DVD PLAYER

DVD-S510/DV-S5350

SERVICE MANUAL

IMPORTANT NOTICE

This manual has been provided for the use of authorized YAMAHA Retailers and their service personnel.
It has been assumed that basic service procedures inherent to the industry, and more specifically YAMAHA Products, are already known and understood by the users, and have therefore not been restated.

WARNING: Failure to follow appropriate service and safety procedures when servicing this product may result in personal injury, destruction of expensive components, and failure of the product to perform as specified. For these reasons, we advise all YAMAHA product owners that any service required should be performed by an authorized YAMAHA Retailer or the appointed service representative.

IMPORTANT: The presentation or sale of this manual to any individual or firm does not constitute authorization, certification or recognition of any applicable technical capabilities, or establish a principle-agent relationship of any form.

The data provided is believed to be accurate and applicable to the unit(s) indicated on the cover. The research, engineering, and service departments of YAMAHA are continually striving to improve YAMAHA products. Modifications are, therefore, inevitable and specifications are subject to change without notice or obligation to retrofit. Should any discrepancy appear to exist, please contact the distributor's Service Division.

WARNING: Static discharges can destroy expensive components. Discharge any static electricity your body may have accumulated by grounding yourself to the ground buss in the unit (heavy gauge black wires connect to this buss).

IMPORTANT: Turn the unit OFF during disassembly and part replacement. Recheck all work before you apply power to the unit.

■ CONTENTS

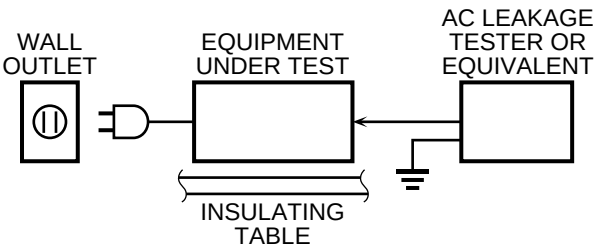
100750

YAMAHA
YAMAHA CORPORATION
P.O.Box 1, Hamamatsu, Japan

■ TO SERVICE PERSONNEL

1. Critical Components Information
   Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.
2. Leakage Current Measurement (For 120V Models Only)
   When service has been completed, it is imperative to verify that all exposed conductive surfaces are properly insulated from supply circuits.

- Meter impedance should be equivalent to 1500 ohm shunted by 0.15μF.
- Leakage current must not exceed 0.5mA.
- Be sure to test for leakage with the AC plug in both polarities.



CAUTION: USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

THE DVD-VIDEO PLAYER SHOULD NOT BE ADJUSTED OR REPAIRED BY ANYONE EXCEPT PROPERLY QUALIFIED SERVICE PERSONNEL.

■ WARNINGS

WARNING: CHEMICAL CONTENT NOTICE!

The solder used in the production of this product contains LEAD. In addition, other electrical/electronic and /or plastic (where applicable) components may also contain traces of chemicals found by the California Health and Welfare Agency (and possibly other entities) to cause cancer and/or birth defects or other reproductive harm.

DO NOT PLACE SOLDER, ELECTRICAL/ELECTRONIC OR PLASTIC COMPONENTS IN YOUR MOUTH FOR ANY REASON WHATSOEVER!

Avoid prolonged, unprotected contact between solder and your skin! When soldering, do not inhale solder fumes or expose eyes to solder/flux vapor!

If you come in contact with solder or components located inside the enclosure of this product, wash your hands before handling food.

WARNING: Laser Safety

This product contains a laser beam component. This component may emit invisible, as well as visible radiation, which may cause eye damage. To protect your eyes and skin from laser radiation, the following precautions must be used during servicing of the unit.

1) When testing and/or repairing any component within the product, keep your eyes and skin more than 30 cm away from the laser pick-up unit at all times. Do not stare the laser beam at any time.

2) Do not attempt readjustment, disassemble or repair of the laser pick-up, unless noted elsewhere in this manual.

3) CAUTION: Use of controls, adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Laser Emitting conditions:

1) When the Top Cover is removed, and the POWER SW is turned to the "ON" position, the laser component will emit a beam for several seconds to detect if a disc is present. During this time (5 - 10 sec.) the laser may radiate through the lens of the laser pick-up unit. Do not attempt any servicing during this period!
   If no disc is detected, the laser will stop emitting the beam. when a disc is set, you will not be exposed to any laser emissions.

2) The laser power level can be adjusted with the VR on pick-up PWB, however, this level has been set by the factory prior to shipping from the factory. Do not adjust this laser level control unless instruction is provided elsewhere in this manual. Adjustment of this control can increase the laser emission level from the device.

Laser Diode Properties

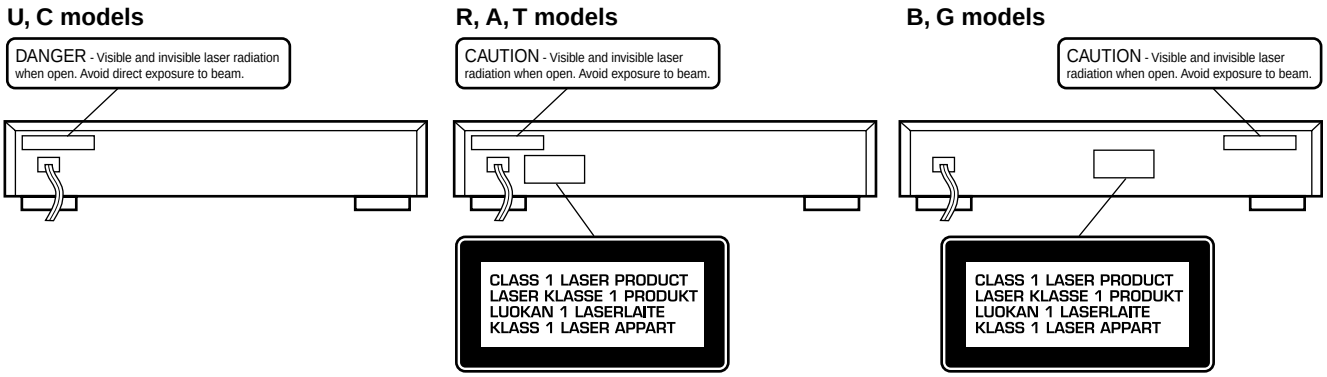
Type:	Semiconductor laser GaAlAs
Wave length:	650 nm (DVD)
	780 nm (VCD/CD)
Output Power:	7 mW (DVD)
	10 mW (VCD/CD)
Beam divergence:	60 degree

Output value is determined by CFR CHAPTER1, SUBCHAPTER J

VARO!	:	AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄkymÄTTÖMÄLLE LASER-SÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.
VARNING!	:	OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.

WARNING

The use of optical instruments with this product will increase eye hazard.
Repair handling should take place as much as possible with a disc loaded inside the player



WARNING LOCATION: REAR PANEL

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

Warning for power supply

The primary side of the power supply including the heatsink carries live mains voltage when the player is connected to the mains even when the player is switched off !
This primary area is not shielded so it is possible to touch copper tracks and/or components when servicing the player. Service personnel have to take precautions to prevent touching this area or components in this area .
The primary side of the power supply has been indicated with a lightening stroke and a stripe-marked print on the printed wiring board

Note:
The screws on the DVD mechanism (position 18-1 in on the exploded view drawing) may never be touched, removed or re-adjusted.
Handle the DVD mechanism with care when the unit has to be exchanged!
The DVD mechanism is very sensitive for dropping or giving shocks.

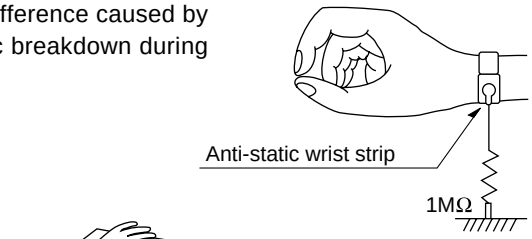
■ PREVENTION OF ELECTROSTATIC DISCHARGE

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor “chip” components. The following techniques should be used to help reduce the incidence of component damage caused by electro static discharge (ESD).

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging ESD wrist strap, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device. Some solder removal devices not classified as “anti-static (ESD protected)” can generate electrical charge sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
   CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity (ESD) sufficient to damage an ES device).

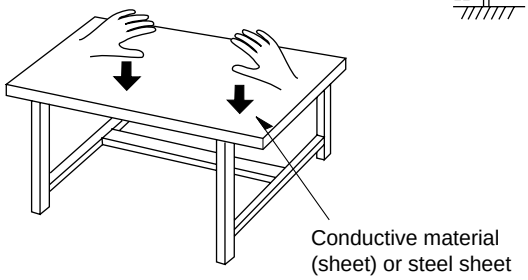
HANDLING PRECAUTIONS

The laser diode in the optical pickup may break down due to potential difference caused by static electricity of clothes or human body. So be careful of electrostatic breakdown during repair of the DVD mechanism.



Grounding for electrostatic breakdown prevention

1. Human body grounding.
   Use the antistatic wrist strap to discharge the static electricity from your body.
2. Work table grounding.
   Put a conductive material (sheet) or steel sheet on the area where the optical pickup is placed and ground the sheet.

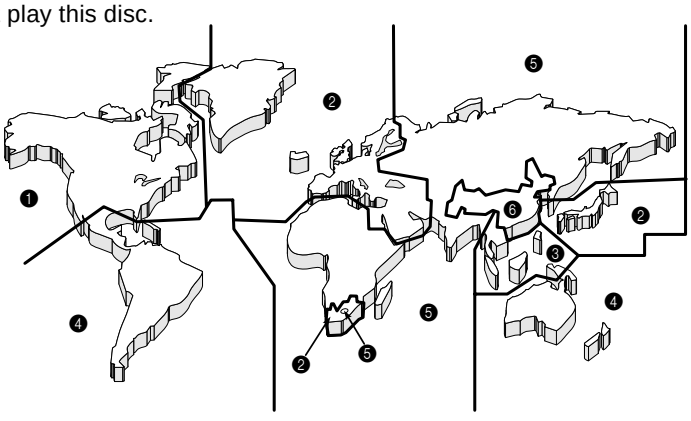


Caution:

The static electricity of your clothes will not be grounded through the wrist strap. So take care not to let your clothes touch the optical pickup.

■ LOCALE MANAGEMENT INFORMATION

Locale Management Information : This DVD player is designed and manufactured to respond to the Locale Management Information that is recorded on a DVD disc. If the Locale number described on the DVD disc does not correspond to the Locale number of this DVD player, this DVD player cannot play this disc.



■ SPECIFICATIONS

PLAYBACK SYSTEM

DVD-Video
Video CD
CD (CD-R and CD-RW)

OPTICAL READOUT SYSTEM

Laser type	Semiconductor AlGaAs
Numerical Aperture	0.60 (DVD)
	0.45 (VCD/CD)
Wavelength	650 nm (DVD)
	780 nm (VCD/CD)

DVD DISC FORMAT

Medium	Optical Disc	
Diameter	12cm (8cm)	
Playing time	One layer	2.15 h*
(12cm)	Dual layer	4 h*
	Two side	4.30 h*
	Single layer	
	Two side	8 h*
	Dual layer	

TV STANDARD	**EUROPE**	**USA**
	(PAL/50Hz)	(NTSC/60Hz)
Number of lines	625	525
Playback	Multistandard	(PAL/NTSC)

VIDEO FORMAT

DA Converter	10 bits
Signal handling	Components
Digital Compression	MPEG2 for DVD, MPEG1 for VCD

DVD

Horiz. Resolution	720 pixels**	720 pixels**
Vertical Resolution	576 lines	480 lines

VCD

Horiz. Resolution	352 pixels	352 pixels
Vertical Resolution	288 lines	240 lines

VIDEO PERFORMANCE

Video output	1 Vpp into 75 ohm
S-Video output	Y: 1 Vpp into 75 ohm
	C: 0.3 Vpp into 75 ohm
Y	1 Vpp into 75 ohm (U, C, A, R, T)
C_R	0.7 Vpp into 75 ohm (U, C, A, R, T)
C_B	0.7 Vpp into 75 ohm (U, C, A, R, T)
RGB output	1 Vpp into 75 ohm (B, G)
Black Level Shift	On/Off
Video Shift	Left/Right

AUDIO FORMAT

Digital	MPEG	Compressed Digital
	DTS	Compressed Digital
	AC-3	Compressed Digital
	PCM	
Analog	Analog Sound Stereo	
	Dolby Pro Logic downmix from AC-3 multi-channel sound	
	3D Sound for virtual 5.1 channel sound on 2 speakers	

AUDIO PERFORMANCE

DA Converter	24 bits	
DVD	fs 48 kHz	2 Hz - 22 kHz
Video CD	fs 44.1 kHz	2 Hz - 20 kHz
CD	fs 44.1 kHz	2 Hz - 20 kHz
Signal-Noise (1kHz)		95 dB
Dynamic Range (1kHz)		95 dB
Harmonic Distortion + Noise (1kHz)		0.0035 %

CONNECTIONS

SCART	SCART2x (B, G)	
S-Video Output	Mini DIN, 4 pins	
Component Video	Y	Cinch (green)
(U, C, A, R, T)	P_B	Cinch (blue)
	P_R	Cinch (red)
Video Output		Cinch (yellow) (B, G)
Video Output		Cinch (yellow) x2 (U, C, A, R, T)
Audio L+R output		Cinch (white/red) (B, G)
Audio L+R output		Cinch (white/red) x2 (U, C, A, R, T)
Digital Output		1 coaxial, 1 optical
		IEC958 for CDDA / LPCM
		IEC1937 for MPEG1/2, AC-3 and DTS

GENERAL

Dimensions(w x h x d)	435 x 91 x 314 mm
Weight	Approx. 3.3 Kg
Finish	Black color (U, C, A, B, G)
	Gold color (R, G, T)
	Titan color (G)
Power supply	120 V, 60 Hz (U)
	230 V, 50 Hz (B, G)
	240 V, 50 Hz (A)
	110/120/220/240 V, 50/60 Hz (R)
	220 V, 50 Hz (T)
Power consumption	20 W
Standby mode	5 W (B, G)
	3 W (When low power Standby is on)

PACKAGE CONTENTS

DVD-Video Player, Remote Control & Batteries,
AC Power cord, Owner's Manual, Audio/Video cable (U, C, A, R, T),
Audio cable (B, G), Video cable (B, G)

GENERAL FUNCTIONALITY

Stop / Play / Pause
Fast Forward / Backward
Time search
Step Forward / Backward
Slow
Title / Chapter / Track Select
Skip Next / Skip Previous
Repeat (Chapter / Title / All) or (Track / All)
A-B Repeat
Shuffle
Enhanced ease of use graphical interface
Zoom (x1.33, x2, x4) with picture enhancement
3D Sound
Audio and video bit rate indicator

DVD FUNCTIONALITY

Multi-angle Selection
Audio Selection (1 out of max. 8 languages)
Subtitles Selection (1 out of max. 32 languages)
Aspect Ratio conversion (16:9, 4:3 Letterbox, 4:3 Pan Scan)
Parental Control and DISC Lock
Disc Menu support (Title Menu and Root Menu)
Resume (5 discs) after stop / standby
Screen Saver (Dim 75% after 15 min.)
Programming Titles/chapters with Favorite Selection

VIDEO CD FUNCTIONALITY

Playback Control for VCD 2.0 discs
Parental Control and DISC lock
Resume (5 discs) after stop / standby
Screen Saver (Dim 75% after 15 min.)
Programming Tracks with Favorite Selection

AUDIO CD FUNCTIONALITY

Time Display (Total / Track / Remaining Track Time)
Full audio functionality with remote control
Programming with Favorite Track Selection

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

** equivalent to 500 lines on your TV

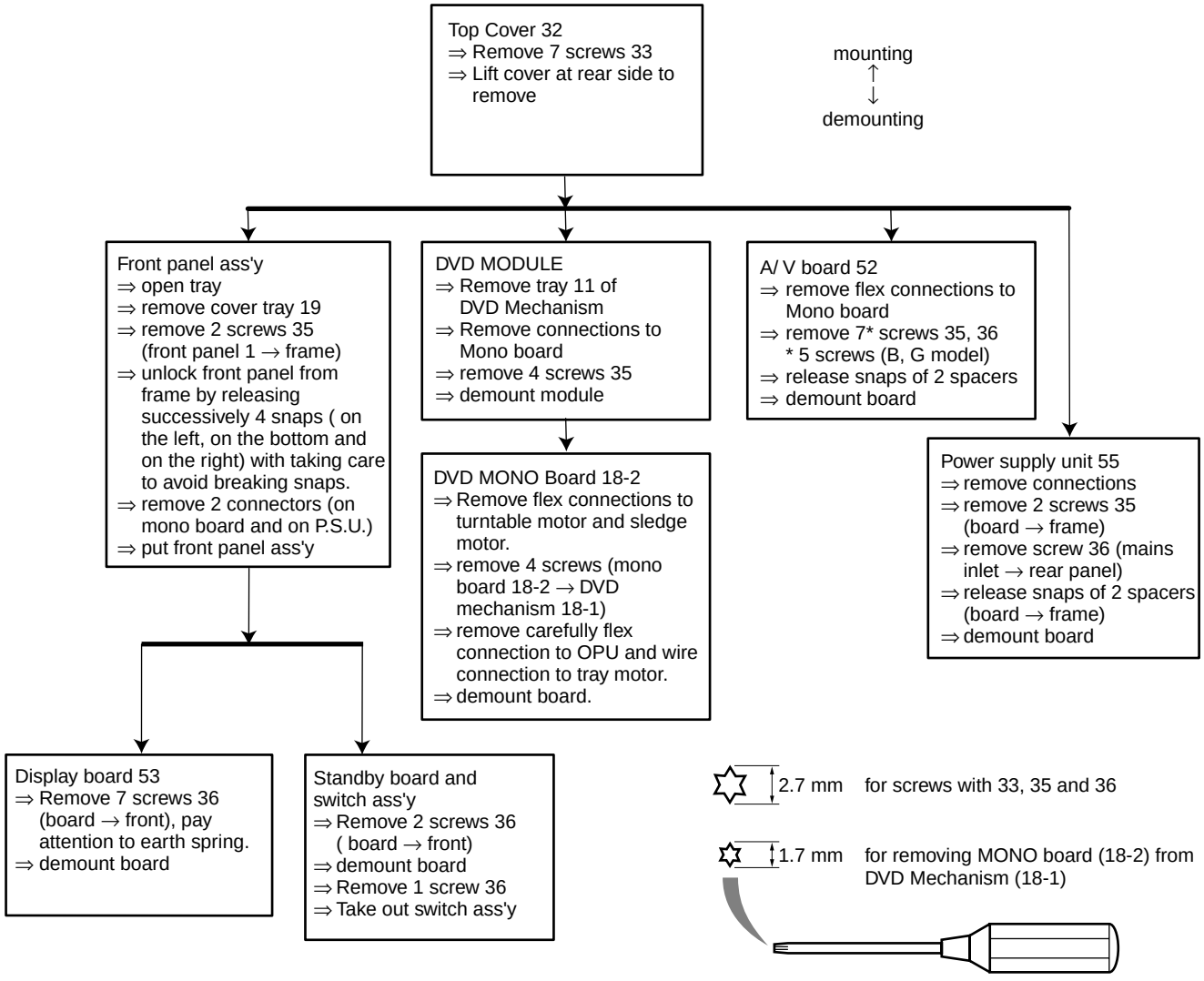
Specifications subject to change without prior notice.

U ..... U.S.A. model
G ..... Europe model
A ..... Australia model
T ..... China model
C .... Canada model
B .... British model
R .... General model

■ DISASSEMBLY PROCEDURES

See exploded view for item numbers.

When disassembling, use the special screw driver with tip shape in figure.



● The way to remove tray

1. Push left end of the lever under the tray toward the right by using screwdriver, move the tray by pulling it forward. (Fig. 1)
2. While lifting up the lever (①), move the left side of the tray by pulling it forward (②). (Fig. 2)
3. While lifting up the tray (③), remove the tray by pulling it forward (④). (Fig. 2)

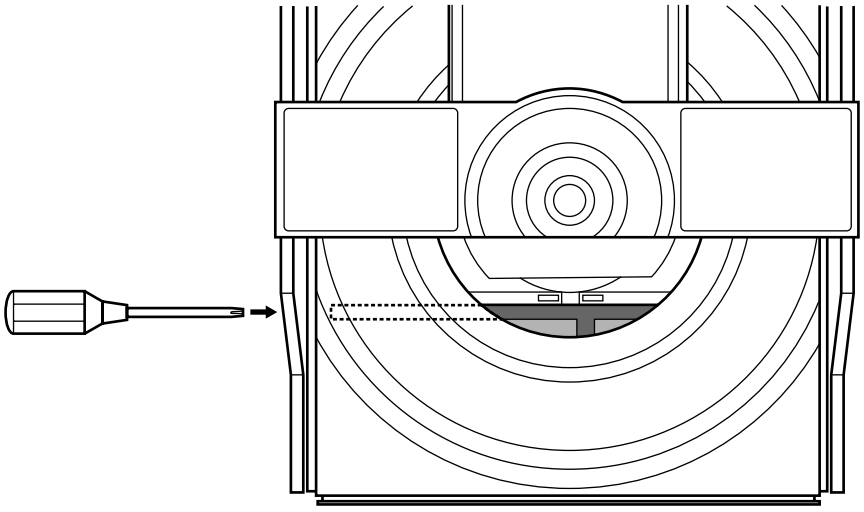


Fig. 1

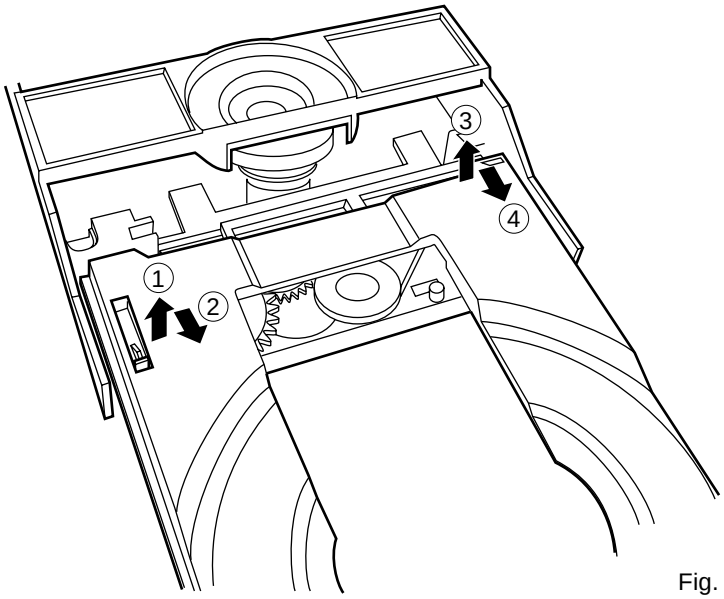


Fig. 2

■ SERVICE HINTS

Diagnostic software

In chapter “Diagnostic software”, some tests are refering to the SCART functionality.
These tests are for sets with RGB-output.

For sets without RGB-output, no SCART connector is mounted.
In these sets, the SCART tests will automatically be skipped.

■ DIAGNOSTIC SOFTWARE : SCRIPT INTERFACES

1. DEALER SCRIPT

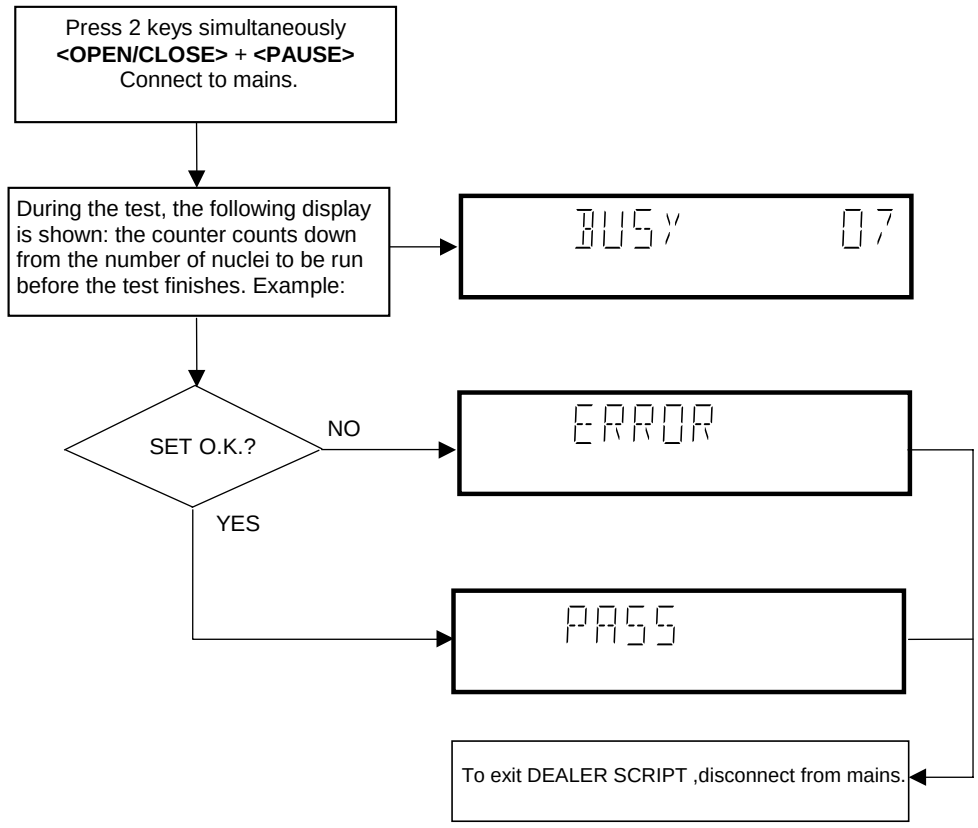
1.1 Purpose of Dealer Script

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.

1.2 Contents of Dealer Script

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		Description
VideoColSetupComm	9	Checks the I2C interface with the RGB video processor on the Audio/Video board (only for DVD players with RGB video processor).
VideoScartSwComm	8	Checks the I2C interface with the scart switch on the Audio/Video board
PapChksFl	7	Calculate and verify checksum of FLASH memory.
PapDramWrR	6	Pattern test of all locations in the DRAM(s).
PapI2cDisp	5	Checks the I2C interface with the slave processor on the display PCB.
PapS2bEcho	4	Checks the I2C interface to the basic engine.
PapI2cNvram	3	Checks the I2C interface with the NVRAM.
PapNvramWrR	2	Pattern test of all locations in the NVRAM
CompSdramWrR	1	Pattern test of all locations in the SDRAM(s).



2. PLAYER SCRIPT

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 boxes 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.

2.2 Contents of Player Script

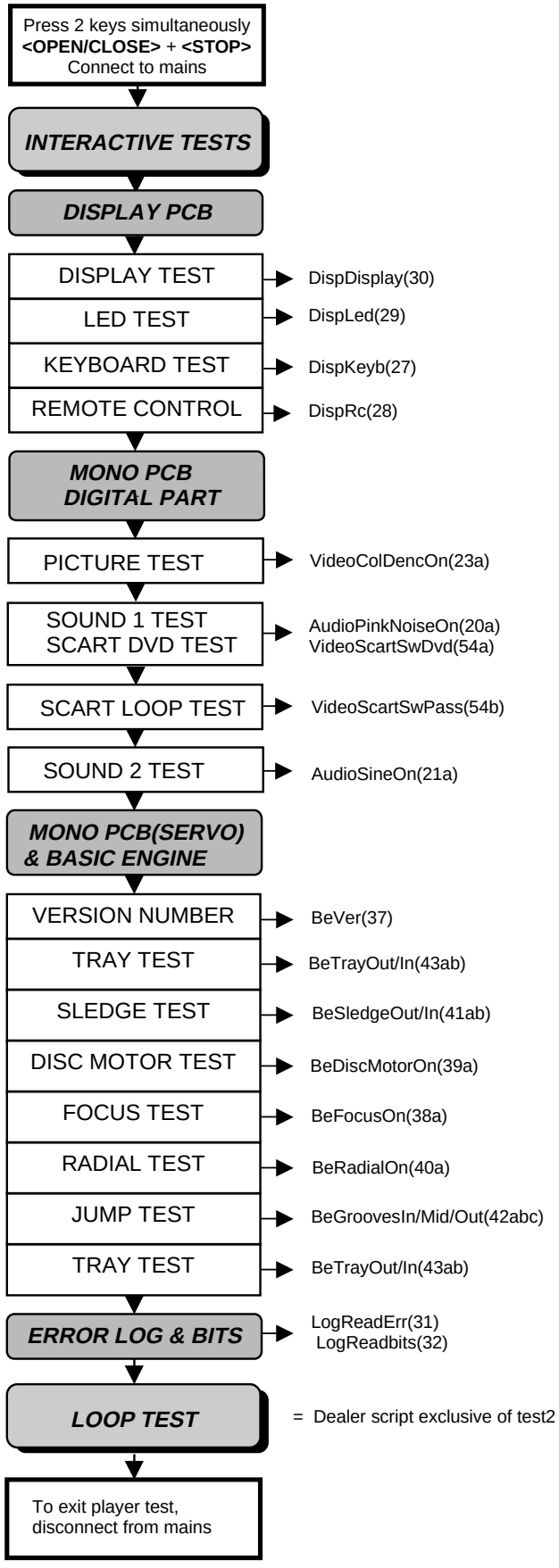
The player script contains all nuclei that are useful on a DVD player that is connected to a TV-set and help to determine which module of the DVD player is faulty, as well as to read out the contents of the error logs.

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:

1. 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.
2. The loop test will perform the same nuclei as the dealer test, but it will loop through the list of nuclei indefinitely.

2.4 Survey



■ INTERACTIVE TESTS

1. DISPLAY PCB

1.1 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 PLAY (pattern is ok) or PAUSE (pattern was incorrect) to proceed to the next pattern. The display of patterns is continued in a cyclic manner until the user presses NEXT. If the user presses NEXT before all display patterns are tested, the DispDisplay nucleus will return TRUE (display test successful).

1.2 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 PLAY, if it is not, press PAUSE. By pressing NEXT the script will proceed to the next test. If the user presses NEXT before PLAY or PAUSE, the DispLed nucleus will return TRUE (LED test successful).

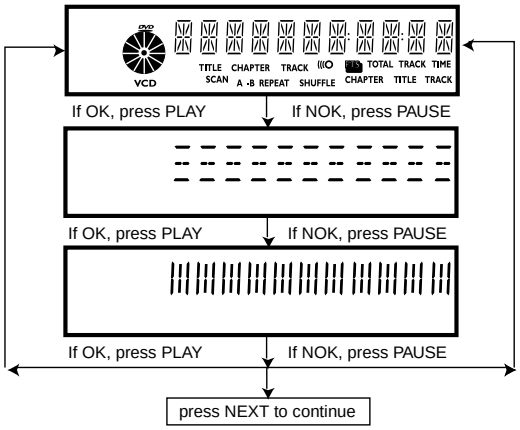


Figure 1

1.3 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:

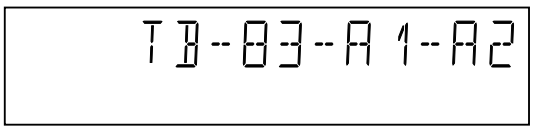


Figure 2

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

key id.	key
0	PLAY
1	NEXT
2	PREVIOUS
3	PAUSE
4	STOP
5	OPEN / CLOSE
A	POWER (B, G models)

Figure 3

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 NEXT 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 4

Or

Figure 5

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

1.4 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:

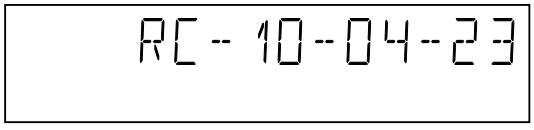


Figure 6

In this example 23 is the hexidecimal code of the pressed RC key. The user can leave the remote-control test by pressing NEXT on the local keyboard of the DVD player. The remote control test is successful if a code was received before the user pressed the NEXT key; pressing the NEXT 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	**C**
STOP	**31**
PLAY	**2C**
PLAY BACKWARD	**2D**
PAUSE	**30**
STEP FORWARD	**F6**
STEP BACKWARD	**F5**
FORWARD	**28**
FORWARD 4X	**DF**
FORWARD 8X	**E0**
BACKWARD	**29**
BACKWARD 4X	**DE**
BACKWARD 8X	**DD**
SLOW	**22**
SLOW 2	**D8**
SLOW BACKWARD	**23**
SLOW BACKWARD 2	**DB**
NEXT	**20**
PREVIOUS	**21**
CURSOR UP	**58**
CURSOR DOWN	**59**
CURSOR LEFT	**5A**
CURSOR RIGHT	**5B**
OK	**5C**
0	**0**
1	**1**
2	**2**
3	**3**
4	**4**
5	**5**
6	**6**
7	**7**
8	**8**
9	**9**
TITLE/CHP	**C8**
ANGLE	**85**
AUDIO	**4E**
SUBTITLES	**4B**
SUBTITLE ON/OFF	**E3**
ROOT MENU	**54**
TITLE MENU	**71**
MENU	**D1**
SETUP MENU	**82**
ON SCREEN	**F**
RETURN	**83**
RESUME	**D7**
SCAN	**2A**
SHUFFLE	**1C**
REPEAT	**1D**
A/B REPEAT	**3B**
TOGGLE SCART	**43**
OPEN/CLOSE	**42**
FTS	**FB**
KARAOKE	**E4**
OPTION	**FA**
ZOOM	**F7**

Figure 7

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

Figure 8

Or

Figure 9

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

2 MONO PCB DIGITAL PART

2.1 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 shows the following message:

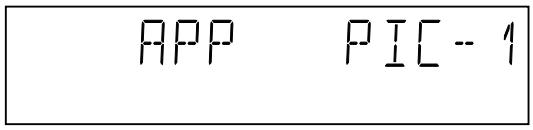


Figure 10

By pressing PLAY, the user confirms the test; pressing PAUSE will indicate the picture was invisible or incorrect. Pressing NEXT will proceed to the next test

2.2 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 shows the following message very shortly:

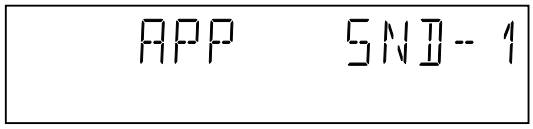


Figure 11

This sound will only be audible from version cut3.1 of Sti5505(item7503 on mono board) onwards. After starting up sound 1, SCART loop-trough will be simultaneously active during this test. SCART loop-trough will be measured with the aid of an external video source.
When entering the SCART loop-trough, the local display indicates:

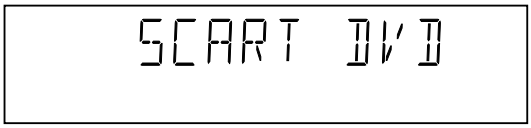


Figure 12

On the TV screen, a colour bar (generated by nucleus VideoColDencOn) is visual and the internally generated pinknoise is audible. By pressing PLAY, the user confirms the test; pressing PAUSE will indicate the sound was inaudible or incorrect. Pressing NEXT will proceed to the next test; if the user presses NEXT without pressing PLAY or PAUSE first, the result of this test will be TRUE (sound ok). By pressing the NEXT button, there will be switched over to the external source, this must become now visible on the TV screen (using the SCART). The local display indicates:

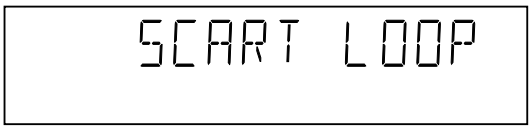


Figure 13

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 PREV button, the internal generated colour bar becomes visual again.
The test can be left by pressing the NEXT key for more than one second.

2.3 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 shows the following message:

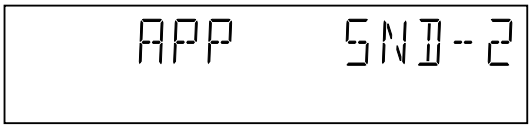


Figure 14

By pressing PLAY, the user confirms the test; pressing PAUSE will indicate that something went wrong. Pressing NEXT will proceed to the next; if the user presses NEXT without pressing PLAY or PAUSE first, the result of this test will be TRUE (sound ok).

3 BASIC ENGINE

note) Basic engine means DVD mechanism.

3.1 VERSION NUMBER

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

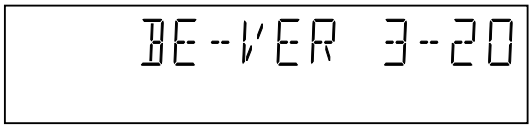


Figure 15

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

3.2 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 looks as follows:

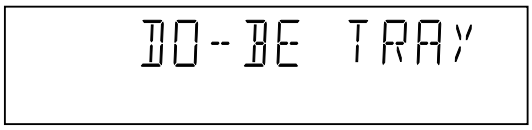


Figure 16

By pressing PLAY or PAUSE, 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 NEXT will proceed to the next test, after the tray has been closed (by the software) if it was open.

3.3 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 PLAY (nucleus BeSledgeOut) and PAUSE (nucleus BeSledgeIn).
Pressing NEXT 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 looks as follows during the sledge test:

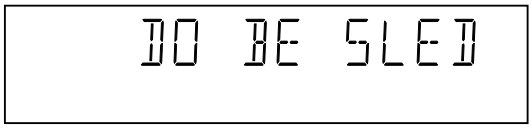


Figure 17

3.4 DISC MOTOR TEST(visual test)

The third Basic Engine test tests the disc motor (nucleus BeDiscMotorOn); the local display looks as follows:

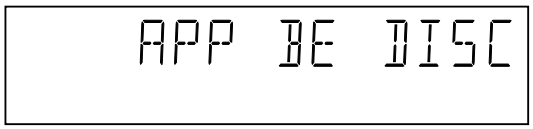


Figure 18

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

3.5 FOCUS TEST(visual test)

The fourth Basic Engine test tests the focussing; first focussing is turned on by calling nucleus BeFocusOn. The display looks as follows:

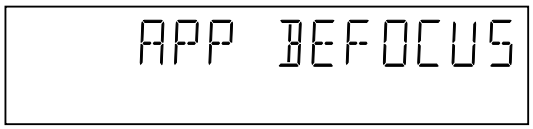


Figure 19

By pressing PLAY, the user confirms that the focussing was succesful; pressing PAUSE indicates a focussing failure.

Pressing NEXT proceeds to the next test after a reset of the focussing (nucleus BeFocusOff); if NEXT is pressed before PLAY or PAUSE, the result of this test will be TRUE (focus successful).

3.6 RADIAL TEST(visual & listening test)

The fifth Basic Engine test tests the radial functionality (nucleus BeRadialOn); the local display looks as follows:

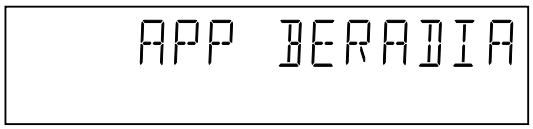


Figure 20

By pressing PLAY, the user confirms that the radial function worked; pressing PAUSE indicates the function does not work.

Pressing NEXT proceeds to the next test, after a reset of the radial (nucleus BeRadialOff). If the user presses NEXT before pressing PLAY or PAUSE, the result of this test will be TRUE (radial successful).

3.7 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:

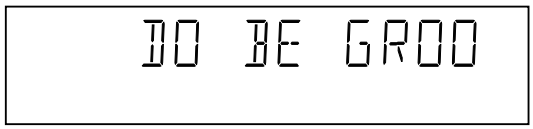


Figure 21

The user can switch between the three different types of groove settings by pressing PLAY (forward to next nucleus in the list In-Mid-Out) or PAUSE (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 NEXT proceeds to the next test, after the disc motor has been shut off with a call to nucleus BeDiscMotorOff.

3.8 TRAY TEST

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

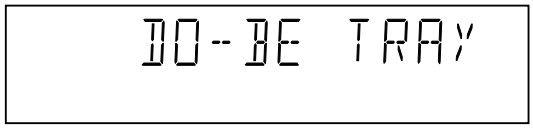


Figure 22

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 PLAY and PAUSE key. The tray will be closed (by the software, if it is open) before proceeding to the next test when the user presses the NEXT key.

3.9 ERROR LOG

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 :

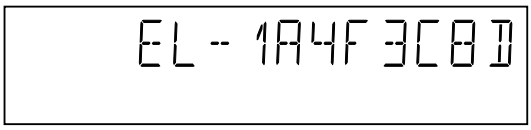


Figure 23

By pressing PLAY or PAUSE, the user can move forward or backward (respectively) through the logged error codes. The highlighted number indicates which errorcode is currently on display (in the example above, errorcode number 4 is displayed). If "0000" is displayed at all positions, the error log is empty. Display of the logged errors is done in a cyclic manner.

The errorcode with the lowest highlighted number is the most recent. By pressing NEXT on the local keyboard, the user can proceed to the next test.

3.10 ERROR BITS

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

Figure 24

Only the set errorbits will be shown by their (decimal) number.
Refer to the appropriate documentation for the explanation of each bit number. If the display only shows "EB-0", no error bits were set. By pressing NEXT, the user can continue to the next test.
See table below:

Error log / bits table	Read ERROR LOG in player script	Read ERROR BITS in player script
Basic engine errors	Value:	Value:
Command to the Basic Engine not allowed in this state or unknown command	150101	8
Parameter(s) from the command to the Basic Engine is not valid	150102	7
Sledge could not be moved to the inner home position	150103	6
Focus failure	150104	5
Turntable motor speed could not be reached within timeout	150105	4
Radial servo could not get on track on the disc	150106	3
PLL could not lock in the accessing or tracking state	150107	2
Subcode or sector information could not be read	150108	1
requested subcode could not be found	150109	16
Tray could not be closed or opened completely	15010A	15
TOC could not be read within timeout	15010B	14
The requested seek on the disc could not be executed	15010C	13
A requested lead-in is not on the disc	15010D	12
A non existing burst cutting area is requested	15010E	11
S2b communication error	1501F0	10
S2b communication error	1501F1	9
S2b communication error	1501F3	24
S2b communication error	1501F4	23
S2b communication error	1501F5	22
Digital PWB errors		
Communication error with the Sti 5505	90000	32
Communication error with the Sti 5505	90001	31
Disply processor errors		
Communication error with the display processor	190000	40

4. LOOP TEST

At the start of the loop test, the display will show the result of the interactive player test:

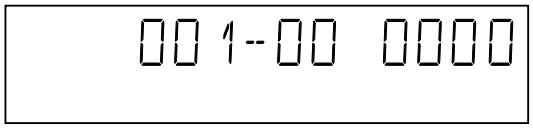


Figure 25

The left side of the display contains a 3-digit code, which can have a value between 000 and 111. These values 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

Figure 26

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.
Example:

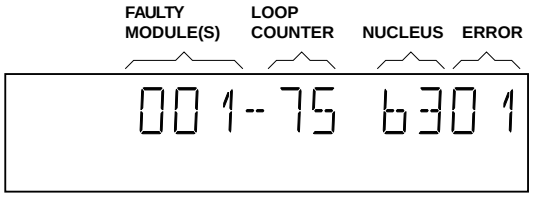


Figure 27

The number after the hyphen indicates the number of times the loop test has been performed; the 4 digits at the right side of the display show the last error that was found when running the loop test: the leftmost two digits of this code indicate which nucleus resulted in a fault; the rightmost two digits refer to the faultcode within that nucleus. For further explanation of this error code, see list of error codes below.

ERROR CODES LOOP TEST

ERROR CODE	NUCLEUS NUMBER	ERROR DESCRIPTION
0601	6	Calculated checksum of FLASH is not correct
0901	9	The DVD DRAM is faulty
1104	11	I2C bus busy before start
1102		NVRAM access time-out
1103		No NVRAM Acknowledge
1104		NVRAM reply time-out
1201	12	I2C bus busy
1202		I2C bus not working
1203		Slave controller not responding
1204		Slave response is not correct
1301	13	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
1601	16	The SDRAM is faulty

Figure 28

5. Servicing DVD module and MONO board

5.1 Reset of Virgin Mode

After the player has been powered up for test by the dealer, it would have gone through the Virgin Mode. It is possible to reset the settings made during that mode before the delivery of player to the customer. This can be done as shown in the following diagram:

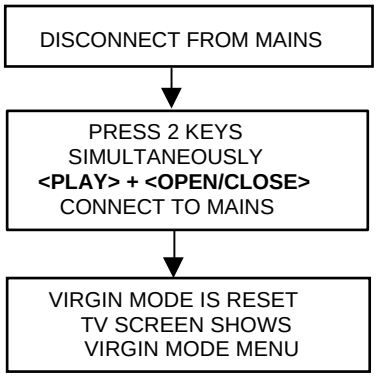


Figure 29

5.2 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.

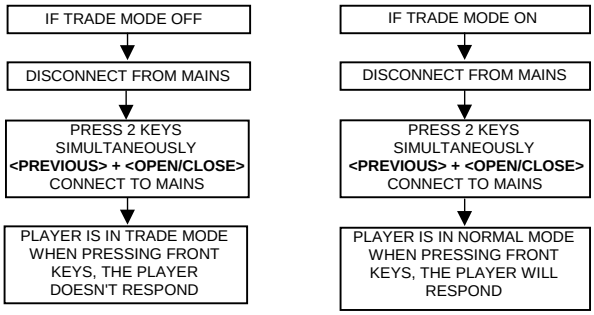


Figure 30

■ TEST INSTRUCTIONS DISPLAY BOARD

1. Display board

1.1 Introduction

These test instructions are written for all versions of the display PCB.

The contents of the PCB can be split up into next blocks:

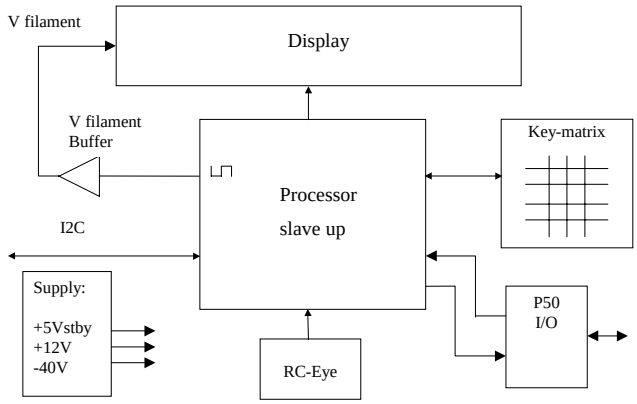


Figure 1

1.2 Functionality description:

The essential component of the display PCB is the µP (slave).

This slave works on an 8MHz resonator and has a reset circuit that is triggered by the +5Vstby. After the reset pulse, the standby control line will release the reset of the host µP. This host µP will then initialize the slave. In addition, when going to stand-by, the slave will put the host µP in reset. When the slave receives the right IR or key code to leave the standby mode, the reset of the host µP will be released.

Other slave functions are:

- Square signal generator to generate the filament voltage, which is required for an AC FTD.
- Generating the grid and segment scanning for the FTD.
- Generating a scanning grid for the keys (separated from display scanning).
- Having inputs for RC (RC5 and RC6) and P50 (P50 controller is built in).

1.3 Reset

Check next reset timing with an oscilloscope at pin 10 of the microprocessor.

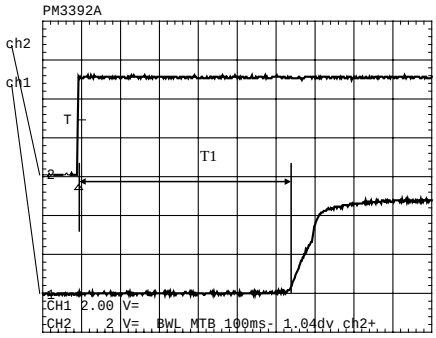


Figure 2

Timing: 400msec < T1 > 700msec.

CH1: +5Vstby voltage at power on.

CH2: Voltage at pin 10.

1.4 Display steering

Check next timing and level for all grid-lines (G1 r G14).

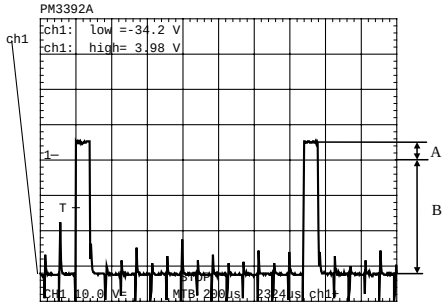


Figure 3

1. Check level A: +4V5 +/-10% for grid lines 1 => 11
2. Check level A: +4V0 +/-10% for grid lines 12 => 14
3. Check level B: -33V +/-10%
4. Check timing and levels of segment-lines P1 => P10:

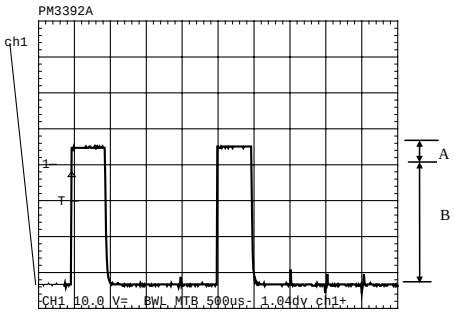


Figure 4

Level A:+4V5 +/-10%

Level B:-33V +/-10%

The data on these segment lines depend on the characters that are displayed.

The characters can be set by sending I2C commands to the display.

See the Slave URS how to send a display command.

1.5 Key-matrix

Connect a extra 10kpull-up resistor to pin 36 en 37 of the µP and check next matrix scanning at these pins.

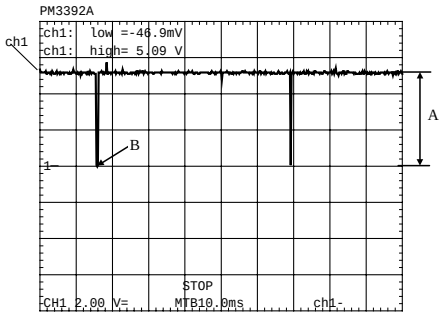


Figure 5

Level A: 5.0V +/-7%
Level B: 0V +/-200mV
Check matrix scanning from pin 26 until 33 of the µP.
The results should be the same as the diagram above.

1.6 I.R. receiver

Check at pin 23 of the µP if this line switches from low (< 0.3V) to high (> 4.5V), while pressing a key on a Philips RC5 or RC6 remote control.

1.7 Karaoke interface

The karaoke interface (4 lines) is a single direction communication.
This means that it consists of four µP output lines.
The interface can be checked by setting or resetting these output-ports via the I2C bus.
Send next command via the I2C bus:

Address	: 0x70
Command byte	: 0x24
Data byte	: xxxxabcd
Where	: a = Karaoke reset.
	: b = Karaoke data.
	: c = Karaoke clock.
	: d = Karaoke strobe.

1.8 P50 interface

P50 is a bi-directional serial interface, which is used for communication between video equipment. For European sets, this communication goes via pin 10 of the scart-bus. In other regions, it can be a cinch bus at the back of the set.

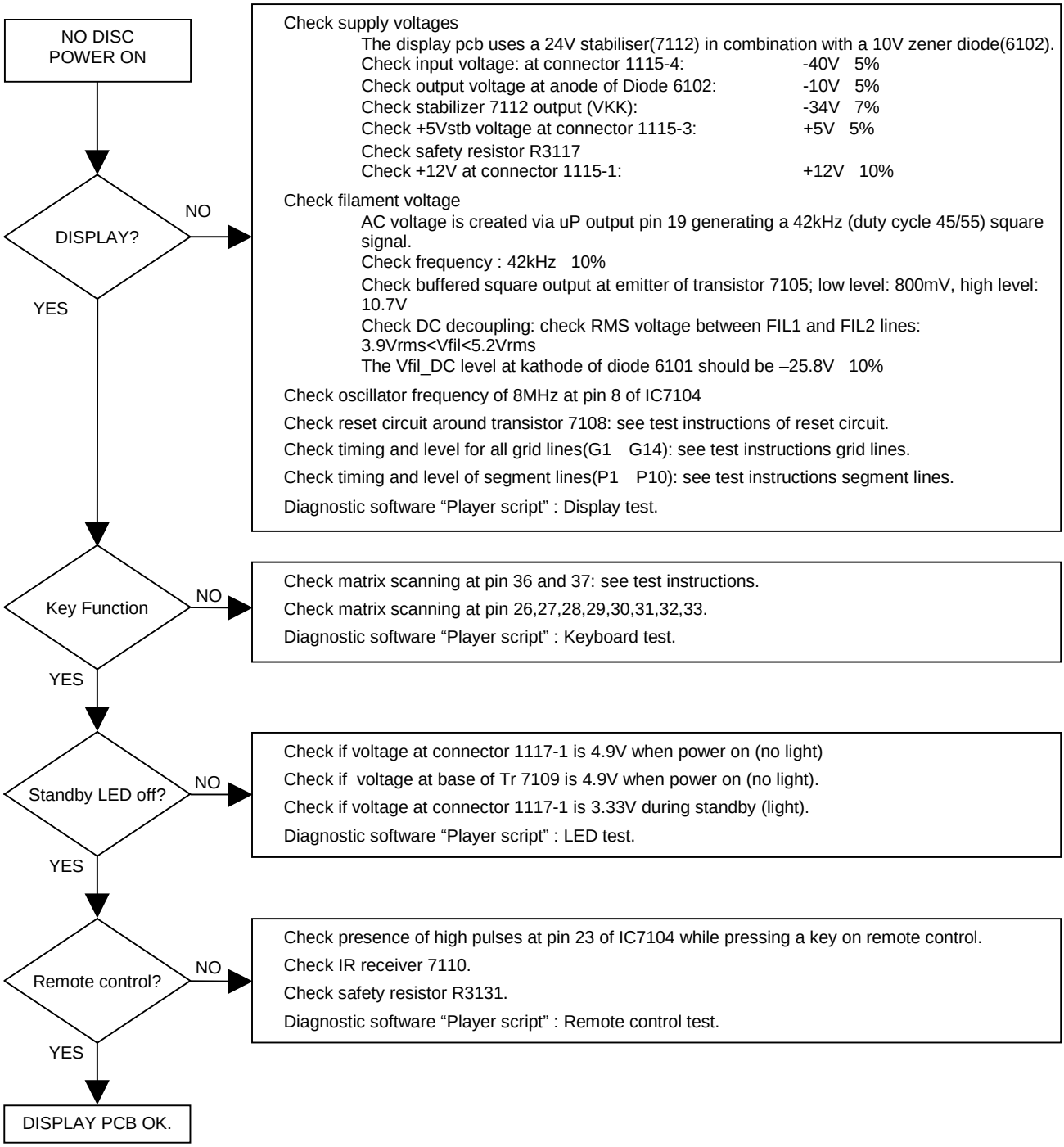
1. Keep the µP in reset by short-circuiting emitter and collector of transistor 7108, via resistor 3100 and 3104 transistor 7101 is switched on.
2. Check the voltage at the P50 output connector 1118-5: < 200mV.

When the reset is released the µP output-pin becomes low and transistor 7101 is switched off.

1. Check the voltage at the P50 output connector 1118-5: 4.9V +/-5%.
2. Check also the µP P50 input (µP pin 20): 5V +/-5%.
3. Connect the P50 line (connector 1118-5) to ground.
4. Check again the µP P50 input (µP pin 20): <0.3V.

■ TROUBLESHOOTING

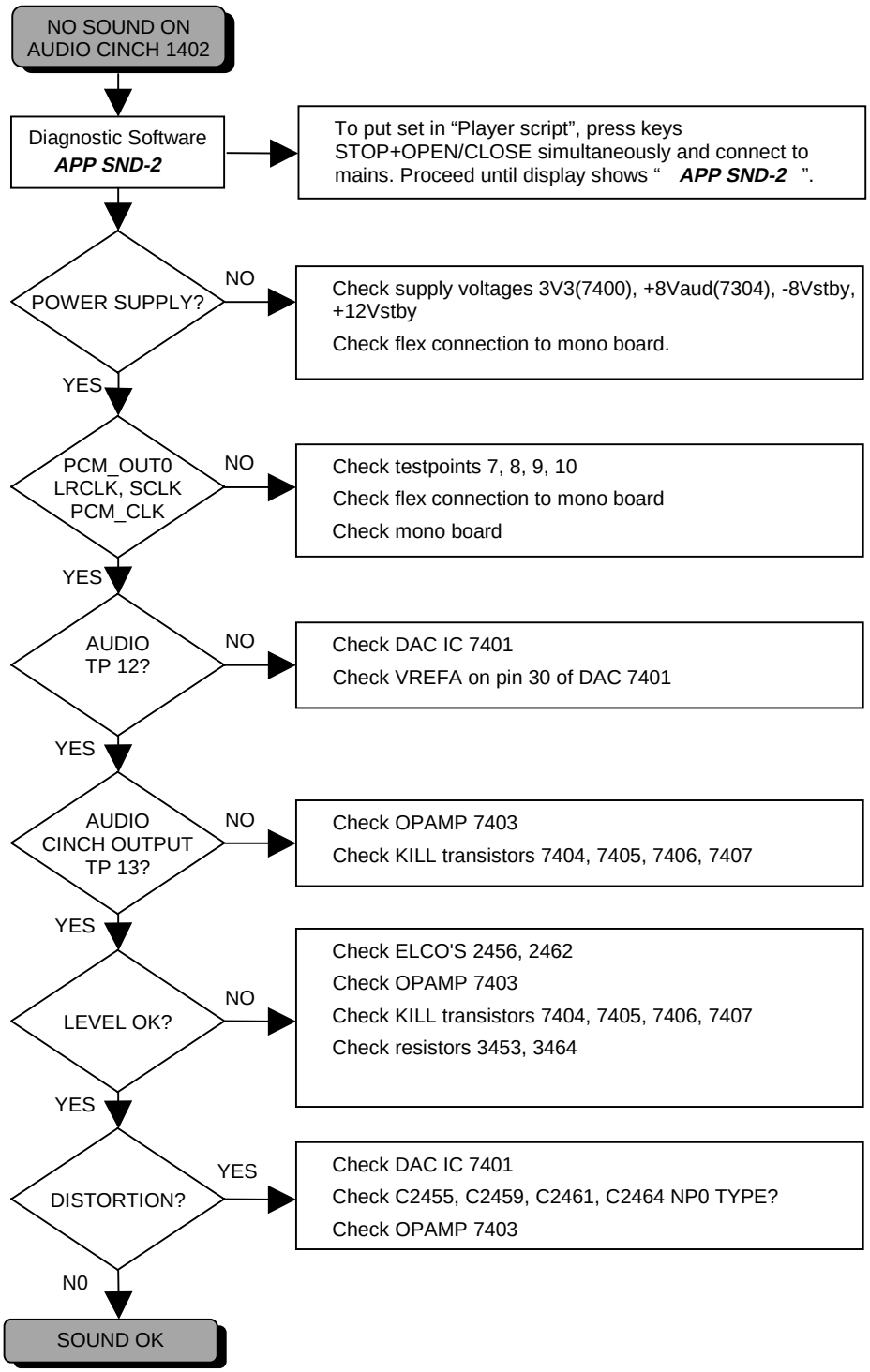
Display board

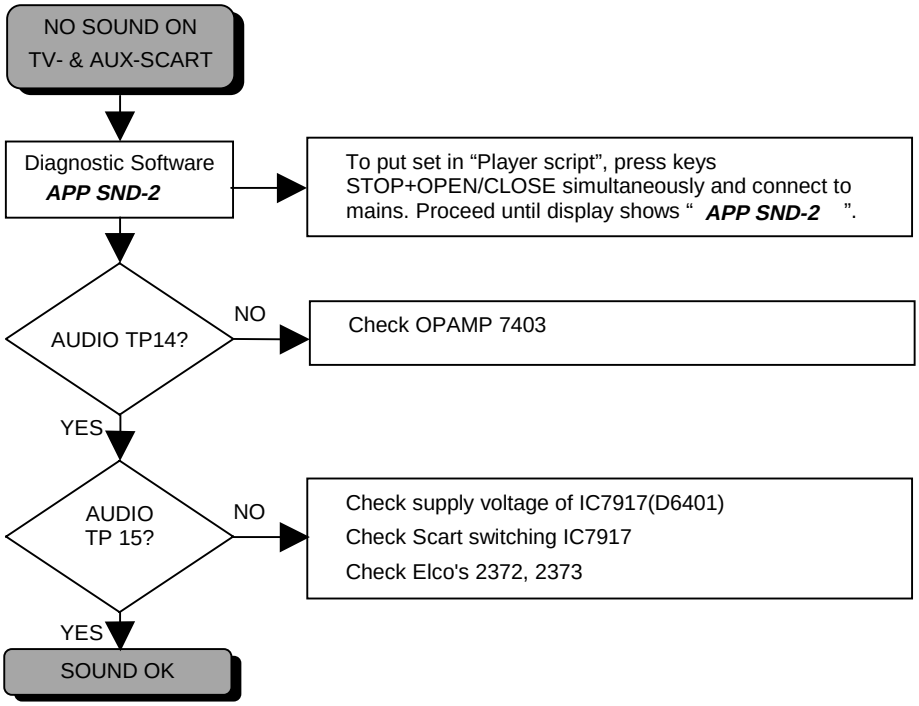


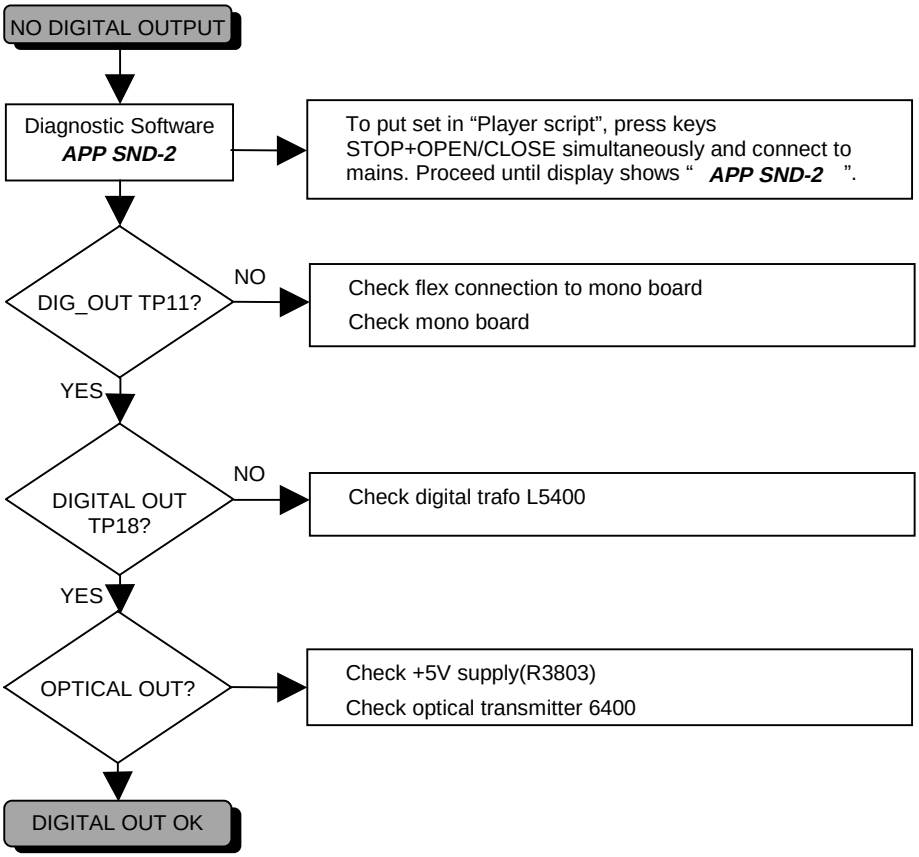
A/V board (B, G models)

Testing of A/ V board can be done using diagnostic software “Player script”.
Mono board is used to generate a sinus with the soundtest SND- 2 or a VIDEO signal with the picture test PIC- 1.
See description in chapter “Diagnostic Software : Script Interfaces”

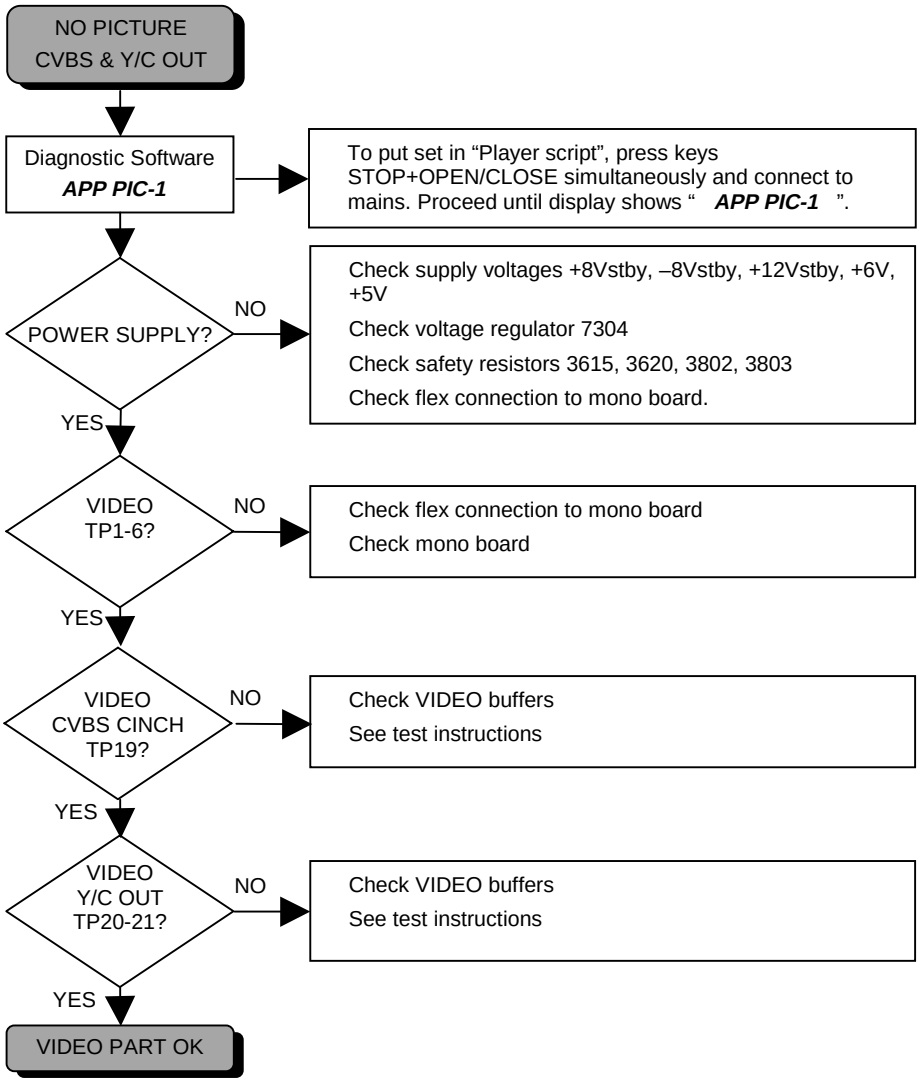
AUDIO PART

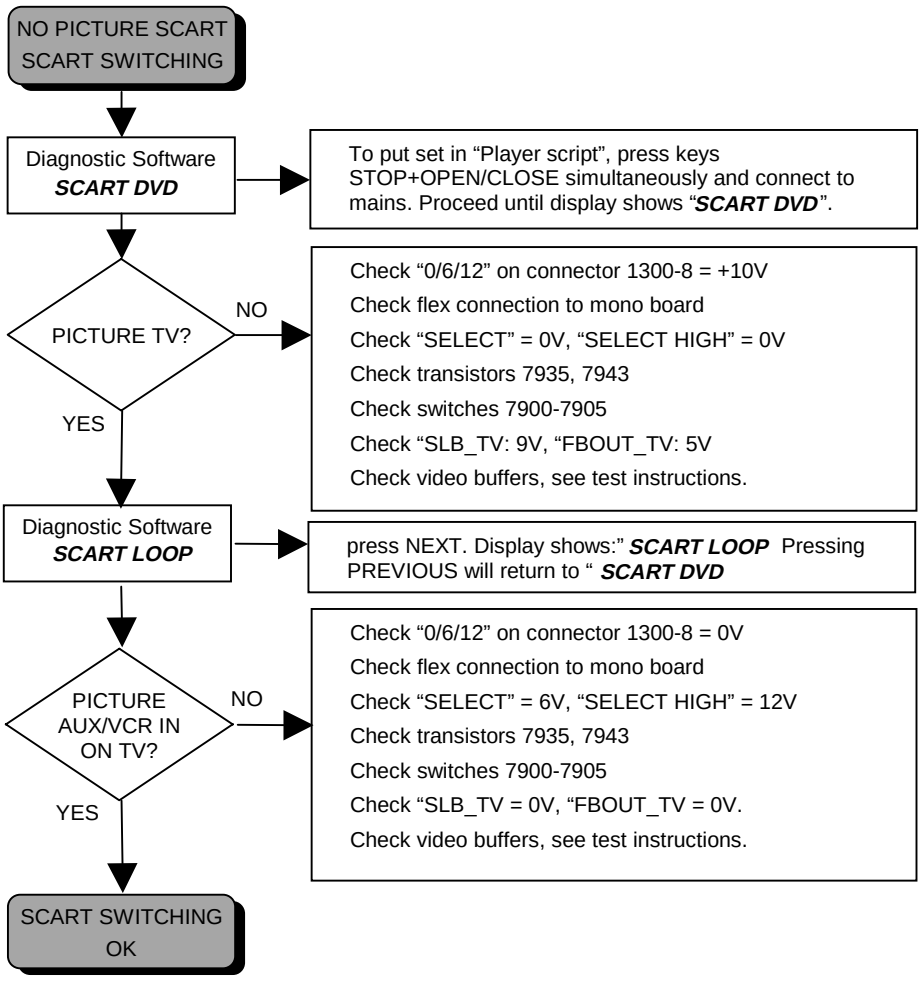


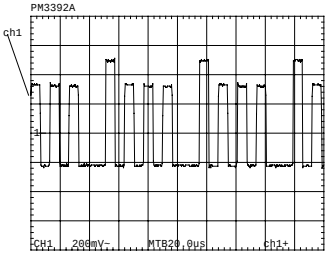

NO SOUND ON
TV- & AUX-SCART
Diagnostic Software
APP SND-2
To put set in “Player script”, press keys STOP+OPEN/CLOSE simultaneously and connect to mains. Proceed until display shows “ APP SND-2 ”.
AUDIO TP14?
NO
Check OPAMP 7403
YES
AUDIO TP 15?
NO
Check supply voltage of IC7917(D6401)
Check Scart switching IC7917
Check Elco's 2372, 2373
YES
SOUND OK


NO DIGITAL OUTPUT
Diagnostic Software
APP SND-2
To put set in “Player script”, press keys STOP+OPEN/CLOSE simultaneously and connect to mains. Proceed until display shows “ APP SND-2 ”.
DIG_OUT TP11?
NO
Check flex connection to mono board
Check mono board
YES
DIGITAL OUT TP18?
NO
Check digital trafo L5400
YES
OPTICAL OUT?
Check +5V supply(R3803)
Check optical transmitter 6400
DIGITAL OUT OK

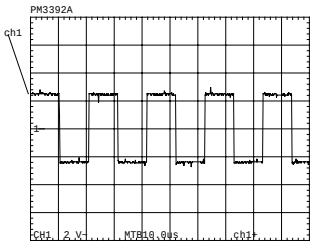
VIDEO PART


NO PICTURE
CVBS & Y/C OUT
Diagnostic Software
APP PIC-1
To put set in “Player script”, press keys STOP+OPEN/CLOSE simultaneously and connect to mains. Proceed until display shows “ APP PIC-1 ”.
POWER SUPPLY?
NO
Check supply voltages +8Vstby, –8Vstby, +12Vstby, +6V, +5V
Check voltage regulator 7304
Check safety resistors 3615, 3620, 3802, 3803
Check flex connection to mono board.
YES
VIDEO TP1-6?
NO
Check flex connection to mono board
Check mono board
YES
VIDEO CVBS CINCH TP19?
NO
Check VIDEO buffers
See test instructions
YES
VIDEO Y/C OUT TP20-21?
NO
Check VIDEO buffers
See test instructions
YES
VIDEO PART OK

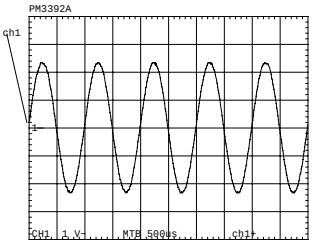

NO PICTURE SCART
SCART SWITCHING
Diagnostic Software
SCART DVD
To put set in “Player script”, press keys STOP+OPEN/CLOSE simultaneously and connect to mains. Proceed until display shows “SCART DVD”.
PICTURE TV?
NO
YES
Check “0/6/12” on connector 1300-8 = +10V
Check flex connection to mono board
Check “SELECT” = 0V, “SELECT HIGH” = 0V
Check transistors 7935, 7943
Check switches 7900-7905
Check “SLB_TV: 9V, “FBOUT_TV: 5V
Check video buffers, see test instructions.
Diagnostic Software
SCART LOOP
press NEXT. Display shows:” SCART LOOP Pressing PREVIOUS will return to “ SCART DVD
PICTURE AUX/VCR IN ON TV?
NO
YES
Check “0/6/12” on connector 1300-8 = 0V
Check flex connection to mono board
Check “SELECT” = 6V, “SELECT HIGH” = 12V
Check transistors 7935, 7943
Check switches 7900-7905
Check “SLB_TV = 0V, “FBOUT_TV = 0V.
Check video buffers, see test instructions.
SCART SWITCHING
OK



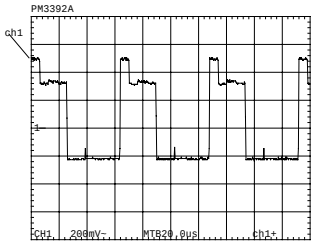
TP 1 : video B



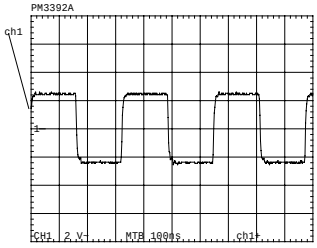
TP8: LRCK



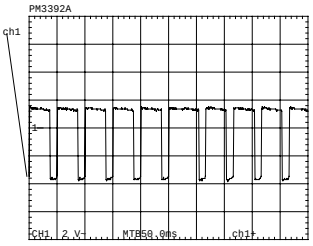
TP 15 : AUDIO SCART SWITCH OUTPUT



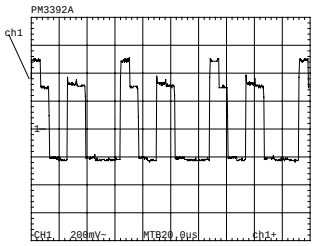
TP 2 : video G



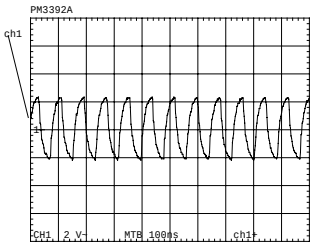
TP9: SCLK



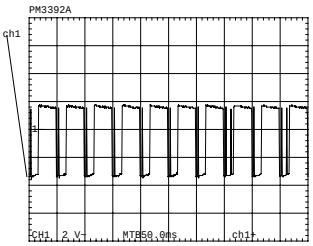
TP16: SDA



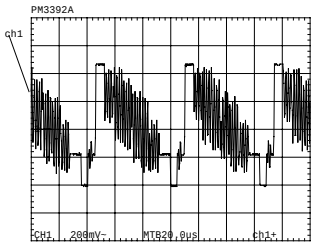
TP 3 : video R



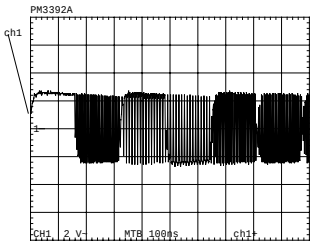
TP10: PCM_CLK



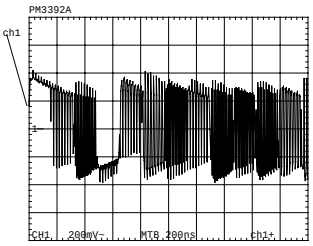
TP17: SCL



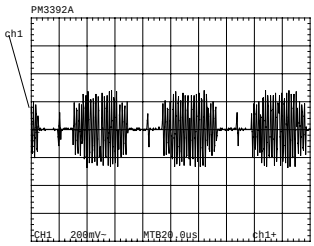
TP 4 : CVBS



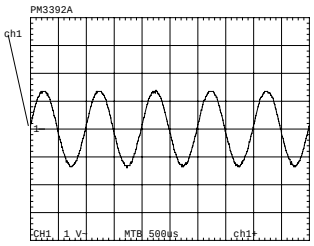
TP 11: DIG_OUT



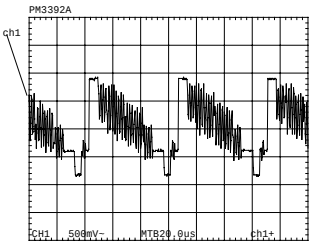
TP18: DIGITAL OUT



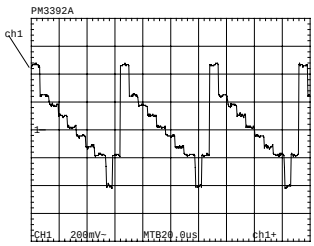
TP 5 : C_ENC



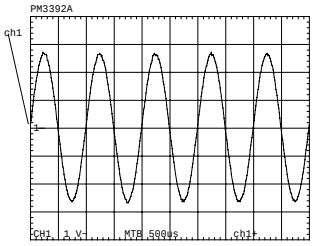
TP 12 : ANALOG OUTPUT DAC



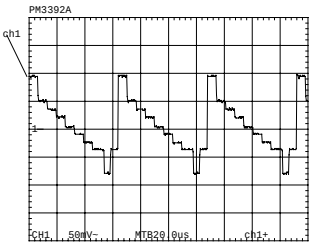
TP 19 : CVBS_OUT



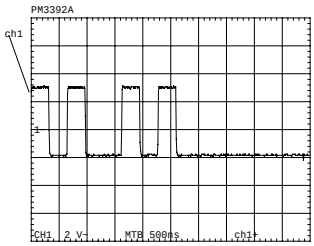
TP 6 : Y_ENC



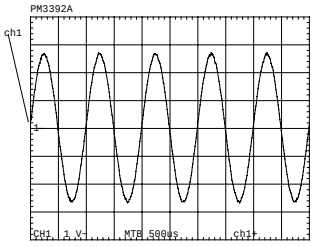
TP 13 : ANALOG OUTPUT AUDIO CINCH



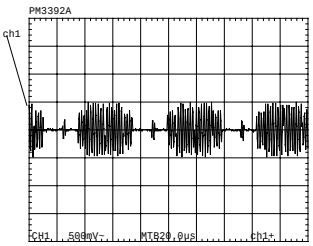
TP 20: Y_OUT



TP7: PCM_OUT0



TP 14 : ANALOG OUTPUT AUDIO HP_R & HP_L



TP 21: C_OUT

■ TECHNICAL SPECIFICATIONS DVD MODULE

1. Connections

1.1 Connector 1600 : Supply input connector.

1. +3.3Vstby
2. +3.3Vstby
3. +5V
4. +5Vstby
5. Vreserved
6. GND
7. GND
8. GND
9. -8Vstby
10. Standby control line
11. +12Vstby
12. GND

1.2 Connector 1603 : A/V 1 connector.

1. P50
2. Blue Video
3. Green Video
4. GND
5. Red Video
6. CVBS
7. GND
8. Slow blanking scart
9. -8Vstby
10. +5V
11. +5V
12. Audio mute
13. GND
14. I2S data0 out
15. I2S wordselect
16. I2S bitclock
17. GND
18. I2S systemclock
19. Center_on
20. Kar_bypass
21. Kar_bypass
22. GND

1.3 Connector 1604 : A/V 2 connector.

1. GND
2. Hor. sync.
3. GND
4. I2S data 2 out
5. GND
6. I2S data 1 out
7. -8Vstby
8. I2C clock
9. +12Vstby
10. I2C data
11. Vreserved
12. +3.3V
13. GND
14. C video
15. GND
16. Y video

1.4 Connector 1501 : I2C interface connector.

1. I2C clock
2. GND
3. I2C data
4. Standby control line
5. P50

1.5 Connector 1602 : Service connector.

1. TXD
2. Service activation
3. RXD
4. Reserved for RTS
5. 5 : GND
6. Reserved for CTS
7. +5V

2. Signal specifications

This the specification of all signals as described under “Connections”

H = +5V ±0.5V
h = 3.3V ±0.3V
L = 0V ±0.5V
l = 0V ±0.3V

Stby	:	If the set supports a “standby” function, all supply voltages marked with “stby” have to stay on during standby.
Standby control line	:	HStandby mode
	:	LOn mode.
P50	:	Connection between front and A/V board, and can be used as P50 signal line. The signal is not connected to the module electronics.
Slow blanking scart	:	This signal switches between
	:	0V (220output impedance)
	:	12Vstby/2 (455output impedance)
	:	12vstby (690output impedance)
Audio mute	:	Can be used for audio mute transistors during stop or power on/off.
	:	Mute on : +5Vstby
	:	Mute off : -8Vstby via a 10k resistor.
I2S data0 out	:	I2S front data output.
	:	Level h/l
I2S wordselect / I2S bitclock	:	I2S timing signals
	:	Level h/l

I2S systemclock	:	256xFS audio systemclock.
	:	Level H/L
Kar_bypass	:	Bypasses the karaoke chip on the A/V board.
	:	Bypass active H
	:	Bypass off L
Center_on	:	Switches the center audio to the scart output.
	:	Center to scart h
	:	L/R to scart l
SPDIF out	:	Digital audio output
	:	Level H/L
Hor. Sync	:	Video Horizontal synchronisation
	:	Level h/l
I2S data1 out	:	I2S surround data output.
	:	Level : h/l.
I2S data2 out	:	I2S center/sub data output.
	:	Level h/l.
I2C clock / I2C data	:	I2C databus
	:	Level : H/L
TXD / RXD / RTS / CTS	:	Service UART to be connected direct to PC serial input.
	:	Output levels H/L
	:	Input levels RS232 compliant
Service activation	:	Signal open Normal module start-up
	:	Signal tied to GND Module start-up in service mode.
Vreserved	:	Reserved in case the A/V board requires an extra supply voltage.
	:	This supply is limited by a positive polarized 47uF/16V elco +100nF/16V.

3. Performance:

3.1 Digital output

CDDA/LPCM	:	According IEC958
MPEG1 is converted to LPCM :		
MPEG2, AC3 audio.	:	According IEC1937
DTS.	:	According IEC61937 Amendment 1.
	:	Digital output level is 0V / 5V with GND as reference. To meet the standards a decouple circuit is necesary.

3.2 I2S output

Accuracy	:	Up to 24bit.
Sample rate	:	44.1kHz / 48kHz.
Standard	:	Philips I2S output
Number of I2S outputs	:	3 (6 channel : Front / Surround / Center-Bass)
Deemphasis	:	Already processed in module.
Audio source streams	:	CDDA / MPEG1 / LPCM / MPEG2 / AC3
	:	No DTS decoding.
Audio trick modes	:	Dolby Pro Logic (multichannel downmix on front output)
	:	3D sound.

3.3 Analog output

The module has no analog audio ouput.	:	The analog audio specification will be determined by the external DAC circuit.

3.4 Video.

Standards	:	The video output standard will follow the source material.
	:	The OSD standard is switchable between PAL or NTSC.
Outputs	:	The module has 6 analog outputs (3 f o r ma t s) : Y/ C C V BS RGB.
Specification.	:	The output is fully according PQR3 IMS except
	:	Output load>1kto GND / Cap. load <47pF.
	:	Level 0.5Vpp with 100% white
	:	DC-levelSync bottom = -0.65V ±10%
	:	Some specification points are significantly better then PQR3
	:	SNR on all video outputs is better than 60dB.
	:	Video bandwidth >5MHz (±3dB)

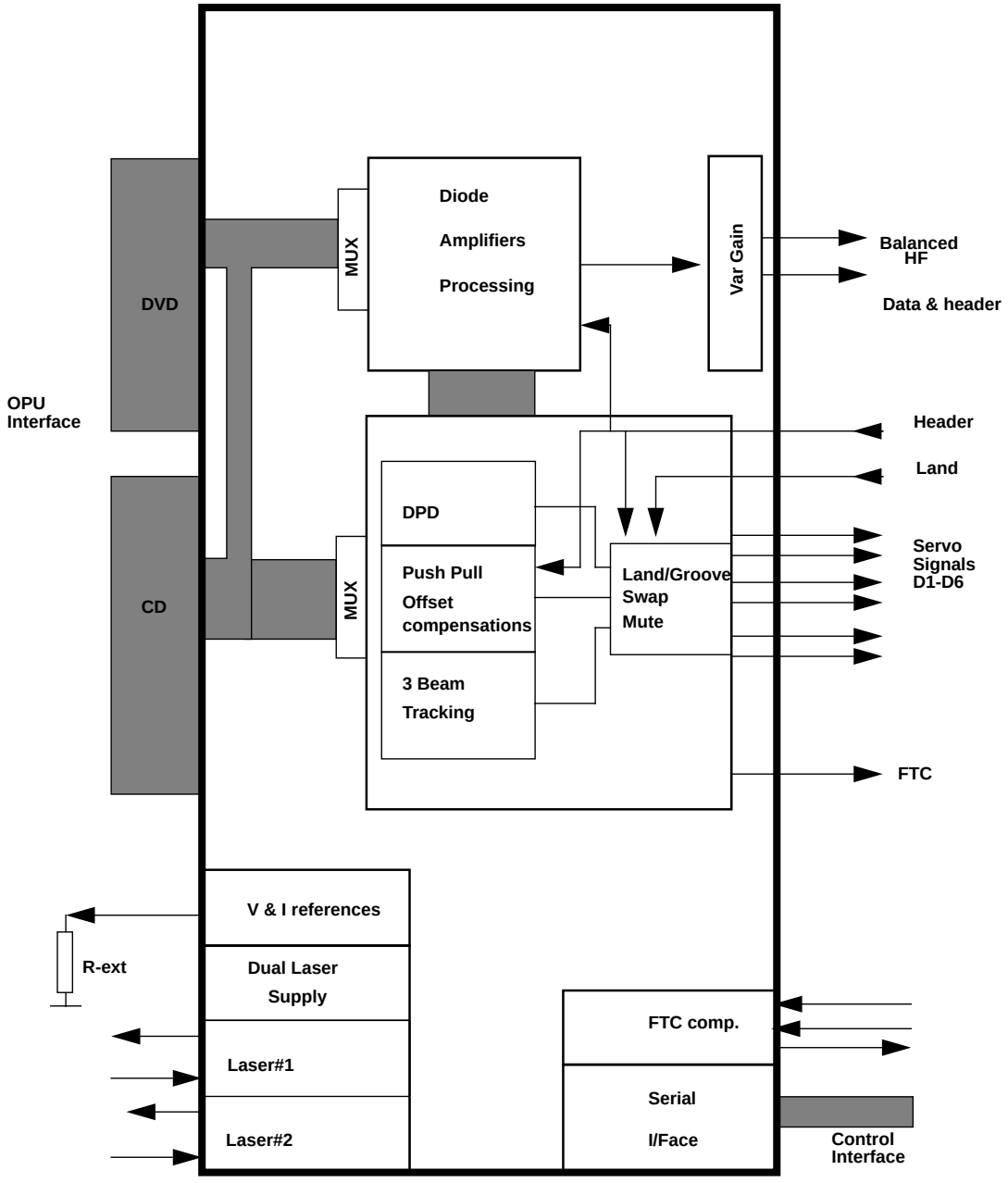
■ LIST OF ABBREVIATIONS

B	Buffered Video input Blue from DVD monoboard
BC_AUX	Blue or Chroma input from AUX-scart
BC_TV	Blue or Chroma output to TV-scart
C_ENC	Buffered Chroma input from DVD monoboard
CVBS	Buffered Composite video input from DVD monoboard
DC_OFF	Control signal to switch off -5Vstby and +12Vstby during standby
DIG_OUT	Digital out
FBIN_AUX	Fast blanking input from AUX-scart
FBOUT_TV	Fast blanking output to TV-scart
G	Buffered Video input Green from DVD monoboard
GIN_AUX	Video input Green from AUX-scart
GOUT_TV	Video output Green to TV-scart
HP_L	Audio output left to headphone and audio scart switch TEA6420
HP_R	Audio output right to headphone and audio scart switch TEA6420
KILL	Kill control signal for audio outputs and for soft mute of DAC
LIN_AUX	Audio input left from AUX-scart
LIN_TV	Audio input left from TV-scart
LOUT_AUX	Audio output left to AUX-scart
LOUT_TV	Audio output left to TV-scart
LRCLK	Left/Right clock
PCM_CLK	Audio system clock for DAC
PCM_OUT0	Audio serial output data
R	Buffered Video input Red from DVD monoboard
RCIN_TV	Red or Chroma input from TV-scart
RCOUT_TV	Red or Chroma output to TV-scart
RIN_AUX	Audio input right from AUX-scart
RIN_TV	Audio input right from TV-scart
ROUT_AUX	Audio output right to AUX-scart
ROUT_TV	Audio output right to TV-scart
SCL	I2C bus clock
SCLK	Audio serial bit clock
SDA	I2C bus data
SELECT	Control signal for video scart switches; high = TV ,low = AUX
SELECT_HIGH	Control signal for switching fast blanking and slow blanking signals; high = TV,.low = AUX
SLB_AUX	Slow blanking control signal from AUX-scart
SLB_TV	Slow blanking control signal to TV-scart
STANDBY	Control signal from STI5505 used to swith off -5Vstby and +12Vstby during standby.
STEREO_L	Audio cinch output left
STEREO_R	Audio cinch output right
Y_ENC	Buffered Luma input from DVD monoboard
YCVBSIN_AUX	Luma or CVBS input from AUX-scart
YCVBSIN_TV	Luma or CVBS input from TV-scart
YCVBSOUT_AUX	Luma or CVBS output to AUX-scart
YCVBSOUT_TV	Luma or CVBS output to TV-scart
0/6/12	Scart switch control signal A/V board. 0V : loop through (AUX to TV), 6V : play 16:9 format, 12V : play 4:3 format

■ IC DESCRIPTIONS

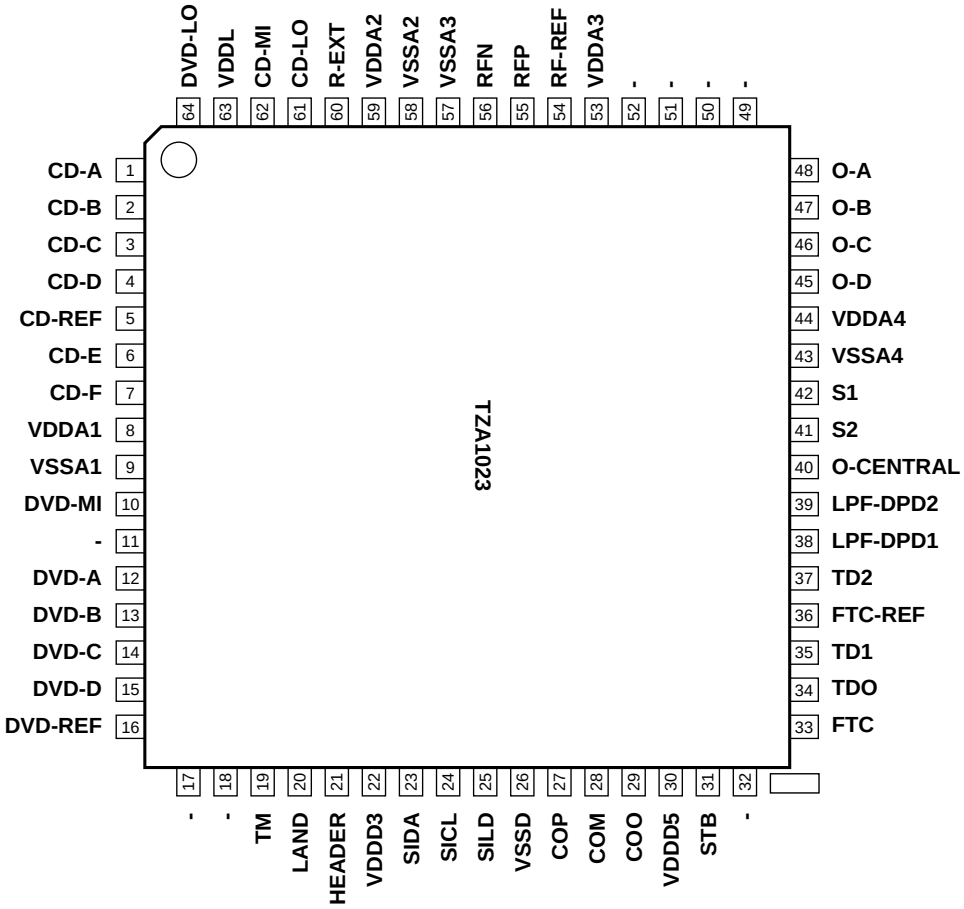
TZA1033

DVDALAS2plus Advanced Analog DVD Signal Processor and Laser Supply



TZA1033

DVDALAS2plus Advanced Analog DVD Signal Processor and Laser Supply



Pin description

Name	Pin	Description
CD-A	1	CD pick up input A
CD-B	2	CD pick up input B
CD-C	3	CD pick up input C
CD-D	4	CD pick up input D
CD-REF	5	CD pick up reference voltage
CD-E	6	CD pick up input E
CD-F	7	CD pick up input F
DVD-A	12	DVD pick up input A
DVD-B	13	DVD pick up input B
DVD-C	14	DVD pick up input C
DVD-D	15	DVD pick up input D
DVD-ref	16	DVD pick up reference voltage
O-A	48	Servo current output for Focus-A
O-B	47	Servo current output for Focus-B
O-C	46	Servo current output for Focus-C
O-D	45	Servo current output for Focus-D

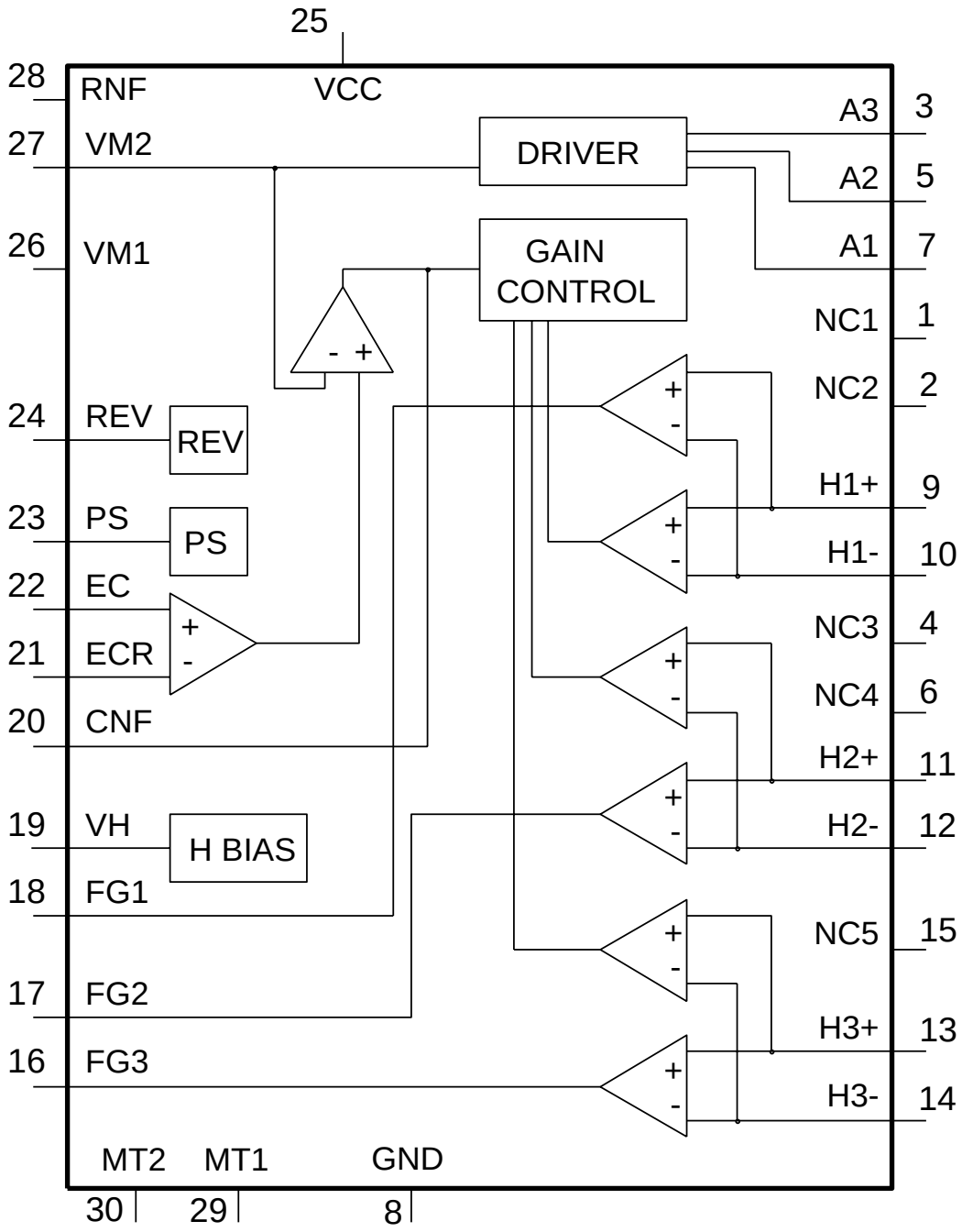
TZA1033

DVDALAS2plus Advanced Analog DVD Signal Processor and Laser Supply

Name	Pin	Description
O-central	40	Test pin for offset cancelation
TD2	37	Internally connected
FTC-ref	36	Servo output voltage reference input
S1	42	Servo current output for radial tracking
S2	41	Servo current output for radial tracking
TD1	35	Internally connected
FTC	33	Fast track count voltage output
RFP	55	pos. RF output signal
RFN	56	neg. RF output signal
RF-REF	54	DC Reference signal input RF
LPF-DPD1	38	DPD Low pass bandwidth capacitor, channel pos
LPF-DPD2	39	DPD Low pass bandwidth capacitor, channel neg
Land	20	Land/groove toggle input
HEADER	21	Header detector window input
CD-MI	62	CD laser monitor input
DVD-MI	10	DVD laser monitor input
CD-LO	61	CD laser output
DVD-LO	64	DVD laser output
COP	27	Positive input FTC comparator
COM	28	Inverting input FTC comparator
COO	29	FTC comparator output
SIDA	23	Serial host interface data input
SICL	24	Serial host interface clock input
SILD	25	Serial host interface load
VDDA1	8	Analog Supply voltage 1 (RF input)
VDDA2	59	Analog Supply voltage 2 (RF internal)
VDDA3	53	Analog Supply voltage 3 (RF output stage)
VDDA4	44	Analog Supply voltage 4 (Servo)
VDDD5	30	Digital Supply voltage (5V dig core)
VDDD3	22	Digital Supply voltage (3V I/O pads and FTC comp.)
VDDL	63	Supply voltage for laser
VSSA1	9	Analog Ground 1
VSSA2	58	Analog Ground 2
VSSA3	57	Analog Ground 3
VSSA4	43	Analog Ground 4
VSSD	26	Digital ground
R-EXT	60	Reference current input (Connect 12k1 to VSSA4)
STB	31	Standby input
TM	19	Test mode input
TDO	34	Test data out

BA6856FP

3 Phase motor driver for DVD players



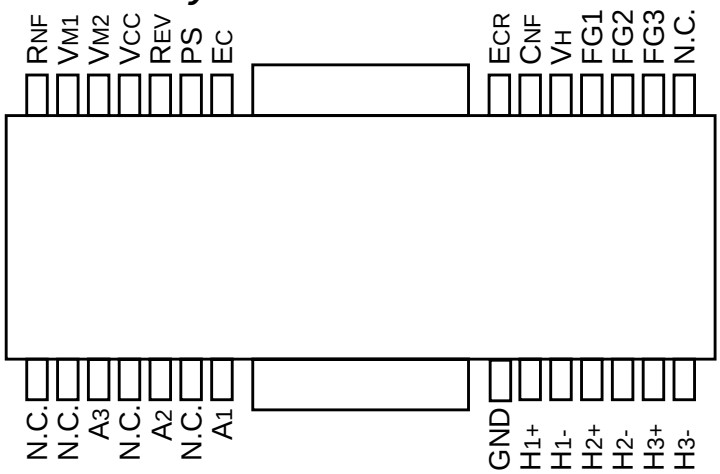
BA6856FP

3 Phase motor driver for DVD players

Pin description

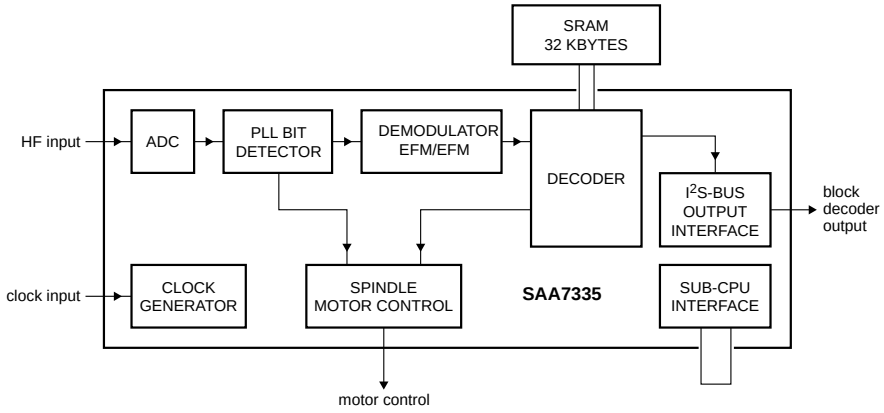
PIN No	PIN NAME	DESCRIPTION
1	N.C.	Not connected
2	N.C.	Not connected
3	A3	Output 3 for motor
4	N.C.	Not connected
5	A2	Output 2 for motor
6	N.C.	Not connected
7	A1	Output 1 for motor
8	GND	Ground
9	H1+	Hall input Amp1. positive input
10	H1-	Hall input Amp1. negative input
11	H2+	Hall input Amp2. positive input
12	H2-	Hall input Amp2. negative input
13	H3+	Hall input Amp3. positive input
14	H3-	Hall input Amp3. negative input
15	N.C.	Not connected
16	FG3	FG3 signal output terminal
17	FG2	FG2 signal output terminal
18	FG1	FG1 signal output terminal
19	VH	Hall Bias
20	CNF	Capacitor connection pin for phase compensation
21	ECR	Torque control standard voltage input terminal
22	EC	Torque control voltage input terminal
23	PS	POWER SAVE switch
24	REV	Reverse terminal
25	VCC	Power supply for signal division
26	VM2	Power supply 2 for driver
27	VM1	Power supply 2 for driver
28	RNF	Power supply for driver division

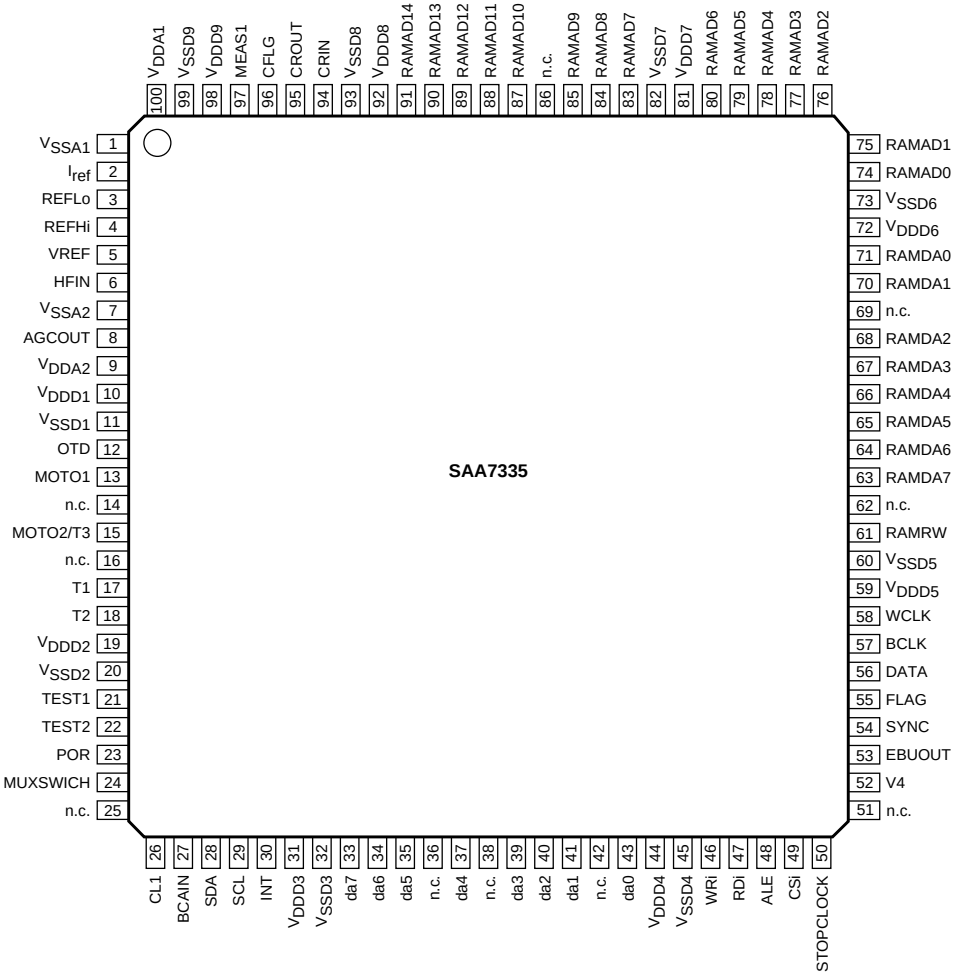
Terminal lay-out



SAA7335

DSP for CD and DVD-ROM system





SAA7335

DSP for CD and DVD-ROM system

Pin description

SYMBOL	PIN	TYPE	DESCRIPTION
VSSA1	1	supply	analog ground 1
Iref	2	I	analog current reference input for ADC
REFLo	3	I	analog low reference input for ADC
REFHi	4	I	analog high reference input for ADC
VREF	5	I	analog negative input
HFIN	6	I	analog positive input
VSSA2	7	supply	analog ground 2
AGCOUT	8	O	analog test pin output
VDDA2	9	supply	analog supply voltage 2
VDDD1	10	supply	digital supply voltage 1
VSSD1	11	supply	digital ground 1
OTD	12	I	off track detect input
MOTO1	13	O	3-state motor control output
n.c.	14	–	not connected, reserved
MOTO2/T3	15	I/O	motor control output/tachometer 3 input
n.c.	16	–	not connected, reserved
T1	17	I	tachometer 1 input
T2	18	I	tachometer 2 input
VDDD2	19	supply	digital supply voltage 2
VSSD2	20	supply	digital ground 2
TEST1	21	I	test input 1
TEST2	22	I	test input 2
POR	23	I	power-on reset input
MUXSWICH	24	I	use clock multiplier input
n.c.	25	–	not connected, reserved
CL1	26	O	divided clock output
BCAIN	27	I	BCA input
SDA	28	I/O	sub-CPU I 2 C-bus serial data input/output
SCL	29	I	sub-CPU I 2 C-bus serial clock input
INT	30	O	sub-CPU interrupt output (open-drain)
VDDD3	31	supply	digital supply voltage 3
VSSD3	32	supply	digital ground 3
da7	33	I/O	sub-CPU data bus bit 7 input/output (parallel)
da6	34	I/O	sub-CPU data bus bit 6 input/output (parallel)
da5	35	I/O	sub-CPU data bus bit 5 input/output (parallel)
n.c.	36	–	not connected, reserved
da4	37	I/O	sub-CPU data bus bit 4 input/output (parallel)
n.c.	38	–	not connected, reserved
da3	39	I/O	sub-CPU data bus bit 3 input/output (parallel)
da2	40	I/O	sub-CPU data bus bit 2 input/output (parallel)
da1	41	I/O	sub-CPU data bus bit 1 input/output (parallel)
n.c.	42	–	not connected, reserved
da0	43	I/O	sub-CPU data bus bit 0 input/output (parallel)
VDDD4	44	supply	digital supply voltage 4
VSSD4	45	supply	digital ground 4
WRi	46	I	sub-CPU write enable input (active LOW)
RDi	47	I	sub-CPU read enable input (active LOW)
ALE	48	I	sub-CPU address latch enable input
CSi	49	I	sub-CPU chip select input (active HIGH)
STOPCLOCK	50	O	stop clock output

SAA7335

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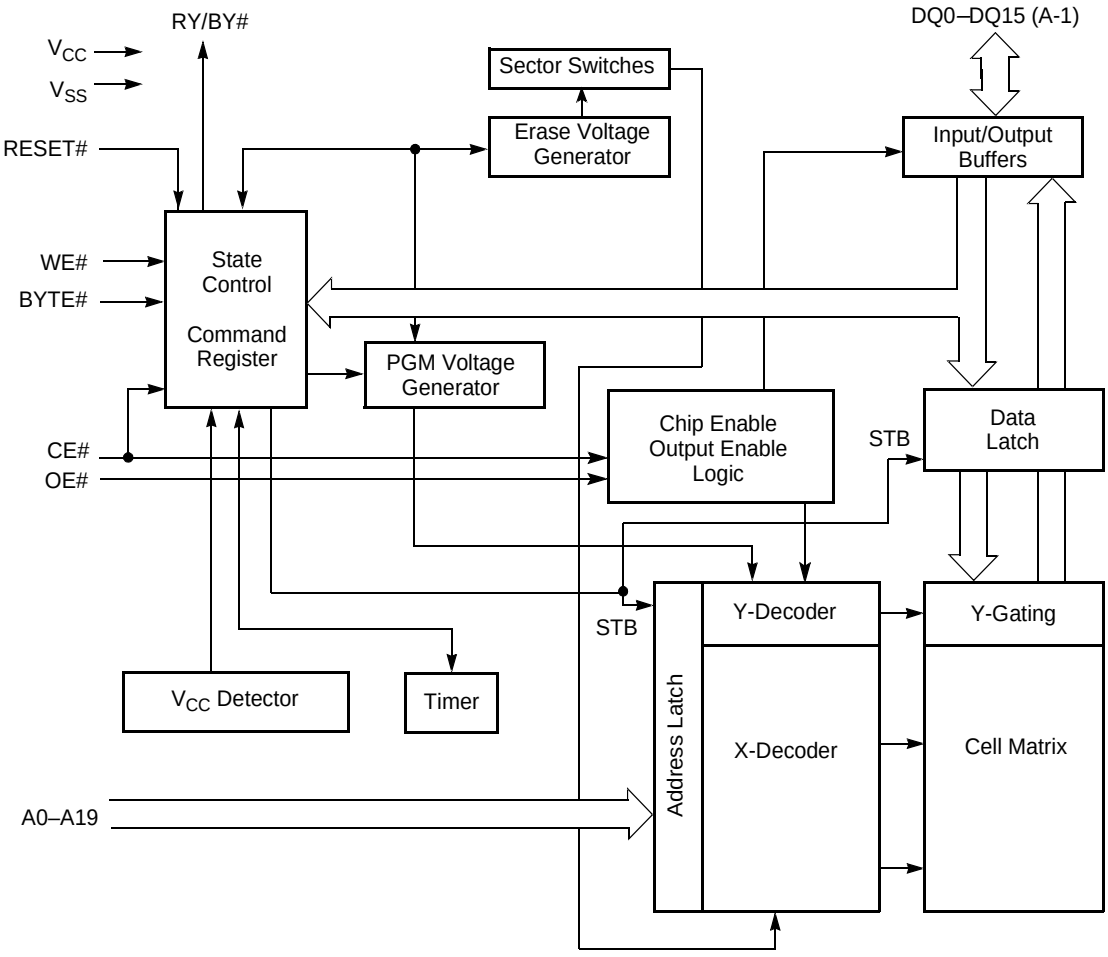
SYMBOL	PIN	TYPE	DESCRIPTION
n.c.	51	–	not connected, reserved
V4	52	O	serial subcode output (for CD)
EBUOUT	53	O	digital audio output
SYNC	54	O	I^2 S-bus sector sync output
FLAG	55	O	I^2 S-bus correction flag output
DATA	56	O	I^2 S-bus serial data output
BCLK	57	I/O	I^2 S-bus bit serial clock input/output
WCLK	58	I/O	I^2 S-bus word clock input/output
VDDD5	59	supply	digital supply voltage 5
VSSD5	60	supply	digital ground 5
RAMRW	61	O	RAM read/write control output
n.c.	62	–	not connected, reserved
RAMDA7	63	I/O	RAM data bus bit 7 input/output
RAMDA6	64	I/O	RAM data bus bit 6 input/output
RAMDA5	65	I/O	RAM data bus bit 5 input/output
RAMDA4	66	I/O	RAM data bus bit 4 input/output
RAMDA3	67	I/O	RAM data bus bit 3 input/output
RAMDA2	68	I/O	RAM data bus bit 2 input/output
n.c.	69	–	not connected, reserved
RAMDA1	70	I/O	RAM data bus bit 1 input/output
RAMDA0	71	I/O	RAM data bus bit 0 input/output
VDDD6	72	supply	digital supply voltage 6
VSSD6	73	supply	digital ground 6
RAMAD0	74	O	RAM address bit 0 output
RAMAD1	75	O	RAM address bit 1 output
RAMAD2	76	O	RAM address bit 2 output
RAMAD3	77	O	RAM address bit 3 output
RAMAD4	78	O	RAM address bit 4 output
RAMAD5	79	O	RAM address bit 5 output
RAMAD6	80	O	RAM address bit 6 output
VDDD7	81	supply	digital supply voltage 7
VSSD7	82	supply	digital ground 7
RAMAD7	83	O	RAM address bit 7 output
RAMAD8	84	O	RAM address bit 8 output
RAMAD9	85	O	RAM address bit 9 output
n.c.	86	–	not connected, reserved
RAMAD10	87	O	RAM address bit 10 output
RAMAD11	88	O	RAM address bit 11 output
RAMAD12	89	O	RAM address bit 12 output
RAMAD13	90	O	RAM address bit 13 output
RAMAD14	91	O	RAM address bit 14 output
VDDD8	92	supply	digital supply voltage 8
VSSD8	93	supply	digital ground 8
CRIN	94	I	analog crystal input
CROUT	95	O	analog crystal output
CFLG	96	O	correction statistics output
MEAS1	97	O	front-end telemetry output
VDDD9	98	supply	digital supply voltage 9
VSSD9	99	supply	digital ground 9
VDDA1	100	supply	analog supply voltage 1

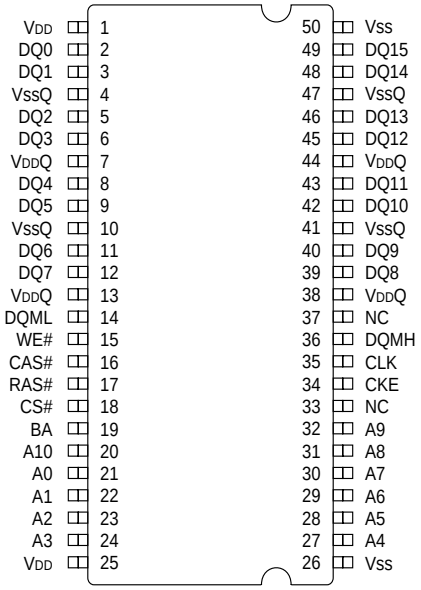
Am29LV160B

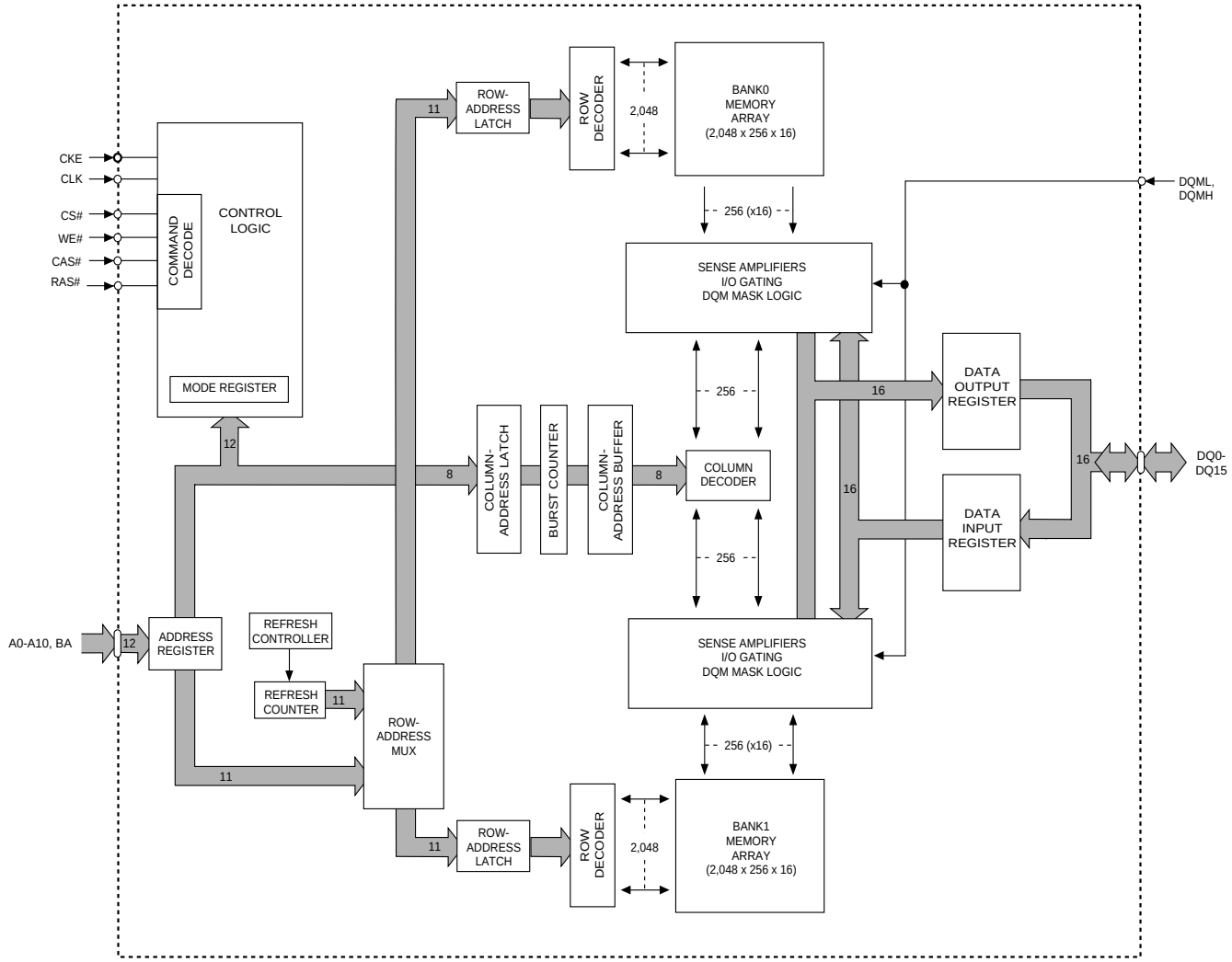
16 MB (2 M x 8-bit / 1 M x 16-bit) CMOS 3.0 Volt-only Sector Erase Flash Memory



MT48LC1M16A1TG S

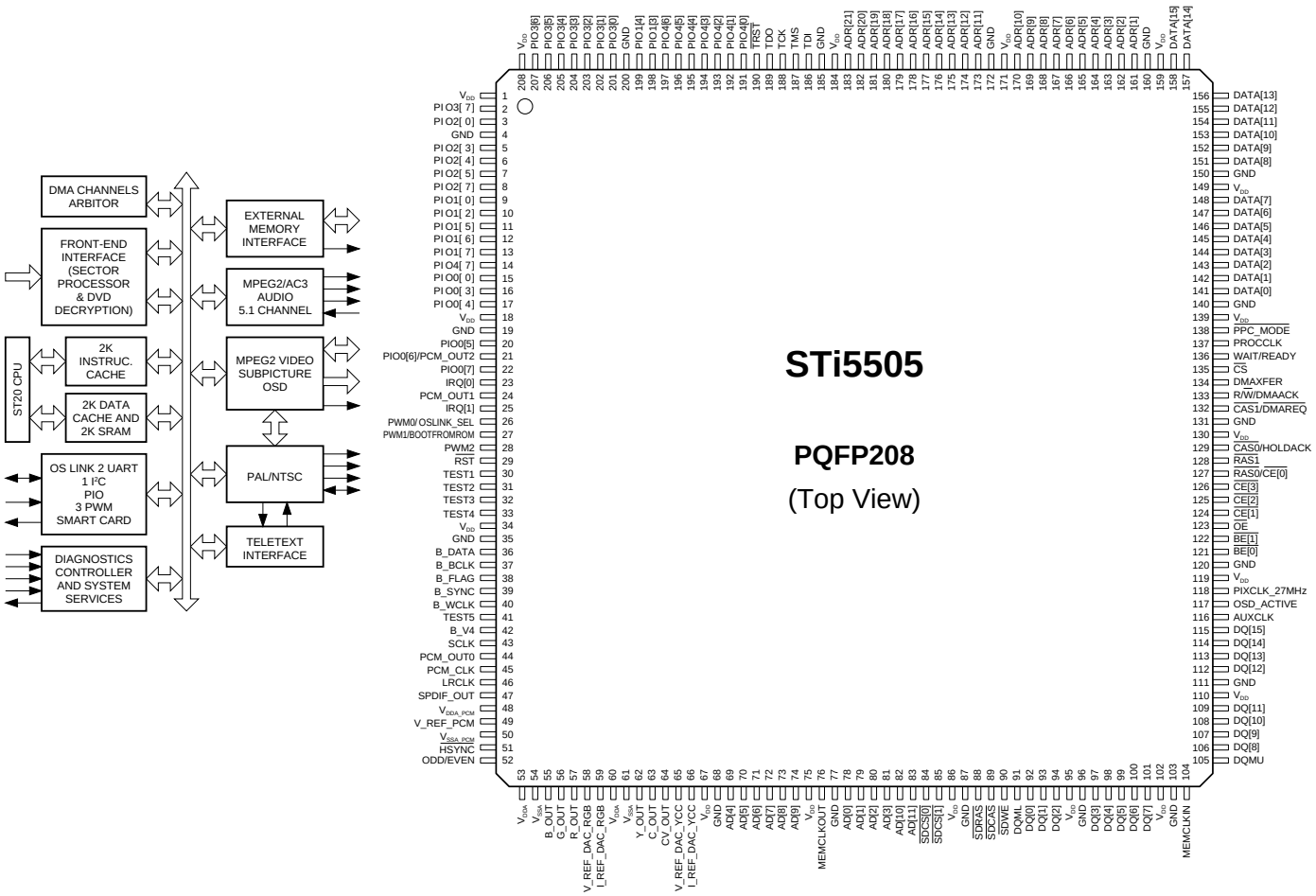
Synchronous DRAM





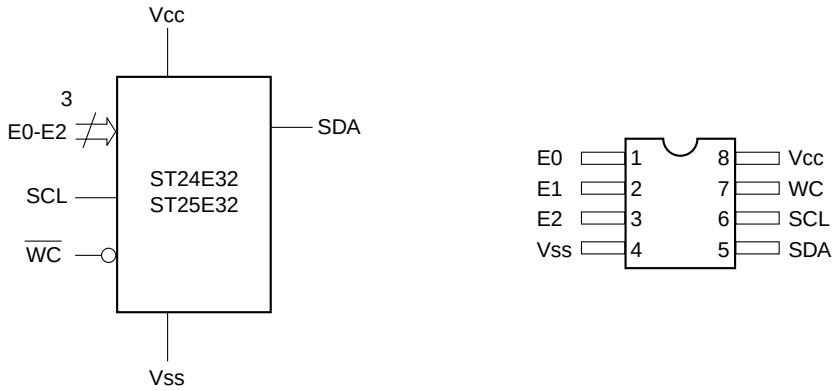
STi5505

DVD backend decoder with integrated host processor

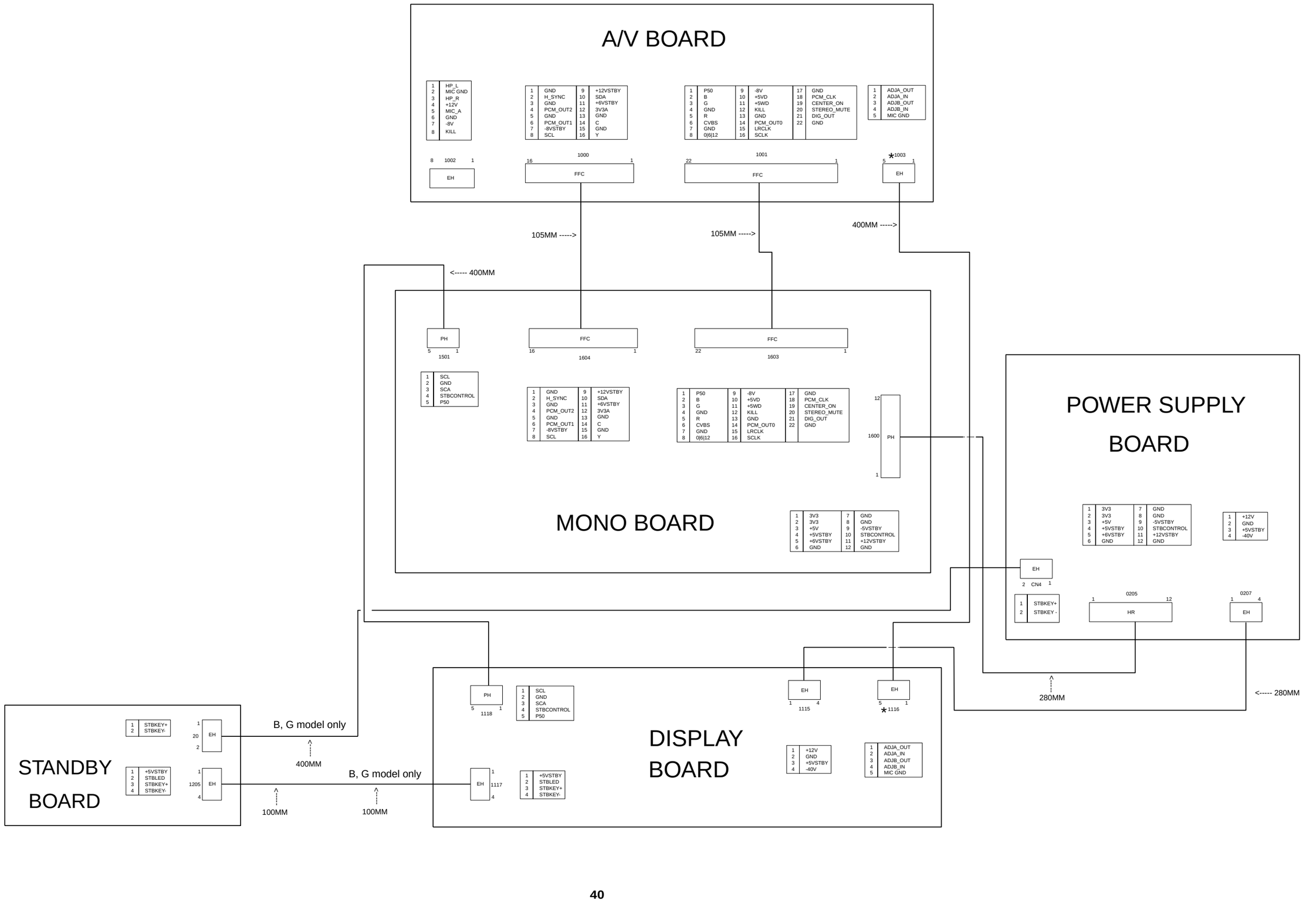


ST24E32 / ST25E32

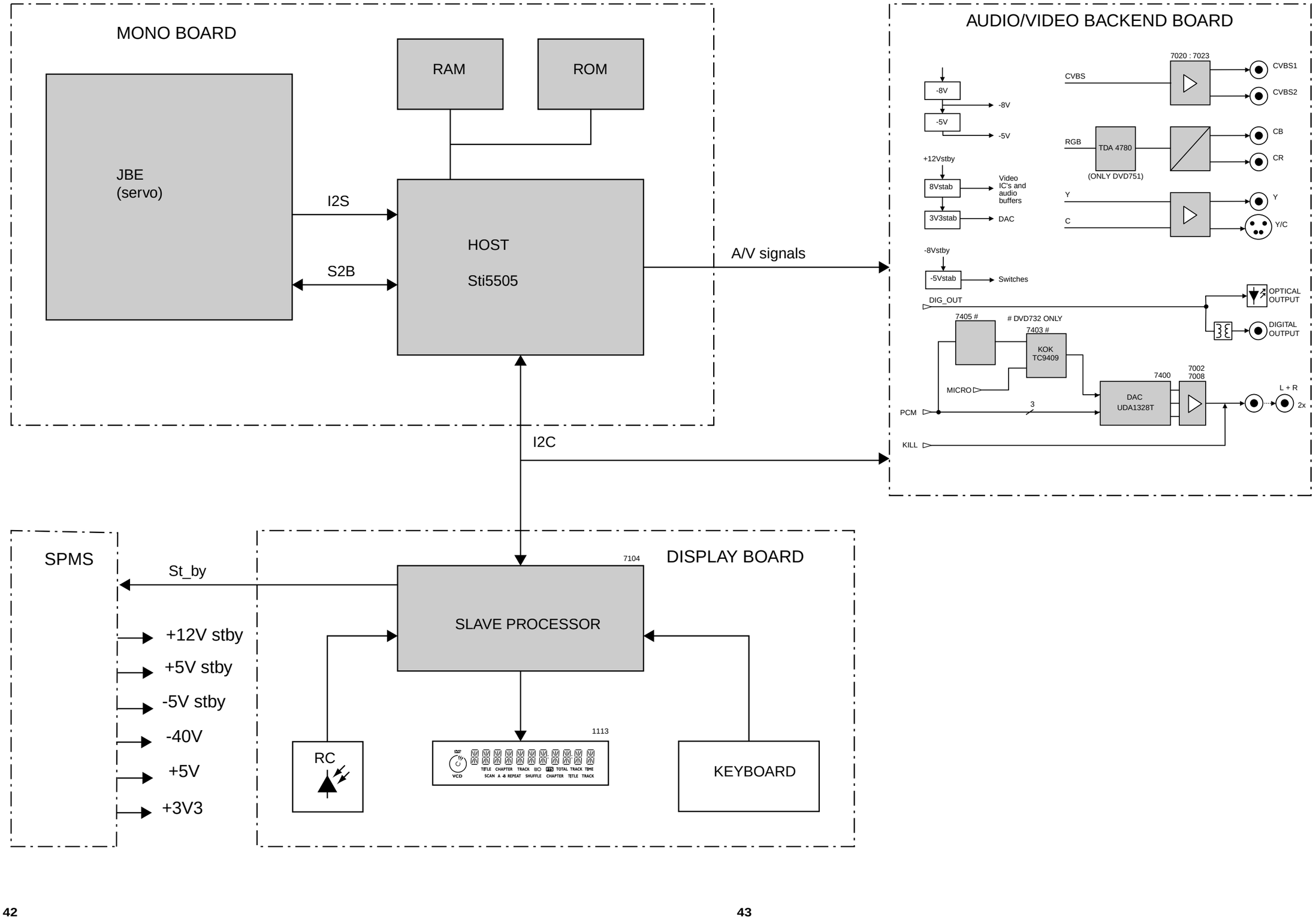
32k serial I²C EEPROM with extended addressing



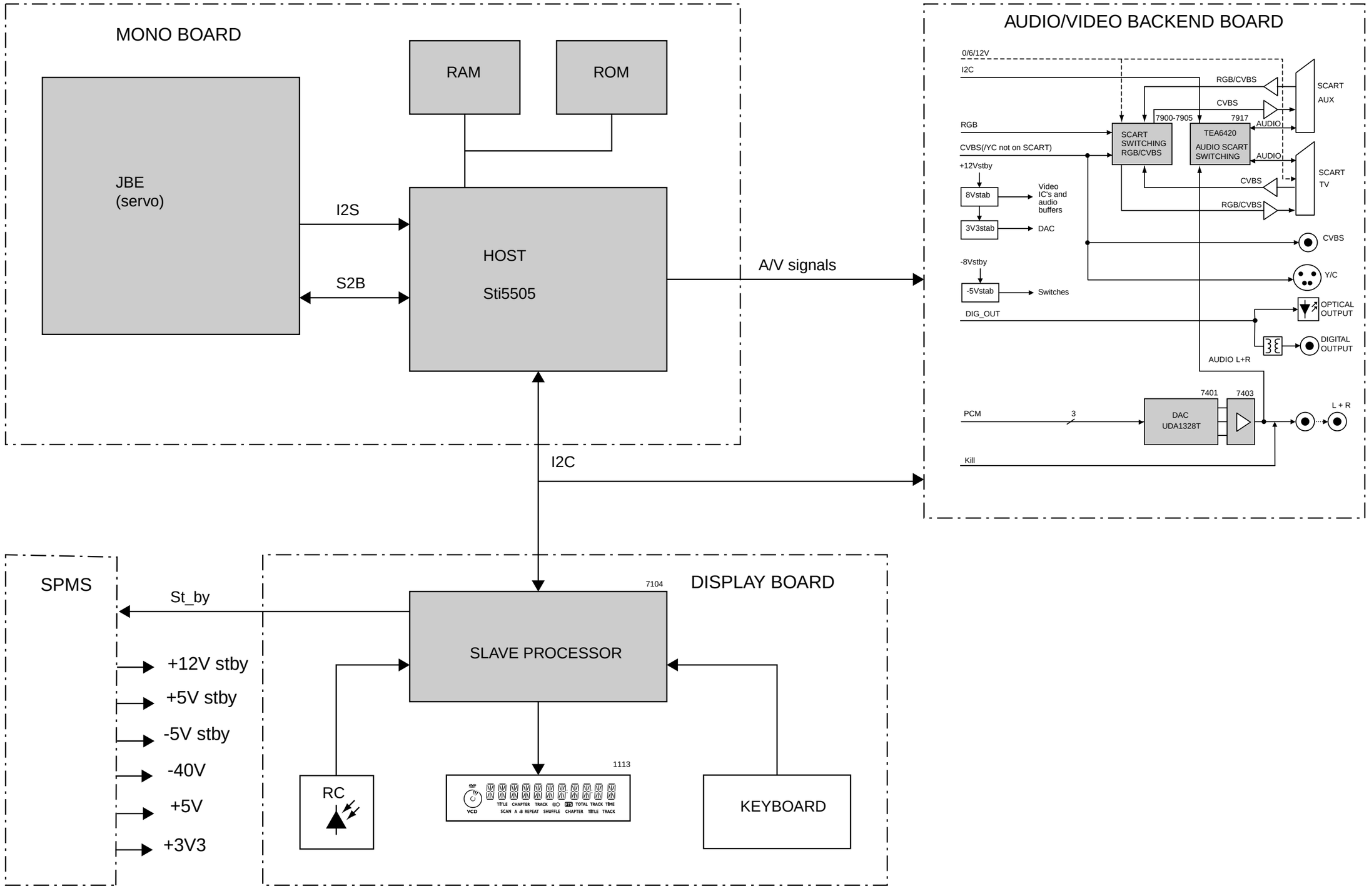
■ WIRING DIAGRAM



■ BLOCK DIAGRAM (U, C, A, R, T)

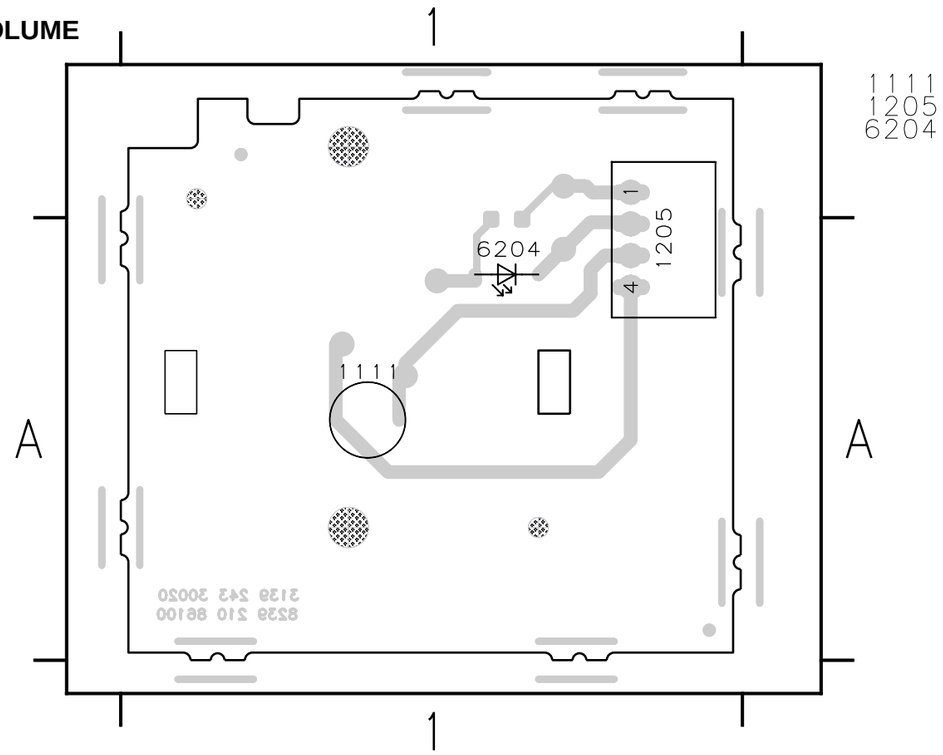


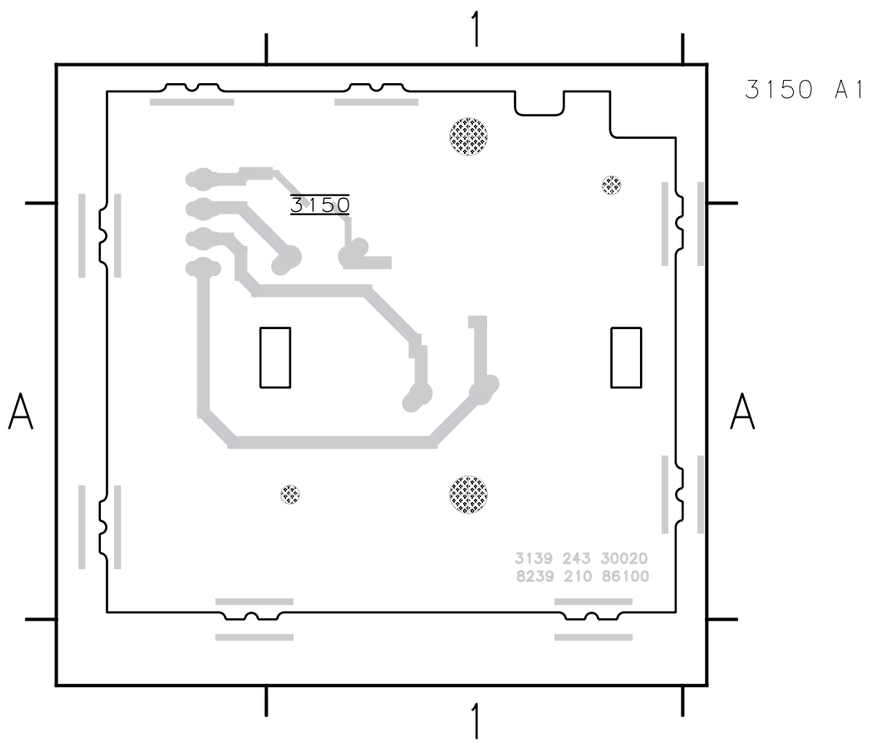
■ BLOCK DIAGRAM (B, G)



■ PRINTED CIRCUIT BOARD

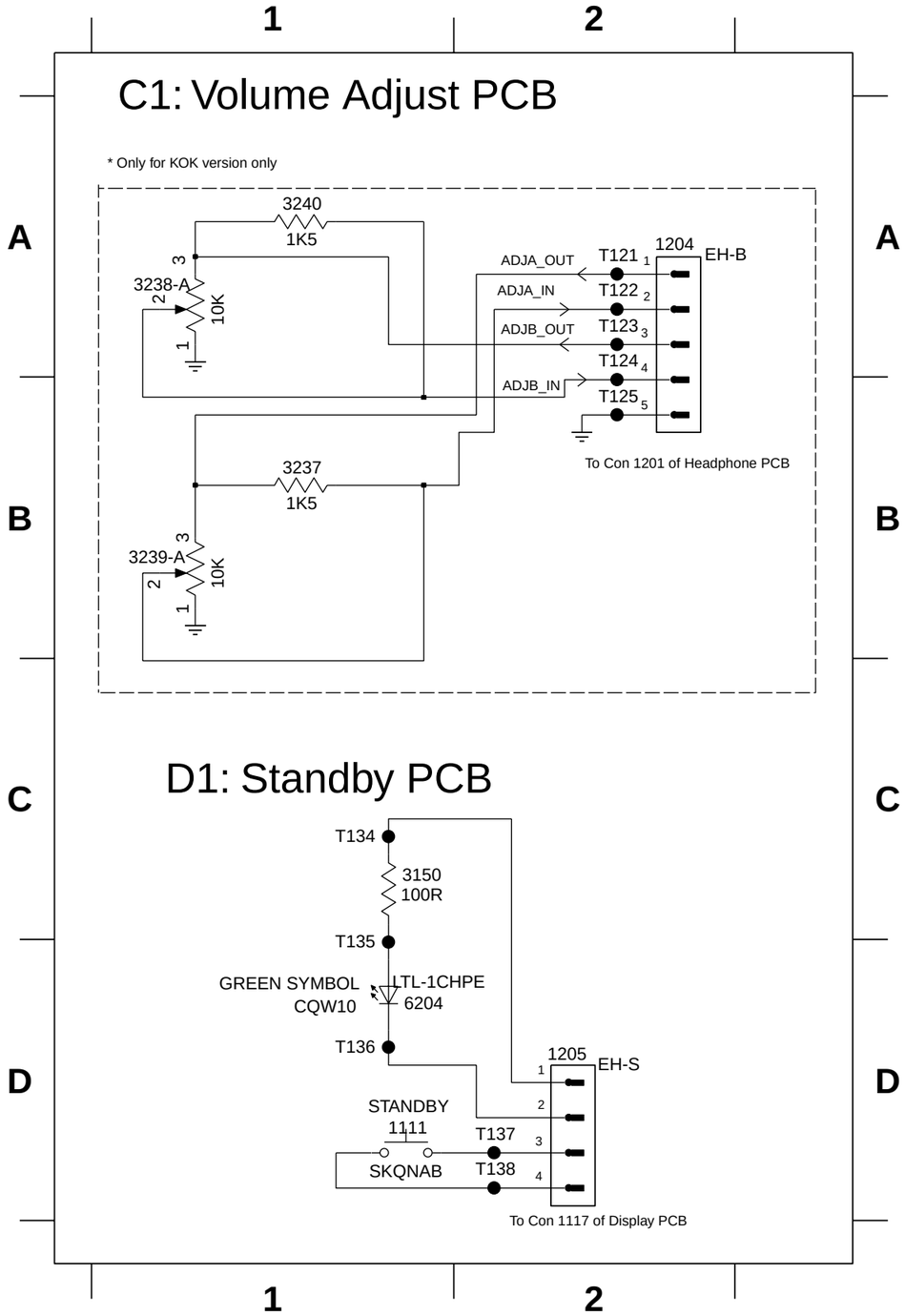
VOLUME





■ SCHEMATIC DIAGRAM

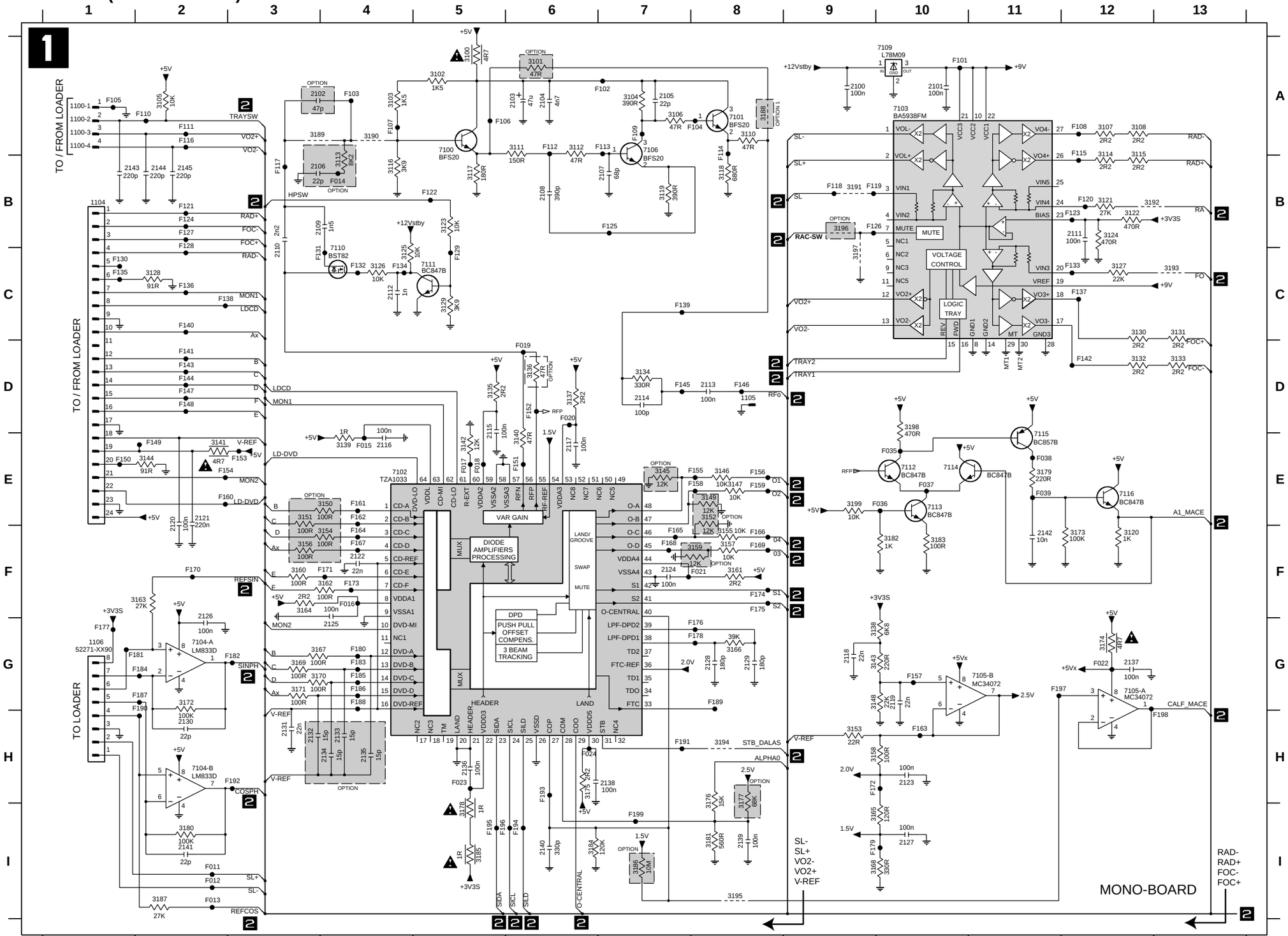
VOLUME



1111 D1
1204 A2
1205 D2
3150 C1
3237 B1
3238-A A1
3239-A B1
3240 A1
6204 D1
T121 A2
T122 A2
T123 A2
T124 A2
T125 B2
T134 C1
T135 D1
T136 D1
T137 D2
T138 D2

■ SCHEMATIC DIAGRAM

MONO 1/6 (SERVO DALAS)



1100-1 A1	3165 I9	F147 D2
1100-2 A1	3166 G8	F148 D2
1100-3 A1	3167 G3	F149 E2
1100-4 A1	3168 I9	F150 E1
1104 B1	3169 G3	F151 E6
1105 D8	3170 G3	F152 D6
1106 G1	3171 G3	F153 E3
2100 A9	3172 G2	F154 E2
2101 A10	3173 F12	F155 E8
2102 A3	3174 G12	F156 E8
2103 A6	3175 H6	F157 G10
2104 A6	3176 H8	F158 E8
2105 A7	3177 H8	F159 E8
2106 B3	3178 I5	F160 E2
2107 B7	3179 E11	F161 E4
2108 B6	3180 I2	F162 E4
2109 B4	3181 I8	F163 H10
2110 C3	3182 F10	F164 F4
2111 B12	3183 F10	F165 F7
2112 C4	3184 I6	F166 F8
2113 D8	3185 I5	F167 F4
2114 D7	3186 I7	F168 F7
2115 D5	3187 I2	F169 F8
2116 E4	3188 A8	F170 F2
2117 E6	3189 A3	F171 F4
2118 G9	3190 A4	F172 H9
2119 G10	3191 B9	F173 F4
2120 E2	3192 B12	F174 F8
2121 E2	3193 C13	F175 F8
2122 F4	3194 H8	F176 G8
2123 H10	3195 I8	F177 G1
2124 F7	3196 B9	F178 G8
2125 G4	3197 C9	F179 I9
2126 G2	3198 D10	F180 G4
2127 I10	3199 E9	F181 G2
2128 G8	7100 A5	F182 G3
2129 G8	7101 A8	F183 G4
2130 H2	7102 E4	F184 G2
2131 H3	7103 A10	F185 G4
2132 H3	7104-A G2	F186 G4
2133 H4	7104-B H2	F187 G2
2134 H4	7105-A G12	F188 G4
2135 H4	7105-B G11	F189 G8
2136 H5	7106 A7	F190 H2
2137 G12	7109 A10	F191 H7
2138 H7	7110 C4	F192 H3
2139 I8	7111 C5	F193 H6
2140 I6	7112 E10	F194 I6
2141 I2	7113 E10	F195 I5
2142 F11	7114 E10	F196 I5
2143 B1	7115 D11	F197 G11
2144 B2	7116 E12	F198 H13
2145 B2	F011 I2	F199 I7
3100 A5	F012 I2	
3101 A6	F013 I2	
3102 A5	F014 B4	
3103 A4	F015 E4	
3104 A7	F016 F4	
3105 A2	F017 E5	
3106 A7	F018 E5	
3107 A12	F019 D6	
3108 A12	F020 D6	
3110 A8	F021 F8	
3111 A6	F022 G12	
3112 A6	F023 H5	
3113 B4	F024 H6	
3114 B12	F035 E10	
3115 B12	F036 E10	
3116 B4	F037 E10	
3117 B5	F038 E11	
3118 B8	F039 E11	
3119 B7	F101 A10	
3120 F12	F102 A7	
3121 B12	F103 A4	
3122 B12	F104 A8	
3123 B5	F105 A1	
3124 B12	F106 A5	
3125 C4	F107 A4	
3126 C4	F108 A12	
3127 C12	F109 A7	
3128 C2	F110 A2	
3129 C5	F111 A2	
3130 C12	F112 A6	
3131 C13	F113 A7	
3132 D12	F114 A8	
3133 D13	F115 B12	
3134 D7	F116 A2	
3135 D5	F117 B3	
3136 D6	F118 B9	
3137 D6	F119 B9	
3138 G9	F120 B12	
3139 E4	F121 B2	
3140 E6	F122 B5	
3141 E2	F123 B12	
3142 E5	F124 B2	
3143 G9	F125 B7	
3144 E2	F126 B9	
3145 E7	F127 B2	
3146 E8	F128 C2	
3147 E8	F129 C5	
3148 G9	F130 C1	
3149 E8	F131 C4	
3150 E4	F132 C4	
3151 E3	F133 C12	
3152 E8	F134 C4	
3153 H9	F135 C1	
3154 F4	F136 C2	
3155 F8	F137 C12	
3156 F3	F138 C2	
3157 F8	F139 C7	
3158 H9	F140 C2	
3159 F8	F141 D2	
3160 F3	F142 D12	
3161 F8	F143 D2	
3162 F4	F144 D2	
3163 F2	F145 D7	
3164 F3	F146 D8	

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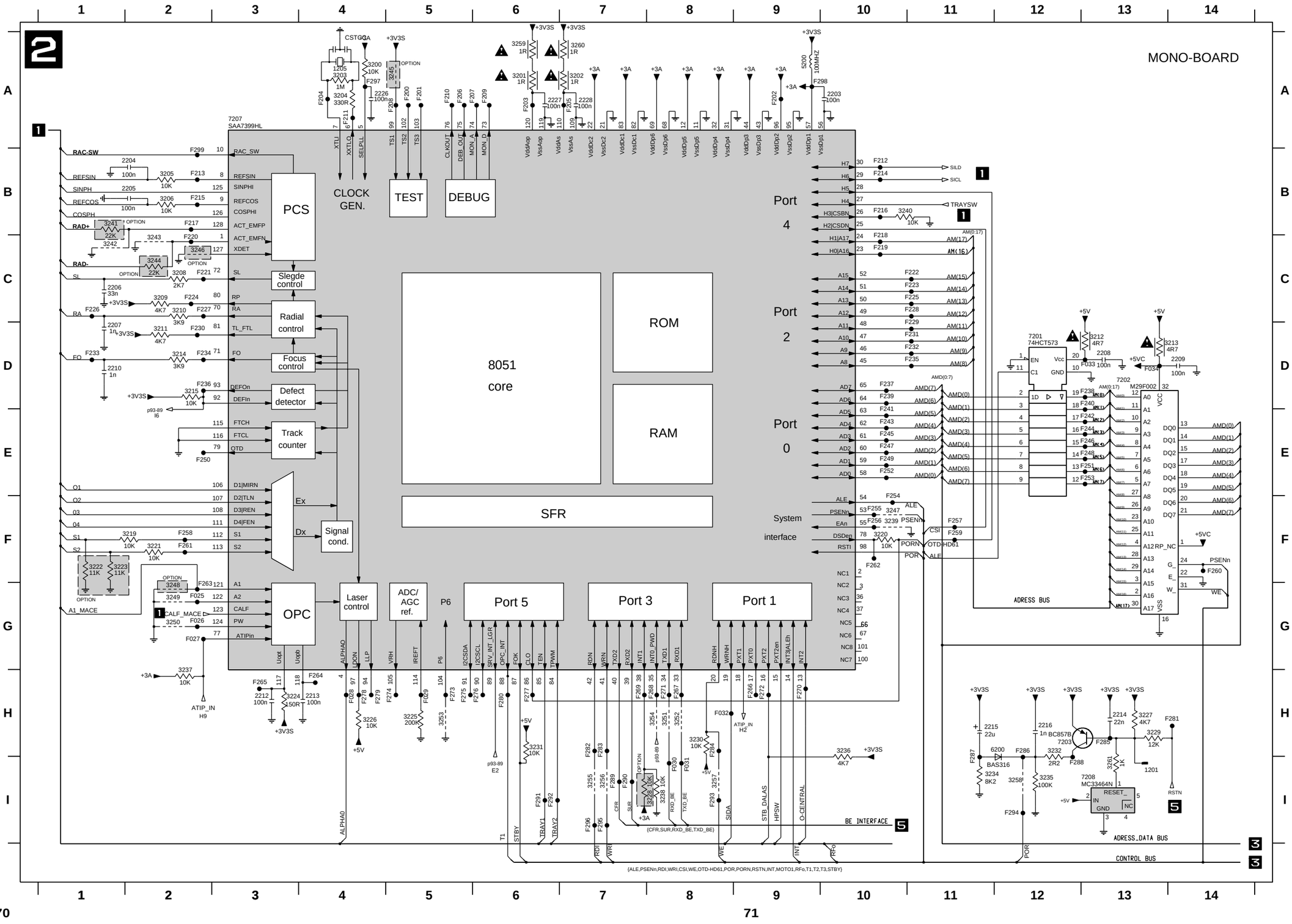
041000

■ SCHEMATIC DIAGRAM

MONO 2/6 (SERVO MACE)



1201 I13	F226 C1	3201 A6	F245 E10
1205 A4	F227 C2	3202 A7	F246 E13
2203 A10	F228 C11	3203 A4	F247 E10
2204 B2	F229 D11	3204 A4	F248 E13
2205 B2	F230 D2	3205 B2	F249 E10
2206 C1	F231 D11	3206 B2	F250 E2
2207 D1	F232 D11	3208 C2	F251 E13
2208 D13	F233 D1	3209 C2	F252 E10
2209 D14	F234 D2	3210 C2	F253 E13
2210 D1	F235 D11	3211 D2	F254 F10
2212 H3	F236 D2	3212 D13	F255 F10
2213 H4	F237 D10	3213 D14	F256 F10
2214 H13	F238 D13	3214 D2	F257 F11
2215 H11	F239 D10	3215 D2	F258 F2
2216 H12	F240 D13	3219 F2	F259 F11
2226 A4	F241 E10	3220 F10	F260 F14
2227 A6	F242 E13	3221 F2	F261 F2
2228 A7	F243 E10	3222 F1	F262 F10
3200 A4	F244 E13	3223 F1	F263 G2
3201 A6	F245 E10	3224 H3	F264 H4
3202 A7	F246 E13	3225 H5	F265 H3
3203 A4	F247 E10	3226 H4	F266 H9
3204 A4	F248 E13	3227 H13	F267 H8
3205 B2	F249 E10	3228 I8	F268 H8
3206 B2	F250 E2	3229 H13	F269 H7
3208 C2	F251 E13	3230 H8	F270 H9
3209 C2	F252 E10	3231 H6	F271 H8
3210 C2	F253 E13	3232 H12	F272 H9
3211 D2	F254 F10	3234 I11	F273 H5
3212 D13	F255 F10	3235 I12	F274 H5
3213 D14	F256 F10	3236 H10	F275 H5
3214 D2	F257 F11	3237 H2	F276 H6
3215 D2	F258 F2	3238 I8	F277 H6
3219 F2	F259 F11	3239 F10	F278 H4
3220 F10	F260 F14	3240 B10	F279 H4
3221 F2	F261 F2	3241 B1	F280 H6
3222 F1	F262 F10	3242 C1	F281 H14
3223 F1	F263 G2	3243 C2	F282 H7
3224 H3	F264 H4	3244 C2	F283 H7
3225 H5	F265 H3	3245 A5	F284 H8
3226 H4	F266 H9	3246 C2	F285 H13
3227 H13	F267 H8	3247 F10	F286 H12
3228 I8	F268 H8	3248 G2	F287 I11
3229 H13	F269 H7	3249 G2	F288 I12
3230 H8	F270 H9	3250 G2	F289 I7
3231 H6	F271 H8	3251 H8	F290 I7
3232 H12	F272 H9	3252 H8	F291 I6
3234 I11	F273 H5	3253 H5	F292 I6
3235 I12	F274 H5	3254 H8	F293 I8
3236 H10	F275 H5	3255 I7	F294 I12
3237 H2	F276 H6	3256 I7	F295 I7
3238 I8	F277 H6	3257 I8	F296 I7
3239 F10	F278 H4	3258 I12	F297 A4
3240 B10	F279 H4	3259 A6	F298 A10
3241 B1	F280 H6	3260 A7	F299 B2
3242 C1	F281 H14	3261 I13	
3243 C2	F282 H7	5200 A9	
3244 C2	F283 H7	6200 H12	
3245 A5	F284 H8	7201 D12	
3246 C2	F285 H13	7202 D13	
3247 F10	F286 H12	7203 H12	
3248 G2	F287 I11	7207 A3	
3249 G2	F288 I12	7208 I13	
3250 G2	F289 I7	F025 G2	
3251 H8	F290 I7	F026 G2	
3252 H8	F291 I6	F027 G2	
3253 H5	F292 I6	F028 H4	
3254 H8	F293 I8	F029 H5	
3255 I7	F294 I12	F030 I8	
3256 I7	F295 I7	F031 I8	
3257 I8	F296 I7	F032 H8	
3258 I12	F297 A4	F033 D13	
3259 A6	F298 A10	F034 D13	
3260 A7	F299 B2	F200 A5	
3261 I13		F201 A5	
5200 A9		F202 A9	
6200 H12		F203 A6	
7201 D12		F204 A4	
7202 D13		F205 A7	
7203 H12		F206 A5	
7207 A3		F207 A6	
7208 I13		F208 A5	
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F026 G2		F210 A5	
F027 G2		F211 A4	
F028 H4		F212 B10	
F029 H5		F213 B2	
F030 I8		F214 B10	
F031 I8		F215 B2	
F032 H8		F216 B10	
F033 D13		F217 B2	
F034 D13		F218 C10	
F200 A5		F219 C10	
F201 A5		F220 C2	
F202 A9		F221 C2	
F203 A6		F222 C11	
F204 A4		F223 C11	
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F220 C2			
F221 C2			
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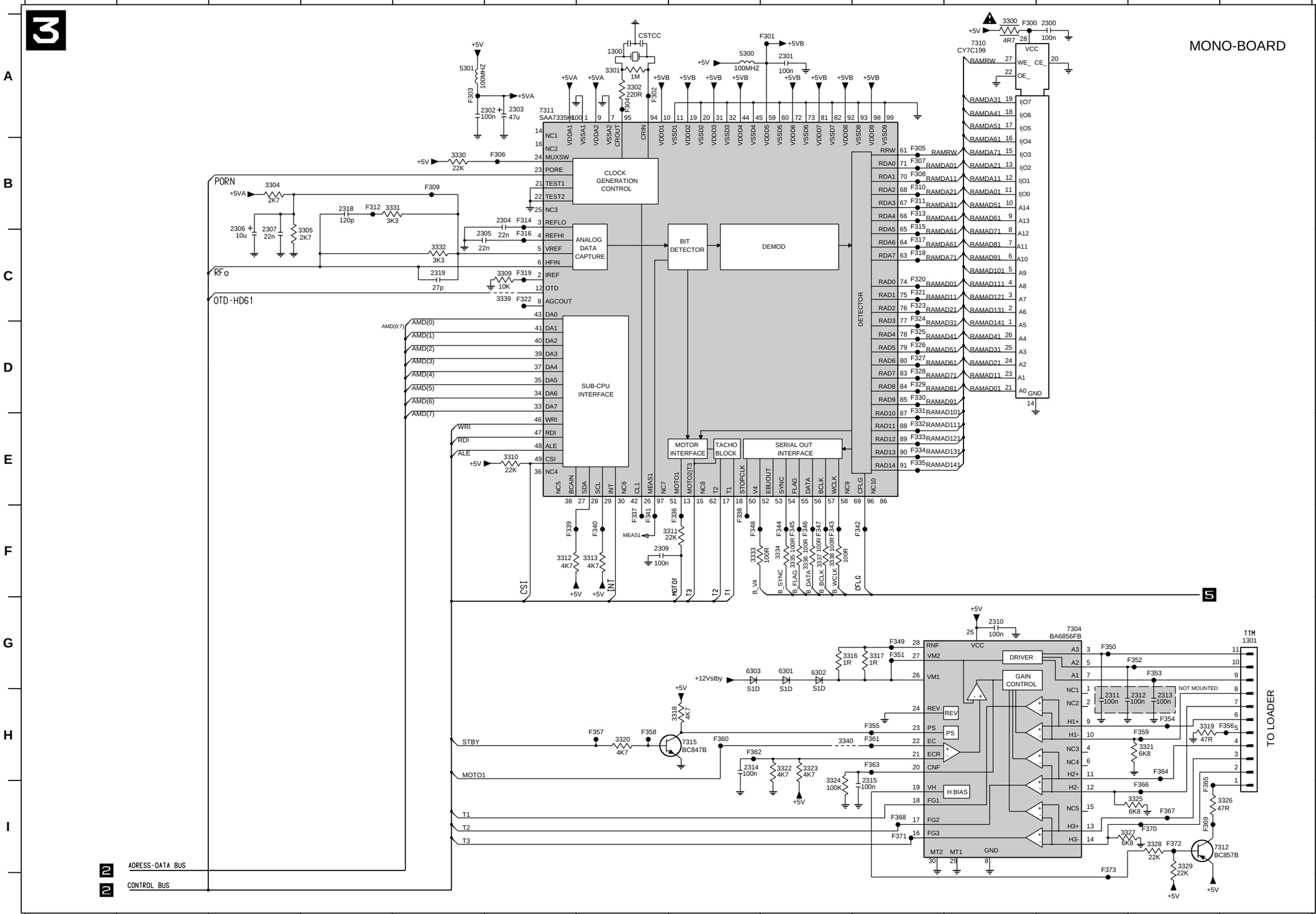
F225 C11			

■ SCHEMATIC DIAGRAM

MONO 3/6 (Decoder & Turntable motor control)

MONO-BOARD



5

1300 A7
1301 G14
2300 A12
2301 A9
2302 A6
2303 A6
2304 B6
2305 C5
2306 C3
2307 C3
2309 F7
2310 G11
2311 H12
2312 H13
2313 H13
2314 H8
2315 I10
2318 B4
2319 C5
3300 A11
3301 A7
3302 A7
3304 B3
3305 C4
3309 C6
3310 E6
3311 F8
3312 F6
3313 F7
3316 G9
3317 G10
3318 H8
3319 H13
3320 H7
3321 H13
3322 H9
3323 H9
3324 I9
3325 I13
3326 I14
3327 I13
3328 I13
3329 I13
3330 B5
3331 B5
3332 C5
3333 F8
3334 F9
3335 F9
3336 F9
3337 F9
3338 F9
3339 C6
3340 H9
5300 A8
5301 A5
6301 G9
6302 G9
6303 G8
7304 G12
7310 A11
7311 A6
7312 I13
7315 H8
F300 A11
F301 A9
F302 A7
F303 A5
F304 A7
F305 B10
F306 B6
F307 B10
F308 B10
F309 B5
F310 B10
F311 B10
F312 B4
F313 B10
F314 B6
F315 B10
F316 C6
F317 C10
F318 C10
F319 C6
F320 C10
F321 C10
F322 C6
F323 C10
F324 C10
F325 D10
F326 D10
F327 D10
F328 D10
F329 D10
F330 D10
F331 D10
F332 E10
F333 E10
F334 E10
F335 E10
F336 F8
F337 F7
F338 F8
F339 F6
F340 F7
F341 F7
F342 F10
F343 F9
F344 F9
F345 F9
F346 F9
F347 F9
F348 F8
F349 G10
F350 G12
F351 G10
F352 G13
F353 G13
F354 H13
F355 H10
F356 H14
F357 H7
F358 H7
F359 H13
F360 H8
F361 H10
F362 H8
F363 H10
F364 H13
F365 I13
F366 I13
F367 I13
F368 I10
F369 I13
F370 I13
F371 I10
F372 I12
F373 I12

■ SCHEMATIC DIAGRAM

MONO 4/6 (Memory)

4

MEMORY PART

MONO-BOARD

OPTION

+5Vstby
5400 100MHZ
F421
+5V_DS
2400 100n
7406 PCF8584T
VDD
3419 10K
RESET_I2C
CE1
DTACKn
IRQ_I2C
CLK_8MHz
SDA_EXE
SCL_EXE
F422
F423
F424
F425
3400 100R
3401 100R
2420 10K
3421 10K
RESET_|STROBE_
CS_
A0
WR_
RD_
INT_|SCL-OUT
IACK_|SDA-IN
CLK
SDA|SDA-OUT
SCL|SCL-IN
VSS
DB7 DB6 DB5 DB4 DB3 DB2 DB1 DB0
D7 D6 D5 D4 D3 D2 D1 D0
RWN
A1

OPTION

+5V_DS
2415 100n
3402 10K
7400-A 74HCT00D
DTACKn
F406
7400-D 74HCT00D
3418
WAIT
7400-B 74HCT00D
CE1

OPTION

+5VOSC
2416 100n
2417 100n
7402 74HCT1G79
F430
7403 74HCT1G04
NC
F431
AUXCLK
3407 22R
CLK_8MHz

VDD_MEM
2405 100n
7401 Am29LV160BT
VCC
A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12 A13 A14 A15 A16 A17 A18 A19
DQ0 DQ1 DQ2 DQ3 DQ4 DQ5 DQ6 DQ7 DQ8 DQ9 DQ10 DQ11 DQ12 DQ13 DQ14 DQ15|A-1
3412
3413
F434
OPTION
F435
3405 10K
3414
3415
F432
3416
CE_
OE_
WE_
RESET_
BYTE_
VSS1 VSS2

SYSTEM DATA Bus
SYSTEM ADDRESS Bus
RAM/ROM Interface
SDRAM Interface

VDD_MEM2

2401 2402 2403 2404 2406 2407 2408 2409 2410 2411 2412 2413 100n

7404 MT48LC1M16A1TG BOTTOM
7405 MT48LC1M16A1TG TOP

BANK SELECT
DATA INPUT REGISTER
I/O CONTROL
LWE
LDQM
ADDRESS REGISTER
ROW BUFFER REFRESH COUNTER
ROW DECODER
512Kx16
SENSE AMP
OUTPUT BUFFER
COLUMN DECODER
LATENCY & BURST LENGTH
PROGRAMMING REGISTER
LWCBR
COL. BUFFER
LRAS
LCBR
LCAS
TIMING REGISTER
LCKE
LQDM
VDD VDDQ VSS VSSQ
NC

AD11 AD0 AD1 AD2 AD3 AD4 AD5 AD6 AD7 AD8 AD9 AD10
CLK CKE CS_ RAS_ CAS_ WE_ DQMH DQML DQMU
BA
CSN1 CSN2
VDD_MEM2 3403 10K F415
3404 10K F416
DQ0 DQ1 DQ2 DQ3 DQ4 DQ5 DQ6 DQ7 DQ8 DQ9 DQ10 DQ11 DQ12 DQ13 DQ14 DQ15

7400-C 74HCT00D
2414 100n

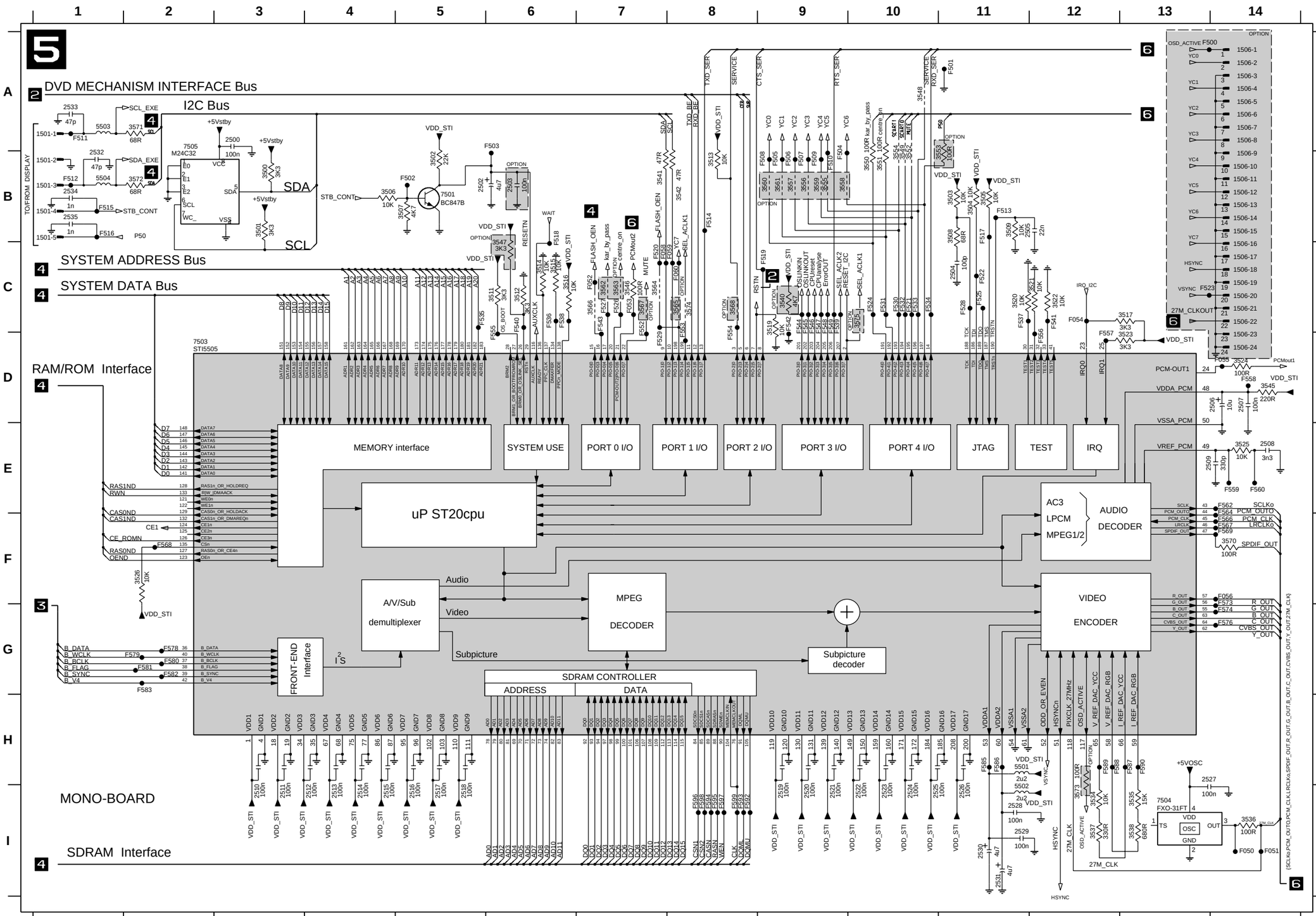
+3V3
5402 100MHZ
F419
VDD_MEM
2418 100u

+3V3
5403 100MHZ
F420
VDD_MEM2
2419 47u
2420 47u

2400 B3
2401 C9
2402 C10
2403 C12
2404 C13
2405 B6
2406 C9
2407 C10
2408 C12
2409 C13
2410 C9
2411 C10
2412 C12
2413 C13
2414 H7
2415 E1
2416 H2
2417 H3
2418 I10
2419 I13
2420 I13
3400 C2
3401 C2
3402 E1
3403 F8
3404 F11
3405 F5
3407 I3
3412 E5
3413 F5
3414 F5
3415 F5
3416 G5
3418 E4
3419 B2
3420 D1
3421 D2
5400 A3
5402 I10
5403 I12
7400-A E2
7400-B F2
7400-C I6
7400-D E3
7401 C6
7402 H2
7403 H3
7404 D9
7405 D12
7406 B3
F406 E3
F415 G8
F416 G11
F419 I10
F420 I13
F421 A3
F422 C2
F423 C2
F424 C2
F425 C2
F430 H3
F431 H2
F432 G5
F434 F5
F435 F5

■ SCHEMATIC DIAGRAM

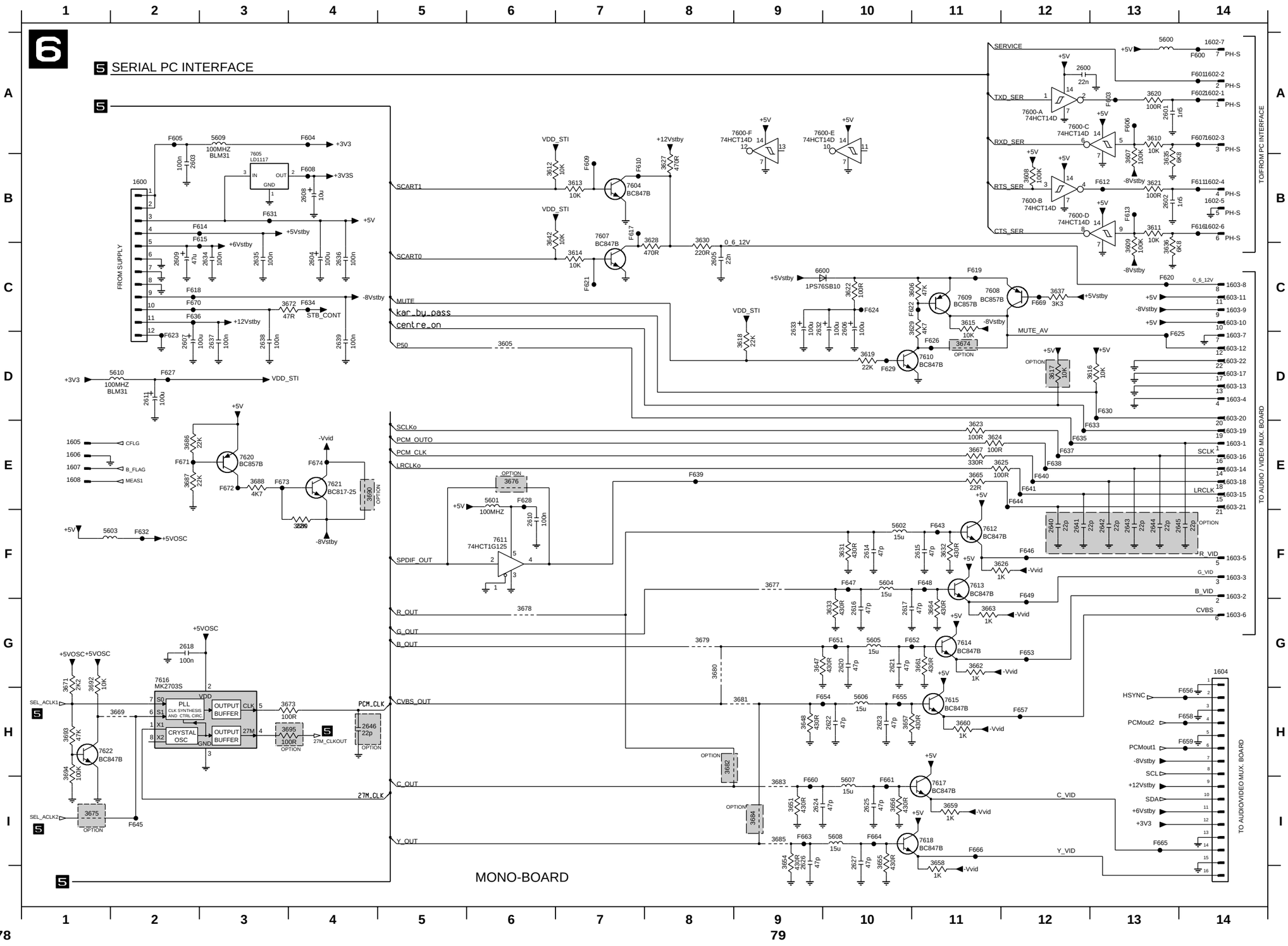
MONO 5/6 (DVD Decoder STI 5505)



1501-1 A1	3565 C8
1501-2 B1	3566 C7
1501-3 B1	3567 C7
1501-4 B1	3568 C8
1501-5 B1	3570 F14
1506-1 A14	3571 A2
1506-10 B14	3572 B2
1506-11 B14	3573 I12
1506-12 B14	3574 C8
1506-13 B14	3575 C10
1506-14 B14	5501 H11
1506-15 B14	5502 I11
1506-16 C14	5503 A1
1506-17 C14	5504 B1
1506-18 C14	7501 B5
1506-19 C14	7503 D2
1506-2 A14	7504 I13
1506-20 C14	7505 A2
1506-21 C14	F050 I14
1506-22 C14	F051 I14
1506-23 D14	F052 C7
1506-24 D14	F053 C7
1506-3 A14	F054 C12
1506-4 A14	F055 D14
1506-5 A14	F056 F14
1506-6 A14	F058 C7
1506-7 A14	F059 C8
1506-8 A14	F060 C8
1506-9 B14	F500 A13
2500 A3	F501 A11
2502 B5	F502 B5
2503 B6	F503 A6
2504 C11	F504 B9
2505 B12	F505 B9
2506 D14	F506 B9
2507 D14	F507 B9
2508 E14	F508 B9
2509 E14	F509 B9
2510 I3	F510 B9
2511 I3	F511 A1
2512 I4	F512 B1
2513 I4	F513 B11
2514 I4	F514 B8
2515 I4	F515 B1
2516 I5	F516 B1
2517 I5	F517 B11
2518 I5	F518 B6
2519 I9	F519 C9
2520 I9	F520 C7
2521 I9	F521 C10
2522 I10	F522 C11
2523 I10	F523 C13
2524 I10	F524 C10
2525 I10	F525 C11
2526 I11	F526 C7
2527 H13	F527 C7
2528 I11	F528 C11
2529 I11	F529 D7
2530 I11	F530 C10
2531 I11	F531 C10
2532 B1	F532 C10
2533 A1	F533 C10
2534 B1	F534 C10
2535 B1	F535 C5
3500 B3	F536 C6
3501 B3	F537 C11
3502 B5	F538 C6
3503 B11	F539 C9
3504 B11	F540 C6
3505 B11	F541 C12
3506 B4	F542 C9
3507 B5	F543 C7
3508 B11	F544 C9
3509 B11	F545 C9
3511 C6	F546 C9
3512 C6	F547 C9
3513 A10	F548 C9
3514 C6	F549 C9
3515 C6	F552 C7
3516 C6	F553 C8
3517 C13	F554 D8
3519 C9	F555 D6
3520 C11	F556 D12
3521 C12	F557 D12
3522 C12	F558 D14
3523 D13	F559 E14
3524 D14	F560 E14
3525 E14	F562 E14
3526 F2	F564 F14
3534 I12	F566 F14
3535 I13	F567 F14
3536 I14	F568 F2
3537 I12	F569 F14
3538 I13	F573 G14
3540 C9	F574 G14
3541 B7	F576 G14
3542 B8	F578 G2
3545 D14	F579 G2
3546 C7	F580 G2
3547 B6	F581 G2
3548 A10	F582 G2
3549 B10	F583 G2
3550 B10	F585 H11
3551 B10	F586 H11
3552 B10	F587 H13
3553 B11	F588 H12
3554 B10	F589 H12
3555 B9	F590 H13
3556 B9	F592 I8
3557 B9	F593 I8
3558 B9	F594 I8
3559 B9	F595 I8
3560 B9	F596 I8
3561 B9	F597 I8
3562 C7	F598 I8
3563 C7	F599 I8
3564 C7	

■ SCHEMATIC DIAGRAM

MONO 6/6 (Back-end & Service interface)



1600 B2	3661 G11	F654 H10
1602-1 A14	3662 G11	F655 H10
1602-2 A14	3663 G11	F656 H14
1602-3 A14	3664 G11	F657 H12
1602-4 B14	3665 E11	F658 H14
1602-5 B14	3667 E11	F659 H14
1602-6 B14	3669 H2	F660 I9
1602-7 A14	3671 G1	F661 I10
1603-1 E14	3672 C4	F663 I9
1603-10 C14	3673 H3	F664 I10
1603-11 C14	3674 D11	F665 I13
1603-12 D14	3675 I1	F666 I11
1603-13 D14	3676 E6	F669 C12
1603-14 E14	3677 F9	F670 C2
1603-15 E14	3678 G6	F671 E2
1603-16 E14	3679 G8	F672 E3
1603-17 D14	3680 G8	F673 E3
1603-18 E14	3681 H9	F674 E4
1603-19 E14	3682 H8	
1603-2 F14	3683 I9	
1603-20 D14	3684 I9	
1603-21 E14	3685 I9	
1603-22 D14	3686 E2	
1603-3 F14	3687 E2	
1603-4 D14	3688 E3	
1603-5 F14	3689 F4	
1603-6 G14	3690 E4	
1603-7 D14	3692 G1	
1603-8 C14	3693 H1	
1603-9 C14	3694 H1	
1604 G14	3695 H4	
1605 E1	5600 A13	
1606 E1	5601 E6	
1607 E1	5602 F10	
1608 E1	5603 F1	
2600 A12	5604 F10	
2601 A13	5605 G10	
2602 B13	5606 H10	
2603 B2	5607 I10	
2604 C4	5608 I10	
2605 C8	5609 A3	
2606 C10	5610 D2	
2607 D2	6600 C9	
2608 B4	7600-A A12	
2609 C2	7600-B B12	
2610 F6	7600-C A12	
2611 D2	7600-D B12	
2614 F10	7600-E A10	
2615 F11	7600-F A9	
2616 G10	7604 B7	
2617 G10	7605 B3	
2618 G2	7607 B7	
2620 G10	7608 C11	
2621 G10	7609 C11	
2622 H10	7610 D11	
2623 H10	7611 F6	
2624 I9	7612 F11	
2625 I10	7613 F11	
2626 I9	7614 G11	
2627 I10	7615 H11	
2632 C9	7616 H2	
2633 C9	7617 I11	
2634 C3	7618 I11	
2635 C3	7620 E3	
2636 C4	7621 E4	
2637 D3	7622 H1	
2638 D3	F600 A14	
2639 D4	F601 A14	
2640 F12	F602 A14	
2641 F12	F603 A13	
2642 F13	F604 A4	
2643 F13	F605 A2	
2644 F13	F606 A13	
2645 F14	F607 A14	
2646 H4	F608 B4	
3605 D6	F609 B7	
3606 C11	F610 B7	
3607 B13	F611 B14	
3608 B12	F612 B13	
3609 C13	F613 B13	
3610 A13	F614 B3	
3611 B13	F615 B3	
3612 B6	F616 B14	
3613 B7	F617 B7	
3614 C7	F618 C2	
3615 C11	F619 C11	
3616 D13	F620 C13	
3617 D12	F621 C7	
3618 D9	F622 C11	
3619 D10	F623 D2	
3620 A13	F624 C10	
3621 B13	F625 D13	
3622 C10	F626 D11	
3623 E11	F627 D2	
3624 E11	F628 E6	
3625 E12	F629 D10	
3626 F12	F630 D13	
3627 B8	F631 B3	
3628 B8	F632 F2	
3629 C11	F633 E13	
3630 B8	F634 C4	
3631 F10	F635 E12	
3632 F11	F636 C2	
3633 G10	F637 E12	
3635 B13	F638 E12	
3636 C13	F639 E8	
3637 C12	F640 E12	
3642 B6	F641 E12	
3647 G9	F643 F11	
3648 H9	F644 E12	
3651 I9	F645 I2	
3654 I9	F646 F12	
3655 I10	F647 F10	
3656 I10	F648 F11	
3657 H10	F649 F12	
3658 I11	F651 G10	
3659 I11	F652 G11	
3660 H11	F653 G12	

■ SCHEMATIC DIAGRAM

A/V (U, C, A, R, T) 1/2

A1 AV_VIDEO

TO MONO BOARD

1000 FMN

4000 Option

7002 MC79L05

7409 BC817-25

7403 BC857B (BC858B)

7400 BC847B

7405 BC847B

7406 BC847B

7404 BC847B

7408 BC857B

7407 BC847B

7410 BC847B

7001-A AD8073

7455 BC847B

7458 BC857B

7457 BC847B

7411 BC847B

7412 BC857B

7413 BC847B

7414 BC847B

7415 BC847B

7001-B AD8073

7001-C AD 8073

VIDEO

S-VIDEO

1003 TCS79

1008-A YKC21-4040

1006-A 2 YKC21-4104 Y

1006-B 4 YKC21-4104 U

1006-C 6 YKC21-4104 V

TP1 TP2 TP3 TP4 TP5 TP6 TP14 TP15 TP16 TP17 TP18 TP19

BZX284-C15

DSS306

V DC Vtg measured in STOP_MODE

1000 B1
1003 E14
1006-A F14
1006-B G14
1006-C I14
1008-A B14
2001 A6
2004 C11
2007 D7
2008 E6
2009 E12
2010 E13
2011 F12
2012 G10
2013 H10
2014 H12
2015 I12
2016 G5
2020 A7
3000 A5
3001 A4
3002 A4
3003 A9
3004 A10
3005 A5
3006 B10
3007 B10
3009 B12
3010 B2
3011 B4
3012 B11
3013 B7
3014 B6
3015 B10
3016 B10
3017 B7
3018 B2
3019 B5
3020 C5
3021 C13
3022 C2
3023 C5
3024 C12
3025 D4
3028 C5
3029 D6
3030 D5
3031 D6
3032 D11
3033 D7
3034 D5
3035 D6
3037 E2
3038 E4
3039 E7
3040 F6
3041 F3
3042 F2
3043 F9
3044 F11
3045 F10
3046 G9
3047 G9
3048 G11
3049 G9
3050 G9
3051 H9
3052 H9
3053 H10
3054 H9
3055 I9
3056 I11
3057 I9
3058 I9
3059 I9
3060 I10
3061 E2
3062 F4
3063 F5
3064 F6
3065 F5
3066 F5
3067 G5
3068 G5
4000 A5
4001 A10
4003 C10
4004 C6
4006 E6
4007 F12
4008 G12
4009 I12
4010 E6
4011 E3
5003 B13
5004 B13
5005 F12
5006 G12
5007 I12
6000 B3
6001 B4
6002 D8
6003 F7
6004 C12
6005 F11
6006 H11
6007 I11
6008 B12
7001-A E3
7001-B I10
7001-C G10
7002 A6
7400 C3
7403 B5
7404 C5
7405 B6
7406 B6
7407 D5
7408 D6
7409 A5
7410 D7
7411 A9
7412 A10
7413 A11
7414 B12
7415 F10
7455 E6
7457 F4
7458 F5
9102 I9

■ SCHEMATIC DIAGRAM

A/V (U, C, A, R, T) 2/2

A2 AV-SOUND

TO MONO BOARD

RIGHT

LEFT

OPTICAL

DIGITAL

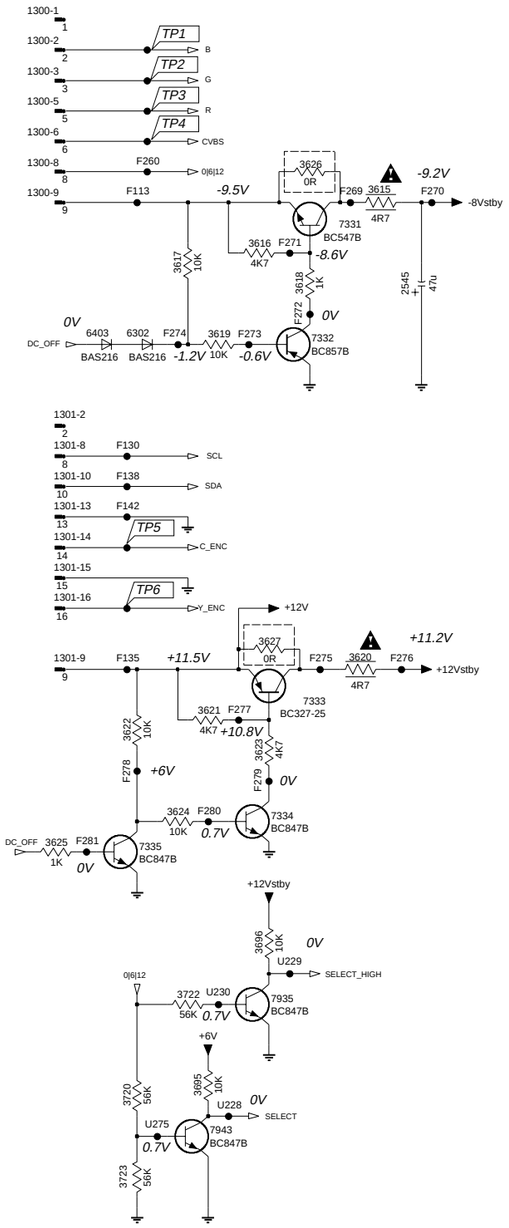
V DC Vtg measured in STOP_MODE

1001 A1
1008-B E14
1008-C B14
1011 G14
2200 B2
2201 A10
2202 B7
2203 A10
2204 A2
2205 A7
2206 A7
2207 A5
2208 A5
2209 B10
2210 C6
2211 C6
2212 C13
2213 C13
2214 C7
2215 D10
2216 E3
2217 E4
2221 F13
2222 E14
2224 F14
2225 G11
2226 G11
2227 G13
2228 H13
2229 B10
2230 E10
2231 E3
3200 A5
3201 A3
3202 B2
3203 A11
3205 B4
3206 B12
3207 B11
3208 B10
3209 B12
3210 B10
3211 C13
3212 C14
3213 D3
3214 D11
3215 E12
3216 E10
3218 E10
3219 E11
3220 F12
3221 F13
3222 F13
3224 F10
3225 G10
3226 G12
3227 A9
3228 D9
3229 D2
3230 E2
3231 E2
3232 A4
4200 A3
4201 E4
5008 G11
6201 D4
6202 D4
7010 E3
7011 A5
7012-A A10
7012-B D10
7028 G14
7450 A4
7451 B13
7452 B13
7453 E13
7454 F12
7456 D3

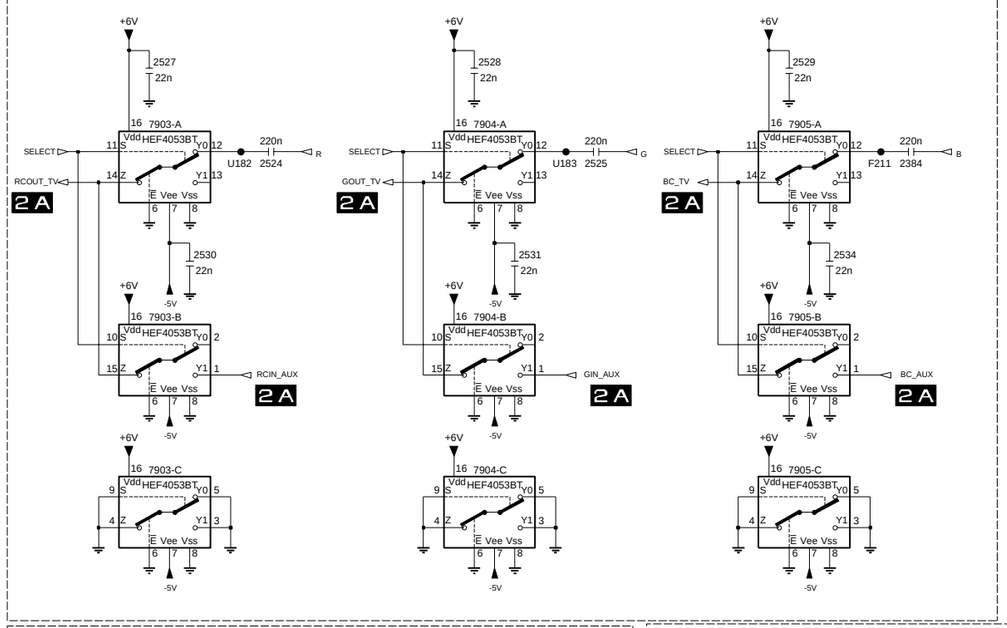
■ SCHEMATIC DIAGRAM

A/V (B, G) 1/4

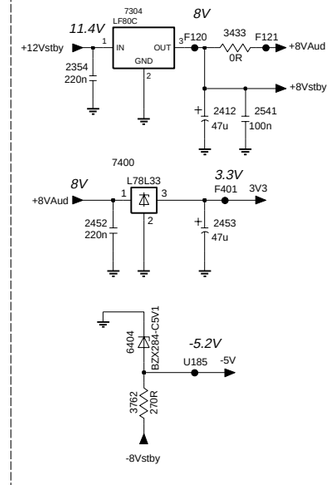
1 A SUPPLY & VIDEO SWITCHING



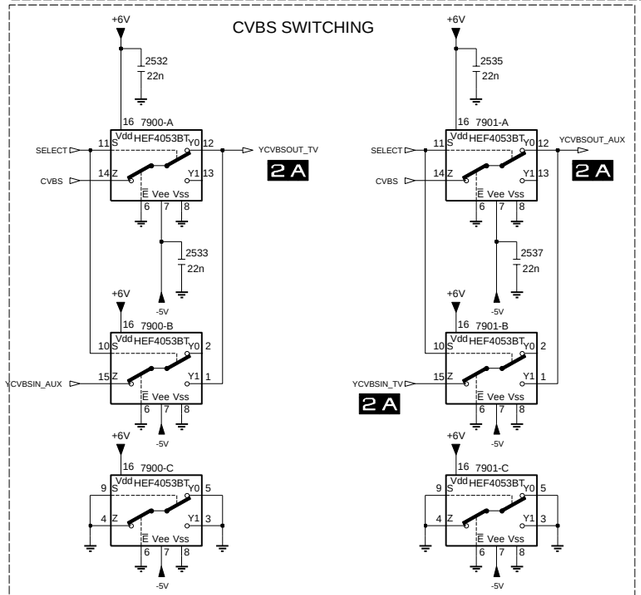
RGB switching



supply



CVBS SWITCHING



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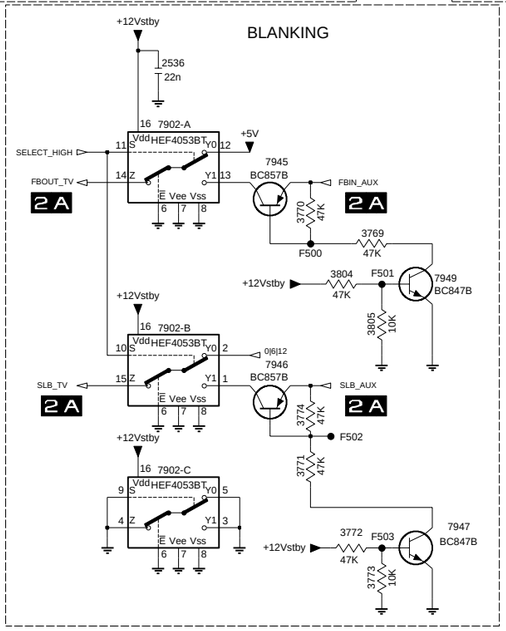


SELECT:
0V DURING PLAYER SCRIPT: "SCART DVD"
6V DURING PLAYER SCRIPT: "SCART LOOP"

SELECT HIGH:
0V DURING PLAYER SCRIPT: "SCART DVD"
12V DURING PLAYER SCRIPT: "SCART LOOP"

ALL DC VOLTAGES MEASURED IN STOP MODE.

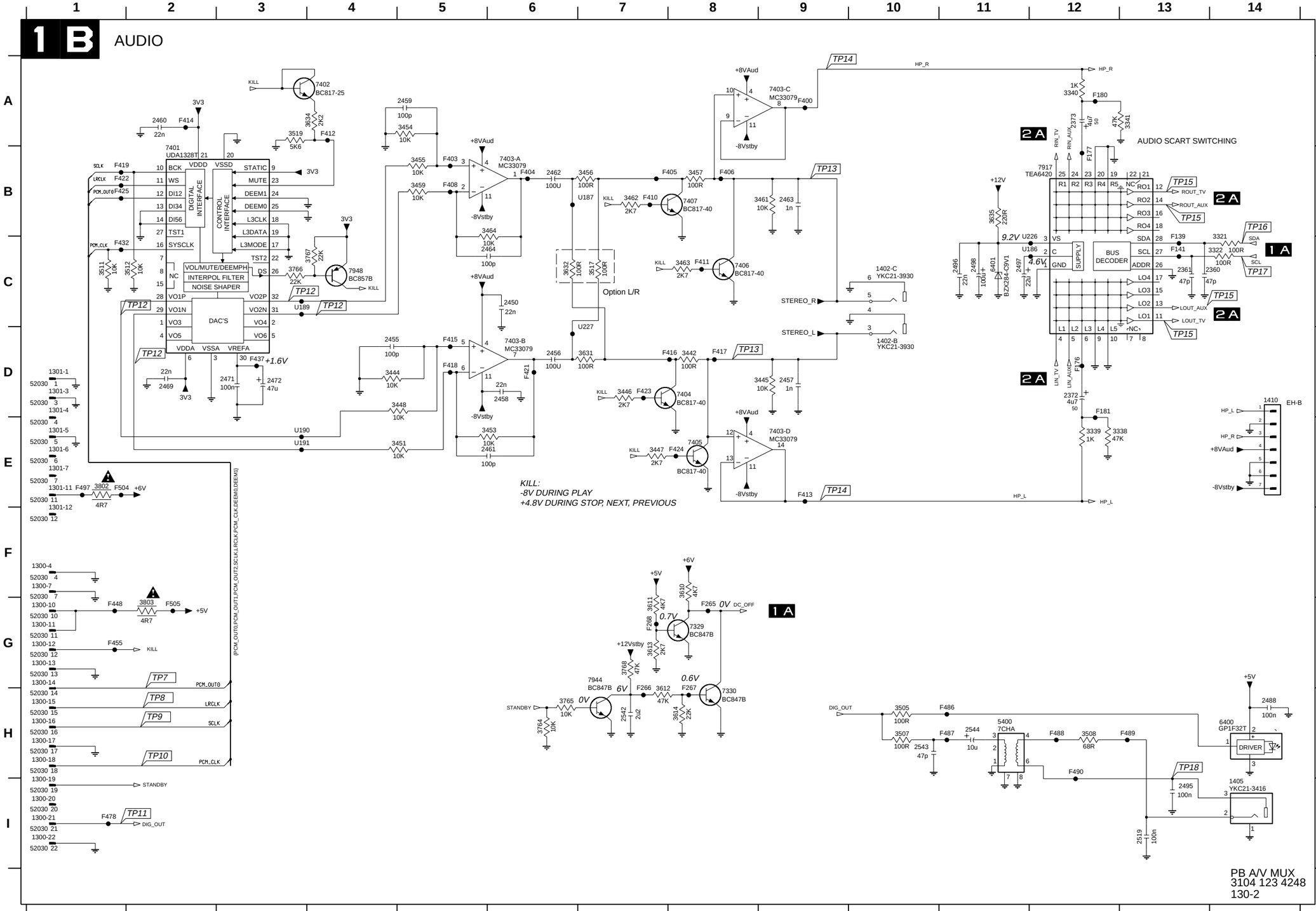
PB A/V MUX
3104 123 4248
130-1

1300-1 A1
1300-2 A1
1300-3 A1
1300-5 A1
1300-6 B1
1300-8 B1
1300-9 B1
1301-10 D1
1301-13 D1
1301-14 D1
1301-15 E1
1301-16 E1
1301-2 D1
1301-8 D1
1301-9 E1
2354 B13
2384 B11
2412 B14
2452 C13
2453 C14
2524 B6
2525 B9
2527 A6
2528 A8
2529 A10
2530 C6
2531 C8
2532 F6
2533 G6
2534 C10
2535 F8
2536 F10
2537 G8
2541 B14
2545 C4
3433 B14
3615 B3
3616 B3
3617 C2
3618 C3
3619 C2
3620 E3
3621 F2
3622 F2
3623 F3
3624 F2
3625 G1
3626 B3
3627 E3
3695 H2
3696 G3
3720 H2
3722 H2
3723 I2
3762 D13
3769 G12
3770 G11
3771 H11
3772 I11
3773 I12
3774 H11
3804 G11
3805 G12
6302 C2
6403 C1
6404 D13
7304 B13
7331 B3
7332 C3
7333 F3
7334 F3
7335 G2
7400 C13
7900-A F6
7900-B G6
7900-C H6
7901-A F8
7901-B G8
7901-C H8
7902-A F10
7902-B G10
7902-C H10
7903-A B6
7903-B C6
7903-C D6
7904-A B8
7904-B C8
7904-C D8
7905-A B10
7905-B C10
7905-C D10
7935 H3
7943 I2
7945 F11
7946 H11
7947 I12
7949 G12
F106 A2
F109 A2
F110 A2
F112 B2
F113 B2
F120 B13
F121 B14
F130 D2
F135 E2
F138 D2
F142 D2
F144 D2
F150 E2
F211 B11
F260 B2
F269 B3
F270 B4
F271 B3
F272 C3
F273 C2
F274 C2
F275 E3
F276 E4
F277 F2
F278 F2
F279 F3
F280 F2
F281 G1
F401 C14
F500 G11
F501 G12
F502 H11
F503 I12
U182 B6
U183 B8
U185 D13
U228 H2
U229 G3
U230 H2
U275 I2

■ SCHEMATIC DIAGRAM

A/V (B, G) 2/4

1 B AUDIO

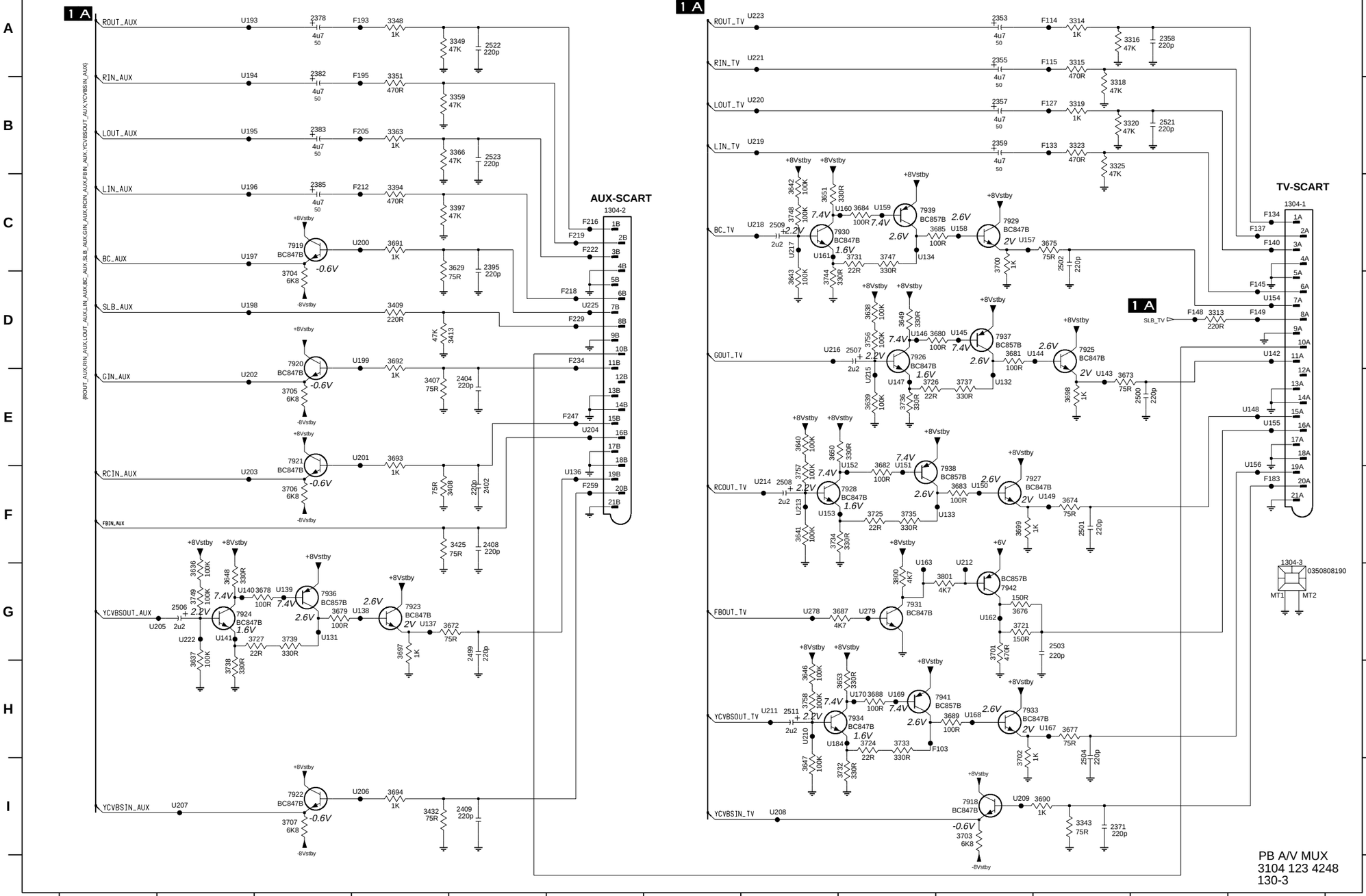


1300-10 G1
1300-11 G1
1300-12 G1
1300-13 G1
1300-14 G1
1300-15 H1
1300-16 H1
1300-17 H1
1300-18 H1
1300-19 I1
1300-20 I1
1300-21 I1
1300-22 I1
1300-4 F1
1300-7 F1
1301-1 D1
1301-11 E1
1301-12 F1
1301-3 D1
1301-4 D1
1301-5 E1
1301-6 E1
1301-7 E1
1402-B D10
1402-C C10
1405 I14
1410 D14
2360 C14
2361 C13
2372 D12
2373 A12
2450 C6
2455 D4
2456 D6
2457 D9
2458 D6
2459 A5
2460 A2
2461 E6
2462 B6
2463 B9
2464 C6
2469 D2
2471 D3
2472 D3
2488 H14
2495 I13
2496 C11
2497 C11
2498 C11
2519 I13
2542 H7
2543 H10
2544 H11
3321 C14
3322 C14
3338 E13
3339 E12
3340 A12
3341 A13
3442 D8
3444 D4
3445 D9
3446 D7
3447 E7
3448 D5
3451 E5
3453 E6
3454 A5
3455 B5
3456 B7
3457 B8
3459 B5
3461 B9
3462 B7
3463 C8
3464 B6
3505 H10
3507 H10
3508 H12
3511 C1
3512 C2
3517 C7
3519 A3
3610 F8
3611 G7
3612 H7
3613 G7
3614 H8
3631 D7
3632 C6
3634 A4
3635 B11
3764 H6
3765 H6
3766 C3
3767 C4
3768 G7
3802 E1
3803 G2
5400 H11
6400 H14
6401 C11
7329 G8
7330 H8
7401 B2
7402 A4
7403-A B6
7403-B D6
7403-C A9
7403-D E9
7404 D8
7405 E8
7406 C8
7407 B8
7917 B12
7944 G7
7948 C4
F139 C13
F141 C13
F176 D12
F177 B12
F180 A12
F181 D12
F265 G8
F266 H7
F267 H8
F268 G7
F400 A9
F403 B5
F404 B6
F405 B8
F406 B8
F408 B5
F410 B7
F411 C8
F412 A4
F413 E9
F414 A2
F415 D5
F416 D8
F417 D8
F418 D5
F421 B1
F423 D7
F424 C6
F425 B1
F432 C1
F437 D3
F448 G1
F455 G1
F478 I1
F486 H11
F487 H11
F488 H12
F489 H13
F490 H12
F497 E1
F504 E1
F505 G2
U186 C12
U187 B7
U188 C3
U189 C3
U190 E3
U191 E3
U226 C12
U227 D7

■ SCHEMATIC DIAGRAM

A/V (B, G) 3/4

2 A SCART



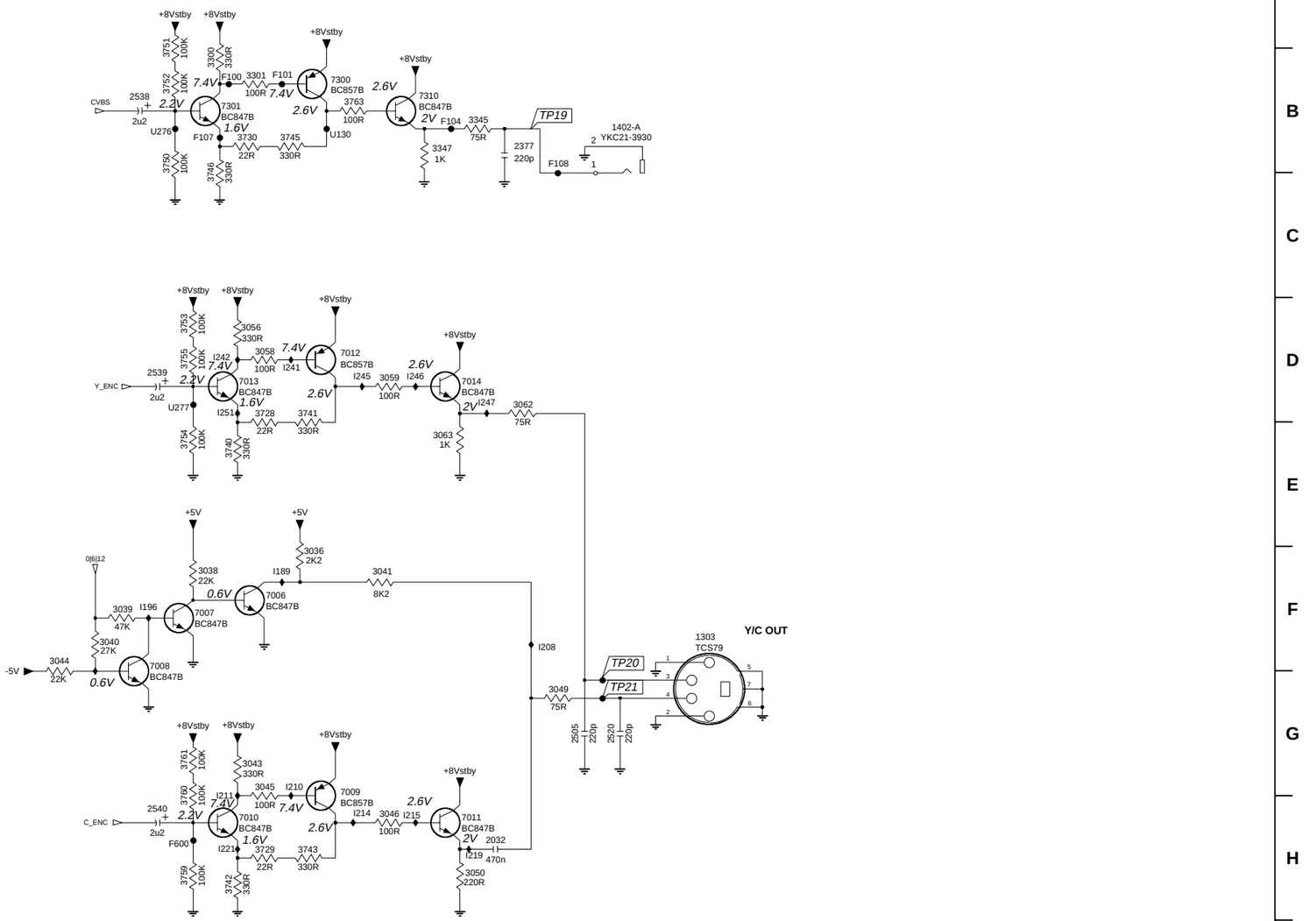
1304-1 C13 1304-2 C6 1304-3 G13 2353 A10 2355 A10 2357 B10 2358 A12 2359 B10 2371 I11 2378 A3 2382 A3 2383 B3 2385 C3 2395 C5 2402 F5 2404 E5 2408 F5 2409 I5 2499 G5 2500 E12 2501 F11 2502 C11 2503 G11 2504 H11 2506 G2 2507 D9 2508 F8 2509 C8 2511 H8 2521 B12 2522 A5 2523 B5 3313 D12 3314 A11 3315 A11 3316 A12 3318 B11 3319 B11 3320 B12 3323 B11 3325 B11 3343 I11 3348 A4 3349 A5 3351 B4 3359 B5 3363 B4 3366 B5 3394 C4 3397 C5 3407 E5 3408 F4 3409 D4 3413 D4 3425 F5 3432 I4 3629 C5 3636 G2 3637 G2 3638 D9 3639 E9 3640 E8 3641 F8 3642 C8 3643 D8 3646 H8 3647 I8 3648 G2 3649 D9 3650 E8 3651 C8 3653 H9 3672 G5 3673 E11 3674 F11 3675 C11 3676 G10 3677 H11 3678 G3 3679 G3 3680 D10 3681 D10 3682 F9 3683 F10 3684 C9 3685 C10 3687 G9 3688 H9 3689 H10 3690 I11 3691 C4 3692 D4 3693 E4 3694 I4 3697 G4 3698 E11 3699 F10 3700 C10 3701 G10 3702 I10 3703 I10 3704 D3 3705 E3 3706 F3 3707 I3 3721 G10 3724 H9 3725 F9 3726 E9 3727 G3 3731 C9 3732 I9 3733 H9 3734 F8 3735 F9 3736 E9

U214 F8 U215 D9 U216 D8 U217 C8 U218 C8 U219 B8 U220 B8 U221 A8 U222 G2 U223 A8 U225 D6 U278 G8 U279 G9

■ SCHEMATIC DIAGRAM

A/V (B, G) 4/4

2 B CVBS & YC



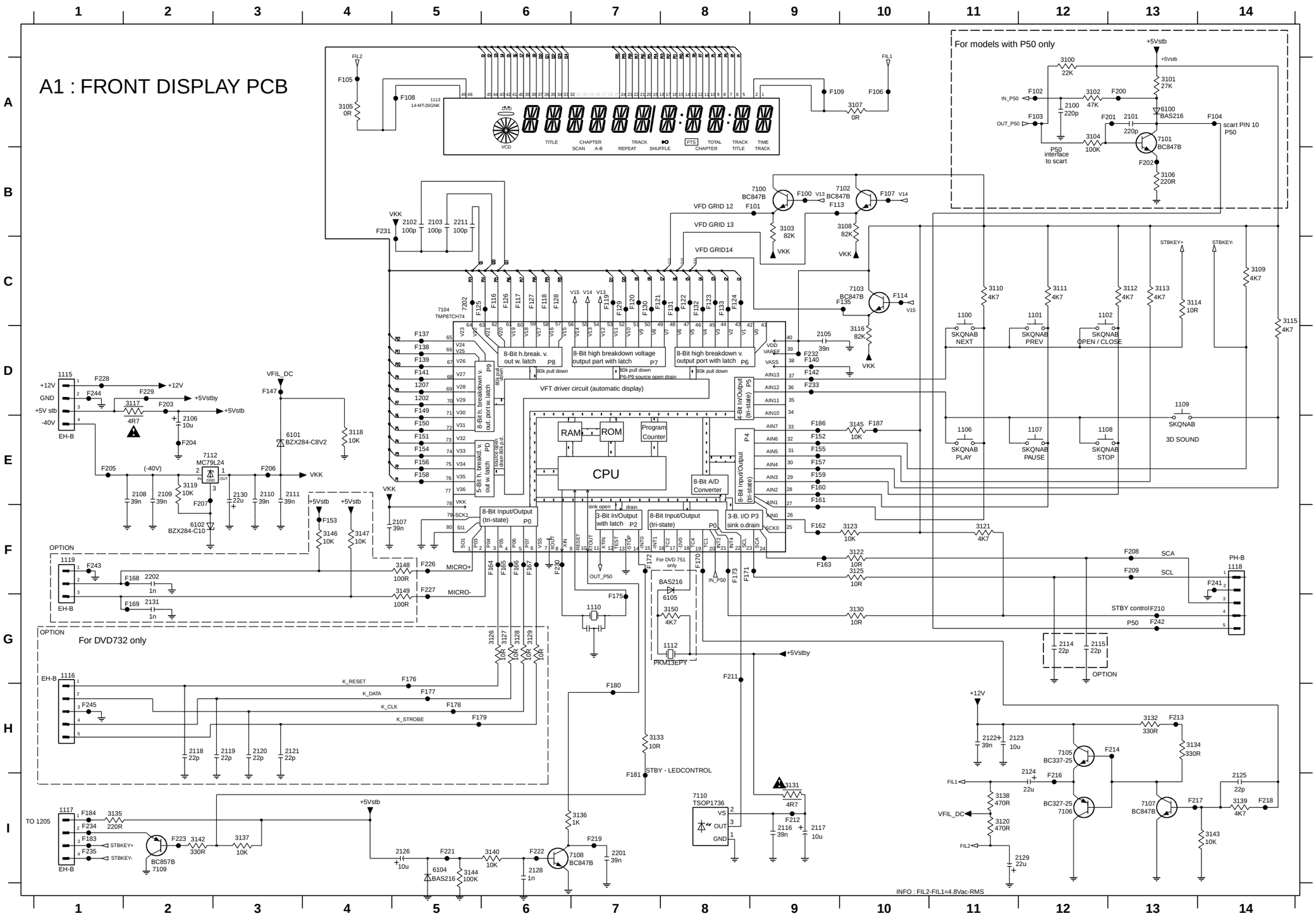
PB A/V MUX
3104 123 4248
130-4

1303 F10
1402-A B9
2032 H8
2377 B9
2505 G9
2520 G9
2538 B5
2539 D6
2540 H6
3036 F7
3038 F6
3039 F5
3040 F5
3041 F7
3043 G6
3044 F5
3045 G6
3046 H7
3049 G9
3050 H8
3056 D6
3058 D6
3059 D7
3062 D9
3063 E8
3300 B6
3301 B6
3345 B8
3347 B8
3728 D6
3729 H6
3730 B6
3740 E6
3741 D7
3742 H6
3743 H7
3745 B7
3746 B6
3750 B6
3751 A6
3752 B6
3753 D6
3754 E6
3755 D6
3759 H6
3760 G6
3761 G6
3763 B7
3999 I1
7006 F6
7007 F6
7008 F6
7009 G7
7010 H6
7011 H8
7012 D7
7013 D6
7014 D8
7300 B7
7301 B6
7310 B8
F100 B6
F101 B7
F104 B8
F107 B6
F108 B9
F600 H6
I189 F7
I191 F6
I196 F6
I200 G5
I208 F9
I210 G7
I211 G6
I214 H7
I215 H8
I219 H8
I221 H6
I241 D7
I242 D6
I245 D7
I246 D8
I247 D8
I251 D6
U130 B7
U192 G9
U224 G9
U276 B6
U277 D6

■ SCHEMATIC DIAGRAM

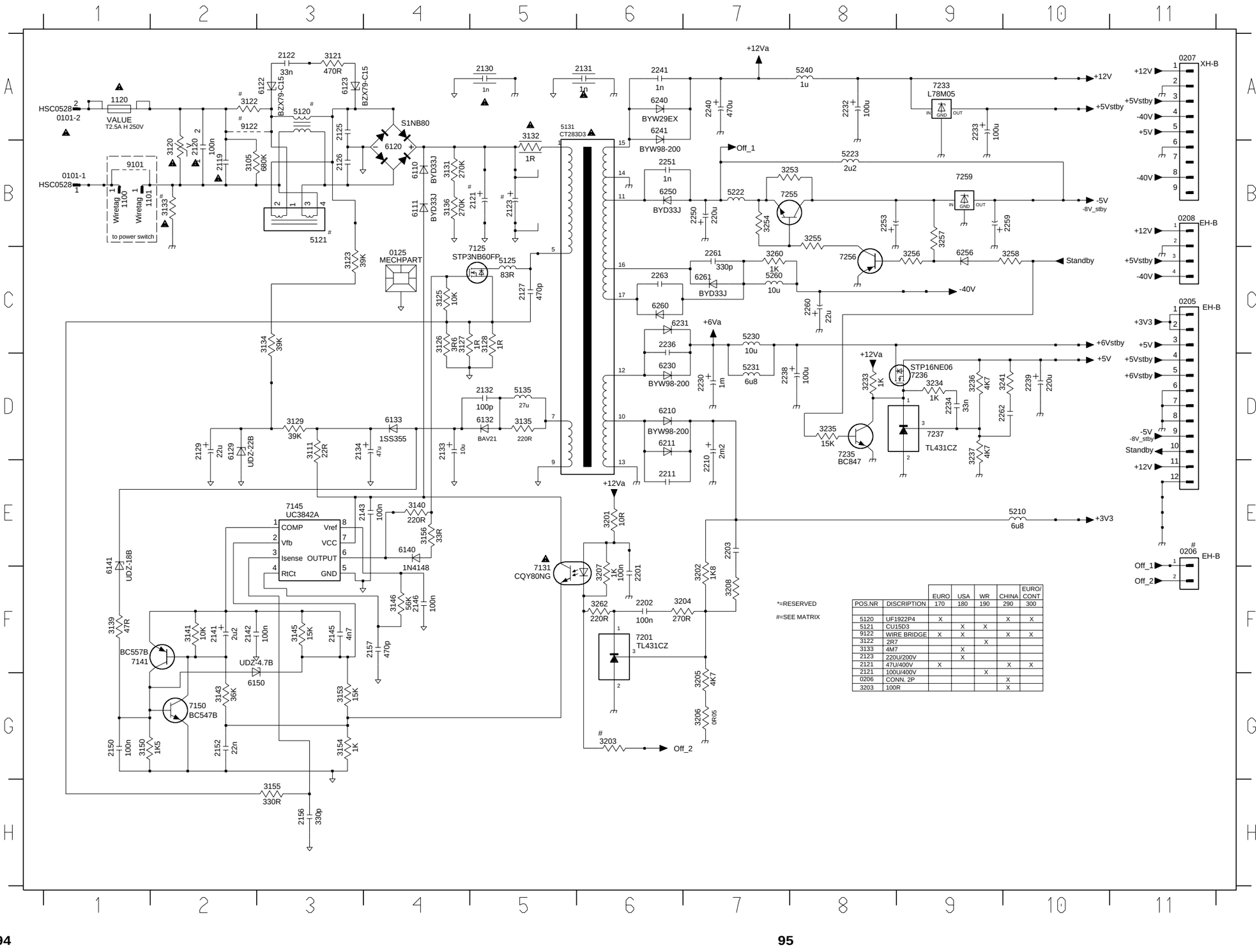
DISPLAY

A1 : FRONT DISPLAY PCB



■ SCHEMATIC DIAGRAM

POWER (B, G)



POS.NR	DISCRIPTION	EURO 170	USA 180	WR 190	CHINA 290	EURO/ CONT 300
5120	UF1922P4	X			X	X
5121	CU15D3		X	X		
9122	WIRE BRIDGE	X	X		X	X
3122	2R7			X		
3133	4M7		X			
2123	220U/200V		X			
2121	47U/400V	X			X	X
2121	100U/400V			X		
0206	CONN. 2P				X	
3203	100R				X	

0101-1 B1
0101-2 A1
0125 C4
0205 C11
0206 E11
0207 A11
0208 B11
1100 B1
1101 B1
1120 A1
2119 B2
2120 B2
2121 B5
2122 A3
2123 B5
2125 A3
2126 B3
2127 C5
2129 D2
2130 A5
2131 A6
2132 D5
2133 D4
2134 D3
2141 F2
2142 F2
2143 F4
2145 F3
2146 F4
2150 G1
2152 G2
2156 H3
2157 F4
2201 F6
2202 F6
2203 E7
2210 E7
2211 E6
2230 D7
2232 A8
2233 A9
2234 D9
2236 C6
2238 D7
2239 D10
2240 A7
2241 A6
2250 B7
2251 B6
2253 B8
2259 B10
2260 C8
2261 C7
2262 D10
2263 C6
3105 B2
3111 D3
3120 B2
3121 A3
3122 A2
3123 C3
3125 C4
3126 C4
3127 C4
3128 C5
3129 D3
3131 B4
3132 A5
3133 B2
3134 C3
3135 D5
3136 B4
3139 F1
3140 E4
3141 F2
3143 G2
3145 F3
3146 F4
3150 G1
3153 G3
3154 G3
3155 H3
3156 E4
3201 E6
3202 F7
3203 G6
3204 F6
3205 G7
3206 G7
3207 F6
3208 F7
3233 D8
3234 D9
3235 D8
3236 D9
3237 D9
3241 D10
3253 B8
3254 B7
3255 B8
3256 C9
3257 B9
3258 C10
3260 C7
3262 F6
5120 A3
5121 B3
5125 C5
5131 A5
5135 D5
5210 E10
5222 B7
5223 B8
5230 C7
5231 D7
5240 A8
5260 C7
6110 B4
6111 B4
6120 B4
6122 A3
6123 A3
6129 D2
6132 D5
6133 D4
6140 E4
6141 E1
6150 G2
6210 D6
6211 D6
6230 D6
6231 C6
6240 A6
6241 A6
6250 B6
6256 C9
6260 C6
6261 C7
7125 C5
7131 F5
7141 F1
7145 E3
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7233 A9
7235 D8
7236 D9
7237 D9
7255 B7
7256 C8
7259 B9
9101 B1
9122 A2