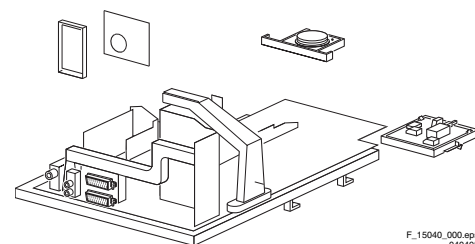


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Service Manual

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1. Technical Specifications, Connections, and Chassis Overview

Index of this chapter:

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

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

1.1 Technical Specifications

1.1.1 Vision

Display type	: CRT, DV, RF
Screen size	: 28" (70 cm), 4:3
	: 28" (70 cm), 16:9
	: 29" (72 cm), 4:3
	: 32" (82 cm), 16:9
Tuning system	: PLL
TV Colour systems	: PAL B/G, D/K, I
	: SECAM B/G, D/K, L/L'
Video playback	: NTSC M/N 3.58, 4.43
	: PAL B/G
	: SECAM L/L'
Presets/channels	: 100/125 presets
Tuner bands	: VHF
	: UHF
	: S-band
	: Hyper-band

1.1.2 Sound

Sound systems	: FM-mono
	: AM-mono
	: FM-stereo B/G
	: NICAM B/G, D/K, I, L
	: AV Stereo
Maximum power (W_{RMS})	: 2 x 10

1.1.3 Miscellaneous

Power supply:	
- Mains voltage (V_{AC})	: 230
- Mains frequency (Hz)	: 50 / 60
Ambient conditions:	
- Temperature range ($^{\circ}C$)	: -5 to +40
- Maximum humidity	: 95% R.H.
Power consumption	
- Normal operation (W)	: ≈ 160
- Stand-by (W)	: < 1
Dimensions (WxHxD cm)	: ?x?x?
Weight (kg)	: ?

1.2 Connection Overview

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

1.2.1 Front / Side Connections

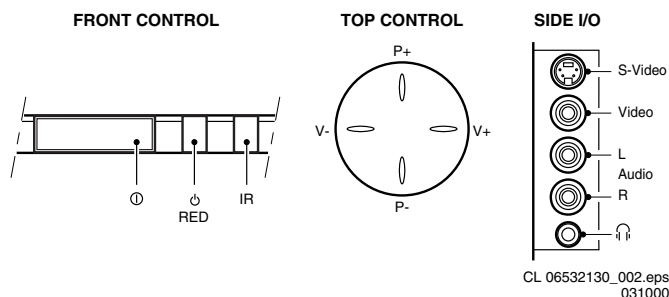


Figure 1-1 Front and top control, side I/O connections

Cinch: Video CVBS - In, Audio - In

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

SVHS (Hosiden): Video Y/C - In

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

Mini Jack: Audio Headphone - Out

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

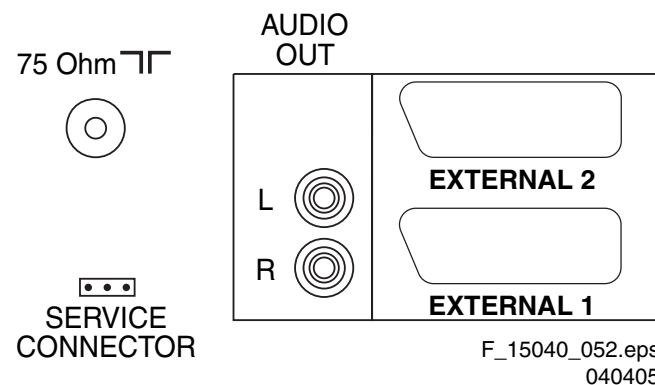


Figure 1-2 Rear connections

Aerial - In

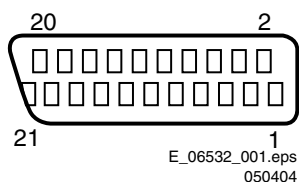
- - IEC-type (EU)	Coax, 75 ohm	⊕ ⊙
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Cinch: Video CVBS - Out, Audio - Out

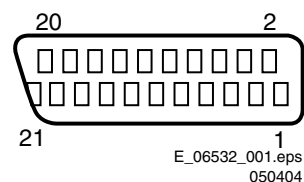
Ye - Video CVBS	1 V_{PP} / 75 ohm	⊕ ⊙
Wh - Audio L	0.5 V_{RMS} / 10 kohm	⊕ ⊙
Rd - Audio R	0.5 V_{RMS} / 10 kohm	⊕ ⊙

Service Connector (ComPair)

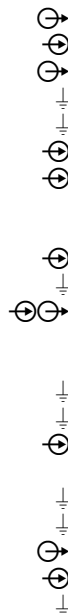
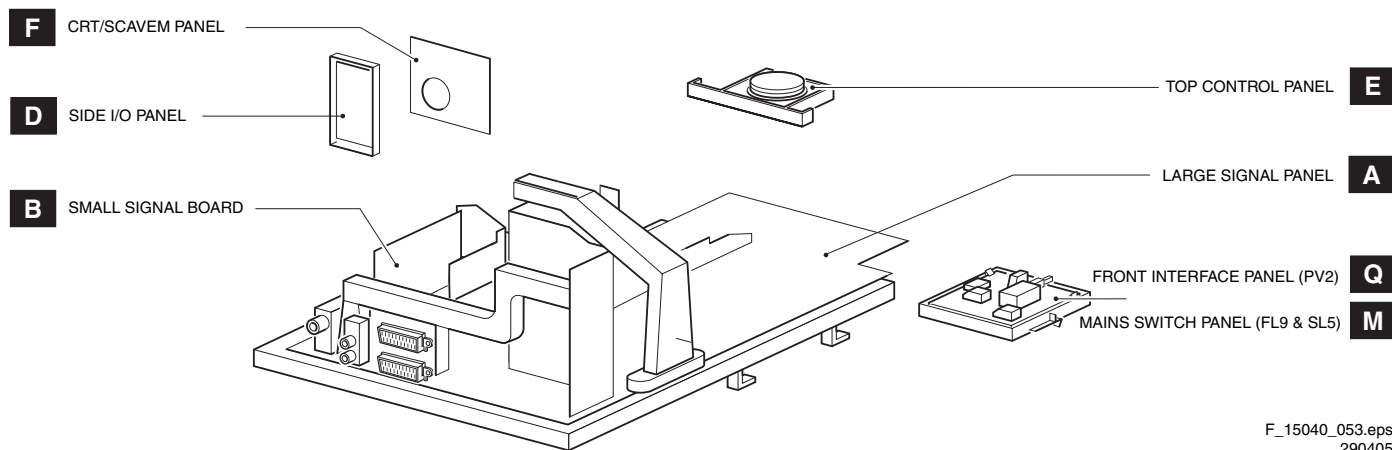
1 - SDA-S	I ² C Data (0 - 5 V)	⊕ ⊙
2 - SCL-S	I ² C Clock (0 - 5 V)	⊕ ⊙
3 - Ground	Gnd	⊕ ⊙

EXT1: Video RGB - In, CVBS - In/Out, Audio - In/Out**Figure 1-3 SCART connector**

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

**EXT2: Video YC - In, CVBS - In/Out, Audio - In/Out****Figure 1-4 SCART connector**

1	- Audio R	0.5 V _{RMS} / 1 kohm
2	- Audio R	0.5 V _{RMS} / 10 kohm
3	- Audio L	0.5 V _{RMS} / 1 kohm
4	- Ground Audio	Gnd
5	- Ground Blue	Gnd
6	- Audio L	0.5 V _{RMS} / 10 kohm
7	- C-FRONT	0.7 V _{PP} / 75 ohm
8	- Function Select	0 - 2 V: INT 4.5 - 7 V: EXT 16:9 9.5 - 12 V: EXT 4:3
9	- Ground Green	Gnd
10	- Easylink P50	0 - 5 V / 4.7 kohm
11	- n.c.	
12	- n.c.	
13	- Ground Red	Gnd
14	- Ground Data	Gnd
15	- C	0.7 V _{PP} / 75 ohm
16	- n.c.	
17	- Ground Video	Gnd
18	- Ground FBL	Gnd
19	- Video CVBS	1 V _{PP} / 75 ohm
20	- Video CVBS/Y	1 V _{PP} / 75 ohm
21	- Shield	Gnd

**1.3 Chassis Overview**F_15040_053.eps
290405**Figure 1-5 PWB location**

2. Safety Instructions, Warnings, and Notes

Index of this chapter:

- 2.1 Safety Instructions
- 2.2 Maintenance Instructions
- 2.3 Warnings
- 2.4 Notes

2.1 Safety Instructions

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

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

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

- General repair instruction: as a strict precaution, we advise you to re-solder the solder connections through which the horizontal deflection current flows. In particular this is valid for the:
 1. Pins of the line output transformer (LOT).
 2. Fly-back capacitor(s).
 3. S-correction capacitor(s).
 4. Line output transistor.
 5. Pins of the connector with wires to the deflection coil.
 6. Other components through which the deflection current flows.

Note: This re-soldering is advised to prevent bad connections due to metal fatigue in solder connections, and is therefore only necessary for television sets more than two years old.

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

2.2 Maintenance Instructions

We recommend a maintenance inspection carried out by qualified service personnel. The interval depends on the usage conditions:

- When a customer uses the set under normal circumstances, for example in a living room, the recommended interval is three to five years.
- When a customer uses the set in an environment with higher dust, grease, or moisture levels, for example in a kitchen, the recommended interval is one year.
- The maintenance inspection includes the following actions:
 1. Perform the "general repair instruction" noted above.

2. Clean the power supply and deflection circuitry on the chassis.
3. Clean the picture tube panel and the neck of the picture tube.

2.3 Warnings

- In order to prevent damage to ICs and transistors, avoid all high voltage flashovers. In order to prevent damage to the picture tube, use the method shown in figure "Discharge picture tube", to discharge the picture tube. Use a high voltage probe and a multi-meter (position V_{DC}). Discharge until the meter reading is 0 V (after approx. 30 s).

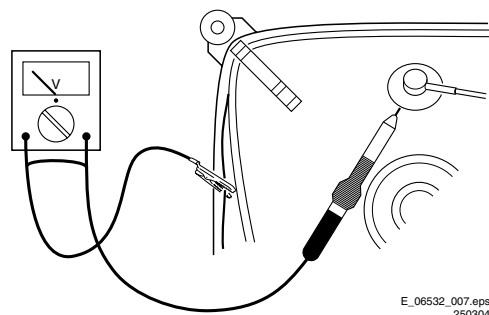


Figure 2-1 Discharge picture tube

- 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 prevents circuits from becoming unstable.

2.4 Notes

2.4.1 General

- Measure the voltages and waveforms with regard to the chassis (= tuner) ground (⊥), or hot ground (⊥), depending on the tested area of circuitry. The voltages and waveforms shown in the diagrams are indicative. Measure them in the Service Default Mode (see chapter 5) with a colour bar signal and stereo sound (L: 3 kHz, R: 1 kHz unless stated otherwise) and picture carrier at 475.25 MHz for PAL, or 61.25 MHz for NTSC (channel 3).
- Where necessary, measure the waveforms and voltages with (⏏) and without (⏏) aerial signal. Measure the voltages in the power supply section both in normal operation (⏏) and in stand-by (⏏). These values are indicated by means of the appropriate symbols.
- The semiconductors indicated in the circuit diagram and in the parts lists, are interchangeable per position with the semiconductors in the unit, irrespective of the type indication on these semiconductors.

- Manufactured under license from Dolby Laboratories. "Dolby", "Pro Logic" and the "double-D symbol", are trademarks of Dolby Laboratories.

2.4.2 Schematic Notes

- All resistor values are in ohms, and the value multiplier is often used to indicate the decimal point location (e.g. 2K2 indicates 2.2 kohm).
- Resistor values with no multiplier may be indicated with either an "E" or an "R" (e.g. 220E or 220R indicates 220 ohm).
- All capacitor values are given in micro-farads ($\mu = \times 10^{-6}$), nano-farads ($n = \times 10^{-9}$), or pico-farads ($p = \times 10^{-12}$).
- Capacitor values may also use the value multiplier as the decimal point indication (e.g. 2p2 indicates 2.2 pF).
- An "asterisk" (*) indicates component usage varies. Refer to the diversity tables for the correct values.
- The correct component values are listed in the Spare Parts List. Therefore, always check this list when there is any doubt.

2.4.3 Rework on BGA (Ball Grid Array) ICs

General

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

Device Removal

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

Area Preparation

When the component has been removed, the vacant IC area must be cleaned before replacing the (LF)BGA.

Removing an IC often leaves varying amounts of solder on the mounting lands. This excessive solder can be removed with either a solder sucker or solder wick. The remaining flux can be removed with a brush and cleaning agent.

After the board is properly cleaned and inspected, apply flux on the solder lands and on the connection balls of the (LF)BGA.

Note: Do not apply solder paste, as this has been shown to result in problems during re-soldering.

Device Replacement

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

More Information

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

2.4.4 Lead-free Solder

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

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



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Figure 2-2 Serial number example

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

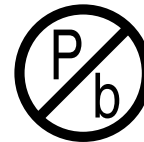


Figure 2-3 Lead-free logo

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

- Use only lead-free soldering tin Philips SAC305 with order code 0622 149 00106. If lead-free solder paste is required, please contact the manufacturer of your soldering equipment. In general, use of solder paste within workshops should be avoided because paste is not easy to store and to handle.
- Use only adequate solder tools applicable for lead-free soldering tin. The solder tool must be able:
 - To reach a solder-tip temperature of at least 400°C.
 - To stabilise the adjusted temperature at the solder-tip.
 - To exchange solder-tips for different applications.
- Adjust your solder tool so that a temperature of around 360°C - 380°C is reached and stabilised at the solder joint. Heating time of the solder-joint should not exceed ~ 4 sec. Avoid temperatures above 400°C, otherwise wear-out of tips will increase drastically and flux-fluid will be destroyed. To avoid wear-out of tips, switch "off" unused equipment or reduce heat.
- Mix of lead-free soldering tin/parts with leaded soldering tin/parts is possible but PHILIPS recommends strongly to **avoid** mixed regimes. If this cannot be avoided, carefully clean the solder-joint from old tin and re-solder with new tin.
- Use only original spare-parts listed in the Service-Manuals. Not listed standard material (commodities) has to be purchased at external companies.
- Special information for lead-free BGA ICs: these ICs will be delivered in so-called "dry-packaging" to protect the IC against moisture. This packaging may only be opened shortly before it is used (soldered). Otherwise the body of the IC gets "wet" inside and during the heating time the structure of the IC will be destroyed due to high (steam-) pressure inside the body. If the packaging was opened before usage, the IC has to be heated up for some hours (around 90°C) for drying (think of ESD-protection!).
Do not re-use BGAs at all!

- For sets produced before 1.1.2005, containing leaded soldering tin and components, all needed spare parts will be available till the end of the service period. For the repair of such sets nothing changes.

In case of doubt whether the board is lead-free or not (or with mixed technologies), you can use the following method:

- Always use the highest temperature to solder, when using SAC305 (see also instructions below).
- De-solder thoroughly (clean solder joints to avoid the mixing of two alloys).

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

For additional questions please contact your local repair help desk.

2.4.5 Practical Service Precautions

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

3. Directions for Use

You can download this information from the following websites:

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

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

4. Mechanical Instructions

Index of this chapter:

- 4.1 Service Connector (for ComPair)
- 4.2 Set Disassembly
- 4.3 Service Positions
- 4.4 Assy / Board Removal
- 4.5 Set Re-assembly

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

4.1 Service Connector (for ComPair)

For service diagnostics with ComPair, it is not necessary to disassemble the set. You only have to connect the ComPair interface box, via the appropriate cable, to the service connector (on the rear of the set, see figure 1-2), and start the program (see also chapter 5 "Service Modes, Error Codes, and Fault Finding").

4.2 Set Disassembly

Follow the disassemble instructions in described order.

4.2.1 Rear Cover Removal

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

1. Remove all the fixation screws of the rear cover.
2. Now the rear cover can be removed.

4.3 Service Positions

This chassis has several predefined service positions, for better accessibility. They are explained below in more detail.

4.3.1 Large Signal Panel (LSP)

Component Side LSP

For better accessibility of the LSP, do the following (see Figure "Service position 1"):

1. Simultaneously do the following: a) pull the two plastic locking handles at the mid left and mid right side of the bracket gently backwards to unlock the bracket, and b) loosen the bracket from the bottom tray, by pulling it backwards. N.B.: You do not need to pull the other two locking handles backwards.
2. Remove the LSP-bracket from the bottom tray by lifting it upwards.
3. Hook the bracket in the first row of fixation holes of the bottom tray. In other words, reposition the bracket from [1] to [2].

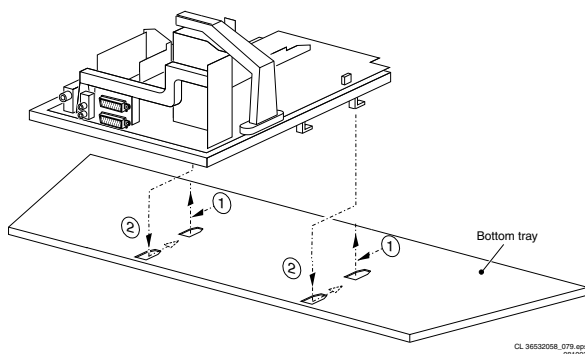


Figure 4-1 Service position 1

Solder Side LSP

To get access to the bottom side (solder side) of the LSP, do the following (see figure 4-1):

1. Remove the connector of the mains cable (coming from the mains switch-module) from the LSP.
2. Remove the cable (connector) from the side I/O panel.
3. Release some wiring from their fixation clamps, in order to get room for repositioning the LSP.
4. Flip the LSP 90 degrees clockwise [2], and place it in the fixation hole at the left side of the bottom tray [3].
5. Push the LSP forward to fix it. (Alternatively, the LSP may also be placed on your work bench without being positioned in its fixation hole, or it may even be removed from the bracket for better accessibility, see "Assy / Board Removal: Large Signal Panel (LSP)" on the next pages.)

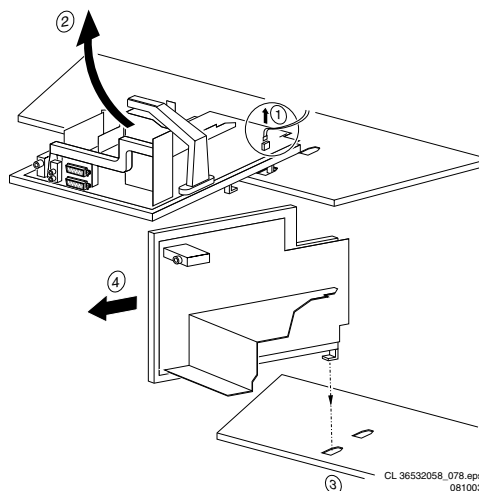


Figure 4-2 Service position 2

4.3.2 Small Signal Board (SSB)

In fact, there is no predefined service position for the SSB. Most test points are located on the A-side (side that is facing the tuner). If you have to replace ICs, you must take the complete SSB module out of the SIMM-connector.

Notes:

- For better access to the SSB, it is possible to order an "extension tool" with cables. You can use this service extension tool to connect a Small Signal Board (SSB) of an ES1E, A02, A10, or EMG (EMx) chassis, via two "IDE" cables to the SIMM connector in the set. In this way, you can service the SSB more easily outside the TV set. You can order this tool under 12nc: 9965 000 14526.
- If necessary for the measurement, you can put the LSP in "service position 2" (as described above).

4.4 Assy / Board Removal

Sometimes, it can be necessary to swap a complete assy or Printed Wiring Board (PWB). How that can be done is explained below.

4.4.1 Top Control Assy/Panel

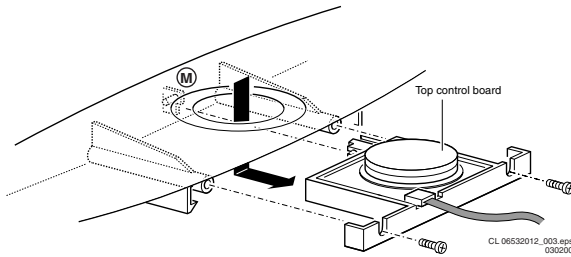


Figure 4-3 Top control panel

1. Remove the two fixation screws that hold the panel.
2. Pull the board backwards (i.e., release it from the front hinge).
3. The board can be lifted out of the bracket after releasing the two fixation clamps at the connector side.

4.4.2 Side I/O Assy and Panel

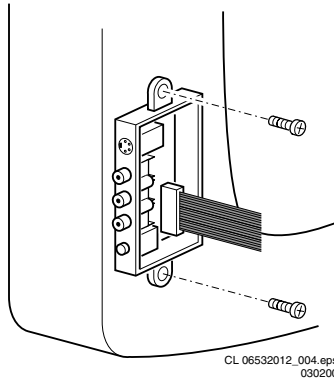


Figure 4-4 Side-I/O panel

1. The complete side I/O-assembly can be removed by unscrewing the two fixation screws.
2. The board can be lifted out of the bracket after releasing the two fixation clamps.

4.4.3 Mains Switch Assy/Panel

4.4.4 Accessing the Mains Switch/LED panel

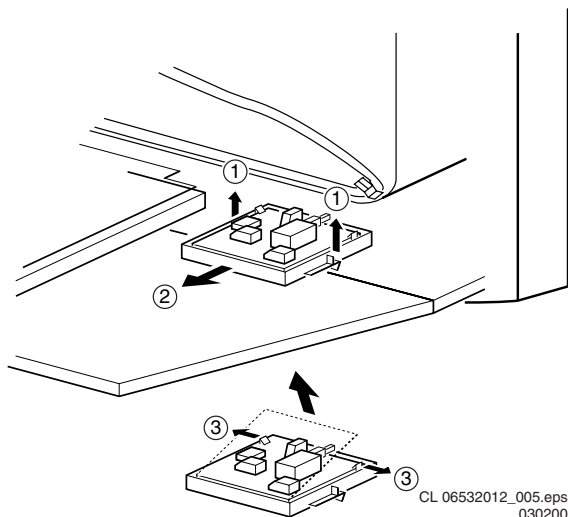


Figure 4-5 Mains Switch/LED panel

1. Release the two fixation clamps (1) by pushing them upward.
2. At the same time, the complete assy must be pulled backward (2).
3. If the board has to be removed, release the two clamps at the sides of the bracket and lift the panel out (3).

4.4.5 Small Signal Board (SSB)

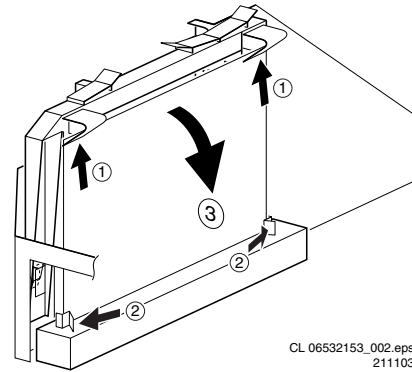


Figure 4-6 SSB removal

1. Push the top of the SSB towards the LOT [1].
2. Due to the pressure, the two metal clamps at both sides of the SIMM-connector will release [2].
3. Take the complete SSB out [3].

4.4.6 Large Signal Panel (LSP)

1. Remove the SSB (see paragraph "Small Signal Board (SSB)" above).
2. Remove the two fixation screws from the large plastic bracket on the right hand side of the LSP (above the EHT shield), and remove the bracket, after releasing the EHT cable and the CRT cables from the fixation clamps on this bracket.
3. Disconnect the other cables (loudspeaker, mains, etc.) from the LSP, and release some cables from their fixation clamps.
4. Press the fixation clamp on the left front side of the LSP-bracket (close to the white arrow/loudspeaker connector) to unlock the LSP, and tilt it upwards (the board hinges at the right side).
5. Remove the board from the bracket by unhooking it from its fixation clamps on the right side.

4.5 Set Re-assembly

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

Be sure that, before the rear cover is mounted:

- The mains cord is positioned correctly in its guiding brackets (make sure that the strain relief will function correctly!).
- All wires/cables are returned in their original positions. This is very important, in view of the "hot" and "EHT" areas of the set.

5. Service Modes, Error Codes, and Fault Finding

Index of this chapter:

- 5.1 Test Points
- 5.2 Service Modes
- 5.3 Problems and Solving Tips (related to CSM)
- 5.4 ComPair
- 5.5 Error Codes
- 5.6 The Blinking LED Procedure
- 5.7 Software Downloading

5.1 Test Points

See chapter 6 "Block Diagrams, Testpoint Overview, and Waveforms".

Perform measurements under the following conditions:

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

5.2 Service Modes

Service Default Mode (SDM) and Service Alignment Mode (SAM) 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 below) and the TV chassis. It offers the ability of structured troubleshooting, test pattern generation, error code reading, software version readout, and software upgrading.

Minimum requirements: a Pentium processor, Windows 95/98, and a CD-ROM drive (see also paragraph "ComPair").

5.2.1 Service Default Mode (SDM)

Purpose

- To create a pre-defined setting for measurement purposes.
- To override SW protections (only when SDM is activated via shorting the SDM pins on the SSB).
- To start the blinking LED procedure.
- Inspection of error buffer, life timer, and software version.

Specifications

- Tuning frequency: 475.25 MHz for PAL/SECAM.
- Colour system: SECAM L for France or PAL B/G for the rest of Europe.
- All picture settings at 50 % (brightness, colour, contrast).
- All sound settings at 50 %, except volume at 25 %.
- All service-unfriendly modes (if present) are disabled, like:
 - (Sleep) timer.
 - Child/parental lock.
 - Blue mute.
 - Automatic volume limiter (AVL).
 - Auto switch-off (when no video signal was received for 10 minutes).
 - Skip/blank of non-favourite pre-sets.
 - Hotel or hospital mode.
 - Local keyboard block.
 - Smart modes.
 - Auto store of personal presets.
 - Auto user menu time-out.

How to Activate SDM

Use one of the following methods:

- Use the standard RC-transmitter and key in the code "062596", directly followed by the "MENU" button.

Note: It is possible that, together with the SDM, the main menu will appear. To switch it "off", push the "MENU" button again.

- Short circuit, during switch "on" of the set, the two solder pads on the SSB with the indication "FOR SERVICE". These solder pads are located at the "tuner" side of the SSB (just above the large BGA IC).

Caution: If the SDM is activated via these pins, all the software-controlled protections are de-activated for 15 s. When these 15 s are expired, the set will shutdown to protection mode.

- Use the DST-emulation feature of ComPair.

After activating this mode:

- "SDM" will appear in the upper right corner of the screen.
- Also, the error buffer, operating hours, and software version are displayed (can be toggled "on/off" with the "STATUS / OSD / [i+]" button).
- Blinking LED procedure will be started.
- All software-controlled protections are overridden for 15 s. When these 15 s are expired, the set will shutdown to protection mode.

Contents of SDM:

- **HRS.** Displays the accumulated total of operation hours (not the standby hours) in hexadecimal value.
- **SW.** Displays the date of the software and the software version of the ROM;
 - example:** A2EU04-5.10 = AAABBC-X.YY.
 - **AAA**= chassis name.
 - **BB**= region and/or function name: E= Europe, A= Asia Pacific, U= NAFTA, L= LATAM, B= Basic, T= Top, P= PAL, N= NTSC, S= Stereo, M= Mono.
 - **C**= the language cluster number.
 - **X.Y**= the software version, where X is the main version number (different numbers are not compatible with one another) and Y is the sub version number (a higher number is always compatible with a lower number).
- **ERR** (followed by maximal 8 errors). The most recent error is displayed at the upper left (for an error explanation see paragraph "Error Codes").

How to Navigate

- When you press the "MENU" button on the RC transmitter, the set will toggle between the SDM and the normal user menu (with the SDM mode still active in the background).
- When you press the "STATUS / OSD / [i+]" button on the RC transmitter, the set will toggle between the full SDM screen or a screen with only the text "SDM" displayed on it. This mode is useful when performing measurements, then the OSD info will not generate interference.

How to Exit SDM

Use one of the following methods:

- Switch the set to STANDBY via a standard customer RC-transmitter (the error buffer is erased).
- Via a standard customer RC-transmitter: key in "00"-sequence (the error buffer is **not** erased).

5.2.2 Service Alignment Mode (SAM)

Purpose

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

Specifications

- Operating hours counter.
- Software version.

- Option settings.
- Error buffer reading and erasing.
- Software alignments.
- Disable service unfriendly modes.

How to Activate SAM

Use one of the following methods:

- Via a standard RC transmitter: key in the code **"062596"** directly followed by the "STATUS / OSD / [i+]" button.
- Use the DST-emulation feature of ComPair.

After activating this mode, "SAM" will appear in the upper right corner of the screen.

Contents of SAM:

- **HRS.** Displays the accumulated total of operation hours (not the standby hours) in hexadecimal value
Note: every time the set is switched "on" by the mains switch or the RC, the timer is increased by 0.5.
- **SW ID.** Displays the software version of the ROM
example: A2EU04-5.10 = AAABBC-X.YY.
 - **AAA**= chassis name.
 - **BB**= region and/or function name: E= Europe, A= Asia Pacific, U= NAFTA, L= LATAM, B= Basic, T= Top, P= PAL, N= NTSC, S= Stereo, M= Mono.
 - **C**= the language cluster number.
 - **X.Y**= the software version, where X is the main version number (different numbers are not compatible with one another) and Y is the sub version number (a higher number is always compatible with a lower number).
- **ERR** (followed by maximal 8 errors). The most recent error is displayed at the upper left (for an error explanation see paragraph "Error Codes").
- **OPTIONS.** Extra features for Service.
- **CLEAR ERRORS.** When you press the "OK" button, the error buffer is reset.
- **AKB.** Disable (off) or enable (on) the "black current loop" (AKB= Auto Kine Bias). For Vg2 alignment.
- **TUNER.** This will activate the "TUNER" alignments sub-menu.
- **WHITE TONE.** This will activate the "WHITE TONE" alignments sub-menu.
- **GEOMETRY.** This will activate the "GEOMETRY" alignments sub-menu.
- **SOUND.** This will activate the "SOUND" alignments sub-menu.
- **SMART SETTINGS.** This will activate the "SMART SETTINGS" alignments sub-menu.
- **STORE.** This will save the new settings/alignments.
- **EEPROM TEST.** This will report if the SW checksum is OK. Convenient after SW upgrading.
- **VID RAM TEST.** This will check the continuity of the address bus and data bus of the Video RAM.
- **VG2.** This feature is not implemented yet. **Do not use.**

Note: Alignments are described in chapter 8 "Alignments".

How to Navigate

- In SAM, you can select the menu items with the "CURSOR UP/DOWN" key on the RC-transmitter. The selected item will be highlighted. When not all menu items fit on the screen, move the "CURSOR UP/DOWN" key to display the next/previous menu items.
- With the "CURSOR LEFT/RIGHT" keys, it is possible to:
 - (De) activate the selected menu item.
 - Change the value of the selected menu item.
 - Activate the selected submenu.
- When you press the "MENU" button on the RC transmitter, the set will toggle between the SAM and the normal user menu (with the SAM mode still active in the background).

How to Exit SAM

Use one of the following methods:

- Switch the set to STANDBY via the RC-transmitter (the error buffer is erased).
- Via a standard customer RC-transmitter: key in "00"-sequence (the error buffer is **not** erased).

5.2.3 Customer Service Mode (CSM)

Purpose

When a customer is having problems with his TV-set, he can call his dealer or the Philips helpdesk (P3C). The service technician can then ask the customer to activate the CSM, in order to identify the status of the set. Now, the service technician can judge the severity of the complaint. In many cases, he can advise the customer how to solve the problem, or he can decide if it is necessary to visit the customer. The CSM is a **read only** mode; therefore, modifications in this mode are not possible.

How to Activate CSM

Use one of the following methods:

- Press the "MUTE" button on the RC-transmitter **simultaneously** with any key on the TV for at least 4 seconds.
- Key in the code **"123654"** via the standard RC transmitter.

Notes:

- Activation of the CSM is only possible if there is no (user) menu on the screen!
- During CSM, sound volume is set to 25% of the scale, "Smart Sound" is set to "Theatre" mode, and "Smart Picture" is set to "Rich/Movies" mode temporarily to ensure a good picture and sound of the working set. After leaving CSM, the original settings are restored.

How to Navigate

By means of the "CURSOR-DOWN/UP" knob on the RC-transmitter, you can navigate through the menus.

Contents of CSM

The following information is displayed on screen:

- Text "CSM" on the first line.
 - Line number for every line (to make CSM language independent).
 - Option code information.
 - Configuration information.
 - Service-unfriendly modes.
1. **SET TYPE.** Type/model number (if present) according to the Philips standard (example: 28PW8720/12).
 2. **SOFTWARE.** Software version AAABBC-X.YY.
 3. **HOURS ON.** Operating hours (in hexadecimal code).
 4. **CODE1.** Shows the contents of the error buffer (the word "error" may not be used on this screen, instead "code1" and "code2" is used).
 5. **CODE2.** Idem.
 6. **OPTION1.** Option code information.
 7. **OPTION2.** Idem.
 8. **OPTION3.** Idem.
 9. **OPTION4.** Idem.
 10. **SIGNAL.** "Ident" signal present or not present (VID status bit in MPIF) on selected source.
 11. **TIMER.** Timer is activated (in "FEATURE" menu) or deactivated.
 12. **CHANNEL.** Child Lock (if present) is activated or deactivated (i.e. when local keyboard is locked).
 13. **PRESET.** (If present). Current channel is defined as skipped or non-preferred.
 14. **HOTELMODE.** Shows if the HOTEL mode is activated or deactivated (only for Europe and AP).
 15. **SOURCE.** Selected source before entry of CSM; XXX (channel no.), external source name (i.e. AV1, CVI, EXT1, etc...).

16. **SOUND.** Selected SOUND mode; "XX"= MONO, NICAM, STEREO, L1 (Language 1), L2 (Language 2), SAP, VIRTUAL, or DIGITAL prior entry to CSM.
17. **VOLUME.** Volume level before entry of CSM (typ. 00..100).
18. **BALANCE.** Balance level before entry of CSM (typ. - 50..50).
19. **BRIGHTNESS.** Brightness level before entry of CSM (typ. 00..100).
20. **COLOUR.** Colour level before entry of CSM (typ. 00..100).
21. **CONTRAST.** Contrast level before entry of CSM (typ. 00..100).
22. **HUE** (if present). Hue level before entry of CSM (typ. - 50..100).

How to exit CSM

Use one of the following methods:

- After you press a key on the RC-transmitter (with exception of the "CHANNEL", "VOLUME" and digit (0-9) keys), or
- After you switch the TV-set "OFF" with the mains switch.
- After 15 min. no RC or local keyboard actions.

5.3 Problems and Solving Tips (related to CSM)

Note: The problems described below are all related to the TV settings. The procedures to change the value (or status) of the different settings are described above. New value(s) are automatically stored.

5.3.1 Picture Problems

Picture too Dark

1. Press SMART PICTURE on the RC. In case the picture improves, increase the "Brightness" or the "Contrast" value. The new value(s) are automatically stored (in "personal" pre-set) for all TV channels.
2. Check in CSM lines BRIGHTNESS and/or CONTRAST. If the value of line BRIGHTNESS is low (< 10) or the value of line CONTRAST is low (< 10), increase them.

Picture too Bright

1. Press SMART PICTURE on the RC. In case the picture improves, decrease the "Brightness" or the "Contrast" value. The new value(s) are automatically stored (in "personal" pre-set) for all TV channels.
2. Check in CSM lines BRIGHTNESS and/or CONTRAST. If the value of line BRIGHTNESS is high (> 50) or the value of line CONTRAST is high (> 50), decrease the "Brightness" or the "Contrast" value.

White Line Around Picture Elements and Text

1. Press SMART PICTURE on the RC. In case the picture improves, decrease the "Sharpness" value. The new value is automatically stored (in "personal" pre-set) for all TV channels.
2. Check in CSM line SHARPNESS. Decrease the "Sharpness" value. The new value is automatically stored for all TV channels.

No Picture

Check in CSM line 10 (SIGNAL). In case this line shows NO SIGNAL, check the aerial cable/aerial system.

Blue Picture

No proper signal is received. Check the aerial cable/aerial system.

Blue Picture and/or Unstable Picture

A scrambled or coded signal is received.

Black and White Picture

Check in CSM line COLOR. In case the value is low (< 10), increase the "Color" value. The new value is automatically stored for all TV channels.

No Colours/colour Lines around Picture Elements or Colours not Correct or Unstable Picture

1. Check in CSM line SYSTEM. If a "strange" system pops up, something has gone wrong during installation. Re-install the channel.
2. In case line SYSTEM is "FRANCE", the installed system for this pre-set is SECAM, while PAL is required. Install the required program again: open the installation menu and perform manual installation. Select system "West Europe".

Menu Text not Sharp Enough

1. Press "SMART PICTURE". In case picture improves, decrease the "Contrast" value. The new value(s) are automatically stored for all TV channels.
2. Check in CSM line CONTRAST. If the value of this line is high (> 50), decrease the "Contrast" value.

5.3.2 Sound Problems

No Sound from Left and Right Speaker

Check in CSM line VOLUME. If the value is high, increase the value of "Volume". The new value(s) are automatically stored (in "personal" pre-set) for all TV channels.

Sound too Loud for Left and Right Speaker

Check in CSM line VOLUME. If the value is low, decrease the value of "Volume". The new value(s) are automatically stored (in "personal" pre-set) for all TV channels.

5.4 ComPair

5.4.1 Introduction

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

- ComPair helps you to quickly get an understanding on how to repair the chassis in a short time by guiding you systematically through the repair procedures.
- ComPair allows very detailed diagnostics (on I²C level) and is therefore capable of accurately indicating problem areas. You do not have to know anything about I²C commands yourself because ComPair takes care of this.
- ComPair speeds up the repair time since it can automatically communicate with the chassis (when the microprocessor is working) and all repair information is directly available. When ComPair is installed together with the SearchMan electronic manual of the defective chassis, schematics and PWBs are only a mouse click away.

5.4.2 Specifications

ComPair consists of a Windows based faultfinding program and an interface box between PC and the (defective) product. The ComPair interface box is connected to the PC via a serial or RS232 cable.

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

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

- **Automatically** (by communicating with the television set): ComPair can automatically read out the contents of the

entire error buffer. Diagnosis is done on I²C level. ComPair can access the I²C bus of the television. ComPair can send and receive I²C commands to and from the micro controller of the television set. In this way, it is possible for ComPair to communicate (read and write) to devices on the I²C busses of the TV-set.

- **Manually** (by asking questions to you): This option is helpful, because automatic diagnosis is only possible if the micro controller of the television is working correctly (also, the diagnostic possibilities of automatic diagnosis are more limited). When you choose manual diagnosis, 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 by showing you examples (e.g. Measure test-point I7 and click on the correct oscillogram you see on the oscilloscope). You can answer by clicking on a link (e.g. a piece of 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.

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

- Up- or downloading of pre-sets.
 - Managing of pre-set lists.
 - Emulation of the 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 C2568 (Schematic/Panel) at the Mono-carrier.*
- Click on the “Panel” hyperlink to automatically show the PWB with a highlighted capacitor C2568.
 - Click on the “Schematic” hyperlink to automatically show the position of the highlighted capacitor.
- SW upgrading

5.4.3 How To Order

ComPair order codes:

- Starter kit ComPair32/SearchMan32 software and ComPair interface (excl. transformer): 3122 785 90450.
- ComPair interface (excluding transformer): 4822 727 21631.
- Starter kit ComPair32 software (registration version): 3122 785 60040.
- Starter kit SearchMan32 software: 3122 785 60050.
- ComPair32 CD (2003 update): 3122 785 60110.
- SearchMan32 CD (2003 update): 3122 785 60120.
- ComPair interface cable: 3122 785 90004.
- ComPair firmware upgrade IC: 3122 785 90510.
- Transformer Europe: 4822 727 21632.
- Transformer UK: 4822 727 21633.

5.5 Error Codes

5.5.1 Introduction

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

When an error has occurred, the error is added to the list of errors, provided the list is not full or the error is a protection error.

When an error occurs and the error buffer is full, then the new error is not added, and the error buffer stays intact (history is maintained), except when the error is a protection error.

To prevent that an occasional error stays in the list forever, the error is removed from the list after 50+ operation hours.

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

5.5.2 How to Read the Error Buffer

Use one of the following methods:

- On screen via the SAM (only if you have a picture).
Examples:
 - **0 0 0 0**: No errors detected
 - **6 0 0 0**: Error code 6 is the last and only detected error
 - **9 6 0 0**: Error code 6 was first detected and error code 9 is the last detected error
- Via the blinking LED procedure (when you have no picture). See next paragraph.
- Via ComPair.

5.5.3 How to Clear the Error Buffer

Use **one** of the following methods:

- By activation of the “CLEAR ERRORS” command in the SAM menu.
- With a normal RC, key in sequence “MUTE” followed by “062599” and “OK”.
- When you transmit the commands “DIAGNOSE” - “99” - “OK” with ComPair (or with a DST).
- If the content of the error buffer has not changed for 50+ hours, it resets automatically.

5.5.4 Error Codes

The function of error codes is to indicate failures in the TV set. In principle a unique error code is available for every:

- I²C device error.
- I²C bus error (for every bus containing two or more I²C devices).
- Protection error (e.g. +8V protection or Horizontal protection).
- Error not related to an I²C device, but of importance (e.g. BC-loop, RAM error).

Table 5-1 Error Table

Error	Description
0	No error
1	Horizontal Protection (via NOHFB bit in ADOC)
3	+8V error (missing/protection active by checking MPIF ASUP bit))
4	X-ray/High beam current protection signal (via XPROT bit in ADOC)
5	Highbeam protection
7	Under-voltage protection
11	MPIF I ² C communication failure / MPIF test failed
12	BC-loop not stabilised within the time limit (i.e. after timer is expired)
13	NVM I ² C communication failure
14	Main tuner 1232 I ² C failure UV13xx
17	3D Y/C 7823 Combfilter I ² C communication failure
18	PIP Tuner I ² C failure
19	2fH component input I ² C failure (PCF8574)
21	PIP IF demodulator IC TDA988x communication failed (only for PIP/DW sets)
22	Flash over protection error (to register CRT flash-overs, via FPR status bit in ADOC)

Service Tips:

- 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. Before clearing the buffer, write down the content, as this history can give you significant information.
- 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).

5.6 The Blinking LED Procedure

5.6.1 Introduction

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

When the SDM is activated, the front LED will show (by blinking) the contents of the error-buffer. Error-codes > 10 are shown as follows:

1. A long blink of 750 ms (which is an indication of the decimal digit),
2. A pause of 1500 ms,
3. “n” short blinks (where “n” = 1 - 9),
4. When all the error-codes are displayed, the sequence finishes with a LED blink of 3000 ms,
5. The sequence starts again.

Example: Error 12 9 6 0 0.

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

1. 1 long blink of 750 ms (which is an indication of the decimal digit) followed by a pause of 1500 ms,
2. 2 short blinks of 250 ms, followed by a pause of 3000 ms,
3. 9 short blinks of 250 ms, followed by a pause of 3000 ms,
4. 6 short blinks of 250 ms, followed by a pause of 3000 ms,
5. 1 long blink of 3000 ms to finish the sequence,
6. The sequence starts again.

5.6.2 How to Activate

Use one of the following methods:

- Activate the SDM (only via soldering pads marked “FOR SERVICE” on the SSB). The blinking front LED will show the entire contents of the error buffer (this works in “normal

operation” mode and in “protection” mode). In order to avoid confusion with RC5 signal reception blinking, this LED blinking procedure is terminated when an RC5 command is received.

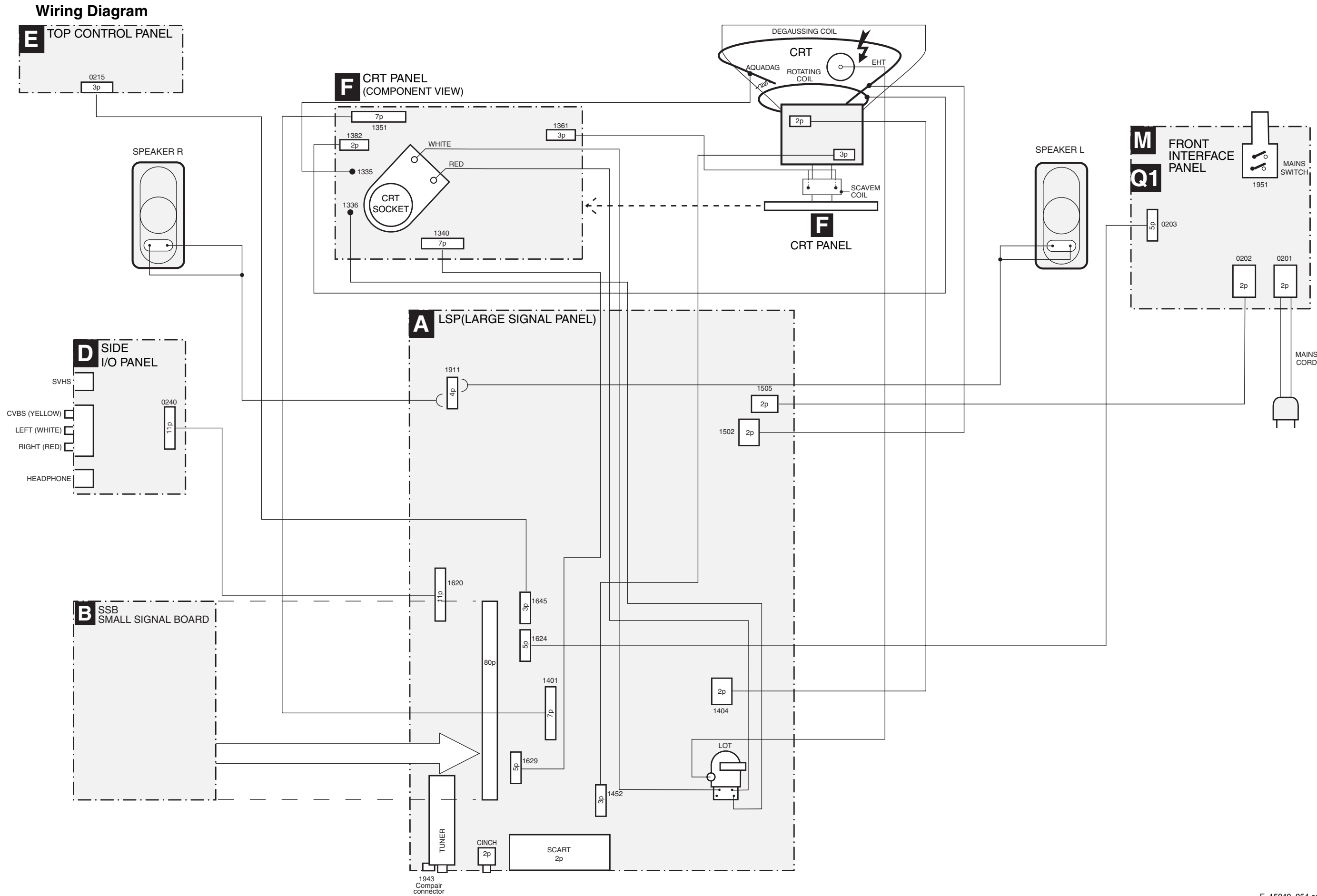
- Transmit the commands “MUTE”, “06250x”, and “OK” with a normal RC (where “x” is the position in the error buffer that has to be displayed). With x= 1, the last detected error is shown, x= 2 the second last error, etc.... When x= 0, all errors are shown.
- “DIAGNOSE X” with the DST (where “x” is the position in the error buffer that has to be displayed). With x= 1, the last detected error is shown, x= 2 the second last error, etc.... When x= 0, all errors are shown.

Note: It can take some seconds before the blinking LED starts.

5.7 Software Downloading

In this chassis, you can **upgrade** the software via ComPair. You can find more information on how this procedure works in the ComPair file. It is possible that not all sets are equipped with the hardware, needed to make software upgrading possible. To speed up the programming process the firmware of the ComPair interface can be upgraded. See paragraph “How To Order” for the order numbers.

6. Block Diagrams, Testpoint Overviews, and Waveforms



The schematic diagram illustrates the power supply section of a VHS VCR, divided into three main functional areas: Front Interface, Power Supply, and Control/Standby Circuits.

Front Interface (M Q1): This section shows the connection to the mains power. It includes a mains switch (1951) and two output terminals (0201 and 0202) for the power supply.

Power Supply (A1): This section details the power conversion process. It starts with a degaussing coil (1504) and a transformer (1505) with a T4E core. The primary winding is connected to the mains. The secondary winding provides VDC (VDC) to the power supply. The power supply is a full-bridge rectifier (6500) with a filter capacitor (2505). The output of the power supply is connected to the control IC (7511 TEA1507) and the standby IC (7510).

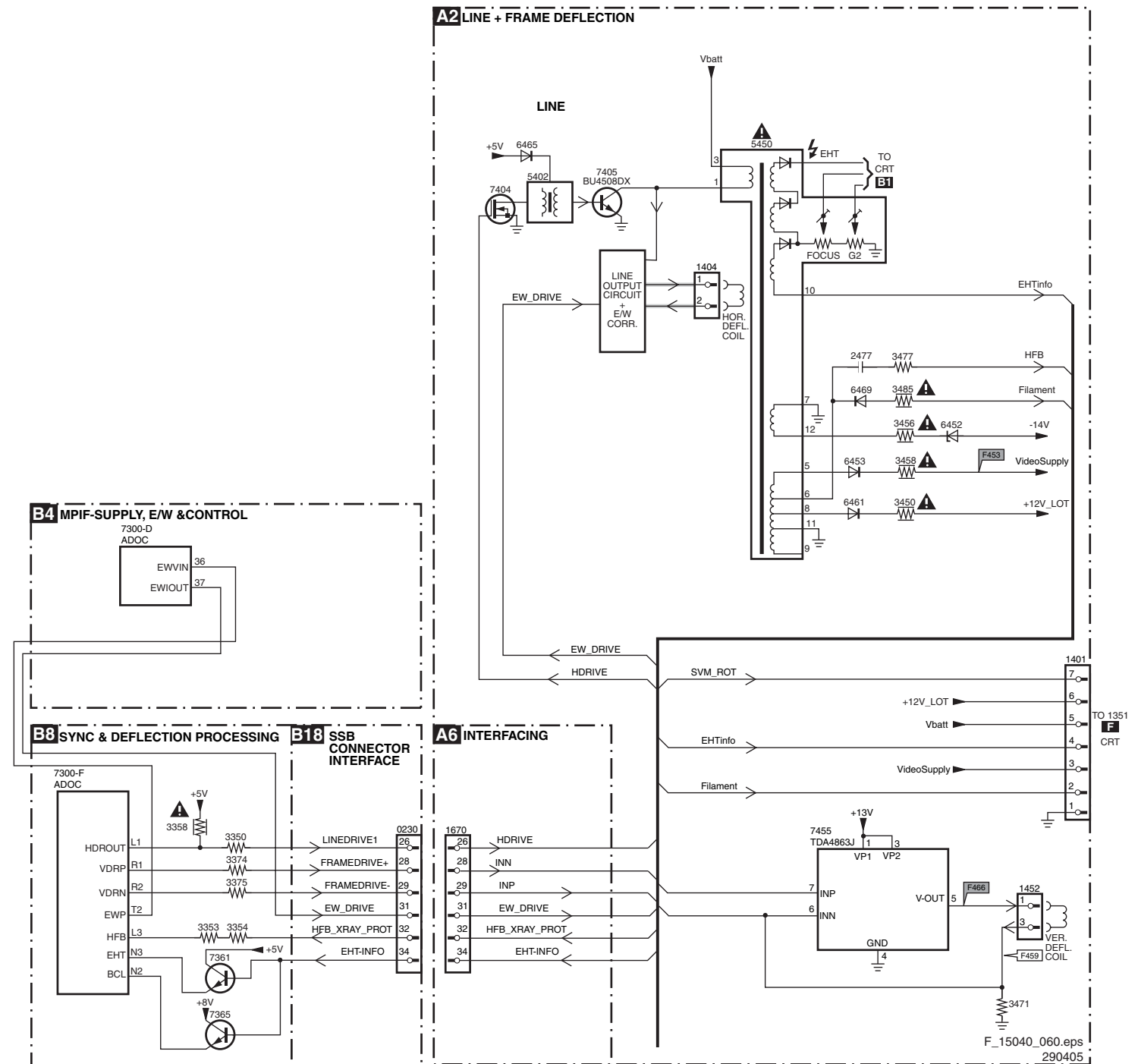
Control IC (7511 TEA1507): This IC is responsible for controlling the power supply. It has pins for VCC (2), CTRL (6), and DEMAG (7). It is connected to a sense resistor (3513) and a drain driver (7512) which controls the power MOSFET (7517).

Standby IC (7510): This IC is responsible for controlling the standby circuit. It has pins for VCC (2), CTRL (6), and DEMAG (7). It is connected to a sense resistor (3513) and a drain driver (7512) which controls the power MOSFET (7517).

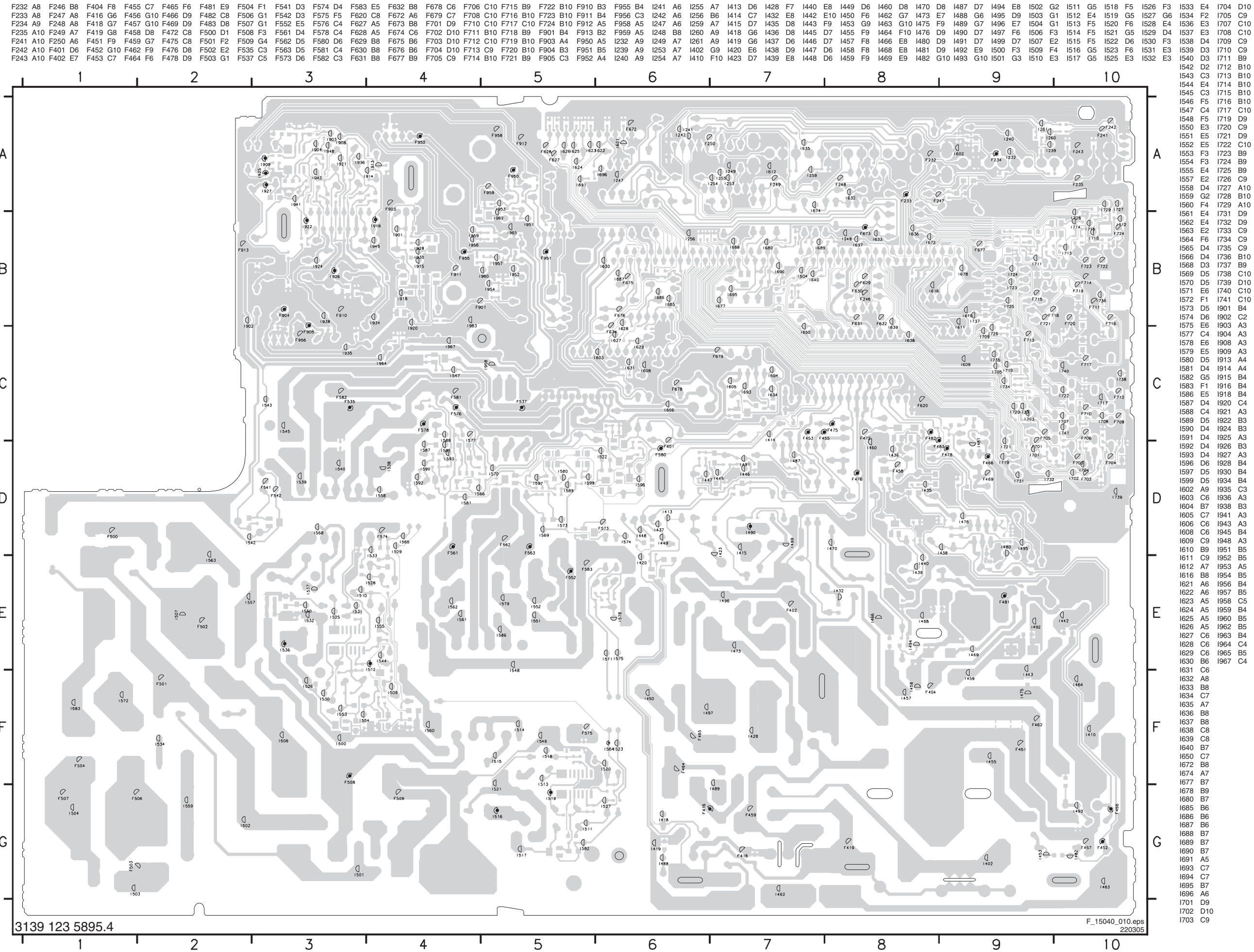
Standby and Reference Circuits: The standby circuit (7513 TCET1103) and reference circuit (7571) are connected to the power supply. The standby circuit provides a standby signal (A6) to the control IC. The reference circuit provides a reference voltage (+3V3) to the control IC.

Audio and Video Outputs: The power supply also provides power to the audio and video outputs. The audio output is connected to the energizing circuit (7541) and the video output is connected to the video amplifier (7542).

Grounding: The diagram shows two types of ground connections: HOT GROUND and COLD GROUND.



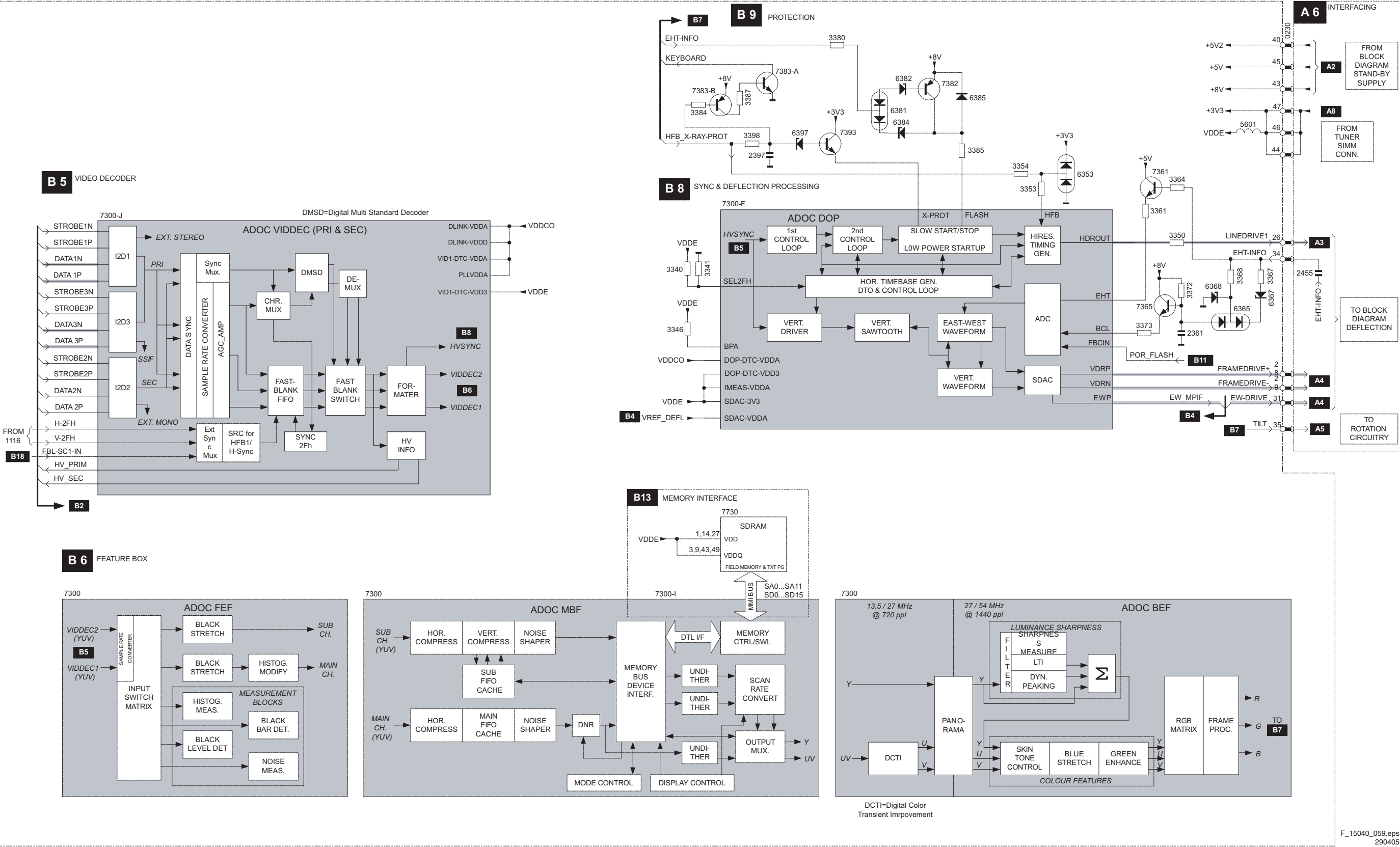
Testpoint Overview LSP



F_15040_055.eps ·
250405

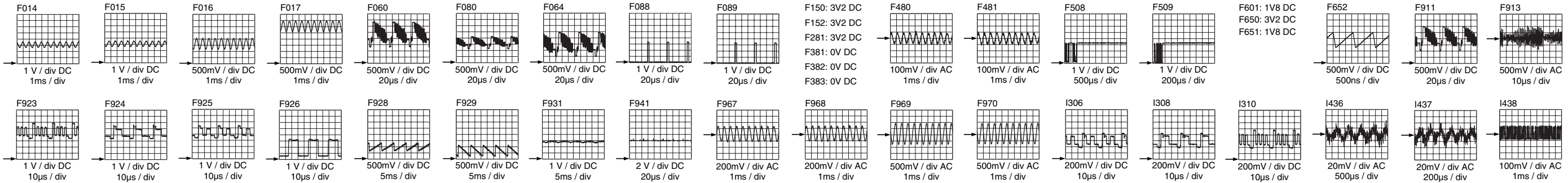
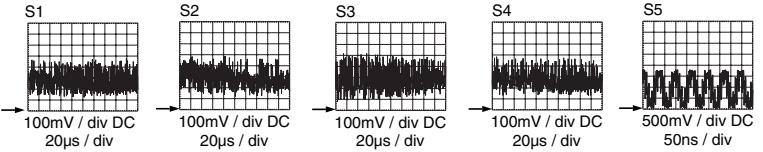
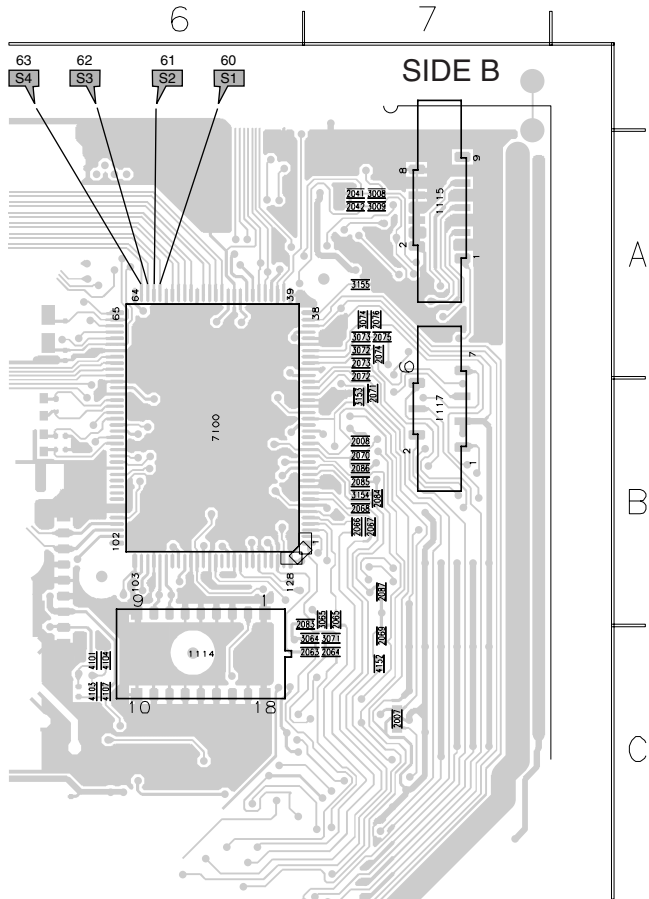
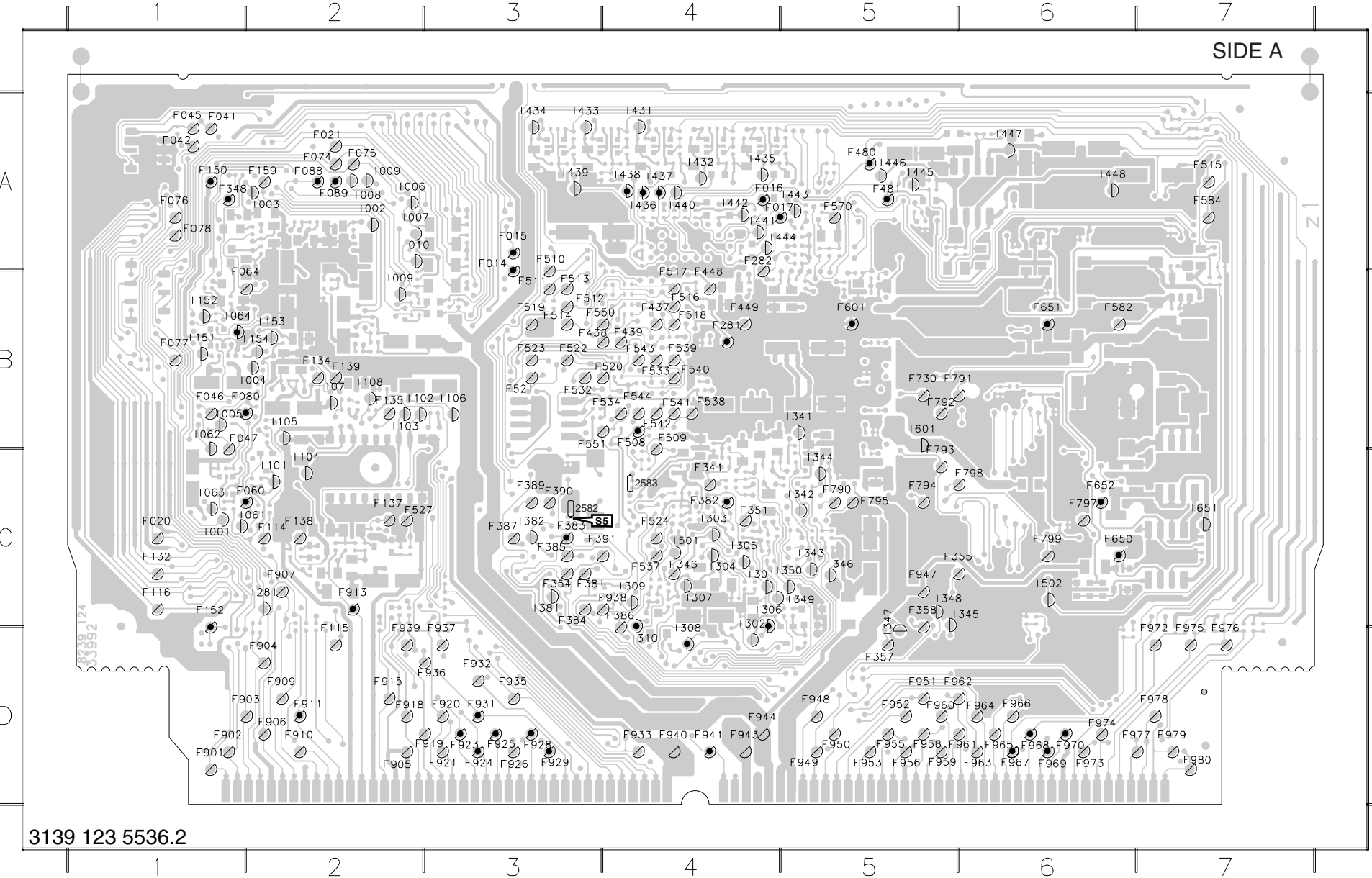
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Block Diagram 3 Audio & Video



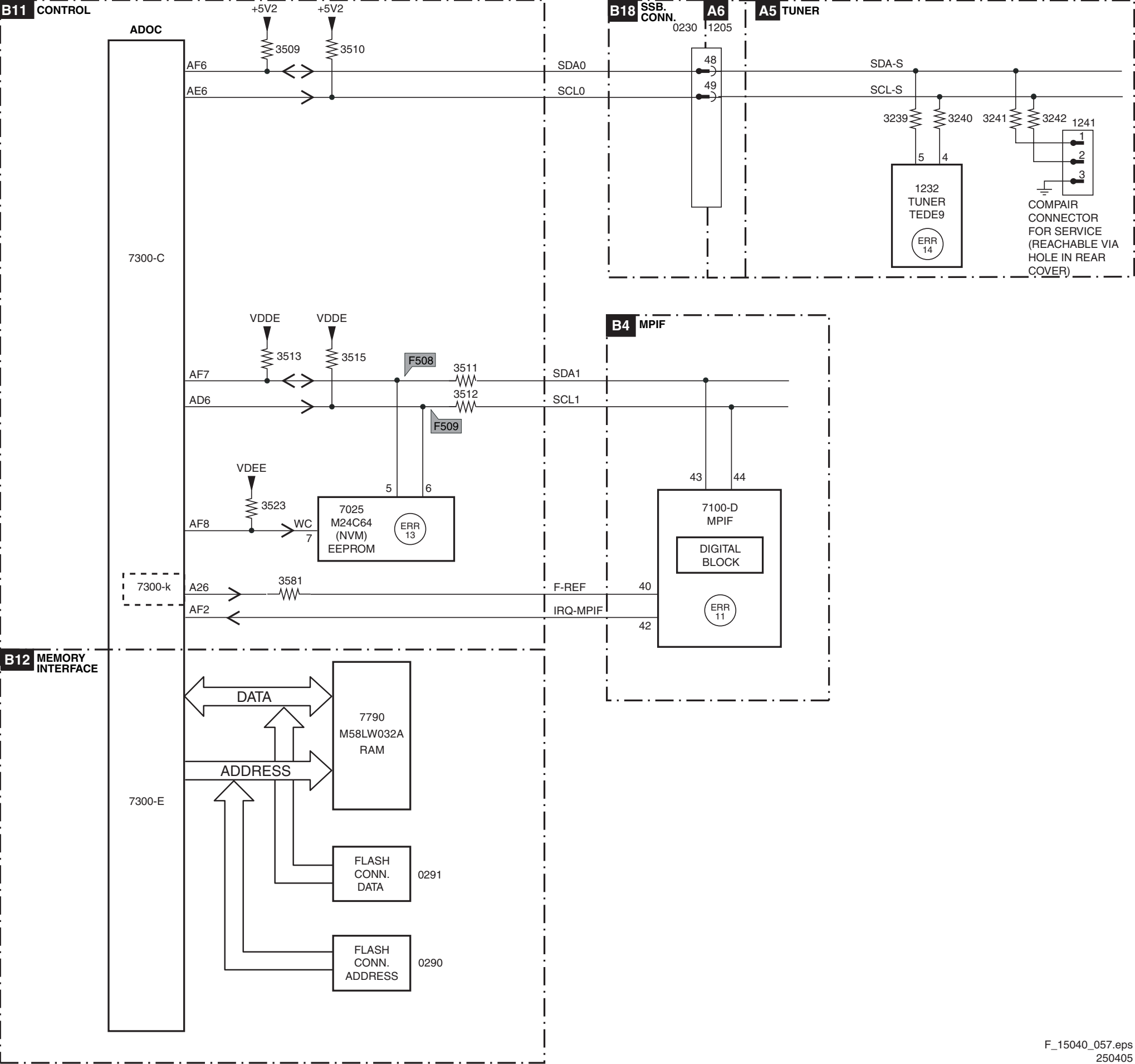
Testpoint Overview SSB

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F014 A3	F074 A2	F135 B2	F354 C3	F391 C3	F513 B3	F532 B3	F570 A5	F795 C5	F911 D2	F931 D3	F948 D5	F963 D6	F977 D6	I010 A2	I151 B1	I309 C4	I382 C3	I443 A5
F015 A3	F075 A2	F137 C2	F355 C5	F437 B4	F514 B3	F533 B4	F582 B6	F797 C6	F913 C2	F932 D3	F949 D5	F964 D6	F978 D7	I061 C2	I152 B1	I310 D4	I431 A4	I444 A5
F016 A4	F076 A1	F138 C2	F357 D5	F438 B3	F515 A7	F534 B4	F584 A7	F798 C6	F915 D2	F933 D4	F950 D5	F965 D6	F979 D7	I062 B1	I153 B2	I341 B5	I432 A4	I445 A5
F017 A4	F077 B1	F139 B2	F358 C5	F439 B4	F516 B4	F537 C4	F601 B5	F799 C6	F918 D2	F935 D3	F951 D5	F966 D6	F980 D7	I063 C1	I154 B2	I342 C5	I433 A3	I446 A5
F020 C1	F078 A1	F150 A1	F381 C3	F448 B4	F517 B4	F538 B4	F650 C6	F901 D1	F919 D3	F936 D3	F952 D5	F967 D6	I001 C1	I064 B1	I281 C2	I343 C5	I434 A3	I447 A6
F021 A2	F080 B1	F152 C1	F382 C4	F449 B4	F518 B4	F539 B4	F651 B6	F902 D1	F920 D3	F937 D3	F953 D5	F968 D6	I002 A2	I101 C2	I301 C4	I344 C5	I435 A4	I448 A6
F041 A1	F088 A2	F159 A2	F383 C3	F480 A5	F519 B3	F540 B4	F652 C6	F903 D1	F921 D3	F938 C4	F955 D5	F969 D6	I003 A2	I102 B2	I302 C4	I345 C6	I436 A4	I501 C4
F042 A1	F089 A2	F281 B4	F384 C3	F481 A5	F520 B4	F541 B4	F730 B5	F904 D2	F923 D3	F939 D2	F956 D5	F970 D6	I004 B2	I103 B2	I303 C4	I346 C5	I437 A4	I502 C6
F045 A1	F114 C2	F282 A4	F385 C3	F508 B4	F521 B3	F542 B4	F790 C5	F905 D2	F924 D3	F940 D4	F958 D5	F972 D7	I005 B1	I104 C2	I304 C4	I347 C5	I438 A4	I601 B5
F046 B1	F115 D2	F341 C4	F386 C4	F509 B4	F522 B3	F543 B4	F791 B5	F906 D2	F925 D3	F941 D4	F959 D5	F973 D6	I006 A2	I105 B2	I305 C4	I348 C5	I439 A3	I651 C7
F047 B1	F116 C1	F346 C4	F387 C3	F510 A3	F523 B3	F544 B4	F792 B5	F907 C2	F926 D3	F943 D4	F960 D5	F974 D6	I007 A2	I106 B3	I306 C4	I349 C5	I440 A4	
F060 C2	F132 C1	F348 A1	F389 C3	F511 B3	F524 C4	F550 B3	F793 C5	F909 D2	F928 D3	F944 D4	F961 D6	F975 D7	I008 A2	I107 B2	I307 C4	I350 C5	I441 A4	

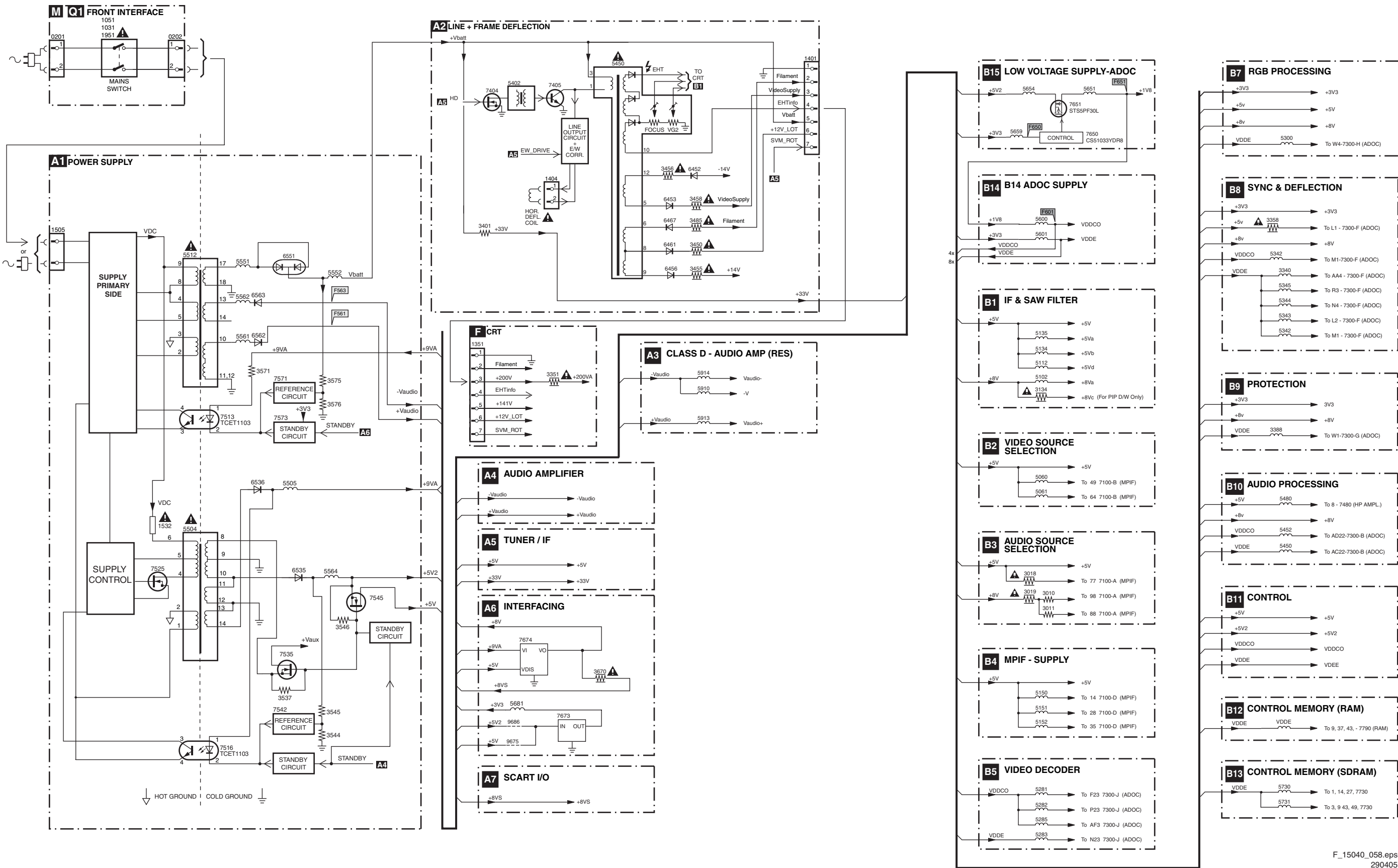


I2C Overview

I²C Overview

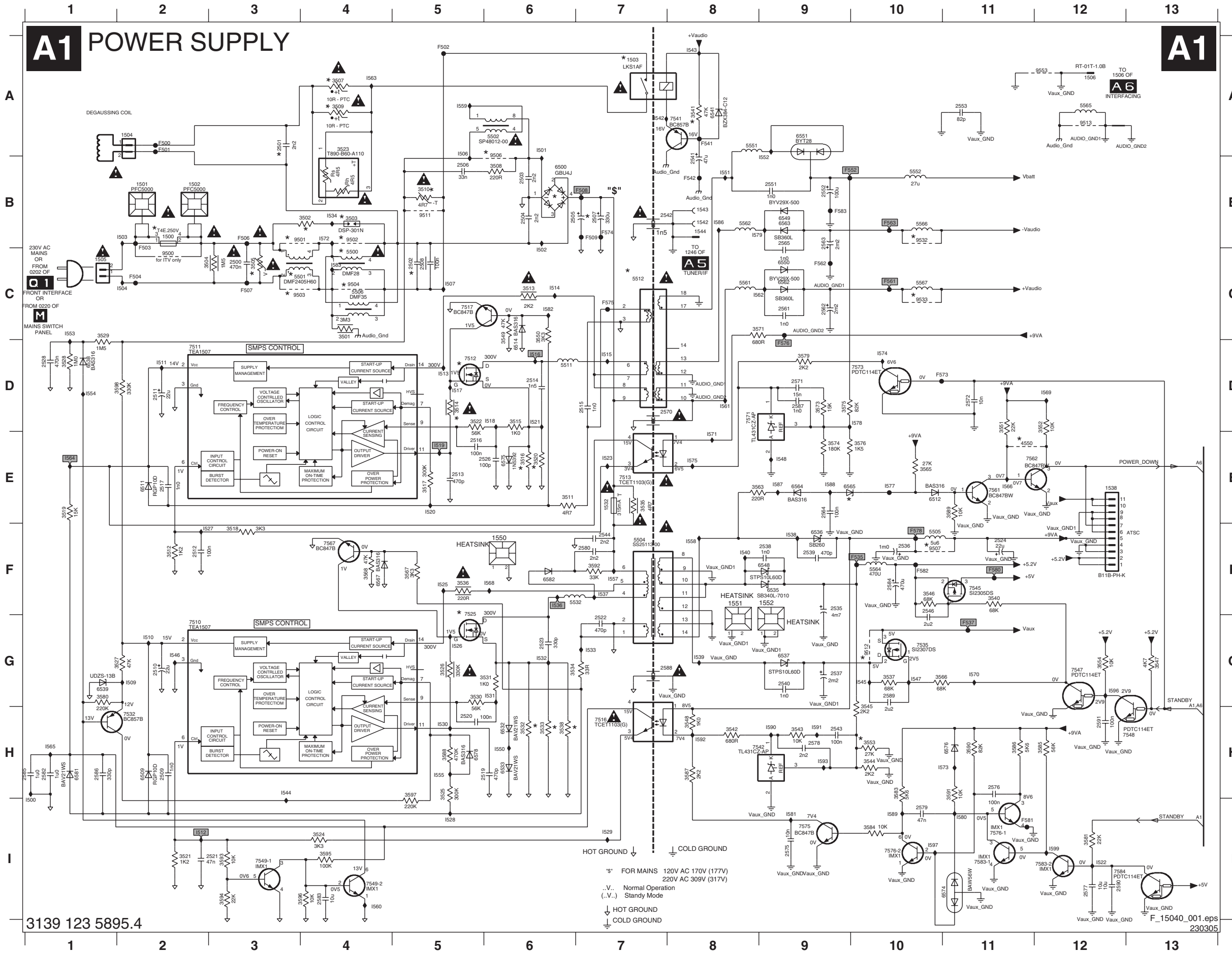


Supply Lines Overview
SUPPLY LINES OVERVIEW



7. Circuit Diagrams and PWB Layouts

LSP: Power Supply

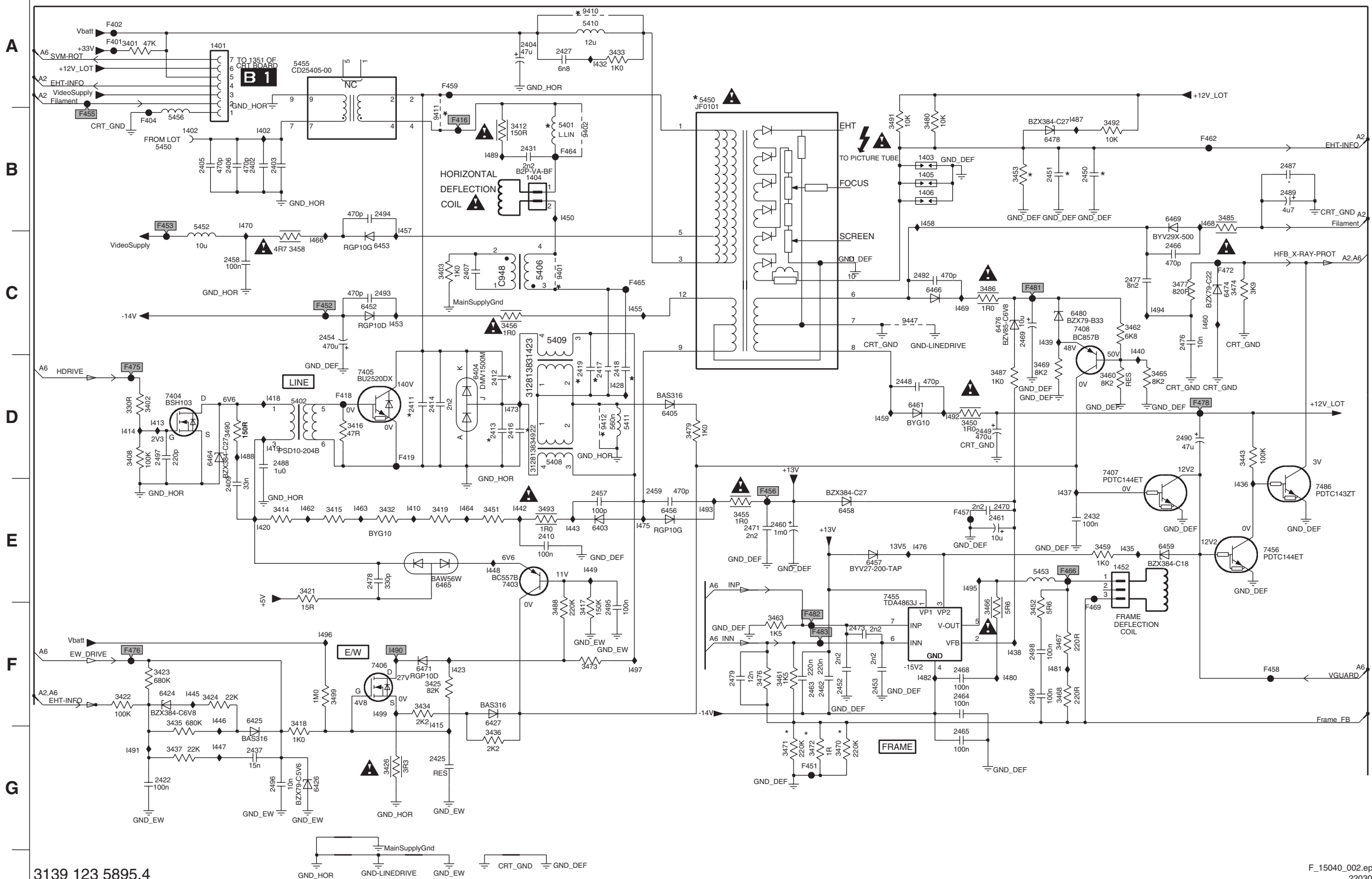


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1503 A7	3545 G10	9507 F10	1599 I12
1504 A2	3546 F10	9511 B5	
1505 C1	3547 G13	9512 G10	
1506 A13	3548 H8	9513 A12	
1532 E7	3549 C6	9532 B10	
1538 E12	3550 C6	9533 C10	
1542 B8	3551 D11	9553 A12	
1543 B8	3552 D12	F500 A2	
1544 B8	3553 H10	F501 A2	
1550 F6	3554 G12	F502 A5	
1551 F8	3563 E8	F503 C2	
1552 F9	3565 E10	F504 C2	
2500 C3	3566 G10	F506 B3	
2501 A3	3567 F5	F507 C3	
2502 C5	3568 F4	F508 B7	
2503 B6	3571 C8	F509 B7	
2504 B6	3573 D9	F535 F10	
2505 B6	3574 E9	F537 G11	
2506 B5	3575 D9	F541 A8	
2507 B7	3576 E10	F542 B8	
2508 C5	3579 D9	F552 B9	
2509 H2	3580 G1	F561 C10	
2510 G2	3581 I12	F562 C9	
2511 D2	3583 H10	F563 B10	
2512 F2	3584 I10	F573 D10	
2513 E5	3585 H12	F574 B7	
2514 D6	3586 H11	F575 C7	
2515 D7	3587 H8	F576 D9	
2516 E5	3588 H5	F578 F10	
2517 E2	3589 E11	F580 F11	
2519 H6	3590 H11	F581 I11	
2520 H5	3591 H11	F582 F10	
2521 I3	3592 F7	F583 B9	
2522 G7	3593 I3	I500 I1	
2523 G6	3594 I3	I501 A6	
2524 F11	3595 I4	I502 C6	
2525 E6	3596 I4	I503 B9	
2528 D1	3597 H5	I504 C2	
2535 F9	3598 D2	I506 A5	
2536 F10	4550 E11	I507 C5	
2537 G9	5500 C4	I509 G2	
2538 F9	5501 C3	I510 G2	
2539 F9	5502 A6	I511 D2	
2540 G9	5504 F7	I512 I2	
2541 B8	5505 F10	I513 D5	
2542 B7	5506 C4	I514 C6	
2543 H9	5511 D6	I515 D7	
2544 F7	5512 C7	I516 D8	
2546 F10	5532 F7	I517 D5	
2551 B9	5551 A8	I518 D6	
2552 B9	5552 B10	I519 E5	
2553 A11	5561 C8	I520 E5	
2561 C9	5562 B8	I521 D6	
2562 C9	5564 F10	I522 I12	
2563 B9	5565 A12	I523 E7	
2564 E9	5566 B10	I525 F5	
2565 B9	5567 C10	I526 G5	
2570 D7	6500 B6	I527 F2	
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2572 D11	6511 E2	I529 I7	
2575 I9	6512 E10	I530 H5	
2576 H11	6514 D6	I531 G6	
2577 I12	6532 H6	I532 G6	
2578 H9	6533 H6	I533 G7	
2579 I10	6535 F9	I534 B4	
2580 F7	6536 F9	I536 F6	
2582 H1	6537 G9	I537 F7	
2583 I4	6538 D1	I538 F9	
2584 F10	6539 G1	I539 G8	
2585 H1	6541 A8	I540 F8	
2586 H1	6548 F9	I542 A7	
2587 D9	6549 B9	I543 A8	
2588 G7	6550 C9	I544 H3	
2589 G10	6551 A9	I545 G10	
2590 I12	6562 C9	I546 G2	
2591 H12	6563 B9	I547 G10	
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3502 B4	6565 E9	I550 H6	
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3505 C3	6575 E6	I553 C1	
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3511 E6	7510 G2	I559 A5	
3512 F2	7511 D2	I560 I4	
3513 C6	7512 D5	I561 D8	
3514 D5	7513 E7	I562 C8	
3515 D6	7516 H7	I563 A4	
3516 E6	7517 C5	I564 E1	
3517 E5	7525 G5	I565 H1	
3518 F3	7532 H2	I566 E11	
3519 E1	7535 G10	I568 F6	
3520 E6	7541 A8	I569 D12	
3521 I2	7542 H8	I570 G11	
3522 D5	7545 F11	I571 E8	
3523 A4	7547 G12	I572 B4	
3524 I4	7548 H13	I573 H11	
3525 H5	7549 I13	I574 D10	
3526 G5	7549 I14	I575 E8	
3527 G2	7561 E11	I577 E10	
3528 D1	7562 E11	I578 D10	
3529 C1	7567 F4	I579 B8	
3530 G5	7571 D8	I580 I11	
3531 G6	7573 D10	I581 I9	
3532 H6	7575 I9	I582 C6	
3533 H6	7576 I11	I583 C4	
3534 G6	7576 I10	I586 B8	
3535 E7	7583 I11	I587 E9	
3536 F5	7583 I12	I588 E9	
3537 G10	7584 I12	I589 I10	
3538 H6	9500 C2	I590 H9	
3540 F11	9501 B3	I591 H9	
3541 A8	9502 B4	I592 H8	

LSP: Deflection

A2 DEFLECTION

A2



1401 A1	3443 D10	F418 D3
1402 B1	3450 D8	F419 D3
1403 B7	3451 E4	F451 G6
1404 B4	3452 F8	F452 C2
1405 B7	3453 B8	F453 B1
1406 B7	3455 E6	F455 B1
1452 E9	3456 C4	F456 E6
2402 B2	3458 C2	F457 E8
2403 B2	3459 E9	F458 F10
2404 A4	3460 D9	F459 A3
2405 B1	3461 F6	F462 B10
2406 B2	3462 C9	F464 B4
2407 C4	3463 F6	F465 C5
2409 E2	3465 D9	F466 E8
2410 E4	3466 F8	F469 F9
2411 D3	3467 F8	F472 C10
2412 D4	3468 F8	F475 D1
2413 D4	3469 D8	F476 F1
2414 D3	3470 G7	F478 D10
2416 D4	3471 G6	F481 C8
2417 D5	3472 G6	F482 F6
2418 D5	3473 F5	F483 F6
2419 D4	3474 C10	I402 B2
2422 G1	3476 F6	I410 E3
2425 G3	3477 C9	I413 D1
2427 A4	3479 D5	I414 D1
2431 B4	3480 B7	I415 F3
2432 E9	3485 B10	I418 D2
2437 G2	3486 C8	I419 D2
2448 D7	3487 D8	I420 E2
2449 D8	3488 F4	I423 F3
2450 B9	3490 D2	I428 D5
2451 B8	3491 B7	I432 A5
2452 F7	3492 B9	I435 E9
2453 F7	3493 E4	I436 E10
2454 C2	3499 F2	I437 E8
2457 E5	5401 B4	I438 F8
2458 C2	5402 D2	I439 C8
2459 E5	5406 C4	I440 C9
2460 E6	5408 D4	I442 E4
2461 E8	5409 C4	I443 E4
2462 F6	5410 A5	I445 F1
2463 F6	5411 D5	I446 F2
2464 F8	5450 A6	I447 G2
2465 G8	5452 B1	I448 E4
2466 C9	5453 E8	I449 E5
2468 F8	5455 A2	I450 B4
2469 C8	5456 B1	I453 C3
2470 E8	6403 E5	I455 C5
2471 E6	6404 D4	I457 B3
2473 F7	6405 D5	I458 B7
2476 C9	6424 F1	I459 D7
2477 C9	6425 F2	I460 C10
2478 E3	6426 G2	I462 E2
2479 F6	6427 F4	I463 E3
2487 B10	6452 C3	I464 E4
2488 D2	6453 C3	I466 C2
2489 B10	6456 E5	I468 B10
2490 D9	6457 E7	I469 C8
2492 C7	6458 E7	I470 B2
2493 C3	6459 E9	I473 D4
2494 B3	6461 D7	I475 E5
2495 F5	6464 D2	I476 E7
2496 G2	6465 E3	I480 F8
2497 D1	6466 C7	I481 F8
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3401 A1	6474 C10	I488 D2
3402 D1	6476 C8	I489 B4
3403 C3	6478 B8	I490 F3
3408 D1	6480 C9	I491 G1
3412 B4	7403 E4	I492 D7
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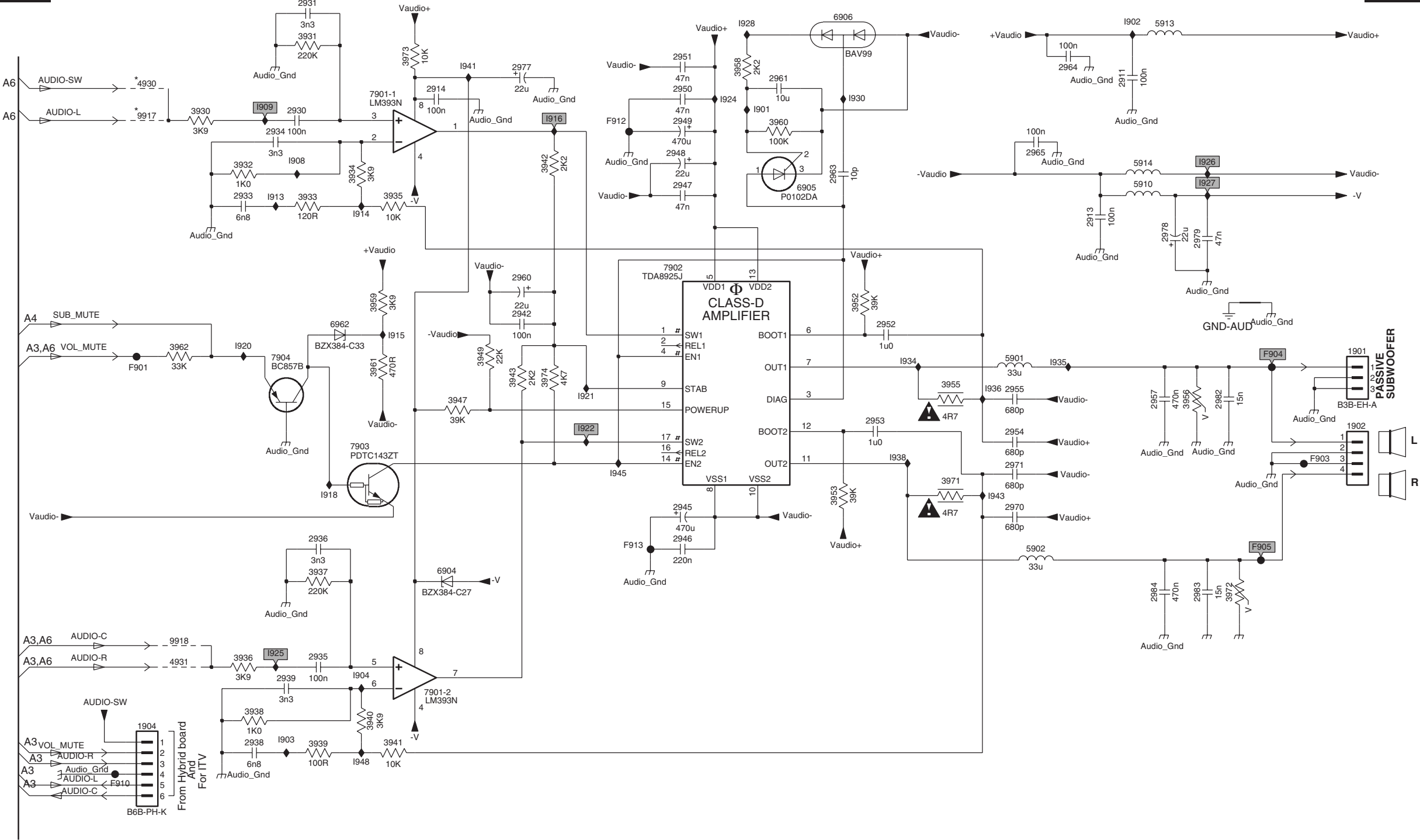
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LSP: Class D Audio Amplifier (Res)

A3 CLASS D - AUDIO AMP(RES)

A3

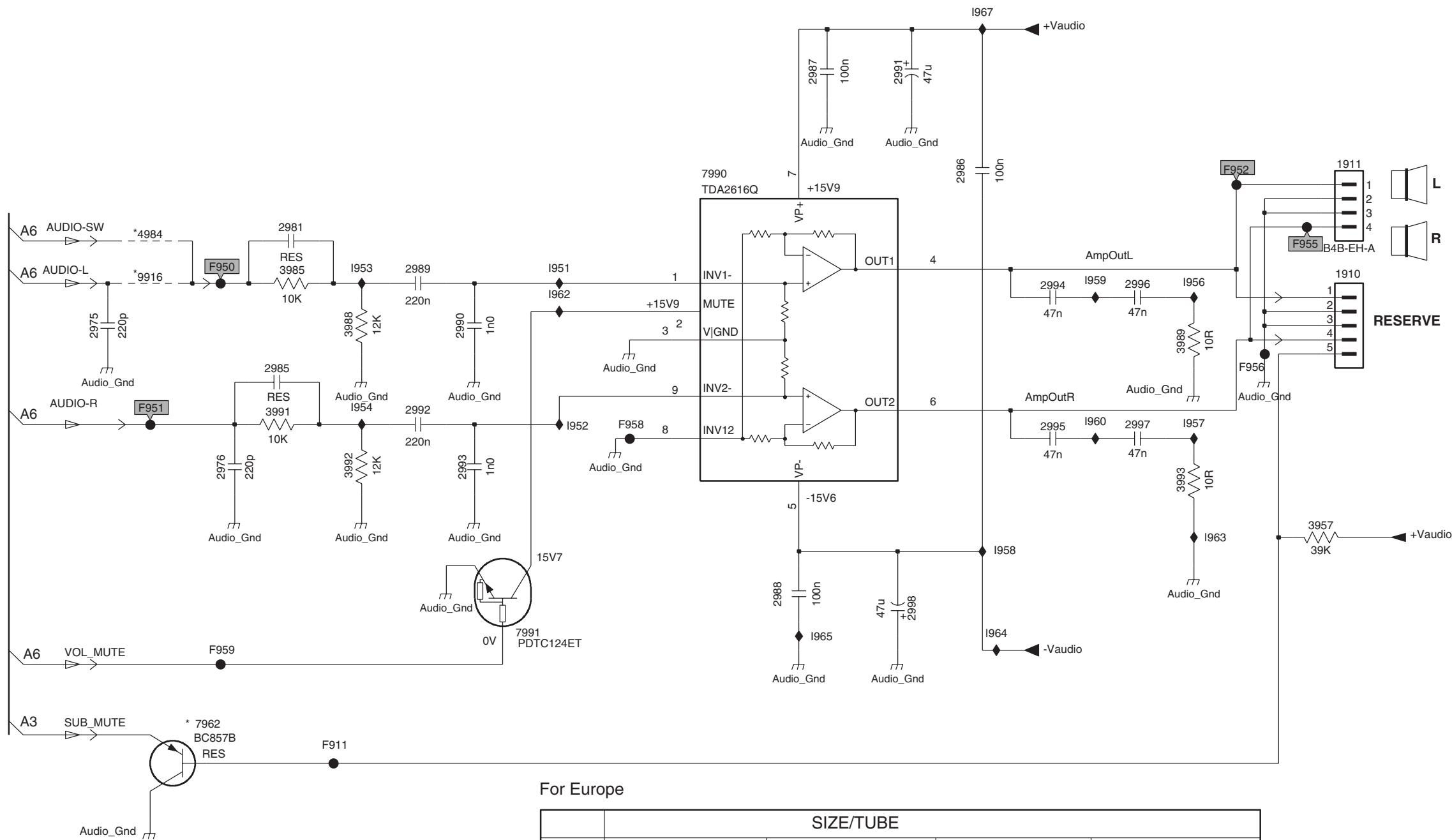


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- 2931 A2
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- 2934 B2
- 2935 E2
- 2936 D2
- 2938 F2
- 2939 E2
- 2942 C4
- 2945 D5
- 2946 D5
- 2947 B5
- 2948 B5
- 2949 B5
- 2950 A5
- 2951 A5
- 2952 C6
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- 3938 F2
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- I1000 B8

LSP: Audio Amplifier

A4 AUDIO AMPLIFIER

A4



For Europe

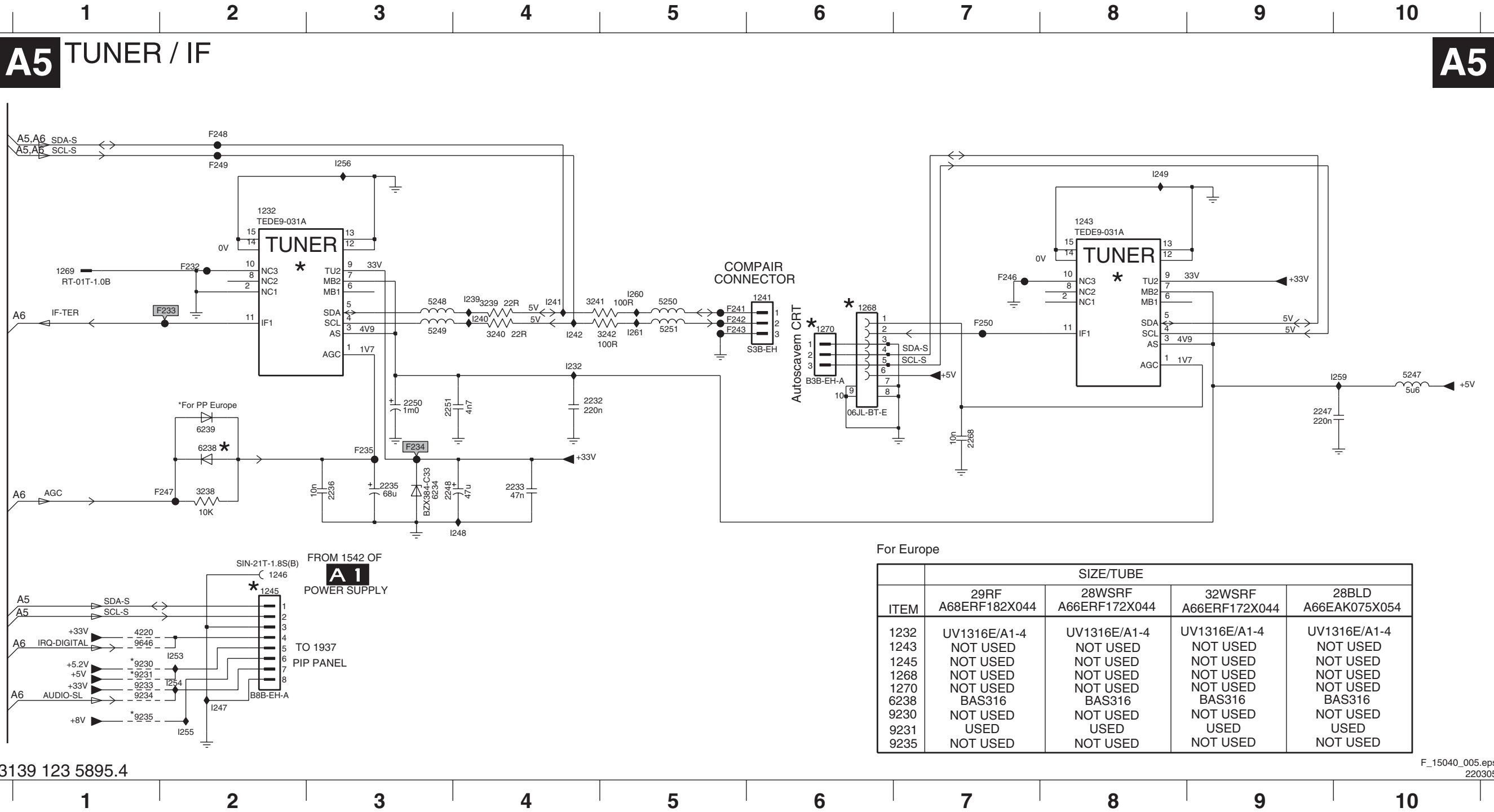
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1911	USED	USED	USED	USED
4984	NOT USED	NOT USED	NOT USED	NOT USED
7962	NOT USED	NOT USED	NOT USED	NOT USED
9916	USED	USED	USED	USED

"985" ~ "999"

1910 B8
1911 A8
2975 B1
2976 C2
2981 B2
2985 B2
2986 A6
2987 A5
2988 D5
2989 B3
2990 B3
2991 A5
2992 C3
2993 C3
2994 B6
2995 C6
2996 B7
2997 C7
2998 D5
3957 C7
3985 B2
3988 B3
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3991 C2
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7962 D2
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7991 D4
9916 B2
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LSP: Tuner IF

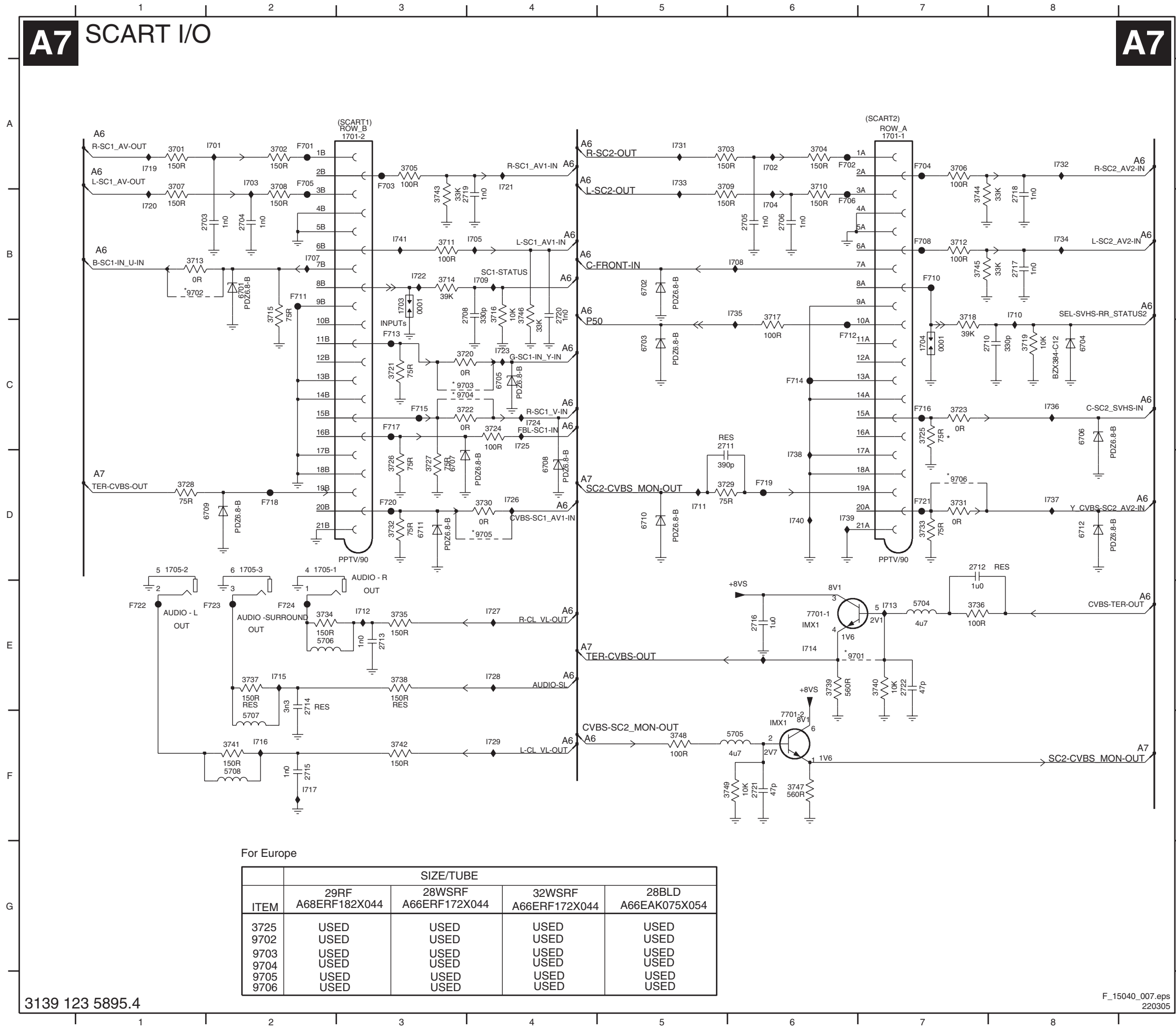
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1241 B6	1246 D2	1270 B6	2235 D3	2248 D3	2268 C7	3240 C4	4220 E1	5249 C3	6234 D3	9230 E1	9234 E1	F232 B2	F235 C3	F243 B5	F248 A2	I232 C4	I241 B4	I248 D4	I254 E2	I259 C10	
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A6 INTERFACING

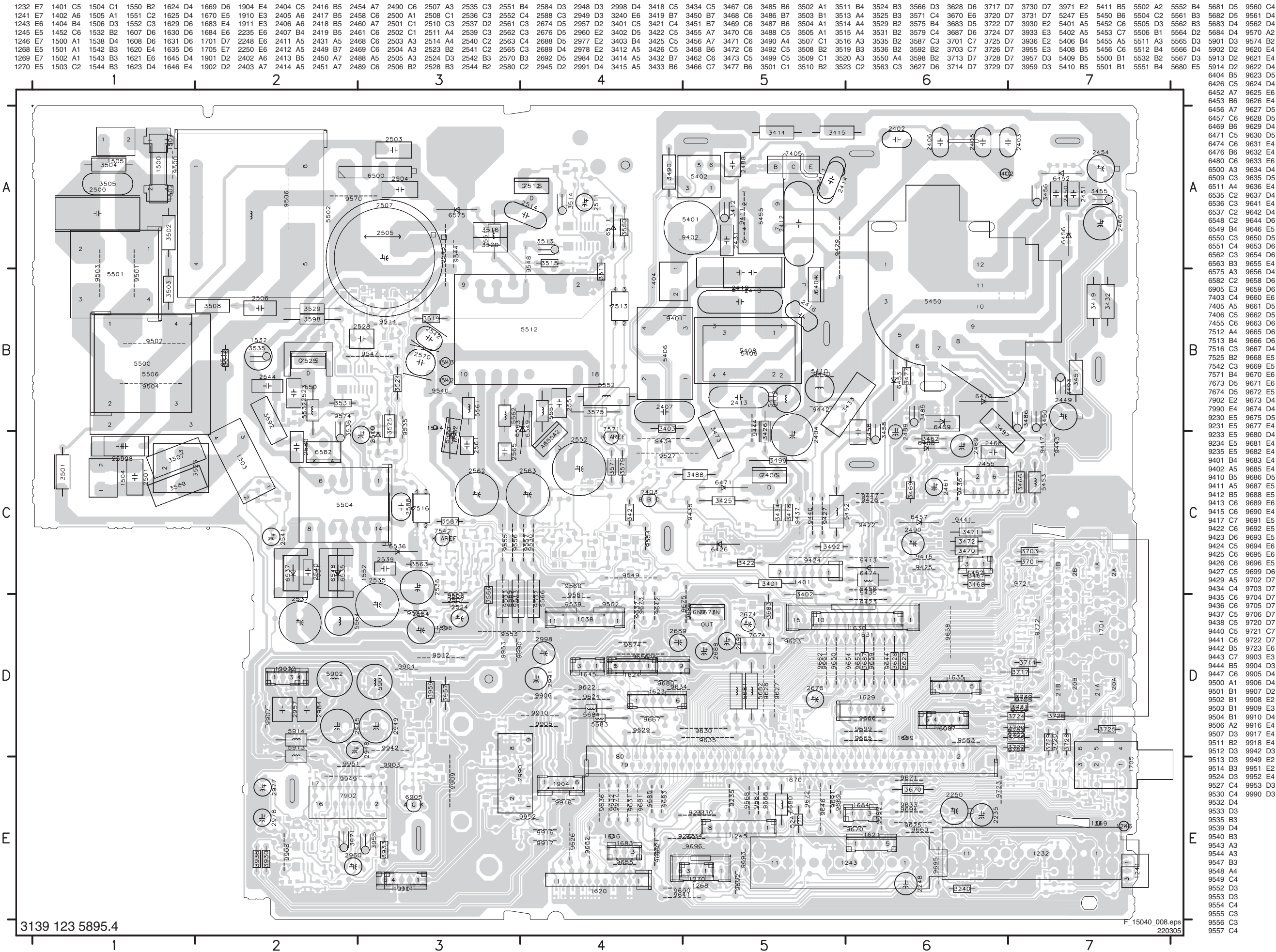


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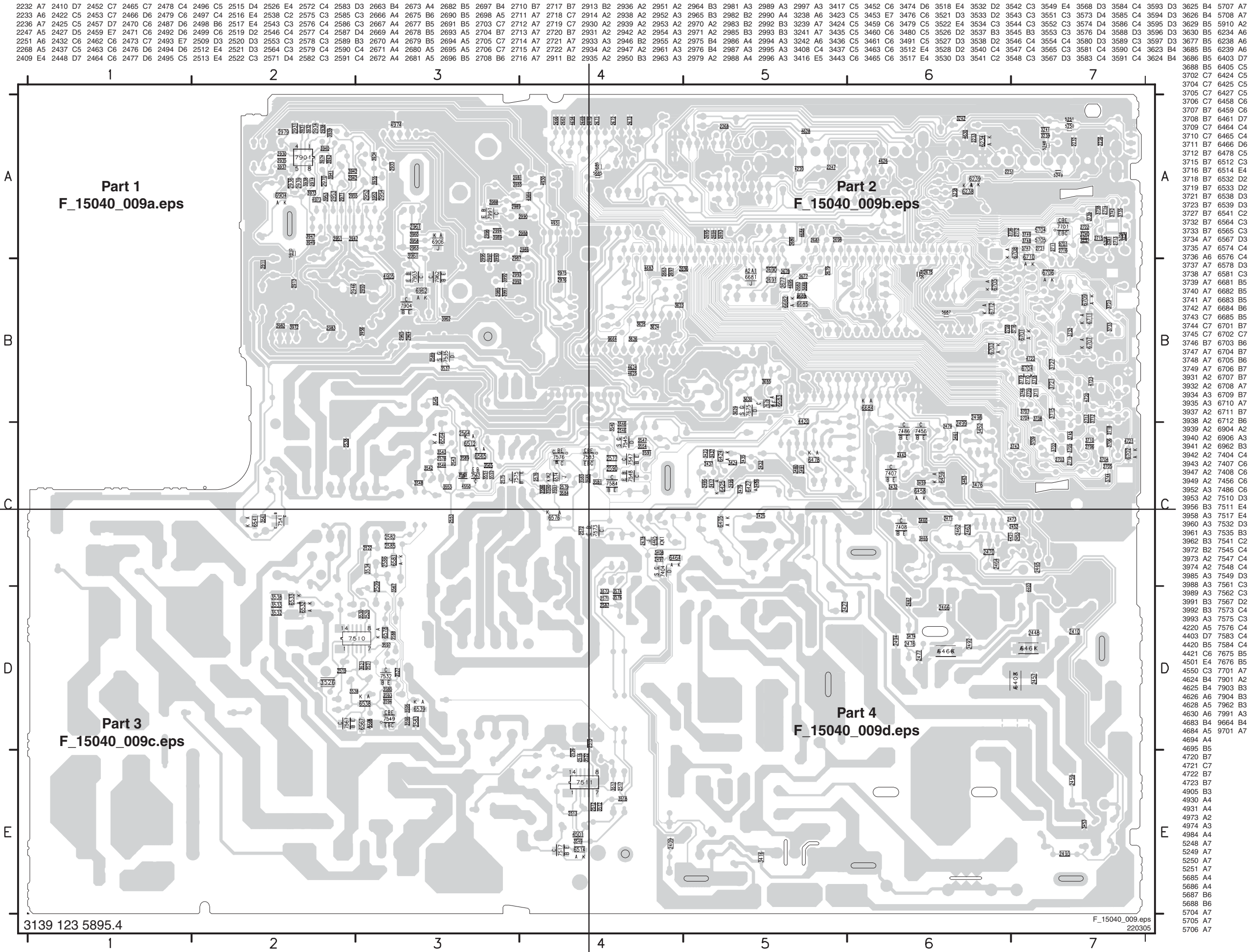


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1703 B3	3738 E3	I702 A6
1704 C7	3739 E6	I703 A2
1705-1 D2	3740 E7	I704 B6
1705-2 D1	3741 F2	I705 B4
1705-3 D2	3742 F3	I707 B2
2703 B2	3743 B3	I708 B6
2704 B2	3744 B7	I709 B4
2705 B6	3745 B7	I710 B8
2706 B6	3746 B4	I711 D5
2708 B4	3747 F6	I712 E3
2710 C8	3748 F5	I713 E7
2711 C5	3749 F6	I714 E6
2712 D7	5704 E7	I715 E2
2713 E3	5705 F6	I716 F2
2714 E2	5706 E2	I717 F2
2715 F2	5707 F2	I719 A1
2716 E6	5708 F2	I720 B1
2717 B8	6701 B2	I721 A4
2718 B8	6702 B5	I722 B3
2719 B4	6703 C5	I723 C4
2720 B4	6704 C8	I724 C4
2721 F6	6705 C4	I725 C4
2722 E7	6706 C8	I726 D4
3701 A1	6707 D3	I727 E4
3702 A2	6708 D4	I728 E4
3703 A5	6709 D1	I729 F4
3704 A6	6710 D5	I731 A5
3705 A3	6711 D3	I732 A8
3706 A7	6712 D8	I733 A5
3707 A1	7701-1 E6	I734 B8
3708 A2	7701-2 F6	I735 B6
3709 A5	9701 E6	I736 C8
3710 A6	9702 B1	I737 D8
3711 B3	9703 C3	I738 D6
3712 B7	9704 C3	I739 D6
3713 B1	9705 D4	I740 D6
3714 B3	9706 D7	I741 B3
3715 B2	F701 A2	
3716 B4	F702 A6	
3717 B6	F703 A3	
3718 B7	F704 A7	
3719 C8	F705 A2	
3720 C3	F706 B6	
3721 C3	F708 B7	
3722 C3	F710 B7	
3723 C7	F711 B2	
3724 C4	F712 C6	
3725 C7	F713 C3	
3726 D3	F714 C6	
3727 D3	F715 C3	
3728 D1	F716 C7	
3729 D5	F717 C3	
3730 D4	F718 D2	
3731 D7	F719 D6	
3732 D3	F720 D3	
3733 D7	F721 D7	
3734 E2	F722 E1	
3735 E3	F723 E2	

Layout LSP (Top Side)

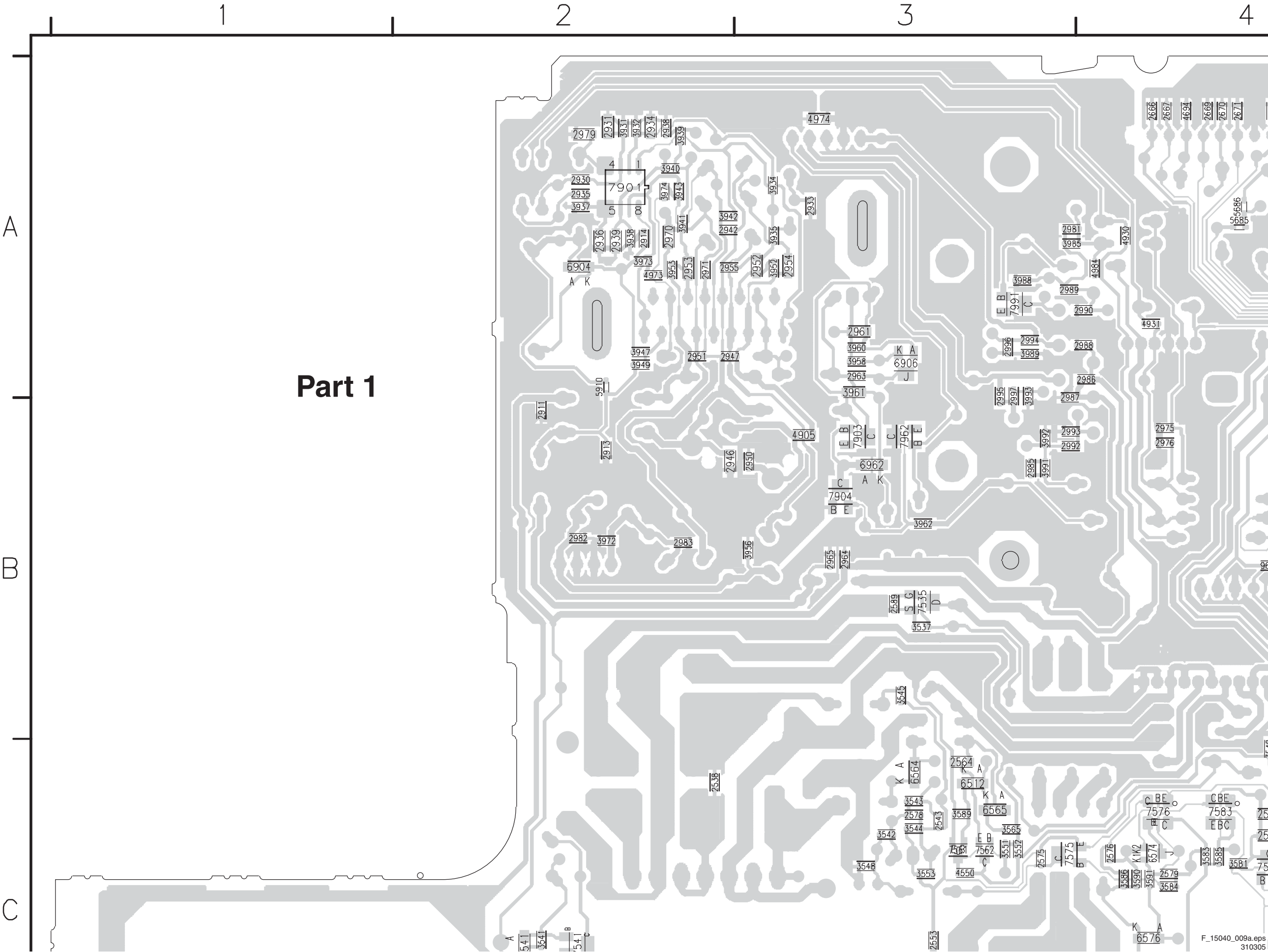


Layout LSP (Overview Bottom Side)



2232 A7 2410 D7 2452 C7 2465 C7 2478 C4 2496 C5 2515 D4 2526 E4 2572 C4 2583 D3 2663 B4 2673 A4 2682 B5 2697 B4 2710 B7 2717 B7 2913 B2 2936 A2 2951 A2 2964 B3 2981 A3 2989 A3 2997 A3 3417 C5 3452 C6 3474 D6 3518 E4 3532 D2 3542 C3 3549 E4 3568 D3 3584 C4 3593 D3 3625 B4 5707 A7
2233 A6 2422 C5 2453 C7 2466 D6 2479 C6 2497 C4 2516 E4 2538 C2 2575 C3 2585 C3 2666 A4 2675 B6 2690 B5 2698 A5 2711 A7 2718 C7 2914 A2 2938 A2 2952 A3 2965 B3 2982 B2 2990 A4 3238 A6 3423 C5 3453 E7 3476 C6 3521 D3 3533 D2 3543 C3 3551 C3 3573 D4 3585 C4 3594 D3 3626 B4 5708 A7
2236 A7 2425 C5 2457 D7 2470 C6 2487 D6 2498 B6 2517 E4 2543 C3 2576 C4 2586 C3 2667 A4 2677 B5 2691 B5 2703 C7 2712 A7 2719 C7 2930 A2 2939 A2 2953 A2 2970 A2 2983 B2 2992 B3 3239 A7 3424 C5 3459 C6 3479 C5 3522 E4 3534 C3 3544 C3 3552 C3 3574 D4 3586 C4 3595 D3 3629 B5 5910 A2
2247 A5 2427 D5 2459 E7 2471 C6 2492 D6 2499 C6 2519 D2 2546 C4 2577 C4 2587 D4 2669 A4 2678 B5 2693 A5 2704 B7 2713 A7 2720 B7 2931 A2 2942 A2 2954 A3 2971 A2 2985 B3 2993 B3 3241 A7 3435 C5 3460 C6 3480 C5 3526 D2 3537 B3 3545 B3 3553 C3 3576 D4 3588 D3 3596 D3 3630 B5 6234 A6
2251 A6 2432 C6 2462 C6 2473 C7 2493 E7 2509 D3 2520 D3 2553 C3 2578 C3 2589 B3 2670 A4 2679 B5 2694 A5 2705 C7 2714 A7 2721 A7 2933 A3 2946 B2 2955 A2 2975 B4 2986 A4 2994 A3 3242 A6 3436 C5 3461 C6 3491 C5 3527 D3 3538 D2 3546 C4 3554 C4 3580 D3 3589 C3 3597 D3 3677 B5 6238 A6
2268 A5 2437 C5 2463 C6 2476 D6 2494 D6 2512 E4 2521 D3 2564 C3 2579 C4 2590 C4 2671 A4 2680 A5 2695 A5 2706 C7 2715 A7 2722 A7 2934 A2 2947 A2 2961 A3 2976 B4 2987 A3 2995 A3 3408 C4 3437 C5 3463 C6 3512 E4 3528 D2 3540 C4 3547 C4 3565 C3 3581 C4 3590 C4 3623 B4 3685 B5 6239 A6
2409 E4 2448 D7 2464 C6 2477 D6 2495 C5 2513 E4 2522 C3 2571 D4 2582 C3 2591 C4 2672 A4 2681 A5 2696 B5 2708 B6 2716 A7 2911 B2 2935 A2 2950 B3 2963 A3 2979 A2 2988 A4 2996 A3 3416 E5 3443 C6 3465 C6 3517 E4 3530 D3 3541 C2 3548 C3 3567 D3 3583 C4 3591 C4 3624 B4 3686 B5 6403 D7
3688 B5 6405 C5
3702 C7 6424 C5
3704 C7 6425 C5
3705 C7 6427 C5
3706 C7 6458 C6
3707 B7 6459 C6
3708 B7 6461 D7
3709 C7 6464 C4
3710 C7 6465 C4
3711 B7 6466 D6
3712 B7 6478 C5
3715 B7 6512 C3
3716 B7 6514 E4
3718 B7 6532 D2
3719 B7 6533 D2
3721 B7 6538 D3
3723 B7 6539 D3
3727 B7 6541 C2
3732 B7 6564 C3
3733 B7 6565 C3
3734 A7 6567 D3
3735 A7 6574 C4
3736 A6 6576 C4
3737 A7 6578 D3
3738 A7 6581 C3
3739 A7 6681 B5
3740 A7 6682 B5
3741 A7 6683 B5
3742 A7 6684 B6
3743 C7 6685 B5
3744 C7 6701 B7
3745 C7 6702 C7
3746 B7 6703 B6
3747 A7 6704 B7
3748 A7 6705 B6
3749 A7 6706 B7
3931 A2 6707 B7
3932 A2 6708 A7
3934 A3 6709 B7
3935 A3 6710 A7
3937 A2 6711 B7
3938 A2 6712 B6
3939 A2 6904 A2
3940 A2 6906 A3
3941 A2 6962 B3
3942 A2 7404 C4
3943 A2 7407 C6
3947 A2 7408 C6
3949 A2 7456 C6
3952 A3 7486 C6
3953 A2 7510 D3
3956 B3 7511 E4
3958 A3 7517 E4
3960 A3 7532 D3
3961 A3 7535 B3
3962 B3 7541 C2
3972 B2 7545 C4
3973 A2 7547 C4
3974 A2 7548 C4
3985 A3 7549 D3
3988 A3 7561 C3
3989 A3 7562 C3
3991 B3 7567 D2
3992 B3 7573 C4
3993 A3 7575 C3
4220 A5 7576 C4
4403 D7 7583 C4
4420 B5 7584 C4
4421 C6 7675 B5
4501 E4 7676 B5
4550 C3 7701 A7
4624 B4 7901 A2
4625 B4 7903 B3
4626 A6 7904 B3
4628 A5 7962 B3
4630 A6 7991 A3
4683 B4 9664 B4
4684 A5 9701 A7
4694 A4
4695 B5
4720 B7
4721 C7
4722 B7
4723 B7
4905 B3
4930 A4
4931 A4
4973 A2
4974 A3
4984 A4
5248 A7
5249 A7
5250 A7
5251 A7
5685 A4
5686 A4
5687 B6
5688 B6
5704 A7
5705 A7
5706 A7

Layout LSP (Part 1 Bottom Side)



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1112-A A4	1114-A B5
1112-B A10	1114-B A10
1113-A B4	1115 D10
1113-B A10	2101 C1

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SSB: Video Source Selection & Data Link

1116 E1	2064 C2	2068 D2	2072 E2	2076 E2	2082 A7	2086 D4	3061 A8	3065 C2	3070 B1	3074 E3	5060 E3	7060-B B2	F060 B1	F076 E1	F088 F7	I063 D3
2060 A3	2065 C2	2069 D2	2073 E2	2078 E3	2083 C4	2087 C2	3062 B3	3066 A8	3071 B3	4062 E2	5061 F3	7062 B8	F064 B7	F077 E1	F089 F7	I064 D3
2062 B4	2066 D2	2070 D2	2074 E2	2079 F4	2084 C4	2088 A8	3063 B3	3067 B7	3072 E3	4152 D1	5063 A8	7063 B7	F074 E2	F078 E1	I061 C3	
2063 C2	2067 D2	2071 D2	2075 E2	2081 F3	2085 D3	3060 A2	3064 C2	3068 B7	3073 E3	4153 E2	7060-A A3	7100-B B4	F075 F1	F080 B4	I062 C3	

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B2 VIDEO SOURCE SELECTION AND DATA LINK

A

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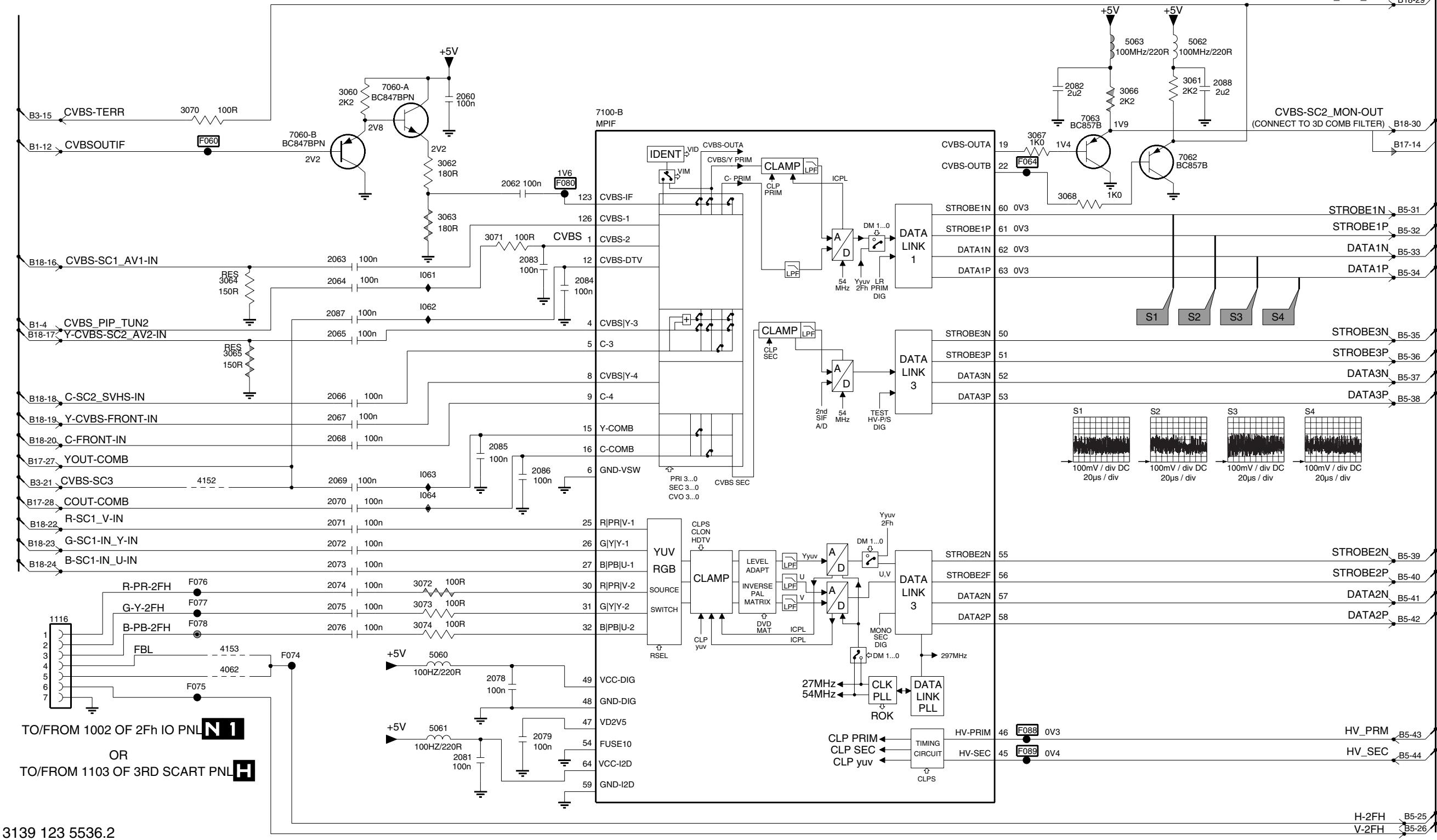
B

C

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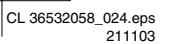
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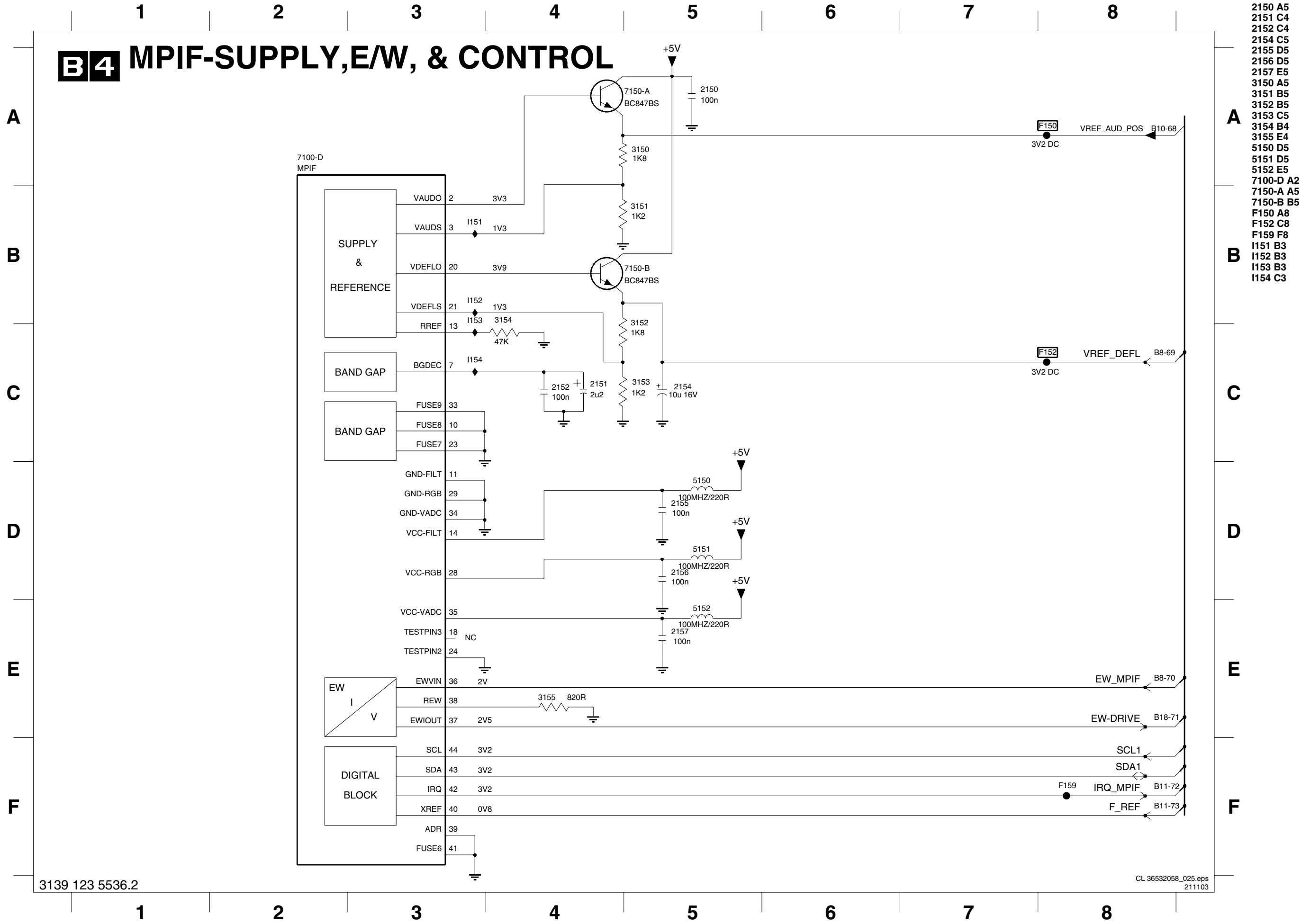
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B3 AUDIO SOURCE SELECT



SSB: MPIF-Supply, E/W, & Control



2150 A5
2151 C4
2152 C4
2154 C5
2155 D5
2156 D5
2157 E5
3150 A5
3151 B5
3152 B5
3153 C5
3154 B4
3155 E4
5150 D5
5151 D5
5152 E5
7100-D A2
7150-A A5
7150-B B5
F150 A8
F152 C8
F159 F8
I151 B3
I152 B3
I153 B3
I154 C3

SSB: Video Decoder

2281 A9 2282 C9 2284 D9 2285 D9 3281 C1 3282 D2 3283 D2 3284 D2 5281 A9 5282 C9 5283 D9 5285 D9 7300-J A3 F281 D9 F282 C2 I281 D2

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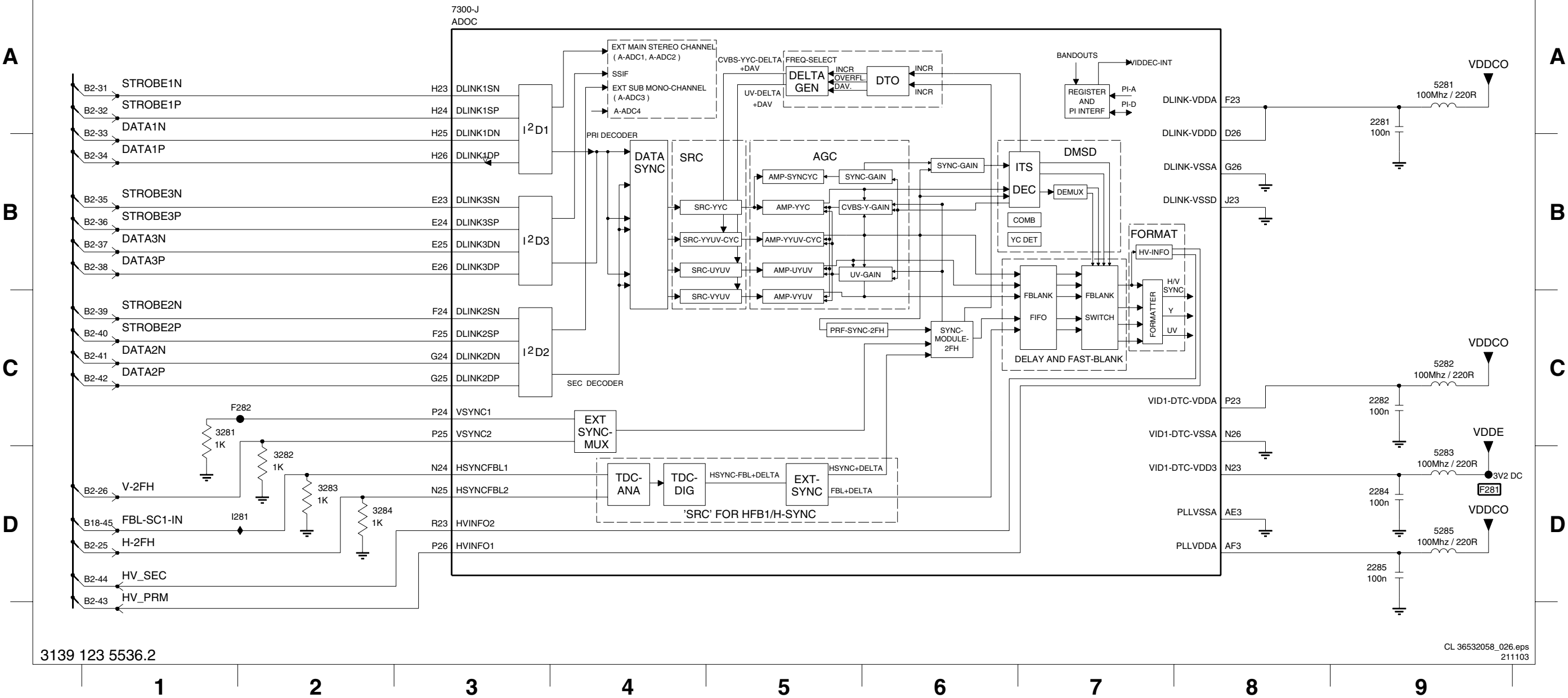
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B5 VIDEO DECODER

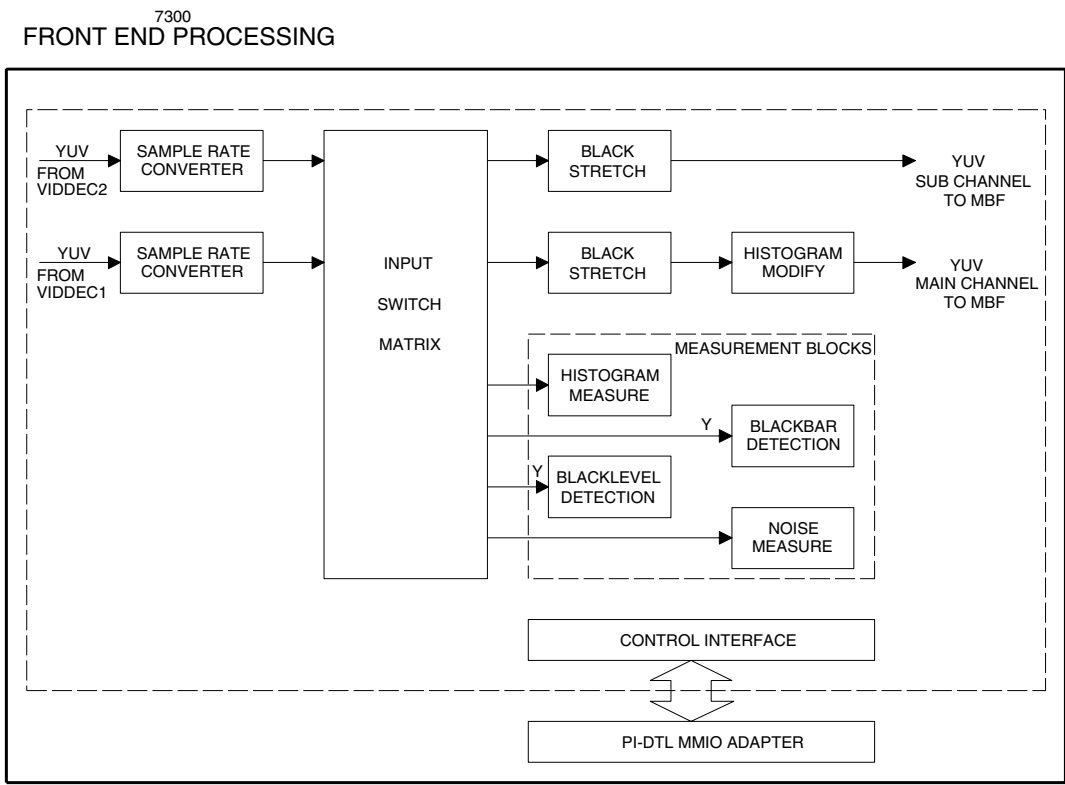
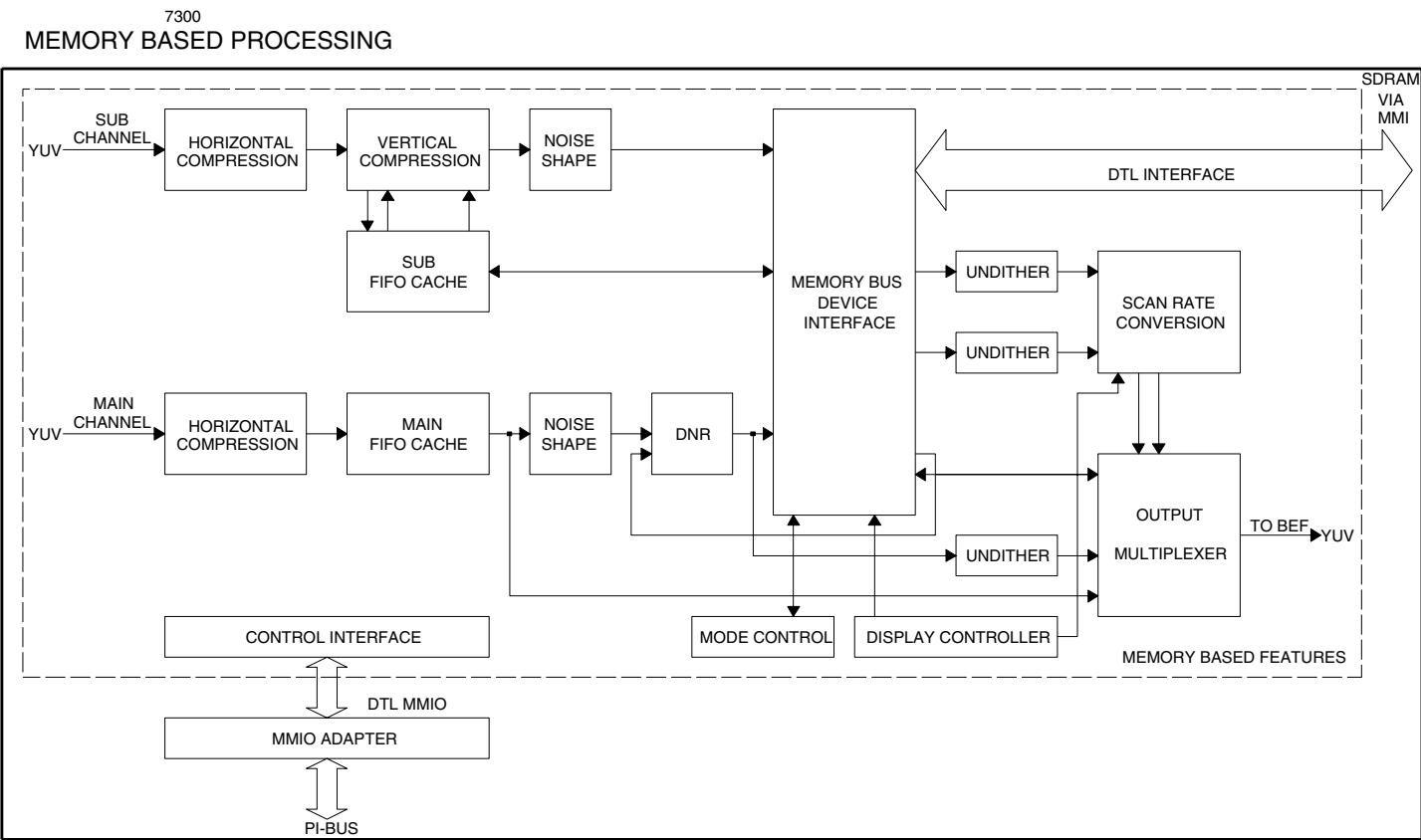
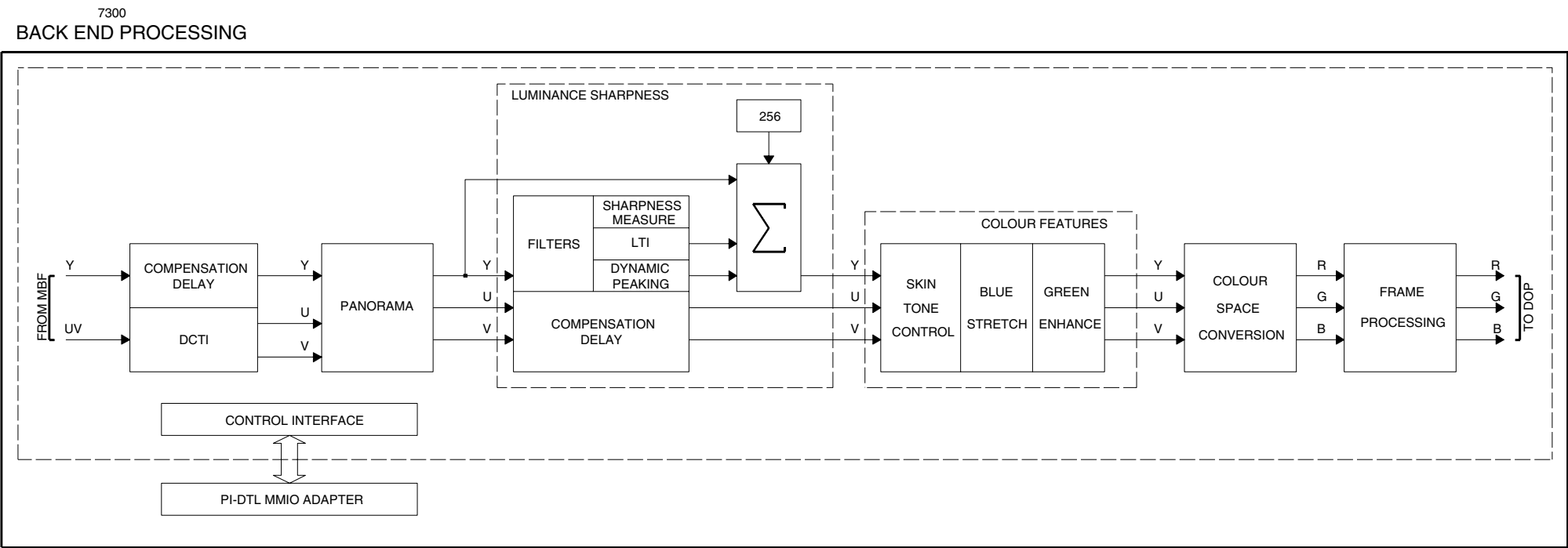


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211103

SSB: Feature Box

B6 FEATURE BOX



SSB: RGB Processing

2300 B1	2311 A9	2324 D4	2329 B8	3303 D7	3308 A5	3313 A8	3320 B8	3326 D4	3332 D8	3337 B4	3347 D6	5307 A5	6326 D4	7303 D8	7320-B B9	I301 C5	I306 A6
2305 E6	2317 B6	2325 C5	2331 C9	3304 D7	3309 A8	3316 B8	3321 C8	3328 C5	3333 D8	3338 D8	3348 D6	5317 B5	6327 E5	7304 D7	7330-A D8	I302 C6	I307 A5
2307 A6	2318 B5	2326 C6	2339 D8	3305 E7	3310 A8	3317 A5	3322 C8	3329 C8	3334 A4	3339 B5	3349 C6	5327 B5	7300-H A1	7310-A A8	7330-B D9	I303 D4	I308 A6
2308 A5	2319 A8	2327 B6	2346 E5	3306 E7	3311 A8	3318 D5	3323 C8	3330 C8	3335 B4	3343 E4	3356 E5	5328 C5	7301 A8	7310-B A9	7346 D5	I304 D5	I309 B5
2310 A9	2321 B9	2328 B5	3302 B1	3307 A8	3312 A8	3319 B8	3324 D5	3331 D8	3336 B4	3345 E5	5300 A1	6301 E7	7302 C8	7320-A B8	7356 E5	I305 A5	I310 B6

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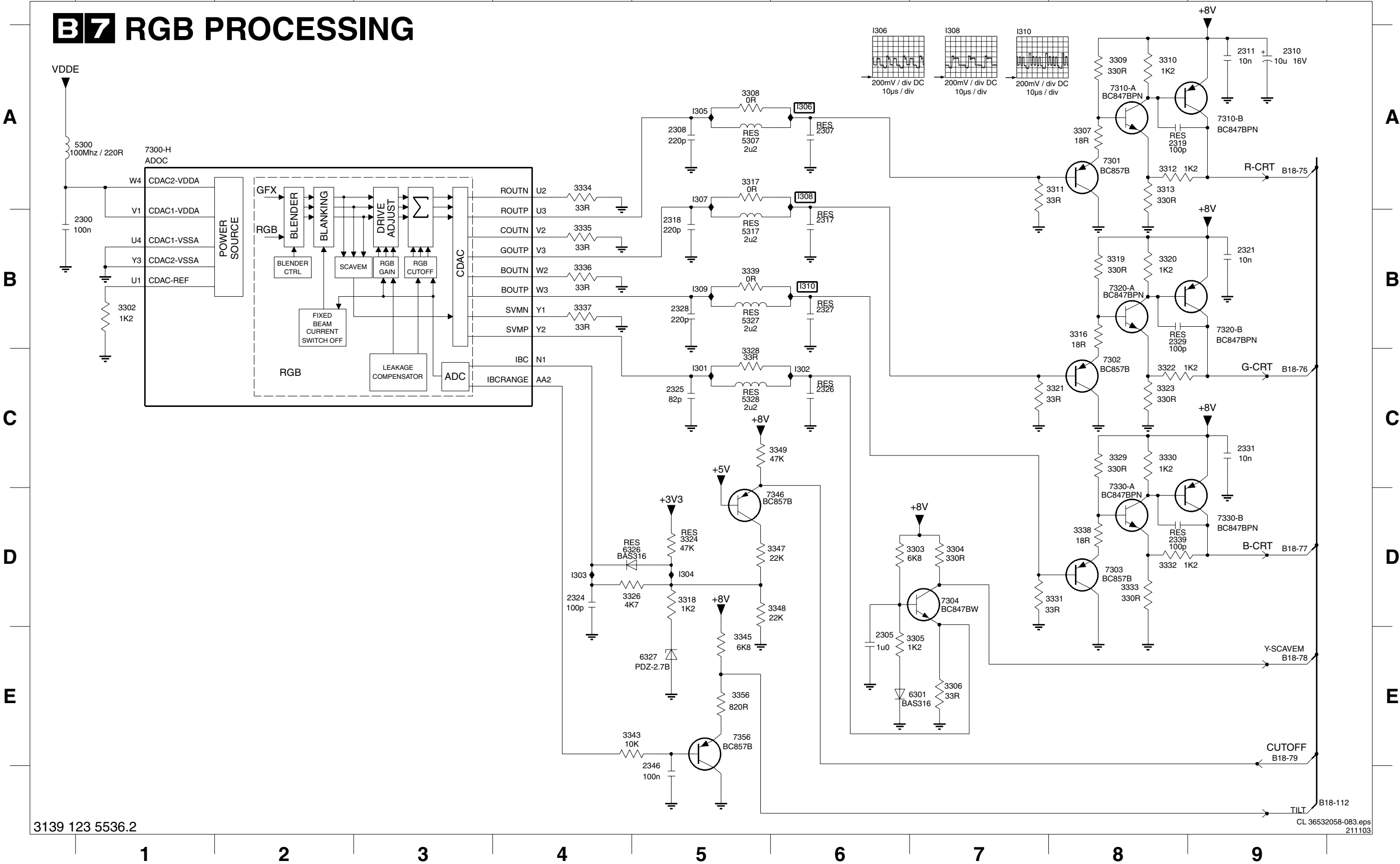
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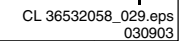
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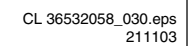
B7 RGB PROCESSING



2341 B2	2350 A7	2360 C6	2365 D8	2379 E10
2342 C2	2351 A8	2361 C8	2366 C9	3340 A2
2343 C2	2352 A9	2362 B9	2371 D9	3341 B2
2344 C1	2358 D7	2363 B7	2372 D9	3346 D2
2345 C1	2359 C6	2364 C8	2377 E10	3350 A8

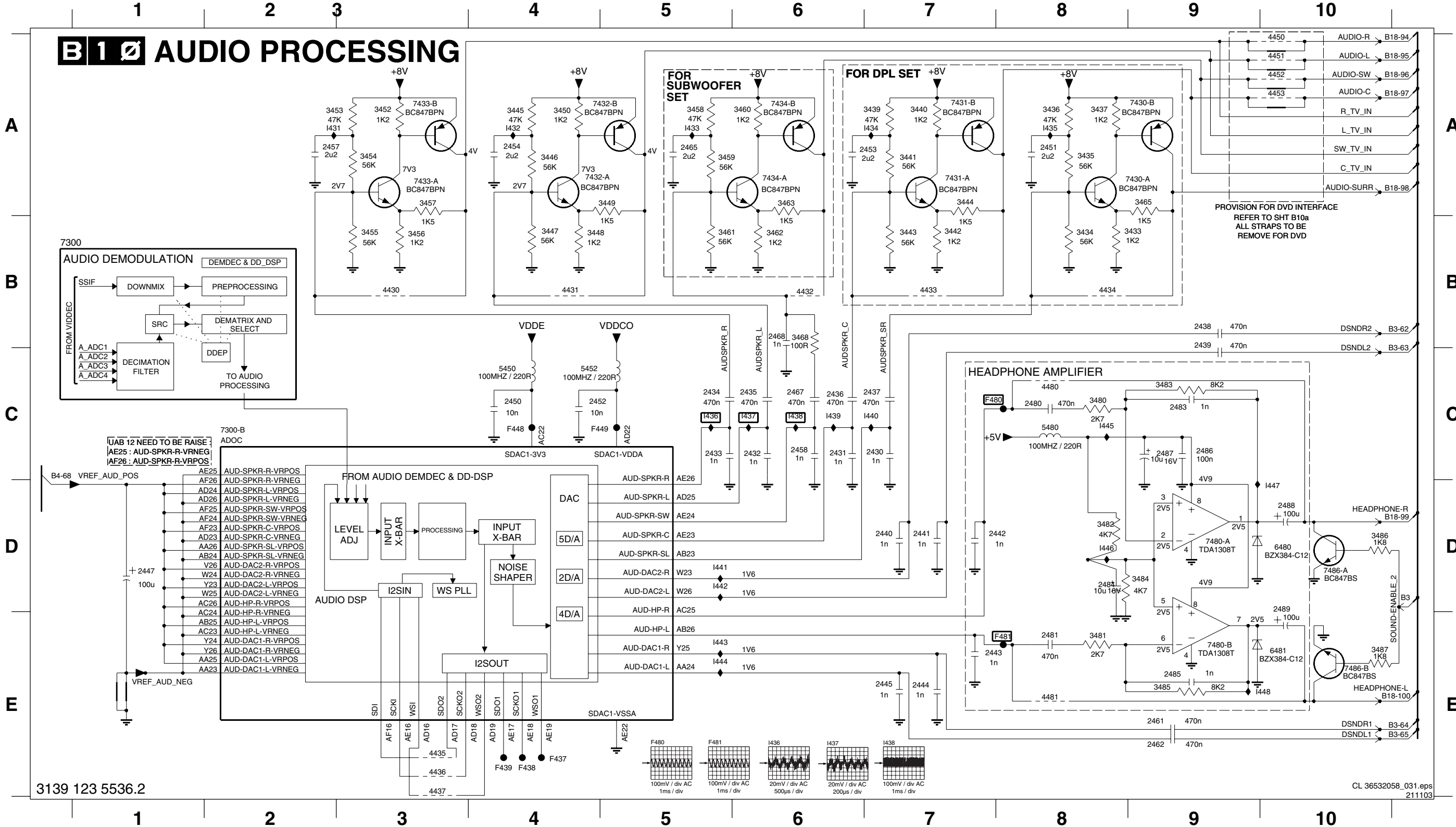


2380 B2	2395 D6	3382 A4	3386 B5	3391 E4	3394 D4	3397 C4	6382 A3	6397 C3	7382 A4	7393 D5	F383 C6	F386 B2	F390 C4	I382 C4
2386 B5	2397 D3	3384 E5	3388 C5	3392 E3	3395 E5	3398 C2	6384 B3	6398 C3	7383-A E6	F381 C6	F384 A4	F387 E4	F391 B4	
2395 E5	3380 B2	3385 B5	3390 C5	3393 D5	3396 D4	6381 A3	6385 A4	7300-G C6	7383-B E5	F382 C6	F385 B3	F389 C3	I381 A2	



SSB: Audio Processing

2430 C7	2437 C7	2444 E7	2454 A4	2468 B6	2487 C9	3437 A8	3445 A4	3453 A2	3460 A6	3481 E8	4430 B3	4437 E3	5450 C4	7430-B A9	7434-A A6	F438 E4	I432 A4	I439 C6	I446 D8
2431 C6	2438 B9	2445 E7	2457 A2	2480 C8	2488 D10	3439 A7	3446 A4	3454 A3	3461 B5	3482 D8	4431 B4	4450 A10	5452 C4	7431-A A7	7434-B A6	F439 E4	I433 A5	I440 C7	I447 D10
2432 C6	2439 B9	2447 D1	2458 C6	2481 E8	2489 D10	3440 A7	3447 B4	3455 B3	3462 B6	3483 C9	4432 B6	4451 A10	5480 C8	7431-B A7	7480-A D9	F448 C4	I434 A7	I441 D5	I448 E10
2433 C5	2440 D7	2450 C4	2461 E9	2483 C9	3433 B9	3441 A7	3448 B4	3456 B3	3463 A6	3484 D9	4433 B7	4452 A10	6480 D10	7432-A A4	7480-B E9	F449 C4	I435 A8	I442 D5	
2434 C5	2441 D7	2451 A8	2462 E9	2484 D8	3434 B8	3442 B7	3449 A5	3457 A3	3465 A9	3485 E9	4434 B8	4453 A10	6481 E10	7432-B A4	7486-A D10	F480 C7	I436 C5	I443 E5	
2435 C6	2442 D8	2452 C4	2465 A5	2485 E9	3435 A8	3443 B7	3450 A4	3458 A5	3468 B6	3486 D10	4435 E3	4480 C8	7300-B C2	7433-A A3	7486-B E10	F481 E8	I437 C6	I444 E5	
2436 C6	2443 E7	2453 A7	2467 C6	2486 C9	3436 A8	3444 A7	3452 A3	3459 A5	3480 C8	3487 E10	4436 E3	4481 E8	7430-A A8	7433-B A3	F437 E4	I431 A2	I438 C6	I445 C8	



SSB: Control

0201 A10	2525 C3	2583 D5	3507 B3	3513 B2	3542 A9	3549 B9	3565 D8	3581 C4	4560 D8	6589 C10	7581 E5	F513 C10	F519 C10	F527 A1	F539 B7	F550 B9	I502 E6
0202 A10	2546 C9	2584 D5	3508 B2	3515 B2	3543 B9	3550 A9	3570 E8	3582 E4	4570 E9	7300-A E8	F508 B1	F514 B10	F520 A9	F532 D2	F540 B7	F551 B3	
1581 C5	2557 C9	3501 A3	3509 B3	3518 A3	3544 A9	3557 C9	3571 E9	3583 E6	4571 E9	7300-C A4	F509 B1	F515 B10	F521 A9	F533 B7	F541 B7	F570 E7	
1582 E4	2571 E7	3502 A4	3510 B3	3523 C3	3546 B9	3561 D8	3572 E9	3586 E6	4573 E9	7300-D A8	F510 C10	F516 B9	F522 A9	F534 B3	F542 B7	F582 E5	
2514 B1	2581 C4	3503 A2	3511 B1	3530 E3	3547 C9	3563 D8	3573 E8	3590 D6	5570 E7	7300-K C6	F511 C10	F517 B9	F523 A9	F537 A4	F543 B7	F584 D6	
2516 C1	2582 C4	3504 A2	3512 B1	3541 A10	3548 B9	3564 D9	3580 C3	4501 E9	5583 D4	7525 D2	F512 C10	F518 B9	F524 A4	F538 B3	F544 B7	I501 A1	

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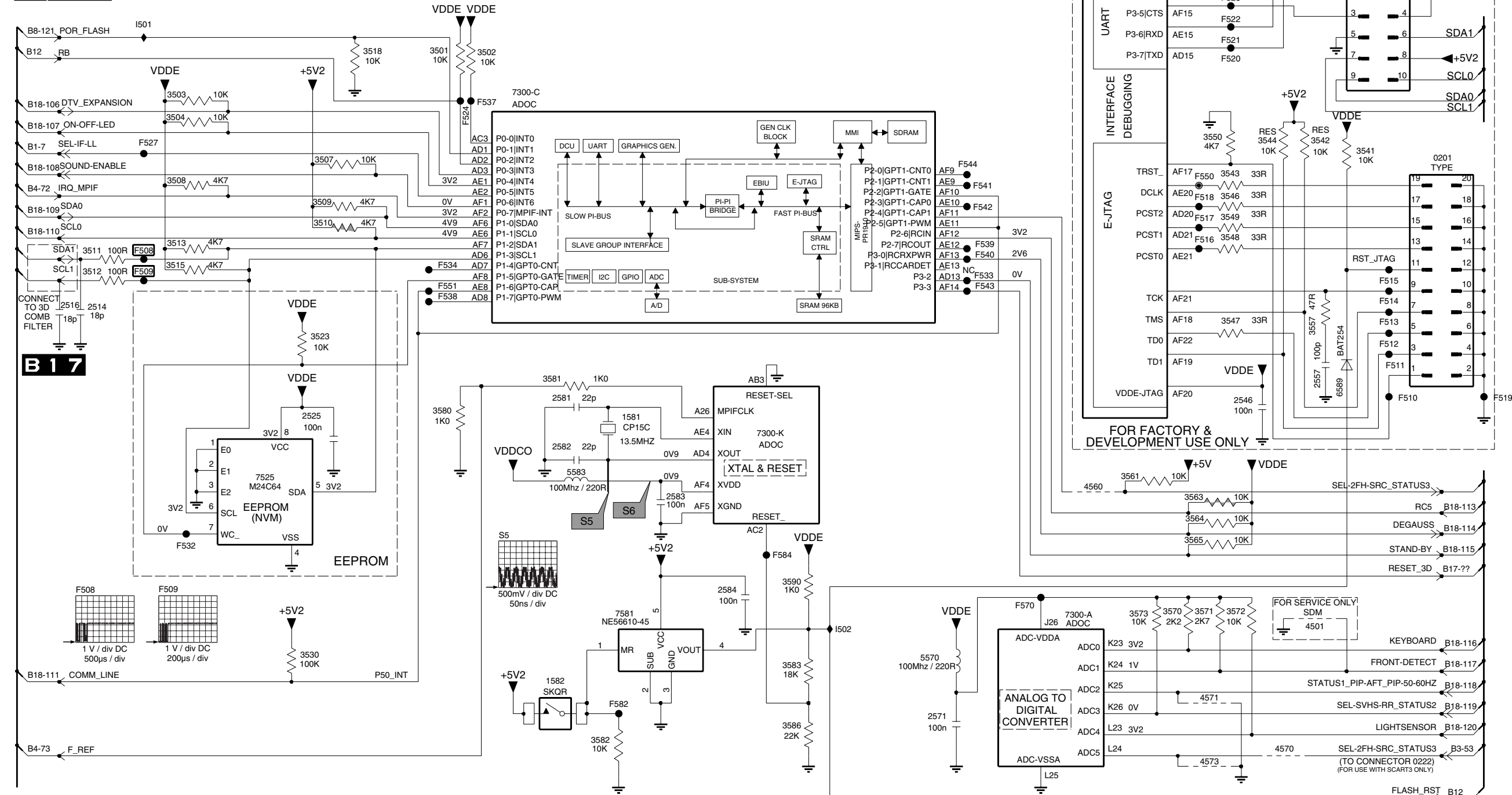
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B11 CONTROL



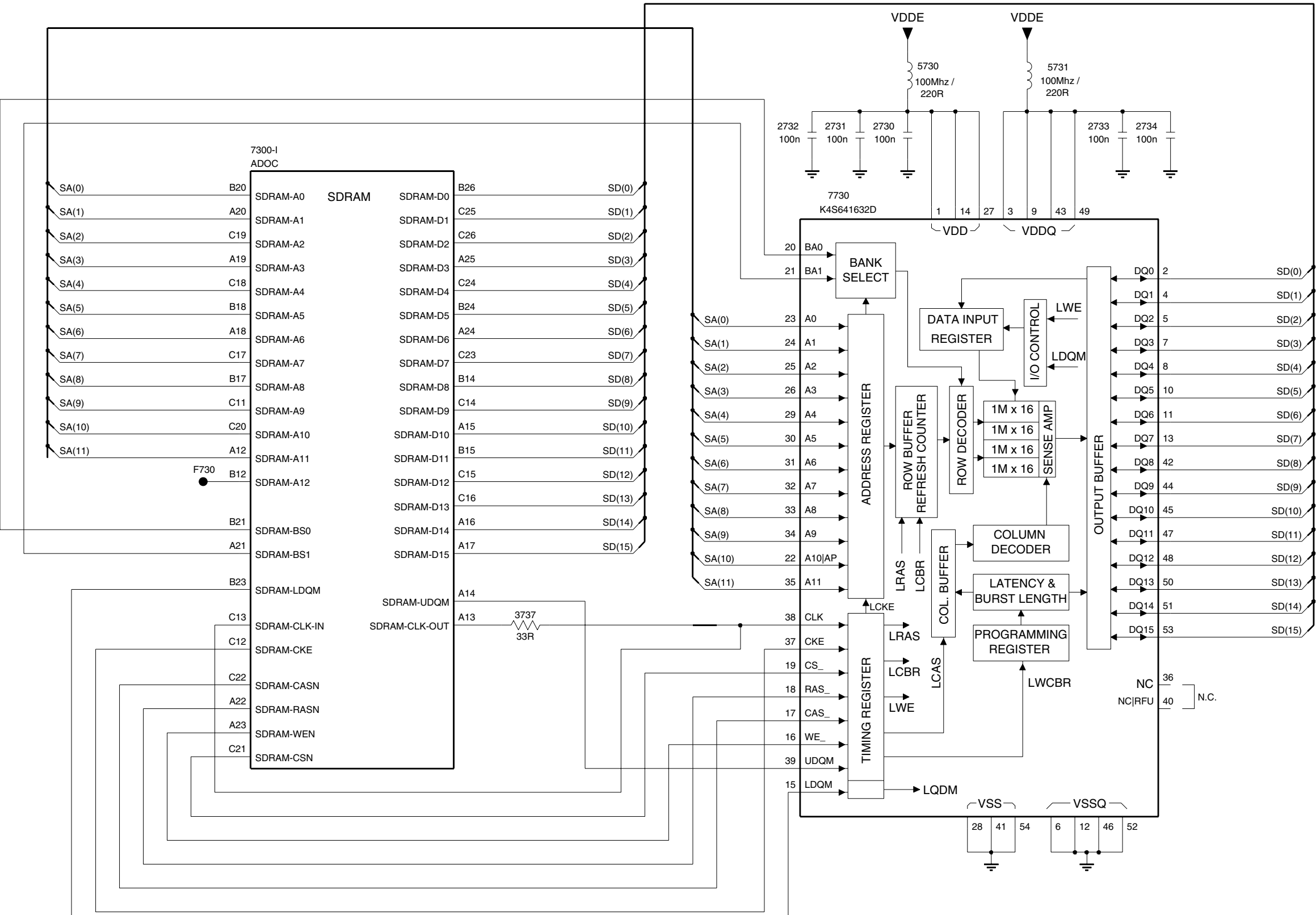
B 1 2 CONTROL-MEMORY INTERFACE (EBIU)



0290 B7
0291 B9
2792 B4
2793 B6
4790 F1
4791 E4
5792 A4
7300-E B1
7790 B4
F790 E1
F791 E1
F792 F1
F793 E3
F794 E3
F795 D3
F797 E5
F798 E3
F799 E3

SSB: Control-Memory Interface (SDRAM)

B13 CONTROL-MEMORY INTERFACE (SDRAM)



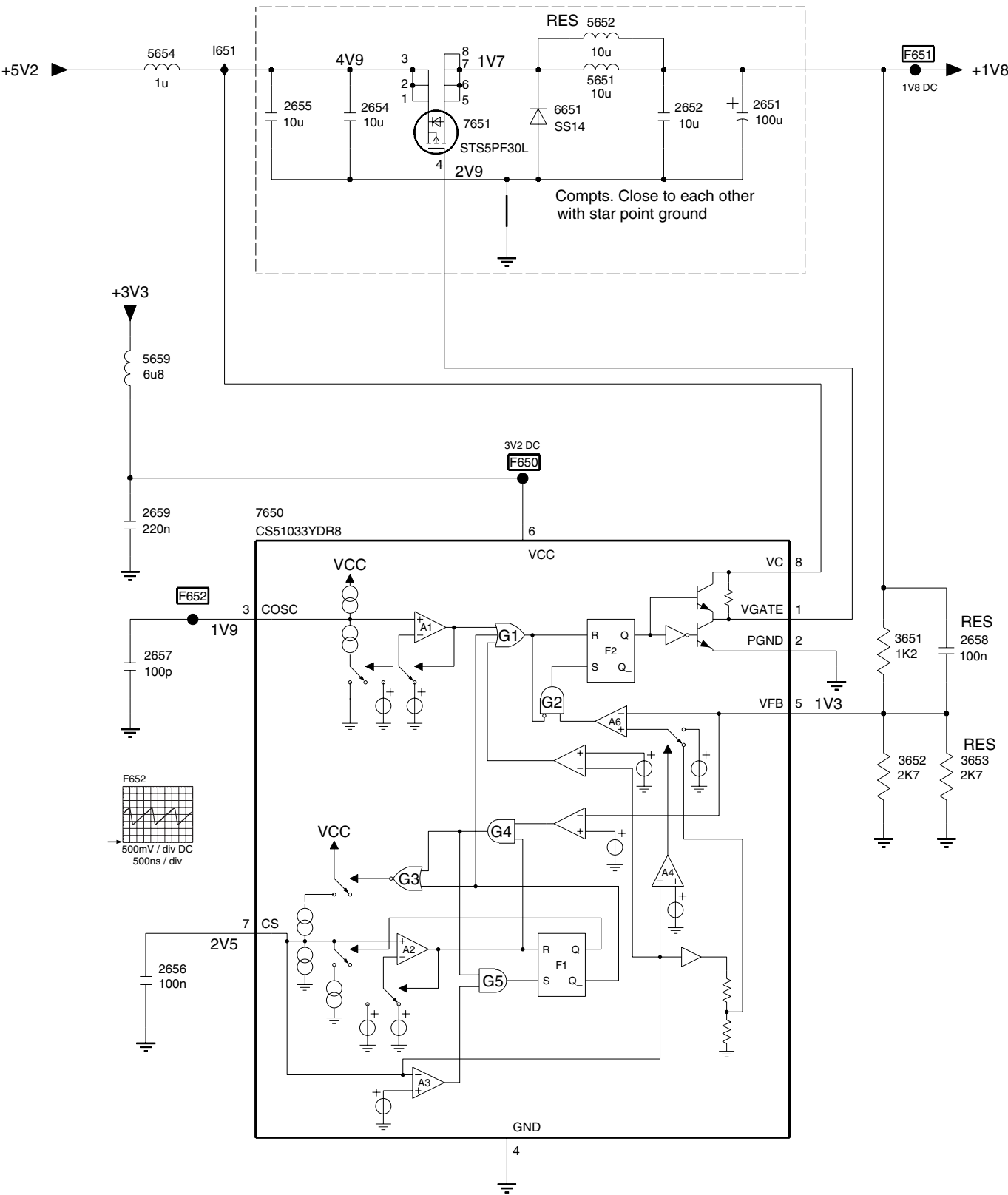
2730 B6
2731 B6
2732 B5
2733 B7
2734 B7
3737 E4
5730 A6
5731 A7
7300-I B2
7730 B6
F730 D2

2600 C10	2604 C10	2609 C9	2612 C9	2618 C8	2622 C7	2628 C7	2630 C6	2634 C6	2644 D7	2649 C2	5601 D7	7300-M A1	1601 D8
2601 C10	2607 C9	2611 C9	2615 C8	2620 C8	2623 C7	2629 C6	2633 C6	2638 C2	2645 C1	5600 C1	7300-L B6	F601 C1	



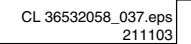
SSB: Low Voltage Supply ADOC

B15 LOW VOLTAGE SUPPLY - ADOC

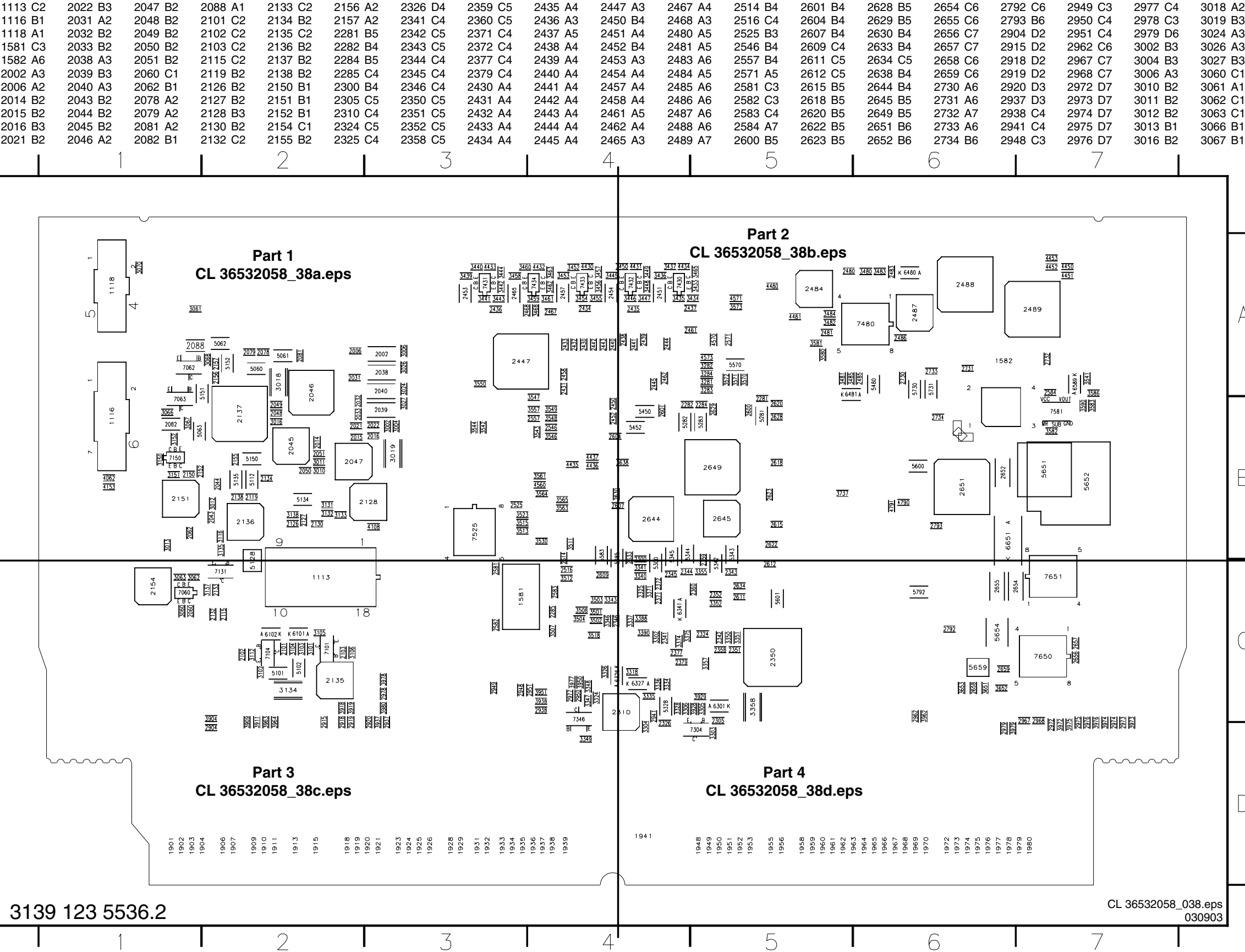


- 2651 A4
- 2652 A4
- 2654 A2
- 2655 A2
- 2656 E2
- 2657 D2
- 2658 D5
- 2659 C2
- 3651 D5
- 3652 D5
- 3653 D5
- 5651 A4
- 5652 A4
- 5654 A2
- 5659 C2
- 6651 A3
- 7650 C2
- 7651 B3
- F650 C3
- F651 A5
- F652 D2
- I651 A2

B 18 SSB-CONNECTOR INTERFACE



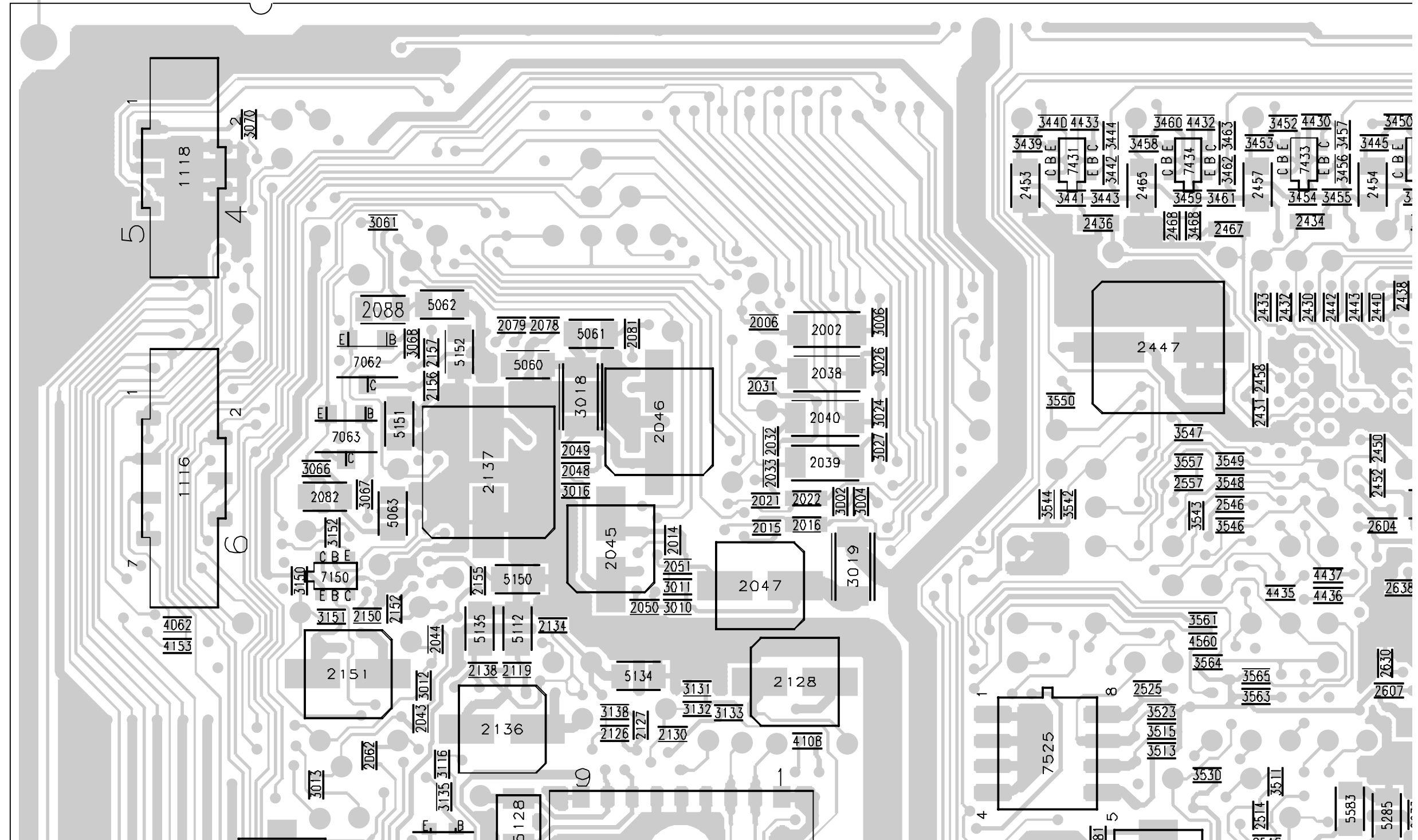
Layout SSB (Overview LOT Side)



3018 A2	3068 A2	3448 A4	3928 C5	5600 B6
3019 B3	3070 A1	3449 A4	3929 C5	5601 C5
3024 A3	3101 C2	3450 A4	3937 D3	5651 B7
3026 A3	3102 C2	3452 A4	3938 C4	5652 B7
3027 B3	3103 C2	3453 A4	3950 C4	5654 C6
3060 C1	3104 C2	3454 A4	3951 C4	5659 C6
3061 A1	3105 C2	3455 A4	3962 C6	5730 A6
3062 C1	3106 C2	3456 A4	3963 D2	5731 A6
3063 C1	3112 C2	3457 A4	3964 D2	5792 C6
3066 B1	3116 B2	3458 A3	3972 D7	6101 C2
3131 B2	3131 B2	3459 A4	3973 D7	6102 C2
3132 B2	3132 B2	3460 A3	3974 D7	6301 C5
3133 B2	3133 B2	3461 A4	3975 D7	6326 C4
3134 C2	3134 C2	3462 A4	3976 D7	6327 C4
3135 B2	3135 B2	3463 A4	3977 C4	6341 C4
3137 C2	3137 C2	3465 A5	3978 C3	6480 A6
3138 B2	3138 B2	3468 A4	3979 D6	6481 A5
3150 B1	3150 B1	3480 A6	3980 C3	6589 A7
3151 B1	3151 B1	3481 A5	4062 B1	6651 B6
3152 B1	3152 B1	3482 A5	4108 B3	7060 C1
3281 A5	3281 A5	3483 A6	4153 B1	7062 A1
3282 A5	3282 A5	3484 A5	4430 A4	7063 B1
3283 A5	3283 A5	3485 A5	4431 A4	7101 C2
3284 A5	3284 A5	3501 C4	4432 A4	7104 C2
3302 C4	3302 C4	3502 C4	4433 A3	7131 C2
3303 D5	3303 D5	3503 C4	4434 A4	7150 B1
3304 D4	3304 D4	3504 C4	4435 B4	7304 D5
3305 C5	3305 C5	3507 C4	4436 B4	7346 C4
3306 C4	3306 C4	3508 C4	4437 B4	7430 A4
3318 C4	3318 C4	3511 B4	4450 A7	7431 A3
3324 C4	3324 C4	3512 C4	4451 A7	7432 A4
3326 C4	3326 C4	3513 B3	4452 A7	7433 A4
3328 C4	3328 C4	3515 B3	4453 A7	7434 A4
3334 C4	3334 C4	3518 C4	4480 A5	7480 A6
3335 C4	3335 C4	3523 B3	4481 A5	7525 B3
3336 C4	3336 C4	3530 B4	4560 B4	7581 B7
3337 C4	3337 C4	3541 A7	4570 A5	7650 C7
3340 C4	3340 C4	3542 B3	4571 A5	7651 C7
3341 C4	3341 C4	3543 B4	4573 A5	
3343 C4	3343 C4	3544 B3	4790 B6	
3346 C4	3346 C4	3546 B4	4791 B6	
3347 C4	3347 C4	3547 B4	5060 A2	
3348 C4	3348 C4	3548 B4	5061 A2	
3349 D4	3349 D4	3549 B4	5062 A2	
3350 C5	3350 C5	3550 A3	5063 B1	
3351 C5	3351 C5	3557 B4	5101 C2	
3352 C5	3352 C5	3561 B4	5102 C2	
3355 C5	3355 C5	3563 B4	5112 B2	
3357 C5	3357 C5	3564 B4	5128 C2	
3358 C5	3358 C5	3565 B4	5134 B2	
3371 C4	3371 C4	3570 A5	5135 B2	
3374 C4	3374 C4	3571 A5	5150 B2	
3375 C4	3375 C4	3572 A5	5151 A2	
3388 C4	3388 C4	3573 A5	5152 A2	
3390 C4	3390 C4	3580 A5	5281 B5	
3433 A5	3433 A5	3581 A5	5282 B4	
3434 A5	3434 A5	3582 B7	5283 B5	
3435 A4	3435 A4	3583 B7	5285 B4	
3436 A4	3436 A4	3586 A7	5300 C4	
3437 A4	3437 A4	3590 B7	5328 C4	
3439 A3	3439 A3	3651 C6	5342 C5	
3440 A3	3440 A3	3652 C6	5343 B5	
3441 A3	3441 A3	3653 C6	5344 B4	
3442 A3	3442 A3	3737 B5	5345 B4	
3443 A3	3443 A3	3904 C2	5450 B4	
3444 A3	3444 A3	3909 D2	5452 B4	
3445 A4	3445 A4	3911 D2	5480 A6	
3446 A4	3446 A4	3918 C2	5570 A5	
3447 A4	3447 A4	3919 C2	5583 B4	

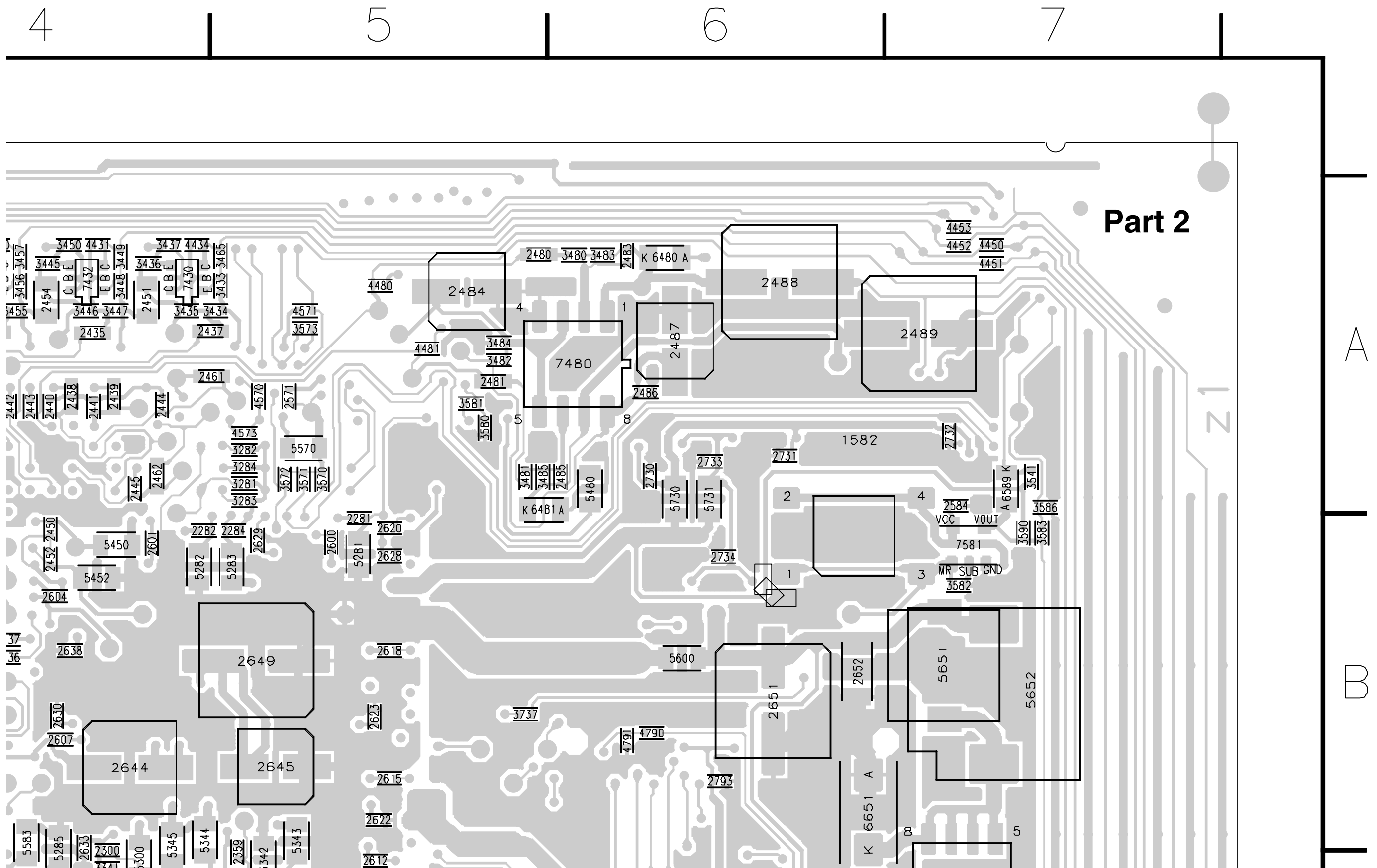
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B

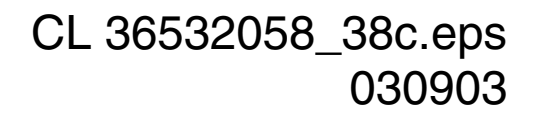


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Layout SSB (Part 2 LOT Side)



Part 3



1

2

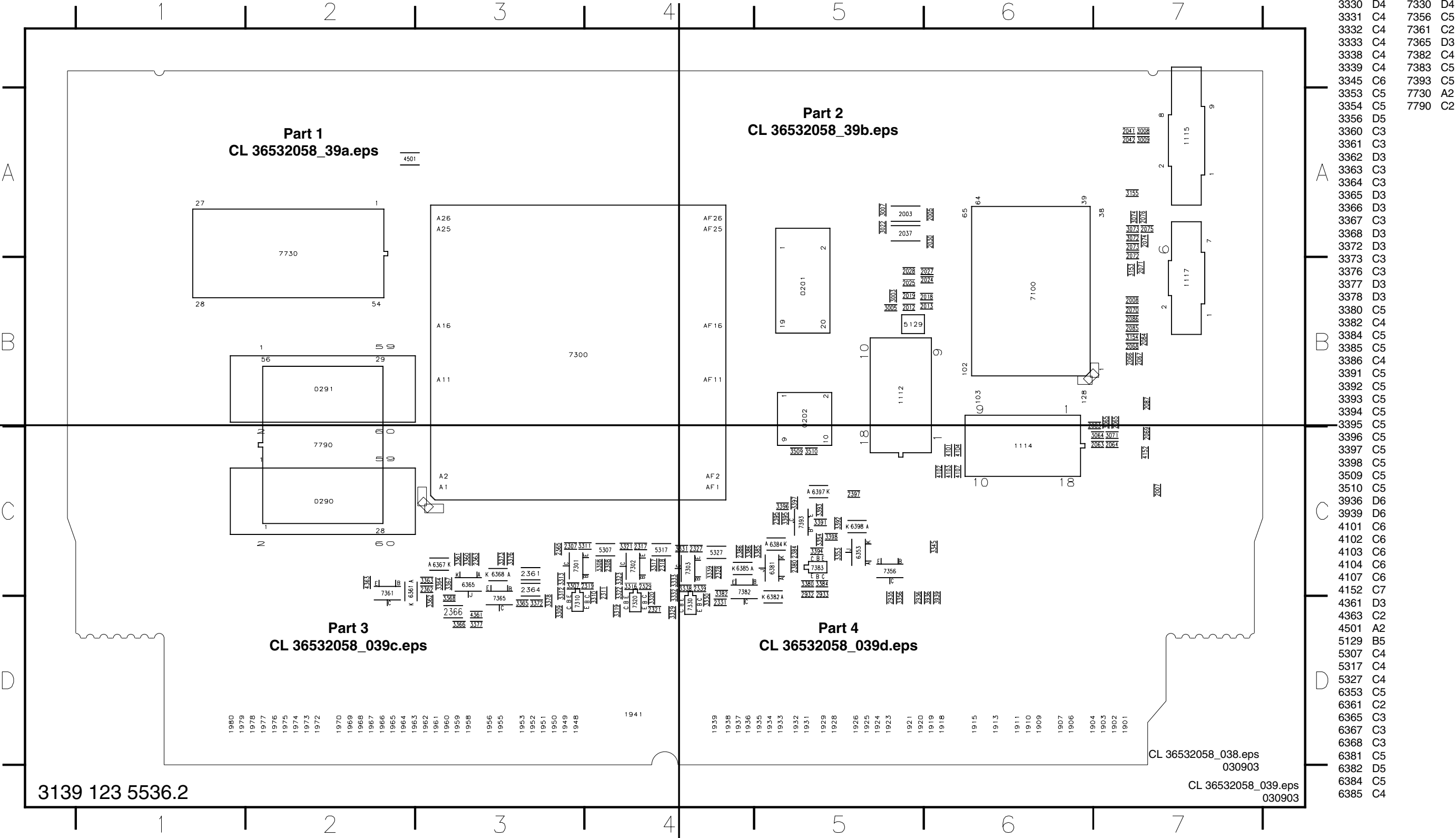
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4

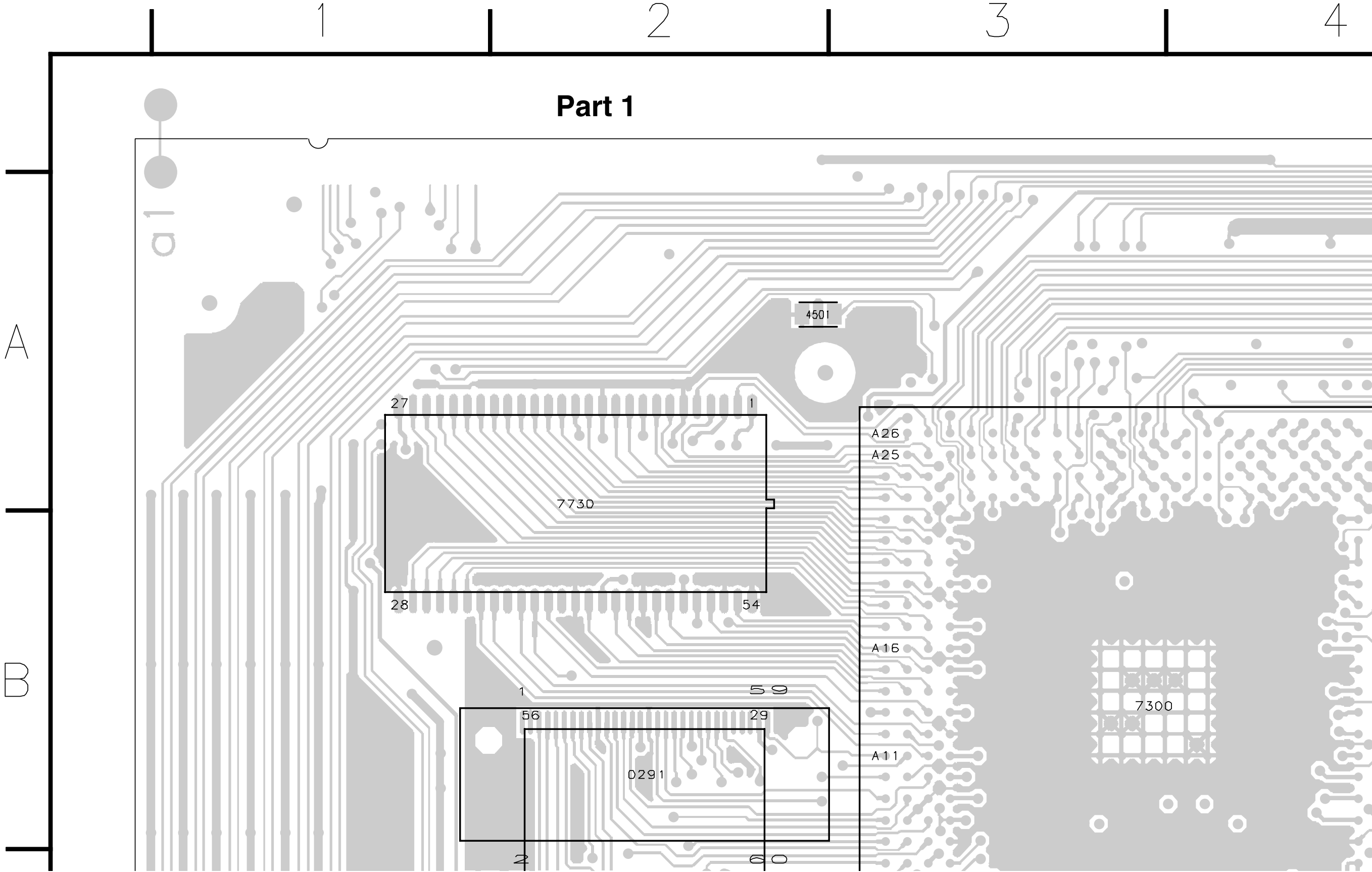
7

Layout SSB (Overview Tuner Side)

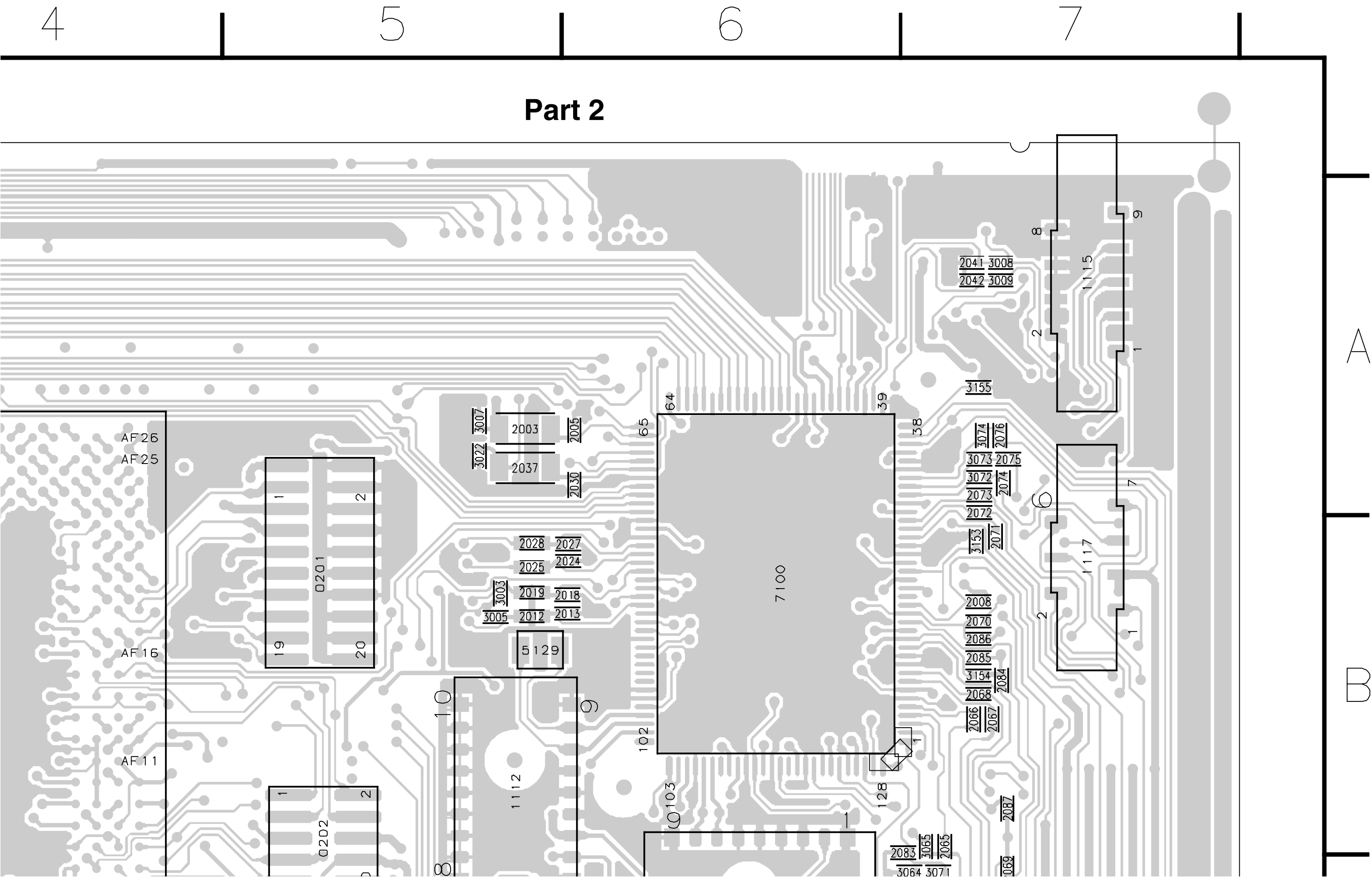
0201 B5	1901 D7	1911 D6	1924 D5	1934 D5	1949 D3	1959 D3	1967 D2	1976 D2	2008 B7	2028 B5	2066 B7	2074 A7	2307 C3	2328 C4	2365 C3	2933 C5	3022 A5	3154 B7	3313 C3	6397 C5
0202 B5	1902 D7	1913 D6	1925 D5	1935 D5	1950 D3	1960 D3	1968 D2	1977 D2	2012 B5	2030 A6	2067 B7	2075 A7	2308 C4	2329 C4	2366 D3	2935 D5	3064 C7	3155 A7	3316 C4	6398 C5
0290 C2	1903 D7	1915 D6	1926 D5	1936 D4	1951 D3	1961 D3	1969 D2	1978 D2	2013 B6	2037 A5	2068 B7	2076 A7	2311 C4	2331 D4	2380 C5	2936 D5	3065 B7	3307 C3	3317 C4	7100 B6
0291 B2	1904 D6	1918 D6	1928 D5	1937 D4	1952 D3	1962 D3	1970 D2	1979 D1	2018 B6	2041 A7	2069 C7	2083 B7	2317 C4	2339 C4	2384 C5	3003 B5	3071 C7	3308 C4	3319 D4	7300 B3
1112 B5	1906 D6	1919 D6	1929 D5	1938 D4	1953 D3	1963 D2	1972 D2	1980 D1	2019 B5	2042 A7	2070 B7	2084 B7	2318 C4	2361 C3	2386 C4	3005 B5	3072 A7	3309 D3	3320 D4	7301 C3
1114 C6	1907 D6	1920 D5	1931 D5	1939 D4	1955 D3	1964 D2	1973 D2	2003 A5	2024 B6	2063 C7	2071 B7	2085 B7	2319 C4	2362 C3	2395 C5	3007 A5	3073 A7	3310 D4	3321 C4	7302 C4
1115 A7	1909 D6	1921 D5	1932 D5	1941 D4	1956 D3	1965 D2	1974 D2	2005 A6	2025 B5	2064 C7	2072 A7	2086 B7	2321 D4	2363 C3	2397 C5	3008 A7	3074 A7	3311 C3	3322 C4	7303 C4
1117 B7	1910 D6	1923 D5	1933 D5	1948 D3	1958 D3	1966 D2	1975 D2	2007 C7	2027 B6	2065 B7	2073 A7	2087 B7	2327 C4	2364 C3	2932 C5	3009 A7	3153 B7	3312 C3	3323 C4	7310 D3



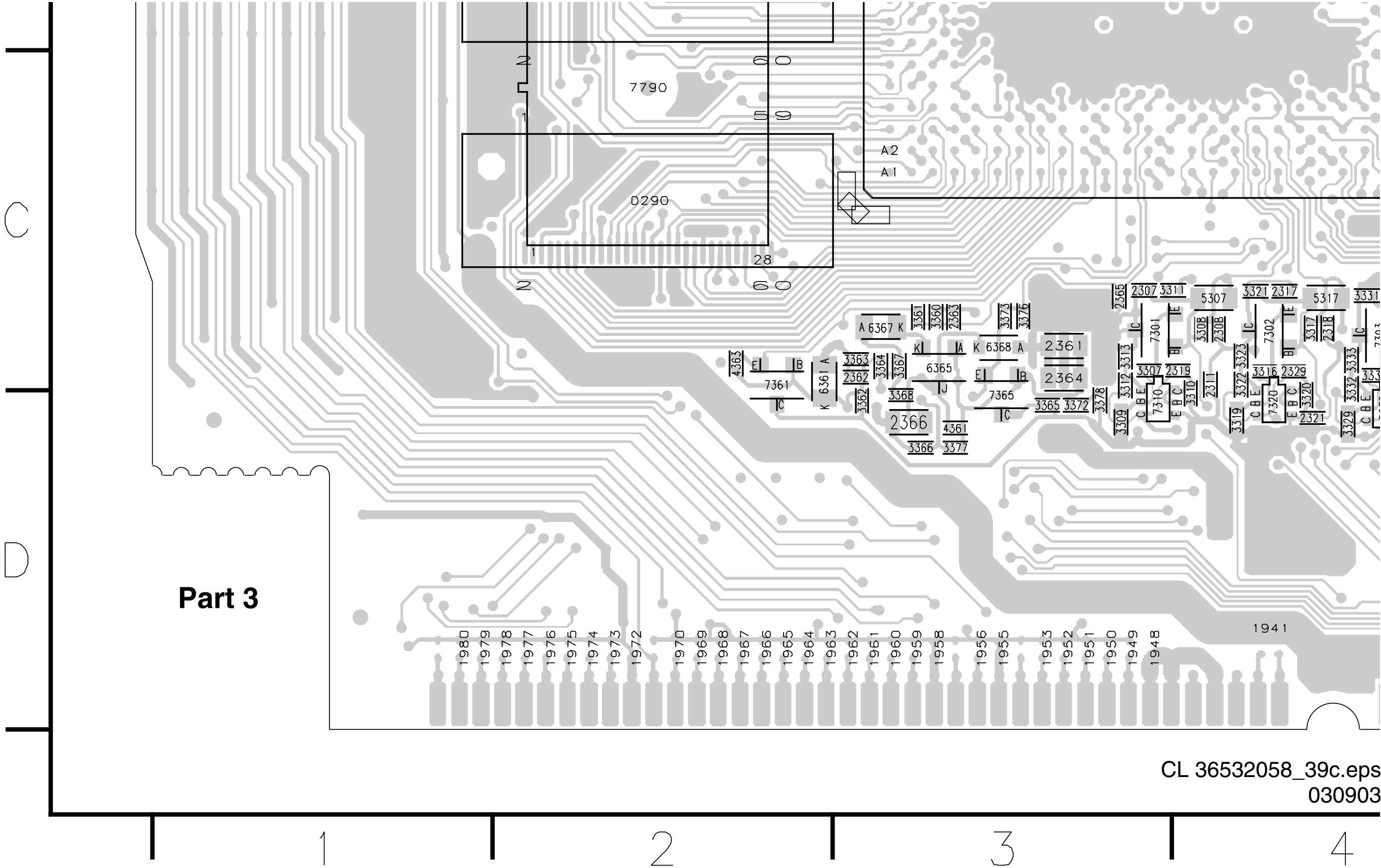
Layout SSB (Part 1 Tuner Side)



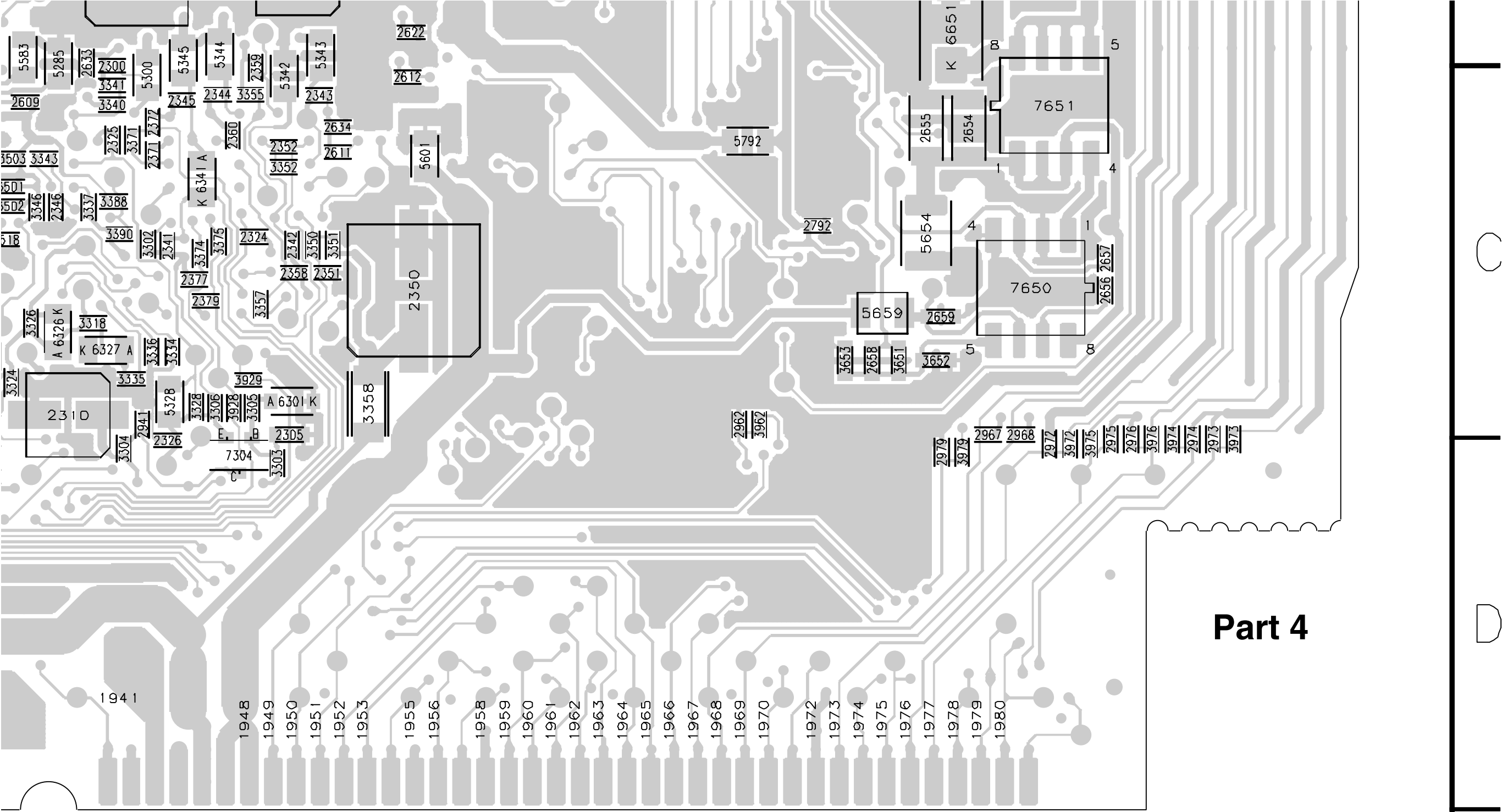
Layout SSB (Part 2 Tuner Side)



Layout SSB (Part 3 Tuner Side)



Layout SSB (Part 4 Tuner Side)



Part 4

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030903

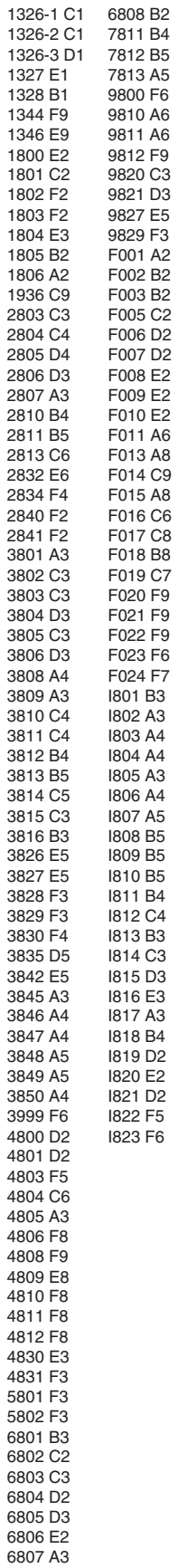
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5

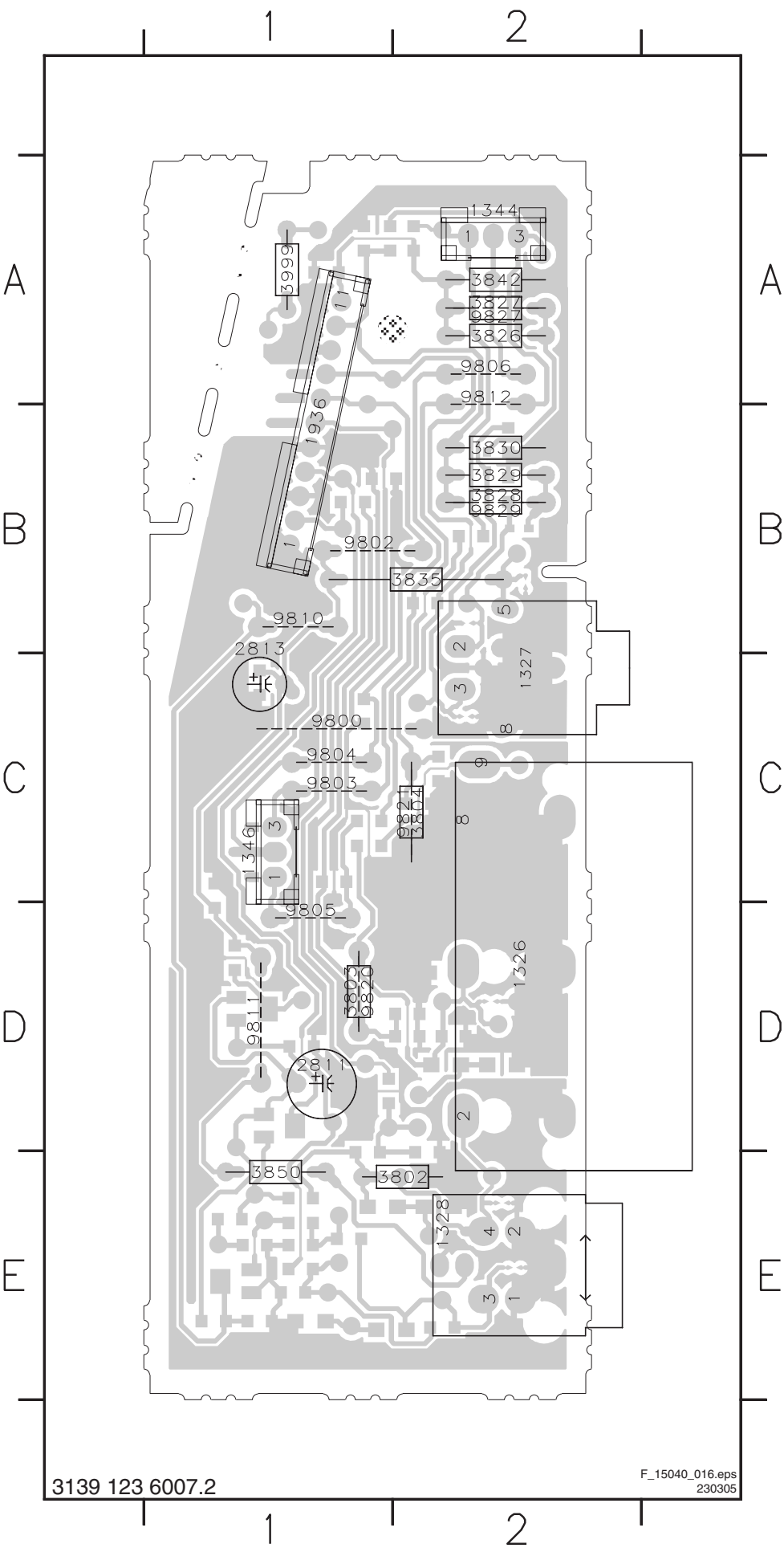
6

7

D SIDE I/O PANEL

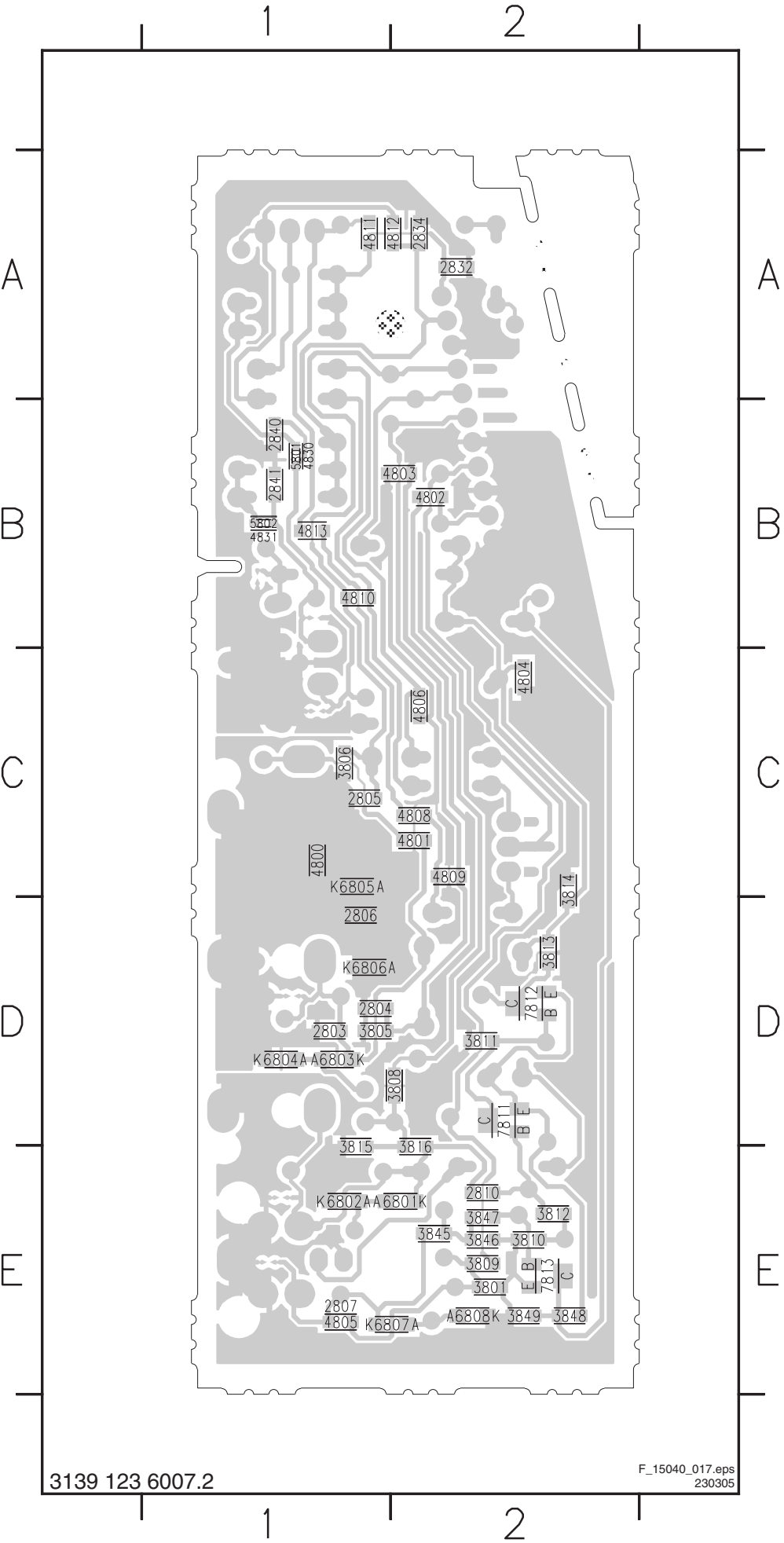


Layout Side I/O Panel (FL9) (Top Side)



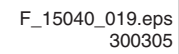
- 1326 D2
- 1327 C2
- 1328 E2
- 1344 A2
- 1346 C1
- 1936 B1
- 2811 D1
- 2813 B1
- 3802 E2
- 3803 D1
- 3804 C2
- 3826 A2
- 3827 A2
- 3828 B2
- 3829 B2
- 3830 B2
- 3835 B2
- 3842 A2
- 3850 E1
- 3999 A1
- 9800 C1
- 9802 B1
- 9803 C1
- 9804 C1
- 9805 D1
- 9806 A2
- 9810 B1
- 9811 D1
- 9812 A2
- 9820 D1
- 9821 C2
- 9827 A2
- 9829 B2

Layout Side I/O Panel (FL9) (Bottom Side)



- 2803 D1
- 2804 D1
- 2805 C1
- 2806 D1
- 2807 E1
- 2810 E2
- 2832 A2
- 2834 A2
- 2840 B1
- 2841 B1
- 3801 E2
- 3805 D1
- 3806 C1
- 3808 D2
- 3809 E2
- 3810 E2
- 3811 D2
- 3812 E2
- 3813 D2
- 3814 C2
- 3815 E1
- 3816 E2
- 3845 E2
- 3846 E2
- 3847 E2
- 3848 E2
- 3849 E2
- 4800 C1
- 4801 C2
- 4802 B2
- 4803 B2
- 4804 C2
- 4805 E1
- 4806 C2
- 4808 C2
- 4809 C2
- 4810 B1
- 4811 A1
- 4812 A2
- 4813 B1
- 4830 B1
- 4831 B1
- 5801 B1
- 5802 B1
- 6801 E2
- 6802 E1
- 6803 D1
- 6804 D1
- 6805 C1
- 6806 D1
- 6807 E2
- 6808 E2
- 7811 D2
- 7812 D2
- 7813 E2

D SIDE I/O PANEL



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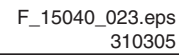
0240 A3	1256 A2	2292 A2	2297 A4	3287 A1	3291 A3	9231 A3
1254 A4	2286 A2	2294 A3	3285 A2	3288 A1	3293 A3	9232 A4
1255 A3	2288 A1	2296 A4	3286 A2	3289 A1	3295 A2	



3292	A3	3297	A1	4241	A3	4291	A1	5292	A1	6293	A1	6296	A3
3294	A2	4201	A3	4242/2243	A1	4292	A1	6291	A2	6294	A1	6297	A3
3296	A1	4202	A4	4243	A2	5291	A1	6292	A1	6295	A3		



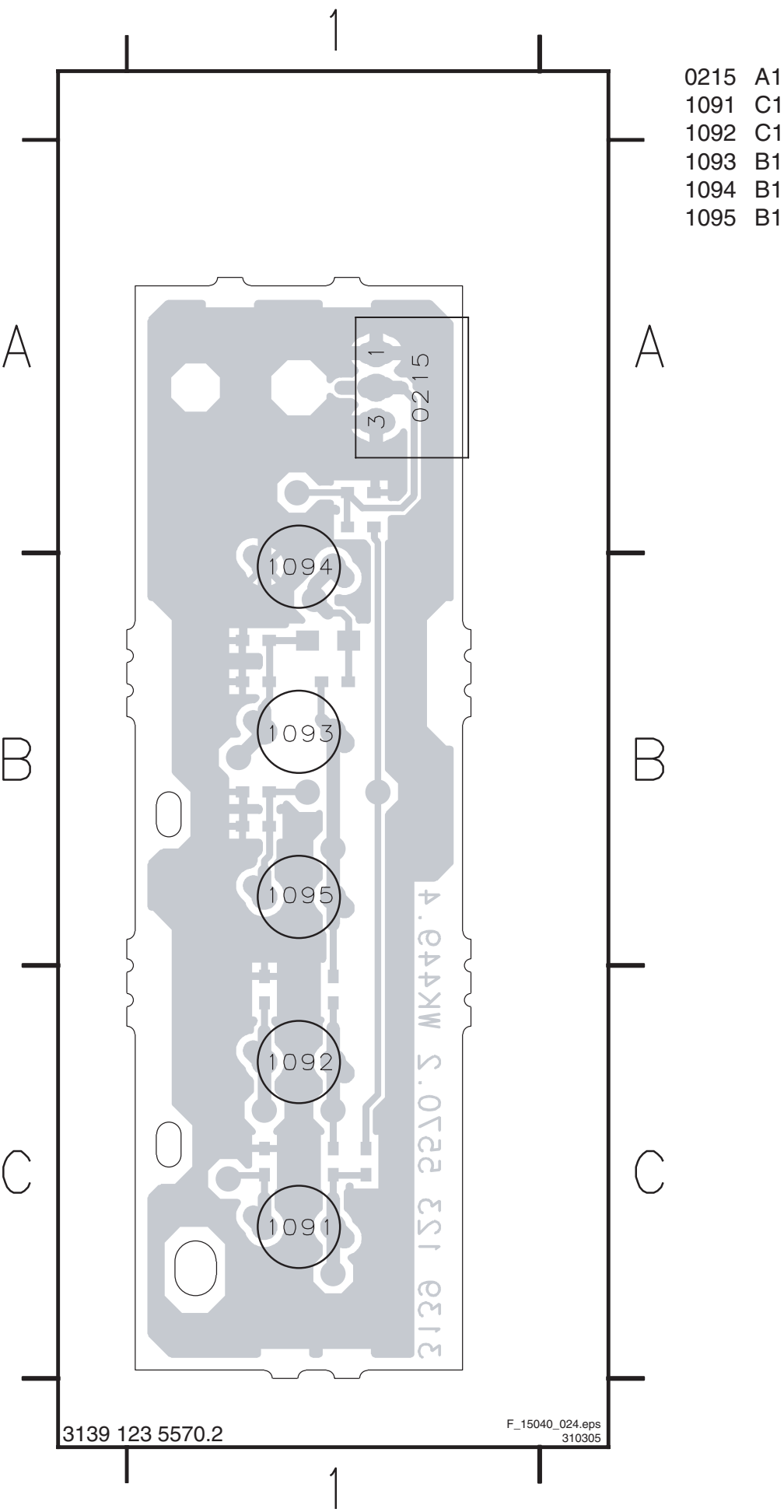
0215 A1	1093 A4	2010 A1	3089 B3	3092 A2	3095 A4	6091 A4	I003 A3	I006 A2	I009 A4
1091 A2	1094 B4	3087 B4	3090 B2	3093 A3	3096 B4	I001 A1	I004 A4	I007 A2	I012 B3
1092 A3	1095 A4	3088 B3	3091 A2	3094 A3	3098 B3	I002 A2	I005 A4	I008 A3	I021 A4



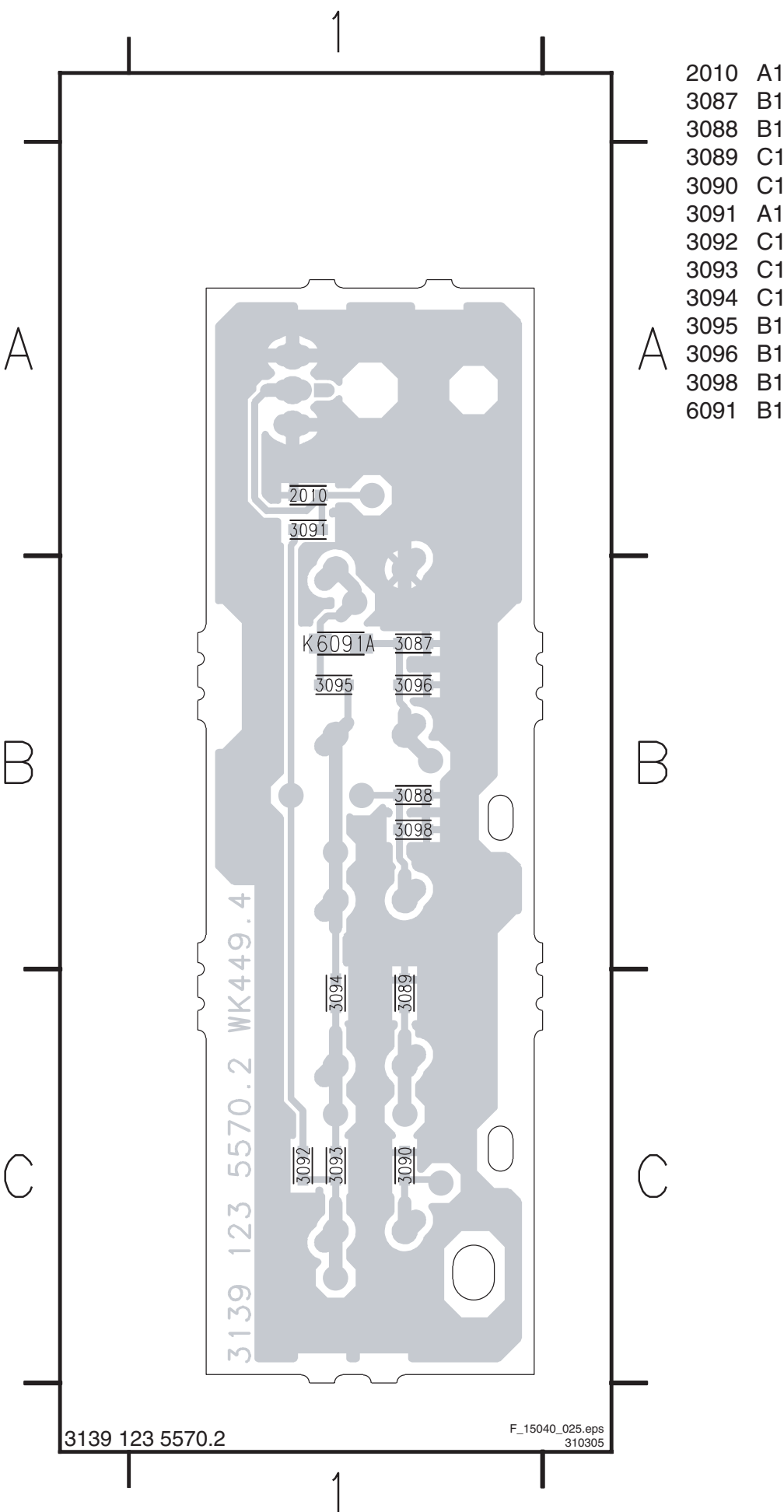
Personal Notes:

[illegible]

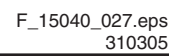
Layout Front Control Panel (Top Side)



Layout Front Control Panel (Bottom Side)



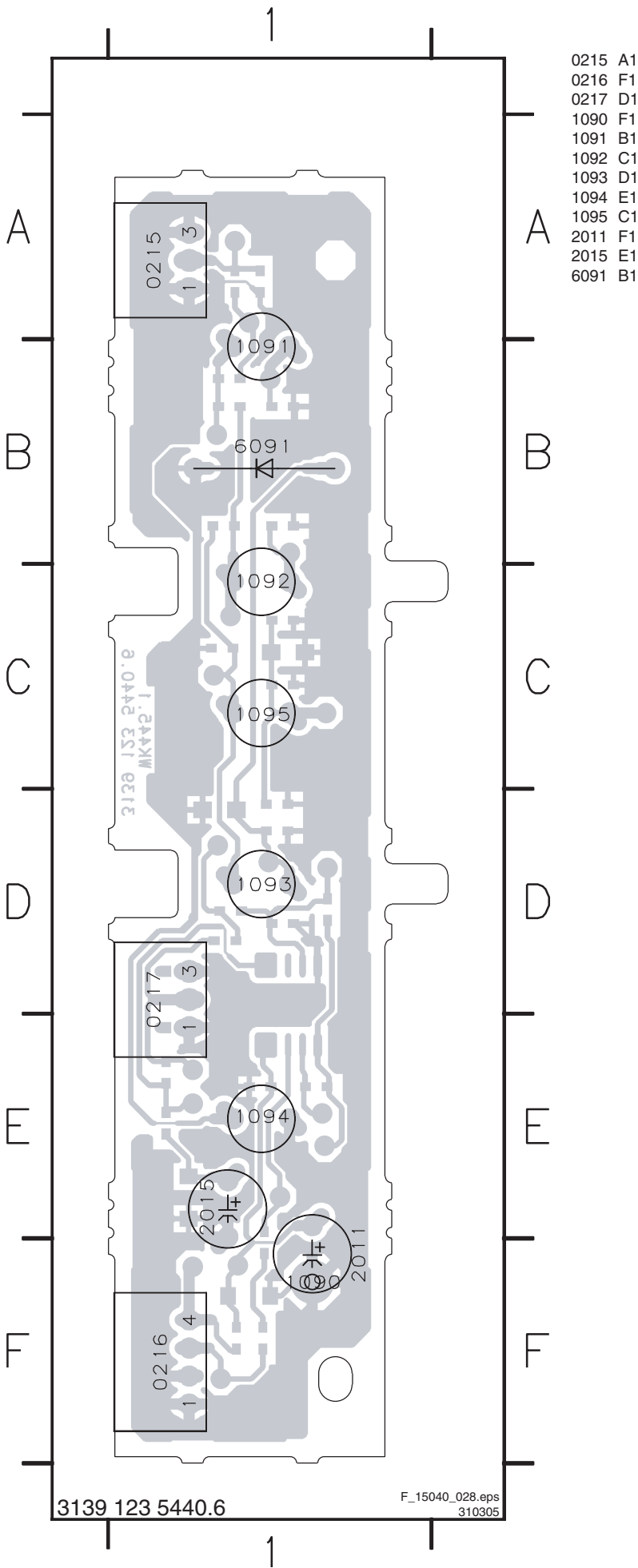
E TOP CONTROL PANEL



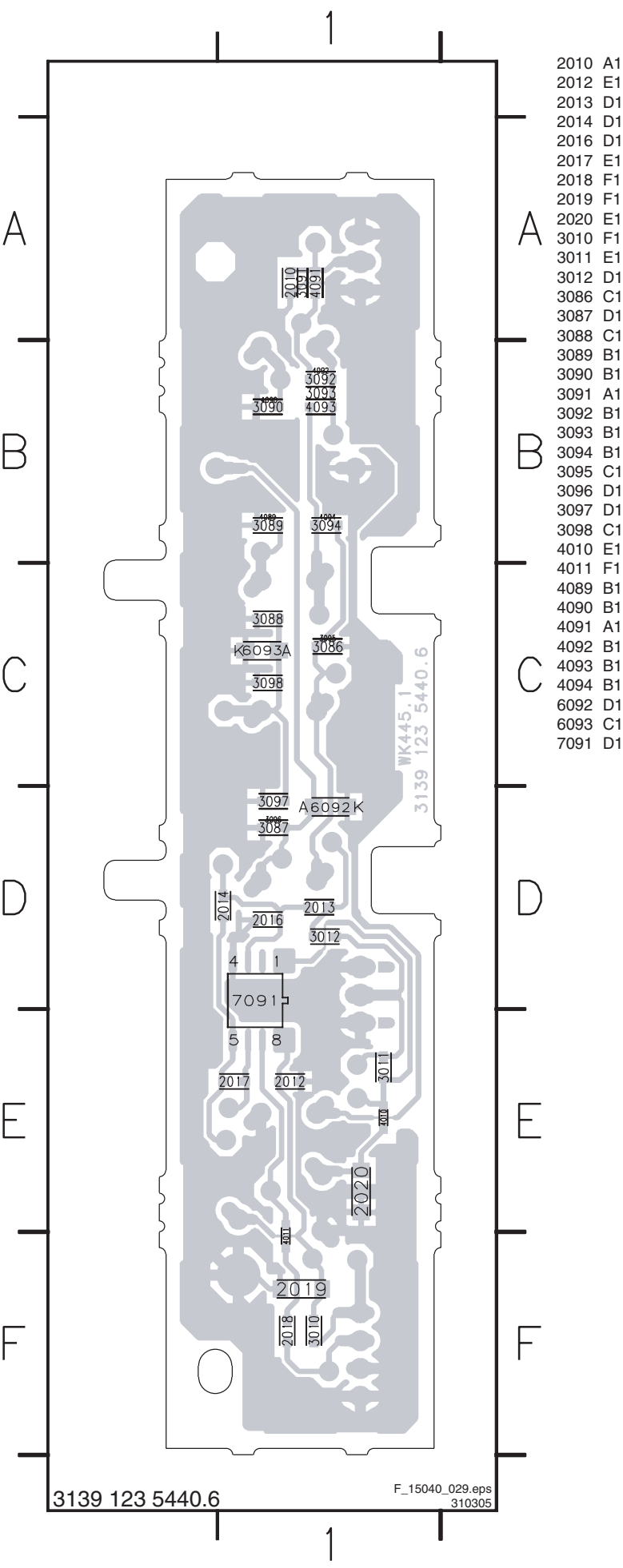
0215 A1
0216 E1
0217 D1
1090 D2
1091 B2
1092 B3
1093 B4
1094 B4
1095 B4
2010 A2
2011 D2
2012 D3
2013 E2
2014 E3
2015 E2
2016 E3
2017 E4
2018 E4
2019 D3
2020 E2
3010 D2
3011 D2
3012 E2
3086 A4
3087 B4
3088 B3
3089 B3
3090 B2
3091 A2
3092 A2
3093 A3
3094 A3
3095 A4
3096 B4
3097 B3
3098 B3
4089 B3
4090 B2
4091 A2
4092 A2
4093 A3
4094 A3
6091 B4
6092 B4
6093 B4
7091 D3
F001 D2
F002 E2
F003 E2
F004 E3
I001 A2
I002 A2
I003 A3
I004 A4
I005 A4
I006 A2
I007 B2
I008 B3
I009 B4
I010 D3
I011 D2
I012 C3
I013 D2
I016 D3
I017 E3
I019 E4
I020 E4
I021 B4

Personal Notes:

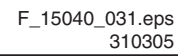
Layout Top Control Panel (PV2) (Top Side)



Layout Top Control Panel (PV2) (Bottom Side)



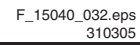
0215 A1	1093 A4	2010 A1	3093 A2	3096 B4	6092 B3	1001 A1	1004 A3	1007 B2
1091 A2	1094 B4	3091 A2	3094 A3	3099 B1	F001 B1	1002 A2	1005 A4	1008 B3
1092 A3	1095 A3	3092 A2	3095 A4	6091 A4	F002 B1	1003 A2	1006 A4	1009 A4



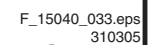
Personal Notes:

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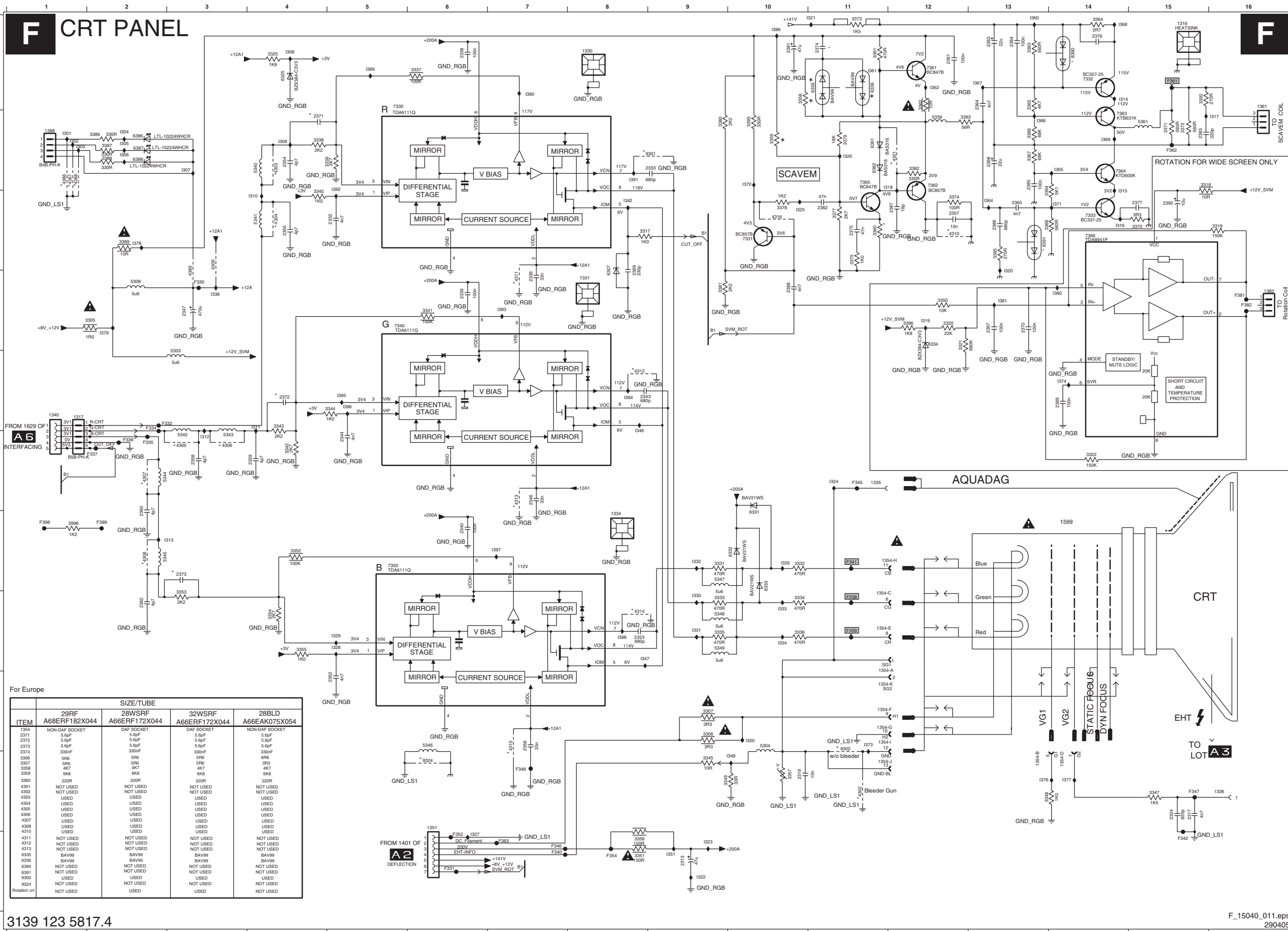
0215 C2	1091 B2	1092 B1	1093 C1	1094 A1	1095 B1
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2010 C1 3091 C1 3092 C1 3093 B1 3094 B1 3095 B2 3096 A2 3099 C2 6091 A2 6092 B1



F CRT PANEL



For Eutech		SIZE/TUBE			
ITEM	29RF A68RFR182X044	22WSRF A66RFR172X044	32WSRF A66RFR172X044	28BLD A66EAK075X054	
1354	NON-DAF SOCKET	DAF SOCKET	DAF SOCKET	NON-DAF SOCKET	
2371	5.6F	5.6F	5.6F	5.6F	
2372	5.6F	5.6F	5.6F	5.6F	
2373	5.6F	5.6F	5.6F	5.6F	
2374	330H#	330H#	330H#	330H#	
3306	5R6	5R6	5R6	6R8	
3307	5R6	5R6	5R6	5R3	
3358	4K7	4K7	4K7	4K7	
3359	6K3	6K3	6K3	6K3	
220R	220R	220R	220R	220R	
4301	NOT USED	NOT USED	NOT USED	NOT USED	
4302	NOT USED	NOT USED	NOT USED	NOT USED	
4303	USED	USED	USED	USED	
4304	USED	USED	USED	USED	
4305	USED	USED	USED	USED	
4306	USED	USED	USED	USED	
4307	USED	USED	USED	USED	
4308	USED	USED	USED	USED	
4310	USED	USED	USED	USED	
4311	NOT USED	NOT USED	NOT USED	NOT USED	
4312	NOT USED	NOT USED	NOT USED	NOT USED	
4313	NOT USED	NOT USED	NOT USED	NOT USED	
6335	BAV99	BAV99	BAV99	BAV99	
6336	BAV99	BAV99	BAV99	BAV99	
6390	NOT USED	NOT USED	NOT USED	NOT USED	
6391	NOT USED	NOT USED	NOT USED	NOT USED	
6902	USED	USED	USED	USED	
9024	NOT USED	NOT USED	NOT USED	NOT USED	
Rotation ori	NOT USED	USED	USED	NOT USED	

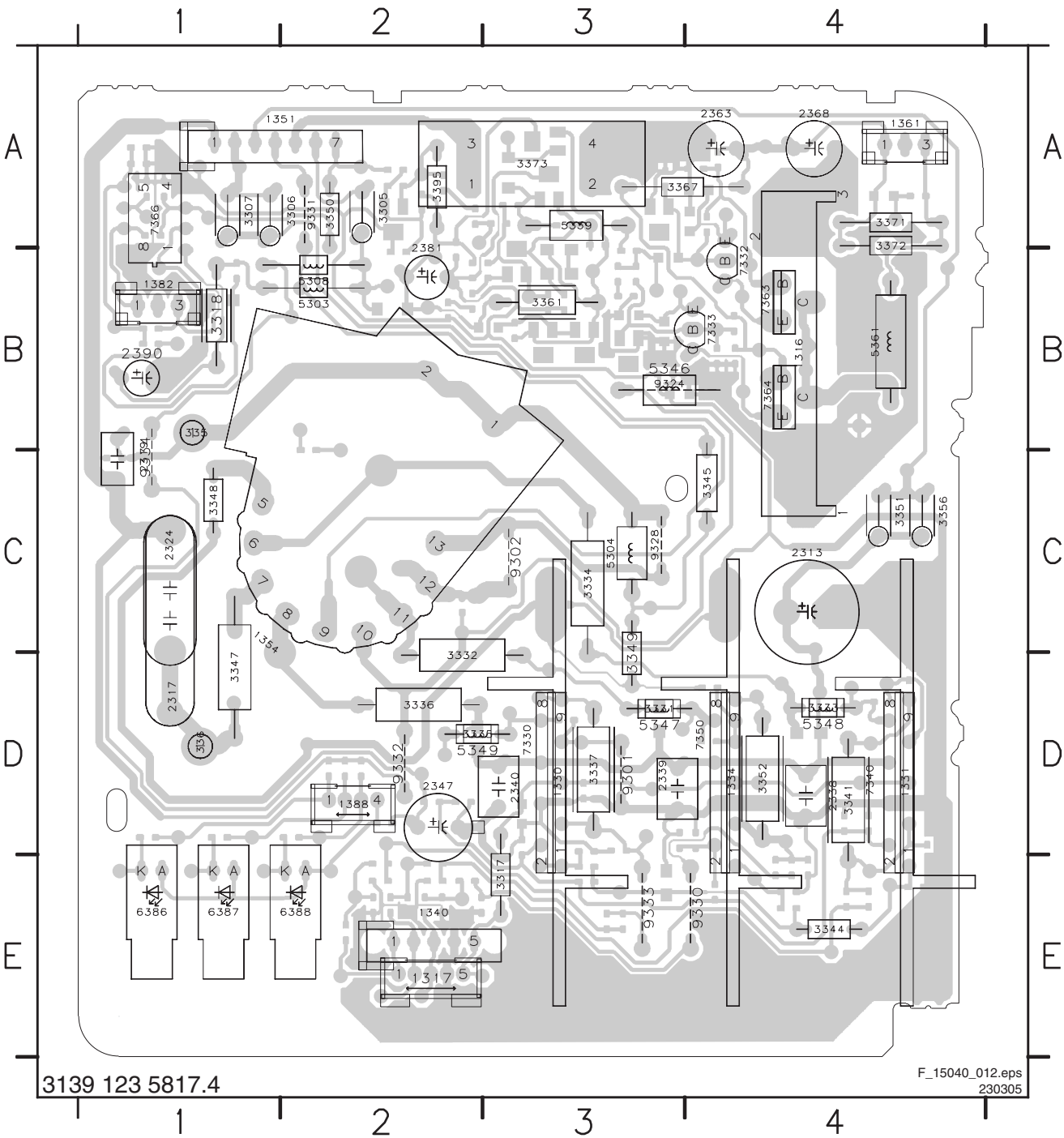
3139 123 5817.4

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290405

	1316 A15	4306 F3	1389 A5
	1317 E1	4307 F2	1390 A7
	1330 A8	4308 G2	1391 B8
	1331 D6	4309 C3	1392 B5
	1334 G8	4310 C12	1393 D7
	1335 F11	4311 D7	1394 E8
	1336 D12	4312 C12	1395 E5
	1340 E1	4313 F7	1396 E5
	1351 J6	4314 H7	1397 G7
A	1354-A112	4315 F7	1398 H8
	1354-B13	4316 C10	
	1354-C-H12	4386 B1	
	1354-D-J14	4387 B1	
	1354-E-H12	4388 B1	
	1354-F-I12	4389 D3	
	1354-G-I12	5303 E3	
	1354-H-G12	5304 I10	
	1354-I-H12	5308 D2	
	1354-J-J12	5309 B12	
	1354-K-I12	5340 B4	
	1361 A10	5341 C4	
	1382 D16	5342 D3	
B	1388 B1	5343 F3	
	2313 K9	5344 F2	
	2315 J15	5345 C23	
	2319 J10	5346 I6	
	2324 J15	5347 G9	
	2323 C32	5348 H9	
	2324 B3	5349 B9	
	2336 D7	5361 B15	
	2338 A6	6307 C8	
	2340 D6	6325 A4	
	2342 E6	6331 F10	
	2343 E8	6332 G10	
	2344 F5	6333 G10	
	2345 F7	6334 D12	
C	2347 D3	6335 A11	
	2352 I5	6336 B11	
	2353 H6	6337 D11	
	2354 B4	6362 B11	
	2355 C4	6368 B2	
	2356 I7	6367 B2	
	2358 F12	6368 B2	
	2359 F4	6391 C13	
	2362 G2	7330 A5	
	2361 A12	7331 C10	
	2362 H2	7332 A14	
D	2365 A13	7333 A14	
	2365 B13	7334 D5	
	2365 C13	7350 F5	
	2367 D13	7361 A12	
	2368 B13	7362 B12	
	2369 C8	7363 B14	
	2370 D13	7364 B14	
	2371 B4	7365 B11	
	2372 E4	7366 C14	
	2373 G3	9001 B9	
	2374 A11	9002 I11	
	2375 C1	9324 B6	
	2377 A14	9330 D3	
E	2377 C15	9331 K6	
	2381 A10	9332 E3	
	2382 C1	9334 E2	
	2383 B15	9335 F2	
	2384 A13	9336 F2	
	2385 D13	9337 E2	
	2386 C13	9338 H11	
	2387 C12	9339 H11	
	2388 D10	9340 K7	
	2389 E14	9341 G11	
	2390 F5	9342 F15	
	3305 D2	9346 F7	
F	3306 D9	9347 I15	
	3317 C8	9348 J7	
	3318 B15	9352 K6	
	3319 C14	9354 K8	
	3320 D12	9361 A15	
	3321 D12	9362 B15	
	3322 F14	9363 D16	
	3330 A4	9362 I16	
	3331 G9	9363 K7	
	3332 G10	9368 F1	
	3333 H9	9369 D2	
	3334 H10	1301 B1	
G	3335 H9	1302 B1	
	3336 H10	1303 B1	
	3337 A6	1304 B2	
	3338 B4	1305 E2	
	3339 B5	1306 B2	
	3340 C4	1307 D3	
	3341 D6	1308 A4	
	3342 F4	1309 B4	
	3343 E4	1310 C4	
	3344 C4	1311 E4	
	3345 J9	1312 F3	
	3347 J15	1313 G3	
	3348 J13	1314 F4	
H	3349 J9	1315 C14	
	3350 D12	1316 C14	
	3351 K8	1317 E16	
	3352 G4	1318 D12	
	3353 H3	1319 D12	
	3354 H4	1320 D13	
	3355 H4	1321 A11	
	3356 K8	1322 K9	
	3357 J10	1323 K9	
	3358 A10	1324 F11	
	3359 D13	1325 D10	
	3360 C11	1326 B11	
	3361 A11	1327 K6	
	3362 A12	1328 K6	
	3363 E13	1329 B5	
	3364 A14	1330 H9	
	3365 A13	1331 G9	
	3366 B13	1332 H9	

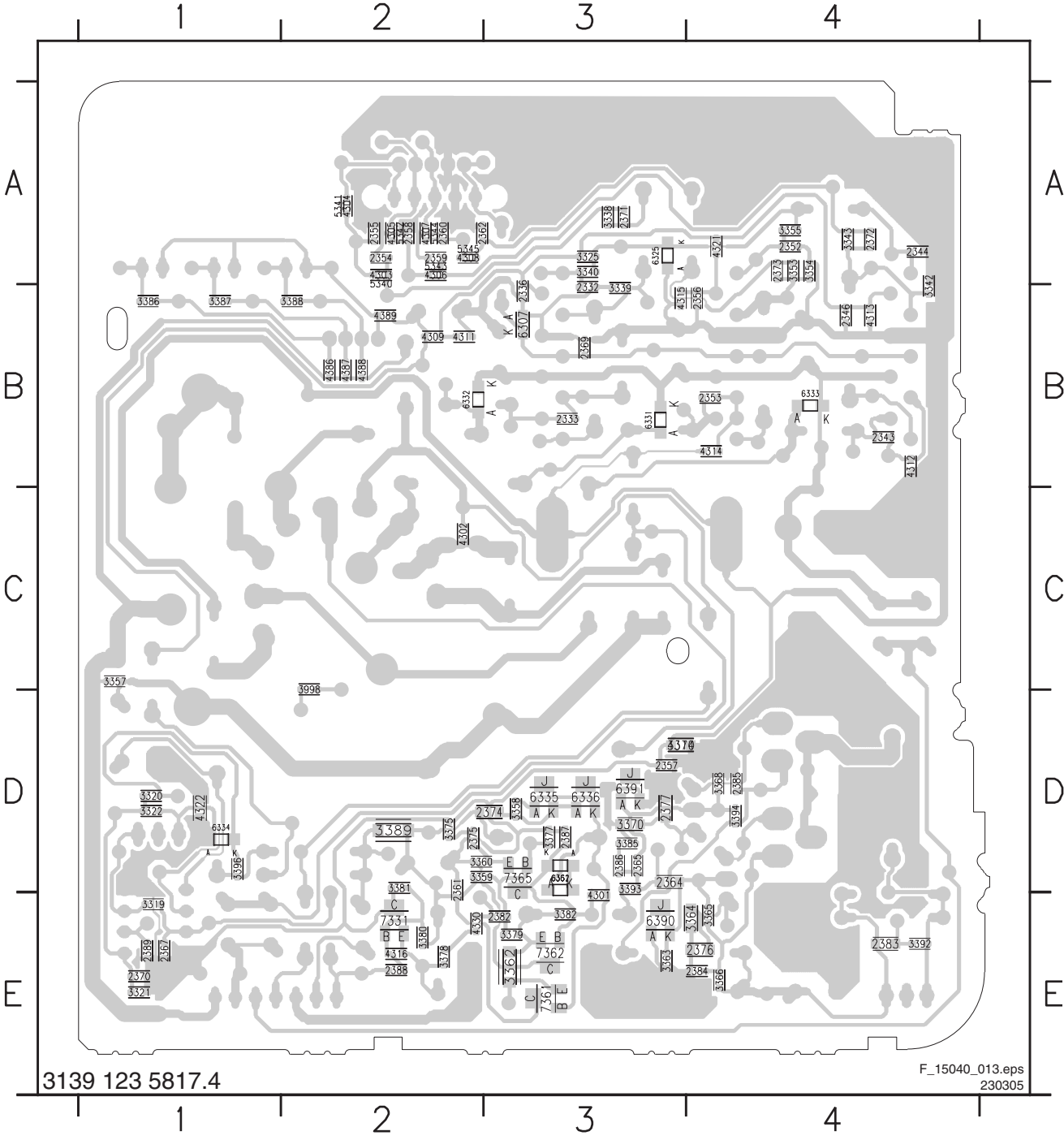
Layout CRT Panel (Top Side)

1316 B4	1336 D1	1388 D2	2339 D3	2390 B1	3331 D3	3337 D3	3349 D3	3367 A3	5304 C3	5349 D2	7332 B4	7366 A1	9331 A2
1317 E2	1340 E2	2313 C4	2340 D3	3305 A2	3332 D2	3341 D4	3350 A2	3371 A4	5308 B2	5361 B4	7333 B4	9301 D3	9332 D2
1330 D3	1351 A1	2317 D1	2347 D2	3306 A2	3333 D4	3344 E4	3351 C4	3372 A4	5339 A3	6386 E1	7340 D4	9302 C3	9333 E3
1331 D4	1354 C1	2319 C1	2363 A4	3307 A1	3334 C3	3345 C4	3352 D4	3373 A3	5346 B3	6387 E1	7350 D4	9324 B3	9334 C1
1334 D4	1361 A4	2324 C1	2368 A4	3317 E3	3335 D2	3347 D1	3356 C4	3395 A2	5347 D3	6388 E2	7363 B4	9328 C3	
1335 B1	1382 B1	2338 D4	2381 B2	3318 B1	3336 D2	3348 C1	3361 B3	5303 B2	5348 D4	7330 D3	7364 B4	9330 E4	

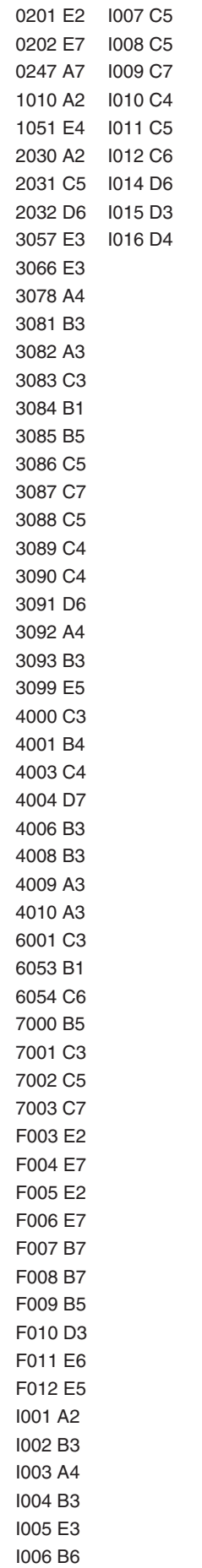


Layout CRT Panel (Bottom Side)

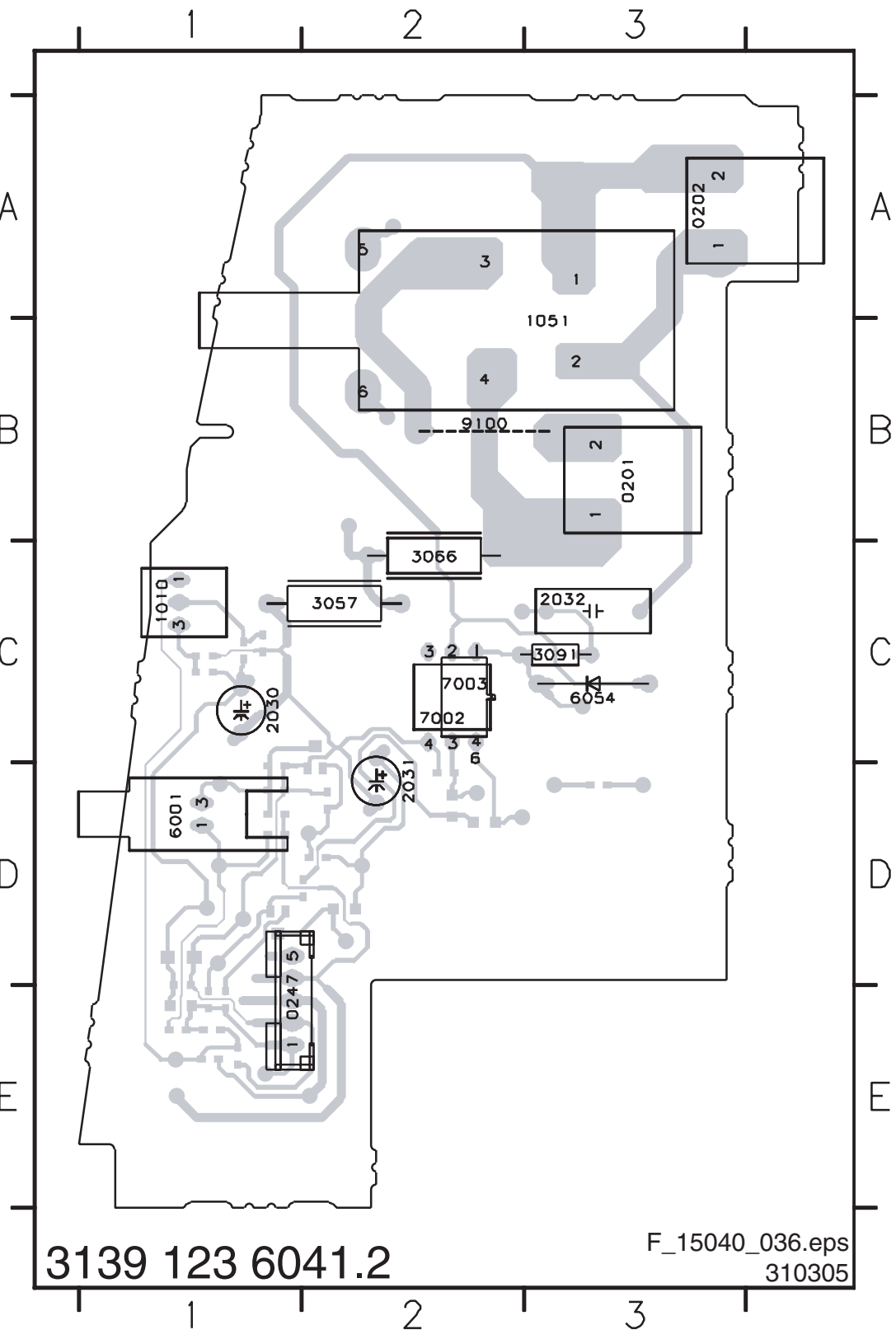
2332 D2	2353 D1	2360 E3	2370 A4	2388 A3	3339 D2	3362 A2	3377 B2	3388 D3	4304 E3	4312 D1	4387 D3	5344 E3	6333 D1
2333 D2	2354 E3	2361 B3	2382 A2	2389 A4	3340 E2	3363 A2	3378 A3	3392 A1	4305 E3	4313 D1	4388 D3	5345 E3	6334 B4
2336 D2	2355 E3	2362 E3	2383 A1	3319 A4	3342 D1	3364 A1	3379 A2	3394 B1	4306 E3	4314 D1	4389 D3	6307 D2	6361 B2
2343 D1	2356 D1	2364 B2	2384 A1	3320 B4	3343 E1	3365 A1	3380 A3	3396 B4	4307 E3	4315 D2	5340 E3	6308 A3	7331 A3
2344 E1	2357 B2	2365 B2	2385 B1	3321 A4	3354 E1	3366 A1	3381 A3	3399 B3	4308 E3	4321 E1	5341 E3	6325 E2	7361 A2
2346 D1	2358 E3	2367 A4	2386 B2	3322 B4	3355 E1	3368 B1	3386 D4	4302 C3	4309 D3	4330 A3	5342 E3	6331 D2	7362 A2
2352 E1	2359 E3	2369 D2	2387 B2	3325 E2	3357 B4	3370 B2	3387 D4	4303 E3	4311 D3	4386 D3	5343 E3	6332 D3	7365 B2



M MAINS SWITCH PANEL(FL9)

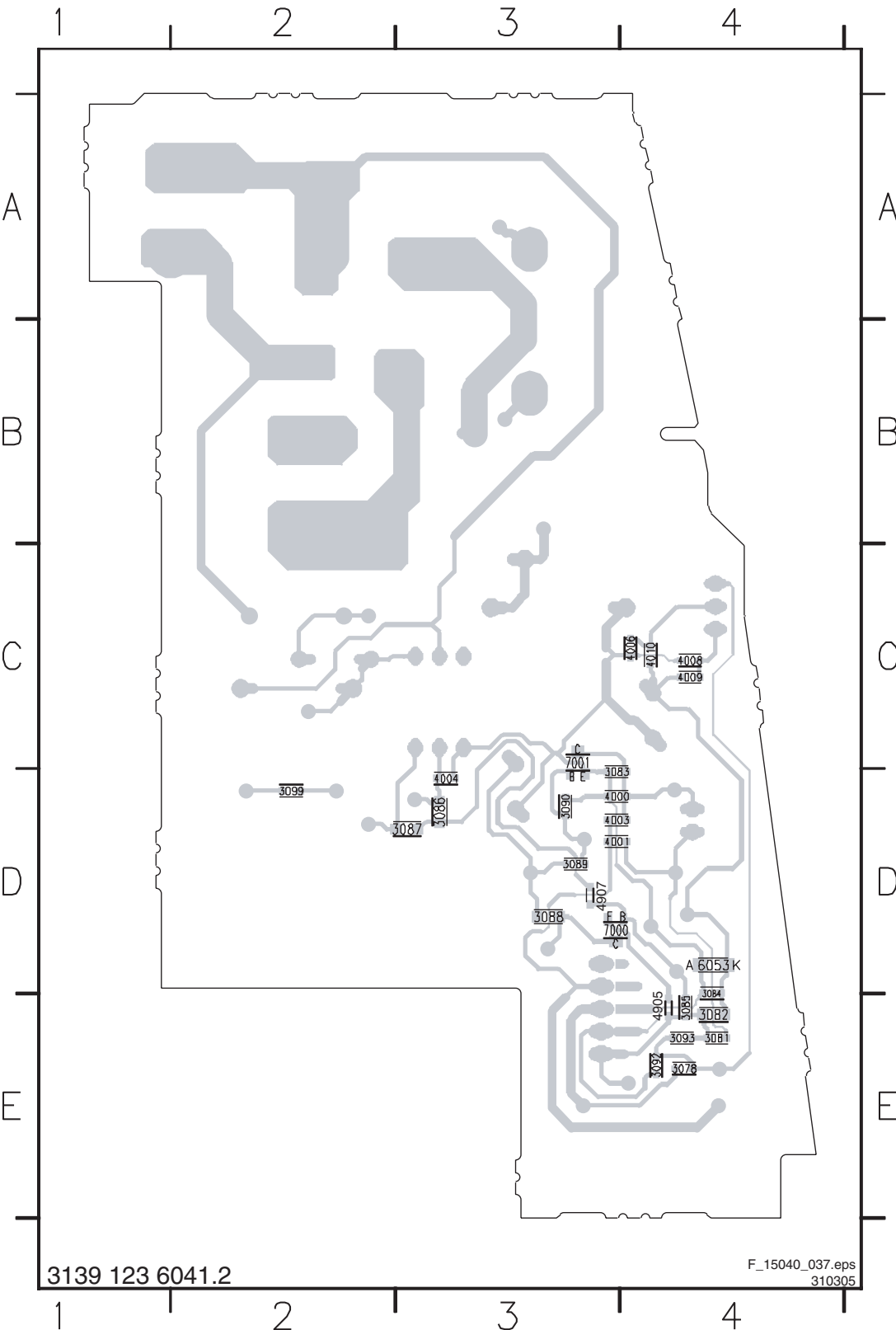


Layout Mains Switch Panel (FL9) (Top Side)



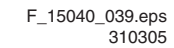
- 0201 B3
- 0202 A3
- 0247 E1
- 1010 C1
- 1051 B3
- 2030 C1
- 2031 D2
- 2032 C3
- 3057 C2
- 3066 C2
- 3091 C3
- 6001 D1
- 6054 C3
- 7002 C2
- 7003 C2
- 9100 B2

Layout Mains Switch Panel (FL9) (Bottom Side)



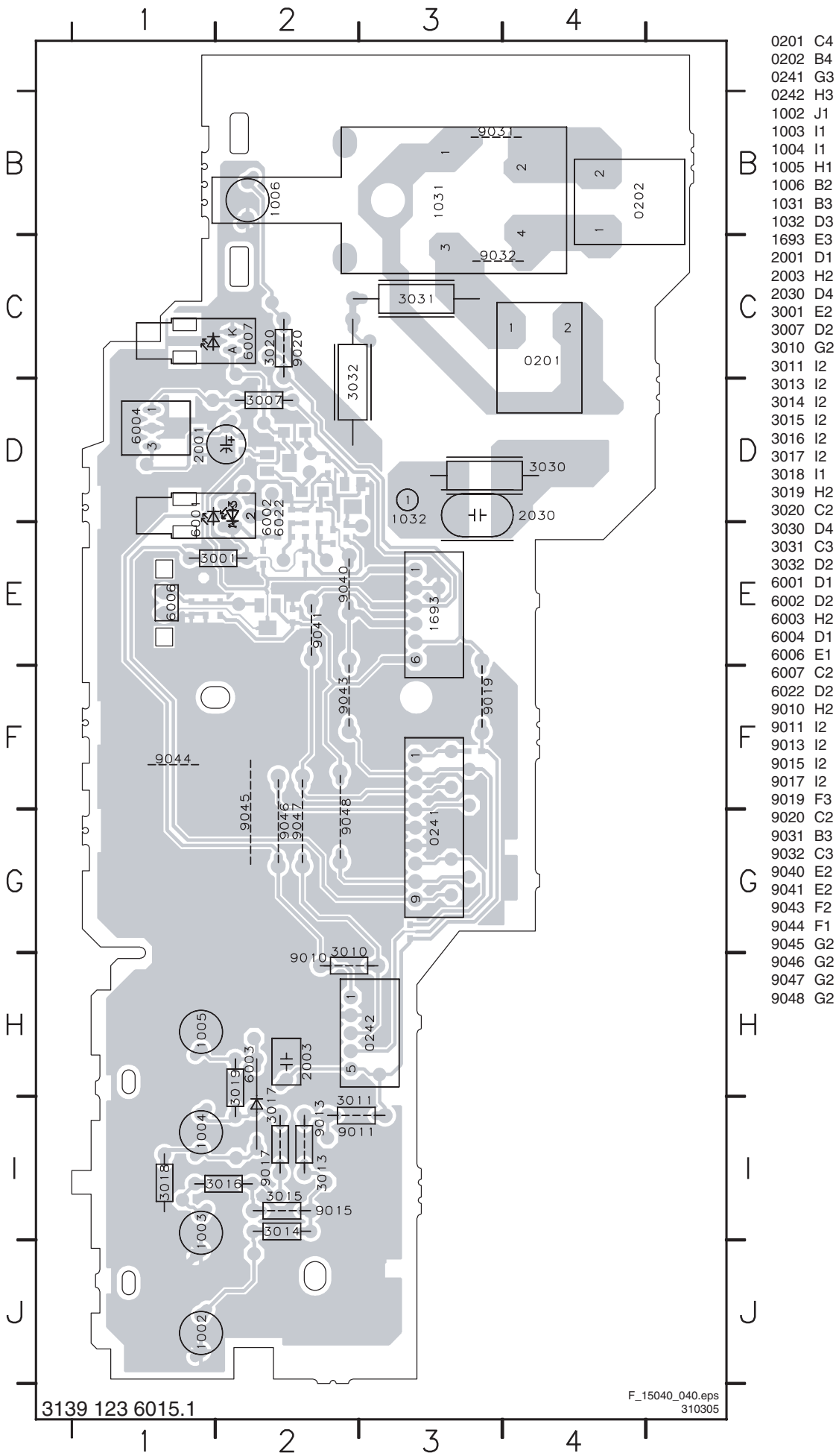
- 3078 E4
- 3081 E4
- 3082 E4
- 3083 D3
- 3084 E4
- 3085 E4
- 3086 D3
- 3087 D3
- 3088 D3
- 3089 D3
- 3090 D3
- 3092 E4
- 3093 E4
- 3099 D2
- 4000 D3
- 4001 D3
- 4003 D3
- 4004 D3
- 4006 C4
- 4008 C4
- 4009 C4
- 4010 C4
- 4905 E4
- 4907 D3
- 6053 D4
- 7000 D3
- 7001 C3

MAINS SWITCH PANEL(SL5)

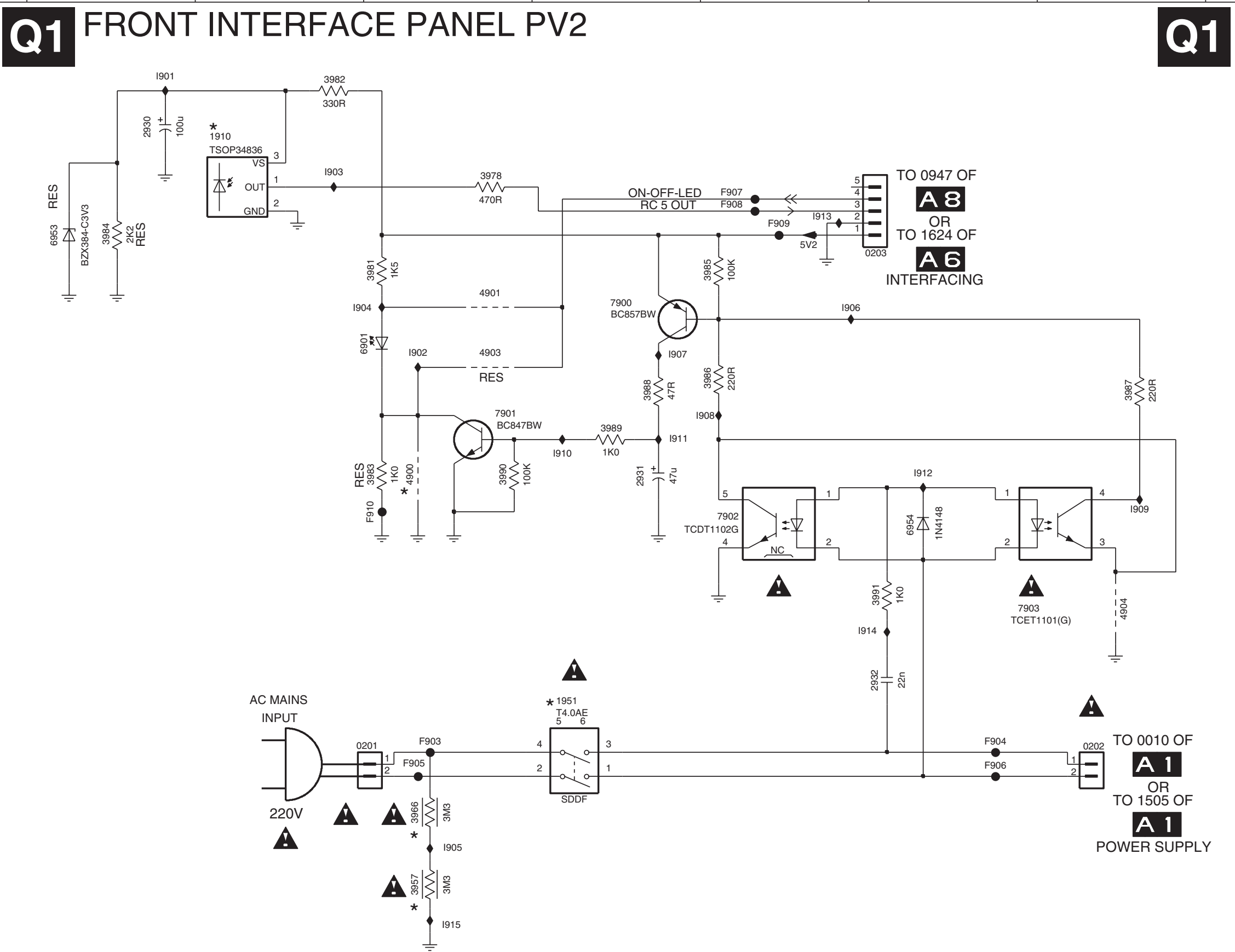


0201 B7	9019 D4
0202 B9	9020 E4
0241 A1	9031 A8
0242 B2	9032 B8
1002 D5	F001 A2
1003 D5	F002 A2
1004 C6	F003 A2
1005 D6	F004 A2
1006 D5	F005 A2
1031 A8	F007 B2
1032 C9	F008 B2
1693 D2	F009 B2
2001 D3	F010 B7
2002 E3	F011 B7
2003 C4	F012 B9
2004 B6	F013 B9
2030 B8	I002 B7
3001 A4	I003 C7
3002 A5	I004 A4
3003 A5	I005 D2
3004 A4	I006 B5
3005 B4	I009 D3
3006 C3	I010 C4
3007 D3	I011 D4
3008 E3	I012 A5
3009 E3	I013 D2
3010 C2	I016 E3
3011 C4	I018 D5
3013 C5	I019 D5
3014 C5	I020 B4
3015 C5	I021 C5
3016 C5	I023 C6
3017 C5	I024 D6
3018 D6	I025 C4
3019 C6	I025 C5
3020 D4	I026 D6
3021 A5	I027 A5
3022 A5	I028 A6
3023 A6	I029 A6
3030 B8	I030 B6
3031 B7	I031 B6
3032 C7	
4001 A4	
4002 A4	
4003 A4	
4004 B4	
4005 B4	
4006 B5	
4007 A3	
4008 E3	
6001 A4	
6002-1 B5	
6003 C6	
6004 C3	
6005 D3	
6006 E3	
6007 B6	
6008 A5	
6009 A6	
6022-2 B4	
7001 E3	
7002 A6	
7003 B6	
9010 C2	
9011 C4	
9013 C5	
9015 C5	
9017 C5	

Layout Mains Switch Panel (SL5) (Top Side)



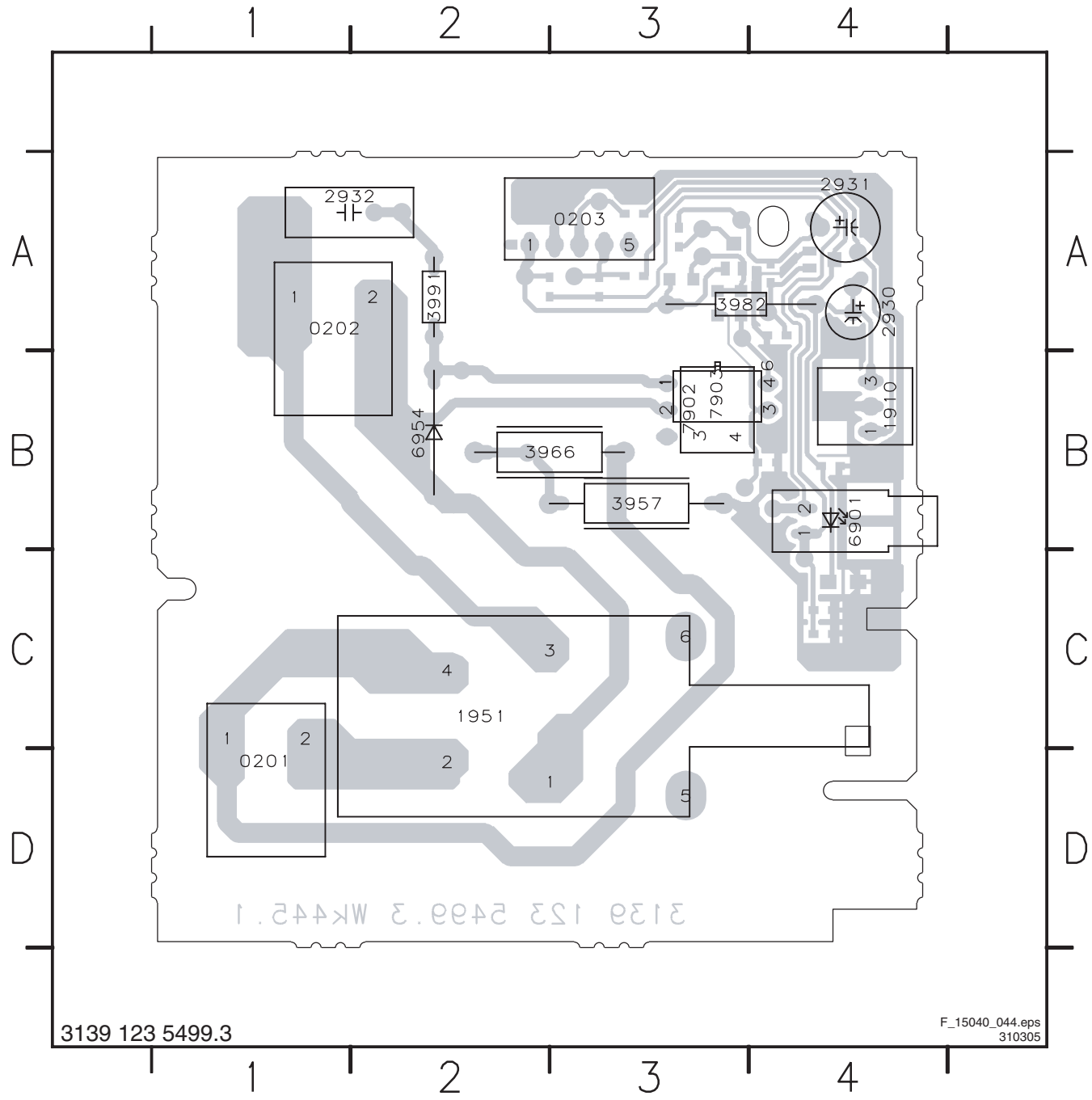
Front Interface Panel (PV2)



0201 D2
0202 D7
0203 A6
1910 A2
1951 D4
2930 A1
2931 C4
2932 D6
3957 E3
3966 E3
3978 A3
3981 A3
3982 A2
3983 C3
3984 A1
3985 A5
3986 B5
3987 B7
3988 B4
3989 B4
3990 C3
3991 C6
4900 C3
4901 B3
4903 B3
4904 D7
6901 B3
6953 A1
6954 C6
7900 B4
7901 B3
7902 C5
7903 D6
F903 D3
F904 D6
F905 D3
F906 D6
F907 A5
F908 A5
F909 A5
F910 C3
I901 A1
I902 B3
I903 A2
I904 B2
I905 E3
I906 B5
I907 B4
I908 B5
I909 C7
I910 C4
I911 B4
I912 C6
I913 A5
I914 D5
I915 E3

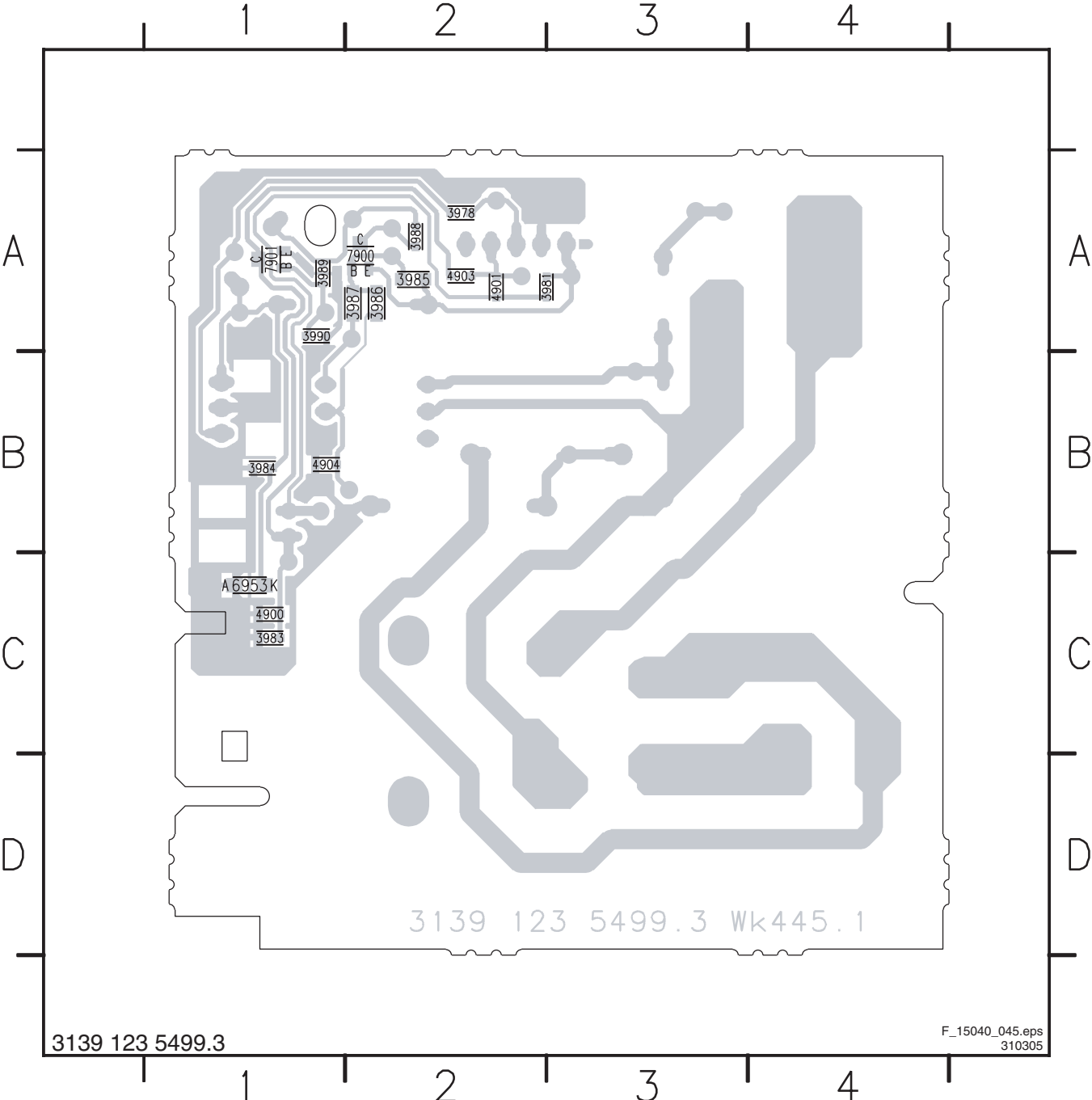
Layout Front Interface Panel (PV2) (Top Side)

0201 D1 0203 A3 1951 C2 2931 A4 3957 B3 3982 A3 6901 B4 7902 B3
0202 A1 1910 B4 2930 A4 2932 A1 3966 B3 3991 A2 6954 B2 7903 B3



Layout Front Interface Panel (PV2) (Bottom Side)

3978 A2 3983 C1 3985 A2 3987 A2 3989 A1 4900 C1 4903 A2 6953 C1 7901 A1
3981 A2 3984 B1 3986 A2 3988 A2 3990 A1 4901 A2 4904 B1 7900 A2



8. Alignments

Index of this chapter:

- 8.1 General Alignment Conditions
- 8.2 Hardware Alignments
- 8.3 Software Alignments
- 8.4 Option Settings

8.1 General Alignment Conditions

8.1.1 Default Alignment Settings

Perform all electrical adjustments under the following conditions:

- Power supply voltage: 230 V_{AC} / 50 Hz (± 10 %).
- Connect the set to the mains via an isolation transformer with low internal resistance.
- Allow the set to warm up for approximately 20 to 30 minutes.
- Measure voltages and waveforms in relation to chassis ground (with the exception of the voltages on the primary side of the power supply).

Caution: never use heatsinks as ground.

- Test probe: 100 : 1, R_i > 10 Mohm, C_i < 3.5 pF.
- Use an isolated trimmer/screwdriver to perform alignments.

Perform all electrical adjustments with the following default settings (for all CRTs):

- Choose "Soft" picture mode with the "Smart Picture" button on the remote control.
- Set "Dynamic Contrast" and "Active Control" to "off" (if either one of them is present).
- Set "Brightness" to aligned value unless otherwise specified.
- Set "Contrast value" to 99.

8.1.2 Adjustment Sequence

Use the following adjustment sequence:

1. Set the correct TV-set OPTIONS as described in paragraph "Options". After storing, re-start the set.
2. Rough adjustment of VG2 and FOCUS (potentiometers in "midway" positions).
3. RF-AGC alignment.
4. IF-PLL OFFSET adjustment.
5. Rough adjustment of GEOMETRY.
6. Allow the set to warm up.
7. Precise adjustment of VG2 and FOCUS.
8. Precise adjustment of GEOMETRY.
9. PIP alignments (if present).
10. COLOUR alignments.
11. Other software alignments.

8.2 Hardware Alignments

Notes:

- The Service Alignment Mode (SAM) is described in chapter 5 "Service Modes, Error Codes, and Fault Finding".
- Use the cursor-, menu-, and OK-buttons of the remote control (RC) transmitter for navigation.

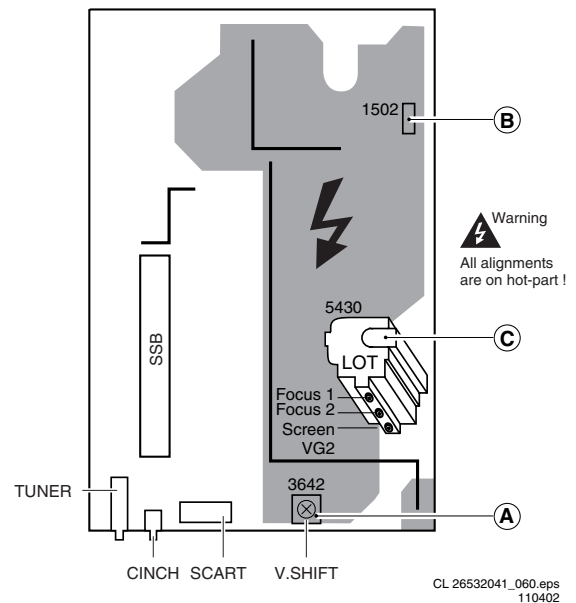


Figure 8-1 Top view LSP

8.2.1 Vg2 Adjustment

In the frame-blanking period of the R, G, and B signals applied to the CRT, the video processor inserts a measuring pulse with different DC levels. Measure the black level pulse during the vertical flyback at the RGB cathodes of the CRT.

1. Connect the RF output of a pattern generator to the antenna input. Input a "black" picture (blank screen on CRT without any OSD info) test pattern.
2. In the SAM mode, set the "Normal Red", "Normal Green" and "Normal Blue" values to "0" for "White Tone".
3. Disable the black current loop (via the AKB bit).
4. Use the MENU key to enter the "user" menu, select "Picture", and set "Brightness" and "Contrast" to "0".
5. Set the oscilloscope to 20 V/div and the time base to 20 us/div. Use external triggering on the vertical pulse.
Caution: use a trigger point on the "cold" side!
6. Ground the scope on the CRT panel ("cold" side) and connect a 10:1 probe to one of the cathodes of the picture tube socket (see circuit diagram B1).
7. Measure at test points F338, F339 and F341 on the picture tube socket the DC-level of the measuring pulse (1st full line after the frame blanking) with respect to earth.
8. Select the pin with the highest level found and adjust V_{cutoff} by means of the Vg2-potmeter (lowest-one) on the Line Output Transformer (LOT) to 160 +/- 5 V_{DC} (for all screen sizes).
9. Reset "Contrast" and "Brightness" to their original values.

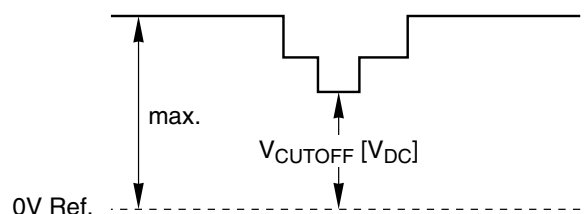


Figure 8-2 Waveform Vg2 alignment

8.2.2 Focus alignment

The LOT has the following outline:

- Focus 1 (F1) = Static alignment (red wire).
 - Focus 2 (F2) = Dynamic alignment (white wire).
1. Use an external video pattern generator to input a "circle" or "crosshatch" test pattern to the set.
 2. Choose "Natural" picture mode with the "Smart Picture" button on the remote control transmitter.
 3. Adjust the "dynamic focus 2" potentiometer (in the middle on the LOT) until the horizontal lines at the centre of the screen are of minimum width without introducing a visible haze.
 4. Adjust the "static focus 1" potentiometer (highest of the LOT) until the horizontal lines at the sides of the screen are of minimum width without introducing a visible haze.
 5. Repeat these two steps to achieve the best result.

8.3 Software Alignments

Put the set in the SAM (see the "Service Modes, Error Codes and Fault Finding" section). The SAM menu will now appear on the screen. The different alignment parameters are described further on.

Notes:

- All changes to menu items and alignments must be stored manually.
- If an empty EAROM (permanent memory) is detected, all settings are set to pre-programmed default values, so the set must be re-aligned.

8.3.1 Tuner

AGC

1. Set an external pattern generator to a colour bar video signal and connect the RF output to the aerial input of the TV. Set the amplitude to 10 mV and the frequency to 475.25 MHz. Use system PAL B/G if possible, otherwise match the system of your generator with the received signal in the set.
2. Put the set in the SAM mode.
3. Select via the TUNER menu, the AGC sub-menu.
4. Connect a DC multi-meter to pin 1 of the tuner (F235, AGC pin).
5. Adjust the AGC until the voltage at pin 1 (F235, AGC pin) of the tuner is 3.3 V (+/- 0.1 V). The value can be incremented or decremented by pressing the right/left CURSOR button on the RC.
6. After alignment, save the value(s) with the STORE command in the SAM main menu.

IF PLL OFFSET

No adjustments needed: default value is "35".

If the mentioned default value does not give the required result, use the following alignment method:

1. Set an external pattern generator to a crosshatch video signal and connect the RF output to the aerial input of the TV. Set the amplitude to 10 mV and the frequency to 475.25 MHz. Use system PAL B/G if possible, otherwise match the system of your generator with the received signal in the set.
 - For "Negative modulation", the **sound** signal must be a non-modulated FM signal.
 - For "Positive modulation", the **video** signal must have high modulation (100% or above).
2. Put the set in the SAM mode.
3. Select via the TUNER menu, the IF-PLL OFFSET sub-menu.
4. Measure and align:

- For "Negative modulation", on SCART pin 1 or 3 (**audio** out): Adjust IF-PLL OFFSET until the largest Signal Noise Ratio (SNR) is reached.
- For "Positive modulation", on SCART pin 19 (**video** out): Adjust IF-PLL OFFSET until you get minimal V-sync disturbance.

8.3.2 Geometry

Notes:

- Set an **external** pattern generator to a crosshatch video signal and connect the RF output to the aerial input of the TV. Set the amplitude at least 1 mV_{RMS} (60 dBμV) and the frequency to 475.25 MHz. Use system PAL B/G if possible, otherwise match the system of your generator with the received signal in the set.
Note: Do **not** use the internal test pattern from the GEOMETRY menu!
- Use the default alignment settings, but set "Brightness" to "32".
- For wide screen models, set to "wide screen" mode, for "classic" models, set to "4:3".
- After alignment, save the value(s) with the STORE command in the SAM main menu.

Service tip: When the set is equipped with a rotation coil, use this menu item to check its correct alignment. If alignment is not correct, go to the user MENU, choose FEATURES, and select ROTATION. With the use of a crosshatch test pattern, align it to a correct horizontal picture.

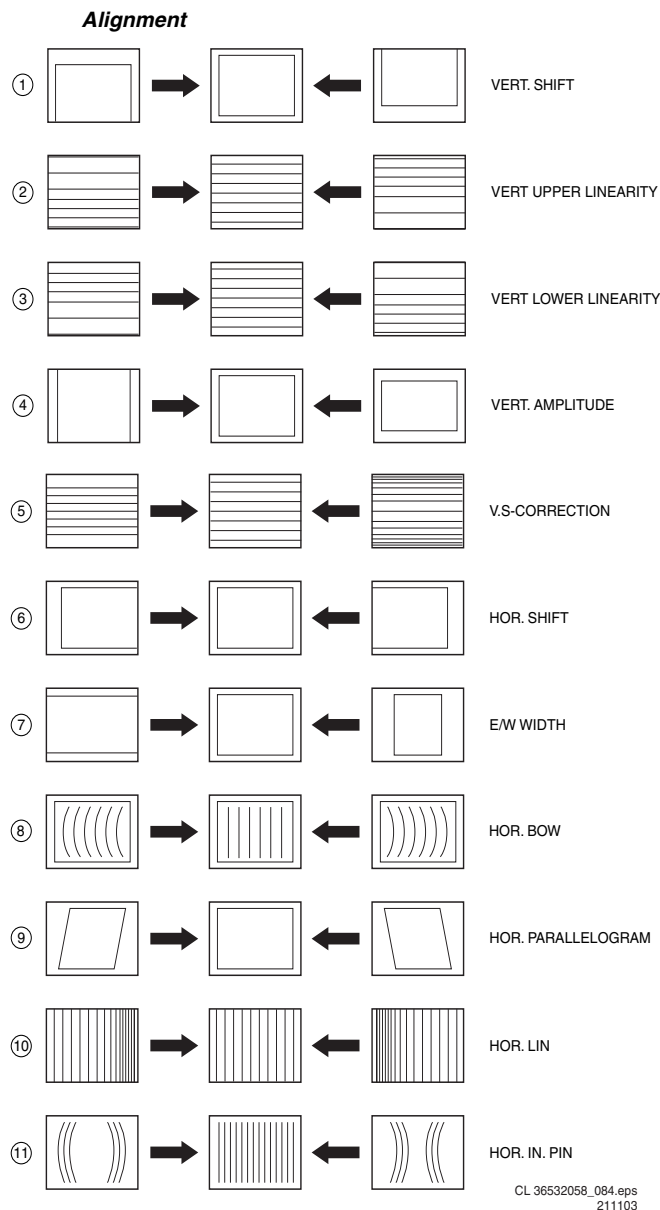


Figure 8-3 Geometry Alignments

Use the following software regulations to modify the geometry:

1. VER. SHIFT (Vertical Shift): Align for the vertical picture centre, range from -32 to +32.
2. VER. AMPL (Vertical Amplitude): Compensating for any gain error in amplifier, adjust range from -32 to +32 to the proper amplitude.
3. VER. SCOR (Vertical S-Correction): Align for equal height of the blocks in the top, the bottom and the middle, range from -63 to +63.
4. VER. U_LIN (Vertical Upper Linearity): Align for linearity of the upper screen, range from -63 to +63.
5. VER. L_LIN (Vertical Lower Linearity): Align for linearity of the lower screen, range from -63 to +63.
6. HOR. SHIFT (Horizontal Shift): Adjust for the horizontal centre of the screen, range from -127 to +128.

Next step is to align the East/West geometry.

1. First, set the parameters EW_5 and EW_6 to "0"
2. EW. WIDTH (East-West Width): This sets the (overall) horizontal size of the picture on the screen. Range from -63 to +63 (with the following EW alignments, these lines can be straightened).
3. EW_1 (East-West parameter 1): Has effect on the length of the upper part of the vertical E/W lines.
4. EW_2 (East-West parameter 2): Has effect on the length of the vertical E/W lines just below EW_1.

5. EW_3 (East-West parameter 3): Has effect on the length of the vertical E/W lines just below EW_2.
6. EW_4 (East-West parameter 4): Has effect on the length of the vertical E/W lines just below EW_3.
7. EW_5 (East-West parameter 5): Has effect on the length of the vertical E/W lines just below EW_4.
8. EW_6 (East-West parameter 6): Has effect on the length of the vertical E/W lines just below EW_5.
9. EW_7 (East-West parameter 7): Has effect on the length of the vertical E/W lines just below EW_6.
10. EW_8 (East-West parameter 8): Has effect on the length of the vertical E/W lines just below EW_7.
11. EW_9 (East-West parameter 9): Has effect on the length of the vertical E/W lines just below EW_8.
12. EW_10 (East-West parameters 10): Has effect on the length of the lowest part of the vertical E/W lines.
13. HOR. BOW (Horizontal Bow): Align the EW parabola to be symmetrical, range from -63 to +63.
14. HOR. PARALLEL (Horizontal Parallel): Align for straight vertical lines on the picture sides, range from -63 to +63.
15. HOR. LIN (Horizontal Linearity): Align for equal width of horizontal blocks on the left, the right and the centre, range from -63 to +63.
16. HOR. SCOR (Horizontal S-correction): Align for equal height of the blocks on the left, the right and the centre, range from -63 to +63.
17. HOR. IN_PIN (Horizontal Inner Pincushion): Align for the inner straight vertical lines, range from -15 to +15.

8.3.3 White Tone

In the WHITE TONE sub menu, the colour values for the different colour temperatures can be changed.

The colour temperature mode (NORMAL, DELTA COOL, DELTA WARM) can be selected per colour (R, G, and B) with the RIGHT/LEFT cursor keys. The mode or value can be changed with the UP/DOWN cursor keys.

First, the values for the NORMAL colour temperature must be selected. Then the offset values for the DELTA COOL and DELTA WARM mode can be selected. Note that the alignment values are non-linear.

Alignment

Normally, no adjustments are needed.
If the white tone alignment values used in CSM of the the TV set do not give the required result, use the following alignment method:

- Set the external pattern generator to a 100% white pattern, and connect its RF output to the aerial input of the TV. Set the amplitude to at least 1 mV_{RMS} (60 dBuV) and the frequency to 475.25 MHz. Use system PAL B/G if possible, otherwise match the system of your generator with the received signal in the set.
- Set "Smart Picture" to "Natural".
- Set "Dynamic NR" to "off".
- Put the set in the SAM mode.
- Select via the WHITE TONE menu, the PATTERN sub-menu.
- Set PATTERN to "on".
- Set NORMAL GREEN to "0".
- Measure with the colour analyser (Minolta CA100 Colour Analyser or equivalent), calibrated with the spectra, on the centre of the screen.
- Adjust with the cursor left/right command the Red and Blue register for the right xy-coordinates (see the table below).
- Repeat the white tone adjustment also for the colour temperatures COOL and WARM.

Table 8-1 White tone alignment (with colour analyser)

White D mode	Temperature	DUV	x	y
Normal	8500 K	+/-0.004	288 +/- 4	300 +/- 4
Cool	11500 K	+/-0.005	273 +/- 5	282 +/- 5
Warm	7000 K	+/-0.005	305 +/- 5	312 +/- 5

8.3.4 Sound

No adjustments needed. Use the given default values:

- PRESCALE LEVEL
 - FM: "+1".
 - NICAM: "+3".
 - EXTAM Gain: "0".
 - PIPMONO: "0".
 - ExtLR-in: "0".
- THRESHOLD LEVEL
 - Over Mod Tresh: "+3dB".
 - NIC ErrLmt_Hi: "200".
 - NIC ErrLmt_Lo: "100".
 - NoiseThres SC2: "+2".
 - NoiseHyst SC2: "+4".
- EFFECTS LEVEL
 - BMT CutOffFrq: "50Hz".
 - Incredible SND: "60%".
 - VDolby: "100%".

8.3.5 Smart Settings

No adjustments needed.

8.4 Option Settings

8.4.1 Introduction

The microprocessor communicates with a large number of I²C ICs in the set. To ensure good communication and to make digital diagnosis possible, the microprocessor has to know which ICs to address. The presence / absence of these specific ICs (or functions) is made known by the option codes.

Notes:

- After changing the option(s), save them with the STORE command.
- All changes are disregarded when the OPTIONS submenu is left without using the STORE command.

- The new option setting is only active after the TV is switched "off" and "on" again with the Mains switch (the EAROM is then read again).

8.4.2 Changing Options

Options are used to control the presence / absence of certain features and hardware. There are two ways to change the option settings. All changes in the option settings are saved by selecting STORE and pressing the CURSOR RIGHT key. Some changes will only take affect after the set has been switched OFF and ON with the mains switch (cold start).

Changing Multiple Options by Changing Option Byte Values

Option Bytes (OB) makes it possible to set all options very fast. An option byte represents a number of different options. All options are controlled via option bytes (OB1 to OB13; each "OB" number represents 16 bits; bit numbers that are not used are omitted in the second column). Select an Option Byte you want to change with the CURSOR UP/DOWN keys, and key in the new value. See the table for more details. An explanation per option is listed in paragraph "Option Bit Definition".

Changing a Single Option

It is also possible to change an option one at a time. Therefore, select the option with the CURSOR UP/DOWN keys and change its setting with the LEFT/RIGHT keys.

8.4.3 Option Settings

In the table below, you will find the option settings.

Option Bytes (OB1...OB13)	Number of Bits	Decimal value	Name	Features	32PW8720/12	28PW8720/12	32PW8620/12	28PW8620/12	29PT8640/12	29PT8520/12	28PT7120/12	28PW8720/05	32PW8720/05	32PW8820/12	32PW8820/12	32PW8820/12	32PW8820/12
1	5	32	RCMX	RC for Teletext Mix Mode	0	0	0	0	0	0	0	0	0	0	0	0	0
	6	64	EQTO	Equalizer/Tone	0	0	0	0	0	0	0	0	0	0	0	0	0
	8	256	WSSB	Wide Screen Signal Bit	1	1	1	1	0	0	0	1	1	1	1	0	0
	12	4096	DGSC	Digital Scan	1	1	1	1	1	1	1	1	1	1	1	1	1
	14	16384	SSHT	Subtitle Shift	1	1	1	1	0	0	0	1	1	1	1	0	0
2	5	32	DBYV	Dolby Virtual	1	1	1	1	1	1	1	1	1	1	1	1	1
	7	128	SWOF	Swoofer** (1st bit)	0	0	0	0	0	0	0	0	0	0	0	0	0
	8	256	SWOF	Swoofer** (2nd bit)	0	0	0	0	0	0	0	0	0	0	0	0	0
	9	512	P50	P50	1	1	1	1	1	1	1	1	1	1	1	1	1
	11	2048	QPEAK	AV Sound Mode Detection	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	1	AV3	Side AV Source	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	2	SCT3	Scart 3 Input	0	0	0	0	0	0	0	0	0	0	0	0	0
	8	256	ASPR	Aspect Ratio	1	1	1	1	0	0	0	1	1	1	1	0	0
	9	512	ROTI	Rotation Tilt	1	1	1	1	0	0	0	1	1	1	1	0	0
4	3	8	PITN	Philips tuner*** (1st bit)	1	1	1	1	1	1	1	1	1	1	1	1	1
	4	16	PITN	Philips tuner*** (2nd bit)	0	0	0	0	0	0	0	0	0	0	0	0	0
5	6	64	AAVL	Automatic Volume Leveller	1	1	1	1	1	1	1	1	1	1	1	1	1
6	12	4096	BASF	Bass Feature* (1st bit)	1	1	1	1	1	1	1	1	1	1	1	1	1
	13	8192	BASF	Bass Feature* (2nd bit)	0	0	0	0	0	0	0	0	0	0	0	0	0
8	4	16	PIPC	PIP control	0	0	0	0	0	0	0	0	0	1	1	1	1
	5	32	PIPT	PIP tuner	0	0	0	0	0	0	0	0	0	0	0	0	0
	6	64	W4X3	DW 4:3	0	0	0	0	0	0	0	0	0	1	1	1	1
	7	128	W169	DW 16:9	0	0	0	0	0	0	0	0	0	1	1	1	1
9	0	1	APC	Auto Picture Control (Auto TV)	1	1	1	1	1	1	1	1	1	1	1	1	1
	5	32	VMOD	Virgin Mode	0	0	0	0	0	0	0	1	1	0	0	0	0
	7	128	TIME	Timer	1	1	1	1	1	1	1	1	1	1	1	1	1
	8	256	DNR	Dynamic Noise Reduction	1	1	1	1	1	1	1	1	1	1	1	1	1
	9	512	BBD	Black Bar Detect	1	1	1	1	0	0	0	1	1	1	1	0	0
10	5	32	UKPNP	UK plug and play	0	0	0	0	0	0	0	1	1	0	0	0	0
	6	64	DTXT	Dual Text	1	1	1	1	0	0	0	1	1	1	1	0	0
	7	128	VTXT	Video Text	1	1	1	1	0	0	0	1	1	1	1	0	0
	8	256	SBNP	Auto Standby with no picture	1	1	1	1	1	1	1	1	1	1	1	1	1
	9	512	AUSB	Auto Standby Auto On	0	0	0	0	0	0	0	0	0	0	0	0	0
	10	1024	CZOM	Continuous Zoom	1	1	1	1	0	0	0	1					

8.4.4 Option Bit Definition

Sources

AV3: Side AV source.

Function: Disable/Enable side AV source.

Values: OFF= Disabled, side AV source is not available. ON= Enabled, side AV source is available.

SCT3: SCART 3 input.

Function: Disable/Enable Scart3 input.

Values: OFF= Disabled. ON= Enabled.

Video

ASPR: Aspect Ratio Setting.

Function: Select between 4 by 3 or 16 by 9 set.

Values: OFF= 4 by 3 set. ON= 16 by 9 set.

W4X3: Screen size 4x3.

Function: Disable/Enable Screen size 4x3.

Values: OFF= Disabled. Screen size 4x3 is not available. ON= Enabled. Screen size 4x3 is available.

W169: Screen size 16x9.

Function: Disable/Enable Screen size 16x9.

Values: OFF= Disabled. Screen size 16x9 is not available.

ON= Enabled. Screen size 16x9 is available.

DNR: Dynamic Noise Reduction.

Function: Disable/Enable (Dynamic) Noise Reduction function.

Values: OFF=Disabled. ON= Enabled.

BBD: Black Bar Detection.

Function: Disable/Enable Black Bar Detection.

Values: OFF=Disabled, Black Bar Detection not available. ON= Enabled, Black Bar Detection available.

Note: The Auto Screen Fit will not be included in the picture size loop when BBD is OFF (WS = 1; 4 : 3 = 0).

CZOM: Continuous Zoom.

Function: Disable/Enable Continuous Zoom.

Values: OFF=Disabled. ON= Enabled (WS = 1; 4 : 3 = 0).

HSHT: Heading Shift.

Function: Disable/Enable Heading Shift.

Values: OFF=Disabled. ON= Enabled (WS = 1; 4 : 3 = 0).

SSHT: Subtitle Shift.

Function: Disable/Enable Subtitle Shift.

Values: OFF=Disabled. ON= Enabled (WS = 1; 4 : 3 = 0).

APC: Auto Picture Control (Auto TV).

Function: Disable/Enable Auto picture control.

Values: OFF= Disabled. ON= Enabled.

WSSB: Wide Screen Signalling Bit.

Function: Disable/Enable Wide screen Signalling bit function.

Values: OFF= Disabled. ON= Enabled (WS = 1; 4 : 3 = 0).

ROTI: Rotation Tilt.

Function: Change the tilt level of picture tube.

Values: OFF= Disabled, menu item ROTATION is not available. ON= Enabled, menu item ROTATION is available (WS = 1; 4 : 3 = 0).

DGSC: Digital Scan.

Function: Enable/Disable the Digital Scan in the DIGITAL OPT menu.

Values: OFF= Disabled, menu item DIG SCAN is not available. ON= Enabled, menu item DIG SCAN is available.

SSD: Split Screen Demo.

Function: Disable/Enable Split Screen Demo.

Values: OFF= Disabled. Split Screen Demo is not available.

ON= Enabled. Split Screen Demo is available.

Audio

AAVL: Automatic Volume Level control.

Function: Disable/Enable automatic volume leveller function.

Values: OFF=Disabled, menu item AVL is not available. ON= Enabled, menu item AVL is available.

DBYV: Dolby Virtual.

Function: Select surround setting.

Values: OFF= Disabled, DOLBY VIRTUAL setting is not available.

ON= Enabled, DOLBY VIRTUAL setting is available.

Note: Incredible surround & Dolby virtual are mutually exclusive.

EQTO: Equalizer or Tone control.

Function: Selection between Equalizer and Tone control (Bass and Treble).

Values: OFF= Tone control (Bass and Treble). ON= Equalizer.

Note: Equalizer and Tone (Bass and treble) control are mutually exclusive.

QPEAK: AV Sound Mode detection.

Function: The current Sound Mode detection in AV is not working correctly. The optimal threshold value for the correct sound mode detection is still being investigated. Therefore, this is needed to disable the Sound Mode detection in AV until the correct threshold is identified.

Value: OFF= Disabled, AV sound auto detection is not available.

ON= Enabled. AV sound auto detection is available.

BASF: Bass Feature.

Function: Disable/Enable Bass Feature.

Values: OFF= Disabled. Bass Feature is not available. ON= Enabled. Bass Feature is available.

Note: For this feature, 2 bits are used: bit 5 and bit 4 of NVM address 21_{hex}. The following combinations are possible:

00 = Disable DBE and DUB;

01 = Enable DBE (bit 5 @ 21_{hex} = 0; bit 4 @ 21_{hex} = 1);

10 = Enable DUB (bit 5 @ 21_{hex} = 1; bit 4 @ 21_{hex} = 0);

11 = not used.

HPMN: Headphone menu.

Function: Disable/Enable Headphone menu.

Values: OFF= Disabled. Headphone menu is not available.

ON= Enabled. Headphone menu is available.

SWOF: Subwoofer.

Function: Disable/Enable Subwoofer.

Values: OFF= Disabled. Subwoofer is not available. ON= Enabled. Subwoofer is available.

Note: For this feature, 2 bits are used: bit 1 of NVM address

19_{hex} and bit 7 of NVM address 18_{hex}. The following combinations are possible:

00 = None;

01 = Subwoofer (bit 1 @ 19_{hex} = 0; bit 7 @ 18_{hex} = 1);

10 = Woox (bit 1 @ 19_{hex} = 1; bit 7 @ 18_{hex} = 0);

11 = not used.

Tuning

PITN: Philips Tuner.

Function: Choose the tuner type that is configured in the hardware.

Values: OFF= Disabled, Other (non-Philips) tuner is used. ON= Enabled, Philips compatible tuner is used.

Note: For this feature, 2 bits are used: bit 4 and bit 3 of NVM address 1C_{hex}. The following combinations are possible:

00 = Other tuner;

11 = Philips tuner (bit 4 and bit 3 @ 1C_{hex} = 1).

Installation

ACI: Automatic Channel Installation.

Function: Disable/Enable automatic channel installation.

Values: OFF= Disabled Automatic Channel Installation. ON= Enabled Automatic Channel Installation.

Note: Download present program when ACI is ON.

ATS: Automatic Tuning System.

Function: Disable/Enable automatic tuning system.

Values: OFF= Disabled, automatic tuning system is ignored.

ON= Enabled Automatic Tuning System, sort the program in an ascending order starting from Program 1.

Note: Sort the program in an ascending order starting from Program 1 when ATS is ON.

VMOD: Virgin Mode.

Function: Disable/Enable virgin mode.

Values: OFF= Disabled, cannot access virgin mode. ON= Enabled, can access virgin mode.

Note: Plug and Play menu item will be displayed to perform installation at the initial start up of the TV when MOD is ON and after installation is done, VMOD will be automatically set to OFF.

UKPNP: UK Plug and Play.

Function: Disable/Enable UK's default Plug and Play setting.

Values: OFF= Disabled, UK's default Plug and Play setting is not available. ON= Enabled, UK's default Plug and Play setting is available.

Note: When UKPNP and VMOD are ON at the initial set-up, LANGUAGE= ENGLISH, COUNTRY= GREAT BRITAIN and after auto store is complete, VMOD will be set automatically to OFF while UKPNP remain ON.

Program Selection**PLST:** Program List.

Function: Disable/Enable Program List function.

Values: OFF= Disabled, the access to Program List Command is ignored. ON= Enabled, the access to Program List Command is processed.

Picture In Picture**PIPC:** PIP Control.

Function: Disable/Enable submenu to adjust PIP Picture settings

Values: OFF= Disabled, PIP feature is not available. ON= Enabled, PIP feature is available

Note: PIP is present in FEATURES submenu when PIPC is ON. When PIPC is switched OFF, bits PIPT, W4X3, and W169 must be automatically set to OFF.

PIPT: PIP Tuner.

Function: To determine the presence of second tuner.

Values: OFF= Disabled, second tuner is not available. ON= Enabled, second tuner is available.

Note: When PIPC is switched OFF, bits PIPT, W4X3, and W169 must be automatically set to OFF.

Clock**SMCK:** Smart Clock/Autochron.

Function: Disable/Enable smart clock/AutoChron function.

Values: OFF= Disabled, menu item smart clock function not available. ON= Enabled, menu item smart clock function available.

Note: For NAFTA, AUTOCHRON is present in INSTALL submenu when SMCK is ON. For AP-PAL and EUROPE, Smart clock downloaded from Teletext is enabled when SMCK is ON.

TIME: Timer.

Function: Disable/Enable menu item TIMER.

Values: OFF= Disabled, menu item TIMER not available. ON= Enabled, menu item TIMER available.

Note: TIMER submenu is present in FEATURES submenu when TIME is ON.

Data Service**DTXT:** Dual Text.

Function: Disable/Enable Dual Text.

Values: OFF= Disabled. Dual text is not available. ON= Enabled. Dual text is available (WS = 1; 4 : 3 = 0).

RCMX: RC for Teletext Mix Mode.

Function: Disable/Enable RC for Teletext Mix mode support.

Values: OFF= Disabled. RC for mix mode is not available. ON= Enabled, RC for mix mode is available.

FAPG: Favourite Page.

Function: Disable/Enable favourite page in Teletext mode.

Values: OFF= Disabled favourite page in Teletext mode. ON= Enabled favourite page in Teletext mode.

T1H0: 100-Page Text.

Function: Disable/Enable 100-page Text.

Values: OFF= Disabled. 100-page text is not available. ON= Enabled, 100-page text is available.

T2H5: 250-Page Text.

Function: Disable/Enable 250-page Text.

Values: OFF= Disabled. 250-page text is not available. ON= Enabled, 250-page text is available.

T12H: 1200-Page Text.

Function: Disable/Enable 1200-page Text.

Values: OFF= Disabled. 1200-page text is not available. ON= Enabled, 1200-page text is available.

VTXT: Video Text.

Function: Disable/Enable Video Text.

Values: OFF= Disabled. Video text is not available. ON= Enabled. Video text is available (WS = 1; 4 : 3 = 0).

Lock Features**CHLK:** Child Lock.

Function: Disable / Enabled function to block/unblock channels.

Values: OFF= Disabled. ON= Enabled.

OSD/Menu Related**SOSD:** Smart OSD.

Function: Disable/Enable full display of SMART SOUND and SMART PICTURE OSD.

Values: OFF= Disabled, full display of SMART SOUND and SMART PICTURE OSD not available. ON= Enabled, full display of SMART SOUND and SMART PICTURE OSD available.

Miscellaneous**HOSP:** Hospitality mode.

Function: Disable/Enable Hospitality mode.

Values: OFF= Disabled. Hospitality mode is not available. ON= Enabled. Hospitality mode is available.

SBNP: Auto Standby with No Picture.

Function: Disable/Enable automatic switch to standby after 15 minutes when no ident.

Values: OFF= Disabled, no automatic switch to standby. ON= Enabled, set switches to standby after 15 minutes when no ident.

AUSB: Auto Standby Auto On.

Function: Disable/Enable automatic switch to standby if no RC or local keyboard response after 4 hours provided that the set is ON from standby mode by the timer.

Values: OFF= Disabled, no automatic switch to standby. ON= Enabled, set switches to standby after 4 hours.

P50: P50 (Easylink).

Function: Disable/Enable P50 feature.

Values: OFF= Disabled, P50 feature not available. ON= Enabled, P50 feature is available.

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

Index of this chapter:

- 9.1 Introduction
- 9.2 Deflection
- 9.3 Software Upgrading
- 9.4 Abbreviation List
- 9.5 IC Data Sheets

Note: Only **new** circuits (circuits that have not been published recently) are described. For the other circuits, see the A02E manual.

9.1 Introduction

The ES1E is a flat screen type CRT TV set for the year 2005 - 2006. It is based on the SSB of the A02, but the LSP, called Esplanade, has been redesigned in order to reduce the "hot" part of the chassis. In this chapter, only the deflection circuits, the correction circuits and the X-ray protection circuits are described.

9.1.1 Large Signal Panel

The Esplanade chassis has a full sized LSP, which has been redesigned with respect to the previous A02 chassis in order to reduce the "hot" parts of the circuit.

The main functionalities of the LSP are:

- Supply,
- Deflection,
- Sound amplification.

The LSP (single sided) is built up very conventional, with hardly any surface mounted components on the copper side.

9.2 Deflection

Deflection Principle Diagram ES1E

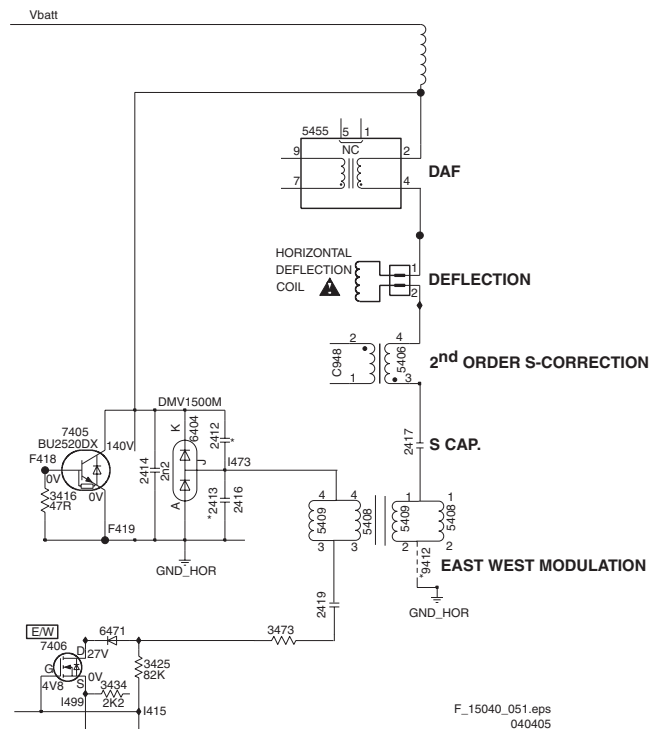


Figure 9-1 Deflection Principle

9.2.1 Basic Description.

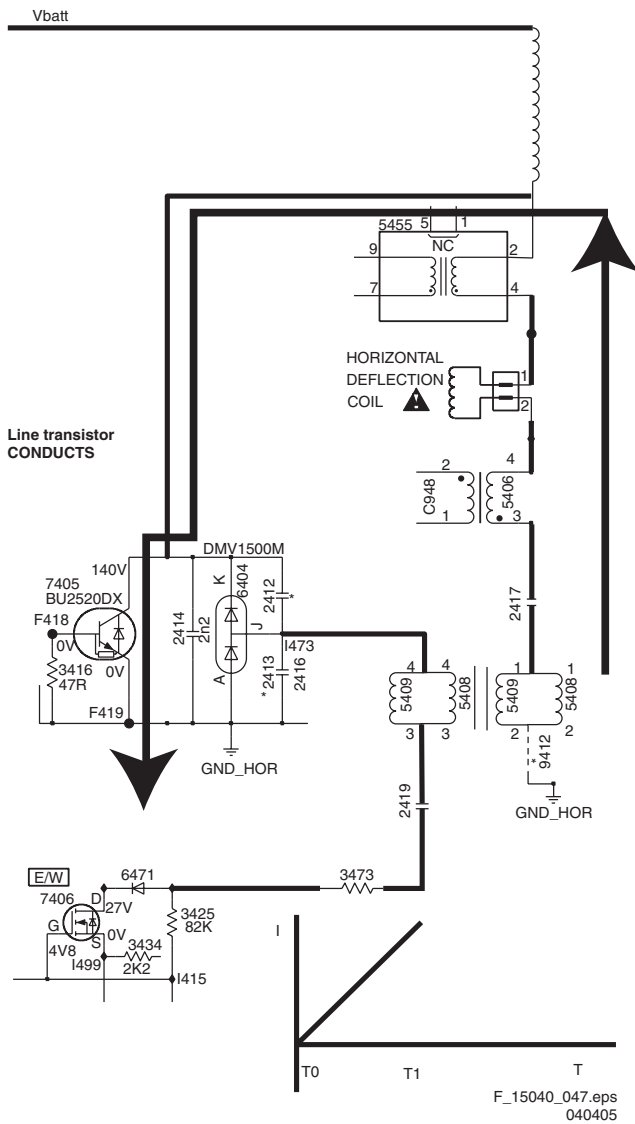
T0 - T1**Deflection T0-T1**

Figure 9-2 Deflection T0 - T1

At switch on of the TV set Scap (2417/2418) is charged by Vbatt. At T0 line transistor 7405 starts conducting. Now the current flows as shown in figure (T0 - T1), as a result of which the horizontal deflection will bend the electron beam from the centre of the screen to the right. Note that the deflection current has an almost linear waveform.

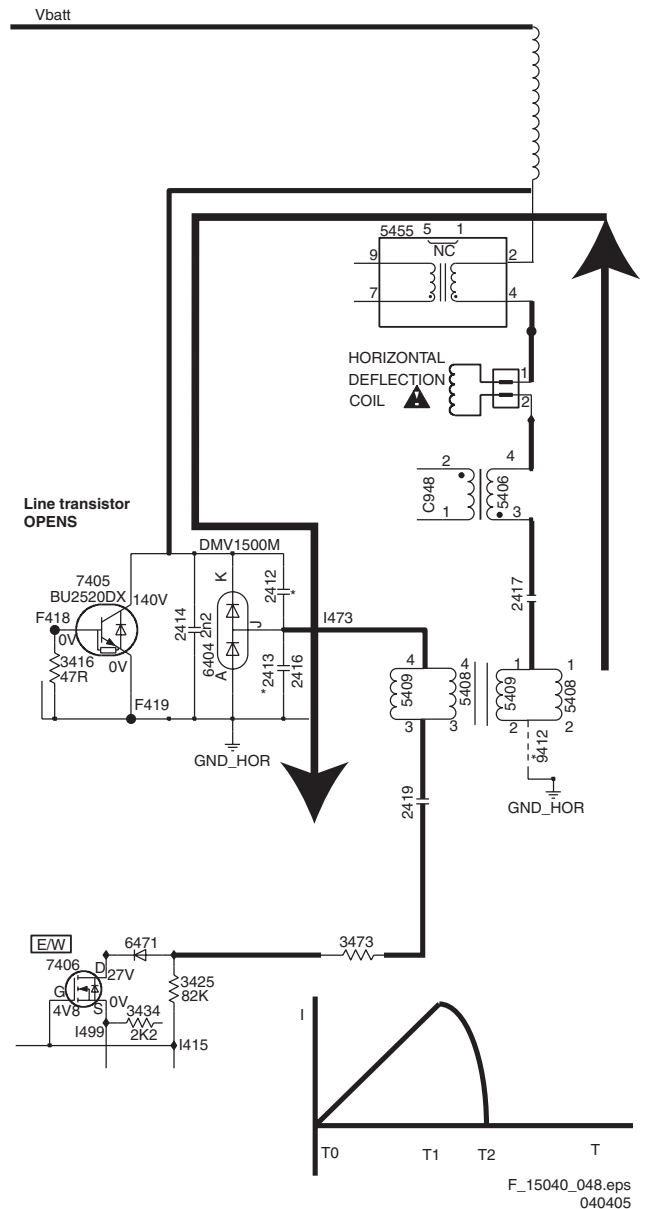
T1 - T2**Deflection T1-T2**

Figure 9-3 Deflection T1 - T2

At T1 line transistor 7405 is switched off and the line fly-back starts. When the line transistor stops conducting, the line current is at its maximum level. The current charges fly-back capacitors 2412 and 2413, and also capacitor 2414. This causes a decrease of line current. (Note that this current has a half-cosine waveform). The deflection position (i.e. the electron beam) is in the middle of the screen now.

T2 - T3

Deflection T2-T3

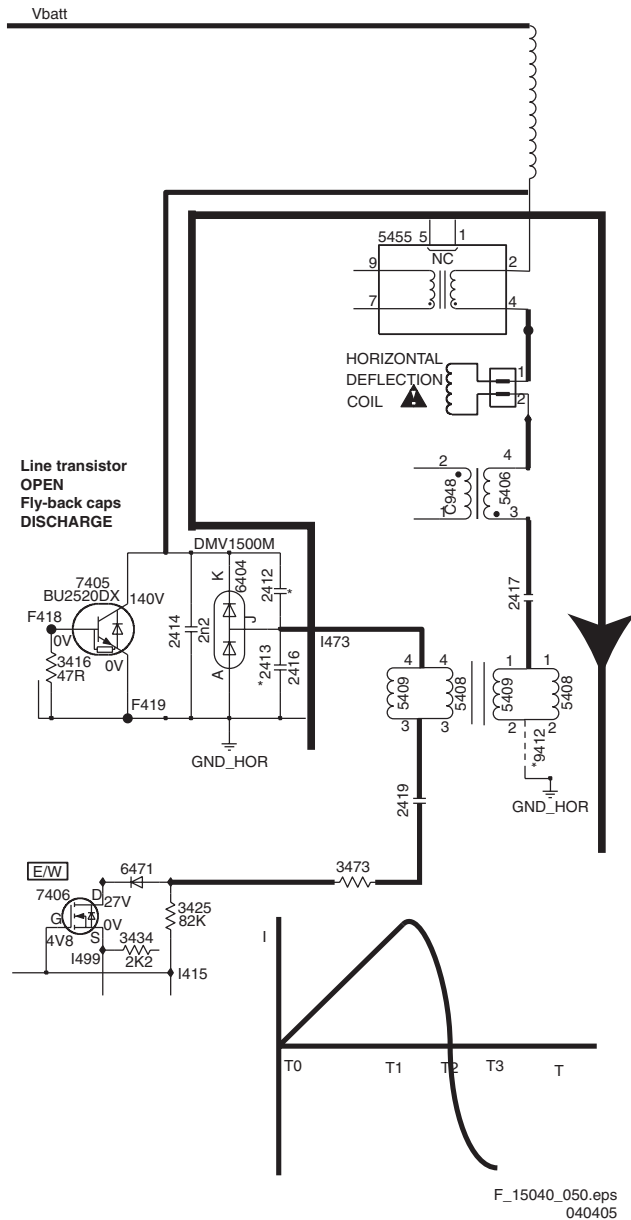


Figure 9-4 Deflection T2 - T3

At T2 the deflection current is 0 Amp. The fly-back capacitor (2412/2413/2414) is charged to approximately 1200 V and will discharge now. As a result of this, the deflection current will bend the electron beam to the left of the screen.

T3 - T4

Deflection T3-T4

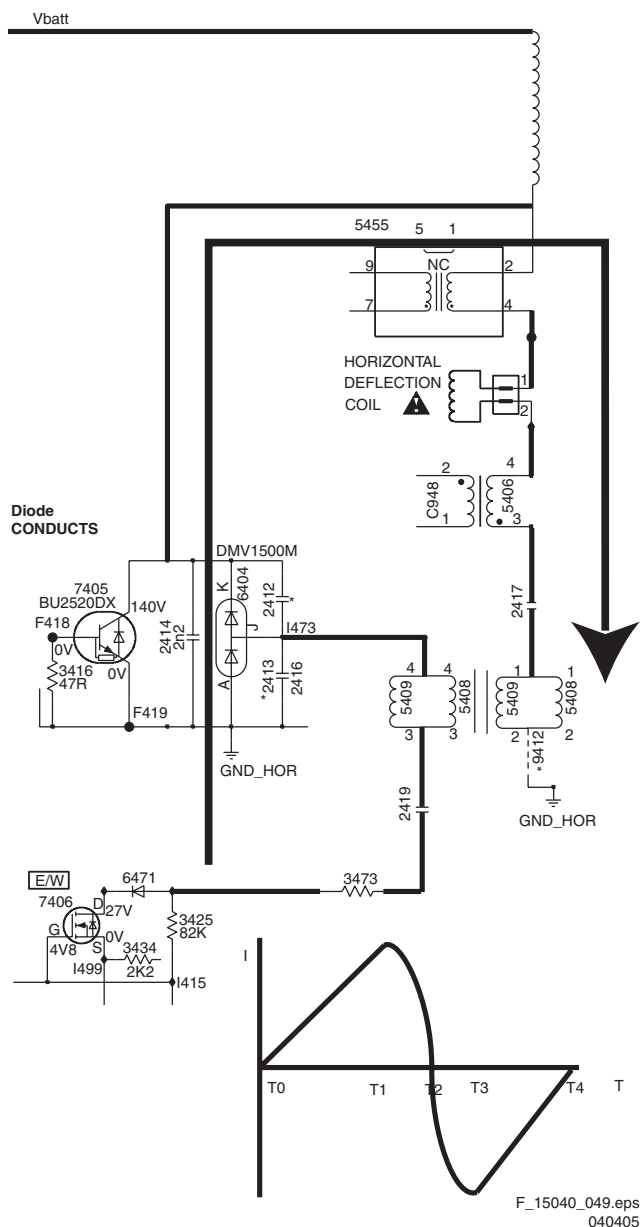


Figure 9-5 Deflection T3 - T4

When the fly-back capacitor (2412/2413/2414) is discharged, the current is at its maximum negative level. This maximum negative current will then charge the fly-back capacitor (2412/2413/2414) with a negative voltage. At this moment, fly-back diode 6404 will start conducting. The voltage at Scap 2418 causes a linear current flow from T3 - T4. This causes a deflection current which bends the electron beam back from the left to the centre of the screen.

9.2.2 Standby and Start Up

In Standby mode, both +5V and Vbatt are not available in order to meet the standby power saving requirement.

During the start-up phase, +5V is switched on by STANDBY via 7548/7547/7545 and Vbatt is switched on by STANDBY via 7573.

After this, Hdrive is output from the SSB to driver 7404 (see circuit diagram A2), and consequently to the deflection output stage (7405). During the slow start-up phase, the Hdrive duty cycle gradually increases from small to normal. At the

beginning of the start-up phase, the driver receives its +5V supply via 3421 and 6465 (see circuit diagram A2). During the slow start-up phase, the LOT 5450 pin9 voltage gradually increases, and finally takes over the supply of the +5V voltage, to supply 5402/7404 via 6403/3493/3451/3419/3432/3415/3414.

At the end of the slow start-up phase, the deflection stage is operating at its normal operating condition and all the voltages are stabilized. Then, the +13V volt supply has fully replaced the +5V supply to power the horizontal output stage.

At that moment, not only the horizontal deflection, but also the vertical deflection is functioning at its normal operating conditions.

9.2.3 Normal Operation and Horizontal Deflection

In normal operation mode, the Hdrive with its 45/55 duty cycle is switching on and off 7404 (see circuit diagram A2). The driver stage is working in flyback mode: When 7404 is on, 5402 retains its flux energy and also switches off 7405 via its secondary coil during flyback mode. When 7404 is switched off, 5402 releases its energy and turns on 7405. By means of the on-off switching process, a sawtooth yoke deflection current is generated.

There are various circuits that are part of the horizontal deflection circuit.

These will be discussed below:

Horizontal Output Stage:

This is a standard circuit (see circuit diagram A2), in which the main horizontal output stage consists of driver 7404/5402, line output transistor 7405, tuning capacitor 2411/2414, Scap 2417/2418 and diode modulator 6404/2413/2416.

Anti-Curtain Effect (Anti-Beta Ringing) Circuit:

5410/2427/3433 (see circuit diagram A2) are the anti-beta ringing circuit that is tuned to and suppresses the parasitic ringing frequencies normally occurring in Slot type LOTs to an acceptable level. For Layer type LOTs, these components are not required and 9410 is the jumper alternative for Layer type LOTs.

Beta Ringing, if not suppressed, will cause a type of interference which is visible as a curtain effect at the left edge of the screen. This interference is caused by the high amplitude ringing energy being coupled magnetically or via an electrically conducting path from the LOT to the small signal circuit. If the ringing is suppressed to a specific level, the interference will not be visible anymore.

DAF Circuit:

5455/2402/2403/2405/2406 (see circuit diagram A2) are the DAF circuit that will be used in DAF or double focus CRT tubes. For single focus tubes, these components are not required; 9411 is the jumper alternative for non-DAF tubes.

The DAF circuit is used to improve the dynamic focusing of the tube, particularly in the edge areas. The DC high voltage of constant level which is supplied to the focus electrode is referred to as static focus or single focus. In addition to that, an AC parabolic waveform (derived from the vertical and/or the horizontal deflection voltages) can be superimposed onto the DC static focus voltage; this extra AC focusing voltage will then correct the focus dynamically, corresponding to the scan position at that particular moment. This is what we refer to as DAF (Dynamic Astigmatism and Focusing; a method to keep the electron spot round and focused during the whole scan).

Transformer 5455 takes the horizontal deflection current as its input and transfers its energy to the capacitor (2402/2403/2405/2406) on its secondary side. The current in the secondary

coil of the transformer charges the capacitor and this results in a parabolic waveform. The parabolic waveform is fed to connector 1402 of the LOT focus cable and is coupled via an internal 500 pF capacitor inside the LOT and superimposed onto the static focus voltage.

2nd order S-correction circuit:

5406/2407/3403 (see circuit diagram A2) are the 2nd order S-correction circuit, which is used mainly in large wide screen tubes, because they are prone to scanning imperfections that need 2nd order S-correction. For 4x3 tubes or relatively small wide screen tubes, these components are not required, and then 9401 is the jumper alternative for them.

Due to the relatively wide angle of large wide screen flat tubes, the inner tube surface (which is flat) and the surface scanned by the electron beam (which is spherical) are very far apart, especially at the edges. This is because both areas are nowhere parallel with respect to each other (as they ideally would have to be). The larger and wider the screen size is, the more visible the unwanted phenomenon resulting from this optical misalignment will be. The phenomenon manifests itself, because the horizontal scanning will be wider at the 1/4 and 3/4 position, but narrower at the centre and edge position. Note that this is different from S-correction (correct centre-versus-edge scanning) and Linearity Correction (correct left-versus-right scanning).

To carry out the 2nd order S-correction, transformer 5406 takes the horizontal deflection current as its input and transfers it to capacitor 2407 on its secondary side. Together with the yoke coil, capacitor 2407 forms a tuning circuit, and this circuit modifies the yoke current during the 1/4 and 3/4 scanning position. In this way, the modified yoke current compensates the imperfections that are caused by the CRT geometry.

The function of resistor 3403 is to prevent the secondary circuit from floating. It pulls DC components of the correction voltages to gnd.

Dynamic S-correction Circuit (Inner-Pincushion):

5408/5409/2419 (see circuit diagram A2) form the dynamic S-correction circuit, which is mainly used in relatively large wide screen tubes. This is, because they are prone to optical inner pincushion distortions. For 4x3 tubes or relatively small wide screen tubes, these components are not required; in that case, 9412 is the jumper alternative for them.

As has been explained earlier, due to the relatively wide angle of large wide screen flat tubes, the inner tube surface (flat) and the scanning surface (spherical) can never be perfectly parallel to each other, so optical distortions will be the result, especially at the edges of the screen. The first imperfection that will become visible is the phenomenon called pin-cushion distortion; this can be corrected by the East West circuit for distortions in the proportions of the top/bottom versus centre area (distortions in the proportions in the vertical direction have to be corrected as well, see further down in this text).

Additionally, the larger and wider the screen size becomes, the more clearly a second unwanted phenomenon will become visible, called inner pincushion distortion. This happens because, when two corresponding horizontal scanning lines are compared, the top one and the centre one will have different centre-versus-edge scanning length ratios (when the vertical line at the edge of the screen has been corrected by the East West circuit, the vertical lines at the 1/4 and 3/4 positions will still be concave. Note that this phenomenon is different from 2nd-order S-distortion.)

To correct the dynamic S-distortion, the East West correction circuit has to generate a deflection current which is higher at the centre scanning position of the screen than at the top/bottom positions. With the Bridge coil 5408/5409, this higher

extra current generates a parabolic waveform across 2419 at the centre scanning position. The parabolic waveform is superimposed (series-added) onto the S-cap voltage (2417/2418); in this way, a more parabolic waveform is obtained which corrects the inner pincushion distortion.

East West correction Circuit:

Together with diode modulator 2413/2416/6404, components 6471/7406/3425/2425 form the main East-West correction circuit. The circuit is a current drive circuit driven by MOSFET 7406. 3425 and 2425 function as a simple RC filter with the task of filtering the horizontal pulses in the diode modulator stage. The parabolic current source for the EW-drive comes from the SSB and modulates the diode modulator voltage by means of 7406. Because 7406 is in series with Scap 2417/2418), the diode modulator voltage plus the Scap voltage are always equal to Vbatt. So, by modulating the diode modulator voltage, we are able to modulate the Scap voltage, and so the deflection current and scanning width as well.

EHT-info Compensation:

In addition to the EHT-info compensation feedback to the SSB IC, components 3422/3423/6424/3424/3435/6425/3437/2437/2422 are the EHT-info compensation circuit that injects beam information into the East-West correction circuit to achieve better compensation.

Waveform "EHT-info" is a voltage source which is derived from lbeam; the voltage is injected via the EHT-info compensation circuit mentioned above, and modulates the East West circuit.

Beam Current and Horizontal Flyback:

The beam current is determined by 3480/3491/3453/3492/6478 (see circuit diagram A2), while 2450/2451 filters out the high frequency info.

The horizontal flyback circuit is provided with an X-ray protection function; for this reason the combined circuit bears the name Hfb_Xray_Prot. Hfb is derived from the heater pulses via 2477 and 2476 and clamped by 3477/6474. The protection is realized by 7486. The SSB monitors the Hfb_Xray_Prot voltage and will go into protection mode if this voltage is low without pulses.

damaged if the vertical scanning circuit is not working and all the beam energy is concentrated on one spot of the CRT neck.

The function of diode 6457 is to isolate the small signal supply from the flyback supply boost up voltages.

9.2.5 Protection

The protections are realized by 7407/7456/7486. All the protection voltages coming from the various protection circuits like: the vertical protection (3459/6459), the bridge coil protection (5411/6405/3479), the X-ray protection (6480/7408/3460/3462/3465/3469) and the East West protection (7403/3473/3488/3417/2495) are combined in 7407/7456/7586.

If a protection circuit is triggered, the protection triggering voltage will turn on 7407 and consequently 7486, which will pull the Hfb-Xray_Prot voltage low. The SSB will respond to this triggering signal and will shut down the deflection circuit

9.3 Software Upgrading

In this chassis, you can **upgrade** the software via ComPair. This offers the possibility, to replace the entire SW image without having to remove the flash-RAM from its socket. You can find more information on how this procedure works in the ComPair file. It is possible that not all sets are equipped with the hardware, needed to make software upgrading possible. To speed up the programming process, the firmware of the ComPair interface can be upgraded. See Chapter "Service Modes ..."; paragraph "ComPair" - "How To Order" for the order number.

9.2.4 Vertical Deflection

IC 7455 (see circuit diagram A2) is the differential vertical deflection amplifier. The amplification gain is determined only by 3461/3476 and 3470/3471/3472. The SSB IC output is a differential vertical current source to 7455 and its signal is amplified and output as a vertical deflection current through the vertical yoke coil.

IC 7455 has a separate flyback supply (on its VFB pin) which is tapped from the positive portion of the heater voltage. The flyback heater voltage charges 2461 via 6476/3487 and is clamped by 6458.

The vertical scanning voltage (on pin V-OUT of 7455) varies between +13V and -14V.

Components 3466/2468 are for pole-zero compensation purposes and suppress oscillation tendencies.

Components 3467/3468 suppress horizontal coupling, and also suppress noise.

Components 3459/6459 are part of the circuit which protects the CRT tube from burning in, in case someone accidentally unplugs the vertical yoke or disconnects the power supply of 7455. Without this protection, the picture tube neck may be

9.4 Abbreviation List

		D/K	Monochrome TV system. Sound carrier distance is 6.5 MHz. D= VHF-band, K= UHF-band
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	DAC	Digital to Analogue Converter
2CS	2 Carrier Sound	DAF	Dynamic Astigmatism and Focusing; a method to keep the electron spot round and focused during the whole scan
A2	Commonly known as 2 Carrier Sound (2CS) system	DBE	Dynamic Bass Enhancement; extra low frequency amplification
AC	Alternating Current	DC	Direct Current
ACI	Automatic Channel Installation: algorithm that installs TV channels directly from a cable network by means of a predefined TXT page	DCC	Dynamic Contrast Control
		DC-filament	Filament supply voltage
ADC	Analogue to Digital Converter	DEGAUSS	Control line. Logic LOW to enable CRT degaussing. Logic HIGH to disable the CRT degaussing.
ADOC	Analogue Digital One Chip		Directions For Use: owner's manual
AFC	Automatic Frequency Control: control signal used to tune to the correct frequency	DFU	Digital Noise Reduction; Noise reduction feature of the set / Dynamic Noise Reduction
		DNR	Digital Noise Reduction; Noise reduction feature of the set / Dynamic Noise Reduction
AGC	Automatic Gain Control: algorithm that controls the video input of the feature box	DNR	Digital Noise Reduction; Noise reduction feature of the set / Dynamic Noise Reduction
AM	Amplitude Modulation		Digital Output Processor (Part of ADOC which takes care of RGB control and deflection)
ANC	Automatic Noise Reduction; One of the algorithms of Auto TV	DOP	Dolby Pro Logic
AP	Asia Pacific		Dolby Pro Logic
AR	Aspect Ratio: 4 by 3 or 16 by 9	DPL	Dolby Pro Logic
ASD	Automatic Standard Detection	DPL	Dolby Pro Logic
AUDIO-SL	Audio Surround Left	DRAM	Dynamic RAM; dynamically refreshed RAM
AV	Audio Video		Dynamic RAM; dynamically refreshed RAM
AVL	Automatic Volume Level control	DRAM	Dynamic RAM; dynamically refreshed RAM
B-SC1-IN	Blue SCART1 in		Digital Scan
B-SC2-IN	Blue SCART2 in	DS	Digital Signal Processing
B-TXT	Blue teletext	DSP	Dealer Service Tool; Special remote control designed for dealers to enter e.g. service mode (a DST-emulator is available in ComPair)
B/G	Monochrome TV system. Sound carrier distance is 5.5 MHz	DST	Digital Theatre Sound
BBD	Black Bar Detection		Digital Versatile Disc
BCL	Beam Current Limiter	DTS	Digital Visual Interface (d= digital only) (i= integrated); A digital video interface to a display, designed to replace the analogue YPbPr or RGB interface
BC-PROT	PROtection signal to the microprocessor in case of a too high Beam Current.	DVD	Double Window
		DVI(-d)(-i)	Dynamic phase correction, to correct the phase of the H-drive
BLC-INFO	BLack Current INFO.		Electrically Erasable and Programmable Read Only Memory
BLD	BLack Level Detection.		Extreme High Tension; the voltage between the cathode and the shadow mask that accelerates the electrons towards the screen (around 25 kV)
BS	BLack Stretch.		Extra High Tension INFORMATION, used for contrast reduction, vertical and horizontal amplitude correction, beam current protection, and flash detection
BTSC	Broadcast Television Standard Committee; Multiplex FM stereo sound system, originating from the USA and used e.g. in LATAM and AP-NTSC countries.	DW	
		DYN-FASE-COR	
		EEPROM	
C	Centre channel (audio) or Chroma; The NTSC/PAL/SECAM video signal contains two parts that make up what we see on the display; the luminance (or intensity) part and the colour (or chroma) part	EHT	
		EHT-INFO	
CBA	Circuit Board Assembly (or PWB)		
CL	Constant Level: audio output to connect with an external amplifier		
CLUT	Colour Look Up Table	EMI	Electro Magnetic Interference; Leakage of high-frequency radiation from a transmission medium
ComPair	Computer aided rePair		Electronic Program Guide; System used by broadcasters to transmit TV guide information (= NexTView)
CRT	Cathode Ray Tube (or picture tube)	EPG	Erasable Programmable Logic Device
CSM	Customer Service Mode		EUrope
CTI	Colour Transient Improvement; Manipulation of the steepness of the chroma transients	EPLD	
		EU	
CVBS	Composite Video Blanking and Synchronisation	EW	East West, related to horizontal deflection of the set
CVBS-EXT	CVBS signal from external source (VCR, VCD, etc.)	EW-DRIVE	East -West correction drive signal.
CVBS-INT	CVBS signal from Tuner	EXT	EXTernal (source), entering the set by SCART or by cinches (jacks)
CVBS-MON	CVBS monitor signal		Fast Blanking: DC signal accompanying RGB signals
CVBS-TER-OUT	CVBS terrestrial out	FBL	Fast blanking signal for SCART1 in
CVI	Component Video Input	FBL-SC1-IN	Fast blanking signal for SCART2 in
		FBL-SC2-IN	

FBL-TXT	Fast Blanking Teletext		half the number of the total amount of lines. The fields are written in "pairs", causing line flicker.
FBX	Feature BoX; Part of the small signal board /separate module which contains 100 Hz processing, extra features and AutoTV algorithms (FBX6= based on PICNIC, FBX7= based on PICNIC and Eagle, FBX8= based on PICNIC, Eagle, and Columbus)	IO	In/Out
		IR	Infra Red
		IROM	Internal ROM (inside the microcontroller)
		IRQ	Interrupt ReQuest
		ITV	Institutional TV
FE	Front End; Tuner and RF part together	JTAG	Joint Test Action Group; Definition for a standardised serial test interface
FLASH	FLASH memory		Front panel keyboard
Field	Each interlaced broadcast FRAME is composed of two Fields, each Field consists of either Odd or Even lines	KEYB	Input line. Carries the voltage value of the corresponding tact switch on TOP-control or FRONT-control keypad
		KEYBOARD	
Filament	Filament of CRT		
FLASH	FLASH memory	L	Left audio channel
FM	Field Memory / Frequency Modulation	L/L'	Monochrome TV system. Sound carrier distance is 6.5 MHz. L' is Band I, L is all bands except for Band I
FM-Radio	Radio receiver that can receive the FM Band 87.5 - 108 MHz		The settings last chosen by the customer and read and stored in RAM or in the NVM. They are called at start-up of the set to configure it according to the customer's preferences
FMR	FM Radio	Last Status	
Frame	A complete TV picture comprising all lines (625/525)		
FRAMEDRIVE -	Differential frame (vertical) drive signal (negative)	LATAM	LATIn America
FRAMEDRIVE +	Differential frame (vertical) drive signal (positive)	LCD	Liquid Crystal Display
FRC	Frame Rate Converter	L-CL_VLOUT	REAR CINCH stereo output
FRONT-C	Front input chrominance (SVHS)	LED	Light Emitting Diode
FRONT-DETECT	Control line for detection of headphone insertion, Service Mode jumper, power failure detection	LFE	Low Frequency Enhancement audio channel
	Front input luminance or CVBS (SVHS)	L-FRONT-IN	EXT3 stereo input
FRONT-Y_CVBS		LIGHT-SENSOR	Ambient light intensity signal.
FTV	Flat TeleVision	LINE DRIVE	Horizontal (line) deflection drive signal (for the Line transistor)
G	Green	LNA	Low Noise Adapter / Low Noise Amplifier
G-SC1-IN	Green SCART1 in		
G-SC2-IN	Green SCART2 in	LOT	Line Output Transformer (also called FBT); The transformer in which the EHT is generated
G-TXT	Green teletext		
Gb/s	Giga bits per second	LS	Loud Speaker
H	H_sync to the module	LS, Rs	Left surround and Right surround channel (audio)
H-2FH	Horizontal sync input for the 2fH source	LSP	Large Signal Panel
H-A50	Horizontal Acquisition 1fH: horizontal sync pulse coming out of the HIP	Lt, Rt	Left total and Right total in case of a Dolby ProLogic encoded signal (audio)
H-D100	Horizontal Drive 2fH; Horizontal sync pulse coming out of the Feature Box		
H-DRIVE	Horizontal Drive	LTI	Luminance Transient Improvement
H-FLYBACK	Horizontal Flyback	LTP	Luminance Transient Processor
H-OUT	H_sync output of the module / Horizontal Output pulse	LUT	Look Up Table
HA	Horizontal Acquisition; horizontal sync pulse	LVDS	Low Voltage Differential Signalling, data transmission system for high speed and low EMI communication.
HD	High Definition: 720p, 1080i, 1080p	M/N	Monochrome TV system. Sound carrier distance is 4.5 MHz. M= 525 lines @ 60 Hz, N= 625 lines @ 50 Hz
HDMI	High Definition Multimedia Interface, digital audio and video interface		
HEADPHONE-L	Stereo headphone (Left) signal output.	Mb/s / Mbps	Mega bits per second
HEADPHONE-R	Stereo headphone (Right) signal output.	MCS	Multi Channel Sound: refers to Dolby Pro Logic Surround in ES1E ADOC
HFB	Horizontal Flyback Pulse; Horizontal sync pulse from large signal deflection	MDO	Mode control data output
HP	Head Phone	MIPS	Microprocessor without Interlocked Pipeline-Stages; A RISC-based microprocessor
HW	Hardware		
I	Monochrome TV system. Sound carrier distance is 6.0 MHz. VHF- and UHF-band	Mips	Million instructions per second
I ² C	Inter IC bus (also called IIC)	MMI	Multi Media Interface
I ² S	Inter IC Sound bus	MOSFET	Metal Oxide Semiconductor Field Effect Transistor
IC	Integrated Circuit	MPEG	Motion Pictures Experts Group
IDRIVE-	Vertical drive -	MPIF	Multi Platform InterFace (Part of Salsa chipset, sister-chip of ADOC IC)
IDRIVE+	Vertical drive +		
IF	Intermediate Frequency	MPIP	Multi Picture in Picture; Commercial feature showing several frozen or moving pips
IF-TER	IF signal from main tuner		
IIC	Inter IC bus (also called I2C)	MPX	MultiPleX
Interlaced	Scan mode where two fields are used to form one frame. Each field contains	MSP	Multi-standard Sound Processor: ITT sound decoder

MUTE	MUTE Line	RDS	Radio Data System (European); This is an MPX signal carried in FM radio channels (87.5 ... 108 MHz)
NAFTA	North American Free Trade Association: Trade agreement between Canada, USA and Mexico	RESET	RESET signal
NC	Not Connected	RF	Real Flat (picture tube) or Radio Frequency
NDF	No vertical Deflection; Vertical fly back protection	RGB	Red, Green, and Blue colour space; The primary colour signals for TV. By mixing levels of R, G, and B, all colours (Y/C) are reproduced
NHF	No Horizontal deflection; Horizontal fly back protection	RGBHV	Red, Green, Blue, Horizontal sync, and Vertical sync
NICAM	Near Instantaneously Companded Audio Multiplexing; This is a digital sound system, mainly used in Europe	RISC	Reduced Instruction Set Computer; A processor architecture based on ultra-high speed processing technology that uses a far simpler set of operating commands than a normal microprocessor does
NTC	Negative Temperature Coefficient, non-linear resistor (resistance decreases if temperature increases)	RMS	Root Mean Square value
NTSC	National Television Standard Committee. Colour system used mainly in North America and Japan. Colour carrier NTSC M/N = 3.579545 MHz, NTSC 4.43 = 4.433619 MHz (this is a VCR norm, it is not transmitted off-air)	ROM	Read Only Memory
NVM	Non Volatile Memory; IC containing data such as alignment values, preset stations	S	Surround channel or mono surround channel (audio)
O/C	Open Circuit	SALSA	System Application for Low Segment of Analogue TV
OB	Option Byte	SAM	Service Alignment Mode
OC	Open Circuit	SAP	Secondary Audio Program; Generally used to transmit audio in a second language
ON/OFF LED	On/Off control signal for the LED	SAW	Surface Acoustic Wave
ON/STBY	On/Standby	SC	SandCastle: two-level pulse derived from sync signals
ON-OFF-LED	Active-LOW control line. Logic LOW = red LED "on", HIGH = red LED "off"	SCART	Syndicat des Constructeurs d'Appareils Radiorécepteurs et Téléviseurs; This is a 21-pin connector used in EU, that carries various audio, video, and control signals (it is also called Péritel connector)
OP	Option Byte	SCAVEM	Scan Velocity Modulation; Advanced beam control technology, which results in sharper edges on all images for outstanding clarity
OSD	On Screen Display	SC1-OUT	SCART output of the MSP audio IC
P50	Project 50; Communication protocol between TV and peripherals	SC2-B-IN	SCART2 Blue in
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)	SC2-C-IN	SCART2 chrominance in
PC	Personal Computer	SC2-OUT	SCART output of the MSP audio IC
PCB	Printed Circuit Board (or PWB)	S/C	Short Circuit
PCM	Pulse Code Modulation	SCL	Serial Clock signal on I ² C bus
PILOT	Pilot Signal	SCL-F	Serial CLock signal on Fast I ² C bus
PIG	Picture In Graphic	SD	Standard Definition
PIP	Picture In Picture	SDA	Serial Data line of I ² C bus
PLL	Phase Locked Loop; Used for e.g. FST tuning systems. The customer can directly provide the desired frequency	SDA-F	Data Signal on Fast I ² C bus
POR	Power On Reset; Signal to reset the μ P	SDM	Service Default Mode
POR-FLASH	Signal that informs the micro controller (painter) that set will switch "off"	SDAM	Service Default / Alignment Mode
Progressive Scan	Scan mode where all scan lines are displayed in one frame at the same time, creating a double vertical resolution.	SDRAM	Synchronous DRAM
PTC	Positive Temperature Coefficient, non linear resistor (resistance increases if temperature increases)	SECAM	SÉquence Couleur Avec Mémoire; Colour system mainly used in France and East Europe. The chroma is FM modulated and the R-Y and B-Y signals are transmitted line sequentially. Colour carriers= 4.406250 MHz and 4.250000 MHz
PTP	Picture Tube Panel	SEL-SVHS-RR-STATUS2	SVHS Selection Signal
PWB	Printed Wiring Board (also called PCB or CBA)	SIF	Sound Intermediate Frequency
PWM	Pulse Width Modulation	SIMM	Single In-line Memory Module; 80-fold connector between LSP and SSB
QSS	Quasi Split Sound	SL	Single In-line Memory Module; 80-fold connector between LSP and SSB
R	Right audio channel / Red	SLDP	Smart Local Dooming Prevention (HW and SW)
RAM	Random Access Memory	SMC	Surface Mounted Component
RC	Remote Control transmitter	SMPS	Switched Mode Power Supply
RC5 (6)	Remote Control system 5 (6), the signal from the remote control receiver	SND	SouND
		SNDL-SC1-IN	Sound left SCART1 in
		SNDL-SC1-OUT	Sound left SCART1 out

SNDL-SC2-IN	Sound left SCART2 in
SNDL-SC2-OUT	Sound left SCART2 out
SNDR-SC1-IN	Sound right SCART1 in
SNDR-SC1-OUT	Sound right SCART1 out
SNDR-SC2-IN	Sound right SCART2 out
SNDR-SC2-OUT	Sound right SCART2 out
SNDS-VL-OUT	Surround sound left variable level out
SNDS-VR-OUT	Surround sound right variable level out
SNERT	Synchronous No parity Eight bit Reception and Transmission
SOG	Sync On Green
SOPS	Self Oscillating Power Supply
SOUND-ENABLE	Control line to do hardware mute or un-mute of loudspeakers.
SRAM	Static RAM
SRAM	Static RAM
SS	Small Screen
ST-BY	STandBY
STANDBY (POR)	Signal coming from Main Supply informing the supply is switching "off"
STATUS	Status signal from pin 8 of SCART connector
STBY	STandBY
SVHS	Super Video Home System
SW	Software or Subwoofer or Switch
TBD	To Be Defined
THD	Total Harmonic Distortion
TILT	PWM Output signal (variable DC level) to control the picture tilt from the DOP block of the ADOC.
TXT	Teletext; TXT is a digital addition to analogue TV signals that contain textual and graphical information (25 rows x 40 columns). The information is transmitted within the first 25 lines during the Vertical Blank Interval (VBI)
TXT-SW	Teletext switch
U-100	U signal 1fH (after Feature Box)
UART	Universal Asynchronous Receiver Transmitter
UBE	Ultra Bass Enhancement
µC	Microcontroller
UI	User Interface
UOC	Ultimate One Chip
µP	Microprocessor
UV	Colour difference signals
V	V_sync
V-100	V_sync from Feature Box (2fH)
V-2FH	Vertical sync input for the 2fH source.
VA50	Vertical Acquisition 1fH
V-AMP	Vertical Amplitude DAC output
V-BAT	Main supply for deflection (usually 141 V)
VD-100	Vertical Drive 2fH; vertical sync pulse from deflection
VD-NEG	One of the symmetrical drive signals for the DC frame output stage.
VD-POS	One of the symmetrical drive signals for the DC frame output stage
V-OSD	Vertical sync OSD
VA	Vertical Acquisition
VBI	Vertical Blanking Interval; Time during which the video signal is blanked when going from bottom to top of the display
V-chip	Violence chip. Adds content filtering capabilities to NTSC video
VCR	Video Cassette Recorder
VD	Vertical Drive; Vertical sync pulse coming from the Feature Box
VDS	Virtual Dolby Surround
VERT	Vertical Output pulse
VESA	Video Electronics Standards Association
VGA	Video Graphics Array
VGND	Video ground

VGUARD	Vertical guard voltage
VIF	Video Intermediate Frequency
VL	Variable Level out; Processed audio output towards external amplifier
VOL (+/-)	Volume (+/-)
V-SYNC-VGA	V_sync on VGA connector
WD	Watch Dog
WE	Write Enable control line
WS	Wide Screen; Screens with an aspect ratio of 16:9
WSS	Wide Screen Signalling; Used by broadcasters to transmit e.g. PALPLUS and 16:9 Aspect Ratio
WST	World System Teletext
WXGA	1280x768 (15:9) or 1366x768 (16:9)
WYSIWYR	What You See Is What You Record: record selection that follows main picture and sound
XGA	Extended Graphics Array; 1024x768 (4:3)
XTAL	Quartz crystal
Y	Luminance signal
YPbPr	Component video (Y= Luminance, Pb/Pr= Colour difference signals B-Y and R-Y, other amplitudes w.r.t. to YUV)
Y/C	Y consists of luminance signal, blanking level and sync; C consists of chroma (colour) signal
Y-OUT	Luminance-signal
YUV	Colour space used by the NTSC and PAL video systems. Y is the luminance and U/V are the colour difference signals

9.5 IC Data Sheets

This section shows the internal block diagrams and pin layouts of ICs that are drawn as "black boxes" in the electrical diagrams (with the exception of "memory" and "logic" ICs). This is not applicable to this manual.

10. Spare Parts List

Large Signal Panel [A]

Various

0080	4822 492 70789	Transistor clamp
0136	3104 301 24181	Spring for Bracket
0137	3104 301 24181	Spring for Bracket
0138	4822 255 41371	Transistor clamp
0139	4822 492 62076	Transistor clamp
0261	3104 304 10661	Cable clamp
0262	3104 304 10722	Cable clamp
0320	4822 255 41371	Transistor clamp
0341	4822 492 70788	IC clamp
0389	4822 492 70789	Transistor clamp
0395	4822 492 70789	Transistor clamp
0396	4822 492 70789	Transistor clamp
1205	2422 025 17242	Connector 80p f
1417	4822 265 20723	Connector 2p m
1424	2422 025 11244	Connector 7p m
1491	4822 267 10973	Connector 1p m
1498	2422 025 04849	Connector 2p m
1499	2422 025 04849	Connector 2p m
1501	4822 070 35002	Fuse 5A
1502	4822 267 10774	Connector 2p m Rd
1503	4822 070 12502	Fuse 2.5A
1505	2422 025 16374	Connector 2p m
1511	4822 265 11253	Fuse holder 2p
1512	4822 265 11253	Fuse holder 2p
1550	2422 132 07411	Relay 1p 5V 5A
1590	4822 252 60151	Sparkgap dsp501
1591	4822 252 60151	Sparkgap dsp501
1601	2422 086 10919	Fuse 65V 125mA
1620	4822 267 10735	Connector 3p m
1625	2422 025 16382	Connector 3p m
1735	4822 267 10565	Connector 4p
1901	4822 267 10771	Socket 2 x SCART
1902	4822 267 10982	Connector 2p
1936	2422 025 12485	Connector 11p m
1940	2422 025 12485	Connector 11p m
1943	4822 267 10748	Connector 3p m
1945	4822 267 10735	Connector 3p m
1947	4822 267 10734	Connector 5p m
8000	3104 311 03272	Cable 640mm EHT
8193	4822 320 20216	Focus cable 364 mm
8194	4822 320 20189	Cable HT-focus 44cm Rd
8417	3104 311 04561	Cable 2p3/400/2p3
8424	3104 311 02991	Cable 7p/560/7p Wh
8625	3104 311 03101	Cable 3p/560/3p Bk
8625	3104 311 06261	Cable 2p/560/2p3 HR BK INS
8936	3104 311 04121	Cable 11p/680/11p INS
8936	4822 320 12514	Cable 11p 680mm
8940	3104 311 01161	Cable 11p/340/11p Bk
8940	4822 323 10458	Cable 11p 480mm HR WH

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2100	4822 126 13841	1nF 20% 250V
2101	4822 121 51598	2.2nF 5% 400V
2102	4822 124 40248	10μF 20% 63V
2103	2020 552 94427	100pF 5% 50v 0603
2104	4822 123 14025	2200μF 20% 16V
2105	2020 552 94427	100pF 5% 50v 0603
2107	4822 121 43855	3.3nF 5% 400V
2108	4822 121 70162	10nF 5% 400V
2109	4822 126 14472	1μF 10% 10V 0805
2110	4822 126 14472	1μF 10% 10V 0805
2111	4822 121 43526	47nF 5% 250V
2112	5322 126 11583	10nF 10% 50V 0603
2115	4822 124 40764	22μF 100 V
2116	4822 126 13682	100pF 5% 1kV
2118	4822 124 80061	1000μF 20% 25V
2119	4822 123 14025	2200μF 20% 16V
2120	4822 126 13682	1.5nF 10% 2kV
2126	4822 123 14025	2200μF 20% 16V
2130	5322 126 11583	10nF 10% 50V 0603
2131	4822 126 13881	470pF 5% 50V
2132	4822 126 10206	2.2nF 10% 500V
2140	4822 124 40248	10μF 20% 63V
2141	4822 124 40248	10μF 20% 63V
2143	4822 126 10206	2.2nF 10% 500V
2144	4822 126 14472	1μF 10% 10V 0805
2145	4822 126 13881	470pF 5% 50V
2147	3198 017 31530	15nF 20% 50V 0603
2148	4822 126 13599	3.3nF 10% 500V
2149	4822 126 14472	1μF 10% 10V 0805
2150	5322 126 11583	10nF 10% 50V 0603

2153	5322 126 11582	6.8nF 10% 63V
2154	4822 126 14549	33nF 16V 0603
2161	2020 558 90556	680pF 10%b 1kV
2161	4822 126 14152	680pF 10% 1kV
2163	2222 338 22104	100nF 20% 275V
2200	4822 124 40248	10μF 20% 63V
2201	4822 126 13879	220nF 20% 16V
2202	4822 126 13473	220nF 80-20% 50V
2203	4822 124 41584	100μF 20% 10V
2400	4822 124 11936	47μF 20% 160V
2401	4822 121 42077	6.8nF 10% 400V
2402	4822 124 12373	47μF 20% 250V
2403	2238 916 15641	22nF 10% 25V 0603
2404	2238 916 15641	22nF 10% 25V 0603
2405	4822 126 13841	1nF 20% 250V
2412	3198 024 44730	47nF 50V 0603
2413	4822 124 12255	10μF 20% 50V
2414	3198 024 44730	47nF 50V 0603
2415	4822 126 13883	220pF 5% 50V
2417	4822 126 14076	220nF 25V. 20%
2419	4822 126 14237	470pF 10% 2kV
2420	4822 121 70581	1.5nF 5% 2kV
2420	4822 121 70594	1nF 5% 2kV
2421	2038 301 00312	1.2μF 5% 250V
2421	4822 121 42634	560nF 5% 250V
2425	4822 121 10526	9.1nF 5% 2kV
2425	4822 121 70435	10nF 5% 2kV
2426	4822 121 10653	22nF 5% 630V
2430	4822 126 10206	2.2nF 10% 500V
2431	4822 126 10206	2.2nF 10% 500V
2433	2022 333 00087	510nF 5% 250V
2433	2022 333 00163	360nF 5% 250V
2440	2020 552 96448	1μF 10% 16V
2443	9965 000 09661	470pF 50V 10%
2448	5322 122 32268	470pF 5% 63V
2450	4822 121 42408	220nF 10% 50V
2450	5322 121 42578	100nF 5% 250V
2451	2020 012 93757	1000μF 20% 10V
2454	3198 017 31530	15nF 20% 50V 0603
2455	5322 126 11578	1nF 10% 50V 0603
2457	4822 126 13188	15nF 5% 63V
2458	4822 126 14241	330pF 50V 0603
2460	4822 124 81144	1000μF 16V
2461	4822 122 31169	1.5nF 10% 500V
2461	4822 126 11524	1.5nF 10% 1kV
2462	4822 124 11767	470μF 20% 25V
2463	4822 122 31177	470pF 10% 500V
2464	4822 124 11767	470μF 20% 25V
2465	4822 122 31177	470pF 10% 500V
2466	2238 586 59812	100nF 20-80% 50V 0603
2468	4822 122 31177	470pF 10% 500V
2480	5322 126 11582	6.8nF 10% 63V
2482	3198 017 34730	47nF 16V 0603
2483	3198 017 31530	15nF 20% 50V 0603
2490	4822 124 41584	100μF 20% 10V
2491	4822 124 81151	22μF 50V
2492	4822 124 41584	100μF 20% 10V
2494	2238 780 15654	220nF 10% 16V
2495	2238 780 15654	220nF 10% 16V
2496	2238 586 59812	100nF 20-80% 50V 0603
2497	4822 126 12105	33nF 5% 50V
2498	2020 552 96448	1μF 10% 16V
2499	5322 126 11579	3.3nF 10% 63V
2501	4822 126 13449	1nF 10% 2kV
2501	4822 126 14053	1nF 10% 2kV
2503	5322 121 42489	33nF 5% 250V
2504	2238 916 15641	22nF 10% 25V 0603
2505	2020 554 90169	470pF 20% 250V
2507	2222 338 22474	470nF 20% 275V
2508	4822 124 11913	22nF 20% 275V
2509	4822 124 11913	22nF 20% 275V
2510	4822 126 12263	220pF 10% 2kV
2512	4822 124 12056	1000μF 20% 35V
2513	4822 126 13881	470pF 5% 50V
2514	4822 126 14238	2.2nF 50V 0603
2515	4822 124 80096	47μF 200V
2516	2222 057 36221	220μF 20% 400V 057
2518	4822 122 31211	100pF 10% 500V
2519	4822 126 10206	2.2nF 10% 500V
2524	5322 126 11583	10nF 10% 50V 0603
2525	4822 126 14247	1.5nF 50V 0603
2526	2020 558 90571	2.2nF 10% 1kV
2527	4822 126 14237	470pF 10% 2kV
2528	4822 126 14472	1μF 10% 10V 0805
2530	4822 126 14472	1μF 10% 10V 0805
2531	4822 122 31175	1nF 10% 500V
2532	4822 126 14472	1μF 10% 10V 0805
2533	2020 557 90732	4.7nF 10% 250V
2535	4822 126 13193	4.7nF 10% 63V

2537	4822 124 11913	22nF 20% 275V
2538	4822 122 33177	10nF 20% 50V
2540	4822 124 21913	1μF 20% 63V
2541	4822 122 31211	100pF 10% 500V
2544	4822 126 14238	2.2nF 50V 0603
2547	2222 338 22104	100nF 20% 275V
2601	2238 586 59812	100nF 20-80% 50V 0603
2603	4822 126 13883	220pF 5% 50V
2604	4822 126 13473	220nF 80-20% 50V
2605	4822 126 13883	220pF 5% 50V
2620	4822 126 13473	220nF 80-20% 50V
2621	2238 586 59812	100nF 20-80% 50V 0603
2622	4822 124 40255	100μF 20% 63V
2623	4822 126 14238	2.2nF 50V 0603
2624	4822 121 51252	470nF 5% 63V
2625	4822 121 51252	470nF 5% 63V
2627	5322 124 40641	10μF 20% 100V
2628	4822 124 40255	100μF 20% 63V
2630	4822 126 14491	2.2μF -20+80% 10V 0805
2631	4822 126 14491	2.2μF -20+80% 10V 0805
2633	5322 126 11579	3.3nF 10% 63V
2635	2238 586 59812	100nF 20-80% 50V 0603
2642	4822 124 40255	100μF 20% 63V
2653	2238 586 15628	2.7nF 10% 50V 0603
2653	5322 126 11579	3.3nF 10% 63V
2656	2238 916 15641	22nF 10% 25V 0603
2657	2238 916 15641	22nF 10% 25V 0603
2659	2238 916 15641	22nF 10% 25V 0603
2660	5322 126 11578	1nF 10% 50V 0603
2701	4822 126 14043	1μF 20% 16V
2702	3198 016 31020	1nF 10% 25V 0603
2703	4822 126 14043	1μF 20% 16V
2704	3198 016 31020	1nF 10% 25V 0603
2707	4822 126 14043	1μF 20% 16V
2708	4822 124 11767	470μF 20% 25V
2709	3198 026 51020	1000μF 50V 20%
2710	4822 126 14585	100nF 10% 50V
2711	4822 124 80061	1000μF 20% 25V
2712	3198 017 34730	47nF 16V 0603
2713	3198 017 34730	47nF 16V 0603
2714	4822 124 80061	1000μF 20% 25V
2715	3198 017 34730	47nF 16V 0603
2716	3198 017 34730	47nF 16V 0603
2722	4822 124 40255	100μF 20% 63V
2914	4822 124 40248	10μF 20% 63V
2915	4822 124 40248	10μF 20% 63V
2918	4822 126 14585	100nF 10% 50V
2940	4822 124 41584	100μF 20% 10V
2941	4822 126 14585	100nF 10% 50V
2942	4822 126 14585	100nF 10% 50V
2943	4822 126 14585	100nF 10% 50V
2945	4822 126 14491	2.2μF -20+80% 10V 0805
2946	4822 126 14491	2.2μF -20+80% 10V 0805
2947	4822 124 40769	4.7μF 20% 100V
2950	5322 126 11583	10nF 10% 50V 0603
2951	5322 126 11583	10nF 10% 50V 0603
2987	5322 122 31863	330pF 5% 63V
2989	5322 122 31863	330pF 5% 63V
2990	5322 122 31863	330pF 5% 63V
2991	4822 051 20333	33kΩ 5% 0.1W
2991	5322 122 32531	100pF 5% 50V
2992	5322 122 31863	330pF 5% 63V
2993	4822 051 20333	33kΩ 5% 0.1W
2993	5322 122 32531	100pF 5% 50V
2994	5322 122 31863	330pF 5% 63V
2995	5322 122 31863	330pF 5% 63V
2996	5322 122 31863	330pF 5% 63V
2997	5322 122 31863	330pF 5% 63V
2998	4822 051 20333	33kΩ 5% 0.1W
2998	5322 122 32531	100pF 5% 50V

3118	2122 101 01363	2.2Ω 5%	3465	4822 052 11108	1Ω 5% 0.5W	3643	4822 051 30334	330kΩ 5% 0.062W
3120	4822 051 20109	10Ω 5% 0.1W	3466	4822 051 30472	4.7kΩ 5% 0.062W	3644	4822 051 30221	220Ω 5% 0.062W
3123	4822 116 52176	10Ω 5% 0.5W	3467	4822 117 13632	100kΩ 1% 0.62W 0603	3645	4822 116 52245	150kΩ 5% 0.5W
3124	4822 116 52199	68Ω 5% 0.5W	3472	4822 051 30393	39kΩ 5% 0.062W	3646	4822 117 12925	47kΩ 1% 0.063W 0603
3125	4822 116 52182	15Ω 5% 0.5W	3474	4822 051 30563	56kΩ 5% 0.062W	3647	4822 051 20228	2.2Ω 5% 0.1W
3126	4822 050 21003	10kΩ 1% 0.6W	3475	4822 051 30472	4.7kΩ 5% 0.062W	3652	4822 051 20479	47Ω 5% 0.1W
3127	4822 116 52289	5.6kΩ 5% 0.5W	3476	4822 116 83874	220kΩ 5% 0.5W	3653	4822 051 20223	22kΩ 5% 0.1W
3130	4822 051 30479	47Ω 5% 0.062W	3478	4822 116 52175	100Ω 5% 0.5W	3655	4822 051 30123	12kΩ 5% 0.062W
3131	4822 051 20471	470Ω 5% 0.1W	3479	4822 052 10478	4.7Ω 5% 0.33W	3656	4822 117 11817	1.2kΩ 1% 0.062W
3132	4822 051 20479	47Ω 5% 0.1W	3480	4822 052 10478	4.7Ω 5% 0.33W	3657	4822 051 30223	22kΩ 5% 0.062W
3133	4822 117 12925	47kΩ 1% 0.063W 0603	3480	4822 052 10688	6.8Ω 5% 0.33W	3658	4822 051 30223	22kΩ 5% 0.062W
3134	4822 051 30102	1kΩ 5% 0.062W	3481	2322 750 61001	100Ω 5% 1206	3659	4822 051 30222	2.2kΩ 5% 0.062W
3135	4822 051 30101	100Ω 5% 0.062W	3482	4822 051 30221	220Ω 5% 0.062W	3660	4822 051 30562	5.6kΩ 5% 0.063W 0603
3136	4822 051 30109	10Ω 5% 0.062W	3483	4822 117 12903	1.8kΩ 1% 0.063W 0603	3661	4822 116 52226	560Ω 5% 0.5W
3137	4822 050 24702	4.7kΩ 1% 0.6W	3485	4822 051 30471	470Ω 5% 0.062W	3662	4822 051 30152	1.5kΩ 5% 0.062W
3138	4822 051 20105	17kΩ 5% 0.1W	3486	2322 704 67502	7.5kΩ 1% 0.5W	3681	4822 116 52207	1.2kΩ 5% 0.5W
3140	4822 051 20223	22kΩ 5% 0.1W	3487	5322 117 13056	8.2kΩ 1% 0.063W 0603	3682	4822 117 13632	100kΩ 1% 0.62W 0603
3141	4822 116 52263	2.7kΩ 5% 0.5W	3488	4822 050 21005	1MΩ 1% 0.6W	3683	4822 051 30103	10kΩ 5% 0.062W
3142	4822 051 30332	3.3kΩ 5% 0.062W	3489	4822 051 30103	10kΩ 5% 0.062W	3684	4822 051 30223	22kΩ 5% 0.062W
3143	4822 051 30101	100Ω 5% 0.062W	3490	4822 051 30332	3.3kΩ 5% 0.062W	3685	4822 051 30273	27kΩ 5% 0.062W
3144	4822 053 10221	220Ω 5% 1W	3491	4822 117 12925	47kΩ 1% 0.063W 0603	3686	4822 051 30563	56kΩ 5% 0.062W
3150	4822 117 11373	100Ω 1% 0805	3492	4822 116 52175	100Ω 5% 0.5W	3687	4822 116 52207	1.2kΩ 5% 0.5W
3151	4822 051 30109	10Ω 5% 0.062W	3493	4822 050 21504	150kΩ 1% 0.6W	3688	4822 051 20684	680kΩ 5% 0.1W
3152	4822 051 30102	1kΩ 5% 0.062W	3495	4822 050 21503	15kΩ 1% 0.6W	3690	4822 051 30109	10Ω 5% 0.062W
3153	4822 051 20472	4.7kΩ 5% 0.1W	3496	4822 051 30272	2.7kΩ 5% 0.062W	3701	4822 051 30103	10kΩ 5% 0.062W
3155	4822 051 30101	100Ω 5% 0.062W	3497	4822 051 30333	33kΩ 5% 0.062W	3701	4822 117 12925	47kΩ 1% 0.063W 0603
3156	5322 117 13017	100Ω 1% 0.063W 0603	3501	2120 103 90057	100Ω 20% 0.5W	3702	4822 051 30223	22kΩ 5% 0.062W
3157	4822 051 30103	10kΩ 5% 0.062W	3504	4822 051 30222	2.2kΩ 5% 0.062W	3703	4822 051 30103	10kΩ 5% 0.062W
3158	2322 704 61801	180Ω 1% 0603	3505	4822 116 52257	22kΩ 5% 0.5W	3703	4822 117 12925	47kΩ 1% 0.063W 0603
3158	5322 117 13061	180Ω 1% 0.063W 0603	3506	4822 051 30562	5.6kΩ 5% 0.063W 0603	3704	4822 051 30223	22kΩ 5% 0.062W
3159	4822 051 30103	10kΩ 5% 0.062W	3507	4822 050 21604	160kΩ 1% 0.6W	3707	4822 051 30103	10kΩ 5% 0.062W
3160	4822 051 30102	1kΩ 5% 0.062W	3508	4822 116 52182	15Ω 5% 0.5W	3708	4822 117 12925	47kΩ 1% 0.063W 0603
3161	4822 052 10101	100Ω 5% 0.33W	3509	2122 550 00158	VDR 1mA 612V	3710	4822 117 12925	47kΩ 1% 0.063W 0603
3164	4822 117 13632	100kΩ 1% 0.62W 0603	3510	5322 117 12487	10kΩ 1% 0.125W	3711	4822 051 30103	10kΩ 5% 0.062W
3165	2322 704 61801	180Ω 1% 0603	3511	4822 053 11222	2.2kΩ 5% 2W	3713	2322 702 81828	8.2Ω 5% 0.1W 0603
3165	5322 117 13061	180Ω 1% 0.063W 0603	3512	4822 117 12891	220kΩ 1% 0.063W 0603	3714	2322 702 81828	8.2Ω 5% 0.1W 0603
3168	4822 051 20472	4.7kΩ 5% 0.1W	3513	4822 116 52272	330Ω 5% 0.5W	3716	4822 050 21003	10kΩ 1% 0.6W
3171	4822 116 52297	68kΩ 5% 0.5W	3514	2322 193 53397	0.39Ω 5% 0.6W	3719	4822 051 30103	10kΩ 5% 0.062W
3172	4822 116 52297	68kΩ 5% 0.5W	3515	2322 193 53397	0.39Ω 5% 0.6W	3720	4822 052 10108	1Ω 5% 0.33W
3200	4822 051 20229	22Ω 5% 0.1W	3517	4822 117 10834	47kΩ 1% 0.1W	3721	4822 052 10108	1Ω 5% 0.33W
3201	4822 051 20229	22Ω 5% 0.1W	3518	4822 116 52234	100kΩ 5% 0.5W	3725	4822 116 52251	18kΩ 5% 0.5W
3250	4822 117 10833	10kΩ 1% 0.1W	3519	4822 051 30102	1kΩ 5% 0.062W	3726	4822 050 21003	10kΩ 1% 0.6W
3261	4822 117 11373	100Ω 1% 0805	3520	4822 053 11333	33kΩ 5% 2W	3904	4822 052 10688	6.8Ω 5% 0.33W
3262	4822 117 11373	100Ω 1% 0805	3521	4822 053 21155	1.5Ω 5% 0.5W	3905	4822 051 30101	100Ω 5% 0.062W
3400	4822 052 11108	1Ω 5% 0.5W	3522	4822 117 11507	6.8kΩ 1% 0.1W	3912	4822 051 30008	Jumper 0603
3401	4822 053 12279	27R00 5% 3W	3523	4822 051 20105	1MΩ 5% 0.1W	3928	4822 051 30101	100Ω 5% 0.062W
3402	4822 053 10121	120Ω 5% 1W	3524	4822 051 30333	33kΩ 5% 0.062W	3929	4822 051 30103	10kΩ 5% 0.062W
3403	4822 116 52175	100Ω 5% 0.5W	3525	4822 051 30479	47Ω 5% 0.062W	3930	4822 051 20561	560Ω 5% 0.1W
3404	4822 051 30471	470Ω 5% 0.062W	3527	4822 117 11951	2kΩ 1% 0.1W	3938	4822 117 11373	100Ω 1% 0805
3406	4822 117 11373	100Ω 1% 0805	3528	4822 051 30103	10kΩ 5% 0.062W	3939	4822 051 30103	10kΩ 5% 0.062W
3407	4822 051 30103	10kΩ 5% 0.062W	3529	4822 051 30472	4.7kΩ 5% 0.062W	3940	4822 051 20561	560Ω 5% 0.1W
3409	4822 050 11002	1kΩ 1% 0.4W	3530	4822 051 30102	1kΩ 5% 0.062W	3941	4822 052 10688	6.8Ω 5% 0.33W
3410	4822 051 20479	47Ω 5% 0.1W	3531	4822 117 11507	6.8kΩ 1% 0.1W	3959	4822 117 10353	150Ω 1% 0.1W
3411	2122 101 02111	39Ω 5% 0.5W	3532	4822 117 12925	47kΩ 1% 0.063W 0603	3960	4822 117 10353	150Ω 1% 0.1W
3412	4822 117 11817	1.2kΩ 1% 0.062W	3533	4822 116 52182	15Ω 5% 0.5W	3961	4822 117 10353	150Ω 1% 0.1W
3414	4822 051 30331	330Ω 5% 0.062W	3534	4822 117 12925	47kΩ 1% 0.063W 0603	3962	4822 117 10353	150Ω 1% 0.1W
3415	3198 012 31590	15Ω 5% 3W	3535	4822 051 30479	47Ω 5% 0.062W	3965	4822 117 10353	150Ω 1% 0.1W
3417	4822 116 52176	10Ω 5% 0.5W	3536	4822 051 30152	1.5kΩ 5% 0.062W	3966	4822 117 10353	150Ω 1% 0.1W
3418	4822 050 25603	56kΩ 1% 0.6W	3537	4822 052 10102	1kΩ 5% 0.33W	3967	4822 116 52201	75Ω 5% 0.5W
3419	4822 051 30474	470kΩ 5% 0.062W	3540	4822 050 23303	33k 1% 0.6W	3968	4822 116 52201	75Ω 5% 0.5W
3420	4822 051 30332	3.3kΩ 5% 0.062W	3541	4822 116 52186	22Ω 5% 0.5W	3969	4822 051 20008	Jumper 0805
3421	4822 051 30474	470kΩ 5% 0.062W	3543	4822 050 24708	4.7Ω 1% 0.6W	3969	4822 117 11373	100Ω 1% 0805
3422	4822 051 30332	3.3kΩ 5% 0.062W	3547	4822 051 30008	Jumper 0603	3970	4822 051 20008	Jumper 0805
3423	4822 053 10688	6.8Ω 5% 1W	3549	4822 051 30393	39kΩ 5% 0.062W	3970	4822 117 11373	100Ω 1% 0805
3425	4822 116 52176	10Ω 5% 0.5W	3550	2122 663 00018	PTC 4.7Ω 20%	3971	4822 116 52201	75Ω 5% 0.5W
3426	4822 116 52176	10Ω 5% 0.5W	3552	4822 051 30222	2.2kΩ 5% 0.062W	3972	4822 116 52201	75Ω 5% 0.5W
3427	4822 051 30683	68kΩ 5% 0.062W	3553	4822 051 30103	10kΩ 5% 0.062W	3973	4822 116 52201	75Ω 5% 0.5W
3427	4822 117 13632	100kΩ 1% 0.62W 0603	3610	4822 051 30223	22kΩ 5% 0.062W	3974	4822 116 52201	75Ω 5% 0.5W
3428	4822 051 30684	680kΩ 5% 0.062W	3611	4822 051 30222	2.2kΩ 5% 0.062W	3975	4822 116 52201	75Ω 5% 0.5W
3429	4822 051 30103	10kΩ 5% 0.062W	3620	4822 050 21808	1.8Ω 1% 0.6W	3976	4822 117 11373	100Ω 1% 0805
3429	4822 051 30223	22kΩ 5% 0.062W	3620	4822 116 80176	1Ω 5% 0.5W	3977	4822 051 20008	Jumper 0805
3430	4822 051 30123	12kΩ 5% 0.062W	3621	4822 116 80176	1Ω 5% 0.5W	3977	4822 117 11373	100Ω 1% 0805
3430	4822 051 30223	22kΩ 5% 0.062W	3622	4822 116 81154	2.2Ω 5% 0.5W	3978	4822 051 20008	Jumper 0805
3431	2306 207 03151	150Ω 5% 0.5W	3622	5322 116 53564	3.3Ω 5% 0.5W	3978	4822 117 11373	100Ω 1% 0805
3440	4822 051 30102	1kΩ 5% 0.062W	3623	4822 116 52251	18kΩ 5% 0.5W	3979	4822 116 52201	75Ω 5% 0.5W
3441	4822 051 30223	22kΩ 5% 0.062W	3624	4822 052 10158	1.5Ω 5% 0.33W	3980	4822 051 20008	Jumper 0805
3442	4822 051 30474	470kΩ 5% 0.062W	3625	4822 116 52206	120Ω 5% 0.5W	3980	4822 117 11373	100Ω 1% 0805
3443	4822 051 30684	680kΩ 5% 0.062W	3625	4822 116 52219	330Ω 5% 0.5W	3981	4822 051 10102	1kΩ 2% 0.25W
3447	4822 117 11373	100Ω 1% 0805	3626	4822 116 52175	100Ω 5% 0.5W	3981	4822 117 10833	10kΩ 1% 0.1W
3449	4822 052 10101	100Ω 5% 0.33W	3626	4822 116 52219	330Ω 5% 0.5W	3982	4822 051 20392	3.9kΩ 5% 0.1W
3450	4822 050 21003	10kΩ 1% 0.6W	3627	4822 051 20223	22kΩ 5% 0.1W	3982	4822 051 20393	39kΩ 5% 0.1W
3451	4822 050 21003	10kΩ 1% 0.6W	3630	4822 051 30333	33kΩ 5% 0.062W	3983	4822 116 52175	100Ω 5% 0.5W
3454	4822 051 20108	1Ω 5% 0.1W	3631	4822 051 30222	2.2kΩ 5% 0.062W	3984	4822 051 10102	1kΩ 2% 0.25W
3455	4822 117 12902	8.2kΩ 1% 0.063W 0603	3632	4822 051 30393	39kΩ 5% 0.062W	3984	4822 117 10833	10kΩ 1% 0.1W
3455	5322 117 13056	8.2kΩ 1% 0.063W 0603	3633	4822 051 30563	56kΩ 5% 0.062W	3985	4822 116 52201	75Ω 5% 0.5W
3456	4822 117 12903	1.8kΩ 1% 0.063W 06						

3992	4822 117 10353	150Ω 1% 0.1W
3993	4822 116 83868	150Ω 5% 0.5W
3994	4822 051 10102	1kΩ 2% 0.25W
3994	4822 117 11373	100Ω 1% 0805
3995	4822 051 10102	1kΩ 2% 0.25W
3995	4822 117 11373	100Ω 1% 0805
3996	4822 117 10353	150Ω 1% 0.1W
3997	4822 117 10353	150Ω 1% 0.1W
4xxx	4822 051 30008	Jumper 0603
9xxx	4822 051 20008	Jumper 0805
9xxx	4822 051 30008	Jumper 0603



5100	3104 308 20431	Transformer BS25126-03
5101	4822 526 10704	Bead 45Ω at 50MHz
5102	2422 535 94639	10μH 20%
5103	4822 526 10704	Bead 45Ω at 50MHz
5104	4822 157 11411	Bead 83Ω at 100MHz
5105	2422 535 94632	1μH 30%
5106	4822 157 11716	Bead 30Ω at 100MHz
5107	4822 157 11716	Bead 30Ω at 100MHz
5108	4822 526 10704	Bead 45Ω at 50MHz
5110	4822 526 10704	Bead 45Ω at 50MHz
5111	4822 157 11411	Bead 83Ω at 100MHz
5113	4822 157 11411	Bead 83Ω at 100MHz
5130	4822 157 11411	Bead 83Ω at 100MHz
5400	4822 157 11869	33μH 10%
5401	2422 536 00059	12μH 10%
5402	3198 018 21510	150μH 10%
5410	3128 138 39091	Transformer CE165T
5411	4822 157 71097	0.56μH 10%
5421	3104 308 20471	Linearity coil 28"/29"
5421	3104 308 20591	Linearity coil 32"
5422	2422 531 02357	Bridge coil W7132-004Y 29"
5422	4822 146 11137	Bridge coil W7131-003 28"/32"
5423	4822 157 71097	0.56μH 10%
5425	4822 157 11411	Bead 83Ω at 100MHz
5426	4822 157 11411	Bead 83Ω at 100MHz
5430	3104 308 20491	LOT 1392.9014A
5461	4822 157 11411	Bead 83Ω at 100MHz
5463	4822 157 11411	Bead 83Ω at 100MHz
5465	4822 157 11411	Bead 83Ω at 100MHz
5467	4822 157 11411	Bead 83Ω at 100MHz
5469	4822 157 11411	Bead 83Ω at 100MHz
5503	2422 549 44877	Filter 45mH DMF2845H
5505	4822 157 11411	Bead 83Ω at 100MHz
5506	2422 531 02575	Transformer SMT BS30029-01
5506	2422 531 02635	Transformer SMT SS30327-01 B
5507	4822 157 11411	Bead 83Ω at 100MHz
5511	3104 308 20511	Filter mains 40mH
5515	4822 157 11869	33μH 10%
5517	4822 157 11411	Bead 83Ω at 100MHz
5518	4822 526 10704	Bead 45Ω at 50MHz
5519	4822 157 11716	Bead 30Ω at 100MHz
5520	4822 157 11411	Bead 83Ω at 100MHz
5620	4822 157 11771	0.09μH 10%
5621	3104 308 20571	Transf. S13974-03
5901	4822 157 11299	10μH 5%
5902	3198 018 71010	100μF 10%
5903	4822 157 10359	33μH 10%
5904	4822 157 11411	Bead 83Ω at 100MHz



6080	4822 130 11397	BAS316
6082	4822 130 80622	BAT54
6103	4822 130 41601	BYV95A
6104	9340 548 67115	PDZ22B
6105	4822 130 34281	BZX79-B15
6106	3198 010 52290	BZX79-B22
6108	4822 130 80622	BAT54
6109	4822 130 31083	BYW55
6110	4822 130 41487	BYV95C
6111	9322 161 78682	SB360L-7024
6112	4822 130 11551	UDZS10B
6115	4822 130 80622	BAT54
6120	4822 130 30621	1N4148
6121	4822 130 30621	1N4148
6122	3198 010 53980	BZX79-B3V9
6130	4822 130 11596	BYW29EX-200
6132	9322 171 80685	BZX384-B6V8
6133	4822 130 11397	BAS316
6134	4822 130 11397	BAS316
6141	4822 130 11522	UDZ15B
6142	4822 130 80622	BAT54
6144	4822 130 11397	BAS316
6147	4822 130 34278	BZX79-B6V8

6148	5322 130 31938	BYV27-200
6149	4822 130 11397	BAS316
6200	9340 548 71115	PDZ33B
6202	4822 130 11397	BAS316
6400	4822 130 41601	BYV95A
6402	4822 130 11397	BAS316
6405	4822 130 34383	BZX79-B47
6406	4822 130 11397	BAS316
6407	4822 130 11397	BAS316
6408	4822 130 41601	BYV95A
6421	4822 130 10753	BY359X-1500
6422	4822 130 10218	BY229X-800
6442	4822 130 11522	UDZ15B
6455	4822 130 11397	BAS316
6456	5322 130 34337	BAV99
6457	9322 102 64685	UDZ2.7B
6458	3198 020 55680	BZX384-C5V6
6460	4822 130 41487	BYV95C
6462	9340 559 53112	BYW95C-24
6464	9340 559 53112	BYW95C-24
6480	4822 130 31607	RGPI0D
6481	4822 130 11522	UDZ15B
6482	4822 130 11397	BAS316
6483	4822 130 80622	BAT54
6493	4822 130 80622	BAT54
6499	4822 130 11551	UDZS10B
6505	4822 130 34281	BZX79-B15
6506	4822 130 80622	BAT54
6509	4822 130 11397	BAS316
6510	4822 130 61219	BZX79-B10
6511	4822 130 11397	BAS316
6512	4822 130 11397	BAS316
6514	5322 130 31932	BZT03-C200
6515	4822 130 33657	BZV85-C6V8
6516	4822 130 11397	BAS316
6517	4822 130 80622	BAT54
6525	3198 010 10640	Bridge cell GBU4K
6530	4822 130 41487	BYV95C
6534	9322 165 72687	DTV1500MFP
6535	4822 130 11572	STPS8H100F
6537	4822 130 11397	BAS316
6538	4822 130 11397	BAS316
6614	4822 130 80622	BAT54
6615	4822 130 11397	BAS316
6616	4822 130 11397	BAS316
6617	4822 130 11397	BAS316
6618	4822 130 11397	BAS316
6619	4822 130 31607	RGPI0D
6620	5322 130 31938	BYV27-200
6621	4822 130 31607	RGPI0D
6623	4822 130 11397	BAS316
6624	4822 130 11397	BAS316
6625	4822 130 11397	BAS316
6626	4822 130 11397	BAS316
6627	4822 130 11397	BAS316
6901	4822 130 11416	PDZ6.8B
6950	4822 130 11416	PDZ6.8B
6951	4822 130 11416	PDZ6.8B
6953	4822 130 11416	PDZ6.8B
6954	4822 130 11416	PDZ6.8B
6955	4822 130 11416	PDZ6.8B
6956	4822 130 11416	PDZ6.8B
6957	4822 130 11416	PDZ6.8B
6958	4822 130 11416	PDZ6.8B
6959	4822 130 11416	PDZ6.8B
6960	9340 548 61115	PDZ12B
6961	4822 130 11416	PDZ6.8B
6962	4822 130 11416	PDZ6.8B



7100	4822 130 44568	BC557B
7101	4822 130 40981	BC337-25
7102	9322 160 34687	FQPF3N60
7103	9322 149 04682	TCET1102
7130	5322 130 60159	BC846B
7131	4822 130 11336	STP16NE06FP
7132	5322 130 60159	BC846B
7133	4822 130 60373	BC856B
7140	5322 130 60159	BC846B
7141	4822 130 11336	STP16NE06FP
7408	5322 130 44647	BC368
7409	5322 130 60159	BC846B
7421	9340 210 30127	BU2520DX
7440	4822 209 70672	LM358N SEL.
7441	4822 130 60373	BC856B
7442	4822 130 60373	BC856B
7443	5322 130 60159	BC846B
7445	5322 130 60159	BC846B
7450	5322 209 61472	LM393M
7455	4822 209 73852	PMBT2369
7480	4822 130 11417	STP3NB60FP
7482	4822 130 11418	TCDT1102G

7486	5322 130 60159	BC846B
7487	5322 130 60159	BC846B
7501	5322 130 60159	BC846B
7502	4822 130 40959	BC547B
7504	9322 194 20687	STP5NK50ZFP
7506	4822 209 14933	TL4311Z
7507	9322 149 04682	TCET1102
7528	4822 130 40981	BC337-25
7529	4822 130 44461	BC546B
7530	5322 130 60159	BC846B
7611	5322 130 60159	BC846B
7612	5322 130 60159	BC846B
7613	4822 209 81397	TL431CLPST
7614	5322 130 60159	BC846B
7620	4822 209 90009	TDA8177
7641	5322 130 60159	BC846B
7652	5322 130 60159	BC846B
7653	5322 130 60159	BC846B
7654	4822 130 60373	BC856B
7680	4822 209 60956	TDA7052/N2
7681	5322 130 60159	BC846B
7682	5322 130 44647	BC368
7701	9322 166 94682	TDA7495S
7710	5322 130 60159	BC846B
7711	5322 130 60159	BC846B
7901	5322 130 60159	BC846B
7902	5322 130 60159	BC846B
7910	9322 152 53687	LD1086V33
7912	5322 209 86445	LM7805CT

Small Signal Board [B]

Various

1112	2422 549 44369	SAW 38.9MHz K9656L
1113	2422 549 44372	SAW 38.9MHz K3953L
1581	2422 543 01359	Xtal 13.5MHz 12pF NX8045



2002	2020 552 96507	10μF 10V
2003	2020 552 96507	10μF 10V
2005	2020 552 96618	1nF 10% 50V 0402
2006	2020 552 96618	1nF 10% 50V 0402
2008	2020 552 96618	1nF 10% 50V 0402
2012	3198 017 44740	470nF 10V 0603
2013	3198 035 04710	470pF 50V 0402
2014	3198 035 71040	100nF 10% 16V 0402
2015	3198 035 04710	470pF 50V 0402
2016	3198 017 44740	470nF 10V 0603
2018	3198 035 04710	470pF 50V 0402
2019	3198 017 44740	470nF 10V 0603
2021	3198 035 04710	470pF 50V 0402
2022	3198 017 44740	470nF 10V 0603
2024	3198 035 04710	470pF 50V 0402
2025	3198 017 44740	470nF 10V 0603
2027	3198 035 04710	470pF 50V 0402
2028	3198 017 44740	470nF 10V 0603
2030	2020 552 96618	1nF 10% 50V 0402
2031	2020 552 96618	1nF 10% 50V 0402
2032	2020 552 96618	1nF 10% 50V 0402
2033	2020 552 96618	1nF 10% 50V 0402
2037	2020 552 96507	10μF 10V
2038	2020 552 96507	10μF 10V
2039	2020 552 96507	10μF 10V
2040	2020 552 96507	10μF 10V
2045	3198 030 82280	2.2μF 20% 50V
2046	5322 124 41945	22μF 20% 35V
2047	4822 124 23002	10μF 20% 16V
2048	3198 035 71040	100nF 10% 16V 0402
2049	3198 035 71040	100nF 10% 16V 0402
2050	3198 035 71040	100nF 10% 16V 0402
2051	3198 035 71040	100nF 10% 16V 0402
2060	3198 035 71040	100nF 10% 16V 0402
2062	3198 035 71040	100nF 10% 16V 0402
2063	3198 035 71040	100nF 10% 16V 0402
2065	3198 035 71040	100nF 10% 16V 0402
2066	3198 035 71040	100nF 10% 16V 0402
2067	3198 035 71040	100nF 10% 16V 0402
2068	3198 035 71040	100nF 10% 16V 0402
2071	3198 035 71040	100nF 10% 16V 0402
2072	3198 035 71040	100nF 10% 16V 0402
2073	3198 035 71040	100nF 10% 16V 0402
2078	3198 035 71040	100nF 10% 16V 0402
2079	3198 035 71040	100nF 10% 16V 0402
2081	3198 035 71040	100nF 10% 16V 0402
2082	4822 126 14491	2.2μF -20+80% 10V 0805
2083	3198 035 71040	100nF 10% 16V 0402
2084	3198 035 71040	100nF 10% 16V 0402
2085	3198 035 71040	100nF 10% 16V 0402

2088	4822 126 14491	2.2μF -20+80% 10V 0805	2525	3198 035 71040	100nF 10% 16V 0402	3150	3198 031 01820	1K8 5% 0402
2101	3198 035 71030	10nF 16V 0402	2546	3198 035 71040	100nF 10% 16V 0402	3151	3198 031 01220	1K2 5% 0402
2102	3198 035 71030	10nF 16V 0402	2557	2238 869 15101	100pF 5% 50V 0402	3152	3198 031 01820	1K8 5% 0402
2119	3198 035 71030	10nF 16V 0402	2571	3198 035 71040	100nF 10% 16V 0402	3153	3198 031 01220	1K2 5% 0402
2126	2238 869 15101	100pF 5% 50V 0402	2581	4822 126 14519	22pF 5% 50V 0402	3154	3198 031 04730	47Ω 5% 0402
2127	3198 035 71040	100nF 10% 16V 0402	2582	4822 126 14519	22pF 5% 50V 0402	3155	3198 031 08210	820Ω 5% 0.5W
2128	3198 030 82280	2.2μF 20% 50V	2583	3198 035 71040	100nF 10% 16V 0402	3281	4822 117 13548	1kΩ 5% 0402
2130	3198 035 71030	10nF 16V 0402	2584	3198 035 71040	100nF 10% 16V 0402	3282	4822 117 13548	1kΩ 5% 0402
2134	3198 035 71040	100nF 10% 16V 0402	2600	3198 035 71040	100nF 10% 16V 0402	3283	4822 117 13548	1kΩ 5% 0402
2135	4822 124 23002	10μF 20% 16V	2601	3198 035 71040	100nF 10% 16V 0402	3284	4822 117 13548	1kΩ 5% 0402
2136	4822 124 23002	10μF 20% 16V	2604	3198 035 71040	100nF 10% 16V 0402	3302	3198 031 01220	1K2 5% 0402
2137	4822 124 12095	100μF 20% 16V	2607	3198 035 71040	100nF 10% 16V 0402	3303	3198 031 06820	6.8kΩ 5% 0.01W 0402
2138	3198 035 71040	100nF 10% 16V 0402	2609	3198 035 71040	100nF 10% 16V 0402	3304	4822 117 13597	330Ω 5% 0402 0.01W
2150	3198 035 71040	100nF 10% 16V 0402	2611	3198 035 71040	100nF 10% 16V 0402	3305	4822 117 13548	1kΩ 5% 0402
2151	3198 030 82280	2.2μF 20% 50V	2612	3198 035 71040	100nF 10% 16V 0402	3306	3198 031 03390	33Ω 1% 0402
2152	3198 035 71040	100nF 10% 16V 0402	2615	3198 035 71040	100nF 10% 16V 0402	3307	2322 705 87189	18Ω 5% 0402
2154	4822 124 23002	10μF 20% 16V	2618	3198 035 71040	100nF 10% 16V 0402	3309	4822 051 30331	330Ω 5% 0.062W
2155	3198 035 71040	100nF 10% 16V 0402	2620	3198 035 71040	100nF 10% 16V 0402	3310	3198 031 01220	1K2 5% 0402
2156	3198 035 71040	100nF 10% 16V 0402	2622	3198 035 71040	100nF 10% 16V 0402	3311	3198 031 03390	33Ω 1% 0402
2157	3198 035 71040	100nF 10% 16V 0402	2623	3198 035 71040	100nF 10% 16V 0402	3312	3198 031 01220	1K2 5% 0402
2281	3198 035 71040	100nF 10% 16V 0402	2628	3198 035 71040	100nF 10% 16V 0402	3313	4822 117 13597	330Ω 5% 0402 0.01W
2282	3198 035 71040	100nF 10% 16V 0402	2629	3198 035 71040	100nF 10% 16V 0402	3316	2322 705 87189	18Ω 5% 0402
2284	3198 035 71040	100nF 10% 16V 0402	2630	3198 035 71040	100nF 10% 16V 0402	3318	3198 031 01220	1K2 5% 0402
2285	3198 035 71040	100nF 10% 16V 0402	2633	3198 035 71040	100nF 10% 16V 0402	3319	4822 051 30331	330Ω 5% 0.062W
2300	3198 035 71040	100nF 10% 16V 0402	2634	3198 035 71040	100nF 10% 16V 0402	3320	3198 031 01220	1K2 5% 0402
2305	3198 017 41050	1μF 10V 0603	2638	3198 035 71040	100nF 10% 16V 0402	3321	3198 031 03390	33Ω 1% 0402
2307	2238 869 15101	100pF 5% 50V 0402	2644	5322 124 41945	22μF 20% 35V	3322	3198 031 01220	1K2 5% 0402
2308	2238 869 15101	100pF 5% 50V 0402	2645	4822 124 23002	10μF 20% 16V	3323	4822 117 13597	330Ω 5% 0402 0.01W
2310	4822 124 23002	10μF 20% 16V	2651	2020 021 91679	100μF 20% 6.3V	3325	3198 031 04720	4.7kΩ 5% 0402
2311	3198 035 71030	10nF 16V 0402	2652	2020 552 96507	10μF 10V	3326	4822 117 13543	470Ω 5% 0402
2317	2238 869 15101	100pF 5% 50V 0402	2654	2020 552 96507	10μF 10V	3329	4822 051 30331	330Ω 5% 0.062W
2318	2238 869 15101	100pF 5% 50V 0402	2655	2020 552 96507	10μF 10V	3330	3198 031 01220	1K2 5% 0402
2321	3198 035 71030	10nF 16V 0402	2656	3198 035 71040	100nF 10% 16V 0402	3331	3198 031 03390	33Ω 1% 0402
2324	2238 869 15101	100pF 5% 50V 0402	2657	2238 869 15101	100pF 5% 50V 0402	3332	3198 031 01220	1K2 5% 0402
2325	2238 869 75829	82pF 5% 50V 0402	2659	4822 126 13879	220nF 20% 16V	3333	4822 117 13597	330Ω 5% 0402 0.01W
2327	2238 869 15101	100pF 5% 50V 0402	2730	3198 035 71040	100nF 10% 16V 0402	3334	3198 031 03390	33Ω 1% 0402
2328	2238 869 15101	100pF 5% 50V 0402	2731	3198 035 71040	100nF 10% 16V 0402	3335	3198 031 03390	33Ω 1% 0402
2331	3198 035 71030	10nF 16V 0402	2732	3198 035 71040	100nF 10% 16V 0402	3336	3198 031 03390	33Ω 1% 0402
2341	3198 035 71040	100nF 10% 16V 0402	2733	3198 035 71040	100nF 10% 16V 0402	3337	3198 031 03390	33Ω 1% 0402
2342	3198 035 71040	100nF 10% 16V 0402	2734	3198 035 71040	100nF 10% 16V 0402	3338	2322 705 87189	18Ω 5% 0402
2343	3198 035 71040	100nF 10% 16V 0402	2792	3198 035 71040	100nF 10% 16V 0402	3340	4822 117 13548	1kΩ 5% 0402
2344	3198 035 71040	100nF 10% 16V 0402	2793	3198 035 71040	100nF 10% 16V 0402	3343	4822 117 13606	10kΩ 5% 0.01W 0402
2345	3198 035 71040	100nF 10% 16V 0402	2918	2238 869 15101	100pF 5% 50V 0402	3345	3198 031 06820	6.8kΩ 5% 0.01W 0402
2346	3198 035 71040	100nF 10% 16V 0402	2919	2238 869 15101	100pF 5% 50V 0402	3346	4822 117 13548	1kΩ 5% 0402
2350	4822 124 12095	100μF 20% 16V	2920	2238 869 75829	82pF 5% 50V 0402	3347	4822 117 13601	22kΩ 5% 0402
2351	2238 869 15109	10pF 5% 50V 0402	2932	2238 869 15101	100pF 5% 50V 0402	3348	4822 117 13601	22kΩ 5% 0402
2352	2238 869 15109	10pF 5% 50V 0402	2933	2238 869 15101	100pF 5% 50V 0402	3349	3198 031 04730	47Ω 5% 0402
2358	2238 869 15101	100pF 5% 50V 0402	2935	2238 869 15101	100pF 5% 50V 0402	3350	4822 117 13596	220Ω 5% 0.01W 0402
2359	3198 035 71040	100nF 10% 16V 0402	2936	2238 869 15101	100pF 5% 50V 0402	3351	4822 117 13548	1kΩ 5% 0402
2360	2238 869 15101	100pF 5% 50V 0402	2938	2238 869 15101	100pF 5% 50V 0402	3352	3198 031 04730	47Ω 5% 0402
2361	4822 126 14491	2.2μF -20+80% 10V 0805	2948	2238 869 15189	18pF 5% 50V 0402	3353	4822 117 13606	10kΩ 5% 0.01W 0402
2363	2238 869 15101	100pF 5% 50V 0402	2949	2238 869 15189	18pF 5% 50V 0402	3354	4822 117 13606	10kΩ 5% 0.01W 0402
2364	4822 126 14491	2.2μF -20+80% 10V 0805	2950	2238 869 15101	100pF 5% 50V 0402	3355	4822 117 13601	22kΩ 5% 0402
2365	2238 869 15101	100pF 5% 50V 0402	2951	2238 869 15101	100pF 5% 50V 0402	3356	3198 031 08210	820Ω 5% 0.5W
2366	4822 126 14491	2.2μF -20+80% 10V 0805	2962	2238 869 15101	100pF 5% 50V 0402	3357	4822 117 13601	22kΩ 5% 0402
2371	2020 552 96618	1nF 10% 50V 0402	2967	2020 552 96618	1nF 10% 50V 0402	3358	5322 117 11726	10Ω 5%
2372	2020 552 96618	1nF 10% 50V 0402	2968	2020 552 96618	1nF 10% 50V 0402	3361	4822 117 13605	Jumper 0402
2377	2020 552 96623	2.2nF 10% 50V 0402	2975	2020 552 96793	4.7nF 10% 50V 0402	3364	2322 705 70124	120kΩ 5% 0402
2379	2020 552 96623	2.2nF 10% 50V 0402	2976	2020 552 96793	4.7nF 10% 50V 0402	3365	4822 117 13605	Jumper 0402
2380	3198 035 04710	470pF 50V 0402	2977	2238 869 15101	100pF 5% 50V 0402	3366	4822 117 13602	2.2kΩ 5% 0.01W 0402
2384	2020 552 96618	1nF 10% 50V 0402	2978	2238 869 15101	100pF 5% 50V 0402	3367	4822 117 13548	1kΩ 5% 0402
2386	2238 869 15109	10pF 5% 50V 0402	2979	2238 869 15101	100pF 5% 50V 0402	3368	3198 031 06830	68kΩ 5% 0.01W 0402
2395	3198 035 71030	10nF 16V 0402				3371	4822 117 13548	1kΩ 5% 0402
2397	3198 035 71040	100nF 10% 16V 0402				3372	2322 705 70155	1.5MΩ 5% 0402
2432	2020 552 96618	1nF 10% 50V 0402				3373	4822 117 13606	10kΩ 5% 0.01W 0402
2433	2020 552 96618	1nF 10% 50V 0402				3374	3198 031 02720	2.7kΩ 5% 0.01W 0402
2434	3198 017 44740	470nF 10V 0603	3002	3198 031 04730	47Ω 5% 0402	3375	3198 031 02720	2.7kΩ 5% 0.01W 0402
2435	3198 017 44740	470nF 10V 0603	3003	3198 031 04730	47Ω 5% 0402	3376	4822 117 13606	10kΩ 5% 0.01W 0402
2438	3198 017 44740	470nF 10V 0603	3004	3198 031 04730	47Ω 5% 0402	3377	3198 031 02250	2.2MΩ 5% 0402
2439	3198 017 44740	470nF 10V 0603	3005	3198 031 04730	47Ω 5% 0402	3378	3198 031 03340	330kΩ 5% 0402
2440	2020 552 96618	1nF 10% 50V 0402	3006	3198 031 04730	47Ω 5% 0402	3380	4822 117 13606	10kΩ 5% 0.01W 0402
2441	2020 552 96618	1nF 10% 50V 0402	3007	3198 031 04730	47Ω 5% 0402	3382	4822 117 13548	1kΩ 5% 0402
2442	2020 552 96618	1nF 10% 50V 0402	3010	4822 117 13605	Jumper 0402	3384	4822 117 13606	10kΩ 5% 0.01W 0402
2443	2020 552 96618	1nF 10% 50V 0402	3011	4822 117 13605	Jumper 0402	3385	3198 031 04730	47Ω 5% 0402
2444	2020 552 96618	1nF 10% 50V 0402	3018	4822 117 11152	4.7Ω 5% 0.062W	3386	3198 031 02730	27kΩ 5% 0402
2445	2020 552 96618	1nF 10% 50V 0402	3019	5322 117 11726	10Ω 5%	3390	4822 117 13548	1kΩ 5% 0402
2447	4822 124 12095	100μF 20% 16V	3022	3198 031 04730	47Ω 5% 0402	3391	3198 031 03930	39kΩ 5% 0402
2450	3198 035 71030	10nF 16V 0402	3024	3198 031 04730	47Ω 5% 0402	3392	3198 031 04730	47Ω 5% 0402
2452	3198 035 71030	10nF 16V 0402	3026	3198 031 04730	47Ω 5% 0402	3393	3198 031 03320	3.3kΩ 5% 0402
2454	4822 126 14491	2.2μF -20+80% 10V 0805	3027	3198 031 04730	47Ω 5% 0402	3395	4822 117 13606	10kΩ 5% 0.01W 0402
2457	4822 126 14491	2.2μF -20+80% 10V 0805	3060	4822 117 13602	2.2kΩ 5% 0.01W 0402	3396	4822 117 13543	470Ω 5% 0402
2461	3198 017 44740	470nF 10V 0603	3061	4822 117 13602	2.2kΩ 5% 0.01W 0402	3397	4822 117 13543	470Ω 5% 0402
2462	3198 017 44740	470nF 10V 0603	3062	3198 031 01810	180Ω 5% 0402	3398	4822 117 13545	100Ω 1% 0402
2480	3198 017 44740	470nF 10V 06						

3457	3198 031 01520	1.2kΩ 5% 0.01W 0402
3480	3198 031 02720	2.7kΩ 5% 0.01W 0402
3481	3198 031 02720	2.7kΩ 5% 0.01W 0402
3482	3198 031 04720	4.7kΩ 5% 0402
3483	3198 031 08220	8.2kΩ 5% 0.5W
3484	3198 031 04720	4.7kΩ 5% 0402
3485	3198 031 08220	8.2kΩ 5% 0.5W
3501	4822 117 13606	10kΩ 5% 0.01W 0402
3502	4822 117 13606	10kΩ 5% 0.01W 0402
3503	4822 117 13606	10kΩ 5% 0.01W 0402
3504	4822 117 13606	10kΩ 5% 0.01W 0402
3507	4822 117 13606	10kΩ 5% 0.01W 0402
3508	3198 031 04720	4.7kΩ 5% 0402
3509	3198 031 02720	2.7kΩ 5% 0.01W 0402
3510	3198 031 02720	2.7kΩ 5% 0.01W 0402
3511	4822 117 13546	47Ω 5% 0402
3512	4822 117 13546	47Ω 5% 0402
3513	3198 031 02720	2.7kΩ 5% 0.01W 0402
3515	3198 031 02720	2.7kΩ 5% 0.01W 0402
3518	4822 117 13601	22kΩ 5% 0402
3523	4822 117 13606	10kΩ 5% 0.01W 0402
3530	4822 117 11297	100kΩ 5% 0.1W
3547	3198 031 03390	33Ω 1% 0402
3550	3198 031 04720	4.7kΩ 5% 0402
3557	4822 117 13546	47Ω 5% 0402
3563	4822 117 13606	10kΩ 5% 0.01W 0402
3564	4822 117 13606	10kΩ 5% 0.01W 0402
3565	4822 117 13606	10kΩ 5% 0.01W 0402
3570	4822 117 13602	2.2kΩ 5% 0.01W 0402
3571	3198 031 02720	2.7kΩ 5% 0.01W 0402
3572	4822 117 13606	10kΩ 5% 0.01W 0402
3581	4822 117 13545	100Ω 1% 0402
3582	4822 117 13606	10kΩ 5% 0.01W 0402
3583	3198 031 01830	18kΩ 5% 0.01W 0402
3586	4822 117 13601	22kΩ 5% 0402
3590	4822 117 13548	1kΩ 5% 0402
3651	5322 117 13036	1.2kΩ 1% 0.063W 0603
3652	5322 117 13052	2.7kΩ 1% 0.063W 0603
3737	3198 031 03390	33Ω 1% 0402
3904	4822 117 13605	Jumper 0402
3909	4822 117 13545	100Ω 1% 0402
3911	4822 117 13545	100Ω 1% 0402
3918	4822 117 13545	100Ω 1% 0402
3919	4822 117 13545	100Ω 1% 0402
3928	4822 117 13545	100Ω 1% 0402
3929	4822 117 13545	100Ω 1% 0402
3936	4822 117 13545	100Ω 1% 0402
3938	4822 117 13545	100Ω 1% 0402
3950	4822 117 13545	100Ω 1% 0402
3951	4822 117 13545	100Ω 1% 0402
3962	4822 117 13545	100Ω 1% 0402
3963	4822 117 13545	100Ω 1% 0402
3964	4822 117 13545	100Ω 1% 0402
3975	4822 117 13545	100Ω 1% 0402
3976	4822 117 13545	100Ω 1% 0402
3977	4822 117 13545	100Ω 1% 0402
3978	4822 117 13545	100Ω 1% 0402
3979	4822 117 13545	100Ω 1% 0402
3980	4822 117 13545	100Ω 1% 0402
4xxx	4822 117 13605	Jumper 0402



5060	2422 549 44197	Bead 220Ω at 100MHz
5061	2422 549 44197	Bead 220Ω at 100MHz
5062	2422 549 44197	Bead 220Ω at 100MHz
5063	2422 549 44197	Bead 220Ω at 100MHz
5101	4822 157 71303	0.39μH 10% 0805
5102	2422 549 44197	Bead 220Ω at 100MHz
5112	2422 549 44197	Bead 220Ω at 100MHz
5134	2422 549 44197	Bead 220Ω at 100MHz
5135	2422 549 44197	Bead 220Ω at 100MHz
5150	2422 549 44197	Bead 220Ω at 100MHz
5151	2422 549 44197	Bead 220Ω at 100MHz
5152	2422 549 44197	Bead 220Ω at 100MHz
5281	2422 549 44197	Bead 220Ω at 100MHz
5282	2422 549 44197	Bead 220Ω at 100MHz
5283	2422 549 44197	Bead 220Ω at 100MHz
5285	2422 549 44197	Bead 220Ω at 100MHz
5300	2422 549 44197	Bead 220Ω at 100MHz
5307	4822 051 20008	Jumper 0805
5317	4822 051 20008	Jumper 0805
5327	4822 051 20008	Jumper 0805
5328	4822 051 20008	Jumper 0805
5342	2422 549 44197	Bead 220Ω at 100MHz
5343	2422 549 44197	Bead 220Ω at 100MHz
5344	2422 549 44197	Bead 220Ω at 100MHz
5345	2422 549 44197	Bead 220Ω at 100MHz
5450	2422 549 44197	Bead 220Ω at 100MHz
5452	2422 549 44197	Bead 220Ω at 100MHz
5480	2422 549 44197	Bead 220Ω at 100MHz
5570	2422 549 44197	Bead 220Ω at 100MHz
5583	2422 549 44197	Bead 220Ω at 100MHz

5600	4822 157 11716	Bead 30Ω at 100MHz
5601	2422 549 44197	Bead 220Ω at 100MHz
5651	2422 535 94134	10μH 20% 0805
5654	4822 157 11258	1μH 20% NLC322522T
5659	4822 157 71334	0.68μH
5730	2422 549 44197	Bead 220Ω at 100MHz
5731	2422 549 44197	Bead 220Ω at 100MHz
5792	2422 549 44197	Bead 220Ω at 100MHz



6101	4822 130 11525	1SS356
6301	4822 130 11397	BAS316
6327	9322 102 64685	UDZ2.7B
6341	4822 130 11397	BAS316
6353	5322 130 34337	BAV99
6365	5322 130 34337	BAV99
6367	9340 548 67115	PDZ22B
6368	4822 130 11397	BAS316
6381	5322 130 34337	BAV99
6382	4822 130 11594	BZX284-C47
6384	9340 548 67115	PDZ22B
6385	4822 130 11397	BAS316
6397	9340 548 69115	PDZ27B
6398	4822 130 11397	BAS316
6480	9340 548 61115	PDZ12B
6481	9340 548 61115	PDZ12B
6651	9322 128 70685	SMSS14



7060	9340 425 30115	BC847BPN
7062	4822 130 60373	BC856B
7063	4822 130 60373	BC856B
7100	9352 712 54557	PNX3000HL/N1
7101	3198 010 42310	BC847BW
7150	9340 425 20115	BC847BS
7300	9352 735 54557	PNX3002E/N302
7301	4822 130 60373	BC856B
7302	4822 130 60373	BC856B
7303	4822 130 60373	BC856B
7304	3198 010 42310	BC847BW
7310	9340 425 30115	BC847BPN
7320	9340 425 30115	BC847BPN
7330	9340 425 30115	BC847BPN
7346	4822 130 60373	BC856B
7356	4822 130 60373	BC856B
7365	5322 130 60159	BC846B
7382	4822 130 60373	BC856B
7383	9340 425 30115	BC847BPN
7393	3198 010 42310	BC847BW
7432	9340 425 30115	BC847BPN
7433	9340 425 30115	BC847BPN
7480	4822 209 33165	TDA1308T/N1
7525	9322 130 41668	M24C64-WMN6
7581	9352 691 56115	NE56610-45GW
7650	9322 170 61668	CS51033YDR8
7651	9322 170 87668	STS5PF30L
7730	9322 180 88668	K4S641632F-TC75
7790	9322 199 76668	M58LW032C90N1

Side I/O Panel [D]

Various

0240	2422 025 12485	Connector 11p m
0241	4822 267 10734	Connector 5p m
0242	4822 267 10734	Connector 5p m
1254	4822 267 31014	Socket headphone
1255	4822 265 11606	Connector 3p
1256	2422 026 04926	Socket SVHS 4p f



2286	4822 122 33642	150pF 5% 50V
2288	4822 122 33642	150pF 5% 50V
2292	5322 122 32311	470pF 10% 100V
2294	5322 122 32311	470pF 10% 100V
2296	4822 122 30103	22nF 80% 63V
2297	4822 122 30103	22nF 80% 63V



3285	4822 116 52201	75Ω 5% 0.5W
3286	4822 116 52176	10Ω 5% 0.5W
3287	4822 116 52201	75Ω 5% 0.5W
3288	4822 116 52176	10Ω 5% 0.5W
3289	4822 116 52249	1.8kΩ 5% 0.5W
3291	4822 050 11002	1kΩ 1% 0.4W
3292	4822 117 10834	47kΩ 1% 0.1W

3293	4822 050 11002	1kΩ 1% 0.4W
3294	4822 117 10834	47kΩ 1% 0.1W
3295	4822 116 52276	3.9kΩ 5% 0.5W
3296	4822 117 10833	10kΩ 1% 0.1W
3297	4822 117 10833	10kΩ 1% 0.1W
4xxx	4822 051 20008	Jumper 0805



6291	9340 548 61115	PDZ12B
6292	9340 548 61115	PDZ12B
6293	9340 548 61115	PDZ12B
6294	9340 548 61115	PDZ12B
6296	9340 548 61115	PDZ12B
6297	9340 548 61115	PDZ12B

Top Control Panel [E]

Various

0135	3104 311 04671	Cable 3p/1200/3p
0215	2422 025 16601	Connector 3p m
1091	4822 276 13775	Switch
1092	4822 276 13775	Switch
1093	4822 276 13775	Switch
1094	4822 276 13775	Switch



2010	4822 122 33177	10nF 20% 50V
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3088	4822 051 30008	Jumper 0603
3089	4822 051 30008	Jumper 0603
3091	4822 051 30561	560Ω 5% 0.062W
3092	4822 051 30391	390Ω 5% 0.062W
3093	4822 051 30561	560Ω 5% 0.062W
3094	4822 051 30271	270Ω 5% 0.062W
3095	4822 051 30332	3.3kΩ 5% 0.062W
3096	4822 051 30152	1.5kΩ 5% 0.062W
4092	4822 051 30008	Jumper 0603



6092	4822 130 10654	BAT254
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CRT Panel [F]

Various

0032	4822 492 70788	IC clamp
1298	2422 500 80063	Connector CRT 10p f
1424	2422 025 11244	Connector 7p m
1434	4822 267 10973	Connector 1p m
1483	4822 267 10735	Connector 3p m
1940	2422 025 12485	Connector 11p m
8483	3104 311 03111	Cable 3p/340/3p ferrite



2300	4822 124 40764	22μF 100 V
2301	4822 124 40196	220μF 20% 16V
2304	4822 121 41856	22nF 5% 250V
2306	2238 586 59812	100nF 20-80% 50V 0603
2307	4822 121 41856	22nF 5% 250V
2309	3198 017 42230	22nF 50V
2313	4822 124 12373	47μF 20% 250V
2315	5322 126 11583	10nF 10% 50V 0603
2316	4822 121 40518	100nF 10% 250V
2318	5322 122 32654	22nF 10% 63V
2319	4822 122 30043	10nF 80% 63V
2320	2238 586 59812	100nF 20-80% 50V 0603
2324	5322 121 44356	4.7nF 5% 2kV
2325	2238 586 59812	100nF 20-80% 50V 0603
2330	4822 126 13879	220nF 20% 16V
2338	2238 786 19856	330nF 16V 0603
2409	4822 051 30008	Jumper 0603
2410	3198 017 44740	470nF 10V 0603
2411	4822 126 14585	100nF 10% 50V
2420	4822 051 30008	Jumper 0603



3300	4822 052 10109	10Ω 5% 0.33W
3301	4822 053 12103	10K00 5% 3W
3302	4822 051 30681	680Ω 5% 0.062W

3303	4822 051 30682	6.8kΩ 5% 0.062W
3304	4822 051 10102	1kΩ 2% 0.25W
3306	4822 117 13608	4.7Ω 5% 0603 0.62W
3307	4822 051 30109	10Ω 5% 0.062W
3308	4822 051 30563	56kΩ 5% 0.062W
3310	4822 051 10102	1kΩ 2% 0.25W
3311	4822 051 30181	180Ω 5% 0.062W
3312	4822 051 30222	2.2kΩ 5% 0.062W
3316	4822 051 30563	56kΩ 5% 0.062W
3318	4822 117 12971	15Ω 5% 0.62W 0603
3319	4822 051 30102	1kΩ 5% 0.062W
3323	4822 050 24708	4.7Ω 1% 0.6W
3324	4822 051 30221	220Ω 5% 0.062W
3329	4822 050 24708	4.7Ω 1% 0.6W
3334	4822 050 11002	1kΩ 1% 0.4W
3335	4822 051 30271	270Ω 5% 0.062W
3336	4822 051 30271	270Ω 5% 0.062W
3337	4822 051 30271	270Ω 5% 0.062W
3338	3198 013 01020	1kΩ 2% 0.5W
3339	3198 013 01020	1kΩ 2% 0.5W
3340	3198 013 01020	1kΩ 2% 0.5W
3341	2306 207 03151	150Ω 5% 0.5W
3342	4822 116 83883	470Ω 5% 0.5W
3345	4822 116 52191	33Ω 5% 0.5W
3347	3198 013 01520	1.5kΩ 2% 0.5W
3349	3198 013 01020	1kΩ 2% 0.5W
3350	4822 116 83883	470Ω 5% 0.5W
3351	4822 116 83883	470Ω 5% 0.5W
3352	4822 116 83883	470Ω 5% 0.5W
3354	4822 051 30222	2.2kΩ 5% 0.062W
3355	4822 117 13608	4.7Ω 5% 0603 0.62W
3356	4822 051 10102	1kΩ 2% 0.25W
3357	4822 117 13608	4.7Ω 5% 0603 0.62W
3370	4822 117 13016	VDR 1mA/50V
3371	4822 051 30472	4.7kΩ 5% 0.062W
3401	4822 116 52175	100Ω 5% 0.5W
3403	4822 052 11228	2R20 5% 0.5W
3404	4822 052 11228	2R20 5% 0.5W
3410	4822 051 30103	10kΩ 5% 0.062W
3411	4822 051 30103	10kΩ 5% 0.062W
3412	2322 750 61509	15Ω 5% 1206 fusible
3413	4822 051 30181	180Ω 5% 0.062W
3414	4822 051 30109	10Ω 5% 0.062W
3417	4822 051 30109	10Ω 5% 0.062W
3418	4822 051 30181	180Ω 5% 0.062W
3420	4822 051 30008	Jumper 0603
3427	4822 051 30008	Jumper 0603
3999	4822 051 30152	1.5kΩ 5% 0.062W
9402	4822 051 20008	Jumper 0805
9405	4822 051 30008	Jumper 0603

5300	3104 308 20571	Transf. S13974-03
5400	4822 157 11869	33μH 10%
5401	4822 157 71334	0.68μH

6300	4822 130 83757	BAS216
6301	4822 051 20008	Jumper 0805
6305	9340 553 52115	BAS321
6306	9340 553 52115	BAS321
6307	9340 553 52115	BAS321
6310	4822 130 11397	BAS316
6311	4822 130 11397	BAS316
6312	4822 130 11397	BAS316
6313	4822 130 11397	BAS316
6314	4822 130 11397	BAS316



7300	5322 130 42718	BFS20
7301	5322 130 42718	BFS20
7302	5322 130 62804	BCP53
7303	5322 130 63033	BCP56
7304	4822 130 60383	BF824
7307	9352 561 40112	TDA6108
7308	5322 130 60159	BC846B

DC Shift Panel [G]

Various

0317	4822 265 20723	Connector 2p m
0318	4822 265 20723	Connector 2p m
1430	2422 086 10581	Fuse 400mA 65V
8317	3104 311 01421	Cable 2p3/220/2p3 Wh

2430	4822 122 31177	470pF 10% 500V
2431	4822 122 31177	470pF 10% 500V

5430	3128 138 38911	DC-shift coil CU15
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6432	9340 317 00133	BYD33V
6433	9340 317 00133	BYD33V

DAF + 2nd order [I]

Various

0034	3104 304 23041	DAF bracket EMGS
1417	4822 265 20723	Connector 2p m
1418	2422 025 16374	Connector 2p m
1419	4822 265 20723	Connector 2p m
1497	4822 267 10973	Connector 1p m
8418	3104 311 01951	Cable 2p3/560/2p4 Bk

2800	2222 375 90498	470pF 5% 2kV
2821	2222 479 90166	68nF 5% 400V
2890	2222 375 90276	220pF 5% 2kV

3898	4822 116 21211	VDR 420V
3899	4822 116 21211	VDR 420V

5800	2422 531 02437	Transformer S21975-03
5801	2422 531 02435	Transformer C948-02
5801	8228 001 34391	Driver Transformer CU15

Front Interface Panel [J]

Various

0157	3104 311 02421	Cable 5p/480/5p
0177	3104 311 03011	Cable 2p/340/2p Bk
0201	2422 025 16268	Connector 2p m
0202	2422 025 16268	Connector 2p m
0203	2422 025 06353	Connector 5p m
1910	9322 127 54667	TSOP1836UH1
1951	2422 128 02972	Mains switch

2930	4822 124 41584	100μF 20% 10V
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3957	4822 053 21335	3.3MΩ 5% 0.5W
3966	4822 053 21335	3.3MΩ 5% 0.5W
3978	4822 051 30008	Jumper 0603
3981	4822 051 30681	680Ω 5% 0.062W
3982	4822 116 52219	330Ω 5% 0.5W
4903	4822 051 30008	Jumper 0603

6901	9322 050 99682	LTL-10224WHCR
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11. Revision List

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- First release.

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