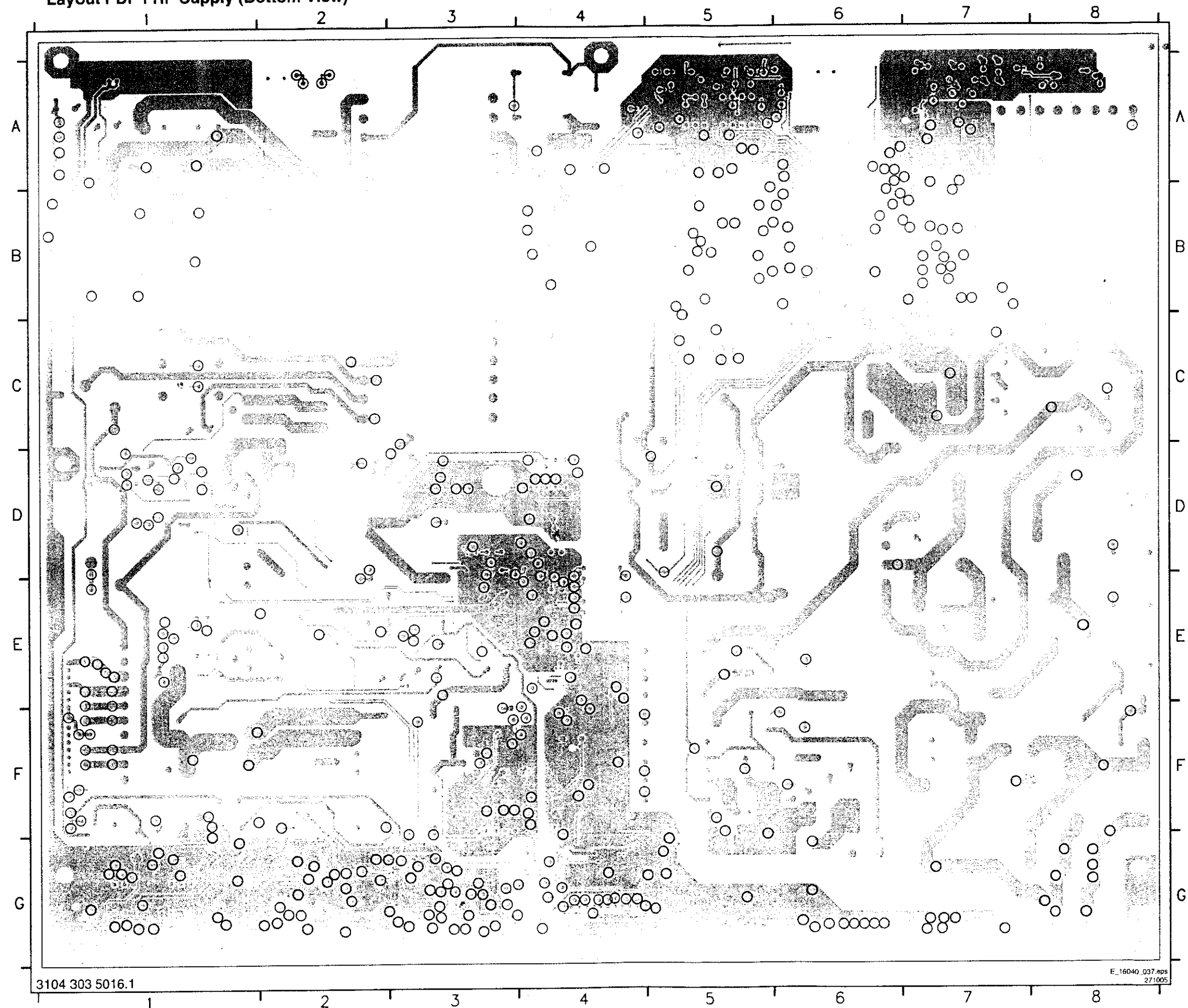


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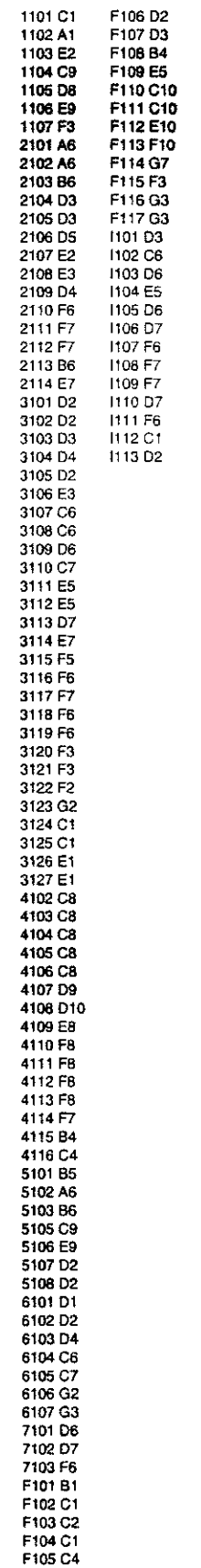


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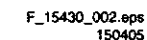
Layout PDP FHP Supply (Bottom View)



B1 TUNER & IF

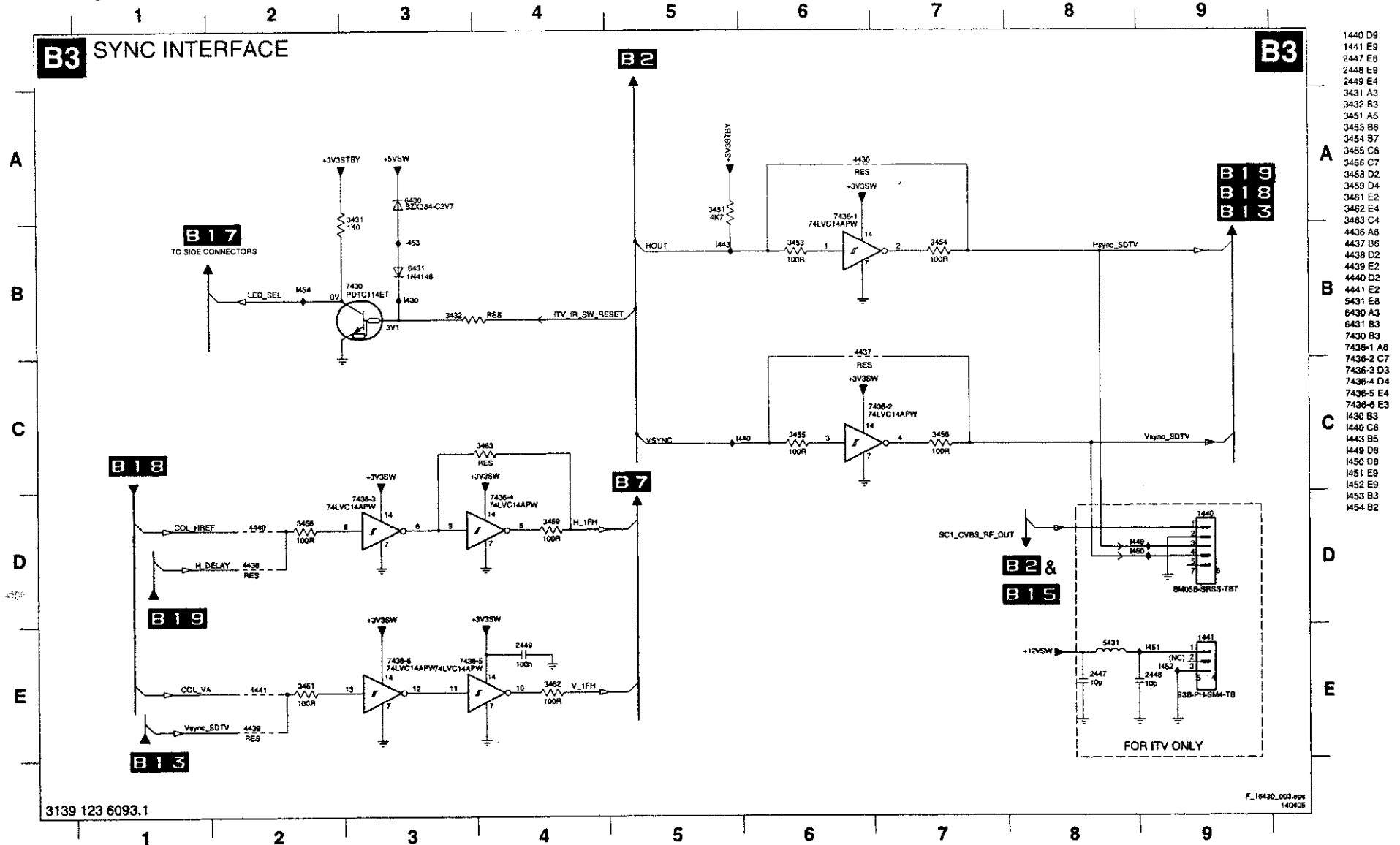


B2 HERCULES

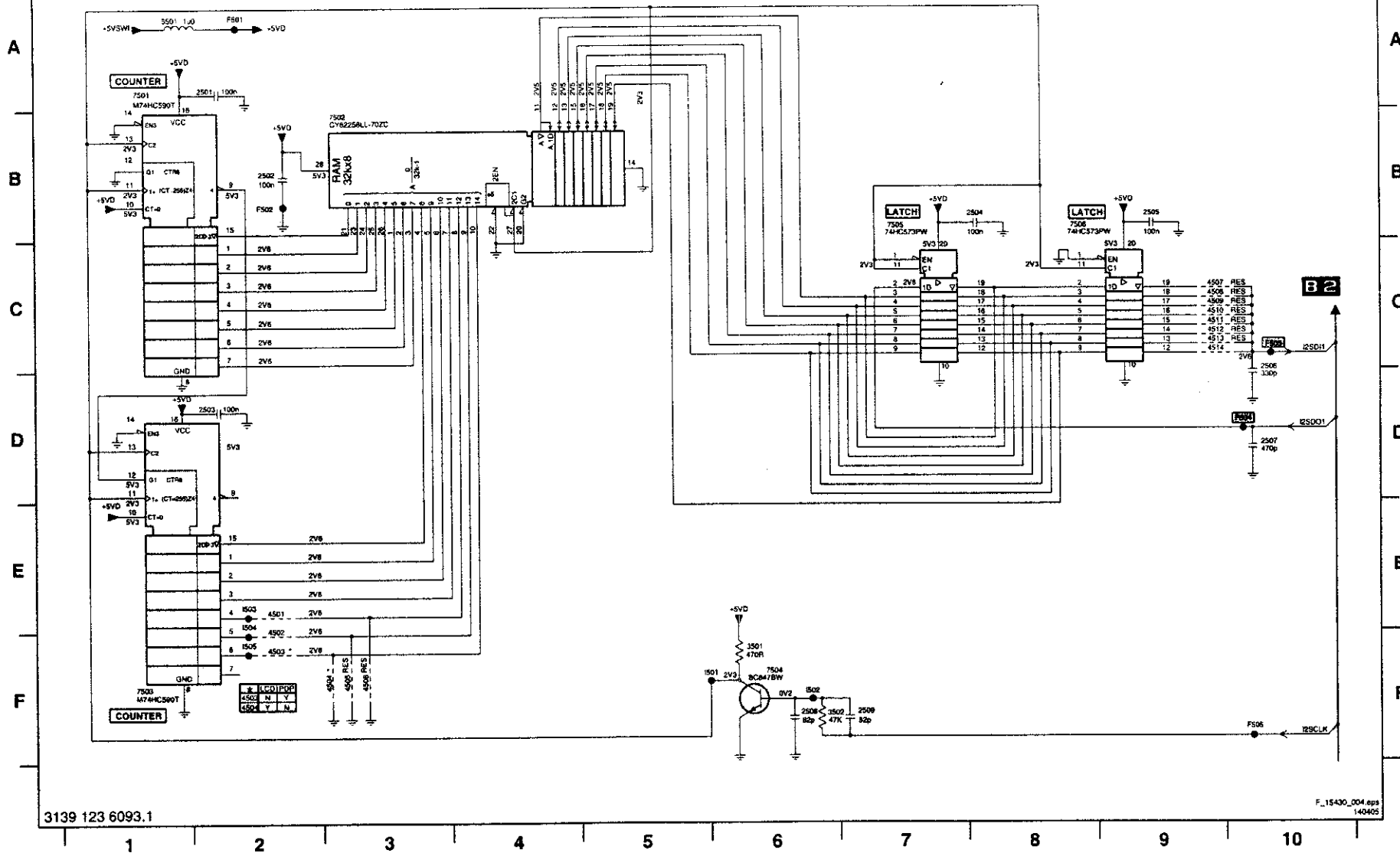


1201 B7	3215 96	5209 D5	1216 C10
1202 G10	3216 A6	5210 D5	1217 C11
1202 A3	3217 B7	5212 E5	1218 D3
1202 B3	3218 B7	5212 E5	1219 C5
1203 D2	3219 B7	5213 E5	1220 D5
1205 C4	3220 B7	5214 G9	1221 D5
1206 G4	3222 B6	5215 F10	1222 D5
1207 F5	3223 B6	5216 F10	1223 D6
1208 G4	3224 B8	5217 H7	1224 E5
1209 G4	3225 B8	5218 F2	1225 C10
1210 B6	3226 B9	6201 E4	1226 F8
1211 B6	3227 C8	6204 C11	1227 F6
1214 B6	3228 D2	6205 C11	1228 F7
1216 B6	3229 C9	6206 C12	1229 F7
1218 A7	3230 B9	7201-1 B1	1230 F7
1219 A7	3231 B9	7201-2 C2	1231 F7
1220 B7	3232 B9	7202-1 C2	1232 F8
1221 A7	3233 B9	7202-2 C3	1233 F8
1223 B8	3234 B9	7203-1 C3	1234 F8
1224 C8	3235 B9	7203-2 C3	1235 F8
1225 B10	3236 B9	7204-1 A3	1236 F8
1226 C10	3237 C9	7204-2 A3	1237 F8
1227 B11	3238 C10	7205-1 B4	1238 F9
1228 C5	3239 C10	7205-2 B4	1239 F9
1229 C5	3240 B10	7206 B6	1240 F10
1230 B5	3241 B10	7207 B11	1241 B10
1231 D5	3242 C10	7208 D2	1242 F4
1232 D5	3243 C10	7209 D2	1243 C4
1233 D5	3244 D2	7210 D3	1244 B7
1234 D4	3245 C10	7211 F4	1245 D2
1235 D4	3246 C11	7214 G3	1247 D4
1236 D5	3247 B11	7215 G4	1248 D4
1237 D5	3248 B11	7216-1 G3	1254 F6
1238 D5	3249 A11	7216-2 G3	1255 F6
1239 E5	3250 D2	7217 C6	1256 E7
1240 E5	3251 D3	7218 F11	1257 E7
1241 E5	3252 D3	7219 F2	1258 E7
1242 E5	3253 D3	7201 B2	1259 F8
1243 E5	3254 F3	7202 B2	1262 F8
1244 E5	3255 E2	7203 B3	1264 F9
1245 E5	3256 E2	7204 B3	1265 F10
1246 F5	3257 E3	7205 B6	1266 F10
1247 F6	3258 E2	7206 B6	1267 F11
1248 G6	3259 E2	7207 C7	1268 G11
1249 G6	3260 E3	7208 C7	1269 B11
1250 F7	3262 F3	7209 B7	1270 B11
1251 F7	3263 F3	7210 F1	1271 B10
1252 F7	3264 F4	7211 C9	1272 B10
1253 F7	3265 F4	7212 C8	1273 C9
1254 F7	3266 F4	7213 C10	1274 A9
1255 F7	3267 F4	7214 C10	1275 A9
1256 F8	3268 F5	7215 C10	1277 C8
1257 F8	3270 F7	7216 C10	1278 C8
1258 G5	3271 F7	7218 A11	1283 B6
1259 G8	3272 F8	7219 B12	1284 B6
1260 F8	3273 F8	7220 D3	1285 B6
1262 G8	3274 F8	7221 D3	1288 B6
1263 F8	3275 F9	7222 D5	1289 A3
1264 G8	3276 F9	7223 D5	1290 A3
1265 G8	3277 F10	7224 F5	1291 A4
1266 G8	3278 F11	7225 D5	1292 B3
1267 F8	3279 G11	7226 D5	1293 B3
1268 G8	3280 E4	7227 A4	1294 B3
1269 F9	3281 F8	7228 E5	1297 B6
1270 F9	3282 F3	7229 E5	1298 C7
1271 F9	3283 B8	7230 G4	
1272 F9	3284 B8	7231 G4	
1273 F10	3285 G6	7232 F5	
1274 F10	3286 G6	7233 F5	
1275 G9	3287 B7	7234 F5	
1276 G10	3288 B7	7235 F5	
1277 F10	3289 D2	7236 F6	
1278 F11	3290 B8	7237 F6	
1279 F11	3291 F2	7238 F6	
1280 A3	3292 F2	7239 F6	
1281 B3	3293 G2	7240 F6	
1282 F10	3294 G2	7241 G7	
1283 F10	3295 F8	7242 G7	
1284 F10	3296 B5	7243 G7	
1285 F6	4201 F5	7244 F8	
1286 F7	4202 F5	7245 F9	
1287 H7	4203 F5	7246 F10	
1288 H6	4204 C9	7247 D11	
1289 F3	4205 C9	7248 F8	
1290 F2	4206 F3	7249 E11	
1292 E11	4207 E2	7250 A7	
1293 C10	4208 E2	1201 A5	
1201 A3	4209 E3	1202 B5	
1202 A4	4211 A4	1203 B6	
1203 A4	4212 B4	1204 B6	
1204 B3	4213 F5	1205 B6	
1205 B4	4214 F5	1206 A7	
1206 B4	4215 F5	1207 C7	
1207 B6	5201 B5	1208 B7	
1208 B6	5202 B5	1209 C8	
1209 B8	5203 B7	1210 C8	
1210 B6	5204 D5	1211 B8	
1211 B8	5205 D5	1212 B9	
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1214 B7	5208 D5	1215 C10	

SSB: Sync Interface

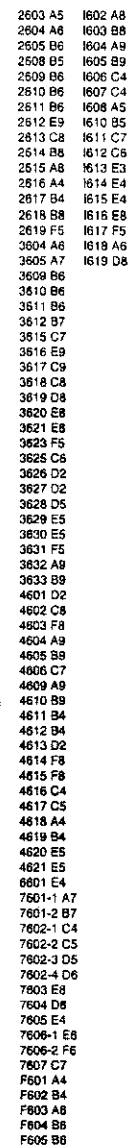


SSB: Audio Delay line (Reserved)

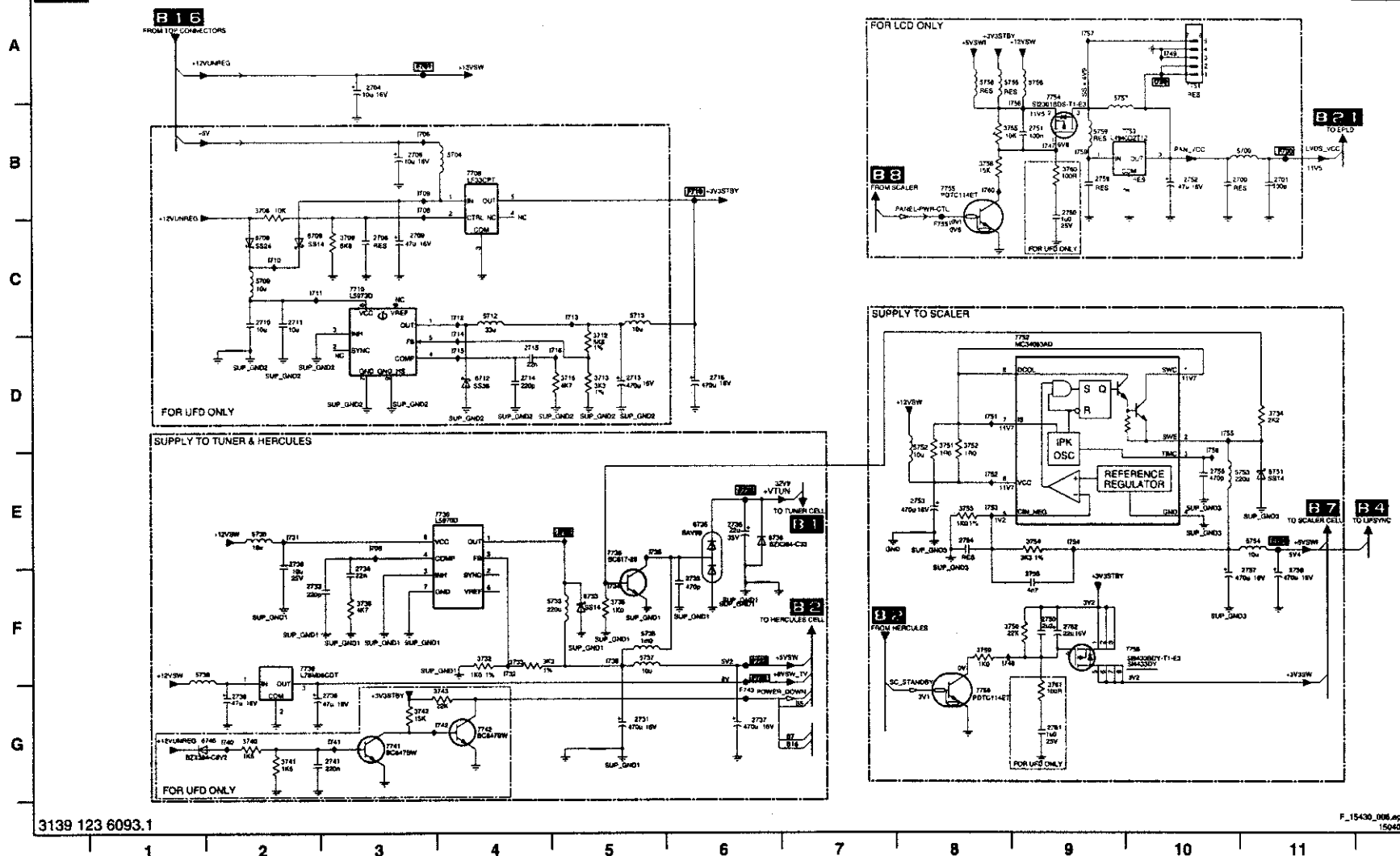
B4 AUDIO DELAY LINE (RESERVED)**B4**

2501 A2
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2503 D2
2504 B8
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2506 C10
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2508 F6
2509 F7
3501 F6
4501 E2
4502 F2
4503 F2
4504 F3
4505 F3
4506 F3
4507 C9
4508 C9
4509 C9
4510 C9
4511 C9
4512 C9
4513 C9
4514 C9
5501 A1
5501 A1
7501 A1
7502 B3
7503 F1
7504 F8
7505 B7
7506 B8
F501 A2
F502 B2
F503 C10
F504 D10
F505 F10
I501 F5
I502 F6
I503 E2
I504 E2
I505 F2

B5 AUDIO PROCESSING



B6 DC-DC CONVERTER



1751 A10 7735 F2
2700 B11 7741 G3
2701 B11 7742 G4
2704 A3 7752 D9
2705 B11 7753 B10
2706 C3 7754 A9
2709 C3 7755 B8
2710 C2 7756 A0
2712 C2 7758 F11
2713 A2 7759 B10
2714 A4 7701 A3
2715 A4 7701 B8
2716 D6 7738 E5
2717 C1 7737 F5
2731 E5 7738 F8
2732 F2 7743 G5
2734 E3 7754 E1
2735 F8 7755 C8
2736 C3 7705 E3
2737 C6 7706 B3
2738 C2 7708 B0
2739 C3 7709 B3
2740 C3 7710 C2
2750 P9 7711 C2
2751 B9 7712 C4
2752 E10 7713 C5
2753 E8 7714 C3
2754 B1 7715 D4
2755 P9 7718 D5
2756 E10 7721 E2
2757 E11 7722 P4
2758 E8 7723 E5
2759 B8 7734 F5
2760 B9 7735 E5
2761 G9 7736 F5
2762 B1 7740 C2
2769 B2 7741 G3
2769 C3 7742 A4
2772 C5 7743 B8
2773 C5 7744 B8
2775 D6 7748 A1
2776 D6 7749 A1
2778 F4 7750 A1
2782 F4 7751 D6
2783 D1 7752 E8
2784 F5 7753 E9
2785 F9 7754 E9
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2787 F9 7756 B8
2788 F9 7757 B8
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2894 C2 7864 A9
2895 C2 7865 A9
2896 C2 7866 A9
2897 C2 7867 A9
2898 C2 7868 A9
2899 C2 7869 A9
2900 C2 7870 A9
2901 C2 7871 A9
2902 C2 7872 A9
2903 C2 7873 A9
2904 C2 7874 A9
2905 C2 7875 A9
2906 C2 7876 A9
2907 C2 7877 A9
2908 C2 7878 A9
2909 C2 7879 A9
2910 C2 7880 A9
2911 C2 7881 A9
2912 C2 7882 A9
2913 C2 7883 A9
2914 C2 7884 A9
2915 C2 7885 A9
2916 C2 7886 A9
2917 C2 7887 A9
2918 C2 7888 A9
2919 C2 7889 A9
2920 C2 7890 A9
2921 C2 7891 A9
2922 C2 7892 A9
2923 C2 7893 A9
2924 C2 7894 A9
2925 C2 7895 A9
2926 C2 7896 A9
2927 C2 7897 A9
2928 C2 7898 A9
2929 C2 7899 A9
2930 C2 7900 A9
2931 C2 7901 A9
2932 C2 7902 A9
2933 C2 7903 A9
2934 C2 7904 A9
2935 C2 7905 A9
2936 C2 7906 A9
2937 C2 7907 A9
2938 C2 7908 A9
2939 C2 7909 A9
2940 C2 7910 A9
2941 C2 7911 A9
2942 C2 7912 A9
2943 C2 7913 A9
2944 C2 7914 A9
2945 C2 7915 A9
2946 C2 7916 A9
2947 C2 7917 A9
2948 C2 7918 A9
2949 C2 7919 A9
2950 C2 7920 A9
2951 C2 7921 A9
2952 C2 7922 A9
2953 C2 7923 A9
2954 C2 7924 A9
2955 C2 7925 A9
2956 C2 7926 A9
2957 C2 7927 A9
2958 C2 7928 A9
2959 C2 7929 A9
2960 C2 7930 A9
2961 C2 7931 A9
2962 C2 7932 A9
2963 C2 7933 A9
2964 C2 7934 A9
2965 C2 7935 A9
2966 C2 7936 A9
2967 C2 7937 A9
2968 C2 7938 A9
2969 C2 7939 A9
2970 C2 7940 A9
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2991 C2 7961 A9
2992 C2 7962 A9
2993 C2 7963 A9
2994 C2 7964 A9
2995 C2 7965 A9
2996 C2 7966 A9
2997 C2 7967 A9
2998 C2 7968 A9
2999 C2 7969 A9
3000 C2 7970 A9
3001 C2 7971 A9
3002 C2 7972 A9
3003 C2 7973 A9
3004 C2 7974 A9
3005 C2 7975 A9
3006 C2 7976 A9
3007 C2 7977 A9
3008 C2 7978 A9
3009 C2 7979 A9
30

SSB: Diversity Tables B1-B6

B1 TUNER & IF

Item	AP - non China	Europe	NAFTA	AP - DVB	Europe - DVB	China	Description
1102						V	TUN V-HU PLL IEC 80GDM B
1102	V						TUN V-HU PLL IEC 80GDM B
1102		V					TUNER LV1338/A F S H-4
1102	V						TUNER LV1316/A I H-4
1102			V				TUNER LV131850/A CP H H-4
1104		V		V			FIL SAW SM 38MHz OFWK3953L R
1104			V			V	FIL SAW SM 38MHz OFWK3956L R
1104		V					FIL SAW SM 45MHz OFWK1967L R
1104	V		V				FIL SAW SM 38MHz OFWK265L R
1105				V			FIL SAW SM 38MHz OFWK3953L R
1106	V			V			FIL SAW SM 38MHz OFWK966L R
1106				V			FIL SAW SM 38MHz OFWK3953L R
1106	V		V				FIL SAW SM 38MHz OFWK3953L R
3101	V	V		V			RST SM 0603 100R PMS COL
3102	V	V		V			RST SM 0603 100R PMS COL
3104	V	V		V			RST SM 0603 10K PMS COL
3104	V	V	V	V			RST SM 0603 JUMP 0R05 COL
3107	V	V	V	V			RST SM 0603 8R PMS COL
3108	V	V	V	V			RST SM 0603 2K PMS COL
3109	V	V	V	V			RST SM 0603 2K PMS COL
3110	V	V	V	V			RST SM 0603 2K PMS COL
3111	V	V	V	V			RST SM 0603 2K PMS COL
3112	V	V	V	V			RST SM 0603 1K PMS COL
3113	V	V	V	V			RST SM 0603 2K PMS COL
3114	V	V	V	V			RST SM 0603 47K PMS COL
4102	V	V	V	V			RST SM 0603 JUMP 0R05 COL
4103	V	V	V	V			RST SM 0603 JUMP 0R05 COL
4104	V	V	V	V			RST SM 0603 JUMP 0R05 COL
4106	V	V	V	V			RST SM 0603 JUMP 0R05 COL
4107	V	V	V	V			RST SM 0603 JUMP 0R05 COL
4108	V	V	V	V			RST SM 0603 JUMP 0R05 COL
4110	V	V	V	V			RST SM 0603 JUMP 0R05 COL
4111	V	V	V	V			RST SM 0603 JUMP 0R05 COL
4113	V	V	V	V			RST SM 0603 JUMP 0R05 COL
5101	V	V	V	V			FXDIND SM 0805 0U39 PM10 COL R
5101	V	V	V	V			FXDIND SM 0805 0U66 PM10 COL R
5102	V	V	V	V			FXDIND SM 0805 12U PM10 COL R
5102	V	V	V	V			FXDIND SM 1008 6U8 PMS COL R
5107	V	V	V	V			FXDIND 0803 100MHz 800R COL R
5107	V	V	V	V			RST SM 0603 100R PMS COL
5108	V	V	V	V			FXDIND 0803 100MHz 800R COL R
5108	V	V	V	V			RST SM 0603 100R PMS COL
6103	V	V	V	V			DIO SIG SM BAS318 (COL) R
6105	V	V	V	V			DIO SIG SM 1S3356 (RHMD) R
7101	V	V	V	V			TRA SIG SM BC847BW (COL) R
7102	V	V	V	V			TRA SIG SM BC847BW (COL) R

B2 HERCULES

Item	LC4.3A AB (DVB-T)	LC4.3E ABULCA SE AB (DVB-T)	LC4.3U/L	LC4.3E/LCA/CA/RE/LCA SE	LC4.3E WFO 3D COMB FILTER	LC4.3A - CHINA	LC4.3A - AP (non-China)	Description
2203	V	V	V	V	V			ELCAP SM 16V 10U PM20 COL R
2229	V	V	V	V	V			CER2 0805 XSR 6V3 10U PM10 R
2244	V	V	V	V	V			CER2 0402 Y5V 18V 100N COL
2245	V	V	V	V	V			CER2 0402 Y5V 18V 100N COL
2246	V	V	V	V	V			CER1 0402 Y5V 16V 100N COL
2255	V	V	V	V	V			CER2 0402 Y5V 16V 100N COL
2256	V	V	V	V	V			CER2 0402 Y5V 16V 100N COL
2259	V	V	V	V	V			CER2 0805 Y5V 10V 4U7 PR020 R
2289	V	V	V	V	V			RST SM 0603 150R PMS COL
2290	V	V	V	V	V			CER2 0805 Y5V 10V 4U7 PR020 R
2291	V	V	V	V	V			CER2 0402 Y5V 18V 100N COL
2292	V	V	V	V	V			CER2 0402 Y5V 16V 100N COL
3250	V	V	V	V	V			RST SM 0603 100R PMS COL
3251	V	V	V	V	V			RST SM 0402 100R PMS COL
3252	V	V	V	V	V			RST SM 0403 100R PMS COL
3253	V	V	V	V	V			RST SM 0403 100R PMS COL
3255	V	V	V	V	V			RST SM 0402 JUMP 0R05 COL
3256	V	V	V	V	V			RST SM 0402 JUMP 0R05 COL
3257	V	V	V	V	V			RST SM 0402 JUMP 0R05 COL
3258	V	V	V	V	V			RST SM 0402 1K PMS COL
3259	V	V	V	V	V			RST SM 0402 1K PMS COL
3260	V	V	V	V	V			RST SM 0402 1K PMS COL
3270	V	V	V	V	V			RST SM 0402 10K PMS COL
3282	V	V	V	V	V			RST SM 0603 150R PMS COL
3285	V	V	V	V	V			RST SM 0402 JUMP 0R05 COL
3286	V	V	V	V	V			RST SM 0402 100R PMS COL
3291	V	V	V	V	V			RST SM 0402 47K PMS COL
3292	V	V	V	V	V			RST SM 0402 12K PMS COL
3292	V	V	V	V	V			RST SM 0402 47K PMS COL
3293	V	V	V	V	V			RST SM 0402 47K PMS COL
3294	V	V	V	V	V			RST SM 0402 47K PMS COL
3295	V	V	V	V	V			RST SM 0402 100K PMS COL
3296	V	V	V	V	V			RST SM 0402 100R PMS COL
4206	V	V	V	V	V			RST SM 0805 JUMP 0R05 COL R
4213	V	V	V	V	V			RST SM 0402 JUMP 0R05 COL
4214	V	V	V	V	V			RST SM 0402 JUMP 0R05 COL
4215	V	V	V	V	V			RST SM 0402 JUMP 0R05 COL
5216	V	V	V	V	V			IND FXD 1206 EM 100MHz 120R R
6206	V	V	V	V	V			DIO SIG SM BAT54 SOD323 COL R
7208	V	V	V	V	V			TRA SIG SM BC847BW (COL) R
7209	V	V	V	V	V			TRA SIG SM BC847BW (COL) R
7210	V	V	V	V	V			TRA SIG SM BC847BW (COL) R
7217	V	V	V	V	V			IC SM TDA1501H4N1820 (PHSE) Y
7217	V	V	V	V	V			IC SM TDA1502H4N1891 (PHSE) Y
7219	V	V	V	V	V			IC SM 74HC4053D (PHSE) R

B3 SYNC INTERFACE

Item	2632PF422 - AP/NAFTA	EU & AP DVB sets	LC4.3E/LCA/CA/RE/LCA SE	LC4.3E/LCA/CA/RE/LCA SE	LC4.3E/LCA/CA/RE/LCA SE	LC4.3E/LCA/CA/RE/LCA SE	LC4.3E/LCA/CA/RE/LCA SE	Description
2440	V	V	V	V	V			CER2 0402 Y5V 18V 100N COL
3412	V	V	V	V	V			RST SM 0402 2K7 PMS COL
3456	V	V	V	V	V			RST SM 0402 100R PMS COL
3459	V	V	V	V	V			RST SM 0402 100R PMS COL
3461	V	V	V	V	V			RST SM 0402 100R PMS COL
3462	V	V	V	V	V			RST SM 0402 100R PMS COL
4436	V	V	V	V	V			RST SM 0402 JUMP 0R05 COL
4437	V	V	V	V	V			RST SM 0402 JUMP 0R05 COL
4440	V	V	V	V	V			RST SM 0402 JUMP 0R05 COL
6430	V	V	V	V	V			DIO REG SM P022.48 (PHSE) R
6431	V	V	V	V	V			DIO SIG SM 1N4148WS (VISH) R
7436	V	V	V	V	V			IC SM 74VLC44APW (PHSE) R

B5 AUDIO WITHOUT AMPLIFIER

Item	2632PF422 - AP/NAFTA	EU & AP DVB sets	LC4.3E/LCA/CA/RE/LCA SE	LC4.3E/LCA/CA/RE/LCA SE	LC4.3E/LCA/CA/RE/LCA SE	LC4.3E/LCA/CA/RE/LCA SE	LC4.3E/LCA/CA/RE/LCA SE	Description
2612	V	V	V	V	V			CER2 0603 Y5V 10V 10U COL
2613	V	V	V	V	V			CER2 0603 Y5V 10V 10U COL
2616	V	V	V	V	V			CER2 0603 XSR 6V3 2U2 PM10 R
2617	V	V	V	V	V			CER2 0603 XSR 6V3 2U2 PM10 R
3615	V	V	V	V	V			RST SM 3432 10K PMS COL
3616	V	V	V	V	V			RST SM 3432 1K PMS COL
3617	V	V	V	V	V			RST SM 3432 1K PMS COL
3618	V	V	V	V	V			RST SM 3432 22K PMS COL
3619	V	V	V	V	V			RST SM 3432 10K PMS COL
3620	V	V	V	V	V			RST SM 3432 10K PMS COL
3623	V	V	V	V	V			RST SM 3432 47K PMS COL
3625	V	V	V	V	V			RST SM 3432 3K3 PMS COL
3627	V	V	V	V	V			RST SM 3432 22K PMS COL
3628	V	V	V	V	V			RST SM 3432 10K PMS COL
3629	V	V	V	V	V			RST SM 3432 22K PMS COL
3630	V	V	V	V	V			RST SM 3432 10K PMS COL
3630	V	V	V	V	V			RST SM 3432 470R PMS COL
3631	V	V	V	V	V			RST SM 3432 330R PMS COL
3631	V	V	V	V	V			RST SM 3432 470R PMS COL
3632	V	V	V	V	V			RST SM 3432 RC31 39R PMS R
3633	V	V	V	V	V			RST SM 3432 RC31 39R PMS R
4601	V	V	V	V	V			RST SM 3603 JUMP 0R05 COL
4602	V	V	V	V	V			RST SM 3603 JUMP 0R05 COL
4603	V	V	V	V	V			RST SM 3603 JUMP 0R05 COL
4606	V	V	V	V	V			RST SM 3603 JUMP 0R05 COL
4609	V	V	V	V	V			RST SM 3603 JUMP 0R05 COL
4610	V	V	V	V	V			RST SM 3603 JUMP 0R05 COL
4611	V	V	V	V	V			RST SM 3603 JUMP 0R05 COL
4612	V	V	V	V	V			RST SM 3603 JUMP 0R05 COL
4613	V	V	V	V	V			RST SM 3603 JUMP 0R05 COL
4614	V	V	V	V	V			RST SM 3603 JUMP 0R05 COL
4615	V	V	V	V	V			RST SM 3603 JUMP 0R05 COL
4616	V	V	V	V	V			RST SM 3603 JUMP 0R05 COL
4617	V	V	V	V	V			RST SM 3603 JUMP 0R05 COL
4618	V	V	V	V	V			RST SM 3603 JUMP 0R05 COL
4620	V	V	V	V	V			RST SM 3603 JUMP 0R05 COL
4621	V	V	V	V	V			RST SM 3603 JUMP 0R05 COL
7603	V	V	V	V	V			TRA SIG SM BC847BW (COL) R
7604	V	V	V	V	V			TRA SIG SM BC847BW (COL) R
7607	V	V	V	V	V			TRA SIG SM BC847BW (COL) R

B6 OC DC CONVERTER

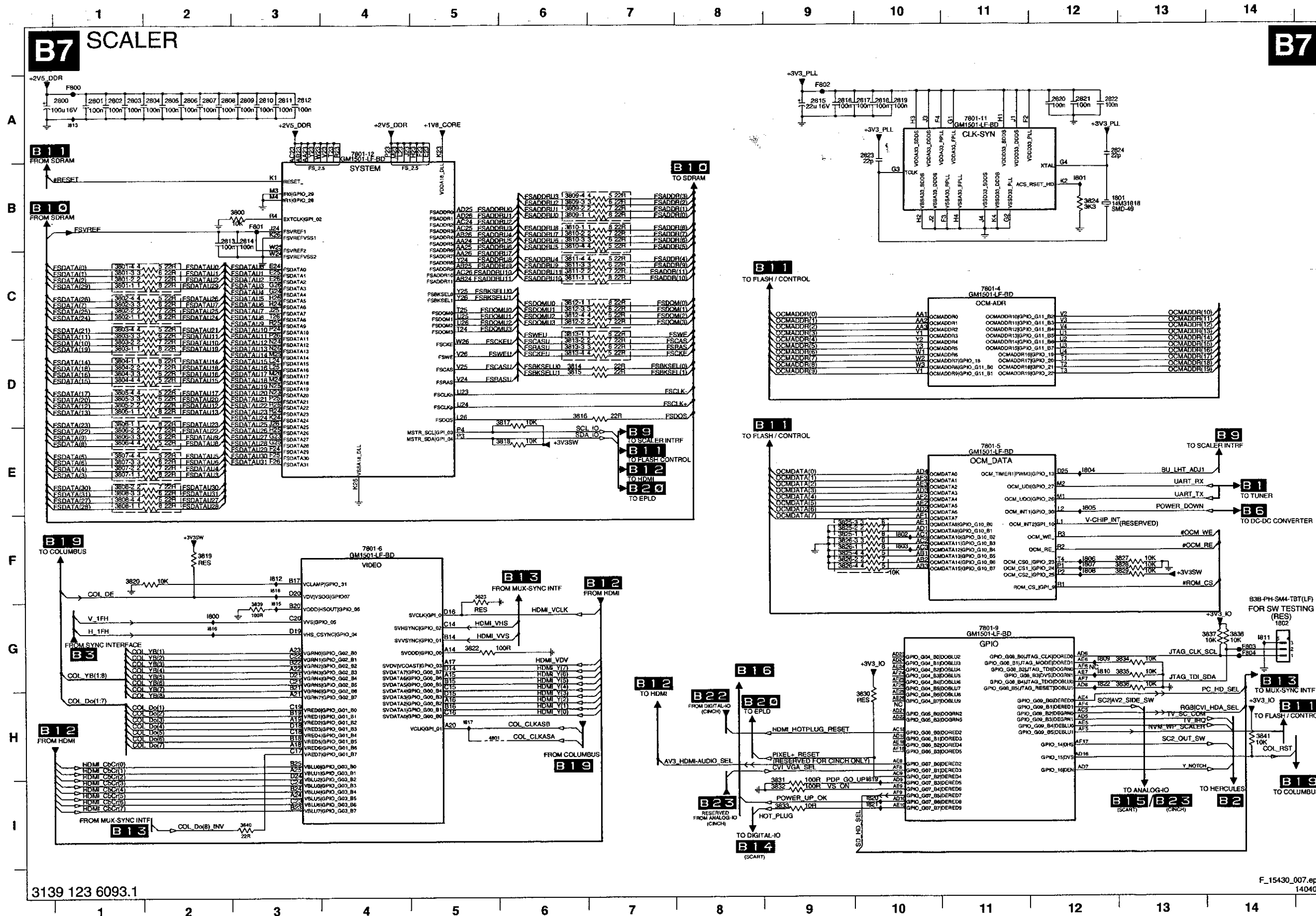
Item	2632PF422	LC4.3E/LCA/CA/RE/LCA SE	LC4.3E/LCA/CA/RE/LCA SE	LC4.3E/LCA/CA/RE/LCA SE	LC4.3E/LCA/CA/RE/LCA SE	LC4.3E/LCA/CA/RE/LCA SE	LC4.3E/LCA/CA/RE/LCA SE	Description
2701	V	V	V	V	V			CER1 0402 NP1 50V 100P COL
2706	V	V	V	V	V			ELCAP SM 16V 10U PM20 COL R
2709	V	V	V	V	V			ELCAP SM 16V 47U PM20 COL R
2710	V	V	V	V	V			CER2 1210 Y5V 25V 10U PM20 R
2711	V	V	V	V	V			CER2 3210 Y5V 25V 10U PM20 R
2713	V	V	V	V	V			ELCAP SM 50V 15V 470U PM20 R
2714	V	V	V	V	V			CER2 0402 X7R 50V 220P COL
2715	V	V	V	V	V			CER2 0402 X7R 16V 22N PM10 R
2741	V	V	V	V	V			CER2 3603 X7R 10V 220N COL
2751	V	V	V	V	V			CER2 0402 Y5V 16V 100N COL
2752	V	V	V	V	V			ELCAP SM 16V 47U PM20 COL R
2760	V	V	V	V	V			CER2 1210 X7R 25V 10U PM10 R
2761	V	V	V	V	V			CER2 1210 X7R 25V 10U PM10 R
3708	V	V	V	V	V			RST SM 0402 10K PMS COL
3709	V	V	V	V	V			RST SM 0402 6K8 PMS COL
3712	V	V	V	V	V			RST SM 0603 RC22H 5K6 PM1 R
3713	V	V	V	V	V			RST SM 0603 RC22H 3K3 PM1 R
3716	V	V	V	V	V			RST SM 0402 4K7 PMS COL
3740	V	V	V	V	V			RST SM 0402 1K5 PMS COL
3741	V	V	V	V	V			RST SM 0402 1K5 PMS COL
3742	V	V	V	V	V			RST SM 0402 5K PMS COL
3743	V	V	V	V	V			RST SM 0402 22K PMS COL
3755	V	V	V	V	V			RST SM 0402 10K PMS COL
3758	V	V	V	V	V			RST SM 0402 15K PMS COL
3760	V	V	V	V	V			RST SM 0402 100R PMS COL
3761	V	V	V	V	V			RST SM 0402 100R PMS COL
5704	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5705	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5706	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5707	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5708	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5709	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5710	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5711	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5712	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5713	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5714	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5715	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5716	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5717	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5718	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5719	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5720	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5721	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5722	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5723	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5724	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5725	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5726	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5727	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5728	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5729	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5730	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5731	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5732	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5733	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5734	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5735	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5736	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5737	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5738	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5739	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5740	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5741	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5742	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5743	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5744	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5745	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5746	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5747	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5748	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5749	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5750	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5751	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5752	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5753	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5754	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5755	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5756	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5757	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5758	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5759	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5760	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5761	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5762	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5763	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5764	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5765	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5766	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5767	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5768	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5769	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5770	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5771	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5772	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5773	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5774	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5775	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5776	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5777	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5778	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
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5781	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5782	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5783	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
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5787	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
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5842	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
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5846	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5847	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5848	V	V	V	V	V			IND FXD 1206 EM 100MHZ 126R R
5849	V	V	V					

B7 SCALER



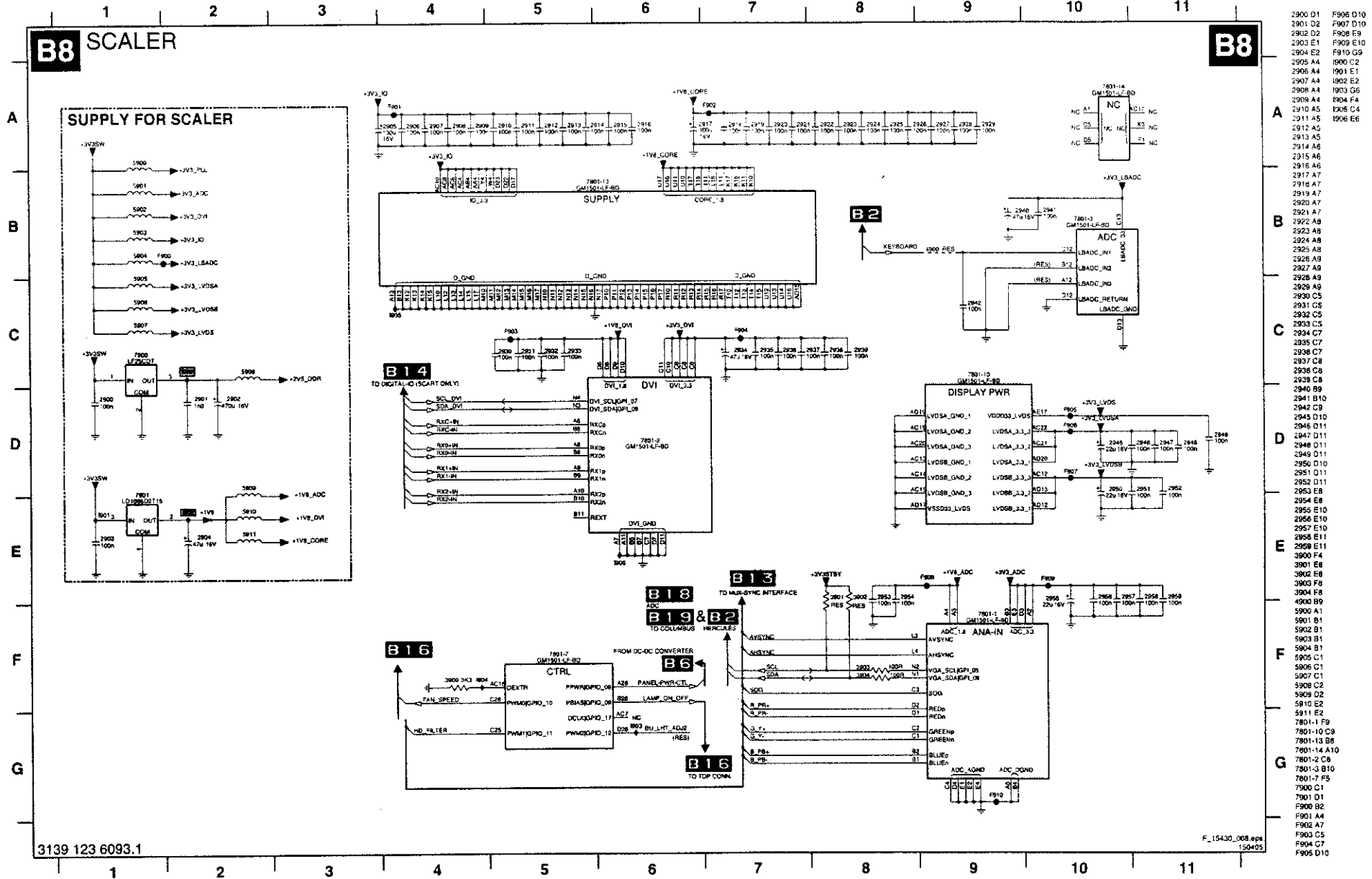
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1802-317	7802-01 A1
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SSB: Scaler

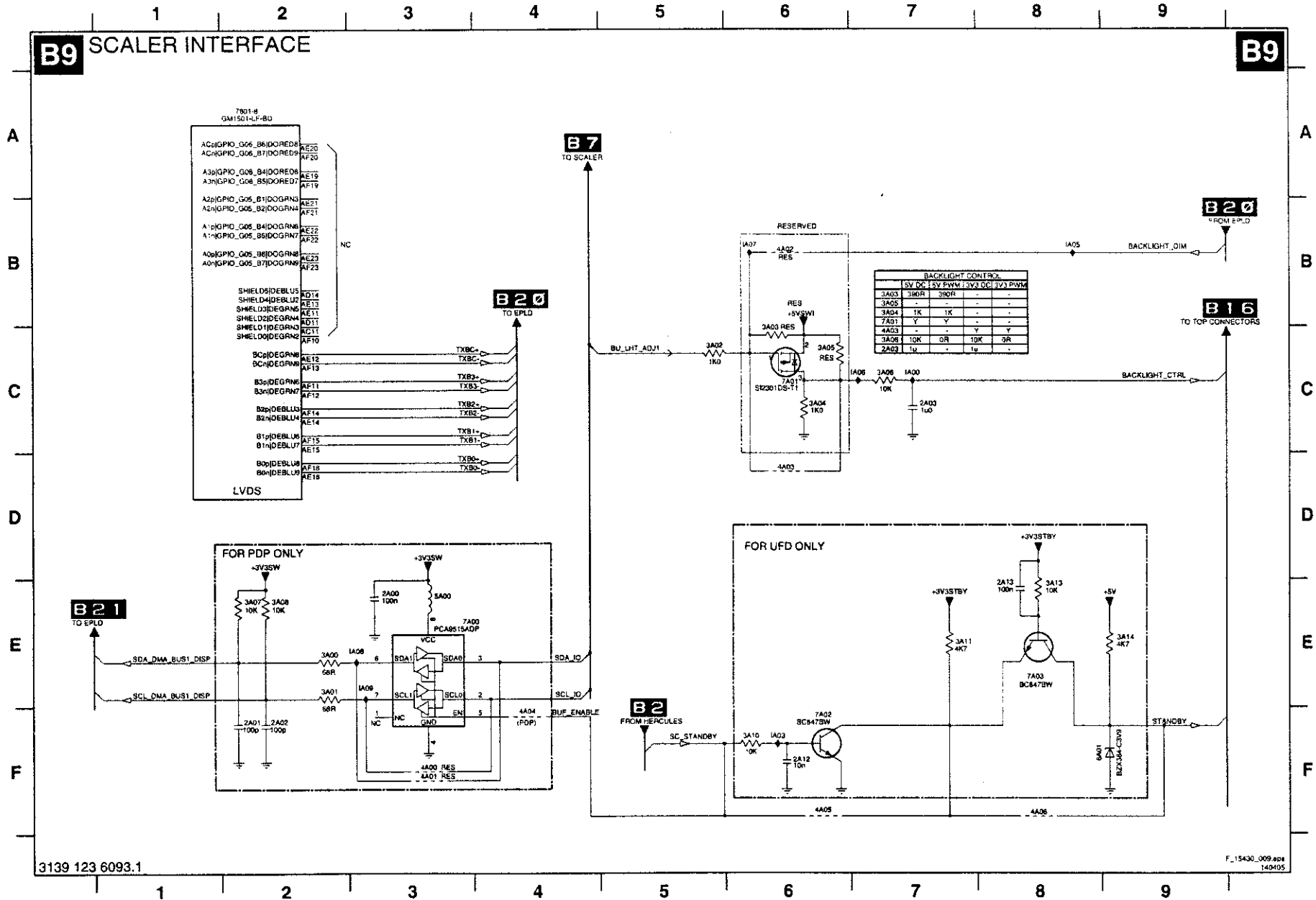


1801 B12
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2800 A1
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2806 A2
2807 A2
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2809 A3
2810 A3
2811 A3
2812 A3
2813 B2
2814 B3
2815 A9
2816 A9
2817 A10
2818 A10
2819 A10
2820 A12
2821 A12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

SSB: Scaler Supply

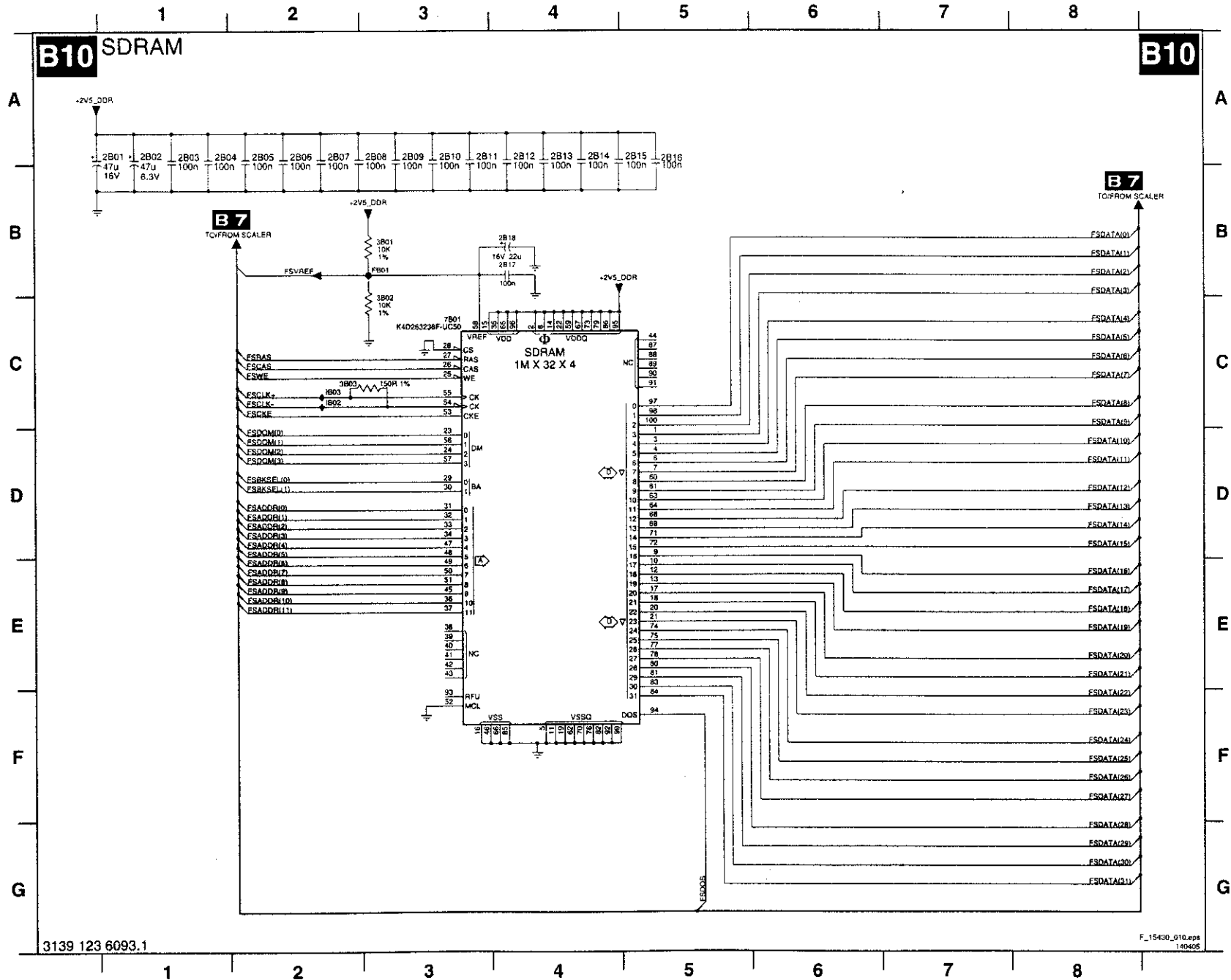


SSB: Scaler Interface

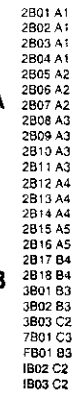


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2A02 F2
2A03 C7
2A12 F6
2A13 E8
3A00 E2
3A01 E2
3A02 C5
3A03 C6
3A04 C6
3A05 C6
3A06 C7
3A07 E2
3A08 E2
3A10 F6
3A11 E7
3A13 E8
3A14 E9
4A00 F3
4A01 F3
4A02 B6
4A03 D6
4A04 F4
4A05 F6
4A06 F8
5A00 E3
6A01 F8
7801-8 A2
7A00 E4
7A01 C6
7A02 F6
7A03 E8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

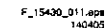
SSB: SDRAM



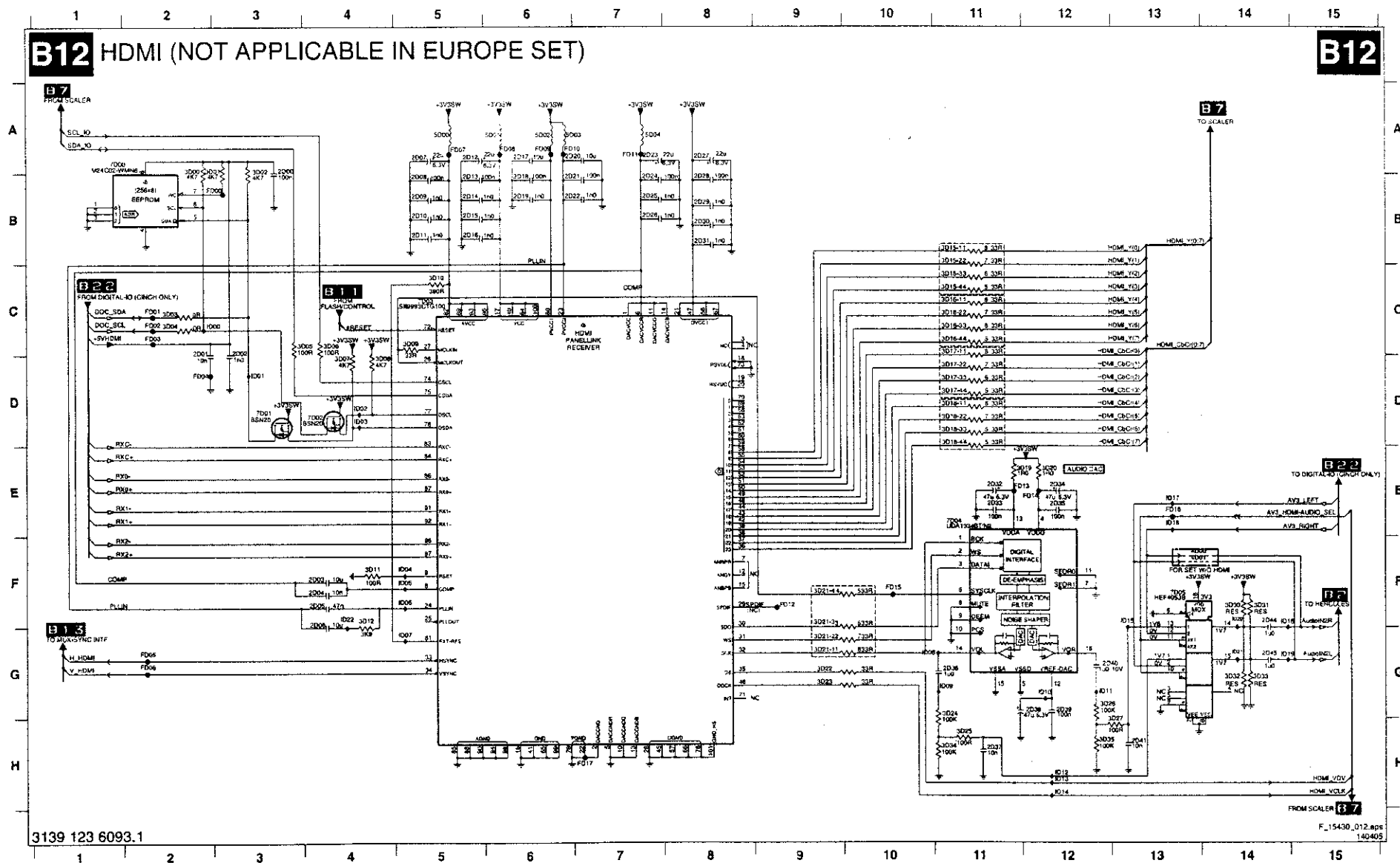
B10 SDRAM



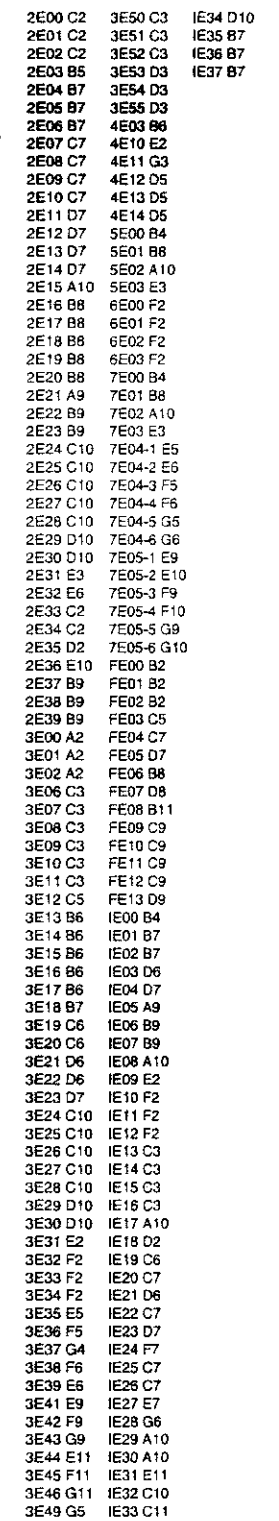
B11 FLASH / CONTROL



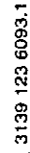
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2001 C2	2007 A5	2013 B6	2019 B8	2025 B8	2031 B8	2037 C4	2045 F14	2051 C4	2011 F14	2017 H11	2018 F12	2022 G14	2026 F14	2032 F13	2038 F14	2004 A7	2005 F13	F005 G2	F011 A7	F017 H7	I005 F5	I011 G13	I017 E13	
2002 C2	2008 A5	2014 B6	2020 B8	2026 B8	2032 B8	2038 C4	2046 F14	2052 C4	2012 F14	2018 F12	2019 F11	2023 G14	2027 F14	2033 F13	2039 F14	2005 A7	2006 F13	F006 G2	F012 F9	I006 G3	I008 F5	I012 H12	I018 F14	
2003 F4	2009 B5	2015 B6	2021 B8	2027 A8	2033 E11	2039 C4	2047 F14	2053 C4	2013 F14	2019 F11	2020 F11	2024 G14	2028 F14	2034 F13	2040 F14	2006 A7	2007 F13	F007 G2	F013 F9	I007 G3	I009 F5	I013 H12	I019 G14	
2004 F4	2010 B5	2016 B6	2022 B8	2028 B8	2034 E11	2040 E12	2048 F14	2054 C4	2014 F14	2020 F11	2021 F11	2025 G14	2029 F14	2035 F13	2041 F14	2007 A7	2008 F13	F008 G2	F014 F9	I008 G3	I010 F5	I014 H12	I020 F14	
2005 F4	2011 B6	2017 A6	2023 A7	2029 B8	2035 E12	2041 H13	2049 F14	2055 C5	2015 F14	2021 F11	2022 F11	2026 G12	2030 F14	2036 F13	2042 F14	2008 A7	2009 F13	F009 G2	F015 F9	I009 G3	I011 F5	I015 H12	I021 G14	



B13 MUX-SYNC INTERFACE



SSB: Digital VO

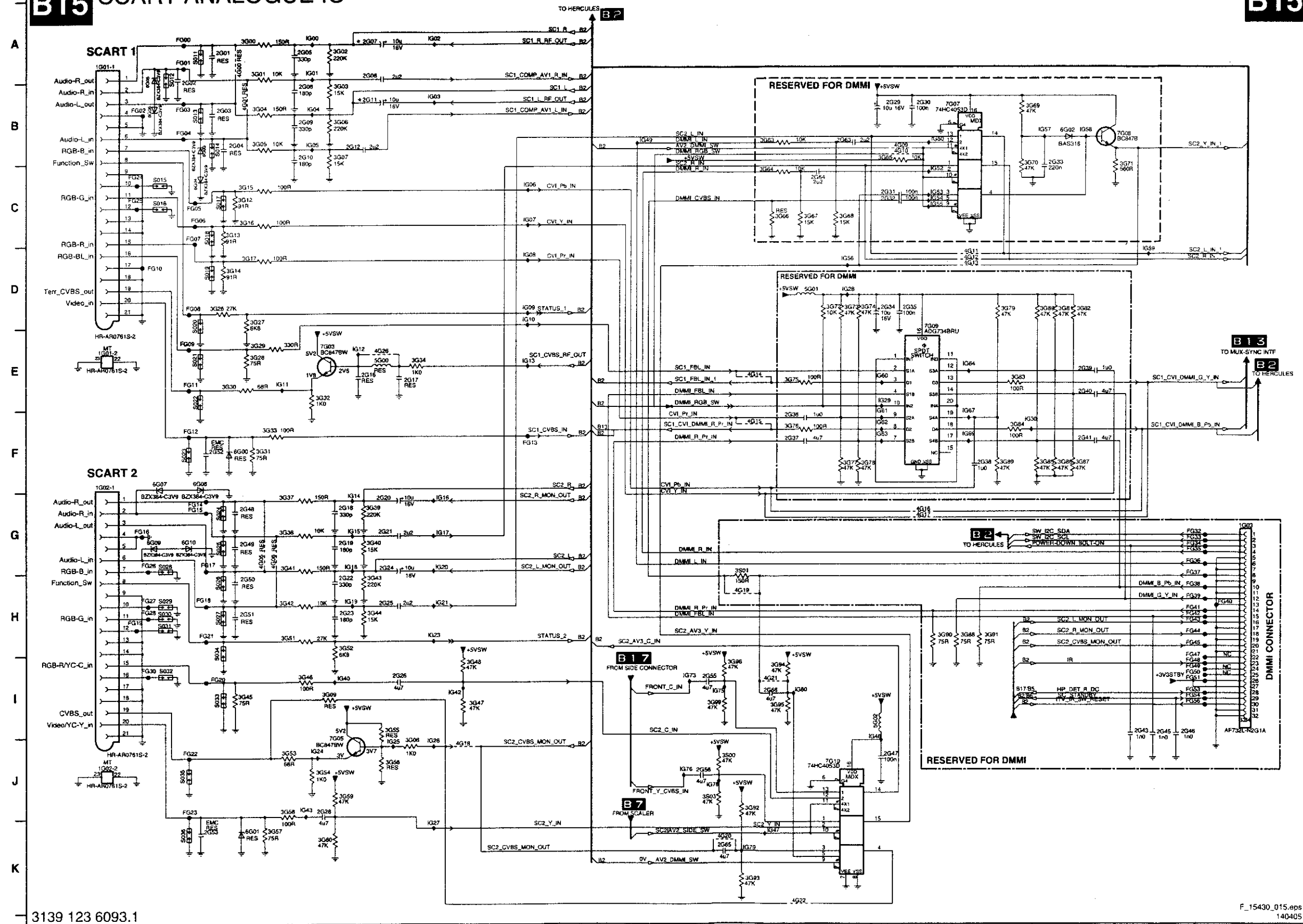


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140405

SSB: Analog I/O

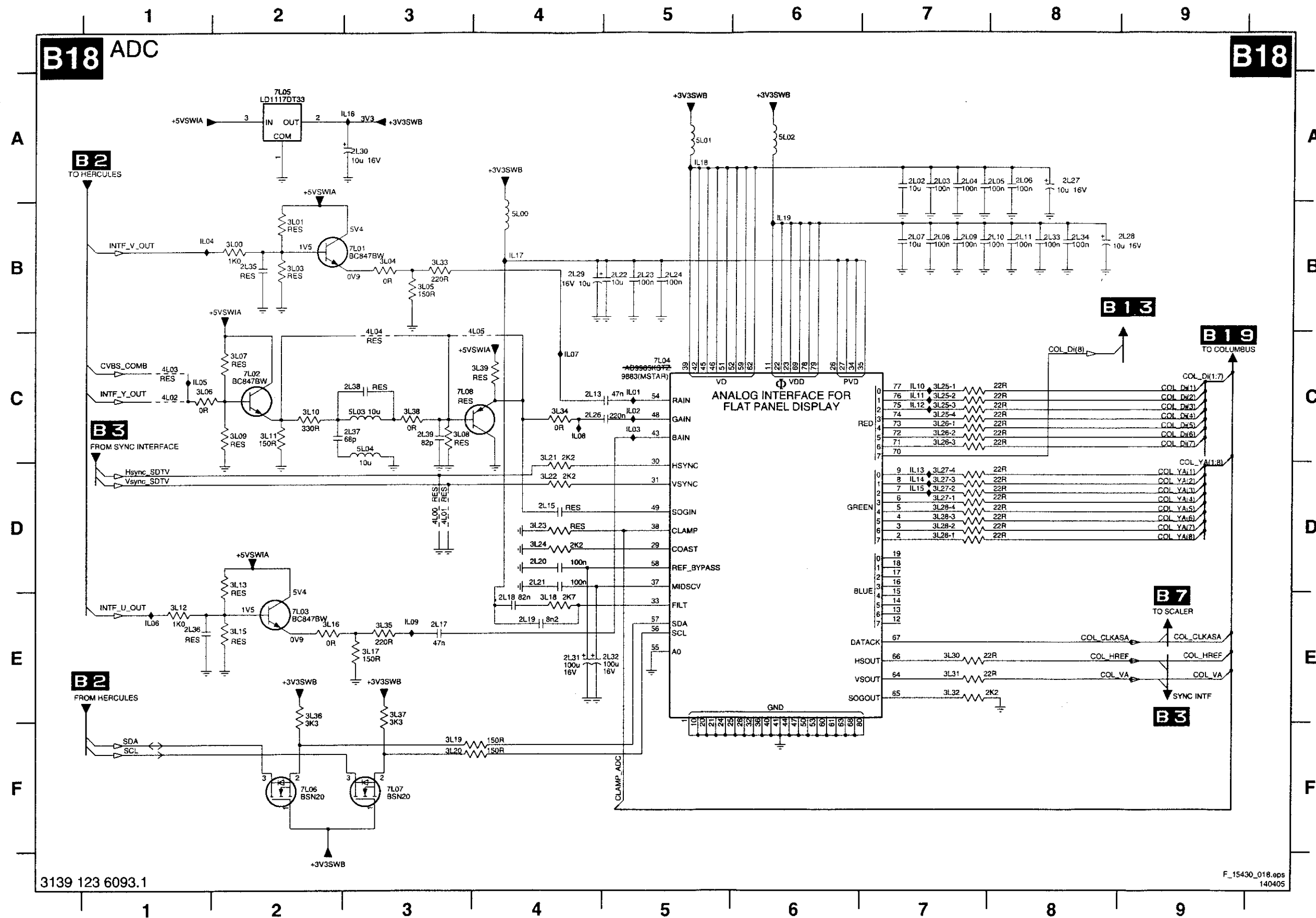
B15 SCART ANALOGUE IO

B15

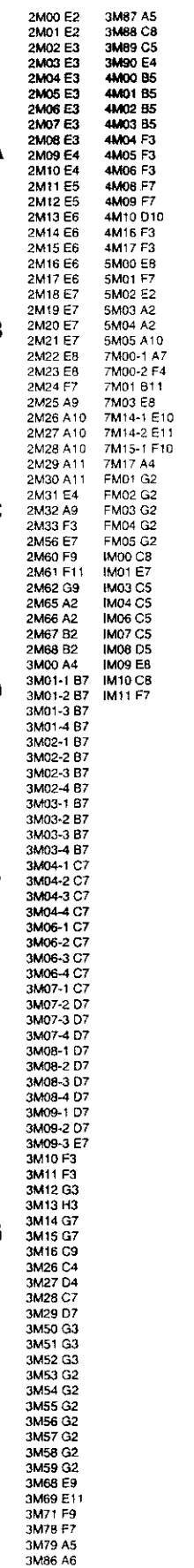


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1002-1 F1	3006 B9	IG57 B13
1002-2 J1	3006 B9	IG58 B13
1003 G15	3001 G6	IG59 D14
2001 A3	3001 J6	IG60 E11
2002 A2	4000 A3	IG61 F11
2003 B3	4001 B3	IG62 F11
2004 B3	4005 G3	IG63 F11
2005 A3	4006 G3	IG64 E12
2006 B3	4006 B11	IG67 F12
2007 A4	4010 B11	IG68 F12
2008 A4	4011 D12	IG73 B8
2008 B3	4012 D12	IG75 B8
2010 B3	4013 D12	IG76 B8
2011 B4	4014 E9	IG78 J8
2012 B4	4015 F9	IG79 K9
2016 E4	4016 G11	IG80 I10
2017 E5	4017 G11	IG81 A2
2018 G4	4018 J5	IG82 E4
2019 G4	4019 H9	IG83 H9
2020 G5	4020 K9	IG84 B2
2021 G4	4021 F9	IG85 C2
2022 H4	4022 K10	IG86 C2
2023 H4	4023 E4	IG87 C3
2024 G5	4024 E4	IG88 C2
2025 H4	4025 D10	IG89 D2
2026 E5	4026 I11	IG90 E2
2028 A4	4028 F3	IG91 E2
2029 B11	4029 E5	IG92 E2
2030 B11	4030 E5	IG93 F2
2031 C11	4031 E2	IG94 G3
2032 C11	4032 E2	IG95 G3
2033 C13	4033 E2	IG96 H3
2034 D11	4034 E2	IG97 H2
2035 D11	4035 E2	IG98 G2
2036 F9	4036 E2	IG99 H2
2037 F9	4037 E2	IG100 H2
2038 F12	4038 E4	IG101 H2
2039 E13	4039 E4	IG102 H2
2040 E13	4040 E4	IG103 H2
2041 F13	4041 E4	IG104 H2
2042 H14	4042 E4	IG105 H2
2043 H14	4043 E4	IG106 H2
2044 H14	4044 E4	IG107 H2
2045 H14	4045 E4	IG108 H2
2046 H14	4046 E4	IG109 H2
2047 H14	4047 E4	IG110 H2
2048 G3	4048 E4	IG111 H2
2049 G3	4049 E4	IG112 H2
2050 H3	4050 E4	IG113 H2
2051 H3	4051 E4	IG114 H2
2052 F2	4052 E4	IG115 H2
2053 H2	4053 E4	IG116 H2
2054 H2	4054 E4	IG117 H2
2055 H2	4055 E4	IG118 H2
2056 H2	4056 E4	IG119 H2
2057 H2	4057 E4	IG120 H2
2058 H2	4058 E4	IG121 H2
2059 H2	4059 E4	IG122 H2
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2061 H2	4061 E4	IG124 H2
2062 H2	4062 E4	IG125 H2
2063 H2	4063 E4	IG126 H2
2064 H2	4064 E4	IG127 H2
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2073 H2	4073 E4	IG136 H2
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2089 H2	4089 E4	IG152 H2
2090 H2	4090 E4	IG153 H2
2091 H2	4091 E4	IG154 H2
2092 H2	4092 E4	IG155 H2
2093 H2	4093 E4	IG156 H2
2094 H2	4094 E4	IG157 H2
2095 H2	4095 E4	IG158 H2
2096 H2	4096 E4	IG159 H2
2097 H2	4097 E4	IG160 H2
2098 H2	4098 E4	IG161 H2
2099 H2	4099 E4	IG162 H2
2100 H2	4100 E4	IG163 H2

SSB: ADC



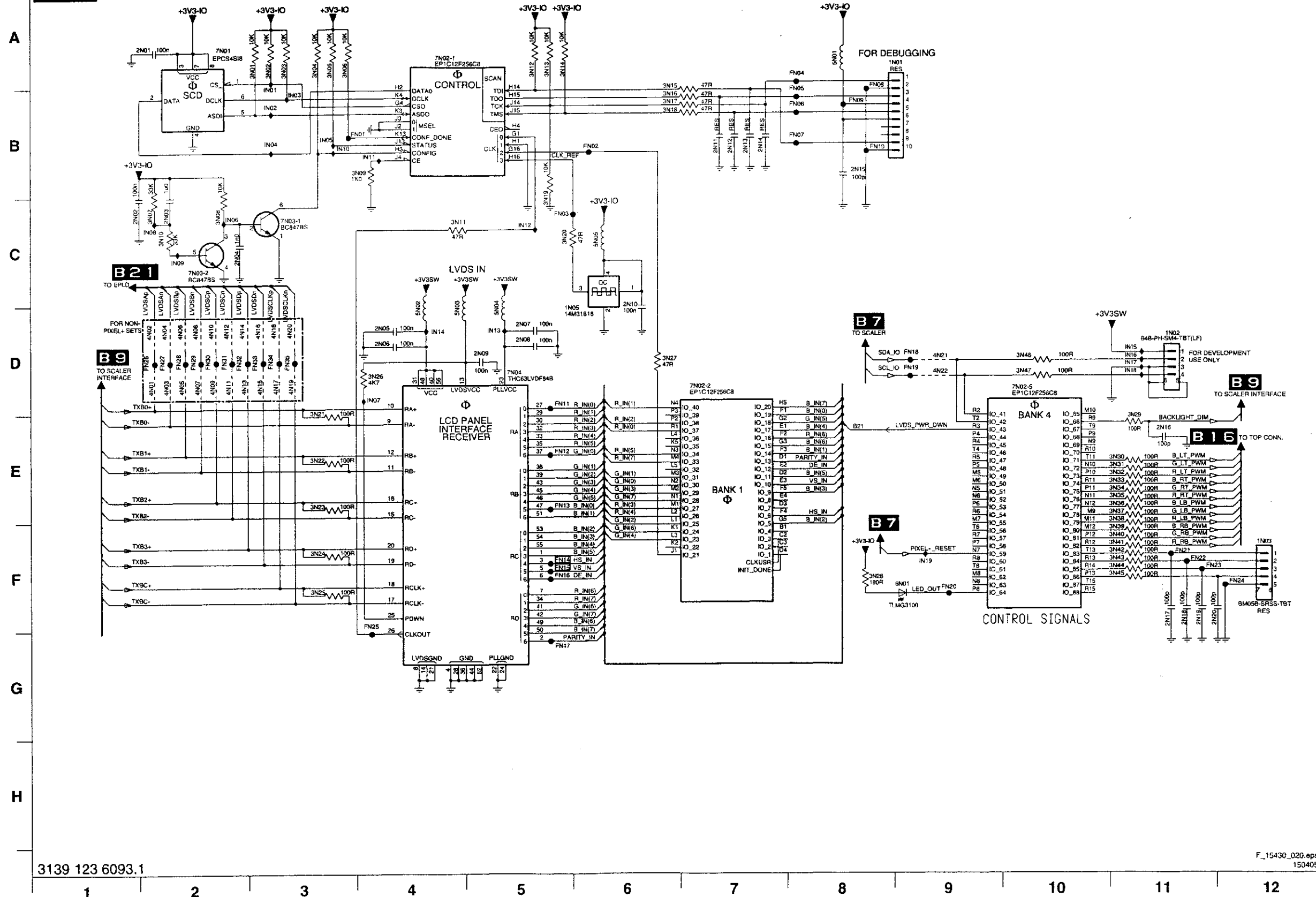
B19 COLUMBUS



SSB: EPLD

B20 EPLD

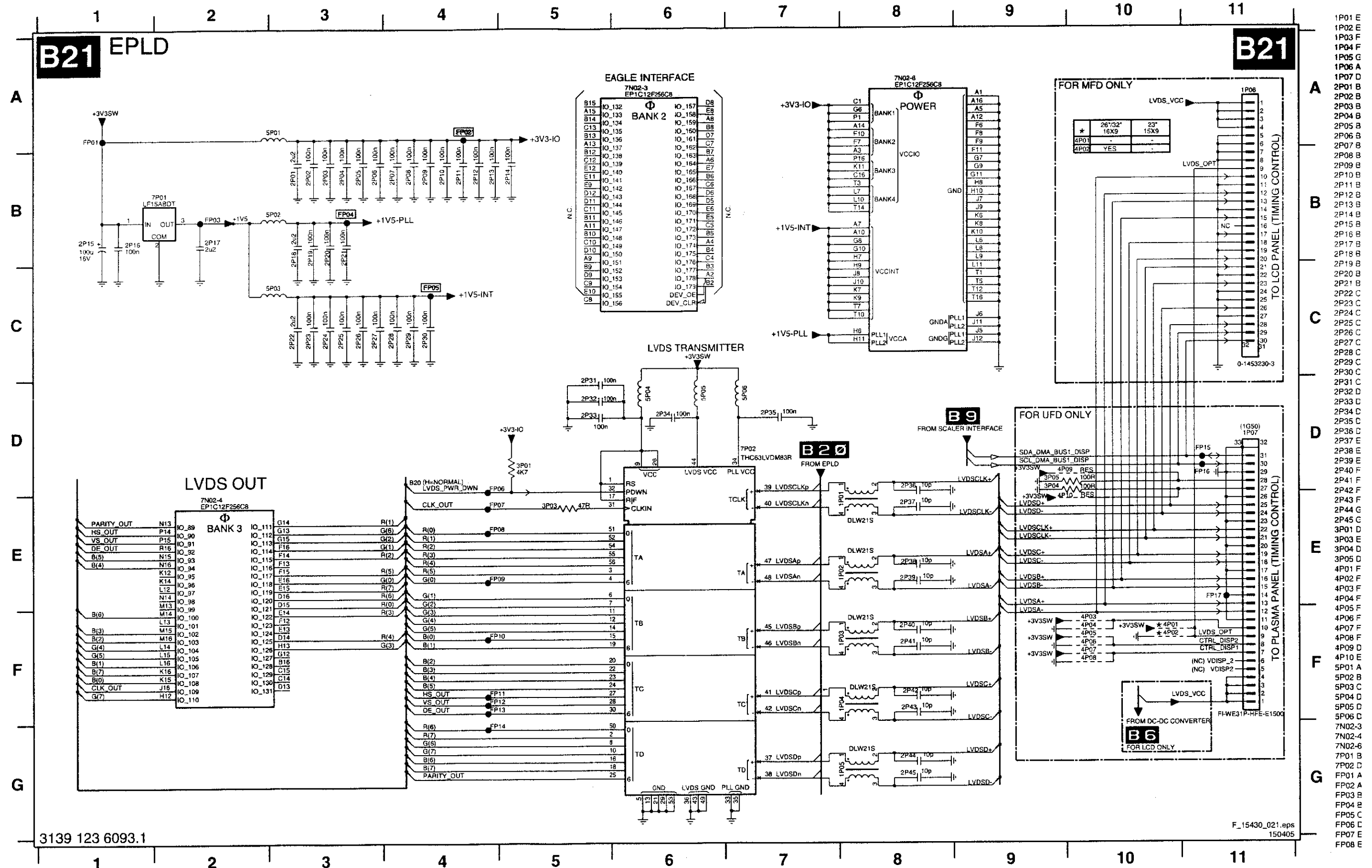
B20



3139 123 6093.1

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SSB: EPLD



B9 MUX-SYNC INTERFACE

Item	LC43x	LC48x	Description
2A00		V	GER2 0402 XTR 16V 100M COI
2A01		V	GER1 0402 NTC 10K 1% COI
2A02		V	GER1 0402 MFC 10K 1% COI
2A03		V	GER2 0402 Y5V 10V 10% COI
2A17	V	V	GER2 0402 Y3V 16V 10% COI
2A12	V	V	GER2 0402 Y3V 16V 100M COI
3A00		V	RST 5M 0402 68K PMS COI
3A01		V	RST 5M 0402 68K PMS COI
3A02	V	V	RST 5M 0402 68K PMS COI
3A05		V	RST 5M 0402 10K PMS COI
3A06		V	RST 5M 0402 10K PMS COI
3A07		V	RST 5M 0402 10K PMS COI
3A08		V	RST 5M 0402 10K PMS COI
3A09		V	RST 5M 0402 10K PMS COI
3A10		V	RST 5M 0402 10K PMS COI
3A11	V	V	RST 5M 0402 10K PMS COI
3A13	V	V	RST 5M 0402 10K PMS COI
3A14	V	V	RST 5M 0402 500K PMS COI
4A03	V	V	RST 5M 0402 10K PMS COI
4A04	V	V	RST 5M 0402 10K PMS COI
4A05	V	V	RST 5M 0402 10K PMS COI
4A06	V	V	RST 5M 0402 10K PMS COI
5A00	V	V	F100M03 03S 1000UM 3VX COI
6A01	V	V	DCO REG 5M BZ00M03 3VX COI
7A00	V	V	AL 5M MC 84C45 (PHS) R
7A01	V	V	AL 5M MC 84C45 (PHS) R
7A03	V	V	AL 5M MC 84C45 (PHS) R
7A04	V	V	AL 5M MC 84C45 (PHS) R

B13 MUX-SYNC INTERFACE

ITEM	APRIL-2008 (with Talent)	SEP-2008 (with Talent)	MAY-2011 & China (non-Talent)	DESCRIPTION
2000	V	V		CER2 0603 35R 8V5 10 PAD0 R
2001	V			CER2 0603 35R 8V5 10T PAD10
2002	V	V		CER2 0603 35R 8V5 10T PAD10
2004	V	V		CER2 0406 35R 8V5 10 PAD0 R
2005	V	V		CER2 0406 35R 8V5 10 PAD0 R
2006	V	V		CER2 0402 35S 8V5 10 PAD0 R
2008	V			R/S1 5M 0402 47K PMS COL
2007	V			R/S1 5M 0402 47K PMS COL
2009	V			R/S1 5M 0402 47K PMS COL
2012	V	V		R/S1 5M 0402 330R PMS COL
2014	V			R/S1 5M 0402 330R PMS COL
2015	V	V		R/S1 5M 0402 330R PMS COL
2016	V			R/S1 5M 0402 330R PMS COL
2017	V			R/S1 5M 0402 330R PMS COL
2018	V			R/S1 5M 0402 330R PMS COL

B15 ANALOG VO SCART[illegible]

B16 SIDE CONNECTORS

Item	LC43E - CINCH	LC43E - SCART	LC43E - PDP	LC43E - LCD	Description
1.050	V	V	V	V	CON V 10P M 2.00 PH B
1.051	V	V	V	V	CON V 11P M 2.00 PH B
1.052	V	V	V	V	CON V 12P M 2.00 PH B
1.053	V	V	V	V	CON V 3P M 2.00 PH B
1.054	V	V	V	V	FUSE 5MT 1 2A 125V UL R
1.055	V	V	V	V	FUSE 5MF 630MA 50V UL R
2.131	V	V	V	V	REST 0402 100 5W 100P COL
2.052	V	V	V	V	REST 5M 0402 60W PMS COL
2.054	V	V	V	V	REST 5M 0402 60W PMS COL
2.071	V	V	V	V	REST 5M 0402 100W PMS COL
5.004	V	V	V	V	IND 502 120V EMI 100W 120P

B17 SIDE CONNECTORS

Item	LC43+ -INES Styling	LC43+ - Area Styling	LC43+ - LCP	LC43+ - POP	Description
1K00				V	COL V 6P M 2.00 PH B
1K01				V	COL V 12P M 2.00 PH B
2K03		V			COL V 2NP F 1.25 PFC 0.3 B
1K04			V	V	COL V 11P M 2.00 PH B
2K15	V	V			CRK1 0402 NPO 50V 100P COL
3K08	V	V			RST 5M 0402 60R PMW COL
4K02			V	V	RST 5M 0603 JUMP 31P25 COL
5K02					RST 5M 0402 JUMP 80RPM COL
6K02	V	V	V	V	FXDPM 5M 0603 10 51P25 COL

B18 ADC

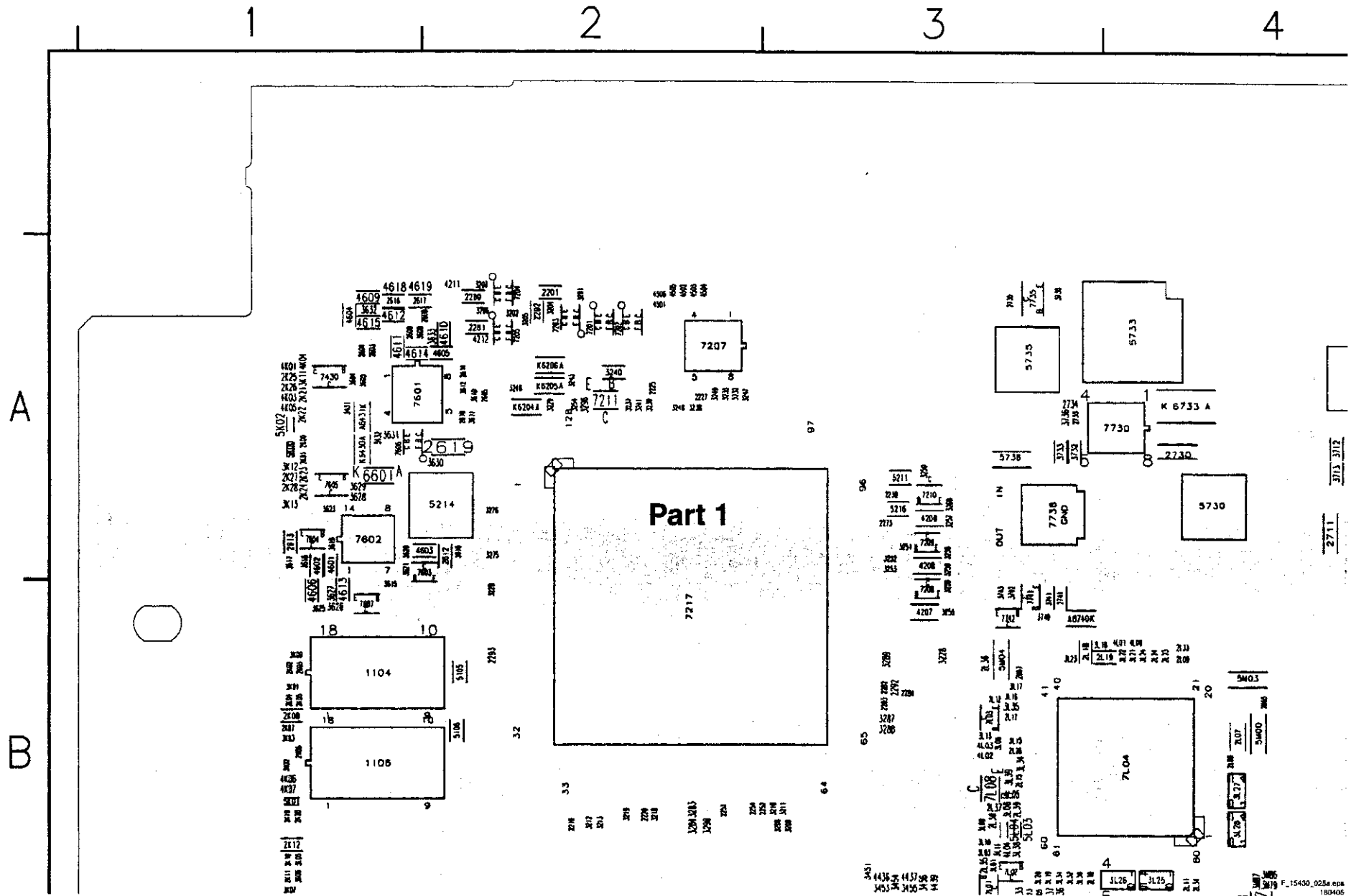
Item	Description
2.72	RST RM 6450 AMP, 100% COG
4.96	RST RM 6450 AMP, 100% COG
5.04	RST SM 6500 AMP, 100% COG

B20 & B21 PIXEL PLUS

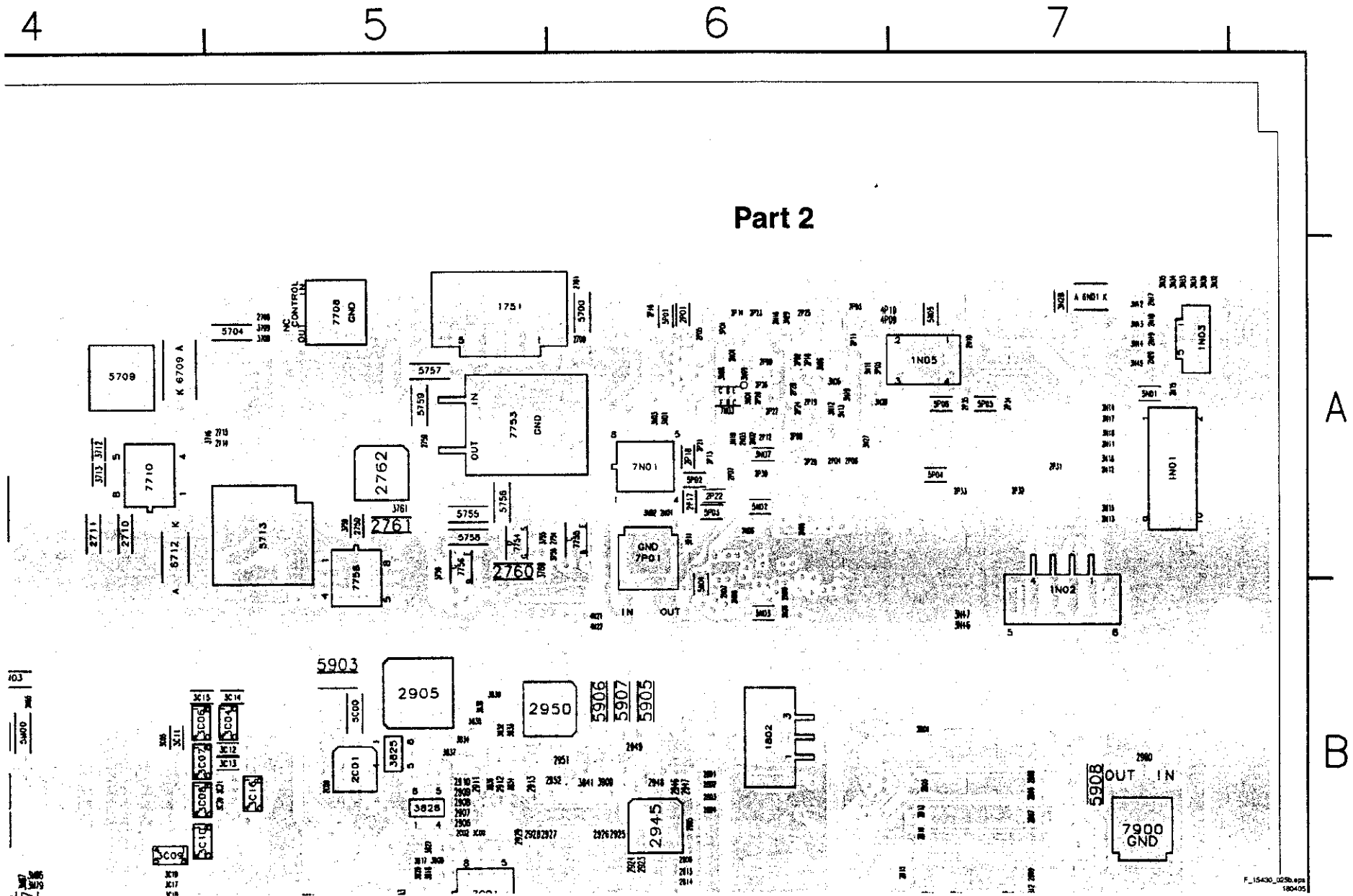
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138	LOC 139	LOC 140	LOC 141	LOC 142	LOC 143	LOC 144	LOC 145	LOC 146	LOC 147	LOC 148	LOC 149	LOC 150	LOC 151	LOC 152	LOC 153	LOC 154	LOC 155	LOC 156	LOC 157	LOC 158	LOC 159	LOC 160	LOC 161	LOC 162	LOC 163	LOC 164	LOC 165	LOC 166	LOC 167	LOC 168	LOC 169	LOC 170	LOC 171	LOC 172	LOC 173	LOC 174	LOC 175	LOC 176	LOC 177	LOC 178	LOC 179	LOC 180	LOC 181	LOC 182	LOC 183	LOC 184	LOC 185	LOC 186	LOC 187	LOC 188	LOC 189	LOC 190	LOC 191	LOC 192	LOC 193	LOC 194	LOC 195	LOC 196	LOC 197	LOC 198	LOC 199	LOC 200	LOC 201	LOC 202	LOC 203	LOC 204	LOC 205	LOC 206	LOC 207	LOC 208	LOC 209	LOC 210	LOC 211	LOC 212	LOC 213	LOC 214	LOC 215	LOC 216	LOC 217	LOC 218	LOC 219	LOC 220	LOC 221	LOC 222	LOC 223	LOC 224	LOC 225	LOC 226	LOC 227	LOC 228	LOC 229	LOC 230	LOC 231	LOC 232	LOC 233	LOC 234	LOC 235	LOC 236	LOC 237	LOC 238	LOC 239	LOC 240	LOC 241	LOC 242	LOC 243	LOC 244	LOC 245	LOC 246	LOC 247	LOC 248	LOC 249	LOC 250	LOC 251	LOC 252	LOC 253	LOC 254	LOC 255	LOC 256	LOC 257	LOC 258	LOC 259	LOC 260	LOC 261	LOC 262	LOC 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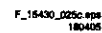
Layout Small Signal Board (Top Side Part 1)



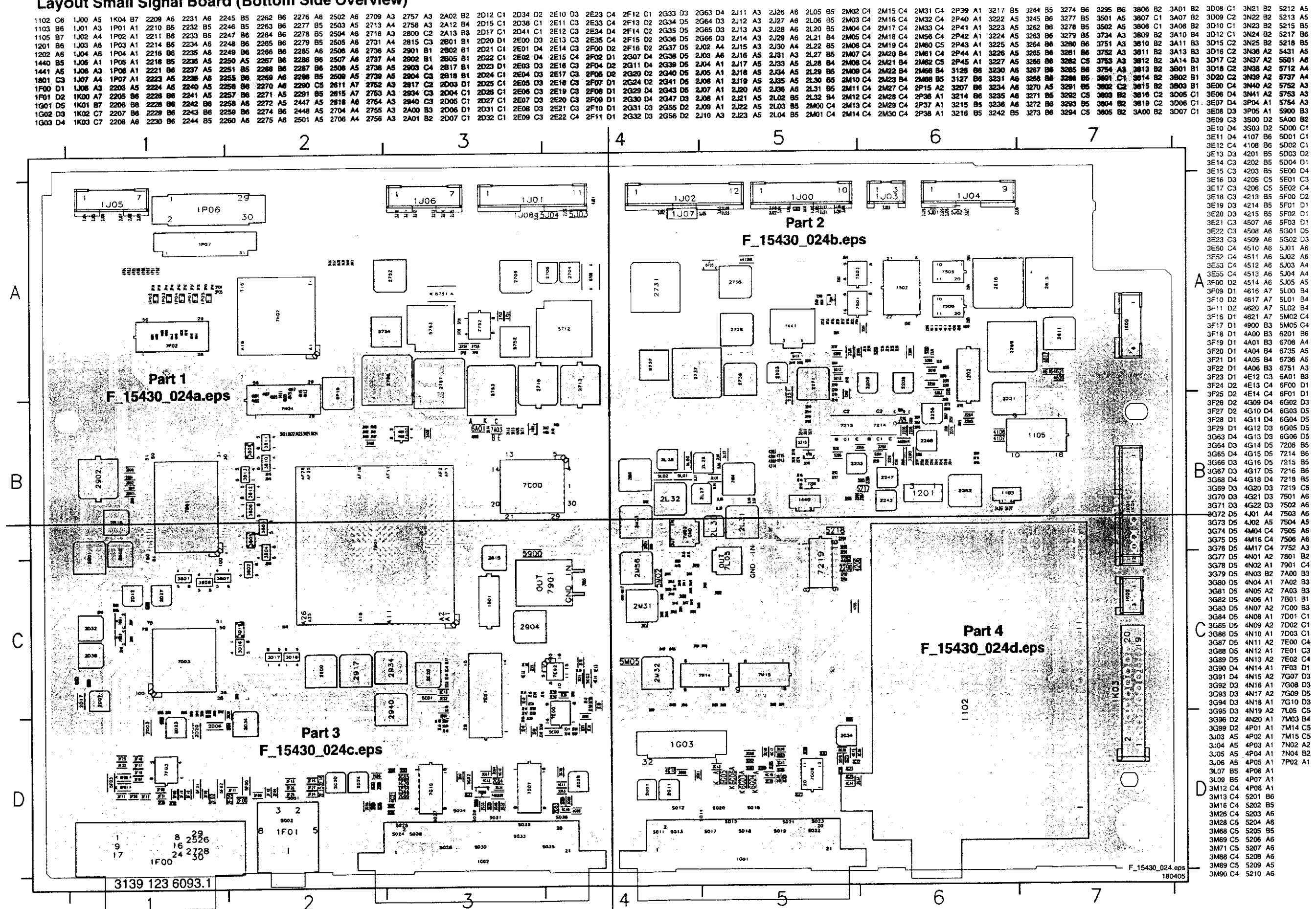
Layout Small Signal Board (Top Side Part 2)



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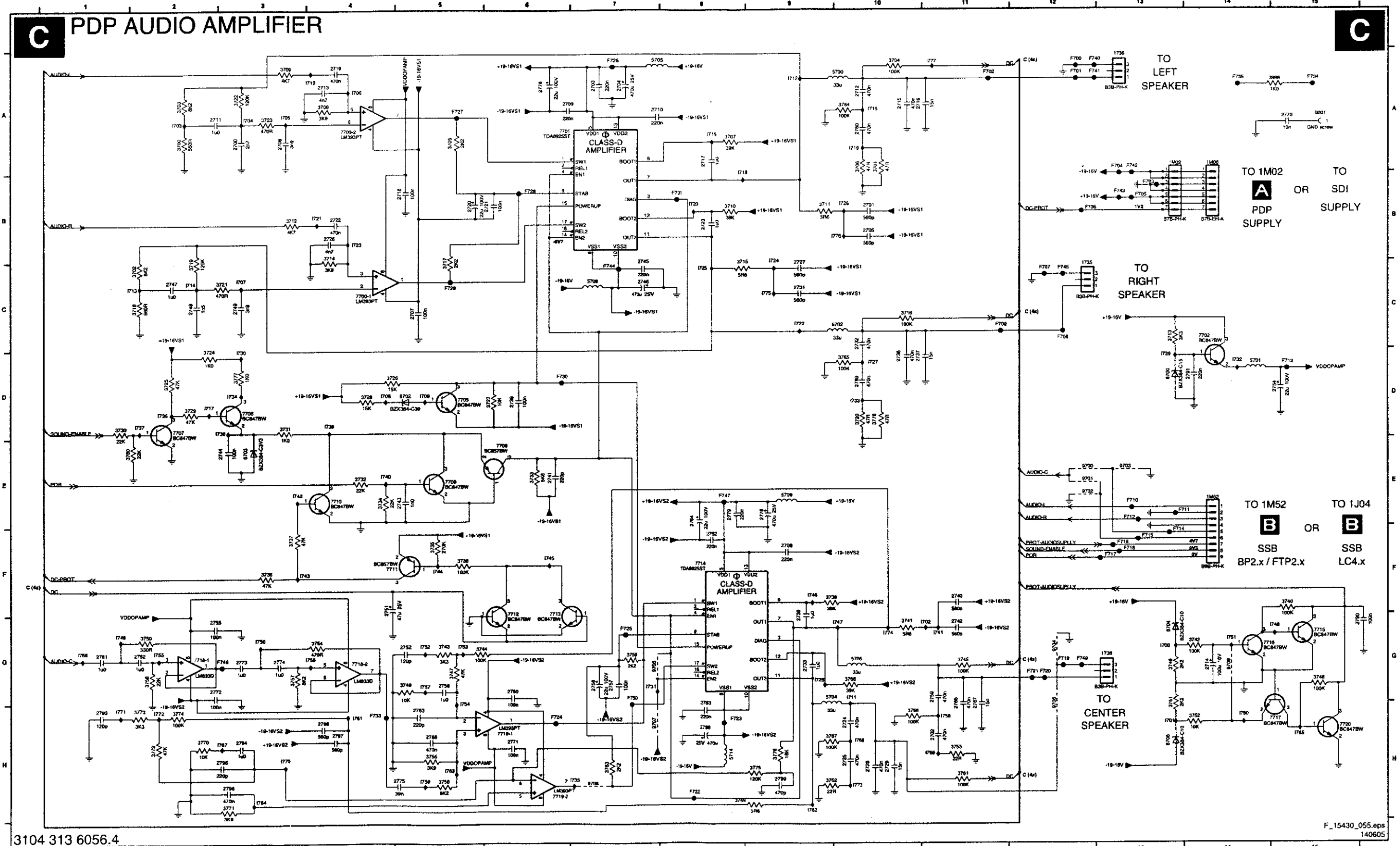


Layout Small Signal Board (Bottom Side Overview)

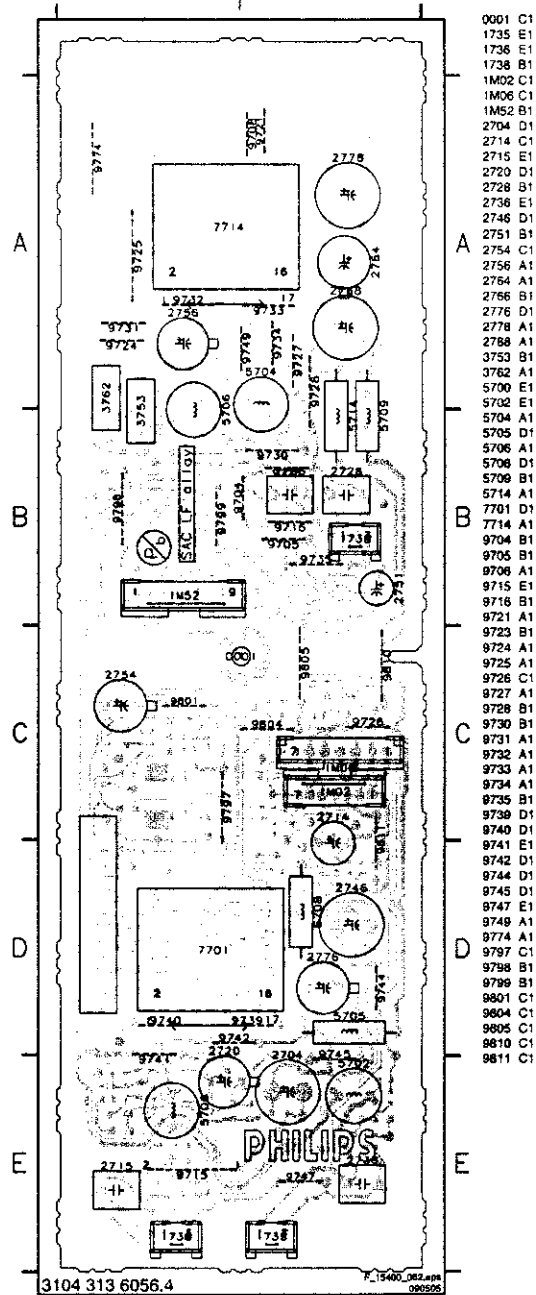


PDP Audio Amplifier Panel

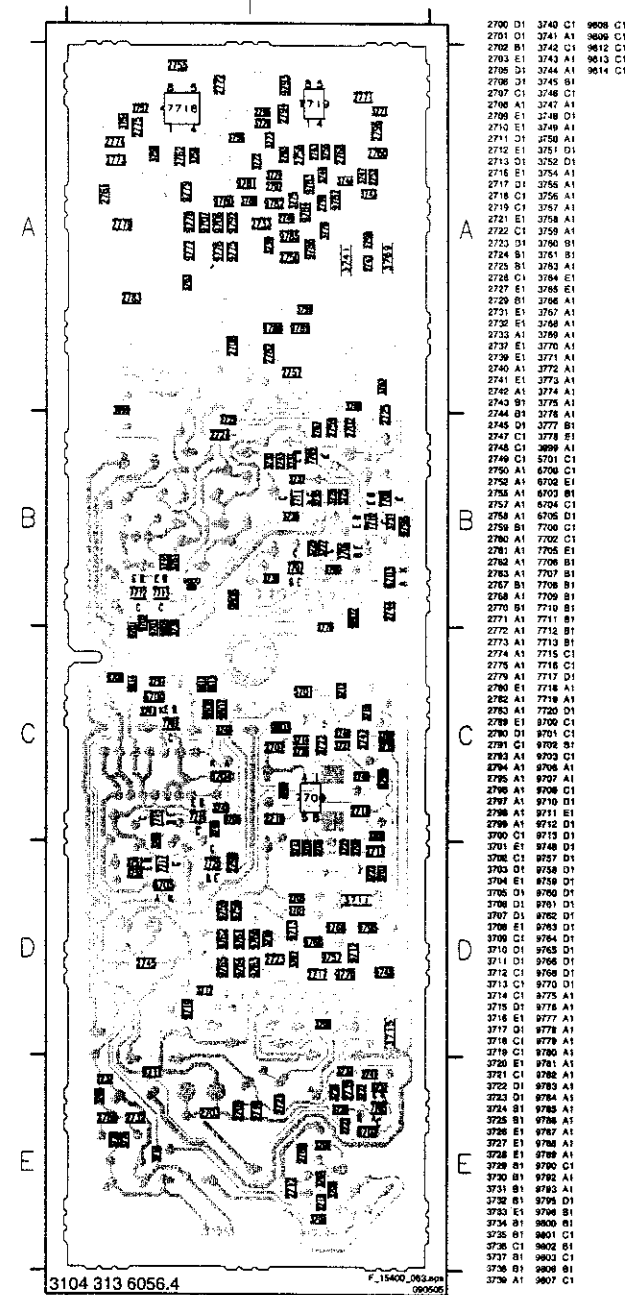
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1735 C12	2706 A3	2718 B5	2731 C9	2746 C7	2759 G11	2773 G3	2791 D14	3704 A10	3716 C10	3728 D4	3740 F15	3752 H14	3764 A10	3776 H8	5714 H6	7707 D2	7719-2 G4	9708 H7	F710 E13	F722 H6	F735 A14	I701 H13	I713 C2	I725 C8	I737 D2	I749 G1	I761 H4	I773 H10
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2702 H11	2714 G14	2726 B4	2742 G11	2755 G2	2768 H5	2783 G6	2790 A2	3712 B3	3724 C2	3736 F3	3748 G15	3760 E2	3772 H2	5705 A7	5709 G10	7715 G15	7720 H14	F706 B12	F718 F13	F730 D6	F747 B8	I709 D6	I721 B4	I733 D10	I745 F6	I757 G5	I769 H11	
2703 A7	2715 A10	2727 C6	2743 E5	2756 G7	2769 A15	2784 H6	2791 A10	3713 C13	3725 D2	3737 F3	3749 G6	3761 H11	3773 H2	5706 C14	5710 G14	7716 G14	7720 H15	F707 C12	F719 G12	F731 B8	F748 G12	I710 A4	I722 C9	I734 D3	I746 F9	I758 H11	I770 H3	
2704 A7	2716 A10	2728 H10	2744 E3	2757 G7	2771 H6	2789 D10	2792 C2	3714 B4	3726 D4	3738 F5	3750 G2	3762 H9	3774 H2	5707 C7	5711 H14	7717 H14	7720 H16	F708 C12	F720 G12	F733 H4	F750 G7	I711 G10	I723 B4	I735 H7	I747 G10	I759 H5	I771 H1	



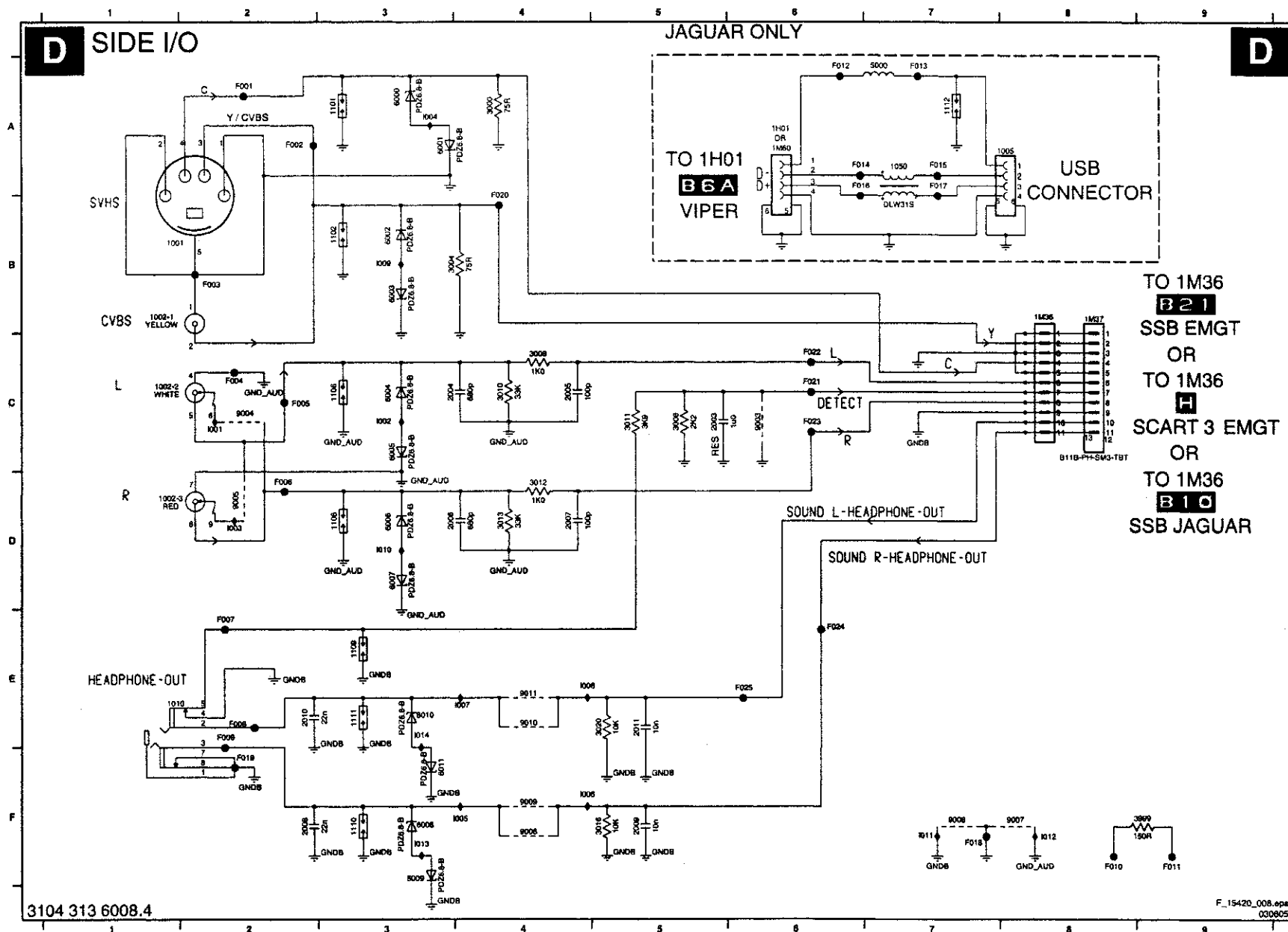
Layout PDP Audio Amplifier Panel (Top Side)



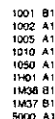
Layout PDP Audio Amplifier Panel (Bottom Side)



Side I/O Panel



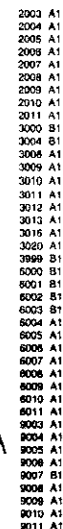
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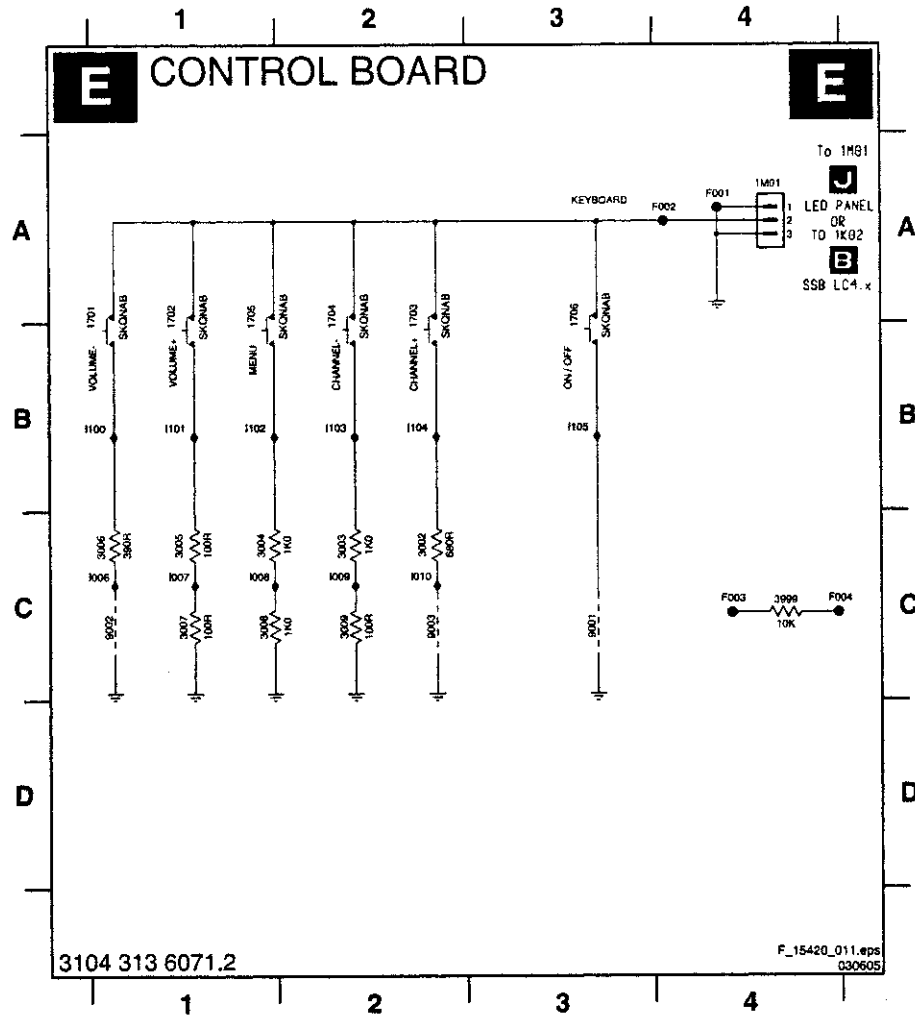


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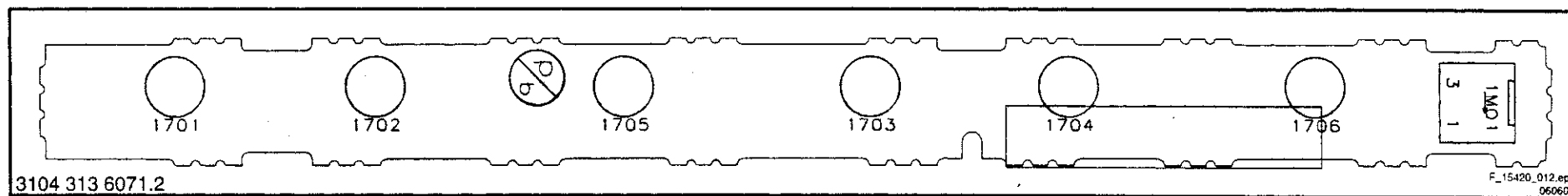
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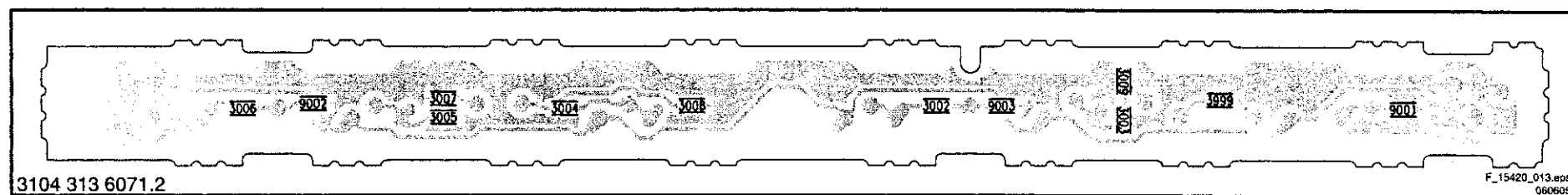
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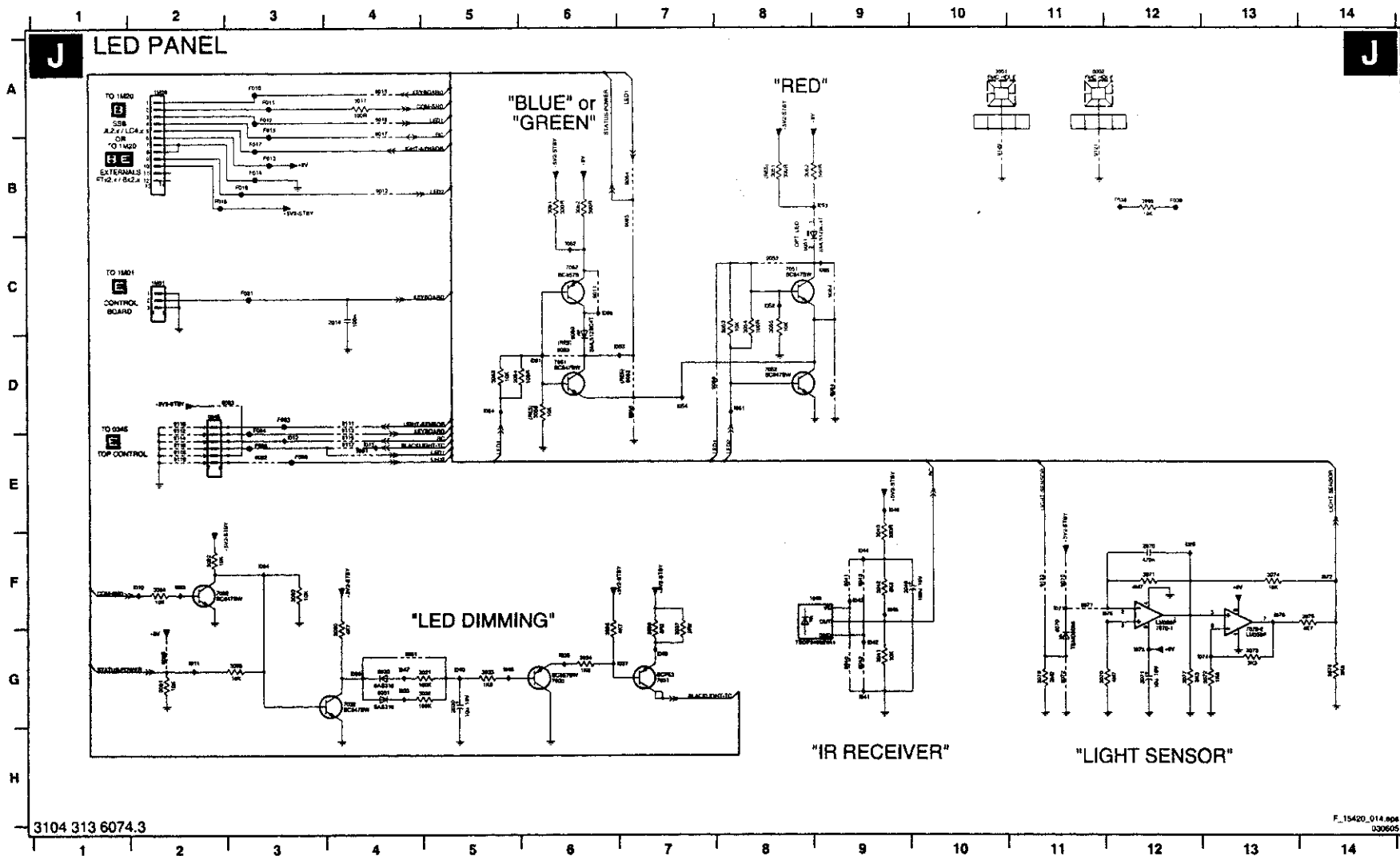


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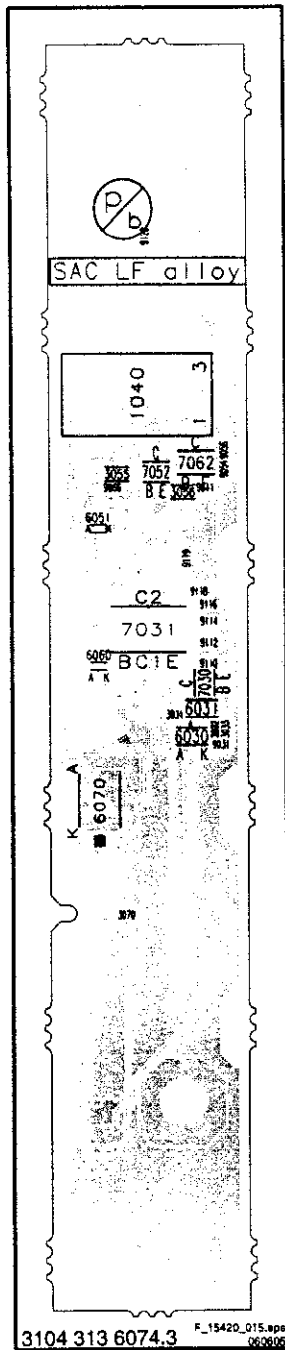


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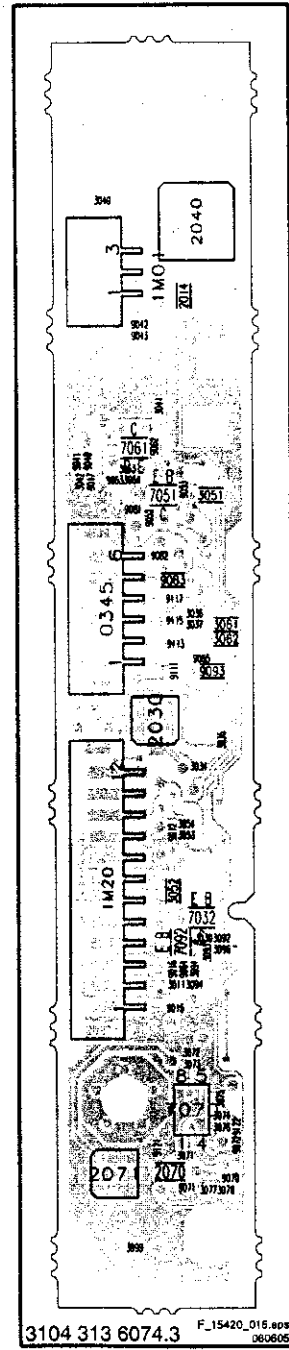


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Personal Notes:

8. Alignments

Index of this chapter:

- 8.1 General Alignment Conditions
- 8.2 Hardware Alignments
- 8.3 Software Alignments

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

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

8.1 General Alignment Conditions

Perform all electrical adjustments under the following conditions:

Mains voltage and frequency: 100-240 V / 50/60 Hz.
Allow the set to warm up for approximately 10 minutes.
Test probe: $R_i > 10 \text{ M}\Omega$; $C_i < 2.5 \text{ pF}$.

8.2 Hardware Alignments

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

8.3 Software Alignments

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

8.3.1 SAM Menu

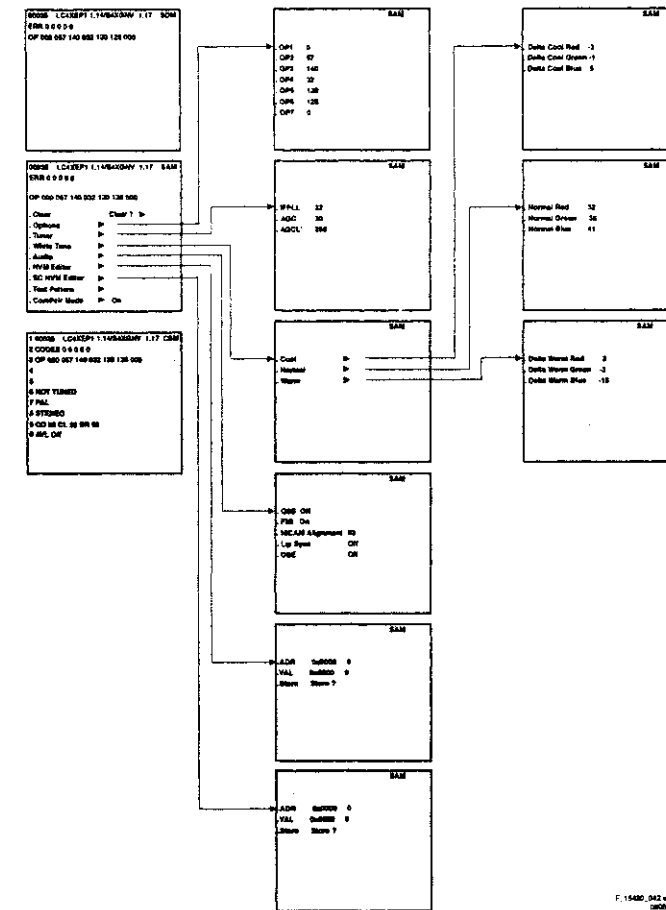


Figure 8-1 Overview SAM menu.

8.3.2 Tuner Adjustment

AGC (RF AGC Take Over Point)

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

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

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

8.3.4 ADC Gain and Grey Scale Alignment

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

Caution:

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

Table 8-1 ADC gain and grey scale alignment

SDTV ADC Gain settings: Use the NVM Editor in SAM to set these values in the Hercules NVM				
Setting	Hercules NVM Address (decimal value)	These models are with ADC & Columbus 3D CombFilter		
		50FF7320/10	42FF7320/10	42FF5320/10
NVM_ADC_GAIN_R	006	143	143	143
NVM_ADC_GAIN_G	007	191	191	191
NVM_ADC_GAIN_B	008	143	143	143

SDTV Greyscale settings: Use the SC NVM Editor in SAM to set these values in the Scaler NVM				
Setting	Scaler NVM Address (decimal value)	These models are with ADC & Columbus 3D CombFilter		
		50FF7320/10	42FF7320/10	42FF5320/10
ADC_RED_OFFSET2	336	080	080	080
ADC_GREEN_OFFSET2	339	080	080	080
ADC_BLUE_OFFSET2	340	080	080	080
ADC_RED_GAIN	341	154	154	154
ADC_GREEN_GAIN	343	154	154	154
ADC_BLUE_GAIN	345	154	154	154

PC Greyscale settings				
Setting	Scaler NVM Address (decimal value)	These models are with ADC & Columbus 3D CombFilter		
		50FF7320/10	42FF7320/10	42FF5320/10
ADC_RED_OFFSET2	325	080	080	080
ADC_GREEN_OFFSET2	328	080	080	080
ADC_BLUE_OFFSET2	327	080	080	080
ADC_RED_GAIN	328	154	154	154
ADC_GREEN_GAIN	330	154	154	154
ADC_BLUE_GAIN	332	154	154	154

HD Greyscale settings				
Setting	Scaler NVM Address (decimal value)	These models are with ADC & Columbus 3D CombFilter		
		50FF7320/10	42FF7320/10	42FF5320/10
ADC_RED_OFFSET2	351	064	064	064
ADC_GREEN_OFFSET2	352	062	062	062
ADC_BLUE_OFFSET2	353	064	064	064
ADC_RED_GAIN	354	159	159	159
ADC_GREEN_GAIN	356	144	144	144
ADC_BLUE_GAIN	358	147	147	147

8.3.5 Sound

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

8.3.6 Options

Options OP1...OP7 in the SAM menu can be used for quickly restoring 64 features or settings of the HERCULES part of the TV set to their original default factory values (8 groups of 8 features/settings each). When the decimal value of one option byte OP1...OP7 is changed (see the first table below) then a group of 8 bits, representing 8 HERCULES options or features, is changed as well (see the second table below for a detailed description of the features or settings that are changed). The second table shows which option byte (OP1...OP7) represents which group of 8 option bits. Each bit (0...7) switches a particular HERCULES feature or setting ON or OFF, depending on its value (1 or 0).

It is also possible to change the features or settings mentioned in the second table directly at bit level, by means of the NVM Editor in the SAM menu. In the NVM Editor, first the correct NVM address (ADR) has to be entered, then the correct value (VAL, 1 or 0) for each bit (see second table), and finally the settings have to be stored (STORE). For quickly restoring the HERCULES part of the TV set to its original factory settings, however, it is more convenient to simply enter the default factory settings OP1...OP7 that are given in the first table below. How to do this, is described in the next paragraph.

How to Change an Option Byte

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

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

Table 8-2 Option codes OP1...OP7

Option table for quickly restoring the HERCULES to its Factory Default settings			
	Model number	These models are with ADC & Columbus 3D CombFilter	
		50FF7320/10	42FF7320/10
OP1	152	152	152
OP2	37	37	37
OP3	79	79	15
OP4	241	241	241
OP5	252	252	252
OP6	27	27	27
OP7	19	19	19
Options (can be changed only via the SAM menu)		Total decimal value for each option per model number	

How to Change Options at Bit Level

If you wish to know which features or settings of the HERCULES are changed via OP1...OP7, or if you want to change each option or feature bit by bit, use the more detailed table below.

Note: the table below contains only part of the NVM settings that can be changed. A second range of settings and features can be found in Chapter 5 of this manual, in table NVM Default values. The settings mentioned there can only be changed via the NVM editor. For further settings, see also the table "ADC Gain and Grey scale alignment" elsewhere in this manual.

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

Option byte & bit table for restoring the TV set to its original Factory Default settings via the NVM Editor in the SAM menu			
	Model number	50PF130A10	42PF130A10
OP1			
bit 7 (msb)	OP_PHILIPS_TUNER	1	1
bit 6	OP_FM_RADIO	0	0
bit 5	OP_LNA	0	0
bit 4	OP_ITS // for EU	1	1
bit 3	OP_ACI	1	1
bit 2	OP_OK_RNP	0	0
bit 1	OP_VIRGIN_MODE	0	0
bit 0 (lsb)	OP_CINCH	0	0
	Total DEC Value	152	152
	Total HEX Value	98	98
OP2			
bit 7 (msb)	OP_SC	0	0
bit 6	OP_TBEX	0	0
bit 5	OP_CHANNEL_NAMING	1	1
bit 4	OP_LTI (Lum Transient Improvmt)	0	0
bit 3	OP_TILT	0	0
bit 2	OP_FINE_TUNING	1	1
bit 1	OP_PIP_PHILIPS_TUNER	0	0
bit 0 (lsb)	OP_HUE	1	1
	Total DEC Value	37	37
	Total HEX Value	25	25
OP3			
bit 7 (msb)	OP_EW_FUNCTION	0	0
bit 6	OP_PIXEL_PLUS	1	1
bit 5	OP_PIP_SPLITTER // temp	0	0
bit 4	OP_SPLITTER // temp	0	0
bit 3	OP_VIRTUAL_DOLBY	1	1
bit 2	OP_WIDE_SCREEN	1	1
bit 1	OP_WISSE	1	1
bit 0 (lsb)	OP_OF_MES // OP_MES - 5/8 local buttons implementation	1	1
	Total DEC Value	79	79
	Total HEX Value	4F	4F
OP4			
bit 7 (msb)	OP_LIP_SYNC	1	1
bit 6	OP_HIP	1	1
bit 5	OP_UCLINA_BASS	1	1
bit 4	OP_DELTA_VOLUME	1	1
bit 3	OP_TAIWAN_KOREA	0	0
bit 2	OP_VOLUME_LIMITER	0	0
bit 1	OP_STEREO_DMX	0	0
bit 0 (lsb)	OP_STEREO_NICAM_SC5	1	1
	Total DEC Value	241	241
	Total HEX Value	F1	F1
OP5			
bit 7 (msb)	OP_AV1	1	1
bit 6	OP_AV2	1	1
bit 5	OP_AV3	1	1
bit 4	OP_CV	1	1
bit 3	OP_SVRHS2	1	1
bit 2	OP_SVRHS1	1	1
bit 1	OP_HOTEL_MODE	0	0
bit 0 (lsb)	OP_FACTORY_FACTORY-OP_BTSC_AUSTEREO	0	0
	Total DEC Value	252	252
	Total HEX Value	FC	FC
OP6			
bit 7 (msb)	OP_PERSONAL_ZAPPING	0	0
bit 6	OP_SMART_SURF	0	0
bit 5	OP_PATMAP	0	0
bit 4	OP_COMBFILTER	1	1
bit 3	OP_ACTIVE_CONTROL	1	1
bit 2	OP_VIDEO_TEXT	1	1
bit 1	OP_LIGHT_SENSOR	1	1
bit 0 (lsb)	OP_TWIN_TEXT	1	1
	Total DEC Value	27	27
	Total HEX Value	1B	1B
OP7			
bit 7 (msb)	OP_TIME_WINT	0	0
bit 6	OP_DVB_USB = OP_MALAY	0	0
bit 5	OP_AUDIO_COPY	0	0
bit 4	OP_COLUMBUS	1	1
bit 3	OP_DUMMYY	0	0
bit 2	OP_DUMMYY?	0	0
bit 1	OP_WEST_EU	1	1
bit 0 (lsb)	OP_MULTI-STANDARD_EUR	1	1
	Total DEC Value	19	19
	Total HEX Value	03	03

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

Index of this chapter:

- 9.1 Introduction
- 9.2 Block Diagram
- 9.3 Input/Output
- 9.4 Tuner and IF
- 9.5 Video: TV Part (Diagrams B1, B2, and B3)
- 9.6 Columbus
- 9.7 Video: Scaler Part (Diagram B7, B8 and B9)
- 9.8 Audio Processing
- 9.9 Control
- 9.10 Abbreviation List
- 9.11 IC Data Sheets

Pixel Plus architecture; the architecture of the Digital Crystal Clear model is shown in the block diagram on the next page (Figure "Block diagram of the internal building blocks").

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

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

9.1 Introduction

The "LC4.9 Plasma TV" is a global plasma TV for the year 2005. It is the successor of the "LC4.7" and has a screen size of 42 inch or 50 inch (in 16:9 ratio); it has a new styling, called Entry+ 05. There are two different picture qualities available, depending on the model: Pixel Plus and Digital Crystal Clear. The block diagram below (Figure "Block diagram") shows the

9.2 Block Diagram

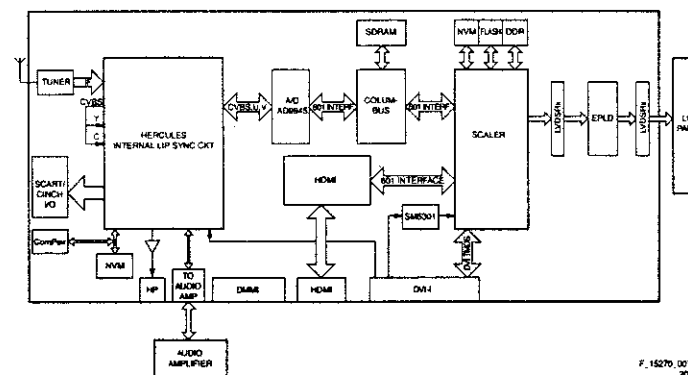


Figure 9-1 Block Diagram

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

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

The Hercules has one input for the internal CVBS signal and a video switch with 3 external CVBS inputs and a CVBS output. All CVBS inputs can be used as Y-input for Y/C signals. However, only 2 Y/C sources can be selected because the circuit has 2 chroma inputs. It is possible to add an additional CVBS(Y)/C input (CVBS/YX and CX) when the YUV interface and the RGB/YPRPB input are not needed. Two SCART-

connectors are used: SCART1 is for RGB-in, video in (CVBS) and terrestrial out (CVBS), and SCART2 is meant for VCR (CVBS out and Y/C in). The CVBS-out on pin 19 of SCART2 can be used for monitoring purposes: WYSIWYR (What You See is What You Record).

Depending on the model of the TV set, the Hercules delivers its RGB signals either directly to the Scaler IC or indirectly, via a Columbus chip (for 2D/3D comb filtering and spatial/temporal noise reduction, for its description: see further down in this text). The EPLD, which is present in Pixel Plus models, provides additional sharpening to the picture. For a general outline, see the table and the block diagrams below, in which the architectures of the various models are given, together with their electronic building blocks.

Table 9-1 Models and picture quality

Model	Picture quality
50PF7320/10	Pixel Plus
42PF7320/10	Pixel Plus
42PF5320/10	Digital Crystal Clear

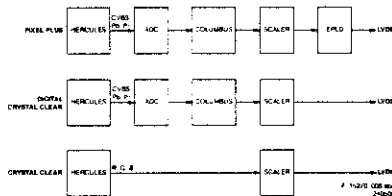


Figure 9-2 Block diagram of the internal building blocks

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

After the video processing, the digital data is sent via a Low Voltage Differential Signaling bus to the LCD panel. LVDS is used to improve data speed and to reduce EMI significantly. There are two I²C lines and two interrupt and communication lines (TV_IRQ and TV_SC_COM) for the Scaler control. The Scaler communicates with the Hercules as a slave device. To avoid buffer overflow at the Scaler side, the TV_SC_COM line provides the necessary hardware flow control. To allow bi-directional communication, the Scaler can initiate a service interrupt-request to the Hercules via the TV_IRQ line.

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

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

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

9.3 Input/Output

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

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

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

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

9.4 Tuner and IF

A Philips UV1318 Tuner is used in the TV board. The SIF signals are decoded by the Hercules. Tuning is done via I²C.

9.4.1 Video IF Amplifier

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

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

The video processing is completely handled by the Hercules

- IF demodulator.
- Chrominance decoder
- Sync separator.
- Horizontal & vertical drive.
- RGB processing.
- CVBS and SVHS source select.

It has also built-in features like:

- CTI.
- Black stretch.
- Blue stretch.
- White stretch.
- Slow start up.
- Dynamic skin tone correction etc.

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

9.6 Columbus

9.6.1 Introduction

The Columbus is a combination of:

- A 2D/3D Comb filter for both PAL and NTSC, and
- A spatial/temporal noise reduction system for both colour and luminance signals.

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

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

9.6.2 2D/3D Comb Filter

Introduction

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

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

The Columbus can comb the following standard signals:

- PAL B, PAL G, PAL H, PAL I, PAL D, PAL K: Colour standard PAL, Colour carrier at 4.43 MHz, field frequency: 50 Hz
- PAL M: Colour standard PAL, Colour carrier at 3.58 MHz, field frequency: 60 Hz
- PAL N: Colour standard PAL, Colour carrier at 3.58 MHz, field frequency: 50 Hz
- NTSC M: Colour standard NTSC, Colour carrier at 3.58 MHz, field frequency: 60 Hz

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

The following signals CANNOT be combed:

- Double Window signals or Multi PIP. For these signals, only one part or even no part of the signal is in relation with the burst. The part that is not in relation with the burst can become very blurred when combed by the Columbus

Comb filter. Such a signal must be bypassed. Notch mode is not even an option since e.g. in double window, one part can be a PAL signal while the other part is NTSC or SECAM.

- In cases where a SECAM signal is presented to the Columbus Comb filter; both the luminance and UV path must be bypassed. The PAL delay line inside the Columbus cannot be used for SECAM signals so it must also be bypassed. The luminance path must have luminance at its input instead of CVBS. A chroma delay line outside Columbus must be used for SECAM signals. Reason for this: the Columbus PAL delay line halves the output of the chroma signals in case of SECAM.
- Y/C, YPbPr, and RGB signals do not have to be combed. So both the luminance and UV path must be bypassed. The PAL delay line will also be bypassed.
- In cases where the Columbus Comb filter does not receive a CVBS signal with burst at the right place according to the standard (this includes black and white signals without burst), phase correction results become unpredictable and the Comb filter must be set in bypass (= luminance path bypassed, UV path bypassed, PAL delay line bypassed)
- VCR signals cannot be combed and must be processed in notch mode, or bypassed.

Columbus Modes

The several modes of the Columbus 3D Comb filter are:

- Bypass mode.
- Band-Pass-Notch mode.
- 2D Comb filter modes:
 - Simple median.
 - Median.
- Field Comb filter mode.
- Frame Comb filter mode.

Bypass Mode

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

Band-Pass-Notch Mode

This is a mode where no Comb filtering is applied. A "Band Pass Filter" is used to filter the chroma information out of the CVBS signal. A "Notch Filter" is used to subtract the sub carrier out of the CVBS in order to make a luminance signal without chroma sub carrier.

In terms of cross colour and cross luminance, this mode has the worst performance of all. It is only used on these signals where no comb filtering can be applied (non-standard signals and most VCR signals for example).

2D Comb Filter Modes

A Comb filter does an action on a current pixel and a delayed pixel. When the delayed pixel is a line-delayed pixel, we talk about a "Spatial or 2D Comb Filter" (for NTSC the delay must be 1 line, for PAL it must be 2 lines).

Spatial or 2D Comb filters show problems on vertical colour transients and on single coloured lines. For these situations, extra hardware is added in the Columbus chip to avoid these kinds of problems. However even with these extra measures, there are still situations where the 2D Comb filter does not perform optimally (diagonal resolution and single lines with equal luminance content). In order to restrict the working area of the 2D Comb filter to the frequencies where the sub carrier is present, a horizontal band pass filter always precedes a 2D Comb filter.

When a 2D Comb filter has no extra hardware to avoid problems at vertical colour transients (or this extra hardware is switched "off"), the Comb filter is called a "simple median filter". When there is extra hardware to avoid these kinds of problems, the filter is called a "median filter".

Field Comb Filter Mode

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

about a "Field Comb Filter". Field Comb filters are only for PAL of commercial interest.

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

A field Comb filter is also called a "vertical-temporal filter" because it filters in the vertical and temporal direction.

Frame Comb Filter Mode

A Comb filter does an action on a current pixel and a delayed pixel. When the delay is a frame, we talk about a "Frame Comb Filter". For NTSC we need a delay of one frame, for PAL however the delay must be two frames.

Frame Comb filters have the best performance, but just like the Field Comb filter, they perform very badly on motion. A motion detector will have to detect motion and on these motion pixels, 2D Comb filtering will have to be applied. A frame Comb filter is a pure "temporal filter".

The Columbus needs an external memory connected to it, before it can do a temporal or vertical-temporal Comb filter action. When no external memory is connected, field or frame Comb filtering is impossible.

Block Diagram

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

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

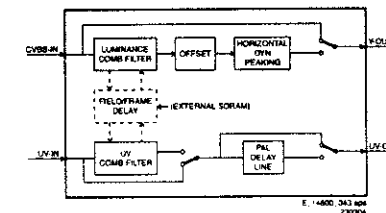


Figure 9-4 Columbus 2D/3D Comb Filter block diagram

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

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

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

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

A horizontal dynamic peaking can be done on the luminance signal. This peaking is adaptive in order not to amplify any cross luminance distortion. It detects where there could be left over sub carrier in the luminance signal and reduces the peaking over there. The detection of the left over cross luminance is different depending on the pre-filter or post-filter mode.

The amount of peaking and coring can be chosen. The peaking algorithm behind it is a simplified copy of the luminance peaking of picnic. After the peaking block, the signal is output as clean luminance.

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

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

For PAL signals, the PAL delay line in front of the Columbus 3D Comb filter is bypassed and the Columbus delay line is switched "on". In cases where the delay line in front of Columbus cannot be bypassed, the Columbus PAL delay line is bypassed.

For NTSC signals, the PAL delay line is bypassed as usual.

9.7.1 Teletext Path

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

9.7.2 Features

The Scaler provides several key IC functions:

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

9.7.3 Inputs

Analog RGB

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

PC (VGA) Input

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

9.7.4 Output

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

9.8 Audio Processing

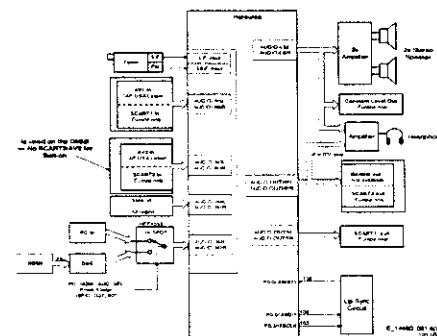


Figure 9-6 Block diagram audio processing

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

In this chassis, the analogue decoder is used in two cases:

- It is used for AM Sound demodulation in the Europe SECAM LL' transmission.
- It is used for all FM demodulation in AV-Stereo sets.

9.8.1 Diversity

The diversity for the Audio decoding can be broken up into two main concepts:

- The Quasi Split Sound concept used in Europe and some AP sets.
 - The Inter Carrier concept, used in NAFTA and LATAM.
- The UOC-III family makes no difference anymore between QSS- and Intercarrier IF, nearly all types are software-switchable between the two SAW-filter constructions.

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

On top of that, it can be further broken down into various systems depending on the region. The systems or region chosen, will in turn affect the type of sound standard that is/are allowed to be decoded.

- For the case of Europe, the standard consists of BG/DK/LL' for a Multi-System set. There are also versions of Eastern Europe and Western Europe set and the standard for decoding will be BG/DK and I/DK respectively. FM Radio (not applicable for the models discussed in this manual) is a feature diversity for some Europe TV sets. The same version can have either FM Radio or not, independent of the system (e.g. sets with BG/DK/LL' can have or not have FM radio).
- For the case of NAFTA and LATAM, there is only one transmission standard, which is the M standard. The diversity then will be based on whether it has a dBx noise reduction or a Non-dBx (no dBx noise reduction).

- For the case of AP, the standard consists of BG/DK/IM for a Multi-System set. The diversity here will then depend on the region. AP China can have a Multi-System and I/DK version. For India, it might only be BG standard.

9.8.2 Functionality

The features available in the Hercules are as follows:

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

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

9.8.3 Audio Amplifier

The audio amplifier part is very straightforward. It uses two integrated TDA8931T power amplifiers for the L and R channels; each amplifier IC is able to deliver a maximum output of 20 W_{RMS} continuously in a 4-6 ohm speaker without needing a heatsink.

The operating supply for the amplifier may range from 12 V to 32 V; in the LC04x TV set, depending on the model, supply voltages of 18 V (for the 5 W / 8 ohm version) or 24 V (for the 15 W / 4 ohm version) are used.

Muting is done via the SOUND_ENABLE line connected to pins 7 of both amplifier-ICs, which comes from the Hercules.

9.8.4 Audio: Lip Sync

No Lip Sync adjustments are necessary in this model.

9.9 Control

9.9.1 Hercules

The System Board has two main micro-controllers on board. These are:

- On-chip x86 micro-controller (OCM) from Genesis LCD or plasma TV/Monitor Controller.
 - On-chip 80C51 micro-controller from Philips Semiconductor UOCIII (Hercules) series.
- Each micro-controller has its own I²C bus which hosts its own internal devices.
- The Hercules is integrated with the Video and Audio Processor. For dynamic data storage, such as SMART PICTURE and SMART SOUND settings, an external NVM IC is being used. Another feature includes an optional Teletext/Closed Caption decoder with the possibility of different page storage depending on the Hercules type number.

9.9.2 Block Diagram

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

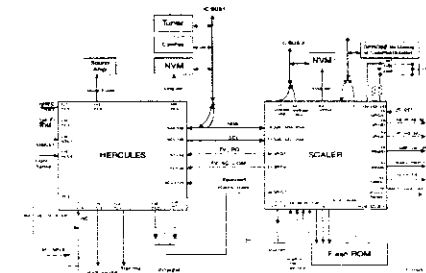


Figure 9-7 Micro Controller block diagram

9.9.3 Basic Specification

The Micro Controller operates at the following supply voltages:

- +3.3 V_{DD} at pins 4, 88, 94, and 109.
- +1.8 V_{DD} at pins 93, 96, and 117.
- I²C pull up supply: +3.3V_{DD}.

9.9.4 Pin Configuration and Functionality

The ports of the Micro Controller can be configured as follows:

- A normal input port.
- An input ADC port.
- An output Open Drain port.
- An output Push-Pull port.
- An output PWM port.
- Input/Output Port

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

Table 9-2 Micro Controller ports overview

Pin	Name	Description	Configuration
97	INT0/P0.5	IR	INT0
98	P1.0/INT1	TV_IRQ	INT2
99	P1.1/T0	TV_SC_COM	P1.1
102	P0.4/I2SWS	EXT_MUTE	P0.4
103	P0.3/I2SCLK	Lip Sync	I2SCLK
104	P0.2/I2SDO2	NVM_WP	P0.2
105	P0.1/I2SDO1	Lip Sync	I2SDO1
106	P0.0/I2SDIO	Lip Sync	I2SDIO
107	P1.3/T1	PC-TV_LED	P1.3
108	P1.6/SCL	SCL	SCL
109	P1.7/SDA	SDA	SDA
111	P2.0/TPWM	SOUND_ENABLE	P2.0
112	P2.1/PWM0	(for future use)	-
113	P2.2/PWM1	(for future use)	-
114	P2.3/PWM2	SEL_IF	P2.3
115	P3.0/ADC0	Light Sensor - SDM	ADC0
116	P3.1/ADC1	STATUS_1	ADC1
119	P3.2/ADC2	STATUS_2	ADC2
120	P3.3/ADC3	KEYBOARD	ADC3
122	P2.4/PWM3	STANDBY	P2.4
123	P2.5/PWM4	(for future use)	-
126	P1.2/INT2	(for future use)	-
127	P1.4/RX	HERC_RESET	-
128	P1.5/TX	POWER_DOWN	P1.5

The description of each functional pin is explained below:

- **LED.** This signal is used as an indication for the Standby, Remote and Error Indicator. Region diversity:
 - During protection mode, the LED blinks and the set is in standby mode.
 - During error conditions it blinks at a predefined rate.
 - After receiving a valid RC-5 or local keyboard command it flashes once.
 - For sets with error message indication, the LED blinks when message is active and the set is in standby mode.
- **SCL.** This is the clock wire of the two-wire single master bi-directional I²C bus.
- **SDA.** This is the data wire of the two-wire single master bi-directional I²C bus.
- **STANDBY.** The Hercules generates this signal. This can enable the power supply in normal operation and disable it during Standby. It is of logic "high" (3.3 V) under normal operation and "low" (0 V) during Standby.
- **IR.** This input pin is connected to an RC5 remote control receiver.
- **SEL-IF.** This is an output pin to switch the Video SAW filter between M system and other systems.
 - 0: NTSC M (default)
 - 1: PAL B/G, DK, I, L
- **NVM_WP.** The global protection line is used to enable and disable write protection to the NVM. When write to the NVM is required, pin 7 of the NVM must be pulled to logic '0' first (via Write_Protect of the micro-controller pin) before a write is performed. Otherwise pin 7 of NVM must always be at logic '1'.
 - 0: Disabled
 - 1: Enabled (default)
- **SOUND_ENABLE.** This pin is used to MUTE the audio amplifier. It is configured as push pull.
- **STATUS_1.** This signal is used to read the status of the SCART 1 input.
- **STATUS_2.** This signal is used to read the status of the SCART 2 input.
- **HERC_RESET.** This pin is used to switch the +1.8V supply.
- **POWER_DOWN.** The power supply generates this signal. Logic "high" (3.3 V) under normal operation of the TV and goes "low" (0 V) when the Mains input voltage supply goes below 70 V_{AC}.
- **KEYBOARD.** Following are the Keyboard functions and the step values (8 bit) for it.

Table 9-3 Local keyboard values

Function	Voltage (V _{DC})	Step values (8 bit)
NAFTA Standby	0	0 - 6
Ch +	0.43	7 - 33
Exit Factory (Ch- and Vol-)	0.69	34 - 53
Ch -	0.93	54 - 73
Menu (Vol - and Vol +)	1.19	74 - 96
Vol -	1.49	97 - 121
DVD Eject (not applicable)	1.8	122 - 147
Vol +	2.12	148 - 169

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

9.10 Abbreviation List

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

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

SCL
SD
SDA
SDRAM
SECAM

Téléviseurs: This is a 21-pin connector used in EU, that carries various audio, video, and control signals (it is also called Peritel connector).

Serial Clock Signal on I²C bus

Standard Definition

Serial Data Signal on I²C bus

Synchronous DRAM

SÉquence Couleur Avec Mémoire;

Colour system mainly used in France and East Europe. The chroma is FM modulated and the R-Y and B-Y signals are transmitted line

sequentially. Colour carriers=

4.406250 MHz and 4.250000 MHz

Sound Intermediate Frequency

Switched Mode Power Supply

SouND

Sound left SCART1 in

Sound left SCART1 out

Sound left SCART2 in

Sound left SCART2 out

Sound right SCART1 in

Sound right SCART1 out

Sound right SCART2 in

Sound right SCART2 out

Self Oscillating Power Supply

SOPS
S/PDIF Sony Philips Digital InterFace; This is a consumer interface used to transfer digital audio

SRAM

Static RAM

STBY

STandBY

SVHS

Super Video Home System

SW

Software or Subwoofer or Switch

THD

Total Harmonic Distortion

TXT

Teletext; TXT is a digital addition to analogue TV signals that contain textual and graphical information (25 rows x 40 columns). The information is transmitted within the first 25 lines during the Vertical Blank Interval (VBI)

µP

Microprocessor

VA

Vertical Acquisition

VL

Variable Level out: processed audio output towards external amplifier

VCR

Video Cassette Recorder

VGA

Video Graphics Array; 640x480 (4:3)

WD

Watch Dog

WYSIWYR

What You See Is What You Record: record selection that follows main picture and sound

XTAL

Quartz crystal

Y

Luminance signal

Y/C

Y consists of luminance signal, blanking level and sync; C consists of chroma (colour) signal

YPbPr

This is a scaled version of the YUV colour space. Y= Luminance, Pb/Pr= Colour difference signals B-Y and R-Y, other amplitudes w.r.t. to YUV

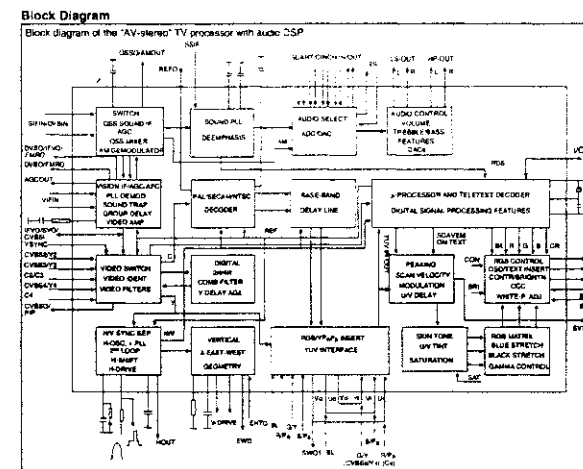
YUV

Colour space used by the NTSC and PAL video systems. Y is the luminance and U/V are the colour difference signals

9.11 IC Data Sheets

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

9.11.1 Diagram B2, Type TDA15021H (IC7217, Hercules)



Pin Configuration



Figure 9-8 Internal block diagram and pin configuration

9.11.2 Diagram B19, Type T6TUSXB (IC7M00, Columbus)

Figure 1 Package outline (top view)

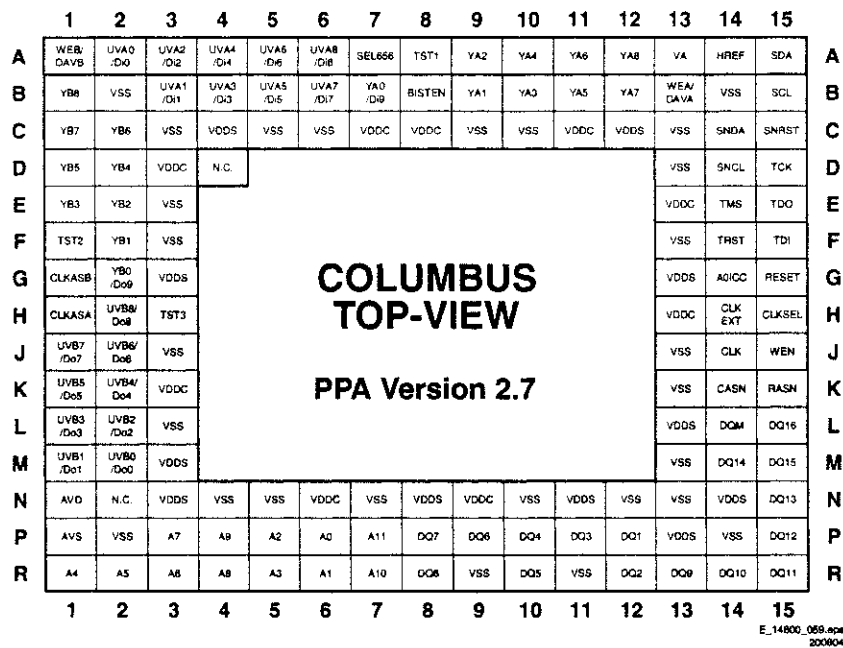
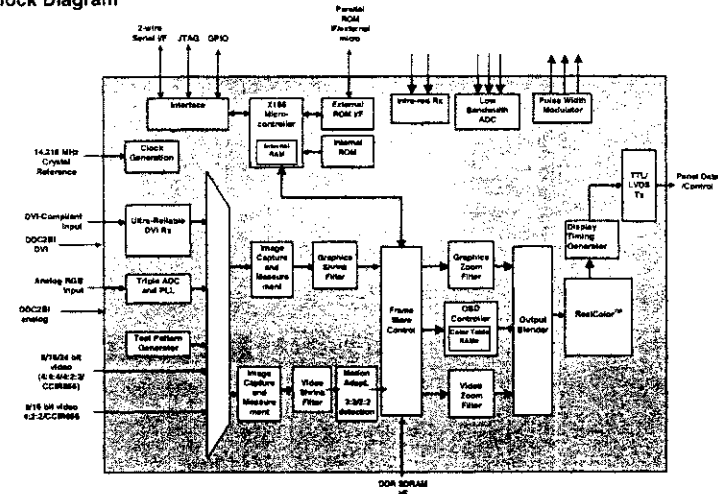


Figure 9-9 Pin configuration

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

Block Diagram



Pin Configuration

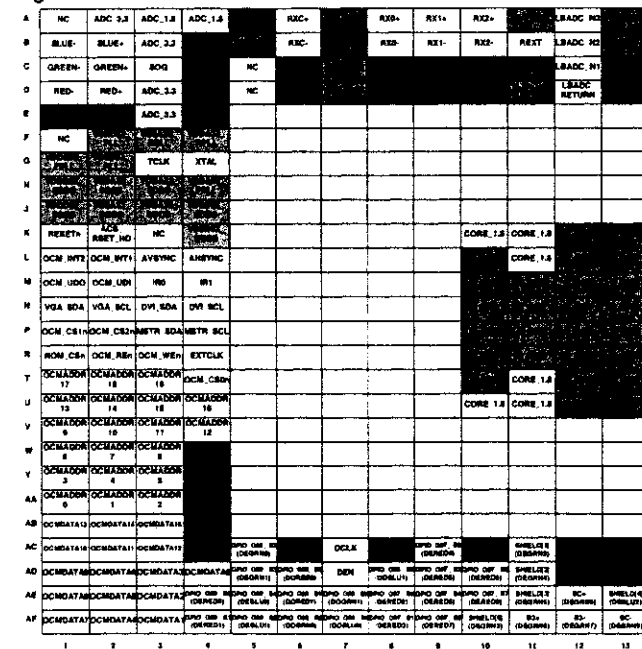


Figure 9-10 Internal block diagram and pin configuration

2335	2020 552 96628	10mF 10% 18V 0402
2386	2020 552 96628	10mF 10% 18V 0402
2387	4822 124 12095	100uF 20% 16V
2398	2020 552 96628	10mF 10% 18V 0402
2397	4822 124 12095	100uF 20% 16V
2402	2222 336 22474	100uF 20% 16V
2401	2222 336 22474	10mF 20% 275V
2404	4822 126 14525	470pF 5% 1kV
2405	2252 811 95017	470pF 10% 250V
2406	4822 126 14525	47pF 5% 1kV
2407	2252 811 95017	470pF 10% 250V
2465	4822 124 12095	100uF 20% 16V
2502	2238 869 15101	100pF 5% 50V 0402
2502	2020 552 96628	10mF 10% 18V 0402
2504	2020 552 96618	10mF 10% 18V 0402
2507	2238 869 15101	100pF 5% 50V 0402
2508	4822 124 12095	100uF 20% 16V
2510	2238 869 15101	100pF 5% 50V 0402
2510	2020 021 81506	100uF 20% 16V
2511	2238 586 59812	100nF 20% 50V 0603
2512	2238 586 59812	100nF 20% 50V 0603
2513	2020 552 96618	10mF 10% 18V 0402
2532	4822 124 12095	100uF 20% 16V
2533	4822 124 12095	100uF 20% 16V
2534	2020 552 96679	1uF 10% 16V 0805
2540	4822 124 12095	100uF 20% 16V
2541	4822 124 12095	100uF 20% 16V
2542	2238 586 59812	100nF 20% 50V 0603
2600	4822 122 33799	1nF 10% 1kV
2601	4822 122 33799	1nF 10% 1kV
2602	2020 552 96623	2.2nF 10% 50V 0402
2603	2222 383 90136	1uF 5% 400V
2605	2222 383 90136	1uF 5% 400V
2608	2020 552 96618	1nF 10% 50V 0402
2610	4822 121 70584	1.8nF 5% 2kV
2611	4822 126 12663	220pF 10% 2kV
2612	2020 552 96618	1nF 10% 50V 0402
2613	2020 552 96618	2.2nF 10% 50V 0402
2614	4822 124 12415	220uF 20% 400V
2617	4822 124 12415	220uF 20% 400V
2640	3198 035 04710	470pF 50V 0402
2642	2020 552 96618	1nF 10% 50V 0402
2651	2020 552 96618	10mF 10% 16V 0402
2653	2020 535 06810	680pF 5% 50V 0402
2654	4822 124 80151	47uF 16V
2656	2020 552 96679	2.2nF 10% 8V 0805
2658	2222 586 15649	100nF 20% 50V 0805
2660	4822 126 13881	470pF 5% 50V
2661	2020 552 96618	1nF 10% 50V 0402
2662	4822 124 80061	100uF 20% 25V
2663	4822 121 51319	1uF 10% 63V
2664	4822 124 40255	100uF 20% 63V
2665	4822 126 13881	470pF 5% 50V
2666	2020 552 96793	4.7nF 10% 50V 0402
2668	2238 586 59812	100nF 20% 50V 0603
2670	2238 586 59812	100nF 20% 50V 0603
2672	2222 580 15649	100nF 10% 50V 0805
2673	2020 558 90621	10mF 630V
2674	2020 558 90621	10mF 630V
2675	2020 558 90621	10mF 630V
2676	2020 558 90621	10mF 630V
2677	2020 552 96623	2.2nF 10% 50V 0402
2690	2020 552 96618	1nF 10% 50V 0402
-W-		
3001	4822 051 30471	470k 5% 0.062W
3002	4822 051 30471	470k 5% 0.062W
3003	4722 117 11297	100k 1% 0.1W
3004	3198 031 01530	15k 1% 5% 0.01W 0402
3005	3198 031 02730	27k 1% 5% 0.01W 0402
3006	4822 117 13606	100k 5% 0.01W 0402
3007	3198 031 04720	4.7k 1% 5% 0.0402
3008	4822 101 10102	10k 1% 5% 0.062W
3009	4822 051 30102	10k 1% 5% 0.062W
3010	3198 031 01530	15k 1% 5% 0.01W 0402
3011	4822 051 30661	560k 1% 5% 0.062W
3012	3198 031 04720	4.7k 1% 5% 0.0402
3013	4822 117 13606	100k 5% 0.01W 0402
3014	4822 050 23309	33

3024	4822 117 12306	150kΩ 1% 0.1W
3025	2322 706 72202	2.2kΩ 5% 0.402
3026	4822 051 20684	680kΩ 5% 0.1W
3027	3198 031 04730	47kΩ 5% 0.402
3028	2322 704 67502	7.5kΩ 1% 0.5W
3029	4822 051 30123	10kΩ 5% 0.402
3030	3198 031 04730	47kΩ 5% 0.1W
3031	2322 706 71003	10kΩ 5% 0.402
3032	2322 706 71003	10kΩ 5% 0.402
3033	2322 705 70184	18kΩ 5% 0.1W
3034	4822 117 12306	220kΩ 5% 0.01W 0.402
3035	4822 051 20684	680kΩ 5% 0.1W
3036	2122 612 00068	NTC 11Ω 20% 6W
3037	4822 117 13606	10kΩ 5% 0.01W 0.402
3038	4822 117 12306	10kΩ 5% 0.1W
3039	4822 051 30105	1MΩ 5% 0.062W
3040	4822 117 10637	10kΩ 1% 0.1W
3041	4822 117 12306	33kΩ 5% 0.402
3042	4822 051 30471	47kΩ 5% 0.062W
3043	3198 031 04730	47kΩ 5% 0.402
3044	4822 051 30102	1kΩ 5% 0.062W
3045	4822 051 30102	1kΩ 5% 0.062W
3046	4822 051 20565	5.9kΩ 5% 0.25W
3047	3198 031 04730	47kΩ 5% 0.402
3048	3198 031 04730	47kΩ 5% 0.402
3049	3198 031 01330	12kΩ 5% 0.402
3050	4822 051 10398	3.9kΩ 5% 0.33W
3051	4822 051 20222	8.2kΩ 5% 0.1W
3052	4822 117 12306	150kΩ 1% 0.1W
3053	2322 662 93131	PTC 10Ω
3054	4822 117 13548	470kΩ 5% 0.402
3055	4822 117 10637	10kΩ 1% 0.1W
3056	4822 051 30331	330kΩ 5% 0.062W
3057	4822 051 30101	100kΩ 5% 0.062W
3058	4822 051 20105	1MΩ 5% 0.1W
3059	3198 031 05330	560kΩ 5% 0.402
3060	4822 051 22204	220kΩ 5% 0.06W
3061	3198 031 01830	18kΩ 5% 0.01W 0.402
3062	4822 117 13548	1kΩ 5% 0.402
3063	4822 117 13548	1kΩ 5% 0.402
3064	4822 117 13606	10kΩ 5% 0.01W 0.402
3065	4822 117 13548	1kΩ 5% 0.402
3066	4822 117 13606	10kΩ 5% 0.01W 0.402
3067	3198 031 01530	15kΩ 5% 0.01W 0.402
3068	4822 117 13606	10kΩ 5% 0.01W 0.402
3069	4822 051 30471	47kΩ 5% 0.062W
3070	4822 051 30103	10kΩ 5% 0.062W
3071	3198 031 04730	47kΩ 5% 0.402
3072	3198 031 01530	15kΩ 5% 0.402
3073	3198 031 01530	15kΩ 5% 0.402
3074	3198 031 01530	15kΩ 5% 0.01W 0.402
3075	4822 051 20105	1MΩ 5% 0.1W
3076	4822 117 12306	10kΩ 5% 0.1W
3077	4822 051 20105	1MΩ 5% 0.1W
3078	4822 117 12306	10kΩ 5% 0.1W
3079	4822 051 30681	680kΩ 5% 0.062W
3080	4822 051 30681	680kΩ 5% 0.062W
3081	3198 031 01520	12kΩ 5% 0.01W 0.402
3082	3198 031 01520	12kΩ 5% 0.01W 0.402
3083	2512 915 11002	1kΩ 1% 0.5W
3084	4822 117 13606	10kΩ 5% 0.01W 0.402
3085	3198 031 04730	47kΩ 5% 0.402
3086	3198 031 04730	47kΩ 5% 0.402
3087	3198 031 04730	47kΩ 5% 0.402
3088	3198 031 04730	47kΩ 5% 0.402
3089	4822 117 13606	10kΩ 5% 0.01W 0.402
3090	4822 117 13548	100kΩ 1% 0.402
3091	4822 051 30102	1kΩ 5% 0.062W
3092	4822 051 10102	1kΩ 2% 0.25W
3093	4822 117 13548	1kΩ 5% 0.402
3094	4822 051 10102	1kΩ 2% 0.25W
3095	4822 117 13548	470kΩ 5% 0.402
3096	3198 031 05620	5.6kΩ 5% 0.01W 0.402
3097	3198 031 05620	5.6kΩ 5% 0.01W 0.402
3098	4822 117 13548	1kΩ 5% 0.402
3099	2322 706 71003	10kΩ 5% 0.402
3100	2322 706 71003	10kΩ 5% 0.402
3101	2322 706 71003	10kΩ 5% 0.402
3102	2322 706 71003	10kΩ 5% 0.402
3103	2322 706 71003	10kΩ 5% 0.402
3104	2322 706 71003	10kΩ 5% 0.402
3105	4822 117 12306	10kΩ 5% 0.1W 0.805
3106	4822 117 12306	2.7kΩ 1% 0.1W 0.805
3107	4822 117 12306	2.7kΩ 1% 0.1W 0.805
3108	4822 117 12306	2.7kΩ 1% 0.1W 0.805
3109	4822 117 12306	2.7kΩ 1% 0.1W 0.805
3110	4822 117 13548	1kΩ 5% 0.402
3112	4822 051 30102	1kΩ 5% 0.062W
3114	2322 706 70564	560kΩ 5% 0.402
3115	3198 031 02240	220kΩ 5% 0.1W 0.402
3116	4822 117 13548	1kΩ 5% 0.402
3117	4822 117 13606	10kΩ 5% 0.01W 0.402
3118	2122 612 00068	0.051Ω 1% 1W 2512
3120	3198 031 04730	47kΩ 5% 0.062W
3121	3198 031 04730	47kΩ 5% 0.402
3123	4822 117 10637	10kΩ 1% 0.1W
3124	2322 704 67502	7.5kΩ 1% 0.5W

3125	2322 704 67502	7.5kΩ 1% 0.5W
3126	2322 706 72202	2.2kΩ 5% 0.402
3128	4822 117 13603	33kΩ 5% 0.402
3130	4822 051 30123	10kΩ 5% 0.1W
3131	2322 706 71003	10kΩ 5% 0.402
3132	4822 117 13548	220kΩ 5% 0.01W 0.402
3133	4822 051 30101	100kΩ 5% 0.062W
3134	4822 051 30681	680kΩ 5% 0.062W
3135	3198 031 04730	47kΩ 5% 0.402
3136	3198 031 04730	47kΩ 5% 0.402
3143	4822 053 12472	4.7kΩ 5% 3W
3147	2322 706 71003	10kΩ 5% 0.402
3149	4822 052 10478	4.7kΩ 5% 0.33W
3150	3198 031 01050	1MΩ 5% 0.402
3151	4822 051 20334	330kΩ 5% 0.1W
3202	4822 051 30479	47kΩ 5% 0.062W
3203	4822 051 30101	100kΩ 5% 0.062W
3204	4822 117 12306	10kΩ 5% 0.1W
3205	3198 031 01540	150kΩ 5% 0.402
3206	4822 117 12306	2.7kΩ 1% 0.1W 0.805
3207	4822 117 12306	2.7kΩ 1% 0.1W 0.805
3208	4822 117 12306	2.7kΩ 1% 0.1W 0.805
3209	4822 117 12306	2.7kΩ 1% 0.1W 0.805
3210	4822 051 30102	1kΩ 5% 0.062W
3213	4822 117 13603	33kΩ 5% 0.402
3214	2322 705 70124	120kΩ 5% 0.402
3215	2322 705 70274	270kΩ 5% 0.402
3216	4822 117 13548	1kΩ 5% 0.402
3217	4822 117 13606	10kΩ 5% 0.01W 0.402
3218	2122 612 00068	0.051Ω 5% 1W 2512
3219	4822 117 13606	10kΩ 5% 0.01W 0.402
3220	4822 050 23309	33kΩ 1% 0.6W
3224	2322 706 71003	10kΩ 5% 0.402
3225	2322 706 71003	10kΩ 5% 0.402
3226	4822 051 30471	47kΩ 5% 0.01W 0.402
3228	4822 051 30151	150kΩ 5% 0.062W
3262	2322 706 71003	10kΩ 5% 0.402
3263	2322 706 71003	10kΩ 5% 0.402
3265	4822 117 13548	1kΩ 5% 0.402
3266	4822 117 13548	1kΩ 5% 0.402
3269	3198 031 02720	2.7kΩ 5% 0.01W 0.402
3272	4822 051 30651	560kΩ 5% 0.062W
3300	2322 706 72204	220kΩ 5% 0.402
3301	2322 706 72204	220kΩ 5% 0.402
3302	4822 051 30101	100kΩ 5% 0.062W
3306	2322 706 71003	10kΩ 5% 0.402
3307	5322 117 13028	12kΩ 1% 0.063W 0.603
3308	4822 051 30102	1kΩ 5% 0.062W
3311	4822 117 13579	20kΩ 1% 0.1W 0.805
3312	4822 051 30102	1kΩ 5% 0.062W
3313	2322 704 67502	7.5kΩ 1% 0.5W
3317	2322 704 67502	7.5kΩ 1% 0.5W
3320	2322 706 71003	10kΩ 5% 0.402
3321	4822 051 30102	1kΩ 5% 0.062W
3322	2322 706 73902	3.9kΩ 1% 0.402
3323	2322 706 71003	10kΩ 5% 0.402
3324	4822 051 30102	1kΩ 5% 0.062W
3325	4822 051 30471	47kΩ 5% 0.062W
3326	3198 031 04720	4.7kΩ 5% 0.402
3327	4822 117 13606	10kΩ 5% 0.01W 0.402
3328	4822 051 30103	10kΩ 5% 0.062W
3332	2322 706 75803	68kΩ 5% 0.402
3333	4822 051 30102	1kΩ 5% 0.062W
3334	2322 706 71003	10kΩ 5% 0.402
3335	2322 706 71503	15kΩ 5% 0.1W 0.402
3340	4822 051 30102	1kΩ 5% 0.062W
3341	4822 117 13606	10kΩ 5% 0.01W 0.402
3342	4822 051 30103	10kΩ 5% 0.062W
3343	4822 051 30102	1kΩ 5% 0.062W
3344	4822 051 30102	1kΩ 5% 0.062W
3345	4822 117 13548	1kΩ 5% 0.402
3346	4822 117 13548	1kΩ 5% 0.402
3347	4822 051 30331	330kΩ 5% 0.062W
3348	4822 051 30331	330kΩ 5% 0.062W
3349	4822 051 30102	1kΩ 5% 0.062W
3360	4822 051 30472	4.7kΩ 5% 0.062W
3351	4822 051 30103	10kΩ 5% 0.062W
3352	4822 051 30103	10kΩ 5% 0.062W
3353	4822 117 13606	10kΩ 5% 0.01W 0.402
3354	4822 117 13606	10kΩ 5% 0.01W 0.402
3358	4822 051 30222	2.2kΩ 5% 0.062W
3359	3198 031 05620	5.6kΩ 5% 0.01W 0.402
3360	3198 031 01220	1.2kΩ 5% 0.01W 0.402
3361	3198 031 04720	4.7kΩ 5% 0.402
3362	3198 031 02720	2.7kΩ 5% 0.01W 0.402
3363	4822 051 30102	1kΩ 5% 0.062W
3364	4822 051 30102	1kΩ 5% 0.062W
3365	4822 117 13606	10kΩ 5% 0.01W 0.402
3366	4822 051 30103	10kΩ 5% 0.062W
3367	4822 051 30103	10kΩ 5% 0.062W
3368	3198 031 04720	4.7kΩ 5% 0.402
3370	2322 675 20807	PTC 470kΩ 50% 25V 0.605
3373	3198 031 04720	4.7kΩ 5% 0.402
3374	3198 031 04730	47kΩ 5% 0.402

3376	3198 031 04730	47kΩ 5% 0.402
3377	3198 031 04720	3.9kΩ 5% 0.402
3378	4822 117 13606	10kΩ 5% 0.01W 0.402
3380	3198 031 04730	47kΩ 5% 0.402
3381	3198 031 04730	47kΩ 5% 0.402
3383	4822 117 13606	10kΩ 5% 0.01W 0.402
3384	4822 117 13606	10kΩ 5% 0.01W 0.402
3386	4822 051 30101	100kΩ 5% 0.062W
3388	4822 051 30102	1kΩ 5% 0.062W
3389	4822 051 30102	1kΩ 5% 0.062W
3390	4822 117 13548	1kΩ 5% 0.402
3391	4822 117 13606	10kΩ 5% 0.01W 0.402
3392	3198 031 04730	47kΩ 5% 0.402
3393	3198 031 04730	47kΩ 5% 0.402
3394	3198 031 04730	47kΩ 5% 0.402
3395	3198 031 01540	150kΩ 5% 0.402
3397	3198 031 04730	47kΩ 5% 0.402
3398	3198 031 04730	47kΩ 5% 0.402
3399	3198 031 05620	5.6kΩ 5% 0.01W 0.402
3400	2122 550 00158	VDR 1mA 812V
3401	4822 117 10118	1MΩ 5% 0.5W
3404	4822 116 43872	220kΩ 5% 0.5W
3405	2322 662 33131	PTC 10Ω
3406	2322 662 33131	PTC 10Ω
3452	2122 612 00068	NTC 10Ω 20% 6W
3460	4822 117 13602	2.2kΩ 5% 0.01W 0.402
3461	4822 117 13606	10kΩ 5% 0.01W 0.402
3463	4822 117 13606	10kΩ 5% 0.01W 0.402
3465	4822 117 13606	10kΩ 5% 0.01W 0.402
3467	4822 117 13606	10kΩ 5% 0.01W 0.402
3469	3198 031 04720	4.7kΩ 5% 0.402
3470	4822 117 13606	10kΩ 5% 0.01W 0.402
3471	4822 117 13548	1kΩ 5% 0.402
3472	4822 117 13548	1kΩ 5% 0.402
3501	4822 051 30102	1kΩ 5% 0.062W
3502	4822 051 30471	47kΩ 5% 0.062W
3503	2322 706 74702	4.7kΩ 5% 0.402
3504	2322 706 73903	3.9kΩ 5%

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2105	4822 122 33781	220F 5% 50V	2711	2020 552 96656	10uF 20% 25V 1210	2948	3198 035 71040	100mF 10% 16V 0402	3212	2020 552 00035	2.2uF 6.3V 10% 0603	2410	3198 035 71040	100mF 10% 16V 0402	3104	4822 051 30303	10kΩ 5% 0.062W
2106	5322 124 11561	100mF 10% 50V 0603	2712	2020 012 00008	470uF 20% 16V	2949	3198 035 71040	100mF 10% 16V 0402	3216	4822 126 14241	330pF 0603 50V	2411	3198 035 71040	100mF 10% 16V 0402	3105	4822 117 13548	10kΩ 5% 0.0402
2107	3198 024 44730	47nF 50V 0603	2713	3198 035 02210	220pF 5% 50V 0402	2950	5322 124 41945	22uF 20% 35V	3219	4822 126 14508	180pF 5% 50V 0603	2412	3198 035 71040	100mF 10% 16V 0402	3107	4822 051 30682	6.8kΩ 5% 0.062W
2109	5322 124 41945	22uF 20% 35V	2714	2020 552 96455	22nF 10% 16V 0402	2951	3198 035 71040	100mF 10% 16V 0402	3220	4822 124 23002	10uF 16V	2413	3198 035 71040	100mF 10% 16V 0402	3108	4822 051 30222	2.2kΩ 5% 0.062W
2113	4822 124 12095	100uF 20% 16V	2716	2020 012 00028	470uF 20% 16V	2952	3198 035 71040	100mF 10% 16V 0402	3221	2020 552 00035	2.2uF 6.3V 10% 0603	2414	3198 035 71040	100mF 10% 16V 0402	3109	4822 051 30222	2.2kΩ 5% 0.062W
2203	4822 124 23002	10uF 16V	2730	2020 552 96656	10uF 20% 25V 1210	2953	3198 035 71040	100mF 10% 16V 0402	3222	4822 126 14241	330pF 0603 50V	2415	3198 035 71040	100mF 10% 16V 0402	3111	4822 051 30222	2.2kΩ 5% 0.062W
2206	2020 552 00035	2.2uF 6.3V 10% 0603	2731	2020 012 00003	470uF 16V 20% SMD	2954	3198 035 71040	100mF 10% 16V 0402	3225	4822 126 14508	180pF 5% 50V 0603	2416	3198 035 71040	100mF 10% 16V 0402	3112	4822 051 30682	6.8kΩ 5% 0.062W
2207	2020 552 96718	220mF 10% 6.3V 0402	2732	3198 035 02210	220pF 5% 50V 0402	2955	5322 124 41945	22uF 20% 35V	3226	4822 124 23002	10uF 16V	2417	3198 035 71040	100mF 10% 16V 0402	3113	4822 117 13548	10kΩ 5% 0.0402
2210	4822 124 12095	100uF 20% 16V	2734	2238 787 15641	22nF 10% 16V 0402	2956	1uF 20% 50V		3228	2020 552 96618	100mF 10% 50V 0402	2418	3198 035 71040	100mF 10% 16V 0402	3121	4822 117 13548	10kΩ 5% 0.0402
2209	4822 124 23002	10uF 16V	2735	3198 035 04710	470pF 50V 0402	2957	3198 035 71040	100mF 10% 16V 0402	3229	2020 552 00005	4.7uF 10% 6.3V 0603	2419	3198 035 71040	100mF 10% 16V 0402	3122	4822 117 13548	10kΩ 5% 0.0402
2210	2020 552 96718	220mF 10% 6.3V 0402	2736	2022 031 00308	22uF 20% 35V	2958	3198 035 71040	100mF 10% 16V 0402	3230	2020 552 00005	4.7uF 10% 6.3V 0603	2420	3198 035 71040	100mF 10% 16V 0402	3123	4822 117 13548	10kΩ 5% 0.0402
2211	2020 552 96628	10mF 10% 16V 0402	2737	2020 012 00003	470uF 16V 20% SMD	2959	3198 035 71040	100mF 10% 16V 0402	3231	2238 586 59812	100mF 20% 50V 0603	2421	2020 552 00035	2.2uF 6.3V 10% 0603	3124	4822 117 13548	10kΩ 5% 0.0402
2214	2020 552 96618	1nF 10% 50V 0402	2738	4822 124 80151	47uF 16V	2A00	2238 586 59812	100mF 20% 50V 0603	3232	2020 552 00005	4.7uF 10% 6.3V 0603	2422	3198 035 71040	100mF 10% 16V 0402	3125	4822 117 13548	10kΩ 5% 0.0402
2216	2020 552 96618	1nF 10% 50V 0402	2739	4822 126 18919	47uF 16V	2A01	2238 869 15101	100pF 5% 50V 0402	3233	2020 552 00005	4.7uF 10% 6.3V 0603	2423	4822 124 12095	10uF 20% 16V	3207	3198 031 06810	680kΩ 5% 0.01W 0402
2218	3198 035 71040	100mF 10% 16V 0402	2741	4822 126 30371	47uF 16V	2A02	2238 869 15101	100pF 5% 50V 0402	3236	2020 552 96618	1nF 10% 50V 0402	2424	3198 035 71040	100mF 10% 16V 0402	3208	4822 117 13548	10kΩ 5% 0.0402
2219	3198 035 71040	100mF 10% 16V 0402	2750	2020 012 00015	2.2uF 6.3V	2A03	2020 552 96628	1nF 10% 16V 0402	3237	3198 035 71040	100mF 10% 16V 0402	2425	3198 035 71040	100mF 10% 16V 0402	3209	4822 117 13548	10kΩ 5% 0.0402
2223	2238 869 15101	100pF 5% 50V 0402	2752	2020 012 00003	470uF 16V 20% SMD	2A13	3198 035 71040	100mF 10% 16V 0402	3238	2020 552 96618	1nF 10% 50V 0402	2426	3198 035 71040	100mF 10% 16V 0402	3210	4822 117 13548	10kΩ 5% 0.0402
2225	2020 552 96618	1nF 10% 50V 0402	2755	3198 035 14720	4.7nF 5% 25V 0402	2A18	4822 124 80151	47uF 16V	3239	2238 869 15101	100pF 5% 50V 0402	2427	3198 035 71040	100mF 10% 16V 0402	3211	4822 117 13548	10kΩ 5% 0.0402
2226	3198 035 03320	3.3nF 5% 50V 0402	2756	3198 035 04710	470pF 50V 0402	2B02	4822 124 11131	47uF 6.3V	3240	2238 869 15101	100pF 5% 50V 0402	2428	3198 035 71040	100mF 10% 16V 0402	3212	4822 117 13548	10kΩ 5% 0.0402
2227	2020 552 96618	1nF 10% 50V 0402	2757	2020 012 00003	470uF 16V 20% SMD	2B03	3198 035 71040	100mF 10% 16V 0402	3241	2238 869 15101	100pF 5% 50V 0402	2429	3198 035 71040	100mF 10% 16V 0402	3213	4822 117 13548	10kΩ 5% 0.0402
2228	3198 035 71040	100mF 10% 16V 0402	2758	2020 012 00003	470uF 16V 20% SMD	2B04	3198 035 71040	100mF 10% 16V 0402	3242	2238 869 15101	100pF 5% 50V 0402	2430	3198 035 71040	100mF 10% 16V 0402	3214	3198 031 06810	680kΩ 5% 0.01W 0402
2230	3198 035 71040	100mF 10% 16V 0402	2761	2020 552 96671	1uF 10% 25V	2B05	3198 035 71040	100mF 10% 16V 0402	3243	2238 869 15101	100pF 5% 50V 0402	2431	4822 124 12095	10uF 20% 16V	3215	3198 031 02710	270kΩ 5% 0.1W 0402
2231	2320 552 96718	220mF 10% 6.3V 0402	2762	4822 124 23237	22uF 6.3V	2B06	3198 035 71040	100mF 10% 16V 0402	3246	2238 869 15101	100pF 5% 50V 0402	2432	3198 035 71040	100mF 10% 16V 0402	3216	4822 117 13548	10kΩ 5% 0.0402
2232	3198 035 71040	100mF 10% 16V 0402	2780	2020 012 00003	470uF 16V 20% SMD	2B08	3198 035 71040	100mF 10% 16V 0402	3247	2238 869 15101	100pF 5% 50V 0402	2433	3198 035 71040	100mF 10% 16V 0402	3217	4822 117 13548	10kΩ 5% 0.0402
2233	4822 124 23002	10uF 16V	2801	3198 035 71040	100mF 10% 16V 0402	2B09	3198 035 71040	100mF 10% 16V 0402	3248	2238 869 15101	100pF 5% 50V 0402	2434	3198 035 71040	100mF 10% 16V 0402	3218	4822 117 13548	10kΩ 5% 0.0402
2234	2020 552 96718	220mF 10% 6.3V 0402	2802	3198 035 71040	100mF 10% 16V 0402	2B10	3198 035 71040	100mF 10% 16V 0402	3249	2238 869 15101	100pF 5% 50V 0402	2435	3198 035 71040	100mF 10% 16V 0402	3219	4822 117 13548	10kΩ 5% 0.0402
2235	2020 552 96718	220mF 10% 6.3V 0402	2803	3198 035 71040	100mF 10% 16V 0402	2B11	3198 035 71040	100mF 10% 16V 0402	3250	2020 552 96618	1nF 10% 50V 0402	2436	3198 035 71040	100mF 10% 16V 0402	3220	3198 031 04720	47kΩ 5% 0.0402
2236	4822 126 14078	220mF +80% 20% 25V	2804	3198 035 71040	100mF 10% 16V 0402	2B12	3198 035 71040	100mF 10% 16V 0402	3251	3198 035 71040	100mF 10% 16V 0402	2437	3198 035 71040	100mF 10% 16V 0402	3221	4822 117 13548	10kΩ 5% 0.0402
2237	2020 552 96718	220mF 10% 6.3V 0402	2805	3198 035 71040	100mF 10% 16V 0402	2B13	3198 035 71040	100mF 10% 16V 0402	3252	4822 124 12095	10uF 20% 16V	2438	3198 035 71040	100mF 10% 16V 0402	3222	4822 117 13548	10kΩ 5% 0.0402
2238	2020 552 96718	220mF 10% 6.3V 0402	2806	3198 035 71040	100mF 10% 16V 0402	2B14	3198 035 71040	100mF 10% 16V 0402	3253	3198 035 71040	100mF 10% 16V 0402	2439	3198 035 71040	100mF 10% 16V 0402	3223	3198 031 03320	3.3kΩ 5% 0.0402
2239	2020 552 96718	220mF 10% 6.3V 0402	2807	3198 035 71040	100mF 10% 16V 0402	2B15	3198 035 71040	100mF 10% 16V 0402	3254	2020 552 96618	1nF 10% 50V 0402	2440	3198 035 71040	100mF 10% 16V 0402	3224	3198 031 03320	3.3kΩ 5% 0.0402
2240	2020 552 96718	220mF 10% 6.3V 0402	2808	3198 035 71040	100mF 10% 16V 0402	2B16	3198 035 71040	100mF 10% 16V 0402	3255	2238 869 15109	100pF 5% 50V 0402	2441	3198 035 71040	100mF 10% 16V 0402	3225	4822 117 13548	10kΩ 5% 0.0402
2241	2020 552 96718	220mF 10% 6.3V 0402	2809	3198 035 71040	100mF 10% 16V 0402	2B17	3198 035 71040	100mF 10% 16V 0402	3256	4822 124 12095	10uF 20% 16V	2442	3198 035 71040	100mF 10% 16V 0402	3226	4822 117 13548	10kΩ 5% 0.0402
2242	3198 035 71040	100mF 10% 16V 0402	2810	3198 035 71040	100mF 10% 16V 0402	2B18	3198 035 71040	100mF 10% 16V 0402	3257	3198 035 71040	100mF 10% 16V 0402	2443	3198 035 71040	100mF 10% 16V 0402	3227	4822 117 13548	10kΩ 5% 0.0402
2243	4822 124 23002	10uF 16V	2811	3198 035 71040	100mF 10% 16V 0402	2B19	3198 035 71040	100mF 10% 16V 0402	3258	2238 869 15109	100pF 5% 50V 0402	2444	3198 035 71040	100mF 10% 16V 0402	3228	3198 031 04720	47kΩ 5% 0.0402
2244	3198 035 71040	100mF 10% 16V 0402	2812	3198 035 71040	100mF 10% 16V 0402	2C00	3198 035 71040	100mF 10% 16V 0402	3259	2238 869 15109	100pF 5% 50V 0402	2445	3198 035 71040	100mF 10% 16V 0402	3229	3198 031 04720	47kΩ 5% 0.0402
2245	3198 035 71040	100mF 10% 16V 0402	2813	3198 035 71040	100mF 10% 16V 0402	2C01	4822 124 23002	10uF 16V	3260	2238 869 15109	100pF 5% 50V 0402	2446	3198 035 71040	100mF 10% 16V 0402	3230	4822 117 13606	10kΩ 5% 0.01W 0402
2246	3198 035 71040	100mF 10% 16V 0402	2814	3198 035 71040	100mF 10% 16V 0402	2C02	3198 035 71040	100mF 10% 16V 0402	3261	2238 869 15109	100pF 5% 50V 0402	2447	3198 035 71040	100mF 10% 16V 0402	3231	4822 117 13606	10kΩ 5% 0.01W 0402
2247	3198 035 71040	100mF 10% 16V 0402	2815	5322 124 41945	22uF 20% 35V	2C03	3198 035 71040	100mF 10% 16V 0402	3262	2238 869 15109	100pF 5% 50V 0402	2448	3198 035 71040	100mF 10% 16V 0402	3232	3198 031 03320	3.3kΩ 5% 0.0402
2250	2020 552 96618	1nF 10% 50V 0402	2816	3198 035 71040	100mF 10% 16V 0402	2E00	2020 552 00005	4.7uF 10% 6.3V 0603	3263	2238 869 15109	100pF 5% 50V 0402	2449	3198 035 71040	100mF 10% 16V 0402	3233	3198 031 03320	3.3kΩ 5% 0.0402
2251	2020 552 96656	10uF 20% 25V 1210	2817	3198 035 71040	100mF 10% 16V 0402	2E01	2020 552 00005	4.7uF 10% 6.3V 0603	3264	2238 869 15109	100pF 5% 50V 0402	2450	3198 035 71040	100mF 10% 16V 0402	3234	3198 031 03320	3.3kΩ 5% 0.0402
2252	3198 035 71040	100mF 10% 16V 0402	2818	3198 035 71040	100mF 10% 16V 0402	2E02	2020 55										

Spare Parts List

LC4.9E AA 10. EN 107

3604	4822 117 13601	22k1 5% 0.0402	3C04	3198 031 11030	4 x 10k1 5% 1206	3G28	4822 051 30759	750 5% 0.062W
3605	4822 117 13601	22k1 5% 0.0402	3C05	4822 117 13606	10k1 5% 0.01W 0402	3G29	4822 051 30331	330k 5% 0.062W
3609	4822 117 13601	22k1 5% 0.0402	3C06	3198 031 11030	4 x 10k1 5% 1206	3G30	4822 051 30689	680 5% 0.063W 0603
3610	4822 117 1297	100k1 5% 0.1W	3C07	3198 031 11030	4 x 10k1 5% 1206	3G31	4822 051 30759	750 5% 0.062W
3611	4822 117 1297	100k1 5% 0.1W	3C08	3198 031 11030	4 x 10k1 5% 1206	3G32	4822 051 30102	1k1 5% 0.062W
3612	4822 117 13601	22k1 5% 0.0402	3C09	3198 031 11030	4 x 10k1 5% 1206	3G33	4822 051 30101	100k 5% 0.062W
3616	4822 117 13548	1k1 5% 0.0402	3C10	3198 031 11030	4 x 10k1 5% 1206	3G34	4822 051 30102	1k1 5% 0.062W
3617	4822 117 13548	1k1 5% 0.0402	3C16	3198 031 11030	4 x 10k1 5% 1206	3G37	4822 051 30151	150k 5% 0.062W
3619	4822 117 13606	10k1 5% 0.01W 0402	3C17	4822 117 13606	10k1 5% 0.01W 0402	3G38	4822 051 30103	10k1 5% 0.062W
3620	4822 117 13606	10k1 5% 0.01W 0402	3C18	4822 117 13606	10k1 5% 0.01W 0402	3G39	4822 117 12991	220k1 1%
3628	4822 117 13606	10k1 5% 0.01W 0402	3E06	2322 705 70569	561 5% 0.0402	3G40	4822 051 30151	150k 5% 0.062W
3629	4822 117 13601	22k1 5% 0.0402	3E01	2322 705 70569	561 5% 0.0402	3G41	4822 051 30151	150k 5% 0.062W
3630	4822 117 13602	2.2k1 5% 0.01W 0402	3E02	2322 705 70569	561 5% 0.0402	3G42	4822 051 30103	10k1 5% 0.062W
3631	4822 117 13602	2.2k1 5% 0.01W 0402	3E03	3198 031 04730	47k1 5% 0.0402	3G43	4822 117 12991	220k1 1%
3632	2322 705 70569	561 5% 0.0402	3E07	3198 031 04730	47k1 5% 0.0402	3G44	4822 051 30153	15k1 5% 0.062W
3633	2322 705 70569	561 5% 0.0402	3E08	3198 031 04730	47k1 5% 0.0402	3G45	4822 051 30759	750 5% 0.062W
3708	4822 117 13606	10k1 5% 0.01W 0402	3E09	3198 031 04730	47k1 5% 0.0402	3G46	4822 051 30101	100k 5% 0.062W
3709	3198 031 06820	6.8k1 5% 0.01W 0402	3E10	3198 031 04730	47k1 5% 0.0402	3G47	4822 117 12925	47k1 1% 0.063W 0603
3712	5322 117 13031	5.8k1 1% 0.063W 0603	3E11	3198 031 04730	47k1 5% 0.0402	3G48	4822 117 12925	47k1 1% 0.063W 0603
3713	2322 704 63302	3.3k1 1% 0.063	3E12	4822 117 13606	10k1 5% 0.01W 0402	3G51	4822 051 30273	27k1 5% 0.062W
3716	3198 031 04720	4.7k1 5% 0.0402	3E13	4822 117 13597	330k 5% 0.0402 0.01W	3G52	4822 051 30682	6.8k1 5% 0.062W
3732	2322 704 61002	1k1 1%	3E14	4822 117 13597	330k 5% 0.0402 0.01W	3G53	4822 051 30689	681 5% 0.063W 0603
3733	2322 704 61002	3.3k1 1% 0.063	3E15	4822 117 13597	330k 5% 0.0402 0.01W	3G54	4822 051 30102	1k1 5% 0.062W
3734	4822 117 13602	2.2k1 5% 0.01W 0402	3E16	4822 117 13597	330k 5% 0.0402 0.01W	3G57	4822 051 30759	750 5% 0.062W
3735	4822 117 13548	1k1 5% 0.0402	3E17	4822 117 13597	330k 5% 0.0402 0.01W	3G58	4822 051 30101	100k 5% 0.062W
3736	3198 031 04720	4.7k1 5% 0.0402	3E18	4822 117 13597	330k 5% 0.0402 0.01W	3G59	4822 117 12925	47k1 1% 0.063W 0603
3740	3198 031 01520	1.2k1 5% 0.01W 0402	3E19	2322 705 70569	561 5% 0.0402	3G60	4822 117 12925	47k1 1% 0.063W 0603
3741	3198 031 01520	1.2k1 5% 0.01W 0402	3E20	2322 705 70569	561 5% 0.0402	3G61	4822 117 12925	47k1 1% 0.063W 0603
3742	3198 031 01530	15k1 5% 0.01W 0402	3E21	2322 705 70569	561 5% 0.0402	3G99	4822 117 12925	47k1 1% 0.063W 0603
3743	4822 117 13601	22k1 5% 0.0402	3E22	4822 117 13632	100k1 5% 0.063 0.52W	3J05	3198 031 06890	680 5% 0.0402
3750	4822 117 13601	22k1 5% 0.0402	3E23	3198 031 02110	820k 5% 0.5W	3K00	3198 031 04720	4.7k1 5% 0.0402
3751	3198 021 31080	10 5% 0.063	3E24	4822 117 13543	470k 5% 0.0402	3K01	4822 117 13543	100k 5% 0.0402
3752	3198 021 31080	10 5% 0.063	3E25	2322 705 70399	390 5% 0.0402	3K02	4822 117 13606	10k1 5% 0.01W 0402
3753	2322 704 61002	1k1 1%	3E26	3198 031 02290	22k1 5% 0.1W 0402	3K30	3198 031 01530	15k1 5% 0.01W 0402
3754	2322 704 63302	3.3k1 1% 0.063	3E27	2322 705 70399	390 5% 0.0402	3K05	4822 117 13606	10k1 5% 0.01W 0402
3759	3198 031 01230	12k1 5% 0.0402	3E28	3198 031 02290	22k1 5% 0.1W 0402	3K32	3198 031 01530	15k1 5% 0.01W 0402
3761	4822 117 13545	100k 1% 0.0402	3E29	2322 705 70399	390 5% 0.0402	3K34	4822 117 13545	100k 1% 0.0402
3800	4822 117 13606	10k1 5% 0.01W 0402	3E30	3198 031 02290	22k1 5% 0.1W 0402	3K35	4822 117 13545	100k 1% 0.0402
3801	2350 035 10229	4 x 22k1 5% 1206	3E31	4822 117 13545	100k 1% 0.0402	3K36	3198 031 06890	680 5% 0.0402
3802	2350 035 10229	4 x 22k1 5% 1206	3E32	4822 117 13545	100k 1% 0.0402	3K47	4822 117 13545	100k 1% 0.0402
3803	2350 035 10229	4 x 22k1 5% 1206	3E33	4822 117 13545	100k 1% 0.0402	3P01	3198 031 06890	680 5% 0.0402
3804	2350 035 10229	4 x 22k1 5% 1206	3E34	4822 117 13545	100k 1% 0.0402	3P03	4822 117 13546	47k1 5% 0.0402
3805	2350 035 10229	4 x 22k1 5% 1206	3E35	4822 117 13545	100k 1% 0.0402	3P04	4822 117 13545	100k 1% 0.0402
3806	2350 035 10229	4 x 22k1 5% 1206	3E36	4822 117 13545	100k 1% 0.0402	3P04	4822 117 13605	Jumper 0402
3807	2350 035 10229	4 x 22k1 5% 1206	3E37	3198 031 02290	22k1 5% 0.1W 0402	3P06	4822 117 13545	100k 1% 0.0402
3808	2350 035 10229	4 x 22k1 5% 1206	3E38	4822 117 13545	100k 1% 0.0402	3P05	4822 117 13605	Jumper 0402
3809	2350 035 10229	4 x 22k1 5% 1206	3E39	4822 117 13545	100k 1% 0.0402	3P06	4822 117 12925	47k1 1% 0.063W 0603
3810	2350 035 10229	4 x 22k1 5% 1206	3E41	4822 117 13545	100k 1% 0.0402	3S00	4822 117 12925	47k1 1% 0.063W 0603
3811	2350 035 10229	4 x 22k1 5% 1206	3E42	4822 117 13545	100k 1% 0.0402	3S03	4822 117 13605	Jumper 0402
3812	2350 035 10229	4 x 22k1 5% 1206	3E43	4822 117 13545	100k 1% 0.0402	4211	4822 117 13605	Jumper 0402
3813	2350 035 10229	4 x 22k1 5% 1206	3E44	4822 117 13545	100k 1% 0.0402	4212	4822 117 13605	Jumper 0402
3814	3198 031 02290	22k1 5% 0.1W 0402	3E45	4822 117 13545	100k 1% 0.0402	4440	4822 117 13605	Jumper 0402
3815	3198 031 02290	22k1 5% 0.1W 0402	3E49	3198 031 02290	22k1 5% 0.1W 0402	4441	4822 117 13605	Jumper 0402
3816	3198 031 02290	22k1 5% 0.1W 0402	3E50	3198 031 04730	47k1 5% 0.0402	4801	4822 117 13605	Jumper 0402
3817	4822 117 13606	10k1 5% 0.01W 0402	3E51	3198 031 04730	47k1 5% 0.0402	4802	4822 117 13605	Jumper 0402
3818	4822 117 13606	10k1 5% 0.01W 0402	3E52	3198 031 04730	47k1 5% 0.0402	4803	4822 117 13605	Jumper 0402
3820	4822 117 13606	10k1 5% 0.01W 0402	3E53	3198 031 04730	47k1 5% 0.0402	4804	4822 117 13605	Jumper 0402
3822	4822 117 13545	100k 1% 0.0402	3E54	3198 031 04730	47k1 5% 0.0402	4805	4822 117 13605	Jumper 0402
3824	3198 031 03320	3.3k1 5% 0.0402	3E55	3198 031 04730	47k1 5% 0.0402	4806	4822 117 13605	Jumper 0402
3826	3198 031 11030	4 x 10k1 5% 1206	3F00	4822 051 30759	750 5% 0.062W	4807	4822 117 13605	Jumper 0402
3828	3198 031 11030	4 x 10k1 5% 1206	3F09	4822 051 30759	750 5% 0.062W	4808	4822 117 13605	Jumper 0402
3827	4822 117 13606	10k1 5% 0.01W 0402	3F10	3198 021 31080	10 5% 0.063	4809	4822 117 13605	Jumper 0402
3828	4822 117 13606	10k1 5% 0.01W 0402	3F11	4822 051 30759	750 5% 0.062W	4810	4822 117 13605	Jumper 0402
3829	4822 117 13606	10k1 5% 0.01W 0402	3F16	4822 051 30103	10k1 5% 0.062W	4811	4822 117 13605	Jumper 0402
3831	4822 117 13545	100k 1% 0.0402	3F17	4822 051 30103	10k1 5% 0.062W	4812	4822 117 13605	Jumper 0402
3832	4822 117 13545	100k 1% 0.0402	3F18	4822 051 30103	10k1 5% 0.062W	4813	4822 117 13605	Jumper 0402
3833	3198 031 01090	10k1 5% 0.01W 0402	3F19	3198 021 31080	10 5% 0.063	4814	4822 117 13605	Jumper 0402
3834	4822 117 13606	10k1 5% 0.01W 0402	3F20	4822 051 30101	100k 5% 0.062W	4815	4822 117 13605	Jumper 0402
3835	4822 117 13606	10k1 5% 0.01W 0402	3F21	4822 051 30102	1k1 5% 0.062W	4816	4822 117 13605	Jumper 0402
3836	4822 117 13606	10k1 5% 0.01W 0402	3F22	4822 051 30103	10k1 5% 0.062W	4817	4822 117 13605	Jumper 0402
3837	4822 117 13606	10k1 5% 0.01W 0402	3F23	4822 051 30103	10k1 5% 0.062W	4818	4822 117 13605	Jumper 0402
3838	4822 117 13606	10k1 5% 0.01W 0402	3F24	4822 051 30103	10k1 5% 0.062W	4819	4822 117 13605	Jumper 0402
3839	4822 117 13545	100k 1% 0.0402	3F25	4822 051 30103	10k1 5% 0.062W	4820	4822 117 13605	Jumper 0402
3840	3198 031 02290	22k1 5% 0.1W 0402	3F26	4822 051 30153	15k1 5% 0.062W	4821	4822 117 13605	Jumper 0402
3841	4822 117 13606	10k1 5% 0.01W 0402	3F27	4822 051 30153	15k1 5% 0.062W	4822	4822 117 13605	Jumper 0402
3900	3198 031 03320	3.3k1 5% 0.0402	3F28	4822 051 30101	100k 5% 0.062W	4823	4822 117 13605	Jumper 0402
3901	4822 117 13606	10k1 5% 0.01W 0402	3F29	4822 051 30101	100k 5% 0.062W	4824	4822 117 13605	Jumper 0402
3902	4822 117 13606	10k1 5% 0.01W 0402	3G00	4822 051 30151	150k 5% 0.062W	4825	4822 117 13605	Jumper 0402
3903	4822 117 13545	100k 1% 0.0402	3G01	4822 051 30151	150k 5% 0.062W	4826	4822 117 13605	Jumper 0402
3904	4822 117 13545	100k 1% 0.0402	3G02	4822 117 12991	220k1 1%	4827	4822 117 13605	Jumper 0402
3905	3198 031 06890	680 5% 0.0402	3G03	4822 051 30153	15k1 5% 0.062W	4828	4822 117 13605	Jumper 0402
3A00	3198 031 06890	680 5% 0.0402	3G04	4822 051 30153	15k1 5% 0.062W	4829	4822 117 13605	Jumper 0402
3A07	4822 117 13606	10k1 5% 0.01W 0402	3G05	4822 051 30103	10k1 5% 0.062W	4830	4822 117 13605	Jumper 0402
3A08	4822 117 13606	10k1 5% 0.01W 0402	3G06	4822 117 12991	220k1 1%	4831	4822 117 13605	Jumper 0402
3A10	4822 117 13606	10k1 5% 0.01W 0402	3G07	4822 051 30153	15k1 5% 0.062W	4832		

7A00	9352 759 98118	PCA9515ADP
7A02	3198 010 42310	BC847BW
7A03	3198 010 42310	BC847BW
7B01	9322 214 42671	K40263238F-OC50
7C00		For SW see item 7051
7C01	9322 206 23668	M24C32-WMNP6
7C02	9322 215 39685	PST596JN
7E00	9322 195 23668	ADG733BRU
7E01	9322 199 80668	SM5301BS-G
7E02	9322 199 56668	ADG781BCP
7E03	4822 209 60792	74HC4053D
7E04	9352 607 39118	74LVC14APW
7E05	9352 607 39118	74LVC14APW
7F03		For SW see item 7055
7G03	3198 010 42310	BC847BW
7G05	3198 010 42310	BC847BW
7G10	4822 209 60792	74HC4053D
7L01	3198 010 42310	BC847BW
7L02	3198 010 42310	BC847BW
7L03	3198 010 42310	BC847BW
7L04	9322 212 77572	MS79883C-LF-110
7L05	4822 209 17398	LD1117D7J3
7L06	9965 000 04199	BSN20
7L07	9965 000 04199	BSN20
7M00	9322 204 76671	T6TUSXBG-0001
7M01	9322 206 19672	MSM56V16160F-7T3-FG
7N01		For SW see item 7052
7N02	9322 217 35671	EP1C12F256CBN
7N03	9340 425 20115	BC847B5
7N04	9322 210 59668	THC63LVDF84B
7P01	9322 170 14668	LF15AB0T
7P02	9322 201 03668	THC63LVDM83R

PDP Audio [C]

Various

1735	4822 267 10918	Connector 3p
1736	2422 025 10768	Connector 3p m
1M02	4822 267 10818	Connector 7p
1M06	2422 025 11244	Connector 7p m
1M52	2422 025 10769	Connector 3p m

-W-

2700	4822 126 14247	1.5nF 50V 0603
2701	4822 126 14249	560pF 10% 50V 0603
2703	2020 552 96683	220nF 10% 50V
2704	4822 124 11767	470nF 20% 25V
2705	4822 126 14249	560pF 10% 50V 0603
2706	5322 126 11579	3.3nF 10% 63V
2707	2222 580 15649	100nF 10% 50V 0805
2709	2020 552 96683	220nF 10% 50V
2710	2020 552 96683	220nF 10% 50V
2711	2022 552 05679	1µF 10% 16V 0805
2712	4822 126 14583	470nF 10% 16V 0805
2713	4822 126 13193	4.7nF 10% 63V
2715	4822 121 51252	470nF 5% 63V
2716	3198 017 31530	15nF 20% 50V 0603
2717	2022 552 05679	1µF 10% 16V 0805
2718	2222 580 15649	100nF 10% 50V 0805
2719	4822 126 14583	470nF 10% 16V 0805
2720	2020 021 91431	22µF 20% 100V
2721	2222 580 15649	100nF 10% 50V 0805
2722	4822 126 14583	470nF 10% 16V 0805
2723	2022 552 05679	1µF 10% 16V 0805
2726	4822 126 13193	4.7nF 10% 63V
2727	4822 126 14249	560pF 10% 50V 0603
2731	4822 126 14249	560pF 10% 50V 0603
2732	4822 126 14583	470nF 10% 16V 0805
2736	4822 121 51252	470nF 5% 63V
2737	3198 017 31530	15nF 20% 50V 0603
2739	2222 580 15649	100nF 10% 50V 0805
2741	4822 126 13883	220pF 5% 50V
2743	3198 016 31020	1nF 25V 0803
2744	2222 580 15649	100nF 10% 50V 0805
2745	2020 552 96683	220nF 10% 50V
2746	4822 124 11767	470nF 20% 25V
2747	2022 552 05679	1µF 10% 16V 0805
2748	4822 126 14247	1.5nF 50V 0603
2749	5322 126 11579	3.3nF 10% 63V
2751	4822 124 40433	47µF 20% 25V
2754	2020 021 91431	22µF 20% 100V
2770	3198 017 41060	1µF 10V 0603
2776	2020 021 91431	22µF 20% 100V
2780	4822 126 14583	470nF 10% 16V 0805
2789	4822 126 14583	470nF 10% 16V 0805
2791	4822 126 13879	220nF +80-20% 16V

-W-

3700	4822 051 30581	560kΩ 5% 0.062W
3701	4822 051 30479	47kΩ 5% 0.062W
3702	3198 021 38220	8.2kΩ 5% 0.062W 0603
3703	3198 021 38220	8.2kΩ 5% 0.062W 0603
3704	4822 117 13632	100kΩ 1% 0.063 0.62W
3705	4822 051 30222	2.2kΩ 5% 0.062W
3706	4822 051 30682	6.8kΩ 5% 0.062W
3707	4822 051 30393	39kΩ 5% 0.062W
3708	4822 051 30479	47kΩ 5% 0.062W
3709	4822 051 30272	2.7kΩ 5% 0.062W
3710	4822 051 30393	39kΩ 5% 0.062W
3711	2322 762 60568	5.6kΩ 5% 5% 2512
3712	4822 051 30272	2.7kΩ 5% 0.062W
3713	4822 051 30332	3.3kΩ 5% 0.062W
3714	4822 051 30682	6.8kΩ 5% 0.062W
3715	2322 762 60568	5.6kΩ 5% 5% 2512
3716	4822 117 13632	100kΩ 1% 0.063 0.62W
3717	4822 051 30222	2.2kΩ 5% 0.062W
3718	4822 051 30681	560kΩ 5% 0.062W
3719	4822 051 30124	120kΩ 5% 0.062W
3720	4822 051 30479	47kΩ 5% 0.062W
3721	4822 051 30471	47kΩ 5% 0.062W
3722	4822 051 30124	120kΩ 5% 0.062W
3723	4822 051 30471	47kΩ 5% 0.062W
3724	4822 051 30102	1kΩ 5% 0.062W
3725	4822 117 12925	47kΩ 1% 0.063W 0603
3726	4822 051 30153	15kΩ 5% 0.062W
3727	4822 051 30103	10kΩ 5% 0.062W
3728	4822 051 30153	15kΩ 5% 0.062W
3729	4822 117 12925	47kΩ 1% 0.063W 0603
3730	4822 051 30223	22kΩ 5% 0.062W
3731	4822 051 30102	1kΩ 5% 0.062W
3732	4822 051 30223	22kΩ 5% 0.062W
3733	4822 051 30582	5.6kΩ 5% 0.063W 0603
3734	4822 051 30223	22kΩ 5% 0.062W
3735	4822 117 12869	270kΩ 1% 0.063W 0603
3736	4822 117 12925	47kΩ 1% 0.063W 0603
3737	4822 117 12925	47kΩ 1% 0.063W 0603
3738	4822 117 13632	100kΩ 1% 0.063 0.62W
3760	4822 051 30223	22kΩ 5% 0.062W
3764	4822 117 13632	100kΩ 1% 0.063 0.62W
3765	4822 117 13632	100kΩ 1% 0.063 0.62W
3777	4822 051 30102	1kΩ 5% 0.062W
3778	4822 051 30479	47kΩ 5% 0.062W
3988	4822 051 30472	4.7kΩ 5% 0.062W
9710	4822 051 20008	Jumper 0805
9711	4822 051 20008	Jumper 0805
9712	4822 051 20008	Jumper 0805
9713	4822 051 20008	Jumper 0805
9748	4822 051 20008	Jumper 0805
9757	4822 051 20008	Jumper 0805
9758	4822 051 20008	Jumper 0805
9759	4822 051 20008	Jumper 0805
9760	4822 051 20008	Jumper 0805
9761	4822 051 20008	Jumper 0805
9762	4822 051 20008	Jumper 0805
9763	4822 051 20008	Jumper 0805
9764	4822 051 20008	Jumper 0805
9765	4822 051 20008	Jumper 0805
9766	4822 051 20008	Jumper 0805
9768	4822 051 20008	Jumper 0805
9770	4822 051 20008	Jumper 0805
9790	4822 051 20008	Jumper 0805
9795	4822 051 20008	Jumper 0805
9796	4822 051 20008	Jumper 0805
9806	4822 051 20008	Jumper 0805
9807	4822 051 20008	Jumper 0805
9808	4822 051 20008	Jumper 0805

-W-

5700	2422 536 00942	33µH 20%
5701	4822 157 11716	Bead 30kΩ at 100MHz
5702	2422 536 00942	33µH 20%
5705	4822 157 11411	Bead 80kΩ at 100MHz
5708	4822 157 11411	Bead 80kΩ at 100MHz

-W-

6700	4822 130 11522	U0215B
6702	9322 150 18685	BZX384-C47
6703	4822 130 10638	U0233B

-W-

7700	9322 202 89868	LM393P
7701	9352 729 65112	TD48925ST/N1
7702	3198 010 42310	BC847BW
7705	3198 010 42310	BC847BW

7706	3198 010 42310	BC847BW
7707	3198 010 42310	BC847BW
7708	3198 010 42320	BC857BW
7709	3198 010 42310	BC847BW
7710	3198 010 42310	BC847BW
7711	3198 010 42320	BC857BW
7712	3198 010 42310	BC847BW
7713	3198 010 42310	BC847BW

LED Panel [J]

Various

0345	2422 025 18741	Connector 6p m
1040	9322 206 81667	TSOP34836YA1

-W-

2040	4822 124 12095	100µF 20% 16V
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-W-

3040	4822 117 13597	330kΩ 5% 0.002 0.01W
3051	4822 051 30221	22kΩ 5% 0.062W
3061	4822 051 30221	22kΩ 5% 0.062W
3063	4822 117 13606	10kΩ 5% 0.01W 0402
3078	3198 031 02250	2.2MΩ 5% 0.1W 0402
9012	4822 117 13605	Jumper 0402
9041	4822 117 13605	Jumper 0402
9042	4822 117 13605	Jumper 0402
9062	4822 117 13605	Jumper 0402
9066	4822 117 13608	10kΩ 5% 0.01W 0402
9070	4822 117 13605	Jumper 0402
9081	4822 117 13605	Jumper 0402
9082	4822 117 13605	Jumper 0402
9111	4822 117 13605	Jumper 0402
9112	4822 117 13605	Jumper 0402
9115	4822 117 13605	Jumper 0402
9122	4822 117 13605	Jumper 0402

-W-

6051	9322 218 97685	SML310VTK
6060	9322 134 46685	SML310MT
6070	9322 140 63685	TEMDS000

-W-

7051	3198 010 42310	BC847BW
7052	3198 010 42310	BC847BW
7062	4822 130 60373	BC856B

11. Revision List

Manual xxxx xxx xxxx.0

- First release.

Manual xxxx xxx xxxx.1

- Diversity tables in chapter 7 added.

Manual xxxx xxx xxxx.2

- Corrected several errors in the text.

Manual xxxx xxx xxxx.3

- Chapter 7: PSU schematics and PWB's [A] added.

- Chapter 10: PSU parts list [A] added and software items updated.