Colour Television **Chassis**

FM242

AA

Service
Service
Service

Service Manual

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Published by CO 0363 Service PaCE Printed in the Netherlands Subject to modification EN 3122 785 13400

PHILIPS

1. Technical Specifications, Connections, and Chassis Overview

1.1 Technical Specifications

1.1.1 Picture

Display	:	FHT plasma panel
Screen size	:	42" (106 cm)
Resolution	:	852 x 480 pixels (pixel pitch 1.095 x 1.11 mm)
Contrast ratio	:	1000 : 1

1.1.2 Sound

Maximum power	:	30 Wrms (for version with speakers)

1.1.3 Miscellaneous

Mains voltage	:	95 - 264 V
Mains frequency	:	50/60 Hz
Ambient temperature	:	+ 5 to + 40 deg. C
Maximum humidity	:	90% R.H.
Power consumption	:	around 380 W
Standby Power consumption	:	< 2 W
Weight	:	35 kg
Dimensions (WxHxD)	:	Speakered version: 1215 x 657 x 90 mm
	:	Speaker-less version: 1070 x 660 x 90 mm

1.2 Connections

1.2.1 Rear Connections

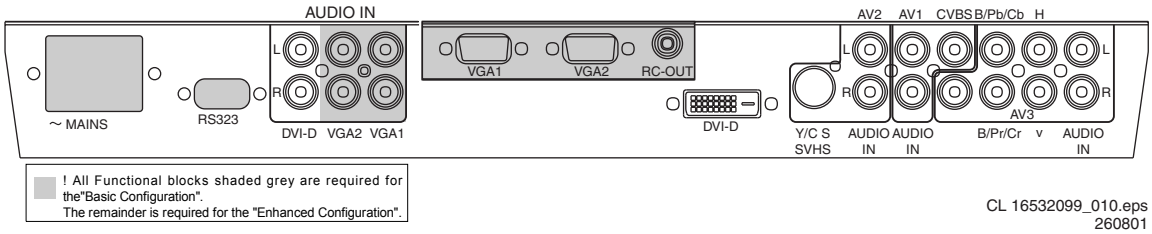


Figure 1-1 Rear Connections

RS232

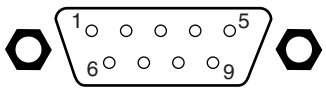


Figure 1-2 RS232 connector (subD-9p)

1	-	
2	- TXD	(UART)
3	- RXD	(UART)
4	- RL_ICN	(ICONN)
5	-	Ground
6	- GL_ICN	(ICONN)
7	- LD_ICN	(ICONN)
8	- IR_TX	(ICONN)
9	- IR_RX	(ICONN)
10	-	Ground
11	-	Ground

Audio - In (DVI-D)

1	- Audio - L	0.5 Vrms / 1 kΩ
2	- Audio - R	0.5 Vrms / 1 kΩ

Audio - In (VGA2)

1	- Audio - L	0.5 Vrms / 1 kΩ
2	- Audio - R	0.5 Vrms / 1 kΩ

Audio - In (VGA1)

1	- Audio - L	0.5 Vrms / 1 kΩ
2	- Audio - R	0.5 Vrms / 1 kΩ

VGA1 - In

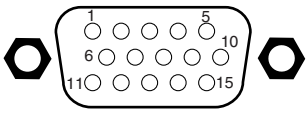


Figure 1-3 VGA Connector

1	- Red	0.7 Vpp / 75 Ω
2	- Green	0.7 Vpp / 75 Ω
3	- Blue	0.7 Vpp / 75 Ω
4	- TXD	
5	-	Ground
6	- Red	Ground
7	- Green	Ground
8	- Blue	Ground
9	- RC	
10	-	Ground
11	- RXD	
12	- DDC_SDA	
13	- H-sync	0 - 5 V
14	- V-sync	0 - 5 V
15	- DDC_SCL	

VGA2 - Out

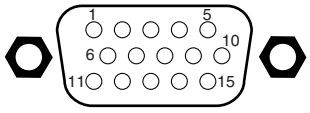


Figure 1-4 VGA Connector

1 - Red	(0.7 Vpp/75 Ω)	
2 - Green	(0.7 Vpp/75 Ω)	
3 - Blue	(0.7 Vpp/75 Ω)	
4 - TXD		
5 -	Ground	
6 - Red	Ground	
7 - Green	Ground	
8 - Blue	Ground	
9 -		
10 -	Ground	
11 - RXD		
12 - DDC_SDA		
13 - H-sync	0 - 5 V	
14 - V-sync	0 - 5 V	
15 - DDC_SCL		

RC - Out

1 - RC

DVI-D

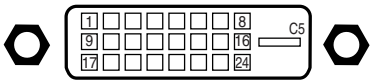


Figure 1-5 DVI-D Connector

1 - RX2-		
2 - RX2+		
3 -	Ground	
4 -		
5 -		
6 - DDC-SCL		
7 - DDC-SDA		
8 -		
9 - RX1-		
10 - RX1+		
11 -	Ground	
12 -		
13 -		
14 - 5V_STBY_SW		
15 -	Ground	
16 - 5V_STBY_SW		
17 - RX0-		
18 - RX0+		
19 -	Ground	
20 -		
21 -	Ground	
22 -		
23 - RXC+		
24 - RXC-		
C5-	Ground	

AV2: SVHS - In

1 - Y	Ground	
2 - C	Ground	
3 - Y	1 Vpp / 75 Ω	
4 - C / 16:9	0.3 Vpp / 75 Ω	

AV2: Audio - In

1 - Audio - L	0.5 Vrms/10 kΩ	
2 - Audio - R	0.5 Vrms/10 kΩ	

AV1: Audio/Video - In

1 - CVBS	1 Vpp / 75 Ω	
2 - Audio - L	0.5 Vrms / 10 kΩ	
3 - Audio - R	0.5 Vrms / 10 kΩ	

AV3: Audio/Video - In

1 - G/Y/Y	0.7 Vpp / 75 Ω	
2 - B/Pb/Cb	0.7 Vpp / 75 Ω	
3 - R/Pr/Cr	0.7 Vpp / 75 Ω	
4 - H		
5 - V		
6 - Audio - L	0.5 Vrms / 10 kΩ	
7 - Audio - R	0.5 Vrms / 10 kΩ	

1.3 Chassis Overview

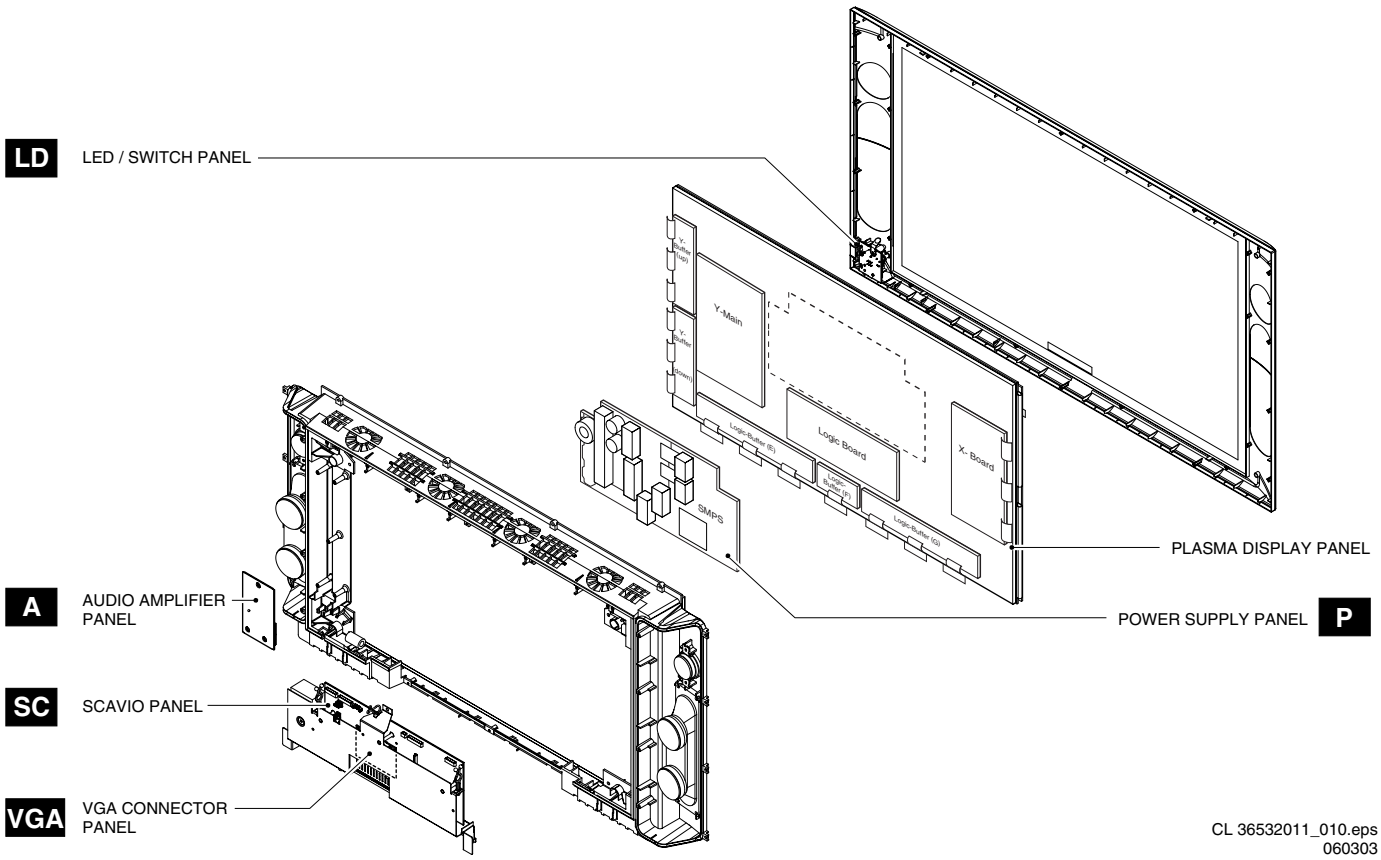


Figure 1-6 PWB Location

2. Safety Instructions, Warnings, and Notes

2.1 Safety Instructions

Safety regulations require that **during** a repair:
- Connect the set to the mains via an isolation transformer (> 800 VA).
- Do not operate the monitor without the front glass plate. One function of this glass plate is to absorb IR radiation. Without this glass plate, the level of radiation could damage your eyes.
- Replace safety components, indicated by the symbol ⚠, only by components identical to the original ones.

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

2.2 Warnings

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

2.3 Notes

- Clean the glass plate in front of the plasma display with a slightly humid cloth. If, due to circumstances, there is some dirt between the glass plate and the plasma display, this must be cleaned by a qualified service engineer (see section “Mechanical Instructions”).
- Measure the direct voltages and oscillograms with regard to the chassis ground (⏚), or hot ground (⏚) as this is called.
- The direct voltages and oscillograms shown in the diagrams are indicative. Measure them in the Service Default Mode (see section “Service Modes”).
- Where necessary, measure the voltages in the power supply section both in normal operation (⏻) and in standby (⏻). These values are indicated by means of the appropriate symbols.
- The semiconductors indicated in the circuit diagram and in the parts lists, are interchangeable per position with the semiconductors in the unit, irrespective of the type indication on these semiconductors

2.3.1 Schematic Notes

- All resistor values are in ohms and the value multiplier is often used to indicate the decimal point location (e.g. 2K2 indicates 2.2 kOhm).
- Resistor values with no multiplier may be indicated with either an 'E' or an 'R' (e.g. 220E or 220R indicates 220 Ohm).
- All Capacitor values are expressed in Micro-Farads ($\mu = x10^{-6}$), Nano-Farads ($n = x10^{-9}$), or Pico-Farads ($p = x10^{-12}$).
- Capacitor values may also use the value multiplier as the decimal point indication (e.g. 2p2 indicates 2.2 pF).
- An 'asterisk' (*) indicates component usage varies. Refer to the diversity tables for the correct values.
- The correct component values are listed in the Electrical Replacement Parts List. Therefore, always check this list when there is any doubt.

2.3.2 Rework on BGA ICs

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

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

Area preparation
When the component has been removed, the vacant IC area must be cleaned before replacing the (LF)BGA.
Removing an IC often leaves varying amounts of solder on the mounting lands. This excessive solder can be removed with either a solder sucker or solder wick. The remaining flux can be removed with a brush and cleaning agent.
After the board is properly cleaned and inspected, apply flux on the solder lands and on the connection balls of the (LF)BGA.
Note: Do not apply solder paste, as this has shown to result in problems during re-soldering.

Device replacement

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

English

Unpacking and wall mounting instructions

For the unpacking instructions follow the illustrated steps printed on the packaging (outside and inside). For the wall mounting instructions follow the illustrated steps ❹ to ❻ printed on the separate leaflet.

Make sure that the wall mount is being fixed securely enough so that it meets safety standards. The weight of the monitor (excl. packaging) is about 35 kg.

Note: Stands are optional accessories. Consult your dealer.

Connect your electronic receiver box
See the separate supplied instruction manual with your receiver box.

Connect your computer

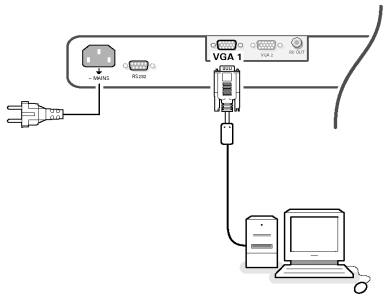
To the receiver box

See the illustration in the inside frontcover of this handbook.

Connect one end of a VGA cable to the video card of the computer and the other end to the **VGA IN** connector at the rear side of the receiver box. Fix the connectors firmly with the screws on the plug.

Directly to the monitor

❶ Connect one end of a VGA cable to the video card of the computer and the other end to the **VGA 1** connector at the rear side of the monitor. Fix the connectors firmly with the screws on the plug.



Daisy chaining

The Loop Through facility makes it possible to make a daisy chain with a second monitor.

❷ Connect one end of another VGA cable to the **VGA 2** connector at the rear side of the monitor and the other end to the **VGA 1** connector of a second monitor.

The RC out jack next to the VGA 2 connector makes it possible to daisy chain remote control signals to other equipment. This output cannot be used to daisy chain a second monitor.

Serial I/O port RS232

The RS232 connector is only to be used with the monitor as stand alone.
This connector allows you to control the monitor via your PC (as a replacement of the remote control).

Note: This connector can also be used for dealer service tools.

Monitor Display modes

VGA	640x480	60, 72, 75, 85 Hz
Wide VGA	848x480	60 Hz
Wide VGA	852x480	60 Hz
MAC	640x480	66.67 Hz
MAC	832x624	74.55 Hz
MAC	1024x768	74.93 Hz
MAC	1152x870	75 Hz
SVGA	800x600	56, 60, 72, 75, 85 Hz
XGA	1024x768	60, 70, 75, 85 Hz
SXGA	1280x1024	60, 72 Hz

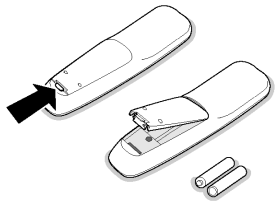
When a VGA computer is connected, the display selection is made automatically.

A message is displayed when the monitor does not support the connected VGA mode. Switch your computer to a correct display mode.

Operation

❶ **Insert the mains plug** supplied into the mains inlet at the back of the monitor and in the wall socket.
For safety, please, only use the supplied rim-earthed mains cord which has to be inserted in a grounded socket.

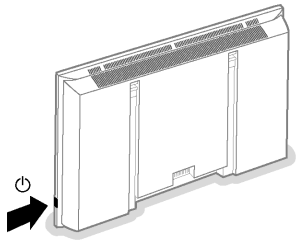
❷ **Remote control:** remove the cover of the battery compartment.
Insert the 2 batteries supplied (Type R6/AA-1.5V).



The batteries supplied do not contain the heavy metals mercury and cadmium. Nevertheless in many countries batteries may not be disposed of with your household waste. Please check on how to dispose of batteries according to local regulations.

❸ Make sure that your electronic receiver box and/or PC are switched on and that your PC is in the correct display mode.

❹ **Switch the monitor on :** Press the on/off key ⏻ at the right side of the monitor.
A green indicator lights up and the screen comes on.



When the monitor does not receive a supported VGA signal and is not connected to a receiver box, the screen switches to standby and the red indicator lights up.

When you switch on your monitor **for the first time**, and the monitor is not connected to an electronic receiver box, the language menu automatically appears on the screen. The explanation appears in different languages one at a time.
Follow the instructions on screen to select the correct language or see Setup menu, Language, p. 5.

Use of the remote control

VGA to select your computer connected to the **VGA 1** connector

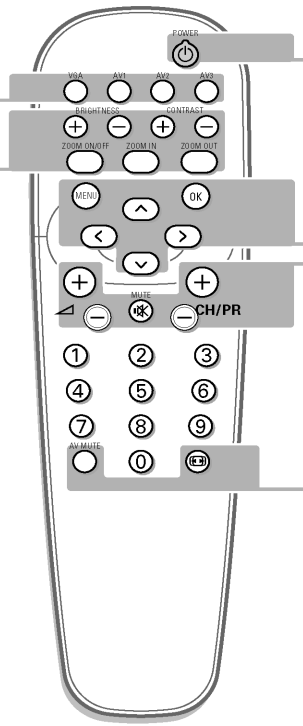
AV1, AV2, AV3 no function

BRIGHTNESS +/-
to adjust the brightness level of the picture

CONTRAST +/-
to adjust the contrast level of the picture

ZOOM ON/OFF to activate/de-activate the zoom function. See p. 4.

ZOOM IN/OUT to adjust the zoom factor and to change the magnification of the picture when zoom is activated. See p. 4.



⏻ to switch to standby or on again

MENU to switch the menu on/off

cursor keys to select your choice and to alter a selected adjustment.

OK to activate your choice

press - or + to adjust the volume

no function (except when in combination with a receiver box and a Home Cinema audio receiver)

CH/PR Programme selection
To browse through the sources selected.

AV MUTE to temporarily mute the picture and the sound or restore it.
When activated a yellow indicator starts blinking in front of the monitor.

Picture format
See Picture 2 menu, p. 4.
Press the key to switch between the different picture formats.

If your monitor no longer responds to the remote control, the batteries may be exhausted.

How to dispose of batteries ?

The batteries supplied do not contain the heavy metals mercury and cadmium. Nevertheless in many countries batteries may not be disposed of with your household waste. Please ensure you dispose of batteries according to local regulations.

End of life directives

Philips is paying a lot of attention to produce environmentally-friendly in green focal areas. Your new monitor contains materials which can be recycled and reused.
At the end of its life specialised companies can dismantle the discarded monitor to concentrate the reusable materials and to minimise the amount of materials to be disposed of.
Please ensure you dispose of your old monitor according to local regulations.

Use of the menus and the menu system

```
Picture 1    Picture 2    Setup
      Brightness
        Contrast
    Colour temp.
       Sharpness
```

❶ Press the **MENU** key on the remote control to summon the different menu headers.

❷ Press the cursor left/right to move the cursor horizontally through the menu headers.

❸ Press the cursor down to access the menu.
In case of a slider, move the cursor left/right to adjust.
In case of a list with options, move the cursor right to enter and use the cursor up/down to select an option.
Press the cursor left to leave the options list.

❹ Press the **MENU** key again to switch off the menu.

Note: Sometimes not all the menu items are visible on the screen.
Press the cursor down until all the items are displayed.

Only when the US English language has been selected (see Setup menu, Language, p. 5), the menu items will be displayed with additional icons.

Operation

Press the **MENU** key on the remote control to summon the main menu.

Picture 1 menu

```
Picture 1
      Brightness
        Contrast
Colour temperature
       Sharpness
```

Brightness
This control allows you to adjust the brightness level of the picture.

Contrast
This control allows you to adjust the contrast level of the picture.

Colour temperature
This control allows you to select the colour temperature of the picture.
Move the cursor up/down to make a selection.
Press the cursor left to return to the Picture 1 menu.

Sharpness
This control allows you to adjust the edge definition of a picture.

Picture 2 menu

```
Picture 2
      Format      ■ 4:3
        Zoom        Wide screen
  Zoom factor
       Shift
Clock frequency
       Phase
  Auto align
```

4:3 Wide screen

In this menu you are allowed to adjust attributes which are relevant for the picture on the display, like format, zoom, size, etc.

Format
Select **Format** to summon a list of **available** display formats for showing images in the traditional 4:3 proportions.
Press the cursor up/down to select another display format: 4:3 or Wide screen.

Zoom
Select **Zoom On** to activate the zoom function.
You may also activate the zoom function with the **ZOOM ON/OFF** key on the remote control.
Press the cursor left/right, up/down to select which part of the screen will be zoomed.

Zoom factor
Select **Zoom factor** and press the cursor left/right to adjust the zoom factor and to change the magnification of the picture.
If zoom is not active, Zoom Off, changing the magnification factor will have no effect on the displayed picture.

Shift
This control allows you, when necessary, to move the picture in a horizontal or vertical way.

1. Use the cursor left/right to adjust.
2. Press the **OK** key when done.

Clock frequency

This control allows you, when necessary, to adjust the values of the clock frequency so that especially text can be displayed with an optimal overall sharpness.

Use the cursor left/right to adjust.

Phase

This control allows you, when necessary, to adjust the pixel phase of the picture to avoid picture interference.

Use the cursor left/right to adjust.

Auto align

This control allows you to automatically adjust the shift, the clock frequency and the phase in VGA mode.
Press **OK** to execute.

Setup menu

1. Use the cursor down to select **Language**.
2. Press the cursor right to enter the list of selectable languages.
3. Use the cursor up/down to scroll through the list and to bring up other languages which are not displayed on the screen at present.

Tips

Ambient temperature

Do not hang up the monitor above a central heating or other heating sources.

Care of the screen

Clean the anti-reflex coated flat glass screen with a slightly damp soft cloth. Do not use abrasives solvents as it can damage the glass surface of the screen.

Plasma Display characteristics

Caution: A video source (such as a video game, DVD, or video information channel) which shows a constant non-moving pattern on the screen, can cause damage to the screen. When your Flat-Monitor is continuously used with such a source, the pattern of the non-moving portion of the game (DVD, etc.) could leave an image permanently on the screen. When not in use, turn the video source **OFF**.
Regularly alternate the use of such video sources with normal viewing.
When switching over to another picture after having displayed the same still picture for a long time (many hours), it may happen that some parts from the previous picture will remain on screen due to a kind of memory effect. This ghost picture will disappear after some time. To avoid this effect change the pictures regularly or for PC use you can turn on a screen saver in your computer.
For video signals, Philips has built in an automatic shift of the picture every 5 minutes to avoid this effect and to prolong the life of the screen.
Very incidentally and after a longer period of unuse (approx. 1 year) the screen may display some strange colour deficiencies. This is quite normal for plasma displays and these effects will disappear after the set has been turned on for some time.
A plasma display consists of a huge amount of colour pixels. It is within industry standards that very few pixels (< 0.001%) may be defective, even for a new set. There is however no reason to doubt about the quality of the set.
The plasma display technology operates with rare gases which are being influenced by air pressure.

Up to an altitude of 2000 m above sea-level (local air pressure equal or above 800 hPa), the display is functioning fine.
Operating the set at a higher altitude (lower air pressure), the picture becomes unstable and the picture performance is deteriorating. The plasma display might then also produce a humming sound. After bringing the set below 2000 m (local air pressure equal or above 800 hPa) it works fine again. Transportation has no influence.

Control of peripheral equipment

The infrared signals of the screen may influence the reception sensitivity of other peripherals. Solution: replace the batteries of the remote control or change position of other equipment. E.g. keep away a wireless headphone from within a radius of 1.5 m.

No stable or not synchronised VGA picture

Check if you have selected the correct VGA mode in your PC.

No picture or no sound

Are the supplied cables connected properly? (The power cable to the display, the VGA cables, the audio cables,...)
Is your PC or receiver box switched on?
Do you see a black screen and the indicator on front of the monitor lights up green, this means that the display mode is not supported.
Switch your VGA source to a correct mode.

If your problem is not solved:
Switch your monitor off and then on again.
Never attempt to repair a defective monitor yourself.
Check with your dealer or call a video technician.

Transport

Keep the original packaging to transport the monitor if needed.

Miscellaneous

- Ambient temperature: + 5 ~ + 40°C
- Maximum operating altitude: 2000 m (min. air pressure 800 hPa)
- Mains: Auto Voltage ranging from 95V to 264V 50Hz/60Hz
- Power consumption: around 380 W
- Standby consumption: < 2 W
- Weight (excl. packaging) Display: 35 kg
- Dimensions (wxhxd): Display: 107 x 66 x 9cm
- Wall mounting bracket included

4. Mechanical Instructions

Index of this chapter:

- Service Position Monitor
- Rear Cover Removal
- Service Position Panels
- PDP and Glass Plate Replacement
- Re-assembly

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

4.1 Service Position Monitor

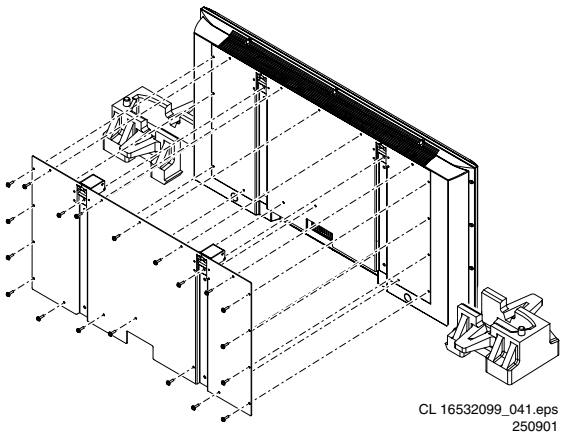


Figure 4-1 Service Position

First, put the monitor in its service position. (Can be done via buffers as showed on figure, but preferable via new service position solution as described below. Still some improvising is needed for service positions panels however). Therefore, disconnect all cables connected to the monitor and take the monitor of the wall (or tabletop stand). Then, fix the monitor to the 2 service-poles. (the 2 poles together form a service-kit: 3122 785 90480; this service-stand can be used for 30” until 42” FTVs.

4.2 Rear Cover Removal

To be able to access or measure the panels, remove the rear cover (metal back plate):
Warning: make sure that the mains power is disconnected before you remove the metal back plate.

1. Remove all fixation screws of the back plate, as indicated in the figure above (five at the top, five at each side, seven at the bottom and the two larger ones just below the 'wall mounting holes').
2. Remove the metal back plate. Make sure that wires and flat foils are not damaged during plate removal.

4.3 Service Position Panels

4.3.1 SCAVIO Panel

Solder-side SCAVIO

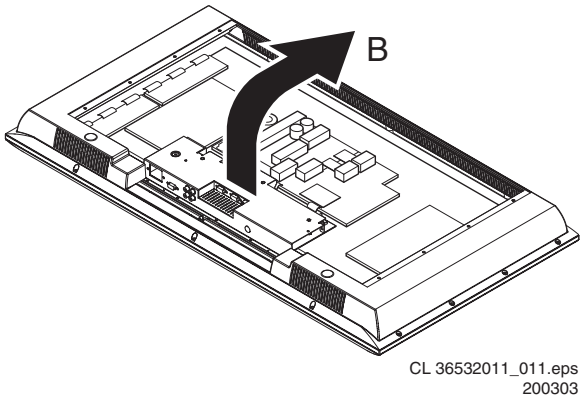


Figure 4-2 Service position SCAVIO (1)

To access the panel:

1. Remove the cables from connectors 0320, 0305, 0301, 0319 and 0388 on the SCAVIO panel.
2. Remove the power cable from the mains power inlet to the power supply (connector 0308).
3. Remove the five screws at the bottom of the SCAVIO-panel cover plate.
4. Hold the SCAVIO panel while removing the top screw, in order to prevent that it will fall.
5. Take the panel out, and turn it 180 degrees, so that you face the solder side of the SCAVIO panel.
6. Reconnect all cables. Use a standard power cable to connect the mains directly to PSU-connector 0308, and use the 'LED/Switch panel' service kit 3122 785 90410 (as the original cable is too short).

Caution: When measuring, watch out for the 'hot' left heat sink of the PSU!

Another way to measure the SCAVIO panel:

1. Remove the five screws at the bottom of the SCAVIO-panel cover plate.
2. Hold the SCAVIO panel while removing the top screw, in order to prevent that it will fall.
3. Put a piece of paper (or cardboard) in front of the Power Supply.
4. Take the panel out, and turn it upward [B], so that you face the solder-side of the SCAVIO panel.

Caution: Make sure that the metal connector plate does not touch any 'hot' part of the Power Supply (heatsink).

Component-side SCAVIO

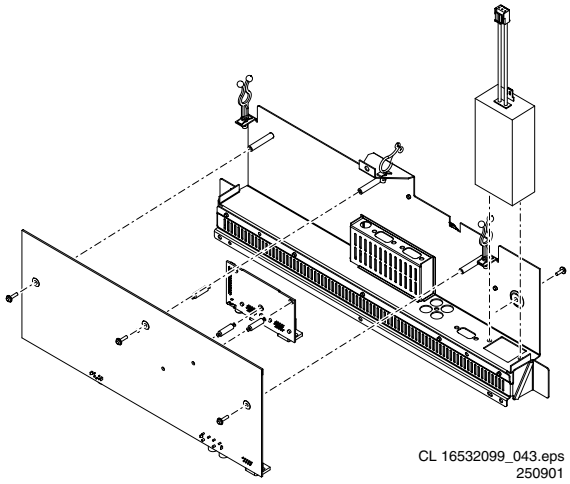


Figure 4-3 Service position SCAVIO (2)

To access the other side of the SCAVIO panel:
1. Disconnect all cables going to the SCAVIO panel.
2. Remove all screws at the connectors of the connector plate, see figure 'Solder-side SCAVIO'.
3. Remove the three fixation screws that connect the SCAVIO panel to the connector plate, see figure 'Component-side SCAVIO'.
4. Reconnect the SCAVIO panel, be careful: do not make a short-circuit!

4.3.2 VGA Connector Panel

How to remove the VGA Connector panel:
1. Squeeze the plastic pins that attach this panel to the SCAVIO board, while you pull it carefully upwards.
2. Unplug the flat foil cable.

4.3.3 Power Supply Panel

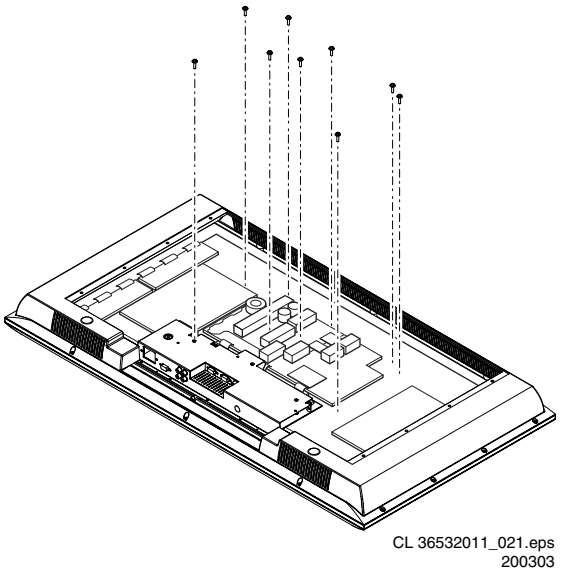


Figure 4-4 Remove PSU

The supply panel can not be repaired by the network. As measure points are accessible for possible re-alignment, there is no further service-position.
To remove the panel unscrew the 9 screws (see drawing) and disconnect the cables.

4.3.4 Audio Amplifier Panel (only valid for “speaker”-version)

The solder-side of this panel is directly accessible. To access the component-side, or to remove the whole panel, unscrew the three fixation screws

4.3.5 LED/Switch Panel and Speakers

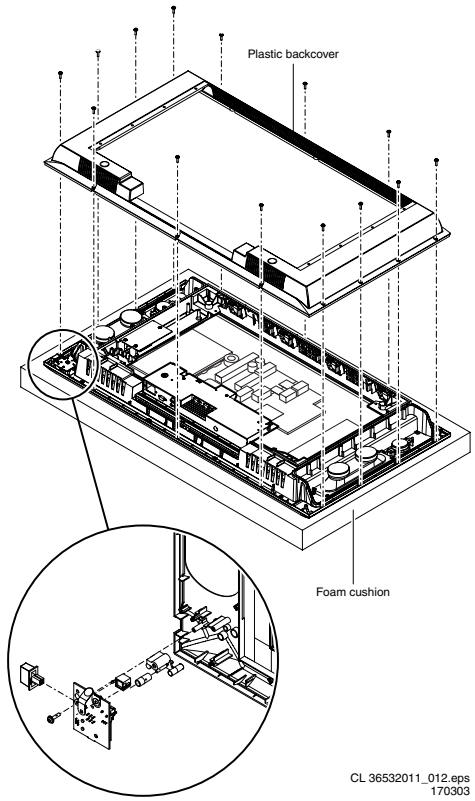


Figure 4-5 Service Position LED/Switch Panel and Speakers

To access or replace the LED/Switch panel and/or speakers:
1. Take the monitor from its service stand, and put it (face down) on a **soft surface** (blanket or foam cushion), to make sure that you do not damage the front glass plate.
2. Unscrew all fixation screws of the plastic back cover: five at all sides.
3. Lift and remove the plastic back cover.
4. You can access now the LED/Switch panel and/or the speakers.

4.3.6 LED/Switch panel

To measure the component-side, or to remove the LED/Switch panel, unscrew one fixation screw (see enlarged part of figure 'LED/Switch Panel and Speakers'), and remove the panel.

4.3.7 Loudspeakers (if valid)

When you have removed the plastic back cover, you **must** replace the speaker-box sealing foams (12nc: 3122 358 76221). This, to ensure that the loudspeakers are airtight. **Do not stretch the foam during mounting**. Pay special attention to the corners, to make sure that the foam is not stretched and that it is pushed into the corners.

4.4 PDP and Glass Plate Replacement

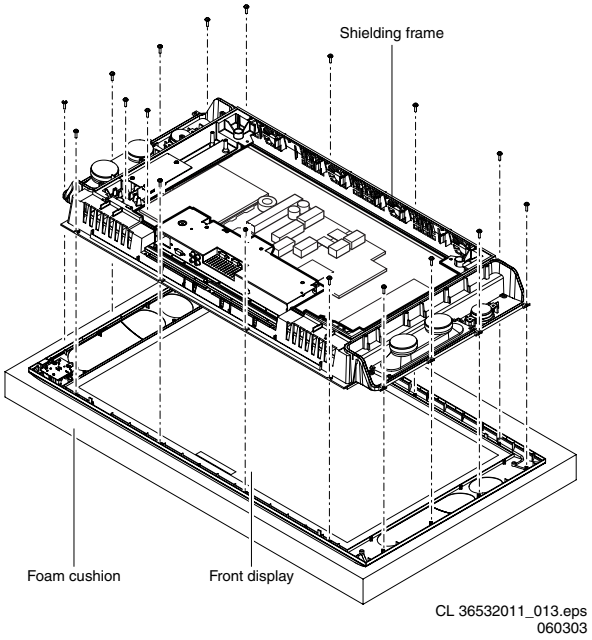


Figure 4-6 Exchange Glass Plate

To exchange the glass plate

1. Take the monitor from its service stand, and put it (face down) on a soft surface (blanket or foam cushion), to make sure that you do not damage the front glass plate.
2. Remove the metal back plate as described in paragraph 'Rear Cover Removal'.
3. Unscrew all fixation screws of the plastic back cover: four at the left and right side, three at the bottom and top side.
4. Lift and remove the plastic back cover.
5. Unscrew two fixation screws of the triangular shaped cable holder at the left bottom, see figure 'Exchange Glass Plate'.
6. Unscrew all fixation screws of the (metallised) shielding frame, four at both sides and four at the top and bottom, see figure 'Exchange Glass Plate'.
7. Unplug the cable of the LED/Switch panel, connector 0320.
8. You can now remove the (metallised) shielding frame, together with the PDP, Audio panel, Power supply and SCAVIO panel attached to it, see figure 'Exchange Glass Plate'.
   Note: To prevent scratches, make sure to put the shielding frame together with the PDP on a soft surface.
9. Replace the glass plate.

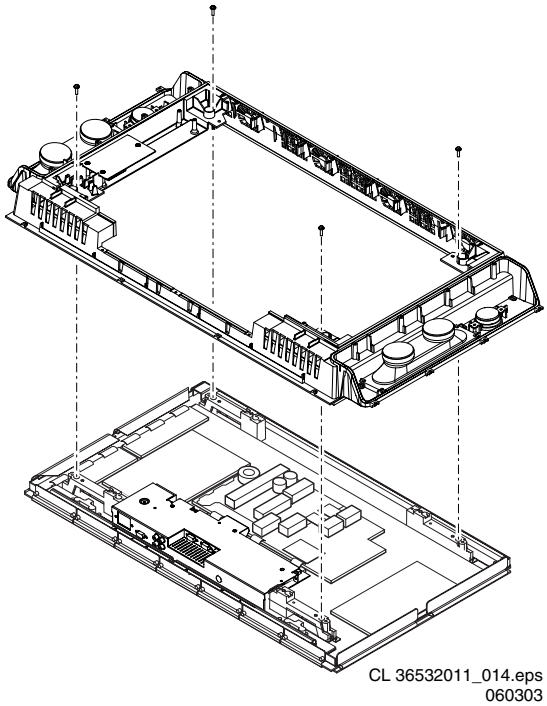


Figure 4-7 Exchange PDP

To exchange the PDP panel:

1. Take out the SCAVIO panel and Power Supply panel.
2. Unscrew all fixation screws of the (metallised) shielding frame (two at the top and two at the bottom, see figure 'Exchange PDP').
3. Replace the PDP.

4.5 Re-assembly

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

Notes:

- You **must** replace the speaker-box sealing foam, in case the plastic rear cover has been (re)moved.
- While re-assembling, make sure all the cables are in their original position and make sure all the EMC foams are present to ensure 'EMC tightness'.

5. Service Modes, Error Codes and Fault Finding

Index of this chapter:
1. Test points
2. Service Modes
3. Problems and Solving Tips (related to CSM)
4. ComPair
5. Error Codes
6. The Blinking LED Procedure
7. Protections
8. Repair Tips

5.1 Test Points

The chassis is equipped with test points (I- and F-points) printed on the circuit board assemblies. See test point overviews in section “Block Diagrams”

Perform measurements under the following conditions:
- Service Default Mode.
- Video: colour bar signal (via PC or VGA-generator).
- Audio: 1 kHz, 2 V_{PP} (via PC or VGA-generator).

5.2 Service Modes

Service Default Mode (SDM) and Service Alignment Mode (SAM) offer several features for the service technician, while the Customer Service Mode (CSM) is used for communication between a Philips Customer Care Centre (P3C) and a customer.

There is also the option of using ComPair, a hardware interface between a computer (see requirements) and the FTV chassis. It offers the ability of structured trouble shooting, test pattern generation, error code reading, software version readout and software upgrading.
Minimum requirements: a Pentium Processor, Windows 9x/NT/ 2000/XP, and a CD-ROM drive (see also paragraph “ComPair”).
Note: This FM242-monitor has different as the FM24, not a internal pdp-testpattern that can be enabled via the SAM-menu
A test pattern however can be generated.
How?
Select via ComPair-tool the right hex-address (sub address 0080 and then PS (Pattern Select) (00 full window black; 01~04 full window white, red, green, blue) and more variants until 17)
It however only works when set is signalled (Scavio and pdp, needs a sync). This is less nice solution as in FM24.
Switch off the pattern again via hex-code 0080 and 0

5.2.1 Service Default Mode (SDM)

Purpose
- To create a pre-defined setting to get the same measurement results as given in this manual.
- To override SW protections (only when SDM is entered via the 'service pins' on connector 0382).
- To start the blinking LED procedure.

Specifications
- All picture settings at 50% (brightness, contrast, etc.).
- Colour temperature is set to 'normal'.
- Bass, treble and balance at 50%; volume at 25%.
- All service-unfriendly modes (if present) are disabled, like:
- Video blanking,
- Slow de-mute,
- Anti ageing,
- Automatic switch to Standby when no sync signals are received.

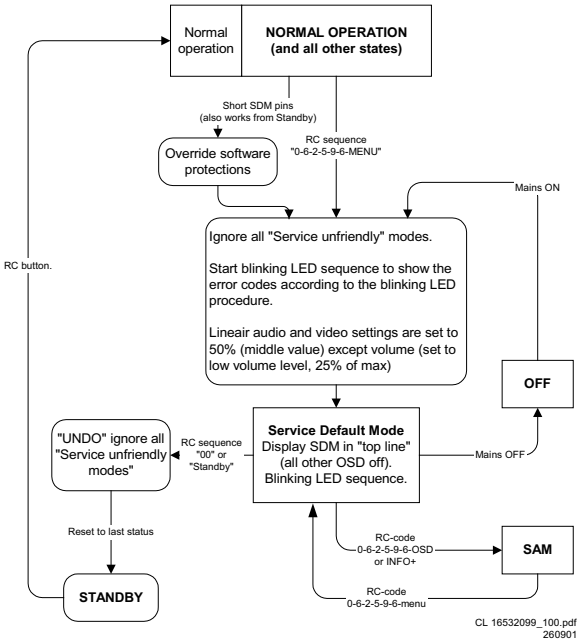


Figure 5-1 SDM Flowchart

How to enter SDM
Use one of the following methods:
- Use the standard RC-transmitter and key in the code **062596**, directly followed by the **MENU** button.
- Short jumpers 1 and 2 of connector 0382 on the SCAVIO panel.

After entering SDM, a blank screen is visible, with SDM in the upper left side for recognition. The Blinking LED procedure is started and will indicate any possible errors via the (orange) front LED.

How to navigate
To toggle to the SAM mode, use a standard customer RC-transmitter and key in the code **062596**, directly followed by the **OSD (i+)** key.

How to exit
Use one of the following methods (the set returns to its last status):
- Switch the set to STANDBY by pressing the power button on the remote control transmitter (if you switch the set 'off' by removing the Mains power, the set will return in SDM, when the Mains power is re-applied).
- Use the standard RC-transmitter and key in the code **00**.

5.2.2 Service Alignment Mode (SAM)

Purpose
- To perform (software) alignments.
- Easy way to identify the commercial type number of the set.
- Easy identification of the used software versions.
- To display (or clear) the error code buffer.
- View operational hours.

Specifications
- Operation hours counter.
- Software version reading.
- Error buffer reading and erasing.
- Software alignments.

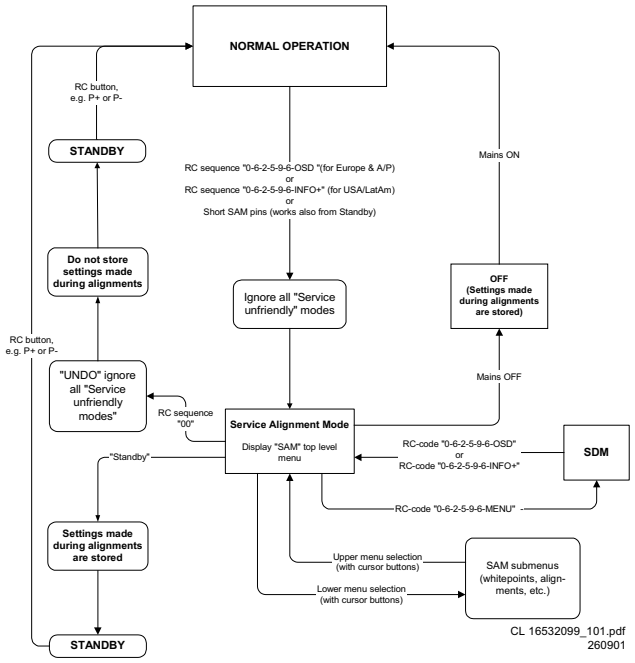


Figure 5-2 SAM Flowchart

How to enter

Use one of the following methods:

- Use a standard RC-transmitter and key in the code **062596** directly followed by the **OSD (i+)** button
  Note: the OSD (i+) is not available on the original FM242 remote control, therefore use another Philips remote control (e.g. MG, EMG or A10).
- Short jumpers 3 and 4 of connector 0382 on the SCAVIO panel.

The following screen is visible:

Service Alignment Menu	General
Type Nr. - AG Code	42FD9945/01 **00 00
SW Version OTC	AAAAAB-X.Y_xxxxx
SW Version PW	AAAABC-X.Y_xxxxx
SW Version EPLD	AAAABC-X.Y_xxxxx
Errors 1	xx xx xx xx xx
Errors 2	xx xx xx xx xx
Operational hours	xx
Reset error buffer	Press OK to reset
Store	Press OK to store

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Figure 5-3 SAM Menu 'General'

1. **Type Nr.** Gives the commercial type number of the monitor, e.g. 42FD9945/01.
2. **AG Code.** Is not implemented.
3. **SW Version OTC** (AAAAAB-X.Y-xxxxx).
   Note: You will find details of the latest software versions in the chapter 'Software Survey' of the 'Product Survey - Colour Television' publication, which is published four times each year.
   - A = the chassis name (FM23 for 32" displays or FM242 for 42" SDI-displays).
   - B = the region (E= Europe, A= Asia Pacific, U= NAFTA, L= LATAM; in our case G = Global).
   - (if valid) C = the configuration name (B= Basic, E= Enhanced; for PW & EPLD-software this will be named B).
   - X = the main software version number.
   - Y = the sub software version number.
   - x = last five digits of 12nc code.
4. **SW Version PW** (AAAABC-X.Y-xxxxx). See description above.
5. **SW Version EPLD** (AAAABC-X.Y-xxxxx). See description above.
6. **Errors 1.** Gives the last five errors of the error buffer. The last detected error is displayed at the most left position. The errors are displayed as 2 digit numbers and separated by a space. When less than 10 errors occurred, the rest of the line(s) is empty. In case of no errors the text 'No Errors' is displayed behind menu item 'Errors 1'. See paragraph 5.5 for a description.
7. **Errors 2.** Gives the first five errors of the error buffer. The last detected error is displayed at the most left position.
8. **Operational hours.** The Operations Hours indicate the time that the display was active with half an hour resolution. It represents the system hours (OTC), not the PDP hours.
9. **Reset error buffer.** Erase the contents of the error buffer. Press 'OK' on your remote control to activate. The content of the error buffer is cleared.
10. **Store.** This will store the performed alignments. Press 'OK' on your remote control to activate.
    Note: if you do not want to store the performed alignments, leave the SAM mode via code 00 on your remote control. Do not activate the 'store' item.

How to navigate

Use one of the following methods:

- Select the sub-menu's (upper line) with the CURSOR LEFT/RIGHT keys on the remote control transmitter.
- Select the menu items with the CURSOR UP/DOWN keys. With the CURSOR LEFT/RIGHT keys it is possible to:
  – Activate the selected menu item.
  – Change the value of the selected menu item.
- To toggle to the SDM mode, use the standard customer RC-transmitter and key in the code **062596**, directly followed by the **MENU** key.

How to exit

Use one of the following methods:

- Switch the set 'off' (with the Mains switch or by pulling the Mains cord).
  Note: new alignment settings are always stored, even when item 'store' was not activated!
- Switch the set to 'standby' by pressing the power button on the remote control transmitter.
  Note: new alignment settings are always stored, even when item 'store' was not activated!
- Use the standard RC-transmitter and key in the code **0 0**.
  Note: new alignment settings are not stored (except when item 'store' was activated)!

5.2.3 Customer Service Mode (CSM)

Purpose

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

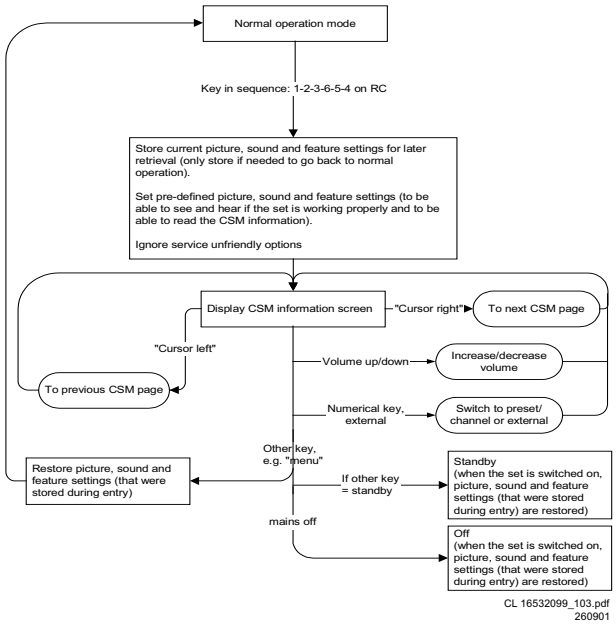

Figure 5-4 CSM Flowchart

How to enter

Use the standard customer RC-transmitter and key in the code **123654**.

When CSM is entered, the values of brightness, contrast, etc. are set to 50% (of max. value), and volume is set to 25%, to ensure that you always have a picture and sound.

After switching 'on' the Customer Service Mode, the following screen will appear:

Customer Service Menu 1	
1 - Type Nr. - AG Code	42FD9945/01
2 - SW Version OTC	AAAAAB-X.Y_xxxxx
3 - SW Version PW	AAAABC-X.Y_xxxxx
4 - SW Version EPLD	AAAABC-X.Y_xxxxx
5 - Code 1	xx xx xx xx xx
6 - Code 2	xx xx xx xx xx
7 - Volume	xx
8 - Brightness	xx
9 - Contrast	xx

Customer Service Menu 2	
10 - Colour	xx
11 - Tint	xx
12 - Sharpness	xx
13 - Soundmode	xx
14 - Source	xx
15 - AV Mute	xx

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Figure 5-5 CSM Menu

1. **Type Nr. AG Code.** Gives the commercial type number of the monitor, e.g. 42FD9945/01. AG Code is not implemented.
2. **SW Version OTC** (AAAAAB-X.Y-xxxxx) **Note:** You will find details of the latest software versions in the chapter 'Software Survey' of the 'Product Survey - Colour Television' publication, which is published four times each year.
   - A = the chassis name (FM23 for 32" displays or FM242 for 42" SDI-displays).
   - B = the region (E= Europe, A= Asia Pacific, U= NAFTA, L= LATAM or G = Global).
   - (if valid) C = the configuration name (B= Basic, E= Enhanced).
   - X = the main software version number.
   - Y = the sub software version number.
   - x = last five digits of 12nc code.
3. **SW Version PW** (AAAABC-X.Y-xxxxx). See description above.
4. **SW Version EPLD** (AAAABC-X.Y-xxxxx). See description above.
5. **Code 1.** Gives the last five errors of the error buffer. The last detected error is displayed at the most left position. The errors are displayed as 2 digit numbers and separated by a space. When less than 10 errors occurred, the rest of the line(s) is empty. In case of no errors, the text 'No Errors' is displayed behind menu item 'Code 1'. See paragraph “Error Buffer” for a description.
6. **Code 2.** Gives the first five errors of the error buffer. The last detected error is displayed at the most left position.
7. **Volume.** Gives the last volume status for the selected source, as set by the customer.
8. **Brightness.** Gives the last brightness status for the selected source, as set by the customer.
9. **Contrast.** Gives the last contrast status for the selected source, as set by the customer.
10. **Colour** (not present in *Basic* configuration). Gives the last colour status for the selected source, as set by the customer.
11. **Tint** (only for *NTSC Enhanced* configuration). Gives the last tint status for the selected source, as set by the customer.
12. **Sharpness.** Gives the last sharpness status for the selected source, as set by the customer.
13. **Source.** Gives the selected source, as set by the customer.
14. **AV Mute.** Indicates if AV Mute is 'on' or 'off'.

How to navigate

Use one of the following methods:

- Switch to the other CSM page with the CURSOR LEFT/ RIGHT keys on the remote control.
- You can increase/decrease volume with the VOLUME UP/ DOWN keys on the remote control.
- You can switch to another source with the NUM/EXT keys on the remote control.

How to exit

Use one of the following methods:

- Press the MENU key of the remote control transmitter.
- Switch the set to 'standby' with the Power switch on the remote control.
- Switch the set 'off' with the Mains power switch.

5.3 Problems and Solving Tips (Related to CSM)

5.3.1 Picture Problems

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

Picture too dark or too bright

Increase/decrease the BRIGHTNESS and/or the CONTRAST value when the picture improves after you have switched on the Customer Service Mode. The new value is automatically stored.

White line around picture elements and text

Decrease the SHARPNESS value when the picture improves after you have switched on the Customer Service Mode. The new value is automatically stored.

Snowy picture and/or unstable picture

A scrambled or decoded signal is received.

Black and white picture
Increase the COLOUR value when the picture improves after you have switched on the Customer Service Mode. The new value is automatically stored.

Menu text not sharp enough
Decrease the CONTRAST value when the picture improves after you have switched on the Customer Service Mode. The new value is automatically stored.

5.3.2 Sound Problems

(if valid, related to speaker-version yes or no)

No sound from left or right speaker
Check item 'Volume' in the CSM mode. If value is low, increase the volume level. The new value is automatically stored.

No sound or sound too loud (after channel change/ switching on)
Increase/decrease the VOLUME level when the volume is OK after you switched on the CSM. The new value is automatically stored.

5.4 ComPair

5.4.1 Introduction

ComPair (Computer Aided Repair) is a service tool for Philips Consumer Electronics products. ComPair is a further development on the European DST (Dealer Service Tool), which allows faster and more accurate diagnostics. ComPair has three big advantages:
- ComPair helps you to quickly get an understanding on how to repair the chassis in a short time by guiding you systematically through the repair procedures.
- ComPair allows very detailed diagnostics (on I^2C level) and is therefore capable of accurately indicating problem areas. You do not have to know anything about I^2C commands yourself because ComPair takes care of this.
- ComPair speeds up the repair time since it can automatically communicate with the chassis (when the microprocessor is working) and all repair information is directly available. When ComPair is installed together with the SearchMan electronic manual of the defective chassis, schematics and PWBs are only a mouse click away.

5.4.2 Specifications

ComPair consists of a Windows based faultfinding program, and an RS232 cable between PC and the (defective) product.

The ComPair faultfinding program is able to determine the problem of the defective monitor. ComPair can gather diagnostic information in two ways:
- **Automatic** (by communication with the monitor): ComPair can automatically read out the contents of the entire error buffer. Diagnosis is done on I2C level. ComPair can send and receive commands to the micro controller of the monitor, and so can access the I2C bus of the monitor. In this way, it is possible for ComPair to communicate (read and write) to devices on the I2C busses of the FTV monitor.
- **Manually** (by asking questions to you): Automatic diagnosis is only possible if the micro controller of the monitor is working correctly and only to a certain extend. 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 F7 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.

Beside fault finding, ComPair provides some additional features like:
- Software upgrading (upload possible to OTC and PW Scaler).
- Emulation of the (European) Dealer Service Tool (DST).
- If both ComPair and SearchMan (Electronic Service Manual) are installed, all the schematics and the PWBs of the set are available by clicking on the appropriate hyperlink. **Example:** Measure the DC-voltage on capacitor C2228 (Schematic/Panel) of the SCAVIO panel. Click on the 'Panel' hyperlink to automatically show the PWB with a highlighted capacitor C2568. Click on the 'Schematic' hyperlink to automatically show the position of the highlighted capacitor.

5.4.3 How to Connect

1. First, install the ComPair Browser software on your PC (read the installation instructions carefully).
2. Connect an RS232 interface cable between a free serial (COM) port on your PC and the RS232 connector on the FM242 plasma monitor.
3. Switch the plasma monitor 'off' and 'on' again (with the Mains switch).
4. Start the ComPair program and follow the instructions.

Note: once the set is in ComPair mode, the front LED will blink red, at a frequency of 0.3 Hz.

5.4.4 How to Order

ComPair order codes:
- Starter kit ComPair32 software (registration version): 3122 785 60040.
- ComPair32 CD (update): 3122 785 60070.
- Starter kit SearchMan32 software: 3122 785 60050.
- SearchMan32 CD (update): 3122 785 60080.

Note: The RS232 cable is not included. It is a standard cable (9p sub-D male-to-female) that can be obtained by a computer store. It is supplied however with the ComPair interface (4822 727 21631), necessary for servicing other Philips TVs.

5.5 Error Buffer

The error code buffer contains all detected errors 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 written at the left side and all other errors shift one position to the right.

5.5.1 How to Read the Error Buffer

Use one of the following methods:
- On screen via the SAM (only if you have a picture). Examples:
  - Errors: **6 0 0 0 0,** error code 6 is the last and only detected error.
  - Errors: **9 6 0 0 0,** error code 6 was first detected and error code 9 is the last detected (newest) error.
- Via the blinking LED procedure (when you have no picture). See paragraph “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 activation of the 'Reset error buffer' command in the SAM menu.
- When you transmit the code **062599** with a standard remote control transmitter.

5.5.3 Error Codes

Table 5-1 Error code overview

Error	Device	Description	Item	Diagr.
1	TEA6422D	Audio switch (only Enhanced)	7798	SC13
2	MSP3451G	Sound processor	7812	SC14
3	PCF8574-SCAVIO	I/O expander SCAVIO	7540	SC8
4	PCF8591	AD-DA expander	7530	SC8
5	FS6377	Clock generator	7570	SC9
6	PCF8574-PSU	I/O expander PSU	7370	P3
7	24C16 OTC	NVM OTC	7430	SC7
8	24C16 PW	NVM PW	7580	SC9
9	SAA7118	Video decoder (only Enhanced)	7225	SC5
10	AD9887	ADC/TMDS receiver	7170	SC4
11	SDA9400	De-interlacer (only Enhanced)	7280	SC5
12	EP1K30QC	EPLD processor	7656	SC11
13	PDP	I2C error of the PDP		
20	Download comm.	Errors during downloading		
21	CSP comm.	CSP time-out error		
40	Temperature alarm	Detections of over-temperature		
70	Over voltage	Vs, Va, +5V, +3V3 overvoltage	Black box	P
71	Vs under voltage	Vs under voltage	Black box	P
72	Va under voltage	Va under voltage	Black box	P
73	+5V under voltage	+5V under voltage	Black box	P
74	+3V3 under voltage	+3V3 under voltage	Black box	P
75	DC-PROT	Audio amplifier protection	Black box	P

Notes:
- In case of non-intermittent faults, clear the error buffer before you begin the repair. This to ensure that old error codes are no longer present.
- If possible, check the entire contents of the error buffer. In some situations, an error code is only the result of another error code and not the actual cause (e.g., a fault in the protection detection circuitry can also lead to a protection).
- In case error 70 occurs, the belonging over-voltage line cause can be located via measuring. (via measuring all 4 voltages simultaneously with an oscilloscope). Chosen FM242-workshops will be trained how to do so. (special document will be generated for this).

5.6 The Blinking LED Procedure

Via this procedure, you can make the contents of the error buffer visible via the front LED (orange colour).This is especially useful when there is no picture. When no errors are present, the LED will stay green.

When the SDM is entered, or when code **062500** is entered with the remote control, the LED will blink the contents of the error-buffer.

Error-codes ≥ 10 are shown as follows:
1. n long blinks of 750 ms, which is/are an indication of the decimal digit,
2. a pause of 1.5 s,
3. n short blinks (n = 1-9),
4. when all the error-codes are displayed, the sequence finishes with a LED blink of 3 s,
5. the sequence starts again.

Example of error buffer: **12 9 6 0 0**
After entering SDM:
1. 1 long blink of 750 ms followed by a pause of 1.5 s,
2. 2 short blinks followed by a pause of 3 s,
3. 9 short blinks followed by a pause of 3 s,
4. 6 short blinks followed by a pause of 3 s,
5. 1 long blink of 3 s to finish the sequence,
6. the sequence starts again.

5.7 Protections

You can read the error codes of the error buffer via the service menu (SAM), the blinking LED procedure, or via ComPair. If a fault situation is detected an error code will be generated and if necessary, the set will be put in the protection mode. Blinking of the red LED at a frequency of 5 Hz indicates the protection mode.
In some error cases, the microprocessor does not put the set in the protection mode. The error codes are indicated by an orange front LED.

To get a quick diagnosis the chassis has three service modes implemented:
- The Customer Service Mode (CSM): easy way to read out the status of the set.
- The Service Default Mode (SDM): start-up of the set in a predefined way.
- The Service Alignment Mode (SAM): adjustment of the set via a menu and with the help of test patterns.

Exceptional 'protection' situation
There exists one 'protection' (due to too high internal set-temperature), where the set does not switch to 'protection'-mode but to Standby-mode. This protection is not logged into the error-buffer.
When the set becomes too warm, an 'On Screen Display'-message will be showed set is going to switch to Standby. After some time set can be switched on again. (It is very unlikely this will happen. For that reason this performance has been accepted).

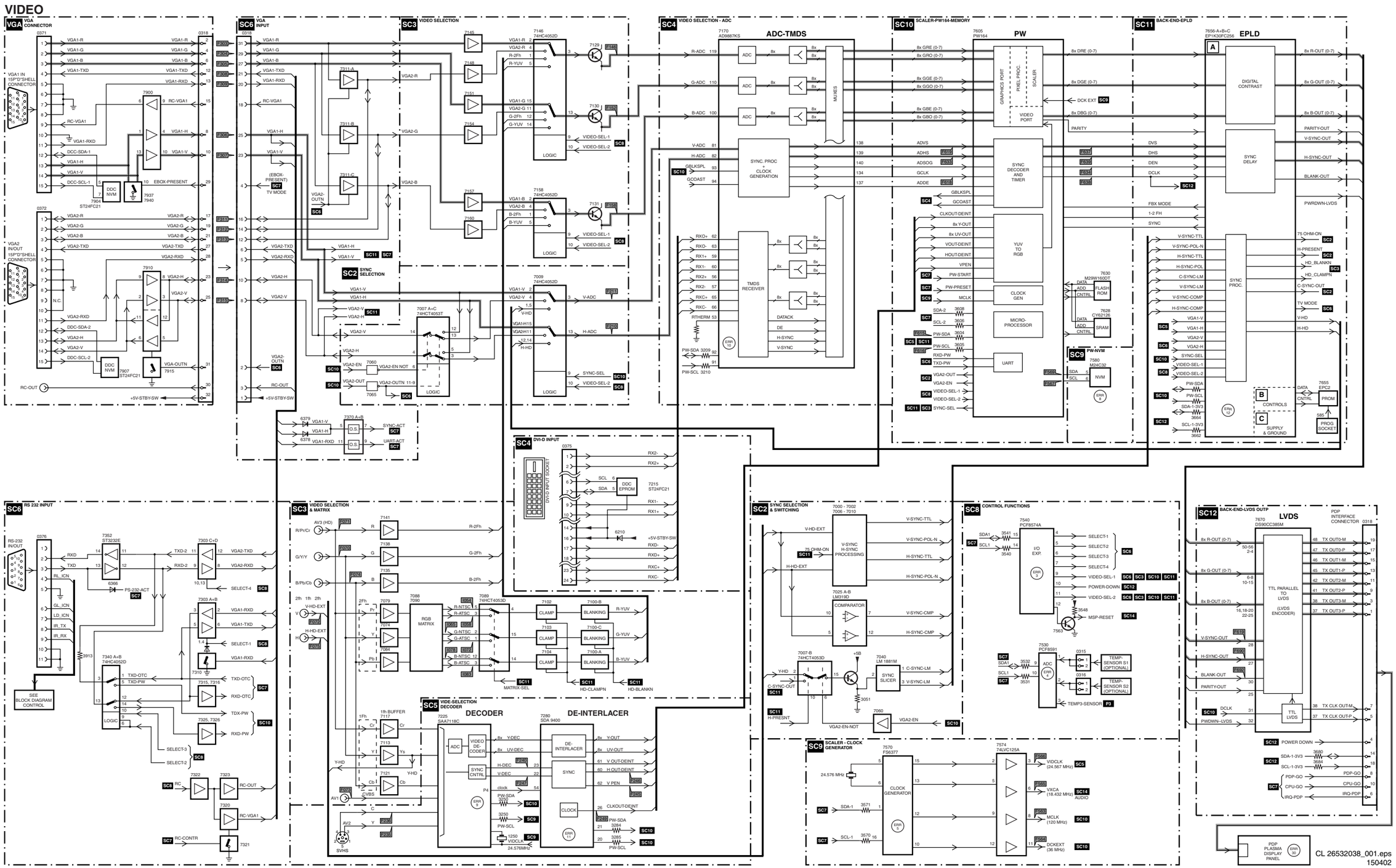
Temperature error The monitor will switch to standby automatically. Please allow cool down.

5.8 Repair Tips

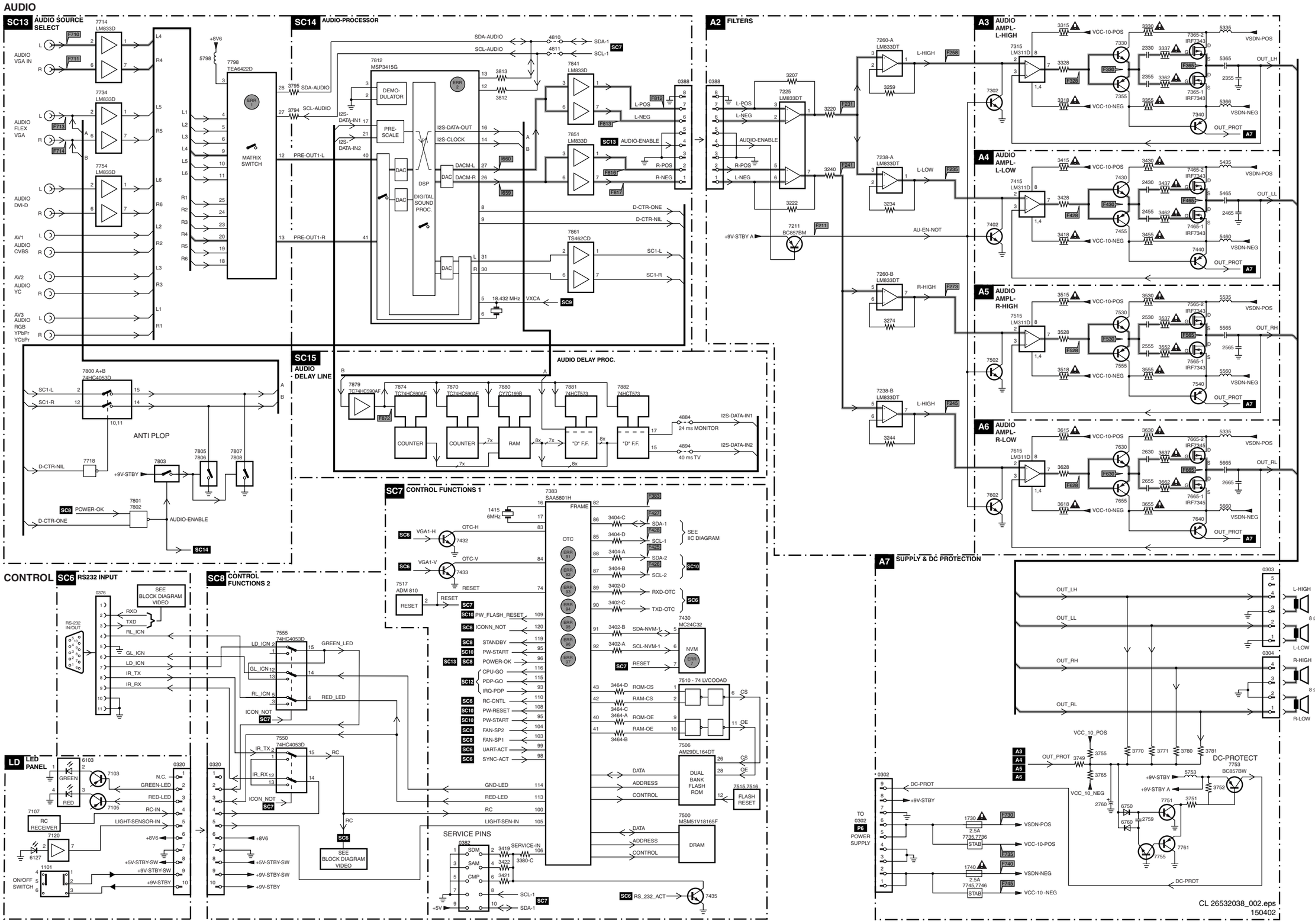
If one of the errors of the error buffer points to a defective supply, then the supply-panel must be send for central repair.
If the symptoms (still to be communicated; e.g. when VS-value is too high some pixels do not extinguish, when VS-value is too low some pixels do not enlighten) match with a possible misalignment of a supply-line, this supply-line could be checked, and re-aligned.
Only do this if there is a slight spec-violation.
In case it does not help, re-align to the previous wrong setting, to keep cause-image in tact, for central repair workshop.
Replace supply panel by a new one, and match the supply with the pdp. (See alignment instructions in chapter “Alignments”).

6. Block Diagrams, Testpoint Overviews, and Wiring Diagram

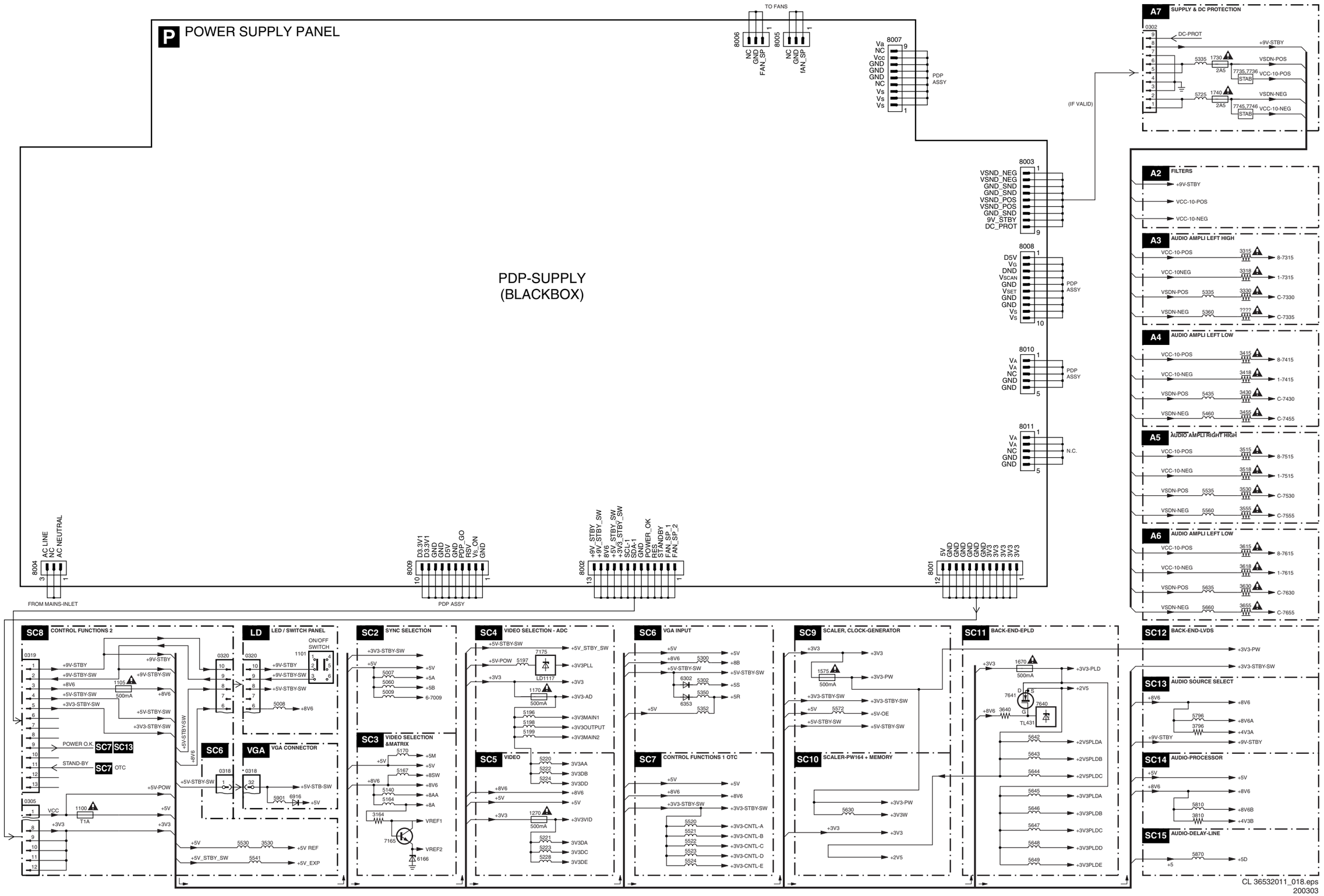
Block Diagram Video



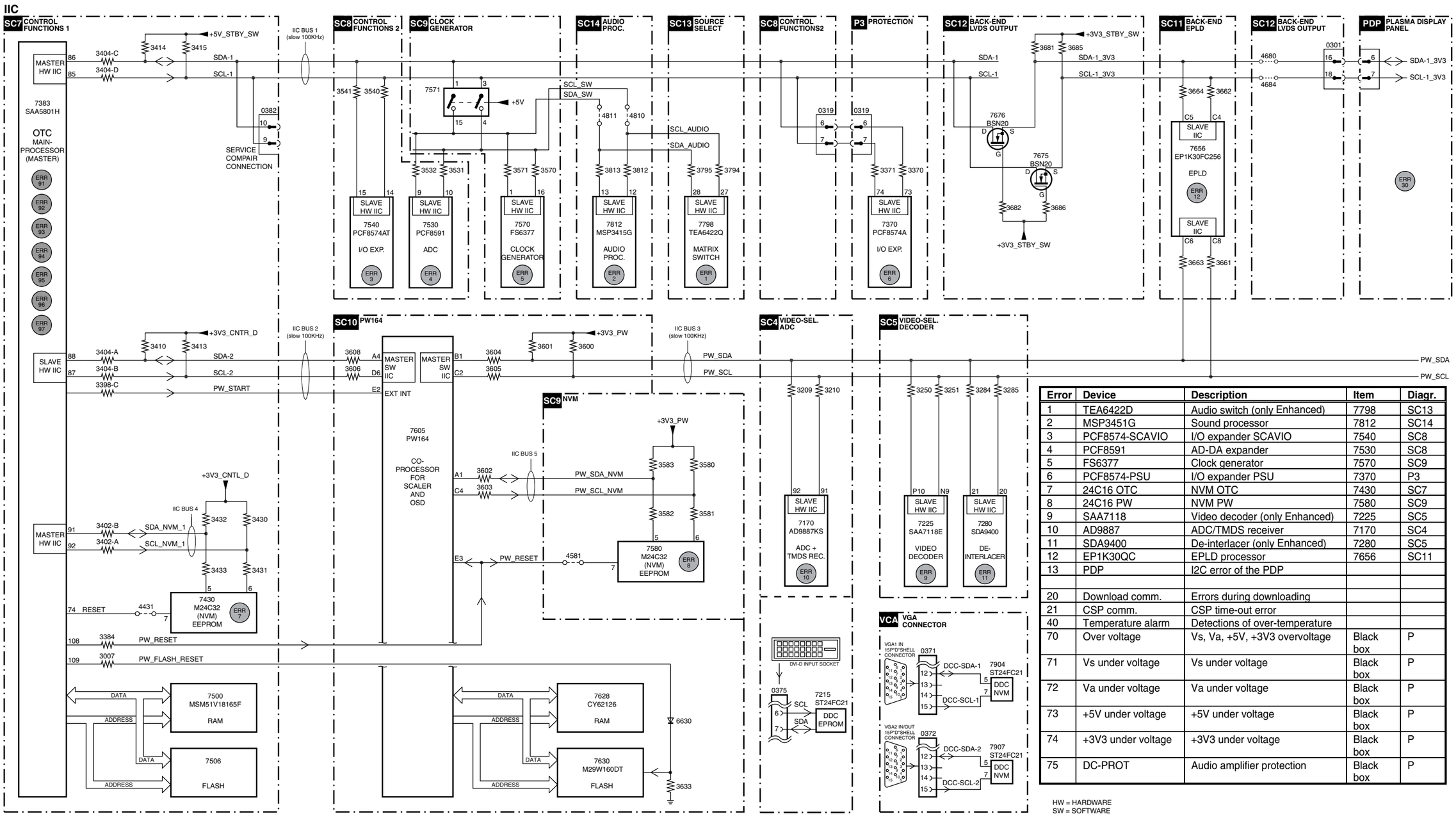
Block Diagram Audio



Power Lines Overview



I²C-IC Overview



Error	Device	Description	Item	Diagr.
1	TEA6422D	Audio switch (only Enhanced)	7798	SC13
2	MSP3451G	Sound processor	7812	SC14
3	PCF8574-SCAVIO	I/O expander SCAVIO	7540	SC8
4	PCF8591	AD-DA expander	7530	SC8
5	FS6377	Clock generator	7570	SC9
6	PCF8574-PSU	I/O expander PSU	7370	P3
7	24C16 OTC	NVM OTC	7430	SC7
8	24C16 PW	NVM PW	7580	SC9
9	SAA7118	Video decoder (only Enhanced)	7225	SC5
10	AD9887	ADC/TMDS receiver	7170	SC4
11	SDA9400	De-interlacer (only Enhanced)	7280	SC5
12	EP1K30QC	EPLD processor	7656	SC11
13	PDP	I2C error of the PDP		
20	Download comm.	Errors during downloading		
21	CSP comm.	CSP time-out error		
40	Temperature alarm	Detections of over-temperature		
70	Over voltage	Vs, Va, +5V, +3V3 overvoltage	Black box	P
71	Vs under voltage	Vs under voltage	Black box	P
72	Va under voltage	Va under voltage	Black box	P
73	+5V under voltage	+5V under voltage	Black box	P
74	+3V3 under voltage	+3V3 under voltage	Black box	P
75	DC-PROT	Audio amplifier protection	Black box	P

HW = HARDWARE
SW = SOFTWARE

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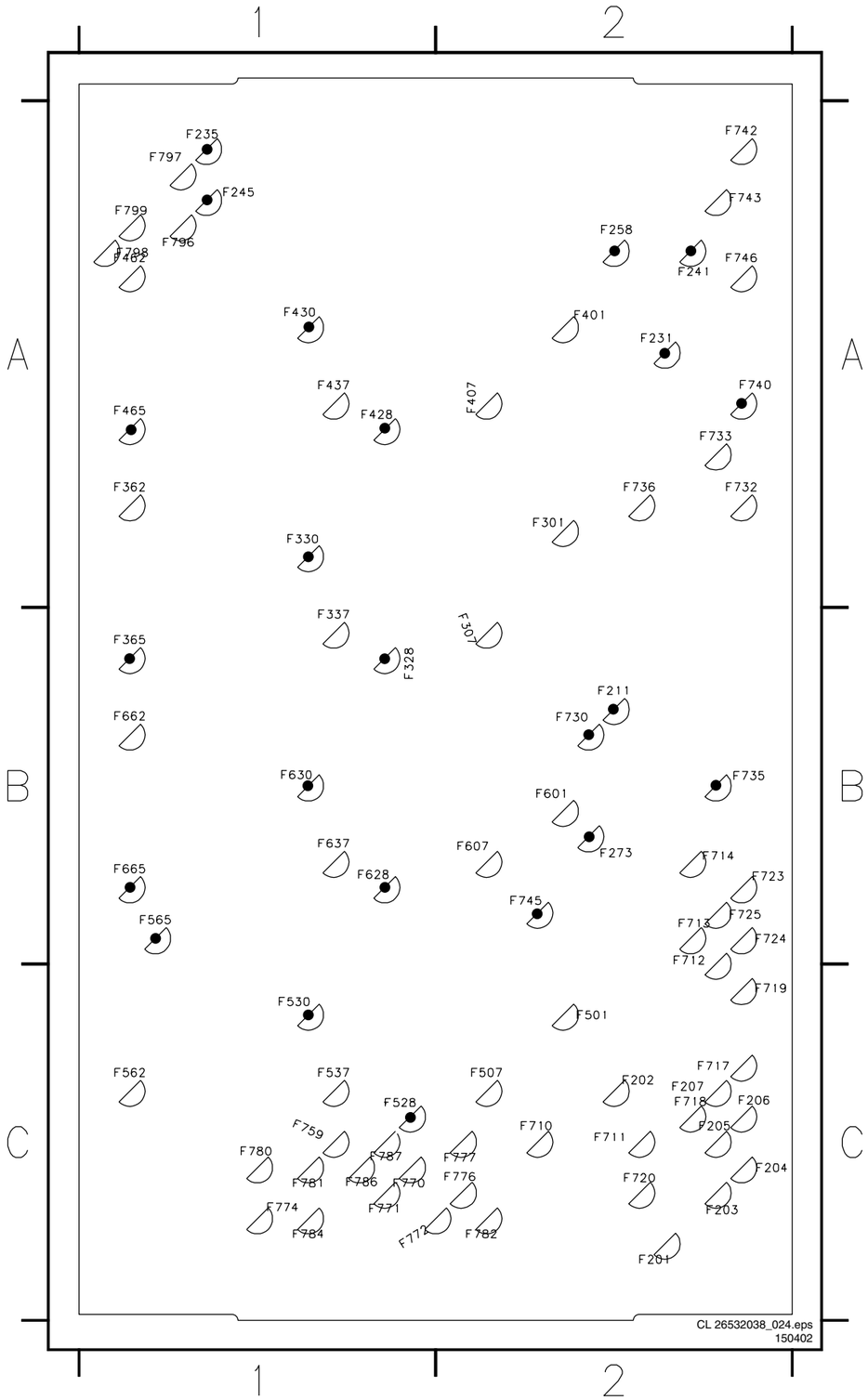
210303

Testpoint Overview: Audio Amplifier Panel



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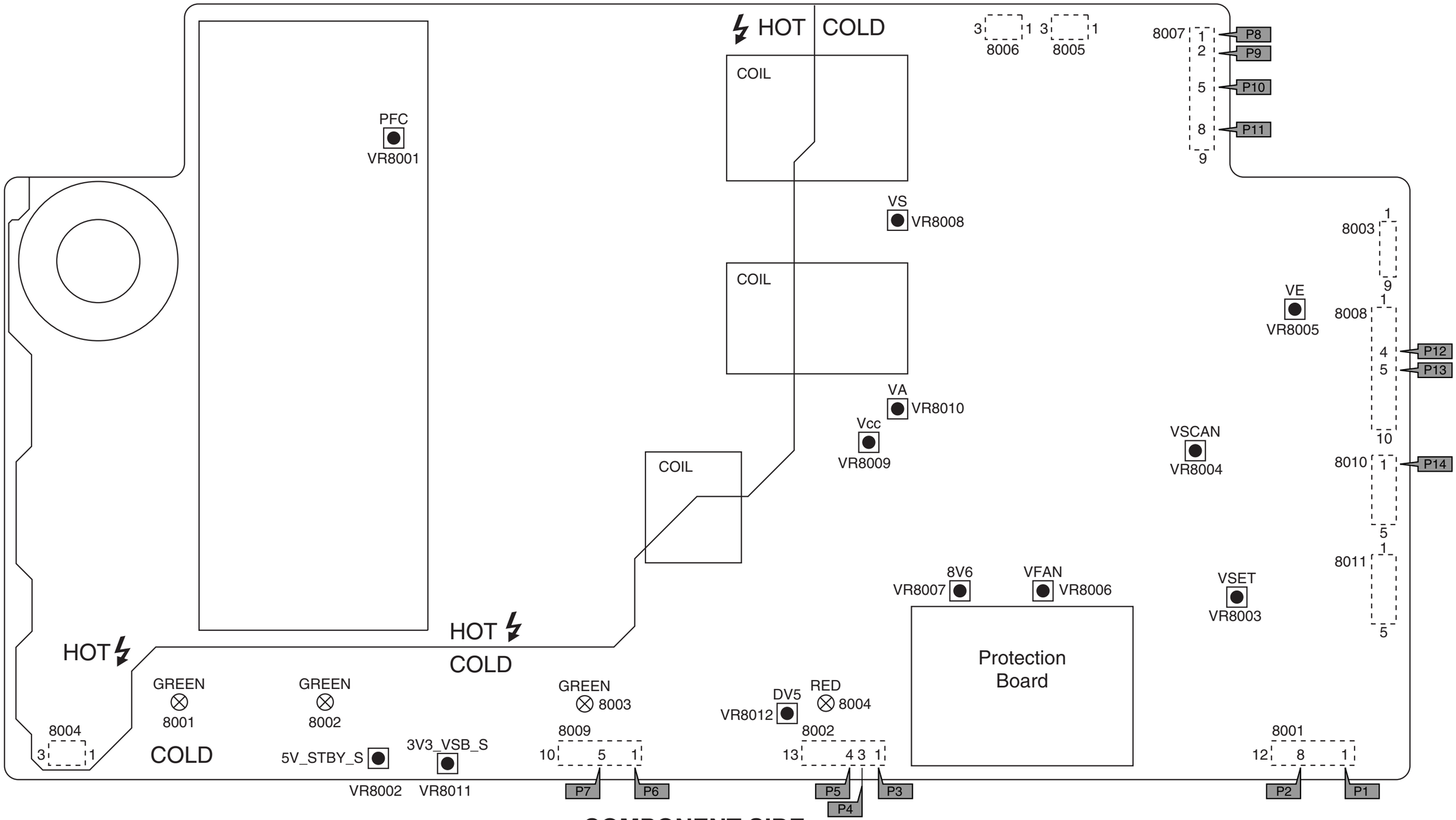
F201	C2	F718	C2
F202	C2	F719	C2
F202	C2	F719	C2
F203	C2	F720	C2
F203	C2	F720	C2
F204	C2	F723	B2
F204	C2	F723	B2
F205	C2	F724	B2
F205	C2	F724	B2
F206	C2	F725	B2
F206	C2	F725	B2
F207	C2	F730	B2
F207	C2	F730	B2
F211	B2	F732	A2
F211	B2	F732	A2
F231	A2	F733	A2
F231	A2	F733	A2
F235	A1	F735	B2
F235	A1	F735	B2
F241	A2	F736	A2
F241	A2	F736	A2
F245	A1	F740	A2
F245	A1	F740	A2
F258	A2	F742	A2
F258	A2	F742	A2
F273	B2	F743	A2
F273	B2	F743	A2
F301	A2	F745	B2
F301	A2	F745	B2
F307	B2	F746	A2
F307	B2	F746	A2
F328	B1	F759	C1
F328	B1	F759	C1
F330	A1	F770	C1
F330	A1	F770	C1
F365	B1	F771	C1
F365	B1	F771	C1
F401	A2	F772	C1
F401	A2	F772	C1
F407	A2	F774	C1
F407	A2	F774	C1
F428	A1	F776	C2
F428	A1	F776	C2
F430	A1	F777	C2
F430	A1	F777	C2
F465	A1	F780	C1
F465	A1	F780	C1
F501	C2	F781	C1
F501	C2	F781	C1
F507	C2	F782	C2
F507	C2	F782	C2
F528	C1	F784	C1
F528	C1	F784	C1
F530	C1	F786	C1
F530	C1	F786	C1
F565	B1	F787	C1
F565	B1	F787	C1
F601	B2	F796	A1
F601	B2	F796	A1
F607	B2	F797	A1
F607	B2	F797	A1
F628	B1	F798	A1
F628	B1	F798	A1
F630	B1	F799	A1
F630	B1	F799	A1
F665	B1		
F665	B1		
F710	C2		
F710	C2		
F711	C2		
F711	C2		
F712	B2		
F712	B2		
F713	B2		
F713	B2		
F714	B2		
F714	B2		
F717	C2		
F717	C2		

Personal Notes:

Testpoint Overview: Power Supply



COMPONENT SIDE

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200303

Testpoint Overview: SCAVIO Panel

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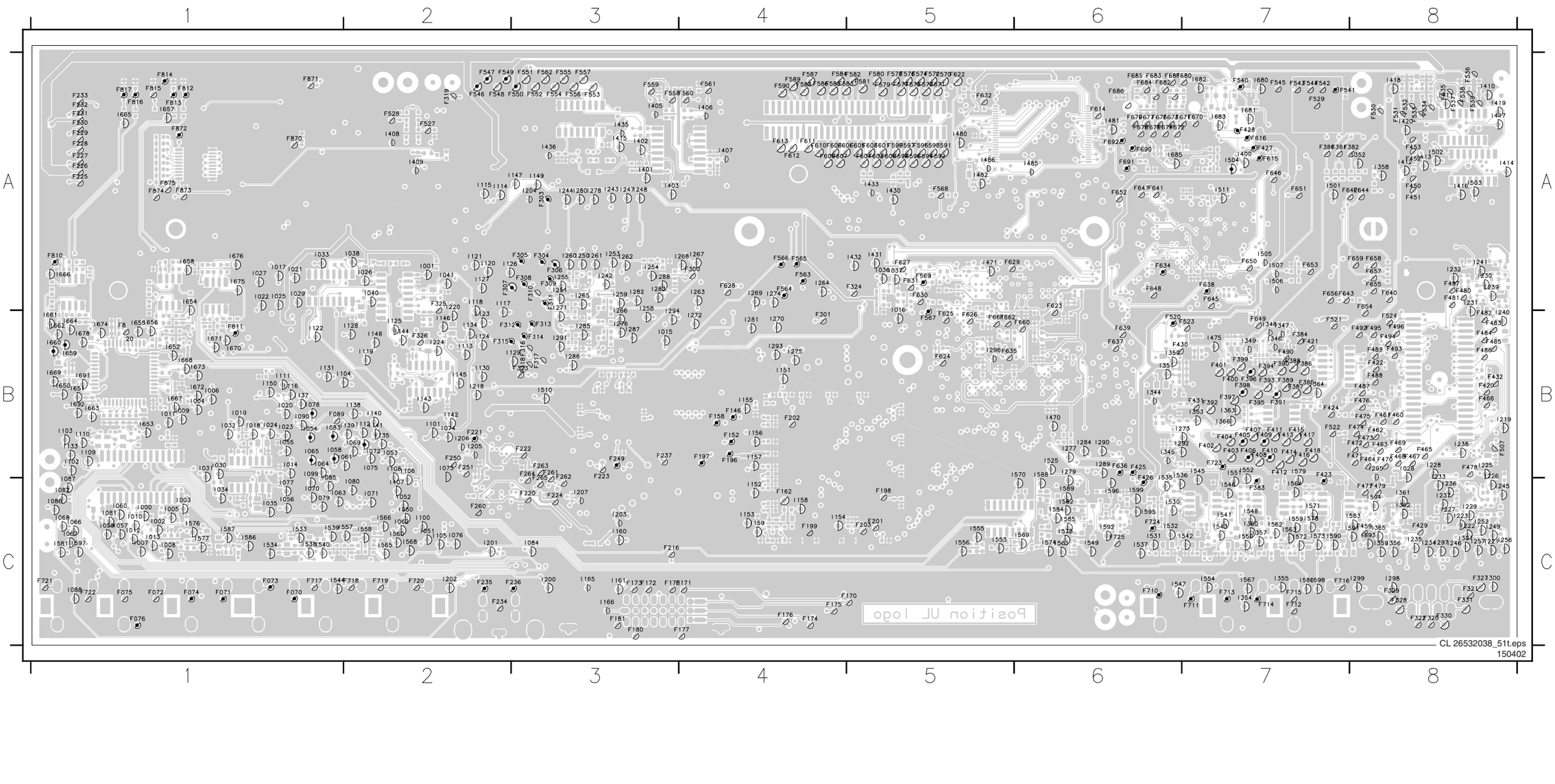
F171 C4 F216 C3 F237 B3 F306 A3 F324 A5 F395 B7 F413 B7 F431 B7 F471 B8 F489 B8 F532 A8 F550 A3 F568 A5 F586 A4 F604 A5 F624 B5 F643 A7 F661 B5 F686 A6 F724 C6 I001 A2 I019 B1 I037 A5 I067 C1 I085 B1 I114 A2 I151 B4 I204 A3 I235 C8 I253 A3 I271 A3 I289 B6 I354 C7 I407 A4 I504 A7 I544 C1 I562 C7 I580 C7 I598 C6 I666 A1
F172 C3 F220 C3 F240 B3 F307 A2 F325 A2 F396 B7 F414 B7 F432 B8 F472 B8 F490 B7 F532 A8 F550 A3 F568 A5 F586 A4 F604 A5 F625 B5 F644 A8 F662 B5 F690 A6 F725 C6 I002 C1 I020 B1 I050 C2 I068 C1 I086 C1 I115 A2 I152 C4 I205 B2 I236 C8 I254 A3 I272 B4 I290 B6 I355 C7 I408 A2 I505 A7 I545 C7 I563 C7 I581 C1 I599 C6 I667 B1
F173 C3 F221 B2 F242 B3 F308 A3 F326 B2 F397 B7 F415 B7 F450 A8 F473 B8 F492 B8 F533 A8 F551 A3 F569 A5 F587 A4 F605 A5 F626 B5 F644 A8 F662 B5 F690 A6 F725 C6 I002 C1 I020 B1 I050 C2 I068 C1 I086 C1 I115 A2 I152 C4 I205 B2 I236 C8 I254 A3 I272 B4 I290 B6 I355 C7 I408 A2 I505 A7 I545 C7 I563 C7 I581 C1 I599 C6 I667 B1
F173 C3 F221 B2 F245 B5 F308 A3 F326 B2 F397 B7 F415 B7 F450 A8 F473 B8 F492 B8 F534 A8 F552 A3 F570 A5 F588 A4 F606 A4 F626 B5 F645 A7 F670 A7 F691 A6 F810 A1 I003 C1 I021 A1 I051 C2 I069 B2 I087 C1 I116 B1 I153 C4 I206 B2 I237 C8 I255 A3 I273 B7 I291 B3 I356 C8 I409 A2 I506 A7 I546 C7 I564 C7 I582 C6 I650 B1 I668 B1
F174 C4 F222 B3 F246 B5 F309 A3 F380 A7 F398 B7 F416 B7 F451 A8 F474 B8 F493 B8 F534 A8 F552 A3 F570 A5 F588 A4 F606 A4 F627 A5 F645 A7 F670 A7 F691 A6 F810 A1 I003 C1 I021 A1 I051 C2 I069 B2 I087 C1 I116 B1 I153 C4 I206 B2 I237 C8 I255 A3 I273 B7 I291 B3 I356 C8 I409 A2 I506 A7 I546 C7 I564 C7 I582 C6 I650 B1 I668 B1
F174 C4 F222 B3 F247 B5 F309 A3 F380 A7 F398 B7 F416 B7 F451 A8 F474 B8 F493 B8 F535 A8 F553 A3 F571 A5 F589 A4 F607 A4 F627 A5 F646 A7 F671 A7 F692 A6 F811 B1 I004 B1 I022 A1 I052 C2 I070 C1 I088 C1 I117 A2 I154 C4 I220 A2 I238 B8 I256 C8 I274 A4 I292 B6 I357 C7 I430 A5 I507 A7 I547 C6 I565 C2 I583 C8 I651 B1 I669 B1
F175 C4 F223 B3 F249 B3 F310 A3 F381 A7 F399 B7 F417 B7 F452 A8 F475 B8 F494 B8 F535 A8 F553 A3 F571 A5 F589 A4 F607 A4 F628 A4 F646 A7 F671 A7 F692 A6 F811 B1 I004 B1 I022 A1 I052 C2 I070 C1 I088 C1 I117 B2 I154 C4 I220 B2 I238 B8 I256 C8 I274 A4 I292 B6 I357 C7 I430 A5 I507 A7 I547 C6 I565 C2 I583 C8 I651 B1 I669 B1
F175 C4 F223 B3 F249 B3 F310 A3 F381 A7 F399 B7 F417 B7 F452 A8 F475 B8 F494 B8 F536 A8 F554 A3 F572 A5 F590 A4 F608 A4 F628 A4 F647 A6 F672 A6 F710 C6 F812 A1 I005 C1 I023 B1 I053 B2 I071 C2 I100 C2 I118 A2 I155 B4 I221 C8 I239 A8 I257 C8 I275 B4 I293 B4 I358 A8 I431 A5 I530 C6 I548 C7 I566 C2 I584 C6 I652 B1 I670 B1
F176 C4 F224 C3 F250 B2 F311 A3 F382 A8 F400 B7 F418 B7 F453 A8 F476 B8 F495 B8 F536 A8 F554 A3 F572 A5 F590 A4 F608 A4 F629 A5 F647 A6 F672 A6 F710 C6 F812 A1 I005 C1 I023 B1 I053 B2 I071 C2 I100 C2 I118 B2 I155 B4 I221 C8 I239 A8 I257 C8 I275 B4 I293 B4 I358 A8 I431 A5 I530 C6 I548 C7 I566 C2 I584 C6 I652 B1 I670 B1
F176 C4 F224 C3 F250 B2 F311 A3 F382 A8 F400 B7 F418 B7 F453 A8 F476 B8 F495 B8 F537 A8 F555 A3 F573 A5 F591 A5 F609 A4 F629 A5 F648 A6 F673 A6 F711 C7 F813 A1 I006 B1 I024 B1 I054 B1 I072 B2 I101 B2 I119 B2 I156 B4 I222 C8 I240 B8 I258 A3 I276 B3 I294 B3 I359 C8 I432 A5 I531 C6 I549 C6 I567 C7 I585 C6 I653 B1 I671 B1



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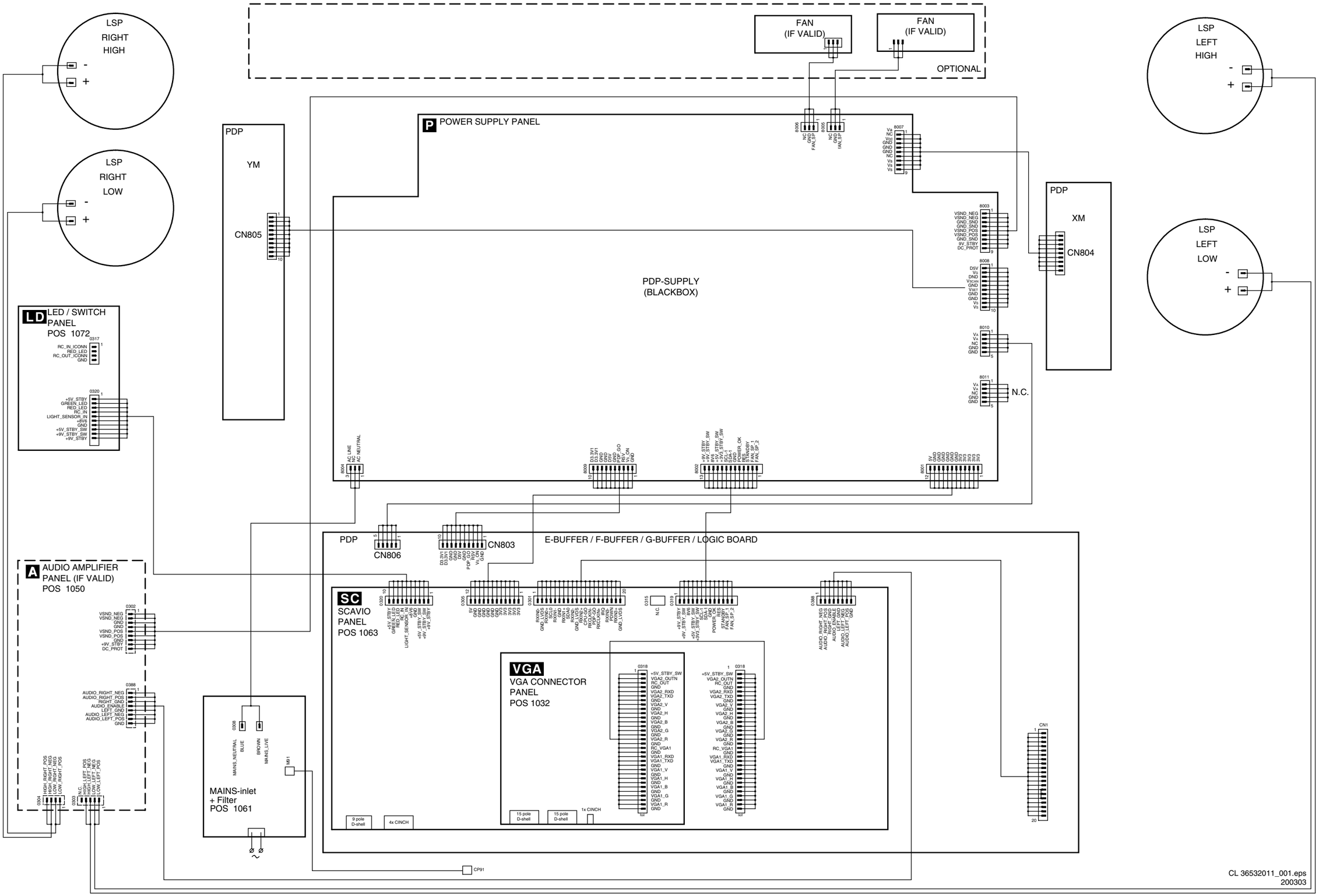
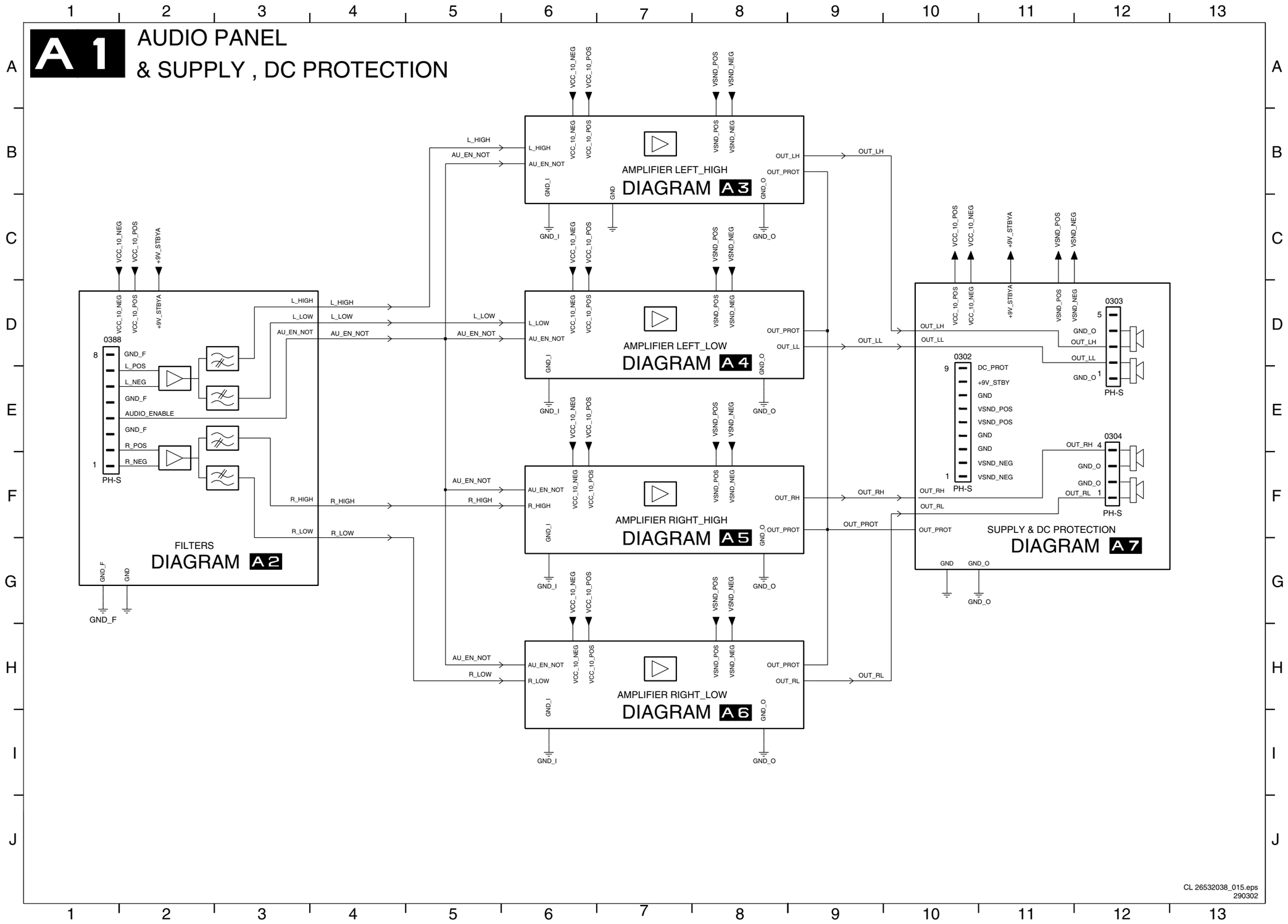
150402

Wiring Diagram

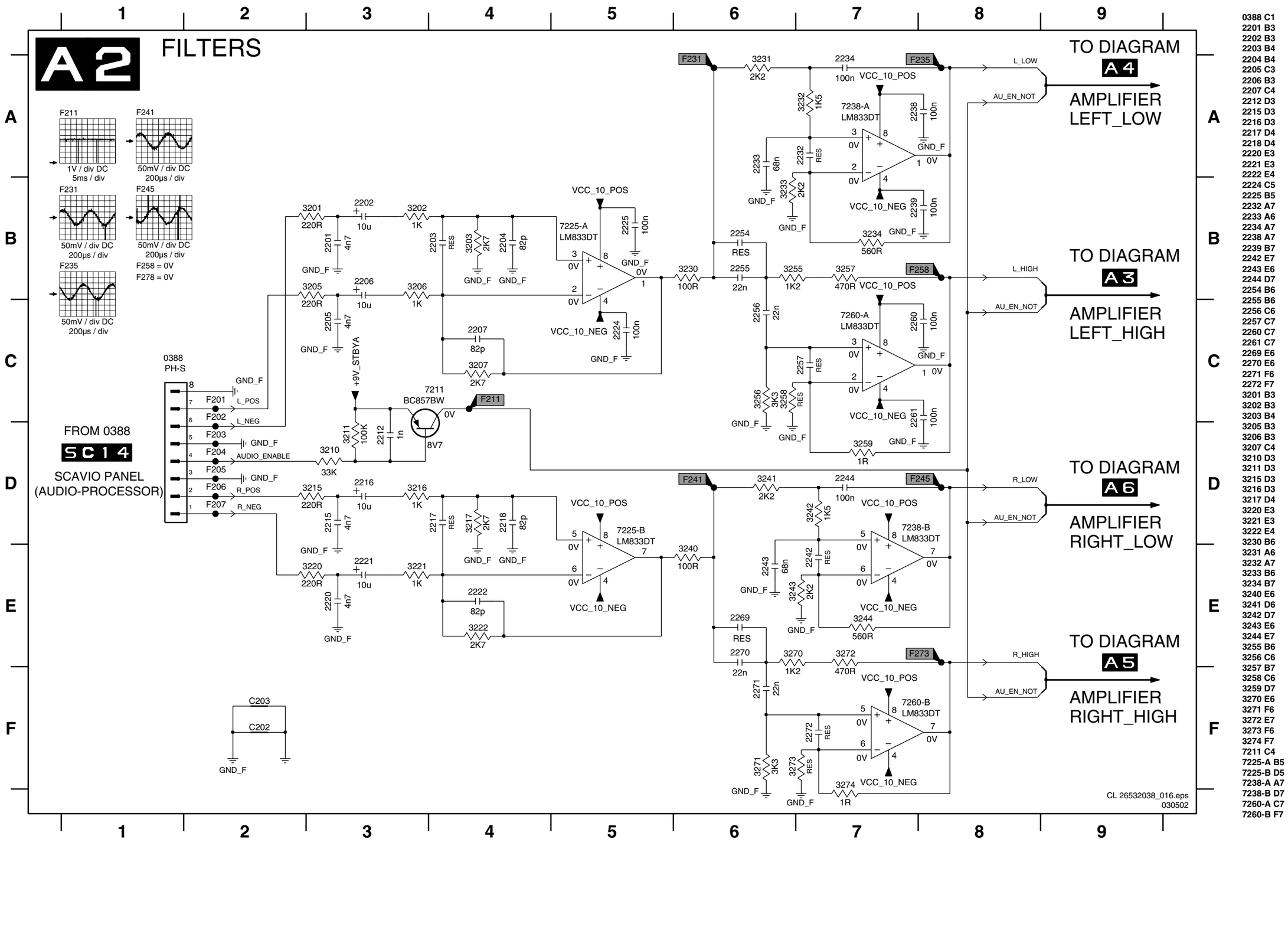


7. Electrical Diagrams and PWB Layouts

Audio Panel & Supply: DC Protection



Audio Panel & Supply: Filters



0388 C1
2201 B3
2202 B3
2203 B4
2204 B4
2205 C3
2206 B3
2207 C4
2212 D3
2215 D3
2216 D3
2217 D4
2218 D4
2220 E3
2221 E3
2222 E4
2224 C5
2225 B5
2232 A7
2233 A6
2234 A7
2238 A7
2239 B7
2242 E7
2243 E6
2244 D7
2254 B6
2255 B6
2256 C6
2257 C7
2260 C7
2261 C7
2269 E6
2270 E6
2271 F6
2272 F7
3201 B3
3202 B3
3203 B4
3205 B3
3206 B3
3207 C4
3210 D3
3211 D3
3215 D3
3216 D3
3217 D4
3220 E3
3221 E3
3222 E4
3230 B6
3231 A6
3232 A7
3233 B6
3234 B7
3240 E6
3241 D6
3242 D7
3243 E6
3244 E7
3255 B6
3256 C6
3257 B7
3258 C6
3259 D7
3270 E6
3271 F6
3272 E7
3273 F6
3274 F7
7211 C4
7225-A B5
7225-B D5
7238-A A7
7238-B D7
7260-A C7
7260-B F7

C202 F2
C203 F2
F201 C2
F202 C2
F203 D2
F204 D2
F205 D2
F206 D2
F207 D2
F211 C4
F231 A6
F235 A8
F241 D6
F245 D8
F258 B8
F273 E8

Audio Panel & Supply: Left High

2309 D4	2316 C5	2330 C7	2340 E7	2360 E8	3301 C3	3304 D2	3308 C4	3311 C4	3325 B5	3330 B6	3340 D6	3362 D8	5365 C9	6335 C7	6359 E7	7303 C3	7340 D7	7365-2 C8	F301 C3	F330 C7	F365 C8
2310 B3	2318 D5	2334 B8	2355 D7	2365 C9	3302 D3	3306 C3	3309 D4	3315 B5	3327 C5	3336 B8	3355 E6	5335 B8	6328 C6	6355 D6	6360 D7	7315 C4	7355 D6	C301 E3	F307 C4	F337 C8	
2315 C4	2319 D5	2335 B8	2359 E8	2366 C9	3303 C3	3307 C4	3310 B3	3318 D5	3328 B6	3337 C8	3361 E8	5360 E8	6334 B7	6356 E6	7302 D3	7330 C6	7365-1 D8	C302 E3	F328 B6	F362 D8	

A3 AUDIO AMPLIFIER LEFT HIGH

F328
2V / div DC
1µs / div

F330
2V / div DC
1µs / div

F365
5V / div DC
1µs / div

FROM DIAGRAM A2
FILTERS

TO DIAGRAM A7
SUPPLY & DC PROTECTION

VSND_POS
5335 100MHZ
VCC_10_POS
2310 82p
3310 82K
3315 10R
3330 10R
3307 100K
3308 100K
2315 1u
2316 100n
3325 2K2
3328 1K
F328
3327 2K2
6328 BAS316
14V2
7330 BC817-25
-0V04
F330
7355 BC807-25
-14V2
7340 BC847BW
0V
3340 10K
-14V2
3355 10R
2340 10n
6355 BZX384-C4V7
6356 BZX384-C4V7
6359 BZX384-C4V7
6360 BZX384-C4V7
6334 BZX384-C4V7
6335 BZX384-C4V7
3336 4M7
2334 220u
2335 100n
GND_O
F337
3337 10R
7365-2 IRF7343
14V3
2330 100n
2355 100n
5365 33u
F365
0V
7365-1 IRF7343
3362 10R
-14V4
F362
OUT_LH
OUT_PROT
2365 220n
2366 220n
2360 220u
2359 100n
5360 100MHZ
VSND_NEG
L_HIGH
3303 1K
3301 1K
F301
7303 BC847BW
3304 4K7
AU_EN_NOT
3302 4K7
7302 BC847BW
3306 8K2
F307
3311 1R
2309 1n5
3309 180R
7315 LM311D
BAL
STR|BAL
V+
V-
GND
0V
-2V
-9V8
9V7
2318 100n
2319 1u
3318 10R
VCC_10_NEG
C302
C301
GND_I

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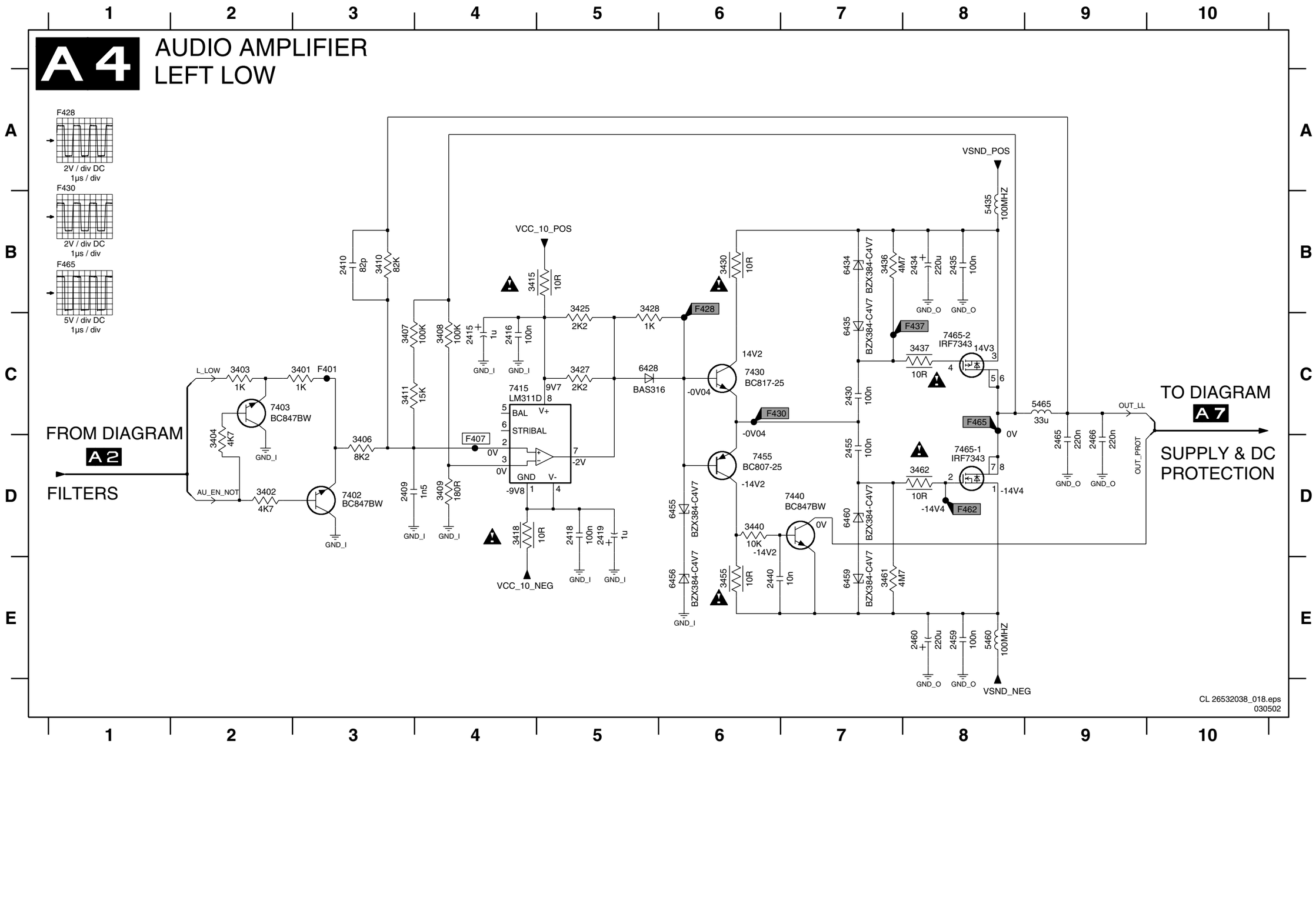
030502

Audio Panel & Supply: Left Low

2409 D3	2416 C4	2430 C7	2440 E6	2460 E8	3401 C3	3404 D2	3408 C4	3411 C3	3425 B5	3430 B6	3440 D6	3462 D8	5465 C9	6435 C7	6459 E7	7403 C2	7440 D7	7465-2 C8	F428 B6	F462 D8
2410 B3	2418 D5	2434 B8	2455 D7	2465 D9	3402 D2	3406 C3	3409 D4	3415 B4	3427 C5	3436 B7	3455 E6	5435 B8	6428 C5	6455 D6	6460 D7	7415 C4	7455 D6	7465-1 D8	F430 C6	F465 C8
2415 C4	2419 D5	2435 B8	2459 E8	2466 D9	3403 C2	3407 C3	3410 B3	3418 D4	3428 B5	3437 C8	3461 E7	5460 E8	6434 B7	6456 E6	7402 D3	7430 C6	7465-1 D8	F401 C3	F437 C8	



Audio Panel & Supply: Right High

2509 D3	2516 C4	2530 C7	2540 E6	2560 E8	3501 C2	3504 D2	3508 C4	3511 C3	3525 B5	3530 B6	3540 D6	3562 D8	5565 C9	6535 C7	6559 E7	7503 C2	7540 D7	7565-2 C8	F528 B6	F562 D8
2510 B3	2518 D5	2534 B8	2555 D7	2565 D9	3502 D2	3506 D3	3509 D4	3515 B4	3527 C5	3536 B7	3555 E6	5535 B8	6528 C5	6555 D6	6560 D7	7515 C4	7555 D6	7565-1 D8	F530 C6	F565 C8
2515 C4	2519 D5	2535 B8	2559 E8	2566 D9	3503 C2	3507 C3	3510 B3	3518 D4	3528 B5	3537 C8	3561 E7	5560 E8	6534 B7	6556 E6	7502 D3	7530 C6		F501 D4	F537 C8	

A5 AUDIO AMPLIFIER RIGHT HIGH

F528
2V / div DC
1µs / div

F530
2V / div DC
1µs / div

F565
5V / div DC
1µs / div

FROM DIAGRAM A2
FILTERS

TO DIAGRAM A7
SUPPLY & DC PROTECTION

VSND_POS
VSND_NEG
VCC_10_POS
VCC_10_NEG
R_HIGH
AU_EN_NOT
OUT_RH
OUT_PROT

2510 82p
3510 82K
3515 10R
3530 10R
3507 100K
3508 100K
2515 1u
2516 100n
3525 2K2
3528 1K
F528
3527 2K2
6528 BAS316
3511 6K8
2509 1n5
3509 180R
3503 1K
3501 1K
F501
3504 4K7
7503 BC847BW
3506 8K2
F507
3502 4K7
7502 BC847BW
7515 LM311D
BAL
STRIBAL
V+
V-
GND
9V7
-2V
-9V8
0V
3518 10R
2518 100n
2519 1u
7530 BC817-25
14V2
-0V04
F530
7555 BC807-25
-14V2
7540 BC847BW
3540 10K
3555 10R
2540 10n
6555 BZX384-C4V7
6556 BZX384-C4V7
6534 BZX384-C4V7
6535 BZX384-C4V7
6560 BZX384-C4V7
6559 BZX384-C4V7
3536 4M7
3537 10R
3562 10R
3561 4M7
2534 220u
2535 100n
2530 100n
2555 100n
7565-2 IRF7343
7565-1 IRF7343
14V3
-14V4
F537
F562
F565
5535 100MHZ
5565 33u
2565 220n
2566 220n
2560 220u
2559 100n
5560 100MHZ
GND_I
GND_O

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030502

Audio Panel & Supply: Right Low

2609 D4	2616 C4	2630 C7	2640 E7	2660 E8	3601 C3	3604 C2	3608 C4	3611 C4	3625 B5	3630 B6	3640 D6	3662 D8	5665 C9	6635 C7	6659 E7	7603 C2	7640 D7	7665-2 C8	F628 B6	F662 D8
2610 B3	2618 D5	2634 B8	2655 C7	2665 C9	3602 D2	3606 C3	3609 D4	3615 B5	3627 C5	3636 B8	3655 E6	5635 B8	6628 C6	6655 D6	6660 D7	7615 C4	7655 D6	7665-1 D8	F601 C3	F630 C7	F665 C8
2615 C4	2619 D5	2635 B8	2659 E8	2666 C9	3603 C2	3607 C4	3610 B3	3618 D4	3628 B6	3637 C8	3661 E8	5660 E8	6634 B7	6656 E6	7602 D3	7630 C6			F637 C4		

A6 AUDIO AMPLIFIER RIGHT LOW

F628
2V / div DC
1µs / div

F630
2V / div DC
1µs / div

F665
5V / div DC
1µs / div

FROM DIAGRAM A2
FILTERS

TO DIAGRAM A7
SUPPLY & DC PROTECTION

R_LOW 3603 1K 3601 1K F601
7603 BC847BW
3604 4K7
AU_EN_NOT 3602 4K7
7602 BC847BW
3606 8K2
3607 100K 3608 100K
3611 22K
2609 1n5
3609 180R
2610 82p 3610 82K
2615 1u 2616 100n
F607
7615 LM311D 9V7
BAL STRIBAL V+ V- GND
0V -2V -9V8
3615 10R
3618 10R
2618 100n 2619 1u
VCC_10_POS
VCC_10_NEG
3625 2K2 3627 2K2
3628 1K
3630 10R
F628
6628 BAS316
14V2
7630 BC817-25
-0V04
F630
7655 BC807-25
-14V2
7640 BC847BW
0V
3640 10K
-14V2
3655 10R
2640 10n
6655 BZX384-C4V7
6656 BZX384-C4V7
VSND_POS
5635 100MHZ
6634 BZX384-C4V7
6635 BZX384-C4V7
3636 4M7
2634 220u
2635 100n
F637
7665-2 IRF7343 14V3
3637 10R
2630 100n
2655 100n
6659 BZX384-C4V7
6660 BZX384-C4V7
3661 4M7
5665 33u
F665 0V
7665-1 IRF7343
3662 10R
-14V4
F662
2665 220n
2666 220n
OUT_RL
OUT_PROT
2660 220u
2659 100n
5660 100MHZ
VSND_NEG
GND_I
GND_O

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030502

Audio Panel & Supply: Supply and DC Protection

A 7 SUPPLY & DC PROTECTION

F730 = 14V4
F735 = 9V
F740 = -14V4
F745 = -8V8

FROM DIAGRAM A3 AUDIO AMPLIFIER LEFT HIGH
FROM DIAGRAM A4 AUDIO AMPLIFIER LEFT LOW
FROM DIAGRAM A5 AUDIO AMPLIFIER RIGHT HIGH
FROM DIAGRAM A6 AUDIO AMPLIFIER RIGHT LOW

SUPPLY

FROM 8003 OF P

0302 PH-S
F710 DC_PROT
F711 +9V_STBY
F712 F713 F714 5714 100MHZ
F717 F718 F719 5719 F720 100MHZ
F723 F724 F725 5725 100MHZ

1730 T2.5AL 250V
F730 VSND_POS
F735 VCC_10_POS
7735 BC869 9V +14V4
F736 13V7
7736 BC847BW
F732 9V8 9V2
F733 3733 1K
2730 220u 2732 220u 3732 2K7
6732 BZX384-C10
2734 1u

1740 T2.5AL 250V
F740 VSND_NEG
7745 BC868 -8V8 -14V4
F746 -13V7
7746 BC857BW
F742 -9V7 -9V2
F743 3743 1K
2740 220u 2742 220u 3742 2K7
6742 BZX384-C10
2744 1u

RES=RESERVED
F796 F797 3799 F798 F799 RES

0305 SHIELDING 3.3
0390 SHIELDING 3.3
0391 SHIELDING 3.3
2799 10n

C704
C703
C702
GND_O

DC PROTECTION

0303 PH-S
NC.
F771 F770
F772 GND_O
F776 F777
F774 GND_O
LEFT HIGH
8 Ohm
LEFT LOW

OUT_LH
OUT_PROT
OUT_LL
OUT_PROT
OUT_PROT
OUT_PROT
3770 100K
3771 100K
2771 1n
2770 1n
GND_O
GND_O

+9V_STBY
5753 100MHZ
+9V_STBYA
2753 10u
3752 47K
2752 10u
8V7
7753 BC857BW
-0V2
3751 47K
3754 1K
DC_PROT
7751 BC847BW
8V6
2760 22u
3749 10K
F759
VCC_10_POS
3750 470R
6750 BAV99W
2759 1n
7761 BC857BW
7755 BC847BW
3760 470R
6760 BAV99W
3755 100K
VCC_10_NEG
3765 100K

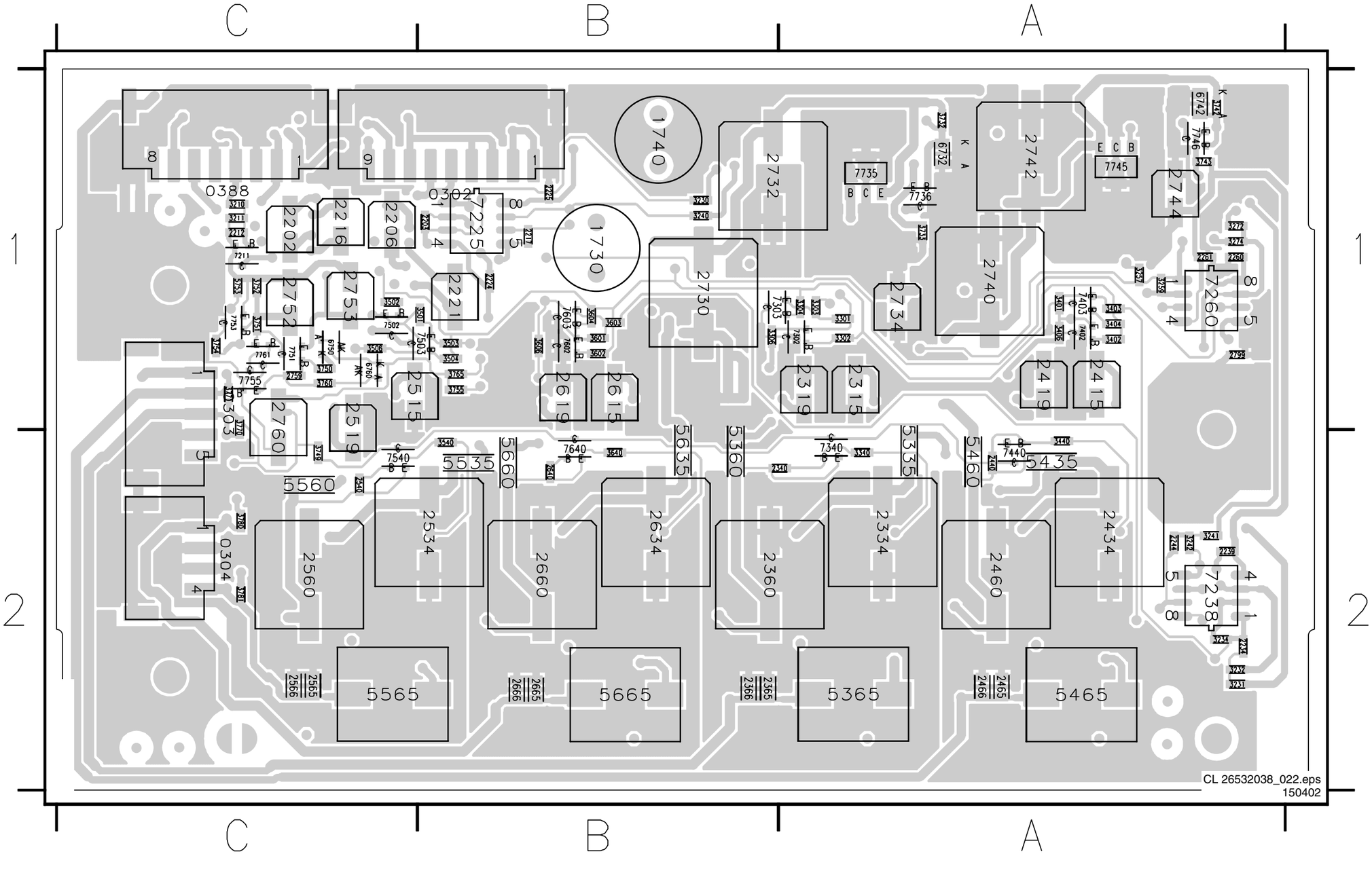
0304 PH-S
OUT_RH
F780 F781
F782
GND_O
F784
GND_O
F786 F787
RIGHT HIGH
8 Ohm
RIGHT LOW
OUT_RL
3780 100K
3781 100K
2780 1n
2781 1n
GND_O
GND_O

CL 36532011_023.eps
200303

0302 C1 F770 A8
0303 A8 F771 A8
0304 E8 F772 A8
0305 E1 F774 A8
0390 E2 F776 A8
0391 E3 F777 A8
1730 B3 F780 E8
1740 D3 F781 E8
2730 C3 F782 F8
2732 C4 F784 F8
2734 D5 F786 F8
2740 E3 F787 F8
2742 E4 F796 E2
2744 E5 F797 E2
2752 C9 F798 E2
2753 C8 F799 E2
2759 D8
2760 B7
2770 B8
2771 B7
2780 F7
2781 F7
2799 F1
3732 C4
3733 C5
3742 E4
3743 E5
3749 C6
3750 C8
3751 C9
3752 C9
3754 C9
3755 D6
3760 D8
3765 E6
3770 B7
3771 B7
3780 E7
3781 E7
3799 E2
5714 C3
5719 D3
5725 D3
5753 B9
6732 C4
6742 E4
6750 D7
6760 D7
7735 C5
7736 C4
7745 D5
7746 E4
7751 C8
7753 C9
7755 D8
7761 D9
C702 F3
C703 E3
C704 E3
F710 C2
F711 C2
F712 C2
F713 C2
F714 C2
F717 D2
F718 D2
F719 D2
F720 D3
F723 D2
F724 D2
F725 D2
F730 B5
F732 C4
F733 C5
F735 C5
F736 C4
F740 D5
F742 E4
F743 E5
F745 D5
F746 E4
F759 C7

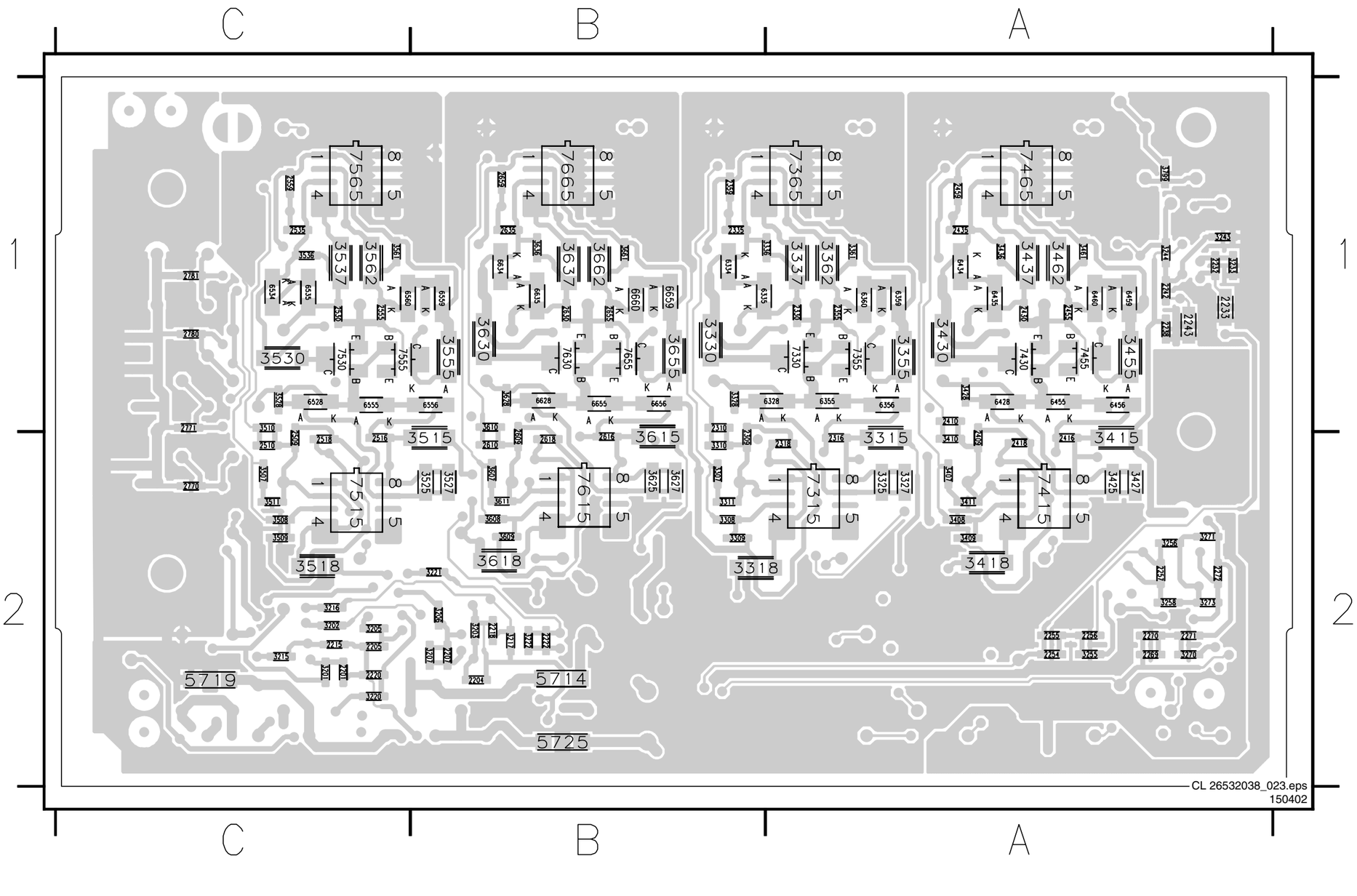
Layout Audio Panel (Top Side)

0302	B1	2216	C1	2315	A1	2440	A2	2566	C2	2734	A1	3211	C1	3272	A1	3403	A1	3601	B1	3749	C2	3780	C2	5565	C2	7225	B1	7503	B1	7753	C1
0303	C1	2217	B1	2319	A1	2460	A2	2615	B1	2740	A1	3230	B1	3274	A1	3404	A1	3602	B1	3750	C1	3781	C2	5635	B2	7238	A2	7540	C2	7755	C1
0304	C2	2221	B1	2334	A2	2465	A2	2619	B1	2742	A1	3231	A2	3301	A1	3406	A1	3603	B1	3751	C1	5335	A2	5660	B2	7260	A1	7602	B1	7761	C1
0388	C1	2224	B1	2340	A2	2466	A2	2634	B2	2744	A1	3232	A2	3302	A1	3440	A2	3604	B1	3752	C1	5360	B2	5665	B2	7302	A1	7603	B1		
1730	B1	2225	B1	2360	B2	2515	C1	2640	B2	2752	C1	3234	A2	3303	A1	3501	B1	3606	B1	3754	C1	5365	A2	5753	C1	7303	B1	7640	B2		
1740	B1	2234	A2	2365	B2	2519	C1	2660	B2	2753	C1	3240	B1	3304	A1	3502	C1	3640	B2	3755	B1	5435	A2	6732	A1	7340	A2	7735	A1		
2202	C1	2239	A2	2366	B2	2534	B2	2665	B2	2759	C1	3241	A2	3306	B1	3503	B1	3732	A1	3760	C1	5460	A2	6742	A1	7402	A1	7736	A1		
2203	B1	2244	A2	2415	A1	2540	C2	2666	B2	2760	C1	3242	A2	3340	A2	3504	B1	3733	A1	3765	B1	5465	A2	6750	C1	7403	A1	7745	A1		
2206	C1	2260	A1	2419	A1	2560	C2	2730	B1	2799	A1	3257	A1	3401	A1	3506	C1	3742	A1	3770	C1	5535	B2	6760	C1	7440	A2	7746	A1		
2212	C1	2261	A1	2434	A2	2565	C2	2732	B1	3210	C1	3259	A1	3402	A1	3540	B2	3743	A1	3771	C1	5560	C2	7211	C1	7502	C1	7751	C1		

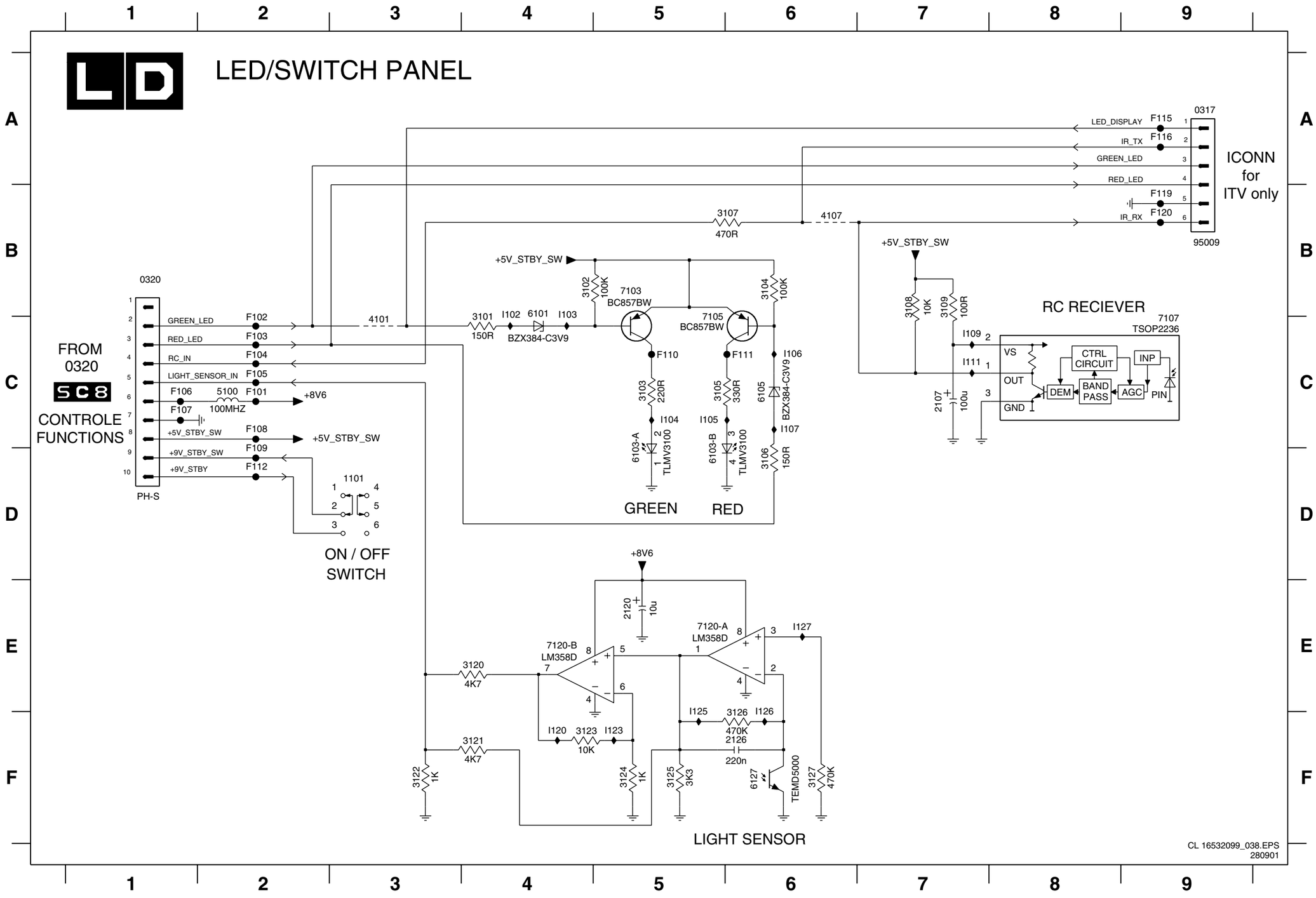


Layout Audio Panel (Bottom Side)

2201	C2	2255	A2	2359	B1	2535	C1	2781	C1	3243	A1	3318	B2	3411	A2	3509	C2	3607	B2	3661	B1	6434	A1	6634	B1	7515	C2
2204	B2	2256	A2	2409	A2	2555	C1	3201	C2	3244	A1	3325	A2	3415	A2	3510	C1	3608	B2	3662	B1	6435	A1	6635	B1	7530	C1
2205	C2	2257	A2	2410	A1	2559	C1	3202	C2	3255	A2	3327	A2	3418	A2	3511	C2	3609	B2	3799	A1	6455	A1	6655	B1	7555	C1
2207	B2	2269	A2	2416	A2	2609	B2	3203	B2	3256	A2	3328	B1	3425	A2	3515	B2	3610	B1	5714	B2	6456	A1	6656	B1	7565	C1
2215	C2	2270	A2	2418	A2	2610	B2	3205	C2	3258	A2	3330	B1	3427	A2	3518	C2	3611	B2	5719	C2	6459	A1	6659	B1	7615	B2
2218	B2	2271	A2	2430	A1	2616	B2	3206	B2	3270	A2	3336	A1	3428	A1	3525	B2	3615	B2	5725	B2	6460	A1	6660	B1	7630	B1
2220	C2	2272	A2	2435	A1	2618	B2	3207	B2	3271	A2	3337	A1	3430	A1	3527	B2	3618	B2	6328	A1	6528	C1	7315	A2	7655	B1
2222	B2	2309	B2	2455	A1	2630	B1	3215	C2	3273	A2	3355	A1	3436	A1	3528	C1	3625	B2	6334	B1	6534	C1	7330	A1	7665	B1
2232	A1	2310	B1	2459	A1	2635	B1	3216	C2	3307	B2	3361	A1	3437	A1	3530	C1	3627	B2	6335	B1	6535	C1	7355	A1		
2233	A1	2316	A2	2509	C2	2655	B1	3217	B2	3308	B2	3362	A1	3455	A1	3536	C1	3628	B1	6355	A1	6555	C1	7365	A1		
2238	A1	2318	A2	2510	C2	2659	B1	3220	C2	3309	B2	3407	A2	3461	A1	3537	C1	3630	B1	6356	A1	6556	B1	7415	A2		
2242	A1	2330	A1	2516	C2	2770	C2	3221	B2	3310	B2	3408	A2	3462	A1	3555	B1	3636	B1	6359	A1	6559	B1	7430	A1		
2243	A1	2335	B1	2518	C2	2771	C1	3222	B2	3311	B2	3409	A2	3507	C2	3561	C1	3637	B1	6360	A1	6560	C1	7455	A1		
2254	A2	2355	A1	2530	C1	2780	C1	3233	A1	3315	A2	3410	A2	3508	C2	3562	C1	3655	B1	6428	A1	6628	B1	7465	A1		

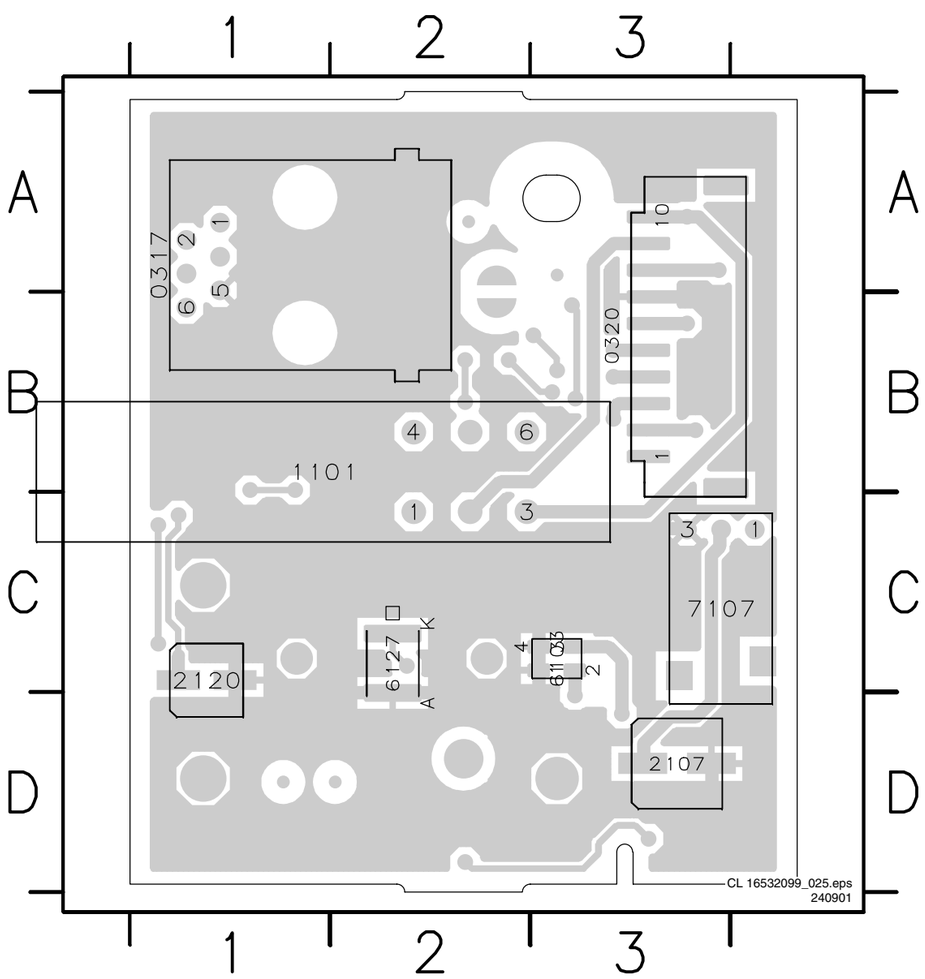


LED/Switch Panel



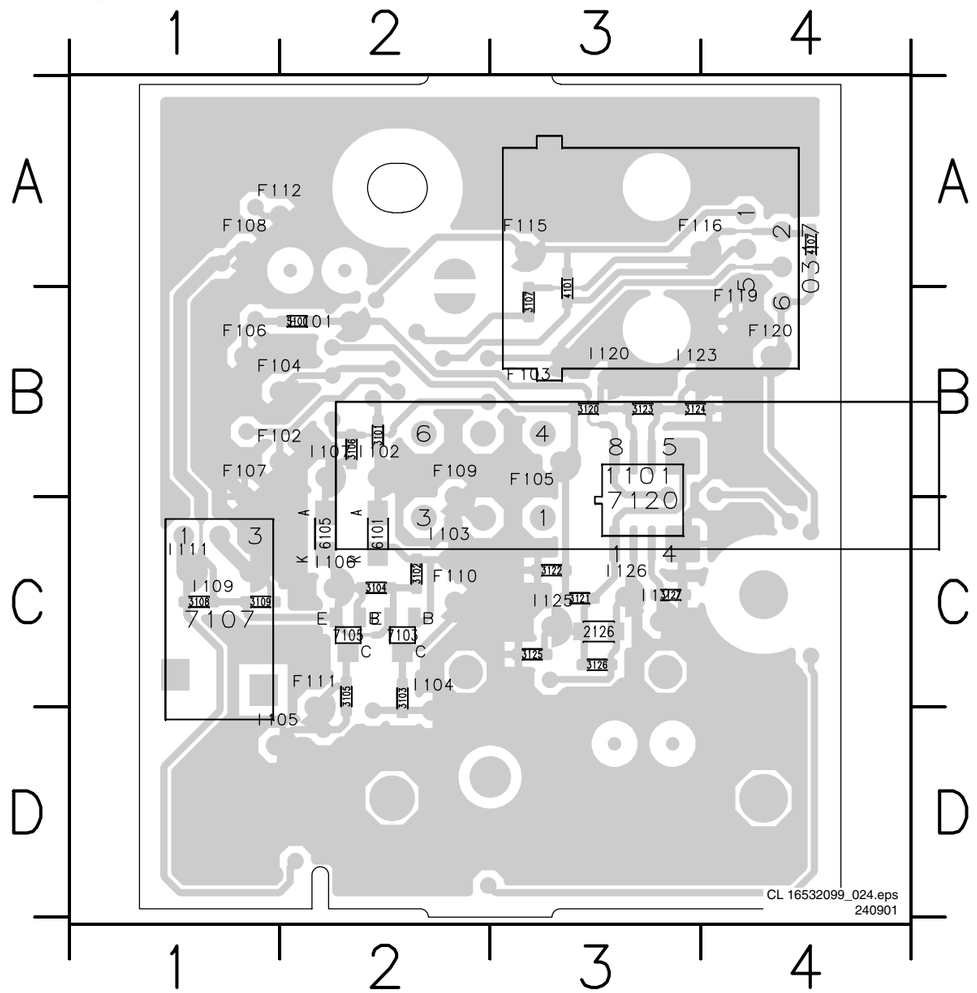
0317 A9
0320 B1
1101 D3
2107 C7
2120 E5
2126 F6
3100 C2
3101 C4
3102 B4
3103 C5
3104 B6
3105 C5
3106 D6
3107 B6
3108 B7
3109 B7
3120 E4
3121 F4
3122 F3
3123 F4
3124 F5
3125 F5
3126 F6
3127 F6
4101 C3
4107 B6
6101 C4
6103-A C5
6103-B D5
6105 C6
6127 F6
7103 B5
7105 B5
7107 C9
7120-A E6
7120-B E4
F101 C2
F102 C2
F103 C2
F104 C2
F105 C2
F106 C1
F107 C1
F108 C2
F109 D2
F110 C5
F111 C6
F112 D2
F115 A9
F116 A9
F119 B9
F120 B9
I102 B4
I103 B4
I104 C5
I105 C5
I106 C6
I107 C6
I109 C7
I111 C7
I120 F4
I123 F5
I125 E5
I126 E6
I127 E6

Layout LED/Switch Panel (Top Side)



0317 A1
0320 B3
1101 B1
2107 D3
2120 C1
6103 C3
6127 C2
7107 C3

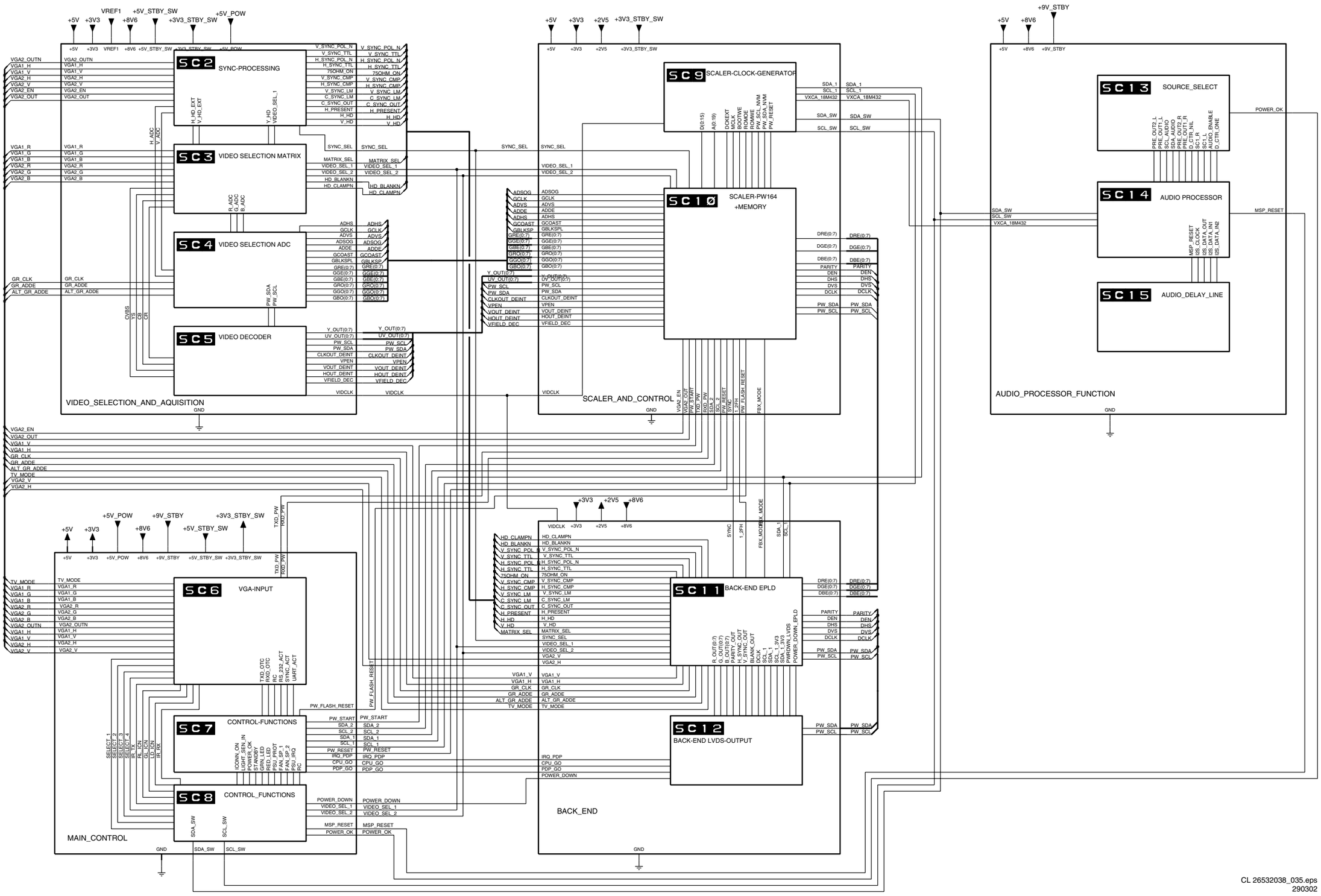
Layout LED/Switch Panel (Bottom Side)



0317 A4
1101 B3
2126 C3
3101 B2
3102 C2
3103 C2
3104 C2
3105 C2
3106 B2
3107 B3
3108 C1
3109 C1
3120 B3
3121 C3
3122 C3
3123 B3
3124 B3
3125 C3
3126 C3
3127 C3
4101 B3
4107 A4
5100 B2
6101 C2
6105 C2
7103 C2
7105 C2
7107 C1
7120 C3

SCAVIO Panel: Function Blocks and Diagram Connections

SC1 SCAVIO PANEL (FUNCTION BLOCKS AND DIAGRAM CONNECTIONS)



CL 26532038_035.eps
290302

SCAVIO Panel: Sync Selection & Switching

SC2 SYNC SELECTION & SWITCHING

(ENHANCED ONLY, UNLESS INDICATED OTHERWISE)

SC6 10 11

TO SC3 4 6 8 10

SC3

+5V 5000 100MHZ I000 2000 100n 3000 470K I002 2001 100n

7000 BC847BW 7001 BC847BW 7002 BC847BW I003

V_SYNC_TTL I004

V_HD_EXT 6001 BZM55-C33 3001 75R 7006 BC847BW I007 75OHM_ON 3006 10K I008 2004 2u2

3002 100R I005 3003 4K7 2002 2u2 2008 47p 3004 470K 3005 220K 2003 100n V_SYNC_POL_N I006

H_SYNC_TTL I009

H_HD_EXT 6010 BZM55-C33 3010 75R 7010 BC847BW I012 75OHM_ON 3015 10K I013 2005 2u2

3011 100R I010 3012 4K7 2012 100n 2015 47p 3013 470K 3014 220K 2014 10n 3008 470K H_SYNC_POL_N I011

+5V 5020 100MHZ I014 2020 100n

V_HD_EXT 2021 470n I019 3020 100K 3021 4K7 3022 2K2 I023 3023 22K 3024 100K I024 2022 100n 6022 BAT254 I018

7025-B LM319D V_SYNC_CMP I020

H_HD_EXT 2030 470n I031 3030 100K 3033 4K7 3031 2K2 I034 3032 22K 3034 100K I035 2034 10n 6034 BAT254 I030

7025-A LM319D H_SYNC_CMP I032

VGA2_V VGA1_V V_HD VGA2_OUTN VGA2_EN_NOT VGA2_H VGA1_H H_HD H_PRESENT C_SYNC_LM V_SYNC_LM

BASIC 4006 RES BASIC 4007 RES

7007-A 74HCT4053D I041 6019 BZX384-C2V4 3019 10K

7007-C 74HCT4053D I040 6007 BZX384-C2V4 3007 10K

+5A

SWITCH

+5V 5009 100MHZ I038 2009 100n

7009-A 74HC4052D VCC VEE GND MDX BASIC 4010 VIDEO_SEL_2 SYNC_SEL V_ADC

7009-B 74HC4052D BASIC 4009 H_ADC

+3V3_STBY_SW 3066 1K 2066 100n

+5A I001 5007 100MHZ +5V 2007 100n

3065 10K I016 7065 BC847BW I015 VGA2_OUTN VGA2_OUT

7007-B 74HCT4053D V_HD C_SYNC_OUT

SYNC. SLICER 7040 LM1881M VS OIE-FI RSET BGIBP CSYNC VIN VSYNC GND

2040 100n 2041 100n 3042 220K 2042 100n I025 7041 BC847BW I022 3050 1K 3051 1K 3052 1K 3053 1K I026 3054 2K2

3041 2K2 I017 3040 3K3 I021 3043 2K2 I027 3044 3K3 I029

+5V 5060 100MHZ I033 +5B 2060 100n

SHIELDING 3.3 1001 SHIELDING 3.3 1002 SHIELDING 3.3 1003

+3V3_STBY_SW I028 3061 4K7 2061 100n I036 3060 10K I037 7060 BC847BW

VGA2_EN_NOT VGA2_EN VGA2_EN_NOT

CL 26532038_036.eps
030502

1001 I7 1002 I8 1003 I8 2000 A3 2001 B4 2002 C5 2003 C6 2004 D2 2005 E2 2007 F11 2008 C5 2009 B12 2012 D5 2014 E6 2015 E5 2020 F5 2021 F4 2022 G4 2030 H4 2034 I4 2040 G8 2041 G8 2042 G9 2060 I10 2061 H13 2066 E14 3000 A4 3001 C2 3002 C5 3003 C5 3004 C5 3005 C6 3006 D2 3007 E10 3008 E6 3010 E2 3011 D4 3012 E4 3013 E5 3014 D6 3015 E2 3019 B10 3020 F4 3021 F4 3022 G4 3023 G4 3024 G4 3025 G6 3026 F6 3030 H4 3031 H4 3032 I4 3033 H4 3034 H4 3035 H6 3036 H6 3040 G7 3041 F8 3042 G8 3043 H8 3044 H7 3050 G11 3051 G10 3052 G12 3053 H12 3054 G12 3060 I12 3061 H13 3065 F13 3066 E13 4006 B8 4007 D8 4009 E13 4010 C13 5000 A3 5007 F11 5009 A12 5020 E5 5060 H10 6001 C1 6007 E9 6010 E1 6019 B9 6022 G5 6034 I5 7000 B4 7001 B5 7002 B6 7006 C2 7007-A A9 7007-B F11 7007-C C9 7009-A A13 7009-B C13 7010 E2 7025-A H5 7025-B F5 7040 G9 7041 G10 7060 I13 7065 F13 I000 A3 I001 F11 I002 A4 I003 B6 I004 B7 I005 C5 I006 C7 I007 C3 I008 D2 I009 D7 I010 D4 I011 D7 I012 E3 I013 E2 I014 E5 I015 F13 I016 F13 I017 F8 I018 F5 I019 F4 I020 F7 I021 F7 I022 G10 I023 G4 I024 G5 I025 G10 I026 G12 I027 H8 I028 H13 I029 H7 I030 H5 I031 H4 I032 H7 I033 H10 I034 H4 I035 H5 I036 H13 I037 I12 I038 A12 I040 D10 I041 A10

SCAVIO Panel: Video Selection & Matrix

SC3 VIDEO-SELECTION & MATRIX (ENHANCED ONLY, UNLESS INDICATED OTHERWISE)

0377 SPEAKERLESS VERSION

CVBS + Y INPUT ONE BLOCK WITH AUDIO_YC + AUDIO_CVBS ON SC 13

NOT FOR SPEAKERLESS

ONE BLOCK WITH AUDIO_RGB ON SC 13

TO SC2

MATRIX

VIDEO-SELECTION

4 X SWITCH

BASIC + ENHANCED

B + E

CLOSE TO 7118 IN LAYOUT

TO SC5 6 1 1

TO SC4

SC8

CL 26532038_037.eps
030502

0377 A2
0379-A A2
0380-B A4
0380-C A3
2072 C3
2077 D3
2082 E3
2088 C6
2089 C7
2090 D6
2097 F6
2103 G6
2105 C10
2106 C9
2107 C9
2108 E8
2109 E7
2110 H7
2111 H8
2112 F2
2113 F3
2114 D6
2115 G3
2116 H2
2117 H3
2119 H3
2120 I2
2123 I3
2124 E6
2127 H6
2128 I6
2134 A6
2137 A9
2140 B10
2142 I10
2143 I10
2144 D10
2145 D12
2146 D14
2147 E10
2150 F10
2151 F14
2152 F14
2153 G10
2156 H10
2157 G12
2158 H14
2159 H10
2160 A12
2161 B12
2162 B12
2164 A13
2165 A13
2166 A13
2167 A14
2168 B14
3071 C2
3072 C2
3073 C3
3074 B3
3075 C4
3076 D2
3077 D2
3078 D3
3079 D3
3080 D4
3081 E2
3082 E2
3083 E3
3084 E3
3085 F4
3086 C5
3087 C5
3088 D5
3089 D6
3090 D5
3091 D5
3092 E5
3093 E6
3094 E5
3095 F5
3096 F5
3097 F6
3098 F5
3099 G5
3100 G5
3101 G5
3102 G5
3103 G6
3104 H5
3105 H5
3106 I5
3107 I6
3108 I5
3109 I5
3110 I5
3111 I6
3112 F1
3113 F2
3114 C5
3115 G2
3116 H1
3117 H2
3118 C6
3119 H2
3120 I1
3121 I2
3122 D5
3123 I3
3124 D6
3125 E5
3126 F6
3127 H5
3128 I6
3129 D13
3130 F13
3131 H13
3132 E13
3133 E14
3134 A6
3135 A7
3136 A7
3137 A8
3138 A9
3139 A9
3140 B10
3141 B11
3142 B11
3144 D10
3145 D10
3147 E10
3148 E10
3149 E11
3150 F10
3151 F10
3152 F11
3153 G10
3154 G10
3155 G11
3156 H10
3157 G10
3158 H11
3159 I10
3160 H10
3161 I11
3162 G13
3163 G13
3164 A13
3165 H13
3166 H13
3170 D9
3171 F9
3172 H9
3173 D9
3174 C10
3175 B9
3176 C9
3177 E7
3178 D7
3179 H7
3180 I7
3181 I8
3182 I9
3183 H8
3184 H8
3186 E9
3188 I11
3189 G11
3190 E11
3193 I3
3194 H3
3195 G3
4146 E13
4152 F13
4158 H13
5089 C7
5090 C7
5140 I10
5160 A12
5161 B12
5162 B12
5166 B14
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7079 D3
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7088-A C5
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7088-C F5
7089-A H7
7089-B F7
7089-C D7
7090-A D5
7090-B I5
7090-C G5
7100-A G8
7100-B E8
7100-C F8
7102 E7
7103 G7
7104 I8
7105 I8
7107 H9
7110 C7
7111 C8
7112 C8
7117 H2
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7131 G13
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7141 B11
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7146-A C13
7146-B E13
7148 E10
7151 F11
7154 G10
7157 G11
7158-A G13
7158-B I13
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7165 A14
F070 A2
F071 A3
F072 A5
F073 A2
F074 A3
F075 A5
F076 A3
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F146 E14
F152 F14
F158 H14
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I064 F5
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I124 G10
I125 G11
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I128 H11
I129 H10
I130 H11
I131 I10
I133 A13
I134 B13
I135 I2
I137 I8
I138 H8
I139 H6
I140 H7
I141 E6
I142 E7
I143 B7
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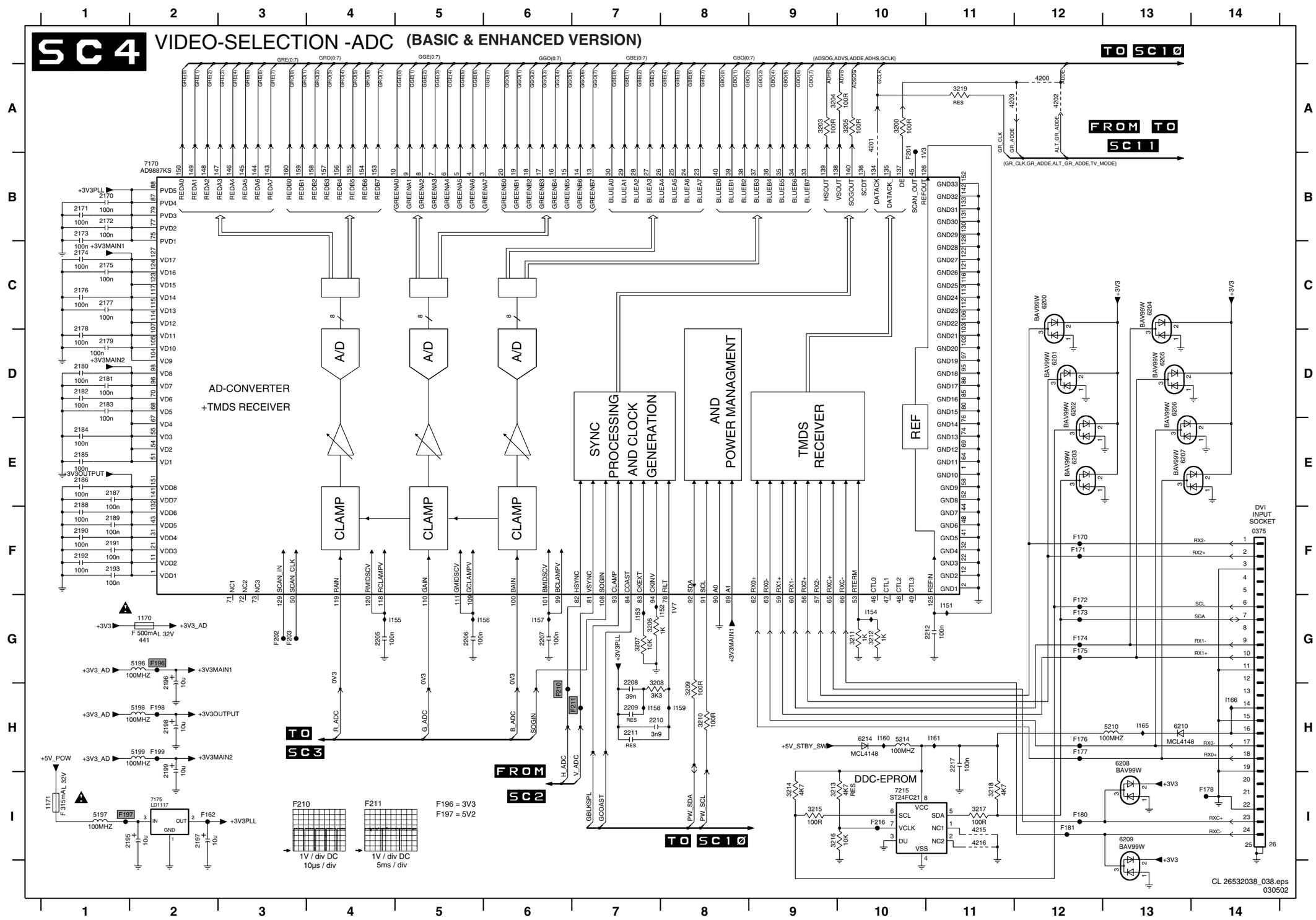
I147 C9
I148 H8
I149 I8
I150 I8

SCAVIO Panel: Video Selection ADC



0375 F14 I160 H10
1170 G2 I161 H11
1171 I1 I165 H13
2170 B1 I166 H14
2171 B1
2172 B1
2173 B1
2174 C1
2175 C1
2176 C1
2177 C1
2178 D1
2179 D1
2180 D1
2181 D1
2182 D1
2183 D1
2184 E1
2185 E1
2186 E1
2187 E1
2188 F1
2189 F1
2190 F1
2191 F1
2192 F1
2193 F1
2195 I2
2196 G2
2197 I2
2198 H2
2199 H2
2205 G4
2206 G5
2207 G6
2208 H7
2209 H7
2210 H7
2211 H7
2212 G11
2217 H11
3200 A10
3203 A9
3204 A9
3205 A10
3206 G7
3207 G7
3208 H7
3209 H8
3210 H8
3211 G10
3212 G10
3213 I9
3214 I9
3215 I9
3216 I9
3217 I11
3218 I11
3219 A11
4200 A12
4201 A10
4202 A12
4203 A11
4215 I11
4216 I11
5196 G2
5197 I1
5198 H2
5199 H2
5210 H13
5214 H10
6200 C12
6201 D12
6202 D12
6203 E12
6204 C13
6205 D13
6206 D13
6207 E13
6208 H13
6209 I13
6210 H13
6214 H10
7170 B2
7175 I2
7215 I10
F162 I2
F170 F12
F171 F12
F172 G12
F173 G12
F174 G12
F175 G12
F176 H12
F177 H12
F178 I14
F180 I12
F181 I12
F196 G2
F197 I1
F198 H2
F199 H2
F201 B10
F202 G3
F203 G3
F210 H6
F211 H7
F216 I10
I151 G11
I152 G8
I153 G7
I154 G10
I155 G5
I156 G6
I157 G6
I158 H7
I159 H8

SCAVIO Panel: Video Selection Decoder

SC5 VIDEO-SELECTION-DECODER
(ENHANCED VERSION ONLY)

TO 3D COMB FILTER

VIDEO-DECODER

DE-INTERLACER

TO SC10

FROM SC3

FROM SC9

SVHS

0381 YC Input

7225 SAA7118E

7280 SDA9400

AD-PORT

CONTROL

IIC REGISTER MAP

1ST TASK IIC REG MAP SCALER

2ST TASK IIC REG MAP SCALER

SCALER EVENT CONTROLLER

OUTPUT FORMATTER I-PORT

ANALOG INPUT CONTROL

FAST SWITCH DELAY

COMP PROC

CHROM PROC

COMB FIL

LUM PROC

SYNC

DECODER OUTPUT CONTROL

FIR-PREFILTER PRESCALER BCS-SCALER

LINE FIFO BUFFER

VERTICAL SCALING HORIZONTAL FINE (PHASE-) SCALING

VIDEO FIFO

VBI DATA SLICER

TEXT FIFO

VIDEO/TEXT ARBITER

AUDIO CLK

X-PORT

H-PORT

BOUNDARY SCAN

ISC INP SYNC CONTROLLER

IFC INPUT FORMAT CONVERSION

LDR NOISE REDUCTION VERTICEL MOTION REDUCTION HORIZONTAL MOVIE MODE DETECTOR AND MEASUREMENT DECIMATION AND PHASE DETECTION

MC MEM CTRL

ED eDRAM INTERFACES

VOLTAGE CONTROL DATA BUFFER TEST CTRL

OSC OUTP SYNC CONTR.

HDR SCANRATE CONVERSION

VERTICAL INTERPOLATION

LM LINE MEM

PLL1 CLOCK DOUBLING

PLL2 CLOCK DOUBLING

OFC OUTPUT FORMAT CONVERSION

I²C-BUS INTERFACE

+3V3 1270 +3V3VID
F 500mAL 32V
441

CL 26532038_039.eps
030502

0381 H3
0387 B1
1250 F4
1270 G5
2220 I6
2221 H6
2222 I6
2223 H6
2224 I6
2225 C2
2226 C2
2228 H5
2230 A5
2231 A5
2232 A6
2240 A6
2247 A6
2248 A7
2249 A7
2250 A7
2252 F4
2253 F4
2254 F5
2260 F2
2261 F3
2262 F2
2263 F3
2264 F2
2265 F3
2266 G2
2267 G3
2268 G2
2269 G3
2270 G2
2274 G1
2275 G1
2276 G1
2277 H3
2278 H4
2279 H4
2280 B11
2281 B11
2282 B11
2283 B11
2284 B12
2285 B12
2286 B12
2287 B12
2288 B12
3220 B1
3225 C3
3250 B8
3251 B8
3260 F3
3261 F6
3262 E8
3263 E8
3271 G3
3274 H1
3275 H2
3276 H2
3277 H3
3278 H4
3279 H4
3284 F9
3285 F10
3286-A D13
3286-B C13
3286-C C13
3289-A D13
3289-B D13
3289-C D13
3289-D D13
3290-A D13
3290-B E13
3290-C E13
3290-D E13
3291-A E13
3291-B E13
3291-C E13
3291-D F13
3292-A F13
3292-B F13
3292-C F13
3292-D F13
3293 F13
4250 G4
5220 I5
5221 H5
5222 I5
5223 H5
5224 I5
5226 F5
5228 H5
6274 I1
6276 I2
6277 I2
6278 I2
7225 C3
7280 C10
F220 I6
F221 H6
F222 I6
F223 H6
F224 I6
F225 B1
F226 B1
F227 B1
F228 B1
F229 C1
F230 C1
F231 C1
F232 C1
F233 C1
F234 H3
F235 I2
F236 I2
F237 H6
F240 C9
F241 C9
F242 D9
F245 C14
F246 C14
F247 D14
F249 F13
F250 B7
F251 B7
F260 E2
F261 E6
F262 E6
F263 E6
F264 E6
F265 F6
I200 I2
I201 H4
I202 H4
I203 F5
I204 H7
I205 F3
I206 E8
I207 F5

SCAVIO Panel: VGA Input

SC6

VGA INPUT
(BASIC & ENHANCED VERSION)

TO 0318 VGA

VGA PANEL CONNECTOR

FROM SC 10 11

TO SC7 8 10

RS232 DOWN-CONVERTER

7352 ST3232E

4:1 SWITCH

4:1 SWITCH

VGA OUTPUT BUFFERS

1 SHOT

1 SHOT

TO SC8

TO SC7

RS232 INPUT OUTPUT 0376

CL 26532038_040.eps 030502

F303 200mV / div DC 5µs / div

F304 200mV / div DC 5µs / div

F305 200mV / div DC 5µs / div

F306 1V / div DC 5µs / div

F307 2V / div DC 5ms / div

F308 2V / div DC 2µs / div

F309 2V / div DC 200µs / div

F311 1V / div DC 5µs / div

F312 2V / div DC 10µs / div

F313 1V / div DC 5µs / div

F314 1V / div DC 5µs / div

F315 1V / div DC 5ms / div

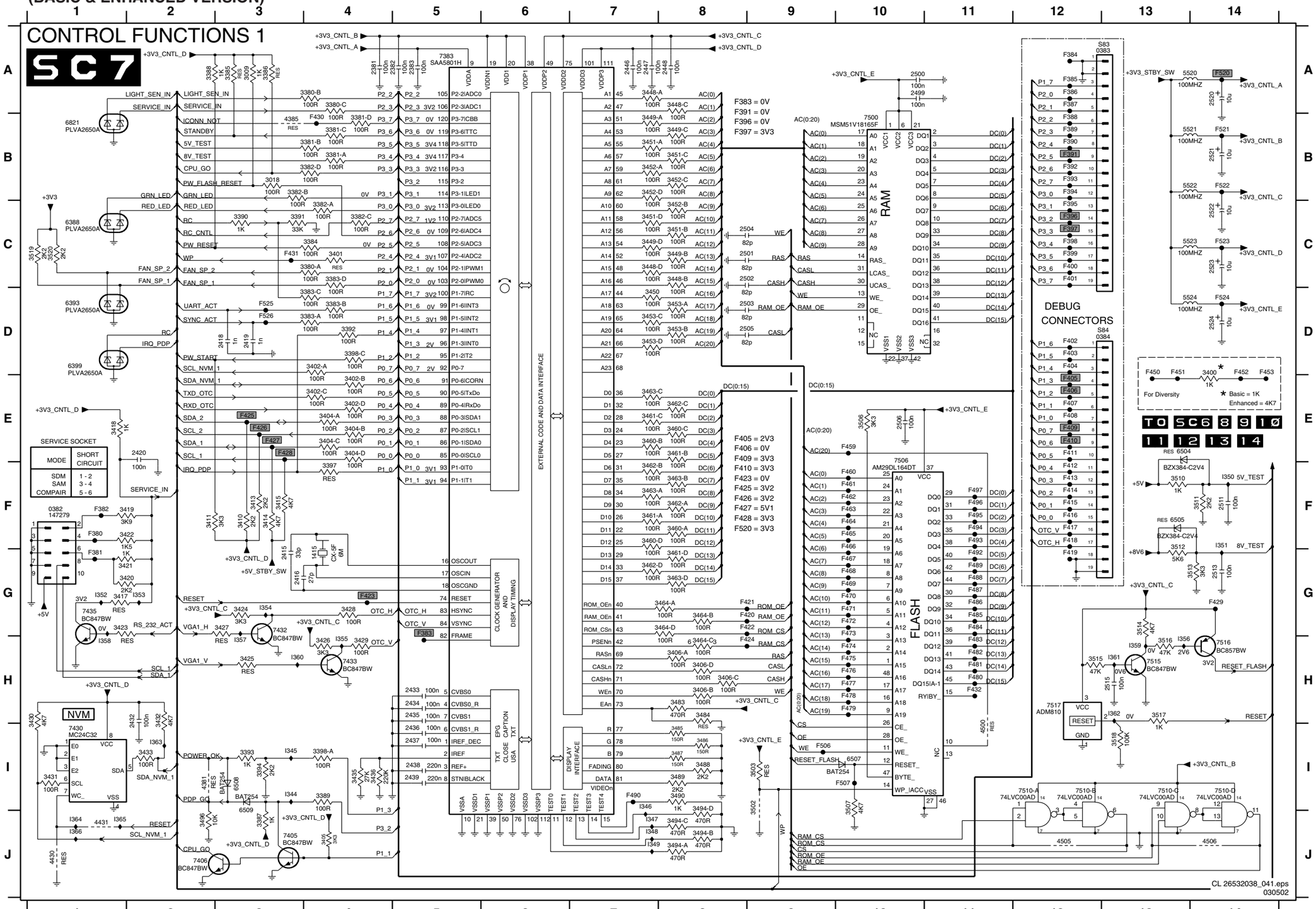
0318 C1
0376 B14
2300 B1
2301 B2
2302 B2
2304 B4
2305 B3
2306 D3
2308 E3
2310 A4
2311 E6
2318 G3
2328 I3
2335 H10
2336 H2
2337 I2
2338 J1
2340 B8
2341 C6
2343 C10
2345 D6
2351 C11
2352 D11
2353 B12
2354 B12
2355 D12
2356 D12
2365 F12
2370 G10
2372 G12
2375 H12
2376 I11
3294 D6
3295 D6
3296 D7
3297 F6
3298 H6
3299 J6
3300 F5
3301 H6
3302 H7
3303 H8
3304 G8
3305 I2
3306 J5
3307 C6
3308 E3
3309 E4
3310 F4
3311 E5
3312 F5
3313 F5
3314 F6
3315 E6
3316 H5
3317 D6
3318 G3
3319 G4
3320 H4
3321 G5
3322 H5
3323 H5
3324 H6
3325 G6
3326 C6
3327 C6
3328 I3
3329 I4
3330 I4
3331 I5
3332 I5
3333 J5
3334 J6
3335 I6
3336 I2
3337 I1
3338 I2
3339 J2
3340 C7
3341 B9
3342 B9
3343 B10
3344 B10
3345 A10
3346 D7
3347 E10
3348 C7
3349 C7
3350 D10
3351 I8
3352 B11
3353 C12
3354 C12
3355 C12
3356 F6
3357 F7
3358 F8
3359 F8
3360 F9
3361 E10
3362 E10
3363 H2
3364 F11
3365 F12
3366 E12
3367 I6
3368 J7
3369 I8
3370 G10
3371 H10
3372 D5
3373 I10
3374 H11
3375 H12
3376 I12
3377 I12
3378 J10
3379 J10
3900 I1
3901 D7
3902 E6
3903 G6
3904 I6
3905 F4
3906 G4
3907 I4
3908 B4
3909 H10
3910 A4
3911 A4
3912 A5
3913 C9
3914 C7
3915 D7
3917 B4
3918 J10
3919 I11
3920 G10
3922 D8
3923 D5
3924 D14
3925 D14
3926 D14
3927 E14
3928 E14
4008 E8
4011 A8
4315 E7
4316 D5
4325 G7
4335 I7
4898 C5
5300 B1
5302 B2
5350 B12
5352 B11
6302 B1
6310 A3
6311 B4
6315 F13
6316 G13
6317 F13
6318 G13
6319 F13
6320 G13
6321 F13
6322 G13
6323 F14
6324 G14
6353 A12
6354 C12
6355 C13
6356 D12
6357 D13
6365 F12
6366 F12
6378 I10
6379 I10
6380 C7
6381 D7
7303-A B4
7303-B B3
7303-C D4
7303-D C4
7305 G7
7306 H7
7307 G8
7308 E4
7309 F5
7310 A4
7311-A E6
7311-B G6
7311-C I6
7315 C6
7316 C7
7318 G4
7319 H5
7320 I1
7321 J1
7322 I2
7325 D6
7326 D7
7328 I4
7333 J5
7340-A B8
7340-B C8
7341 B9
7343 B10
7352 B11
7356 F7
7357 F7
7358 E8
7360 F10
7362 E10
7364 F11
7365 I7
7366 I8
7370-A H13
7370-B G11
F300 B2
F301 B2
F303 D2
F304 D2
F305 D2
F306 D2
F307 E2
F308 E2
F309 E2
F310 E2
F311 F2
F312 F2
F313 F2
F314 G2
F315 G2
F316 G2
F317 G2
F318 G2
F319 H2
F320 C12
F321 C14
F322 C13
F323 H2
F324 G2
F325 A4
F326 B5
F327 C14
F328 C14
F329 C14
F330 C14
F331 D14
I218 C7
I219 E8
I220 A3
I221 A12
I222 B12
I223 B10
I224 B4
I225 B10
I226 B9
I227 B11
I228 B8
I229 C8
I230 C6
I231 C7
I232 C6
I233 C12
I234 C12
I235 C13
I236 D9
I237 D10
I238 D8
I239 D6
I240 D7
I241 D6
I242 E7
I243 E4
I244 E3
I245 E10
I246 E12
I247 E4
I248 E5
I249 E10
I250 F6
I251 F7
I252 F9
I253 F6
I254 F5
I255 F7
I256 F11
I257 F11
I258 F5
I259 G7
I260 G4
I261 G3
I262 G4
I263 G5
I264 G10
I265 G6
I266 G7
I267 G6
I268 H5
I269 H9
I270 H10
I271 H7
I272 H5
I273 H9
I274 H11
I275 H12
I276 I7
I277 I1
I278 I4
I279 I2
I280 I3
I281 I7
I282 I4
I283 I5
I284 I2
I285 I6
I286 I7
I287 I6
I288 I5
I289 I1
I290 J2
I291 J7
I292 J9
I293 J10

SCAVIO Panel: Control Functions 1

(BASIC & ENHANCED VERSION)

CONTROL FUNCTIONS 1

SC7



CL 26532038_041.eps
030502

0382 F1	3452-D B7	F415 F12
0383 A12	3453-A D8	F416 F12
0384 D12	3453-B D8	F417 F12
1415 G4	3453-C D7	F418 F12
2381 A4	3453-D D7	F419 G12
2382 A5	3460-A F8	F420 G9
2383 A5	3460-B E7	F421 G9
2415 G3	3460-C E8	F422 G9
2416 G3	3460-D F7	F423 G4
2418 D3	3461-A F7	F424 H9
2419 D3	3461-B E8	F425 E3
2420 E2	3461-C E7	F426 E3
2432 H2	3461-D G8	F427 E3
2433 H5	3462-A F8	F428 E3
2434 H5	3462-B F7	F429 G14
2435 H5	3462-C E8	F430 B4
2436 I5	3462-D G7	F431 C3
2437 I5	3463-A F7	F432 H11
2438 I5	3463-B F8	F450 D13
2439 I5	3463-C E7	F451 D13
2446 A7	3463-D G8	F452 D14
2447 A7	3464-A G8	F453 D14
2448 A8	3464-B G8	F459 E10
2499 A10	3464-C H8	F460 F10
2500 A10	3464-D G8	F461 F10
2501 C8	3483 H8	F462 F10
2502 C8	3484 H8	F463 F10
2503 D8	3485 I8	F464 F10
2504 C8	3486 I8	F465 F10
2505 D8	3487 I8	F466 F10
2506 E10	3488 I8	F467 G10
2511 F14	3489 I8	F468 G10
2513 G14	3490 I8	F469 G10
2515 H13	3494-A J8	F470 G10
2520 A14	3494-B J8	F471 G10
2521 B14	3494-C J8	F472 G10
2522 C14	3494-D I8	F473 G10
2523 C14	3496 J2	F474 H10
2524 D14	3502 I9	F475 H10
3009 A3	3503 I9	F476 H10
3018 B3	3506 E10	F477 H10
3380-A C4	3507 I10	F478 H10
3380-B A4	3510 F13	F479 H10
3380-C A4	3511 F14	F480 H11
3381-A B4	3512 F13	F481 H11
3381-B B4	3513 G14	F482 H11
3381-C B4	3514 G13	F483 H11
3381-D B4	3515 H12	F484 G11
3382-A C4	3516 H13	F485 G11
3382-B B3	3517 H13	F486 G11
3382-C C4	3518 I13	F487 G11
3382-D B4	3519 C1	F488 G11
3383-A D4	3520 C1	F489 G11
3383-B D4	4381 I2	F490 I7
3383-C D4	4385 B3	F492 G11
3383-D C4	4430 J1	F493 F11
3384 C4	4431 J1	F494 F11
3385 A3	4500 I11	F495 F11
3386 A3	4505 J12	F496 F11
3387 J3	4506 J14	F497 F11
3388 A2	5520 A13	F506 I9
3389 I4	5521 B13	F507 I10
3390 C3	5522 B13	F520 A14
3391 C3	5523 C13	F521 B14
3392 D4	5524 D13	F522 B14
3393 I3	6388 C1	F523 C14
3394 I3	6393 D1	F524 D14
3397 F4	6399 D1	F525 D3
3398-A I4	6504 E13	F526 D3
3398-C D4	6505 F13	I344 I3
3400 D14	6507 I10	I345 I3
3401 C4	6508 I3	I346 I7
3402-A D4	6509 J3	I347 J7
3402-B E4	6821 B1	I348 J7
3402-C E4	7383 A5	I349 J7
3402-D E4	7405 J3	I350 F14
3404-A E4	7406 J2	I351 F14
3404-B E4	7430 I1	I352 G1
3404-C E4	7432 G3	I353 G2
3404-D E4	7433 H4	I354 G3
3405 J4	7435 G1	I355 H4
3406-A H8	7500 B10	I356 H13
3406-B H8	7506 F10	I357 H3
3406-C H8	7510-A I12	I358 H1
3406-D H8	7510-B I13	I359 H13
3410 F3	7510-C I13	I360 H3
3411 F2	7510-D I14	I361 H13
3413 F3	7515 H13	I362 H13
3414 F3	7516 H14	I363 I2
3415 F3	7517 H12	I364 J1
3417 G1	7518 F1	I365 J1
3418 E1	F381 G1	I366 J1
3419 F2	F382 F1	
3420 G2	F383 G5	
3421 G1	F384 A12	
3422 F2	F385 A12	
3423 G1	F386 A12	
3424 G3	F387 A12	
3425 H3	F388 B12	
3426 H4	F389 B12	
3427 G3	F390 B12	
3428 G4	F391 B12	
3429 H4	F392 B12	
3430 H1	F393 B12	
3431 I1	F394 B12	
3432 H2	F395 C12	
3433 I2	F396 C12	
3435 I4	F397 C12	
3436 I4	F398 C12	
3448-A A7	F399 C12	
3448-B C8	F400 C12	
3448-C A8	F401 C12	
3448-D C7	F402 D12	
3449-A B7	F403 D12	
3449-B C8	F404 D12	
3449-C B8	F405 E12	
3449-D C7	F406 E12	
3450 D7	F407 E12	
3451-A B7	F408 E12	
3451-B C8	F409 E12	
3451-C B8	F410 E12	
3451-D C7	F411 E12	
3452-A B7	F412 F12	
3452-B C8	F413 F12	
3452-C B8	F414 F12	

SCAVIO Panel: Control Functions 2

SC8 CONTROL FUNCTIONS 2
(BASIC & ENHANCED VERSION)

F540 = 5V
F541 = 3V3
F546 = 9V
F547 = 9V
F549 = 5V
F550 = 3V3

TO 0320 LD LED-PANEL DISPLAY

TO 8001 P POWER SUPPLY

TO 8002 P POWER SUPPLY

EXTERNAL ADC

I/O EXPANDER

RES

TO S - 1

TO S - 2

TO SC3 6 7 9 10 12 13 14

CL 36532011_020.eps
190303

0305 C2
0315 H5
0316 I5
0319 E2
0320 B2
1100 C3
1105 F3
2530 C8
2531 C6
2533 G5
2534 G6
2535 F5
2537 D2
2538 D3
2541 C9
2546 C3
2547 C3
2548 C3
2550 A3
2551 A3
2552 A3
2553 A4
2554 H10
2555 F10
2557 H4
2558 G4
2559 H3
2560 G3
2562 H2
2563 H2
2564 H2
2565 I2
2566 I2
3530 C7
3531 E7
3532 E7
3533 G5
3534 G6
3535 F5
3536 F4
3537 H5
3538 I5
3539 H5
3540 B9
3541 B9
3542 B12
3543 A12
3544 B13
3545 G3
3546 C13
3547 C13
3548 D14
3549 I5
3550 B3
3551 B3
3552 B3
3553 B3
3554 G5
3555 G6
3556 E9
3557 G3
3558 G3
3559 G3
3560 G3
3561 C13
3562 D13
3563 C13
3564 B14
3565 C14
3566 C13
3567 C13
3568 D7
3569 E7
3570 F9
3572 E7
3573 D7
5530 C5
5541 C9
6551 H13
6552 H13
6553 G13
6554 F13
6555 E13
7530 D6
7540 A10
7550-A I12
7550-B H10
7555-A F10
7555-B E12
7555-C G12
7563 D14
F527 C12
F528 B12
F529 D2
F530 B2
F531 B2
F532 B2
F533 B2
F534 B2
F535 B2
F536 C2
F537 C2
F538 C2
F539 C2
F540 C3
F541 E2
F542 E2
F543 E2
F544 E2
F545 D2
F546 E2
F547 F2
F548 F2
F549 F2
F550 F2
F551 F2
F552 F2
F553 G2
F554 G2
F555 G2
F556 G2
F557 G2
F558 H5
F559 H5
F560 I5
F561 I5
F562 C7
I400 C7
I401 C7
I402 C7
I403 D7
I405 D6
I406 D6
I407 D5
I408 D14
I409 D13
I410 F10
I411 G9
I412 G9
I413 H9
I414 I12
I415 D8
I416 H12
I417 G12
I418 G12
I419 F12
I420 F12

SCAVIO Panel: Scaler Clock Generator

SC9 SCALER-CLOCK-GENERATOR
(BASIC & ENHANCED VERSION)

F563: 2V / div DC, 50µs / div
F564: 2V / div DC, 100µs / div
F565: 1V / div DC, 20ns / div
F566: 1V / div DC, 20ns / div
F567 = 3V2
F569 = 3V2

CLOCK GENERATOR

TO SC5 {VIDCLK}

TO SC8 SC14

TO SC7

TO SC10 14

7570 FS6377: XIN, XOUT, PD, SCL, SDA, ADDR, SEL_CD, OE, VDD, VSS; REF OSC, PWR DWN CTRL, I²C BUS INTERF, PLL A/B/C, MUX A/B/C/D

7574-A/B/C/D 74LVC125A

VIDCLK 24.576MHz F566

F565 4574 VXCA_18M432

F563 MCLK 120MHz

F564 DCKEXT 36MHz

S86 0386 FTR — DEBUG CONNECTOR PW

BOOTWE, ROMOE, ROMWE, A(0:19), D(0:15)

PW-NVM: 7580 M24C32 (E0, E1, E2, SCL, WC_, SDA, VCC, VSS); PW_SCL_NVM, PW_SDA_NVM, PW_RESET

7571-A/B/C 74HCT4053D

TO SC10

CL 26532038_043.eps
030502

0386 C9
1570 C2
1575 G6
2570 D2
2572 C4
2573 C4
2574 C6
2581 H2
2583 F5
2584 F1
3016 D3
3571 D2
3575 E3
3580 F3
3581 G3
3582 F5
3583 F5
3590 D10
3591 D10
3592 E10
3593 E10
3594 H2
4572 C6
4574 D7
4581 G3
4582 G4
4591 C10
4592 G1
4593 E2
5570 C2
5572 B3
5574 B5
6500 G1
6501 G1
6502 G1
6503 H1
7570 C3
7571-A G2
7571-B F2
7571-C E3
7574-A C6
7574-B D6
7574-C D6
7574-D E6
7580 F4
F563 E7
F564 E7
F565 D7
F566 B7
F567 G3
F568 G3
F569 G5
F570 C8
F571 C8
F572 C8
F573 C8
F574 C8
F575 D8
F576 D8
F577 D8
F578 D8
F579 D8
F580 D8
F581 E8
F582 E8
F583 E8
F584 E8
F585 F8
F586 F8
F587 F8
F588 F8
F589 F8
F590 F8
F591 C10
F592 C10
F593 C10
F594 C10
F595 C10
F596 D10
F597 D9
F598 D9
F599 D10
F600 D10
F601 D10
F602 D10
F603 E10
F604 E10
F605 E10
F606 E10
F607 E10
F608 E10
F609 F10
F610 F10
F611 F10
F612 F10
F613 F10
I430 C3
I431 D3
I432 B4
I433 D2
I435 H1
I436 H1

SCAVIO Panel: PW Scaler and Memory

SC10

SCALER PW164 + MEMORY (BASIC & ENHANCED VERSION)

PW164

I/O PORTS

16-BIT MICRO-PROCESSOR

PROCESSOR ROM/RAM INTERFACE

INTERRUPT CONTROLLER

WATCHDOG AND TIMERS

UART

IR DECODERS

MICROPROCESSOR BUS

YUV TO RGB

VIDEO PORT PIXEL PROCESSING

GRAPHICS PORT PIXEL PROCESSING

OSD

PROCESSOR MEMORY INTERFACE

SDRAM FRAME BUFFER

MEMORY CONTROLLER

MEMORY IN BUS

INTERNAL REGISTER INTERFACE

REGISTER BUS

MEMORY OUT BUS

VERTICAL IMAGE SCALAR

HORIZ. IMAGE SCALAR

DISPLAY FIFO

OSD AND GAIN

COLOR LOOKUP TABLES

COLOR SPACE EXPANDER

ON SCREEN DISPLAY

SYNC DECODER AND TIMER

AUTOMATIC IMAGE OPTIMIZER

CLOCK GENERATOR

TEST CONTROL

DISPLAY TIMING GENERATOR

SRAM 7628 CY62126

FLASH 7630 M29W160DT

F619 1V / div DC 5ms / div

F633 1V / div DC 5µs / div

F634 1V / div DC 10µs / div

F615 1V / div DC 200µs / div

F616 1V / div DC 50µs / div

F618 1V / div DC 10ns / div

F637 1V / div DC 20ms / div

F638 1V / div DC 100µs / div

FROM SC2 · FROM SC9 · FROM SC3 · SC7 · TO SC11 · TO SC6 · FROM SC5 · FROM SC4 · FROM SC15 · TO SC7 · TO SC7 9 · TO SC11 12

CL 26532038_044.eps 030502

2600 I1
2601 I2
2602 I2
2603 I2
2604 I2
2605 I3
2606 I3
2607 I3
2608 I4
2609 I4
2610 I4
2611 I4
2612 I5
2613 I5
2614 I5
2615 I6
2616 I8
2617 I9
2618 I9
2619 I9
2620 I9
2621 I10
2622 I10
2623 I10
2624 I11
2625 I11
2628 A12
2629 E12
2630 E12
3600 A2
3601 A2
3602 A3
3603 A3
3604 A3
3605 A2
3606 A4
3607 A4
3608 A4
3609 A4
3610 H11
3611 A3
3612 A4
3613 A5
3615 A10
3616 A11
3617 A11
3620 B11
3621 B11
3622 B11
3623 B11
3625 D1
3626 D1
3627 D1
3628 A14
3630 E13
3631 E13
3632 I14
3633 I14
3634 I14
3636 H14
3637 D13
3638 A9
3639 A9
4605 B2
4632 I14
5628 A12
5630 E12
6630 E13
7605 A3
7628 A13
7630 E13
F614 H13
F615 A2
F616 A2
F617 D12
F618 G2
F619 G2
F620 H2
F621 H2
F622 D12
F623 C11
F624 C11
F625 C11
F626 C12
F627 A4
F628 A4
F629 A13
F630 A3
F631 A3
F632 I13
F633 H2
F634 H11
F635 A4
F636 A4
F637 H11
F638 I11
F639 H11
I470 A9
I471 A9
I475 D13
I480 E13
I481 E13
I482 E14
I485 H13
I486 I13

SCAVIO Panel: Back-End EPLD

SC11 BACK-END-EPLD (BASIC & ENHANCED VERSION)

FROM SC3

FROM TO SC2

FROM SC1Ø

TO SC8 TO SC12

TO SC12

I/O PORT PROCESSING

TO SC12

TO SC12

TO SC12

FROM SC1Ø

FROM TO SC3 4 5 6

FROM SC1Ø

I504 = 2V5

GROUND AND SUPPLY

CL 26532038_045.eps
030502

0385 A3
1670 B3
2640 B1
2641 B1
2642 C1
2643 D1
2644 D1
2645 E1
2646 F1
2647 F1
2648 G1
2649 G1
2655 C4
2656 I9
2657 I10
2658 I10
2659 I11
2660 I12
2661 I12
2662 I13
2663 I14
3640 A1
3641 B2
3653 C2
3654 C2
3655 C3
3657 E4
3658 E4
3660 A11
3661 I4
3662 F5
3663 I4
3664 G5
3665 G11
3666 H11
3667 G6
3668 H6
4654 D5
4655 E4
4656 E4
4657 E4
4658 E4
4659 E4
5642 C1
5643 C1
5644 D1
5645 E1
5646 E1
5647 F1
5648 G1
5649 G1
7640 B1
7641 A2
7655 D3
7656-A A6
7656-B E3
7656-C I9
F640 E4
F641 E4
F642 F4
F643 F4
F644 F4
F645 F4
F646 C1
F647 C1
F648 D1
F649 E1
F650 E1
F651 F1
F652 G1
F653 G1
F654 B4
F655 B4
F656 A4
F657 B4
F658 B4
F659 A4
F660 H4
F661 I4
F662 I4
I501 B3
I502 A1
I503 B1
I504 B2
I505 C3
I506 D3
I507 F2
I510 A11
I511 G11

SCAVIO Panel: Back-End LVDS Output

SC12 BACK-END-LVDS-OUTPUT
(BASIC & ENHANCED VERSION)

LVDS ENCODER

FROM SC8

FROM SC9

TO SC11

TO SC7

TO SC11

TO SC10

7670 DS90C385MTD

TTL PARALLEL-TO-LVDS

PLL

S01 PDP INTERFACE CONNECTOR

DF13 0301

F690

F691

F692

500mV /div DC
10µs / div

500mV /div DC
5ms / div

500mV /div DC
10µs / div

CL 26532038_046.eps
030502

0301 E9
2670 B5
2671 B5
2672 B5
2673 B6
2674 B6
2694 F11
2695 F11
2696 F11
2697 F11
2698 F12
2699 F12
3670 F10
3671 D11
3672 D11
3673 C6
3674 E10
3675 G4
3676 E11
3677 E10
3679 G4
3681 B10
3682 B11
3685 A10
3686 A10
3687 F11
3688 A11
3689 B11
4680 C10
4684 B10
5670 B5
5672 B5
5673 B6
7670 B4
7675 A11
7676 B11
F670 D9
F671 D9
F672 D9
F673 D9
F674 D9
F675 E9
F676 E9
F677 E9
F678 E9
F679 E9
F680 D10
F681 D10
F682 E10
F683 E10
F684 E10
F685 E10
F686 E10
F690 F4
F691 F4
F692 G4
I680 A11
I681 B11
I682 B9
I683 C9
I685 C6

SCAVIO Panel: Audio Source Select

SC13 AUDIO SOURCE SELECT

(BASIC & ENHANCED VERSION)

AV1 CVBS — COMBINED WITH CVBS + Y INPUT ON SC 2 — AUDIO_CVBS 0379-B COMBI

AUDIO_VGA_IN 0378-A COMBI

AV2 AUDIO YC — COMBINED WITH CVBS + Y INPUT ON SC 2 — AUDIO_YC 0379-C COMBI

AUDIO_FLEX_VGA 0378-B COMBI

AV3 — COMBINED WITH PR + PB + H_HD_EXT + V_HD_EXT ON SC 2 — AUDIO_YPbPr 0380-A COMBI

AUDIO_DVI 0378-C COMBI

MATRIX SWITCH

F723 = 8V6
F724 = 4V3

F710 / F711 / F713 / F714: 500mV / div DC, 500µs / div

SC7 {POWER_OK}

SC14

CL 26532038_047.eps
030502

0378-A A1	3800 G10	I565 F7
0378-B E1	3801 G12	I566 F7
0378-C G1	3802 H9	I567 F1
0379-B A5	3803 H10	I568 F6
0379-C E5	3804 I10	I569 F11
0380-A G5	3805 H11	I570 F12
2711 B2	3806 I11	I571 G3
2712 A2	3807 H12	I572 G2
2714 A3	3808 I12	I573 G2
2715 A3	3809 H11	I574 G11
2716 B3	3820 I9	I575 G12
2717 A4	3821 I9	I576 G7
2721 C2	3822 H9	I577 G7
2722 B2	3836 F10	I578 G3
2724 B3	3837 F11	I579 G4
2726 C3	4794 A11	I580 H1
2727 B4	4797 D11	I581 H6
2731 D2	4800 E11	I582 H11
2732 D2	4801 G12	I583 H3
2734 D3	5796 A13	I584 H11
2735 D3	5798 B9	I585 H13
2736 E3	6710 A1	I586 H7
2737 D4	6711 B1	I587 H7
2741 F2	6720 C1	I588 H11
2742 F2	6721 C1	I589 H13
2744 F3	6730 D1	I590 H2
2746 F3	6731 E1	I591 H2
2747 F4	6740 F1	I592 H10
2751 G2	6741 F1	I593 I3
2752 G2	6750 G1	I594 I4
2754 G3	6751 H1	I595 I9
2755 G3	6760 I1	I596 I10
2756 H3	6761 I1	I597 I6
2757 G4	6770 A6	I598 I1
2761 I2	6771 A6	I599 I9
2762 H2	6774 B6	
2764 H3	6775 C6	
2766 I3	6778 E6	
2767 H4	6779 E6	
2771 A6	6782 F6	
2772 A7	6783 G6	
2775 B6	6786 G6	
2776 B7	6787 H6	
2779 E6	6790 H6	
2780 E7	6791 I6	
2783 F6	6802 I9	
2784 F7	6805 H11	
2787 G6	6807 H12	
2788 G7	7714-A A3	
2791 H6	7714-B B3	
2792 H7	7718 D12	
2794 B11	7734-A D3	
2795 B12	7734-B E3	
2796 C11	7754-A G3	
2797 C12	7754-B H3	
2798 C9	7798 A9	
2799 C9	7800-A E11	
2800 A13	7800-B E12	
2801 E9	7800-C E10	
2802 G10	7801 I9	
2803 G12	7802 I10	
2804 H10	7803 H10	
3710 A1	7805 H11	
3711 A2	7806 H12	
3713 A3	7807 H13	
3714 A3	7808 H13	
3716 A3	F710 B1	
3717 D13	F711 B1	
3718 E12	F712 B1	
3719 D12	F713 E1	
3720 C1	F714 E1	
3721 B2	F715 H1	
3723 B3	F716 H1	
3724 B3	F717 A5	
3726 C3	F718 B5	
3730 D1	F719 E5	
3731 D2	F720 F5	
3733 D3	F721 H5	
3734 D3	F722 H5	
3736 D3	F723 A13	
3740 F1	F724 A13	
3741 F2	F725 I9	
3743 E3	I525 I1	
3744 F3	I530 A3	
3746 F3	I531 A2	
3750 G1	I532 A2	
3751 G2	I533 A7	
3753 G3	I534 A7	
3754 G3	I535 A3	
3756 G3	I536 A4	
3760 I1	I537 B1	
3761 H2	I538 A6	
3763 H3	I539 B7	
3764 H3	I540 B7	
3766 I3	I541 B3	
3771 A6	I542 B2	
3772 A7	I543 B2	
3773 A7	I544 B6	
3775 B6	I545 C3	
3776 B7	I546 C4	
3777 B7	I547 C1	
3779 E6	I548 D3	
3780 E7	I549 D2	
3781 E7	I550 D2	
3783 F6	I551 D3	
3784 F7	I552 D4	
3785 F7	I553 D12	
3787 G6	I554 E1	
3788 G7	I555 D12	
3789 G7	I556 D13	
3791 H6	I557 E7	
3792 H7	I558 E7	
3793 H7	I559 E3	
3794 B12	I560 E6	
3795 B12	I561 F2	
3796 A12	I562 F2	
3797 A12	I563 F3	
3798 A12	I564 F4	

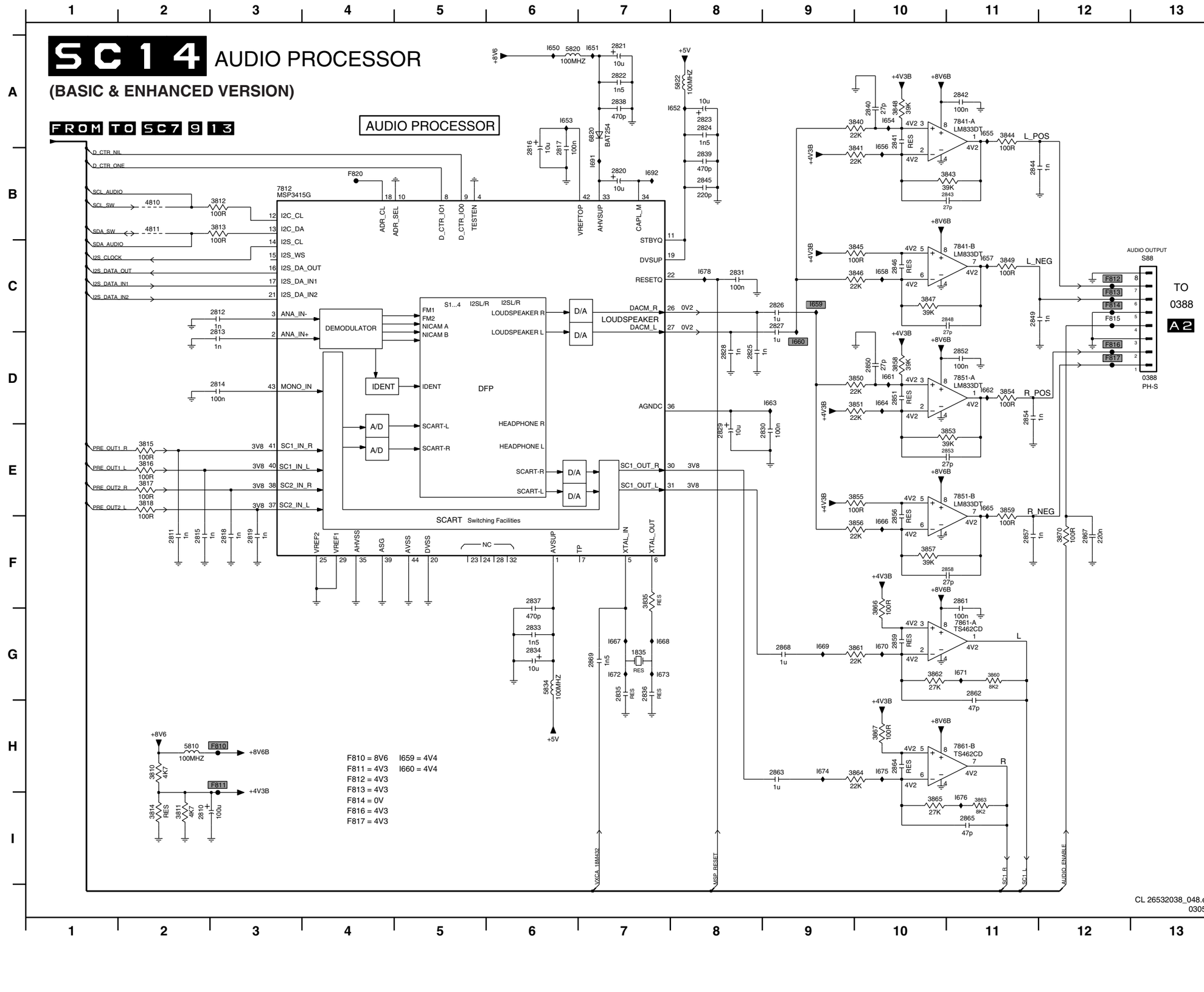
SCAVIO Panel: Audio Processor

SC14 AUDIO PROCESSOR

(BASIC & ENHANCED VERSION)

FROM TO SC7 9 13

AUDIO PROCESSOR



0388 D13 F820 B4
1835 G7 I650 A6
2810 I2 I651 A7
2811 F2 I652 A8
2812 C3 I653 A6
2813 D3 I654 A10
2814 D3 I655 A11
2815 F2 I656 A10
2816 B6 I657 C11
2817 B6 I658 C10
2818 F3 I659 C9
2819 F3 I660 D9
2820 B7 I661 D10
2821 A7 I662 D11
2822 A7 I663 D9
2823 A8 I664 D10
2824 A8 I665 E11
2825 D8 I666 F10
2826 C9 I667 G7
2827 C9 I668 G7
2828 D8 I669 G9
2829 E8 I670 G10
2830 E9 I671 G11
2831 C8 I672 G7
2833 G6 I673 G7
2834 G6 I674 H9
2835 G7 I675 H10
2836 G7 I676 I11
2837 F6 I678 C8
2838 A7 I691 B7
2839 B8 I692 B7
2840 A10
2841 A10
2842 A11
2843 B11
2844 B11
2845 B8
2846 C10
2848 C11
2849 C11
2850 D10
2851 D10
2852 D11
2853 E11
2854 D11
2856 F10
2857 F11
2858 F11
2859 G10
2861 F11
2862 G11
2863 H9
2864 H10
2865 I11
2867 F12
2868 G9
2869 G7
3810 H2
3811 I2
3812 B3
3813 B3
3814 I2
3815 E2
3816 E2
3817 E2
3818 E2
3835 F7
3840 A10
3841 B10
3843 B11
3844 A11
3845 C10
3846 C10
3847 C10
3848 A10
3849 C11
3850 D10
3851 D10
3853 E11
3854 D11
3855 E10
3856 F10
3857 F10
3858 D10
3859 E11
3860 G11
3861 G10
3862 G10
3863 I11
3864 H10
3865 I10
3866 F10
3867 H10
3870 F12
4810 B2
4811 B2
5810 H2
5820 A6
5822 A8
5834 G6
6820 A7
7812 B3
7841-A A11
7841-B C11
7851-A D11
7851-B E11
7861-A G11
7861-B H11
F810 H3
F811 H3
F812 C12
F813 C12
F814 C12
F815 C12
F816 D12
F817 D12

SCAVIO Panel: Audio Delay Line

SC15 AUDIO DELAY LINE
(BASIC & ENHANCED VERSION)

+5V — 5870 100MHZ — F870 — +5D

COUNTER 7870 TC74HC590AF

COUNTER 7874 TC74HC590AF

7880 CY7C199B RAM

DFF 7881 74HCT573

DFF 7882 74HCT573

F872 — 1V / div DC, 500ns / div

7879 BC847BW

DELAY 1 FOR MONITOR CONFIGURATION 24ms

DELAY 2 FOR TV CONFIGURATION 40ms

FROM SC14

CL 26532038_049.eps
030502

2870 C2
2874 F2
2879 H7
2880 B7
2881 E8
2882 E10
3879 H6
3880 G6
4871 G2
4872 G3
4873 G2
4874 G3
4875 G3
4876 G3
4882 E10
4883 E10
4884 F10
4885 F10
4886 F10
4887 F10
4888 F10
4889 F10
4890 G10
4891 G10
4892 G10
4893 G10
4894 G10
4895 G10
4896 G10
4897 H10
5870 A3
7870 B1
7874 E1
7879 G6
7880 B3
7881 E7
7882 E9
F870 A3
F871 G6
F872 G6
F873 H7
F874 G11
F875 F11

Layout SCAVIO Panel (Overview Top Side)

0301 A3 0305 A2 0315 A6 0316 A5 0318 A6 0319 A6 0320 A1 0375 C6 0376 C1 0378 C2 0379 C7 0380 C8 0381 C7 0382 A1 0383 B2 0384 B2 0385 A1 0387 A8 0388 A8 1100 A2 1105 A7 1170 C4 1171 B5 1250 C6 1270 B7 1415 B2 1570 A4 1575 A3 1670 A1 1835 B8 2002 C8 2003 C8 2004 C8

2005 C8 2008 C8 2012 C8 2014 C8 2015 C8 2021 C8 2030 C8 2040 A8 2041 A8 2042 A8 2060 A7 2072 C7 2077 C8 2082 C8 2085 B2 2089 B7 2090 C7 2097 C8 2103 C7 2105 B7 2106 B7 2107 B7 2108 B7 2109 B7 2110 B7 2111 B8 2112 B7 2113 B7 2114 C8 2115 C7 2116 C8 2117 C8 2119 C6

2120 C8 2123 C7 2124 C7 2127 B8 2128 B7 2134 B8 2137 C7 2140 A8 2142 A7 2143 A7 2144 A7 2145 B8 2146 B5 2147 A7 2150 A7 2151 B5 2152 B5 2153 B7 2156 A7 2157 B8 2158 B5 2159 B7 2161 C8 2162 C8 2164 C8 2165 C8 2166 B8 2167 B8 2168 B8 2195 B5 2196 C7 2198 C4

2217 C6 2220 C6 2221 B7 2222 C7 2223 C6 2224 C6 2225 A8 2226 A8 2228 C6 2252 C6 2253 C6 2254 C6 2260 C6 2261 C6 2262 C6 2263 C6 2264 C6 2265 C7 2266 C6 2267 C6 2268 C7 2269 C7 2270 C7 2274 C7 2275 C7 2276 C7 2277 C7 2278 C7 2279 C7 2300 A6 2301 A6 2302 B7 2308 A6

2311 A6 2318 A6 2328 A6 2335 B5 2336 C3 2337 B3 2338 C3 2340 B1 2343 C1 2351 C1 2352 C1 2353 C1 2354 C1 2355 C1 2365 C1 2370 A5 2372 B5 2375 B5 2376 B5 2383 B2 2433 B2 2435 B2 2437 B2 2438 B2 2446 B2 2447 C2 2499 B1 2520 B2 2521 B2 2522 B1 2523 B3 2524 B1 2530 A6

2541 A7 2557 A6 2558 A6 2559 A6 2560 A6 2562 A7 2563 A7 2564 A7 2565 A7 2566 A6 2570 A4 2572 A4 2573 A5 2574 A5 2583 A4 2628 A3 2640 A1 2641 A1 2642 A2 2643 A3 2644 A3 2645 B2 2646 A2 2647 A2 2648 A3 2649 A2 2657 A3 2662 A3 2663 A3 2799 B8 2800 C3 2802 C3 2803 C3

2810 A8 2816 B8 2820 B8 2821 B8 2823 B8 2829 B8 2831 B8 2834 B8 2870 A8 2874 A7 2879 A8 2881 A8 3001 C8 3002 C8 3003 C8 3004 C8 3005 C8 3006 C8 3008 C8 3009 B3 3010 C8 3011 C8 3012 C8 3013 C8 3014 C8 3015 C8 3016 A5 3040 A8 3041 A8 3042 A8 3043 A8 3044 A8 3050 A8

3051 A8 3071 C8 3072 C7 3073 C7 3074 C7 3075 C7 3076 C8 3077 C8 3078 C8 3079 C8 3080 C8 3081 C8 3082 C8 3083 C8 3084 C8 3085 C8 3086 B8 3087 C8 3088 C8 3089 C8 3090 B7 3091 C7 3092 C8 3093 C7 3094 B8 3095 C8 3096 C8 3097 B8 3098 B8 3099 B7 3100 C8 3101 C7 3102 B7

3103 B7 3104 B8 3105 B8 3106 C8 3107 C8 3108 B7 3109 B7 3110 C8 3111 C7 3112 C7 3113 B7 3114 B8 3115 B7 3116 C8 3117 B8 3118 C8 3119 C8 3120 C8 3121 B8 3122 B7 3123 C8 3124 C7 3125 C8 3126 B8 3127 B8 3128 B8 3129 B8 3130 B8 3131 B7 3133 B5 3134 B8 3135 B8 3136 B8

3137 C7 3138 C7 3139 C7 3140 B8 3141 B8 3142 B8 3144 A6 3145 A7 3146 A7 3147 A6 3148 B7 3149 A7 3150 A6 3151 A7 3152 A7 3153 B6 3154 B7 3155 B7 3156 A6 3157 A7 3158 A7 3159 B6 3160 B7 3161 B7 3162 B5 3163 B8 3164 C8 3165 B7 3166 B5 3170 A6 3171 A6 3172 A6 3173 B7

3174 B7 3175 B7 3176 B7 3177 B7 3178 B8 3179 B7 3180 B8 3181 B8 3182 B8 3183 B7 3184 B7 3186 B7 3188 B7 3189 B8 3193 C7 3194 C6 3195 C7 3200 B5 3203 B5 3204 B5 3205 B5 3209 C5 3210 C5 3213 C6 3214 C6 3215 C6 3216 C6 3217 C6 3218 C6 3219 B5 3220 A8 3250 B7 3251 B7

3260 B7 3261 C6 3262 B7 3263 B7 3271 B7 3274 C8 3275 C6 3276 C7 3277 C8 3278 C7 3279 C7 3284 B6 3285 B6 3286 B6 3289 B6 3290 B6 3291 B6 3292 B6 3293 B6 3297 B6 3298 B5 3299 B6 3304 B6 3305 B3 3306 A5 3308 A6 3309 A6 3310 A6 3311 A6 3318 A6 3319 A6 3320 A6

3321 A6 3323 A5 3324 A5 3328 A6 3329 A6 3330 A6 3331 A6 3333 A5 3334 A5 3336 B3 3337 B3 3338 B3 3339 B3 3340 B1 3346 B1 3351 B6 3352 C1 3353 C1 3354 C1 3355 C1 3359 A6 3363 C3 3364 C1 3365 C1 3366 C1 3370 A5 3371 A5 3373 A5 3374 A5 3375 B5 3376 B5 3377 B5 3378 B5

3379 B5 3380 B2 3381 B2 3382 B2 3383 B2 3385 B3 3386 B3 3387 B3 3389 B3 3390 B3 3391 B3 3392 B3 3393 B3 3394 B3 3397 B3 3398 B2 3401 B2 3402 C2 3404 C2 3406 C2 3410 C2 3413 C2 3414 C2 3415 C2 3424 C2 3425 C2 3426 C2 3427 C2 3428 C2 3429 C2 3448 B1 3449 B1 3451 B1

3452 C1 3453 C1 3460 B1 3461 B1 3462 B1 3463 B1 3464 B1 3483 C2 3484 C2 3485 C2 3486 C2 3487 C2 3488 C2 3489 C2 3496 B3 3502 B1 3503 B1 3506 B1 3510 B3 3512 B3 3519 B3 3520 B3 3536 A5 3540 A7 3541 A7 3542 A7 3543 A7 3544 A7 3545 A6 3546 A7 3547 A7 3556 A1 3557 A6

3558 A6 3559 A6 3560 A6 3570 A1 3571 A4 3572 A6 3573 A6 3575 A4 3580 A4 3581 A4 3582 A4 3583 A4 3610 B3 3611 A4 3625 A3 3626 A3 3627 A3 3640 A1 3641 A1 3655 A2 3657 A3 3658 A3 3660 B8 3667 B6 3668 B6 3679 A3 3687 B3 3710 C3 3720 C2 3730 C2 3740 C2 3750 C2 3760 C2

3809 C3 3810 A8 3811 A8 3814 A8 3836 C4 3837 C4 3879 A8 3880 A8 3900 C3 3905 A6 3906 A6 3907 A6 3909 A5 3913 C1 3914 A1 3915 B1 3918 B5 3919 A5 3920 A5 3922 B1 3924 C1 3925 C1 3926 C1 3927 C1 3928 C1 4008 A1 4011 A1 4146 B8 4152 B8 4158 B7 4200 B5 4201 B5 4202 B5

4203 B5 4215 C6 4216 C6 4381 B3 4500 C1 4572 A5 4574 A5 4654 A2 4659 A2 4871 A8 4872 A8 4873 A8 4874 A8 4875 A8 4876 A8 4890 A8 4891 A8 4892 A8 4893 A8 4894 A8 4895 A8 4896 A8 4897 A8 4898 A1 5089 B8 5090 B8 5140 A7 5161 C8 5164 C8 5166 B8 5167 B8 5170 C8 5175 B7

5180 B7 5196 B5 5197 B5 5198 C4 5199 C5 5210 C6 5214 C6 5221 B7 5222 C7 5223 C6 5224 C6 5226 C6 5228 B5 5300 A6 5302 B7 5350 C1 5352 C1 5520 A2 5524 B1 5541 A7 5570 A4 5572 A5 5574 A5 5628 A3 5642 A2 5643 A3 5644 A3 5646 A2 5647 A2 5648 A3 5649 A2 5810 A8 5820 B8

5834 B8 5870 A7 6001 C8 6010 C8 6071 C8 6076 C8 6091 C8 6105 B7 6166 B8 6200 C5 6201 C5 6202 C6 6203 C6 6204 C5 6205 C5 6206 C5 6207 C5 6208 C5 6209 C5 6210 C6 6214 C6 6274 C8 6276 C6 6278 C7 6302 B7 6315 C1 6316 C1 6317 C1 6318 C1 6319 C1 6321 C2 6379 B5

6322 C1 6323 C1 6324 C1 6353 C1 6354 C1 6355 C1 6356 C1 6357 C1 6365 C1 6366 C1 6378 B5 6379 B5 6388 B3 6393 B3 6399 B3 6508 B3 6509 B3 6551 C1 6552 C1 6553 C1 6554 C1 6555 C1 6710 C3 6711 C3 6720 C2 6721 C2 6730 C2 6731 C2 6740 C2 6741 C2 6750 C2 6751 C2 6760 C2

6761 C2 6770 C8 6771 C8 6774 C7 6775 C7 6778 C7 6779 C7 6782 C7 6783 C7 6786 C8 6787 C8 6790 C8 6791 C8 6820 B8 6821 B3 7006 C8 7010 C8 7040 A8 7041 A8 7074 C7 7075 C7 7079 C8 7080 C8 7084 C8 7085 C8 7088 C8 7089 B8 7090 C7 7100 B7 7102 B7 7103 B7 7104 B8 7105 B8

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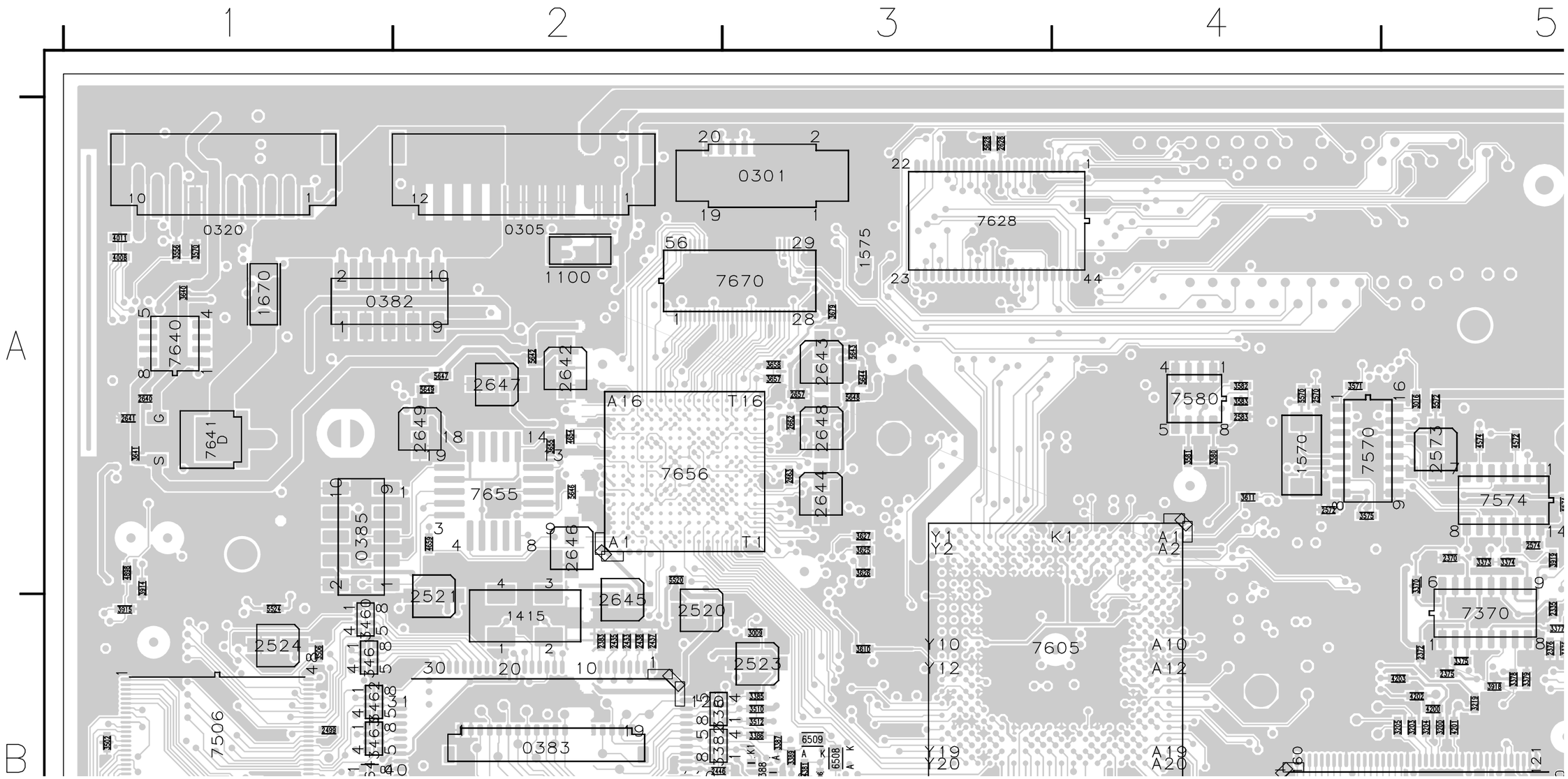
Layout SCAVIO Panel (Part 1 Top Side)



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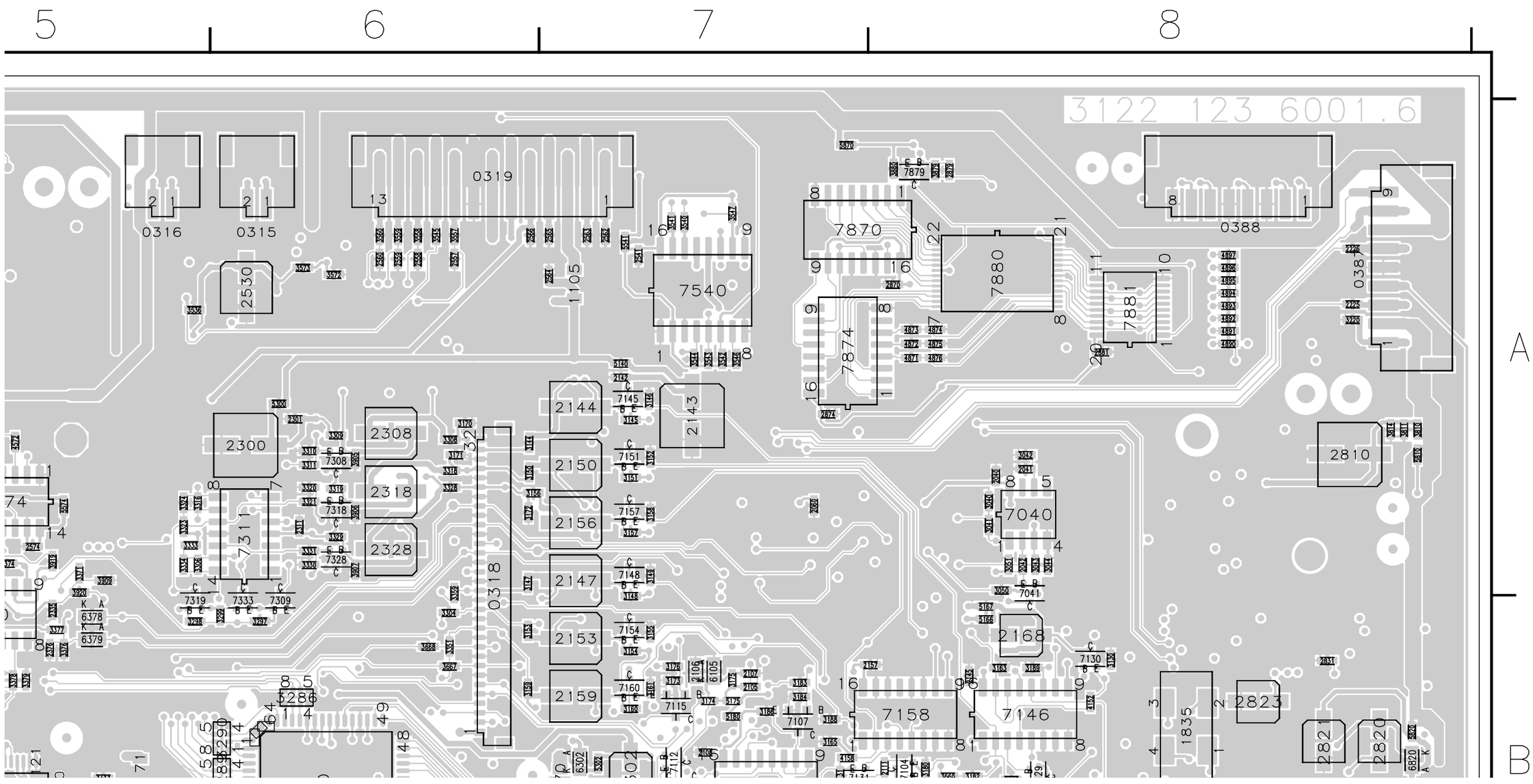
Layout SCAVIO Panel (Part 2 Top Side)



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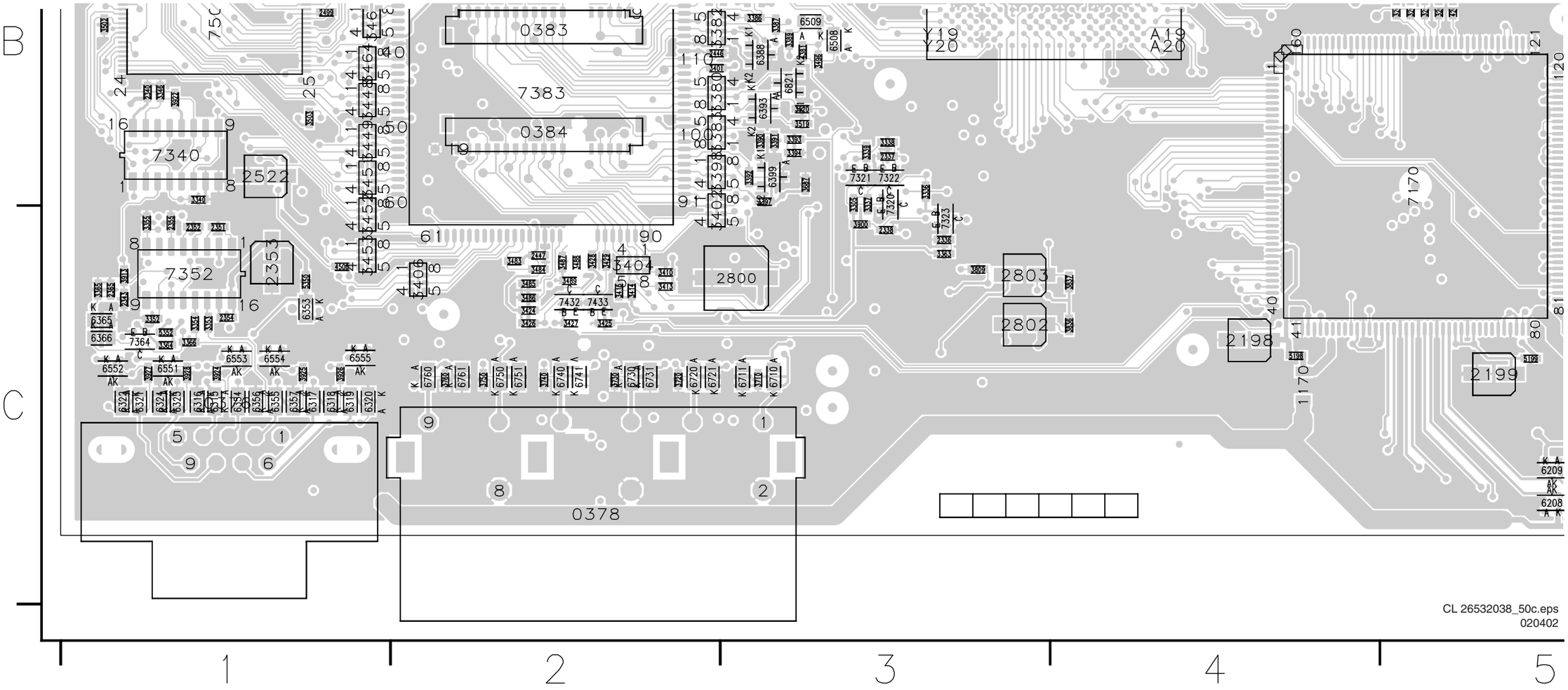
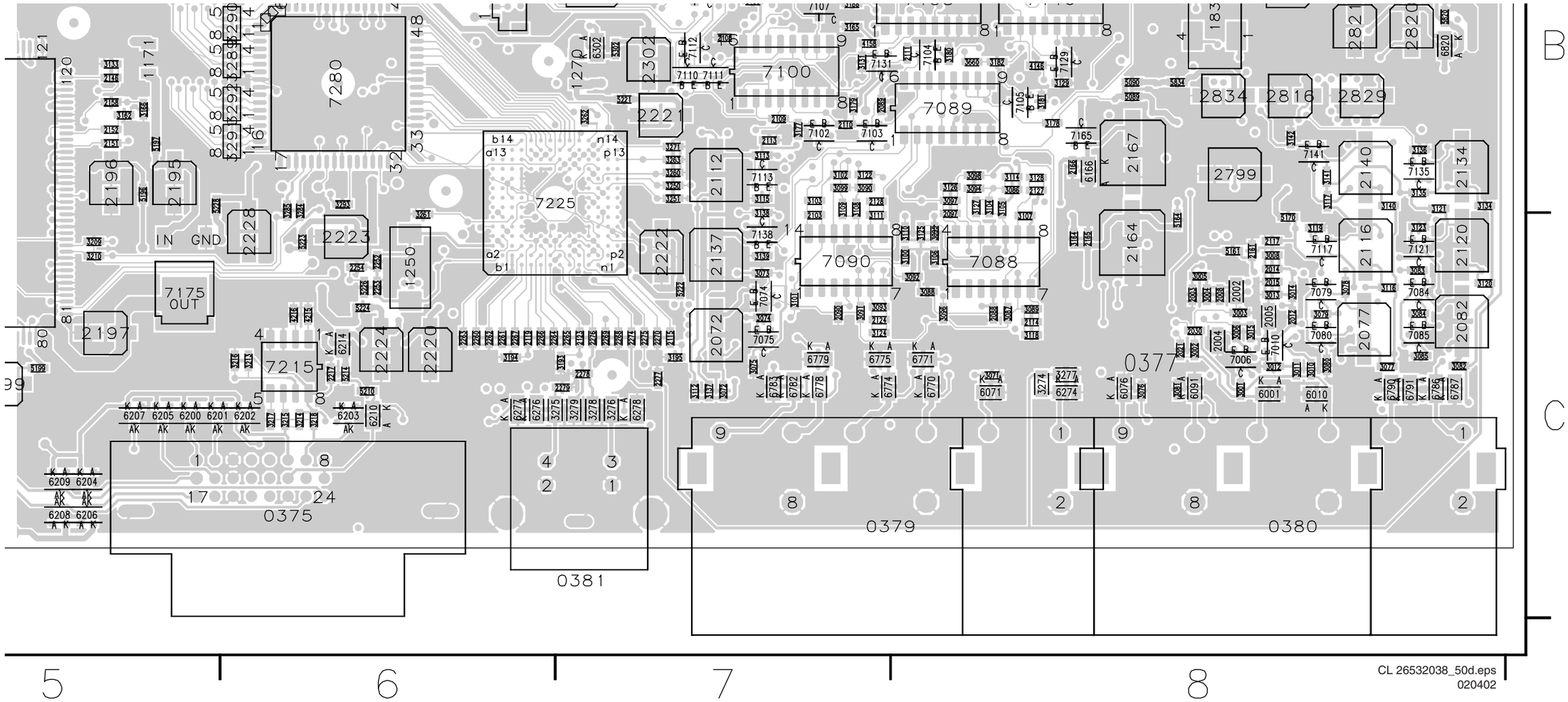
Layout SCAVIO Panel (Part 3 Top Side)



Layout SCAVIO Panel (Part 4 Top Side)



Layout SCAVIO Panel (Overview Bottom Side)

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2001 C1
2007 A2
2009 B2
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2066 A5
2160 B2
2162 B2
2170 C4
2171 C4
2172 C4
2173 C4
2174 B4
2175 B4
2176 B4
2177 B4
2178 B4
2179 C4
2180 C4
2181 B4
2182 C4
2183 C4
2184 C4
2185 C5
2186 B5
2187 B4
2188 B4
2189 C5
2190 C5
2191 B5
2192 B5
2193 B5
2205 B4
2206 B4
2207 B4
2208 C4
2209 C4
2210 C4
2211 C4
2212 B4
2230 C3
2231 C3
2232 C2
2240 B2
2247 B3
2248 B3
2249 B2
2250 B2
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2283 B3
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2285 B3
2286 B3
2287 B3
2288 B3
2304 B2
2305 B2
2306 B2
2310 B2
2341 A8
2345 A8
2356 C8
2381 B7
2382 B7
2415 B7
2416 B7
2418 B6
2419 B6
2420 B6
2432 B7
2434 B7
2436 B7
2439 B7
2448 B7
2500 B8
2501 B8
2502 B8
2503 B8
2504 B8
2505 B8
2506 B8
2511 B7
2513 B7
2515 C8
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2534 A4
2535 A4
2537 A7
2538 A7
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2547 A8
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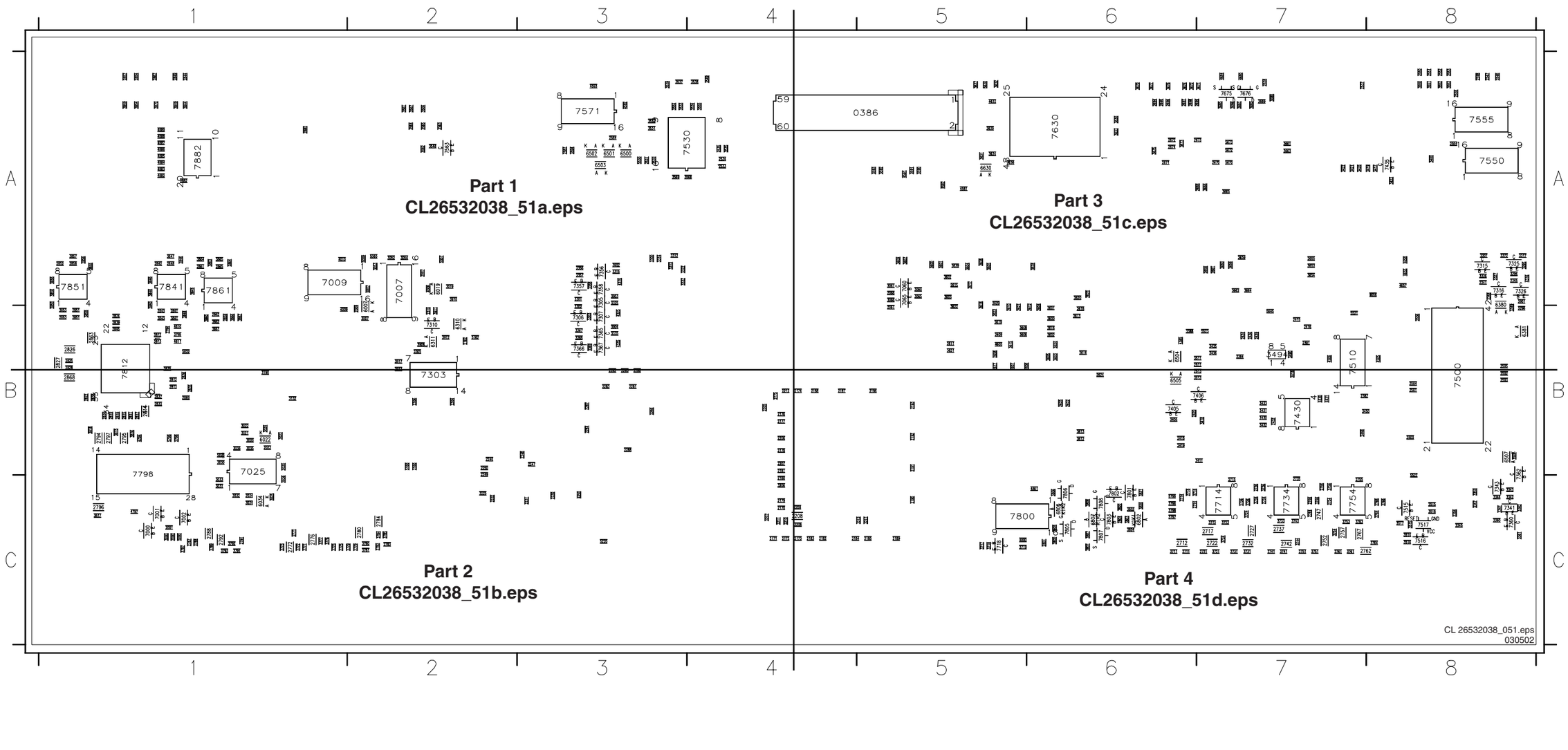
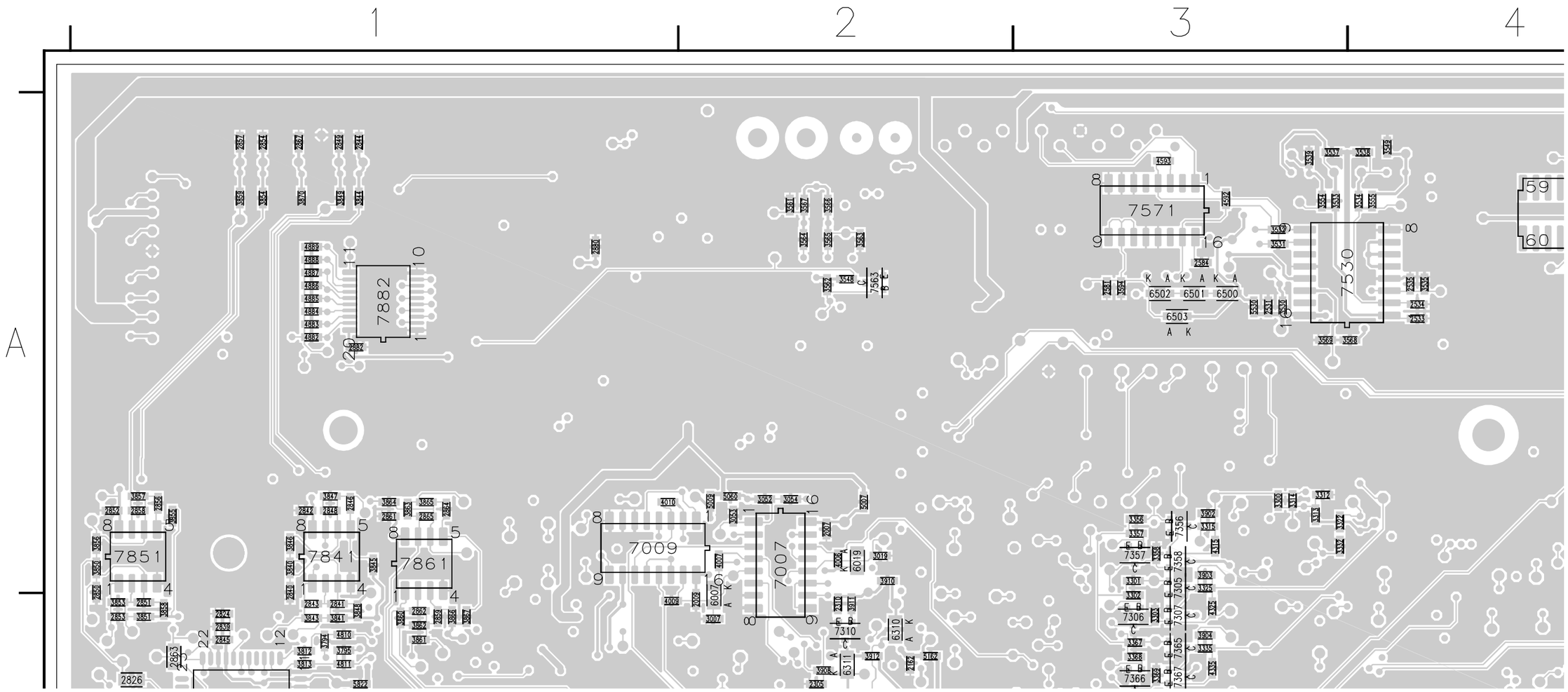


Layout SCAVIO Panel (Part 1 Bottom Side)



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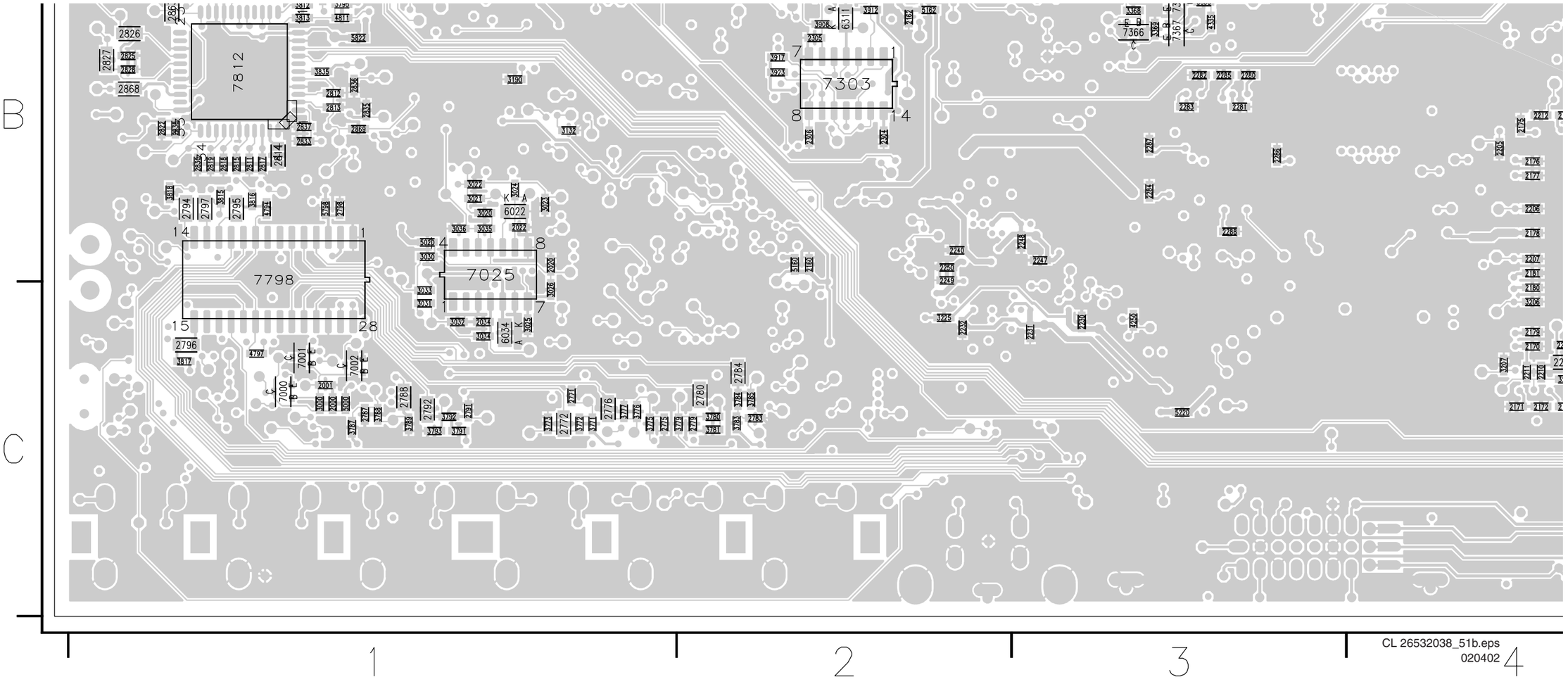
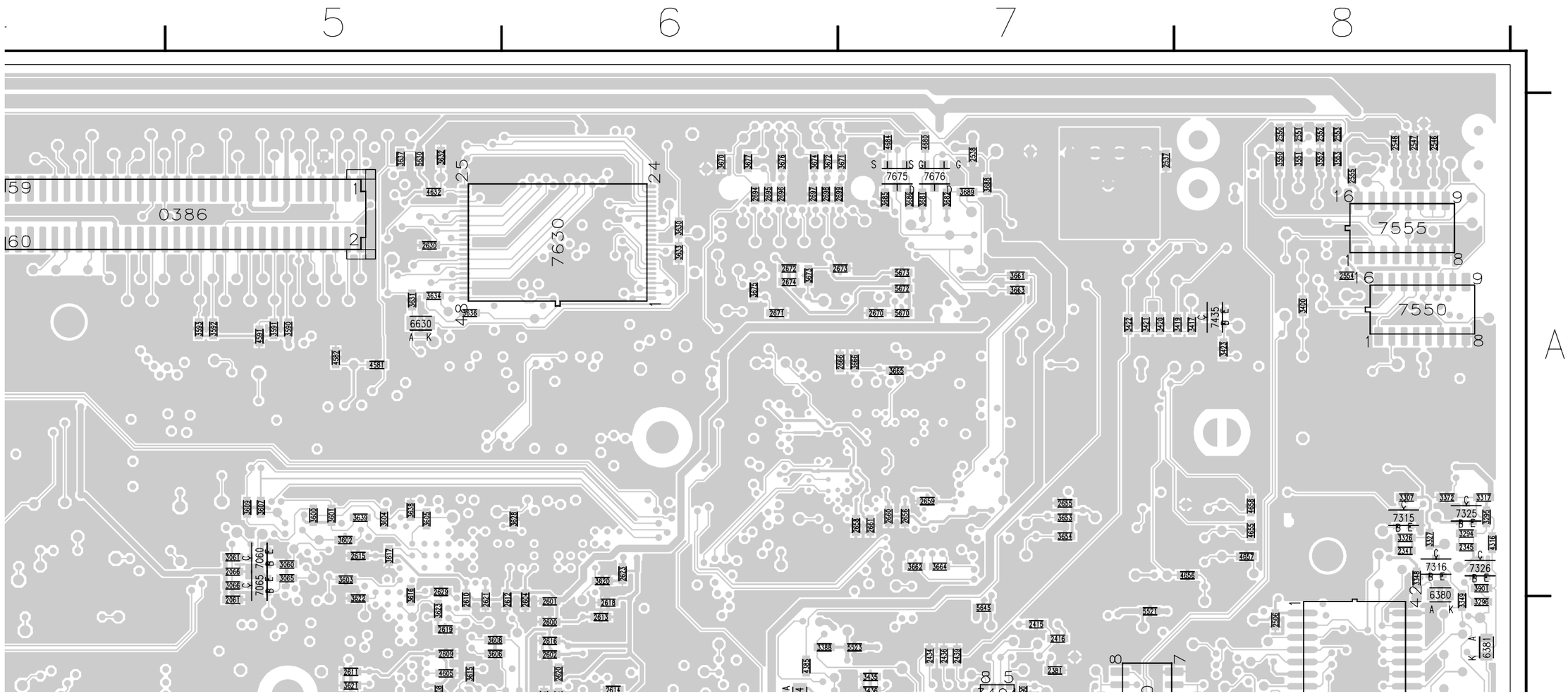
Layout SCAVIO Panel (Part 2 Bottom Side)



Layout SCAVIO Panel (Part 3 Bottom Side)



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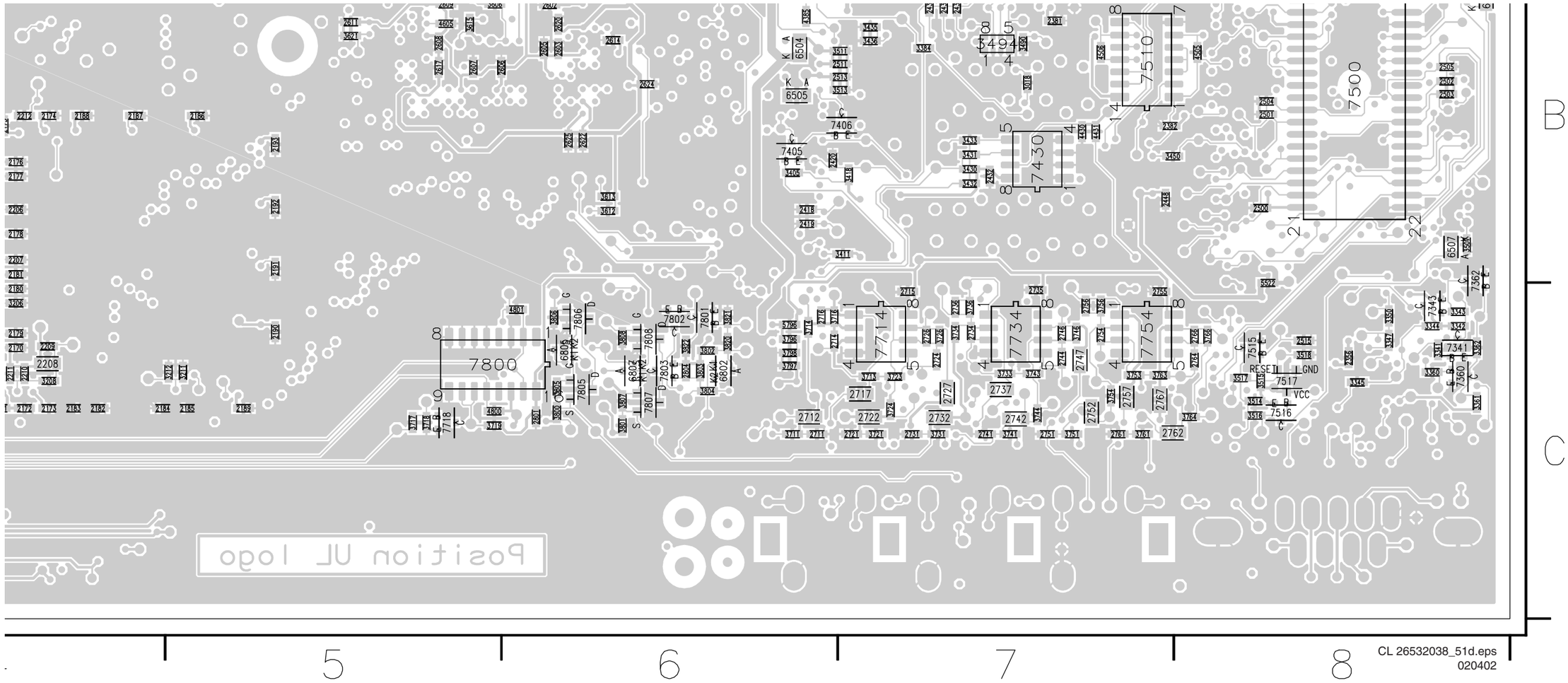
Layout SCAVIO Panel (Part 4 Bottom Side)



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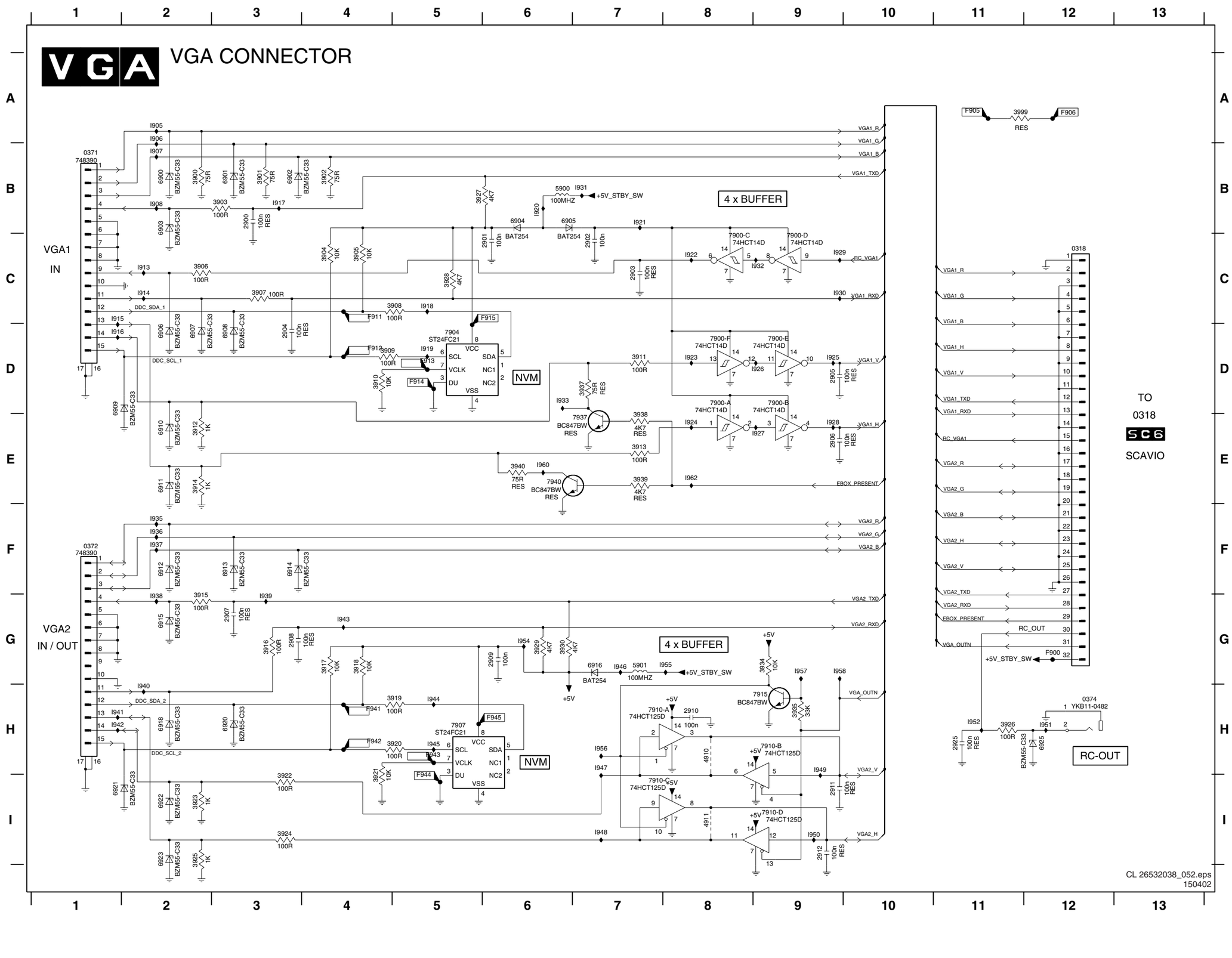
VGA Connector Panel



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2902 C7
2903 C7
2904 D3
2905 D9
2906 E9
2907 G3
2908 G3
2909 G6
2910 H8
2911 I9
2912 I9
2925 H11
3900 B2
3901 B3
3902 B4
3903 B3
3904 C4
3905 C4
3906 C2
3907 C3
3908 C5
3909 D5
3910 D5
3911 D7
3912 E2
3913 E7
3914 E2
3915 G2
3916 G3
3917 G4
3918 G4
3919 H5
3920 H5
3921 I5
3922 I3
3923 I2
3924 I3
3925 I2
3926 H12
3927 B5
3928 C5
3929 G6
3930 G6
3934 G9
3935 H9
3937 D6
3938 E7
3939 E7
3940 E6
3999 A12
4910 H8
4911 I8
5900 B6
5901 G7
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6907 D2
6908 D3
6909 D1
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6913 F3
6914 F3
6915 G2
6916 G7
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6920 H3
6921 I1
6922 I2
6923 I2
6925 H12
7900-A D8
7900-B D9
7900-C C8
7900-D D9
7900-E D9
7900-F D8
7904 D5
7907 H5
7910-A H7
7910-B H9
7910-C I7
7910-D I9
7915 H9
7937 E6
7940 E6
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F913 D5
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F915 D5
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F944 I5
F945 H5
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I916 D1
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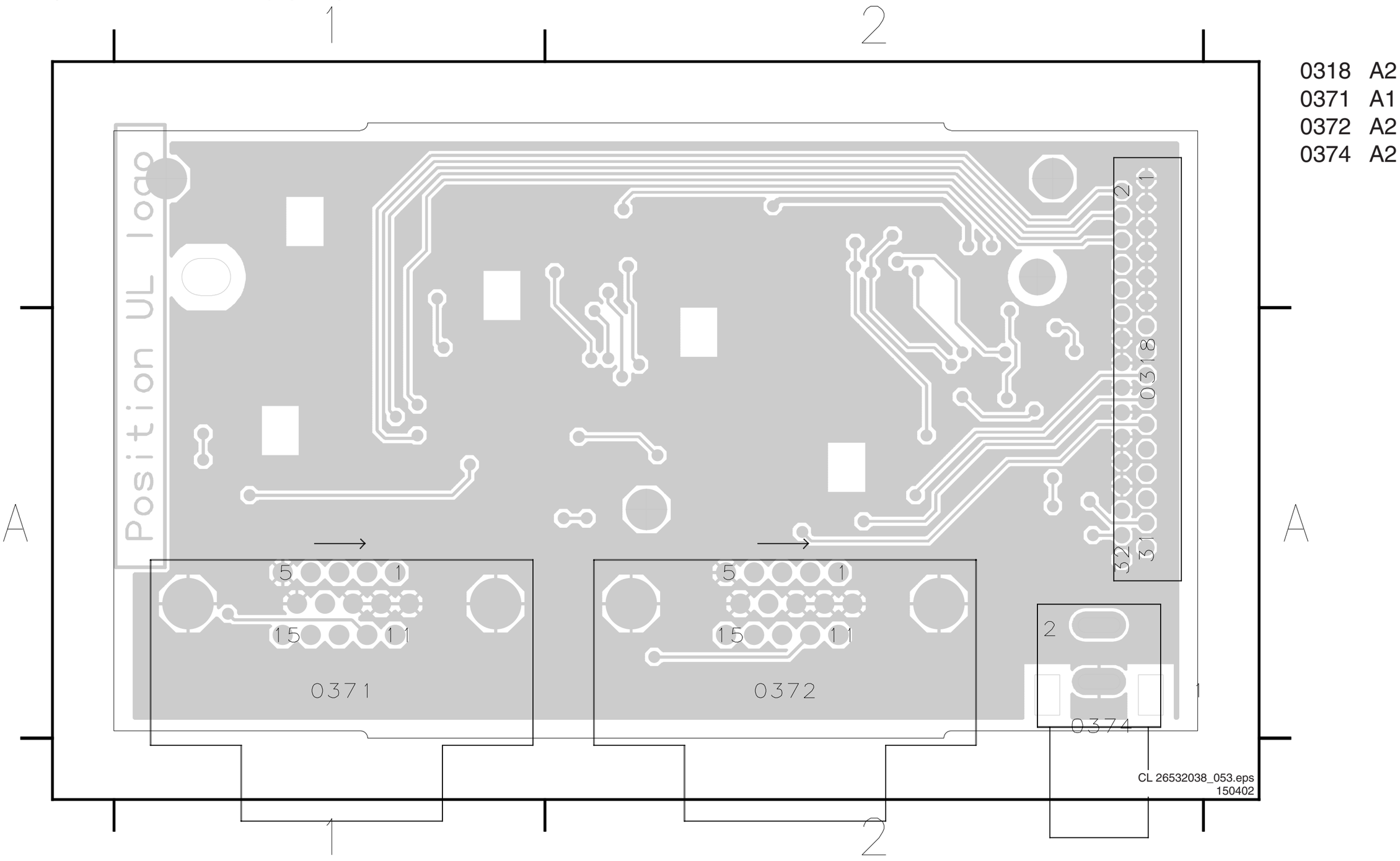
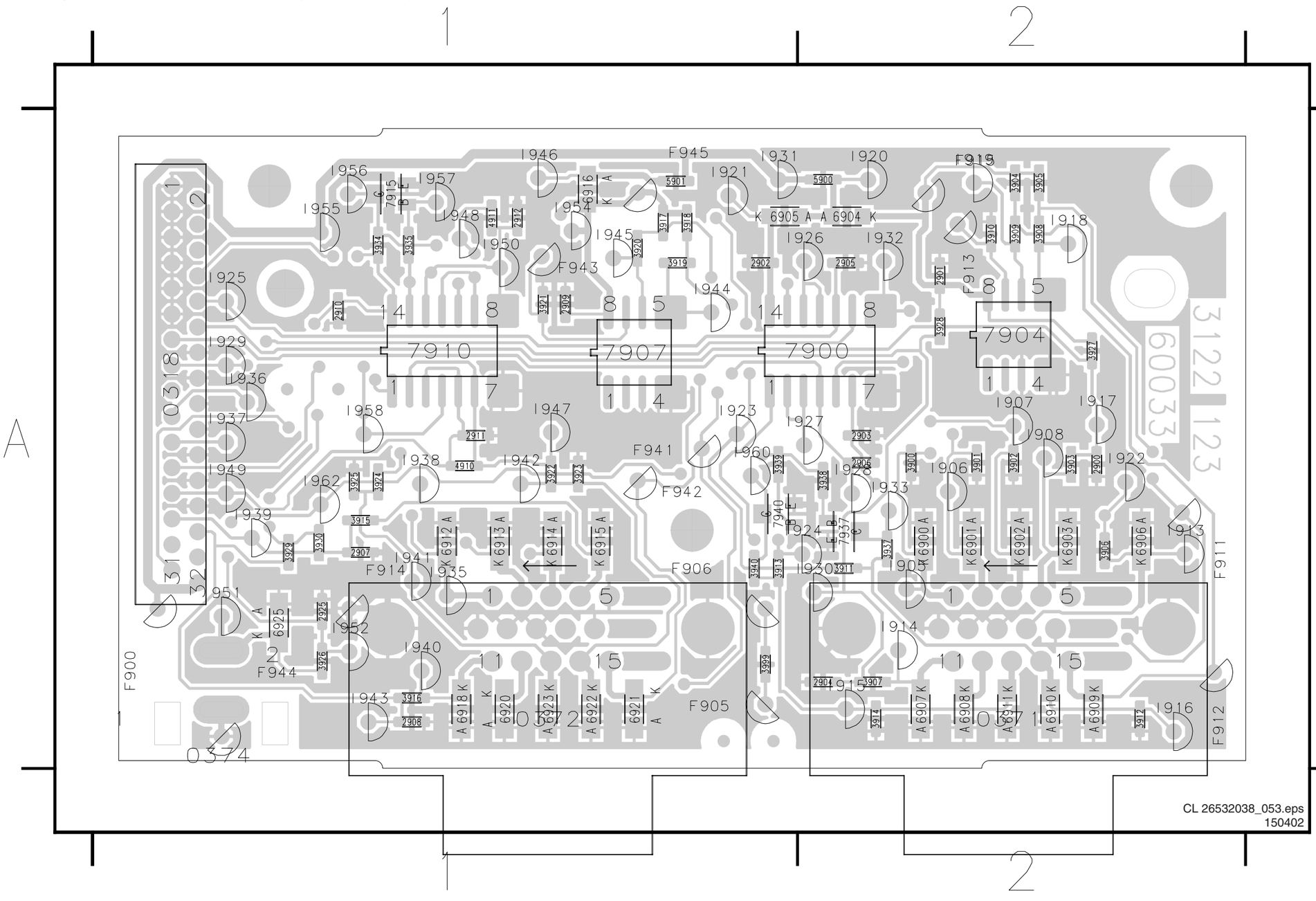
Layout VGA Connector Panel (Top Side)



Layout VGA Connector Panel (Bottom Side)



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2901	A2	3939	A1
2902	A1	3940	A1
2903	A2	3999	A1
2904	A2	4910	A1
2905	A2	4911	A1
2906	A2	5900	A2
2907	A1	5901	A1
2908	A1	6900	A2
2909	A1	6901	A2
2910	A1	6902	A2
2911	A1	6903	A2
2912	A1	6904	A2
2925	A1	6905	A1
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3904	A2	6910	A2
3905	A2	6911	A2
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3914	A2	6922	A1
3915	A1	6923	A1
3916	A1	6925	A1
3917	A1	7900	A2
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3928	A2		
3929	A1		

Personal Notes:

Personal Notes:

8. Alignments

Index of this chapter:
1. General Alignment Conditions
2. Hardware Alignments
3. Software Alignments and Settings

Note: The Service Default Mode (SDM) and Service Alignment Mode (SAM) are described in chapter “Service Modes”.
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: 220 V_{AC} / 50 Hz unless otherwise stated.
- Connect the set to the Mains via an isolation transformer.
- Allow the set to warm up for approximately 20 minutes.
- Measure the voltages and waveforms in relation to chassis ground (with the exception of the voltages on the primary side of the power supply). Never use the cooling fins/plates as ground.
- Test probe: Ri > 10 MΩ, Ci < 2.5 pF.
- Use an isolated trimmer/screwdriver to perform the alignments.

Use a VGA-generator or a Personal Computer (contact your National Service Organisation for the necessary test pattern files) as test pattern generator and connect it to the VGA1 input of the FM242 plasma monitor. When you use a PC, start Microsoft PowerPoint (or Paintbrush), and load the mentioned file. Then display the picture as full screen.

8.2 Hardware Alignments

There no alignments needed, except in care the pdp has been exchanged or the pdp-supply has been exchanged.
In that case the both must be matched.

Voltage Label

8.5 cm

4.0 cm

VS	VA	VSET	VE	VSC			
adjusted	adjusted	adjusted	adjusted	adjusted		->	Adjusted
VSB	3.3SBSW	VCC	D5V	8V6	VFAN		
5.2V	3.3V	3.3V	5.2V	8.6V	9.5V	->	Fixed

VOLTAGE ADJUST DIRECTION

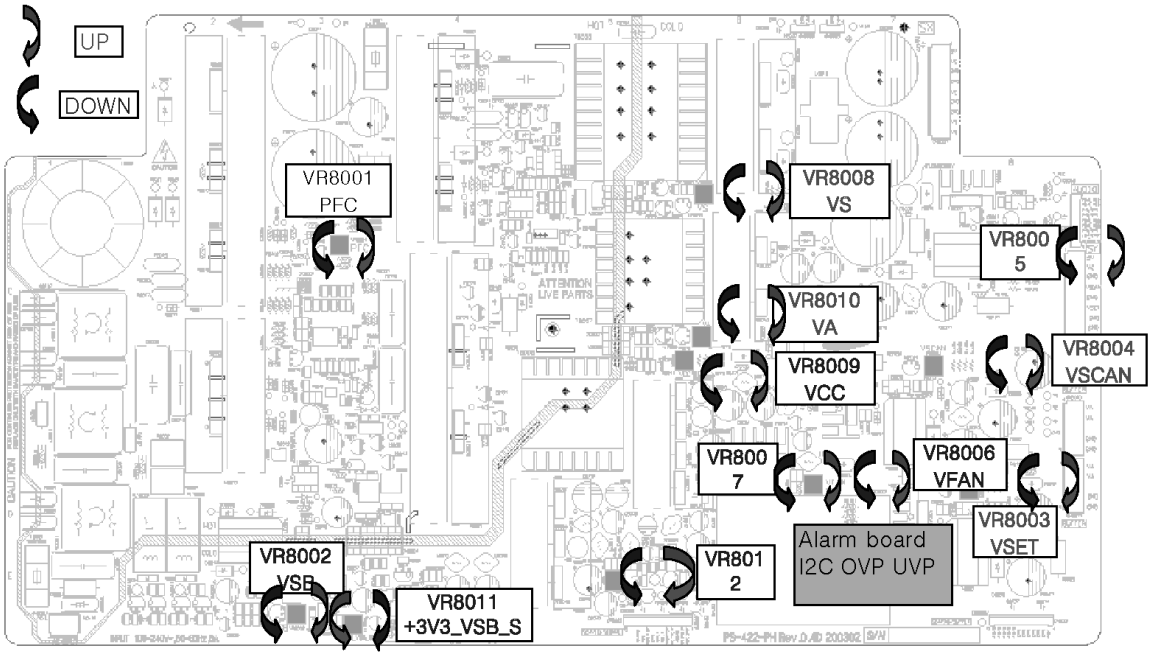

Figure 8-1 Supply Alignment

Procedure:
- See figure above
- The 6 pot meters influencing VSB, 3.3SBSW, VCC, D5V, 8V6, VFAN are not critical for matching. In case of doubt values can be checked versus mentioned voltages.
- The 5 pot meters VS, VA, VSET, VE, VSC have to be matched with the values displayed on the pdp-label.
- Start with aligning pot meter VR8008 to adjust VS and then respectively VR8010 (VA), VR8003 (VSET), VR8005 (VE), VR8004 (VSCAN)
- To double check, repeat whole sequence again, to check right value

8.3 Software Alignments

Enter the Service Alignment Mode (see chapter 5). The SAM menu will now appear on the screen.
Select one of the following alignment menus via the upper horizontal bar:
1. Scaler (Scal.)
2. Video 1 (Vid.1)
3. Video 2 (Vid.2)
4. Options (Opt.)

Note: the last three items are not available in the *Basic* configuration.

8.3.1 General

Table 8-1 SAM Menu 'Gen.'

Service Alignment Menu	General
Type nr. - AG Code	42FD9945/01 **00 00
SW version OTC	AAAAAB-X.Y xxxxx
SW version PW	AAAABC-X.Y xxxxx
SW version EPLD	AAAABC-X.Y xxxxx
Errors 1	xx xx xx xx xx
Errors 2	xx xx xx xx xx
Operational hours	xx
Reset error buffer	Press OK to reset
Store	Press OK to store

Store
Select this item, and press OK, to store the made alignments.

Note: There are several methods to exit the SAM, each with its own characteristics:
- Switch the set 'off' (with the Mains switch or by pulling the Mains cord); new alignment settings are **always** stored, even when item 'store' was not activated!
- Switch the set to 'Standby' by pressing the power button on the remote control transmitter; new alignment settings are **always** stored, even when item 'store' was not activated!
- Use a standard RC-transmitter and key in the code **00**; new alignment settings are **not** stored, except when item 'store' was activated!

8.3.2 Scaler

Table 8-2 SAM Menu 'Scal.'

Service Alignment Menu	Scaler
Test pattern	On / Off
Color temperature	6500K / 8700K / 10000K
White point	Adjust ...
Align ADC	Press OK to execute
Clear user settings	Press OK to clear

The lower 2 menu lines, only are valid when having a VGA-source. (otherwise low lighted)

Test pattern
This function makes it possible to generate a 'colour bar' test pattern (generated by the PW Scaler IC). You can use this picture, to check the video path, starting at the PW Scaler IC to the plasma display.

Colour temperature
Select the appropriate colour temperature for the alignments (see also 'White point' adjustment below).

White Point

Table 8-3 SAM Menu 'Scaler - White Point'

Service Alignment Menu	Scaler - White point
White point red	<----------|----------> 125
White point green	<---------|----------> 100
White point blue	<----------|----------> 110
Press OK when done	

Method 1 (with colour analyser)
1. Supply, via an external VGA source (e.g. a PC with 1024x768 mode, or a VGA generator), a '**White Drive**' test pattern (ask your NSO). This picture consists of a black picture with in the middle a 100% white square.
2. Set BRIGHTNESS to '53' and CONTRAST to '65' (via the standard customer menu).
3. Go to the SAM menu.
4. Set COLOUR TEMPERATURE to '8700 K'.
5. Measure with a CTV colour analyser (calibrated with the spectra) on the centre of the white square on the screen.
6. Select 'White point' in the SAM Scaler menu, and press CURSOR RIGHT.
7. Adjust with the CURSOR UP/DOWN or LEFT/RIGHT command, the three white points Red, Green and Blue to '128' (do **not** go above this value!), and align with one or two of the drivers to the correct coordinates (see table).
8. Repeat the same measurement for respectively colour temperature '6500 K' and '10000 K'.
9. Repeat again if necessary.

Table 8-4 White Point XY-coordinates

Colour Temperature	x	y
5600 K (Cool)	313	329
8700 K (Normal)	289	299
10000 K (Warm)	280	289

Method 2 (without colour analyser)
Without a CTV colour analyser, it is possible to set some parameters, which are based on average values from production.
These values will be communicated in a later stage.

Table 8-5 White point RGB-values

Colour Temperature	R	G	B
5600 K (Cool)			
8700 K (Normal)			
10000 K (Warm)			

Align ADC

1. Supply, via an external VGA source (e.g. a PC, mode 1024x768), the '**ADC alignment**' test pattern (retrieve this file of the NSO). This picture consists of a half black and half white picture: black is 16, and white is 235 on a full scale of 255 (=770 mV).
2. Go to the SAM menu.
3. Select 'Align ADC' in the SAM Scaler menu, and press CURSOR RIGHT.
4. The alignment is performed automatically.

8.3.3 Video 1 (Enhanced version only)

Table 8-6 SAM Menu 'Vid. 1'

Service Alignment Menu	Video 1
Test pattern	On / Off
Brightness	0 <----------|---------- > 255
Contrast	0 <----------|---------- > 255
Sharpness	0 <----------|---------- > 255

Test pattern

This function makes it possible to generate a 'full white' test pattern (generated by the de-interlacer SDA9400, item 7280). You can use this picture, to check the video path of the external inputs AV1, 2 and 3, starting at item 7280

Note: The proper functioning of the Digital Video Decoder SAA7118 is not tested!

Note: To generate the test pattern, it is necessary to feed a signal to one of the AV-inputs. (if not the menu lines are low lighted)

Brightness

This is the setting of IC7225 (SAA7118). Not necessary to align, fixed value is:

- PAL/SECAM: 132
- NTSC: 139

Contrast

This is the setting of IC7225 (SAA7118). Not necessary to align, fixed value is:

- PAL/SECAM: 139
- NTSC: 128

Sharpness

Not necessary to align, fixed value is 6.

8.3.4 Video 2 (Enhanced version only)

Table 8-7 SAM Menu 'Vid. 2'

Service Alignment Menu	Video 2
Lum. delay PAL	0 <----------|---------- > 7
Lum. delay SECAM	0 <----------|---------- > 7
Lum. delay NTSC	0 <----------|---------- > 7

With the 'Luminance delays' alignment, you can place the luminance information on the chrominance information (push brightness onto the colour). Use a colour bar/grey scale pattern as test signal.
These values are normally fixed.

Lum. delay PAL

Apply a PAL colour bar/grey scale pattern as a test signal. Adjust value until the transients of the colour part and black and white part of the test pattern are at the same position. Fixed value is 4.

Lum. delay SECAM

Apply a SECAM colour bar/grey scale pattern as a test signal. Adjust value until the transients of the colour part and black and white part of the test pattern are at the same position. Fixed value is 4.

Lum. delay NTSC

Apply a NTSC colour bar/grey scale pattern as a test signal. Adjust value until the transients of the colour and black & white part of the test area are at the same position. Fixed value is 4.

8.3.5 Options (Enhanced version only)

Table 8-8 SAM Menu 'Opt.'

Service Alignment Menu	Options
Vs/Va control	
Display size	
Virgin	On / Off
ICONN control	On / Off
Fan control	

Virgin

Normally 'off'. When this option is set to 'on', the display starts with the language selection menu.

ICONN control

Normally 'off'. Set this option to 'on' in case a so-called 'ICONN'-box (for Hotel TV) is connected to the display.

Caution: When this option is set to 'on', **without an ICONN-Box** connected to the monitor, one cannot control the monitor anymore (because the RC connection is interrupted).

There are two ways to restore the remote control again:

- Connect pin 8 (IR_TX) to pin 9 (IR_RX) on the RS232 connector of the monitor (the easiest way to do this, is to make a 'dummy' connector with these pins connected, and plug this into the monitor), or
- Set the set in the Service Alignment Mode (SAM) via **shorting jumpers 1 and 2 of connector 0382** on the SCAVIO panel. After this you can enter the appropriate menu to set 'ICONN control' to 'off' again.

9. Circuit Descriptions and List of Abbreviations

Index of this chapter:

1. General
2. Power Supply unit (very limited)
3. VGA connector panel
4. SCAVIO panel
5. Audio Amplifier panel
6. LED/Switch panel
7. Plasma Display Panel
8. Abbreviations
9. IC Block diagrams

Notes:

- Figures can deviate slightly from the actual situation, due to different set executions.
- For a good understanding of the following circuit descriptions, please use the diagrams in chapter 6 and 7. Where necessary, you will find a separate drawing for clarification.

9.1 General

The FM242 is the 3rd generation Philips plasma monitors. Related to the FM242 it is a cost down product. A lower specified pdp is used here (SDI-pdp), however performing still very acceptable. In comparison to the FTV1.9DE, it has:

- The power supply has been exchanged by another supply-panel
- A new SCAVIO panel, which takes over the tasks of the former AVC and LIMESCO panels.
- A new class-D audio amplifier,
- A VGA-resolution pdp. It is possible to use this product as stand-alone monitor or, in combination with the so-called F21R Receiver box, for TV applications.

There are two configurations:

- **Basic:** which has one video input (VGA1) and one video output (VGA2). The VGA2 video output is directly connected to the VGA1 video input, without any processing. The audio output of VGA2 is also directly connected to the VGA1 audio input.
- **Enhanced:** which has six video inputs (VGA1, VGA2, DVI-D, CVBS, YC and HD) and six corresponding audio inputs. These inputs are internally converted to the appropriate signals. The VGA2 connection is here bi-directional (Flex-VGA).

Note: In all descriptions below, the *Enhanced* version of the FM242 is discussed. When there are important differences between the *Basic* and *Enhanced* versions, this is mentioned.

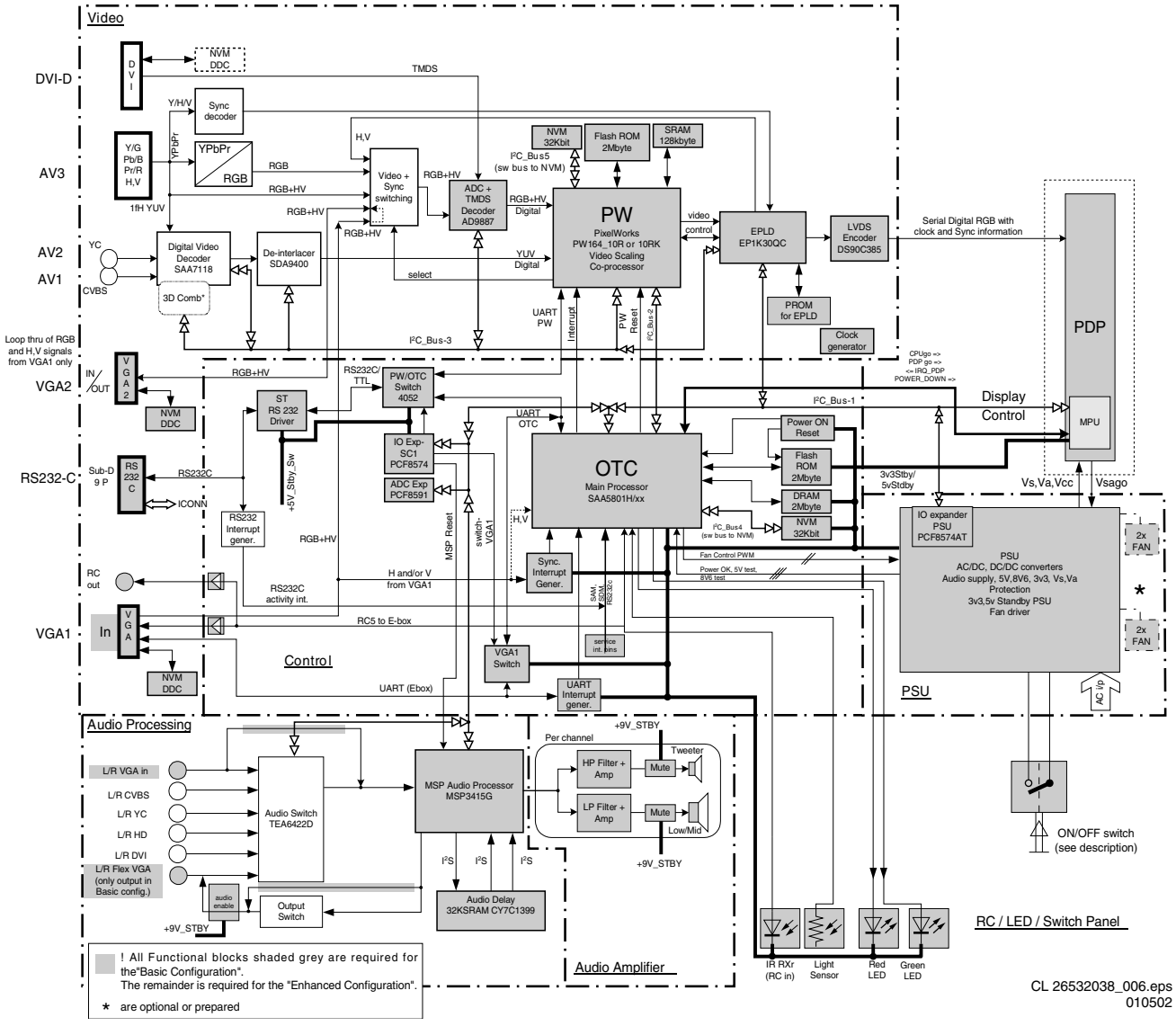

Figure 9-1 Control and Data Path

9.1.1 Input/Output

The main inputs are:

- **Basic:** VGA only,
- **Enhanced:** VGA, Flex-VGA, DVI-D, HD-RGB+HV, HD-2fH-YPbPr (sync on Y), 1fH-YCbCr (sync on Y), YC, CVBS on cinch. Flex-VGA gives the user a choice to configure the 'loop-through VGA output' as an output or as input.

9.1.2 Video

This mainly consists of an analogue processing part and a digital processing part. The video inputs like VGA (*Basic* configuration), CVBS, YC, HD-RGB/YUV (1fH and 2fH) and DVI-D are received and processed.
The VGA signals are first converted to digital signals and then processed by the PW Scaler.

The YPbPr (2fH) signal is discretely converted to RGB, whereas the YCbCr (1fH) signal is processed in the SAA7118 Digital Video decoder.

The base-band video inputs (CVBS and YC) are output from this decoder as digital YUV, which are then further processed by the Pixel Works Scaler (PW).

The signals on the digital DVI input are first decoded by the TMDS decoder inside the AD9887 and then processed by the PW Scaler.

The PW Scaler output is going through an EPLD and then via an LVDS Encoder to the SDI PDP (Plasma Display Panel) as differential serial data. This PDP has a resolution of 852(H) x 480 (V) pixels.

9.1.3 Audio

This mainly hosts the audio inputs for the various video inputs. They go through an I^2C controlled source selector. The main audio processing is done by the Micronas MSP3415G version with built-in UltraBass-II algorithm.

A digital delay line is created using the I^2S channel and SRAM. The delay created can be selected between two values, one for the Receiver box, and one for the Monitor.

The processed audio signals are then differentially transmitted to the audio amplifier panel. This amplifier drives a tweeter and a twin-drive woofer (low/mid range). Active filtering is done prior to the amplifiers.

9.1.4 Control

The main controller is the OTC, referred to as the 'main processor'. This operates in co-ordination with the processor in the Pixel Works Scaler (PW), referred to as the 'co-processor'.

When the FM242 monitor is connected to an F21R Receiver box, the UART commands from the Receiver box will control the monitor.

In stand-alone mode, the monitor can be controlled via the Remote Control or via the RS232C port.

DDC1/2B (Digital Data Channel, an I^2C-based protocol) is implemented with separate identification NVMs for the two VGA inputs and the DVI-D input as well. In addition, the RS232C port can be used for software download to the PW and the OTC. The target for downloading is controlled via a switch in the RS232C path; the switch itself is controlled by the OTC.

9.1.5 Power Supply

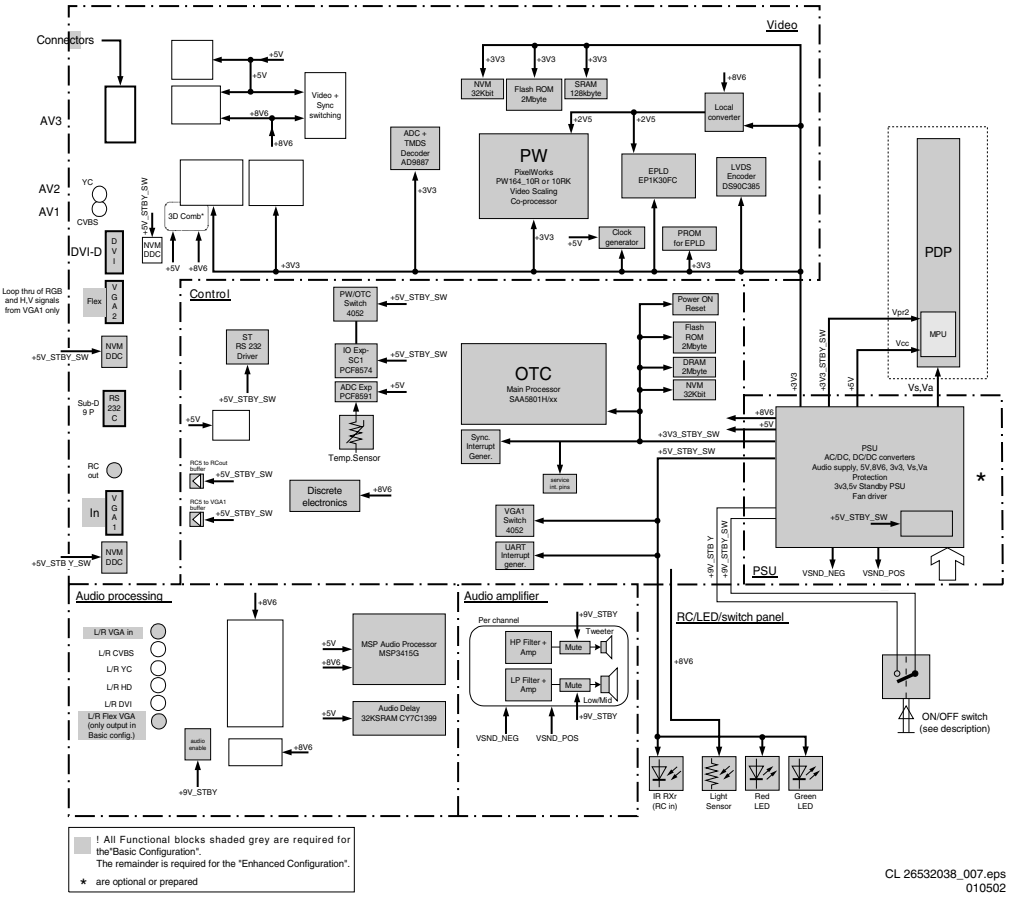

Figure 9-2 Power Supply Path

The PSU consists of a pre-conditioner part and a DC/DC converter part. This converter supplies power to the PDP high voltages, the auxiliary voltages, and the audio amplifier. There is a separate standby power supply, which supplies the Main Processor, PDP microcontroller, interrupt generator and some other circuits.

The mains inlet module will host the inlet and filtering.

There is a functional 'Mains on/off' switch on the LED panel. This switch is on the secondary side, controlling the relays on the primary side.

9.2 Power Supply Unit (Diagrams P)

The Power Supply Unit (PSU) is designed to provide regulated output voltages for the plasma display panel (PDP) and the built-in electronic panels (such as e.g. the SCAVIO and Audio Amplifier panels).
It will house the Pre-conditioner, DC/DC converters and the Standby circuitry. In addition, this panel will house the protection and the (optional) fan drive circuitry.
For Service this supply-panel is a black-box.
When defect (this can be traced via error-codes in the error buffer, or by strange phenomena), a new panel must be ordered, and after receipt, the defective panel must be send for repair.
In that case before sending it, check if the supply-output lines match with the values on the pdp-sticker.

9.3 VGA Connector Panel (Diagram VGA)

The Video Graphics Array (VGA) panel serves as an interface between the peripheral VGA equipment (Receiver box, PC, etc.) and the SCAVIO panel. Some specifications of this panel:

- Two NVMs are present, which hold identification data for the DDC line.
- Further, there are buffers present for the incoming and outgoing sync signals.
- RC_OUT cinch for linking with other equipment.
- Provision to terminate the incoming sync lines with 75 Ω via the EBOX_PRESENT line.

For a description, see the next **SCAVIO** chapter.

9.4 SCAVIO Panel (Diagrams SC)

The Scaler Control Audio Video Input Output (SCAVIO) panel contains:

- All the input connectors,
- Analogue and digital video processing,
- Scaler (co-processor)
- Interface to the PDP,
- Audio processing (excluding the audio amplifier),
- OTC (main processor), and
- RS232C in/out.

Note: There are two versions of this panel, a *Basic* and an *Enhanced* version. Therefore, a lot of components are therefore not mounted for the *Basic* version.

For the circuit description, we divide the board into the following parts:

1. Supply
2. Video processing
3. Audio processing
4. Control

version, VGA2 can be switched as output, via the control

9.4.1 Supply

See figure 'Power Supply Part' in paragraph 9.1.5. (even opletten dat hij goed verwijst)

9.4.2 Video Processing (Diagrams SC3, 4, 5, 6, 10, 11 and 12)

Introduction

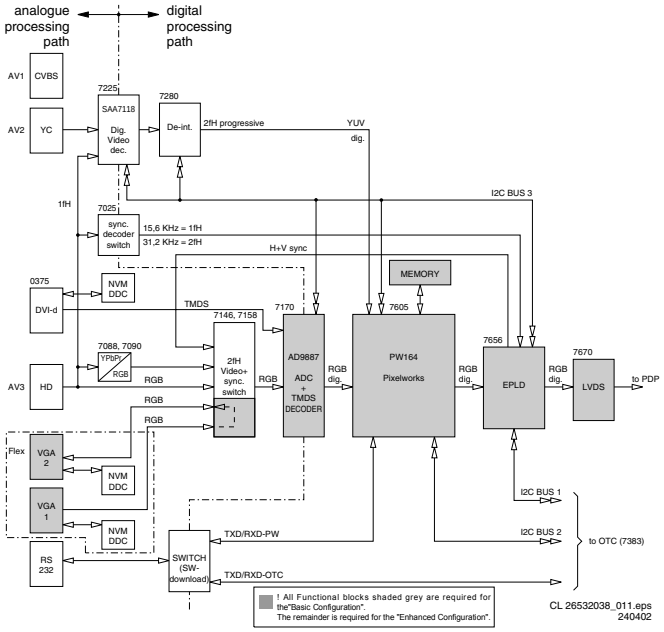

Figure 9-3 Video path

This mainly consists of a small **analogue** processing part and a larger **digital** signal processing part.
The video inputs like CVBS, YC, High Definition RGB, or YUV (1fH and 2fH), VGA, and DVI-D are received and processed.
The YPbPr (2fH) is discretely converted to RGB, whereas the YCbCr (1fH) is processed in the SAA7118 Digital Video decoder. The base-band video inputs (CVBS and YC) are output from the digital video decoder as digital YUV, which are then further processed by the PixelWorks Scaler.
The VGA signals are first AD converted and then processed by the PW Scaler.
The digital input on the DVI is first decoded by the TMDS decoder inside the AD9887 and then processed by the PW Scaler.
The PW Scaler output is going through an EPLD and then via the LVDS transmitter to the PDP (Plasma Display Panel) as differential serial data.

Analogue Video
This part describes the analogue video and synchronisation path of all inputs, until it reaches the 'analogue digital converters' of either the AD9887 (ADC+TMDS Decoder) or the SAA7118E (Digital Video Decoder).
Also the switching part is described and the necessary control signals.
In principle, all video control functions are done by the PixelWorks processor.

Note: This part also includes the VGA connector panel that is mounted on top of the SCAVIO panel.

Inputs
There are five video inputs, which are divided in three types:

- **VGA** (2fH): named VGA1 and VGA2. Both are 15-pole SUB-D connectors for RGB and HV, and are situated on the VGA connector panel. For automatic identification by a PC, each VGA input is foreseen with a DDC NVM IC. VGA2 is set default as loop through of VGA1. In the *Enhanced* signals VGA2_OUT and VGA2_EN.

- **YPbPr/RGB** (combined 2fH and 1fH): named AV3 and suitable for YCbCr/HD-YPbPr/HD-RGB + HV. These are cinch inputs. YPbPr and RGB are seen as separate inputs by the HW and must be properly selected by SW.
- **CVBS like** (1fH): named AV1 for CVBS and AV2 for Y/C. These are also cinch inputs.

Video Path
The 1fH signals (including YPbPr) are buffered (item 7113/21/17) and go directly to a digital video processor, the SAA7118E (item 7225 on diagram SC5), where they are converted into a digital signal.

The 2fH signals are also buffered; both YPbPr (item 7074/84/79) and RGB (item 7141/38/35) buffers get the same input signals.
When YPbPr signals are connected, the correct input must be selected, to get a picture with proper colours. Thus, the signals must pass a video matrix (item 7088/90, see diagram SC3), where they are converted into RGB. There are two matrices, an NTSC and an ATSC. With the MATRIX_SEL signal, the correct matrix is chosen (item 7089). The detection is done automatic, by an algorithm in the EPLD.
After the matrix, the signals enter a clamp/blanking circuit (7102/03/04 and 7100), for the removal of the residual sync signals. The control is done via the lines HD_BLANKN and HD_CLAMPN coming from the EPLD.

All RGB signals come together at 4-pole switches (item 7146/58), one for each colour, where they are switched to the AD converter item 7170 (R_ADC, G_ADC and B_ADC).

Sync Path
All incoming H and V sync signals go to a 4-pole switch (item 7009) where SYNC_SEL and VIDEO_SEL_2 determine, which signal is available on the ADC.
Before this switch, the VGA sync path is rather straight, only 1 switch (item 7007) is added for the VGA2 sync signals, which determines if VGA2 sync is input or output (VGA2_OUT).
In the *Basic* configuration, these switches are omitted, and replaced by jumpers (4009/4010).

The external sync (AV1 - 3) signals are treated differently. Both H_HD_EXT and V_HD_EXT go to three circuits:
- A comparator circuitry with an LM319 (item 7025), to ensure both sync pulses are always positive going (H and V_SYNC_CMP),
- A level detection circuitry (items 7000 to 7002), to detect if the sync is of TTL level (H and V_SYNC_TTL),
- A positive/negative going detection circuitry (items 7006 to 7010), to indicate the polarity of the sync in case of TTL level (H and V_SYNC_POL_N).

All above-mentioned signals go to the EPLD (see also diagram SC11) for further processing.

Processed sync signals H_HD and V_HD coming from the EPLD, are also switched to the ADC (H_ADC and V_ADC) along with the proper RGB signals (R_ADC, G_ADC and B_ADC).

Digital Video
This part describes the digital video path on the SCAVIO panel, starting at the AD converters in either the AD9887 (item 7170) or in the SAA7118E (item 7225) and ending at the output for the PDP.
For both the *Basic* as the *Enhanced* version, everything 'after' the PixelWorks chip, is equal.
For the *Basic* version, the input for the PixelWorks only consists of the 'Graphics path'.
For the *Enhanced* version, it is both the 'Graphics path' as the 'Video path'.

The SCAVIO panel contains the following functions in the video path:

1. The 'YPbPr to RGB matrix' and '2fH Video+Sync Switch' are explained above in the 'Analogue Video' part.
2. The 'Digital Video' path containing the Digital Video Decoder and the De-interlacer.
3. The 'Digital Graphics' path containing the ADC+TMDS decoder.
4. The 'Scaler' which is the PixelWorks (PW164-10R) plus Memory.
5. The 'EPLD' for sync decoding and video manipulation.
6. The 'LVDS' encoder.

The Digital 'Graphics Path'
This is a straightforward application of the Analogue Devices AD9887 (item 7170). Inputs for this device are:
- FTV Receiver box,
- VGA formats (up to SXGA@75 Hz),
- 2fH RGB+HV (only in *Enhanced* version),
- 2fH YPbPr, which is converted to RGB by the 'YUV to RGB' matrix (only in *Enhanced* version),
- DVI-d (only in *Enhanced* version).

Analogue input: The AD9887 is meant to sample 'pixel synchronous'. To achieve this, a (software) driver is running on the PixelWorks processor (PW). After hooking up a source to the AD9887, the PW starts counting the number of lines per field and calculates the H-period time. With these two values, it determines the exact match or the closest match out of a look-up-table (LUT) with VGA standards. When the correct standard is determined, the PW will set the AD9887 I^2C registers to the correct value. The AD9887 should now sample with exact the same frequency as the incoming standard requires. This is done to get an optimal picture performance.
It also is a 'must' when a computer graphics card is connected, because there is no, or very little, post anti-aliasing filtering done on such cards. Therefore, the outputted RGB samples need to be exactly aligned with the sampling of the AD converter.
Analogue input signals can go up to SXGA@75 Hz, which gives a pixel clock of 135 MHz. In fact, it can handle any standard with a pixel rate up to 140 MHz.
Special modes are made for the F21R E-box, for both PAL and NTSC. These are invoked when an E-box is connected to the SCAVIO panel.

Digital input: Via the DVI connector (*Enhanced* version only) it is possible to insert TMDS (Transition Minimised Differential Signalling) data into the SCAVIO panel. DVI is a fairly new computer graphics standard, which can be seen as the digital follow-up of the analogue VGA interface. The TMDS signal is directly fed into the AD9887, where any DVI standard up to SXGA@60 Hz can be decoded to RGBHV.
The preferred VGA standard for the FM242 is programmed in the DDC EEPROM (item 7215), which can be read by the PC. Via an internal switch, it is possible to choose between the analogue input and the digital input. The output format is for both inputs the same (8 bit RGB plus HV). The driver determines whether the AD9887 outputs single or dual pixels. For lower standards like VGA@60Hz, the interface will be single pixel, which means that every clock cycle one byte of R, G, and B data is outputted. Dual pixel means that on every clock cycle two bytes of R, G, and B data outputted. These two bytes are de-multiplexed, which is done to make the interface more robust for jitter, set-up, and hold times, and to reduce the digital data rate over the PCB (reduced EMC).

Digital 'Video Path'
This path is only available in the *Enhanced* version of the SCAVIO panel and is used for the following input signals:
- CVBS input,
- Y/C input, and
- 1fH YPbPr.

It is a straightforward application of the Philips SAA7118 (item 7225) and the Micronas SDA9400 (item 7280).

The SAA7118 is a PAL/NTSC/SECAM Digital Video Decoder with adaptive digital comb filter and component video input. It decodes all input standards to 4:2:2 YCbCr, which then is processed by the SDA9400.

The SDA9400 is a motion adaptive de-interlacer, which makes a progressive video signal from the interlaced input. Depending on the motion in the picture, it will just interleave the odd and even field (no motion: ABAB) or repeats the same field twice; this is also known as line doubling (motion: AABB). The motion detection is pixel based, with a soft-switch between 'motion' and 'no motion'.

After the de-interlacer, the signal is fed as a 4:2:2 YCbCr progressive scan signal to the video port of the PixelWorks processor.

The PixelWorks PW164 Scaler
The PixelWorks PW164 Image Processor is a highly integrated (Ball Grid Array, BGA) chip, which interfaces video inputs and computer graphics in virtually any format to the PDP.

Computer images from VGA to UXGA resolution input to the chip can be resized to fit on the PDP. Horizontal and vertical image scalers, coupled with intelligent frame locking circuitry create sharp images, centred on the screen and without user intervention. An embedded DRAM frame buffer and memory controller perform the frame rate conversion.

Video data from 4:3 aspect ratio NTSC or PAL and 16:9 aspect ratio sources such as HDTV and DVD are supported. Non-linear scaling (only with Receiver Box) and separate horizontal and vertical scalers allow these inputs to be resized optimally for the native resolution of the PDP.

For more information, see *http://www.pixelworksinc.com/index.phtml*

Table 9-1 PixelWorks Scaler: Ports

Pin	Name	I/O	Remark
C2	PW_SCL	+3V3 output	to I2C devices, Video related
B1	PW_SDA	+3V3 output	to I2C devices, Video related
A1	PW_SDA_NVM	+3V3 output	to I2C device NVM
C4	PW_SCL_NVM	+3V3 output	to I2C device NVM
B3	SCL_2	+3V3 output	to I2C device OTC
A2	SDA_2	+3V3 output	to I2C device OTC
A3	VIDEO_SEL_1	+3V3 output	to video selection switches (see truth table)
C5	VIDEO_SEL_2	+3V3 output	to video selection switches (see truth table)
B4	VGA2_OUTN	+3V3 output	Selects VGA 2 as output. (Low => Output)
A4	VGA2_EN	+3V3 output	Enables VGA 2 (High = Enable)
C6	SYNC	Input	Is 'high' if EPLD detects separate sync signals on YPbPr
B5	1_2FH	Input	Is 'high' if sync on YPbPr is 1fH (from EPLD)

Table 9-2 PixelWorks Scaler: Video Select

VIDEO_SEL_1	VIDEO_SEL_2	Selected input for AD9887
0	0	RGB 2fh
0	1	YPbPr 2fh
1	0	VGA 1
1	1	VGA 2

Service remark: Desoldering/soldering of this BGA-ICs requires very specialised (BGA) equipment. This can only be done by the full-equipped service repair workshops. (See also chapter “Safety Instructions, warning and notes”).

The EPLD
The main reason to add the EPLD, is the contrast reserve function. Other reasons:
- **Black and white ADC adjustment.** The EPLD provides a high-resolution measurement of the black and white level, to adjust the gain and offset of the ADC (AD9887). It is read via I^2C.
- **LVDS reset.** This function resets the LVDS transmitter on the SCAVIO board, in case the LVDS transmitter starts up without a clock. This could cause an abnormal picture. Therefore, as soon as the clock is not fast enough (as during start-up) the EPLD will keep the LVDS transmitter in reset.
- **Receiver-box mode detection.** For loop through mode (a second FTV monitor connected to the output of the first monitor), a secondary detection is needed to check the presence of an Receiver or E-box.
- **ATSC sync detection/ decoding.** Core for proper sync decoding for ATSC sources.
- **Contrast reserve.** This function can increase the gain of the video signal to a factor of two. It will reduce the gain again if it sees too many overflows (code 255) in any of the R, G, or B channels. Adjustable via two parameters: user contrast and overflow limit. Parameters are I^2C controlled.

The LVDS transmitter
This DS90C385MTD56 IC from National Semiconductors converts 28 bits of CMOS/TTL data into four LVDS (Low Voltage Differential Signalling) data streams. A PLL transmit clock is transmitted in parallel with the data streams over a fifth LVDS link. Every cycle of the clock, 28 bits of input data are sampled and transmitted. At a transmit clock frequency of 36 MHz, 24 bits of RGB data and 3 bits of display control data are transmitted per LVDS data channel. This IC operates at 3.3 V

For more information, see *http://www.national.com/*

Picture Mute
In some cases, it is necessary to mute the video output:
- In Monitor mode:
  - During switch 'on/off' of the monitor,
  - During source change,
  - During video or sync loss, or
  - By a user action (A/V-mute or mute)
  - In audio only mode (when the ICONN-box is connected).
- In TV mode:
  - During switch 'on/off' of the Monitor/Receiver box,
  - During source change in the Receiver box,
  - During video or sync loss, or
  - In audio only mode (Receiver box mutes the picture).

Most of the picture mute controls are done via the PixelWorks co-processor.

Anti Ageing
In order to prevent visible luminance differences, due to ageing of the monitor, a special algorithm is implemented. This algorithm is based on horizontal shifting of the picture in the

monitor. For good understanding some terms will now first be explained:

- **Ageing:** The effect that the efficiency of a plasma cell (pixel) decreases as a function of the total time that it is illuminated. This effect occurs mostly because of phosphor ageing. As a result, the cell brightness decreases over time. An alternative name for ageing is 'burn-in'.
- **Picture shifting:** Fixed structures, like logo's, OSDs, and subtitles, will cause burn-in effects. The only way to mask this to a certain extends, is picture shifting so that the 'burn-in' effect is smeared out over a larger area, and makes it less visible.

Most of the anti-ageing controls are implemented in the PixelWorks co-processor.

Horizontal

Horizontal anti-ageing steps:

- **Step width/height,** the step width/height shall be 1 horizontal pixel width (approx. 1 mm).
- **Number of steps,** the maximum number of steps in horizontal direction shall be 9.
- **Time between steps,** the time between the steps shall be 5 minutes.

The effect of H anti-ageing is a horizontal movement (start at 0):

$$0 \rightarrow 1 \rightarrow 2 \rightarrow 3 \rightarrow 4$$
$$12 \leftarrow 11 \leftarrow 10 \leftarrow 9 \leftarrow 8 \leftarrow 7 \leftarrow 6 \leftarrow 5 \leftarrow$$
$$\rightarrow 13 \rightarrow 14 \rightarrow 15$$

With the following sequence:
$0 \rightarrow 1 \rightarrow 2 \rightarrow ..... \rightarrow 14 \rightarrow 15 \rightarrow 0 \rightarrow 1 \rightarrow$ etc.

After every step, the updated value is stored in NVM and gives an indication about the direction (0...4 and 13...15 to the right and 5...12 to the left).

The horizontal anti-ageing is a process, which is basically independent of any other processes that are running in SW. This means that this process should never be reset in order to get the best anti-ageing effect. Therefore, the horizontal shift positions and directions need to be stored in NVM, so that he anti-ageing process returns to its latest position after the set has been switched off or to standby. There is only one H and one V shift value for the anti-ageing process that is applicable for the AV1, AV2, and AV3 inputs.

Note: Horizontal shift cannot be done for sources that are screen filling and do not have sufficient overscan.

Vertical

V-shift is done in the F21R Receiver box when the TV mode is active, or in the *enhanced* configuration when the monitor mode is active.

Vertical anti-ageing steps:

- **Height/height,** the height/height shall be 1 display line (approximately 1 mm).
- **Number of steps,** the maximum number of steps in vertical direction shall be 9.
- **Time between steps,** the time between the steps shall be 80 minutes, which equals one complete horizontal ageing shift (16 steps x 5 minutes).

The effect of V anti-ageing is a vertical movement (start at 0):

4
↑ ↓
3 5
↑ ↓
2 6
↑ ↓
1 7
↑ ↓
0 8
↓
9 15
↓ ↑
10 14
↓ ↑
11 13
↓ ↑
12

With the following sequence:
$0 \rightarrow 1 \rightarrow 2 \rightarrow ..... \rightarrow 14 \rightarrow 15 \rightarrow 0 \rightarrow 1 \rightarrow$ etc.

After every step, the vertical shift position and its direction are stored in NVM. So the anti-ageing process returns to its last position after the set has been switched off (or to standby). Also, if by any cause (i.e. VGA-source selection or when service/factory mode is active), the anti-ageing process is stopped; the vertical shift position should be restored after resuming the anti-ageing process.

9.4.3 Audio processing (Diagrams SC13, 14 and 15)

This chapter describes the audio processing on the SCAVIO board. The circuit enables to connect several audio sources, selects the source on the desired input, and performs audio processing and audio delay. It also matches the output signals for the Audio Amplifier panel.
The sound-related electronics for FM242 are very straight forward, and consists of a Micronas MSP3415G sound processor, an active high pass and low pass filter, and separate Class-D amplifiers for woofers and tweeters.

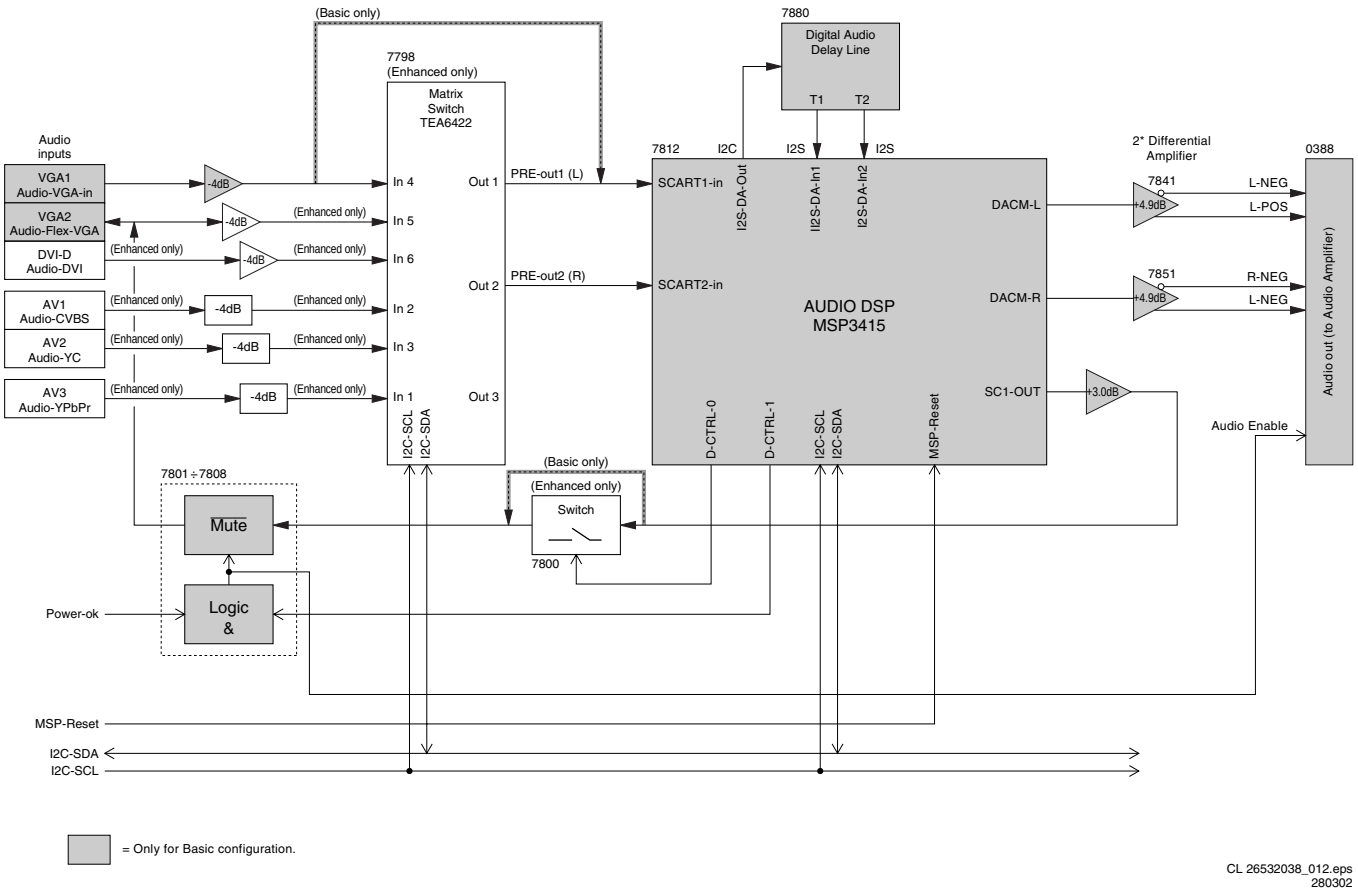

Figure 9-4 Audio Path

The processing part consists mainly of the following components:

- **MSP3415G:** a DSP sound processor from Micronas. This component is able to do all kinds of digital signal processing like volume, bass/treble, UltraBass and balance. It has analogue inputs and outputs, as well as an I^2S in/output used for digital audio delay.
- **RAM** with its logic to be able to store the I^2S information for audio delay.
- **Anti-plop/ mute circuit:** which is necessary to prevent disturbances on the audio lines during start-up or switching.
- **TEA6422:** a matrix switch of ST. This component is able to switch six inputs to three different outputs (only used in the *Enhanced* version).

MSP3415G

Ultra Bass

Because of the closed box implementation in FM242, a common DBE solution will not give an optimal bass performance. A closed box needs a substantial boost over a wide frequency range, while DBE operates in a limited frequency region.

Adaptive Ultra Bass 2 (UB2) is a suitable alternative. This feature is based on the psycho-acoustic effect of the missing fundamental, and gives the impression of a deep bass while the loudspeakers do not reproduce these low frequencies. This feature is implemented in the MSP3415G.

Audio delay

To compensate for 'lip sync error' (the difference in time between the aural and visual perceptions), two different audio delays are selectable via the customer's menu (one for the Receiver box and one for the Monitor).

This is done at the audio processor IC7812 via an I^2S bus and an additional delay circuit (IC7880 - 7882).

One can select delays of 24 ms (I2S_DATA_IN1) and 40 ms (I2S_DATA_IN2), or no delay.

In case of a delay, the AUDIO_L/R_IN is re-routed as I2S_DATA_OUT to the audio delay circuit and, depending on the selected delay, returned as I2S_DATA_IN1 or I2S_DATA_IN2, resulting in AUDIO_L/R_OUT.

Anti-plop/Mute

In several cases, it is necessary to mute the sound output. This muting is handled by the MSP sound processor, or by the Receiver box in case of TV-mode.

- In Monitor mode:
  - During switch 'on/off' of the monitor.
  - During source change.
  - During video or sync loss, or
  - By a user action (A/V-mute or mute).
- In TV mode:
  - During switch 'on/off' of the Monitor/Receiver box.
  - During source change in the Receiver box.
  - During video or sync loss, or
  - By a user action (mute).

9.4.4 Control (Diagrams SC7, 8 and 9)

Introduction

As a main controller, better known as OTC (**O**n screen display, **T**eletext and **C**ontrol). It is a 8051 (XA) based controller from Philips Semiconductors, the SAA5801H.

Although the OTC is the main controller, it acts as a 'slave' when communicating with the PixelWorks IC via the I^2C-bus 2.

When the monitor is connected to an F21R Receiver box, the UART commands from the Receiver box will control the monitor.

In stand-alone mode, the monitor can be controlled via the Remote Control or via the RS232C port.

DDC1/2B (Display Data Channel, an I²C based protocol) is implemented with separate NVMs for the two VGA inputs and the DVI-D input as well.

It is also possible to use the RS232C port for software upload to the PW Scaler and the OTC. The target for downloading is controlled via a switch in the RS232C path; the switch itself is controlled by the OTC.

OTC Processor

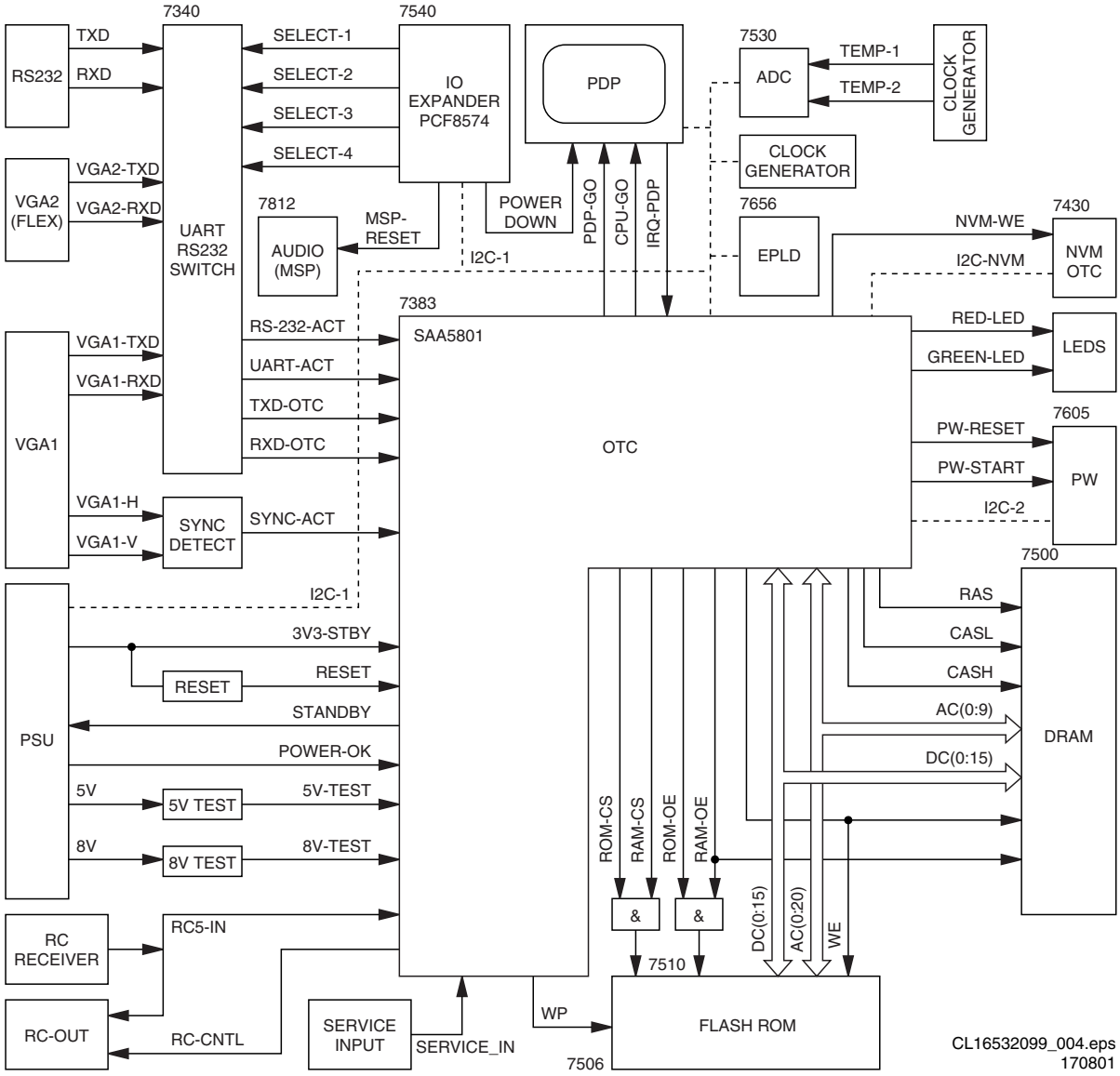

Figure 9-5 Control Part

This part describes the Main Control part of the SCAVIO panel and the interfaces with the software. The control function consists of the following tasks:

- Control of external IOs, like fan speed, temperature, service and RC5,
- UART communication with Receiver box,
- RS232 control / communication,
- Supports the uploading of new SW into the Flash-ROMs,
- Start-up of monitor and initialisation via I²C,
- Error detection and storing.

Start-up and Shut-down

The POR signal is not generated on the PSU, but on the SCAVIO board. This is done with a fully integrated ADM810T POR chip (item 7517), which senses the 3.3 V coming from the PSU. The sense level is 3.08 V. During power-up as well as power-down, this chip will make the RESET signal high. During on pin 100). If the monitor is in standby, and a proper RC power-up, this signal will be held 'high' until 240 ms after V_{CC} has become stable.

During power-down, the system will be reset as soon as the V_{CC} drops below 3.08 V.

Start-up from Standby

When the monitor is in standby mode, it can wake-up in several ways:

- When an RC command is received (RC_IN).
- Detection of H- and/or V-sync on VGA1.
- Detection of UART communication on VGA1.
- Detection of RS232 communication.
- Detection of Service modes.

RC Command Reception

When a RC command is received at the RC receiver on the LED panel, it will go directly to the RC input of the OTC (RC_IN command is send, it will wake up.

The RC commands are routed to the Receiver box via the VGA1 connector pin 9 (RC_VGA1), but this loop through connection is controlled by RC_CNTL. Below is the truth table.

Table 9-3 RC Commands overview

F21REE-box	FM242Monitor	RC commands	RC_CNTL
In Standby	In Standby	Send to E-box	Low
In Standby	On	Blocked	High
On	In Standby	Send to E-box	Low
On	On	Send to E-box	Low

Note: All RC commands are direct available on a separate RC-out cinch connector (RC_OUT) on the VGA connector panel.

H- and/or V-sync Detection
When both H and or V sync are present on VGA1, there is a pulse (low) on SYNC_ACT. When only H is present, SYNC_ACT is continuously low. The SW disables the interrupt, once an interrupt is received.

UART Communication Detection
When there is UART communication on VGA1, the UART detection circuitry generates on every falling edge a pulse on UART_ACT. This is a negative going pulse with a width of ± 470 s. The first pulse will trigger the main software to check for the FTV System Protocol (FSP). The SW disables the interrupt, once an interrupt is received.

RS232 Communication Detection
When an RS232 connection is made, and communication is started (pulses on RS232_RXD), RS232_ACT becomes 'high'. Via a transistor, RS232_ACT will make SERVICE_IN low. When the Monitor is operating (+5 V available), this signal is made low (in fact it is disabled).

Service Mode Detection
It is possible to enter four different Service Modes (provided the OTC is still supplied by the +3V3_STBY).
Via the SERVICE_IN signal, which is an ADC input of the OTC, a voltage drop is detected from +3.3 V to V_X.
V_X is a DC voltage, which represents the mode to be entered:

Table 9-4 Service Mode levels

Service mode	Limits Vx [V]	Vx [V]	Remarks
SDM	3.0 > Vx > 2.4	± 2.6	0382-2 to GND
SAM	2.4 > Vx > 1.8	± 2.0	0382-4 to GND
COMPAIR	1.8 > Vx > 1.2	± 1.4	0382-6 to GND
RS232 active	Vx < 0.8	>0.8	Plug in RS232, start program

I²C

There are four I²C busses used in the monitor (see also I²C overview in chapter 6):

- **I²C bus 1** is a (5 V) device bus, controlled by the OTC, and connected to the following devices:
  - PDP.
  - EPLD.
  - IO expander SCAVIO - PCF8574A.
  - IO expander PSU - PCF8574A.
  - ADC - PCF8591.
  - Clock generator for PW - FS6377.
  - Sound processor MSP3415G.
  - Audio switch TEA6422 (*Enhanced* version only).
- **I²C bus 2** is used for communication with the PixelWorks co-processor (PW). Although the OTC is the main controller, it will act in this case as a 'slave', since the PW can only act as a 'master'. Before any I²C commands are exchanged, the PW gets an interrupt (PW_START) to indicate that the OTC wants to talk to the PW.
- **I²C bus 3** is a (5 V) device bus, controlled by the PW, and connected to the following devices:
  - Video Decoder SAA7118 (*Enhanced* version only).
  - De-interlacer SDA9400 (*Enhanced* version only).
  - ADC/TMDS receiver AD9887.
  - 3D Comb filter MN8783LSI (optional).
- **I²C bus 4** is a (5 V) device bus, only connected to the NVM (to avoid data corruption).

Notes:
- The PDP and EPLD are in fact 3.3 V bus devices, but they need to be connected to bus 1, since the OTC is the first controller to be fully operating at start-up. For this reason, an I²C level shifter (items 7675/76 on diagram SC12) is included, which converts the 5 V signals into 3V3 and visa versa.
- One of the first commands is to set the clock generator (item7570), else the PW can not start-up.

RS232/UART

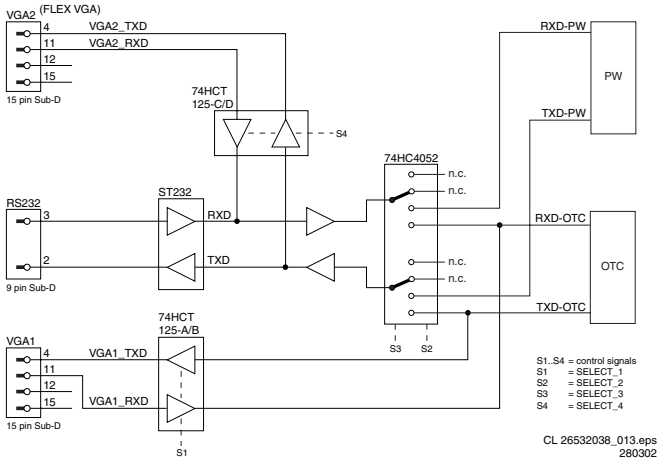

Figure 9-6 RS232/UART

Introduction
The FM242 monitor is equipped with an RS232 interface. Via a 9 pin Sub-D connector, it is possible to connect a PC for special modes like:
- SW download.
- Factory purposes.
- Service.
- Professional use.

A second option is the connection of a so-called ICONN-box for Institutional TV (Hotel TV).

For communication with the Receiver Box, UART is used, because this protocol can handle longer cable distances than I²C. The (Receiver box) UART is interfaced via a 15 pin Sub-D connector (VGA connector). Via this UART connection, the F21R Receiver box and the FM242 Monitor can communicate (via FSP). By doing so, the monitor will know that there is an Receiver box connected and thus it is operating as a TV configuration.

RS232/UART Control
The OTC (SELECT_1 to 4) controls the RS232/UART switches. When the monitor is in Receiver box mode, there is no RS232 communication possible. The monitor is default set in Receiver box mode (switch to n.c. position) and the UART from/to VGA1 is enabled, to allow communication with Receiver box.
If no Receiver box is detected, the UART is disabled to ensure that there will be no communication towards the OTC, and the switch is set to OTC. Below the truth table of the switches is shown, which determine the TXD/RXD path.

Table 9-5 RS232/UART Control

S1= SELECT_1 (P0)	S2 = SELECT_1 (P1)	S3 = SELECT_1 (P3) (3)	S4 = SELECT_4 (P4) (4)	UART VGA1 (E-box)	UART VGA2 (flex)	RS232 set to OTC (1)	RS232 set to PW (2)
0	0	0	0	0	0	0	0
0	0	0	1	0	0	0	0
0	0	1	0	0	0	0	0
0	0	1	1	1	0	0	0
0	1	0	0	0	0	0	0
0	1	0	1	0	0	0	0
0	1	1	0	0	0	0	0
0	1	1	1	1	0	0	0
1	0	0	0	0	0	0	0
1	0	0	1	0	0	1	0
1	0	1	0	0	1	0	0
1	0	1	1	0	0	0	0
1	1	0	0	0	0	0	0
1	1	0	1	0	0	0	1
1	1	1	0	0	1	0	0
1	1	1	1	0	0	0	0

(1) Software download or ComPair mode.
(2) Software download or Debug mode.
(3) When S3 = 1 the 74HCT4052 is in a tri-state ('off' state).
(4) When S4 = 0 the TXD out of RS232 is disabled (S4 may not become low in any other case).

UART Detection
When the VGA1_RXD line is continuously 'low', the OTC might run slow due the fact that so-called 'break' signals are generated. To prevent this, a small circuitry is added to detect whether VGA1_RXD is continuously 'low' (item 7310).
When the VGA1_RXD line is 'low' for about 20 ms, the buffer-switch (item 7303-A) is opened. After this buffer, a second discrete buffer is placed (items 7315/16), which keeps the RXD_OTC line 'high' and changes the 5 V into a 3.3 V level.

ICONN-box
For application of a Flat TV in a hotel environment, the monitor is designed to operate with a so-called ICONN-Box. The ICONN-box will take over the user control of the monitor, by intercepting the RC5-commands coming from a dedicated RC-transmitter, which sends specific hotel-mode commands and sending its own RC-commands to the microprocessor in the monitor.
So in the ICONN-Box, the hotel-mode commands will be converted to RC5-commands, which than can be interpreted by the monitor.
When connected to the RS232 input, this box takes over the control of the IR-receiver in the monitor. It is also able to control the front LED. The switches (7550 for the IR and 7555 for the LED signals) are controlled by the ICONN_NOT signal.

The ICONN-Box shall interface the Monitor with the following signals:
- **IR-RX.** These are the RC5-commands coming from the specific hotel RC5 - transmitter, which are received via the RC5-receiver of the monitor.
- **IR_TX.** These are the RC5-commands generated by the ICONN-Box and send to the monitor.
- **RL_ICN.** Control signal from the microprocessor (of the monitor), indicating the power state of the monitor. The ICONN-Box and monitor LED are driven in parallel.
- **GL_ICN.** Control signal from the microprocessor (of the monitor), indicating the functionality of the monitor, to drive the LED on the ICONN-Box.
- **LD_ICN.** Control signal from the ICONN-Box to drive the green LED on the monitor.

9.5 Audio Amplifier Panel (Diagram A)

9.5.1 Introduction

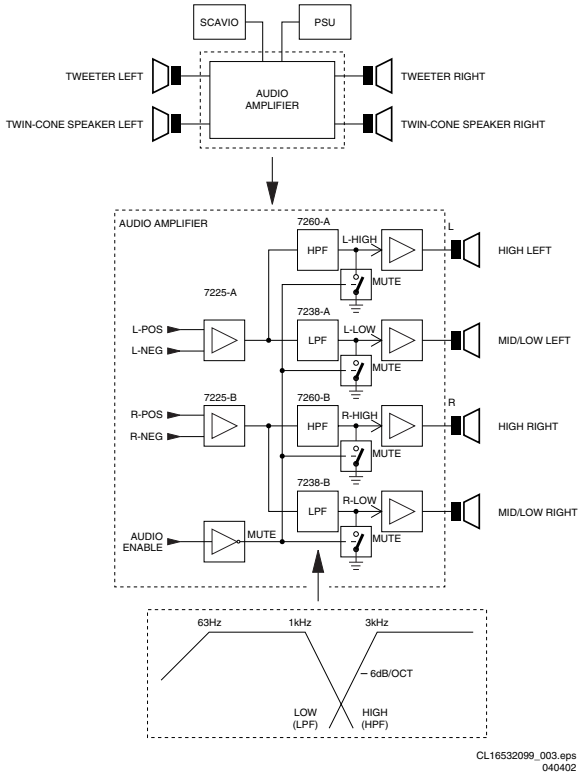

Figure 9-7 Blockdiagram Audio Amplifier

This panel houses the audio filters and amplifiers necessary for driving the speakers. The differential audio inputs (for common mode immunity) come from the SCAVIO panel (via connector 0388).
The PSU delivers the positive and negative supply voltage of 14.5 V_{DC}, as well as the +9V_STBY voltage.
After being filtered and amplified, the signals go to the speaker section, where the (twin cone) low/mid range speakers and the tweeters are driven (load impedance is 8 Ω).

9.5.2 Supply (Diagram A7)

The supply voltage is a symmetrical voltage of +/- 14.5 V_{DC}, generated by the main supply via L5002.
- V_{SND_POS} (+14.5 V_{DC}) on connector 0302 pin 5/6, and
- V_{SND_NEG} (-14.5 V_{DC}) on connector 0302 pin 1/2.

9.5.3 Filter (Diagram A2)

Electrical filtering is needed for following reasons:
- Limiting the cone excursion, thereby reducing the distortion.
- Increasing the power handling capacity (PHC).

In the FM242, active second order Sallen-Key filters are used, with crossover frequencies of 1 kHz for the lowpass filter, and 3 kHz for the highpass filter.

The audio signals are filtered **before** the amplifier. There are some reasons for doing this:
- It is now easy to do active filtering, and

- At less costs (no expensive coils and capacitors).

Low Pass Filter (LPF)
For L and R separately, a Low Pass Filter (IC7238A and B) is processing L_LOW and R_LOW.
The output signal of this filter is then fed to the audio amplifier (identical for right channel).

High Pass Filter (HPF)
For L and R separately, a High Pass Filter (IC7260A and B) is processing L_HIGH and R_HIGH.
The output signal of this filter is then fed to the audio amplifier (identical for right channel).

9.5.4 Amplifier (Diagrams A3 to A6)

Each speaker has its' own 15 W class-D amplifier. These amplifiers combine a good performance with a high efficiency, resulting in a big reduction in heat generation.

Principle
Audio-power-amplifier systems have traditionally used linear amplifiers, which are well known for being inefficient. In fact, a linear Class AB amplifier is designed to act as a variable resistor network between the power supply and the load. The transistors operate in their linear region, and the voltage that is dropped across the transistors (in their role as variable resistors) is lost as heat, particularly in the output transistors. Class D amplifiers were developed as a way to increase the efficiency of audio-power-amplifier systems.

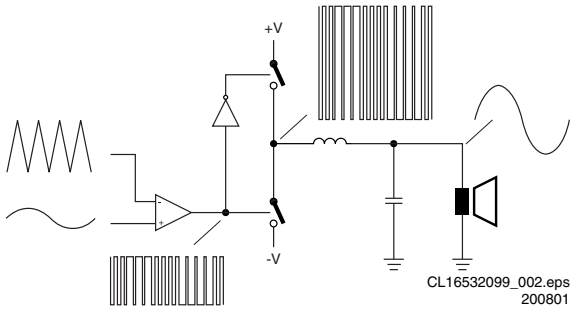

Figure 9-8 Principle Class-D Amplifier

The Class D amplifier works by varying the duty cycle of a Pulse Width Modulated (PWM) signal.
By comparing the input voltage to a triangle wave, the amplifier increases duty cycle to increase output voltage, and decreases duty cycle to decrease output voltage.
The output transistors (item 7365 on diagram A3) of a Class D amplifier switch from 'full off' to 'full on' (saturated) and then back again, spending very little time in the linear region in between. Therefore, very little power is lost to heat. If the transistors have a low 'on' resistance ($R_{DS(ON)}$), little voltage is dropped across them, further reducing losses.
A Low Pass Filter at the output passes only the average of the output wave, which is an amplified version of the input signal. In order to keep the distortion low, negative feedback is applied (via R3308). A second feedback loop (via R3310) is tapped after the output filter, in order to decrease the distortion at high frequencies.

The **advantage** of Class D is increased efficiency (= less heat dissipation). Class D amplifiers can drive the same output power as a Class AB amplifier using less supply current.
The **disadvantag**e is the large output filter that drives up cost and size. The main reason for this filter is that the switching waveform results in maximum current flow. This causes more loss in the load, which causes lower efficiency. An LC filter with a cut-off frequency less than the Class D switching frequency (350 kHz), allows the switching current to flow through the filter instead of the load. The filter is less lossy than the speaker, which causes less power dissipated at high output power and increases efficiency in most cases.

9.5.5 Mute (Diagram A2 to A6)

A mute switch (item 7302) is provided at the PWM inputs (item 7315, LM311). This switch is controlled by the AUDIO_ENABLE line, which checks the availability of the +9V_STBY voltage.

9.5.6 Protections

Short-circuit Protection (Diagram A3)
A protection is made against a too high temperature of transistor 7355 in case of a short-circuit of output FET 7365-1. Transistor 7340 is sensing the current through transistor 7355 via R3355, and activates the DC-protection line (see below) in case the current becomes too high. This is the same for all four amplifier parts.

DC-protection (Diagram A7)

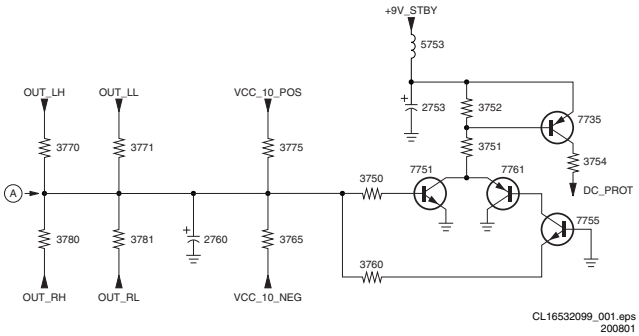

Figure 9-9 DC Protection

Because of the symmetrical supply, a DC-blocking capacitor, between the amplifier and the speaker, is not necessary. However, it is still necessary to protect the speaker for DC voltages.
The following protections are therefore implemented:
- Via R3765 and R3775, each stabilised supply voltage line (via items 7735 and 7745) is checked on deviations.
- Via R3770/3771/3780/3781, each amplifier output is checked for DC-voltage.

Via R3765/3775, a virtual earth is imposed on point A. When one of the supply voltages deviates, a DC voltage will occur on this point. If point A is positive, T7751 will conduct. If it is negative, T7761 will conduct.
Both cases will make T7735 conduct, so that the DC-PROT signal will be made high. This ensures that the power supply is rapidly trimmed back.
Capacitor C2760 will ensure that only DC-signals at point A will activate the protection.

9.6 LED/Switch Panel (Diagram LD)

This panel contains:
- The red and green status LEDs,
- The RC input receiver,
- The light sensor, and
- The 'on/off' switch.

All signals on this panel come directly from the SCAVIO panel:
- The LED and sensor signals (RED_LED, GREEN_LED and LIGHT_SEN_IN) are routed to the OTC. When a F21R Receiver box is connected, the sensor signal is routed to the OTC of this box (via UART), where it will control the HOP via I^2C.

- The RC signal (RC_IN) is routed to the OTC, the VGA1 connector, and the RC-out cinch connector.
- The signals to (+9V_STBY) and from (+9V_STBY_SW) the 'on'/'off' switch are routed to the PSU board.

9.7 Plasma Display Panel (PDP)

9.7.1 General

The PDP, which is used in the FM242, is a product of SDI (Samsung Display Industry) . When defect, a new panel must be ordered, and after receipt, the defective panel must be send for repair in the packing (flight case) of the new ordered panel.

9.7.2 Operation

Principle

Plasma displays work by applying a voltage between two transparent display electrodes on the front glass plate of the display. The electrodes are separated by an MgO dielectric layer and surrounded by a mixture of neon and xenon gases. When the voltage reaches the 'firing level', a plasma discharge occurs on the surface of the dielectric, resulting in the emission of ultra violet light.

This UV light then excites the phosphor material at the back of the cell and emits visible light. Each cell or sub-pixel has red, blue or green phosphor material and three sub-pixels combine to make up a pixel. The intensity of each colour is controlled by varying the number and width of voltage pulses applied to the sub-pixel during a picture frame. This is implemented by dividing each picture frame into sub-frames.(for 50 Hz-mode there are 12 sub frames, for the 60 Hz-mode there are 10 sub frames). During a sub-frame, all cells are first addressed - those to be lit are pre-charged to a specific address voltage - then during the display time the display voltage is applied to the entire screen lighting those that were addressed.

Each sub-frame has a weighting-factor. (Time-entity depends on size and number of pixels on the screen). This is a purely digital PWM control mechanism, which is a key advantage as it eliminates any unnecessary digital to analogue conversions.

9.8 Abbreviation list

ADC	Analogue to Digital Converter
AM	Amplitude Modulation
AP	Asia Pacific
AV	External Audio Video
B/G	Monochrome TV system. Sound carrier distance is 5.5 MHz
BGA	Ball Grid Array
BTSC	Broadcast Television Standard Committee. Multiplex FM stereo sound system, originating from the USA and used e.g. in LATAM and AP-NTSC countries
ComPair	Computer aided rePair
CVBS	Composite Video Blanking and Synchronisation
DAC	Digital to Analogue Converter
DDC	Display Data Channel (a protocol based on I2C)
D/K	Monochrome TV system. Sound carrier distance is 6.5 MHz
DFU	Direction For Use: description for the end user
DNR	Dynamic Noise Reduction
DRAM	Dynamic RAM
DSP	Digital Signal Processing
DTS	Digital Theatre Sound
DVD	Digital Versatile Disc
DVI-d	Digital Visual Interface, d = digital only
EEPROM	Electrically Erasable and Programmable Read Only Memory
EMI	Electro Magnetic Interference
EPLD	Erasable Programmable Logic Device
EU	Europe
EXT	External (source), entering the set via SCART or Cinch
FLASH	Flash memory
FM	Frequency Modulation
FSP	FTV System Protocol
FTV	Flat TeleVision
HP	Headphone
I	Monochrome TV system. Sound carrier distance is 6.0 MHz
I2C	Integrated IC bus
I2S	Integrated IC Sound bus
ICONN	Institutional CONNector
IF	Intermediate Frequency
Interlaced	Scan mode where two fields are used to form one frame. Each field contains half the number of the total amount of lines. The fields are written in 'pairs', causing line flicker.
IR	Infra Red
IRQ	Interrupt Request
LATAM	Latin America
LED	Light Emitting Diode
L/L'	Monochrome TV system. Sound carrier distance is 6.5 MHz. L' is Band I, L is all bands except for Band I
LS	Loudspeaker
LVDS	Low Voltage Differential Signalling
M/N	Monochrome TV system. Sound carrier distance is 4.5 MHz
MOSFET	Metal Oxide Silicon Field Effect Transistor, switching device
MPEG	Motion Pictures Experts Group
NC	Not Connected
NICAM	Near Instantaneous Compounded Audio Multiplexing. This is a digital sound system, mainly used in Europe.
NTC	Negative Temperature Coefficient, non-linear resistor

NTSC	National Television Standard Committee. Colour system mainly used in North America and Japan. Colour carrier NTSC M/N = 3.579545 MHz, NTSC 4.43 = 4.433619 MHz (this is a VCR norm, it is not transmitted off-air)
NVM	Non Volatile Memory: IC containing TV related data e.g. alignments
OC	Open Circuit
OSD	On Screen Display
OTC	On screen display, Teletext and Control
P50	Project 50 or Easy Link
PAL	Phase Alternating Line. Colour system mainly used in West Europe (colour carrier = 4.433619 MHz) and South America (colour carrier PAL M = 3.575612 MHz and PAL N = 3.582056 MHz)
PCB	Printed Circuit Board
PCM	Pulse Code Modulation
PDP	Plasma Display Panel
PFC	Power Factor Corrector (or Pre-conditioner)
PIP	Picture In Picture
PLL	Phase Locked Loop. Used for e.g. FST tuning systems. The customer can give directly the desired frequency
POR	Power On Reset, signal to reset the P
Progressive Scan	Scan mode, where all scan lines are displayed in one frame at the same time, creating a double vertical resolution.
PTC	Positive Temperature Coefficient, non linear resistor
PW	Pixel Works (manufacturer) video scaling co-processor
PWM	Pulse Width Modulation
RAM	Random Access Memory
RC	Remote Control handset
RC5	Remote Control system 5, signal from the remote control receiver
RGB	Red Green Blue
ROM	Read Only Memory
SCART	Syndicat des Constructeurs d'Appareils Radiorecepteurs et Televisieurs
SCAVIO	Scaler Control Audio Video Input and Output
SCL	Serial Clock I2C
SDA	Serial Data I2C
SDI	Samsung Display Industry
SDRAM	Synchronous DRAM
SECAM	SEequence Couleur Avec Memoire. Colour system mainly used in France and East Europe. Colour carriers = 4.406250 MHz and 4.250000 MHz
SMPS	Switched Mode Power Supply
SOG	Sync On Green
SOPS	Self Oscillating Power Supply
S/PDIF	Sony Philips Digital InterFace
SRAM	Static RAM
STBY	Standby
SVHS	Super Video Home System
SW	Software
SXGA	1280x1024
THD	Total Harmonic Distortion
TMDS	Transition Minimised Differential Signalling
TXT	Teletext
UART	Universal Asynchronous Receiver Transmitter, 2-wire bus which can handle longer cables than I2C.
P	Microprocessor
VCR	Video Cassette Recorder
Va	Addressing voltage for the plasma display
Vra	Setting voltage for Va
Vrs	Setting voltage for Vs
Vs	Sustain voltage for the plasma display
Y/C	Luminance (Y) and Chrominance (C) signal
YUV	Component video
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

10. Spare Parts List

Audio Amplifier [A]

Various

0302	2422 025 16846	Connector 9P m h 2.00 SMD
0303	2422 025 16702	Connector 5P m h 2.00 SMD
0304	2422 025 16543	Connector 4P m h 2.00 SMD
0388	2422 025 16704	Connector 8P m h 2.00 SMD
1730	4822 071 52502	Fuse 2.5A
1740	4822 071 52502	Fuse 2.5A

⊣⊢

2201	4822 126 13193	4.7nF 10% 63V
2202	4822 124 23002	10µF 16V
2204	4822 126 14226	82pF 5% 50V 0603
2205	4822 126 13193	4.7nF 10% 63V
2206	4822 124 23002	10µF 16V
2207	4822 126 14226	82pF 5% 50V 0603
2212	5322 126 11578	1nF 10% 50V 0603
2215	4822 126 13193	4.7nF 10% 63V
2216	4822 124 23002	10µF 16V
2218	4822 126 14226	82pF 5% 50V 0603
2220	4822 126 13193	4.7nF 10% 63V
2221	4822 124 23002	10uF 16V
2222	4822 126 14226	82pF 5% 50V 0603
2224	4822 126 14305	100nF 10% 16V 0603
2225	4822 126 14305	100nF 10% 16V 0603
2233	3198 017 31530	15nF 50V 0603
2233	3198 017 36830	68nF 10% 16V 0603
2234	2238 586 59812	100nF +80/-20% 50V 0603
2234	4822 126 14494	22nF 10% 25V 0603
2238	4822 126 14305	100nF 10% 16V 0603
2239	4822 126 14305	100nF 10% 16V 0603
2243	3198 017 31530	15nF 50V 0603
2243	3198 017 36830	68nF 10% 16V 0603
2244	2238 586 59812	100nF +80/-20% 50V 0603
2244	4822 126 14494	22nF 10% 25V 0603
2255	4822 126 13193	4.7nF 10% 63V
2255	4822 126 14494	22nF 10% 25V 0603
2256	4822 126 13193	4.7nF 10% 63V
2256	4822 126 14494	22nF 10% 25V 0603
2260	4822 126 14305	100nF 10% 16V 0603
2261	4822 126 14305	100nF 10% 16V 0603
2270	4822 126 13193	4.7nF 10% 63V
2270	4822 126 14494	22nF 10% 25V 0603
2271	4822 126 13193	4.7nF 10% 63V
2271	4822 126 14494	22nF 10% 25V 0603
2309	4822 126 14247	1.5nF 50V 0603
2310	4822 126 14226	82pF 5% 50V 0603
2315	4822 124 12084	1µF 20% 50V SMD
2315	4822 124 23002	10µF 16V
2316	4822 126 14305	100nF 10% 16V 0603
2318	4822 126 14305	100nF 10% 16V 0603
2319	4822 124 12084	1µF 20% 50V SMD
2319	4822 124 23002	10µF 16V
2330	4822 126 14305	100nF 10% 16V 0603
2334	2020 012 93764	220µF 20% 35V
2335	4822 126 14305	100nF 10% 16V 0603
2340	5322 126 11583	10nF 10% 50V 0603
2355	4822 126 14305	100nF 10% 16V 0603
2359	4822 126 14305	100nF 10% 16V 0603
2360	2020 012 93764	220µF 20% 35V
2365	2020 552 96326	220nF 10% 16V
2366	2020 552 96326	220nF 10% 16V
2409	4822 126 14247	1.5nF 50V 0603
2410	4822 126 14226	82pF 5% 50V 0603
2415	4822 124 12084	1µF 20% 50V SMD
2415	4822 124 23002	10µF 16V
2416	4822 126 14305	100nF 10% 16V 0603
2418	4822 126 14305	100nF 10% 16V 0603
2419	4822 124 12084	1µF 20% 50V SMD
2419	4822 124 23002	10µF 16V
2430	4822 126 14305	100nF 10% 16V 0603
2434	2020 012 93764	220µF 20% 35V
2435	4822 126 14305	100nF 10% 16V 0603
2440	5322 126 11583	10nF 10% 50V 0603
2455	4822 126 14305	100nF 10% 16V 0603
2459	4822 126 14305	100nF 10% 16V 0603
2460	2020 012 93764	220µF 20% 35V
2465	2020 552 96326	220nF 10% 16V
2466	2020 552 96326	220nF 10% 16V
2509	4822 126 14247	1.5nF 50V 0603
2510	4822 126 14226	82pF 5% 50V 0603
2515	4822 124 12084	1µF 20% 50V SMD
2515	4822 124 23002	10µF 16V
2516	4822 126 14305	100nF 10% 16V 0603
2518	4822 126 14305	100nF 10% 16V 0603
2519	4822 124 12084	1µF 20% 50V SMD
2519	4822 124 23002	10µF 16V
2530	4822 126 14305	100nF 10% 16V 0603
2534	2020 012 93764	220µF 20% 35V
2535	4822 126 14305	100nF 10% 16V 0603
2540	5322 126 11583	10nF 10% 50V 0603
2555	4822 126 14305	100nF 10% 16V 0603
2559	4822 126 14305	100nF 10% 16V 0603
2560	2020 012 93764	220µF 20% 35V
2565	2020 552 96326	220nF 10% 16V
2566	2020 552 96326	220nF 10% 16V
2609	4822 126 14247	1.5nF 50V 0603
2610	4822 126 14226	82pF 5% 50V 0603
2615	4822 124 12084	1µF 20% 50V SMD
2615	4822 124 23002	10µF 16V
2616	4822 126 14305	100nF 10% 16V 0603
2618	4822 126 14305	100nF 10% 16V 0603
2619	4822 124 12084	1µF 20% 50V SMD
2619	4822 124 23002	10µF 16V
2630	4822 126 14305	100nF 10% 16V 0603
2634	2020 012 93764	220µF 20% 35V
2635	4822 126 14305	100nF 10% 16V 0603
2640	5322 126 11583	10nF 10% 50V 0603
2655	4822 126 14305	100nF 10% 16V 0603
2659	4822 126 14305	100nF 10% 16V 0603
2660	2020 012 93764	220µF 20% 35V
2665	2020 552 96326	220nF 10% 16V
2666	2020 552 96326	220nF 10% 16V
2730	2020 012 93764	220µF 20% 35V
2732	2020 012 93764	220µF 20% 35V
2734	4822 124 12084	1µF 20% 50V SMD
2734	4822 124 23002	10µF 16V
2740	2020 012 93764	220µF 20% 35V
2742	2020 012 93764	220µF 20% 35V
2744	4822 124 12084	1µF 20% 50V SMD
2744	4822 124 23002	10µF 16V
2752	4822 124 23002	10µF 16V
2753	4822 124 23002	10µF 16V
2759	5322 126 11578	1nF 10% 50V 0603
2760	5322 124 41945	22µF 20% 35V
2770	5322 126 11578	1nF 10% 50V 0603
2771	5322 126 11578	1nF 10% 50V 0603
2780	5322 126 11578	1nF 10% 50V 0603
2781	5322 126 11578	1nF 10% 50V 0603
2799	5322 126 11583	10nF 10% 50V 0603

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3201	4822 051 30221	220Ω 5% 0.062W
3202	4822 051 30102	1k 5% 0.062W
3203	4822 051 30272	2k7 5% 0.062W
3205	4822 051 30221	220Ω 5% 0.062W
3206	4822 051 30102	1k 5% 0.062W
3207	4822 051 30272	2k7 5% 0.062W
3210	4822 051 30333	33k 5% 0.062W
3211	4822 117 13632	100k 1% 0603 0.62W
3215	4822 051 30221	220Ω 5% 0.062W
3216	4822 051 30102	1k 5% 0.062W
3217	4822 051 30272	2k7 5% 0.062W
3220	4822 051 30221	220Ω 5% 0.062W
3221	4822 051 30102	1k 5% 0.062W
3222	4822 051 30272	2k7 5% 0.062W
3230	4822 051 30101	100Ω 5% 0.062W
3231	4822 051 30103	10k 5% 0.062W
3231	4822 051 30222	2k2 5% 0.062W
3232	4822 051 30152	1k5 5% 0.062W
3232	4822 051 30682	6k8 5% 0.062W
3233	4822 051 30103	10k 5% 0.062W
3233	4822 051 30222	2k2 5% 0.062W
3234	4822 051 30272	2k7 5% 0.062W
3234	4822 051 30561	560Ω 5% 0.062W
3240	4822 051 30101	100Ω 5% 0.062W
3241	4822 051 30103	10k 5% 0.062W
3241	4822 051 30222	2k2 5% 0.062W
3242	4822 051 30152	1k5 5% 0.062W
3242	4822 051 30682	6k8 5% 0.062W
3243	4822 051 30103	10k 5% 0.062W
3243	4822 051 30222	2k2 5% 0.062W
3244	4822 051 30272	2k7 5% 0.062W
3244	4822 051 30561	560Ω 5% 0.062W
3255	4822 051 30562	5k6 5% 0.063W 0603
3255	4822 117 11817	1k2 1% 1/16W
3256	4822 051 30153	15k 5% 0.062W
3256	4822 051 30332	3k3 5% 0.062W
3257	4822 051 30222	2k2 5% 0.062W
3257	4822 051 30471	470Ω 5% 0.062W
3259	4822 117 12917	1Ω 5% 0.062W 0603
3270	4822 051 30562	5k6 5% 0.063W 0603
3270	4822 117 11817	1k2 1% 1/16W
3271	4822 051 30153	15k 5% 0.062W
3271	4822 051 30332	3k3 5% 0.062W
3272	4822 051 30222	2k2 5% 0.062W
3272	4822 051 30471	470Ω 5% 0.062W
3274	4822 117 12917	1Ω 5% 0.062W 0603
3301	4822 117 12902	8k2 1% 0.063W 0603
3302	4822 051 30103	10k 5% 0.062W
3306	4822 117 12903	1k8 1% 0.063W 0603
3307	4822 117 13632	100k 1% 0603 0.62W
3308	4822 117 13632	100k 1% 0603 0.62W
3309	4822 051 30181	180Ω 5% 0.062W
3310	4822 117 12864	82k 5% 0.6W
3311	4822 051 30682	6k8 5% 0.062W
3315	5322 117 11726	10Ω 5%
3318	5322 117 11726	10Ω 5%
3325	4822 117 11449	2k2 5% 0.1W 0805
3327	4822 117 11449	2k2 5% 0.1W 0805
3328	4822 051 30102	1k 5% 0.062W
3330	5322 117 11726	10Ω 5%
3336	4822 051 30475	4M7 5% 0,062W 0603
3337	5322 117 11726	10Ω 5%
3340	4822 051 30103	10k 5% 0.062W
3355	5322 117 11726	10Ω 5%
3361	4822 051 30475	4M7 5% 0,062W 0603
3362	5322 117 11726	10Ω 5%
3401	4822 117 12902	8k2 1% 0.063W 0603
3402	4822 051 30103	10k 5% 0.062W
3406	4822 117 12903	1k8 1% 0.063W 0603
3407	4822 117 13632	100k 1% 0603 0.62W
3408	4822 117 13632	100k 1% 0603 0.62W
3409	4822 051 30181	180Ω 5% 0.062W
3410	4822 117 12864	82k 5% 0.6W
3411	4822 051 30153	15k 5% 0.062W
3415	5322 117 11726	10Ω 5%
3418	5322 117 11726	10Ω 5%
3425	4822 117 11449	2k2 5% 0.1W 0805
3427	4822 117 11449	2k2 5% 0.1W 0805
3428	4822 051 30102	1k 5% 0.062W
3430	5322 117 11726	10Ω 5%
3436	4822 051 30475	4M7 5% 0,062W 0603
3437	5322 117 11726	10Ω 5%
3440	4822 051 30103	10k 5% 0.062W
3455	5322 117 11726	10Ω 5%
3461	4822 051 30475	4M7 5% 0,062W 0603
3462	5322 117 11726	10Ω 5%
3501	4822 117 12902	8k2 1% 0.063W 0603
3502	4822 051 30103	10k 5% 0.062W
3506	4822 117 12903	1k8 1% 0.063W 0603
3507	4822 117 13632	100k 1% 0603 0.62W
3508	4822 117 13632	100k 1% 0603 0.62W
3509	4822 051 30181	180Ω 5% 0.062W
3510	4822 117 12864	82k 5% 0.6W
3511	4822 051 30682	6k8 5% 0.062W
3515	5322 117 11726	10Ω 5%
3518	5322 117 11726	10Ω 5%
3525	4822 117 11449	2k2 5% 0.1W 0805
3527	4822 117 11449	2k2 5% 0.1W 0805
3528	4822 051 30102	1k 5% 0.062W
3530	5322 117 11726	10Ω 5%
3536	4822 051 30475	4M7 5% 0,062W 0603
3537	5322 117 11726	10Ω 5%
3540	4822 051 30103	10k 5% 0.062W
3555	5322 117 11726	10Ω 5%
3561	4822 051 30475	4M7 5% 0,062W 0603
3562	5322 117 11726	10Ω 5%
3601	4822 117 12902	8k2 1% 0.063W 0603
3602	4822 051 30103	10k 5% 0.062W
3606	4822 117 12903	1k8 1% 0.063W 0603
3607	4822 117 13632	100k 1% 0603 0.62W
3608	4822 117 13632	100k 1% 0603 0.62W
3609	4822 051 30181	180Ω 5% 0.062W
3610	4822 117 12864	82k 5% 0.6W
3611	4822 051 30153	15k 5% 0.062W
3615	5322 117 11726	10Ω 5%
3618	5322 117 11726	10Ω 5%
3625	4822 117 11449	2k2 5% 0.1W 0805
3627	4822 117 11449	2k2 5% 0.1W 0805
3628	4822 051 30102	1k 5% 0.062W
3630	5322 117 11726	10Ω 5%
3636	4822 051 30475	4M7 5% 0,062W 0603
3637	5322 117 11726	10Ω 5%
3640	4822 051 30103	10k 5% 0.062W
3655	5322 117 11726	10Ω 5%
3661	4822 051 30475	4M7 5% 0,062W 0603
3662	5322 117 11726	10Ω 5%
3732	4822 051 30272	2k7 5% 0.062W
3733	4822 051 30102	1k 5% 0.062W
3742	4822 051 30272	2k7 5% 0.062W
3743	4822 051 30102	1k 5% 0.062W

3749	4822 051 30103	10k 5% 0.062W
3750	4822 051 30471	470Ω 5% 0.062W
3751	4822 117 12925	47k 1% 0.063W 0603
3752	4822 117 12925	47k 1% 0.063W 0603
3754	4822 051 30102	1k 5% 0.062W
3755	4822 117 13632	100k 1% 0603 0.62W
3760	4822 051 30471	470Ω 5% 0.062W
3765	4822 117 13632	100k 1% 0603 0.62W
3770	4822 117 13632	100k 1% 0603 0.62W
3771	4822 117 13632	100k 1% 0603 0.62W
3780	4822 117 13632	100k 1% 0603 0.62W
3781	4822 117 13632	100k 1% 0603 0.62W

5335	4822 157 11717	BLM31P500SPT
5360	4822 157 11717	BLM31P500SPT
5365	2422 536 00338	33µH 10% SMD 10mm
5435	4822 157 11717	BLM31P500SPT
5460	4822 157 11717	BLM31P500SPT
5465	2422 536 00338	33µH 10% SMD 10mm
5535	4822 157 11717	BLM31P500SPT
5560	4822 157 11717	BLM31P500SPT
5565	2422 536 00338	33µH 10% SMD 10mm
5635	4822 157 11717	BLM31P500SPT
5660	4822 157 11717	BLM31P500SPT
5665	2422 536 00338	33µH 10% SMD 10mm
5714	4822 157 11717	BLM31P500SPT
5719	4822 157 11717	BLM31P500SPT
5725	4822 157 11717	BLM31P500SPT
5753	2422 549 43769	Bead 30Ω at 100MHz

6328	4822 130 11397	BAS316
6334	4822 130 11148	UDZ4.7B
6335	4822 130 11148	UDZ4.7B
6355	4822 130 11148	UDZ4.7B
6356	4822 130 11148	UDZ4.7B
6359	4822 130 11148	UDZ4.7B
6360	4822 130 11148	UDZ4.7B
6428	4822 130 11397	BAS316
6434	4822 130 11148	UDZ4.7B
6435	4822 130 11148	UDZ4.7B
6455	4822 130 11148	UDZ4.7B
6456	4822 130 11148	UDZ4.7B
6459	4822 130 11148	UDZ4.7B
6460	4822 130 11148	UDZ4.7B
6528	4822 130 11397	BAS316
6534	4822 130 11148	UDZ4.7B
6535	4822 130 11148	UDZ4.7B
6555	4822 130 11148	UDZ4.7B
6556	4822 130 11148	UDZ4.7B
6559	4822 130 11148	UDZ4.7B
6560	4822 130 11148	UDZ4.7B
6628	4822 130 11397	BAS316
6634	4822 130 11148	UDZ4.7B
6635	4822 130 11148	UDZ4.7B
6655	4822 130 11148	UDZ4.7B
6656	4822 130 11148	UDZ4.7B
6659	4822 130 11148	UDZ4.7B
6660	4822 130 11148	UDZ4.7B
6732	4822 130 11551	UDZS10B
6742	4822 130 11551	UDZS10B
6750	4822 130 10328	BAV99W
6760	4822 130 10328	BAV99W

7211	5322 130 42756	BC857C
7225	4822 209 30095	LM833D
7238	4822 209 30095	LM833D
7260	4822 209 30095	LM833D
7302	3198 010 42310	BC847BW
7315	9338 028 20668	LM311D
7330	4822 130 42804	BC817-25
7340	3198 010 42310	BC847BW
7355	5322 130 60845	BC807-25
7365	9322 161 86668	IRF7343
7402	3198 010 42310	BC847BW
7415	9338 028 20668	LM311D
7430	4822 130 42804	BC817-25
7440	3198 010 42310	BC847BW
7455	5322 130 60845	BC807-25
7465	9322 161 86668	IRF7343
7502	3198 010 42310	BC847BW
7515	9338 028 20668	LM311D
7530	4822 130 42804	BC817-25
7540	3198 010 42310	BC847BW
7555	5322 130 60845	BC807-25
7565	9322 161 86668	IRF7343
7602	3198 010 42310	BC847BW
7615	9338 028 20668	LM311D
7630	4822 130 42804	BC817-25
7640	3198 010 42310	BC847BW
7655	5322 130 60845	BC807-25
7665	9322 161 86668	IRF7343
7735	4822 130 60142	BC869
7736	3198 010 42310	BC847BW
7745	5322 130 61569	BC868
7746	5322 130 42756	BC857C
7751	3198 010 42310	BC847BW
7753	5322 130 42756	BC857C
7755	3198 010 42310	BC847BW
7761	5322 130 42756	BC857C

Led/Switch Panel [LD]

Various

0040	3122 128 14292	mains knob FM24 SL
0044	3122 124 36081	Day light filter FM242
0301	2422 025 17396	onnector20P m v 1.25
0305	2422 025 16705	Connector 12P m h 2.00 SMD
0317	2422 025 13369	Socket 6P (Telephone)
0318	2422 025 17233	Connector 32P f v 1.00 FFC
0319	2422 025 17047	Connector 13P m h 2.00 SMD
0320	2422 025 16545	Connector 10P m h 2.00 SMD
0375	2422 033 00464	Socket DVI 24P f h
0376	2422 025 16768	Connector 9P f h SUB-D
0378	2422 026 05273	Socket cinch 6P f h Wh/Rd
0379	2422 026 05274	Socket cinch 6P 1xGnYe 2x/WhRd
0380	2422 026 05275	Socket cinch 6P 1xBuBl 2xWhRd
0381	4822 267 10994	Socket SVHS
0382	2422 025 17274	Connector 10P m v
0385	2422 025 17274	Connector 10P m v
0388	2422 025 16704	Connector 8P m h 2.00 SMD
0600	3122 357 00421	Software FM23GA-1.7-00421
0603	3122 357 00404	Software EPLD FM23GB24000404
0607	3122 357 00371	Software DCC-DVI_7215_00371
1100▲	2422 086 11009	Fuse T1.A 63V 2410
1101	2422 128 02927	Switch push 2P
1105▲	2422 086 11092	Fuse F0.5A 50V 1206
1170▲	2422 086 11092	Fuse F0.5A 50V 1206
1171▲	2422 086 11013	Fuse F0.315A 32V 1206
1270▲	2422 086 11092	Fuse F0.5A 50V 1206
1415	2422 543 89022	Crystal 6MHz 20pF CX5F
1570	2422 543 01115	Crystal 24.576MHz 12P QS06
1575▲	2422 086 11092	Fuse F0.5A 50V 1206
1670▲	2422 086 10964	Fuse T0.630A 63V 2410
8320	3122 358 76521	Cable L20-S20 FM24

3101	4822 051 30151	150Ω 5% 0.062W
3102	4822 117 13632	100k 1% 0603 0.62W
3103	4822 051 30102	1k 5% 0.062W
3104	4822 117 13632	100k 1% 0603 0.62W
3105	4822 051 30102	1k 5% 0.062W
3106	4822 051 30151	150Ω 5% 0.062W
3107	4822 051 30471	470Ω 5% 0.062W
3108	4822 051 30103	10k 5% 0.062W
3109	4822 051 30101	100Ω 5% 0.062W
3120	4822 051 30472	4k7 5% 0.062W
3121	4822 051 30472	4k7 5% 0.062W
3122	4822 051 30102	1k 5% 0.062W
3123	4822 051 30103	10k 5% 0.062W
3124	4822 051 30102	1k 5% 0.062W
3125	4822 051 30332	3k3 5% 0.062W
3126	4822 051 30474	470k 5% 0.062W
3127	4822 051 30474	470k 5% 0.062W
4101	4822 051 30008	Jumper 0603
4107	4822 051 30008	Jumper 0603

5100	2422 549 43769	Bead 30Ω at 100MHz

6101	4822 130 11564	UDZ3.9B
6103	4822 130 83915	TLMV3100
6105	4822 130 11564	UDZ3.9B
6127	9322 140 63685	TEMD5000

7103	9340 218 50115	BC857BW
7105	9340 218 50115	BC857BW
7107	9322 155 82667	TSOP2236
7107	9322 178 03667	TSOP2136YA1
7120	5322 209 82941	LM358D

SCAVIO Panel [SC]

Various

0377	2422 026 05319	Socket cinch 6P f YeBuWhGnBlRd
1270▲	2422 086 11064	Fuse F0.5A 32V 1206
0378	2422 026 05071	Socket cinch 4P f h Wh/Rd
0603	3122 357 00285	Software EPLD FM23GB2400285
1105▲	2422 086 11064	Fuse F0.5A 32V 1206
1170▲	2422 086 11064	Fuse F0.5A 32V 1206
1575▲	2422 086 11064	Fuse F0.5A 32V 1206

2000	2238 586 59812	100nF +80/-20% 50V 0603
2001	2238 586 59812	100nF +80/-20% 50V 0603
2002	4822 126 14491	2.2µF 10V
2003	2238 586 59812	100nF +80/-20% 50V 0603
2004	4822 126 14491	2.2µF 10V
2005	4822 126 14491	2.2µF 10V
2007	2238 586 59812	100nF +80/-20% 50V 0603
2008	4822 126 11785	47pF 5% 50V 0603
2009	2238 586 59812	100nF +80/-20% 50V 0603
2012	2238 586 59812	100nF +80/-20% 50V 0603
2014	5322 126 11583	10nF 10% 50V 0603
2015	4822 126 11785	47pF 5% 50V 0603
2020	2238 586 59812	100nF +80/-20% 50V 0603
2021	3198 017 44740	470nF 10V 0603
2022	2238 586 59812	100nF +80/-20% 50V 0603
2030	3198 017 44740	470nF 10V 0603
2034	5322 126 11583	10nF 10% 50V 0603
2040	2238 586 59812	100nF +80/-20% 50V 0603
2041	2238 586 59812	100nF +80/-20% 50V 0603
2042	2238 586 59812	100nF +80/-20% 50V 0603
2060	2238 586 59812	100nF +80/-20% 50V 0603
2061	2238 586 59812	100nF +80/-20% 50V 0603
2066	2238 586 59812	100nF +80/-20% 50V 0603
2072	5322 124 41945	22µF 20% 35V
2077	5322 124 41945	22µF 20% 35V
2082	5322 124 41945	22µF 20% 35V
2088	2238 586 59812	100nF +80/-20% 50V 0603
2089	2238 586 59812	100nF +80/-20% 50V 0603
2090	2238 586 59812	100nF +80/-20% 50V 0603
2097	3198 016 31080	1pF 25% 50V 0603
2103	3198 016 31080	1pF 25% 50V 0603
2105	2238 586 59812	100nF +80/-20% 50V 0603
2106	4822 126 14491	2.2µF 10V
2107	2238 586 59812	100nF +80/-20% 50V 0603
2108	2238 586 59812	100nF +80/-20% 50V 0603
2109	3198 017 44740	470nF 10V 0603
2110	3198 017 44740	470nF 10V 0603
2111	3198 017 44740	470nF 10V 0603
2112	5322 124 41945	22µF 20% 35V
2113	2238 586 59812	100nF +80/-20% 50V 0603
2114	3198 016 31080	1pF 25% 50V 0603
2115	3198 017 34730	47nF 16V 0603
2116	5322 124 41945	22µF 20% 35V
2117	2238 586 59812	100nF +80/-20% 50V 0603
2118	3198 017 34730	47nF 16V 0603
2119	3198 017 34730	47nF 16V 0603
2120	2020 024 90166	10µF 20% 35V
2123	3198 017 34730	47nF 16V 0603
2124	3198 016 31080	1pF 25% 50V 0603
2126	2020 552 96326	220nF 10% 16V
2127	3198 016 31080	1pF 25% 50V 0603
2128	3198 016 31080	1pF 25% 50V 0603
2134	5322 124 41945	22µF 20% 35V
2137	5322 124 41945	22µF 20% 35V
2140	5322 124 41945	22µF 20% 35V
2142	2238 586 59812	100nF +80/-20% 50V 0603
2143	4822 124 12095	100µF 20% 16V
2144	5322 124 41945	22µF 20% 35V
2145	2238 586 59812	100nF +80/-20% 50V 0603
2146	3198 017 34730	47nF 16V 0603
2147	5322 124 41945	22µF 20% 35V
2150	5322 124 41945	22µF 20% 35V
2151	3198 016 31020	1nF 25V 0603
2152	3198 017 34730	47nF 16V 0603
2153	5322 124 41945	22µF 20% 35V

2156	5322 124 41945	22µF 20% 35V
2157	2238 586 59812	100nF +80/-20% 50V 0603
2158	3198 017 34730	47nF 16V 0603
2159	5322 124 41945	22µF 20% 35V
2160	2238 586 59812	100nF +80/-20% 50V 0603
2161	2238 586 59812	100nF +80/-20% 50V 0603
2162	2238 586 59812	100nF +80/-20% 50V 0603
2164	4822 124 12095	100µF 20% 16V
2165	2238 586 59812	100nF +80/-20% 50V 0603
2166	2238 586 59812	100nF +80/-20% 50V 0603
2167	4822 124 12095	100µF 20% 16V
2168	4822 124 23002	10µF 16V
2170	2238 586 59812	100nF +80/-20% 50V 0603
2171	2238 586 59812	100nF +80/-20% 50V 0603
2172	2238 586 59812	100nF +80/-20% 50V 0603
2173	2238 586 59812	100nF +80/-20% 50V 0603
2174	2238 586 59812	100nF +80/-20% 50V 0603
2175	2238 586 59812	100nF +80/-20% 50V 0603
2176	2238 586 59812	100nF +80/-20% 50V 0603
2177	2238 586 59812	100nF +80/-20% 50V 0603
2178	2238 586 59812	100nF +80/-20% 50V 0603
2179	2238 586 59812	100nF +80/-20% 50V 0603
2180	2238 586 59812	100nF +80/-20% 50V 0603
2181	2238 586 59812	100nF +80/-20% 50V 0603
2182	2238 586 59812	100nF +80/-20% 50V 0603
2183	2238 586 59812	100nF +80/-20% 50V 0603
2184	2238 586 59812	100nF +80/-20% 50V 0603
2185	2238 586 59812	100nF +80/-20% 50V 0603
2186	2238 586 59812	100nF +80/-20% 50V 0603
2187	2238 586 59812	100nF +80/-20% 50V 0603
2188	2238 586 59812	100nF +80/-20% 50V 0603
2189	2238 586 59812	100nF +80/-20% 50V 0603
2190	2238 586 59812	100nF +80/-20% 50V 0603
2191	2238 586 59812	100nF +80/-20% 50V 0603
2192	2238 586 59812	100nF +80/-20% 50V 0603
2193	2238 586 59812	100nF +80/-20% 50V 0603
2195	4822 124 23002	10µF 16V
2196	4822 124 23002	10µF 16V
2197	4822 124 23002	10µF 16V
2198	4822 124 23002	10µF 16V
2199	4822 124 23002	10µF 16V
2205	2238 586 59812	100nF +80/-20% 50V 0603
2206	2238 586 59812	100nF +80/-20% 50V 0603
2207	2238 586 59812	100nF +80/-20% 50V 0603
2208	4822 126 14127	39nF 10% 50V 0805
2210	5322 126 11581	3.9nF 10% 63V 0603
2212	2238 586 59812	100nF +80/-20% 50V 0603
2217	2238 586 59812	100nF +80/-20% 50V 0603
2220	4822 124 23002	10µF 16V
2221	4822 124 23002	10µF 16V
2222	4822 124 23002	10µF 16V
2223	4822 124 23002	10µF 16V
2224	4822 124 23002	10µF 16V
2228	4822 124 23002	10µF 16V
2230	2238 586 59812	100nF +80/-20% 50V 0603
2231	2238 586 59812	100nF +80/-20% 50V 0603
2232	2238 586 59812	100nF +80/-20% 50V 0603
2240	2238 586 59812	100nF +80/-20% 50V 0603
2247	2238 586 59812	100nF +80/-20% 50V 0603
2248	2238 586 59812	100nF +80/-20% 50V 0603
2249	2238 586 59812	100nF +80/-20% 50V 0603
2250	2238 586 59812	100nF +80/-20% 50V 0603
2260	3198 017 34730	47nF 16V 0603
2261	3198 017 34730	47nF 16V 0603
2262	3198 017 34730	47nF 16V 0603
2263	3198 017 34730	47nF 16V 0603
2264	3198 017 34730	47nF 16V 0603
2265	3198 017 34730	47nF 16V 0603
2266	3198 017 34730	47nF 16V 0603
2267	3198 017 34730	47nF 16V 0603
2268	3198 017 34730	47nF 16V 0603
2269	3198 017 34730	47nF 16V 0603
2270	3198 017 34730	47nF 16V 0603
2274	3198 017 34730	47nF 16V 0603
2275	3198 017 34730	47nF 16V 0603
2276	3198 017 34730	47nF 16V 0603
2280	2238 586 59812	100nF +80/-20% 50V 0603
2281	2238 586 59812	100nF +80/-20% 50V 0603
2282	2238 586 59812	100nF +80/-20% 50V 0603
2283	2238 586 59812	100nF +80/-20% 50V 0603
2284	2238 586 59812	100nF +80/-20% 50V 0603
2285	2238 586 59812	100nF +80/-20% 50V 0603
2286	2238 586 59812	100nF +80/-20% 50V 0603
2287	2238 586 59812	100nF +80/-20% 50V 0603
2288	2238 586 59812	100nF +80/-20% 50V 0603
2300	4822 124 12095	100µF 20% 16V
2301	2238 586 59812	100nF +80/-20% 50V 0603
2302	4822 124 23002	10µF 16V
2304	2238 586 59812	100nF +80/-20% 50V 0603
2308	5322 124 41945	22µF 20% 35V
2310	2238 586 59812	100nF +80/-20% 50V 0603
2311	2238 586 59812	100nF +80/-20% 50V 0603
2318	5322 124 41945	22µF 20% 35V
2328	5322 124 41945	22µF 20% 35V
2337	2020 552 94427	100pF 5% 50v 0603
2340	2238 586 59812	100nF +80/-20% 50V 0603
2351	2238 586 59812	100nF +80/-20% 50V 0603
2352	2238 586 59812	100nF +80/-20% 50V 0603
2353	4822 124 23002	10µF 16V
2354	2238 586 59812	100nF +80/-20% 50V 0603
2355	2238 586 59812	100nF +80/-20% 50V 0603
2356	2238 586 59812	100nF +80/-20% 50V 0603
2365	2238 586 59812	100nF +80/-20% 50V 0603
2370	2238 586 59812	100nF +80/-20% 50V 0603
2372	2238 586 59812	100nF +80/-20% 50V 0603
2375	2238 586 59812	100nF +80/-20% 50V 0603
2381	2238 586 59812	100nF +80/-20% 50V 0603
2382	2238 586 59812	100nF +80/-20% 50V 0603
2383	2238 586 59812	100nF +80/-20% 50V 0603
2415	2238 867 75339	33pF 5% 50V 0603
2416	4822 126 11669	27pF
2418	3198 016 31020	1nF 25V 0603
2419	3198 016 31020	1nF 25V 0603
2420	2238 586 59812	100nF +80/-20% 50V 0603
2432	2238 586 59812	100nF +80/-20% 50V 0603
2433	2238 586 59812	100nF +80/-20% 50V 0603
2434	2238 586 59812	100nF +80/-20% 50V 0603
2435	2238 586 59812	100nF +80/-20% 50V 0603
2436	2238 586 59812	100nF +80/-20% 50V 0603
2437	2238 586 59812	100nF +80/-20% 50V 0603
2438	4822 126 13879	220nF 20% 16V
2439	4822 126 13879	220nF 20% 16V
2446	2238 586 59812	100nF +80/-20% 50V 0603
2447	2238 586 59812	100nF +80/-20% 50V 0603
2448	2238 586 59812	100nF +80/-20% 50V 0603
2499	2238 586 59812	100nF +80/-20% 50V 0603
2500	2238 586 59812	100nF +80/-20% 50V 0603
2501	4822 126 14226	82pF 5% 50V 0603
2502	4822 126 14226	82pF 5% 50V 0603
2503	4822 126 14226	82pF 5% 50V 0603
2504	4822 126 14226	82pF 5% 50V 0603
2505	4822 126 14226	82pF 5% 50V 0603
2506	2238 586 59812	100nF +80/-20% 50V 0603
2511	2238 586 59812	100nF +80/-20% 50V 0603
2513	2238 586 59812	100nF +80/-20% 50V 0603
2515	2238 586 59812	100nF +80/-20% 50V 0603
2520	4822 124 23002	10µF 16V
2521	4822 124 23002	10µF 16V
2522	4822 124 23002	10µF 16V
2523	4822 124 23002	10µF 16V
2524	4822 124 23002	10µF 16V
2530	5322 124 41945	22µF 20% 35V
2531	2238 586 59812	100nF +80/-20% 50V 0603
2533	2238 586 59812	100nF +80/-20% 50V 0603
2534	2238 586 59812	100nF +80/-20% 50V 0603
2535	2238 586 59812	100nF +80/-20% 50V 0603
2537	2238 586 59812	100nF +80/-20% 50V 0603
2538	3198 016 31020	1nF 25V 0603
2541	2238 586 59812	100nF +80/-20% 50V 0603
2546	3198 016 31020	1nF 25V 0603
2547	3198 016 31020	1nF 25V 0603
2548	3198 016 31020	1nF 25V 0603
2550	3198 016 31020	1nF 25V 0603
2551	3198 016 31020	1nF 25V 0603
2552	3198 016 31020	1nF 25V 0603
2553	3198 016 31020	1nF 25V 0603
2554	2238 586 59812	100nF +80/-20% 50V 0603
2555	2238 586 59812	100nF +80/-20% 50V 0603
2557	3198 016 31020	1nF 25V 0603
2558	3198 016 31020	1nF 25V 0603
2559	3198 016 31020	1nF 25V 0603
2560	3198 016 31020	1nF 25V 0603
2562	3198 016 31020	1nF 25V 0603
2563	3198 016 31020	1nF 25V 0603
2564	3198 016 31020	1nF 25V 0603
2565	3198 016 31020	1nF 25V 0603
2566	3198 016 31020	1nF 25V 0603
2570	3198 016 31020	1nF 25V 0603
2572	2238 586 59812	100nF +80/-20% 50V 0603
2573	4822 124 23002	10µF 16V
2574	2238 586 59812	100nF +80/-20% 50V 0603
2581	2238 586 59812	100nF +80/-20% 50V 0603
2583	2238 586 59812	100nF +80/-20% 50V 0603
2584	2238 586 59812	100nF +80/-20% 50V 0603
2600	2238 586 59812	100nF +80/-20% 50V 0603
2601	2238 586 59812	100nF +80/-20% 50V 0603
2602	2238 586 59812	100nF +80/-20% 50V 0603
2603	2238 586 59812	100nF +80/-20% 50V 0603
2604	2238 586 59812	100nF +80/-20% 50V 0603
2605	2238 586 59812	100nF +80/-20% 50V 0603
2606	2238 586 59812	100nF +80/-20% 50V 0603
2607	2238 586 59812	100nF +80/-20% 50V 0603
2608	2238 586 59812	100nF +80/-20% 50V 0603
2609	2238 586 59812	100nF +80/-20% 50V 0603
2610	2238 586 59812	100nF +80/-20% 50V 0603
2611	2238 586 59812	100nF +80/-20% 50V 0603
2612	2238 586 59812	100nF +80/-20% 50V 0603
2613	2238 586 59812	100nF +80/-20% 50V 0603
2614	2238 586 59812	100nF +80/-20% 50V 0603
2615	2238 586 59812	100nF +80/-20% 50V 0603
2616	2238 586 59812	100nF +80/-20% 50V 0603
2617	2238 586 59812	100nF +80/-20% 50V 0603
2618	2238 586 59812	100nF +80/-20% 50V 0603
2619	2238 586 59812	100nF +80/-20% 50V 0603
2620	2238 586 59812	100nF +80/-20% 50V 0603
2621	2238 586 59812	100nF +80/-20% 50V 0603
2622	2238 586 59812	100nF +80/-20% 50V 0603
2623	2238 586 59812	100nF +80/-20% 50V 0603
2624	2238 586 59812	100nF +80/-20% 50V 0603
2625	2238 586 59812	100nF +80/-20% 50V 0603
2628	2238 586 59812	100nF +80/-20% 50V 0603
2629	4822 122 33741	10pF 10% 50V
2630	2238 586 59812	100nF +80/-20% 50V 0603
2640	2238 586 59812	100nF +80/-20% 50V 0603
2641	3198 016 31020	1nF 25V 0603
2642	4822 124 23002	10µF 16V
2643	4822 124 23002	10µF 16V
2644	4822 124 23002	10µF 16V
2645	4822 124 23002	10µF 16V
2646	4822 124 23002	10µF 16V
2647	4822 124 23002	10µF 16V
2648	4822 124 23002	10µF 16V
2649	4822 124 23002	10µF 16V
2655	2238 586 59812	100nF +80/-20% 50V 0603
2656	2238 586 59812	100nF +80/-20% 50V 0603
2657	2238 586 59812	100nF +80/-20% 50V 0603
2658	2238 586 59812	100nF +80/-20% 50V 0603
2659	2238 586 59812	100nF +80/-20% 50V 0603
2660	2238 586 59812	100nF +80/-20% 50V 0603
2661	2238 586 59812	100nF +80/-20% 50V 0603
2662	2238 586 59812	100nF +80/-20% 50V 0603
2663	2238 586 59812	100nF +80/-20% 50V 0603
2670	2238 586 59812	100nF +80/-20% 50V 0603
2671	2238 586 59812	100nF +80/-20% 50V 0603
2672	2238 586 59812	100nF +80/-20% 50V 0603
2673	2238 586 59812	100nF +80/-20% 50V 0603
2674	2238 586 59812	100nF +80/-20% 50V 0603
2694	3198 016 31080	1pF 25% 50V 0603
2695	3198 016 31080	1pF 25% 50V 0603
2696	3198 016 31080	1pF 25% 50V 0603
2697	3198 016 31080	1pF 25% 50V 0603
2698	3198 016 31080	1pF 25% 50V 0603
2699	3198 016 31080	1pF 25% 50V 0603
2711	2020 552 94427	100pF 5% 50v 0603
2712	4822 126 14472	1µF 10% 10V
2715	2238 586 59812	100nF +80/-20% 50V 0603
2716	4822 126 11785	47pF 5% 50V 0603
2717	4822 126 14472	1µF 10% 10V
2721	2020 552 94427	100pF 5% 50v 0603
2722	4822 126 14472	1µF 10% 10V
2726	4822 126 11785	47pF 5% 50V 0603
2727	4822 126 14472	1µF 10% 10V
2731	2020 552 94427	100pF 5% 50v 0603
2732	4822 126 14472	1µF 10% 10V
2735	2238 586 59812	100nF +80/-20% 50V 0603
2736	4822 126 11785	47pF 5% 50V 0603
2737	4822 126 14472	1µF 10% 10V
2741	2020 552 94427	100pF 5% 50v 0603
2742	4822 126 14472	1µF 10% 10V
2746	4822 126 11785	47pF 5% 50V 0603
2747	4822 126 14472	1µF 10% 10V
2751	2020 552 94427	100pF 5% 50v 0603
2752	4822 126 14472	1µF 10% 10V
2755	2238 586 59812	100nF +80/-20% 50V 0603
2756	4822 126 11785	47pF 5% 50V 0603
2757	4822 126 14472	1µF 10% 10V
2761	2020 552 94427	100pF 5% 50v 0603
2762	4822 126 14472	1µF 10% 10V
2766	4822 126 11785	47pF 5% 50V 0603
2767	4822 126 14472	1µF 10% 10V
2771	2020 552 94427	100pF 5% 50v 0603
2772	4822 126 14472	1µF 10% 10V
2775	2020 552 94427	100pF 5% 50v 0603
2776	4822 126 14472	1µF 10% 10V
2779	2020 552 94427	100pF 5% 50v 0603
2780	4822 126 14472	1µF 10% 10V
2783	2020 552 94427	100pF 5% 50v 0603
2784	4822 126 14472	1µF 10% 10V
2787	2020 552 94427	100pF 5% 50v 0603
2788	4822 126 14472	1µF 10% 10V
2791	2020 552 94427	100pF 5% 50v 0603
2792	4822 126 14472	1µF 10% 10V
2794	4822 126 14472	1µF 10% 10V
2795	4822 126 14472	1µF 10% 10V
2796	4822 126 14472	1µF 10% 10V
2797	4822 126 14472	1µF 10% 10V
2798	2238 586 59812	100nF +80/-20% 50V 0603
2799	5322 124 41945	22µF 20% 35V
2800	4822 124 12095	100µF 20% 16V
2801	2238 586 59812	100nF +80/-20% 50V 0603
2802	4822 124 23002	10µF 16V
2803	4822 124 23002	10µF 16V

2804	3198 016 31020	1nF 25V 0603
2810	4822 124 12095	100µF 20% 16V
2811	3198 016 31020	1nF 25V 0603
2812	3198 016 31020	1nF 25V 0603
2813	3198 016 31020	1nF 25V 0603
2814	4822 126 14585	100nF 10% 50V
2815	3198 016 31020	1nF 25V 0603
2816	4822 124 23002	10µF 16V
2817	2238 586 59812	100nF +80/-20% 50V 0603
2818	3198 016 31020	1nF 25V 0603
2819	3198 016 31020	1nF 25V 0603
2820	4822 124 23002	10µF 16V
2821	4822 124 23002	10µF 16V
2822	4822 126 14247	1.5nF 50V 0603
2823	4822 124 23002	10µF 16V
2824	4822 126 14247	1.5nF 50V 0603
2825	3198 016 31020	1nF 25V 0603
2826	4822 126 14472	1µF 10% 10V
2827	4822 126 14472	1µF 10% 10V
2828	3198 016 31020	1nF 25V 0603
2829	4822 124 23002	10µF 16V
2830	2238 586 59812	100nF +80/-20% 50V 0603
2831	2238 586 59812	100nF +80/-20% 50V 0603
2833	4822 126 14247	1.5nF 50V 0603
2834	4822 124 23002	10µF 16V
2837	4822 126 13881	470pF 5% 50V
2838	4822 126 13881	470pF 5% 50V
2839	4822 126 13881	470pF 5% 50V
2840	4822 126 11669	27pF
2842	2238 586 59812	100nF +80/-20% 50V 0603
2843	4822 126 11669	27pF
2844	3198 016 31020	1nF 25V 0603
2845	4822 126 13883	220pF 5% 50V
2848	4822 126 11669	27pF
2849	3198 016 31020	1nF 25V 0603
2850	4822 126 11669	27pF
2852	2238 586 59812	100nF +80/-20% 50V 0603
2853	4822 126 11669	27pF
2854	3198 016 31020	1nF 25V 0603
2857	3198 016 31020	1nF 25V 0603
2858	4822 126 11669	27pF
2861	2238 586 59812	100nF +80/-20% 50V 0603
2862	4822 126 11785	47pF 5% 50V 0603
2863	4822 126 14472	1µF 10% 10V
2865	4822 126 11785	47pF 5% 50V 0603
2867	4822 126 13879	220nF 20% 16V
2868	4822 126 14472	1µF 10% 10V
2869	4822 126 14247	1.5nF 50V 0603
2870	2238 586 59812	100nF +80/-20% 50V 0603
2874	2238 586 59812	100nF +80/-20% 50V 0603
2879	4822 126 11669	27pF
2880	2238 586 59812	100nF +80/-20% 50V 0603
2881	2238 586 59812	100nF +80/-20% 50V 0603
2882	2238 586 59812	100nF +80/-20% 50V 0603

7656	9322 165 40671	EP1K30FC256-3

3000	4822 051 30474	470k 5% 0.062W
3001	4822 051 30759	75Ω 5% 0.062W
3002	4822 051 30101	100Ω 5% 0.062W
3003	4822 051 30472	4k7 5% 0.062W
3004	4822 051 30474	470k 5% 0.062W
3005	4822 117 12891	220k 1%
3006	4822 051 30103	10k 5% 0.062W
3007	4822 051 30103	10k 5% 0.062W
3008	4822 051 30474	470k 5% 0.062W
3009	4822 051 30102	1k 5% 0.062W
3010	4822 051 30759	75Ω 5% 0.062W
3011	4822 051 30101	100Ω 5% 0.062W
3012	4822 051 30472	4k7 5% 0.062W
3013	4822 051 30474	470k 5% 0.062W
3014	4822 117 12891	220k 1%
3015	4822 051 30103	10k 5% 0.062W
3016	4822 051 30101	100Ω 5% 0.062W
3018	4822 051 30101	100Ω 5% 0.062W
3019	4822 051 30103	10k 5% 0.062W
3020	4822 117 13632	100k 1% 0603 0.62W
3021	4822 051 30472	4k7 5% 0.062W
3022	4822 051 30222	2k2 5% 0.062W
3023	4822 051 30223	22k 5% 0.062W
3024	4822 117 13632	100k 1% 0603 0.62W
3025	4822 051 30222	2k2 5% 0.062W
3026	4822 051 30102	1k 5% 0.062W
3030	4822 117 13632	100k 1% 0603 0.62W
3031	4822 051 30222	2k2 5% 0.062W
3032	4822 051 30223	22k 5% 0.062W
3033	4822 051 30472	4k7 5% 0.062W
3034	4822 051 30103	10k 5% 0.062W
3035	4822 051 30102	1k 5% 0.062W
3036	4822 051 30222	2k2 5% 0.062W
3040	4822 051 30332	3k3 5% 0.062W
3041	4822 051 30222	2k2 5% 0.062W
3042	4822 117 12891	220k 1%
3043	4822 051 30222	2k2 5% 0.062W
3044	4822 051 30332	3k3 5% 0.062W
3045	4822 051 30684	680k 5% 0.062W
3050	4822 051 30102	1k 5% 0.062W
3051	4822 051 30102	1k 5% 0.062W
3052	4822 051 30102	1k 5% 0.062W
3053	4822 051 30102	1k 5% 0.062W
3054	4822 051 30222	2k2 5% 0.062W
3060	4822 051 30103	10k 5% 0.062W
3061	4822 051 30472	4k7 5% 0.062W
3065	4822 051 30103	10k 5% 0.062W
3066	4822 051 30102	1k 5% 0.062W
3071	4822 051 30759	75Ω 5% 0.062W
3072	4822 051 30271	270Ω 5% 0.062W
3073	4822 051 30223	22k 5% 0.062W
3074	4822 051 30221	220Ω 5% 0.062W
3075	4822 051 30561	560Ω 5% 0.062W
3076	4822 051 30759	75Ω 5% 0.062W
3077	4822 051 30271	270Ω 5% 0.062W
3078	4822 051 30223	22k 5% 0.062W
3079	4822 051 30221	220Ω 5% 0.062W
3080	4822 051 30561	560Ω 5% 0.062W
3081	4822 051 30759	75Ω 5% 0.062W
3082	4822 051 30271	270Ω 5% 0.062W
3083	4822 051 30223	22k 5% 0.062W
3084	4822 051 30221	220Ω 5% 0.062W
3085	4822 051 30561	560Ω 5% 0.062W
3086	5322 117 13034	1k5 1% 0.063W 0603
3087	5322 117 13057	820Ω 1% 0.063W 0603
3088	5322 117 13057	820Ω 1% 0.063W 0603
3089	5322 117 13034	1k5 1% 0.063W 0603
3090	5322 117 13051	680R 1% 0.063W 0603
3091	5322 117 13047	330Ω 1% 0.063W 0603
3092	5322 117 13047	330Ω 1% 0.063W 0603
3093	5322 117 13051	680R 1% 0.063W 0603
3094	5322 117 13018	1k0 1% 0.063W 0603
3095	5322 117 13036	1k2 1% 0.063W 0603
3096	5322 117 13049	470Ω 1% 0.063W 0603
3097	5322 117 13062	390R 1% 0.063W 0603
3098	5322 117 13018	1k0 1% 0.063W 0603
3099	5322 117 13018	1k0 1% 0.063W 0603
3100	5322 117 13034	1k5 1% 0.063W 0603
3101	5322 117 13051	680R 1% 0.063W 0603
3102	5322 117 13046	1k8 1% 0.063W 0603
3103	5322 117 13047	330Ω 1% 0.063W 0603
3104	5322 117 13042	3K9 1% 0.063W 0603
3105	5322 117 13036	1k2 1% 0.063W 0603
3106	5322 117 13036	1k2 1% 0.063W 0603
3107	5322 117 13042	3K9 1% 0.063W 0603
3108	5322 117 13037	2K2 1% 0.063W 0603
3109	5322 117 13036	1k2 1% 0.063W 0603
3110	5322 117 13036	1k2 1% 0.063W 0603
3111	5322 117 13037	2K2 1% 0.063W 0603
3112	4822 051 30271	270Ω 5% 0.062W
3113	4822 051 30223	22k 5% 0.062W
3114	5322 117 13026	4K7 1% 0.063W 0603
3115	4822 051 30102	1k 5% 0.062W
3116	4822 051 30271	270Ω 5% 0.062W
3117	4822 051 30223	22k 5% 0.062W
3118	5322 117 13026	4K7 1% 0.063W 0603
3119	4822 051 30102	1k 5% 0.062W
3120	4822 051 30271	270Ω 5% 0.062W
3121	4822 051 30223	22k 5% 0.062W
3122	5322 117 13037	2K2 1% 0.063W 0603
3123	4822 051 30102	1k 5% 0.062W
3124	5322 117 13037	2K2 1% 0.063W 0603
3125	5322 117 13026	4K7 1% 0.063W 0603
3126	5322 117 13042	3K9 1% 0.063W 0603
3127	5322 117 13026	4K7 1% 0.063W 0603
3128	5322 117 13026	4K7 1% 0.063W 0603
3129	4822 051 30331	330Ω 5% 0.062W
3130	4822 051 30331	330Ω 5% 0.062W
3131	4822 051 30331	330Ω 5% 0.062W
3132	4822 051 30221	220Ω 5% 0.062W
3133	4822 051 30101	100Ω 5% 0.062W
3133	4822 051 30331	330Ω 5% 0.062W
3134	4822 051 30271	270Ω 5% 0.062W
3135	4822 051 30223	22k 5% 0.062W
3136	4822 051 30561	560Ω 5% 0.062W
3137	4822 051 30271	270Ω 5% 0.062W
3138	4822 051 30223	22k 5% 0.062W
3139	4822 051 30561	560Ω 5% 0.062W
3140	4822 051 30271	270Ω 5% 0.062W
3141	4822 051 30223	22k 5% 0.062W
3142	4822 051 30561	560Ω 5% 0.062W
3144	4822 051 30271	270Ω 5% 0.062W
3145	4822 051 30223	22k 5% 0.062W
3146	4822 051 30561	560Ω 5% 0.062W
3147	4822 051 30271	270Ω 5% 0.062W
3148	4822 051 30223	22k 5% 0.062W
3149	4822 051 30561	560Ω 5% 0.062W
3150	4822 051 30271	270Ω 5% 0.062W
3151	4822 051 30223	22k 5% 0.062W
3152	4822 051 30561	560Ω 5% 0.062W
3153	4822 051 30271	270Ω 5% 0.062W
3154	4822 051 30223	22k 5% 0.062W
3155	4822 051 30561	560Ω 5% 0.062W
3156	4822 051 30271	270Ω 5% 0.062W
3157	4822 051 30223	22k 5% 0.062W
3158	4822 051 30561	560Ω 5% 0.062W
3159	4822 051 30271	270Ω 5% 0.062W
3160	4822 051 30223	22k 5% 0.062W
3161	4822 051 30561	560Ω 5% 0.062W
3162	4822 051 30101	100Ω 5% 0.062W
3162	4822 051 30331	330Ω 5% 0.062W
3163	4822 051 30101	100Ω 5% 0.062W
3164	4822 051 30471	470Ω 5% 0.062W
3165	4822 051 30221	220Ω 5% 0.062W
3166	4822 051 30101	100Ω 5% 0.062W
3166	4822 051 30331	330Ω 5% 0.062W
3170	4822 051 30101	100Ω 5% 0.062W
3171	4822 051 30101	100Ω 5% 0.062W
3172	4822 051 30101	100Ω 5% 0.062W
3173	4822 051 30103	10k 5% 0.062W
3174	4822 051 30102	1k 5% 0.062W
3175	4822 051 30102	1k 5% 0.062W
3176	4822 051 30103	10k 5% 0.062W
3177	4822 051 30561	560Ω 5% 0.062W
3178	4822 051 30103	10k 5% 0.062W
3179	4822 051 30561	560Ω 5% 0.062W
3180	4822 051 30561	560Ω 5% 0.062W
3181	4822 051 30103	10k 5% 0.062W
3182	4822 051 30103	10k 5% 0.062W
3183	4822 051 30103	10k 5% 0.062W
3184	4822 051 30103	10k 5% 0.062W
3186	4822 051 30103	10k 5% 0.062W
3188	4822 051 30221	220Ω 5% 0.062W
3189	4822 051 30221	220Ω 5% 0.062W
3190	4822 051 30221	220Ω 5% 0.062W
3200	4822 051 30101	100Ω 5% 0.062W
3203	4822 051 30101	100Ω 5% 0.062W
3204	4822 051 30101	100Ω 5% 0.062W
3205	4822 051 30101	100Ω 5% 0.062W
3206	4822 051 30102	1k 5% 0.062W
3207	4822 051 30103	10k 5% 0.062W
3208	4822 051 30332	3k3 5% 0.062W
3209	4822 051 30101	100Ω 5% 0.062W
3210	4822 051 30101	100Ω 5% 0.062W
3211	4822 051 30102	1k 5% 0.062W
3212	4822 051 30102	1k 5% 0.062W
3214	4822 051 30472	4k7 5% 0.062W
3215	4822 051 30101	100Ω 5% 0.062W
3216	4822 051 30103	10k 5% 0.062W
3217	4822 051 30101	100Ω 5% 0.062W
3218	4822 051 30472	4k7 5% 0.062W
3219	4822 117 12139	22Ω 5% 0.062W
3225	4822 051 30472	4k7 5% 0.062W
3250	4822 051 30101	100Ω 5% 0.062W
3251	4822 051 30101	100Ω 5% 0.062W
3260	4822 051 30472	4k7 5% 0.062W
3261	4822 051 30471	470Ω 5% 0.062W
3263	4822 051 30472	4k7 5% 0.062W
3271	4822 051 30101	100Ω 5% 0.062W
3274	5322 117 12534	18Ω 2% 0.1W 0805
3275	5322 117 12534	18Ω 2% 0.1W 0805
3276	5322 117 12534	18Ω 2% 0.1W 0805
3277	2322 734 65609	56Ω 1% 0.125W 0805
3278	2322 734 65609	56Ω 1% 0.125W 0805
3279	2322 734 65609	56Ω 1% 0.125W 0805
3284	4822 051 30101	100Ω 5% 0.062W
3285	4822 051 30101	100Ω 5% 0.062W
3286	3198 031 11010	4 x 100Ω 5% 1206
3289	3198 031 11010	4 x 100Ω 5% 1206
3290	3198 031 11010	4 x 100Ω 5% 1206
3291	3198 031 11010	4 x 100Ω 5% 1206
3292	3198 031 11010	4 x 100Ω 5% 1206
3293	4822 051 30101	100Ω 5% 0.062W
3294	4822 051 30102	1k 5% 0.062W
3295	4822 051 30103	10k 5% 0.062W
3296	4822 051 30474	470k 5% 0.062W
3297	4822 051 30103	10k 5% 0.062W
3298	4822 051 30103	10k 5% 0.062W
3299	4822 051 30103	10k 5% 0.062W
3300	4822 051 30153	15k 5% 0.062W
3301	4822 051 30103	10k 5% 0.062W
3302	4822 051 30103	10k 5% 0.062W
3303	4822 051 30472	4k7 5% 0.062W
3304	4822 051 30689	68Ω 5% 0.063W 0603
3305	4822 051 30472	4k7 5% 0.062W
3306	4822 051 30153	15k 5% 0.062W
3307	4822 051 30472	4k7 5% 0.062W
3308	4822 051 30271	270Ω 5% 0.062W
3309	4822 051 30273	27k 5% 0.062W

3310	4822 051 30102	1k 5% 0.062W
3311	4822 051 30102	1k 5% 0.062W
3312	4822 117 12903	1k8 1% 0.063W 0603
3313	4822 051 30103	10k 5% 0.062W
3314	4822 117 12903	1k8 1% 0.063W 0603
3315	4822 051 30471	470Ω 5% 0.062W
3316	4822 051 30153	15k 5% 0.062W
3317	4822 051 30472	4k7 5% 0.062W
3318	4822 051 30271	270Ω 5% 0.062W
3319	4822 051 30273	27k 5% 0.062W
3320	4822 051 30102	1k 5% 0.062W
3321	4822 051 30102	1k 5% 0.062W
3322	4822 117 12903	1k8 1% 0.063W 0603
3323	4822 051 30103	10k 5% 0.062W
3324	4822 117 12903	1k8 1% 0.063W 0603
3325	4822 051 30471	470Ω 5% 0.062W
3326	4822 051 30102	1k 5% 0.062W
3327	4822 051 30103	10k 5% 0.062W
3328	4822 051 30271	270Ω 5% 0.062W
3329	4822 051 30273	27k 5% 0.062W
3330	4822 051 30102	1k 5% 0.062W
3331	4822 051 30102	1k 5% 0.062W
3332	4822 117 12903	1k8 1% 0.063W 0603
3333	4822 051 30103	10k 5% 0.062W
3334	4822 117 12903	1k8 1% 0.063W 0603
3335	4822 051 30471	470Ω 5% 0.062W
3336	4822 051 30103	10k 5% 0.062W
3337	4822 051 30103	10k 5% 0.062W
3338	4822 051 30333	33k 5% 0.062W
3339	4822 051 30103	10k 5% 0.062W
3340	4822 051 30103	10k 5% 0.062W
3344	4822 051 30472	4k7 5% 0.062W
3346	4822 051 30103	10k 5% 0.062W
3348	4822 051 30474	470k 5% 0.062W
3349	4822 051 30333	33k 5% 0.062W
3350	4822 051 30101	100Ω 5% 0.062W
3351	4822 051 30689	68Ω 5% 0.063W 0603
3352	4822 051 30103	10k 5% 0.062W
3353	4822 051 30101	100Ω 5% 0.062W
3354	4822 051 30101	100Ω 5% 0.062W
3355	4822 051 30103	10k 5% 0.062W
3356	4822 051 30103	10k 5% 0.062W
3357	4822 051 30103	10k 5% 0.062W
3358	4822 051 30472	4k7 5% 0.062W
3359	4822 051 30689	68Ω 5% 0.063W 0603
3363	4822 051 30472	4k7 5% 0.062W
3364	4822 117 12925	47k 1% 0.063W 0603
3365	4822 051 30474	470k 5% 0.062W
3366	4822 051 30102	1k 5% 0.062W
3367	4822 051 30103	10k 5% 0.062W
3368	4822 051 30103	10k 5% 0.062W
3369	4822 051 30472	4k7 5% 0.062W
3370	4822 051 30474	470k 5% 0.062W
3371	4822 051 30101	100Ω 5% 0.062W
3372	4822 051 30103	10k 5% 0.062W
3373	4822 051 30222	2k2 5% 0.062W
3375	4822 117 13632	100k 1% 0603 0.62W
3376	4822 051 30472	4k7 5% 0.062W
3377	4822 051 30101	100Ω 5% 0.062W
3379	4822 051 30222	2k2 5% 0.062W
3380	3198 031 11010	4 x 100Ω 5% 1206
3381	3198 031 11010	4 x 100Ω 5% 1206
3382	3198 031 11010	4 x 100Ω 5% 1206
3383	3198 031 11010	4 x 100Ω 5% 1206
3384	4822 051 30101	100Ω 5% 0.062W
3385	4822 051 30102	1k 5% 0.062W
3386	4822 051 30222	2k2 5% 0.062W
3387	4822 051 30102	1k 5% 0.062W
3388	4822 051 30102	1k 5% 0.062W
3389	4822 051 30101	100Ω 5% 0.062W
3390	4822 051 30102	1k 5% 0.062W
3391	4822 051 30333	33k 5% 0.062W
3392	4822 051 30101	100Ω 5% 0.062W
3393	4822 051 30102	1k 5% 0.062W
3394	4822 051 30222	2k2 5% 0.062W
3398	3198 031 11010	4 x 100Ω 5% 1206
3400	4822 051 30222	2k2 5% 0.062W
3400	4822 051 30103	10k 5% 0.062W
3400	4822 051 30472	4k7 5% 0.062W
3402	3198 031 11010	4 x 100Ω 5% 1206
3404	3198 031 11010	4 x 100Ω 5% 1206
3405	4822 051 30332	3k3 5% 0.062W
3406	3198 031 11010	4 x 100Ω 5% 1206
3410	4822 051 30222	2k2 5% 0.062W
3411	4822 051 30332	3k3 5% 0.062W
3413	4822 051 30222	2k2 5% 0.062W
3414	4822 051 30472	4k7 5% 0.062W
3415	4822 051 30472	4k7 5% 0.062W
3417	4822 051 30221	220Ω 5% 0.062W
3418	4822 051 30102	1k 5% 0.062W
3419	4822 051 30392	3k9 5% 0.063W 0603
3420	4822 051 30222	2k2 5% 0.062W
3421	4822 051 30102	1k 5% 0.062W
3422	4822 051 30152	1k5 5% 0.062W
3423	4822 051 30103	10k 5% 0.062W
3424	4822 051 30332	3k3 5% 0.062W
3426	4822 051 30332	3k3 5% 0.062W
3428	4822 051 30101	100Ω 5% 0.062W
3429	4822 051 30101	100Ω 5% 0.062W
3430	4822 051 30472	4k7 5% 0.062W
3431	4822 051 30101	100Ω 5% 0.062W
3432	4822 051 30472	4k7 5% 0.062W
3433	4822 051 30101	100Ω 5% 0.062W
3435	4822 051 30273	27k 5% 0.062W
3436	4822 117 12891	220k 1%
3448	3198 031 11010	4 x 100Ω 5% 1206
3449	3198 031 11010	4 x 100Ω 5% 1206
3450	4822 051 30101	100Ω 5% 0.062W
3451	3198 031 11010	4 x 100Ω 5% 1206
3452	3198 031 11010	4 x 100Ω 5% 1206
3453	3198 031 11010	4 x 100Ω 5% 1206
3460	3198 031 11010	4 x 100Ω 5% 1206
3461	3198 031 11010	4 x 100Ω 5% 1206
3462	3198 031 11010	4 x 100Ω 5% 1206
3463	3198 031 11010	4 x 100Ω 5% 1206
3464	3198 031 11010	4 x 100Ω 5% 1206
3483	4822 051 30471	470Ω 5% 0.062W
3485	4822 051 30151	150Ω 5% 0.062W
3486	4822 051 30151	150Ω 5% 0.062W
3487	4822 051 30151	150Ω 5% 0.062W
3488	4822 051 30222	2k2 5% 0.062W
3489	4822 051 30222	2k2 5% 0.062W
3490	4822 051 30102	1k 5% 0.062W
3494	3198 031 14710	4 x 470Ω 5% 1206
3496	4822 051 30103	10k 5% 0.062W
3502	4822 051 30008	Jumper 0603
3506	4822 051 30332	3k3 5% 0.062W
3507	4822 051 30472	4k7 5% 0.062W
3510	4822 051 30102	1k 5% 0.062W
3511	4822 051 30222	2k2 5% 0.062W
3512	4822 051 30562	5k6 5% 0.063W 0603
3513	4822 051 30332	3k3 5% 0.062W
3514	4822 051 30472	4k7 5% 0.062W
3515	4822 117 12925	47k 1% 0.063W 0603
3516	4822 117 12925	47k 1% 0.063W 0603
3517	4822 051 30102	1k 5% 0.062W
3518	4822 117 13632	100k 1% 0603 0.62W
3519	4822 051 30222	2k2 5% 0.062W
3520	4822 051 30222	2k2 5% 0.062W
3530	4822 051 30101	100Ω 5% 0.062W
3531	4822 051 30101	100Ω 5% 0.062W
3532	4822 051 30101	100Ω 5% 0.062W
3536	5322 117 13037	2K2 1% 0.063W 0603
3540	4822 051 30101	100Ω 5% 0.062W
3541	4822 051 30101	100Ω 5% 0.062W
3545	4822 051 30008	Jumper 0603
3547	4822 051 30102	1k 5% 0.062W
3548	4822 051 30102	1k 5% 0.062W
3550	4822 051 30101	100Ω 5% 0.062W
3551	4822 051 30101	100Ω 5% 0.062W
3552	4822 051 30101	100Ω 5% 0.062W
3553	4822 051 30101	100Ω 5% 0.062W
3556	4822 051 30222	2k2 5% 0.062W
3557	4822 051 30101	100Ω 5% 0.062W
3558	4822 051 30101	100Ω 5% 0.062W
3559	4822 051 30101	100Ω 5% 0.062W
3560	4822 051 30101	100Ω 5% 0.062W
3561	4822 051 30008	Jumper 0603
3562	4822 051 30103	10k 5% 0.062W
3563	4822 051 30008	Jumper 0603
3566	4822 051 30103	10k 5% 0.062W
3567	4822 051 30103	10k 5% 0.062W
3568	4822 051 30008	Jumper 0603
3570	4822 051 30332	3k3 5% 0.062W
3571	4822 051 30101	100Ω 5% 0.062W
3572	4822 051 30008	Jumper 0603
3575	4822 051 30102	1k 5% 0.062W
3578	4822 051 30151	150Ω 5% 0.062W
3580	4822 051 30472	4k7 5% 0.062W
3581	4822 051 30101	100Ω 5% 0.062W
3582	4822 051 30101	100Ω 5% 0.062W
3583	4822 051 30472	4k7 5% 0.062W
3590	4822 051 30332	3k3 5% 0.062W
3591	4822 051 30332	3k3 5% 0.062W
3592	4822 051 30332	3k3 5% 0.062W
3593	4822 051 30332	3k3 5% 0.062W
3594	4822 051 30472	4k7 5% 0.062W
3600	4822 051 30332	3k3 5% 0.062W
3601	4822 051 30332	3k3 5% 0.062W
3602	4822 051 30101	100Ω 5% 0.062W
3603	4822 051 30101	100Ω 5% 0.062W
3604	4822 051 30101	100Ω 5% 0.062W
3605	4822 051 30101	100Ω 5% 0.062W
3606	4822 051 30101	100Ω 5% 0.062W
3607	4822 051 30101	100Ω 5% 0.062W
3608	4822 051 30101	100Ω 5% 0.062W
3609	4822 051 30101	100Ω 5% 0.062W
3610	4822 051 30479	47Ω 5% 0.062W
3611	4822 051 30101	100Ω 5% 0.062W
3612	4822 051 30332	3k3 5% 0.062W
3613	4822 051 30332	3k3 5% 0.062W
3615	4822 051 30101	100Ω 5% 0.062W
3616	4822 051 30102	1k 5% 0.062W
3617	4822 051 30102	1k 5% 0.062W
3620	4822 051 30103	10k 5% 0.062W
3621	4822 051 30103	10k 5% 0.062W
3622	4822 051 30479	47Ω 5% 0.062W
3623	4822 051 30102	1k 5% 0.062W
3625	4822 051 30332	3k3 5% 0.062W
3626	4822 051 30332	3k3 5% 0.062W
3627	4822 051 30332	3k3 5% 0.062W
3628	4822 051 30101	100Ω 5% 0.062W
3630	4822 051 30102	1k 5% 0.062W
3632	4822 051 30332	3k3 5% 0.062W
3633	4822 051 30472	4k7 5% 0.062W
3634	4822 051 30332	3k3 5% 0.062W
3636	4822 051 30332	3k3 5% 0.062W
3637	4822 051 30102	1k 5% 0.062W
3638	4822 051 30102	1k 5% 0.062W
3639	4822 051 30102	1k 5% 0.062W
3640	4822 051 30222	2k2 5% 0.062W
3641	4822 051 30102	1k 5% 0.062W
3641	4822 051 30101	100Ω 5% 0.062W
3653	4822 051 30102	1k 5% 0.062W
3654	4822 051 30102	1k 5% 0.062W
3655	4822 051 30102	1k 5% 0.062W
3657	4822 051 30103	10k 5% 0.062W
3658	4822 051 30103	10k 5% 0.062W
3660	4822 051 30101	100Ω 5% 0.062W
3661	4822 051 30101	100Ω 5% 0.062W
3662	4822 051 30101	100Ω 5% 0.062W
3663	4822 051 30101	100Ω 5% 0.062W
3664	4822 051 30101	100Ω 5% 0.062W
3665	4822 051 30101	100Ω 5% 0.062W
3667	4822 051 30101	100Ω 5% 0.062W
3668	4822 051 30101	100Ω 5% 0.062W
3673	4822 051 30103	10k 5% 0.062W
3674	4822 051 30101	100Ω 5% 0.062W
3675	4822 051 30103	10k 5% 0.062W
3676	4822 051 30101	100Ω 5% 0.062W
3677	4822 051 30101	100Ω 5% 0.062W
3679	4822 051 30101	100Ω 5% 0.062W
3681	4822 051 30332	3k3 5% 0.062W
3682	4822 051 30471	470Ω 5% 0.062W
3685	4822 051 30332	3k3 5% 0.062W
3686	4822 051 30471	470Ω 5% 0.062W
3688	4822 051 30471	470Ω 5% 0.062W
3689	4822 051 30471	470Ω 5% 0.062W
3710	4822 051 30333	33k 5% 0.062W
3711	4822 051 30102	1k 5% 0.062W
3713	4822 051 30101	100Ω 5% 0.062W
3714	4822 051 30223	22k 5% 0.062W
3716	4822 051 30153	15k 5% 0.062W
3717	4822 051 30333	33k 5% 0.062W
3718	4822 051 30103	10k 5% 0.062W
3719	4822 051 30333	33k 5% 0.062W
3720	4822 051 30333	33k 5% 0.062W
3721	4822 051 30102	1k 5% 0.062W
3723	4822 051 30101	100Ω 5% 0.062W
3724	4822 051 30223	22k 5% 0.062W
3726	4822 051 30153	15k 5% 0.062W
3730	4822 051 30333	33k 5% 0.062W
3731	4822 051 30331	330Ω 5% 0.062W
3733	4822 051 30101	100Ω 5% 0.062W
3734	4822 051 30223	22k 5% 0.062W
3736	4822 051 30153	15k 5% 0.062W
3740	4822 051 30333	33k 5% 0.062W
3741	4822 051 30331	330Ω 5% 0.062W
3743	4822 051 30101	100Ω 5% 0.062W
3744	4822 051 30223	22k 5% 0.062W
3746	4822 051 30153	15k 5% 0.062W
3750	4822 051 30333	33k 5% 0.062W
3751	4822 051 30102	1k 5% 0.062W
3753	4822 051 30101	100Ω 5% 0.062W
3754	4822 051 30223	22k 5% 0.062W
3756	4822 051 30153	15k 5% 0.062W
3760	4822 051 30333	33k 5% 0.062W
3761	4822 051 30102	1k 5% 0.062W
3763	4822 051 30101	100Ω 5% 0.062W
3764	4822 051 30223	22k 5% 0.062W
3766	4822 051 30153	15k 5% 0.062W
3771	4822 051 30102	1k 5% 0.062W
3772	4822 051 30332	3k3 5% 0.062W
3773	4822 051 30103	10k 5% 0.062W
3775	4822 051 30102	1k 5% 0.062W
3776	4822 051 30332	3k3 5% 0.062W
3777	4822 051 30103	10k 5% 0.062W
3779	4822 051 30102	1k 5% 0.062W
3780	4822 051 30332	3k3 5% 0.062W
3781	4822 051 30103	10k 5% 0.062W
3783	4822 051 30102	1k 5% 0.062W
3784	4822 051 30332	3k3 5% 0.062W

3785	4822 051 30103	10k 5% 0.062W
3787	4822 051 30102	1k 5% 0.062W
3788	4822 051 30332	3k3 5% 0.062W
3789	4822 051 30103	10k 5% 0.062W
3791	4822 051 30102	1k 5% 0.062W
3792	4822 051 30332	3k3 5% 0.062W
3793	4822 051 30103	10k 5% 0.062W
3794	4822 051 30101	100Ω 5% 0.062W
3795	4822 051 30101	100Ω 5% 0.062W
3796	4822 051 30472	4k7 5% 0.062W
3797	4822 051 30472	4k7 5% 0.062W
3798	4822 051 30333	33k 5% 0.062W
3800	4822 051 30331	330Ω 5% 0.062W
3801	4822 051 30331	330Ω 5% 0.062W
3802	4822 051 30333	33k 5% 0.062W
3803	4822 117 13632	100k 1% 0603 0.62W
3804	4822 051 30333	33k 5% 0.062W
3805	4822 117 13632	100k 1% 0603 0.62W
3806	4822 117 13632	100k 1% 0603 0.62W
3807	4822 117 13632	100k 1% 0603 0.62W
3808	4822 117 13632	100k 1% 0603 0.62W
3809	4822 051 30333	33k 5% 0.062W
3810	4822 051 30472	4k7 5% 0.062W
3811	4822 051 30472	4k7 5% 0.062W
3812	4822 051 30101	100Ω 5% 0.062W
3813	4822 051 30101	100Ω 5% 0.062W
3815	4822 051 30101	100Ω 5% 0.062W
3816	4822 051 30101	100Ω 5% 0.062W
3817	4822 051 30101	100Ω 5% 0.062W
3818	4822 051 30101	100Ω 5% 0.062W
3820	4822 051 30333	33k 5% 0.062W
3821	4822 051 30103	10k 5% 0.062W
3822	4822 051 30333	33k 5% 0.062W
3836	4822 117 13632	100k 1% 0603 0.62W
3837	4822 117 13632	100k 1% 0603 0.62W
3840	4822 051 30223	22k 5% 0.062W
3841	4822 051 30223	22k 5% 0.062W
3843	4822 051 30393	39k 5% 0.062W
3844	4822 051 30101	100Ω 5% 0.062W
3845	4822 051 30101	100Ω 5% 0.062W
3846	4822 051 30223	22k 5% 0.062W
3847	4822 051 30393	39k 5% 0.062W
3848	4822 051 30393	39k 5% 0.062W
3849	4822 051 30101	100Ω 5% 0.062W
3850	4822 051 30223	22k 5% 0.062W
3851	4822 051 30223	22k 5% 0.062W
3853	4822 051 30393	39k 5% 0.062W
3854	4822 051 30101	100Ω 5% 0.062W
3855	4822 051 30101	100Ω 5% 0.062W
3856	4822 051 30223	22k 5% 0.062W
3857	4822 051 30393	39k 5% 0.062W
3858	4822 051 30393	39k 5% 0.062W
3859	4822 051 30101	100Ω 5% 0.062W
3860	4822 117 12902	8k2 1% 0.063W 0603
3861	4822 051 30223	22k 5% 0.062W
3862	4822 051 30273	27k 5% 0.062W
3863	4822 117 12902	8k2 1% 0.063W 0603
3864	4822 051 30223	22k 5% 0.062W
3865	4822 051 30273	27k 5% 0.062W
3866	4822 051 30101	100Ω 5% 0.062W
3867	4822 051 30101	100Ω 5% 0.062W
3870	4822 051 30101	100Ω 5% 0.062W
3879	4822 117 12925	47k 1% 0.063W 0603
3880	4822 051 30471	470Ω 5% 0.062W
3900	4822 051 30472	4k7 5% 0.062W
3901	4822 051 30333	33k 5% 0.062W
3902	4822 051 30471	470Ω 5% 0.062W
3903	4822 051 30471	470Ω 5% 0.062W
3904	4822 051 30471	470Ω 5% 0.062W
3905	4822 051 30103	10k 5% 0.062W
3906	4822 051 30103	10k 5% 0.062W
3907	4822 051 30103	10k 5% 0.062W
3908	4822 051 30103	10k 5% 0.062W
3909	4822 051 30152	1k5 5% 0.062W
3910	4822 051 30102	1k 5% 0.062W
3911	4822 117 12925	47k 1% 0.063W 0603
3912	4822 051 30472	4k7 5% 0.062W
3913	4822 051 30101	100Ω 5% 0.062W
3917	4822 051 30472	4k7 5% 0.062W
3918	4822 051 30102	1k 5% 0.062W
3919	4822 051 30102	1k 5% 0.062W
3922	4822 051 30102	1k 5% 0.062W
3923	4822 051 30472	4k7 5% 0.062W
3924	4822 051 30331	330Ω 5% 0.062W
3925	4822 051 30331	330Ω 5% 0.062W
3925	4822 051 30151	150Ω 5% 0.062W
3926	4822 051 30331	330Ω 5% 0.062W
3927	4822 051 30331	330Ω 5% 0.062W
3928	4822 051 30331	330Ω 5% 0.062W

4006	4822 051 30008	Jumper 0603
4007	4822 051 30008	Jumper 0603
4009	4822 051 30008	Jumper 0603
4010	4822 051 30008	Jumper 0603
4146	4822 051 30008	Jumper 0603
4152	4822 051 30008	Jumper 0603
4158	4822 051 30008	Jumper 0603
4201	4822 051 30008	Jumper 0603
4202	4822 051 30008	Jumper 0603
4203	4822 051 30008	Jumper 0603
4250	4822 051 30008	Jumper 0603
4315	4822 051 30008	Jumper 0603
4325	4822 051 30008	Jumper 0603
4335	4822 051 30008	Jumper 0603
4385	4822 051 30008	Jumper 0603
4431	4822 051 30008	Jumper 0603
4572	4822 051 30008	Jumper 0603
4574	4822 051 30008	Jumper 0603
4582	4822 051 30008	Jumper 0603
4605	4822 051 30008	Jumper 0603
4659	4822 051 30008	Jumper 0603
4680	4822 051 30008	Jumper 0603
4684	4822 051 30008	Jumper 0603
4794	4822 051 30008	Jumper 0603
4797	4822 051 30008	Jumper 0603
4800	4822 051 30008	Jumper 0603
4801	4822 051 30008	Jumper 0603
4810	4822 051 30008	Jumper 0603
4811	4822 051 30008	Jumper 0603
4871	4822 051 30008	Jumper 0603
4874	4822 051 30008	Jumper 0603
4875	4822 051 30008	Jumper 0603
4884	4822 051 30008	Jumper 0603
4894	4822 051 30008	Jumper 0603

5000	2422 549 43769	Bead 30Ω at 100MHz
5007	2422 549 43769	Bead 30Ω at 100MHz
5009	2422 549 43769	Bead 30Ω at 100MHz
5020	2422 549 43769	Bead 30Ω at 100MHz
5060	2422 549 43769	Bead 30Ω at 100MHz
5089	2422 549 43062	Bead 600Ω at 100MHz 0603
5140	2422 549 43062	Bead 600Ω at 100MHz 0603
5160	2422 549 43062	Bead 600Ω at 100MHz 0603
5161	2422 549 43062	Bead 600Ω at 100MHz 0603
5162	2422 549 43062	Bead 600Ω at 100MHz 0603
5164	2422 549 43062	Bead 600Ω at 100MHz 0603
5166	2422 549 43769	Bead 30Ω at 100MHz
5170	2422 549 43769	Bead 30Ω at 100MHz
5175	2422 549 43062	Bead 600Ω at 100MHz 0603
5180	2422 549 43062	Bead 600Ω at 100MHz 0603
5196	2422 549 43062	Bead 600Ω at 100MHz 0603
5197	2422 549 43769	Bead 30Ω at 100MHz
5198	2422 549 43062	Bead 600Ω at 100MHz 0603
5199	2422 549 43062	Bead 600Ω at 100MHz 0603
5210	2422 549 43062	Bead 600Ω at 100MHz 0603
5214	2422 549 43062	Bead 600Ω at 100MHz 0603
5220	2422 549 43062	Bead 600Ω at 100MHz 0603
5221	2422 549 43062	Bead 600Ω at 100MHz 0603
5222	2422 549 43062	Bead 600Ω at 100MHz 0603
5223	2422 549 43062	Bead 600Ω at 100MHz 0603
5224	2422 549 43062	Bead 600Ω at 100MHz 0603
5228	2422 549 43062	Bead 600Ω at 100MHz 0603
5300	2422 549 43062	Bead 600Ω at 100MHz 0603
5302	2422 549 43062	Bead 600Ω at 100MHz 0603
5352	2422 549 43769	Bead 30Ω at 100MHz
5520	2422 549 43062	Bead 600Ω at 100MHz 0603
5521	2422 549 43062	Bead 600Ω at 100MHz 0603
5522	2422 549 43062	Bead 600Ω at 100MHz 0603
5523	2422 549 43062	Bead 600Ω at 100MHz 0603
5524	2422 549 43062	Bead 600Ω at 100MHz 0603
5530	2422 549 43769	Bead 30Ω at 100MHz
5541	2422 549 43062	Bead 600Ω at 100MHz 0603
5570	3198 018 51090	10µH 10% 0603
5572	2422 549 43769	Bead 30Ω at 100MHz
5574	2422 549 43062	Bead 600Ω at 100MHz 0603
5628	2422 549 43062	Bead 600Ω at 100MHz 0603
5630	2422 549 43062	Bead 600Ω at 100MHz 0603
5642	2422 549 43062	Bead 600Ω at 100MHz 0603
5643	2422 549 43062	Bead 600Ω at 100MHz 0603
5644	2422 549 43062	Bead 600Ω at 100MHz 0603
5645	2422 549 43062	Bead 600Ω at 100MHz 0603
5646	2422 549 43062	Bead 600Ω at 100MHz 0603
5647	2422 549 43062	Bead 600Ω at 100MHz 0603
5648	2422 549 43062	Bead 600Ω at 100MHz 0603
5649	2422 549 43062	Bead 600Ω at 100MHz 0603
5670	2422 549 43062	Bead 600Ω at 100MHz 0603
5672	2422 549 43062	Bead 600Ω at 100MHz 0603
5673	2422 549 43062	Bead 600Ω at 100MHz 0603
5796	2422 549 43062	Bead 600Ω at 100MHz 0603
5798	2422 549 43062	Bead 600Ω at 100MHz 0603
5810	2422 549 43062	Bead 600Ω at 100MHz 0603
5820	2422 549 43062	Bead 600Ω at 100MHz 0603
5822	2422 549 43769	Bead 30Ω at 100MHz
5834	2422 549 43769	Bead 30Ω at 100MHz
5870	2422 549 43769	Bead 30Ω at 100MHz

6001	9340 548 71115	SM PDZ33B
6007	9322 149 96685	BZX384-C2V4
6010	9340 548 71115	SM PDZ33B
6019	9322 149 96685	BZX384-C2V4
6022	4822 130 10654	BAT254
6034	4822 130 10654	BAT254
6071	9340 548 71115	SM PDZ33B
6076	9340 548 71115	SM PDZ33B
6091	9340 548 71115	SM PDZ33B
6105	9322 149 96685	BZX384-C2V4
6166	9322 149 96685	BZX384-C2V4
6200	4822 130 10328	BAV99W
6201	4822 130 10328	BAV99W
6202	4822 130 10328	BAV99W
6203	4822 130 10328	BAV99W
6204	4822 130 10328	BAV99W
6205	4822 130 10328	BAV99W
6206	4822 130 10328	BAV99W
6207	4822 130 10328	BAV99W
6208	4822 130 10328	BAV99W
6209	4822 130 10328	BAV99W
6210	4822 130 83757	BAS216
6214	4822 130 83757	BAS216
6274	9340 548 71115	SM PDZ33B
6276	9340 548 71115	SM PDZ33B
6277	9340 548 71115	SM PDZ33B
6278	9340 548 71115	SM PDZ33B
6302	4822 130 10654	BAT254
6310	4822 130 10654	BAT254
6311	4822 130 10654	BAT254
6315	9340 548 71115	SM PDZ33B
6316	9340 548 71115	SM PDZ33B
6317	9340 548 71115	SM PDZ33B
6318	9340 548 71115	SM PDZ33B
6319	9340 548 71115	SM PDZ33B
6320	9340 548 71115	SM PDZ33B
6321	9340 548 71115	SM PDZ33B
6322	9340 548 71115	SM PDZ33B
6323	9340 548 71115	SM PDZ33B
6324	9340 548 71115	SM PDZ33B
6354	9340 548 71115	SM PDZ33B
6355	9340 548 71115	SM PDZ33B
6356	9340 548 71115	SM PDZ33B
6357	9340 548 71115	SM PDZ33B
6365	9322 129 38685	BZM55-C6V8
6366	4822 130 10654	BAT254
6378	4822 130 83757	BAS216
6380	4822 130 10654	BAT254
6381	4822 130 10654	BAT254
6388	4822 130 11422	PLVA2650A
6393	4822 130 11422	PLVA2650A
6399	4822 130 11422	PLVA2650A
6503	9322 149 96685	BZX384-C2V4
6507	4822 130 10654	BAT254
6508	4822 130 10654	BAT254
6509	4822 130 10654	BAT254
6551	4822 130 10328	BAV99W
6552	4822 130 10328	BAV99W
6553	4822 130 10328	BAV99W
6554	4822 130 10328	BAV99W
6555	4822 130 10328	BAV99W
6630	4822 130 10654	BAT254
6710	9340 548 71115	SM PDZ33B
6711	9340 548 71115	SM PDZ33B
6720	9340 548 71115	SM PDZ33B
6721	9340 548 71115	SM PDZ33B
6730	9340 548 71115	SM PDZ33B
6731	9340 548 71115	SM PDZ33B
6740	9340 548 71115	SM PDZ33B
6741	9340 548 71115	SM PDZ33B
6750	9340 548 71115	SM PDZ33B
6751	9340 548 71115	SM PDZ33B
6760	9340 548 71115	SM PDZ33B
6761	9340 548 71115	SM PDZ33B
6770	9340 548 71115	SM PDZ33B
6771	9340 548 71115	SM PDZ33B
6774	9340 548 71115	SM PDZ33B
6775	9340 548 71115	SM PDZ33B
6778	9340 548 71115	SM PDZ33B
6779	9340 548 71115	SM PDZ33B
6782	9340 548 71115	SM PDZ33B
6783	9340 548 71115	SM PDZ33B
6786	9340 548 71115	SM PDZ33B
6787	9340 548 71115	SM PDZ33B
6790	9340 548 71115	SM PDZ33B
6791	9340 548 71115	SM PDZ33B
6802	9340 260 20115	BAW56W

6805	9340 260 20115	BAW56W
6807	9340 260 20115	BAW56W
6820	4822 130 10654	BAT254
6821	4822 130 11422	PLVA2650A

7000	3198 010 42310	BC847BW
7001	3198 010 42310	BC847BW
7002	3198 010 42310	BC847BW
7006	3198 010 42310	BC847BW
7007	5322 209 11598	PC74HCT4538T
7009	9337 153 10118	74HCT4052D
7010	3198 010 42310	BC847BW
7025	4822 209 30732	LM319D
7040	4822 209 60767	LM1881M
7041	3198 010 42310	BC847BW
7060	3198 010 42310	BC847BW
7065	3198 010 42310	BC847BW
7074	3198 010 42310	BC847BW
7075	3198 010 42320	BC857BW
7079	3198 010 42310	BC847BW
7080	3198 010 42320	BC857BW
7084	3198 010 42310	BC847BW
7085	3198 010 42320	BC857BW
7088	9322 145 66668	TSH93ID
7089	4822 209 60792	74HC4053D
7090	9322 145 66668	TSH93ID
7100	4822 209 60792	74HC4053D
7102	3198 010 42310	BC847BW
7103	3198 010 42310	BC847BW
7104	3198 010 42310	BC847BW
7105	3198 010 42310	BC847BW
7107	4822 209 73852	PMBT2369
7110	3198 010 42310	BC847BW
7111	3198 010 42310	BC847BW
7112	3198 010 42310	BC847BW
7113	3198 010 42310	BC847BW
7115	4822 209 73852	PMBT2369
7117	3198 010 42310	BC847BW
7121	3198 010 42310	BC847BW
7129	9340 217 80115	BC847CW
7130	9340 217 80115	BC847CW
7131	9340 217 80115	BC847CW
7135	3198 010 42310	BC847BW
7138	3198 010 42310	BC847BW
7141	3198 010 42310	BC847BW
7145	3198 010 42310	BC847BW
7146	9337 153 10118	74HCT4052D
7148	3198 010 42310	BC847BW
7151	3198 010 42310	BC847BW
7154	3198 010 42310	BC847BW
7157	3198 010 42310	BC847BW
7158	9337 153 10118	74HCT4052D
7160	3198 010 42310	BC847BW
7165	3198 010 42310	BC847BW
7170	9322 160 96671	AD9887KS-140
7175	4822 209 17398	LD1117DT33
7215	9322 046 99668	ST24FC21M6
7225	9352 673 95518	SAA7118E/V1
7280	9322 158 95668	SDA9400
7303	4822 209 30212	PC74HCT125T
7305	3198 010 42310	BC847BW
7306	3198 010 42310	BC847BW
7307	3198 010 42310	BC847BW
7308	3198 010 42310	BC847BW
7309	3198 010 42310	BC847BW
7310	3198 010 42310	BC847BW
7311	9322 145 66668	TSH93ID
7315	3198 010 42310	BC847BW
7316	3198 010 42310	BC847BW
7318	3198 010 42310	BC847BW
7319	3198 010 42310	BC847BW
7320	3198 010 42310	BC847BW
7321	3198 010 42310	BC847BW
7322	3198 010 42310	BC847BW
7323	3198 010 42310	BC847BW
7325	3198 010 42310	BC847BW
7326	3198 010 42310	BC847BW
7328	3198 010 42310	BC847BW
7333	3198 010 42310	BC847BW
7340	9337 153 10118	74HCT4052D
7352	9322 160 17668	ST202ECD
7356	3198 010 42310	BC847BW
7357	3198 010 42310	BC847BW
7358	3198 010 42310	BC847BW
7364	4822 130 61553	DTC124EU
7365	3198 010 42310	BC847BW
7366	3198 010 42310	BC847BW
7367	3198 010 42310	BC847BW
7370	4822 209 71585	74HCT4538N
7383	9352 684 81557	SAA5801H/015
7405	3198 010 42310	BC847BW
7406	3198 010 42310	BC847BW
7430	9322 156 81668	M24C32-WMN6TNKSA
7435	3198 010 42310	BC847BW
7500	9322 157 20668	MSM51V18165F-60J
7506	9322 168 18668	AM29DL164DT-70EI
7510	9352 499 60118	74LVC00AD
7515	3198 010 42310	BC847BW
7516	3198 010 42320	BC857BW
7517	9322 158 67685	ADM810TART
7530	4822 209 90188	PCF8591T
7540	5322 209 33172	PCF8574AT
7555	5322 209 11598	PC74HCT4538T
7563	3198 010 42310	BC847BW
7570	9322 137 99668	FS6377-01
7571	5322 209 11598	PC74HCT4538T
7574	9352 317 00118	74LVC125AD
7580	9322 156 81668	M24C32-WMN6TNKSA
7605	9322 158 73671	PW164-10R
7628	9322 164 75682	CY62126BVLL-70ZI
7630	9322 168 18668	AM29DL164DT-70EI
7640	4822 209 16406	TL431ACD
7641	9322 157 95668	STD16NE06L
7655	9322 141 53682	EPC2LC20
7656	9322 186 23671	EP1K50FC256-3
7670	9322 159 45668	DS90C385MTD
7675	9340 560 36235	BSH111
7676	9340 560 36235	BSH111
7714	4822 209 30095	LM833D
7718	3198 010 42310	BC847BW
7734	4822 209 30095	LM833D
7754	4822 209 30095	LM833D
7798	9322 116 87668	TEA6422D
7800	4822 209 60792	74HC4053D
7801	3198 010 42310	BC847BW
7802	3198 010 42310	BC847BW
7803	3198 010 42320	BC857BW
7805	9340 547 13215	BSH103
7806	9340 547 13215	BSH103
7807	9340 547 13215	BSH103
7808	9340 547 13215	BSH103
7812	9322 167 63668	MSP3415G-QG-B8
7841	4822 209 30095	LM833D
7851	4822 209 30095	LM833D
7861	9322 173 77668	TS462CD
7870	9322 167 76668	TC74HC590AF
7874	9322 167 76668	TC74HC590AF
7879	3198 010 42310	BC847BW
7880	9322 153 66668	CY7C199-15ZC
7881	9351 869 80118	74HCT573DB
7882	9351 869 80118	74HCT573DB

VGA Panel [VGA]

Various

0318	2422 025 17183	Connector 32P f h 1.00 FFC
0371	2422 025 17027	Connector 15P F h SUB-D
0371	4822 267 51477	Socket 15P f h 1.27 SUB-D
0372	2422 025 17027	Connector 15P F h SUB-D
0372	4822 267 51477	Socket 15P f h 1.27 SUB-D
0374	2422 026 05276	Socket cinch 1P f h Orange
0604	3122 357 00301	Software DCC_7904_00301
0605	3122 357 00311	Software DCC_7907_00311

2901	2238 586 59812	100nF +80/-20% 50V 0603
2902	2238 586 59812	100nF +80/-20% 50V 0603
2909	2238 586 59812	100nF +80/-20% 50V 0603
2910	2238 586 59812	100nF +80/-20% 50V 0603
2925	2020 552 94427	100pF 5% 50v 0603

3900	4822 051 30331	330Ω 5% 0.062W
3901	4822 051 30331	330Ω 5% 0.062W
3902	4822 051 30331	330Ω 5% 0.062W
3903	4822 051 30101	100Ω 5% 0.062W
3904	4822 051 30103	10k 5% 0.062W
3905	4822 051 30103	10k 5% 0.062W
3906	4822 051 30101	100Ω 5% 0.062W
3907	4822 051 30101	100Ω 5% 0.062W
3908	4822 051 30101	100Ω 5% 0.062W
3909	4822 051 30101	100Ω 5% 0.062W
3910	4822 051 30103	10k 5% 0.062W
3911	4822 051 30101	100Ω 5% 0.062W
3912	4822 051 30102	1k 5% 0.062W
3913	4822 051 30101	100Ω 5% 0.062W
3914	4822 051 30102	1k 5% 0.062W
3915	4822 051 30101	100Ω 5% 0.062W
3916	4822 051 30101	100Ω 5% 0.062W
3917	4822 051 30103	10k 5% 0.062W
3918	4822 051 30103	10k 5% 0.062W
3919	4822 051 30101	100Ω 5% 0.062W
3920	4822 051 30101	100Ω 5% 0.062W
3921	4822 051 30103	10k 5% 0.062W
3922	4822 051 30101	100Ω 5% 0.062W
3923	4822 051 30102	1k 5% 0.062W
3924	4822 051 30101	100Ω 5% 0.062W
3925	4822 051 30102	1k 5% 0.062W
3926	4822 051 30101	100Ω 5% 0.062W
3927	4822 051 30472	4k7 5% 0.062W
3929	4822 051 30472	4k7 5% 0.062W
3930	4822 051 30472	4k7 5% 0.062W
3934	4822 051 30103	10k 5% 0.062W
3935	4822 051 30333	33k 5% 0.062W
3999	4822 051 30152	1k5 5% 0.062W

5900	2422 549 43062	Bead 600Ω at 100MHz 0603
5901	2422 549 43062	Bead 600Ω at 100MHz 0603

6900	9322 149 10685	BZM55-C33
6901	9322 149 10685	BZM55-C33
6902	9322 149 10685	BZM55-C33
6903	9322 149 10685	BZM55-C33
6904	4822 130 10654	BAT254
6905	4822 130 10654	BAT254
6906	9322 149 10685	BZM55-C33
6907	9322 149 10685	BZM55-C33
6908	9322 149 10685	BZM55-C33
6909	9322 149 10685	BZM55-C33
6910	9322 149 10685	BZM55-C33
6911	9322 149 10685	BZM55-C33
6912	9322 149 10685	BZM55-C33
6913	9322 149 10685	BZM55-C33
6914	9322 149 10685	BZM55-C33
6915	9322 149 10685	BZM55-C33
6916	4822 130 10654	BAT254
6918	9322 149 10685	BZM55-C33
6920	9322 149 10685	BZM55-C33
6921	9322 149 10685	BZM55-C33
6922	9322 149 10685	BZM55-C33
6923	9322 149 10685	BZM55-C33
6925	9322 149 10685	BZM55-C33

7900	5322 209 71568	PC74HCT14T
7904	9322 046 99668	ST24FC21M6
7907	9322 046 99668	ST24FC21M6
7910	4822 209 30212	PC74HCT125T
7915	3198 010 42310	BC847BW

11. Revision List

First release.