2. Safety Information, General Notes & Lead Free Requirements

2.1 Safety Instructions

2.1.1 General Safety

Safety regulations require that during a repair:
- Connect the unit to the mains via an isolation transformer.
- Replace safety components, indicated by the symbol ⚠ , only by components identical to the original ones. Any other component substitution (other than original type) may increase risk of fire or electrical shock hazard.

Safety regulations require that after a repair, you must return the unit in its original condition. Pay, in particular, attention to the following points:
- Route the wires/cables correctly, and fix them with the mounted cable clamps.
- Check the insulation of the mains lead for external damage.
- Check the electrical DC resistance between the mains plug and the secondary side:
  1. Unplug the mains cord, and connect a wire between the two pins of the mains plug.
  2. Set the mains switch to the 'on' position (keep the mains cord unplugged!).
  3. Measure the resistance value between the mains plug and the front panel, controls, and chassis bottom.
  4. Repair or correct unit when the resistance measurement is less than 1 MΩ.
  5. Verify this, before you return the unit to the customer/ user (ref. UL-standard no. 1492).
  6. Switch the unit 'off', and remove the wire between the two pins of the mains plug.

2.1.2 Laser Safety

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

Laser Device Unit

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

Figure 2-1

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

2.2 Warnings

2.2.1 General

- All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD, ⚠). Careless handling during repair can reduce life drastically. Make sure that, during repair, you are at the same potential as the mass of the set by a wristband with resistance. Keep components and tools at this same potential. Available ESD protection equipment:
  – Complete kit ESD3 (small tablemat, wristband, connection box, extension cable and earth cable) 4822 310 10671.
  – Wristband tester 4822 344 13999.
- Be careful during measurements in the live voltage section. The primary side of the power supply, including the heatsink, carries live mains voltage when you connect the player to the mains (even when the player is 'off'!). It is possible to touch copper tracks and/ or components in this unshielded primary area, when you service the player. Service personnel must take precautions to prevent touching this area or components in this area. A 'lightning stroke' and a stripe-marked printing on the printed wiring board, indicate the primary side of the power supply.
- Never replace modules, or components, while the unit is 'on'.

2.2.2 Laser

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

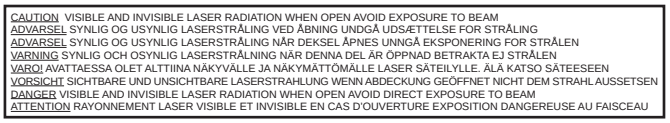


Figure 2-2

2.3 Lead Free Requirement

Information about Lead-free produced sets

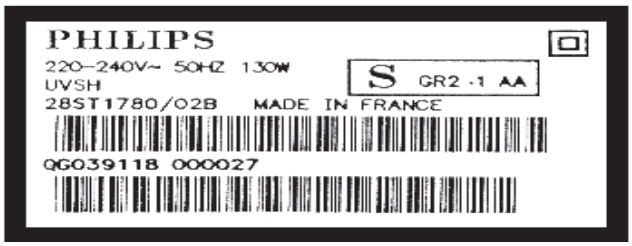
Philips CE is starting production of lead-free sets from 1.1.2005 onwards.

INDENTIFICATION:

Regardless of special logo (not always indicated) 

One must treat all sets from **1 Jan 2005** onwards, according next rules.

Example S/N:



Bottom line of typeplate gives a 14-digit S/N. Digit 5&6 is the year, digit 7&8 is the week number, so in this case 1991 wk 18

So from 0501 onwards = from 1 Jan 2005 onwards

Important note: In fact also products of year 2004 must be treated in this way as long as you avoid mixing solder-alloys (leaded/ lead-free). So best to always use SAC305 and the higher temperatures belong to this.

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

- Use only lead-free solder alloy Philips SAC305 with order code 0622 149 00106. If lead-free solder-pate is required, please contact the manufacturer of your solder-equipment. In general use of solder-paste within workshops should be avoided because paste is not easy to store and to handle.
- Use only adequate solder tools applicable for lead-free solder alloy. The solder tool must be able
  - o To reach at least a solder-temperature of 400°C,
  - o To stabilize the adjusted temperature at the solder-tip
  - o To exchange solder-tips for different applications.
- Adjust your solder tool so that a temperature around 360°C – 380°C is reached and stabilized at the solder joint. Heating-time of the solder-joint should not exceed ~ 4 sec. Avoid temperatures above 400°C otherwise wear-out of tips will rise drastically and flux-fluid will be destroyed. To avoid wear-out of tips switch off un-used equipment, or reduce heat.
- Mix of lead-free solder alloy / parts with leaded solder alloy / parts is possible but PHILIPS recommends strongly to avoid mixed solder alloy types (leaded and lead-free). If one cannot avoid or does not know whether product is lead-free, clean carefully the solder-joint from old solder alloy and re-solder with new solder alloy (SAC305).
- Use only original spare-parts listed in the Service-Manuals. Not listed standard-material (commodities) has to be purchased at external companies.
- Special information for BGA-ICs:
  - always use the 12nc-recognizable soldering temperature profile of the specific BGA (for de-soldering always use the lead-free temperature profile, in case of doubt)
  - lead free BGA-ICs will be delivered in so-called ‘dry-packaging’ (sealed pack including a silica gel pack) to protect the IC against moisture. After opening, dependent of MSL-level seen on indicator-label in the bag, the BGA-IC possibly still has to be baked dry. (MSL=Moisture Sensitivity Level). This will be communicated via AYS-website.
  Do not re-use BGAs at all.
- For sets produced before 1.1.2005 (except products of 2004), containing leaded solder-alloy and components, all needed spare-parts will be available till the end of the service-period. For repair of such sets nothing changes.
- On our website **www.atyourservice.ce.Philips.com** you find more information to:
  - BGA-de-/soldering (+ baking instructions)
  - Heating-profiles of BGAs and other ICs used in Philips-sets

  You will find this and more technical information within the “magazine”, chapter “workshop news”.

For additional questions please contact your local repair-helpdesk.

1. Alignments & Test Procedures

1.1. Reprogramming Procedure of NVM on the Digital Board

The NVM, item 7809 on the Digital board contains the following:

- Slash information (or slash version)
- IEEE Unique number

The slash version and IEEE Unique number are stored at the end of the production line of the set.

In case of failure the Digital board is replaced by a new board (the NVM is an empty device). After replacement of the NVM the set can only startup in Diagnostic software mode because the Slash version is not in placed.

By way of commands via the Diagnostic Software (DS) and hyperterminal connection to the PC, these factory settings must be restored into the NVM.

1.1.1. Slash Version

The slash version is stored with DS command 1217 followed by the slash version as parameter.
The slash versions used in DVDR7310H are as follows:

- DVDR7310H/05 11208
- DVDR7310H/31 11207
- DVDR7310H/51 11222
- DVDR7310H/58 11207

Example:
DS:> 1217 11221

With DS command 1218 the slash version can be displayed

1.1.2. IEEE Unique Number

1. Note the serial number of the set example:
   VN050136130156
   - VN = production center (VN….Szekesfehervar).
     According to UAW-500: V=22 and N=14
   - 05 = change code (this is not used for this calculation)
   - 01 = YEAR
   - 36 = Production WEEK
   - 130156 = Lot and SERIAL number
2. Calculate the unique number: this number always exists out of 10 hexadecimal numbers
3. First 5 numbers: First we calculate a decimal number according to formula below:
   - 35828*YEAR + 676*WEEK + 26*A + H + 8788
   - The figures are fixed, YEAR + WEEK + production center code (A + H) are variables
   - Example: 35828*01 + 676*36 + 26*1 + 8 + 8788 = 68986 (decimal)
   - Then we translate this decimal number to a hexadecimal number.
   - Example: 68986 = 10D7A (hex)
4. Last 5 numbers: The last 5 numbers exist out of the Lot and SERIAL number.
   We have to translate the decimal number to the next 5 hexadecimal numbers:
   Example: 130156 (decimal) = 1FC6C (hex)
5. This IEEE Unique number (10-digit hexadecimal number) is stored with DS command 1207.

   Example:
   DS:>1207 10D7A1FC6C
   120700: Test OK@

The set has now its original IEEE unique number.

With DS command 1208 the slash version can be displayed

1.2. Reprogramming Procedure of NVM on the Digital Board

The Boot Eeprom, item 7810 on the Digital board contains the “Diversity String” that tells the software during

startup which hardware version is present. This setting is stored during the production of the Digital board.

In case of failure and the Digital board has been replaced it is adviseable to ensure that the Eeprom containing the correct boot script.
With DS command 1228 the settings can be displayed.

Note: An error in the Diversity string will render the set not able to boot-up and the Digital board becomes defective

Via the Dignostic Software the “Diversity String” is stored with the command 1226, followed by the “Diversity String” as parameter.

The Diversity strings used in BHDR2/02 is as follows:
444248499BFB40014630355F330000005504030000010102000101004008080044564452323030312E303031
0102020808000000010002010000000000000000

Example:
DS:> 1226
444248499BFB40014630355F330000005504030000010102000101004008080044564452323030312E303031
0102020808000000010002010000000000000000
Test OK @

1.3. Laser Control Adjustment

No Laser control adjustment is necessary because the Basic Engine (Drive) delivered by the factory is already pre-aligned to optimum matching between the Frontend (Servo) Board & the OPU unit in the Basic Engine.

1.3.1. Adjustment procedure

This adjustment is done with the DSW software nucleus 931. The adjustments takes about 30 seconds and the data is stored in the OPU Eeprom.

Example:
DS:> 931
93100
Test OK @

1.4. Procedure for Formatting a new HDD drive

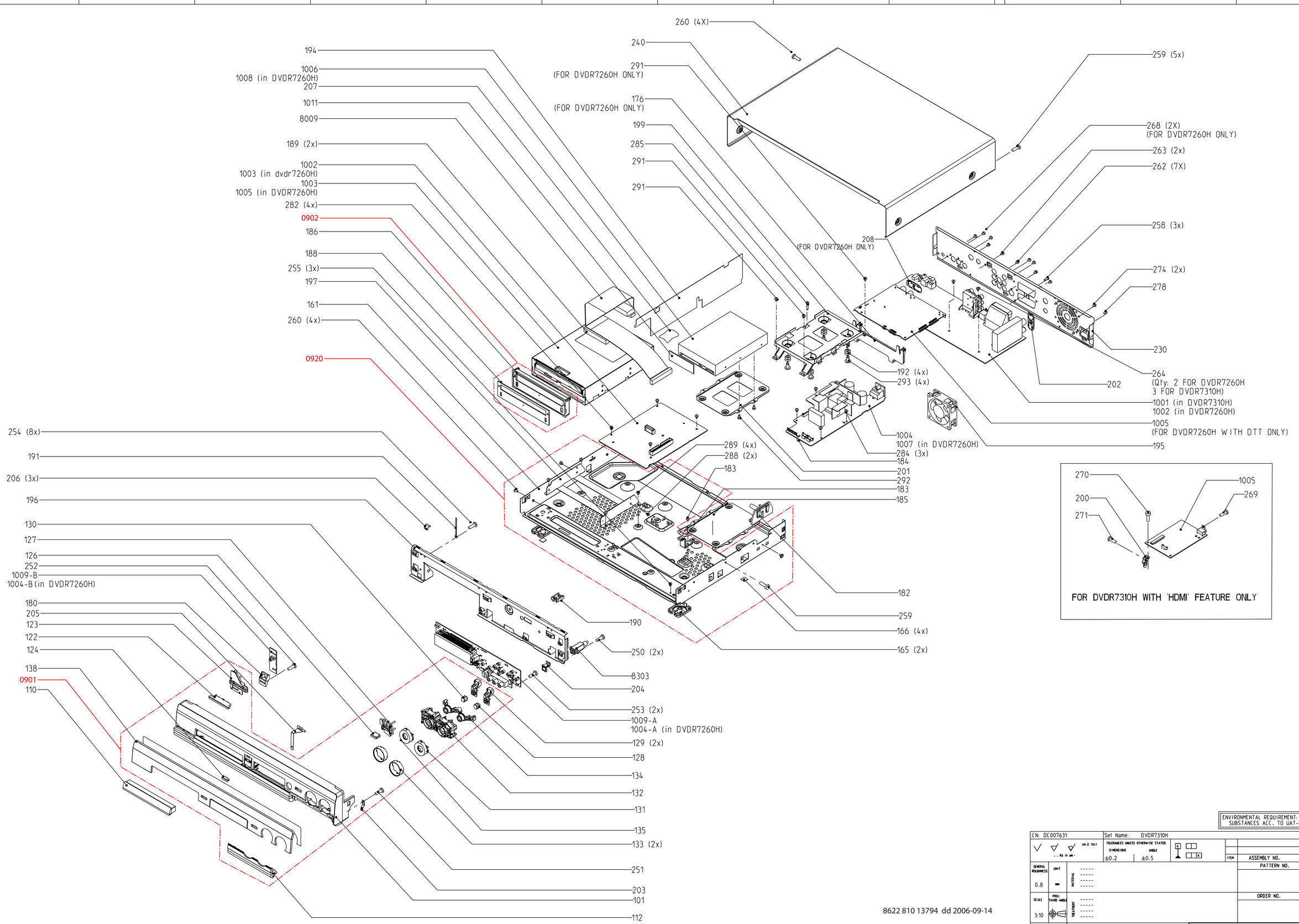
In case of failure the HDD is replaced by a new unformatted HDD.
To prepare the new HDD for use it must be formatted with a Master DVD via the Diagnostic software nucleus 2107.

Example:
DS:> 2107
Please insert the Master DVD <OK>
Executing transfer table 1 of 4.....
Please wait... <OK>
210700: Transfer OK
Test OK @

DVDR7310H/05/31/51/58 Service Part List

0110	3139 244 14751		COVER TRAY DVDR7310H	
0182	3103 604 00291		SCREW SAFETY HOLDER	
0184	3103 604 01311		SPACER 9	
0189	3103 603 20141		SPACER RUBBER IDE CABLE	
0190	2422 015 00493		SADDLE WIRE NY6/6 NT 19.1MM B	
0192	3103 604 01861		DAMPER HDD	
0194	3103 603 20201		AIR GUIDE	
0195	2822 031 00041		FAN 12VDC 0.8W 3100RPM B	
0202	3103 601 20612		SPRING GROUND TUNER	
0204	3103 601 20212		SPRING I-LINK	
0205	3103 601 20291		SPRING ESD	
0206	3103 601 20231		SPRING GROUND	
0230	3139 247 61211		PLATE BACK HDMI EUR DVDR7300H	
0240	3103 607 51621		COVER ASSY DVDR5300H	
0292	2522 200 98475		SCR PAN TORX ST BK #6-32X6	
0293	3103 600 30021		SCREW-DAMPER-M3	
0341	2422 549 00739		REMOTE CONTR DVDR5350H/7300H B	
0345	2422 070 98135	$	MAINSCORD UK 5A 1M8 VH BK B	/05
0345	2422 070 98151	$	MAINSCORD EUR 1M5 BK B	/31/51/58
0351	2422 076 00825		CBLE SCART 1M5 SCART 21P BK B	
0352	2422 076 00522		G-LINK CABLE & TRANSMITTER	
0353	3103 140 25022		CONNECT. CABLE PAL	
0901	3143 027 66211		FRONT CAB ASSY DVDR7310H EUR	
0902	3143 027 63321		COVER DUST ASSY DVDR9000H	
0920	3143 027 66201		FRAME ASSY DVDR7310H	
1001	3103 608 51941		PBAS AB 04 E3/5300H	
1002	3139 248 86101		PCBAS CHRY-F05 DVDR7300H	
1003	3139 247 11362		MODULE DRIVE D4.3 CLOSED	
1004	3139 247 11985	$	MODULE PSU 05H8000 EU	
1005	3103 608 51872		PBAS PSCAN HDMI VIE L	
1006	2822 062 00099		HDD 3.5 250GB 6L250R0 (MAXT)Y	
1009	3103 608 51242		PBAS DC 04 N1	
1011	2422 549 00107		FERRITE CORE RP 25X5X12 Y	
1012	3103 601 00861		FFC FOIL 40P/180/40P BD UL	
1013	3139 248 86111		PCBAS IDE HDD DVDR7300H	
8001	3103 601 00591		CBLE KR 11P/160/11P KR UL	

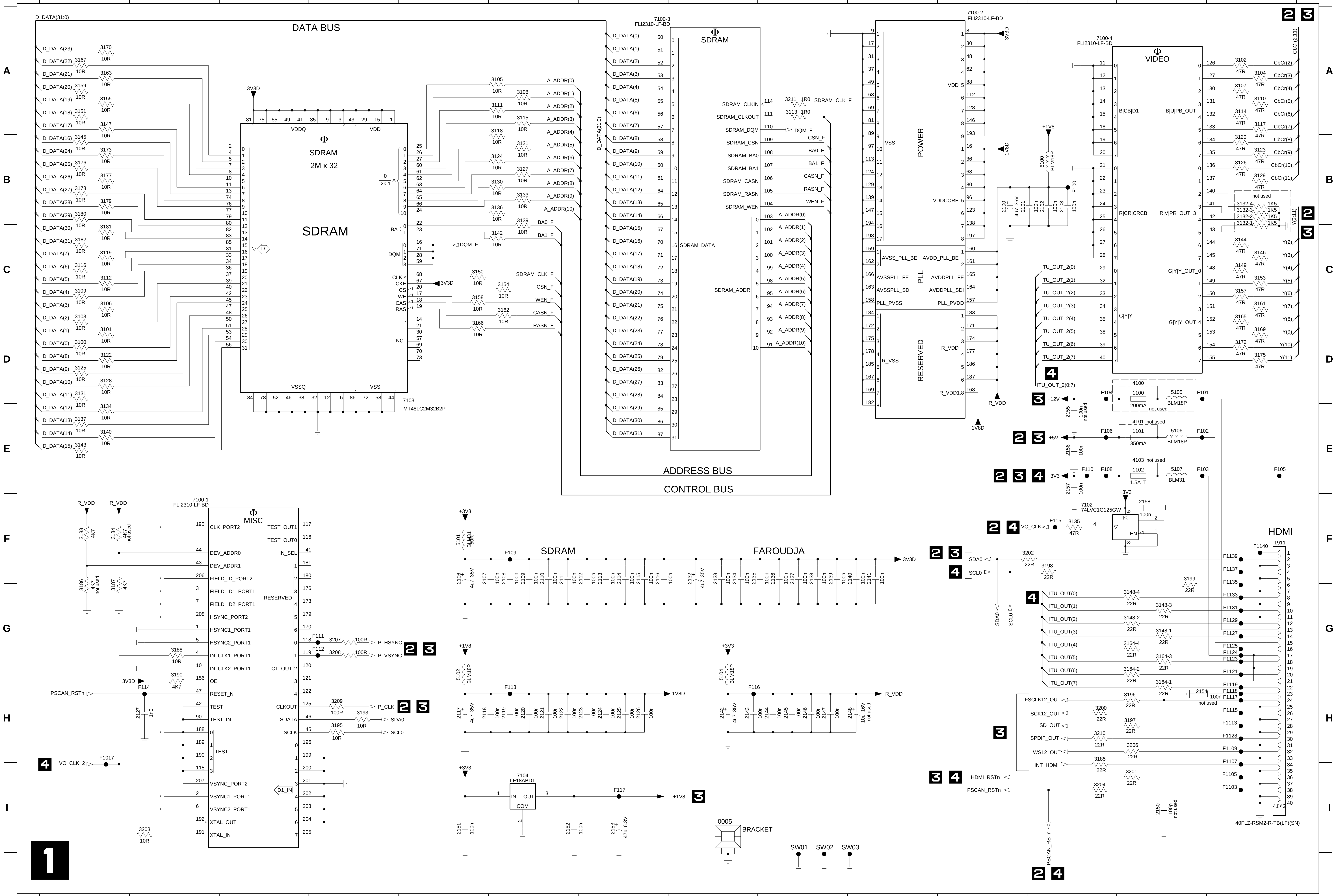
8002	3103 601 00631	FFC FOIL 10P/315/10P BD FLD UL
8003	3103 601 00751	FFC FOIL 22P/220/22P BD FLD UL
8004	3103 601 00442	CBLE KR 12P/130/12P UL
8005	3103 601 00611	CBLE IDE 40P/400/40P IDE UL
8006	3103 601 00561	CBLE EHR 4P/430/4P LC UL
8007	3103 601 00721	FFC FOIL 22P/220/22P BD FLD UL
8008	3103 601 00571	CBLE EHR 4P/130/4P LC UL
8009	3139 241 01451	FFC FOIL 40P/280/40P BD 0.5MMP
8010	3139 111 02141	FFC FOIL 07P/100/07P BD 1.0MMP
8011	3103 601 00651	FFC FOIL 13P/600/13P AD UL
8012	3103 601 00311	KR 9POL GESCH 370MM
8013	3103 601 00361	IEEE 1394 CHRYSALIS 350MM



8622 810 13794 dd 2006-09-14

ENVIRONMENTAL REQUIREMENT: NO BANNED SUBSTANCES ACC. TO UAT-0480/100

CN: DC007631	Set Name: DVDR7310H		
UM-D 104	TOLERANCES UNLESS OTHERWISE STATED DIMENSIONS ±0.2 ANGLE ±0.5	ITEM	ASSEMBLY NO. / QUANT.
GENERAL ROUGHNESS 0.8 UNIT mm MATERIAL -----			PATTERN NO.
SCALE 3:10 PROJ THIRD ANGLE TREATMENT -----			ORDER NO. / QUANT.
CLASS NO. 2XX000	DVD RECORDER DVDR7310H/31	8622 810 13794	2006-07-07
NAME CUI HONG	SUPERS xxxx xxx xxxx 1 10 110 - 1		A1
SV CHECK	DATE 2006-07-07	© KONINKLIJKE PHILIPS ELECTRONICS N.V. 2006	



0005 I8	3158 C5		
1100 D13	3159 A1		
1101 E13	3161 C14		
1102 E13	3162 C6		
1911 F14	3163 A1		
2100 B11	3164-1 H13		
2101 B11	3164-2 G13		
2102 B12	3164-3 G13		
2103 B12	3164-4 G13		
2106 F5	3165 D14		
2107 F5	3166 D5		
2108 F6	3167 A1		
2109 F6	3169 D14		
2110 F6	3170 A1		
2111 F6	3172 D14		
2112 F7	3173 B1		
2113 F7	3175 D14		
2114 F7	3176 B1		
2115 F7	3177 B1		
2116 F7	3178 B1		
2117 H5	3179 B1		
2118 H5	3180 B1		
2119 H6	3181 C1		
2120 H6	3182 C1		
2121 H6	3183 F1		
2122 H6	3184 F1		
2123 H7	3185 H12		
2124 H7	3186 G1		
2125 H7	3187 G1		
2126 H7	3188 G2		
2127 H2	3190 H2		
2132 F8	3193 H4		
2133 F8	3195 H4		
2134 F8	3196 H13		
2135 F8	3197 H13		
2136 F9	3198 F12		
2137 F9	3199 F13		
2138 F9	3200 H12		
2139 F9	3201 I13		
2140 F10	3202 F12		
2141 F10	3203 I2		
2142 H8	3204 I12		
2143 H8	3206 H13		
2144 H9	3207 G4		
2145 H9	3208 G4		
2146 H9	3209 H4		
2147 H9	3210 H12		
2148 H10	3211 A9		
2150 I13	4100 D13		
2151 I5	4101 E13		
2152 I6	4103 E13		
2153 I7	5100 B12		
2154 H13	5101 F5		
2155 E12	5102 H5		
2156 E12	5104 H8		
2157 E12	5105 D13		
2158 F13	5106 E13		
3100 D1	5107 E13		
3101 D1	7100-1 F2		
3102 A14	7100-2 A11		
3103 D1	7100-3 A8		
3104 A14	7100-4 A12		
3105 A6	7102 F12		
3106 C1	7103 D5		
3107 A14	7104 I6		
3108 A6	F100 B12		
3109 C1	F101 D13		
3110 A14	F1017 H1		
3111 A6	F102 E13		
3112 C1	F103 E13		
3113 A9	F104 D12		
3114 A14	F105 E14		
3115 A6	F106 E12		
3116 C1	F108 E12		
3117 A14	F109 F6		
3118 A6	F110 E12		
3119 C1	F1103 I14		
3120 B14	F1105 I14		
3121 B6	F1107 I14		
3122 D1	F1109 H14		
3123 B14	F111 G4		
3124 B6	F1113 H14		
3125 D1	F1115 H14		
3126 B14	F1117 H14		
3127 B6	F1118 H14		
3128 D1	F1119 H14		
3129 B14	F112 G4		
3130 B6	F1121 H14		
3131 D1	F1123 G14		
3132-1 C14	F1124 G14		
3132-2 B14	F1125 G14		
3132-3 B14	F1127 G14		
3132-4 B14	F1128 H14		
3133 B6	F1129 G14		
3134 E1	F113 H6		
3135 F12	F1131 G14		
3136 B6	F1133 G14		
3137 E1	F1135 G14		
3139 B6	F1137 F14		
3140 E1	F1139 F14		
3142 C6	F114 H2		
3143 E1	F1140 F14		
3144 C14	F115 F12		
3145 B1	F116 H8		
3146 C14	F117 I7		
3147 A1	SW01 I9		
3148-1 G13	SW02 I9		
3148-2 G13	SW03 I10		
3148-3 G13			
3148-4 G13			
3149 C14			
3150 C5			
3151 A1			
3153 C14			
3154 C6			
3155 A1			
3157 C14			

CHN | SETNAME DVDR9000H
CLASS_NO 3PC332

PCB PANEL PSCAN HDMI COLUMBUS

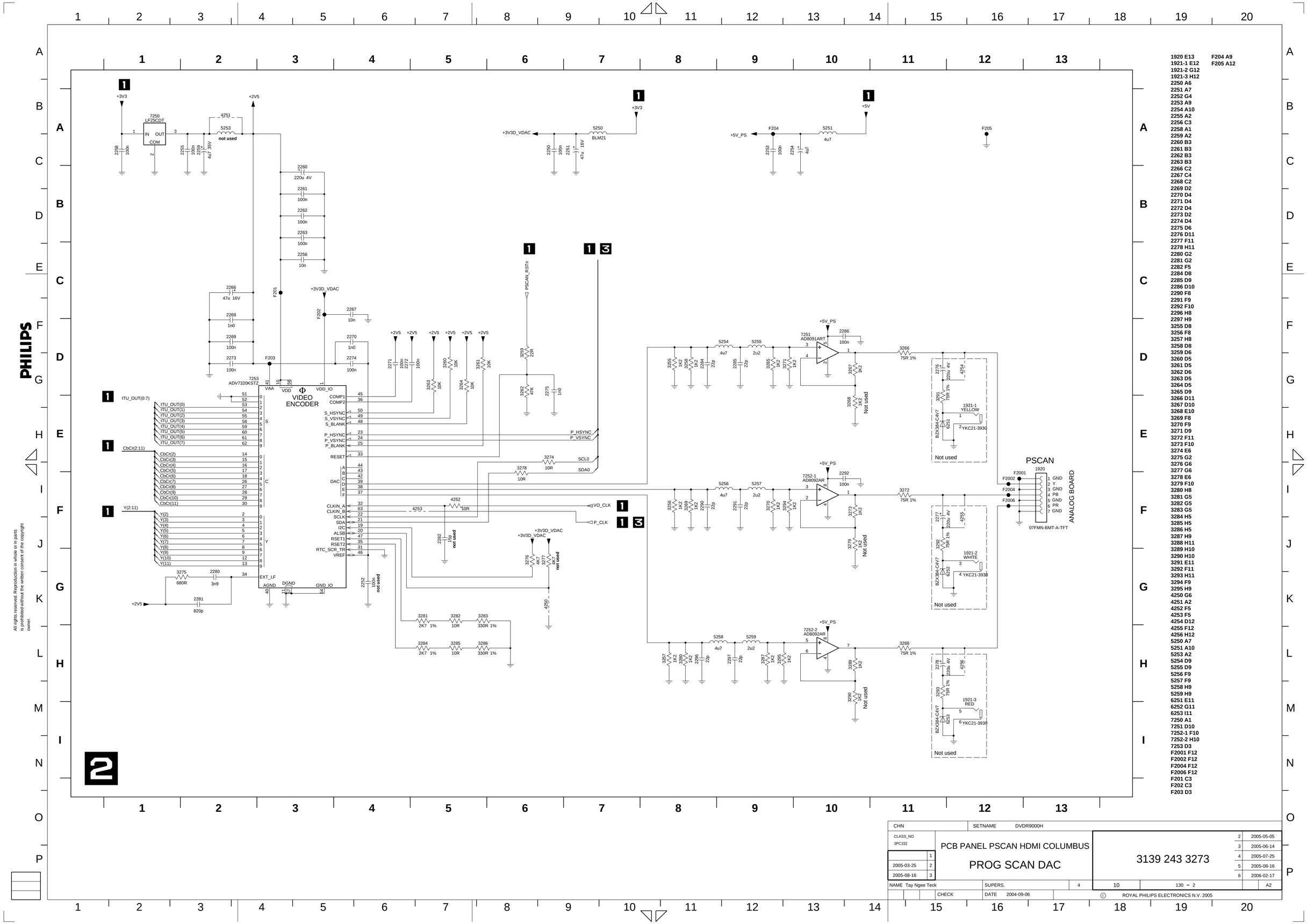
FAROUDJA

3139 243 3273

1	
2	2005-03-25
3	2005-08-16

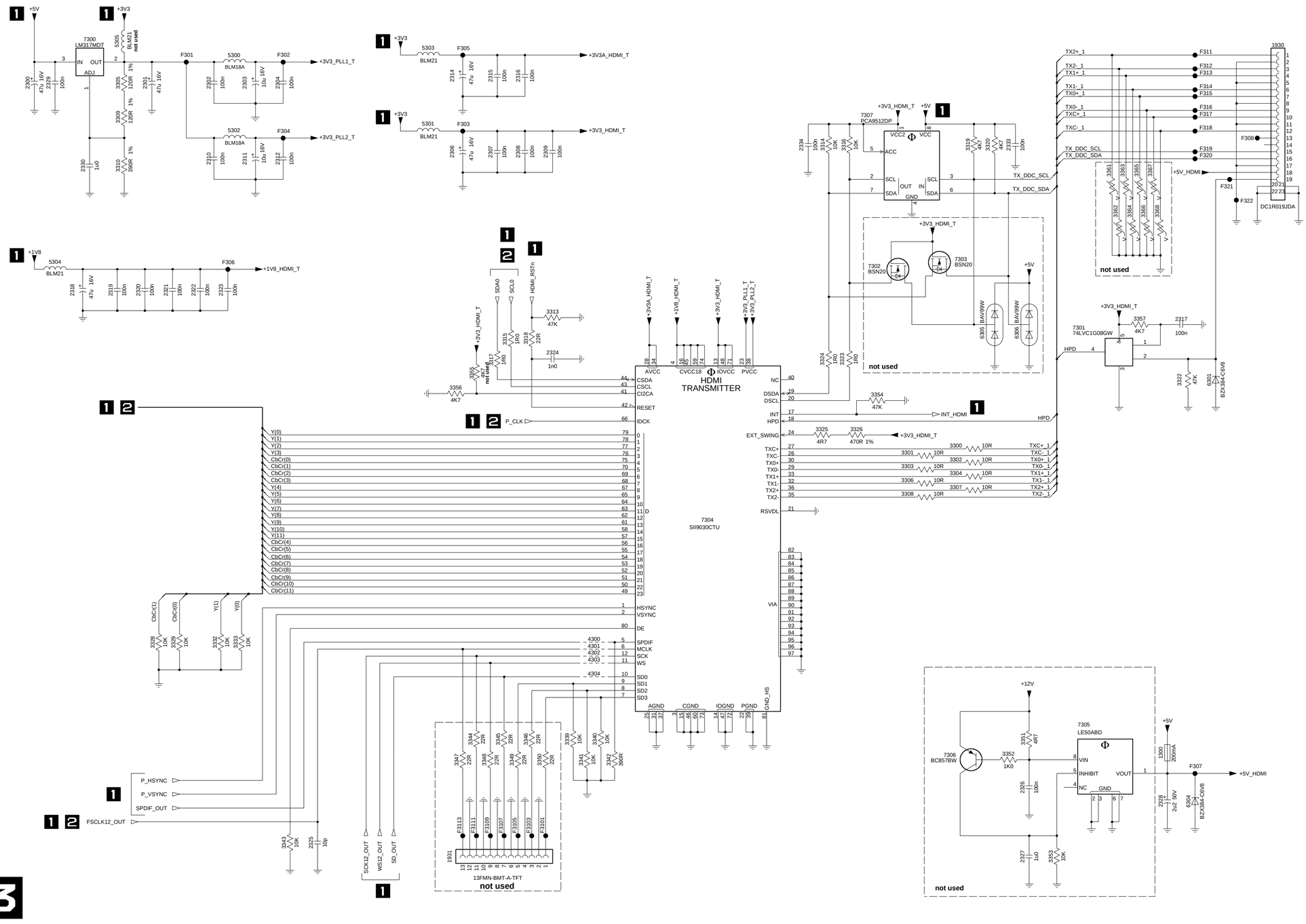
2	2005-05-05
3	2005-06-14
4	2005-07-25
5	2005-08-16
6	2006-02-17

NAME Tay Ngee Teck | SUPERS. | 4 | 10 | 130 = 1 | A2
CHECK | DATE 2004-09-06



1920 E13 F204 A9
1921-1 E12 F205 A12
1921-2 G12
1921-3 H12
2250 A6
2251 A7
2252 G4
2253 A9
2254 A10
2255 A2
2256 C3
2258 A1
2259 A2
2260 B3
2261 B3
2262 B3
2263 B3
2266 C2
2267 C4
2268 C2
2269 D2
2270 D4
2271 D4
2272 D4
2273 D2
2274 D4
2275 D6
2276 D11
2277 F11
2278 H11
2280 G2
2281 G2
2282 F5
2284 D8
2285 D9
2286 D10
2290 F8
2291 F9
2292 F10
2296 H8
2297 H9
3255 D8
3256 F8
3257 H8
3258 D8
3259 D6
3260 D5
3261 D5
3262 D6
3263 D5
3264 D5
3265 D9
3266 D11
3267 D10
3268 E10
3269 F8
3270 F9
3271 D9
3272 F11
3273 F10
3274 E6
3275 G2
3276 G6
3277 G6
3278 E6
3279 F10
3280 H8
3281 G5
3282 G5
3283 G5
3284 H5
3285 H5
3286 H5
3287 H9
3288 H11
3289 H10
3290 H10
3291 E11
3292 F11
3293 H11
3294 F9
3295 H9
4250 G6
4251 A2
4252 F5
4253 F5
4254 D12
4255 F12
4256 H12
5250 A7
5251 A10
5253 A2
5254 D9
5255 D9
5256 F9
5257 F9
5258 H9
5259 H9
6251 E11
6252 G11
6253 I11
7250 A1
7251 D10
7252-1 F10
7252-2 H10
7253 D3
F2001 F12
F2002 F12
F2004 F12
F2006 F12
F201 C3
F202 C3
F203 D3

CHN	SETNAME DVDR9000H		
CLASS_NO 3PC332	PCB PANEL PSCAN HDMI COLUMBUS	2	2005-05-05
		3	2005-06-14
2005-03-25 2	PROG SCAN DAC	4	2005-07-25
2005-08-16 3	3139 243 3273	5	2005-08-16
NAME Tay Ngee Teck	SUPERS. 4	6	2006-02-17
CHECK	DATE 2004-09-06	10	130 – 2 A2



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		3	2005-06-14
1	HDMI Tx	4	2005-07-25
2005-03-25 2		5	2005-08-16
2005-08-16 3	3139 243 3273	6	2006-02-17
NAME Tay Ngee Teck	SUPERS. 4	10	130 – 3 A2
CHECK	DATE 2004-09-06	© ROYAL PHILIPS ELECTRONICS N.V. 2005	

1300 H12
1930 A13
1931 I5
2300 A1
2301 A2
2302 A3
2303 A3
2304 A3
2306 B5
2307 B5
2308 B6
2309 B6
2310 B3
2311 B3
2312 B3
2314 A5
2315 A5
2316 A6
2317 D13
2318 C1
2319 C1
2320 C2
2321 C2
2322 C2
2323 C3
2324 D6
2325 I4
2326 H11
2327 I11
2328 I12
2329 A1
2330 B1
2333 B11
2334 B9
3300 E10
3301 E10
3302 E10
3303 E10
3304 E10
3305 A2
3306 E10
3307 E10
3308 E10
3309 A2
3310 B2
3313 C6
3314 B9
3315 D6
3316 B9
3317 D5
3318 D6
3319 B10
3320 B11
3322 D13
3323 D9
3324 D9
3325 E9
3326 E9
3328 G2
3329 G2
3332 G3
3333 G3
3339 H6
3340 H6
3341 H6
3342 H7
3343 I3
3344 H5
3345 H5
3346 H6
3347 H5
3348 H5
3349 H6
3350 H6
3351 H11
3352 H11
3353 I11
3354 D9
3355 D5
3356 D5
3357 D12
3361 B12
3362 B12
3363 B12
3364 B12
3365 B12
3366 B12
3367 B12
3368 B12
4300 G6
4301 G6
4302 G6
4303 G6
4304 G6
5300 A3
5301 B5
5302 B3
5303 A5
5304 C1
5305 A2
6301 D13
6304 I13
6305 D10
6306 D11
7300 A1
7301 D11
7302 C9
7303 C10
7304 F8
7305 H11
7306 H10
7307 A9
F301 A2
F302 A3
F303 B5
F304 B3
F305 A5
F306 C3
F307 H13
F308 B13
F310 I6
F3103 I6
F3105 I6
F3107 I6
F3109 I5
F311 A13
F3111 I5
F3113 I5
F312 A13
F313 A13
F314 A13
F315 A13
F316 A13
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F318 B13
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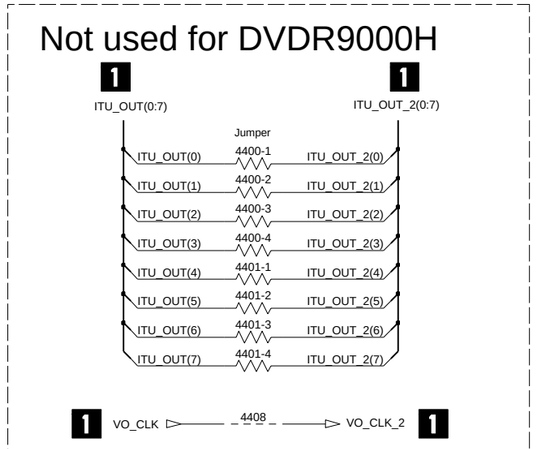
F322 B13

PHILIPS

Not used for DVDR9000H



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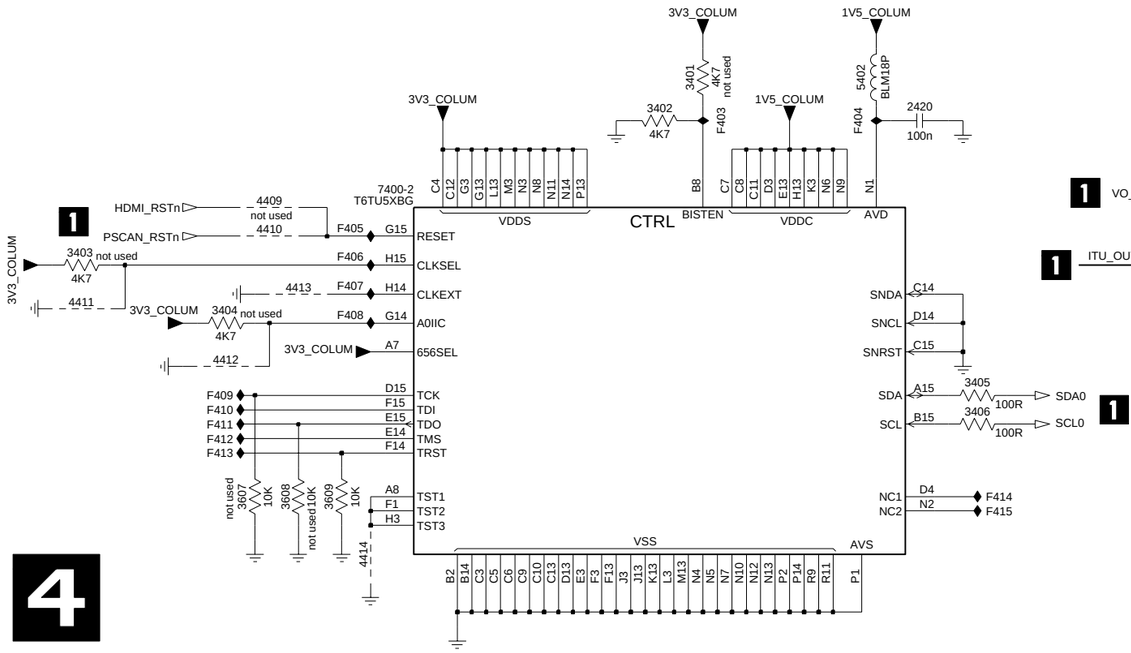
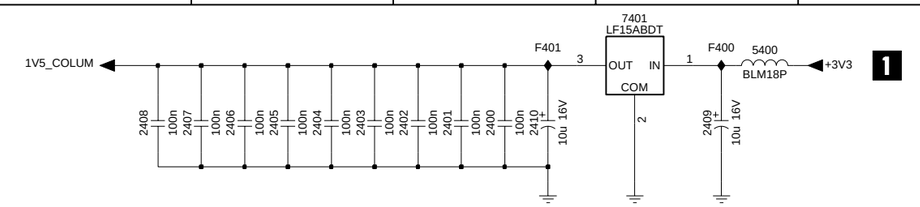
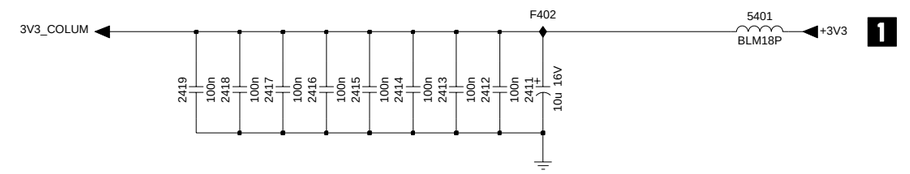
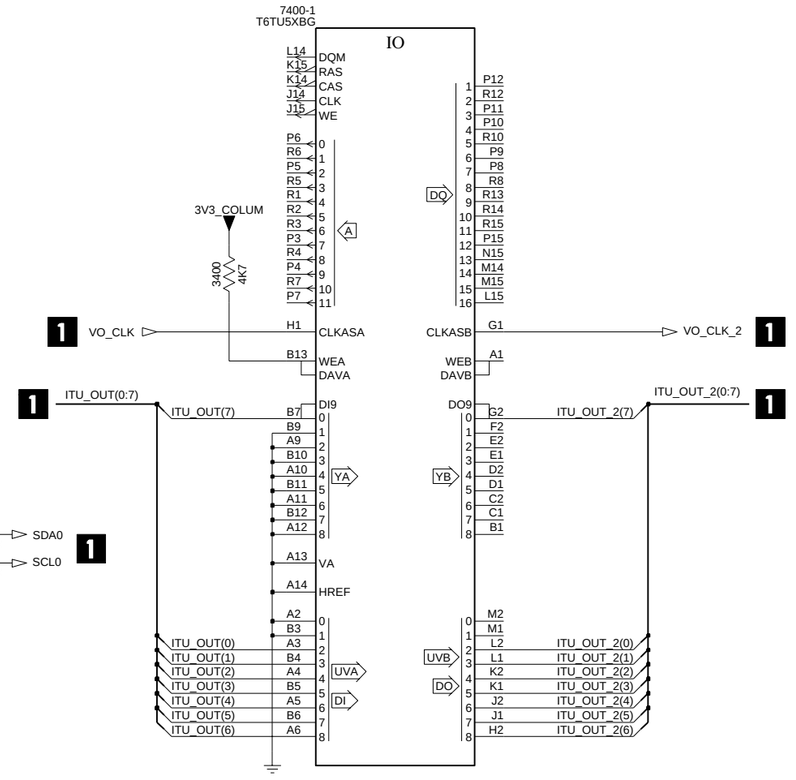








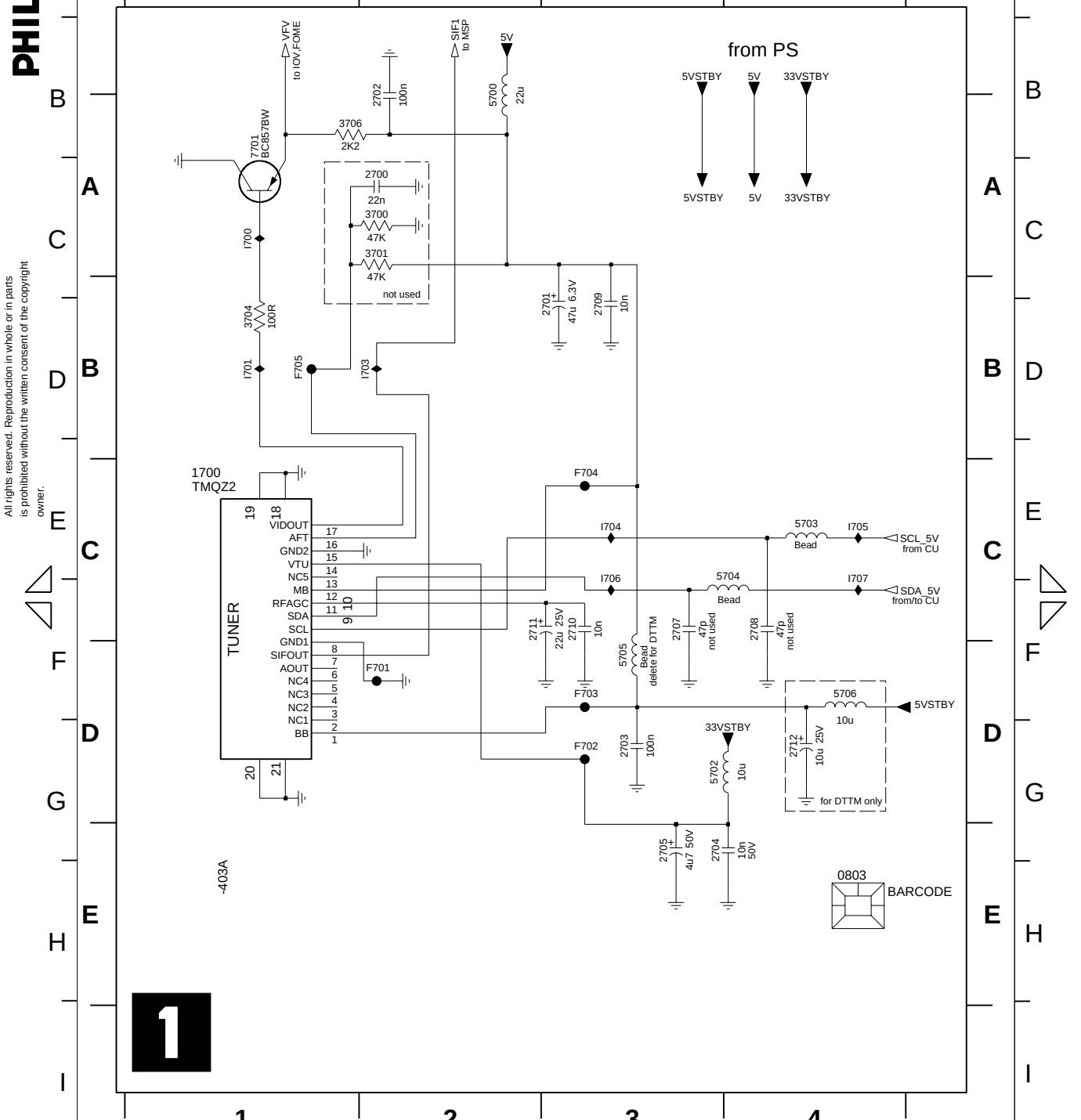
F481 F482
F483 F484

2400 A7
2401 A7
2402 A7
2403 A6
2404 A6
2405 A6
2406 A6
2407 A5
2408 A5
2409 A8
2410 A7
2411 B7
2412 B7
2413 B7
2414 B7
2415 B6
2416 B6
2417 B6
2418 B6
2419 B5
2420 D5
3400 D6
3401 D4
3402 D4
3403 D1
3404 E1
3405 E5
3406 E5
3607 F2
3608 F2
3609 F2
4400-1 A2
4400-2 A2
4400-3 B2
4400-4 B2
4401-1 B2
4401-2 B2
4401-3 B2
4401-4 B2
4408 C2
4409 D2
4410 D2
4411 E1
4412 E1
4413 E2
4414 F2
5400 A8
5401 B8
5402 D5
7400-1 C7
7400-2 D2
7401 A8
F400 A8
F401 A7
F402 B7
F403 D4
F404 D5
F405 D2
F406 D2
F407 E2
F408 E2
F409 E1
F410 E1
F411 E1
F412 E1
F413 E1
F414 F5
F415 F5

CHN		SETNAME DVDR9000H	
CLASS_NO 3PC332		PCB PANEL PSCAN HDMI COLUMBUS	
	1	COLUMBUS	3139 243 3273
2005-03-25	2		
2005-08-16	3		
NAME Tay Ngee Teck		SUPERS. 4	10 130 – 4 A3
CHECK		DATE 2004-09-06	© ROYAL PHILIPS ELECTRONICS N.V. 2005

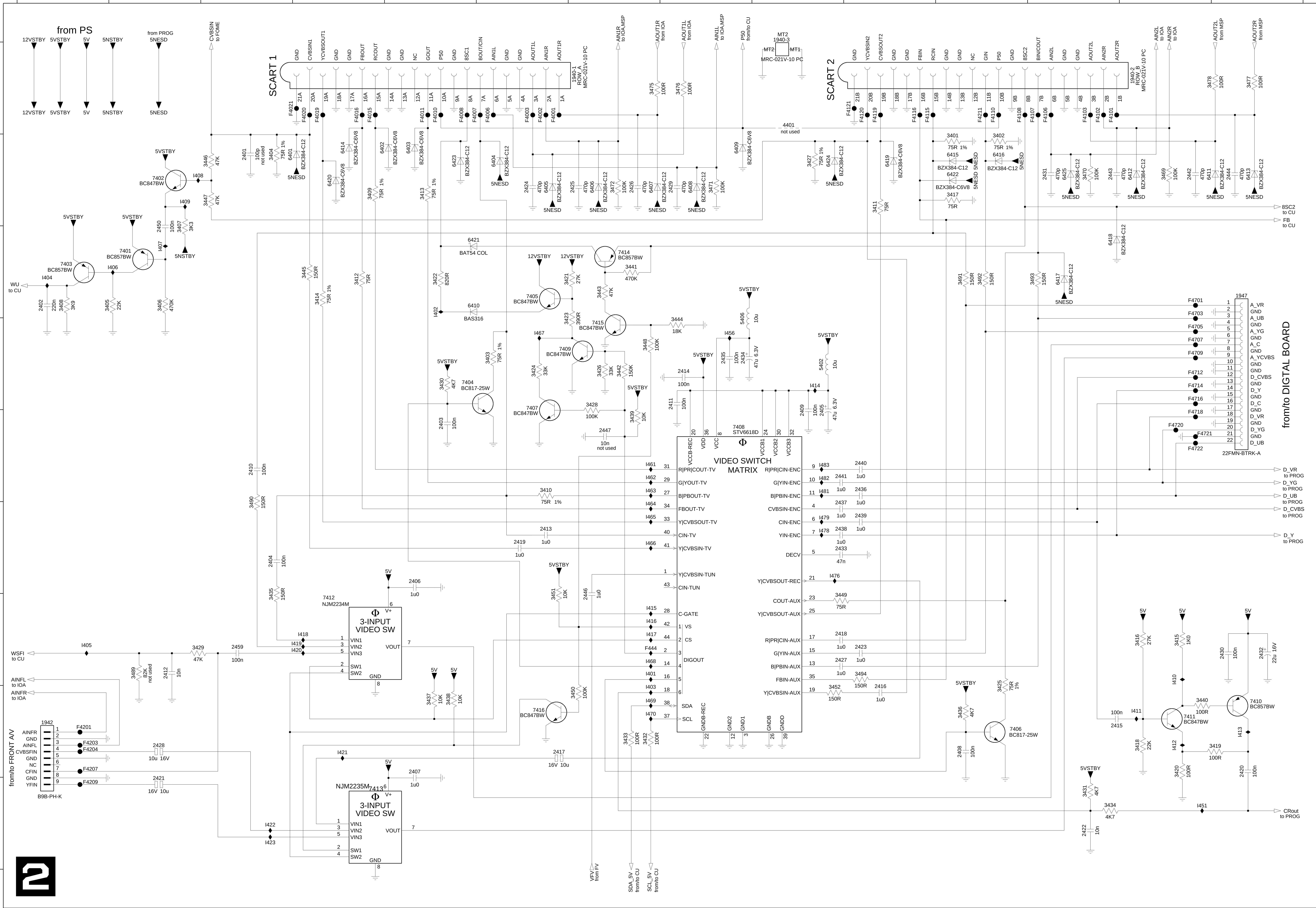
2	2005-05-05
3	2005-06-14
4	2005-07-25
5	2005-08-16
6	2006-02-17

0803 E4	2701 B3	2704 E3	2708 C4	2711 C1	3701 A2	5700 A2	5704 C4	7701 A1	F702 D3	F705 B1	I703 B2	I706 C3	
1700 E1	2702 A2	2705 E3	2709 B3	2712 D4	3704 B1	5702 D3	5705 D3	F700 D1	F703 D3	I700 A1	I704 C3	I707 C4	
2700 A2	2703 D3	2707 C3	2710 C1	3700 A2	3706 A1	5703 C4	5706 D4	F701 E3	F704 C3	I701 B1	I705 C4		



1

CHN	SETNAME dvdrw_2004		
CLASS_NO 3PB120	PB AB 04 E1	3103 603 3035	7 2006-01-27
			6 2005-07-07
	Frontend Video FV		0 2004-10-22
			0 2004-05-07
2004-03-26 3			0 2004-03-25
NAME Friedreich	SUPERS. 10	130 – 1	A4
CHECK	DATE 2003-01-13	© ROYAL PHILIPS ELECTRONICS N.V. 2005	



PHILIPS

2

1940-1 A7	6407 B7
1940-2 A13	6408 B8
1940-3 A9	6409 B8
1942 H1	6410 C5
1947 C14	6411 B13
2401 B3	6412 B13
2402 C1	6413 B14
2403 E5	6414 B4
2404 F3	6415 B11
2405 E9	6416 B11
2406 F5	6417 C12
2407 H5	6418 C12
2408 H11	6419 B10
2409 E9	6420 B4
2410 E3	6421 C5
2411 D8	6422 B11
2412 G2	6423 B5
2413 F6	6424 B9
2414 D8	6425 B12
2415 H12	7401 C2
2416 H10	7402 B2
2417 H6	7403 C1
2418 G9	7404 D5
2419 F6	7405 C6
2420 I14	7406 H11
2421 I2	7407 D6
2422 I12	7408 E8
2423 G10	7409 D7
2424 B6	7410 H14
2425 B7	7411 H13
2426 B7	7412 G4
2427 G9	7413 I4
2428 H2	7414 C7
2429 B8	7415 D7
2430 G14	7416 H6
2431 B12	F4001 A6
2432 G14	F4002 A6
2433 F9	F4003 A6
2434 D8	F4006 A6
2435 D8	F4007 A5
2436 E10	F4008 A5
2437 F9	F4010 A5
2438 F9	F4011 A5
2439 F10	F4015 A4
2440 E10	F4016 A4
2441 E9	F4019 A4
2442 B13	F4020 A4
2443 B12	F4021 A3
2444 B14	F4101 A12
2446 G7	F4102 A12
2447 E7	F4103 A12
2450 C2	F4106 A12
2459 G3	F4107 A12
3401 B11	F4108 A11
3402 B11	F4110 A11
3403 D6	F4115 A10
3404 B3	F4116 A10
3405 C1	F4119 A10
3406 C2	F4120 A10
3407 C2	F4121 A10
3408 C1	F4201 H1
3409 B4	F4203 H1
3410 E6	F4204 H1
3411 B10	F4207 H1
3412 C4	F4209 I1
3413 B5	F4211 A11
3414 C4	F444 G7
3415 G13	F4701 C13
3416 G13	F4703 C13
3417 B11	F4705 D13
3418 H13	F4707 D13
3419 H14	F4709 D13
3420 I13	F4712 D13
3421 C6	F4714 D13
3422 C5	F4716 D13
3423 D6	F4718 E13
3424 D6	F4720 E13
3425 H11	F4721 E13
3426 D7	F4722 E13
3427 B9	I401 G7
3428 D7	I402 C5
3429 G2	I403 H7
3430 D5	I404 C1
3431 I12	I405 G1
3432 H7	I406 C2
3433 H7	I407 C2
3434 I13	I408 B2
3435 G3	I409 B2
3436 H11	I410 H13
3437 H5	I411 H13
3438 H5	I412 H13
3439 E7	I413 H14
3440 H13	I414 D9
3441 C7	I415 G7
3442 D7	I416 G7
3443 C7	I417 G7
3444 D8	I418 G4
3445 C4	I419 G4
3446 B3	I420 G4
3447 B3	I421 H4
3448 D7	I422 I3
3449 G9	I423 I3
3450 H7	I451 I13
3451 G6	I456 D8
3452 H9	I461 E7
3469 B13	I462 E7
3470 B12	I463 E7
3471 B8	I464 F7
3472 B7	I465 F7
3475 A7	I466 F7
3476 A8	I467 D6
3477 A14	I468 G7
3478 A13	I469 H7
3489 G2	I470 H7
3490 F3	I476 F9
3491 C11	I478 F9
3492 C11	I479 F9
3493 C12	I481 E9
3494 G10	I482 E9
4401 A9	I483 E9
5402 D9	
5406 D8	
6401 B3	
6402 B4	
6403 B5	
6404 B6	
6405 B6	
6406 B7	

CHN | SETNAME dvdrw_2004

CLASS_NO 3PB120

PB AB 04 E1

Video In/Out IOV

3103 603 3035

7	2006-01-27
6	2005-07-07
0	2004-10-22
0	2004-05-27
0	2004-05-07

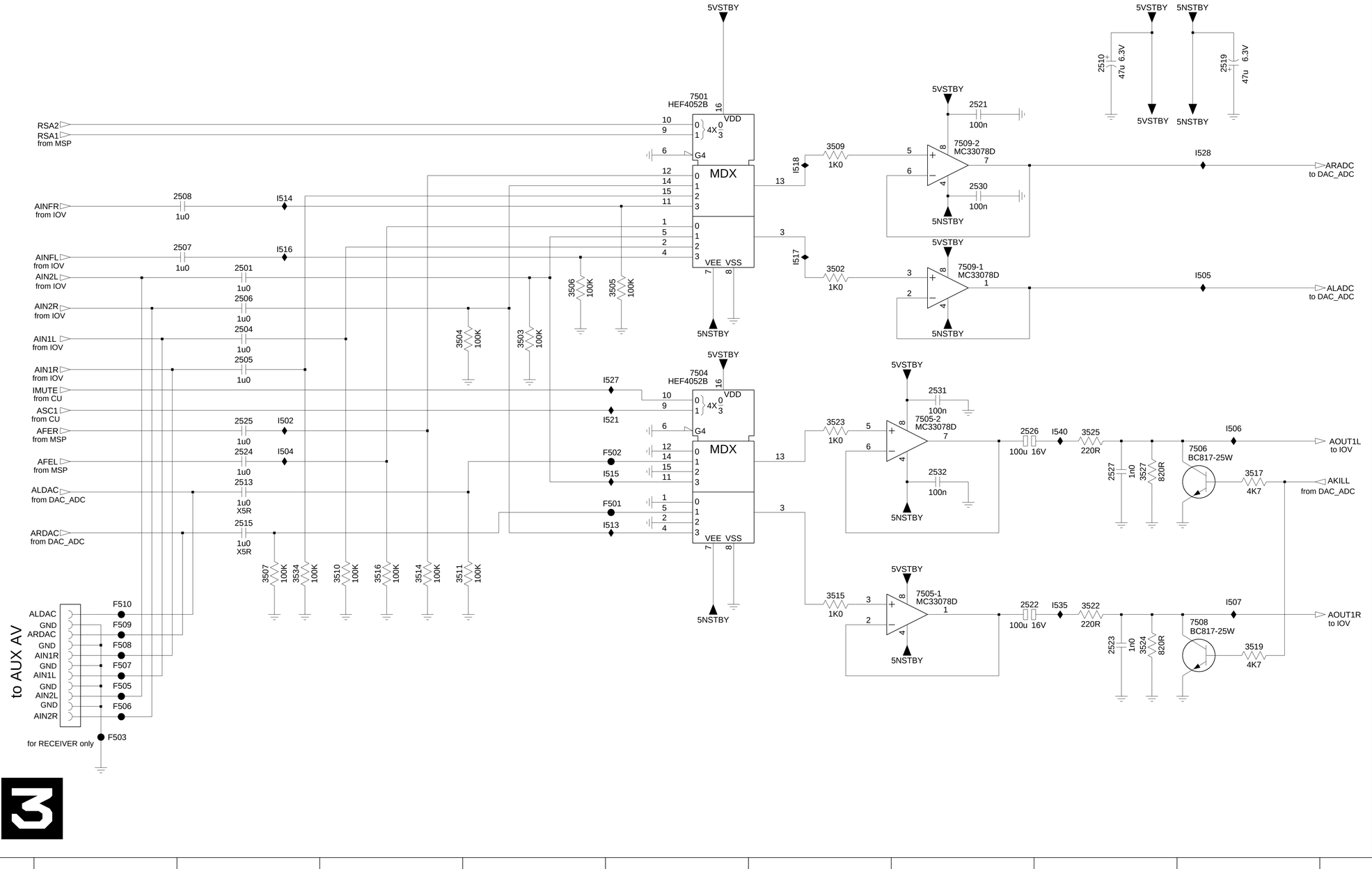
1 2 3

2004-03-26

NAME Neubauer | SUPERS. | 10 | 130 – 2 | A2

CHECK | DATE 2003-01-13

PHILIPS



3

1950 E1
2501 C2
2504 C2
2505 C2
2506 C2
2507 B2
2508 B2
2510 A8
2513 D2
2515 D2
2519 A9
2521 A7
2522 E7
2523 E8
2524 D2
2525 D2
2526 D7
2527 D8
2530 B7
2531 C7
2532 D7
3502 C6
3503 C4
3504 C3
3505 C5
3506 C4
3507 E4
3509 B6
3510 E3
3511 E3
3514 E3
3515 E6
3516 E3
3517 D9
3519 E9
3522 E8
3523 D6
3524 E8
3525 D8
3527 D8
3534 E2
7501 A5
7504 C5
7505-1 D7
7505-2 E7
7506 D9
7508 E9
7509-1 B7
7509-2 C7
F501 D5
F502 D5
F503 F1
F505 E1
F506 E1
F507 E1
F508 E1
F509 E1
F510 F1
I502 D2
I504 D2
I505 C9
I506 D9
I507 E9
I513 D5
I514 B2
I515 D5
I516 B2
I517 B6
I518 B6
I521 D5
I527 C5
I528 B9
I535 E8
I540 D8

CHN		SETNAME dvdrw_2004	
CLASS_NO 3PB120		PB AB 04 E1	3103 603 3035
	1	Audio In/Out IOA	7 2006-01-27
	2		6 2005-07-07
2004-03-26	3		0 2004-10-22
			0 2004-05-07
			0 2004-03-25
NAME Fischer		SUPERS. 10	130 – 3 A3
		CHECK DATE 2003-01-13	© ROYAL PHILIPS ELECTRONICS N.V. 2005

PHILIPS

1351 A3	2353 E1	3363 C1	3368 D1	5353 B3	7353 D2	9704 C3	F355 A1	F360 A1	F365 A1	F370 D3	F375 B3
1352 A3	3358 D4	3364 C1	3369 E3	6352 D1	7354 D2	F351 A4	F356 A2	F361 A2	F366 A2	F371 E2	I351 D3
1353 B3	3360 C1	3365 D1	4701 A3	6353 E1	7355 E4	F352 A4	F357 A2	F362 B4	F367 A1	F372 E4	I352 D1
1932 A1	3361 C3	3366 D3	5351 A3	7351 E3	9702 B3	F353 A3	F358 A1	F363 A1	F368 A1	F373 A1	I353 D1
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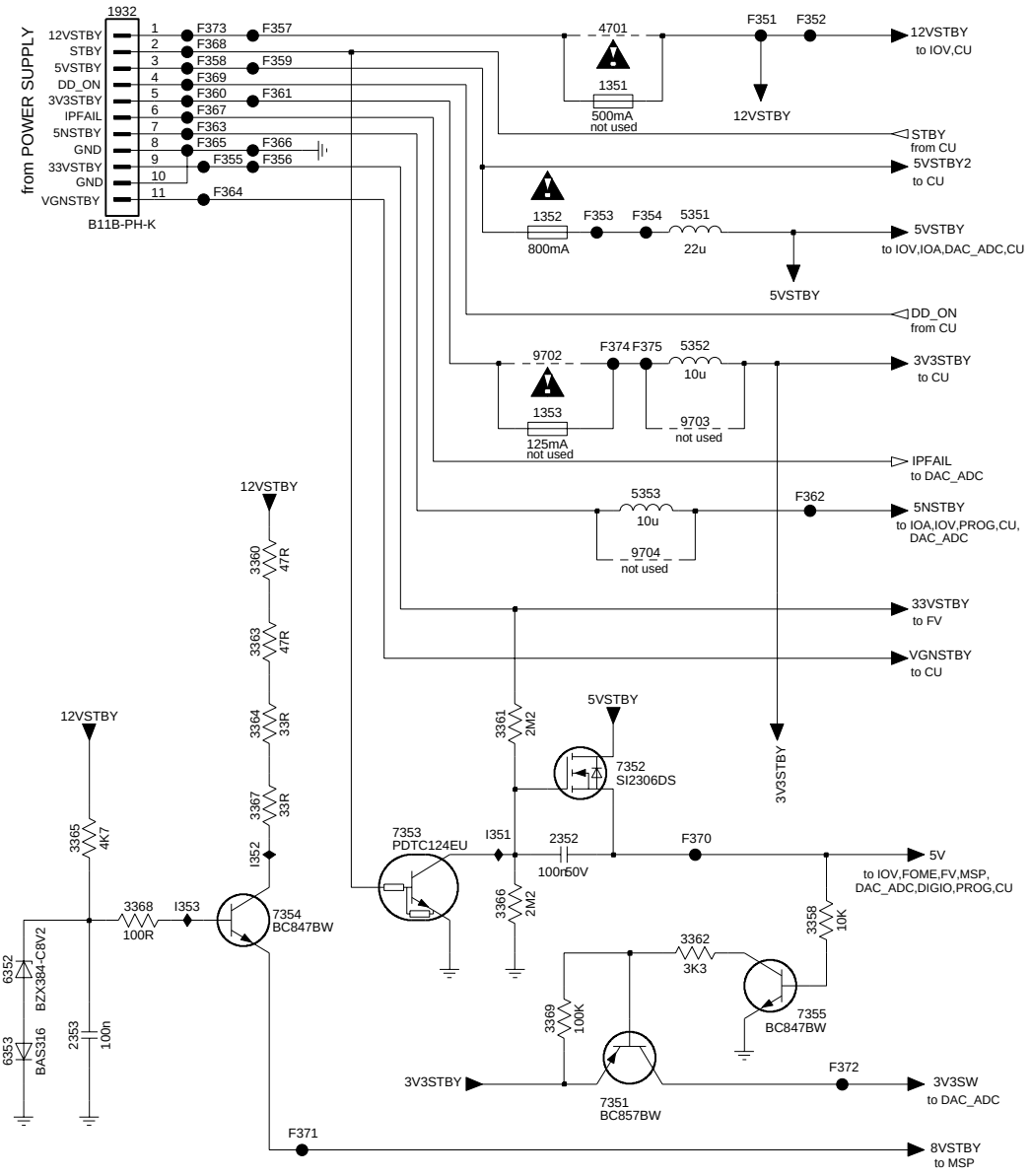

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CLASS_NO 3PB120	PB AB 04 E1	3103 603 3035	7 2006-01-27
			6 2005-07-07
			0 2004-10-22
	Power Supply PS		0 2004-05-07
2004-03-26 3			0 2004-03-25
NAME Folzberger	SUPERS.	10	130 – 4 A4
CHECK	DATE 2003-01-13		

PHILIPS

from PS
8VSTBY 5V
8VSTBY 5V
2605 10u 25V

7600
MSP3415G

ADR_CL 18
ADR_SEL 10
I602
D_CTR_IO1 8
I624
D_CTR_IO0 9
I625
TESTEN 4
RSA1 to IOA
RSA2 to IOA
3611 10K
3612 10K
VREFTOP 42
AHVSUP 33
CAPL_M 34
2600 10u 25V
2601 10n
8VSTBY
3604 12K
2602 10u 25V
2603 100n
2611 47u 16V
3605 22K
7601 PDTC124EU
STBY from CU

SCL_5V from/to CU
SDA_5V from/to CU
3601 100R
3603 100R
I615
I616
I2C_CL 12
I2C_DA 13
I2S_CL 14
I2S_WS 15
I2S_DA_OUT 16
I2S_DA_IN1 17
I2S_DA_IN2 21

STBYQ 11 I614
DVSUP 19 I605
RESETQ 22 I617
DACM_R 26 I618
DACM_L 27 I619
5V
6600 BAS316
3602 4K7
5600 10u
2606 100n
2608 10u

2607 56p
I606
ANA_IN- 3
SIF1 from FV
I607 2609 56p I608
ANA_IN+ 2
DEMODULATOR
IDENT
MONO_IN 43

S1...4 I2SL/R I2SL/R
FM1
FM2
NICAM A
NICAM B
IDENT
DFP
LOUDSPEAKER R
LOUDSPEAKER L
D/A
D/A
LOUDSPEAKER
2618 1n0
2619 1n0
AFER to IOA
AFEL to IOA

AGNDC 36
2612 4u7 50V
2610 10n

A/D
A/D
SCART-L
SCART-R
HEADPHONE R
HEADPHONE L
SCART-R
SCART-L
D/A
D/A
SC1_OUT_R 30
SC1_OUT_L 31
I620
I623
2613 10u 25V
2614 10u 25V
I621
I622
3606 220R
3607 220R
I612
2615 1n0 not used
7602 BC817-25W
AOUT2R to IOV
3609 4K7
AKILL from DAC_ADC
3610 4K7
I634
AOUT2L to IOV
2622 1n0 not used
7603 BC817-25W
2628 1n0
2629 1n0

SCART Switching Facilities

AIN1R from IOV
2624 2u2 50V
3614 1K0
41 SC1_IN_R
AIN1L from IOV
2625 2u2 50V
3615 1K0
40 SC1_IN_L
ARDAC from DAC_ADC
3616 2K2
2626 1u0
2630 1u0 50V
38 SC2_IN_R
from DAC_ADC ALDAC
3617 2K2
2627 1u0
2631 1u0 50V
37 SC2_IN_L
3619 12K
3618 12K

VREF2 25
VREF1 29
AHVSS 35
ASG 39
AVSS 44
DVSS 20
NC 23 24 28 32
AVSUP 1
TP 7
XTAL_IN 5
XTAL_OUT 6
5V
5602 10u
I613
2623 100n
I610
I611
1600 18M432
2620 3p3
2621 3p3

5

1600 F6
2600 A6
2601 A6
2602 A6
2603 A7
2605 A2
2606 B8
2607 C2
2608 C8
2609 C2
2610 D7
2611 A7
2612 D7
2613 D8
2614 E8
2615 E8
2618 C7
2619 C7
2620 F6
2621 F7
2622 E8
2623 F5
2624 D1
2625 D1
2626 E2
2627 E2
2628 E7
2629 E7
3601 B2
3602 B8
3603 B2
3604 A7
3605 A7
3606 D8
3607 E8
3608 E8
3609 E9
3610 E9
3611 A4
3612 A5
3613 F8
3614 D2
3615 D2
3616 E1
3617 E1
3618 E1
3619 E1
5600 B8
5602 F5
6600 B8
7600 A3
7601 A8
7602 E9
7603 F9
I602 A4
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I605 B7
I606 C2
I607 C2
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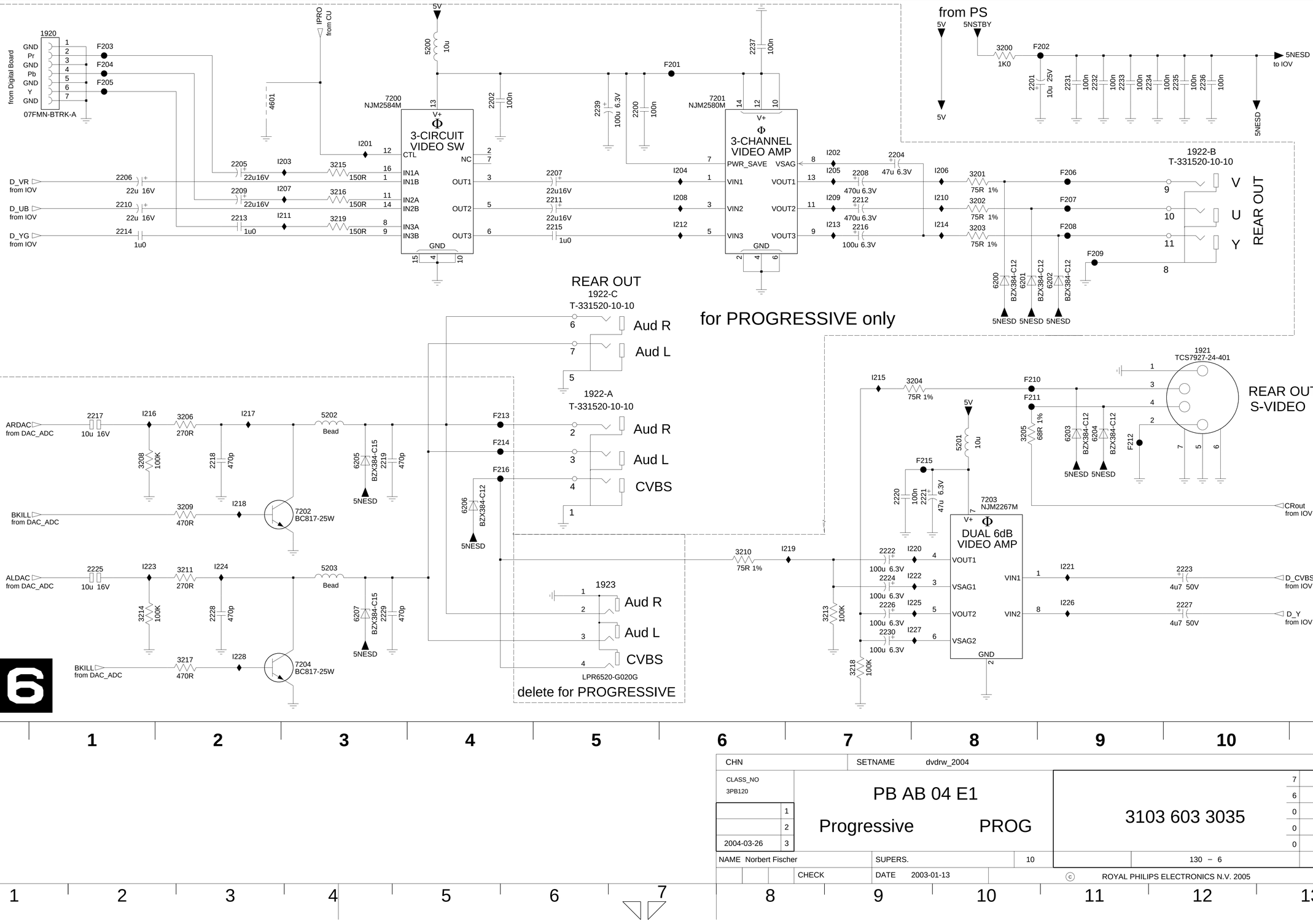
I610 F6
I611 F7
I612 D8
I613 F5
I614 B7
I615 B2
I616 B2
I617 B7
I618 C7
I619 C7
I620 D7
I621 D8
I622 E8
I623 E7
I624 A4
I625 A4
I626 D2
I627 D2
I628 D2
I629 D2
I630 E1
I631 E2
I632 E1
I633 E2
I634 F8

CHN	SETNAME dvdrw_2004		
CLASS_NO 3PB120	PB AB 04 E1	7	2006-01-27
1		6	2005-07-07
2	Multi Sound Processing MSP	0	2004-10-22
2004-03-26 3		0	2004-05-07
	3103 603 3035	0	2004-03-25
NAME Posch K.H.	SUPERS. 10	130 – 5	A3
CHECK	DATE 2003-01-13		

PHILIPS

1920 A1	2201 A8	2209 B3	2216 B7	2223 E10	2230 E7	2237 A6	3205 D8	3214 E1	5201 D8	6204 D9	7203 D8	F206 B9	F213 C4	I204 A6	I211 B3	I218 D2	I225 E8
1921 C10	2202 A4	2210 B2	2217 C1	2224 E7	2231 A9	3200 A8	3206 C2	3215 C1	5202 E3	6205 D3	7204 E3	F207 B9	F214 D4	I205 A7	I212 B6	I219 D7	I226 E9
1922-A C5	2204 A7	2211 B5	2218 D2	2225 E1	2232 A9	3201 B8	3208 D1	3216 C1	5203 E3	6206 D4	F201 A6	F208 B9	F215 D8	I206 A8	I213 B7	I220 D8	I227 E8
1922-B A10	2205 A3	2212 B7	2219 D3	2226 E7	2233 A9	3202 B8	3209 D2	3217 E2	6200 B8	6207 E3	F202 A9	F209 B9	F216 D4	I207 B3	I214 B8	I221 E9	I228 E2
1922-C B5	2206 B2	2213 B3	2220 D7	2227 E10	2234 A9	3203 B8	3210 C2	3218 E7	6201 B8	7200 A3	F203 A1	F210 C8	I201 A3	I208 B6	I215 C7	I222 E8	
1923 E5	2207 B5	2214 B2	2221 D8	2228 E2	2235 A10	3204 C8	3211 E2	5200 A4	6202 B9	7201 A6	F204 A1	F211 C8	I202 A7	I209 B7	I216 C1	I223 E1	
2200 A5	2208 B7	2215 B5	2222 E7	2229 E3	2236 A10	3205 C8	3213 E7	5201 A4	6203 D9	7202 D3	F205 A1	F212 D9	I203 A3	I210 B8	I217 C2	I224 E2	



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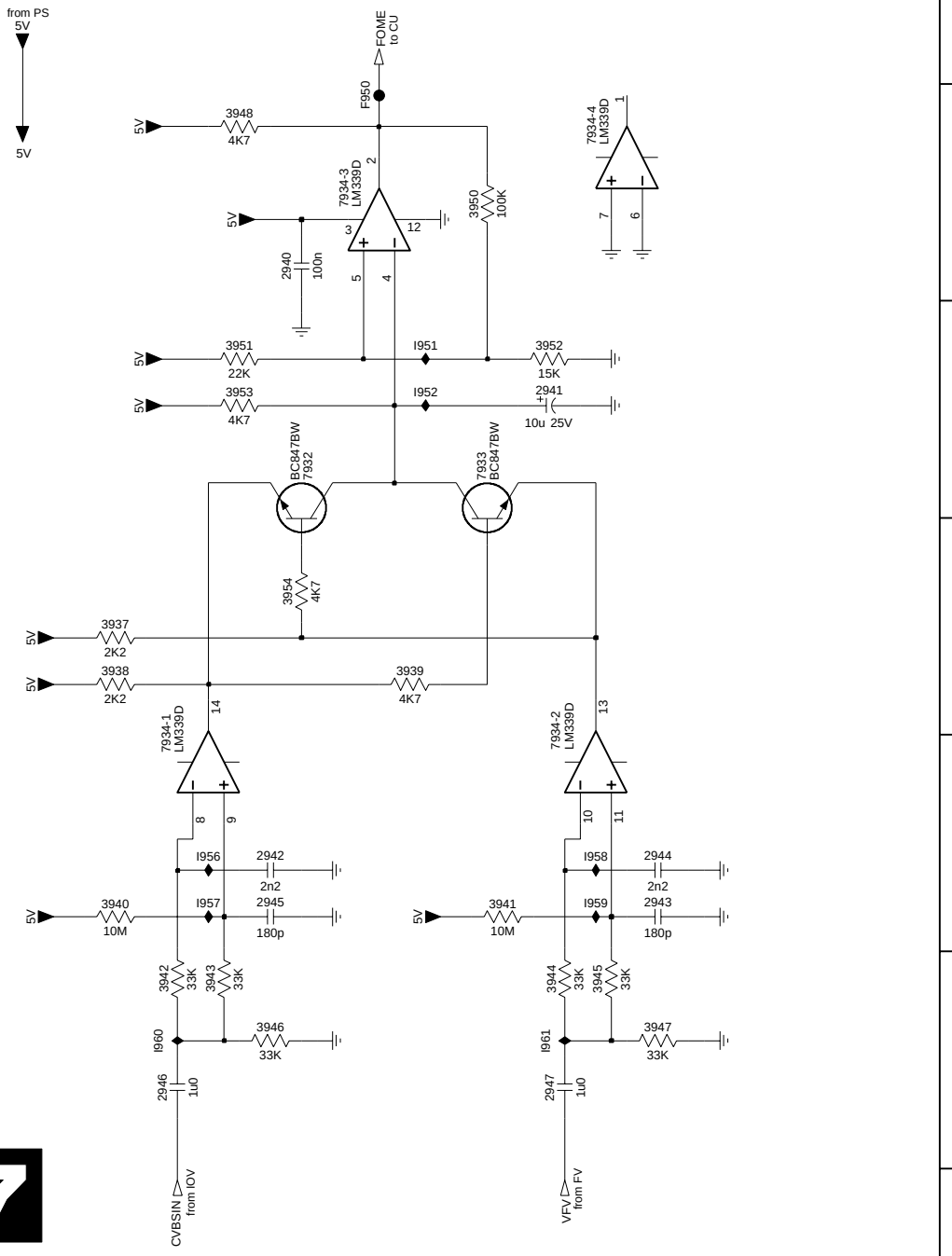
	1				6 2005-07-07
	2	Progressive PROG			0 2004-10-22
2004-03-26	3				0 2004-05-07
					0 2004-03-25
NAME Norbert Fischer		SUPERS.	10	130 − 6	A3
		CHECK	DATE 2003-01-13	© ROYAL PHILIPS ELECTRONICS N.V. 2005	

2940 A2	2944 D4	3937 C1	3941 D3	3945 E3	3950 A3	3954 C2	7934-2 D3	I951 B2	I958 D3
2941 B3	2945 D2	3938 C1	3942 E1	3946 E2	3951 B2	7932 B2	7934-3 A2	I952 B2	I959 D3
2942 D2	2946 E1	3939 C2	3943 E1	3947 E4	3952 B3	7933 B3	7934-4 A3	I956 D1	I960 E1
2943 D4	2947 E3	3940 D1	3944 E3	3948 A2	3953 B2	7934-1 D1	F950 A2	I957 D1	I961 E3



CHN	SETNAME dvdrw_2004		
CLASS_NO 3PB120	PB AB 04 E1	3103 603 3035	7 2006-01-27
			6 2005-07-07
	Follow Me FOME		0 2004-10-22
2004-03-26 3			0 2004-05-07
			0 2004-03-25
NAME Neubauer	SUPERS. 10	130 – 7	A4
CHECK	DATE 2003-01-13	© ROYAL PHILIPS ELECTRONICS N.V. 2005	

PHILIPS

from PS 5V

5V

3250 470R

I250

2265 10n

2250 1u0 10V

3257 100K

7250-6 SN74HCU04D

I251 I252

3255 100K

DAINCOAX to DAC_ADC

3265 100R

3258 10K

3266 560R not used

for DIGITAL COAX IN only

3252 100R

2251 100n

6250 BZX384-C6V8 not used

3256 75R

F2603 F2602

1926 YKC21-3416

DIGITAL IN CINCH

DAOUT from DAC_ADC

3253 750R 1%

3254 100R

2256 100n

I258

3261 470R

I256

7250-1 SN74HCU04D

I253

7250-3 SN74HCU04D

I254

7250-2 SN74HCU04D

3260 2K2

3262 560R

7250-5 SN74HCU04D

2257 1n0

7250-4 SN74HCU04D

2255 100n

I255

5250 6RG

2266 100n

2254 150p

I257

3259 75R

3251 82R

F2503 F2502

1925 YKC21-3416

DIGITAL OUT CHINCH

5V

3263 47R

3264 100R

F251

F266

6255 JFJ1000

VS IN GND

DIGITAL OUT OPTICAL

2259 100n 25V

DAINOPT to DAC_ADC

for EPG only

IROUT from CU

GLINK_TXD from CU

GLINK_RXD to CU

F2405 F2403 F2402

1924 HSJ1637-010510

6251 6252 6253 BZX384-C6V8

2267 1n0

F2401

G-Link OUT

0005 BRACKET

3267 1K8

for DIGITAL OPT IN only

3268 47R

3269 180R

F267 F250

6269 JFJ2000

VS OUT GND

DIGITAL IN OPTICAL

2262 100n

8

0001 E1
1924 E4
1925 C8
1926 B8
1927 A1
2250 A4
2251 B7
2252 B2
2254 C7
2255 C5
2256 C2
2257 D4
2259 E8
2262 F8
2265 A4
2266 C8
2267 F4
3250 A4
3251 C7
3252 B6
3253 C1
3254 C1
3255 B4
3256 B8
3257 A4
3258 B4
3259 C7
3260 C3
3261 C3
3262 C4
3263 D8
3264 D6
3265 B3
3266 C2
3267 F6
3268 E8
3269 F8
5250 C6
6250 B7
6251 F3
6252 F3
6253 F3
6255 D9
6269 E9
7250-1 C3
7250-2 C4
7250-3 C4
7250-4 D4
7250-5 D4
7250-6 B3
F2401 F4
F2402 F4
F2403 E4
F2405 E4
F250 F8
F2502 C8
F2503 C8
F251 D7
F2602 B8
F2603 B8
F266 D8
F267 E8
F2701 A1
F2702 A1
F2704 A1
F2706 A1
F2708 B2
I250 A4
I251 B3
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I253 C3
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I257 C7
I258 C2

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CLASS_NO 3PB120		PB AB 04 E1	3103 603 3035
--**	1	Digital In/Out DIGIO	7 2006-01-27
--**	2		6 2005-07-07
2004-03-26	3		0 2004-10-22
			0 2004-05-07
			0 2004-03-25
NAME Fischer		SUPERS. **** *** ***** 10	130 – 8 A3
CHECK		DATE 2003-01-13	

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2002 A5	2009 C9	2017 C10	2030 D8	2042 E3	3003 D4	3010 B9	3017 C10	3024 C3	3031 B2	3040 E10	4002 E5	7002 A2	7010 A8	F007 C1	F015 C2	I009 A1	I017 B6	I024 B6	I032 E5
2003 A5	2010 C10	2018 C4	2032 D8	2043 E4	3004 C8	3011 A1	3018 E7	3025 A10	3032 D9	3046 A7	5000 A5	7003-1 B10	F001 B1	F008 C1	I001 B2	I010 A6	I018 D5	I025 B6	I033 D9
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2007 C9	2014 E10	2023 C8	2038 D4	2050 D1	3008 B7	3015 A1	3022 C3	3029 A10	3037 A8	3054 C3	6006 A7	7006 C2	F005 C1	F013 D1	I006 B5	I014 D5	I022 E5	I030 D2	

PHILIPS

from PS

from/to Digital Board

22FMN-BTRK-A

7004 AD1852JRS

7007 UDA1361TS

24-BIT AUDIO ADC

7003-1 MC33078D

7003-2 MC33078D

CHN		SETNAME dvdrw_2004	
CLASS_NO 3PB120		PB AB 04 E1	3103 603 3035
	1	Audio Converter DAC_ADC	
	2		
2004-03-26	3		
NAME Fischer		SUPERS. 10	130 – 9 A3
	CHECK	DATE 2003-01-13	

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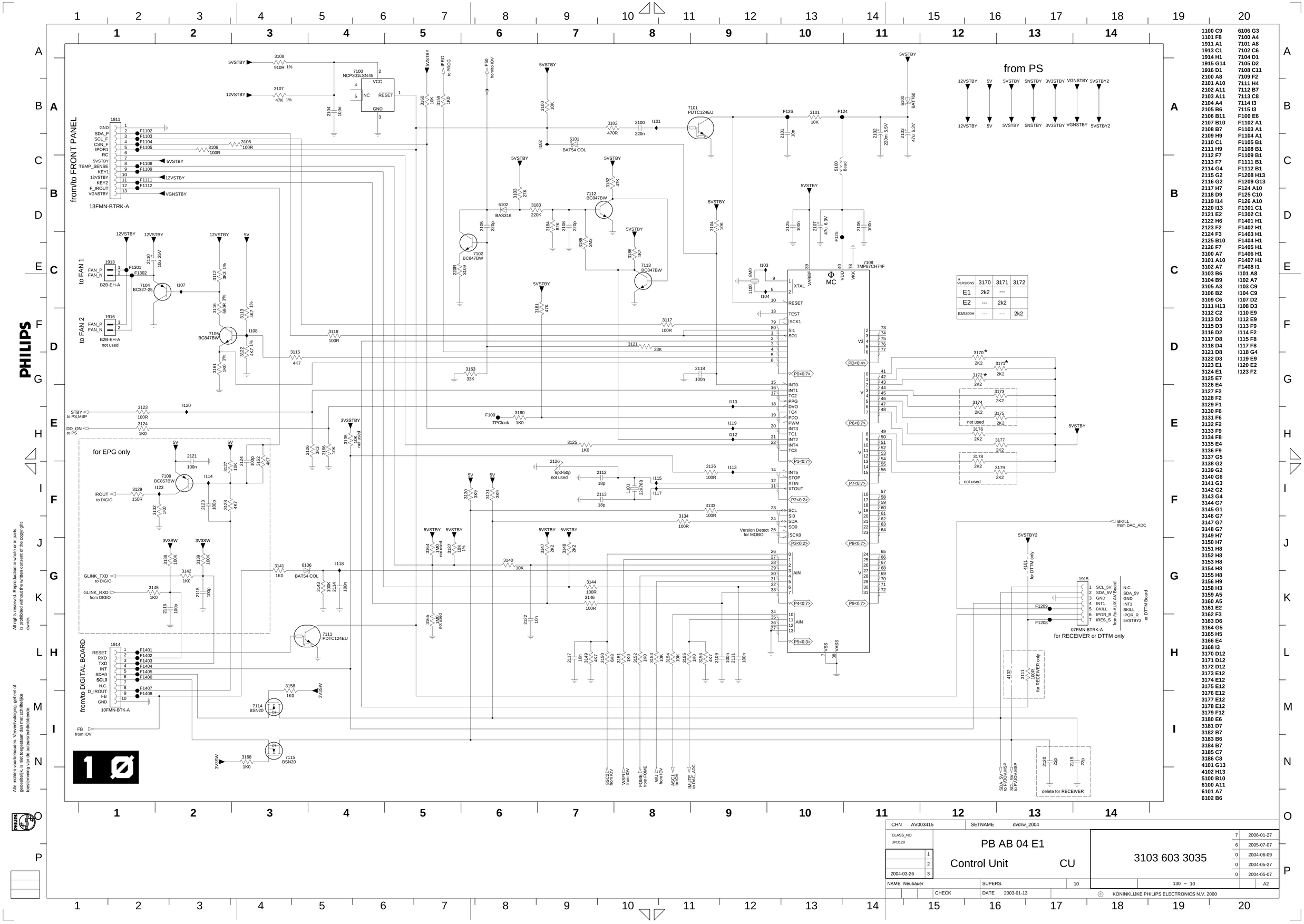
0	2004-05-07



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E2	---	2k2	
E3/S300H	---	---	2k2

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1913 C1
1914 H1
1915 G14
1916 D1
2100 A8
2101 A10
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2106 B11
2107 B10
2108 B7
2109 H9
2110 C1
2111 H9
2112 F7
2113 F7
2114 G4
2115 G2
2116 G2
2117 H7
2118 D9
2119 I14
2120 I13
2121 E2
2122 H6
2123 F2
2124 F3
2125 B10
2126 F7
3100 A7
3101 A10
3102 A7
3103 B6
3104 B9
3105 A3
3106 B2
3109 C6
3111 H13
3112 C2
3113 D3
3115 D3
3116 D2
3117 D8
3118 D4
3121 D8
3122 D3
3123 E1
3124 E1
3125 E7
3126 E4
3127 F2
3128 F2
3129 F1
3130 F6
3131 F6
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3133 F9
3134 F8
3135 E4
3136 F9
3137 G5
3138 G2
3139 G2
3140 G6
3141 G3
3142 G2
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3148 G7
3149 H7
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3151 H8
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3153 H8
3154 H8
3155 H8
3156 H9
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3177 E12
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7102 C6
7104 D1
7105 D2
7108 C11
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7114 I3
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I102 A7
I103 C9
I104 C9
I107 D2
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I110 E9
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1	Control Unit CU		6 2005-07-07
2		3103 603 3035	0 2004-06-09
2004-03-26 3			0 2004-05-27
			0 2004-05-07
NAME Neubauer	SUPERS. 10	130 – 10	A2
CHECK	DATE 2003-01-13	© KONINKLIJKE PHILIPS ELECTRONICS N.V. 2000	

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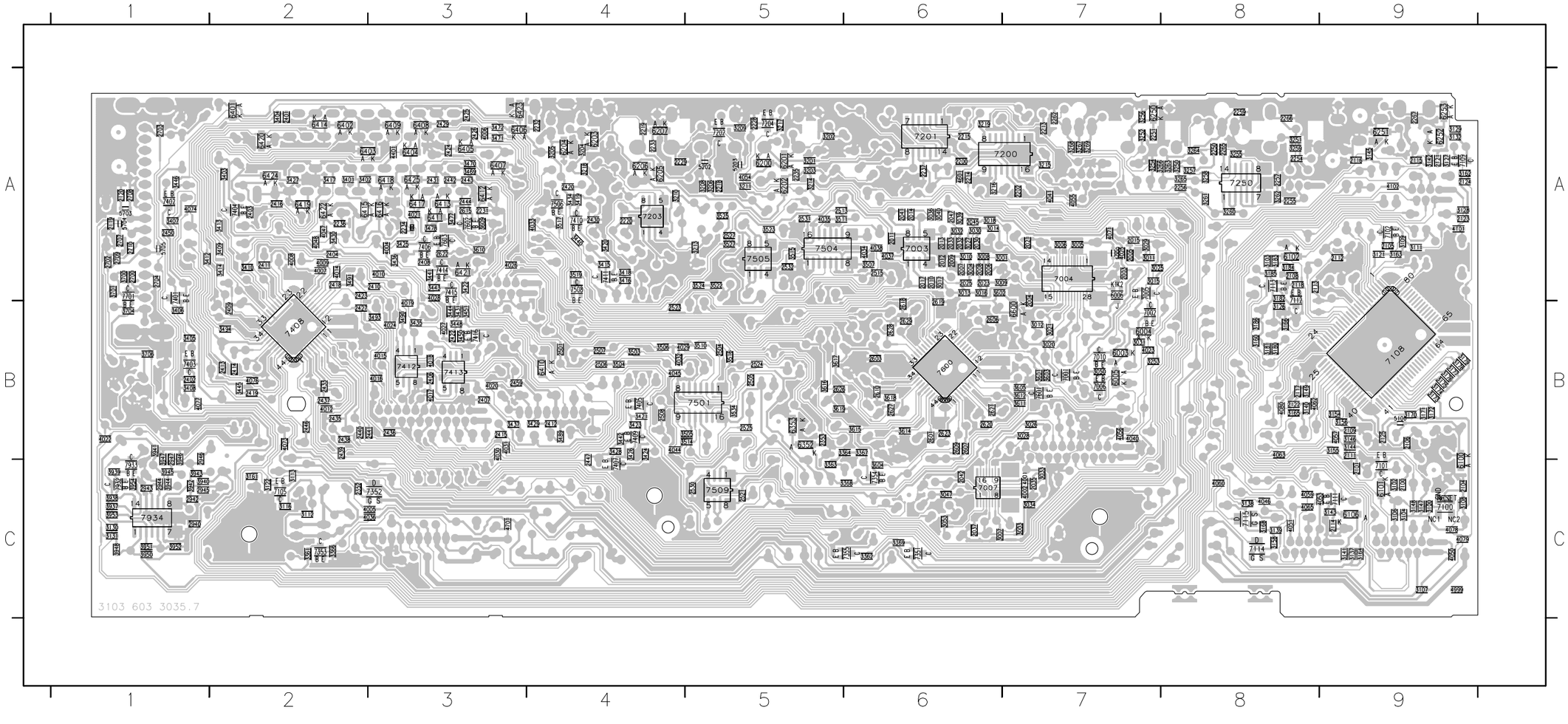

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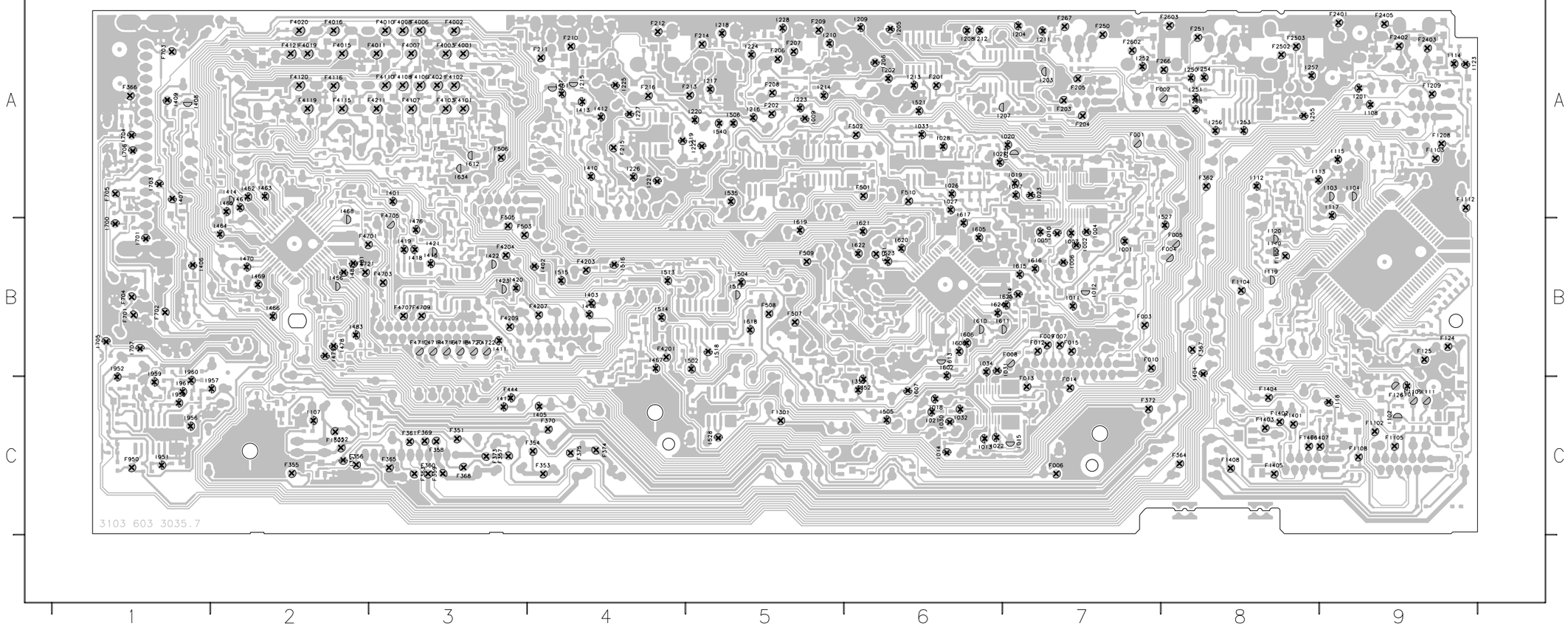

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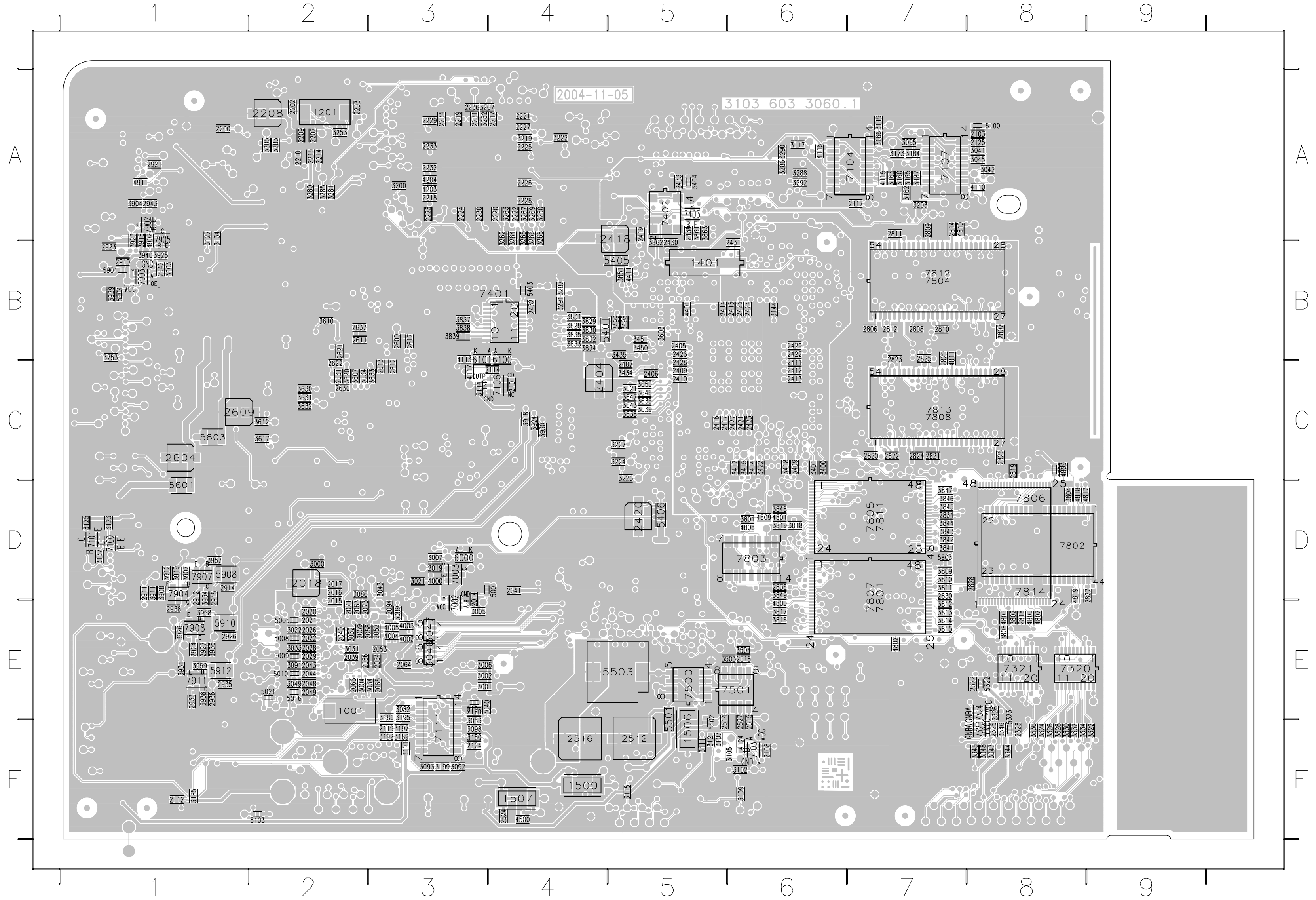

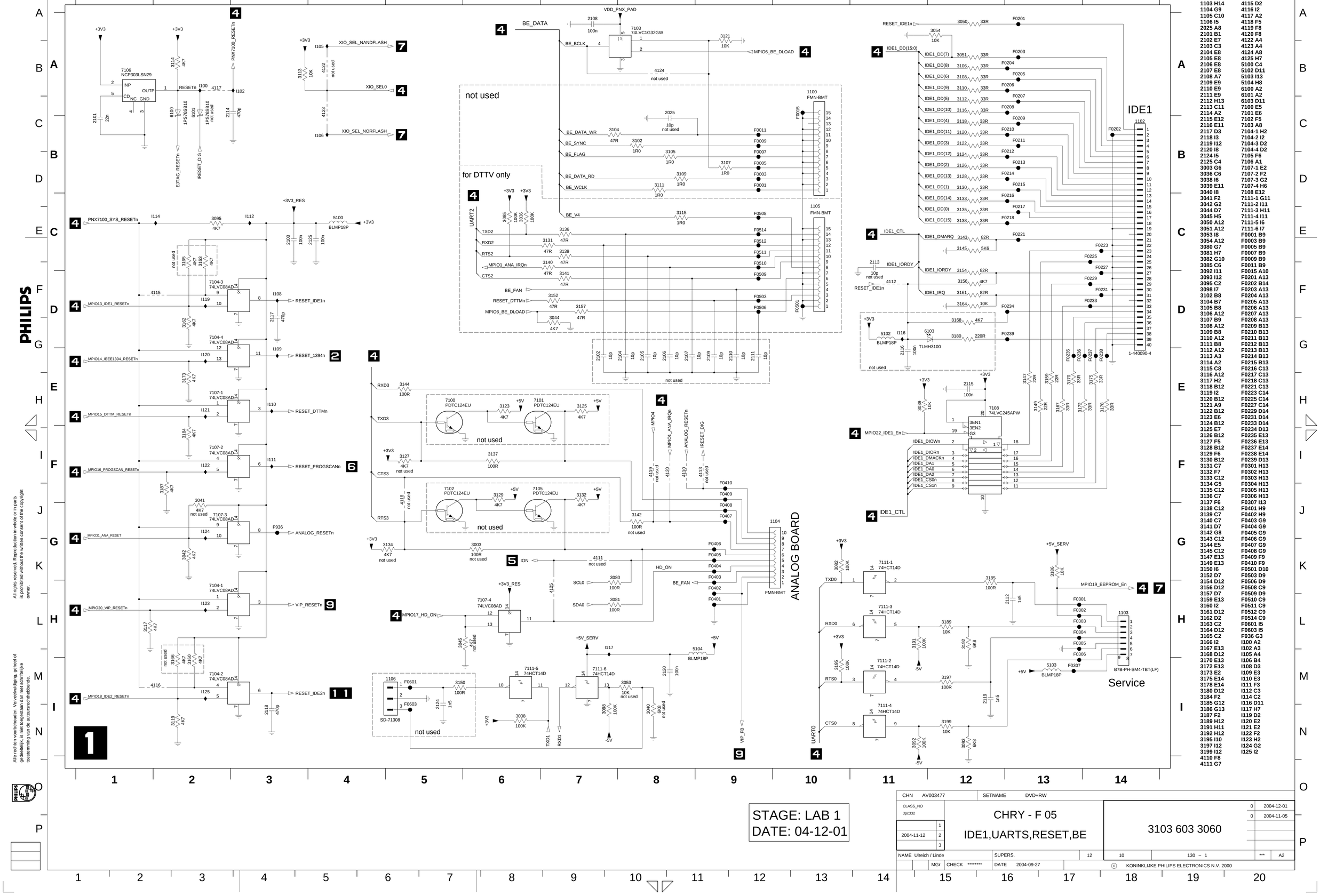

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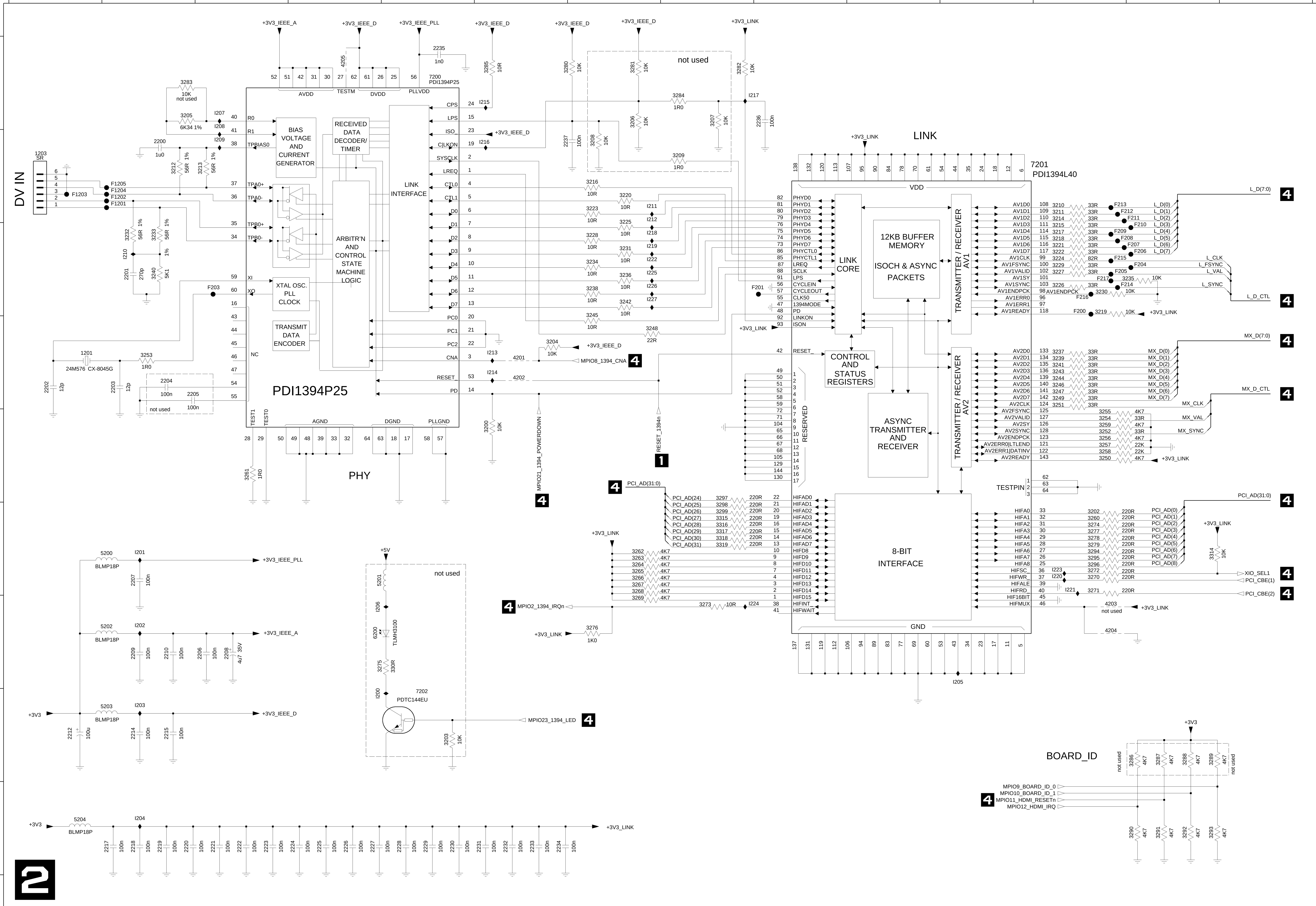

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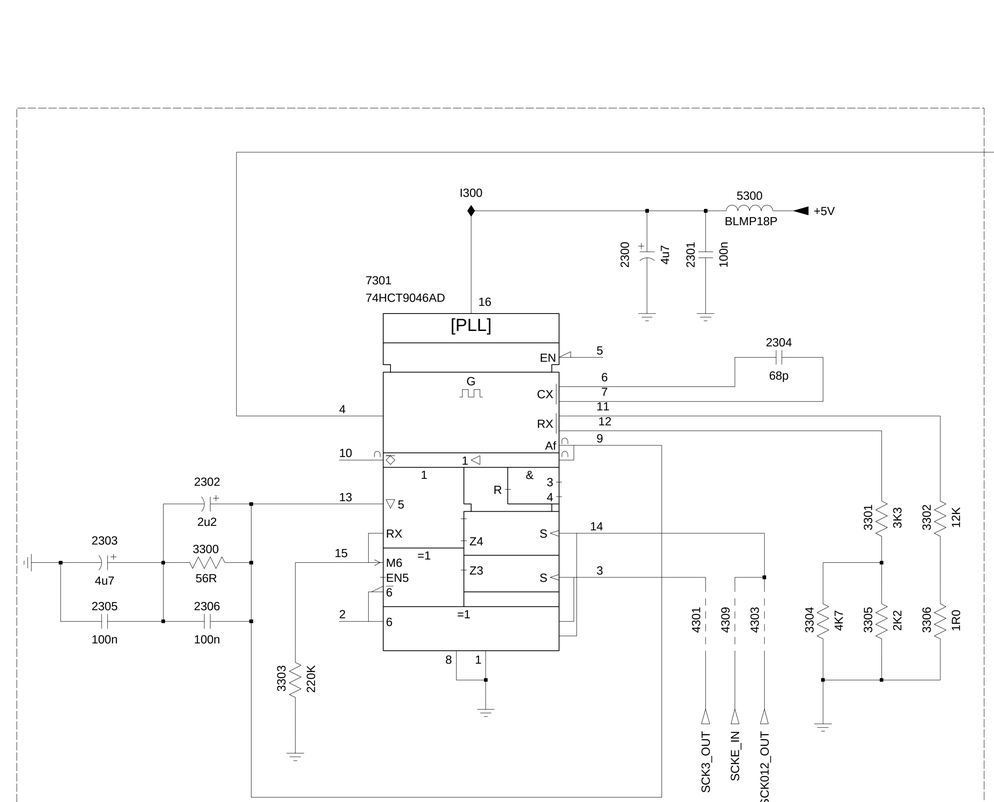
I213 D6
I214 D6
I215 A6
I216 B6
I217 A8
I218 C7
I219 C7
I220 F12
I221 F12
I222 C7
I223 F12
I224 G8
I225 C7
I226 C7
I227 C7

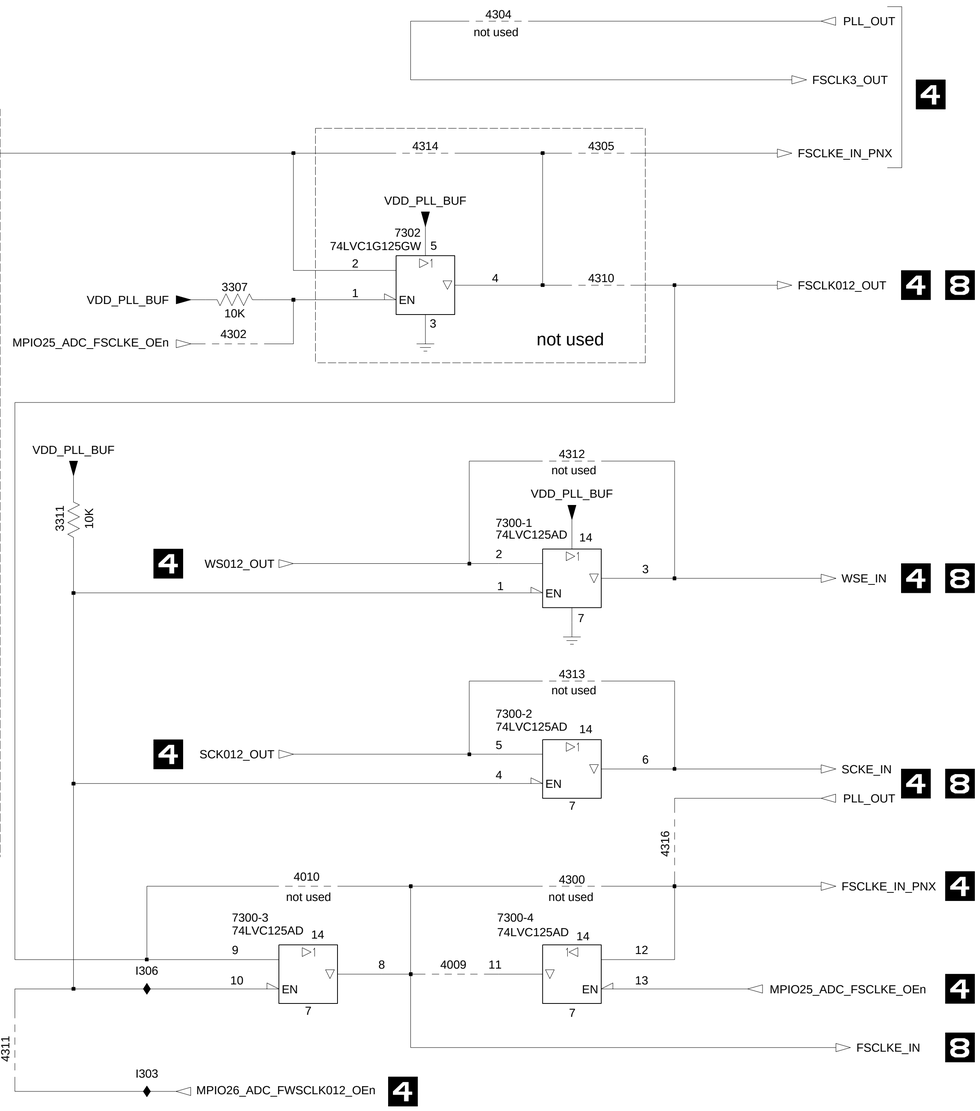
PHILIPS

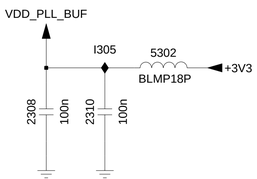
STAGE: LAB 1
DATE: 04-12-01

CHN AV003477 | SETNAME DVD+RW
CLASS_NO 3pc332
CHRY - F 05
1394
3103 603 3060
0 2004-12-01
0 2004-11-05
2004-11-12 1 2 3
NAME Voko / Linde | SUPERS. | 12 | 10 | 130 – 2 | *** | A2
MGr | CHECK ******** | DATE 2004-09-27

PHILIPS







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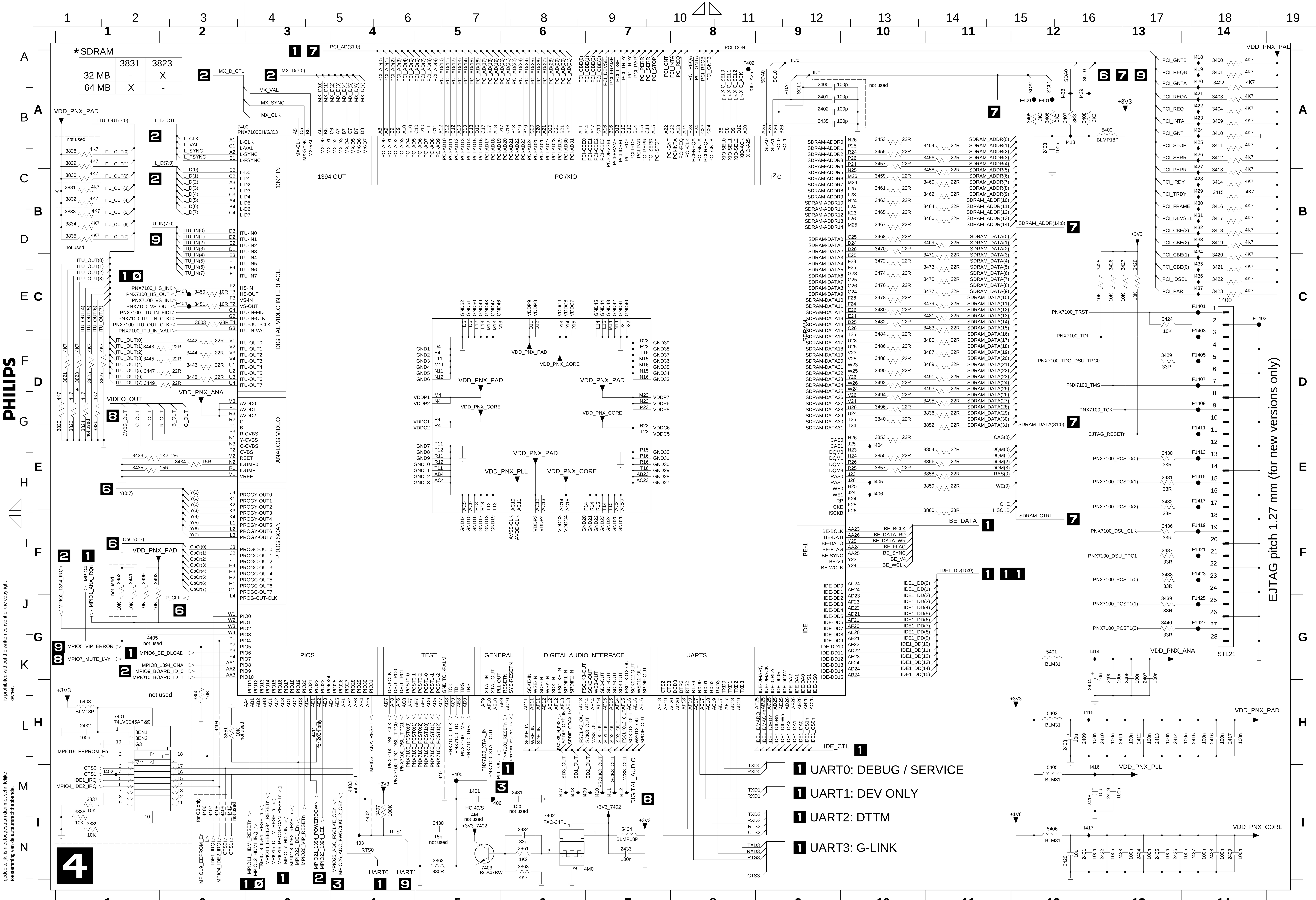
2301 B4
2302 C1
2303 C1
2304 B4
2305 C1
2306 C1
2308 E1
2310 E2
3300 C1
3301 C4
3302 C5
3303 D2
3304 C4
3305 C4
3306 C5
3307 B6
3311 C5
4009 E7
4010 E6
4300 E8
4301 C4
4302 B6
4303 C4
4304 A7
4305 A8
4309 C4
4310 B8
4311 E5
4312 C8
4313 D8
4314 A7
4316 D8
5300 A4
5302 E2
7300-1 C7
7300-2 D7
7300-3 E6
7300-4 E7
7301 B2
7302 A7
I300 A2
I303 E6
I305 E2
I306 E6

STAGE: LAB 1
DATE: 04-12-01

CHN AV003477			SETNAME DVD+RW				
CLASS_NO 3pc332		CHRY - F 05			0	2004-12-01	
	1				0	2004-11-05	
2004-11-12	2	Audio PLL					
	3						
NAME Kabinger / Linde		SUPERS.	12	10	130 – 3	***	A3
MGr	CHECK ********	DATE 2004-09-27					

3103 603 3060



1400	C14
1401	I5
2400	A9
2401	A9
2402	A9
2403	A12
2404	H12
2405	G13
2406	G13
2407	G13
2408	H12
2409	H12
2410	H13
2411	H13
2412	H13
2413	H13
2414	H13
2415	H14
2416	H14
2417	H14
2418	I12
2419	I13
2420	I12
2421	I12
2422	I13
2423	I13
2424	I13
2425	I13
2426	I13
2427	I14
2428	I14
2429	I14
2430	I5
2431	I6
2432	H1
2433	I7
2434	I6
2435	A9
3400	A14
3401	A14
3402	A14
3403	A14
3404	A14
3405	A12
3406	A12
3407	A12
3408	A12
3409	A14
3410	A14
3411	A14
3412	A14
3413	B14
3414	B14
3415	B14
3416	B14
3417	B14
3418	B14
3419	B14
3420	C14
3421	C14
3422	C14
3423	C14
3424	C13
3425	C13
3426	C13
3427	C13
3428	C13
3429	D13
3430	E13
3431	E13
3432	E13
3433	E1
3434	E2
3435	E1
3436	F13
3437	F13
3438	F13
3439	G13
3440	G13
3441	F1
3442	D2
3443	D1
3444	D2
3445	D1
3446	D2
3447	D1
3448	D2
3449	D1
3450	C2
3451	C2
3452	F1
3453	A10
3454	A11
3455	A10
3456	A11
3457	A10
3458	B11
3459	B10
3460	B11
3461	B10
3462	B11
3463	B10
3464	B11
3465	B10
3466	B11
3467	B10
3468	B10
3469	B11
3470	B10
3471	C11
3472	C10
3473	C11
3474	C10
3475	C11
3476	C10
3477	C11
3478	C10
3479	C11
3480	C10
3481	C11
3482	C10
3483	C11
3484	C10
3485	D11
3486	D10
3487	D11
3488	D10
3489	D11
3490	D10
3491	D11
3492	D10

3493	D11
3494	D10
3495	D11
3496	D10
3497	I4
3498	F1
3499	F1
3603	C2
3820	D1
3821	D1
3822	D1
3823	D1
3824	D1
3825	D1
3826	D1
3827	D1
3828	A1
3829	A1
3830	B1
3831	B1
3832	B1
3833	B1
3834	B1
3835	B1
3836	D11
3837	I1
3838	I1
3839	I1
3840	D10
3850	G1
3851	H2
3852	E11
3853	E10
3854	E11
3855	E10
3856	E11
3857	E10
3858	E11
3859	E11
3860	F11
3861	I6
3862	I5
3863	I6
4401	I5
4402	I4
4403	I2
4404	H2
4405	G1
4406	I2
4407	I2
4408	I2
4409	I2
4410	I2
4411	H3
5400	A13
5401	G12
5402	H12
5403	H1
5404	I7
5405	I12
5406	I12
7400	A2
7401	H1
7402	I6
7403	I5
F1401	C14
F1402	C14
F1403	C14
F1405	D14
F1407	D14
F1409	D14
F1411	E14
F1413	E14
F1415	E14
F1417	E14
F1419	F14
F1421	F14
F1423	F14
F1425	G14
F1427	G14
F400	A12
F401	A12
F402	A8
F403	C2
F404	C2
F405	I5
F406	I5
I402	I1
I403	I4
I404	E10
I405	E10
I406	E10
I407	I6
I408	I6
I409	I6
I410	I7
I411	I7
I412	I7
I413	A12
I414	G12
I415	H12
I416	I12
I417	I12
I418	A14
I419	A14
I420	A14
I421	A14
I422	A14
I423	A14
I424	A14
I425	A14
I426	A14
I427	A14
I428	B14
I429	B14
I430	B14
I431	B14
I432	B14
I433	B14
I434	B14
I435	C14
I436	C14
I437	C14
I438	A12
I439	A12

STAGE: LAB 1
DATE: 04-12-01

CHN AV003477 SETNAME DVD+RW
CLASS_NO 3pc332

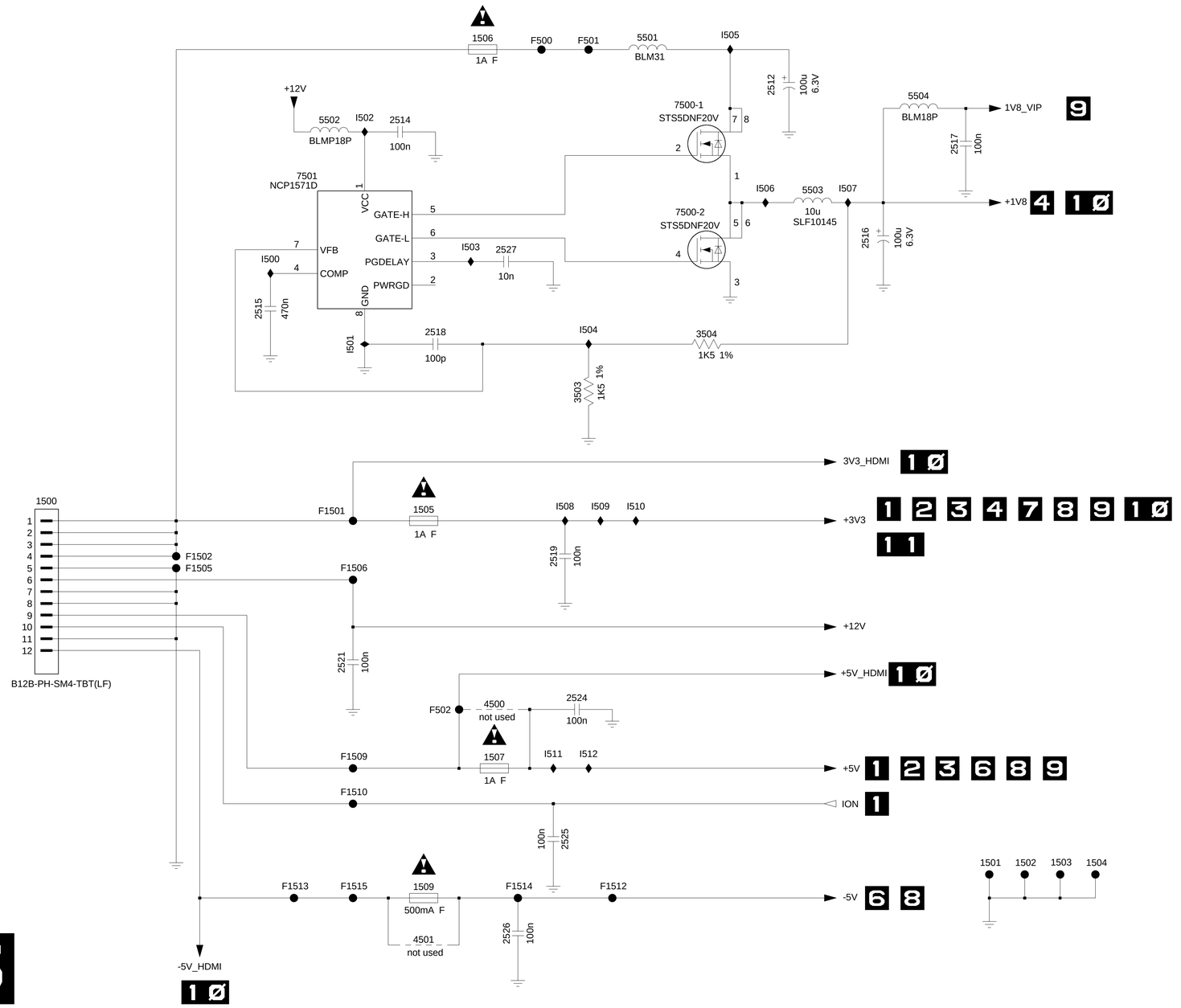
CHRY - F 05
CHRYSALIS

3103 603 3060

0 2004-12-01
0 2004-11-05

2004-11-12 1 2 3

NAME Kabinger / Linde SUPERS. 12 10 130 - 4 *** A2
MGr CHECK ******** DATE 2004-09-27



1500 C1
1501 F7
1502 F7
1503 F7
1504 F7
1505 D3
1506 A4
1507 E4
1509 F3
2512 A5
2514 A3
2515 B2
2516 B6
2517 A6
2518 B3
2519 D4
2521 D3
2524 E4
2525 F4
2526 F4
2527 B4
3503 C4
3504 B5
4500 E4
4501 F3
5501 A5
5502 A3
5503 B6
5504 A6
7500-1 A5
7500-2 B5
7501 B3
F1501 D3
F1502 D2
F1505 D2
F1506 D3
F1509 E3
F1510 E3
F1512 F4
F1513 F2
F1514 F4
F1515 F3
F500 A4
F501 A4
F502 E3
I500 B2
I501 C3
I502 A3
I503 B3
I504 B4
I505 A5
I506 B5
I507 B6
I508 D4
I509 D4
I510 D4
I511 E4
I512 E4

STAGE: LAB 1
DATE: 04-12-01

CHN AV003477		SETNAME DVD+RW	
CLASS_NO 3pc332		CHRY - F 05	0 2004-12-01
	1		0 2004-11-05
2004-11-12	2	Power Supply	3103 603 3060
	3		
NAME Ulreich / Linde		SUPERS. 12	130 – 5 A3
	CHECK	DATE 2004-09-27	© KONINKLIJKE PHILIPS ELECTRONICS N.V. 2000

CHN	AV003477
SETNAME	DVD+RW
CLASS_NO	3pc332
	CHRY - F 05
	PROG SCAN DAC
2004-11-12	
NAME	Voko / Linde
SUPERS.	12
CHECK	
DATE	2004-09-27
	3103 603 3060
	0 2004-12-01
	0 2004-11-05
	130 – 6
	A2

1002 D14
2024 A8
2600 A7
2601 A7
2603 A9
2604 A9
2605 A1
2606 A2
2607 A10
2608 A11
2609 A11
2610 A3
2611 B3
2612 B3
2613 B3
2614 C9
2615 C10
2616 C2
2617 C4
2618 C2
2619 D2
2620 D4
2621 D4
2622 D5
2623 D2
2624 D4
2625 E7
2626 E9
2627 E10
2628 G9
2629 G10
2630 G4
2631 G4
2632 A2
2633 A8
2634 A8
2635 A10
2636 A10
2637 B3
3035 C12
3037 B13
3601 C9
3602 C10
3604 C11
3605 E7
3606 D5
3607 D6
3608 E7
3609 D5
3610 D5
3611 D13
3612 E9
3613 E10
3614 E12
3615 E11
3616 F13
3617 G9
3618 G10
3619 F6
3620 G3
3621 F5
3622 G7
3623 G7
3624 F5
3625 G12
3626 G11
3627 G5
3628 G5
3629 G6
3630 H5
3631 H5
3632 H6
3633 D6
3634 D6
3635 E2
3636 E2
3637 E2
3638 E2
3639 E2
3640 E2
3641 E2
3642 E2
3643 F2
3644 F2
3645 F2
3646 F2
3647 F2
3648 F2
3649 F2
3650 F2
4600 G7
4601 C11
4602 E11
4603 G11
5600 A7
5601 A9
5603 A11
5604 B9
5605 B10
5606 D9
5607 D10
5608 F9
5609 F10
7600 A2
7601 B12
7602-1 D12
7602-2 F12
7603 D3
F1601 D14
F1602 D14
F1604 D13
F1606 D14
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I727 D10
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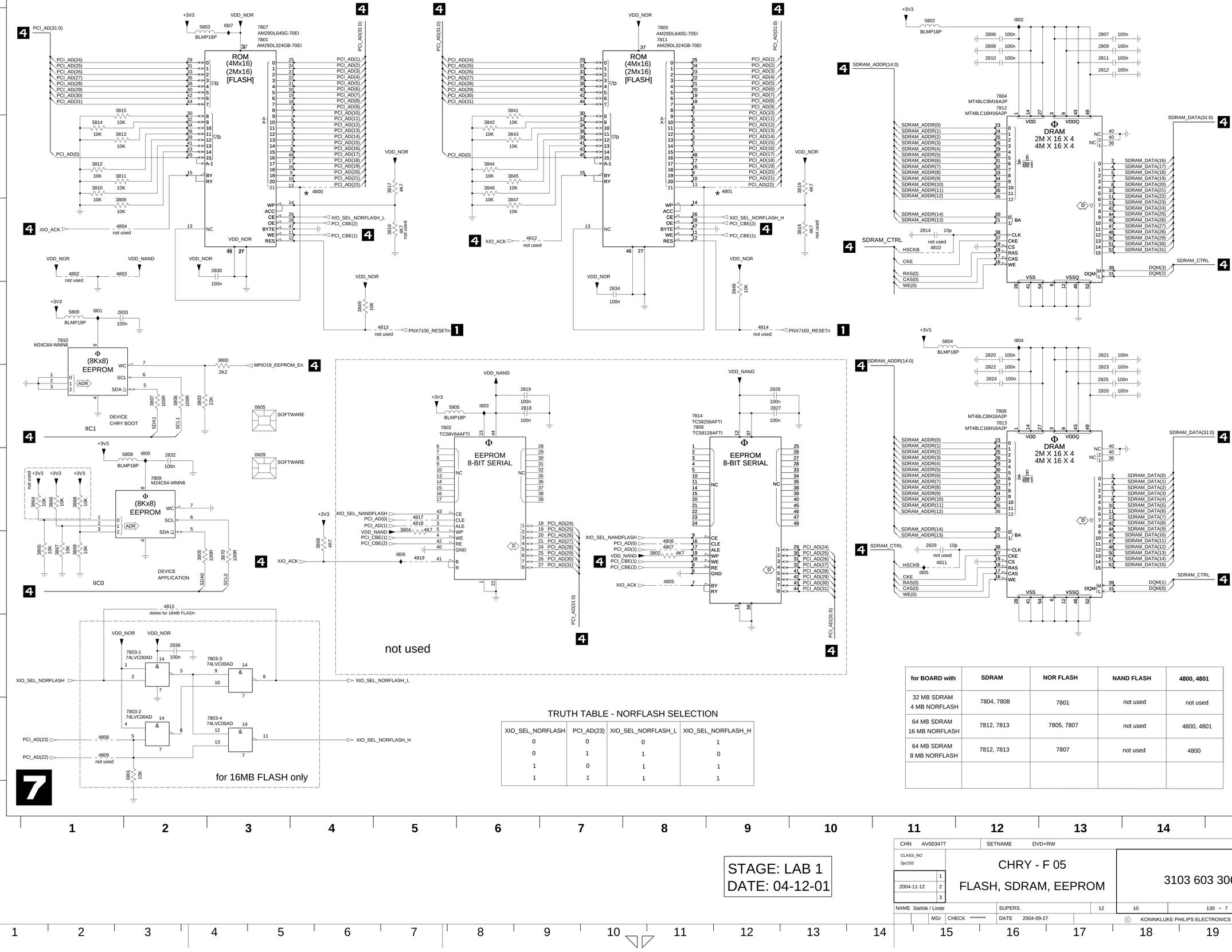
I729 F10



for BOARD with	SDRAM	NOR FLASH	NAND FLASH	4800, 4801
32 MB SDRAM 4 MB NORFLASH	7804, 7808	7801	not used	not used
64 MB SDRAM 16 MB NORFLASH	7812, 7813	7805, 7807	not used	4800, 4801
64 MB SDRAM 8 MB NORFLASH	7812, 7813	7807	not used	4800

TRUTH TABLE - NORFLASH SELECTION

XIO_SEL_NORFLASH	PCI_AD(23)	XIO_SEL_NORFLASH_L	XIO_SEL_NORFLASH_H
0	0	0	1
0	1	1	0
1	0	1	1
1	1	1	1

STAGE: LAB 1
DATE: 04-12-01

CHN AV003477	SETNAME DVD+RW		
CLASS_NO 3pc332	CHRY - F 05 FLASH, SDRAM, EEPROM	0 2004-12-01	
2004-11-12		0 2004-11-05	
NAME Stehlik / Linde	SUPERS. 12	10	130 – 7 *** A2
MGr CHECK ********	DATE 2004-09-27		

3103 603 3060

0605 E3
0609 F3
2806 A12
2807 A13
2808 A12
2809 A13
2810 A12
2811 A13
2812 A13
2814 C11
2818 E6
2819 E6
2820 D12
2821 D13
2822 E12
2823 E13
2824 E12
2825 E13
2826 E13
2827 E9
2828 E9
2829 G11
2830 C3
2832 F2
2833 D1
2834 D7
2836 H2
3800 D3
3801 I2
3802 G8
3803 E2
3804 G5
3805 G2
3806 E2
3807 E2
3808 G4
3809 C1
3810 B1
3811 B1
3812 B1
3813 B1
3814 B1
3815 A1
3816 C5
3817 B5
3818 C10
3819 B10
3841 A6
3842 B6
3843 B6
3844 B6
3845 B6
3846 B6
3847 C6
3848 D9
3849 D4
3864 F1
3865 G1
3866 F1
3867 G1
3868 F1
3869 G1
3870 G3
4800 B4
4801 B9
4802 C1
4803 C1
4804 C1
4805 G8
4806 G8
4807 G8
4808 I1
4809 I1
4810 C11
4811 G11
4812 C6
4813 D5
4814 D9
4815 G2
4817 F5
4818 F5
4819 G5
5802 A11
5803 A2
5804 D11
5805 E5
5808 F2
5809 D1
7801 A3
7802 E5
7803-1 H2
7803-2 I2
7803-3 H3
7803-4 I3
7804 A12
7805 A8
7806 E8
7807 A3
7808 E12
7809 F2
7810 D1
7811 A8
7812 A12
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I803 E6
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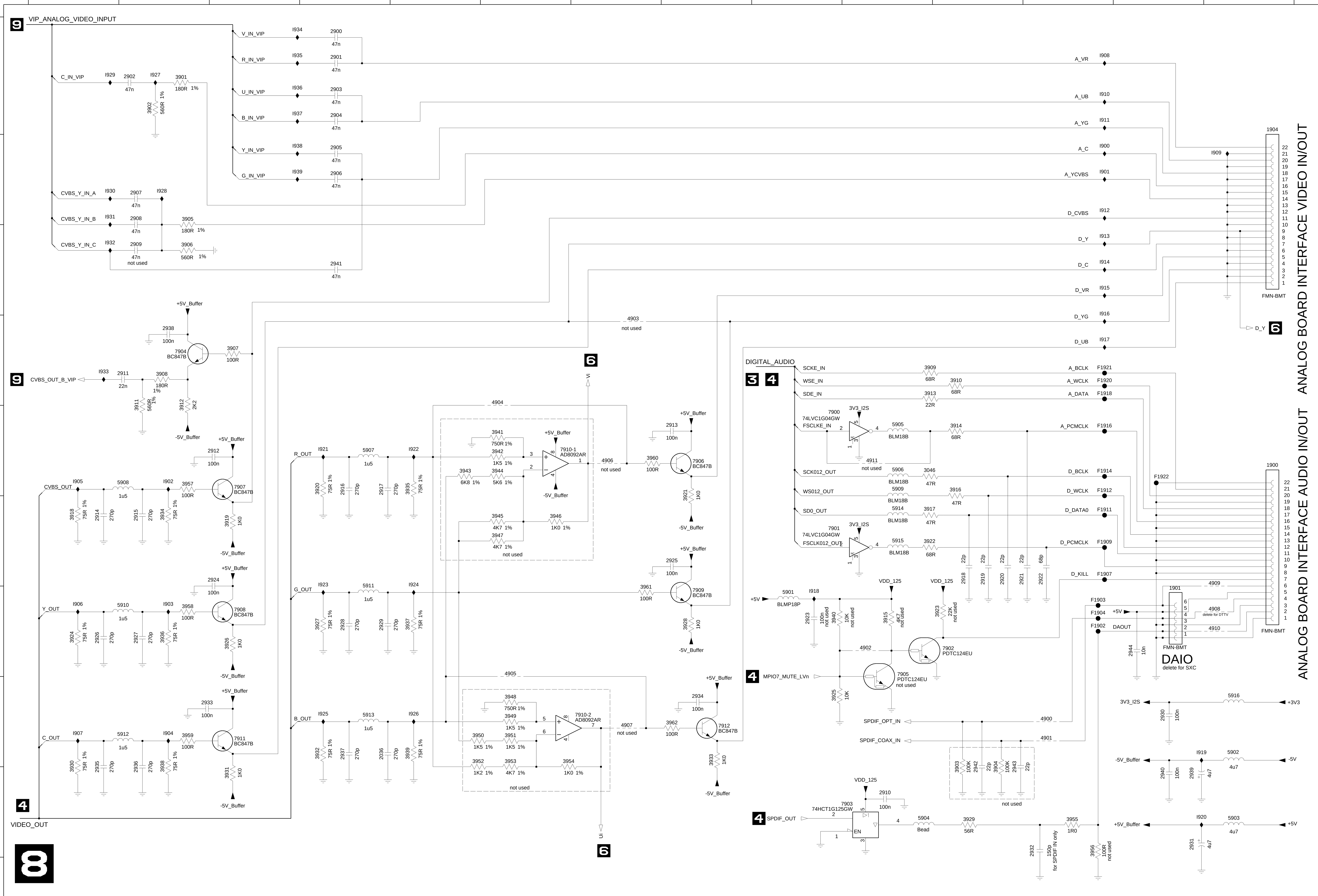
I806 G5
I807 A3



1900 E14	5907 E4
1901 F13	5908 E2
1904 A14	5909 E10
2036 H4	5910 G2
2900 A4	5911 G4
2901 A4	5912 H2
2902 A2	5913 H4
2903 A4	5914 F10
2904 A4	5915 F10
2905 B4	5916 H14
2906 B4	7900 E9
2907 B2	7901 F9
2908 B2	7902 G11
2909 C2	7903 I10
2910 I10	7904 D2
2911 D2	7905 G10
2912 E3	7906 E8
2913 E8	7907 E3
2914 F1	7908 G3
2915 F2	7909 G8
2916 E4	7910-1 E6
2917 E4	7910-2 H7
2918 F11	7911 H3
2919 F11	7912 H8
2920 F11	F1902 G12
2921 F12	F1903 G12
2922 F12	F1904 G12
2923 G9	F1907 F12
2924 F3	F1909 F12
2925 F8	F1911 F12
2926 G1	F1912 E12
2927 G2	F1914 E12
2928 G4	F1916 E12
2929 G4	F1918 D12
2930 H13	F1920 D12
2931 I13	F1921 D12
2932 I12	F1922 E13
2933 H2	I900 B12
2934 H8	I901 B12
2935 H1	I902 E2
2936 H2	I903 G2
2937 H4	I904 H2
2938 D2	I905 E1
2939 I13	I906 G1
2940 I13	I907 H1
2941 C4	I908 A12
2942 H11	I909 B14
2943 H11	I910 A12
2944 G13	I911 A12
3046 E10	I912 B12
3901 A2	I913 C12
3902 A2	I914 C12
3903 H11	I915 C12
3904 H11	I916 C12
3905 B2	I917 D12
3906 C2	I918 G9
3907 D3	I919 H13
3908 D2	I920 I13
3909 D10	I921 E4
3910 D11	I922 E5
3911 D2	I923 F4
3912 D2	I924 F5
3913 D10	I925 H4
3914 E11	I926 H5
3915 G10	I927 A2
3916 E11	I928 B2
3917 F10	I929 A1
3918 F1	I930 B1
3919 F3	I931 B1
3920 E4	I932 C1
3921 E8	I933 D1
3922 F10	I934 A3
3923 G11	I935 A3
3924 G1	I936 A3
3925 H9	I937 A3
3926 G3	I938 B3
3927 G4	I939 B3
3928 G8	
3929 I11	
3930 H1	
3931 I3	
3932 H4	
3933 H8	
3934 F2	
3935 E5	
3936 G2	
3937 G5	
3938 H2	
3939 H5	
3940 G9	
3941 E6	
3942 E6	
3943 E5	
3944 E6	
3945 F6	
3946 F6	
3947 F6	
3948 H6	
3949 H6	
3950 H5	
3951 H6	
3952 H5	
3953 H6	
3954 H6	
3955 I12	
3956 I12	
3957 E2	
3958 G2	
3959 H2	
3960 E7	
3961 G7	
3962 H8	
4900 H12	
4901 H12	
4902 G10	
4903 D7	
4904 D6	
4905 G6	
4906 E7	
4907 H7	
4908 G14	
4909 F14	
4910 G14	
4911 E10	
5901 G9	
5902 H14	
5903 I14	
5904 I10	
5905 E10	
5906 E10	

PHILIPS

STAGE: LAB 1
DATE: 04-12-01

CHN AV003477 SETNAME DVD+RW
CLASS_NO 3pc332

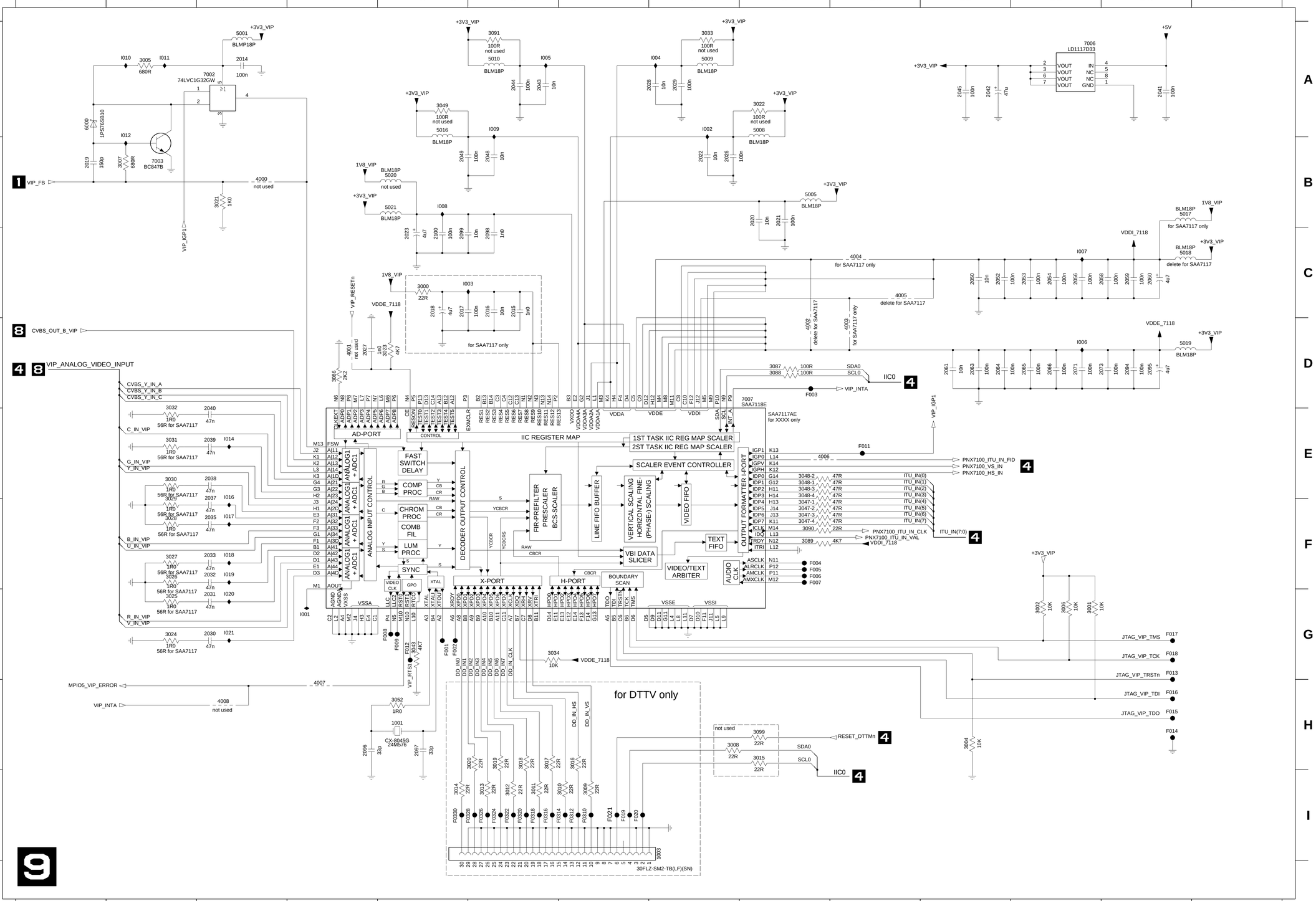
CHRY - F 05
Video IO

3103 603 3060

0 2004-12-01
0 2004-11-05
2004-11-12

NAME Kabinger / Linde SUPERS. 12 130 ~ 8 A2
CHECK DATE 2004-09-27

PHILIPS



STAGE: LAB 1
DATE: 04-12-01

CHN AV003477	SETNAME DVD+RW		
CLASS_NO 3pc332	CHRY - F 05 VIP	3103 603 3060	0 2004-12-01 / 0 2004-11-05
2004-11-12			
NAME Voko / Linde	SUPERS. 12 10 130 – 9 *** A2		
MGr CHECK ********	DATE 2004-09-27		

1001 H5
1003 I8
2014 A3
2015 C6
2016 C6
2017 C5
2018 C5
2019 B1
2020 B9
2021 B9
2022 B8
2023 C5
2026 B8
2027 D4
2028 A8
2029 A8
2030 G3
2031 G3
2032 F3
2033 F3
2035 F3
2037 E3
2038 E3
2039 E3
2040 E3
2041 A13
2042 A11
2043 A6
2044 A6
2045 A11
2048 B6
2049 B5
2050 C11
2052 C11
2053 C12
2054 C12
2056 C12
2058 C13
2059 C13
2060 C13
2061 D11
2063 D11
2064 D11
2065 D12
2066 D12
2071 D12
2073 D13
2094 D13
2095 D13
2096 H4
2097 H5
2098 C6
2099 C5
2100 C5
3000 C5
3001 G12
3002 G12
3004 H11
3005 A2
3006 G12
3007 B2
3008 H8
3009 I7
3010 I7
3011 I6
3012 I6
3013 I6
3014 I5
3015 H9
3016 H7
3017 H6
3018 H6
3019 H6
3020 H6
3021 B2
3022 A9
3023 D5
3024 G2
3025 G2
3026 F2
3027 F2
3028 F2
3029 E2
3030 E2
3031 E2
3032 D2
3033 A8
3034 G7
3043 G5
3047-1 F9
3047-2 F9
3047-3 F9
3047-4 F9
3048-1 E9
3048-2 E9
3048-3 E9
3048-4 E9
3049 A5
3052 H5
3086 D4
3087 D9
3088 D9
3089 F9
3090 F9
3091 A6
3099 H9
4000 B3
4001 D4
4002 D9
4003 D10
4004 C10
4005 C10
4006 E9
4007 H4
4008 H3
5001 A3
5005 B9
5008 A9
5009 A8
5010 A6
5016 A5
5017 B13
5018 C13
5019 D13
5020 B5
5021 B5
6000 A1
7002 A2
7003 B2
7006 A12
7007 D9
F001 G5
F002 G5
F003 D9
F004 F9
F005 F9
F006 F9
F007 F9
F008 G5
F009 G5
F011 E10
F012 G5
F013 G13
F014 H13
F015 H13
F016 H13
F017 G13
F018 G13
F019 I7
F020 I7
F021 I7
F0310 I7
F0312 I7
F0314 I7
F0316 I6
F0318 I6
F0320 I6
F0322 I6
F0324 I6
F0326 I6
F0328 I6
F0330 I5
I001 G4
I002 A8
I003 C6
I004 A8
I005 A6
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I007 C12
I008 B5
I009 A6
I010 A2
I011 A2
I012 A2
I014 E3
I016 E3
I017 F3
I018 F3
I019 F3
I020 G3
I021 G3

1004 A4	2754 D2	3754 C3	3759 C3	F0409 C3	F0418 B3	F0425 B3	F0431 A3	F0440 A4
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2751 D1	3751 A3	3756 C2	F0403 C3	F0413 C3	F0421 B3	F0427 B3	F0435 A3	
2752 D1	3752 A3	3757 C3	F0405 C3	F0415 C3	F0423 B3	F0428 B3	F0437 A3	
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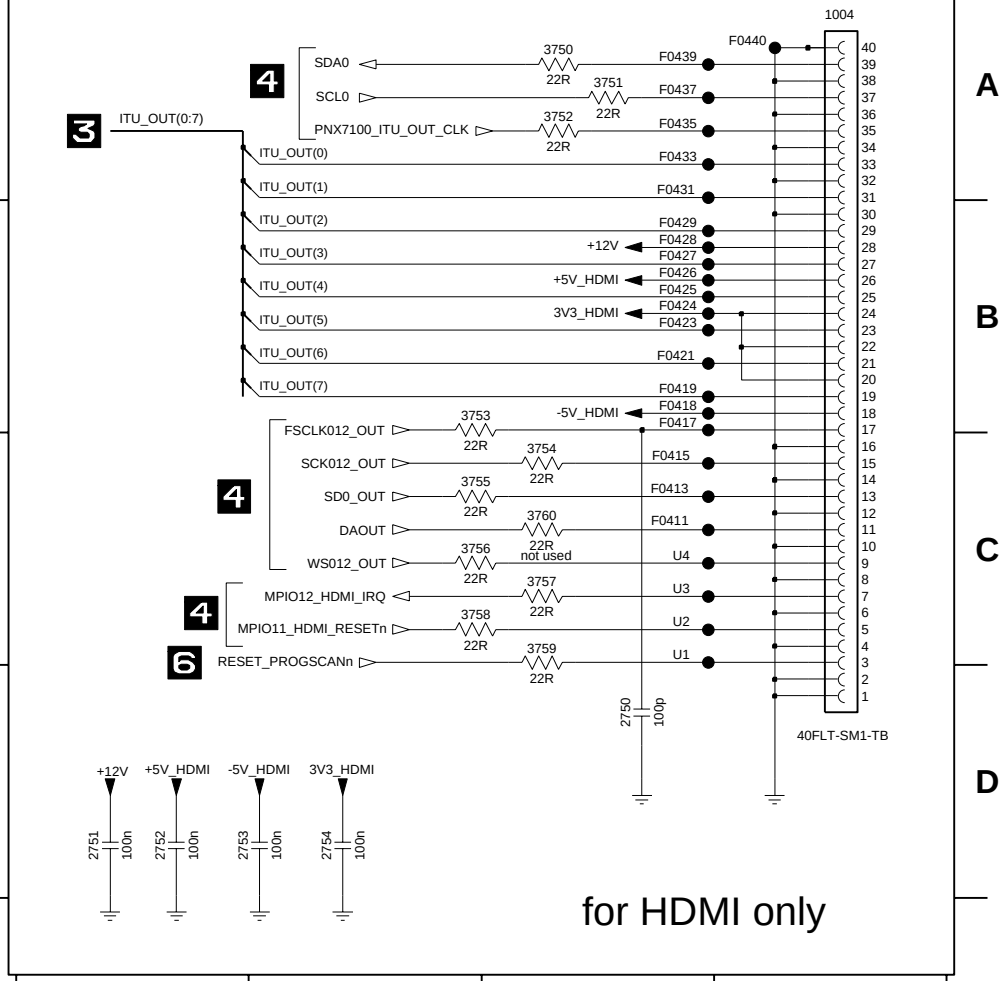
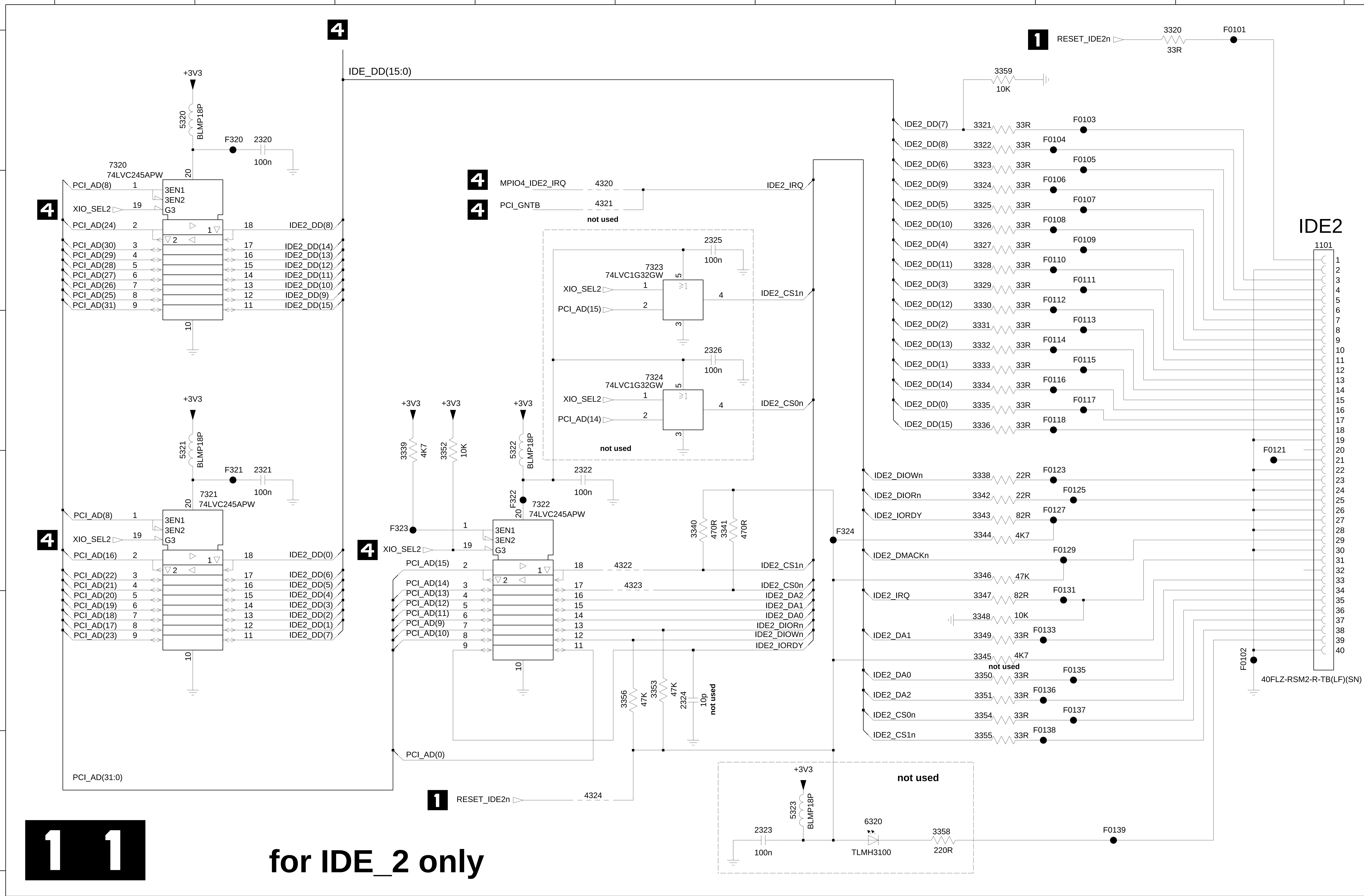


STAGE: LAB 1
DATE: 04-12-01

CHN AV003477	SETNAME DVD+RW		
CLASS_NO 3pc332	CHRY - F 05	3103 603 3060	0 2004-12-01
			0 2004-11-05
2004-11-12	HDMI INTERFACE		
NAME Voko / Linde	SUPERS. 12	130 – 10	A4
CHECK	DATE 2004-09-27	© KONINKLIJKE PHILIPS ELECTRONICS N.V. 2004	

PHILIPS



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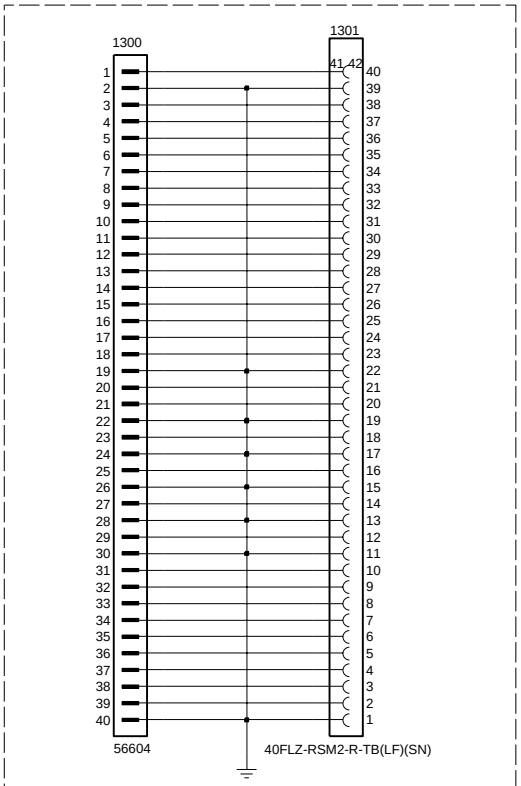
2322 D4	F0121 D9
2323 F6	F0123 D8
2324 E5	F0125 D8
2325 B5	F0127 D8
2326 C5	F0129 D8
3320 A8	F0131 E8
3321 A7	F0133 E8
3322 A7	F0135 E8
3323 A7	F0136 E8
3324 B7	F0137 E8
3325 B7	F0138 F8
3326 B7	F0139 F8
3327 B7	F320 A2
3328 B7	F321 D2
3329 B7	F322 D4
3330 B7	F323 D3
3331 C7	F324 D6
3332 C7	
3333 C7	
3334 C7	
3335 C7	
3336 C7	
3338 D7	
3339 D3	
3340 D5	
3341 D5	
3342 D7	
3343 D7	
3344 D7	
3345 E7	
3346 D7	
3347 E7	
3348 E7	
3349 E7	
3350 E7	
3351 E7	
3352 D3	
3353 E5	
3354 E7	
3355 F7	
3356 E5	
3358 F7	
3359 A7	
4320 B4	
4321 B4	
4322 D5	
4323 D5	
4324 F4	
5320 A1	
5321 C1	
5322 C4	
5323 F6	
6320 F6	
7320 A1	
7321 D2	
7322 D4	
7323 B5	
7324 C5	
F0101 A9	
F0102 E9	
F0103 A8	
F0104 A8	
F0105 A8	
F0106 B8	
F0107 B8	
F0108 B8	
F0109 B8	
F0110 B8	
F0111 B8	
F0112 B8	
F0113 C8	
F0114 C8	
F0115 C8	

STAGE: LAB 1
DATE: 04-12-01

CHN AV003477	SETNAME DVD+RW		
CLASS_NO 3pc332	CHRY - F 05	3103 603 3060	0 2004-12-01
2004-11-12 (1, 2, 3)	IDE 2		0 2004-11-05
NAME Ulreich / Linde	SUPERS. 12	130 – 11	A3
CHECK	DATE 2004-09-27		

1300 A2 1301 A3

PHILIPS



for HDRW720 only (not used)

12

STAGE: LAB 1
DATE: 04-12-01

CHN AV003477	SETNAME DVD+RW		
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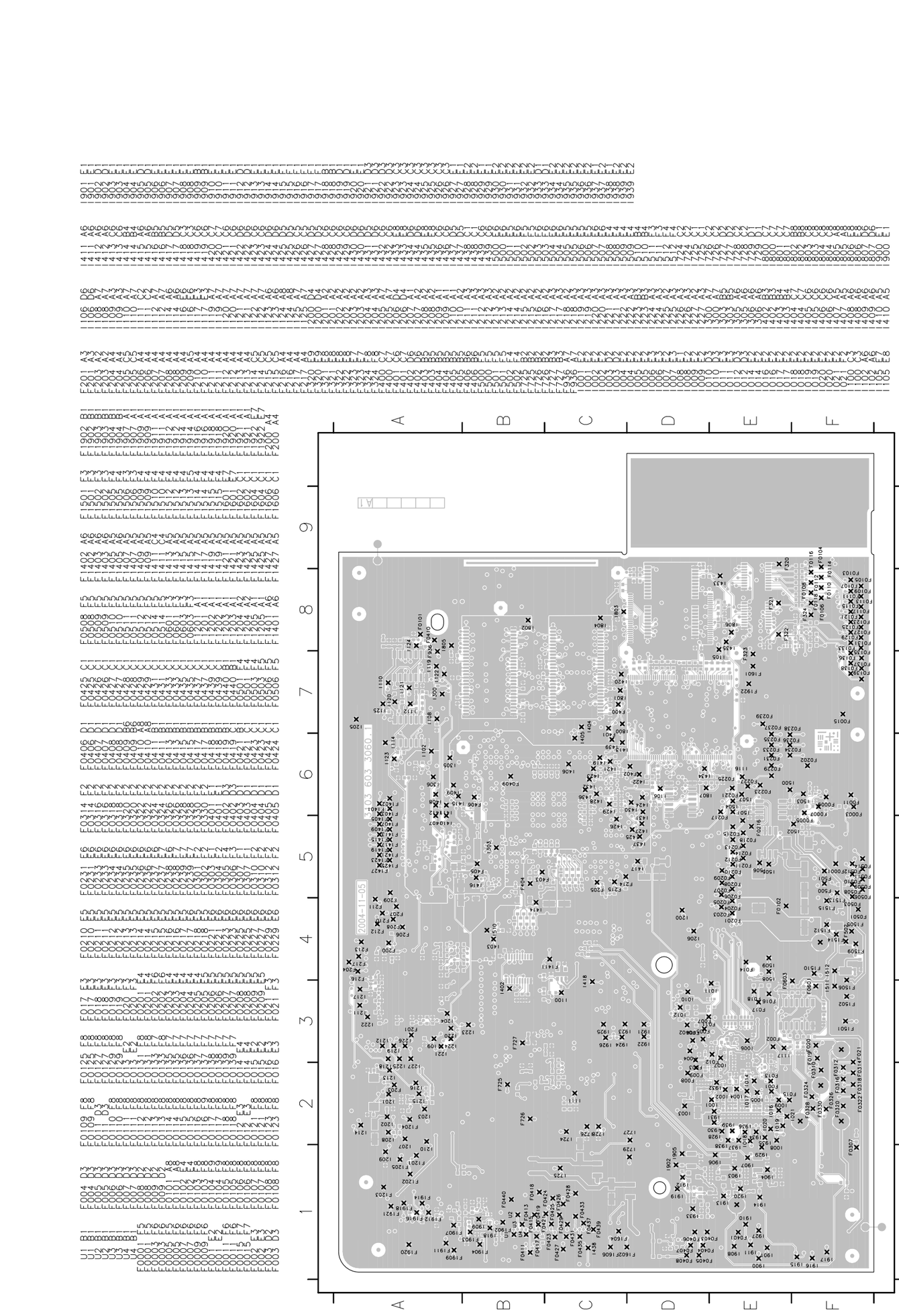
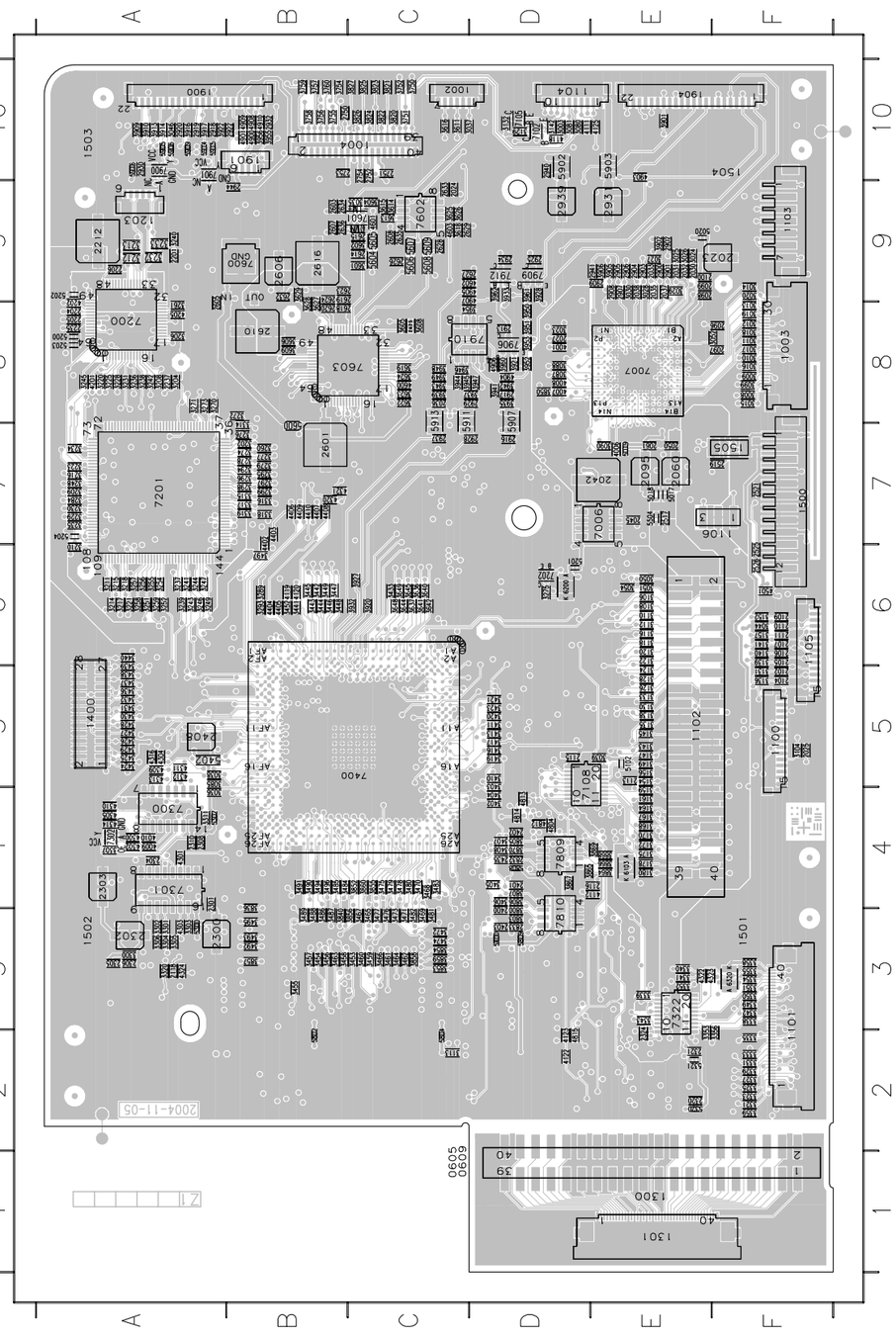
1 2004-11-12 2 3	IDE Interface		
NAME Cyniburk/Linde	SUPERS. 12	130 – 12	A4
CHECK	DATE 2004-09-27		


A
B
C
D
E
F
1
2
3
4
5
6
7
8
9
2004-11-05



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0609	C1
1002	C10
1003	F8
1004	C10
1100	F5
1101	F3
1102	E5
1103	F9
1104	D10
1105	F6
1106	F7
1203	A9
1300	E1
1301	E1
1400	A5
1500	F7
1505	F7
1900	A10
1901	B10
1904	E10
2023	F9
2024	C9
2025	F5
2027	D8
2030	E9
2031	E9
2032	E9
2033	E9
2035	E9
2036	C8
2037	E9
2038	E9
2042	E7
2045	E7
2050	E7
2060	E7
2061	E7
2095	E7
2096	F8
2097	F8
2098	E9
2099	E9
2100	E9
2102	F5
2104	F5
2105	F6
2106	F6
2107	F6
2109	F6
2110	F6
2111	F6
2113	E5
2115	D5
2116	E4
2118	A3
2201	A9
2204	A8
2205	A8
2206	A9
2212	A9
2235	A8
2237	A8
2300	A3
2301	A4
2302	A3
2303	A4
2304	A4
2305	A3
2306	A3
2308	A4
2310	A4
2320	E2
2321	E2
2324	E2
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2401	D4
2402	D4
2403	D3
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2435	D4
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2519	F7
2521	F7
2525	F6
2526	F6
2601	B7
2603	B9
2605	A8
2606	B9
2607	B9
2608	C9
2610	B8
2614	C9
2615	C9
2616	B9
2618	B8
2619	B9
2620	B8
2623	B9
2624	B9
2625	C8
2626	C9
2627	C9
2628	C9
2629	C9
2632	B9
2633	C9
2634	B9
2635	C9
2636	B9
2750	B10
2751	C10
2752	C10
2753	B10
2754	C10
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2833	D3
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2903	E9
2904	E9
2905	E9
2906	E9
2907	E9
2908	E9
2909	E9
2913	D8
2916	D7
2917	D8
2918	A10
2919	A10
2920	A10
2922	B10
2925	D9
2928	D7
2929	D8
2930	A10
2931	E9
2932	B10
2934	D9
2937	C7
2939	D9
2940	D10
2941	E9
2944	B9
3003	D10
3008	F8
3009	F8
3010	F8
3011	F8
3012	F8
3013	F8
3014	F9
3015	F8
3016	F8
3017	F8
3018	F8
3019	F8
3020	F9
3023	D8
3024	E9
3025	E9
3026	E9
3027	E9
3028	E9
3029	E9
3030	E9
3035	C9
3036	A4
3037	C10
3038	A5
3039	E5
3044	F6
3046	A10
3050	E6
3051	E6
3052	F8
3054	E6
3080	D10
3081	D10
3085	A5
3087	D8
3088	D8
3090	E7
3099	F8
3104	F5
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3108	E6
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3112	E6
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3116	E6
3118	E6
3120	E6
3122	E6
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3126	E5
3128	E5
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3131	F5
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3248	A7
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3271	A8
3272	B8
3273	A8
3274	B7
3275	D6
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3854	C3
3855	C4
3856	C3
3857	B3
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3864	E4
3865	D4
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3870	D4
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3927	C6
3928	D9
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3952	D8
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3962	D9
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4007	D8
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4118	D10
4119	B6
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4202	A8
4205	A8
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4303	A3
4304	A5
4305	A4
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4603	C9
4804	D4
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5019	E7
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7202	D6
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7601	C9
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7603	C8
7809	D4
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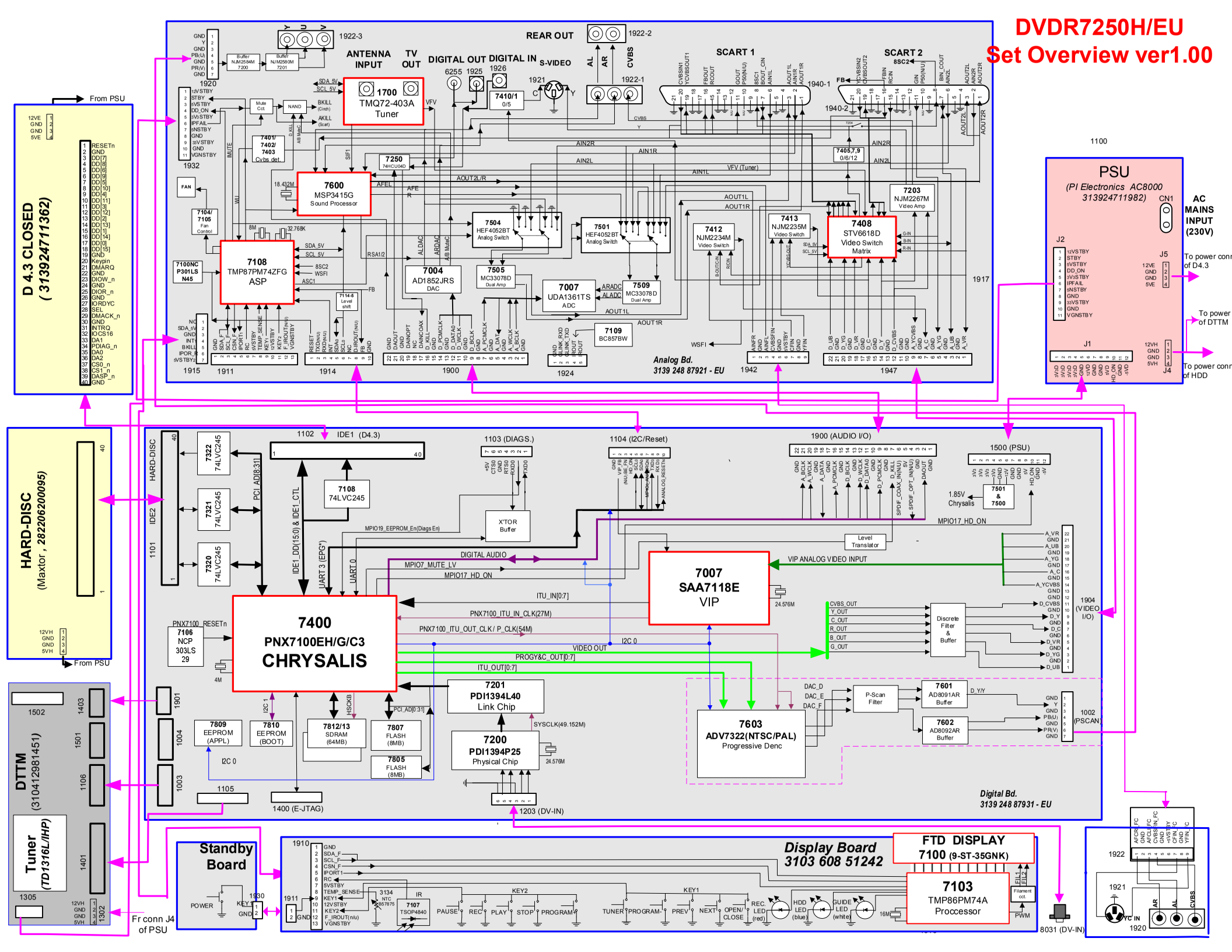
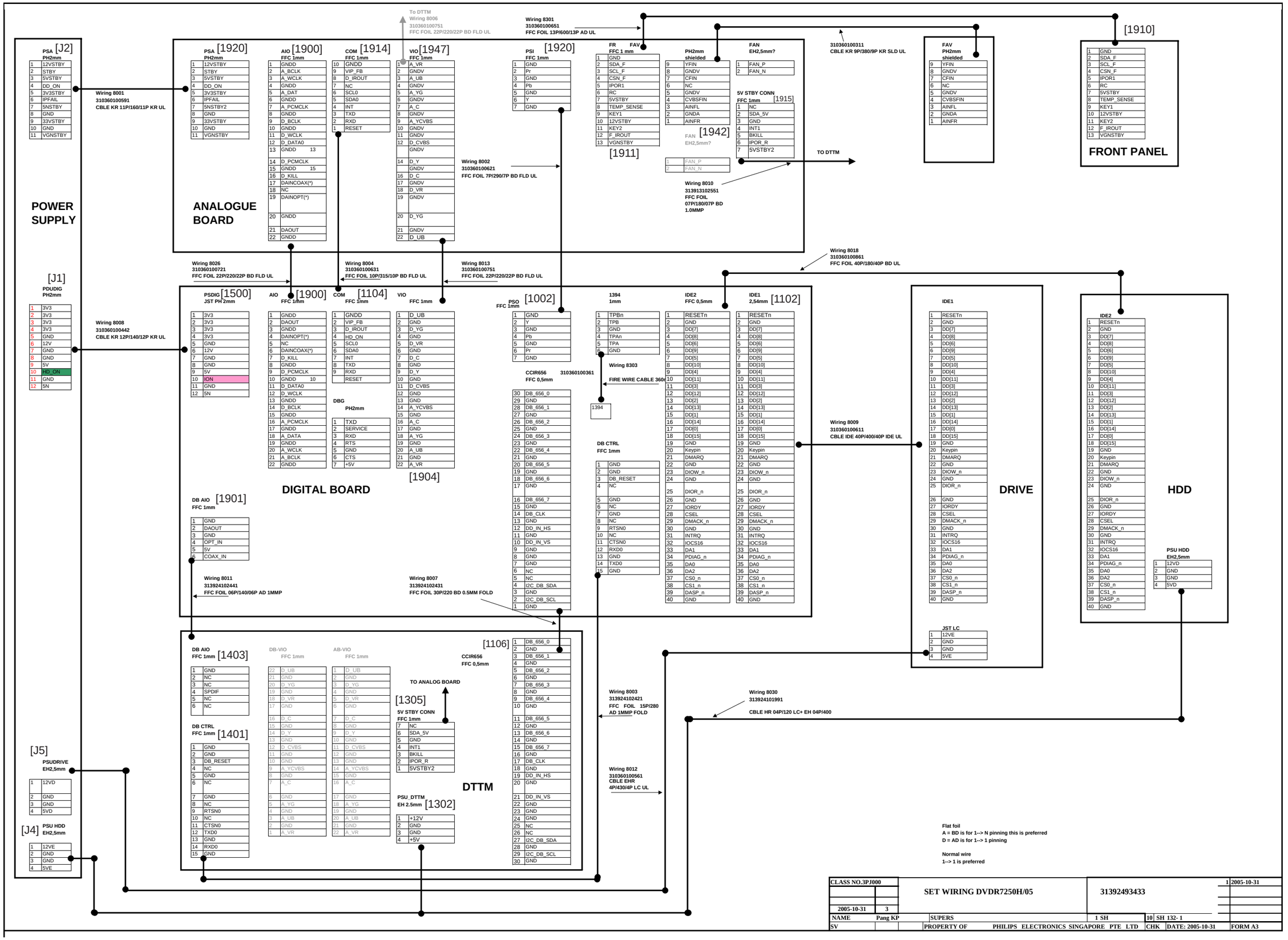
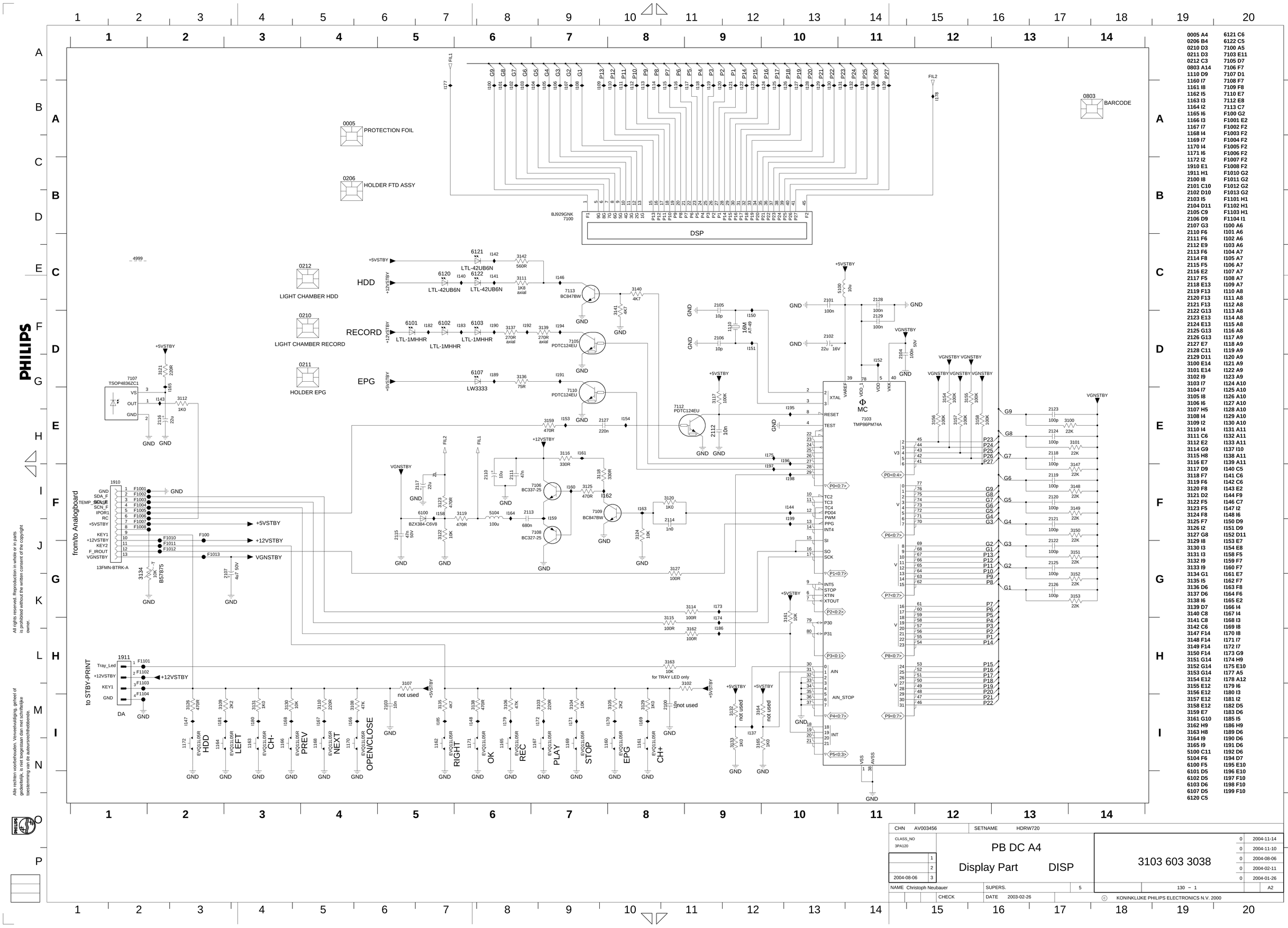
7912	D9

DVDR7250H/EU
Set Overview ver1.00




POWER SUPPLY
[J2]
PSA PH2mm
1 12VSTBY
2 STBY
3 5VSTBY
4 DD_ON
5 3V3STBY
6 IPFAIL
7 5NSTBY
8 GND
9 33VSTBY
10 GND
11 VGNSTBY
Wiring 8001
310360100591
CBLE KR 11P/160/11P KR UL
[J1]
PDUDIG PH2mm
1 3V3
2 3V3
3 3V3
4 3V3
5 GND
6 12V
7 GND
8 GND
9 5V
10 HD_ON
11 GND
12 5N
Wiring 8008
310360100442
CBLE KR 12P/140/12P KR UL
ANALOGUE BOARD
PSA [1920] PH2mm
1 12VSTBY
2 STBY
3 5VSTBY
4 DD_ON
5 3V3STBY
6 IPFAIL
7 5NSTBY2
8 GND
9 33VSTBY
10 GND
11 VGNSTBY
AIO [1900] FFC 1mm
1 GNDD
2 A_BCLK
3 A_WCLK
4 GNDD
5 A_DAT
6 GNDD
7 A_PCMCLK
8 GNDD
9 D_BCLK
10 GNDD
11 D_WCLK
12 D_DATA0
13 GNDD
14 D_PCMCLK
15 GNDD
16 D_KILL
17 DAINCOAX(*)
18 NC
19 DAINOPT(*)
20 GNDD
21 DAOUT
22 GNDD
COM [1914] FFC 1mm
10 GNDD
9 VIP_FB
8 D_IROUT
7 NC
6 SCL0
5 SDA0
4 INT
3 TXD
2 RXD
1 RESET
VIO [1947] FFC 1mm
1 A_VR
2 GNDV
3 A_UB
4 GNDV
5 A_YG
6 GNDV
7 A_C
8 GNDV
9 A_YCVBS
10 GNDV
11 GNDV
12 D_CVBS
GNDV
14 D_Y
GNDV
16 D_C
17 GNDV
18 D_VR
19 GNDV
20 D_YG
21 GNDV
22 D_UB
PSI [1920] FFC 1mm
1 GND
2 Pr
3 GND
4 Pb
5 GND
6 Y
7 GND
FR FAV FFC 1 mm [1911]
1 GND
2 SDA_F
3 SCL_F
4 CSN_F
5 IPOR1
6 RC
7 5VSTBY
8 TEMP_SENSE
9 KEY1
10 12VSTBY
11 KEY2
12 F_IROUT
13 VGNSTBY
PH2mm shielded
9 YFIN
8 GNDV
7 CFIN
6 NC
5 GNDV
4 CVBSFIN
3 AINFL
2 GNDA
1 AINFR
FAN [1942] EH2,5mm?
1 FAN_P
2 FAN_N
FAN EH2,5mm?
1 FAN_P
2 FAN_N
5V STBY CONN FFC 1mm [1915]
1 NC
2 SDA_5V
3 GND
4 INT1
5 BKILL
6 IPOR_R
7 5VSTBY2
TO DTTM
Wiring 8002
310360100621
FFC FOIL 7P/290/7P BD FLD UL
Wiring 8010
313913102551
FFC FOIL 07P/180/07P BD 1.0MMP
Wiring 8301
310360100651
FFC FOIL 13P/600/13P AD UL
To DTTM
Wiring 8006
310360100751
FFC FOIL 22P/220/22P BD FLD UL
310360100311
CBLE KR 9P/380/9P KR SLD UL
FAV PH2mm shielded
9 YFIN
8 GNDV
7 CFIN
6 NC
5 GNDV
4 CVBSFIN
3 AINFL
2 GNDA
1 AINFR
[1910]
1 GND
2 SDA_F
3 SCL_F
4 CSN_F
5 IPOR1
6 RC
7 5VSTBY
8 TEMP_SENSE
9 KEY1
10 12VSTBY
11 KEY2
12 F_IROUT
13 VGNSTBY
FRONT PANEL
Wiring 8026
310360100721
FFC FOIL 22P/220/22P BD FLD UL
Wiring 8004
310360100631
FFC FOIL 10P/315/10P BD FLD UL
Wiring 8013
310360100751
FFC FOIL 22P/220/22P BD FLD UL
Wiring 8018
310360100861
FFC FOIL 40P/180/40P BD UL
DIGITAL BOARD
PSDIG [1500] JST PH 2mm
1 3V3
2 3V3
3 3V3
4 3V3
5 GND
6 12V
7 GND
8 GND
9 5V
10 ION
11 GND
12 5N
AIO [1900] FFC 1mm
1 GNDD
2 DAOUT
3 GNDD
4 DAINOPT(*)
5 NC
6 DAINCOAX(*)
7 D_KILL
8 GNDD
9 D_PCMCLK
10 GNDD
11 D_DATA0
12 D_WCLK
13 GNDD
14 D_BCLK
15 GNDD
16 A_PCMCLK
17 GNDD
18 A_DATA
19 GNDD
20 A_WCLK
21 A_BCLK
22 GNDD
COM [1104] FFC 1mm
1 GNDD
2 VIP_FB
3 D_IROUT
4 HD_ON
5 SCL0
6 SDA0
7 INT
8 TXD
9 RXD
RESET
DBG PH2mm
1 TXD
2 SERVICE
3 RXD
4 RTS
5 GND
6 CTS
7 +5V
VIO FFC 1mm
1 D_UB
2 GND
3 D_YG
4 GND
5 D_VR
6 GND
7 D_C
8 GND
9 D_Y
10 GND
11 D_CVBS
12 GND
13 GND
14 A_YCVBS
15 GND
16 A_C
17 GND
18 A_YG
19 GND
20 A_UB
21 GND
22 A_VR
[1904]
PSO [1002] FFC 1mm
1 GND
2 Y
3 GND
4 Pb
5 GND
6 Pr
7 GND
1394 1mm
1 TPBn
2 TPB
3 GND
4 TPAn
5 TPA
6 GND
Wiring 8303
FIRE WIRE CABLE 360W
1394
IDE2 FFC 0,5mm
1 RESETn
2 GND
3 DD[7]
4 DD[8]
5 DD[6]
6 DD[9]
7 DD[5]
8 DD[10]
9 DD[4]
10 DD[11]
11 DD[3]
12 DD[12]
13 DD[2]
14 DD[13]
15 DD[1]
16 DD[14]
17 DD[0]
18 DD[15]
19 GND
20 Keypin
21 DMARQ
22 GND
23 DIOW_n
24 GND
25 DIOR_n
26 GND
27 IORDY
28 CSEL
29 DMACK_n
30 GND
31 INTRQ
32 IOCS16
33 DA1
34 PDIAG_n
35 DA0
36 DA2
37 CS0_n
38 CS1_n
39 DASP_n
40 GND
IDE1 2,54mm [1102]
1 RESETn
2 GND
3 DD[7]
4 DD[8]
5 DD[6]
6 DD[9]
7 DD[5]
8 DD[10]
9 DD[4]
10 DD[11]
11 DD[3]
12 DD[12]
13 DD[2]
14 DD[13]
15 DD[1]
16 DD[14]
17 DD[0]
18 DD[15]
19 GND
20 Keypin
21 DMARQ
22 GND
23 DIOW_n
24 GND
25 DIOR_n
26 GND
27 IORDY
28 CSEL
29 DMACK_n
30 GND
31 INTRQ
32 IOCS16
33 DA1
34 PDIAG_n
35 DA0
36 DA2
37 CS0_n
38 CS1_n
39 DASP_n
40 GND
CCIR656 310360100361 FFC 0,5mm
30 DB_656_0
29 GND
28 DB_656_1
27 GND
26 DB_656_2
25 GND
24 DB_656_3
23 GND
22 DB_656_4
21 GND
20 DB_656_5
19 GND
18 DB_656_6
17 GND
16 DB_656_7
15 GND
14 DB_CLK
13 GND
12 DD_IN_HS
11 GND
10 DD_IN_VS
9 GND
8 GND
7 GND
6 NC
5 NC
4 I2C_DB_SDA
3 GND
2 I2C_DB_SCL
1 GND
DB CTRL FFC 1mm
1 GND
2 GND
3 DB_RESET
4 NC
5 GND
6 NC
7 GND
8 NC
9 RTSN0
10 NC
11 CTSN0
12 RXD0
13 GND
14 TXD0
15 GND
Wiring 8009
310360100611
CBLE IDE 40P/400/40P IDE UL
DRIVE
IDE1
1 RESETn
2 GND
3 DD[7]
4 DD[8]
5 DD[6]
6 DD[9]
7 DD[5]
8 DD[10]
9 DD[4]
10 DD[11]
11 DD[3]
12 DD[12]
13 DD[2]
14 DD[13]
15 DD[1]
16 DD[14]
17 DD[0]
18 DD[15]
19 GND
20 Keypin
21 DMARQ
22 GND
23 DIOW_n
24 GND
25 DIOR_n
26 GND
27 IORDY
28 CSEL
29 DMACK_n
30 GND
31 INTRQ
32 IOCS16
33 DA1
34 PDIAG_n
35 DA0
36 DA2
37 CS0_n
38 CS1_n
39 DASP_n
40 GND
JST LC
1 12VE
2 GND
3 GND
4 5VE
HDD
IDE2
1 RESETn
2 GND
3 DD[7]
4 DD[8]
5 DD[6]
6 DD[9]
7 DD[5]
8 DD[10]
9 DD[4]
10 DD[11]
11 DD[3]
12 DD[12]
13 DD[2]
14 DD[13]
15 DD[1]
16 DD[14]
17 DD[0]
18 DD[15]
19 GND
20 Keypin
21 DMARQ
22 GND
23 DIOW_n
24 GND
25 DIOR_n
26 GND
27 IORDY
28 CSEL
29 DMACK_n
30 GND
31 INTRQ
32 IOCS16
33 DA1
34 PDIAG_n
35 DA0
36 DA2
37 CS0_n
38 CS1_n
39 DASP_n
40 GND
PSU HDD EH2,5mm
1 12VD
2 GND
3 GND
4 5VD
DB AIO [1901] FFC 1mm
1 GND
2 DAOUT
3 GND
4 OPT_IN
5 5V
6 COAX_IN
Wiring 8011
313924102441
FFC FOIL 06P/140/06P AD 1MMP
Wiring 8007
313924102431
FFC FOIL 30P/220 BD 0.5MM FOLD
DB AIO [1403] FFC 1mm
1 GND
2 NC
3 NC
4 SPDIF
5 NC
6 NC
DB CTRL FFC 1mm [1401]
1 GND
2 GND
3 DB_RESET
4 NC
5 GND
6 NC
7 GND
8 NC
9 RTSN0
10 NC
11 CTSN0
12 TXD0
13 GND
14 RXD0
15 GND
DB-VIO FFC 1mm
22 D_UB
21 GND
20 D_YG
19 GND
18 D_VR
17 GND
16 D_C
15 GND
14 D_Y
13 GND
12 D_CVBS
11 GND
10 GND
9 A_YCVBS
8 GND
7 A_C
6 GND
5 A_YG
4 GND
3 A_UB
2 GND
1 A_VR
AB-VIO FFC 1mm
1 D_UB
2 GND
3 D_YG
4 GND
5 D_VR
6 GND
7 D_C
8 GND
9 D_Y
10 GND
11 D_CVBS
12 GND
13 GND
14 A_YCVBS
15 GND
16 A_C
17 GND
18 A_YG
19 GND
20 A_UB
21 GND
22 A_VR
TO ANALOG BOARD
[1305]
5V STBY CONN FFC 1mm
7 NC
6 SDA_5V
5 GND
4 INT1
3 BKILL
2 IPOR_R
1 5VSTBY2
DTTM
PSU_DTTM EH 2.5mm [1302]
1 +12V
2 GND
3 GND
4 +5V
[1106]
CCIR656 FFC 0,5mm
1 DB_656_0
2 GND
3 DB_656_1
4 GND
5 DB_656_2
6 GND
7 DB_656_3
8 GND
9 DB_656_4
10 GND
11 DB_656_5
12 GND
13 DB_656_6
14 GND
15 DB_656_7
16 GND
17 DB_CLK
18 GND
19 DD_IN_HS
20 GND
21 DD_IN_VS
22 GND
23 GND
24 GND
25 NC
26 NC
27 I2C_DB_SDA
28 GND
29 I2C_DB_SCL
30 GND
Wiring 8003
313924102421
FFC FOIL 15P/280 AD 1MMP FOLD
Wiring 8012
310360100561
CBLE EHR 4P/430/4P LC UL
Wiring 8030
313924101991
CBLE HR 04P/120 LC+ EH 04P/400
[J5]
PSUDRIVE EH2,5mm
1 12VD
2 GND
3 GND
4 5VD
[J4]
PSU HDD EH2,5mm
1 12VE
2 GND
3 GND
4 5VE
Flat foil
A = BD is for 1--> N pinning this is preferred
D = AD is for 1--> 1 pinning
Normal wire
1--> 1 is preferred
CLASS NO.3PJ000
SET WIRING DVDR7250H/05
31392493433
1 2005-10-31
2005-10-31 3
NAME Pang KP
SUPERS
1 SH
10 SH 132- 1
SV
PROPERTY OF PHILIPS ELECTRONICS SINGAPORE PTE LTD
CHK
DATE: 2005-10-31
FORM A3



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0206 B4	6122 C5	F1001 E2	I103 A6
0210 D3	7100 A5	F1002 F2	I104 A7
0211 D3	7103 E11	F1003 F2	I105 A7
0212 C3	7105 D7	F1004 F2	I106 A7
0803 A14	7106 F7	F1005 F2	I107 A7
1110 D9	7107 D1	F1006 F2	I108 A7
1160 I7	7108 F7	F1007 F2	I109 A7
1161 I8	7109 F8	F1008 F2	I110 A8
1162 I5	7110 E7	F1010 G2	I111 A8
1163 I3	7112 E8	F1011 H1	I112 A8
1164 I2	7113 C7	F1012 H1	I113 A8
1165 I6	F100 G2	F1013 H1	I114 A8
1166 I3	F1001 E2	F1101 H1	I115 A8
1167 I7	F1002 F2	F1102 H1	I116 A8
1168 I4	F1003 F2	F1103 H1	I117 A9
1169 I7	F1004 F2	F1104 I1	I118 A9
1170 I4	F1005 F2	I100 A6	I119 A9
1171 I6	F1006 F2	I101 A6	I120 A9
1172 I2	F1007 F2	I102 A6	I121 A9
1910 E1	F1008 F2	I103 A6	I122 A9
1911 H1	F1010 G2	I104 A7	I123 A9
2100 I8	F1011 G2	I105 A7	I124 A10
2101 C10	F1012 G2	I106 A7	I125 A10
2102 D10	F1013 G2	I107 A7	I126 A10
2103 I5	F1101 H1	I108 A7	I127 A10
2104 D11	F1102 H1	I109 A7	I128 A10
2105 C9	F1103 H1	I110 A8	I129 A10
2106 D9	F1104 I1	I111 A8	I130 A10
2107 G3	I100 A6	I112 A8	I131 A11
2110 F6	I101 A6	I113 A8	I132 A11
2111 F6	I102 A6	I114 A8	I133 A11
2112 E9	I103 A6	I115 A8	I137 I10
2113 F6	I104 A7	I116 A8	I138 A11
2114 F8	I105 A7	I117 A9	I139 A11
2115 F5	I106 A7	I118 A9	I140 C5
2116 E2	I107 A7	I119 A9	I141 C6
2117 F5	I108 A7	I120 A9	I142 C6
2118 E13	I109 A7	I121 A9	I143 E2
2119 F13	I110 A8	I122 A9	I144 F9
2120 F13	I111 A8	I123 A9	I146 C7
2121 F13	I112 A8	I124 A10	I147 I2
2122 G13	I113 A8	I125 A10	I148 I6
2123 E13	I114 A8	I126 A10	I150 D9
2124 E13	I115 A8	I127 A10	I151 D9
2125 G13	I116 A8	I128 A10	I152 D11
2126 G13	I117 A9	I129 A10	I153 E7
2127 E7	I118 A9	I130 A10	I154 E8
2128 C11	I119 A9	I131 A11	I158 F5
2129 D11	I120 A9	I132 A11	I159 F7
3100 E14	I121 A9	I133 A11	I160 F7
3101 E14	I122 A9	I137 I10	I161 E7
3102 I9	I123 A9	I138 A11	I162 F7
3103 I7	I124 A10	I139 A11	I163 F8
3104 I7	I125 A10	I140 C5	I164 F6
3105 I8	I126 A10	I141 C6	I165 E2
3106 I6	I127 A10	I142 C6	I166 I4
3107 H5	I128 A10	I143 E2	I167 I4
3108 I4	I129 A10	I144 F9	I168 I3
3109 I2	I130 A10	I146 C7	I169 I8
3110 I4	I131 A11	I147 I2	I170 I8
3111 C6	I132 A11	I148 I6	I171 I7
3112 E2	I133 A11	I150 D9	I172 I7
3114 G9	I137 I10	I151 D9	I173 G9
3115 H8	I138 A11	I152 D11	I174 H9
3116 E7	I139 A11	I153 E7	I175 E10
3117 D9	I140 C5	I154 E8	I177 A5
3118 F7	I141 C6	I158 F5	I178 A12
3119 F6	I142 C6	I159 F7	I179 I6
3120 F8	I143 E2	I160 F7	I180 I3
3121 D2	I144 F9	I161 E7	I181 I2
3122 F5	I146 C7	I162 F7	I182 D5
3123 F5	I147 I2	I163 F8	I183 D6
3124 F8	I148 I6	I164 F6	I185 I5
3125 F7	I150 D9	I165 E2	I186 H9
3126 I2	I151 D9	I166 I4	I189 D6
3127 G8	I152 D11	I167 I4	I190 D6
3129 I8	I153 E7	I168 I3	I191 D6
3130 I3	I154 E8	I169 I8	I192 D6
3131 I3	I158 F5	I170 I8	I194 D7
3132 I9	I159 F7	I171 I7	I195 E10
3133 I9	I160 F7	I172 I7	I196 E10
3134 G1	I161 E7	I173 G9	I197 F10
3135 I5	I162 F7	I174 H9	I198 F10
3136 D6	I163 F8	I175 E10	I199 F10
3137 D6	I164 F6	I177 A5	
3138 I6	I165 E2	I178 A12	
3139 D7	I166 I4	I179 I6	
3140 C8	I167 I4	I180 I3	
3141 C8	I168 I3	I181 I2	
3142 C6	I169 I8	I182 D5	
3147 F14	I170 I8	I183 D6	
3148 F14	I171 I7	I185 I5	
3149 F14	I172 I7	I186 H9	
3150 F14	I173 G9	I189 D6	
3151 G14	I174 H9	I190 D6	
3152 G14	I175 E10	I191 D6	
3153 G14	I177 A5	I192 D6	
3154 E12	I178 A12	I194 D7	
3155 E12	I179 I6	I195 E10	
3156 E12	I180 I3	I196 E10	
3157 E12	I181 I2	I197 F10	
3158 E12	I182 D5	I198 F10	
3159 E7	I183 D6	I199 F10	
3161 G10	I185 I5		
3162 H9	I186 H9		
3163 H8	I189 D6		
3164 I9	I190 D6		
3165 I9	I191 D6		
5100 C11	I192 D6		
5104 F6	I194 D7		
6100 F5	I195 E10		
6101 D5	I196 E10		
6102 D5	I197 F10		
6103 D6	I198 F10		
6107 D5	I199 F10		
6120 C5			

CHN AV003456		SETNAME HDRW720	
CLASS_NO 3PA120		PB DC A4	
	1	Display Part DISP	
	2		
2004-08-06	3	3103 603 3038	
NAME Christoph Neubauer		SUPERS.	5
		CHECK	DATE 2003-02-26

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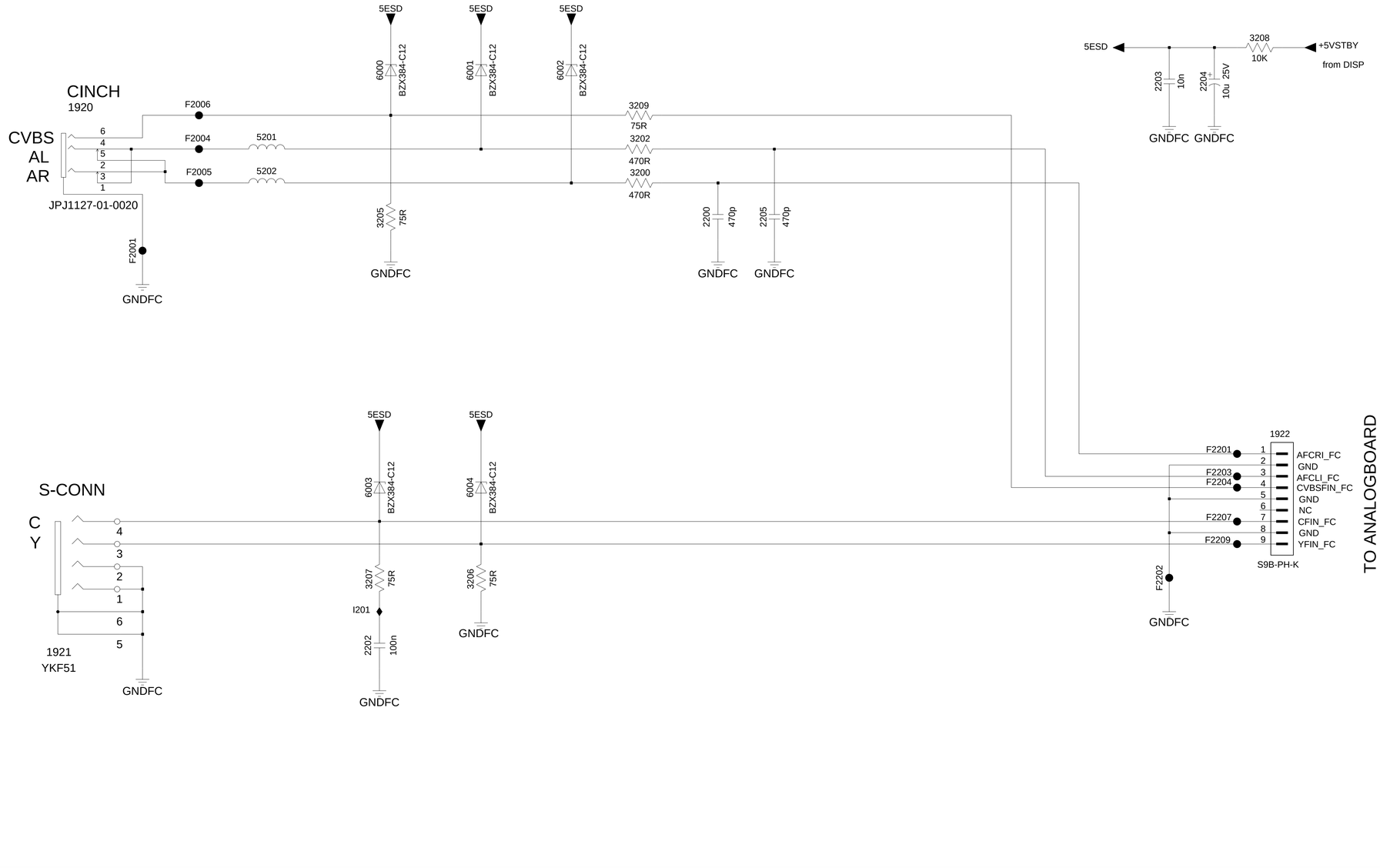
0	2004-11-10
0	2004-08-06
0	2004-02-11
0	2004-01-26

130 – 1 A2

PHILIPS



1920 A1
1921 E1
1922 C9
2200 B5
2202 E3
2203 A8
2204 A8
2205 B6
3200 B5
3202 A5
3205 B3
3206 D4
3207 D3
3208 A9
3209 A5
5201 A2
5202 B2
6000 A3
6001 A4
6002 A4
6003 D3
6004 D4
F2001 B2
F2004 A2
F2005 A2
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F2203 C8
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F2207 D8
F2209 D8
I201 D3

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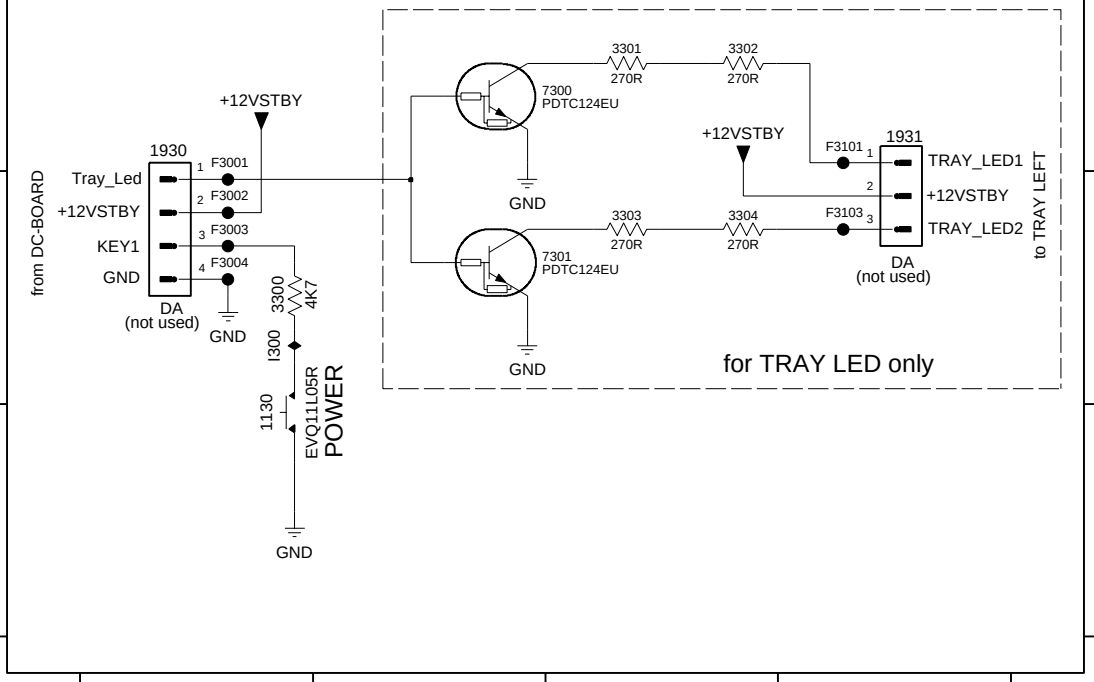
CLASS_NO 3PA120	PB DC A4	3103 603 3038	0 2004-11-10
1	Front Connector FC		0 2004-08-06
2			0 2004-02-11
2004-08-06 3			0 2003-08-12
			0 2003-07-02
NAME Christoph Neubauer	SUPERS. 5	130 – 2	A3
CHECK	DATE 2003-02-26		

1130 C1 **1931 A4** **3301 A3** **3303 B3** **7300 A2** **F3001 A1** **F3003 B1** **F3101 A4** **I300 B1**
1930 A1 **3300 B1** **3302 A3** **3304 B3** **7301 B2** **F3002 B1** **F3004 B1** **F3103 B4**



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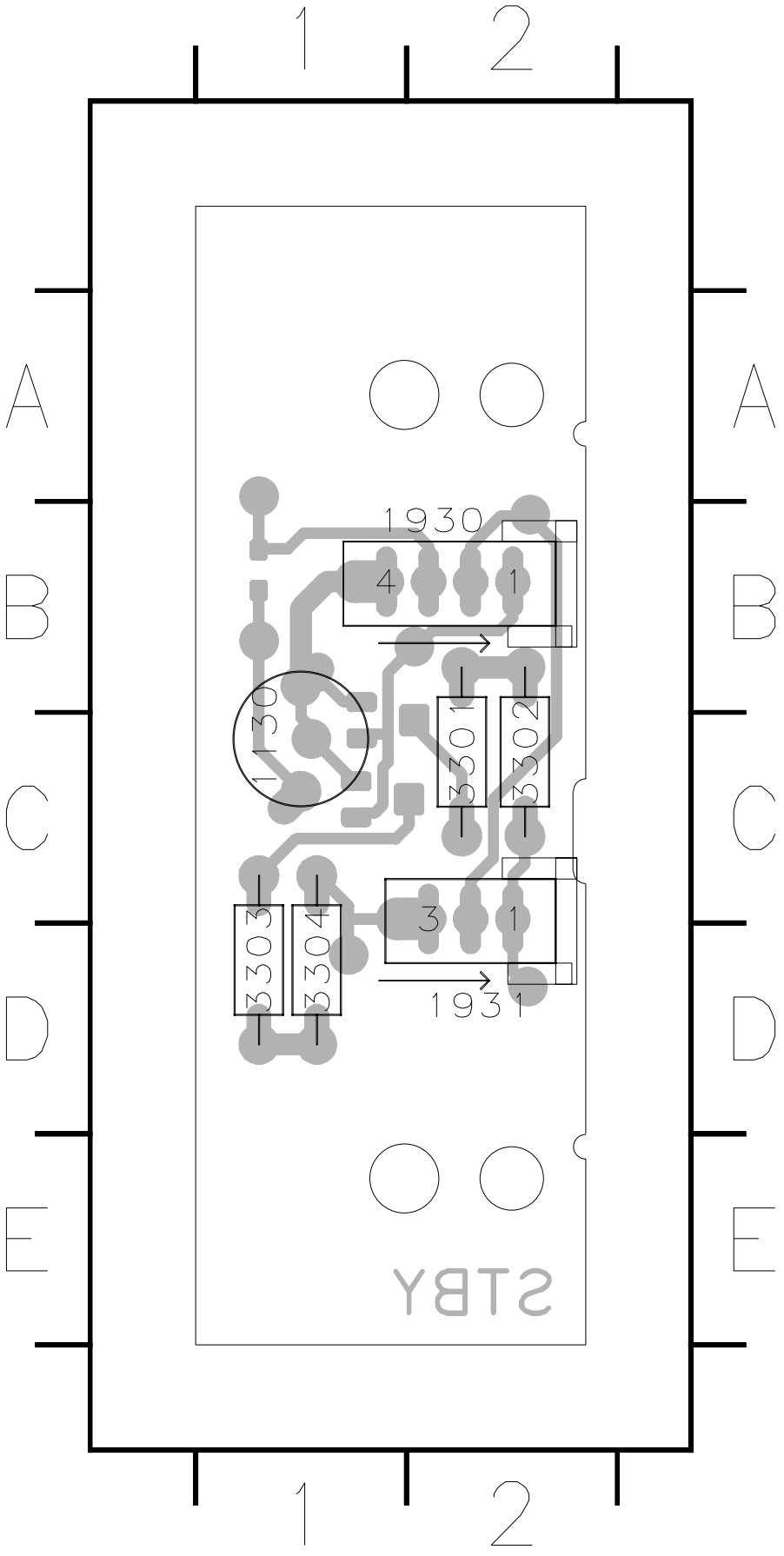
CLASS_NO 3PA120	PB DC 03 EU	3103 603 3042	0 2004-11-24
			0 2003-11-21
			0 2003-10-27
	Standby STBY		0 2003-08-12
2003-10-31 3			0 2003-05-26
NAME CYNIBURK	SUPERS. 5	130 – 3	A4
CHECK	DATE 2002-06-14		



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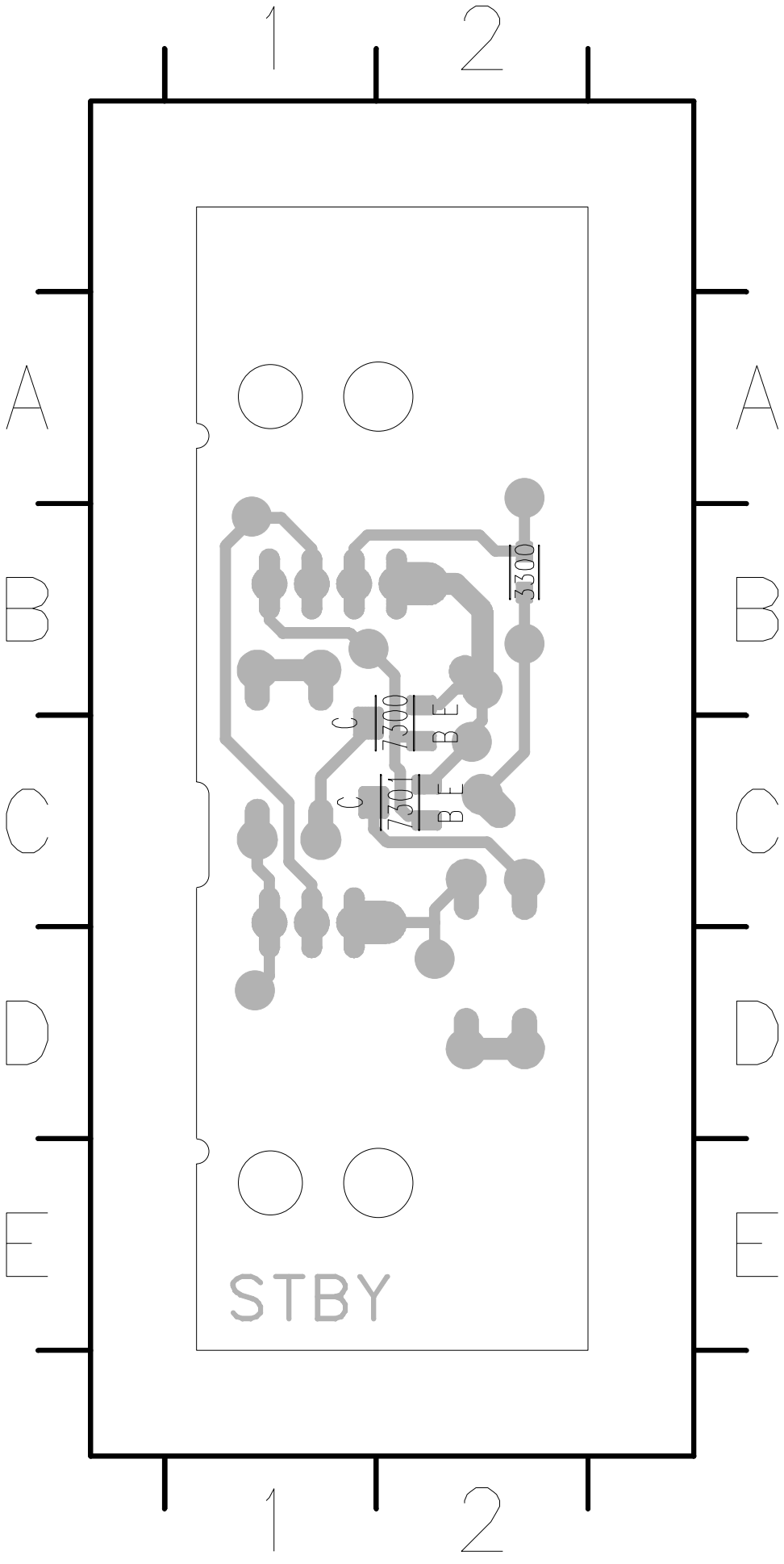
1931	D2
3301	C2
3302	B2
3303	D1
3304	D1



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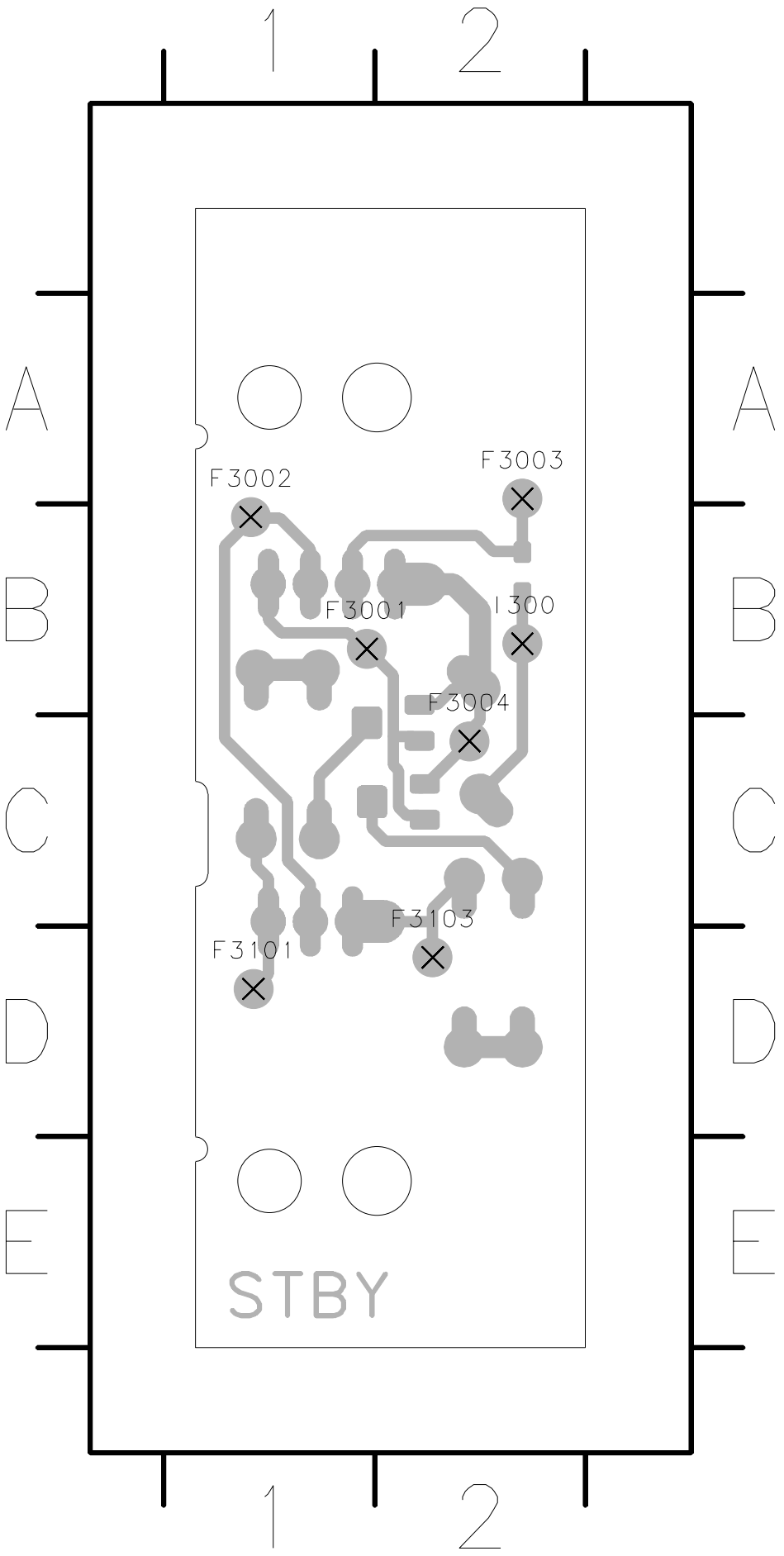
7300 C2
7301 C2



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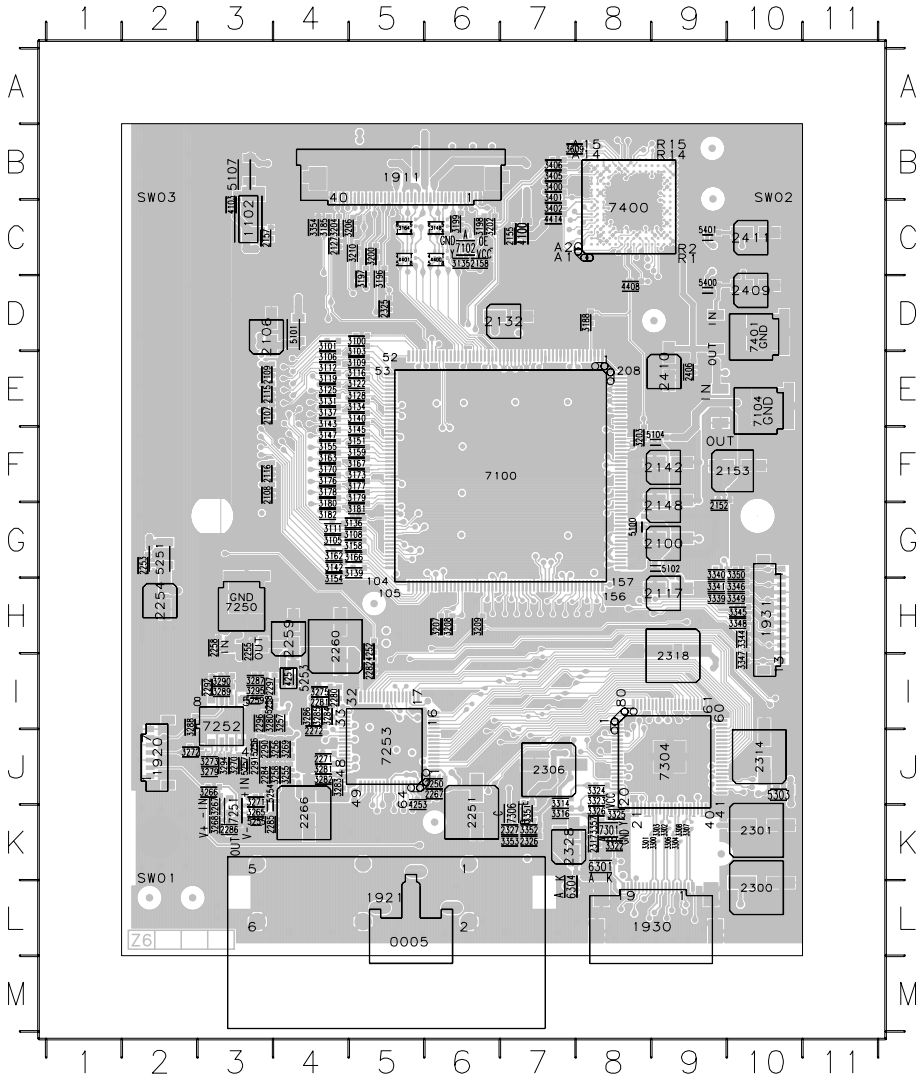
F3002 A1
F3003 A2
F3004 B2
F3101 D1
F3103 C2
I300 B2



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1100	C7	3122	E5	3288	I2	7251	K3
1102	C3	3125	E4	3289	I3	7252	I3
1911	B5	3128	E5	3290	I3	7253	J5
1920	J2	3131	E4	3294	J3	7301	K8
1921	L5	3134	E5	3295	I3	7304	J9
1930	L8	3135	C6	3300	K9	7306	K7
1931	H10	3136	G5	3301	K8	7400	C8
2100	G9	3137	E4	3302	K9	7401	D10
2106	D3	3139	G5	3303	K9		
2107	E3	3140	E5	3304	K9		
2108	F3	3142	G4	3306	K9		
2109	E3	3143	E4	3307	K9		
2115	E3	3145	F5	3308	K9		
2116	F3	3147	F4	3314	J7		
2117	H9	3148	C6	3316	K7		
2127	C4	3151	F5	3322	K8		
2132	D7	3154	H4	3323	J8		
2142	F9	3155	F4	3324	J8		
2148	G9	3158	G5	3325	K8		
2152	G9	3159	F5	3326	K8		
2153	F10	3162	G4	3339	H9		
2155	C7	3163	F4	3340	G9		
2157	C3	3164	C5	3341	H9		
2158	C6	3166	G5	3344	H10		
2250	J6	3167	F5	3345	H10		
2251	K6	3170	F4	3346	H10		
2253	G2	3173	F5	3347	I10		
2254	H2	3176	F4	3348	H10		
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2258	H3	3178	F4	3350	G10		
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2266	K4	3181	G5	3353	K7		
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2280	I4	3196	D5	3401	B7		
2281	I4	3197	D5	3402	C7		
2282	I5	3198	C6	3405	B7		
2284	J3	3199	C6	3406	B7		
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2296	I3	3207	H6	4253	J5		
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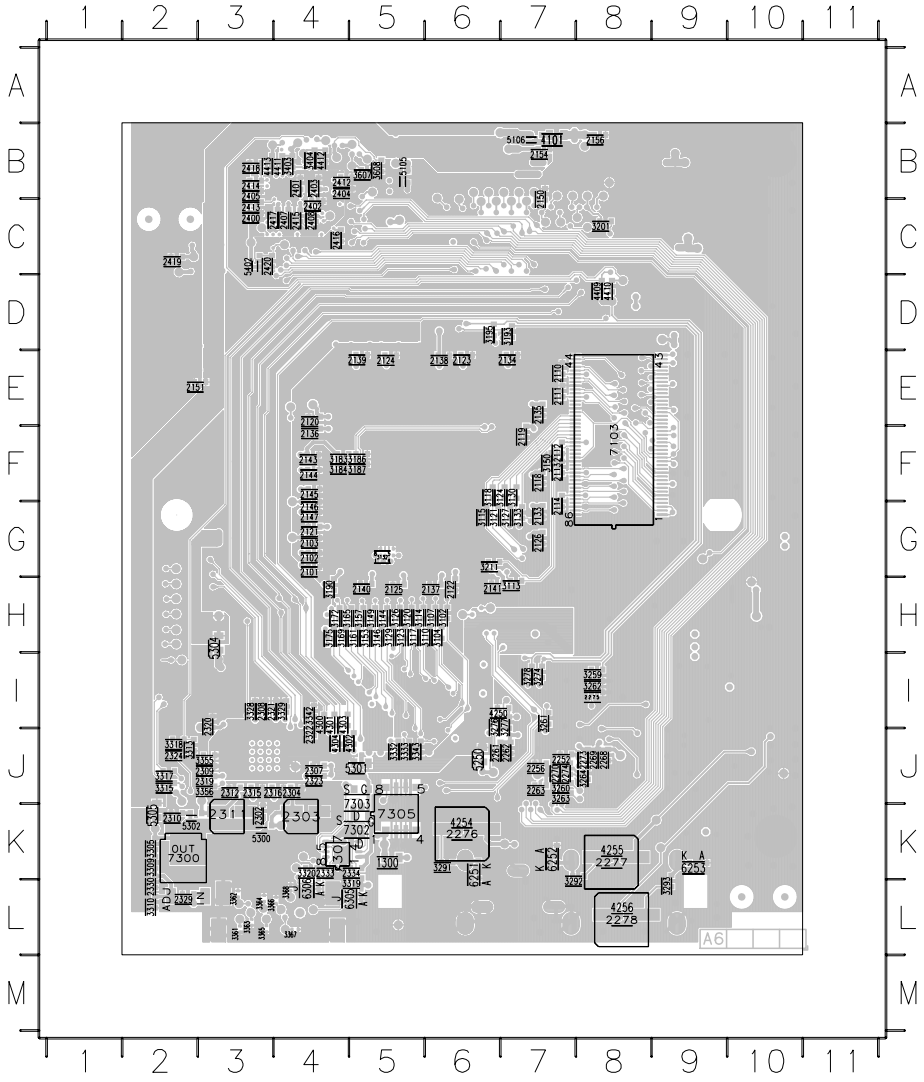

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2126	G7	3104	H6	3365	L3
2133	G7	3107	H6	3366	L3
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2135	E7	3113	H7	3368	L4
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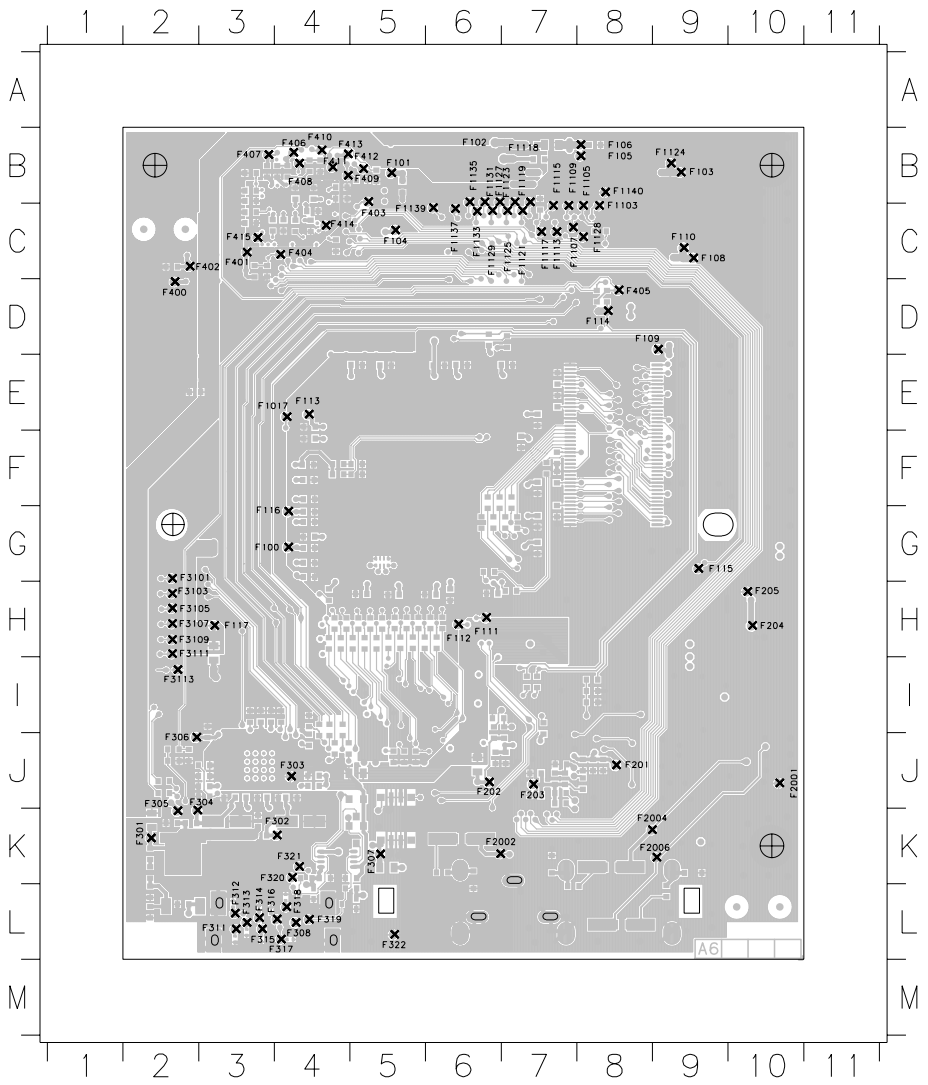

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F1131	B6	F3131	L3		
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F1133	C6	F3141	L3		
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F1135	B6	F3151	L3		
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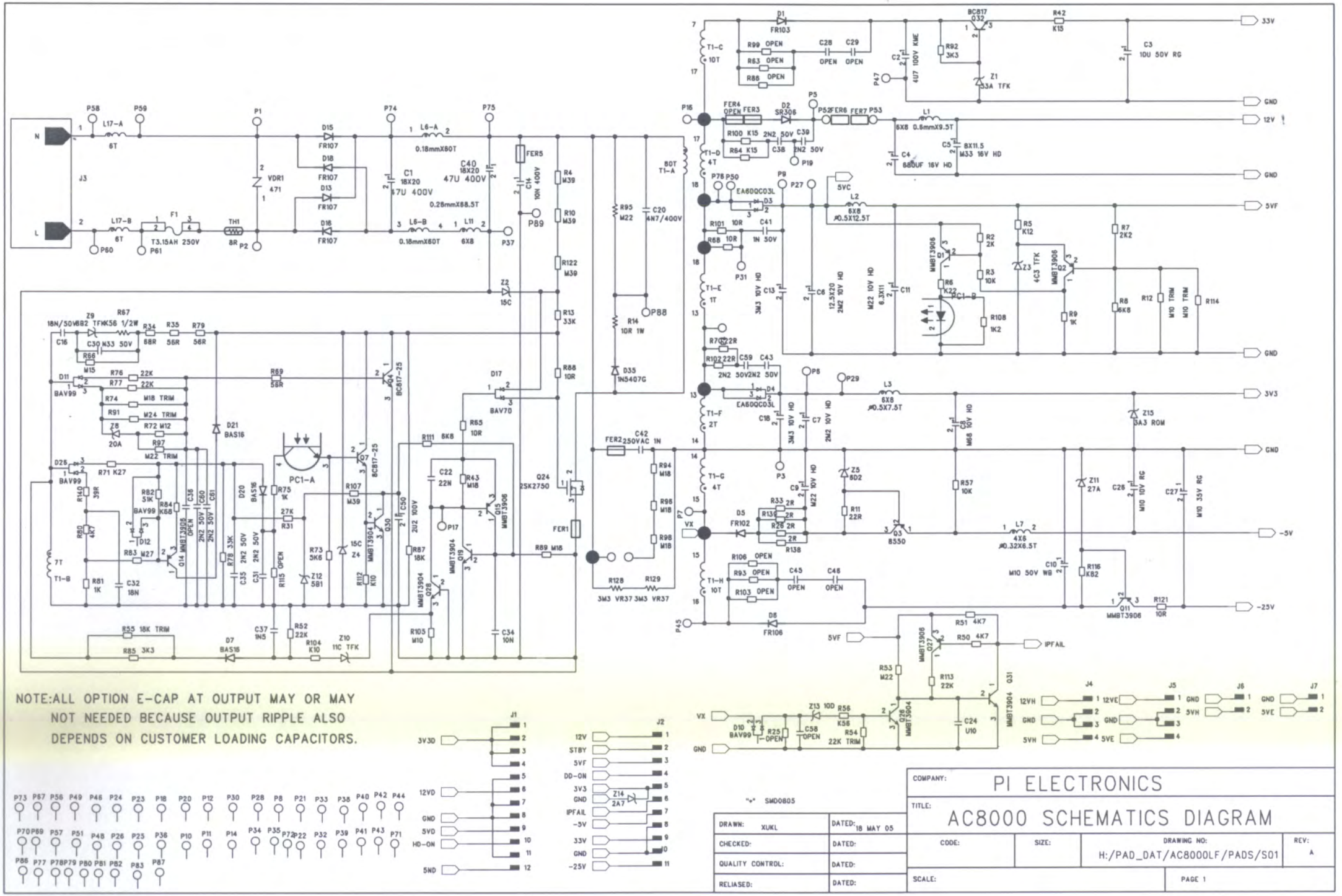
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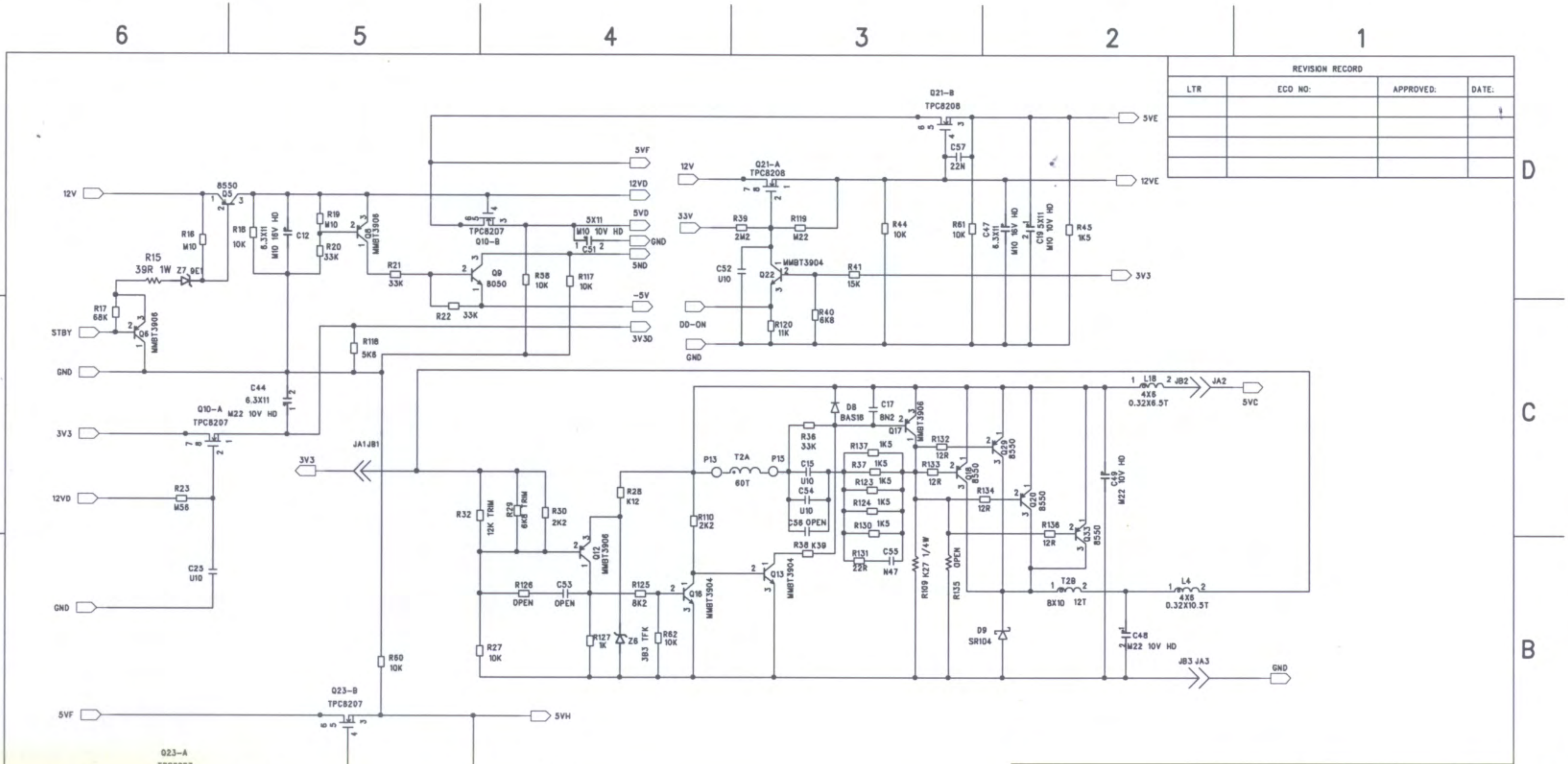
DRAWN: XUKL
DATED: 18 MAY 05
CHECKED:
DATED:
QUALITY CONTROL:
DATED:
RELIASED:
DATED:
CODE:
SIZE:
DRAWING NO: H:/PAD_DAT/AC8000LF/PADS/S01
REV: A
SCALE:
PAGE 1

S01.sch-2 - Sat Jun 04 09:22:26 2005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LTR
ECO NO:
APPROVED:
DATE:
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8550
Q5
R16 M10
R18 10K
6.3X11 M10 16V HD
C12
R19 M10
R20 33K
Q6 MMBT3906
R15 39R 1W
Z7 9E1
R17 68K
STBY
Q6 MMBT3906
GND
R21 33K
Q9 8050
R22 33K
TPC8207 Q10-B
R58 10K
R117 10K
5X11 M10 10V HD
C51
5VF
12VD
5VD
GND
5ND
-5V
3V3D
R118 5K6
C44 6.3X11 M22 10V HD
Q10-A TPC8207
3V3
12VD
R23 M56
C25 U10
GND
Q21-B TPC8208
5VE
C57 22N
12V
Q21-A TPC8208
12VE
33V
R39 2M2
R119 M22
R44 10K
R61 10K
C47 6.3X11 M10 16V HD
C19 5X11 M10 10V HD
R45 1K5
C52 U10
Q22 MMBT3904
R41 15K
3V3
DD-ON
R120 11K
R40 6K8
GND
JA1JB1
3V3
R32 12K TRIM
R29 6K8 TRIM
R30 2K2
R28 K12
Q12 MMBT3906
R126 OPEN
C53 OPEN
R125 8K2
Q16 MMBT3904
R127 1K
Z8 3B3 TFK
R62 10K
R27 10K
R60 10K
P13
T2A 60T
P15
R110 2K2
Q13 MMBT3904
D8 BAS16
C17 8N2
Q17 MMBT3906
R36 33K
C15 U10
C54 U10
C58 OPEN
R38 K39
R137 1K5
R37 1K5
R123 1K5
R124 1K5
R130 1K5
R131 22R
C55 N47
R109 K27 1/4W
R135 OPEN
R132 12R
R133 12R
Q18 8550
Q29 8550
R134 12R
Q20 8550
R136 12R
Q33 8550
D9 SR104
C49 M22 10V HD
L18 4X6 0.32X6.5T
JB2
JA2
5VC
T2B 8X10 12T
L4 4X6 0.32X10.5T
C48 M22 10V HD
JB3 JA3
GND
Q23-B TPC8207
5VF
5VH
Q23-A TPC8207
12V
12VH
33V
R46 2M2
R1 M22
R49 10K
6.3X11 M10 16V HD
C21
M10 10V HD 5X11
C23
C33 U10
Q25 MMBT3904
R48 15K
3V3
HD-ON
R47 6K8
R59 11K
GND

DRAWN: XUKL	DATED: 18 MAY 05	COMPANY: PI ELECTRONICS	
CHECKED:	DATED:	TITLE: AC8000 SCHEMATICS DIAGRAM	
QUALITY CONTROL:	DATED:	CODE: / SIZE: / DRAWING NO: H:/PAD_DAT/AC8000/PADS/S01	REV: A
RELEASED:	DATED:	SCALE:	PAGE 2

The PSU Layout is not available as it is purchase part.

PHILIPS

Philips Consumer Electronics
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ATLAS_DSW

User Manual

Diagnostic Software

Document					
Author	:	ATLAS_DSW team	Date	:	2006-05-26
Reference	:	SGP_AVS_SW_ATLAS-05-04	Filename	:	atlas_user_manual_DS.doc
Version	:	3.6	Archive	:	Atlas_dsw
Status	:	Draft	Classification	:	COMPANY RESTRICTED

TABLE OF CONTENTS

DOCUMENT CHANGE HISTORY 4

1 INTRODUCTION 5

1.1 REFERENCES 5
1.2 GLOSSARY 5
1.3 PURPOSE, SCOPE AND SHORT DESCRIPTION 6
1.4 NOTES 7

2 USER INTERFACE 8

2.1 NUCLEI NUMERATION 8
2.2 ERROR HANDLING 9
2.3 COMMAND LINE INTERFACE 10
2.3.1 SET-UP OF PHYSICAL INTERFACE COMPONENTS 10
2.3.2 ACTIVATION 10
2.3.3 USAGE 10
2.3.4 TERMINATION 11
2.4 END-USER/DEALER SCRIPT INTERFACE 11
2.4.1 SET-UP PHYSICAL INTERFACE COMPONENTS 11
2.4.2 ACTIVATION 11
2.4.3 USAGE 11
2.4.4 TERMINATION 11

3 DETAILED DESCRIPTION OF AVAILABLE NUCLEI 12

3.1 CODEC HOST CONTROLLER (CHR) 12
3.2 BOOT EEPROM (BROM) 19
3.3 NON VOLATILE RAM (NVRAM) 20
3.4 SDRAM (SDRAM) 23
3.5 FLASH (FLASH) 25
3.6 VIDEO INPUT PROCESSOR (VIP) 27
3.7 DIGITAL VIDEO INPUT OUTPUT CIRCUIT (DVIO) 31
3.8 PROGRESSIVE SCAN CIRCUIT (PSCAN) 34
3.9 BASIC ENGINE (BE) 37
3.10 DISPLAY AND CONTROL BOARD (DCB) 52
3.11 ANALOGUE BOARD (ANAB) 55
3.12 SYSTEM (SYS) 67
3.13 ELECTRONIC PROGRAM GUIDE BOARD (EPGB) 87
3.14 PCMCIA INTERFACE (PCMCIA) 88
3.15 HIGH-DEFINITION MULTIMEDIA INTERFACE (HDMI) 90
3.16 ANALOGUE SLAVE PROCESSOR (ASP) 103
3.17 ANALOGUE BOARD EEPROM (AROM) 116
3.18 VIDEO MATRIX (VMIX) 117
3.19 AUDIO MATRIX (SOUND PROCESSOR) (AMIX) 124
3.20 FRONTEND (TUNER) (FRE) 128
3.21 HARD DISK DRIVE (HDD) 131
3.22 DIGITAL TERRESTRIAL TUNER MODULE (DTTM) 140
3.23 UNIVERSAL SERIAL BUS (USB) 154
3.24 AUDIO VIDEO LINK (AVL) BOARD 155
3.25 SCRIPT (SCRIPT) 162

4 DIGITAL BOARD DIVERSITY 165

DOCUMENT CHANGE HISTORY

Date	Person	Version	Reason
2002-08-27	T.J. Scheffel	1.0	Approved version for DS step 3 (P1_4) (Release 0.2.1.)
2002-09-16	T.J. Scheffel	1.1	Approved version for DS step 4 (P1_4) (Release 0.5)
2002-11-22	T.J. Scheffel	1.2	Approved version for DS step 4 (P1_5) (Release 0.5.2)
2002-12-12	T.J. Scheffel	1.3	Approved version for DS step 5 (P1_5) (Pre-release 0.9) (DS version 6)
2003-01-14	T.J. Scheffel	1.4	Approved version for DS step 5 (P1_5) (Release 0.9 Full Functionality) (DS version 7)
2003-04-04	T.J. Scheffel	2.0	Approved version for Release 1.0 Full Functionality (DS version 8)
2003-05-28	M. Quik	2.1	Added chapters User Interface and Digital Board Diversity. I-Step update.
2003-10-15	M. Quik	2.2	Modified some small descriptions. Added DS_HDD nuclei.
2003-12-04	T.J. Scheffel	2.3	Merged all existing variants into 1 document.
2004-01-22	T.J. Scheffel	2.4	Approved version for all variants.
2004-03-30	T.J. Scheffel	2.5	
2004-03-30	M. Quik	2.6	Added DS_DTTM nuclei, DS_SYS_UartSetup, and DS_AMIX_Mute.
2004-05-24	J. Lekkerkerker	2.7	DS_DTTM updated. Added DS_HDMI nuclei.
	M. van der Ham		Added HDD nuclei
2004-07-06	M. Quik	2.8	Modified some small things.
2004-09-17	M. Quik	3.0	Approved version.
2005-01-18	M. Quik	3.1	Updated for VCRCOMBI.
2005-03-10	M. Quik	3.2	Updated for SXC(+/-) and small changes.
2005-04-06	M. Quik	3.3	Added and changed HDMI nuclei, BE nuclei, and some small things.
2005-09-02	M. van der Ham	3.4	sgp29atl#47: correct error codes DS_HDD
2005-10-13	Yeo K.B	3.5	Added new pins for DS_ASP_Extended and included warning for ATAPI based drives for BE nuclei.
2006-05-26	Teo T. T.	3.6	Added DS_AVL tests.

1 INTRODUCTION

1.1 REFERENCES

[RW2_GLOSSARY] ***DVD+RW Generation 2, Standards, Methods and Tools, Project Glossary***
Mark Krom
AR6-106022 C05S00003
Version: V0.5, 2002-02-05

[RW2_DS_PP] ATLAS Competence Team Project Plan
Martie J.M. Timmers
AR6-106022 C02S00048
Version 1.0 2004-01-20

[RW2_FRS_DS] ***Functional Requirements Specification of Diagnostic and Service***
M. Quik
Reference number AR6-106022 C6S11
Version 3.0, date 2003-10-15

[DTTM_UM] ***User Manual of IBOZapper Diagnostic Software.***
Peter Jans, Michiel Visser
Reference number AHR-72-7DSW_IBOZapper_Man-0001
Version 0.4, date 02/04/2004

1.2 GLOSSARY

AC3 : Audio Compression format 3
ACK : Acknowledge
ADC : Analogue to Digital Conversion
AMIX : Audio Matrix (Audio switching)
ANAB : Analogue Board
AROM : Analogue Board EEPROM
ASP : Analogue Slave Processor
ATA : AT Attachment
ATAPI : AT Attachment Packet Interface
BE : Basic Engine
BROM : BOOT EEPROM
CHR : Codec Host Repository
CRC : Cyclic Redundancy Check
DAC : Digital to Analogue Conversion
DB : Digital Board
DCB : Display and Control Board
DENC : Digital (video) ENCoder
DMA : Direct Memory Access
DS : Diagnostic and Service Software
DSP : Digital Signal Processor
DTTM : Digital Terrestrial Tuner Module

DV : Digital Video
DVIO : Digital Video Input Output
EPGB : Electronic Program Guide Board
FRE : Front End (Tuner)
HDD : Hard Disk Drive
HDMI : High Definition Multimedia Interface
IC : Integrated Circuit
IDE : Integrated Drive Electronics
IH : Interface Handler
IIC : Inter IC Communication
INT : Interrupt
LED : Light Emitting Diode
NVRAM : Non Volatile Random Access Memory
OPC : Optimal Power Control
PIO : Peripheral IO pin
PSCAN : Progressive Scan
RC : Remote Control
S2B : Serial to Basic Engine
SYS : System
TOC : Table Of Contents
UART : Universal Asynchronous Receiver Transmitter
UDF : Universal Disc Format
VIP : Video Input Processor
VMIX : Video Matrix (Video switching)

1.3 PURPOSE, SCOPE AND SHORT DESCRIPTION

This document is the user manual for the Diagnostic Software (DS).
Its goal is to facilitate the usage of the DS software.

The users of this document are typically the factory and service teams.

The Diagnostic Software consists of independent ‘atomic’ tests, called **nuclei**.
Each nucleus forms a test to indicate possible hardware failure.
Its purpose is to facilitate fault-finding in DVD+RW sets.

This document describes all tests that are currently available in the diagnostic software.

Different DVD+RW recorder sets containing different hardware become available all the time, resulting in hardware diversity covered by chapter 4 :‘Digital Board Diversity’.

Apart from this there will be some different software-builds that define some hardware-specific issues at compile-time.
As a result of this there will be parts in this document that will NOT be executable on your specific DVD+RW recorder.
So if you execute a nucleus from one of these groups not currently in your software-build the command-line will e.g. look like:
DS:> 1800
DS:>

This user manual is intended for an audience that is aware of the diversity in hardware and is aware which hardware is encompassed in their DVD+RW recorder sets.

Please note that the examples given in this user manual can differ from your actual hardware. The error codes returned by the diagnostic software will ALWAYS be as indicated in the nucleus-description. Should there be any discrepancy then please contact our team so we can correct the issue.

1.4 NOTES

The OPC change is industrial/production change because it was reported to have high OPC value (about 2 to 3%) in the production line. This change will help to improve the production fall out due to high OPC value. So the drives that have went thru the production will have good OPC value. As for the drives that are already in the market, they will not be affected. The service centre must perform the drive calibration (nucleus 931; DS_BE_AdjustLaserControl) for AV3.5 drive, which has firmware version 35 below. We do not think that the download SW needs to change anything. Please issue the drive calibration in the service nucleus (931) after the drive is upgrade with the newer firmware.

2 USER INTERFACE

The table below shows an overview of the user interfaces of the DS. The table is based on logical interface, interfaces as seen from user perspective. A logical interface can use one or more physical interface components.
The DVD Recorder has only a single RS232 port (service port) available for diagnostic or debugging purposes, implying that all interfaces using this port are mutually exclusive.

Logical Interface	Description	Physical interface components
Command line interface	Used to send commands from the Control PC or Service PC to the DVD Recorder DS.	• Control PC or service PC, running a program (e.g. Asterix, Compair, HyperTerminal), connected to service port of the DVD Recorder • Test pin
Scripts interface	Used to execute End-user/Dealer Test Script.	• Local-Keyboard • Local-Display

In the next chapters the logical user interfaces are described in more detail including the exact use of the physical interface components. To switch between interfaces, the DVD Recorder needs to be switched off and on again.

2.1 NUCLEI NUMERATION

Each nucleus has a unique number of four digits. This number is the input of the command line interface.

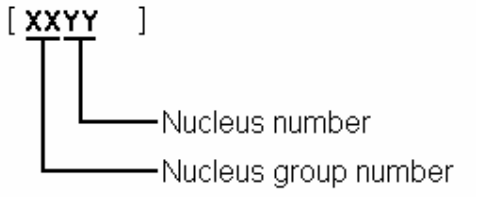

Figure 1 Unique number of a diagnostic nucleus.

The following groups are defined:

Group number	Group name
0	Scripts
1	Codec (e.g. Chrysalis, Leco)
2	Boot EEPROM
3	NVRAM
4	SDRAM
5	FLASH
6	Video Input Processor
7	DVIO
8	Progressive Scan
9	Basic Engine
10	Display and Control Board

11	Analogue Board
12	System
13	Electronic Program Guide Board
14	PCMCIA
15	HDMI
16	Analogue Slave Processor
17	Analogue Board EEPROM
18	Video Matrix
19	Audio Matrix
20	Front End
21	Hard Disk
22	Digital Terrestrial Tuner Module
23	USB

2.2 ERROR HANDLING

Results returned from a diagnostic nucleus to the control/service PC are terminated by a 'CR' character (included in the string length).

The result has the following layout
`<number> <string> [Test OK | Error] @<CR>`

The use of the "@" enables the ***Asterix*** system on the ***control PC*** to parse the output string of each nucleus into a database. This system is used in the factory and automates the test sequences needed to test each product using the Diagnostic and Service Software.

`<number>` is a 6-digit decimal number padded with leading zeros if its value is less than 6 digits. The first four digits identify the generating nucleus (group and nucleus); the latter two digits indicate the error number.

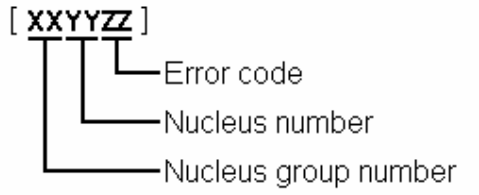

Figure 2 Error-code of a diagnostic nucleus.

2.3 COMMAND LINE INTERFACE

Via the command line interface the execution of diagnostic nuclei can be controlled.

2.3.1 Set-up of physical interface components

Hardware required:
- Control PC
- One free COM port on the Control PC
- Special cable to connect the DVD Recorder to the Control PC

The control PC must use the following port settings for the used COM port:
- 19200 bps,
- 8 data bits,
- no parity,
- 1 stop bit and
- no flow control.
The control PC is connected with a special cable (see chapter 4A.2) to the RS232 port of the DVD Recorder. Via the same connection the 'test pin' will be connected to ground. Using this pin the software can determine whether Diagnostic mode needs to be entered.

2.3.2 Activation

After power on the next text will be sent to the control PC

```
Factory Diagnostics and Service Software
DVD Video Recorder (Dec 13 2003, 10:55:37)

Version  :258          Build     :20031213_1030
Release  :P1_7_b       Buildtype :no
Baseline :I_P1_8_63    Variant   :verum:dvdrw2_lib

DS:>
```

The first lines indicate that the DS has been activated and contains the version and build info of the DS. The next line is the command line prompt ("`DS:>`"). The DS is now ready to receive commands. Please note that this text will be different on your specific variant of the DVD+RW recorder product range.

2.3.3 Usage

The commands that can be given are the numbers of the nuclei. A command must be terminated with an <ENTER> character from the control PC. When typing commands, the backspace key can be used to make corrections. Apart from this one can use the Up and Down arrows to browse to previous commands.
When one enters non-supported commands, the interface returns the command line prompt.

If the command (the nucleus number) is recognised, the nucleus is executed. Result and output of an activated (and terminated) nucleus will be sent back to the control PC.

Example in case the command is correct:

```
DS:> 1200
```

```
120000: Hardware ID = 0x27
Test OK @
```

Example in case the result is an error (DVD+RW 2.1 example):

```
DS:> 1100
110002: Communication with Analogue Board fails
Error @

DS:>
```

2.3.4 Termination

To turn off the command line interface switch off the DVD Recorder.

2.4 END-USER/DEALER SCRIPT INTERFACE

This interface is used during execution of the script to display output and error messages.
The local display will be used to display the output and the error messages.

2.4.1 Set-up physical interface components

Hardware required:

- DVD Recorder

The DVD Recorder is tested stand-alone: no other equipment than the DVD Recorder is needed.

2.4.2 Activation

Pressing the **play**-key on the keyboard of the DVD Recorder during **power-on** activates the dealer script.

2.4.3 Usage

The test requires no user interaction. A number of nuclei will be run before a message is returned indicating if there is a failure in the DVD Recorder (‘’PASS” will be indicated when the product functions OK and “FAIL” when there has been an error during one of the tests).
During the execution of this script, a progress indicator is displayed on the display of the DVD Recorder.
Note that from the command line interface this script can be started as well, by entering ‘***script’*** on it.

2.4.4 Termination

To turn off the dealer test, the DVD Recorder must be powered down.

3 DETAILED DESCRIPTION OF AVAILABLE NUCLEI

3.1 CODEC HOST CONTROLLER (CHR)

Nucleus Name	**DS_CHR_DevTypeGet**	
Nucleus Number	100	
Description	Retrieves the device id, the module ids and revisions of the Codec and returns them to the stdout port.	
Technical	- Determine the codec id by means of comparing version ids of the modules. - Read the module-id register of every module and display it to the user.	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	10000	Getting the information succeeded
	10001	Wrong codec id detected
Example	DS:> 100 010000: Device ID 7100 Codec ID PNX7100_C F-BCU (0x0102) 1.0 INTC (0x011d) 1.0 PCI-XIO(0x0113) 1.0 SIF (0x013b) 1.0 EJTAG (0x0104) 0.1 S-BCU (0x0102) 1.0 BOOT (0x010a) 1.0 CONFIG (0x013f) 1.1 RESET (0x0123) 1.0 DEBUG (0x0116) 0.0 UART0 (0x0107) 0.1 UART1 (0x0107) 0.1 UART2 (0x0107) 0.1 UART3 (0x0107) 0.1 I2C0 (0x0105) 0.1 I2C1 (0x0105) 0.1 GPIO (0x013c) 1.0 SYNC (0x013a) 1.0 DISP0 (0xa015) 1.12 DISP1 (0xa00f) 1.1 OSD (0x0136) 0.1 SPU (0xa00e) 0.0 MIXER (0x0137) 1.0 DENC (0x0138) 1.0 CCIR (0x0139) 1.0 VDEC (0x0133) 0.2 PARSER (0xa00d) 0.0 DV (0xa00c) 0.0 BEI (0xa00a) 0.1 IDE (0xa009) 0.1 SGDX (0xa008) 1.0 BYTE (0xa00b) 0.1 OUTPUT (0xa003) 1.0 ACOMP (0xa000) 1.0 VFE (0xa001) 0.1 VCOMP (0xa002) 1.0 SCR (0x0000) 0.0 SIFF (0xa011) 0.1 WMD (0xa010) 0.0 AUDIO0 (0xa015) 1.12 AUDIO1 (0xa00f) 1.1 PSCAN (0xa018) 0.1 Test OK @	

<table>
<tr><td>Nucleus Name</td><td colspan="2">DS_CHR_TestImageOn</td></tr>
<tr><td>Nucleus Number</td><td colspan="2">101</td></tr>
<tr><td>Description</td><td colspan="2">Generates a test-image of a selected video standard on selected video output on the digital board. When no input is given, the default values will be used (see user input description below). Make sure to use the proper nuclei to route the video signal on the analogue board to get the video signal to the proper output.

Note: Although a DTT has a Chrysalis C3, the codec IC may never use the YUV functionality of the internal DENC. This is specified by the hardware. The digital boards for DTT do have a YUV-matrix. The signals from this YUV-matrix are not routed to the regular video output connector but to the progressive scan output connector.</td></tr>
<tr><td>Technical</td><td colspan="2">- Validate the user input.
- Initialise the SYNC module.
- Initialise the DISPLAY module.
- Initialise the MIXER module.
- Initialise the DENC module.
- Set the selected video standard.
- Generate the selected test image in memory.
- Start the DISPLAY module.
- Start the MIXER module.
- Start the DENC module according to the selected test image id.</td></tr>
<tr><td>Execution Time</td><td colspan="2">6 seconds.</td></tr>
<tr><td>User Input</td><td colspan="2">The user has to decide which test image, video standard and video output must be used: < Test image id > < Video standard > < Video output >

Test image id:
<table>
<tr><td>0</td><td>VERTICAL_COLOURBAR (default)</td></tr>
<tr><td>1</td><td>HORIZONTAL_COLOURBAR</td></tr>
<tr><td>2</td><td>WHITE</td></tr>
<tr><td>3</td><td>YELLOW</td></tr>
<tr><td>4</td><td>CYAN</td></tr>
<tr><td>5</td><td>GREEN</td></tr>
<tr><td>6</td><td>MAGENTA</td></tr>
<tr><td>7</td><td>RED</td></tr>
<tr><td>8</td><td>BLUE</td></tr>
<tr><td>9</td><td>BLACK</td></tr>
<tr><td>10</td><td>GRAY</td></tr>
<tr><td>11</td><td>TEST_IMAGE_FOR_PROGRESSIVE_SCAN</td></tr>
</table>
Video standard:
<table>
<tr><td>PAL</td><td>Standard PAL 50 Hz (default)</td></tr>
<tr><td>NTSC</td><td>Standard NTSC 60 Hz</td></tr>
</table>
Video output:
<table>
<tr><td>ALL</td><td>CVBS and YC and RGB DACs are enabled (default)</td></tr>
<tr><td>CVBS</td><td>CVBS DAC is enabled</td></tr>
<tr><td>YC</td><td>Y and C DAC is enabled</td></tr>
<tr><td>RGB</td><td>CVBS, R, G, and B DACs are enabled</td></tr>
<tr><td>YUV</td><td>Y, U, and V DACs are enabled</td></tr>
<tr><td>PSCAN</td><td>Progressive scan is enabled.</td></tr>
</table></td></tr>
<tr><td>Error</td><td>Number</td><td>Description</td></tr>
<tr><td></td><td>10100</td><td>Generating the test image succeeded.</td></tr>
<tr><td></td><td>10101</td><td>Invalid input was provided.</td></tr>
<tr><td></td><td>10102</td><td>The Codec SYNC-module cannot be initialised.</td></tr>
<tr><td></td><td>10103</td><td>The Codec MIXER-module cannot be initialised.</td></tr>
<tr><td></td><td>10104</td><td>The Codec VPP-module cannot be initialised.</td></tr>
<tr><td></td><td>10105</td><td>The Codec DENC-module cannot be initialised.</td></tr>
<tr><td></td><td>10106</td><td>The digital board hardware information is corrupt</td></tr>
</table>

Example	DS:> 101 010100: Test OK @ DS:> 101 0 pal cvbs 010100: Test OK @ DS:> 101 4 ntsc yc 010100: Test OK @

Nucleus Name	**DS_CHR_TestImageOff**	
Nucleus Number	102	
Description	Switches the test-image off.	
Technical	- Stop the DENC module.	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	10200	Stopping the test image generation succeeded
	10201	The Codec DENC-module failed.
Example	DS:> 102 010200: Test OK @	

Nucleus Name	**DS_CHR_SineOn**	
Nucleus Number	103	
Description	Generate an audio sine signal on the audio output of the digital board. Note: Left channel 6kHz, right channel 12 kHz sine. Make sure to route the signal first. When 'SPDIF' is entered as a parameter, the SPDIF path will be activated correctly to contain the sine wave.	
Technical	- De-mute the analogue board - Set fifo parameters for audio - Set the volume - Set the I2S outputs and configuration paths - Set the decoder mode - Configure the audio decoder - Put the AC3 audio in the fifo - Send 'prepare' command to the audio decoder - Send 'play' command to the audio decoder	
Execution Time	Less than 1 second	
User Input	None or 'SPDIF'	
Error	Number	Description
	10300	The sine signal was successfully generated
	10301	The analogue board could not be de-muted
	10302	The audio decoder did not initialise
	10303	The dsp2 (DUET) of the audio decoder did not configure
	10304	The dsp1 (PALM) of the audio decoder did not configure
	10305	There was a delay-error before starting
	10306	Wrong input was given to the decoder function
	10307	Wrong input was given to the decoder function @@@@@
	10308	The audio decoder did not get into the 'prepared' state
Example	DS:> 103 010300: Test OK @ DS:> 103 spdif 010300: Test OK @	

Nucleus Name	**DS_CHR_SineOff**	
Nucleus Number	104	
Description	Stop generating the audio sine signal	
Technical	- Reset the audio block of the Codec	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	10400	Switching off the audio sine signal succeeded
	10401	Failed to reset the audio decoder
Example	DS:> 104 010400: Test OK @	

Nucleus Name	**DS_CHR_SineBurst**	
Nucleus Number	105	
Description	Generate an audio sine signal on the audio output of the digital board for 4 seconds. Note: Left channel 6kHz, right channel 12 kHz sine with some known hick-ups	
Technical	- Call the DS_CHR_SineOn nucleus - Delay for 4 seconds - Call the DS_CHR_SineOff nucleus	
Execution Time	4 seconds	
User Input	None	
Error	Number	Description
	10500	The sine signal burst was successfully generated
	10501	The delay did not succeed during the burst
	10502	The audio sine could not be generated
Example	DS:> 105 010500: Test OK @	

Nucleus Name	**DS_CHR_MuteOn**	
Nucleus Number	106	
Description	Mute the audio outputs of the digital board	
Technical	- Send the 'Mute' command to the audio decoder - Activate the 'audio mute' PIO pin	
Execution Time	Less than 1 second.	
User Input	"PIO" to just use the PIO pin mute. When muting using this, also de-mute using this as this works 'paired'.	
Error	Number	Description
	10600	Muting the audio succeeded
	10601	Muting the audio through the PIO-pin failed
Example	DS:> 106 010600: Test OK @ DS:> 106 PIO 010600: Test OK @	

Nucleus Name	**DS_CHR_MuteOff**	
Nucleus Number	107	
Description	De-mute the audio outputs of the digital board	
Technical	- Send the 'DeMute' command to the audio decoder - Deactivate the 'audio mute' PIO pin	
Execution Time	"PIO" to just use the PIO pin de-mute. Only de-mute using this when you muted using the PIO parameter, as this works ''paired.	
User Input	None	
Error	Number	Description
	10700	De-muting the audio succeeded
	10701	De-muting the audio through the PIO-pin failed

Example	`DS:> 107`
	`010700:`
	`Test OK @`
	
	`DS:> 107 PIO`
	`010700:`
	`Test OK @`	

Nucleus Name	**DS_CHR_DvLedOn**	
Nucleus Number	108	
Description	Check the connection to the DV-LED on the digital board by switching it on	
Technical	- Write to the PIO pin to light the DV LED	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	10800	Switching the DV-LED on succeeded
	10801	Switching the DV-LED on failed

Example	`DS:> 108`
	`010800:`
	`Test OK @`	

Nucleus Name	**DS_CHR_DvLedOff**	
Nucleus Number	109	
Description	Switch off the DV-LED on the digital board	
Technical	- Write to the PIO pin to switch off the DV LED	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	10900	Switching the DV-LED off succeeded
	10901	Switching the DV-LED off failed

Example	`DS:> 109`
	`010900:`
	`Test OK @`	

Nucleus Name	**DS_CHR_MacroVisionOn**	
Nucleus Number	110	
Description	Turn on MacroVision.	
Technical	- Set some registers of the DENC module in the Codec.	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	11000	Turning on MacroVision succeeded
	11001	Turning on MacroVision failed

Example	`DS:> 110`
	`011000:`
	`Test OK @`	

Nucleus Name	**DS_CHR_MacroVisionOff**	
Nucleus Number	111	
Description	Turn off MacroVision.	
Technical	- Set some registers of the DENC module in the Codec.	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	11100	Turning off MacroVision succeeded
	11101	Turning off MacroVision failed

Example	`DS:> 111`
	`011100:`
	`Test OK @`	

Nucleus Name	**DS_CHR_Peek**	
Nucleus Number	112	
Description	Peek a value on a specified address	
Technical	- Check the user input - Read out the address specified - Check whether the address to be read is aligned on 4 bytes	
Execution Time	Less than 1 second.	
User Input	The address to peek on	
Error	Number	Description
	11200	Peeking on the specified address succeeded
	11201	Peeking on the specified address failed, wrong user input
	11202	Peeking on the specified address failed due to misalignment

Example	`DS:> 112 0xa0700000`
	`011200: Value read = 0x000001BD`
	`Test OK @`	

Nucleus Name	**DS_CHR_Poke**	
Nucleus Number	113	
Description	Poke a value on a specified address	
Technical	- Check the user input - Change the value on the address specified - Check whether the address to be modified is aligned on 4 bytes	
Execution Time	Less than 1 second.	
User Input	The address to poke and the value: <address><value>	
Error	Number	Description
	11300	Poking the specified address succeeded
	11301	Poking the specified address failed, wrong user input
	11302	Poking the specified address failed due to misalignment

Example	`DS:> 113 0xa0700000 0xaabbccdd`
	`011300:`
	`Test OK @`	

Nucleus Name	**DS_CHR_INT_PICInterrupts**	
Nucleus Number	114	
Description	Test all interrupts of the priority interrupt controller	
Technical	- Install interrupt handlers - Generate interrupts - Test whether all interrupts were received	
Execution Time	Less than 1 second.	
User Input	-	
Error	Number	Description
	11400	Testing all the PIC interrupts succeeded
	11401	Testing all the PIC interrupts failed

Example	`DS:> 114`
	`011400:`
	`Test OK @`	

Nucleus Name	**DS_CHR_DMA_TestDMA**	
Nucleus Number	115	
Description	Test the memory to memory DMA transfer	
Technical	- Create a block with known data in memory - Copy this block to the consecutive area using 3 different DMAs - Check whether all DMAs transferred the data properly	
Execution Time	Less than 2 seconds.	
User Input	-	
Error	Number	Description
	11500	The testing of the DMAs succeeded
	11501	The initialisation of the DMAs failed for one or more DMA
	11502	One or more DMAs failed the test

Example	`DS:> 115`
	`011500:`
	`Test OK @`	

3.2 BOOT EEPROM (BROM)

Nucleus Name	**DS_BROM_Communication**	
Nucleus Number	200	
Description	Check the communication between the IIC controller of the Codec and the boot EEPROM	
Technical	- Initialise IIC - Read something from the EEPROM	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	20000	The data is properly read so the communication is OK
	20001	The IIC bus was not accessible
	20002	There was a timeout reading the device
	20003	The IIC acknowledge was not received
	20004	An IIC-bus error occurred
	20005	The IIC bus initialisation failed
	20006	An unexpected IIC error occurred

Example	`DS:> 200`
	`020000:`
	`Test OK @`	

Nucleus Name	**DS_BROM_WriteRead**	
Nucleus Number	201	
Description	Check whether the Boot EEPROM can be written to and read from	
Technical	- Initialise IIC - Write something to the EEPROM - Read from the same location and check whether it is the same as written	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	20100	The write-read test succeeded
	20101	The write-read test failed
	20102	An IIC-bus error occurred
	20103	There was a timeout reading the device
	20104	The IIC bus was not accessible
	20105	The IIC acknowledge was not received
	20106	Got unknown IIC bus error
	20107	The IIC bus initialisation failed

Example	`DS:> 201`
	`020100:`
	`Test OK @`	

3.3 NON VOLATILE RAM (NVRAM)

Nucleus Name	**DS_NVRAM_Communication**	
Nucleus Number	300	
Description	Check the communication between the IIC controller of the Codec and the NVRAM EEPROM	
Technical	- Initialise IIC - Read from a location in the NVRAM EEPROM device	
Important note:	This nucleus only checks the physical connection between the Codec and IIC EEPROM. If no EEPROM is mounted this test will fail. However other NVRAM nuclei might still work because the software will store NVM data into flash memory	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	30000	Something is properly read so the communication is OK
	30001	The IIC bus was not accessible
	30002	There was a timeout reading the device
	30003	The IIC acknowledge was not received
	30004	The communication with the device failed
	30005	The IIC bus initialisation failed

Example	`DS:> 300`
	`030000:`
	`Test OK @`	

Nucleus Name	**DS_NVRAM_WriteRead**	
Nucleus Number	301	
Description	Check whether the EEPROM can be written to and read from	
Technical	- Initialise IIC - If no IIC EEPROM was found then initialise flash memory to use NVM pages - Backup data from location to modify - Write to location and read it back again - Write back the backed up data to the location to leave the NVRAM as found	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	30100	The write-read test succeeded
	30101	The IIC bus could not be initialised
	30102	There was an NVRAM IO error
	30103	The value could not be read back from the NVRAM

Example	`DS:> 301`
	`030100:`
	`Test OK @`	

Nucleus Name	**DS_NVRAM_Clear**	
Nucleus Number	302	
Description	Make the EEPROM empty, containing all zeroes.	
Technical	- Initialise IIC - If no IIC EEPROM was found then initialise flash memory to use NVM pages - Read the DVID and diversity string from NVM (either EEPROM or Flash) - Create a memory block filled with zeroes - Write this block to the NVRAM (either EEPROM or Flash) - Write back the Read the DVID and diversity string to NVM (either EEPROM or Flash)	
Important note:	The Hardware Diversity Information and unique identification number (IEE1394-specific) of the **D**igital **V**ideo processing part is NOT cleared by this nucleus!	
Execution Time	16 seconds	
User Input	None	
Error	Number	Description
	30200	The clearing of the NVRAM succeeded
	30201	There was an IIC error
	30202	Clearing the NVRAM failed

Example	`DS:> 302`
	`030200:`
	`Test OK @`	

Nucleus Name	**DS_NVRAM_Modify**	
Nucleus Number	303	
Description	Modifies one or more locations in NVRAM and updates the checksum of the section modified	
Technical	- Initialise IIC - If no IIC EEPROM was found then initialise flash memory to use NVM pages - Decode user input - Modify the NVRAM as indicated - Validate the NVRAM by calculating the checksum and storing it	
Execution Time	Less than 1 second	
User Input	1. The location that must be modified i.e. "ALL" "BOOT" "DIAGNOSTICS" "DOWNLOAD" "CONFIG" "RECORDER" or no string if an offset from the base address of the NVRAM is required 2. The offset and data which to put on the selected location <offset> <length> <data>	
Error	Number	Description
	30300	Modifying the NVRAM contents succeeded
	30301	Unable to initialise NVM
	30302	Modifying the NVRAM contents failed
	30303	length out of range
	30304	unable to decode length
	30305	offset out of range
	30306	unable to decode offset
	30307	unknown location specified
	30308	no location is specified
	30309	number of values incorrect
	30310	There was an IIC error

Example	`DS:> 303 DIAGNOSTICS 5 1 0x5a`
	`030300: Section is modified successfully`
	`Test OK @`	

Nucleus Name	**DS_NVRAM_Read**	
Nucleus Number	304	
Description	Read out one or more locations in the NVRAM	
Technical	- Initialise IIC - If no IIC EEPROM was found then initialise flash memory to use NVM pages - Decode user input - Read from the NVRAM and return this info to the user	
Execution Time	Less than 1 second	
User Input	1. The location which must be read i.e. "ALL" "BOOT" "DIAGNOSTICS" "DOWNLOAD" "CONFIG" "RECORDER" or no string if an offset from the base address of the NVRAM is required 2. The offset and number of bytes to read <offset> <length>	
Error	Number	Description
	30400	Value read
	30401	Unable to initialise NVM
	30402	Reading the NVRAM contents failed
	30403	Length out of range
	30404	Unable to decode length
	30405	Offset out of range
	30406	Unable to decode offset
	30407	Unknown location specified
	30408	No location is specified

Example	`304 DIAGNOSTICS 0 6`
	`030400: Value read = 0x00 0x00 0x00 0x00 0x00 0x5A`
	`Test OK @`	

3.4 SDRAM (SDRAM)

Nucleus Name	**DS_SDRAM_WriteRead**	
Nucleus Number	400	
Description	Check all data lines, address lines and memory locations of the SDRAM	
Technical	- Test the data bus - Test the address bus - Test the integrity of the device itself (memory locations)	
Execution Time	11 seconds for 32 Mb 23 seconds for 64 Mb	
User Input	None	
Error	Number	Description
	40000	The write-read test succeeded
	40001	The data bus contains an error
	40002	The address bus contains an error
	40003	The SDRAM itself contains an error

Example	`DS:> 400`
	`040000:`
	`Test OK @`	

Nucleus Name	**DS_SDRAM_WriteReadFast**	
Nucleus Number	401	
Description	Check all data lines and address lines of the SDRAM	
Technical	- Test the data bus - Test the address bus	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	40100	The write-read test succeeded
	40101	The data bus contains an error
	40102	The address bus contains an error

Example	`DS:> 401`
	`040100:`
	`Test OK @`	

Nucleus Name	**DS_SDRAM_Write**	
Nucleus Number	402	
Description	Write to a specific un-cached memory address	
Technical	- Decode the user input and check its ranges and alignment on 4 bytes - Write the data to the SDRAM	
Execution Time	Less than 1 second	
User Input	1. The location that must be modified (SDRAM starts at address 0xA0000000) 2. The value to put on the selected location	
Error	Number	Description
	40200	Writing to the SDRAM succeeded
	40201	Writing to the SDRAM failed; Wrong user input
	40202	Address is not dividable by 4

Example	`DS:> 402 0xa1000010 0xad112222`
	`040200:`
	`Test OK @`	

Nucleus Name	**DS_SDRAM_Read**	
Nucleus Number	403	
Description	Read from a specific un-cached memory address	
Technical	- Decode the user input and check the ranges - Read from the SDRAM and return this info to the user	
Execution Time	Less than 1 second	
User Input	The location from which the data must be read (SDRAM starts at address 0xA0000000)	
Error	Number	Description
	40300	Reading from the SDRAM succeeded
	40301	Reading from the SDRAM failed; Wrong user input
	40302	Address is not dividable by 4

Example	`DS:> 403 0xa1000010`
	`040300: Value read = 0xAD112222`
	`Test OK @`	

Nucleus Name	**DS_SDRAM_DmaWriteRead**	
Nucleus Number	404	
Description	Write a pattern to the entire SDRAM using DMA and check the data	
Technical	- Check if the Stack pointer is not in the write range - Clear a 64kb block and then fill it with a pattern - Initialise the DMA controller and write the data to the SDRAM - Then check if all the data was written correctly (except descriptor tables) - Repeat the process 4 times with 4 different patterns	
Execution Time	24 seconds	
User Input	None.	
Error	Number	Description
	40400	Writing to the SDRAM succeeded
	40401	Stack area definition ERROR!
	40402	DMA controller could not be initialised.
	40403	Not all data was transferred correctly

Example	`DS:> 404`
	`040400:`
	`Test OK @`	

3.5 FLASH (FLASH)

Nucleus Name	**DS_FLASH_DevTypeGet**	
Nucleus Number	500	
Description	Get the device (revision) type information of the FLASH ICs. (type, manufacturer, device ID and size)	
Technical	- Set the timing for the flash writing - Write a command sequence to determine device type information - Return the information to the user	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	50000	Getting the information from the FLASH succeeded
	50001	Getting the information from the FLASH failed

Example	`DS:> 500`
	`050000: Found FLASH memory:`
	`NOR AMD 29DL640G 8MB,NOR AMD 29DL640G 8MB`
	`Test OK @`	

Nucleus Name	**DS_FLASH_WriteRead**	
Nucleus Number	501	
Description	Check whether the FLASH can be written to and read from	
Technical	- Find the test segment in flash - Read the data into SDRAM - Modify the data - Write this data from SDRAM to FLASH and verify it by reading back again	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	50100	The FLASH write-read test succeeded
	50101	The test segment could not be found
	50102	All bits in the TEST region are filled with 0 (region exhausted)
	50103	The Write Read test failed
	50104	The Write Failed

Example	`DS:> 501`
	`050100:`
	`Test OK @`	

Nucleus Name	**DS_FLASH_Read**	
Nucleus Number	502	
Description	Read from a specific memory address in FLASH	
Technical	- Decode the user input and check the ranges and whether the address is aligned on 4 bytes - Read the data and return this to the user	
Execution Time	Less than 1 second.	
User Input	The location from which data must be read (FLASH starts at address 0xB8000000)	
Error	Number	Description
	50200	Reading the FLASH succeeded
	50201	Reading the FLASH failed; Wrong user input
	50202	Address is not dividable by 4

Example	`DS:> 502 0xb8000000`
	`050200: Value read = 0x3C08A000`
	`Test OK @`	

Nucleus Name	**DS_FLASH_ChecksumProgram**	
Nucleus Number	503	
Description	Check the checksum of the application partitions by recalculating and comparing partition checksums	
Technical	- Determine the number of segments - Find the application in each segment and determine its checksum - Check whether the checksums stored match the newly calculated	
Execution Time	6 seconds	
User Input	None	
Error	Number	Description
	50300	The checksum is valid, the test succeeded
	50301	The checksum is invalid

Example	`DS:> 503`
	`050300:`
	`BootCode checksum is: 0xBABE5B6F, which is correct`
	`Diagnostics checksum is: 0xBABEBAFF, which is correct`
	`Download checksum is: 0xBABEEDBF, which is correct`
	`Application checksum is: 0xBABE8EEC, which is correct`
	`Test OK @`	

Nucleus Name	**DS_FLASH_CalculateChecksum**	
Nucleus Number	504	
Description	Calculate the checksum over all memory addresses. Used to check entire FLASH contents	
Technical	- Run the checksum calculation algorithm on all flash memory addresses	
Execution Time	6 seconds	
User Input	None	
Error	Number	Description
	50400	Calculating the checksum over all addresses succeeded

Example	`DS:> 504`
	`050400: The Checksum = 0xBABE30A4`
	`Test OK @`	

Nucleus Name	**DS_FLASH_CalculateChecksumFast**	
Nucleus Number	505	
Description	Calculate a checksum over a selected number of address locations	
Technical	- Run the checksum calculation algorithm on a selected number of flash memory addresses	
Execution Time	6 seconds	
User Input	None	
Error	Number	Description
	50500	Calculating the checksum over selected addresses succeeded

Example	`DS:> 505`
	`050500: The Checksum = 0xBABEB064`
	`Test OK @`	

3.6 VIDEO INPUT PROCESSOR (VIP)

Nucleus Name	**DS_VIP_DevTypeGet**	
Nucleus Number	600	
Description	Get the device (revision) type information of the VIP IC	
Technical	- Initialise IIC - Read out the device (revision) type information of the VIP IC	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	60000	Getting the information from the VIP succeeded
	60001	The IIC bus initialisation failed
	60002	The was an error getting the information from the VIP
	60003	Type not according to type stored in HW diversity string

Example	`DS:> 600`
	`060000: Found SAA7118`
	`Test OK @`	

Nucleus Name	**DS_VIP_Communication**	
Nucleus Number	601	
Description	Check the communication between the IIC controller of the Codec and the VIP IC	
Technical	- Initialise IIC - Read data from a location in the VIP	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	60100	Communicating with the VIP succeeded
	60101	The IIC bus was not accessible
	60102	There was a timeout reading the device
	60103	The IIC acknowledge was not received
	60104	The communication with the device failed
	60105	The IIC bus initialisation failed

Example	`DS:> 601`
	`060100:`
	`Test OK @`	

Nucleus Name	**DS_VIP_ClockOutputOn**	
Nucleus Number	602	
Description	Switch the clock output on	
Technical	- Initialise IIC - Set the clock output through IIC	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	60200	Switching the clock output on succeeded
	60201	Switching the clock output on failed

Example	`DS:> 602`
	`060200:`
	`Test OK @`	

Nucleus Name	**DS_VIP_ClockOutputOff**	
Nucleus Number	603	
Description	Switch the clock output off	
Technical	- Initialise IIC - Reset the clock output through IIC	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	60300	Switching the clock output off succeeded
	60301	Switching the clock output off failed

Example	`DS:> 603`
	`060300:`
	`Test OK @`	

<table>
<tr><td>Nucleus Name</td><td colspan="2">DS_VIP_SelectInput</td></tr>
<tr><td>Nucleus Number</td><td colspan="2">604</td></tr>
<tr><td>Description</td><td colspan="2">Select an input video path to be switched to the analogue output pin (AOUT) of the VIP</td></tr>
<tr><td>Technical</td><td colspan="2">- Check the user input
- Initialise IIC
- Read out the VIP id
- Write the set of registers required for the input specified</td></tr>
<tr><td>Execution Time</td><td colspan="2">Less than 1 second</td></tr>
<tr><td>User Input</td><td colspan="2">The input to select, see table below.

Available channels for input of the 7118 and their description:
<table>
<tr><th>Channel number</th><th>Description</th></tr>
<tr><td>1</td><td>CVBS_Y_IN_A</td></tr>
<tr><td>2</td><td>CVBS_OUT_B</td></tr>
<tr><td>3</td><td>CVBS_Y_IN_B</td></tr>
<tr><td>4</td><td>CVBS_Y_IN_C</td></tr>
<tr><td>6</td><td>C_IN</td></tr>
<tr><td>8</td><td>G_IN</td></tr>
<tr><td>9</td><td>Y_IN</td></tr>
<tr><td>13</td><td>B_IN</td></tr>
<tr><td>14</td><td>U_IN</td></tr>
<tr><td>18</td><td>R_IN</td></tr>
<tr><td>19</td><td>V_IN</td></tr>
</table>
Available channels for input of the 7115 and their description:
<table>
<tr><th>Channel number</th><th>Description</th></tr>
<tr><td>1</td><td>CVBS_Y_IN_B</td></tr>
<tr><td>2</td><td>CVBS_OUT_B_VIP</td></tr>
<tr><td>4</td><td>C_IN_VIP</td></tr>
<tr><td>7</td><td>CVBS_Y_IN_B</td></tr>
</table>
Available channels for input of the 7119 and their description:
<table>
<tr><th>Channel number</th><th>Description</th></tr>
<tr><td>1</td><td>Y / CVBS</td></tr>
<tr><td>3</td><td>CVBS</td></tr>
<tr><td>4</td><td>Y3</td></tr>
<tr><td>6</td><td>C / CVBS</td></tr>
<tr><td>8</td><td>G</td></tr>
<tr><td>9</td><td>Y</td></tr>
<tr><td>12</td><td>Y2</td></tr>
<tr><td>13</td><td>B</td></tr>
<tr><td>14</td><td>U</td></tr>
<tr><td>17</td><td>C</td></tr>
<tr><td>18</td><td>R</td></tr>
<tr><td>19</td><td>V</td></tr>
</table>
Available channels for input of the 7173 and their description:
<table>
<tr><th>Channel number</th><th>Description</th></tr>
<tr><td>1</td><td>CVBS_TUNER_IN</td></tr>
<tr><td>2</td><td>CVBS_REAR_IN</td></tr>
<tr><td>3</td><td>CVBS_FRONT_IN</td></tr>
<tr><td>4</td><td>C_REAR_IN</td></tr>
<tr><td>5</td><td>Y_REAR_IN</td></tr>
<tr><td>6</td><td>Y_FRONT_IN</td></tr>
<tr><td>7</td><td>C_FRONT_IN</td></tr>
<tr><td>8</td><td>AL_REAR_IN</td></tr>
<tr><td>9</td><td>AL_FRONT_IN</td></tr>
<tr><td>10</td><td>AR_FRONT_IN</td></tr>
<tr><td>11</td><td>AR_REAR_IN</td></tr>
<tr><td>12</td><td>SIF_TUNER_IN</td></tr>
</table></td></tr>
<tr><td>Error</td><td>Number</td><td>Description</td></tr>
</table>

	60400	Selecting the input of the VIP succeeded
	60401	The user provided wrong input
	60402	The VIP was not accessible
	60403	An unsupported VIP was found
Example	DS:> 604 1 060400: Test OK @	

3.7 DIGITAL VIDEO INPUT OUTPUT CIRCUIT (DVIO)

Nucleus Name	**DS_DVIO_LinkDevTypeGet**	
Nucleus Number	700	
Description	Get the device (revision) type information of the 1394 Link layer IC	
Technical	- Initialise the PIO pins on the Codec - Read out the ID register	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	70000	Getting the information from the link layer IC succeeded
	70001	Getting the information from the link layer IC failed
	70002	Type not according to type stored in HW diversity string

Example	`DS:> 700`
	`070000: Device type of the link layer IC: ffc00301`
	`Test OK @`	

Nucleus Name	**DS_DVIO_PhyDevTypeGet**	
Nucleus Number	701	
Description	Get the device (revision) type information of the 1394 Physical layer IC	
Technical	- Initialise the PIO pins of the Codec - Write the PHY-access register in the Link chip to indicate phy read access - Wait until the link chip has obtained the value from the phy-chip - Read this out and filter the data to be returned to the user	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	70100	Getting the information from the physical layer IC succeeded
	70101	The physical layer IC was not accessible
	70102	Getting the information from the physical layer IC failed
	70103	Type not according to type stored in HW diversity

Example	`DS:> 701`
	`070100: Physical layer IC: VendorID: 0x006037, ProductID: 0x412801`
	`Test OK @`	

Nucleus Name	**DS_DVIO_LinkCommunication**	
Nucleus Number	702	
Description	Check the accessibility of the 1394 Link layer IC by writing to and reading from a specific address	
Technical	- Initialise the PIO pins of the Codec - Write a pattern to the CYCTM register of the link chip - Read back and verify the pattern	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	70200	Communicating with the link layer IC succeeded
	70201	Communicating with the link layer IC failed
	70202	Result of nucleus not according to HW diversity string

Example	`DS:> 702`
	`070200:`
	`Test OK @`	

Nucleus Name	**DS_DVIO_PhyCommunication**	
Nucleus Number	703	
Description	Check the accessibility of the 1394 Physical layer IC by writing to and reading from a specific address	
Technical	- Initialise the PIO pins of the Codec - Initialise IIC - Write the data to be written to the PHY-chip to the link chip first - Wait until the link chip indicates that the data has been written to the PHY - Write the PHY-access register in the Link chip to indicate PHY read access - Wait until the link chip has obtained the value from the PHY-chip - Test whether the value read back equals the one previously written	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	70300	Communicating with the physical layer IC succeeded
	70301	The physical layer IC was not accessible
	70302	Communicating with the physical layer IC failed
	70303	Result of nucleus not according to HW diversity string

Example	`DS:> 703`
	`070300:`
	`Test OK @`	

Nucleus Name	**DS_DVIO_Routing**	
Nucleus Number	704	
Description	Route a DV stream containing an audio and video signal through the physical and link layer ICs to the Codec. This test works for both NTSC and PAL.	
Technical	- Initialise the DMA to transfer 5 frames PAL/NTSC - Initialise the DV de-multiplexer - Initialise the 1394 interface and start reception of the DV stream - Check whether the stream was copied to memory properly by the byte input interface (port to memory type DMA)	
Execution Time	6-10 seconds (6 when OK, 10 when no stream or error)	
User Input	None	
Error	Number	Description
	70400	Routing the signals succeeded
	70401	The 1394 link chip could not be initialised properly
	70402	There was a syntax error in the DV stream
	70403	DMA could not copy DV stream to memory. Stream connected?
	70404	DMA not working properly

Example	`DS:> 704`
	`070400:`
	`Test OK @`	

Nucleus Name	**DS_DVIO_DetectNode**	
Nucleus Number	705	
Description	Check whether a DV node can be detected by the hardware. This test works for both NTSC and PAL.	
Technical	- Initialise the 1394 interface - Detect whether a node is in range	
Execution Time	3 or 5 seconds (3 when OK, 5 when no stream or error)	
User Input	None	
Error	Number	Description
	70500	The node was detected OK
	70501	The 1394 link chip could not be initialised properly
	70502	Unable to write to 1394 PHY chip
	70503	Unable to read from 1394 PHY chip
	70504	No node was detected

Example	`DS:> 705`
	`070500:`
	`Test OK @`	

Nucleus Name	**DS_DVIO_DetectStream**	
Nucleus Number	706	
Description	Check whether a DV stream can be detected by the hardware. This test works for both NTSC and PAL.	
Technical	- Initialise the 1394 interface - Start receiving the stream - Detect whether the stream is OK	
Execution Time	3 or 5 seconds (3 when OK, 5 when no stream or error)	
User Input	None	
Error	Number	Description
	70600	The stream was detected
	70601	The 1394 link chip could not be initialised properly
	70602	No stream detected

Example	`DS:> 706`
	`070600:`
	`Test OK @`	

3.8 PROGRESSIVE SCAN CIRCUIT (PSCAN)

Nucleus Name	**DS_PSCAN_DevTypeGet**	
Nucleus Number	800	
Description	Get the device (revision) type information of the progressive scan ic.	
Technical	- Initialise the progressive scan ic. - Try to read the version register of the progressive scan ic.	
Execution Time	1 second	
User Input	None	
Error	Number	Description
	80000	Everything went well.
	80001	The communication with the device failed
	80002	No chip was expected

Example	`DS:> 800`
	`080000:`
	`Chip name : 2300`
	`Chip version : 1`
	`Test OK @`	

	`DS:> 800`
	`080000:`
	`Chip name : ADV7196`
	`Test OK @`	

	`DS:> 800`
	`080000:`
	`Chip name : ADV7302`
	`Test OK @`	

Nucleus Name	**DS_PSCAN_Communication**	
Nucleus Number	801	
Description	Check the communication between the IIC controller of the Codec and the progressive scan IC	
Technical	- Initialise IIC - Write data to a register of the progressive scan ic through IIC	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	80100	Communicating with the progressive scan ic succeeded
	80101	The IIC bus was not accessible
	80102	There was a timeout reading the device
	80103	The IIC acknowledge was not received
	80104	Communicating with the progressive scan ic failed
	80105	The initialisation of the IIC bus failed
	80106	The read data is not the same as the written data
	80107	No chip was expected

Example	`DS:> 801`
	`080100:`
	`Test OK @`	

Nucleus Name	**DS_PSCAN_TestImageOn**
Nucleus Number	802
Description	Generate the test images that are present on the progressive scan IC.
Technical	- Determine whether the user wanted a HATCH or a FRAME image pattern - Initialise the PIO pins of the Codec - Initialise IIC - Reset the DENC - Enable the 27Mhz clock - Send all settings for the pattern to the DENC through IIC
Execution Time	Less than 1 second

User Input	In case of ADV7196: When no input is given “HATCH” is the default -“HATCH” -“FRAME” Remark: “HATCH” is a crosshatch test pattern (horizontal and vertical white lines are displayed against a black background) “FRAME” is a uniform coloured frame/field test pattern (default white). In case of FLI2300: Nothing.	
Error	Number	Description
	80200	The generation of the test image succeeded
	80201	Unable to initialise PSCAN IC
	80202	Unable to reset DENC
	80203	Unable to generate image
	80204	No chip was expected

Example	`DS:> 802 HATCH`
	`080200:`
	`Test OK @`	

Nucleus Name	**DS_PSCAN_TestImageOff**	
Nucleus Number	803	
Description	Switch off the generated test image	
Technical	- Initialise IIC - Send the default DENC settings to the DENC through IIC	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	80300	Turning off the test image succeeded
	80301	Unable to initialise PSCAN IC
	80302	IIC Error during writing PSCAN IC
	80303	No chip was expected

Example	`DS:> 803`
	`080300:`
	`Test OK @`	

Nucleus Name	**DS_PSCAN_TestImageColourSettingsSet**	
Nucleus Number	804	
Description	Set the colour of the hatch- or the frame- field to a different value than the default white	
Technical	- Determine which colour must be set. - Initialise IIC. - Enable 27 MHz PSCAN Clock. - Send all settings to the DENC through IIC.	
Execution Time	Less than 1 second.	
User Input	A colour string of one of the next non-case sensitive strings (WHITE, BLACK, RED, GREEN, BLUE, YELLOW, CYAN, MAGENTA) or Y Cr Cb (hexa-) decimal values.	
Error	Number	Description
	80400	Setting the new colour-settings succeeded
	80401	The user provided wrong input
	80402	Unable to initialise PSCAN IC
	80403	Unable to set colour
	80404	No chip was expected

Example	`DS:> 804 yellow`
	`080400:`
	`Test OK @`
	
	`DS:> 804 0x6a 0xde 0xca`
	`080400:`
	`Test OK @`	

Nucleus Name	**DS_PSCAN_TestImageColourSettingsGet**	
Nucleus Number	805	
Description	Get the colour settings of the hatch- or the frame- field.	
Technical	- Initialise IIC. - Read the colour settings from the DENC through IIC.	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	80500	Getting the colour-settings succeeded
	80501	The progressive scan DENC-IC was not accessible through IIC
	80502	Unable to get colour
	80503	No chip was expected

Example	`DS:> 805`
	`080500: Colour Y Cr Cb values: 0xD2 0x92 0x10`
	`Test OK @`	

Nucleus Name	**DS_PSCAN_Routing**	
Nucleus Number	806	
Description	Route a video signal from the codec host processor through the progressive scan ICs to the progressive scan output of the set. **Note**: To route the progressive scan to the output of the set, first call the nucleus to do the video routing on the analogue (part of the) board.	
Technical	- Initialise the PIO pins of the codec - Initialise IIC - Reset the DENC - Enable the 27Mhz clock - Send all settings to the DENC through IIC.	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	80600	Routing path is created successfully.
	80601	Unable to initialise the Codec.
	80602	Unable to access DENC
	80603	Unable to access de-interlacer.
	80604	Wrong chips were expected.

Example	`DS:> 806`
	`080600:`
	`Test OK @`	

Nucleus Name	**DS_PSCAN_DevTypeGetDeinterlacer**
Nucleus Number	807
Description	See nucleus 800.

Example	`DS:> 807`
	`080700:`
	`Chip name : 2300`
	`Chip version : 1`
	`Test OK @`

Nucleus Name	**DS_PSCAN_CommunicationDeinterlacer**
Nucleus Number	808
Description	See nucleus 801.

Example	`DS:> 808`
	`080800:`
	`Test OK @`

3.9 BASIC ENGINE (BE)

Nucleus Name	**DS_BE_CommunicationEcho**	
Nucleus Number	900	
Description	Check the communication between the digital board and the basic engine by issuing an ***echo*** command	
Technical	- Check if an AV2 or AV3 is connected - In case of an AV2 Check the communication between the digital board and the basic engine by issuing an ***echo*** command over the S2B interface - Check if the BE returned the string 0x00 0xAA 0x55 - In case of an AV3 send an ATAPI TEST_UNIT_READY command	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	90000	Communicating with the BE over the S2B interface succeeded
	90001	There was a time-out while communicating
	90002	The Basic Engine returned an unexpected result
	90003	The Basic Engine returned an error code
	90004	No acknowledge received from BE
	90005	Communicating with the Basic Engine failed
	90006	Echo check failed, no echo received
	90007	Echo check failed, received wrong pattern

Example	`DS:> 900`
	`090000:`
	`Test OK @`	

Nucleus Name	**DS_BE_Reset**	
Nucleus Number	901	
Description	Reset the basic engine	
Technical	- Check if an AV2 or AV3 is connected - In case of an AV2 Toggle the reset pin of the I2S interface - In case of an AV3 Toggle the reset pin of the IDE interface	
Execution Time	2 seconds on AV2 9 seconds on AV3 (when disc inside)	
User Input	None	
Error	Number	Description
	90100	Resetting the Basic Engine succeeded
	90101	Resetting the Basic Engine failed

Example	`DS:> 901`
	`090100:`
	`Test OK @`	

Nucleus Name	**DS_BE_GetSelftestResult**	
Nucleus Number	902	
Description	Return the self-test results through the service port	
Technical	- Check if an AV2 or AV3 is connected - In case of an AV2 Send the S2B GET_SELF_TEST_RESULT command - In case of an AV3 Send the ATAPI REPORT_DRIVE_DIAGNOSTICS command - On error display the specific error codes received from the BE	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	90200	Self test succeeded, no errors
	90201	There was a time-out while communicating
	90202	The Basic Engine returned an unexpected result
	90203	The BE returned an error code
	90204	No acknowledge received from BE
	90205	Communicating with the Basic Engine failed
	90206	Basic Engine returned no info
	90207	Self test failed, errors are echoed

Example	`DS:> 902`
	`090200:`
	`Self-test result byte : 00000000`
	`Self-test result byte : 00000000`
	`Self-test result byte : 00000000`
	`Test OK @`	

Nucleus Name	**DS_BE_VersionGet**	
Nucleus Number	903	
Description	Get the version of the basic engine and that of the optical unit	
Technical	- Check if an AV2 or AV3 is connected - In case of an AV2 send the S2B GET_VERSION_NUMBER command - In case of an AV3 send the ATAPI INQUIRY command - Send the GET_OPU_VERSION command - Display the returned version information	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	90300	BE version OK
	90301	There was a time-out while communicating
	90302	The Basic Engine returned an unexpected result
	90303	The BE returned an error code
	90304	No acknowledge received from BE
	90305	Communicating with the Basic Engine failed
	90306	The BE returned no info

Example (AV2)	`DS:> 903`
	090300: BE version = 20.09.18 Optical unit version = 3C.00.09.41.08
	`Test OK @`	

Example (AV3)	`DS:> 903`
	`090300:`
	`BE version = 31.30.24. PHILIPS ,VAD8031`
	`,31302400,REL_8031_313024 2073,`
	`Optical unit version = 00.06.82.19.00`
	`Test OK @`	

Nucleus Name	**DS_BE_TrayOut**	
Nucleus Number	904	
Description	Open the tray of the basic engine	
Technical	- Check if an AV2 or AV3 is connected - In case of an AV2 Send the S2B TRAY_OUT command - In case of an AV3 send an ATAPI START_STOP_UNIT command	
Execution Time	Approximately 2 seconds	
User Input	None	
Error	Number	Description
	90400	The command executed successfully
	90401	There was a time-out while communicating
	90402	The Basic Engine returned an unexpected result
	90403	The BE returned an error code
	90404	No acknowledge received from BE
	90405	Unable to enter normal mode
	90406	Communicating with the Basic Engine failed

Example	`DS:> 904`
	`090400:`
	`Test OK @`	

Nucleus Name	**DS_BE_TrayIn**	
Nucleus Number	905	
Description	Close the tray of the basic engine	
Technical	- Check if an AV2 or AV3 is connected - Send the S2B TRAY_IN command - In case of an AV3 send an ATAPI START_STOP_UNIT command	
Execution Time	Approximately 1 - 2 seconds	
User Input	None	
Error	Number	Description
	90500	The command executed successfully
	90501	There was a time-out while communicating
	90502	The Basic Engine returned an unexpected result
	90503	The BE returned an error code
	90504	No acknowledge received from BE
	90505	Unable to enter normal mode
	90506	Communicating with the Basic Engine failed

Example	`DS:> 905`
	`090500:`
	`Test OK @`	

Nucleus Name	**DS_BE_WriteReadDvdRw**	
Nucleus Number	906	
Description	Write data to and read data from a DVD+RW or DVD-RW disc through the basic engine for verification of the writing	
Technical	- Check if an AV2 or AV3 is connected - Execute DS_BE_GetSelftestResults - Send the TRAY_IN command - Send the READ_TOC command - Generate a random disc location - Generate test data to write to the DVD+RW - In case of an AV2 Transfer the test data to the disc location using DMA - In case of an AV3 Transfer the test data to the disc location using PIO mode ATAPI WRITE_10 - In case of an AV2 Read back the data from disc using DMA - In case of an AV3 Transfer the test data to the disc location using PIO mode ATAPI READ_10 - Compare the two data areas and check whether the areas are equal	
Execution Time	Approximately 20 seconds	
User Input	None	
Error	Number	Description
	90600	The command executed successfully
	90601	This nucleus cannot be executed because the Self-Test failed
	90602	The BE cannot enter normal operating mode
	90603	Unable to send the tray in
	90604	Unable to read TOC from disc
	90605	Invalid disc is loaded, please insert a DVD+RW or DVD-RW disc
	90606	Writing the test pattern to DVD+RW or DVD-RW failed
	90607	Reading back the test pattern from DVD+RW of DVD-RW failed
	90608	Compare check failed
	90609	Calibrating DVD+RW or DVD-RW failed

Example	`DS:> 906`
	`090600: DVD+RW test on sector 0x5dbe0: OK`
	`Test OK @`	

	`DS:> 906`
	`090600: DVD-RW test on sector 0x304e0: OK`
	`Test OK @`	

Nucleus Name	**DS_BE_WriteReadDvdR**	
Nucleus Number	907	
Description	Write data to and read data from a DVD+R or DVD-R disc through the basic engine for verification of the writing	
Technical	- Check if an AV2 or AV3 is connected - Execute DS_BE_GetSelftestResults - Send the TRAY_IN command - Send the READ_TOC command - Use the OPC area to test if the DVD+R or DVD-R is (still) writable - Generate test data to write to the DVD+R or DVD-R - In case of an AV2 Transfer the test data to the disc location using DMA - In case of an AV3 Transfer the test data to the disc location using PIO mode ATAPI WRITE_10 - In case of an AV2 Read back the data from disc using DMA - In case of an AV3 Transfer the test data to the disc location using PIO mode ATAPI READ_10 - Compare the two data areas and check whether the areas are equal	
Execution Time	Approximately 20 seconds	
User Input	None	
Error	Number	Description
	90700	The command executed successfully
	90701	This nucleus cannot be executed because the Self-Test failed
	90702	The BE cannot enter normal operating mode
	90703	Unable to send the tray in
	90704	Unable to read TOC from disc
	90705	Invalid disc is loaded, please insert a DVD+RW disc
	90706	Unable to write, the DVD+R or DVD-R disc is full
	90707	No writable DVD+R or DVD-R sector found
	90708	Writing the test pattern to DVD failed
	90709	Reading back the test pattern from DVD failed
	90710	Compare check failed

Example	`DS:> 907`
	`090700: DVD+R test on sector 0x36210: OK`
	`Test OK @`	

	`DS:> 907`
	`090700: DVD-R test on sector 0x30000: OK`
	`Test OK @`	

Note:	**Not for ATAPI based drives!** **Command may not work for ATAPI based drives!**	
Nucleus Name	**DS_BE_StatisticalInformationGet**	
Nucleus Number	908	
Description	Retrieve the statistical information from the basic engine	
Technical	- Check if an AV2 or AV3 is connected - In case of an AV2 Send the S2B GET_STATISTICAL_INFO command - In case of an AV3 Send the transparent BIT engine GET_STATISTICAL_INFO command - Display the info returned from the BE	
Execution Time	Less than 1 second on AV2 2 seconds on AV3	
User Input	None	
Error	Number	Description
	90800	The command executed successfully
	90801	There was a time-out while communicating
	90802	The Basic Engine returned an unexpected result
	90803	The BE returned an error code
	90804	No acknowledge received from BE
	90805	Communicating with the Basic Engine failed
	90806	The BE returned no info

Example (AV2)

```
DS:> 908
Number of times Tray went Open/Closed :  4
Total minutes the CD laser was on     :  0
Total minutes the DVD laser was on    :  0
Total minutes the write laser was on  :  0
090800:
Test OK @
```

Example (AV3)

```
DS:> 908
Number of times Tray went Open/Closed
4
Total time the power power on (HR:MIN)
0:0h
Total time of reading CDROM discs (HR:MIN)
0:0h
Total time of reading high speed CD-R discs (HR:MIN)      0:0h
Total time of reading other CD-R discs (HR:MIN)           0:0h
Total time of reading high speed CD-RW discs (HR:MIN)     0:0h
Total time of reading other CD-RW discs (HR:MIN)          0:0h
Total time of reading high speed DVD SL discs (HR:MIN)    0:0h
Total time of reading other DVD SL discs (HR:MIN)         0:0h
Total time of reading high speed DVD DL discs (HR:MIN)    0:0h
Total time of reading other DVD DL discs (HR:MIN)         0:0h
Total time of reading high speed DVD+R discs (HR:MIN)     0:0h
Total time of reading other DVD+R discs (HR:MIN)          0:2h
Total time of reading high speed DVD+RW discs (HR:MIN)    0:0h
Total time of reading other DVD+RW discs (HR:MIN)         0:35h
Total time of writing DVD+R discs at 2.4 x (HR:MIN)       0:0h
Total time of writing DVD+R discs at 4 x (HR:MIN)         0:0h
Total time of writing DVD+RW discs at 2.4 x (HR:MIN)      0:0h
Total time of writing DVD+RW discs at 4 x (HR:MIN)        0:0h
090800:
Test OK @
```

Note:	**Not for ATAPI based drives!** **Command may not work for ATAPI based drives!**	
Nucleus Name	**DS_BE_StatisticalInformationReSet**	
Nucleus Number	909	
Description	Reset the statistical information in the basic engine	

Technical	- Check if an AV2 or AV3 is connected
	- In case of an AV2
	  - Send the S2B RESET_STATISTICAL_INFO command
	  - Send the S2B POWER_DOWN command
	  - Toggle the reset pin of the I2S interface
	- In case of an AV3 Send the transparent BIT engine RESET_STATISTICAL_INFO command	

Execution Time	2 seconds	
User Input	None	
Error	Number	Description
	90900	The command executed successfully
	90901	There was a time-out while communicating
	90902	The Basic Engine returned an unexpected result
	90903	The BE returned an error code
	90904	No acknowledge received from BE
	90905	Communicating with the Basic Engine failed

Example	`DS:> 909`
	`090900:`
	`Test OK @`	

Note:	**Not for ATAPI based drives!** **Command may not work for ATAPI based drives!**	
Nucleus Name	**DS_BE_ErrorLogGet**	
Nucleus Number	910	
Description	Get the error log from the basic engine	
Technical	- Check if an AV2 or AV3 is connected - In case of an AV2 Send the S2B GET_ERROR command - In case of an AV3 Send the transparent BIT engine GET_ERROR and GET_FATAL commands - Display the returned info	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	91000	The command executed successfully
	91001	There was a time-out while communicating
	91002	The Basic Engine returned an unexpected result
	91003	The BE returned an error code
	91004	No acknowledge received from BE
	91005	Communicating with the Basic Engine failed
	91006	The BE returned no info

Example (AV2)	`DS:> 910`
	` Momentary errors (Byte 1 - Byte 7) : 0x00 0x00 0x00 0x00 0x00 0x00 0x00`
	` Cumulative errors (Byte 1 - Byte 7) : 0x00 0x00 0x00 0x20 0x00 0x00 0x00`
	` Fatal errors (Oldest - Youngest)  : 0x00 0x00 0x00 0x00 0x00`
	`091000:`
	`Test OK @`	

Example (AV3)	`DS:> 910`
	`Momentary errors  (0-9): 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00`
	`Cumulative errors (1-9) : 0x00 0x80 0x20 0x00 0x00 0x00 0x00 0x00 0x00`
	`Software fatal assert  : 799 engineproxy.cpp`
	`091000:`
	`Test OK @`	

Note:	**Not for ATAPI based drives!** **Command may not work for ATAPI based drives!**	
Nucleus Name	**DS_BE_ErrorLogReset**	
Nucleus Number	911	
Description	Reset the error log in the basic engine	

Technical	- Check if an AV2 or AV3 is connected
	- In case of an AV2
	  - Send theS2B RESET_STATISTICAL_INFO command
	  - Send the S2B POWER_DOWN command
	  - Toggle the reset pin of the I2S interface
	- In case of an AV3 Send the transparent BIT engine RESET_STATISTICAL_INFO command	

Execution Time	2 seconds	
User Input	None	
Error	Number	Description
	91100	The command executed successfully
	91101	There was a time-out while communicating
	91102	The Basic Engine returned an unexpected result
	91103	The BE returned an error code
	91104	No acknowledge received from BE
	91105	Communicating with the Basic Engine failed

Example	`DS:> 911`
	`091100:`
	`Test OK @`	

Nucleus Name	**DS_BE_JitterOptimise**	
Nucleus Number	912	
Description	Perform jitter optimisation: A formatted DVD must be loaded into the engine before executing this nucleus	

Technical	- Check if an AV2 or AV3 is connected
	- Send the TRAY_IN command
	- Send the READ_TOC command
	- In case of an AV2
	  - Send the JITTER_COMMAND command with parameter 0x00 0x00
	  - Send the JITTER_COMMAND command with parameter 0x00 0x01
	  - Send the JITTER_COMMAND command with parameter 0x00 0x02 until offset 0x80 is received
	- In case of an AV3 Send the MEASURE_JITTER_BLER_PPN command and display the average jitter and bler values	

Execution Time	Approximately 20 seconds	
User Input	None	
Error	Number	Description
	91200	Optimising jitter succeeded
	91201	There was a time-out while communicating
	91202	The Basic Engine returned an unexpected result
	91203	The Basic Engine returned an error code
	91204	No acknowledge received from BE
	91205	Unable to send tray in
	91206	Unable to read the disc
	91207	No disc is loaded
	91208	Unknown disc is loaded
	91209	Unable to enter service mode

Example (AV2)	`DS:> 912`
	`091200: Jitter bathtub: (-42,135)(-40,127)(-38,106)(-36,106)(-34,101)(-32,97)(-30,92)(-28,92)(-26,92)(-24,92)(-22,86)(-20,80)(-18,86)(-16,86)(-14,80)(-12,80)(-10,80)(-8,80)(-6,80)(-4,86)(-2,86)(0,86)(2,86)(4,92)(6,92)(8,101)(10,106)(12,111)(14,120)(16,123)(18,127)(20,142)`
	`Test OK @`	

Example (AV3)	`DS:> 912`
	`091200: Average Jitter, Bler C1, Bler C2: (92,4,254)`
	`Test OK @`	

Note:	**Not for ATAPI based drives!** **Command may not work for ATAPI based drives!**	
Nucleus Name	**DS_BE_FocusOn**	
Nucleus Number	913	
Description	Put the laser of the BE into focus	
Technical	- Check if an AV2 or AV3 is connected - In case of an AV2 Send the FOCUS command with parameter 0x01 - In case of an AV3 Send the transparent BIT engine FOCUS command	
Execution Time	3 seconds	
User Input	None	
Error	Number	Description
	91300	Focus on succeeded
	91301	There was a time-out while communicating
	91302	The Basic Engine returned an unexpected result
	91303	The BE returned an error code
	91304	No acknowledge received from BE
	91305	Communicating with the Basic Engine failed
	91306	Unable to enter service mode

Example	`DS:> 913`
	`091300:`
	`Test OK @`	

Note:	**Not for ATAPI based drives!** **Command may not work for ATAPI based drives!**	
Nucleus Name	**DS_BE_FocusOff**	
Nucleus Number	914	
Description	Turn off putting the laser of the BE into focus	
Technical	- Check if an AV2 or AV3 is connected - In case of an AV2 Send the FOCUS command with parameter 0x00 - In case of an AV3 Send the transparent BIT engine FOCUS command	
Execution Time	Less than 1 second on AV2 2 seconds on AV3	
User Input	None	
Error	Number	Description
	91400	Focus off succeeded
	91401	There was a time-out while communicating
	91402	The Basic Engine returned an unexpected result
	91403	The BE returned an error code
	91404	No acknowledge received from BE
	91405	Communicating with the Basic Engine failed
	91406	Unable to enter service mode

Example	`DS:> 914`
	`091400:`
	`Test OK @`	

Nucleus Name	**DS_BE_MotorOn**	
Nucleus Number	915	
Description	Turn on the turntable motor	
Technical	- Check if an AV2 or AV3 is connected - In case of an AV2 Send the TURN_TABLE_MOTOR_ON command - In case of an AV3 Send the transparent BIT engine TTM command	
Execution Time	Less than 1 second on AV2 4 seconds on AV3	
User Input	None	
Error	Number	Description
	91500	Turn table motor is on
	91501	There was a time-out while communicating
	91502	The Basic Engine returned an unexpected result
	91503	The BE returned an error code
	91504	No acknowledge received from BE
	91505	Communicating with the Basic Engine failed
	91506	Unable to enter service mode

Example	`DS:> 915`
	`091500:`
	`Test OK @`	

Nucleus Name	**DS_BE_MotorOff**	
Nucleus Number	916	
Description	Turn off the turntable motor	
Technical	- Check if an AV2 or AV3 is connected - In case of an AV2 Send the TURN_TABLE_MOTOR_OFF command - In case of an AV3 Send the transparent BIT engine TTM command	
Execution Time	Less than 1 second on AV2 4 seconds on AV3	
User Input	None	
Error	Number	Description
	91600	Turn table motor is off
	91601	There was a time-out while communicating
	91602	The Basic Engine returned an unexpected result
	91603	The BE returned an error code
	91604	No acknowledge received from BE
	91605	Communicating with the Basic Engine failed
	91606	Unable to enter service mode
Example	DS:> 916 091600: Test OK @	

Nucleus Name	**DS_BE_Tilt**	
Nucleus Number	920	
Description	Test the tilt mechanism control loop, or allow its proper functioning to be measured. Before executing this nucleus a non-empty disc must be loaded in the recorder	

Technical	- Check if an AV2 or AV3 is connected
	- In case of an AV2
	  - Send the TRAY_IN command
	  - Send the READ_TOC command
	  - Send the TILT_COMMAND command with parameter 0x00 0x00
	  - Send the TILT_COMMAND command with parameter 0x00 0x01
	  - Send the TILT_COMMAND command with parameter 0x00 0x02
	- In case of an AV3 display a “not supported” message	

Execution Time	Approximately 15 seconds	
User Input	None	
Error	Number	Description
	92000	The command executed successfully
	92001	There was a time-out while communicating
	92002	The Basic Engine returned an unexpected result
	92003	The Basic Engine returned an error code
	92004	No acknowledge received from BE
	92005	Unable to send tray in
	92006	Unable to read the disc
	92007	No disc is loaded
	92008	Unknown disc is loaded
	92009	Unable to enter service mode
	92010	This nucleus is not supported by the engine
Example (AV2)	DS:> 920 092000: Tilt sensor bathtub: (71,-12,145)(68,-12,135)(62,-10,120)(56,-92,97)(50,-75,86)(44,-59,80)(41,-52,80)(35,-37,86)(29,-22,86)(23,-7,92)(17,8,111)(11,23,135)(8,31,138)(5,39,158) Test OK @	
Example (AV3)	DS:> 920 092010: Tilt function is not supported by the engine Error @	

Nucleus Name	**DS_BE_CheckDisc**	
Nucleus Number	921	
Description	Check whether there is a disc inside the BE	
Technical	- Send the TRAY_IN command - Send the READ_TOC command - Display the Disc type info - If Disc type is a DVD+R(W), then read ADIP info. - Display manufacturer and media type.	
Execution Time	Approximately 10 seconds	
User Input	None	
Error	Number	Description
	92100	There was a disc inside the set
	92101	Unable to load the tray
	92102	Error received from BE
Example	DS:> 921 092100: Disc type: DVD+RW disc Disc manufacturer id: PHILIPS Media type id: 010 Test OK @ DS:> 921 090500: Disc type: None Test OK @ DS:> 921 092100: Disc type: DVD+R disc Disc manufacturer id: RICOHJPN Media type id: R00 Test OK @	

Nucleus Name	**DS_BE_SledgeMotor**	
Nucleus Number	922	
Description	Send the sledge to its home position, then to the middle of the disc, and then to the end.	
Technical	- Send the PCS_COMMAND command with parameter 0x03 0x00 - Send the PCS_COMMAND command with parameter 0x02 0x00 - Send the PCS_COMMAND command with parameter 0x00 0x01 - Send the PCS_JUMP_SLEGE_STEPS command for 3 times - Send the PCS_COMMAND command with parameter 0x00 0x00	
Execution Time	4 seconds on AV2 11 seconds on AV3	
User Input	None	
Error	Number	Description
	92200	The command executed successfully
	92201	There was a time-out while communicating
	92202	The Basic Engine returned an unexpected result
	92203	The BE returned an error code
	92204	No acknowledge received from BE
	92205	Communicating with the Basic Engine failed
	92206	Unable to enter service mode
Example	DS:> 922 092200: Test OK @	

Nucleus Name	**DS_BE_ReadTocInfo**	
Nucleus Number	924	
Description	Read the TOC from the disc. This gives a good indication if the BE works properly.	
Technical	- Send the TRAY_IN command - Send the READ_TOC command - Display the TOC info.	
Execution Time	Approximately 10 seconds	
User Input	None	
Error	Number	Description
	92400	A disc is loaded, TOC info if echoed
	92401	Unable to load the tray
	92402	The BE has not returned TOC info
	92403	Error received from BE

Example	`DS:> 924`
	`092400: TOC info [hex] = 91 3A 0C`
	`Test OK @`
	
	`DS:> 924`
	`092403: The BE returned: 0x10 #{no_disc_error} No disc is detected`
	`Error @`
	
	`DS:> 924`
	`092403: The BE returned: 0x1e #{illegal_medium_error} Engine unable to handle current disc. Probably illegal medium.`
	`Error @`	

Nucleus Name	**DS_BE_DiscErase**	
Nucleus Number	925	
Description	Perform a DC-erase on a DVD+RW disc.	

Technical	- Check if an AV2 or AV3 is connected
	- In case of an AV2
	  - Execute DS_BE_GetSelftestResults
	  - Send the TRAY_IN command
	  - Send the READ_TOC command
	  - Send the SET_INPUT_TYPE command with parameter DC_ERASE
	  - Overwrite the header of the DVD+RW disc with DC erase data.
	  - Send the SET_INPUT_TYPE command with parameter NORMAL.
	- In case of an AV3 display a “not supported” message	

Execution Time	Approximately 1:15 minute	
User Input	None	
Error	Number	Description
	92500	A DVD+RW disc is erased
	92501	This nucleus cannot be executed because the Self-Test failed
	92502	The BE cannot enter normal operating mode
	92503	Unable to send the tray in
	92504	Unable to read TOC from disc
	92505	Invalid disc is loaded, please insert a DVD+RW disc
	92506	Calibrating DVD+RW failed
	92507	Set Input Type command failed
	92508	Erasing the DVD+RW disc failed
	92509	Erasing is aborted by user
	92510	This nucleus is not supported by the engine

Example (AV2)	`DS:> 925`
	`The entirely disc will be erased.`
	`Are you sure you want this?[y/n]`
	
	`092500:`
	`Test OK @`	

Example (AV3)	`092510: This nucleus is not supported by the engine` `Error @`	

Nucleus Name	**DS_BE_RegionCodeSet**	
Nucleus Number	928	
Description	Set the region code in the AV3.	
Technical	- Check if an AV2 or AV3 is connected - In case of anAV2 display a “not supported” message - In case of an AV3 send the ATAPI SEND_KEY command	
Execution Time		
User Input	Region code	
Error	Number	Description
	92800	The command executed successfully
	92801	There was a time-out while communicating
	92802	The Basic Engine returned an unexpected result
	92803	The BE returned an error code
	92804	No acknowledge received from BE
	92805	Communicating with the Basic Engine failed
	92806	No disc is present, please insert disc
	92807	Region code out of range
	92808	User input wrong
	92809	Region counter expired
	92810	This nucleus is not supported by the engine

Example (AV2)	`DS:> 928`
	`092810: This nucleus is not supported by the engine`
	`Error @`	

Example (AV3)	`DS:> 928 1`
	`092800:`
	`Test OK @`	

Nucleus Name	**DS_BE_RegionCodeGet**	
Nucleus Number	929	
Description	Read the region code from the AV3.	
Technical	- Check if an AV2 or AV3 is connected - In case of an AV2 display a “not supported” message - In case of an AV3 send the ATAPI REPORT_KEY command	
Execution Time		
User Input	None	
Error	Number	Description
	92900	The command executed successfully
	92901	There was a time-out while communicating
	92902	The Basic Engine returned an unexpected result
	92903	The BE returned an error code
	92904	No acknowledge received from BE
	92905	Communicating with the Basic Engine failed
	92906	This nucleus is not supported by the engine

Example (AV2)	`DS:> 929`
	`092906: This nucleus is not supported by the engine`
	`Error @`	

Example (AV3)	`DS:> 929`
	`092900: DVD region 1`
	`Test OK @`	

Nucleus Name	**DS_BE_RegionCounterReset**	
Nucleus Number	930	
Description	Reset the region counter in the AV3.	
Technical	- Check if an AV2 or AV3 is connected - In case of an AV2 display a “not supported” message - In case of an AV3 send a special ATAPI RESET_REGION_COUNTER command	
Execution Time		
User Input	None	
Error	Number	Description
	93000	The command executed successfully
	93001	There was a time-out while communicating
	93002	The Basic Engine returned an unexpected result
	93003	The BE returned an error code
	93004	No acknowledge received from BE
	93005	Communicating with the Basic Engine failed
	93006	This nucleus is not supported by the engine

Example (AV2)	`DS:> 930`
	`093006: This nucleus is not supported by the engine`
	`Error @`	

Example (AV3)	`DS:> 930`
	`093000:`
	`Test OK @`	

Note:	**Not for ATAPI based drives!** **Command may not work for ATAPI based drives!**	
Nucleus Name	**DS_BE_AdjustLaserControl**	
Nucleus Number	931	
Description	Adjust the DVD-M (with the OPU) with PCBA. (So adjusts the two PCBS to each other)	
Technical	- Check if an AV2 or AV3 is connected - In case of an AV2 display a “not supported” message - In case of an AV3 adjust the DVD-M (with the OPU) with PCBA by sending a S2B command to align the PCBs to each other.	
Execution Time	30 seconds	
User Input	None	
Error	Number	Description
	93100	The command executed successfully
	93101	There was a time-out while communicating
	93102	The Basic Engine returned an unexpected result
	93103	The BE returned an error code
	93104	No acknowledge received from BE
	93105	Communicating with the Basic Engine failed
	93106	Unable to enter service mode
	93107	This nucleus is not supported by the engine

Example (AV2)	`DS:> 931`
	`093107: This nucleus is not supported by the engine`
	`Error @`	

Example (AV3)	`DS:> 931`
	`093100:`
	`Test OK @`	

Nucleus Name	**DS_BE_WriteReadDvdRDualLayer**	
Nucleus Number	932	
Description	Write data to and read data from both layers of a DVD+R DL disc through the basic engine for verification of the writing	
Technical	- Send the TRAY_IN command - Send the READ_TOC command - Use READ_TRACK_INFORMATION to determine the next free writable address on Layer 0. - In case of address 0, reserve a track of 0x1FD800 sectors for Layer 0 - Use command SEND_OPC_INFORMATION to calibrate Layer 0 - Generate test data to write to the disc - Transfer the test data to Layer 0 using PIO mode ATAPI WRITE_12 - Use READ_TRACK_INFORMATION to determine the next free writable address on Layer 1 - Use command SEND_OPC_INFORMATION to calibrate Layer 1 - Transfer the test data to Layer 1 using PIO mode ATAPI WRITE_12 - Read back the data of Layer 0 using PIO mode ATAPI READ_12 - Compare the original data with the read data and check whether the areas are equal - Read back the data of Layer 1 using PIO mode ATAPI READ_12 - Compare the original data with the read data and check whether the areas are equal	
Execution Time	Approximately 30 seconds	
User Input	None	
Error	Number	Description
	93200	The command executed successfully
	93201	This nucleus cannot be executed because the Self-Test failed
	93202	The BE cannot enter normal operating mode
	93203	Unable to send the tray in
	93204	Unable to read TOC from disc
	93205	Invalid disc is loaded, please insert a DVD+R DL disc
	93206	Unable to write, the DVD+R DL disc is full
	93207	No writable sector found
	93208	Writing the test pattern to Layer 0 failed
	93209	Writing the test pattern to Layer 1 failed
	93210	Reading back the test pattern from Layer 0 failed
	93211	Reading back the test pattern from Layer 1 failed
	93212	Compare check for Layer 0 failed
	93213	Compare check for Layer 1 failed

Example	`DS:> 932`
	`093200: Dual Layer DVD+R test on LBA 0x750 and 0x1fdf60 OK`
	`Test OK @`	

3.10 DISPLAY AND CONTROL BOARD (DCB)

Nucleus Name	**DS_DCB_CommunicationEcho**	
Nucleus Number	1000	
Description	Check the communication between the digital board and the DCB by issuing an ***echo*** command	
Technical	- Send an echo command to the DCB via the analogue board and wait for the result	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	100000	Communicating with the DCB succeeded
	100001	The analogue board could not access the DCB.
	100002	There was no response from the analogue board.
	100003	The returned error code from the analogue board is unknown
	100004	Unknown error code returned by the DCB.

Example	`DS:> 1000`
	`100000:`
	`Test OK @`	

Nucleus Name	**DS_DCB_VersionGet**	
Nucleus Number	1001	
Description	Get the version of the DCB	
Technical	- Issue the DCB version get command to the analogue board and wait for the result	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	100100	Retrieving the version of the DCB succeeded
	100101	The analogue board could not access the DCB.
	100102	There was no response from the analogue board.
	100103	The returned error code from the analogue board is unknown
	100104	Unknown error code returned by the DCB.

Example	`DS:> 1001`
	`100100: DCB version: 13`
	`Test OK @`	

Nucleus Name	**DS_DCB_LightDisplay**	
Nucleus Number	1002	
Description	Light the entire display of the DCB, and clear the display after confirmation. User confirmation is necessary. The REC and PLAY keys on the local keyboard are used for this confirmation. The PLAY key confirms that the test pattern is OK and the REC key indicates an error. The STOP key is used to exit this nucleus at any time. The keyboard can also be used for the same purpose. The O or o key confirms that the test pattern is OK and the N or n key indicates the user wants to go to the next test or that there is an error. The rest of the keys of the keyboard are used to exit this nucleus at any time.	
Technical	- First issue a command to clear the display and wait for the result - Then issue the command to light the entire display and wait for confirmation by the user	
Execution Time	Until user confirmation.	
User Input	None	
Error	Number	Description
	100200	Lighting the entire display succeeded
	100201	The analogue board could not access the DCB.
	100202	There was no response from the analogue board.
	100203	The returned error code from the analogue board is unknown
	100204	The analogue board could not access the DCB.
	100205	There was no response from the analogue board.
	100206	The DCB did not light all labels.
	100207	The user skipped the rest of the DCB_Light_Display test.
	100208	The user returned an unknown confirmation:
	100209	The returned error code from the analogue board is unknown

Example	`DS:> 1002`
	`100200:`
	`Test OK @`	

Nucleus Name	**DS_DCB_Keyboard**	
Nucleus Number	1004	
Description	Check all keys of the keyboard by confirming the key-code displayed of each key. The PLAY key is used to confirm this nucleus. However, this key is also part of the keyboard test itself. Also the REC and STOP keys are used to exit the test. With the REC key the user signals a failure, while the STOP key signals the abortion of the test by the user. To use one of these three keys for confirmation, failure or abortion, the user needs to hold the key pressed down for more than one second.	
Technical	- Initialise the display - Display the key pressed by the user on the display - Monitor the service port for an abort and get the next key pressed - Update the display and repeat previous steps until user stops / confirms	
Execution Time	Until user confirmation.	
User Input	None	
Error	Number	Description
	100400	All the keys on the keyboard have been pressed
	100401	DCB Keyboard; test failed
	100402	DCB Keyboard; test aborted by the user
	100403	The analogue board could not access the DCB.

Example	`DS:> 1004`
	`100400:`
	`Test OK @`	

Nucleus Name	**DS_DCB_RemoteControl**	
Nucleus Number	1005	
Description	Check the interface between the remote control and the DCB by checking the key-code displayed At least one key must be tested. The test can be exited by pressing the STOP-, REC-, or PLAY-key on the local keyboard. The user should press PLAY to indicate a successful test. The REC-key is pressed if the test failed, and STOP can be pressed to abort the test.	
Technical	- Initialise the display - Display the key pressed by the user on the display - Monitor the service port for an abort and get the next key pressed - Update the display and repeat previous steps until user stops / confirms	
Execution Time	Until user confirmation.	
User Input	None	
Error	Number	Description
	100500	Remote Control test succeeded
	100501	DCB Remote control; test failed
	100502	DCB Remote control; test aborted
	100503	The analogue board could not access the DCB.
	100504	DCB Remote control; no user input received

Example	`DS:> 1005`
	`100500:`
	`Test OK @`	

Nucleus Name	**DS_DCB_Led**	
Nucleus Number	1006	
Description	Switch the record LED on, and after confirmation off. The user confirms by pressing the REC key, STOP key, or the PLAY key on the local keyboard. The PLAY key confirms that the LED is on and the REC key indicates an error. The STOP key signals the abortion of the test by the user. The keyboard can also be used for the same purpose. The O or o key confirms that the test pattern is OK and the N or n key indicates an error or that the user wants to go to the next test. The rest of the keys of the keyboard are used to exit this nucleus at any time. After that the nucleus switches the LED off.	
Technical	- Issue the command to light the ***record*** LED via the analogue board and wait for confirmation by the user	
Execution Time	Until user confirmation.	
User Input	None	
Error	Number	Description
	100600	Switching Led on succeeded
	100601	The analogue board could not access the DCB.
	100602	There was no response from the analogue board.
	100603	The DCB did not light the record LED.
	100604	The user skipped the rest of the DCB_Led test.
	100605	The user returned an unknown confirmation:
	100606	The returned error code from the analogue board is unknown

Example	`DS:> 1006`
	`100600:`
	`Test OK @`	

3.11 ANALOGUE BOARD (ANAB)

Nucleus Name	**DS_ANAB_CommunicationEcho**	
Nucleus Number	1100	
Description	Check the communication between the digital board and the analogue board by issuing some ***echo*** string.	
Technical	Send command P_DS_ANACOM_ECHO with the parameter string “Hello Analogue board” to the analogue board and read back the result	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	110000	Communicating with the analogue board succeeded
	110001	The test returned the wrong string
	110002	Communicating with the analogue board failed
	110103	The analogue board returned an unexpected result

Example	`DS:> 1100`
	`110000:`
	`Test OK @`	

Nucleus Name	**DS_ANAB_CommunicationlicNvram**	
Nucleus Number	1101	
Description	Check the communication between the digital board and the NVRAM on the analogue board.	
Technical	Send command P_DS_ANACOM_NVRAM with no parameters to the analogue board and read back the result	
Execution Time	Less than 3 seconds	
User Input	None	
Error	Number	Description
	110100	Communicating with the NVRAM on the analogue board succeeded
	110101	The analogue board could not communicate with the NVRAM
	110102	Communicating with the analogue board failed
	110103	The analogue board returned an unexpected result

Example	`DS:> 1101`
	`110100:`
	`Test OK @`	

Nucleus Name	**DS_ANAB_CommunicationlicTuner**	
Nucleus Number	1102	
Description	Check the communication between the digital board and the tuner on the analogue board	
Technical	Send command P_DS_ANACOM_TUNER with no parameters to the analogue board and read back the result	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	110200	Communicating with the tuner on the analogue board succeeded
	110201	The analogue board could not communicate with the tuner
	110202	There was an error communicating with the analogue board
	110203	The analogue board returned an unexpected result

Example	`DS:> 1102`
	`110200:`
	`Test OK @`	

Nucleus Name	**DS_ANAB_CommunicationIicDataSlicer**	
Nucleus Number	1103	
Description	Check the communication between the digital board and the data slicer on the analogue board	
Technical	Send command P_DS_ANACOM_DATA_SLICER with no parameters to the analogue board and read back the result	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	110300	Communicating with the data slicer on the analogue board succeeded
	110301	The analogue board could not communicate with the data slicer
	110302	There was an error communicating with the analogue board
	110303	The analogue board returned an unexpected result

Example	`DS:> 1103`
	`110300:`
	`Test OK @`	

Nucleus Name	**DS_ANAB_CommunicationIicSoundProcessor**	
Nucleus Number	1104	
Description	Check the communication between the digital board and the sound processor on the analogue board	
Technical	Send command P_DS_ANACOM_SOUND_PROCESSOR with no parameters to the analogue board and read back the result	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	110400	Communicating with the sound processor on the analogue board succeeded
	110401	The analogue board could not communicate with the sound processor
	110402	There was an error communicating with the analogue board
	110403	The analogue board returned an unexpected result

Example	`DS:> 1104`
	`110400:`
	`Test OK @`	

Nucleus Name	**DS_ANAB_CommunicationIicAVSelector**	
Nucleus Number	1105	
Description	Check the communication between the digital board and the A/V-selector on the analogue board	
Technical	Send command P_DS_ANACOM_AV_SELECTOR with no parameters to the analogue board and read back the result	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	110500	Communicating with the A/V selector on the analogue board succeeded
	110501	The analogue board could not communicate with the A/V selector
	110502	There was an error communicating with the analogue board
	110503	The analogue board returned an unexpected result

Example	`DS:> 1105`
	`110500:`
	`Test OK @`	

Nucleus Name	**DS_ANAB_HardwareVersionGet**	
Nucleus Number	1106	
Description	Get the hardware version of the analogue board	
Technical	Send command P_DS_ANACOM_HARDWARE_VERSION with no parameters to the analogue board and read back the result	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	110600	Reading the hardware version succeeded
	110601	The segment containing the hardware version could not be found
	110602	There was an error communicating with the analogue board
	110603	The analogue board returned an unexpected result

Example	`DS:> 1106`
	`110600: Analogue hardware version : 11`
	`Test OK @`	

Nucleus Name	**DS_ANAB_SoftwareVersionBootGet**	
Nucleus Number	1107	
Description	Get the software version of the boot software of the analogue board	
Technical	Send command P_DS_ANACOM_SOFTWARE_VERSION with no parameters to the analogue board and read back the result	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	110700	Reading the boot-software version succeeded
	110701	The segment containing the boot-software version could not be found
	110702	There was an error communicating with the analogue board
	110703	The analogue board returned an unexpected result

Example	`DS:> 1107`
	`110700: Bootcode application version : 11.00.11`
	`Test OK @`	

Nucleus Name	**DS_ANAB_SoftwareVersionDownloadGet**	
Nucleus Number	1108	
Description	Get the software version of the download software of the analogue board	
Technical	Send command P_DS_ANACOM_SW_VERSION_DOWN with no parameters to the analogue board and read back the result	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	110800	Reading the download-software version succeeded
	110801	The segment containing the download-software version could not be found
	110802	There was an error communicating with the analogue board
	110803	The analogue board returned an unexpected result

Example	`DS:> 1108`
	`110800: Download application version : 11.00.06`
	`Test OK @`	

Nucleus Name	**DS_ANAB_SoftwareVersionApplGet**	
Nucleus Number	1109	
Description	Get the software version of the application software of the analogue board	
Technical	Send command P_DS_ANACOM_SW_VERSION_APPL with no parameters to the analogue board and read back the result	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	110900	Reading the application-software version succeeded
	110901	The segment containing the application-software version could not be found
	110902	There was an error communicating with the analogue board
	110903	The analogue board returned an unexpected result

Example	`DS:> 1109`
	`110900: Recorder application version : 11.00.23`
	`Test OK @`	

Nucleus Name	**DS_ANAB_SoftwareVersionDiagnosticsGet**	
Nucleus Number	1110	
Description	Get the software version of the diagnostic software of the analogue board	
Technical	Send command P_DS_ANACOM_SW_VERSION_DIAG with no parameters to the analogue board and read back the result	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	111000	Reading the diagnostics-software version succeeded
	111001	The segment containing the diagnostics-software version could not be found
	111002	There was an error communicating with the analogue board
	111003	The analogue board returned an unexpected result

Example	`DS:> 1110`
	`111000: Diagnostics application version : 11.00.13`
	`Test OK @`	

Nucleus Name	**DS_ANAB_ChecksumProgram**	
Nucleus Number	1111	
Description	Check the checksum of the several partitions by recalculating and comparing partition checksums	
Technical	Send command P_DS_ANACOM_FLASH_CHECKSUM with no parameters to the analogue board and read back the result	
Execution Time	Less than 5 seconds	
User Input	None	
Error	Number	Description
	111100	Checksum calculation succeeded
	111101	The FLASH was not accessible
	111102	The checksum stored in FLASH is not correct
	111103	There was an error communicating with the analogue board
	111104	The analogue board returned an unexpected result

Example	`DS:> 1111`
	`111100:`
	`BootCode checksum is: 0xBABE6240, which is correct`
	`Diagnostics checksum is: 0xBABEBEAD, which is correct`
	`Download checksum is: 0xBABEA6B7, which is correct`
	`Application checksum is: 0xBABEB277, which is correct`
	`Test OK @`	

Nucleus Name	**DS_ANAB_VideoRouting**	
Nucleus Number	1112	
Description	Perform the routing of the video paths on the analogue board	
Technical	Send command P_DS_ANACOM_ROUTE_VIDEO with parameters to the analogue board and read back the result	
Execution Time	Less than 1 second	
User Input	The user has to input the parameter for the routing (see Table 1 and Table 2 below)	
Error	Number	Description
	111200	Routing the video on the analogue board succeeded
	111201	Routing the video on the analogue board failed
	111202	The user provided wrong input
	111203	There was an error communicating with the analogue board
	111204	The analogue board returned an unexpected result

Example	`DS:> 1112 00`
	`111200:`
	`Test OK @`	

Table 1: The paths that are available for video routing and their description (Europe region)

Path ID	Description
00	Input signal is VIDEO(CVBS) from digital board and will be re-routed back to the digital board.
01	Input signal is from FRONT VIDEO(CVBS) IN and will be routed to the digital board.
02	No routing.
03	Input signal is from FRONT S-VIDEO(Y/C) and will be routed to the digital board.
04	No routing.
05	Input signal is CVBS from SCART1 and will be routed to the digital board.
06	Input signal is CVBS from SCART2 and will be routed to the digital board.
07	Input Signal is CVBS from Digital Board and it will be routed to Scart1 and Scart2.
08	Input signal is VIDEO(CVBS) from ANTENNA IN and will be routed to SCART2.
09	Input signal is VIDEO(CVBS) from SCART1 and will be routed to SCART2.
10	Input signal is VIDEO(CVBS) from SCART2 and will be routed to SCART1.
11	Signal path is routed Fast Blank from Scart2 pin16 and will be routed Scart1 pin16
12	Input Signal is YC from Digital Board and it will be routed to Scart1.
13	No routing.
14	No routing.
15	Input Signal is CVBS from TUNER and it will be routed to Digital .
16	No routing.
17	Input Signal is routed from digital board YC to REAR S-VIDEO(YC) OUT
18	Signal path is routed from digital board RGB to RGB SCART1 and from digital board CVBS to digital board CVBS.
19	No routing.
20	Input RGB Signal is routed from Digital Board to SCART1(RGB),Input CVBS Signal from Digital Board to Digital Board and Fast Blanking Signal from Scart 2 to Scart1.
21	Input Y/C Signal from Digital Board is routed to Rear Y/C Connector and Input Y/c Signal from Front Y/C connector is routed to Digital Board.

Table 2: The paths that are available for video routing and their description (Nafta region)

Path ID	Description
00	Input signal is VIDEO(CVBS) from digital board and will be re-routed back to the digital board.A Cinch Cable needs to be connected from Rear Cinch Out to Front Cinch In for this Test.(Direct routing on analogue board from YUV In to YUV Out is not Possible)
01	Input signal is from FRONT VIDEO(CVBS) IN and will be routed to the digital board.This routing is same as the above path id.
02	Input signal is from REAR VIDEO(CVBS) IN and will be routed to the digital board.
03	Input signal is from FRONT S-VIDEO(Y/C) IN and the signal received will be routed to the digital board.
04	Input signal is from REAR S-VIDEO(Y/C) IN and will be routed to the digital board.
05	No Routing.
06	No routing.
07	No routing.
08	Input signal is VIDEO(CVBS) from TUNER and will be routed to Y Pin of Rear Y/C Connector.This will give only black/White Picture .
09	Input signal is from YUV IN and will be routed to YUV OUT.This is possible only if Digital Board routes back YUV signal received back to the Analogue board(DENC)
10	No routing.
11	No routing.
12	No Routing.
13	No Routing.
14	No Routing.
15	Input CVBS Signal from Tuner is routed to Digital Board..
16	No Routing.
17	Input RGB Signal is routed from Digital Board to RGB Rear Out and Input CVBS Signal is routed from Rear Cinch In 1 to Digital Board (This second step is for routing Input CVBS Signal from Digital Board to Digital Board again – A Cinch cable needs to be connected from Rear Cinch Out1 to Rear Cinch In 1)
18	Input Signal from CVBS Rear In is routed to Digital Board. This is the same as path id 02.
19	Input Y/C signal from Digital Board is routed to Y/C Rear Out Connector and Input signal from Y/C Front In Connector is routed to Y/C Digital Board.
20	Y/C signal from Digital Board is routed to Y/C Rear Out Connector and Input signal from Y/C Rear In Connector is routed to Y/C Digital Board.
23	The Video signal received from the Digital board will be output on Modulator channel 3.
24	The Video signal received from the Digital board will be output on Modulator channel 4.

Nucleus Name	**DS_ANAB_AudioRouting**	
Nucleus Number	1113	
Description	Perform the routing of the audio paths on the analogue board	
Technical	Send command P_DS_ANACOM_ROUTE_AUDIO with parameters to the analogue board and read back the result	
Execution Time	Less than 1 second	
User Input	The user has to input the parameter for the routing (see Table 3 and Table 4 below)	
Error	Number	Description
	111300	Routing the audio on the analogue board succeeded
	111301	Routing the audio on the analogue board failed
	111302	The user provided wrong input
	111303	There was an error communicating with the analogue board
	111304	The analogue board returned an unexpected result

Example	`DS:> 1113 00`
	`111300:`
	`Test OK @`	

Table 3: The paths that are available for audio routing and their description (Europe region)

Path ID	Description
00	Input signal is from FRONT AUDIO IN and will be routed to the digital board.
01	Input signal is from FRONT AUDIO IN and will be routed to the digital board.
02	No routing.
03	Input signal is AUDIO from SCART1 and will be routed to the digital board.
04	Input signal is AUDIO from SCART2 and will be routed to the digital board.
05	No routing.
06	No routing.
07	Input Audio signal is from the digital Board and it will be routed to the Scart 1 and Scart2
08	Input AUDIO signal from TUNER and will be routed to SCART2.
09	Input signal is AUDIO from SCART1 and will be routed to SCART2.
10	Input audio signal from Scart2 is routed to Scart1.
11	Input Audio signal is routed from DVIO to Scart2.
12	No routing.
13	No routing.
14	Input is Audio Signal from DVIO and it will be routed to Digital Board.
15	Input is Audio Signal from TUNER and it will be routed to Digital Board..
16	No routing.
17	No routing.
18	Input signal is from FRONT AUDIO IN and will be routed to SCART2.
21	Input signal is from FRONT AUDIO IN and will be routed to the digital board.

Table 4: The paths that are available for audio routing and their description (Nafta region)

Path ID	Description
00	No routing.
01	Input signal is from FRONT AUDIO IN and will be routed to the digital board.
02	Input signal is from REAR AUDIO IN 2 and will be routed to the digital board.
03	Input Audio Signal is routed from FRONT Cinch In to Digital Board.(This is same as path id 01)
04	Input Signal is from Rear Cinch In1 and it will be routed to Digital Board..
05	No routing.
06	No routing.
07	No routing.
08	No routing.
09	No routing.
10	No routing.
11	No routing.
12	No routing.
13	Input Signal is from Digital Board and it will be routed to the digital board.
14	No routing.
15	Input is Audio Signal from TUNER and it will be routed to Digital Board.
16	Input signal is AUDIO from DVIO board and will be routed to Digital Board.
17	No routing.
18	No routing.
19	No routing.
20	Input signal is from REAR AUDIO IN 2 and will be routed to the digital board.
21	Input signal is from REAR AUDIO IN 1 and will be routed to the digital board.
22	Input signal is from REAR AUDIO IN 1 and will be routed to the digital board.
23	The Audio signal received from the Digital board will be output on Modulator channel 3.
24	The Audio signal received from the Digital board will be output on Modulator channel 4.

Nucleus Name	**DS_ANAB_SelectTunerChannel**	
Nucleus Number	1114	
Description	Set the tuner to receive a valid audio and video signal	
Technical	Send command P_DS_ANACOM_TUNER_FREQ_SELECT with parameters to the analogue board and read back the result	
Execution Time	Less than 1 second	
User Input	<Frequency*16> <video standard id> Tuner frequency: to tune the tuner to e.g. 216 MHz, this parameter must be 3456. (Since 216*16 = 3456. This is to avoid the decimal points to the parameter list.) Video standard id:	
Error	Number	Description
	111400	Setting the tuner channel succeeded
	111401	Setting the tuner channel failed
	111402	The user provided wrong input
	111403	There was an error communicating with the analogue board
	111404	The analogue board returned an unexpected result

Example	`DS:> 1114 3456 16`
	`111400:`
	`Test OK @`	

Video standard id	**Europe**	**Nafta**
16	PAL_BG	NTSC
32	PAL_I	Invalid
48	PAL_DK	Invalid
64	SEC_L	Invalid
80	SEC_LS	Invalid
96	SEC_BG	Invalid
112	SEC_DK	Invalid

Nucleus Name	**DS_ANAB_IICWriteRead**	
Nucleus Number	1115	
Description	Perform an IIC write and read action on the analogue board	
Technical	Send command P_DS_ANACOM_I2C_WRR with parameters to the analogue board and read back the result	
Execution Time	Less than 1 second	
User Input	Writing: [<W>|<w>] [I2C address] [number of data bytes to write] with <data[0]...data[n]> Max 16 data bytes (n < 16). Reading: [<R>|<r>] [I2C address] [number of data bytes to read] Max 16 data bytes (n < 16).	
Error	Number	Description
	111500	Reading and writing IIC on the analogue board succeeded
	111501	The user provided wrong input
	111502	Reading and writing IIC on the analogue board failed
	111503	There was an error communicating with the analogue board
	111504	The analogue board returned an unexpected result

Example	`DS:> 1115 w 0x94 2 0x06 0x02`
	`111500:`
	`Test OK @`	

Nucleus Name	**DS_ANAB_ClockAdjust**	
Nucleus Number	1116	
Description	Set the clock to the value passed through in the YYYY MM DD HH MM SS format	
Technical	Send command P_DS_ANACOM_CLOCK_ADJUST with parameters to the analogue board and read back the result	
Execution Time	Less than 1 second	
User Input	<YYYY> <MM> <DD> <HH> <MM> <SS>	
Error	Number	Description
	111600	Adjusting the clock succeeded
	111601	Adjusting the clock failed
	111602	The user provided wrong input
	111603	There was an error communicating with the analogue board
	111604	The analogue board returned an unexpected result

Example	`DS:> 1116 2002 11 11 11 11 11`
	`111600:`
	`Test OK @`	

Nucleus Name	**DS_ANAB_ClockReference**	
Nucleus Number	1117	
Description	Generate a 1 kHz signal on pin 7 (INT) of the clock IC	
Technical	Send command P_DS_ANACOM_CLOCK_REFERENCE with no parameters to the analogue board and read back the result	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	111700	Generating the signal on the designated pin succeeded
	111701	Generating the signal on the designated pin failed
	111702	There was an error communicating with the analogue board
	111703	The analogue board returned an unexpected result

Example	`DS:> 1117`
	`111700:`
	`Test OK @`	

Nucleus Name	**DS_ANAB_ClockCorrection**	
Nucleus Number	1118	
Description	Store the clock IC correction value in NVRAM	
Technical	Send command P_DS_ANACOM_CLOCK_CORRECTION with parameters to the analogue board and read back the result	
Execution Time	Less than 1 second	
User Input	The correction value for the clock	
Error	Number	Description
	111800	Storing the correction value for the clock in NVRAM succeeded
	111801	Storing the correction value for the clock in NVRAM failed
	111802	Value out of range: default value stored
	111803	The user provided wrong input
	111804	There was an error communicating with the analogue board
	111805	The analogue board returned an unexpected result

Example	`DS:> 1118 1000023`
	`111800:`
	`Test OK @`	

Nucleus Name	**DS_ANAB_TunerAFCReferenceVoltage**	
Nucleus Number	1119	
Description	Store the reference voltage for the tuner in NVRAM	
Technical	Send command P_DS_ANACOM_AFC_REFERENCE_TUNER with no parameters to the analogue board and read back the result	
Execution Time	Less than 1 second	
User Input	The reference voltage, between 0 and 255	
Error	Number	Description
	111900	Storing the reference voltage for the tuner in NVRAM succeeded
	111901	Storing the reference voltage for the tuner in NVRAM failed
	111902	The user provided wrong input
	111903	There was an error communicating with the analogue board
	111904	The analogue board returned an unexpected result

Example	`DS:> 1119 5`
	`111900:`
	`Test OK @`	

Nucleus Name	**DS_ANAB_TunerFrequencyDownload**	
Nucleus Number	1120	
Description	Store the frequency table in NVRAM. The frequency table is passed through the error-string provided to the nucleus.	
Technical	Send command P_DS_ANACOM_FREQ_DOWNLOAD with parameters to the analogue board and read back the result	
Execution Time	Less than 3 seconds	
User Input	The user input should conform to: **“X(XXX)_VVWW_ZZ_HH_IIJJKKLLMM”.** Where ‘X(XXX)’ is a decimal value in the range of 0 to 255. V, W, Z, H, I, J, K, L, M are hex values with out the prefix ‘0x’ (in the range 0... 9,A ... F) “ _” Denotes a space character. See Table 5 below.	
Error	Number	Description
	112000	Downloading the frequency table in NVRAM succeeded
	112001	Downloading the frequency table in NVRAM failed
	112002	The user provided wrong input
	112003	There was an error communicating with the analogue board
	112004	The analogue board returned an unexpected result

Example	`DS:> 1120 1 2233 00 02 4E45442031`
	`112000:`
	`Test OK @`	

Table 5: Format of user input in case of a frequency download

Format	description	remarks
X(XXX)	Preset number	
VVWW	VV: Channel number WW : Channel offset	
ZZ	Byte containing 8 bit fields for TRUE/FALSE : BIT 0: Decoder BIT 1: Modulation BIT 2 : NICAM SAP BIT 3: Satpreset BIT 4: Presetdefined Channelpreferred BIT 5: ExtPreset BIT 6: NameManuallyChanged BIT 7: ChannelPreset	 Nicam/stereo bit for Europe SAP/stereo bit for Nafta Preset defined bit is only used for Europe. For Nafta, it is renamed as channelpreferred to indicate if a channel is preferred or not. TRUE if preset is defined from P50 as extern [TGA]
HH	HfSystemFineTuning	HfS: 4 bit, FT: -4,...,4
IIJJKKLLMM	Netname	Range: A,..,Z,0,..,9,_,.. Netname length exists for Europe only 'II' is the HEX-value for the first character, 'JJ' for the second, …

Remarks:
CHANNEL_SYSTEM is for Nafta
PRESET_SYSTEM is for Europe

Nucleus Name	**DS_ANAB_StoreExternalPresets**	
Nucleus Number	1121	
Description	Store the external presets in NVRAM	
Technical	Send command P_DS_ANACOM_STORE_EXT_PRESETS with no parameters to the analogue board and read back the result	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	112100	Storing the external presets in NVRAM succeeded
	112101	Storing the external presets in NVRAM failed
	112102	There was an error communicating with the analogue board
	112103	The analogue board returned an unexpected result

Example	`DS:> 1121`
	`112100:`
	`Test OK @`	

Nucleus Name	**DS_ANAB_BargraphLevelAdjust**	
Nucleus Number	1122	
Description	Measure the audio signal corresponding to 0dB per channel and store it as correction value in NVRAM	
Technical	Send command P_DS_ANACOM_BARGRAPH_LEVEL_ADJUSTMENT with no parameters to the analogue board and read back the result	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	112200	Storing the bargraph adjustment values in NVRAM succeeded
	112201	Storing the bargraph adjustment values in NVRAM failed
	112202	There was an error communicating with the analogue board
	112203	The analogue board returned an unexpected result

Example	`DS:> 1122`
	`112200:`
	`Test OK @`	

3.12 SYSTEM (SYS)

Nucleus Name	**DS_SYS_HardwareVersionGet**	
Nucleus Number	1200	
Description	Get the hardware version and type of the digital board	
Technical	- Initialise the PIO pins of the Codec - Read the segment header in FLASH and determine hardware version	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	120000	Getting the hardware version and type of the digital board succeeded
	120001	Getting the hardware version and type of the digital board failed
	120002	Wrong hardware version read from FLASH

Example	`DS:> 1200`
	`120000: Hardware ID = 0x29`
	`Test OK @`	

Nucleus Name	**DS_SYS_SoftwareVersionBootGet**	
Nucleus Number	1201	
Description	Get the version of the boot software on the digital board	
Technical	- Read the segment header in FLASH and determine Boot software version	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	120100	Getting the Boot software version succeeded
	120101	Getting the Boot software version failed

Example	`DS:> 1201`
	`120100: Software Boot Version = 0331`
	`Test OK @`	

Nucleus Name	**DS_SYS_SoftwareVersionDownloadGet**	
Nucleus Number	1202	
Description	Get the version of the download software on the digital board	
Technical	- Read the segment header in FLASH and determine Download software version	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	120200	Getting the Download software version succeeded
	120201	Getting the Download software version failed

Example	`DS:> 1202`
	`120200: Software Download Version = 0001`
	`Test OK @`	

Nucleus Name	**DS_SYS_SoftwareVersionApplGet**	
Nucleus Number	1203	
Description	Get the version of the application software on the digital board	
Technical	- Read the segment header in FLASH and determine Application software version	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	120300	Getting the Application software version succeeded
	120301	Getting the Application software version failed

Example	`DS:> 1203`
	`120300: Software Application Version = 0001`
	`Test OK @`	

Nucleus Name	**DS_SYS_SoftwareVersionDiagnosticsGet**	
Nucleus Number	1204	
Description	Get the version of the diagnostics software on the digital board	
Technical	- Read the segment header in FLASH and determine Diagnostics software version	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	120400	Getting the Diagnostics software version succeeded
	120401	Getting the Diagnostics software version failed

Example	`DS:> 1204`
	`120400: Software Diagnostics Version = 0001`
	`Test OK @`	

Nucleus Name	**DS_SYS_EepromUpload**	
Nucleus Number	1205	
Description	Upload the contents of the NVRAM on the analogue board or the digital board to the service PC, by using the X-modem protocol	
Technical	- Decode the user input - Determine whether to upload the analogue board or digital board NVRAM - Start uploading using the XMODEM protocol - Determine whether all was uploaded OK	
Execution Time	This depends on the chosen NVRAM and the User.	
User Input	Choose one of the following parameters for the nucleus: 1. Upload the contents of the NVRAM of the digital board 2. Upload the contents of the NVRAM of the analogue board Choose in the terminal on the control PC **-> transfer -> receive file**. Select **X-modem** protocol. Then click **receive** in the dialogue and fill in the file name in which you want to store the data. **Note**: If no analogue board NVRAM is in the product no user input is needed.	
Error	Number	Description
	120500	Download succeeded.
	120501	User input is not valid.
	120502	Something went wrong while copying the data from NVRAM to SDRAM .
	120503	Something went wrong while transferring the data.
	120504	User cancelled the upload.

Example	`DS:> 1205 1`
	`120500:`
	`Test OK @`	

Nucleus Name	**DS_SYS_EepromDownload**	
Nucleus Number	1206	
Description	Download a file with the contents of the NVRAM for the analogue board or the digital board from the service PC to the recorder, by using the X-modem protocol	
Technical	- Decode the user input and determine what EEPROM to fill: digital / analogue - Store the downloaded (using XMODEM) bytes in SDRAM first - Then copy these contents into the EEPROM after verification	
Execution Time	This depends on the chosen NVRAM and the User.	
User Input	Choose one of the following parameters for the nucleus: 1. Download the contents of the NVRAM of the digital board 2. Download the contents of the NVRAM of the analogue board Choose in the terminal of the control **PC -> transfer -> send file**. Select **X-modem** protocol. Then choose a file with the Browse button in the dialogue and click on **send**. **Note**: If no analogue board NVRAM is in the product no user input is needed.	
Error	Number	Description
	120600	Download succeeded
	120601	The write to NVRAM failed.
	120602	Timeout. Too many retries.
	120603	A file was sent with a wrong header.
	120604	User cancelled the download.
	120605	User input is not valid.
	120606	Unknown Error

Example	`DS:> 1206 1`
	`120600:`
	`Test OK @`	

Nucleus Name	**DS_SYS_DvIdNumberSet**	
Nucleus Number	1207	
Description	Set the IEEE 1394 unique ID	
Technical	- Decode the user input - Store the id (<b4><b3><b2><b1><b0>) into NVRAM (offset + <b4><b3><b2><b1><b0>) - Validate the segment of storage by updating the checksum	
Execution Time	Less than 1 second.	
User Input	The unique ID to be set.	
Error	Number	Description
	120700	Setting the unique DV ID succeeded
	120701	User input is not valid.
	120702	Setting the unique DV ID failed.
	120703	Write succeeded, but checksum is corrupt.

Example	`DS:> 1207 1234567890`
	`120700:`
	`Test OK @`	

Nucleus Name	**DS_SYS_DvIdNumberGet**	
Nucleus Number	1208	
Description	Get the IEEE1394 unique ID	
Technical	- Read out the ID from the configuration segment and return this info to the user	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	120800	Getting the unique DV ID succeeded
	120801	Getting the unique DV ID failed
	120802	Reading an unexpected section version in NVRAM

Example	`DS:> 1208`
	`120800: The DvIdNumber is: 1234567890`
	`Test OK @`	

Nucleus Name	**DS_SYS_IicWrite**	
Nucleus Number	1209	
Description	Perform an IIC write action on the digital board	
Technical	- Determine bus ID, slave address, number of bytes to be written and the byte array of data from the user input - Initialise IIC - Write the data to the slave specified through IIC	
Execution Time	Less than 1 second	
User Input	The user input the number of bytes to write followed by the bytes to write: <BusID><Slave address to write to><number of bytes to write><d1><d2><..><dx> Where the bus id is either 0 (normally used) or 1	
Error	Number	Description
	120900	Writing the data over IIC succeeded
	120901	The IIC bus was not accessible
	120902	There was a timeout writing to the device
	120903	The IIC acknowledge was not received
	120904	The communication with the device failed
	120905	Got unknown IIC bus error:
	120906	Unable to initialise IIC bus
	120907	Decoding bus ID unsigned value failed
	120908	Decoding slaveAddr unsigned value failed
	120909	Decoding nrBytes unsigned value failed
	120910	Bus ID out of range
	120911	nrBytes out of range
	120912	Unable to decode parameters

Example	`DS:> 1209 0 0xa0 1 0x6`
	`120900: 1 Bytes written`
	`Test OK @`	

Nucleus Name	**DS_SYS_IicRead**	
Nucleus Number	1210	
Description	Perform an IIC read action on the digital board	
Technical	- Determine the bus ID, slave address and number of bytes to read from the user input - Initialise IIC - Read the data form the slave specified	
Execution Time	Less than 1 second	
User Input	The user inputs the bus number, the address to read them from and the number of bytes to read: <BusID><Slave address to read from><Number of bytes to read> Where the bus id is either 0 (normally used) or 1	
Error	Number	Description
	121000	Reading the data over IIC succeeded
	121001	The IIC bus was not accessible
	121002	There was a timeout writing to the device
	121003	The IIC acknowledge was not received
	121004	The communication with the device failed
	121005	There was an unknown IIC bus error
	121006	IIC bus initialisation failed
	121007	Decoding bus ID unsigned value failed
	121008	Decoding slave address unsigned value failed
	121009	Decoding number of bytes unsigned value failed
	121010	Bus ID out of range
	121011	nrBytes out of range

Example	`DS:> 1210 0 0xa0 0x20`
	`Read :`
	`0x0000: 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00`
	`0x0008: 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00`
	`0x0010: 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00`
	`0x0018: 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00`
	
	`121000: 0 0xa0 0x20`
	`Test OK @`	

Nucleus Name	**DS_SYS_UartWrite**	
Nucleus Number	1211	
Description	Perform an UART write action on the digital board on a specified UART	
Technical	- Decode the user input for the proper port to use - Write out the bytes through the indicated port	
Execution Time	Less than 1 second.	
User Input	The user inputs the UART to write to, the number of bytes and the bytes to be written to the UART. 1=UART port 1 : not used 2=UART port 2 : Bit Engine 3=UART port 3 : Analogue board <UartNr><Number of bytes to write><d1><d2><..><dx>	
Error	Number	Description
	121100	Writing the bytes to the UART succeeded
	121101	The user provided wrong input
	121102	Writing to the UART failed

Example	`DS:> 1211 2 2 0xd1 0x01`
	`121100:`
	`Test OK @`	

Nucleus Name	**DS_SYS_UartRead**	
Nucleus Number	1212	
Description	Perform an UART read action on the digital board on a specified UART	
Technical	- Decode the user input for the port to read from - Read from the port and return data read to the user	
Execution Time	Less than 1 second.	
User Input	The user inputs the UART to read from. 1=UART port 1 : not used 2=UART port 2 : Bit Engine 3=UART port 3 : Analogue board <UartNr >	
Error	Number	Description
	121200	Reading the data from the UART succeeded
	121201	The user provided wrong input
	121202	Reading the data from the UART failed

Example	`DS:> 1212 2`
	`121200: The HEX value that was read is:  0x50 0xD1 0x00`
	`Test OK @`	

Nucleus Name	**DS_SYS_VideoLoopThroughStart**
Nucleus Number	1213
Description	The video signal, which is conform the user input, is routed from the input to the output. The input is set using the proper nucleus to route the signal on the board(s). All outputs are enabled.
Technical	- Decode the videosignal: PAL / NTSC and Y/C, RGB, CVBS,YUV - Initialise the Video Input Processor and check for valid signal - Initialise the Video Front End and start capturing frames to memory - Initialise the SYNC module - Initialise the Video Post Processing and retrieve frames from memory - Initialise the mixer - Initialise the DENC module - Route the signal to all outputs
Execution Time	Less than 1 second, but stays running.
Note:	When a DTT module is in the set use **DS_DTTM_SwitchCVBSPath** as well !

<table>
<tr><td>User Input</td><td colspan="2"><vipInput> <VideoOutput> <VideoStandard>
1. vipInput (see table below).

GEN, OLAX, DXC, DTT specific
<table><tr><th>User input</th><th>Video input</th><th>Data path to VIP</th></tr><tr><td>CVBS</td><td>RGB</td><td>CVBS from analogue board</td></tr><tr><td>YC</td><td>YC</td><td>YC from analogue board</td></tr><tr><td>YUV</td><td>CVBS</td><td>YUV from analogue board</td></tr><tr><td>RGB</td><td>CVBS</td><td>RGB from analogue board</td></tr><tr><td>10</td><td>XPORT</td><td>Digital video from DTT module</td></tr></table>
OLAL22LITE specific
<table><tr><th>User input</th><th>Video input</th><th>Data path to VIP</th></tr><tr><td>R_CVBS</td><td>CVBS</td><td>Rear CVBS</td></tr><tr><td>F_CVBS</td><td>CVBS</td><td>Front CVBS</td></tr><tr><td>T_CVBS</td><td>CVBS</td><td>Tuner CVBS</td></tr><tr><td>R_YC</td><td>YC</td><td>Rear YC</td></tr><tr><td>F_YC</td><td>YC</td><td>Front YC</td></tr></table>
OLAL22PREMIER specific
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OLAL22MKII (mark II) specific
<table><tr><th>User input</th><th>Video input</th><th>Data path to VIP</th></tr><tr><td>F_CVBS</td><td>CVBS</td><td>Front CVBS</td></tr><tr><td>T_CVBS</td><td>CVBS</td><td>Tuner CVBS</td></tr><tr><td>E1_CVBS</td><td>CVBS</td><td>SCART 1 CVBS in</td></tr><tr><td>E2_CVBS</td><td>CVBS</td><td>SCART 2 CVBS in</td></tr><tr><td>F_YC</td><td>YC</td><td>Front YC</td></tr></table>
OLAL22VCRCOMBI specific:
Same as Premier, exept User input nr 4 is for tuner and VCR module

2. VideoOutput (YUV, RGB).
3. VideoStandard (PAL, NTSC).</td></tr>
<tr><td>Error</td><td>Number</td><td>Description</td></tr>
<tr><td></td><td>121300</td><td>Video LoopthroughStart succeeded</td></tr>
<tr><td></td><td>121301</td><td>User input is not valid.</td></tr>
<tr><td></td><td>121302</td><td>Initialisation of the VIP failed.</td></tr>
<tr><td></td><td>121303</td><td>Unable to stop the loop through before restarting.</td></tr>
<tr><td></td><td>121304</td><td>Video Signal on the input is not a valid signal.</td></tr>
<tr><td></td><td>121305</td><td>Initialisation of the VFE failed.</td></tr>
<tr><td></td><td>121306</td><td>The digital board hardware information is corrupt</td></tr>
<tr><td>Example</td><td colspan="2">DS:> 1213 CVBS RGB PAL
121300:
Test OK @</td></tr>
</table>

Nucleus Name	**DS_SYS_VideoLoopThroughStop**
Nucleus Number	1214
Description	Stop routing the video input to all the outputs.

Technical	- Stop the DENC and the Video Front End	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	121400	VideoLoopthroughStop succeeded
	121401	DENC module on Codec failed.

Example	`DS:> 1214`
	`121400:`
	`Test OK @`	

Nucleus Name	**DS_SYS_VideoLoop**
Nucleus Number	1215
Description	The Codec generates a video signal with a specific signature and sends it to the output of the digital board. The user selects which video input path must be routed on the digital board and a video standard. The Codec encodes the video signal, checks the signature, and returns a conclusion. **Note**: Before executing this nucleus the user must route the video signal on the analog board with the proper nucleus.
Technical	- Evaluate user input. - Reset the global variables, video memory. - Fill the video memory with a vertical colourbar. - Initialise the Codec SYNC-module. - Initialise the Codec MIXER-module. - Initialise the Codec VPP-module. - Initialise the Codec DENC-module. - Display the original image. - Initialise the VIP. - Initialise the Codec VFE-module. - Try to detect a sync in the VIP input. - Catch the received image in memory. - Display the received image. - Compare the received image with original image. - Create a conclusion.
Execution Time	3 seconds.
NOTE!!	MORE INFO ON NEXT PAGES

<table>
<tr><td>User Input</td><td colspan="2"><vipinput> <video standard>
1 Vip input of the digital board:

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2 Video standard:
- PAL
- NTSC

When no input is given, the nucleus will take TEST for video input and PAL for video standard.</td></tr>
<tr><td>Error</td><td>Number</td><td>Description</td></tr>
<tr><td></td><td>121500</td><td>Videoloop test succeeded.</td></tr>
<tr><td></td><td>121501</td><td>Wrong user input.</td></tr>
<tr><td></td><td>121502</td><td>The Codec SYNC-module cannot be initialised.</td></tr>
<tr><td></td><td>121503</td><td>The Codec MIXER-module cannot be initialised.</td></tr>
<tr><td></td><td>121504</td><td>The Codec VideoPostProcessor-module cannot be initialised.</td></tr>
<tr><td></td><td>121505</td><td>The Codec DENC-module cannot be initialised.</td></tr>
<tr><td></td><td>121506</td><td>The VideoInputProcessor cannot be initialised.</td></tr>
<tr><td></td><td>121507</td><td>The VideoInputProcessor cannot detect a sync-signal.</td></tr>
<tr><td></td><td>121508</td><td>The Codec VideoFrontEnd-module cannot be initialised.</td></tr>
<tr><td></td><td>121509</td><td>The Codec VideoFrontEnd-module cannot capture a video field.</td></tr>
</table>

	121510	When selected the RGB video input: Error in colour red signal and/or Error in colour green signal and/or Error in colour blue signal. When selected one of the other video inputs: Error in luminance signal (Y) and/or Error in chrominance signal (U) and/or Error in chrominance signal (V).
	121511	The digital board hardware information is corrupt
Example	DS:> 1215 cvbs ntsc 121500: Test OK @ DS:> 1215 cvbs pal 121508: The VideoInputProcessor cannot detect a sync-signal. Error @ DS:> 1215 yuv ntsc 121511: Error in luminance signal(Y) Error in chrominance signal(U) Error in chrominance signal(V) Error @	

Nucleus Name	**DS_SYS_AudioLoop**	
Nucleus Number	1216	
Description	The user first needs to select how the audio path must be routed on the analogue board and/or digital board before calling this nucleus. The user also has to route the audio outputs back to the inputs by means of cables. In this nucleus the Codec generates an audio sine signal with a specific signature and sends it to the output of the digital board. The Codec encodes the audio signal to MPEG I layer II and after this the signature of the signal will be checked.	
Technical	- The user needs to route the signal to the audio inputs so the test can encode the audio to MPEG I layer II - An audio signal is generated, resulting in a sine of 6kHz on the left and 12kHz on the right channel. - Then the signal is decoded in memory. - When both signals are detected correctly in the MPEG, the test succeeded.	
Execution Time	Approximately 9 seconds	
User Input	InputType: - I2S (default, when no user input is given) - SPDIF: This input needs a second parameter: - OPT (optical, **default**, when no user input is given) - COAX	
Error	Number	Description
	121600	Testing the components on the audio signal path succeeded
	121601	The audio encoder did not initialise.
	121602	No audio could be generated.
	121603	The audio encoder did not encode audio.
	121604	The audio could not be decoded.
	121605	Frequency on left channel out of range.
	121606	Frequency on right channel out of range.
	121607	The frequencies on both channels are out of range.
	121608	Frequency on left channel out of range. Right channel silent.
	121609	Right channel is silent.
	121610	Frequency on right channel out of range. Left channel silent.
	121611	Left channel is silent.
	121612	Both channels are silent.

Example	DS:> 1216 121600: Test OK @ DS:> 1216 spdif coax 121600: Test OK @ DS:> 1216 spdif opt 121600: Test OK @

Nucleus Name	**DS_SYS_SlashVersionSet**	
Nucleus Number	1217	
Description	Set the slash version of the system	
Technical	- Decode the user input for the slash version to set - Issue the command to set the slash version to the analogue board	
Execution Time	Less than 1 second.	
User Input	The slash version	
Error	Number	Description
	121700	Setting the slash version succeeded
	121701	Invalid slash version, no slash version is set.
	121702	Setting the slash version on the Analogue Board fails.
	121703	Invalid input.
	121704	The returned error code from the analogue board is unknown:
	121705	No DS error code known for analogue board error:
	121706	There was no response from the analogue board.
	121707	Retrieving the current version failed
	121708	Unknown recorder layout type
	121709	Validating the section where the version is stored failed
	121710	Getting the configuration section from NVRAM failed
	121711	Initialisation of IIC or reaching NVRAM failed
Example	DS:> 1217 82 121700: Test OK @	

Nucleus Name	**DS_SYS_SlashVersionGet**	
Nucleus Number	1218	
Description	Get the slash version of the system	
Technical	- Issue the command to get the slash version to the analogue board - Return the received information to the user	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	121800	Getting the slash version succeeded
	121801	Getting the slash version failed
	121802	The IIC write failed
	121803	The IIC read failed
	121804	There was no response from the analogue board.
	121805	No DS error code known for analogue board error:
	121806	Reading the slash version failed
	121807	Initialisation of IIC or reaching NVRAM failed
	121808	Reading an unexpected section version in NVRAM
Example	DS:> 1218 121800: The slash version is: 82 Test OK @	

Nucleus Name	**DS_SYS_Virginize**
Nucleus Number	1219
Description	(Re-) Virginize the recorder. User data in the NVRAM of the analogue board is cleared
Technical	- Issue the command to return to the factory defaults to the analogue board
Execution Time	1 second.
User Input	None

Error	Number	Description
	121900	Virginization succeeded
	121901	Virginization on the Analogue Board failed.
	121902	The returned error code from the analogue board is unknown:
	121903	No DS error code known for analogue board error:
	121904	There was no response from the analogue board.

Example	`DS:> 1219`
	`121900:`
	`Test OK @`	

Nucleus Name	**DS_SYS_VirginModeOn**	
Nucleus Number	1220	
Description	Turn on the virgin mode functionality (e.g. the auto channel search upon start-up)	
Technical	- Issue the command to set the bit for the virgin mode to the analogue board	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	122000	Turning on the virgin mode succeeded
	122001	Turning on VirginMode on the Analogue Board failed.
	122002	The returned error code from the analogue board is unknown:
	122003	No DS error code known for analogue board error:
	122004	There was no response from the analogue board.
	122005	Section validation or write failed in NVRAM
	122006	Reading the CONFIG section from NVRAM failed
	122007	Initialisation of IIC or reaching NVRAM failed

Example	`DS:> 1220`
	`122000:`
	`Test OK @`	

Nucleus Name	**DS_SYS_VirginModeOff**	
Nucleus Number	1221	
Description	Turn off the virgin mode functionality (e.g. the auto channel search upon start-up)	
Technical	- Issue the command to reset the bit for the virgin mode to the analogue board	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	122100	Turning off the virgin mode succeeded
	122101	Turning off VirginMode on the Analogue Board failed.
	122102	The returned error code from the analogue board is unknown:
	122103	No DS error code known for analogue board error:
	122104	There was no response from the analogue board.
	122105	Section validation or write failed in NVRAM
	122106	Reading the CONFIG section from NVRAM failed
	122107	Initialisation of IIC or reaching NVRAM failed

Example	`DS:> 1221`
	`122100:`
	`Test OK @`	

Nucleus Name	**DS_SYS_VirginModeGet**	
Nucleus Number	1222	
Description	Get the virgin mode functionality status (e.g. the auto channel search upon start-up)	
Technical	- Issue the command to reset the bit for the virgin mode to the analogue board	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	122200	Getting the virgin mode succeeded
	122201	Reading the Virgin Mode flag from NVRAM failed
	122202	Initialisation of IIC or reaching the NVRAM failed
	122203	Reading an unexpected version of the section in NVRAM

Example	`DS:> 1222`
	`122200: The Virgin Mode functionality is: ON`
	`Test OK @`

Nucleus Name	**DS_SYS_DisplayFatalOn**	
Nucleus Number	1223	
Description	Turn on the display-fatal functionality which displays debug-information on the display when encountering a fatal error condition from which could not be recovered automatically	
Technical	- Issue the command to use the display-fatal functionality to the analogue board	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	122300	Turning on the display-fatal functionality succeeded
	122301	Turning on the display-fatal functionality failed
	122302	The returned error code from the analogue board is unknown:
	122303	No DS error code known for analogue board error:
	122304	There was no response from the analogue board.
	122305	Section validation or write failed in NVRAM
	122306	Reading the section from NVRAM failed
	122307	Initialisation of IIC or reaching NVRAM failed

Example	`DS:> 1223`
	`122300:`
	`Test OK @`	

Nucleus Name	**DS_SYS_DisplayFatalOff**	
Nucleus Number	1224	
Description	Turn off the display-fatal functionality which displays debug-information on the display when encountering a fatal error condition from which could not be recovered automatically	
Technical	- Issue the command to stop using the display-fatal functionality to the analogue board	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	122400	Turning off the display-fatal functionality succeeded
	122401	Turning off the display-fatal functionality failed
	122402	The returned errorcode from the analogue board is unknown:
	122403	No DS errCode known for analogue board error:
	122404	There was no response from the analogue board.
	122405	Section validation or write failed in NVRAM
	122406	Reading the section from NVRAM failed
	122407	Initialisation of IIC or reaching NVRAM failed

Example	`DS:> 1224`
	`122400:`
	`Test OK @`	

Nucleus Name	**DS_SYS_DisplayFatalGet**	
Nucleus Number	1225	
Description	Get the display-fatal flag of the recorder	
Technical	- Issue the command to get the status of the display-fatal functionality to the analogue board	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	122500	Getting the display-fatal flag succeeded
	122501	Getting the display-fatal flag failed
	122502	The returned errorcode from the analogue board is unknown:
	122503	No DS errCode known for analogue board error:
	122504	There was no response from the analogue board.
	122505	Reading the ***display fatal*** flag failed
	122506	Initialisation of IIC or reaching NVRAM failed
	122507	Unexpected version read from NVRAM section
	122508	Reading the fatal flag from NVRAM failed

Example	`DS:> 1225`
	`122500: The Display Fatal functionality is ON`
	`Test OK @`	

Nucleus Name	**DS_SYS_SettingsSet**	
Nucleus Number	1226	
Description	Programs the digital board settings into the boot EEPROM on the digital board.	
Technical	- Evaluate user input. - Set-up IIC-bus. - Write data to boot EEPROM. - Update checksum.	
Execution Time	1 second	
User Input	A large hexadecimal value that represents the digital board settings obtained from the **XDIVTOOL.exe** program or from a reference set.	
Error	Number	Description
	122600	The settings were successfully programmed.
	122601	User input is invalid.
	122602	IIC access failed.

Example	`DS:> 1226 6469616774737462010102000101010101000020080000`
	`122600:`
	`Test OK @`	

Nucleus Name	**DS_SYS_SettingsDisplay**	
Nucleus Number	1228	
Description	Show the settings that are programmed in the BROM on the digital board.	
Technical	- Set-up IIC-bus. - Read Digital Board Settings from boot EEPROM. - Display the settings.	
Execution Time	1 second	
User Input	None.	
Error	Number	Description
	122800	The settings were successfully displayed.
	122801	IIC access failed.
	122802	Invalid settings
Example	DS:> 1228 Settings ID: 444248491D9420014E46332B00000000290403030001010200010100400808000 Board name: NF3+ Hardware ID: 29 Codec IC: PNX7100_C2/C3 Video Input Processor IC: SAA7118 Progressive Scan Deinterlacer IC: S2301 Progressive Scan Denc IC: None I-Link physical layer circuit IC: PDI1394P25 I-Link link layer circuit IC: PDI1394P40 Audio clock: Clock scheme 1 Bit engine connector: not available IDE connector 1: available IDE connector 2: available PCI connector: not available RAM size 64MByte ROM size (NOR FLASH bank 1) 8MByte ROM size (NOR FLASH bank 2) 8MByte ROM size (NAND FLASH) Not available Bit Engine: AV 3.1 122800: Test OK @	

Nucleus Name	**DS_SYS_SettingsGet**	
Nucleus Number	1229	
Description	Get the digital board diversity settings string that is programmed in the BROM on the digital board.	
Technical	- Set-up IIC-bus. - Read Digital Board Settings from boot EEPROM. - Read System Settings from boot EEPROM. - Display the settings.	
Execution Time	1 second	
User Input	None.	
Error	Number	Description
	122900	The settings were successfully displayed.
	122901	IIC access failed.
	122902	The settings are invalid
Example	DS:> 1229 122900: 6D7920626F617264000203000101010201010000020080000 Test OK @	

Nucleus Name	**DS_SYS_AudioLoopThroughStart**	
Nucleus Number	1230	
Description	Description: The audio input is routed from the input to all outputs. The input is set routing the signal with the proper nucleus. All outputs are enabled.	
Technical	- Encode the audio to AC3 in memory - Decode the AC3 in memory to audio on the outputs	
Execution Time	1second buffer time and 30 seconds playing.	
User Input	**Available for all sets except for sets with a SAA7173 VIP onboard** InputType: - I2S (default) - SPDIF (Only for recorders with 5.1 input and DTT module) InputPort: (Only for recorders with 5.1 input. For DTT modules no parameter should be filled in, so default is chosen) - OPT : Optical input path is selected (default) - COAX : Coax input path is selected	
	Available only for sets with a SAA7173 VIP onboard **User input** / **Data path to VIP** R_A / Rear Cinch F_A / Front Cinch T_A / Tuner	
Error	Number	Description
	123000	AudioLoopthroughStart succeeded
	123001	Resetting the audio decoder failed
	123002	Resetting the audio encoder failed
	123003	Encoding the audio failed
	123004	Decoding the audio failed

Example	`DS:> 1230`
	`123000:`
	`Test OK @`	

Example DTT	`DS:> 1230 spdif`
	`123000:`
	`Test OK @`	

Example 5.1 input	`DS:> 1230 spdif coax`
	`123000:`
	`Test OK @`	

Example SAA7173	`DS:> 1230 T_A`
	`123000:`
	`Test OK @`	

Nucleus Name	**DS_SYS_AudioLoopThroughStop**	
Nucleus Number	1231	
Description	Stop routing the audio input to all the outputs	
Technical	- Send the 'Mute' command to the audio decoder and reset the audio decoder	
Execution Time	Less than 1 second.	
User Input	None.	
Error	Number	Description
	123100	AudioLoopthroughStop succeeded
	123101	Resetting the audio decoder failed
	123102	Resetting the audio encoder failed

Example	`DS:> 1231`
	`123100:`
	`Test OK @`	

Nucleus Name	**DS_SYS_SettingsHwIdSet**	
Nucleus Number	1232	
Description	This nucleus sets the HW-Id in the HW-diversity string	
Technical	- Read out the HW-diversity string - Modify the HW-ID in that string as requested - Write the modified HW-diversity string to the EEPROM	
Execution Time	Less than 1 second.	
User Input	- <HW-ID> - The hardware ID to set - No input - The user will be asked for the ID	
Error	Number	Description
	123200	Setting the hardware ID succeeded
	123201	Setting the hardware ID failed
	123202	The user aborted setting the hardware ID, no changes made
Example	DS:> 1232 Enter the new HW ID of the digital board (Currently equals 21) Enter a value between 0 and 99: > 22 The HW ID will be set to: 22. Is that correct? ([Y/N]):y 123200: Test OK @ DS:> 1232 Enter the new HW ID of the digital board (Currently equals 22) Enter a value between 0 and 99: > The HW ID will be set to: 0. Is that correct? ([Y/N]):N 123202: Setting the HW ID was aborted by the user. Error @ DS:> 1232 99 123200: Test OK @	

<table>
<tr><td>Nucleus Name</td><td colspan="2">DS_SYS_SettingsDoubleCheck</td></tr>
<tr><td>Nucleus Number</td><td colspan="2">1233</td></tr>
<tr><td>Description</td><td colspan="2">Double check whether stored HW-string equals actual HW as far
as we can automatically detect this. An automatic and a manual mode is supported.</td></tr>
<tr><td>Technical</td><td colspan="2">- Read out the HW diversity string
- Check whether these settings correspond the actual hardware
- In case of modification: Write back the new HW-diversity settings.</td></tr>
<tr><td>Execution Time</td><td colspan="2">4 seconds in auto mode when everything matches</td></tr>
<tr><td>User Input</td><td colspan="2">- ‘manual’ or ‘MANUAL’ to enter manual mode
- default is automatic mode where the nucleus stops upon and reports the first encountered error</td></tr>
<tr><td>Error</td><td>Number</td><td>Description</td></tr>
<tr><td></td><td>123300</td><td>Double checking the HW-diversity settings succeeded</td></tr>
<tr><td></td><td>123301</td><td>Double check failed, a difference in settings was encountered</td></tr>
<tr><td></td><td>123302</td><td>Reading the HW-diversity settings failed</td></tr>
<tr><td></td><td>123303</td><td>Writing the modified HW-diversity settings failed</td></tr>
<tr><td>Example</td><td colspan="2"><pre>
DS:> 1233
123300:
Test OK @

DS:> 1233 manual
123300:
Test OK @

DS:> 1233
123301:
Hardware ID mismatch: in HW-Diversity string:99, actual in FLASH:0

Error @

DS:> 1233 manual
Hardware ID mismatch! in HW-Diversity string:99, actual in FLASH:0

Enter the correct HW ID of the digital board.
>   0
The HW-diversity string has been modified by you. Settings:

Board name: DIAG
Hardware ID: 0
Codec IC: PNX7100_MF3
Video Input Processor IC: SAA7118
Progressive Scan Deinterlacer IC: None
Progressive Scan Denc IC: ADV7196
I-Link physical layer circuit IC: PDI1394P25
I-Link link layer circuit IC: PDI1394P40
Audio clock: Clock scheme 1
Bit engine connector: available
IDE connector 1:   available
IDE connector 2:   not available
PCI connector: not available
RAM size   32MByte
ROM size (NOR FLASH bank 1)   8MByte
ROM size (NOR FLASH bank 2)   Not available
ROM size (NAND FLASH)   Not available
Is it OK to program this in
the new HW-diversity string? ([y]es/[n]o):y
Diversity HW-string programmed successfully.

123300:
Test OK @

DS:>
</pre></td></tr>
</table>

Nucleus Name	**DS_SYS_SettingsDITableFilenameSet**	
Nucleus Number	1234	
Description	This nucleus sets the Download table filename in the HW-diversity string	
Technical	- Retrieve the new filename from the user - Ask the user whether the filename is correct before setting it - Update the diversity settings to use the newly entered filename	
Execution Time	Dependent on the user confirmation	
User Input	- The filename to be set - No input - No new filename will be set	
Error	Number	Description
	123400	Setting the new filename succeeded
	123401	Unsupported setting of the current HW-diversity settings
	123402	Setting the filename was aborted by the user.
Example	DS:> 1234 Enter the new Download Table Filename (Currently equals DVDR2001.001) Enter a filename: > The Download Table Filename will be set to: DVDR2001.001. Is that correct? ([Y/N]): 123402: Setting the filename was aborted by the user. Error @ DS:> 1234 Enter the new Download Table Filename (Currently equals DVDR2001.001) Enter a filename: >DVDR2002.001 The Download Table Filename will be set to: DVDR2002.001. Is that correct? ([Y/N]):Y 123400: Test OK @	

Nucleus Name	**DS_SYS_IicWriteRead**	
Nucleus Number	1235	
Description	Perform an IIC write-read action on the digital board	
Technical	- Determine bus ID, slave address, number of bytes to be written and the byte array of data from the user input - Initialise IIC - Write the data to the IIC slave - Read the data from the IIC slave	
Execution Time	Less than 1 second	
User Input	The user inputs the Bus ID, Slave Address, number of bytes to read, number of bytes to write and the bytes to be written <NucNr><BusId><SlaveAddr><ReadLen><WriteLen><WrByte0...WrByteN> Max number of bytes to write: 255 Max number of bytes to read: 255	
Error	Number	Description
	123500	Writing data to and reading data from the IIC slave succeeded
	123501	The IIC bus was not accessible
	123502	There was a bus timeout reading the device
	123503	The IIC acknowledge was not received
	123504	Unable to initialise IIC bus
	123505	The communication with the device failed
	123506	Unknown IIC bus error received
	123507	Decoding bus ID unsigned value failed
	123508	Decoding slave address unsigned value failed
	123509	Decoding number of bytes unsigned value failed
	123510	Bus ID out of range
	123511	Number of bytes out of range
Example	DS:> 1235 0 0xa0 0xf 1 0 0x0000: 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x0008: 0x00 0x00 0x00 0x00 0x00 0x00 0x00 123500: Test OK @	

Nucleus Name	**DS_SYS_BuildInfoGet**	
Nucleus Number	1236	
Description	Retrieve the software build information of the Diagnostics & Service application	
Technical	- Show the information that is stored in the DVDR_BuildInfoType structure	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	123600	Retrieving build info succeeded
	123601	Retrieving build info failed
Example	DS:> 1236 123600: Version :560 Build :20040614_0510 Release :C1 Buildtype :no Baseline :F_P1_9_152 Variant :verum:dvdrw2_lib Test OK @	

Nucleus Name	**DS_SYS_UartSetup**	
Nucleus Number	1237	
Description	Set up a configuration for the selected UART	
Technical	- Parse user input - Use MIS_UART_Setup to setup the selected UART with the requested parameters	
Execution Time	Less than 1 second	
User Input	The user inputs 6 parameters: <UartNr><baudrate><flowcontrol><databits><parity><stopbits> UartNr: 1=UART port 1 : not used (Chrysalis only) 2=UART port 2 : Bit Engine or DTTM (Chrysalis only) 3=UART port 3 : Analogue board baudrate: 115200,62500,57600,38400,19200,9600,4800,2400,1200 flowcontrol: 0=disabled 1=enabled databits: 7 or 8 parity: “NO”, “ODD” or “EVEN” stopbits: 1 or 2	
Error	Number	Description
	123700	Setting up the selected UART succeeded
	123701	User provided Invalid setup parameters
	123702	Setting up the selected UART Failed
	123703	Selected UART is not available
Example (Chrysalis)	DS:> 1237 2 38400 0 8 NO 1 123700: Test OK @	
Example (Leco)	DS:> 1237 2 38400 0 8 NO 1 123703: The selected UART is not available Error @	

Nucleus Name	**DS_SYS_GLinkWriteRead**	
Nucleus Number	1238	
Description	Send out some data through the G-Link UART and read back the data. The user must short-circuit the TX and RX line of the G-Link connector.	
Technical	- UART 3 setup (1200, 8, n, 1) - Send “HELLO”. - Receive data. - Compare data with “HELLO”.	
Execution Time	1 second	
User Input	None	
Error	Number	Description
	123800	Writing and reading back data through the G-Link succeeded
	123801	Unable to setup the G-Link UART
	123802	Failed to write data to the the G-Link connector
	123803	No data was received from the G-Link connector
	123804	Invalid data was received from the G-Link connector

Example	`DS:> 1238`
	`123800:`
	`Test OK @`	

Nucleus Name	**DS_SYS_LowPowerStandby**	
Nucleus Number	1239	
Description	Send wakeup reason to ASP and set the set to low power standby.	
Technical	- Set up ASP - Send wakeup reason to ASP - Send low power standby command to ASP	
Execution Time	Vary (Maximum time will depend on the relative timer used)	
User Input	- wakeup reason - the wakeup reason for the DB to power up - timer - relative timing for the DB to power up if wakeup reason 1 or 3 is chosen	
Error	Number	Description
	123901	Invalid data was given by the user
	123902	Failed to communication to ASP

Example	`DS:> 1239`
	
	`Wakeup reason from Low Power Standby`
	`1) timer only`
	`2) local key or RC pressed only`
	`3) any reason`
	`or press 'a' to abort`
	`1`
	`Enter time to wake up from low power standby.`
	`Range 1 - 5 mins:`
	`1`
	
	`Entering low power standby`	

3.13 ELECTRONIC PROGRAM GUIDE BOARD (EPGB)

Nucleus Name	**DS_EPGB_VersionGet**	
Nucleus Number	1300	
Description	Returns the version of the EPG board.	
Technical	- Issue the command to get the version of the EPG board to the analogue board - Return the received information to the user	
Execution Time	3 seconds.	
User Input	None	
Error	Number	Description
	130000	Getting the version succeeded
	130001	Communication with the analogue board failed.
	130002	Communication with the EPG board failed.
	130003	There was no response from the analogue board.
	130004	No DS error code known for analogue board error.

Example	`DS:> 1300`
	`130000:`
	`Version :  6.1.9`
	`Test OK @`	

3.14 PCMCIA INTERFACE (PCMCIA)

Nucleus Name	**DS_PCMCIA_Reset**	
Nucleus Number	1400	
Description	Reset the PCMCIA device by sending a reset command through IDE	
Technical	- Initialise/start IDE - Send the reset (ATA) command to the PCMCIA device	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	140000	Resetting PCMCIA device succeeded
	140001	The initialisation of IDE failed
	140002	The PCMCIA device failed
	140003	The reset ATA command failed

Example	`DS:> 1400`
	`140000:`
	`Test OK @`	

Nucleus Name	**DS_PCMCIA_Inquiry**	
Nucleus Number	1401	
Description	Get the vendor- and product identification and the product revision level of the media in the slot.	
Technical	- Initialise/start IDE - Execute the Inquiry command to get the VendorID, ProductID and FirmwareRevLevel	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	140100	Inquiry on PCMCIA device succeeded
	140101	The initialisation of IDE failed
	140102	The Inquiry command failed

Example	`DS:> 1401`
	`140100: VendorID: GENERIC , ProductId: IDE CARD READER , FirmwareRevLevel: 1382`
	`Test OK @`	

Nucleus Name	**DS_PCMCIA_WriteRead**	
Nucleus Number	1402	
Description	Perform a Write Read test to a random sector on the inserted medium in the PCMCIA device and check if the data read is equal to the data written.	
Technical	- Initialise/start IDE - Check if the device is ready to receive ATAPI commands and if there is a medium present in the PCMCIA slot (ATAPI) - Get the capacity (number of sectors and sector size) of the inserted medium (ATAPI) - Generate a random location in the range of the mediums memory - Write data to the medium (ATAPI) - Read the data from the medium (ATAPI) - Compare the written data and the data that was read back	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	140200	WriteRead to PCMCIA device succeeded
	140201	The initialisation of IDE failed
	140202	The PCMCIA device is not read
	140203	Getting the capacity parameters of the medium failed
	140204	There is no medium present in the adapter
	140205	Writing to medium failed
	140206	Reading from medium failed
	140207	The data written does not match the data that was read back

Example	`DS:> 1402`
	`140200:`
	`Test OK @`	

Nucleus Name	**DS_PCMCIA_Diagnostics**	
Nucleus Number	1403	
Description	Shall perform the internal diagnostic tests implemented by the PCMCIA slot. The electronics of the PCMCIA slot are tested here, not the inserted medium.	
Technical	- Initialise/start IDE - Send the diagnostic (ATA) command to the PCMCIA device	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	140300	The Diagnostic test on the PCMCIA device succeeded
	140301	The initialisation of IDE failed
	140302	The PCMCIA device failed
	140303	The diagnostics ATA command failed

Example	`DS:> 1403`
	`140300:`
	`Test OK @`	

3.15 HIGH-DEFINITION MULTIMEDIA INTERFACE (HDMI)

Nucleus Name	**DS_HDMI_DevTypeGet**	
Nucleus Number	1500	
Description	Get the device (revision) type information of the HDMI-IC.	
Technical	- Read out the information through IIC	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	150000	Getting the device type of the nucleus succeeded
	150001	Failed to retrieve the hardware diversity string
	150002	Failed to initialise the IIC communication
	150003	The hardware was not detected although indicated by Diversity
	150004	Failed to access HDMI transmitter chip SI9030

Example	`DS:> 1500`
	`150000:`
	`Vendor ID : 0x 0 0x 1`
	`Device ID : 0x91 0x42`
	`Device Revision : 0x 0`
	`Test OK @`	

Nucleus Name	**DS_HDMI_Communication**	
Nucleus Number	1501	
Description	Check the communication between the I2C controller on the Codec and the HDMI-IC by reading and writing data to one device register. This test detects faults of the I2C lines or a defected HDMI transmitter IC.	
Technical	- Read out an accessible register in the HDMI transmitter IC - Modify this register by writing a known value to it - Read back and check this value for correctness	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	150100	Communicating with the HDMI tx chip succeeded
	150101	Failed to retrieve the hardware diversity string
	150102	Failed to initialise the IIC communication
	150103	The hardware was not detected although indicated by Diversity
	150104	An IIC-bus error occurred
	150105	There was a timeout reading the device
	150106	The IIC bus was not accessible
	150107	The IIC acknowledge was not received
	150108	There was an IIC error upon the stop-condition
	150109	The IIC bus was chosen wrong
	150110	The IIC functionality is not running
	150111	An unknown error was returned by the IIC read
	150112	The data written did not equal the date read

Example	`DS:> 1501`
	`150100:`
	`Test OK @`	

Nucleus Name	**DS_HDMI_EdidParse**	
Nucleus Number	1502	
Description	Return the E-EDID (Enhanced Extended Display Identification Data) contained in the HDMI / DVI able TV attached to the DVD+RW. Parse the information retrieved to print the capabilities of the TV in user understandable format	
Technical	- Read out the E-EDID through the DDC channel (IIC) - Parse the information contained in the E-EDID - Print out the information to the user in understandable format	
Execution Time	2 seconds.	
User Input	None	
Error	Number	Description
	150200	Getting the configuration of the HDMI-IC succeeded
	150201	Failed to retrieve the hardware diversity string
	150202	Failed to initialise the IIC communication
	150203	The hardware was not detected although indicated by Diversity
	150204	Retrieving the E-EDID failed

Example

```
DS:> 1502
Checksum OK of EDID block 0.

Checking EDID Structure with 1 extensions:
        Checking each Extension for consistency.
E-EDID structure contains no errors.
EDID structure OK.
Vendor Specific Data Block: 03 0c 00 10 00
Attached Display is an HDMI device.
        EDID Version 1.3
        Total Native DTD Formats = 0
        Monitor Features (CEA Byte 3):  BasicAudio YCbCr444
YCbCr422
HDMI compatible EDID
Supported video format 1
Supported video format 2
Supported video format 3
Supported video format 5
Supported video format 6
Supported video format 7
index:0 Linear PCM  1 channels,  48KHz, 44KHz, 32KHz,

SPK:RLC FLC RC  RL  FC  LFE FL
    RRC FRC ..  RR  ..  ... FR

Attached display is HDMI compatible.
Display is YCbCr444 compatible.
Display is YCbCr422 compatible.

150200:
Test OK @
```

Nucleus Name	**DS_HDMI_DefaultVideoSet**	
Nucleus Number	1503	
Description	Set a default video configuration in the HDMI TX chip (720x480p)	
Technical	- Write a known configuration for 720x480P in the registers of the HDMI transmitter chip	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	150300	Setting the video configuration succeeded
	150301	Failed to retrieve the hardware diversity string
	150302	Failed to initialise the IIC communication
	150303	The hardware was not detected although indicated by Diversity
	150304	Setting the video configuration failed

Example	`DS:> 1503`
	`150300:`
	`Test OK @`
	
	`DS:> 101 11 ntsc all`
	`010100:`
	`Test OK @`	

Nucleus Name	**DS_HDMI_Reset**	
Nucleus Number	1504	
Description	Reset the HDMI transmitter chip by means of a hardware reset and re-initialize in order to have the HDMI transmitter chip accessible again.	
Technical	- Pull the reset line connected to the HDMI transmitter low - Wait a little while - Enable the HDMI chip again by setting the reset line high	
Execution Time	9 seconds.	
User Input	None	
Error	Number	Description
	150400	Resetting the HDMI tx chip succeeded
	150401	Failed to retrieve the hardware diversity string
	150402	Failed to initialise the IIC communication
	150403	The hardware was not detected although indicated by Diversity
	150404	Resetting the HDMI tx chip trhrough PIO failed.
	150405	Software Reset of the HDMI tx chip failed.

Example	`DS:> 1504`
	`150400:`
	`Test OK @`	

Nucleus Name	**DS_HDMI_Bist**	
Nucleus Number	1505	
Description	This nucleus performs the Built In Self Test (BIST) of the SII9030	
Technical	-	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	150500	The BIST succeeded
	150501	Failed to retrieve the hardware diversity string
	150502	Failed to initialise the IIC communication
	150503	The hardware was not detected although indicated by Diversity
	150504	The BIST failed
	150505	There was no IIC communication to the BIST registers
	150506	Counter expired in BIST test
	150507	The BIST failed due to an unknown type of error
	150508	BIST prerequisites were not met

Example	`DS:> 1505`
	`150500:`
	`Test OK @`	

Nucleus Name	**DS_HDMI_DdclicWrite**	
Nucleus Number	1506	
Description	Perform an IIC write action to a device on the DDC bus	
Technical	-	
Execution Time	Less than 1 second.	
User Input	<TimeOut> <Slave address> <offset> <nr of bytes> <d1> <.> <dx>	
Error	Number	Description
	150600	Writing to the device was OK, number of bytes is echoed
	150601	Failed to retrieve the hardware diversity string
	150602	Failed to initialise the IIC communication
	150603	The hardware was not detected although indicated by Diversity
	150604	Writing the bytes to the device failed
	150605	Decoding time-out unsigned value failed
	150606	Decoding slave address unsigned value failed
	150607	Decoding offset unsigned value failed
	150608	Decoding number of bytes unsigned value failed
	150609	Number of bytes out of range. Should be less than 17.
	150610	Incorrect number of data bytes entered
	150611	Unable to initialise IIC

Example	`DS:> 1506 1 0xa0 1 0`
	`150600:`
	`Test OK @`
	
	`DS:> 1506 1 0xa8 1 0`
	`150604: Writing the bytes to the device failed.`
	`Error @`	

Nucleus Name	**DS_HDMI_DdclicRead**	
Nucleus Number	1507	
Description	Perform an IIC read action to a device on the DDC bus	
Technical	-	
Execution Time	Less than 1 second.	
User Input	<TimeOut> <Slave address> <Offset> <Number of bytes>	
Error	Number	Description
	150700	
	150701	Failed to retrieve the hardware diversity string
	150702	Failed to initialise the IIC communication
	150703	The hardware was not detected although indicated by Diversity
	150704	Reading from the device on the DDC bus failed
	150705	Decoding time-out unsigned value failed
	150706	Decoding slave address unsigned value failed
	150707	Decoding offset unsigned value failed
	150708	Decoding number of bytes unsigned value failed
	150709	Unable to initialise IIC bus

Example	`DS:> 1507 1 0xa0 0 15`
	`[ 0]:0x0`
	`[ 1]:0xff`
	`[ 2]:0xff`
	`[ 3]:0xff`
	`[ 4]:0xff`
	`[ 5]:0xff`
	`[ 6]:0xff`
	`[ 7]:0x0`
	`[ 8]:0x34`
	`[ 9]:0xa9`
	`[ 10]:0x53`
	`[ 11]:0xc0`
	`[ 12]:0x1a`
	`[ 13]:0x0`
	`[ 14]:0x0`
	`150700:`
	`Test OK @`	

Nucleus Name	**DS_HDMI_ExtendedWrite**	
Nucleus Number	1508	
Description	Perform an IIC write action on port 0/1 of the HDMI transmitter	
Technical	-	
Execution Time	Less than 1 second.	
User Input	<Port> <Register> <Data> Where 0 == Port 0 and 1 == Port 1	
Error	Number	Description
	150800	Byte was written OK
	150801	Failed to retrieve the hardware diversity string
	150802	Failed to initialise the IIC communication
	150803	The hardware was not detected although indicated by Diversity
	150804	A wrong port number was given by the user
	150805	An invalid register was given by the user
	150806	Invalid data was given by the user
	150807	There was an error writing to the register indicated

Example	`DS:> 1508 0 0x10 0x22`
	`150800:`
	`Test OK @`	

Nucleus Name	**DS_HDMI_ExtendedRead**	
Nucleus Number	1509	
Description	Perform an IIC read action on port 0 or 1 of the HDMI transmitter	
Technical	-	
Execution Time	Less than 1 second.	
User Input	<Port> <Register> Where 0 == Port0 and 1 == Port 1	
Error	Number	Description
	150900	Byte was read and echoed OK
	150901	Failed to retrieve the hardware diversity string
	150902	Failed to initialise the IIC communication
	150903	The hardware was not detected although indicated by Diversity
	150904	A wrong port number was given by the user
	150905	An invalid register was given by the user
	150906	There was an error reading the register indicated

Example	`DS:> 1509 0 0x10`
	`150900: Data read: 0x22`
	`Test OK @`	

Nucleus Name	**DS_HDMI_CheckHPDTx**	
Nucleus Number	1510	
Description	Check whether Hot-Plugging of the HDMI cable is detected by the SII9030 HDMI transmitter.	
Technical	-	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	151000	The Hot Plug was detected OK by the HDMI transmitter
	151001	Failed to retrieve the hardware diversity string
	151002	Failed to initialise the IIC communication
	151003	The hardware was not detected although indicated by Diversity
	151004	Error writing to interrupt register
	151005	Error reading interrupt register
	151006	Test aborted by user
	151007	Unknown action

Example	`DS:> 1510`
	`Insert or remove the HDMI cable.(or type 'a' to abort):`
	`151006: Test aborted by user.`
	`Test OK @`
	
	`DS:> 1510`
	`Insert or remove the HDMI cable.(or type 'a' to abort):`
	`151000:`
	`Test OK @`	

Nucleus Name	**DS_HDMI_CheckHPDChrysalis**	
Nucleus Number	1511	
Description	Check whether Hot-Plugging of the HDMI cable is detected by the software. This tests the interrupt line to the Chrysalis.	
Technical	-	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	151100	The Hot Plug was detected OK by software. Interrupt line OK.
	151101	Failed to retrieve the hardware diversity string
	151102	Failed to initialise the IIC communication
	151103	The hardware was not detected although indicated by Diversity
	151104	Error writing to HDMI tx register
	151105	User aborted HPD test
	151106	Error reading from HDMI tx register

Example	`DS:> 1511`
	`Insert or remove the HDMI cable.(or type 'a' to abort):`
	`151100:`
	`Test OK @`
	
	`DS:> 1511`
	`Insert or remove the HDMI cable.(or type 'a' to abort):`
	`151105: User aborted HPD test.`
	`Test OK @`	

Nucleus Name	**DS_HDMI_FLI2310_DevTypeGet**	
Nucleus Number	1512	
Description	Get the device and revision information of the FLI2310	
Technical	-	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	151200	Retrieving the device type information succeeded
	151201	Failed to retrieve the hardware diversity string
	151202	Failed to initialise the IIC communication
	151203	The hardware was not detected although indicated by Diversity
	151204	The communication with the device failed

Example	`DS:> 1512`
	`151200:`
	`Chip name    : 2300`
	`Chip version : 4`
	`Test OK @`	

Nucleus Name	**DS_HDMI_FLI2310_Communication**	
Nucleus Number	1513	
Description	Test whether the communication to the FLI2310 can be established	
Technical	-	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	151300	Something is properly read so the communication is OK
	151301	Failed to retrieve the hardware diversity string
	151302	Failed to initialise the IIC communication
	151303	The hardware was not detected although indicated by Diversity
	151304	The IIC bus was not accessible
	151305	There was a timeout reading the device
	151306	The IIC acknowledge was not received
	151307	The communication with the device failed
	151308	The IIC bus initialisation failed
	151309	The read data is not the same as the written data

Example	`DS:> 1513`
	`151300:`
	`Test OK @`	

Nucleus Name	**DS_HDMI_FLI2310_TestImageOn**

Nucleus Number	1514	
Description	Generate a test image using the FLI2310	
Technical	-	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	151400	Test image is generated successfully
	151401	Failed to retrieve the hardware diversity string
	151402	Failed to initialise the IIC communication
	151403	The hardware was not detected although indicated by Diversity
	151404	Unable to generate image
	151405	Unable to initialise De-inter-lacer

Example	`DS:> 1514`
	`151400:`
	`Test OK @`	

Nucleus Name	**DS_HDMI_FLI2310_TestImageOff**	
Nucleus Number	1515	
Description	Switch of test-image generation by the FLI2310	
Technical	-	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	151500	Test image is turned off successfully
	151501	Failed to retrieve the hardware diversity string
	151502	Failed to initialise the IIC communication
	151503	The hardware was not detected although indicated by Diversity
	151504	Unable to initialise De-Inter-lacer
	151505	IIC Error during writing DENC

Example	`DS:> 1515`
	`151500:`
	`Test OK @`	

Nucleus Name	**DS_HDMI_FLI2310_Routing**	
Nucleus Number	1516	
Description	Have the FLI2310 pass the video from its input to its output	
Technical	-	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	151600	Routing path is created successfully
	151601	Failed to retrieve the hardware diversity string
	151602	Failed to initialise the IIC communication
	151603	The hardware was not detected although indicated by Diversity
	151604	Unable to initialise the Chrysalis.
	151605	Unable to access de-inter-lacer

Example	`DS:> 1516`
	`151600:`
	`Test OK @`	

Nucleus Name	**DS_HDMI_FLI2310_ExtendedWrite**	
Nucleus Number	1517	
Description	Write to any register of the FLI2310	
Technical	-	
Execution Time	Less than 1 second.	
User Input	<Register> <RegLen:1=8bits;2=16bits> <Data>	
Error	Number	Description
	151700	The IIC write action succeeded
	151701	Failed to retrieve the hardware diversity string
	151702	Failed to initialise the IIC communication
	151703	The hardware was not detected although indicated by Diversity
	151704	Decoding register unsigned value failed
	151705	Decoding register length unsigned value failed
	151706	Decoding register data unsigned value failed
	151707	Error writing to register

Example	`DS:> 1517 0x303 1 0x9a`
	`151700:`
	`Test OK @`	

Nucleus Name	**DS_HDMI_FLI2310_ExtendedRead**	
Nucleus Number	1518	
Description	Read from any register of the FLI2310	
Technical	-	
Execution Time	Less than 1 second.	
User Input	<Register> <RegLen:1=8bits;2=16bits>	
Error	Number	Description
	151800	The IIC read action succeeded
	151801	Failed to retrieve the hardware diversity string
	151802	Failed to initialise the IIC communication
	151803	The hardware was not detected although indicated by Diversity
	151804	Decoding register unsigned value failed
	151805	Decoding register length unsigned value failed
	151806	Error reading from the register

Example	`DS:> 1518 0x303 1`
	`151800: Data read:  0x009A`
	`Test OK @`	

Nucleus Name	**DS_HDMI_FLI2310_1080I**	
Nucleus Number	1519	
Description	Set the Faroudja FLI2310 to generate a 1080I image from the video on its inputs.	
Technical	-	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	151900	Generating the up-scaled image succeeded
	151901	Failed to retrieve the hardware diversity string
	151902	Failed to initialise the IIC communication
	151903	The hardware was not detected although indicated by Diversity
	151904	Generating the up-scaled image failed

Example	`DS:> 1519`
	`151900:`
	`Test OK @`	

Nucleus Name	**DS_HDMI_Adv7302_Communication**	
Nucleus Number	1520	
Description	Test whether communication with the ADV7320 can be established	
Technical	-	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	152000	Something is properly written so the communication is OK
	152001	Failed to retrieve the hardware diversity string
	152002	Failed to initialise the IIC communication
	152003	The hardware was not detected although indicated by Diversity
	152004	The IIC bus was not accessible
	152005	There was a timeout reading the device
	152006	The IIC acknowledge was not received
	152007	The communication with the device failed
	152008	Data read back does not match the data written
	152009	Got unknown error: xx on MIS_IIC_Read
	152010	Unable to initialise the ADV7320

Example	`DS:> 1520`
	`152000:`
	`Test OK @`	

Nucleus Name	**DS_HDMI_Adv7302_TestImageOn**	
Nucleus Number	1521	
Description	Generate a test-image using the ADV7320. Generate the test images that are present on the progressive scan DENC-IC. This can be a crosshatch test pattern (horizontal and vertical white lines are displayed against a black background) or a uniform coloured frame/field test pattern. Default is a white hatch.	
Technical	-	
Execution Time	Less than 1 second.	
User Input	Image pattern type containing the next non-case sensitive string "HATCH" or "FRAME" or nothing.	
Error	Number	Description
	152100	Test image is generated successfully
	152101	Failed to retrieve the hardware diversity string
	152102	Failed to initialise the IIC communication
	152103	The hardware was not detected although indicated by Diversity
	152104	Unable to generate image
	152105	Unable to initialise DENC
	152106	Unable to reset DENC

Example	`DS:> 1521`
	`152100:`
	`Test OK @`
	
	`DS:> 1521 FRAME`
	`152100:`
	`Test OK @`
	
	`DS:> 1521 HATCH`
	`152100:`
	`Test OK @`	

Nucleus Name	**DS_HDMI_Adv7302_TestImageOff**	
Nucleus Number	1522	
Description	Switch off test-image generation by the ADV7320	
Technical	-	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	152200	Testimage is turned off successfully
	152201	Failed to retrieve the hardware diversity string
	152202	Failed to initialise the IIC communication
	152203	The hardware was not detected although indicated by Diversity
	152204	IIC Error during writing DENC

Example	`DS:> 1522`
	`152200:`
	`Test OK @`	

Nucleus Name	**DS_HDMI_Adv7302_Routing**	
Nucleus Number	1523	
Description	Have the ADV7320 pass the video from its inputs to its outputs	
Technical	-	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	152300	Routing path is created successfully
	152301	Failed to retrieve the hardware diversity string
	152302	Failed to initialise the IIC communication
	152303	The hardware was not detected although indicated by Diversity
	152304	Unable to initialise the Chrysalis
	152305	Unable to access DENC

Example	`DS:> 1523`
	`152300:`
	`Test OK @`	

Nucleus Name	**DS_HDMI_Adv7302_ColSettingsSet**	
Nucleus Number	1524	
Description	Set the colour of the hatch- or frame-field to a different colour than the default white colour.	
Technical	-	
Execution Time	Less than 1 second.	
User Input	colour string or Y Cr Cb values: either one of the next non-case sensitive strings: - WHITE, BLACK, RED, GREEN, BLUE, YELLOW, CYAN, MAGENTA or 3 unsigned values, - hex: <0xYY> <0xUU> <0xVV> or decimal <YY> <UU> <VV>	
Error	Number	Description
	152400	Colour is set successfully
	152401	Failed to retrieve the hardware diversity string
	152402	Failed to initialise the IIC communication
	152403	The hardware was not detected although indicated by Diversity
	152404	Invalid parameters
	152405	IIC Error during writing DENC

Example	`DS:> 1524 yellow`
	`152400:`
	`Test OK @`
	
	`DS:> 1524 0x6a 0xde 0xca`
	`152400:`
	`Test OK @`	

Nucleus Name	**DS_HDMI_Adv7302_ColSettingsGet**	
Nucleus Number	1525	
Description	Get the colour settings of the hatch- or frame-field	
Technical	-	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	152500	Reading the colour settings succeeded
	152501	Failed to retrieve the hardware diversity string
	152502	Failed to initialise the IIC communication
	152503	The hardware was not detected although indicated by Diversity
	152504	IIC Error during accessing DENC

Example	`DS:> 1525`
	`152500: Colour Y Cr Cb values: 0x6A 0xDE 0xCA`
	`Test OK @`	

Nucleus Name	**DS_HDMI_Adv7302_ExtendedWrite**	
Nucleus Number	1526	
Description	Perform an IIC write action to the ADV7320	
Technical	-	
Execution Time	Less than 1 second.	
User Input	The register to write to and the data to be written: <Register> <data>	
Error	Number	Description
	152600	Writing to the register succeeded
	152601	Failed to retrieve the hardware diversity string
	152602	Failed to initialise the IIC communication
	152603	The hardware was not detected although indicated by Diversity
	152604	Decoding register unsigned value failed
	152605	Decoding data unsigned value failed
	152606	Error writing to the register

Example	`DS:> 1526 0 0x1e`
	`152600:`
	`Test OK @`	

Nucleus Name	**DS_HDMI_Adv7302_ExtendedRead**	
Nucleus Number	1527	
Description	Perform an IIC read action on the ADV7320	
Technical	-	
Execution Time	Less than 1 second.	
User Input	The register to read from: <Register>	
Error	Number	Description
	152700	Reading from the register succeeded
	152701	Failed to retrieve the hardware diversity string
	152702	Failed to initialise the IIC communication
	152703	The hardware was not detected although indicated by Diversity
	152704	Decoding register unsigned value failed
	152705	Error reading from register

Example	`DS:> 1527 0`
	`152700: Data read:  0x1E`
	`Test OK @`	

Nucleus Name	**DS_HDMI_Audio**	
Nucleus Number	1528	
Description	Set the proper audio settings to the HDMI transmitter. **Note:** When **1528 spdif** is used to set the HDMI transmitter audio settings correctly and just **103** is entered i.s.o. **103 spdif** then 'clicking' audio is heard because the Chrysalis audio decoder does not use its SPDIF-path explicitly. **Note:** Currently there is an issue in the order of the tests: - Reboot the set. - First create the video, as audio is passed alongside the video on HDMI - Create the spdif audio using nucleus **103 spdif** - Create the spdif audio settings in the HDMI transmitter using nucleus **1528 spdif** - The spdif audio will be audible - Switch off spdif audio using nucleus **104** - Create i2s audio using nucleus **103** - Create the i2s audio settings in the HDMI transmitter using nucleus **1528** or **1528 I2S** - The audio will be audible - Switch off the audio using nucleus **104**	
Technical	-	
Execution Time	Less than 1 second.	
User Input	'SPDIF' - Set the HDMI transmitter's audio path to SPDIF 'I2S' or nothing - Set the HDMI transmitter's audio path to I2S	
Error	Number	Description
	152800	Creating the proper audio settings succeeded
	152801	Failed to retrieve the hardware diversity string
	152802	Failed to initialise the IIC communication
	152803	The hardware was not detected although indicated by Diversity

Example	`DS:> 1528 i2s`
	`152800:  i2s`
	`Test OK @`
	
	`DS:> 1528 spdif`
	`152800:  spdif`
	`Test OK @`	

Nucleus Name	**DS_HDMI_ColumbusTestImage**	
Nucleus Number	1529	
Description	Have the Columbus IC generate a test image	
Technical	-	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	152900	Generating the test-image on the Columbus succeeded
	152901	Failed to retrieve the hardware diversity string
	152902	Failed to initialise the IIC communication
	152903	The hardware was not detected although indicated by Diversity
	152904	Generating the test-image on the Columbus failed
	152905	Soft reset of the Columbus failed
	152906	IIC initialisation failed
	152907	Columbus did not answer the call (reading dig. ID)

Example	`DS:> 1529`
	`152905: Soft reset of Columbus failed.`
	`Test OK @`
	
	`DS:> 1529`
	`152900:`
	`Test OK @`	

Nucleus Name	**DS_HDMI_ColumbusPass**	
Nucleus Number	1530	
Description	Have the Columbus pass the video from its inputs to its outputs	
Technical	-	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	153000	Getting the columbus to pass the video succeeded
	153001	Failed to retrieve the hardware diversity string
	153002	Failed to initialise the IIC communication
	153003	The hardware was not detected although indicated by Diversity
	153004	Getting the columbus to pass the video failed

Example	`DS:> 1530`
	`153000:`
	`Test OK @`	

3.16 ANALOGUE SLAVE PROCESSOR (ASP)

Nucleus Name	**DS_ASP_Communication**	
Nucleus Number	1600	
Description	This nucleus checks the communication between the IIC controller of the Codec and the ASP.	
Technical	- Initialise IIC-bus. - Read something from ASP. - Handle the errorcode.	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	160000	Communicating with the ASP succeeded
	160001	The IIC bus was not accessible
	160002	There was a timeout reading the device
	160003	The IIC acknowledge was not received
	160004	An IIC-bus error occurred
	160005	Got unknown IIC bus error
	160006	The IIC bus initialisation failed

Example	`DS:> 1600`
	`160000:`
	`Test OK @`	

Nucleus Name	**DS_ASP_Version**	
Nucleus Number	1601	
Description	This nucleus returns the version number of the software running on the ASP or MCU and if available that of the display driver.	
Technical	- Read versions from ASP and display it.	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	160100	Retrieving the software versions succeeded
	160101	The IIC bus initialisation failed.
	160102	The IIC bus failed.
	160103	The CRC checksum of the message is wrong.

Example ASP	`DS:> 1601`
	`160100:`
	`Software version : 0.9`
	`Display driver version: 0.1`
	`Hardware version : 0x02`
	`Hardware layout : 0x03`
	`Hardware revision : 0x00`
	`Test OK @`	

Example MCU	`DS:> 1601`
	`160100:`
	`Software main version: 0.3`
	`Software sub version: 0.0`
	`Test OK @`	

Nucleus Name	**DS_ASP_RealTimeClockSetValues**	
Nucleus Number	1602	
Description	This nucleus is used to set the real time clock to the correct values.	
Technical	- Decode the user input. - Write RTC value to ASP.	
Execution Time	Less than 1 second.	
User Input	User must give time and date like this: hh:mm:ss dd/mm/yy	
Error	Number	Description
	160200	Setting the real time clock succeeded
	160201	The ASP initialisation failed.
	160202	The IIC bus failed.
	160203	Wrong user input.

Example	`DS:> 1602 03:20:01 22/06/03`
	`160200:`
	`Test OK @`	

Nucleus Name	**DS_ASP_RealTimeClockGetValues**	
Nucleus Number	1603	
Description	This nucleus is used to retrieve the actual real time from the ASP	
Technical	- Read RTC value from ASP. - Decode the RTC value.	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	160300	Retrieving the real time succeeded
	160301	The ASP initialisation failed.
	160302	The IIC bus failed.
	160303	The CRC checksum of the message is wrong.
	160304	The Real Time Clock has been found invalid or was not found.

Example	`DS:> 1603`
	`Time: 03:20:17`
	`Date: 22/06/03 (dd/mm/yy)`
	`160300:`
	`Test OK @`	

Nucleus Name	**DS_ASP_RealTimeClockAdjustment**	
Nucleus Number	1605	
Description	This nucleus sets a test signal for clock crystal measurement. The signal with a frequency of 1 kHz and duty cycle of 50% appears on pin RCC.	
Technical	- Send ‘Clock Adjustment’ command to the ASP.	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	160500	The test succeeded
	160501	The ASP initialisation failed.
	160502	The IIC bus failed.

Example	`DS:> 1605`
	`160500:`
	`Test OK @`	

Nucleus Name	**DS_ASP_NTCGet**	
Nucleus Number	1606	
Description	This nucleus reads the value of the NTC-resistor connected to the ASP, which tells the ambient temperature to the processor.	
Technical	- Read the ADC input pin of the ASP that is connected to the NTC-resistor. - Display this value.	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	160600	Getting the NTC-value succeeded
	160601	The IIC bus failed

Example	`DS:> 1606`
	`160600: Temperature(NTC) ADC input value = 0x94`
	`Test OK @`	

Nucleus Name	**DS_ASP_FanSpeedSet**	
Nucleus Number	1607	
Description	This nucleus sets the speed of the fan that controls the temperature within the set.	
Technical	- Decode user input. - Set pio-pins FAN_C1 and FAN_C2.	
Execution Time	Less than 1 second.	
User Input	Speed to be set: off, low, medium, high	
Error	Number	Description
	160700	Setting the new fan speed succeeded
	160701	The IIC bus failed
	160702	The user provided wrong input

Example	`DS:> 1607 low`
	`160700:`
	`Test OK @`	

Nucleus Name	**DS_ASP_LightDisplay**	
Nucleus Number	1608	
Description	This nucleus lights the entire display.	
Technical	- Set all segments on in the display buffer. - Set the grids correct in the display buffer. - Send the display buffer to the ASP.	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	160800	Lighting the entire display succeeded
	160801	IIC-bus communication failed

Example	`DS:> 1608`
	`160800:`
	`Test OK @`	

Nucleus Name	**DS_ASP_BlinkDisplay**	
Nucleus Number	1609	
Description	This nucleus lights the entire display, and lets it blink. Only for ASP	
Technical	- Set all segments on in the blink buffer. - Set the grids correct in the blink buffer. - Send the blink buffer to the ASP.	
Execution Time	Less than 1 second.	
User Input	None or 'on' to start the blinking of the display. 'off' To stop the blinking of the display.	
Error	Number	Description
	160900	The test succeeded
	160901	IIC-bus communication failed
	160902	The user provided wrong input

Example ASP	`DS:> 1609`
	`160900:`
	`Test OK @`
	
	`DS:> 1609 off`
	`160900:`
	`Test OK @`	

Example MCU	`DS:> 1609`
	`160900: Empty function`
	`Test OK @`	

Nucleus Name	**DS_ASP_DimmingDisplay**	
Nucleus Number	1610	
Description	This nucleus lights the entire display, and dims it.	
Technical	- Change in a loop the display brightness from maximum to minimum.	
Execution Time	Less than 1 second.	
User Input	'ON' or 'OFF'	
Error	Number	Description
	161000	The test succeeded
	161001	IIC-bus communication failed
	161002	The user provided wrong input

Example	`DS:> 1610 ON`
	`161000:`
	`Test OK @`	

Nucleus Name	**DS_ASP_ClearDisplay**	
Nucleus Number	1611	
Description	This nucleus clears the display and deactivates dimming/blinking functionality	
Technical	- Make the display buffer empty. - Make the blink buffer empty. - Send the display buffer to the ASP. - Send the blink buffer to the ASP.	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	161100	The test succeeded
	161101	IIC-bus communication failed

Example	`DS:> 1611`
	`161100:`
	`Test OK @`	

Nucleus Name	**DS_ASP_KeyBoard**	
Nucleus Number	1612	
Description	This nucleus checks all keys of the keyboard by having the user confirm the key-code displayed of all keys. If the user presses ‘a’ or ‘A’ the test is aborted. If the user presses ‘o’ or ‘O’ the test is indicated as OK. If the user holds down ‘PLAY’ for more than a second the test is indicated as OK, if the user holds down ‘RECORD’ the test is indicated as failed. Indicate the number of keys pressed to the user, both in the terminal logging and on the display.	
Technical	- Initialise the display. - Display the key pressed by the user on the display. - Monitor the service port for an abort and get the next key pressed. - Update the display and repeat previous steps until user stops / confirms. - Display the number of keys that were pressed.	
Execution Time	Depends on the user.	
User Input	None	
Error	Number	Description
	161200	Checking all keys succeeded
	161201	IIC-bus communication failed
	161202	The user signals a failure of the keyboard
	161203	The user aborted the test

Example	`DS:> 1612`
	`161200: 3 keys were pressed.`
	`Test OK @`	

Nucleus Name	**DS_ASP_RemoteControl**	
Nucleus Number	1613	
Description	This nucleus checks the interface to the remote control by having the user confirm the key-code displayed. At least one key must be tested. If the user presses ‘a’ or ‘A’ the test is aborted. If the user presses ‘o’ or ‘O’ the test is indicated as OK. If the user holds down ‘PLAY’ for more than a second the test is indicated as OK, if the user holds down ‘RECORD’ the test is indicated as failed. Indicate the number of keys pressed to the user, both in the terminal logging and on the display.	
Technical	- Initialise the display. - Display the key pressed by the user on the display. - Monitor the service port for an abort and get the next key pressed. - Update the display and repeat previous steps until user stops / confirms. - Display the number of keys that were pressed.	
Execution Time	Depends on the user.	
User Input	None	
Error	Number	Description
	161300	The test succeeded
	161301	IIC-bus communication failed
	161302	The user signals a failure of the remote control
	161303	The user aborted the test

Example	`DS:> 1613`
	`161300: 4 keys were pressed.`
	`Test OK @`	

Nucleus Name	**DS_ASP_LEDsOn**	
Nucleus Number	1614	
Description	Switches on the display leds.	
Technical	ASP specific - Check if the analogue board is a MOBO board, if so: - Read the ASP pio port. - Set the RECORD-LED bit on in this port. - Write the ASP pio port. - Read the ASP pio port. - Set the TRAY-LED bit on in this port. - Write the ASP pio port. - Read the ASP pio port. - Set the EPG-LED bit on in this port. - Write the ASP pio port. - Else - Set the RECORD-LED bit on. - Write the external ASP pio port. - Set the TRAY-LED bit on. - Write the external ASP pio port. - Set the EPG-LED bit on. - Write the external ASP pio port. MCU Specific - Get the user input and capitalize it and check validity - Check which lights should be turned on - Write the command to the MCU	
Execution Time	Less than 1 second.	
User Input	None, Green or Red: Choose which colour of the bi-led should be lit with the rest (only for OLAL22PREMIER variant)	
Error	Number	Description
	161400	Switching on the LEDs succeeded
	161401	IIC-bus communication failed
	161402	Invalid parameter

Example	`DS:> 1614`
	`161400:`
	`Test OK @`	

Nucleus Name	**DS_ASP_LEDsOff**	
Nucleus Number	1615	
Description	This nucleus switches off the display leds.	
Technical	ASP specific - Check if the analogue board is a MOBO board, if so: - Read the ASP pio port. - Set the RECORD-LED bit off in this port. - Write the ASP pio port. - Read the ASP pio port. - Set the TRAY-LED bit off in this port. - Write the ASP pio port. - Read the ASP pio port. - Set the EPG-LED bit off in this port. - Write the ASP pio port. - Else - Set the RECORD-LED bit off. - Write the external ASP pio port. - Set the TRAY-LED bit off. - Write the external ASP pio port. - Set the EPG-LED bit off. - Write the external ASP pio port. MCU Specific - Write the command to the MCU to turn all display leds off	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	161500	Switching off the LEDs succeeded
	161501	IIC-bus communication failed

Example	`DS:> 1615`
	`161500:`
	`Test OK @`	

Nucleus Name	**DS_ASP_Reset**	
Nucleus Number	1616	
Description	This nucleus resets the ASP.	
Technical	- Reset the ASP by toggling the reset wire by a GPIO pin of the codec. - Wait 500ms according to the HSI. - Read Status from ASP. - Put ASP in normal mode. - Configure general ASP PIO. - Make a ASP pio pin low to read the version. - Get GPP40 - GPP47 and GPP48 - GPP55. - Decode hardware version, revision, and layout. - Configure the ASP clock. - Configure display, part 1. - Configure display, part 2. - Configure blinking. - Configure external ASP PIO. - Configure ADC input. - Configure remote control input. - Enable power on the AV3.	
Execution Time	3 seconds.	
User Input	None	
Error	Number	Description
	161600	Reset command succeeded
	161601	IIC-bus communication failed

Example	`DS:> 1616`
	`161600:`
	`Test OK @`	

Note:	**Expert use only!**	
Nucleus Name	**DS_ASP_Extended**	
Nucleus Number		
Description	With this nucleus, possible problems in the factory can be worked around. It: - Enables the user to switch the General Purpose Pins of the ASP - Lets the user read out an ADC input value.	
Technical	- Decode user input. - Execute the parameter command.	
Execution Time	Less than 1 second.	
User Input	**Either <GPP> <0|1>** * GPP = The General Purpose I/O Pin: * 8SC1 * ASC1 * AUD_MUX2 or DTT_SEL * AUD_MUX3/ YC_REAR * DD_ON * DISP_CLK * DISP_CS * DISP_DATA * EEPROM_CLS * EEPROM_SDA * EPG_LED * FAN_C1 * FAN_C2 * FBOUT * HDD_LED * IMUTE * IPRO * LOOP_THRU_ON * P50_OUT * REC_LED * SEL_KEY2_3 * STDBY * STDBY_LED * TRAY_LED * VCR_CS * VCR_DIN * VCR_RESET * VCR_SCLK * VFD_CLK * WSRO * YUV_ACTIVE **Or <PIO pin>** * P50_IN * RC_IN * REG_SELA * REG_SELB * VCR_DOUT **Or <ADC pin>** * 8SC2 or WSRI * WSFI * TEMP * FBIN * FOME or AFC * WU * KEY1 * KEY2 See example below	
Error	Number	Description
	161700	The test succeeded
	161701	The IIC-bus failed.
	161702	Invalid user input.

Example	DS:> 1617 temp 161700: TEMP ADC input value: 143 Test OK @ DS:> 1617 rec_led 1 161700: Test OK @

Nucleus Name	**DS_ASP_Watchdog**	
Nucleus Number	1618	
Description	This nucleus configures the watchdog timer of the ASP, and waits till the watchdog expires. The watchdog time-out is 10 seconds. On expiry of the watchdog timer, the ASP switching off, and on its power supply, and resets the main controller. So, this nucleus will not return an error code when the test succeeded, but the system will restart again.	
Technical	- Configure watchdog timer. - Wait till the watchdog expired.	
Execution Time	10 seconds.	
User Input	None	
Error	Number	Description
	161801	IIC-bus communication failed.
	161802	The ASP did not reset the host processor.
Example	DS:> 1618 Waiting till the watchdog expires. Factory Diagnostics and Service Software DVD Video Recorder (Sep 10 2004, 08:11:24) Version :662 Build :20040910_0515 Release :C1_1 Buildtype :no Baseline :F_C1_195 Variant :verum:dvdrw2_lib DS:>	

Nucleus Name	**DS_ASP_Reboot**	
Nucleus Number	1619	
Description	This command forces a reboot of the main controller. The ASP shutdown the digital board power supply and then switch it on to force reset. So, this nucleus will not return an error code when the test succeeded, but the system will restart again.	
Technical	- Send command reboot to ASP.	
Execution Time	2 seconds.	
User Input	None	
Error	Number	Description
	161901	IIC-bus communication failed.
	161902	The ASP did not reset the host processor.
Example	DS:> 1619 Factory Diagnostics and Service Software DVD Video Recorder (Sep 10 2004, 08:11:24) Version :662 Build :20040910_0515 Release :C1_1 Buildtype :no Baseline :F_C1_195 Variant :verum:dvdrw2_lib DS:>	

Nucleus Name	**DS_ASP_DetectVideo**	
Nucleus Number	1620	
Description	Checks if an active video signal is available on the CVBS input of SCART 1 or SCART 2.	
Technical	- Read out the WU ADC pin on the ASP	
Execution Time	2 seconds.	
User Input	None	
Error	Number	Description
	162000	Detecting the Active video succeeded.
	162001	Detecting the Active video failed.
	162002	This test is not applicable for current HW layout.
	162003	Could not retrieve hardware version from ASP.
Example	DS:> 1620 162000: Active video is ON Test OK @	

Nucleus Name	**DS_ASP_GlinkRcLoop**	
Nucleus Number	1621	
Description	Checks if an RC command can be transmitted via the G-Link connector and test if the sent command can be read back. The user must connect the G-Link to the rear G-Link connector and place the RC transmitter in front of the RC receiver of the front panel.	
Technical	- Send IR data to the ASP. - Check the RC input of the ASP.	
Execution Time	2 seconds.	
User Input	None	
Error	Number	Description
	162100	Detecting the Active video succeeded.
	162101	Sending RC command failed.
	162102	Receiving RC command failed.
	162103	No RC command was received
	162104	Could not retrieve hardware version from ASP

Example	`DS:> 1621`
	`162100:`
	`Test OK @`	

<table>
<tr><td>Nucleus Name</td><td>DS_ASP_VcrControl</td></tr>
<tr><td>Nucleus Number</td><td>1622</td></tr>
<tr><td>Description</td><td>This nucleus makes it possible to control the VCR module. It puts the VCR module into specified operation. It configures VCR play parameters. It configures VCR record parameters. It returns the status of the VCR module.</td></tr>
<tr><td>Technical</td><td>- Get the parameters from the user input and then execute the correct test</td></tr>
<tr><td>Execution Time</td><td>1 seconds.</td></tr>
<tr><td>User Input</td><td><Command> <parameters>
1 Command:

OPERATE:
<table>
<tr><th>User input</th><th>Meaning of value</th></tr>
<tr><td>0</td><td>Stop</td></tr>
<tr><td>1</td><td>Eject</td></tr>
<tr><td>2</td><td>Play</td></tr>
<tr><td>3</td><td>Pause</td></tr>
<tr><td>4</td><td>Fast Forward (FF)</td></tr>
<tr><td>5</td><td>Rewind (REW)</td></tr>
<tr><td>6</td><td>Slow</td></tr>
<tr><td>7</td><td>Enter Index Search</td></tr>
<tr><td>8</td><td>Forward Index Search</td></tr>
<tr><td>9</td><td>Reverse Index Search</td></tr>
<tr><td>10</td><td>Record (REC)</td></tr>
<tr><td>11</td><td>DVDR->VCR Dubbing Standby</td></tr>
<tr><td>12</td><td>VCR->DVDR Dubbing Standby</td></tr>
<tr><td>13</td><td>Start Dubbing</td></tr>
<tr><td>14</td><td>Cancel Dubbing</td></tr>
<tr><td>15</td><td>Reserved</td></tr>
<tr><td>16</td><td>Increase Tracking Value</td></tr>
<tr><td>17</td><td>Decrease Tracking Value</td></tr>
<tr><td>18</td><td>Restore Default Tracking Value</td></tr>
<tr><td>19</td><td>Cancel Tracking</td></tr>
<tr><td>20-31</td><td>Reserved</td></tr>
</table>
SETUPPLAY: (One byte)
<table>
<tr><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr>
<tr><td>N.U.</td><td colspan="3">HiFiAudioSelect</td><td colspan="2">SmartPicture</td><td colspan="2">Videosystem</td></tr>
</table>
VideoSystem: (Selects type of video system for playback.)
0 Auto
1 SECAM
2 PAL
3 ME-SECAM

SmartPicture: (Selects how video is enhanced during playback.)
0 Natural
1 Distinct
2 Soft
3 Sharp

HiFiAudioSelect: (type of audio for playback of recorded HiFi tape.)
0 Stereo left & right channels
1 Left channel only
2 Right channel only
3 Mono channel
4 Mixed left & right channels
5..7 Reserved

NotUsed:</td></tr>
</table>

User Input Continued

SETUPRECORD: (One Byte)

7	6	5	4	3	2	1	0
Not Used		T.E.	S.	M.A.	A.	VideoSys	

VideoSystem:
Selects type of video system to record.
Value range: [0..3]
Default value: 0
Meaning of values:
0 Auto
1 SECAM
2 PAL
3 ME-SECAM

Aspect:
Selects video aspect ratio during DVDR→VCR dubbing.
Value range: [0..1]
Default value: 0
Meaning of values:
0 4:3
1 16:9

MonoAudio:
Selects type of audio to record on monoaural audio track.
Value range: [0..1]
Default value: 0
Meaning of values:
0 Mixed left & right channels
1 Left channel only

Speed:
Selects tape speed for recording.
Value range: [0..1]
Default value: 0
Meaning of values:
0 SP
1 LP

TapeEnd:
Selects how tape end condition is handled during recording.
Value range: [0..1]
Default value: 0
Meaning of values:
0 Auto-rewind and go to Stop
1 Eject and go to Stop

NotUsed:

STATUS:
No Parameters needed

Error	Number	Description
	162200	succeeded.
	162201	The IIC bus failed.
	162202	The CRC checksum of the message is wrong.
	162203	Invalid parameter.

Example

```
DS:> 1622 operate 0
162200:
Test OK @
```

3.17 ANALOGUE BOARD EEPROM (AROM)

Nucleus Name	**DS_AROM_Communication**	
Nucleus Number	1700	
Description	Check the communication between the IIC controller of the Codec and the EEPROM	
Technical	- Initialise IIC - Read from a location in AROM	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	170000	Something is properly read so the communication is OK
	170001	The IIC bus was not accessible
	170002	There was a timeout reading the device
	170003	The IIC acknowledge was not received
	170004	The communication with the device failed
	170005	The IIC bus failed
	170006	The IIC bus initialisation failed

Example	`DS:> 1700`
	`170000:`
	`Test OK @`	

3.18 VIDEO MATRIX (VMIX)

Nucleus Name	**DS_VMIX_Communication**	
Nucleus Number	1800	
Description	This nucleus checks the communication between the IIC controller of the Codec and the Video Matrix on the analogue board	
Technical	- Try to read anything from the video matrix by means of IIC	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	180000	Communicating wit the Video Matrix succeeded
	180001	An IIC-bus error occurred
	180002	There was a timeout reading the device
	180003	The IIC bus was not accessible
	180004	The IIC acknowledge was not received
	180005	There was an IIC error upon the stop-condition
	180006	The IIC bus was chosen wrong
	180007	The IIC functionality is not running
	180008	An unknown error was returned

Example	`DS:> 1800`
	`180000:`
	`Test OK @`	

Nucleus Name	**DS_VMIX_Routing**	
Nucleus Number	1801	
Description	This nucleus performs the routing of the video signals in the set. It sets the video path according to the user input.	
Technical	- Determine whether the set is NAFTA/APAC or EUROPE - Switch the videomatrix according to the input specified by the user	
Execution Time	Less than 1 second.	
User Input	The user inputs the path Id of choice, as specified in tables below for Europe/NAFTA-APAC	
Error	Number	Description
	180100	Routing the video path succeeded
	180101	The user provided wrong input
	180102	There was no response from the video matrix
	180103	Could not retrieve region from analogue slave processor

Example	`DS:> 1801 00`
	`180100:`
	`Test OK @`	

Table 6: Available VIDEO path-Ids for EUROPE routing

EURO Path ID	Description
	(DbOut=Digital Board Output, DbIn = Digital Board Input)
00	DbOut-CVBS/YC/RGB to RearOut-CVBS/YC and Scart_1-RGB.
01	- DbOut-CVBS to RearOut-CVBS. - FrontIn-CVBS to DbIn-CVBS. - FrontIn-CVBS to VcrIn-CVBS. (If a VCR module is present)
02	- DbOut-YC to RearOut-YC. - FrontIn-YC to DbIn-YC.
03	- DbOut-CVBS to Scart_1-CVBS. - Scart_2-CVBS to DbIn-CVBS. - Scart_2-CVBS to VcrIn-CVBS. (If a VCR module is present)
04	- DbOut-YC to Scart_1-YC. - Scart_2-YC to DbIn-YC. - Scart_2-YC to VcrIn-YC. (If a VCR module is present)
05	- DbOut-RGB to Scart_1-RGB. - Scart_2-RGB to DbIn-RGB.
06	- DbOut-CVBS to RearOut-CVBS. - Tuner-CVBS to DbIn-CVBS. - Tuner-CVBS to VcrIn-CVBS. (If a VCR module is present)
07	- DbOut-CVBS to DbIn-CVBS. - DbOut-CVBS to VcrIn-CVBS. (If a VCR module is present
08	DbOut-PSCAN to RearOut-YUV.
09	DbOut-YUV to RearOut-YUV.
10	- DbOut-CVBS to Scart_2-CVBS. - Scart_1-CVBS to DbIn-CVBS.
11	- DbOut-YC to Scart_2-YC. - Scart_1-YC to DbIn-YC.
12	Scart_2-RGB to Scart_1-RGB.
13	Scart_2-CVBS to Scart_1-CVBS.
14	Scart_1-CVBS to Scart_2-CVBS.

Table 7: Available VIDEO path-Ids for NAFTA / APAC routing

NAFTA PathID	Description
	(DbOut=Digital Board Output, DbIn = Digital Board Input)
00	DbOut-CVBS/YC/YUV to RearOut-CVBS/YC/YUV.
01	- DbOut-CVBS to RearOut-CVBS. - FrontIn-CVBS to DbIn-CVBS.
02	- DbOut-YC to RearOut-YC. - FrontIn-YC to DbIn-YC.
03	- DbOut-CVBS to RearOut-CVBS. - RearIn-CVBS to DbIn-CVBS.
04	- DbOut-YC to RearOut-YC. - RearIn-YC to DbIn-YC.
05	- DbOut-YUV to RearOut-YUV. - RearIn-YUV to DbIn-YUV.
06	- DbOut-CVBS to RearOut-CVBS. - Tuner-CVBS to DbIn-CVBS.
07	DbOut-CVBS to DbIn-CVBS.
08	DbOut-PSCAN to RearOut-YUV.

Note	**Expert use only!**	
Nucleus Name	**DS_VMIX_Extended**	
Nucleus Number	1802	
Description	With this nucleus, possible problems in the factory can be worked around. It enables the user to switch the STV6618 to all possibilities provided by that chip. The routing is numbered in the following fashion: <**Reg. Addr**.><**Path**> This all is derived from the table in chapter 3 of the STV6618 datasheet: October 2001: Rev. 1.5. Page 14. Example: 1802 100 : First path of Reg.Addr. 1 will be set. Update afterwards needed in separate call. The path set in this example is DsVMixYCVBSIN_TV_TO_YCVBSOUT_AUX. Note: in determining path, skip the '**not allowed**' paths when counting Paths: Eg. Path 0104 = Mute Aux (scart2) Y/CVBS Path 0105 = Mute Aux (scart2) Chroma Path 0203 = RGB/YprPb_Aux to RGB/YprPb out **See tables below**	
Technical	- Parse the user input to determine the switching to perform and see if an update or reset is needed	
Execution Time	Less than 1 second	
User Input	The path number to set followed by a 1 if update to STV6618 is needed. Also 1802 followed by 'RESET' or 'UPDATE' do tricks. 1802 100 1 =>First path of sub address 1 will be set and updated. 1802 RESET =>STV6618 switched to defaults 1802 UPDATE => STV6618 switched to new path	
Error	Number	Description
	180200	The extended function succeeded
	180201	The extended function failed

Example	`DS:> 1802 100 1`
	`180200:`
	`Test OK @`	

Reg. Addr (Hex)	Description	Bits	Data								Comments	Path:
			d7	d6	d5	d4	d3	d2	d1	d0		
00	Recorder Y/CVBS Output Selection	3	X	X	X	X	X	0	0	0	Mute	0000
			X	X	X	X	X	0	0	1	YIN_ENC	0001
			X	X	X	X	X	0	1	0	CVBSIN_ENC	0002
			X	X	X	X	X	0	1	1	Y/CVBSIN_AUX	0003
			X	X	X	X	X	1	0	0	Y/CVBSIN_TV	0004
			X	X	X	X	X	1	0	1	YCVBSIN_TUN	0005
			X	X	X	X	X	1	1	0	Not allowed	
			X	X	X	X	X	1	1	1	Not allowed	
	TV Y/CVBS Output Selection	2	X	X	X	0	0	X	X	X	Y/CVBS_AUX	0006
			X	X	X	0	1	X	X	X	YIN_ENC	0007
			X	X	X	1	0	X	X	X	CVBSIN_ENC	0008
			X	X	X	1	1	X	X	X	Mute	0009
	DigOUT6 Control	1	0	X	X	X	X	X	X	X	0 = Low Level	0010
			1	X	X	X	X	X	X	X	1 = High Level	0011
01	AUX (SCART2) Y/CVBS Output Selection	3	X	X	X	X	X	0	0	0	Y/CVBSin_TV	0100
			X	X	X	X	X	0	0	1	YIN_ENC	0101
			X	X	X	X	X	0	1	0	CVBSIN_ENC	0102
			X	X	X	X	X	0	1	1	YCVBSIN_TUN	0103
			X	X	X	X	X	1	0	0	Mute	0104
			X	X	X	X	X	1	0	1	Not allowed	
			X	X	X	X	X	1	1	0	Not allowed	
			X	X	X	X	X	1	1	1	Not allowed	
	AUX (SCART2) Chroma Output Selection	2	X	X	X	0	0	X	X	X	Mute	0105
			X	X	X	0	1	X	X	X	CIN_ENC	0106
			X	X	X	1	0	X	X	X	CIN_TV	0107
			X	X	X	1	1	X	X	X	CIN_TUN	0108
	DigOUT5 Control	1	0	X	X	X	X	X	X	X	0 = Low Level	0109
			1	X	X	X	X	X	X	X	1 = High Level	0110

Figure 3-1 Signal routing table for sub-addresses 0 and 1

Reg. Addr (Hex)	Description	Bits	Data d7	d6	d5	d4	d3	d2	d1	d0	Comments	Path:
02	Fast Blanking Output Control	2	X	X	X	X	X	X	0	0	FBIN_AUX	200
			X	X	X	X	X	X	0	1	FB forced to Low Level	201
			X	X	X	X	X	X	1	0	FB forced to High Level	202
			X	X	X	X	X	X	1	1	Not allowed	
	RGB/YPrPb Output Selection	2	X	X	X	X	0	0	X	X	RGB/YPrPb_AUX	203
			X	X	X	X	0	1	X	X	RGB/YPrPb_ENC	204
			X	X	X	X	1	0	X	X	CIN_ENC (pin 6) at R/Pr/COUT_TV, B/PbOUT & G/YOUT muted	205
			X	X	X	X	1	1	X	X	RGB/YPrPb mute	206
	RGB or YPrPb or C Selection	2	X	X	0	0	0	0	X	X	RGB mode selection, bottom clamp at RGB inputs, AUX. input selected	207
			X	X	0	0	0	1	X	X	RGB mode selection, bottom clamp at RGB inputs, ENC. input selected	208
			X	X	0	1	0	0	X	X	CIN_AUX (pin 17)selected, average clamp at R/Pr/CIN_AUX input, GIN_AUX (bottom clamp) selected, BIN_AUX (bottom clamp) selected	209
			X	X	0	1	0	1	X	X	CIN_ENC (pin 9)selected, average clamp at R/Pr/CIN_ENC input, GIN_ENC (bottom clamp) selected, BIN_ENC (bottom clamp) selected	210
			X	X	1	0	0	0	X	X	YPrPb mode selection, sync pulse clamp at Pr Pb inputs, black clamp at Y input, AUX. input selected	211
			X	X	1	0	0	1	X	X	YPrPb mode selection, sync pulse clamp at Pr Pb inputs, black clamp at Y input, ENC. input selected	212
			X	X	1	1	0	0	X	X	YPrPb mode selection, delayed sync pulse clamp at Pr Pb inputs, black clamp at Y input, AUX. input select	213
			X	X	1	1	0	1	X	X	YPrPb mode selection, delayed sync pulse clamp at Pr Pb inputs, black clamp at Y input, ENC. input select	214
	RGB/YPrPb Control	2	0	0	X	X	X	X	X	X	RGB/YPrPb outputs active	215
			0	1	X	X	X	X	X	X	RGB/YPrPb outputs high imp state	216
			1	X	X	X	X	X	X	X	Red output active, Green and Blue high imp. state	217

Figure 3-2 Signal routing table for sub-address 2

Reg. Addr (Hex)	Description	Bits	Data d7	d6	d5	d4	d3	d2	d1	d0	Comments	Path:
03	C_Gate Output Control	1	X	X	X	X	X	X	X	0	Low Level	300
			X	X	X	X	X	X	X	1	High Level	301
	DIGOUT1	2	X	X	X	X	X	0	X	X	Low Level	302
			X	X	X	X	X	1	0	X	Mid Level	303
			X	X	X	X	X	1	1	X	High Level	304
	DIGOUT2	2	X	X	X	0	X	X	X	X	Low Level	305
			X	X	X	1	0	X	X	X	Mid Level	306
			X	X	X	1	1	X	X	X	High Level	307
	DIGOUT3	2	X	0	X	X	X	X	X	X	Low Level	308
			X	1	0	X	X	X	X	X	Mid Level	309
			X	1	1	X	X	X	X	X	High Level	310
	DIGOUT4 Control	1	0	X	X	X	X	X	X	X	0 = Low Level	311
			1	X	X	X	X	X	X	X	1 = High Level	312
04	ENC Inputs	1	X	X	X	X	X	X	X	0	Inputs Active	400
			X	X	X	X	X	X	X	1	Inputs Disabled	401
	TUN Inputs	1	X	X	X	X	X	X	0	X	Inputs Active	402
			X	X	X	X	X	X	1	X	Inputs Disabled	403
	TV Inputs	1	X	X	X	X	X	0	X	X	Inputs Active	404
			X	X	X	X	X	1	X	X	Inputs Disabled	405
	AUX Inputs	1	X	X	X	X	0	X	X	X	Inputs Active	406
			X	X	X	X	1	X	X	X	Inputs Disabled	407
	REC Outputs	1	X	X	X	0	X	X	X	X	Y/CVBSOUT_REC Outputs ON	408
			X	X	X	1	X	X	X	X	Y/CVBSOUT_REC Outputs OFF	409
	AUX Outputs	1	X	X	0	X	X	X	X	X	Y/CVBSOUT_AUX Outputs ON	410
			X	X	1	X	X	X	X	X	Y/CVBSOUT_AUX Outputs OFF	411
	COUT_AUX Output	1	X	0	X	X	X	X	X	X	COUT_AUX Outputs ON	412
			X	1	X	X	X	X	X	X	COUT_AUX Outputs OFF (high imped.)	413
	TV Outputs	1	0	X	X	X	X	X	X	X	TV Video Outputs ON	414
			1	X	X	X	X	X	X	X	TV Video Outputs OFF	415
	Full Stop	8	1	1	1	1	1	1	1	1	Only I²C bus supplied, and digital outputs	416

Figure 3-3 Signal routing table for sub-addresses 3 and 4

Nucleus Name	**DS_VMIX_FastBlankingCheck**	
Nucleus Number	1803	
Description	Check if the Fast Blanking signal can be set low and high. The user must connect SCART2 (pin16) to SCART1 (pin16) on the outside of the set. Works on EURO sets only.	
Technical	- Set the Fast blanking pin of the Video Matrix low - Measure the value on the ASP Fast blanking input ADC - Set the Fast blanking pin of the Video Matrix high - Measure the value on the ASP Fast blanking input ADC	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	180300	Detecting Fast blanking signal succeeded
	180301	Detecting Fast blanking signal failed
	180302	This test is not applicable for current HW layout
	180304	Could not retrieve hardware version from AS

Example	`DS:> 1803`
	`180300:`
	`Test OK @`	

Nucleus Name	**DS_VMIX_8SC2Check**	
Nucleus Number	1804	
Description	Check if the 8SC2 signal (slow blanking) can be set low, medium and high. The user must connect SCART2 (pin8) to SCART1 (pin8) on the outside of the set. Works on EURO sets only.	
Technical	- Set the Digital out 3 pin of the Video Matrix low - Measure the value on the ASP 8SC2 input ADC - Set the Digital out 3 pin of the Video Matrix to medium level - Measure the value on the 8SC2 input ADC - Set the Digital out 3 pin of the Video Matrix high - Measure the value on the ASP 8SC2 input ADC	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	180400	Detecting 8SC2 signal succeeded
	180401	Detecting 8SC2 signal failed
	180402	This test is not applicable for current HW layout
	180403	Could not retrieve hardware version from AS

Example	`DS:> 1804`
	`180400:`
	`Test OK @`	

Nucleus Name	**DS_VMIX_WideScreenSignallingCheck**	
Nucleus Number	1805	
Description	Check if the wide screen signal can be set low and high The user must specify if he uses the Rear In-YC or the Front In-YC. Before starting this nucleus, Rear Out-YC must be connected to Rear In-YC to Front In-YC. Works on NAFTA and APAC sets only.	

Technical	- Check user input
	- In case of Rear In YC
	  - Set the Digital out 5 & 6 pin of the Video Matrix low
	  - Measure the value on the ASP AIN0 input ADC
	  - Set the Digital out 5 to HIGH and 6 to LOW
	  - Measure the value on the ASP AIN0 input ADC
	- In case of Front In YC
	  - Set the Digital out 5 to HIGH and 6 to LOW
	  - Measure the value on the ASP AIN1 input ADC
	  - Set the Digital out 5 to HIGH and 6 to HIGH
	  - Measure the value on the ASP AIN1 input ADC	

Execution Time	Less than 1 second	
User Input	The route to check i.e. - "REAR": to test the Rear In-YC - "FRONT": to test the Front In-YC	
Error	Number	Description
	180400	Detecting wide screen signal succeeded
	180401	Detecting wide screen signal failed
	180402	This test is not applicable for current HW layout
	180403	Could not retrieve hardware version from ASP
	180404	Invalid user input

Example	`DS:> 1805 rear`
	`180500:`
	`Test OK @`	

3.19 AUDIO MATRIX (SOUND PROCESSOR) (AMIX)

Nucleus Name	**DS_AMIX_Communication**	
Nucleus Number	1900	
Description	This nucleus checks the communication between the IIC controller of the Codec and the Audio Matrix (sound processor) on the analogue board	
Technical	- Test whether anything can be read from the sound processor	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	190000	Communicating wit the Audio Matrix succeeded
	190001	An IIC-bus error occurred
	190002	There was a timeout reading the device
	190003	The IIC bus was not accessible
	190004	The IIC acknowledge was not received
	190005	There was an IIC error upon the stop-condition
	190006	The IIC bus was chosen wrong
	190007	The IIC functionality is not running
	190008	An unknown error was returned

Example	`DS:> 1900`
	`190000:`
	`Test OK @`	

Nucleus Name	**DS_AMIX_Routing**	
Nucleus Number	1901	
Description	This nucleus performs the routing of the audio signals in the set. It sets the audio path according to the user input.	
Technical ASP	- Determine whether the set is of type NAFTA-APAC or EUROPE - Parse the user input to determine the routing - According to parameters set the sound processor and multiplexers	
Technical MCU	- Determine whether the set is of type NAFTA-APAC or EUROPE - Configure the UDA1380 - Parse the user input to determine the routing - According to parameters set the sound processor and multiplexers	
Execution Time	Less than 1 second.	
User Input	The user inputs the path ID of his/her choice, as specified in tables below for Europe/NAFTA	
Error	Number	Description
	190100	Routing the audio path succeeded
	190101	Routing the audio path failed
	190102	There was an error resetting the sound processor
	190103	The user provided wrong input
	190104	There was no response from the ASP

Example	`DS:> 1901 00`
	`190100:`
	`Test OK @`	

Table 8: Available AUDIO path-Ids for EUROPE routing

EURO Path ID	Description
	(DbOut=Digital Board Output, DbIn = Digital Board Input)
00	DbOut to All Outs.
01	- DbOut to RearOut for CVBS/YC, and RearOut for YUV. - FrontIn to DbIn. - FrontIn to VcrIn. (If a VCR module is present)
02	- DbOut to Scart_1-AOut. - Scart_2-AIn to DbIn. - Scart_2-AIn to VcrIn. (If a VCR module is present)
03	- DbOut to Scart_2-AOut. - Scart_1-AIn to DbIn. - Scart_1-AIn to VcrIn. (If a VCR module is present)
04	- DbOut to RearOut for CVBS/YC. - Tuner to DbIn. - Tuner to VcrIn. (If a VCR module is present)
05	DbOut to RearOut-5.1.
06	DbOut to DbIn
07	Scart_2-AIn to Scart_1-AOut.
08	Scart_1-AIn to Scart_2-AOut.
09	VcrOut to DbIn (If a VCR module is present)

Table 9: Available AUDIO path-Ids for NAFTA / APAC routing

NAFTA PathID	Description
	(DbOut=Digital Board Output, DbIn = Digital Board Input)
00	DbOut to All Outputs.
01	- DbOut to RearOut for CVBS/YC, and RearOut for YUV. - FrontIn to DbIn.
02	- DbOut to RearOut for CVBS/YC, and RearOut for YUV. - RearIn1 (**EXT2**) for CVBS/YC to DbIn.
03	- DbOut to RearOut for CVBS/YC, and RearOut for YUV. - RearIn2 (**EXT1**) for YUV to DbIn.
04	- DbOut to RearOut for CVBS/YC, and RearOut for YUV. - Tuner to DbIn.
05	DbOut to RearOut-5.1.
06	DbOut to DbIn.

Nucleus Name	**DS_AMIX_VersionGet**	
Nucleus Number	1902	
Description	This nucleus gets the version information from the sound processor.	
Technical	- Read the information from the sound processor using IIC	
Execution Time	Less than 1 second	
User Input	-	
Error	Number	Description
	190200	Getting the version info from the sound processor succeeded
	190201	Getting the version info from the sound processor failed
Example	DS:> 1902 Hardware Version:0x 2, Revision Code :0x 7 MSP Product Code:0x19, ROM Version Code:0x48 190200: Test OK @	

Nucleus Name	**DS_AMIX_Control**	
Nucleus Number	1903	
Description	Test the controllability of the sound processor by performing a controlled reset	
Technical	Test the control register, contains 0x80 after reset and 0x0 after first read of this control register. MSP is reset and the control register is tested for the 0x80 reset indication	
Execution Time	1 second	
User Input	None	
Error	Number	Description
	190300	Testing the controllability succeeded
	190301	Accessing the MSP failed
	190302	Accessing the MSP succeeded, but wrong data was returned

Example	`DS:> 1903`
	`190300:`
	`Test OK @`	

Note	**European sets only !!**	
Nucleus Name	**DS_AMIX_Beep**	
Nucleus Number	1904	
Description	Test the beeper functionality of the sound processor	
Technical	-	
Execution Time	3 seconds	
User Input	'ON' or 'OFF'	
Error	Number	Description
	190400	Testing the beeper succeeded
	190401	Testing the beeper failed
	190402	There was an error routing the test path
	190402	The user provided the wrong input

Example	`DS:> 1904 ON`
	`190400:`
	`Test OK @`	

Note:	**Expert use only!**	
Nucleus Name	**DS_AMIX_Extended**	
Nucleus Number	1905	
Description	This nucleus extends the functionality implemented in the AMIX tests. With this nucleus it is possible to access the MSP registers directly. **Expert use only!!**	
Technical	- Parse the user input and determine which routing to perform - Perform the routing through the sound processor, the multiplexers or the ASP	
Note	This information is retrieved from the preliminary data sheet 'MSP34X5G Multi-standard Sound Processor Family', March 5, 2001, 6251-480-3PD, Micronas.	
Execution Time	- Less than 1 second.	

User Input	The following possibilities are supported :
	`1905 W DSP 0xaddress 0xdata: Write data to DSP address`
	`1905 R DEM 0xaddress : Read data from Demodulator address`
	`1905 W CTL 0xdata : Write data to control register`
	`1905 R CTL : Read data from control register`
	`1905 SA 2 : Switch HEF4052 at position 7501 to HL`
	`1905 SB 2 : Switch HEF4052 at position 7504 to HL`
	`1905 ASP init : Initialise the ASP`
	`1905 ASP ASC1 1 : Switch the ASC1 line high`
	`1905 ASP IMUTE 1 : Switch the IMUTE line high`	

Error	Number	Description
	190500	The extended function succeeded
	190501	The extended function failed

Example	`DS:> 1905 SA 1`
	`190500:`
	`Test OK @`	

Nucleus Name	**DS_AMIX_CommunicationAdcDac**	
Nucleus Number	1906	
Description	This nucleus checks the communication between the IIC controller of the Codec and the ADC/DAC chip (UDA 1380) on the analogue board	
Technical	- Test whether anything can be read from the ADC/DAC	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	190600	Communicating with the ADC/DAC succeeded
	190601	The IIC bus was not accessible
	190602	There was a timeout reading the device
	190603	The IIC acknowledge was not received
	190604	An IIC-bus error occurred
	190605	Got unknown IIC bus error
	190606	The IIC bus initialisation failed

Example	`DS:> 1906`
	`190600:`
	`Test OK @`	

Nucleus Name	**DS_AMIX_Mute**	
Nucleus Number	1907	
Description	Set or unset the master mute of the ADC/DAC chip (UDA 1380) on the analogue board	
Technical	- Send the master mute command via IIC	
Execution Time	Less than 1 second.	
User Input	'ON' or 'OFF'	
Error	Number	Description
	190700	Muting the sound processor succeeded
	190701	Muting sound processor failed

Example	`DS:> 1907`
	`190700:`
	`Test OK @`	

3.20 FRONTEND (TUNER) (FRE)

Nucleus Name	**DS_FRE_Communication**	
Nucleus Number	2000	
Description	This nucleus checks the communication between the IIC controller of the Codec and the Front End (Tuner) on the analogue board	
Technical	- Determine whether anything can be read from the FRE through IIC	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	200000	Communicating with the front end succeeded
	200001	The IIC bus was not accessible
	200002	There was a timeout reading the device
	200003	The IIC acknowledge was not received
	200004	An IIC-bus error occurred
	200005	Got unknown IIC bus error
	200006	The IIC bus initialisation failed

Example	`DS:> 2000`
	`200000:`
	`Test OK @`	

<table>
<tr><td>Nucleus Name</td><td colspan="3">DS_FRE_ChannelSelect</td></tr>
<tr><td>Nucleus Number</td><td colspan="3">2001</td></tr>
<tr><td>Description</td><td colspan="3">This nucleus sets the tuner to receive a valid audio and video signal</td></tr>
<tr><td>Technical</td><td colspan="3">- Parse the user input to determine all parameters to set
- Pass these parameters to the respective parts using IIC</td></tr>
<tr><td>Execution Time</td><td colspan="3">Less than 1 second</td></tr>
<tr><td>User Input</td><td colspan="3"><Frequency*16> <video standard id> <Tuner>

Tuner frequency: to tune the tuner to e.g. 216 MHz, this parameter must be 3456. (Since 216*16 = 3456. This is to avoid the decimal points to the parameter list.)

<table>
<tr><th>Name</th><th>Colour system</th><th>Transmission standard</th><th>Sound modulation</th></tr>
<tr><td>PAL_BG_S</td><td>PAL</td><td>BG</td><td>FM-Stereo</td></tr>
<tr><td>PAL_BG_M</td><td>PAL</td><td>BG</td><td>FM-Mono / NICAM</td></tr>
<tr><td>PAL_I_M</td><td>PAL</td><td>I</td><td>FM-Mono / NICAM</td></tr>
<tr><td>PAL_DK_S</td><td>PAL</td><td>DK</td><td>FM-Stereo</td></tr>
<tr><td>PAL_DK_M</td><td>PAL</td><td>DK</td><td>FM-Mono / NICAM</td></tr>
<tr><td>NTSC_M_S</td><td>NTSC</td><td>M</td><td>FM-Stereo</td></tr>
</table>

Video Standard ID: The table below shows which video standards are possible
<table>
<tr><th>ID</th><th>Europe</th><th>Nafta / Apac</th></tr>
<tr><td>0</td><td>PAL_BG_S</td><td>NTSC</td></tr>
<tr><td>1</td><td>PAL_BG_M</td><td>Invalid</td></tr>
<tr><td>2</td><td>PAL_I_M</td><td>Invalid</td></tr>
<tr><td>3</td><td>PAL_DK_S</td><td>Invalid</td></tr>
<tr><td>4</td><td>PAL_DK_M</td><td>Invalid</td></tr>
</table>

Tuner: Select the tuner type that you want to tune. This input is not mandatory. (If no input is detected, tuner will be defined run-time (if recognised).)

<table>
<tr><th>Tuner</th><th>Tuner ID</th><th>Runtime Detected</th></tr>
<tr><td>1</td><td>FE1316 (Europe Philips)</td><td>V</td></tr>
<tr><td>2</td><td>FE1319 (Europe Philips)</td><td>V</td></tr>
<tr><td>3</td><td>TMQZ2-403A (Europe ALPS)</td><td></td></tr>
<tr><td>4</td><td>JS6B2-L121 (Europe Xuguang)</td><td></td></tr>
<tr><td>5</td><td>TCPK0601 (APAC Samsung)</td><td></td></tr>
<tr><td>6</td><td>TCMN0682 (NAFTA Samsung)</td><td>V</td></tr>
<tr><td>7</td><td>TCPK0600 (APAC Samsung)</td><td></td></tr>
<tr><td>8</td><td>TCPD0601 (APAC Samsung)</td><td></td></tr>
<tr><td>9</td><td>VPC12R_ENG56PPG1F (Panasonic)</td><td></td></tr>
</table>
</td></tr>
<tr><td>Error</td><td>Number</td><td colspan="2">Description</td></tr>
<tr><td></td><td>200100</td><td colspan="2">Setting the tuner channel succeeded</td></tr>
<tr><td></td><td>200101</td><td colspan="2">Invalid user input</td></tr>
<tr><td></td><td>200102</td><td colspan="2">Getting the version of the set failed</td></tr>
<tr><td></td><td>200103</td><td colspan="2">Configuration of the tuner failed</td></tr>
<tr><td></td><td>200104</td><td colspan="2">Configuration of the IF module failed</td></tr>
<tr><td>Example</td><td colspan="3">DS:> 2001 3456 0 1
200100:
Test OK @</td></tr>
</table>

<table>
<tr><td>Note</td><td colspan="2">European sets only!!</td></tr>
<tr><td>Nucleus Name</td><td colspan="2">DS_FRE_CommunicationIfModule</td></tr>
<tr><td>Nucleus Number</td><td colspan="2">2003</td></tr>
<tr><td>Description</td><td colspan="2">This nucleus checks the communication with the IF(Intermediate Frequency) module of the front end</td></tr>
<tr><td>Technical</td><td colspan="2">- Determine whether the IF module can be read through IIC</td></tr>
<tr><td>Execution Time</td><td colspan="2">Less than 1 second</td></tr>
<tr><td>User Input</td><td colspan="2"><Tuner>

Tuner: Select the tuner type that you want to tune. This input is not mandatory. (If no input is detected, tuner will be defined run-time (if recognised).)

<table>
<tr><th>Tuner</th><th>Tuner ID</th><th>Runtime Detected</th></tr>
<tr><td>1</td><td>FE1316 (Europe Philips)</td><td>V</td></tr>
<tr><td>2</td><td>FE1319 (Europe Philips)</td><td>V</td></tr>
<tr><td>3</td><td>TMQZ2-403A (Europe ALPS)</td><td></td></tr>
</table></td></tr>
<tr><td>Error</td><td>Number</td><td>Description</td></tr>
<tr><td></td><td>200300</td><td>Communicating with the front end succeeded</td></tr>
<tr><td></td><td>200301</td><td>The IIC bus was not accessible</td></tr>
<tr><td></td><td>200302</td><td>There was a timeout reading the device</td></tr>
<tr><td></td><td>200303</td><td>The IIC acknowledge was not received</td></tr>
<tr><td></td><td>200304</td><td>An IIC-bus error occurred</td></tr>
<tr><td></td><td>200305</td><td>Got unknown IIC bus error</td></tr>
<tr><td></td><td>200306</td><td>The IIC bus initialisation failed</td></tr>
<tr><td></td><td>200307</td><td>Not a Europe set</td></tr>
<tr><td>Example</td><td colspan="2">DS:> 2003 3
200300:
Test OK @</td></tr>
</table>

3.21 HARD DISK DRIVE (HDD)

Nucleus Name	**DS_HDD_Communication**	
Nucleus Number	2100	
Description	Check the communication between the digital board and the hard disk drive by querying the device type of the hard disk drive	
Technical	- Initialise/start IDE - Check for an ATA device on the IDE interface	
Execution Time	3 seconds	
User Input	None	
Error	Number	Description
	210000	Communication with the hard disk drive succeeded
	210001	The initialisation of IDE failed
	210002	Communication with the hard disk drive failed
Example	DS:> 2100 210000: Found a hard disk drive: MASTER device on IDE interface 1 Test OK @	

Nucleus Name	**DS_HDD_Reset**	
Nucleus Number	2101	
Description	Reset the hard disk drive	
Technical	- Initialise/start IDE - Check for an ATA device on the IDE interface - Toggle the IDE reset pin of the selected interface	
Execution Time	1 second	
User Input	None	
Error	210100	Resetting the hard disk drive succeeded
	210101	The initialisation of IDE failed
	210102	Communication with the hard disk drive failed
	210103	Failed to reset the hard disk drive
Example	DS:> 2101 210100: Resetting IDE interface 1 succeeded Test OK @	

Nucleus Name	**DS_HDD_VersionGet**	
Nucleus Number	2102	
Description	Get the vendor- and product identification and the product revision level of the hard disk drive	
Technical	- Initialise/start IDE - Send ATA command IDENTIFY DRIVE - Display the serial, firmware revision and model information	
Execution Time	Less than 1 second.	
User Input	None	
Error	210200	Version info successfully
	210201	The initialisation of IDE failed
	210202	Communication with the hard disk drive failed
	210203	Failed to get version info from the hard disk drive
Example	DS:> 2102 210200: Serial number = F19LP8WE,Firmware rev. = VAM51JJ0 ,Model nu mber = Maxtor 2F040L0 Test OK @	

Nucleus Name	**DS_HDD_WriteRead**	
Nucleus Number	2103	
Description	Write data to the hard disk, read it back and verify the data read back.	
Technical	- Initialise/start IDE - Generate a random sector number - Generate test data to write to the disk - Read the data from the sector using READ_SECTOR(S) and store this in a temporarily buffer - Transfer the test data to the disk location using ATA command WRITE_SECTOR(S) - Read back the data from the disk location using ATA command READ_SECTOR(S) - Compare the two data areas and check whether the areas are equal - Write back the data from the temporarily buffer	
Execution Time	3 seconds	
User Input	None	
Error	210300	Version info successfully
	210301	The initialisation of IDE failed
	210302	Communication with the hard disk drive failed
	210303	Unable to retrieve device capabilities from HDD
	210304	Writing data to HDD failed
	210305	Reading back data from HDD failed
	210306	Data read back did not equal written data

Example	`DS:> 2103`
	`210300: OK, writing to sector 3f95776`
	`Test OK @`	

Nucleus Name	**DS_HDD_CapabilitiesGet**	
Nucleus Number	2104	
Description	Get the cylinders, heads and track information of the hard disk drive	
Technical	- Initialise/start IDE - Send ATA command Identify drive information - Display all required capabilities	
Execution Time	Less than 1 second.	
User Input	None	
Error	210400	Capabilities are displayed correctly
	210401	The initialisation of IDE failed
	210402	Communication with the hard disk drive failed
	210403	Failed to get information from the hard disk drive

Example	`DS:> 2104`
	`Number of cylinders 16383`
	`Number of heads 16`
	`Number of sectors per track 63`
	`Capacity in sectors 80293248`
	`Number of current cylinders 16383`
	`Number of current heads 16`
	`Number of current sectors per track 63`
	`Current capacity in sectors 16514064`
	`Number of unformatted bytes per track 0`
	`Number of unformatted bytes per sector 0`
	`210400:`
	`Test OK @`	

Nucleus Name	**DS_HDD_Diagnostics**	
Nucleus Number	2105	
Description	Shall perform the internal diagnostic tests implemented by the hard disk drive.	
Technical	- Initialise/start IDE - Send the diagnostic (ATA) command to the HDD device	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	210500	The Diagnostic test on the hard disk drive device succeeded
	210501	The initialisation of IDE failed
	210502	The hard disk drive failed
	210503	The diagnostics ATA command failed

Example	`DS:> 2105`
	`210500:`
	`Test OK @`	

Nucleus Name	**DS_HDD_UploadImage**	
Nucleus Number	2106	
Description	Upload raw data from the HDD to a DVD+RW	
Technical	- Initialise/start IDE - Check for an ATA device on the IDE interface - Check for an ATAPI DVD+RW drive - Calibrate the DVD+RW laser - Repeat until transfer is completed - Read x MB from HDD source sector into SDRAM - Write x MB from SDRAM to the destination sector on DVD+RW - Read sector 0x34000 on DVD containing the transfer table to use - Update the contents of the table and write it back	
Execution Time	Depending on the number of sectors to transfer it may take approximately 2 MB per second.	
User Input	The user can enter 3 parameters in the next format: <COMMAND> <HDD sector> <nr of HDD sectors> <COMMAND> is one of the next strings: • NEW: Create a new transfer image table, <HDD sector> and <nr of HDD sectors> must be entered. The tray of the DVD drive is sent out an the user is asked to insert a DVD+RW • ADD: Add a section to the current transfer table, <HDD sector> and <nr of HDD sectors> must be entered • READ: Read the current transfer image table from the DVD. The tray of the DVD drive is sent out an the user is asked to insert a DVD+RW • VIEW: View the contents of the current transfer table • GO: Copy data from the HDD to the DVD+RW according to the currently entered transfer table <HDD sector> = the sector on HDD to start reading from <HDD sectors> = the number of HDD sectors to transfer	
Error	Number	Description
	210600	Uploading image succeeded
	210601	The initialisation of IDE failed
	210602	Communication with the hard disk drive failed
	210603	Communication with the AV3 failed
	210604	No DVD+RW is available
	210605	Calibrating DVD+RW failed
	210607	Error while reading image data from HDD
	210608	Error while writing image to DVD+RW
	210609	Unable to update the transfer table on the DVD+RW

Example

```
DS:> 2106
210605: Invalid user input
Error @

DS:> 2106 READ
Please insert a writable DVD+RW
210609: Unable to update transfer table
Error @

DS:> 2106 NEW 0x1 2048
Creating new transfer table
Adding entry 1 to transfer table
Length 1 entries
210605:  NEW 0X1 2048
Test OK @

DS:> 2106 VIEW
Length 1 entries
Entry 1:
  hddPosition  : 0x1
  nrHddSectors : 0x800
  dvdPosition  : 0x34040
  nrDvdSectors : 0x200
210605:  VIEW
Test OK @

DS:> 2106 ADD 0x2001 20480
Adding entry 2 to transfer table
Length 2 entries
210605:  ADD 0X2001 20480
Test OK @

DS:> 2106 GO
Please insert a writable DVD+RW
Executing transfer table 1 of 1, size 1048576 bytes (=1 MB)
Calibrating laser of DVD drive
Start creating image on DVD at 0x34040. Checking ... <OK>
210600: Transfer OK
Test OK @
```

Nucleus Name	**DS_HDD_DownloadImage**	
Nucleus Number	2107	
Description	Download a raw image from a DVD+RW disc to the hard disc drive. This image will be written on the hard disc drive.	
Technical	- Initialise/start IDE - Check for an ATA device on the IDE interface - Check for an ATAPI DVD+RW drive - Mount the DVD containing the image to transfer - Read sector x containing the transfer table to use - Read the source sector, destination sector and transfer length from the transfer table - Repeat until transfer is completed - Read x MB from DVD source sector into SDRAM - Write x MB from SDRAM to the destination sector on HDD	
Execution Time	Assumption based on 4.3GB data → 11 movies of 3 minutes. 33 minutes	
User Input	Actions: The tray of the DVD drive is sent out and the user is asked to insert a DVD+RW	
Error	Number	Description
	210700	Downloading image succeeded
	210701	The initialisation of IDE failed
	210702	Communication with the hard disk drive failed
	210703	Communication with the AV3 failed
	210704	No disc is available
	210705	Invalid medium is mounted
	210706	Unable to read the transfer table from DVD
	210707	Error while reading image from DVD
	210708	Error while writing image to HDD

Example	DS:> 2107
	Please insert the Master DVD <OK>
	Executing transfer table 1 of 4
	524288 bytes
	  Dvd Sector 0x50000
	  Dvd Sector Count 256
	  Hdd Sector 0x40000
	  Hdd Sector Count 1024
	please wait ..<OK>
	Executing transfer table 2 of 4
	10485760 bytes (=10 MB)
	  Dvd Sector 0x70000
	  Dvd Sector Count 5120
	  Hdd Sector 0x60000
	  Hdd Sector Count 20480
	please wait ..<OK>
	Executing transfer table 3 of 4
	524288 bytes
	  Dvd Sector 0x50000
	  Dvd Sector Count 256
	  Hdd Sector 0x40000
	  Hdd Sector Count 1024
	please wait ..<OK>
	Executing transfer table 4 of 4
	524288 bytes
	  Dvd Sector 0x50000
	  Dvd Sector Count 256
	  Hdd Sector 0x40000
	  Hdd Sector Count 1024
	please wait ..<OK>
	210700: Transfer OK
	Test OK @	

Nucleus Name	**DS_HDD_RandomReadScan**	
Nucleus Number	2108	
Description	Perform a short random read scan of x times 1000 commands (x is selectable between 1 to 20) to test the servo. If anything would be wrong with the servo or tracking, the result would be too slow. Recheck the LBA addresses that caused the disc to fail in order to avoid incorrect failure caused by shock or vibrations during the measurement.	

Technical	- Initialise the HDD connection
	- Get the user input
	- Generate a random sequence of test sectors
	- For every sector in the random sequence do
	  - Read 1000 sectors and measure the time to perform this action
	  - Update a list of statistics about the measurement
	- Display statistical information about the test sequence
	- If more than 10% above 160 ms and/or more than 1 request in between 200 & 250ms and/or requests above 250 ms make the result of the test fail.	

Execution Time	Depending on the user input x times 4 minutes	
User Input	parameters in the next format: <nr_cmds><GRAPH> - Number of commands to send (in multiples of 1000), if no input is given 1000 commands will be sent - "GRAPH" optional to print out the measured read scan graph	
Error	Number	Description
	210800	Communication with the hard disk drive succeeded
	210801	The initialisation of the HDD failed
	210802	Invalid user input
	210803	Performance failure: more than 10% above 160 ms and/or more than 1 request in between 200 & 250ms and/or requests above 250 msec
	210804	Read error, unable to read a specified sector from disc

Example	`DS:> 2108 1`
	`210800:`
	`Minimum access time = 142 msec`
	`Maximum access time = 159 msec`
	`Average access time = 146 msec`
	`Number of commands below 160 msec = 1000`
	`Number of commands between 160 and 200 msec = 0`
	`Number of commands between 200 and 250 msec = 0`
	`Number of commands above 250 = 0`
	`Test OK @`	

<table>
<tr><td>Nucleus Name</td><td colspan="2">DS_HDD_LinearSurfaceScan</td></tr>
<tr><td>Nucleus Number</td><td colspan="2">2109</td></tr>
<tr><td>Description</td><td colspan="2">Perform a linear surface scan so that most of the disc is covered.</td></tr>
<tr><td>Technical</td><td colspan="2">- Initialise the HDD connection
- Get the user input
- Generate a sequence of test sectors according to the user input
- For every sector in the sequence do
- Read the sector and measure the time to perform this action
- Update a list of statistics about the measurement
- Display statistical information about the test sequence
- If more than 1% above 100 ms and/or more than 0.1% above 200 msec and/or requests above 300 msec make the result of the test fail.</td></tr>
<tr><td>Execution Time</td><td colspan="2">Depending on the user input and HDD size</td></tr>
<tr><td>User Input</td><td colspan="2">parameters in the next format:
<SECTORS> <STEP> <LOW> <HIGH>
where
- SECTORS: Specifies the number of sectors to read in each access
- STEP: Specifies the step (in sectors) between each access.
- LOW: The start sector address of an explicit range of LBA addresses to be used for testing. If no value is entered LBA 0 will be used
- HIGH: The end sector address of an explicit range of LBA addresses to be used for testing. If no value is entered the maximum LBA will be used.
The user must enter either no parameter or all parameters
If no parameters are entered the next defaults will be used:
1000 sector each access, steps of 1000 sectors and an address range from 0 to the maximum LBA</td></tr>
<tr><td>Error</td><td>Number</td><td>Description</td></tr>
<tr><td></td><td>210900</td><td>Communication with the hard disk drive succeeded</td></tr>
<tr><td></td><td>210901</td><td>The initialisation of the HDD failed</td></tr>
<tr><td></td><td>210902</td><td>Invalid user input</td></tr>
<tr><td></td><td>210903</td><td>Performance failure: more than 10% above 160 ms and/or more than 1 request in between 200 & 250ms and/or requests above 250 msec</td></tr>
<tr><td></td><td>210904</td><td>Read error, unable to read a specified sector from disc</td></tr>
<tr><td>Example</td><td colspan="2"><pre>DS:> 2109 1000 1000 0 100000
210900:
Executed 100 linear seeks of 1000 sectors each
Minimum access time = 141 msec
Maximum access time = 148 msec
Average access time = 141 msec
Number of commands below 160 msec = 100
Number of commands between 160 and 200 msec = 0
Number of commands between 200 and 250 msec = 0
Number of commands above 250 = 0
Test OK @</pre></td></tr>
</table>

Nucleus Name	**DS_HDD_SpinOff**	
Nucleus Number	2110	
Description	Put the HDD in parking position by sending the sleep command so it can be moved without endangering the mechanical parts	
Technical	- Initialise/start IDE - Send the Sleep (ATA) command to the HDD device	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	211000	The spin off of the hard disk drive device succeeded
	211001	The initialisation of IDE failed
	211002	The hard disk drive failed
	211003	The sleep ATA command failed
Note	**All other HDD nuclei will not work until DS_HDD_Reset is executed**	

Example	`DS:> 2110`
	`211000:`
	`Test OK @`	

Nucleus Name	**DS_HDD_SectorRead**	
Nucleus Number	2111	
Description	Read 512 bytes from a specified sector on HDD	
Technical	- Get the user input - Read the data from the sector using READ_SECTOR(S) and display the contents	
Execution Time	Less than 1 second.	
User Input	3 parameters in the next format: <sector> <offset> <length> where - sector is the sector to read from - offset is the byte-offset in the sector buffer (0 .. 256) - length the length (in bytes) of the data to display (1 .. 256)	
Error	Number	Description
	211100	Reading from HDD succeeded
	211101	Invalid user input
	211102	The initialisation of IDE failed
	211103	The hard disk drive failed
	211104	The read command failed

Example	`DS:> 2111 0x80001 0 128`
	`211100:`
	`0x00 : 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF`
	`0x08 : 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF`
	`0x10 : 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF`
	`0x18 : 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF`
	`0x20 : 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF`
	`0x28 : 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF`
	`0x30 : 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF`
	`0x38 : 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF`
	`0x40 : 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF`
	`0x48 : 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF`
	`0x50 : 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF`
	`0x58 : 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF`
	`0x60 : 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF`
	`0x68 : 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF`
	`0x70 : 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF`
	`0x78 : 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF`
	
	`Test OK @`	

Nucleus Name	**DS_HDD_SetPower**	
Nucleus Number	2112	
Description	Set the power of the HDD On or Off	
Technical	- Get user input - Set the IDE1_POWER PIO line to the desired value	
Execution Time	Less than 1 second.	
User Input	1 parameter: "ON" , enables the power of the HDD "OFF" , turn off the power of the HDD	
Error	Number	Description
	211200	Setting the HDD power mode succeeded
	211201	Setting the HDD power mode failed
	211202	Invalid user input
Note	**All other HDD nuclei will not work until DS_HDD_Reset is executed**	

Example	`DS:> 2112 off`
	`211200:`
	`Test OK @`	

3.22 DIGITAL TERRESTRIAL TUNER MODULE (DTTM)

Nucleus Name	**DS_DTTM_Reset**	
Nucleus Number	2200	
Description	Resets the DTTM module in diagnostic mode, and the communication to it.	
Note	This reset action is also done before the first of the other executed DTTM nuclei, to set-up communications with the DTT module.	
Technical	- Setup of the Basic Engine UART port, which connects to the DTT Module. - Make RTS pin of the UART inactive - Toggle the reset-pin of the DTT Module - Wait for DTTM to become online - Send the Boot loader start character to the DTT Module - Check if the DTT Module boot loader accepted the character. It must return "READY>" - Put the DTTM into D&S command mode. - Empty the DTTM output buffer - Set Reset flag to prevent resetting before every nucleus.	
Execution Time	Approx. 5 sec.	
User Input	None	
Error	Number	Description
	220000	The DTT Module has been successfully reset.
	220001	The DTT Module could not be reset.
	220002	DTT Module initialisation failed.

Example	`DS:> 2200`
	`220000:`
	`Test OK @`	

Nucleus Name	**DS_DTTM_TransparentCommand**	
Nucleus Number	2201	
Description	Sends any DTTM DSW command to the DTT Module, and returns the response transparently.	
Note	No response will be returned before the required number of parameters (zero or more) has been supplied.	
Technical	- Sends all the parameters of this nucleus, starting with the DTTM command ID, to the DTT module. The parameter separator is changed into a single space character.	
Execution Time	Varies between 1 and 30 sec., depending on the supplied DTTM command.	
User Input	Any command ID with parameters, as described in the IBOZapper User Manual. [DTTM_UM]	
Error	Number	Description
	220100	Send/receive of DTTM command successful. (Irrespective of the result of this DTTM command)
	220101	Communication with the DTT Module failed.
	220102	DTT Module initialisation failed.

Example	`DS:> 2201  1503 0x0111 0x0112 0x0111`
	`220100:`
	`>0000:`
	`Test OK @`	

Nucleus Name	**DS_DTTM_Communication**	
Nucleus Number	2202	
Description	Checks the communication between the digital board and the DTT Module.	
Technical	- Send the DTTM DSW command ID 9101 (“switch to command mode”)	
Execution Time	< 1 sec.	
User Input	None	
Error	Number	Description
	220200	Communication with the DTT Module succeeded.
	220201	Communication with the DTT Module failed.
	220202	DTT Module initialisation failed.

Example	DS:> 2202 220200: Test OK @

Nucleus Name	**DS_DTTM_FlashDeviceType**	
Nucleus Number	2203	
Description	Get the manufacture code and the device ID of the boot flash.	
Technical	- Send DTTM command ID 2701	
Execution Time	< 1 sec.	
User Input	None	
Error	Number	Description
	220300	Retrieving Flash device type succeeded.
	220301	Flash device type could not be returned
	220302	Communication with the DTT Module failed.
	220303	DTT Module initialisation failed.
Example	DS:> 2203 220300: Flash manufacture code: 0x00002000 Flash device ID : 0x0000DF22 Test OK @	

Nucleus Name	**DS_DTTM_DiagSwVersion**	
Nucleus Number	2204	
Description	The version of Diagnostics software of the DTT module is read from Boot Flash memory.	
Technical	- Send DTTM command ID 6101	
Execution Time	< 1 sec.	
User Input	None	
Error	Number	Description
	220400	Retrieving the DTTM DS version succeeded
	220401	DTTM DS version could not be returned
	220402	Communication with the DTT Module failed.
	220403	DTT Module initialisation failed.
Example	DS:> 2204 220400: DTT Module Diagnostics software version: 1.2 Test OK @	

Nucleus Name	**DS_DTTM_BootSwVersion**	
Nucleus Number	2205	
Description	The version of the Boot on the DTT module is read from Boot Flash memory. It checks also the CRC-value of the Boot software.	
Technical	- Send DTTM command ID 6201 - Send DTTM command ID 6202	
Execution Time	< 1 sec.	
User Input	None	
Error	Number	Description
	220500	Retrieving the Boot SW version succeeded
	220501	Boot SW version could not be returned
	220502	Boot SW CRC value could not be returned
	220503	Boot SW CRC value is different from stored one
	220504	Communication with the DTT Module failed.
	220505	DTT Module initialisation failed.
Example	DS:> 2205 220500: DTT Module Boot software version: 0x00000002 Stored CRC value : 0x8980C5DC Calculated CRC value : 0x8980C5DC Test OK @	

Nucleus Name	**DS_DTTM_ApplSwVersion**	
Nucleus Number	2206	
Description	The version of Application software at the DTT module is read out of Boot Flash memory.	
Technical	- Send DTTM command ID 6301	
Execution Time	< 1 sec.	
User Input	None	
Error	Number	Description
	220600	DTTM Application software version could be returned
	220601	No Application software present
	220602	DTTM Application software version could not be returned
	220603	Communication with the DTT Module failed.
	220604	DTT Module initialisation failed.

Example	`DS:> 2206`
	`220600:`
	`DTT Module Application software version: 0x0002 0x0605 (0x0265)`
	`DTT Module Hardware version : 0x0102 0x0101 (0x1211)`
	`Test OK @`	

Nucleus Name	**DS_DTTM_HardwareVersion**	
Nucleus Number	2207	
Description	The Hardware version of the DTT module is read from Boot Flash memory at two places, and compared.	
Technical	- Send DTTM command ID 6801 - Send DTTM command ID 6301 - Compare the results, and report if different.	
Execution Time	< 1 sec.	
User Input	None	
Error	Number	Description
	220700	Retrieving the DTTM Hardware version succeeded
	220701	DTTM Hardware version could not be returned
	220702	Stored DTTM Hardware version could not be returned
	220703	DTTM Hardware version does not start with 0x12
	220704	Downloaded DTTM Hardware version is different
	220705	No Application software present
	220706	Communication with the DTT Module failed.
	220707	DTT Module initialisation failed.

Example	`DS:> 2207`
	`220700:`
	`DTT Module Hardware model/version: 0x0102 0x0101 (0x1211)`
	`Test OK @`	

Nucleus Name	**DS_DTTM_SdramWriteRead**	
Nucleus Number	2208	
Description	Checks all data lines, address lines, and memory locations of the DTT module's SDRAM.	
Technical	- Send DTTM command ID 2201 (SDRAM stuck-at fault) with parameters: 0xa0000000 0x00800000 - Send DTTM command ID 2202 (SDRAM address w/r test) with parameters: 0xa0000000 0x00800000	
Execution Time	Approx. 45 sec.	
User Input	None	
Error	Number	Description
	220800	SDRAM WR test succeeded
	220801	SDRAM WR stuck-at test failed at given address
	220802	Other SDRAM WR stuck-at test failure
	220803	SDRAM WR write/read test failed at given address
	220804	Other SDRAM WR write/read test failure.
	220805	Communication with the DTT Module failed.
	220806	DTT Module initialisation failed.

Example	`DS:> 2208`
	`220800:`
	`Test OK @`	

Nucleus Name	**DS_DTTM_ SdramWriteReadFast**	
Nucleus Number	2209	
Description	Checks all datalines, address lines, and some memory locations of the DTT module's SDRAM.	
Technical	- Send DTTM command ID 2202	
Execution Time	< 1 sec.	
User Input	None	
Error	Number	Description
	220900	SDRAM WR test succeeded
	220901	SDRAM WR test failed at given address
	220902	SDRAM WR fast test failed w.r.t. data lines.
	220903	Other fast SDRAM test failure
	220904	Communication with the DTT Module failed.
	220905	DTT Module initialisation failed.

Example	`DS:> 2209`
	`220900:`
	`Test OK @`	

Nucleus Name	**DS_DTTM_EepromWriteRead**	
Nucleus Number	2210	
Description	Checks whether the bit cells in the User EEPROM can toggle.	
Technical	Send the DTTM command ID 2402 (stuck-at fault test)	
Execution Time	< 1 sec.	
User Input	None	
Error	Number	Description
	221000	EEPROM WR test succeeded
	221001	EEPROM WR test failed at given address
	221002	Other EEPROM test failure
	221003	Communication with the DTT Module failed.
	221004	DTT Module initialisation failed.

Example	`DS:> 2210`
	`221000:`
	`Test OK @`	

Nucleus Name	**DS_DTTM_FatalErrorRead**	
Nucleus Number	2211	
Description	Reads the fatal error database from the User EEPROM.	
Technical	- Send DTTM command ID 6303	
Execution Time	< 1 sec.	
User Input	None	
Error	Number	Description
	221100	Retrieving the Fatal error list succeeded
	221101	Fatal error list could not be returned
	221102	Communication with the DTT Module failed.
	221103	DTT Module initialisation failed.

Example	`DS:> 2211`
	`221100: Fatal error database content:`
	`0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00`
	`0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00`
	`0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00`
	`0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00`
	
	`Test OK @`	

Nucleus Name	**DS_DTTM_FatalErrorClear**	
Nucleus Number	2212	
Description	Clears the fatal error database in the User EEPROM.	
Technical	- Send DTTM command ID 6304	
Execution Time	< 1 sec.	
User Input	None	
Error	Number	Description
	221200	Clearing the Fatal error list succeeded
	221201	Fatal error list could not be cleared
	221202	Communication with the DTT Module failed.
	221203	DTT Module initialisation failed.

Example	`DS:> 2212`
	`221200:`
	`Test OK @`	

Nucleus Name	**DS_DTTM_FactoryBitSet**	
Nucleus Number	2213	
Description	The factory bit is set in the user EEPROM.	
Technical	- Send DTTM command ID 6203	
Execution Time	< 1 sec.	
User Input	None	
Error	Number	Description
	221300	Setting the Factory bit succeeded
	221301	Factory bit could not be set
	221302	Communication with the DTT Module failed
	221303	DTT Module initialisation failed.

Example	`DS:> 2213`
	`221300:`
	`Test OK @`	

Nucleus Name	**DS_DTTM_PllVcxoFrequencySet**	
Nucleus Number	2214	
Description	Set the PLL/VCXO frequency values of the processor. The M, N, and P values determine the PLL's clockspeed.	
Technical	- Send DTTM command ID 3101, with the given parameters.	
Execution Time	Approx. 2 sec.	
User Input	1. PLLNumber: The seq. nr of PLL to be changed [0,3] 2. Mvalue : PLL M value [0x1,0x7FF] 3. NValue : PLL N value [0x1,0xFF] 4. Pvalue : PLL P value [0x1,0x1F]	
Error	Number	Description
	221400	Setting the PLL/VCXO parameter values was successful
	221401	Insufficient number of input data supplied
	221402	One of the parameters not within range
	221403	The PLL/VCXO values could not be set
	221404	Communication with the DTT Module failed.
	221405	DTT Module initialisation failed.

Example	`DS:> 2214  0 0xef 0x03 0x01`
	`221400:`
	`Test OK @`	

Nucleus Name	**DS_DTTM_PllVcxoFrequencyGet**	
Nucleus Number	2215	
Description	Retrieves the PLL/VCXO values of the processor.	
Technical	- Send DTTM command ID 3102 with the PLL number. - Parse and format the response values.	
Execution Time	< 1 sec.	
User Input	PLLNumber: The seq. nr of PLL to be queried [0,3]	
Error	Number	Description
	221500	Retrieving the PLL/VCXO parameter values was successful
	221501	Insufficient number of input data supplied
	221502	Non-existent PLL number
	221503	The PLL/VCXO values of the processor could not be retrieved.
	221504	Communication with the DTT Module failed
	221505	DTT Module initialisation failed.

Example	`DS:> 2215 0`
	`221500:`
	`PLL M parameter value: 0x00EF`
	`PLL N parameter value: 0x0003`
	`PLL P parameter value: 0x0001`
	`Test OK @`	

Nucleus Name	**DS_DTTM_IicWrite**	
Nucleus Number	2216	
Description	Performs an IIC write action on the DTT module.	
Technical	- Send DTTM command ID 2902 with the supplied parameters, separated by a single space character.	
Execution Time	< 1 sec.	
User Input	1. IicChannel : IIC channel of the device 2. IicDeviceAddress : address of IIC device to write to 3. NrOfSubAddressBytes: number of sub-address bytes (=x) 4. SubAddressBytes : x sub-address bytes 5. NrOfValues : number of values to write (=y) 6. Data : y bytes data to write	
Error	Number	Description
	221600	The test was successful
	221601	Insufficient number of input data supplied
	221602	No response from the given device-address
	221603	Incorrect device address was given
	221604	Unable to send IIC start-condition
	221605	Error during write to IIC-address
	221606	Device does not support IIC write
	221607	The IIC write action failed.
	221608	Communication with the DTT Module failed.
	221609	DTT Module initialisation failed.

Example	`DS:> 2216  0x00 0x00 0 2 0xAA 0xBB`
	`221600:`
	`Test OK @`	

Nucleus Name	**DS_DTTM_IicRead**	
Nucleus Number	2217	
Description	Performs an IIC read action on the DTT module.	
Technical	- Send DTTM command ID 2901 with the supplied parameters, separated by a single space character.	
Execution Time	< 1 sec.	
User Input	1. IicChannel : IIC channel of the device 2. IicDeviceAddress : address of IIC device to read from 3. NrOfSubAddressBytes: number of sub-address bytes (=x) 4. SubAddressBytes : x sub-address bytes 5. NrOfValues : number of values to read (=y)	
Error	Number	Description
	221700	The test was successful
	221701	Insufficient number of input data supplied
	221702	No response from the given device-address
	221703	Incorrect device address was given
	221704	Unable to send IIC start-condition
	221705	Error during read from IIC-address
	221706	Device does not support IIC read
	221707	The IIC read action failed.
	221708	Communication with the DTT Module failed.
	221709	DTT Module initialisation failed.

Example	`DS:> 2217 0x00 0x10 2 0x00 0x00 2`
	`221700: Read values: 0x17 0x00`
	`Test OK @`	

Nucleus Name	**DS_DTTM_AvTsPidSet**	
Nucleus Number	2218	
Description	Sets the PID values of the transport stream.	
Technical	- Send the DTTM command ID 1503, with the supplied parameters.	
Execution Time	< 1 sec.	
User Input	1. Video PID value [0x0000-0x1FFF] 2. Audio PID value [0x0000-0x1FFF] 3. PRC PID value [0x0000-0x1FFF]	
Error	Number	Description
	221800	The TS PID's are set successfully
	221801	Insufficient number of input data supplied
	221802	One or more PID values is out of range
	221803	The TS PID's could not be set.
	221804	Communication with the DTT Module failed
	221805	DTT Module initialisation failed.

Example	`DS:> 2218 0x79 0x7a 0x79`
	`221800:`
	`Test OK @`	

Nucleus Name	**DS_DTTM_AvMojoBeepOn**	
Nucleus Number	2219	
Description	Generates the Mojo beep.	
Technical	- Send the DTTM command ID 1605.	
Execution Time	< 1 sec.	
User Input	None	
Error	Number	Description
	221900	The Mojo beep has been turned on successfully
	221901	Can not start another AV test (one is already running)
	221902	The Mojo beep could not be turned on
	221903	Communication with the DTT Module failed
	221904	DTT Module initialisation failed.

Example	`DS:> 2219`
	`221900:`
	`Test OK @`	

Nucleus Name	**DS_DTTM_AvMojoBeepOff**	
Nucleus Number	2220	
Description	Stops generating the Mojo beep.	
Technical	- Send the DTTM command ID 1606.	
Execution Time	< 1 sec.	
User Input	None	
Error	Number	Description
	222000	The Mojo beep has been turned off successfully
	222001	The Mojo beep could not be turned off
	222002	Communication with the DTT Module failed
	222003	DTT Module initialisation failed.

Example	`DS:> 2220`
	`222000:`
	`Test OK @`	

Nucleus Name	**DS_DTTM_ AvAudioVideoStreamPlay**	
Nucleus Number	2221	
Description	Selects a predefined stream, and configures the peripherals to enable streaming, and starts playing the selected audio and video streams.	
Technical	- Send the DTTM command ID 1002 with the selected stream number - Send the DTTM command ID 1001. - Ignore possible error code 2203 (AV play test already started)	
Execution Time	< 2 sec.	
User Input	Stream number: Stream number to be selected. [0-9]	
Error	Number	Description
	222100	The given predefined stream has been selected and started successfully
	222101	Insufficient number of input data supplied
	222102	The given stream could not be selected
	222103	The given stream number is not within range
	222104	The predefined stream has an out-of-range value
	222105	No carrier found
	222106	The selected predefined stream could not be started
	222107	Communication with the DTT Module failed
	222108	DTT Module initialisation failed.

Example	`DS:> 2221 2`
	`222100:`
	`Test OK @`	

Nucleus Name	**DS_DTTM_ AvPredefinedStreamGet**	
Nucleus Number	2222	
Description	Retrieves the settings of the currently selected stream.	
Technical	- Send the DTTM command ID 1003 - Parse and format the response values.	
Execution Time	< 1 sec.	
User Input	None	
Error	Number	Description
	222200	The settings of the currently selected predefined stream are retrieved successfully
	222201	The settings of the currently selected predefined stream could not be retrieved
	222202	Communication with the DTT Module failed
	222203	DTT Module initialisation failed.

Example	`DS:> 2222`
	`222200: The settings of the selected stream are:`
	`current video standard : 0 = PAL`
	`current video PID : 0x0083`
	`current audio PID : 0x0084`
	`current PCR PID : 0x0083`
	`tuner frequency : 506000000 Hz`
	`tuner bandwidth : 8000000 Hz`
	`tuner spectral inversion: 0 = Normal`
	`Test OK @`	

Nucleus Name	**DS_DTTM_ AvPredefinedStreamChange**	
Nucleus Number	2223	
Description	Adds or changes the settings of a predefined stream.	
Note	No parameter validity check is being performed. This is done when this stream is selected. Stream no 0 is built-in and cannot be changed.	
Technical	- Send the DTTM command ID 1004, with the supplied parameters.	
Execution Time	< 1 sec.	
User Input	1. Stream number : The stream to be changed. [1-9] 2. VideoStandard : video standard (0=PAL, 1=SECAM) 3. VideoTypeCh3 : TV channel video type (0=RGB, 1=YPbPr, 2=YC) 4. VideoTypeCh2 : TV channel video type (0=CVBS, 1=YC) 5. VideoTypeCh1 : AUX channel video type (0=YC, 1=CVBS) 6. VideoPid : current video PID [0x0000-0x1FFF] 7. AudioPid : current audio PID [0x0000-0x1FFF] 8. PCRPid : current PCR PID [0x0000-0x1FFF] 9. Frequency : tuner frequency [Hz] [5000000, 859000000] 10. Bandwidth : tuner bandwidth (0=7 MHz, 1=8 MHz) 11. SpectralInversion: tuner spectral inversion (0=normal, 1=inverse)	
Error	Number	Description
	222300	A predefined stream has been added or changed successfully
	222301	Insufficient number of input data supplied
	222302	Could not change or add a predefined stream
	222303	Communication with the DTT Module failed
	222304	DTT Module initialisation failed.

Example	`DS:> 2223 4 0 0 0 1 0x79 0x7a 0x79 506000000 1 0`
	`222300:`
	`Test OK @`	

Nucleus Name	**DS_DTTM_ AvMojoColourbarOn**	
Nucleus Number	2224	
Description	Activates the Mojo colour bar.	
Note	This nucleus will return with error 222401, if another AV test is already running.	
Technical	- Send the DTTM command ID 1607	
Execution Time	< 1 sec.	
User Input	None	
Error	Number	Description
	222400	The Mojo colour bar has been activated successfully
	222401	Can not start another AV test (one is already running)
	222402	The Mojo colour bar could not be activated
	222403	Communication with the DTT Module failed
	222404	DTT Module initialisation failed.

Example	`DS:> 2224`
	`222400:`
	`Test OK @`	

Nucleus Name	**DS_DTTM_ AvMojoColourbarOff**	
Nucleus Number	2225	
Description	Turns off the Mojo colour bar.	
Technical	- Send the DTTM command ID 1608	
Execution Time	< 1 sec.	
User Input	None	
Error	Number	Description
	222500	The Mojo colour bar has been turned off successfully
	222501	The Mojo colour bar could not be turned off
	222502	Communication with the DTT Module failed
	222503	DTT Module initialisation failed.

Example	`DS:> 2225`
	`222500:`
	`Test OK @`	

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Nucleus Name	**DS_DTTM_ AvVideoStandardSet**	
Nucleus Number	2228	
Description	Configures the Mojo video channel to the given video standard.	
Technical	- Send the DTTM command ID 1501, together with supplied input value.	
Execution Time	< 1 sec.	
User Input	VideoStandard: Video standard to set the channel to (0=PAL, 1=SECAM)	
Error	Number	Description
	222800	Succeeded in configuring the Mojo video channel
	222801	Insufficient number of input data supplied
	222802	Non-existent video standard
	222803	Configuring the Mojo video channel was not successful
	222804	Communication with the DTT Module failed.
	222805	DTT Module initialisation failed.

Example	`DS:> 2228 0`
	`222800:`
	`Test OK @`	

Nucleus Name	**DS_DTTM_ AvVideoOutputSet**	
Nucleus Number	2229	
Description	Configures the video output to the selected video standard.	
Technical	- Send the DTTM command ID 1504, together with supplied input values.	
Execution Time	< 1 sec.	
User Input	1. VideoDAC : The video DAC to configure 0 = RGB / YUV / YC (TV DAC's) 1 = CVBS / Y (TV DAC) 2 = YC / CVBS (VCR DAC's) 2. VideoOutput: The video output to set the DAC's to 0 = RGB or CVBS or YC (resp. the chosen DAC's) 1 = YUV or YC or CVBS 2 = YC	
Error	Number	Description
	222900	Video output could be set successfully
	222901	Insufficient number of input data supplied
	222902	One of the parameter values is out of range
	222903	Video output could not be set
	222904	Communication with the DTT Module failed
	222905	DTT Module initialisation failed.

Example	`DS:> 2229 0 1`
	`222900:`
	`Test OK @`	

Nucleus Name	**DS_DTTM_FreRegisterRead**	
Nucleus Number	2230	
Description	Reads a single byte of data out of a demodulator register.	
Technical	- Send the DTTM command ID 3601, together with supplied input value.	
Execution Time	< 1 sec.	
User Input	Address: register address to read from	
Error	Number	Description
	223000	The selected address register could be read successfully
	223001	Insufficient number of input data supplied
	223002	The register address value is out-of-range
	223003	The selected address register could not be read
	223004	Communication with the DTT Module failed
	223005	DTT Module initialisation failed.

Example	`DS:> 2230 0x12`
	`223000: The value of this register: 0x00`
	`Test OK @`	

Nucleus Name	**DS_DTTM_FreRegisterWrite**	
Nucleus Number	2231	
Description	Writes a single byte of data out to a demodulator register.	
Technical	- Send the DTTM command ID 3602, together with supplied input values.	
Execution Time	< 1 sec.	
User Input	Address: register address to write to Data : the value to be written to the register	
Error	Number	Description
	223100	The selected address register has been written successfully
	223101	Insufficient number of input data supplied
	223102	The register address value is out-of-range
	223103	The selected address register could not be written
	223104	Communication with the DTT Module failed
	223105	DTT Module initialisation failed.

Example	`DS:> 2231 0x12 0xb1`
	`223100:`
	`Test OK @`	

Nucleus Name	**DS_DTTM_FreLockStatusGet**	
Nucleus Number	2232	
Description	Checks and returns the lock status of the front-end.	
Technical	- Send the DTTM command ID 3607. - Parse and format the response values.	
Execution Time	< 1 sec.	
User Input	None	
Error	Number	Description
	223200	The lock status of the front-end is returned successfully
	223201	The lock status of the front-end could not be returned
	223202	Communication with the DTT Module failed
	223203	DTT Module initialisation failed.

Example	`DS:> 2232`
	`223200: Front-end lock status: 0x0F`
	`Internal PLL locked : YES`
	`Frequency Locked : YES`
	`Time locked : YES`
	`TPS locked : YES`
	
	`Test OK @`	

Nucleus Name	**DS_DTTM_FreLockingParamSet**	
Nucleus Number	2233	
Description	Configures the tuner and the demodulator according to the given parameters. First the configuration mode of the front-end is set to Manual or Autoconfig mode, depending on the number of supplied parameters.	
Technical	- Send the DTTM command ID 3604, with parameter value '0' to put the front-end to Manual configuration mode, or '1' for AutoConfig configuration mode. - Send the DTTM command ID 3605, together with supplied input value.	
Execution Time	< 1 sec.	
User Input	1. Frequency : Tuner frequency [Hz] [5000000 – 859000000] 2. Bandwidth : Tuner bandwidth (0=7MHz, 1=8MHz) 3. SpectralInversion : Spectral inversion (0=Normal, 1=Inverse) The following parameters are optional (Manual mode): 4. Constellation : Constellation type (0=QPSK, 1=QAM16, 2=QAM64, or 3=unknown) 5. Hierarchy : Hierarchy (0=None, 1=Alpha 1,2=Alpha 2, or 3=Alpha 4) 6. CodeRateHigh : High priority CodeRate (0=1_2, 2=2_3, 2=3_4, 3=5_6, 4=7_8, 5=unknown) 7. CodeRateLow : Low priority CodeRate (0-5) 8. GuardInterval : Guard interval (0=1/32, 1=1/16, 2=1/8, 3=1/4, 4=unknown) 9. TransmissionMode : Transmission mode (0=2 KO, 1=8 KO, or 3=unknown) 10. FrequencyOffset : Frequency offset [MHz] (0=none, 1=+1/6, 2=-1/6, 3=+2/6, 4=-2/6, 5=+3/6, 6=-3/6,7=unknown) 11. Priority : Priority (0=High, 1=Low, 2=Both, or 3=unknown)	
Error	Number	Description
	223300	The tuner and demodulator have been configured successfully
	223301	Insufficient number of input data supplied
	223302	One or more parameters is out-of-range
	223303	No carrier could be found with these parameters
	223304	The tuner and demodulator could not be configured
	223305	False lock achieved (incorrect parameters).
	223306	Communication with the DTT Module failed
	223307	DTT Module initialisation failed.

Example	`DS:> 2233 506000000 1 0 2 0 4 0 0 0 0 0`
	`223300:`
	`Test OK @`	

Nucleus Name	**DS_DTTM_FreLockingParamGet**	
Nucleus Number	2234	
Description	Retrieves the tuner and demodulator settings.	
Technical	- Send the DTTM command ID 3606. - Parse and format the response values.	
Execution Time	> 1 sec.	
User Input	None	
Error	Number	Description
	223400	The tuner and demodulator settings have been retrieved successfully
	223401	The tuner and demodulator settings could not be retrieved
	223402	Communication with the DTT Module failed
	223403	DTT Module initialisation failed.
Example	DS:> 2234 223400: The front-end locking parameters are: Tuner frequency : 506000000 Hz Tuner bandwidth : 8000000 Hz Spectral inversion : 0 = Normal Constellation type : 2 = QAM64 Hierarchy : 0 = None High Priority CodeRate: 4 = 7_8 Low Priority CodeRate: 0 = 1_2 Guard Interval : 0 = 1/32 Transmission mode : 0 = 2 KO Frequency offset : 0 = None Priority : 0 = High Test OK @	

Nucleus Name	**DS_DTTM_FreSignalStatusGet**	
Nucleus Number	2235	
Description	Retrieves the status of the current signal.	
Technical	- Send the DTTM command ID 3608. - Parse and format the response values.	
Execution Time	> 1 sec.	
User Input	None	
Error	Number	Description
	223500	The current signal status has been retrieved successfully
	223501	The current signal status could not be retrieved
	223502	Communication with the DTT Module failed
	223503	DTT Module initialisation failed.
Example	DS:> 2235 223500: Signal status: CBER : 25e-7 VBER : 0e-6 AGC IF : 160 AGC RF : Unknown SNR : 254 Cell ID: 0x0000 Test OK @	

Nucleus Name	**DS_DTTM_SwitchCVBSPath**	
Nucleus Number	2236	
Description	This function switches the CVBS path on the DTTM module by having the MOJO (on the DTTM module) toggle a PIO pin. There are two paths: - Passing video from the analogue board to the digital board - Passing video from the analogue board through the DTT module to the digital board (where the signal might be changed by DTT)	
Technical	- Send the DTTM command ID 3103. - Parse the response values and change bit two of the PIO pin. - Set the new PIO value using DTTM command ID 3104	
Execution Time	> 1 sec.	
User Input	There are three possibilities here: - 'pass' - The video is passed from the analogue board to the digital board - '' - The video is passed from the analogue board to the digital board - 'dttm' - The video is passed from the analogue board through the DTT module to the digital board (where the signal might be changed by DTT)	
Error	Number	Description
	223600	Switching the CVBS path through DTTM PIO succeeded
	223601	Executing the DTTM PIO write failed
	223602	Switching the CVBS path through DTTM PIO failed
	223603	DTT Module initialisation failed.

Example	`DS:> 2236 pass`
	`223600:`
	`Test OK @`
	
	`DS:> 2236 dttm`
	`223600:`
	`Test OK @`
	
	`DS:> 2236`
	`223600:`
	`Test OK @`	

3.23 UNIVERSAL SERIAL BUS (USB)

Nucleus Name	**DS_USB_Communication**	
Nucleus Number	2300	
Description	This nucleus tests whether the USB controller can be communicated with properly.	
Technical	- Test whether data can be written to and read back from the scratch register in the USB controller chip	
Execution Time	< 1 sec.	
User Input	None	
Error	Number	Description
	230000	Communicating with the USB controller succeeded
	230001	Communicating with the USB controller failed

Example	`DS:> 2300`
	`230000:`
	`Test OK @`	

Nucleus Name	**DS_USB_DevTypeGet**	
Nucleus Number	2301	
Description	This nucleus retrieves the device and type information of the USB controller	
Technical	- Read out the chip-ID and revision register and return the info to the user	
Execution Time	< 1 sec.	
User Input	None	
Error	Number	Description
	230100	Retrieving the device type information succeeded

Example	`DS:> 2301`
	`230100: USB Controller chip ID: 0x6123 Revision:0x10.`
	`Test OK @`	

Nucleus Name	**DS_USB_Reset**	
Nucleus Number	2302	
Description	This nucleus performs a software reset of the controller and tests whether the functional state of the controller has become USBReset	
Technical	- Write the command to software reset the controller and read back the functional status of the controller	
Execution Time	< 1 sec.	
User Input	None	
Error	Number	Description
	230200	Resetting the host controller succeeded
	230201	Resetting the host controller failed

Example	`DS:> 2302`
	`230200:`
	`Test OK @`	

3.24 AUDIO VIDEO LINK (AVL) BOARD

Nucleus Name	**DS_AVL_Communications**	
Nucleus Number	2600	
Description	This nucleus attempts to communicate with the AVL board by requesting the AVL controller to transmit its software major and minor versions.	
Technical	- Packetize the AVL ***ReadVersion*** command. - Send the command to the AVL board via IIC interface. - Read the major and minor version bytes (2 bytes total) from the AVL board. - Display the read versions via the diagnostics serial interface.	
Execution Time	Less than 1 sec.	
User Input	None	
Error	Number	Description
	260000	Communications with the AVL board succeeded
	260001	AVL board communications failed
	260002	AVL board communications timeout
	260003	IIC bus not accessible
	260004	IIC ACK not received
	260005	IIC stop condition error
	260006	Unknown error

Example	`DS:> 2600`
	
	`260000:`
	
	`Software Version: 0x 1 0x 4`
	
	`Test OK @`	

Nucleus Name	**DS_AVL_Reset**	
Nucleus Number	2601	
Description	This nucleus resets the AVL controller by sending it a AVL reset message via the IIC interface.	
Technical	- Packetize the AVL ***DS_AVL_WriteReadAVLInRC*** command with “On” as argument. - Send message to AVL controller. - Read the AVLInRC bit from the AVL controller to make sure it has been set. - Packetize the AVL ***SendReset*** command. - Send the command to the AVL board via IIC interface. - Wait 150 milliseconds. - Packetize and send the DS_***AVL_ReadAVLInRC*** version command to the AVL controller - Read one byte from the AVL controller, if the controller has been reset properly, this value will be zero if reset has completed successfully. - Display the reset results to user.	
Execution Time	Less than 1 sec.	
User Input	None	
Error	Number	Description
	260100	AVL board reset successful
	260101	IIC bus error
	260102	Timeout trying to read from AVL board
	260103	IIC bus is not accessible
	260104	IIC ACK not received
	260105	IIC stop condition error
	260106	Unknown error
	260107	AVL reset fail
	260108	Unable to set test mode bit in AVL board

Example	`DS:> 2601`
	
	`260100:`
	
	`Test OK @`	

Nucleus Name	**DS_AVL_MXConfigRead**	
Nucleus Number	2602	
Description	This nucleus retrieves the MX Config information from the AVL board and displays it.	
Technical	- Packetize the AVL ***ReadMxConfig*** command. - Send the command to the AVL board via IIC interface. - Read one byte from the AVL board. - Decode and display the MX Config information.	
Execution Time	Less than 1 sec.	
User Input	None	
Error	Number	Description
	260200	Read MX Configuration settings successful.
	260201	IIC bus error
	260202	Timeout trying to read from AVL board
	260203	IIC bus is not accessible
	260204	IIC ACK not received
	260205	IIC stop condition error
	260206	Unknown error

Example	`DS:> 2602`
	
	`260200: MX mode`
	
	`Test OK @`	

Nucleus Name	**DS_AVL_MXConfigWriteRead**	
Nucleus Number	2603	
Description	This nucleus writes the MX Config information to the AVL board. It then reads back the information from the AVL board and displays it.	
Technical	- Packetize the AVL ***WriteMxConfig*** command with user argument. - Send the command to the AVL board via IIC interface. - Packetize the AVL ***ReadMxConfig*** command. - Send command to AVL board via IIC interface. - Read one byte from the AVL board. - Decode and display the MX Config information.	
Execution Time	Less than 1 sec.	
User Input	“On“ or “Off”	
Error	Number	Description
	260300	MX configuration setting written to and verified successfully.
	260301	IIC bus error
	260302	Timeout trying to read from AVL board
	260303	IIC bus is not accessible
	260304	IIC ACK not received
	260305	IIC stop condition error
	260306	Unknown error
	260307	Invalid parameter supplied to nucleus
	260308	The write-read operation on the MX Configuration setting failed.

Example	`DS:> 2603 off`
	
	`260200: Non MX mode`
	
	`Test OK @`	

Nucleus Name	**DS_AVL_UARTByteWrite**
Nucleus Number	2604
Description	This nucleus writes one byte to the UART of the AVL board for transmission.
Technical	- Packetize the AVL ***WriteUart*** command with user byte to send. - Send the command to the AVL board via IIC interface. - The AVL controller receives the message and transmits the byte via its UART interface. - If the AVL Tx and Rx lines has been shorted for testing, the AVL controller receives the transmitted byte immediately and buffers it for a possible read operation later.
Execution Time	Less than 1 sec.

User Input	Data byte to send. Byte supplied must be printable. Can be in hexadecimal or just the character to send. See example.	
Error	Number	Description
	260400	Command successful, byte written to AVL UART output.
	260401	IIC bus error
	260402	Timeout trying to read from AVL board
	260403	IIC bus is not accessible
	260404	IIC ACK not received
	260405	IIC stop condition error
	260406	Unknown error
	260407	Invalid parameter supplied to nucleus
	260408	The byte write to AVL UART output port has failed.

Example	`DS:> 2604 0x42`
	
	`260400: Character sent successfully: B`
	
	`Test OK @`
	
	`DS:>2604 c`
	
	`260400: Character sent successfully: c`
	
	`Test OK @`	

Nucleus Name	**DS_AVL_UARTByteRead**
Nucleus Number	2605
Description	This nucleus tells the AVL controller to retrieve from its internal memory, the previously received byte from the UART interface and send the data byte back to the host processor for display on the diagnostics logging port. Sending this command without a previous **DS_AVL_UARTByteWrite** command will retrieve whatever data buffered in the AVL controller's UART receive buffer at that time.
Technical	- Packetize the AVL ***ReadUart*** command. - Send the command to the AVL board via IIC interface. - The AVL controller receives the message and retrieves the data byte previously received. - This data is transmitted to the host processor and displayed via the diagnostics UART interface.
Execution Time	Less than 1 sec.
User Input	Data byte to send
Error	Number / Description
	260500 — One printable byte read successfully from AVL and displayed.
	260501 — IIC bus error
	260502 — Timeout trying to read from AVL board
	260503 — IIC bus is not accessible
	260504 — IIC ACK not received
	260505 — IIC stop condition error
	260506 — Unknown error

Example	`DS:> 2605`
	
	`260500: Character received: c`
	
	`Test OK @`

Nucleus Name	**DS_AVL_UARTByteWriteRead**
Nucleus Number	2606
Description	This nucleus executes an AVL UART write and AVL UART read operation back to back. For this test to work, the Tx and Rx UART lines on the AVL board needs to be shorted.

Technical	- Packetize the AVL ***WriteUart*** command with user byte to send. - Send the command to the AVL board via IIC interface. - The AVL controller receives the message and transmits the byte via its UART interface. - If the Tx and Rx lines are shorted for testing, the AVL controller receives the transmitted byte almost immediately and buffers it. - The ***ReadUart*** command is packetized and transmitted to the AVL controller. - The AVL controller receives the command, reads the UART receive buffer, and returns the byte to the host processor. - The host processor receives the read byte from the AVL controller, performs a comparison with the byte that was sent and displays the appropriate pass/fail message via the diagnostics UART interface.	
Execution Time	Less than 1 sec.	
User Input	Data byte to send, byte needs to be a printable character. Input byte can be the character itself or its hexadecimal representation. See example.	
Error	Number	Description
	260600	One printable byte has been sent
	260601	IIC bus error
	260602	Timeout trying to read from AVL board
	260603	IIC bus is not accessible
	260604	IIC ACK not received
	260605	IIC stop condition error
	260606	Unknown error
	260607	Invalid parameter supplied to nucleus
	260608	Byte write read to /from AVL board has failed.

Example	`DS:> 2606 0x45`
	
	`260600:`
	
	`Test OK @`
	
	`DS:> 2606 k`
	
	`260600:`
	
	`Test OK @`	

Nucleus Name	**DS_AVL_AVLInRCWriteRead**	
Nucleus Number	2607	
Description	This nucleus enables or disables the test mode of the AVL board. 1. This mode is meant for board level testing. 2. A periodic signal is generated externally (e.g. 1KHz pulse) and injected into the SC1_Pin8 input of the AVL circuit. Pin8 biasing input from ASP can be grounded. 3. The AVL controller polls the AVL_IN input pin, samples the level on this pin and output the sampled level on the RC6 output line (intended for the ASP processor). 4. A signal generator needs to be connected to the input source and an oscilloscope/logic analyzer needs to be connected to the RC6 line to measure and verify the output signal.	
Technical	- Packetize the ***WriteTestAVLInRC*** command with on/off byte to send. - Send the message to the AVL controller. - Packetize the ***ReadTestAVLInRC*** command and send it to the AVL controller. - Read back one byte from the AVL controller. - Decode the results and display via diagnostics UART interface.	
Execution Time	Less than 1 sec.	
User Input	“On” or “Off”.	
Error	Number	Description

	260700	Setting the AVLInRC bit is successful
	260701	IIC bus error
	260702	Timeout trying to read from AVL board
	260703	IIC bus is not accessible
	260704	IIC ACK not received
	260705	IIC stop condition error
	260706	Unknown error
	260707	Invalid parameter supplied as nucleus input
	260708	Write and read back operation for this bit has failed.
Example	DS:> 2607 on 260700: Test OK @ DS:> 2607 off 260700: Test OK @	

Nucleus Name	**DS_AVL_AVLInRCRead**	
Nucleus Number	2608	
Description	This nucleus requests the AVL controller to read the test mode field and send it back to the host processor.	
Technical	- Packetize and send the ***ReadTestAVLInRC*** command to the AVL controller. - Read back one byte from the AVL controller. - Decode the results and display via diagnostics UART interface.	
Execution Time	Less than 1 sec.	
User Input	None.	
Error	Number	Description
	260800	Test mode has been read successfully and displayed.
	260801	IIC bus error
	260802	Timeout trying to read from AVL board
	260803	IIC bus is not accessible
	260804	IIC ACK not received
	260805	IIC stop condition error
	260806	Unknown error
Example	DS:> 2608 260800: Test Mode: OFF Test OK @	

Nucleus Name	**DS_AVL_AVLFormatInRead**	
Nucleus Number	2609	
Description	This nucleus requests the AVL controller to read the FORMAT_IN pin of the AVL controller and send the logic level back to the host processor. This pin should be HIGH when the DVDR is in low power standby and LOW otherwise.	
Technical	- Packetize and send the ***ReadFormatIn*** command to the AVL controller. - Read back one byte from the AVL controller. - Decode the results and display via diagnostics UART interface.	
Execution Time	Less than 1 sec.	
User Input	None.	
Error	Number	Description
	260900	AVL_FORMAT_IN information received and displayed
	260901	IIC bus error
	260902	Timeout trying to read from AVL board
	260903	IIC bus is not accessible
	260904	IIC ACK not received
	260905	IIC stop condition error
	260906	Unknown error

Example	DS:> 2609 260900: Format In: LOW Test OK @

3.25 SCRIPT (SCRIPT)

Nucleus Name	**DS_IH_ScriptHandler**
Nucleus Number	Script
Description	The test requires no user interaction. A number of nuclei will be run before a message is returned indicating if there is a failure in the DVD Recorder. When a nucleus failed, the script stops and displays the message "**FAIL**". Otherwise it displays "**PASS**" at the end when all nuclei are executed. During the execution of a script, a progress indicator is displayed on the display of the DVD Recorder.
Technical	Execute the included nuclei one by one If a nucleus fails quit and display the failed nucleus on the local display and service port
Execution Time	16 seconds
Included tests:	1. DS_ANAB_COMMUNICATIONECHO_NUC 2. DS_DCB_COMMUNICATIONECHO_NUC 3. DS_BROM_COMMUNICATION_NUC 4. DS_SYS_SETTINGSDISPLAY_NUC 5. DS_CHR_DEVTYPEGET_NUC 6. DS_CHR_INT_PIC_NUC 7. DS_CHR_DMA_NUC 8. DS_BROM_WRITEREAD_NUC 9. DS_NVRAM_COMMUNICATION_NUC 10. DS_NVRAM_WRITEREAD_NUC 11. DS_SDRAM_WRITEREADFAST_NUC 12. DS_FLASH_WRITEREAD_NUC 13. DS_FLASH_CHECKSUMPROGRAM_NUC 14. DS_SYS_HARDWAREVERSIONGET_NUC 15. DS_VIP_DEVTYPEGET_NUC 16. DS_VIP_COMMUNICATION_NUC 17. DS_DVIO_LINKDEVTYPEGET_NUC 18. DS_DVIO_PHYDEVTYPEGET_NUC 19. DS_DVIO_LINKCOMMUNICATION_NUC 20. DS_DVIO_PHYCOMMUNICATION_NUC 21. DS_PSCAN_COMMUNICATIONDENC_NUC 22. DS_PSCAN_COMMUNICATIONDEINTERLACER_NUC 23. DS_BE_COMMUNICATIONECHO_NUC 24. DS_ANAB_COMMUNICATIONIICNVRAM_NUC 25. DS_ANAB_COMMUNICATIONIICTUNER_NUC 26. DS_ANAB_COMMUNICATIONIICSOUNDPROCESSOR_NUC 27. DS_ANAB_COMMUNICATIONIICAVSELECTOR_NUC 28. DS_ANAB_CHECKSUMPROGRAM_NUC
Note!	**Invocation by holding down the PLAY button when powering up the system**
Note!	The following example is for a generation 2.1 DVD+RW recorder. The variant you test may behave differently. For a detailed description of the script-behaviour of your variant under test refer to the [RW2_1_SWA_DS].

Example

```
DS:> script
Executing User/Dealer script.
Busy executing NUC1100 1-28
Hello Analogue Board
Busy executing NUC1000 2-28

Busy executing NUC200 3-28

Busy executing NUC1228 4-28

Settings ID:  4C4541440D0000000003030001010102010100002008000
Board name:                          LEAD
Hardware ID:                         0
Codec IC:                            PNX7100_MF3
Video Input Processor IC:            SAA7118
Progressive Scan Deinterlacer IC:  None
Progressive Scan Denc IC:            ADV7196
I-Link physical layer circuit IC:  PDI1394P25
I-Link link layer circuit IC:      PDI1394P40
Audio clock:                         Clock scheme 1
Bit engine connector:                available
IDE connector 1:                     available
IDE connector 2:                     not available
PCI connector:                       not available
RAM size                             32MByte
ROM size (NOR FLASH bank 1)          8MByte
ROM size (NOR FLASH bank 2)          Not available
ROM size (NAND FLASH)                Not available
Bit Engine: AV 2.0

Busy executing NUC100 5-28

Device ID  7100
Codec ID   PNX7100_MF3
F-BCU  (0x0102) 1.0    INTC   (0x011d) 1.0    PCI-XIO(0x0113) 1.0
SIF    (0x013b) 1.0    EJTAG  (0x0104) 0.0    S-BCU  (0x0102) 1.0
BOOT   (0x010a) 1.0    CONFIG (0x013f) 1.0    RESET  (0x0123) 1.0
DEBUG  (0x0116) 0.0    UART0  (0x0107) 0.1    UART1  (0x0107) 0.1
UART2  (0x0107) 0.1    UART3  (0x0107) 0.1    I2C0   (0x0105) 0.1
I2C1   (0x0105) 0.1    GPIO   (0x013c) 1.0    SYNC   (0x013a) 1.0
DISP0  (0xa015) 0.2    DISP1  (0xa00f) 0.0    OSD    (0x0136) 0.1
SPU    (0xa00e) 0.0    MIXER  (0x0137) 1.0    DENC   (0x0138) 0.1
CCIR   (0x0139) 1.0    VDEC   (0x0133) 0.1    PARSER (0xa00d) 0.0
DV     (0xa00c) 0.0    BEI    (0xa00a) 0.0    IDE    (0xa009) 0.0
SGDX   (0xa008) 0.0    BYTE   (0xa00b) 0.0    OUTPUT (0xa003) 0.0
ACOMP  (0xa000) 0.0    VFE    (0xa001) 0.0    VCOMP  (0xa002) 0.0
SCR    (0x0000) 0.0    SIFF   (0xa011) 0.0    WMD    (0xa010) 0.0
AUDIO0 (0xa015) 0.2    AUDIO1 (0xa00f) 0.0    PSCAN  (0xa018) 0.0

Busy executing NUC114 6-28

Busy executing NUC115 7-28

Busy executing NUC201 8-28

Busy executing NUC300 9-28

Busy executing NUC301 10-28

Busy executing NUC401 11-28

Busy executing NUC501 12-28

Busy executing NUC503 13-28

BootCode    checksum is: 0xBABEB432, which is correct
Diagnostics checksum is: 0xBABED22B, which is correct
Download    checksum is: 0xBABE025F, which is correct
Application checksum is: 0xBABE2825, which is correct

Busy executing NUC1200 14-28
Hardware ID = 00
Busy executing NUC600 15-28
Found SAA7118
```

Example

```
Busy executing NUC601 16-28

Busy executing NUC700 17-28
Device type of the link layer IC: ffc00301
Busy executing NUC701 18-28
Device type of the phy layer IC: 0
Busy executing NUC702 19-28

Busy executing NUC703 20-28

Busy executing NUC801 21-28

Busy executing NUC808 22-28
The IIC acknowledge was not received, which is correct
Busy executing NUC900 23-28

Busy executing NUC1101 24-28

Busy executing NUC1102 25-28

Busy executing NUC1104 26-28

Busy executing NUC1105 27-28

Busy executing NUC1111 28-28

BootCode    checksum is: 0xBABE6240, which is correct
Diagnostics checksum is: 0xBABEDC9A, which is correct
Download    checksum is: 0xBABEA6B7, which is correct
Application checksum is: 0xBABE5968, which is correct

PASS

DS:>
```

4 DIGITAL BOARD DIVERSITY

The D&S software needs to know what kind of system it must diagnose, in other words it must know what components can be tested on the hardware at hand. This to avoid misjudgement of components: e.g. indicating error when the component is not mounted on this specific board.
So, DS needs some settings that tell DS which hardware components are available.

In the boot EEPROM on the digital board a section is reserved for digital board settings. These settings contain which hardware components are available.

When the factory is building digital boards, the first thing that must be done when DS is started, is to execute nucleus DS_SYS_SettingsSet (1226) that programs these settings into the boot EEPROM. This nucleus must have a string value as parameter. This string contains the settings.

The service department must take the following remark into account. When some components in the DVD Recorder must be replaced (for example: replacing the digital board), the following nucleus must be executed: DS_SYS_SettingsSet (1226).

The nucleus DS_BROM_WriteRead will not clear these settings in the BOOT EEPROM.

When DS detects (by testing the checksum) that the settings are not valid, it gives a warning. In this case some nuclei executed in DS mode may return errors because of the corrupt settings string. Most nuclei however will behave correctly.

So, it is possible that the next message will appear when starting the Recorder for the first time:

```
[MIS_DIV,WARNING,Digital Board Hardware Information is corrupt,]
Factory Diagnostics and Service Software
DVD Video Recorder (Dec 13 2003, 10:55:37)

Version  :258          Build     :20031213_1030
Release  :P1_7_b       Buildtype :no
Baseline :I_P1_8_63    Variant   :verum:dvdrw2_lib
WARNING,Digital Board Hardware Information is corrupt

DS:>
```

- In this case the boot EEPROM of the digital board does not contain a string with the required hardware information. To update the digital board with the correct string, nucleus DS_SYS_SettingsSet (1226) must be executed. With the delivery of the software the correct HW-diversity strings are shipped. These can be used as parameters for the nucleus.

The latest overview of all diversity strings can be found on:
http://cww.ehv.pdsl.philips.com/dvdrw2/html/div_strings.shtml
If you need access to this site please contact the DS-team. Access will be granted or the latest information will be sent to you.

APPENDIX A TERMINAL INTERFACE

The DVD+RW set needs to be connected to a terminal in order to see the message when starting the set e.g.:

```
Factory Diagnostics and Service Software
DVD Video Recorder (Dec 13 2003, 10:55:37)

Version  :258          Build     :20031213_1030
Release  :P1_7_b       Buildtype :no
Baseline :I_P1_8_63    Variant   :verum:dvdrw2_lib

DS:>
```

A.1 SOFTWARE SETTINGS:

The terminal needs to be set to **19200** Baud, **8** Data bits, **n**o Parity, **1** Stop bit, **n**o Flow control, and no XON/XOFF usage.

A.2 HARDWARE CONNECTION:

Pin-out of the ‘Service’ connector on the board:

1 - Txd
2 - PIO ‘Service’ Pin
3 - Rxd
4 - RTS
5 - Gnd
6 - CTS
7 - +5V

The ‘Service’ connector provided to you will connect pin 2 to pin 5, in order to have the software detect that service mode is requested.

APPENDIX B LIST OF COMMANDS

A quick reference list of all available commands in the ***command-line-interface*** is given below:

Command	Description
100	Executing nucleus DS_CHR_DevTypeGet.
101	Executing nucleus DS_CHR_TestImageOn.
102	Executing nucleus DS_CHR_TestImageOff.
103	Executing nucleus DS_CHR_SineOn
104	Executing nucleus DS_CHR_SineOff
105	Executing nucleus DS_CHR_SineBurst
106	Executing nucleus DS_CHR_MuteOn
107	Executing nucleus DS_CHR_MuteOff
108	Executing nucleus DS_CHR_DvLedOn
109	Executing nucleus DS_CHR_DvLedOff
110	Executing nucleus DS_CHR_MacroVisionOn.
111	Executing nucleus DS_CHR_MacroVisionOff.
112	Executing nucleus DS_CHR_Peek
113	Executing nucleus DS_CHR_Poke
114	Executing nucleus DS_CHR_INT_PICInterrupts
115	Executing nucleus DS_CHR_DMA_TestDMA

Table 10 Commands for testing the Codec Host processor.

Command	Description
200	Executing nucleus DS_BROM_Communication
201	Executing nucleus DS_BROM_WriteRead

Table 11 Commands for testing the Boot EEPROM.

Command	Description
300	Executing nucleus DS_NVRAM_Communication.
301	Executing nucleus DS_NVRAM_WriteRead.
302	Executing nucleus DS_NVRAM_Clear.
303	Executing nucleus DS_NVRAM_Modify.
304	Executing nucleus DS_NVRAM_Read.

Table 12 Commands for testing the NVRAM.

Command	Description
400	Executing nucleus DS_SDRAM_WriteRead.
401	Executing nucleus DS_SDRAM_WriteReadFast.
402	Executing nucleus DS_SDRAM_Write.
403	Executing nucleus DS_SDRAM_Read.
404	Executing nucleus DS_SDRAM_DmaWriteRead.

Table 13 Commands for testing the SDRAM.

Command	Description
500	Executing nucleus DS_FLASH_DevTypeGet.
501	Executing nucleus DS_FLASH_WriteRead.
502	Executing nucleus DS_FLASH_Read.
503	Executing nucleus DS_FLASH_ChecksumProgram.
504	Executing nucleus DS_FLASH_CalculateChecksum.
505	Executing nucleus DS_FLASH_CalculateChecksumFast.

Table 14 Commands for testing the FLASH.

Command	Description
600	Executing nucleus DS_VIP_DevTypeGet.
601	Executing nucleus DS_VIP_Communication.
602	Executing nucleus DS_VIP_ClockOutputOn.
603	Executing nucleus DS_VIP_ClockOutputOff.
604	Executing nucleus DS_VIP_SelectInput.

Table 15 Commands for testing the Video Input Processor.

Command	Description
700	Executing nucleus DS_DVIO_LinkDevTypeGet.
701	Executing nucleus DS_DVIO_PhyDevTypeGet.
702	Executing nucleus DS_DVIO_LinkCommunication.
703	Executing nucleus DS_DVIO_PhyCommunication.
704	Executing nucleus DS_DVIO_Routing.
705	Executing nucleus DS_DVIO_DetectNode.
706	Executing nucleus DS_DVIO_DetectStream.

Table 16 Commands for testing the DVIO.

Command	Description
800	Executing nucleus DS_PSCAN_DevTypeGetDenc.
801	Executing nucleus DS_PSCAN_CommunicationDenc.
802	Executing nucleus DS_PSCAN_TestImageOn.
803	Executing nucleus DS_PSCAN_TestImageOff.
804	Executing nucleus DS_PSCAN_TestImageCoulourSettingsSet
805	Executing nucleus DS_PSCAN_TestImageCoulourSettingsGet
806	Executing nucleus DS_PSCAN_Routing
807	Executing nucleus DS_PSCAN_DevTypeGetDeInterlacer
808	Executing nucleus DS_PSCAN_CommunicationDeinterlacer.

Table 17 Commands for testing the Progressive Scan.

Command	Description
900	Executing nucleus DS_BE_CommunicationEcho
901	Executing nucleus DS_BE_Reset
902	Executing nucleus DS_BE_GetSelfTestResult
903	Executing nucleus DS_BE_VersionGet
904	Executing nucleus DS_BE_TrayOut
905	Executing nucleus DS_BE_TrayIn
906	Executing nucleus DS_BE_WriteReadDvdRw
907	Executing nucleus DS_BE_WriteReadDvdR
908	Executing nucleus DS_BE_StatisticaInformationGet
909	Executing nucleus DS_BE_StatisticalInformationReSet

910	Executing nucleus DS_BE_ErrorLogGet
911	Executing nucleus DS_BE_ErrorLogReset
912	Executing nucleus DS_BE_JitterOptimise
913	Executing nucleus DS_BE_FocusOn
914	Executing nucleus DS_BE_FocusOff
915	Executing nucleus DS_BE_MotorOn
916	Executing nucleus DS_BE_MotorOff
920	Executing nucleus DS_BE_Tilt
921	Executing nucleus DS_BE_CheckDisc
922	Executing nucleus DS_BE_SledgeMotor
924	Executing nucleus DS_BE_ReadTocInfo
925	Executing nucleus DS_BE_DiscErase
928	Executing nucleus DS_BE_RegionCodeSet
929	Executing nucleus DS_BE_RegionCodeGet
930	Executing nucleus DS_BE_RegionCounterReset
931	Executing nucleus DS_BE_AdjustLaserControl
932	Executing nucleus DS_BE_WriteReadDvdRDualLayer

Table 18 Commands for testing the Basic Engine.

Command	**Description**
1000	Executing nucleus DS_DCB_CommunicationEcho
1001	Executing nucleus DS_DCB_VersionGet
1002	Executing nucleus DS_DCB_Display
1004	Executing nucleus DS_DCB_ Keyboard
1005	Executing nucleus DS_DCB_RemoteControl
1006	Executing nucleus DS_DCB_Led

Table 19 Commands for testing the Display and Control Board.

Command	Description
1100	Executing nucleus DS_ANAB_CommunicationEcho
1101	Executing nucleus DS_ANAB_CommunicationIicNvram
1102	Executing nucleus DS_ANAB_CommunicationIicTuner
1103	Executing nucleus DS_ANAB_CommunicationIicDataSlicer
1104	Executing nucleus DS_ANAB_CommunicationIicSoundProcessor
1105	Executing nucleus DS_ANAB_CommunicationIicAVSelector
1106	Executing nucleus DS_ANAB_HardwareVersionGet
1107	Executing nucleus DS_ANAB_SoftwareVersionBootGet
1108	Executing nucleus DS_ANAB_SoftwareVersionDownloadGet
1109	Executing nucleus DS_ANAB_SoftwareVersionApplGet
1110	Executing nucleus DS_ANAB_SoftwareVersionDiagnosticsGet
1111	Executing nucleus DS_ANAB_ChecksumProgram
1112	Executing nucleus DS_ANAB_VideoRouting
1113	Executing nucleus DS_ANAB_AudioRouting
1114	Executing nucleus DS_ANAB_SelectTunerChannel
1115	Executing nucleus DS_ANAB_IICWriteRead
1116	Executing nucleus DS_ANAB_ClockAdjust
1117	Executing nucleus DS_ANAB_ClockReference
1118	Executing nucleus DS_ANAB_ClockCorrection
1119	Executing nucleus DS_ANAB_TunerAFCReferenceVoltage
1120	Executing nucleus DS_ANAB_TunerFrequencyDownload
1121	Executing nucleus DS_ANAB_StoreExternalPresets
1122	Executing nucleus DS_ANAB_BargraphLevelAdjust

Table 20 Commands for testing the Analogue Board.

Command	Description
1200	Executing nucleus DS_SYS_HardwareVersionGet.
1201	Executing nucleus DS_SYS_SoftwareVersionBootGet.
1202	Executing nucleus DS_SYS_SoftwareVersionDownloadGet.
1203	Executing nucleus DS_SYS_SoftwareVersionApplGet.
1204	Executing nucleus DS_SYS_SoftwareVersionDiagnosticsGet.
1205	Executing nucleus DS_SYS_EepromUpload.
1206	Executing nucleus DS_SYS_EepromDownload.
1207	Executing nucleus DS_SYS_DvIdNumberSet
1208	Executing nucleus DS_SYS_DvIdNumberGet
1209	Executing nucleus DS_SYS_IicWrite
1210	Executing nucleus DS_SYS_IicRead
1211	Executing nucleus DS_SYS_UartWrite
1212	Executing nucleus DS_SYS_UartRead
1213	Executing nucleus DS_SYS_VideoLoopThroughStart
1214	Executing nucleus DS_SYS_VideoLoopThroughStop
1215	Executing nucleus DS_SYS_VideoLoop
1216	Executing nucleus DS_SYS_AudioLoop
1217	Executing nucleus DS_SYS_SlashVersionSet
1218	Executing nucleus DS_SYS_SlashVersionGet
1219	Executing nucleus DS_SYS_Virginize
1220	Executing nucleus DS_SYS_VirginModeOn
1221	Executing nucleus DS_SYS_VirginModeOff
1222	Executing nucleus DS_SYS_VirginModeGet

1223	Executing nucleus DS_SYS_DisplayFatalOn
1224	Executing nucleus DS_SYS_DisplayFatalOff
1225	Executing nucleus DS_SYS_DisplayFatalGet
1226	Executing nucleus DS_SYS_SettingsSet
1228	Executing nucleus DS_SYS_SettingsDisplay
1229	Executing nucleus DS_SYS_SettingsGet
1230	Executing nucleus DS_SYS_AudioLoopThroughStart
1231	Executing nucleus DS_SYS_AudioLoopThroughStop
1232	Executing nucleus DS_SYS_SettingsHwIdSet
1233	Executing nucleus DS_SYS_SettingsDoubleCheck
1234	Executing nucleus DS_SYS_SettingsDlTableFilenameSet
1235	Executing nucleus DS_SYS_IicWriteRead
1236	Executing nucleus DS_SYS_BuildInfoGet
1237	Executing nucleus DS_SYS_UartSetup
1238	Executing nucleus DS_SYS_GlinkWriteRead

Table 21 Commands for testing (parts of) the System.

Command	Description
1300	Executing nucleus DS_EPGB_VersionGet.

Table 22 Commands for testing the EPG Board.

Command	Description
1400	Executing nucleus DS_PCMCIA_Reset.
1401	Executing nucleus DS_PCMCIA_Inquiry.
1402	Executing nucleus DS_PCMCIA_WriteRead.
1403	Executing nucleus DS_PCMCIA_Diagnostics.

Table 23 Commands for testing the PCMCIA interface.

Command	Description
1500	Executing nucleus DS_HDMI_DevTypeGet
1501	Executing nucleus DS_HDMI_Communication
1502	Executing nucleus DS_HDMI_EdidParse
1503	Executing nucleus DS_HDMI_DefaultVideoSet
1504	Executing nucleus DS_HDMI_Reset
1505	Executing nucleus DS_HDMI_Bist
1506	Executing nucleus DS_HDMI_DdcIicWrite
1507	Executing nucleus DS_HDMI_DdcIicRead
1508	Executing nucleus DS_HDMI_ExtendedWrite
1509	Executing nucleus DS_HDMI_ExtendedRead
1510	Executing nucleus DS_HDMI_CheckHPDTx
1511	Executing nucleus DS_HDMI_CheckHPDCodec
1512	Executing nucleus DS_HDMI_FLI2310_DevTypeGet
1513	Executing nucleus DS_HDMI_FLI2310_Communication
1514	Executing nucleus DS_HDMI_FLI2310_TestImageOn
1515	Executing nucleus DS_HDMI_FLI2310_TestImageOff
1516	Executing nucleus DS_HDMI_FLI2300_Routing
1517	Executing nucleus DS_HDMI_FLI2310_ExtendedWrite
1518	Executing nucleus DS_HDMI_FLI2310_ExtendedRead
1519	Executing nucleus DS_HDMI_FLI2310_1080I
1520	Executing nucleus DS_HDMI_Adv7302_Communication
1521	Executing nucleus DS_HDMI_Adv7302_TestImageOn
1522	Executing nucleus DS_HDMI_Adv702_TestImageOff
1523	Executing nucleus DS_HDMI_Adv7302_Routing
1524	Executing nucleus DS_HDMI_Adv7302_ColSettingsSet
1525	Executing nucleus DS_HDMI_Adv7302_ColSettingsGet
1526	Executing nucleus DS_HDMI_Adv7302_ExtendedWrite
1527	Executing nucleus DS_HDMI_Adv7302_ExtendedRead
1528	Executing nucleus DS_HDMI_Audio
1529	Executing nucleus DS_HDMI_ColumbusTestImage
1530	Executing nucleus DS_HDMI_ColumbusPass

Table 24 Commands for testing the HDMI interface.

Command	Description
1600	Executing nucleus DS_ASP_Communication.
1601	Executing nucleus DS_ASP_Version
1602	Executing nucleus DS_ASP_RealTimeSetClockValues.
1603	Executing nucleus DS_ASP_RealTimeGetClockValues.
1604	Executing nucleus DS_ASP_RealTimeSetClockCorrection.
1605	Executing nucleus DS_ASP_RealTimeClockAdjustment.
1606	Executing nucleus DS_ASP_NTCGet.
1607	Executing nucleus DS_ASP_FanSpeedSet.
1608	Executing nucleus DS_ASP_LightDisplay.
1609	Executing nucleus DS_ASP_BlinkDisplay.
1610	Executing nucleus DS_ASP_DimmingDisplay.
1611	Executing nucleus DS_ASP_ClearDisplay.
1612	Executing nucleus DS_ASP_KeyBoard.
1613	Executing nucleus DS_ASP_RemoteControl.
1614	Executing nucleus DS_ASP_LEDsOn.
1615	Executing nucleus DS_ASP_LEDsOff.
1616	Executing nucleus DS_ASP_Reset.
1617	Executing nucleus DS_ASP_Extended.
1618	Executing nucleus DS_ASP_Watchdog.
1619	Executing nucleus DS_ASP_Reboot.
1620	Executing nucleus DS_ASP_DetectVideo.
1621	Executing nucleus DS_ASP_GlinkRcLoop.
1622	Executing nucleus DS_ASP_VcrControl.

Table 25 Commands for testing the Analogue Slave Processor.

Command	Description
1700	Executing nucleus DS_AROM_Communication.

Table 26 Commands for testing the Analogue Board EEPROM.

Command	Description
1800	Executing nucleus DS_VMIX_Communication
1801	Executing nucleus DS_VMIX_Routing
1802	Executing nucleus DS_VMIX_Extended
1803	Executing nucleus DS_VMIX_FastBlankingCheck
1804	Executing nucleus DS_VMIX_8SC2Check
1805	Executing nucleus DS_VMIX_WideScreenSignallingCheck

Table 27 Commands for testing the Video Matrix.

Command	Description
1900	Executing nucleus DS_AMIX_Communication.
1901	Executing nucleus DS_AMIX_Routing.
1902	Executing nucleus DS_AMIX_VersionGet.
1903	Executing nucleus DS_AMIX_Control
1904	Executing nucleus DS_AMIX_Beep
1905	Executing nucleus DS_AMIX_Extended
1906	Executing nucleus DS_AMIX_CommunicationAdcDac
1907	Executing nucleus DS_AMIX_Mute

Table 28 Commands for testing the Audio Matrix (Sound Processor).

Command	Description
2000	Executing nucleus DS_FRE_Communication.
2001	Executing nucleus DS_FRE_ChannelSelect.
2003	Executing nucleus DS_FRE_CommunicationIfModule

Table 29 Commands for testing the Front End (Tuner).

Command	Description
2100	Executing nucleus DS_HDD_Communication.
2101	Executing nucleus DS_HDD_Reset.
2102	Executing nucleus DS_HDD_VersionGet.
2103	Executing nucleus DS_HDD_WriteRead.
2104	Executing nucleus DS_HDD_CapabilitiesGet.
2105	Executing nucleus DS_HDD_Diagnostics.
2106	Executing nucleus DS_HDD_UploadImage.
2107	Executing nucleus DS_HDD_DownloadImage.
2108	Executing nucleus DS_HDD_RandomReadScan
2109	Executing nucleus DS_HDD_LinearSurfaceScan
2110	Executing nucleus DS_HDD_SpinOff
2111	Executing nucleus DS_HDD_SectorRead
2112	Executing nucleus DS_HDD_SetPower

Table 30 Commands for testing the Hard Disc.

Command	Description
2200	Executing nucleus DS_DTTM_Reset.
2201	Executing nucleus DS_DTTM_TransparentCommand.
2202	Executing nucleus DS_DTTM_Communication.
2203	Executing nucleus DS_DTTM_FlashDeviceType.
2204	Executing nucleus DS_DTTM_DiagSwVersion.
2205	Executing nucleus DS_DTTM_BootSwVersion.
2206	Executing nucleus DS_DTTM_ApplSwVersion.
2207	Executing nucleus DS_DTTM_HardwareVersion.
2208	Executing nucleus DS_DTTM_SdramWriteRead.
2209	Executing nucleus DS_DTTM_SdramWriteReadFast.
2210	Executing nucleus DS_DTTM_EepromWriteRead.
2211	Executing nucleus DS_DTTM_FatalErrorRead.
2212	Executing nucleus DS_DTTM_FatalErrorClear.
2213	Executing nucleus DS_DTTM_FactoryBitSet.
2214	Executing nucleus DS_DTTM_PllVcxoFrequencySet.
2215	Executing nucleus DS_DTTM_PllVcxoFrequencyGet.
2216	Executing nucleus DS_DTTM_IicWrite.
2217	Executing nucleus DS_DTTM_IicRead.
2218	Executing nucleus DS_DTTM_AvTsPidSet.
2219	Executing nucleus DS_DTTM_AvMojoBeepOn.
2220	Executing nucleus DS_DTTM_AvMojoBeepOff.
2221	Executing nucleus DS_DTTM_AvAudioVideoStreamPlay.
2222	Executing nucleus DS_DTTM_AvPredefinedStreamGet.
2223	Executing nucleus DS_DTTM_AvPredefinedStreamChange.
2224	Executing nucleus DS_DTTM_AvMojoColoutbarOn.
2225	Executing nucleus DS_DTTM_AvMojoColourbarOff.
2228	Executing nucleus DS_DTTM_AvVideoStandardSet.
2229	Executing nucleus DS_DTTM_AvVideoOutputSet.
2230	Executing nucleus DS_DTTM_FreRegisterRead.
2231	Executing nucleus DS_DTTM_FreRegisterWrite.
2232	Executing nucleus DS_DTTM_FreLockStatusGet.
2233	Executing nucleus DS_DTTM_FreLockingParamSet.
2234	Executing nucleus DS_DTTM_FreLockingParamGet.
2235	Executing nucleus DS_DTTM_FreSignalStatusGet.

Table 31 Commands for testing the Digital Terrestrial Tuner Module.

Command	Description
2300	Executing nucleus DS_USB_Communication.
2301	Executing nucleus DS_USB_DevTypeGet.
2302	Executing nucleus DS_USB_Reset

Table 32 Commands for testing the Universal Serial Bus (USB).

User / Dealer script: This script will be executed when holding down the **PLAY**-button when powering up the set.

PSU Board

General

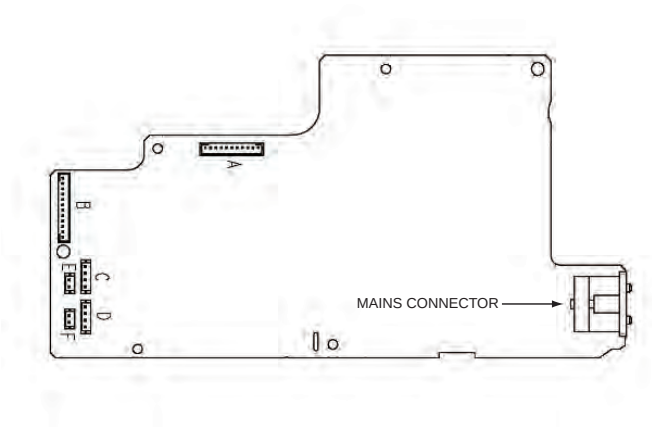


Figure 1 PSU Board Layout

The PSU board provides the following connection to the rest of the set:

Connector A: Supply/Signal to Analog Board

Pin no.	Supply / Signal	Remarks
1	12VSTBY	
2	STBY control	>2.5V = supply for conn. B is off (Standby mode) <0.5V = supply for conn. B is on (On mode)
3	5VSTBY	
4	DD_ON	>2.5V = supply for conn. D is on <0.5V = supply for conn. D is off
5	3V3STBY	
6	IPFAIL	>4.0V = power is good <0.5V = power fail
7	5NSTBY	
8	GND	
9	33VSTBY	
10	GND	
11	VGNSTBY	

Connector B: Supply to Digital Board

Pin no.	Supply / Signal	Remarks
1	3V3D	
2	3V3D	
3	3V3D	
4	3V3D	
5	GND	
6	12VD	
7	GND	
8	GND	
9	5VD	
10	HD_ON	>2.5V = supply for conn. C & G is on <0.5V = supply for conn. C is off
11	GND	
12	5ND	

Connector C: Supply to HDD/DTTM

Pin no.	Supply
1	12VH
2	GND
3	GND
4	5VH

Connector D: Supply to Basic Engine

Pin no.	Supply
1	12VE
2	GND
3	GND
4	5VE

Connector E: Not in use
F: Not in use

SAFETY!

The PSU is designed with short-circuit protection that will shutdown the power supply. When this happen, the voltage stored in capacitor C1 and C40 will prevent the Power Supply to turn-on, therefore they must be discharged before the PSU can function normally again.

9.1 Front Board (Panel – Display + Key)

9.1.1 General

This board consists of the following parts:

- Frontend (Audio & Video)
- Keypad registration

9.1.2 Frontend (Audio & Video)

The Frontend connector Frontboard[1003] allows for Audio and Video Connector to connect to Audio and video sources for recording using the Basic Engine or HDD and keypad registration when users depresses any of the button and the key is sent to Analog board via Connector 1910 to Microprocessor for controlling the various function on the recorder.

9.2 Analog Board

9.2.1 General

The Analog board consists of the following parts:

- Microprocessor
- Fan Control (optional)
- Power Supply Unit
- Tuner Frontend
- Audio ADC/DAC

9.2.2 Microprocessor µP (IC 7108 : TMP87PM74AFG)

The µP which run on a 5V supply and is responsible for the following functions:
• Interface with the Chrysalis chip on the Digital Board via I_2C interface.
• Evaluation of the keyboard matrix (network of resistors) on the Front board via pin 32 and 33.
• Decoding the remote control commands from the infra-red receiver on the Front board via pin 22.
• Activation and control of the FTD display on the Front board (with the help of 7103 as driver) via I_2C bus
• Timer Wake-up activation
• Fan control via transistors 7104 and 7105

It runs on two clock frequencies namely:
• 8MHz for normal operation
• 32.768KHz for the real time clock

9.2.3 Simple Power Supply

The main power supply for this set is generated in the PSU board. Within the Analog board only the 5V, 3V3SW and 8VSTBY lines are generated. Below are the supply lines from the Simple Power supply on the Analog board:

• 3V3SW to DAC_ADC and CU
• 3V3STBY to CU
• 5V to IOV, CU, PROG, MSP, DIGIO and FV
• 5NSTBY to IOA, PROG, DAC_ADC and Front board
• 5VSTBY to IOA, IOV, FV, CU, DAC_ADC and Front Board
• 8VSTBY to MSP
• 12VSTBY to CU, IOV, DAC_ADC and Front Board
• 33VSTBY to FV
• VGNSTBY to CU and Front Board

Standby modes:
In Standby mode the STBY control line is low, switching off the 3V3D, 5VD, 5ND and 12VE supply and thus reducing the power consumption.

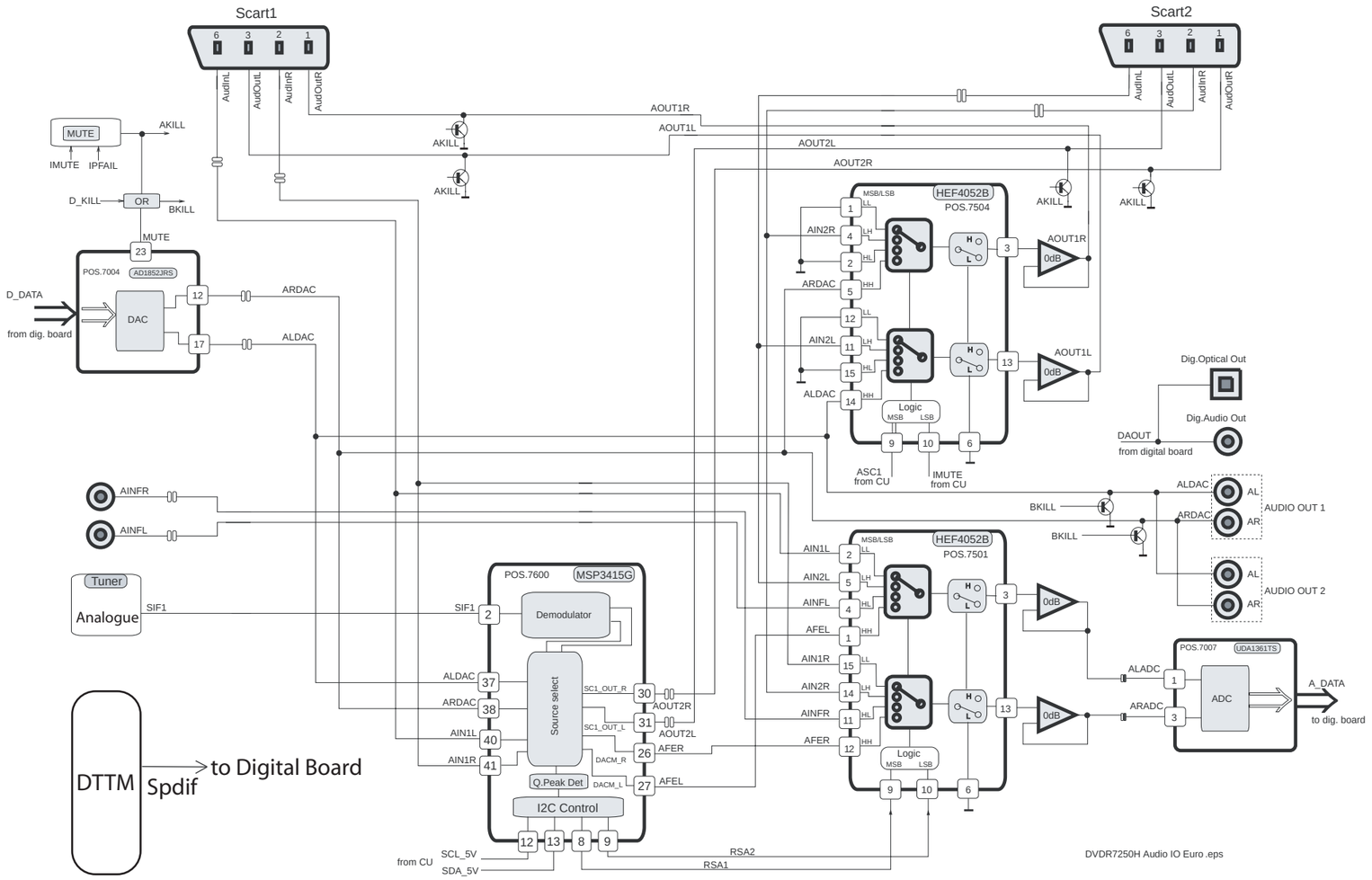
9.2.4 Analogue Tuner Frontend [1100 : TMQZ2]

Tuner Frontend [1700 : TMQZ2]

It has a RF IN for antenna connection and RF OUT which provides a RF loop through for connection to the TV. The Frontend (Tuner & IF-demodulator) is controlled by I_2C (SCL_5V- and SDA_5V-) lines coming from the Slave µP [7103].
Complete video processing is done in this unit and the video output (CVBS) is taken out from the [VIDOUT] pin 17 via a transistor [7701] as VFV-line to the Video I/O circuitry. The audio-IF component SIF1 is taken out from the [SIFOUT] pin 7 for the demodulation by the Multi-sound processor (MSP).

Audio demodulator
The sound demodulation is done by the MSP3415G [7600], which is also fully controlled via I_2C bus by the µP. The audio signals are available at pin 26 and pin 27 and fed as AFER- & AFEL- line to the audio I/O for further processing.

Audio IO Europe Overview



9.3 Audio Routing (Refer to Audio IO Europe overview diagram)

The sound processing is always done in stereo (that means separate left- and right- channel) and the complete switching is realized by using HEF4052B[7501,7504] which is a dual four-to-one multiplexer and MSP3415G which is a multi-sound processor.

a) Scart 1 – Output path

The multiplexer [7501] selects either signals from the Scart 2 Input (AIN2L/AIN2R) or the Audio DAC (ALDAC/ARDAC) as the output source for Scart 1 (AOUT1L/AOUT1R).

b) Scart 2 – Output path

The MSP [7600] selects either signals from the Scart 1 Input (AIN1L/AIN1R), the Audio DAC (ALDAC/ARDAC) or the Tuner Frontend as the output source for Scart 2 (AOUT2L/AOUT2R).

c) Digital audio-out path

In addition, a digital output (DAOUT) coming from the Digital board is passed through a 4-fold inverter [7250] for performance reasons (noise reduction, jitter, …) as digital Audio / Optical outputs at the rear.

d) Record path

The record-selector [7501] selects either signals from the Scart 1 Input (AIN1L/AIN1R), Scart 2 Input (AIN2L/AIN2R),Front Cinch (AINFL/AINFR) or the MSP (AFEL/AFER) and routes to the audio ADC (ALADC/ARADC) for record purposes. The switch is controlled via RSA1 and RSA2 signals coming from the MSP.

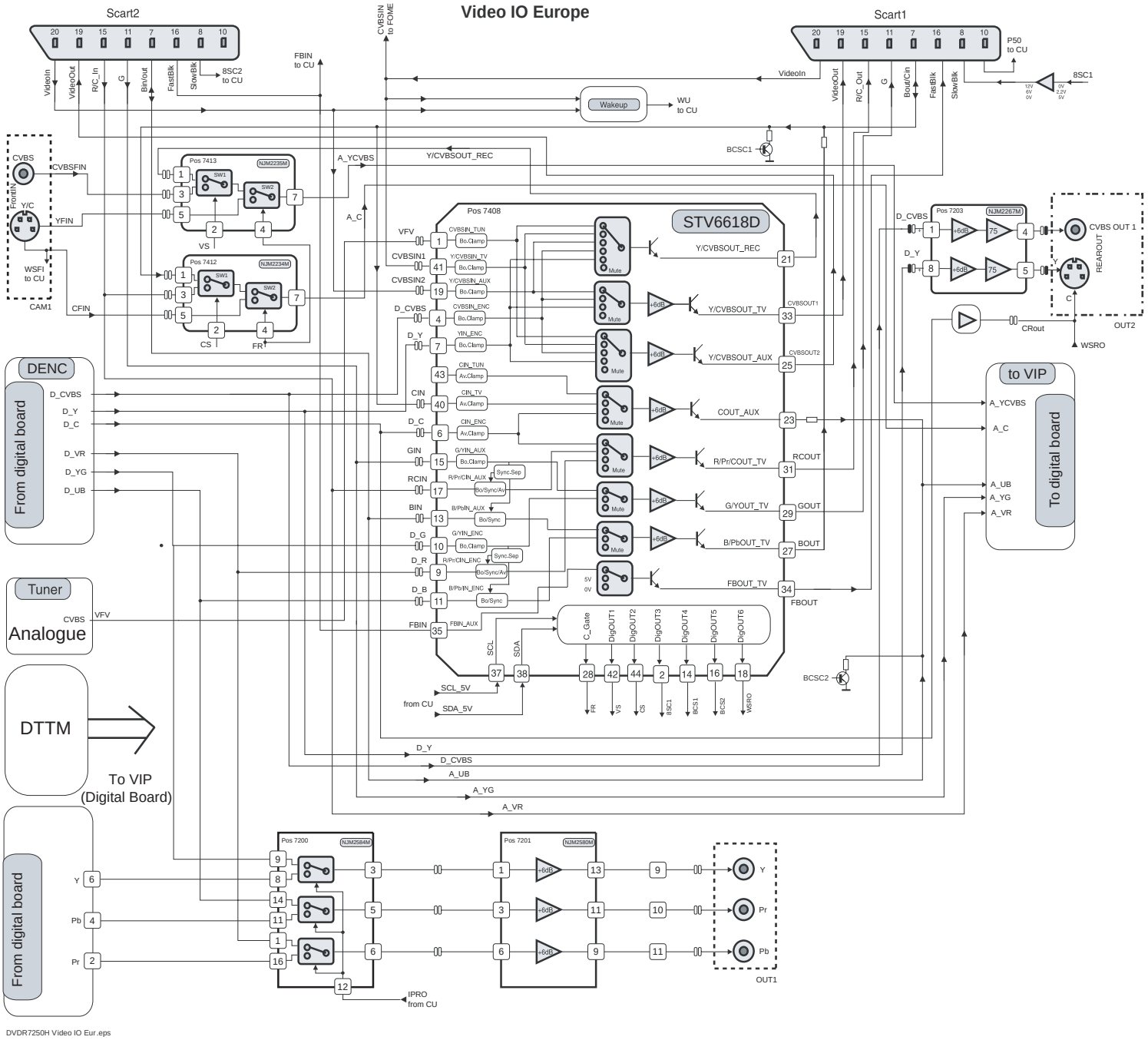
9.3.1. Audio ADC/DAC

The conversion of analog audio signals from the record selector [7501] outputs (ALADC/ARADC) is done via UDA1361TS [7007]. This IC can process input signals up to $2V_{rms}$ by using external resistors in series to the input pins. All required clock signals are generated on the digital board and only the audio data (A_DAT-line) are routed to Digital board for further processing.

The transformation of digital audio back into analog domain is done by AD1852JRS[7004]. All necessary clock signals are coming from the digital board and digital audio data (D_DATA0-line) are converted into analog signals (pin 15 and 18). The output signals from the audio DAC part (ALDAC/ARDAC) are directly routed to the rear cinch sockets. To avoid plops and any other audible noise on the output muting circuits are implemented for each channel.

9.3.2. Muting

Muting for the various outputs (Scart 1, Scart 2 and rear Cinch sockets) are done via the AKILL, BKILL lines which is a combination of the D_KILL from the Digital board, IMUTE from the Slave µP and IPFAIL from power supply.


Video IO Europe
Scart2
Scart1
VideoIn
VideoOut
R/C_In
G
Bin/out
FastBlk
SlowBlk
8SC2 to CU
FBIN to CU
CVBSIN to FOME
Wakeup
WU to CU
P50 to CU
8SC1
BCSC1
BCSC2
CVBS
CVBSFIN
Y/C
YFIN
WSFI to CU
CAM1
CFIN
Pos 7413
Pos 7412
NJM2235M
NJM2234M
SW1
SW2
VS
CS
FR
A_YCVBS
A_C
Y/CVBSOUT_REC
Pos 7408
STV6618D
VFV
CVBSIN1
CVBSIN2
D_CVBS
D_Y
CIN
D_C
GIN
RCIN
BIN
D_G
D_R
D_B
FBIN
CVBSIN_TUN
Y/CVBSIN_TV
Y/CVBSIN_AUX
CVBSIN_ENC
YIN_ENC
CIN_TUN
CIN_TV
CIN_ENC
G/YIN_AUX
R/Pr/CIN_AUX
B/PbIN_AUX
G/YIN_ENC
R/Pr/CIN_ENC
B/PbIN_ENC
FBIN_AUX
Bo,Clamp
Av,Clamp
Sync,Sep
Bo/Sync/Av
Bo/Sync
Mute
+6dB
Y/CVBSOUT_TV
Y/CVBSOUT_AUX
COUT_AUX
R/Pr/COUT_TV
G/YOUT_TV
B/PbOUT_TV
FBOUT_TV
CVBSOUT1
CVBSOUT2
RCOUT
GOUT
BOUT
FBOUT
5V
0V
SCL
SDA
C_Gate
DigOUT1
DigOUT2
DigOUT3
DigOUT4
DigOUT5
DigOUT6
FR
VS
CS
8SC1
BCS1
BCS2
WSRO
SCL_5V
SDA_5V
from CU
Pos 7203
NJM2267M
CVBS OUT 1
REAROUT
Y
C
CRout
OUT2
WSRO
DENC
From digital board
D_CVBS
D_Y
D_C
D_VR
D_YG
D_UB
to VIP
To digital board
A_YCVBS
A_C
A_UB
A_YG
A_VR
Tuner
Analogue
CVBS
VFV
DTTM
To VIP
(Digital Board)
D_Y
D_CVBS
A_UB
A_YG
A_VR
From digital board
Y
Pb
Pr
Pos 7200
NJM2584M
Pos 7201
NJM2580M
IPRO from CU
OUT1
DVDR7250H Video IO Eur.eps

9.4 Video Routing (Refer to Video IO Europe diagram)

A matrix switch STV6618D [7408] controlled by the Slave µP via I^2C-bus is used for Video I/O switching. All used outputs excluding pin 21 (Y/CVBSOUT-REC) have a 6Db amplification and a 75 ohms-driver-stage inside. This IC also includes several digital outputs, which are used for switching purposes on the Analog board. This matrix switch routes the selected inputs to the correct output lines for TV viewing and further processing in the Digital board.

The record selector inside the switch selects between the inputs from Tuner Frontend (VFV), CVBS Scart1 (CVBSIN1), CVBS Scart2 (CVBSIN2) or D_CVBS from the DENC (on Digital board). The output signal CVBS_REC together with the other signals CVBSFIN, YFIN & C_FIN from the Front and RCin from Scart2 are routed directly to the VIP (on Digital board) for further processing.

The signals D_CVBS and D_Y are fed through NJM2267M[7203] (6dB amplification) and D_C via transistors [7410 & 7411] as driver to the rear S-Video output socket and CVBS cinch socket.

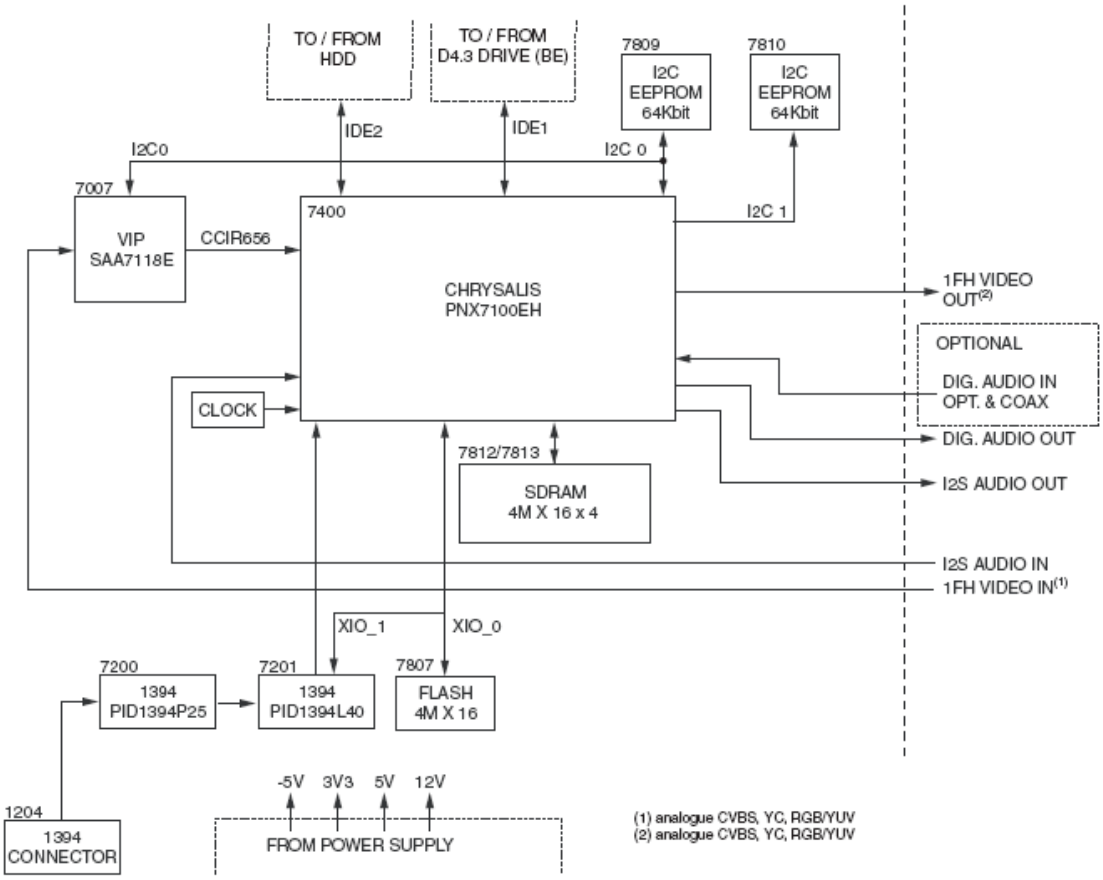
9.5. Basic Engine

The VAD8043 module (also known as D4.3 drive) is dual format DVD-R/+R and DVD-RW/+RW drive video recorder with an E-IDE/ATAPI interface. The video recorder engine performs all basic servo tasks. It reads data from and writes data to the disc and controls all functions like tray control, start/stop the disc, tracking, jumping and communicating with the host. Mechanically, the module consists of a motorized tray loader that contains the dual laser optical pickup unit and a PCBA that contains all the electronics needed to control the drive and interfacing the MPEG encoder/decoder back-end application.

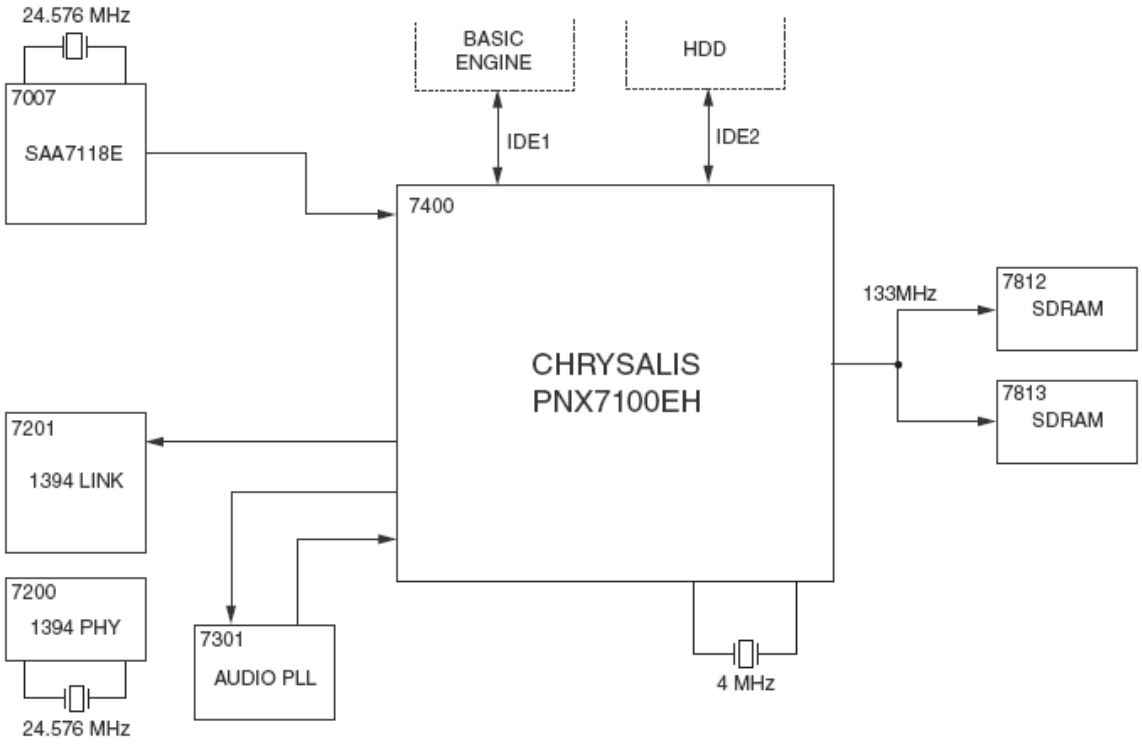
There is a temperature sensor included in the drive that prevents malfunction or destruction of the drive in case the temperature inside the drive gets too high.

9.6. Digital Board

The Digital Board is based on the highly integrated Chrysalis BGA chip (Ball Grid Array), PNX7100EH and supports 2 IDE (ATAPI) connection.The board encodes and multiplexes the analogue video and digital uncompressed audio (I^2S) into an MPEG2 stream. This MPEG2 stream is formatted for recording by the DVD+RW engine. In the playback, the board will decode the MPEG2 video into analogue video. In addition, a DV stream can be received via IEEE 1394 (i-Link),and transformed to MPEG2 format.



The Chrysalis chip has a complex system, which is needed to support the processes running at different frequencies such as video decoding, audio decoding or peripheral I/O devices etc.To ensure a synchronous initialization of all the registers and state machines, all the PLLs are switched to their default frequency and the reset sequence is run at 4MHz. Then when the booting control unit is correctly initialized and once it has captured all the booting parameters, it sets the PLLs to its functional frequencies to allow the modules to run at their nominal frequencies. Thanks to a clock blocking mechanism, the frequency switching is glitch free.



System clocks:
- PNX7100EH (7400, pin AF9 and AF10) : 4MHz provided by the x'tal 1401
- SAA7118E (7007, pins A3 and B4) : 24.576MHz provided by x'tal 1001
- 1394-PHY (7200, pins 59 and 60) : 24.576MHz provided by x'tal 1201
- 1394-LINK (7201, pin 88) : 49.152MHz provided by 1394-PHY
- SDRAM (7812 and 7813, pin 38) : 133MHz provided by the Chrysalis chip

Video Part

The analogue video input signals CVBS, YC and RGB are routed via the board to connector 1904 and sent to Video Input Processor, SAA7118E. The Video Input Processor encodes the analogue video to digital video stream (CCIR656 format). The output stream, named ITU_IN(7:0), is then routed to the Chrysalis chip. This IC encodes and decodes the digital video stream into / from MPEG2 format.

The digital video input signals from the DV-in are routed from connector 1204 via the 1394 PHY IC [7200] and the 1394 LINK IC [7201] also to the Chrysalis chip.

Audio Part

I_2S audio is sent from the Analog board to the Chrysalis chip via connector 1900.
The Chrysalis chip compresses the I_2S audio data into an MPEG1-L2 / AC3 audio stream.

Front-end I2S

The Chrysalis chip interfaces directly to the Basic Engine and HDD via the IDE connectors.
It buffers the data streams that are coming from (or going to) these hardware devices.In the Chrysalis chip, the video MPEG2 stream and the audio AC3 stream are multiplexed into an I_2S stream. In normal recording the serial data are send to the HDD for recording.Only archiving and playback is done with optical drive.

9.6.2. Playback mode

During playback, the serial data from the Basic Engine is going directly to the Chrysalis chip via ATAPI interface.

The Chrysalis chip has the following outputs:
- Analog video CVBS, YC and RGB outputs on connector 1904
- I_2S audio (PCM format) on connector 1900
- SPDIF audio (digital audio output) on connector 1900
- Progressive Scan output connector 1002

9.6.3. Basic Engine Interface

The Digital board is equipped with 2 IDE bus (ATAPI) for connecting to the Basic Engine and HDD via connectors 1101 and 1102 respectively.

9.6.4. Power Supply

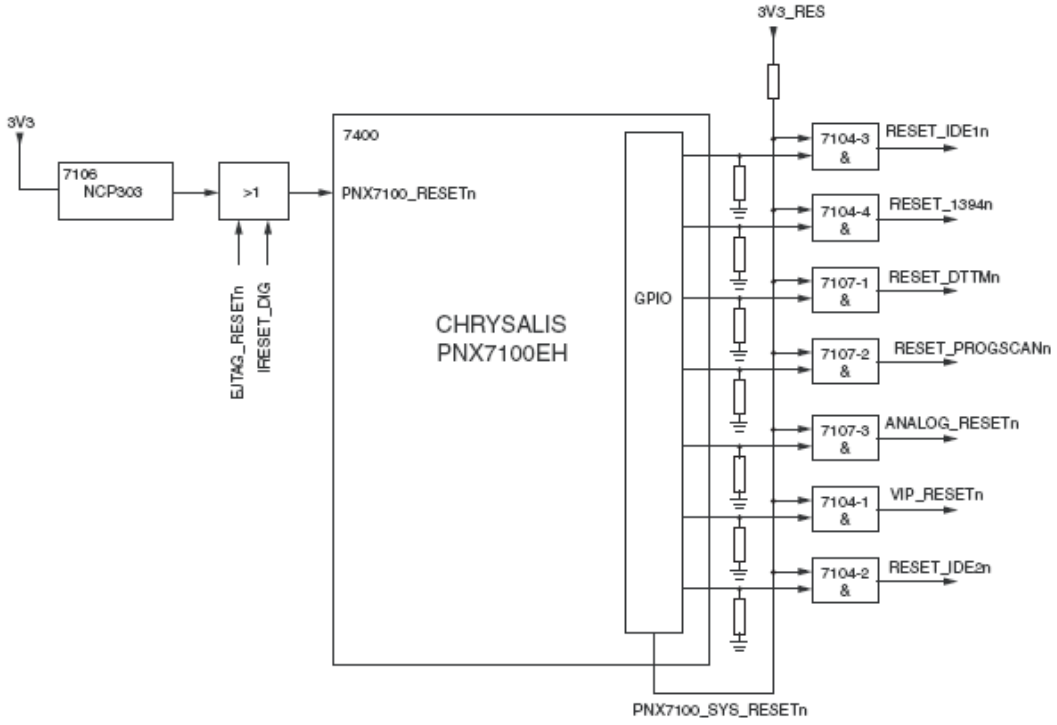
The Digital board is not powered in standby mode. The control signal STBY on the analog board will enable the PSU and power the digital board.

- STBY = High : the digital board is in powered down standby mode
- STBY = Low : the power supply to the digital board is enabled. The 3V3, -5V, +5V and +12V come from the PSU, while the following voltages are generated in the digital board:
- 1.8V core voltage generated by a NCP1571D [7501] .It provides a DC-DC power solution producing a 1.8V output voltage over a wide current range
- 2.5V generated by a LF25CDT [7600] for Pro-scan Video Encoder

9.6.5. Memory

Several memories are used on the Digital Board:

- Eeprom IC [7809] : this memory contains all the parameters for the application
- Eeprom IC [7810] : this memory contains the boot parameters of the board
- Flash IC [7807] : this memory contains the application and Service diagnostic firmware



***9.6.6* Reset concept Digital board**

The voltage detector NCP303LSN29 [7106] provides the reset signal PNX7100_RESETn with the correct timing behavior. This circuitry functions as a Power-on reset module which detects the minimum functional voltage that is needed by the device. It also detects any voltage drop. When the power voltage is outside the nominal range, a reset signal is generated and fed to the Chrysalis chip to reset the different peripherals and processing units.

- PNX7100_RESETn = High {the Digital board is up and running}
- PNX7100_RESETn = Low {the Digital board will reset}

There are two control lines which can overrule this reset signal:

- IRESET_DIG (controlled by the microprocessor on the Analog Board)
- EJTAG_RESETn (only for production)

The PNX7100_SYS_RESETn is a general enabling signal for the different reset lines. All other reset lines are directly driven from the Chrysalis port pins. All reset lines are logically connected via 74LVC08AD [7104 and 7107] AND-gates. If both reset signals are low, all other external devices are initialized.

9.6.7. In/Out Connector

Audio In/Out Connector [1900]

The Audio In / Out (AIO) connector is used to interchange digital audio signals between the Analog and Digital board.

Video In/Out Connector [1904]

The Video In / Out (VIO) Connector is used to interchange analogue video signals between the Analog and Digital board.

Video Out Connector [1002]

The Video Out Connector is used for Progressive Scan video signals to the Analog board

9.5.8. Service UART Interface

Hex Inverting Schmitt trigger 74HCT14D[7111] are used to make a level conversion between LVTTL and 5V (compatible with most RS232 interfaces) and vice versa. The control line MPIO19_EEPROM_En is used to activate service and diagnostic SW at start-up. The connectivity is provided via an external service tool.

9.7 Digital Terrestial Tuner Module (DTTM)

The DTTM module received DVB-T signal from Digital Tuner and outputs to the Connector 1901 for Audio signal processing and Connector 1003 for video processing.

Mechanical Instruction

Note : The position numbers given here refers to the Exploded view

1.1 Dismantling of the DVD Tray Cover manually

1) Insert a screw-driver into the slot provided at the bottom of the set and push in the direction as shown in figure 4-1 to unlock before sliding the Cover Tray 110 out.

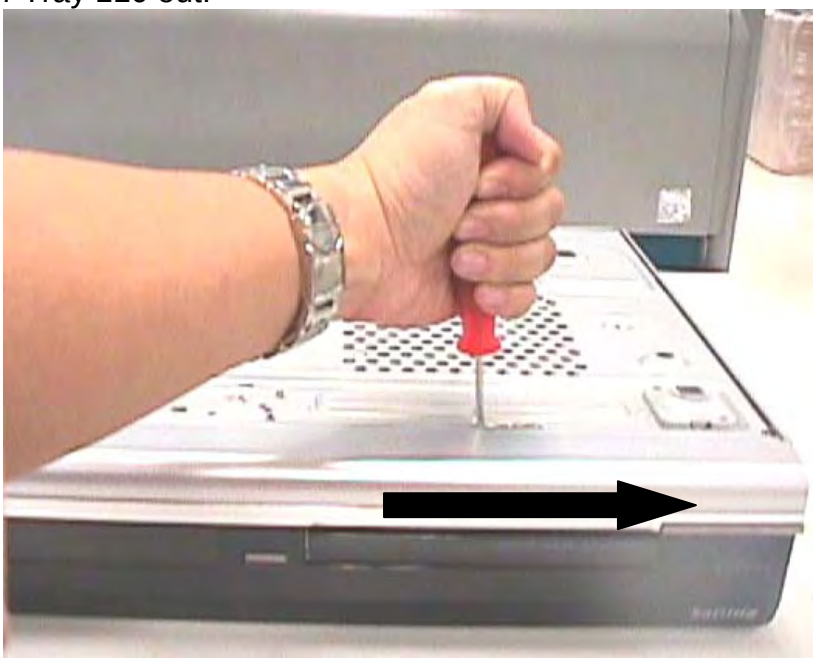


Figure 4-1:Slide out Cover Tray Assembly

2)Remove the Cover Tray 110 as shown in Figure 4-2 .

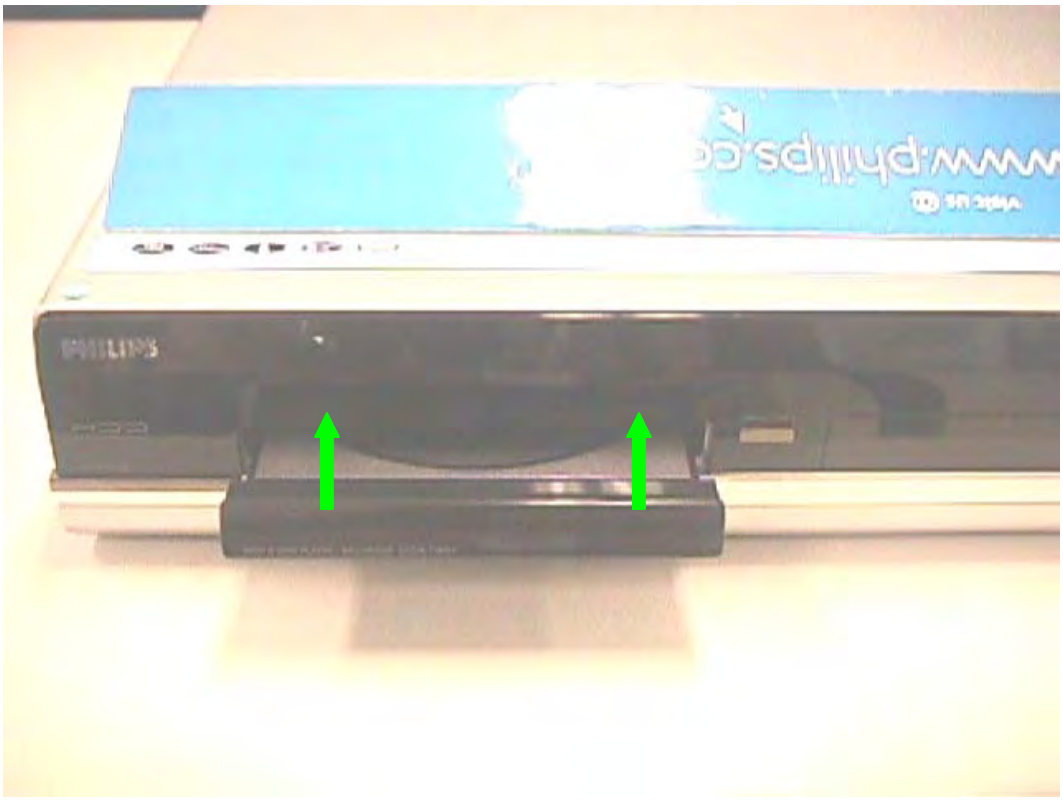


Figure 4-2:Remove Cover Tray Assembly

1.2 Dismantling of the Basic Engine (Drive D4.3closed)

1) Remove 9 screws to loosen Top cover 240 .
2) Remove 4 screws to loosen the Basic Engine assembly 284+197 as shown in Figure 4-3.

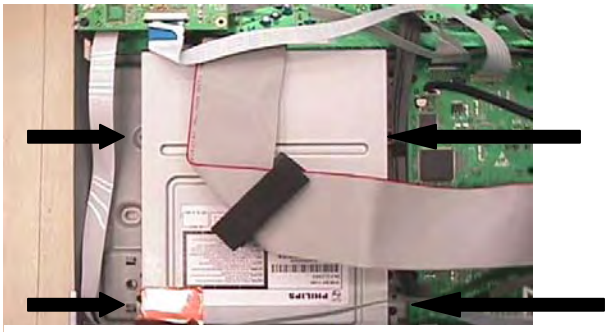


Figure 4-3:Remove Basic Engine

3) Remove 4 screw to loosen the Bracket Loader 197 and uncatch the Dust cover assembly 188 .Basic Engine Service position as shown in Figure 4-4.

Figure 4-4:Basic Engine Service Position

1.3 Dismantling of Frontboard

1) Remove Screws as indicated to detach front panel assembly from frame 196 as shown in Figure 4-5.

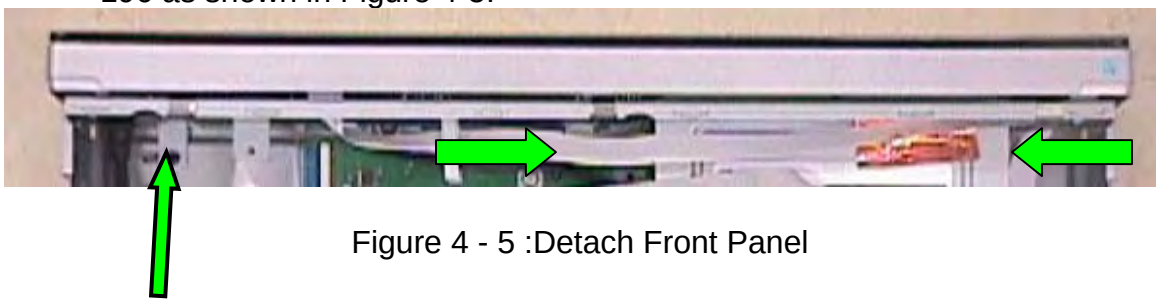


Figure 4 - 5 :Detach Front Panel

2) Detach front plate by removing screw from Font PCB securing Front PCB.Service Position of Frontboard as shown in Figure 4-6.

Figure 4-6 : Frontboard Service Position

1.4 Dismantling of the HDD / PSU Board

Figure 4- 7:Remove HDD Position 1

1) Remove the 3 screws to loosen the HDD Assembly 1007+185+292 as shown in Figure 4 – 7 .

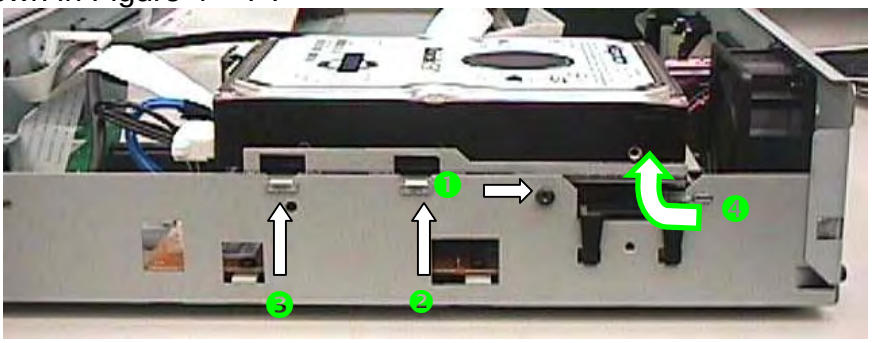


Figure 4 – 8:Remove HDD Position 2

2) At the Side of the set as shown in Figure 4-8, remove HDD as indicated
3) Turn the HDD assembly with Bracket HDD Back (199) facing up to remove screw 183 as shown in Figure 4-9.

Note : Screws 183 are special type of screws that must be replaced only with those specified in the Service Parts list on Chapter 10.

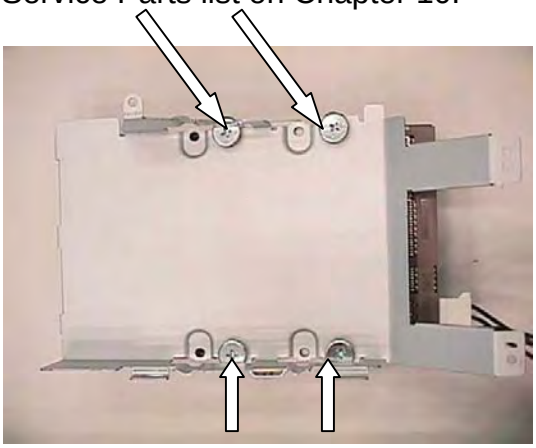


Figure 4-9:Removing Screws 183

4) Remove 3 screws to loosen the PSU Board 1006.
5) Service position for PSU Board is given in Figure 4-10.

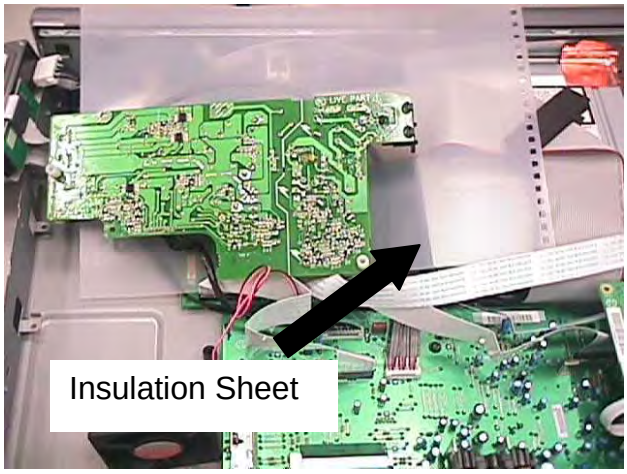


Figure 4-10: PSU Board Service Position

1.5 Dismantling of the Digital Board

1) Remove 4 screws to loosen the Digital Board 1002 as shown in Figure 4-11.

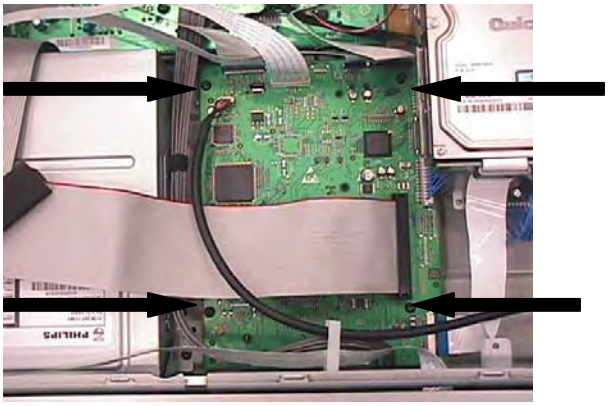


Figure 4-11 :

2) Service Position for Digital Board is given in Figure 4-12.

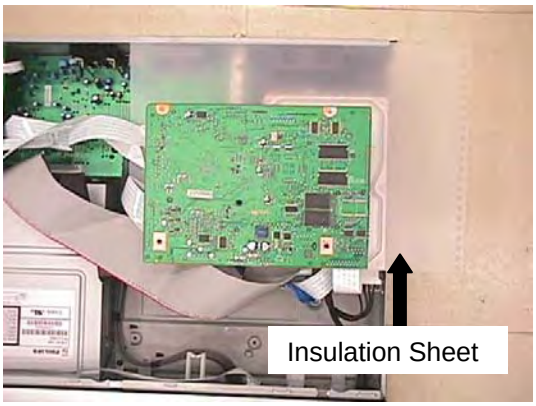


Figure 4–12: Digital Board Service Position

1.5 Dismantling of the Analogue Board

1) Remove screws from the rear panel 230 to detach Analogue Board.
2) Service Position of Analogue Board is given in Figure 4-13.

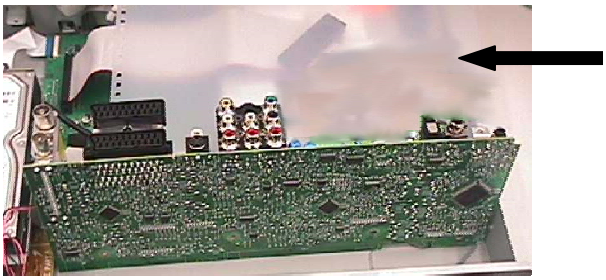


Figure 4–12: Analogue Board Service Position

1.6 Dismantling of the DTTM Board

1) Remove 1 screw and two catch from Bracket DTTM 178 to loosen DTTM board 1005
2) Service Position of DTTM board as shown in Figure 4-13.

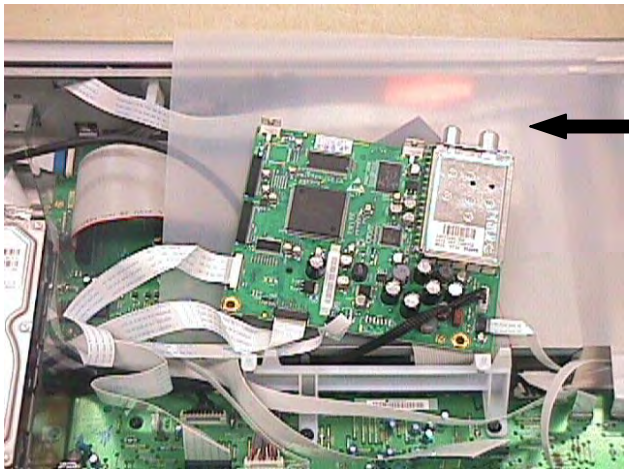
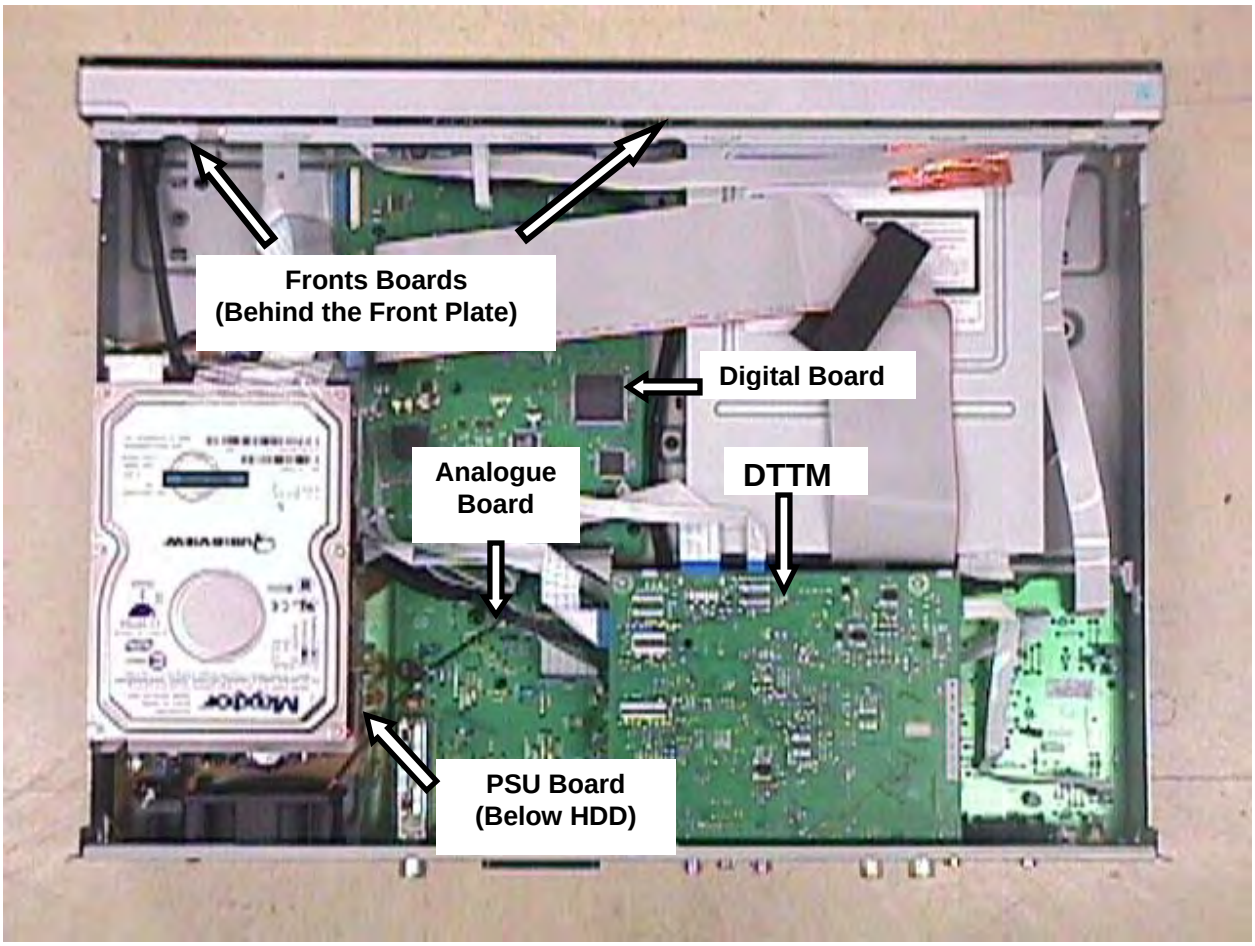


Figure 4–13 :DTTM Service Position

1.Technical Specifications and Connection Facilities

1.1 PCB Locations



1.2 Read / Write Speed

Type of Disc(Function)	Disc Rotation Speed
Read Speed CD	7X CAV
Read Speed DVD	4X CAV
Write Speed DVD+R/RW	2.4X ZCAV
Write Speed DVD-R/RW	2X

1.3 General:

Mains voltage	:	198V-276V
Mains frequency	:	47Hz-63Hz
Power consumption (record)	:	<75W

Standby Power consumption	:	<4W
Eco stand-by	:	< 3W

1.4 RF Tuner(Analogue)

1.4.1.1 System:

PAL B/G, PAL D/K, SECAM L/L', PAL I

1.4.1.2 RF – Loop Through

Frequency range	:	45MHz-860MHz
Gain: (ANT IN-ANT OUT)	:	-6dB to 0dB

1.4.1.3 Receiver:

PLL tuning with AFC for optimum reception

Frequency range	:	45.25MHz - 857MHz
Sensitivity at 40dB S/N (video unweighted)	:	≤ 60dBμV at 75Ω

1.4.1.5 Video Performance:

Channel 25 / 503,25MHz,
Test pattern: PAL BG PHILIPS standard test pattern,
RF Level 74dBV
Measured on SCART 1

Frequency response	: 0.1MHz - 4.00MHz ± 3dB
Group delay (0.1MHz-4.4MHz)	: 0 nsec ± 150 nsec

1.4.1.6 Audio Performance:

Audio Performance Analogue – HiFi:

Frequency response at SCART 1 (L + R) output	: 100Hz -12kHz / 0 ± 3dB
S/N according to DIN 45405,7,1967 and PHILIPS standard test pattern video signal	: ≥ 50dB
Harmonic distortion (1kHz, ± 25kHz deviation)	:≤ 1.5%

Audio Performance NICAM:
Frequency response at SCART 1

(L + R) output	:	40 Hz – 15 kHz / 0 ± 3dB
S/N according to DIN 45405,7,1967 and PHILIPS standard test pattern video signal	:	≥ 60dB
Harmonic distortion (1kHz)	:	≤ 0.5%

1.4.1.7 RF Tuning

Automatic Search Tuning

scanning time without antenna	:	3min. typical
stop level (vision carrier)	:	≥ 37dBμV
Maximum tuning error during operation	:	± 100kHz

Tuning Principle
Automatic B, G, I, DK and L/L' detection .Manual selection in "STORE" mode

1.4.2 RF TUNER (Digital Terrestial)

1.4.2.1DVB – T – Tuner

Frequency range	:448-861MHz
Gain(Ant IN – Ant OUT)	:-1dB to 3dB
Auto Search scanning time (without Antenna input signal)	:40 sec typical

1.4.2.2DVB-T-Video Performance

DVB-T-RF antenna signal IN :Video Performance measured at Rear Cinch Audio Out:

-S/N(Unweighted,5MHz-BW limitation SC trap ON)	:≥55dB
-Frequency response 0.1 to 4.8MHz	:+1/-3dB
-Y/Chroma delay	:≤55ns
-2-T-K-factor	: ≤2%

1.4.2.3DVB-T-Audio Performance

DVB-T-RF antenna signal IN;Audio performance measured at Rear Cinch Audio Out:

-S/N(A-weighted, 22kHz-BW limited)	: ≥88dB
-Frequency response 20Hz to 20kHz	:±1dB

-THD + Noise (at 1kHz) : ≥85dB
-THD + noise (ratio) for 16Hz to 20kHz
-Channel Separation(at 1kHz) : ≥100dB

1.5 Analogue Inputs / Outputs

1.5.1 SCART 1(Connected to TV)

Pin Signals:

1	- Audio-out R	1.8V RMS
2	- Audio-out R	
3	- Audio-out L	1.8V RMS
4	- Audio GND	
5	- Blue / Chroma GND	
6	- Audio- in L	
7	- Blue-out	0.7Vpp ± 0.1V into 75 Ω
8	- Function switch	< 2V = TV > 4.5V / < 7V = asp. Ratio 16:9 DVD > 9.5V / < 12V = asp. Ratio 4:3 DVD
9	- Green GND	
10	– P50 control	not use
11	– Green out	0.7Vpp ± 0.1V into 75Ω (*)
12	- NC	
13	- Red / Chroma GND	
14	- Fast switch GND	
15	- Red-out / Chroma-out	0.7Vpp ± 0.1V into 75Ω (*)
16	- Fast switch RGB / CVBS or Y out	< 0.4V into 75Ω = CVBS >1V / < 3V into 75Ω = RGB
17	- Y/CVBS GND OUT	
18	- CVBS GND IN	
19	- CVBS-out	1Vpp ± 0.1V into 75Ω(*)
20	- CVBS-in	
21	- Shield	

1.5.2 SCART 2 (Connected to AUX)

Pin Signals:

1	- Audio-out R	1.8V RMS
2	- Audio-in R	
3	- Audio-out L	1.8V RMS
4	- Audio GND	
5	- Blue / Chroma GND	
6	- Audio-in L	
7	- Blue-in	

8 - Function switch
9 - Green GND
10 - NC
11 - Green-in
12 - NC
13 - Red / Chroma GND
14 - Fast switch GND
15 - Red-in/Chroma-in
16 - Fast switch
RGB / CVBS or Y in
17 - CVBS-OUT GND
18 – Y/CVBS in GND
19 - CVBS out sync 1Vpp ± 0.1V into 75Ω
20 – CVBS in / Y-in
21 – Shield

1.5.3 Audio/Video Front Input Connectors

Audio – Cinch

Input voltage	:	2.2Vrms
Input impedance	:	> 10kΩ

Video – Cinch

Input voltage	:	1Vpp ± 3dB
Input impedance	:	75Ω

Video – YC (Hosiden)

According to IEC 933-5
Superimposed DC-level on pin 4(load >100kΩ)
<2.4V is detected as 4:3 aspect ratio
>3.5V is detected as 16:9 aspect ratio

Input voltage Y	:	1Vpp ± 3dB
Input impedance Y	:	75Ω
Input voltage C	:	burst 300 mVpp ± 3dB
Input impedance C	:	75Ω

1.5.4 Audio/Video Output rear Connectors

Audio – Cinch

Output voltage	:	2.2Vrms max.
Output impedance	:	>10kΩ

Video – Cinch

Output voltage	:	1Vpp ± 3dB
Output impedance	:	75Ω

Video – YC (Hosiden)

According to IEC 933-5
Superimposed DC-level on pin 4(load >100kΩ)
<2.4V is detected as 4:3 aspect ratio
>3.5V is detected as 16:9 aspect ratio

Output voltage Y	:	1Vpp ± 10/-15%
Input Impedance	:	75 Ω
Output voltage C	:	300mVpp ± 1/-4dB
Input Impedance	:	75 Ω

1.6 Video Performance

All outputs loaded with 75 Ω
SNR measurements over full bandwidth without weighting.

1.7 Digital Inputs / Outputs

1.7.1 Digital Output

Digital Audio – Coaxial/Optical

LCM	:	according IEC 60958
MPEG 1,MPEG2,AC3	:	according IEC 61937
DTS	:	according IEC 61937+addendum

1.7.2 HDMI Output

Type A connector(19 pins)

1.7.3 Digital Video Input(IEEE 1394)

Implementation Standard according:
IEEE Std 1394-1995
IEC61883 - Part1
IEC61883 - Part2 SD-DVCR (02-01-1997)

Specification of consumer use digital VCR's using 6.3mm magnetic tape – dec. 1994
Mechanical connection according to Annex of IEC 61883-1

1.7.4 G-link(for IR-remote transmitting device)

Output voltage :5±0.5V(high level)

0.4±0.3V(low level)

Output impedance :150Ω

1.7.5 SCART (RGB)

SNR	:	> -65dB on all output
Bandwidth	:	4.8MHz ± 2dB

1.8 Audio Performance CD

1.8.3 Cinch Output Rear

Output voltage 2 channel mode	:	2Vrms ± 2dB
Channel unbalance (1kHz)	:	< 0.22dB
Crosstalk 1kHz	:	> 100dB
Crosstalk 16Hz-20kHz	:	> 87dB
Frequency response 20Hz-20kHz	:	± 0.5dB max
Signal to noise ratio	:	> 85dB
Dynamic range 1kHz	:	> 83dB
Distortion and noise 1kHz	:	> 83dB
Distortion and noise 16Hz-20kHz	:	> 75dB
Intermodulation distortion	:	> 70dB
Mute	:	> 95dB

1.8.4 Scart Audio

Output voltage 2 channel mode	:	1.6Vrms ± 2dB
Channel unbalance (1kHz)	:	< 1dB
Crosstalk 1kHz	:	> 85dB
Crosstalk 16Hz-20kHz	:	> 70dB
Frequency response 20Hz-20kHz	:	± 0.5dB max
Signal to noise ratio	:	> 80dB
Dynamic range 1kHz	:	> 75dB
Distortion and noise 1kHz	:	> 75dB
Distortion and noise 16Hz-20kHz	:	> 50dB
Intermodulation distortion	:	> 70dB
Mute	:	> 80dB

1.9 Digital Output

1.9.3 Coaxial

CDDA / LPCM (incl MPEG1)	:according IEC958, IEC60958-1,-3
MPEG2, AC3 audio	:according IEC1937, IEC61937
DTS	:according IEC1937, IEC 61937 amendment 1

1.10 Digital Video Input (IEEE 1394)

1.10.3 Applicable Standards

Implementation according:
IEEE Std 1394-1995
IEC61883 - Part1
IEC61883 - Part 2 SD-DVCR (02-01-1997)
Specification of consumer use digital VCR's using 6.3mm magnetic tape – dec.1994
Annex A of 61883-1

1.11 Dimensions and Weight

Height of feet	:	5.5mm
Apparatus tray closed	:	WxDxH: 435 x 350 x 89mm
Apparatus tray open	:	WxDxH: 435 x 487 x 89mm
Weight without packaging	:	app.5.0kg ± 0.5kg
Weight with packaging	:	app.8kg

1.12 Laser Output Power & Wavelength

1.12.3 DVD

Output power during reading	:	0.8mW
Output power during writing	:	20mW
Wavelength		650nm

1.12.4 CD

Output power	:0.3mW
Wavelength	:780nm

Firmware Upgrading

A. Preparation to upgrade firmware:
1. Unzip the zip-archive file
2. Start the CD Burning software and create a new CD project (data disc) with the following settings:
File system: Joliet
Format: MODE 2: CDROM XA
Recording mode: SINGLE SESSION (TRACK-AT-ONCE), FINALIZED CD
Note: Long file name is necessary for the preparation of the upgrade disc
3. Place the content of the zip-archive into the root directory of the new CD project.
4. Burn the data onto a blank CDR or CD-RW

B. Procedure to apply the firmware upgrade:
1. Hold the <Record> + <Open/Close> buttons down and Power up the set.
2. The tray opens and set will display:

FORCE DL -> …. INSERT DISC

3. Insert the prepared Upgrade CDROM and close the tray.
4. The set will display:

INIT DSC -> ……. SYS VER -> READ FILES …. DOWNLOAD BE

The whole process takes less than 15 minutes
Note: Do not press any buttons or interrupt the mains supply during the upgrading process, otherwise the set may becomes defective.
5. When the upgrade is completed the tray will open automatically and the set will display:

REMOVE DISC

6. Close the tray and the set will display:

DONE

7 The set will go into Standby mode.

C. How to read out the firmware version to confirm set has been upgraded:
1. Power up the set
2. Press <System> button on the Remote control and select {Setup} option
3. Press <Right> button to select {System}
4. The set will prompt you about clearing the Time Shift Buffer
5. Select {Yes} and press <OK> button
6. Press <Down> button several times to select {Version info}
7. Press <OK> button.
8. The TV connected to the set will display:

(C) PHILIPS 2006 VERSION INFORMATION:
DIF05_8/7028 AN SV11226
BE 43.3.7.9 ASP 1,18,1,10FP
DTTM HW:01020102 DTTM
SW:00040206
SIT7260H-FF5F-S28_F604
20060203-1650 pro sxcplusint
EPG:3.06 DPMS:P_DPM
9. Press <System> button to exit.

1 Connect

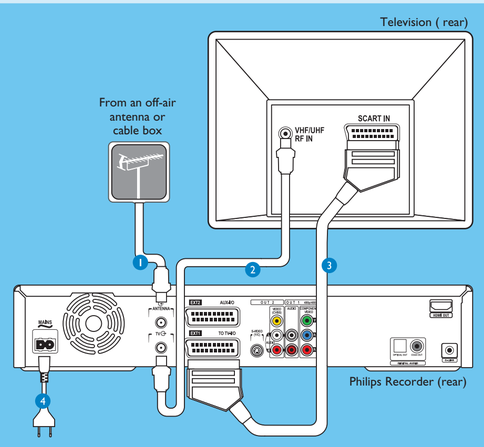
Start with the 'Basic connection'.
If you have a VCR, follow the instructions for 'Connection with VCR or similar device'.
If you have a set-top box, follow the instructions for 'Connection with set-top box'.

Basic Connection

A Before Connecting

Unplug the antenna cable that is currently connected to your TV.

B Connecting



1. Disconnect the antenna cable from your TV and connect it to the **ANTENNA** socket on this recorder.
2. Use the supplied RF coaxial cable to connect the **TV** socket on this recorder to the Antenna In socket on the TV.
3. Use the supplied scart cable to connect the EXT1 TO TV-I/O scart socket on this recorder to the SCART IN socket on your TV.
4. Plug in the power cable from the recorder to an AC power outlet

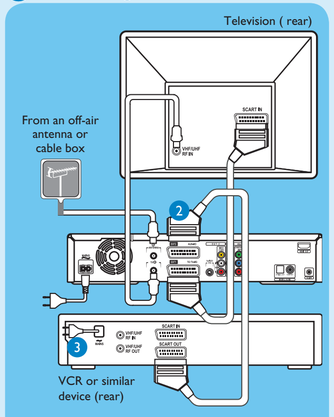
Note See the accompanying user manual for other possible connections (e.g. HDMI, Component Video)

Connection with VCR or similar device

A Before Connecting

Your new Philips Recorder replaces the VCR for your recording needs. First, unplug all the connections from your VCR.

B Connecting



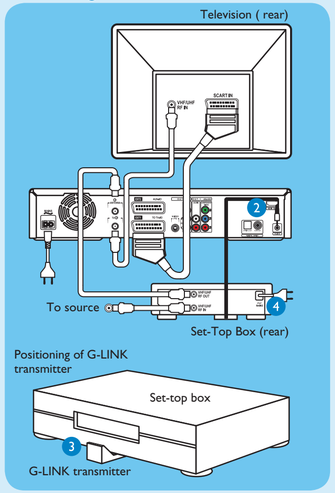
1. Follow step 1 to 4 of 'Basic connection' to connect this recorder before you proceed to step 2 below.
2. Use another scart cable (not supplied) to connect the EXT2 AUX-I/O scart socket on this recorder to the SCART OUT socket on your VCR.
3. Connect the power cable from the VCR to an AC power outlet.

Note In this setup, the VCR cannot record TV programmes.

Connection with set-top box

Your new Philips Recorder provides a G-LINK transmitter which allows you to control the tuner of the set-top box (satellite receiver, cable TV box) through the GUIDE Plus+ system. You can record the TV programmes that are received through the set-top box.

Connecting

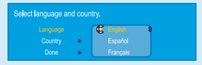


1. Follow step 1 to 4 of 'Basic connection' to connect this recorder before you proceed to step 2 below.
2. Connect the supplied G-LINK cable to the G-LINK socket on this recorder.
3. Place the G-LINK transmitter in front of your set-top box in such a way that it can acquire the signal broadcasted by the transmitter.
4. Connect the power cable from the set-top box to an AC power cable.

2 Set up

A Finding the viewing channel

1. Presss **STANDBY-ON** on the recorder.
   The recorder will display 'IS THE TV ON?'.
2. Turn on the TV.
   You should see the { EASY SETUP } menu.



Note If your VCR is connected to this recorder, ensure it is turned off or in standby before proceeding.

3. In case you don't see the recorder's setting menu, press the Channel Down button on the TV's remote control repeatedly (or AV, SELECT, button) until you see the menu. This is the correct viewing channel for the recorder.

B Start basic setup

Use the recorder's remote control and follow the on-screen instructions to complete the installation.

1. Select the desired menu language, your country and the TV shape.

   Note Select { Done } in the menu and press OK to go to the next screen.

2. Activate automatic channel search.
3. Check the date and time and press OK.
4. To continue with the GUIDE Plus+ installation, select { Continue } and press OK.
   Otherwise, select { Do not install now } and press OK. Wait until the recorder has finished initialising the system, then press OK again.

C Install the GUIDE Plus+ system

1. Follow the on-screen instructions to select your language, country and enter the postal code of your area.

   Note If no or wrong postal code is entered, it will cause no GUIDE Plus+ (EPG) service information.

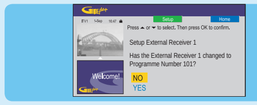
D Install the set-top box

If you do not have a set-top box, skip '**D**' and go to '**E**'.

1. Press ▼ **down** to select 'External Receiver 1' and press OK.
2. Press OK again to continue.
3. Select the type of reception, service provider and brand name of the connected set-top box.

   Note Press OK to go to the next screen. Select { None } if none of the entries are applicable.

4. Select the recorder socket through which your set-top box is connected (e.g. 'EXT2' for EXT2 AUX-I/O socket) and press OK.
5. Turn on your set-top box and select channel number **02** on the set-top box.
6. Read the instructions on the TV and press OK.



7. If the set-top box has switched to the same programme number as displayed on the TV, select { Yes } in the menu and press OK.

   Note If not, select { No } and press OK to try a different code.

8. Your set-top box is now installed. Press the **green** button to exit.

   Note To switch the GUIDE Plus+ system's host channel manually, go to { Host Channel Setup }.

E Load the TV listing data

1. Press **GUIDE** to exit GUIDE Plus+ system. Leave the recorder in 'standby' mode and turn 'on' the set-top box overnight to collect the TV listing data, this may take up to 24 hours.

   Note If you tune to your Host Channel before going to 'standby' mode, this recorder will start downloading the TV listings data immediately.

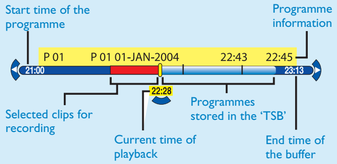
2. Check the { Editor } screen the next day to ensure the source and programme numbers are matching for all channels.

3 Enjoy

About the Time Shift Buffer (TSB)

Once you turn on the recorder, the selected TV programme will be stored in a temporary hard disk storage called the '**TSB**' (Time Shift Buffer). The '**TSB**' can store up to 6 hours of programmes temporarily.

Press **INFO** once to display the Time Shift video bar.



The contents in the time shift video bar will be cleared when you press **STANDBY ON (⏻)**.

Note A confirmation message for clearing the Time Shift Video bar will be appeared if you press the **CAM** button on the remote control or access the { Setup } or { Record mode } option in the setup menu.

Watch TV – Pause live TV

Your Philips Recorder allows you to control the TV programme. You can PAUSE it as if you were in control of the live broadcast.

1. Turn on your recorder and press **TUNER** to switch between analogue and digital tuner, then press **CHANNEL** +/– to select a TV programme.
2. Press **PAUSE** to suspend it.
3. Press **PLAY** to continue.
4. Press **TUNER** to return to the live broadcast.

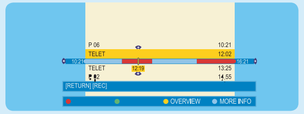
Help text information bar

The help text bar located at the bottom of the screen is providing the information on:

- remote control keys that can be used at the current state.
- brief information of the selected item.

Record to hard disk

A Contents in the temporary HDD storage



1. Press **INFO** to view what is temporarily stored in the hard disk storage.
2. Press ▲ **up** or ▼ **down** to choose the title you want to record.
3. Press JUMP JUMP to search for the scene where you want to start recording, then press the **red** button.

Note Pressing the **red** button again will cancel the recording.

4. Press **STOP** to end the recording.

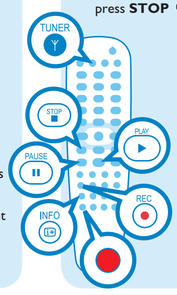
Note The title will be marked in red and the recording will only take effect when you turn off the recorder.

B Current TV programme

1. Press **REC** to start recording. It can record up to 6 hours.

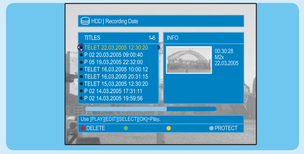
Note To set the recording time, press repeatedly to extend the recording time in 30-minute increments, up to 6 hours. In the countries where no GUIDE Plus+ TV listing data is available, recording will start from the beginning of the current viewing channel onwards.

2. To stop the recording before the scheduled time, press **STOP**.



Start playback

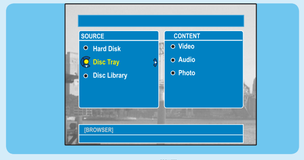
A From the hard disk



1. Press **HDD-BROWSER**, then press ▶ **right** until you see the { TITLES } and { INFO } menus.
2. Press ▲ **up** or ▼ **down** to select a title.
3. Press **PLAY** to start playback.

B From a disc

1. Hold down **STOP** until the disc tray opens. Load a disc and close the disc tray.



2. Press **HDD-BROWSER** to go to the content menu. Select { Disc Tray } and press ▶ **right** until you see the { TITLES }, { TRACKS } or { PHOTO ROLLS } menu, depending on the disc type.
3. Press ▲ **up** or ▼ **down** to select a title.
4. Press **PLAY** to start playback.

Using the GUIDE Plus+ system

Make sure that the analogue tuner installation and TV listing data download is completed.

Record TV programmes

1. Press **GUIDE**.
2. Press ▼ **down** to select a TV channel.

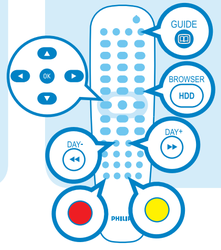
Note Press the **yellow** button to see an overview of all the available channels and choose from there.

3. Press ◀ **left** or ▶ **right** to select a TV programme.

Note Press DAY- DAY+ to go directly to a day before or the next day TV listings.

4. Press the **red** button to set the highlighted programme for recording.

Note You can store up to 25 programmes for recording.



Need help?

GUIDE Plus+ system
Go to www.europe.guideplus.com

User Manual
See the user manual that came with your Philips Recorder

Online
Go to www.philips.com/support

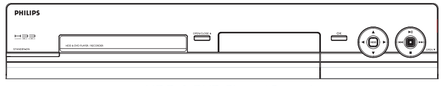
Be responsible
Respect copyrights

12 NC 3139 245 25001
www.philips.com

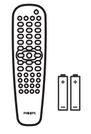
Quick Start Guide

1 Connect
2 Set up
3 Enjoy

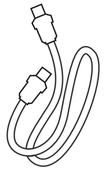
What's in the box?



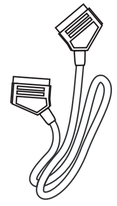
HDD & DVD Player / Recorder



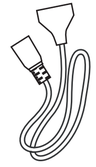
Remote Control and 2 batteries



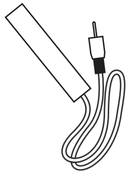
RF coaxial cable



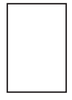
Scart cable



Power cable



G-LINK cable & transmitter



User Manual

PHILIPS