Colour Television

Chassis

ES1E

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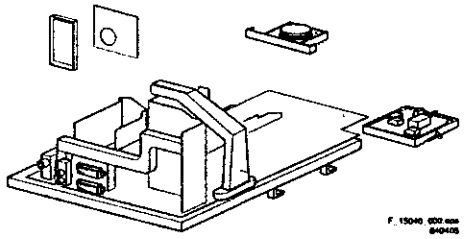

Service Manual

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PHILIPS

1. Technical Specifications, Connections, and Chassis Overview

Index of this chapter:

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 (°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

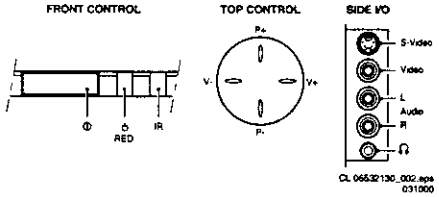


Figure 1-1 Front and top control, side I/O connections

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}P / 75 ohm	
Mini Jack: Audio Headphone - Out			
Bk	- Head phone	32 - 600 ohm / 10 mW	

1.2.2 Rear Connections

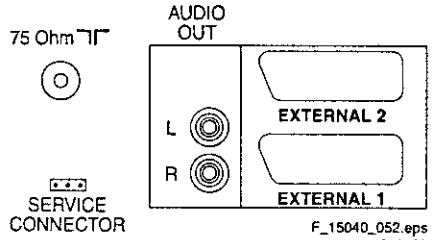


Figure 1-2 Rear connections

Aerial - In			
-	- IEC-type (EU)	Coax, 75 ohm	
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^2C Data (0 - 5 V)	
2	- SCL-S	I^2C Clock (0 - 5 V)	
3	- Ground	Gnd	

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

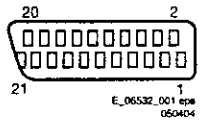


Figure 1-3 SCART connector

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

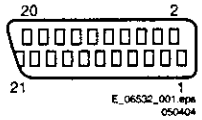


Figure 1-4 SCART connector

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

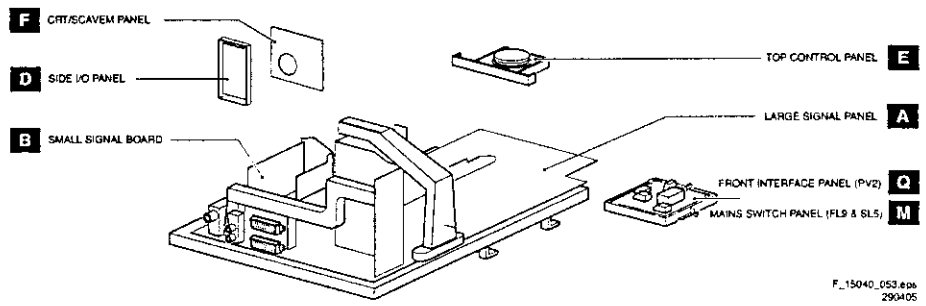


Figure 1-5 PWB location

2. Safety Instructions, Warnings, and Notes

Index of this chapter:

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).

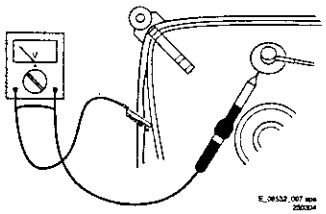


Figure 2-1 Discharge picture tube

- 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 ($\mu = x10^{-6}$), nano-farads ($n = x10^{-9}$), or pico-farads ($p = x10^{-12}$).
- Capacitor values may also use the value multiplier as the decimal point indication (e.g. 2p2 indicates 2.2 pF).
- An "asterisk" (*) indicates component usage varies. Refer to the diversity tables for the correct values.
- The correct component values are listed in the 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).

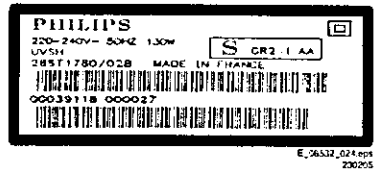


Figure 2-2 Serial number example

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 solderning 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!

4. Mechanical Instructions

Index of this chapter:

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. Simultanuously 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].

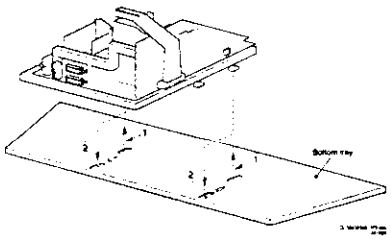


Figure 4-1 Service position 1

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.)

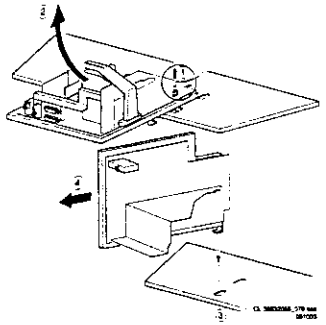


Figure 4-2 Service position 2

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

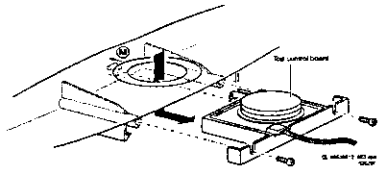


Figure 4-3 Top control panel

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

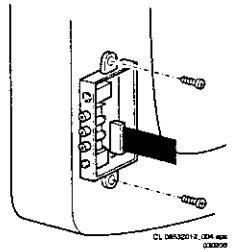


Figure 4-4 Side-I/O panel

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

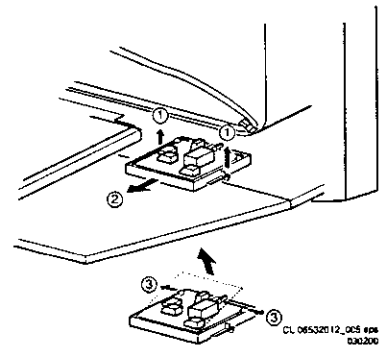


Figure 4-5 Mains Switch/LED panel

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)

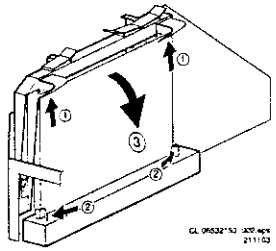


Figure 4-6 SSB removal

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 postioned 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.

- 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

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 the 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).

5. Service Modes, Error Codes, and Fault Finding

Index of this chapter:

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 than 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...).

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^2C communication failure / MPIF test failed
12	BC-loop not stabilised within the time limit (i.e. after timer is expired)
13	NVM I^2C communication failure
14	Main tuner 1232 I^2C failure UV13xx
17	3D Y/C 7823 Combfilter I^2C communication failure
18	PIP Tuner I^2C failure
19	2fH component input I^2C 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.

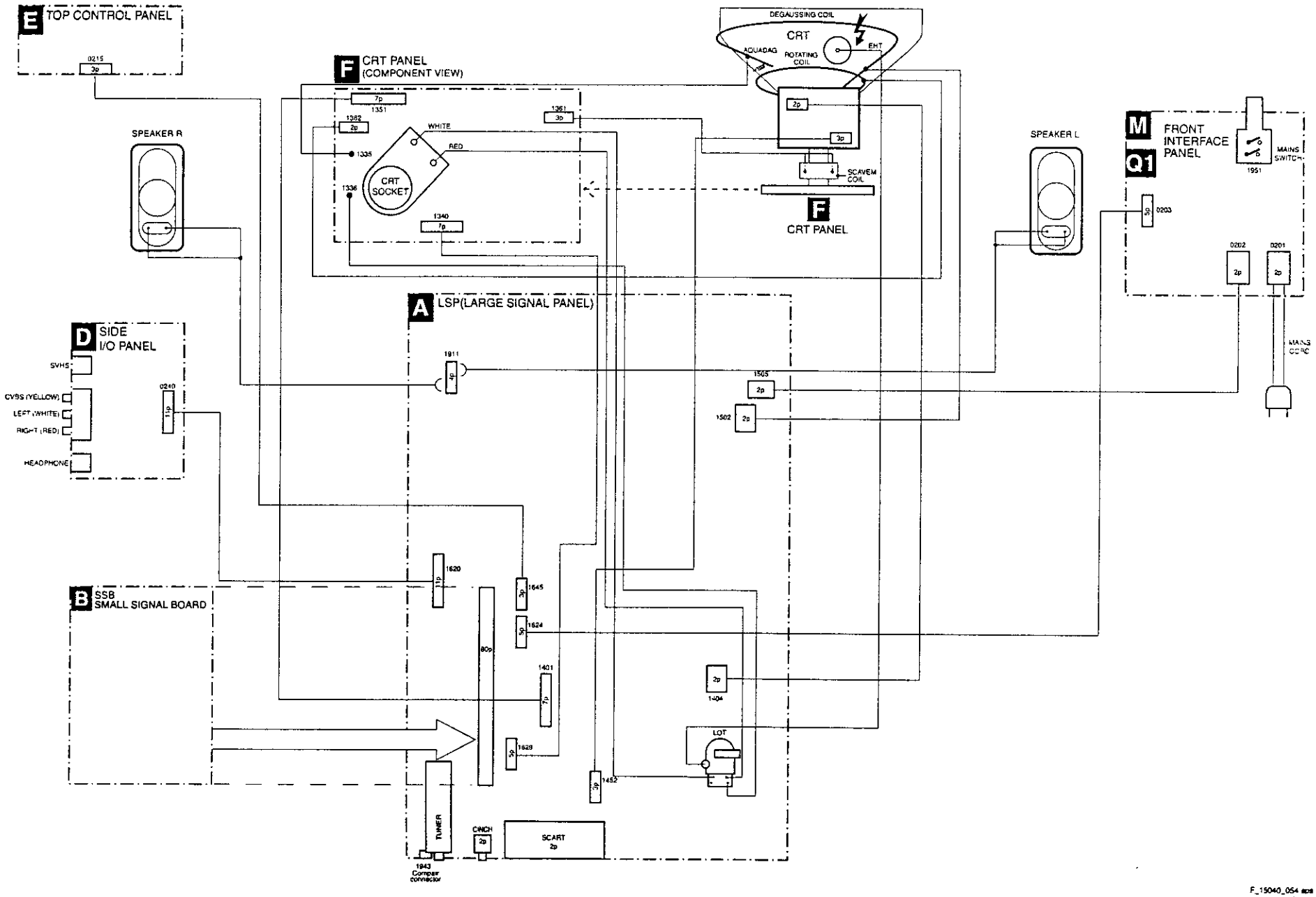
Note: It can take some seconds before the blinking LED starts.

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.

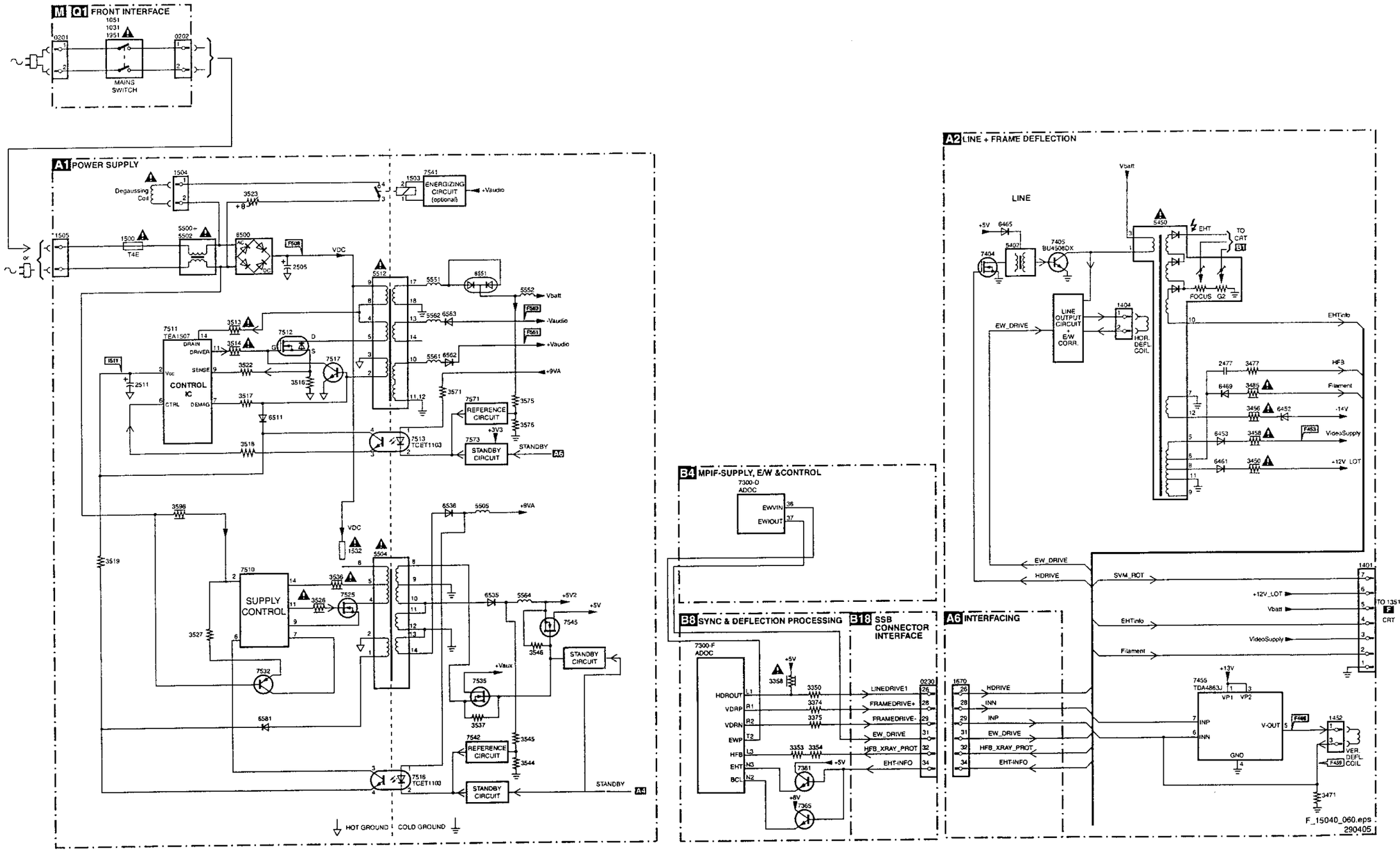
6. Block Diagrams, Testpoint Overviews, and Waveforms

Wiring Diagram



F_15040_054.eps
250405

Block Diagram LSP Supply and Deflection



Testpoint Overview LSP

F232 A8 F246 B8 F404 F8 F455 C7 F465 F6 F481 E9 F504 F1 F541 D3 F574 D4 F583 E5 F632 B8 F678 C8 F708 C10 F715 B9 F722 B10 F910 B3 F955 B4 I241 A6 I255 A7 I413 D6 I428 F7 I440 E8 I449 D6 I460 D8 I470 D8 I487 D7 I494 E8 I502 G2 I511 G5 I518 F5 I526 F3 I533 E4 I704 D10
F233 A8 F247 A8 F416 G6 F456 G10 F466 D9 F482 C8 F506 G1 F542 D3 F575 F5 F620 C8 F672 A6 F679 C7 F708 C10 F716 B10 F723 B10 F911 B4 F956 C3 I242 A6 I256 B6 I414 C7 I432 E8 I442 E10 I450 F6 I462 G7 I473 E7 I488 G8 I495 D9 I503 G1 I512 E4 I519 G5 I527 G6 I534 F2 I705 C9
F234 A9 F248 A8 F418 G7 F457 G10 F469 D9 F483 D8 F507 G1 F552 E5 F576 C4 F627 A5 F673 B8 F701 D9 F710 C10 F717 C10 F724 B10 F912 A5 F958 A5 I247 A6 I259 A7 I415 D7 I435 D8 I443 F9 I453 G9 I463 G10 I475 F8 I489 G7 I496 E7 I504 G1 I513 F5 I520 F6 I528 E4 I536 E3 I707 C10
F235 A10 F249 A7 F419 G8 F458 D8 F472 C8 F500 D1 F508 F3 F561 D4 F578 C4 F628 A5 F674 C8 F702 D10 F711 B10 F718 B9 F901 B4 F913 B2 F959 A5 I248 B8 I260 A9 I418 G6 I436 D8 I445 D7 I455 F9 I464 F10 I476 D9 I490 D7 I497 F6 I506 F3 I514 F5 I521 G5 I529 D4 I537 E3 I708 C10
F241 A10 F250 A6 F451 F9 F459 G7 F475 C8 F501 F2 F509 G4 F562 D5 F580 D6 F629 B8 F675 B6 F703 D10 F712 C10 F719 B10 F904 A3 F950 A5 I232 A9 I249 A7 I261 A9 I419 G6 I437 D6 I446 D7 I457 F8 I466 E8 I480 D9 I491 D7 I499 D7 I507 E2 I515 F5 I522 D6 I530 F3 I538 D4 I709 C9
F242 A10 F401 D6 F452 G10 F462 F9 F476 D8 F502 E2 F535 C3 F563 D5 F581 C4 F630 B8 F676 B6 F704 D10 F713 C9 F720 B10 F904 B3 F951 B5 I239 A9 I253 A7 I402 G9 I420 E6 I438 D9 I447 D6 I458 F8 I468 E8 I481 D9 I492 E9 I500 F3 I509 F4 I516 G5 I523 F6 I531 E3 I539 D3 I710 C9
F243 A10 F402 E7 F453 C7 F464 F6 F478 D9 F503 G1 F537 C5 F573 D6 F582 C3 F631 B8 F677 B9 F705 C9 F714 B10 F721 B9 F905 C3 F952 A4 I240 A9 I254 A7 I410 F10 I423 D7 I439 E8 I448 D6 I459 F9 I469 E9 I482 G10 I493 G10 I501 G3 I510 E3 I517 G5 I525 E3 I532 E3 I540 D3 I711 B9
I542 D2 I712 B10
I543 C3 I713 B10
I544 E4 I714 B10
I545 C3 I715 B10
I546 F5 I716 B10
I547 C4 I717 C10
I548 F5 I719 D9
I550 E3 I720 C9
I551 E5 I721 D9
I552 E5 I722 C10
I553 F3 I723 B9
I554 F3 I724 B9
I555 E4 I725 B9
I557 E2 I726 C9
I558 D4 I727 A10
I559 G2 I728 B10
I560 F4 I729 A10
I561 E4 I731 D9
I562 E4 I732 D9
I563 E2 I733 C9
I564 F6 I734 C9
I565 D4 I735 C9
I566 D4 I736 B10
I568 D3 I737 B9
I569 D5 I738 C10
I570 D5 I739 D10
I571 E6 I740 C10
I572 F1 I741 C10
I573 D5 I901 B4
I574 D6 I902 C2
I575 E6 I903 A3
I577 C4 I904 A3
I578 E6 I908 A3
I579 E5 I909 A3
I580 D5 I913 A4
I581 D4 I914 A4
I582 G5 I915 B4
I583 F1 I916 B4
I586 E5 I918 B4
I587 D4 I920 C4
I588 C4 I921 A3
I589 D5 I922 B3
I590 D4 I924 B3
I591 D4 I925 A3
I592 D4 I926 B3
I593 D4 I927 A3
I596 D6 I928 B4
I597 D5 I930 B4
I599 D5 I934 B4
I602 A9 I935 C3
I603 C6 I936 A3
I604 B7 I938 B3
I605 C7 I941 A3
I606 C8 I943 A3
I608 C6 I945 B4
I609 C9 I948 A3
I610 B9 I951 B5
I611 C9 I952 B5
I612 A7 I953 A5
I616 B8 I954 B5
I621 A6 I956 B4
I622 A6 I957 B5
I623 A5 I958 C5
I624 A5 I959 B4
I625 A5 I960 B5
I626 A5 I962 B5
I627 C6 I963 B4
I628 C6 I964 C4
I629 C6 I965 B5
I630 B6 I967 C4
I631 C6
I632 A8
I633 B8
I634 C7
I635 A7
I636 B8
I637 B8
I638 C8
I639 C8
I640 B7
I650 C7
I672 B8
I674 A7
I677 B7
I678 B9
I680 B7
I685 B6
I686 B6
I687 B6
I688 B7
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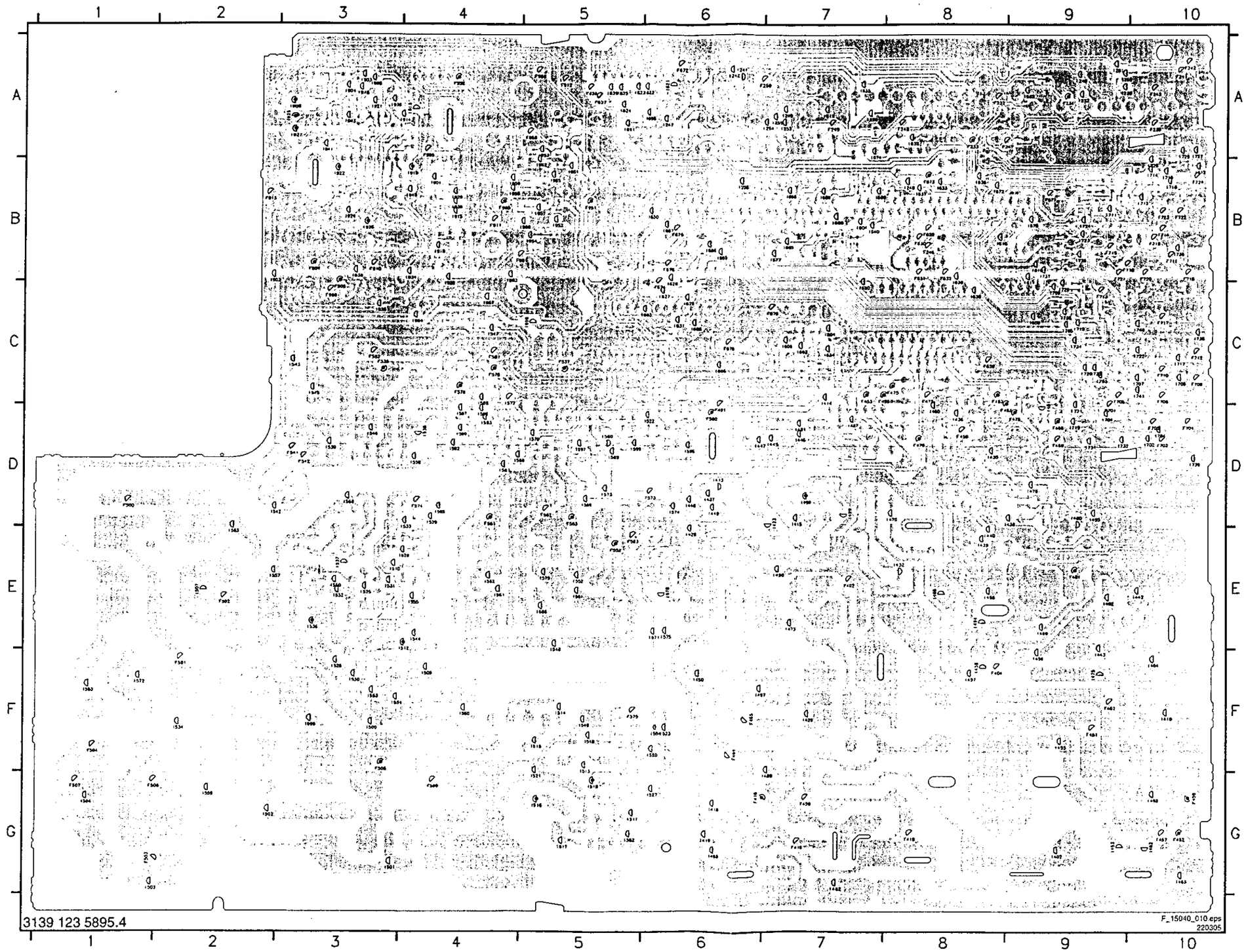
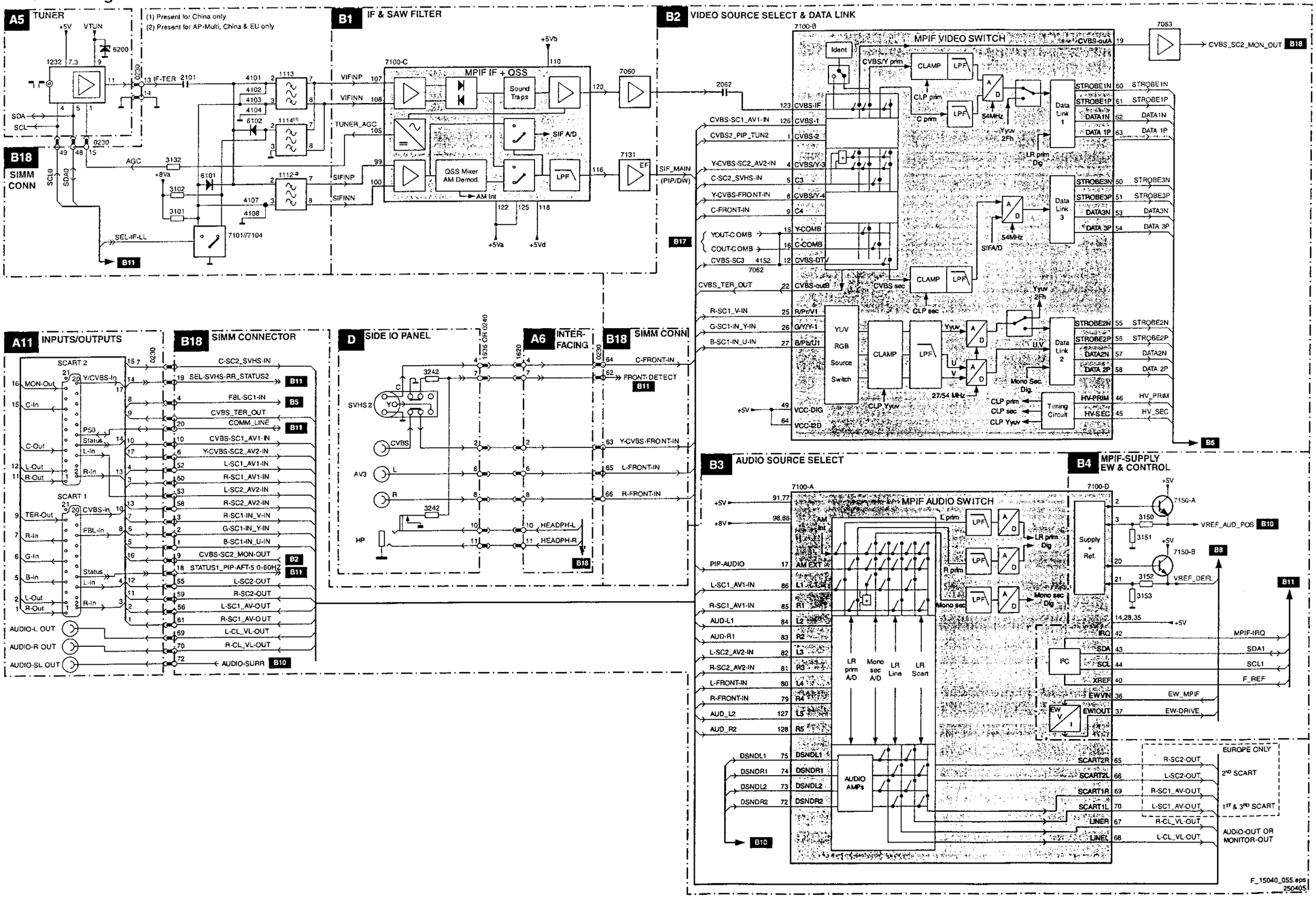
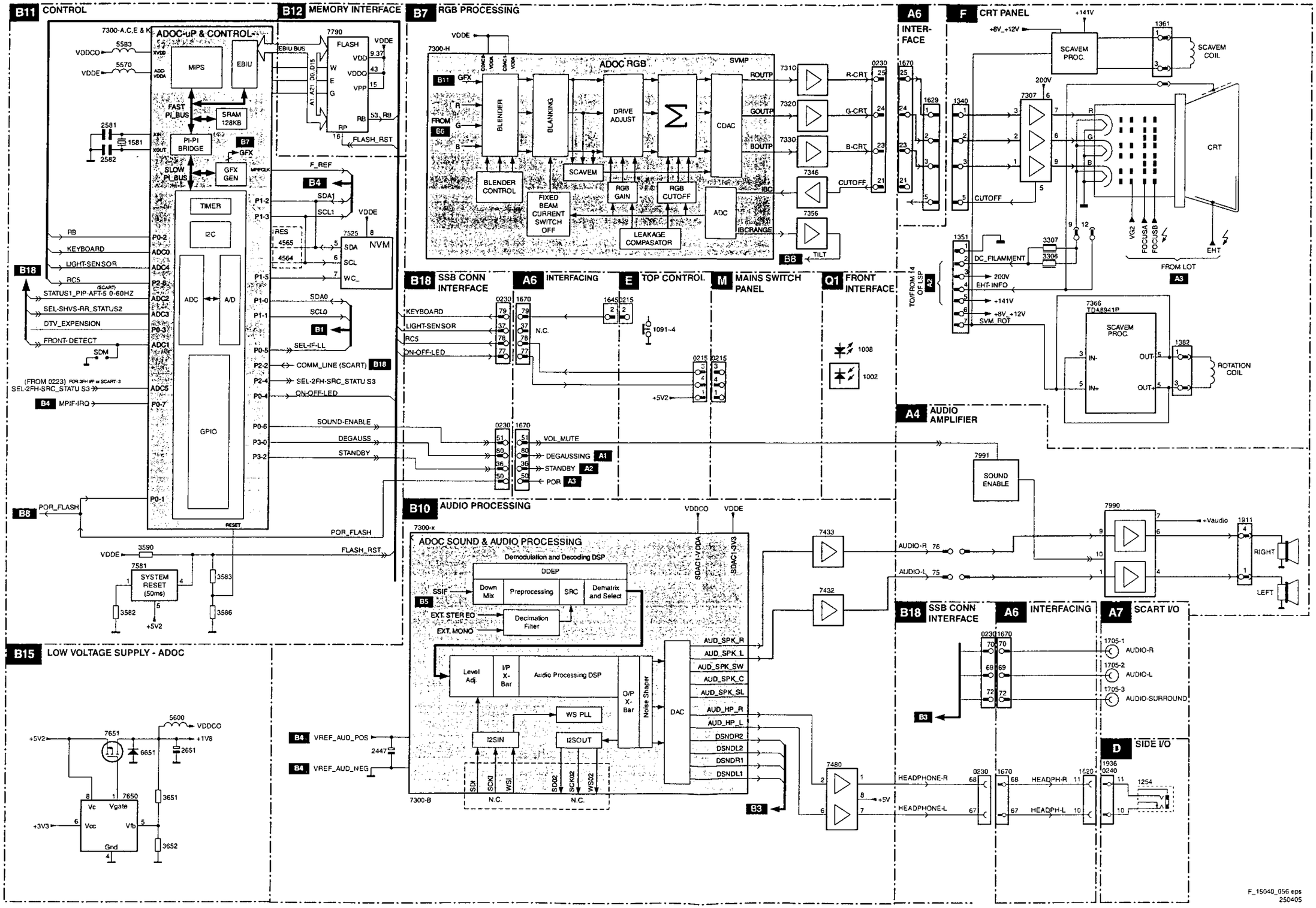
I691 A5
I693 C7
I694 C7
I695 B7
I696 A6
I701 D9
I702 D10
I703 C9



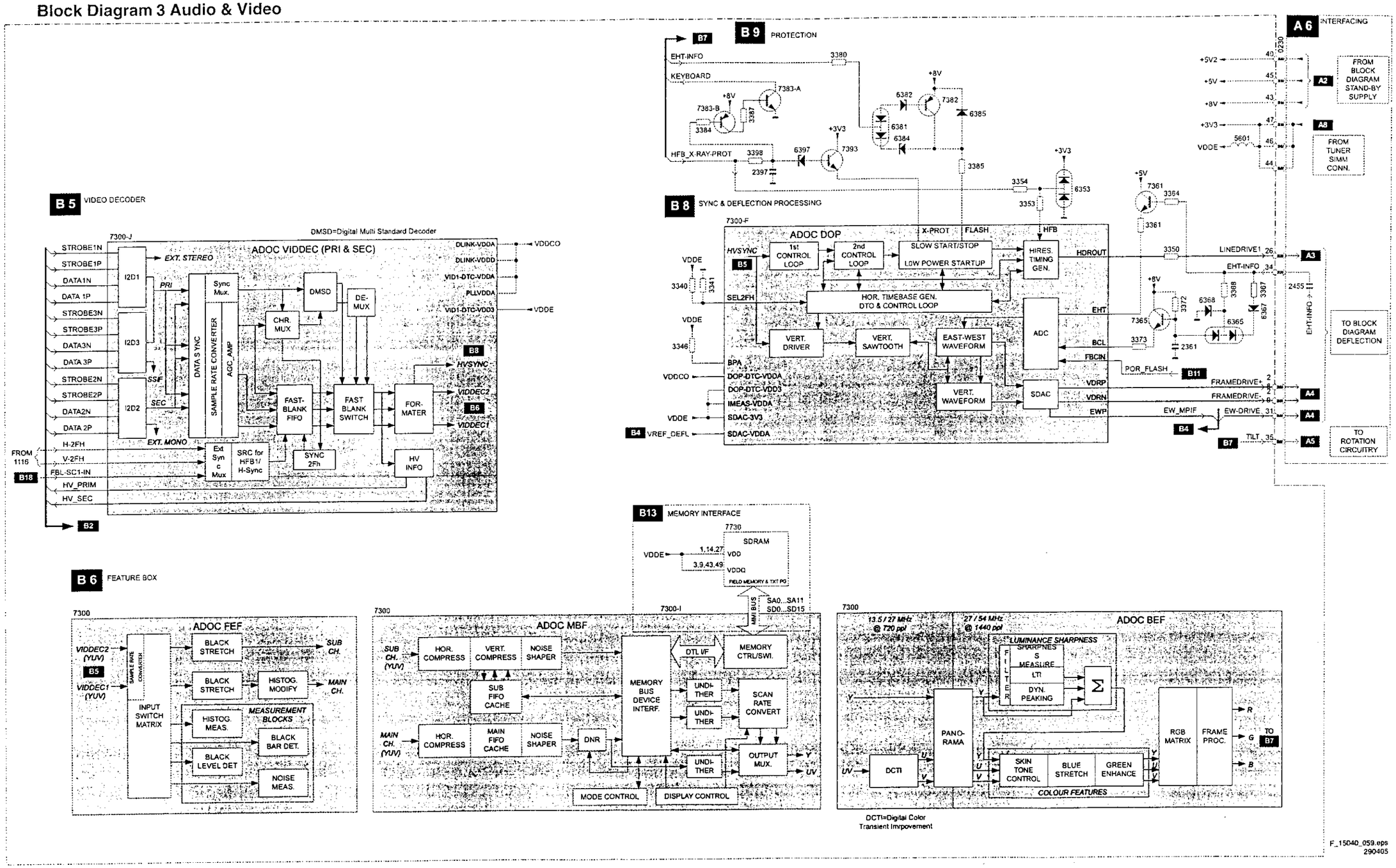
Block Diagram 1 Audio & Video



Block Diagram 2 Audio & Video



Block Diagram 3 Audio & Video



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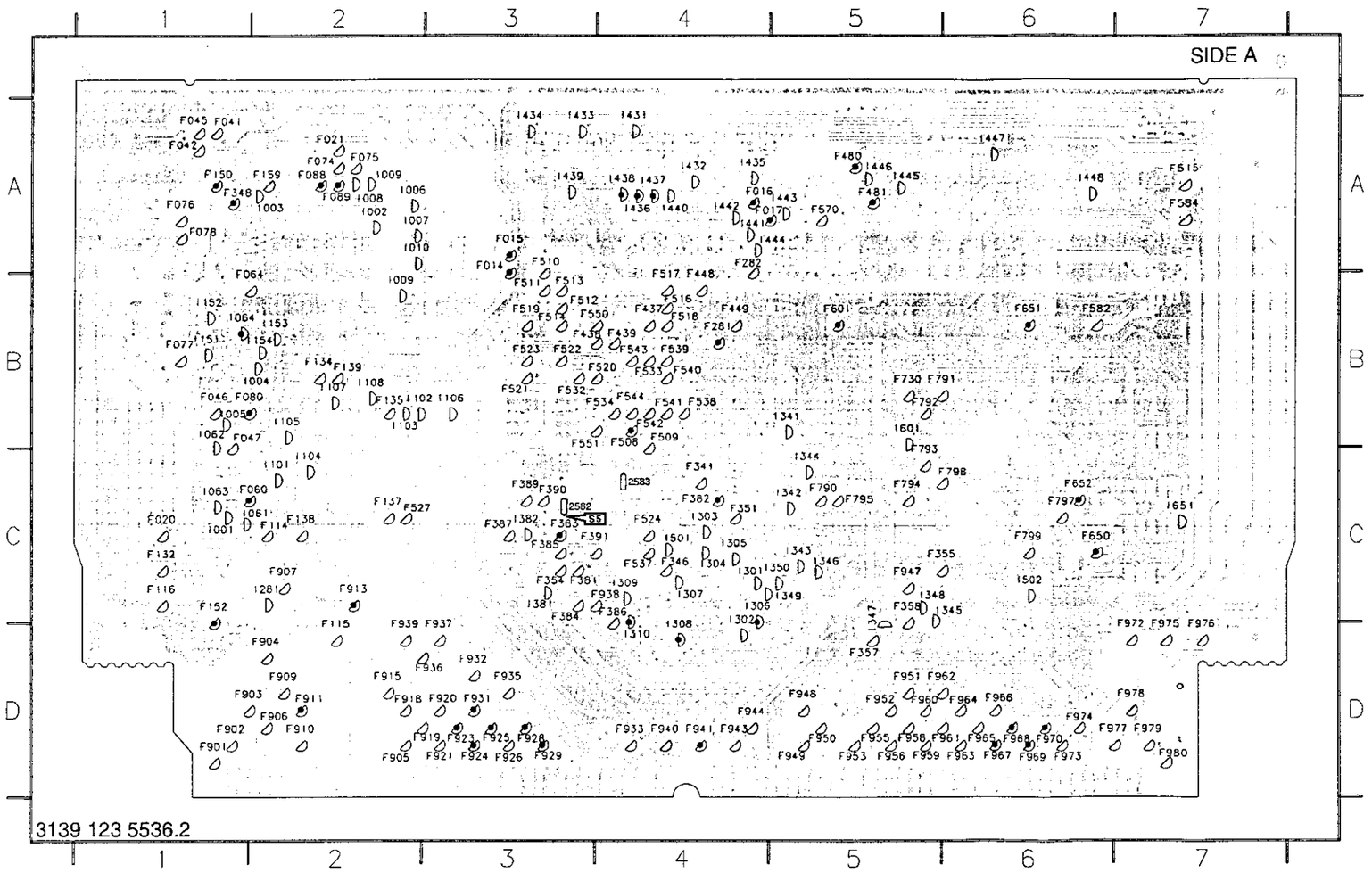
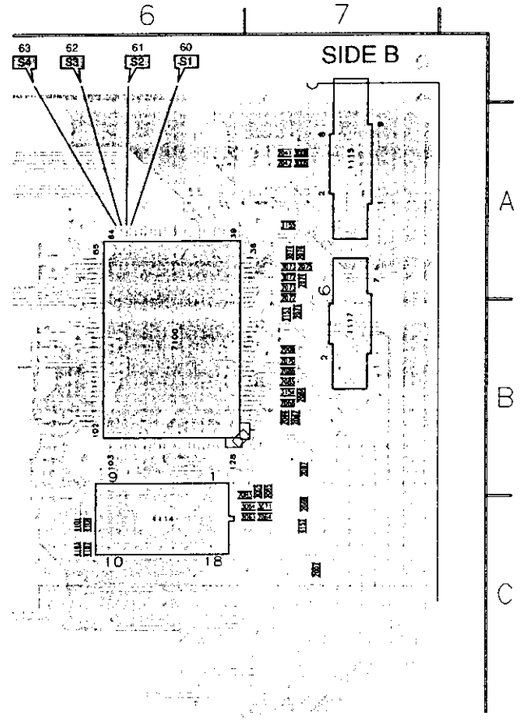
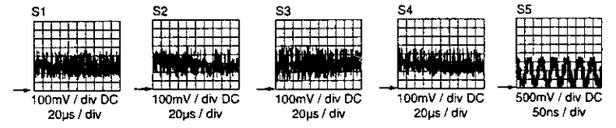
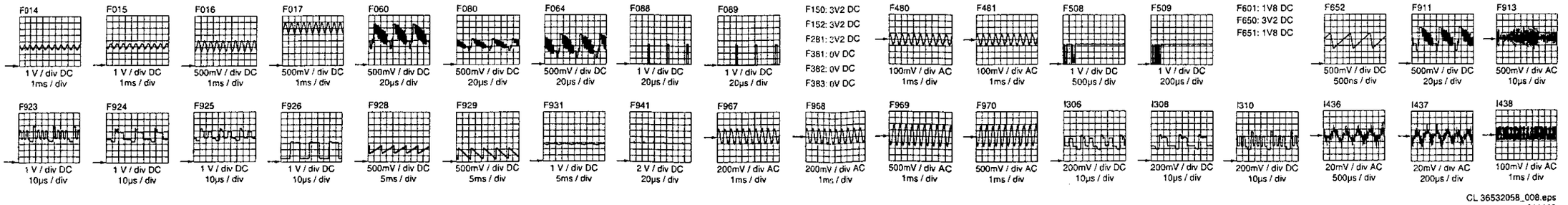
Testpoint Overview SSB

1009 A2	F064 B1	F134 B2	F351 C4	F390 C3	F512 B3	F527 C2	F551 B3	F794 C5	F910 D2	F929 D3	F947 C5	F962 D5	F976 D7	I009 B2	I108 B2	I308 D4	I381 C3	I442 A4
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	









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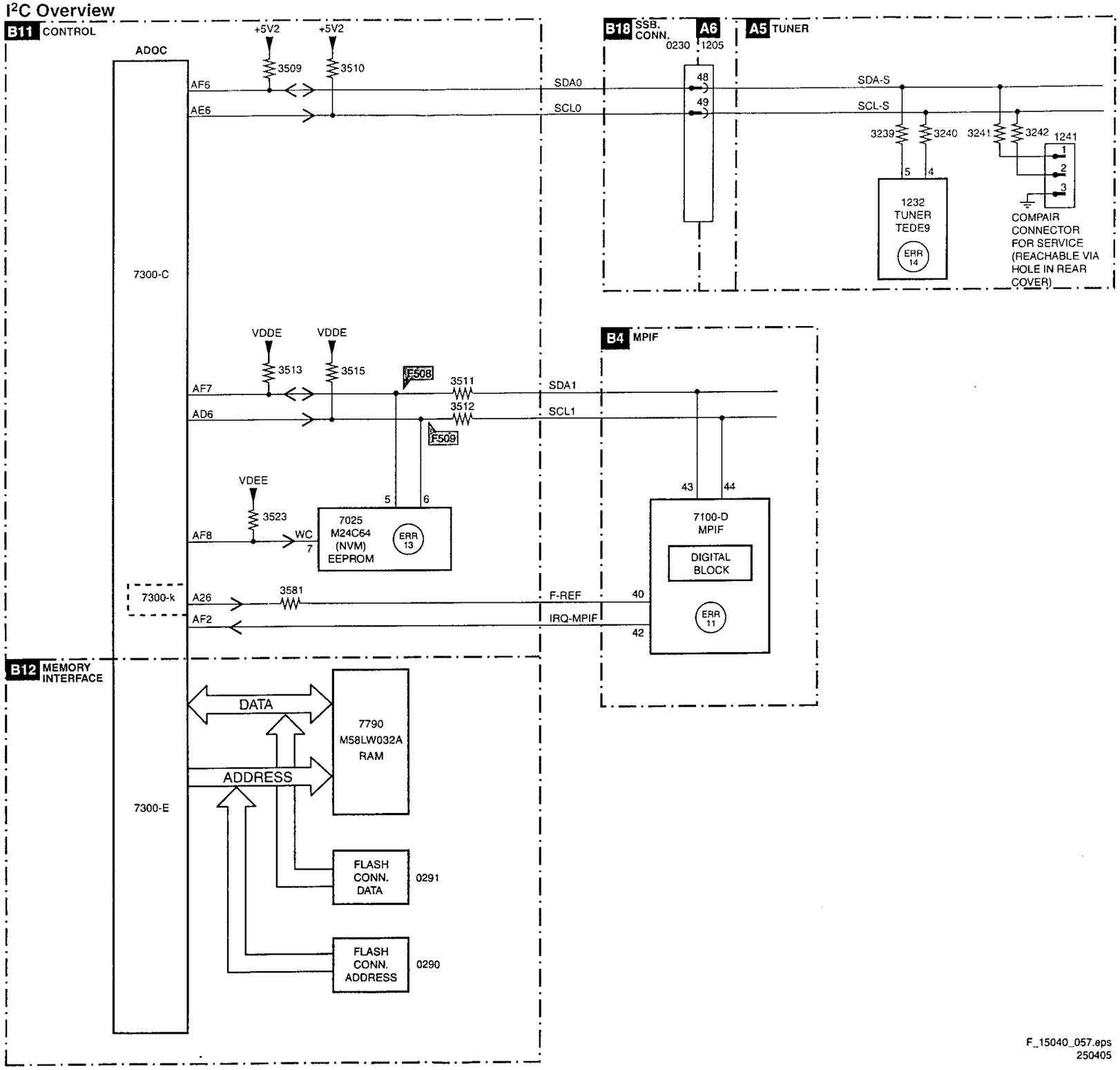
211103

I2C Overview

I²C Overview



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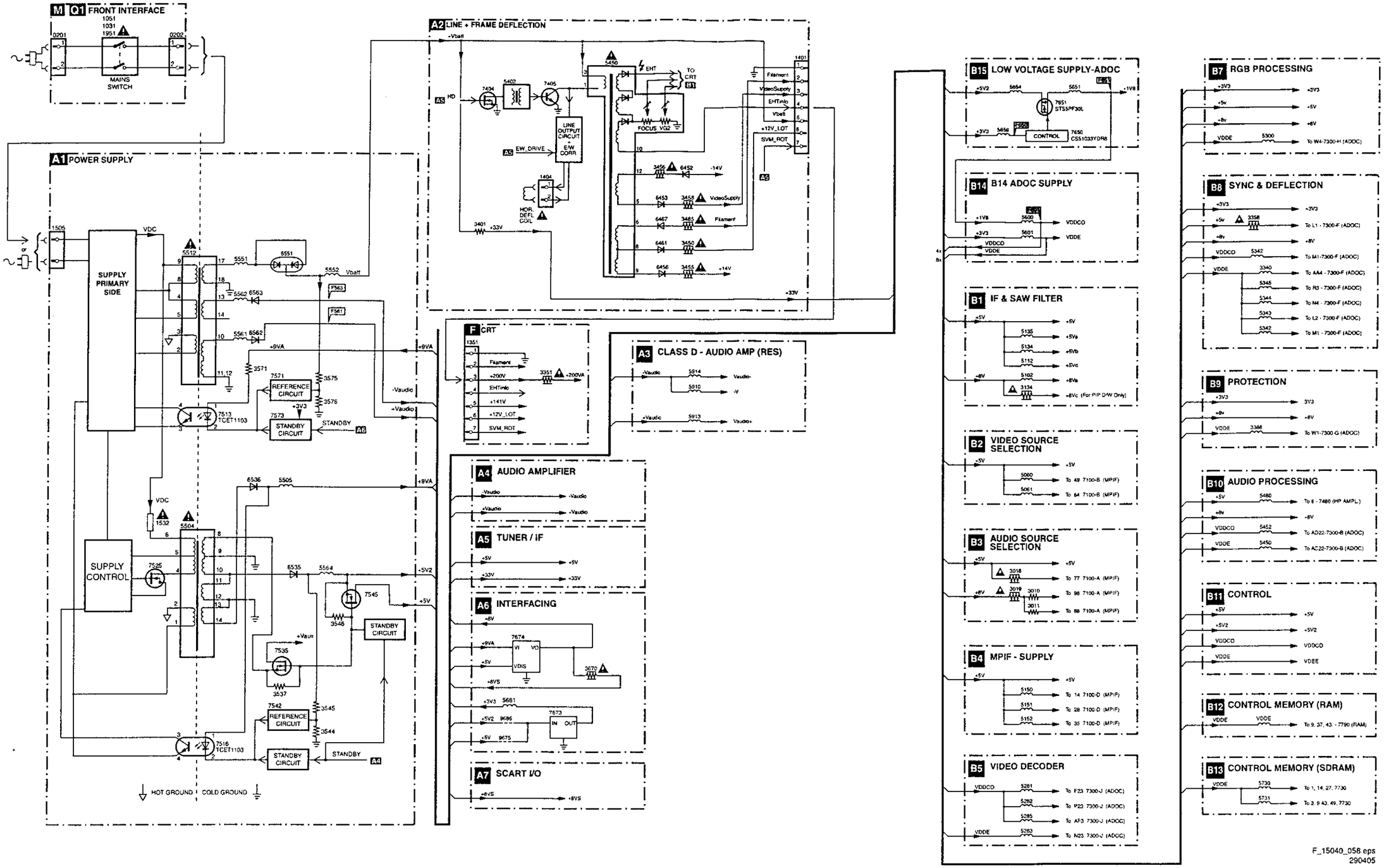
Supply Lines Overview

SUPPLY LINES OVERVIEW



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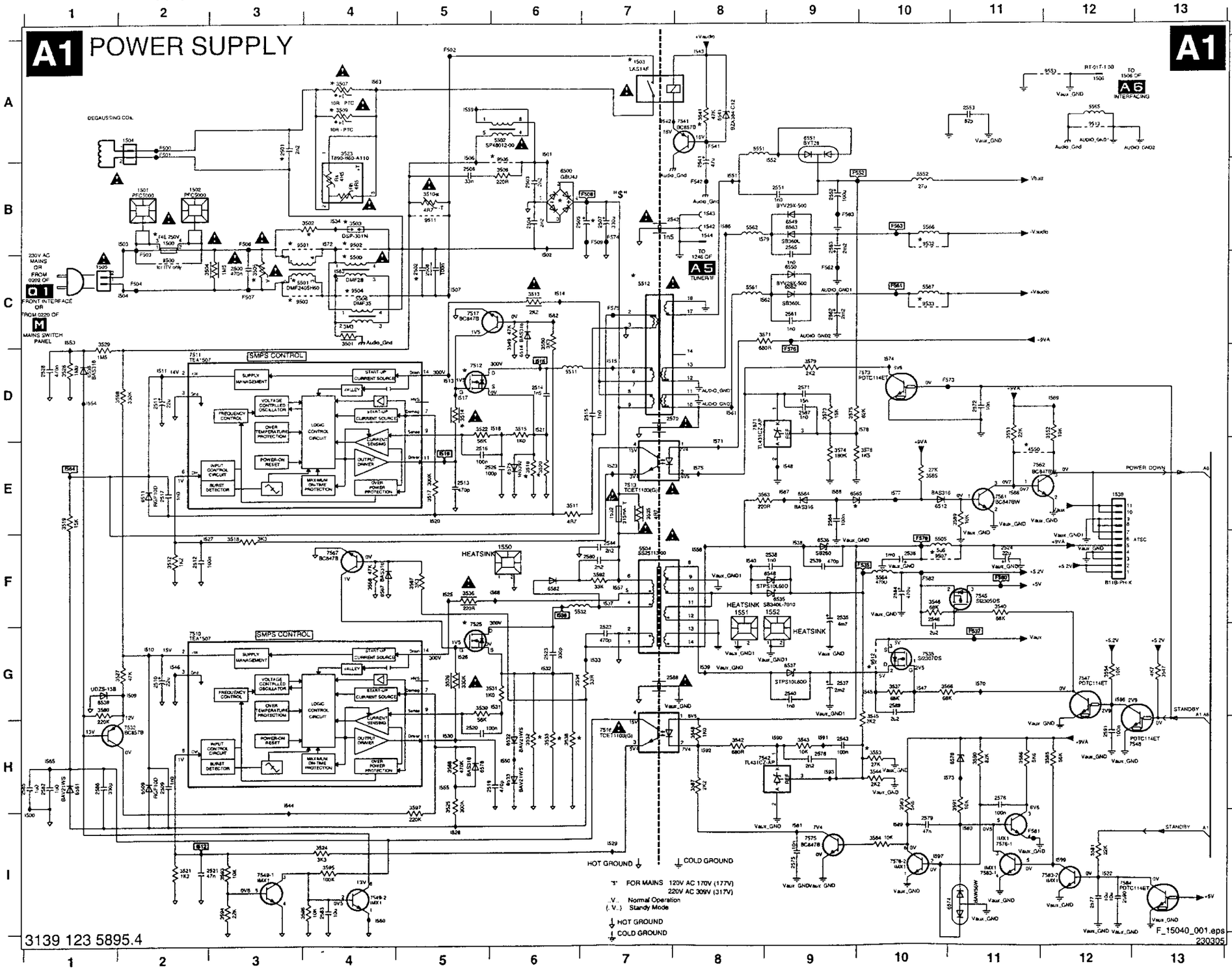
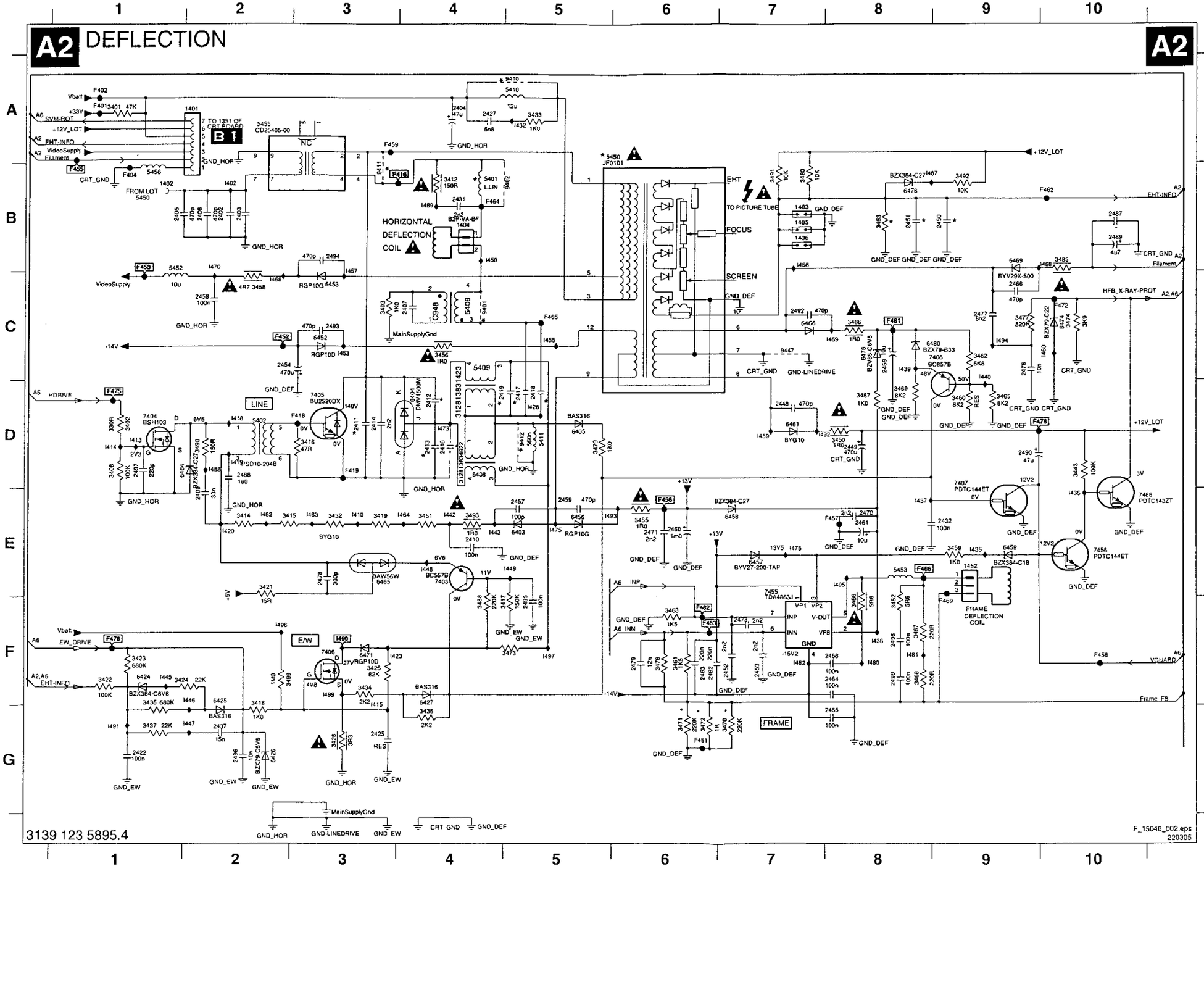
7. Circuit Diagrams and PWB Layouts

LSP: Power Supply



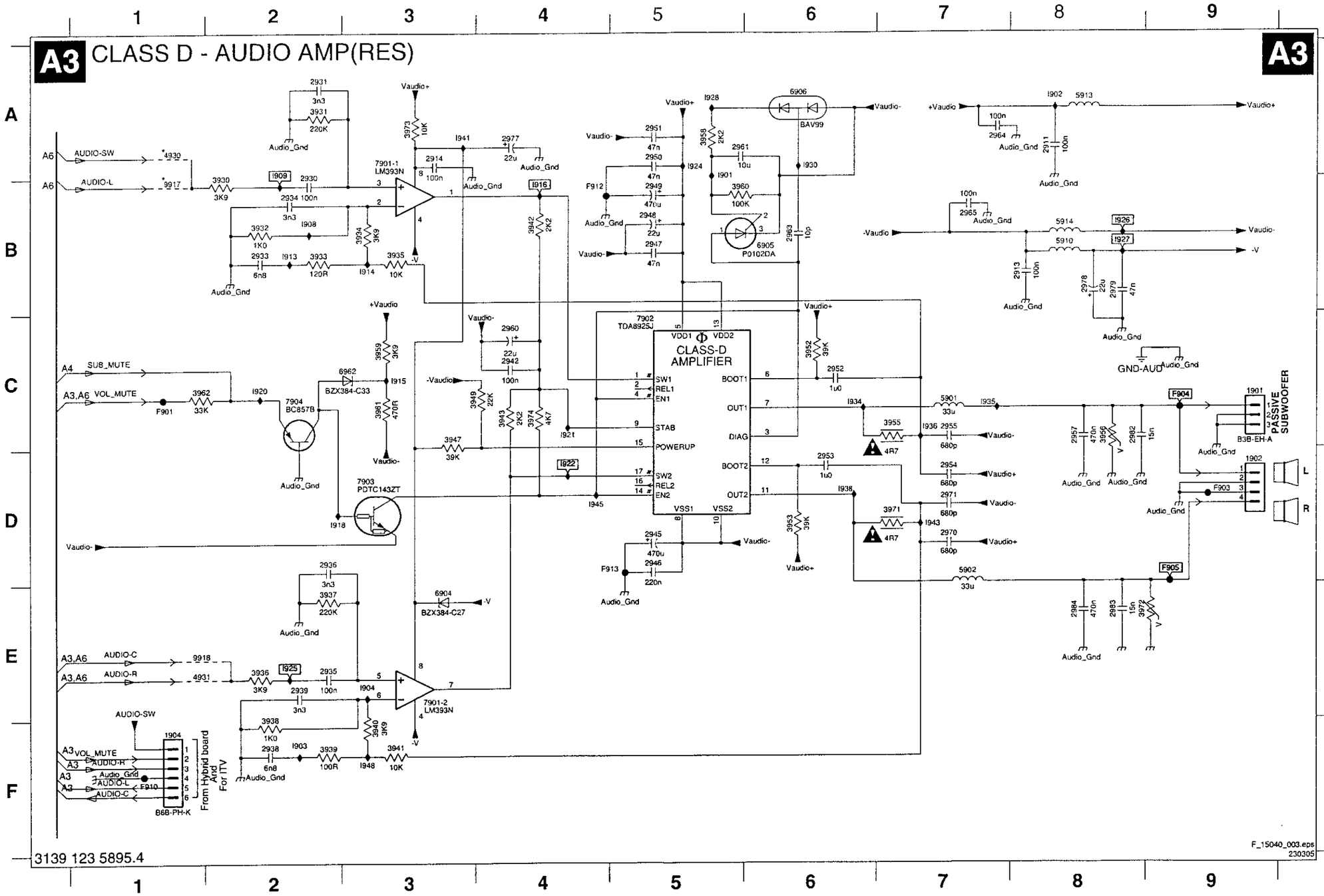
LSP: Deflection

A2 DEFLECTION



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	1402 B2
2422 G1	3476 F6	1410 E3
2425 G3	3477 C9	1413 D1
2427 A4	3479 D5	1414 D1
2431 B4	3480 B7	1415 F3
2432 E9	3485 B10	1418 D2
2437 G2	3486 C8	1419 D2
2448 D7	3487 D8	1420 E2
2449 D8	3488 F4	1423 F3
2450 B9	3490 D2	1428 D5
2451 B8	3491 B7	1432 A5
2452 F7	3492 B9	1435 E9
2453 F7	3493 E4	1436 E10
2454 C2	3499 F2	1437 E8
2457 E5	5401 B4	1438 F8
2458 C2	5402 D2	1439 C8
2459 E5	5406 C4	1440 C9
2460 E6	5408 D4	1442 E4
2461 E8	5409 C4	1443 E4
2462 F6	5410 A5	1445 F1
2463 F6	5411 D5	1446 F2
2464 F8	5450 A6	1447 G2
2465 G8	5452 B1	1448 E4
2466 C9	5453 E8	1449 E5
2468 F8	5455 A2	1450 B4
2469 C8	5456 B1	1453 C3
2470 E8	6403 E5	1455 C5
2471 E6	6404 D4	1457 B3
2473 F7	6405 D5	1458 B7
2476 C9	6424 F1	1459 D7
2477 C9	6425 F2	1460 C10
2478 E3	6426 G2	1462 E2
2479 F6	6427 F4	1463 E3
2487 B10	6452 C3	1464 E4
2488 D2	6453 C3	1466 C2
2489 B10	6456 E5	1468 B10
2490 D9	6457 E7	1469 C8
2492 C7	6458 E7	1470 B2
2493 C3	6459 E9	1473 D4
2494 B3	6461 D7	1475 E5
2495 F5	6464 D2	1476 E7
2496 G2	6465 E3	1480 F8
2497 D1	6466 C7	1481 F8
2498 F8	6469 B9	1482 F7
2499 F8	6471 F3	1487 B8
3401 A1	6474 C10	1488 D2
3402 D1	6476 C8	1489 B4
3403 C3	6478 B8	1490 F3
3408 D1	6480 C9	1491 G1
3412 B4	7403 E4	1492 D7
3414 E2	7404 D1	1493 E5
3415 E2	7405 D3	1494 C9
3416 D3	7406 F3	1495 E8
3417 F5	7407 D9	1496 F2
3418 F2	7408 C9	1497 F5
3419 E3	7455 E7	1499 F3
3421 E2	7456 E10	
3422 F1	7486 E10	
3423 F1	9401 C4	
3424 F1	9402 B5	
3425 F3	9410 A5	
3426 G3	9411 B3	
3432 E3	9412 D5	
3433 A5	9447 C7	
3434 F3	F401 A1	
3435 F1	F402 A1	
3436 G4	F404 B1	
3437 G1	F416 B4	

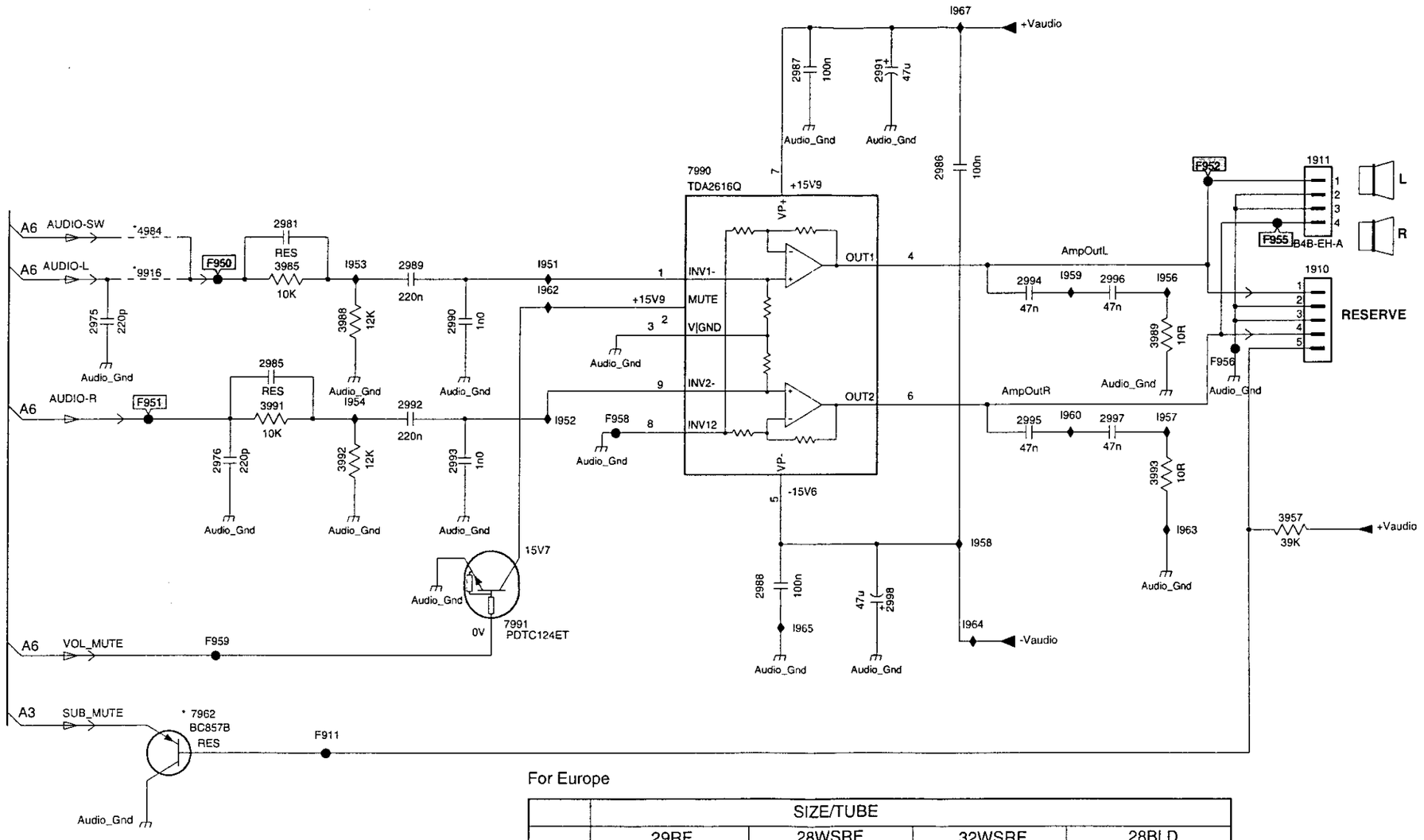
LSP: Class D Audio Amplifier (Res)



1901 C9	5913 A8	3930 B2	I934 C6
1902 D9	5914 B8	3931 A2	I935 C7
1904 F1	6904 E3	3932 B2	I936 C7
2911 A8	6905 B6	3933 B2	I938 D6
2913 B8	6906 A6	3934 B3	I941 A3
2914 A3	6962 C3	3935 B3	I943 D7
2930 B2	7901-1 A3	3936 E2	I945 D4
2931 A2	7901-2 E3	3937 E2	I948 F3
2933 B2	7902 C5	3938 F2	
2934 B2	7903 D3	3939 F2	
2935 E2	7904 C2	3940 F3	
2936 D2	9917 B1	3941 F3	
2938 F2	9918 E1	3942 B4	
2939 E2	F901 C1	3943 C4	
2942 C4	F903 D9	3947 C3	
2945 D5	F904 C9	3949 C4	
2946 D5	F905 D9	3952 C6	
2947 B5	F910 F1	3953 D6	
2948 B5	F912 B4	3955 C7	
2949 B5	F913 D5	3956 C8	
2950 A5	I901 A5	3958 A5	
2951 A5	I902 A8	3959 C3	
2952 C6	I903 F2	3960 B5	
2953 D6	I904 E3	3961 C3	
2954 D7	I908 B2	3962 C1	
2955 C7	I909 A2	3971 D7	
2957 C8	I913 B2	3972 E8	
2960 C4	I914 B3	3973 A3	
2961 A5	I915 C3	3974 C4	
2963 B6	I916 B4	4930 A1	
2964 A7	I918 D2	4931 E1	
2965 B7	I920 C2	5901 C7	
2970 D7	I921 C4	5902 D7	
2971 D7	I922 D4	5910 B8	
2977 A4	I924 A5		
2978 B8	I925 E2		
2979 B8	I926 B8		
2982 C8	I927 B8		
2983 E8	I928 A5		
2984 E8	I930 A6		

LSP: Audio Amplifier

A4 AUDIO AMPLIFIER



For Europe

ITEM	SIZE/TUBE 29RF A68ERF182X044	28WSRF A66ERF172X044	32WSRF A66ERF172X044	28BLD A66EAK075X054
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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
3989 B7
3991 C2
3992 C3
3993 C7
4984 B2
7962 D2
7990 A4
7991 D4
9916 B2
F911 D2
F950 B2
F951 C2
F952 A7
F955 B7
F956 B7
F958 C4
F959 D2
I951 B4
I952 C4
I953 B3
I954 C3
I956 B7
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I958 C6
I959 B6
I960 C6
I962 B4
I963 C7
I964 D6
I965 D5
I967 A6

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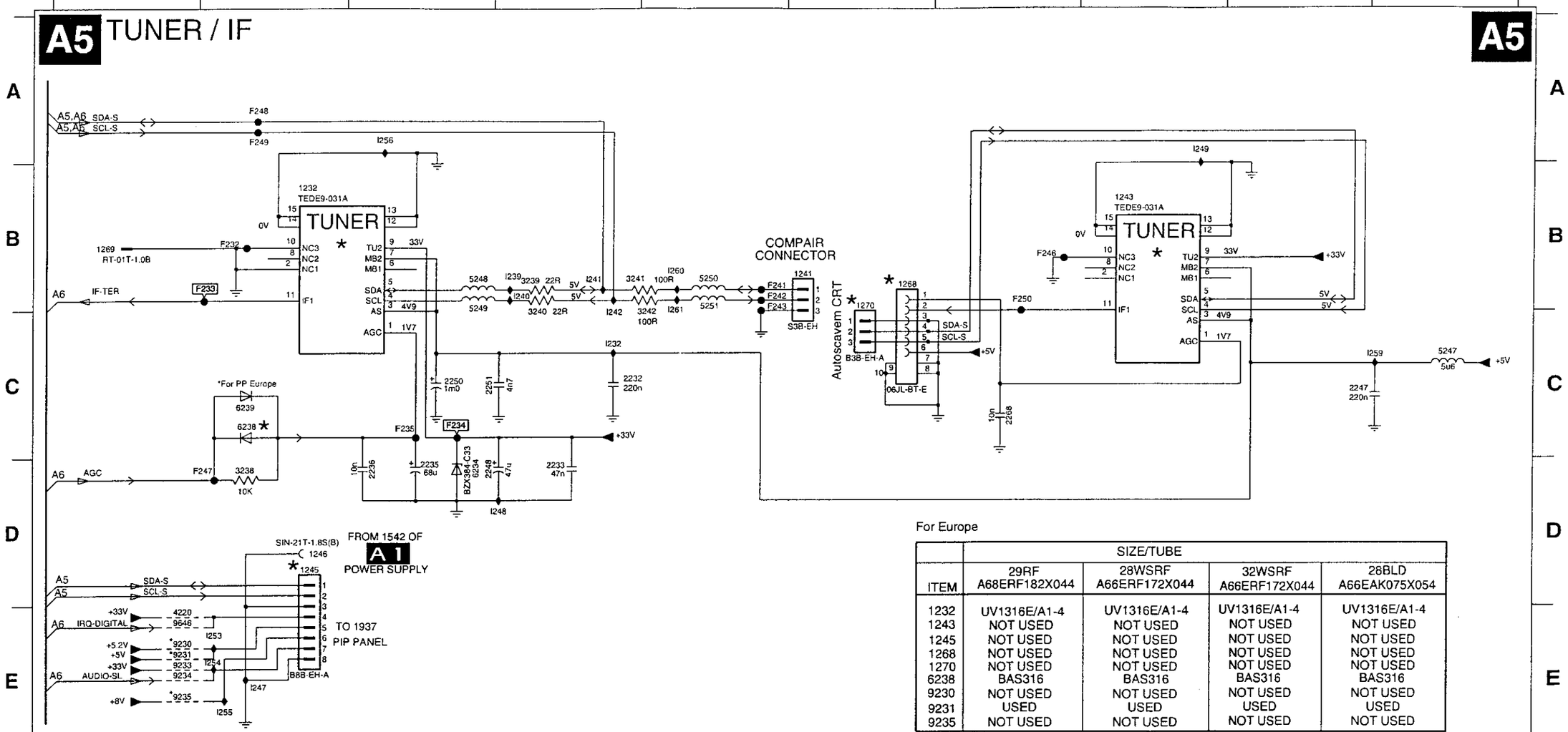
LSP: Tuner IF

1232 B2 1245 D2 1269 B1 2233 D4 2247 C9 2251 C3 3239 B4 3242 C4 5248 B3 5251 B5 6239 C2 9233 E1 9646 E1 F234 C3 F242 B5 F247 D2 F250 B7 I240 B4 I241 B4 I247 E2 I253 E2 I256 A3 I261 B5
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 I242 C4 I248 D4 I254 E2 I259 C10
1243 B8 1268 B6 2232 C4 2236 D3 2250 C3 3238 D2 3241 B4 5247 C10 5250 B5 6238 C2 9231 E1 9235 E1 F233 B2 F241 B5 F246 B7 F249 A2 I239 B4 I242 C4 I249 A8 I255 E2 I260 B5

A5 TUNER / IF



For Europe

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1243	NOT USED	NOT USED	NOT USED	NOT USED
1245	NOT USED	NOT USED	NOT USED	NOT USED
1268	NOT USED	NOT USED	NOT USED	NOT USED
1270	NOT USED	NOT USED	NOT USED	NOT USED
6238	BAS316	BAS316	BAS316	BAS316
9230	NOT USED	NOT USED	NOT USED	NOT USED
9231	USED	USED	USED	USED
9235	NOT USED	NOT USED	NOT USED	NOT USED

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3139 123 5895.4

LSP: Interfacing

A6 INTERFACING

ITV

TO 0203 OF D1 FRONT INTERFACE PANEL OR TO 0242/0247 OF D1 MAINS SWITCH PANEL

TO PIXEL PLUS FRONT INTERFACE

TO A10 2T PIP DW PANEL

2FH PANEL 3rd SCART HDMI

TO 1936 OR 0240 OF D SIDE I/O PANEL

TO 1340 OF B CRT PANEL

TO 2T PIP DW PANEL

TO 0215 OF E TOP CONTROL

TO A10 2T PIP DW PANEL

FROM 1506 OF A1 POWER SUPPLY

TO A10 2T PIP DW PANEL

TO SSB PANEL

For Europe

ITEM	SIZE/TUBE 29RF A68ERF182X044	28WSRF A66ERF172X044	32WSRF A66ERF172X044	28BLD A66EAK075X054
1620	USED	USED	USED	USED
1623	NOT USED	NOT USED	NOT USED	NOT USED
1624	USED	USED	USED	USED
1625	NOT USED	NOT USED	NOT USED	NOT USED
1645	USED	USED	USED	USED
4683	USED	USED	USED	USED
4694	NOT USED	NOT USED	NOT USED	NOT USED
9620	NOT USED	NOT USED	NOT USED	NOT USED
9621	USED	USED	USED	USED
9626	USED	USED	USED	USED

	9674	9683	4624	4625	9675	9686
PIXEL PLUS	--	--	--	JMP	JMP	--
SALSA	JMP	JMP	JMP	--	--	JMP

1607 H1 1634 C5
1608 I1 1635 A10
1620 A13 1636 C7
1621 A9 1637 I4
1623 B2 1638 H6
1624 C2 1639 H6
1625 D2 1640 I6
1628 C12 1650 H9
1630 C12 1672 H3
1631 D13 1674 H4
1635 D12 1677 H7
1645 E13 1678 H1
1646 F13 1680 H8
1669 H3 1685 B3
1670 I1 1686 C3
1683 F12 1687 C3
1684 E2 1688 H9
2663 H11 1689 H6
2666 B12 1690 I7
2667 B12 1691 I10
2669 B12 1693 D7
2670 B12 1694 C6
2671 B12 1695 E8
2672 B12 1696 H10
2673 B13
2674 C7
2675 E12
2676 H7
2677 H7
2678 H7
2679 H6
2680 H8
2681 H7
2682 H6
2688 E6
2689 E7
2690 E8
2691 C8
2692 C5
2693 H9
2694 H9
2695 H10
2696 H11
2697 H11
2698 H6
3623 B3
3624 B3
3625 C3
3626 C3
3627 H6
3628 H6
3629 A5
3630 A5
3670 D7
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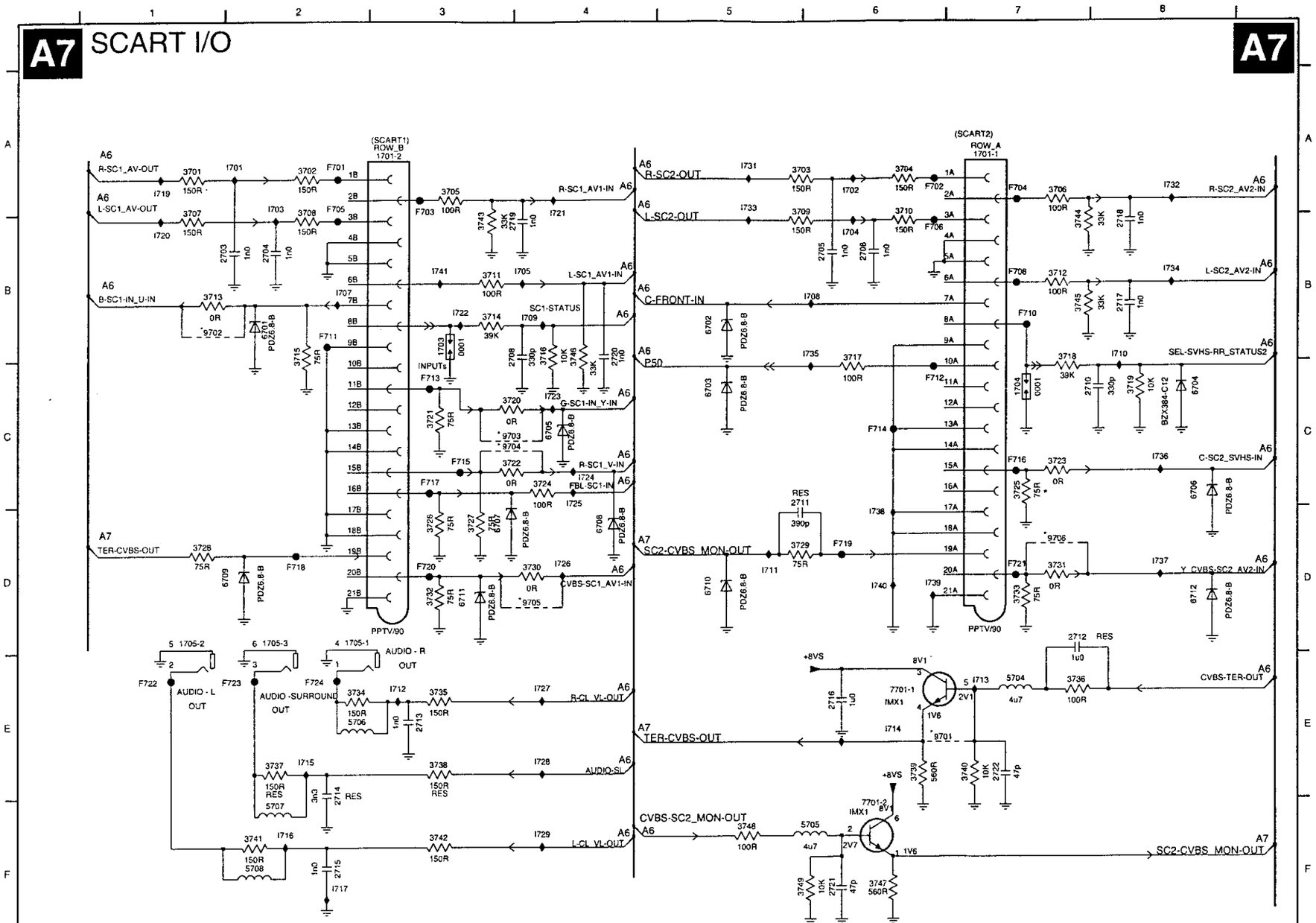

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3734 E2 F722 E1
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Layout LSP (Top Side)

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1904	E4	1910	E3	1911	E3	2235	E6
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2416	B5	2417	B5	2418	B5	2419	B5
2431	A5	2449	B7	2450	A7	2451	A7
2454	A7	2458	C6	2460	A7	2461	C6
2468	C6	2469	C6	2488	A5	2489	C6
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3456	A7	3458	B6	3462	C6	3466	C7
3467	C6	3468	C6	3469	C6	3470	C6
3471	C6	3472	C6	3473	C5	3477	B6
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3490	A4	3492	C5	3499	C5	3501	C1
3502	A1	3503	B1	3504	A1	3505	A1
3507	C1	3508	B2	3509	C1	3510	B2
3511	B4	3513	A4	3514	A4	3515	A4
3516	A3	3519	B3	3520	A3	3523	C2
3524	B3	3525	B3	3529	B2	3531	B2
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3587	C3	3592	B2	3598	B2	3627	D6
3628	D6	3670	E6	3683	D5	3687	D6
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3717	D7	3720	D7	3722	D7	3724	D7
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3936	E2	3955	E3	3957	D3	3959	D3
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5406	B4	5408	B5	5409	B5	5410	B5
5411	B5	5450	B6	5452	C6	5453	C7
5455	A5	5456	C6	5500	B1	5501	B1
5502	A2	5504	C2	5505	D3	5506	B1
5511	A3	5512	B4	5532	B2	5551	B4
5552	B4	5561	B3	5562	B3	5564	D2
5565	D3	5566	D4	5567	D3	5680	E5
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6456	A7	6457	C6	6469	B6	6471	C5
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6509	C3	6511	A4	6535	C2	6536	C3
6537	C2	6548	C2	6549	B4	6550	C3
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9547	B3	9548	A4	9549	C4	9552	D3
9553	D3	9554	C4	9555	C3	9556	C3
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9630	D5	9631	E4	9632	E4	9633	E6
9634	D4	9635	D5	9636	E4	9637	D4
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9650	D5	9653	D6	9654	D6	9655	E4
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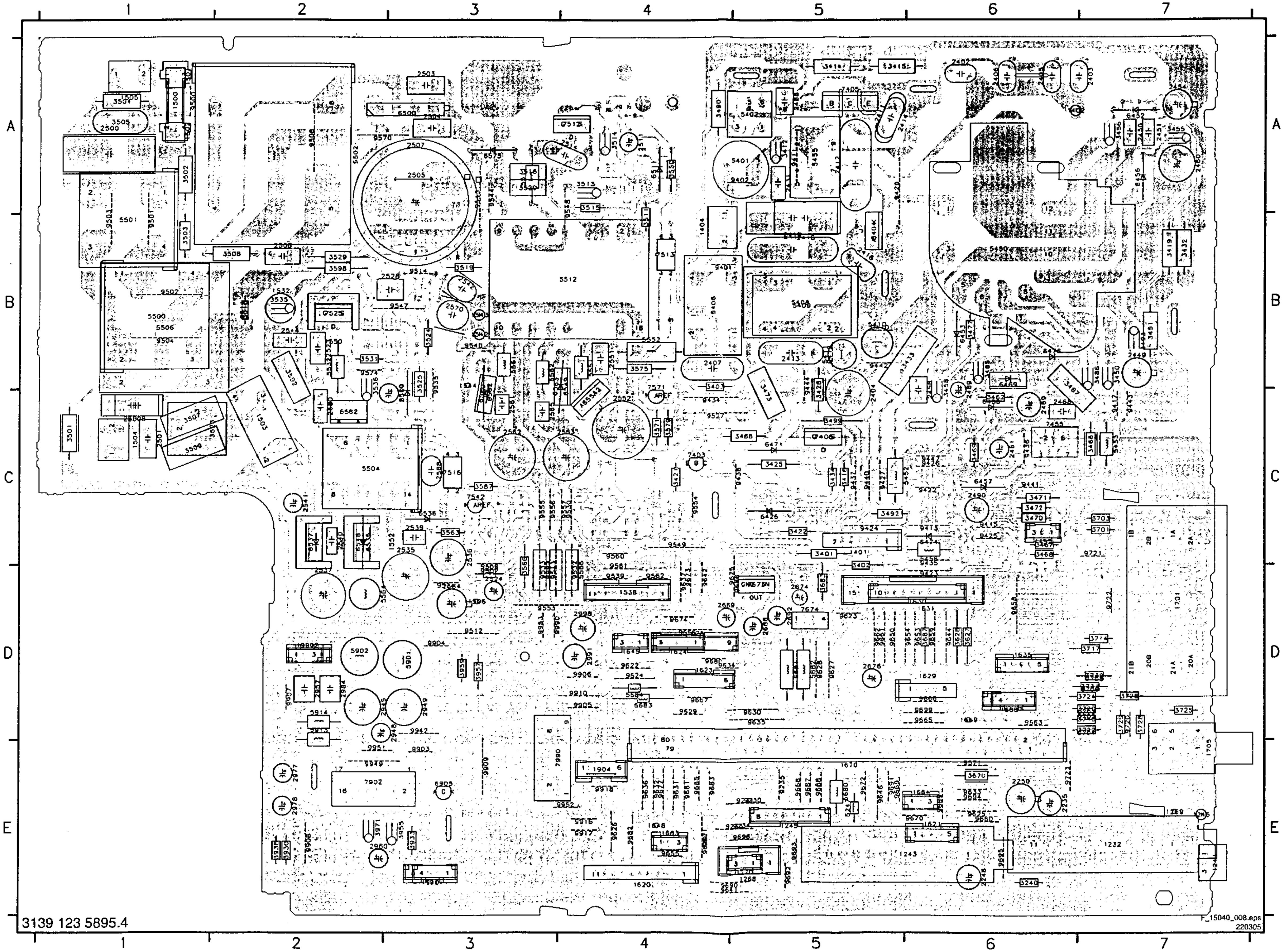
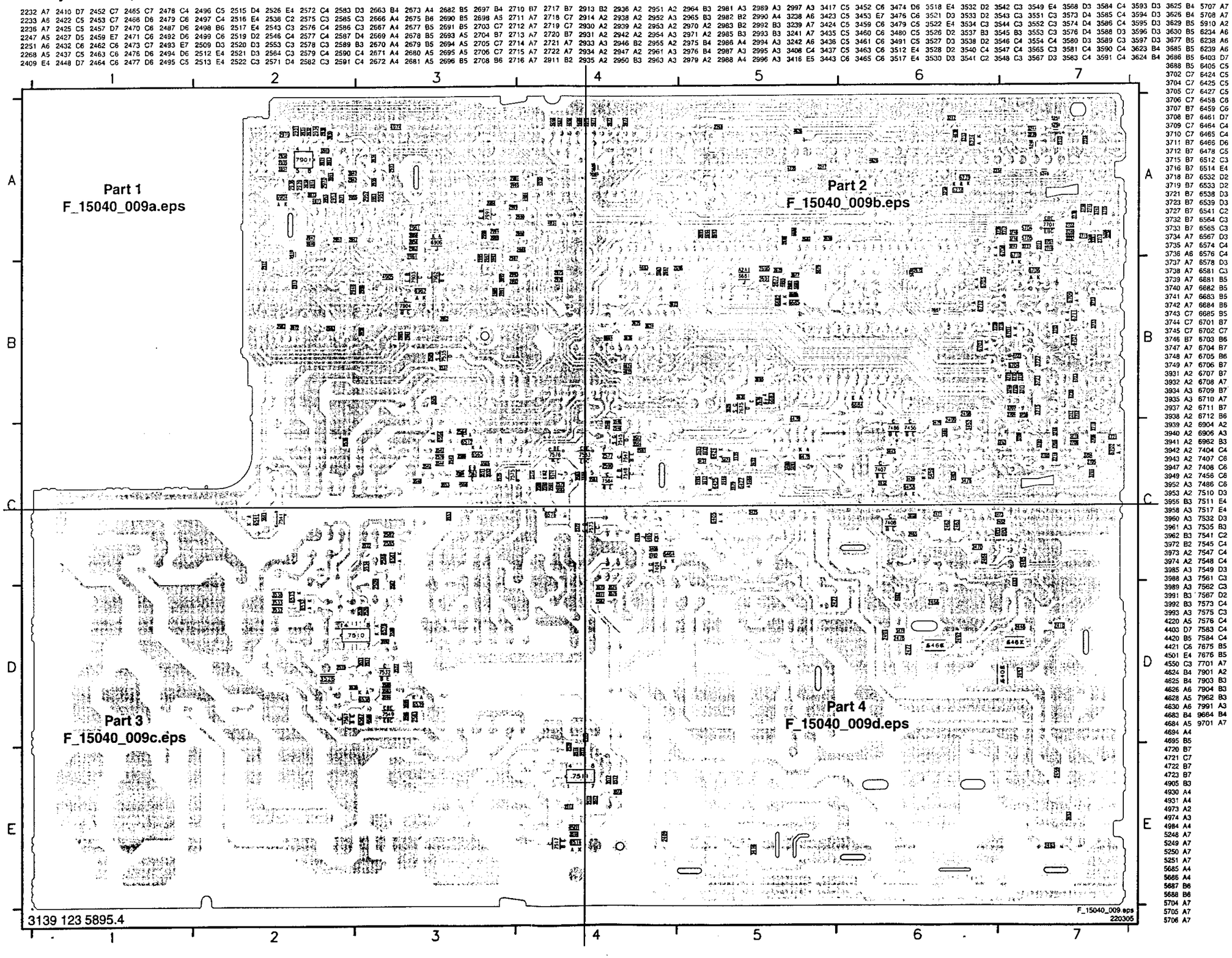


Layout LSP (Overview Bottom Side)



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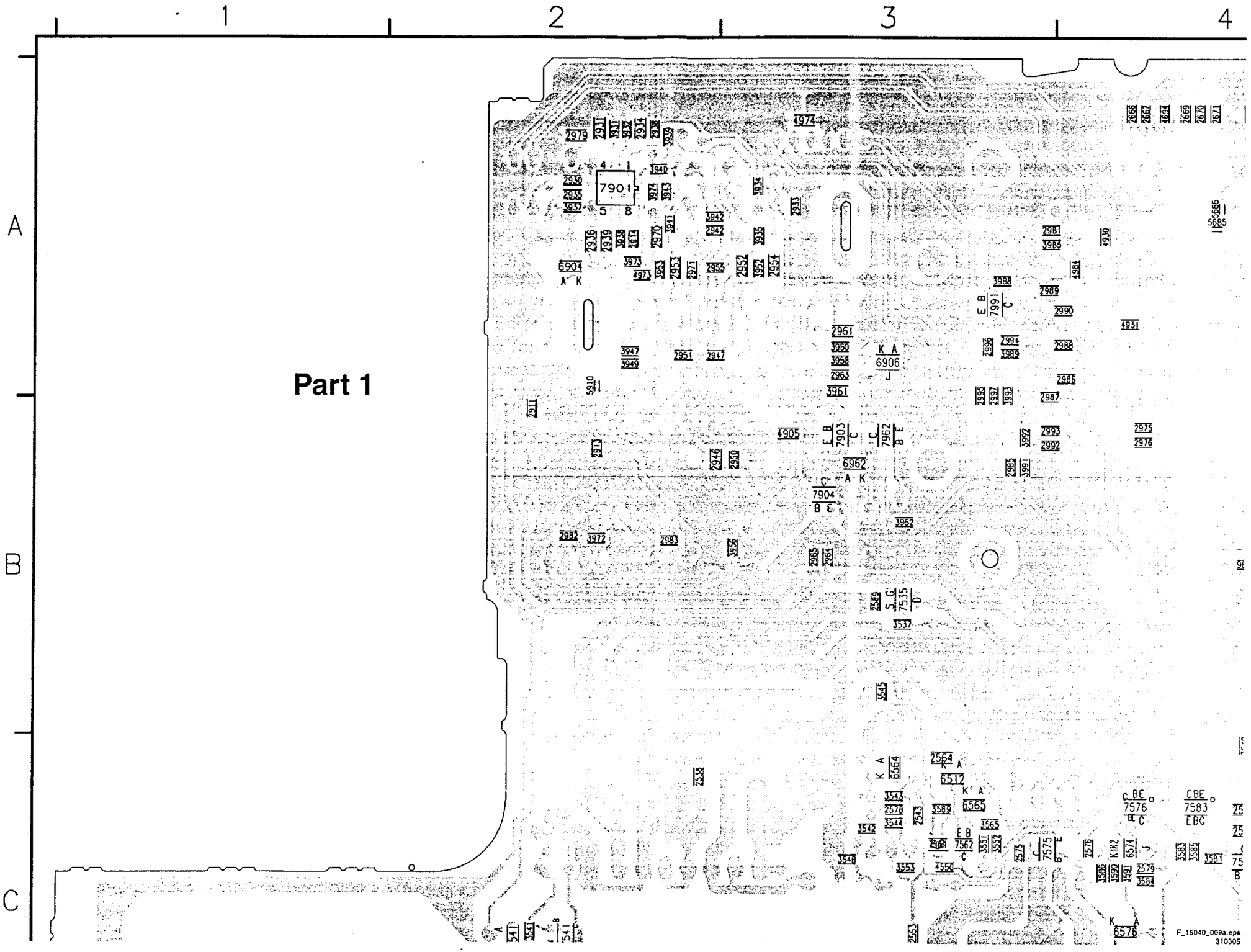

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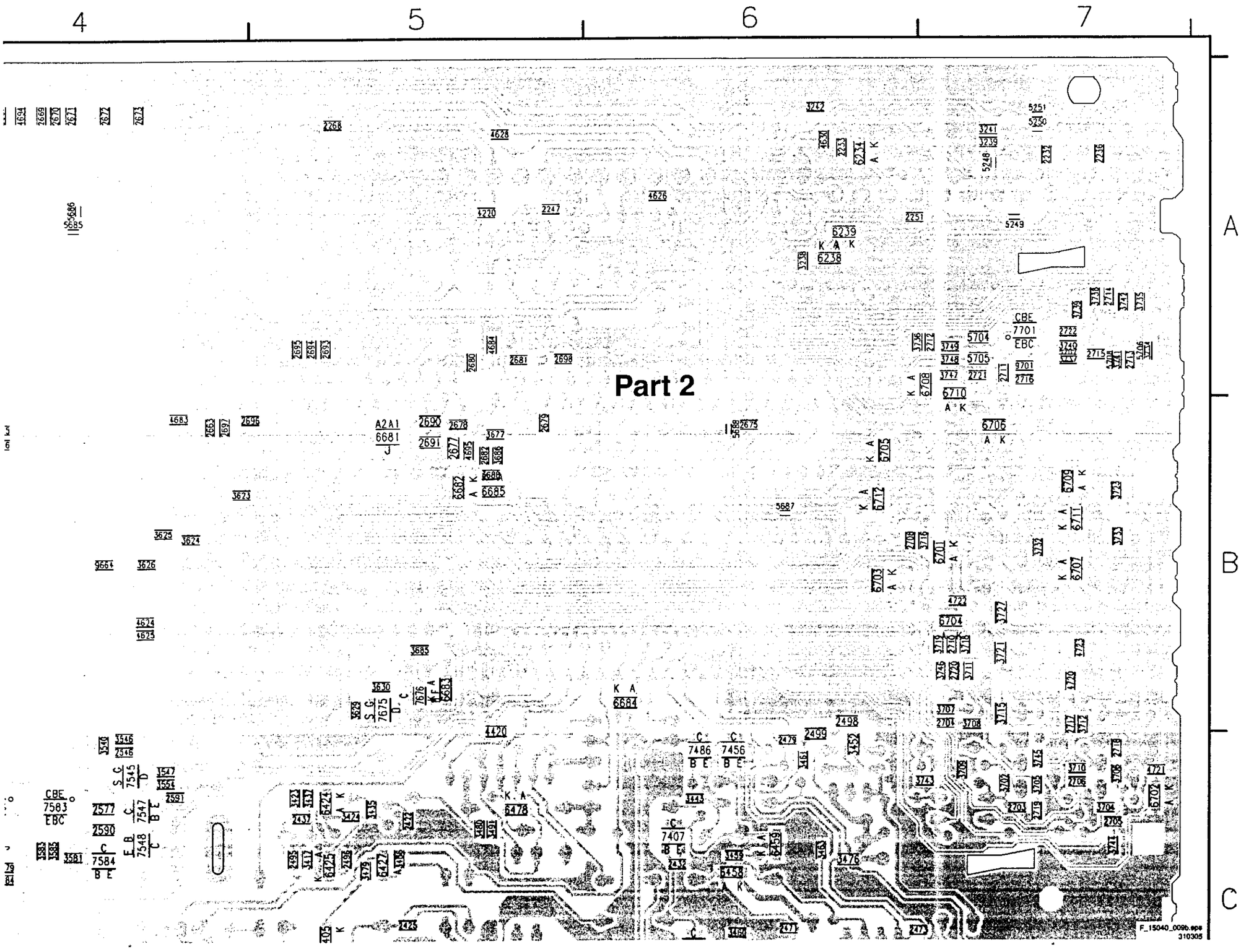

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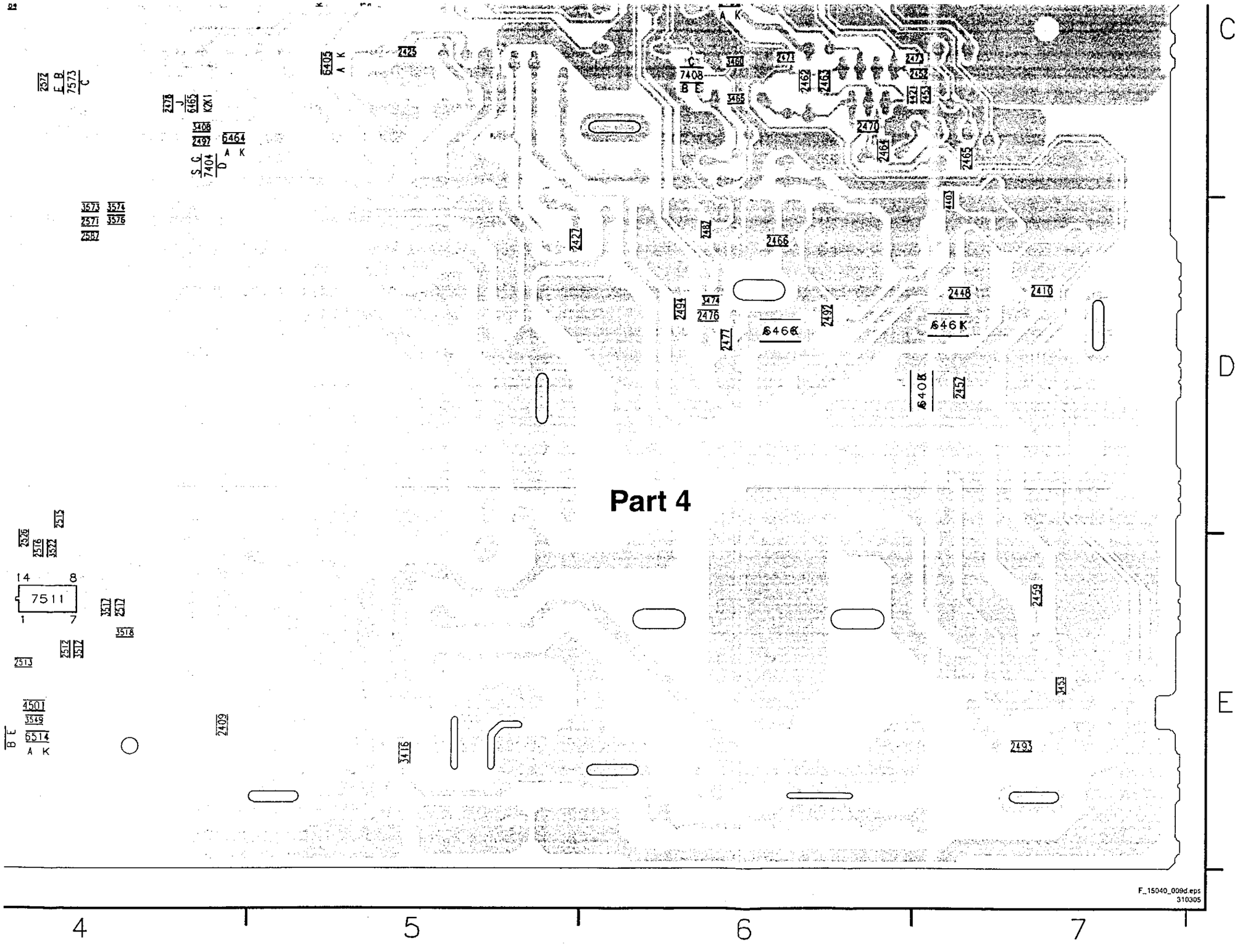
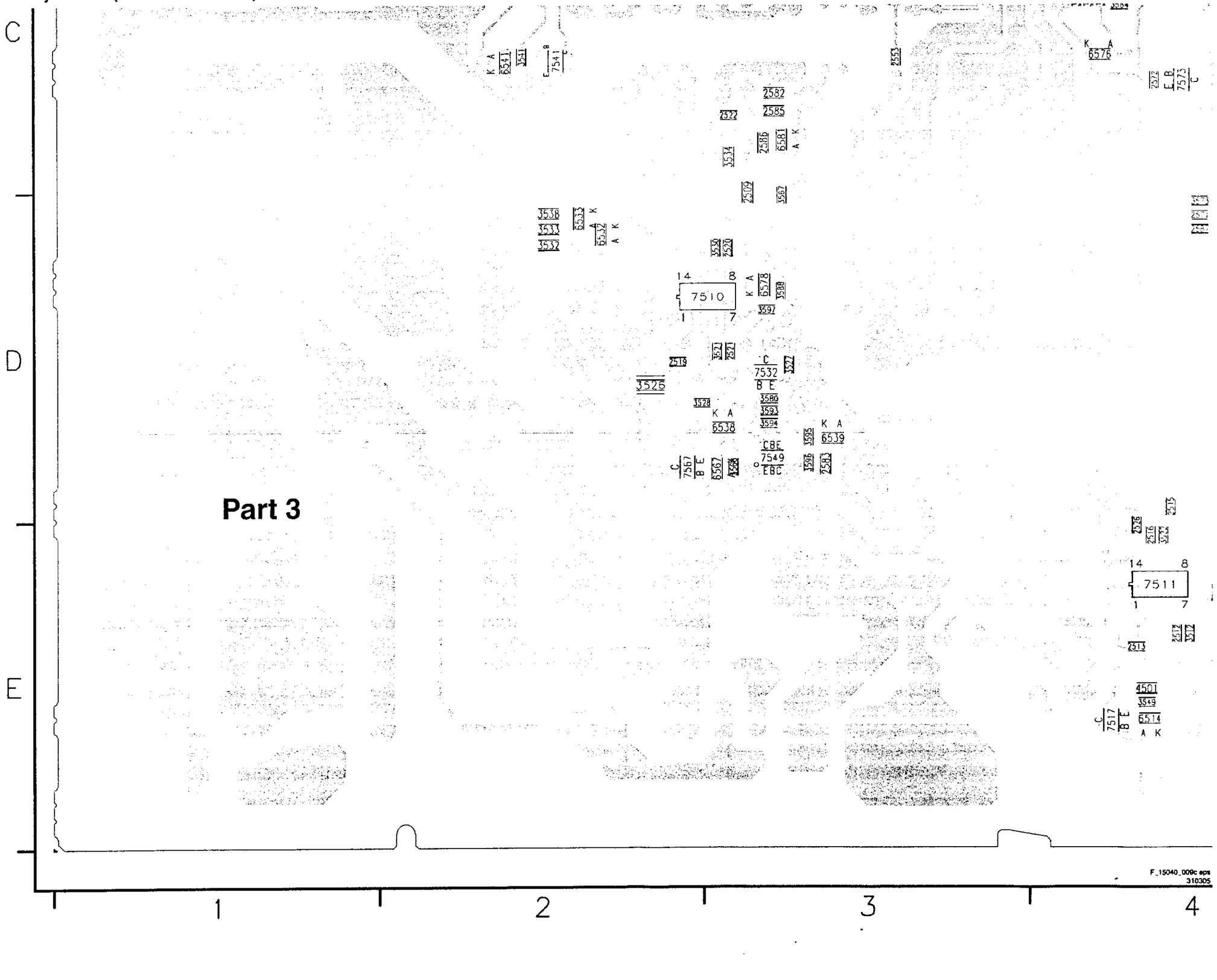


Layout LSP (Part 3 Bottom Side)



SSB: If & SAW Filter

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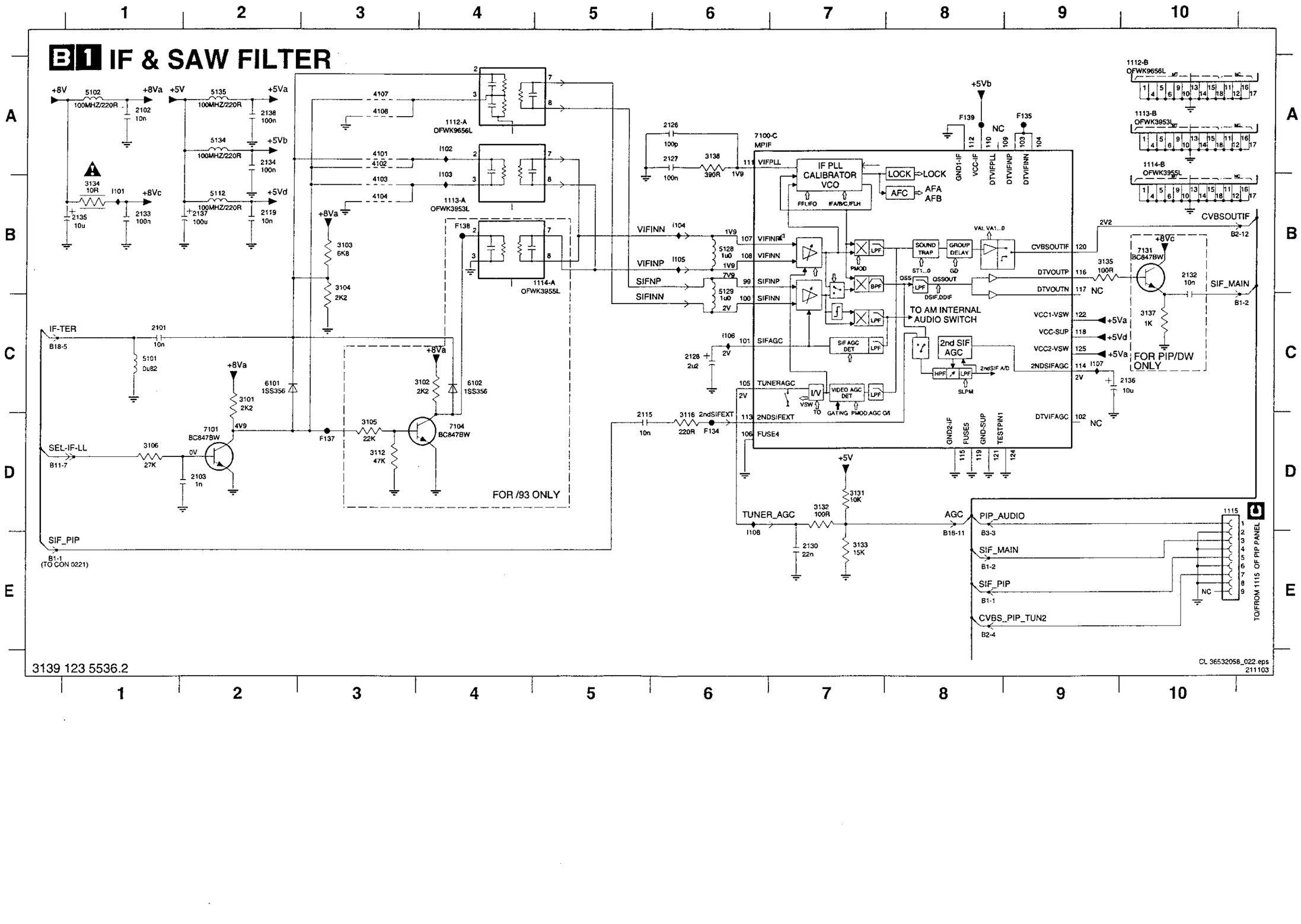

SSB: Video Source Selection & Data Link

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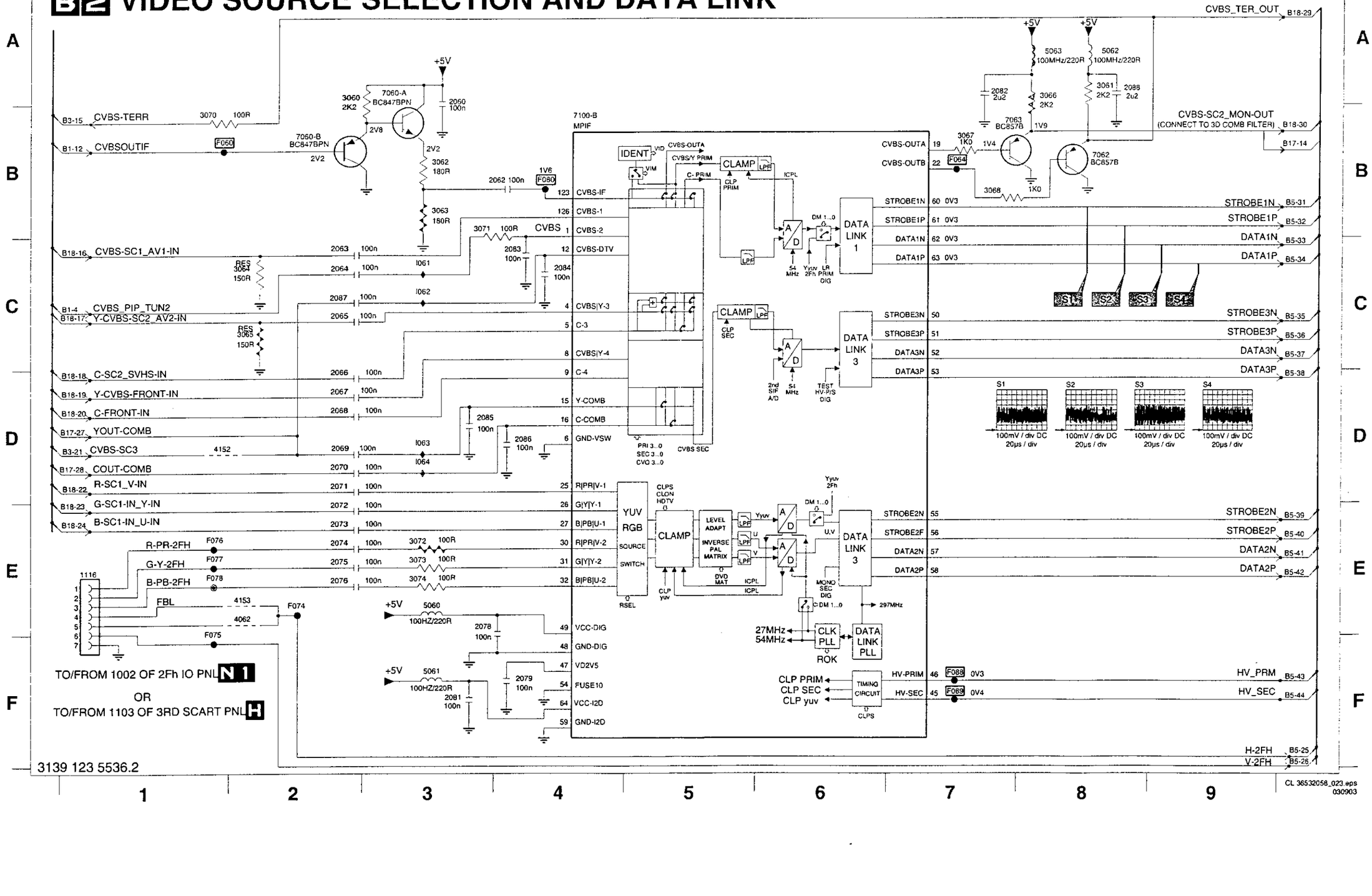
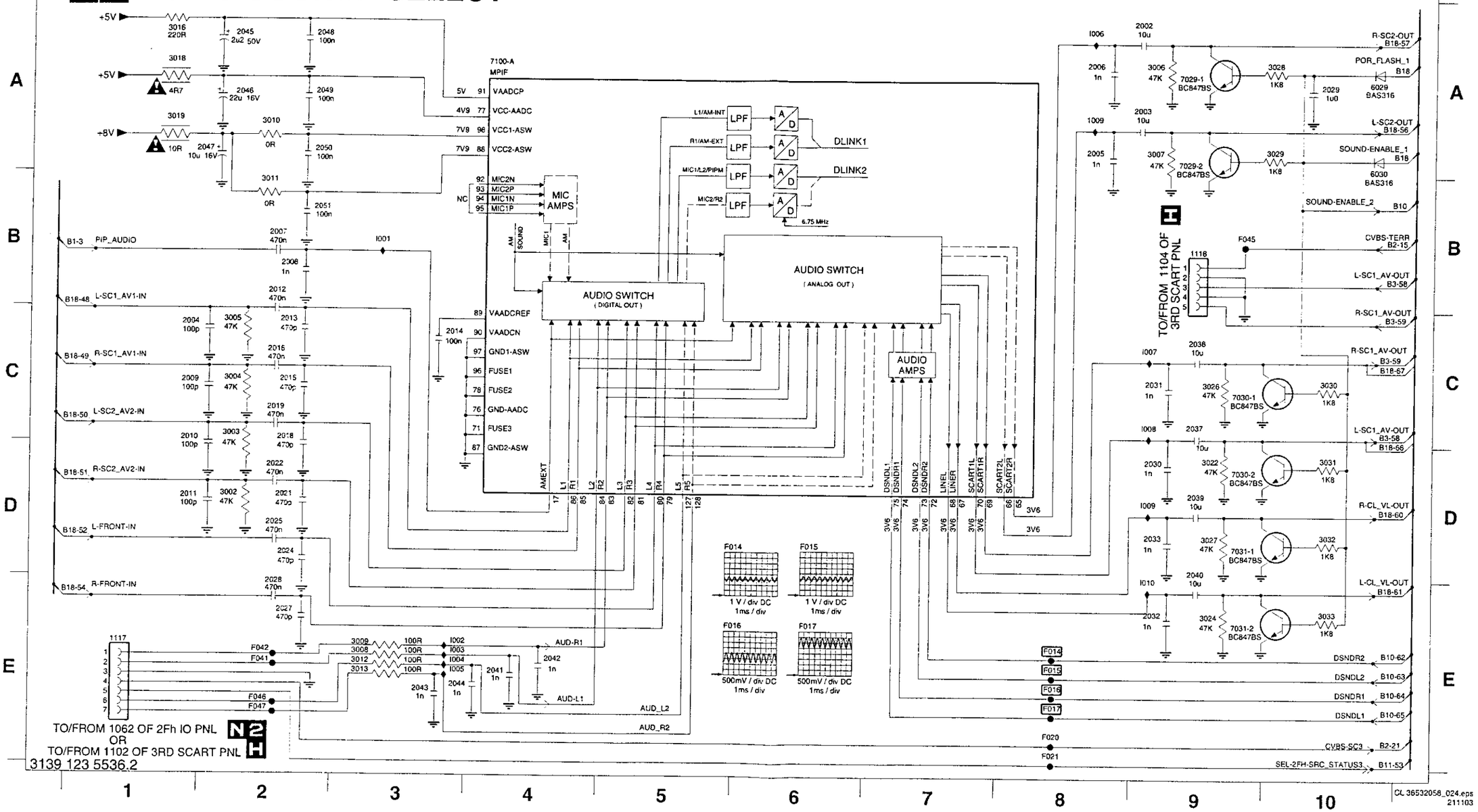
B2 VIDEO SOURCE SELECTION AND DATA LINK



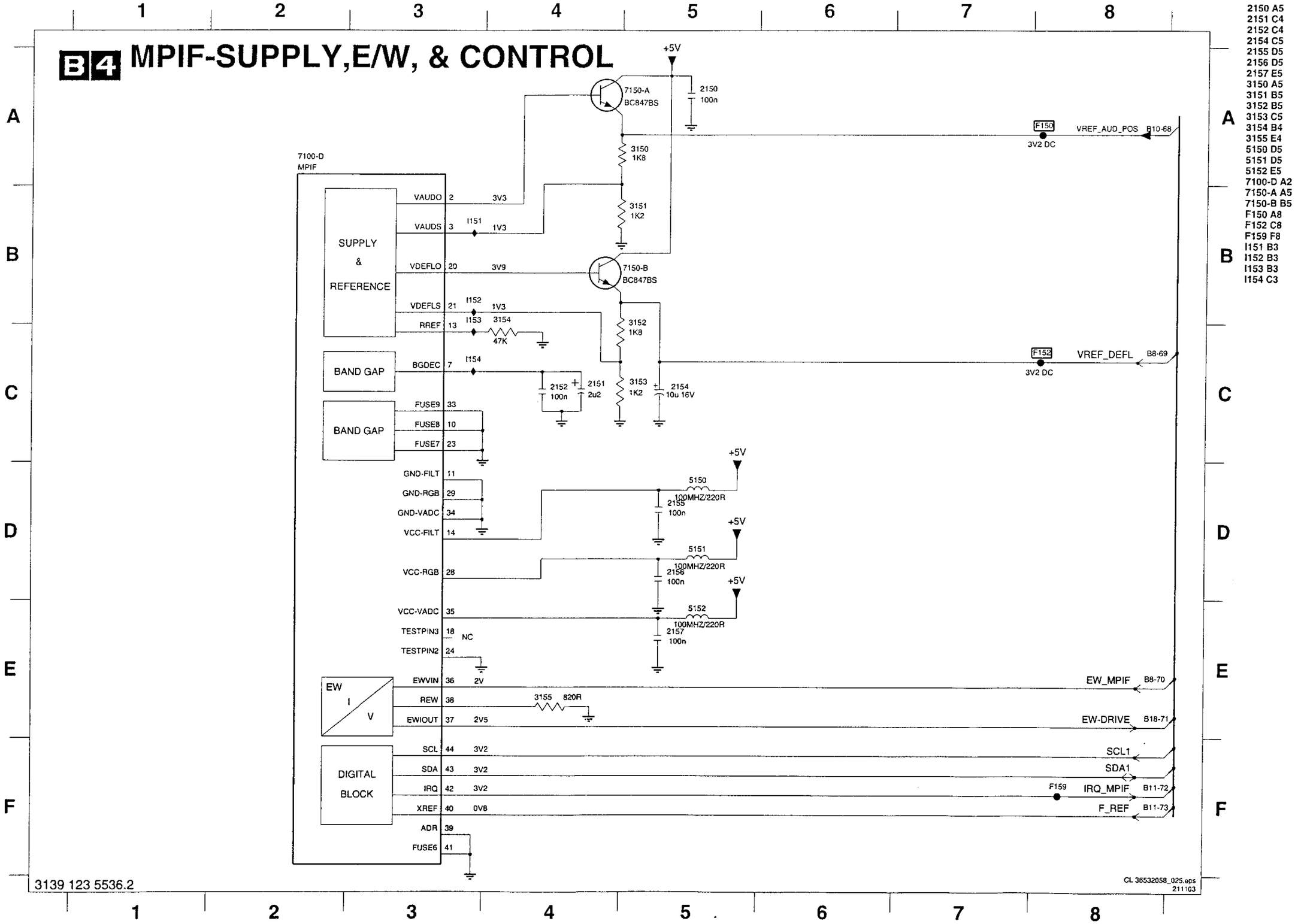
SSB: Audio Source Select

1009 A8, 1117 E1, 1118 B9, 2002 A9, 2003 A9, 2004 C1, 2005 A8, 2006 A8, 2007 B2, 2008 B2, 2009 C1, 2010 C1, 2011 D1, 2012 B2, 2013 C2, 2014 C3, 2015 C2, 2016 C2, 2018 C2, 2019 C2, 2021 D2, 2022 D2, 2024 D2, 2025 D2, 2027 E2, 2028 E2, 2029 A10, 2030 D9, 2031 C9, 2032 E9, 2033 D9, 2037 C9, 2038 C9, 2039 D9, 2040 D9, 2041 E4, 2042 E4, 2043 E3, 2044 E3, 2045 A2, 2046 A2, 2047 A2, 2048 A2, 2049 A2, 2050 A2, 2051 B2, 3002 D2, 3003 C2, 3004 C2, 3005 C2, 3006 A9, 3007 A9, 3008 E3, 3009 E3, 3010 A2, 3011 B2, 3012 E3, 3013 E3, 3016 A1, 3018 A1, 3019 A1, 3022 D9, 3024 E9, 3026 C9, 3027 D9, 3028 A10, 3029 A10, 3030 C10, 3031 D10, 3032 D10, 3033 E10, 6029 A10, 6030 A10, 7029-1 A9, 7029-2 A9, 7030-1 C9, 7030-2 D9, 7031-1 D9, 7031-2 E9, 7100-A A4, F014 E8, F015 E8, F016 E8, F017 E8, F020 E8, F021 E8, F041 E2, F042 E2, F045 B10, F046 E2, F047 E2, I001 B3, I002 E3, I003 E3, I004 E3, I005 E3, I006 A8, I007 C9, I008 C9, I009 D9, I010 D9

B3 AUDIO SOURCE SELECT



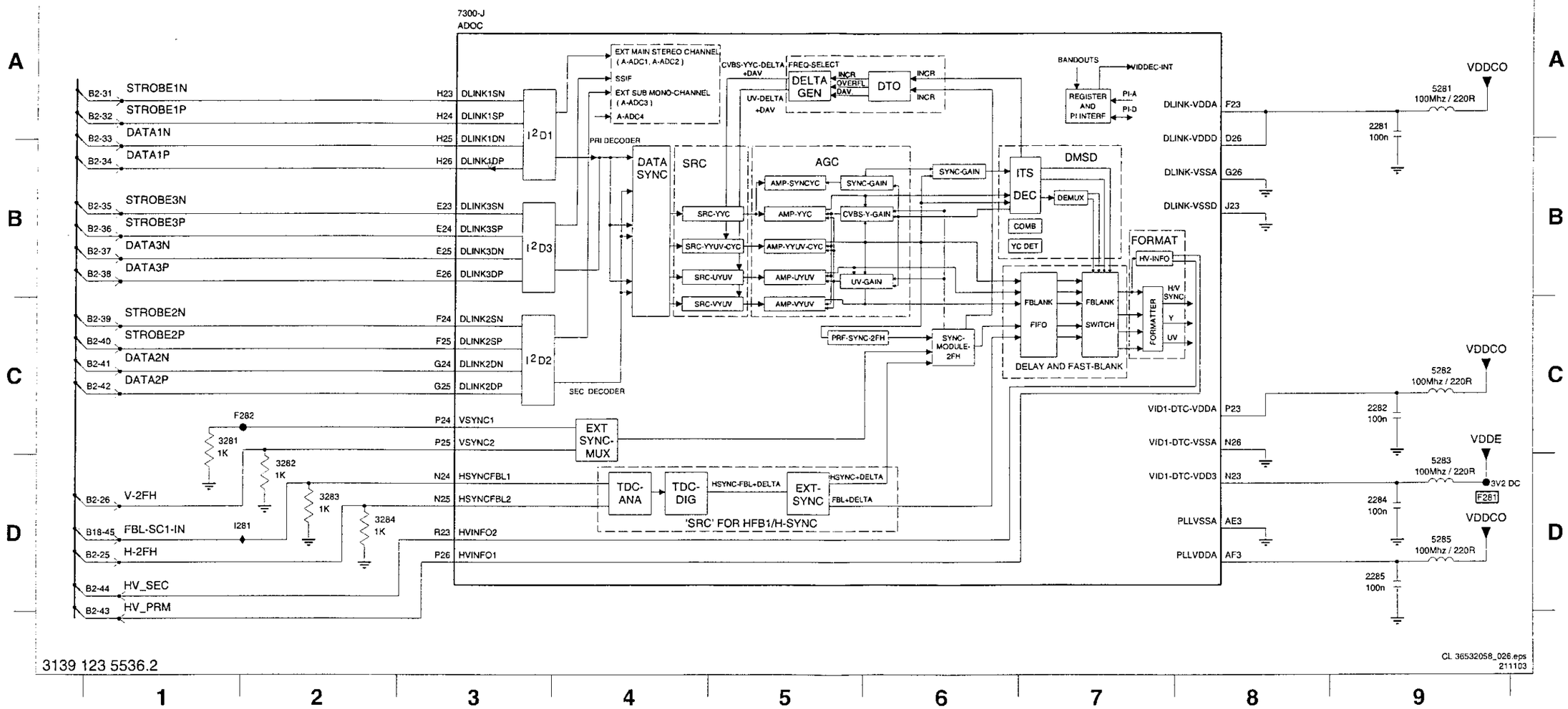
SSB: MPIF-Supply, E/W, & Control



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

B5 VIDEO DECODER

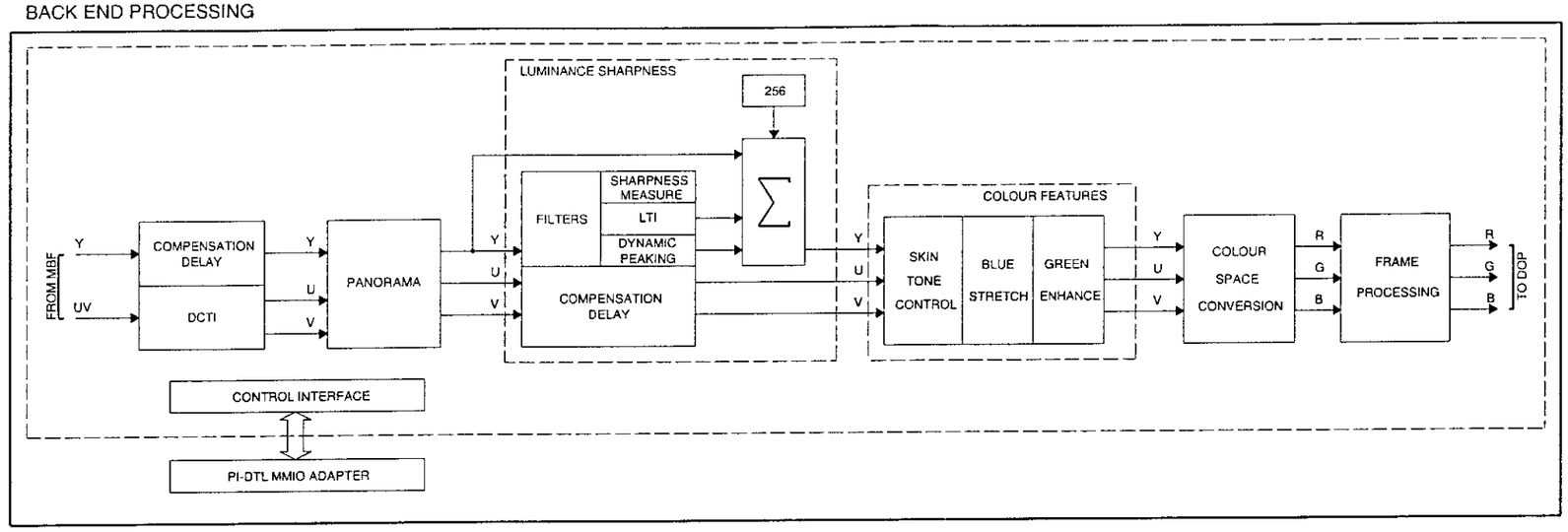


3139 123 5536.2

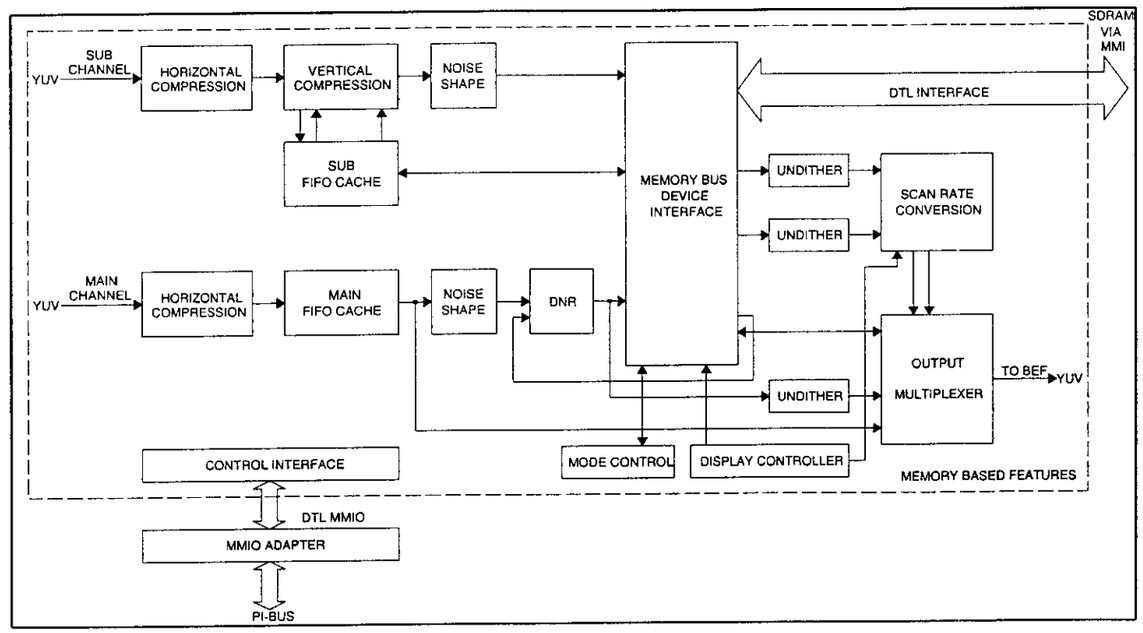
SSB: Feature Box

B6 FEATURE BOX

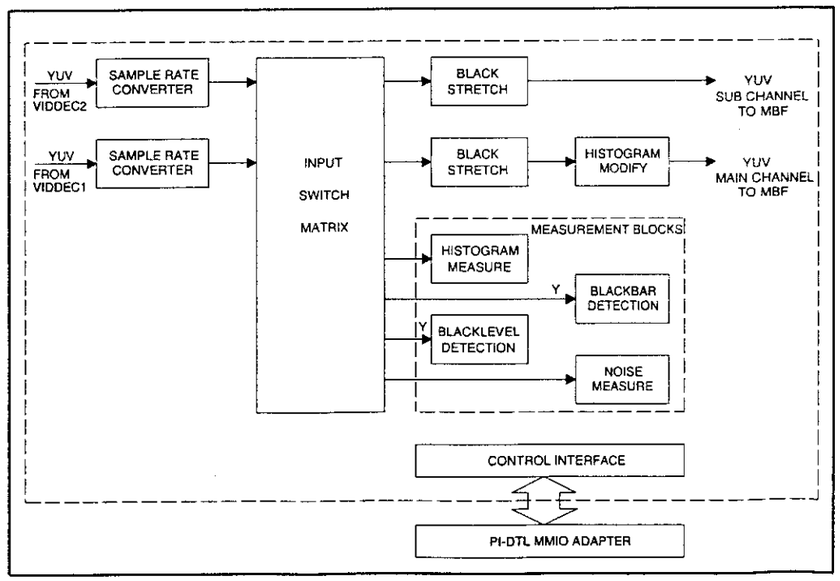
7300
BACK END PROCESSING



7300
MEMORY BASED PROCESSING



7300
FRONT END PROCESSING



3139 123 5536.2

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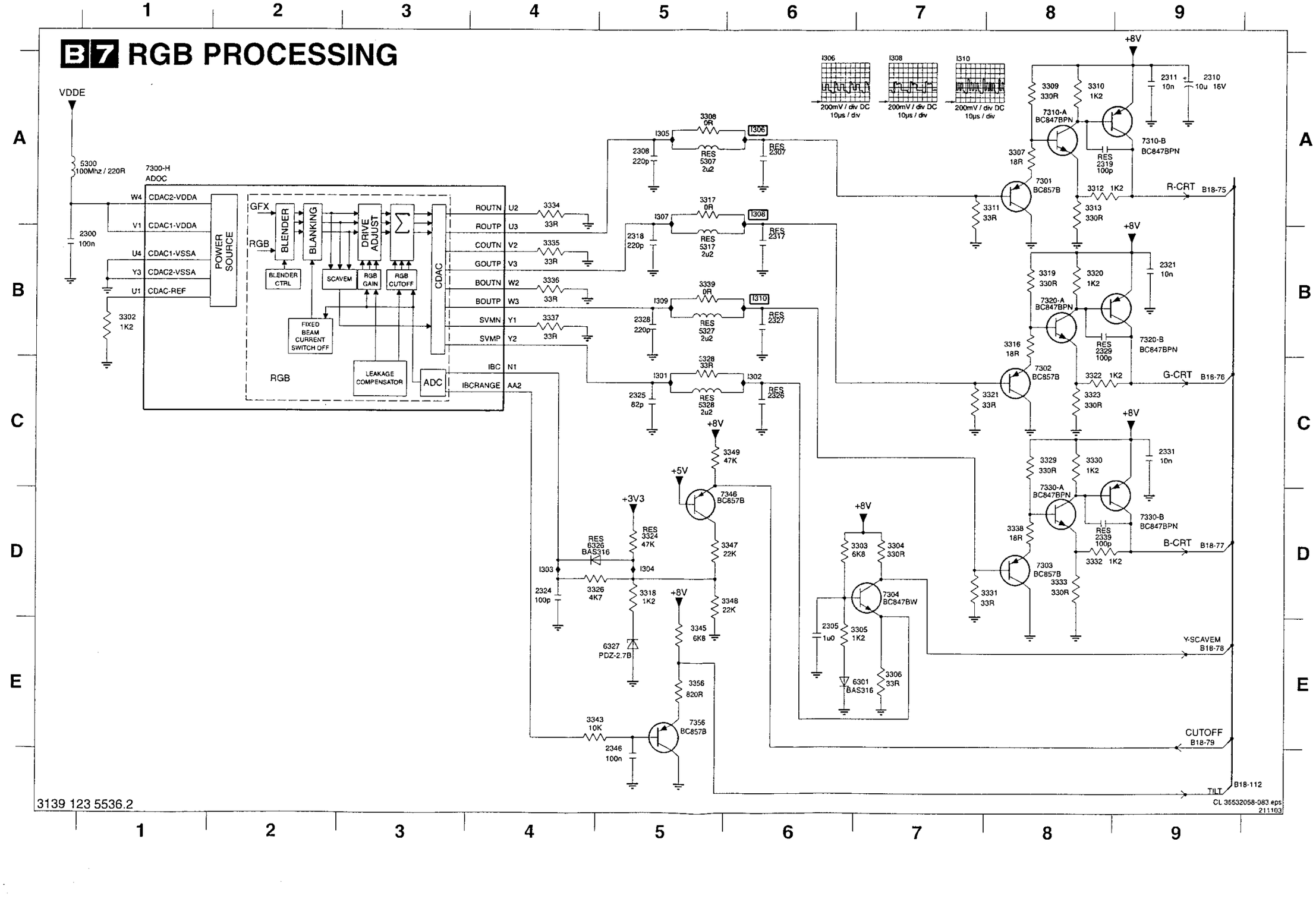
020903

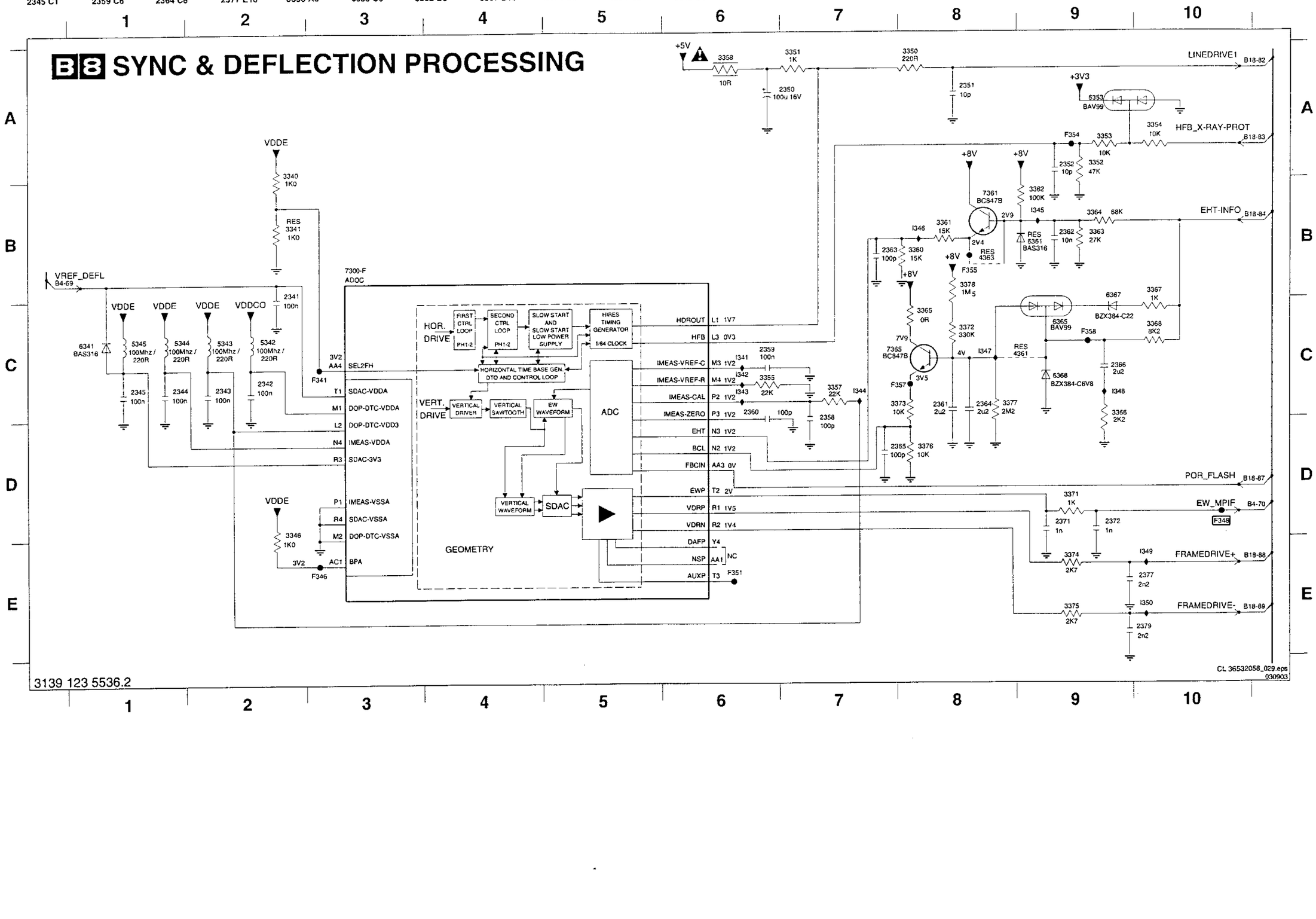
SSB: RGB Processing

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



SSB: Sync & Deflection Processing

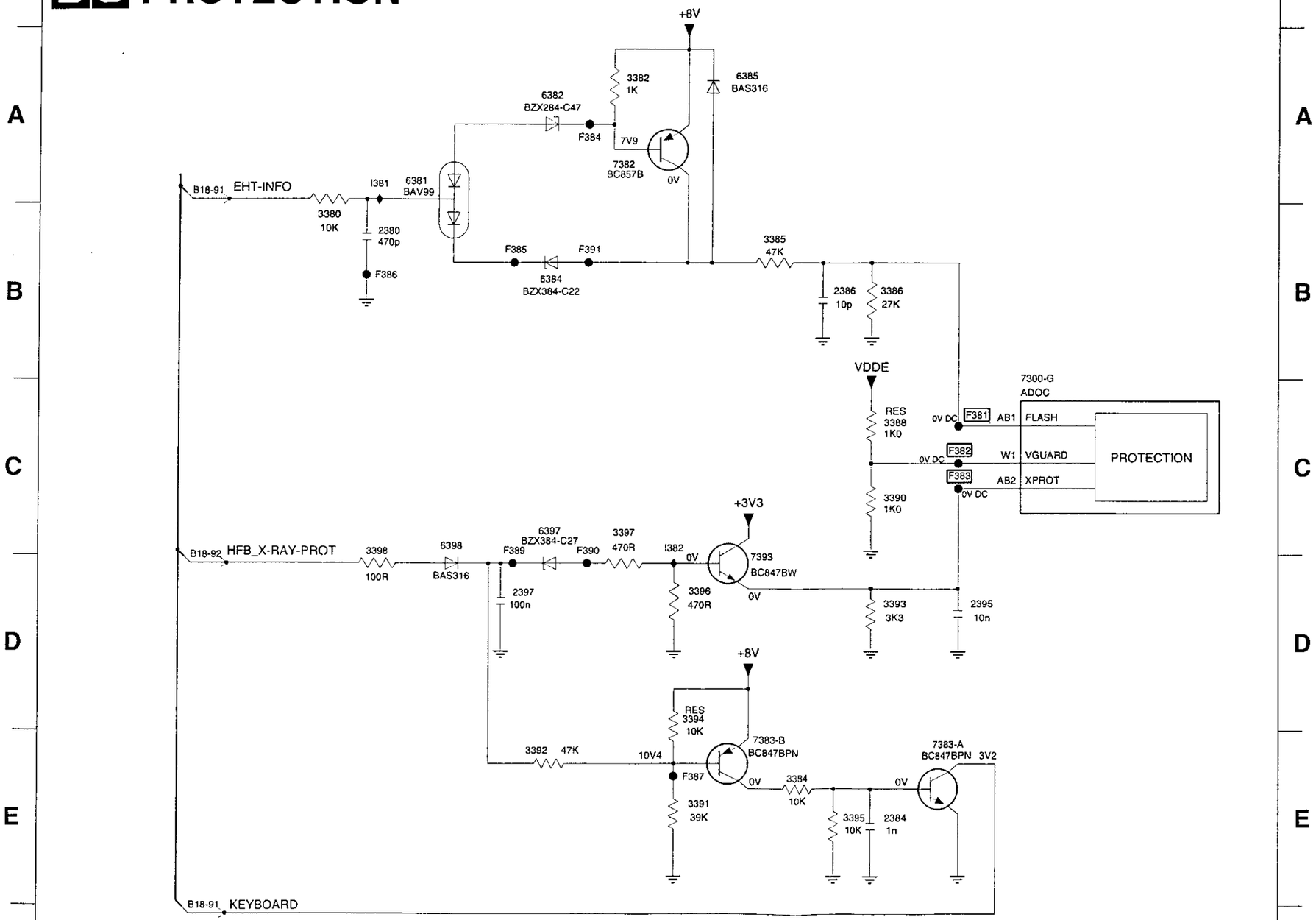
2341 B2	2350 A7	2360 C6	2365 D8	2379 E10	3351 A7	3357 C7	3363 B9	3368 C10	3375 E9	4363 B8	6341 C1	6368 C9	F346 E3	F357 C8	I344 C7	I349 E10
2342 C2	2351 A8	2361 C8	2366 C9	3340 A2	3352 A9	3358 A6	3364 B9	3371 D9	3376 D8	5342 C2	6353 A9	7300-F B3	F348 D10	F358 C9	I345 B9	I350 E10
2343 C2	2352 A9	2362 B9	2371 D9	3341 B2	3353 A9	3360 B8	3365 C8	3372 C8	3377 C8	5343 C2	6361 B9	7361 B8	F351 E6	I341 C6	I346 B8	
2344 C1	2358 D7	2363 B7	2372 D9	3346 D2	3354 A10	3361 B8	3366 C9	3373 C8	3378 B8	5344 C1	6365 C9	7365 C8	F354 A9	I342 C5	I347 C8	
2345 C1	2359 C6	2364 C8	2377 E10	3350 A8	3355 C6	3362 B9	3367 B10	3374 E9	4361 C9	5345 C1	6367 C9	F341 C3	F355 B8	I343 C6	I348 C9	



SSB: Protection

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

B9 PROTECTION



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SSB: Audio Processing

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

B10 AUDIO PROCESSING

+8V
7433-B BC847BPN
3453 47K I431
3452 1K2
2457 2u2
3454 56K
7V3
2V7
7433-A BC847BPN
3457 1K5
3455 56K
3456 1K2
4V
4430

+8V
7432-B BC847BPN
3445 47K I432
3450 1K2
2454 2u2
3446 56K
7V3
2V7
7432-A BC847BPN
3449 1K5
3447 56K
3448 1K2
4V
4431

FOR SUBWOOFER SET
+8V
7434-B BC847BPN
3458 47K I433
3460 1K2
2465 2u2
3459 56K
7434-A BC847BPN
3463 1K5
3461 56K
3462 1K2
4432

FOR DPL SET
+8V
7431-B BC847BPN
3439 47K I434
3440 1K2
2453 2u2
3441 56K
7431-A BC847BPN
3444 1K5
3443 56K
3442 1K2
4433

+8V
7430-B BC847BPN
3436 47K I435
3437 1K2
2451 2u2
3435 56K
7430-A BC847BPN
3465 1K5
3434 56K
3433 1K2
4434

4450 AUDIO-R B18-94
4451 AUDIO-L B18-95
4452 AUDIO-SW B18-96
4453 AUDIO-C B18-97
R_TV_IN
L_TV_IN
SW_TV_IN
C_TV_IN
AUDIO-SURR B18-98
PROVISION FOR DVD INTERFACE
REFER TO SHT B10a
ALL STRAPS TO BE
REMOVE FOR DVD

7300
AUDIO DEMODULATION
DEMDEC & DD_DSP
SSIF
DOWNMIX
PREPROCESSING
FROM VIDDEC
SRC
DEMATRIX AND SELECT
DDEP
A_ADC1
A_ADC2
A_ADC3
A_ADC4
DECIMATION FILTER
TO AUDIO PROCESSING

VDDE
VDDCO
5450 100MHZ / 220R
5452 100MHZ / 220R
2450 10n
2452 10n
F448
F449
AC22
AD22
SDAC1-3V3
SDAC1-VDDA

AUDSPKR_R
AUDSPKR_L
AUDSPKR_C
AUDSPKR_SR
2468 1n
3468 100R
2434 470n
2435 470n
2467 470n
2436 470n
2437 470n
I436
I437
I438
I439
I440
2433 1n
2432 1n
2458 1n
2431 1n
2430 1n
2440 1n
2441 1n
2442 1n
2443 1n
2445 1n
2444 1n

2438 470n DSNDR2 B3-62
2439 470n DSNDL2 B3-63

HEADPHONE AMPLIFIER
4480
F480
2480 470n
3480 2K7
I445
3483 8K2
2483 1n
5480 100MHZ / 220R
+5V
2487 10u 16V
2486 100n
4V9
I447
2488 100u
HEADPHONE-R B18-99
3482 4K7
I446
2484 10u 16V
3484 4K7
7480-A TDA1308T
6480 BZX384-C12
3486 1K8
7486-A BC847BS
F481
2481 470n
3481 2K7
7480-B TDA1308T
6481 BZX384-C12
2485 1n
3485 8K2
I448
4481
2489 100u
3487 1K8
7486-B BC847BS
HEADPHONE-L B18-100
SOUND-ENABLE_2
B3
2451 470n
2462 470n
DSNDR1 B3-64
DSNDL1 B3-65

7300-B
ADOC
UAB 12 NEED TO BE RAISE
AE25 : AUD-SPKR-R-VRNEG
AF26 : AUD-SPKR-R-VRPOS
B4-68 VREF_AUD_POS
2447 100u
VREF_AUD_NEG
AE25 AUD-SPKR-R-VRPOS
AF26 AUD-SPKR-R-VRNEG
AD24 AUD-SPKR-L-VRPOS
AD26 AUD-SPKR-L-VRNEG
AF25 AUD-SPKR-SW-VRPOS
AF24 AUD-SPKR-SW-VRNEG
AF23 AUD-SPKR-C-VRPOS
AD23 AUD-SPKR-C-VRNEG
AA26 AUD-SPKR-SL-VRPOS
AB24 AUD-SPKR-SL-VRNEG
V26 AUD-DAC2-R-VRPOS
W24 AUD-DAC2-R-VRNEG
Y23 AUD-DAC2-L-VRPOS
W25 AUD-DAC2-L-VRNEG
AC26 AUD-HP-R-VRPOS
AC24 AUD-HP-R-VRNEG
AB25 AUD-HP-L-VRPOS
AC23 AUD-HP-L-VRNEG
Y24 AUD-DAC1-R-VRPOS
Y26 AUD-DAC1-R-VRNEG
AA25 AUD-DAC1-L-VRPOS
AA23 AUD-DAC1-L-VRNEG

FROM AUDIO DEMDEC & DD-DSP
LEVEL ADJ
INPUT X-BAR
PROCESSING
INPUT X-BAR
NOISE SHAPER
AUDIO DSP
I2SIN
WS PLL
I2SOUT
DAC
5D/A
2D/A
4D/A
AUD-SPKR-R AE26
AUD-SPKR-L AD25
AUD-SPKR-SW AE24
AUD-SPKR-C AE23
AUD-SPKR-SL AB23
AUD-DAC2-R W23
AUD-DAC2-L W26
AUD-HP-R AC25
AUD-HP-L AB26
AUD-DAC1-R Y25
AUD-DAC1-L AA24
I441 1V5
I442 1V5
I443 1V6
I444 1V6
SDAC1-VSSA
AE22
SDI SCKI WSI SDO2 SCKO2 WSO2 SDO1 SCKO1 WSO1
AF16 AE16 AD16 AD17 AD18 AD19 AE17 AE18 AE19
4435
4436
4437
F439 F438 F437

F480 100mV / div AC 1ms / div
F481 100mV / div AC 1ms / div
I436 20mV / div AC 500µs / div
I437 20mV / div AC 200µs / div
I438 100mV / div AC 1ms / div

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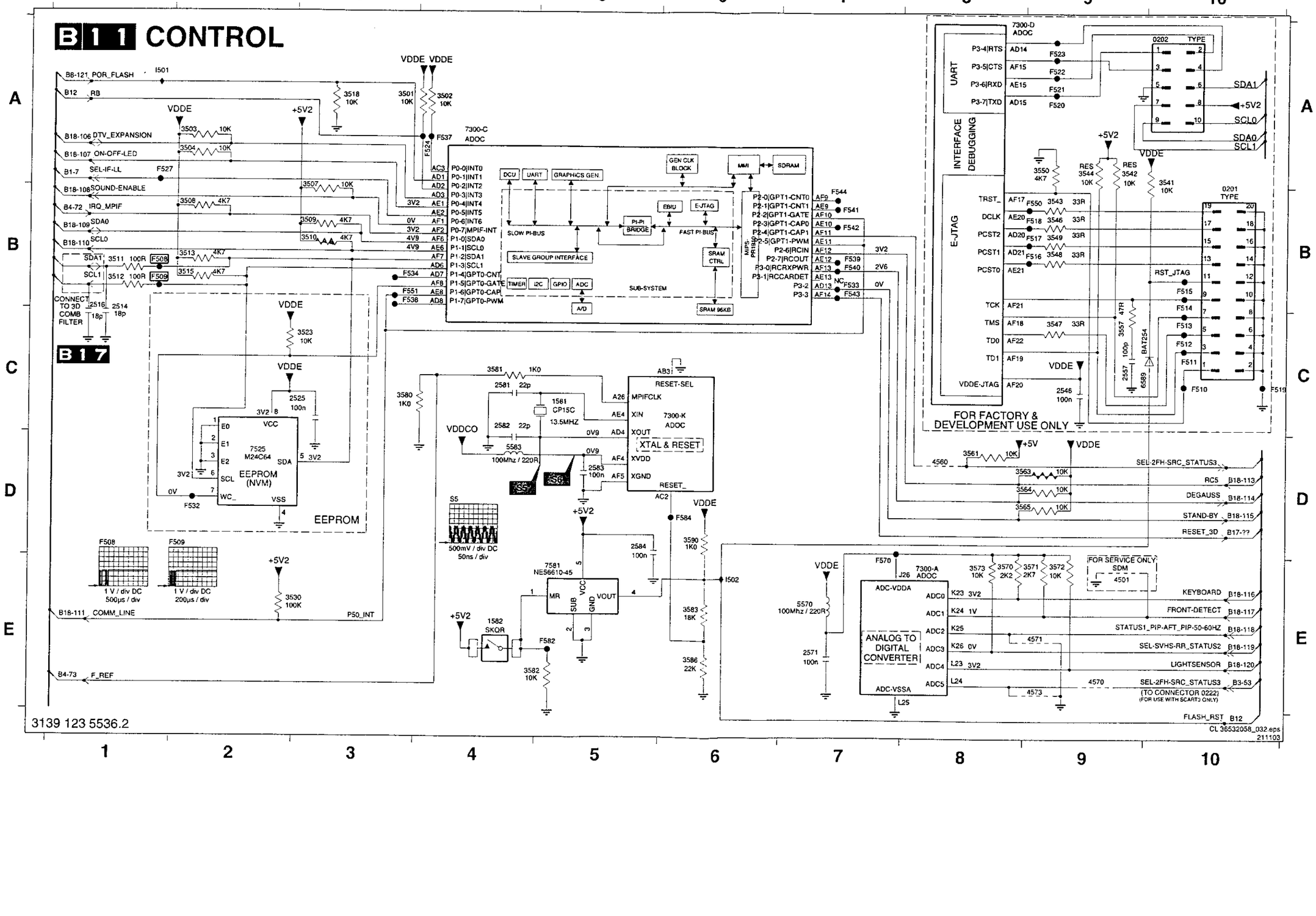
1 2 3 4 5 6 7 8 9 10
A B C D E

SSB: Control

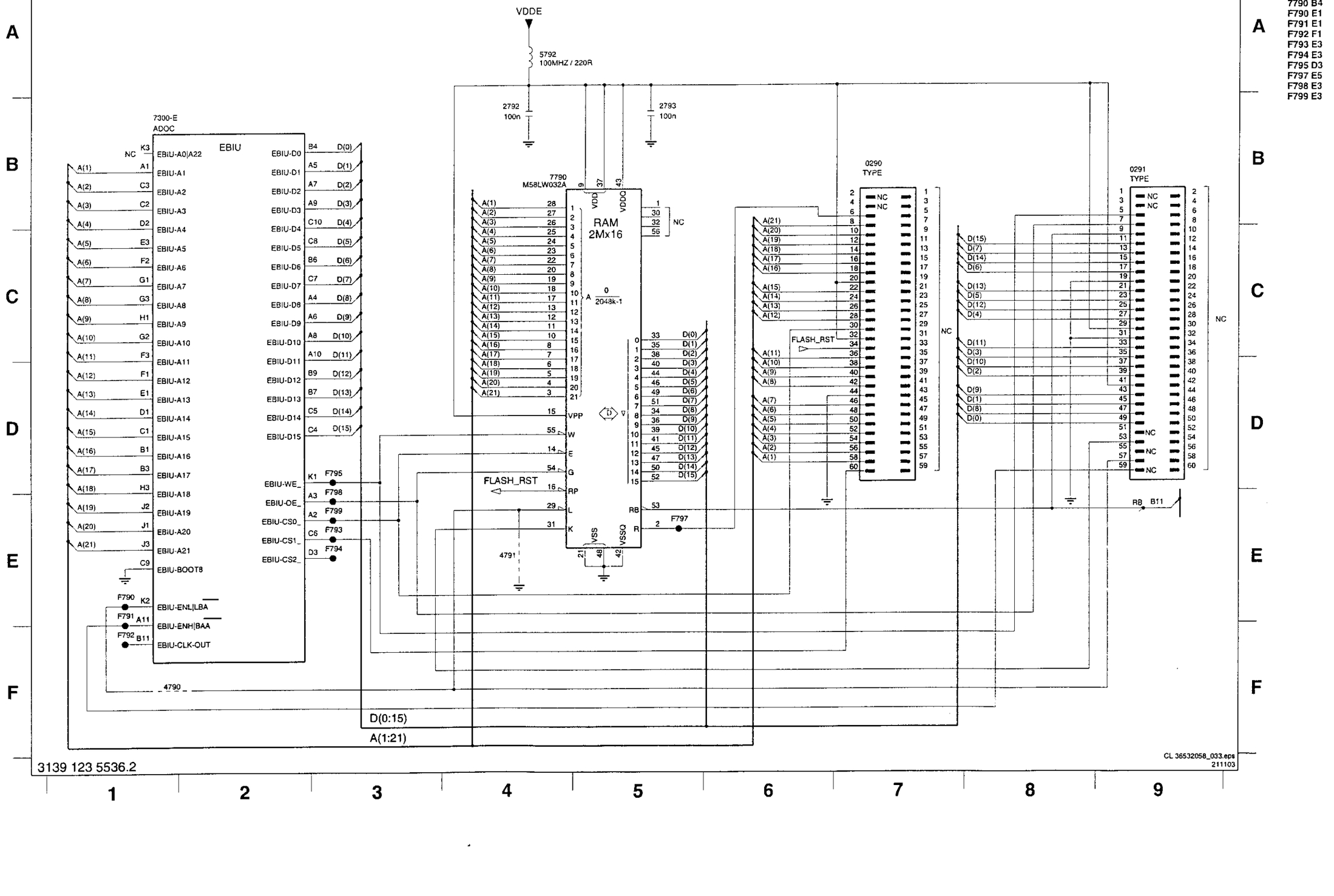
0201 A10	2525 C3	2583 D5	3507 B3	3513 B2	3542 A9	3549 B9	3565 D8	3581 C4	4560 D8	6589 C10	7581 E5	F513 C10	F519 C10	F527 A1	F539 B7	F550 B9	I502 E6
0202 A10	2546 C9	2584 D5	3508 B2	3515 B2	3543 B9	3550 A9	3570 E8	3582 E4	4570 E9	7300-A E8	F508 B1	F514 B10	F520 A9	F532 D2	F540 B7	F551 B3	
1581 C5	2557 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 B7	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	



SSB: Control-Memory Interface (EBIU)

B12 CONTROL-MEMORY INTERFACE (EBIU)

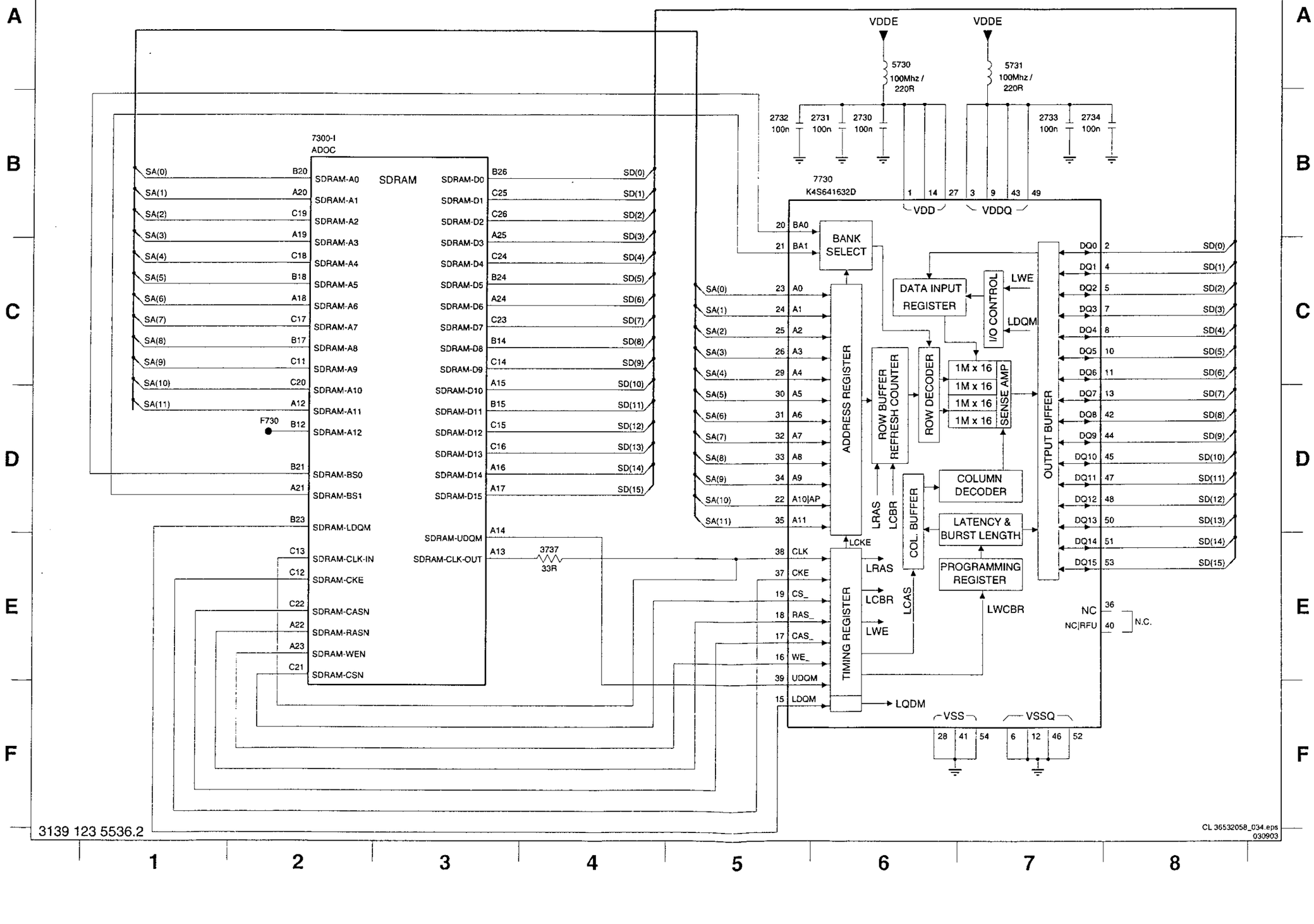
0290 B7
0291 B9
2792 B4
2793 B6
4790 F1
4791 E4
5792 A4
7300-E B1
7790 B4
F790 E1
F791 E1
F792 F1
F793 E3
F794 E3
F795 D3
F797 E5
F798 E3
F799 E3



SSB: Control-Memory Interface (SDRAM)

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

B13 CONTROL-MEMORY INTERFACE (SDRAM)



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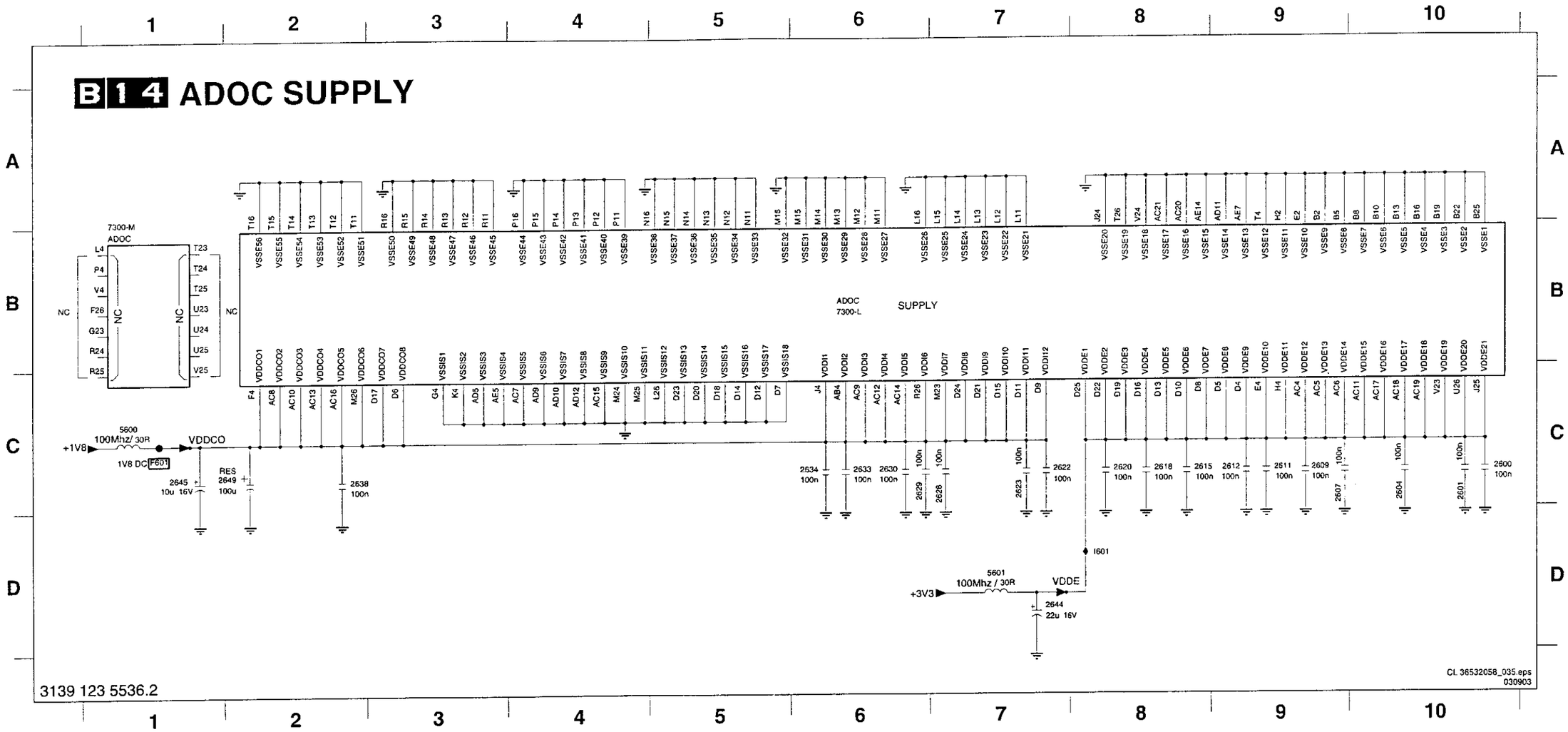
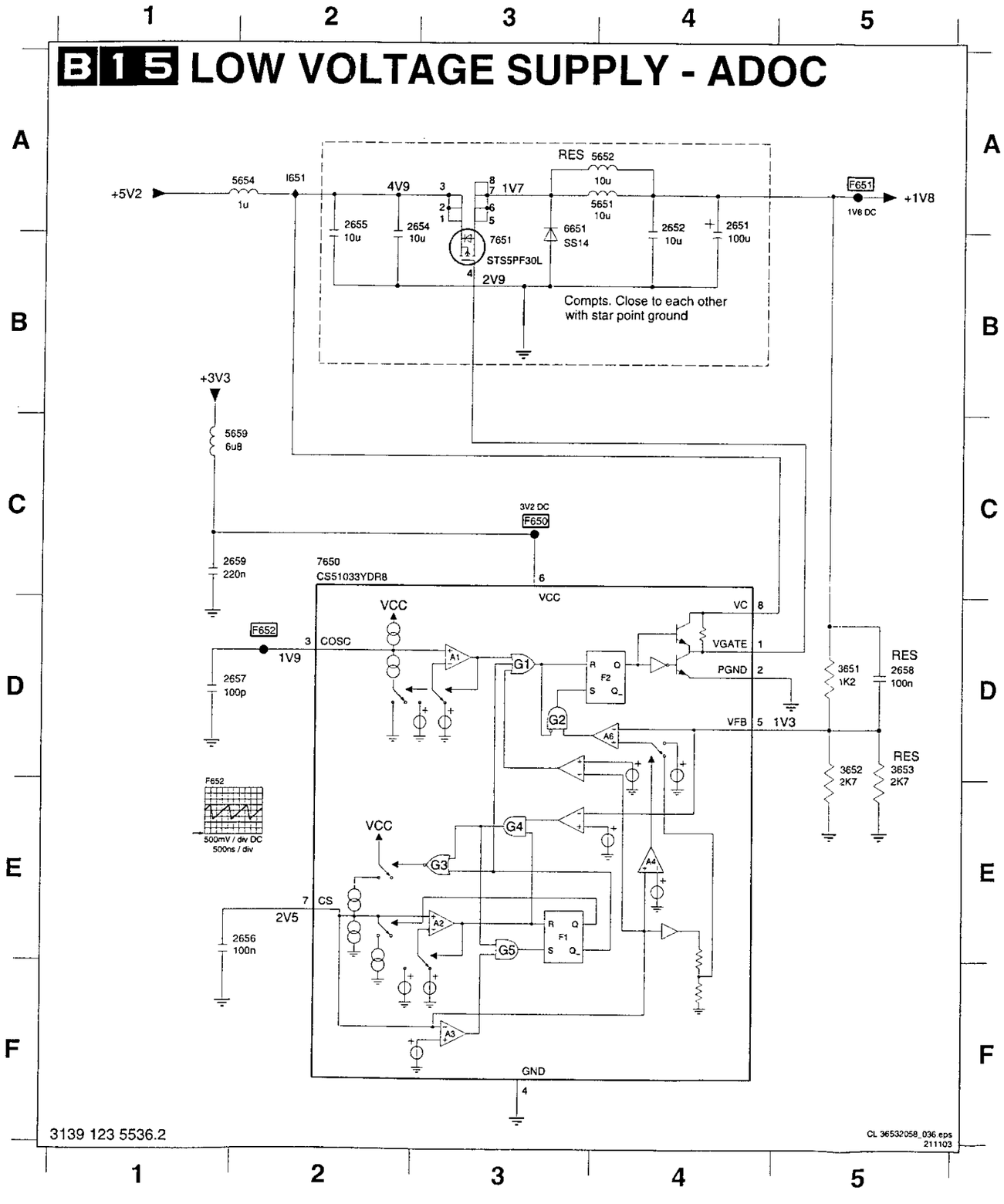
SSB: ADOC Supply

2600 C10 2601 C10 2604 C10 2607 C9 2609 C9 2611 C9 2612 C9 2615 C8 2618 C8 2620 C8 2622 C7 2623 C7 2628 C7 2629 C6 2630 C6 2633 C6 2634 C6 2638 C2 2644 D7 2645 C1 2649 C2 5600 C1 5601 D7 7300-L B6 7300-M A1 F601 C1 I601 D8

B14 ADOC SUPPLY



SSB: 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

SSB: Connector Interface

0230 A8 1901 A5 1902 A5 1903 B5 1904 A2 1906 B5
1907 C5 1909 C5 1910 D5 1911 D5 1913 D5 1915 E5
1918 B2 1919 B2 1920 B2 1921 C2 1923 C2 1924 D2
1925 D2 1926 E2 1928 E2 1929 E2 1931 G6 1932 F2
1933 F2 1934 G2 1935 G2 1936 H2 1937 H2 1938 H2
1939 H6 1941 H13 1948 H13 1949 H13 1950 G13 1951 G13
1952 H10 1953 G10 1955 G10 1956 F10 1958 F10 1959 F10
1960 E10 1961 E10 1962 F13 1963 D10 1964 D10 1965 C10
1966 C10 1967 F13 1968 E13 1969 B10 1970 B10 1972 E13
1973 E13 1974 D13 1975 D13 1976 C13 1977 C13 1978 C13
1979 B13 1980 B13 2904 A2 2915 E5 2918 B2 2919 B2
2920 B2 2932 F2 2933 F2 2935 G2 2936 H2 2937 H2
2938 H2 2941 H13 2948 H13 2949 H13 2950 G13 2951 G13
2962 F13 2967 F13 2966 E13 2972 E13 2973 E13 2974 D13
2975 D13 2976 C13 2977 C13 2978 C13 2979 B13 3904 A2
3909 C4 3911 D4 3918 A2 3919 B2 3928 E2 3929 E2
3936 G2 3937 H2 3938 H2 3939 H5 3950 G13 3951 G13
3962 F13 3963 D11 3964 D11 3974 D13
3975 D13 3976 C13 3977 C13 3978 B13 3979 B13 3980 A13
F901 A7 F902 A7 F903 A7 F904 A7 F905 A7 F906 B7
F907 B7 F909 B7 F910 B7 F911 B7 F913 C7 F915 C7
F918 C7 F919 C7 F920 D7 F921 D7 F923 D7 F924 D7
F925 D7 F926 D7 F928 E7 F929 E7 F931 E7 F932 E7
F933 E7 F935 F7 F936 F7 F937 F7 F938 F7 F939 F7
F940 G8 F941 F8 F943 F8 F944 F8 F947 F8 F948 E8
F949 E8 F950 E8 F951 E8 F952 E8 F953 E8 F955 D8
F956 D8 F958 D8 F959 D8 F960 D8 F961 D8 F962 C8
F963 C8 F964 C8 F965 C8 F966 C8 F967 C8 F968 C8
F969 B8 F970 B8 F972 B8 F973 B8 F974 B8 F975 B8
F976 A8 F977 A8 F978 A8 F979 A8 F980 A8

1 2 3 4 5 6 7 8 9 10 11 12 13 14

B18 SSB-CONNECTOR INTERFACE

MPIF

ADOC

TO/FROM 1205 OF LSSB

A8 0230 CON-BOARD-EDGE

FBL-SC1-IN B5-45 — 3904 100R — 2904 100p — 1904

STATUS1_PIP-AFT_PIP-50-60HZ B11-118 — 3918 100R — 2918 100p — 1918

SEL-SVHS-RR_STATUS2 B11-119 — 3919 100R — 2919 100p — 1919

COMM_LINE B11-111 — 2920 82p — 1920

CUTOFF B7-79 — 1921

B-CRT B7-77 — 1923

G-CRT B7-76 — 1924

R-CRT B7-75 — 1925

LINEDRIVE1 B8-82 — 1926

FRAMEDRIVE+ B8-88 — 3928 100R — 1928

FRAMEDRIVE- B8-89 — 3929 100R — 1929

HFB_X-RAY-PROT B8-83 / B9-92 — 2932 100p — 1932

EHT-INFO B8-84 / B9-91 — 2933 100p — 1933

1934

TILT B11-112 — 2935 100p — 1935

STAND-BY B11-115 — 3936 100R — 2936 100p — 1936

LIGHTSENSOR B11-120 — 3937 100R — 2937 100p — 1937

DTV EXPANSION B11-106 — 3938 100R — 2938 100p — 1938

B-SC1-IN_U-IN B2-24 — 1901

G-SC1-IN_Y-IN B2-23 — 1902

R-SC1_V-IN B2-22 — 1903

Y-CVBS-SC2_AV2-IN B2-17 — 1906

C-SC2_SVHS-IN B2-18 — 1907

CVBS-SC2_MON-OUT B2-30 — 3909 100R — 1909

CVBS-SC1_AV1-IN B2-16 — 1910

CVBS_TER_OUT B2-29 — 3911 100R — 1911

IF-TER B1-5 / B1-9 — 1913

AGC B1-11 — 2915 100p — 1915

EW-DRIVE B4-71 — 1931

PIP_AUDIO B4-71 — 3939 100R — 1939

F901 F902 F903 F904 F905 F906 F907 F909 F910 F911 F914 F915 F918 F919 F920 F921 F922 F924 F926 F928 F929 F930 F932 F933 F935 F936 F937 F938 F939 F940

1 80 2 79 3 78 4 77 5 76 6 75 7 74 8 73 9 72 10 71 11 70 12 69 13 68 14 67 15 66 16 65 17 64 18 63 19 62 20 61 21 60 22 59 23 58 24 57 25 56 26 55 27 54 28 53 29 52 30 51 31 50 32 49 33 48 34 47 35 46 36 45 37 44 38 43 39 42 40 41

F947 +3V3 — F948 — F949 +5V — F944 — F943 +8V — F941 — +5V2

F980 F979 F978 F977 F976 F975 F974 F973 F972 F971 F963 F962 F961 F960 F958 F956 F955 F953 F952 F951 F950 F949 F948

R-CL_VL-OUT B3-60 — 1970
L-CL_VL-OUT B3-61 — 1969
R-FRONT-IN B3-54 — 1966
L-FRONT-IN B3-52 — 1965
C-FRONT-IN B2-20 — 3964 100R — 1964
Y-CVBS-FRONT-IN B2-19 — 3963 100R — 1963
R-SC1_AV-OUT B3-67 — 1961
R-SC1_AV1-IN B3-49 — 1960
R-SC2-OUT B3-57 — 1959
R-SC2_AV2-IN B3-51 — 1958
L-SC1_AV-OUT B3-66 — 1956
L-SC2-OUT B3-58 — 1955
L-SC2_AV2-IN B3-50 — 1953
L-SC1_AV1-IN B3-48 — 1952

DEGAUSS B11-114 — 3980 100R — 1980
KEYBOARD B11-116 — 3979 100R — 2979 100p — 1979
RCS B11-113 — 3978 100R — 2978 100p — 1978
ON-OFF-LED B11-107 — 3977 100R — 2977 100p — 1977
AUDIO-R B10-94 — 3976 100R — 2976 1n — 1976
AUDIO-L B10-95 — 3975 100R — 2975 1n — 1975
AUDIO-SW B10-96 — 3974 100R — 2974 1n — 1974
AUDIO-C B10-97 — 3973 100R — 2973 1n — 1973
AUDIO-SURR B10-98 — 3972 100R — 2972 1n — 1972
HEADPHONE-R B10-99 — 2968 1n — 1968
HEADPHONE-L B10-100 — 2967 1n — 1967
FRONT-DETECT B11-117 — 3962 100R — 2962 1n — 1962
SOUND-ENABLE B11-108 — 3951 100R — 2951 1n — 1951 — SOUND-ENABLE_1
POR_FLASH B8-87 / B11-121 — 3950 100R — 2950 100p — 1950 — POR_FLASH_1
SCLO B11-110 — 2949 100p — 1949
SDAO B11-109 — 2948 100p — 1948
Y-SCAVEM B7-78 — 2941 100p — 1941

F911 500mV / div DC 20µs / div
F913 500mV / div AC 10µs / div
F923 1 V / div DC 10µs / div
F924 1 V / div DC 10µs / div
F925 1 V / div DC 10µs / div
F926 1 V / div DC 10µs / div
F928 500mV / div DC 5ms / div
F929 500mV / div DC 5ms / div
F931 1 V / div DC 5ms / div
F941 2 V / div DC 20µs / div
F967 200mV / div AC 1ms / div
F968 200mV / div AC 1ms / div
F969 500mV / div AC 1ms / div
F970 500mV / div AC 1ms / div

3139 123 5536.2

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Layout SSB (Overview LOT Side)

1113 C2 2022 B3 2047 B2 2088 A1 2133 C2 2156 A2 2326 D4 2359 C5 2435 A4 2447 A3 2467 A4 2514 B4 2601 B4 2628 B5 2654 C6 2792 C6 2949 C3 2977 C4 3018 A2 3068 A2 3448 A4 3928 C5 5600 B6
1116 B1 2031 A2 2048 B2 2101 C2 2134 B2 2157 A2 2341 C4 2360 C5 2436 A3 2450 B4 2468 A3 2516 C4 2604 B4 2629 B5 2655 C6 2793 B6 2950 C4 2978 C3 3019 B3 3070 A1 3449 A4 3929 C5 5601 C5
1118 A1 2032 B2 2049 B2 2102 C2 2135 C2 2281 B5 2342 C5 2371 C4 2437 A5 2451 A4 2480 A5 2525 B3 2607 B4 2630 B4 2656 C7 2904 D2 2951 C4 2979 D6 3024 A3 3101 C2 3450 A4 3937 D3 5651 B7
1581 C3 2033 B2 2050 B2 2103 C2 2136 B2 2282 B4 2343 C5 2372 C4 2438 A4 2452 B4 2481 A5 2546 B4 2609 C4 2633 B4 2657 C7 2915 D2 2962 C6 3002 B3 3026 A3 3102 C2 3452 A4 3938 C4 5652 B7
1582 A6 2038 A3 2051 B2 2115 C2 2137 B2 2284 B5 2344 C4 2377 C4 2439 A4 2453 A3 2483 A6 2557 B4 2611 C5 2634 C5 2658 C6 2918 D2 2967 C7 3004 B3 3027 B3 3103 C2 3453 A4 3950 C4 5654 C6
2002 A3 2039 B3 2060 C1 2119 B2 2138 B2 2285 C4 2345 C4 2379 C4 2440 A4 2454 A4 2484 A5 2571 A5 2612 C5 2638 B4 2659 C6 2919 D2 2968 C7 3006 A3 3060 C1 3104 C2 3454 A4 3951 C4 5659 C6
2006 A2 2040 A3 2062 B1 2126 B2 2150 B1 2300 B4 2346 C4 2430 A4 2441 A4 2457 A4 2485 A6 2581 C3 2615 B5 2644 B4 2730 A6 2920 D3 2972 D7 3010 B2 3061 A1 3105 C2 3455 A4 3962 C6 5730 A6
2014 B2 2043 B2 2078 A2 2127 B2 2151 B1 2305 C5 2350 C5 2431 A4 2442 A4 2458 A4 2486 A6 2582 C3 2618 B5 2645 B5 2731 A6 2937 D3 2973 D7 3011 B2 3062 C1 3106 C2 3456 A4 3963 D2 5731 A6
2015 B2 2044 B2 2079 A2 2128 B3 2152 B1 2310 C4 2351 C5 2432 A4 2443 A4 2461 A5 2487 A6 2583 C4 2620 B5 2649 B5 2732 A7 2938 C4 2974 D7 3012 B2 3063 C1 3112 C2 3457 A4 3964 D2 5792 C6
2016 B3 2045 B2 2081 A2 2130 B2 2154 C1 2324 C5 2352 C5 2433 A4 2444 A4 2462 A4 2488 A6 2584 A7 2622 B5 2651 B6 2733 A6 2941 C4 2975 D7 3013 B1 3066 B1 3116 B2 3458 A3 3972 D7 6101 C2
2021 B2 2046 A2 2082 B1 2132 C2 2155 B2 2325 C4 2358 C5 2434 A4 2445 A4 2465 A3 2489 A7 2600 B5 2623 B5 2652 B6 2734 B6 2948 C3 2976 D7 3016 B2 3067 B1 3131 B2 3459 A4 3973 D7 6102 C2
3132 B2 3460 A3 3974 D7 6301 C5
3133 B2 3461 A4 3975 D7 6326 C4
3134 C2 3462 A4 3976 D7 6327 C4
3135 B2 3463 A4 3977 C4 6341 C4
3137 C2 3465 A5 3978 C3 6480 A6
3138 B2 3468 A4 3979 D6 6481 A5
3150 B1 3480 A6 3980 C3 6589 A7
3151 B1 3481 A5 4062 B1 6651 B6
3152 B1 3482 A5 4108 B3 7060 C1
3281 A5 3483 A6 4153 B1 7062 A1
3282 A5 3484 A5 4430 A4 7063 B1
3283 A5 3485 A5 4431 A4 7101 C2
3284 A5 3501 C4 4432 A4 7104 C2
3302 C4 3502 C4 4433 A3 7131 C2
3303 D5 3503 C4 4434 A4 7150 B1
3304 D4 3504 C4 4435 B4 7304 D5
3305 C5 3507 C4 4436 B4 7346 C4
3306 C4 3508 C4 4437 B4 7430 A4
3318 C4 3511 B4 4450 A7 7431 A3
3324 C4 3512 C4 4451 A7 7432 A4
3326 C4 3513 B3 4452 A7 7433 A4
3328 C4 3515 B3 4453 A7 7434 A4
3334 C4 3518 C4 4480 A5 7480 A6
3335 C4 3523 B3 4481 A5 7525 B3
3336 C4 3530 B4 4560 B4 7581 B7
3337 C4 3541 A7 4570 A5 7650 C7
3340 C4 3542 B3 4571 A5 7651 C7
3341 C4 3543 B4 4573 A5
3343 C4 3544 B3 4790 B6
3346 C4 3546 B4 4791 B6
3347 C4 3547 B4 5060 A2
3348 C4 3548 B4 5061 A2
3349 D4 3549 B4 5062 A2
3350 C5 3550 A3 5063 B1
3351 C5 3557 B4 5101 C2
3352 C5 3561 B4 5102 C2
3355 C5 3563 B4 5112 B2
3357 C5 3564 B4 5128 C2
3358 C5 3565 B4 5134 B2
3371 C4 3570 A5 5135 B2
3374 C4 3571 A5 5150 B2
3375 C4 3572 A5 5151 A2
3388 C4 3573 A5 5152 A2
3390 C4 3580 A5 5281 B5
3433 A5 3581 A5 5282 B4
3434 A5 3582 B7 5283 B5
3435 A4 3583 B7 5285 B4
3436 A4 3586 A7 5300 C4
3437 A4 3590 B7 5328 C4
3439 A3 3651 C6 5342 C5
3440 A3 3652 C6 5343 B5
3441 A3 3653 C6 5344 B4
3442 A3 3737 B5 5345 B4
3443 A3 3904 C2 5450 B4
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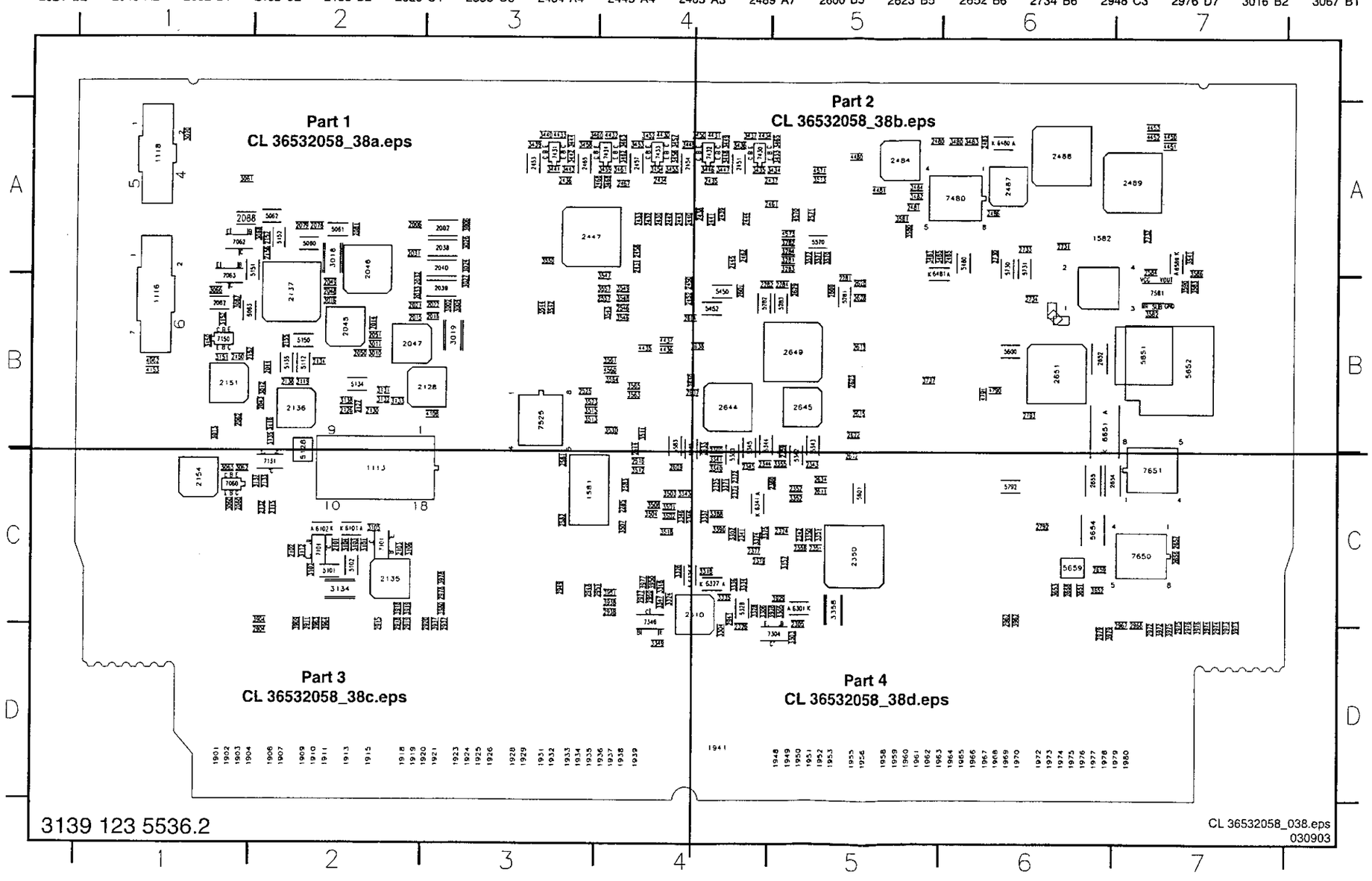
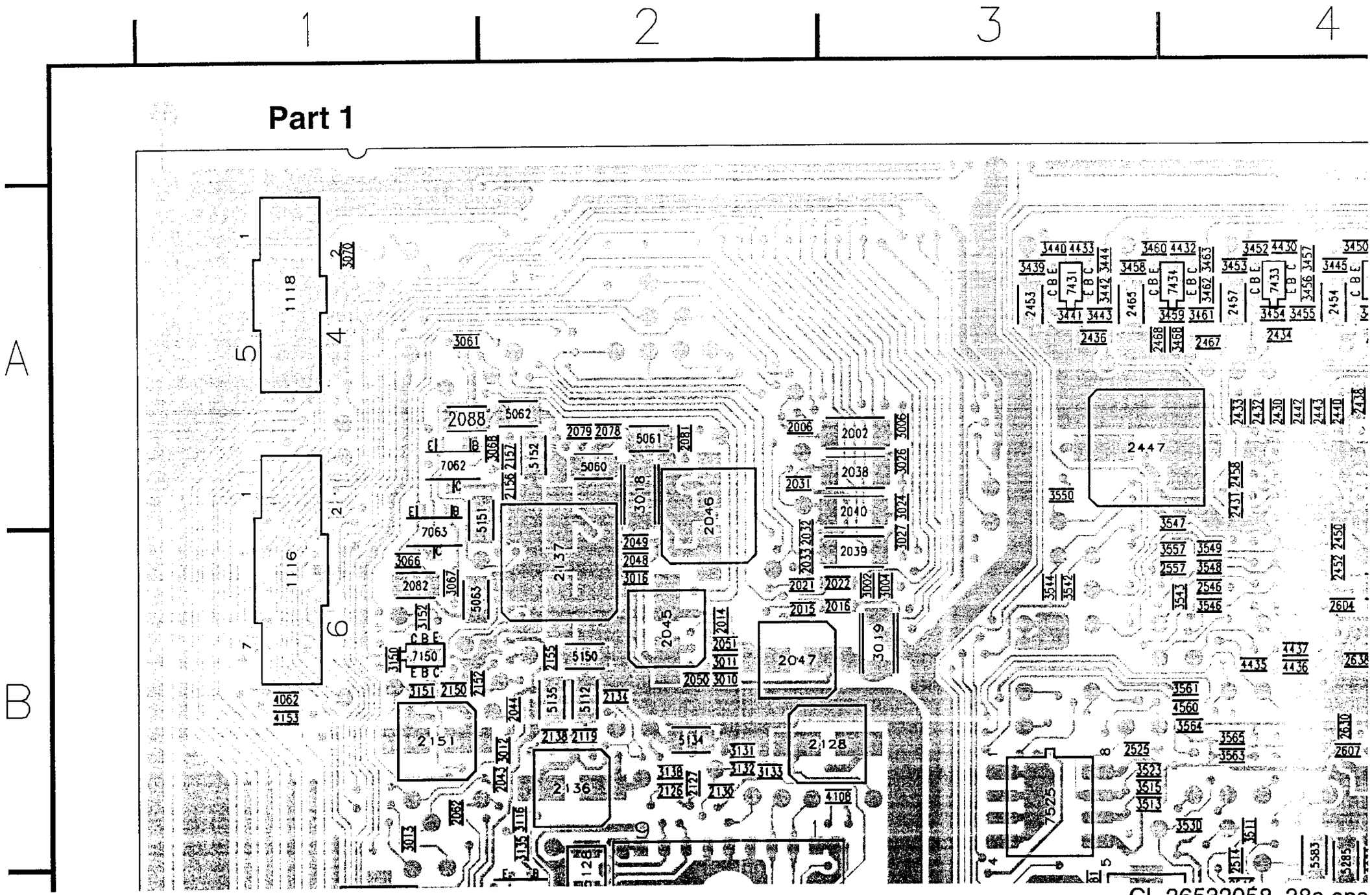
3445 A4 3911 D2 5480 A6
3446 A4 3918 C2 5570 A5
3447 A4 3919 C2 5583 B4



Layout SSB (Part 1 LOT Side)



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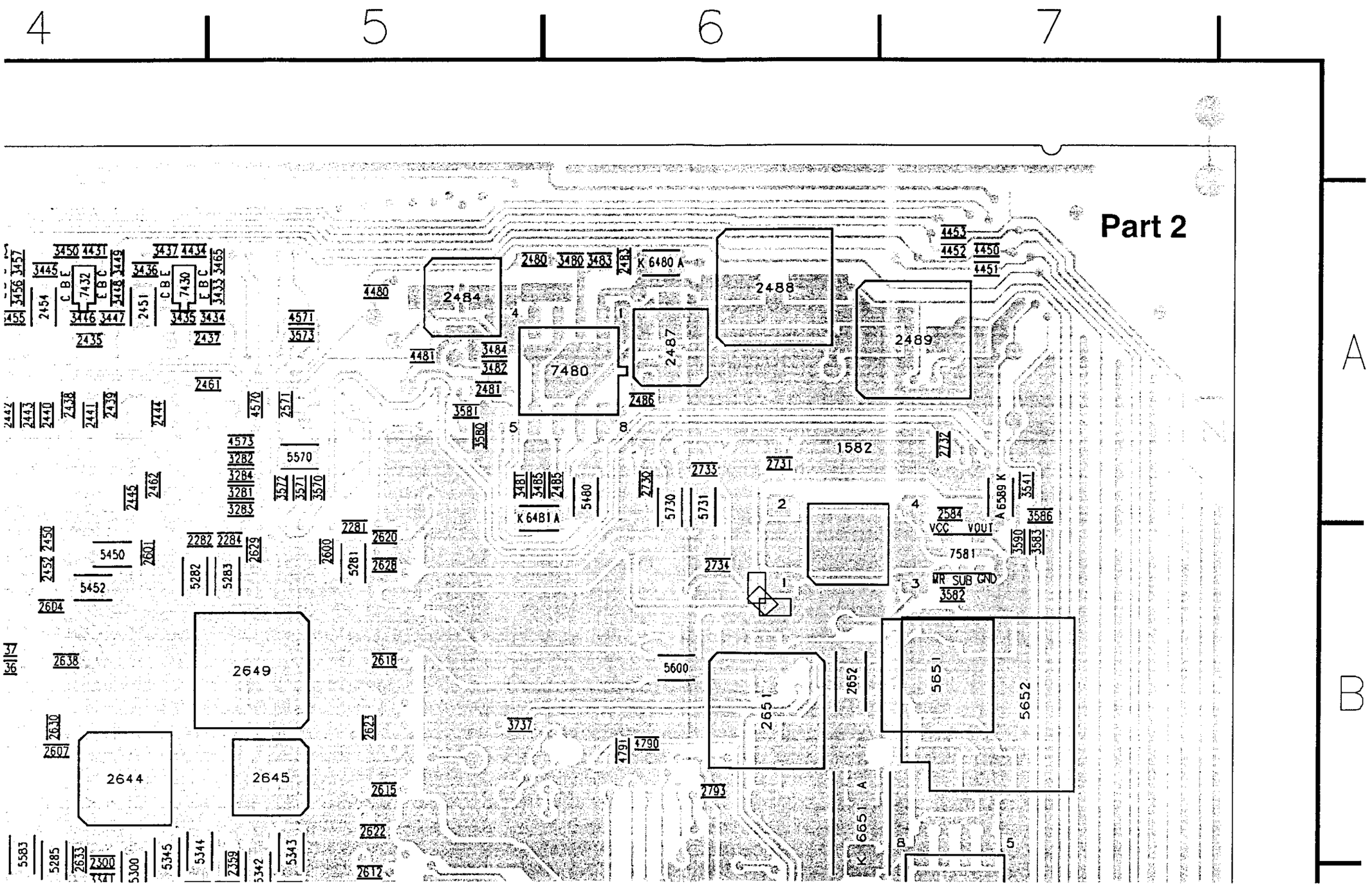
Layout SSB (Part 2 LOT Side)



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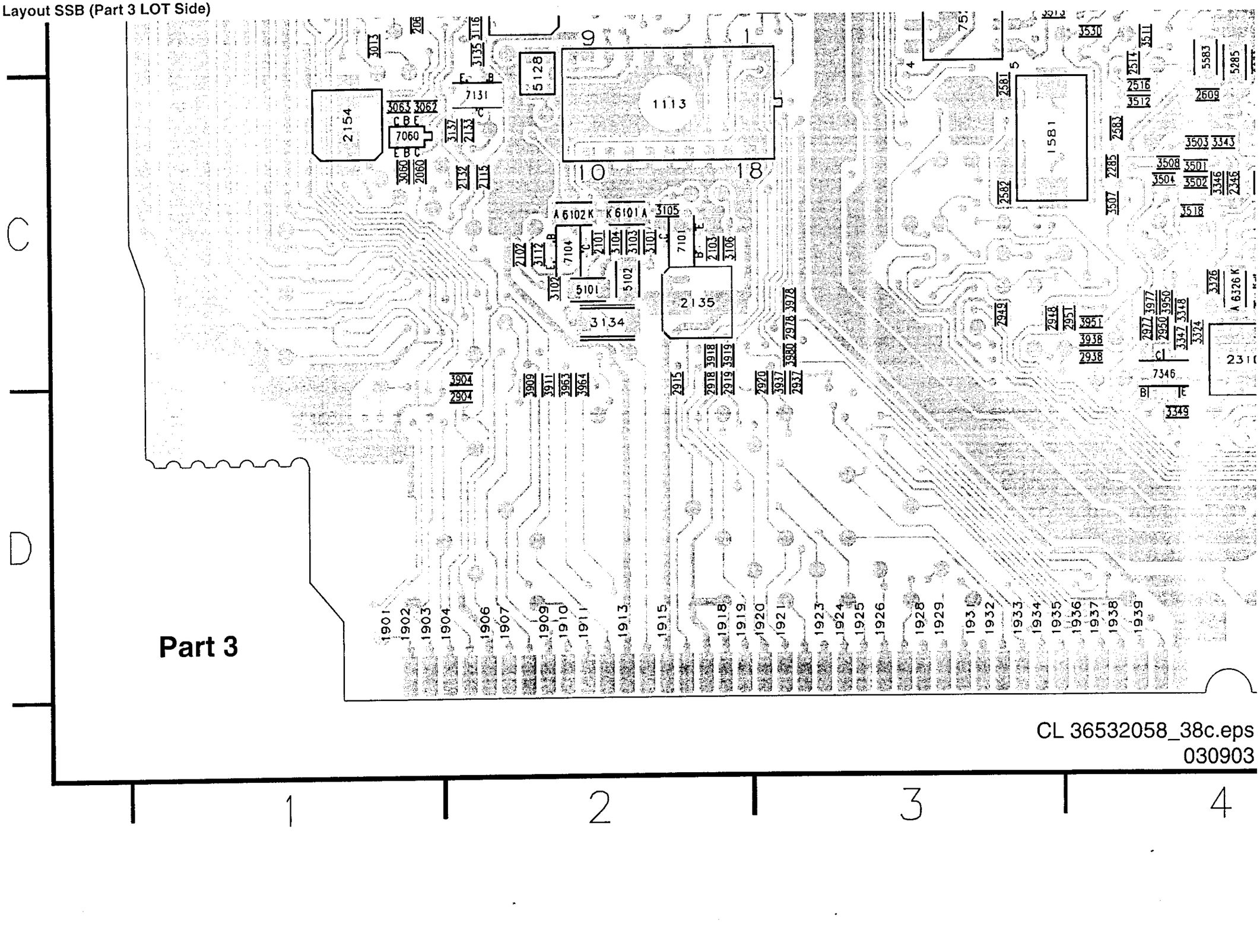
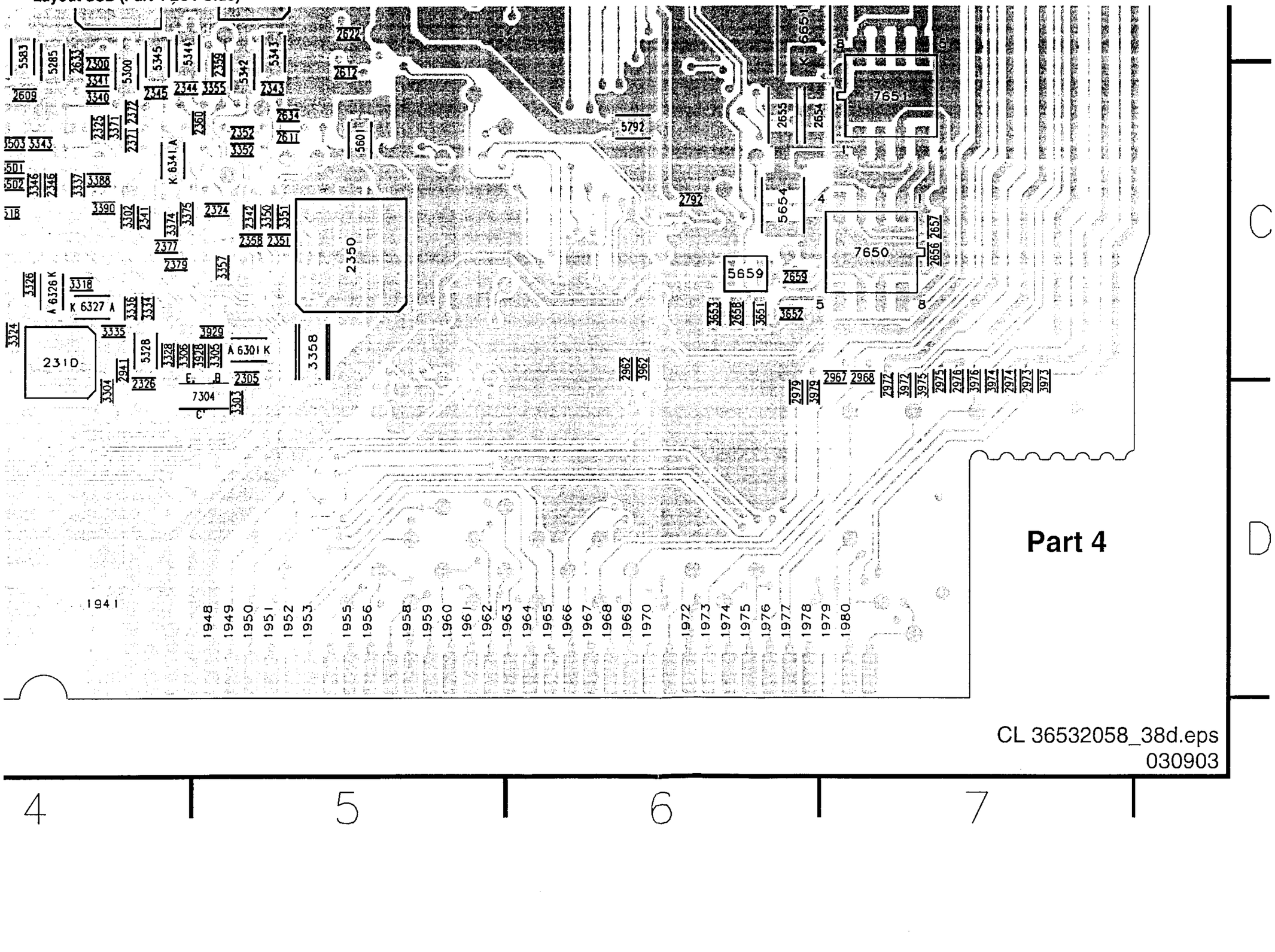
Layout SSB (Part 3 LOT Side)



Layout SSB (Part 4 LOT Side)



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
																																						3329	D4	7320	D4
																																						3330	D4	7330	D4
																																						3331	C4	7356	C5
																																						3332	C4	7361	C2
																																						3333	C4	7365	D3
																																						3338	C4	7382	C4
																																						3339	C4	7383	C5
																																						3345	C6	7393	C5
																																						3353	C5	7730	A2
																																						3354	C5	7790	C2
																																						3356	D5		
																																						3360	C3		
																																						3361	C3		
																																						3362	D3		
																																						3363	C3		
																																						3364	C3		
																																						3365	D3		
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																																						3367	C3		
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																																						4501	A2		
																																						5129	B5		
																																						5307	C4		
																																						5317	C4		
																																						5327	C4		
																																						6353	C5		
																																						6361	C2		
																																						6365	C3		
																																						6367	C3		
																																						6368	C3		
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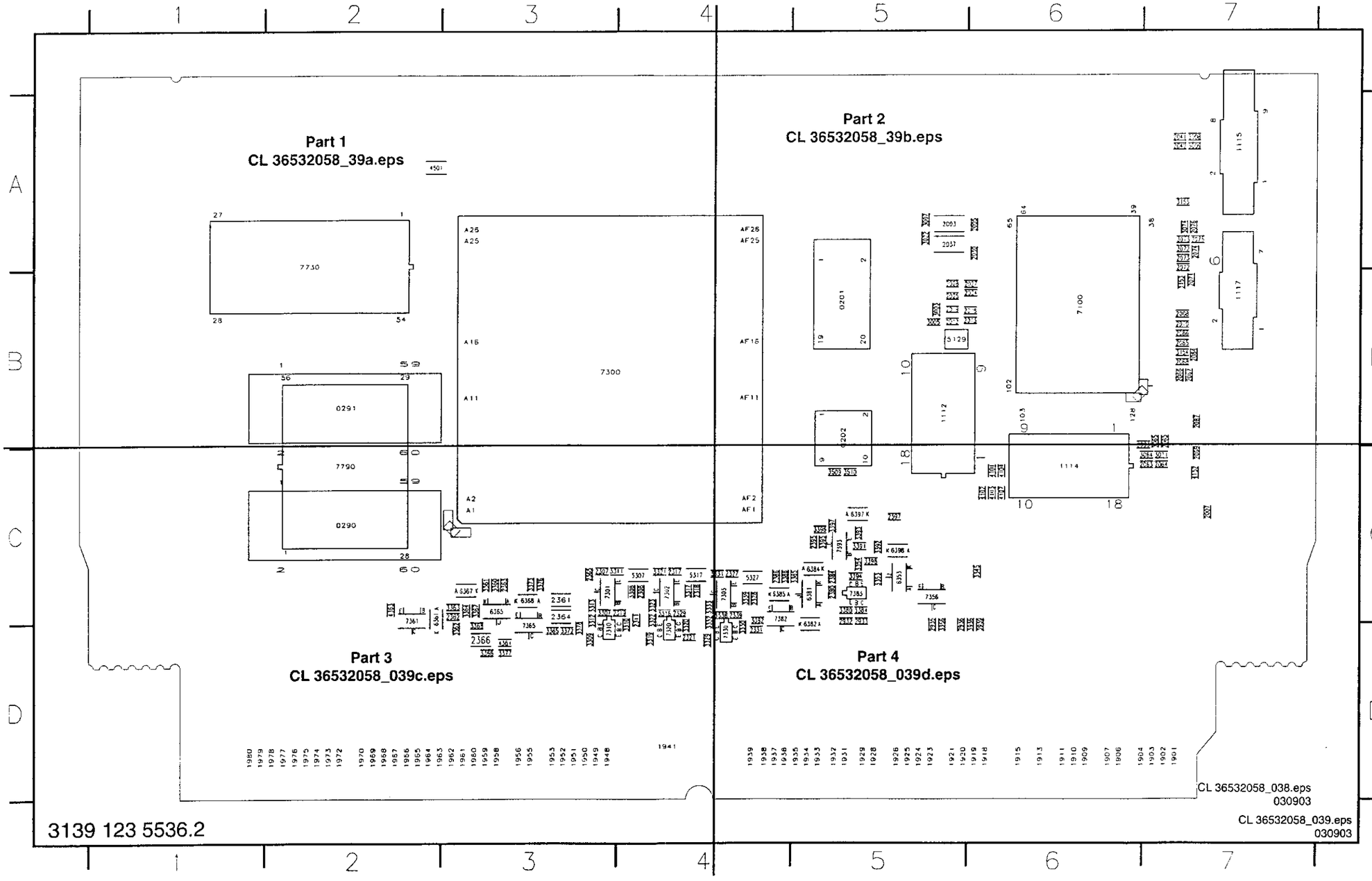
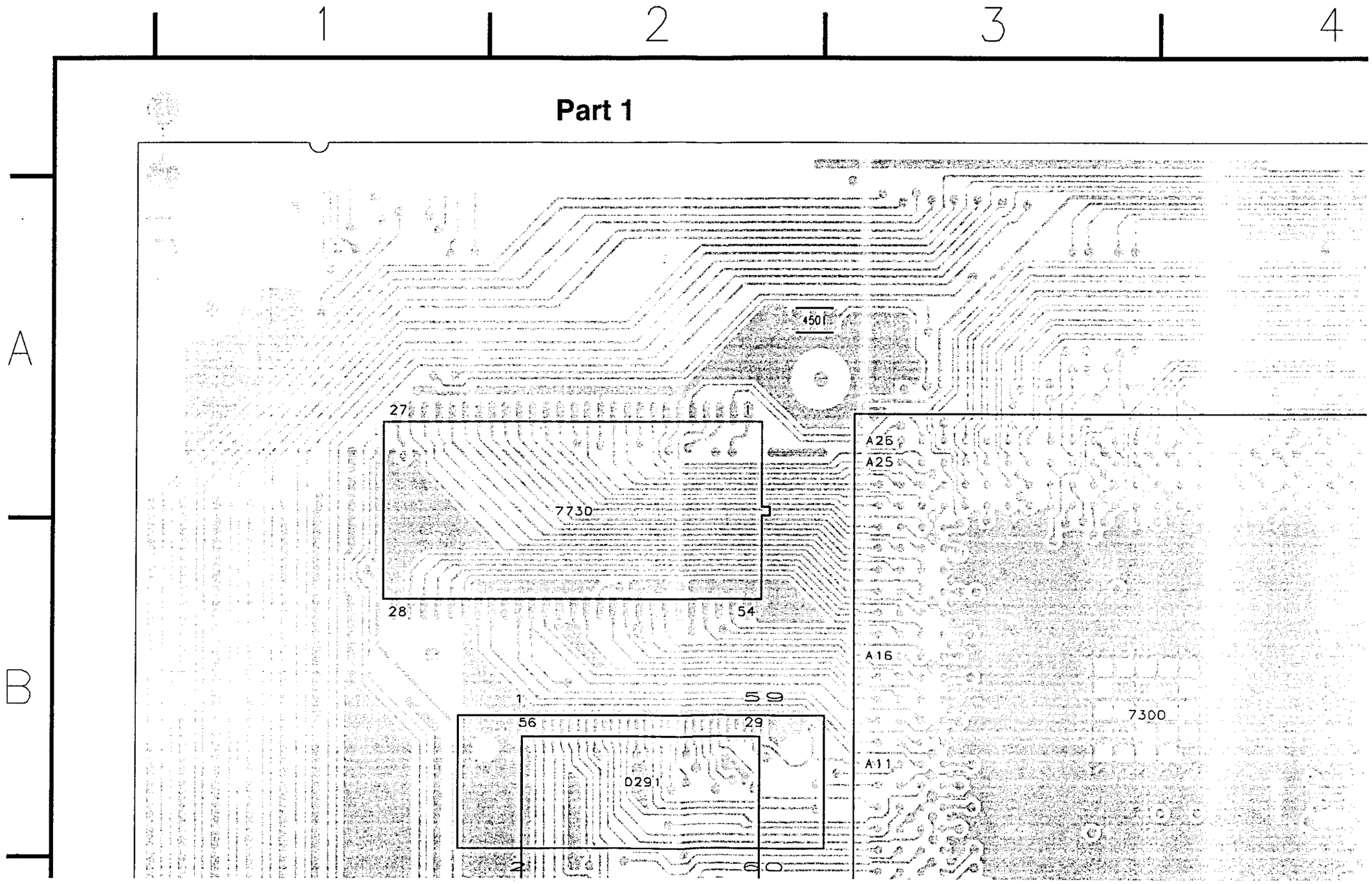


Layout SSB (Part 1 Tuner Side)



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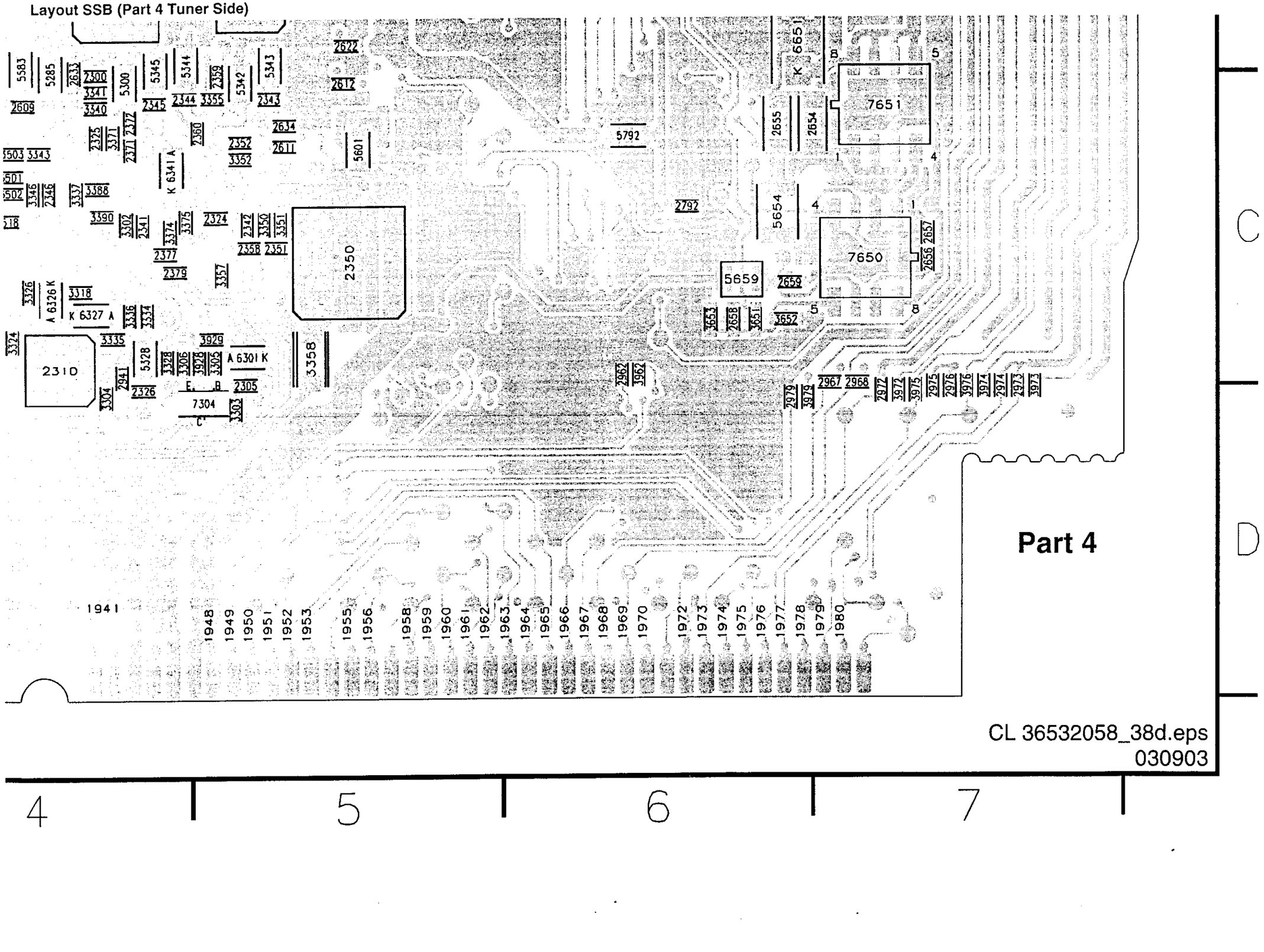
Layout SSB (Part 4 Tuner Side)



Side I/O Panel (FL9)

SIDE I/O PANEL

SVHS

CVBS

HEADPHONE-OUT

1328 YKF51-5304

1326-1 1326-2 1326-3

1327 YKB21-5101A

1936

1346

1344

FROM/TO 1936 OF A8 OR FROM 1620 OF A6 INTERFACING

N.C

DETECT

GNDB

GND_AUD

SOUND L-HEADPHONE-OUT

SOUND R-HEADPHONE-OUT

RES (SDM-EMG_S)

* DIVERSITY

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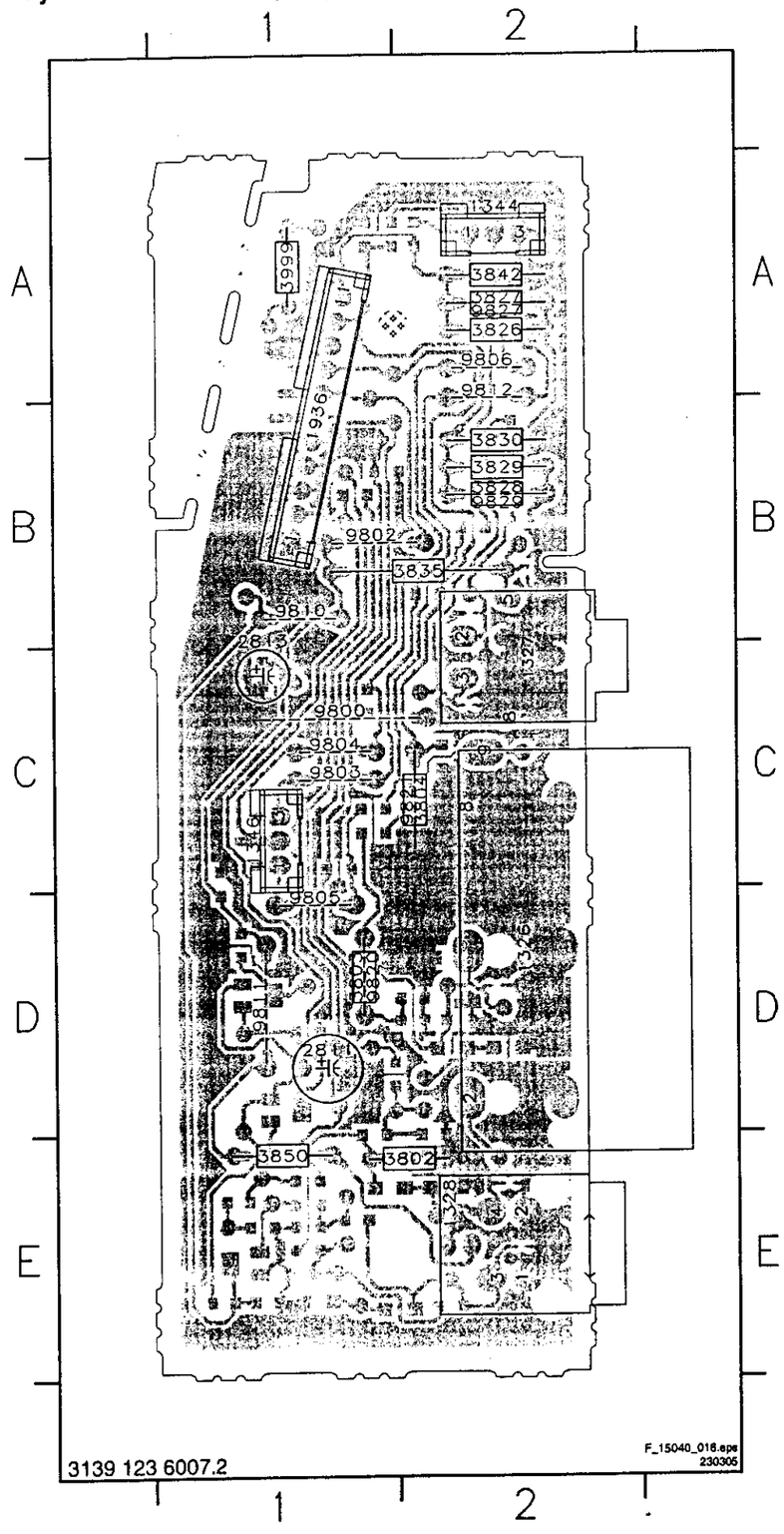
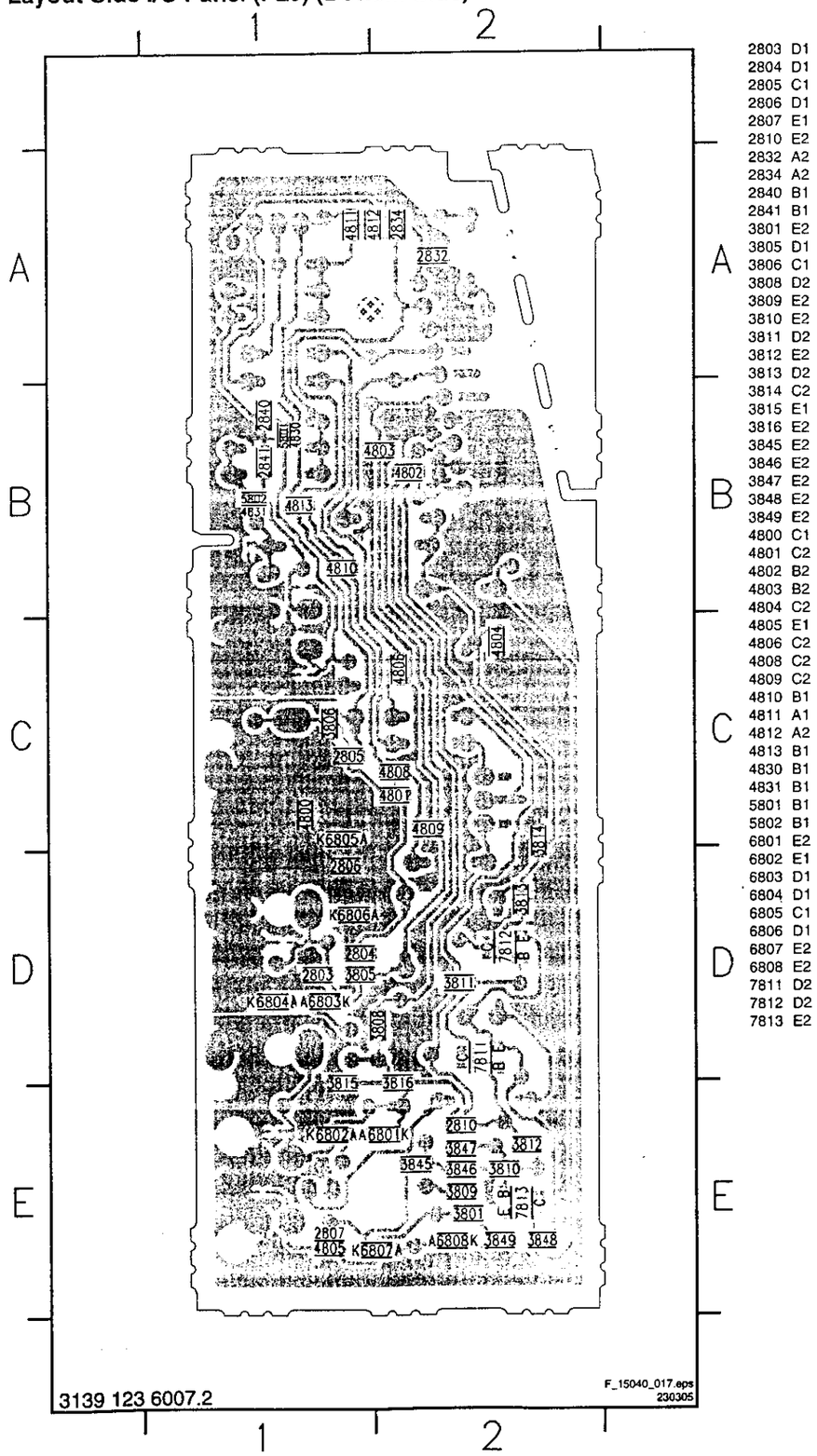
1326-1	C1	6808	B2
1326-2	C1	7811	B4
1326-3	D1	7812	B5
1327	E1	7813	A5
1328	B1	9800	F6
1344	F9	9810	A6
1346	E9	9811	A6
1800	E2	9812	F9
1801	C2	9820	C3
1802	F2	9821	D3
1803	F2	9827	E5
1804	E3	9829	F3
1805	B2	F001	A2
1806	A2	F002	B2
1936	C9	F003	B2
2803	C3	F005	C2
2804	C4	F006	D2
2805	D4	F007	D2
2806	D3	F008	E2
2807	A3	F009	E2
2810	B4	F010	E2
2811	B5	F011	A6
2813	C6	F013	A8
2832	E6	F014	C9
2834	F4	F015	A8
2840	F2	F016	C6
2841	F2	F017	C8
3801	A3	F018	B8
3802	C3	F019	C7
3803	C3	F020	F9
3804	D3	F021	F9
3805	C3	F022	F9
3806	D3	F023	F6
3808	A4	F024	F7
3809	A3	I801	B3
3810	C4	I802	A3
3811	C4	I803	A4
3812	B4	I804	A4
3813	B5	I805	A3
3814	C5	I806	A4
3815	C3	I807	A5
3816	B3	I808	B5
3826	E5	I809	B5
3827	E5	I810	B5
3828	F3	I811	B4
3829	F3	I812	C4
3830	F4	I813	B3
3835	D5	I814	C3
3842	E5	I815	D3
3845	A3	I816	E3
3846	A4	I817	A3
3847	A4	I818	B4
3848	A5	I819	D2
3849	A5	I820	E2
3850	A4	I821	D2
3999	F6	I822	F5
4800	D2	I823	F6
4801	D2		
4803	F5		
4804	C6		
4805	A3		
4806	F8		
4808	F9		
4809	E8		
4810	F8		
4811	F8		
4812	F8		
4830	E3		
4831	F3		
5801	F3		
5802	F3		
6801	B3		
6802	C2		
6803	C3		
6804	D2		
6805	D3		
6806	E2		
6807	A3		

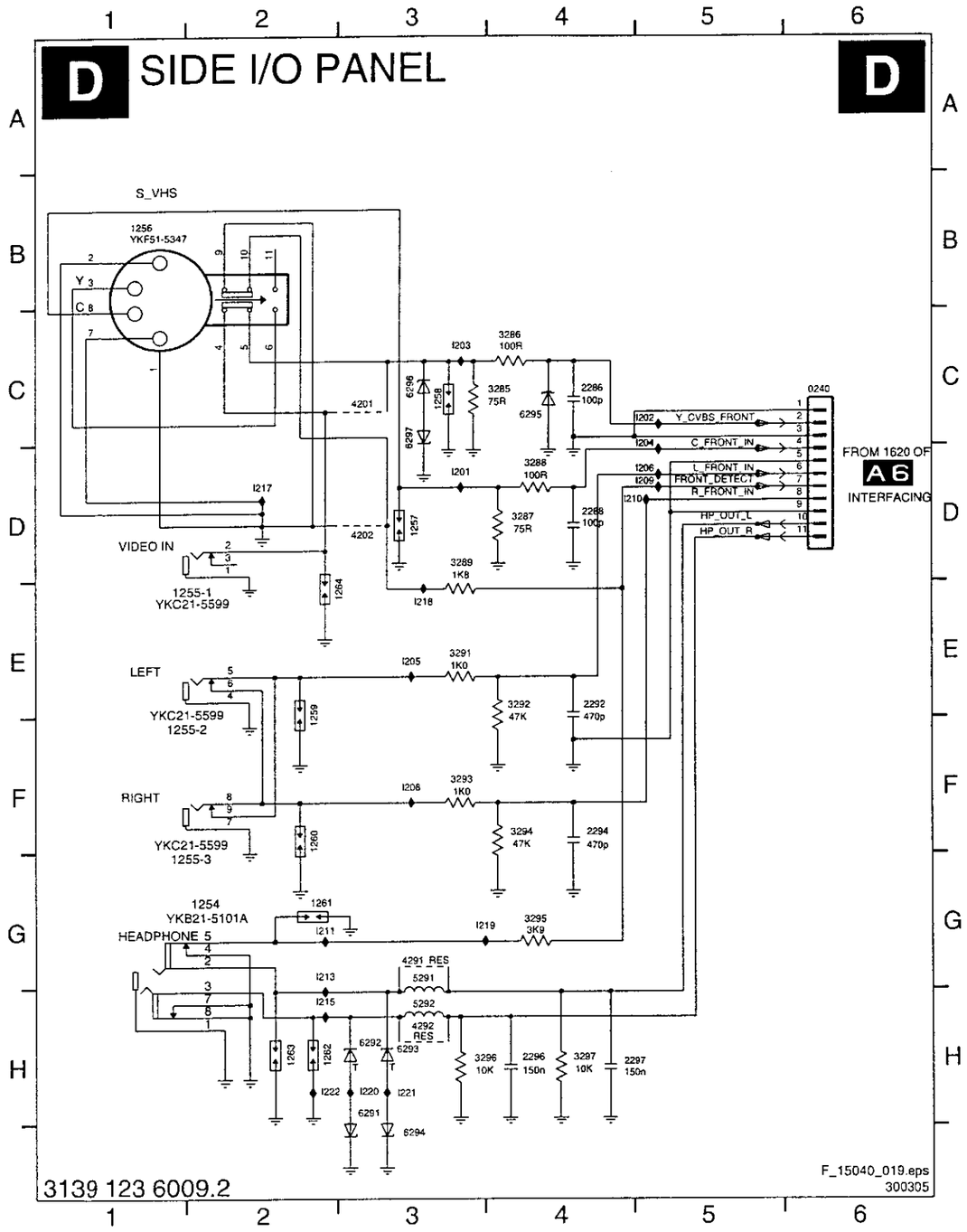
Layout Side I/O Panel (FL9) (Top Side)



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



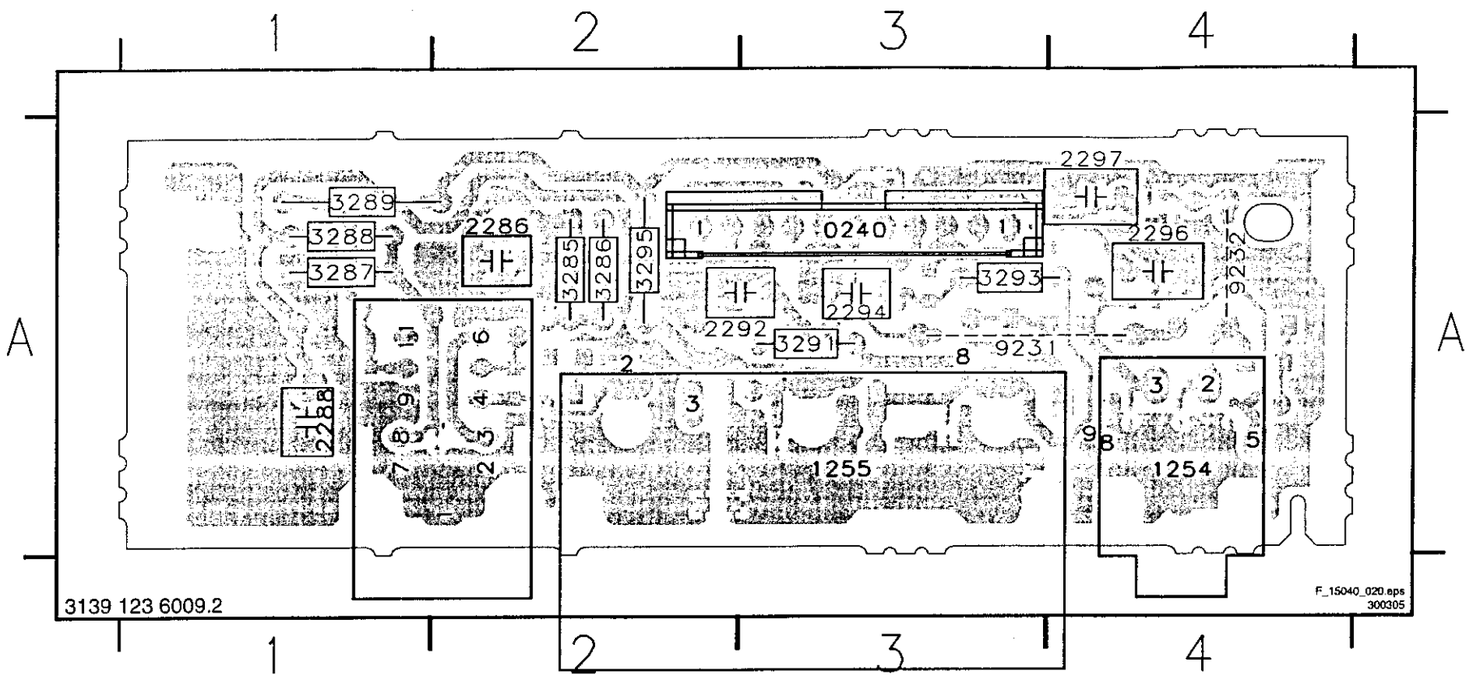
Side I/O Panel (SL5/PV2)



Personal Notes:

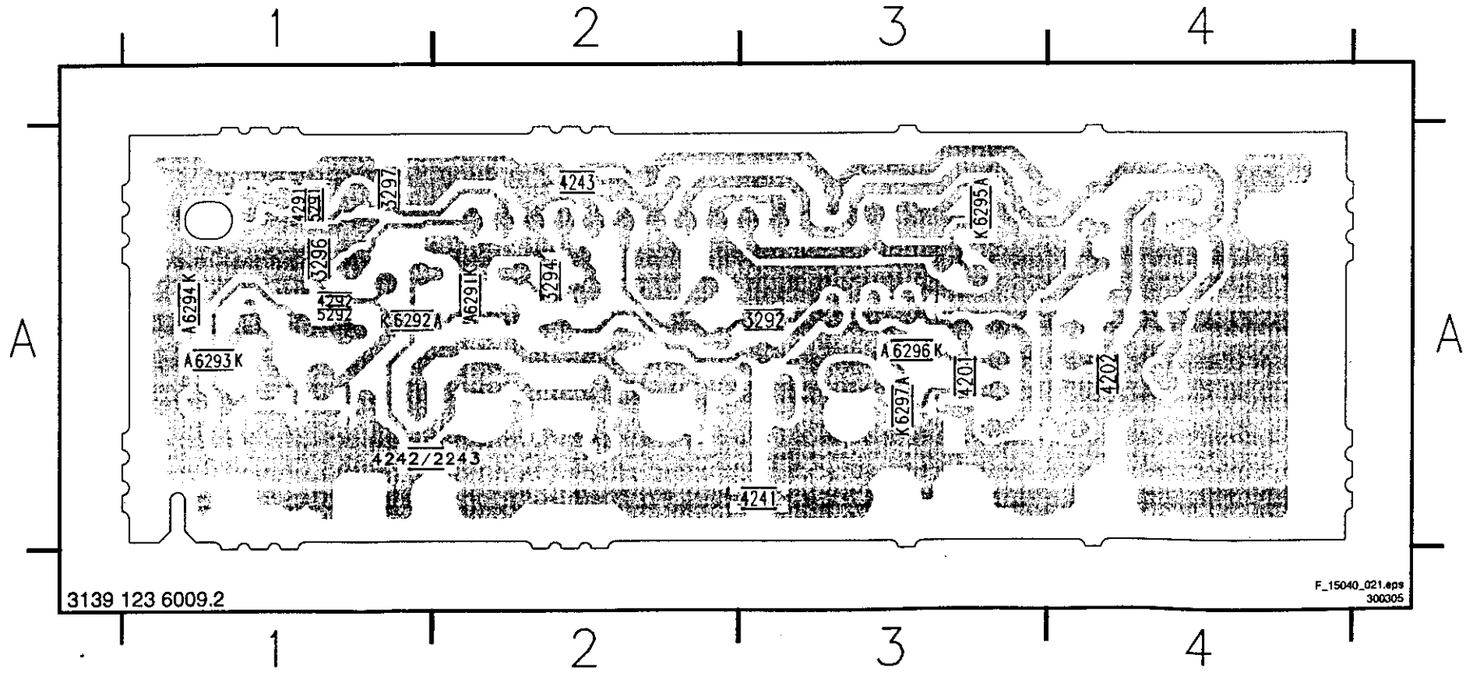
Layout Side I/O Panel (SL5/PV2) (Top Side)

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		



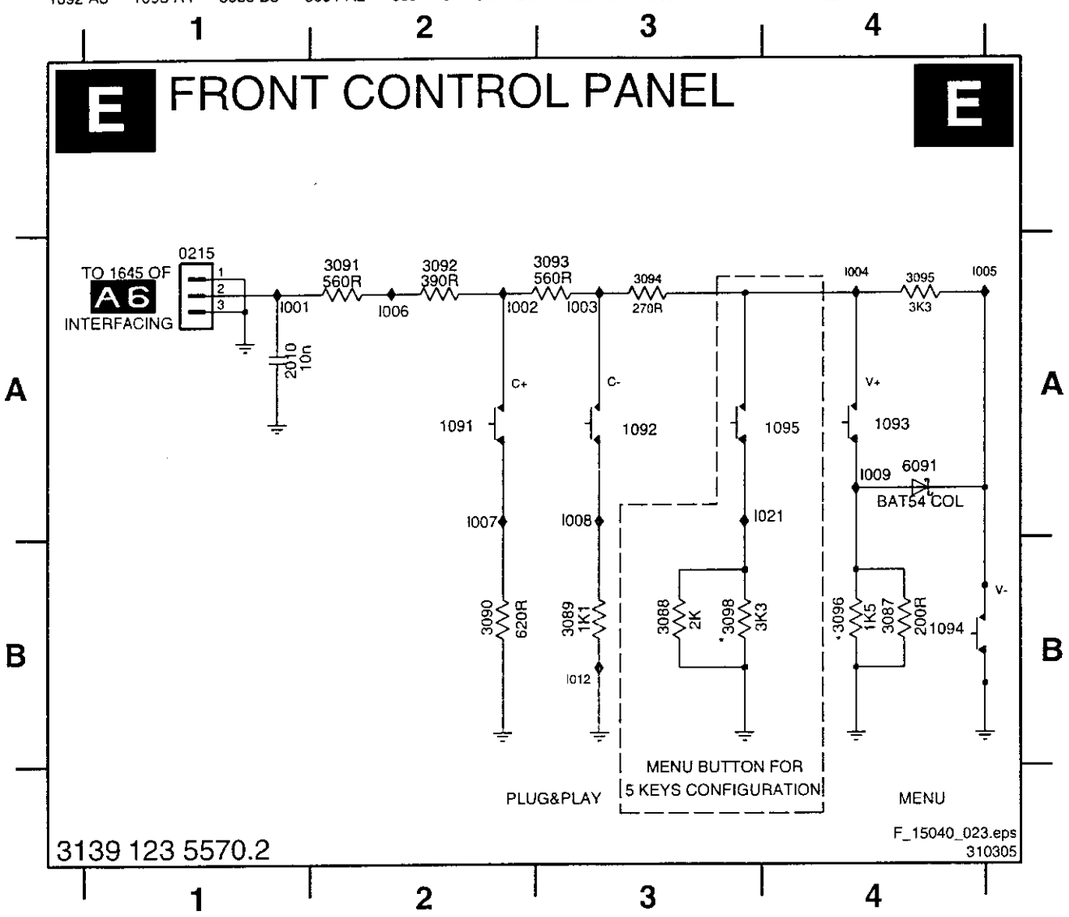
Layout Side I/O Panel (SL5/PV2) (Bottom Side)

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		



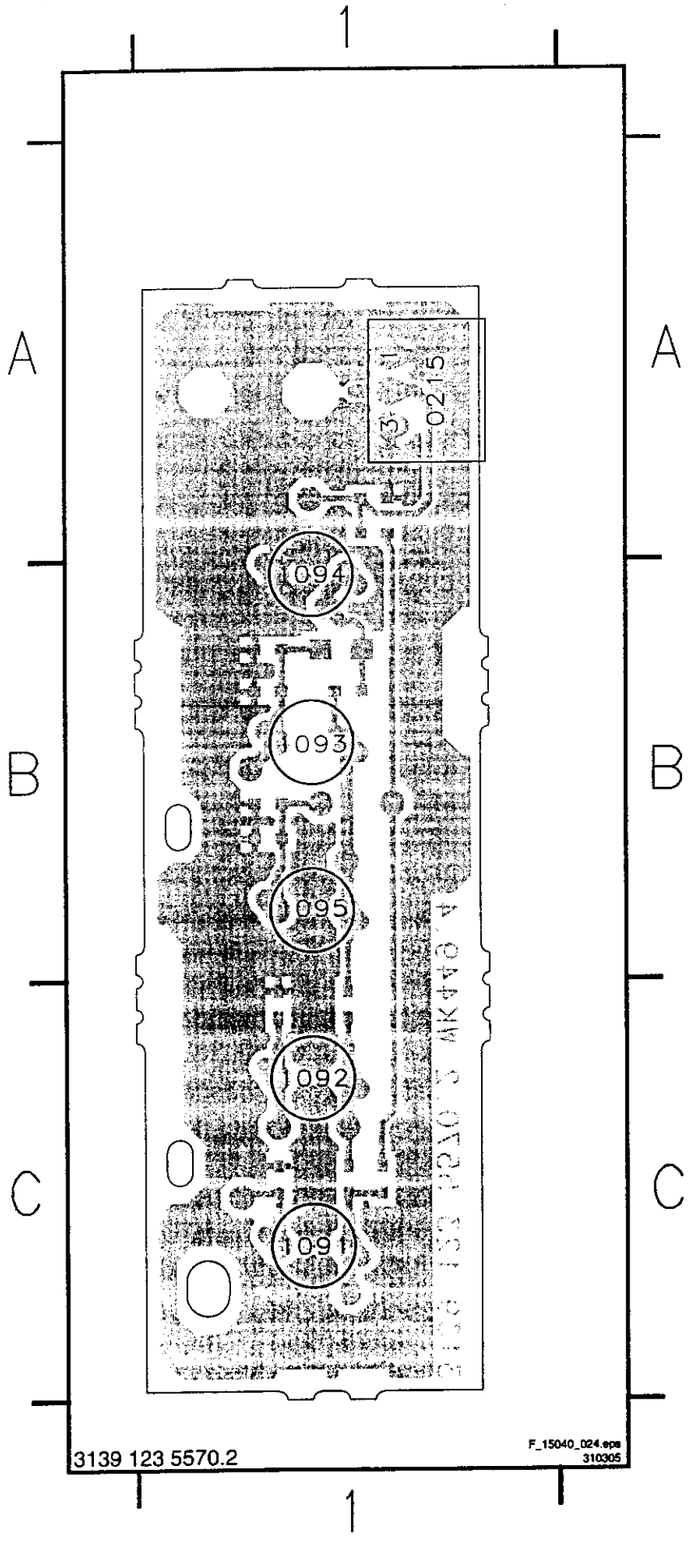
Front Control Panel

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



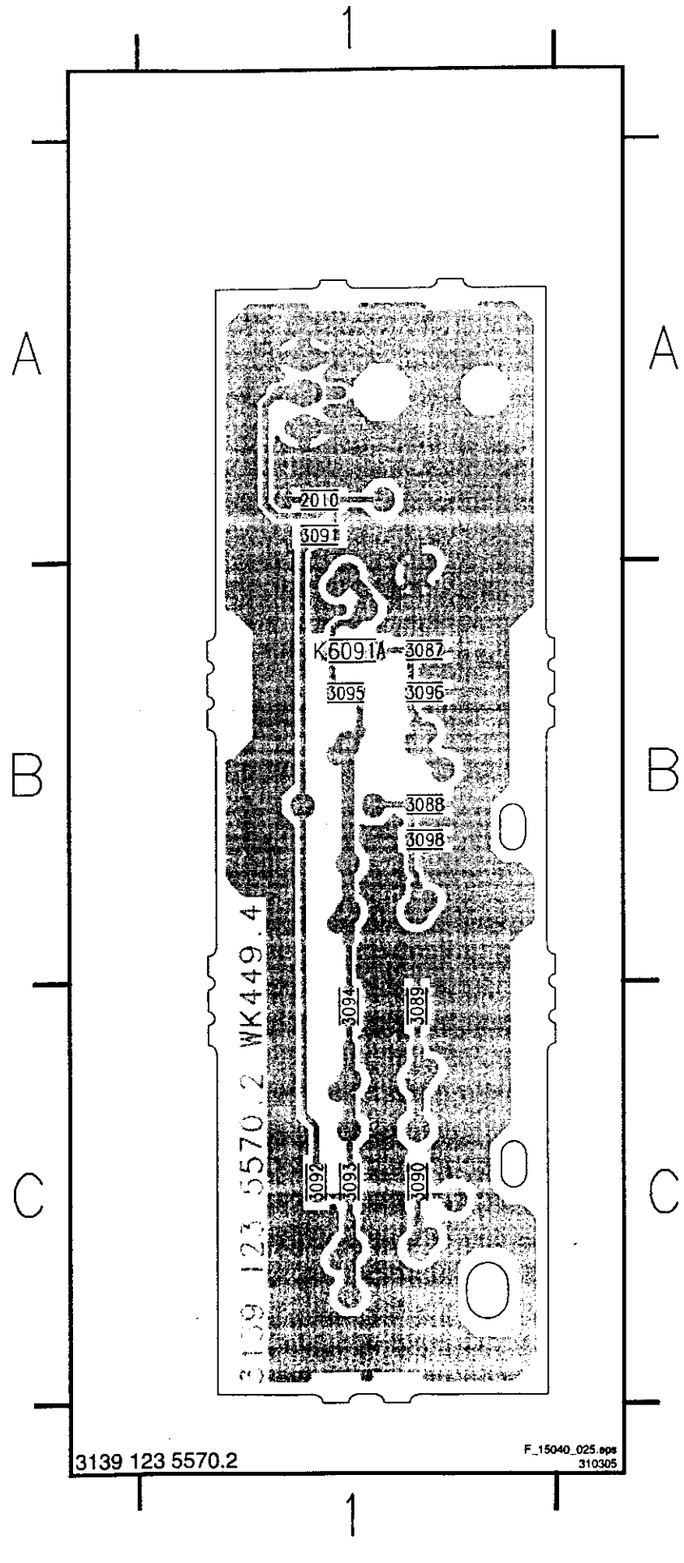
Personal Notes:

Layout Front Control Panel (Top Side)



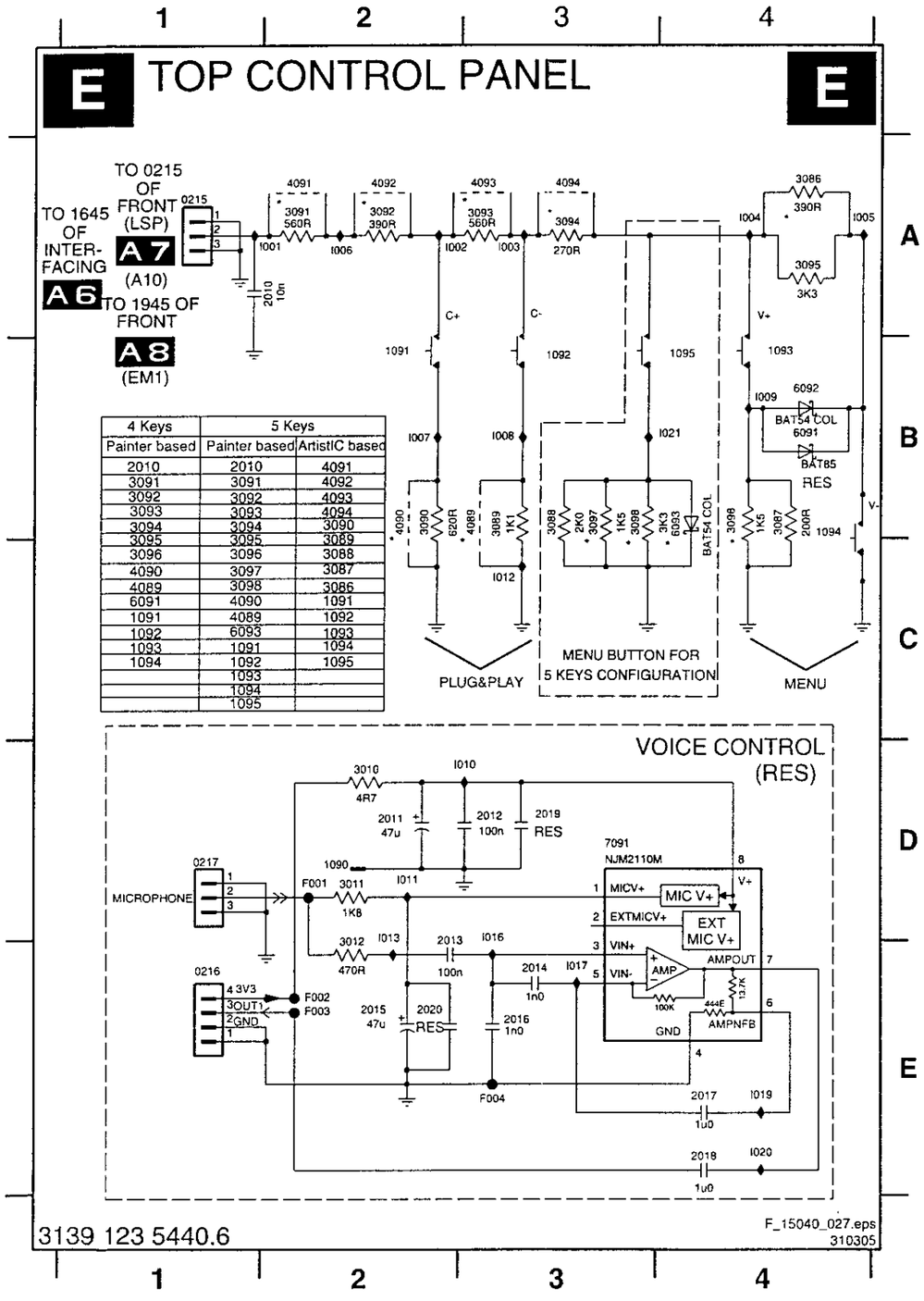
0215 A1
1091 C1
1092 C1
1093 B1
1094 B1
1095 B1

Layout Front Control Panel (Bottom Side)



2010 A1
3087 B1
3088 B1
3089 C1
3090 C1
3091 A1
3092 C1
3093 C1
3094 C1
3095 B1
3096 B1
3098 B1
6091 B1

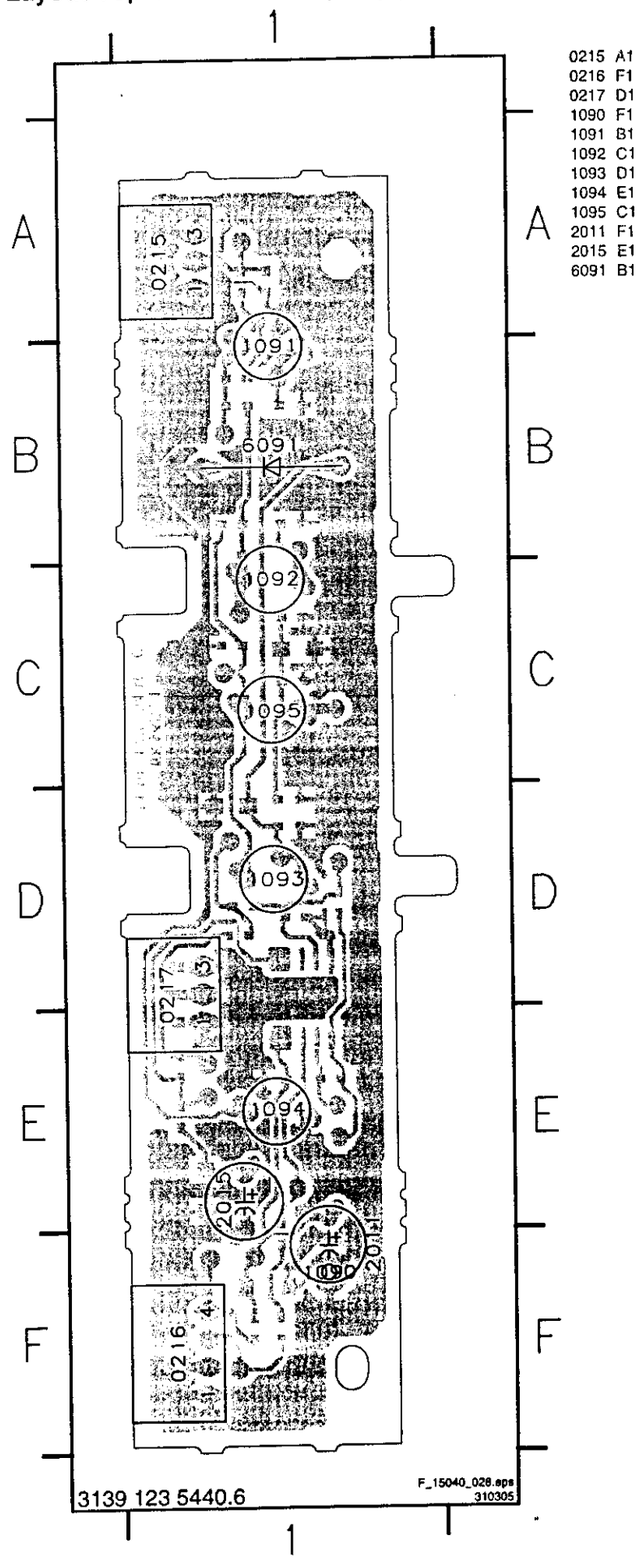
Top Control Panel (PV2)



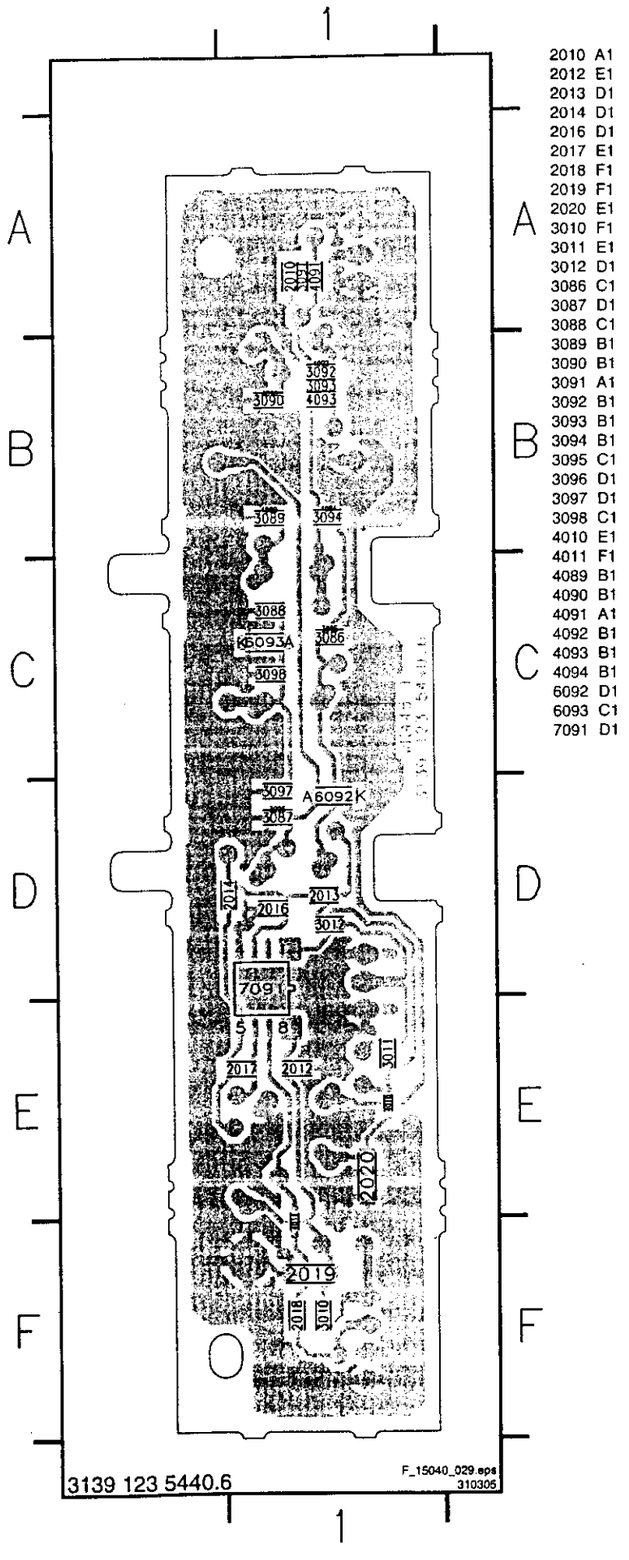
0215 A1
0216 E1
0217 D1
1090 D2
1091 B2
1092 B3
1093 B4
1094 B4
1095 B4
2010 A2
2011 D2
2012 D3
2013 E2
2014 E3
2015 E2
2016 E3
2017 E4
2018 E4
2019 D3
2020 E2
3010 D2
3011 D2
3012 E2
3086 A4
3087 B4
3088 B3
3089 B3
3090 B2
3091 A2
3092 A2
3093 A3
3094 A3
3095 A4
3096 B4
3097 B3
3098 B3
4089 B3
4090 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)

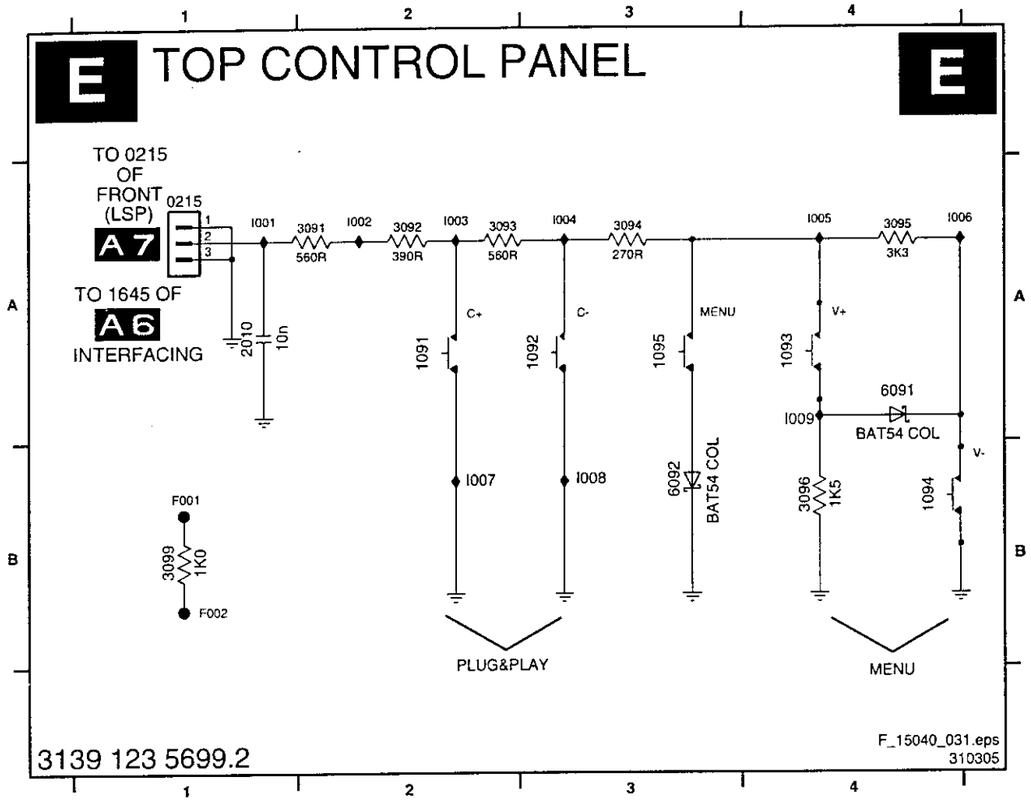


Layout Top Control Panel (PV2) (Bottom Side)



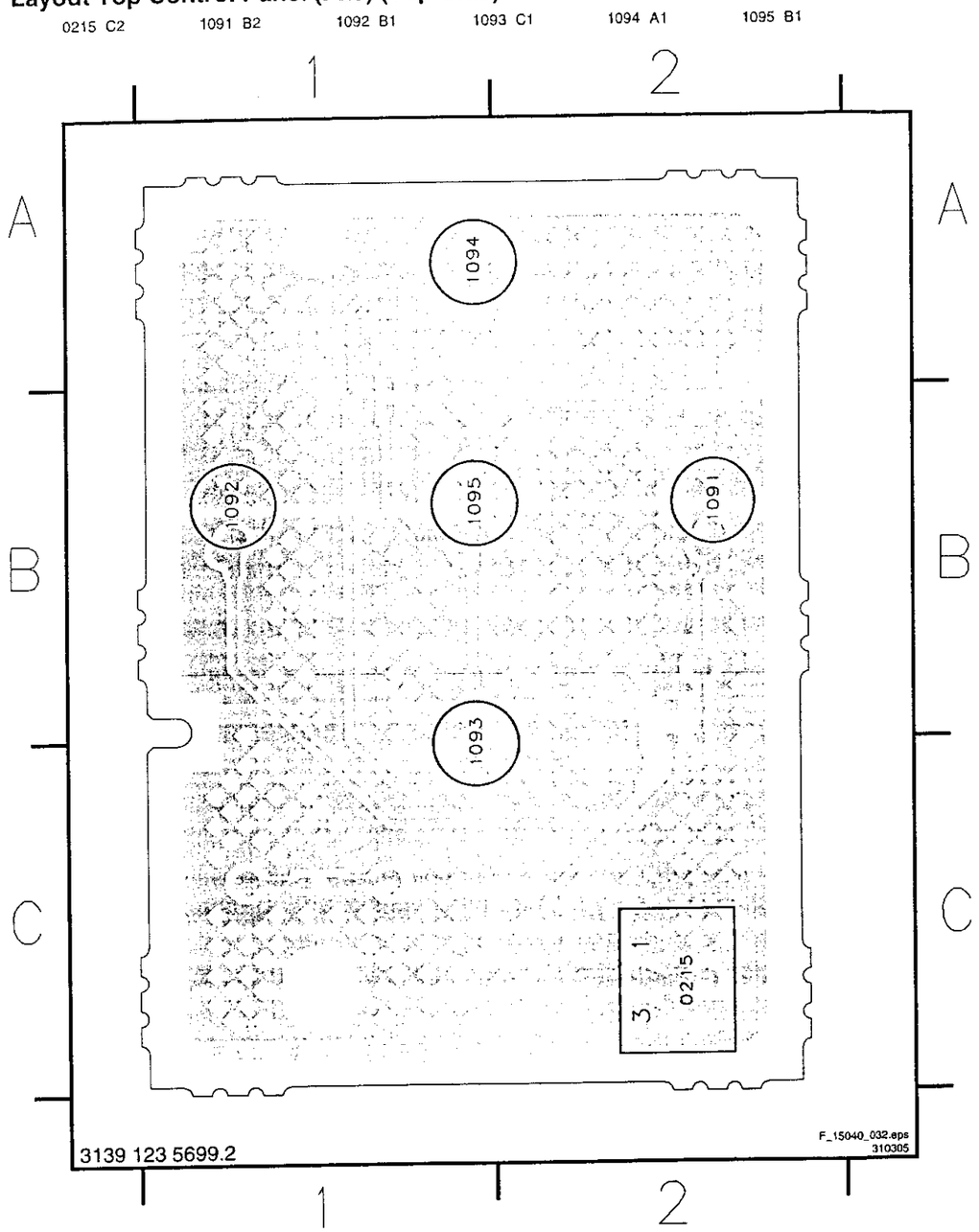
Top Control Panel (FL9)

0215 A1	1093 A4	2010 A1	3093 A2	3096 B4	6092 B3	I001 A1	I004 A3	I007 B2
1091 A2	1094 B4	3091 A2	3094 A3	3099 B1	F001 B1	I002 A2	I005 A4	I008 B3
1092 A3	1095 A3	3092 A2	3095 A4	6091 A4	F002 B1	I003 A2	I006 A4	I009 A4

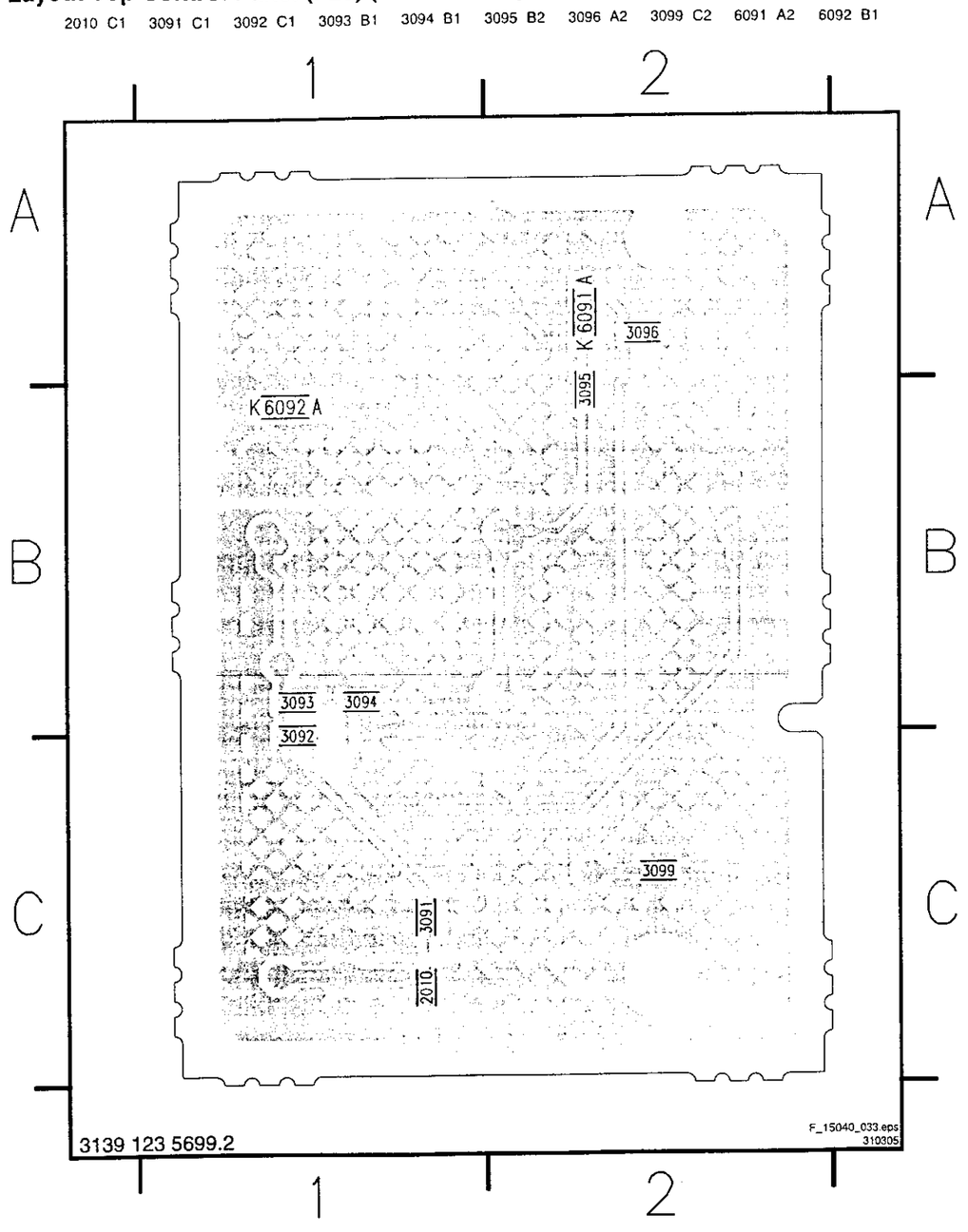


Personal Notes:

Layout Top Control Panel (FL9) (Top Side)



Layout Top Control Panel (FL9) (Bottom Side)



CRT Panel

F CRT PANEL

F

ROTATION FOR WIDE SCREEN ONLY

AQUADAG

CRT

VG1 VG2 STATIC FOCUS DYN FOCUS EHT

TO LOT A3

FROM 1629 OF A5 INTERFACING

FROM 1401 OF A2 DEFLECTION

TO SCAVEM COIL

TO Rotation Coil

SCAVEM

MIRROR DIFFERENTIAL STAGE V BIAS CURRENT SOURCE

STANDBY/ MUTE LOGIC

SHORT CIRCUIT AND TEMPERATURE PROTECTION

w/o bleeder

Bleeder Gun

For Europe

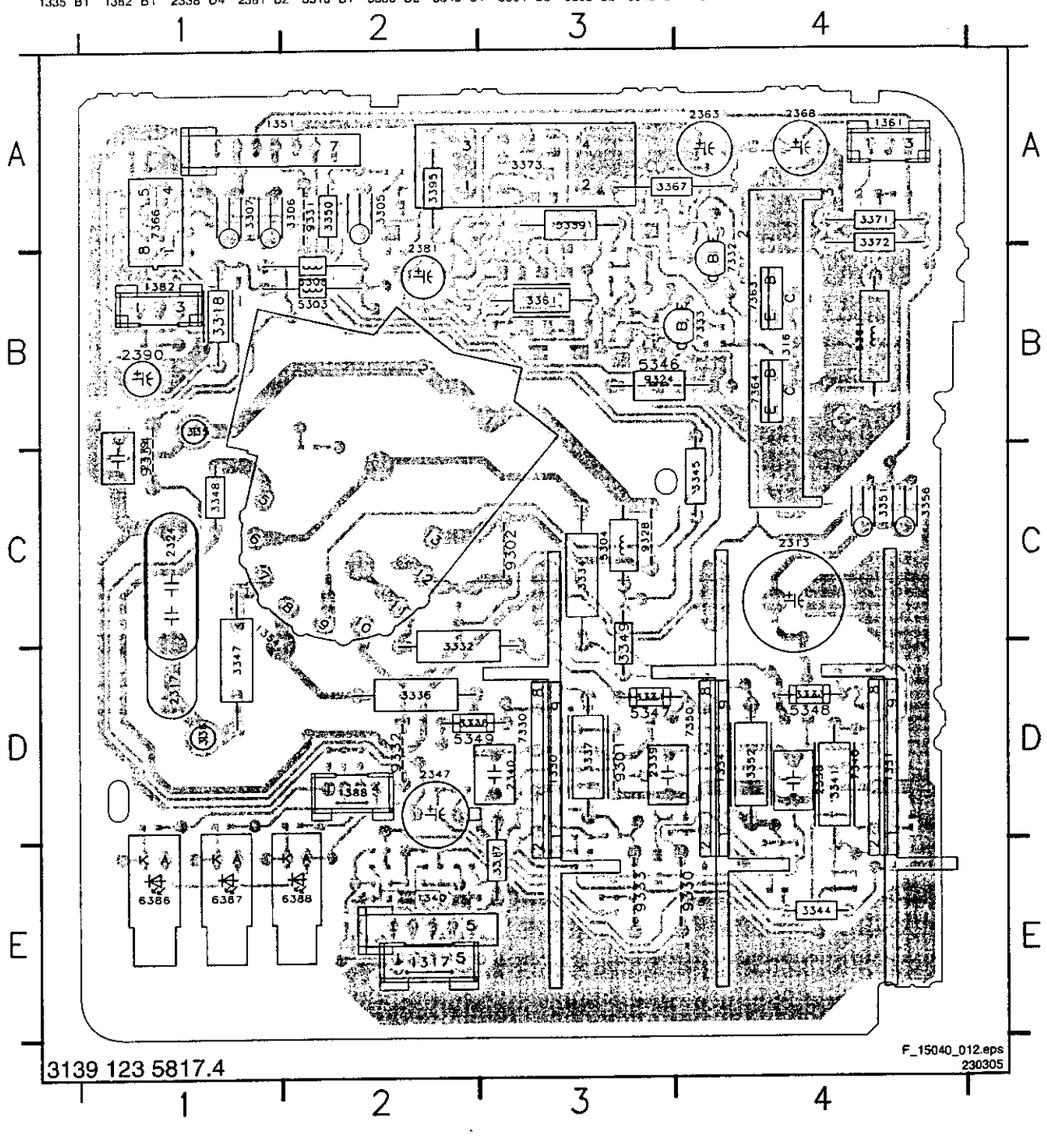
ITEM	SIZE/TUBE 29RF A68ERF182X044	28WSRF A66ERF172X044	32WSRF A66ERF172X044	28BLD A66EAK075X054
1334	NON-DAF SOCKET	DAF SOCKET	DAF SOCKET	NON-DAF SOCKET
2371	5.6pF	5.6pF	5.6pF	5.6pF
2372	5.6pF	5.6pF	5.6pF	5.6pF
2373	5.6pF	5.6pF	5.6pF	5.6pF
2374	330nF	330nF	330nF	330nF
3306	5R6	5R6	5R6	6R8
3307	5R6	5R6	5R6	3R3
3358	4K7	4K7	4K7	4K7
3359	6K8	6K8	6K8	6K8
3360	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
6340	NOT USED	NOT USED	NOT USED	NOT USED
6341	NOT USED	NOT USED	NOT USED	NOT USED
8402	USED	USED	USED	USED
8324	NOT USED	NOT USED	NOT USED	NOT USED
Replaced by	NOT USED	USED	USED	NOT USED

3139 123 5817.4

F_15040_011.eps 290405

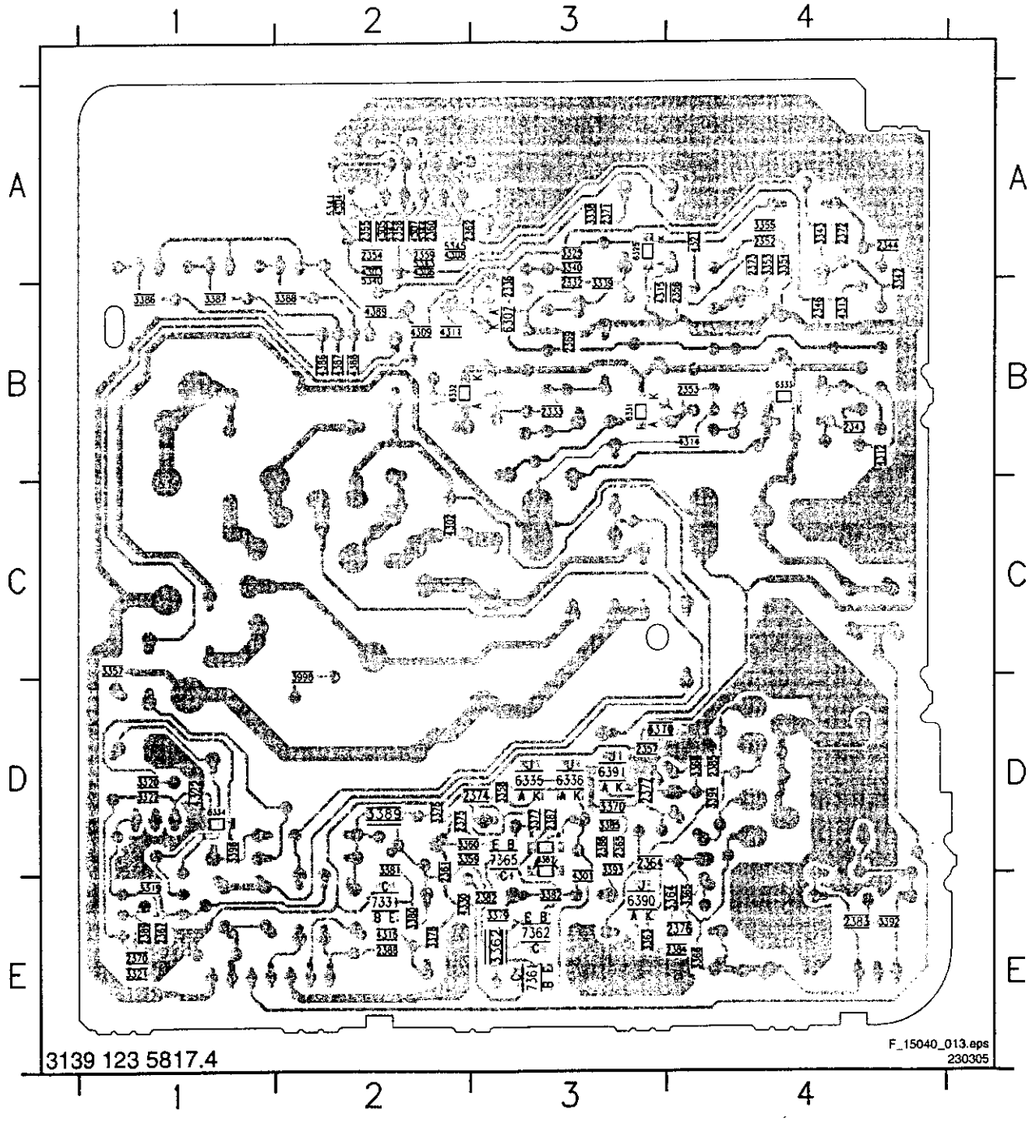
Layout CRT Panel (Top Side)

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	3999	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



Mains Switch Panel (FL9)

MAINS SWITCH PANEL(FL9)

M

M

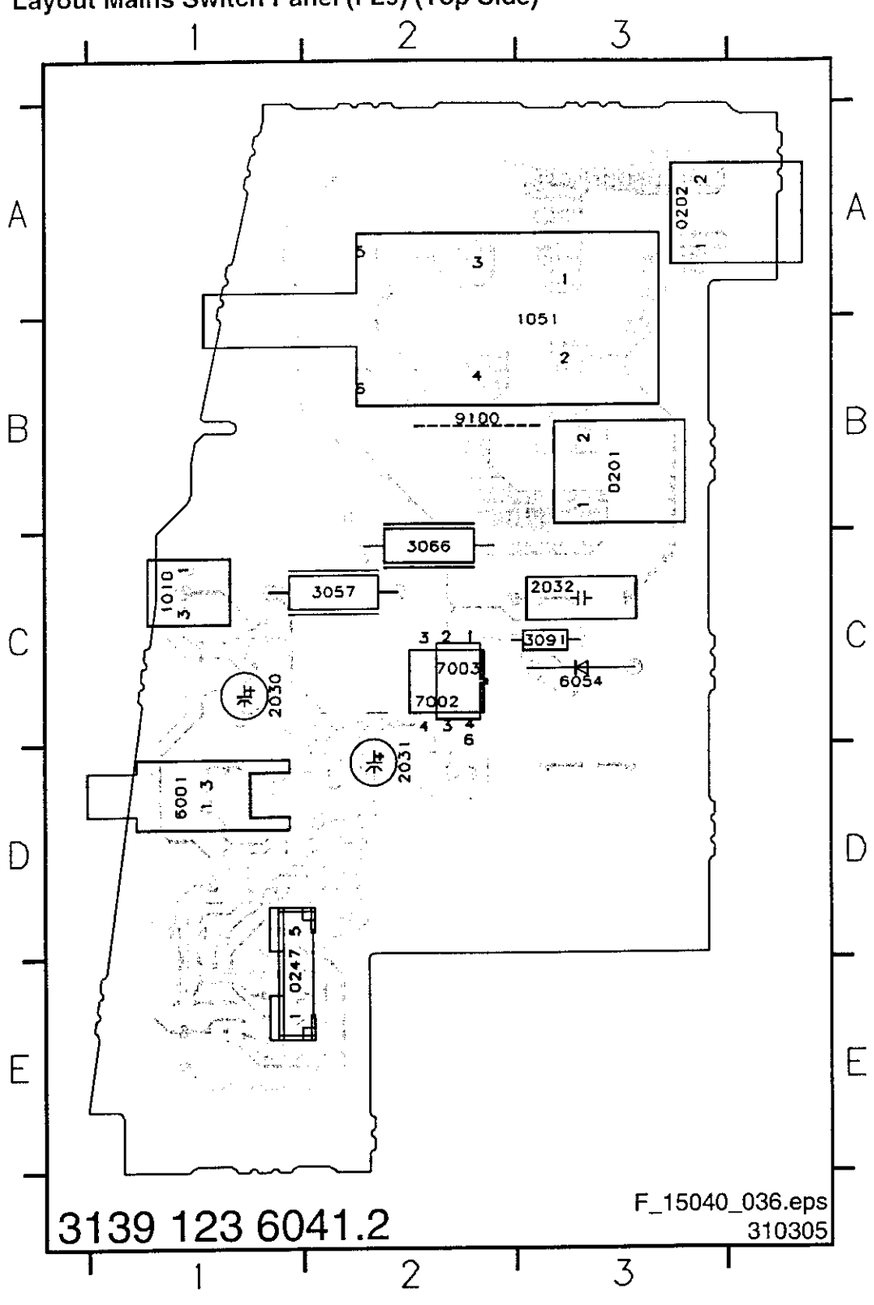
I001
3082
330R
2030
100u
3092
10K
4009
4010
I003
3078
100R
1010
TSOP34836
VS
OUT
GND
RC5 RECEIVER
6053 RES
BZX284-C3V3
RES 3084
2K2
3093
6K8
0247
F007
F008
ON-OFF-LED
RC 5 OUT
5V2
TO 1624 OF
A6
INTERFACING
F009
4006
4008
3081
1K5
3085
100K
7000
BC857BW
I006
I004
4001
RES
I002
4003
6001
I007
3088
47R
3086
220R
3087
220R
7001
BC847BW
I010
3089
1K0
I011
RES 3083
1K0
4000
3090
100K
2031
47u
F010
I008
I009
I012
7002
NC
6054
1N4148
7003
TCET1102(G)
TCDT1102G
4004
3091
1K0
I014
2032
22n
I015
I016
MAINS
AC
IN
only for AP
178 - 250V
0201
F003
F005
1051
SDDF
3066
3M3
3057
I005
3M3
F004
F006
0202
TO 0010
OF
A1
OR
TO 1505 OF
A1
POWER SUPPLY
F012
3099
1K0
F011

3139 123 6041.2

F_15040_035.eps
310305

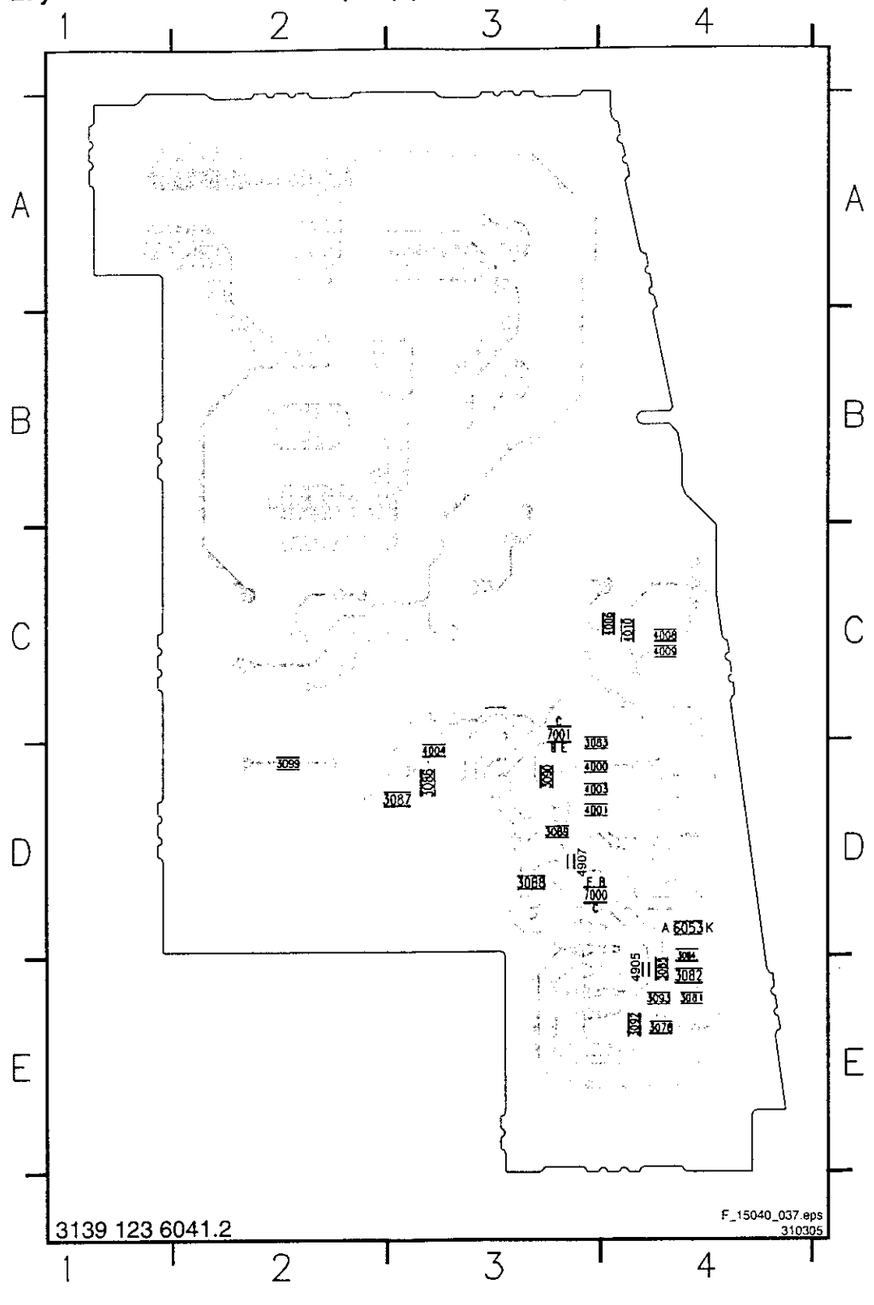
0201 E2 I007 C5
0202 E7 I008 C5
0247 A7 I009 C7
1010 A2 I010 C4
1051 E4 I011 C5
2030 A2 I012 C6
2031 C5 I014 D6
2032 D6 I015 D3
3057 E3 I016 D4
3066 E3
3078 A4
3081 B3
3082 A3
3083 C3
3084 B1
3085 B5
3086 C5
3087 C7
3088 C5
3089 C4
3090 C4
3091 D6
3092 A4
3093 B3
3099 E5
4000 C3
4001 B4
4003 C4
4004 D7
4006 B3
4008 B3
4009 A3
4010 A3
6001 C3
6053 B1
6054 C6
7000 B5
7001 C3
7002 C5
7003 C7
F003 E2
F004 E7
F005 E2
F006 E7
F007 B7
F008 B7
F009 B5
F010 D3
F011 E6
F012 E5
I001 A2
I002 B3
I003 A4
I004 B3
I005 E3
I006 B6

Layout Mains Switch Panel (FL9) (Top Side)



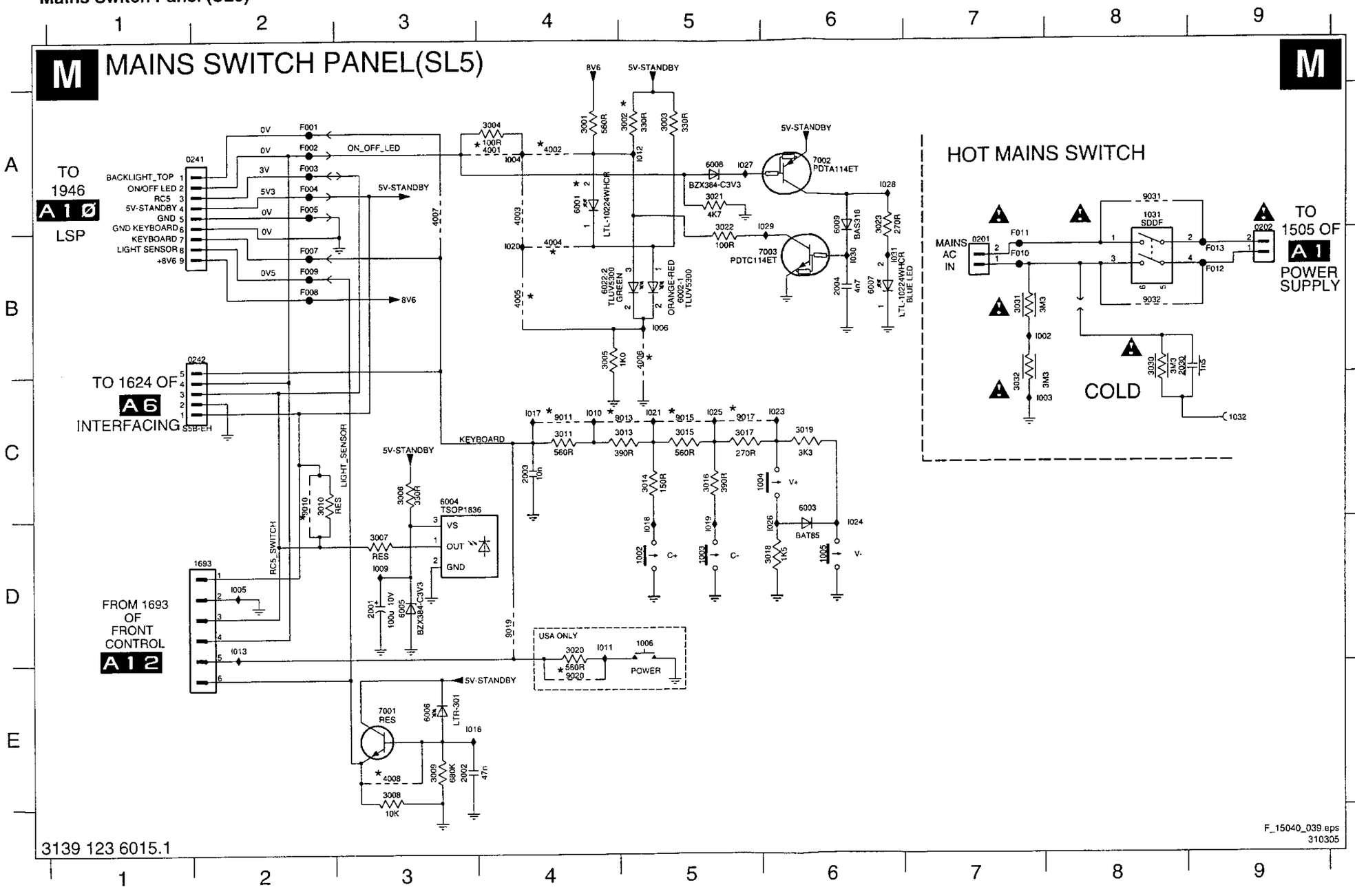
0201 B3
0202 A3
0247 E1
1010 C1
1051 B3
2030 C1
2031 D2
2032 C3
3057 C2
3066 C2
3091 C3
6001 D1
6054 C3
7002 C2
7003 C2
9100 B2

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

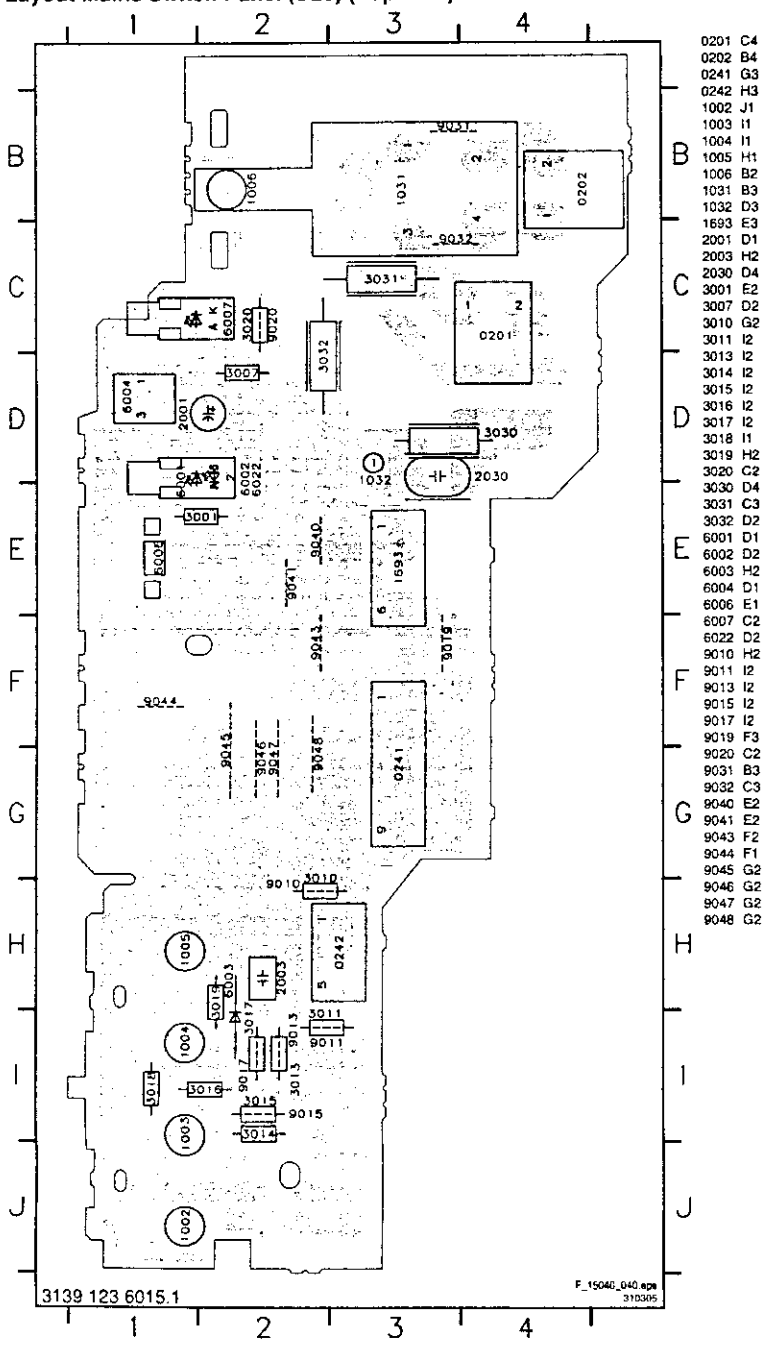
Mains Switch Panel (SL5)



3139 123 6015.1

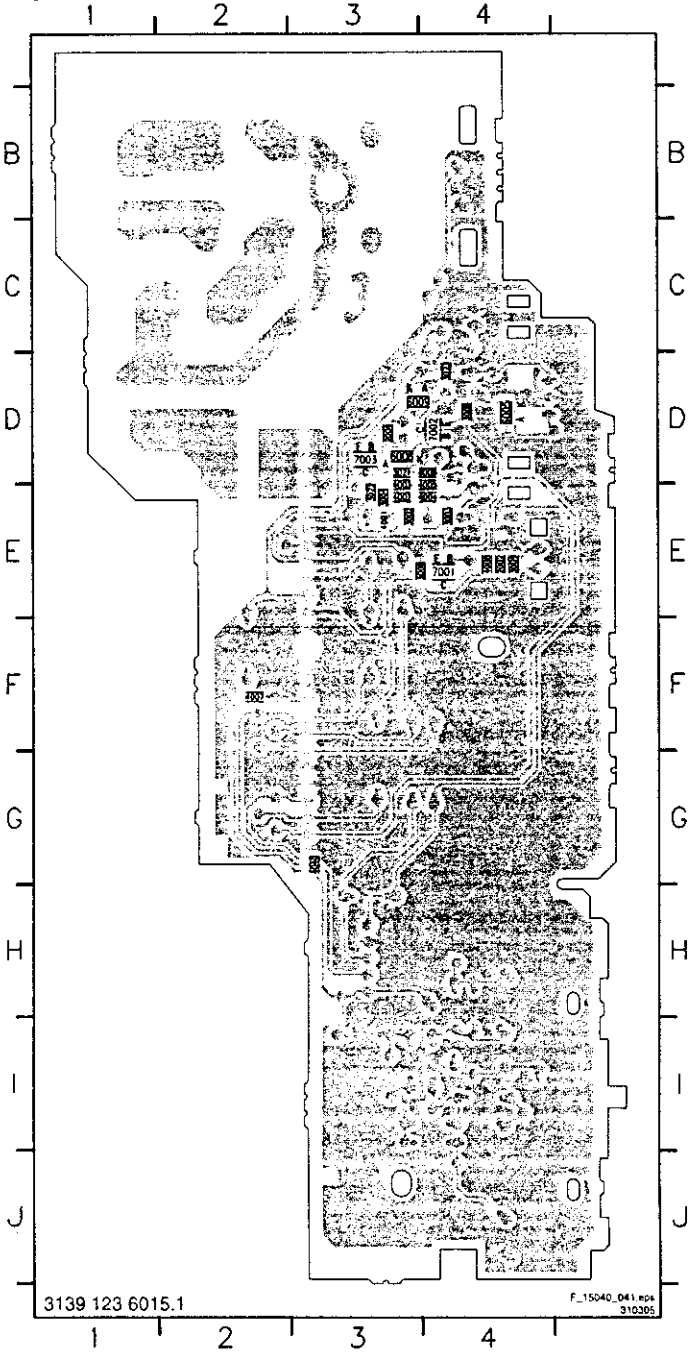
0201 B7
0202 B9
0241 A1
0242 B2
1002 D5
1003 D5
1004 C6
1005 D6
1006 D5
1031 A8
1032 C9
1693 D2
2001 D3
2002 E3
2003 C4
2004 B6
2030 B8
3001 A4
3002 A5
3003 A5
3004 A4
3005 B4
3006 C3
3007 D3
3008 E3
3009 E3
3010 C2
3011 C4
3013 C5
3014 C5
3015 C5
3016 C5
3017 C5
3018 D6
3019 C6
3020 D4
3021 A5
3022 A5
3023 A6
3030 B8
3031 B7
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
9019 D4
9020 E4
9031 A8
9032 B8
F001 A2
F002 A2
F003 A2
F004 A2
F005 A2
F007 B2
F008 B2
F009 B2
F010 B7
F011 B7
F012 B9
F013 B9
I002 B7
I003 C7
I004 A4
I005 D2
I006 B5
I009 D3
I010 C4
I011 D4
I012 A5
I013 D2
I016 E3
I018 D5
I019 D5
I020 B4
I021 C5
I023 C6
I024 D6
I025 C5
I026 D6
I027 A5
I028 A6
I029 A6
I030 B6
I031 B6

Layout Mains Switch Panel (SL5) (Top Side)



0201 C4
0202 B4
0241 G3
0242 H3
1002 J1
1003 I1
1004 I1
1005 H1
1006 B2
1031 B3
1032 D3
1693 E3
2001 D1
2003 H2
2030 D4
3001 E2
3007 D2
3010 G2
3011 I2
3013 I2
3014 I2
3015 I2
3016 I2
3017 I2
3018 I1
3019 H2
3020 G2
3030 D4
3031 C3
3032 D2
6001 D1
6002 D2
6003 H2
6004 D1
6006 E1
6007 C2
6022 D2
9010 H2
9011 I2
9013 I2
9015 I2
9017 I2
9019 F3
9020 C2
9031 B3
9032 C3
9040 E2
9041 E2
9043 F2
9044 F1
9045 G2
9046 G2
9047 G2
9048 G2

Layout Mains Switch Panel (SL5) (Bottom Side)



2002 E4
2004 D3
3002 E3
3003 E4
3004 E3
3005 D4
3006 D4
3008 E4
3009 E4
3021 D3
3022 E3
3023 D4
4001 E3
4002 E3
4003 E3
4004 E4
4005 E4
4006 D4
4007 F2
4008 E4
4040 G3
6005 D4
6008 D3
6009 D3
7001 E4
7002 D4
7003 D3

9.2.1 Basic Description.

T0 - T1

Deflection T0-T1

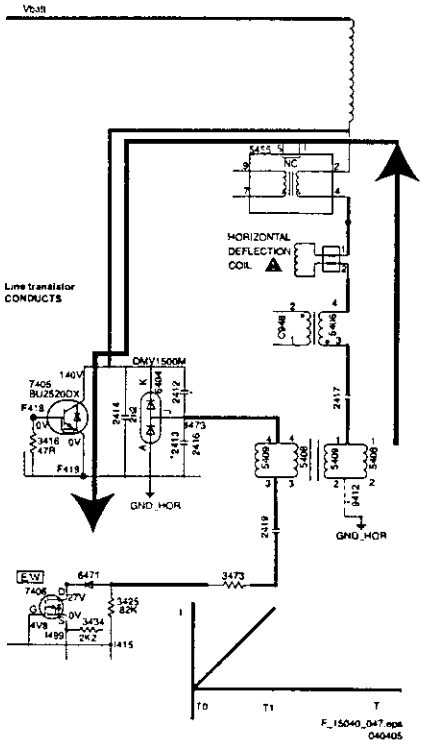


Figure 9-2 Deflection T0 - T1

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

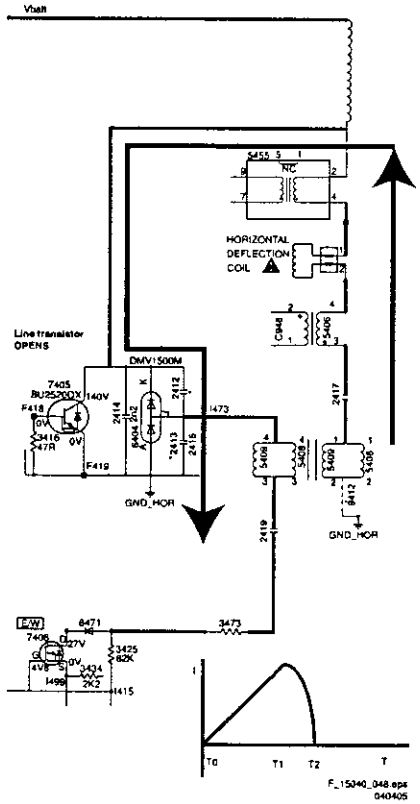


Figure 9-3 Deflection T1 - T2

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

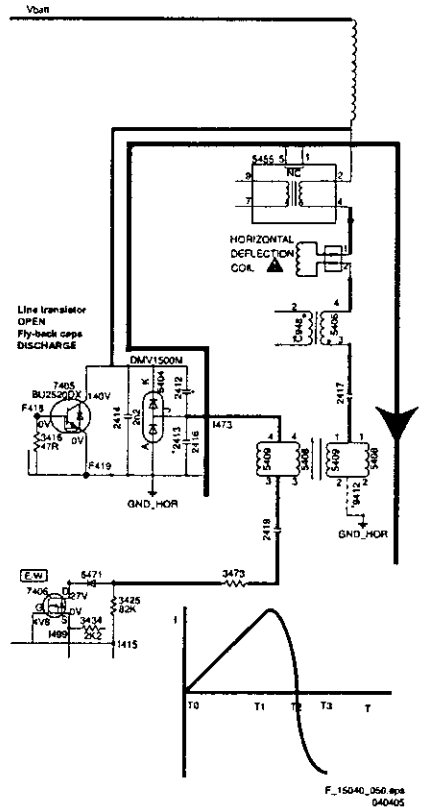


Figure 9-4 Deflection T2 - T3

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

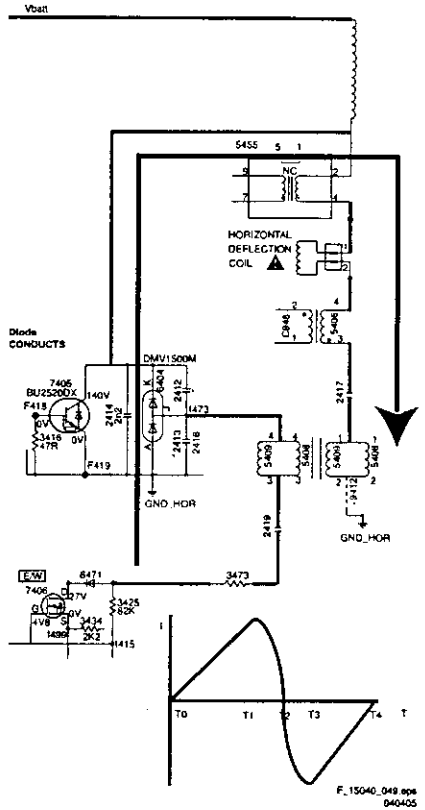


Figure 9-5 Deflection T3 - T4

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.

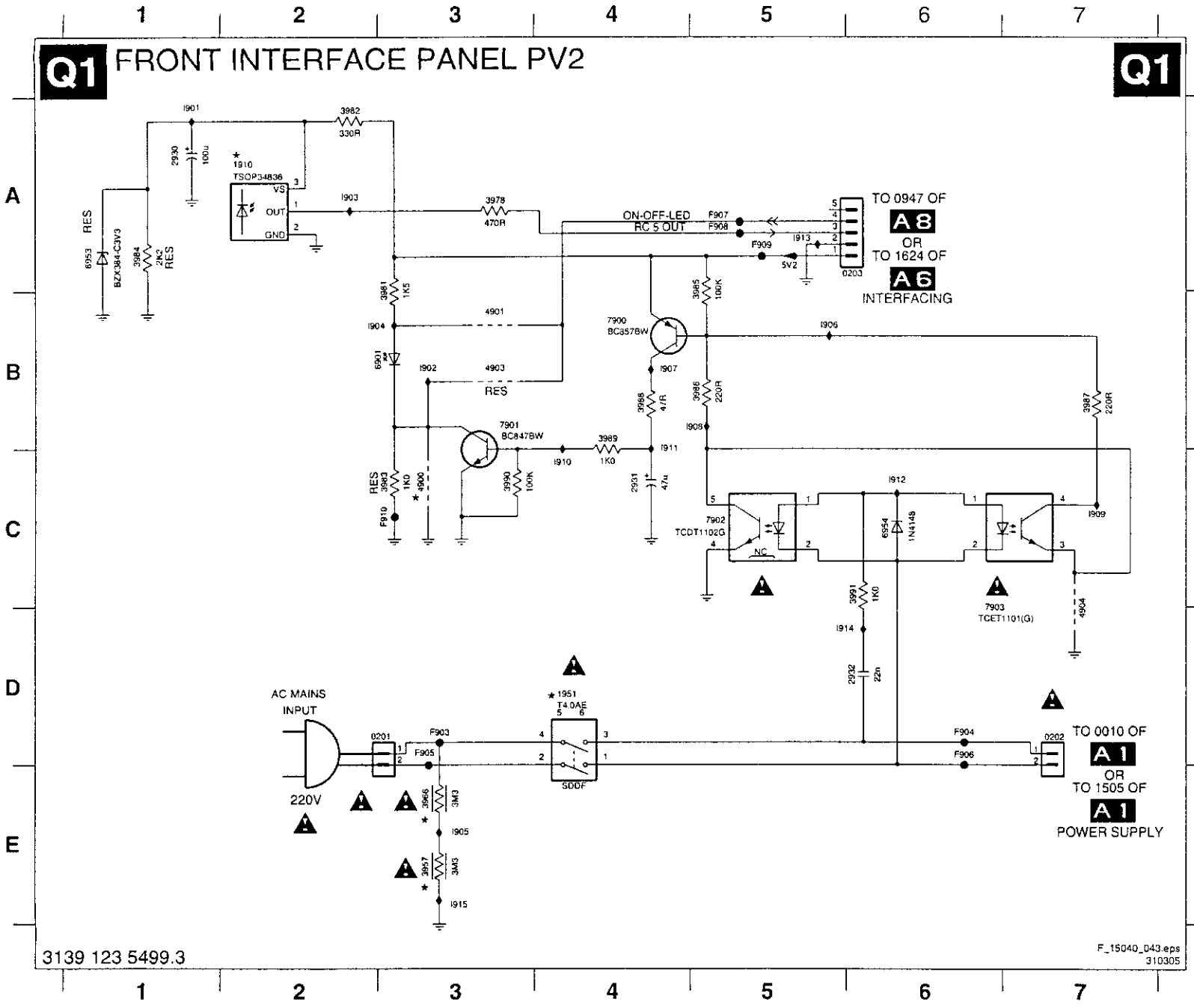
9.2.2 Standby and Start Up

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

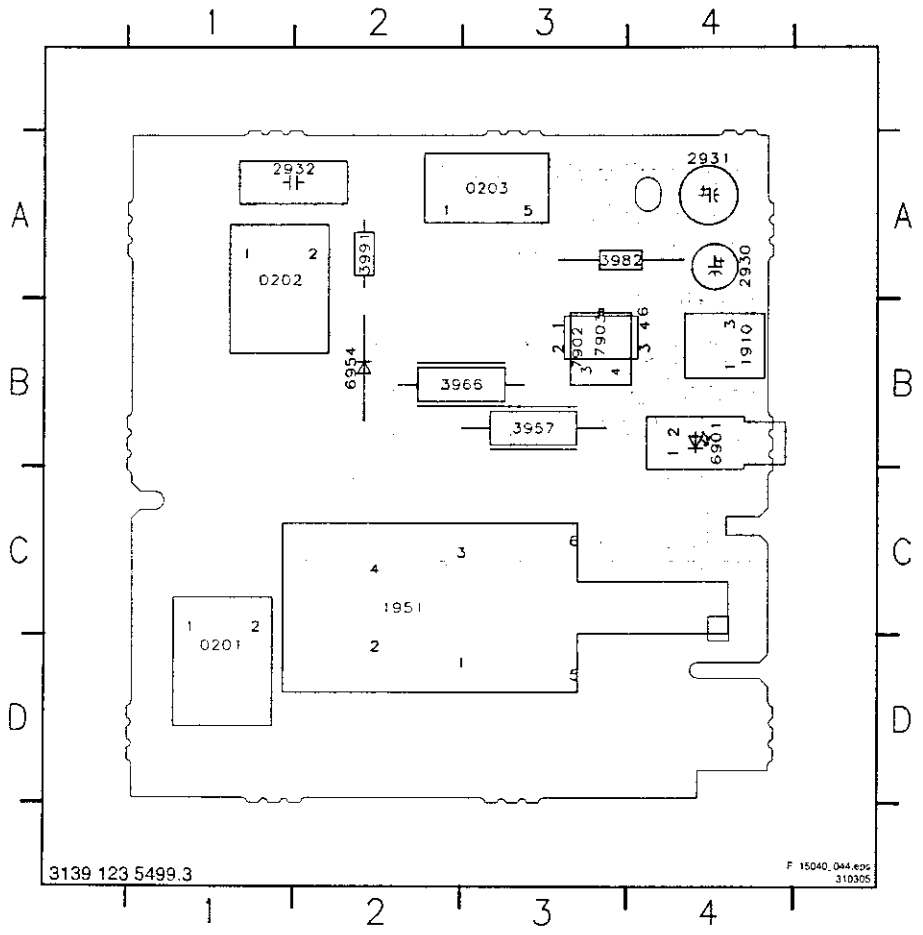
Front Interface Panel (PV2)



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

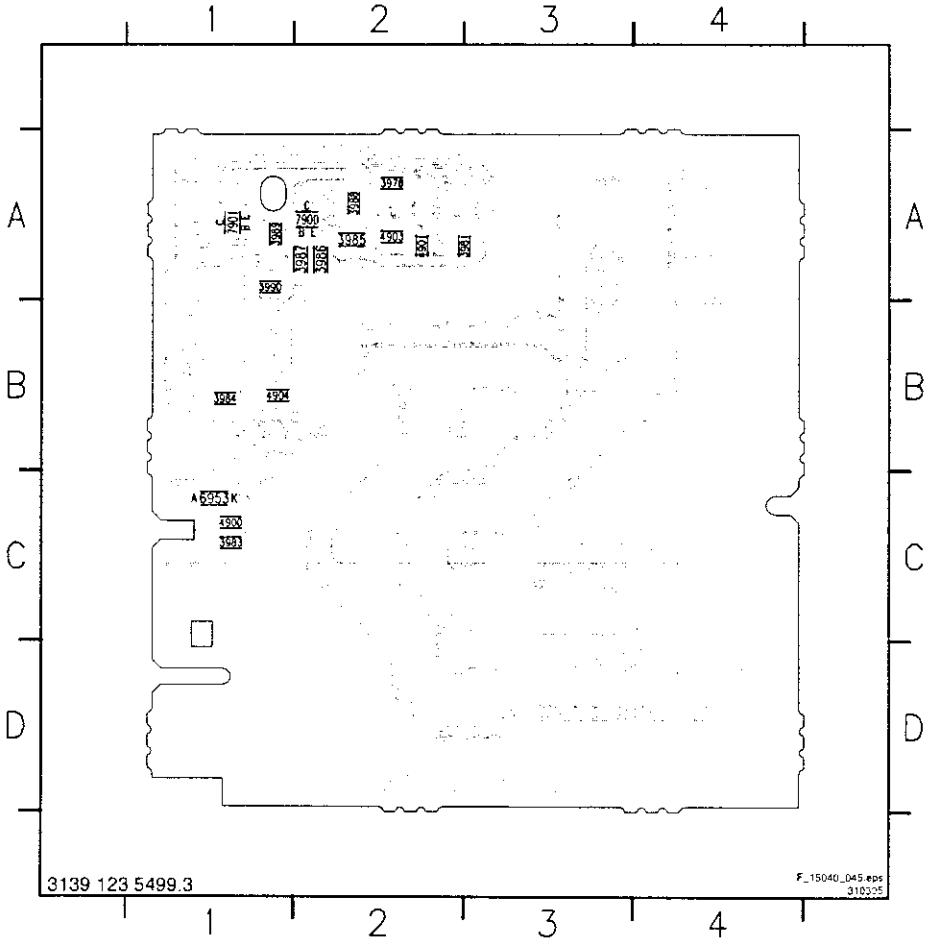
Layout Front Interface Panel (PV2) (Top Side)

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

8.1.1 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, Ri > 10 Mohm, Ci < 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.

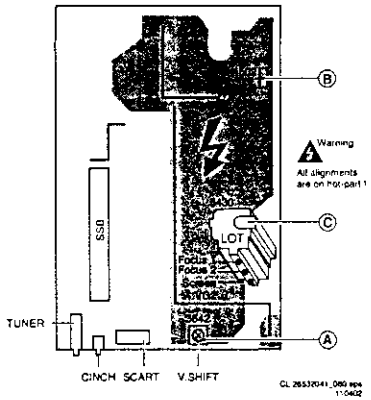


Figure 8-1 Top view LSP

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.

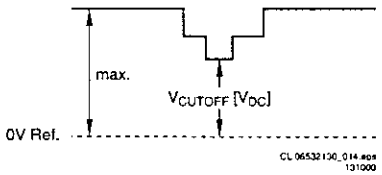


Figure 8-2 Waveform Vg2 alignment

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.

Alignment

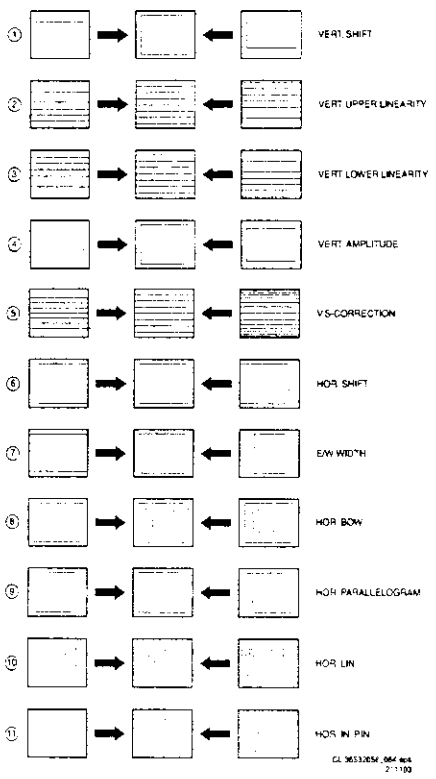


Figure 8-3 Geometry Alignments

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:

1. 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.
2. Set "Smart Picture" to "Natural".
3. Set "Dynamic NR" to "off".
4. Put the set in the SAM mode.
5. Select via the WHITE TONE menu, the PATTERN sub-menu.
6. Set PATTERN to "on".
7. Set NORMAL GREEN to "0".
8. Measure with the colour analyser (Minolta CA100 Colour Analyser or equivalent), calibrated with the spectra, on the centre of the screen.
9. Adjust with the cursor left/right command the Red and Blue register for the right xy-coordinates (see the table below).
10. 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 I^2C 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.

Table 8-2 Option bit overview

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	Swooler** (1st bit)	0	0	0	0	0	0	0	0	0	0	0	0	0
	8	256	SWOF	Swooler** (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	1	1	1	0	0
	11	2048	HSHT	Heading Shift	1	1	1	1	0	0	0	1	1	1	1	0	0
	13	8192	HOSP	Hospitality Mode	1	1	1	1	1	1	1	1	1	1	1	1	1
	14	16384	CHLK	Child Lock	1	1	1	1	1	1	1	1	1	1	1	1	1
11	3	8	SOSD	Smart OSD	0	0	0	0	0	0	0	0	0	0	0	0	0
	9	512	T1H0	100 Page Text	0	0	0	0	0	0	0	0	0	0	0	0	0
	13	8192	FAPG	Favorite page	1	1	1	1	1	1	1	1	1	1	1	1	1
	14	16384	ACI	Automatic Channel Installation	1	1	1	1	1	1	1	1	1	1	1	1	1
12	8	256	PLST	Program List	1	1	1	1	1	1	1	1	1	1	1	1	1
	12	4096	HPMN	Headphone Menu	1	1	1	1	1	1	1	1	1	1	1	1	1
13	0	1	T2H5	250 Page Text	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	4	T12H	1200 Page Text	1	1	1	1	1	1	1	1	1	1	1	1	1
	7	128	SMCK	Smart clock	1	1	1	1	1	1	1	1	1	1	1	1	1
	8	256	ATS	Automatic Tuning System	1	1	1	1	1	1	1	1	1	1	1	1	1
	12	4096	SSD	SplitScreenDemo	1	1	1	1	1	1	1	1	1	1	1	1	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:

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 is 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

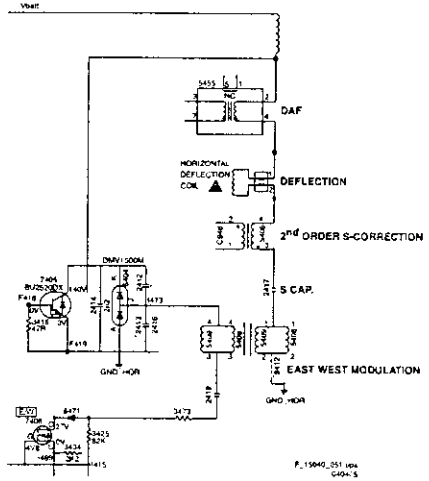


Figure 9-1 Deflection Principle

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 13035	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
3935	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 75668	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 11508	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

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

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	TDA8108
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

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 15374	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 05353	Connector 5p m
1910	9322 127 54667	TSOP1836UH1
1951	2422 128 02972	Mains switch

2930	4822 124 41584	100µF 20% 10V

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

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 00055	12µH 10%
5402	3198 018 21510	150µH 10%
5410	3128 138 39081	Transformer CE16ST
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 SS30927-01 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 60685	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	RGP10D
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	RGP10D
6620	5322 130 31938	BYV27-200
6621	4822 130 31607	RGP10D
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 44547	BC368
7409	5322 130 60159	BC846B
7421	9340 210 30127	BU2520DX
7440	4822 209 70672	LM358N SEL.
7441	4822 130 60379	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	TL431IZ
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 36.9MHz K9656L
1113	2422 549 44372	SAW 38.9MHz K9953L
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
2101	3198 035 71030	10nF 16V 0402
2102	3198 035 71030	10nF 16V 0402
2119	3198 035 71030	10nF 16V 0402
2126	2238 869 15101	100pF 5% 50V 0402
2127	3198 035 71040	100nF 10% 16V 0402
2128	3198 030 82280	2.2µF 20% 50V
2130	3198 035 71030	10nF 16V 0402
2134	3198 035 71040	100nF 10% 16V 0402
2135	4822 124 23002	10µF 20% 16V
2136	4822 124 23002	10µF 20% 16V
2137	4822 124 12095	100µF 20% 16V
2138	3198 035 71040	100nF 10% 16V 0402
2150	3198 035 71040	100nF 10% 16V 0402
2151	3198 030 82280	2.2µF 20% 50V
2152	3198 035 71040	100nF 10% 16V 0402
2154	4822 124 23002	10µF 20% 16V
2155	3198 035 71040	100nF 10% 16V 0402
2156	3198 035 71040	100nF 10% 16V 0402
2157	3198 035 71040	100nF 10% 16V 0402
2281	3198 035 71040	100nF 10% 16V 0402
2282	3198 035 71040	100nF 10% 16V 0402
2284	3198 035 71040	100nF 10% 16V 0402
2285	3198 035 71040	100nF 10% 16V 0402
2300	3198 035 71040	100nF 10% 16V 0402
2305	3198 017 41050	1µF 10V 0603
2307	2238 869 15101	100pF 5% 50V 0402
2308	2238 869 15101	100pF 5% 50V 0402
2310	4822 124 23002	10µF 20% 16V
2311	3198 035 71030	10nF 16V 0402
2317	2238 869 15101	100pF 5% 50V 0402
2318	2238 869 15101	100pF 5% 50V 0402
2321	3198 035 71030	10nF 16V 0402
2324	2238 869 15101	100pF 5% 50V 0402
2325	2238 869 75829	82pF 5% 50V 0402
2327	2238 869 15101	100pF 5% 50V 0402
2328	2238 869 15101	100pF 5% 50V 0402
2331	3198 035 71030	10nF 16V 0402
2341	3198 035 71040	100nF 10% 16V 0402
2342	3198 035 71040	100nF 10% 16V 0402
2343	3198 035 71040	100nF 10% 16V 0402
2344	3198 035 71040	100nF 10% 16V 0402
2345	3198 035 71040	100nF 10% 16V 0402
2346	3198 035 71040	100nF 10% 16V 0402
2350	4822 124 12095	100µF 20% 16V
2351	2238 869 15109	10pF 5% 50V 0402
2352	2238 869 15109	10pF 5% 50V 0402
2358	2238 869 15101	100pF 5% 50V 0402
2359	3198 035 71040	100nF 10% 16V 0402
2360	2238 869 15101	100pF 5% 50V 0402
2361	4822 126 14491	2.2µF -20+80% 10V 0805
2363	2238 869 15101	100pF 5% 50V 0402
2364	4822 126 14491	2.2µF -20+80% 10V 0805
2365	2238 869 15101	100pF 5% 50V 0402
2366	4822 126 14491	2.2µF -20+80% 10V 0805
2371	2020 552 96618	1nF 10% 50V 0402
2372	2020 552 96618	1nF 10% 50V 0402
2377	2020 552 96623	2.2nF 10% 50V 0402
2379	2020 552 96623	2.2nF 10% 50V 0402
2380	3198 035 04710	470pF 50V 0402
2384	2020 552 96618	1nF 10% 50V 0402
2386	2238 869 15109	10pF 5% 50V 0402
2395	3198 035 71030	10nF 16V 0402
2397	3198 035 71040	100nF 10% 16V 0402
2432	2020 552 96618	1nF 10% 50V 0402
2433	2020 552 96618	1nF 10% 50V 0402
2434	3198 017 44740	470nF 10V 0603
2435	3198 017 44740	470nF 10V 0603
2438	3198 017 44740	470nF 10V 0603
2439	3198 017 44740	470nF 10V 0603
2440	2020 552 96618	1nF 10% 50V 0402
2441	2020 552 96618	1nF 10% 50V 0402
2442	2020 552 96618	1nF 10% 50V 0402
2443	2020 552 96618	1nF 10% 50V 0402
2444	2020 552 96618	1nF 10% 50V 0402
2445	2020 552 96618	1nF 10% 50V 0402
2447	4822 124 12095	100µF 20% 16V
2450	3198 035 71030	10nF 16V 0402
2452	3198 035 71030	10nF 16V 0402
2454	4822 126 14491	2.2µF -20+80% 10V 0805
2457	4822 126 14491	2.2µF -20+80% 10V 0805
2461	3198 017 44740	470nF 10V 0603
2462	3198 017 44740	470nF 10V 0603
2480	3198 017 44740	470nF 10V 0603
2481	3198 017 44740	470nF 10V 0603
2483	2020 552 96618	1nF 10% 50V 0402
2484	4822 124 23002	10µF 20% 16V
2485	2020 552 96618	1nF 10% 50V 0402
2486	3198 035 71040	100nF 10% 16V 0402
2487	4822 124 23002	10µF 20% 16V
2488	4822 124 12095	100µF 20% 16V
2489	4822 124 12095	100µF 20% 16V
2514	2238 869 15189	18pF 5% 50V 0402
2516	2238 869 15189	18pF 5% 50V 0402

2525	3198 035 71040	100nF 10% 16V 0402
2546	3198 035 71040	100nF 10% 16V 0402
2557	2238 869 15101	100pF 5% 50V 0402
2571	3198 035 71040	100nF 10% 16V 0402
2581	4822 126 14519	22pF 5% 50V 0402
2582	4822 126 14519	22pF 5% 50V 0402
2583	3198 035 71040	100nF 10% 16V 0402
2584	3198 035 71040	100nF 10% 16V 0402
2600	3198 035 71040	100nF 10% 16V 0402
2601	3198 035 71040	100nF 10% 16V 0402
2604	3198 035 71040	100nF 10% 16V 0402
2607	3198 035 71040	100nF 10% 16V 0402
2609	3198 035 71040	100nF 10% 16V 0402
2611	3198 035 71040	100nF 10% 16V 0402
2612	3198 035 71040	100nF 10% 16V 0402
2615	3198 035 71040	100nF 10% 16V 0402
2618	3198 035 71040	100nF 10% 16V 0402
2620	3198 035 71040	100nF 10% 16V 0402
2622	3198 035 71040	100nF 10% 16V 0402
2623	3198 035 71040	100nF 10% 16V 0402
2626	3198 035 71040	100nF 10% 16V 0402
2629	3198 035 71040	100nF 10% 16V 0402
2630	3198 035 71040	100nF 10% 16V 0402
2633	3198 035 71040	100nF 10% 16V 0402
2634	3198 035 71040	100nF 10% 16V 0402
2638	3198 035 71040	100nF 10% 16V 0402
2644	5322 124 41945	22µF 20% 35V
2645	4822 124 23002	10µF 20% 16V
2651	2020 021 91679	100µF 20% 6.3V
2652	2020 552 96507	10µF 10V
2654	2020 552 96507	10µF 10V
2655	2020 552 96507	10µF 10V
2656	3198 035 71040	100nF 10% 16V 0402
2657	2238 869 15101	100pF 5% 50V 0402
2659	4822 126 13879	220nF 20% 16V
2730	3198 035 71040	100nF 10% 16V 0402
2731	3198 035 71040	100nF 10% 16V 0402
2732	3198 035 71040	100nF 10% 16V 0402
2733	3198 035 71040	100nF 10% 16V 0402
2734	3198 035 71040	100nF 10% 16V 0402
2792	3198 035 71040	100nF 10% 16V 0402
2793	3198 035 71040	100nF 10% 16V 0402
2918	2238 869 15101	100pF 5% 50V 0402
2919	2238 869 15101	100pF 5% 50V 0402
2920	2238 869 75829	82pF 5% 50V 0402
2932	2238 869 15101	100pF 5% 50V 0402
2933	2238 869 15101	100pF 5% 50V 0402
2935	2238 869 15101	100pF 5% 50V 0402
2936	2238 869 15101	100pF 5% 50V 0402
2938	2238 869 15101	100pF 5% 50V 0402
2948	2238 869 15189	18pF 5% 50V 0402
2949	2238 869 15189	18pF 5% 50V 0402
2950	2238 869 15101	100pF 5% 50V 0402
2951	2238 869 15101	100pF 5% 50V 0402
2962	2238 869 15101	100pF 5% 50V 0402
2967	2020 552 96618	1nF 10% 50V 0402
2968	2020 552 96618	1nF 10% 50V 0402
2975	2020 552 96793	4.7nF 10% 50V 0402
2976	2020 552 96793	4.7nF 10% 50V 0402
2977	2238 869 15101	100pF 5% 50V 0402
2978	2238 869 15101	100pF 5% 50V 0402
2979	2238 869 15101	100pF 5% 50V 0402

3002	3198 031 04730	47Ω 5% 0402
3003	3198 031 04730	47Ω 5% 0402
3004	3198 031 04730	47Ω 5% 0402
3005	3198 031 04730	47Ω 5% 0402
3006	3198 031 04730	47Ω 5% 0402
3007	3198 031 04730	47Ω 5% 0402
3010	4822 117 13605	Jumper 0402
3011	4822 117 13605	Jumper 0402
3018	4822 117 11152	4.7Ω 5% 0.062W
3019	5322 117 11726	10Ω 5%
3022	3198 031 04730	47Ω 5% 0402
3024	3198 031 04730	47Ω 5% 0402
3026	3198 031 04730	47Ω 5% 0402
3027	3198 031 04730	47Ω 5% 0402
3060	4822 117 13602	2.2kΩ 5% 0.01W 0402
3061	4822 117 13602	2.2kΩ 5% 0.01W 0402
3062	3198 031 01810	180Ω 5% 0402
3063	3198 031 01810	180Ω 5% 0402
3066	4822 117 13602	2.2kΩ 5% 0.01W 0402
3067	4822 117 13548	1kΩ 5% 0402
3068	4822 117 13548	1kΩ 5% 0402
3101	4822 117 13602	2.2kΩ 5% 0.01W 0402
3103	3198 031 06820	6.8kΩ 5% 0.01W 0402
3104	4822 117 13602	2.2kΩ 5% 0.01W 0402
3106	3198 031 02730	27kΩ 5% 0402
3131	3198 031 04720	4.7kΩ 5% 0402
3132	4822 117 13545	100Ω 1% 0402
3138	3198 031 03910	390Ω 1% 0402

3150	3198 031 01820	1K8 5% 0402
3151	3198 031 01220	1K2 5% 0402
3152	3198 031 01820	1K8 5% 0402
3153	3198 031 01220	1K2 5% 0402
3154	3198 031 04730	47Ω 5% 0402
3155	3198 031 08210	820Ω 5% 0.5W
3281	4822 117 13548	1kΩ 5% 0402
3282	4822 117 13548	1kΩ 5% 0402
3283	4822 117 13548	1kΩ 5% 0402
3284	4822 117 13548	1kΩ 5% 0402
3302	3198 031 01220	1K2 5% 0402
3303	3198 031 06820	6.8kΩ 5% 0.01W 0402
3304	4822 117 13597	330Ω 5% 0402 0.01W
3305	4822 117 13548	1kΩ 5% 0402
3306	3198 031 03390	33Ω 1% 0402
3307	2322 705 87189	18Ω 5% 0402
3309	4822 051 30331	330Ω 5% 0.062W
3310	3198 031 01220	1K2 5% 0402
3311	3198 031 03390	33Ω 1% 0402
3312	3198 031 01220	1K2 5% 0402
3313	4822 117 13597	330Ω 5% 0402 0.01W
3316	2322 705 87189	18Ω 5% 0402
3318	3198 031 01220	1K2 5% 0402
3319	4822 051 30331	330Ω 5% 0.062W
3320	3198 031 01220	1K2 5% 0402
3321	3198 031 03390	33Ω 1% 0402
3322	3198 031 01220	1K2 5% 0402
3323	4822 117 13597	330Ω 5% 0402 0.01W
3325	3198 031 04720	4.7kΩ 5% 0402
3326	4822 117 13543	470Ω 5% 0402
3329	4822 051 30331	330Ω 5% 0.062W
3330	3198 031 01220	1K2 5% 0402
3331	3198 031 03390	33Ω 1% 0402
3332	3198 031 01220	1K2 5% 0402
3333	4822 117 13597	330Ω 5% 0402 0.01W
3334	3198 031 03390	33Ω 1% 0402
3335	3198 031 03390	33Ω 1% 0402
3336	3198 031 03390	33Ω 1% 0402
3337	3198 031 03390	33Ω 1% 0402
3338	2322 705 87189	18Ω 5% 0402
3340	4822 117 13548	1kΩ 5% 0402
3343	4822 117 13606	10kΩ 5% 0.01W 0402
3345	3198 031 06820	6.8kΩ 5% 0.01W 0402
3346	4822 117 13548	1kΩ 5% 0402
3347	4822 117 13601	22kΩ 5% 0402
3348	4822 117 13601	22kΩ 5% 0402
3349	3198 031 04730	47Ω 5% 0402
3350	4822 117 13596	220Ω 5% 0.01W 0402
3351	4822 117 13548	1kΩ 5% 0402
3352	3198 031 04730	47Ω 5% 0402
3353	4822 117 13606	10kΩ 5% 0.01W 0402
3354	4822 117 13606	10kΩ 5% 0.01W 0402
3355	4822 117 13601	22kΩ 5% 0402
3356	3198 031 08210	820Ω 5% 0.5W
3357	4822 117 13601	22kΩ 5% 0402
3358	5322 117 11726	10Ω 5%
3361	4822 117 13605	Jumper 0402
3364	2322 705 70124	120kΩ 5% 0402
3365	4822 117 13605	Jumper 0402
3366	4822 117 13602	2.2kΩ 5% 0.01W 0402
3367	4822 117 13548	1kΩ 5% 0402
3368	3198 031 06830	68kΩ 5% 0.01W 0402
3371	4822 117 13548	1kΩ 5% 0402
3372	2322 705 70155	1.5MΩ 5% 0402
3373	4822 117 13606	10kΩ 5% 0.01W 0402
3374	3198 031 02720	2.7kΩ 5% 0.01W 0402
3375	3198 031 02720	2.7kΩ 5% 0.01W 0402
3376	4822 117 13606	10kΩ 5% 0.01W 0402
3377	3198 031 02250	2.2MΩ 5% 0402
3378	3198 031 03340	330kΩ 5% 0402
3380	4822 117 13606	10kΩ 5% 0.01W 0402
3382	4822 117 13548	1kΩ 5% 0402
3384	4822 117 13606	10kΩ 5% 0.01W 0402
3385	3198 031 04730	47Ω 5% 0402
3386	3198 031 02730	27kΩ 5% 0402
3390	4822 117 13548	1kΩ 5% 0402
3391	3198 031 03930	39kΩ 5% 0402
3392	3198 031 04730	47Ω 5% 0402
3393	3198 031 03320	3.3kΩ 5% 0402
3395	4822 117 13606	10kΩ 5% 0.01W 0402
3396	4822 117 13543	470Ω 5% 0402
3397	4822 117 13543	470Ω 5% 0402
3398	4822 117 13545	100Ω 1% 0402
3445	3198 031 04730	47Ω 5% 0402
3446	3198 031 05630	56kΩ 5% 0402
3447	3198 031 05630	56kΩ 5% 0402
3448	3198 031 01220	1K2 5% 0402
3449	3198 031 01520	1.2kΩ 5% 0.01W 0402
3450	3198 031 01220	1K2 5% 0402
3452	3198 031 01220	1K2 5% 0402
3453	3198 031 04730	47Ω 5% 0402
3454	3198 031 05630	56kΩ 5% 0402
3455	3198 031 05630	56kΩ 5% 0402
3456	3198 031 01220	1K2 5% 0402

MUTE	MUTE Line
NAFTA	North American Free Trade Association: Trade agreement between Canada, USA and Mexico
NC	Not Connected
NDF	No vertical Deflection; Vertical fly back protection
NHF	No Horizontal deflection; Horizontal fly back protection
NICAM	Near Instantaneously Companded Audio Multiplexing; This is a digital sound system, mainly used in Europe
NTC	Negative Temperature Coefficient, non-linear resistor (resistance decreases if temperature increases)
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)
NVM	Non Volatile Memory; IC containing data such as alignment values, preset stations
O/C	Open Circuit
OB	Option Byte
OC	Open Circuit
ON/OFF LED	On/Off control signal for the LED
ON/STBY	On/Standby
ON-OFF-LED	Active-LOW control line. Logic LOW = red LED "on", HIGH = red LED "off"
OP	Option Byte
OSD	On Screen Display
P50	Project 50; Communication protocol between TV and peripherals
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)
PC	Personal Computer
PCB	Printed Circuit Board (or PWB)
PCM	Pulse Code Modulation
PILOT	Pilot Signal
PIG	Picture In Graphic
PIP	Picture in Picture
PLL	Phase Locked Loop; Used for e.g. FST tuning systems. The customer can directly provide the desired frequency
POR	Power On Reset; Signal to reset the µP
POR-FLASH	Signal that informs the micro controller (painter) that set will switch "off"
Progressive Scan	Scan mode where all scan lines are displayed in one frame at the same time, creating a double vertical resolution.
PTC	Positive Temperature Coefficient, non linear resistor (resistance increases if temperature increases)
PTP	Picture Tube Panel
PWB	Printed Wiring Board (also called PCB or CBA).
PWM	Pulse Width Modulation
QSS	Quasi Split Sound
R	Right audio channel / Red
RAM	Random Access Memory
RC	Remote Control transmitter
RC5 (6)	Remote Control system 5 (6), the signal from the remote control receiver
RDS	Radio Data System (European); This is an MPX signal carried in FM radio channels (87.5 ... 108 MHz)
RESET	RESET signal
RF	Real Flat (picture tube) or Radio Frequency
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
RGBHV	Red, Green, Blue, Horizontal sync, and Vertical sync
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
RMS	Root Mean Square value
ROM	Read Only Memory
S	Surround channel or mono surround channel (audio)
SALSA	System Application for Low Segment of Analogue TV
SAM	Service Alignment Mode
SAP	Secondary Audio Program; Generally used to transmit audio in a second language
SAW	Surface Acoustic Wave
SC	SandCastle: two-level pulse derived from sync signals
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)
SCAVEM	Scan Velocity Modulation; Advanced beam control technology, which results in sharper edges on all images for outstanding clarity
SC1-OUT	SCART output of the MSP audio IC
SC2-B-IN	SCART2 Blue in
SC2-C-IN	SCART2 chrominance in
SC2-OUT	SCART output of the MSP audio IC
S/C	Short Circuit
SCL	Serial Clock signal on I^2C bus
SCL-F	Serial CLock signal on Fast I^2C bus
SD	Standard Definition
SDA	Serial Data line of I^2C bus
SDA-F	Data Signal on Fast I^2C bus
SDM	Service Default Mode
SDAM	Service Default / Alignment Mode
SDRAM	Synchronous DRAM
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
SEL-SVHS-RR-STATUS2	SVHS Selection Signal
SIF	Sound Intermediate Frequency
SIMM	Single In-line Memory Module; 80-fold connector between LSP and SSB
SL	Single In-line Memory Module; 80-fold connector between LSP and SSB
SLDP	Smart Local Dooming Prevention (HW and SW)
SMC	Surface Mounted Component
SMPS	Switched Mode Power Supply
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 384 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 13862	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
2999	4822 051 20333	33kΩ 5% 0.1W
2999	5322 122 32531	100pF 5% 50V

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3101	4822 053 20475	4.7MΩ 5% 0.25W
3102	4822 050 21002	1kΩ 1% 0.6W
3103	4822 050 21002	1kΩ 1% 0.6W
3104	4822 116 52195	47Ω 5% 0.5W
3105	4822 050 11002	1kΩ 1% 0.4W
3106	4822 116 52256	2.2kΩ 5% 0.5W
3107	4822 116 52256	2.2kΩ 5% 0.5W
3108	2122 101 01363	2.2Ω 5%
3111	4822 053 10152	1.5kΩ 5% 1W
3113	4822 116 52186	22Ω 5% 0.5W
3114	4822 116 52219	330Ω 5% 0.5W
3115	4822 116 52257	22kΩ 5% 0.5W
3116	4822 116 52257	22kΩ 5% 0.5W
3117	4822 116 52195	47Ω 5% 0.5W

3118	2122 101 01363	2.2Ω 5%
3120	4822 051 20109	10Ω 5% 0.1W
3123	4822 116 52176	10Ω 5% 0.5W
3124	4822 116 52199	68Ω 5% 0.5W
3125	4822 116 52182	15Ω 5% 0.5W
3126	4822 050 21003	10kΩ 1% 0.6W
3127	4822 116 52289	5.6kΩ 5% 0.5W
3130	4822 051 30479	47Ω 5% 0.062W
3131	4822 051 20471	470Ω 5% 0.1W
3132	4822 051 20479	47Ω 5% 0.1W
3133	4822 117 12925	47kΩ 1% 0.063W 0603
3134	4822 051 30102	1kΩ 5% 0.062W
3135	4822 051 30101	100Ω 5% 0.062W
3136	4822 051 30109	10Ω 5% 0.062W
3137	4822 050 24702	4.7kΩ 1% 0.6W
3138	4822 051 20105	1MΩ 5% 0.1W
3140	4822 051 20223	22kΩ 5% 0.1W
3141	4822 116 52263	2.7kΩ 5% 0.5W
3142	4822 051 30332	3.3kΩ 5% 0.062W
3143	4822 051 30101	100Ω 5% 0.062W
3144	4822 053 10221	220Ω 5% 1W
3150	4822 117 11373	100Ω 1% 0805
3151	4822 051 30109	10Ω 5% 0.062W
3152	4822 051 30102	1kΩ 5% 0.062W
3153	4822 051 20472	4.7kΩ 5% 0.1W
3155	4822 051 30101	100Ω 5% 0.062W
3156	5322 117 13017	100Ω 1% 0.063W 0603
3157	4822 051 30103	10kΩ 5% 0.062W
3158	2322 704 61801	180Ω 1% 0603
3158	5322 117 13061	180Ω 1% 0.063W 0603
3159	4822 051 30103	10kΩ 5% 0.062W
3160	4822 051 30102	1kΩ 5% 0.062W
3161	4822 052 10101	100Ω 5% 0.33W
3164	4822 117 13632	100kΩ 1% 0.62W 0603
3165	2322 704 61801	180Ω 1% 0603
3165	5322 117 13061	180Ω 1% 0.063W 0603
3168	4822 051 20472	4.7kΩ 5% 0.1W
3171	4822 116 52297	68kΩ 5% 0.5W
3172	4822 116 52297	68kΩ 5% 0.5W
3200	4822 051 20229	22Ω 5% 0.1W
3201	4822 051 20229	22Ω 5% 0.1W
3250	4822 117 10833	10kΩ 1% 0.1W
3261	4822 117 11373	100Ω 1% 0805
3262	4822 117 11373	100Ω 1% 0805
3400	4822 052 11108	1Ω 5% 0.5W
3401	4822 053 12279	27R00 5% 3W
3402	4822 053 10121	120Ω 5% 1W
3403	4822 116 52175	100Ω 5% 0.5W
3404	4822 051 30471	470Ω 5% 0.062W
3406	4822 117 11373	100Ω 1% 0805
3407	4822 051 30103	10kΩ 5% 0.062W
3409	4822 050 11002	1kΩ 1% 0.4W
3410	4822 051 20479	47Ω 5% 0.1W
3411	2122 101 02111	39Ω 5% 0.5W
3412	4822 117 11817	1.2kΩ 1% 0.062W
3414	4822 051 30331	330Ω 5% 0.062W
3415	3198 012 31590	15Ω 5% 3W
3417	4822 116 52176	10Ω 5% 0.5W
3418	4822 050 25603	56kΩ 1% 0.6W
3419	4822 051 30474	470kΩ 5% 0.062W
3420	4822 051 30332	3.3kΩ 5% 0.062W
3421	4822 051 30474	470kΩ 5% 0.062W
3422	4822 051 30332	3.3kΩ 5% 0.062W
3423	4822 053 10688	6.8Ω 5% 1W
3425	4822 116 52176	10Ω 5% 0.5W
3426	4822 116 52176	10Ω 5% 0.5W
3427	4822 051 30683	68kΩ 5% 0.062W
3427	4822 117 13632	100kΩ 1% 0.62W 0603
3428	4822 051 30684	680kΩ 5% 0.062W
3429	4822 051 30103	10kΩ 5% 0.062W
3429	4822 051 30223	22kΩ 5% 0.062W
3430	4822 051 30123	12kΩ 5% 0.062W
3430	4822 051 30223	22kΩ 5% 0.062W
3431	2306 207 03151	150Ω 5% 0.5W
3440	4822 051 30102	1kΩ 5% 0.062W
3441	4822 051 30223	22kΩ 5% 0.062W
3442	4822 051 30474	470kΩ 5% 0.062W
3443	4822 051 30684	680kΩ 5% 0.062W
3447	4822 117 11373	100Ω 1% 0805
3449	4822 052 10101	100Ω 5% 0.33W
3450	4822 050 21003	10kΩ 1% 0.6W
3451	4822 050 21003	10kΩ 1% 0.6W
3454	4822 051 20108	1Ω 5% 0.1W
3455	4822 117 12902	8.2kΩ 1% 0.063W 0603
3455	5322 117 13056	8.2kΩ 1% 0.063W 0603
3456	4822 117 12903	1.8kΩ 1% 0.063W 0603
3457	4822 051 30152	1.5kΩ 5% 0.062W
3458	4822 051 30471	470Ω 5% 0.062W
3459	4822 051 30272	2.7kΩ 5% 0.062W
3460	4822 052 10108	1Ω 5% 0.33W
3461	4822 052 10108	1Ω 5% 0.33W
3462	4822 052 11108	1Ω 5% 0.5W
3463	4822 052 11108	1Ω 5% 0.5W
3464	4822 052 11108	1Ω 5% 0.5W
3465	4822 052 11108	1Ω 5% 0.5W
3466	4822 051 30472	4.7kΩ 5% 0.062W
3467	4822 117 13632	100kΩ 1% 0.62W 0603
3472	4822 051 30393	39kΩ 5% 0.062W
3474	4822 051 30563	56kΩ 5% 0.062W
3475	4822 051 30472	4.7kΩ 5% 0.062W
3476	4822 116 83874	220kΩ 5% 0.5W
3478	4822 116 52175	100Ω 5% 0.5W
3479	4822 052 10478	4.7Ω 5% 0.33W
3480	4822 052 10478	4.7Ω 5% 0.33W
3480	4822 052 10688	6.8Ω 5% 0.33W
3481	2322 750 61001	100Ω 5% 1206
3482	4822 051 30221	220Ω 5% 0.062W
3483	4822 117 12903	1.8kΩ 1% 0.063W 0603
3485	4822 051 30471	470Ω 5% 0.062W
3486	2322 704 67502	7.5kΩ 1% 0.5W
3487	5322 117 13056	8.2kΩ 1% 0.063W 0603
3488	4822 050 21005	1MΩ 1% 0.6W
3489	4822 051 30103	10kΩ 5% 0.062W
3490	4822 051 30332	3.3kΩ 5% 0.062W
3491	4822 117 12925	47kΩ 1% 0.063W 0603
3492	4822 116 52175	100Ω 5% 0.5W
3493	4822 050 21504	150kΩ 1% 0.6W
3495	4822 050 21503	15kΩ 1% 0.6W
3496	4822 051 30272	2.7kΩ 5% 0.062W
3497	4822 051 30333	33kΩ 5% 0.062W
3501	2120 103 90057	100Ω 20% 0.5W
3504	4822 051 30222	2.2kΩ 5% 0.062W
3505	4822 116 52257	22kΩ 5% 0.5W
3506	4822 051 30562	5.6kΩ 5% 0.063W 0603
3507	4822 050 21604	160kΩ 1% 0.6W
3508	4822 116 52182	15Ω 5% 0.5W
3509	2122 550 00158	VDR 1mA 612V
3510	5322 117 12487	1kΩ 1% 0.125W
3511	4822 053 11222	2.2kΩ 5% 2W
3512	4822 117 12891	220kΩ 1% 0.063W 0603
3513	4822 116 52272	330k 5% 0.5W
3514	2322 193 53397	0.39Ω 5% 0.6W
3515	2322 193 53397	0.39Ω 5% 0.6W
3517	4822 117 10834	47kΩ 1% 0.1W
3518	4822 116 52234	100kΩ 5% 0.5W
3519	4822 051 30102	1kΩ 5% 0.062W
3520	4822 053 11333	33kΩ 5% 2W
3521	4822 053 21155	1.5Ω 5% 0.5W
3522	4822 117 11507	6.8kΩ 1% 0.1W
3523	4822 051 20105	1MΩ 5% 0.1W
3524	4822 051 30333	33kΩ 5% 0.062W
3525	4822 051 30479	47Ω 5% 0.062W
3527	4822 117 11951	2kΩ 1% 0.1W
3528	4822 051 30103	10kΩ 5% 0.062W
3529	4822 051 30472	4.7kΩ 5% 0.062W
3530	4822 051 30102	1kΩ 5% 0.062W
3531	4822 117 11507	6.8kΩ 1% 0.1W
3532	4822 117 12925	47kΩ 1% 0.063W 0603
3533	4822 116 52182	15Ω 5% 0.5W
3534	4822 117 12925	47kΩ 1% 0.063W 0603
3535	4822 051 30479	47Ω 5% 0.062W
3536	4822 051 30152	1.5kΩ 5% 0.062W
3537	4822 052 10102	1kΩ 5% 0.33W
3540	4822 050 23303	33k 1% 0.6W
3541	4822 116 52186	22Ω 5% 0.5W
3543	4822 050 24708	4.7Ω 1% 0.6W
3547	4822 051 30008	Jumper 0603
3549	4822 051 30393	39kΩ 5% 0.062W
3550	2122 663 00018	PTC 4.7Ω 20%
3552	4822 051 30222	2.2kΩ 5% 0.062W
3553	4822 051 30103	10kΩ 5% 0.062W
3610	4822 051 30223	22kΩ 5% 0.062W
3611	4822 051 30222	2.2kΩ 5% 0.062W
3620	4822 050 21808	1.8Ω 1% 0.6W
3620	4822 116 80176	1Ω 5% 0.5W
3621	4822 116 80176	1Ω 5% 0.5W
3622	4822 116 81154	2.2Ω 5% 0.5W
3622	5322 116 53564	3.3Ω 5% 0.5W
3623	4822 116 52251	18kΩ 5% 0.5W
3624	4822 052 10158	1.5Ω 5% 0.33W
3625	4822 116 52206	120Ω 5% 0.5W
3625	4822 116 52219	330Ω 5% 0.5W
3626	4822 116 52175	100Ω 5% 0.5W
3626	4822 116 52219	330Ω 5% 0.5W
3627	4822 051 20223	22kΩ 5% 0.1W
3630	4822 051 30333	33kΩ 5% 0.062W
3631	4822 051 30222	2.2kΩ 5% 0.062W
3632	4822 051 30393	39kΩ 5% 0.062W
3633	4822 051 30563	56kΩ 5% 0.062W
3634	4822 116 83882	39kΩ 5% 0.5W
3635	4822 116 52219	330Ω 5% 0.5W
3636	4822 051 30223	22kΩ 5% 0.062W
3637	4822 051 30103	10kΩ 5% 0.062W
3638	4822 051 30474	470kΩ 5% 0.062W
3639	4822 051 30563	56kΩ 5% 0.062W
3640	4822 051 30222	2.2kΩ 5% 0.062W
3641	4822 116 83883	470Ω 5% 0.5W
3642	4822 101 11193	47kΩ 30% 0.1W
3643	4822 051 30334	330kΩ 5% 0.062W
3644	4822 051 30221	220Ω 5% 0.062W
3645	4822 116 52245	150kΩ 5% 0.5W
3646	4822 117 12925	47kΩ 1% 0.063W 0603
3647	4822 051 20228	2.2Ω 5% 0.1W
3652	4822 051 20479	47Ω 5% 0.1W
3653	4822 051 20223	22kΩ 5% 0.1W
3655	4822 051 30123	12kΩ 5% 0.062W
3656	4822 117 11817	1.2kΩ 1% 0.062W
3657	4822 051 30223	22kΩ 5% 0.062W
3658	4822 051 30223	22kΩ 5% 0.062W
3659	4822 051 30222	2.2kΩ 5% 0.062W
3660	4822 051 30562	5.6kΩ 5% 0.063W 0603
3661	4822 116 52226	560Ω 5% 0.5W
3662	4822 051 30152	1.5kΩ 5% 0.062W
3681	4822 116 52207	1.2kΩ 5% 0.5W
3682	4822 117 13632	100kΩ 1% 0.62W 0603
3683	4822 051 30103	10kΩ 5% 0.062W
3684	4822 051 30682	6.8kΩ 5% 0.062W
3685	4822 051 30273	27kΩ 5% 0.062W
3686	4822 051 30563	56kΩ 5% 0.062W
3687	4822 116 52207	1.2kΩ 5% 0.5W
3688	4822 051 20684	680kΩ 5% 0.1W
3690	4822 051 30109	10Ω 5% 0.062W
3701	4822 051 30103	10kΩ 5% 0.062W
3701	4822 117 12925	47kΩ 1% 0.063W 0603
3702	4822 051 30223	22kΩ 5% 0.062W
3703	4822 051 30103	10kΩ 5% 0.062W
3703	4822 117 12925	47kΩ 1% 0.063W 0603
3704	4822 051 30223	22kΩ 5% 0.062W
3707	4822 051 30103	10kΩ 5% 0.062W
3708	4822 117 12925	47kΩ 1% 0.063W 0603
3710	4822 117 12925	47kΩ 1% 0.063W 0603
3711	4822 051 30103	10kΩ 5% 0.062W
3713	2322 702 81828	8.2Ω 5% 0.1W 0603
3714	2322 702 81828	8.2Ω 5% 0.1W 0603
3716	4822 050 21003	10kΩ 1% 0.6W
3719	4822 051 30103	10kΩ 5% 0.062W
3720	4822 052 10108	1Ω 5% 0.33W
3721	4822 052 10108	1Ω 5% 0.33W
3725	4822 116 52251	18kΩ 5% 0.5W
3726	4822 050 21003	10kΩ 1% 0.6W
3904	4822 052 10688	6.8Ω 5% 0.33W
3905	4822 051 30101	100Ω 5% 0.062W
3912	4822 051 30008	Jumper 0603
3928	4822 051 30101	100Ω 5% 0.062W
3929	4822 051 30103	10kΩ 5% 0.062W
3930	4822 051 20561	560Ω 5% 0.1W
3938	4822 117 11373	100Ω 1% 0805
3939	4822 051 30103	10kΩ 5% 0.062W
3940	4822 051 20561	560Ω 5% 0.1W
3941	4822 052 10688	6.8Ω 5% 0.33W
3959	4822 117 10353	150Ω 1% 0.1W
3960	4822 117 10353	150Ω 1% 0.1W
3961	4822 117 10353	150Ω 1% 0.1W
3962	4822 117 10353	150Ω 1% 0.1W
3965	4822 117 10353	150Ω 1% 0.1W
3966	4822 117 10353	150Ω 1% 0.1W
3967	4822 116 52201	75Ω 5% 0.5W
3968	4822 116 52201	75Ω 5% 0.5W
3969	4822 051 20008	Jumper 0805
3969	4822 117 11373	100Ω 1% 0805
3970	4822 051 20008	Jumper 0805
3970	4822 117 11373	100Ω 1% 0805
3971	4822 116 52201	75Ω 5% 0.5W
3972	4822 116 52201	75Ω 5% 0.5W
3973	4822 116 52201	75Ω 5% 0.5W
3974	4822 116 52201	75Ω 5% 0.5W
3975	4822 116 52201	75Ω 5% 0.5W
3976	4822 117 11373	100Ω 1% 0805
3977	4822 051 20008	Jumper 0805
3977	4822 117 11373	100Ω 1% 0805
3978	4822 051 20008	Jumper 0805
3978	4822 117 11373	100Ω 1% 0805
3979	4822 116 52201	75Ω 5% 0.5W
3980	4822 051 20008	Jumper 0805
3980	4822 117 11373	100Ω 1% 0805
3981	4822 051 10102	1kΩ 2% 0.25W
3981	4822 117 10833	10kΩ 1% 0.1W
3982	4822 051 20392	3.9kΩ 5% 0.1W
3982	4822 051 20393	39kΩ 5% 0.1W
3983	4822 116 52175	100Ω 5% 0.5W
3984	4822 051 10102	1kΩ 2% 0.25W
3984	4822 117 10833	10kΩ 1% 0.1W
3985	4822 116 52201	75Ω 5% 0.5W
3986	4822 116 52276	3.9kΩ 5% 0.5W
3986	4822 116 83882	39kΩ 5% 0.5W
3987	4822 116 52175	100Ω 5% 0.5W
3988	4822 051 10102	1kΩ 2% 0.25W
3988	4822 117 11373	100Ω 1% 0805
3989	4822 050 11002	1kΩ 1% 0.4W
3989	4822 116 52175	100Ω 5% 0.5W
3990	4822 117 10353	150Ω 1% 0.1W
3991	4822 117 10353	150Ω 1% 0.1W

9.4 Abbreviation List

0/6/12	SCART switch control signal on A/V board. 0 = loop through (AUX to TV), 6 = play 16:9 format, 12 = play 4:3 format
2CS	2 Carrier Sound
A2	Commonly known as 2 Carrier Sound (2CS) system
AC	Alternating Current
ACI	Automatic Channel Installation: algorithm that installs TV channels directly from a cable network by means of a predefined TXT page
ADC	Analogue to Digital Converter
ADOC	Analogue Digital One Chip
AFC	Automatic Frequency Control: control signal used to tune to the correct frequency
AGC	Automatic Gain Control: algorithm that controls the video input of the feature box
AM	Amplitude Modulation
ANC	Automatic Noise Reduction; One of the algorithms of Auto TV
AP	Asia Pacific
AR	Aspect Ratio: 4 by 3 or 16 by 9
ASD	Automatic Standard Detection
AUDIO-SL	Audio Surround Left
AV	Audio Video
AVL	Automatic Volume Level control
B-SC1-IN	Blue SCART1 in
B-SC2-IN	Blue SCART2 in
B-TXT	Blue teletext
B/G	Monochrome TV system. Sound carrier distance is 5.5 MHz
BBD	Black Bar Detection
BCL	Beam Current Limiter
BC-PROT	PROTection signal to the microprocessor in case of a too high Beam Current.
BLC-INFO	BLack Current INFO.
BLD	BLack Level Detection.
BS	BLack Stretch.
BTSC	Broadcast Television Standard Committee; Multiplex FM stereo sound system, originating from the USA and used e.g. in LATAM and AP-NTSC countries.
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
CBA	Circuit Board Assembly (or PWB)
CL	Constant Level: audio output to connect with an external amplifier
CLUT	Colour Look Up Table
ComPair	Computer aided rePair
CRT	Cathode Ray Tube (or picture tube)
CSM	Customer Service Mode
CTI	Colour Transient Improvement; Manipulation of the steepness of the chroma transients
CVBS	Composite Video Blanking and Synchronisation
CVBS-EXT	CVBS signal from external source (VCR, VCD, etc.)
CVBS-INT	CVBS signal from Tuner
CVBS-MON	CVBS monitor signal
CVBS-TER-OUT	CVBS terrestrial out
CVI	Component Video Input
D/K	Monochrome TV system. Sound carrier distance is 6.5 MHz. D= VHF-band, K= UHF-band
DAC	Digital to Analogue Converter
DAF	Dynamic Astigmatism and Focusing; a method to keep the electron spot round and focused during the whole scan
DBE	Dynamic Bass Enhancement; extra low frequency amplification
DC	Direct Current
DCC	Dynamic Contrast Control
DC-filament	Filament supply voltage
DEGAUSS	Control line. Logic LOW to enable CRT degaussing. Logic HIGH to disable the CRT degaussing.
DFU	Directions For Use: owner's manual
DNR	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
DOP	Digital Output Processor (Part of ADOC which takes care of RGB control and deflection)
DPL	Dolby Pro Logic
DPL	Dolby Pro Logic
DRAM	Dynamic RAM; dynamically refreshed RAM
DRAM	Dynamic RAM; dynamically refreshed RAM
DS	Digital Scan
DSP	Digital Signal Processing
DST	Dealer Service Tool; Special remote control designed for dealers to enter e.g. service mode (a DST-emulator is available in ComPair)
DTS	Digital Theatre Sound
DVD	Digital Versatile Disc
DVI(-d)(-i)	Digital Visual Interface (d= digital only) (i= integrated); A digital video interface to a display, designed to replace the analogue YPbPr or RGB interface
DW	Double Window
DYN-FASE-COR	Dynamic phase correction, to correct the phase of the H-drive
EEPROM	Electrically Erasable and Programmable Read Only Memory
EHT	Extreme High Tension; the voltage between the cathode and the shadow mask that accelerates the electrons towards the screen (around 25 kV)
EHT-INFO	Extra High Tension INFOrmation, used for contrast reduction, vertical and horizontal amplitude correction, beam current protection, and flash detection
EMI	Electro Magnetic Interference; Leakage of high-frequency radiation from a transmission medium
EPG	Electronic Program Guide; System used by broadcasters to transmit TV guide information (= NexTView)
EPLD	Erasable Programmable Logic Device
EU	EUrope
EW	East West, related to horizontal deflection of the set
EW-DRIVE	East -West correction drive signal.
EXT	EXTernal (source), entering the set by SCART or by cinches (jacks)
FBL	Fast Blanking: DC signal accompanying RGB signals
FBL-SC1-IN	Fast blanking signal for SCART1 in
FBL-SC2-IN	Fast blanking signal for SCART2 in

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

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 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 Ibeam; 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.

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 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.

11. Revision List

Manual xxxx xxx xxxx.0

- First release.