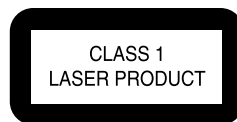


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# Service Manual



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# 1. Technical Specifications and Connection Facilities

## Specifications

### PLAYBACK SYSTEM

DVD Video  
 SACD multi channel and SACD stereo  
 Video CD & SVCD  
 CD (CD-Recordable and CD-Rewritable)  
 MP3 CD

### TV STANDARD (PAL/50Hz) (NTSC/60Hz)

Number of lines	625	525
Playback	Multistandard	(PAL/NTSC)

### VIDEO PERFORMANCE

RGB output	0.7Vpp into 75 ohm
YUV output	Y: 1Vpp into 75 ohm Pr/Cr Pb/Cb: 0.7Vpp into 75 ohm
S-Video output	Y: 1Vpp into 75 ohm C: 0.3Vpp into 75 ohm
Video output	1 Vpp into 75 ohm
Black Level Shift	On/Off
Video Shift	Left/Right

### AUDIO FORMAT

DSD	Multichannel and Stereo
MPEG/	Compressed Digital
Dolby Digital	16, 20, 24 bits
DTS/PCM	fs, 44.1, 48, 96 kHz
MP3	96, 112, 128, 256 kbps and
(ISO 9660)	variable bit rate fs 32, 44.1, 48kHz
Full decoding of Dolby Digital and DTS multi channel sound	
Analogue Stereo Sound	
Dolby Surround-compatible downmix from Dolby Digital multi-channel sound	
3D Sound for virtual 5.1 channel sound on 2 speakers	

### SACD AUDIO PERFORMANCE

D/A Converter	DSD
SACD	fs 2.8224MHz DC - 100kHz
Max. output voltage (0dB)	2V rms
Channel unbalance	<0.5 dB
Cut-off frequency	50kHz (Front) 40kHz (Surround, Centre, Subwoofer)
Signal-Noise (1kHz)	-125 dB
Dynamic Range (1kHz)	-105 dB
Crosstalk (1kHz)	-120 dB
Total Harmonic Distortion (1kHz)	-100 dB

### AUDIO PERFORMANCE (Without upsampling)

DA Converter	24 bits
DVD	fs 96 kHz 4 Hz - 44 kHz
CD/Video CD	fs 44.1 kHz 4 Hz - 20 kHz
S-Video CD	fs 48 kHz 4 Hz - 22 kHz
	fs 44.1 kHz 4 Hz - 20 kHz
Signal-Noise (1kHz)	< -120 dB
Dynamic Range (1kHz)	< -95 dB
Crosstalk (1kHz)	< -110 dB
Total Harmonic Distortion (1kHz)	< -95 dB
MPEG MP3	MPEG Audio L3

### CONNECTIONS

SCART	2x Euroconnector
Y Pb/Cb Pr/Cr (480i/p)	Cinch 3x (green, blue, red)
S-Video Output	Mini DIN, 4 pins
Video Output	Cinch (yellow) 2x
Audio L+R output	Cinch (white/red)
Digital Output	1 coaxial, 1 optical IEC958 for CDDA / LPCM IEC1937 for MPEG1/2, Dolby Digital, DTS

### 6 channel analogue output

Audio Front L/R	Cinch (white/red)
Audio Surround L/R	Cinch (white/red)
Audio Centre	Cinch (blue)
Audio Subwoofer	Cinch (black)

### CABINET

Dimensions (w x h x d)	435 x 101 x 315 mm
Weight	Approximately 4.6 Kg

### POWER SUPPLY

Power inlet	110-240V, 50/60Hz
Power usage	Approx. 30W
Power usage standby	< 1W

\* typical playing time for movie with 2 spoken languages and 3 subtitle languages

**Specifications subject to change without prior notice**


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## 2. Safety Instructions, Warnings and Notes

### 2.1 Safety Instructions

#### 2.1.1 General Safety

Safety regulations require that during a repair:

- Connect the unit to the mains via an isolation transformer.
- 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, you must return the unit in its original condition. Pay, in particular, attention to the following points:

- Route the wires/cables correctly, and fix them with the mounted cable clamps.
- Check the insulation of the mains lead for external damage.
- Check the electrical DC resistance between the mains plug and the secondary side:
  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 mains plug and the front panel, controls, and chassis bottom.
  4. Repair or correct unit when the resistance measurement is less than 1 MΩ.
  5. Verify this, before you return the unit to the customer/user (ref. UL-standard no. 1492).
  6. Switch the unit 'off', and remove the wire between the two pins of the mains plug.

#### 2.1.2 Laser Safety

This unit employs a laser. Only qualified service personnel may remove the cover, or attempt to service this device (due to possible eye injury).

##### Laser Device Unit

Type	: Semiconductor laser GaAlAs
Wavelength	: 650 nm (DVD) 780 nm (VCD/CD)
Output Power	: 20 mW (DVD+RW writing) 0.8 mW (DVD reading) 0.3 mW (VCD/CD reading)
Beam divergence	: 60 degree

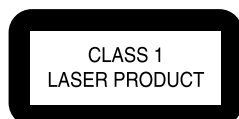



Figure 2-1 Class 1 Laser Product

**Note:** Use of controls or adjustments or performance of procedure other than those specified herein, may result in hazardous radiation exposure. Avoid direct exposure to beam.

### 2.2 Warnings

#### 2.2.1 General

- All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD, symbol ). Careless handling during repair can reduce life drastically. Make sure that, during repair, you are at the same potential as the mass of the set by a wristband with resistance. Keep components and tools 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 live voltage section. The primary side of the power supply (pos. 1005), including the heatsink, carries live mains voltage when you connect the player to the mains (even when the player is 'off!'). It is possible to touch copper tracks and/or components in this unshielded primary area, when you service the player. Service personnel must take precautions to prevent touching this area or components in this area. A 'lightning stroke' and a stripe-marked printing on the printed wiring board, indicate the primary side of the power supply.
- Never replace modules, or components, while the unit is 'on'.

#### 2.2.2 Laser

- The use of optical instruments with this product, will increase eye hazard.
- Only qualified service personnel may remove the cover or attempt to service this device, due to possible eye injury.
- Repair handling should take place as much as possible with a disc loaded inside the player.
- Text below is placed inside the unit, on the laser cover shield:

CAUTION VISIBLE AND INVISIBLE LASER RADIATION WHEN OPEN AVOID EXPOSURE TO BEAM  
 ADVARSEL SYNLIG OG USYNLIG LASERSTRÅLING VED ÅBNING UNDGÅ UDSÆTTELSE FOR STRÅLING  
 ADVARSEL SYNLIG OG OSYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES UNNGÅ EKSPONERING FOR STRÅLEN  
 VARNING SYNLIG OCH OSYNLIG LASERSTRÅLING NÅR DENNA DEL ÅR ÖPPNAD BETRÄKTA EJ STRÅLEN  
 VARO! AVATT AESSA OLET ALTTIINA NÄKYVÄLLE JA NÄKYMÄTT ÖMÄLLE LASER SÄTELYLLE. ÄLÄ KATSO SÄTEESEEN  
 VORSICHT SICHTBARE UND UNSICHTBARE LASERSTRAHLUNG WENN ABDECKUNG GEÖFFNET NICHT DEM STRAHL AUSSETZEN  
 DANGER VISIBLE AND INVISIBLE LASER RADIATION WHEN OPEN AVOID DIRECT EXPOSURE TO BEAM  
 ATTENTION RAYONNEMENT LASER VISIBLE ET INVISIBLE EN CAS D'OUVERTURE EXPOSITION DANGEREUSE AU FAISCEAU

Figure 2-2 Warning text

#### 2.2.3 Notes

##### Dolby

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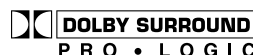


Figure 2-3

##### Trusurround

TRUSURROUND, SRS and symbol (fig 2-4) are trademarks of SRS Labs, Inc. TRUSURROUND technology is manufactured under licence from SRS Labs, Inc.



Figure 2-4

# 4. Mechanical-, Dismantling Instructions, and Service Hints

## 4.1 Dismantling Instructions

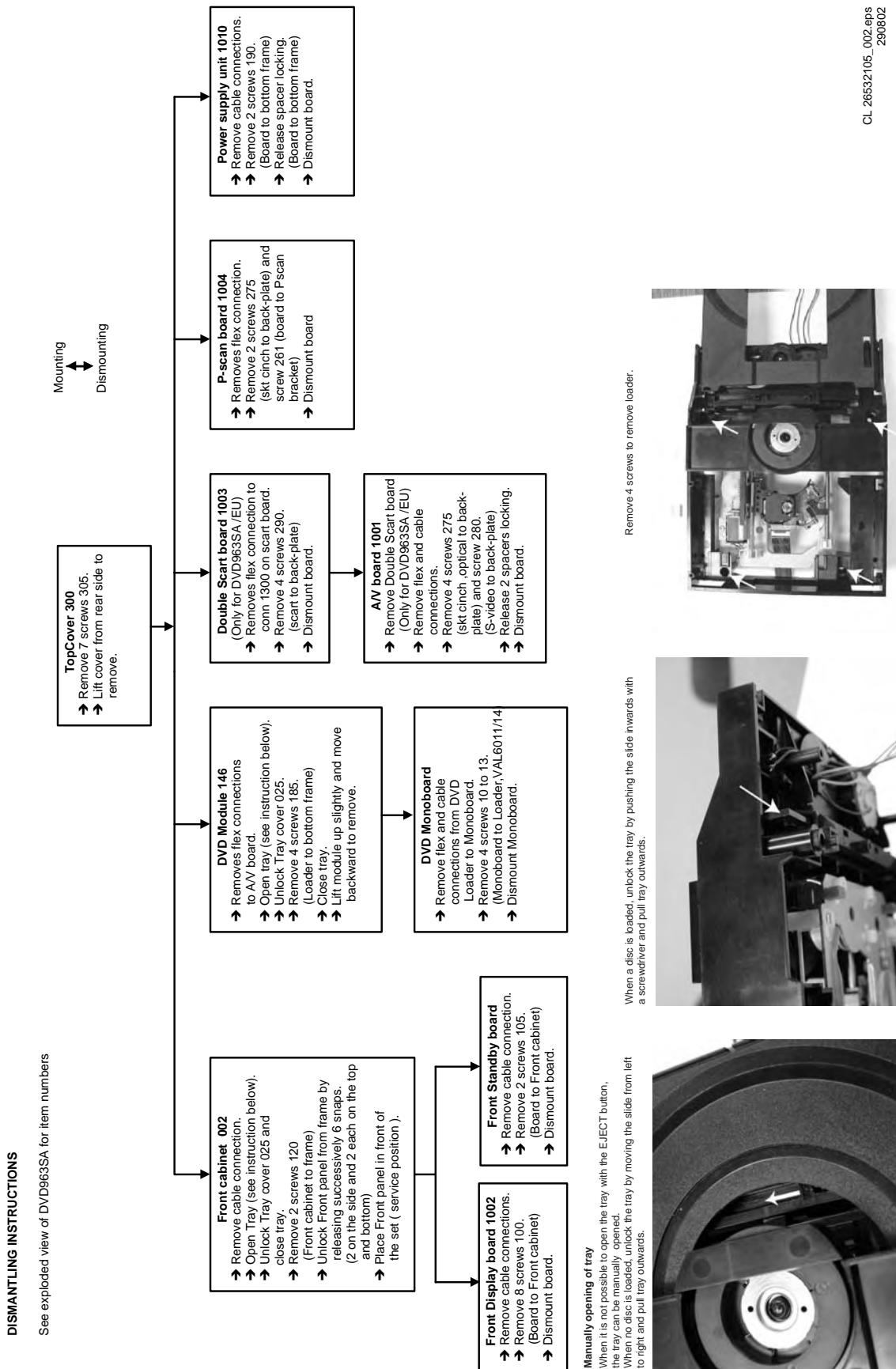


Figure 4-1 Dismantling Instructions



### 4.3 Service Hints

#### 4.3.1 Switched Mode Power Supply

The power supply unit has to be replaced in case of failure. The schematic provided in the manual is only for information and no service parts will be available.

#### 4.3.2 DVD Module

This module can be repaired as follows:

1. The VAL6011/14 is a combination of loading mechanism and DVD-mechanism. Both are not repairable units and in case of failure, it has to be replaced with a new loader VAL6011/14.

**Note:** When replacing with a new VAL6011/14, two solder joints have to be removed after connecting the OPU flex foil to the mono board.

The solder joints, which shortcircuits the laser diodes to ground, are for protection against ESD. Refer to figures 2-5 and 2-6 for location of solder joints.

2. The mono board has to be repaired down to component level. Repair handling of the monoboard requires a workshop with sophisticated desoldering tools.

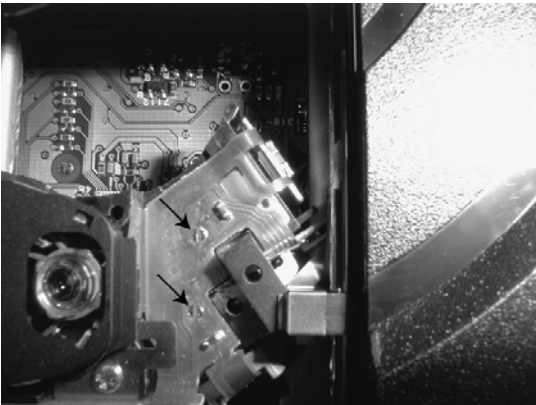


Figure 4-3 Solder joints

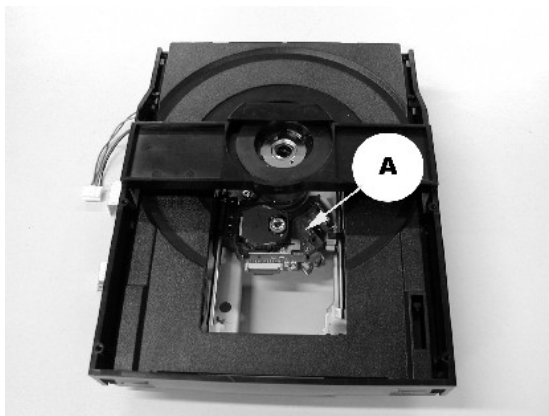


Figure 4-4 Solder joints

#### 4.3.3 ComPair

For assistance with the repair process of the monoboard an electronic fault finding guidance has been developed. This program is called ComPair.

This ComPair program is available on CDROM.

The version of the CDROM for repair of the monoboard is V1.3 or higher and can be ordered with codenumber 4822 727 21637. This is an update CDROM, so when the ComPair CDROM is used for the first time, one has to install the ComPair Engine CDROM V1.2 first.

The V1.2 CDROM can be ordered with code number 4822 727 21634 and has to be registered after installation. The procedure for registration is explained in the help file of the program and in the CDROM booklet.

The cable to connect the monoboard with a PC can be ordered with codenumber: 3122 785 90017.

All the hardware and software requirements of the systems, necessary for working with ComPair, are described on the CDROM.

#### 4.3.4 Service Positions

Refer to dismantling instructions for dismantling of the board. Figures 2-7 to 2-8 shows the service position that are recommended during repair of the boards.

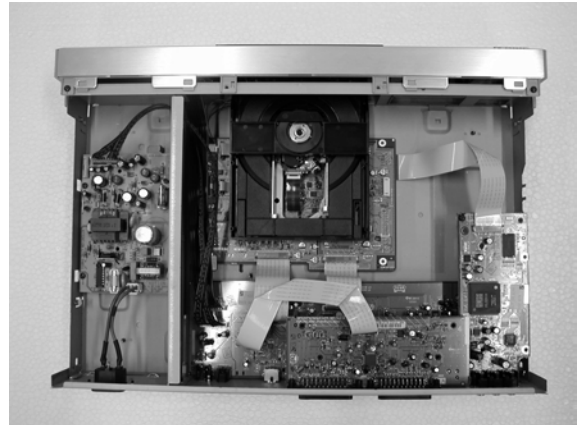


Figure 4-5 DVD963SA Layout

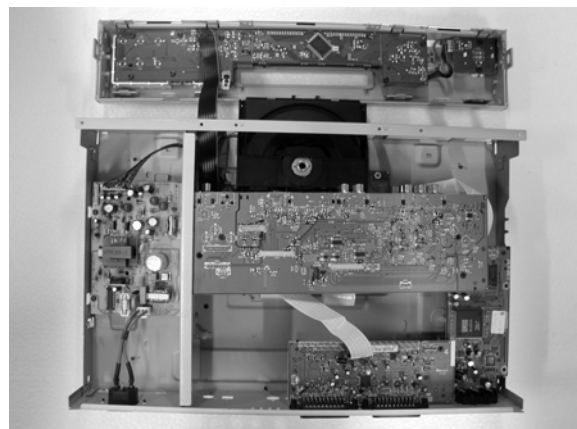


Figure 4-6 DVD963SA service manual

## 5. Diagnostic Software, Trouble Shooting and Test Instructions

### 5.1 Dealerscript

#### 5.1.2 Contents of Dealer Script

##### 5.1.1 Purpose of Dealer Script

The dealer script can give a diagnosis on a standalone DVD player, no other equipment is needed to perform a number of hardware tests to check if the DVD player is faulty. The diagnosis is simply a "error" or "pass" message. No indication is given of faulty hardware modules. Only tests within the scope of the diagnostic software will be executed hence only faults within this scope can be detected.

The dealer script executes all diagnostic nuclei that do not need any user interaction and are meaningful on a standalone DVD player.

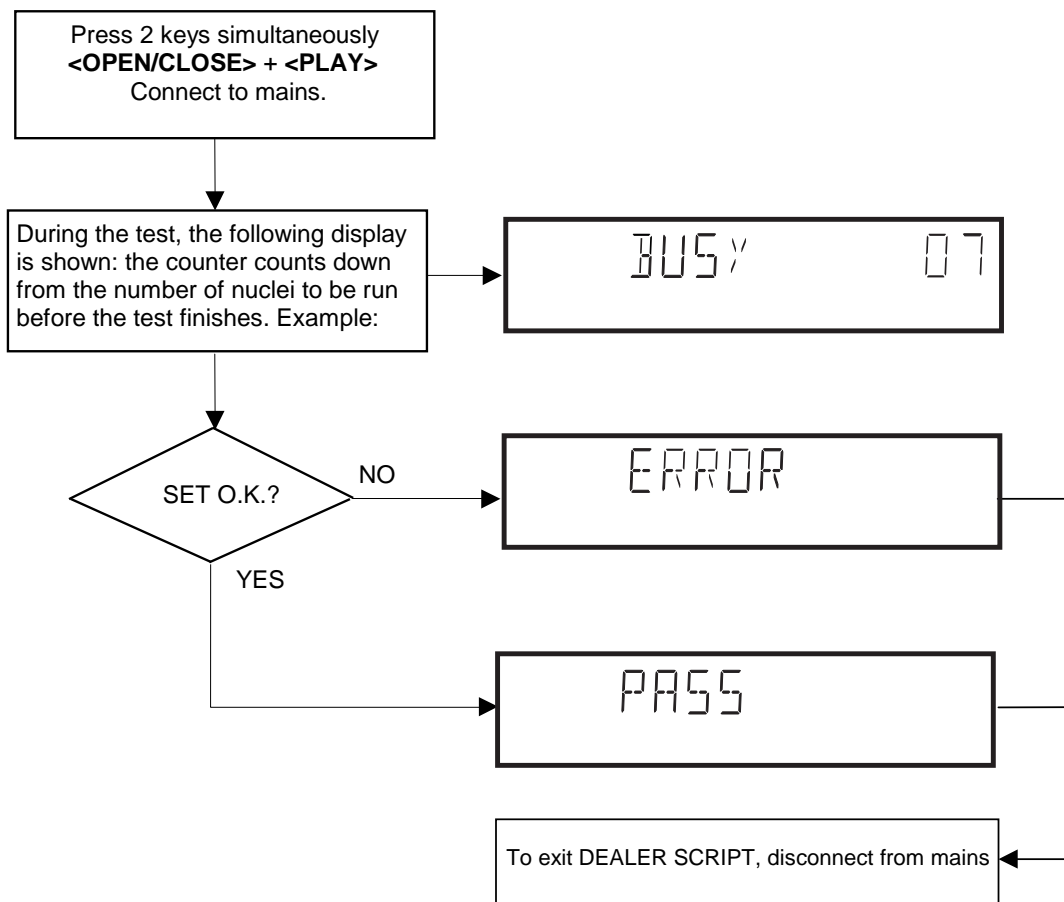
The nuclei called in the dealer script are the following (the number after each nucleus name corresponds with the number being on the local display when the nucleus is executed during the dealer script):

##### Nucleus

Display Countdown	Nucleus Number	Nucleus Name	Description
7	6	PapChksFl	Calculate and verify checksum of FLASH memory
6	12	PapI2cDisp	Checks the I2C interface with the slave processor on the display board
5	13	PapS2bEcho	Checks the I2C interface to the basic engine
4	11	PapI2cNvram	Checks the I2C interface with the NVRAM
3	15	PapNvramWrR	Pattern test of all locations in the NVRAM
2	16	CompSdramWrR	Pattern test of all locations in the SDRAM(s)
1	63	FURORERSdramWrRLow	Pattern test of all locations in the SDRAM(s)

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Figure 5-1 Dealer script nuclei



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Figure 5-2 Dealer Script

## 5.2 Player Script

Press the OPEN/CLOSE key to proceed to the next test.

### 5.2.1 Purpose of Player Script

The Player script will give the opportunity to perform a test that will determine which of the DVD player's modules are faulty, to read the error log and error bits and to perform an endurance loop test. To successfully perform the tests, the DVD player must be connected to a TV set to check the output of a number of nuclei. For DVDv2b a multi-channel amplifier, a set of 6 speakers and an external video source are necessary to test. To be able to check results of certain nuclei, the player script expects some interaction of the user (i.e. to approve a test picture or a test sound). Some nuclei (e.g. nuclei that test functionality of the Basic Engine module) require that the DVD player itself is opened, to enable the user to observe moving parts and approve their movement visually. Only tests within the scope of the diagnostic software will be executed hence only faults within this scope can be detected.

### 5.2.2 Contents of Player Script

The player script contains all nuclei that are useful on a DVD player that is connected to a TV set and help to determine which module of the DVD player is faulty, as well as to read out the contents of the error logs.

### 5.2.3 Structure of Player Script

The player script consists of a set of nuclei testing the three hardware modules in the DVD player: the Display PWB, the Digital PWB, and the Basic Engine. Nuclei run by the player test need some user interaction. In the next paragraph this interaction is described. The player test is done in two phases:

- Interactive tests:** this part of the player test depends strongly on user interaction and input to determine nucleus results and to progress through the full test. Reading the error log and error bits information can be useful to determine any errors that occurred recently during normal operation of the DVD player.
- The loop test:** this part of the player test will loop through the list of nuclei indefinitely, till the player is reset. The list of nuclei is as follows:
  - PapChksFlash
  - PapI2cNvram
  - CompSdramWrR
  - PapS2bEcho
  - PapI2cDisp

At the beginning of the tests, the DSW version number will be indicated on the local display of the DVD. The display will look like the following:

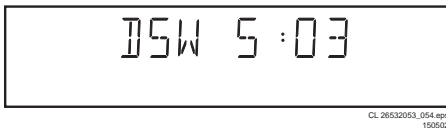


Figure 5-3

Pressing the PLAY key will proceed to the slave S/W version display, which is shown on the local display of the DVD player. The display will look like the following:

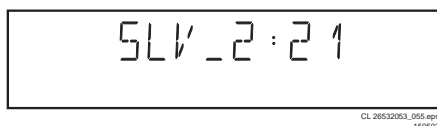


Figure 5-4

### 5.2.4 Survey

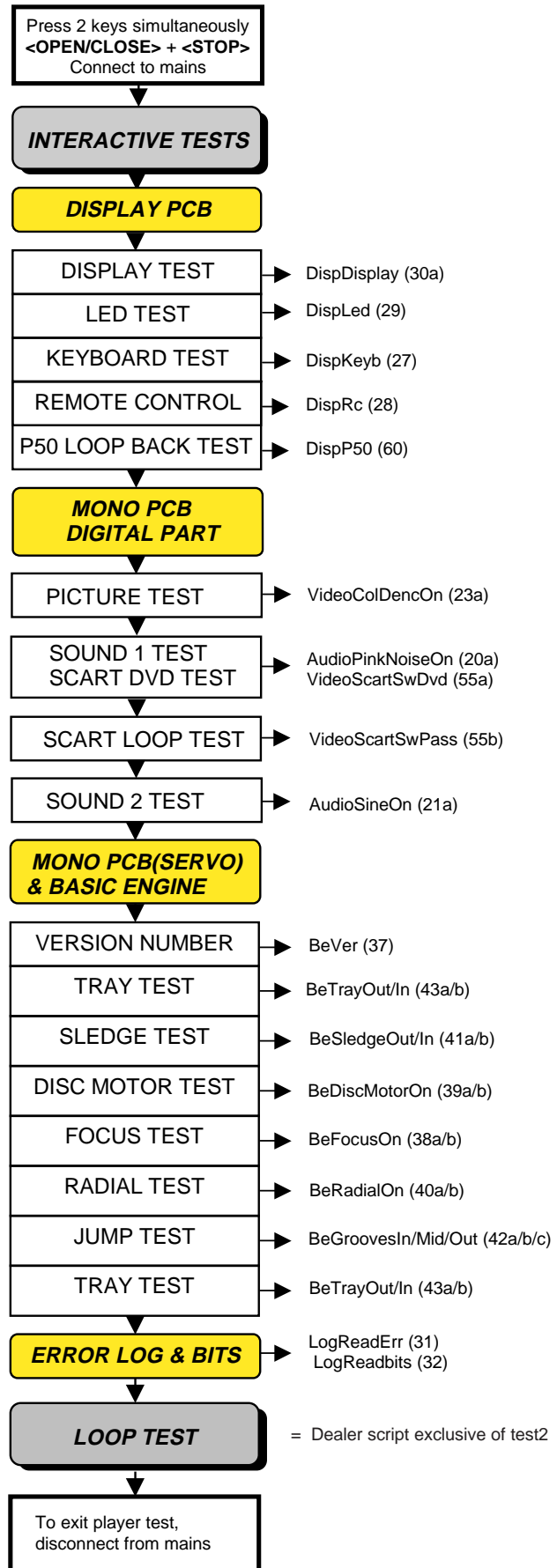


Figure 5-5

### 5.3 Display PCB

#### 5.3.1 Display Test

The display test is performed by nucleus DispDisplay. By putting a series of test patterns on the local display, the local display is tested. To step through all different patterns, the user must either press OPEN/CLOSE (pattern is ok) or STOP (pattern was incorrect) to proceed to the next pattern. The display of patterns is continued in a cyclic manner, shown in Fig. 5-6, until the user presses PLAY. If the user presses PLAY before all display patterns are tested, the DispDisplay nucleus will return FALSE (display test unsuccessful).

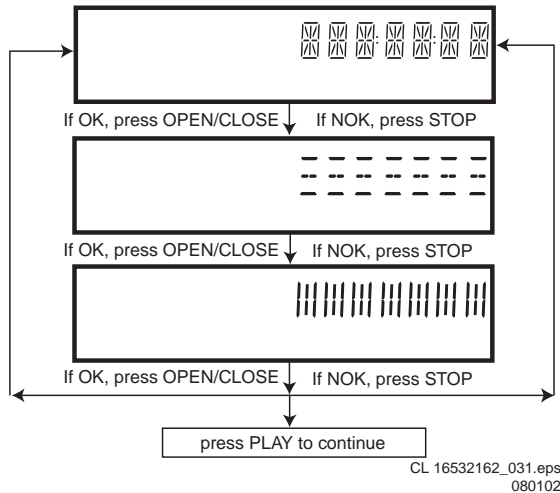


Figure 5-6

#### 5.3.2 LED Test

The LED(s) on the DVD player is (are) tested by nucleus DispLed. The user must check if the LED(s) is (are) lighted; if it is, press OPEN/CLOSE, if it is not, press STOP. By pressing PLAY the script will proceed to the next test. If the user presses PLAY before OPEN/CLOSE or STOP, the DispLed nucleus will return TRUE (LED test successful).

#### 5.3.3 Keyboard Test

The keyboard of the DVD player is tested by nucleus DispKeyb. The user is expected to press all keys on the local keyboard once. The code of the key pressed is shown on the local display (1 hexadecimal digit) immediately followed by a (hexadecimal) number indicating how many times that key has been pressed. Example of the local display during this test:

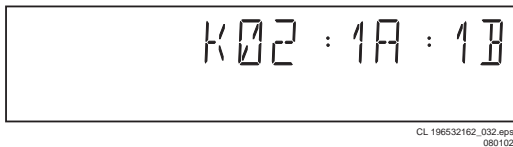


Figure 5-7

The key-codes displayed on the local display will scroll from right to left when the display gets full, the text "K" will remain on display.

KEY ID	KEY
0	PLAY
1	STOP
2	OPEN/CLOSE
3	STANDBY
4	NEXT
5	PREVIOUS
6	PAUSE
7	AUDIO DIRECT
E	SOUND MODE
F	REPEAT

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Figure 5-8

If any keys are detected more than once (due to hardware error), the key-code is displayed twice (or more), with the second digit increased by 1. If the user does not press all keys minimally once (in any order), the DispKeys nucleus will return FALSE and cause an error in the overall result of the player script. The user can leave the keyboard test by pressing the PLAY key on the local display of the DVD player for at least one full second. The result of the keyboard test is shown on local display as follows:

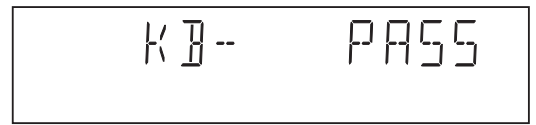


Figure 5-9

Or



Figure 5-10

Pressing PLAY on the local keyboard again will proceed to the next text.

#### 5.3.4 Remote Control Test

The remote control of the DVD player is tested by nucleus DispRc. The user must press any key on the remote control just once. The codes of the key pressed will be shown on the local display in hexadecimal format. Example:

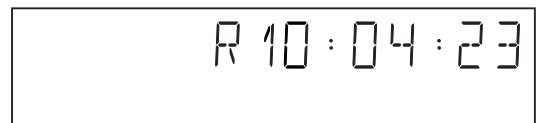


Figure 5-11

In this example 23 is the hexadecimal code of the pressed RC key. The user can leave the remote-control test by pressing PLAY on the local keyboard of the DVD player. The remote control test is successful if a code was received before the user

pressed the PLAY key. Pressing the PLAY key, before pressing a key on the remote control, gives an error in the remote control test (note that the remote control test will also fail if a key on the remote control was pressed but no code was received). The remote control test does not check upon the contents of the received code, that is it will not be checked if the received code matches the key pressed. If desired, the user can manually check this code by using a code-table for the remote control key-codes.

RC Key id	Hexadecimal code
STANDBY	0C
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
0	0
RETURN	83
DISPLAY	EF
DISC MENU	54
SYSTEM MENU	82
CURSOR UP	58
CURSOR DOWN	59
CURSOR LEFT	5A
CURSOR RIGHT	5B
OK	5C
PREVIOUS	21
NEXT	20
STOP	31
PLAY	2C
PAUSE	30
SUBTITLE	4B
ANGLE	85
ZOOM	F7
AUDIO	4E
REPEAT	1D
REPEAT A-B	3B
SHUFFLE	1C
SCAN	2A

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Figure 5-12

After pressing PLAY, the result of the remote control test is displayed on the local display of the DVD player as follows:

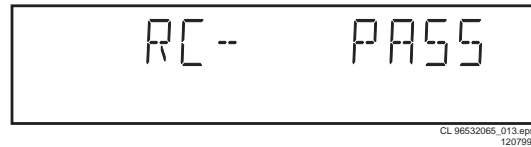


Figure 5-13

Or

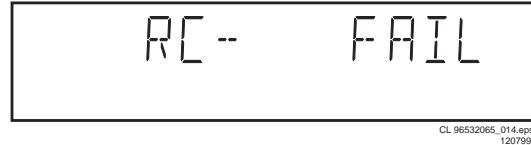


Figure 5-14

Pressing PLAY on the local keyboard again will proceed to the next test.

### 5.3.5 P50 Loop-Back Test

For the P50 loop-back test, the user must first press a key to decide if the test is to be performed. The display will show the following message:



Figure 5-15

If the user presses STOP, the P50 test will be skipped. If the user presses OPEN/CLOSE, the P50 test is performed and the result is displayed as follows:

Test successful:



Figure 5-16

Test fails:



Figure 5-17

Press the PLAY key to continue to the next text

## 5.4 Mono PCB Digital Part

### 5.4.1 Picture Test

The picture test is performed by putting a predefined picture (colour bar) on the display (nucleus VideoColDencOn), and asking the user for confirmation.

The display will show the following message:

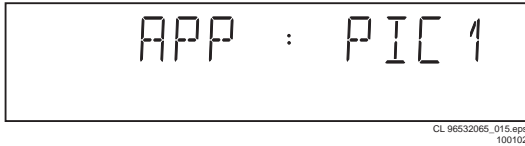


Figure 5-18

By pressing OPEN/CLOSE the user confirms the test, pressing STOP will indicate the picture was invisible or incorrect. Pressing PLAY will proceed to the next test. If the user presses PLAY without pressing OPEN/CLOSE or STOP first, the result of this test will be TRUE (picture ok).

**Note:** The colour bar must be simultaneously available on the CVBS, YC, and RGB (or YUV) outputs available. On the SCART only the CVBS and RGB signals will be available.

### 5.4.2 Sound 1 & SCART DVD Test

The first soundtest is performed by starting a pink noise sound that needs confirmation from the user (nucleus AudioPinkNoiseOn).

The display will show the following message:

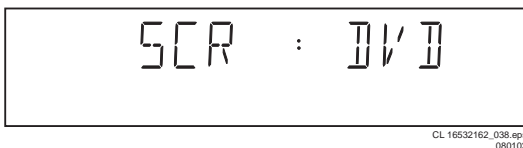


Figure 5-19

On the TV screen a colour bar (generated by nucleus VideoColDencOn) is visible and the internally generated pinknoise is audible.

By pressing the PLAY key, the user confirms the test. Pressing the STOP key will indicate the sound was inaudible or incorrect.

**Note:** Only for double scart models, SCART loop-through will be simultaneously active during this test. SCART loop-through will be measured with the aid of an external video source.

By pressing the PLAY key, there will be switched over to the external source. This must become now visible on the TV screen (using the SCART).

The local display will show the following message:

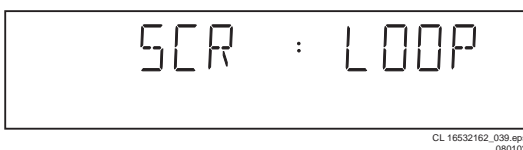


Figure 5-20

The internally generated colour bar is still available on the CVBS and Y/C outputs. And the pinknoise-signal is still available on the cinch audio outputs. By pressing the OPEN/CLOSE button, the internal generated colour bar becomes visual again.

The test can be left by pressing the PLAY key for more than one second.

### 5.4.3 Sound 2 Test

The second soundtest is performed by producing a sine sound (nucleus AudioSineOn). The signal can be stopped by pressing the STOP key.

The display will show the following message:

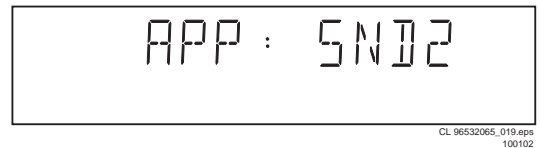


Figure 5-21

After the audio signal has been stopped, by pressing OPEN/CLOSE, the user confirms the test. Pressing STOP will indicate that something went wrong. Pressing PLAY will proceed to the next. If the user presses PLAY without pressing OPEN/CLOSE or STOP first, the result of this test will be TRUE (sound ok).

## 5.5 Basic Engine

### 5.5.1 Version Number

In the basic engine tests, the version number of the Basic Engine will be shown first, as the following example:

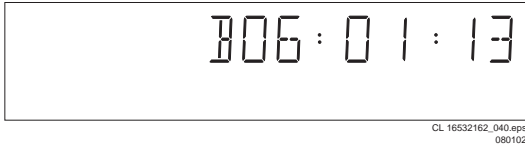


Figure 5-22

By pressing the PLAY key, the Basic Engine tests are started.

### 5.5.2 Tray Test

First, the tray is tested. The purpose of this test is also to give the user the opportunity to put a disc in the tray of the DVD player. Some tests on the Basic Engine require that a disc (e.g. DVD MPTD test disc) is present in the player. At the end of the Basic Engine tests this tray test will be repeated solely to enable the user to remove the disc in the tray. The local display will look as follows:

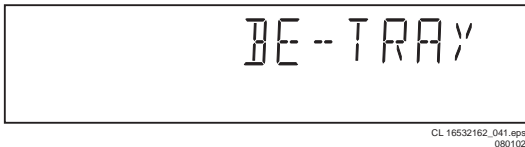


Figure 5-23

By pressing OPEN/CLOSE the user can toggle the position of the tray. Note that this test will not contribute to the test result of the Basic Engine. Pressing PLAY will proceed to the next test. At this point, the tray will be closed automatically by the software if it was open.

### 5.5.3 Sledge Test (Visual Test)

The second Basic Engine test tests the sledge. The user can move the sledge as many times as desired by using OPEN/CLOSE (nucleus BeSledgeOut) and STOP (nucleus BeSledgeIn). Pressing PLAY on the local keyboard proceeds to the next test. Note that this test will not contribute to the test result of the Basic Engine.

The local display will look as follows during the sledge test:

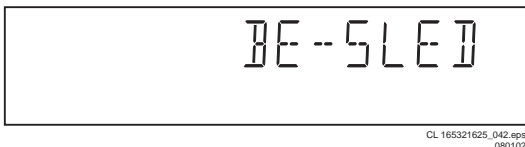


Figure 5-24

### 5.5.4 Disc Motor Test (Visual Test)

The third Basic Engine test tests the disc motor (nucleus BeDiscMotorOn).

The local display looks as follows:

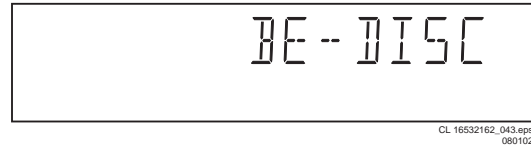


Figure 5-25

By pressing OPEN/CLOSE the user confirms that the disc motor is running. Pressing STOP indicates the disc motor does not work. Pressing PLAY proceeds to the next test, after a reset of the disc motor (nucleus BeDiscMotorOff). If the user presses PLAY before pressing OPEN/CLOSE or STOP, the result of this test will be TRUE (disc motor is running).

### 5.5.5 Focus Test (Visual Test)

The fourth Basic Engine test tests the focussing. First focussing is turned on by calling nucleus BeFocusOn. The display will look as follows:

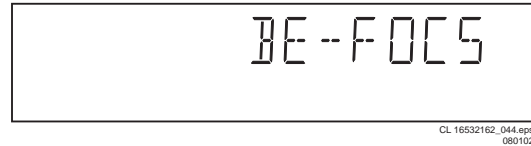


Figure 5-26

By pressing OPEN/CLOSE the user confirms that the focussing was successful. Pressing STOP indicates a focussing failure. Pressing PLAY proceeds to the next test after a reset of the focussing (nucleus BeFocusOff). If PLAY is pressed before OPEN/CLOSE or STOP, the result of this test will be TRUE (focus successful).

### 5.5.6 Radial Test (Visual & Listening Test)

The fifth Basic Engine test tests the radial functionality (nucleus BeRadialOn).

The local display looks as follows:

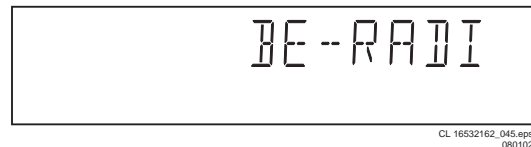


Figure 5-27

By pressing OPEN/CLOSE the user confirms that the radial function works. Pressing STOP indicates the function does not work. Pressing PLAY proceeds to the next test, after a reset of the radial (nucleus BeRadialOff). If the user presses PLAY before pressing OPEN/CLOSE or STOP, the result of this test will be TRUE (radial successful).

### 5.5.7 Jump Test (Listening Test)

The sixth and last Basic Engine test tests the jumping by calling nuclei BeGroovesIn, BeGroovesMid and BeGroovesOut. During this test, the local display looks as follows:

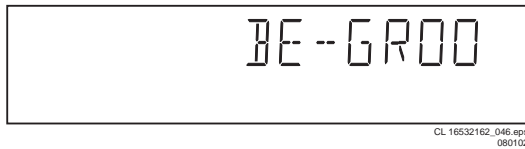


Figure 5-28

The user can switch between the three different types of groove settings by pressing OPEN/CLOSE (forward to next nucleus in the list In-Mid-Out), or STOP (backward in the list In-Mid-Out). This is done in a cyclic manner; note that this test will not contribute to the test result of the Basic Engine. Pressing PLAY proceeds to the next test, after the disc motor has been shut off with a call to nucleus BeDiscMotorOff.

### 5.5.8 Tray Test

As a last action for the Basic Engine tests, the tray test is repeated. The local display will look as follows:

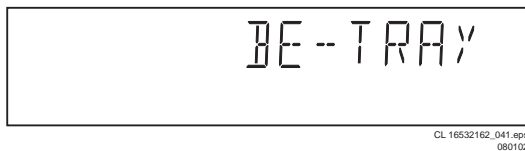


Figure 5-29

This test is meant to give the user the opportunity to remove the disc in the tray. The tray position can be toggled using the OPEN/CLOSE key. The tray will be closed (by the software, if it is open) before proceeding to the next test when the user presses the PLAY key.

### 5.5.9 Error Log (See Table on Page 25)

Reading the error log and error bits information can be useful to determine any errors that occurred recently during normal operation of the DVD player. Reading the error log is done by nucleus LogReadErr.

The display during the errorlog readout looks as follows :

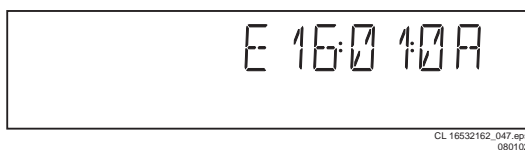


Figure 5-30

**Note:** Previous versions of the diagnostic software showed a 8-digit error code.

Due to limitations in the number of digits that can be displayed by some front panel displays, the most significant digits will not be shown. This can be done since all the error codes used by this player has set these 2 digits to "00"

By pressing OPEN/CLOSE or STOP the user can move forward or backward (respectively) through the logged error codes. If "0000" is displayed at all positions, the error log is empty. Display of the logged errors is done in a cyclic manner. By pressing PLAY on the local keyboard, the user can proceed to the next test.

### 5.5.10 Error Bits

Reading the error bits is done by nucleus LogReadBits. The display during the errorbits readout looks as follows:

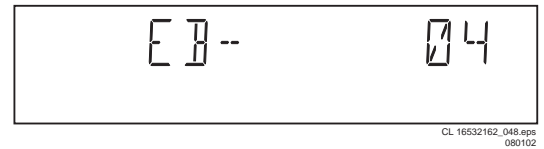


Figure 5-31

Only the identification number (decimal) representing set errorbits will be shown. By pressing OPEN/CLOSE or STOP, the user can move forward or backward (respectively) through the logged errorcodes. If the display only shows "EB-0", no error bits were set. By pressing PLAY the user can continue to the next test.

## 5.6 Loop Test (See Table Below)

At the start of the loop test, the local display of the DVD player will show the interactive player test result readout in the following display:

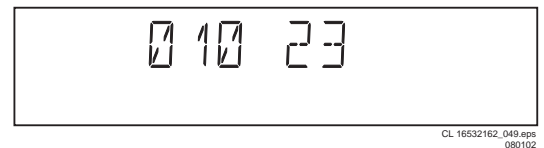


Figure 5-32

The left side of the display contains a 3-digit code, which can have a value between 000 and 111. These values indicate the faulty modules and are to be interpreted as follows:

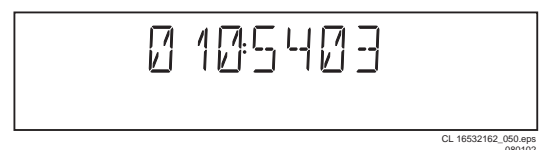
Displayed Value	Indication for each module		
	Basic Engine	Mono PCB	Display PCB
000	ok	ok	ok
001	ok	ok	faulty
010	ok	faulty	ok
011	ok	faulty	faulty
100	faulty	ok	ok
101	faulty	ok	faulty
110	faulty	faulty	ok
111	faulty	faulty	faulty

CL 96532065\_031.eps  
120799

Figure 5-33

The loop test will perform the same nuclei as the dealer test, but it will loop through the list of nuclei indefinitely. The display of the DVD player will display not only the three digits indicating correct/faulty modules and the last found error code (as mentioned, faults are detected as far as they can be within the scope of the diagnostic software), but also a loop counter indicating how many times the loop has been gone through. If an error was detected, the display will remain as in figure 5-34 until the user presses the PLAY key and then it will continue to the next loop.

Example:



CL 16532162\_050.eps  
080102

Figure 5-34

The 2-digit number (23) on the right of figure 5-32 indicates the number of times the loop test has been performed.

**After one loop cycle:** Display the 3-digit module bits together with the last error code which occurred in the loop test. The 4 digits at the right side of the display (fig. 5-34) show the last error that was found during the loop test. The leftmost two digits (54) of this code indicates which nucleus resulted in a fault. The rightmost two digits (03) refer to the faultcode within that nucleus. For further explanation of this error code, refer to chapter 5.8 (Nuclei Error Codes).

### 5.6.1 Errorlog

#### Explanation:

The application errors will be logged in the NVRAM. The maximum number of error bytes that will be visible is 16. The first word (4 digits) of the byte is the component identification, the last word is the error code.

The diagnostics software will present a combination of this component identification plus an error code on the local display (and on the attached terminal). The last reported error is shown as < 00000000, the oldest visible error as 00000000 > and the errors in between as < 00000000 >.

The devices that may report errors are the serial controller (UART), the basic engine (BE), the slave processor (SLPH), the SACD Stream Manager (SSM) and the SACD Media Access (SMA). The identification of these components is as follows:

Component name	Component identification
Serial controller (UART)	000A
Engine (BE)	0016
Slave Processor (SLPH)	001A
SACD Stream Manager (SSM)	001C
SACD Media Access (SMA)	002E
Diagnostic software (DS)	Dxxx

The tables in the next chapters list the error code and corresponding problem. The column 'Explanation' holds a more elaborate description and the most likely reason for the error.

#### Some Examples:

002E0000 (SMA reported a timeout error)  
 0016010A (Engine could not fully close or open the tray)  
 D0010001 (Flash checksum failed).

For further explanation of DS errors, see description of nuclei error codes in paragraph 5.8.

#### UART Error Codes

Error Number	Error name	Explanation
0000	BUF_OVE RFLOW	To many characters were offered in too little time. Reason: system was too busy doing other jobs.
0001	COMMUNI CATION	Usually a protocol error. Reason: bad connection between engine and processor.
0002	TIME OUT	

#### BE Errors

Error Number	Error name	Explanation
0101	S2B_ILL_CO MMAND	Parameter(s) not valid for this command. Reason: some communication problem between UART and engine.
0102	S2B_ILL_PAR AM	Command not allowed in this state or unknown. Reason: see S2B_ILL_COMMAND error

Error Number	Error name	Explanation
0103	S2B_SLEDGE	Sledge could not be moved to home position.
0104	S2B_FOCUS	Focus failure
0105	S2B_MOTOR	Motor could not reach speed within timeout
0106	S2B_RADIAL	Servo didn't get on track after several retries.
0107	S2B_PLL_LO CK	PLL could not lock in Accessing or Tracking state
0108	SBC_HEADE R_TO	Header timeout
0109	S2B_SBC_NO T_FOUND	Requested subcode item could not be found.
010A	S2B_TRAY	Tray could not be opened or closed completely.
010B	S2B_TOC_RE AD	TOC could not be read within timeout period.
010C	S2B_JUMP	Requested seek could not be performed.
010D	S2B_NON_EX IST_SES	Attempt to access a non-existing session.
010E	S2B_NON_EX IST_BCA	Caller tries to acces a non-existing BCA area
010F	Speed setting	A wrong or inappropriate speed value has been set
0116	NO_DISC	No disc selected
011A	TRAY_INIT	After reset, initialized tray
011B	NO TOC INFO	No TOC information in lead-in area or erase TOC found
01F0	S2B_OVERR UN	Too many bytes received over S2B Reason: see S2B_ILL_COMMAND error
01F1	S2B_COMM_ TO	Not enough bytes are received over S2B Reason: see S2B_ILL_COMMAND error
01F2	S2B_PARITY	Byte received with parity error. Reason: see S2B_ILL_COMMAND error
01F3	S2B_ILL_PHA SE	CMD IDC is not valid, transmission out of sync. Reason: see S2B_ILL_COMMAND error
01F4	S2B_ILL_NR_ OF_BYTES	Byte count has an illegal value. Reason: see S2B_ILL_COMMAND error

#### SLPH Error Codes

Error Number	Error name	Explanation
0000	COMMUNICA TION	Error in I2C communication. Reason: bad connection between slave processor and main processor.

#### SSM Error Codes

Error Code	Error name	Explanation
0006	SP_SYNCER ROR	System cannot get synchronised with sectors coming from disc. Reason: Usually a damaged disc or the player was dropped/pushed during operation. If not, the engine is malfunctioning.
0007	SP_EDCERR OR	Data coming from disc is damaged. Reason: see SP_SYNCERROR

Error Code	Error name	Explanation
0008	SP_CONTINUITYERROR	Sequence of sectors coming from disc is incorrect. Reason: see SP_SYNCERROR
0009	DMX_CONTINUITYERROR	Sequence of sectors is incorrect. Reason: problem with buffer RAM
000A	LLD_ERROR	An illegal audio format was offered to the decoder. Reason: unknown audio type on disc or problem with buffer RAM
000B	BCU_ERROR	Internal problem in Furore chip

**SMA Error Codes**

Error Number	Error name	Explanation
0000	SMA_TIMEOUTERROR	Data coming from disc not in time. Reason: damaged disc or engine problem.

**5.6.2 Reprogramming of New Mono Boards.****Caution**

***This information is confidential and may not be distributed. Only a qualified service person should reprogram the mono board.***

After reset of NV-memory or repair of the mono board, all the customer settings and also the region code will be lost.

Reprogramming of the mono board will put the player back in the state in which it has left the factory, i.e. with the default settings and the allowed region code.

Reprogramming is limited to 25 times

When the counter reaches 25, reprogramming is not possible anymore

Reprogramming will be done by way of the remote control.

Put the player in stop mode, no disc loaded.

Press the following keys on the remote control:

<PLAY> followed by numerical keys <1> <5> <9>

The display shows: “-----”

Press now successively the following keys :

for DVD963SA /001 : <2><2><2> <0><1><2><0><0>

for DVD963SA 171 : <1><1><1> <0><1><0><0><0>

for DVD963SA 691 : <3><2><3> <0><1><0><0><0>

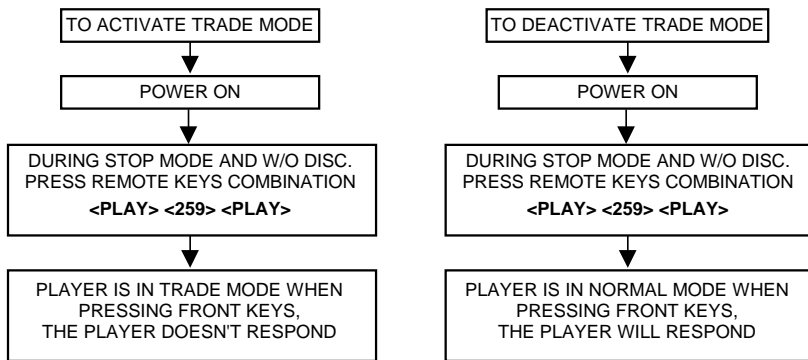
Press <PLAY> again.

The TV screen will become BLUE during a short time to confirm that the mono board has been reprogrammed.

Figure 5-35 Reprogramming code

5.6.3 Trade Mode

**When the player is in Trade Mode, the player cannot be controlled by means of the front key buttons, but only by means of the remote control.**



CL16532162\_052.eps  
0850102

Figure 5-36

**Note:** To activate and deactivate the Trade Mode with the disc in the player, the procedure is similar to above, except that the remote control keys combination is pressed at the instant when the local display is flashing "READING"

5.7 Menu and Command Mode Interface

5.7.1 Layout of Results Diagnostic Nuclei

Results returned from a Diagnostic Nucleus will be displayed in the following layout:  
< number >< string > [ok | ER]

< number >: is a 4-digit decimal number padded with leading zeros if its value is less than 4 digits. The first 2 digits identify the generating nucleus (or group of nuclei) while the latter 2 digits indicate the error number.

< string >: is a text string containing information about the result of the Diagnostic Nucleus.

< number > and < string > are defined in [SSD\_DN] in the output sections of each Nucleus.

Examples:

1. 0001Unknown command ER @
2. 3100OK @
3. 0901Data line X is not connected to the DRAM ER @

5.7.2 Command Mode Interface

**Set-up Physical Interface Components**

Hardware required:

- Service PC
- one free COM port on the Service PC
- special cable to connect DVD player to Service PC

The service PC must have a terminal emulation program (e.g. OS2 WarpTerminal or Procomm) installed and must have a free COM port (e.g. COM1). Activate the terminal emulation program and check that the port settings for the free COM port are: 19200 bps, 8 data bits, no parity, 1 stop bit and no flow control. The free COM port must be connected via a special cable to the RS232 port of the DVD player. This special cable will also connect the test pin, which is available on the connector, to ground (i.e. activate test pin).

Code number of PC interface cable: 3122 785 90017

**Activation**

Switch the player on and the following text will appear on the screen of the terminal (program):

```
DVDv4 Diagnostic Software version 5.03
(M)enu, (C)ommand or (S)2B interface ? [M]:@ C <enter>

SDRAM Interconnection test passed
Basic SDRAM test passed
Slave Processor: SLAVE2

DD:> CL 26532105_058.eps 020902
```

Figure 5-37

The first line indicates that the Diagnostic software has been activated and contains the version number. The second line lets the user choose the interface format. Enter 'C' to select Command Mode and the next three lines are the successful result of the two subsequent basic tests (nuclei 2, 4 and the detection of the display type used by the panel respectively). If not all these messages appear on the terminal screen, then the related nucleus found an error. The last line is the prompt ("DD>"). The diagnostic software is now ready to receive commands.

**Command Overview of Nuclei**

The following table gives an overview of all available nuclei. The first column contains an identification number, the second contains the name of a nucleus and the last column indicate the description of the nucleus.

**Note:** User confirmation is necessary during front panel tests

Table 5-1 Basic diagnostic nuclei

Ref. #	Reference Name	Remark
1	BasicSpAcc	Serial port Access test/ initialization
2a	BasicInterconDram	Data and address bus Interconnection (only for development)
2b	BasicInterconSdram	Data and address bus interconnection
3	BasicDramWrR	DRAM Write Read (only for development)
4	BasicSdramWrR	SDRAM Write Read

Table 5-2 Processor and peripherals

Ref. #	Reference Name	Remark
6	PapChksFl	Checksum FLASH
7a	PapUclkAclkCdda	uClock A_CLK in CD-DA mode
7b	PapUclkAclkDvd	uClock A_CLK in DVD mode
7c	PapUclkAclkDvd96	uClock A_CLK in DVD (96kHz) mode
10	PapFlashWrAcc	FLASH Write Access (only for development)
11	PapI2cNvram	I2C NVRAM access
12	PapI2cDisp	I2C Display PWB
13	PapS2bEcho	S2B Echo
14	PapS2bPass	S2B Pass-through
15	PapNvramWrR	NVRAM Write Read
62	PapChksSum	Show checksums stored in flash

Table 5-3 Components

Ref. #	Reference Name	Remark
16	CompSdramWrR	SDRAM Write Read

Table 5-4 Audio

Ref. #	Reference Name	Remark
19a	AudioMuteOn	Audio Mute On
19b	AudioMuteOff	Audio Mute Off
20a	AudioPinkNoiseOn	Audio Pinknoise On
20b	AudioPinkNoiseOff	Audio Pinknoise (or beep tone) Off
20c	AudioBeepToneOn	Audio Beep Tone On
21a	AudioSineOn	Audio Sine signal On/Off
21b	AudioSineBurst	Audio Sine signal Burst
56a	AudioLfePortHigh	Set the LFE_SEL port to HIGH
56b	AudioLfePortLow	Set the LFE_SEL port to LOW
66a	DAC_I2C	Resets DAC and check I2C communication with DAC
66b	DAC_I2CEnable	Enable I2C communication to AV board
66c	DAC_I2CDisable	Disable I2C communication to AV board
67a	DAC_ClockInternal	Uses internal clock from monoboard for DAC (256fs)
67b	DAC_ClockExternal	Uses external clock for DAC (384fs)
68a	DAC_AudioPreMuteOn	Enable Audio Pre-mute pin
68b	DAC_AudioPreMuteOff	Disable Audio Pre-mute pin
69a	DAC_CenterOn	Enable Center on pin
69b	DAC_CenterOff	Disable Center on pin
79	DAC_Reset	Resets DAC
80a	DAC_ModeCDDA	Sets DAC to CDDA mode
80b	DAC_ModeDVD48	Sets DAC to DVD mode (48kHz)
80c	DAC_ModeDVD96	Sets DAC to DVD mode (96kHz)

Ref. #	Reference Name	Remark
80d	DAC_ModeDSD	Sets DAC to DSD mode
81a	DAC_LowPowerStandbyOn	Enable Low Power Standby
81b	DAC_LowPowerStandbyOff	Disable Low Power Standby
82a	DAC_UpsamplingFreq192k	Sets Upsampling frequency to 192kHz
82b	DAC_UpsamplingFreq96k	Sets Upsampling frequency to 96kHz
82c	DAC_UpsamplingOn	Enable upsampling
82d	DAC_UpsamplingOff	Disable upsampling

Table 5-5 Video

Ref. #	Reference Name	Remark
17a	VidPortOutAA	Output the value 0XAA at the Digital Video Interface Port
17b	VidPortOut55	Output the value 0X55 at the Digital Video Interface Port
23a	VideoColDencOnPAL	Colourbar (PAL) DENC On
23b	VideoColDencOff	Colourbar DENC Off
23c	VideoColDencOnNTSC	Colourbar (NTSC) DENC On
24a	VideoProgMPEGon	Progressive - DigitalVideo Colour Bar ON
24b	VideoYuvMPEGon	Enhanced YUV-DigitalVideo Colour Bar
25a	VideoScartLo	Scart Low
25b	VideoScartMi	Scart Medium
25c	VideoScartHi	Scart High
54	VideoScartSwComm	Scart Switch communication
55a	VideoScartSwDvd	Scart Switch Dvd
55b	VideoScartSwPass	Scart Switch Pass-through
57a	VideoScartPinLo	PIO-pins as used in 2A for Scart-switching
57b	VideoScartPinMi	PIO-pins as used in 2A for Scart-switching
57c	VideoScartPinHi	PIO-pins as used in 2A for Scart-switching
61a	VideoColOutRGB (ST5508)	Output RGB from ST5508
61b	VideoColOutYUV (ST5508)	Output YUV from ST5508

Table 5-6 Display (slave processor)

Ref. #	Reference Name	Remark
26	DispVer	Version number
27	DispKeyb	Keyboard
28	DispRc	Remote Control
29	DispLed	LEDs
30a	DispDisplay	VFT Display test
30b	DispLCDisplay	LCD Display test
30c	DispLCDBkLight	LCD Backlight test
60	DispP50	P50 loopback test

Table 5-7 Log (Error logging in Nvram)

Ref. #	Reference Name	Remark
31	LogReadErr	Read last Errors
32	LogReadBits	Read errors Bits
33	LogReset	Reset

Table 5-8 Miscellaneous

Ref. #	Reference Name	Remark
34	MiscReadConfig	Read Configuration area from NVRAM
35	MiscNvramReset	NVRAM Reset
36	MiscNvramMod	Modify NVRAM contents
46	MiscAppVer	Read version of application software
47a	MiscTrayOpenNr	Read the number of times the tray opened
47b	MiscPowerOnTime	Read the total time the player's power has been on
47c	MiscPlayTimeCddaVcd	Read the Playtime of CDDA and VCD discs
47d	MiscPlayTimeDvd	Read the Playtime of DVD discs

Table 5-9 Basic engine

Ref. #	Reference Name	Remark
37	BeVer	Version number
38a	BeFocusOn	Focus On
38b	BeFocusOff	Focus Off
39a	BeDiscmotorOn	Discmotor On
39b	BeDiscmotorOff	Discmotor Off
40a	BeRadialOn	Radial control On
40b	BeRadialOff	Radial control Off
41a	BeSledgeIn	Sledge Inwards
41b	BeSledgeOut	Sledge Outwards
42a	BeGroovesIn	jump Grooves to Inside
42b	BeGroovesMid	jump Grooves to Middle
42c	BeGroovesOut	jump Grooves to Outside
43a	BeTrayIn	Tray In
43b	BeTrayOut	Tray Out
44	BeReset	Reset Basic Engine
58a	LaserCdOn	CD Laser on
58b	LaserCdOff	CD Laser off
58c	LaserDvdOn	DVD Laser on
58d	LaserDvdOff	DVD Laser off
70	BedReadFlashID	Read flash memory manufacturer and device ID
71	BedCalcRomChecksum	Calculate ROM checksum
72	BedScratchTest	Test scratch detection circuit

Table 5-10 Furore IC

Ref. #	Reference Name	Remark
63	Furore_SdramWrR	Furore SDRAM Write Read test
64	Furore_SdramWrR Fast	Furore SDRAM interconnection test
65	Furore_Id	Furore version ID check
83	Furore_Reset	Furore reset

Ref. #	Reference Name	Remark
84a	Furore_High	Sets Furore output pins DSD_PCM0-9 to high
84b	Furore_Low	Sets Furore output pins DSD_PCM0-9 to low

Table 5-11 Karaoke (not available)

Ref. #	Reference Name	Remark
48a	KaraokeModeOff	Switch Karaoke mode off
48b	KaraokeModeOn	Switch Karaoke mode on
49	KaraokeMicInput	Check path from the microphone input to audio output
50a	KaraokeKeyOn	Set Karaoke Key to the maximum level (1200 cent)
50b	KaraokeKeyOff	Set Karaoke Key to flat octave (0 cent)
51a	KaraokeEchoOn	Set Echo Control function on
51b	KaraokeEchoOff	Set Echo Control function off

### 5.7.3 Menu Mode Interface

#### Activation

Switch the player on and the following text will appear on the screen of the terminal (program):

```
DVDv4 Diagnostic Software version 5.03

(M)enu, (C)ommand or (S)2B interface ? [M]:e <enter>
SDRAM Interconnection test passed
Basic SDRAM test passed
Slave Processor: SLAVE2

Press ENTER to go to main menu
CC: > <enter>

MAIN MENU
1. Audio ...
2. Video ...
3. Front Panel ...
4. Basic Engine ...
5. Processor Peripherals ...
6. Error Log ...
7. Furore ...
8. Miscellaneous ...

Select > CL 26532105_059.eps
020902
```

Figure 5-38 Screen menu

The first line indicates that the Diagnostic software has been activated and contains the version number. The next lines are the successful result of the SDRAM interconnection test and the basic SDRAM test. The last line allows the user to choose between the four possible interface forms. If pressing M has made a choice for Menu Interface, the Main Menu will appear.

#### Layout of Menu and Submenu

The following menu layout will appear after starting up the DVD player in menu mode. The symbol "- -" indicates that the current menu choice will invoke the display of a submenu. The number between [ ] indicates the nucleus number. These numbers will not be shown on the screen.

#### Menus

##### MAIN MENU

- 1 Audio...
- 2 Video...
- 3 Front Panel...

- 4 Basic Engine...
- 5 Processor Peripherals...
- 6 Error Log...
- 7 Furore...
- 8 Miscellaneous...

**First Level Submenus****MAIN > AUDIO MENU**

- 1 Mute...
- 2 Pink Noise...
- 3 Sine Wave...
- 4 Digital Ports...
- 5 Ext. DAC Board...

**MAIN > VIDEO MENU**

- 1 Colourbar...
- 2 Scart...
- 3 Digital Port...

**MAIN > FRONT PANEL MENU**

- 1 Slave Processor...
- 2 VFT Display [30a]
- 3 LCD Display [30b]
- 4 LCD BkLight [30c]
- 5 Keyboard [27]
- 6 LEDs [29]
- 7 Remote Control [28]
- 8 P50 Check [60]

**MAIN > BASIC ENGINE MENU**

- 1 Reset [44]
- 2 Version [37]
- 3 S2B...
- 4 Loader Mechanism...
- 5 Special Diagnostics...

**MAIN > PROCESSOR PERIPHERALS MENU**

- 1 Clock...
- 2 Flash...
- 3 NVRAM...
- 4 SDRAM Write/Read [16]

**MAIN > ERROR LOG MENU**

- 1 Read Last Errors [31]
- 2 Read Error Bits [32]
- 3 Reset Error Log [33]

**MAIN > FURORE MENU**

- 1 SDRAM Write/Read [63]
- 2 SDRAM Write/Read [64]
- 3 Chip Revision ID [65]
- 4 Set DSD\_PCM Output High [84a]
- 5 Set DSD\_PCM Output Low [84b]
- 6 Reset Furore IC [83]

**MAIN > MISCELLANEOUS MENU**

- 1 Statistics Info...
- 2 Read DVD Application version[46]

**Second Level Submenus****MAIN > AUDIO > MUTE MENU**

- 1 Mute On [19a]
- 2 Mute Off [19b]
- 3 Mute Front LR On (963 only) [19c]
- 4 Mute Front LR Off (963 only) [19d]

**MAIN > AUDIO > PINK NOISE MENU**

- 1 Pink Noise On [20a]
- 2 Pink Noise / Beep Tone Off [20b]
- 3 Beep Tone On [20c]

**MAIN > AUDIO > SINE WAVE MENU**

- 1 Audio Sine On [21a]
- 2 Audio Burst On [21b]

**MAIN > AUDIO > DIGITAL PORTS MENU**

- 1 No tests available

**MAIN > AUDIO > EXT DAC BOARD MENU**

- 1. DAC Reset [79]
- 2. I2C Test...
- 3. Clock...
- 4. Audio...
- 5. Low Power Standby...
- 6. DAC Mode...

**MAIN > VIDEO > COLOURBAR MENU**

- 1 Colourbar DENC On (PAL) [23a]
- 2 Colourbar DENC On (NTSC) [23c]
- 3 Colourbar DENC/MPEG Off [23b]
- 4 ProgressiveScan MPEG On [24a]
- 5 Enhanced YUV MPEG On [24b]
- 6 Set Video Out To RGB [61a]
- 7 Set Video Out To YUV [61b]

**MAIN > VIDEO > SCART MENU**

- 1 I2C Scart IC Check [54]
- 2 Scart To DVD [55a]
- 3 Scart Pass Through [55b]
- 4 Scart Pin 8 Low (0 to 2)V [25a]
- 5 Scart Pin 8 Mid (4.5 to 7)V [25b]
- 6 Scart Pin 8 Hi(9.5 to 12)V [25c]

**MAIN > VIDEO > DIGITAL PORT MENU**

- 1 Video Port Out 0xAA [17a]
- 2 Video Port Out 0x55 [17b]
- 3 P-scan board IO exp [17c]

**MAIN > FRONT PANEL > SLAVE PROCESSOR MENU**

- 1 Bus Comms Check [12]
- 2 S/W Version [26]

**MAIN > BASIC ENGINE > S2B MENU**

- 1 S2B Echo [13]
- 2 S2B Pass-Through [14]

**MAIN > BASIC ENGINE > MECHANISM MENU**

- 1 Disc Motor...
- 2 Laser...
- 3 Tray...
- 4 Focus...
- 5 Radial...
- 6 Sledge...
- 7 Grooves...

**MAIN > BASIC ENGINE > SPECIAL DIAGNOSTICS MENU**

- 1 Read FlashID [70]
- 2 ROM Checksum [71]
- 3 Scratch Circuit [72]

**MAIN > PROCESSOR PERIPHERALS > PCM CLOCK MENU**

- 1 Ext PCM\_CLK In CDDA Mode (11.3MHz) [7a]
- 2 Ext PCM\_CLK In DVD Mode (12.3MHz) [7b]
- 3 Ext PCM\_CLK In DVD96kHz Mode (24.6MHz) [7c]

**MAIN > PROCESSOR PERIPHERALS > FLASH MENU**

- 1 Verify FLASH Checksum [6]
- 2 Show FLASH Checksum [62]

**MAIN > PROCESSOR PERIPHERALS > NVRAM MENU**

- 1 I2C NVRAM Acces [11]
- 2 NVRAM Config [34]
- 3 NVRAM Reset [35]

- 4 NVRAM Modify [36]
- 5 NVRAM Read/Wr Test [15]

**MAIN > MISCELLANEOUS > STATISTICS INFO MENU**

- 1 Total Nr Of Times Tray Open [47a]
- 2 Total Time Power On [47b]
- 3 Total Play-Time CDDA & VCD [47c]
- 4 Total Play-Time DVD [47d]

**Third Level Submenus**

**MAIN > AUDIO > EXT DAC BOARD > I2C TEST MENU**

- 1. I2C Test [66a]
- 2. I2C Enable Pin On [66b]
- 3. I2C Enable Pin Off [66c]

**MAIN > AUDIO > EXT DAC BOARD > CLOCK MENU**

- 1. Clock Internal [67a]
- 2. Clock External [67b]
- 3. Clock Upsampling 192k (963 only) [82a]
- 4. Clock Upsampling 96k (963 only) [82b]
- 5. Clock Upsampling On (963 only) [82c]
- 6. Clock Upsampling Off (963 only) [82d]

**MAIN > AUDIO > EXT DAC BOARD > AUDIO**

- 1. Audio Pre-Mute On [68a]
- 2. Audio Pre-Mute Off [68b]
- 3. Audio Center On [69a]
- 4. Audio Center Off [69b]

**MAIN > AUDIO > EXT DAC BOARD > LOW POWER  
STANDBY**

- 1. Low Power Standby On [81a]
- 2. Low Power Standby Off [81b]

**MAIN > AUDIO > EXT DAC BOARD > DAC MODE MENU**

- 1. DAC CDDA Mode [80a]
- 2. DAC DVD48 Mode [80b]
- 3. DAC DVD96 Mode [80c]
- 4. DAC DSD Mode [80d]

**MAIN > BASIC ENGINE > MECHANISM > DISC MOTOR  
MENU**

- 1 Disc Motor On [39a]
- 2 Disc Motor Off [39b]

**MAIN > BASIC ENGINE > MECHANISM > LASER MENU**

- 1 CD Laser On [58a]
- 2 CD Laser Off [58b]
- 3 DVD Laser On [58c]
- 4 DVD Laser Off [58d]

**MAIN > BASIC ENGINE > MECHANISM > TRAY MENU**

- 1 Tray Open [43b]
- 2 Tray Close [43a]

**MAIN > BASIC ENGINE > MECHANISM > FOCUS MENU**

- 1 Focus On [38a] (load DVD first)
- 2 Focus Off [38b]

**MAIN > BASIC ENGINE > MECHANISM > RADIAL MENU**

- 1 Radial Control On [40a] (load DVD first)
- 2 Radial Control Off [40b]

**MAIN > BASIC ENGINE > MECHANISM > SLEDGE MENU**

- 1 Sledge Inwards [41a]
- 2 Sledge Outwards [41b]

**MAIN > BASIC ENGINE > MECHANISM > GROOVES (Uses  
DVD) MENU**

- 1 Jump To Inside Grooves [42a]
- 2 Jump To Middle Grooves [42b]

- 3 Jump To Outside Grooves [42c]

## 5.8 Nuclei Error Codes

In the following tables the error description of the error codes will be described.

### 5.8.1 Audio Nuclei

Error code	Error text
1800	Audio Deemp On OK
1820	Audio Deemp Off OK
1880	Audio Deemp Tri OK
1900	Audio mute On OK
1920	Audio mute Off OK
1940	Audio Front LR mute On OK
1960	Audio Front LR mute Off OK
2000	Audio Pinknosie On OK
2001	Audio Pinknoise On DAC fail
2020	Audio Pinknoise Off OK
2040	Audio Beep tone On OK
2041	Audio Beep tone On DAC fail
2100	Audio Sine On OK
2101	Audio Sine On DAC fail
2120	Audio Sine Burst OK
2121	Audio Sine Burst DAC fail
6600	DAC I2C OK
6601	DAC I2C Bus busy
6602	DAC I2C expander
6603	DAC I2C DAC 4362
6620	DAC I2C enable OK
6640	DAC I2C disable OK
6700	DAC Clk internal OK
6701	DAC Clk internal I2C bus busy
6702	DAC Clk internal I2C failed
6720	DAC Clk external OK
6721	DAC Clk external I2Cbus busy
6722	DAC Clk external I2C failed
6800	DAC Audio pre-mute On OK
6801	DAC Audio pre-mute On I2C bus busy
6802	DAC Audio pre-mute On I2C failed
6820	DAC Audio pre-mute Off OK
6821	DAC Audio pre-mute Off I2C bus busy
6822	DAC Audio pre-mute Off I2C failed
6900	DAC Center On OK
6901	DAC Center On I2C bus busy
6902	DAC Center On I2C failed
6920	DAC Center Off OK
6921	DAC Center Off I2C bus busy
6922	DAC Center Off I2C failed
7900	DAC Reset OK
7901	DAC Reset I2C bus busy
7902	DAC Reset I2C expander
8000	DAC Mode CDDA OK
8001	DAC Mode CDDA I2C bus busy
8002	DAC Mode CDDA I2C failed
8020	DAC Mode DVD48 OK
8021	DAC Mode DVD48 I2C bus busy
8022	DAC Mode DVD48 I2C failed
8040	DAC Mode DVD96 OK
8041	DAC Mode DVD96 I2C bus busy
8042	DAC Mode DVD96 I2C failed

Error code	Error text
8060	DAC Mode DSD OK
8061	DAC Mode DSD I2C bus busy
8062	DAC Mode DSD I2C failed
8100	DAC Low Power Standby On OK
8101	DAC Low Power Standby On I2C bus busy
8102	DAC Low Power Standby On I2C failed
8120	DAC Low Power Standby Off OK
8121	DAC Low Power Standby Off I2C bus busy
8122	DAC Low Power Standby Off I2C failed
8200	DAC Upsample 192k OK
8201	DAC Upsample 192k I2C bus busy
8202	DAC Upsample 192k I2C failed
8220	DAC Upsample 96k OK
8221	DAC Upsample 96k I2C bus busy
8222	DAC Upsample 96k I2C failed
8240	DAC UpSample On OK
8241	DAC UpSample On bus busy
8242	DAC UpSample On I2C failed
8260	DAC UpSample Off OK
8261	DAC UpSample Off bus busy
8262	DAC UpSample Off I2C failed

### 5.8.2 Basic Engine Nuclei

Error code	Error text
3900	Test successful
3901	"Parity error from Basic Engine to Serial"
3902	"Unexpected response from Basic Engine"
3903	"Communication time-out error"
3904	"Basic Engine returned error number 0xXX"
3921	"Parity error from Basic Engine to Serial"
3922	"Unexpected response from Basic Engine"
3923	"Communication time-out error"
3924	"Basic Engine returned error number 0xXX"
3800	Test successful
3801	"Parity error from Basic Engine to Serial"
3802	"Unexpected response from Basic Engine"
3803	"Communication time-out error"
3804	"Basic Engine returned error number 0xXX"
3805	"Focus loop could not be closed"
3820	Test successful
3821	"Parity error from Basic Engine to Serial"
3822	"Unexpected response from Basic Engine"
3823	"Communication time-out error"
3824	"Basic Engine returned error number 0xXX"
4200	Test successful
4201	"Parity error from Basic Engine to Serial"
4202	"Unexpected response from Basic Engine"
4203	"Communication time-out error"
4204	"Basic Engine returned error number 0xXX"
4205	"Sledge could not be moved to home position"
4206	"Focus loop could not be closed"
4207	"Motor not on speed within time-out"
4208	"Radial loop could not be closed"
4209	"PLL could not lock in accessing or tracking state"

Error code	Error text
4210	"Subcode or sector information could not be read"
4211	"Requested subcode item could not be found"
4212	"TOC could not be read in time"
4213	"Seek could not be performed"
4220	Test successful
4221	"Parity error from Basic Engine to Serial"
4222	"Unexpected response from Basic Engine"
4223	"Communication time-out error"
4224	"Basic Engine returned error number 0xXX"
4225	"Sledge could not be moved to home position"
4226	"Focus loop could not be closed"
4227	"Motor not on speed within time-out"
4228	"Radial loop could not be closed"
4229	"PLL could not lock in accessing or tracking state"
4230	"Subcode or sector information could not be read"
4231	"Requested subcode item could not be found"
4232	"TOC could not be read in time"
4233	"Seek could not be performed"
4240	Test successful
4241	"Parity error from Basic Engine to Serial"
4242	"Unexpected response from Basic Engine"
4243	"Communication time-out error"
4244	"Basic Engine returned error number 0xXX"
4245	"Sledge could not be moved to home position"
4246	"Focus loop could not be closed"
4247	"Motor not on speed within time-out"
4248	"Radial loop could not be closed"
4249	"PLL could not lock in accessing or tracking state"
4250	"Subcode or sector information could not be read"
4251	"Requested subcode item could not be found"
4252	"TOC could not be read in time"
4253	"Seek could not be performed"
4000	Test successful
4001	"Parity error from Basic Engine to Serial"
4002	"Unexpected response from Basic Engine"
4003	"Communication time-out error"
4004	"Basic Engine returned error number 0xXX"
4005	"Radial loop could not be closed"
4020	Test successful
4021	"Parity error from Basic Engine to Serial"
4022	"Unexpected response from Basic Engine"
4023	"Communication time-out error"
4024	"Basic Engine returned error number 0xXX"
4400	Test successful
4401	Test successful
4100	Test successful
4101	"Parity error from Basic Engine to Serial"
4102	"Unexpected response from Basic Engine"
4103	"Communication time-out error"

Error code	Error text
4104	"Basic Engine returned error number XX"
4120	Test successful
4121	"Parity error from Basic Engine to Serial"
4122	"Unexpected response from Basic Engine"
4123	"Communication time-out error"
4124	"Basic Engine returned error number XX"
4300	Test successful
4301	"Parity error from Basic Engine to Serial"
4302	"Unexpected response from Basic Engine"
4303	"Communication time-out error"
4304	"Basic Engine returned error number 0xXX"
4320	Test successful
4321	"Parity error from Basic Engine to Serial"
4322	"Unexpected response from Basic Engine"
4323	"Communication time-out error"
4324	"Basic Engine returned error number 0xXX"
3700	"Version: X.Y.Z"
3701	"Parity error from Basic Engine to Serial"
3702	"Unexpected response from Basic Engine"
3703	"Communication time-out error"
3704	"Basic Engine returned error number 0xXX"
5800	Test successful
5820	Test successful
5840	Test successful
5860	Test successful
5801	"Unexpected response from Basic Engine"
7000	"Manuf. ID: <XX>" "Device ID: <YY>"
7001	"Comm Test Failed"
7002	"Load Cmd Failed"
7003	"Load Dat Failed"
7004	"Run Cmd Failed"
7100	"ROM Checksum: XXXX"
7101	"Comm Test Failed"
7102	"Load Cmd Failed"
7103	"Load Dat Failed"
7104	"Run Cmd Failed"
7201	"Comm Test Failed"
7200	"Test successful"
7202	"Load Cmd Failed"
7203	"Load Dat Failed"
7204	"Run Cmd Failed"
7205	"Scratch circuit not OK"

### 5.8.3 Display PWB Nuclei

Error code	Error text
3000	"Test successful"
3001	"Disp not responding"
3002	"Disp key no response"
3003	"One or more patterns not correct"
3004	"Disp type invalid"
3020	"Test successful"
3021	"Disp not responding"
3022	"Disp key no response"
3023	"One or more patterns not correct"
3040	"Test successful"

Error code	Error text
3041	"Disp not responding"
3042	"Disp key no response"
3043	"One or more patterns not correct"
2700	"Model name in wich the test is running"
2701	"Disp key no response"
2702	"Disp not responding"
2707	"Stop key not pressed"
2708	"Pause key not pressed"
2709	"Play key not pressed"
2710	"Open/close key not pressed"
2713	"Previous key not pressed"
2714	"Next key not pressed"
2715	"More than one key not pressed"
2716	" Audio key not pressed"
2900	"Test successful"
2901	"Slave not responding"
2902	"Slave keyboard not responding"
2903	"Standby led not working"
2800	"Test successful"
2801	"Slave display controller not responding"
2802	"Slave keyboard not responding"
2803	"No key press received from remote control"
2600	"The ROM version of the slave processor = 0xXX, and the internal ID = 0xYY"
2601	"I2c bus busy"
2602	"I2c bus not working"
6000	P50 test
6001	"No readback on P50"
6002	"Disp not responding "
6003	"P50 readback error"

### 5.8.4 Processor & Peripherals Nuclei

Error code	Error text
700	Test successful
720	Test successful
740	Test successful
600	"All checksums are correct"
601	"Following checksum is faulty: BootCode1 Checksum is 0xY2 and is not correct (must be 0xZ2)"
601	"This test is not available when stand-alone compiled"
6200	"Checksums = 0xA1, 0xB1, 0xC1, 0xD1"
6201	"This test is not available when stand-alone compiled"
1000	Test successful
1001	Test successful
1020	Test successful
1021	Test successful
1100	Test successful

Error code	Error text
1104	"NVRAM reply time-out"
1200	Test successful
1202	"Slave bus not working"
1203	"Slave controller not responding"
1204	"Slave response is not correct"
5900	Test successful
5901	"I2c bus busy"
5902	"I2c bus not working"
5904	"DTS chip response not correct"
1300	Test successful
1301	"Parity error from basic engine to serial"
1302	"Parity error from serial to basic engine"
1303	"No communication between serial and basic engine"
1304	"Communication time-out error"
1600	Test successful
1601	"The DVD SDRAM is faulty"

### 5.8.5 Log Nuclei

Error code	Error text
3100	"Show error log"
3101	"Error log is invalid"
3102	"Error log could not be read from NVRAM"
3103	"I2C bus busy before start"
3200	"Show error bit"
3201	"Error log is invalid"
3202	"I2C bus busy before start"
3203	"Error log could not be read from NVRAM"
3300	"Error log is cleared"
3301	"Error log could not be cleared"
3302	"I2C bus busy before start"

### 5.8.6 Miscellaneous Nuclei

Error code	Error text
3400	Test successful
3401	"The configuration data could not be read from NVRAM"
3402	"I2C bus busy before start"
3500	"NVRAM is cleared"
3501	"The NVRAM could not be reset."
3502	"I2C bus busy before start"
3600	"NVRAM contents updated."
	"NVRAM contents and configuration checksum updated."
3601	"NVRAM contents could not be updated."
3602	"I2C bus busy before start"
3603	"NVRAM contents could not be read"
3604	"NVRAM not accessible."
3605	"NVRAM checksum could not be updated."

Error code	Error text
1500	Test successful
1502	"NVRAM access time-out"
1504	"NVRAM fails"
5400	Test successful
5401	"I2c bus busy"
5402	"I2c bus not working"
5403	"Scart switch controller not responding"
5404	"Scart switch controller response not correct"
5500	Test successful
5501	"I2c bus busy"
5502	"I2c bus not working"
5520	Test successful
5521	"I2c bus busy"
5522	"I2c bus not working"
5523	"Scart switch controller not responding"
5200	Test successful
5201	"I2c bus busy"
5202	"I2c bus not working"
5300	Test successful
5301	"I2c bus busy"
5302	"I2c bus not working"
5320	Test successful
5321	"I2c bus busy"
5322	"I2c bus not working"
4700	"Number of times Tray went Open : XX"
4701	The total number of times tray went open could not be read from NVRAM.
4702	I2C bus busy before start
4720	"Total Power On time (minutes) : XX"
4721	The total power-on time could not be read from NVRAM.
4722	I2C bus busy before start
4740	"Total CDDA & VCD disks Play-time (minutes) : XX"
4741	The playtime of CDDA & VCD disks could not be read from NVRAM.
4742	I2C bus busy before start
4760	"Total DVD disks Play-time (minutes) : XX"
4761	The playtime of DVD disks could not be read from NVRAM.
4762	I2C bus busy before start
4600	"Version of Application Software : XX"
4601	"The application version could not be read from NVRAM."
4602	"I2C bus busy before start"

### 5.8.7 Video Nuclei

Error code	Error text
1700	Video digital port OK
1701	Video digital port failed
1720	Pscan IO exp OK
1721	Pscan IO exp com failed
2300	Video colourbar On OK

Error code	Error text
2301	Color Denc On transmit error
2302	I2C Color Denc On bus busy
2320	Video colourbar Off OK
2340	Video colourbar On NTSC OK
2400	ADV7300 com OK
2401	I2C ADV7300 com bus busy
2402	ADV7300 com transit error
2403	No ack from ADV7300 com
2404	ADV7300 com response error
2420	FLI2200 com OK
2421	I2C FLI2200 com bus busy
2422	FLI2200 com transmit error
2423	No ack from FLI2200 com
2424	FLI2200 com response error
2460	Proscan com OK
2440	ADV7190 com OK
2441	I2C ADV7190 com bus busy
2442	ADV7190 com transmit error
2443	No ack from ADV7190 com
2444	ADV7190 com response response
2500	Video scart Low OK
2501	I2C Scart Low bus busy
2502	Scart Low transmit error
2520	Video scart Mid OK
2521	I2C Scart Mid bus busy
2522	Scart Mid transmit error
2540	Video scart High OK
2541	I2C Scart High bus busy
2542	Scart High transmit error
6100	Video colour RGB OK
6120	Video colour YUV OK

### 5.8.8 Furore Nuclei

Error code	Error text
6300	Furore Sdram WRR_L OK
6301	Furore Sdram WRR_L DB fail
6302	Furore Sdram WRR_L AB fail
6303	Furore Sdram WRR_L DVC fail
6320	Furore Sdram WRR_H OK
6321	Furore Sdram WRR_H DB fail
6322	Furore Sdram WRR_H AB fail
6323	Furore Sdram WRR_H DVC fail
6400	Furore Sdram WRR_F_L OK
6401	Furore Sdram WRR_F_L DB fail
6402	Furore Sdram WRR_F_L AB fail
6403	Furore Sdram WRR_F_L DVC fail
6420	Furore Sdram WRR_F_H OK
6421	Furore Sdram WRR_F_H DB fail
6422	Furore Sdram WRR_F_H AB fail
6423	Furore Sdram WRR_F_H DVC fail
6500	Furore ID OK
6501	Furore ID invalid
8300	Furore reset OK
8301	Furore reset ID NOK
8400	Furore High OK
8420	Furore Low OK

## 5.9 Test Instruction Front Display and Audio/Video Board

These test instruction is designed specifically for SACD 2002 single disc models which has the following outputs:

- 6 Channel Audio output
- Coaxial / Optical digital output
- CVBS
- Component output YUV
- SVHS
- Double SCART output
- Front Display

### 5.9.1 General

- All the waveforms measurement carried out in these test instruction will be base on the testpoint indicated in the A/V Board and Front Display schematic diagram in the Service manual.
- Impedance of the measuring-equipment should be > 1M $\Omega$
- Most of the tests can be done using either the Diagnostic software "Player script" which can be found in the chapter "Diagnostic Software description and troubleshooting" or the Menu interface using the Service PC with a terminal emulation program ( e.g. Window Hyperterminal ) where it is possible to control the execution of the Diagnostic Nuclei
- Setup for the measurement will be done in set level with all modules connected as shown in the Wiring Block diagram.

### 5.9.2 General Start-Up Measurement

#### Supply Check:

Before starting the measurement,ensure that all power supply are connected to the A/V and Front Display board via conn.1420 and 1108 respectively.

Pin nr.	A/V Board	Front Display
Voltage	Conn. 1420	Conn. 1108
1	+3V3_Power	-
2	+3V3_Power	-
3	GND	-
4	+12V_Power	-
5	+12VSTBY	-
6	GND	+5VSTBY
7	+5VSTBY	+12V_Power
8	GND	-32V_Power
9	-12V_Power	-
10	GND	-
11	-32V_Power	-
12		-

#### Clock Check

Ensure the present of the clock to the DAC and the slave  $\mu$ P.

Clock Name	Testpoint	Frequency
PCM_CLK	I116	11.2896MHz $\pm$ 0.02% tolerance
XOUT	S1	8MHz $\pm$ 0.2% tolerance

#### Audio Mute Check

Measure the Audio mute voltage input at pin 22 of connector 1421

Status	Value
AudioMuteOn	HIGH (>3V)
AudioMuteOff	LOW (<3V)

To toggle between ON and OFF,use the following commands:

Ref.#	Command Name	Remarks
19a	AudioMuteOn	Audio Mute On
19b	AudioMuteOff	Audio Mute Off

### 5.9.3 Audio DAC And Amplifier

Ensure that the Audio mute signal is OFF

To check the DAC and buffer amplifier, send the following commands.

Ref.#	Command Name	Remarks	Audio output
21a	AudioSineOn	Audio Sine signal ON	Sine, 1KHz on stereo
----	Press stop button	Audio Sine signal OFF	No waveform
20a	AudioPinkNoiseOn	Audio Pinknoise ON	Pink Noise on 6 channels
20b	AudioPinkNoiseOff	Audio Pinknoise OFF	No waveform

The audio signal ( sine or pink noise ) will also be present on the digital output ( SPDIF ). This can be checked by connecting digital signal to an amplifier with digital input.

Check the I2S and audio signal at the following testpoints:

Name	Testpoint
PCM_LRCLK	I112
PCM_SCLK	I114
PCM_CLK	I116
SDT1	I110
SDT2	I106
SDT3	I102
DIG_OUT	I629
STEREO L/R OUT	I510 / I520
FRONT L/R OUT	I552 / I524
SURROUND L/R OUT	I533 / I536
CENTRE OUT	I530
SUB WOOFER L/R OUT	I527

All waveforms can be referred to the A/V board schematic diagram.

### 5.9.4 Video Output And Buffer Amplifier

Check DC output-level at all video cinch output : 1.0V DC  $\pm$  10%

Generate a color bar using the following software commands:

Ref.#	Command Name	Remarks
23a	VideoColDencOn	Colour DENC ON
23b	VideoColDencOff	Colourbar DENC OFF

Check the video outputs at the following testpoints:

Name	Testpoint
GREEN_SCART	I601
BLUE_SCART	I600
RED_SCART	I602
CVBS out_Mono	I662
C_Mono	I675
Y_Mono	I667

All waveforms can be referred to the A/V board schematic diagram.

### 5.9.5 Play and 16/9 Detection

Check DC voltage at S-VIDEO-CHROMA output (pin 4) with a 6k8 ohm load and SCART connector 1403 (pin 16) and change the SCART0 and SCART1 input using the following commands:

Ref.#	Command Name	Remarks
25a	VideoScartLo	Sends out 0V $\pm$ 0.5V
25b	VideoScartMi	Sends out 6V $\pm$ 10%

Ref.#	Command Name	Remarks
25c	VideoScartHi	Sends out 12V $\pm$ 10%

### 5.9.6 Kill Circuit

To check the functionality of the Kill circuitry, the audio outputs has to be present by the following command:

Ref.#	Command Name	Remarks	Audio output
21a	AudioSineOn	Audio Sinewave ON	1kHz tone

Check the audio outputs at the audio cinch of the A/V and SCART board: 1kHz tone.

Activate the Kill circuit by using the following command:

Ref.#	Command Name	Remarks
19a	AudioMuteOn	Audio Mute On

Check the audio outputs at the audio L/R cinch and SCART of the A/V and SCART board respectively: No waveform  
Switch off the kill circuit by using the following command:

Ref.#	Command Name	Remarks
19b	AudioMuteOff	Audio Mute Off

Check the audio outputs at the audio L/R cinch and SCART of the A/V and SCART board: 1kHz tone

### 5.9.7 Digital Silence

Digital silence is a signal from the audio DAC7301 (MFL,MFR) and DAC7300 (MSR/MC), when there is no input to the audio DAC, or when the player is in STOP/PAUSE mode, or during disc changing track.

To check the MFL signal, use the following command and check the voltage level at pin 41 of 7200:

Ref.#	Command Name	Remarks	KILL_LR signal
21a	AudioSineOn	Audio Sinewave ON	LOW (<0.3V)
---	Press STOP button	Audio Sine signal OFF	HIGH (>4.5V)

### 5.9.8 Front Display

To check the segment display of the FTD, the following command can be used. And for full detail description of the test, refer to the chapter of "Diagnostic Software Player Script" which can be found in chapter "Diagnostic Software Description and Troubleshooting"

Ref.#	Command Name	Remarks
30a	DispDisplay	Turn ON local display

### 5.9.9 IR Receiver

Check at pin 22 of 7401 and observe if this line switches from LOW (<0.3V) to HIGH (>4.5V) when pressing a key on a philips RC5 or RC6 remote control

### 5.9.10 P50 Interface

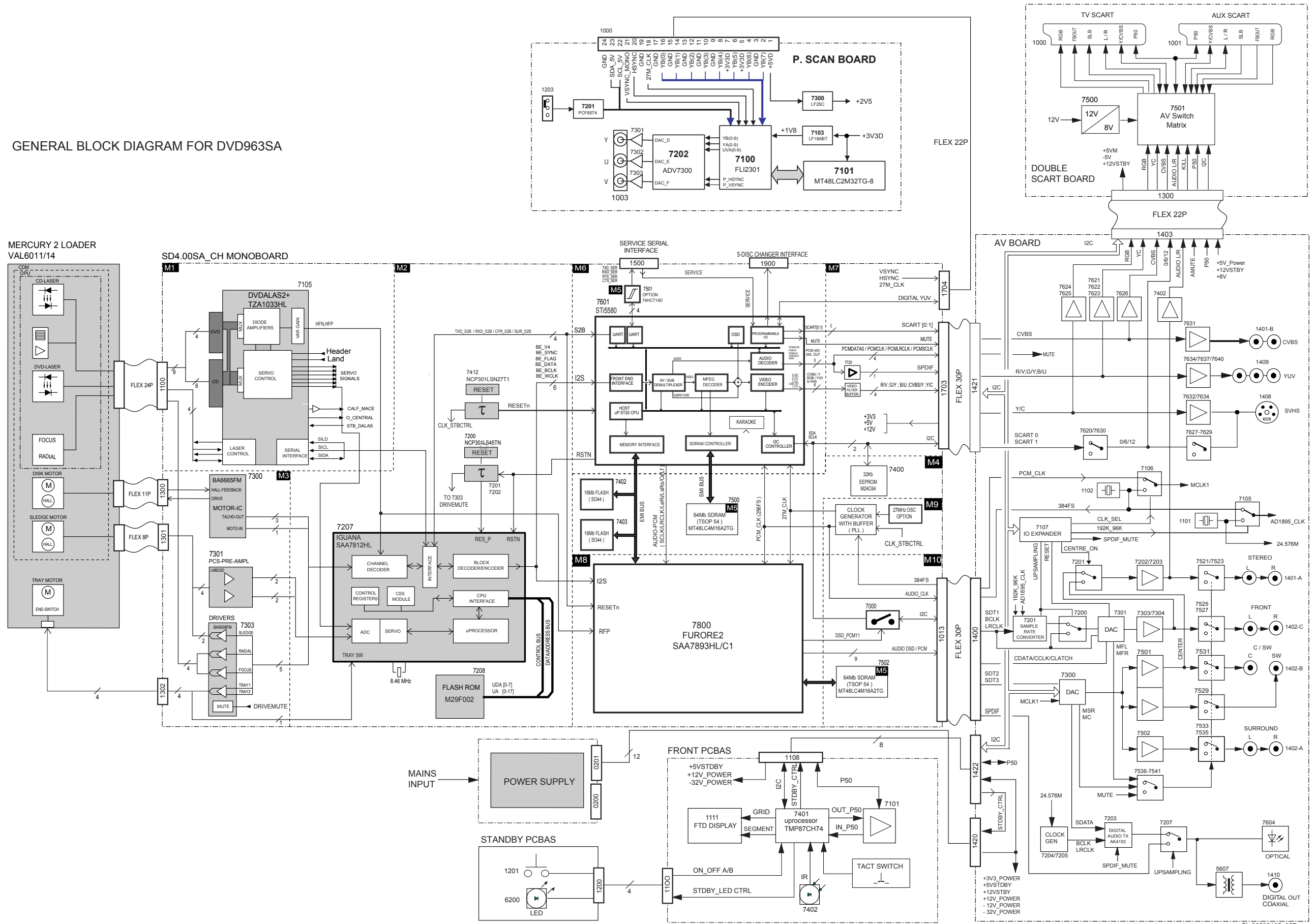
P50 (or Easylink) is a bi-directional serial interface for communication between video equipment. To check for the functionality of the P50 Interface, refer to the chapter of 'Diagnostic Software Player Script' for full detail description.



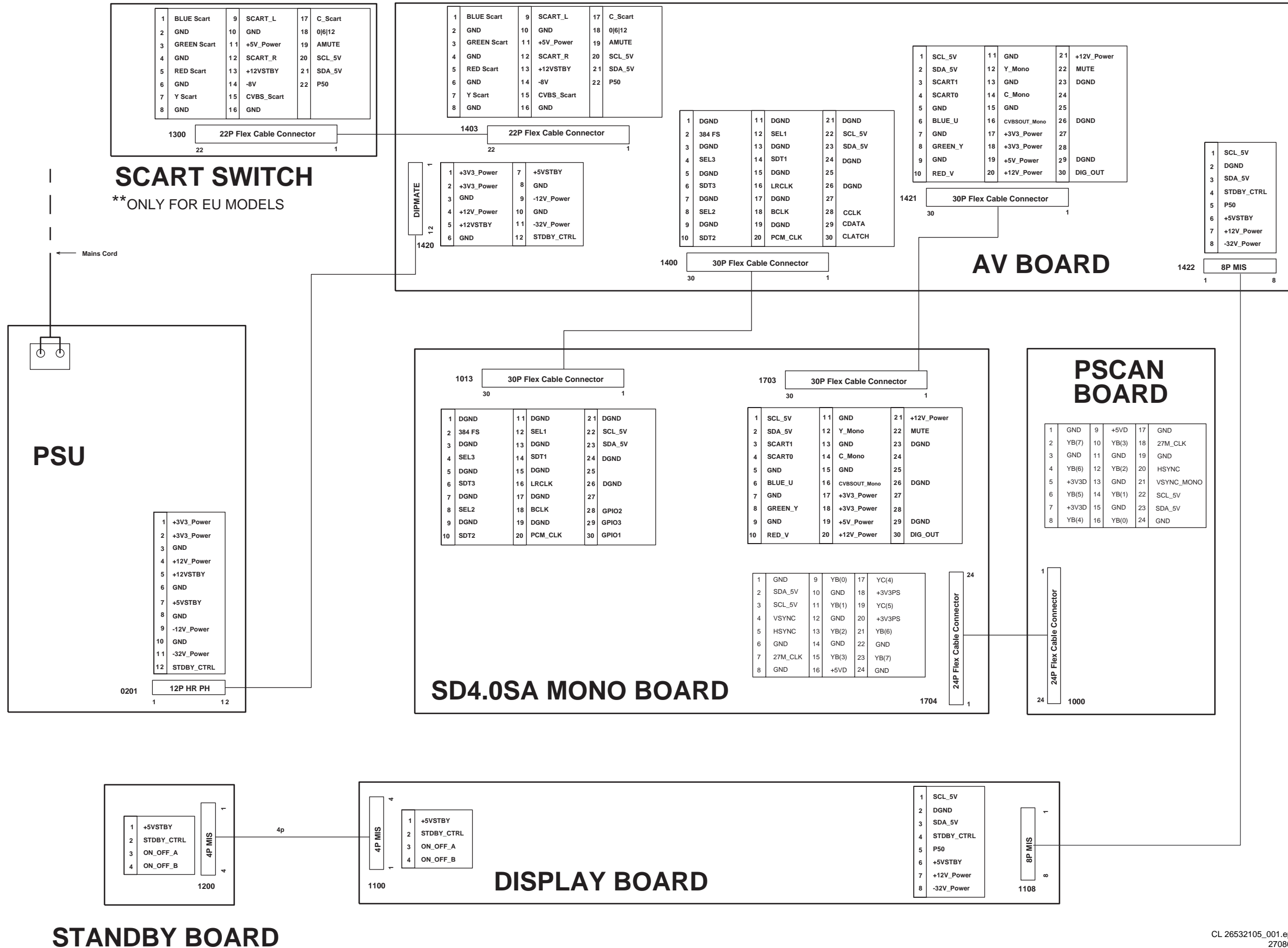
# 6. Block and Wiring Diagram.

## Block Diagram DVD963SA

GENERAL BLOCK DIAGRAM FOR DVD963SA

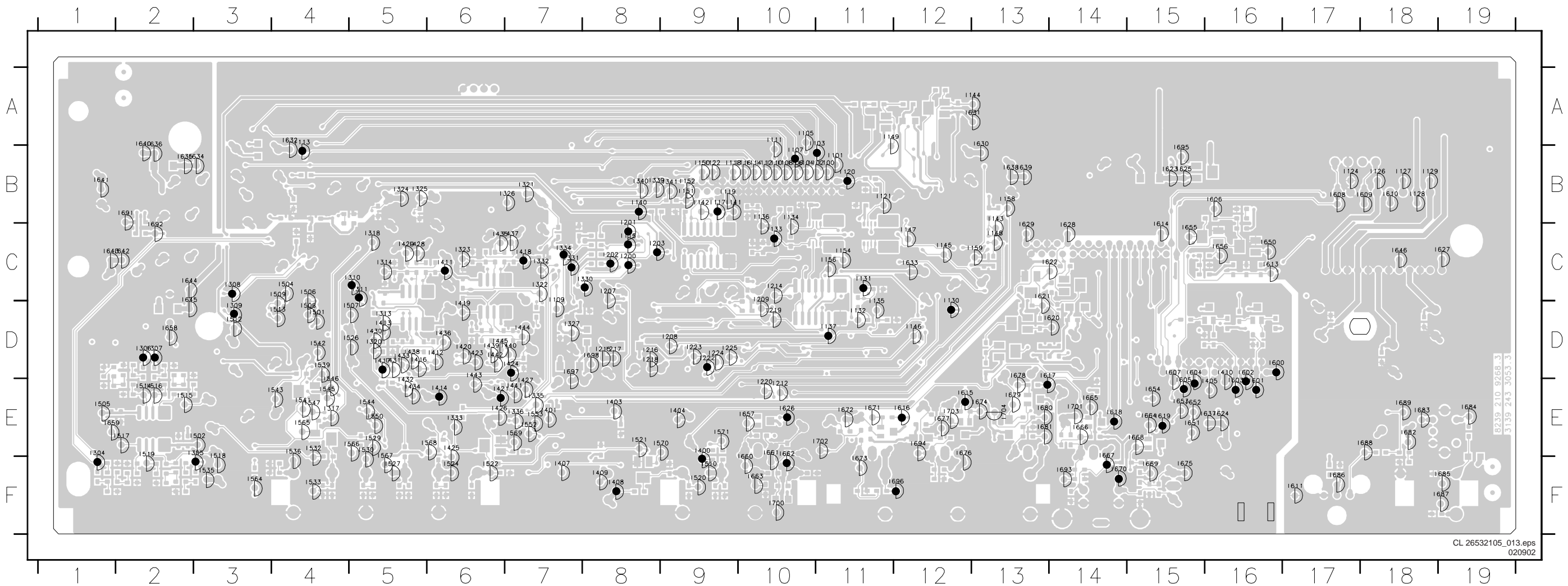


Wiring Diagram DVD963SA



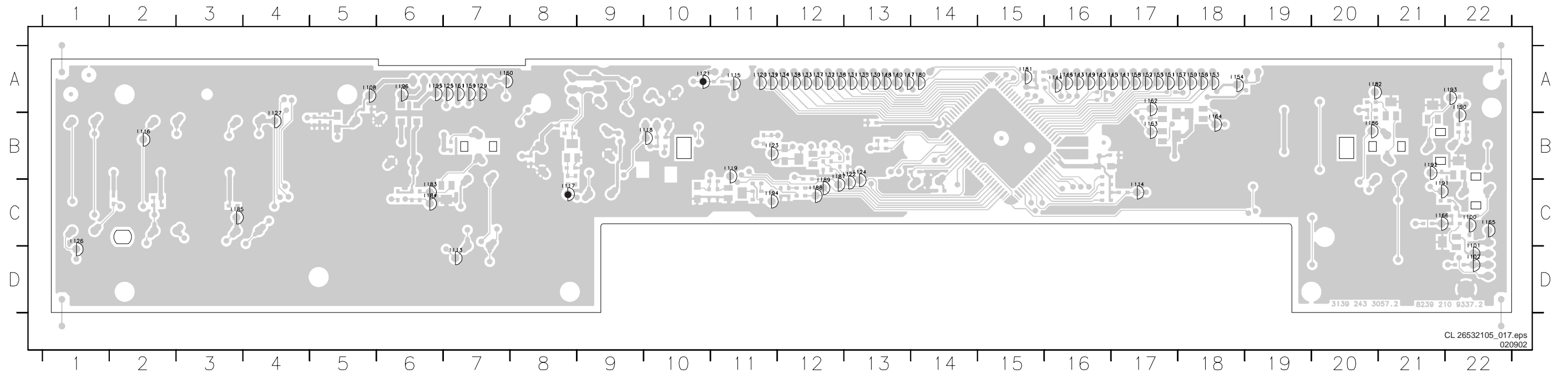
### Testpoint Overview A/V Board

I100	B11	I115	C8	I132	D11	I149	B11	I212	E10	I307	D2	I326	B7	I404	E9	I421	E6	I437	C7	I508	D4	I526	D5	I547	E4	I603	E16	I619	E15	I634	B3	I652	E15	I667	F14	I682	E18	I698	D8
I101	B11	I116	B10	I133	C10	I150	B9	I214	C10	I308	C3	I327	D7	I405	E16	I423	D6	I438	D5	I509	D4	I527	F5	I550	E5	I604	E15	I620	D14	I635	B2	I653	E15	I668	E15	I683	E18	I700	F10
I102	B10	I117	B9	I134	C10	I151	B9	I215	D8	I309	D3	I330	C8	I407	F7	I424	D7	I439	D6	I510	F9	I529	E5	I552	E7	I605	E15	I621	D13	I636	B2	I654	E15	I669	F15	I684	E19	I701	E14
I103	B11	I118	B9	I135	D11	I152	B9	I216	D8	I310	C5	I331	C7	I408	F8	I425	F6	I440	D7	I512	D3	I530	F5	I553	E7	I606	B16	I622	C14	I637	E16	I655	C15	I670	F14	I685	F19	I702	E11
I104	B10	I119	B9	I136	C10	I154	C11	I217	D8	I311	C5	I332	C7	I409	F8	I426	E6	I441	E7	I513	D4	I532	F4	I554	F3	I607	E15	I623	B15	I638	B13	I656	C16	I671	E11	I686	F17	I703	E12
I105	A10	I120	B11	I137	D11	I156	C11	I218	D8	I313	D5	I333	E6	I410	E16	I427	E7	I442	D6	I514	E2	I533	F4	I555	E4	I608	B17	I624	E16	I639	B13	I657	E10	I672	E11	I687	F19	I704	E13
I106	B10	I121	B11	I140	B8	I158	B13	I219	D10	I314	C5	I334	C7	I411	C6	I428	C5	I443	E6	I515	E2	I535	F3	I556	E5	I609	B18	I625	B15	I640	B2	I658	D2	I673	F11	I688	E18		
I107	B10	I122	B9	I141	B9	I159	C13	I220	E10	I317	E4	I335	E7	I412	D6	I429	C5	I444	D7	I516	E2	I536	F4	I557	F5	I610	B18	I626	E10	I641	B1	I659	E1	I674	E13	I689	E18		
I108	B10	I124	B17	I142	B9	I200	C8	I222	D9	I318	C5	I336	E7	I413	D5	I430	D5	I445	D6	I517	E2	I539	D4	I558	E6	I611	F17	I627	C19	I642	C2	I660	F10	I675	F15	I691	B2		
I109	D7	I126	B18	I143	C13	I201	C8	I223	D9	I320	D5	I339	B8	I414	E6	I431	D5	I501	D4	I518	F3	I541	E4	I569	E7	I613	C16	I628	C14	I643	C1	I661	F10	I676	F12	I692	C2		
I110	B10	I127	B18	I144	A13	I202	C8	I224	D9	I321	B7	I340	B8	I416	D5	I432	E5	I502	E3	I519	F2	I542	D4	I570	E9	I614	C15	I629	C13	I644	C2	I662	F10	I677	E12	I693	F14		
I111	B10	I128	B18	I145	C12	I203	C8	I225	D9	I322	C7	I341	B9	I417	D5	I433	D5	I504	C4	I520	F9	I543	E4	I571	E9	I615	E12	I630	B13	I645	D2	I663	F10	I678	E13	I694	E12		
I112	B10	I129	B18	I146	D12	I207	C8	I304	F1	I323	C6	I400	F9	I418	C7	I434	E5	I505	E1	I521	E8	I544	E5	I600	D16	I616	E12	I631	A13	I646	C18	I664	E15	I679	E13	I695	B15		
I113	B4	I130	D12	I147	C12	I208	D9	I305	F3	I324	B5	I401	E7	I419	D6	I435	C6	I506	D4	I522	F6	I545	E4	I601	E16	I617	E13	I632	B4	I650	C16	I665	E14	I680	E13	I696	F12		
I114	B10	I131	C11	I148	C13	I209	D10	I306	D2	I325	B5	I403	E8	I420	D6	I436	D6	I507	D5	I524	F6	I546	E4	I602	E16	I618	E14	I633	C12	I651	E15	I666	E14	I681	E13	I697	E7		



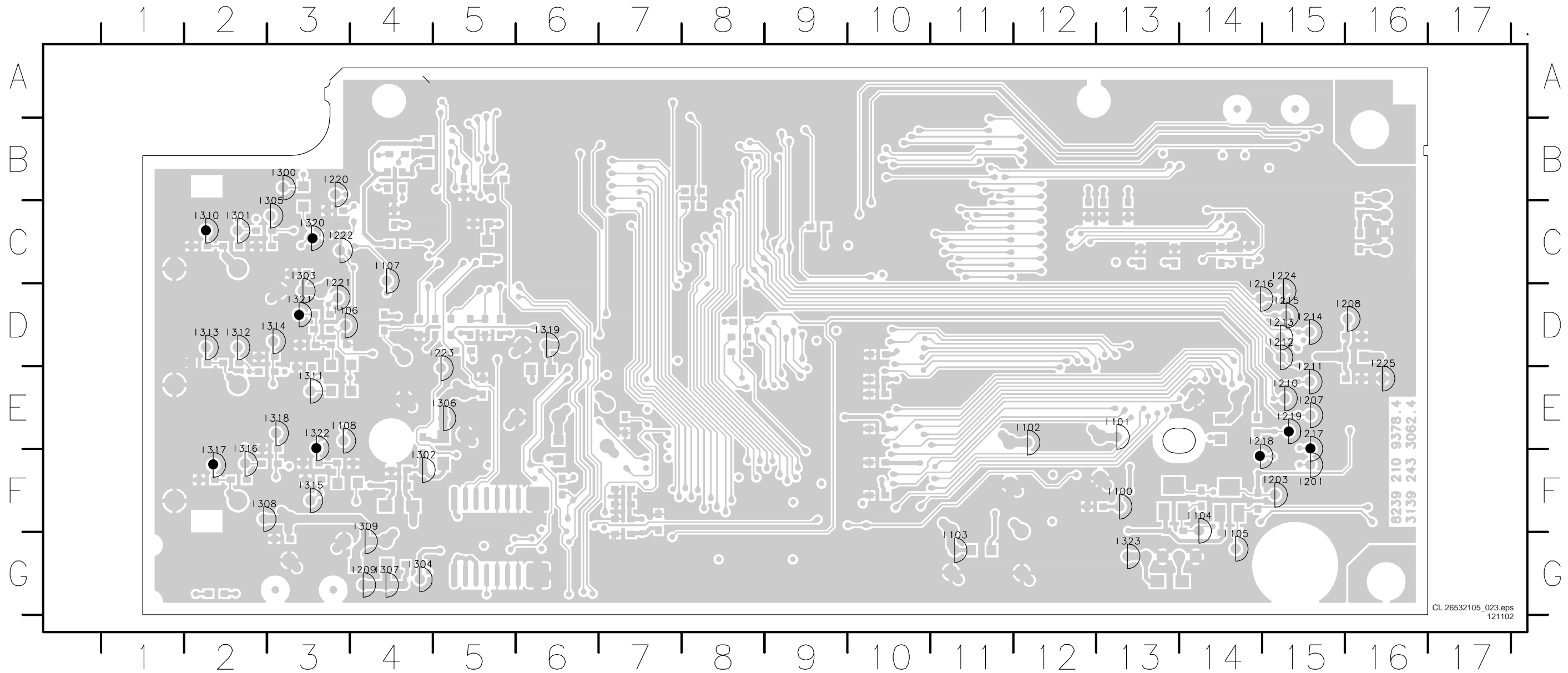
### Testpoint Overview Display Panel

I100	C22	I113	D7	I117	C8	I121	A10	I125	A7	I130	A13	I134	A12	I138	A12	I142	A16	I146	A16	I150	A18	I154	A18	I158	A17	I162	A17	I166	C21	I183	C6	I187	C12	I191	C21	I195	A6
I101	D22	I114	C17	I118	B10	I122	C13	I126	D1	I131	A13	I135	A13	I139	A11	I143	A16	I147	A13	I151	A17	I155	A17	I159	A7	I163	B17	I180	A14	I184	C6	I188	C12	I192	B21	I196	A6
I102	D22	I115	A11	I119	B11	I123	B11	I127	B4	I132	A12	I136	A12	I140	A13	I144	A16	I148	A13	I152	A17	I156	A18	I160	A7	I164	B18	I181	A15	I185	C3	I189	C12	I193	A22		
I108	A5	I116	B2	I120	A11	I124	C13	I129	A7	I133	A12	I137	A12	I141	A17	I145	A16	I149	A16	I153	A18	I157	A18	I161	A7	I165	C22	I182	A20	I186	B20	I190	B22	I194	C11		



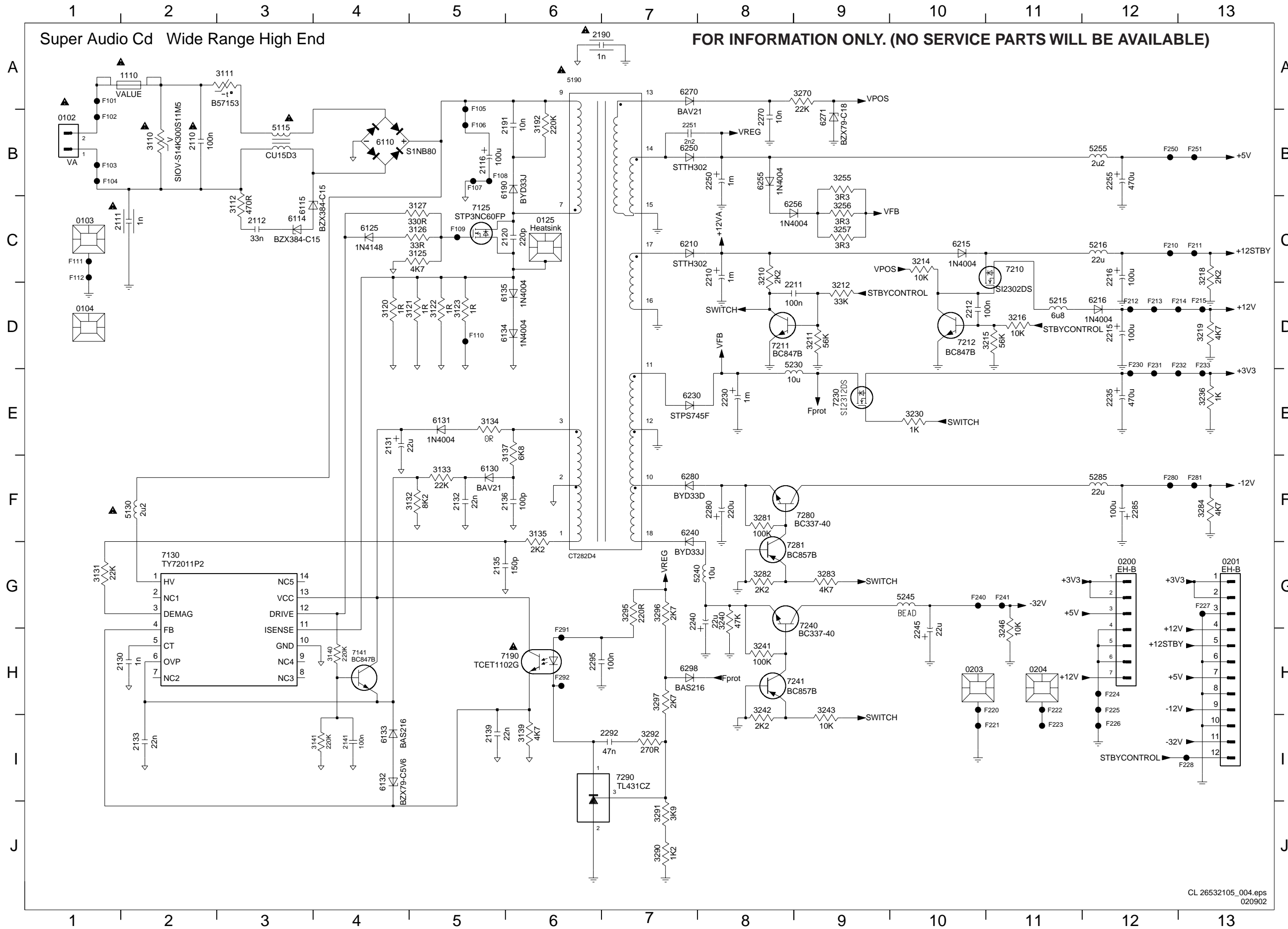
### Testpoint OverviewP-Scan Board

I100 F13	I103 G11	I106 D3	I201 F15	I208 D16	I211 E15	I214 D15	I217 E15	I220 B3	I223 E5	I300 B3	I303 D3	I306 E5	I309 G4	I312 D2	I315 F3	I318 E3	I321 D3
I101 E13	I104 F14	I107 C4	I203 F15	I209 G4	I212 D15	I215 D15	I218 F14	I221 D3	I224 D15	I301 C2	I304 G4	I307 G4	I310 C2	I313 D2	I316 F2	I319 D6	I322 E3
I102 E12	I105 G14	I108 E3	I207 E15	I210 E15	I213 D15	I216 D14	I219 E15	I222 C3	I225 E16	I302 F4	I305 C3	I308 F2	I311 E3	I314 D3	I317 F2	I320 C3	I323 G13



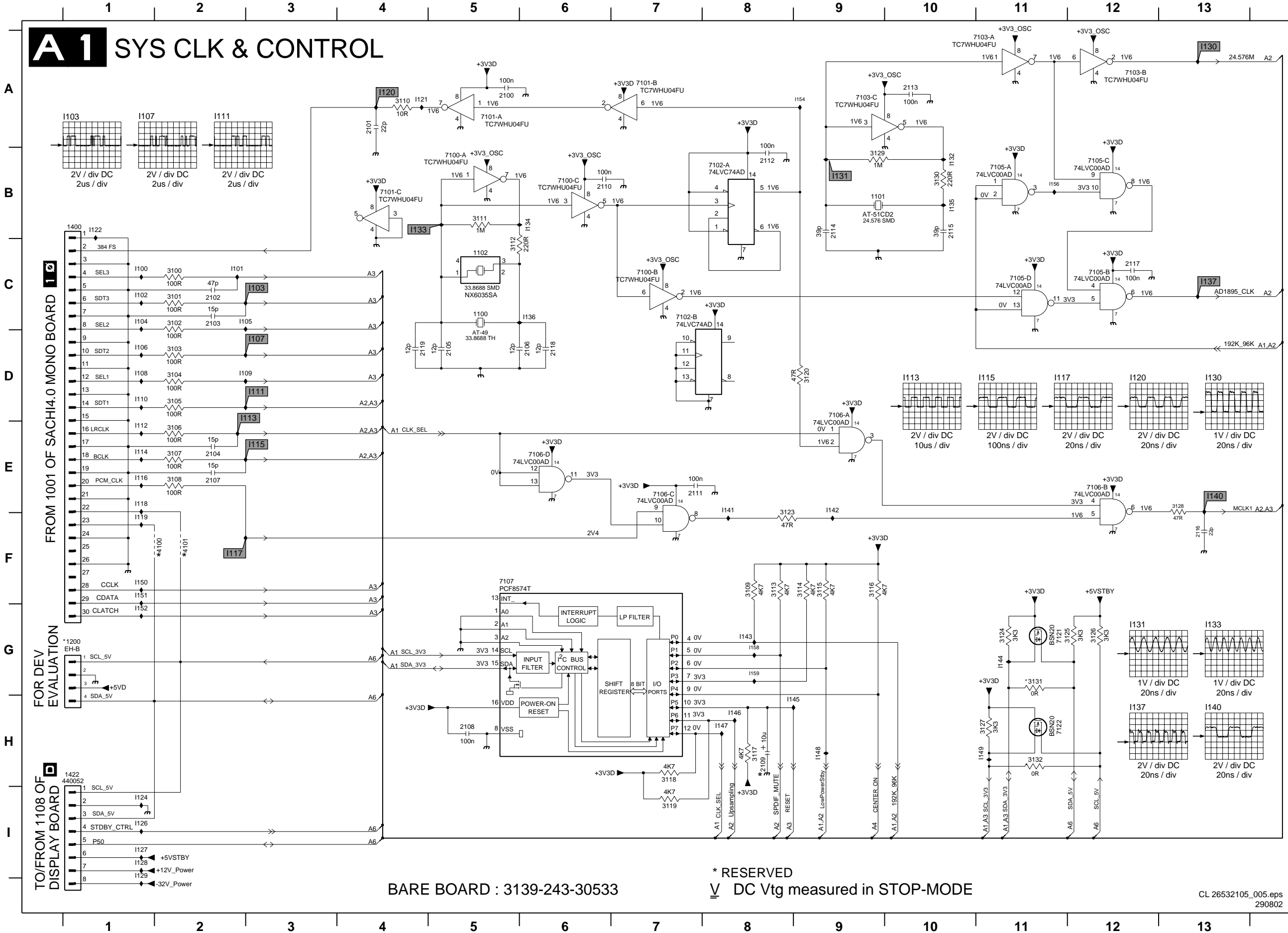
# 7. Electrical Diagrams

## Power Supply Unit DVD963SA



AV-Board: Clock & Control

**A1** SYS CLK & CONTROL

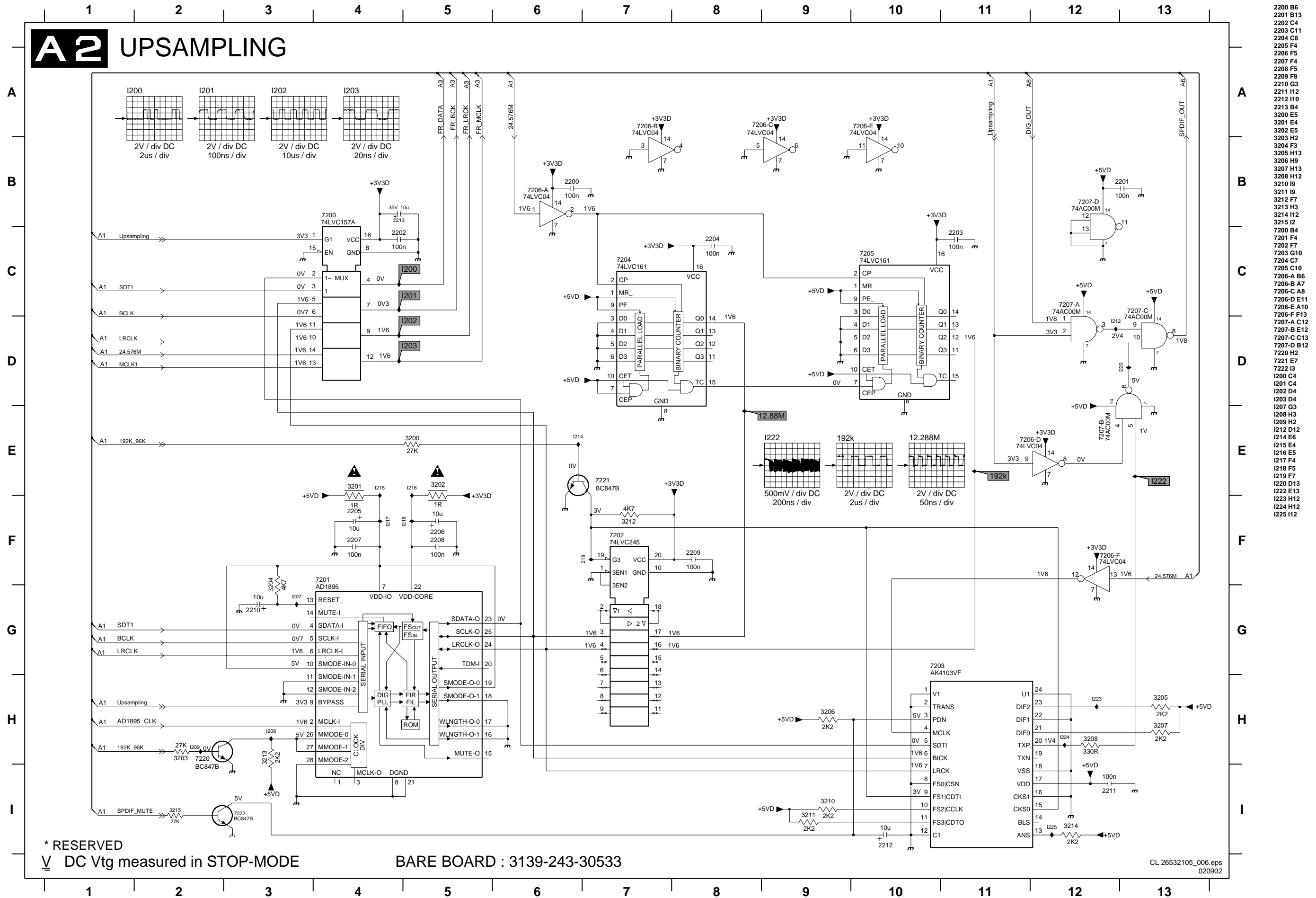


- 1100 C5
- 1101 B9
- 1102 C5
- 1200 G1
- 1400 B1
- 1403 G8
- 1422 H1
- 2100 A5
- 2101 A4
- 2102 C2
- 2103 C2
- 2104 E2
- 2105 D5
- 2106 D6
- 2107 E2
- 2108 H5
- 2109 H8
- 2110 B6
- 2111 E7
- 2112 B8
- 2113 A10
- 2114 B9
- 2115 B10
- 2116 F13
- 2117 C12
- 2118 D6
- 2119 D4
- 3100 C2
- 3101 C2
- 3102 C2
- 3103 D2
- 3104 D2
- 3105 D2
- 3106 E2
- 3107 E2
- 3108 E2
- 3109 F8
- 3110 A4
- 3111 B5
- 3112 C5
- 3113 F8
- 3114 F9
- 3115 F9
- 3116 F9
- 3117 H8
- 3118 H7
- 3119 I7
- 3120 D9
- 3123 F8
- 3124 G11
- 3125 G12
- 3126 G12
- 3127 H11
- 3128 E13
- 3129 B9
- 3130 B10
- 3131 G11
- 3132 H11
- 4100 F2
- 4101 F2
- 7100-A B5
- 7100-B C7
- 7100-C B6
- 7101-A A5
- 7101-B A7
- 7101-C B4
- 7102-A B8
- 7102-B C7
- 7103-A A10
- 7103-B A12
- 7103-C A9
- 7105-A B11
- 7105-B C12
- 7105-C B12
- 7105-D C11
- 7106-A D9
- 7106-B E12
- 7106-C E7
- 7106-D E6
- 7107 F5
- 7121 G11
- 7122 H11
- 1100 C1
- 1101 C2
- 1102 C1
- 1103 C2
- 1104 C1
- 1105 C2
- 1106 D1
- 1107 D2
- 1108 D1
- 1109 D2
- 1110 D1
- 1111 D2
- 1112 E1
- 1113 E2
- 1114 E1
- 1115 E2
- 1116 E1
- 1117 F2
- 1118 E1
- 1119 F1
- 1120 A4
- 1121 A4
- 1122 B1
- 1123 A1
- 1124 H1
- 1125 H1
- 1126 H1
- 1127 H1
- 1128 H1
- 1129 H1
- 1130 A13
- 1131 B9
- 1132 B10
- 1133 B5
- 1134 B6
- 1135 B10
- 1136 C6
- 1137 C13
- 1140 E13
- 1141 E8
- 1142 E9
- 1143 G8
- 1144 G11
- 1145 H8
- 1146 H8
- 1147 H8
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- 1152 G1
- 1154 A9
- 1156 B11
- 1158 G8
- 1159 G8

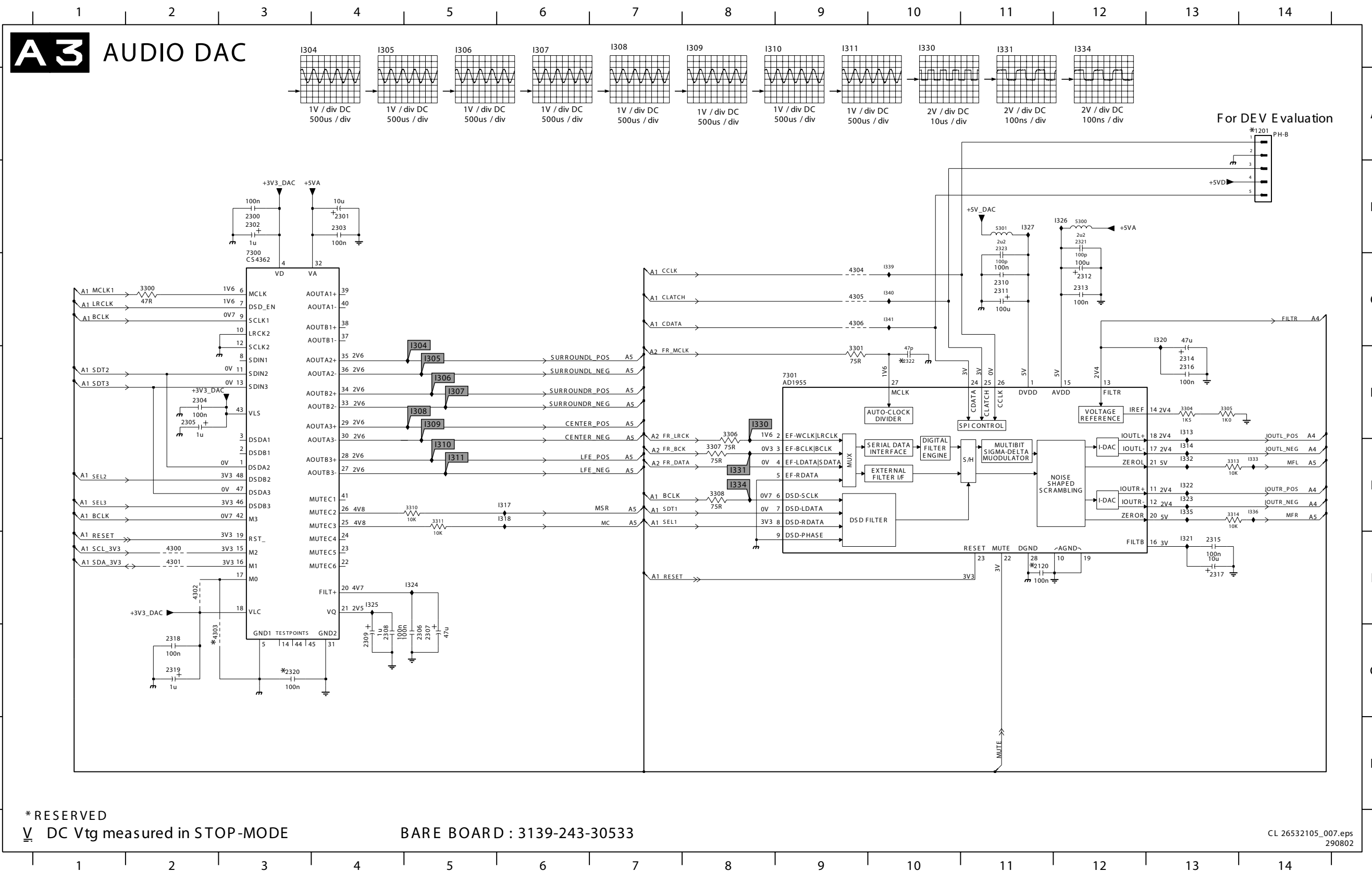
BARE BOARD : 3139-243-30533

\* RESERVED  
 V DC Vtg measured in STOP-MODE

AV-Board: Upsampling

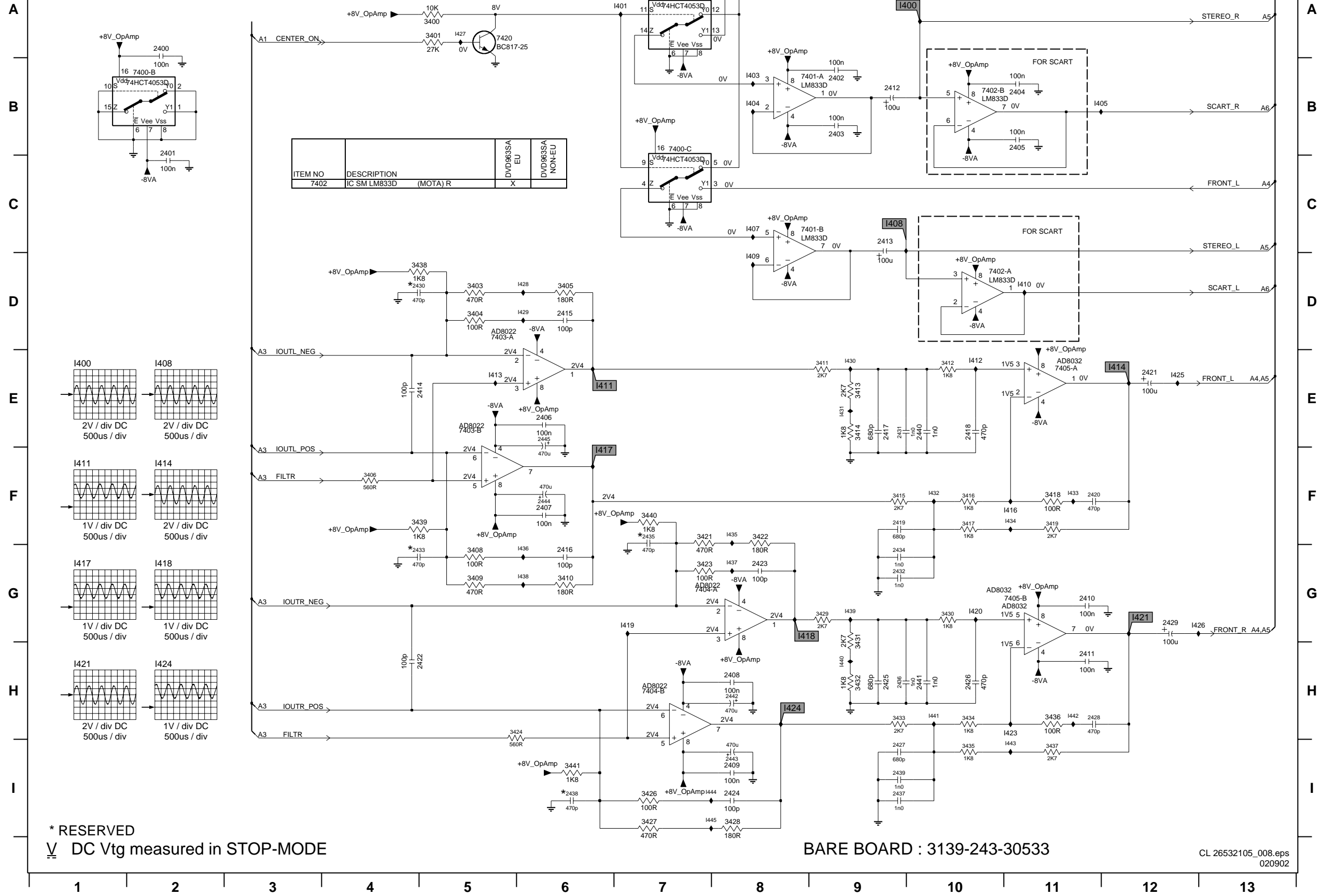


AV-Board: Audio DAC



AV-Board: Current to Voltage Converter

**A 4** Current to Voltage Converter

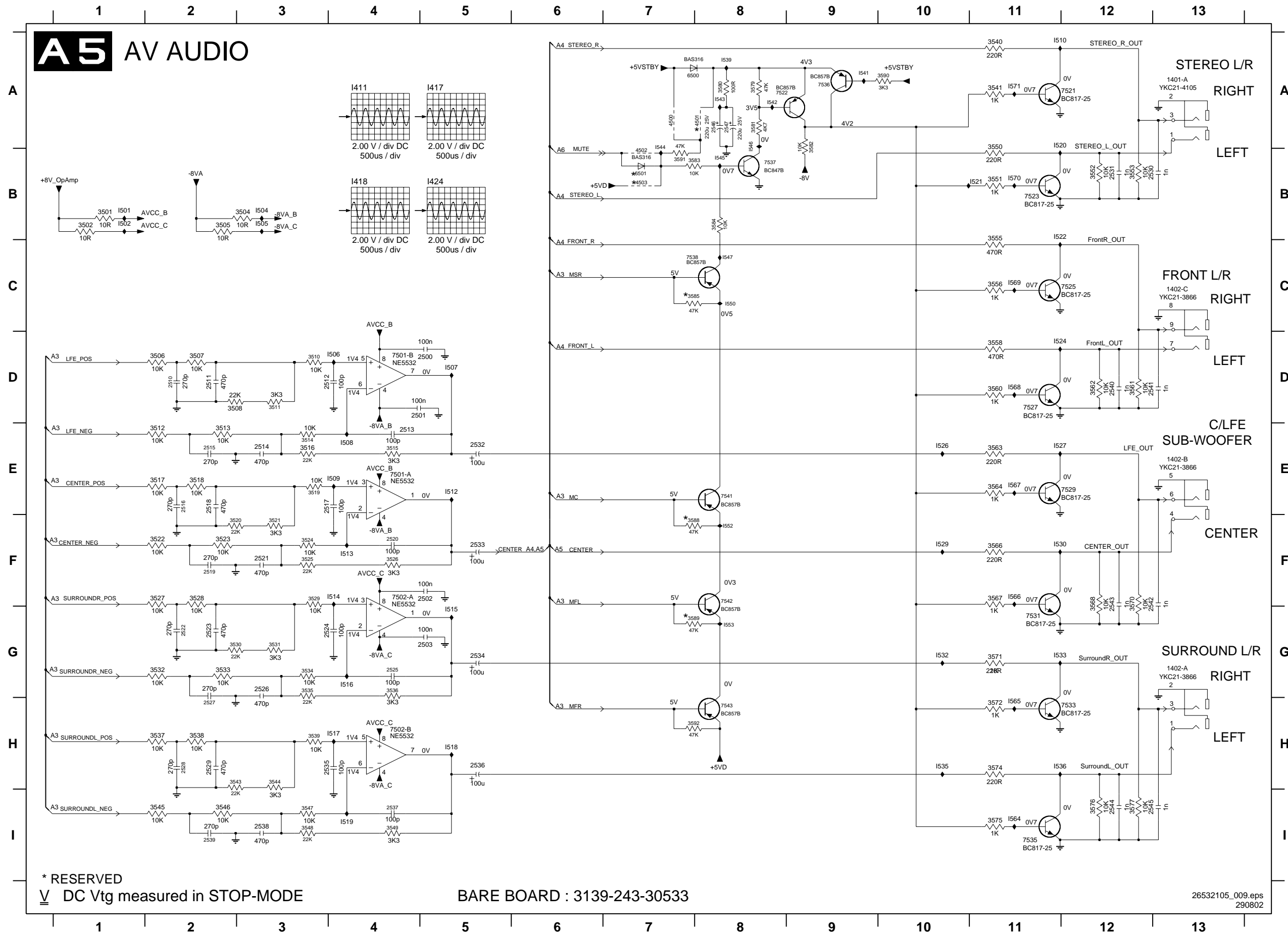


- 2400 A2
- 2401 C2
- 2402 B9
- 2403 B9
- 2404 B11
- 2405 B11
- 2406 E6
- 2407 F6
- 2408 H8
- 2409 I8
- 2410 G11
- 2411 H11
- 2412 B9
- 2413 C9
- 2414 E4
- 2415 D6
- 2416 G6
- 2417 E9
- 2418 E10
- 2419 F9
- 2420 F11
- 2421 E12
- 2422 H4
- 2423 G8
- 2424 I8
- 2425 H9
- 2426 H10
- 2427 I9
- 2428 H11
- 2429 G12
- 2430 D4
- 2431 E9
- 2432 G9
- 2433 G4
- 2434 G9
- 2435 F7
- 2436 H9
- 2437 I9
- 2438 I6
- 2439 I9
- 2440 E10
- 2441 H10
- 2442 H8
- 2443 I8
- 2444 F6
- 2445 F6
- 3400 A5
- 3401 A5
- 3403 D5
- 3404 D5
- 3405 D6
- 3406 F4
- 3408 G5
- 3409 G5
- 3410 G6
- 3411 E9
- 3412 E10
- 3413 E9
- 3414 E9
- 3415 F9
- 3416 F10
- 3417 F10
- 3418 F11
- 3421 F7
- 3422 F8
- 3423 G7
- 3424 H5
- 3426 I7
- 3427 I7
- 3428 I8
- 3429 G9
- 3430 G10
- 3431 G9
- 3432 H9
- 3433 H9
- 3434 H10
- 3435 I10
- 3436 H11
- 3437 I11
- 3438 D5
- 3439 F5
- 3440 F7
- 3441 I6
- 7400-A A7
- 7400-B B2
- 7400-C B7
- 7401-A B8
- 7401-B C8
- 7402-A D10
- 7402-B B10
- 7403-A D5
- 7403-B E5
- 7404-A G7
- 7404-B H7
- 7405-A E11
- 7405-B G11
- 7420 A5
- I400 A10
- I401 A7
- I403 B8
- I404 B8
- I405 B11
- I407 C8
- I408 C9
- I409 D8
- I410 D11
- I411 E6
- I412 E10
- I413 E5
- I414 E12
- I416 F11
- I417 F6
- I418 G8
- I419 G7
- I420 G10
- I421 G12
- I423 H11
- I424 H8
- I425 E12
- I426 G12
- I427 A5
- I428 D6
- I429 D6
- I430 E9
- I431 E9
- I432 F10
- I433 F11
- I434 F11
- I435 F8
- I436 G6
- I437 G8
- I438 G6
- I439 G9
- I440 H9
- I441 H10
- I442 H11
- I443 I7
- I444 I7
- I445 I7

\* RESERVED  
 V DC Vtg measured in STOP-MODE

BARE BOARD : 3139-243-30533

AV-Board: Audio

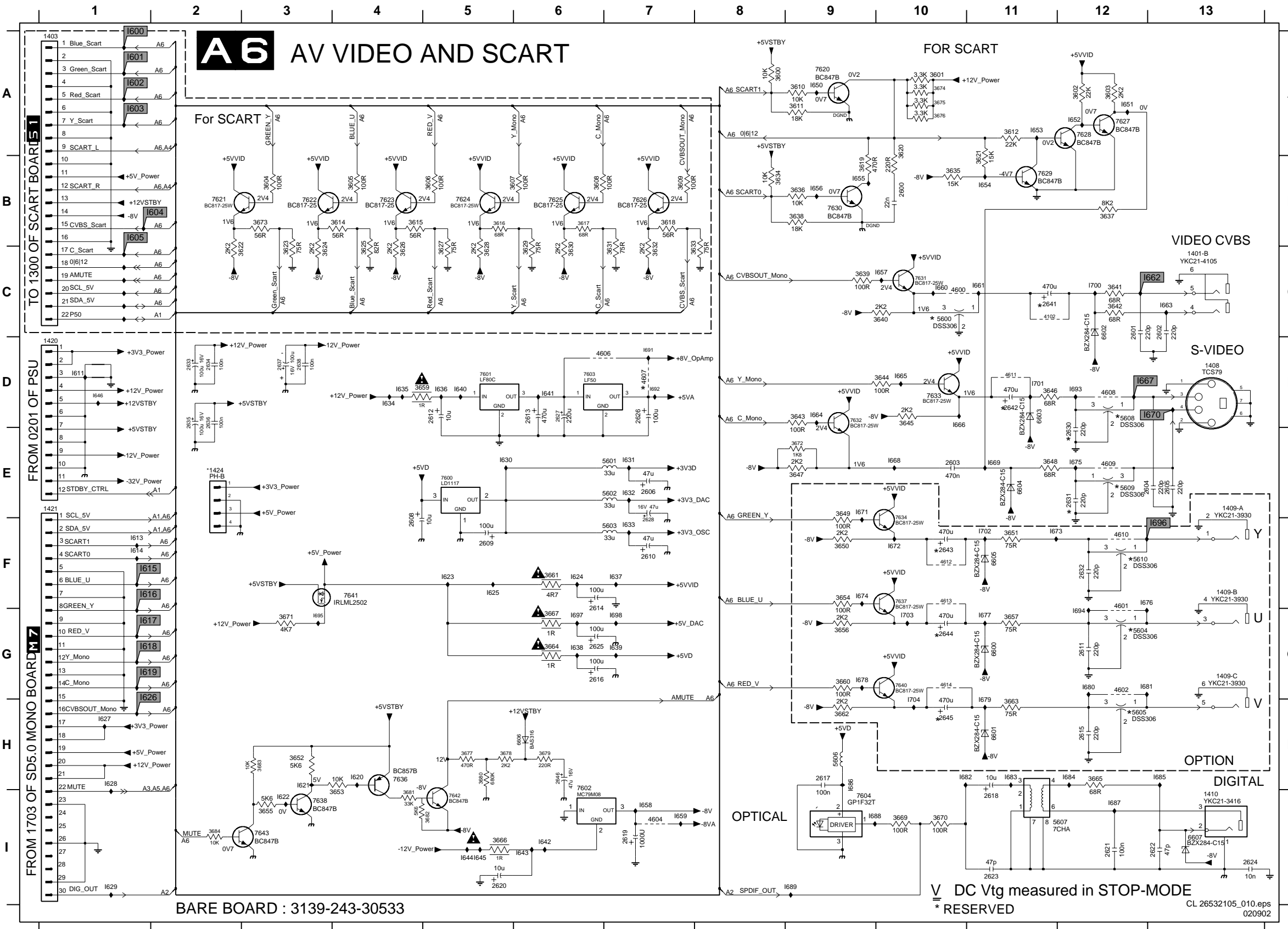


1401-A A13	3581 A8
1402-A G13	3582 A9
1402-B E13	3583 B7
1402-C C13	3584 B8
2500 D5	3585 C7
2501 D4	3588 F7
2502 F5	3589 G7
2503 G5	3590 A10
2510 D2	3591 B7
2511 D2	3592 H7
2512 D4	4500 A7
2513 E4	4501 A8
2514 E3	4502 B7
2515 E2	4503 B7
2516 E2	6500 A7
2517 E4	6501 B7
2518 E2	7501-A E4
2519 F2	7501-B D4
2520 F4	7502-A F4
2521 F3	7502-B H4
2522 G2	7521 A12
2523 G2	7522 A8
2524 G4	7523 B11
2525 G4	7525 C12
2526 G3	7527 D11
2527 H2	7529 E12
2528 H2	7531 G11
2529 H2	7533 H12
2530 B13	7535 I11
2531 B12	7536 A9
2532 E5	7537 B8
2533 F5	7538 C7
2534 G5	7541 E8
2535 H4	7542 F8
2536 H5	7543 H8
2537 I4	I501 B1
2538 I3	I502 B1
2539 I2	I504 B3
2540 D12	I505 B3
2541 D13	I506 D4
2542 F13	I507 D5
2543 F12	I508 E4
2544 I12	I509 E4
2545 I13	I510 A11
2546 A8	I512 E5
2547 A8	I513 F4
3501 B1	I514 F4
3502 B1	I515 G5
3504 B3	I516 G4
3505 B2	I517 H4
3506 D2	I518 H5
3507 D2	I519 I4
3508 D2	I520 A11
3510 D3	I521 B11
3511 D3	I522 B11
3512 E2	I524 D11
3513 E2	I526 E10
3514 E3	I527 E11
3515 E4	I529 F10
3516 E3	I530 F11
3517 E2	I532 G10
3518 E2	I533 G11
3519 E3	I535 H10
3520 F2	I536 H11
3521 F3	I539 A8
3522 F2	I541 A9
3523 F2	I542 A8
3524 F3	I543 A8
3525 F4	I544 A7
3526 F3	I545 B8
3527 F2	I546 A8
3528 F2	I547 C8
3529 F3	I550 C8
3530 G2	I552 F8
3531 G3	I553 G8
3532 G2	I564 H1
3533 G2	I565 H11
3534 G3	I566 F11
3535 G3	I567 E11
3536 G4	I568 D11
3537 H2	I569 C11
3538 H2	I570 B11
3539 H3	I571 A11
3540 A11	
3541 A11	
3543 H2	
3544 H3	
3545 I2	
3546 I2	
3547 I3	
3548 I3	
3549 I4	
3550 B11	
3551 B11	
3552 B12	
3553 B12	
3555 C11	
3556 C11	
3558 D11	
3560 D11	
3561 D12	
3562 D12	
3563 E11	
3564 E11	
3566 F11	
3567 F11	
3568 F12	
3570 F12	
3571 G11	
3572 H11	
3574 H11	
3575 I11	
3576 I12	
3577 I12	
3579 A8	
3580 A8	

\* RESERVED  
 V DC Vtg measured in STOP-MODE

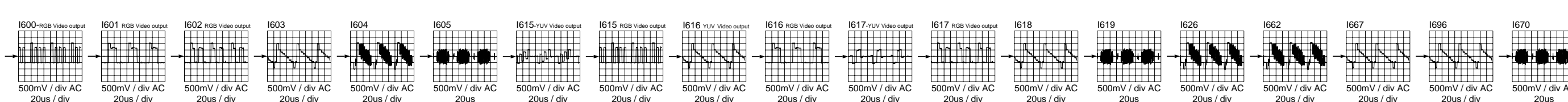
BARE BOARD : 3139-243-30533

**AV-Board: Video and SCART**



1401-B C13	3645 D10	7643 I3	I702 F11
1403 A1	3646 D11	I600 A1	I703 G10
1408 D13	3647 E9	I601 A1	I704 H10
1409-A E13	3648 E11	I602 A1	
1409-B F13	3649 E9	I603 A1	
1409-C G13	3650 F9	I604 B1	
1410 H13	3651 F11	I605 C1	
1420 D1	3652 H3	I606 C1	
1421 E1	3653 H4	I607 C1	
1424 E2	3654 F9	I608 C1	
2600 B10	3655 B3	I609 C1	
2601 C12	3656 G9	I610 C1	
2602 C13	3657 G11	I611 D1	
2603 D4	3658 D4	I612 F1	
2604 E13	3659 G9	I613 F1	
2605 E13	3661 F6	I615 F1	
2606 E7	3662 H9	I616 F1	
2608 F4	3663 H11	I617 G1	
2609 F5	3664 G6	I618 G1	
2610 F7	3665 H12	I619 G1	
2611 G12	3666 I5	I620 H4	
2612 D5	3667 G6	I621 H3	
2613 D6	3669 H0	I622 I3	
2614 F4	3670 H0	I623 F5	
2615 H12	3671 G3	I624 F6	
2616 G6	3672 E9	I625 F5	
2617 H9	3673 B3	I626 H1	
2618 A10	3674 A10	I627 H1	
2619 I7	3675 A10	I628 H1	
2620 I5	3676 A10	I629 H1	
2621 H2	3677 H5	I630 E5	
2622 H3	3678 H5	I631 E7	
2623 I11	3679 H6	I632 E7	
2624 H3	3680 H5	I633 F7	
2625 G6	3681 I4	I634 D4	
2626 D7	3682 I5	I635 D4	
2627 D6	3683 H3	I636 D5	
2628 D2	3684 I2	I637 F7	
2630 E12	4102 C11	I638 G6	
2631 E12	4600 C10	I639 G7	
2632 F12	4601 F12	I640 D5	
2633 D2	4602 D2	I641 D6	
2634 D2	4604 I7	I642 I6	
2635 D2	4606 D6	I643 H6	
2636 D2	4607 D7	I644 I5	
2637 D3	4608 D12	I645 I5	
2638 D3	4609 E12	I646 D1	
2641 C11	2641 C11	I647 D1	
2642 D11	4611 D11	I651 A12	
2643 D10	4612 F10	I652 A12	
2644 G10	4613 F10	I653 A11	
2645 G10	4614 G10	I654 B11	
2646 H6	5600 C10	I655 B9	
3600 A8	5601 E7	I656 B9	
3601 A10	5602 E7	I657 C10	
3602 A12	5603 F7	I658 I7	
3603 A12	5604 G12	I659 I7	
3604 B3	5605 H12	I660 C10	
3605 B4	5606 H12	I661 C11	
3606 B5	5607 I11	I662 C12	
3607 B6	5608 D12	I663 C13	
3608 B7	5609 E12	I664 D9	
3609 B7	5610 F12	I665 D10	
3610 A9	6600 G11	I666 D10	
3611 A9	6601 H11	I667 D12	
3612 A11	6602 C12	I668 I0	
3614 B4	6603 D11	I669 E11	
3615 B4	6604 E11	I670 D11	
3616 B5	6605 F11	I671 E9	
3617 B6	6606 H6	I672 F9	
3618 B7	6607 I13	I673 F11	
3619 B9	7600 E5	I674 F9	
3620 A10	7601 D5	I675 E12	
3621 B11	7602 I6	I676 F12	
3622 C12	7603 D6	I677 D6	
3623 C3	7604 I9	I678 G9	
3624 C3	7620 A9	I679 H11	
3625 C4	7621 B2	I680 G12	
3626 C4	7622 B3	I681 G12	
3627 C5	7623 B4	I682 H10	
3628 C5	7624 B5	I683 H11	
3629 C6	7625 B6	I684 H12	
3630 C6	7626 B7	I685 H13	
3631 C7	7627 A12	I686 H9	
3632 C7	7628 A12	I687 I12	
3633 C8	7629 B11	I688 I9	
3634 B8	7630 B9	I689 I9	
3635 B10	7631 C10	I691 D7	
3636 B9	7632 D9	I692 D7	
3637 B10	7633 D10	I693 D12	
3638 B9	7634 F10	I694 G12	
3639 C9	7636 H4	I695 G3	
3640 C10	7637 F10	I696 F12	
3641 C12	7638 I3	I697 G6	
3642 C12	7640 G10	I698 G7	
3643 D9	7641 F4	I700 C12	
3644 D10	7642 I5	I701 D11	

ITEM NO	DESCRIPTION	DVD963SA E.U.	DVD963SA NON-E.U.
1403	CON BM V 22P F 1.00 FFC D.3 B	X	
3604	RST SM 0603 100R PM5 COL	X	
3605	RST SM 0603 100R PM5 COL	X	
3606	RST SM 0603 100R PM5 COL	X	
3607	RST SM 0603 100R PM5 COL	X	
3608	RST SM 0603 100R PM5 COL	X	
3609	RST SM 0603 100R PM5 COL	X	
3614	RST SM 0603 RC21 56R PM5 R	X	
3615	RST SM 0603 RC21 56R PM5 R	X	
3616	RST SM 0603 68R PM5 COL	X	
3617	RST SM 0603 68R PM5 COL	X	
3618	RST SM 0603 RC21 56R PM5 R	X	
3622	RST SM 0603 2K2 PM5 COL	X	
3623	RST SM 0603 75R PM5 COL	X	
3624	RST SM 0603 2K2 PM5 COL	X	
3625	RST SM 0603 75R PM5 COL	X	
3626	RST SM 0603 2K2 PM5 COL	X	
3627	RST SM 0603 75R PM5 COL	X	
3628	RST SM 0603 2K2 PM5 COL	X	
3629	RST SM 0603 75R PM5 COL	X	
3630	RST SM 0603 2K2 PM5 COL	X	
3631	RST SM 0603 75R PM5 COL	X	
3632	RST SM 0603 2K2 PM5 COL	X	
3633	RST SM 0603 75R PM5 COL	X	
3673	RST SM 0603 RC21 56R PM5 R	X	
7621	TRA SIG SM BC817-25 (COL) R	X	
7622	TRA SIG SM BC817-25 (COL) R	X	
7623	TRA SIG SM BC817-25 (COL) R	X	
7624	TRA SIG SM BC817-25 (COL) R	X	
7625	TRA SIG SM BC817-25 (COL) R	X	
7626	TRA SIG SM BC817-25 (COL) R	X	



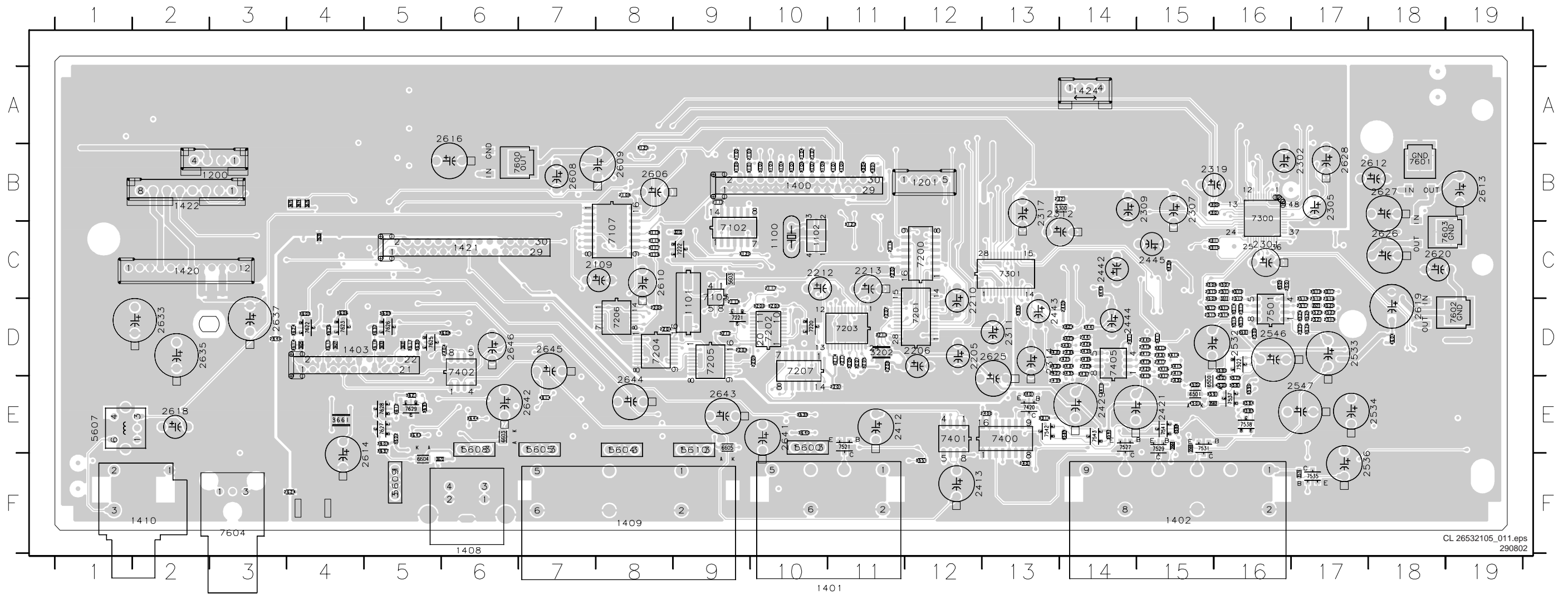
BARE BOARD : 3139-243-30533

V DC Vtg measured in STOP-MODE  
\* RESERVED

CL 26532105\_010.eps  
020902

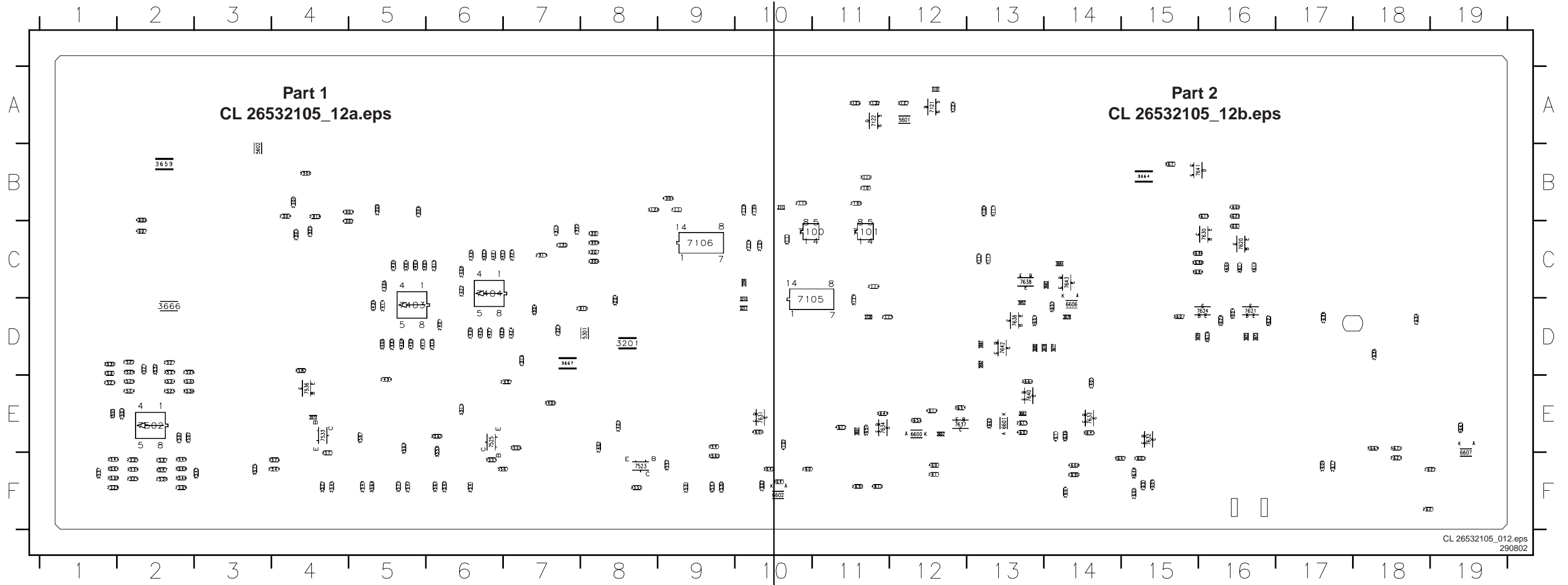
Layout AV-Board (Top Side)

1100	C10	2103	B9	2207	D11	2319	B16	2426	D14	2510	C15	2546	D16	2627	B18	3103	B10	3205	D11	3415	D15	3440	C14	3519	D17	3584	E16	3617	D5	3644	E6	4604	D18	7102	C9	7400	E13	7543	E14
1101	D9	2104	B10	2208	D11	2321	B14	2427	D13	2511	C16	2547	E17	2628	B17	3104	B10	3207	D11	3416	D15	3441	D14	3520	D17	3585	E16	3618	D5	3661	E4	4614	E7	7103	C9	7401	E12	7600	B6
1102	C10	2107	B10	2209	D10	2400	E13	2428	D14	2512	D16	2606	B8	2633	D2	3105	B10	3208	D11	3417	E15	3501	D16	3521	D17	3588	E15	3621	E5	3672	F5	5300	B14	7107	C8	7402	D6	7601	B18
1200	B3	2108	B8	2210	D12	2401	F13	2429	E14	2513	D16	2608	B7	2635	D2	3106	B10	3212	D9	3418	D15	3504	C16	3522	D17	3589	E14	3624	D4	3674	B4	5600	E10	7200	C12	7405	D14	7602	D19
1201	B12	2109	C8	2211	D11	2404	D6	2431	D15	2514	D16	2609	B8	2637	D3	3107	B10	3213	D11	3419	E15	3506	C15	3523	D17	3590	E16	3625	D4	3675	B4	5603	C9	7201	D12	7420	E13	7603	C18
1400	B10	2112	B9	2212	C10	2409	D14	2432	E15	2515	D15	2610	C8	2639	C4	3108	B10	3214	D11	3424	D14	3507	C16	3524	D17	3591	E15	3626	D4	3676	B4	5604	E8	7202	D10	7501	D16	7604	F3
1402	F15	2113	D9	2213	C11	2410	E14	2436	D14	2516	D17	2612	B18	2640	D3	3116	C8	3215	C9	3429	D14	3508	D15	3525	D17	3592	E14	3627	D4	4100	B11	5605	E7	7203	D11	7521	E11	7622	D4
1403	D4	2116	C11	2301	C16	2411	D14	2439	E13	2517	D17	2613	B19	2641	E10	3117	C8	3305	D13	3430	D14	3510	C16	3526	D17	3602	E5	3630	D5	4101	B11	5607	E1	7204	D8	7522	D16	7623	D4
1408	F6	2117	C10	2302	B17	2412	E11	2440	D15	2518	D17	2614	F5	2642	E7	3118	C8	3310	C16	3431	D14	3511	D16	3551	F12	3603	E5	3631	D5	4300	B16	5608	E6	7205	D9	7527	E14	7625	D5
1409	F8	2200	D8	2305	B17	2413	F12	2441	D14	2519	D17	2616	A6	2643	E9	3119	C8	3311	C16	3432	D13	3512	D15	3564	E15	3605	D4	3632	D5	4301	B16	5609	F5	7206	D8	7529	E15	7626	D5
1410	F2	2201	E11	2307	B15	2417	D15	2442	C14	2520	D17	2618	E2	2644	E8	3120	C9	3314	E13	3433	D13	3513	D16	3566	E15	3606	D4	3633	D5	4304	B11	5610	E9	7207	D10	7531	E15	7627	E5
1420	C2	2202	C11	2309	B15	2418	D15	2443	D13	2521	D17	2619	D18	2645	D7	3123	C11	3401	E13	3434	D14	3514	D16	3574	F17	3608	D6	3635	E5	4305	B11	6500	E15	7220	D10	7535	F17	7628	E5
1421	C6	2203	D9	2311	D13	2419	D15	2444	D14	2532	D16	2620	C18	2646	D6	3125	B8	3411	D15	3435	D14	3515	D16	3579	E16	3609	D5	3637	E5	4500	E16	6501	E15	7221	D9	7537	E16	7629	E5
1422	B2	2204	D8	2312	B14	2420	D15	2445	C15	2533	D17	2624	F4	3100	B9	3200	D10	3412	D15	3436	D14	3516	D16	3580	D16	3612	E5	3639	E10	4501	E16	6603	E6	7222	C9	7538	E16		
1424	A14	2205	D12	2314	D13	2421	D15	2500	D16	2534	E18	2625	D13	3101	B9	3202	D11	3413	D15	3437	D14	3517	C17	3581	E16	3614	D4	3640	E10	4502	E15	6604	F5	7300	B16	7541	E15		
2102	B9	2206	D12	2317	B13	2425	D14	2501	C16	2536	F17	2626	C18	3102	B10	3203	D10	3414	D15	3438	C15	3518	C17	3583	E15	3615	D4	3643	E5	4503	E15	6605	E9	7301	C13	7542	E13		

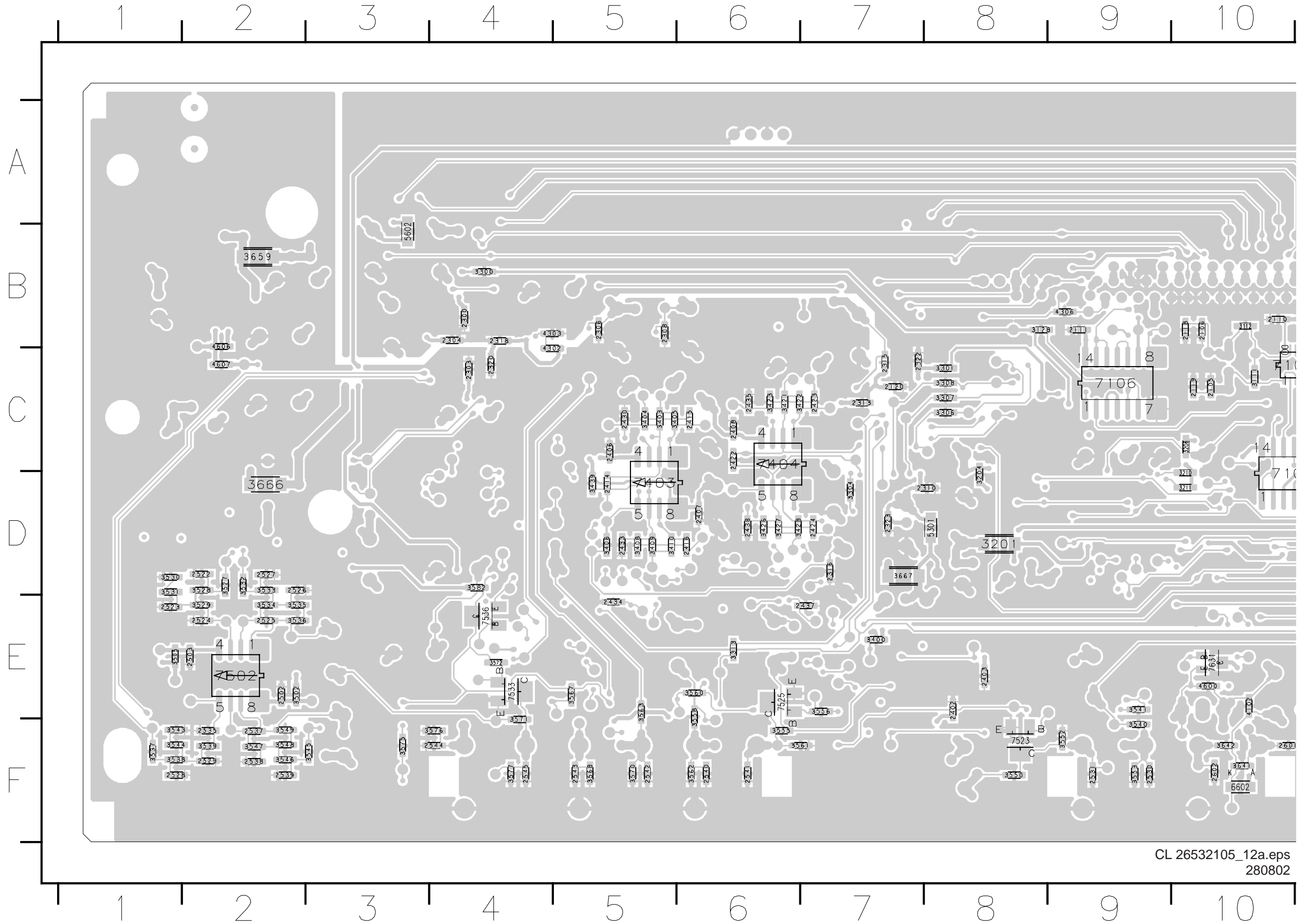


Layout AV-Board (Overview Bottom Side)

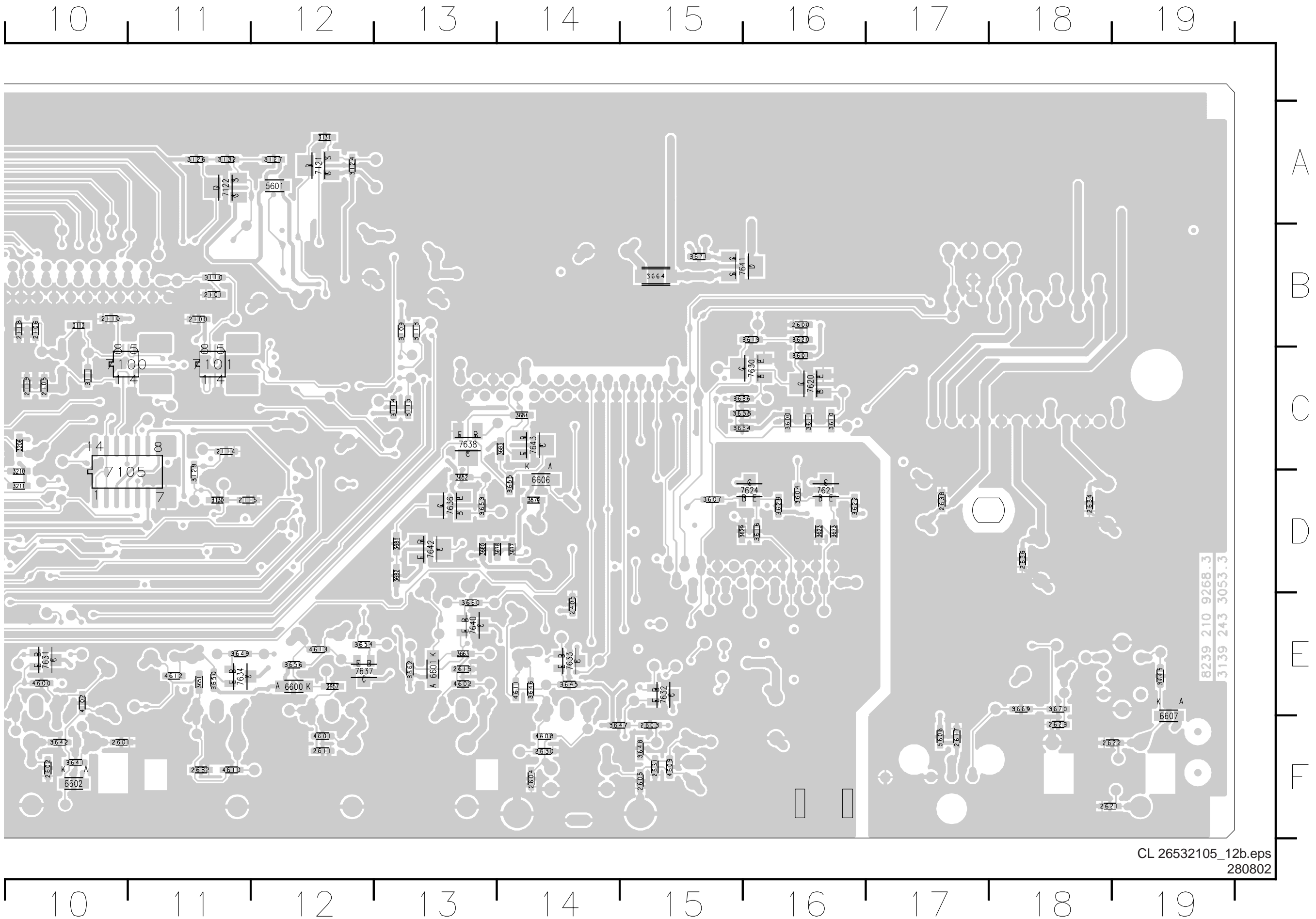
2100 B11	2306 B5	2407 D6	2502 E2	2538 F2	2611 F12	3111 C10	3204 D8	3405 C5	3527 D2	3541 E9	3560 E6	3601 C16	3638 C15	3656 E12	3677 D14	4602 E13	6601 E13	7525 E6	7640 E13
2101 B11	2308 B5	2408 C6	2503 E2	2539 F2	2615 E13	3112 B10	3206 C10	3406 D5	3528 D2	3543 F1	3561 F7	3604 D16	3641 F10	3657 E12	3678 D14	4606 B2	6602 F10	7533 E4	7641 B15
2105 C10	2310 D8	2414 D5	2522 D2	2540 F6	2617 F17	3113 B13	3210 D10	3408 D5	3529 E2	3544 F1	3562 F6	3607 D15	3642 F10	3659 B2	3679 D14	4607 C2	6606 D14	7536 E4	7642 D13
2106 B10	2313 C7	2415 C6	2523 E1	2541 F6	2621 F18	3114 C13	3211 D10	3409 D5	3530 D1	3545 F3	3563 E5	3610 C16	3645 E14	3660 E13	3680 D13	4608 F14	6607 F19	7620 C16	7643 C14
2110 B10	2315 C7	2416 D6	2524 E2	2542 F5	2622 F19	3115 C13	3300 B4	3410 D5	3531 D1	3546 F2	3567 E5	3611 C16	3646 E14	3662 E13	3681 D13	4609 F15	7100 C10	7621 D16	
2111 B9	2316 D7	2422 C6	2525 E2	2543 F5	2623 F18	3124 A12	3301 C8	3421 C6	3532 D2	3547 F2	3568 F5	3616 D16	3647 F14	3663 E13	3682 D13	4610 F11	7101 C11	7624 D16	
2114 C11	2318 B4	2423 C7	2526 D2	2544 F4	2630 F14	3126 A11	3304 D7	3422 C6	3533 D2	3548 F2	3570 F5	3619 B16	3648 F15	3664 B15	3683 C14	4611 E14	7105 D10	7630 C16	
2115 D11	2320 C4	2424 D7	2527 D2	2545 F4	2631 F15	3127 A12	3306 C8	3423 C6	3534 E2	3549 F2	3571 F4	3620 B16	3649 E11	3665 E19	3684 C14	4612 E11	7106 C9	7631 E10	
2118 B10	2322 C7	2430 C5	2528 F1	2600 B16	2632 F11	3128 B8	3307 C8	3426 D6	3535 E2	3550 F8	3572 E4	3622 D16	3650 E11	3666 D2	4102 E10	4613 E12	7121 A12	7632 E15	
2119 C10	2323 D7	2433 D5	2529 F2	2601 F10	2634 D18	3129 D11	3308 C8	3427 D6	3536 E2	3552 F9	3575 F3	3623 D16	3651 E11	3667 D7	4302 C4	5301 D8	7122 A11	7633 E14	
2120 C7	2402 E8	2434 E5	2530 F9	2602 F10	2636 D18	3130 D11	3313 E6	3428 D6	3537 F1	3553 F9	3576 F4	3628 D16	3652 D13	3669 E18	4303 B4	5601 A12	7403 D5	7634 E11	
2300 B4	2403 E8	2435 C6	2531 F9	2603 F15	2638 D17	3131 A12	3400 E7	3439 D5	3538 F1	3555 F6	3577 F4	3629 D15	3653 D13	3670 E18	4306 B9	5602 B3	7404 C6	7636 D13	
2303 C4	2405 E14	2437 E7	2535 F2	2604 F14	3109 B13	3132 A11	3403 C5	3502 E2	3539 F2	3556 E7	3582 D4	3634 C15	3654 E12	3671 B15	4600 E10	5606 F17	7502 E2	7637 E12	
2304 B4	2406 C5	2438 D6	2537 F2	2605 F15	3110 B11	3201 D8	3404 C5	3505 E1	3540 F9	3558 E6	3600 C16	3636 C15	3655 D14	3673 D16	4601 F12	6600 E12	7523 F8	7638 C13	



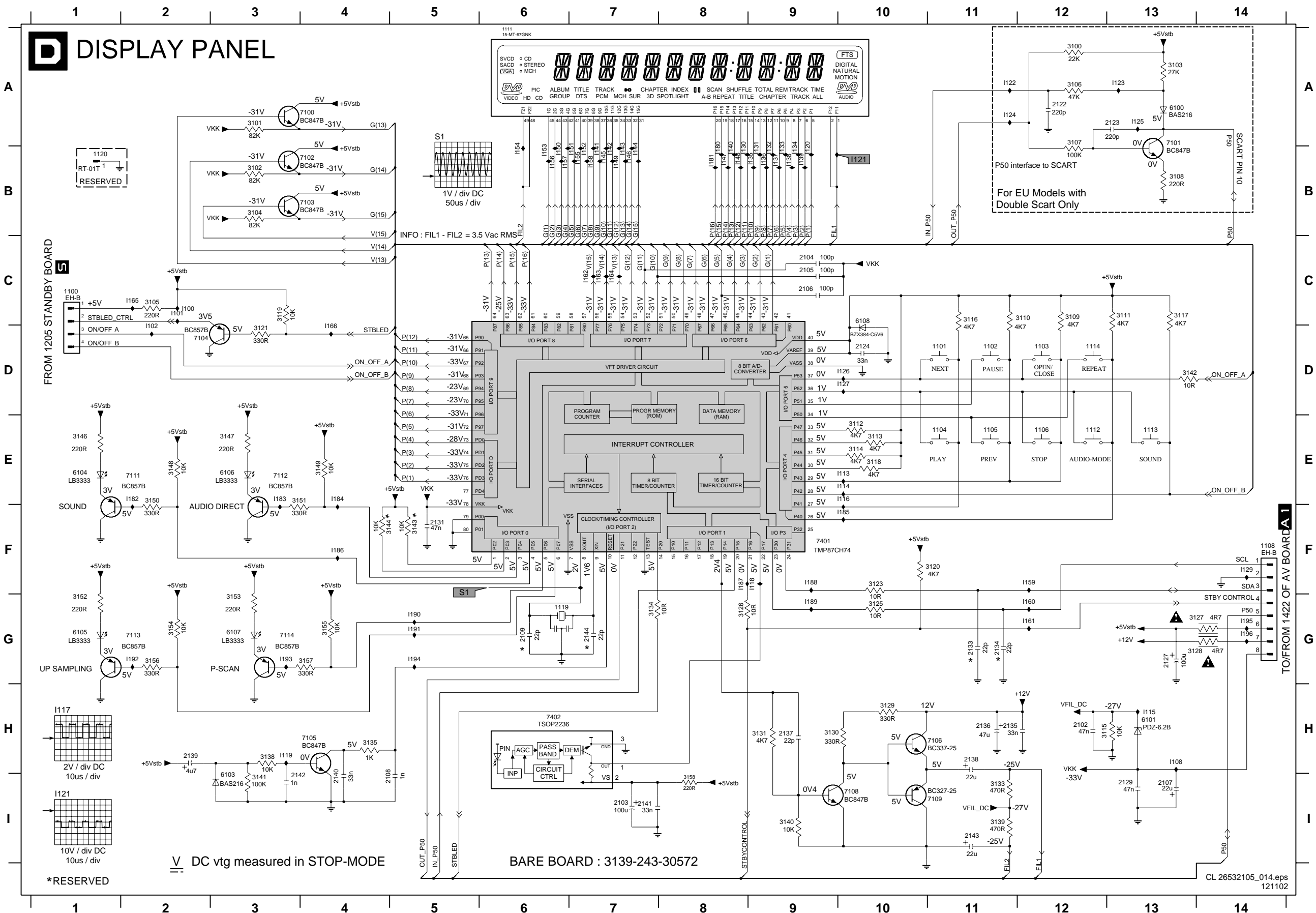
Layout AV-Board (Part 1 Bottom Side)



Layout AV-Board (Part 2 Bottom Side)



Display Panel



- 1100 C1
- 1101 D11
- 1102 D11
- 1103 D12
- 1104 E11
- 1105 E11
- 1106 E12
- 1108 F14
- 1111 A6
- 1112 E12
- 1113 E13
- 1114 D12
- 1119 G6
- 1120 B1
- 1120 H2
- 1203 I7
- 1204 C9
- 1205 C9
- 2106 C9
- 2107 H3
- 2108 I5
- 2109 G6
- 2122 A12
- 2123 A13
- 2124 D10
- 2127 G13
- 2129 H3
- 2131 F5
- 2133 G11
- 2134 G11
- 2135 H11
- 2136 H11
- 2137 H9
- 2138 H11
- 2139 H2
- 2140 I4
- 2141 I7
- 2142 H3
- 2143 H11
- 2144 G7
- 3100 A12
- 3101 A3
- 3102 B3
- 3103 A13
- 3104 B3
- 3105 C2
- 3106 A12
- 3107 A12
- 3108 B13
- 3109 C12
- 3110 C12
- 3111 C13
- 3112 E10
- 3113 E10
- 3114 E10
- 3115 H12
- 3116 C11
- 3117 C13
- 3118 I10
- 3119 C3
- 3120 F11
- 3121 D3
- 3123 F10
- 3125 G10
- 3126 G8
- 3127 G14
- 3128 G13
- 3129 H10
- 3130 H9
- 3131 H9
- 3133 I11
- 3134 G7
- 3135 H4
- 3138 H3
- 3139 H11
- 3140 I9
- 3141 I3
- 3142 D13
- 3143 F5
- 3144 F4
- 3146 E1
- 3147 E3
- 3148 E2
- 3149 E4
- 3150 E2
- 3151 E3
- 3152 F1
- 3153 F3
- 3154 G2
- 3155 G4
- 3156 G2
- 3157 G4
- 3158 I8
- 6100 A13
- 6103 H3
- 6104 E1
- 6105 G1
- 6106 E3
- 6107 G3
- 7100 A4
- 7101 A13
- 7102 B4
- 7103 B4
- 7104 D2
- 7105 H4
- 7106 H11
- 7108 H10
- 7109 H11
- 7111 E2
- 7112 E3
- 7113 G2
- 7114 G3
- 7401 F9

FROM 1205 STANDBY BOARD

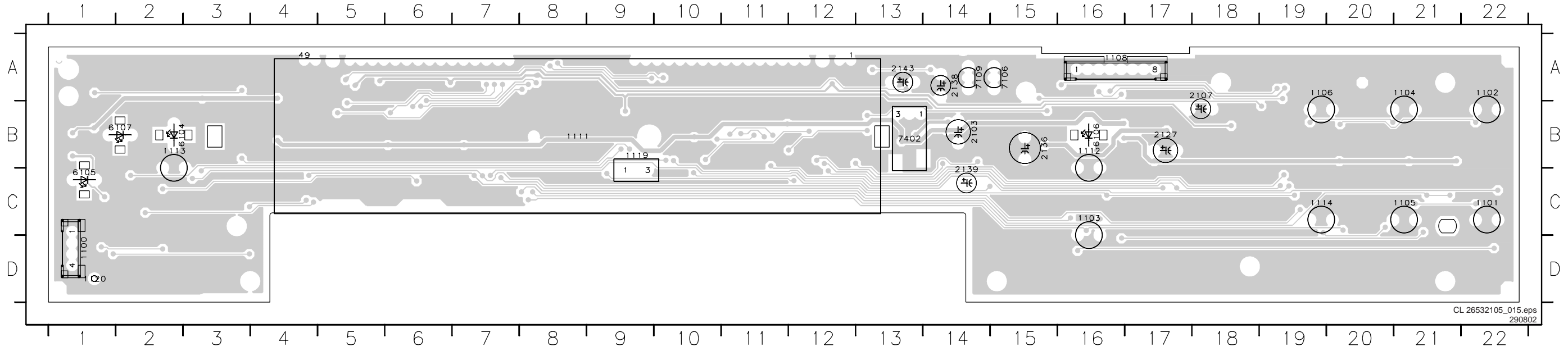
TO/FROM 1422 OF AV BOARD A1

V DC vtg measured in STOP-MODE

BARE BOARD : 3139-243-30572

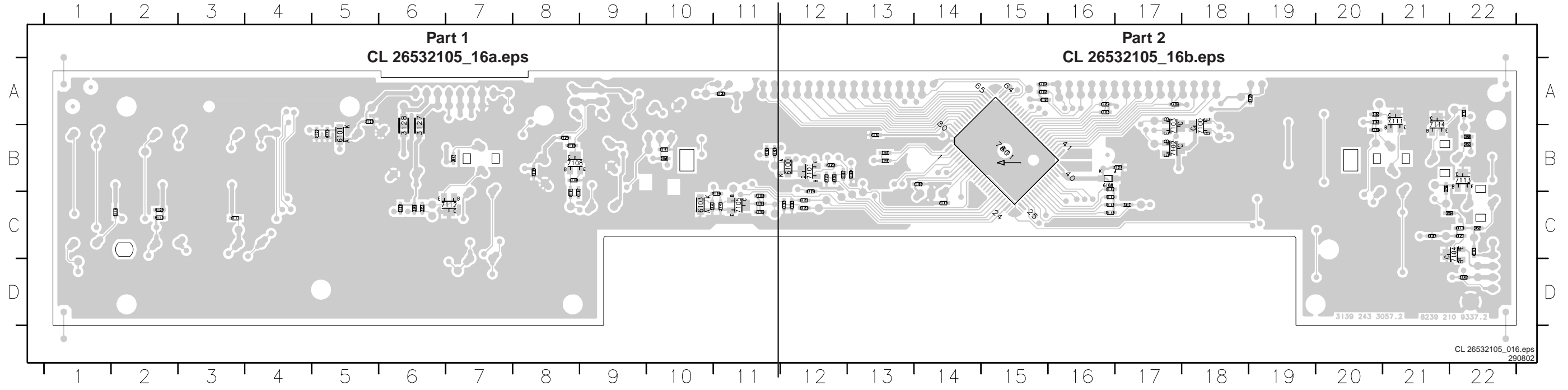
### Layout Display Panel (Top Side)

1100	D1	1102	A22	1104	A21	1106	A19	1111	B8	1113	B2	1119	B9	2103	B14	2127	B17	2138	A14	2143	A13	6105	C1	6107	B2	7109	A14
1101	C22	1103	C16	1105	C21	1108	A16	1112	B16	1114	C19	1120	D1	2107	A18	2136	B15	2139	C14	6104	B2	6106	B16	7106	A15	7402	B13

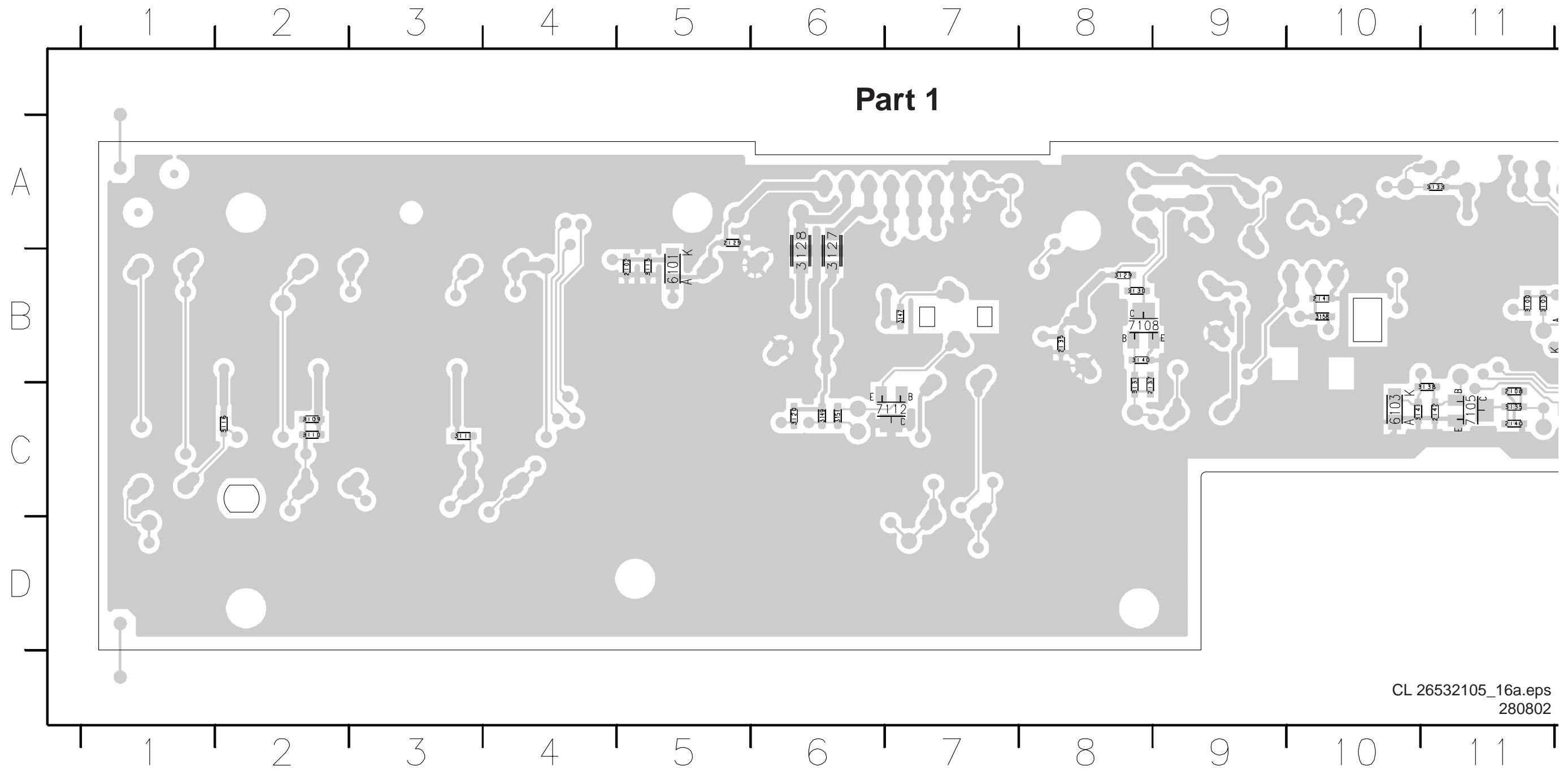


Layout Display Panel (Overview Bottom Side)

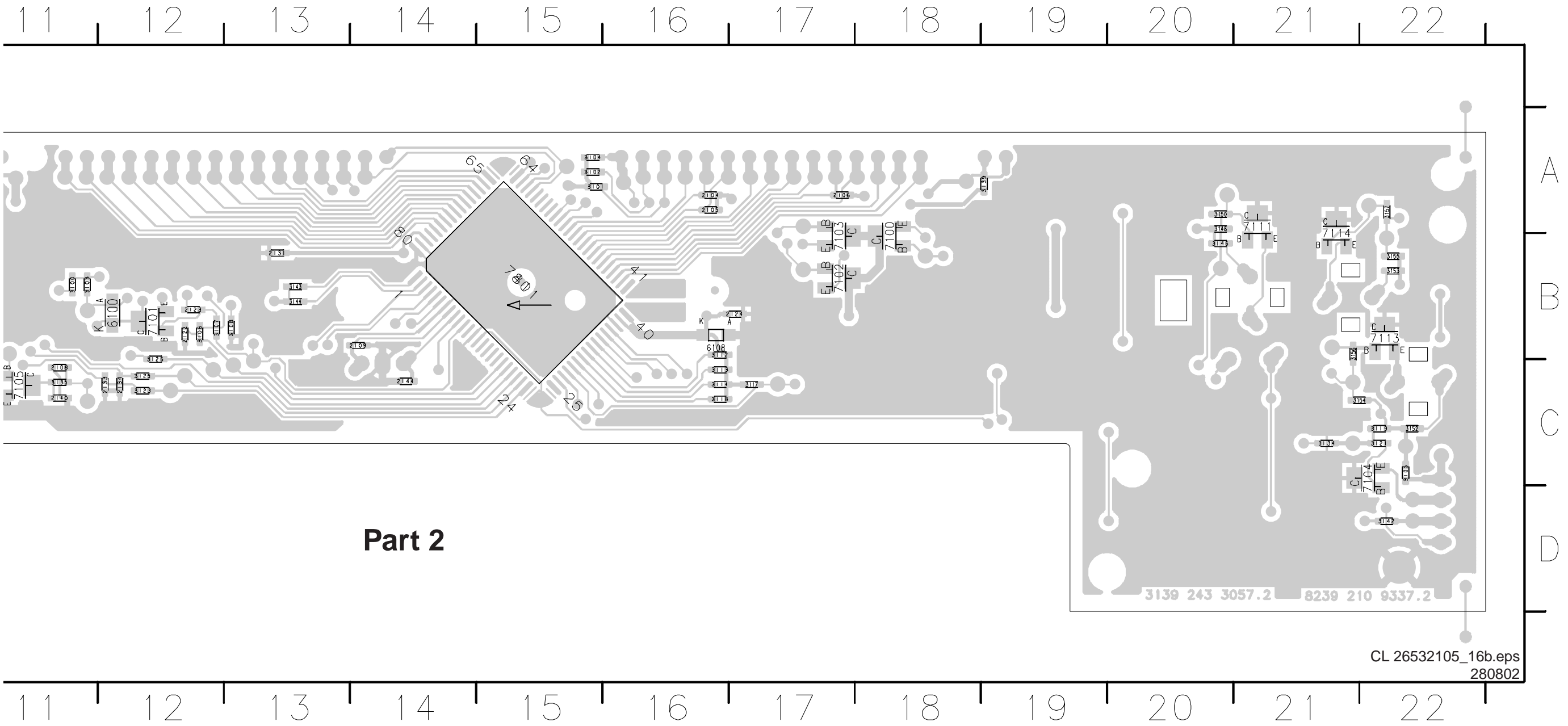
2102 B5	2109 B14	2131 B13	2140 C11	3101 A15	3106 B12	3111 C3	3116 C2	3121 C22	3128 B6	3134 C21	3141 C10	3147 B7	3152 C22	3157 A22	6108 B16	7104 C22	7113 B22
2104 A16	2122 B12	2133 C12	2141 B10	3102 A15	3107 B12	3112 B16	3117 C17	3123 C12	3129 B8	3135 C11	3142 D22	3148 A20	3153 B22	3158 B10	7100 B18	7105 C11	7114 A21
2105 A16	2123 B12	2134 C12	2142 C11	3103 B11	3108 B13	3113 C16	3118 C16	3125 C12	3130 B8	3138 C11	3143 B13	3149 C6	3154 C21	6100 B12	7101 B12	7108 B8	7401 B15
2106 A17	2124 B17	2135 B8	2144 C14	3104 A15	3109 C2	3114 C16	3119 C22	3126 B12	3131 C8	3139 A19	3144 B13	3150 A20	3155 B22	6101 B5	7102 B17	7111 A21	
2108 C11	2129 A5	2137 C8	3100 B11	3105 C22	3110 C2	3115 B5	3120 C6	3127 B6	3133 A11	3140 B8	3146 B20	3151 C6	3156 B21	6103 C10	7103 B17	7112 C7	



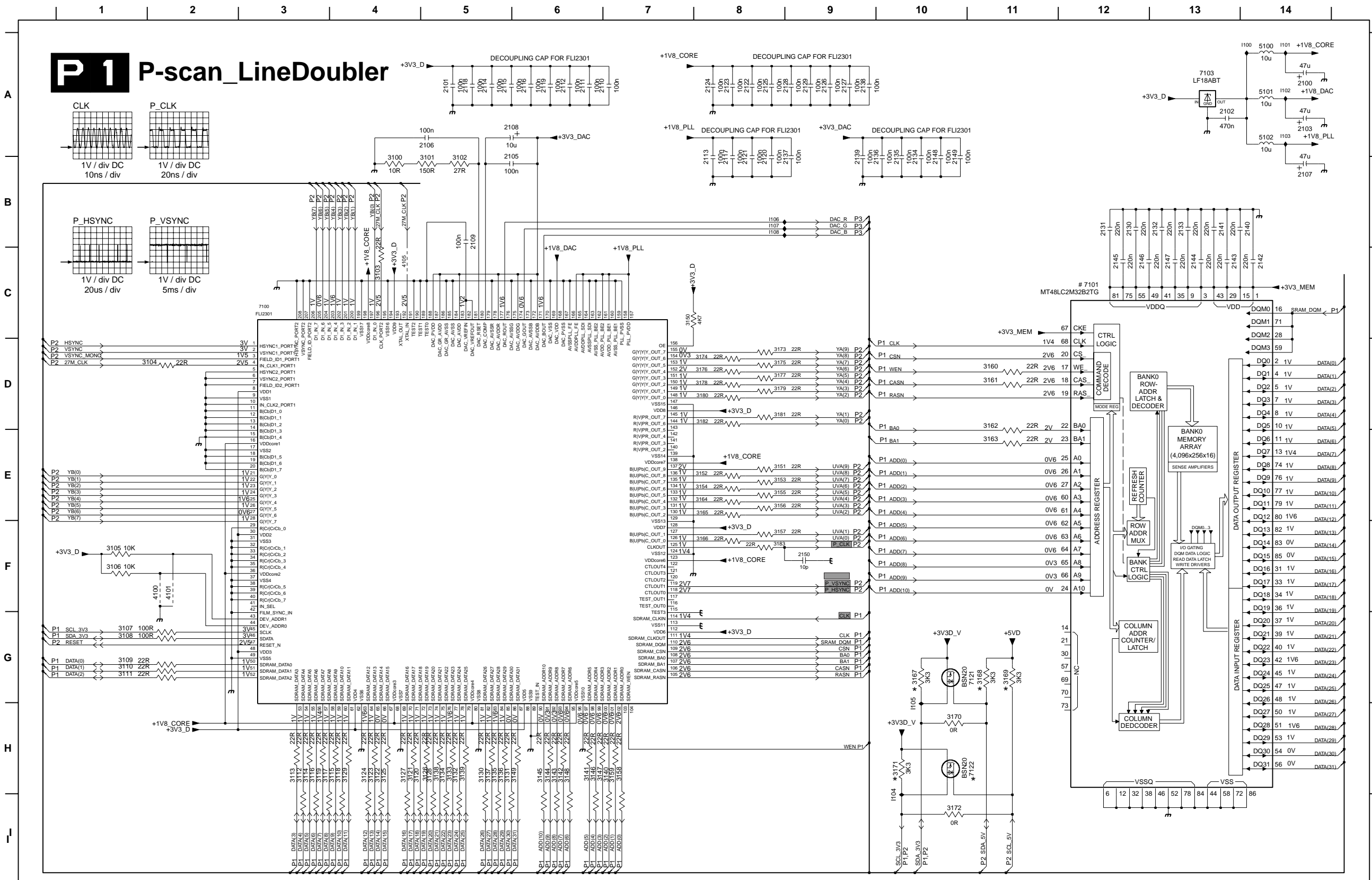
Layout Display Panel (Part 1 Bottom Side)



Layout Display Panel (Part 2 Bottom Side)



P-Scan Board: Line Doubler

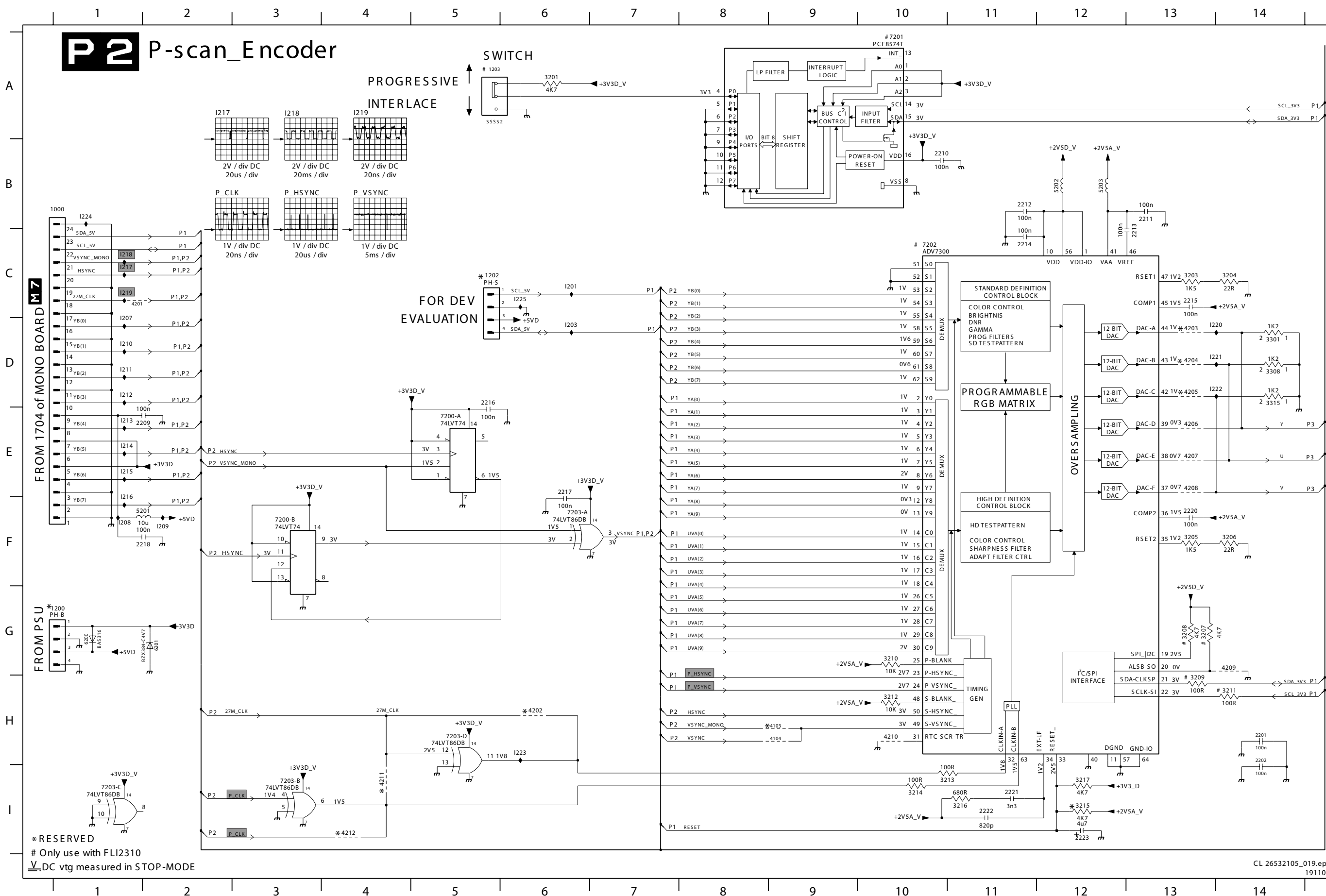


- 2100 A14
- 2101 A5
- 2102 A13
- 2103 A14
- 2105 B5
- 2106 A5
- 2107 B14
- 2108 A5
- 2109 B5
- 2110 A7
- 2111 A6
- 2112 A6
- 2113 B8
- 2114 A5
- 2115 A5
- 2116 A6
- 2117 B8
- 2118 A5
- 2119 A6
- 2120 B8
- 2121 B8
- 2122 A8
- 2123 A8
- 2124 A8
- 2125 A8
- 2126 A9
- 2127 A9
- 2128 A9
- 2129 A9
- 2130 B12
- 2131 B12
- 2132 C13
- 2133 B13
- 2134 B10
- 2135 B10
- 2136 B10
- 2137 B9
- 2138 A9
- 2139 B8
- 2140 B14
- 2141 B13
- 2142 C14
- 2143 C13
- 2144 C13
- 2145 C12
- 2146 C12
- 2147 C13
- 2148 B10
- 2149 B10
- 2150 F9
- 3100 B4
- 3101 B5
- 3102 B5
- 3103 C4
- 3104 D2
- 3105 F1
- 3106 F1
- 3107 G1
- 3108 G1
- 3109 G1
- 3110 H4
- 3111 G1
- 3112 H3
- 3113 H3
- 3114 H3
- 3115 H3
- 3116 H3
- 3117 H3
- 3118 H4
- 3119 H3
- 3120 H4
- 3121 H4
- 3122 H4
- 3123 H4
- 3124 H4
- 3125 H4
- 3126 H5
- 3127 H4
- 3128 H5
- 3129 H4
- 3130 H5
- 3131 H5
- 3132 H5
- 3133 H5
- 3134 H5
- 3135 H5
- 3136 H5
- 3137 H5
- 3138 H5
- 3139 H5
- 3140 H7
- 3141 H6
- 3142 H6
- 3143 H6
- 3144 H6
- 3145 H6
- 3146 H6
- 3147 H6
- 3148 H6
- 3149 H5
- 3150 C7
- 3151 E8
- 3152 E8
- 3153 E8
- 3154 E8
- 3155 E8
- 3156 E8
- 3157 F8
- 3158 H7
- 3159 H7
- 3160 D11
- 3161 D11
- 3162 D11
- 3163 E1
- 3164 E8
- 3165 E8
- 3166 F8
- 3167 G10

\* RESERVED  
 # Only use with FLI2301  
 V DC vtg measured in STOP-MODE

BARE BOARD : 3139-243-30624

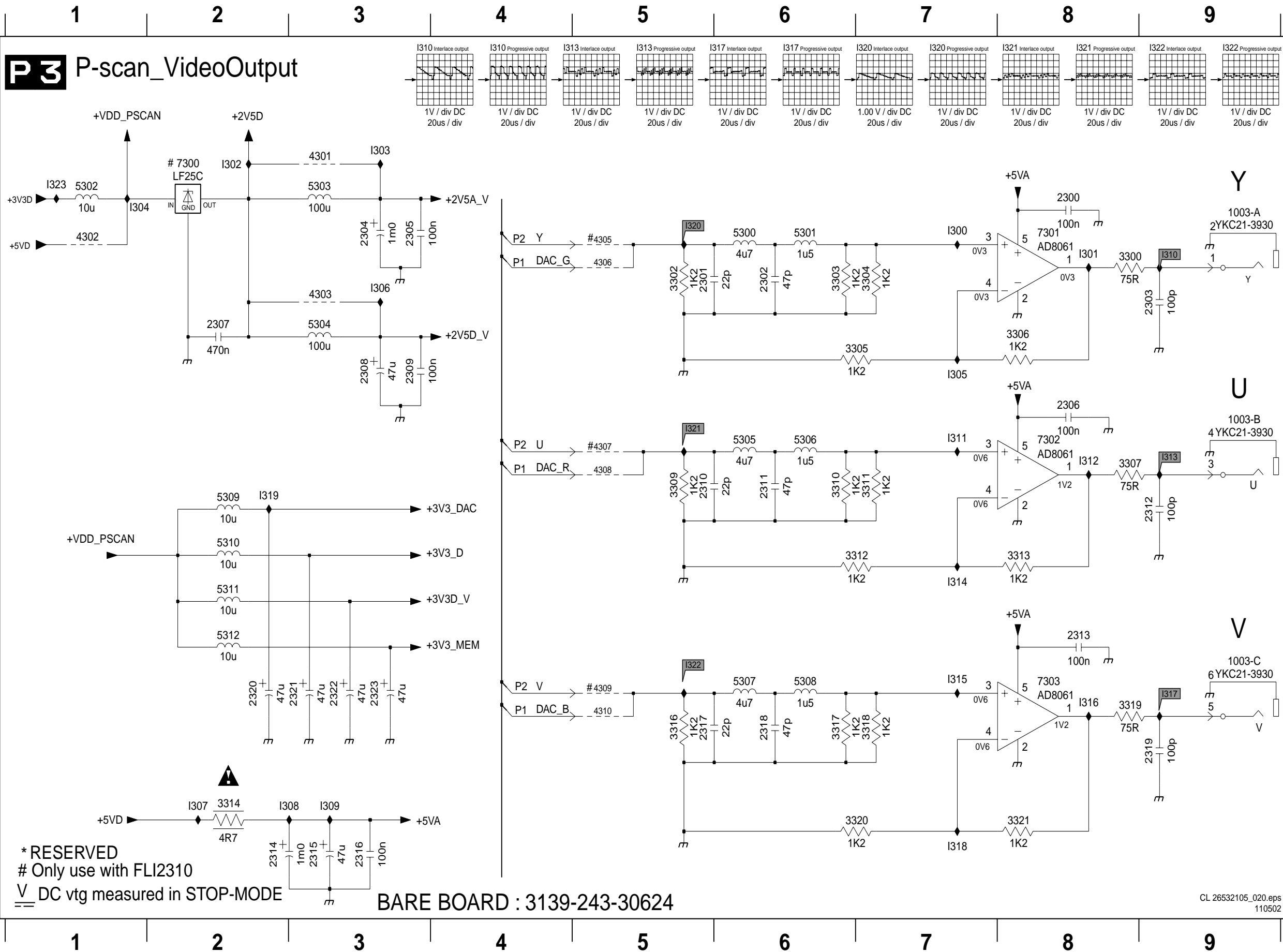
P-Scan Board: Encoder



- 1000 B1
- 1200 G1
- 1202 C5
- 1203 A5
- 2201 H14
- 2202 H14
- 2209 E2
- 2210 B10
- 2211 B13
- 2212 B11
- 2213 C13
- 2214 C11
- 2215 C13
- 2216 D5
- 2217 E6
- 2218 F2
- 2220 F13
- 2221 I11
- 2222 I12
- 2223 I12
- 3201 A6
- 3203 C13
- 3204 C14
- 3205 F13
- 3206 F14
- 3207 G13
- 3208 G13
- 3209 H13
- 3210 G10
- 3211 H14
- 3212 H10
- 3213 I11
- 3214 I10
- 3215 I12
- 3216 I11
- 3217 I12
- 3301 D14
- 3308 D14
- 3315 D14
- 4103 H9
- 4104 H9
- 4201 C1
- 4202 H6
- 4203 D13
- 4204 D13
- 4205 D13
- 4206 E13
- 4207 E13
- 4208 E13
- 4209 G14
- 4210 H10
- 4211 I4
- 4212 I4
- 5201 F2
- 5202 B12
- 5203 B12
- 6200 G1
- 6201 G2
- 7200-B F3
- 7201 A10
- 7202 C10
- 7203-A F6
- 7203-B I3
- 7203-C I1
- 7203-D H5
- 1201 C6
- 1203 D6
- 1207 D1
- 1208 F1
- 1209 F2
- 1210 D1
- 1211 D1
- 1212 D1
- 1213 E1
- 1214 E1
- 1215 E1
- 1216 F1
- 1217 C1
- 1218 C1
- 1219 C1
- 1220 D14
- 1221 D14
- 1222 D14
- 1223 H6
- 1224 B1
- 1225 C6

\* RESERVED  
 # Only use with FLI2310  
 V<sub>DC</sub> vtg measured in STOP-MODE

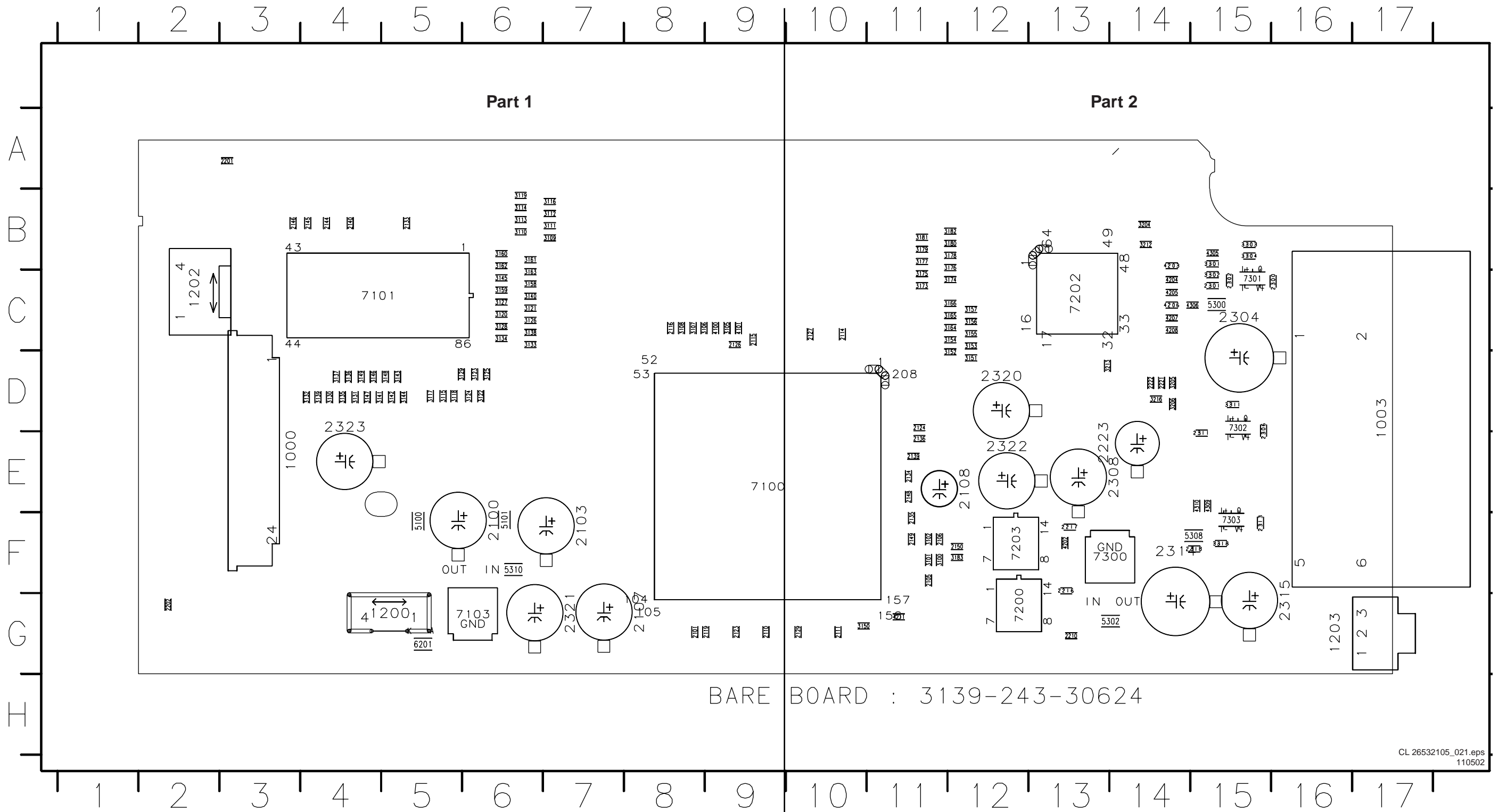
P-Scan Board: Video Output



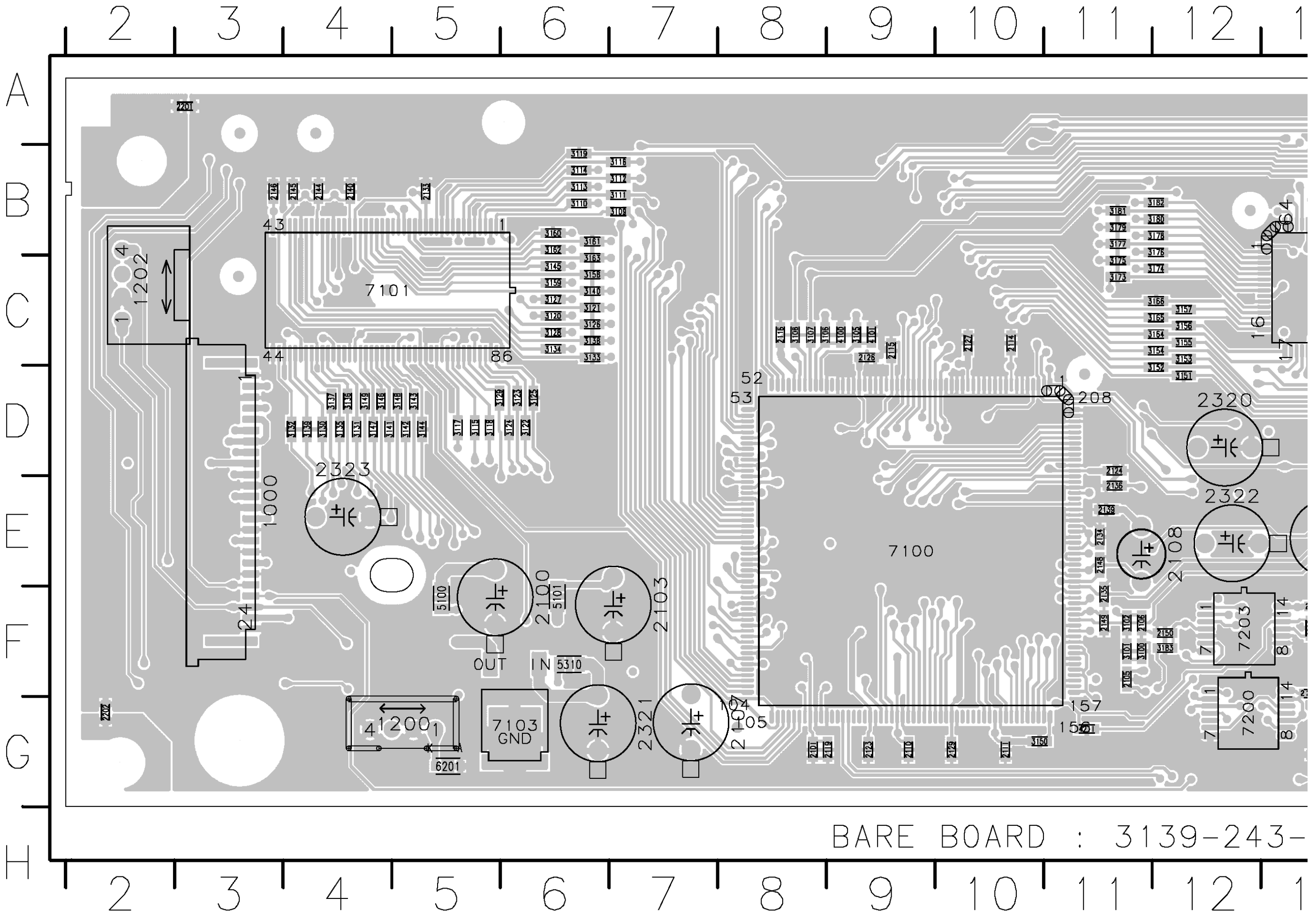
- 1003-A A9
- 1003-B C9
- 1003-C D9
- 2300 A8
- 2301 B5
- 2302 B6
- 2303 B9
- 2304 A3
- 2305 A3
- 2306 C8
- 2307 B2
- 2308 B3
- 2309 B3
- 2310 C5
- 2311 C6
- 2312 C9
- 2313 D8
- 2314 E2
- 2315 E3
- 2316 E3
- 2317 E5
- 2318 E6
- 2319 E9
- 2320 D2
- 2321 D3
- 2322 D3
- 2323 D3
- 3300 B8
- 3302 B5
- 3303 B6
- 3304 B7
- 3305 B7
- 3306 B8
- 3307 C8
- 3309 C5
- 3310 C6
- 3311 C7
- 3312 D7
- 3313 D8
- 3314 E2
- 3316 E5
- 3317 E6
- 3318 E7
- 3319 D8
- 3320 E7
- 3321 E8
- 4301 A3
- 4302 B1
- 4303 B3
- 4305 B5
- 4306 B5
- 4307 C5
- 4308 C5
- 4309 D5
- 4310 D5
- 5300 A6
- 5301 A6
- 5302 A1
- 5303 A3
- 5304 B3
- 5305 C6
- 5306 C6
- 5307 D6
- 5308 D6
- 5309 C2
- 5310 C2

Layout P-Scan Board (Overview Top Side)

1000 E3	2114 C10	2140 B4	2223 E13	2322 E12	3114 B6	3128 C6	3142 D5	3156 C12	3176 B12	3301 B15	4208 C14	7101 C4
1003 D17	2115 C9	2144 B4	2300 C16	2323 D4	3115 D5	3129 D5	3143 D5	3157 C12	3177 B11	3302 C15	4211 G11	7103 G6
1200 G5	2116 C8	2145 B4	2301 C15	3100 F11	3116 B7	3130 D4	3144 D5	3158 C6	3178 B12	3303 B15	4305 B15	7200 G12
1202 C2	2119 G9	2146 B3	2302 C15	3101 F11	3117 D5	3131 D4	3145 C6	3159 C6	3179 B11	3304 B15	4306 C15	7202 C13
1203 G16	2123 G9	2148 E11	2304 C15	3102 F11	3118 D5	3132 D4	3146 D4	3160 B6	3180 B12	3311 D15	4309 E15	7203 F12
2100 F6	2124 D11	2149 F11	2306 D15	3105 C9	3119 B6	3133 C6	3147 D4	3161 B6	3181 B11	3318 F15	4310 E15	7300 F14
2101 G8	2126 C9	2150 F12	2308 E14	3106 C8	3120 C6	3134 C6	3148 D5	3162 B6	3182 B12	4100 C9	5100 F5	7301 C15
2103 F7	2127 C10	2201 A3	2311 E15	3107 C8	3121 C6	3135 D4	3149 D4	3163 C6	3183 F12	4101 C9	5101 F6	7302 D15
2105 F11	2129 G10	2202 G2	2313 F15	3108 C8	3122 D6	3136 D4	3150 G10	3164 C12	3204 B14	4202 F13	5300 C15	7303 F15
2106 F11	2133 B5	2210 G13	2314 F14	3109 B7	3123 D6	3137 D4	3151 D12	3165 C12	3205 D14	4203 B14	5302 G14	
2107 G8	2134 E11	2216 F13	2315 G16	3110 B6	3124 D6	3138 C6	3152 D12	3166 C12	3206 D14	4204 C14	5308 F15	
2108 E12	2135 F11	2217 F13	2318 F15	3111 B7	3125 D6	3139 D4	3153 C12	3173 C11	3212 B14	4205 C14	5310 F6	
2110 G9	2136 E11	2221 D14	2320 D12	3112 B7	3126 C6	3140 C6	3154 C12	3174 C12	3213 D13	4206 C14	6201 G5	
2111 G10	2139 E11	2222 D14	2321 G7	3113 B6	3127 C6	3141 D4	3155 C12	3175 C11	3216 D14	4207 C14	7100 E9	



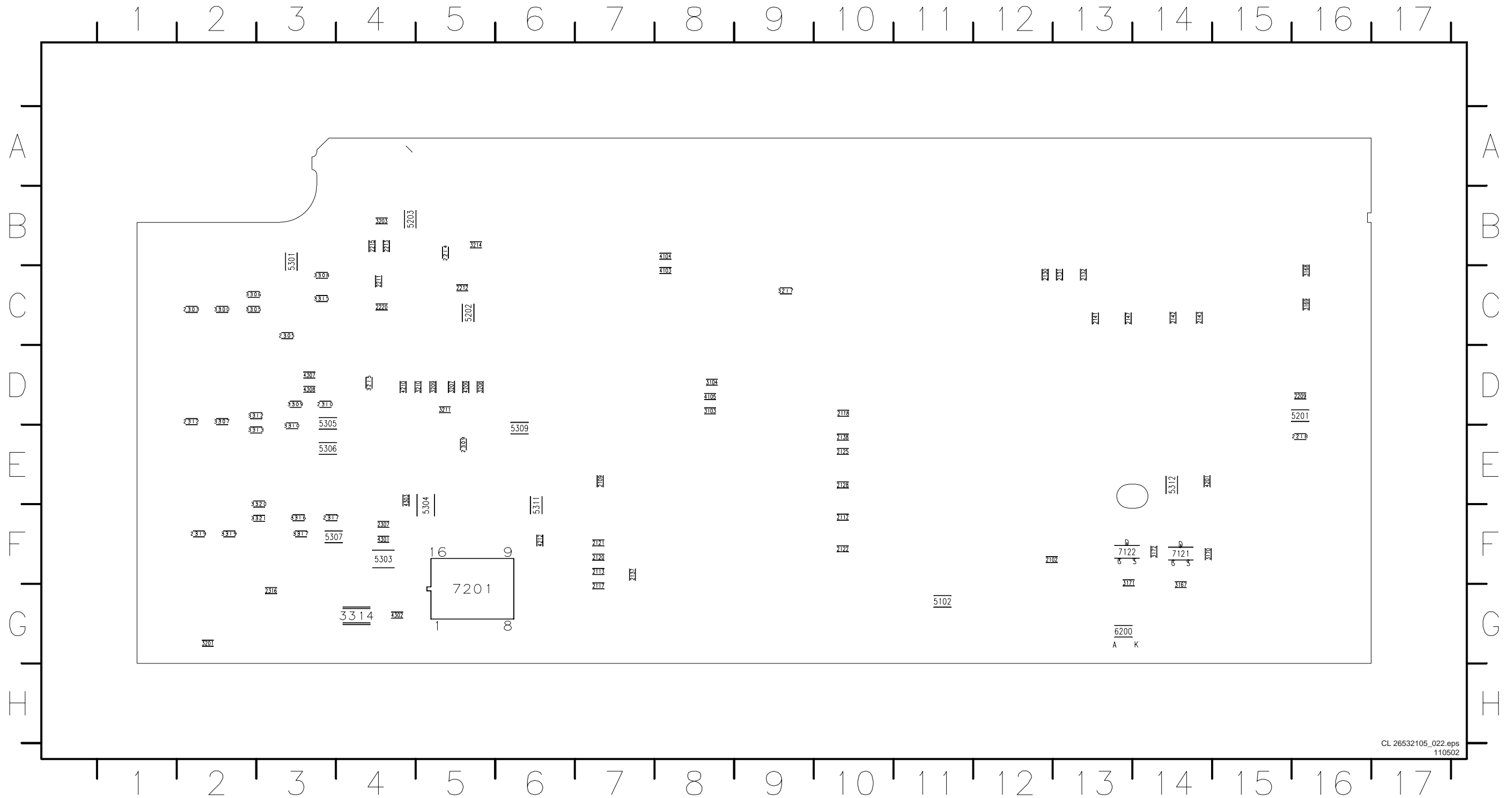
Layout P-Scan Board (Part 1 Top Side)





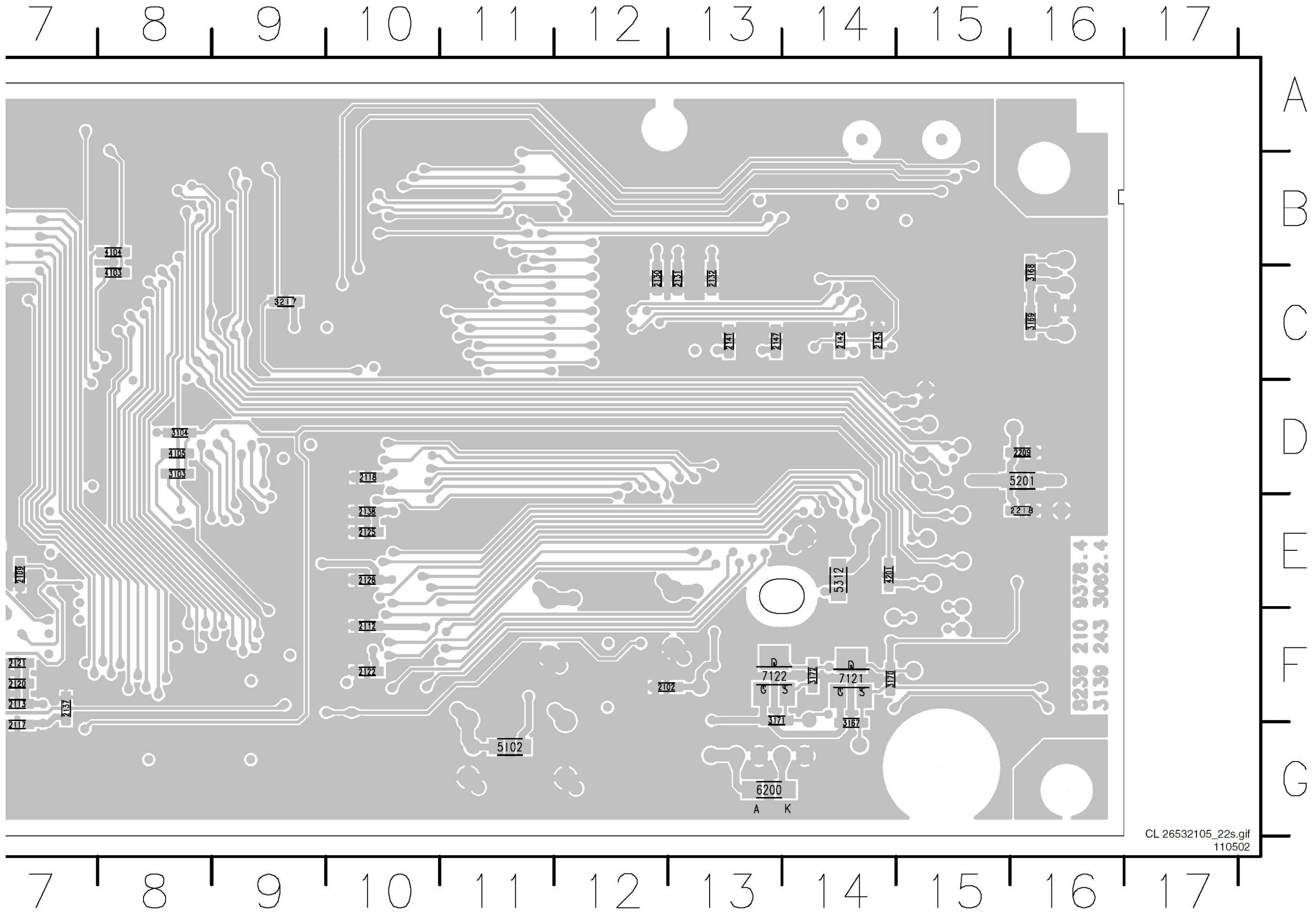
Layout P-Scan Board (Overview Bottom Side)

2102 F12	2118 D10	2128 E10	2138 E10	2209 D16	2215 B4	2307 F4	2317 F3	3168 C16	3201 G2	3210 D5	3300 C2	3309 D3	3315 C3	3321 F3	4209 D5	4303 E4	5202 C5	5305 D3	5312 E14
2109 E7	2120 F7	2130 C12	2141 C13	2211 C4	2218 E16	2309 E5	2319 F2	3169 C16	3203 B4	3211 D5	3305 C2	3310 E3	3316 F3	4103 C8	4210 D4	4307 D3	5203 B4	5306 E3	6200 G13
2112 F10	2121 F7	2131 C13	2142 C14	2212 C5	2220 C4	2310 D3	3103 D8	3170 F14	3207 D5	3214 B5	3306 C2	3312 D2	3317 F3	4104 B8	4212 F6	4308 D3	5301 B3	5307 F3	7121 F14
2113 F7	2122 F10	2132 C13	2143 C14	2213 B4	2303 C2	2312 D2	3104 D8	3171 F13	3208 D5	3215 D4	3307 D2	3313 E2	3319 F2	4105 D8	4301 F4	5102 G11	5303 F4	5309 E6	7122 F13
2117 G7	2125 E10	2137 F7	2147 C13	2214 B5	2305 C3	2316 G3	3167 G14	3172 F14	3209 D5	3217 C9	3308 C3	3314 G4	3320 E3	4201 E14	4302 G4	5201 D16	5304 F5	5311 F6	7201 G5

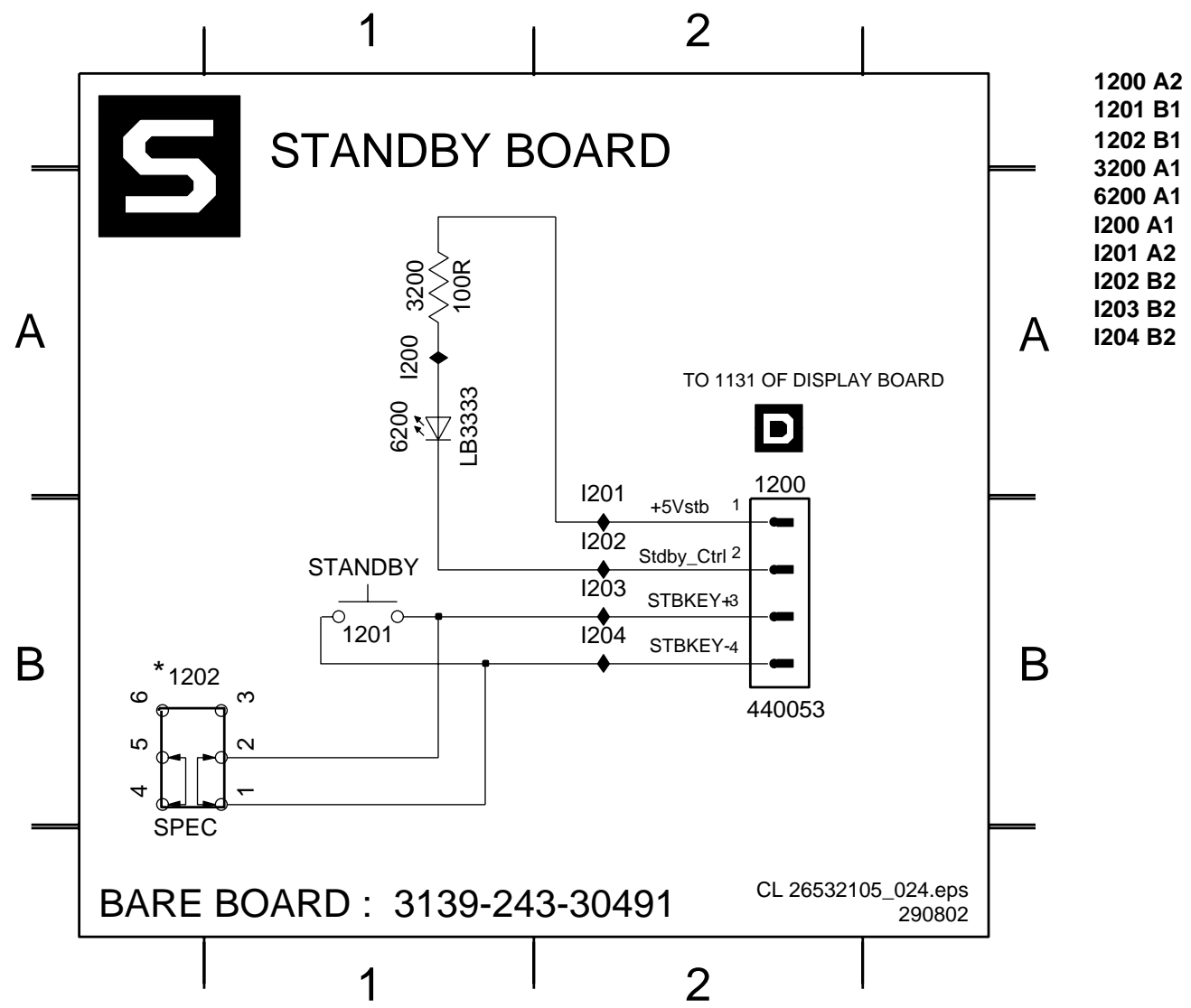




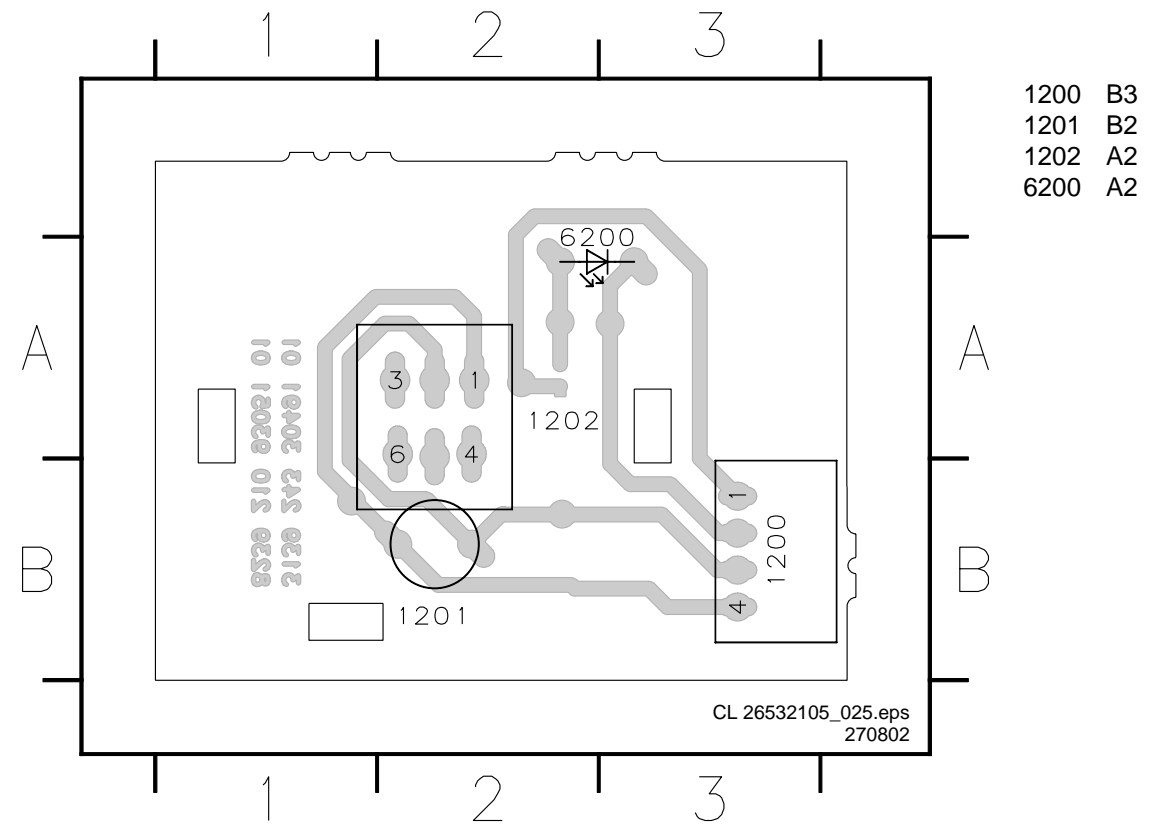
Layout P-Scan Board (Part 2 Bottom Side)



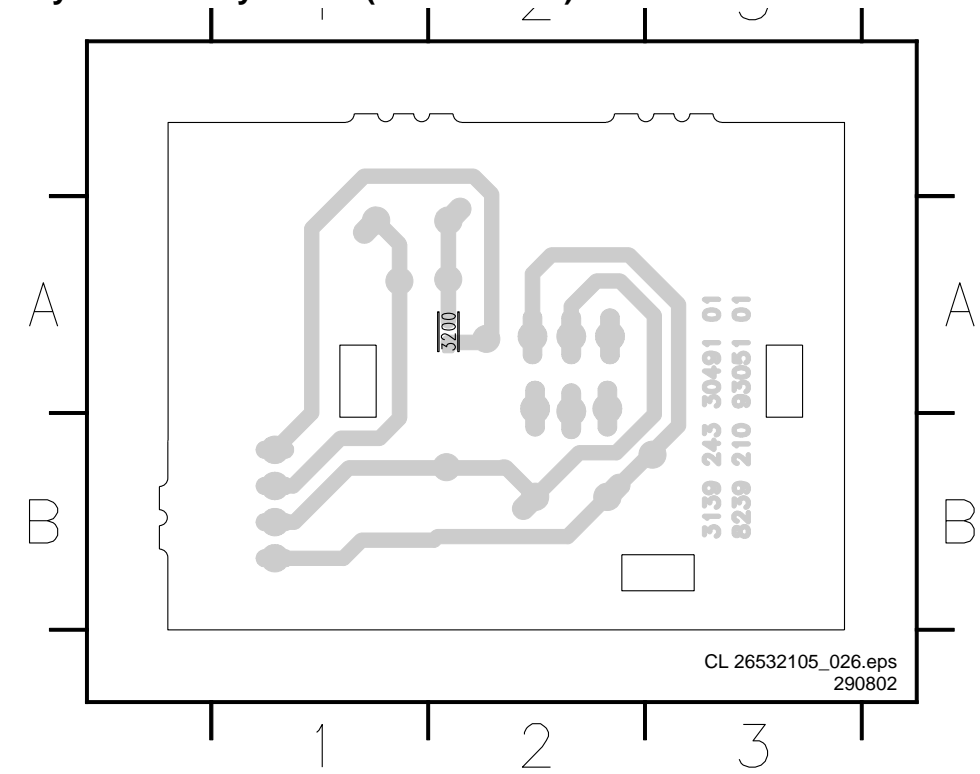
**Standby Board**



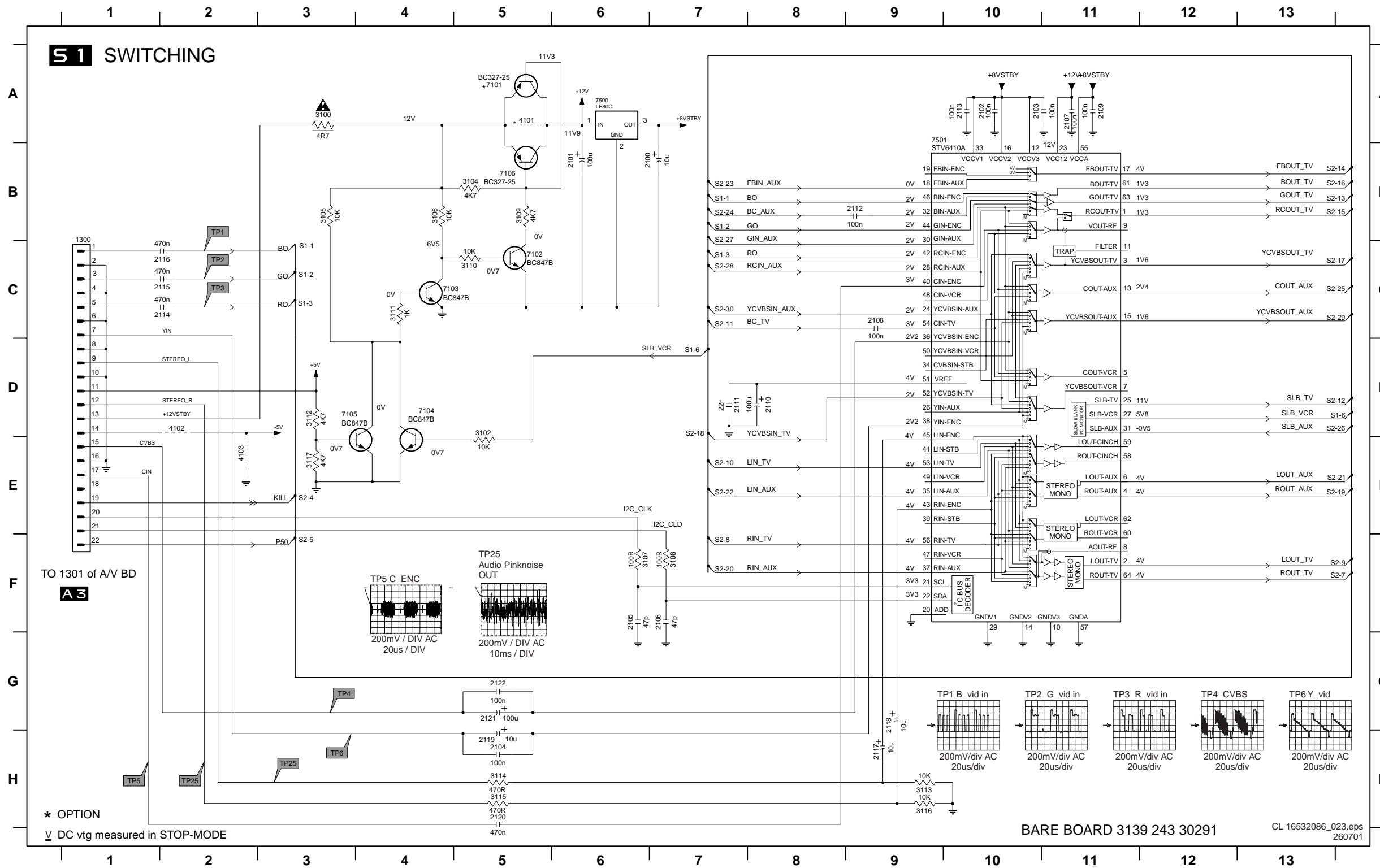
**Layout Standby Board (Top Side)**



**Layout Standby Board (Bottom Side)**



Double SCART Panel: Switching (Only for EU models)



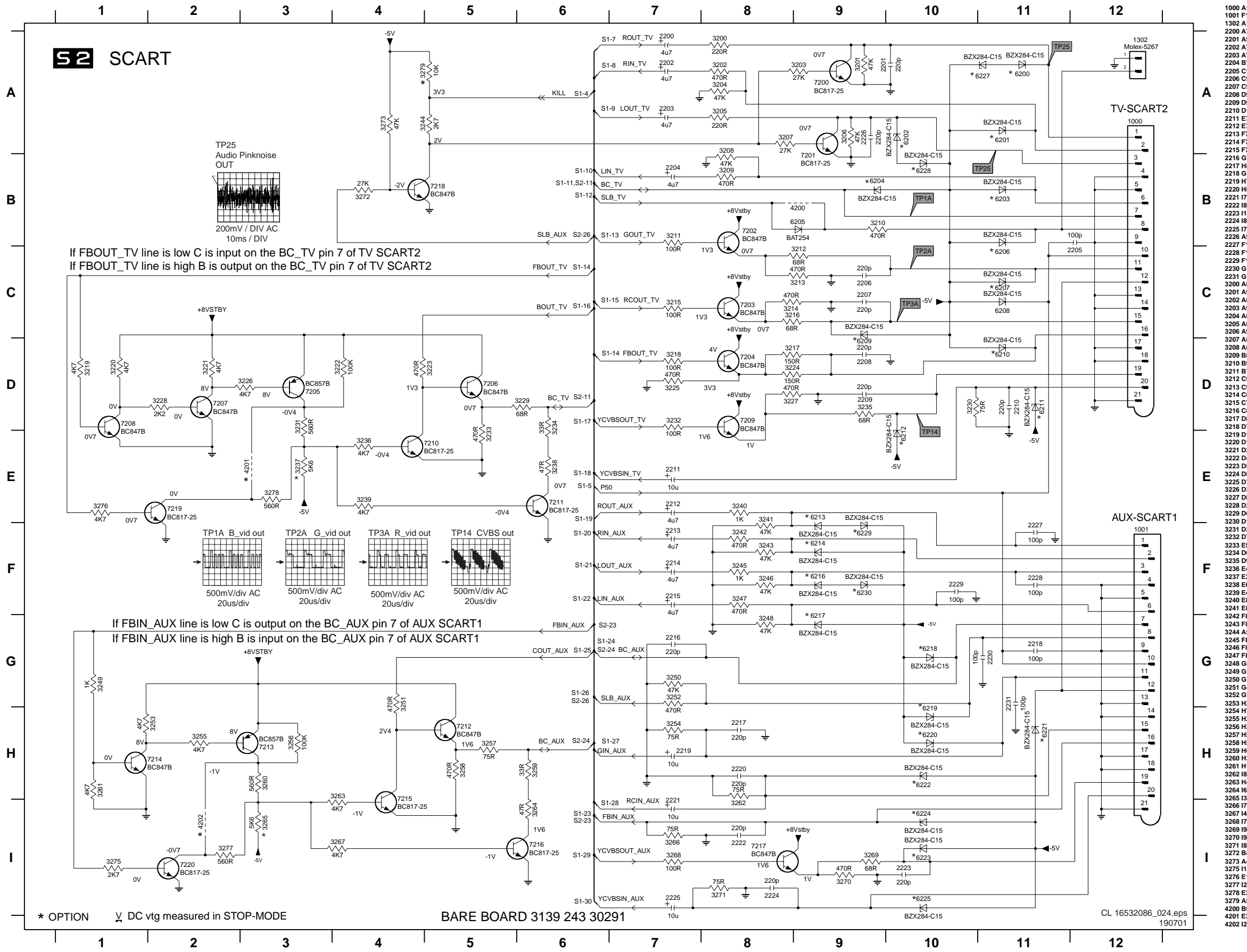
- 1300 C1
- 2100 B7
- 2101 B6
- 2102 A10
- 2103 A10
- 2104 H5
- 2105 F6
- 2106 F7
- 2107 A11
- 2108 C9
- 2109 A11
- 2110 D8
- 2111 D7
- 2112 B9
- 2113 A10
- 2114 C2
- 2115 C2
- 2116 C2
- 2117 H9
- 2118 G9
- 2119 H5
- 2120 H5
- 2121 G5
- 2122 G5
- 3100 A3
- 3102 D5
- 3104 B5
- 3105 B3
- 3106 B4
- 3107 F6
- 3108 F7
- 3109 B5
- 3110 C5
- 3111 C4
- 3112 D3
- 3113 H9
- 3114 H5
- 3115 H5
- 3116 H9
- 3117 E3
- 4101 A5
- 4102 D2
- 4103 E2
- 7101 A5
- 7102 C5
- 7103 C4
- 7104 D4
- 7105 D3
- 7106 B5
- 7500 A6
- 7501 B9

TO 1301 of A/V BD  
A3

\* OPTION  
DC vtg measured in STOP-MODE

BARE BOARD 3139 243 30291  
CL 16532086\_023.eps  
260701

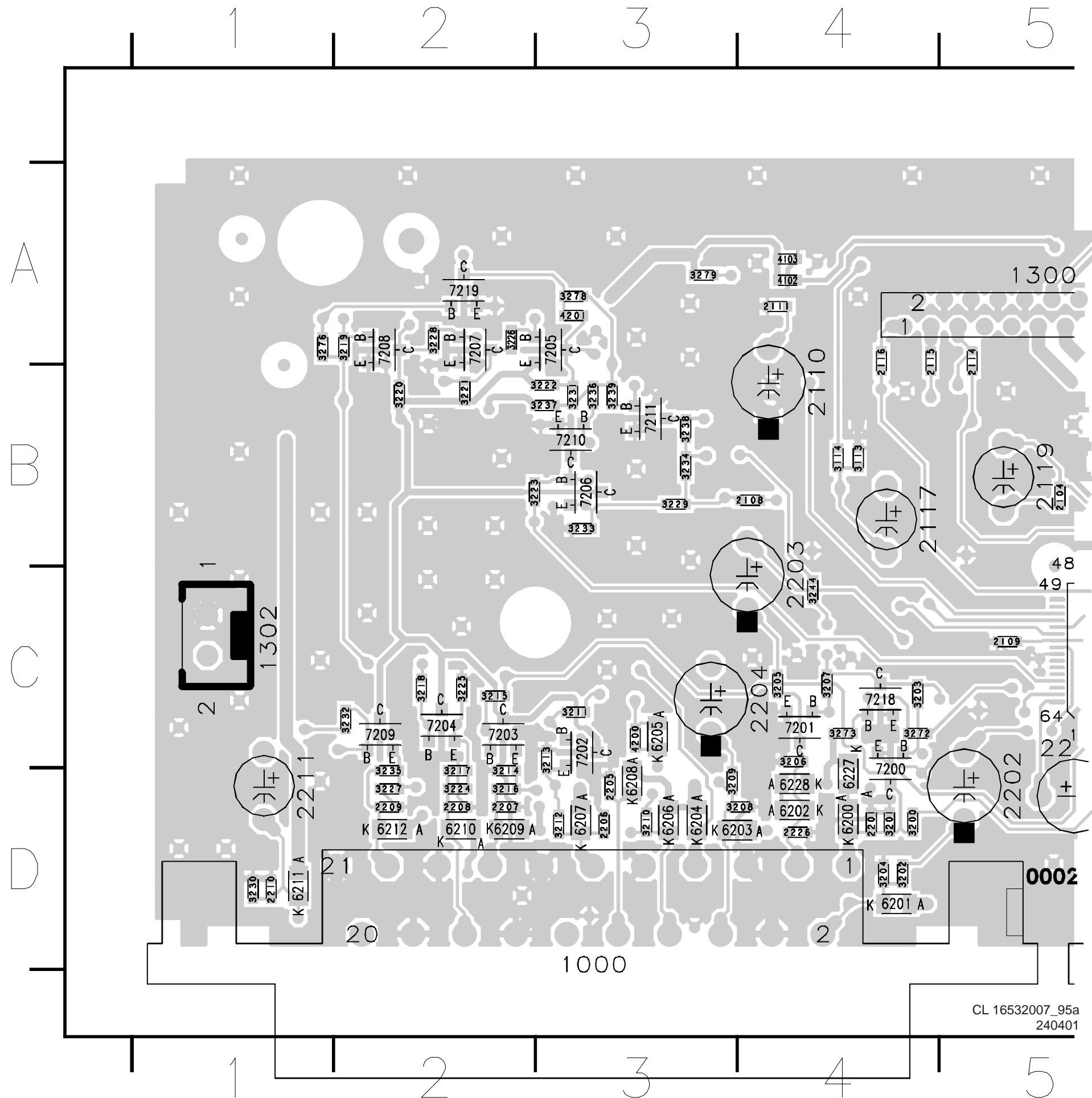
Double SCART Panel: Switching (Only for EU models)



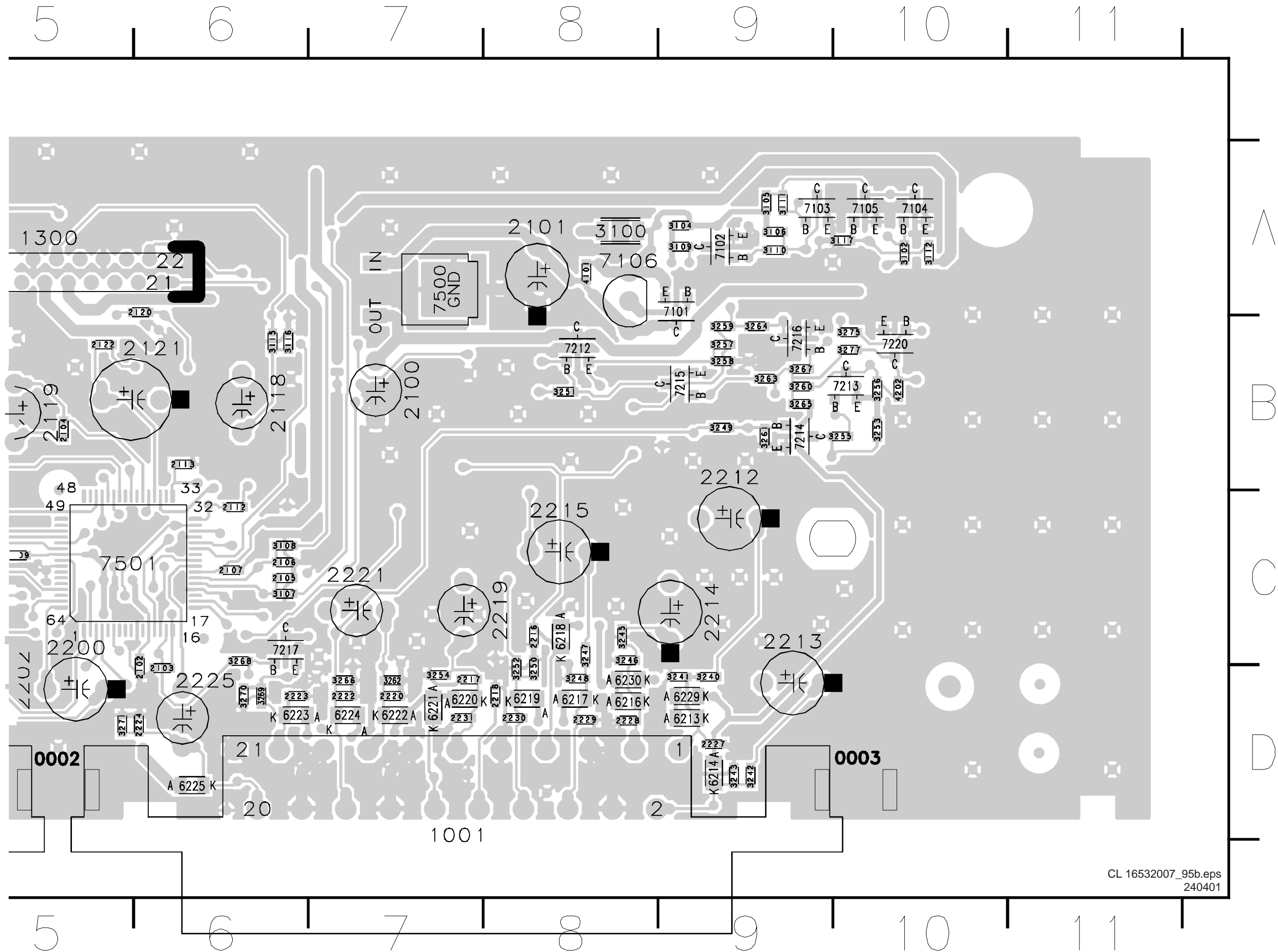
1000	A12	6200	A11
1001	F12	6201	A11
1302	A12	6202	A10
2300	A7	6203	B11
2201	A9	6204	B9
2202	A7	6205	B9
2203	A7	6206	C11
2204	B7	6207	C11
2205	C12	6208	C11
2206	C9	6209	D9
2207	C9	6210	D11
2208	D9	6211	D11
2209	D9	6212	E10
2210	D11	6213	E9
2211	E7	6214	F9
2212	E7	6215	F9
2213	F7	6216	G9
2214	F7	6217	G10
2215	F7	6218	H10
2216	G7	6219	H10
2217	H8	6220	H10
2218	G11	6221	H10
2219	H7	6222	I10
2220	H8	6223	I10
2221	I7	6224	I10
2222	I8	6225	A11
2223	I10	6226	B10
2224	I8	6227	F9
2225	I7	6228	F9
2226	A9	6229	A9
2227	F11	6230	B8
2228	F11	6231	B8
2229	F10	6232	C8
2230	G11	6233	D8
2231	G11	6234	D3
3200	A8	6235	A8
3201	A9	6236	D2
3202	A8	6237	D1
3203	A9	6238	D8
3204	A8	6239	E4
3205	A8	6240	E6
3206	A9	6241	H5
3207	A8	6242	H3
3208	A8	6243	H1
3209	B8	6244	I4
3210	B9	6245	I6
3211	B7	6246	I8
3212	C9	6247	B5
3213	C8	6248	E2
3214	C8	6249	I2
3215	C7	6250	I2
3216	C8	6251	I2
3217	D8	6252	I2
3218	D7	6253	I2
3219	D1	6254	I2
3220	D1	6255	I2
3221	D2	6256	I2
3222	D4	6257	I2
3223	D5	6258	I2
3224	D8	6259	I2
3225	D7	6260	I2
3226	D3	6261	I2
3227	D8	6262	I2
3228	D2	6263	I2
3229	D6	6264	I2
3230	D10	6265	I2
3231	D3	6266	I2
3232	D7	6267	I2
3233	E5	6268	I2
3234	D6	6269	I2
3235	D9	6270	I2
3236	E4	6271	I2
3237	E3	6272	I2
3238	E6	6273	I2
3239	E4	6274	I2
3240	E8	6275	I2
3241	E8	6276	I2
3242	F8	6277	I2
3243	F8	6278	I2
3244	A5	6279	I2
3245	F8	6280	I2
3246	F8	6281	I2
3247	F8	6282	I2
3248	G8	6283	I2
3249	G1	6284	I2
3250	G7	6285	I2
3251	G4	6286	I2
3252	G7	6287	I2
3253	H2	6288	I2
3254	H7	6289	I2
3255	H2	6290	I2
3256	H3	6291	I2
3257	H5	6292	I2
3258	H5	6293	I2
3259	H6	6294	I2
3260	H3	6295	I2
3261	H1	6296	I2
3262	I8	6297	I2
3263	H4	6298	I2
3264	I6	6299	I2
3265	I3	6300	I2
3266	I4	6301	I2
3267	I4	6302	I2
3268	I7	6303	I2
3269	I9	6304	I2
3270	I9	6305	I2
3271	I8	6306	I2
3272	B4	6307	I2
3273	A4	6308	I2
3275	I1	6309	I2
3276	E1	6310	I2
3277	I2	6311	I2
3278	E3	6312	I2
3279	A5	6313	I2
4200	B9	6314	I2
4201	E3	6315	I2
4202	I2	6316	I2



Layout Double SCART panel (Only for EU models) (Part 1 Top Side)



Layout Double SCART panel (Only for EU models) (Part 2 Top Side)



## 8. Alignments

Not applicable.

## 9. Circuit Descriptions and List of Abbreviations

Index of this chapter:

1. Introduction
2. Power Supply Unit (PSU).
3. Loader/Mono Board.
4. Audio Video (A/V) Board.
5. Front Display Board.
6. Abbreviations
7. IC Data

### Notes:

- See also the SD4.00SA\_CH Service Manual (3122 785 12480).
- Figures can deviate slightly from the actual situation, due to different set executions.
- For a good understanding of the following circuit descriptions, please use the diagrams in chapter 6 and 7. Where necessary, you will find a separate drawing for clarification.

### 9.1 Introduction

The DVD963SA is a model from the SACD 2002 'single disc' range. It uses a 2nd generation Philips SACD mono board, based on the Furore 2 DSD/DST decoder.

Below you will find a circuit description of the several modules.

### 9.2 Power Supply Unit

#### 9.2.1 Introduction

This supply is a Switching Mode Power Supply (SMPS), which uses the control IC TY720xx to produce pulses to drive the power 'switch' (MOSFET). The TY720xx (IC7130) is a high performance, current mode controller for DC-to-DC converter applications.

The operation frequency varies with the circuit load. When the output power demand decreases, the switching frequency raises, with a maximum frequency of 125 kHz (defined by C2130 at pin 5). At this point, the internal VCO takes over and starts to decrease the switching frequency.

This has some benefits compared to a 'fixed frequency' flyback converter. The efficiency is better, which results in a lower power consumption.

#### 9.2.2 Output Voltages

The following output voltages are present on connector 0201:

- Pin 1 and 2: +3V3.
- Pin 4: +12V
- Pin 5: +12STBY.
- Pin 7: +5V.
- Pin 9: -12V.
- Pin 11: -32V.

**Note:** The suffix 'STBY' indicates that the supply is not switched 'off' during Standby Mode. Power switching is done with the STBY\_CTRL signal from the slave processor.

#### 9.2.3 Operation

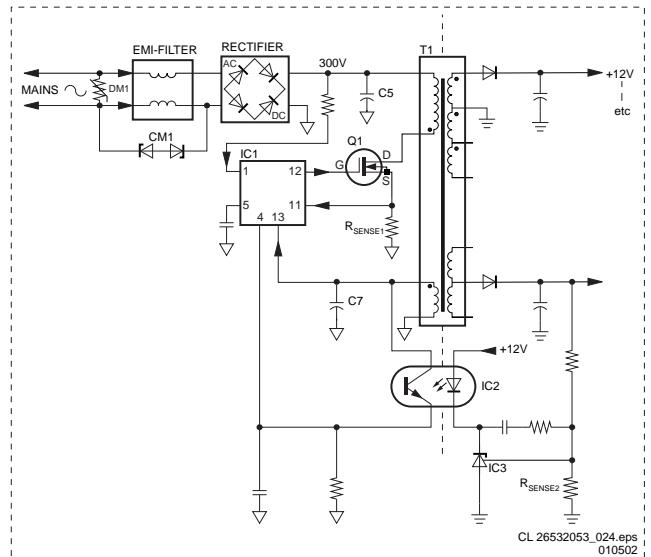


Figure 9-1 Power Supply

#### Mains Input Circuit

The bridge rectifier D6110 rectifies the mains voltage, after which C5 (2117) smoothens it. The DC voltage across this capacitor is the DC input voltage (approximately 300V), to pin 1 of transformer T1 (pin 9 of 5190) and pin 1 of IC1 (7130). The mains input also consists of a (differential mode) lightning protection DM1 (R3110) and a (common mode) lightning protection CM1 (D6114/15).

#### Start-up Circuitry

The rectified voltage from the bridge rectifier is connected to pin 1 of IC1. This voltage will charge the Vcc capacitor C7 (C2131). When this voltage, (at pin 13), reaches the start-up threshold of min. 15V, the control circuit starts to operate. After start-up, the control IC requires a sinking current, which the start-up circuitry cannot deliver. Therefore a take-over circuitry (a coupled winding of transformer T1) is present. The voltage at this point will take over the supply voltage at pin 13 of the IC1(7130).

If the take-over circuit does not function, IC1 (7130) will switch 'off' again at the minimal operating voltage of +8V. The whole operation cycle will repeat itself with audible hiccup sound if take-over is not present.

#### Secondary Voltage Sensing

The secondary voltage regulating circuit comprises of optocoupler IC2 (7190), which isolates the error signal from the control IC on the primary side, and a reference component IC3 (7290, TL431).

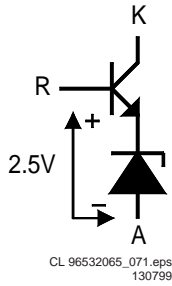


Figure 9-2 TL431

This reference component has two functions:

- A very stable and accurate reference diode
- A high gain amplifier.

When the output voltage increases (due to a reduction in the load), the voltage across  $R_{SENSE-2}$  (R3290/R3291) increases to above the internal reference voltage of 2.5V. The TL431 will conduct and the current through the opto-coupler will increase. This results in an increase of the voltage at pin 4 of IC1, which will reduce the 'on' time of Q1 (FET 7125). In the event of an output voltage decrease (due to an increase in the load), the control circuit will operate in the opposite way.

#### Primary Current Sensing

The current through FET Q1 will result in a voltage drop across  $R_{SENSE-1}$  (R3120-23). This line goes to pin 11 of IC7130, which is the current sense input. The higher the input voltage, the more the primary current is limited. In this way, the maximum output power of the power supply is limited.

#### Under-voltage Protection

If the supply voltage at pin 13 of IC7130 drops below 7.2V (typical), e.g. due to a shorted secondary voltage or excessive load, the drive pulse at pin 12 is disabled and the controller will switch 'off'.

#### Over-voltage Protection

An internal over-voltage protection circuitry continuously monitors the  $V_{cc}$  pin. If, after start-up, this voltage exceeds 40V, the internal latch circuit is triggered, the output buffer is disabled, and the SMPS goes into over-voltage protection. Now a complete restart sequence is required.

**Note:** If the event of the over-voltage situation remains present, the SMPS will go in sequence of protection, start-up, protection and the cycle repeats. This effect is highly audible.

### 9.3 Loader/Mono Board (for diagrams see SD4.00SA\_CH Service Manual)

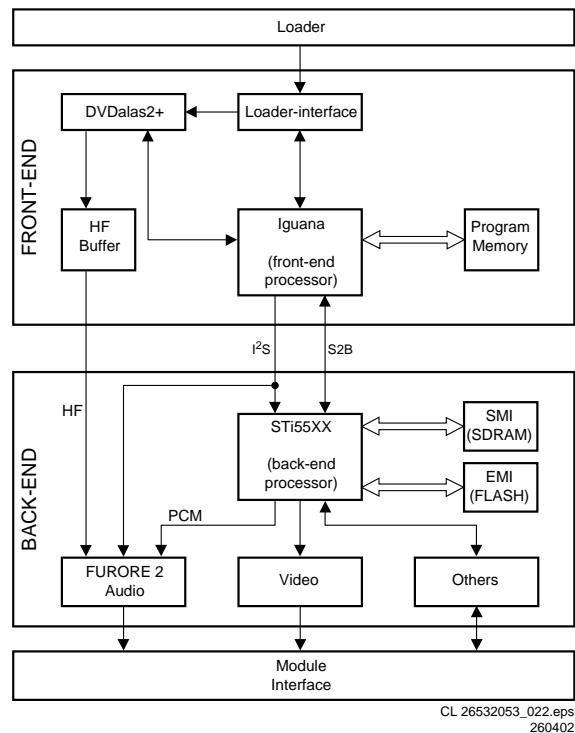


Figure 9-3 Block Diagram Loader/Mono board

The SD4.00\_SA\_CH (SACHI\_4) is the 2nd generation Philips Architectural Standard Design of SACD mono board based on Fureore 2, and will be used in the new generation of SACD players. It is designed in a multi-task way so that it can support the following optional main functions:

- SD4.00\_SA\_CH: Support SACD player with 5-disc changer.
- SD4.00\_SA: Support SACD player with single-disc.
- SD4.00\_CH: Support DVD player with 5-disc changer but without SACD playback.
- SD4.00\_SA\_I²C: Support SACD player with single-disc and I²C slave.

The SD4.00\_SA\_CH (SACHI\_4) module consist of the following key components:

1. OPU: Mercury 2 Loader VAL6011/14 (slim type) for a single-disc SACD player, or DVD VAM6001/14 mechanism for a 5-disc SACD changer.
2. **Front-end:** M2 Basic Engine.
3. **Back-end:** DVD Host Processor STI55xx and Fureore 2 SACD DSD/DST decoder.
4. **Power supply:** To convert the PSU voltages to the correct values.
5. **Reset circuit:** This circuit that the booting of the several devices on the mono board takes place in the correct order.

#### 9.3.1 The Optical Pick-up Unit (OPU)

The Mercury 2 Loader has an optical unit consisting of two lasers:

- One for CD with a wavelength of 780 nm.
- One for DVD with a wavelength of 650 nm.

The TZA1033 (item 7105) controls the data from these lasers, and the supply to them.

#### 9.3.2 Front-end: the Servo Part

The front-end consists of:

- The Loader interface

- The Servo Processor/Decoder
- The Interface/Program Memory

#### The Loader Interface

The TZA1033HL/K2 (or DVDALAS2plus, item 7105) is an analogue pre-processor and laser supply circuit. It contains data amplifiers and several options for radial tracking and focus control.

It is possible to optimise the dynamic range of this pre-amp/processor combination for the LF servo and RF data paths. The gain in both channels is separately programmable. This will guarantee an optimal playability for all kind of discs.

Also, a dual laser supply is implemented, with fully automatic laser control including stabilisation and an ON/OFF switch, plus a separate supply pin for power efficiency.

#### The Servo Processor/Decoder

In the SD3.0 module, the servo signals were fed to the MACE2 servo processor, while the HF output signal was fed to the SAA7335 decoder. In the new SD4.0SA\_CH module, these ICs are combined into one chip: the SAA7812 Iguana.

This chip contains the following blocks: channel decoder, block decoder, servo processor, and microcontroller.

The servo circuit in the SAA7812 (item 7207) takes care of the servo controls.

In a CD system, there are some twelve control loops active. About six of them are needed to adjust the servo error signals that is once per disc rotation. It also adjusts offsets, signal amplitudes, and loop gains (AGCs), to enlarge system robustness and to avoid expensive potentiometer adjustments in production.

The other six loops determine the laser spot position on the disc in the radial, axial (focus), and tangential directions. It also has to take care that the spot accesses a required position as fast as possible. This access system consists of two parts, namely the actuator and the sled, which are (within a certain range) mechanically and electrically independent. Therefore, during an access, the servo has to control as well the actuator as the sled.

The analogue signals, from the diode pre-processor, are converted into a digital representation using A/D converters. For the communication between the host processor (STi55xx) and the servo processor, the S2B bus is used. This bus supports full-duplex asynchronous communication.

The SAA7812 is also a combined CD/DVD compatible decoding device. The device operates with built in hardware for CD/DVD error correction and de-interleaving operations. It decodes EFM or EFM+HF signals directly from the laser pre-amplifier, including analogue front-end, PLL data recovery, demodulation, and error correction.

Its analogue front-end input (the channel decoder), converts the HF input signal to the digital domain via an 8-bit ADC, preceded by an AGC circuit to obtain the optimum performance from the converter. An external resonator clocks this block. This subsystem recovers the data from the channel stream. It corrects asymmetry, performs noise filtering and equalisation, and finally recovers the bit clock and data from the channel using a digital PLL.

The demodulator part detects the frame synchronisation signals and decodes the EFM (14 bit) and EFM+ (16 bit) data and sub-code words into 8-bit symbols. Via the serial output interface, the I<sup>2</sup>S data (audio and video) go to the DVD decoder STi55xx.

The spindle-motor interface provides both motor control signals from the demodulator and, in addition, contains a tachometer loop that accepts tachometer pulses from the motor unit. They drive the motor IC (BA6665FM, item 7300).

The SAA7812 has two independent microcontroller interfaces. The first is a serial I<sup>2</sup>C-bus and the second is a standard 8-bit

multiplexed parallel interface. Both of these interfaces provide access to 32 8-bit registers for control and status.

#### The Interface/Program Memory

The interface between front-end (SAA7812) and back-end (Sti55xx) is via:

- I<sup>2</sup>S bus (BCLK, DATA, WCLK, FLAG, SYNC and V4).
- S2B bus (RXD\_S2B, TXD\_S2B, CPR\_S2B and SUR\_S2B).
- Miscellaneous I/O ports (RSTNF= front-end reset, EANF= front-end processor boot select).

**Service tip:** These lines contain series resistors (47 or 100 Ω) for easy hardware debugging, and for EMC/noise reduction of the high-speed I<sup>2</sup>S lines.

The front-end processor SAA7812 (Iguana) has two boot modes: normal boot from flash memory, or serial mode. The boot selection is via the EANF pin. The Iguana, samples the EANF signal level once during boot-up. Once boot-up is completed, this pin is no longer used for this purpose. However, in the SD4.0SA\_CH circuit, the EANF is also connected to the flash memory. Therefore, when this pin is LOW, the lower 1 Mbits of the memory is accessible. Conversely, when this pin is HIGH, the upper 1 Mbits is accessible.

Under front-end normal operation, the program memory (less than 1 Mbits in size) should reside in the lower bank. Therefore, the EANF pin should be LOW at all times. Since the actual flash memory used is 2 Mbits, the upper 1 Mbits is unused. This area is reserved for possible use by the front-end self-diagnostic software, or flash download application.

### 9.3.3 Back-end: the Digital Part

The back-end consists of:

- DVD back-end processor
- SACD DSD processor
- Audio output
- Video output
- Clock factory
- Miscellaneous

#### DVD Back-end Processor

The SD4.0SA\_CH is designed for the Sti55xx family. Some of the DVD related features of these ICs are:

### Processor overview

Function	STi5580	STi5588	STi5519
Basic CD/VCD/DVD decoding	X	X	X
Extra 2-channel of I2S output (PCMDATA3)	X	X	
Karaoke	X	X	
DTS	X	X	
Audio post processing (equalizer, level meter, etc)		X	
DVD audio		X	
Progressive scan at analog video output		X	

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020902

Figure 9-4 Processor overview

The STi5580 has the same architecture as the STi5508 (used in earlier DVD generations), and is pin-to-pin compatible.

It works on 3.3 V (V<sub>DD</sub>), and comprises the following functions:

- Video decoder, which supports MPEG1 and MPEG2.
- Audio decoder that supports AC-3, MPEG1, MPEG2, DTS, PCM, S/PDIF, and MP3.
- PAL/NTSC video encoder with simultaneously Y/C, CVBS, and RGB/YUV outputs.
- The video encoder supports Closed Caption and allows MacroVision 7.0/6.1.
- Full screen On Screen Display (OSD) generator.
- Three on-chip PLLs to generate all necessary clocks (as reference the 27 MHz video clock is used).

### Input

Input data comes from the I<sup>2</sup>S-bus. The front-end interface of this device, accepts DVD, CD and CD-DA information.

### Signal Processing

For video, the input data stream is decoded to the appropriate MPEG, Sub Picture, and OSD data streams, after which they are fed to the PAL/NTSC encoder. This cell will convert the digital MPEG/Sub Picture/OSD stream into a standard base band signal and into RGB components. It handles interlaced and non-interlaced data, can perform CC/TXT encoding, and allows MacroVision copy protection.

For audio, the processing cell is a fully compatible DTS, Dolby Digital (AC-3), MPEG1, MPEG2, PCM decoder, capable of decoding 5.1 and 2 channel streams.

### Output

For video, six analogue output pins are available on which CVBS, S-VHS (Y/C), and RGB signals are present. They go, via a buffer, to connector 1703. As an option, a digital YUV output is available at connector 1704.

### External Memory

The STi55xx family is capable of accessing external memory via three buses:

- **The enhanced memory interface (EMI).** This interface is configurable and can be used to access Flash, ROM, and various flavours of DRAM.
- **The shared memory interface (SMI).** The SMI is only used to access SDRAM. The SMI is connected to a 64Mbits (4M x 16bit) 7.5ns SDRAM (item 7500). The SDRAM has the following functions:
  - It is used by the MPEG video decoder as a frame buffer,
  - It holds the software and the variables used by it.
- **The I<sup>2</sup>C bus.** Via this bus, the NVRAM (or EEPROM) is accessible. This memory is used to store user settings, player settings, and region code. As the STi55xx I/O-lines are potentially unable to handle 5V inputs, a voltage level shifter is foreseen for all I<sup>2</sup>C-busses. This circuit will isolate the STi55xx I<sup>2</sup>C ports (3.3V) from the system I<sup>2</sup>C bus (5V). See figure below.

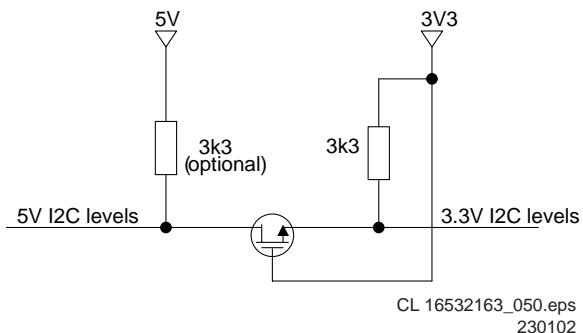


Figure 9-5 I<sup>2</sup>C voltage level shifter

### The SACD DSD processor

The Furore-IC is a one-chip design, containing all the hardware that is required for SACD processing. It is intended to interface with the STixx-family DVD video decoders.

The Furore-IC contains a memory interface to support an external 16 or 64 Mbit SDRAM.

During SACD application, the STi55xx serves as a host, whereby the Furore is controlled via the EMI interface. The Furore processing part is not used during all other play modes. In these modes, the PCM audio signals are fed through the Furore to the appropriate DAC.

### Block diagram

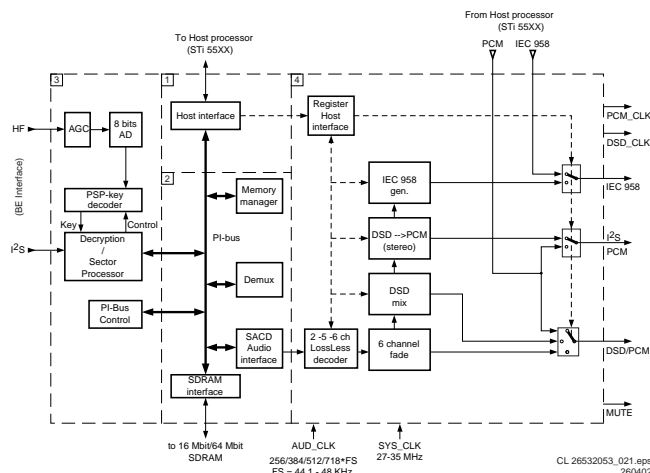


Figure 9-6 Block diagram Furore

We can divide the Furore-IC in four main parts (see block diagram):

1. **Host interface.** This is the link between the host bus and the internal registers and memory bus. It also supplies the general reset signal (HW and SW) and the interrupt signals.
2. **Data processing.** All modules and peripherals in this part are connected to a so-called PI-bus. It is beyond the scope of this manual to go more in detail on this subject.
3. **Copy protection.** On every SACD disc, a PSP-signal is recorded. The player can only play a disc if a valid PSP-signal is detected. This PSP-key is recorded, via a special mechanism, in the EFM-signal on the disc. To detect this key, the analogue HF-signal from the optical pick-up unit is fed directly to the Furore-IC. Via an AGC, the signal is fed to an ADC. The digitised HF signal is then fed to a block where key is encrypted. Control of this process is done via the host interface (sector processor).
4. **DSD decoding and post processing.** In this part, all processing is done to generate a DSD and/or an I<sup>2</sup>S stream (from the de-multiplexed stream coming from the data processing block), in such a way that it can directly be connected to a DA-converter. All processing is done on 384\*FS.

### Interfaces

- **Basic Engine Interface:**
  - Data input interface. The Basic Engine Interface (I<sup>2</sup>S) is connected to the output of the SAA7335 (HD61) high speed CD decoder.
  - Analogue HF input. The analogue HF input, coming from the optical pickup unit (OPU), is also fed to the Furore-IC, to extract the copy-protection information PSP (Pit Signal Processing = invisible data is stored on to disc, which is required to decrypt the encrypted content).
- **SDRAM Interface:** The SDRAM interface forms a glue less interface to one 64 Mbit SDRAM device. The interface takes care for the power-up sequence, mode programming and refreshing of the SDRAM devices. This is hard coded in the interface and does not have to be controlled by the host.
- **Audio data input/output Interface:**
  - DSD/PCM combined data output. DSD\_PCM: Output intended for a combined 6-channel DSD (SACD) and PCM (DVD-CDDA) DAC. Switching between the PCM data coming from the STi55xx, and the internal generated DSD signals, is done in the Furore IC.
  - Stereo DSD only output. DSD\_stereo: 2-channel DSD output with stereo down mix in the case of 5- and 6-channel, and normal stereo in case of 2-channel DSD mode.

- Stereo PCM data output. Two possible stereo sources can be selected as stereo PCM output:
  1. Stereo PCM coming from the STi55xx via the PCM input on Furore.
  2. Stereo or down-mix-PCM derived via a decimation filter from the SACD-DSD signal.
- Digital audio output interface (IEC958). The IEC958 format is intended to connect the DVD736SA to a digital receiver. No DSD signals are defined for IEC958, therefore the 'DSD->PCM converted' signal is transmitted. Following two types of signals are possible on the digital interface:
  1. IEC958 data coming from the STi55xx.
  2. IEC958 data (stereo or down-mix-PCM) derived via a decimation filter from the SACD-DSD signal.
- Clock + reset input. Two different processing clocks and a reset pulse are needed:
  1. Sys\_clk: System clock for data processing part, frequency can be 27 MHz or 768\*FS.
  2. 384\*FS: Processing clock for LLD and post processing.
  3. RESETn is an asynchronous reset and should be low for at least 1 period of DSD\_CLK.

#### Memory

- **SDRAM.** The size of the SDRAM is 64 Mbit (items 7500 and 7502). It has the following functions:
  - It is used by the MPEG video decoder as a frame buffer,
  - It holds the software and the variables used by it.
- **Flash-ROM.** Two 2MB Flash-ROMs (items 7402 and 7403) hold the DVD firmware, and are controlled by pin 16 (FLASH\_OEN) of the STi55xx. It must be able to perform a download (by disk or OS-link) in a Flash-only system.
- **EEPROM.** User settings, player settings, and region code are stored in a 32 Kb I<sup>2</sup>C EEPROM.

#### Audio Output

The audio interfaces available in SD4.0SA\_CH are I<sup>2</sup>S and S/PDIF for digital audio output, and I<sup>2</sup>S karaoke microphone input.

In SACD player, two types of DACs (that are PCM DAC and high end DSD DAC), are used on AV board.

The audio data path to both DACs is routed via the Furore 2.

#### I<sup>2</sup>S audio

The STi55xx is capable of 6-channel I<sup>2</sup>S output. These channels can be configured to output 5.1 Dolby Digital, DTS, etc.

- PCM\_OUT0: Left and Right.
- PCM\_OUT1: Centre and LFE (subwoofer).
- PCM\_OUT2: Left and Right surround.

Two additional channels (available in STi5580 and STi5588) are capable of providing down-mixed stereo.

#### S/PDIF

The S/PDIF signal level (pin 57, SPDIF\_OUT) is 5V TTL at module interface. To meet the complete S/PDIF specifications, an external de-coupling circuit (item 7720, diagram M7) is implemented.

#### I<sup>2</sup>S karaoke (optional)

The STi5580 and STi5588 have built-in karaoke processing. The internal karaoke block accepts I<sup>2</sup>S signal, acting as the master by generating the required KOKPCMCLK frequency. This frequency is always 1/4 the music sampling frequency. An external analogue-to-digital converter (ADC), acting as slave, is required to convert the microphone signals to I<sup>2</sup>S signals.

#### CD-DA/DVD Data Path

The data path for CD-DA and DVD is as follows:

- I<sup>2</sup>S data from the M2 basic engine enters the STi55xx.

- The STi55xx processes the data, and sends the 6 PCM output channels to Furore 2. The LeRi channels are directly passed to the AV board also.
- The switch matrix of the Furore 2 sends the two incoming stereo PCM channels (LeRi) to the AV board.
- The switch matrix of the Furore 2 sends the six incoming PCM channels to the high end DAC board.
- The mute signal from the STi55xx is directly passed to the AV board. This requires a patch on the mono board.
- The IEC958 output of the STi55xx is fed directly to AV board.

The clock distribution is as follows:

- The master clock 384FS is received from the high end DAC board.
- From this clock the 27 MHz clock for STi5580 and the Furore 2 is derived (Video clock).
- From the 27 MHz clock the audio clock (256FS) is derived. The STi55xx and Furore 2 use this clock. For CD-DA FS amounts to 44.1 kHz, for DVD 48 or 96 kHz.
- In case of CD-DA, the high end DAC uses its internal clock (384FS). In case of DVD, the switch matrix of Furore 2 sends the audio clock (256FS) to the high end DAC on AV board.
- The AV board receives the 256FS clock.

Selection of the audio clock is done in the clock factory. For a description of the clock factory, see paragraph 'Clock Factory'.

#### SACD Data Path

The data path for DSD/DST is as follows:

- I<sup>2</sup>S data from the basic engine enters the Furore 2.
- The Furore 2 processes the data. This results in 6 DSD/DST channels.
- The switch matrix of the Furore 2 sends the 6 DSD/DST channels to the high end DAC on AV board.
- The 6 DSD/DST channels are down mixed to a stereo PCM signal.
- The switch matrix of the Furore 2 sends the stereo PCM signal to the AV board.
- The mute signal from the STi55xx is directly passed to the AV board. This requires a patch on the mono board.

The clock distribution is as follows:

- The master clock 384FS is received from the high end DAC on AV board.
- From this clock the 27 MHz clock for STi55xx and Furore 2 is derived (video clock).
- From the 27 MHz clock the audio clock (256FS) is derived. The STi5580 and Furore 2 use this clock.
- The high end DAC on AV board uses its own XTAL clock (384FS). The 256FS clock to the DAC board is switched off, to prevent for interference.
- The AV board receives the 256FS clock.

Selection of the audio clock is done in the clock factory. For a description of the clock factory, see paragraph 'Clock Factory'.

#### Video Output

##### Digital video (optional)

Digital YUV output is routed directly from STi55xx ports to a 24-pin connector (item 1704). From the same connector, the HSYNC, VSYNC and 27MHZ\_CLK signals are available. The digital YUV connector is the interface to external video processing devices; such as high quality progressive scan codex and high quality video DAC.

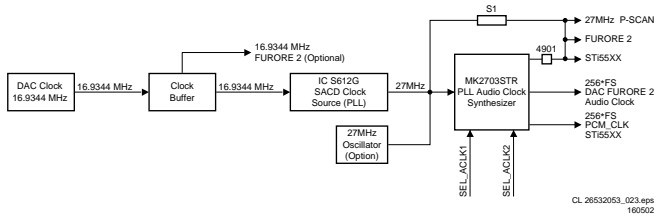
##### Analogue video

The STi55xx is capable of 6-channel analogue video. Three channels (pins 25, 26 and 27) are RGB or YUV format, while the other three channels (pins 32, 33 and 34) are Y, C, and CVBS.

A video output buffer (see diagram M7, e.g. item 7701 for R) is implemented: an 8MHz/16MHz selectable filter stage and a 75Ω drive stage.

**Clock Factory**

One clock factory is implemented to support all clocks required by the Furore 2. The various master clock, which depends on whether SACD is present, is used for SD4.00\_SA\_CH. The clock factory of SD4.00\_SA\_CH is showed in Figure 8-2.



**Figure 9-7 Block diagram clock factory**

For the SACD player, the clock system is a DAC master clock system. For non-SACD player, the clock system is a mono board master clock system.

The Furore 2 supports clock 256\*FS/384\*FS/512\*FS. The most convenient value in the market is 16.9344 MHz (384\*FS, FS=44.1kHz). Therefore, the master clock on the SD4.00\_SA\_CH mono board is the 384\*FS coming from the A/V board. The 384\*FS (16.9344 MHz) from the DAC clock, must always be present. It is buffered before it is sent to the Furore 2 and the rest of the clock factory. The IC S612G delivers a 27 MHz system clock.

The Furore 2 and Sti5580/Sti5588 (Video) use this clock. It is used to derive the PCM audio clocks 256\*FS by the MK2703STR. This IC is also used to buffer the incoming 27 MHz clock.

The communication between the Sti55xx and the Furore 2 is asynchronous.

To support non-SACD playback, an on-board 27MHz oscillator delivers the master clock for SD4.00\_SA\_CH mono board.

**Miscellaneous**

Most general IO ports are connected directly to the module interface. Compared with the SD3.0 module, some on-board circuits are removed, as it made more sense (and more cost effective) to implement these circuits externally.

**SCART Status Signal**

The SCART0 and SCART1 signals are directly available at the module interface, where the 0\_6\_12V signal is generated. See table below:

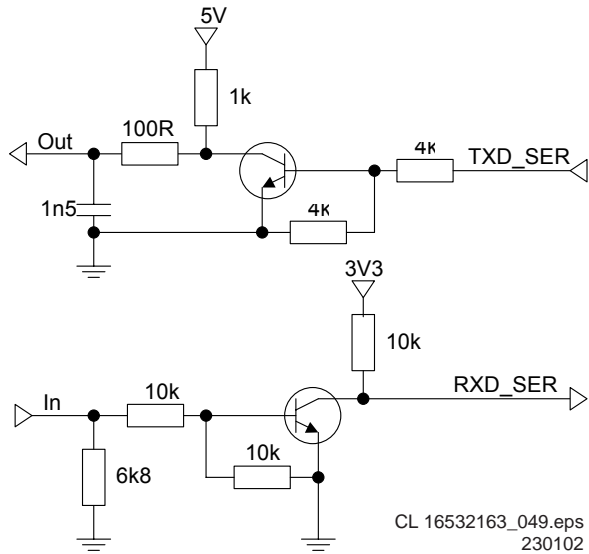
**Table 9-1 0\_6\_12V SCART status truth table**

Function	PIO3_6 (SCART0)	PIO3_7 (SCART1)	0_6_12V (at SCART connector)
TV display	1	1	0V
TV display	0	1	0V
16:9 aspect ratio	1	0	+6V
4:3 aspect ratio	0	0	+12V

**Mute**

The audio MUTE signal (active 'high') is directly available at the module interface.

**Service**

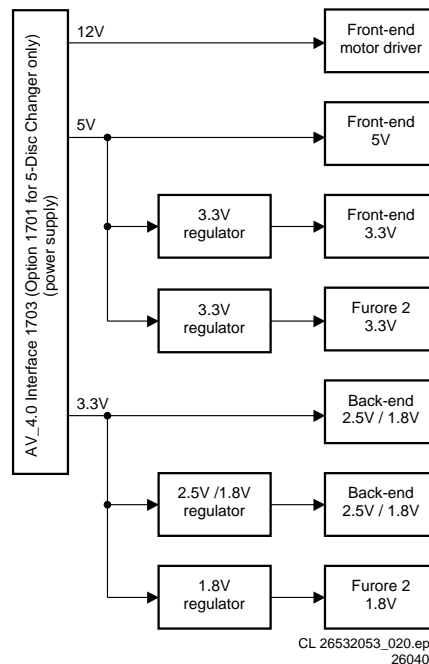


**Figure 9-8 Service Port Buffer**

The service port (see diagram M5) is simplified to reduce cost. The unused RTS and CTS lines are no longer connected. A transistor buffer (item 7502) is used instead of the Schmitt Trigger buffer (item 7501). The overall loading and driving capability of the RS-232 emulator port is not greatly changed. However, as a precaution, the Schmitt Trigger circuit remains in the layout as an optional implementation.

This SD4.0SA\_CH has the same ComPair connector as in previous DVD generations. Flashing of the application-SW is not possible with the ComPair cable, except with a CD-R disc. For sets with Mask-ROM software, replace it with a programmed Flash (available via your Philips Service organisation).

**Power Supply (diagram M7)**



**Figure 9-9 Mono Board Power Supply Block Diagram**

The main power supplies to the module are 3.3V, 5V, and 12V (input via connector 1703).

The SACD DSD/DST decoder Furore 2 uses 1.8V for its core and analogue portion, and 3.3V for its interface. The on-board 1.8V linear regulator LF18ABDT and 3.3V linear LD1117DT33 are used to generate 1.8V and 3.3V power supply respectively. The back-end section mainly uses the 1.8V or 2.5V and 3.3V, which depend on which back-end processor is used. The on-board linear regulators LF25ABDT or LF18ABDT are used to generate the 2.5V (or 1.8V) required by the STi55xx. The front-end section mainly uses the 5V and 12V. An on-board linear regulator LD1117DT33 can be used to generate the 3.3V required by the front-end. The 12V is used by the motor and servo drivers.

#### Reset Circuit

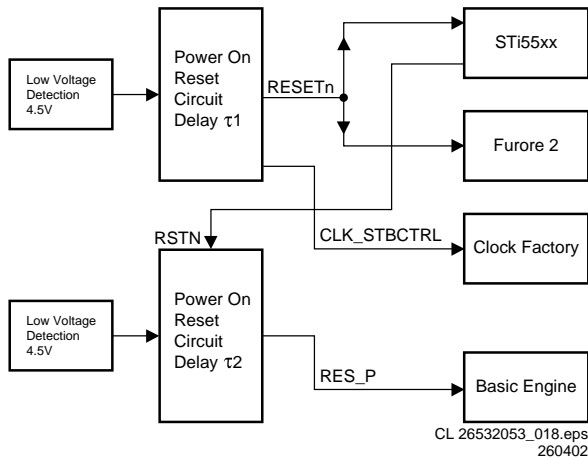


Figure 9-10 Block diagram of reset circuit

This reset circuit takes care that booting the different devices on the mono board takes place in the correct order. The correct reset order is:

1. The Power On Reset circuit (delay t1) creates a reset signal 'RESETn' to reset the STi55xx and Furore .
2. In the meantime, the Power On Reset circuit (delay t1) creates a reset signal 'CLK\_STBCTRL', which is inverted to 'RESETn', to enable the Clock Factory.
3. Then, the Power On Reset circuit (delay t2) generates a reset signal 'RES\_P' to reset the Basic Engine.
4. The STi55xx can now reset the Basic Engine via 'RSTN'.

## 9.4 Audio/Video (A/V) Board

This board is the interface panel between the DVD-player and its peripherals.

### 9.4.1 Block diagram

See Block diagram A/V Board in chapter 6.

### 9.4.2 Control

The control of the A/V board is done by I<sup>2</sup>C-decoder IC7107 (see table below):

Table 9-2 Control lines overview IC7107

Description	Pin	Hi	Lo
CLK_SEL	12	External clock (DSD stream)	Internal clock (PCM stream)
UPSAMPLING	11	No upsampling	Upsampling
DAC_RESET	10	Normal	Reset
CENTER_ON	9	Off	On
SPDIF-MUTE	5	Mute	No mute
192k/96k	4	192k PCM	96k PCM

### 9.4.3 Video

The analogue video signals from the Mono Board are buffered before they are fed to the A/V board. The video outputs from the A/V Board are RGB/YUV, YC, and CVBS. These signals are also fed to the double SCART board.

### 9.4.4 Audio

The digital audio signals for Surround, Centre and LFE (subwoofer) are fed to a 6-channel DAC CS4362 (item 7300, 48-pin LQFP) for the audio output. This DAC accepts both DSD and PCM data streams.

The digital audio signals for Front and Stereo are fed to a high performance current output DAC AD1955 (item 7301) via a multiplexer (item 7200) which selects either the direct PCM or an upsampled data stream (determined by the UPSAMPLING control line).

The Upsampling is only applicable for CD playback, and the AD1895 sample rate converter (item 7201) converts the 44.1 kHz/16 bit audio to various formats such as 96 kHz/24 bit or 192 kHz/24 bit.

The bit and word clock, required by the upsampling DAC AD1955 (item 7301), are derived from the 24.576 MHz master clock (item7103) via counter (item 7204/7205).

The S/PDIF, only supports digital output upsampling of 96 kHz/24 bit and is encoded by the digital audio transmitter AK4103 (item7203).

There is a control line from IC7107, called CENTRE\_ON, which is used to switch between the centre channel and front channels for both SACD- and DVD modes.

### 9.5 Progressive Scan Board

The DVD963SA series offer progressive scan YUV outputs, and the option to select the interlace YUV output by a sliding switch on the board (selectable at the rear of the player).

#### 9.5.1 Block diagram

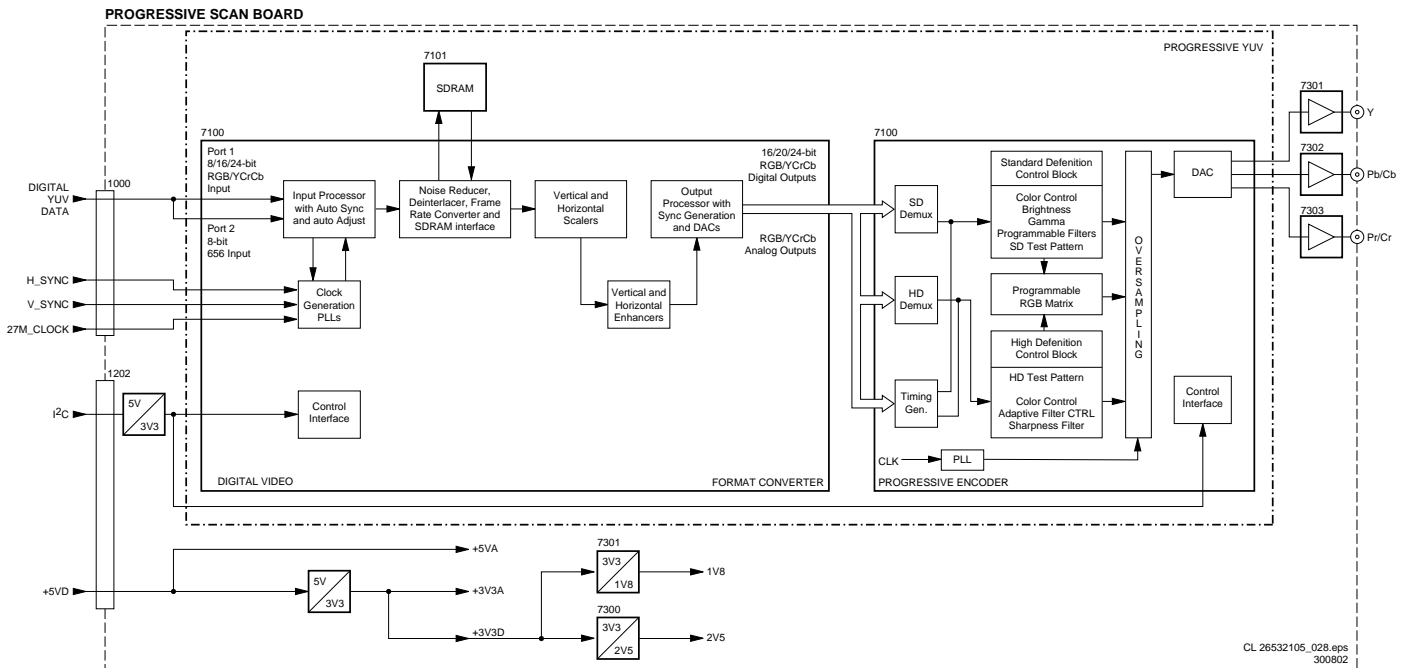


Figure 9-11 Block diagram Progressive Scan Board

#### 9.5.2 Progressive YUV

This creates a picture signal with double the scan lines of a conventional interlaced picture, to create a noticeably sharper and smoother image. It offers higher picture resolution and eliminates virtually all motion artefacts. Even on large screens, the progressive scan lines are barely noticeable and it reduces picture flickering significant.

Two new IC's are used: the Faroudja FLI2310 Digital Video Format Converter, and the Analog Devices ADV7300 Progressive Scan Video Encoder.

This board also offers the Digital Crystal Clear feature, which allow you to fine-tune the following parameters:

- Gamma correction.
- Chroma and Luma delay.
- Sharpness.
- DCDi: to produce a smooth and natural looking image without visible artifacts (like jagged edges).
- True life: brings out details in the picture, producing a more life-like image.

### 9.6 Double SCART

This board consists of two SCART connectors and a SCART-switch (item 7501, STV6410), which is controlled by I<sup>2</sup>C. In a P50 player with double SCART connectors, video and audio loop-through must be available. This loop-through is controlled by the P50 commands, which are send via pin 10 of the SCART connector. When the DVD player is in standby, the loop-through is active. During standby, the display (slave) processor is active (takes over the I<sup>2</sup>C-bus), and will manage the P50 commands.

**Note:** The loop-through only functions when the DVD-player is in standby (NOT in low power standby)

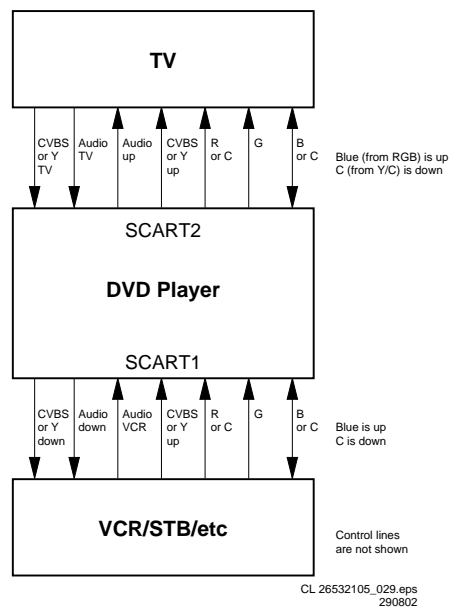


Figure 9-12 Loop-through set-up

The B component (from RGB) and the C component (from Y/ C) share the same pin on the SCART connector (pin 7). Because the B-signal is an "up-stream" signal (towards the TV) and the C-signal is a "down-stream" signal (towards the VCR), this pin 7 must be a bi-directional pin. Because the STV6410

does not support this, an external circuit (two bi-directional switches, named switch "1" and switch "2") is added. The Y- and CVBS-components also share the same pins.

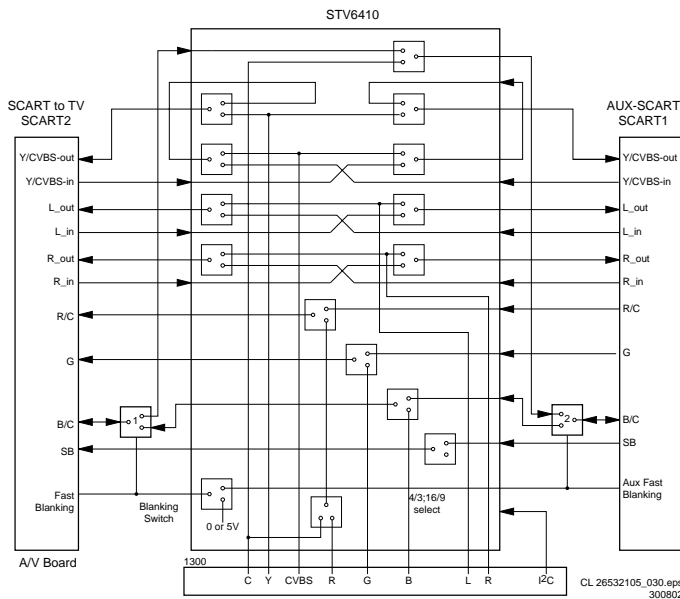


Figure 9-13 SCART switching circuitry

- Switch "1" is controlled by the FB (Fast Blanking) pin (pin 16) of SCART2 (TV SCART):
  - If the FB line is low, C is input on the B/C of SCART2.
  - If the FB line is high, B is output on the B/C of SCART2.
- Switch "2" is controlled by the FB (Fast Blanking) pin (pin 16) of SCART1 (AUX SCART):
  - If the FB line is low, C is output on the B/C of SCART1.
  - If the FB line is high, B is input on the B/C of SCART1.

We can distinguish four situations:

1. DVD player is ON, DVD is active (DVD mode):  
NO LOOP-TROUGH.
2. DVD player is ON, DVD is not active (TV mode):  
LOOP-TROUGH.
3. DVD player is ON, external source becomes active:  
LOOP-TROUGH.
4. DVD player is in STBY:  
LOOP-TROUGH.

## 9.7 Control and Display Panel

### 9.7.1 Control

#### Slave processor

The key component on this board is the (slave) microprocessor (item 7401). It runs on an 8 MHz system clock generated with a ceramic resonator (item 1119) and has a reset circuit (item 7105) that is triggered by the +5Vstb voltage.

The start-up sequence is as follows:

1. The required IC voltage is the +5Vstb, which is present during Standby Mode.
2. When the RESET circuit (item 7105) is triggered by the +5Vstb, the slave uP initialises.
3. This will set the STDBY\_CONTROL signal to LOW, which will switch on the 12V and subsequently the +3V3.
4. Once these voltages are provided, the host uP (on the mono board) will reset (via reset circuit around item 7412 on the mono board, diagram M4).
5. Now, the host uP will initialise, and indicate the slave uP to activate the Standby Mode (STBY\_CONTROL) signal.
6. The player wakes up from the Standby Mode when any button is pressed on the front panel, or when the 'Power' button is pressed on the Remote Control.

Also, when going to Standby, the slave processor will reset the host processor. When the slave processor receives the correct IR (or key) code to leave the Standby mode, it resets the host processor.

**Note:** The slave uP will not reset successfully, if the 8MHz clock oscillator has not stabilised (check on pin 8 of IC7101).

Other slave processor functions are:

- Generation of a scanning grid for the keys,
- Generation of the display grid and segment scanning,
- Generation of square signal to generate the filament voltage for FTD display,
- Inputs for RC5/6 and P50 (P50 controller is build in).

#### Standby LED

Transistor 7104 drives the Standby LED. When the STBLED signal from the slave processor is 'high' (pin 14), the LED is 'off'.

#### Key Matrix

When a key on the local keyboard is pressed, the signal at the scanning pins of the microprocessor (pins 34, 35, 36 and 37) go from +5 V to 0 V.

#### IR Receiver

The IR controller in the slave processor handles both RC5 and RC6 signals (input on pin 22). The logic is +5 V for 'high' and 0 V for 'low'.

#### Status LEDs

The four status LEDs (SOUND, AUDIO DIRECT, UP-SAMPLING, and P-SCAN) are controlled by the slave processor.

#### P50 Interface

P50 (or Easylink) is a bi-directional serial interface for communication between video equipment. For European sets, this communication goes via pin 10 of the SCART connector, while for other regions (when present), this is a cinch connector. The slave processor controls the P50 bus (via pins 11 and 20).

### 9.7.2 Display

Because these DVD players have an AC display (FTD) and a DC supply, an AC voltage is created by the microprocessor. The slave processor has an internal square signal generator (42 kHz, duty cycle 45/55), to generate the AC filament voltage. This square voltage is amplified (by TS7106 and 7109) and decoupled (C2138 and C2143) before it is applied to the display. The necessary voltage of -32 V comes directly from the PSU.

## 9.8 Abbreviation list

ADC	Analogue to Digital Converter	SRAM	Static RAM
AGC	Automatic Gain Control	STBY	Standby
ASD	Architecture and Standard Design	SVCD	Super Video CD
AM	Amplitude Modulation	SW	Software
BE	Basic Engine	THD	Total Harmonic Distortion
ComPair	Computer aided rePair	TTL	Transistor Transistor Logic (5V logic)
CD-DA	CD Digital Audio	uP	Microprocessor
CS	Chip Select	VAL	Video Audio Loader
CVBS	Composite Video Blanking and Synchronisation	VCD	Video CD
DAC	Digital to Analogue Converter	Y/C	Luminance (Y) and Chrominance (C) signal
DAIO	Digital Audio Input Output	YUV	Component video
DEMUX	De-multiplexer		
DENC	Digital Encoder		
DFU	Direction For Use: description for the end user		
DNR	Dynamic Noise Reduction		
DRAM	Dynamic Random Access Memory		
DSD	Direct Stream Digital		
DSP	Digital Signal Processing		
DST	Direct Stream Transfer (= loss less compressed DSD signal)		
DTS	Digital Theatre Sound		
DVD	Digital Versatile Disc		
EEPROM	Electrically Erasable and Programmable Read Only Memory		
EFM	Eight to Fourteen bit Modulation		
EMI	External Memory Interface (STi55xx)		
FFC	Flat Foil Cable		
FLASH	Flash memory		
HPF	High Pass Filter		
HW	Hardware		
I <sup>2</sup> C	Integrated IC bus (signals at 5V level)		
I <sup>2</sup> S	Integrated IC Sound bus (signals at 3.3V level)		
IC	Integrated Circuit		
IF	Intermediate Frequency		
IRQ	Interrupt Request		
KOK	Karaoke		
LFE	Low Frequency Effect (= subwoofer)		
LLD	Loss Less Decoder		
LPCM	Linear Pulse Code Modulation		
LRCLK	Left/Right clock		
LVTTL	Low Voltage Transistor Transistor Logic (3.3V logic)		
M2	Mercury 2 Basic Engine		
MACE	Mini All Compact Disc Engine		
MPEG	Motion Pictures Experts Group		
NC	Not Connected		
NVM	Non Volatile Memory (= IC containing TV related data e.g. alignments)		
OC	Open Circuit		
OPU	Optical Pick-up Unit		
PCB	Printed Circuit Board (see PWB)		
PCM	Pulse Code Modulation		
PCM_CLK	Audio system clock for DAC		
PCM_OUTx	Audio serial output data		
PSP	Pit Signal Processing		
PSU	Power Supply Unit		
PWB	Printed Wiring Board (see PCB)		
RAM	Random Access Memory		
RGB	Red, Green and Blue colour space		
ROM	Read Only Memory		
S2B	Serial to Basic Engine (= communication bus between host- and servo processor)		
SCL	Serial Clock I <sup>2</sup> C		
SCLK	Audio serial bit clock		
SDA	Serial Data I <sup>2</sup> C		
SDRAM	Synchronous DRAM		
SMI	Shared Memory Interface		
S/PDIF	Sony Philips Digital InterFace		

9.9 IC Data

In this paragraph, the internal block diagrams and pinning are given of ICs that are drawn as 'black box' in the electrical diagrams (with the exception of 'memory' and 'logic' ICs).

9.9.1 Diagram Power Supply: TY72011P2 (item 7130)

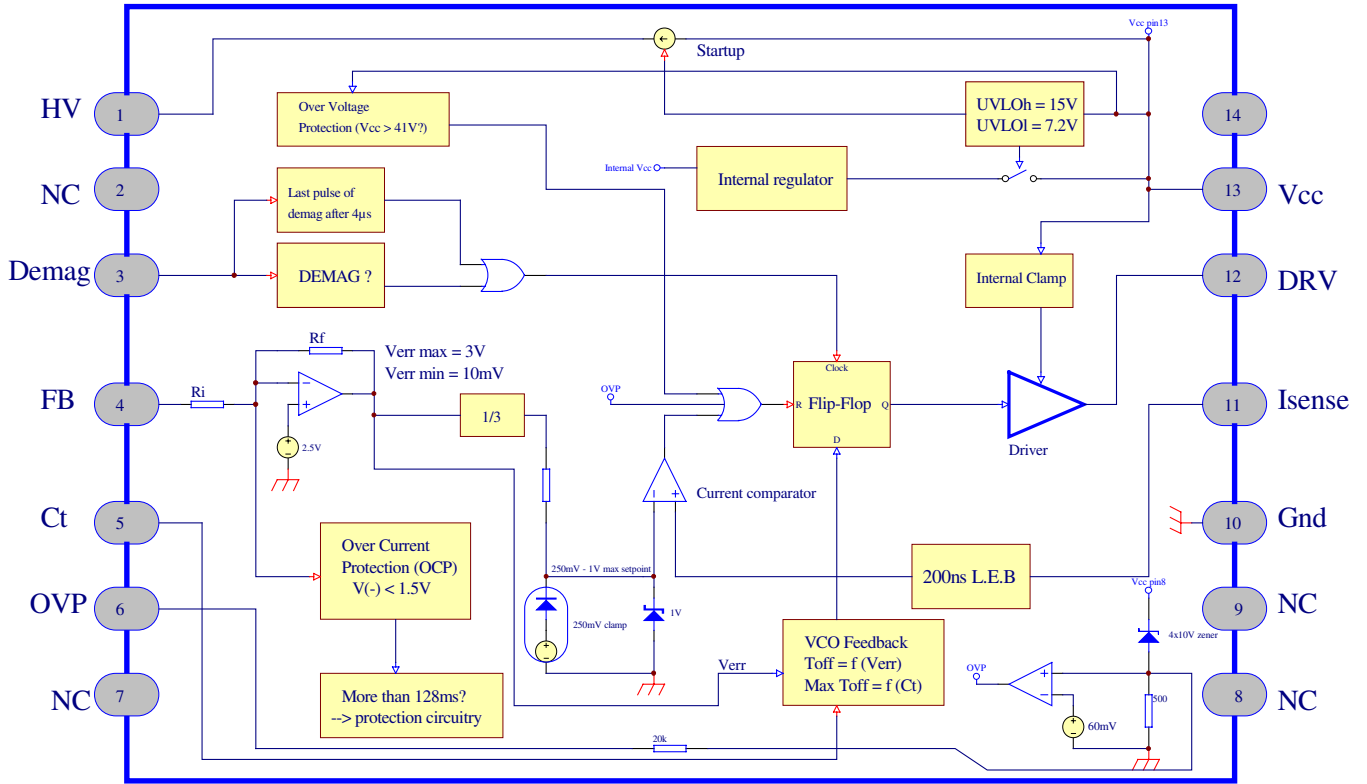


Figure 9-14 Block Diagram

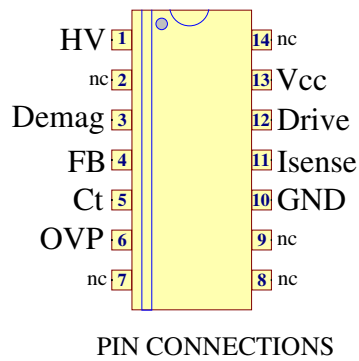
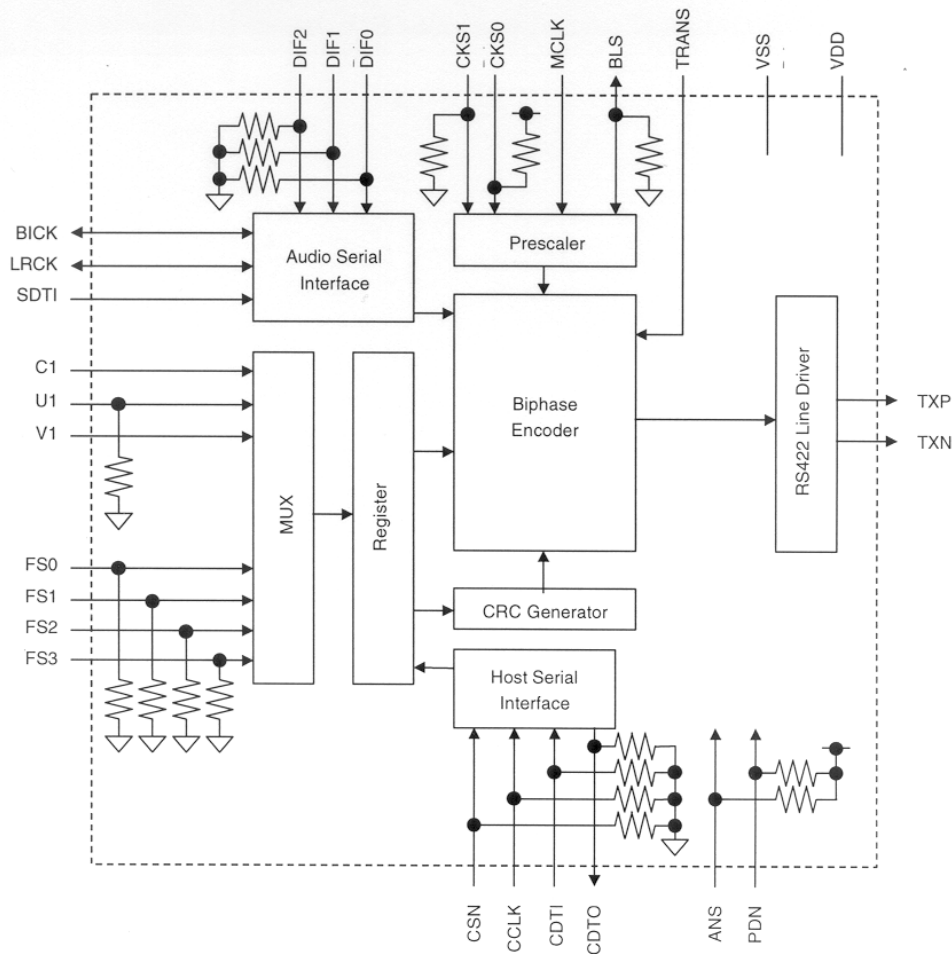


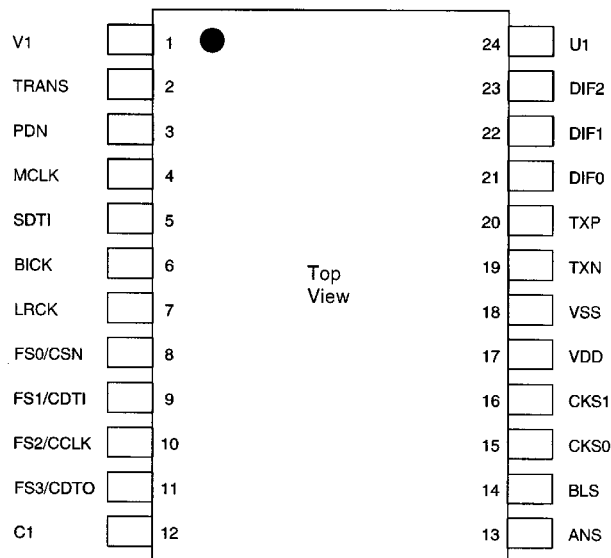
Figure 9-15 Pinning

9.9.2 Diagram A2: AK4103VF (IC7203)

■ Block Diagram



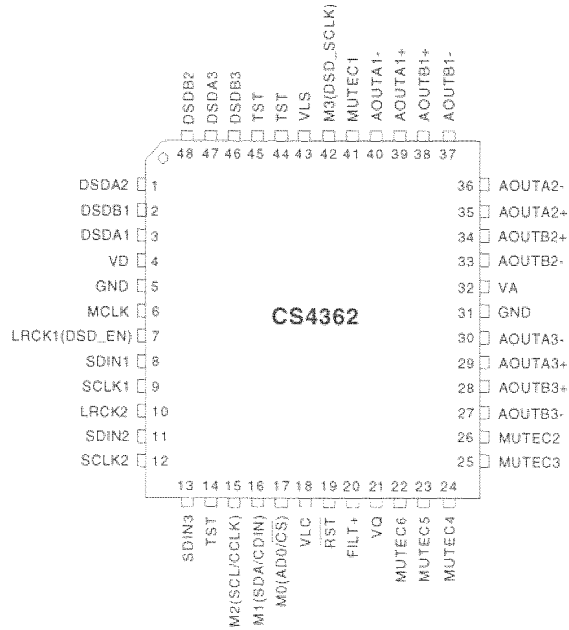
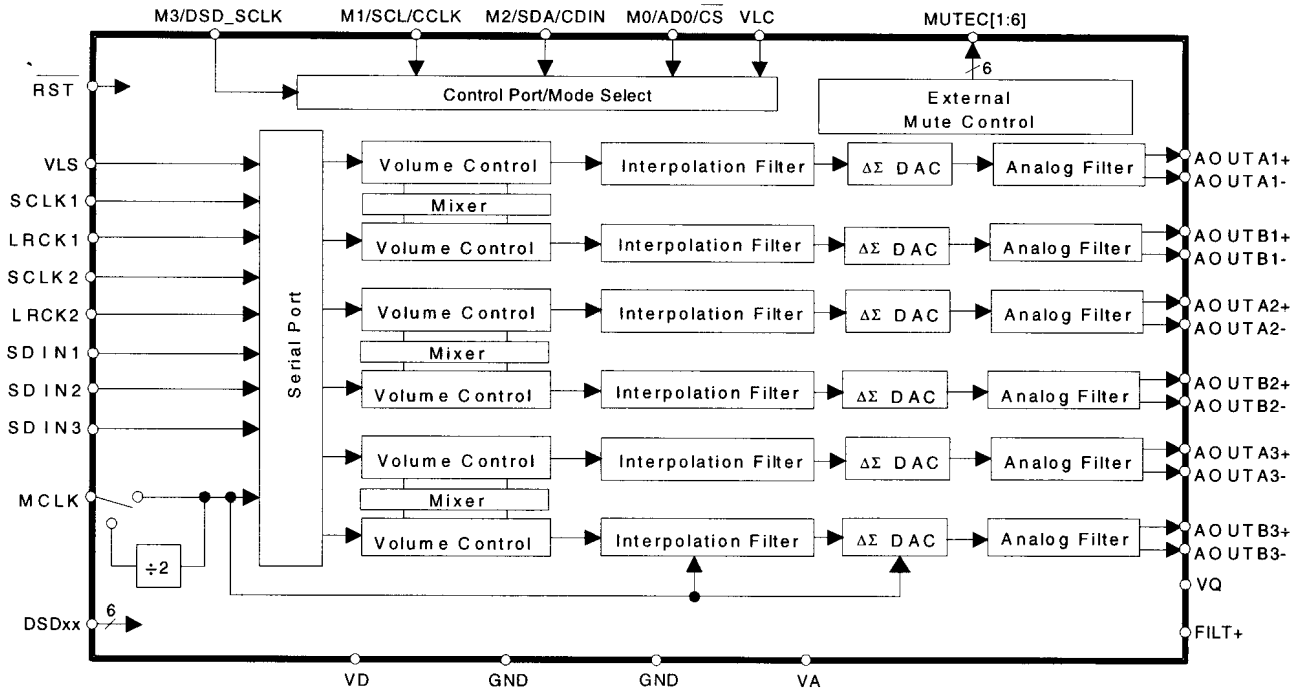
■ Pin Layout



CL 26532105\_054.eps  
300802

Figure 9-16 AK4103VF (IC7203)

9.9.3 Diagram A3: CS4362 (IC7300)



CL26532105\_055.eps  
300802

Figure 9-17 CS4362 (IC7300)



# 10. Spare Parts List


Mechanical /001			0365 3103 308 92610 CABLE AUDIO 2X2RCA MALE 1.5MTR			2310 2238 586 59812 0603 50V 100NP80M		
<b>Various</b>			0366	4822 321 61579	VIDEO-CABLE	2311	4822 124 41584	100µF 20% 10V
0002	3139 247 56601	FRONT ASSY DVD963SA/00X	0375	3139 246 11951	IFU DVD963SA/69X	2312	4822 124 41584	100µF 20% 10V
0078	3139 243 10161	FILTER FTD SACD900	1010▲	3122 427 23261	PSU SUPER AUDIO CD WR HE	2313	2238 586 59812	0603 50V 100NP80M
0150	3139 247 56581	BOTTOM FRAME ASSY DVD963SA/00X	1103	3139 110 36071	FFC FOIL 30P/100/30P BD 1MMP	2314	4822 124 40433	47µF 20% 25V
0155	2422 030 00395	SOC POW H 3P M AC IEC B	1104	3139 110 36071	FFC FOIL 30P/100/30P BD 1MMP	2315	2238 586 59812	0603 50V 100NP80M
0250	3139 247 56571	PLATE BACK DVD963SA/00X PPT	1108	3139 241 00191	FFC FOIL 24P/180/24P BD1MMP FD	2316	2238 586 59812	0603 50V 100NP80M
0300	3139 247 51691	COVER TOP DVD956K PNT PRT	<b>SD4.00SA Module</b>			2317	4822 124 40248	10µF 20% 63V
0350	3139 238 02121	PROD. ASSY RC19237006/01H PKD	<b>Various</b>			2318	2238 586 59812	0603 50V 100NP80M
0360▲	2422 070 98224	MAINSCORD IEC 10A 1M5 DET BK B	0001	9305 023 61114	VAL6011/14	2319	4822 124 21913	1µF 20% 63V
0365	3103 308 92610	CABLE AUDIO 2X2RCA MALE 1.5MTR	<b>AV PWB</b>			2321	2020 552 94427	0603 50V 100P 5%
0366	4822 321 61579	VIDEO-CABLE	<b>Various</b>			2323	2020 552 94427	0603 50V 100P 5%
0372	2422 076 00468	CBLE SCART 1M1 SCART 21P BK B	1101	2422 543 01255	RES XTL SM 24MHz 576 30P AT-51R	2400	2238 586 59812	0603 50V 100NP80M
0375	3139 246 11991	IFU DVD963SA/00X	1102	2422 543 01297	RES XTL SM 33M8688 16P NX6035R	2401	2238 586 59812	0603 50V 100NP80M
1010▲	3122 427 23261	PSU SUPER AUDIO CD WR HE	1400	2422 025 17433	CON BM V 30P F 1.00 FFC 0.3 B	2402	2238 586 59812	0603 50V 100NP80M
1103	3139 110 36071	FFC FOIL 30P/100/30P BD 1MMP	1401	2422 026 05345	SOC CINCH H 4P F YEWHYERD Y	2403	2238 586 59812	0603 50V 100NP80M
1104	3139 110 36071	FFC FOIL 30P/100/30P BD 1MMP	1402	2422 026 05088	CON BM CINCH H 6P F B	2404	2238 586 59812	0603 50V 100NP80M
1108	3139 241 00191	FFC FOIL 24P/180/24P BD1MMP FD	1403	4822 265 11154	52030-2210 (22P)	2405	2238 586 59812	0603 50V 100NP80M
1110	3139 241 00201	FFC FOIL 22P/220/22P BD 1MMP	1408	2422 026 05188	CON BM MDIN H 3P F TCS7927 B	2406	2238 586 59812	0603 50V 100NP80M
0374	3139 246 12131	IFU2 DVD963SA/00X	1410	4822 267 31626		2407	2238 586 59812	0603 50V 100NP80M
<b>Mechanical /171</b>			1420	2422 025 10772	CON BM V 12P M 2.00 PH B	2408	2238 586 59812	0603 50V 100NP80M
<b>Various</b>			1421	2422 025 17433	CON BM V 30P F 1.00 FFC 0.3 B	2409	2238 586 59812	0603 50V 100NP80M
0002	3139 247 56601	FRONT ASSY DVD963SA/00X	1422	2422 025 17467	CON BM V 8P M 2.50 MIS B	2410	2238 586 59812	0603 50V 100NP80M
0078	3139 243 10161	FILTER FTD SACD900	—  —			2411	2238 586 59812	0603 50V 100NP80M
0150	3139 247 56581	BOTTOM FRAME ASSY DVD963SA/00X	2100	2238 586 59812	0603 50V 100NP80M	2412	4822 124 40207	100µF 20% 25V
0155	2422 030 00395	SOC POW H 3P M AC IEC B	2101	4822 122 33761	22pF 5% 50V	2413	4822 124 40207	100µF 20% 25V
0250	3139 247 56561	PLATE BACK DVD963SA/17X PPT	2102	4822 126 11785	0603 50V 47P 5%	2414	2020 552 94427	0603 50V 100P 5%
0300	3139 247 51691	COVER TOP DVD956K PNT PRT	2103	4822 122 33752	15pF 5% 50V	2415	2020 552 94427	0603 50V 100P 5%
0350	3139 238 02121	PROD. ASSY RC19237006/01H PKD	2104	4822 122 33752	15pF 5% 50V	2416	2020 552 94427	0603 50V 100P 5%
0360▲	2422 070 98223	MAINSCORDUL 10A 1M5 DET BK B	2105	4822 126 11663	12pF	2417	3198 016 36810	0603 50V 100P 5%
0365	3103 308 92610	CABLE AUDIO 2X2RCA MALE 1.5MTR	2106	4822 126 11663	12pF	2418	4822 126 13881	470pF 5% 50V
0366	4822 321 61579	VIDEO-CABLE	2107	4822 122 33752	15pF 5% 50V	2419	3198 016 36810	0603 25V 680P COL R
0375	3139 246 11961	IFU DVD963SA/17X	2108	2238 586 59812	0603 50V 100NP80M	2420	4822 126 13881	470pF 5% 50V
1010▲	3122 427 23471	PSU SUPER AUDIO CD USA 35PS104	2110	2238 586 59812	0603 50V 100NP80M	2421	2020 012 93792	EL FG 16V S 100µF PM20 A
1103	3139 110 36071	FFC FOIL 30P/100/30P BD 1MMP	2111	2238 586 59812	0603 50V 100NP80M	2422	2020 552 94427	0603 50V 100P 5%
1104	3139 110 36071	FFC FOIL 30P/100/30P BD 1MMP	2112	2238 586 59812	0603 50V 100NP80M	2423	2020 552 94427	0603 50V 100P 5%
1108	3139 241 00191	FFC FOIL 24P/180/24P BD1MMP FD	2113	2238 586 59812	0603 50V 100NP80M	2424	2020 552 94427	0603 50V 100P 5%
<b>Mechanical /691</b>			2114	2020 552 93645	0603 50V 39P 5%	2425	3198 016 36810	0603 25V 680P COL R
<b>Various</b>			2115	2020 552 93645	0603 50V 39P 5%	2426	4822 126 13881	470pF 5% 50V
0002	3139 247 56601	FRONT ASSY DVD963SA/00X	2116	4822 122 33761	22pF 5% 50V	2427	3198 016 36810	0603 25V 680P COL R
0078	3139 243 10161	FILTER FTD SACD900	2117	2238 586 59812	0603 50V 100NP80M	2428	4822 126 13881	470pF 5% 50V
0150	3139 247 56581	BOTTOM FRAME ASSY DVD963SA/00X	2118	4822 126 11663	12pF	2429	2020 012 93792	EL FG 16V S 100µF PM20 A
0155	2422 030 00395	SOC POW H 3P M AC IEC B	2119	4822 126 11663	12pF	2431	3198 016 31020	0603 25V 1nF
0250	3139 247 56561	PLATE BACK DVD963SA/17X PPT	2200	2238 586 59812	0603 50V 100NP80M	2432	3198 016 31020	0603 25V 1nF
0300	3139 247 51691	COVER TOP DVD956K PNT PRT	2201	2238 586 59812	0603 50V 100NP80M	2433	3198 016 31020	0603 25V 1nF
0350	3139 238 02121	PROD. ASSY RC19237006/01H PKD	2202	2238 586 59812	0603 50V 100NP80M	2434	3198 016 31020	0603 25V 1nF
0360▲	2422 070 98224	MAINSCORD IEC 10A 1M5 DET BK B	2203	2238 586 59812	0603 50V 100NP80M	2436	3198 016 31020	0603 25V 1nF
			2204	2238 586 59812	0603 50V 100NP80M	2437	3198 016 31020	0603 25V 1nF
			2205	4822 124 40248	10µF 20% 63V	2439	3198 016 31020	0603 25V 1nF
			2206	4822 124 40248	10µF 20% 63V	2440	3198 016 31020	0603 25V 1nF
			2207	2238 586 59812	0603 50V 100NP80M	2441	3198 016 31020	0603 25V 1nF
			2208	2238 586 59812	0603 50V 100NP80M	2442	4822 124 80195	470µF 20% 10V
			2209	2238 586 59812	0603 50V 100NP80M	2443	4822 124 80195	470µF 20% 10V
			2210	4822 124 40248	10µF 20% 63V	2444	4822 124 80195	470µF 20% 10V
			2211	2238 586 59812	0603 50V 100NP80M	2445	4822 124 80195	470µF 20% 10V
			2212	4822 124 40248	10µF 20% 63V	2500	2238 586 59812	0603 50V 100NP80M
			2213	4822 124 40248	10µF 20% 63V	2501	2238 586 59812	0603 50V 100NP80M
			2214	2238 586 59812	0603 50V 100NP80M	2502	2238 586 59812	0603 50V 100NP80M
			2215	2020 552 94427	0603 50V 100P 5%	2503	2238 586 59812	0603 50V 100NP80M
			2216	4822 124 40248	10µF 20% 63V	2510	4822 126 14506	270pF 5% 50V 0603
			2217	4822 124 40248	10µF 20% 63V	2511	4822 126 13881	470pF 5% 50V
			2218	4822 124 40248	10µF 20% 63V	2512	2020 552 94427	0603 50V 100P 5%
			2219	4822 124 40248	10µF 20% 63V	2513	2020 552 94427	0603 50V 100P 5%
			2220	2238 586 59812	0603 50V 100NP80M	2514	4822 126 13881	470pF 5% 50V
			2221	2238 586 59812	0603 50V 100NP80M	2515	4822 126 14506	270pF 5% 50V 0603
			2222	4822 124 40248	10µF 20% 63V	2516	4822 126 14506	270pF 5% 50V 0603
			2223	4822 124 40248	10µF 20% 63V	2517	2020 552 94427	0603 50V 100P 5%
			2224	4822 124 40248	10µF 20% 63V	2518	4822 126 13881	470pF 5% 50V
			2225	2238 586 59812	0603 50V 100NP80M	2519	4822 126 14506	270pF 5% 50V 0603
			2226	2238 586 59812	0603 50V 100NP80M	2520	2020 552 94427	0603 50V 100P 5%
			2227	2238 586 59812	0603 50V 100NP80M	2521	4822 126 13881	470pF 5% 50V
			2228	2238 586 59812	0603 50V 100NP80M	2522	4822 126 14506	270pF 5% 50V 0603
			2229	2238 586 59812	0603 50V 100NP80M	2523	4822 126 13881	470pF 5% 50V
			2230	2238 586 59812	0603 50V 100NP80M	2524	2020 552 94427	0603 50V 100P 5%
			2231	4822 124 40248	10µF 20% 63V	2525	2020 552 94427	0603 50V 100P 5%
			2232	4822 124 40248	10µF 20% 63V	2526	4822 126 13881	470pF 5% 50V
			2233	4822 124 21913	1µF 20% 63V	2527	4822 126 14506	270pF 5% 50V 0603
			2234	2238 586 59812	0603 50V 100NP80M	2528	4822 126 14506	270pF 5% 50V 0603
			2235	2238 586 59812	0603 50V 100NP80M	2529	4822 126 13881	470pF 5% 50V
			2236	2238 586 59812	0603 50V 100NP80M	2530	3198 016 31020	0603 25V 1nF
			2237	4822 124 40433	47µF 20% 25V	2531	3198 016 31020	0603 25V 1nF
			2238	2238 586 59812	0603 50V 100NP80M	2532	4822 124 40207	100µF 20% 25V
			2239	4822 124 21913	1µF 20% 63V	2533	2020 012 93792	EL FG 16V S 100µF PM20 A

2541	3198 016 31020	0603 25V 1nF	3305	5322 117 13018	1k0 1% 0.063W 0603 RC22H	3529	4822 117 12706	10k 1% 0.063W CASE0603 RC22H
2542	3198 016 31020	0603 25V 1nF	3306	4822 051 30759	75Ω 5% 0.062W	3530	5322 117 13022	22k 1% 0.063W 0603 RC22H
2543	3198 016 31020	0603 25V 1nF	3307	4822 051 30759	75Ω 5% 0.062W	3531	5322 117 13048	3k3 1% 0.063W 0603 RC22H
2544	3198 016 31020	0603 25V 1nF	3308	4822 051 30759	75Ω 5% 0.062W	3532	4822 117 12706	10k 1% 0.063W CASE0603 RC22H
2545	3198 016 31020	0603 25V 1nF	3310	4822 051 30103	10k 5% 0.062W	3533	4822 117 12706	10k 1% 0.063W CASE0603 RC22H
2546	4822 124 80875	220μF 20% 25V	3311	4822 051 30103	10k 5% 0.062W	3534	4822 117 12706	10k 1% 0.063W CASE0603 RC22H
2547	4822 124 80875	220μF 20% 25V	3313	4822 051 30103	10k 5% 0.062W	3535	5322 117 13022	22k 1% 0.063W 0603 RC22H
2600	4822 126 14494	22nF 10% 25V 0603	3314	4822 051 30103	10k 5% 0.062W	3536	5322 117 13048	3k3 1% 0.063W 0603 RC22H
2601	4822 126 13883	220pF 5% 50V	3400	4822 051 30103	10k 5% 0.062W	3537	4822 117 12706	10k 1% 0.063W CASE0603 RC22H
2602	4822 126 13883	220pF 5% 50V	3401	4822 051 30273	27k 5% 0.062W	3538	4822 117 12706	10k 1% 0.063W CASE0603 RC22H
2603	3198 017 44740	0603 10V 470nF COL	3403	5322 117 13049	470Ω 1% 0.063W 0603 RC22H	3539	4822 117 12706	10k 1% 0.063W CASE0603 RC22H
2604	4822 126 13883	220pF 5% 50V	3404	4822 051 30101	100Ω 5% 0.062W	3540	4822 051 30221	220Ω 5% 0.062W
2605	4822 126 13883	220pF 5% 50V	3405	5322 117 13061	180Ω 1% 0.063W 0603 RC22H	3541	4822 051 30102	1k 5% 0.062W
2606	4822 124 40433	47μF 20% 25V	3406	4822 051 30561	560Ω 5% 0.062W	3543	5322 117 13022	22k 1% 0.063W 0603 RC22H
2608	4822 124 40248	10μF 20% 63V	3408	4822 051 30101	100Ω 5% 0.062W	3544	5322 117 13048	3k3 1% 0.063W 0603 RC22H
2609	4822 124 40207	100μF 20% 25V	3409	5322 117 13049	470Ω 1% 0.063W 0603 RC22H	3545	4822 117 12706	10k 1% 0.063W CASE0603 RC22H
2610	4822 124 40433	47μF 20% 25V	3410	5322 117 13061	180Ω 1% 0.063W 0603 RC22H	3546	4822 117 12706	10k 1% 0.063W CASE0603 RC22H
2612	4822 124 40248	10μF 20% 63V	3411	5322 117 13052	2k7 1% 0.063W 0603 RC22H	3547	4822 117 12706	10k 1% 0.063W CASE0603 RC22H
2613	4822 124 80791	470μF 16V 20% 105C DXH=8X11.5	3412	5322 117 13046	1k8 1% 0.063W 0603 RC22H	3548	5322 117 13022	22k 1% 0.063W 0603 RC22H
2614	4822 124 40207	100μF 20% 25V	3413	5322 117 13052	2k7 1% 0.063W 0603 RC22H	3549	5322 117 13048	3k3 1% 0.063W 0603 RC22H
2616	4822 124 40207	100μF 20% 25V	3414	5322 117 13046	1k8 1% 0.063W 0603 RC22H	3550	4822 051 30221	220Ω 5% 0.062W
2617	2238 586 59812	0603 50V 100NP80M	3415	5322 117 13052	2k7 1% 0.063W 0603 RC22H	3551	4822 051 30102	1k 5% 0.062W
2618	4822 124 40248	10μF 20% 63V	3416	5322 117 13046	1k8 1% 0.063W 0603 RC22H	3552	4822 051 30103	10k 5% 0.062W
2619	4822 124 81144	1000μF 16V	3417	5322 117 13046	1k8 1% 0.063W 0603 RC22H	3553	4822 051 30103	10k 5% 0.062W
2620	4822 124 40248	10μF 20% 63V	3418	4822 051 30101	100Ω 5% 0.062W	3555	4822 051 30471	470Ω 5% 0.062W
2621	2238 586 59812	0603 50V 100NP80M	3419	5322 117 13052	2k7 1% 0.063W 0603 RC22H	3556	4822 051 30102	1k 5% 0.062W
2622	4822 126 11785	0603 50V 47P 5%	3421	5322 117 13049	470Ω 1% 0.063W 0603 RC22H	3558	4822 051 30471	470Ω 5% 0.062W
2623	4822 126 11785	0603 50V 47P 5%	3422	5322 117 13061	180Ω 1% 0.063W 0603 RC22H	3560	4822 051 30102	1k 5% 0.062W
2624	5322 126 11583	10nF 10% 50V 0603	3423	4822 051 30101	100Ω 5% 0.062W	3561	4822 051 30103	10k 5% 0.062W
2625	4822 124 40207	100μF 20% 25V	3424	4822 051 30561	560Ω 5% 0.062W	3562	4822 051 30103	10k 5% 0.062W
2626	4822 124 40207	100μF 20% 25V	3426	4822 051 30101	100Ω 5% 0.062W	3563	4822 051 30221	220Ω 5% 0.062W
2627	4822 124 80875	220μF 20% 25V	3427	5322 117 13049	470Ω 1% 0.063W 0603 RC22H	3564	4822 051 30102	1k 5% 0.062W
2628	4822 124 40433	47μF 20% 25V	3428	5322 117 13061	180Ω 1% 0.063W 0603 RC22H	3566	4822 051 30221	220Ω 5% 0.062W
2633	4822 124 40207	100μF 20% 25V	3429	5322 117 13052	2k7 1% 0.063W 0603 RC22H	3567	4822 051 30102	1k 5% 0.062W
2634	2238 586 59812	0603 50V 100NP80M	3430	5322 117 13046	1k8 1% 0.063W 0603 RC22H	3568	4822 051 30103	10k 5% 0.062W
2635	4822 124 40207	100μF 20% 25V	3431	5322 117 13052	2k7 1% 0.063W 0603 RC22H	3570	4822 051 30103	10k 5% 0.062W
2636	2238 586 59812	0603 50V 100NP80M	3432	5322 117 13046	1k8 1% 0.063W 0603 RC22H	3571	4822 051 30221	220Ω 5% 0.062W
2637	4822 124 40207	100μF 20% 25V	3433	5322 117 13046	1k8 1% 0.063W 0603 RC22H	3572	4822 051 30102	1k 5% 0.062W
2638	2238 586 59812	0603 50V 100NP80M	3434	5322 117 13046	1k8 1% 0.063W 0603 RC22H	3574	4822 051 30221	220Ω 5% 0.062W
2639	2238 586 59812	0603 50V 100NP80M	3435	5322 117 13046	1k8 1% 0.063W 0603 RC22H	3575	4822 051 30102	1k 5% 0.062W
2640	2238 586 59812	0603 50V 100NP80M	3436	4822 051 30101	100Ω 5% 0.062W	3576	4822 051 30103	10k 5% 0.062W
2646	4822 124 40433	47μF 20% 25V	3437	5322 117 13052	2k7 1% 0.063W 0603 RC22H	3577	4822 051 30103	10k 5% 0.062W
			3438	5322 117 13046	1k8 1% 0.063W 0603 RC22H	3579	4822 117 12925	47k 1% 0.063W 0603
			3439	5322 117 13046	1k8 1% 0.063W 0603 RC22H	3580	4822 051 30101	100Ω 5% 0.062W
			3440	5322 117 13046	1k8 1% 0.063W 0603 RC22H	3581	4822 051 30472	4k7 5% 0.062W
			3441	5322 117 13046	1k8 1% 0.063W 0603 RC22H	3582	4822 051 30103	10k 5% 0.062W
			3501	4822 051 30109	10Ω 5% 0.062W	3583	4822 051 30103	10k 5% 0.062W
			3502	4822 051 30109	10Ω 5% 0.062W	3584	4822 051 30103	10k 5% 0.062W
			3504	4822 051 30109	10Ω 5% 0.062W	3590	4822 051 30332	3k3 5% 0.062W
			3505	4822 051 30109	10Ω 5% 0.062W	3591	4822 117 12925	47k 1% 0.063W 0603
			3506	4822 117 12706	10k 1% 0.063W CASE0603 RC22H	3592	4822 117 12925	47k 1% 0.063W 0603
			3507	4822 117 12706	10k 1% 0.063W CASE0603 RC22H	3600	4822 051 30103	10k 5% 0.062W
			3508	5322 117 13022	22k 1% 0.063W 0603 RC22H	3601	4822 051 30332	3k3 5% 0.062W
			3510	4822 117 12706	10k 1% 0.063W CASE0603 RC22H	3602	4822 051 30223	22k 5% 0.062W
			3511	5322 117 13048	3k3 1% 0.063W 0603 RC22H	3603	4822 051 30222	2k2 5% 0.062W
			3512	4822 117 12706	10k 1% 0.063W CASE0603 RC22H	3604	4822 051 30101	100Ω 5% 0.062W
			3513	4822 117 12706	10k 1% 0.063W CASE0603 RC22H	3605	4822 051 30101	100Ω 5% 0.062W
			3514	4822 117 12706	10k 1% 0.063W CASE0603 RC22H	3606	4822 051 30101	100Ω 5% 0.062W
			3515	5322 117 13048	3k3 1% 0.063W 0603 RC22H	3607	4822 051 30101	100Ω 5% 0.062W
			3516	5322 117 13022	22k 1% 0.063W 0603 RC22H	3608	4822 051 30101	100Ω 5% 0.062W
			3517	4822 117 12706	10k 1% 0.063W CASE0603 RC22H	3609	4822 051 30101	100Ω 5% 0.062W
			3518	4822 117 12706	10k 1% 0.063W CASE0603 RC22H	3610	4822 051 30103	10k 5% 0.062W
			3519	4822 117 12706	10k 1% 0.063W CASE0603 RC22H	3611	4822 051 30183	18k 5% 0.062W
			3520	5322 117 13022	22k 1% 0.063W 0603 RC22H	3612	4822 051 30223	22k 5% 0.062W
			3521	5322 117 13048	3k3 1% 0.063W 0603 RC22H	3614	4822 051 30569	56Ω 5% 0.062W
			3522	4822 117 12706	10k 1% 0.063W CASE0603 RC22H	3615	4822 051 30569	56Ω 5% 0.062W
			3523	4822 117 12706	10k 1% 0.063W CASE0603 RC22H	3616	4822 051 30689	68Ω 5% 0.063W 0603 RC21 RST SM
			3524	4822 117 12706	10k 1% 0.063W CASE0603 RC22H	3617	4822 051 30689	68Ω 5% 0.063W 0603 RC21 RST SM
			3525	5322 117 13022	22k 1% 0.063W 0603 RC22H	3618	4822 051 30569	56Ω 5% 0.063W
			3526	5322 117 13048	3k3 1% 0.063W 0603 RC22H	3619	4822 051 30471	470Ω 5% 0.062W
			3527	4822 117 12706	10k 1% 0.063W CASE0603 RC22H	3620	4822 051 30221	220Ω 5% 0.062W
			3528	4822 117 12706	10k 1% 0.063W CASE0603 RC22H	3621	4822 051 30153	15k 5% 0.062W
						3622	4822 051 30222	2k2 5% 0.062W
						3623	4822 051 30759	75Ω 5% 0.062W
						3624	4822 051 30222	2k2 5% 0.062W
						3625	4822 051 30759	75Ω 5% 0.062W
						3626	4822 051 30222	2k2 5% 0.062W
						3627	4822 051 30759	75Ω 5% 0.062W
						3628	4822 051 30222	2k2 5% 0.062W
						3629	4822 051 30759	75Ω 5% 0.062W
						3630	4822 051 30222	2k2 5% 0.062W
						3631	4822 051 30759	75Ω 5% 0.062W

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3100	4822 051 30101	100Ω 5% 0.062W
3101	4822 051 30101	100Ω 5% 0.062W
3102	4822 051 30101	100Ω 5% 0.062W
3103	4822 051 30101	100Ω 5% 0.062W
3104	4822 051 30101	100Ω 5% 0.062W
3105	4822 051 30101	100Ω 5% 0.062W
3106	4822 051 30101	100Ω 5% 0.062W
3107	4822 051 30101	100Ω 5% 0.062W
3108	4822 051 30101	100Ω 5% 0.062W
3109	4822 051 30472	4k7 5% 0.062W
3110	4822 051 30109	10Ω 5% 0.062W
3111	4822 051 30105	1M 5% 0.062W
3112	4822 051 30221	220Ω 5% 0.062W
3113	4822 051 30472	4k7 5% 0.062W
3114	4822 051 30472	4k7 5% 0.062W
3115	4822 051 30472	4k7 5% 0.062W
3116	4822 051 30472	4k7 5% 0.062W
3117	4822 051 30472	4k7 5% 0.062W
3118	4822 051 30472	4k7 5% 0.062W
3119	4822 051 30472	4k7 5% 0.062W
3120	4822 051 30479	47Ω 5% 0.062W
3123	4822 051 30479	47Ω 5% 0.062W
3124	4822 051 30332	3k3 5% 0.062W
3125	4822 051 30332	3k3 5% 0.062W
3126	4822 051 30332	3k3 5% 0.062W
3127	4822 051 30332	3k3 5% 0.062W
3128	4822 051 30479	47Ω 5% 0.062W
3129	4	



6107	9322 185 23676	LED VS LTL1CHTDK3 (LITO) A
6200	9322 190 53676	LED VS LTL42HCWK5P (LITO) A
		
7100	5322 130 60159	BC846B
7101	5322 130 60159	BC846B
7102	5322 130 60159	BC846B
7103	5322 130 60159	BC846B
7104	4822 130 60373	BC856B
7105	5322 130 60159	BC846B
7106	4822 130 40981	BC337-25
7108	5322 130 60159	BC846B
7109	4822 130 40854	BC327
7111	4822 130 60373	BC856B
7112	4822 130 60373	BC856B
7113	4822 130 60373	BC856B
7114	4822 130 60373	BC856B
7401	3139 240 50221	TMP87CH74F-3NB2 DVDV2.21
7402	9322 155 82667	IR RECEIVER TSOP2236

## P Scan PWB

## Various

1000	2422 025 17599	CON BM H 24P F 1.00 FFC 0.3 R
1003	2422 026 05191	CON BM CINCH H 3P F RDBUGN B
1203	2422 127 00548	SWI SLID 1P 2POS SM SSSS21 R

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2100	4822 124 81286	47µF 20% 16V
2101	2238 586 59812	0603 50V 100NP80M
2102	3198 017 44740	0603 10V 470nF COL
2103	4822 124 81286	47µF 20% 16V
2105	2238 586 59812	0603 50V 100NP80M
2106	2238 586 59812	0603 50V 100NP80M
2107	4822 124 81286	47µF 20% 16V
2108	4822 124 11947	10µF 20% 16V
2109	2238 586 59812	0603 50V 100NP80M
2110	2238 586 59812	0603 50V 100NP80M
2111	2238 586 59812	0603 50V 100NP80M
2112	2238 586 59812	0603 50V 100NP80M
2113	2238 586 59812	0603 50V 100NP80M
2114	2238 586 59812	0603 50V 100NP80M
2115	2238 586 59812	0603 50V 100NP80M
2116	2238 586 59812	0603 50V 100NP80M
2117	2238 586 59812	0603 50V 100NP80M
2118	2238 586 59812	0603 50V 100NP80M
2119	2238 586 59812	0603 50V 100NP80M
2120	2238 586 59812	0603 50V 100NP80M
2121	2238 586 59812	0603 50V 100NP80M
2122	2238 586 59812	0603 50V 100NP80M
2123	2238 586 59812	0603 50V 100NP80M
2124	2238 586 59812	0603 50V 100NP80M
2125	2238 586 59812	0603 50V 100NP80M
2126	2238 586 59812	0603 50V 100NP80M
2127	2238 586 59812	0603 50V 100NP80M
2128	2238 586 59812	0603 50V 100NP80M
2129	2238 586 59812	0603 50V 100NP80M
2130	4822 126 13879	220nF 20% 16V
2131	4822 126 13879	220nF 20% 16V
2132	4822 126 13879	220nF 20% 16V
2133	4822 126 13879	220nF 20% 16V
2134	2238 586 59812	0603 50V 100NP80M
2135	2238 586 59812	0603 50V 100NP80M
2136	2238 586 59812	0603 50V 100NP80M
2137	2238 586 59812	0603 50V 100NP80M
2138	2238 586 59812	0603 50V 100NP80M
2139	2238 586 59812	0603 50V 100NP80M
2140	4822 126 13879	220nF 20% 16V
2141	4822 126 13879	220nF 20% 16V
2142	4822 126 13879	220nF 20% 16V
2143	4822 126 13879	220nF 20% 16V
2144	4822 126 13879	220nF 20% 16V
2145	4822 126 13879	220nF 20% 16V
2146	4822 126 13879	220nF 20% 16V
2147	4822 126 13879	220nF 20% 16V
2148	2238 586 59812	0603 50V 100NP80M
2149	2238 586 59812	0603 50V 100NP80M
2150	4822 122 33741	10pF 10% 50V
2209	2238 586 59812	0603 50V 100NP80M
2210	2238 586 59812	0603 50V 100NP80M
2211	2238 586 59812	0603 50V 100NP80M
2212	2238 586 59812	0603 50V 100NP80M

2213	2238 586 59812	0603 50V 100NP80M
2214	2238 586 59812	0603 50V 100NP80M
2215	2238 586 59812	0603 50V 100NP80M
2216	2238 586 59812	0603 50V 100NP80M
2217	2238 586 59812	0603 50V 100NP80M
2218	2238 586 59812	0603 50V 100NP80M
2220	2238 586 59812	0603 50V 100NP80M
2221	5322 126 11579	3.3nF 10% 63V
2222	3198 016 38210	0603 25V 820P COL
2223	4822 124 40769	4.7µF 20% 100V
2300	2238 586 59812	0603 50V 100NP80M
2301	4822 122 33761	22pF 5% 50V
2302	4822 126 11785	0603 50V 47P 5%
2304	4822 124 40184	1000µF 20% 10V
2305	2238 586 59812	0603 50V 100NP80M
2306	2238 586 59812	0603 50V 100NP80M
2307	3198 017 44740	0603 10V 470nF COL
2308	4822 124 81286	47µF 20% 16V
2309	2238 586 59812	0603 50V 100NP80M
2310	4822 122 33761	22pF 5% 50V
2311	4822 126 11785	0603 50V 47P 5%
2313	2238 586 59812	0603 50V 100NP80M
2314	4822 124 40184	1000µF 20% 10V
2315	4822 124 81286	47µF 20% 16V
2316	2238 586 59812	0603 50V 100NP80M
2317	4822 122 33761	22pF 5% 50V
2318	4822 126 11785	0603 50V 47P 5%
2320	4822 124 81286	47µF 20% 16V
2321	4822 124 81286	47µF 20% 16V
2322	4822 124 81286	47µF 20% 16V
2323	4822 124 81286	47µF 20% 16V

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3100	4822 051 30109	10Ω 5% 0.062W
3101	4822 051 30151	150Ω 5% 0.062W
3102	4822 117 12139	22Ω 5% 0.062W
3103	4822 117 12139	22Ω 5% 0.062W
3104	4822 117 12139	22Ω 5% 0.062W
3107	4822 051 30101	100Ω 5% 0.062W
3108	4822 051 30101	100Ω 5% 0.062W
3109	4822 117 12139	22Ω 5% 0.062W
3110	4822 117 12139	22Ω 5% 0.062W
3111	4822 117 12139	22Ω 5% 0.062W
3112	4822 117 12139	22Ω 5% 0.062W
3113	4822 117 12139	22Ω 5% 0.062W
3114	4822 117 12139	22Ω 5% 0.062W
3115	4822 117 12139	22Ω 5% 0.062W
3116	4822 117 12139	22Ω 5% 0.062W
3117	4822 117 12139	22Ω 5% 0.062W
3118	4822 117 12139	22Ω 5% 0.062W
3119	4822 117 12139	22Ω 5% 0.062W
3120	4822 117 12139	22Ω 5% 0.062W
3121	4822 117 12139	22Ω 5% 0.062W
3122	4822 117 12139	22Ω 5% 0.062W
3123	4822 117 12139	22Ω 5% 0.062W
3124	4822 117 12139	22Ω 5% 0.062W
3125	4822 117 12139	22Ω 5% 0.062W
3126	4822 117 12139	22Ω 5% 0.062W
3127	4822 117 12139	22Ω 5% 0.062W
3128	4822 117 12139	22Ω 5% 0.062W
3129	4822 117 12139	22Ω 5% 0.062W
3130	4822 117 12139	22Ω 5% 0.062W
3131	4822 117 12139	22Ω 5% 0.062W
3132	4822 117 12139	22Ω 5% 0.062W
3133	4822 117 12139	22Ω 5% 0.062W
3134	4822 117 12139	22Ω 5% 0.062W
3135	4822 117 12139	22Ω 5% 0.062W
3136	4822 117 12139	22Ω 5% 0.062W
3137	4822 117 12139	22Ω 5% 0.062W
3138	4822 117 12139	22Ω 5% 0.062W
3139	4822 117 12139	22Ω 5% 0.062W
3140	4822 117 12139	22Ω 5% 0.062W
3141	4822 117 12139	22Ω 5% 0.062W
3142	4822 117 12139	22Ω 5% 0.062W
3143	4822 117 12139	22Ω 5% 0.062W
3144	4822 117 12139	22Ω 5% 0.062W
3145	4822 117 12139	22Ω 5% 0.062W
3146	4822 117 12139	22Ω 5% 0.062W
3147	4822 117 12139	22Ω 5% 0.062W
3148	4822 117 12139	22Ω 5% 0.062W
3149	4822 117 12139	22Ω 5% 0.062W
3150	4822 051 30472	4k7 5% 0.062W
3151	4822 117 12139	22Ω 5% 0.062W
3152	4822 117 12139	22Ω 5% 0.062W
3153	4822 117 12139	22Ω 5% 0.062W
3154	4822 117 12139	22Ω 5% 0.062W
3155	4822 117 12139	22Ω 5% 0.062W
3156	4822 117 12139	22Ω 5% 0.062W
3157	4822 117 12139	22Ω 5% 0.062W
3158	4822 117 12139	22Ω 5% 0.062W
3159	4822 117 12139	22Ω 5% 0.062W
3160	4822 117 12139	22Ω 5% 0.062W

3161	4822 117 12139	22Ω 5% 0.062W
3162	4822 117 12139	22Ω 5% 0.062W
3163	4822 117 12139	22Ω 5% 0.062W
3164	4822 117 12139	22Ω 5% 0.062W
3165	4822 117 12139	22Ω 5% 0.062W
3166	4822 117 12139	22Ω 5% 0.062W
3170	4822 051 30008	0Ω jumper
3172	4822 051 30008	0Ω jumper
3173	4822 117 12139	22Ω 5% 0.062W
3174	4822 117 12139	22Ω 5% 0.062W
3175	4822 117 12139	22Ω 5% 0.062W
3176	4822 117 12139	22Ω 5% 0.062W
3177	4822 117 12139	22Ω 5% 0.062W
3178	4822 117 12139	22Ω 5% 0.062W
3179	4822 117 12139	22Ω 5% 0.062W
3180	4822 117 12139	22Ω 5% 0.062W
3181	4822 117 12139	22Ω 5% 0.062W
3182	4822 117 12139	22Ω 5% 0.062W
3183	4822 117 12139	22Ω 5% 0.062W
3201	4822 051 30472	4k7 5% 0.062W
3203	4822 051 30152	1k5 5% 0.062W
3204	4822 117 12139	22Ω 5% 0.062W
3205	4822 051 30152	1k5 5% 0.062W
3206	4822 117 12139	22Ω 5% 0.062W
3207	4822 051 30472	4k7 5% 0.062W
3208	4822 051 30472	4k7 5% 0.062W
3209	4822 051 30101	100Ω 5% 0.062W
3210	4822 051 30103	10k 5% 0.062W
3211	4822 051 30101	100Ω 5% 0.062W
3212	4822 051 30103	10k 5% 0.062W
3213	4822 051 30101	100Ω 5% 0.062W
3214	4822 051 30101	100Ω 5% 0.062W
3215	4822 051 30472	4k7 5% 0.062W
3216	4822 051 30681	680Ω 5% 0.062W
3300	4822 051 30759	75Ω 5% 0.062W
3302	2322 704 63001	300R 1% 0.063W 0603
3303	2322 704 63001	300R 1% 0.063W 0603
3305	4822 051 30102	1k 5% 0.062W
3306	2322 704 63002	3k 1% 0.063W 0603
3307	4822 051 30759	75Ω 5% 0.062W
3309	2322 704 63001	300R 1% 0.063W 0603
3310	2322 704 63001	300R 1% 0.063W 0603
3312	4822 051 30102	1k 5% 0.062W
3313	2322 704 63002	3k 1% 0.063W 0603
3314	4822 117 11152	4Ω 7 5%
3316	2322 704 63001	300R 1% 0.063W 0603

**SCART PWB****Various**

1000	2422 025 12352	CON BM EURO H 21P F BK GRND-L
1001	2422 025 12352	CON BM EURO H 21P F BK GRND-L
1300	2422 025 16526	CON BM V 22P F 1.00 FFC 0.3 R

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2100	4822 124 11947	10µF 20% 16V
2101	4822 124 40207	100µF 20% 25V
2102	4822 126 14305	100nF 10% 16V 0603
2103	4822 126 14305	100nF 10% 16V 0603
2104	4822 126 14305	100nF 10% 16V 0603
2105	4822 122 33777	47pF 5% 63V
2106	4822 122 33777	47pF 5% 63V
2107	4822 126 14305	100nF 10% 16V 0603
2108	4822 126 14305	100nF 10% 16V 0603
2109	4822 126 14305	100nF 10% 16V 0603
2110	4822 124 41584	100µF 20% 10V
2111	4822 126 14494	22nF 10% 25V 0603
2112	4822 126 14305	100nF 10% 16V 0603
2113	4822 126 14305	100nF 10% 16V 0603
2114	3198 017 44740	0603 10V 470nF COL
2115	3198 017 44740	0603 10V 470nF COL
2116	3198 017 44740	0603 10V 470nF COL
2117	4822 124 11947	10µF 20% 16V
2118	4822 124 11947	10µF 20% 16V
2119	4822 124 21732	10µF 20% 25V
2120	3198 017 44740	0603 10V 470nF COL
2121	4822 124 40207	100µF 20% 25V
2122	4822 126 14305	100nF 10% 16V 0603
2200	4822 124 12032	4.7µF 20% 50V
2201	4822 126 13883	220pF 5% 50V
2202	4822 124 12032	4.7µF 20% 50V
2203	4822 124 12032	4.7µF 20% 50V
2204	4822 124 12032	4.7µF 20% 50V
2205	4822 122 31765	100pF 2% 63V 1206
2206	4822 126 13883	220pF 5% 50V
2207	4822 126 13883	220pF 5% 50V
2208	4822 126 13883	220pF 5% 50V
2209	4822 126 13883	220pF 5% 50V
2210	4822 126 13883	220pF 5% 50V
2211	4822 124 21732	10µF 20% 25V
2212	4822 124 12032	4.7µF 20% 50V
2213	4822 124 12032	4.7µF 20% 50V
2214	4822 124 12032	4.7µF 20% 50V
2215	4822 124 12032	4.7µF 20% 50V
2216	4822 126 13883	220pF 5% 50V
2217	4822 126 13883	220pF 5% 50V
2218	4822 122 31765	100pF 2% 63V 1206
2219	4822 124 11947	10µF 20% 16V
2220	4822 126 13883	220pF 5% 50V
2221	4822 124 11947	10µF 20% 16V
2222	4822 126 13883	220pF 5% 50V
2223	4822 126 13883	220pF 5% 50V
2224	4822 126 13883	220pF 5% 50V
2225	4822 124 21732	10µF 20% 25V
2226	4822 126 13883	220pF 5% 50V

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3100	4822 117 11152	4Ω 7 5%
3102	4822 051 30103	10k 5% 0.062W
3104	4822 051 30472	4k7 5% 0.062W
3105	4822 051 30103	10k 5% 0.062W
3106	4822 051 30103	10k 5% 0.062W
3107	4822 051 30101	100Ω 5% 0.062W
3108	4822 051 30101	100Ω 5% 0.062W
3109	4822 051 30472	4k7 5% 0.062W
3110	4822 051 30103	10k 5% 0.062W
3111	4822 051 30102	1k 5% 0.062W
3112	4822 051 30472	4k7 5% 0.062W
3113	4822 051 30103	10k 5% 0.062W
3114	4822 051 30471	470Ω 5% 0.062W
3115	4822 051 30471	470Ω 5% 0.062W
3116	4822 051 30103	10k 5% 0.062W
3117	4822 051 30472	4k7 5% 0.062W
3200	4822 051 30221	220Ω 5% 0.062W
3201	4822 117 12925	47k 1% 0.063W 0603
3202	4822 051 30471	470Ω 5% 0.062W
3203	4822 051 30273	27k 5% 0.062W
3204	4822 117 12925	47k 1% 0.063W 0603
3205	4822 051 30221	220Ω 5% 0.062W
3206	4822 117 12925	47k 1% 0.063W 0603
3207	4822 051 30273	27k 5% 0.062W
3208	4822 117 12925	47k 1% 0.063W 0603

3209	4822 051 30471	470Ω 5% 0.062W
3210	4822 051 30471	470Ω 5% 0.062W
3211	4822 051 30101	100Ω 5% 0.062W
3212	4822 051 30689	68Ω 5% 0.063W 0603 RC21 RST SM
3213	4822 051 30471	470Ω 5% 0.062W
3214	4822 051 30471	470Ω 5% 0.062W
3215	4822 051 30101	100Ω 5% 0.062W
3216	4822 051 30689	68Ω 5% 0.063W 0603 RC21 RST SM
3217	4822 051 30151	150Ω 5% 0.062W
3218	4822 051 30101	100Ω 5% 0.062W
3219	4822 051 30472	4k7 5% 0.062W
3220	4822 051 30472	4k7 5% 0.062W
3221	4822 051 30472	4k7 5% 0.062W
3222	4822 117 13632	100k 1% 0603 0.62W
3223	4822 051 30471	470Ω 5% 0.062W
3224	4822 051 30151	150Ω 5% 0.062W
3225	4822 051 30471	470Ω 5% 0.062W
3226	4822 051 30472	4k7 5% 0.062W
3227	4822 051 30471	470Ω 5% 0.062W
3228	4822 051 30222	2k2 5% 0.062W
3229	4822 051 30689	68Ω 5% 0.063W 0603 RC21 RST SM
3230	4822 051 30759	75Ω 5% 0.062W
3231	4822 051 30561	560Ω 5% 0.062W
3232	4822 051 30101	100Ω 5% 0.062W
3233	4822 051 30471	470Ω 5% 0.062W
3234	4822 051 30339	33Ω 5% 0.062W
3235	4822 051 30689	68Ω 5% 0.063W 0603 RC21 RST SM
3236	4822 051 30472	4k7 5% 0.062W
3237	4822 051 30562	5k6 5% 0.063W 0603 RC21 RST SM
3238	4822 051 30479	47Ω 5% 0.062W
3239	4822 051 30472	4k7 5% 0.062W
3240	4822 051 30102	1k 5% 0.062W
3241	4822 117 12925	47k 1% 0.063W 0603
3242	4822 051 30471	470Ω 5% 0.062W
3243	4822 117 12925	47k 1% 0.063W 0603
3244	4822 051 30272	2k7 5% 0.062W
3245	4822 051 30102	1k 5% 0.062W
3246	4822 117 12925	47k 1% 0.063W 0603
3247	4822 051 30471	470Ω 5% 0.062W
3248	4822 117 12925	47k 1% 0.063W 0603
3249	4822 051 30102	1k 5% 0.062W
3250	4822 117 12925	47k 1% 0.063W 0603
3251	4822 051 30471	470Ω 5% 0.062W
3252	4822 051 30471	470Ω 5% 0.062W
3253	4822 051 30472	4k7 5% 0.062W
3254	4822 051 30759	75Ω 5% 0.062W
3255	4822 051 30472	4k7 5% 0.062W
3257	4822 051 30759	75Ω 5% 0.062W
3258	4822 051 30471	470Ω 5% 0.062W
3259	4822 051 30339	33Ω 5% 0.062W
3260	4822 051 30561	560Ω 5% 0.062W
3261	4822 051 30472	4k7 5% 0.062W
3262	4822 051 30759	75Ω 5% 0.062W
3263	4822 051 30472	4k7 5% 0.062W
3264	4822 051 30479	47Ω 5% 0.062W
3266	4822 051 30759	75Ω 5% 0.062W
3267	4822 051 30472	4k7 5% 0.062W
3268	4822 051 30101	100Ω 5% 0.062W
3269	4822 051 30689	68Ω 5% 0.063W 0603 RC21 RST SM
3270	4822 051 30471	470Ω 5% 0.062W
3271	4822 051 30759	75Ω 5% 0.062W
3272	4822 051 30273	27k 5% 0.062W
3273	4822 117 12925	47k 1% 0.063W 0603
3275	4822 051 30272	2k7 5% 0.062W
3276	4822 051 30472	4k7 5% 0.062W
3277	4822 051 30561	560Ω 5% 0.062W
3278	4822 051 30561	560Ω 5% 0.062W

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6208 9340 548 63115 PDZ15B



7102	4822 130 60511	BC847B
7103	4822 130 60511	BC847B
7104	4822 130 60511	BC847B
7105	4822 130 60511	BC847B
7106	4822 130 40854	BC327
7200	4822 130 42804	BC817-25
7201	4822 130 42804	BC817-25
7202	4822 130 60511	BC847B
7203	4822 130 60511	BC847B
7204	4822 130 60511	BC847B
7205	4822 130 60373	BC856B
7206	4822 130 60511	BC847B

7207	4822 130 60511	BC847B
7208	4822 130 60511	BC847B
7209	4822 130 60511	BC847B
7210	4822 130 42804	BC817-25
7211	4822 130 42804	BC817-25
7212	4822 130 60511	BC847B
7213	4822 130 60373	BC856B
7214	4822 130 60511	BC847B
7215	4822 130 42804	BC817-25
7216	4822 130 42804	BC817-25
7217	4822 130 60511	BC847B
7218	4822 130 60511	BC847B
7219	4822 130 42804	BC817-25
7220	4822 130 42804	BC817-25
7500	9322 134 86668	LF80C
7501	9322 135 59671	STV6411AD

# 11. Errata

## 11.1 Revision List

### 11.1.1 Manual 3122 785 12331

***From production start, the new print layout of the Pscan board has been introduced.***

- In this service manual the circuit diagrams, print layout and the belonging parts list are added.

***In the manual 3122 785 12330, the Double Scart circuit diagrams and print layout was left out.***

- In this version of the service manual, the circuit diagrams and print layout are added.

***In this version, the Layout of Menu script, Audio nuclei table 5.8.1, Video nuclei table 5.8.7 and Furore nuclei table 5.8.8 are updated.***

***In this version, the value of C2102, C2129 and C2131 in the parts list of Front board has been changed to 470nF 50V.***