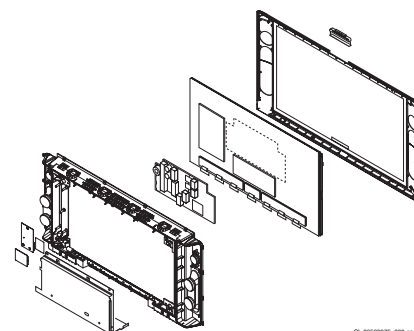


Service
Service
ServiceCL 36532075, 500 4514
201153

Service Manual

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1. Technical Specifications, Connections, and Chassis Overview

Index of this chapter:

1. Technical Specifications
2. Connections
3. Chassis Overview

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

1.1 Technical Specifications

1.1.1 Vision

Display type	: DV-Plasma, 16:9
Screen size	: 42-inch (107 cm)
Resolution (HxV)	: 852(x3) x 480 pixels
Contrast ratio	: 1000:1
Light output	: 650 cd/m ²
Viewing angle (HxV)	: 160x160 deg.
Tuning system	: PLL
Colour systems	: PAL B/G, D/K, I : SECAM B/G, D/K, L, L1
Video playback	: NTSC 4.43/3.58
Channel selections	: 100 presets : UVSH
Aerial input	: 75 ohm, IEC-type
Dimensions (WxHxD) in mm	: 1074x644x135

1.1.2 Sound

Sound systems	: AV Stereo, : BI NICAM BG - 2CS : BI NICAM BG/D - 2CS : BI NICAM BG/K - 2CS : BG
Maximum power	: 2 x 15 W _{rms} (int.)

1.1.3 Miscellaneous

Mains voltage	: 198 - 264 V _{ac}
Mains frequency	: 50 / 60 Hz
Ambient temperature	: +5 to +40 deg. C
Maximum humidity	: 90 % R.H.
Power consumption	:
- Normal operation	: ≈ 340 W
- Standby	: < 3 W

1.2 Connections

1.2.1 Rear/Bottom Connections

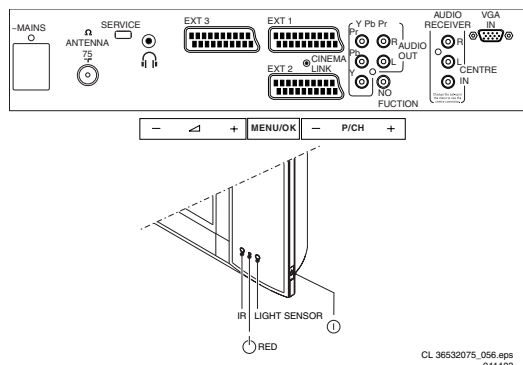


Figure 1-1 Rear/Bottom connections

1.2.2 Audio receiver (if present)

Audio - In (Cinch)

C - Audio - Centre



Audio - Out (Cinch)

R - Audio - R 0.5 V_{rms} / 1 kohm



L - Audio - L 0.5 V_{rms} / 1 kohm



Audio - Out (Cinch)

R - Audio - R 0.5 V_{rms} / 1 kohm



L - Audio - L 0.5 V_{rms} / 1 kohm



1.2.3 VGA

VGA (Input)

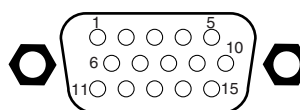


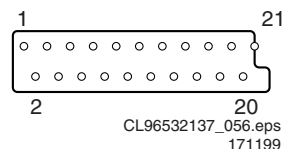
Figure 1-2 VGA Connector

1 - Red	0.7 V _{pp} / 75 ohm	→
2 - Green	0.7 V _{pp} / 75 ohm	→
3 - Blue	0.7 V _{pp} / 75 ohm	→
4 -	Ground	⊥
5 -	Ground	⊥
6 -	Ground	⊥
7 -	Ground	⊥
8 -	Ground	⊥
9 - 5V _{DC_OUT}	+5 V _{dc}	→
10 -	Ground	⊥
11 -	Ground	⊥
12 - DDC_SDA		→
13 - H-sync	0 - 5 V	→
14 - V-sync	0 - 5 V	→
15 - DDC_SCL		→

Cinch (Input)

- Audio - L	0.5 V _{rms} / 10 kohm	→
- Audio - R	0.5 V _{rms} / 10 kohm	→
- Y	0.7 V _{pp} / 75 ohm	→
- Pb	0.35 V _{pp} / 75 ohm	→
- Pr	0.35 V _{pp} / 75 ohm	→

1.2.4 SCARTs



CL96532137_056.eps
171199

Figure 1-3 SCART connector

Table 1-1 SCARTs overview

Pin	Signal	Signal level	Type	EXT1	EXT2	EXT3
1	Audio - R	0.5 V _{rms} / 1 kohm	⊕	x	x	Gnd
2	Audio - R	0.5 V _{rms} / 10 kohm	⊖	x	x	x
3	Audio - L	0.5 V _{rms} / 1 kohm	⊕	x	x	Gnd
4	Audio - Gnd	Ground	⊥	x	x	x
5	Blue - Gnd	Ground	⊥	x	x	x
6	Audio - L	0.5 V _{rms} / 10 kohm	⊖	x	x	x
7	Blue / U	0.7 V _{pp} / 75 ohm	⊖	x	x	o
	C-out	0.3 V _{pp} / 75 ohm	⊕	-	-	o
8	CVBS-status	0 - 2 V: INT 4.5 - 7 V: EXT 16:9 9.5 - 12 V: EXT 4:3	⊖	x	x	x
9	Green - Gnd	Ground	⊥	x	x	x
10	P50 Easylink		⊕	o	x	o
11	Green / Y	0.7 V _{pp} / 75 ohm	⊖	x	x	o
12	N.C.			o	o	o
13	Red - Gnd	Ground	⊥	x	x	x
14	FBL - Gnd	Ground	⊥	x	x	x
15	Red / V	0.7 V _{pp} / 75 ohm	⊖	x	x	o
	C-in	0.3 V _{pp} / 75 ohm	⊖	-	x	x
16	Status / FBL	0 - 0.4 V: INT 1 - 3 V: EXT / 75 ohm	⊖	x	x	o
17	Video - Gnd	Ground	⊥	x	x	x
18	Video - Gnd	Ground	⊥	x	x	x
19	CVBS-out	1 V _{pp} / 75 ohm	⊕	x	x	o
	Y-out	1 V _{pp} / 75 ohm	⊕	-	-	o
20	CVBS-in	1 V _{pp} / 75 ohm	⊖	x	x	x
	Y-in	1 V _{pp} / 75 ohm	⊖	-	x	x
21	Shielding	Ground	⊥	x	x	x
x = connected						
o = not connected						
- = not used						

Because this set is not equipped with a side I/O, a separate converter is added with the set. Use this SCART to cinch adaptor to connect temporary peripheral equipment (camcorder, digital camera, game boy, etc.) to EXTERNAL 3. **Note:** do not connect the CVBS and Y/C connector of one device at the same time.

Aerial - In

- IEC-type

Coax, 75 ohm

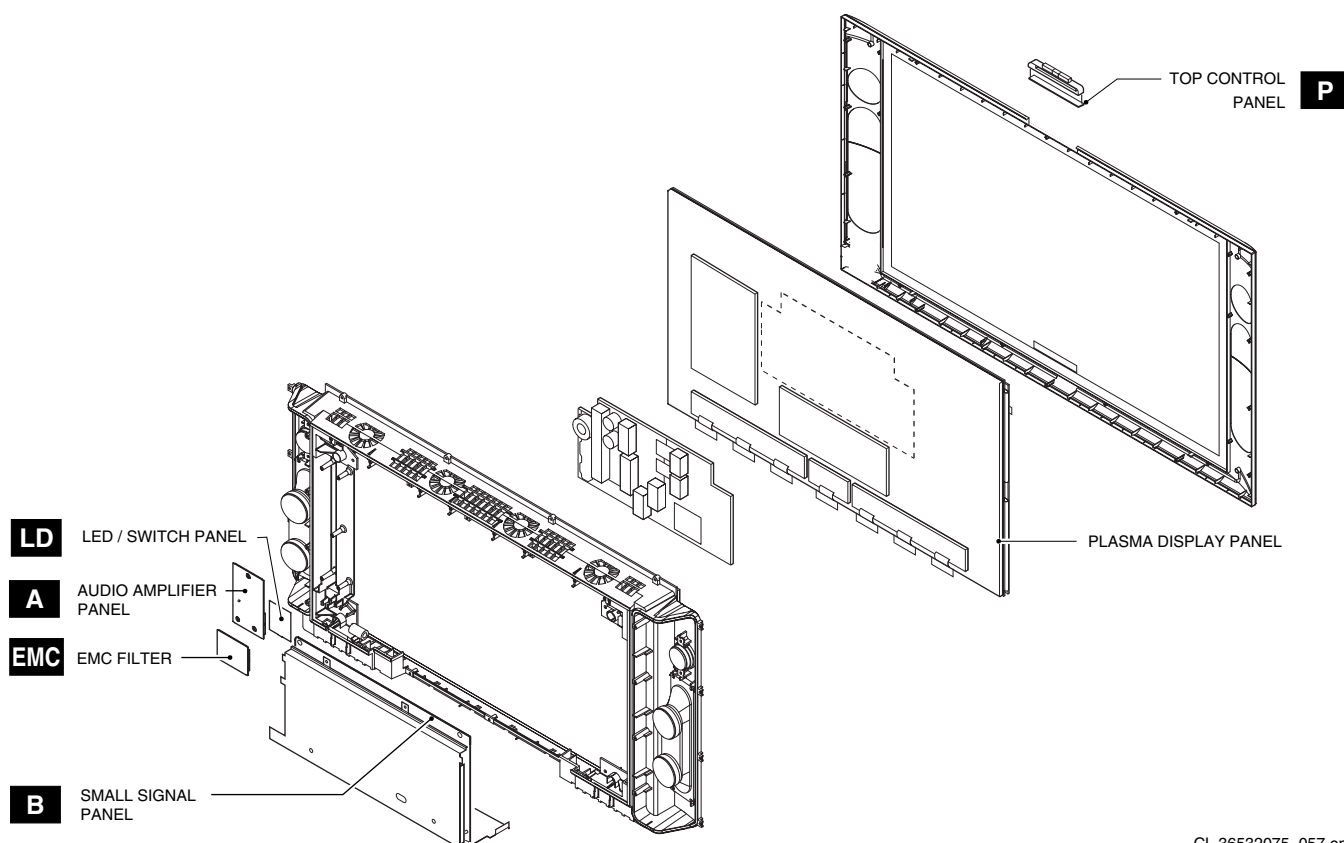



Figure 1-4 Chassis Overview

2. Safety Instructions, Warnings, and Notes

2.1 Safety Instructions


Safety regulations require that **during** a repair:

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

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


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

2.2 Warnings







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

2.3 Notes

2.3.1 General

- In order to prevent damage to ICs and transistors, avoid all high voltage flashovers.
- 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 potential. Available ESD protection equipment:

- Complete kit ESD3 (small tablemat, wristband, connection box, extension cable and ground cable) 4822 310 10671.
- Wristband tester 4822 344 13999.

- Never replace modules or other components while the unit is 'on'.
- 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 (PAL) or 61.25 MHz (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 standby () . These values are indicated by means of the appropriate symbols.
- The semiconductors indicated in the circuit diagram and in the parts lists, are interchangeable per position with the semiconductors in the unit, irrespective of the type indication on these semiconductors.

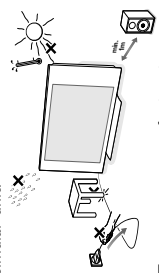
2.3.2 Schematic Notes

- 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 expressed in micro-farads ($\mu = \times 10^{-6}$), nano-farads ($n = \times 10^{-9}$), or pico-farads ($p = \times 10^{-12}$).
- Capacitor values may also use the value multiplier as the decimal point indication (e.g. 2p2 indicates 2.2 pF).
- An "asterisk" (*) indicates component usage varies. Refer to the diversity tables for the correct values.
- The correct component values are listed in the Electrical Replacement Parts List. Therefore, always check this list when there is any doubt.

3. Directions for Use

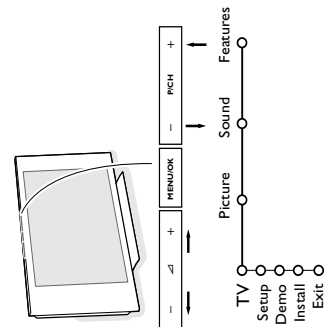
Preparation

- Wall mounting instructions**
For the wall mounting instructions follow the separate template.
Make sure that the wall mount is being fixed securely enough so that it meets safety standards. The weight of the TV (excl. packaging) is about 35 kg.
How to mount the supplied stand, see the separate leaflet.
Note: other (not supplied) stands are optional accessories. Consult your dealer.
- Place or hang the TV wherever you want, but make sure that air can circulate freely through the ventilation slots. Do not install the TV in a confined space such as a book case or a similar unit.



- Insert the aerial plug firmly into the aerial socket "T" at the bottom of the TV. For best picture quality use the suppressor-aerial cable supplied.

Keys on top of the TV



Should your remote be lost or broken you can still change some of the basic settings with the keys on top of your TV.

Press:

- the **▲** - or **+** key to adjust the volume;
- the **P/CH+** keys to select the TV channels or sources.

The **MENU/OK** key can be used to summon the main menu without the remote control.

Use:

- the **▲** - and **+** keys and the **P/CH** - and **P/CH+** keys to select menu items in the directions as shown;
- the **MENU/OK** key to confirm your selection.

Note:
When activated via the **MENU/OK** key on top of the TV, only **Exit** lets you dismiss the menu.
Navigate to **Exit** and press the **MENU/OK** key.

- To connect your computer, see p. 20.

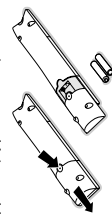
To connect other peripherals, see p. 17.
If you dispose of a Cinema Link combination (Cinema Link Audio receiver and/or Cinema Link video recorder and/or DVD player), see the separate supplied instruction manual.

In order to obtain the best result, please use only the supplied antenna cables between the TV and videorecorder, and between videorecorder and antenna connector.

- Insert the mains cord supplied into the mains at the bottom of the TV and in the wall socket having a mains voltage of 220-240V.

To prevent damaging the power (AC) cord which could cause a fire or electric shock, do not place the TV on the cord.

- Remote control:** Insert the 2 batteries supplied (Type R6-1.5V).



The batteries supplied do not contain the heavy metals mercury and cadmium. Please check on how to dispose of exhausted batteries according to local regulations.

- Switch the TV on:** Press the power switch **⏻** at the right side of the TV.

An indicator on the front of the TV lights up and the screen comes on. If the TV is in standby mode, press the **-P+** keys or the **⏻** key on the remote control.

Use of the remote control RC2080

Note: For most keys pressing a key once will activate the function. Pressing a second time will de-activate it.
When a key enables multiple options, a small list will be shown. Press repeatedly to select the next item in the list.
The list will be removed automatically after 4 seconds or press **OK** to remove immediately.

Remark: in VGA mode only some keys are valid.

Select peripherals (p. 18)

VCR DVD AMP SAT
Audio- and Video equipment keys (p. 21)

Standby

Press to switch the TV on or off.
When switched off, a red indicator on the TV lights up. When activating NEXTVIEW, see p. 14, an orange indicator lights up and after a period of max. 1 hour the TV is switched to full standby and the red indicator lights up.

Incredible surround

With stereo transmission, and when Incredible surround is selected, it seems as though the loudspeakers are spread further apart from one another.

Virtual Dolby surround

Optimal with Dolby surround signals. Enables you to experience the effect of Dolby surround Pro Logic, reproducing a rear sound effect. See Sound menu, 3D effect, p. 11.

Note: You can make the same selection in the Sound menu, surround mode, p. 11.

Cinema Go

See separate Cinema Link booklet supplied.

PIXEL PLUS

no function

Teletext on/off p. 15

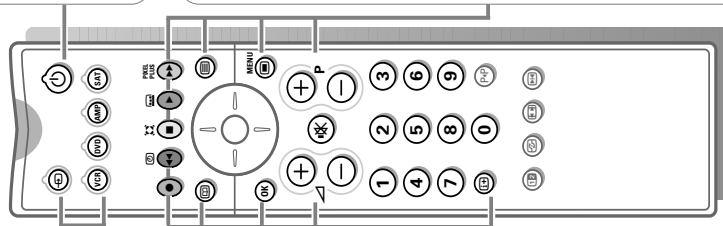
Main menu see p. 5

Programme selection

To browse through the TV channels and sources stored in the favourite list.

0/9 Digit keys

To select a TV channel.
For a two digit programme number: enter the second digit within 2 seconds. To switch immediately to a selected one digit TV channel, keep the digit key pressed a bit longer.



Audio- and Video equipment keys (p. 21)

Record

See Record with your recorder with EasyLink, p. 21

Time display

The time is displayed on the screen.

NEXTVIEW on/off p. 13

OK

Press this key
• to activate your choice, when in the menus.
• to display the programme list.

To adjust the volume.

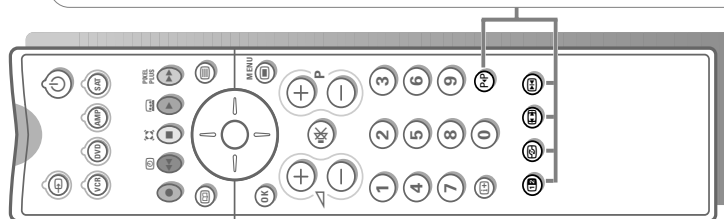
Interrupt the sound or restore it.

On Screen information

Press to display (when available) information about the selected TV channel and programme.

Menu/Remote control info

When a menu is on screen, press **⏻** to display info on the selected menu item. For information on the remote control functions, while the menu info is displayed, press any key on the remote control. The normal function of the key is not executed.



P/P Previous TV channel

Press to display the previously selected TV channel.

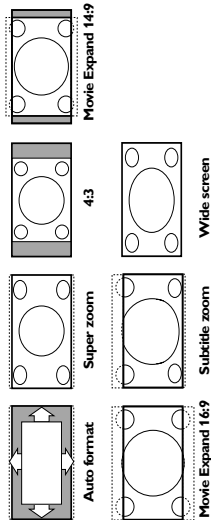
no function

Active control see p. 11

Picture format

Press this key repeatedly or press the cursor up/down to select another picture format: Auto format, Super zoom, 4:3, Movie Expand 14:9, Movie Expand 16:9, Subtitle zoom or Wide screen.

Auto format makes the picture fill the screen as much as possible.



In case of subtitles in the bottom black bar, Auto format makes the subtitles visible. If subtitles are only partly visible, press cursor up. In case of a broadcaster logo in the corner of the top black bar, the logo disappears from the screen.

Super zoom removes the black bars on the sides of 4:3 programs with minimal distortion.

When in Movie Expand 14:9, 16:9, Super zoom or Subtitle zoom picture format, you can make subtitles visible with the cursor up/down.

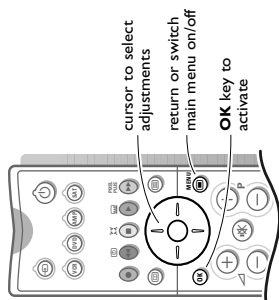
Note: With signals via the **VGA IN** connector less picture formats are selectable.

Freeze

To freeze the picture.

Dependent on the input signal, the function may not be possible.

To use the menus



- 1 Press the **MENU** key on the remote control to summon the main menu. At any moment you can exit the menu by pressing the **MENU** key again.
Note: If you have connected equipment with Cinema Link, more menu items are present.

- 2 Use the cursor in the up/down direction to select the **TV, Setup, Demo or Install** menu.

Use the cursor left/right to select **Picture, Sound or Features**.

Note: Sometimes not all the menu items are visible on the screen (indicated by a cluster of blue balls). Use the cursor down or right to reveal all items.

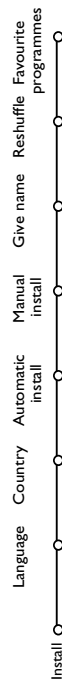
- 3 Use the cursor in the left/right direction to select the menu item.

- 4 Use the cursor up/down again to select the control you want to select or to adjust.

Note: Items temporary not available or not relevant are displayed in a light grey colour and cannot be selected.

Installation

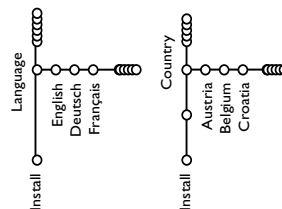
The installation menu contains the following items:



EasyLink

If your video recorder has an EasyLink function, during installation, the language, country and available channels are automatically transmitted to the video recorder.

Select the menu language and country

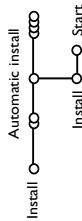


- 1 Press the **MENU** key on the remote control.
- 2 Use the cursor down to select **Install**.
- 3 Use the cursor right to select **Language**.
Follow the instructions on screen.
- 4 Use the cursor up/down to select your preferred language and press the **OK** key to confirm your selection.
- 5 Use the cursor right to select **Country**.
- 6 Select the country where you are now located and press the **OK** key.
Select **Other** when none of the countries applies.
- 7 Proceed with the **Install** menu.

Store TV channels

After language and country are set correctly, you can now search for and store the TV channels in two different ways: using Automatic Installation or Manual Installation (tuning-in channel by channel). Select your choice with the cursor right.

Automatic installation

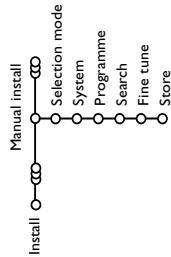


- 1 Select **Automatic install** in the Install menu.
Note: All channels must be unlocked in order to autoprogram. If requested, enter your code to unlock all channels. (See TV Features menu, Childlock, p. 12.)
- 2 Press the cursor down.
The autoprogramming option label **Start** appears.
- 3 Press the cursor right.
- 4 The message **Searching** appears and the progress of autoprogramming is displayed.

If a cable system or a TV channel which broadcasts ACI (Automatic Channel Installation) is detected, a programme list appears. Without ACI broadcast, the channels are numbered according to your language and country selection. You can use Reshuffle to renumber them. See p. 7.

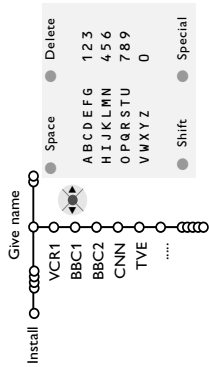
It is possible that the cable company or the TV channel displays a broadcast selection menu. Layout and items are defined by the cable company or the TV channel. Make your choice with the cursor and press the **OK** key.

Manual installation



- Searching for and storing TV channels is done channel by channel. You must go through every step of the Manual Installation menu.
- 1 Select **Manual install** in the Install menu.
Note: If requested, enter your code to unlock all channels. (See TV Features menu, Childlock, p. 12.)
 - 2 Follow the instructions on screen.
Note: Search or direct selection of a TV channel. If you know the frequency, the C- or S-channel number, enter the 3 or 2 digits of the frequency or the channel number directly with the digit keys 0 to 9 (e.g. 048). Press the cursor down to proceed.
- Repeat to search for another TV channel.

Give name



- 1 Select **Give Name** in the Install menu and press the cursor down.
- 2 Select the programme number.
Note: keep the cursor up/down pressed to scroll through the programme list quickly.
- 3 Press the cursor right.
A keyboard appears on the screen.
Press the cursor right to enter the keyboard.
Press the cursor up/down, left/right to select the first character you want to enter.
Select **Space** to enter a space; **Delete** to erase the highlighted character in the name entered; **Shift** to display upper- or lowercase characters on the keyboard; **Special** to display special characters on the keyboard. Press **OK** to confirm.
- 4 Press the cursor left repeatedly when you have finished the name giving.
- 5 Select another programme number and repeat steps 2 to 4.

It is possible to change the name stored in the memory or to assign a name to a TV channel or external for which a name has not yet been entered. A name with up to 5 letters or numbers can be given to the programme numbers 0 to 99.

Note : It is not possible to rename the VGA source.

Reshuffle the programme list

You can change the order of the stored TV channels.

- 1 Select **Reshuffle** in the Installation menu.
- 2 Follow the instructions on screen.

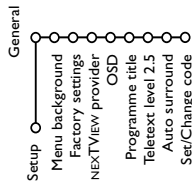
Select Favourite TV channels

AVGA source always belongs to the list of Favourite programmes.

- 1 Select **Favourite programmes** in the Install menu.
- 2 Select your programme number with the cursor up/down.

- 3 Select **Yes** or **No** with the cursor right.
- 4 Repeat 2 and 3 for every TV channel or external you want to make a favourite or a non-favourite TV channel or external.

TV Setup



The Setup menu contains items that control the settings of the TV's functions, features, services and peripherals you may have connected.

The **General** menu allows you to change settings that will typically be accessed only occasionally.

The **Source** menu allows you to select a source.

The **Decoder** menu allows you to define one or more programme numbers as decoder programme numbers.

General

This menu allows you to change various settings that are presumably adjusted less frequently than most other settings.

Press the **[3]** key on the remote control to get information about the selected menu item.

Menu background

Select **Yes** or **No** to turn the menu background on or off.

Factory settings

This resets the picture and sound settings to their predefined factory values, but maintains the channel installation settings.

NEXTVIEW provider

Select a TV broadcaster that provides NEXTVIEW data. How to make use of NEXTVIEW, see p. 13.

OSD (On Screen Display)

See Use of the remote control, p. 3, **[3]** On screen information.

- 1 Select **OSD**.
- 2 Select **Normal** to activate the continuous display of the programme number. Also TV channel and programme information are extended. **Minimum** will display reduced channel information.

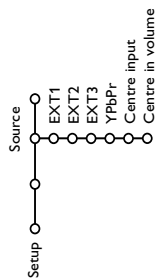
Note: When subtitles is switched on, see Features, p. 12, continuous display of the programme number is not possible.

Programme title

Select **Programme title Yes** or **No**.
When selected **Yes** after the selection of a TV programme or after pressing the **[3]** key on the remote control, a TV channel which broadcasts teletext may transmit the name of the TV channel or the programme title. When selected **No**, the programme title will only appear after pressing the **[3]** key, and not after the selection of a TV channel.

Source

Once you have selected the source type, e.g. DVD, this source will automatically be selected when your remote control is in DVD mode, see p. 3, and when you press the **[4]** key on the remote control.



Centre input - Centre in volume

When you have connected a surround receiver to the TV, see p. 18, the loudspeakers of the TV can act as centre speaker, making a separate centre speaker unnecessary.

Select **Centre input On** or **Cinema Link** (in case you have connected a Cinema Link Surround receiver).

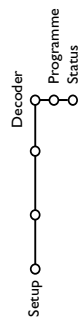
When having selected **On** you can adjust the Centre in volume with the cursor left/right to correct volume level differences of the external audio receiver and speakers.

Note: This is not the case with a Cinema Link surround receiver.

This menu allows you to indicate the peripheral you connected to one of the external inputs.

- 1 Press the cursor right to enter the list of types of peripherals attached to the selected input.
- 2 Select the peripheral device with the cursor up/down.

Decoder



If a decoder or a descrambler is connected, see p. 17, you can define one or more programme numbers as decoder programme numbers.

- 1 Select **Decoder** with the cursor right.
- 2 Select **Programme**.
- 3 Select the programme number under which you have stored the programme coming from your decoder.
- 4 Select **Status**.
 - Select the input used to connect your decoder: **None**, **EXT1** or **EXT2**.
 - Select **None** if you do not want the selected programme number being activated as a decoder programme number.

Note: Select EXT2 when the decoder is connected to your EasyLink video recorder.

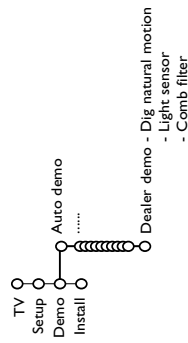
Demo

The Demo menu allows to demonstrate the TV features separately or in a continuous loop.

If **Auto demo** has been selected the demo will automatically present the features sequentially in a loop. Press one of the cursor keys to stop the Auto demo.

If one of the features has been selected, this particular feature demo will run only once, and the Demo menu will reappear.

Note: The Dealer demo is not part of the automatic sequence and can only be activated separately.



Teletext level 2.5

Some broadcasters offer the opportunity to see more colours, other background colours and nicer pictures in the teletext pages.

- 1 Select **Teletext level 2.5**.
 - 2 Press the cursor right to select **Teletext level 2.5 On** to take advantage of this feature.
 - 3 Press the cursor right again to select **Teletext level 2.5 Off** if you like the more neutral teletext layout.
- The selection made is valid for all channels which broadcast teletext level 2.5.

Note: It may take a few seconds before teletext broadcast switches over to Teletext level 2.5.

Auto Surround

Sometimes the broadcaster transmits special signals for Surround Sound encoded programmes.

The TV automatically switches to the best surround sound mode when **Auto Surround** is switched **On**.

Set/Change code

The Child lock feature (see TV, Features, p. 12) allows you to lock channels to prevent others from watching certain programmes. To watch locked channels, a 4-digit code must be entered. The Set/Change code menu item allows you to create or change a Personal Identification Number (PIN).



- 1 Select **Set/Change code**.
- 2 If no code exists yet, the menu item is set to Set code.

If a code has previously been entered, the menu item is set to **Change code**. Follow the instructions on screen.

Important: You have forgotten your code !

- 1 Select **Change code** in the General menu and press **OK**.
- 2 Press the cursor right and enter the overriding code 8-8-8-8.
- 3 Press the cursor again and enter a new personal 4-digit code. The previous code is erased and the new code is stored.

TV menu

Press the **MENU**  key on the remote control to summon the main menu.
Note: Dependent on the input signal, one or more menu items may not be selectable.
Press the  key on the remote control to get information about the selected menu item.

Picture menu

Picture

Sound

Features

TV

Smart picture

Contrast

Brightness

Colour

Sharpness

Tint

Dig natural motion

Dynamic contrast

Colour enhancement

DNR

(Hue)

Picture format

1

Press the cursor right to select **Picture**.

2

Select the menu items in the Picture menu with the cursor up/down.

3

Adjust the settings with the cursor left/right or enter the list of submenu items with the cursor right. Select a submenu item with the cursor up/down.

Note: To remove the menu background before adjusting the picture settings, see Select TV setup, General, p. 7.

Smart picture
Select **Smart picture** to display a list of predefined picture settings, each corresponding with specific factory settings. **Personal** refers to the personal preference settings of picture in the picture menu.

Dig natural motion
Line doubling eliminates line flicker, motion compensation reduces jitter and offers smooth, yet sharp motion reproduction in movie broadcasts.
Select **On** or **Off** to really see the difference in picture quality.

Dynamic contrast
Sets the level at which the TV automatically enhances the details in dark, middle and light areas of the picture.

DNR
This sets the level at which noise is measured and reduced in the picture.

Colour enhancement
This makes the colours more vivid and improves the resolution of details in bright colours.


Hue
This compensates for the colour variations in NTSC encoded transmissions.

Picture format
This will adjust the size of the picture dependent on the broadcast format and your preferred setting.

Active Control

The TV continuously measures and corrects all incoming signals in order to provide the best picture possible.

1

Press the  key on the remote control.

2

The Active Control menu appears.

3

Press the cursor up/down to select the Active Control values **Off**, **Minimum**, **Medium** (recommended) or **Maximum**. The picture settings are being optimised continuously and automatically, which is displayed by bars. The menu items can not be selected.

4

Press the cursor right to select **Smart Picture**.

5

Press the cursor up/down to select one of the predefined picture settings.


6

Press the cursor right to select **Active Display**.

7

Press the cursor up/down to select **Show bars**, one of the Dual screen demos or **Off**. When you select Dynamic contrast, Digital Noise Reduction or Digital Natural Motion, the TV screen is divided into two parts: in the left part the selected picture quality setting is switched off; in the right part it is switched on.
Note: Dependent on the input signal, one or more Dual screen demos may not be selectable.

8

Press the  key again to switch off the Active Control menu.

Sound

1

Press the cursor right to select **Sound**.

2

Select the menu items in the Sound menu with the cursor up/down and adjust the settings with the cursor left/right. Remember, control settings are at normal mid-range levels when the bar scale is centred.

TV

Smart sound

Equalizer

Volume

Balance

Loudness

Headphone volume

Surround mode

(Dual L+R)

(Mono/Stereo)

(Nicom/Analogue)

(3D effect)

AVL

Delta volume

Smart sound
Select **Smart sound** to display a list of predefined sound settings, each corresponding with specific factory settings of Treble and Bass. **Personal** refers to the personal preference settings of sound in the sound menu.

Notes:

- Some menu items are only available in case of a Cinema Link configuration and when the Cinema Link is activated. Others are steered by the audio receiver instead of by the TV. See the separate Cinema Link booklet supplied.
- Dual **HI** is only available with dual sound transmission.
- Mono/Stereo is only selectable in case of analogue stereo transmission.
- Nicam/Analogue is only selectable in case of Nicam transmission.

Features menu

TV

Programme list

Subtitle

Sleep timer

Child lock

On timer


Zoom

1

Press the cursor right to select **Features**.

2

Select the menu items with the cursor up/down and adjust the settings with the cursor left/right.

Use the on-screen Menu-Info  for more information about the menu items.

Teletext

Most TV channels broadcast information via teletext. This TV has a 1200 pages memory that will store most broadcasted pages and subpages to reduce waiting time. After each programme change, the memory is refreshed.

Switch Teletext on and off

Press **[T]** to switch the teletext on.

Select subpages

When a selected teletext page consists of different subpages, a list of available subpages appears on the screen. Press the cursor left or right to select the next or previous subpage.

Enlarge a Teletext page

Press **[F]** repeatedly to display the upper teletext part, the lower teletext part and then to return to the normal teletext page size. When the teletext page is enlarged, you can scroll the text, line by line using the cursor up/down.

Hypertext

With hypertext you can quickly jump to a pagenumber or search for a specific word shown on the current teletext page.

- 1 Press the **OK** key to highlight the first word or a number on the page.
- 2 Use the cursor up/down, left/right to select any other word or number you want to search for.
- 3 Press the **OK** key to confirm. The search starts. A message appears at the bottom of the screen to indicate the searching, or that the word or page is not found.
- 4 Use the cursor up to exit hypertext.



Select a Teletext page

- Enter the desired page number with the digit keys, the cursor keys up/down or with the **-P+** key.
- Select the options at the bottom of the screen with the colour keys.

Previously selected teletext page

(Only possible in case there is no list of favourite teletext pages available. See p. 16.)

Press the **P/P** key.

Select the index teletext page

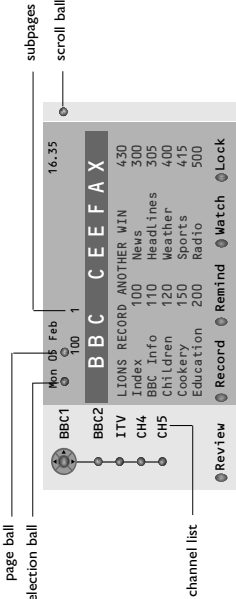
Press the grey colour key **[G]** to display the main index (usually p.100).

Only for T.O.P. teletext broadcasts:

Press **[B]**. A T.O.P. overview of the teletext subjects available is displayed. Select with the cursor up/down, left/right the desired subject and press the **OK** key. Not all TV channels broadcast T.O.P. teletext.

Teletext Guide

- 1 Enter with the digit keys, the teletext page number that contains the programme information for the current channel.
- 2 Press the cursor right to move the puck over the selection ball.
- 3 Use the cursor up/down to scroll through the different programmes.



- If the selected programme contains a page number with an optional subcode referring to a page with more info about the programme, press the **OK** key to display the information. Press the **OK** key again to return to the programme guide page.
- If the selected programme guide page satisfies the VPT requirements,
 - it will be possible to record, remind, watch or lock programmes;
 - the TV will remember the last selected teletext page number of that channel that contains programme guide information and indicates which programme starts at what time. Every time you press the **[G]** key, the teletext programme guide page of the selected TV channel will be available.
- When necessary you can select the subpage number by moving the cursor to the pageball and pressing right.

Note: You must enter the teletext pagenumber for each channel. You can change the channels also by moving the cursor up/down in the list in the left of the page.

Basic functions

- Press one of the grey, red, green, yellow or blue keys to activate a NEXTVIEW or Teletext Guide function. The keys appear in grey if the function is not available.
- Review:** this menu provides a list of programmes that are marked as reminders, those that have to be recorded and those that are locked. This menu can be used to change or remove marked programmes.
- Record:** to programme the recording of the video recorder (if it has a NEXTVIEWLink function and is connected to EXT. 2).
- Remind:** automatically switch on the TV if it is in standby or by displaying a message if the TV is on. Lock: to lock certain programmes to prevent recording or watching.
- For the functions Record, Remind or Lock, a small menu pops up in which you can choose the interval: once, daily or weekly, or clear an earlier made record, remind or lock setting. The default interval is set to **Once**. To confirm the frequency, press the **OK** key.
- Watch:** to watch the selected and currently broadcast programme.
- Acquisition and updating of NEXTVIEW information**
- Acquisition and updating of NEXTVIEW is done when you are watching the TV channel of the selected NEXTVIEW provider, see Setup menu, p. 8, or when the TV is switched to standby;
- Acquisition of fresh data will happen once during the night.
- Note: it may be necessary to put the TV in standby mode when all NEXTVIEW information is outdated, e.g. when returning from holiday.*

Connect Peripheral Equipment

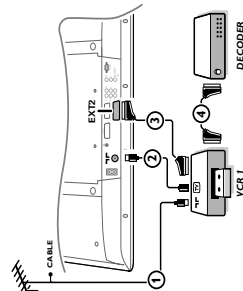
There is a wide range of audio and video equipment that can be connected to your TV. The following connection diagrams show you how to connect them.

Note: **EXT 1** can handle CVBS and RGB; **EXT 2** CVBS, Y/C, **EXT 3** CVBS and Y/C; **YPbPr**, **YPb-Br** 480p, 576p, 1080i; **VGA IN** can handle VGA, SVGA and 480p, 576p, 1080i.

It is preferred to connect peripherals with RGB output to **EXT 1** or **EXT 2** as RGB provides a better picture quality. Note: If your recorder is provided with the EasyLink function, it should be connected to **EXT 2** to benefit from the EasyLink functionality.

Recorder (VCR-DVD+RW)

Note: Do not place your recorder too close to the screen as some recorders may be susceptible for signals out of the display. Keep a minimum distance of 0,5 m to the screen.



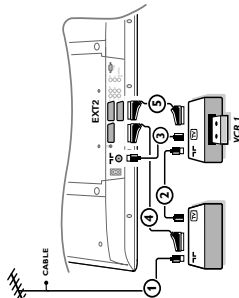
Connect the aerial cables ①, ② and, to obtain the optimum picture quality, eurocable ③ as shown. If your recorder does not have a euroconnector, the only possible connection is via the aerial cable. You will therefore need to tune in your recorder's test signal and assign it programme number 0 or store the test signal under a programme number between 90 and 99, see Manual installation, p. 6.

See the handbook of your recorder.

Decoder and Recorder

Connect a eurocable ④ to your decoder and to the special euroconnector of your recorder. See also the recorder handbook. See Decoder, p. 9. You can also connect your decoder directly to **EXT1** or **2** with a eurocable.

Other equipment (satellite receiver; decoder; DVD, games, etc.)

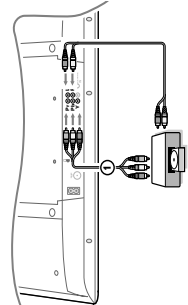


① Connect the aerial cables ①, ② and ③ as shown (only if your peripheral has TV aerial in-/output). Connect your equipment with a eurocable ④ or ⑤ to one of the euroconnectors **EXT1**, **2** or **3** to obtain a better picture quality.

② Look for the test signal of your peripheral in the same way as you do for a recorder.

③ Make a selection in the Setup, Source menu, p. 9.

Equipment with Component Video Output Connectors (YPbPr)



① Connect the three separate component video cables ① to the DVD player's **Y**, **U** (Pb) and **V** (Pr) jacks and to the **Y**, **Pb** and **Pr** jacks on the TV.

② Connect the audio cable to the DVD player's **AUDIO L** and **R** jacks and to the **L** and **R** audio **YPbPr** jacks on the TV.

Searching a word

- ① Type in the word on screen or select a word from the history list on the right and press **OK**.
- ② Select **Accept** and press **OK** again. The message **Searching** appears.
- ③ To cancel the searching or to search for a new word, select **Keyboard** and press **OK**.
- ④ When a word is not found, a message appears. When the word is found, it is highlighted in the teletext page. To continue the search, press the **OK** key.

Cycle subpages (if available)

Makes the subpages cycle automatically. Press the cursor right to activate and to deactivate again.

Timed page


To display a specific page from a selected TV channel at a certain time.

- ① Press the cursor right and select **Yes** or **No**.
- ② Enter the time andpagenumber with the cursor keys or the digit keys.
Note: Teletext does not have to remain switched on, but you should watch the TV channel you have selected the specific page from.
- ③ Press the cursor left: to return to the TV menu again.


Language

If the displayed characters on screen do not correspond with the characters used by the teletext broadcaster, you can change the language group here.

Select **Group 1** or **2** with the cursor right.

Press the **MENU**  key to leave the Teletext menu.

Teletext menu


- ① Press the **MENU**  key to activate the menu.
- ② Press the cursor up/down to select the menu items.
- ③ Press the cursor right to activate.

Reveal

Reveals/conceals hidden information on a page, such as solutions to riddles and puzzles. Press the cursor right to activate.

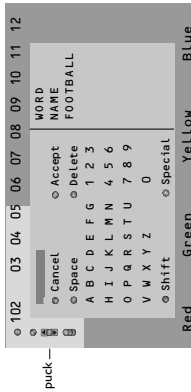
Favourite

This list contains up to eight favourite teletext pages. Only the pages of the current channel can be selected.

- ① Press the cursor right to enter the list.
- ② Press the cursor right again to add the current page or to select one of the favourite pages to the list.
- ③ Press the **MENU**  key to watch the page.
- ④ Use the P4P key to browse through the list of favourite pages.

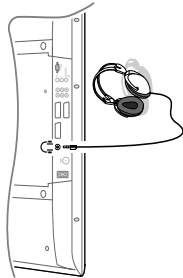
Search



Selecting a word
On the keyboard on screen you can type in a random word you want to search for in the teletext pages. Whether upper- or lowercase is used has no influence.



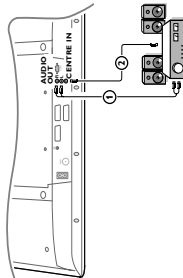
- ① Press the cursor right to enter the keyboard.
- ② Press the cursor left/right, up/down to select the characters, words or functions.
- ③ Press the **OK** key to confirm each character selected.
- ④ Select **Cancel** to cancel the word; **Space** to enter a space; **Delete** to delete the last character selected; **Shift** to switch between lowercase or capital characters; **Special** to display special characters on the keyboard and press the **OK** key.
- ⑤ Press the cursor left repeatedly to return to the Teletext menu again.

Headphone



- 1 Insert the plug into the headphone socket  as shown.
- 2 Press  on the remote control to switch off the internal loudspeakers of the TV.
The headphone impedance must be between 8 and 4000 Ohm. The headphone socket has a 3,5 mm jack.
In the Sound menu select **Headphone volume** to adjust the headphone volume.

Multi channel Surround receiver




- 1 Connect the audio cable to the multi channel Surround receiver and to **AUDIO OUT L** and **R** at the bottom of your TV **1**.
- 2 If you want the loudspeakers of your TV to act as centre speaker, also connect an audiolocable to the multi channel Surround receiver and to the **CENTRE IN** at the bottom of your TV **2**.
- 3 Select **Centre Input On** in the Source menu. See p. 9.

The loudspeakers of the TV will now only produce centre sound, the loudspeakers connected to the audio receiver will produce Surround Sound. The volume has to be controlled via the multi channel Surround receiver.

Note: No sound will be heard when a TV channel or external source is blocked via the Child lock menu (see p. 12).

To select connected equipment

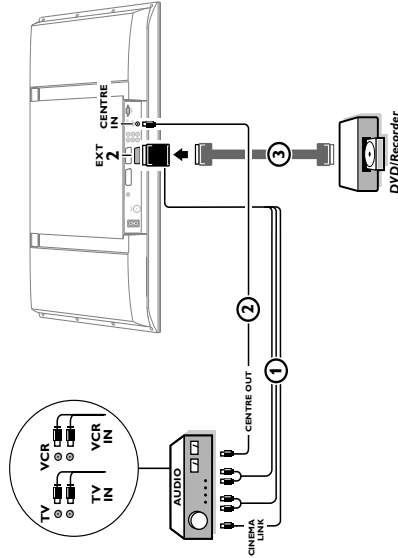
Press the  key on the remote control repeatedly, or select Source in the Setup menu (see p. 9) to select **EXT1**, **EXT2**, **EXT3**, **YPbPr** or **VGA** according to where you connected your equipment.

Remark : Most equipment (decoder, recorder) carries out the switching itself, when it is switched on.

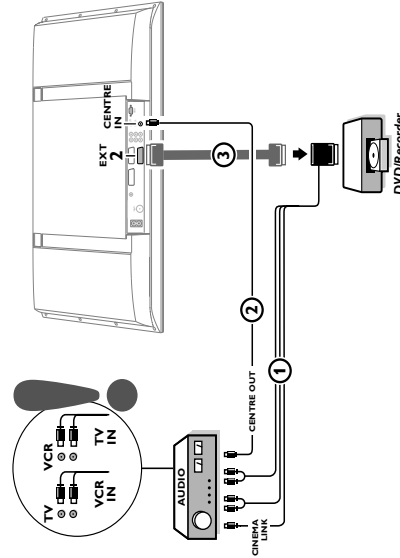
Cinema Link surround receiver

See the separate supplied Cinema Link instruction manual.

Attention: the sound info on screen will not correspond with the actual sound reproduction.

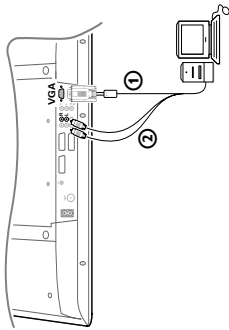


OR



Connect your computer

- 1 Connect one end of a VGA cable ① to the video card connector at the bottom of the TV.
Fix the connectors firmly with the screws on the plug.
- 2 In case of a Multimedia computer, connect the audio cable ② to the audio outputs of your Multimedia computer and to the **AUDIO R** (right) and **L** (left) inputs.

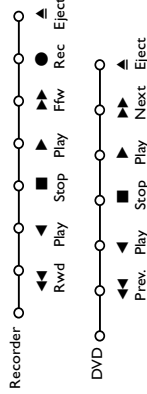


The **VGA IN** connector allows the following TV and monitor display modes:

EDTV	640/720 x 480p
HDTV	720 x 576p
VGA	1920 x 1080i
	640 x 480
SVGA	800 x 600
	60 Hz
	56 Hz

Recorder or DVD with EasyLink

The recorder (VCR or DVD+RW) or DVD can be operated with the remote control via the **Recorder** or **DVD** menu on screen.



- 1 Press the **MENU** key on the remote control.
- 2 Select the **Recorder** or **DVD** menu with the cursor up/down.
- 3 Press the cursor left/right, up/down to select one of the recorder or DVD functions.

The key for recording can be operated in the TV mode.
If your EasyLink recorder has the system standby function, when you press the key for 3 seconds, both TV and the recorder are switched to standby.

Audio- and video equipment keys

Most of the audio and video equipment from our range of products can be operated with the remote control of your TV.

Press one of the keys after you pressed the **VCR**, **DVD**, **AMP** or **SAT** key repeatedly according to the equipment you want to operate with this remote control. See Use of the remote control, p. 3.

	to switch to standby		to switch the menu on or off
	for pause (DVD , CD , VCR)		for chapter, channel, track selection
	for rewind (VCR , CD); search down (DVD , AMP)		digit entry
	for stop		tape index (VCR), select a DVD chapter, select a frequency (AMP)
	for fast forward (VCR , CD); search up (DVD/AMP)		VCR timer
	to select your choice of subtitle language (DVD); RDS news/TA (AMP); to shuffle play (CD)		surround on/off (AMP , CD)
	to select a DVD title; RDS display (AMP); info on screen (CD)		cursor up/down to select the next or the previous disc (CD)
	display information		cursor left/right to select the previous or following track (CD); to search up/down (AMP)

Note: When no action is undertaken within 60 seconds, the remote control returns to TV mode.

Submodes

The **SAT** mode can be customised according to the satellite receiver you want to operate: with **RC6** or **RC5** signalling standard.

Within TV mode, press the **OK** key together with: digit key 3 to select the **SAT RC-5** system digit key 4 to select the **SAT RC-6** system.



Record with your recorder with EasyLink

In TV mode, it is possible to start a direct recording of the programme which is being displayed on the TV screen.
Continue to press the record key on the remote control for more than 2 seconds.

Note:
Switching programme numbers on your TV does not disturb recording !
When recording a programme from a peripheral connected to **EXT. 1**, **EXT. 3** or **YPbPr**, you can not select another TV programme on the screen.

Tips

Ambient temperature	Do not hang up the monitor above a central heating or other heating sources.
Care of the screen	Clean the anti-reflex coated flat glass screen with a slightly damp soft cloth. Do not use abrasives solvents as it can damage the glass surface of the screen.
Plasma Display characteristics	<p>Caution: A video source (such as a video game, DVD, or video information channel) which shows a constant non-moving pattern on the monitor screen, can cause damage to the screen. When your Flat-Monitor is continuously used with such a source, the pattern of the non-moving portion of the game (DVD, etc.) could leave an image permanently on the screen. When not in use, turn the video source Off.</p> <p>Regularly alternate the use of such video sources with normal viewing. When switching over to another picture after having displayed the same still picture for a long time (many hours), it may happen that some parts from the previous picture will remain on screen due to a kind of memory effect. This ghost picture will disappear after some time. To avoid this effect change the pictures regularly or for PC use you can turn on a screen saver in your computer. Philips has built in an automatic shift of the picture in video mode every 5 minutes to avoid this effect and to prolong the life of the screen.</p> <p>Very incidentally and after a longer period of unuse (approx. 1 year) the screen may display some strange colour deficiencies. This is quite normal for plasma displays and these effects will disappear after the set has been turned on for some time.</p> <p>A plasma display consists of a high number of colour pixels. It is within industry standards that very few pixels (< 0.001%) may be defective, even for a new set. There is however no reason to doubt about the quality of the set.</p> <p>The plasma display technology operates with rare gases which are being influenced by air pressure.</p> <p>Up to an altitude of 2000 m above sea-level (local air pressure equal or above 800 hPa), the display is functioning fine. Operating the set at a higher altitude (lower air pressure), the picture becomes unstable and the picture performance is deteriorating. The plasma display might then also produce a humming sound. Bringing the set below 2000 m (local air pressure equal or above 800 hPa) it works fine again. Transportation has no influence.</p>
Control of peripheral equipment	The infrared radiation of the screen may influence the reception sensitivity of other peripherals. Solution: replace the batteries of the remote control or change position of other equipment. E.g. keep away a wireless headphone from within a radius of 1,5 m.
Transport	Keep the original packaging to transport the monitor if needed.
Poor Picture	<ul style="list-style-type: none"> Have you selected the correct TV system in the manual installation menu? Is your TV or house aerial located too close to loudspeakers, non-earthed audio equipment or neon lights, etc.? Mountains or high buildings can cause double pictures or ghost images. Sometimes you can improve the picture quality by changing the direction of the aerial. Is the picture or text unrecognisable? Check if you have entered the correct frequency. See Installation, Manual installation, p. 6. Are brightness, sharpness and contrast out of adjustment? Select Factory settings in the Setup, General menu, p. 8.

No Picture	<ul style="list-style-type: none"> Are the supplied cables connected properly? (The aerial cable to the TV, the other aerial to your recorder, the VGA cables to the display, the power cables.) Has the child lock been switched off? Is your PC switched on? Do you see a black screen and the indicator in front of the TV lights up green, this means that the display mode is not supported. Switch your VGA-source to a correct mode. In case of weak or bad signal, consult your dealer. <p>The low quality of some digital picture material may be the cause of digital image distortion. In this case select the Soft setting using the Picture menu, Smart Picture, without changing the picture settings manually.</p>
Digital distortion	
No sound	<ul style="list-style-type: none"> No sound on any channel? Check the volume isn't at minimum. Is the sound interrupted with the mute key . <p>Switch your TV off and then on again once. Never attempt to repair a defective TV yourself. Check with your dealer or call a TV technician.</p>
No solution found for your picture or sound problem?	
Menu	Have you selected the wrong menu? Press the MENU  key again to exit from the menu.
NEXTVIEW	<p>Orange indicator on front of the TV during standby / No NEXTVIEW info: See Acquisition and updating of NEXTVIEW information, p. 14.</p> <p>Displayed time is wrong: The broadcaster on programme number one does not transmit the correct local date and time. Use Reshuffle in the installation menu to place another broadcaster on programme number one.</p>
Remote control	<ul style="list-style-type: none"> Check if the remote control is in the correct mode. If your TV no longer responds to the remote control, the batteries may be dead. You can still use the MENU/OK key and the -/+ keys on top of your TV.
Standby	Your TV consumes energy in the standby mode. Energy consumption contributes to air and water pollution. Power consumption: 2 W.
No stable or not synchronised VGA picture	Check if you have selected the correct VGA mode in your PC. See the separate instruction manual with the monitor.
Miscellaneous	<ul style="list-style-type: none"> Ambient temperature: + 5~ + 40°C Maximum operating altitude: 2000 m / 6562 ft (min. air pressure 800 hPa) Mains: AC 95-264V 50/60 Hz Power consumption: around 290W Standby consumption: < 2W Weight (excl. packaging): Display: 35 kg Dimensions (wxhxd): 107 x 66 x 9 cm Wall mounting bracket included

Personal Notes:

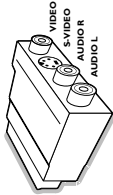
ERRATUM

English

Supplied adaptor

Use the scart to cinch adaptor to connect temporary peripheral equipment (camcorder; digital camera, game boy,...) to **EXTERNAL 3.**

Note: do not connect the CVBS and Y/C connector of one device at the same time.



Deutsch

Mitgelieferter Adapter

Der Cinch auf Scart Adapter wird gebraucht, um periphere Geräte (Camcorder, Digital Kamera, Telespiel,...) an **EXTERNAL 3** anzuschließen.

Anmerkung: Niemals den CVBS und Y/C Stecker eines Gerätes gleichzeitig einstecken.

Français

Adaptateur fourni

Utiliser l'adaptateur péritel/cinch pour connecter temporairement des appareils périphériques (caméscopes, appareils photos numériques, consoles de jeu,...) sur **EXTERNAL 3.**

Remarque: ne pas raccorder de câble CVBS et Y/C sur un appareil en même temps.

Nederlands

Bijgevoegde adapter

Gebruik de scart naar cinch adapter om tijdelijke rand-apparatuur (camcorder digitale camera, game boy,...) aan te sluiten op **EXTERNAL 3.**

Opmerking: Sluit de CVBS en Y/C connector van één en hetzelfde randapparaat niet gelijktijdig aan.

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4. Mechanical Instructions

Index of this chapter:

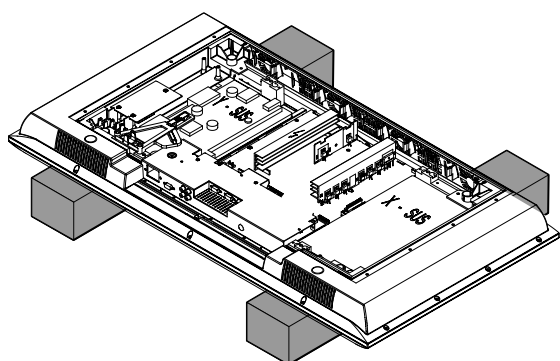
1. Service Positions
2. Assy / PWB Removal
3. Re-assembly

Notes:

- Figures below can deviate slightly from the actual situation, due to the different set executions.
- Follow the disassemble instructions in described order.

4.1 Service Positions

4.1.1 The Foam Bars



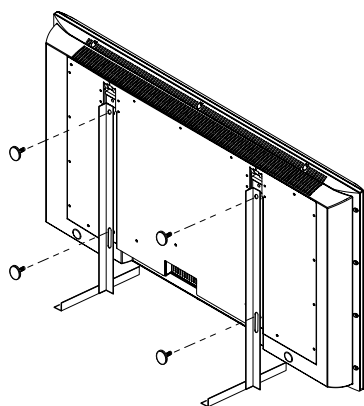
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Figure 4-1 Foam bars

To put the TV set in its service position place it upside down on a table top, use foam cushions or a protection sheet. The foam bars (order code 3122 785 90580 for two pieces) can be used for all types and sizes of Flat TVs. By laying the plasma or LCD TV flat on the (ESD protective) foam bars, a stable situation is created to perform measurements and alignments. By first placing a mirror flat on the table under the TV you can easily see if something is happening on the screen.

Caution: When using a sheet, the plasma screen can become very hot. Therefore, it is advised to use foam cushions

4.1.2 The Aluminium Stands



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Figure 4-2 Aluminium stands

The aluminium stands (order code 3122 785 90480 for two pieces) can also be used to do measurements and alignments, also they are very suitable to perform duration tests. With this stands the set does not take much space, has no risk of over

heating, and/or falling. The stands can be mounted and removed quickly and easily with use of the provided screws, which can be tightened and loosened manually without the use of tools.

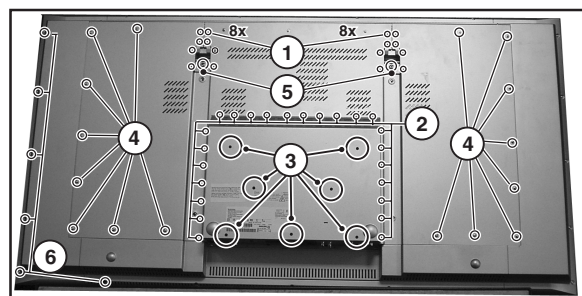
The stands are also handy to replace the screen.

Caution: Only use the screws provided, otherwise it is possible to damage the monitor inside.

4.2 Assy/PWB Removal

4.2.1 Metal Back Plate

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



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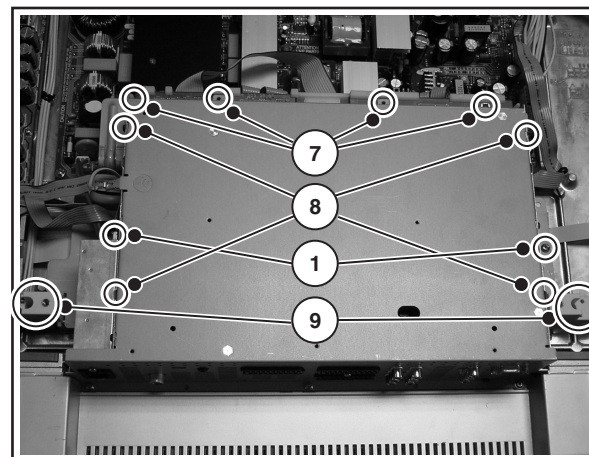
Figure 4-3 Rear cover removal

Notes:

- It is not needed to remove the T8 screws (1) around and above the "stand holes".
 - It is also not needed to remove the T8 screws (2) around the SSB outer box.
1. Remove all T10 metric screws (3) from the centre part of the metal back plate.
 2. Remove all T10 parker screws (4), some of them are indicated on the figure above.
 3. Remove two T20 screws (5).
 4. Lift the metal back plate from the cabinet. Make sure that wires and flat foils are not damaged during cover removal.

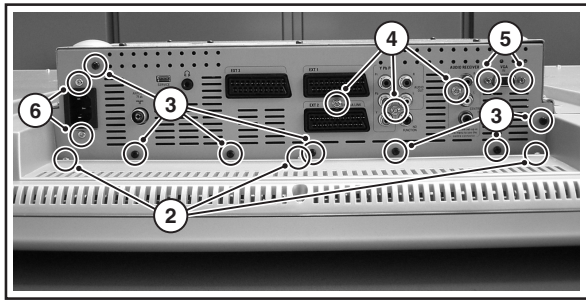
4.2.2 Small Signal Board

Small Signal Board (SSB) Box disassembly



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Figure 4-4 SSB Box. Top view

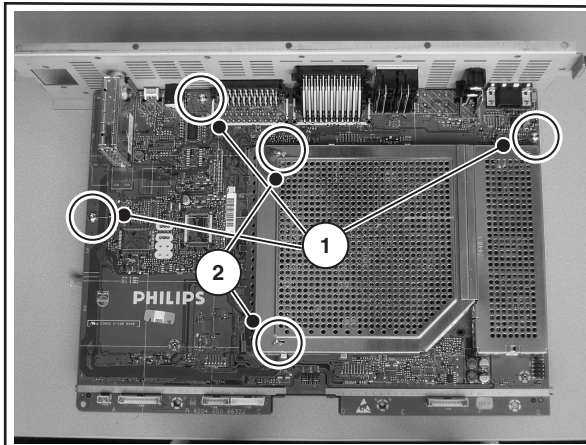


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Figure 4-5 SSB Box. Front view

1. Release the AC input cables from the Plasma Panel and SSB.
2. Remove the two mounting screws (1) at the both sides of the SSB Box.
3. Remove all mounting screws (2) at the front side of the SSB Box.
4. Remove all metric screws (3) at the front side of the SSB Box.
5. Remove all Parker screws (4) at the front side of the SSB Box.
6. Use a hex nut driver or pliers to remove both connector fixing screws (5) by the VGA connector.
7. Remove the two silver coloured metric mounting screws (6) by the mains cord.
8. Carefully turn upside-down the SSB Box. Remove the two mounting screws at the bottom side of the SSB box.
9. Turn the SSB Box back to the initial position. Release plastic clamps (7) at the topside of the SSB Box (see figure: "SSB Box. Top view"). Carefully use a flat screwdriver to release the metal clamps at the both sides of the SSB Box. Lift the shielding cover of the SSB Box.

SSB removal

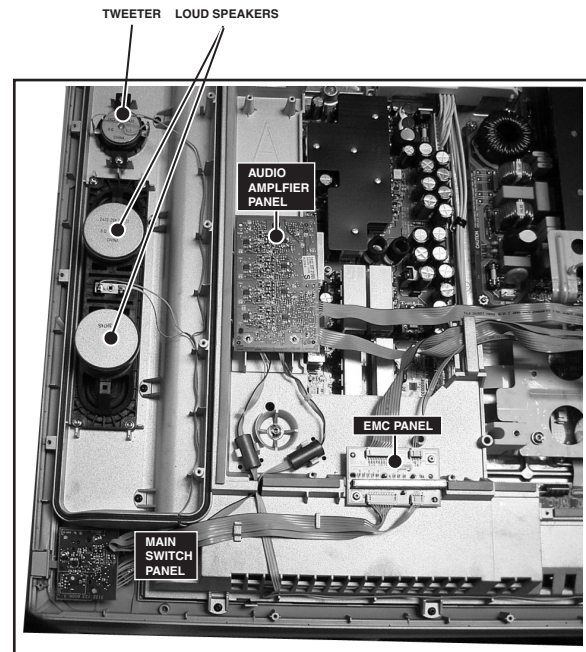


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Figure 4-6 SSB removal

1. Release all cable from the SSB.
2. Remove all mounting screws from the SSB (1).
3. Remove the SSB.

4.2.3 Audio Amplifier Panel



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Figure 4-7 Speaker and panel removal

1. Disconnect all cables from the panel.
2. Remove the fixing screws from the panel.
3. Remove the panel.

4.2.4 EMC Interface Panel and Main Switch Panel

See figure "Speakers and panels removal".

Note: Before removing the EMC Interface Panel and Main Switch Panel you have to remove the plastic rear cover.

1. Remove all T10 Parker screws (6) around edges of the plastic rear cover, some of them are indicated on figure "Rear cover removal".
2. Disconnect all cables from the panels.
3. Remove the fixing screws from the panels.
4. Remove the panels.

4.2.5 Plasma Panel

Make sure, that the power is switched "off" and that the necessary cables are disconnected.

Note: Before replacing the Plasma Panel, first remove SSB Box, Audio Amplifier Panel and EMC Interface Panel, as described above.

1. Remove the four PDP brackets, two of them are indicated (9) on the figure "SSB Box. Top view".
2. Remove all fixing screws from the Shielding Frame. Lift and remove the Shielding Frame.
3. Remove all fixing screws from the Plasma Panel. Lift and remove the Plasma Panel.

4.3 Set Re-assembly

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

Note: While re-assembling, make sure, that all cables are placed and connected in their original position

5. Service Modes, Error Codes, and Fault Finding

Index of this chapter:

1. Test points
2. Service Modes
3. Problems and solving tips (related to CSM)
4. ComPair
5. Error Codes
6. The blinking LED procedure
7. Protections
8. Repair tips
9. Software downloading

5.1 Test Points

The chassis is equipped with test points printed on the circuit board assemblies.

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, to get the same measurement results as given in this manual.
- To override SW protections.
- To start the blinking LED procedure.

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.
 - Smart modes.
 - Auto store of personal presets.
 - Auto user menu time-out.

How to enter SDM

Use one of the following methods:

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

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

- Short for a moment the two solder pads (item 9018) on the SSP, with the indication "SDM". Activation can be performed in all modes, except when the set has a problem with the main microprocessor.

Caution: If the SDM is entered via the pins, all the software-controlled protections are de-activated.

- Use the DST-emulation feature of ComPair.
- Use the "DEFAULT" button on the Dealer Service Tool (RC7150, this remote is no longer available).

After entering this mode, "SDM" will appear in the upper right corner of the screen.

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).

How to exit SDM

Use one of the following methods:

- Switch the set to STANDBY via the RC-transmitter.
- Press the "EXIT" button on the DST.
- Via a standard customer RC-transmitter: key in "00"-sequence.

5.2.2 Service Alignment Mode (SAM)

Purpose

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

Specifications

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

How to enter SAM

Use one of the following methods:

- Via a standard RC transmitter: key in the code "062596" directly followed by the "OSD [i+]" button. After entering SAM with this method a service warning will appear on the screen, you can continue by pressing any digit key on the RC.
- Short for a moment the two solder pads (item 9017) on the SSP with the indication "SAM". Depending on the software version, it is possible that a service warning will appear. You can continue by pressing any digit key on the RC.
- Use the DST-emulation feature of ComPair.
- Press the ALIGN button on the DST while the set is in the normal operation

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

Contents of SAM:

- **OPERATION HOURS.** Displays the accumulated total of operation hours (not the standby hours).
- **HARDWARE INFO.**
 - **ROM VERSION.** Displays the date of the software and the software version of the ROM (**example:** TP11EU_1.0_01234 = AAAABB_X.Y_NNNNN).
 - **AAAA=** the chassis name.

- **BB**= the region: EU= Europe, AP= Asia Pacific PAL/Multi, AN= Asia Pacific NTSC, US= USA, LT= LATAM.
 - **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).
 - **NNNNN**= last five digits of 12nc code software.
- **SW VERSION EPLD**. Displays the software version of the EPLD.
- **ERRORS**. (followed by maximal 10 errors). The most recent error is displayed at the upper left (for an error explanation see paragraph "Error Codes").
 - **DEFECTIVE MODULE**. Here the module that generates the error is displayed. If there are multiple errors in the buffer, which are not all generated by a single module, there is probably another defect. It will then display the message "UNKNOWN" here.
 - **RESET ERROR BUFFER**. When you press the "OK" button, the error buffer is reset.
 - **ALIGNMENTS**. This will activate the "ALIGNMENTS" sub-menu.
 - **DEALER OPTIONS**. Extra features for the dealers.
 - **SERVICE OPTIONS**. Extra features for Service.
 - **INITIALISE NVM**. When an NVM was corrupted (or replaced) in the former EM3 chassis, the microprocessor replaces the content with default data (to assure that the set can operate). However, all pre-sets and alignment values are gone now, and option numbers are not correct. Therefore, this was a very drastic way. In this chassis, the procedure is implemented in another way: The moment the processor recognises a corrupted NVM, the "initialise NVM" line will be highlighted. Now, you can do two things (dependent of the service instructions at that moment):
 - Save the content of the NVM via ComPair for development analysis, **before** initialising. This will give the Philips Service department an extra possibility for diagnosis (e.g. when Development asks for this).
 - Initialise the NVM (same as in the past, however now it happens conscious).
 - **STORE**. All options and alignments are stored when pressing the "OK"-button
 - **FUNCTIONAL TEST**. All devices are tested via the "OK" button. Eventual errors are displayed in the error buffer. The error buffer is not erased, the content returns when this test is terminated.
 - **DAILY MENUS**. With the "OK" button, you can go to the normal user menu. SAM is still active in the background. With the "MENU" button, you return from the user menu to SAM menu. This feature can be helpful to quickly change some settings in the user menu.
 - **SW MAINTENANCE**.
 - **UPGRADE**. More info see paragraph Software downloading.
 - **EVENTS**. Not useful for service purposes. In case of specific software problems, the development department can ask for this info.
 - **BDM INFO**. Broadcast Debug Menu info. The purpose of this menu is to debug the broadcast, **not** the TV. The menu gives an overview of what is received on the current preset.

Following items are displayed:

Presetnr:	--	UTC:	--:--:--
Presetname:	-----	LTO:	--:--:--
		Time:	--:--:--
		Date:	--/--/----
CNI NVM:	----		
CNI F1:	----		
CNI F2:	----	Time TXT:	--:--:--
CNI VPS:	----	Time 8/30 F1:	--:--:--
Morning Prog:	---	Date 8/30 F1:	--/--/----
Name 8/30 F1:	-----	LTO 8/30 F1:	--:--:--
Name 8/30 F2:	-----		
Name TXT:	-----	WSS G1:	----
Signal Strength:	---	WSS G2:	----
		WSS G3:	----
		WSS G4:	----
EPG Service:	---		

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Figure 5-1 Broadcast debug menu overview.

Table 5-1 Broadcast debug menu explanation

Item	Source	Description
Presetnr	Set	Presetnumber of the current selected preset.
Presetname	Set	Presetname of the current selected preset.
CNI NVM	Broadcaster	CNI number stored in NVM for the current preset.
CNI F1	Broadcaster	CNI number from transmitted Packet 8/30 Format 1.
CNI F2	Broadcaster	CNI number from transmitted Packet 8/30 Format 2.
CNI VPS	Broadcaster	CNI number from transmitted VPS line.
Morning Prog	Broadcaster	"ARD" or "ZDF" according to dedicated bit in 8/30 Format 1.
Name 8/30 F1	Broadcaster	Name extracted from status message of 8/30 Format 1.
Name 8/30 F2	Broadcaster	Name extracted from status message of 8/30 Format 2.
Name TXT	Broadcaster	Name extracted from TXT header.
Signal Strength	FBX	Noise figure measured for selected preset.
EPG Service	Set	EPG Service stored in NVM for current preset displayed as "TXT", "MCP", "SCP", "OCP".
UTC	Set	UTC (Universal Time Code formerly known as Greenwich Mean Time) used in the set.
LTO	Set	LTO (Local Time Offset) used in the set. Used by EPG for all Nextview displays. (= Time TXT header - Time 8/30 F1)
Time	Set	Current time running in the set. Was extracted at startup, then maintained by software.
Date	Set	Current date running in the set. Was extracted at startup, then maintained by software.
Time TXT	Broadcaster	TXT header time from the selected preset.
Time 8/30 F1	Broadcaster	UTC time from 8/30 Format 1.
Date 8/30 F1	Broadcaster	Date from 8/30 Format 1.
LTO 8/30 F1	Broadcaster	LTO from 8/30 Format 1.
WSS G1	Broadcaster	WSS Group 1 (Aspect Ratio) bits 0 1 2 3
WSS G2	Broadcaster	WSS Group 2 (Enhanced Services) bits 4 5 6 7
WSS G3	Broadcaster	WSS Group 3 (Subtitles) bits 8 9 10
WSS G4	Broadcaster	WSS Group 4 (Reserved) bits 11 12 13

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.

How to exit SAM

Use one of the following methods:

- Press the "MENU" button on the RC-transmitter, or
- Switch the set to STANDBY via the RC-transmitter, or
- Press the "EXIT" button on the DST.

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

When a customer is having problems with his TV-set, he can call his dealer. The service technician can then ask the customer to activate the CSM, in order to identify the status of the set. Now, the service technician can judge the severity of the complaint. In many cases, he can advise the customer how to solve the problem, or he can decide if it is necessary to visit the customer.

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

How to enter CSM

Use one of the following methods:

- Press the "MUTE" button on the RC-transmitter **simultaneously** with the "MENU" button on the TV (top control) for at least 4 seconds.
- Key in the code "123654" via the standard RC transmitter.

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

How to navigate

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

Contents of CSM**CUSTOMER SERVICE MENU 1**

- **SOFTWARE VERSION (example: TP11EU_1.0_01234).** Displays the built-in software version. In case of field problems related to software, software can be upgraded (for more details, see paragraph Software downloading). You will find details of the software versions in the chapter "Software Survey" of the "Product Survey - Colour Television" publication. This publication is generated four times a year.
- **SOFTWARE VERSION EPLD.** The 12NC-number of the built-in EPLD software.
- **FEATURE BOX.** The 12NC-number of the built-in Feature Box software.
- **SET TYPE.** This information is very helpful for a helpdesk/workshop as reference for further diagnosis. In this way, it is not necessary for the customer to look at the rear of the TV-set.
- **CODE 1.** Gives the latest five errors of the error buffer. As soon as the built-in diagnose software has detected an error the buffer is adapted. The last occurred error is displayed on the leftmost position. Each error code is displayed as a 3-digit number. When less than 10 errors occur, the rest of the buffer is empty (000). See also paragraph Error Codes for a description.
- **CODE 2.** Gives the first five errors of the error buffer. See also paragraph Error Codes for a description.

- **VOLUME.** Gives the last status of the volume as set by the customer. The value can vary from 0 (volume is minimum) to 100 (volume is maximum). Volume values can be changed via the volume key on the RC-transmitter.
- **BRIGHTNESS.** Gives the last status of the brightness as set by the customer. The value can vary from 0 (brightness is minimum) to 100 (brightness is maximum). Brightness values can be changed via the "CURSOR LEFT" and "CURSOR RIGHT" keys on the RC-transmitter after pressing the "MENU" button and selecting "PICTURE" and "BRIGHTNESS".
- **CONTRAST.** Gives the last status of the contrast as set by the customer. The value can vary from 0 (contrast is minimum) to 100 (contrast is maximum). Contrast values can be changed via "CURSOR LEFT" and "CURSOR RIGHT" keys on the RC-transmitter after pressing the "MENU" button and selecting "PICTURE" and "CONTRAST".

CUSTOMER SERVICE MENU 2

- **COLOUR.** Gives the last status of the colour saturation, as set by the customer. The value can vary from 0 (colour is minimum) to 100 (colour is maximum). Colour values can be changed via "CURSOR LEFT" and "CURSOR RIGHT" keys on the RC-transmitter after pressing the "MENU" button and selecting "PICTURE" and "COLOUR".
- **HUE.** Only relevant for NTSC-signals (e.g. some NTSC-DVD-discs).
- **SHARPNESS.** Gives the sharpness value. The value can vary from 0 (sharpness is minimum) to 7 (sharpness is maximum). In case of bad antenna signals, a too high value of the sharpness can result in a noisy picture. Sharpness values can be changed via the "CURSOR LEFT" and "CURSOR RIGHT" keys on the RC-transmitter after pressing the "MENU" button and selecting "PICTURE" and "SHARPNESS".
- **HEADPHONE VOLUME.** Gives the last status of the headphone volume, as set by the customer. The value can vary from 0 (volume is minimum) to 100 (volume is maximum). Headphone volume values can be changed via the "CURSOR LEFT" and "CURSOR RIGHT" keys on the RC-transmitter after pressing the "MENU" button and selecting "SOUND" and "HEADPHONE VOLUME".
- **SURROUND MODE.** Indicates the by the customer selected surround mode (or automatically chosen mode). Possible values are "OFF", "INCREDIBLE SURROUND" OR "DOLBY VIRTUAL". These settings can be influenced after pressing the "MENU" button and selecting "SOUND" and "SURROUND MODE". It can also have been selected automatically by signalling bits (internal software).
- **TUNER FREQUENCY.** Indicates the frequency the selected transmitter is tuned to. The tuner frequency can be changed via the "CURSOR LEFT" and "CURSOR RIGHT" keys for fine tune after opening the installation menu and selecting "INSTALL" and "MANUAL INSTALL".
- **DIGITAL OPTION.** Gives the selected digital mode, "PROGRESSIVE SCAN", "MOVIE PLUS" or "PIXEL PLUS". Change via "MENU", "PICTURE", "DIGITAL OPTIONS".
- **TV SYSTEM.** Gives information about the video system of the selected transmitter.
 - BG: PAL BG signal received.
 - DK: PAL DK signal received.
 - I: PAL I signal received.
 - L/La: SECAM L/La signals received.
 - M: NTSC M signal received with video carrier on 38.9 MHz.
- **BALANCE.** Indicates the balance settings, between "-50" and "+50". Change via "MENU", "SOUND", and "BALANCE". Not applicable for Dolby Pro Logic sets.

CUSTOMER SERVICE MENU 3

- **CENTRE MODE.** Indicates if centre mode is set "ON" or "OFF". When centre mode is on, all TV speakers are used

as one centre speaker. Change Centre mode via "MENU", "SETUP", "SPEAKERS", and "CENTRE MODE".

- **DNR.** Gives the selected DNR setting (Dynamic Noise Reduction), "OFF", "MINIMUM", "MEDIUM", or "MAXIMUM". Change via "MENU", "PICTURE", "DNR"
- **NOISE FIGURE.** Gives the noise ratio for the selected transmitter. This value can vary from 0 (good signal) to 127 (average signal) and to 255 (bad signal). For some software versions, the noise figure will only be valid when "Active Control" is set to "medium" or "maximum".
- **SOURCE.** Indicates which source is used and the video/audio signal quality of the selected source. (Example: Tuner, Video/NICAM) Source: "TUNER", "EXT1", "EXT2", "EXT3", "EXT4", "SIDE", "AV1", "AV2", "AV3" or "AV4". Video signal quality: "VIDEO", "S-VIDEO", "RGB 1FH", "YPBPR 1FH 480P", "YPBPR 1FH 576P", "YPBPR 1FH 1080I", "YPBPR 2FH 480P", "YPBPR 2FH 576P", "YPBPR 2FH 1080I", "RGB 2FH 480P", "RGB 2FH 576P" or "RGB 2FH 1080I". Audio signal quality: "STEREO", "SPDIF 1", "SPDIF 2", or "SPDIF".
- **AUDIO SYSTEM.** Gives information about the audio system of the selected transmitter: "ANALOGUE MONO", "ANALOGUE STEREO", "PCM 2/0", "DD 1/0", "DD 2/0 LrRt", "DD 2/0 L0R0", "DD 2/1", "DD 2/2", "DD 3/0", "DD 3/1", "DD 3/2", "DD 1+1", "MPEG 1/0", "MPEG 2/0", "MPEG 2/0 LrRt", "MPEG 2/1", "MPEG 2/2", "MPEG 3/0", "MPEG 3/1", "MPEG 3/2", "MPEG 1+1" or "MPEG 2+2".
- **TUNED BIT.** Gives information about the tuning method of the stored pre-set. If a channel is found via "automatic installation", you will see the value "YES". When you change this (automatically found) frequency via "fine tune" adjustment (installation menu - manual installation), the displayed value will change to "NO". Therefore, when you see the value "NO" in this line, it is an indication that the received channel is a non-standard signal (e.g. of a VCR).
- **SURROUND SPEAKERS.** Not applicable in this set.
- **ON TIMER.** Indicates if the "On Timer" is set "ON" or "OFF" and if the timer is "ON" also displays start time, start day and program number. Change via "MENU", "TV", "FEATURES", and "ON TIMER".
- **PRESET LOCK.** Indicates if the selected preset has a child lock: "LOCKED" or "UNLOCKED". Change via "MENU", "TV", "FEATURES", "CHILD LOCK", and "CUSTOM LOCK".
- **CHILD LOCK.** Indicates the last status of the general child lock: "UNLOCK", "LOCK", or "CUSTOM LOCK". Change via "MENU", "TV", "FEATURES", "CHILD LOCK", and "LOCK".

CUSTOMER SERVICE MENU 4

- **AGE LOCK.** Indicates the last status of the EPG rating for child lock: "OFF", "4 YEARS", "6 YEARS", "8 YEARS", "10 YEARS", "12 YEARS", "14 YEARS" or "16 YEARS". This is only displayed if child lock is set to "CUSTOM LOCK"
- **LOCK AFTER.** Indicates at what time the child lock is set: "OFF" or e.g. "18:45" (lock time). This is only displayed if child lock is set to "CUSTOM LOCK"
- **CATEGORY LOCK.** Indicates the last status of the EPG theme childlock: "MOVIES", "NEWS", "SHOWS", "SPORTS", "CHILDREN", "MUSIC", "CULTURE", or "SERIES". This is only displayed if child lock is set to "CUSTOM LOCK". It is possible that more than one value is shown.
- **PROGRAM CATEGORY.** Indicates the theme of the selected transmitter: "MOVIES", "NEWS", "SHOWS", "SPORTS", "CHILDREN", "MUSIC", "CULTURE", or "SERIES".
- **TV RATINGS LOCK.** Only applicable for US.
- **MOVIE RATINGS LOCK.** Only applicable for US.
- **V-CHIP TV STATUS.** Only applicable for US.
- **V-CHIP MOVIE STATUS.** Only applicable for US.
- **OPTIONS 1.** Gives the option codes of option group 1 as set in SAM (Service Alignment Mode).
- **OPTIONS 2.** Gives the option codes of option group 2 as set in SAM (Service Alignment Mode).

CUSTOMER SERVICE MENU 5

- **AVL.** Indicates the last status of AVL (Automatic Volume Level): "ON" or "OFF". Change via "MENU", "TV", "SOUND", "AVL"
- **DELTA VOLUME.** Indicates the last status of the delta volume for the selected preset as set by the customer: from "-12" to "+12". Change via "MENU", "TV", "SOUND", "DELTA VOLUME".

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.

5.3 Problems and Solving Tips (related to CSM)

Note: Below described problems are all related to the TV settings (visible in the CSM menu). 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

Snowy/noisy picture

1. Check in CSM line NOISE FIGURE. In case the value is "127" or higher, and the value is also high on other programs, check the aerial cable/aerial system. For some software versions, the noise figure will only be valid when "Active Control" is set to "medium" or "maximum".
2. Check in CSM lines SHARPNESS and NOISE FIGURE. In case the value of line SHARPNESS is "3" or "4" and the value of line NOISE FIGURE is high ("127" or higher), decrease the "Sharpness" value.

Picture too dark

1. Press "Menu", "TV", "Picture", "Smart Picture". 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 line BRIGHTNESS and CONTRAST. If the value of these lines is low (< "10"), increase the "Brightness" or the "Contrast" value via the user menu.

Picture too bright

1. Press "Menu", "TV", "Picture", "Smart Picture". 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 CONTRAST. If the value of these line is high (> 50), decrease the "Brightness" value or increase the "Contrast" value via the user menu.

White line around picture elements and text

1. Press "Menu", "TV", "Picture", "Smart Picture". 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". If the value is high, decrease it. The new value is automatically stored for all TV channels.

No picture

Check in CSM line TUNED BIT. In case the value is "No", install the required program again. Open the installation menu and perform manual installation.

No picture

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

No picture or unstable picture

A scrambled or decoded signal is received.

Black and white picture

Check in CSM line COLOUR. In case the value is low (< "10"), increase the "Colour" value via the user menu. 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 TV SYSTEM. If a "strange" system pops up, something has gone wrong during installation. Re-install the channel.
2. If in CSM line TV SYSTEM is "L", the installed system for this pre-set is "France", while "West Europe" 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 "MENU", "TV", "PICTURE", "SMART PICTURE". In case picture improves, decrease the contrast value. The new value(s) are automatically stored for all TV channels.
2. Check line "Contrast". The value is high (> 50). Decrease the contrast value.

5.3.2 Sound Problems**No sound from left and right speaker**

Check line "Volume". The value is low. 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 line "Volume". The value is high. 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:

- Automatic (by communication with the television): 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 the micro controller of the television. 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): Automatic diagnosis is only possible if the micro controller of the television is working correctly and only to a certain extent. When this is not the case, ComPair will guide you through the faultfinding tree by asking you questions (e.g. *Does the screen give a picture? Click on the correct answer: YES / NO*) and showing you examples (e.g. *Measure test-point 17 and click on the correct oscillogram you see on the oscilloscope*). You can answer by clicking on a link (e.g. text or a waveform picture) that will bring you to the next step in the faultfinding process.

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

Beside 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.

5.4.3 Stepwise Start-up

Under normal circumstances, a fault in the power supply, or an error during start-up, will switch the television to protection mode. ComPair can take over the initialisation of the television. In this way, it is possible to distinguish which part of the start-up routine (hence which circuitry) is causing the problem. Take notice that the transition between two steps can take some time, so give the set some time to reach a stable state. During the transition time, the LED can blink strangely.

Stepwise start-up explanation

This is realised via ComPair and is very helpful when a **protection** is activated (see also chapter "Protections"). The following diagram shows the start-up procedure of the set. Every step of the stepwise start-up (also called trapped start-up) in the diagram corresponds with the number of times the led blinks.

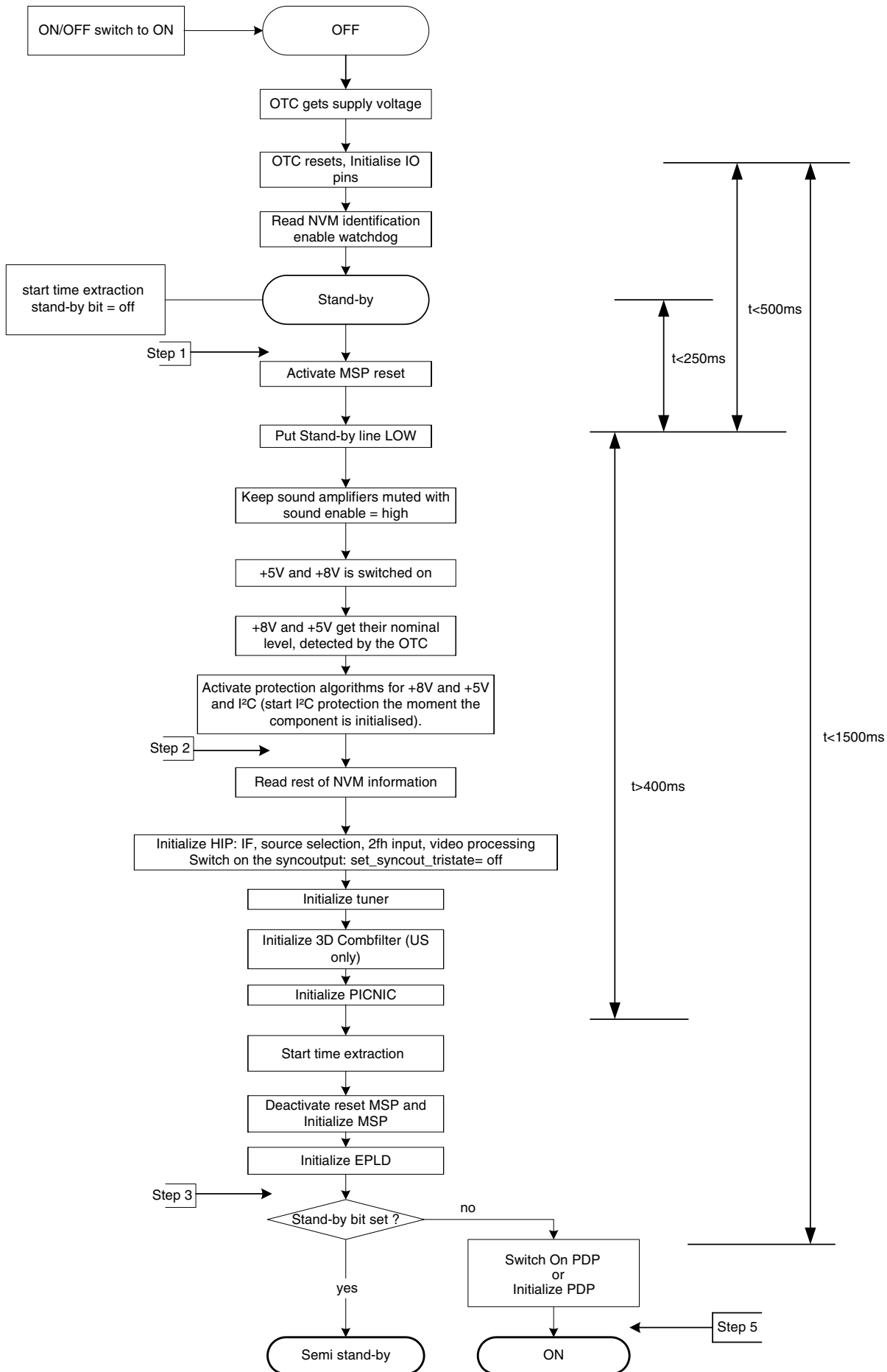


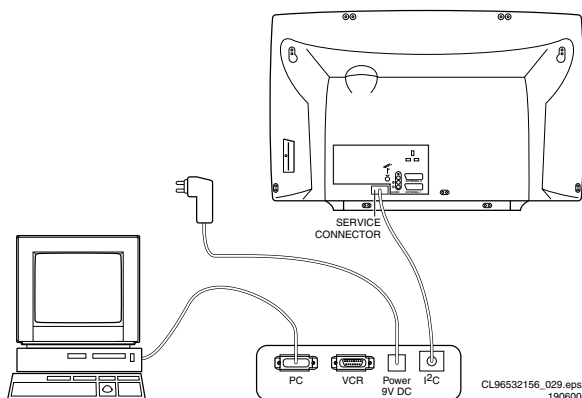
Figure 5-2 Stepwise start-up diagram.

Note (*):

- When the set is in stepwise mode and, due to stepping-up, a protection is activated, the set will really go into protection (blinking LED). The set will not leave the stepwise-mode however. If state X is the state where the set went to protection, stepwise start-up will return to state X-1. At state (X-1) diagnostic measurements can be performed. Also, in the short time the set is in state X but not yet in protection, you can also do some measurements.

5.4.4 How To Connect

- First, install the ComPair Browser software (see the Quick Reference Card for installation instructions).
- Connect the RS232 interface cable between a free serial (COM) port of your PC and the PC connector (marked with "PC") of the ComPair interface.
- Connect the mains adapter to the supply connector (marked with "POWER 9V DC") of the ComPair interface.
- Switch the ComPair interface "OFF".
- Switch the television set "OFF" with the mains switch.
- Connect the ComPair interface cable between the connector on the rear side of the ComPair interface (marked with "I2C") and the ComPair connector at the rear side of the TV.
- Plug the mains adapter in a mains outlet, and switch the interface "ON". The green and red LEDs light up together. The red LED extinguishes after approx. 1 second while the green LED remains lit.
- Start the ComPair program and read the "Introduction" chapter.

**Figure 5-3 ComPair interface connection****5.4.5 How To Order**

ComPair order codes (EU/AP/LATAM):

- 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 (update): 3122 785 60070 (year 2002), 3122 785 60110 (year 2003).
- SearchMan32 CD (update): 3122 785 60080 (year 2002), 3122 785 60120 (year 2003).
- ComPair interface cable: 3122 785 90004.
- ComPair firmware upgrade IC: 3122 785 90510.
- Transformer Europe: 4822 727 21632.
- Transformer UK: 4822 727 21633.

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

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 "RESET ERROR BUFFER" 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

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).

There are various errors:

- I2C device errors.
- I2C bus errors.
- Protection errors.
- Errors not related to an I2C device, but of importance:
 - FALCONIC (ERROR 26)**: at start-up, after initialisation of the PICNIC, the presence of the FALCONIC can be checked.
 - EAGLE (ERROR 27)**: at start-up, after initialisation of the PICNIC, the presence of the Eagle can be checked.

Table 5-2 Error Code Table

Error	Device	Description	Def. item	Def. Module indication	Diagr.
1	M24C32	NVM, spontaneous blinking error 1	7011	Control	B5a
3	SAA4978	PICNIC	7713	Feature Box	B3a
4	Supply 5 V	5V protection	/	+5V Supply	B5a
5	Supply 8 V	8V protection	/	+8V Supply	B5a
6	Slow I2C bus blocked	Spontaneous blinking error 6	/	Slow I2C Blocked	/
8	TDA932x	HIP High-end Input Processor	7323	Chroma IF IO	B2
13	UV1318/...	Tuner protection	1T01	Tuner	B13
14	MSPxxx	ITT sound processor	7A02	Audio module	B6a
18	Fast I2C bus blocked	Spontaneous blinking error 18	/	Fast I2C Blocked	/
21	M62320P	I/O Expander	7P56	Video Dual Screen	B15b
26	SAA4992	Falonic	7718	+3V (FBX) Supply	B3b
27	T8F24EF	Eagle	7724	+3V (FBX) Supply	B3c
32	M29W400BT	Flash Ram (EPG)	7012	EPG Memory	B5a
53	AD9883A	AD converter 2fh input	7L01	HD	B19c
55	3V3_PDP	One of the voltages is not ok + protection error	/	Supply	/
56	EPLD	EPLD error	7V01	Video control	B19d,f
76	Audio Amplifier	Audio DC protection	-	-	A
83	TEA6422	Source select matrix audio	7117	Audio Source Select	B14d

Note:

- Error codes 1, 6, or 18 are protection codes and in this case, supplies of some circuits will be switched "OFF". Also, in protection, the LED will blink the number of times equivalent to the most recent error code.

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 entered, the front LED will show (blink) the contents of the error-buffer. Error-codes > 10 are shown as follows:

- A long blink of 750 ms (which is an indication of the decimal digit),
- A pause of 1.5 s,
- "n" short blinks (where "n" = 1 - 9),
- When all the error-codes are displayed, the sequence finishes with a LED blink of 3 s,
- The sequence starts again.

Example: Error 12 9 6 0 0.

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

- 1 long blink of 750 ms (which is an indication of the decimal digit) followed by a pause of 1.5 s,
- 2 short blinks followed by a pause of 3 s,
- 9 short blinks followed by a pause of 3 s,
- 6 short blinks followed by a pause of 3 s,
- 1 long blink of 3 s to finish the sequence,
- The sequence starts again.

Note: If errors 1, 6, or 18 occur, the LED always gives the last occurred error even if the set is NOT in service mode.

5.6.2 How to Enter

Use one of the following methods:

- Enter the SDM (only via soldering pads marked "SDM" on SSP). The blinking front LED will show the entire contents of the error buffer (this works in "normal operation" mode and in "protection" mode).
- Transmit the commands "MUTE" - "062500" - "OK" with a normal RC. The complete error buffer is shown. Take notice that it takes some seconds before the blinking LED starts.
- Transmit the commands "MUTE" - "06250x" - "OK" with a normal RC (where "x" is a number between 1 and 5). When x= 1 the last detected error is shown, x= 2 the second last error, etc.... Take notice that it takes some seconds before the blinking LED starts.
- "DIAGNOSE X" with the DST (where "x" is a number between 1 and 5). When x= 1 the last detected error is shown, x= 2 the second last error, etc.... When x = 0 all errors are shown.

5.7 Protections

5.7.1 Introduction

This chassis has only one microprocessor (OTC), which remains active during Standby. This because power of the microprocessor and the attached memory chip set is coming from the 3V3 supply, which is derived from the 5V Standby-circuitry. Therefore, in both Power-on as in Standby mode, the microprocessor is connected to this power supply.

If a fault situation is detected, an error code will be generated and if necessary, the set is put in protection mode. The protection mode is indicated by the blinking of the front LED at a frequency of 3 Hz (or by a coded blinking in special cases).

The content of the error buffer can be read via the service menu (SAM), the blinking LED procedure or via DST/ComPair.

To get a quick diagnosis, this chassis has three service-modes implemented:

- The **Customer Service Mode** (CSM).
- The **Service Default Mode** (SDM). Start-up of the set in a predefined way.
- The **Service Alignment Mode** (SAM). In this mode, items of the set can be adjusted via a menu.

You can enter both SDM and SAM modes via the "service pads" on the SSP, via an RC-transmitter (DST or standard RC), or via ComPair. It is not possible to enter the SAM in "standby"; the TV has to be in "normal operation" mode.

The "Protection Diagram" shows the structure of the protection system. See diagram below.

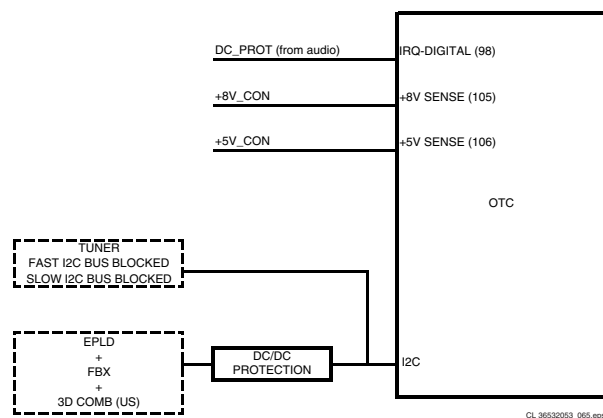


Figure 5-4 Protection diagram.

There are several types of protections:

- I2C related protections.
- OTC related protections (via polling on I/O pins or via algorithms).
- Hardware protection

All protections are explained below.

5.7.2 I2C Related Protections

In normal operation, some registers of the I2C controlled ICs are refreshed every 200 ms. During this sequence, the I2C busses and the I2C ICs are checked.

An I2C protection will take place if the SDA and SCL lines are short-circuited to ground, or to each other. An I2C error will also occur, if the power supply of the IC is missing.

3V3_PDP protection: When the 3V3 supply is short-circuited or interrupted the set switches off and goes into protection. The FBX, EPLD IC and 3D comb (US only) have no supply voltage and give no acknowledge. In this case the set should go into protection. An error code is written in the NVM: 3V3_PDP error.

FBX protection: the FBX protection is not available anymore.

5.7.3 OTC Related Protections

If a protection is detected at an OTC input, the OTC will start to scan all protection inputs every 200 ms for 5 times. If the protection on one of the inputs is still active after 1 s, the microprocessor will put the set in the protection mode. Before the scanning is started, a so-called “ESD refresh” is carried out. This is done, because the interrupt on one of the inputs is possibly caused either by a flash or by ESD. As a flash or ESD can influence IC settings, the HIP, MSP, 3D Comb (US only) and wireless module (not used in this set) are initialised again, to ensure the normal picture and sound conditions of the set.

8 V and 5 V protections: The microprocessor senses the presence of the 8 V and 5 V (via the “+5V_CON” and “+8V_CON” lines). If one (or both) of these voltages is (are) not present, an error code is stored in the error buffer of the NVM, and the set is put in the protection mode.

Audio DC protection: The OTC senses if the audio module is in protection via IRQ-DIGITAL (pin 98 of OTC). If this is the case, the OTC puts the set in protection.

5.7.4 Hardware Protection

Short-circuiting the 3V3 supply from the PDP will bring the TV in protection mode. The absence of the 3V3 supply line is also sensed via I2C and will be mentioned in the error overview.

5.8 Repair tips

5.8.1 3V3 Supply

As mentioned above, the 3V3 supply is switched “off” when something goes wrong (detection of a missing 3V3 supply at one of the devices supplied by the 3V3). Because of this, the set goes to protection (I2C protection). Error code 55 is logged. For further diagnoses of the SSB, you need to overrule the I2C protection: put the set in Service Default Mode by means of the solder pads on the SSB. Connect an external 3V3 supply at connector 1Y81 (B20) and make sure the current is limited to approximately 1200 mA. If the supplied current exceeds 1100 mA (approximately normal working current) you can conclude that one of the devices supplied by 3V3 is short-circuited on the SSB. If the current does not exceed 1100mA the supply of the PDP is defective.

5.8.2 ComPair

This chassis does not have an IR transmitting LED (as in MG-sets). Therefore, a “Service” (ComPair) connector is implemented at the rear side of the set, which is directly accessible (as in A10-, EM2E-, EM3E and EM5E-sets). In addition to this, there is also a blinking LED procedure to show the contents of the error buffer.

When you use ComPair, you have the possibility to activate a “stepwise start-up” mode. With this mode, you can initiate the start-up sequence step by step. This also means that in certain steps, some protections are not activated. This is sometimes very convenient during repair.

5.8.3 Protections

Activating SDM via the “service pads” will overrule the processor-controlled protections, but not the hardware protections. This means, that the A/D-input protections (5 and 8 V) and the I2C “not-acknowledging” info of FBX + EPLD + 3D Comb (US) and of the tuner are overruled.

Caution: When doing this, the service technician must know what he is doing, as it could lead to damaging the set.

5.8.4 Power Supply

The power supply is part of the PDP display which is not described in this manual. However for normal operation at least +9V-STBY and +9V-STBY-SW must be available, both are available on connector 1Y82 of SSB. When this is valid the standby voltage +5V2-DISP must be available otherwise OTC is not powered.

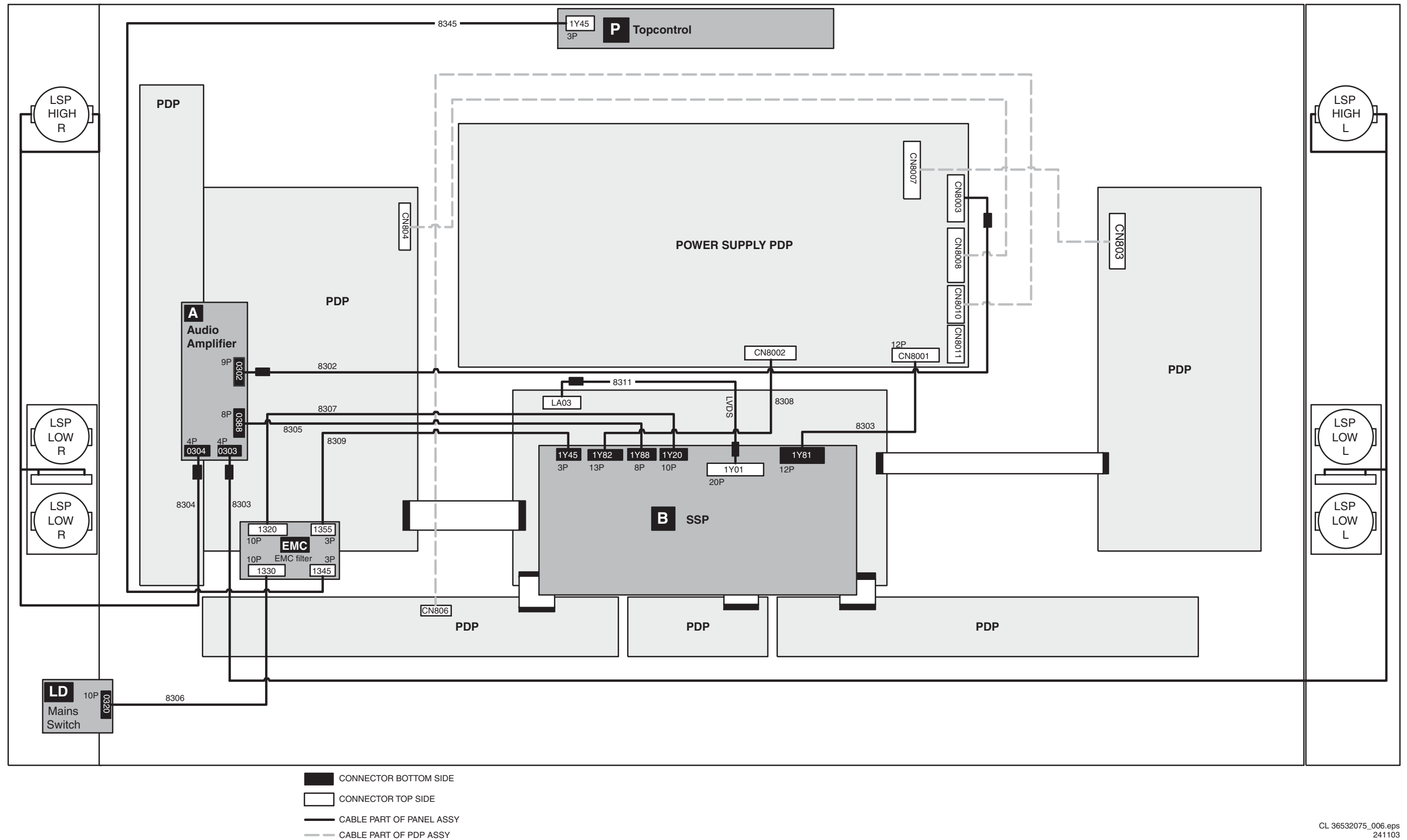
Table 5-3 Repair tips

Phenomenon	Possible Cause	Repair tip
No picture, LED blinking at 3 Hz.	Set is in protection due to various causes. For error codes see error-code list.	You have no picture, so: Read the error buffer via ComPair (error buffer is accessible when set is in protection, compare-file will guide you to this) Read the blinking LED information via standard remote command <mute>06250x<ok>. Or you read the error code sequence via standard remote command <mute>062500<ok>. When you have found the error, check the circuitry related to the supply voltage and I2C-communication or the circuitry that triggers the protection.
No picture, LED blinking with code 6-6-6 or 18-18-18.	No communication on slow I2C- or fast I2C-bus.	As processor cannot communicate with one of the 2 busses it the standby-led spontaneously starts blinking 6-6-6-etc or 18-18-18-etc... If in the error buffer somewhere is an error 6 or 18, these will have the highest priority starting the mentioned blinking. Measure dependent of the error on the I2C-bus which device is loading the bus. (Use I2C-overview)
No picture, LED blinking with code 1-1-1.	No communication on NVM-I2C bus to the uP.	As the uP cannot communicate with the NVM I2C bus, it spontaneously starts blinking 1-1-1. Note: when there is no access to the NVM, a lot of picture setting can go wrong.
No RC-reception. LED does not echo RC-commands.	uP circuitry or RC-receiver is defective.	In case the set does react on a local keyboard operation, you must check the RC-receiver circuitry (diagram LD).
Picture is not synchronised.	The sync is derived in the HIP.	Check crystals in the HIP circuit on bad contacts.
Picture is distorted.	Check video-path in Service Default Mode.	Investigate whether there is an error code present in the error buffer. In case there is one, check the I2C-bus and/or supply lines (see overview supply lines). Measure and check signal path Tuner-HIP-FBX-EPLD.
Picture with horizontal stripes.	Pixel Plus processing is malfunctioning.	Check functionality on circuitry (B3a, B3b, and B3c) of PICNIC (7713), FALCONIC (7718, EAGLE (7724) and/or field memories (7714, 7717, 7719, 7722 and 7723). Tip: the whole Pixel Plus chipset (3 ICs + 5 Field Memories) can be diagnosed via ComPair.
No menu, no OSD.	Probably a defective uP.	Measure test points B61to B64 on diagram B5A.
No NextView (EPG).	IC7012 defective or not powered.	Check circuitry around IC7012 on diagram B5A.
No Teletext.	IC7007 defective or not powered.	Check circuitry around IC7007 on diagram B5A. Check also B61 to B64 around uP on diagram B5A.
Problems caused by EPG (Electronic Program Guide). The TV set "hangs".	Problems with NextView EPG broadcasts.	To switch from EPG 2C3 to Teletext guide. Press for 4 seconds, simultaneously the Menu button on the TV and digit 0 on the remote. The option settings for NexTVView type and Flashram will not change.
NexTVView EPG is not functioning only Teletext guide.	EPG version 2C3 is switched off during production.	To switch from Teletext guide to EPG 2C3. Press for 4 seconds, simultaneously the Menu button on the TV and digit 1 on the remote. The option settings for NexTVView type and Flashram will not change.
Various symptoms, due to missing local supply voltage.	An interrupted fuse, NFR-resistor or connection.	When no symptom or error code leads you to a specific circuitry, use the supply lines overview (see supply lines overview), for a quick scan of all supply lines.

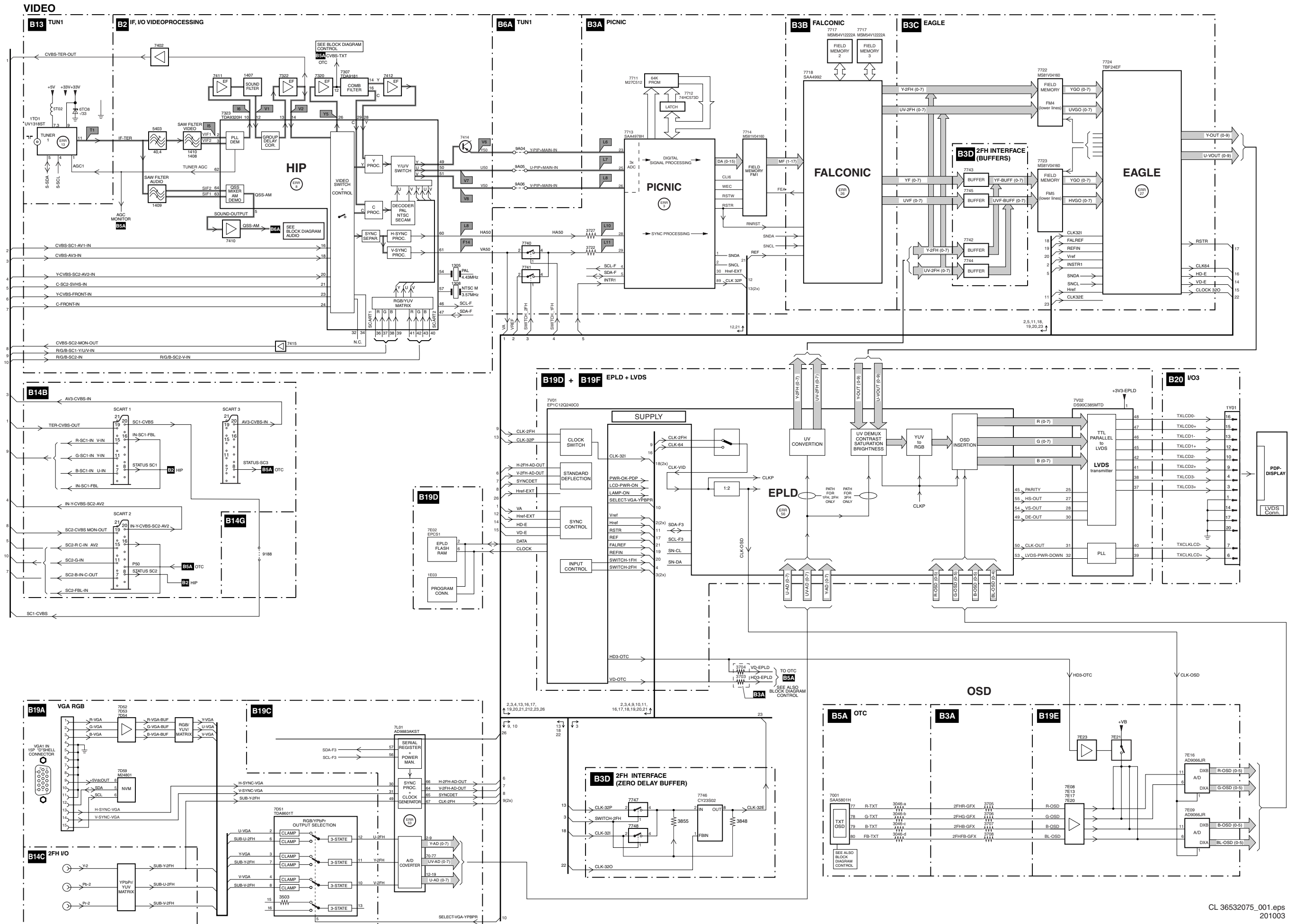
5.9 Software Downloading

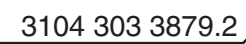
In this chassis, you can **upgrade** the software via ComPair without removing the back cover of the set. The switch, which is needed for the software downloading procedure, can be reached through the cooling gaps of the back cover. The switch is located next to the SAM/SDM pads and can be operated with a long and thin screwdriver. Make sure that you do not damage the PWB with sharp objects. 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 number

Wiring Diagram

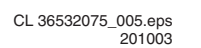
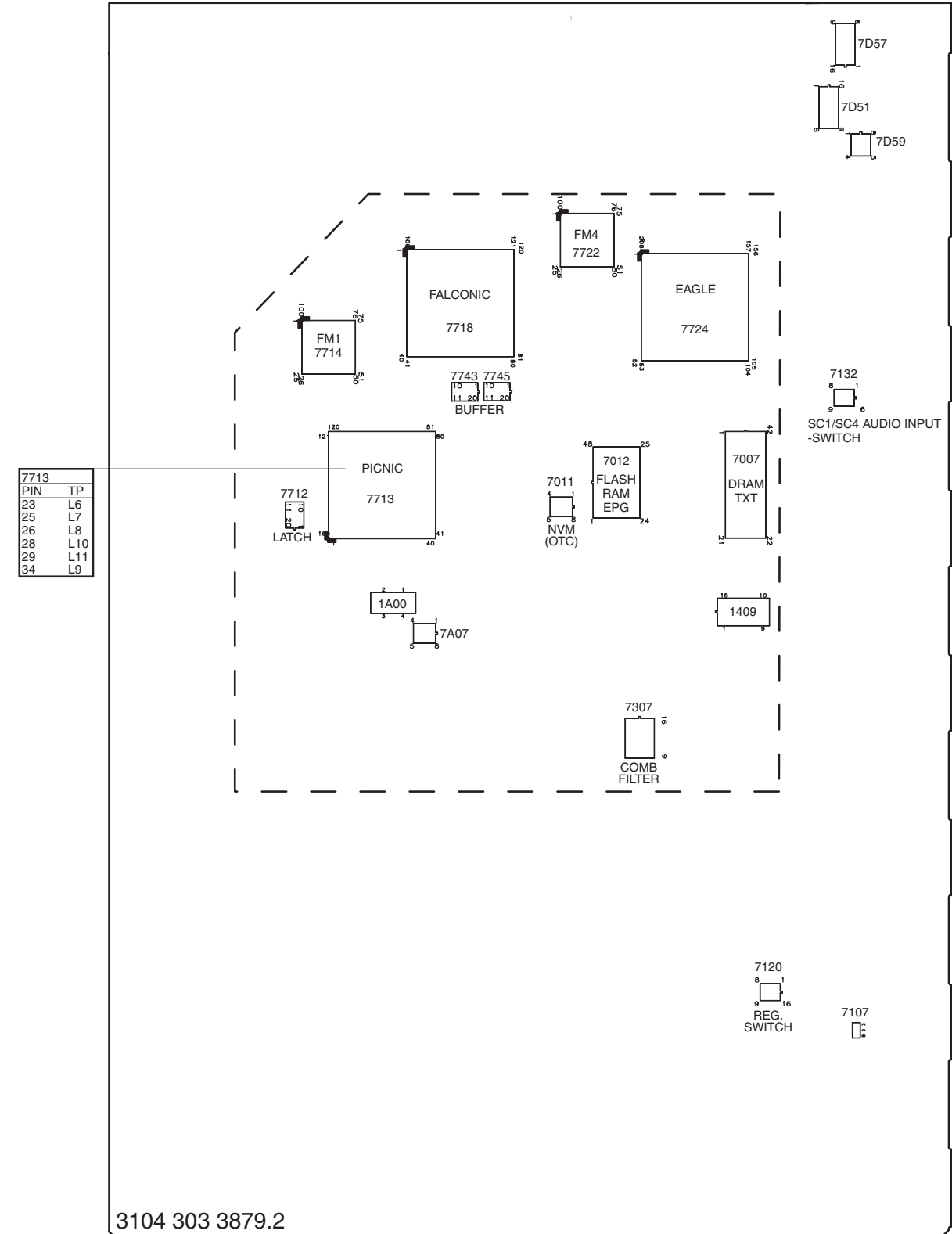


Block Diagram Video



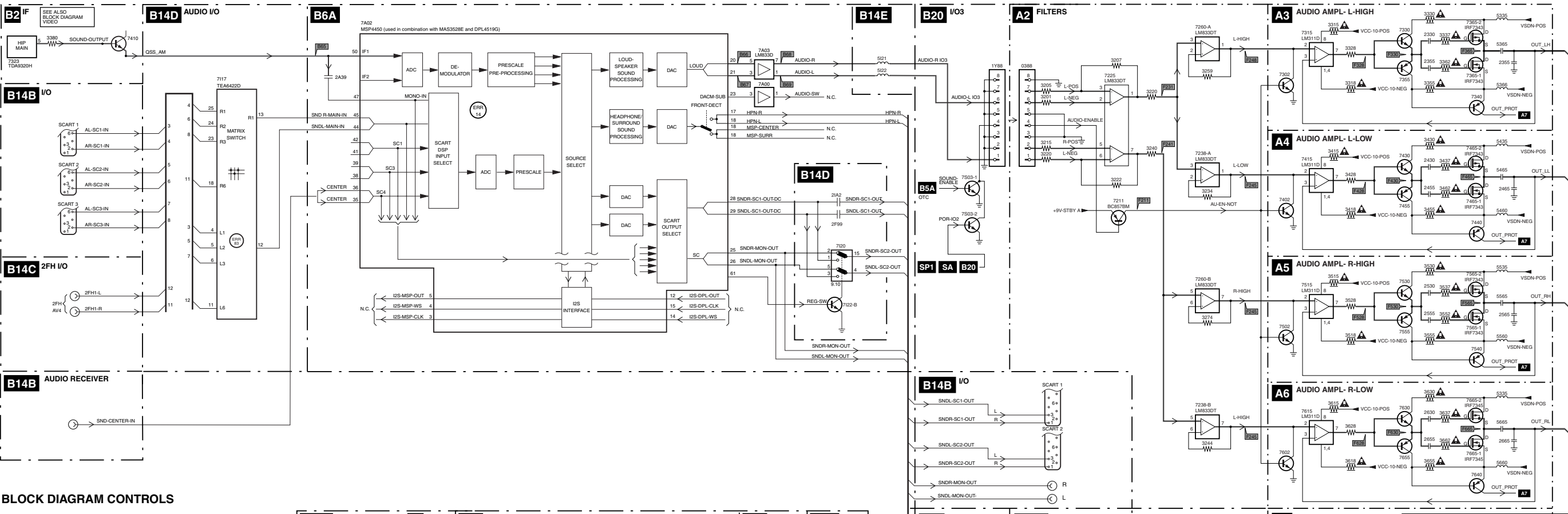
SSB side A

3104 303 3879.2

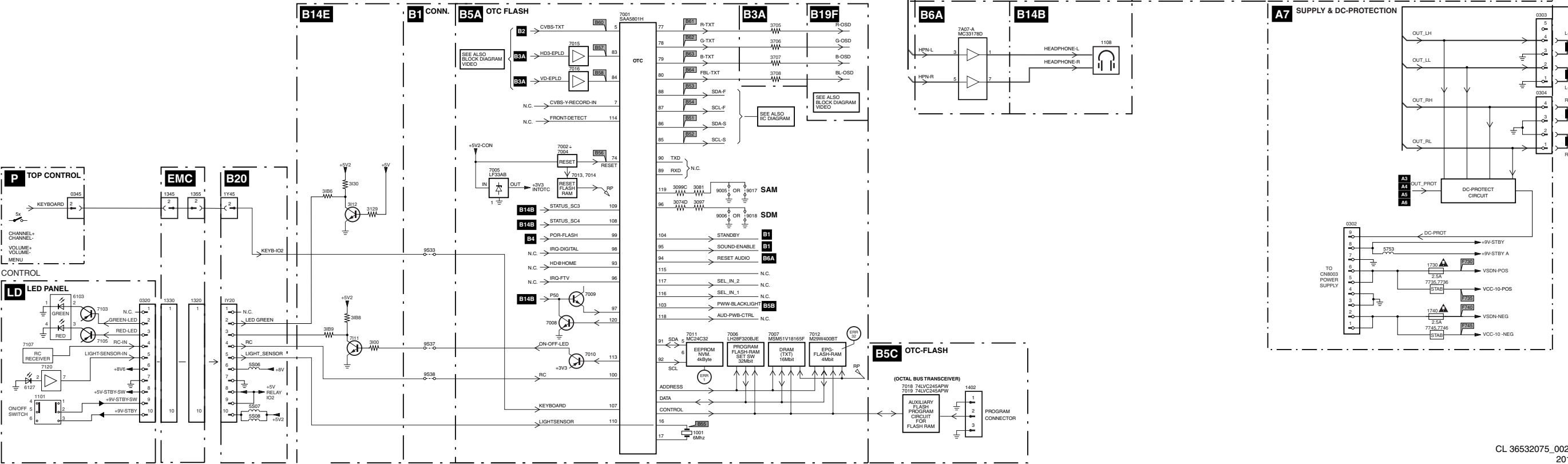


Block Diagram Audio

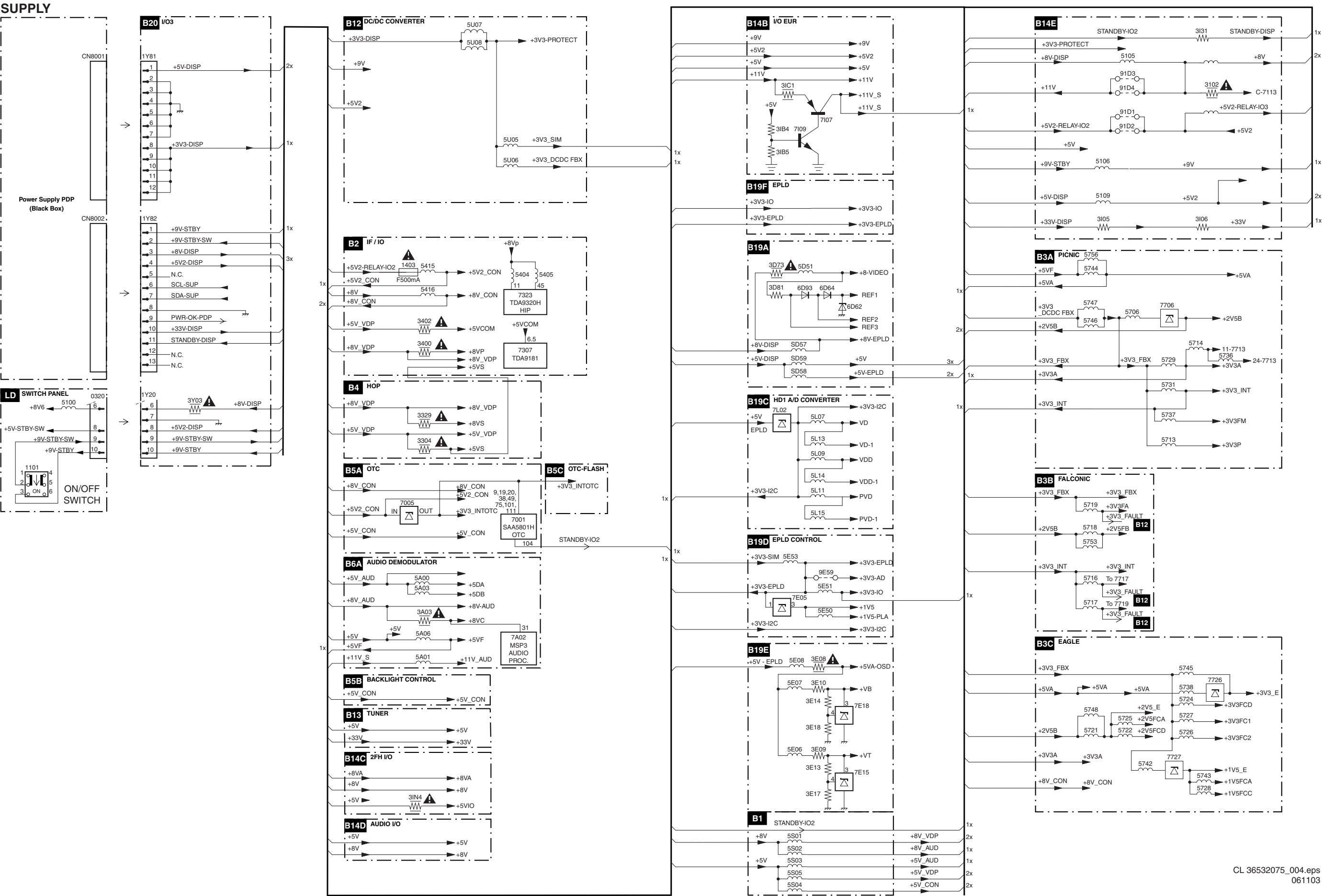
BLOCK DIAGRAM AUDIO



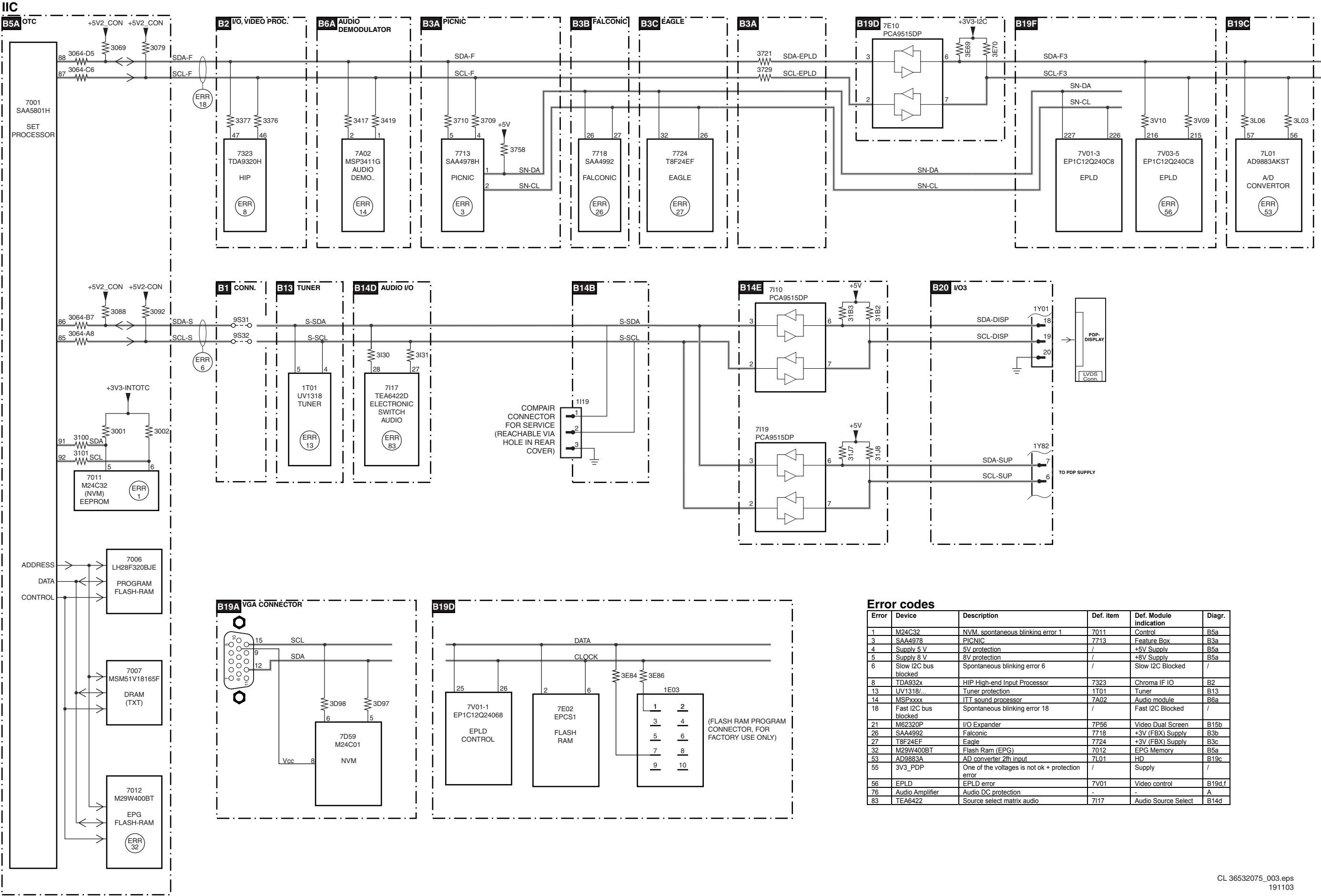
BLOCK DIAGRAM CONTROLS



Supply Lines Overview



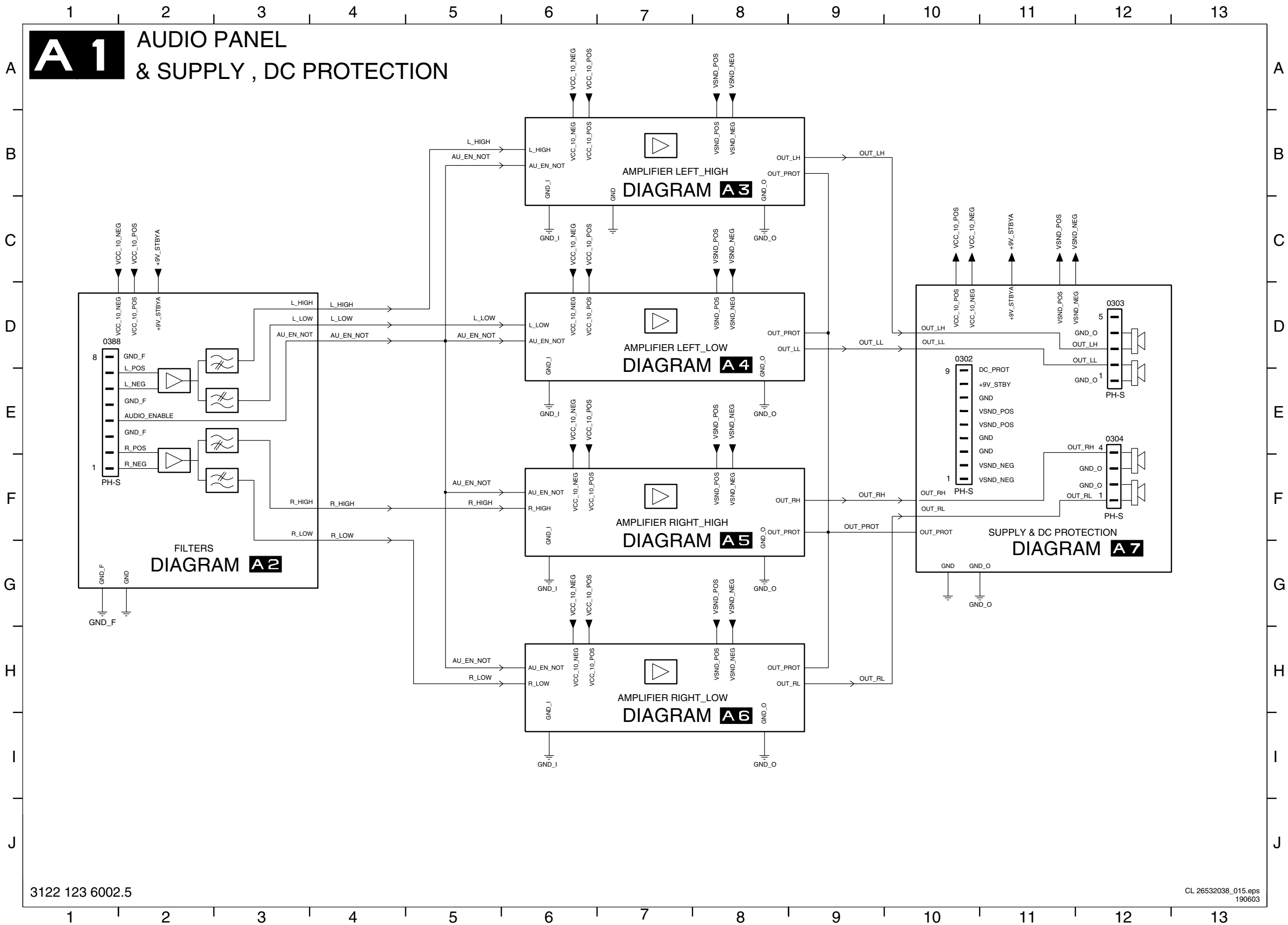
I2C IC's overview



Error	Device	Description	Def. item	Def. Module indication	Diagr.
1	M24C32	NVM. spontaneous blinking error 1	7011	Control	B5a
3	SAA4978	PICNIC	7713	Feature Box	B3a
4	Supply 5 V	5V protection	/	+5V Supply	B5a
5	Supply 8 V	8V protection	/	+8V Supply	B5a
6	Slow I2C bus blocked	Spontaneous blinking error 6	/	Slow I2C Blocked	/
8	TDA932x	HIP High-end Input Processor	7323	Chroma IF IO	B2
13	UV1318/...	Tuner protection	1T01	Tuner	B13
14	MSPxxx	ITT sound processor	7A02	Audio module	B6a
18	Fast I2C bus blocked	Spontaneous blinking error 18	/	Fast I2C Blocked	/
21	M62320P	I/O Expander	7P56	Video Dual Screen	B15b
26	SAA4992	Falconic	7718	+3V (FBX) Supply	B3b
27	T8F24EF	Eagle	7724	+3V (FBX) Supply	B3c
32	M29W400BT	Flash Ram (EPG)	7012	EPG Memory	B5a
53	AD9883A	AD converter 2th input	7L01	HD	B19c
55	3V3_PDP	One of the voltages is not ok + protection error	/	Supply	/
56	EPLD	EPLD error	7V01	Video control	B19d.f
76	Audio Amplifier	Audio DC protection	-	-	A
83	TEA6422	Source select matrix audio	7117	Audio Source Select	B14d

7. Circuit Diagrams and PWB Layouts

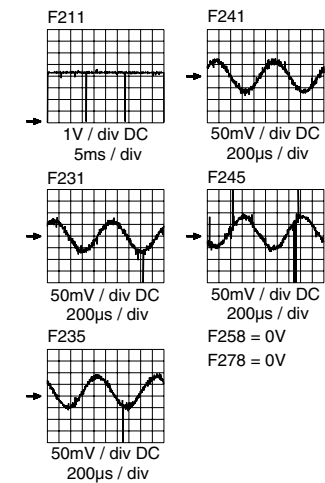
Audio Panel and Supply, DC Protection



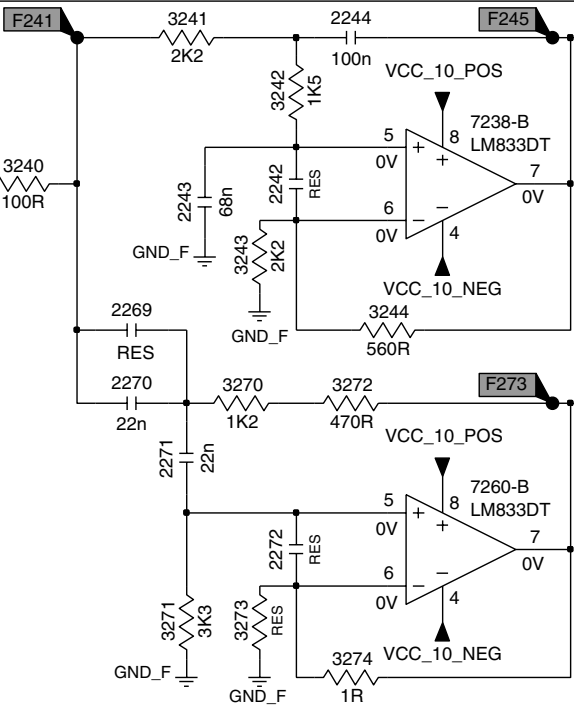
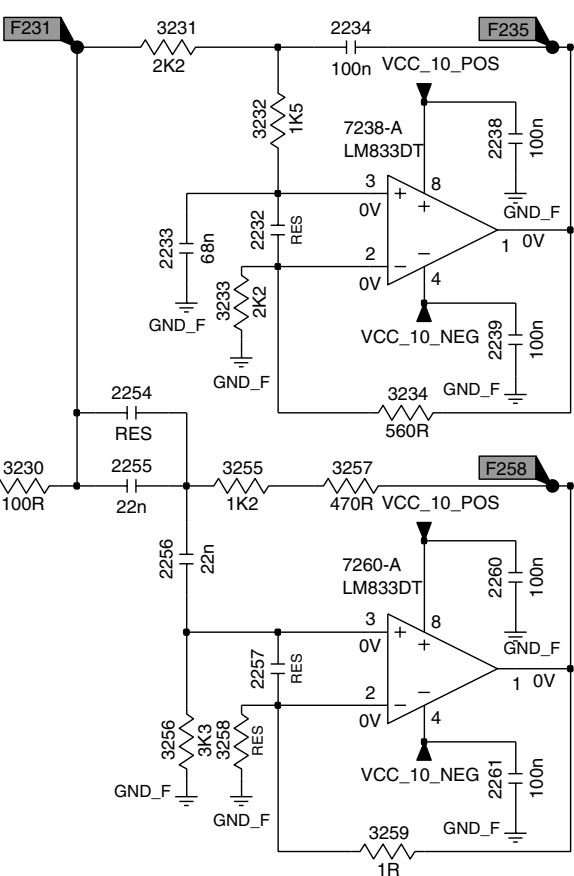
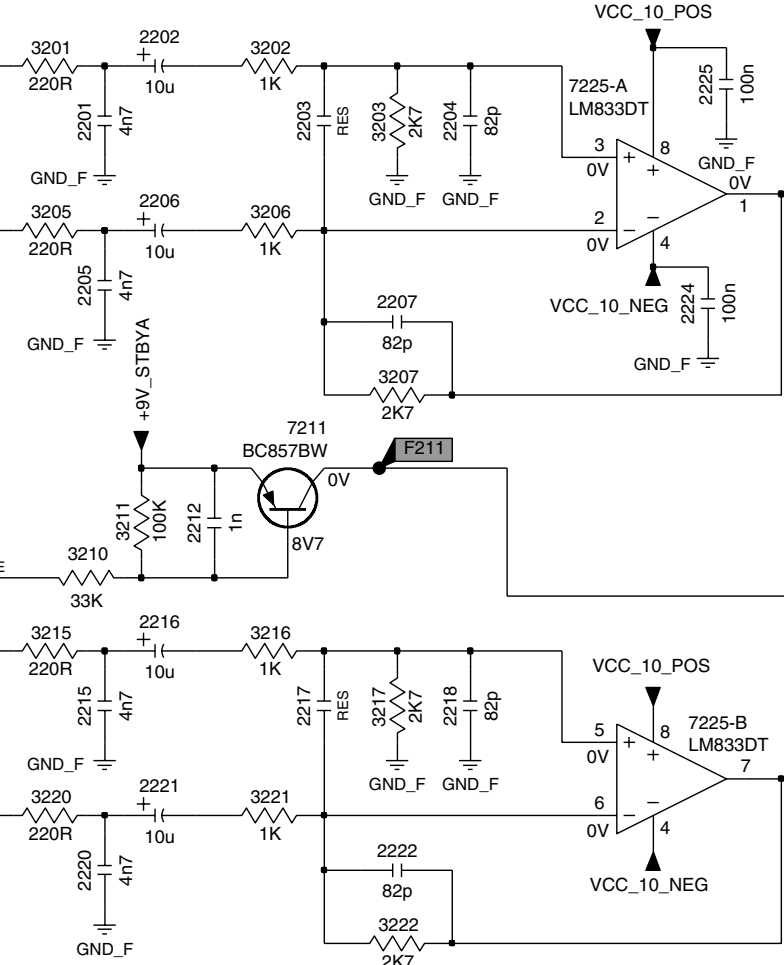
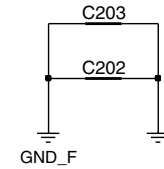
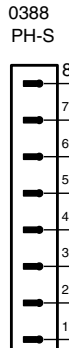
Filters

A2

FILTERS



TO 1S88
B



TO DIAGRAM
A4
AMPLIFIER
LEFT_LOW

TO DIAGRAM
A3
AMPLIFIER
LEFT_HIGH

TO DIAGRAM
A6
AMPLIFIER
RIGHT_LOW

TO DIAGRAM
A5
AMPLIFIER
RIGHT_HIGH

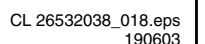
0388 C1	C202 F2
2201 B3	C203 F2
2202 B3	F201 C2
2203 B4	F202 C2
2204 B4	F203 D2
2205 C3	F204 D2
2206 B3	F205 D2
2207 C4	F206 D2
2212 D3	F207 D2
2215 D3	F211 C4
2216 D3	F231 A6
2217 D4	F235 A8
2218 D4	F241 D6
2220 E3	F245 D8
2221 E3	F258 B8
2222 E4	F273 E8
2224 C5	
2225 B5	
2232 A7	
2233 A6	
2234 A7	
2238 A7	
2239 B7	
2242 E7	
2243 E6	
2244 D7	
2254 B6	
2255 B6	
2256 C6	
2257 C7	
2260 C7	
2261 C7	
2269 E6	
2270 E6	
2271 F6	
2272 F7	
3201 B3	
3202 B3	
3203 B4	
3205 B3	
3206 B3	
3207 C4	
3210 D3	
3211 D3	
3215 D3	
3216 D3	
3217 D4	
3220 E3	
3221 E3	
3222 E4	
3230 B6	
3231 A6	
3232 A7	
3233 B6	
3234 B7	
3240 E6	
3241 D6	
3242 D7	
3243 E6	
3244 E7	
3255 B6	
3256 C6	
3257 B7	
3258 C6	
3259 D7	
3270 E6	
3271 F6	
3272 E7	
3273 F6	
3274 F7	
7211 C4	
7225-A B5	
7225-B D5	
7238-A A7	
7238-B D7	
7260-A C7	
7260-B F7	

AUDIO AMPLIFIER

LEFT HIGH

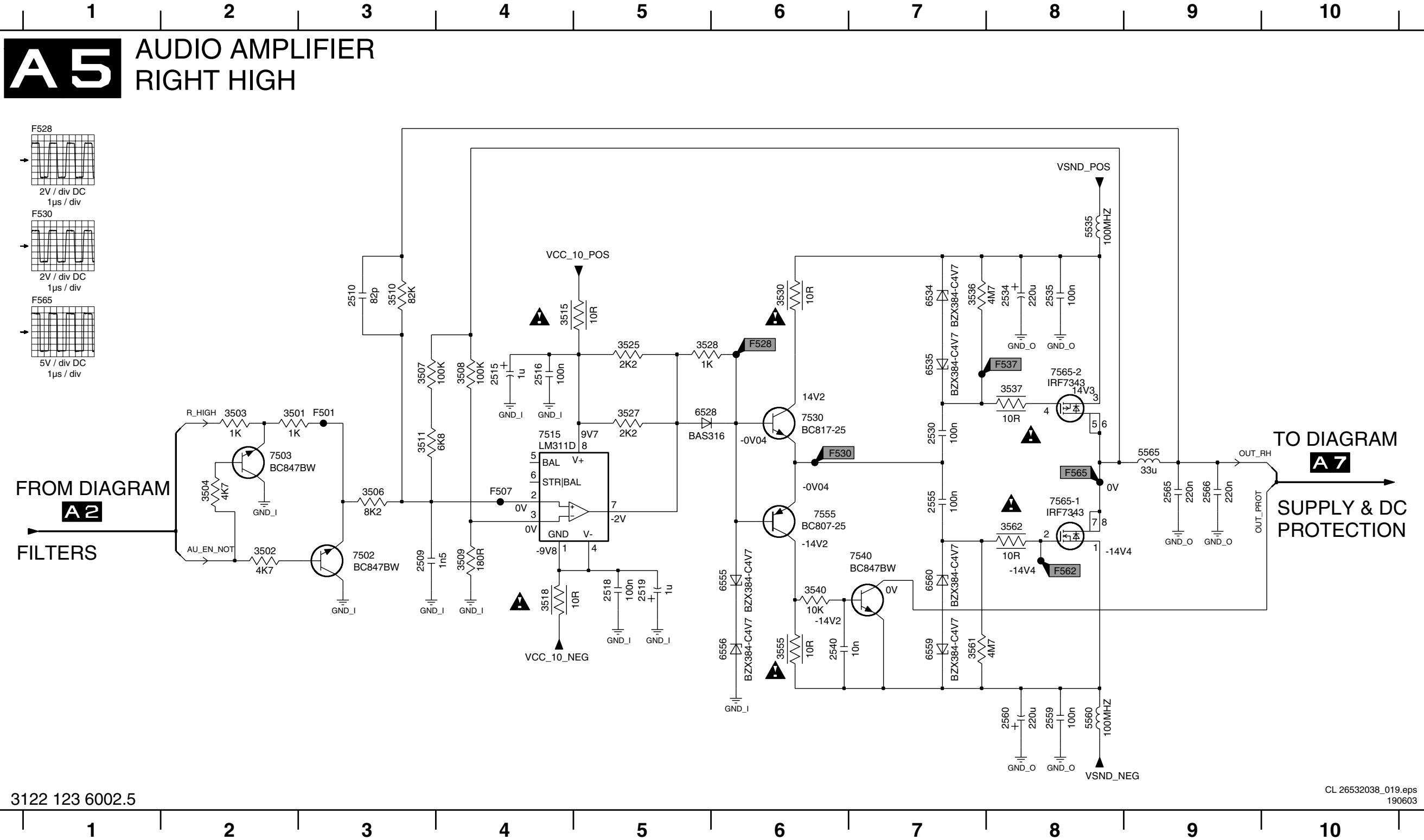
CL 26532038_017.eps
190603

2409 D3	2416 C4	2430 C7	2440 E6	2460 E8	3401 C3	3404 D2	3408 C4	3411 C3	3425 B5	3430 B6	3440 D6	3462 D8	5465 C9	6435 C7	6459 E7	7403 C2	7440 D7	7465-2 C8	F428 B6	F462 D8
2410 B3	2418 D5	2434 B8	2455 D7	2465 D9	3402 D2	3406 C3	3409 D4	3415 B4	3427 C5	3436 B7	3455 E6	5435 B8	6428 C5	6455 D6	6460 D7	7415 C4	7455 D6	F401 C3	F430 C6	F465 C8
2415 C4	2419 D5	2435 B8	2459 E8	2466 D9	3403 C2	3407 C3	3410 B3	3418 D4	3428 B5	3437 C8	3461 E7	5460 E8	6434 B7	6456 E6	7402 D3	7430 C6	7465-1 D8	F407 D4	F437 C8	



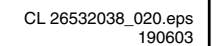
Audio Amplifier Right High

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2510 B3	2518 D5	2534 B8	2555 D7	2565 D9	3502 D2	3506 D3	3509 D4	3515 B4	3527 C5	3536 B7	3555 E6	5535 B8	6528 C5	6555 D6	6560 D7	7515 C4	7555 D6	F501 C3	F530 C6	F565 C8
2515 C4	2519 D5	2535 B8	2559 E8	2566 D9	3503 C2	3507 C3	3510 B3	3518 D4	3528 B5	3537 C8	3561 E7	5560 E8	6534 B7	6556 E6	7502 D3	7530 C6	7565-1 D8	F507 D4	F537 C8	



A 6 AUDIO AMPLIFIER
RIGHT LOW

1 2 3 4 5 6 7 8 9 10



Supply & DC Protection

A7

SUPPLY & DC PROTECTION

DC PROTECTION

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

FROM DIAGRAM **A3** AUDIO AMPLIFIER LEFT HIGH

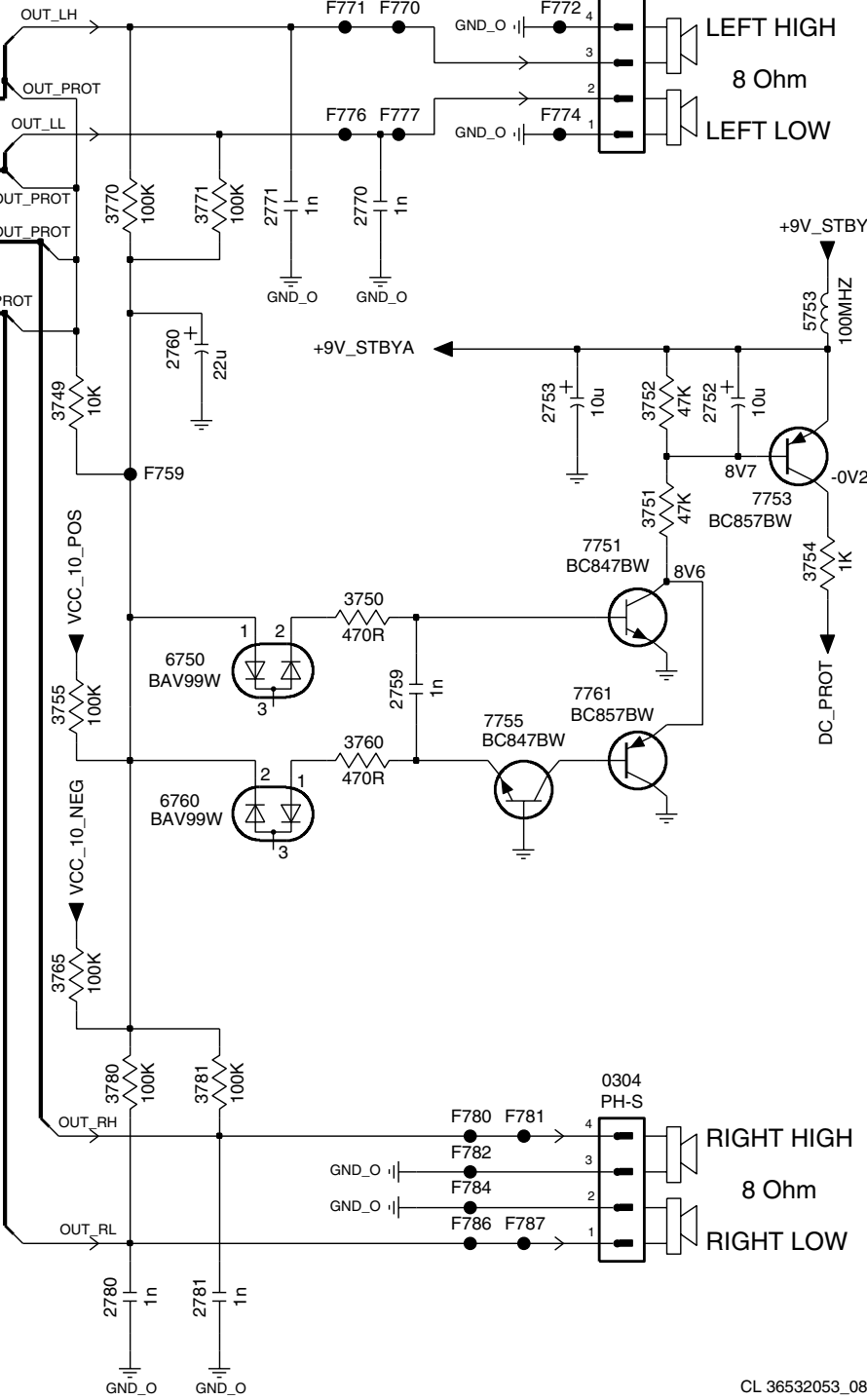
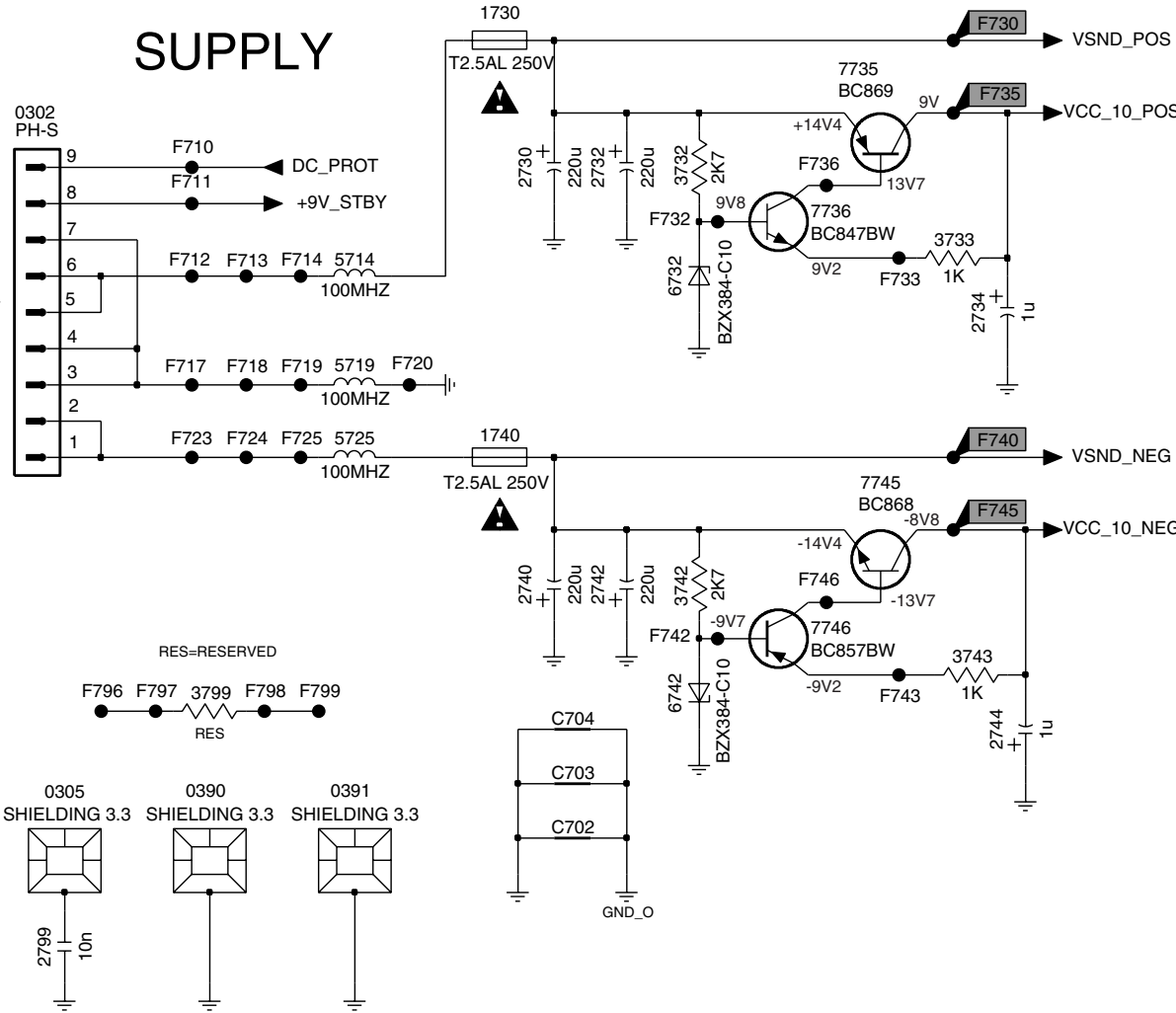
FROM DIAGRAM **A4** AUDIO AMPLIFIER LEFT LOW

FROM DIAGRAM **A5** AUDIO AMPLIFIER RIGHT HIGH

FROM DIAGRAM **A6** AUDIO AMPLIFIER RIGHT LOW

SUPPLY

TO 1302
SA
AUX SUPPLY



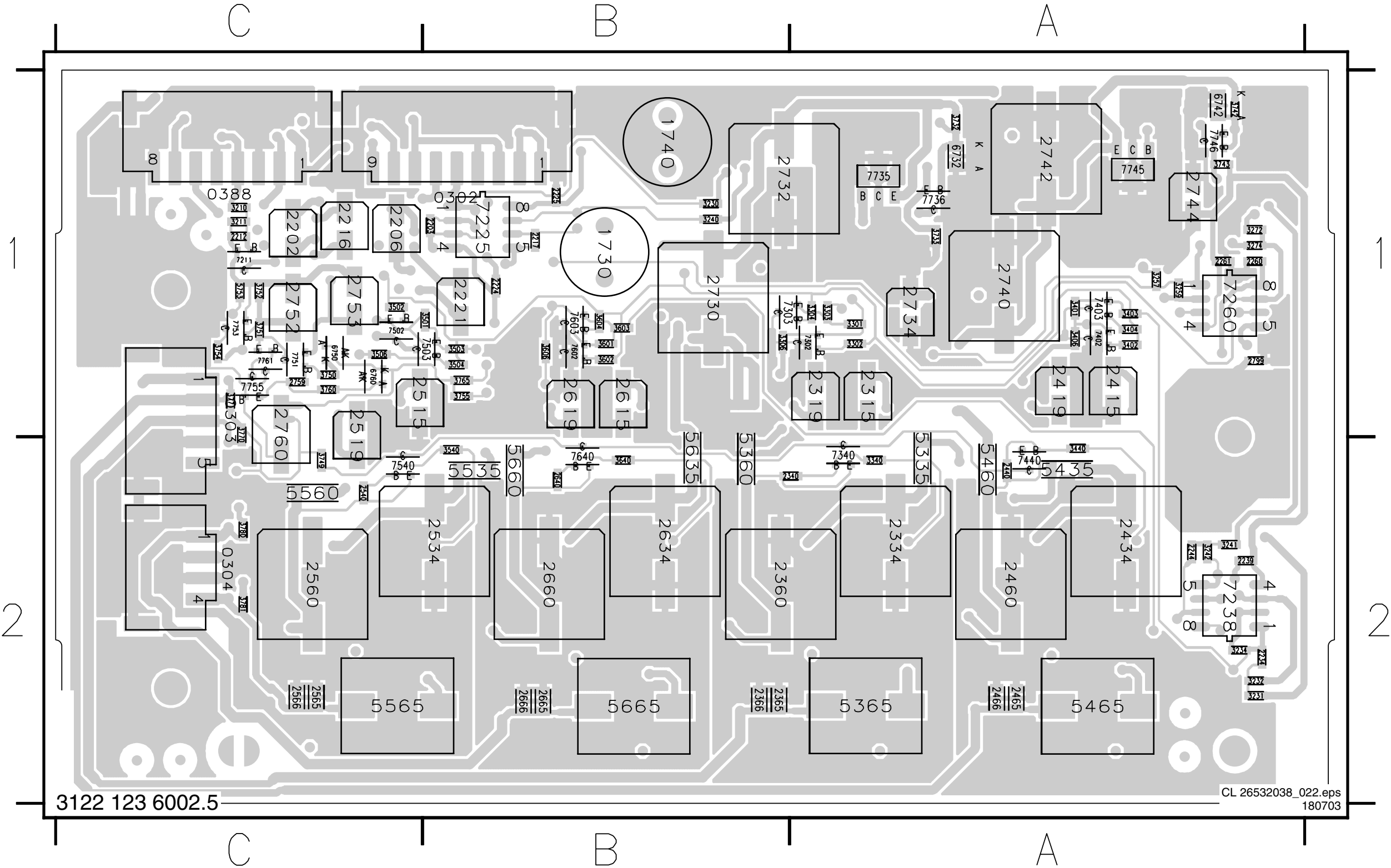
3122 123 6002.5

CL 36532053_087.eps
180703

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

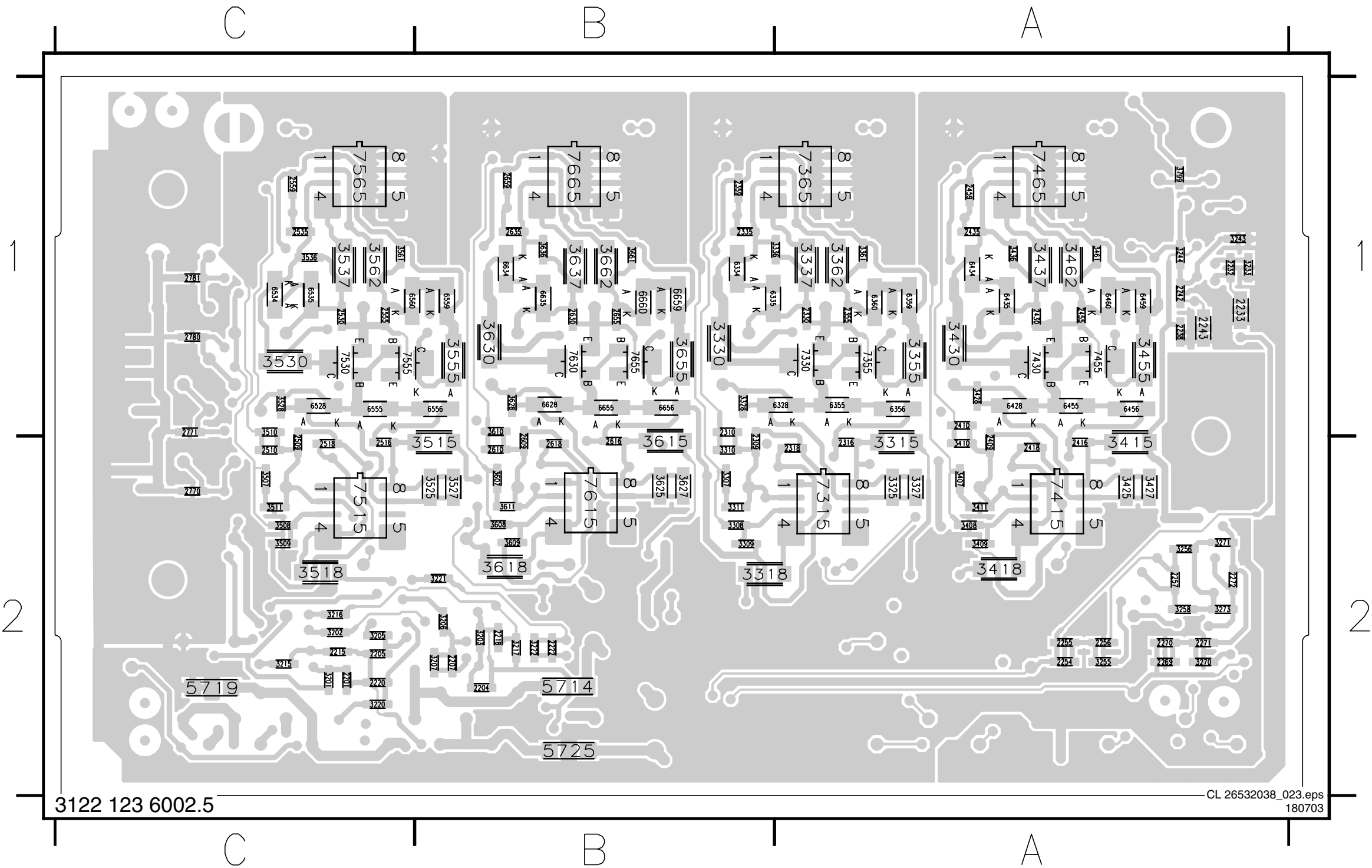
Layout Audio Panel (Top Side)

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

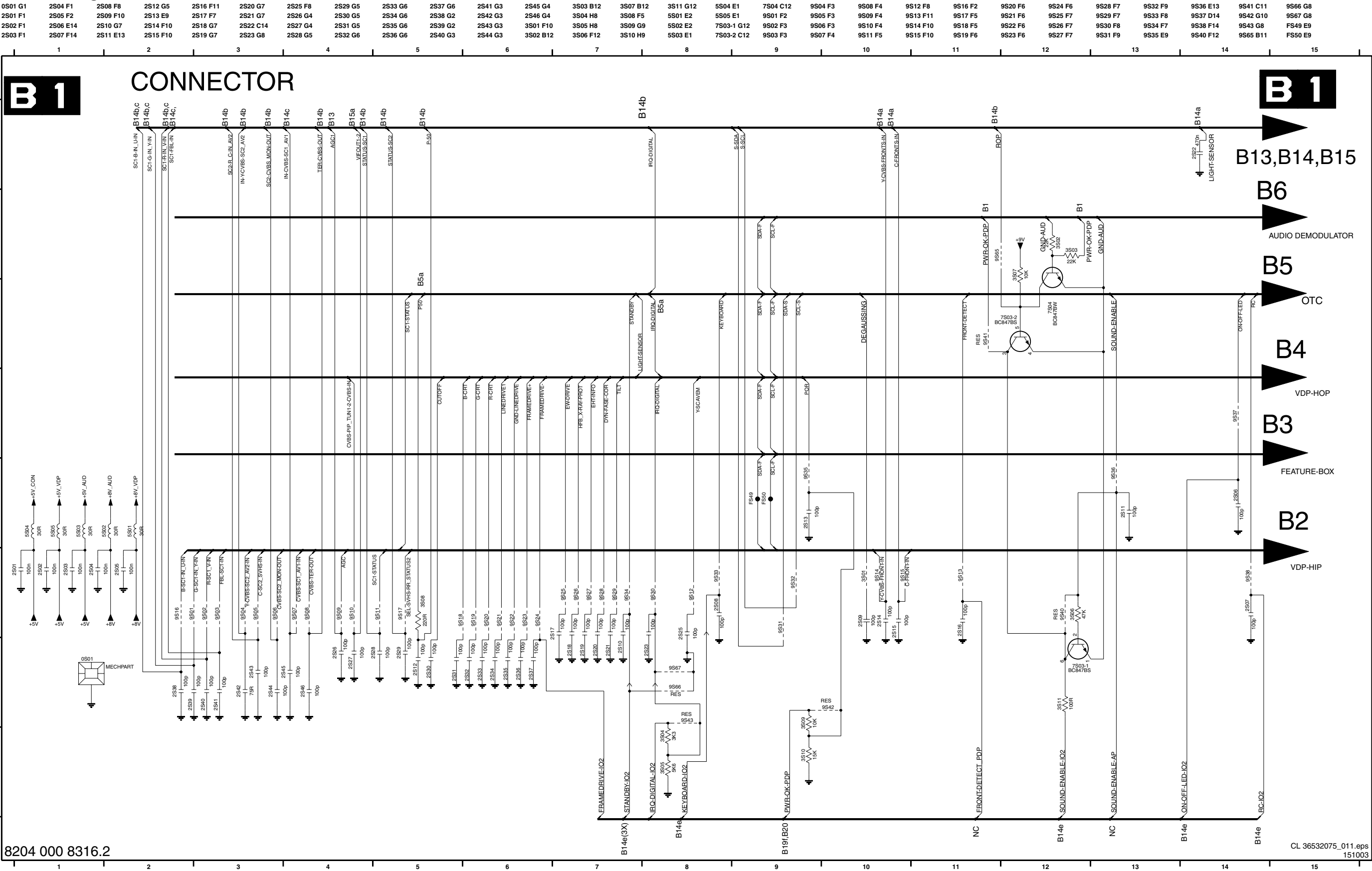


Layout Audio Panel (Bottom Side)

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



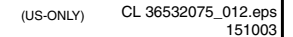
Small Signal Board: Connector



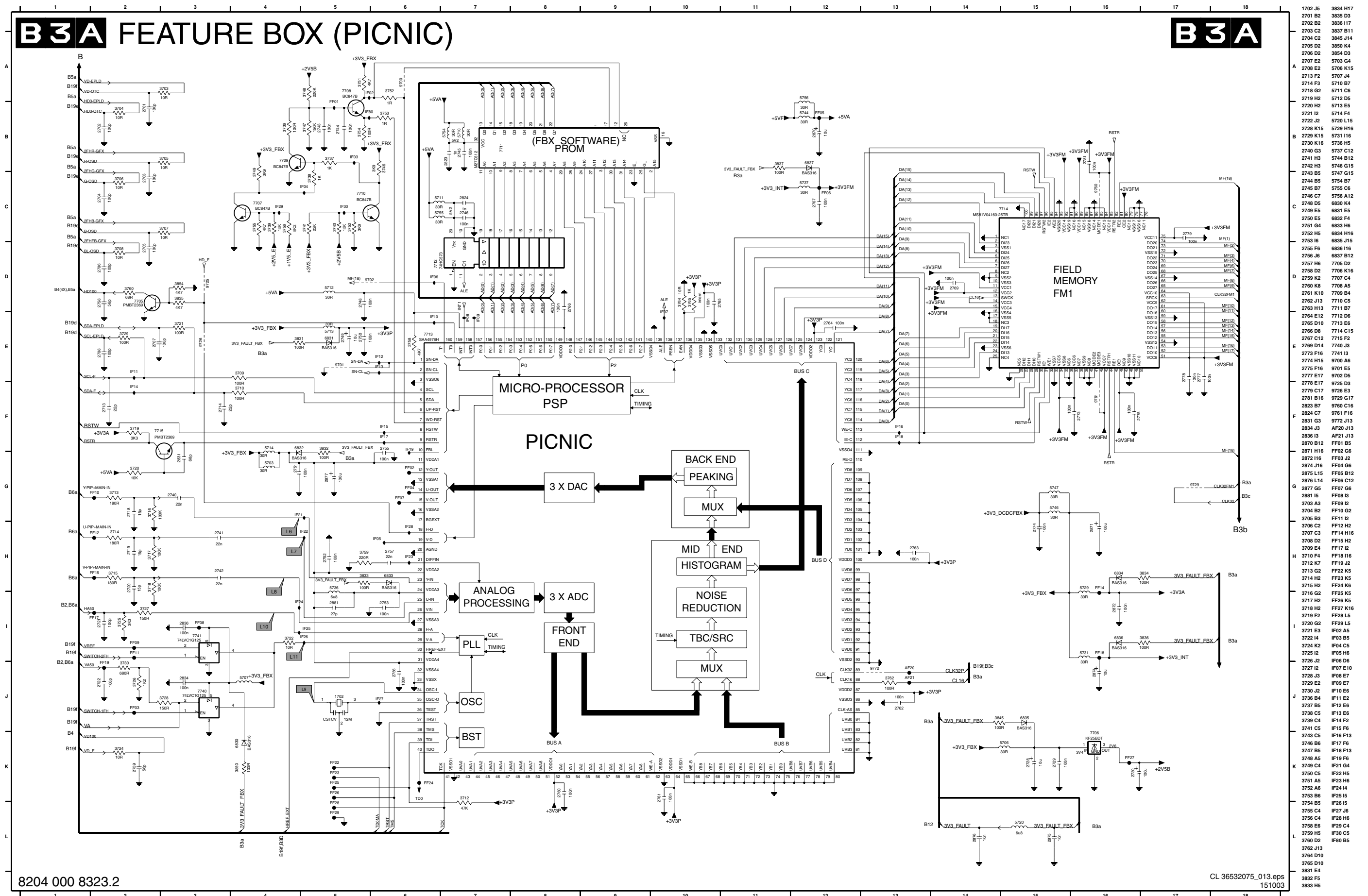
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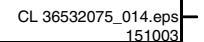
IF,I/O VIDEOPROCESSING



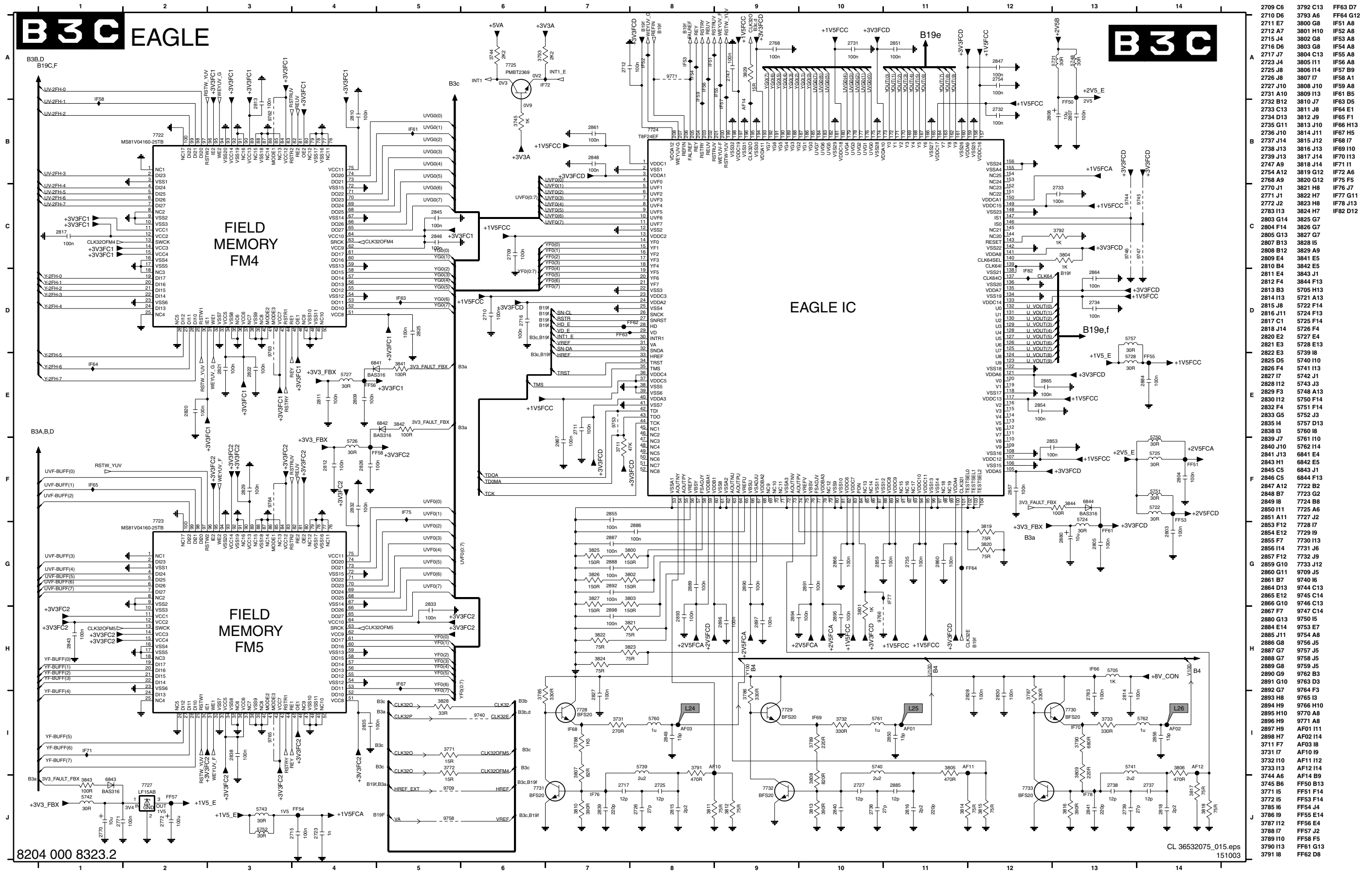
Small Signal Board: Feature Box (PICNIC)



B3B FALCONIC



B3C EAGLE

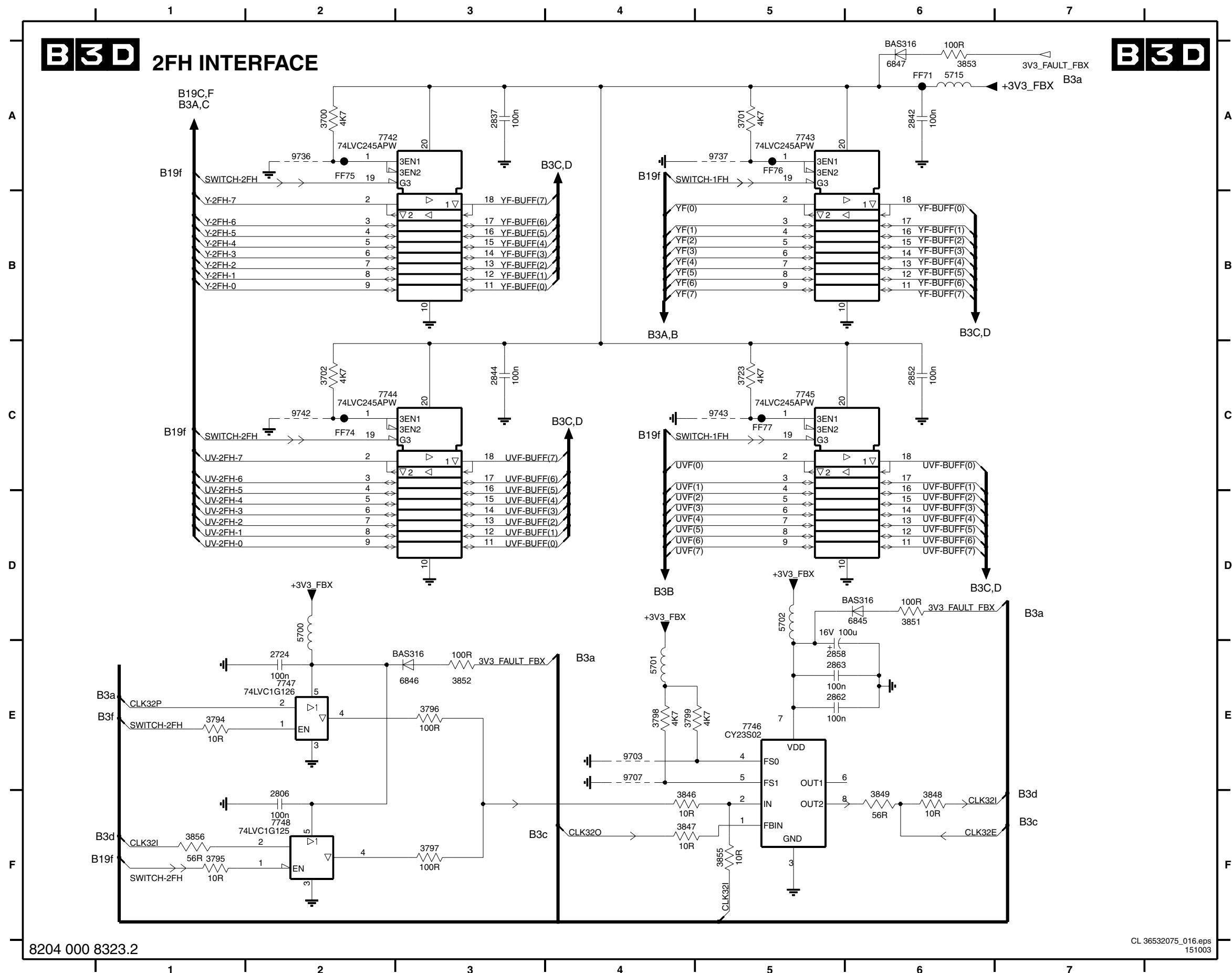


8204 000 8323.2

CL 36532075_015.eps
151003

Small Signal Board: 2FH Interface

2724 E2	2842 A6	2858 E5	3700 A2	3723 C5	3796 E3	3799 E4	3848 F6	3852 E3	3856 F1	5702 D5	6846 E3	7743 A5	7746 E5	9703 E4	9737 A5	9742 C2	9749 C5	FF75 A2
2806 F2	2844 C3	2862 E5	3701 A5	3794 E1	3797 F3	3846 F4	3849 F6	3853 A6	5700 D2	5715 A6	6847 A6	7744 C3	7747 E2	9707 E4	9738 A2	9743 C5	FF71 A6	FF76 A5
2837 A3	2852 C6	2863 E5	3702 C2	3795 F1	3798 E4	3847 F4	3851 D6	3855 F5	5701 E4	6845 D6	7742 A3	7745 C5	7748 F2	9736 A2	9739 A5	9748 C2	FF74 C2	FF77 C5

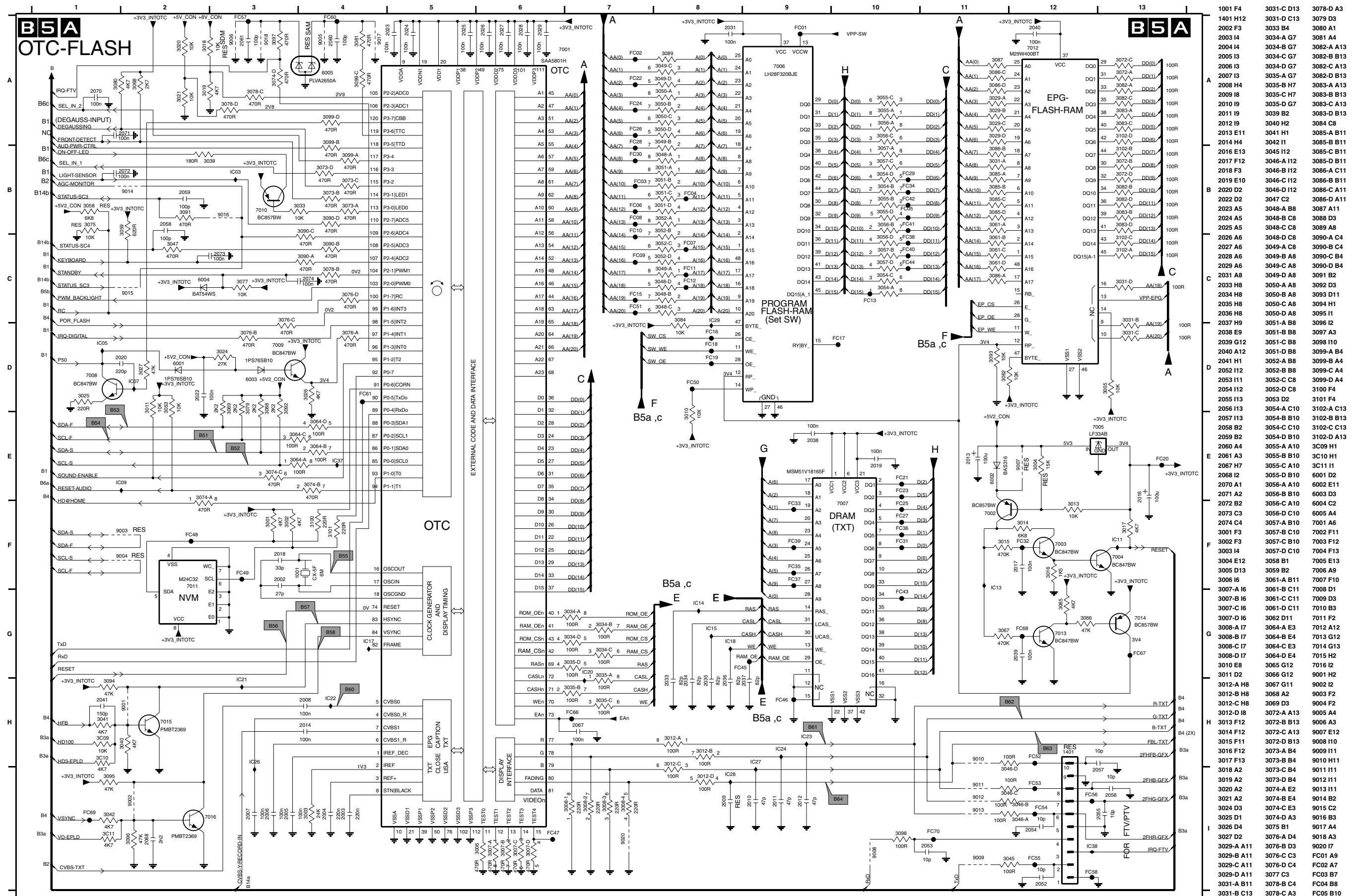


B 4 HOP (NOT USED, UNLESS OTHERWISE INDICATED)



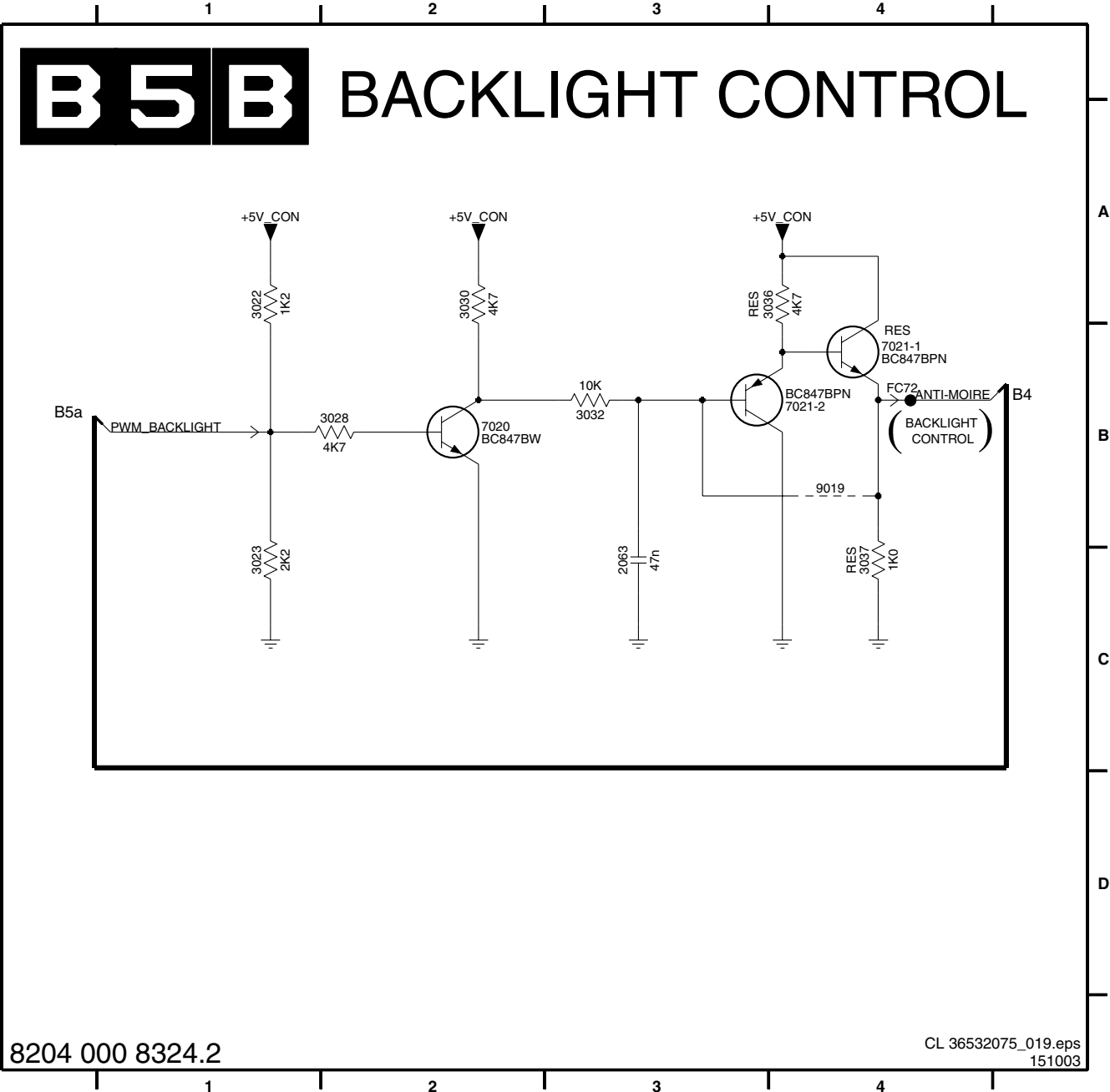
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	1304 H3	3345 D9	7317 C12
	2301 C2	3346 D9	7318 E10
	2303 F9	3347 D9	7319 C12
	2304 G7	3348 D9	7340 B6
	2306 I9	3349 F2	7361 I7
	2307 F4	3350 B10	7362 H7
	2308 G9	3351 B9	7375 B8
	2309 E3	3352 B10	9302 B3
	2310 E3	3353 A10	9303 B4
B	2311 I5	3354 B10	9304 B4
	2312 G9	3355 B7	9305 B4
	2313 F9	3356 H12	9308 C5
	2314 F2	3357 G12	9309 C5
	2315 F3	3358 B11	9310 C5
	2317 F3	3359 B10	9311 I1
	2318 F3	3360 B8	9312 J1
	2319 G10	3361 H7	9313 F13
	2320 G3	3362 G11	9314 I1
	2321 C3	3363 F3	9315 I1
C	2323 B4	3364-A G11	9421 C9
	2324 I6	3364-B G11	C001 H12
	2325 H5	3364-C G10	F309 D11
	2326 F12	3364-D H10	F311 D2
	2328 B7	3365 G13	F312 F9
	2329 B6	3366 H11	F329 H9
	2330 B6	3367 F11	F347 E12
	2331 B6	3368 F13	F348 H3
	2332 F2	3369 C12	F349 H3
	2333 E10	3383 B13	F350 H3
D	2334 E8	3384 D12	F351 H3
	2335 G11	3386 G13	F352 H3
	2336 E9	3387 G2	F353 I3
	2337 B12	3388 B5	F362 I3
	2338 C12	3389 C13	F364 G4
	2340 J11	3390 E9	I302 F2
	2341 D12	3391 G12	I303 F4
	2342 B7	3394 E9	I304 B12
	2343 B9	3395 D3	I305 G5
	2344 I3	3396 D3	I306 G5
E	2345 I2	3397 D2	I307 G7
	2346 I2	3398 D3	I308 B12
	2347 I2	3399 B5	I309 C12
	2348 I2	3442 E12	I310 C12
	2349 I2	3443 I3	I311 D8
	2363 G3	3453 D2	I312 F3
	2386 G12	3454 C1	I313 D12
	2393 E13	3455 C1	I314 D9
	2395 D3	3459 B11	I315 D8
	2396 D3	3465 B9	I316 E9
F	2397 D3	3467 B8	I317 D12
	2398 A3	3470 B8	I319 B11
	2429 B4	3471 B8	I320 B11
	2431 B4	3472 I6	I321 G3
	3302 D4	5301 E2	I326 C7
	3304 I11	5302 F2	I330 B4
	3305 D3	5303 H1	I331 B4
	3306 E9	5304 H1	I332 B3
	3307 F9	5305 H1	I333 C2
	3308 E9	5306 H1	I338 E3
G	3310 E9	5307 H1	I339 F4
	3311 G7	5308 I1	I357 E8
	3312 F11	5313 B12	I358 E4
	3313 E11	5314 C12	I359 F4
	3314 G8	5315 D12	I363 I5
	3315 H8	6301 E12	I365 E10
	3316 I10	6303 H9	I366 C3
	3317 G9	6304 H9	I367 E10
	3318 G9	6306 I5	I368 B7
	3319 F13	6307 I5	I369 B8
H	3320 E3	6308 C2	I370 B10
	3321 E3	6309 E11	I371 I12
	3322 E12	6310 E10	c200 F3
	3323 I5	6311 E12	
	3324 I5	6312 H8	
	3325 B9	6313 I9	
	3326 H5	6314 I9	
	3327 H6	6316 D9	
	3328 F9	6317 F12	
	3329 E2	6319 E9	
I	3330 B7	6334 I5	
	3331 G3	7301 C4	
	3332 B7	7302 B1	
	3333 G3	7303 H8	
	3334 I5	7304 G2	
	3335 B7	7305 C9	
	3336 H6	7306 B9	
	3337 B11	7309 G13	
	3338 B12	7310-A G11	
	3339 C3	7310-B H12	
J	3340 B13	7312 G10	
	3341 C13	7313 B11	
	3342 C13	7314 B10	
	3343 D12	7315 B10	

Small Signal Board: OTC-Flash



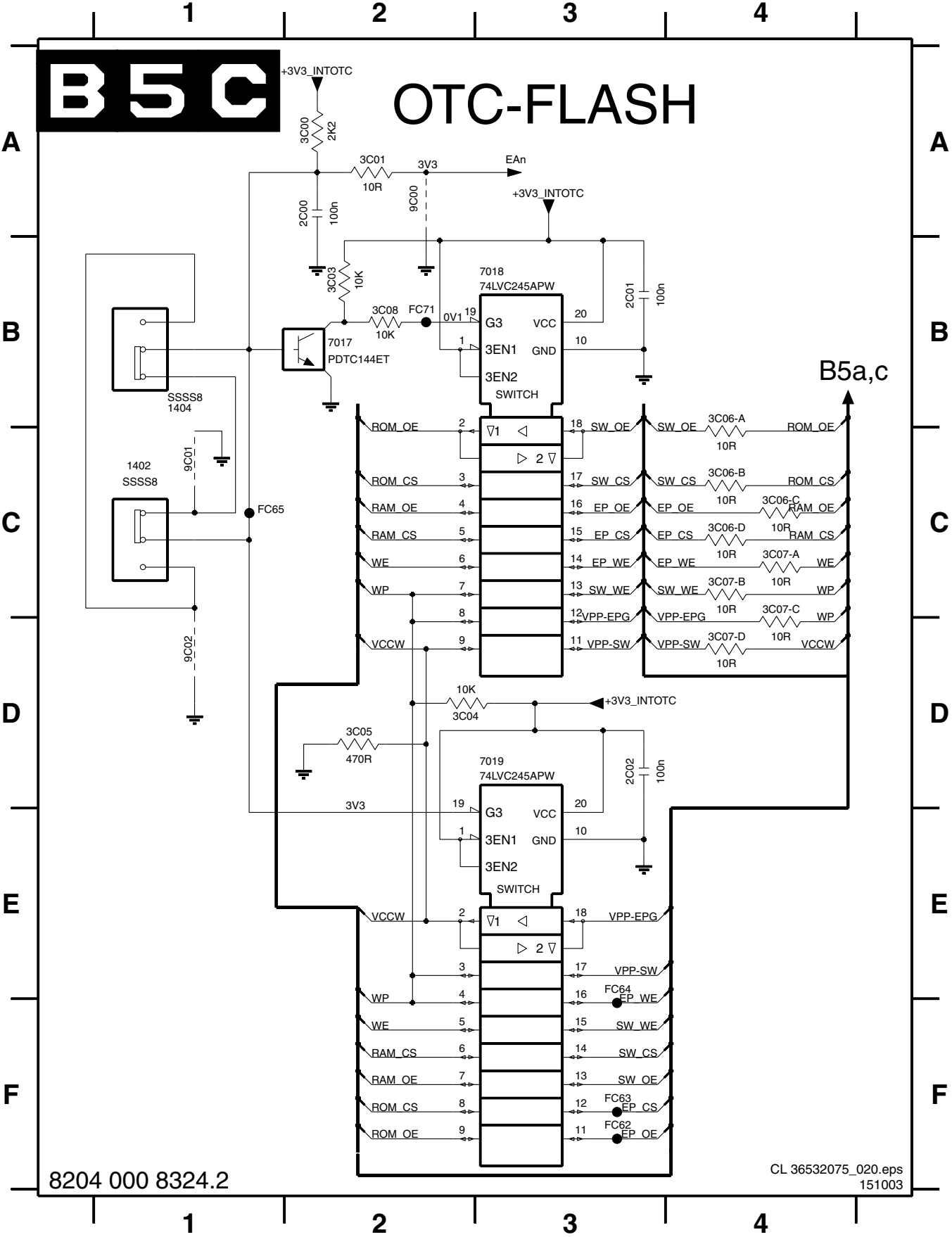
Small Signal Board: Backlight Control

2063 C3	3023 C1	3030 A2	3036 A4	7020 B2	7021-2 B4
3022 A1	3028 B2	3032 B3	3037 C4	7021-1 B4	9019 B4

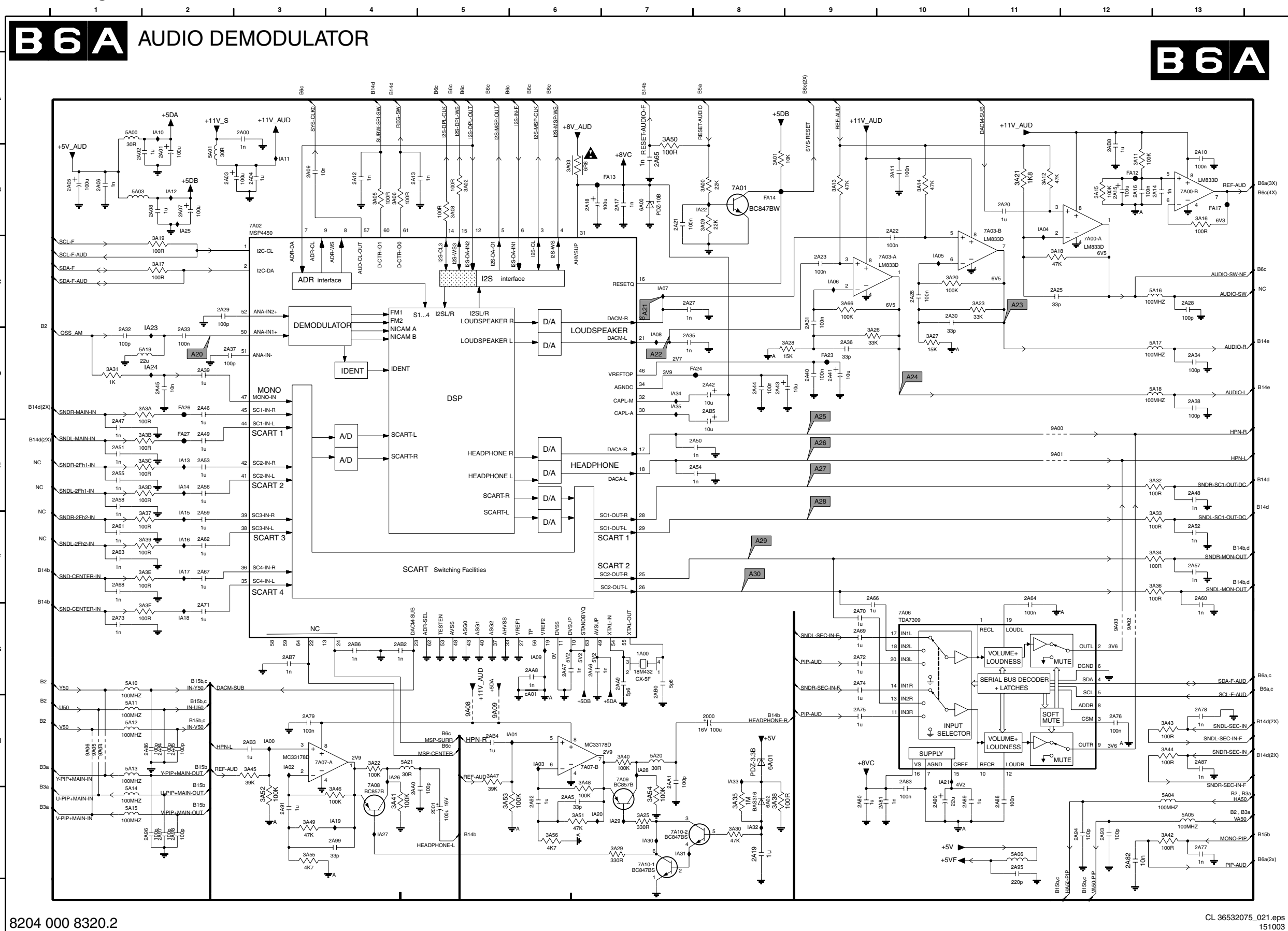


Small Signal Board: OTC-Flash

1402 C1	2C01 B3	3C01 A2	3C05 D2	3C06-C C4	3C07-B C4	3C08 B2	7019 D3	9C02 D1	FC64 E3
1404 B1	2C02 D3	3C03 B2	3C06-A B4	3C06-D C4	3C07-C C4	7017 B2	9C00 A2	FC62 F3	FC65 C1
2C00 A2	3C00 A2	3C04 D2	3C06-B C4	3C07-A C4	3C07-D D4	7018 B3	9C01 C1	FC63 F3	FC71 B2

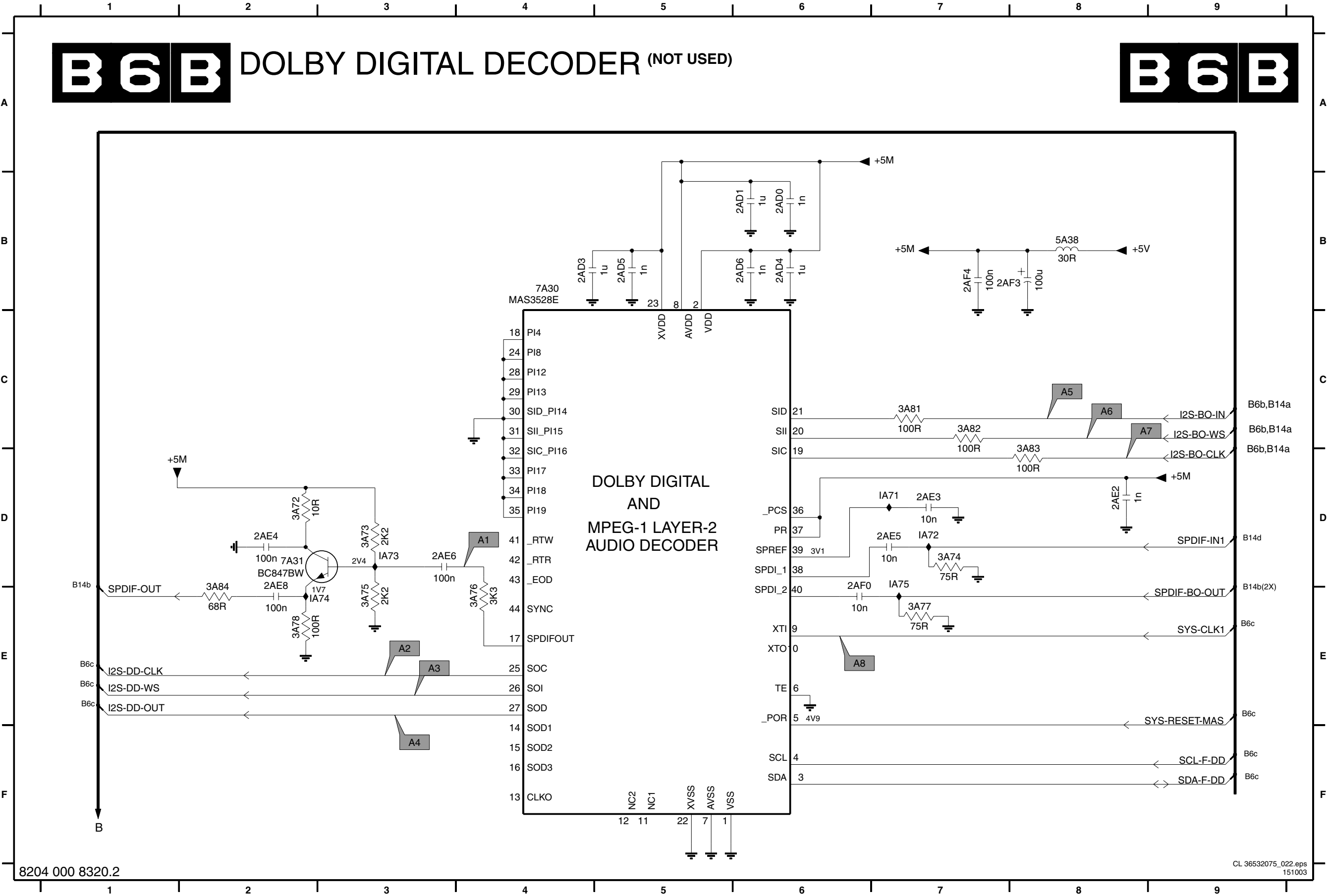


Small Signal Board: Audio Demodulator

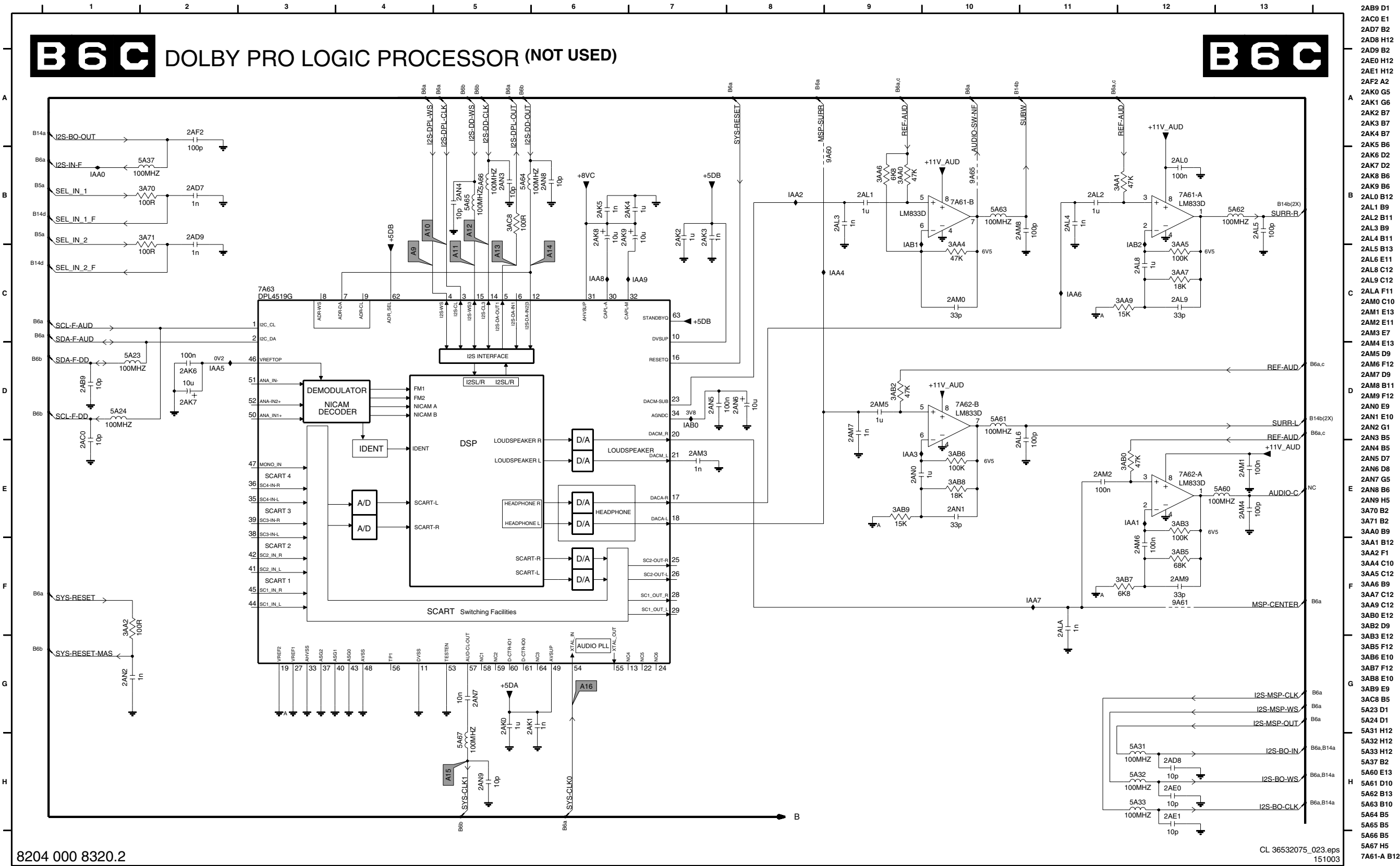


1A00 G7	2A92 I6	5A13 H1
2A00 A3	2A93 I12	5A14 I1
2A01 B2	2A94 I12	5A15 I1
2A02 B1	2A95 I11	5A16 C13
2A03 B2	2A96 I2	5A17 D13
2A04 B3	2A97 I2	5A18 D13
2A05 B1	2A98 I2	5A19 D2
2A06 B1	2A99 I4	5A20 H7
2A07 B2	2A00 I5	5A21 H4
2A08 B2	2A01 H7	6A00 B7
2A09 B3	2A05 I6	6A01 H8
2A10 B13	2A06 G6	6A02 I8
2A11 B10	2A07 G6	7A00-A C12
2A12 B4	2A08 G6	7A00-B B13
2A13 B4	2A09 G7	7A01 B8
2A14 B13	2A00 G7	7A02 B3
2A15 B12	2A02 G4	7A03-A C10
2A16 B12	2A03 H3	7A03-B B11
2A17 B7	2A04 H5	7A06 G10
2A18 B6	2A05 D8	7A07-A H3
2A19 I8	2A06 G4	7A07-B H6
2A20 B11	2A07 G3	7A08 I4
2A21 B7	2A08 B12	7A09 H7
2A22 B10	3A00 B8	7A10-1 I7
2A23 C9	3A01 B8	7A10-2 I7
2A25 C11	3A02 B5	9A00 E11
2A26 C10	3A03 B6	9A01 E11
2A27 C7	3A05 B4	9A02 G12
2A28 C13	3A06 B4	9A03 G12
2A29 C2	3A08 B5	9A04 H1
2A30 C10	3A09 B8	9A05 H1
2A31 C9	3A11 B12	9A06 H1
2A32 D1	3A12 B11	9A08 H5
2A33 D2	3A13 B9	9A09 H5
2A34 D13	3A14 B10	FA12 B12
2A35 D7	3A15 B12	FA13 B7
2A36 D9	3A16 B13	FA14 B8
2A37 D2	3A17 C2	FA17 B13
2A38 D13	3A18 C11	FA23 D9
2A39 D2	3A19 C2	FA24 D8
2A40 D9	3A20 C10	FA26 D2
2A41 D9	3A21 B11	FA27 E2
2A42 D8	3A22 H4	IA00 H3
2A43 D8	3A23 C11	IA01 H6
2A44 D8	3A25 I7	IA02 H3
2A45 D2	3A26 D9	IA03 H6
2A46 D2	3A27 D10	IA04 B11
2A47 E1	3A28 D9	IA05 C10
2A48 E13	3A29 I7	IA06 C9
2A49 E2	3A30 I8	IA07 C7
2A50 E8	3A31 D1	IA08 D7
2A51 E1	3A32 E13	IA09 G6
2A52 F13	3A33 F13	IA10 A2
2A53 E2	3A34 F13	IA11 B3
2A54 E8	3A35 I8	IA12 B2
2A55 E1	3A36 F13	IA13 E2
2A56 E2	3A37 F2	IA14 E2
2A57 F13	3A38 I8	IA15 F2
2A58 E1	3A39 F2	IA16 F2
2A59 F2	3A3A D2	IA17 F2
2A60 F13	3A3B E2	IA18 G2
2A61 F1	3A3C E2	IA19 I4
2A62 F2	3A3D E2	IA20 I6
2A63 F1	3A3E F2	IA21 H10
2A64 F11	3A3F G2	IA22 B8
2A65 B7	3A40 H7	IA23 D2
2A66 F9	3A41 I4	IA24 D2
2A67 F2	3A42 I13	IA25 B2
2A68 F1	3A43 H13	IA26 H4
2A69 G9	3A44 H13	IA27 I4
2A70 G9	3A45 H3	IA28 H7
2A71 G2	3A46 I4	IA29 I7
2A72 G9	3A47 H5	IA30 I7
2A73 G1	3A48 H6	IA31 I7
2A74 G9	3A49 I3	IA32 I8
2A75 H9	3A50 A7	IA33 H8
2A76 H12	3A51 I6	CA01 H6
2A77 I13	3A52 I3	
2A78 H13	3A53 I5	
2A79 H3	3A54 I7	
2A80 I9	3A55 I3	
2A81 I10	3A56 I6	
2A82 I12	3A56 C9	
2A83 H10	5A00 A1	
2A84 H2	5A01 B2	
2A85 H2	5A03 B1	
2A86 H2	5A04 I13	
2A87 H13	5A05 I13	
2A88 I11	5A06 I11	
2A89 I10	5A10 G1	
2A90 I10	5A11 H1	
2A91 I3	5A12 H1	

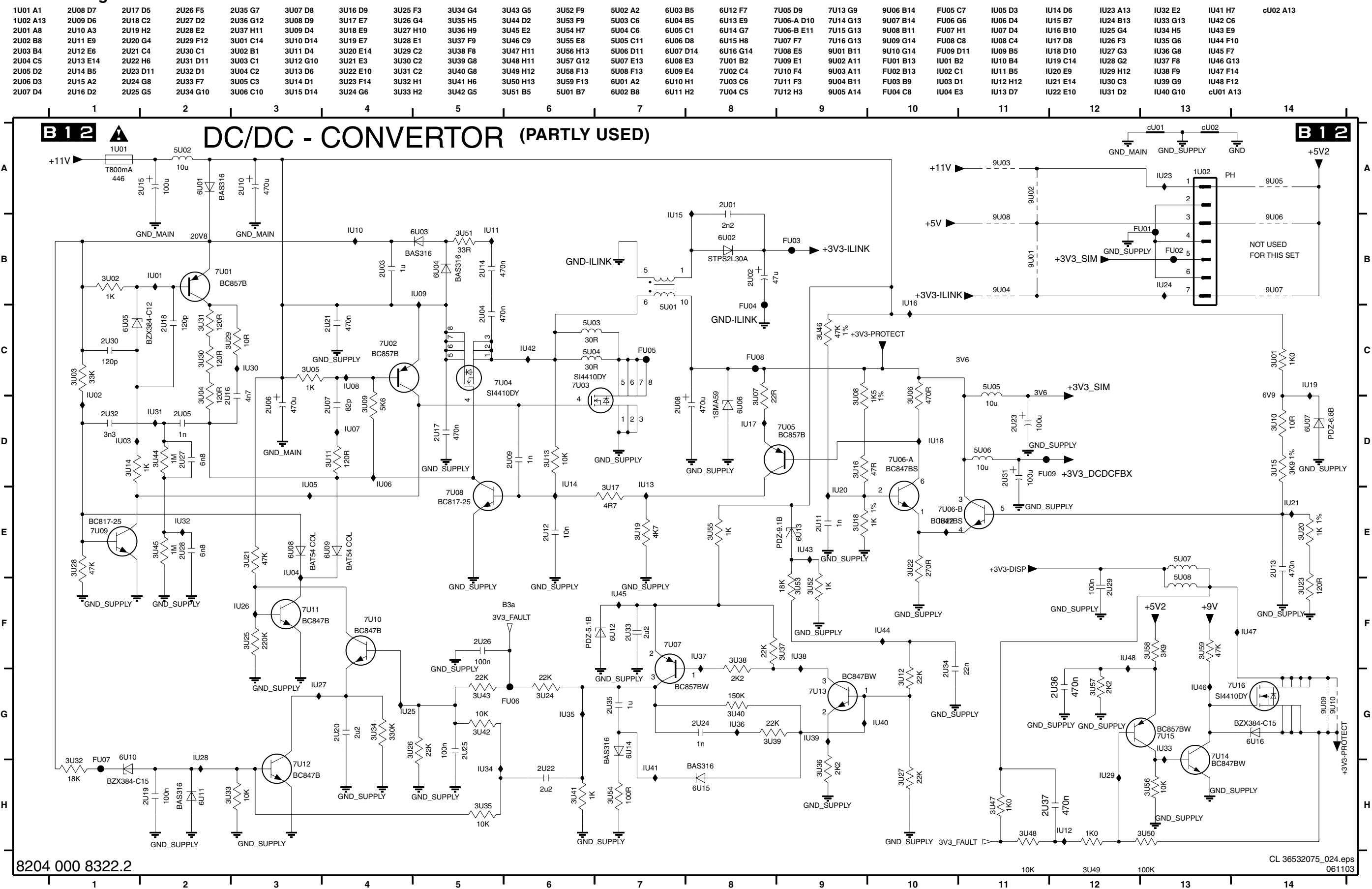
Small Signal Board: Dolby Digital Decoder



Small Signal Board: Dolby Pro Logic Processor

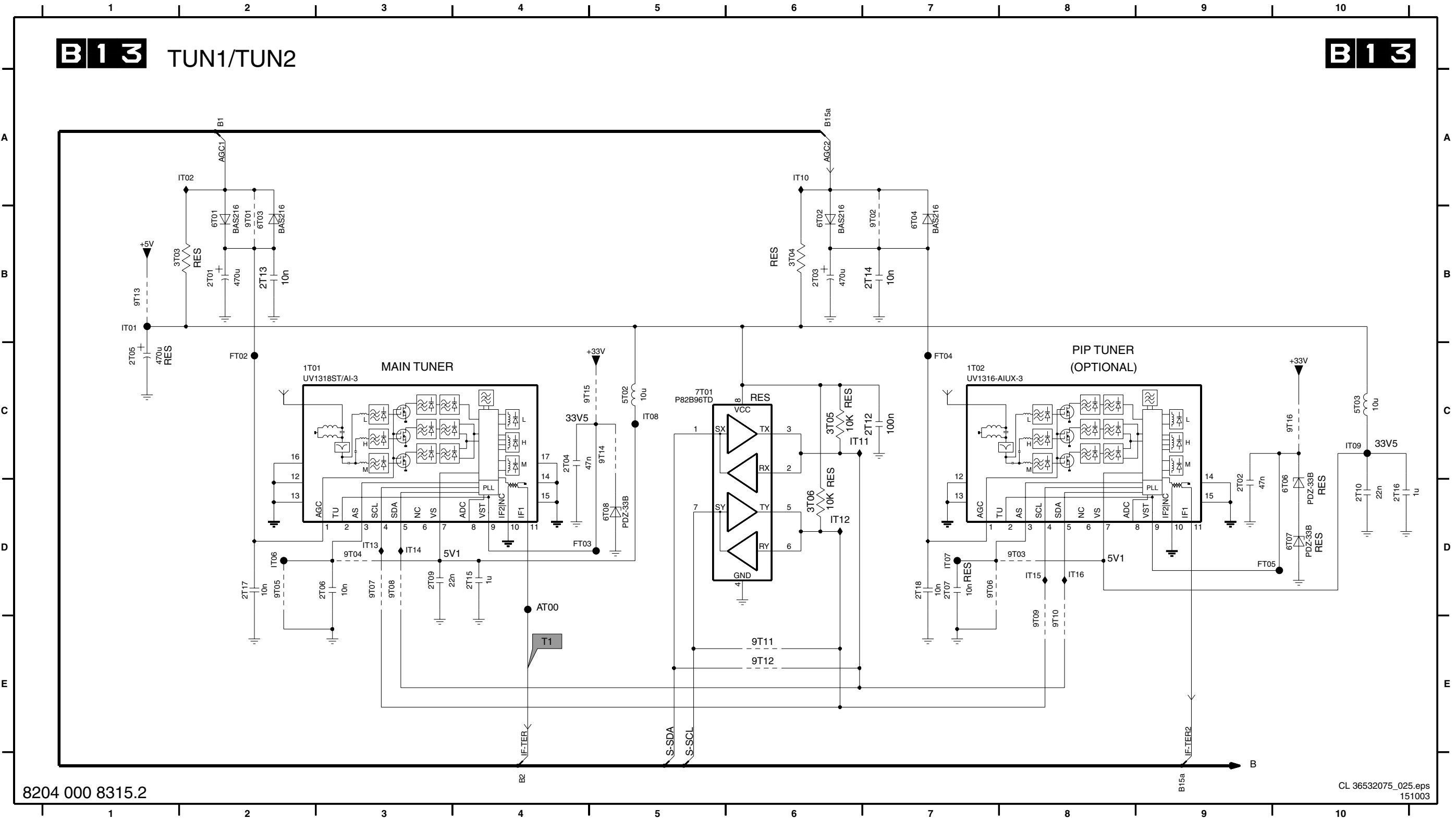


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2AC0 E1	7A62-A E12
2AD7 B2	7A62-B D10
2AD8 H12	7A63 C3
2AD9 B2	9A60 B9
2AE0 H12	9A61 F12
2AE1 H12	9A65 B10
2AF2 A2	IAA0 B1
2AK0 G5	IAA1 E12
2AK1 G6	IAA2 B8
2AK2 B7	IAA3 E9
2AK3 B7	IAA4 C9
2AK4 B7	IAA5 D2
2AK5 B6	IAA6 C11
2AK6 D2	IAA7 F11
2AK7 D2	IAA8 C6
2AK8 B6	IAA9 C7
2AK9 B6	IAB0 D7
2AL0 B12	IAB1 C9
2AL1 B9	IAB2 C12
2AL2 B11	
2AL3 B9	
2AL4 B11	
2AL5 B13	
2AL6 E11	
2AL8 C12	
2AL9 C12	
2ALA F11	
2AM0 C10	
2AM1 E13	
2AM2 E11	
2AM3 E7	
2AM4 E13	
2AM5 D9	
2AM6 F12	
2AM7 D9	
2AM8 B11	
2AM9 F12	
2AN0 E9	
2AN1 E10	
2AN2 G1	
2AN3 B5	
2AN4 B5	
2AN5 D7	
2AN6 D8	
2AN7 G5	
2AN8 B6	
2AN9 H5	
3A70 B2	
3A71 B2	
3AA0 B9	
3AA1 B12	
3AA2 F1	
3AA4 C10	
3AA5 C12	
3AA6 B9	
3AA7 C12	
3AA9 C12	
3AB0 E12	
3AB2 D9	
3AB3 E12	
3AB5 F12	
3AB6 E10	
3AB7 F12	
3AB8 E10	
3AB9 E9	
3AC8 B5	
5A23 D1	
5A24 D1	
5A31 H12	
5A32 H12	
5A33 H12	
5A37 B2	
5A60 E13	
5A61 D10	
5A62 B13	
5A63 B10	
5A64 B5	
5A65 B5	
5A66 B5	
5A67 H5	
7A61-A B12	



Small Signal Board: Tun1/Tun2

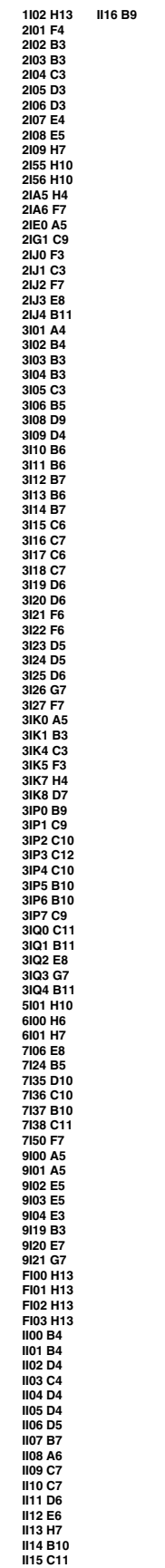
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1T02 C7	2T03 B6	2T06 D3	2T10 D10	2T14 B7	2T17 D2	3T04 B6	5T02 C5	6T02 B6	6T06 D10	7T01 C5	9T03 D8	9T06 D7	9T09 E8	9T12 E6	9T15 C5	FT02 C2	FT05 D9	IT06 D2	IT09 C10	IT12 D6	IT15 D8
2T01 B2	2T04 C4	2T07 D7	2T12 C7	2T15 E3	2T18 D7	3T05 C6	5T03 C10	6T03 B2	6T07 D10	9T01 B2	9T04 D3	9T07 D3	9T10 E8	9T13 B1	9T16 C10	FT03 D4	IT01 B1	IT07 D7	IT10 A6	IT13 D3	IT16 D8



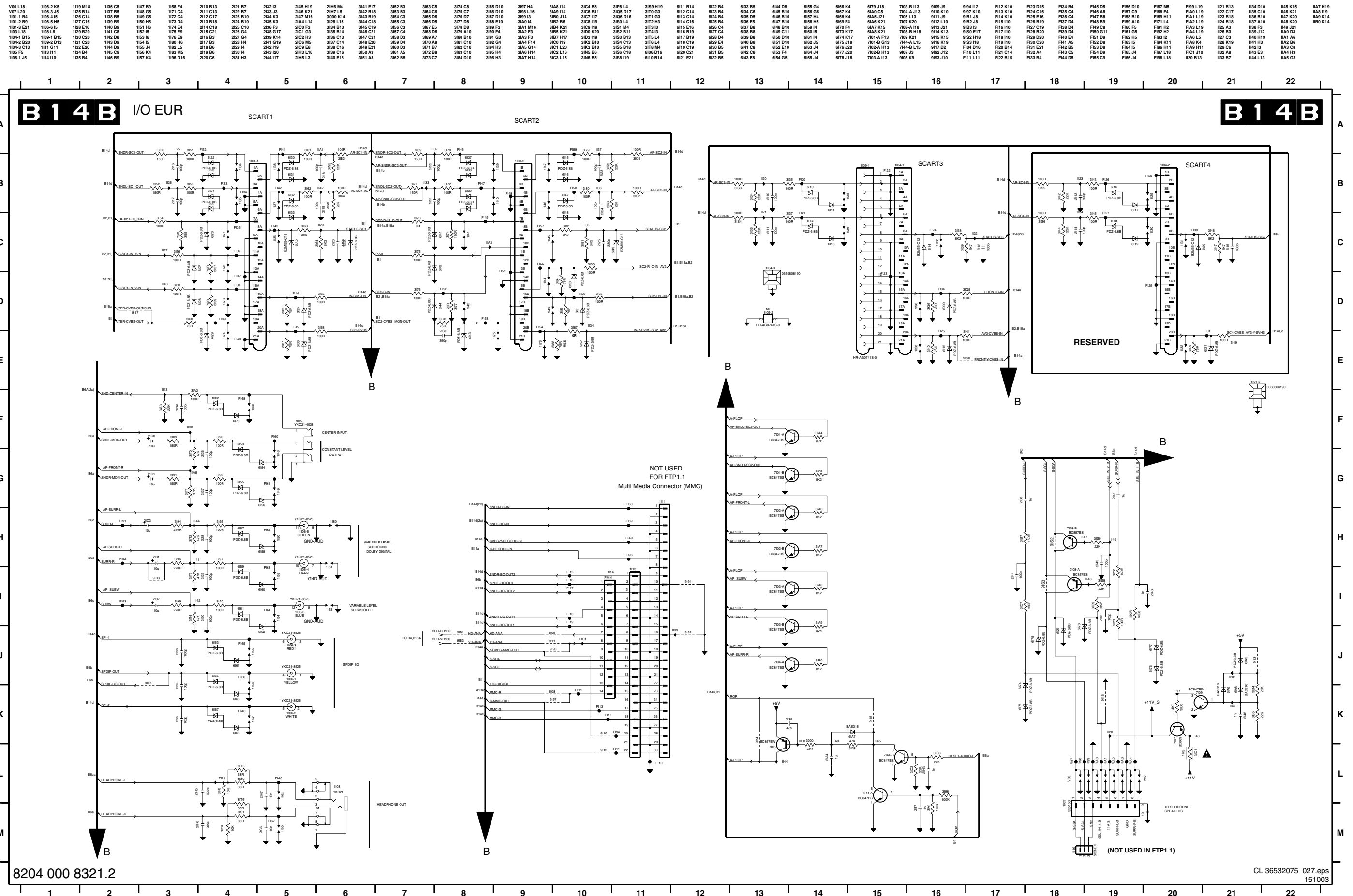
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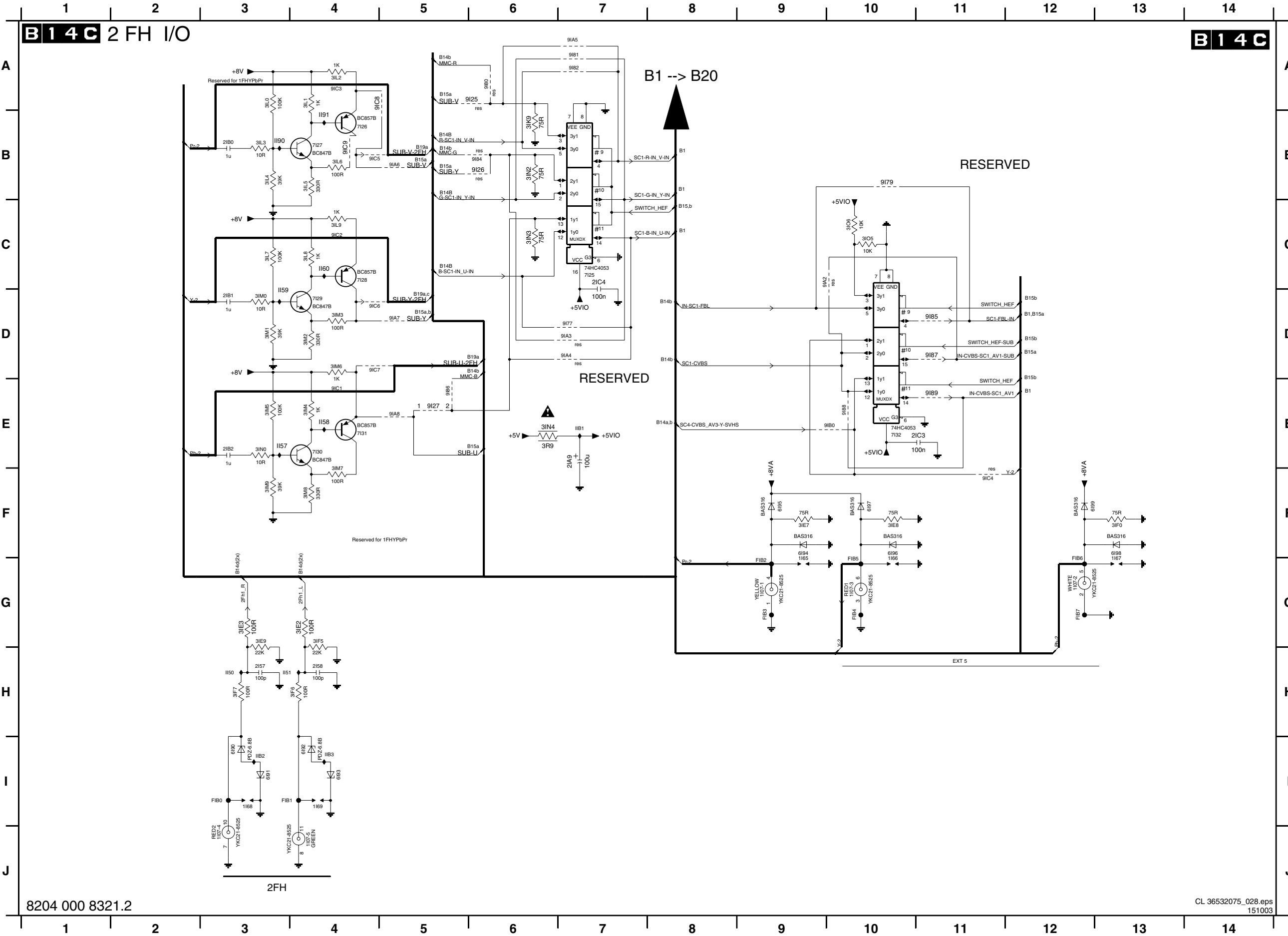
B14A I/O EUR



Small Signal Board: I/O Eur

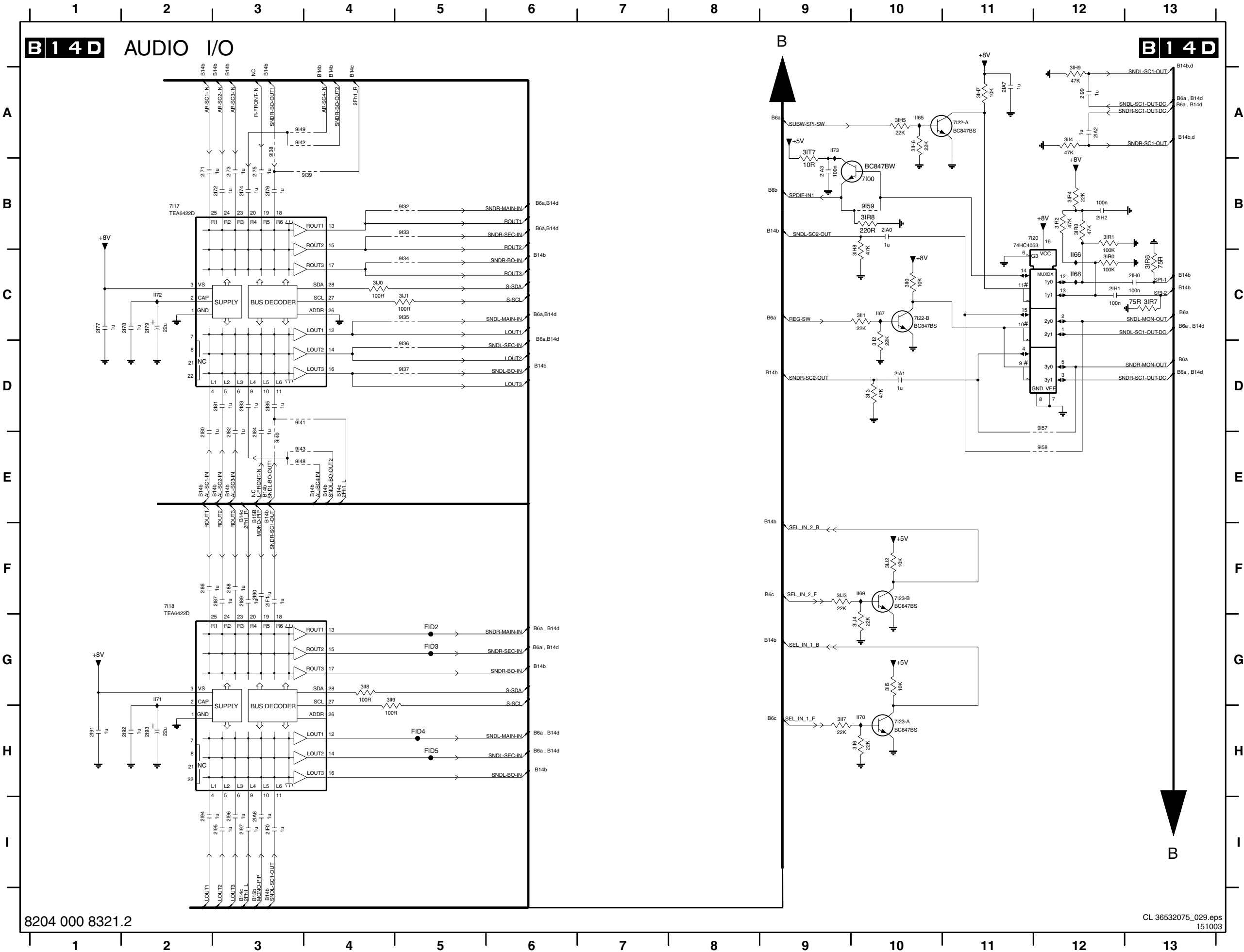


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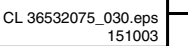
- 1107-1 G9
- 1107-2 G12
- 1107-3 G10
- 1107-4 J3
- 1107-5 J4
- 1165 G9
- 1166 G10
- 1167 G13
- 1168 I3
- 1169 I4
- 2157 H3
- 2158 H4
- 21A9 E7
- 21B0 B3
- 21B1 D3
- 21B2 E3
- 21C3 E11
- 21C4 C7
- 31E2 G4
- 31E3 G3
- 31E7 F9
- 31E8 F10
- 31E9 G3
- 31F0 F13
- 31F5 G4
- 31F6 H4
- 31F7 H3
- 31K9 B6
- 31L0 A3
- 31L1 A4
- 31L2 A4
- 31L3 B3
- 31L4 B3
- 31L5 B4
- 31L6 B4
- 31L7 C3
- 31L8 C4
- 31L9 C4
- 31M0 D3
- 31M1 D3
- 31M2 D4
- 31M3 D4
- 31M4 E4
- 31M5 E3
- 31M6 D4
- 31M7 F4
- 31M8 F4
- 31M9 F3
- 31N0 E3
- 31N2 B6
- 31N3 C6
- 31N4 E6
- 31O5 C10
- 31O6 C10
- 6191 I3
- 6192 I4
- 6193 I4
- 6194 F9
- 6195 F9
- 6196 F10
- 6197 F10
- 6198 F13
- 6199 F12
- 7125 C7
- 7126 B4
- 7127 B4
- 7128 C4
- 7129 D4
- 7130 E4
- 7131 E4
- 7132 E10
- 9125 A6
- 9126 B6
- 9127 E5
- 9177 D7
- 9179 B10
- 9180 A6
- 9181 A7
- 9182 A7
- 9184 B6
- 9185 D11
- 9186 E5
- 9187 D11
- 9188 E10
- 9189 E11
- 91A2 C10
- 91A3 D7
- 91A4 D7
- 91A5 A7
- 91A6 B5
- 91A7 D5
- 91A8 E5
- 91B0 E10
- 91C1 E4
- 91C2 C4
- 91C3 A4
- 91C4 F11
- 91C5 B4
- 91C6 D4
- 91C7 D4
- 91C8 A5
- 91C9 B4
- F1B0 I3
- F1B1 I3
- F1B2 G9
- F1B3 G9
- F1B4 G10
- F1B5 F10
- F1B6 F12
- F1B7 G12
- I150 H3
- I151 H3
- I157 E3
- I158 E4
- I159 D3
- I160 C4
- I190 B3
- I191 B4

Small Signal Board: Audio I/O

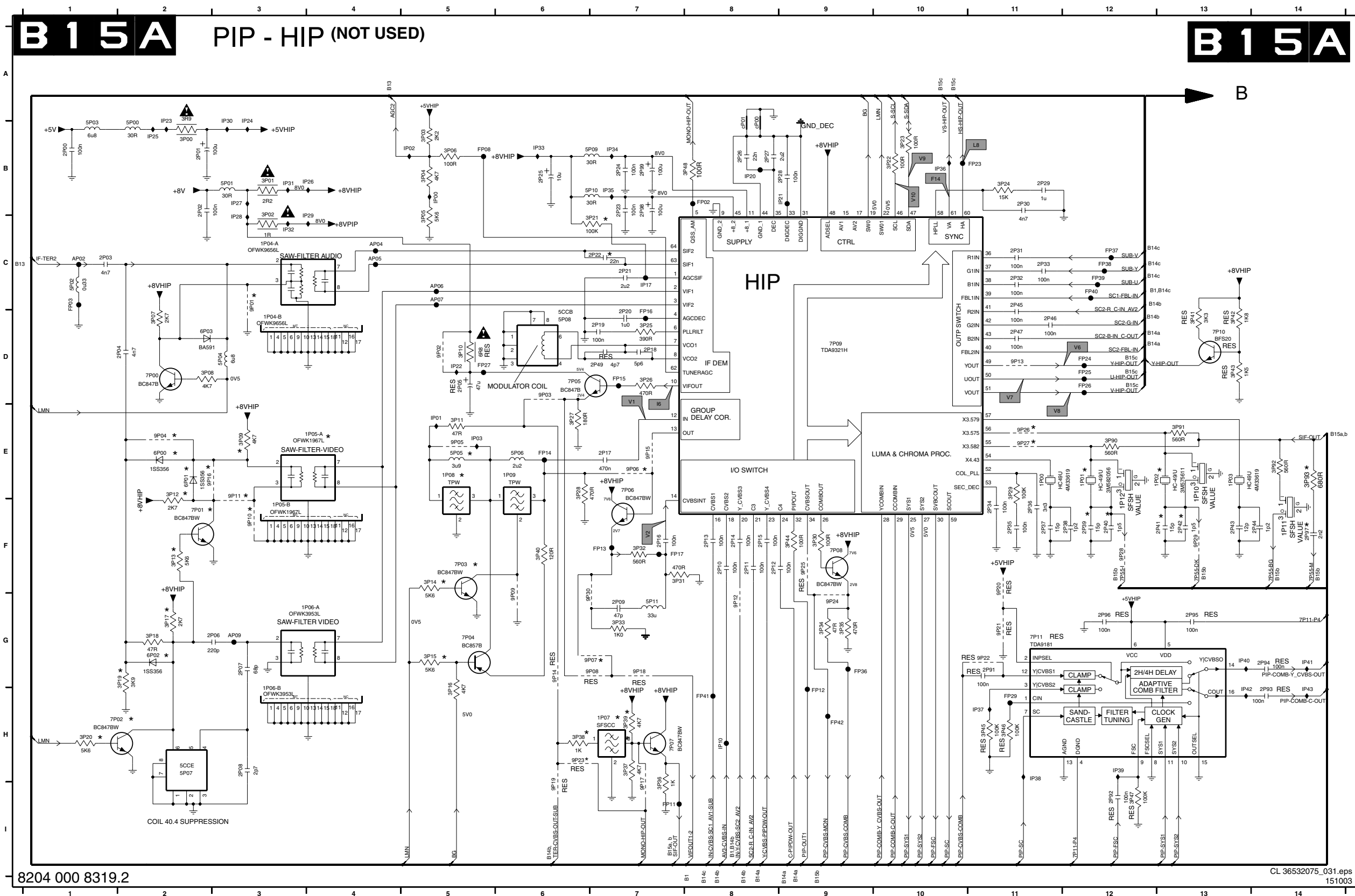


- 2171 B2
- 2172 B3
- 2173 B3
- 2174 B3
- 2175 B3
- 2176 B3
- 2177 C1
- 2178 C2
- 2179 C2
- 2180 E2
- 2181 D3
- 2182 E3
- 2183 D3
- 2184 E3
- 2185 D3
- 2186 F2
- 2187 F3
- 2188 F3
- 2189 F3
- 2190 F3
- 2191 H1
- 2192 H2
- 2193 H2
- 2194 I2
- 2195 I3
- 2196 I3
- 2197 I3
- 2199 A12
- 21A0 B10
- 21A1 D10
- 21A2 A12
- 21A3 B9
- 21A7 A11
- 21A8 I3
- 21F0 I3
- 21F1 F3
- 21H0 C13
- 21H1 C12
- 21H2 B12
- 31H5 A10
- 31H6 A10
- 31H7 A11
- 31H8 C10
- 31H9 A12
- 31I0 C10
- 31I1 C10
- 31I2 D10
- 31I3 D10
- 31I4 A12
- 31I5 G10
- 31I6 H10
- 31I7 H9
- 31I8 G4
- 31I9 G4
- 31J0 C4
- 31J1 C5
- 31J2 F10
- 31J3 F9
- 31J4 G10
- 31R0 C12
- 31R1 B12
- 31R2 B12
- 31R3 B12
- 31R4 B12
- 31R6 C13
- 31R7 C13
- 31R8 B10
- 31T7 A9
- 7100 B10
- 7117 B2
- 7118 F2
- 7120 B12
- 7122-A A11
- 7122-B C10
- 7123-A H10
- 7123-B F10
- 9132 B5
- 9133 B5
- 9134 C5
- 9135 C5
- 9136 D5
- 9137 D5
- 9138 A3
- 9139 B4
- 9140 E3
- 9141 D3
- 9142 A3
- 9143 E3
- 9148 E3
- 9149 A3
- 9157 D12
- 9158 E12
- 9159 B10
- FID2 G5
- FID3 G5
- FID4 H5
- FID5 H5
- I165 A10
- I166 C12
- I167 C10
- I168 C12
- I169 F10
- I170 H10
- I171 G2
- I172 C2
- I173 A9

1197 H3	2149 B9	2159 F13	2165 H9	21B3 C2	21E1 C15	21J8 B8
1199 H2	2150 B9	2160 D2	2166 A9	21B4 D10	21E2 B7	21J9 B10
2100 B2	2151 C2	2161 E9	2167 A9	21B7 C4	21F3 D5	3100 G8
2137 F15	2152 C5	2162 H10	2169 E9	21B8 E13	21J5 D6	3107 A8
2140 H15	2153 E6	2163 B2	2170 A9	21B9 B13	21J6 G8	3129 F8
2148 D3	2154 F9	2164 H9	2198 D9	21C7 C10	21J7 H8	3130 F8



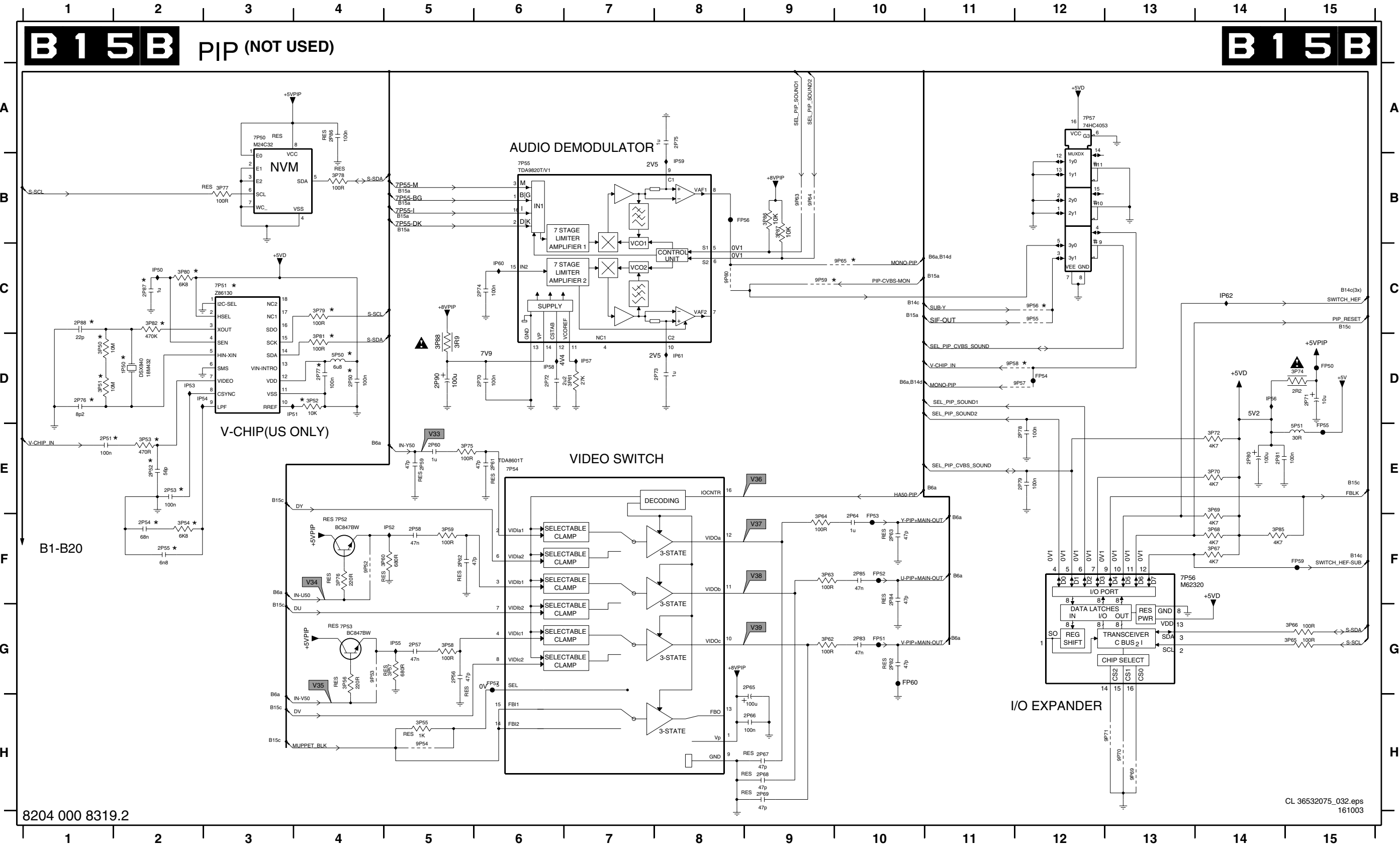
Small Signal Board: PIP-HIP



1000-A E1	3P12 E2	9P20 F11
1P00 E11	3P13 F2	9P21 G11
1P01 E12	3P14 F5	9P22 G11
1P02 E13	3P15 G5	9P23 I6
1P03 E13	3P16 H5	9P24 G9
1P04-A C3	3P17 G2	9P25 F9
1P04-B D3	3P18 G2	9P26 E11
1P05-A E4	3P19 G2	9P27 E11
1P05-B F3	3P20 H1	9P28 F12
1P06-A G4	3P21 C7	9P29 F13
1P06-B H3	3P22 B10	AP02 C1
1P07 G7	3P23 B10	AP04 C4
1P08 E5	3P24 B11	AP05 C4
1P09 E6	3P25 D7	AP06 C5
1P10 E13	3P26 D7	AP07 C5
1P11 F14	3P27 E6	AP09 G3
1P12 E12	3P28 E6	FP02 B8
2P00 B1	3P29 E11	FP03 C1
2P01 B2	3P30 F9	FP08 B5
2P02 B2	3P31 F7	FP11 I7
2P03 C1	3P32 F7	FP12 H9
2P04 D2	3P34 G9	FP13 F7
2P05 D5	3P35 G9	FP14 E6
2P06 G3	3P36 H7	FP15 D7
2P07 G3	3P37 H7	FP16 D7
2P08 H3	3P38 H6	FP17 F7
2P10 F8	3P39 G7	FP23 B11
2P11 F8	3P40 F6	FP24 D12
2P12 F8	3P41 D13	FP25 D12
2P13 F8	3P42 D13	FP26 D12
2P14 F8	3P43 D13	FP27 D5
2P15 F8	3P44 F9	FP29 H11
2P16 F7	3P45 H11	FP36 G9
2P17 E7	3P46 H11	FP37 C12
2P18 D7	3P47 I12	FP38 C12
2P19 D7	3P48 B7	FP39 C12
2P20 D7	3P49 E12	FP40 C12
2P21 C7	3P91 E13	FP41 H8
2P22 C7	3P92 E14	FP42 H9
2P23 B7	3P93 E14	IP00 B5
2P24 B7	5P00 B2	IP01 E5
2P25 B6	5P01 B3	IP02 B5
2P26 B8	5P02 C1	IP03 E5
2P27 B8	5P03 B1	IP10 H8
2P28 B9	5P04 D3	IP17 C7
2P29 B11	5P05 E5	IP20 B8
2P30 B11	5P06 E5	IP21 B9
2P31 C11	5P07 H2	IP22 D5
2P32 C11	5P08 D6	IP23 B2
2P33 C11	5P09 B7	IP24 B3
2P34 F11	5P10 B7	IP25 B2
2P35 F11	6P00 E2	IP26 B4
2P36 F11	6P01 E2	IP27 B3
2P37 F11	6P02 G2	IP28 C3
2P38 F12	6P03 D2	IP29 C4
2P39 F12	7P00 D2	IP30 B3
2P40 F12	7P01 F2	IP31 B3
2P41 F13	7P02 H1	IP32 C3
2P42 F13	7P03 F5	IP33 B6
2P43 F13	7P04 G5	IP34 B7
2P44 F14	7P05 D6	IP35 B7
2P45 C11	7P06 E7	IP36 B10
2P46 D11	7P07 H7	IP37 H11
2P47 D11	7P08 F9	IP38 H11
2P48 F7	7P09 D9	IP39 H12
2P49 D7	7P10 D13	IP40 G13
2P91 G11	7P11 G11	IP41 G14
2P92 I12	9P00 B4	IP42 H13
2P93 H14	9P01 C3	IP43 H14
2P94 G14	9P02 D5	cP00 B8
2P95 G13	9P03 D6	
2P96 G12	9P04 E2	
2P97 F14	9P05 E5	
2P98 B7	9P06 E7	
2P99 B7	9P07 G7	
3P00 B2	9P08 G7	
3P01 B3	9P09 G6	
3P02 C3	9P10 F3	
3P03 B5	9P11 E3	
3P04 B5	9P12 G8	
3P05 C5	9P13 D1	
3P06 B5	9P14 G6	
3P07 D2	9P15 E7	
3P08 D2	9P16 E2	
3P09 E3	9P17 H7	
3P10 D5	9P18 G7	
3P11 E5	9P19 I6	

Small Signal Board: PIP

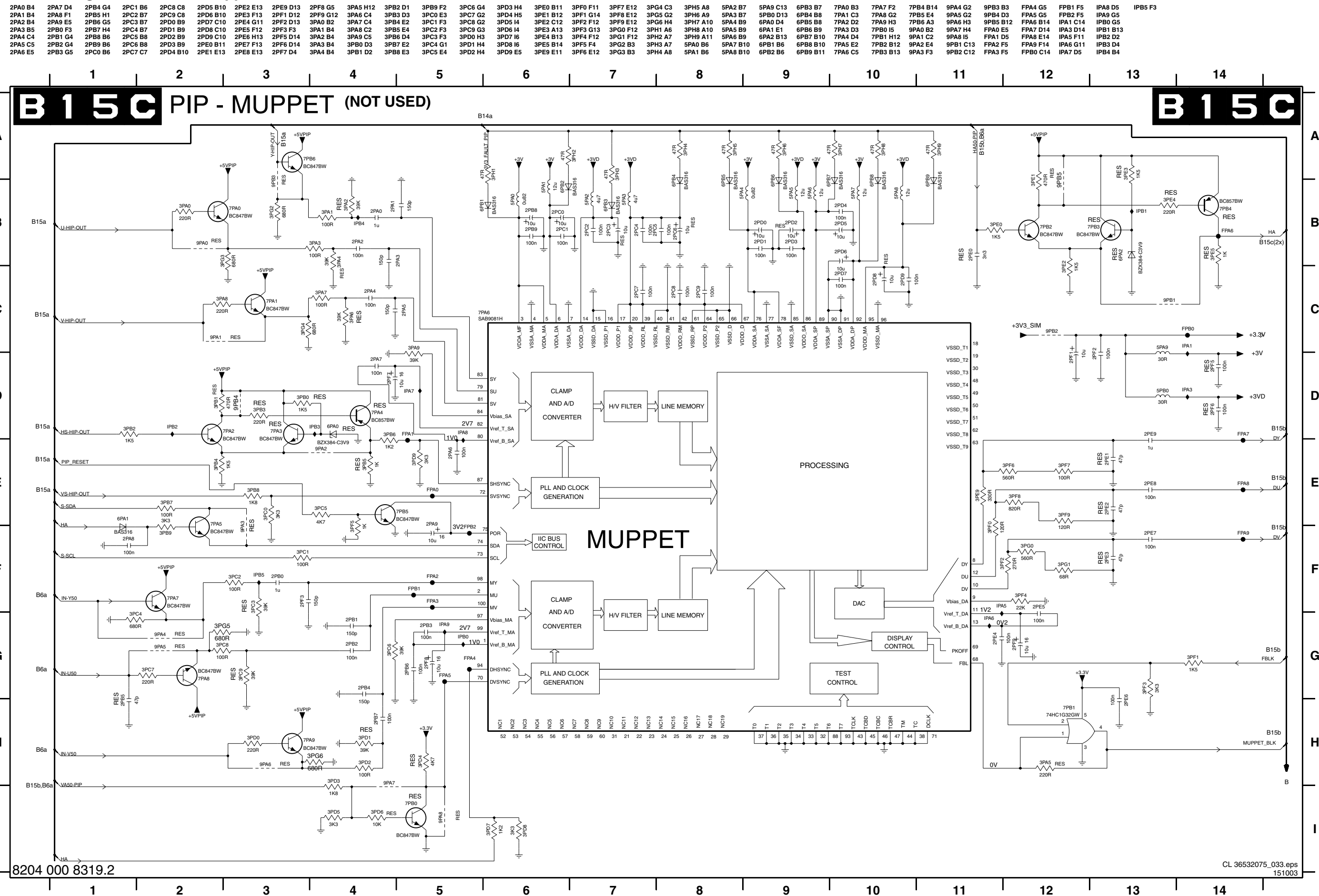
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2P50 D4	2P54 F2	2P58 F5	2P62 F5	2P66 H9	2P70 D6	2P74 C6	2P78 E12	2P82 G10	2P86 A4	3P50 D1	3P54 F2	3P58 G5	3P62 G9	3P66 G15	3P70 E14	3P76 F4	3P80 C2	3P86 B9	5P51 E15	7P53 G4	7P57 A12	9P55 C12	9P59 C9	9P65 C10	9P69 H13	FP54 D12	FP58 F15	IP52 F5	IP56 D14	IP60 C6
2P51 E1	2P55 F2	2P59 E5	2P63 F10	2P67 H9	2P71 D15	2P75 A8	2P79 E12	2P83 G10	2P87 C2	3P51 D1	3P55 H5	3P59 F5	3P63 F9	3P67 F14	3P72 E14	3P77 B3	3P81 D4	3P87 B9	7P50 A3	7P54 E6	9P52 F4	9P56 C12	9P60 C8	9P66 H13	FP51 G10	FP55 E15	IP53 D2	IP57 D7	IP61 D8	
2P52 E2	2P56 G5	2P60 E5	2P64 F10	2P68 H9	2P72 D6	2P76 D1	2P80 E14	2P84 F10	2P88 C1	3P52 D4	3P56 G4	3P60 F5	3P64 F9	3P68 F14	3P74 D15	3P78 B4	3P82 C2	3P88 D5	7P51 C3	7P55 B6	9P53 G4	9P57 D12	9P63 B9	9P70 H13	FP52 F10	FP56 B8	IP54 D2	IP58 D6	IP62 C14	



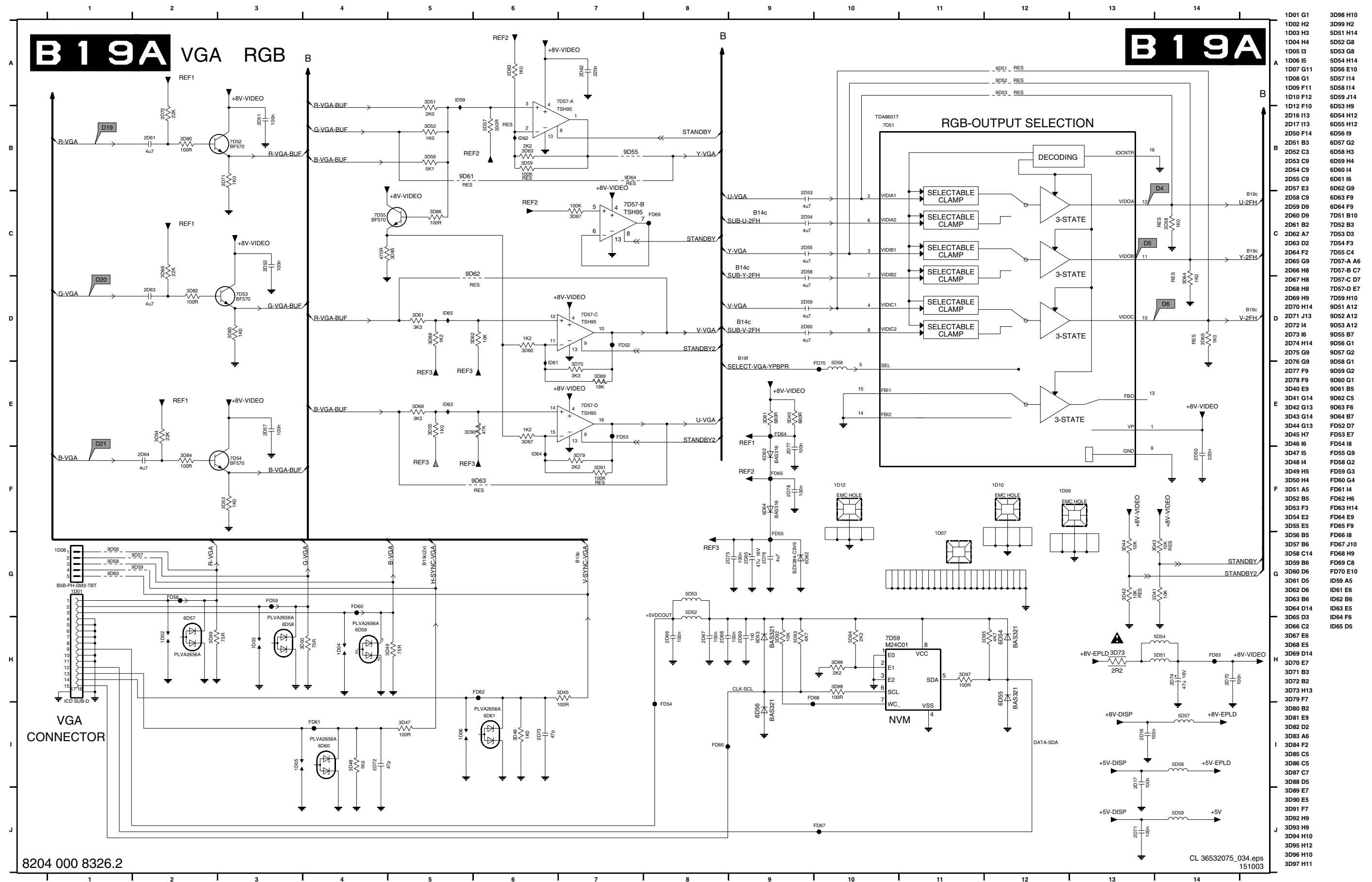
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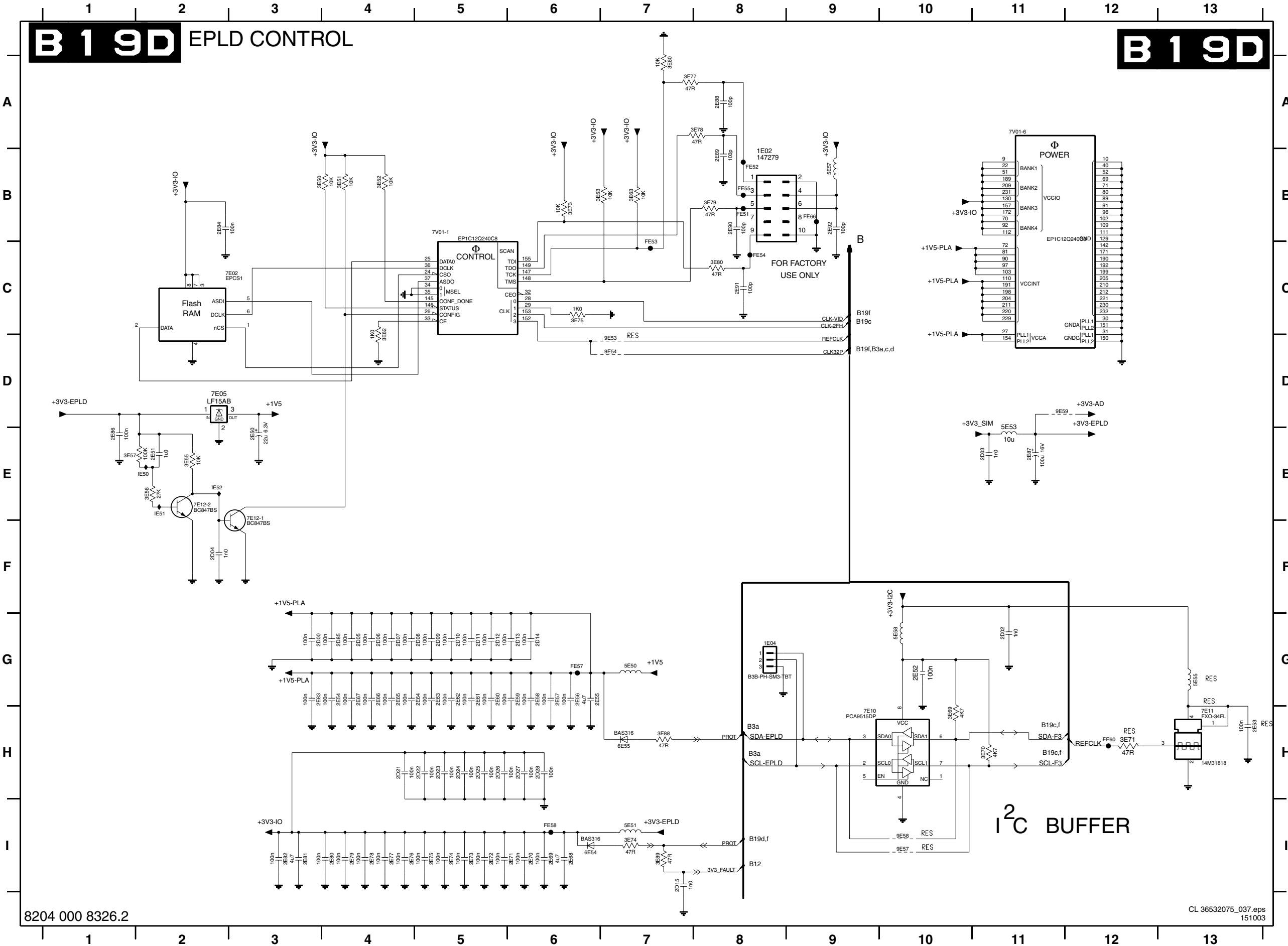
Small Signal Board: PIP Muppet



Small Signal Board: VGA RGB

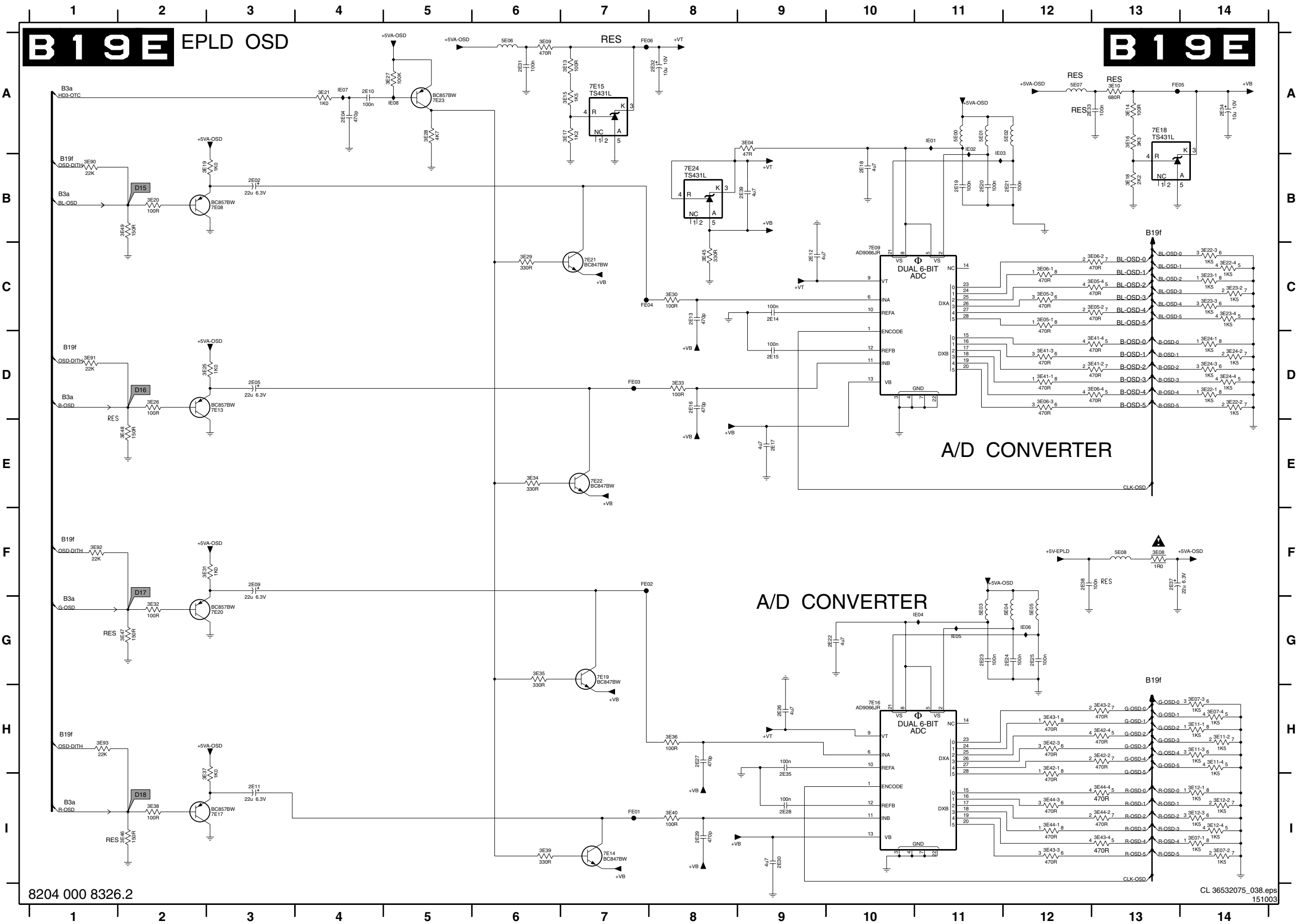


Small Signal Board: EPLD Control



- 1E02 B8
- 1E04 G8
- 2D00 G3
- 2D02 G11
- 2D03 E11
- 2D04 F2
- 2D05 G4
- 2D06 G4
- 2D07 G4
- 2D08 G5
- 2D09 G5
- 2D10 G5
- 2D11 G5
- 2D12 G5
- 2D13 G6
- 2D14 G6
- 2D15 I7
- 2D21 H4
- 2D22 H5
- 2D23 H5
- 2D24 H5
- 2D25 H5
- 2D26 H5
- 2D27 H6
- 2D28 H6
- 2D85 G4
- 2E50 E3
- 2E51 E2
- 2E52 G10
- 2E53 H13
- 2E54 G4
- 2E55 G6
- 2E56 G6
- 2E57 G6
- 2E58 G6
- 2E59 G6
- 2E60 G5
- 2E61 G5
- 2E62 G5
- 2E63 G5
- 2E64 G5
- 2E65 G4
- 2E66 G4
- 2E67 G4
- 2E68 I6
- 2E69 I6
- 2E70 I6
- 2E71 I6
- 2E72 I5
- 2E73 I5
- 2E74 I5
- 2E75 I5
- 2E76 I4
- 2E77 I4
- 2E78 I4
- 2E79 I4
- 2E80 I4
- 2E81 I3
- 2E82 I3
- 2E83 G3
- 2E84 B2
- 2E86 E1
- 2E87 E11
- 2E88 A8
- 2E89 B8
- 2E90 B8
- 2E91 C8
- 2E92 B9
- 3E50 B3
- 3E51 B4
- 3E52 B4
- 3E53 B6
- 3E55 E2
- 3E56 E2
- 3E57 E1
- 3E60 A7
- 3E62 D4
- 3E63 B7
- 3E69 H10
- 3E70 H11
- 3E71 H12
- 3E73 B6
- 3E74 I7
- 3E75 C6
- 3E77 A7
- 3E78 A8
- 3E79 B8
- 3E80 C8
- 3E88 H7
- 3E89 I7
- 5E50 G7
- 5E51 I7
- 5E53 E11
- 5E55 G13
- 5E57 B9
- 5E58 G10
- 6E54 I6
- 6E55 H7
- 7E02 C2
- 7E05 D2
- 7E10 H9
- 7E11 H13
- 7E12-1 E3
- 7E12-2 E2
- 7V01-1 B5
- 7V01-6 A11
- 9E53 D7
- 9E54 D7
- 9E57 I10
- 9E58 I10
- 9E59 D11
- FE51 B8
- FE52 B8
- FE53 C7
- FE54 C8
- FE55 B8
- FE57 G6
- FE58 I6
- FE60 H12
- FE66 B9
- IE50 E2
- IE51 E2
- IE52 E2

Small Signal Board: EPLD OSD

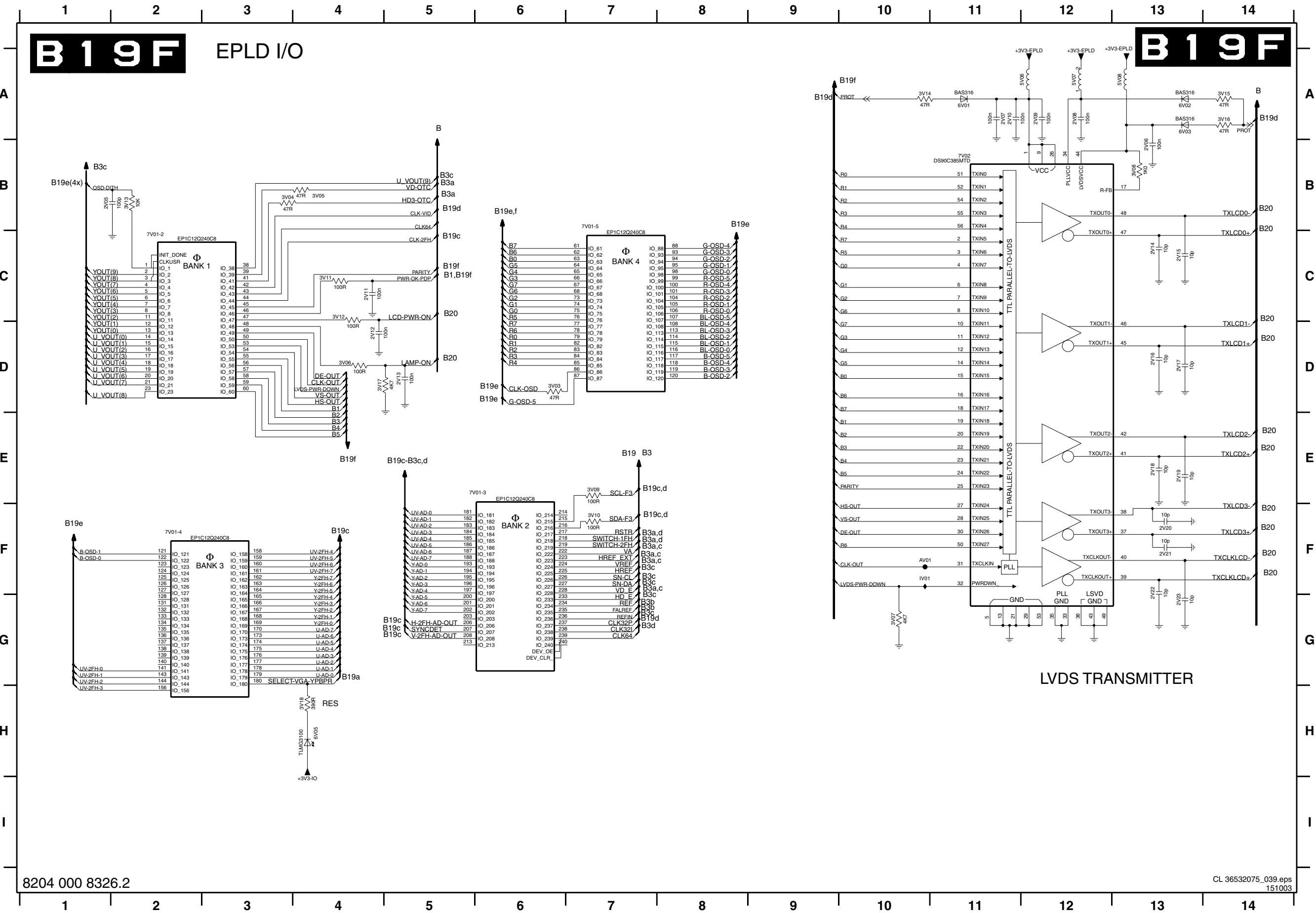


2E02 B3	3E93 H1
2E04 A4	5E00 A11
2E05 D3	5E01 A11
2E09 F3	5E02 A12
2E10 A4	5E03 G11
2E11 I3	5E04 G12
2E12 C9	5E05 G12
2E13 C8	5E06 A6
2E14 C9	5E07 A12
2E15 D9	5E08 F13
2E16 D8	7E08 B3
2E17 E9	7E09 C10
2E18 B10	7E13 D3
2E19 B11	7E14 I7
2E20 B11	7E15 A7
2E21 B12	7E16 H10
2E22 G10	7E17 I3
2E23 G11	7E18 A13
2E24 G12	7E19 G7
2E25 G12	7E20 G3
2E26 H9	7E21 C7
2E27 H8	7E22 E7
2E28 I9	7E23 A5
2E29 I8	7E24 B8
2E30 I9	FE01 I7
2E31 A6	FE02 F7
2E32 A8	FE03 D7
2E33 A12	FE04 C7
2E34 A14	FE05 A13
2E35 H9	FE06 A7
2E37 F13	IE01 A11
2E38 F12	IE02 A11
2E39 B9	IE03 A11
3E04 A9	IE04 G11
3E05-A C12	IE05 G11
3E05-B C13	IE06 G12
3E05-D C13	3E06-A C12
3E06-B C13	3E06-C D12
3E06-D D13	3E07-1 I14
3E07-2 I14	3E07-3 H14
3E07-4 H14	3E07-5 H14
3E08 F13	3E09 A6
3E09 A6	3E10 A13
3E11-1 H14	3E11-2 H14
3E11-3 H14	3E11-4 H14
3E12-1 I14	3E12-2 I14
3E12-3 I14	3E12-4 I14
3E13 A7	3E14 A13
3E15 A7	3E16 A13
3E17 A7	3E18 B13
3E19 B2	3E20 B2
3E21 A4	3E22-1 D14
3E22-2 D14	3E22-3 C14
3E22-4 C14	3E23-1 C14
3E23-2 C14	3E23-3 C14
3E24-1 D14	3E24-2 D14
3E24-3 D14	3E24-4 D14
3E25 D2	3E26 D2
3E27 A5	3E28 A5
3E29 C6	3E30 C8
3E31 F2	3E32 G2
3E33 D8	3E34 E6
3E35 G6	3E36 H8
3E37 I2	3E38 I2
3E39 I6	3E40 I8
3E41-A D12	3E41-B D13
3E41-C D12	3E41-D D12
3E42-A H12	3E42-B H13
3E42-C H12	3E42-D H13
3E43-A H12	3E43-B H13
3E43-C I12	3E43-D I13
3E44-A I12	3E44-B I13
3E44-C I12	3E44-D I13
3E45 C8	3E46 I2
3E47 G2	3E48 E2
3E49 B2	3E90 B1
3E91 D1	3E92 F1

8204 000 8326.2

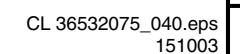
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Small Signal Board: EPLD I/O

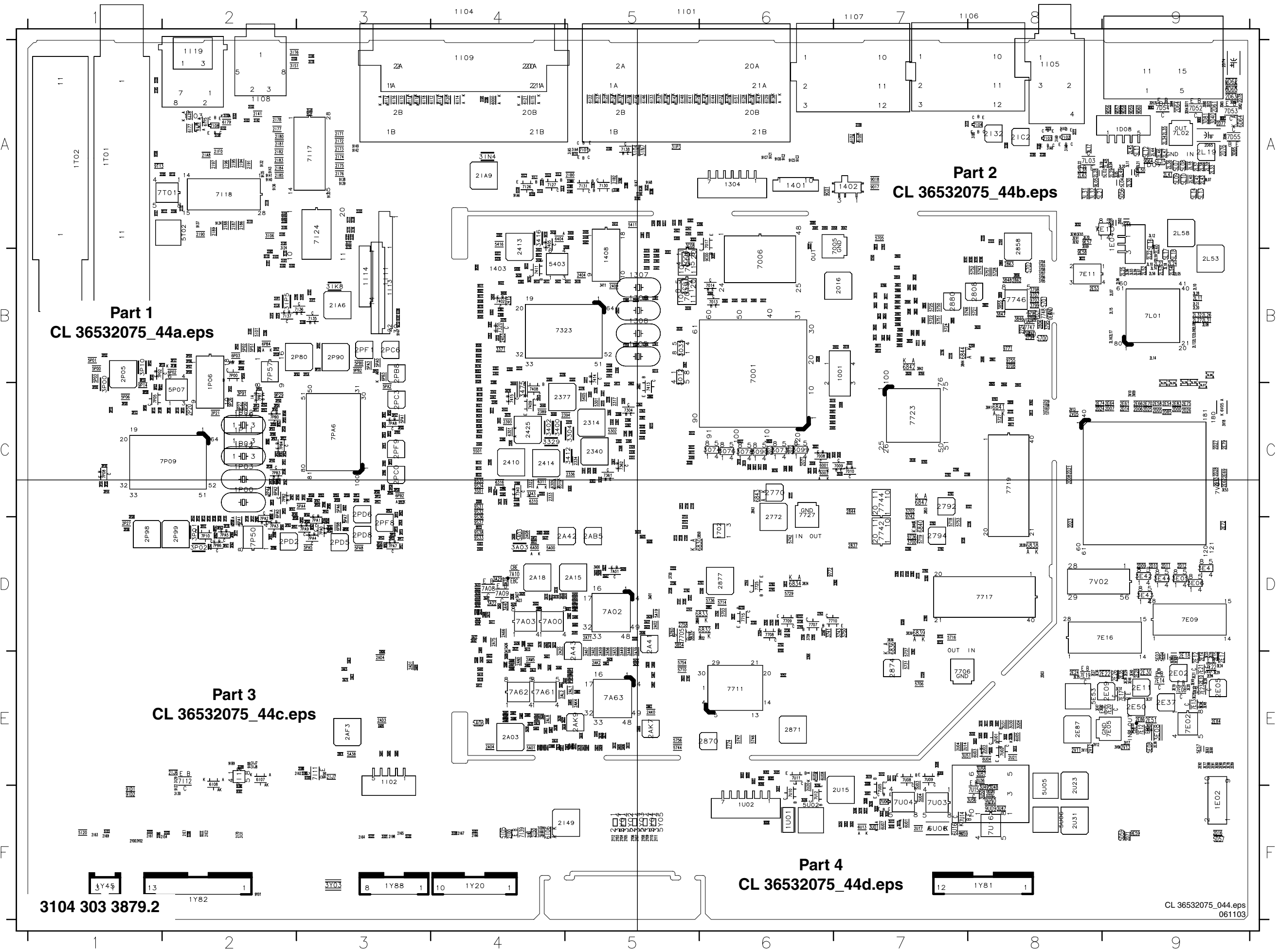


- 2V05 B1
- 2V06 B13
- 2V07 A11
- 2V08 A12
- 2V09 A12
- 2V10 A11
- 2V11 C4
- 2V12 D4
- 2V13 D5
- 2V14 C13
- 2V15 C13
- 2V16 D13
- 2V17 D13
- 2V18 E13
- 2V19 E13
- 2V20 F13
- 2V21 F13
- 2V22 F13
- 2V23 G13
- 3V03 D6
- 3V04 B3
- 3V05 B4
- 3V06 D4
- 3V07 G10
- 3V08 B13
- 3V09 E7
- 3V10 F7
- 3V11 C4
- 3V12 C4
- 3V13 B2
- 3V14 A10
- 3V15 A14
- 3V16 A14
- 3V17 D4
- 3V18 H4
- 5V06 A12
- 5V07 A12
- 5V08 A13
- 6V01 A11
- 6V02 A13
- 6V03 A13
- 6V05 H4
- 7V01-2 C2
- 7V01-3 E6
- 7V01-4 F2
- 7V01-5 B7
- 7V02 B11
- AV01 F10
- IV01 F10

1Y00 A8	1Y06 E4	1Y11 B8	1Y16 D3	1Y30 E1	2Y00 E6	2Y06 B2	2Y11 C2	3Y03 E4	5Y05 C2	FY01 A8	FY06 D7	FY11 E8	FY16 C3	FY21 C2	FY26 D4	FY31 E4	FY36 A4	FY41 E8
1Y01 C4	1Y07 D4	1Y12 D7	1Y17 E3	1Y45 D1	2Y01 C6	2Y07 B2	2Y12 A2	5Y01 A2	9Y00 E4	FY02 A3	FY07 A3	FY12 B3	FY17 C3	FY22 B8	FY27 D4	FY32 E3	FY37 E8	FY42 E3
1Y03 B7	1Y08 D4	1Y13 D8	1Y18 E2	1Y81 A8	2Y03 A2	2Y08 B2	3Y00 E8	5Y02 B2	9Y01 E4	FY03 D7	FY08 B3	FY13 D7	FY18 C3	FY23 E8	FY28 D4	FY33 E3	FY38 B8	
1Y04 C7	1Y09 E7	1Y14 D8	1Y19 C7	1Y82 D8	2Y04 B2	2Y09 C2	3Y01 E8	5Y03 B2	9Y02 E4	FY04 A3	FY09 E8	FY14 B3	FY19 D2	FY24 C7	FY29 D4	FY34 D2	FY39 E3	
1Y05 D4	1Y10 E7	1Y15 D8	1Y20 D3	1Y88 C8	2Y05 B2	2Y10 C2	3Y02 E6	5Y04 C2	9Y03 E4	FY05 C7	FY10 B3	FY15 D7	FY20 C2	FY25 C7	FY30 E4	FY35 D2	FY40 E8	



Layout Small Signal Panel (Top Side Overview)



3104 303 3879.2

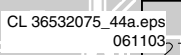
Part 4
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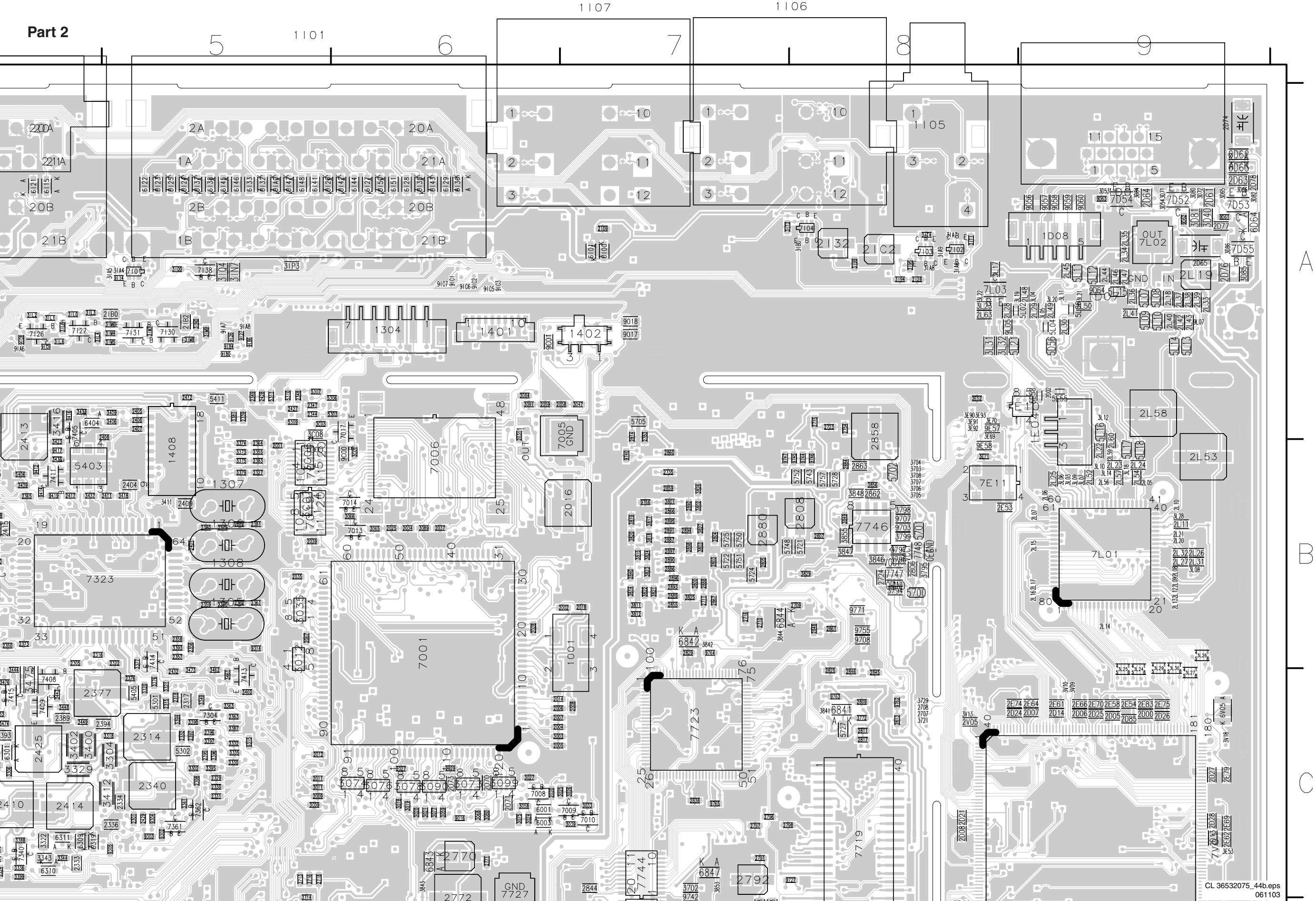
Layout Small Signal Panel Mapping (Top Side)

1001	B7	2334	C5	2758	D5	2A21	D5	2AL5	E4	2E79	C9	2L17	B9	2PB9	C3	3059	C6	3475	B4	3842	B7	3D66	A9	3IB0	A8	3P07	B2	3S08	C4	5737	E7	5U04	F7	6PB4	B2	7I04	A8	9740	B7	9P08	C1
1304	A6	2336	C5	2763	D6	2A22	D4	2AL6	E4	2E83	C9	2L18	A9	2PC0	C3	3065	B6	3476	C4	3843	C6	3D71	A9	3IB6	F1	3P08	B2	3T05	A2	5742	D6	5U05	E8	6PB8	D3	7I08	A2	9742	C7	9P13	D2
1305	B5	2339	A5	2764	E6	2A23	D4	2AL8	E4	2E84	E9	2L19	A9	2PC1	C3	3066	B6	3700	D7	3844	B7	3D72	A9	3IB8	E3	3P10	B1	3T06	A2	5743	B8	5U06	F8	6U01	F7	7I11	E3	9744	B8	9P14	C1
1306	B5	2340	C5	2767	E7	2A25	D4	2AL9	E4	2E86	E9	2L20	B9	2PC2	C3	3068	C6	3702	C7	3846	B8	3D80	A9	3IB9	E3	3P17	B2	3U01	F7	5744	E5	5Y01	F5	6U03	E8	7I12	E2	9745	B8	9P15	C1
1307	B5	2344	A5	2770	C6	2A26	D4	2ALA	E5	2E87	E8	2L21	B9	2PC3	C3	3073	C6	3703	B8	3847	B8	3D81	A9	3IC0	A2	3P18	B2	3U02	E8	5746	E6	5Y02	F5	6U04	E8	7I17	A3	9746	B8	9P19	B1
1308	B5	2347	A5	2771	C6	2A27	D5	2AM0	E4	2E88	E9	2L22	B9	2PC4	B3	3074	C6	3704	B8	3848	B8	3D82	A9	3IC5	F2	3P19	B1	3U03	E8	5747	E6	5Y03	F5	6U05	E8	7I18	A2	9747	B7	9P26	C2
1401	A6	2348	A5	2772	D6	2A29	D5	2AM1	E4	2E89	E9	2L23	B9	2PC5	C3	3075	C6	3705	B8	3849	B8	3D84	A9	3IC9	A1	3P20	B1	3U04	E8	5748	B7	5Y04	F5	6U06	F7	7I19	E2	9755	B8	9P27	C2
1402	A7	2349	A5	2774	E6	2A30	D4	2AM2	E4	2E90	E9	2L24	B9	2PC6	B3	3076	C6	3706	B8	3850	D5	3D85	A9	3ID1	F3	3P25	C2	3U05	E8	5750	B7	5Y05	F5	6U07	F7	7I24	A3	9762	C8	9P29	C2
1403	B4	2350	B4	2776	D8	2A31	D4	2AM3	E5	2E91	E9	2L25	B9	2PC7	B2	3077	C6	3707	B8	3853	C7	3D86	A9	3ID3	A2	3P26	C2	3U06	E7	5751	B7	6000	A4	6U08	E6	7I26	A4	9763	C8	9P70	B3
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1702	D6	2352	B4	2782	D7	2A33	D5	2AM6	E4	2I00	F4	2L27	B9	2PC9	C2	3080	C6	3713	C5	3855	B8	3E06	D9	3ID8	F4	3P28	C1	3U08	F7	5753	D7	6003	C6	6U13	F7	7I30	A5	9765	C7	9PA1	C2
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Part 1



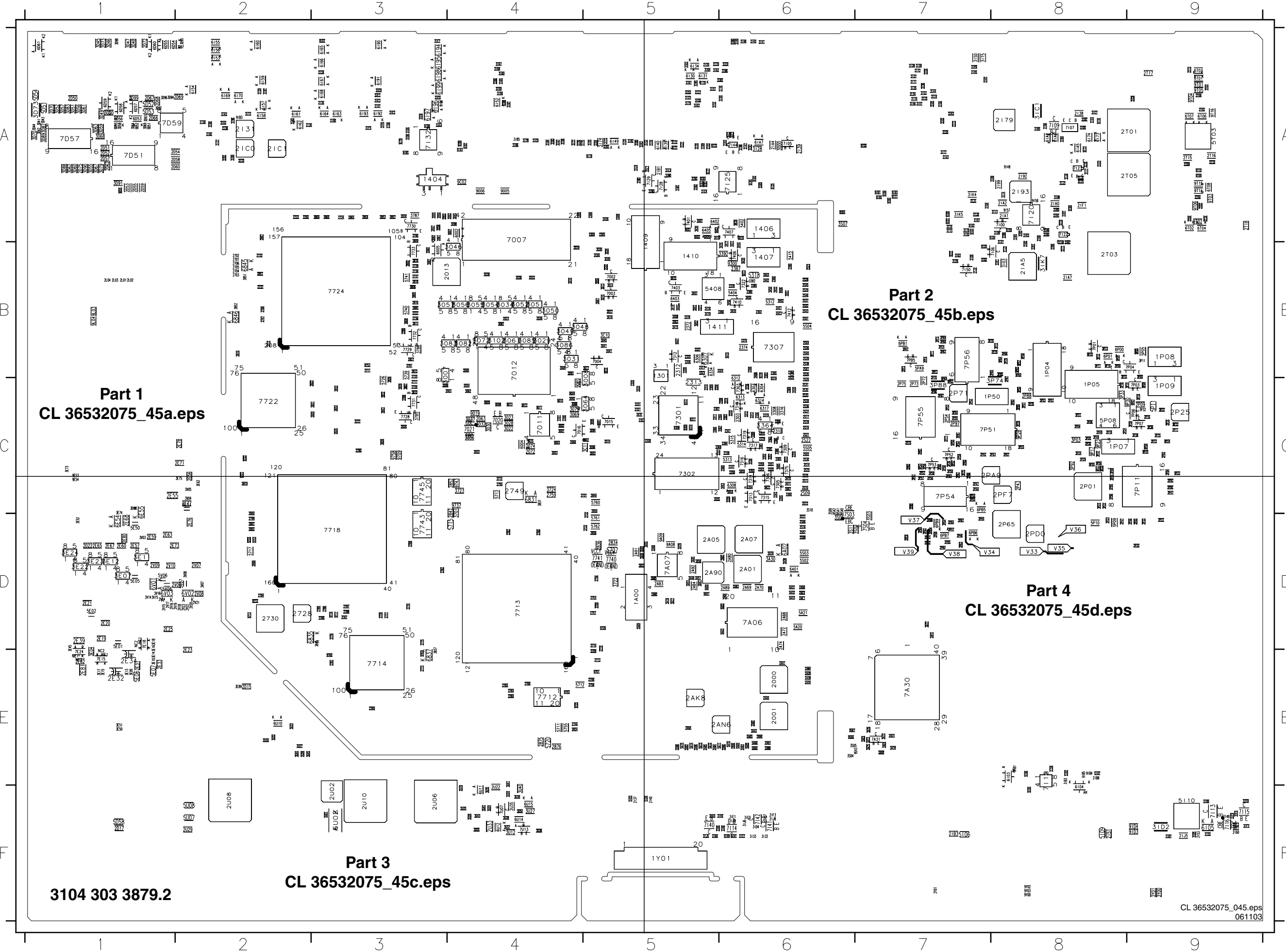
Layout Small Signal Panel (Top Side Part 2)



F



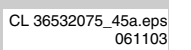
Layout Small Signal Panel (Bottom Side Overview)



Layout Small Signal Panel Mapping (Bottom Side)

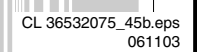
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1P03	C8	2375	B6	2820	C3	2AN2	E6	2I29	A2	2P33	D9	2S21	C6	3008	B5	3339	C6	3786	B3	3D87	A1	3I64	A5	3IH8	A8	3P45	C8	3V07	D2	5S04	B6	6I96	A3	7743	D3	9403	A5	9I B0	A6		
1P04	B8	2378	B6	2821	C3	2AN3	E6	2I30	A2	2P43	C8	2S22	C6	3010	B4	3350	C6	3787	A3	3D88	A1	3I65	A4	3IH9	A8	3P46	C8	3V08	D2	5S05	C6	6I97	A3	7745	C3	9405	A5	9I B1	A7		
1P05	C8	2384	B6	2822	C3	2AN4	E6	2I31	A2	2P45	D9	2S23	B6	3013	B5	3351	C6	3788	C3	3D89	A1	3I66	A4	3I I0	A8	3P47	C9	3V14	D1	5T03	A9	6I98	A3	7A06	D5	9406	B6	9I B2	A7		
1P07	C8	2385	B6	2824	E4	2AN5	E5	2I33	A3	2P46	D9	2S25	C6	3014	B5	3352	C6	3789	B3	3D90	A1	3I67	A4	3I I1	B8	3P48	C8	3V15	D1	5U01	F2	6I99	A3	7A07	D5	9407	B5	9I B3	A2		
1P08	B9	2386	C6	2826	C3	2AN6	E6	2I34	A3	2P47	D8	2S26	B6	3015	B5	3354	C6	3790	A3	3D91	A1	3I68	A4	3I I2	B8	3P50	C8	3V16	D1	5U07	F2	6I A5	A8	7A30	E7	9410	B6	9I B4	E8		
1P09	C9	2387	B6	2827	B3	2AN8	E6	2I35	A3	2P49	C8	2S27	B6	3016	B5	3355	C6	3791	B3	3D92	A1	3I69	A5	3I I3	A8	3P51	C8	3Y00	F9	5U08	F2	6I A6	A8	7A31	E7	9413	B6	9I B5	E8		
1P10	C8	2390	B6	2828	C3	2C00	B5	2I36	A2	2P51	C8	2S28	B6	3017	B5	3356	C6	3792	A2	3D93	A1	3I70	A5	3I I4	A8	3P52	C7	3Y01	F9	5V06	D1	6I A7	A6	7D51	A1	9415	B5	9I C4	A3		
1P11	C8	2402	B6	2830	A3	2C02	B5	2I37	F5	2P52	C7	2S29	B6	3022	C4	3357	C6	3804	A3	3D94	A1	3I71	A5	3I I5	A8	3P53	C8	5304	A5	5V07	D2	6I A8	A8	7D57	A1	9418	A6	9I D3	F9		
1P12	C8	2418	B5	2832	C3	2D15	E2	2I38	A8	2P53	C7	2S30	C6	3023	C4	3358	C6	3805	B3	3D95	A2	3I72	A5	3I I6	A8	3P54	C7	5305	A4	5V08	D1	6P00	B8	7D59	A2	9420	B6	9I D4	F9		
1P50	C8	2419	B5	2833	C3	2D17	F1	2I39	A6	2P54	C7	2S31	C6	3028	C4	3359	C6	3806	B3	3D96	A1	3I73	A5	3I I7	A8	3P55	C7	5308	A5	6002	A4	6P01	B8	7E15	D1	9421	C6	9I S0	A7		
1T01	A9	2420	C6	2834	D5	2D22	D1	2I40	F5	2P55	C7	2S32	C6	3029	B4	3360	C6	3807	C3	3D97	A2	3I74	A5	3I I2	A8	3P56	C7	5312	B6	6004	C4	6PB1	B7	7E18	D1	9701	E5	9L03	B1		
1T02	A9	2421	B6	2835	C3	2D50	A1	2I43	A8	2P56	C7	2S33	C6	3030	C4	3362	C6	3808	B3	3D98	A1	3I75	A4	3I I3	A8	3P57	C7	5313	C6	6005	B3	6PB5	D7	7E24	E1	9702	E4	9L04	B1		
1Y01	F5	2422	B6	2836	D5	2D51	A1	2I44	A8	2P57	C7	2S34	C6	3031	B4	3364	C6	3809	A3	3D99	A1	3I76	A4	3I I4	A8	3P58	C7	5314	C6	6303	B6	6PB6	D7	7I00	A8	9709	C3	9P04	B8		
1Y20	F6	2423	B6	2839	C3	2D52	A1	2I46	A8	2P58	C7	2S35	B6	3032	C4	3365	C6	3810																							

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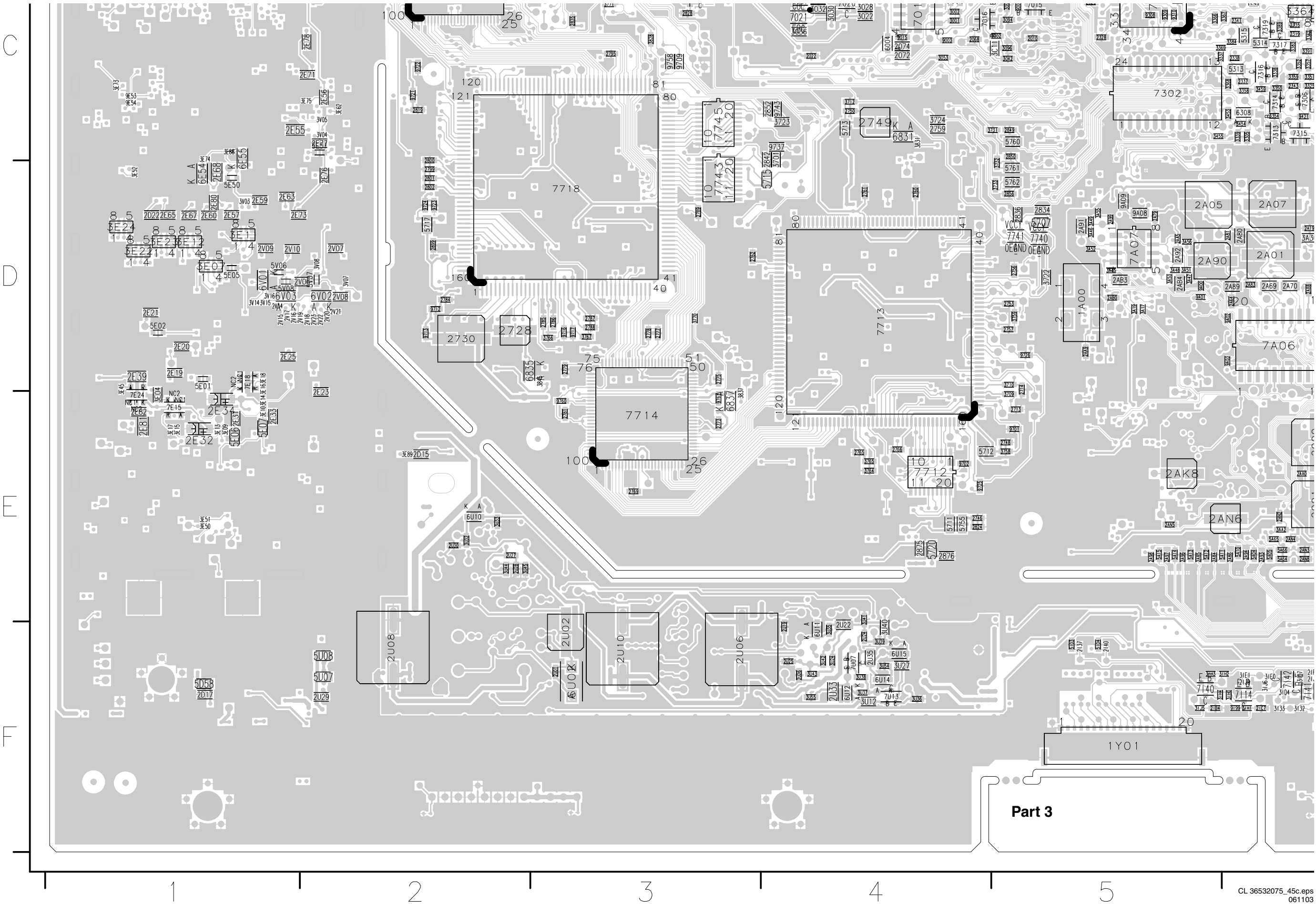


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C

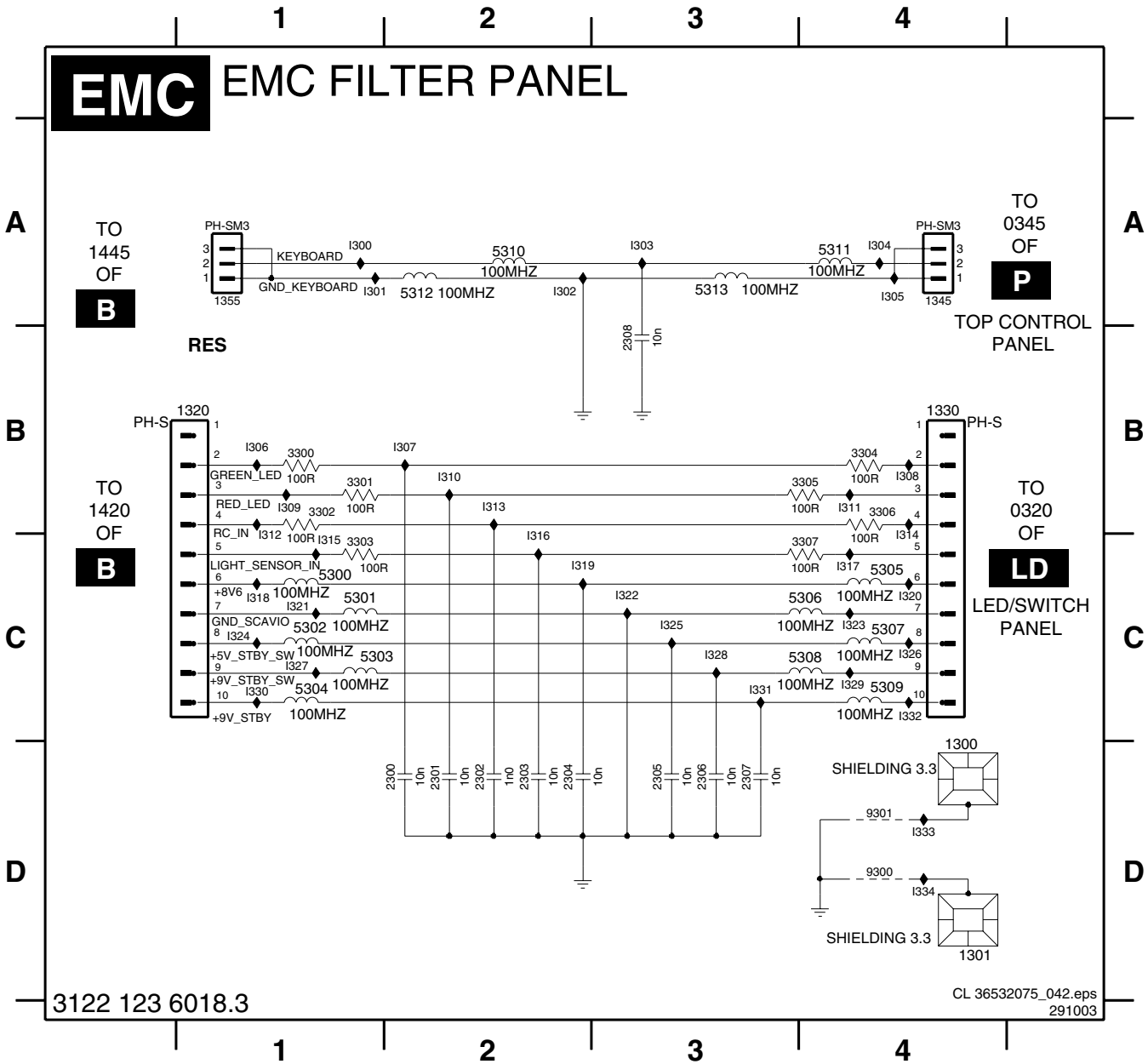


Layout Small Signal Panel (Bottom Side Part 3)



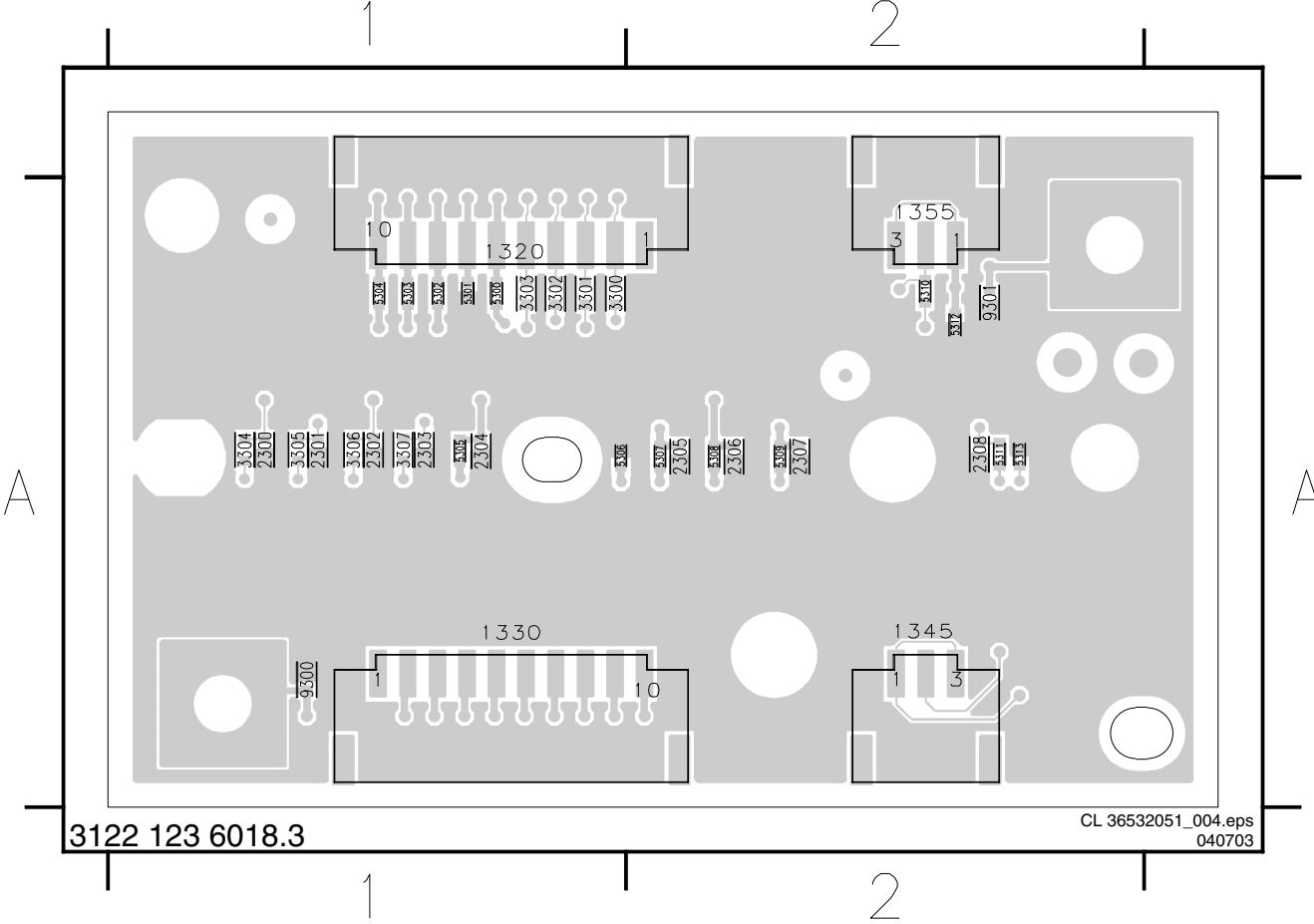
EMC Filter Panel

1300 D4	2301 D2	2308 A3	3306 B4	5305 C4	5312 A2	I303 A3	I310 B2	I317 C4	I324 C1	I331 C3
1301 D4	2302 D2	3300 B1	3307 C4	5306 C4	5313 A3	I304 A4	I311 B4	I318 C1	I325 C3	I332 C4
1320 B1	2303 D2	3301 B1	5300 C1	5307 C4	9300 D4	I305 A4	I312 C1	I319 C2	I326 C4	I333 D4
1330 B4	2304 D2	3302 B1	5301 C1	5308 C4	9301 D4	I306 B1	I313 B2	I320 C4	I327 C1	I334 D4
1345 A4	2305 D3	3303 C1	5302 C1	5309 C4	I300 A1	I307 B2	I314 C4	I321 C1	I328 C3	
1355 A1	2306 D3	3304 B4	5303 C1	5310 A2	I301 A1	I308 B4	I315 C1	I322 C3	I329 C4	
2300 D2	2307 D3	3305 B4	5304 C1	5311 A4	I302 A2	I309 B1	I316 C2	I323 C4	I330 C1	

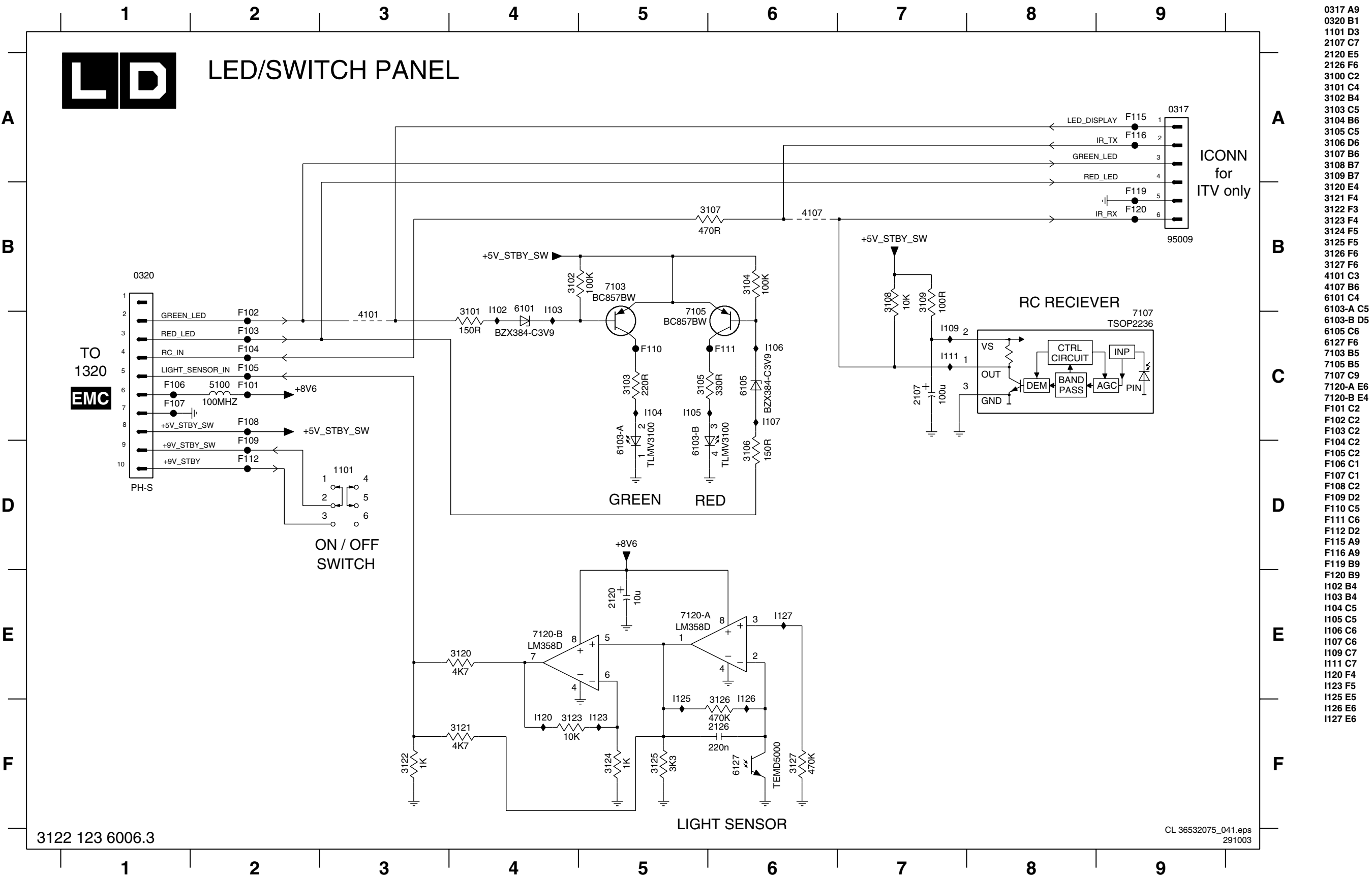


Layout EMC Filter Panel

1320 A1	2300 A1	2304 A1	2308 A2	3303 A1	3307 A1	5303 A1	5307 A2	5311 A2	9301 A2
1330 A1	2301 A1	2305 A2	3300 A1	3304 A1	5300 A1	5304 A1	5308 A2	5312 A2	
1345 A2	2302 A1	2306 A2	3301 A1	3305 A1	5301 A1	5305 A1	5309 A2	5313 A2	
1355 A2	2303 A1	2307 A2	3302 A1	3306 A1	5302 A1	5306 A1	5310 A2	9300 A1	

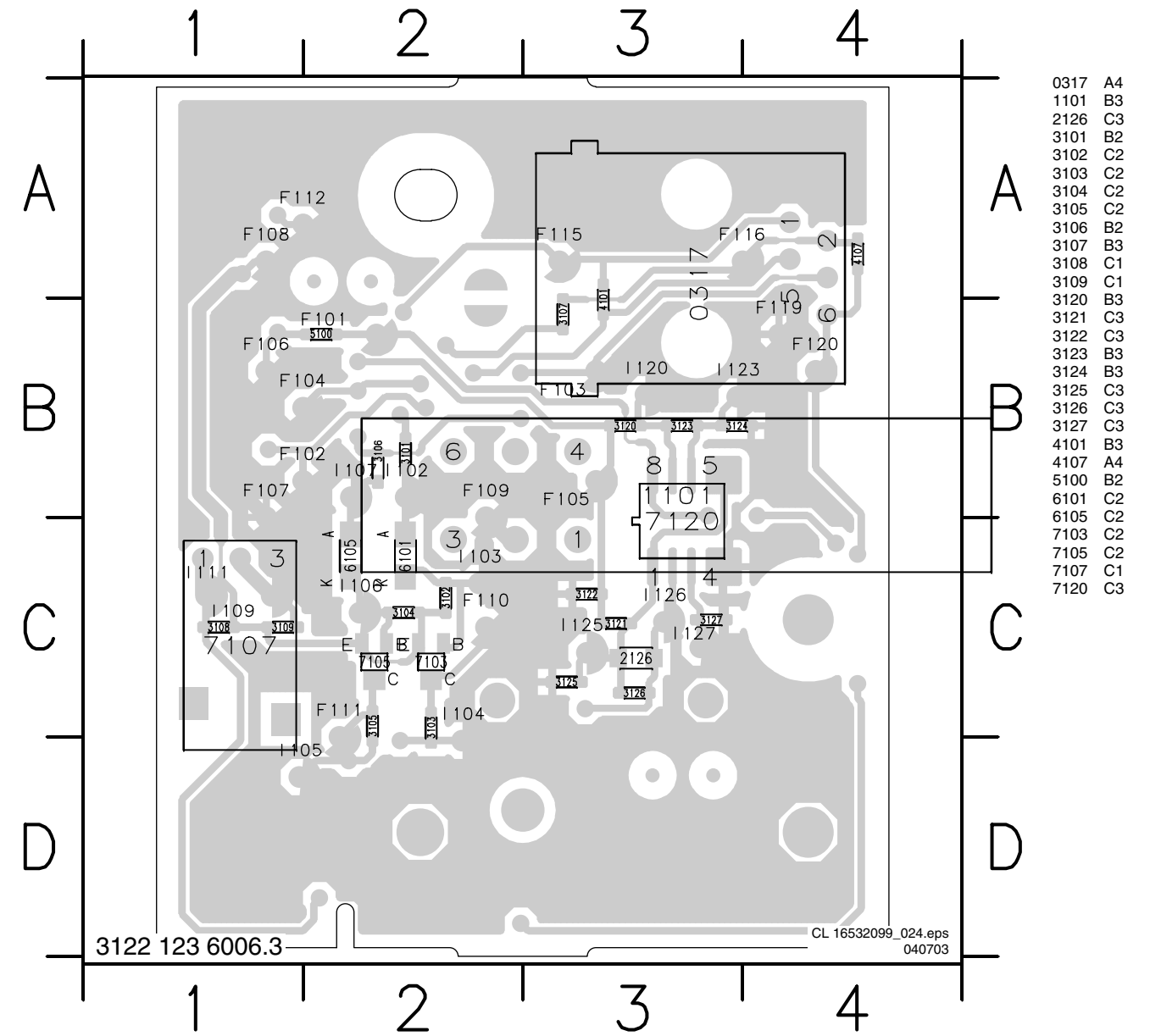
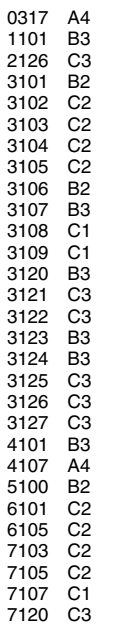


LED/Switch Panel



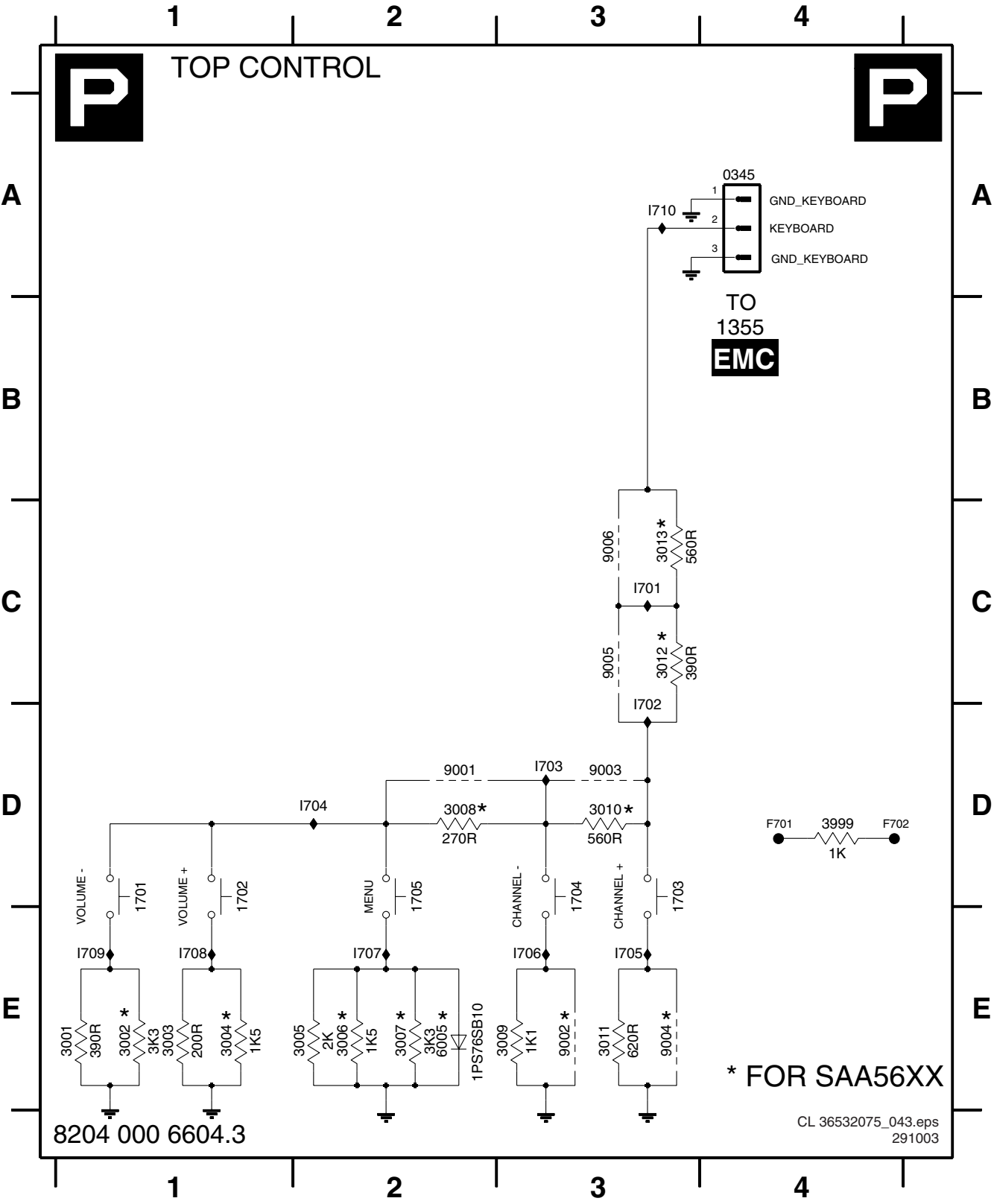
- 0317 A9
- 0320 B1
- 1101 D3
- 2107 C7
- 2120 E5
- 2126 F6
- 3100 C2
- 3101 C4
- 3102 B4
- 3103 C5
- 3104 B6
- 3105 C5
- 3106 D6
- 3107 B6
- 3108 B7
- 3109 B7
- 3120 E4
- 3121 F4
- 3122 F3
- 3123 F4
- 3124 F5
- 3125 F5
- 3126 F6
- 3127 F6
- 4101 C3
- 4107 B6
- 6101 C4
- 6103-A C5
- 6103-B D5
- 6105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

Layout LED/Switch Panel (Bottom Side)



Top Control

0345 A4	1704 D3	3003 E1	3007 E2	3011 E3	6005 E2	9004 E3	F702 D4	I704 D2	I708 E1
1701 D1	1705 D2	3004 E1	3008 D2	3012 C3	9001 D2	9005 C3	I701 C3	I705 E3	I709 E1
1702 D1	3001 E1	3005 E2	3009 E3	3013 C3	9002 E3	9006 C3	I702 D3	I706 E3	I710 A3
1703 D3	3002 E1	3006 E2	3010 D3	3999 D4	9003 D3	F701 D4	I703 D3	I707 E2	

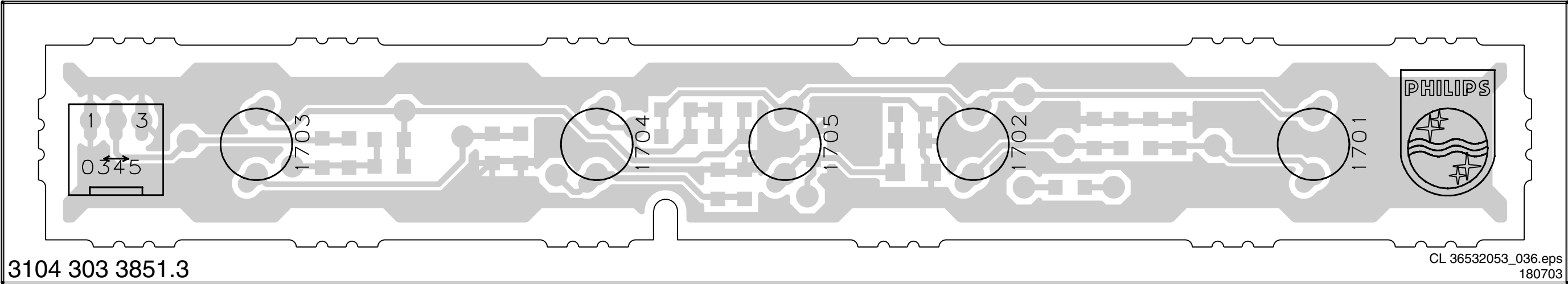


Personal Notes:

Blank lined area for personal notes.

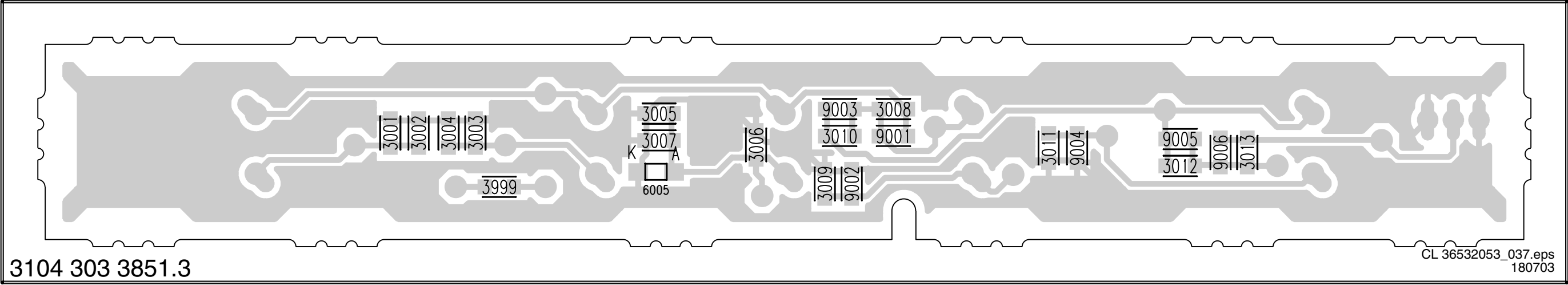
Layout Top Control Panel (Top Side)

0345 1701 1702 1703 1704 1705



Layout Top Control Panel (Bottom Side)

3001 3003 3005 3007 3009 3011 3013 6005 9002 9004 9006
3002 3004 3006 3008 3010 3012 3999 9001 9003 9005



8. Electrical Alignments

Index of this chapter:

1. General alignment conditions
2. Hardware alignments
3. Software alignments
4. Option settings

- Use an isolated trimmer/screwdriver to perform alignments.

8.1.2 Initial Settings

Perform all electrical adjustments with the following initial settings (via the "Active Control" button on the RC):

1. To avoid the working of the lightsensor, set "Active Control" to "Off".
2. Set "Smart Picture" to "Natural".
3. Set "Active Display" to "Off".
4. Set contrast to max (100).

8.1 General Alignment Conditions

8.1.1 Start Conditions

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: Ri > 10 Mohm, Ci < 20 pF.

8.2 Hardware Alignments

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

Va	Vsc	Vs	Ve	Vset		REMARKS
Variable	Variable	Variable	Variable	Variable		Variable per set
VS	+3.3BSW	Vcc	D5V	8V6	VFAN	
5.2V	3.3V	3.3V	5.2V	8.6V	12V	Fixed for all sets

VOLTAGE ADJUST DIRECTION

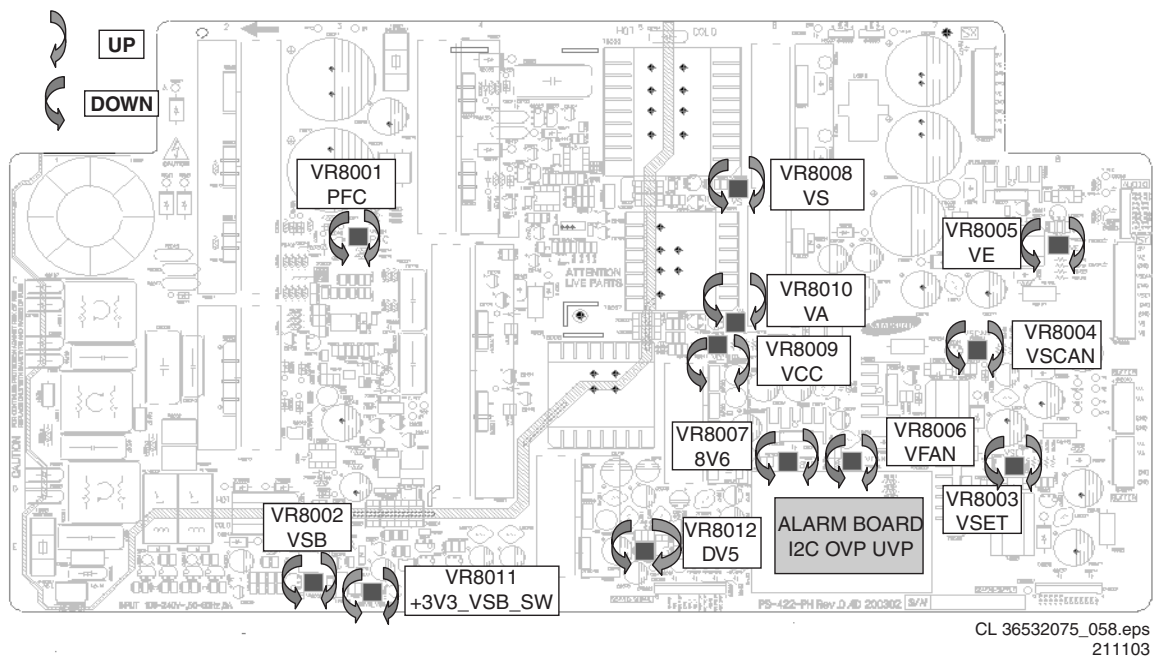


Figure 8-1 Supply Alignment

Procedure:

- See figure above.
- The six potmeters influencing VSB, +3V3_VSB_SW, VCC, D5V, 8V6, and VFAN are not critical for matching. In case of doubt values can be checked versus mentioned voltages.
- The five potmeters VS, VA, VSET, VE, and VSCAN have to be matched with the values displayed on the PDP-label.
- Start with aligning potmeter VR8008 to adjust VS and then respectively VR8010 (VA), VR8003 (VSET), VR8005 (VE), and VR8004 (VSCAN).

- To double check, repeat whole sequence again, to check the correct value.

8.3 Software Alignments

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

Notes:

- All changes must be stored manually.
- If an empty EARM (permanent memory) is detected, all settings are set to pre-programmed default values.

8.3.1 GENERAL**LUMA GAIN**

Fixed setting of "2".

IF AFC

Supply, via a service generator or via off-air, a PAL B/G TV-signal with a signal strength of at least 1 mV and a frequency of 475.25 MHz. Alignment procedure:

1. During the IF AFC-parameter adjustment, one can see OSD feedback on the screen.
2. The OSD feedback at the top of the screen can give 4 kinds of messages:
 1. The first item (IN/OUT) informs you whether you are in or out of the AFC-window.
 2. The second item (HIGH/LOW) informs you whether the AFC-frequency is too high or too low.
 3. Adjust the IF AFC parameter until the **first** value is within the AFC window (= IN).
 4. Next, adjust the IF AFC parameter until the **second** value is LOW.

Table 8-1 AFC OSD feedback of AFC alignment

AFC-window	AFC-frequency vs. reference
Out	High
In	High
[In]	[Low]
Out	Low

IF LPRIME AFC

Same procedure as described above, but with other signal source (SECAM L').

TUNER AGC

1. Connect the RF output of a video pattern generator to the antenna input.
2. From the generator, input a PAL B/G TV signal with a signal strength of approximately 2 mV and a frequency of 475.25 MHz.
3. Measure the DC voltage on pin 1 of the (main) Tuner. You can adjust this voltage by adjusting the TUNER AGC item in the SAM menu. Alignment is correct when the DC voltage is just below 3.5 V.

BLEND INTENSITY

Use this alignment when you replace the microcontroller, NVM, or the EBILD. It aligns the level of transparency of the menu-picture blended into the main-picture. Fixed setting of "16".

FBX TESTPATTERN

This function makes it possible to generate a test pattern varying from full black to full white in eight steps. You can use this pattern to check the video path, starting at the FBX to the plasma display. The pattern is generated by the Eagle (IC7724) for PixelPlus sets, or by the PICNIC (IC7713) for non-PixelPlus sets.

Note: This test pattern can also be very useful for checking the display for pixel failures.

8.3.2 2FH ADC ALIGNMENT

Only necessary to align, when the EPLD or NVM is replaced. Use the default values as mentioned in the table.

Table 8-2 2fH ADC alignment

Menu item	Alignment value
RED GAIN RGB	111
BLUE GAIN RGB	117
GREEN GAIN RGB	157
RED OFFSET RGB	59
BLUE OFFSET RGB	52
GREEN OFFSET RGB	46
RED GAIN YPBPR	111
BLUE GAIN YPBPR	117
GREEN GAIN YPBPR	137 ("GREEN GAIN RGB" minus "20")
RED OFFSET YPBPR	59
BLUE OFFSET YPBPR	52
GREEN OFFSET YPBPR	46

8.3.3 White point alignment**Table 8-3 Default values white point alignment.**

Menu item	Alignment value
Test Pattern	NO / YES (no function)
WhitePointRed	127 (depends on color temperature)
WhitePointGreen	127 (depends on color temperature)
WhitePointBlue	127 (depends on color temperature)
Red BL offset	7
Green BL offset	7
Color Temperature	NORMAL / WARM / COOL

Ignore "Test Pattern" item in the alignment menu, this is not implemented.

Method 1 (with colour analyser)

1. Supply, via an external VGA source (e.g. a PC with 640x480 mode, or a VGA generator), a 'White Drive' test pattern (ask your NSO). This picture consists of a black picture with in the middle a 100% white square.
2. Select the color temperature to adjust (default NORMAL).
3. Measure with a CTV colour analyser (calibrated with the spectra) on the centre of the white square on the screen.
4. Adjust with the CURSOR UP/DOWN or LEFT/RIGHT command, the three white points Red, Green and Blue. Max. value is 127. Align with one or two of the drivers to the correct coordinates (see table of color coordinates).
5. Repeat the same measurement for respectively colour temperature WARM and COOL.

Table 8-4 Color coordinates

Color Temperature	x	y
6500 Warm	0.313	0.329
9400 Normal	0.285	0.290
11500 Cool	0.269	0.289

Method 2 (without colour analyser)

Without a CTV colour analyser, it is possible to set some parameters, which are based on average values from production.

Table 8-5 Color temperature RGB values

Color Temperature	R	G	B
6500 Warm	127	119	107
9400 Normal	127	122	124
11500 Cool	119	125	127

8.3.4 LUM. DEL.

With this Luminance Delay alignment, you place the luminance information exactly on the chrominance information (brightness is pushed onto the colour). Use a colour bar / grey scale pattern as test signal.

- **LUM. DELAY PAL BG:** Apply a PAL BG colour bar / grey scale pattern as a test signal. Adjust this parameter until the transients of the colour part and black and white part of the test pattern are at the same position. Default value is "8".
- **LUM. DELAY PAL I:** Apply a PAL I colour bar/grey scale pattern as a test signal. Adjust this parameter until the transients of the colour part and black and white part of the test pattern are at the same position. Default value is "8".
- **LUM. DELAY SECAM:** Apply a SECAM colour bar/grey scale pattern as a test signal. Adjust this parameter until the transients of the colour part and black and white part of the test pattern are at the same position. Default value is "7".
- **LUM. DELAY BYPASS:** apply a NTSC colour bar/ greyscale pattern as a test signal. Adjust this value until the

transients of the colour and black and white part of the test area are at the same position. Default value is "6".

8.4 Option Settings

8.4.1 Introduction

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

Notes:

- After changing the option(s), save them with the STORE command.
- 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 DEALER OPTIONS

Table 8-6 Dealer Options Overview

Menu name	Subjects	Options	Physically in set
Personal Options	Picture Mute	Yes	Picture mute active in case no picture detected
		No	Noise in case of no picture detected
	Virgin Mode	Yes	TV starts up (once) with language selection menu after mains switch "on" for the first time (virgin mode)
		No	TV does not starts up (once) with language selection menu after mains switch "on" for the first time (virgin mode)
	Auto Store Mode	None	Autostore mode disabled (not in installation menu)
		PDC-VPS	Autostore mode via ATS (PDC/VPS) enabled
		TXT page	Autostore mode via ACI enabled
		PDC-VPS-TXT	Autostore mode via ACI or ATS enabled
	TXT Preference	TOP	Preference to TOP Teletext
		FLOF	Preference to FLOF Teletext

8.4.3 SERVICE OPTIONS

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

Table 8-7 Option overview

Menu-item	Subjects	Options	Description
Chassis/Region	Region	AP	Only for AP.
		Europe	Only for Europe
Teletext	Flash RAM	Yes	Flash RAM present
		No	Flash RAM not present
	NexTView	None	Feature not present
		Textguide only	Feature present, but only as text guide.
		Nextview 2	Feature present, for countries that support this.
		Nextview 2c3	Feature present, for countries that support this.
Display Options	Display Technology	PDP	"Grayed out" in menu, fixed value.
	Size	37"	Panel size (in inches).
		42"	Panel size (in inches).
	Display type	16:9	Widescreen screen format.
		4:3	"Classic" screen format.
Video Repro	Featurebox type	Falconic	No "Eagle" present (only "Natural Motion").
		Eagle	"Eagle" present (Pixel Plus).
	Lightsensor	Yes	Feature present.
		No	Feature not present.
	2D Combfilter	Yes	Feature present.
		No	Feature not present.
	Picture improvement	Yes	LTP (TOPIC) present.
		No	LTP (TOPIC) not present.
	Signalling bits	Yes	For 16:9 sets
		No	For 4:3 sets
Audio Repro	AVL	Yes	Automatic Volume Limiter, available in menu.
		No	Automatic Volume Limiter not available in menu.
Miscellaneous	Home Cinema	Yes	Set with Home Cinema Link (EU only).
		No	Set without Home Cinema Link
	Integrated RC	Yes	Feature present.
		No	Feature not present.
	Tuner type	UV1316	Set with Philips tuner.
		TEDE9	Set with Alps tuner.
	P50 DVD menu line	Yes	Sets with Home Cinema Link (EU only).
		No	Sets without Home Cinema Link.
	Hotel mode	Yes	Hotel mode on
		No	Hotel mode off
Option no.	Group 1		Group 1 option code overview (see set sticker).
	Group 2		Group 2 option code overview (see set sticker).

8.4.4 OPT. NO. (Option numbers)

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

An option number (or "option byte") represents a number of different options. When you change these numbers directly, you can set all options very quickly. All options are controlled via eight option numbers.
When the EAROM is replaced, all options will require resetting. To be certain that the factory settings are reproduced exactly, you must set both option number lines. You can find the correct option numbers on a sticker inside the TV set (just below the main power supply on the metal frame).

Example: The options sticker gives the following option numbers:

- 20556 24610 49410 00000
- 00022 00001 00034 02752

The first line (group 1) indicates options 1 to 4, the second line (group 2) options 5 to 8 (see tables below).
Every 5-digit number represents 16 bits (so the maximum number will be 65536 if all options are set).
When all the correct options are set, the sum of the decimal values of each Option Byte (OB) will give the option number.

Service tip: An easy way to check the option numbers is:

- Convert the decimal option number (as given on the options sticker) to a binary number (e.g. by means of the 'scientific' calculator that comes with MS Windows™). E.g. OB3= 49408 (dec)= 1100000100000000 (bin)
- Use this binary number to check against the bits as mentioned in the tables below. This means in above-mentioned sample, that Bit 8, 14, and 15 are "1" (means "set"), and that the rest is "0". So, actually this means that the options "Aspect Ratio" (Bit 8), "Home Cinema" (Bit 14), and "Integrated RC" (Bit 15) are set for this particular model.

Table 8-8 Option bytes Group 1

Byte nr.	Bit nr.	Decimal value	Option name	Settings (in decimal values)		Option Byte value
OB1	0	1	Featurebox	0= None (n.a.)	2= Prozonc (n.a.) 3= Eagle 4= Falconic (n.a.) 5= Falconic+ (n.a.)	OB1= sum of the "on" bits (decimal)
	1	2				
	2	4				
	3	8	2D Comb Filter	0= Off	8= On	
	4	16	n.a.	0		
	5	32	n.a.	0		
	6	64	Light Sensor	0= Off	64= On	
	7	128	Luma Trans. Proc.	0= Off	128= On	
	8	256	n.a.	0		
	9	512	n.a.	0		
	10	1024	n.a.	0		
	11	2048	n.a.	0		
	12	4096	WSS	0= Off (US/LA/AP-N)	4096= On (EU/AP-P)	
	13	8192	3D Comb Filter	0= Off (EU/AP-P)	8192= On (US/LA/AP-N)	
	14	16384	n.a.	0		
	15	32768	n.a.	0		
OB2	0	1	n.a.	0		OB2= sum of the "on" bits (decimal)
	1	2	n.a.	0		
	2	4	n.a.	0		
	3	8	n.a.	0		
	4	16	n.a.	0		
	5	32	Virtual Dolby	0= Off (Dolby prologic)	32= On	
	6	64	n.a.	0		
	7	128	n.a.	0		
	8	256	n.a.	0		
	9	512	n.a.	0		
	10	1024	n.a.	0		
	11	2048	n.a.	0		
	12	4096	n.a.	0		
	13	8192	Flash RAM	0= Off	8192= On	
	14	16384	EPG Type (EU only)	0= Type2	16384= Textguide only 32768= NextTVView 2C3 49152= NextTVView 2	
	15	32768				
OB3	0	1	n.a.	0		OB3= sum of the "on" bits (decimal)
	1	2	n.a.	0		
	2	4	n.a.	0		
	3	8	n.a.	0		
	4	16	n.a.	0		
	5	32	n.a.	0		
	6	64	n.a.	0		
	7	128	n.a.	0		
	8	256	Aspect Ratio	0= 4:3	256= 16:9	
	9	512	n.a.	0		
	10	1024	n.a.	0		
	11	2048	n.a.	0		
	12	4096	n.a.	0		
	13	8192	n.a.	0		
	14	16384	Home Cinema	0= Off (US/LA/AP)	16384= On (EU)	
	15	32768	Integrated RC (P50)	0= Off (US)	32768= On (EU/LA/AP)	
OB4	0	1	n.a.	0		OB4= sum of the "on" bits (decimal)
	1	2	n.a.	0		
	2	4	n.a.	0		
	3	8	n.a.	0		
	4	16	n.a.	0		
	5	32	n.a.	0		
	6	64	n.a.	0		
	7	128	n.a.	0		
	8	256	n.a.	0		
	9	512	n.a.	0		
	10	1024	n.a.	0		
	11	2048	n.a.	0		
	12	4096	n.a.	0		
	13	8192	n.a.	0		
	14	16384	n.a.	0		
	15	32768	n.a.	0		

Notes:- n.a.= not applicable.- AP-P= Asian Pacific PAL-multi, AP-N= Asian Pacific NTSC, EU= Europe, LA= Latin America, US= NAFTA.

Table 8-9 Option bytes Group 2

Byte nr.	Bit nr.	Decimal values	Option name	Settings (in decimal values)		Option Byte value
OB5	0	1	n.a.	0		OB5= sum of the "on" bits (decimal)
	1	2	Auto Store Mode	0= None (US/LA/AP-N)	2= PDC/VPS (EU) 4= TXT Page (EU) 6= PDC/VPS/TXTpage (EU)	
	2	4				
	3	8	n.a.	0		
	4	16	Picture Mute	0= Off	16= On	
	5	32	n.a.	0		
	6	64	Virgin Mode	0= Off	64= On	
	7	128	Hotel Mode	0= Off	128= On	
	8	256	n.a.	0		
	9	512	n.a.	0		
	10	1024	n.a.	0		
	11	2048	n.a.	0		
	12	4096	TXT Preference	0= TOP	4096= FLOF	
	13	8192	n.a.	0		
	14	16384	n.a.	0		
	15	32768	n.a.	0		
OB6	0	1	P50 DVD menu-line	0= Off (US/LA/AP)	1= On (EU)	OB6= sum of the "on" bits (decimal)
	1	2	n.a.	0		
	2	4	n.a.	0		
	3	8	n.a.	0		
	4	16	Region	0= EU	16= AP PAL-multi 32= AP NTSC 48= US	
	5	32				
	6	64				
	7	128				
	8	256	n.a.	0		
	9	512	n.a.	0		
	10	1024	n.a.	0		
	11	2048	n.a.	0		
	12	4096	n.a.	0		
	13	8192	n.a.	0		
	14	16384	n.a.	0		
	15	32768	n.a.	0		
OB7	0	1	n.a.	0		OB7= sum of the "on" bits (decimal)
	1	2	n.a.	0		
	2	4	n.a.	0		
	3	8	n.a.	0		
	4	16	n.a.	0		
	5	32	n.a.	0		
	6	64	n.a.	0		
	7	128	n.a.	0		
	8	256	n.a.	0		
	9	512	n.a.	0		
	10	1024	n.a.	0		
	11	2048	n.a.	0		
	12	4096	n.a.	0		
	13	8192	n.a.	0		
	14	16384	n.a.	0		
	15	32768	n.a.	0		
OB8	0	1	n.a.	0		OB8= sum of the "on" bits (decimal)
	1	2	n.a.	0		
	2	4	n.a.	0		
	3	8	n.a.	0		
	4	16	n.a.	0		
	5	32	n.a.	0		
	6	64	n.a.	0		
	7	128	n.a.	0		
	8	256	Picture tube size	0= 30 inch	256= 32 inch 512= 37 inch 768= 42 inch	
	9	512				
	10	1024				
	11	2048				
	12	4096	Display type	0= LCD	4096= PDP	
	13	8192				
	14	16384	n.a.	0		
	15	32768	n.a.	0		

Notes: - n.a.= not applicable.- AP-P= Asian Pacific PAL-multi, AP-N= Asian Pacific NTSC, EU= Europe, LA= Latin America, US= NAFTA.

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

Index of this chapter:

1. Introduction
2. Block diagram
3. Power supply
4. Input/Output (I/O)
5. Video Processing
6. Audio
7. Synchronisation
8. Control
9. Protections
10. PDP Panel
11. Software upgrading
12. Abbreviation list
13. IC Data Sheets

Notes:

- Only **new** circuits (circuits that are not published recently) are described.
- For the other "known" circuits, see:
 - EM5E manual. This manual is available under number 3122 785 12560 (= English).
 - EM6E manual. This manual is available under number 3122 785 13070 (= English).
 - FM24 manual. This manual is available under number 3122 785 12770 (= English).
- Figures can deviate slightly from the actual situation, due to different set executions.
- For a good understanding of the following circuit descriptions, please use the wiring, block and circuit diagrams. Where necessary, you will find a separate drawing for clarification.
- Where EBILD (Eagle Based Intelligent LCD Driver) is mentioned, please note that the SW for this programmable device is optimised for PDP.

Further features of the SSP are:

- The 3D Comb filter functionality (for USA) is integrated on the SSP.
- The rear I/O connections (like SCART and cinch) are integrated on the SSP, even as the tuner.
- VGA input (for Europe).
- DVI input (only for USA).

On the photographs you can see where all the functional cells are located on the SSP:

9.1 Introduction

The FTP11 is a 42-inch integrated PDP flat screen set, which uses the EM6 small signal panel. The HOP part is replaced by an Erasable Programmable Logic Device (EPLD). This chassis has no PIP, no FDW, and no TXT-DW. Also, features like Dolby, DVD-loader, HDD, and/or radio are not present.

In this chapter, the European version is described. In some cases also the US version is described.

9.1.1 Features

This chassis has the following (new) features:

- Next step "Active Control" with: two new bars ("Motion" and "Tint Control" bar), four split demos, etc.
- Small Signal Panel (SSP) that is based on the existing EM6 architecture: a full panel with integrated (shielded) Feature Box as in the former MG-chassis. This approach gives better EMC / crosstalk behaviour and less cables.
- Upgradeable main software (via ComPair).

9.1.2 Small Signal Panel

The SSP is a high tech module (four layer, 2 sides reflow technology, full SMC) with very high component density and partial shielding (FBX, EBILD) for EMC-reasons. Despite this, it is designed in such a way, that repair on component level is possible. To achieve this, attention was paid to:

- Clearance around surface mounted ICs (for replacing).
- Detailed diagnostics and fault finding is possible via ComPair.
- Software upgrading is possible via ComPair.

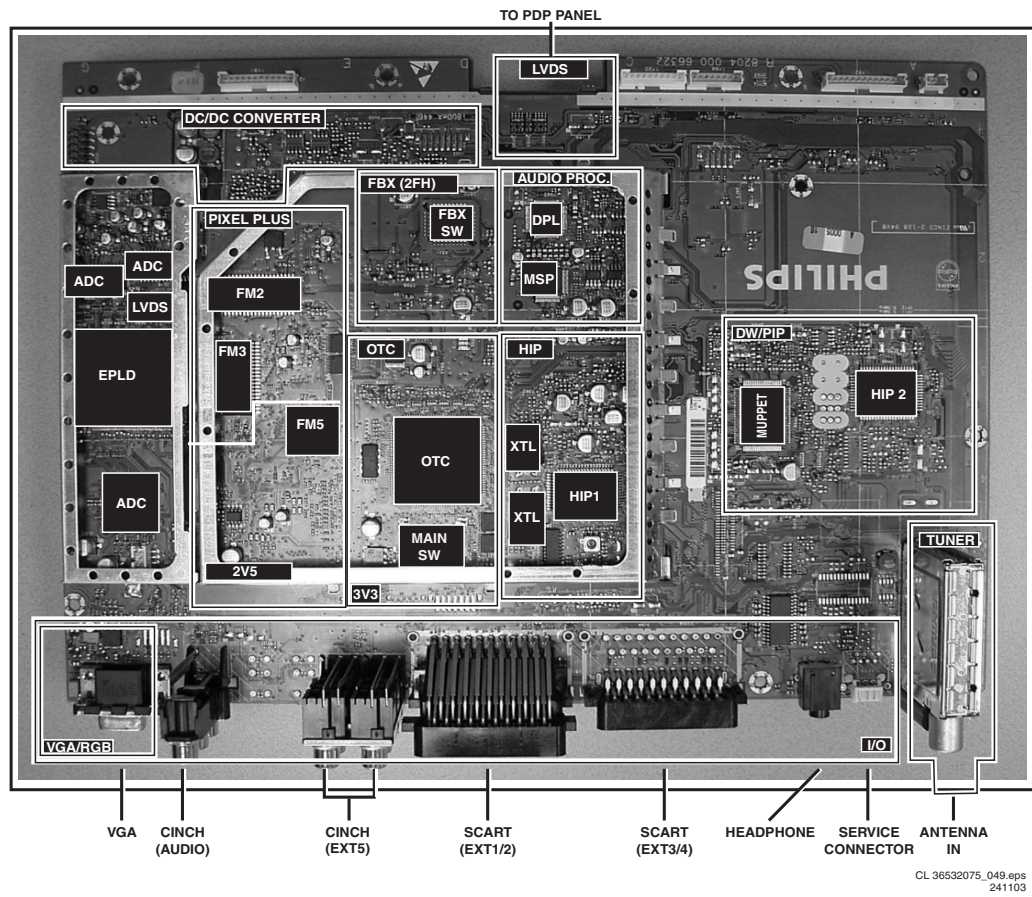


Figure 9-1 SSP top view

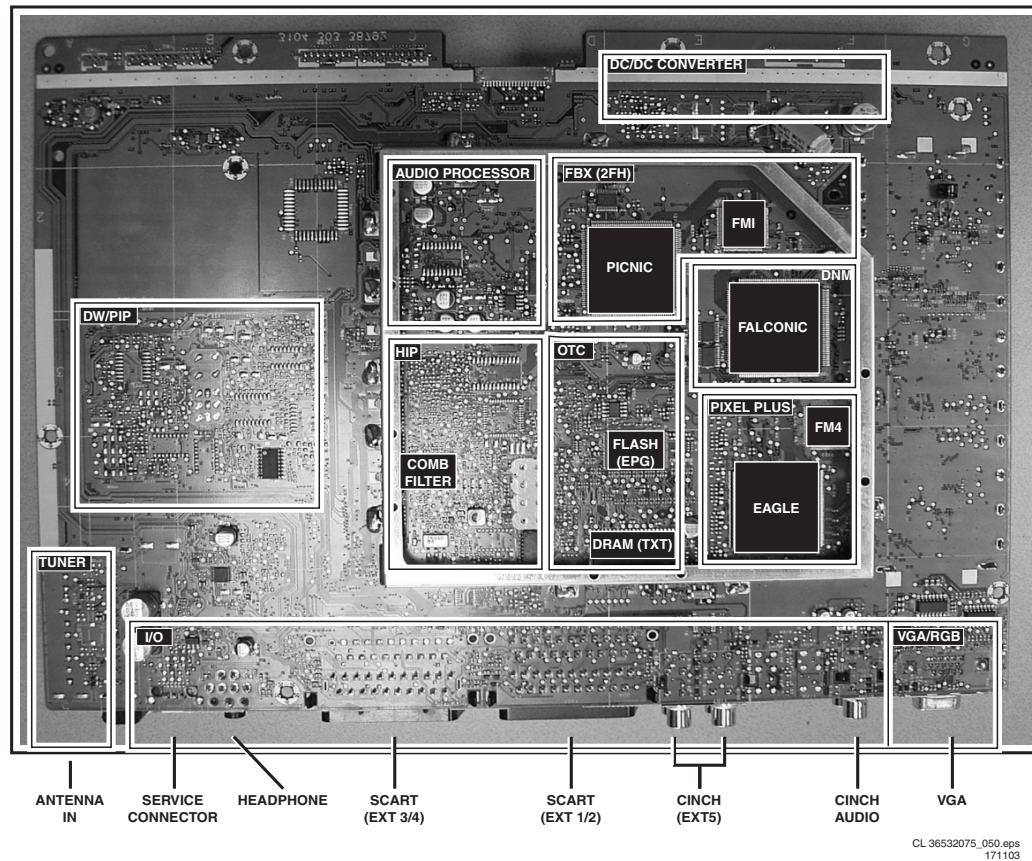


Figure 9-2 SSP bottom view

9.2 Block Diagram

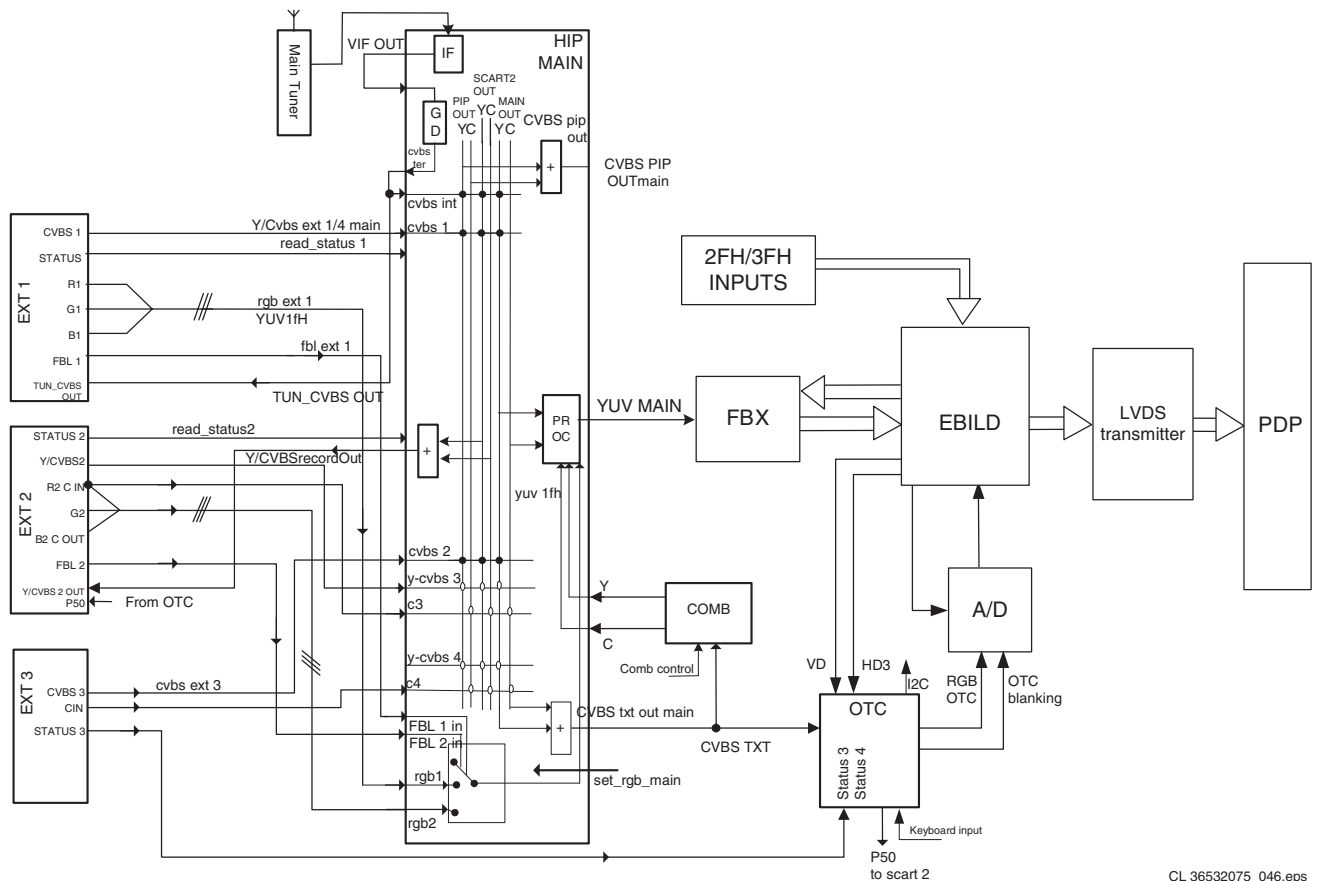


Figure 9-3 Block diagram FTP11

The main tuner is a PLL tuner and delivers the IF-signal, via audio and video SAW-filters, to the main HIP (High-end Input Processor). This HIP has the following functions:

- IF modulation.
- Video source select and record select (for 1fH inputs).
- Colour decoder.
- Synchronisation.

The following video input/output connections (with audio connections) are available for Europe:

- Side: interfaces CVBS and Y/C.
- EXT1: interfaces CVBS, RGB-, and YUV-input (1fH)
- EXT2: interfaces CVBS and Y/C (meant for VCR or DVDR connection).
- EXT3: interfaces CVBS.
- AV5: interfaces YPbPr (2fH/3fH).
- AV6: interfaces VGA (2fH/3fH).

The HIP delivers YUV and H/V-sync signals to the PICNIC (in the Feature Box). This IC takes care of:

- Analogue to Digital conversion and vice versa.
- 100 Hz processing
- Interlaced to progressive scan conversion.
- Panorama mode.
- Noise reduction.
- Dynamic contrast.

After the PICNIC, the YUV-signals are fed to the FALCONIC for "Natural Motion", followed by the Eagle for picture enhancement. The processed YUV signals (from Eagle or PICNIC) are, together with the sync-signals from the PICNIC, then fed to the EBILD (Eagle Based Intelligent LCD Driver). This programmed IC handles the video control. The RGB-signals for TXT/CC/OSD (from the uP) are also inserted via this IC. The video part delivers the RGB signals to the PDP-panel.

The sound part is built around an MSP (Multi-channel Sound Processor) for IF sound detection, sound control and source selection. Amplification is done via a "class D" integrated power amplifier IC, the TDA7490.

The microprocessor, called OTC (OSD, TXT/CC and Control) takes care of the analogue TXT input processing and output processing. The OTC, ROM, and RAM are supplied with 3.3 V. The NVM (Non Volatile Memory) is used to store the settings; the Flash-RAM contains the set software.

9.3 Power Supply

For Service this supply-panel is a black box.

When defect (this can be traced via error-codes in the error buffer, or by strange phenomena), a new panel must be ordered, and after receipt, the defective panel must be send for repair.

In that case before sending it, check if the supply-output lines match with the values on the PDP-sticker.

9.3.1 Power Balance

Table 9-1 Total power balance overview

Voltage	Value	Current (max)	P_max	Remarks
+3V3-DISP	3.3 V	3.6	12	
+5V-DISP	5 V	0.8	4	
+5V2-DISP	5.2 V	0.3	1.6	Standby voltage
+8V-DISP	8.6 V	0.4	3.4	
+9V-STBY	9 V	-		
+9V-STBY-SW	9 V	-		

9.3.2 Switch On/Off

Via the ON/OFF knob on the side the set can be switched "on" or "off", although when "off" not all power is removed. Only by disconnecting the mains power cord from the power socket all power is really gone.

9.3.3 Power States

There are four different power states. Some characteristics of these are summarised in the "Power states" table.

Table 9-2 Power states overview

Power state	On/Off switch	Remarks
OUT (mainscord disconnected)	X	No power
OFF	OFF	Only standby supply is working OTC not powered Main supply not working No LED is "on"
STAND BY (1)	ON	Standby supply is working Red LED is "on" (in Europe and in US)
SEMI STAND BY	ON	Standby supply is working Main supply is working PDP is not active EPG loading and P50 recording possible (Europe) Time extraction (Europe and US) Red and Green LEDs are "on"
ON	ON	The set is working Green LED is "on" (in Europe and in US)

Events from OFF to SEMI-STANDBY or ON

(See also figure "Step wise start-up diagram" in chapter "Service Modes, Error Codes, and Fault Finding").

- The set is in "off" state until the ON/OFF switch is switched to "on". The standby voltage +5V-DISP becomes available, the OTC resets, the I/O pins are initialised, and the watchdog is enabled. The set comes in standby mode.
 - The sets leaves the stand by mode if:
 - A time extraction must be started (after every start up).
 - A P50 recording has to start.
 - An EPG loading has to start.
 - The Standby bit is set to "off"; when a user switches on the set, the standby bit is also set to "off".
- The STANDBY line is set to "low", the +5V_SW is "on", the relay closes, and the LCD AUX supply starts up (8V6 is present).
- The rest of the ICs are initialised. The EBILD is initialised min 400 ms after the standby line is set to "low".
- If the standby bit was set, the set goes into semi-standby until:
 - The time extraction is done.
 - The P50 recording has finished.
 - The EPG loading has finished.
- If the standby bit was not set, the PDP is switched "on". The PWR-OK-PDP signal from the supply is received at the EBILD to inform the main processor of proper operating PDP supply.

Events in SEMI-STANDBY

- The set can be in semi-standby during Time extraction, EPG loading, or P50 (Easylink) recording. The semi-standby state is ended when:
 - Time extraction has finished.
 - P50 recording has finished.
 - EPG loading has finished.
 - A P50 recording starts during EPG loading.
 - A user event "On" or "Standby".
 - The set goes into protection.
- If the standby bit is not set (after user event), the PDP is switched "on".
- If a P50 recording or an EPG loading has to start, the set stays in semi-standby. If the P50 recording has to start during EPG loading, the P50 has priority.
- If there is no P50 recording or EPG loading, the set goes to standby.

Events from ON to SEMI-STANDBY/STANDBY

- The set can be switched to standby:
 - Via the RC (to semi-standby).
 - Via the MENU button on the top control, long press (to semi stand by).
 - Via a protection (to standby).
- The running instructions are finished.
- The PDP is switched "off"; this is controlled by the OTC by means of the STANDBY line.
 - Sound is muted
 - If there was a protection, the STANDBY line is put "high", and the set goes to standby.
- If there was no protection, the set goes to semi-standby.
- After an event in semi-standby, the set goes to standby.
- Protections are disabled.
- The OTC sets the STANDBY line "high", this switches "off" the main power supply, and only the standby supply remains working.
- The set is in standby.

9.4 Input/Output (I/O)

9.4.1 Introduction

The chassis follows the standard SCART specification:

- The presence of the incoming source is detected via pin 8 of the SCART signal.
- The Aspect Ratio of the incoming source is derived from the voltage level on SCART pin 8. The pin 8 information is handled by the HIP for SCART 1 and 2 and by the OTC for SCART 3.
- The P50 in/out is handled via P1-4 and P3-7 of the OTC.
- RGB sources break in with an additional fast blanking signal that is detected by the HIP. The HIP then internally chooses other signal processing. RGB sources that only have fast blanking and no pin 8 status do not overrule the main TV source. There is no automatic break in detection for the front input.
- The HIP for further image processing does the detection between Y/C and CVBS automatically.
- When Y/C is detected, the HIP will add Y and C signal to compose CVBS again. This addition should be overruled by software at the moment any Y/C signal is the source and the presence of a P50 Y/C video recorder is detected: only Y signal is directed to record out (C is already hardwired to EXT 2 out).
Note: P50: Chroma-out is pin 7, Chroma-in is pin 15. Non-P50: both Chroma-out and -in is pin 15 (hardwiring C to pin 7 out; non-P50 not supported).
- The signal on MONITOR_OUT follows the incoming source, except in case the incoming source is EXT2, YPbPr-2fH, or VGA. Then the output signal should be FRONTEND_OUT.

Note: The SCART input (1fH) path is equal to the one described in the EM6E manual. Therefore, it is not described in much detail here.

9.4.2 Input detection

The RGB or YPbPr input signals (2fH/3fH) are sent to the ADC (AD9883A) together with H and V pulses from DVI (USA) or VGA (EUR), and the Y signal from YPbPr called Sync On Green (green is same line as Y). The AD converter:

- Detects via H and V sync, if RGB is present or not.
- Detects via Sync On Green, if YPbPr is present or not.
- Detects the selected sync.
- Selects the sync switch via I2C.
- Does AD conversion to 848 samples per line, 8 bits in 422 format. This means one bus for Y signal with 8 bits and one bus for UV with 4 U and 4 V bits. Depending on the system detected by EBILD, the sample frequency is changed. Via I2C, the "PLL_DIV" signal is given in 11 bits (2 Bytes).

When a 1fH input is detected, the AD converter is set in tristate.

1fH input flow

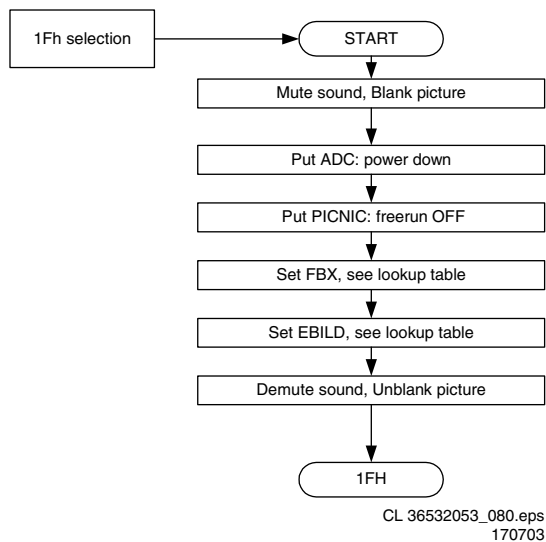
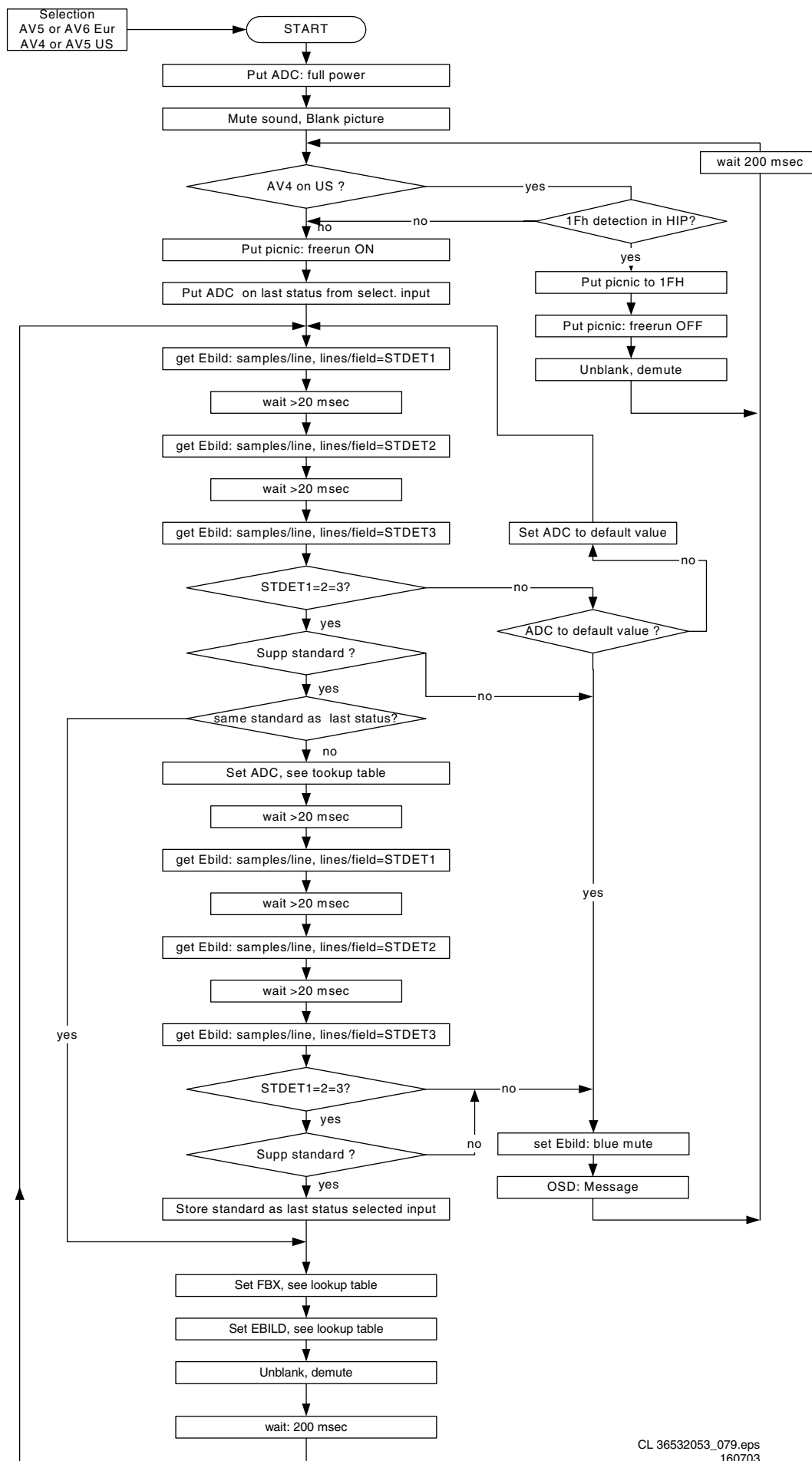


Figure 9-4 Flowchart 1fH detection

1. If a 1fH selection is done (except for AV4 in USA), the sound is muted and the picture is blanked.
2. The ADC is powered down.
3. The PICNIC is not in free run.
4. Both FBX and EBILD are set in 1fH (see lookup table).
5. Sound is demuted and picture is unblanked.

2fH/3fH input flowCL 36532053_079.eps
160703**Figure 9-5 Flowchart 2fH/3fH detection**

1. The standard detection starts with a 2fH/3fH selection (this is AV5 / AV6 in Europe or AV4 / AV5 in USA).
2. The ADC is full powered (it was powered down in 1fH).
3. The sound is muted and the picture is blanked.
4. On AV4 in USA, an 1fH and 2fH/3fH signal can enter. This detection is done by the HIP. When 1fH is detected, the FBX is set to 1fH, the PICNIC is not in free run, the picture is unblanked, and the sound is demuted. The set is in 1fH state. This state is continues checked, because the input can change from 1fH to 2fH/3fH.
5. If the input is 2fH/3fH, the PICNIC is set to free run
6. The ADC is set to the last status from this selected input, because there is a big chance that the same standard is wanted.
7. The number of samples per line and lines per field is collected from the EBILD. The check is done three times. If the same value is measured within some tolerances (see lookup table) the standard is valid. The time between two measurements must be at least one frame or 20 ms.
8. If the ADC has not the right settings, the PLL does not lock, and the "STDET" measurements do not give the same results. The ADC is set to its default value; this value is able to catch all supported standards. If the ADC is already in the default value and no standard detection is possible, the set changes to blue mute.
9. If the standard is not supported, the set changes to blue mute via the EBILD, and a message is displayed.
10. If the standard is the same as the last status, the ADC is in the correct state, an both FBX and EBILD are set (see lookup table).
11. If the standard is changed, the ADC is set to the detected standard and a new check is done. If the standard is valid and supported, the new standard is stored in NVM as last status.
12. The FBX and EBILD are set (see lookup table)
13. Picture is unblanked and sound demuted.

Table 9-3 I/O lookup table

Selected Input	Standard	x fH	FBX	ADC	EPLD	Field Rate
Tuner, SC1..SC3.	480i	1 fH	PICNIC			
	576i	1 fH	PICNIC			
AV5 (Cinch)	480p	2 fH	EAGLE	YPbPr	YPbPr	60 Hz
	576p	2 fH	EAGLE	YPbPr	YPbPr	50 Hz
	1080i / 60 Hz	2 fH	EAGLE	YPbPr	YPbPr	60 Hz
	1080i / 50 Hz	2 fH	EAGLE	YPbPr	YPbPr	50 Hz
	720p / 60 Hz	3 fH / 720p	EAGLE	YPbPr	YPbPr	
	720p / 50 Hz	3 fH / 720p	EAGLE	YPbPr	YPbPr	
AV6 (VGA)	480p	2 fH	EAGLE		RGB	60 Hz
	576p	2 fH	EAGLE		RGB	50 Hz
	1080i / 60 Hz	2 fH	EAGLE		RGB	60 Hz
	1080i / 50 Hz	2 fH	EAGLE		RGB	50 Hz
	720p / 60 Hz	3 fH / 720p	EAGLE		RGB	
	720p / 50 Hz	3 fH / 720p	EAGLE		RGB	
	VGA	2 fH	EAGLE		RGB	60 Hz
	SVGA	2 fH	EAGLE		RGB	56 Hz

9.5 Video Processing

9.5.1 Introduction

Note: The FBX processing part is equal to the one described in the EM6E manual. Therefore, it is not described here (except for some basic info).

There are two diversities (see also figure "Block diagram FTP11" in paragraph "Block Diagram"):

- Europe: 3 SCARTs, 1 x 2fH/3fH inputs (YPbPr), and 1 VGA input
- USA: 3 AV inputs1 (AV4 can be 1fH or 2fH/3fH YPbPr), and a DVI 2fH/3fH input.

Note: There is also an AP version available. This version has no difference w.r.t. the European version, but comes with extra cables and some different option settings.

Short overview of video processing

The video processing is based on four key functions, being:

- The HIP + comb filter (for simple source select and video/chroma processing).
- The EBILD that takes over the video control functions of the HOP (as used in CRT based sets).
- The FBX configuration consisting of a PICNIC (100 Hz featuring), a FALCONIC (motion compensation and Auto TV featuring), and an EAGLE ("Pixel Plus" processing).
- A 2fH/3fH source selection.

Additionally, the following features are added

- One-chip NEC 3D comb filter (only for USA): this comb filter uses spatial and temporal filtering for the elimination of cross colour and cross luminance components. Not only for vertical lines, but also for stationary diagonal lines. This comb filter only supports the NTSC standard.
- The light sensor measurement required for "Active Control" is done by the OTC.

Basic functionality of HIP

I/O functionality

- The HIP selects the signals entering on 1fH base band. The HIP contains a source select matrix in order to handle a Tuner, three CVBS sources, two Y/C sources, and two RGB inputs (this in fact means one VIF input for tuner, four CVBS inputs with among them two Y/C inputs, and two RGB inputs). The HIP detects by itself whether the source is Y/C or CVBS, and decides how to handle the signal for further image processing. For Record Out, the signal is handled by software: if a P50 SVHS VCR is present and the signal to be recorded is Y/C, an Y/C signal should be passed to the VCR.
- There are also two inputs for the OTC that will handle status detection, other, or more detection. In case of RGB, the fast blanking signal (FBL) determines the breakthrough of the RGB1/YPbPr signal if activated beforehand by the user. If a YPbPr-1fH connection was done, then it is equally handled by the RGB1 input without using the internal matrix. The HIP delivers the main video output (YUV- 1fH signal) for further image processing and three

CVBS outputs, being: CVBS PIP/DS, CVBS_TXT_OUT for comb filter (always following YUV main!) and TXT processing, and the CVBS/Y_RECORD_OUT for EXT2.

IF functionality

- The HIP contains a multi standard IF circuit for video demodulation with AFC functionality, a sound IF amplifier, and an AM demodulator. An extra group delay correction is included.
- Chroma demodulation and video processing
- Sync acquisition, delivering H_AV_A (Horizontal/Vertical Acquisition) towards FBX.

Basic functionality of EBILD

The EBILD is the interface between the FBX and the PDP screen. Its principal functions are:

- Video control functions of the HOP (Saturation, Contrast, Brightness).
- OSD and TXT insertion with blending.
- Video Matrix (NTSC, ATSC, PAL).
- For matrix displays additional functions like:

- Contrast reserve (peak limiter),
- Sync wheel,
- Dithering (matrix displays are 8 bit),
- Generation of correct timing for PDP display.

- I2C and SNERT bus.
- Sync control.
- Odd/Even field detection.
- A/D converter alignment for OSD.
- H Sync generation for OTC.
- Control lines.
- Standard detection.
- Handle shifts of VD.
- Suppress H and V pulses in active video.
- Generate a H_REF for PICNIC (1fH) in case of a 2fH/3fH source.

Basic functionality of the OTC

The OTC combines the microprocessor and TXT/OSD functionality; it will also handle some of the status detections. It also takes care of P50 communication.

9.5.2 Video Source Selection

Table 9-4 Video input overview

I/O	Main/Sub	CVBS-in	CVBS-out	Y/C-in	Y/C-out	RGB 1fH+ FBL	YPbPr 1fH	YPbPr 2fH/3fH	RGB 2fH	Status 4/3-16/9	P50
EXT1 SCART	Main	Yes	Yes, frontend	No	No	Yes	No	No	No	Yes	No
	Sub	Yes	n.a.	No	n.a.	No	No	No	No	Yes	No
EXT2 SCART	Main	Yes	Yes, WYSIWYR	Yes	Yes	Yes	No	No	No	Yes	Yes
	Sub	Yes	n.a.	Yes	n.a.	Yes	No	No	No	Yes	Yes
EXT3 SCART	Main	Yes	No	No	No	No	No	No	No	Yes	No
	Sub	Yes	n.a.	No	n.a.	No	No	No	No	Yes	No
AV5 cinch	Main	No	No	No	No	No	Yes	Yes	No	Only video det.	No
	Sub	No	n.a.	No	n.a.	No	Yes	No	No	Only video det.	No
AV6 VGA	Main	No	No	No	No	No	No	No	Yes	Only video det.	No
	Sub	No	n.a.	No	n.a.	No	No	No	No	n.a.	No

The High Definition Input (HDI) part has two input "ports". Each port consists of a video input and an audio input. The ports are named "VGA" (= AV6) and "AV5" and will be referred to using these names.

The physical connectors for these inputs are:

- **AV5.** Three cinches that can be used for YPbPr with sync on Y and two cinches for analogue Audio (left and right).
- **VGA.** One VGA connector and two cinches for analogue Audio (left and right).

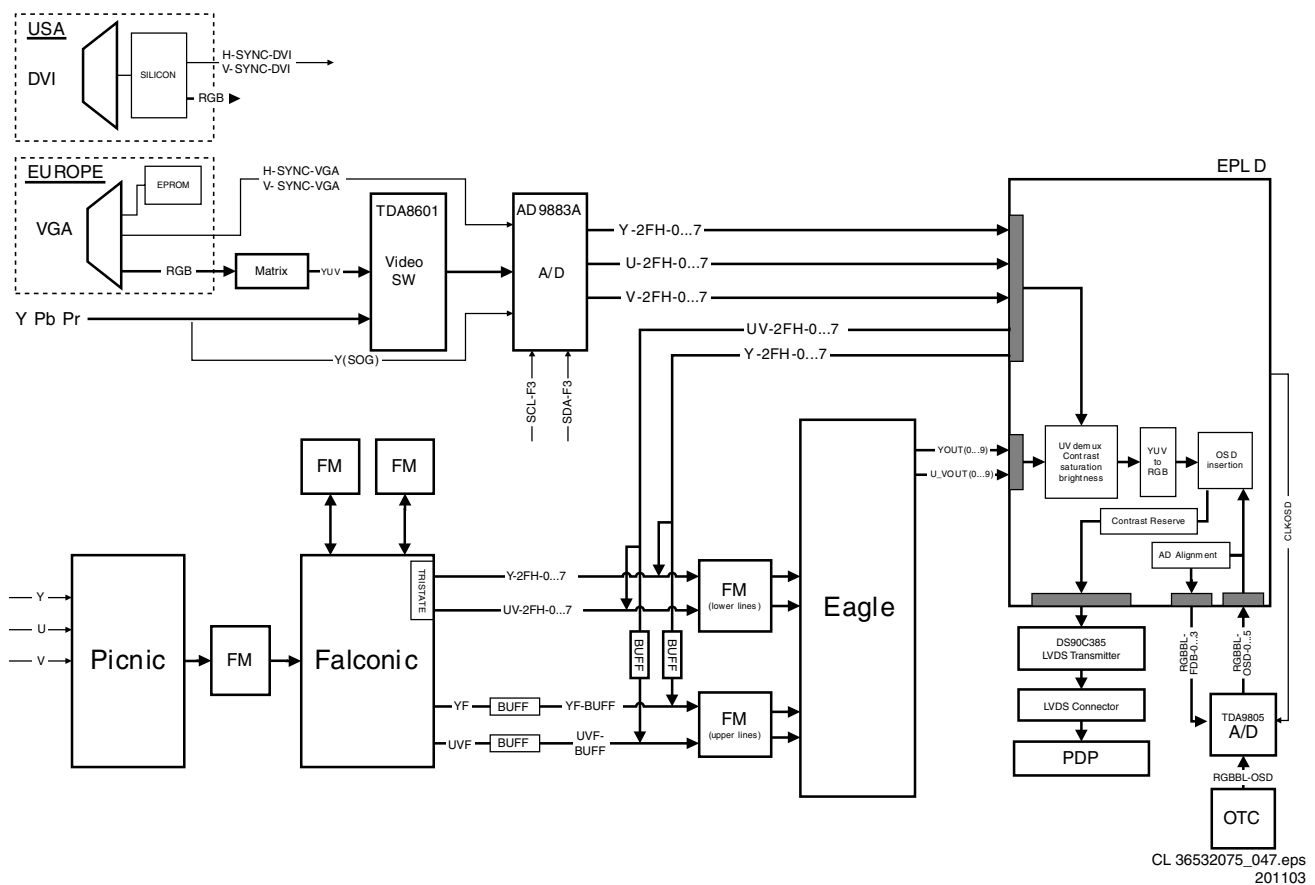
Table 9-5 AV5 (YPbPr) input signals

AV5 Inputs (YPbPr)	System	Field freq. (V)	Line freq. (H)
576 p	PAL	50 Hz	31.25 kHz
480 p	NTSC	60 Hz	31.5 kHz
1080 i	ATSC	60 Hz	33.7 kHz
1080 i	ATSC	50 Hz	28.125 kHz
720 p	ATSC	50 Hz	37.5 kHz
720 p	ATSC	60 Hz	45 kHz

Table 9-6 AV6 (VGA) input signals

AV6 Inputs (VGA)	System	Field freq. (V)	Line freq. (H)
VGA	640x480	60 Hz	31.5 kHz
SVGA	800x600	56 Hz	35.1 kHz
576 p	PAL	50 Hz	31.25 kHz
480 p	NTSC	60 Hz	31.5 kHz
1080 i	ATSC	60 Hz	33.7 kHz
1080 i	ATSC	50 Hz	28.125 kHz
720 p	ATSC	50 Hz	37.5 kHz
720 p	ATSC	60 Hz	45 kHz

9.5.3 Video Processing



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Figure 9-6 Video processing 2fH/3fH input

The outputs toward the electronics of the set consist of:

- YUV-422.
- H-2FH-AD-OUT and V-2FH-AD-OUT.
- Left and right audio channels (analogue).
- CLK-2FH.

Notes:

- In case of 2fH inputs, the signal is (after detection via the EBILD) routed through the FBX for picture improvement. The YUV output of the Eagle is then routed to the EBILD for the displaying part.
- In case of 3fH inputs, the signal is not routed via the FBX (because the Eagle cannot handle them), but directly processed by the EBILD.

9.5.4 Miscellaneous

Comb Filter

The comb filter functionality can be enabled or disabled via the HIP. This means allowing or disallowing the HIP to use the

comb filter. Both the conventional 2D comb filter (EUR) and the 3D comb filter (USA) have to use this HIP command.

Notes:

- The command ENABLE_COMBFILTER enables the function. If the TV standard that enters the TV is one where a comb filter is applicable (e.g. PAL or NTSC, not SECAM), the HIP will determine self if the video signal can be combed and as a consequence, the video processing output can be CVBS or Y/C. No software interaction is needed.
- **Remark:** Enabling the comb filter does not necessarily mean that the signals will be combed.
- The comb filter must be disabled in case of RGB and for YPbPr-1fH, to avoid big horizontal shifts of the picture caused by the comb filter processing.
- The comb filter is also disabled at very low quality antenna signals for AP due to vertical instability/scrolling effects.

Auto TV

The Auto Picture Control or in short AutoTV, aims at providing the customer the best possible picture performance at any time. Therefore, it performs real time processing of the video signal and because of that, it decides to adapt several video parameters throughout the whole chassis. The total effect of Auto Picture Control on the screen can be selected by the use of the remote control. The commercial name for the feature is "Active Control".

The sets have three digital options: Progressive Scan, Pixel Plus, and Movie Plus. The Progressive Scan mode has no Pixel Plus enhancement. For 2fH inputs, only Progressive Scan or Pixel Plus mode can be selected. For 3fH inputs no digital options are available.

The aim of Movie Plus mode is to reduce the Halo artefacts (halo's are artefacts introduced with the Natural Motion feature). Reducing halo's will result in motion judder. This is compensated by the FBX software.

The basic component for Auto TV is the FBX. It measures the picture content and it has the most video control parameters on board, like peaking, coring, DNR, and so on. With the presence of the Eagle, additionally the colour enhancement functions and the LTI are controlled. Also, the light sensor, needed for ambient light control, is supported via the OTC. Finally, vertical peaking is mostly done in Eagle, a little in the PICNIC, and the motion compensation and DNR is done in the FALCONIC.

See also EM5 service manual.

9.6 Audio

9.6.1 Introduction

In this chassis, there are only Virtual Dolby sets, but there is diversity between Europe and USA sets.

9.6.2 Audio decoding

Two audio decoders will be used:

- ITT MSP 3411: for Europe sets.
- ITT MSP 3421: for USA sets.

Both MSP versions also decode NICAM. The AM signal is also decoded by the MSP.

9.6.3 Audio source selecting

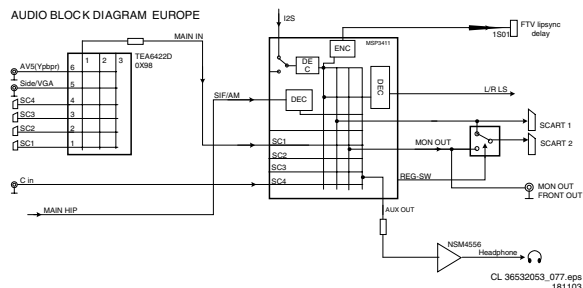


Figure 9-7 Audio block diagram

The MSP covers a SIF input, 4 stereo inputs and one mono input. As this chassis needs more inputs, one matrix IC (TEA6422D, item 7117) is added. The stereo inputs on this IC are:

- For Europe:
 - EXT1.
 - EXT2.
 - EXT3.
 - AV5 (YPbPr 2fH/3fH).
 - AV6 (VGA).

- For USA:
 - AV1.
 - AV2.
 - AV4 (YPbPr 1fH or 2fH/3fH).
 - AV5 (DVI).

There are three separated outputs on the matrix IC, but only the main output (MAIN_IN), going to the MSP, is used.

The MSP has the following inputs:

- SIF input (this can be FM, AM, or NICAM).
- MAIN_IN from matrix IC TEA6422D.
- Centre input.

An S/PDIF in/output is not foreseen.

9.6.4 Audio processing

European sets have an MSP3411, USA sets have an MSP3421. Both can handle Virtual Dolby. All sets have 2 x 10 W_{rms} output.

Following **outputs** are foreseen:

- Europe:
 - EXT1: Front-end
 - EXT2: WYSIWYR.
 - Monitor out: for external Dolby ProLogic amplifier.
 - Headphone out.
- USA:
 - Monitor out: Front-end.
 - Headphone out.

Important remarks

- For Europe: Régimbeau switch (REG_SW): this switch (item 7120) is needed to prevent feedback (Larsen effect). When EXT2 is chosen as incoming signal, the output of EXT2 following the main picture, is also EXT2. This will cause the Larsen effect. To prevent this, the record select must be switched to tuner. This is especially important when decoders are used (e.g. Canal + decoder) behind a "transparent" VCR connected to EXT2.
- It is not allowed to mix up analogue and digital signals in the MSP; SCART-in towards SCART-out should be treated in the analogue source select part of the MSP. Reason for this, is the limited bandwidth in the MSP (16 kHz) while the analogue source selection part can carry up to 20 kHz.
- If a 2fH/3fH source is selected, it is not possible to handle the video signal in the 1fH source selection. Since the video signal cannot be connected to EXT2, the output of EXT2 is switched to FRONTEND, and MONITOR OUT is WYSIWYR (same source as video).

9.6.5 Audio Amplifier Panel (Diagram A)

Introduction

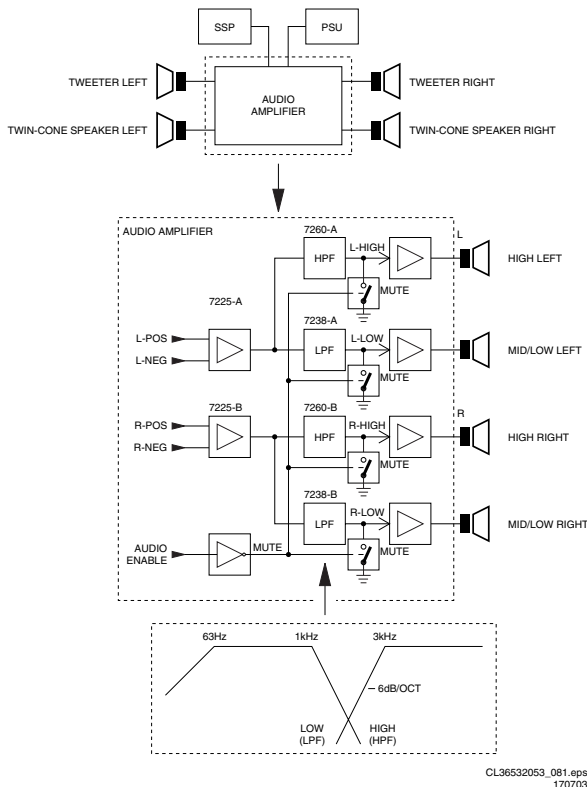


Figure 9-8 Block diagram Audio Amplifier

This panel houses the audio filters and amplifiers necessary for driving the speakers. The differential audio inputs (for common mode immunity) come from the SSP (via connector 0388). The PSU delivers the positive and negative supply voltage of 12 V_{dc}, as well as the +5V2 (standby) voltage. After being filtered and amplified, the signals go to the speaker section, where the (twin cone) low/mid range speakers and the tweeters are driven (load impedance is 8 Ω).

The headphone amplifier is a straightforward OpAmp amplifier (IC7A07-A, MC33178D). It is supplied with +11V_{AUD}.

Supply (Diagram A7)

The supply voltage is a symmetrical voltage of +/- 14.5 V_{dc}, generated by the main supply via L5002.

- V_SND_POS (+12 V_{dc}) on connector 0302 pin 5/6.
- V_SND_NEG (-12 V_{dc}) on connector 0302 pin 1/2.

Filter (Diagram A2)

Electrical filtering is needed for following reasons:

- Limiting the cone excursion, thereby reducing the distortion.
- Increasing the power handling capacity (PHC).

Active second order Sallen-Key filters are used, with crossover frequencies of 1 kHz for the low pass filter, and 3 kHz for the high pass filter.

The audio signals are filtered **before** the amplifier. There are some reasons for doing this:

- It is now easy to do active filtering.
- Less costs (no expensive coils and capacitors).

Low Pass Filter (LPF)

For L and R separately, a Low Pass Filter (IC7238A and B) is processing L_{LOW} and R_{LOW}.

The output signal of this filter is then fed to the audio amplifier (identical for right channel).

High Pass Filter (HPF)

For L and R separately, a High Pass Filter (IC7260A and B) is processing L_{HIGH} and R_{HIGH}.

The output signal of this filter is then fed to the audio amplifier (identical for right channel).

Amplifier (Diagrams A3 to A6)

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

Principle

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

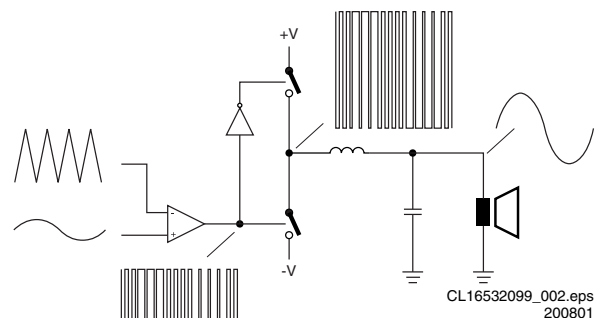


Figure 9-9 Principle Class-D Amplifier

The Class D amplifier works by varying the duty cycle of a Pulse Width Modulated (PWM) signal.

By comparing the input voltage to a triangle wave, the amplifier increases duty cycle to increase output voltage, and decreases duty cycle to decrease output voltage.

The output transistors (item 7365 on diagram A3) of a Class D amplifier switch from 'full off' to 'full on' (saturated) and then back again, spending very little time in the linear region in between. Therefore, very little power is lost to heat. If the transistors have a low 'on' resistance (R_{DS(ON)}), little voltage is dropped across them, further reducing losses.

A Low Pass Filter at the output passes only the average of the output wave, which is an amplified version of the input signal. In order to keep the distortion low, negative feedback is applied (via R3308). A second feedback loop (via R3310) is tapped after the output filter, in order to decrease the distortion at high frequencies.

The **advantage** of Class D is increased efficiency (= less heat dissipation). Class D amplifiers can drive the same output power as a Class AB amplifier using less supply current.

The **disadvantage** is the large output filter that drives up cost and size. The main reason for this filter is that the switching waveform results in maximum current flow. This causes more loss in the load, which causes lower efficiency. An LC filter with a cut-off frequency less than the Class D switching frequency (350 kHz), allows the switching current to flow through the filter instead of the load. The filter is less lossy than the speaker, which causes less power dissipated at high output power and increases efficiency in most cases.

Mute (Diagram A3 for "Left High")

A mute switch (item 7302) is provided at the PWM inputs (item 7315, LM311). This switch is controlled by the AU_EN_NOT line, which is controlled via the POR signal (mute at start-up) and via the SOUND_ENABLE line from the OTC (mute during operation). This circuitry is the same for all four amplifier parts.

Protections

Short-circuit Protection (e.g. Diagram A3 for "Left High")

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

DC-protection (Diagram A7)

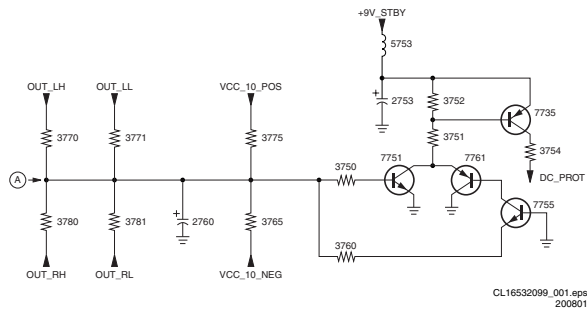


Figure 9-10 DC Protection

Because of the symmetrical supply, a DC-blocking capacitor, between the amplifier and the speaker, is not necessary. However, it is still necessary to protect the speaker for DC voltages.

The following protections are therefore implemented:

- Via R3765 and R3775, each stabilised supply voltage line (via items 7735 and 7745) is checked on deviations.
- Via R3770/3771/3780/3781, each amplifier output is checked for DC-voltage.

Via R3765/3775, a virtual earth is imposed on point A. When one of the supply voltages deviates, a DC voltage will occur on this point. If point A is positive, T7751 will conduct. If it is negative, T7761 will conduct.

Both cases will make T7735 conduct, so that the DC-PROT signal will be made high. This ensures that the power supply is rapidly trimmed back.

Capacitor C2760 will ensure that only DC-signals at point A will activate the protection.

- The Eagle delivers a clock signal for the FALCONIC and the field memories.
- The Eagle delivers a 64MHz clock to the EBILD (CLK64).

9.7.4 Sync Flow 3fH input sync signals

3fH Sync Signals

- The input signals do not come via the HIP and PICNIC but via the AD9883A. This AD converter delivers H and V sync signals to the EBILD (H-2FH-AD-OUT and V-2FH-AD-OUT).
- The sync signals are the same as with 2fH inputs.

3fH Clock Signals

- The master clock is delivered by the AD9883, same as 2fH inputs; The EBILD uses this clock as sample clock for video control.

9.8 Control

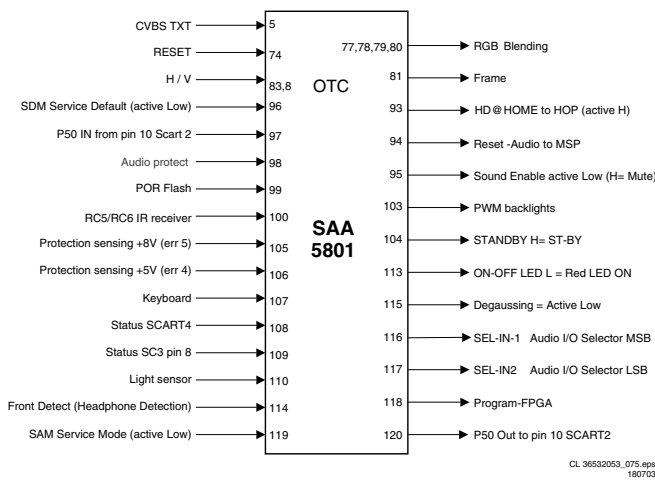


Figure 9-12 OTC interfacing

9.8.1 "Switch On" Behaviour

See paragraph "Power States" in this chapter.

9.8.2 OTC Flash

See paragraph "Software Upgrading" in this chapter.

9.8.3 Keyboard

The local keyboard is connected to P2-4 (pin 107) of the OTC, which is an A/D pin. Each key matches with a range of values within the A/D converter.

9.8.4 LED Control

In USA the same LED configuration is used as in Europe, the 2 colour LED.

Table 9-7 LED control

Condition	Two colour LED
On	Green
Off	No indication
Low power standby	No indication
Standby	Red
Semi-standby	Orange (red and green)
Reaction on RC in On-state	Orange (green and (red blinking))
Reaction on RC in Standby	Red
Reaction on RC in Semi-standby	Orange (green and (red blinking))
Protection	Red blinking

9.9 Protections

9.9.1 General

Under certain fault conditions, as described below, the set must go into the "protection state". This means that the set is switched into standby and displays a blinking LED. These protections are introduced in order to avoid unacceptable temperature rises and burning hazards. The failure cause will be identified and put into the NVM error buffer. For the customer, it is made impossible to switch "on" the set with his remote control.

On the other hand, it must be possible to read out the error codes from NVM while using a Dealer Service Tool or a ComPair tool, or to de-activate the protection states in Service Default Mode. It is possible to enter ComPair from protection but not from standby.

The protection algorithms are activated/de-activated at a certain stage in the "start-up/switch-off" sequence of the set (see also figure "Step wise start-up diagram" in chapter "Service Modes, Error Codes, and Fault Finding").

9.9.2 Hardware protections

See also the chapter Service Modes, Error Codes and Fault Finding of this manual.

Protections with detection via I/O lines of the OTC

8V protection

The +8V information is an ADC input of the microprocessor. This input can sense the absence of the +8V. The failure is filtered by software and put in the error buffer for serviceability. The set must go into protection.

5V protection

The microprocessor can sense the absence of the +5V. The failure must be filtered by software and put in the error buffer for serviceability. The set must go into protection. Because of the architectural set-up of the power supply (the +5V supply is linked to the +5V2 standby supply of the OTC), it is not possible to detect a complete absence of the +5V and to signal it in software. Therefore, no software error indication will be available when there is a complete short circuit of the +5V supply.

What happens is this:

- When the +5V_SW is overloaded (short circuit), this will also overload the +5V2. The supply that feeds the OTC, the standby supply, hiccups. As a result, the +5V2 is not overloaded anymore and can rise again. Because of the dip in the OTC supply voltage, the OTC will get a reset and restarts the set. If the fault cause is still present at that start-up, the system will restart all over and the set will be in a hiccup mode. This is not a problem if the duty cycle is low enough.
- If however, the short circuit on the +5V is such that the +5V2 supply is not overloaded and the remaining voltage on the +5V2 is still high enough to keep the OTC alive, the short circuit on the +5V can be detected via the ADC input

of the OTC the same way the +8V protection is implemented. The set must also go into protection.

If a +8V or a +5V dropout is detected, the protection input should be checked several times, every 200ms. If the protection input is active for five consecutive times, the set must go into protection.

DC protection (from audio amplifier)

Because of the symmetrical supply of the audio amplifier, a DC-blocking capacitor between the amplifier and the speaker is not necessary. However, it is still necessary to protect the speaker for DC voltages. If a DC protection is activated, the OTC will set the TV in protection. A specific error code is **not** generated. For a detailed description, see paragraph "Audio Amplifier".

Protections with detection via I2C bus

Tuner protection

The tuner is supplied by the +5V_SW, which is delivered by the standby supply. When this supply is short-circuited, the standby supply will hiccup. If the tuner does not acknowledge on its I2C address for five consecutive times, the set goes into protection and error "13" is generated. Maximum time allowed before protection: 1.5 s.

9.10 PDP Panel

9.10.1 Introduction

The PDP, which is used in this chassis, is a product of SDI (Samsung Display Industry).

When defect, a new panel must be ordered, and after receipt, the defective panel must be send for repair in the packing (flight case) of the new ordered panel.

9.10.2 Operation

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

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

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

9.10.3 LVDS Interface

- Standard single ended signal (TTL).
 - This requires 28 signal lines and more than 14 grounds.
 - Single ended signals up to 3 V.
 - Wide flat ribbon cable.
 - EMI/EMC problems.

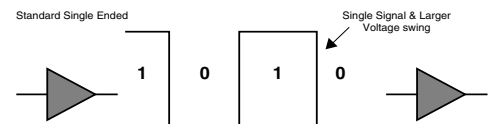
- Feasible up to VGA/NTSC resolution (limited to 250 Mb/s).
- LVDS
 - Five low voltage (350 mV) differential pairs: one clock pair and four data pairs.
 - Five grounds.
 - EMI/EMC friendly.
 - WXGA and HD-1280x720p (up to 1 Gb/s).

LVDS offers superior performance compared to the standard single ended signal (TTL).

It is even "protocol independent" so it requires no software.

- Lower Voltage Swing (only 350 mV vs. 3 V)

- Allows faster Clocking
- Standard open Ended: 250Mbps
- LVDS: >1 Gbps



- Differential Signals (Two Signals) ...Low Noise!

- Receiver reads a 1 or 0 based on the delta of the two signals.
- Noise Impacts both lines and cancels out each others.

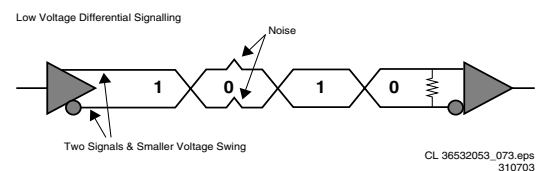


Figure 9-13 LVDS technology

9.11 Software Upgrading

9.11.1 Introduction

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-memory from its socket. You can find more information on how this procedure works in the ComPair file. It is possible that not all sets are equipped with the hardware, needed to make software upgrading possible. To speed up the programming process, the firmware of the ComPair interface can be upgraded. See Chapter "Service Modes ...", paragraph "ComPair" - "How To Order" for the order number.

9.11.2 Specifications

Some specifications are:

- The upgrade feature makes use of I2C to transfer a new SW image (4 MB).
- It requires the ComPair interface Box (RS232 to I2C).
- The I2C bus is available at the rear side of the set.
- It uses a ZIP-compressed BIN image to speed up the transfer process (1/2 size).
- The complete procedure takes less than 20 minutes with an upgraded ComPair interface:
 - About 90 seconds to erase a 4 MB flash-memory.
 - Less than 10 minutes to transfer the file (max 1.9 MB).
 - About 5 minutes to decompress/program the flash-memory.

Note: It takes about 85 minutes with a standard interface. Constraints:

- Needs the EPG flash memory, so this device must be placed also for non-EPG regions like AP and USA.

Advantages:

- Flexibility.
- No change in internal ROM (IROM) required (IROM not used).
- Flexibility to change of code flash manufacturer as the "flash driver" is part of the bootstrap code (part of the main software image).

9.11.3 Concept

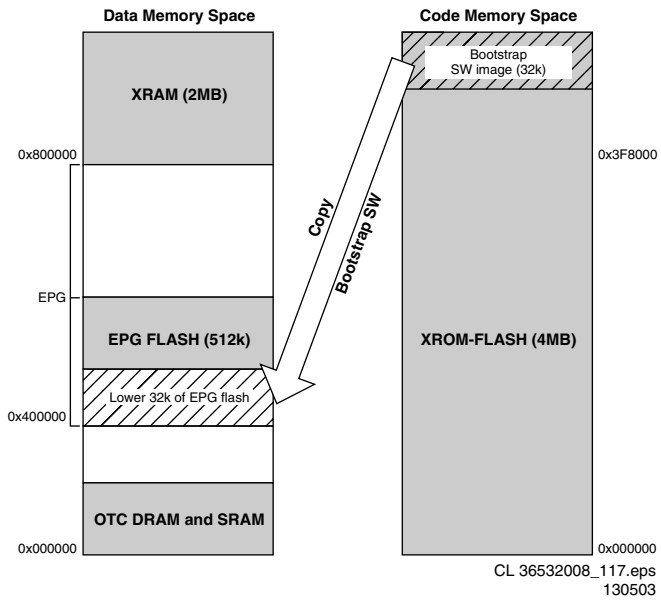


Figure 9-14 Memory diagram (initial situation)

The architecture of the OTC microprocessor does not allow the execution of code from the external RAM. It is also impossible to write data in the code memory space (there is no instruction to write data to those memory locations).

The OTC normally boots from its internal ROM (IROM) but modification of the **internal** ROM software would be too expensive. Fortunately, the chip architecture allows also the booting from **external** ROM (XROM).

The IROM is mapped on the first 32 kB of the ROM address space. The XROM is mapped starting at the same address. Therefore, the lower 32 kB of XROM overlaps the IROM memory space.

Via an external pin (EA), it is possible to reveal the XROM memory below the IROM and so boot using this hidden software. This is the first trick used by the software upgrade procedure.

To be able to write to the CODE flash, it is required to address the device via the RAM address space. Today all RAM but also the EPG flash is mapped on the RAM address space. Devices are mapped to the right address space via a few control lines (kind of chip select). By exchanging the control lines between the EPG and the CODE flash, it is possible to map the CODE flash in the RAM address space and at the same time use the EPG flash to execute software. This is the second trick used by the procedure.

The main idea is to use the EPG flash to boot up the software upgrade procedure.

Therefore, the complete procedure relies on the presence of that one.

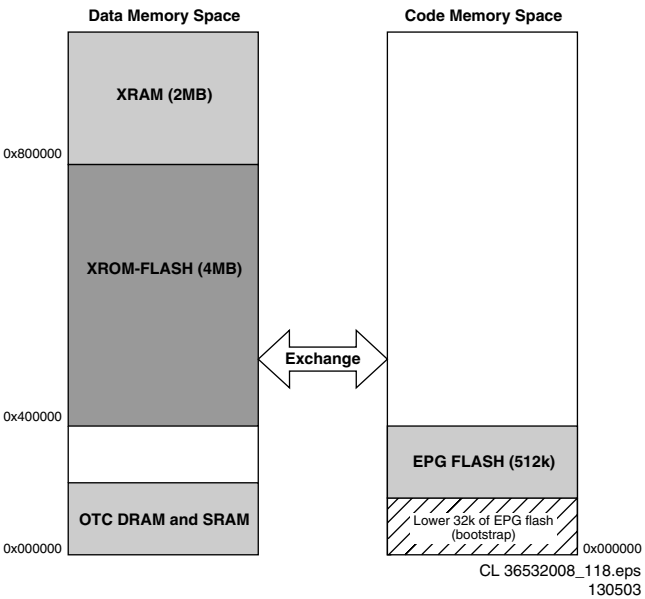


Figure 9-15 Memory diagram (after bus exchange)

In order to be able to write new software code to the set, we therefore must copy the bootstrap code to a free memory area (e.g. the EPG flash-memory) in order to be able to execute "externally" the upgrade procedure code.

Solution: swap the software code to the data memory space (via setting jumper/switch 1402) and boot from the EPG FLASH.

After the zip-file uploading and (internally) software unpacking, the old situation must be restored.

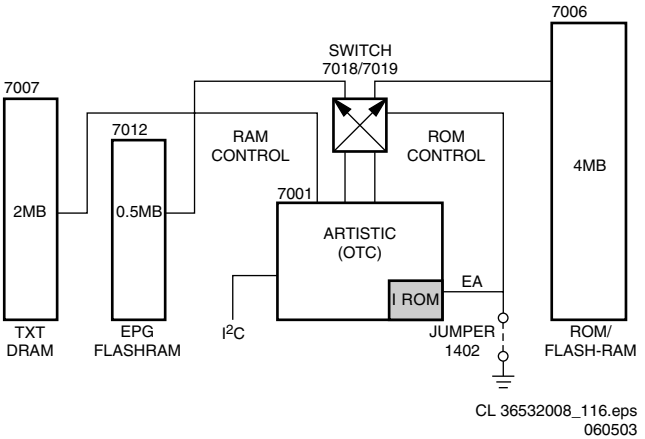


Figure 9-16 Software upgrade set-up

A jumper/switch on the SSP will swap the devices and boot "externally" via the EPG flash. Then, via ComPair, the download command is given. The new (ZIP) image will be first downloaded to the OTCs external RAM (TXT DRAM). Then a checksum on the ZIP image will be computed on both sides (PC and TV) and compared.

If everything is correct, the CODE flash will be erased and the new image will be transferred and unzipped (= decompressed) into the flash. This is done via the bootstrap code. A second checksum will be computed on the decompressed image.

After the upgrade, the EPG flash will be cleared again.

9.12 Abbreviation list

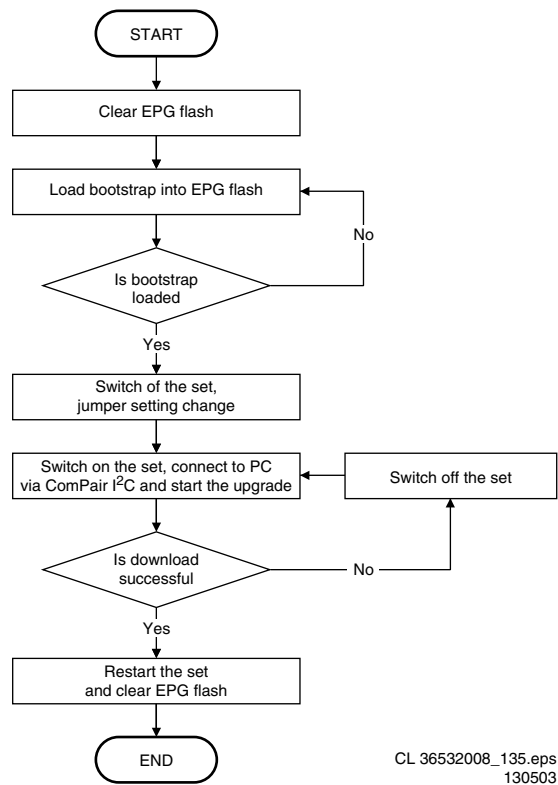


Figure 9-17 Software upgrade flow chart

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
2DNR	Spatial (2D) Noise Reduction
3DNR	Temporal (3D) Noise Reduction
AARA	Automatic Aspect Ratio Adaptation: algorithm that adapts aspect ratio to remove horizontal black bars; keeps the original aspect ratio
ACI	Automatic Channel Installation: algorithm that installs TV channels directly from a cable network by means of a predefined TXT page
ADC	Analogue to Digital Converter
AFC	Automatic Frequency Control: control signal used to tune to the correct frequency
AGC	Automatic Gain Control: algorithm that controls the video input of the feature box
AM	Amplitude Modulation
ANR	Automatic Noise Reduction: one of the algorithms of Auto TV
AP	Asia Pacific
AR	Aspect Ratio: 4 by 3 or 16 by 9
Artistic	See OTC 2.5: main processor
ASF	Auto Screen Fit: algorithm that adapts aspect ratio to remove horizontal black bars without discarding video information
ATSC	Advanced Television Systems Committee
ATV	See Auto TV
Auto TV	A hardware and software control system that measures picture content, and adapts image parameters in a dynamic way
AV	External Audio Video
B/G	Monochrome TV system. Sound carrier distance is 5.5 MHz
BTSC	Broadcast Television Standard Committee. Multiplex FM stereo sound system, originating from the USA and used e.g. in LATAM and AP-NTSC countries
B-TXT	Blue Teletext
C	Centre channel (audio)
CL	Constant Level: audio output to connect with an external amplifier
ComPair	Computer aided rePair
CSM	Customer Service Mode
CLK_2FH	Clock output AD converter
CTI	Colour Transient Improvement: manipulates steepness of chroma transients
CVBS	Composite Video Blanking and Synchronization
DAC	Digital to Analogue Converter
DBE	Dynamic Bass Enhancement: extra low frequency amplification
DDC	See "E-DDC"
D/K	Monochrome TV system. Sound carrier distance is 6.5 MHz
DFU	Directions For Use: owner's manual
DNR	Digital Noise Reduction: noise reduction feature of the set
DRAM	Dynamic RAM
DSP	Digital Signal Processing
DST	Dealer Service Tool: special remote control designed for service technicians

DVD	Digital Versatile Disc	LATAM	Latin America
DVI(-d)	Digital Visual Interface (d= digital only)	LCD	Liquid Crystal Display
Eagle	Feature box IC performing peaking, zooming and subpixel LTI in both horizontal and vertical directions, CTI, and other colour features	LED	Light Emitting Diode
EBILD	Eagle Based Intelligent LCD Driver (Programmed EPLD)	L/L'	Monochrome TV system. Sound carrier distance is 6.5 MHz. 'L' is Band I, L is all bands except for Band I
E-DDC	Enhanced Display Data Channel (VESA standard for communication channel and display). Using E-DDC, the video source can read the EDID information from the display.	LS	Loudspeaker
EDID	Extended Display Identification Data (VESA standard)	LVDS	Low Voltage Differential Signalling
EEPROM	Electrically Erasable and Programmable Read Only Memory	Mbps	Mega bits per second
EMI	Electro Magnetic Interference	M/N	Monochrome TV system. Sound carrier distance is 4.5 MHz
EPLD	Erasable Programmable Logic Device	MOSFET	Metal Oxide Silicon Field Effect Transistor, switching device
EU	Europe	MPEG	Motion Pictures Experts Group
EXT	EXTernal (source), entering the set by SCART or by cinches (jacks)	MSP	Multi-standard Sound Processor: ITT sound decoder
FALCONIC	SAA4992H, feature box IC which performs Digital Natural Motion, 3DNR vertical zoom, and vertical peaking	MUTE	MUTE Line
FBL	Fast BLanking: DC signal accompanying RGB signals	NC	Not Connected
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)	NICAM	Near Instantaneous Compounded Audio Multiplexing. This is a digital sound system, mainly used in Europe.
FDS	Full Dual Screen (same as FDW)	NTC	Negative Temperature Coefficient, non-linear resistor
FDW	Full Dual Window (same as FDS)	NTSC	National Television Standard Committee. Colour system mainly used in North America and Japan. Colour carrier NTSC M/N= 3.579545 MHz, NTSC 4.43= 4.433619 MHz (this is a VCR norm, it is not transmitted off-air)
FLASH	FLASH memory	NVM	Non-Volatile Memory: IC containing TV related data such as alignments
FM	Field Memory or Frequency Modulation	O/C	Open Circuit
FTV	Flat TeleVision	OSD	On Screen Display
Gb/s	Giga bits per second	OTC	On screen display Teletext and Control; also called Artistic (SAA5800)
G-TXT	Green TeleteXT	OTP	One Time Programmable
H	H_sync to the module	P50	Project 50: communication protocol between TV and peripherals
H_2FH_AD_OUT	H-sync output from AD converter	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)
HDI	High Definition Interface	PCB	Printed Circuit Board (same as "PWB")
H-DVI	H_sync from DVI to RGB converter chip	PCM	Pulse Code Modulation
HIP	High-end video Input Processor (TDA9320): video and chroma decoder.	PDP	Plasma Display Panel
HOP	High-end video Output Processor (TDA9330): video, sync, and geometry controller	PFC	Power Factor Corrector (or Pre-conditioner)
HP	HeadPhone	PICNIC	Peripheral Integrated Combined Network IC (SAA4978): main IC for 100 Hz features and feature processing
H_DVI	H-sync from DVI-to-RGB converter chip	PIP	Picture In Picture
H_SYNC_VGA	H-sync on VGA connector	PLL	Phase Locked Loop. Used for e.g. FST tuning systems. The customer can give directly the desired frequency
I	Monochrome TV system. Sound carrier distance is 6.0 MHz	POR	Power On Reset, signal to reset the P
I2C	Integrated IC bus	Progressive Scan	Scan mode where all scan lines are displayed in one frame at the same time, creating a double vertical resolution.
I2S	Integrated IC Sound bus	PTC	Positive Temperature Coefficient, non-linear resistor
IF	Intermediate Frequency	PWB	Printed Wiring Board (same as "PCB")
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.	PWM	Pulse Width Modulation
IR	Infra Red	RAM	Random Access Memory
IRQ	Interrupt Request	RGB	Red, Green, and Blue. The primary colour signals for TV. By mixing levels of R, G, and B, all colours (Y/C) are reproduced.
ITV	Institutional TeleVision, TV sets for hotels, hospitals etc.	RGB_DVI	RGB video input on DVI converter chip
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	RGB_VGA	RGB video input on VGA connector

RC	Remote Control	YUV_2FH	YUV video input AD converter
RC5 / RC6	Signal protocol from the remote control receiver	YUV_VGA	YUV output from matrix (RGB to YUV)
RESET	RESET signal		
ROM	Read Only Memory		
R-TXT	Red TeleteXT		
SAM	Service Alignment Mode		
S/C	Short Circuit		
SCART	Syndicat des Constructeurs d'Appareils Radiorecepteurs et Televisieurs		
SCL	Serial Clock I2C		
SCL-F	CLock Signal on Fast I2C bus		
SD	Standard Definition		
SDA	Serial Data I2C		
SDA-F	DAta Signal on Fast I2C bus		
SDRAM	Synchronous DRAM		
SECAM	SEquence Couleur Avec Memoire. Colour system mainly used in France and East Europe. Colour carriers= 4.406250 MHz and 4.250000 MHz		
SIF	Sound Intermediate Frequency		
SMPS	Switched Mode Power Supply		
SOG	Sync On Green		
SOPS	Self Oscillating Power Supply		
S/PDIF	Sony Philips Digital InterFace		
SRAM	Static RAM		
SSB	Small Signal Board		
SSP	Small Signal Panel		
STBY	STandBY		
SUB_Y/U/V_2FH	Y/U/V input from I/O cel		
SOGIN	Sync-On-Green input AD converter		
SOGOUT	Sync-On-Green output AD converter		
SVGA	800x600 (4:3)		
SVHS	Super Video Home System		
SW	Software		
SXGA	1280x1024		
SYNCDDET	SOGOUT from AD converter		
TFT	Thin Film Transistor		
THD	Total Harmonic Distortion		
TXT	TeleteXT		
TXT-DW	Dual Window with TeleteXT		
uP	Microprocessor		
U_2FH_0..7	U digital output AD converter port 0 to 7 (7= MSB)		
UXGA	1600x1200 (4:3)		
V	V-sync to the module		
V_2FH_0..7	V digital output AD converter port 0 to 7 (7= MSB)		
V_2FH_AD_OUT	V-sync output from AD converter		
VCR	Video Cassette Recorder		
V_DVI	V-sync from DVI-to-RGB converter chip		
VESA	Video Electronics Standards Association		
VGA	640x480 (4:3)		
VL	Variable Level out: processed audio output toward external amplifier		
V_SYNC_VGA	V-sync on VGA connector		
WYSIWYR	What You See Is What You Record: record selection that follows main picture and sound		
WXGA	1280x768 (15:9)		
XTAL	Quartz crystal		
XGA	1024x768 (4:3)		
XVGA	1024x768 (4:3)		
Y	Luminance signal		
Y_2FH_0..7	Y digital output AD converter port 0 to 7 (7= MSB)		
Y/C	Luminance (Y) and Chrominance (C) signal		
YPbPr	Component video. Luminance and scaled colour difference signals (B-Y and R-Y)		
YUV	Component video		

9.13 IC Data Sheets

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

9.13.1 Diagram B3C, T8F24EF (IC7724)

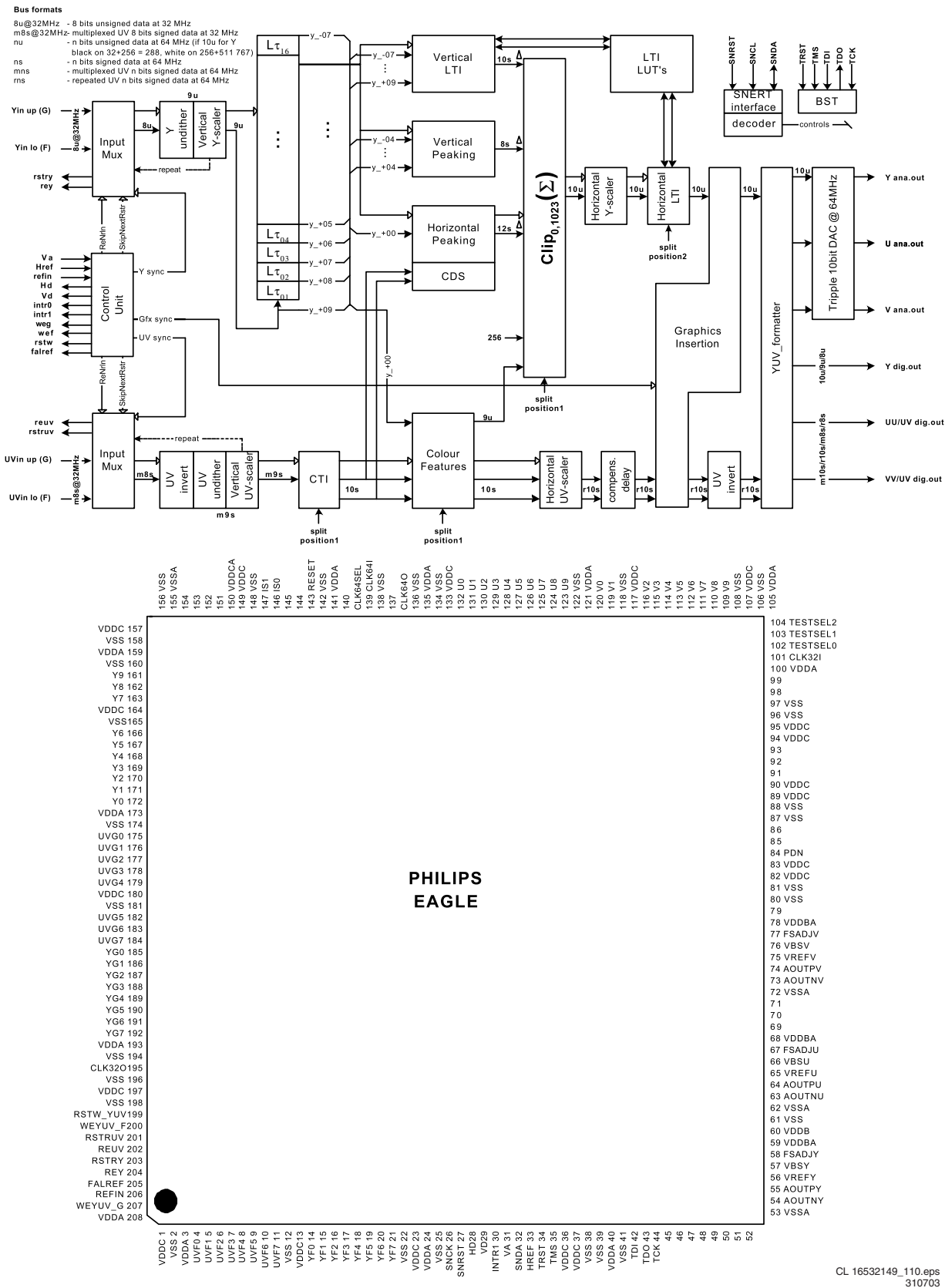


Figure 9-18 Internal Block Diagram and Pin Configuration

9.13.2 Diagram B14A, TEA6415 (IC7I24)

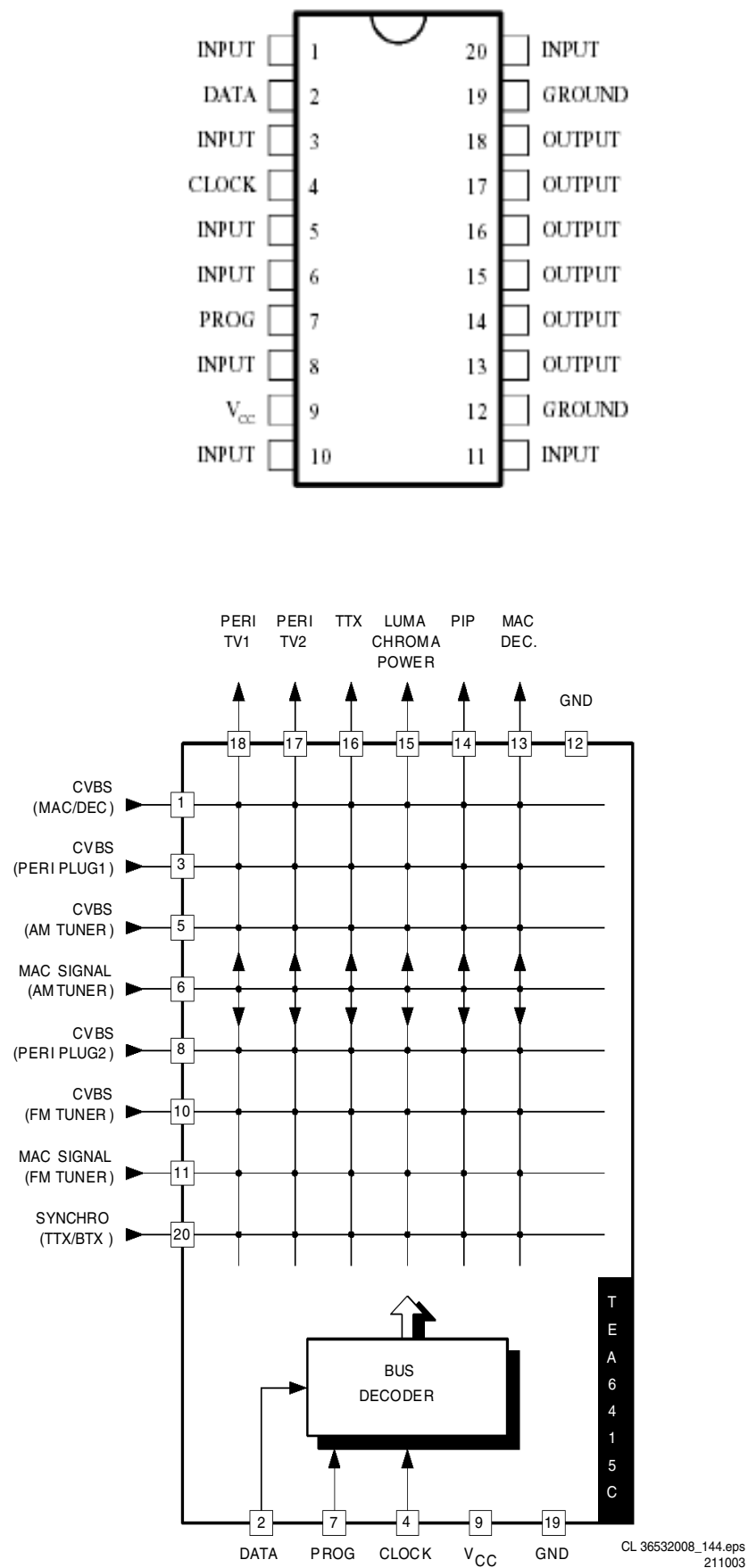
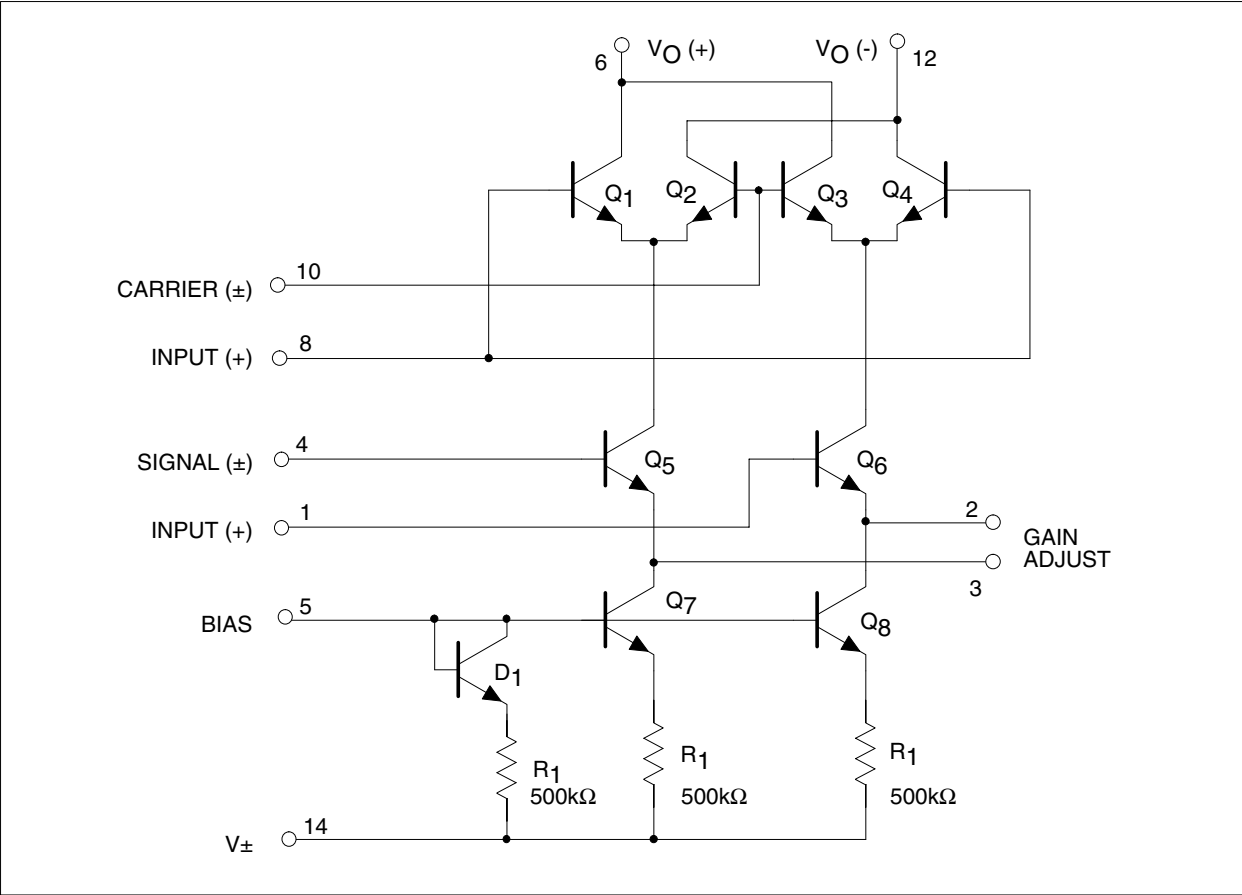


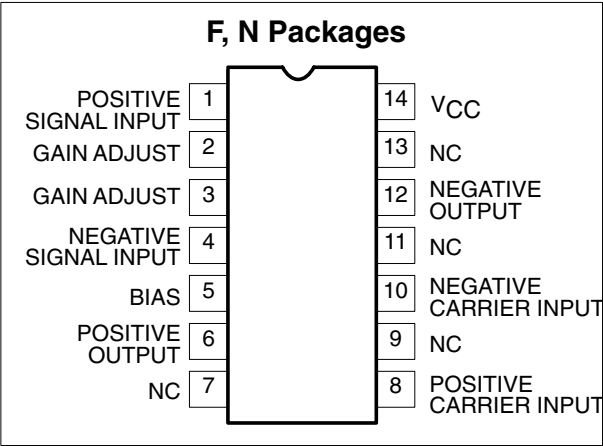
Figure 9-19 Internal Block Diagram and Pin Configuration

9.13.3 Diagram B16DE, MC1496D (IC7H40, 7H50, 7H60)

EQUIVALENT SCHEMATIC



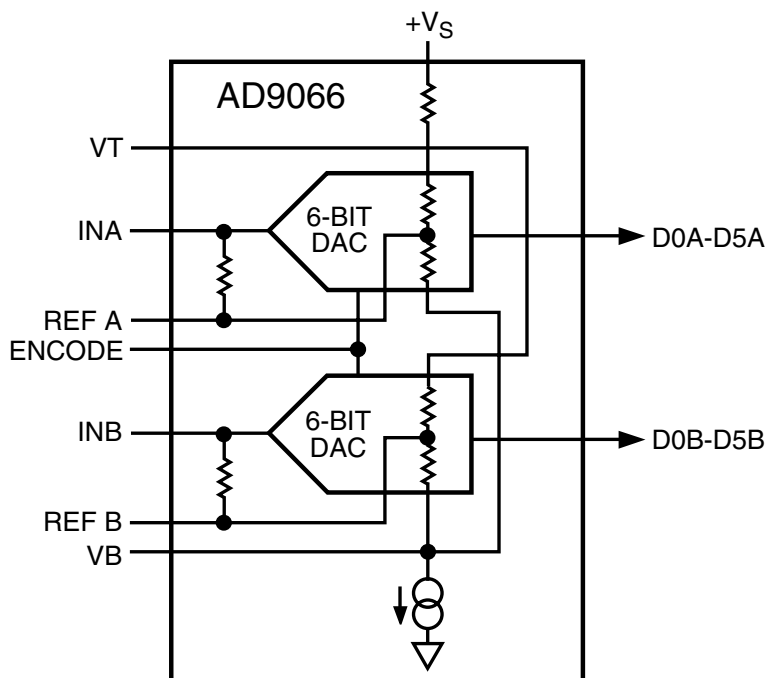
PIN CONFIGURATION



CL 36532053_082.eps
170703

Figure 9-20 Internal Block Diagram and Pin Configuration

FUNCTIONAL BLOCK DIAGRAM



PIN CONFIGURATIONS

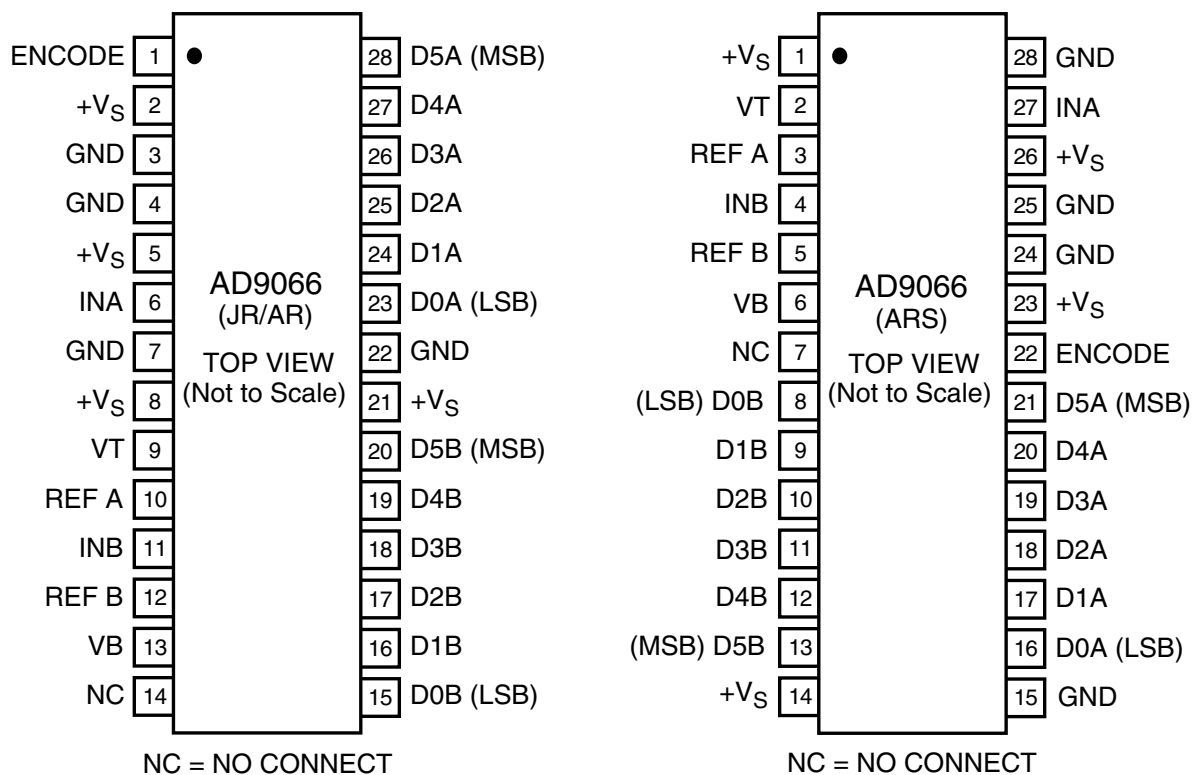


Figure 9-21 Internal Block Diagram and Pin Layout

10. Spare Parts List

Set Level		
Various		
0095	3122 128 14951	Wall mount assy
0098	3122 128 13921	Mounting kit assy
8301	3122 358 76281	Tree assy CN1-S01
8302▲	3104 311 05171	Cable 9p/860/9p
8303▲	3104 311 03611	Cable 12p/280/12p
8304▲	3122 358 76291	Tree assy A04-LS right
8305▲	3104 311 06201	Cable 8p/480/8p
8306▲	3104 311 06691	Cable 10P/340/10P
8307▲	3104 311 06701	Cable 10P/480/10P
8308▲	3104 311 06521	Cable 13P/340/13P
8309▲	3104 311 00351	Cable 3p/400/3p kr
8311▲	8204 000 76372	Cable TW.p 13/280/DF19
8345▲	3104 311 06331	Cable 3P/1700/3P kr
8388▲	3104 311 05161	Cable 8p/600/8p
Audio Amplifier [A]		
Various		
0302	2422 025 16846	Connector 9p m h
0303	2422 025 16702	Connector 5p m h
0304	2422 025 16543	Connector 4p m
0388	2422 025 16704	Connector 8p m
1730	4822 071 52502	Fuse 2.5A
1740	4822 071 52502	Fuse 2.5A
—II—		
2201	4822 126 13193	4.7nF 10% 63V
2202	4822 124 23002	10μF 20% 16V
2204	4822 126 14226	82pF 5% 50V 0603
2205	4822 126 13193	4.7nF 10% 63V
2206	4822 124 23002	10μF 20% 16V
2207	4822 126 14226	82pF 5% 50V 0603
2212	5322 126 11578	1nF 10% 50V 0603
2215	4822 126 13193	4.7nF 10% 63V
2216	4822 124 23002	10μF 20% 16V
2218	4822 126 14226	82pF 5% 50V 0603
2220	4822 126 13193	4.7nF 10% 63V
2221	4822 124 23002	10μF 20% 16V
2222	4822 126 14226	82pF 5% 50V 0603
2224	2238 586 59812	100nF 20-80% 50V 0603
2225	2238 586 59812	100nF 20-80% 50V 0603
2233	2020 552 96325	25V 68nF 10%
2234	2238 586 59812	100nF 20-80% 50V 0603
2238	2238 586 59812	100nF 20-80% 50V 0603
2239	2238 586 59812	100nF 20-80% 50V 0603
2243	2020 552 96325	25V 68nF 10%
2244	2238 586 59812	100nF 20-80% 50V 0603
2255	4822 126 14494	22nF 10% 25V 0603
2256	4822 126 14494	22nF 10% 25V 0603
2260	2238 586 59812	100nF 20-80% 50V 0603
2261	2238 586 59812	100nF 20-80% 50V 0603
2270	4822 126 14494	22nF 10% 25V 0603
2271	4822 126 14494	22nF 10% 25V 0603
2309	4822 126 14247	1.5nF 50V 0603
2310	4822 126 14226	82pF 5% 50V 0603
2315	4822 124 12084	1μF 20% 50V
2316	2238 586 59812	100nF 20-80% 50V 0603
2318	2238 586 59812	100nF 20-80% 50V 0603
2319	4822 124 12084	1μF 20% 50V
2330	2238 586 59812	100nF 20-80% 50V 0603
2334	2020 012 93764	220μF 20% 35V
2335	2238 586 59812	100nF 20-80% 50V 0603
2340	5322 126 11583	10nF 10% 50V 0603
2355	2238 586 59812	100nF 20-80% 50V 0603
2359	2238 586 59812	100nF 20-80% 50V 0603
2360	2020 012 93764	220μF 20% 35V
2365	2020 552 96326	220nF 10% 16V
2366	2020 552 96326	220nF 10% 16V
2409	4822 126 14247	1.5nF 50V 0603
2410	4822 126 14226	82pF 5% 50V 0603
2415	4822 124 12084	1μF 20% 50V
2416	2238 586 59812	100nF 20-80% 50V 0603
2418	2238 586 59812	100nF 20-80% 50V 0603
2419	4822 124 12084	1μF 20% 50V
2430	2238 586 59812	100nF 20-80% 50V 0603
2434	2020 012 93764	220μF 20% 35V
2435	2238 586 59812	100nF 20-80% 50V 0603
2440	5322 126 11583	10nF 10% 50V 0603
2455	2238 586 59812	100nF 20-80% 50V 0603
2459	2238 586 59812	100

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



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



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



7211	3198 010 42320	BC857BW
7225	4822 209 30095	LM833D
7238	4822 209 30095	LM833D
7260	4822 209 30095	LM833D
7302	3198 010 42310	BC847BW
7303	3198 010 42310	BC847BW
7315	9338 028 20668	LM311D
7330	4822 130 42804	BC817-25
7340	3198 010 42310	BC847BW
7355	5322 130 60845	BC807-25
7365	9322 161 86668	IRF7343
7402	3198 010 42310	BC847BW
7403	3198 010 42310	BC847BW
7415	9338 028 20668	LM311D
7430	4822 130 42804	BC817-25
7440	3198 010 42310	BC847BW
7455	5322 130 60845	BC807-25
7465	9322 161 86668	IRF7343
7502	3198 010 42310	BC847BW
7503	3198 010 42310	BC847BW
7515	9338 028 20668	LM311D
7530	4822 130 42804	BC817-25
7540	3198 010 42310	BC847BW
7555	5322 130 60845	BC807-25
7565	9322 161 86668	IRF7343
7602	3198 010 42310	BC847BW

7603	3198 010 42310	BC847BW
7615	9338 028 20668	LM311D
7630	4822 130 42804	BC817-25
7640	3198 010 42310	BC847BW
7655	5322 130 60845	BC807-25
7665	9322 161 86668	IRF7343
7735	4822 130 60142	BC869
7736	3198 010 42310	BC847BW
7745	5322 130 61569	BC868
7746	3198 010 42320	BC857BW
7751	3198 010 42310	BC847BW
7753	3198 010 42320	BC857BW
7755	3198 010 42310	BC847BW
7761	3198 010 42320	BC857BW

Small Signal Panel [B]

Various

0020▲	3122 128 14621	Connector plate F37 EU
0072	3104 301 24451	Frame SSB A-side
0073	3104 301 24461	Cover SSB A-side
0074	3104 301 24221	Cover SSB Z-side
0075	3104 301 24201	Frame SSB Z-side
0079	3104 308 11161	Shielding cover
0080	3104 301 24471	Frame SSB Z-side
0103	3104 303 10871	EMC foam tuner
0166	3122 128 14661	Connector plate FTY37
0305	3104 304 23841	Xtal grommet
0308	3104 304 23841	Xtal grommet
1001	2422 543 89022	Filt. 6MHz 20pF CX5F
1061▲	3122 358 76342	Mains inlet unit
1305	2422 543 01184	Xtal 4.433619MHz 20pF
1308	2422 543 01183	Xtal 3.579545MHz 16pF
1403	2422 086 11092	Fuse F0.5A 50V 1206
1404	2422 127 00543	Switch 1p 2pos
1407	2422 549 44324	Filt. TPWCC04BS
1408	2422 549 44372	SAW 38.9MHz K3953L
1409	2422 549 44369	SAW 38.9MHz K9656L
1702	2422 540 98456	Resonator 12MHz
1A00	2422 543 89019	Xtal 18.432MHz 12pF
1D01	2422 025 16984	Connector 15p f
1E02	2422 025 17274	Connector 10p m
1E04	2422 025 17103	Connector 3p m
1I01	4822 267 10771	Socket 2 x SCART
1I04	4822 267 60385	Socket 1 x SCART
1I05	2422 026 05213	Socket 3p BkWhRd
1I07	2422 026 05501	Socket CINCHE 6p f
1I08	4822 267 31014	Socket headphone
1I19	4822 267 10748	Connector 3p m
1T01	3139 147 19341	Tuner UV1318S/A I-3
1Y01	2422 025 17706	Connector 20p m
1Y45	2422 025 10768	Connector 3p m
1Y81	2422 025 10772	Connector 12p m
1Y82	4822 267 10636	Connector 13P
1Y88	4822 265 11352	Connector 8p
8303▲	3104 311 03611	Cable 12p/280/12p
8305▲	3104 311 06201	Cable 8p/480/8p
8307▲	3104 311 06701	Cable 10P/480/10P
8308▲	3104 311 06521	Cable 13P/340/13P
8309▲	3104 311 00351	Cable 3p/400/3p kr
8311▲	8204 000 76372	Cable TW.p 13/280/DF19



2000	4822 124 12095	100μF 20% 16V
2001	4822 124 12095	100μF 20% 16V
2002	4822 126 11669	27pF 5% 50V 0603
2003	4822 126 13879	220nF 20% 16V
2004	4822 126 13879	220nF 20% 16V
2005	2238 586 59812	100nF 20-80% 50V 0603
2006	2238 586 59812	100nF 20-80% 50V 0603
2007	2238 586 59812	100nF 20-80% 50V 0603
2008	2238 586 59812	100nF 20-80% 50V 0603
2010	4822 126 11785	47pF 5% 50V 0603
2011	4822 126 11785	47pF 5% 50V 0603
2012	4822 126 11785	47pF 5% 50V 0603
2013	2020 021 91557	100μF 20% 16V
2016	4822 124 12095	100μF 20% 16V
2017	2238 586 59812	100nF 20-80% 50V 0603
2018	2222 867 15339	33pF 5% 50V 0603
2019	2238 586 59812	100nF 20-80% 50V 0603
2020	4822 126 13883	220pF 5% 50V
2022	2238 586 59812	100nF 20-80% 50V 0603
2023	2238 586 59812	100nF 20-80% 50V 0603
2024	2238 586 59812	100nF 20-80% 50V 0603
2025	2238 586 59812	100nF 20-80% 50V 0603
2026	2238 586 59812	100nF 20-80% 50V 0603
2027	2238 586 59812	100nF 20-80% 50V 0603
2028	2238 586 59812	100nF 20-80% 50V 0603
2029	2238 586 59812	100nF 20-80% 50V 0603

2031	2238 586 59812	100nF 20-80% 50V 0603
2033	4822 126 14226	82pF 5% 50V 0603
2034	4822 126 14226	82pF 5% 50V 0603
2035	4822 126 14226	82pF 5% 50V 0603
2036	4822 126 14226	82pF 5% 50V 0603
2037	4822 126 14226	82pF 5% 50V 0603
2038	2238 586 59812	100nF 20-80% 50V 0603
2039	2238 586 59812	100nF 20-80% 50V 0603
2040	2238 586 59812	100nF 20-80% 50V 0603
2063	3198 017 34730	47nF 16V 0603
2067	2238 586 59812	100nF 20-80% 50V 0603
2073	2238 586 59812	100nF 20-80% 50V 0603
2074	2238 586 59812	100nF 20-80% 50V 0603
2302	2238 586 59812	100nF 20-80% 50V 0603
2305	2238 586 59812	100nF 20-80% 50V 0603
2316	2238 586 59812	100nF 20-80% 50V 0603
2322	2238 586 59812	100nF 20-80% 50V 0603
2340	2020 021 91557	100μF 20% 16V
2350	2238 586 59812	100nF 20-80% 50V 0603
2351	2238 586 59812	100nF 20-80% 50V 0603
2352	2238 586 59812	100nF 20-80% 50V 0603
2353	2238 586 59812	100nF 20-80% 50V 0603
2354	2238 586 59812	100nF 20-80% 50V 0603
2356	2238 586 59812	100nF 20-80% 50V 0603
2357	2238 586 59812	100nF 20-80% 50V 0603
2358	5322 126 11579	3.3nF 10% 63V
2359	4822 122 33752	15pF 5% 50V
2360	3198 016 31280	1.2pF 50V 0603
2361	3198 016 31280	1.2pF 50V 0603
2362	4822 126 11663	12pF 5% 50V 0603
2365	2238 586 59812	100nF 20-80% 50V 0603
2366	2238 586 59812	100nF 20-80% 50V 0603
2367	2238 586 59812	100nF 20-80% 50V 0603
2368	2238 586 59812	100nF 20-80% 50V 0603
2369	2238 586 59812	100nF 20-80% 50V 0603
2370	2238 586 59812	100nF 20-80% 50V 0603
2371	4822 126 13193	4.7nF 10% 63V
2372	2020 552 96448	1μF 10% 16V
2373	2238 586 59812	100nF 20-80% 50V 0603
2374	4822 126 14491	2.2μF -20+80% 10V 0805
2375	2238 916 15641	22nF 10% 25V 0603
2376	2238 586 59812	100nF 20-80% 50V 0603
2377	2020 021 91557	100μF 20% 16V
2378	2238 586 59812	100nF 20-80% 50V 0603
2384	2238 586 59812	100nF 20-80% 50V 0603
2385	2238 586 59812	100nF 20-80% 50V 0603
2390	2238 586 59812	100nF 20-80% 50V 0603
2391	2238 586 59812	100nF 20-80% 50V 0603
2394	4822 126 14491	2.2μF -20+80% 10V 0805
2403	2238 586 59812	100nF 20-80% 50V 0603
2404	2020 552 96448	1μF 10% 16V
2405	4822 126 13193	4.7nF 10% 63V
2406	4822 126 13883	220pF 5% 50V
2407	4822 126 14221	68pF 5% NP0 50V 0603
2408	3198 016 33380	3.3pF 50V 0603
2409	4822 126 14491	2.2μF -20+80% 10V 0805
2410	2020 021 91557	100μF 20% 16V
2411	2238 586 59812	100nF 20-80% 50V 0603
2412	4822 126 13193	4.7nF 10% 63V
2414	2020 021 91557	100μF 20% 16V
2415	2238 586 59812	100nF 20-80% 50V 0603
2417	3198 017 44740	470nF 10V 0603
2418	3198 016 35680	5.6pF 0.5pF 50V 0603
2422	2238 586 59812	100nF 20-80% 50V 0603
2424	2238 586 59812	100nF 20-80% 50V 0603
2425	2020 021 91557	100μF 20% 16V
2432	2238 586 59812	100nF 20-80% 50V 0603
2433	2238 586 59812	100nF 20-80% 50V 0603
2709	2238 586 59812	100nF 20-80% 50V 0603
2710	2238 586 59812	100nF 20-80% 50V 0603
2711	2238 586 59812	100nF 20-80% 50V 0603
2712	2238 586 59812	100nF 20-80% 50V 0603
2713	4822 122 33761	22pF 5% 50V
2714	4822 122 33761	

2743	2238 586 59812	100nF 20-80% 50V 0603	2852	2238 586 59812	100nF 20-80% 50V 0603	2A92	2020 552 96448	1µF 10% 16V
2744	2238 586 59812	100nF 20-80% 50V 0603	2853	2238 586 59812	100nF 20-80% 50V 0603	2A95	4822 126 13883	220pF 5% 50V
2745	2238 586 59812	100nF 20-80% 50V 0603	2854	2238 586 59812	100nF 20-80% 50V 0603	2A99	2238 869 15101	100pF 5% 50V 0402
2746	2238 586 59812	100nF 20-80% 50V 0603	2855	2238 586 59812	100nF 20-80% 50V 0603	2AA0	2238 869 15101	100pF 5% 50V 0402
2747	2238 586 59812	100nF 20-80% 50V 0603	2857	2238 586 59812	100nF 20-80% 50V 0603	2AA1	2238 869 15101	100pF 5% 50V 0402
2748	2238 586 59812	100nF 20-80% 50V 0603	2858	4822 124 12095	100µF 20% 16V	2AA5	2238 869 15101	100pF 5% 50V 0402
2749	2020 021 91554	10µF 20% 16V	2859	2238 586 59812	100nF 20-80% 50V 0603	2AA6	2020 552 96618	1nF 10% 50V 0402
2750	2238 586 59812	100nF 20-80% 50V 0603	2860	2238 586 59812	100nF 20-80% 50V 0603	2AA7	2020 552 96618	1nF 10% 50V 0402
2751	2238 586 59812	100nF 20-80% 50V 0603	2861	2238 586 59812	100nF 20-80% 50V 0603	2AA8	2020 552 96618	1nF 10% 50V 0402
2752	2238 586 59812	100nF 20-80% 50V 0603	2862	2238 586 59812	100nF 20-80% 50V 0603	2AA9	3198 016 35680	5.6pF 0.5pF 50V 0603
2753	2238 586 59812	100nF 20-80% 50V 0603	2863	2238 586 59812	100nF 20-80% 50V 0603	2AB0	3198 016 35680	5.6pF 0.5pF 50V 0603
2754	2238 586 59812	100nF 20-80% 50V 0603	2864	2238 586 59812	100nF 20-80% 50V 0603	2AB2	2020 552 96618	1nF 10% 50V 0402
2755	2238 586 59812	100nF 20-80% 50V 0603	2865	2238 586 59812	100nF 20-80% 50V 0603	2AB3	2020 552 96448	1µF 10% 16V
2756	2238 586 59812	100nF 20-80% 50V 0603	2866	2238 586 59812	100nF 20-80% 50V 0603	2AB4	2020 552 96448	1µF 10% 16V
2757	2238 916 15641	22nF 10% 25V 0603	2867	2238 586 59812	100nF 20-80% 50V 0603	2AB5	2020 021 91554	10µF 20% 16V
2760	2238 586 59812	100nF 20-80% 50V 0603	2870	2020 021 91554	10µF 20% 16V	2AB8	2020 552 96448	1µF 10% 16V
2761	2238 586 59812	100nF 20-80% 50V 0603	2871	2020 021 91557	100µF 20% 16V	2C00	2238 586 59812	100nF 20-80% 50V 0603
2762	2238 586 59812	100nF 20-80% 50V 0603	2872	2238 586 59812	100nF 20-80% 50V 0603	2C01	2238 586 59812	100nF 20-80% 50V 0603
2763	2238 586 59812	100nF 20-80% 50V 0603	2874	2020 021 91554	10µF 20% 16V	2C02	2238 586 59812	100nF 20-80% 50V 0603
2764	2238 586 59812	100nF 20-80% 50V 0603	2877	2020 021 91557	100µF 20% 16V	2D03	2020 552 96618	1nF 10% 50V 0402
2765	2238 586 59812	100nF 20-80% 50V 0603	2880	2020 021 91554	10µF 20% 16V	2D04	2020 552 96618	1nF 10% 50V 0402
2766	2238 586 59812	100nF 20-80% 50V 0603	2881	4822 126 11669	27pF 5% 50V 0603	2D08	2238 586 59812	100nF 20-80% 50V 0603
2767	2238 586 59812	100nF 20-80% 50V 0603	2884	2238 586 59812	100nF 20-80% 50V 0603	2D10	2238 586 59812	100nF 20-80% 50V 0603
2768	2238 586 59812	100nF 20-80% 50V 0603	2886	2238 586 59812	100nF 20-80% 50V 0603	2D11	2238 586 59812	100nF 20-80% 50V 0603
2769	2238 586 59812	100nF 20-80% 50V 0603	2887	2238 586 59812	100nF 20-80% 50V 0603	2D12	2238 586 59812	100nF 20-80% 50V 0603
2770	2020 021 91554	10µF 20% 16V	2888	2238 586 59812	100nF 20-80% 50V 0603	2D16	2238 586 59812	100nF 20-80% 50V 0603
2771	2238 586 59812	100nF 20-80% 50V 0603	2889	2238 586 59812	100nF 20-80% 50V 0603	2D17	2238 586 59812	100nF 20-80% 50V 0603
2772	2020 021 91557	100µF 20% 16V	2890	2238 586 59812	100nF 20-80% 50V 0603	2D22	2238 586 59812	100nF 20-80% 50V 0603
2773	2238 586 59812	100nF 20-80% 50V 0603	2891	2238 586 59812	100nF 20-80% 50V 0603	2D50	4822 126 13879	220nF 20% 16V
2774	2238 586 59812	100nF 20-80% 50V 0603	2892	2238 586 59812	100nF 20-80% 50V 0603	2D51	2238 586 59812	100nF 20-80% 50V 0603
2775	2238 586 59812	100nF 20-80% 50V 0603	2893	2238 586 59812	100nF 20-80% 50V 0603	2D52	2238 586 59812	100nF 20-80% 50V 0603
2776	2238 586 59812	100nF 20-80% 50V 0603	2894	2238 586 59812	100nF 20-80% 50V 0603	2D53	2022 552 05616	4.7µF 5% 6.3V
2777	2238 586 59812	100nF 20-80% 50V 0603	2895	2238 586 59812	100nF 20-80% 50V 0603	2D54	2022 552 05616	4.7µF 5% 6.3V
2778	2238 586 59812	100nF 20-80% 50V 0603	2896	2238 586 59812	100nF 20-80% 50V 0603	2D55	2022 552 05616	4.7µF 5% 6.3V
2779	2238 586 59812	100nF 20-80% 50V 0603	2897	2238 586 59812	100nF 20-80% 50V 0603	2D57	2238 586 59812	100nF 20-80% 50V 0603
2780	2238 586 59812	100nF 20-80% 50V 0603	2898	2238 586 59812	100nF 20-80% 50V 0603	2D58	2022 552 05616	4.7µF 5% 6.3V
2781	2238 586 59812	100nF 20-80% 50V 0603	2899	2238 586 59812	100nF 20-80% 50V 0603	2D59	2022 552 05616	4.7µF 5% 6.3V
2782	2238 586 59812	100nF 20-80% 50V 0603	2A00	2020 552 96618	1nF 10% 50V 0402	2D60	2022 552 05616	4.7µF 5% 6.3V
2784	2238 586 59812	100nF 20-80% 50V 0603	2A01	2020 021 91557	100µF 20% 16V	2D61	2022 552 05616	4.7µF 5% 6.3V
2785	2238 586 59812	100nF 20-80% 50V 0603	2A02	2020 552 96448	1µF 10% 16V	2D62	4822 126 13879	220nF 20% 16V
2786	2238 586 59812	100nF 20-80% 50V 0603	2A03	2020 021 91557	100µF 20% 16V	2D63	2022 552 05616	4.7µF 5% 6.3V
2787	2238 586 59812	100nF 20-80% 50V 0603	2A04	2020 552 96448	1µF 10% 16V	2D64	2022 552 05616	4.7µF 5% 6.3V
2788	2238 586 59812	100nF 20-80% 50V 0603	2A05	2020 021 91557	100µF 20% 16V	2D65	3198 032 47170	47µF 20% 16V
2789	2238 586 59812	100nF 20-80% 50V 0603	2A06	2020 552 96618	1nF 10% 50V 0402	2D66	2238 586 59812	100nF 20-80% 50V 0603
2790	2238 586 59812	100nF 20-80% 50V 0603	2A07	2020 021 91557	100µF 20% 16V	2D67	2238 586 59812	100nF 20-80% 50V 0603
2791	2238 586 59812	100nF 20-80% 50V 0603	2A08	2020 552 96448	1µF 10% 16V	2D68	2238 586 59812	100nF 20-80% 50V 0603
2792	2020 021 91554	10µF 20% 16V	2A10	2238 586 59812	100nF 20-80% 50V 0603	2D69	3198 016 31020	1nF 10% 25V 0603
2793	2238 586 59812	100nF 20-80% 50V 0603	2A11	2238 586 59812	100nF 20-80% 50V 0603	2D70	2238 586 59812	100nF 20-80% 50V 0603
2794	2020 021 91554	10µF 20% 16V	2A13	2020 552 96618	1nF 10% 50V 0402	2D71	2238 586 59812	100nF 20-80% 50V 0603
2795	2238 586 59812	100nF 20-80% 50V 0603	2A14	2020 552 96618	1nF 10% 50V 0402	2D72	4822 126 11785	47pF 5% 50V 0603
2796	2238 586 59812	100nF 20-80% 50V 0603	2A15	2020 021 91557	100µF 20% 16V	2D73	4822 126 11785	47pF 5% 50V 0603
2797	2238 586 59812	100nF 20-80% 50V 0603	2A16	2238 586 59812	100nF 20-80% 50V 0603	2D74	3198 032 47170	47µF 20% 16V
2798	2238 586 59812	100nF 20-80% 50V 0603	2A17	2020 552 96618	1nF 10% 50V 0402	2D75	2238 586 59812	100nF 20-80% 50V 0603
2799	2238 586 59812	100nF 20-80% 50V 0603	2A18	2020 021 91557	100µF 20% 16V	2D76	2022 552 05616	4.7µF 5% 6.3V
2800	2238 586 59812	100nF 20-80% 50V 0603	2A19	3198 017 41050	1µF 10V 0603	2D77	2238 586 59812	100nF 20-80% 50V 0603
2801	2238 586 59812	100nF 20-80% 50V 0603	2A21	2238 586 59812	100nF 20-80% 50V 0603	2D78	2238 586 59812	100nF 20-80% 50V 0603
2802	2238 586 59812	100nF 20-80% 50V 0603	2A22	2238 586 59812	100nF 20-80% 50V 0603	2E02	4822 124 23237	22µF 20% 6.3V
2803	2238 586 59812	100nF 20-80% 50V 0603	2A23	2238 586 59812	100nF 20-80% 50V 0603	2E04	3198 035 04710	470pF 50V 0402
2804	2238 586 59812	100nF 20-80% 50V 0603	2A26	2238 586 59812	100nF 20-80% 50V 0603	2E05	4822 124 23237	22µF 20% 6.3V
2805	2238 586 59812	100nF 20-80% 50V 0603	2A27	2020 552 96618	1nF 10% 50V 0402	2E09	4822 124 23237	22µF 20% 6.3V
2806	2238 586 59812	100nF 20-80% 50V 0603	2A29	2238 869 15101	100pF 5% 50V 0402	2E10	2238 586 59812	100nF 20-80% 50V 0603
2807	2238 586 59812	100nF 20-80% 50V 0603	2A30	2238 869 15101	100pF 5% 50V 0402	2E11	4822 124 23237	22µF 20% 6.3V
2808	2020 021 91554	10µF 20% 16V	2A31	2238 586 59812	100nF 20-80% 50V 0603	2E12	2022 552 05616	4.7µF 5% 6.3V
2809	2238 586 59812	100nF 20-80% 50V 0603	2A32	2238 869 15101	100pF 5% 50V 0402	2E14	2238 586 59812	100nF 20-80% 50V 0603
2810	2238 586 59812	100nF 20-80% 50V 0603	2A33	2238 586 59812	100nF 20-80% 50V 0603	2E15	2238 586 59812	100nF 20-80% 50V 0603
2811	2238 586 59812	100nF 20-80% 50V 0603	2A34	3198 035 71030	10nF 16V 0402	2E17	2022 552 05616	4.7µF 5% 6.3V
2812	2238 586 59812	100nF 20-80% 50V 0603	2A35	2020 552 96618	1nF 10% 50V 0402	2E18	2022 552 05616	4.7µF 5% 6.3V
2813	2238 586 59812	100nF 20-80% 50V 0603	2A36	2238 869 15101	100pF 5% 50V 0402	2E19	2238 586 59812	100nF 20-80% 50V 0603
2817	2238 586 59812	100nF 20-80% 50V 0603	2A37	2238 869 15101	100pF 5% 50V 0402	2E20	2238 586 59812	100nF 20-80% 50V 0603
2819	2238 586 59812	100nF 20-80% 50V 0603	2A38	3198 035 71030	10nF 16V 0402	2E21	2238 586 59812	100nF 20-80% 50V 0603
2820	2238 586 59812	100nF 20-80% 50V 0603	2A40	2238 586 59812	100nF 20-80% 50V 0603	2E22	2020 552 96448	1µF 10% 16V
2821	2238 586 59812	100nF 20-80% 50V 0603	2A41	2020 021 91554	10µF 20% 16V	2E23	2238 586 59812	100nF 20-80% 50V 0603
2822	2238 586 59812	100nF 20-80% 50V 0603	2A42	2020 021 91554	10µF 20% 16V	2E24	2238 586 59812	100nF 20-80% 50V 0603
2823	5322 126 11578	1nF 10% 50V 0603	2A43	2020 021 91554	10µF 20% 16V	2E25	2238 586 59812	100nF 20-80% 50V 0603
2824	5322 126 11578	1nF 10% 50V 0603	2A44	2238 586 59812	100nF 20-80% 50V 0603	2E26	2022 552 05616	4.7µF 5% 6.3V
2825	2238 586 59812	100nF 20-80% 50V 0603	2A46	2020 552 96448	1µF 10% 16V	2E28	2238 586 59812	100nF 20-80% 50V 0603
2826	2238 586 59812	100nF 20-80% 50V 0603	2A47	2020 552 96618	1nF 10% 50V 0402	2E30	2022 552 05616	4.7µF 5% 6.3V
2829	2238 586 59812	100nF 20-80% 50V 0603	2A48	2020 552 96618	1nF			

2E66	2238 586 59812	100nF 20-80% 50V 0603	2IJ5	4822 126 14585	100nF 10% 50V	2V09	2238 586 59812	100nF 20-80% 50V 0603
2E68	2022 552 05616	4.7µF 5% 6.3V	2L01	3198 035 71040	100nF 10% 16V 0402	2V10	2238 586 59812	100nF 20-80% 50V 0603
2E69	2238 586 59812	100nF 20-80% 50V 0603	2L02	3198 035 71040	100nF 10% 16V 0402	2V11	2238 586 59812	100nF 20-80% 50V 0603
2E70	2238 586 59812	100nF 20-80% 50V 0603	2L03	3198 035 71040	100nF 10% 16V 0402	2V12	2238 586 59812	100nF 20-80% 50V 0603
2E71	2238 586 59812	100nF 20-80% 50V 0603	2L04	3198 035 71040	100nF 10% 16V 0402	2V13	2238 586 59812	100nF 20-80% 50V 0603
2E72	2238 586 59812	100nF 20-80% 50V 0603	2L05	3198 035 71040	100nF 10% 16V 0402	2Y00	2238 869 15101	100pF 5% 50V 0402
2E73	2238 586 59812	100nF 20-80% 50V 0603	2L06	3198 035 71040	100nF 10% 16V 0402	2Y01	2020 552 96618	1nF 10% 50V 0402
2E74	2238 586 59812	100nF 20-80% 50V 0603	2L07	3198 035 71040	100nF 10% 16V 0402			
2E75	2238 586 59812	100nF 20-80% 50V 0603	2L08	3198 035 71040	100nF 10% 16V 0402			
2E76	2238 586 59812	100nF 20-80% 50V 0603	2L09	3198 035 71040	100nF 10% 16V 0402			
2E78	2238 586 59812	100nF 20-80% 50V 0603	2L10	3198 035 71040	100nF 10% 16V 0402			
2E79	2238 586 59812	100nF 20-80% 50V 0603	2L11	2238 586 59812	100nF 20-80% 50V 0603			
2E80	2238 586 59812	100nF 20-80% 50V 0603	2L12	3198 035 71040	100nF 10% 16V 0402			
2E83	2238 586 59812	100nF 20-80% 50V 0603	2L13	3198 035 71040	100nF 10% 16V 0402			
2E84	2238 586 59812	100nF 20-80% 50V 0603	2L14	3198 035 71040	100nF 10% 16V 0402			
2E86	2238 586 59812	100nF 20-80% 50V 0603	2L15	3198 035 71040	100nF 10% 16V 0402			
2E87	4822 124 12095	100µF 20% 16V	2L16	3198 035 71040	100nF 10% 16V 0402			
2I00	2238 586 59812	100nF 20-80% 50V 0603	2L17	3198 035 71040	100nF 10% 16V 0402			
2I07	4822 051 30008	Jumper 0603	2L18	2020 552 96305	4.7µF 20-80% 10V			
2I09	2020 552 94427	100pF 5% 50v 0603	2L19	4822 124 23002	10µF 20% 16V			
2I10	2020 552 94427	100pF 5% 50v 0603	2L20	3198 035 71040	100nF 10% 16V 0402			
2I11	2020 552 94427	100pF 5% 50v 0603	2L21	3198 035 71040	100nF 10% 16V 0402			
2I12	4822 126 14241	330pF 50V 0603	2L22	5322 126 11583	10nF 10% 50V 0603			
2I16	2020 552 94427	100pF 5% 50v 0603	2L23	5322 126 11583	10nF 10% 50V 0603			
2I17	2020 552 94427	100pF 5% 50v 0603	2L24	5322 126 11583	10nF 10% 50V 0603			
2I18	2020 552 94427	100pF 5% 50v 0603	2L25	2238 586 59812	100nF 20-80% 50V 0603			
2I19	2020 552 94427	100pF 5% 50v 0603	2L26	4822 126 14549	33nF 16V 0603			
2I20	4822 126 14241	330pF 50V 0603	2L27	4822 126 13193	4.7nF 10% 63V			
2I21	2020 552 94427	100pF 5% 50v 0603	2L28	4822 126 14226	82pF 5% 50V 0603			
2I22	2020 552 94427	100pF 5% 50v 0603	2L29	4822 122 33761	22pF 5% 50V			
2I23	2020 552 94427	100pF 5% 50v 0603	2L30	4822 126 14226	82pF 5% 50V 0603			
2I24	2020 552 94427	100pF 5% 50v 0603	2L31	3198 017 34730	47nF 16V 0603			
2I25	4822 126 14241	330pF 50V 0603	2L32	5322 126 11579	3.3nF 10% 63V			
2I26	2020 552 94427	100pF 5% 50v 0603	2L33	2238 586 59812	100nF 20-80% 50V 0603			
2I27	2020 552 94427	100pF 5% 50v 0603	2L34	2238 586 59812	100nF 20-80% 50V 0603			
2I36	2020 552 94427	100pF 5% 50v 0603	2L35	4822 126 13879	220nF 20% 16V			
2I39	3198 024 44730	47nF 50V 0603	2L36	3198 016 31020	1nF 10% 25V 0603			
2I46	3198 016 31020	1nF 10% 25V 0603	2L37	3198 016 31020	1nF 10% 25V 0603			
2I47	3198 016 31020	1nF 10% 25V 0603	2L38	3198 016 31020	1nF 10% 25V 0603			
2I48	2238 587 15624	1.2nF 10% 50V 0402	2L39	2238 586 59812	100nF 20-80% 50V 0603			
2I51	2238 586 59812	100nF 20-80% 50V 0603	2L40	2020 552 96305	4.7µF 20-80% 10V			
2I52	2020 552 94427	100pF 5% 50v 0603	2L41	3198 016 31020	1nF 10% 25V 0603			
2I54	2238 869 15101	100pF 5% 50V 0402	2L42	3198 016 31020	1nF 10% 25V 0603			
2I57	2020 552 94427	100pF 5% 50v 0603	2L43	2238 586 59812	100nF 20-80% 50V 0603			
2I58	2020 552 94427	100pF 5% 50v 0603	2L44	2020 552 96305	4.7µF 20-80% 10V			
2I59	2238 586 59812	100nF 20-80% 50V 0603	2L45	3198 016 31020	1nF 10% 25V 0603			
2I60	2238 587 15624	1.2nF 10% 50V 0402	2L46	3198 016 31020	1nF 10% 25V 0603			
2I62	2238 869 15101	100pF 5% 50V 0402	2L47	2238 586 59812	100nF 20-80% 50V 0603			
2I64	2238 869 15101	100pF 5% 50V 0402	2L48	4822 122 33752	15pF 5% 50V			
2I65	2238 869 15101	100pF 5% 50V 0402	2L50	4822 122 33752	15pF 5% 50V			
2I66	2238 869 15101	100pF 5% 50V 0402	2L52	3198 017 34730	47nF 16V 0603			
2I67	2238 869 15101	100pF 5% 50V 0402	2L53	4822 124 81059	220µF 20% 4V			
2I69	2238 869 15101	100pF 5% 50V 0402	2L54	3198 017 34730	47nF 16V 0603			
2I70	2238 869 15101	100pF 5% 50V 0402	2L57	3198 017 34730	47nF 16V 0603			
2I71	2020 552 96448	1µF 10% 16V	2L58	4822 124 81059	220µF 20% 4V			
2I72	2020 552 96448	1µF 10% 16V	2L59	2020 552 96618	1nF 10% 50V 0402			
2I73	2020 552 96448	1µF 10% 16V	2L60	4822 126 11785	47pF 5% 50V 0603			
2I74	2020 552 96448	1µF 10% 16V	2L63	4822 126 11785	47pF 5% 50V 0603			
2I75	2020 552 96448	1µF 10% 16V	2P80	4822 124 12095	100µF 20% 16V			
2I76	2020 552 96448	1µF 10% 16V	2P81	2238 586 59812	100nF 20-80% 50V 0603			
2I77	2020 552 96448	1µF 10% 16V	2S01	2238 586 59812	100nF 20-80% 50V 0603			
2I78	2020 552 96448	1µF 10% 16V	2S02	2238 586 59812	100nF 20-80% 50V 0603			
2I79	2020 021 91886	22µF 20% 16V	2S03	2238 586 59812	100nF 20-80% 50V 0603			
2I80	2020 552 96448	1µF 10% 16V	2S04	2238 586 59812	100nF 20-80% 50V 0603			
2I81	2020 552 96448	1µF 10% 16V	2S05	2238 586 59812	100nF 20-80% 50V 0603			
2I82	2020 552 96448	1µF 10% 16V	2S06	2020 552 94427	100pF 5% 50v 0603			
2I83	2020 552 96448	1µF 10% 16V	2S07	2020 552 94427	100pF 5% 50v 0603			
2I84	2020 552 96448	1µF 10% 16V	2S08	2020 552 94427	100pF 5% 50v 0603			
2I85	2020 552 96448	1µF 10% 16V	2S09	2020 552 94427	100pF 5% 50v 0603			
2I98	2238 869 15101	100pF 5% 50V 0402	2S11	2020 552 94427	100pF 5% 50v 0603			
2I99	2020 552 96448	1µF 10% 16V	2S13	2020 552 94427	100pF 5% 50v 0603			
2IA0	2020 552 96448	1µF 10% 16V	2S14	2020 552 94427	100pF 5% 50v 0603			
2IA1	2020 552 96448	1µF 10% 16V	2S15	2020 552 94427	100pF 5% 50v 0603			
2IA2	2020 552 96448	1µF 10% 16V	2S16	2020 552 94427	100pF 5% 50v 0603			
2IA4	2020 552 96448	1µF 10% 16V	2S22	3198 017 44740	470nF 10V 0603			
2IA5	2020 021 91557	100µF 20% 16V	2S42	4822 051 30759	75Ω 5% 0.062W			
2IA7	2020 552 96448	1µF 10% 16V	2T01	2020 021 91887	470µF 20% 16V			
2IB3	2238 586 59812	100nF 20-80% 50V 0603	2T04	3198 024 44730	47nF 50V 0603			
2IB7	2238 586 59812	100nF 20-80% 50V 0603	2T05	2020 021 91887	470µF 20% 16V			
2IB8	2020 552 96628	10nF 10% 16V 0402	2T06	5322 126 11583	10nF 10% 50V 0603			
2IB9	2238 586 59812	100nF 20-80% 50V 0603	2T09	3198 017 34730	47nF 16V 0603			
2IC0	4822 124 23002	10µF 20% 16V	2T12	2238 586 59812	100nF 20-80% 50V 0603			
2IC1	4822 124 23002	10µF 20% 16V	2T13	5322 126 11583	10nF 10% 50V 0603			
2IC3	2238 586 59812	100nF 20-80% 50V 0603	2T15	2020 552 96448	1µF 10% 16V			
2IC6	5322 126 11583	10nF 10% 50V 0603	2U08	2020 021 91887	470µF 20% 16V			
2IC7	2020 552 94427	100pF 5% 50v 0603	2U23	4822 124 12095	100µF 20% 16V			
2IC9	4822 126 13881	470pF 5% 50V	2U26	2238 586 59812	100nF 20-80% 50V 0603			
2IG1	2238 586 59812	100nF 20-80% 50V 0603	2U29	2238 586 59812	100nF 20-80% 50V 0603			
2IH2	2238 586 59812	100nF 20-80% 50V 0603	2U31	4822 124 12095	100µF 20% 16V			
2IH3	3198 016 31020	1nF 10% 25V 0603	2U37	2020 552 96448	1µF 10% 16V			
2IH5	4822 126 14241	330pF 50V 0603	2V05	4822 122 33741	10pF 10% 50V			
2IH6	4822 126 14241	330pF 50V 0603	2V06	2238 586 59812	100nF 20-80% 50V 0603			
2IH7	5322 126 11583	10nF 10% 50V 0603	2V07	2238 586 59812	100nF 20-80% 50V 0603			
2IJ4	2238 586 59812	100nF 20-80% 50V 0603	2V08	2238 586 59812	100nF 20-80% 50V 0603			

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3000	4822 117 12925	47kΩ 1% 0.063W 0603
3001	4822 051 30472	4.7kΩ 5% 0.062W
3002	4822 051 30472	4.7kΩ 5% 0.062W
3003	4822 117 13525	24kΩ 1% 0.62W 0603
3005	4822 051 30103	10kΩ 5% 0.062W
3006	4822 051 30471	470Ω 5% 0.062W
3007	3198 031 14710	4 x 470Ω 5% 1206
3008	4822 117 13523	220Ω 5% 0.63W
3010	4822 051 30103	10kΩ 5% 0.062W
3011	4822 051 30103	10kΩ 5% 0.062W
3012	3198 031 11010	4 x 100Ω 5% 1206
3013	4822 051 30103	10kΩ 5% 0.062W
3014	4822 051 30682	6.8kΩ 5% 0.062W
3015	4822 051 30474	470kΩ 5% 0.062W
3016	5322 117 13034	1.5kΩ 1% 0.063W 0603
3017	4822 051 30472	4.7kΩ 5% 0.062W
3018	4822 051 30103	10kΩ 5% 0.062W
3019	4822 051 30472	4.7kΩ 5% 0.062W
3020	4822 051 30103	10kΩ 5% 0.062W
3021	4822 051 30103	10kΩ 5% 0.062W
3022	4822 117 11817	1.2kΩ 1% 0.062W
3023	4822 051 30222	2.2kΩ 5% 0.062W
3024	4822 051 30273	27kΩ 5% 0.062W
3025	4822 051 30221	220Ω 5% 0.062W
3026	4822 051 30472	4.7kΩ 5% 0.062W
3027	4822 117 12925	47kΩ 1% 0.063W 0603
3028	4822 051 30472	4.7kΩ 5% 0.062W
3029	3198 031 11010	4 x 100Ω 5% 1206
3030	4822 051 30472	4.7kΩ 5% 0.062W
3031	3198 031 11010	4 x 100Ω 5% 1206
3032	4822 051 30103	10kΩ 5% 0.062W
3033	4822 051 30103	10kΩ 5% 0.062W
3034	3198 031 11010	4 x 100Ω 5% 1206
3035	3198 031 11010	4 x 100Ω 5% 1206
3036	4822 051 30472	4.7kΩ 5% 0.062W
3039	4822 051 30181	180Ω 5% 0.062W
3046	3198 031 11010	4 x 100Ω 5% 1206
3047	4822 051 30008	Jumper 0603
3048	3198 031 11010	4 x 100Ω 5% 1206
3049	3198 031 11010	4 x 100Ω 5% 1206
3050	3198 031 11010	4 x 100Ω 5% 1206
3051	3198 031 11010	4 x 100Ω 5% 1206
3052	3198 031 11010	4 x 100Ω 5% 1206
3053	4822 051 30103	10kΩ 5% 0.062W
3054	3198 031 11010	4 x 100Ω 5% 1206
3055	3198 031 11010	4 x 100Ω 5% 1206
3056	3198 031 11010	4 x 100Ω 5% 1206
3057	3198 031 11010	4 x 100Ω 5% 1206
3059	2322 704 66201	620Ω 1% 0603
3061	3198 031 11010	4 x 100Ω 5% 1206
3062	4822 051 30103	10kΩ 5% 0.062W
3064	3198 031 11010	4 x 100Ω 5% 1206
3065	4822 051 30472	4.7kΩ 5% 0.062W
3066	4822 117 12925	47kΩ 1% 0.063W 0603
3067	4822 051 30474	470kΩ 5% 0.062W
3069	4822 051 30222	2.2kΩ 5% 0.062W
3072	3198 031 11010	4 x 100Ω 5% 1206
3073	3198 031 14710	4 x 470Ω 5% 1206
3074	3198 031 14710	4 x 470Ω 5% 1206
3076	3198 031 14710	4 x 470Ω 5% 1206
3077	4822 051 30103	10kΩ 5% 0.062W
3078	3198 031 14710	4 x 470Ω 5% 1206
3079	4822 051 30222	2.2kΩ 5% 0.062W
3080	4822 051 30472	4.7kΩ 5% 0.062W
3081	4822 051 30471	470Ω 5% 0.062W
3082	3198 031 11010	4 x 100Ω 5% 1206
3083	3198 031 11010	4 x 100Ω 5% 1206
3084	4822 051 30103	10kΩ 5% 0.062W
3085	3198 031 11010	4 x 100Ω 5% 1206
3086	3198 031 11010	4 x 100Ω 5% 1206
3087	4822 051 30101	100Ω 5% 0.062W
3088	4822 051 30222	2.2kΩ 5% 0.062W
3089	4822 051 30101	100Ω 5% 0.062W
3090	3198 031 14710	4 x 470Ω 5% 1206
3091	4822 051 30008	Jumper 0603
3092	4822 051 30222	2.2kΩ 5% 0.062W
3093	4822 051 30103	10kΩ 5% 0.062W
3097	4822 051 30471	470Ω 5% 0.062W
3099	3198 031 14710	4 x 470Ω 5% 1206
3100	4822 051 30221	220Ω 5% 0.062W
3101	4822 051 30221	220Ω 5% 0.062W
3102	3198 031 11010	4 x 100Ω 5% 1206
3301	4822 117 13632	100kΩ 1% 0.62W 0603

3303	4822 117 13632	100kΩ 1% 0.62W 0603	3758	4822 051 30472	4.7kΩ 5% 0.062W	3A42	4822 117 13545	100Ω 1% 0402
3304▲	2322 750 63908	3.9Ω 5% 1206 fusible	3759	4822 051 30221	220Ω 5% 0.062W	3A45	3198 031 04730	47Ω 5% 0402
3308	4822 051 20474	470kΩ 5% 0.1W	3762	4822 051 30101	100Ω 5% 0.062W	3A46	4822 117 11297	100kΩ 5% 0.1W
3368	4822 051 30471	470Ω 5% 0.062W	3764	4822 051 30109	10Ω 5% 0.062W	3A47	3198 031 04730	47Ω 5% 0402
3370	4822 051 30101	100Ω 5% 0.062W	3770	4822 117 13545	100Ω 1% 0402	3A48	4822 117 11297	100kΩ 5% 0.1W
3371	4822 051 30479	47Ω 5% 0.062W	3771	4822 117 12971	15Ω 5% 0.62W 0603	3A49	3198 031 04730	47Ω 5% 0402
3372	4822 051 30471	470Ω 5% 0.062W	3772	4822 117 12971	15Ω 5% 0.62W 0603	3A50	4822 117 13545	100Ω 1% 0402
3373	4822 051 30008	Jumper 0603	3773	4822 117 12925	47kΩ 1% 0.063W 0603	3A51	3198 031 04730	47Ω 5% 0402
3374	4822 051 30008	Jumper 0603	3774	4822 117 12925	47kΩ 1% 0.063W 0603	3A52	3198 031 04730	47Ω 5% 0402
3375	4822 051 30008	Jumper 0603	3781	4822 117 12925	47kΩ 1% 0.063W 0603	3A53	3198 031 04730	47Ω 5% 0402
3376	4822 051 30101	100Ω 5% 0.062W	3782	4822 117 12925	47kΩ 1% 0.063W 0603	3A55	3198 031 04720	4.7kΩ 5% 0402
3377	4822 051 30101	100Ω 5% 0.062W	3783	4822 117 12925	47kΩ 1% 0.063W 0603	3A56	3198 031 04720	4.7kΩ 5% 0402
3378	4822 051 30153	15kΩ 5% 0.062W	3792	4822 051 30102	1kΩ 5% 0.062W	3A66	4822 117 11297	100kΩ 5% 0.1W
3379	4822 051 30008	Jumper 0603	3793	4822 051 30222	2.2kΩ 5% 0.062W	3C00	4822 051 30222	2.2kΩ 5% 0.062W
3380	4822 051 30101	100Ω 5% 0.062W	3794	4822 051 30109	10Ω 5% 0.062W	3C01	4822 051 30109	10Ω 5% 0.062W
3381	4822 051 30008	Jumper 0603	3795	4822 051 30109	10Ω 5% 0.062W	3C03	4822 051 30103	10kΩ 5% 0.062W
3382	3198 031 05610	560Ω 5% 0.01W 0402	3796	4822 051 30101	100Ω 5% 0.062W	3C04	4822 051 30103	10kΩ 5% 0.062W
3385	4822 051 30471	470Ω 5% 0.062W	3797	4822 051 30101	100Ω 5% 0.062W	3C05	4822 051 30471	470Ω 5% 0.062W
3393	4822 117 13632	100kΩ 1% 0.62W 0603	3798	4822 051 30472	4.7kΩ 5% 0.062W	3C08	4822 051 30103	10kΩ 5% 0.062W
3400▲	4822 117 11152	4.7Ω 5% 0.062W	3800	5322 117 13058	150Ω 1% 0.063W 0603	3C10	4822 051 30101	100Ω 5% 0.062W
3402▲	2322 750 63908	3.9Ω 5% 1206 fusible	3802	5322 117 13058	150Ω 1% 0.063W 0603	3C11	4822 051 30101	100Ω 5% 0.062W
3403	4822 051 30101	100Ω 5% 0.062W	3803	5322 117 13058	150Ω 1% 0.063W 0603	3D40	4822 117 10361	680Ω 5% 0.1W
3404	4822 051 30561	560Ω 5% 0.062W	3804	4822 051 30102	1kΩ 5% 0.062W	3D41	4822 117 13606	10kΩ 5% 0.01W 0402
3405	4822 051 30102	1kΩ 5% 0.062W	3811	4822 051 30759	75Ω 5% 0.062W	3D44	4822 117 13606	10kΩ 5% 0.01W 0402
3406	2322 702 60279	27Ω 5% 0.1W 0603	3812	4822 051 30759	75Ω 5% 0.062W	3D45	4822 051 30101	100Ω 5% 0.062W
3408	4822 051 30101	100Ω 5% 0.062W	3814	4822 051 30759	75Ω 5% 0.062W	3D46	4822 051 30102	1kΩ 5% 0.062W
3411	3198 031 02720	2.7kΩ 5% 0.01W 0402	3815	4822 051 30759	75Ω 5% 0.062W	3D47	4822 051 30101	100Ω 5% 0.062W
3412▲	4822 117 11152	4.7Ω 5% 0.062W	3817	4822 051 30759	75Ω 5% 0.062W	3D48	4822 051 30102	1kΩ 5% 0.062W
3414	4822 051 30472	4.7kΩ 5% 0.062W	3818	4822 051 30759	75Ω 5% 0.062W	3D49	4822 051 30759	75Ω 5% 0.062W
3415	4822 051 30222	2.2kΩ 5% 0.062W	3819	4822 051 30759	75Ω 5% 0.062W	3D50	4822 051 30759	75Ω 5% 0.062W
3418	4822 051 30391	390Ω 5% 0.062W	3820	4822 051 30759	75Ω 5% 0.062W	3D51	2322 704 62002	2kΩ 1% 0603
3419	2120 108 91909	39Ω 5% 0603	3821	4822 051 30759	75Ω 5% 0.062W	3D52	2322 704 61002	1kΩ 1% 0603
3435	4822 051 30472	4.7kΩ 5% 0.062W	3822	4822 051 30759	75Ω 5% 0.062W	3D53	4822 117 13548	1kΩ 5% 0402
3436	4822 051 30181	180Ω 5% 0.062W	3823	4822 051 30759	75Ω 5% 0.062W	3D54	4822 117 13601	22kΩ 5% 0402
3437	4822 051 30471	470Ω 5% 0.062W	3824	4822 051 30759	75Ω 5% 0.062W	3D55	2322 704 61002	1kΩ 1% 0603
3439	4822 051 30391	390Ω 5% 0.062W	3825	5322 117 13058	150Ω 1% 0.063W 0603	3D56	2322 704 65102	5.1kΩ 1% 0603
3441	4822 051 30562	5.6kΩ 5% 0.063W 0603	3826	5322 117 13058	150Ω 1% 0.063W 0603	3D57	5322 117 13047	330Ω 1% 0.063W 0603
3445	4822 051 30121	120Ω 5% 0.062W	3827	5322 117 13058	150Ω 1% 0.063W 0603	3D58	4822 117 13548	1kΩ 5% 0402
3463	4822 051 30472	4.7kΩ 5% 0.062W	3828	4822 051 30339	33Ω 5% 0.062W	3D60	5322 117 13036	1.2kΩ 1% 0.063W 0603
3468	4822 117 13632	100kΩ 1% 0.62W 0603	3829	4822 117 12971	15Ω 5% 0.62W 0603	3D61	5322 117 13048	3.3kΩ 1% 0.063W 0603
3473	4822 051 30102	1kΩ 5% 0.062W	3831	4822 117 13545	100Ω 1% 0402	3D62	4822 051 30103	10kΩ 5% 0.062W
3474	4822 051 30109	10Ω 5% 0.062W	3832	4822 117 13545	100Ω 1% 0402	3D63	2322 704 62202	2.2kΩ 1% 0603
3475▲	5322 117 11726	10Ω 5%	3833	4822 117 13545	100Ω 1% 0402	3D64	4822 117 13548	1kΩ 5% 0402
3476	4822 051 30561	560Ω 5% 0.062W	3834	4822 117 13545	100Ω 1% 0402	3D65	4822 117 13548	1kΩ 5% 0402
3700	4822 051 30472	4.7kΩ 5% 0.062W	3836	4822 117 13545	100Ω 1% 0402	3D66	4822 117 13601	22kΩ 5% 0402
3701	4822 051 30472	4.7kΩ 5% 0.062W	3837	4822 117 13545	100Ω 1% 0402	3D67	5322 117 13036	1.2kΩ 1% 0.063W 0603
3702	4822 051 30472	4.7kΩ 5% 0.062W	3838	4822 117 13545	100Ω 1% 0402	3D68	5322 117 13048	3.3kΩ 1% 0.063W 0603
3703	3198 031 01090	10Ω 5% 0.01W 0402	3839	4822 117 13545	100Ω 1% 0402	3D69	4822 117 13548	1kΩ 5% 0402
3704	3198 031 01090	10Ω 5% 0.01W 0402	3840	4822 117 13545	100Ω 1% 0402	3D70	5322 117 13048	3.3kΩ 1% 0.063W 0603
3705	3198 031 01090	10Ω 5% 0.01W 0402	3841	4822 117 13545	100Ω 1% 0402	3D71	4822 117 13548	1kΩ 5% 0402
3706	3198 031 01090	10Ω 5% 0.01W 0402	3842	4822 117 13545	100Ω 1% 0402	3D72	4822 117 13601	22kΩ 5% 0402
3707	3198 031 01090	10Ω 5% 0.01W 0402	3843	4822 117 13545	100Ω 1% 0402	3D73▲	4822 117 11748	2.2Ω 5% 1206
3708	3198 031 01090	10Ω 5% 0.01W 0402	3844	4822 117 13545	100Ω 1% 0402	3D79	2322 704 62202	2.2kΩ 1% 0603
3709	4822 051 30101	100Ω 5% 0.062W	3845	4822 117 13545	100Ω 1% 0402	3D80	4822 117 13545	100Ω 1% 0402
3710	4822 051 30101	100Ω 5% 0.062W	3846	4822 051 30109	10Ω 5% 0.062W	3D81	4822 117 10361	680Ω 5% 0.1W
3711	4822 117 12925	47kΩ 1% 0.063W 0603	3847	4822 051 30109	10Ω 5% 0.062W	3D82	4822 117 13545	100Ω 1% 0402
3712	4822 117 12925	47kΩ 1% 0.063W 0603	3849	4822 051 30569	56Ω 5% 0.062W	3D83	2322 704 61002	1kΩ 1% 0603
3713	4822 051 30181	180Ω 5% 0.062W	3850	4822 117 13545	100Ω 1% 0402	3D84	4822 117 13545	100Ω 1% 0402
3714	4822 051 30181	180Ω 5% 0.062W	3851	4822 117 13545	100Ω 1% 0402	3D85	4822 051 30471	470Ω 5% 0.062W
3715	4822 051 30181	180Ω 5% 0.062W	3852	4822 117 13545	100Ω 1% 0402	3D86	4822 117 13545	100Ω 1% 0402
3716	4822 117 13632	100kΩ 1% 0.62W 0603	3853	4822 117 13545	100Ω 1% 0402	3D87	4822 117 13632	100kΩ 1% 0.62W 0603
3717	4822 117 13632	100kΩ 1% 0.62W 0603	3856	4822 051 30569	56Ω 5% 0.062W	3D88	5322 117 13036	1.2kΩ 1% 0.063W 0603
3718	4822 117 13632	100kΩ 1% 0.62W 0603	3A00	4822 117 13601	22kΩ 5% 0402	3D89	4822 051 30183	18kΩ 5% 0.062W
3719	4822 051 30332	3.3kΩ 5% 0.062W	3A01	4822 117 13606	10kΩ 5% 0.01W 0402	3D90	4822 117 12925	47kΩ 5% 0.063W 0603
3720	4822 051 30103	10kΩ 5% 0.062W	3A03▲	4822 117 13568	6.8Ω 5% 1206	3D92	4822 117 13606	10kΩ 5% 0.01W 0402
3721	4822 117 13545	100Ω 1% 0402	3A06	4822 117 13545	100Ω 1% 0402	3D93	3198 031 04720	4.7kΩ 5% 0402
3722	4822 051 30109	10Ω 5% 0.062W	3A09	4822 117 13601	22kΩ 5% 0402	3D95	3198 031 04720	4.7kΩ 5% 0402
3723	4822 051 30472	4.7kΩ 5% 0.062W	3A11	4822 117 11297	100kΩ 5% 0.1W	3D96	4822 117 13602	2.2kΩ 5% 0.01W 0402
3725	4822 051 30332	3.3kΩ 5% 0.062W	3A13	3198 031 04730	47Ω 5% 0402	3D97	4822 117 13545	100Ω 1% 0402
3726	4822 117 11817	1.2kΩ 1% 0.062W	3A14	3198 031 04730	47Ω 5% 0402	3D98	4822 117 13545	100Ω 1% 0402
3727	4822 051 30151	150Ω 5% 0.062W	3A15	4822 117 11297	100kΩ 5% 0.1W	3D99	4822 051 30759	75Ω 5% 0.062W
3728	4822 051 30151	150Ω 5% 0.062W	3A16	4822 117 13545	100Ω 1% 0402	3E04	4822 051 30479	47Ω 5% 0.062W
3729	4822 117 13545	100Ω 1% 0402	3A17	4822 117 13545	100Ω 1% 0402	3E05	3198 031 14710	4 x 470Ω 5% 1206
3730	3198 031 06810	680Ω 5% 0.01W 0402	3A19	4822 117 13545	100Ω 1% 0402	3E06	3198 031 14710	4 x 470Ω 5% 1206
3736	4822 051 30101	100Ω 5% 0.062W	3A20	4822 117 11297	100kΩ 5% 0.1W	3E07	2350 035 10152	4 x 1.5kΩ 5%
3737	4822 051 30102	1kΩ 5% 0.062W	3A22	4822 117 13632	100kΩ 1% 0.62W 0603	3E08▲	4822 117 11151	1Ω 5%
3738	4822 051 30102	1kΩ 5% 0.062W	3A23	4822 117 13603	33kΩ 5% 0402	3E11	2350 035 10152	4 x 1.5kΩ 5%
3739	3198 031 01530	15kΩ 5% 0.01W 0402	3A25	4822 051 30331	330Ω 5% 0.062W	3E12	2350 035 10152	4 x 1.5kΩ 5%
3740	4822 051 30102	1kΩ 5% 0.062W	3A26	4822 117 13603	33kΩ 5% 0402	3E14	4822 117 13545	100Ω 1% 0402
3741	4822 051 30223	22kΩ 5% 0.062W	3A27	3198 031 01530	15kΩ 5% 0.01W 0402	3E16	3198 031 03320	3.3kΩ 5% 0402
3743	4822 051 30153	15kΩ 5% 0.062W	3A28	3198 031 01530	15kΩ 5% 0.01W 0402	3E18	4822 117 13602	2.2kΩ 5% 0.01W 0402
3744	4822 051 30222	2.2kΩ 5% 0.062W	3A29	4822 051 30331	330Ω 5% 0.062W	3E19	4822 117 13548	1kΩ 5% 0402
3745	4822 051 30102	1kΩ 5% 0.062W	3A30	4822 117 12925	47kΩ 1% 0.063W 0603	3E20	4822 117 13545	100Ω 1% 0402
3746	5322 117 13042	3.9kΩ 1% 0.063W 0603	3A32	4822 117 13545	100Ω 1% 0402	3E21	4	

3E32	4822 117 13545	100Ω 1% 0402	3I98	4822 117 13606	10kΩ 5% 0.01W 0402	3L22	4822 117 13602	2.2kΩ 5% 0.01W 0402
3E33	4822 117 13545	100Ω 1% 0402	3IA2	4822 051 30101	100Ω 5% 0.062W	3L23	4822 051 30471	470Ω 5% 0.062W
3E34	4822 117 13545	100Ω 1% 0402	3IA3	4822 117 13601	22kΩ 5% 0402	3L24	2350 033 91002	4 x jumper ARV341
3E35	4822 117 13545	100Ω 1% 0402	3IA4	3198 031 08220	8.2kΩ 5% 0.5W	3L25	2350 033 91002	4 x jumper ARV341
3E36	4822 117 13545	100Ω 1% 0402	3IA5	3198 031 08220	8.2kΩ 5% 0.5W	3L26	2350 033 91002	4 x jumper ARV341
3E37	4822 117 13548	1kΩ 5% 0402	3IA6	3198 031 08220	8.2kΩ 5% 0.5W	3L27	2350 033 91002	4 x jumper ARV341
3E38	4822 117 13545	100Ω 1% 0402	3IA7	3198 031 08220	8.2kΩ 5% 0.5W	3L28	4822 117 13543	470Ω 5% 0402
3E39	4822 117 13545	100Ω 1% 0402	3IB1	4822 117 13606	10kΩ 5% 0.01W 0402	3L29	2350 033 91002	4 x jumper ARV341
3E40	4822 117 13545	100Ω 1% 0402	3IB2	4822 051 30101	100Ω 5% 0.062W	3L30	2350 033 91002	4 x jumper ARV341
3E41	3198 031 14710	4 x 470Ω 5% 1206	3IB3	4822 117 13606	10kΩ 5% 0.01W 0402	3L31	4822 051 20471	470Ω 5% 0.1W
3E42	3198 031 14710	4 x 470Ω 5% 1206	3IB4	4822 051 30223	22kΩ 5% 0.062W	3L32	4822 051 20471	470Ω 5% 0.1W
3E43	3198 031 14710	4 x 470Ω 5% 1206	3IB5	4822 051 30103	10kΩ 5% 0.062W	3P65	4822 117 13545	100Ω 1% 0402
3E44	3198 031 14710	4 x 470Ω 5% 1206	3IB6	4822 117 13545	100Ω 1% 0402	3P66	4822 117 13545	100Ω 1% 0402
3E45	4822 117 13597	330Ω 5% 0402 0.01W	3IB8	4822 117 13606	10kΩ 5% 0.01W 0402	3P67	3198 031 04720	4.7kΩ 5% 0402
3E49	4822 117 13602	2.2kΩ 5% 0.01W 0402	3IB9	4822 117 13545	100Ω 1% 0402	3P69	3198 031 04720	4.7kΩ 5% 0402
3E50	4822 117 13606	10kΩ 5% 0.01W 0402	3IC1▲	4822 117 13574	1.5Ω 5% 1206	3S01	4822 051 30008	Jumper 0603
3E51	4822 117 13606	10kΩ 5% 0.01W 0402	3IC2	4822 117 13601	22kΩ 5% 0402	3S02	4822 051 30223	22kΩ 5% 0.062W
3E52	4822 117 13606	10kΩ 5% 0.01W 0402	3IC3	4822 117 13601	22kΩ 5% 0402	3S03	4822 051 30223	22kΩ 5% 0.062W
3E53	4822 117 13606	10kΩ 5% 0.01W 0402	3IC4	4822 051 30101	10kΩ 5% 0.062W	3S04	3198 031 03320	3.3kΩ 5% 0402
3E55	4822 117 13606	10kΩ 5% 0.01W 0402	3IC6	4822 051 30101	100Ω 5% 0.062W	3S05	3198 031 05620	5.6 kΩ 5% 0.01W 0402
3E56	4822 117 13603	33kΩ 5% 0402	3ID0	3198 031 04720	4.7kΩ 5% 0402	3S06	4822 117 12925	47kΩ 1% 0.063W 0603
3E57	4822 117 11297	100kΩ 5% 0.1W	3ID1	4822 117 13545	100Ω 1% 0402	3S07	4822 051 30103	10kΩ 5% 0.062W
3E60	4822 117 13606	10kΩ 5% 0.01W 0402	3ID2▲	4822 117 11151	1Ω 5%	3S08	4822 051 30221	220Ω 5% 0.062W
3E62	4822 117 13548	1kΩ 5% 0402	3ID6	4822 051 30222	2.2kΩ 5% 0.062W	3S09	4822 117 13606	10kΩ 5% 0.01W 0402
3E63	4822 117 13606	10kΩ 5% 0.01W 0402	3ID7	4822 117 13545	100Ω 1% 0402	3S10	3198 031 01530	15kΩ 5% 0.01W 0402
3E69	3198 031 04720	4.7kΩ 5% 0402	3ID8	4822 117 13545	100Ω 1% 0402	3S11	4822 051 30101	100Ω 5% 0.062W
3E70	3198 031 04720	4.7kΩ 5% 0402	3IE0	4822 117 13606	10kΩ 5% 0.01W 0402	3U47	4822 051 30103	10kΩ 5% 0.062W
3E73	4822 117 13606	10kΩ 5% 0.01W 0402	3IE1	4822 117 11297	10kΩ 5% 0.1W	3U48	4822 051 30103	10kΩ 5% 0.062W
3E74	4822 117 13546	47Ω 5% 0402	3IE2	4822 051 30101	100Ω 5% 0.062W	3U49	4822 051 30102	1kΩ 5% 0.062W
3E75	4822 117 13548	1kΩ 5% 0402	3IE3	4822 051 30101	100Ω 5% 0.062W	3U50	4822 051 30474	470kΩ 5% 0.062W
3E77	4822 117 13546	47Ω 5% 0402	3IE7	4822 051 30759	75Ω 5% 0.062W	3U56	4822 051 30103	10kΩ 5% 0.062W
3E78	4822 117 13546	47Ω 5% 0402	3IE8	4822 051 30759	75Ω 5% 0.062W	3U57	4822 051 30222	2.2kΩ 5% 0.062W
3E79	4822 117 13546	47Ω 5% 0402	3IE9	4822 117 13601	22kΩ 5% 0402	3U58	4822 051 30392	3.9kΩ 5% 0.063W 0603
3E80	4822 117 13546	47Ω 5% 0402	3IEF0	4822 051 30759	75Ω 5% 0.062W	3U59	4822 117 12925	47kΩ 1% 0.063W 0603
3E88	4822 117 13546	47Ω 5% 0402	3IF1	4822 117 13543	470Ω 5% 0402	3V03	4822 117 13546	47Ω 5% 0402
3E89	4822 117 13546	47Ω 5% 0402	3IF2	3198 031 02720	2.7kΩ 5% 0.01W 0402	3V04	4822 117 13546	47Ω 5% 0402
3E91	3198 031 04730	47Ω 5% 0402	3IF3	4822 117 13606	10kΩ 5% 0.01W 0402	3V05	4822 117 13546	47Ω 5% 0402
3E92	3198 031 04730	47Ω 5% 0402	3IF4	4822 117 13543	470Ω 5% 0402	3V06	4822 117 13545	100Ω 1% 0402
3E93	3198 031 04730	47Ω 5% 0402	3IF5	4822 117 13601	22kΩ 5% 0402	3V07	3198 031 04720	4.7kΩ 5% 0402
3I00	4822 117 13606	10kΩ 5% 0.01W 0402	3IF6	4822 051 30101	100Ω 5% 0.062W	3V08	4822 117 13548	1kΩ 5% 0402
3I08	4822 117 13548	1kΩ 5% 0402	3IF7	4822 051 30101	100Ω 5% 0.062W	3V09	4822 117 13545	100Ω 1% 0402
3I28	4822 117 12925	47kΩ 1% 0.063W 0603	3IF8	4822 117 13602	2.2kΩ 5% 0.01W 0402	3V10	4822 117 13545	100Ω 1% 0402
3I29	3198 031 01830	18kΩ 5% 0.01W 0402	3IF9	3198 031 03320	3.3kΩ 5% 0402	3V11	4822 117 13545	100Ω 1% 0402
3I30	4822 117 13606	10kΩ 5% 0.01W 0402	3IH0	4822 117 13548	1kΩ 5% 0402	3V12	4822 117 13545	100Ω 1% 0402
3I31	4822 117 13545	100Ω 1% 0402	3IH1	4822 117 13545	100Ω 1% 0402	3V13	3198 031 04720	4.7kΩ 5% 0402
3I34	4822 117 13601	22kΩ 5% 0402	3IH8	3198 031 04730	47Ω 5% 0402	3V14	4822 117 13546	47Ω 5% 0402
3I35	4822 051 30101	100Ω 5% 0.062W	3IH9	3198 031 04730	47Ω 5% 0402	3V15	4822 117 13546	47Ω 5% 0402
3I36	4822 117 13601	22kΩ 5% 0402	3I10	4822 117 13606	10kΩ 5% 0.01W 0402	3V16	4822 117 13546	47Ω 5% 0402
3I37	4822 051 30101	100Ω 5% 0.062W	3I11	4822 117 13601	22kΩ 5% 0402	3V17	3198 031 04720	4.7kΩ 5% 0402
3I38	3198 031 08220	8.2kΩ 5% 0.5W	3I12	4822 117 13601	22kΩ 5% 0402	3Y02	4822 117 13545	100Ω 1% 0402
3I39	3198 031 02720	2.7kΩ 5% 0.01W 0402	3I13	3198 031 04730	47Ω 5% 0402	3Y03▲	4822 117 11151	1Ω 5%
3I40	4822 051 30759	75Ω 5% 0.062W	3I14	3198 031 04730	47Ω 5% 0402	9001	4822 051 30008	Jumper 0603
3I50	4822 051 30151	150Ω 5% 0.062W	3I1J0	4822 117 13545	100Ω 1% 0402	9002	4822 051 30008	Jumper 0603
3I51	4822 051 30101	100Ω 5% 0.062W	3I1J1	4822 117 13545	100Ω 1% 0402	9010	4822 051 30008	Jumper 0603
3I52	4822 051 30151	150Ω 5% 0.062W	3I1J7	4822 117 13606	10kΩ 5% 0.01W 0402	9011	4822 051 30008	Jumper 0603
3I53	4822 051 30101	100Ω 5% 0.062W	3I1J8	4822 117 13606	10kΩ 5% 0.01W 0402	9012	4822 051 30008	Jumper 0603
3I54	4822 117 13545	100Ω 1% 0402	3I1K2	4822 117 13601	22kΩ 5% 0402	9013	4822 051 30008	Jumper 0603
3I55	4822 051 30759	75Ω 5% 0.062W	3I1K3	4822 117 13601	22kΩ 5% 0402	9016	4822 051 30008	Jumper 0603
3I56	4822 117 13545	100Ω 1% 0402	3I1K7▲	4822 117 11152	4.7Ω 5% 0.062W	9019	4822 051 30008	Jumper 0603
3I57	4822 051 30759	75Ω 5% 0.062W	3IN5	4822 117 13601	22kΩ 5% 0402	9020	4822 051 30008	Jumper 0603
3I58	4822 117 13545	100Ω 1% 0402	3IN6	4822 117 13601	22kΩ 5% 0402	9318	4822 051 30008	Jumper 0603
3I59	4822 051 30759	75Ω 5% 0.062W	3IN7	4822 117 10361	680Ω 1% 0.1W	9322	4822 051 30101	100Ω 5% 0.062W
3I60	4822 051 30759	75Ω 5% 0.062W	3IP0	5322 117 13056	8.2kΩ 1% 0.063W 0603	9406	4822 051 30008	Jumper 0603
3I61	4822 051 30101	100Ω 5% 0.062W	3IP1	4822 117 11817	1.2kΩ 1% 0.062W	9410	4822 051 30008	Jumper 0603
3I62	4822 051 30101	100Ω 5% 0.062W	3IP2	4822 051 30221	220Ω 5% 0.062W	9413	4822 051 30008	Jumper 0603
3I63	3198 031 03920	3.9kΩ 5% 0402	3IP3	4822 051 30151	150Ω 5% 0.062W	9416	4822 051 30008	Jumper 0603
3I64	3198 031 08220	8.2kΩ 5% 0.5W	3IP4	4822 051 30221	220Ω 5% 0.062W	9417	4822 051 30008	Jumper 0603
3I65	4822 051 30101	100Ω 5% 0.062W	3IP5▲	4822 117 11748	2.2Ω 5% 1206	9418	4822 051 30008	Jumper 0603
3I66	4822 051 30759	75Ω 5% 0.062W	3IP6	4822 051 30102	1kΩ 5% 0.062W	9419	4822 051 30008	Jumper 0603
3I67	4822 051 30759	75Ω 5% 0.062W	3IP7	4822 051 30272	2.7kΩ 5% 0.062W	9420	4822 051 30008	Jumper 0603
3I68	4822 117 13545	100Ω 1% 0402	3IP8	4822 051 30103	10kΩ 5% 0.062W	9702	4822 051 30008	Jumper 0603
3I69	4822 051 30151	150Ω 5% 0.062W	3IQ0	4822 051 30109	10Ω 5% 0.062W	9703	4822 051 30008	Jumper 0603
3I70	4822 051 30101	100Ω 5% 0.062W	3IQ4	4822 117 10361	680Ω 1% 0.1W	9708	4822 051 30008	Jumper 0603
3I71	4822 051 30151	150Ω 5% 0.062W	3IQ5	4822 117 13545	100Ω 1% 0402	9712	4822 051 30008	Jumper 0603
3I72	4822 051 30101	100Ω 5% 0.062W	3IQ6	4822 051 30759	75Ω 5% 0.062W	9714	4822 051 30008	Jumper 0603
3I73	4822 117 13605	Jumper 0402	3IS0	4822 117 12521	68Ω 1% 0.1W	9716	4822 051 30008	Jumper 0603
3I74	4822 051 30151	150Ω 5% 0.062W	3IS1	4822 117 12521	68Ω 1% 0.1W	9717	4822 051 30008	Jumper 0603
3I75	4822 117 13545	100Ω 1% 0402	3IS2	4822 051 30101	100Ω 5% 0.062W	9721	4822 051 30008	Jumper 0603
3I76	4822 117 13545	100Ω 1% 0402	3IS3	4822 051 30101	100Ω 5% 0.062W	9723	4822 051 30008	Jumper 0603
3I77	4822 051 30759	75Ω 5% 0.062W	3IS4	4822 051 30101	100Ω 5% 0.062W	9725	4822 051 30008	Jumper 0603
3I78	4822 051 30759	75Ω 5% 0.062W	3IT0	4822 117 12925	47kΩ 1% 0.063W 0603	9727	4822 051 30008	Jumper 0603
3I79	4822 051 30101	100Ω 5% 0.062W	3IT1	4822 117 12925	47kΩ 1% 0.063W 0603	9728	4822 051 30008	Jumper 0603
3I80	4822 051 30101	100Ω 5% 0.062W	3IT5	4822 117 12521	68Ω 1% 0.1W	9729	4822 051 30008	Jumper 0603
3I81	3198 031 08220	8.2kΩ 5% 0.5W	3IT6	4822 117 12521	68Ω 1% 0.1W	9744	4822 051 30008	Jumper 0603
3I82	3198 031 03920	3.9kΩ 5% 0402	3IT8	4822 051 30103	10kΩ 5% 0.062W	9747	4822 051 30008	Jumper 0603
3I83	4822 117 13545	100Ω 1% 0402	3L03	4822 117 13545	100Ω 1% 0402	9760	4822 051 30008	Jumper 0603
3I84	4822 051 30759	75Ω 5% 0.062W	3L04	4822 117 13545	100Ω 1% 0402	9761	4822 051 30008	Jumper 0603
3I								

9A01	4822 117 13605	Jumper 0402
9A04	4822 117 13605	Jumper 0402
9A05	4822 117 13605	Jumper 0402
9A06	4822 117 13605	Jumper 0402
9A09	4822 051 20008	Jumper 0805
9C02	4822 051 30008	Jumper 0603
9D55	4822 051 30008	Jumper 0603
9E54	4822 117 13605	Jumper 0402
9I00	4822 117 13605	Jumper 0402
9I02	4822 117 13605	Jumper 0402
9I13	4822 051 30008	Jumper 0603
9I32	4822 117 13605	Jumper 0402
9I33	4822 117 13605	Jumper 0402
9I34	4822 117 13605	Jumper 0402
9I35	4822 117 13605	Jumper 0402
9I36	4822 117 13605	Jumper 0402
9I37	4822 117 13605	Jumper 0402
9I39	4822 117 13605	Jumper 0402
9I41	4822 117 13605	Jumper 0402
9I48	4822 117 13605	Jumper 0402
9I49	4822 117 13605	Jumper 0402
9I77	4822 117 13605	Jumper 0402
9I79	4822 117 13605	Jumper 0402
9I81	4822 117 13605	Jumper 0402
9I82	4822 117 13605	Jumper 0402
9I88	4822 117 13605	Jumper 0402
9I89	4822 117 13605	Jumper 0402
9IB5	4822 117 13605	Jumper 0402
9IB9	4822 117 13605	Jumper 0402
9IC1	4822 117 13605	Jumper 0402
9IC2	4822 117 13605	Jumper 0402
9IC3	4822 117 13605	Jumper 0402
9ID1	4822 051 30008	Jumper 0603
9ID2	4822 051 30008	Jumper 0603
9ID3	4822 051 30008	Jumper 0603
9ID4	4822 051 30008	Jumper 0603
9IS0	4822 117 13545	100Ω 1% 0402
9IS2	4822 117 13605	Jumper 0402
9IS3	4822 117 13605	Jumper 0402
9L04	4822 051 30008	Jumper 0603
9P69	4822 117 13605	Jumper 0402
9P70	4822 117 13605	Jumper 0402
9P71	4822 117 13605	Jumper 0402
9S01	4822 051 30008	Jumper 0603
9S02	4822 051 30008	Jumper 0603
9S03	4822 051 30008	Jumper 0603
9S04	4822 051 30008	Jumper 0603
9S05	4822 051 30008	Jumper 0603
9S06	4822 051 30008	Jumper 0603
9S07	4822 051 30008	Jumper 0603
9S08	4822 051 30008	Jumper 0603
9S09	4822 051 30008	Jumper 0603
9S11	4822 051 30008	Jumper 0603
9S13	4822 051 30008	Jumper 0603
9S14	4822 051 30008	Jumper 0603
9S15	4822 051 30008	Jumper 0603
9S16	4822 051 30008	Jumper 0603
9S17	4822 051 30008	Jumper 0603
9S30	4822 051 30008	Jumper 0603
9S31	4822 051 30008	Jumper 0603
9S32	4822 051 30008	Jumper 0603
9S33	4822 051 30008	Jumper 0603
9S34	4822 051 30008	Jumper 0603
9S35	4822 051 30008	Jumper 0603
9S36	4822 051 30008	Jumper 0603
9S37	4822 051 30008	Jumper 0603
9S38	4822 051 30008	Jumper 0603
9S65	4822 051 30008	Jumper 0603
9T01	4822 051 30223	22kΩ 5% 0.062W
9T04	4822 051 30008	Jumper 0603
9T07	4822 051 30008	Jumper 0603
9T08	4822 051 30008	Jumper 0603
9T11	4822 051 30008	Jumper 0603
9T12	4822 051 30008	Jumper 0603
9T13	4822 051 30008	Jumper 0603
9T14	4822 051 20008	Jumper 0805
9T15	4822 051 30008	Jumper 0603
9U99	2038 035 13207	1000μF 20% 16V
9Y01	4822 117 13605	Jumper 0402
9Y03	4822 117 13605	Jumper 0402



5401	3198 018 56880	6.8μH 10% 0603
5403	2422 549 44461	Trimmer 40MHz 5CCE
5404	2422 535 95427	Bead 120Ω at 100MHz
5405	2422 535 95427	Bead 120Ω at 100MHz
5406	3198 018 52280	2.2μH 10% 0603
5408	2422 549 44983	Trimmer 78MHz 5CCB
5411	3198 018 32770	0.27μH 10% 0805
5415	4822 157 11716	Bead 30Ω at 100MHz
5416	4822 157 11716	Bead 30Ω at 100MHz
5700	4822 157 11716	Bead 30Ω at 100MHz

5701	4822 157 11716	Bead 30Ω at 100MHz
5702	4822 157 11716	Bead 30Ω at 100MHz
5703	4822 157 71206	Bead 600Ω at 100MHz
5706	4822 157 11716	Bead 30Ω at 100MHz
5707	4822 157 11716	Bead 30Ω at 100MHz
5710	4822 157 11716	Bead 30Ω at 100MHz
5711	4822 157 11716	Bead 30Ω at 100MHz
5712	4822 156 21729	Bead 1kΩ at 100MHz
5713	4822 157 11716	Bead 30Ω at 100MHz
5714	4822 157 71206	Bead 600Ω at 100MHz
5715	4822 157 11716	Bead 30Ω at 100MHz
5716	4822 156 21729	Bead 1kΩ at 100MHz
5717	4822 156 21729	Bead 1kΩ at 100MHz
5718	4822 157 11716	Bead 30Ω at 100MHz
5719	4822 156 21729	Bead 1kΩ at 100MHz
5720	4822 157 11876	6.8μH 10% 0805
5721	4822 157 11716	Bead 30Ω at 100MHz
5722	4822 157 11716	Bead 30Ω at 100MHz
5724	4822 156 21729	Bead 1kΩ at 100MHz
5725	4822 157 11716	Bead 30Ω at 100MHz
5726	4822 156 21729	Bead 1kΩ at 100MHz
5727	4822 156 21729	Bead 1kΩ at 100MHz
5728	4822 157 11716	Bead 30Ω at 100MHz
5729	4822 157 11716	Bead 30Ω at 100MHz
5731	4822 156 21729	Bead 1kΩ at 100MHz
5736	4822 157 11876	6.8μH 10% 0805
5737	4822 156 21729	Bead 1kΩ at 100MHz
5742	4822 157 11716	Bead 30Ω at 100MHz
5743	4822 157 11716	Bead 30Ω at 100MHz
5744	4822 157 11716	Bead 30Ω at 100MHz
5746	4822 157 11716	Bead 30Ω at 100MHz
5747	4822 157 11716	Bead 30Ω at 100MHz
5748	4822 157 11716	Bead 30Ω at 100MHz
5750	4822 157 11716	Bead 30Ω at 100MHz
5751	4822 157 11716	Bead 30Ω at 100MHz
5752	4822 157 11716	Bead 30Ω at 100MHz
5753	4822 157 11716	Bead 30Ω at 100MHz
5754	4822 157 11716	Bead 30Ω at 100MHz
5755	4822 157 11716	Bead 30Ω at 100MHz
5756	4822 157 11716	Bead 30Ω at 100MHz
5757	4822 157 11716	Bead 30Ω at 100MHz
5A00	4822 157 11716	Bead 30Ω at 100MHz
5A01	4822 157 11716	Bead 30Ω at 100MHz
5A03	4822 157 11716	Bead 30Ω at 100MHz
5A06	4822 157 11716	Bead 30Ω at 100MHz
5A17	4822 051 30151	150Ω 5% 0.062W
5A18	4822 051 30151	150Ω 5% 0.062W
5A19	4822 157 11828	22μH 20% 0805
5A20	4822 157 11716	Bead 30Ω at 100MHz
5A21	4822 157 11716	Bead 30Ω at 100MHz
5D51	4822 157 11716	Bead 30Ω at 100MHz
5D52	4822 157 11716	Bead 30Ω at 100MHz
5D54	4822 157 11716	Bead 30Ω at 100MHz
5D56	4822 156 21729	Bead 1kΩ at 100MHz
5D57	4822 157 11716	Bead 30Ω at 100MHz
5D58	4822 157 11716	Bead 30Ω at 100MHz
5D59	4822 157 11716	Bead 30Ω at 100MHz
5E00	2422 549 42896	Bead 120Ω at 100MHz
5E01	2422 549 42896	Bead 120Ω at 100MHz
5E02	2422 549 42896	Bead 120Ω at 100MHz
5E03	2422 549 42896	Bead 120Ω at 100MHz
5E04	2422 549 42896	Bead 120Ω at 100MHz
5E05	2422 549 42896	Bead 120Ω at 100MHz
5E08	4822 157 11716	Bead 30Ω at 100MHz
5E50	2422 549 43062	Bead 600Ω at 100MHz
5E51	2422 549 43062	Bead 600Ω at 100MHz
5E53	2422 535 94134	10μH 20% 0805
5E57	2422 549 43062	Bead 600Ω at 100MHz
5E58	2422 549 43062	Bead 600Ω at 100MHz
5I02	2422 549 43769	Bead 30Ω at 100MHz
5I03	2422 549 43062	Bead 600Ω at 100MHz
5I04	2422 549 43062	Bead 600Ω at 100MHz
5I05	4822 157 11716	Bead 30Ω at 100MHz
5I06	4822 157 11716	Bead 30Ω at 100MHz
5I07	2422 549 43769	Bead 30Ω at 100MHz
5I08	2422 549 43062	Bead 600Ω at 100MHz
5I09	4822 157 11716	Bead 30Ω at 100MHz
5I10	2422 536 00667	1000μF 20% 7032
5I11	2422 549 43062	Bead 600Ω at 100MHz
5I21	2422 549 43769	Bead 30Ω at 100MHz
5I22	2422 549 43769	Bead 30Ω at 100MHz
5I23	2422 549 43769	Bead 30Ω at 100MHz
5L02	3198 018 51080	1μH 10% 0603
5L04	3198 018 54770	0.47μF 10% 0603
5L06	3198 018 51080	1μH 10% 0603
5L07	4822 157 11716	Bead 30Ω at 100MHz
5L08	4822 157 11716	Bead 30Ω at 100MHz
5L09	4822 157 11716	Bead 30Ω at 100MHz
5L10	4822 157 11716	Bead 30Ω at 100MHz
5L11	4822 157 11716	Bead 30Ω at 100MHz
5L12	4822 157 11716	Bead 30Ω at 100MHz
5L13	4822 156 21729	Bead 1kΩ at 100MHz
5L14	4822 156 21729	Bead 1kΩ at 100MHz
5L15	4822 156 21729	Bead 1kΩ at 100MHz

5L16	4822 117 10353	150Ω 1% 0.1W
5L17	4822 117 10353	150Ω 1% 0.1W
5L18	4822 117 10353	150Ω 1% 0.1W
5L21	4822 117 10353	150Ω 1% 0.1W
5P51	4822 157 11716	Bead 30Ω at 100MHz
5S01	4822 157 11716	Bead 30Ω at 100MHz
5S02	4822 157 11716	Bead 30Ω at 100MHz
5S03	4822 157 11716	Bead 30Ω at 100MHz
5S04	4822 157 11716	Bead 30Ω at 100MHz
5S05	4822 157 11716	Bead 30Ω at 100MHz
5T02	2422 535 94134	10μH 20% 0805
5U05	2422 535 94134	10μH 20% 0805
5U06	2422 535 94134	10μH 20% 0805
5U07	4822 157 11716	Bead 30Ω at 100MHz
5U08	4822 157 11716	Bead 30Ω at 100MHz
5V06	3198 018 90050	Bead 1kΩ at 100MHz
5V07	3198 018 90050	Bead 1kΩ at 100MHz
5V08	3198 018 90050	Bead 1kΩ at 100MHz
5Y01	2422 549 45325	Bead 67Ω at 100MHz.
5Y02	2422 549 45325	Bead 67Ω at 100MHz.
5Y03	2422 549 45325	Bead 67Ω at 100MHz.
5Y04	2422 549 45325	Bead 67Ω at 100MHz.
5Y05	2422 549 45325	Bead 67Ω at 100MHz.



6000	4822 130 11416	PDZ6.8B
6001	4822 130 80622	BAT54
6002	4822 130 11397	BAS316
6003	4822 130 80622	BAT54
6004	4822 130 80622	BAT54
6005	4822 130 11422	PLVA2650A
6403	9340 552 30115	BA591
6830	4822 130 11397	BAS316
6831	4822 130 11397	BAS316
6832	4822 130 11397	BAS316
6833	4822 130 11397	BAS316
6834	4822 130 11397	BAS316
6835	4822 130 11397	BAS316
6836	4822 130 11397	BAS316
6837	4822 130 11397	BAS316
6838	4822 130 11397	BAS316
6839	4822 130 11397	BAS316
6840	4822 130 11397	BAS316
6841	4822 130 11397	BAS316
6842	4822 130 11397	BAS316
6843	4822 130 11397	BAS316
6844	4822 130 11397	BAS316
6845	4822 130 11397	BAS316
6846	4822 130 11397	BAS316
6847	4822 130 11397	BAS316
6A00	4822 130 11551	UDZ3.0B
6A01	4822 130 10838	UDZ3.3B
6A02	4822 130 11397	BAS316
6D53	9340 553 52115	BAS321
6D54	9340 553 52115	BAS321
6D55	9340 553 52115	BAS321
6D56	9340 553 52115	BAS321
6D57	4822 130 11423	PLVA2656A
6D58	4822 130 11423	PLVA2656A
6D59	4822 130 11423	PLVA2656A
6D60	4822 130 11423	PLVA2656A
6D61	4822 130 11423	PLVA2656A
6D62	4822 130 11564	UDZ3.9B
6D63	4822 130 11397	BAS316
6D64	4822 130 11397	BAS316
6E54	4822 130 11397	BAS316
6E55	4822 130 11397	BAS316
6I03	5322 130 34337	BAV99
6I04	5322 130 34337	BAV99
6I05	4822 130 11397	BAS316
6I07	5322 130 34337	BAV99
6I08	5322 130 34337	BAV99
6I10	4822 130 11416	PDZ6.8B
6I11	4822 130 11416	PDZ6.8B
6I12	4822 130 11416	PDZ6.8B
6I13	4822 130 11416	PDZ6.8B
6I14	9340 548 61115	PDZ12B
6I15	4822 130 11416	PDZ6.8B
6I22	4822 130 11416	PDZ6.8B
6I23	4822 130 11416	PDZ6.8B
6I24	4822 130 11416	PDZ6.8B
6I25	4822 130 11416	PDZ6.8B
6I26	4822 130 11416	PDZ6.8B
6I27	4822 130 11416	PDZ6.8B
6I28	4822 130 11416	PDZ6.8B
6I29	4822 130 11416	PDZ6.8B
6I30	4822 130 11416	PDZ6.8B
6I31	4822 130 11416	PDZ6.8B
6I32	4822 130 11416	PDZ6.8B
6I33	4822 130 11416	PDZ6.8B
6I34	4822 130 11416	PDZ6.8B
6I35	4822 130 11416	PDZ6.8B

6I36	4822 130 11416	PDZ6.8B
6I37	4822 130 11416	PDZ6.8B
6I38	4822 130 11416	PDZ6.8B
6I39	4822 130 11416	PDZ6.8B
6I40	4822 130 11416	PDZ6.8B
6I41	4822 130 11416	PDZ6.8B
6I42	4822 130 11416	PDZ6.8B
6I43	4822 130 11416	PDZ6.8B
6I44	4822 130 11416	PDZ6.8B
6I45	4822 130 11416	PDZ6.8B
6I46	4822 130 11416	PDZ6.8B
6I47	4822 130 11416	PDZ6.8B
6I48	4822 130 11416	PDZ6.8B
6I49	9340 548 61115	PDZ12B
6I50	4822 130 11416	PDZ6.8B
6I51	4822 130 11416	PDZ6.8B
6I52	4822 130 11416	PDZ6.8B
6I53	4822 130 11416	PDZ6.8B
6I54	4822 130 11416	PDZ6.8B
6I55	4822 130 11416	PDZ6.8B
6I56	4822 130 11416	PDZ6.8B
6I69	4822 130 11416	PDZ6.8B
6I70	4822 130 11416	PDZ6.8B
6I90	4822 130 11416	PDZ6.8B
6I91	4822 130 11416	PDZ6.8B
6I92	4822 130 11416	PDZ6.8B
6I93	4822 130 11416	PDZ6.8B
6I94	4822 130 11397	BAS316
6I95	4822 130 11397	BAS316
6I96	4822 130 11397	BAS316
6I97	4822 130 11397	BAS316
6I98	4822 130 11397	BAS316
6I99	4822 130 11397	BAS316
6IA0	9340 548 61115	PDZ12B
6IA6	4822 130 11397	BAS316
6IA7	4822 130 11397	BAS316
6TO1	4822 130 11397	BAS316
6TO3	4822 130 11397	BAS316
6T08	9340 548 71115	PDZ33B
6U16	4822 130 11522	UDZ15B
6V01	4822 130 11397	BAS316
6V02	4822 130 11397	BAS316
6V03	4822 130 11397	BAS316



7001	9352 684 81557	SAA5801H/015
7002	3198 010 42320	BC857BW
7003	3198 010 42310	BC847BW
7004	3198 010 42310	BC847BW
7005	9322 172 45668	LF33ABDT
7007	9322 157 20668	MSM51V18165F-60J
7008	3198 010 42310	BC847BW
7009	3198 010 42310	BC847BW
7010	3198 010 42320	BC857BW
7012	9322 156 72668	M29W400BT-90N1
7013	3198 010 42310	BC847BW
7014	3198 010 42320	BC857BW
7017	4822 130 10255	MUN2213
7018	9352 115 40118	74LVC245APW
7019	9352 115 40118	74LVC245APW
7020	3198 010 42310	BC847BW
7066	3104 317 45871	Software (check Prod.Surv)
7067	3104 317 45611	Software (check Prod.Surv)
7070	3104 317 45891	Software (check Prod.Surv)
7307	9352 630 99118	TDA9181T
7320	3198 010 42310	BC847BW
7322	3198 010 42310	BC847BW
7323	9352 625 24518	TDA9321H/N2
7402	3198 010 42310	BC847BW
7403	5322 130 60159	BC846B
7407	4822 130 60373	BC856B
7410	3198 010 42310	BC847BW
7411	5322 130 60159	BC846B
7414	3198 010 42310	BC847BW
7415	3198 010 42310	BC847BW
7706	9322 142 88668	LF25CDT
7707	5322 130 60159	BC846B
7708	5322 130 60159	BC846B
7709	5322 130 60159	BC846B
7710	5322 130 60159	BC846B
7711	2422 486 80938	Socket 32p f
7712	9351 870 00118	74HC573PW
7713	9352 688 09557	SAA4978H/V204
7714	9965 000 02179	MS81V04160-25TB
7715	4822 209 73852	PMBT2369
7717	9322 183 81668	MSM54V12222B-25JS
7718	9352 695 58557	SAA4993H/V1
7719	9322 183 81668	MSM54V12222B-25JS
7722	9965 000 02179	MS81V04160-25TB

7723	9965 000 02179	MS81V04160-25TB
7724	9322 188 08702	T8F24EF-0002 EAGLE
7725	4822 209 73852	PMBT2369
7727	9322 170 14668	LF15ABDT
7740	9352 687 20125	74LVC1G125GW
7741	9352 687 20125	74LVC1G125GW
7742	9352 115 40118	74LVC245APW
7743	9352 115 40118	74LVC245APW
7744	9352 115 40118	74LVC245APW
7745	9352 115 40118	74LVC245APW
7746	9322 190 24668	CY2302SC-1
7747	9352 687 21165	74LVC1G126GW
7748	9352 687 20125	74LVC1G125GW
7999	3104 317 45521	Software (check Prod.Surv.)

7A00	4822 209 30095	LM833D
7A01	3198 010 42310	BC847BW
7A02	9322 196 03702	MSP3411G-QI-B8V3
7A03	4822 209 30095	LM833D
7A07	9322 183 05668	TS482ID
7A08	4822 130 60373	BC856B
7A09	4822 130 60373	BC856B
7A10	9340 425 20115	BC847BS
7D51	4822 209 12776	TDA8601T/C1
7D52	4822 130 62755	BF570
7D53	4822 130 62755	BF570
7D54	4822 130 62755	BF570
7D55	4822 130 62755	BF570
7D57	9322 131 22668	TSH95D
7D59	9322 145 26668	M24C02-WMN6
7E02	9322 196 51668	EPCS1S18
7E05	9322 170 14668	LF15ABDT
7E08	3198 010 42320	BC857BW
7E09	9322 195 65668	AD9066JR
7E10	9352 686 35118	PCA9515DP
7E12	9340 425 20115	BC847BS
7E13	3198 010 42320	BC857BW
7E14	3198 010 42310	BC847BW
7E16	9322 195 65668	AD9066JR
7E17	3198 010 42320	BC857BW
7E18	9322 146 75685	TS431L
7E19	3198 010 42310	BC847BW
7E20	3198 010 42320	BC857BW
7E21	3198 010 42310	BC847BW
7E22	3198 010 42310	BC847BW
7E23	3198 010 42320	BC857BW
7E24	9322 146 75685	TS431L
7I01	9340 425 20115	BC847BS
7I02	9340 425 20115	BC847BS
7I05	3198 010 42320	BC857BW
7I07	4822 130 60142	BC869
7I09	3198 010 42310	BC847BW
7I10	9352 686 35118	PCA9515DP
7I11	4822 130 10255	MUN2213
7I12	4822 130 10255	MUN2213
7I13	4822 130 42804	BC817-25
7I14	3198 010 42310	BC847BW
7I15	3198 010 42310	BC847BW
7I16	9340 425 20115	BC847BS
7I17	9322 116 87668	TEA6422D
7I19	9352 686 35118	PCA9515DP
7I20	9351 869 40118	74HC4053PW
7I22	9340 425 20115	BC847BS
7I35	3198 010 42310	BC847BW
7I36	3198 010 42310	BC847BW
7I37	3198 010 42320	BC857BW
7I38	3198 010 42320	BC857BW
7I44	9340 425 20115	BC847BS
7L01	9322 181 72671	AD9883AKST-110
7L02	4822 209 17398	LD1117DT33
7L03	4822 209 73852	PMBT2369
7P56	4822 209 17345	M62320FP
7S03	9340 425 20115	BC847BS
7S04	3198 010 42310	BC847BW
7U14	3198 010 42310	BC847BW
7U15	3198 010 42320	BC857BW
7U16	9322 091 04668	SI4410DY
7V01	9322 196 44671	EP1C6Q240C8
7V02	9322 159 45668	DS90C385MTD

EMC Interface [EMC]

Various

0002	3122 358 76831	EMC foam filter panel
1320	2422 025 16545	Connector 10p m
1330	2422 025 16545	Connector 10p m
1345	2422 025 16835	Connector 3p m
1355	2422 025 16835	Connector 3p m



2300	5322 126 11583	10nF 10% 50V 0603
2301	5322 126 11583	10nF 10% 50V 0603
2302	3198 016 31020	1nF 10% 25V 0603
2303	5322 126 11583	10nF 10% 50V 0603
2304	5322 126 11583	10nF 10% 50V 0603
2305	5322 126 11583	10nF 10% 50V 0603
2306	5322 126 11583	10nF 10% 50V 0603
2307	5322 126 11583	10nF 10% 50V 0603
2308	5322 126 11583	10nF 10% 50V 0603



3300	4822 051 30101	100Ω 5% 0.062W
3301	4822 051 30101	100Ω 5% 0.062W
3302	4822 051 30101	100Ω 5% 0.062W
3303	4822 051 30101	100Ω 5% 0.062W
3304	4822 051 30101	100Ω 5% 0.062W
3305	4822 051 30101	100Ω 5% 0.062W
3306	4822 051 30101	100Ω 5% 0.062W
3307	4822 051 30101	100Ω 5% 0.062W



5300	2422 549 43062	Bead 600Ω at 100MHz
5301	2422 549 43062	Bead 600Ω at 100MHz
5302	2422 549 43062	Bead 600Ω at 100MHz
5303	2422 549 43062	Bead 600Ω at 100MHz
5304	2422 549 43062	Bead 600Ω at 100MHz
5305	2422 549 43062	Bead 600Ω at 100MHz
5306	2422 549 43062	Bead 600Ω at 100MHz
5307	2422 549 43062	Bead 600Ω at 100MHz
5308	2422 549 43062	Bead 600Ω at 100MHz
5309	2422 549 43062	Bead 600Ω at 100MHz
5310	2422 549 43062	Bead 600Ω at 100MHz
5311	2422 549 43062	Bead 600Ω at 100MHz
5312	2422 549 43062	Bead 600Ω at 100MHz
5313	2422 549 43062	Bead 600Ω at 100MHz

Led + Switch [LD]

Various

0320	2422 025 16545	Connector 10p m
1101	2422 128 02927	Switch push 2p



2107	4822 124 12095	100μF 20% 16V
2120	2020 024 90166	10μF 20% 35V
2126	4822 126 14583	470nF 10% 16V 0805



3101	4822 051 30151	150Ω 5% 0.062W
3102	4822 117 13632	100kΩ 1% 0.62W 0603
3103	4822 051 30561	560Ω 5% 0.062W
3104	4822 117 13632	100kΩ 1% 0.62W 0603
3105	4822 051 30102	1kΩ 5% 0.062W
3106	4822 051 30151	150Ω 5% 0.062W
3107	4822 051 30471	470Ω 5% 0.062W
3108	4822 051 30103	10kΩ 5% 0.062W
3109	4822 051 30101	100Ω 5% 0.062W
3120	4822 051 30472	4.7kΩ 5% 0.062W
3121	4822 051 30103	10kΩ 5% 0.062W
3122	4822 051 30332	3.3kΩ 5% 0.062W
3123	4822 051 30332	3.3kΩ 5% 0.062W
3124	4822 051 30102	1kΩ 5% 0.062W
3126▲	2322 702 60335	3.3MΩ 5% 0603
3127▲	2322 702 60335	3.3MΩ 5% 0603
4101	4822 051 30008	Jumper 0603
4107	4822 051 30008	Jumper 0603



5100	2422 549 43769	Bead 30Ω at 100MHz
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6101	4822 130 11564	UDZ3.9B
6103	4822 130 83915	TLMV3100
6105	4822 130 11564	UDZ3.9B
6127	9322 140 63685	TEMD5000



7103	3198 010 42320	BC857BW
7105	3198 010 42320	BC857BW
7107	9322 178 03667	TSOP2136YA1
7120	5322 209 82941	LM358D

Top Control Panel [P]

Various

0053	3104 308 10551	TC assy knob R LCD 30"
0055	3104 308 10561	TC assy knob L LCD 30"
0057	3104 304 25831	TC frame LCD 30"
0058	3104 308 10571	TC assy knob M LCD 30"
0345	4822 267 10459	Connector 3p
1701	2422 128 02778	Tact switch
1702	2422 128 02778	Tact switch
1703	2422 128 02778	Tact switch
1704	2422 128 02778	Tact switch
1705	2422 128 02778	Tact switch

—W—

3001	4822 051 20391	390Ω 5% 0.1W
3003	4822 117 13528	200Ω 1% 0.125W 0805
3005	4822 117 11951	2kΩ 1% 0.1W
3009	4822 117 11534	1.1kΩ 1% 0.1W
3011	4822 117 10845	620Ω 1% 0.1W
3999	4822 051 20471	470Ω 5% 0.1W
9001	4822 051 20008	Jumper 0805
9003	4822 051 20008	Jumper 0805
9005	4822 051 20008	Jumper 0805
9006	4822 051 20008	Jumper 0805

11. Revision List

First release