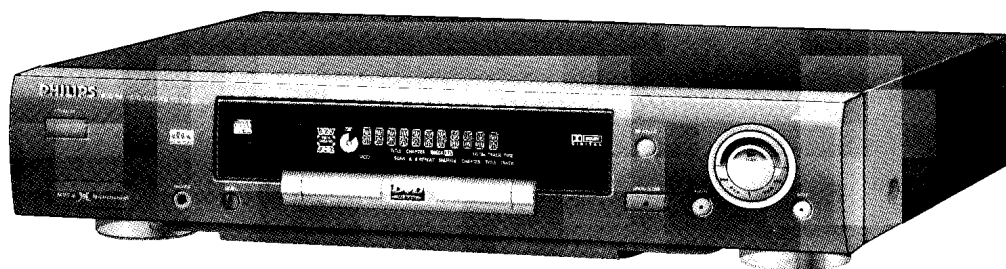
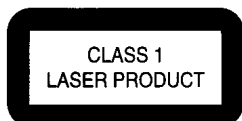


Service  
Service  
**Service**



# Service Manual



<b>Contents</b>	<b>Page</b>	
1 Technical specifications and connection facilities	2	
2 Warnings and laser safety instructions	4	
3 Directions for use	6	
4 Service hints	21	
5 Blockdiagram	23	
Dismantling instructions	24	
Exploded view	25	
Wiringdiagram	26	
6 <i>Electrical diagrams and print-layouts</i>	<i>Diagram PWB</i>	
Power supply	27	28
Headphone panel	30	31
Display panel	32	33
Video control & scart switch panel (Diagram 1A)	38	41
Video out panel (Diagram 1B)	37	41
Audio panel (Diagram 2)	39	41
7 Diagnostic software and Script interfaces	43	
8 Servicing DVD module & mono board	51	
9 Test instructions Display board	52	
10 Current mode power supply 30PS203	54	
11 List of abbreviations	59	
12 IC descriptions	60	
12 Spare parts list	70	

© Copyright reserved 1999 Philips Consumer Electronics B.V. Eindhoven, The Netherlands. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise without the prior permission of Philips.



# 1. Technical specifications

## 1.1 General:

Mains voltage	: 230V (196 - 263V AC)
Mains frequency	: 50 Hz -60Hz
Power consumption	: 20W
Power consumption standby	: <10W (≤5W for low power standby; without P50)

## 1.2 Audio performance

Test equipment	: Audio Precision
Testdiscs	: CDDA: Philips audio signal testdisc 1
	: VCD: Philips A/V testdisc & ABEX A/V testdisc
	: DVD: Philips LVP09.00 audio testdisc

## 1.3 Line output

### 1.3.1 'Normal' mode (stereo)

Output voltage	:
2 channel mode	: 2Vrms +/- 1.5dB
5.1 channel Dolby	: 1.41 +/- 1.5 dB
Channel unbalance (1kHz)	: <0.85dB
Crosstalk	:
1kHz	: >105dB
20Hz-20kHz	: > 95dB
Frequency response	:
20Hz- 12kHz	: +/- 0.1dB max
Signal to noise ratio	: >100 dB
Dynamic range	:
1kHz	: >90dB
20Hz-20kHz	: >88dB
Distortion and noise	:
1kHz	: >90dB
20Hz-20kHz	: >80dB
Intermodulation distortion	: >87dB
Phase non linearity	: +/- 1° max.
Level non linearity	: +/- 0.5dB max.
Mute (spin-up, pause, access)	: >100dB
Outband attenuation	: > 50dB above 25kHz

### 1.3.2 'Center on' mode (mono)

Output voltage	: 2Vrms typ
Channel unbalance (1kHz)	: <0.85dB
Crosstalk:	: mono
Frequency response(20Hz- 12kHz)	: 0.1dB max
Signal to noise ratio	: >85 dB
Dynamic range 20Hz-20kHz	: >85 dB
Distortion and noise 20Hz-20kHz	: >80 dB
Intermodulation distortion	: >87 dB
Phase non linearity	: not applicable
Level non linearity	: +/- 1 dB
Mute (spin-up, pause, access)	: >100dB
Outband attenuation	: > 50dB above 25kHz
Centerdelay adjusting	: 0-5 msec (steps 1 msec)

## 1.6 Video performance

## 1.4 6-channel output

### 1.4.1 Front Line out(channel 1 and 2)

fully according to PQR class III	
Output voltage	:
channel mode	: 1.41Vrms +/- 1.5dB
5.1 channel Dolby	: 1.41V +/- 1.5 dB
Channel unbalance (1kHz)	: <0.85dB
Crosstalk	:
1kHz	: >105dB
20Hz-20kHz	: > 95dB
Frequency response 20Hz- 12kHz	: +/- 0.1dB max
Signal to noise ratio	: >100 dB
Dynamic range	:
1kHz	: >90dB
20Hz-20kHz	: >88dB
Distortion and noise	:
1kHz	: >90dB
20Hz-20kHz	: >80dB
Intermodulation distortion	: >87dB
Phase non linearity	: +/- 1° max.
Level non linearity	: +/- 0.5dB max.
Mute (spin-up, pause, access)	: >100dB
Outband attenuation	: > 50dB above 25kHz

### 1.4.2 Surround channels (channel 3,4,5 and 6)

Surround channels are according to dolby group C products (*1)	
Testequipment: audio precision (*2)	
LFE + Center + Rear line out	
Output voltage	:
2 channel mode	: muted
5.1 channel Dolby	: 1.41Vrms +/-1.5dB
	: Adjustable 0.7V-2.82 V
	: (+/- 6dB to front channels)
Channel unbalance	: <0.85 dB
Signal to noise ratio	: >100 dB (A-weighted)
Dynamic range	: >85 dB
Distortion and noise	: >80 dB (90 typical)
Crosstalk:	: >95 dB (*3)
*1	: referenced to dolby digital licensee information manual version 2.0
*2	: measured in normal mode and with balance control neutral
*3	: crosstalk from channels 1,3,5(channel 1 is ref) to 2,4,6(measured channels)

## 1.5 Headphone output

According PQR1 IMS  
30mW at 32 Ohm load.  
Headphone impedance: 8-2000 Ohm

VCD testdisc : Philips A/V disc & ABEX A/V disc

DVD testdisc : Philips MPTD PAL  
CVP0213 / Philips  
LVP10.00 video  
testdisc

1.6.1 CVBS

Fully according PQR3 IMS  
Video output : 1Vpp(0.1V into 75  
Ohm)

1.6.2 S-video (Y/C)

Fully according PQR3 IMS  
1 - GND  
2 - GND  
3 - Y 1Vpp +/- 0.1V into 75 Ohm  
4 - C burst 300mVpp +/-4dB into 75  
Ohm  
Aspect ratio switching by DC on C(pin4).  
Connector type : 4 pin mini- DIN

1.7 Scart

Fully according PQR3 IMS  
Connector implementation according EN50049-1; color =  
black; dual SCART  
Fully according to prEN1057-2-1  
Signal switching is P50 controlled; supported features of mode  
3 see survey of applicable standards.

1.7.1 SCART II (connected to TV)

Pin signals:

1 - Audio R	1.8V RMS	⊕
2 - Audio R		⊕
3 - Audio L	1.8V RMS	⊕
4 - Audio	GND	⊥
5 - Blue/Chroma	GND	⊥
6 - Audio L		⊕
7 - Blue out/ Chroma in	0.7Vpp +/- 0.1V into 75 Ohm (*)	⊕
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- Nc		
11- Green	0.7Vpp +/- 0.1V into 75 Ohm (*)	⊕
12- Nc		
13- Red/Chroma	GND	⊥
14- Fast switch	GND	⊥
15- Red out/ Chroma out	0.7Vpp +/- 0.1V into 75 Ohm (*) +/- 3dB 0.3Vpp in case of Chroma	⊕
16- Fast switch RGB/ CVBS	or Y <0.4V into 75 Ohm = CVBS >1V / <3V into 75 Ohm = RGB	⊕
17- Y/CVBS	GND	⊥
18- Fast switching	GND	⊥
19- CVBS/Y/RGB sync	1Vpp +/- 0.1V into 75 Ohm (*)	⊕
20- CVBS/Y		⊕
21- Shield		⊥

1.7.2 SCART I (connected to AUX)

Pin signals:  
1 - Audio R 1.8V RMS

2 - Audio R		⊕
3 - Audio L	1.8V RMS	⊕
4 - Audio GND		⊥
5 - Blue/Chroma	GND	⊥
6 - Audio L		⊕
7 - Blue in/ Chroma out	+/- 3dB 0.3vpp Chroma (burst)	⊕
8 - Function switch		⊕
9 - Green	GND	⊥
10- P50 Control		
11- Green		⊕
12- Nc		
13- Red/Chroma	GND	⊥
14- Fast switch	GND	⊥
15- Red in/ Chroma in		⊕
16- Fast switch RGB/ CVBS or Y		⊕
17- CVBS	GND	⊥
18- Fast switching	GND	⊥
19- CVBS/Y/RGB sync	1Vpp +/- 0.1V into 75 Ohm (*)	⊕
20- CVBS/Y		⊕
21- Shield		⊥

(\*) for 100% white

1.8 Digital output

1.8.1 Coaxial

CDDA/ LPCM (incl MPEG1) : According IEC958  
MPEG2, AC3 audio : According IEC1937  
Remark:  
DTS audio output mode is only available on "digital out"

1.8.2 Optical

Identical to coaxial

1.9 Dimensions and weight

Place and height of feet	: acc. to Philips Harmonisation line
Apparatus tray closed	: WxDxH: 435 x 315x 75/88
Apparatus tray open	: WxDxH: 435 x 442 x 75/88
Weight without packaging	: ca. 4 Kg
Weight in packaging	: ca. 6 Kg

1.10 Laser output power & wavelength

1.10.1 DVD

Output power	: 7mW
Wavelength	: 650nm

1.10.2 CD

Output power	: 10mW
Wavelength	: 785nm

## 2. Warnings and Laser safety instructions

**(GB) WARNING**

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.

When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance.

Keep components and tools also at this potential.

**ESD**



**(NL) WAARSCHUWING**

Alle IC's en vele andere halfgeleiders zijn gevoelig voor elektrostatische ontladingen (ESD).

Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.

Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.

Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

**(F) ATTENTION**

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).

Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.

Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.

Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

**(D) WARNUNG**

Alle IC und viele andere Halbleiter sind empfindlich gegen elektrostatische Entladungen (ESD).

Unsorgfältige Behandlung bei der Reparatur kann die Lebensdauer drastisch vermindern. Sorgen sie dafür, das Sie im Reparaturfall über ein Pulsarmband mit Widerstand mit dem Massepotential des Gerätes verbunden sind.

Halten Sie Bauteile und Hilfsmittel ebenfalls auf diesem Potential.

**(I) AVVERTIMENTO**

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).

La loro longevita potrebbe essere fortemente ridatta in caso di non osservazione della piu grande cauzione alla loro manipolazione.

Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.

Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

**(GB)**

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used.

**(NL)**

Veiligheidsbepalingen vereisen, dat het apparaat in zijn oorspronkelijke toestand wordt terug gebracht en dat onderdelen, identiek aan de gespecificeerde worden toegepast.

**(D)**

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Originalzustand des Gerats darf nicht verändert werden. Fur Reparaturen sind Original-Ersatzteile zu verwenden.

**(I)**

Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati pezzi di ricambiaggio idetici a quelli specificati.

**(F)**

Les normes de sécurité exigent que l'appareil soit remis a l'état d'origine et que soient utilisées les pièces de rechange identiques à celles spécifiées.

### SHOCK, FIRE HAZARD SERVICE TEST:

**CAUTION:** After servicing this appliance and prior to returning to customer, measure the resistance between either primary AC cord connector pins (with unit NOT connected to AC mains and its Power switch ON), and the face or Front Panel of product and controls and chassis bottom,

Any resistance measurement less than 1 Megohms should cause unit to be repaired or corrected before AC power is applied, and verified before return to user/customer.

Ref.UL Standard NO.1492.

### NOTE ON SAFETY:

Symbol : Fire or electrical shock hazard. Only original parts should be used to replace any part with symbol Any other component substitution(other than original type), may increase risk or fire or electrical shock hazard.

## LASER SAFETY

This unit employs a laser. Only a qualified service person should remove the cover or attempt to service this device, due to possible eye injury.

### LASER DEVICE UNIT

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



**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

### WARNING

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

### WARNING LOCATION: INSIDE ON LASER COVERSIELD

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

## Warning for powersupply on position 1005

**The primary side of the powersupply including the heatsink carries live mains voltage when the player is connected to the mains even when the player is swiched off !**

This primary area is not shielded so it is possible to touch copper tracks and/or components when servicing the player. Service personnel have to take precautions to prevent touching this area or components in this area .

The primary side of the powersupply has been indicated with a lightning stroke and a stripe-marked printed on the printed wiring board

### Note:

**The screws on the basic Engine (position 82 in on the exploded view drawing) may never be touched removed or re-adjusted.**

**Handle the Basic engine with care when the unit has to be exchanged!**

**The mechanism of the basic engine is very sensative for dropping or shocks**

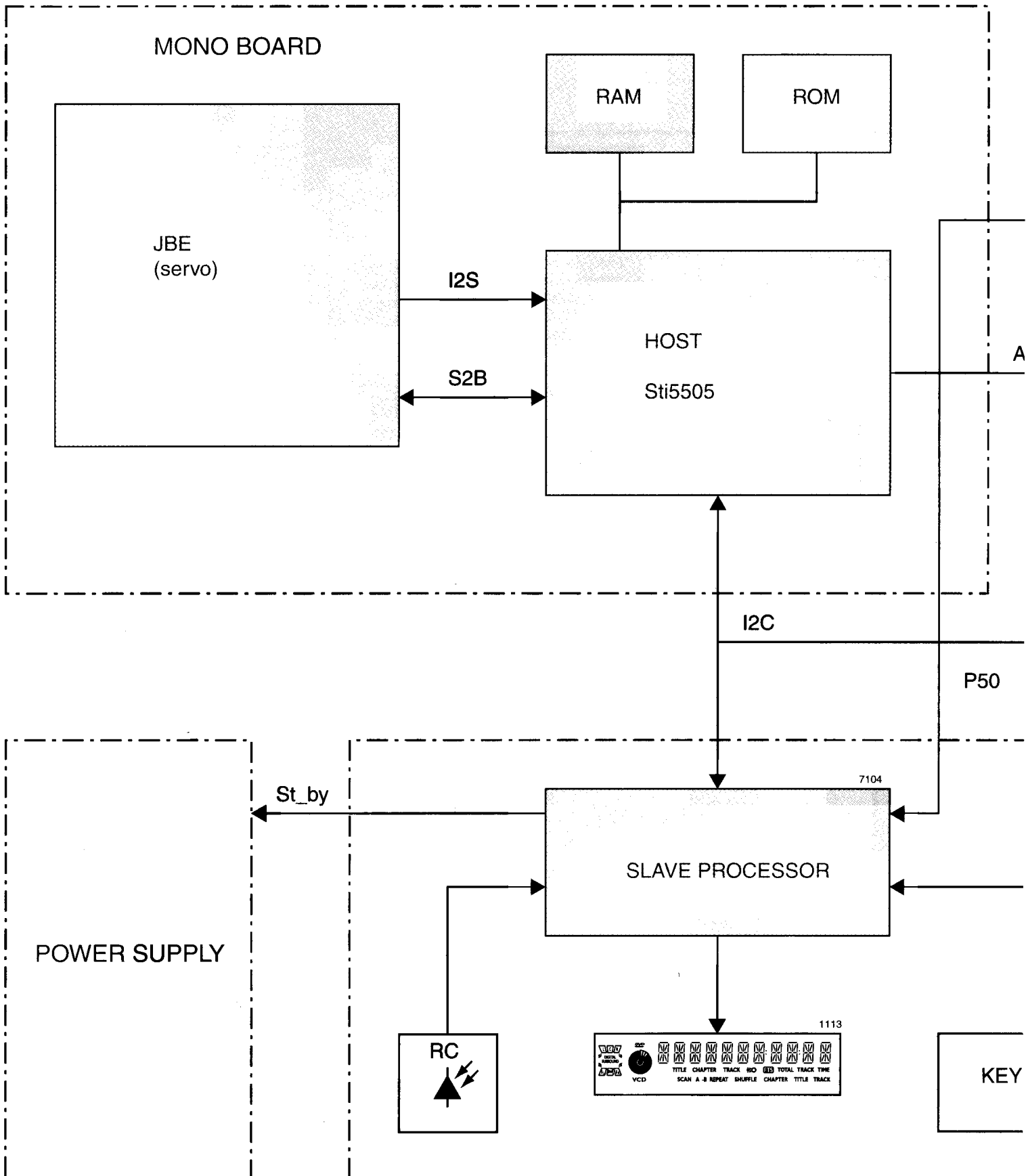
## 4. Service hints

The DVD module(Basic Engine and the mono board) has to be exchanged completely in case of failure. A new module for can be ordered with codenumber 3104 129 52560.

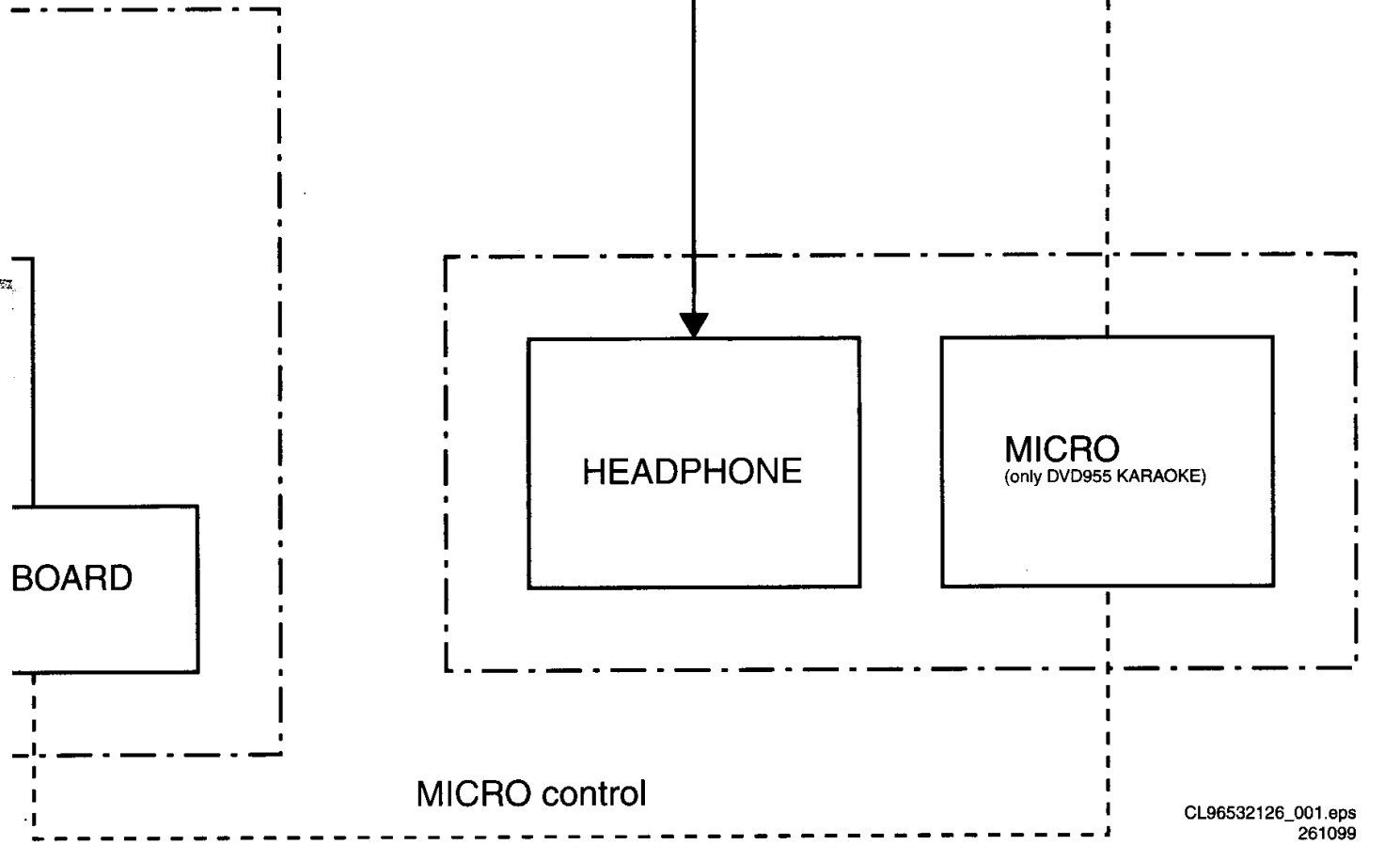
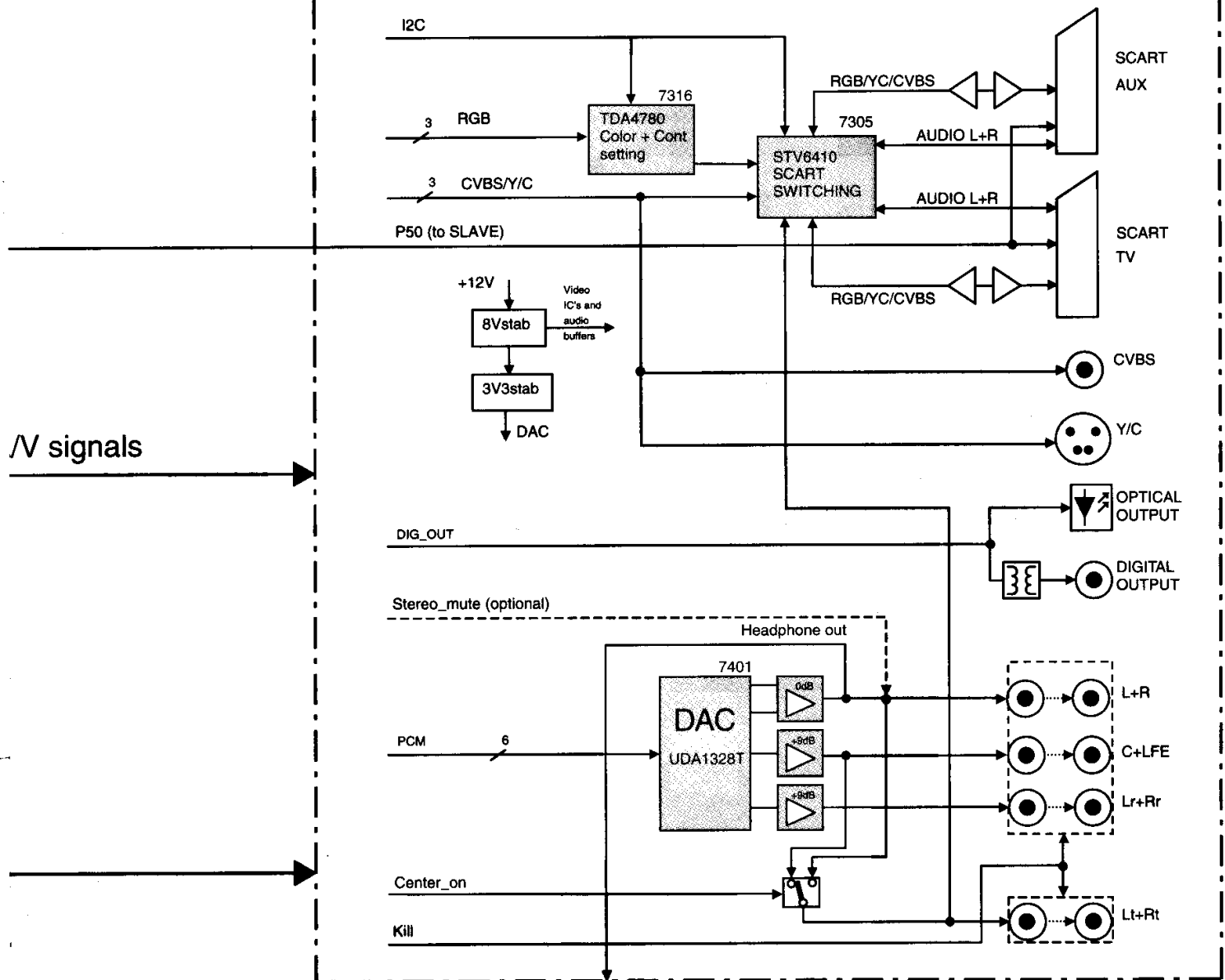
Return the defective unit complete assembled in original package to Philips Consumer Service in Eindhoven

# 5. Block and wiring diagram, dismantling, exploded view and oscillograms

## Blockdiagram



# AUDIO/VIDEO BACKEND

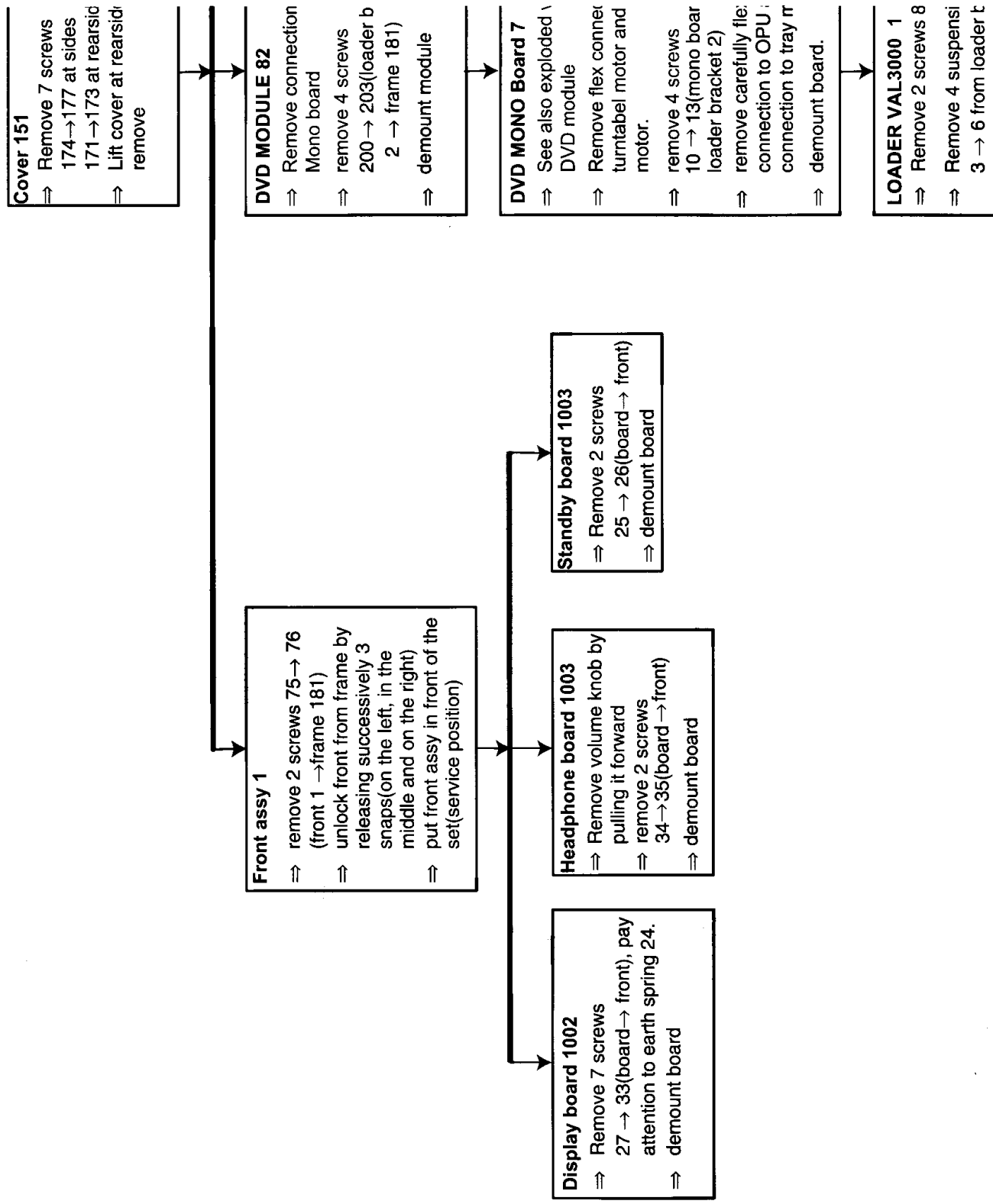




## Dismantling instructions

### DISMANTLING INSTRUCTIONS

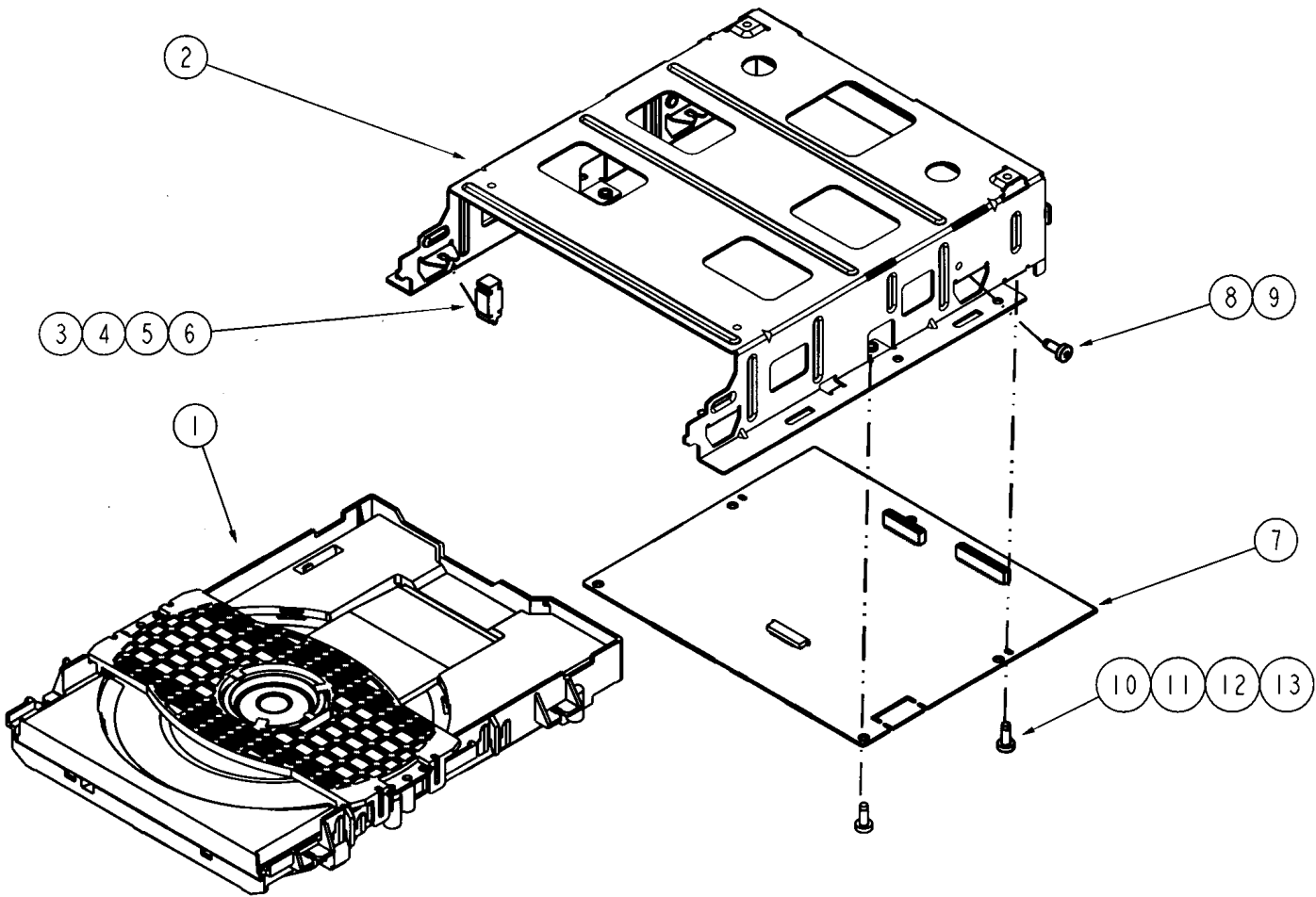
See exploded view for item numbers



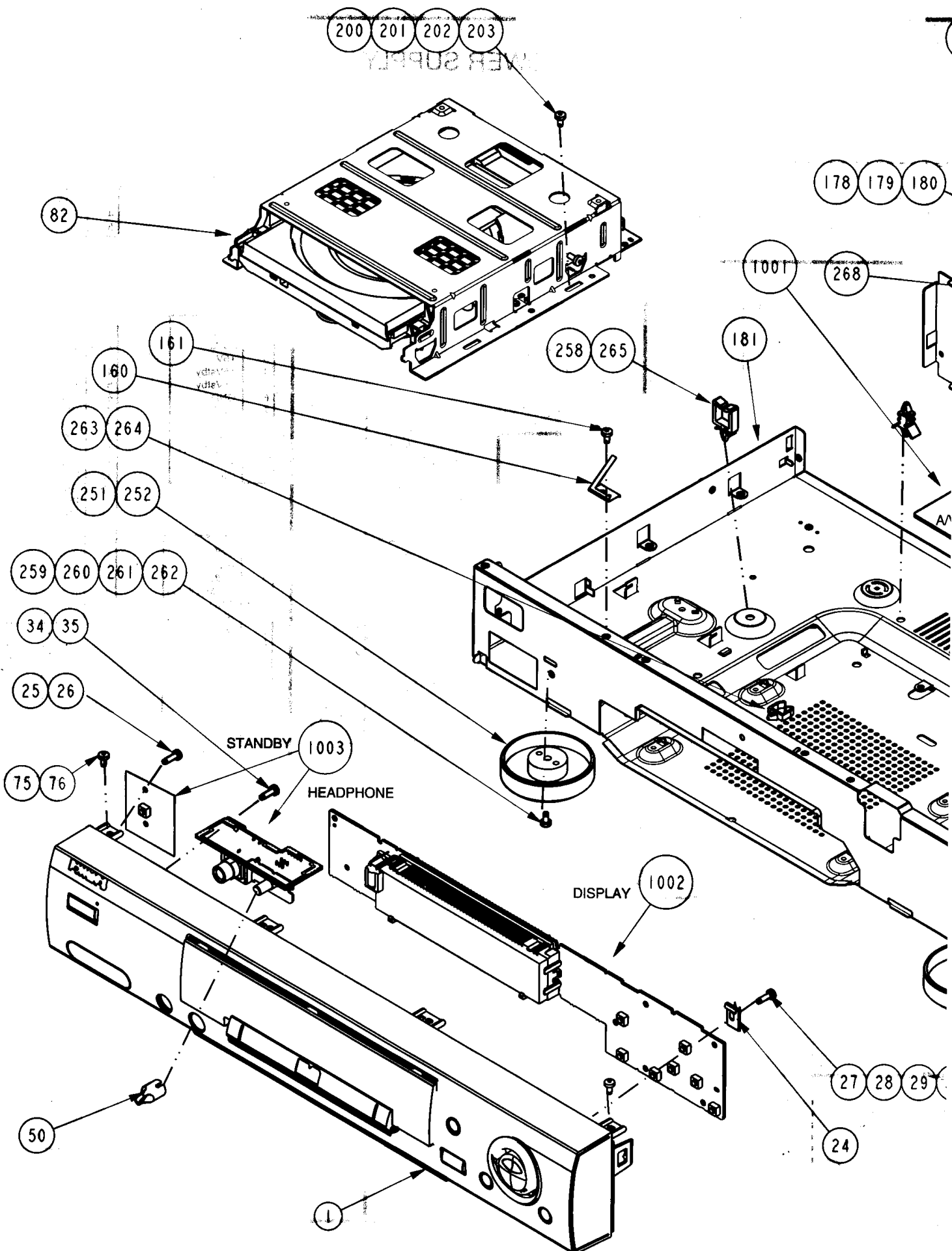
mounting  
 ↑  
 ↓  
 demounting

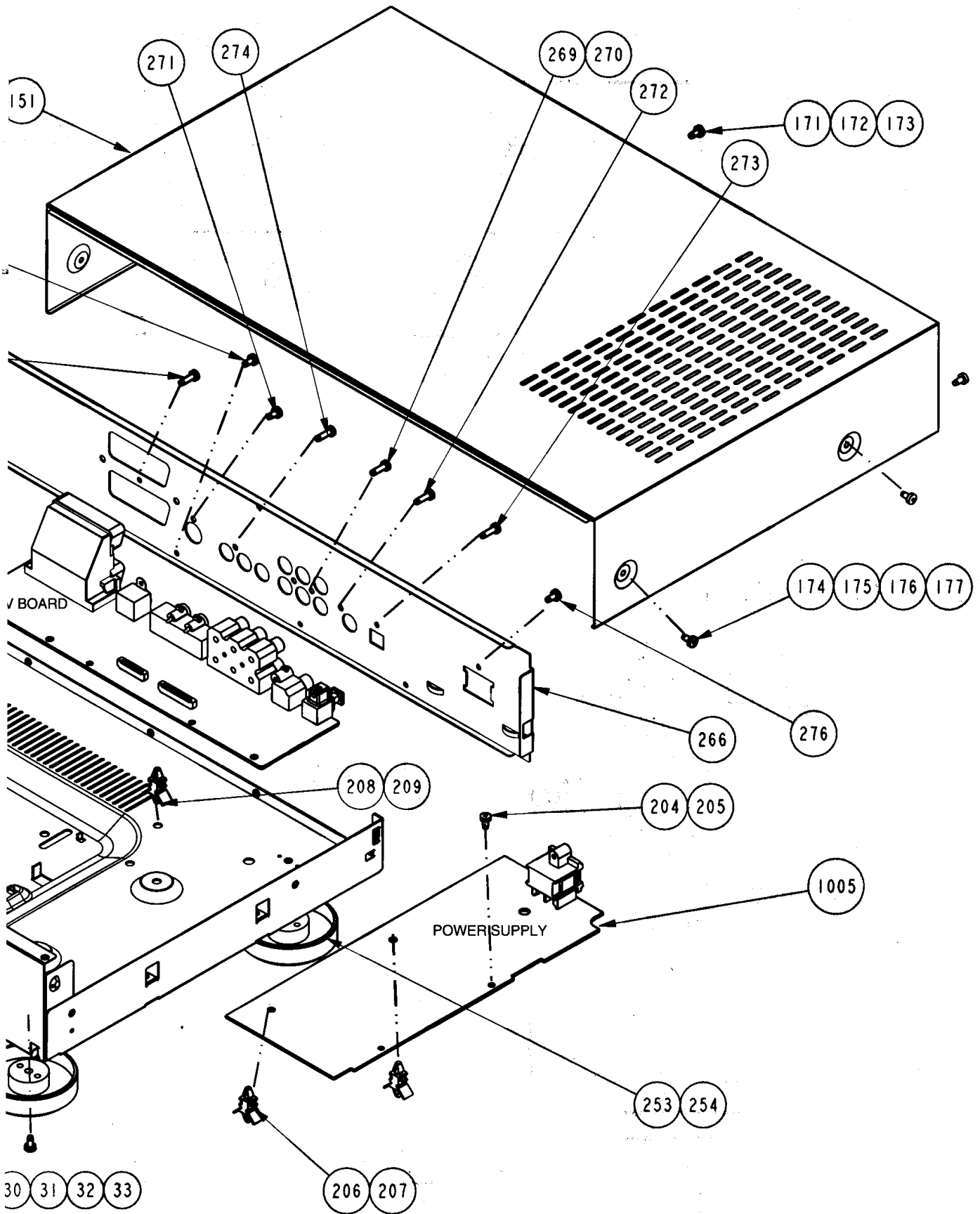
- A/V board 1001**
- ⇒ remove flex connections to Mono board
  - ⇒ remove 1 screw 268 (scart→backplate 266)
  - ⇒ remove 2 screws 271 and 274 (cinches→backplate)
  - ⇒ remove 2 screws 272 and 273 (digital and optical out)
  - ⇒ release snaps of 2 spacers 208 and 209 (board → frame)
  - ⇒ demount board

- Power supply unit 1005**
- ⇒ remove connections
  - ⇒ remove 2 screws 204 and 215 (board→frame)
  - ⇒ remove screw 276 (mains inled→backplate)
  - ⇒ release snaps of spacers 206 and 207 (board→frame)
  - ⇒ demount board



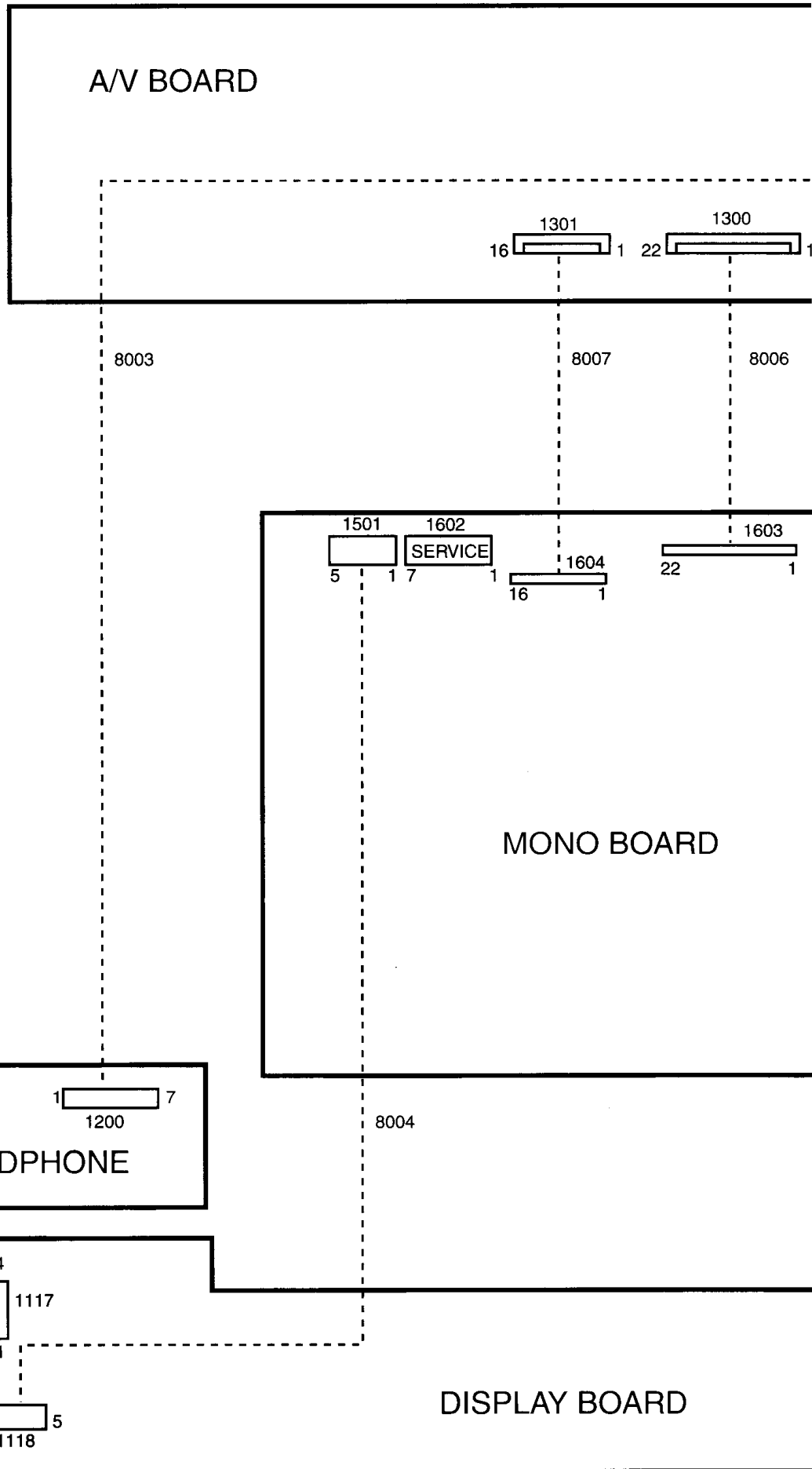
### Exploded view

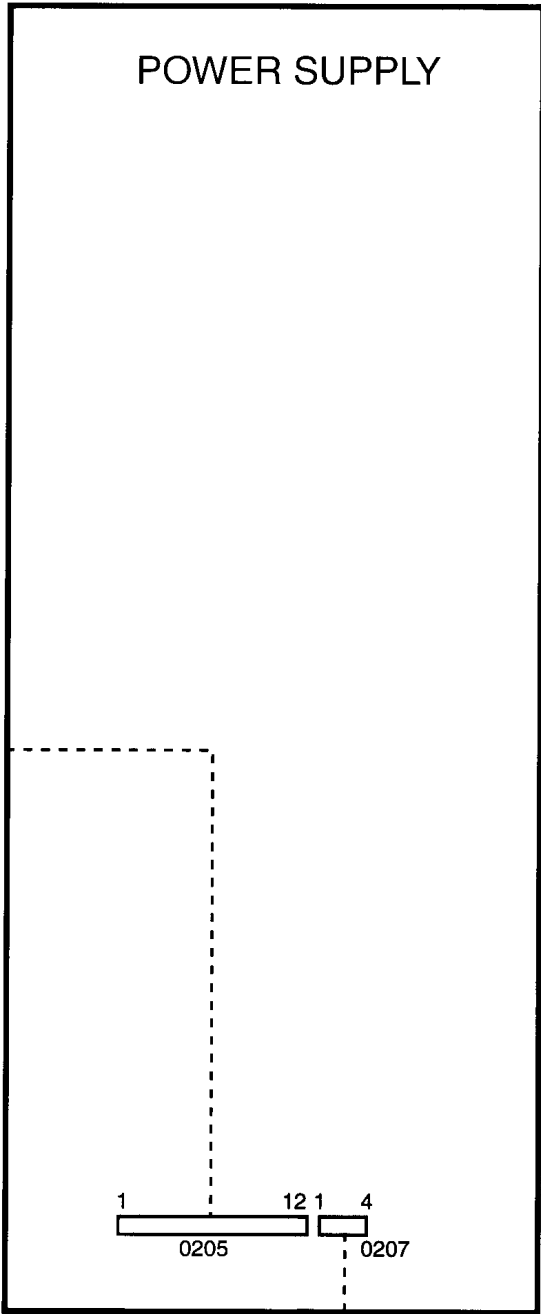
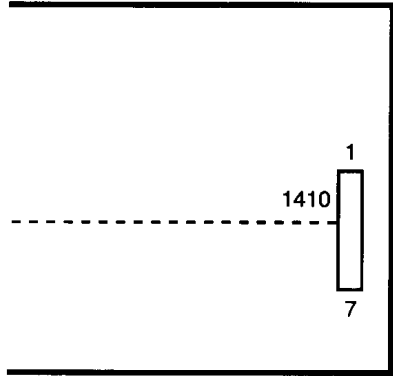




### Wiring diagram

## WIRING DIAGRAM





8001	
1	LED+
2	LED-
3	STBKEY+
4	STBKEY-

8002	
1	+12V
2	GND
3	+5Vstb
4	-40V

8003	
1	HP_L
2	GND
3	HP_R
4	+8Vaud
5	GND
6	GND
7	-8Vstby

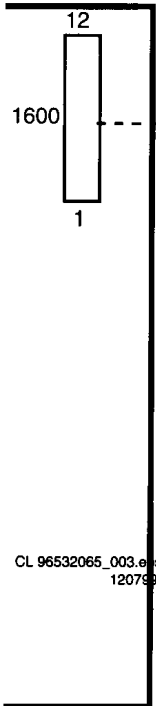
8004	
1	SCL
2	GND
3	SDA
4	STB_CONT
5	P50

8005	
1	+3V3
2	+3V3
3	+5V
4	+5Vstby
5	+6Vstby
6	GND
7	GND
8	GND
9	-8Vstby
10	STB_CONT
11	+12Vstby
12	GND

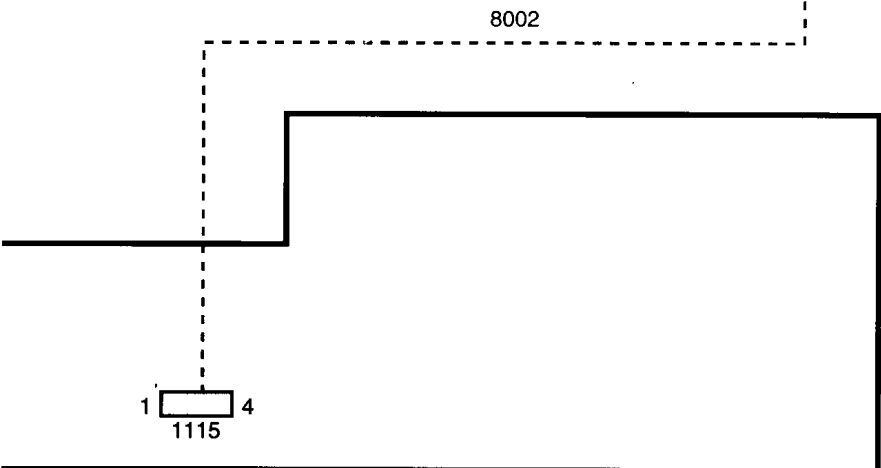
8006	
1	(P50)
2	B
3	G
4	GND
5	R
6	CVBS
7	GND
8	0/6/12V
9	-8Vstby
10	+5V
11	+5V
12	KILL
13	GND
14	PCM_OUT0
15	LRCLK
16	SCLK
17	GND
18	PCM_CLK
19	STANDBY
20	(CENTER_ON)
21	(STEREO_MUTE)
22	DIG_OUT
22	GND

8007	
1	GND
2	(HSYNC)
3	GND
4	(PCM_OUT2)
5	GND
6	(PCM_OUT1)
7	NC
8	SCL
9	12Vstby
10	SDA
11	+6V
12	NC
13	GND
14	C_ENC
15	GND
16	Y_ENC

PIN NAMES BETWEEN BRACKETS ( ) ONLY USED IN DVD950



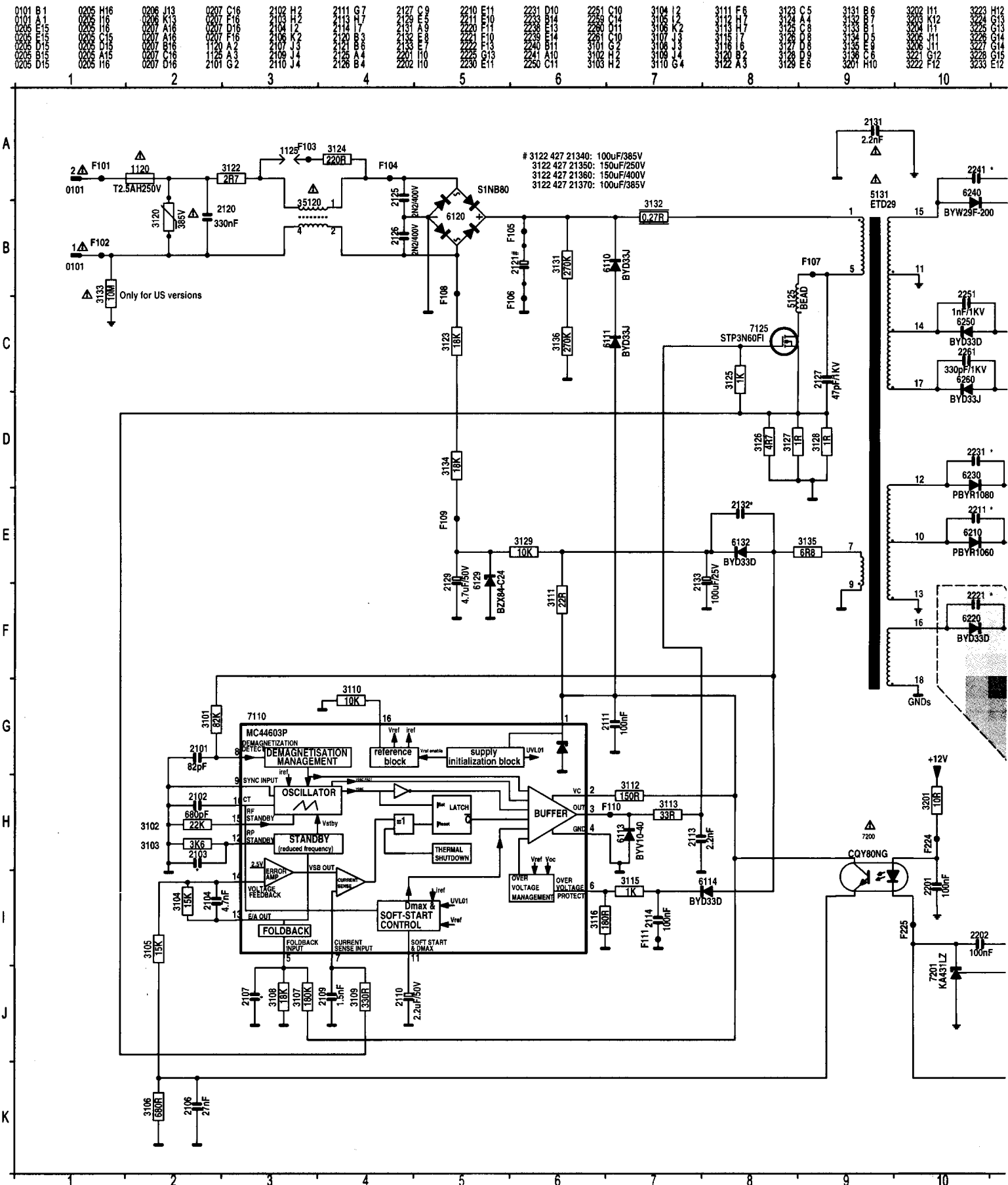
CL 96532065\_003.eps  
120799



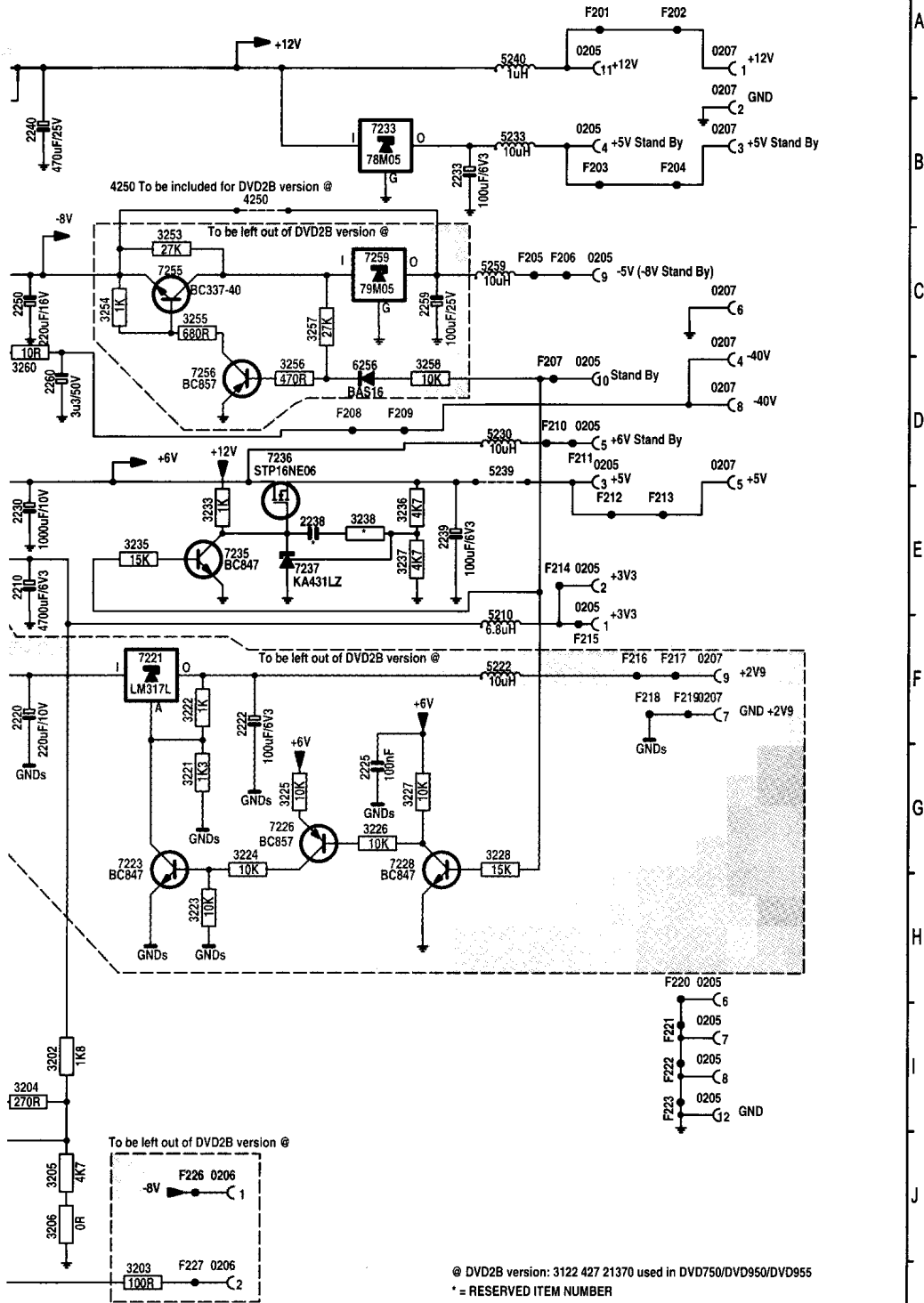
# 6. Electrical diagrams and Print-layouts

## Power supply

### POWER SUPPLY 30PS203

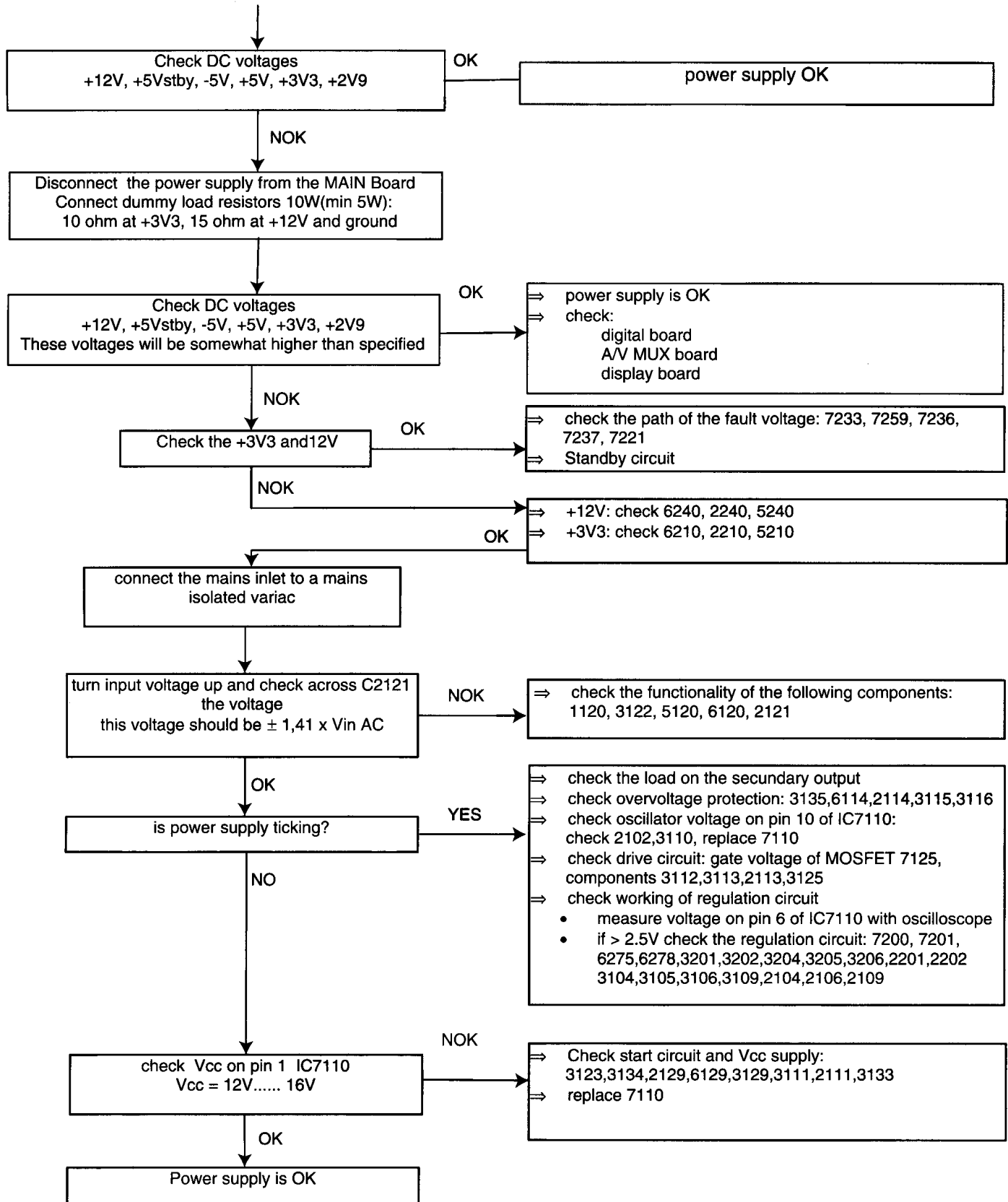


3235	F12	3256	D13	5131	A 9	5258	C14	6132	E 6	6260	C10	7226	G13	7256	D12
3236	C12	3257	C13	5132	F15	5259	A14	6133	F10	6261	C11	7227	G14	7257	C14
3237	F13	3258	D14	5133	F16	5260	B15	6134	F11	6262	C12	7228	H14		
3238	C13	3259	D11	5134	D15	5261	C16	6135	D10	6263	D10	7229	H15		
3239	F14	3260	B13	5135	D16	5262	D17	6136	A11	6264	A10	7230	H16		
3240	C14	3261	B14	5136	F17	5263	E18	6137	A12	6265	B11	7231	H17		
3241	F15	3262	B15	5137	F18	5264	F19	6138	B12	6266	C11	7232	H18		
3242	C15	3263	B16	5138	F19	5265	G20	6139	C13	6267	D12	7233	H19		
3243	F16	3264	C8	5139	A15	5266	G21	6140	D14	6268	E13	7234	H20		

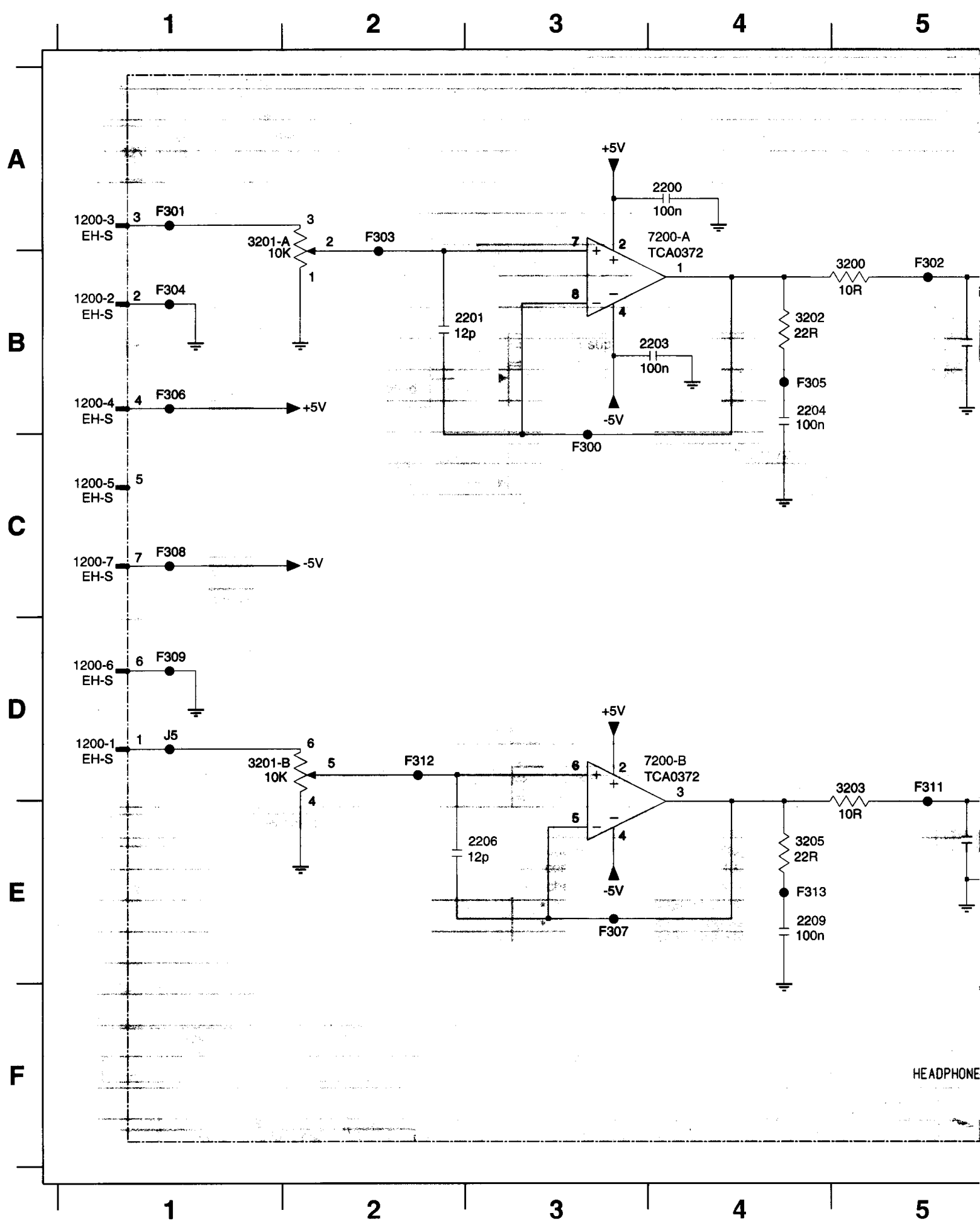




TROUBLESHOOTING POWER SUPPLY UNIT 30PS203



### Headphone panel and standby PWB



6

7

8

9

A

B

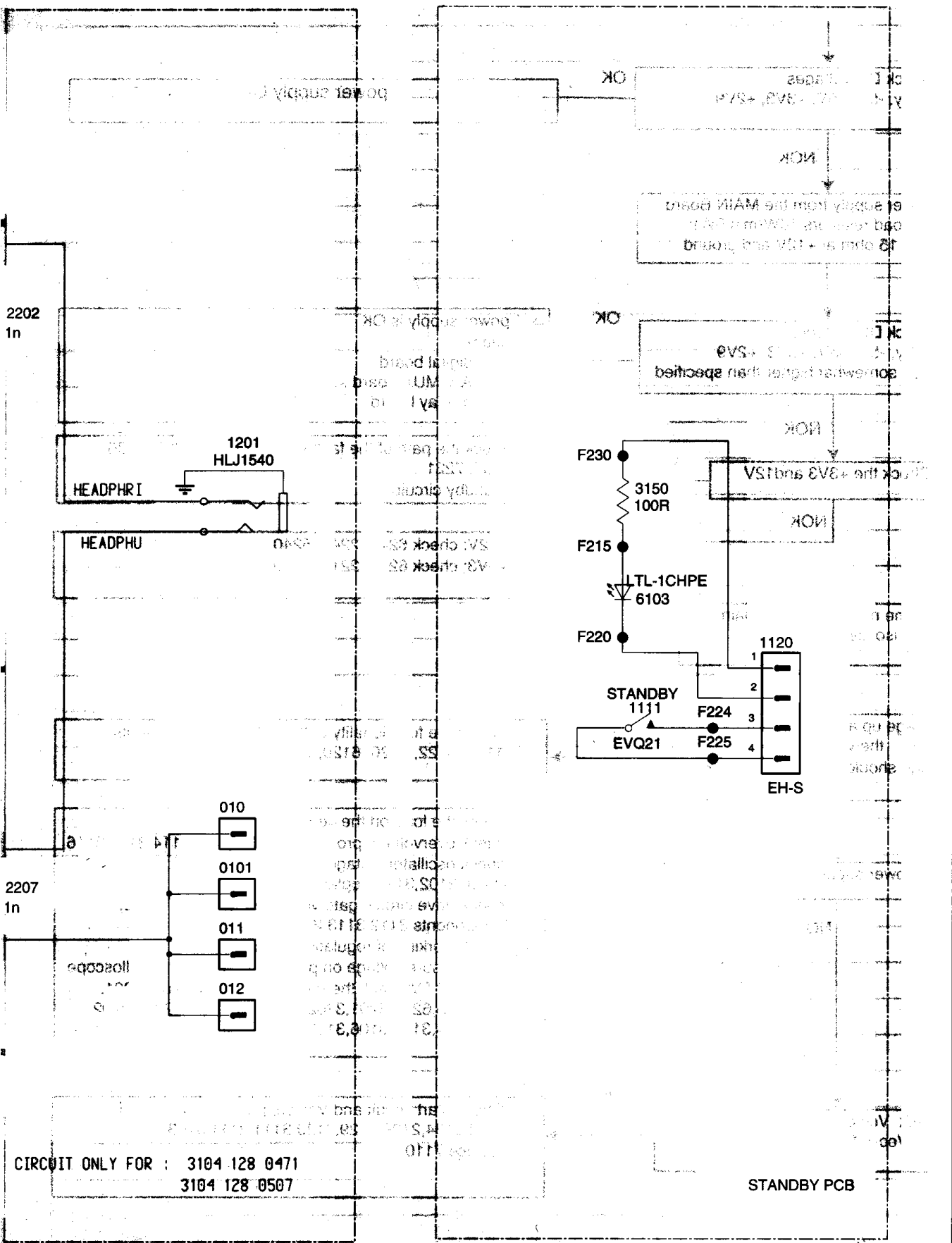
C

D

E

F

- 0100 D6
- 0101 E6
- 0102 E6
- 0103 E6
- 1111 D8
- 1120 D9
- 1200-1 D1
- 1200-2 B1
- 1200-3 A1
- 1200-4 B1
- 1200-5 C1
- 1200-6 D1
- 1200-7 C1
- 1201 C6
- 2200 A4
- 2201 B3
- 2202 B5
- 2203 B4
- 2204 B4
- 2206 E3
- 2207 E5
- 2209 E4
- 3150 C8
- 3200 B5
- 3201-A A1
- 3201-B D1
- 3202 B4
- 3203 D5
- 3205 E4
- 6103 C8
- 7200-A A3
- 7200-B D3
- F215 C8
- F220 D8
- F224 D9
- F225 D9
- F230 C8
- F300 C3
- F301 A1
- F302 B5
- F303 A2
- F304 B1
- F305 B4
- F306 B1
- F307 E3
- F308 C1
- F309 D1
- F310 D1
- F311 D5
- F312 D2
- F313 E4



CIRCUIT ONLY FOR : 3104 128 0471  
 3104 128 0507

STANDBY PCB

3104 123 4227 PB HP/STB DVD750/950

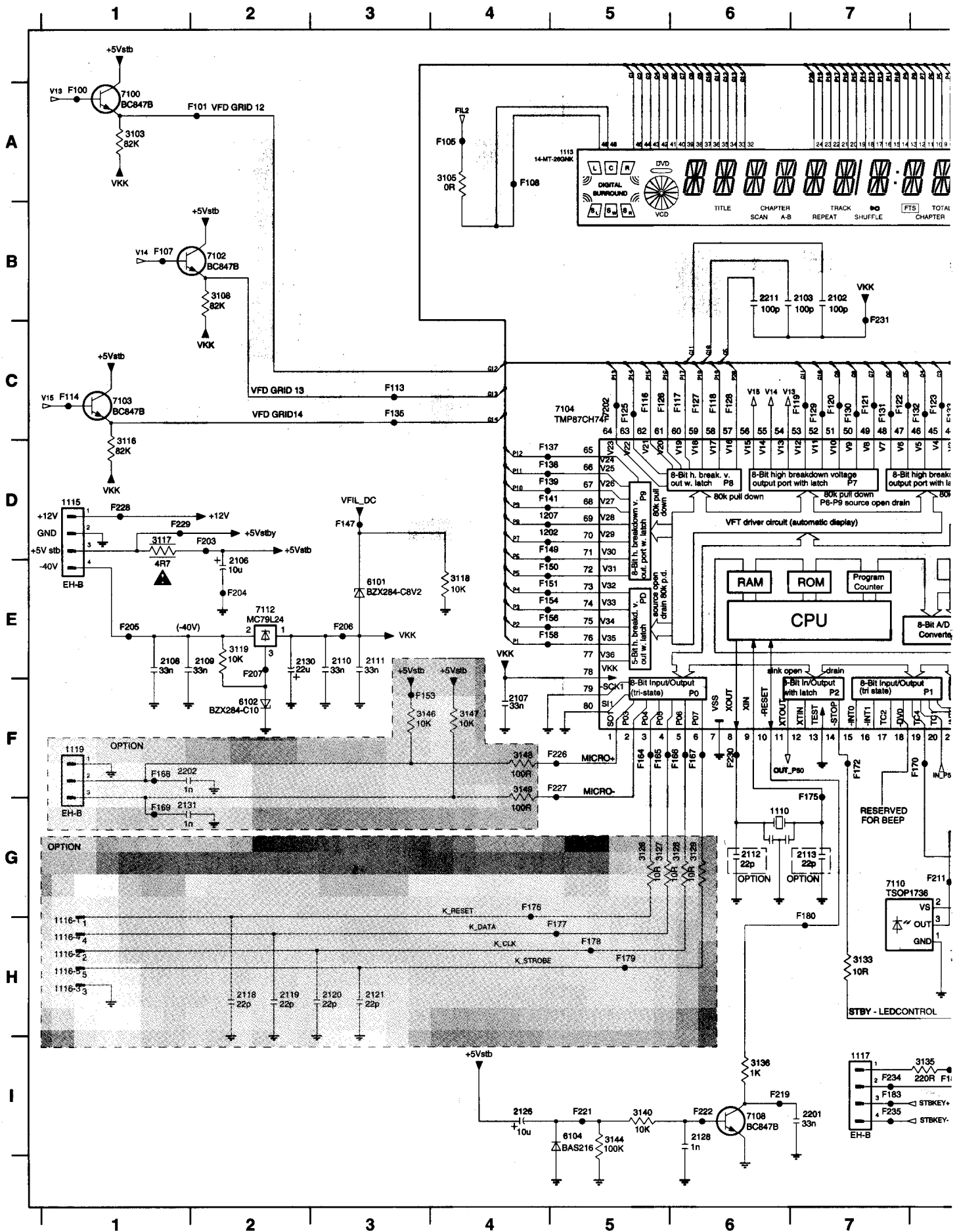
6

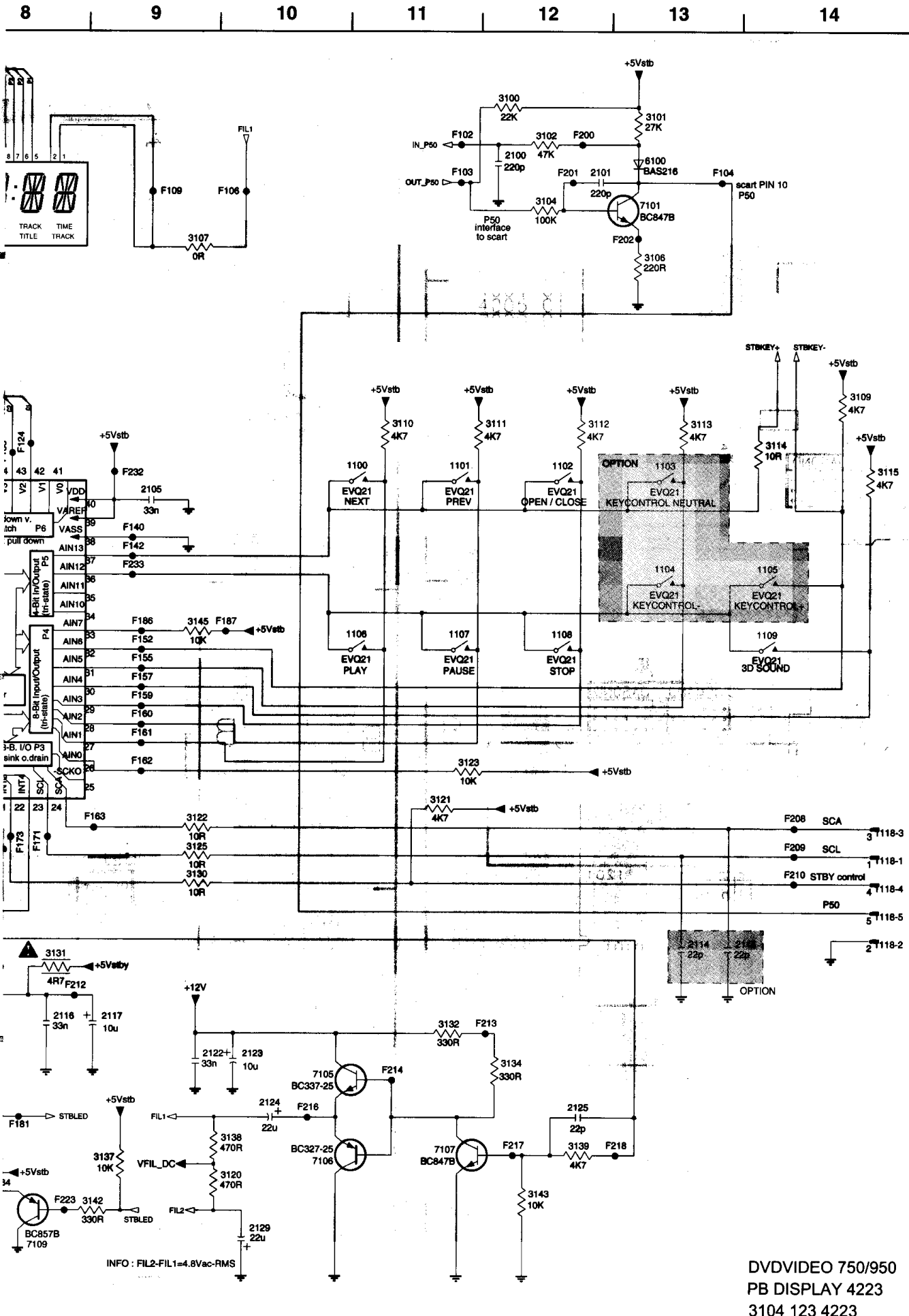
7

8

9

# Display

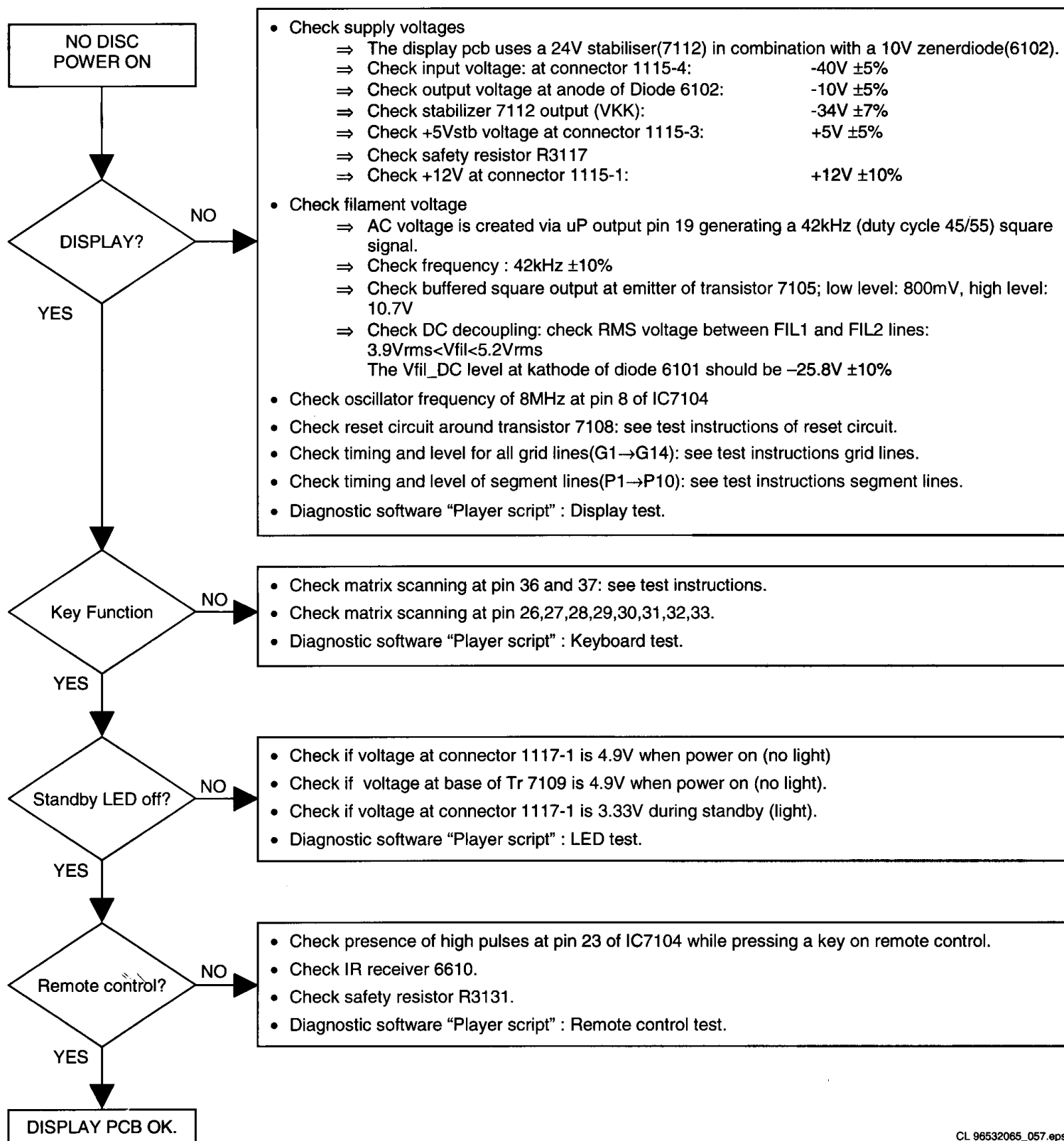




- 1100 C11
- 1101 C11
- 1102 C12
- 1103 C13
- 1104 D13
- 1105 D14
- 1106 E11
- 1107 E11
- 1108 E12
- 1109 E14
- 1110 G6
- 1113 A5
- 1115 D1
- 1116-1 H1
- 1116-2 H1
- 1116-3 H1
- 1116-4 H1
- 1116-5 H1
- 1117 I7
- 1118-1 F14
- 1118-2 G14
- 1118-3 F14
- 1118-4 G14
- 1118-5 G14
- 1119 F1
- 1202 D4
- 1207 D4
- 2100 A12
- 2101 A12
- 2102 B7
- 2103 B7
- 2105 D9
- 2106 E2
- 2107 F4
- 2108 E1
- 2109 E2
- 2110 E3
- 2111 E3
- 2112 G6
- 2113 G7
- 2114 G13
- 2115 G14
- 2116 H8
- 2117 H9
- 2118 H2
- 2119 H2
- 2120 H3
- 2121 H3
- 2122 H9
- 2123 H10
- 2124 H10
- 2125 H12
- 2126 I4
- 2128 I6
- 2129 I10
- 2130 E2
- 2131 G1
- 2201 I7
- 2202 F1
- 2211 B6
- 3100 A12
- 3101 A13
- 3102 A12
- 3103 A1
- 3104 A12
- 3105 A4
- 3106 B13
- 3107 B9
- 3108 B2
- 3109 C14
- 3110 C11
- 3111 C12
- 3112 C12
- 3113 C13
- 3114 C14
- 3115 C14
- 3116 C1
- 3117 D1
- 3118 E4
- 3119 E2
- 3120 I10
- 3121 F11
- 3122 F9
- 3123 F11
- 3125 F9
- 3126 G5
- 3127 G5
- 3128 G6
- 3129 G6
- 3130 G9
- 3131 G8
- 3132 H11
- 3133 H7
- 3134 H12
- 3135 I8
- 3136 I6
- 3137 I9
- 3138 H10
- 3139 I12
- 3140 I5
- 3141 I2
- 3142 I9
- 3143 I12
- 3144 I5
- 3145 E9
- 3146 F3
- 3147 F4
- 3148 F4
- 3149 F4
- 6100 A13
- 6101 E3
- 6102 F2
- 6104 I5
- 7100 A1
- 7101 A13
- 7102 B2
- 7103 C1
- 7104 C5

DVDVIDEO 750/950  
PB DISPLAY 4223  
3104 123 4223

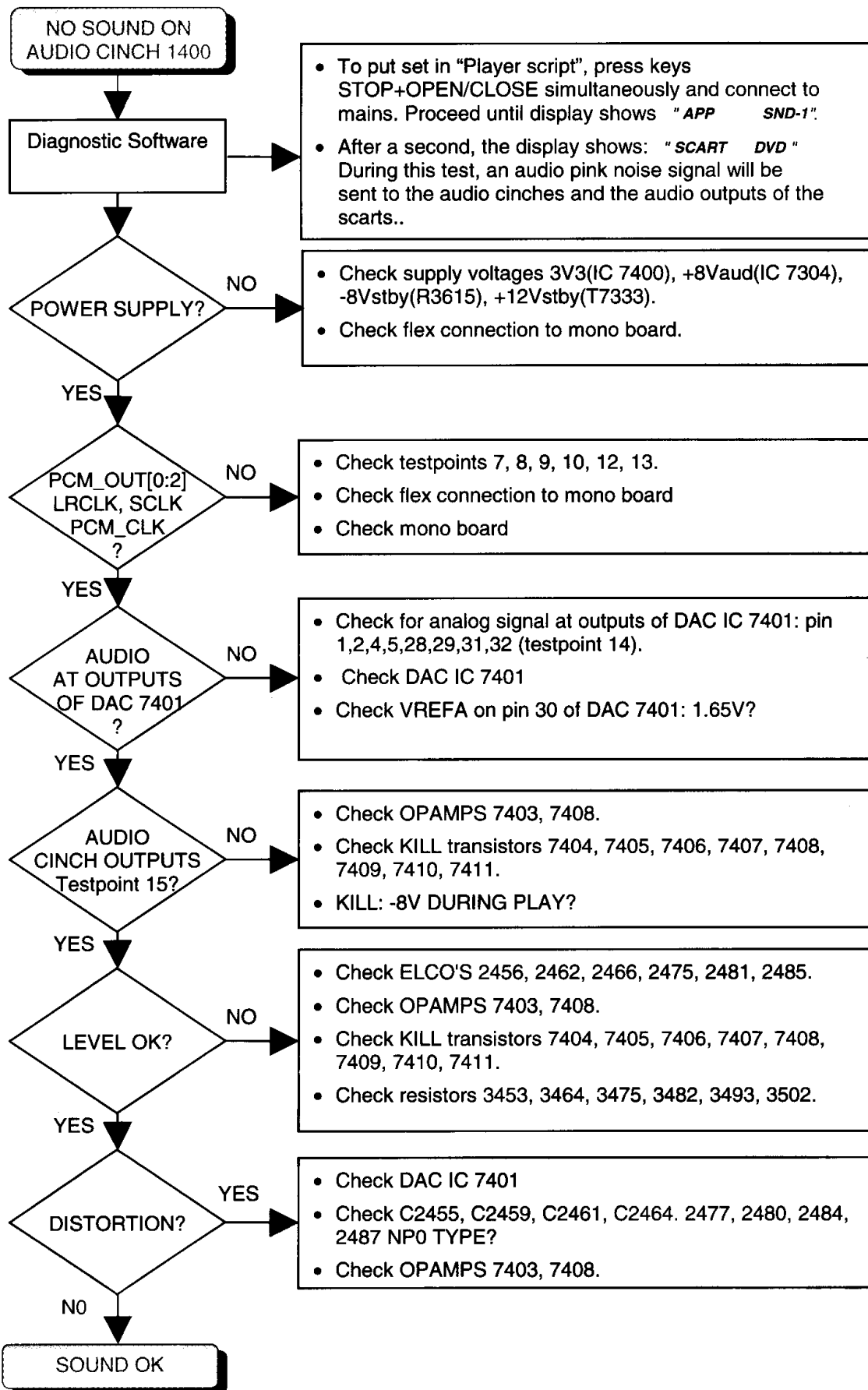
## TROUBLESHOOTING DISPLAY BOARD



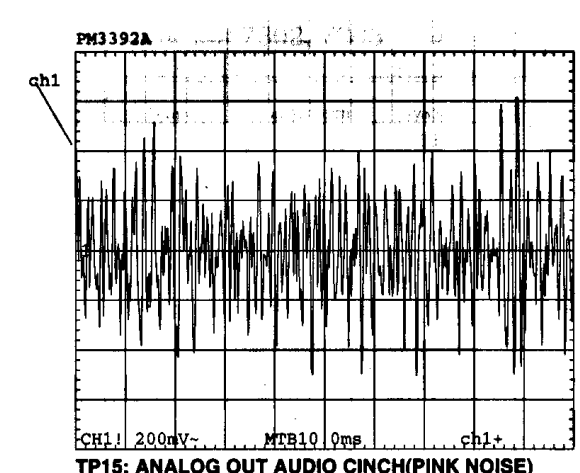
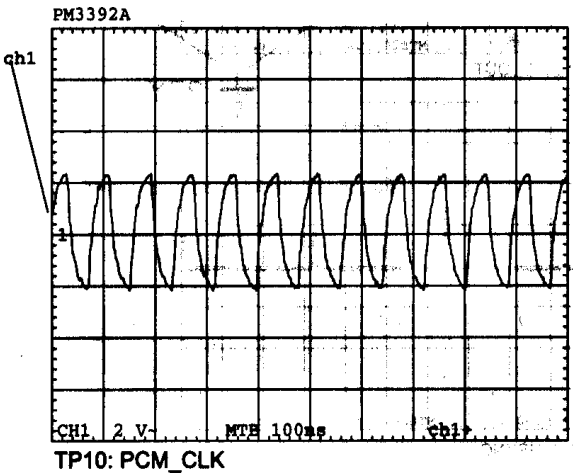
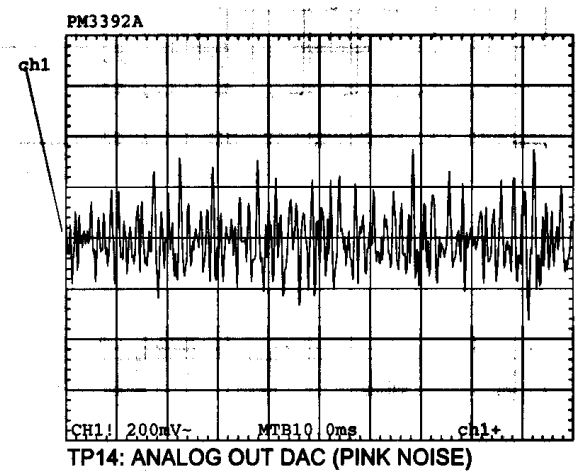
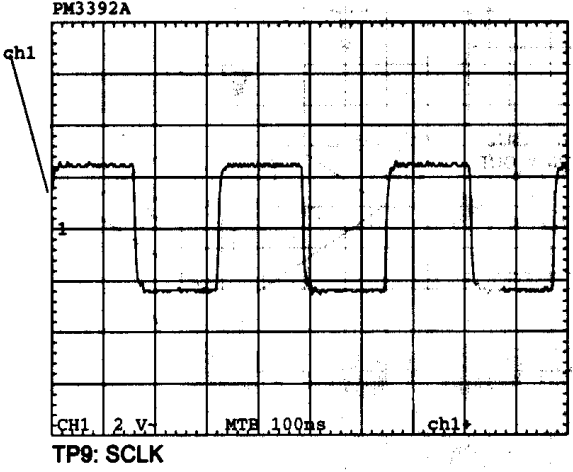
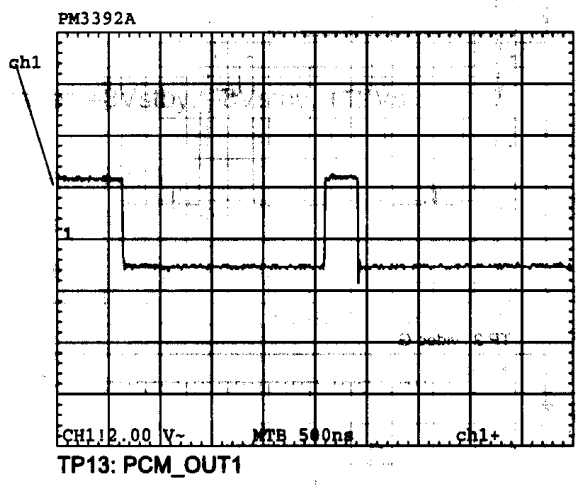
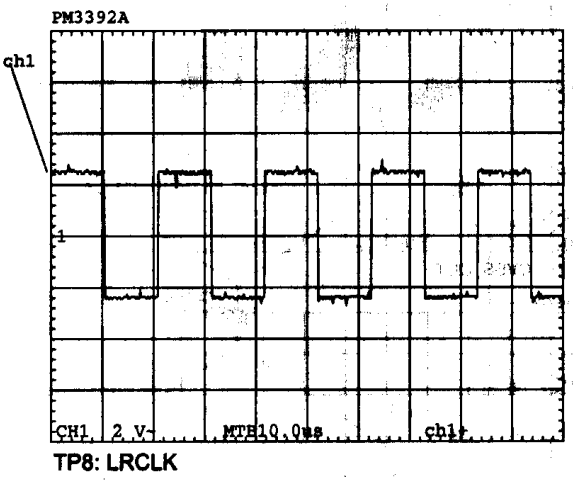
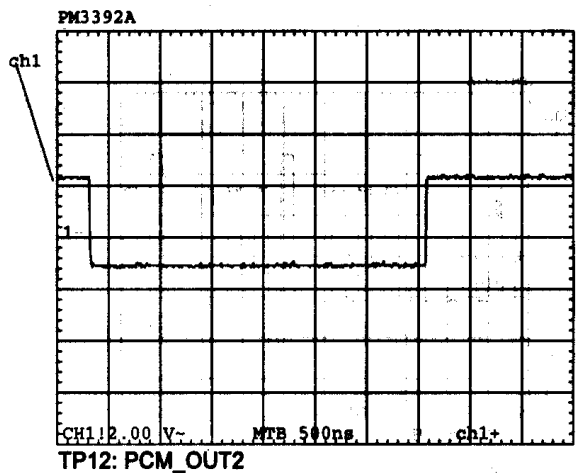
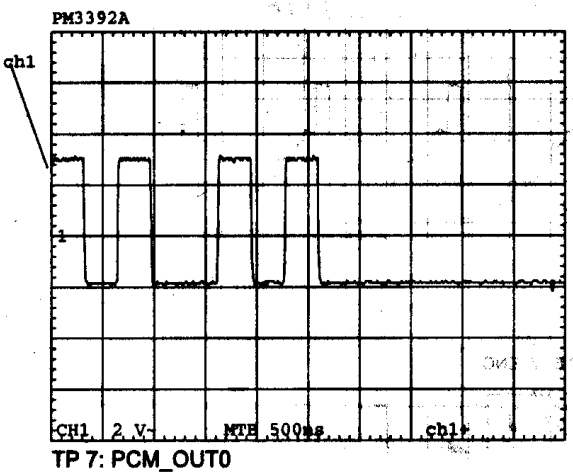
# TROUBLESHOOTING A/V BOARD

Testing of A/V board can be done using diagnostic software "Player script". Mono board is used to generate a sound with the sound tests SND-1 and SND-2 or a VIDEO signal with the picture test PIC-1. Functional control of scart switching and RGB video processing is also possible. See description in chapter "Diagnostic Software: Script Interfaces"

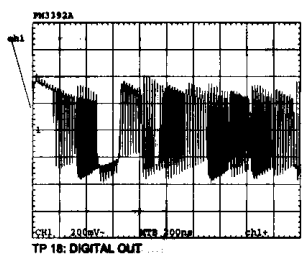
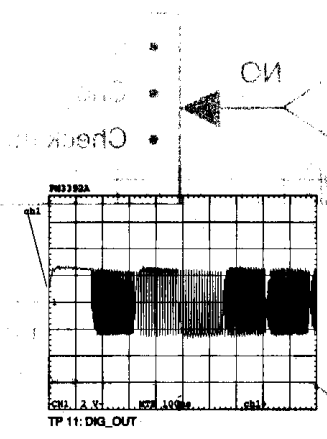
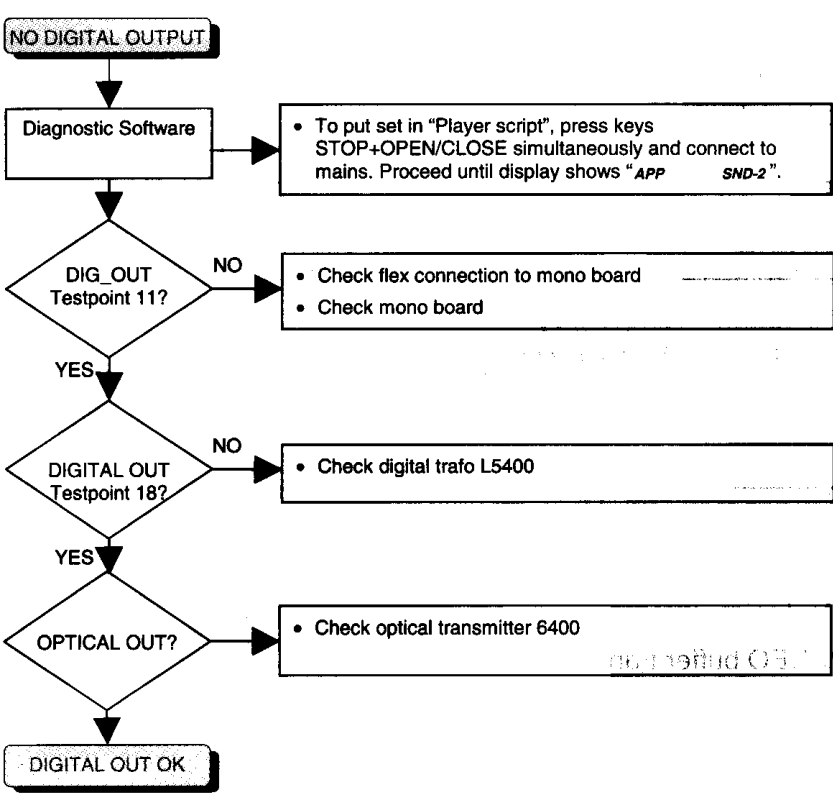
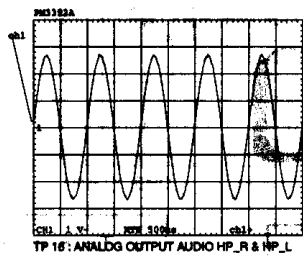
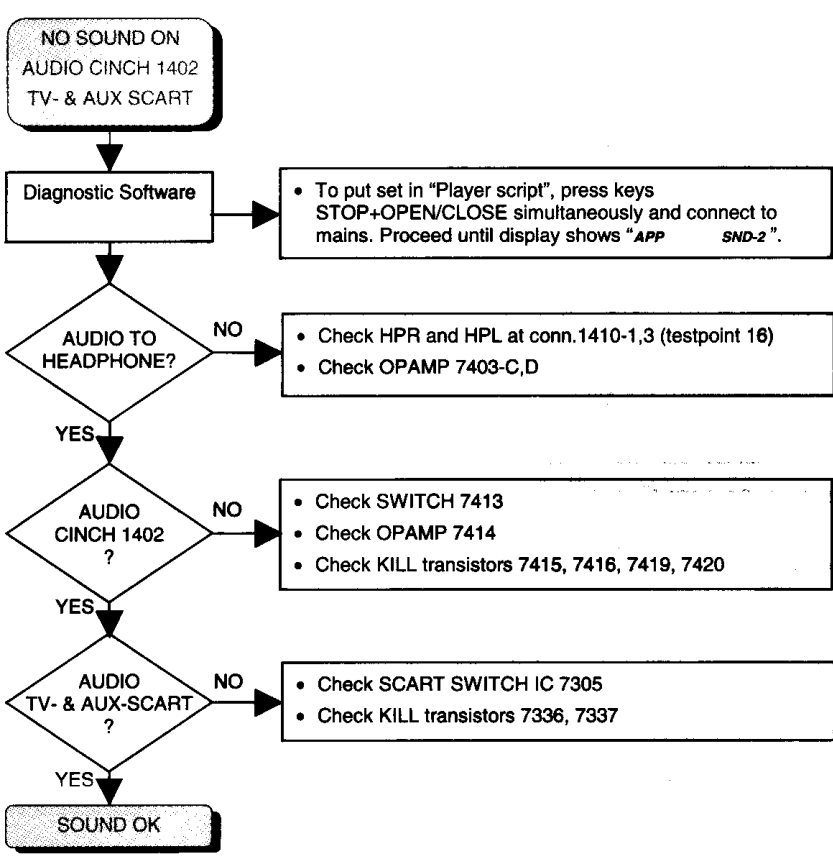
## AUDIO PART

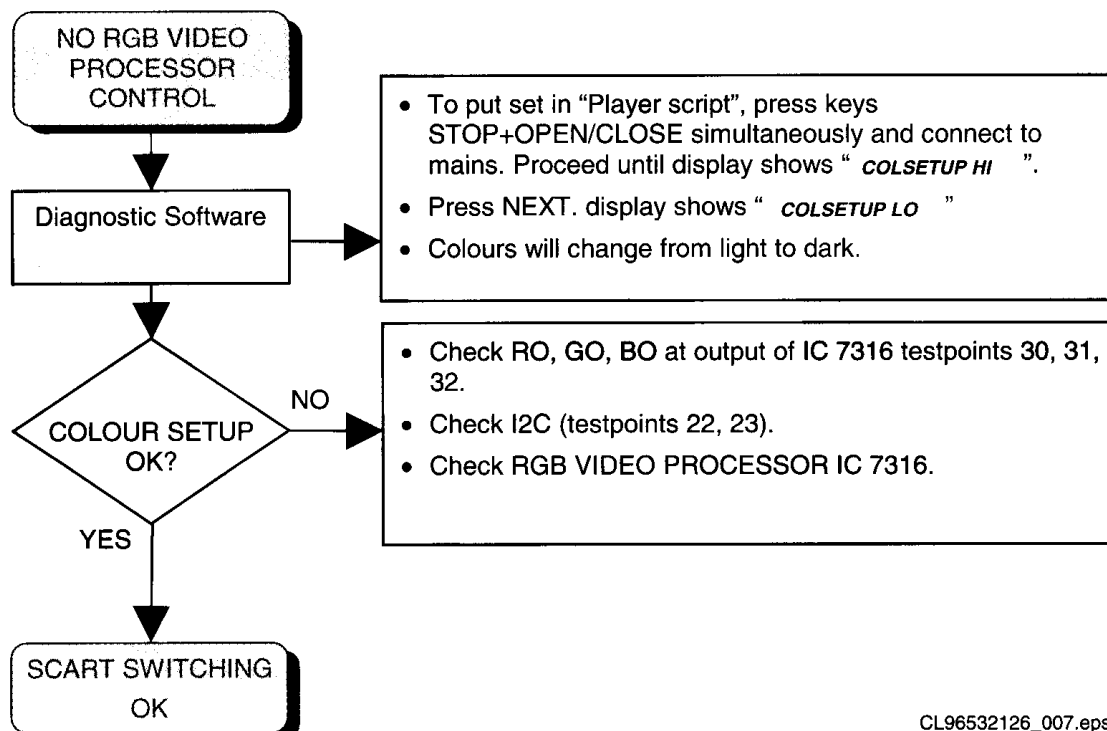
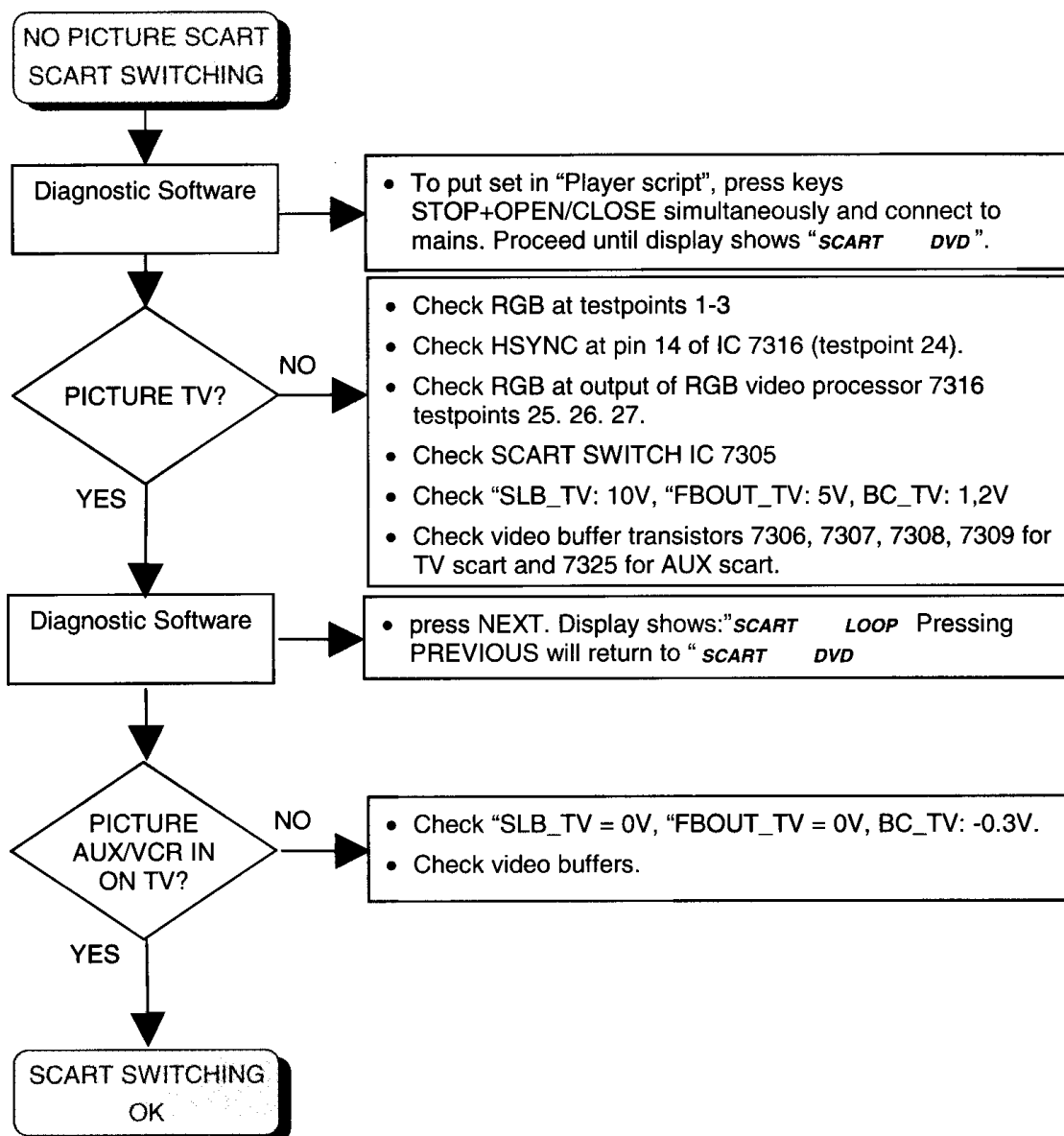


# Audio-1

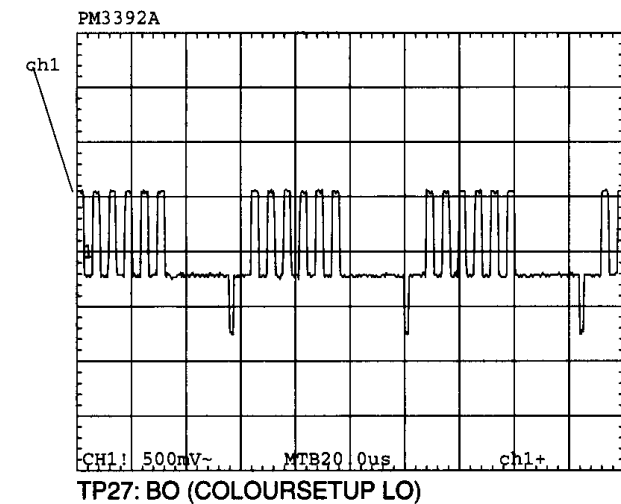
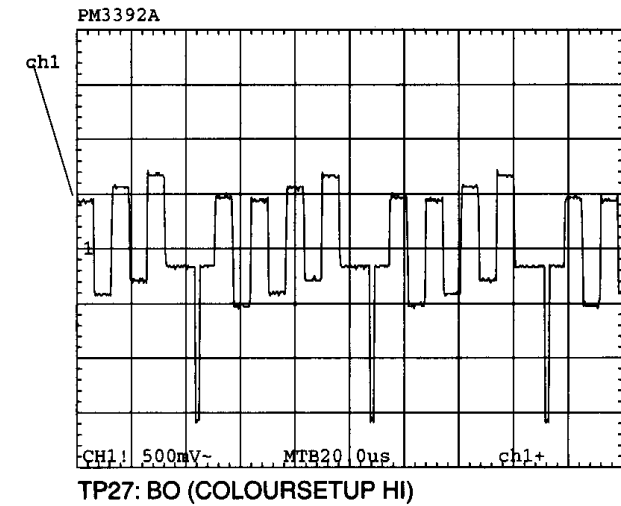
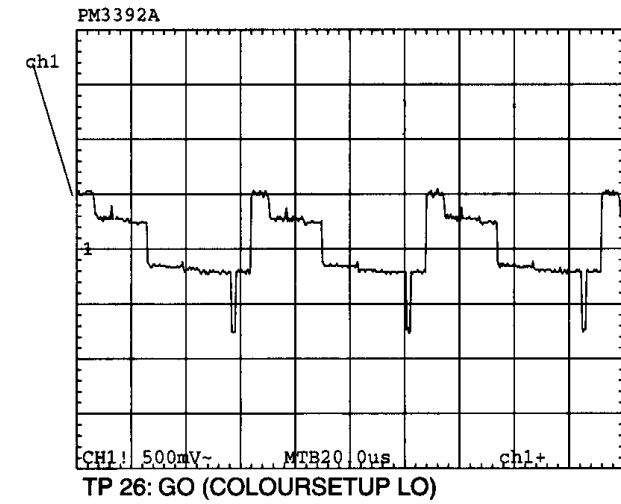
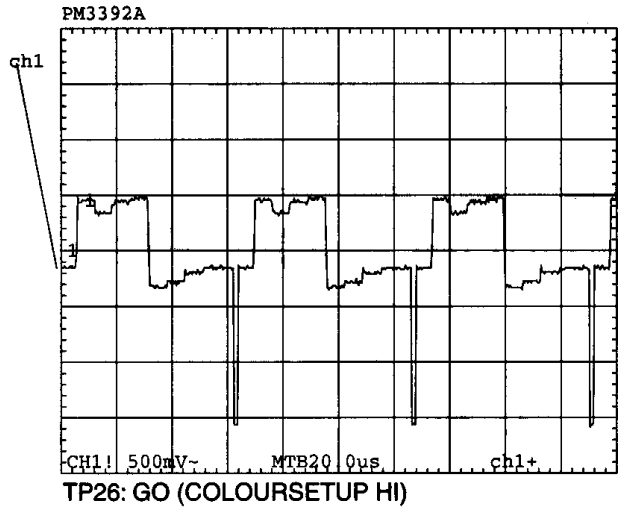
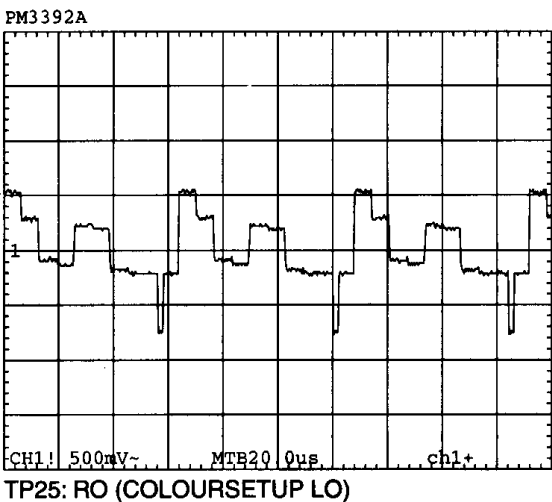
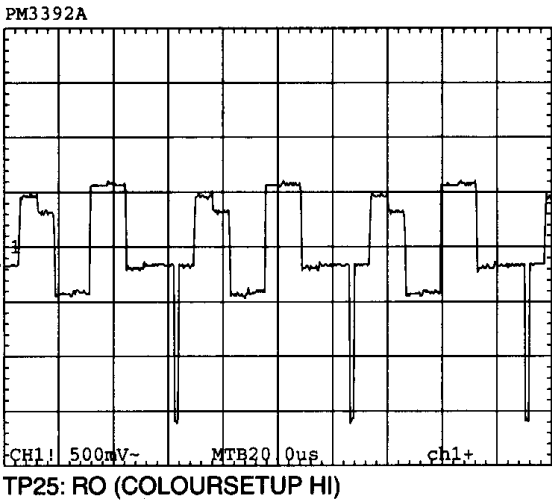
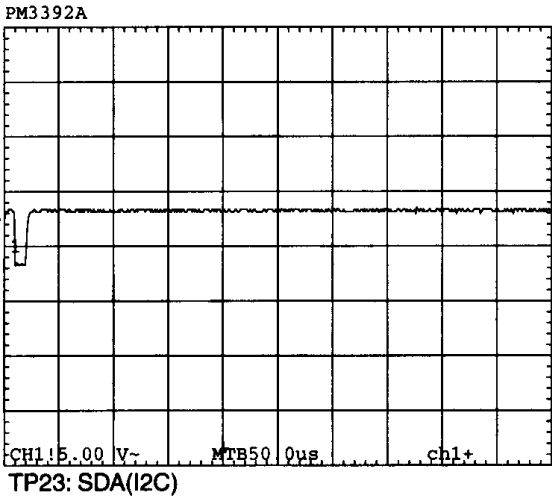
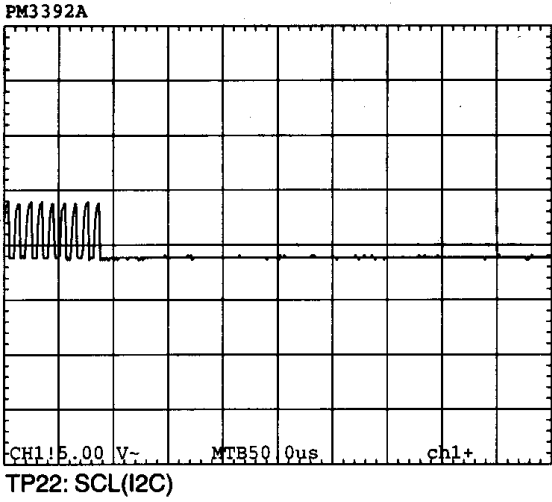






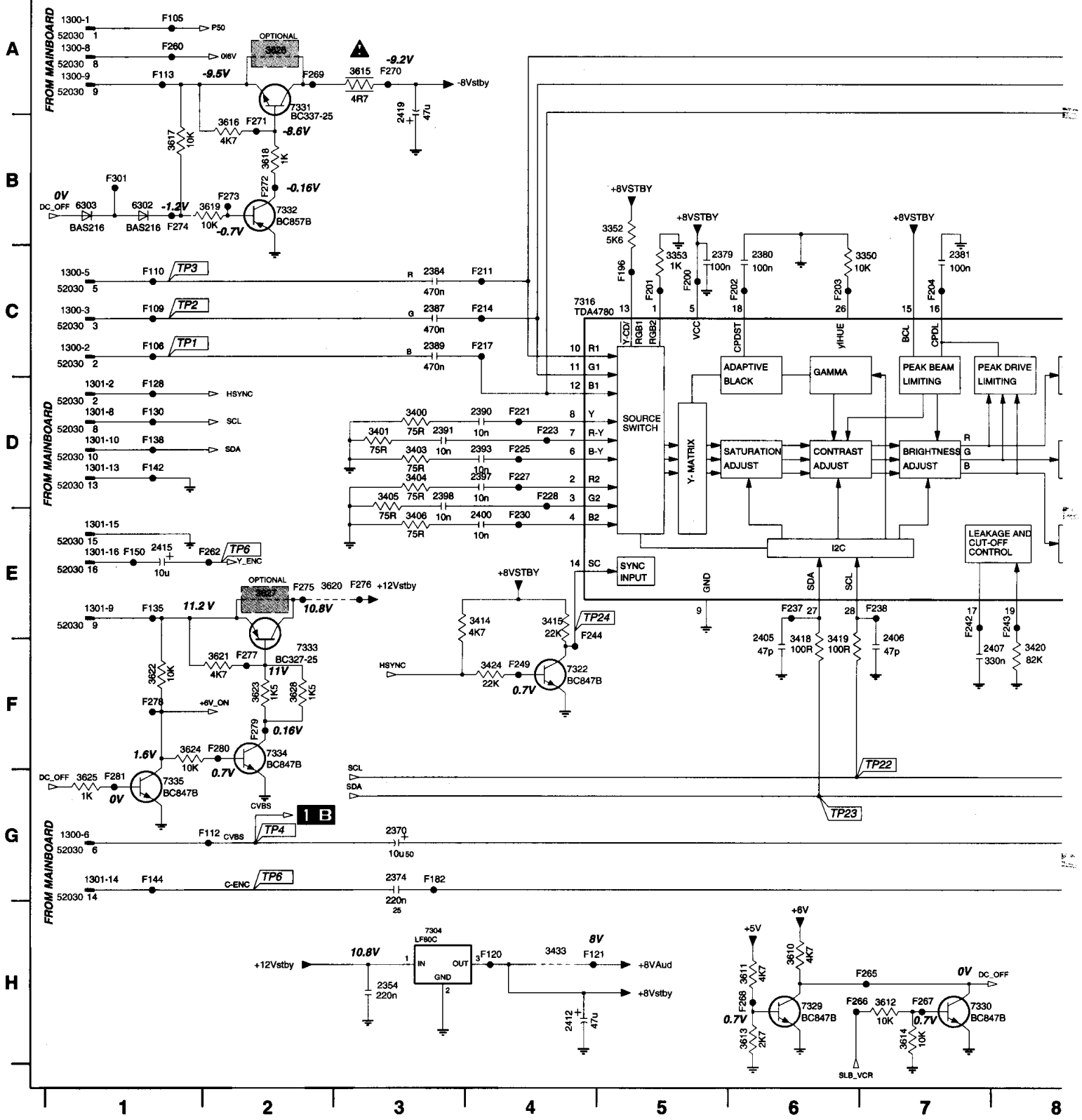


# Video-2



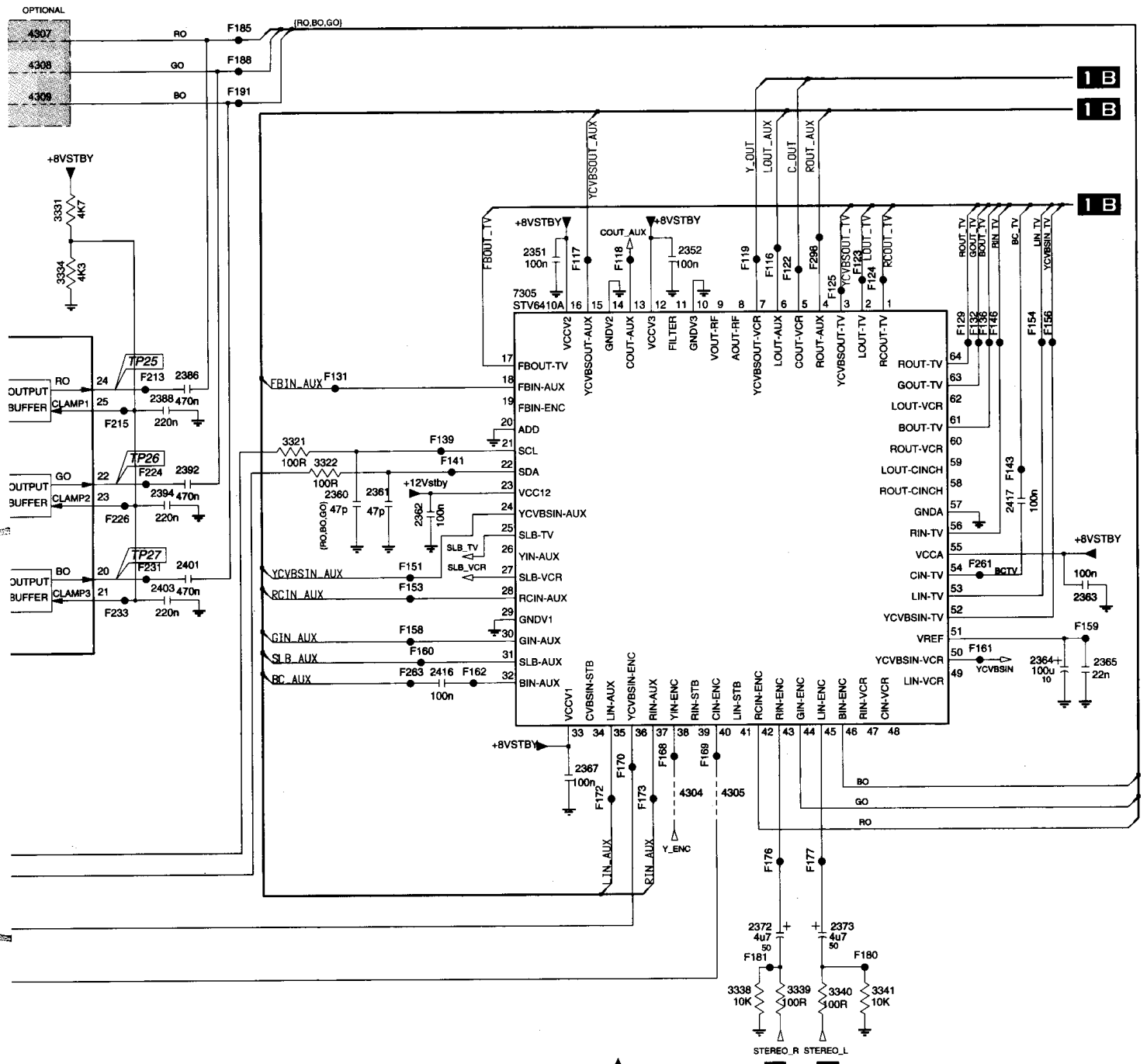
1300-1 A1	1301-14 G1	2360 D10	2373 G14	2389 C3	2401 E9	2419 A3	3350 C7	3414 E4	3612 H7	3621 F2	4304 F13	7316 C4	7999 H
1300-2 C1	1301-15 E1	2361 D11	2374 G3	2390 D4	2403 E9	2403 E9	3352 B5	3415 E4	3613 H6	3622 F1	4305 F13	7322 F4	F105 A
1300-3 C1	1301-16 E1	2362 D11	2379 C5	2391 D3	2405 F6	2406 F7	3322 D10	3418 F6	3614 H7	3623 F2	4307 A8	7329 H6	F106 C
1300-5 C1	1301-2 D1	2363 E15	2380 C6	2392 D9	2406 F7	2407 F8	3331 B8	3419 F6	3615 A3	3624 F1	4308 A8	7330 H7	F109 C
1300-6 G1	1301-8 D1	2364 E15	2381 C7	2393 D4	2407 F8	2412 H4	3334 C8	3420 F9	3616 B2	3625 G1	4309 A8	7331 A2	F110 C
1300-8 A1	1301-9 E1	2365 E15	2384 C3	2394 D9	2412 H4	2415 E1	3338 H13	3424 F4	3617 B1	3626 A2	6302 B1	7332 B2	F112 G
1300-9 A1	2351 C12	2367 F12	2386 C9	2397 D4	2415 E1	2416 E11	3339 H13	3424 F4	3618 B2	3627 E2	6303 B1	7333 F2	F113 A
1301-10 D1	2352 C13	2370 G3	2387 C3	2398 D3	2416 E11	2417 D15	3340 H14	3405 D3	3619 B2	3628 F2	7304 H3	7334 F2	F116 C
1301-13 D1	2354 H3	2372 G13	2388 D9	2400 E4	2417 D15		3341 H14	3406 E3	3620 E2	3999 H9	7305 C11	7335 G1	F117 C

# 1A VIDEO CONTROL & SCART SWITCH

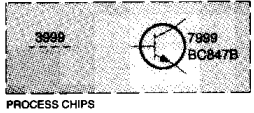


10	F118 C12	F129 C15	F142 D1	F158 E11	F173 F12	F196 C5	F215 D9	F230 E4	F260 A1	F270 A3	F279 F2
1	F119 C13	F130 D1	F143 D15	F159 E15	F176 G13	F200 C5	F217 C4	F231 E9	F261 E15	F271 B2	F280 F2
1	F120 H4	F131 C10	F144 G1	F160 E11	F177 G13	F201 C5	F221 D4	F233 E9	F262 E2	F272 B2	F281 G1
1	F121 H4	F132 C15	F146 C15	F161 E15	F180 G14	F202 C6	F223 D4	F237 E6	F263 E11	F273 B2	F298 C14
1	F122 C13	F135 E1	F150 E1	F162 E11	F181 G13	F203 C6	F224 D9	F238 E7	F265 H7	F274 B1	F301 B1
2	F123 C14	F136 C15	F151 E11	F168 F12	F182 G3	F204 C7	F225 D4	F242 E7	F266 H6	F275 E2	
1	F124 C14	F138 D1	F153 E11	F169 F13	F185 A10	F211 C4	F226 D9	F243 E8	F267 H7	F276 E3	
13	F125 C14	F139 D11	F154 C15	F170 F12	F188 A10	F213 C9	F227 D4	F244 F4	F268 H6	F277 F2	
12	F128 D1	F141 D11	F156 C15	F172 F12	F191 A10	F214 C4	F228 D4	F249 F4	F269 A2	F278 F1	

9 10 11 12 13 14 15



A  
B  
C  
D  
E  
F  
G  
H

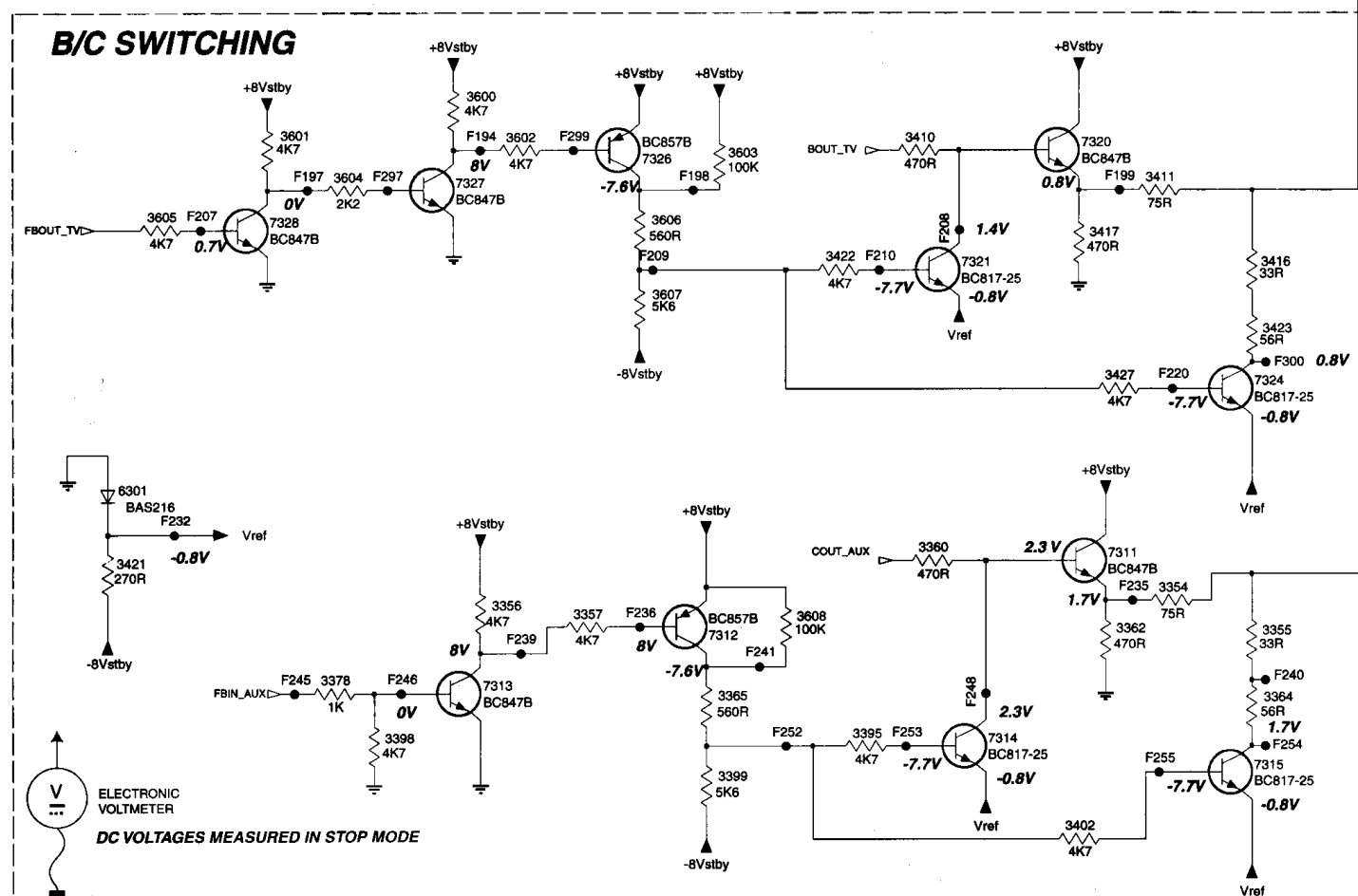
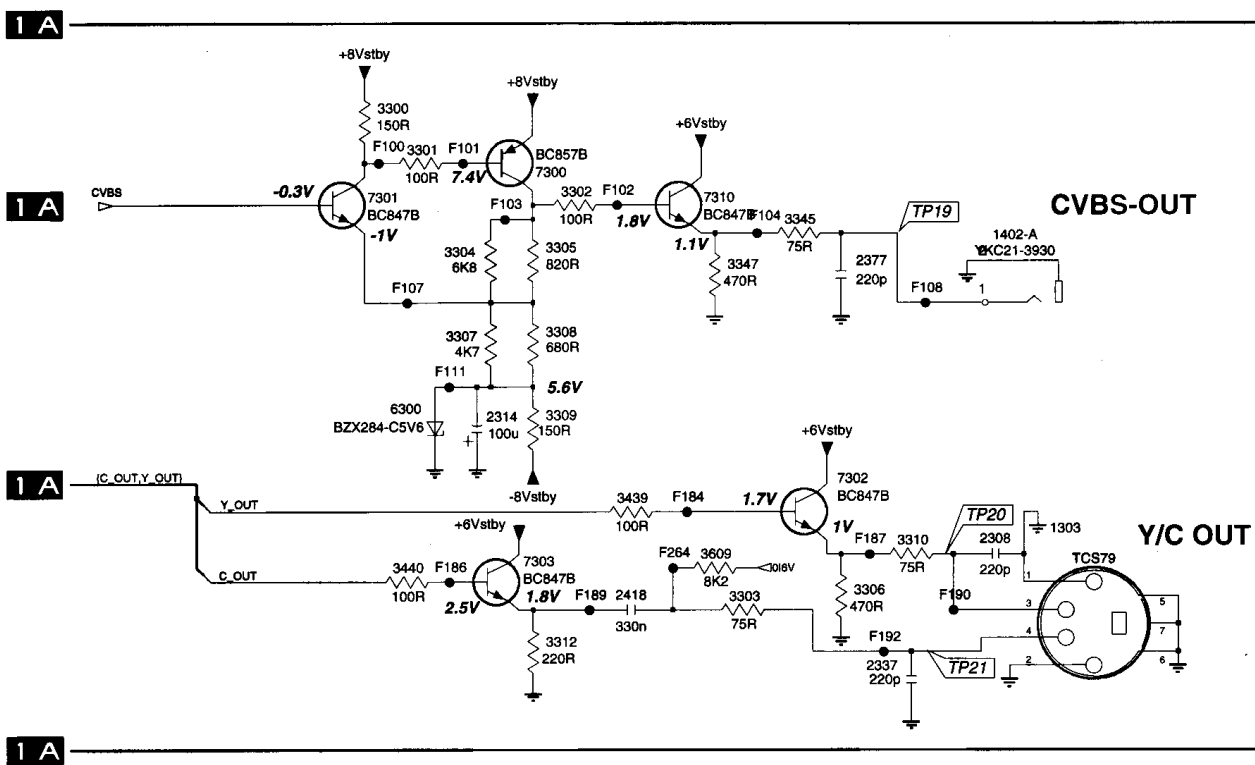


ELECTRONIC VOLTMETER DC VOLTAGES MEASURED IN STOP MODE

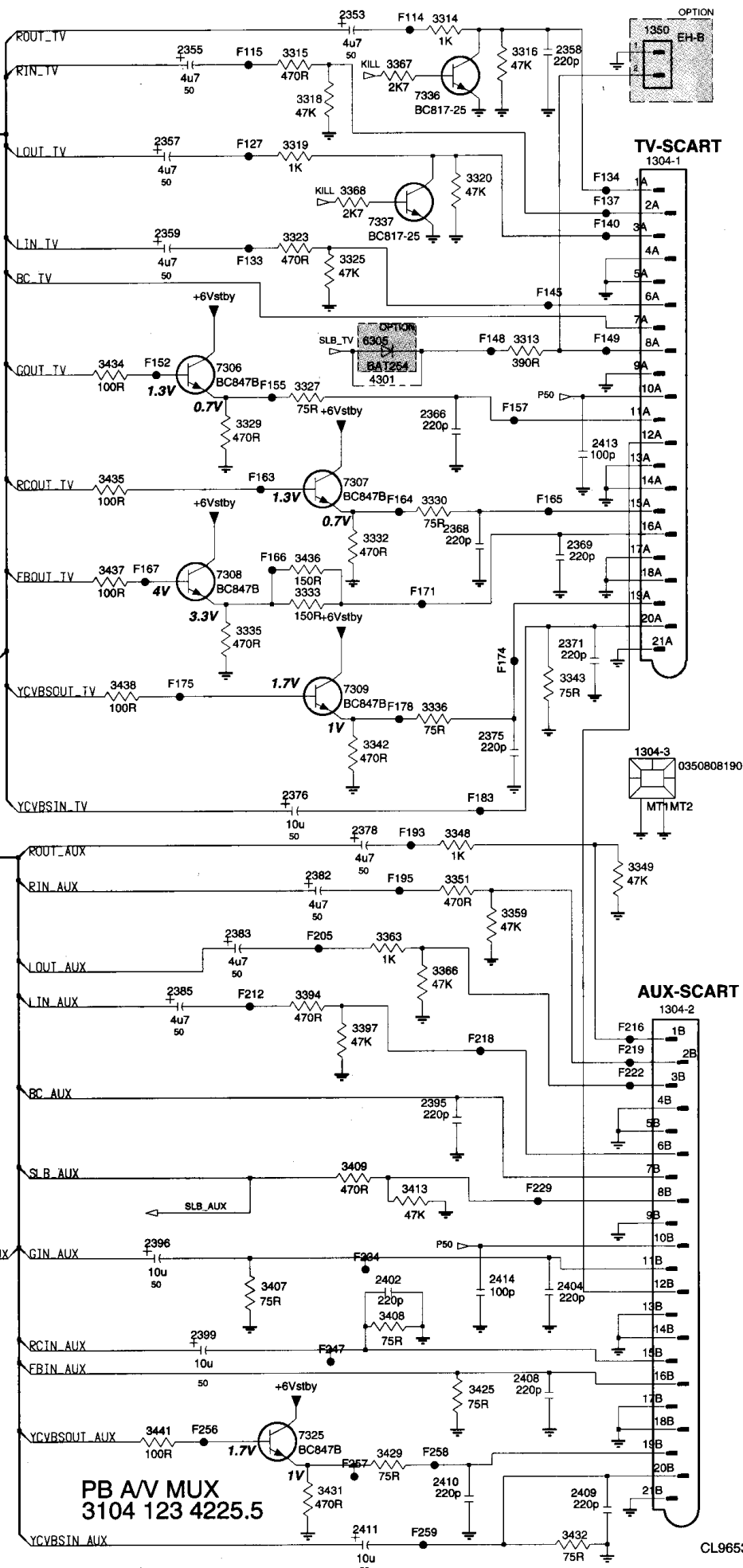
PB AV MUX  
3104 123 4225.5

9 10 11 12 13 14 15

# 1 B VIDEO OUT



**V**  
ELECTRONIC  
VOLTMETER  
DC VOLTAGES MEASURED IN STOP MODE



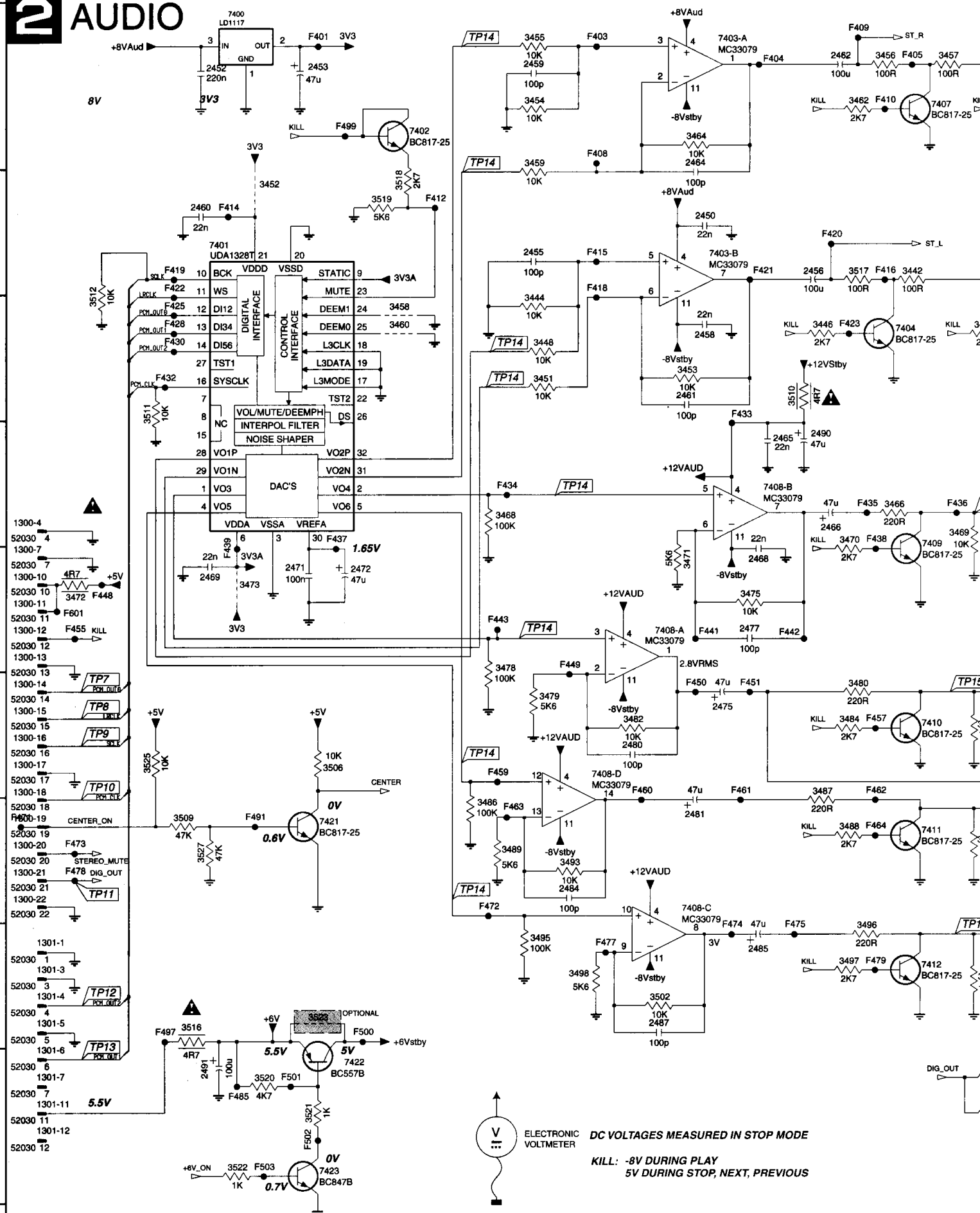
A  
B  
C  
D  
E  
F  
G  
H  
I


- 1303 D6
- 1304-1 A13
- 1304-2 F13
- 1304-3 E13
- 1350 A13
- 1402-A B6
- 2308 D6
- 2314 C3
- 2337 D5
- 2338 D6
- 2353 A12
- 2355 A11
- 2357 A10
- 2358 A13
- 2359 B10
- 2366 C12
- 2368 C12
- 2369 C13
- 2371 D13
- 2375 E12
- 2376 E11
- 2377 B5
- 2378 E12
- 2382 F11
- 2383 F11
- 2385 F10
- 2395 G12
- 2396 H10
- 2399 H11
- 2402 H12
- 2404 H13
- 2408 I13
- 2409 I13
- 2410 I12
- 2411 I12
- 2413 C13
- 2414 H12
- 2418 D4
- 3000 A3
- 3001 B3
- 3002 B4
- 3003 D5
- 3004 B3
- 3005 B4
- 3006 D5
- 3007 C3
- 3008 C4
- 3009 C4
- 3010 D5
- 3012 D4
- 3013 B13
- 3014 A12
- 3015 A11
- 3016 A13
- 3018 A11
- 3019 A11
- 3020 A12
- 3023 B11
- 3025 B12
- 3027 C11
- 3028 C12
- 3029 C12
- 3030 C12
- 3032 C12
- 3033 D11
- 3035 B5
- 3037 B5
- 3038 E12
- 3039 F13
- 3040 F12
- 3041 H7
- 3042 H8
- 3043 H8
- 3044 H8
- 3045 H8
- 3046 H8
- 3047 H8
- 3048 H8
- 3049 H8
- 3050 H8
- 3051 H8
- 3052 H8
- 3053 H8
- 3054 H8
- 3055 H8
- 3056 H8
- 3057 H8
- 3058 H8
- 3059 H8
- 3060 H8
- 3061 F2
- 3602 F4
- 3603 F5
- 3604 F3
- 3605 F2
- 3606 F4
- 3607 D6
- 3608 H5
- 3609 D4
- 3610 H2
- 3611 C3
- 3612 B2
- 3613 B3
- 3614 B3
- 3615 B3
- 3616 B3
- 3617 B3
- 3618 B3
- 3619 B3
- 3620 B3
- 3621 B3
- 3622 B3
- 3623 B3
- 3624 B3
- 3625 B3
- 3626 B3
- 3627 B3
- 3628 B3
- 3629 B3
- 3630 B3
- 3631 B3
- 3632 B3
- 3633 B3
- 3634 B3
- 3635 B3
- 3636 B3
- 3637 B3
- 3638 B3
- 3639 B3
- 3640 B3
- 3641 B3
- 3642 B3
- 3643 B3
- 3644 B3
- 3645 B3
- 3646 B3
- 3647 B3
- 3648 B3
- 3649 B3
- 3650 B3
- 3651 B3
- 3652 B3
- 3653 B3
- 3654 B3
- 3655 B3
- 3656 B3
- 3657 B3
- 3658 B3
- 3659 B3
- 3660 B3

# 2 AUDIO

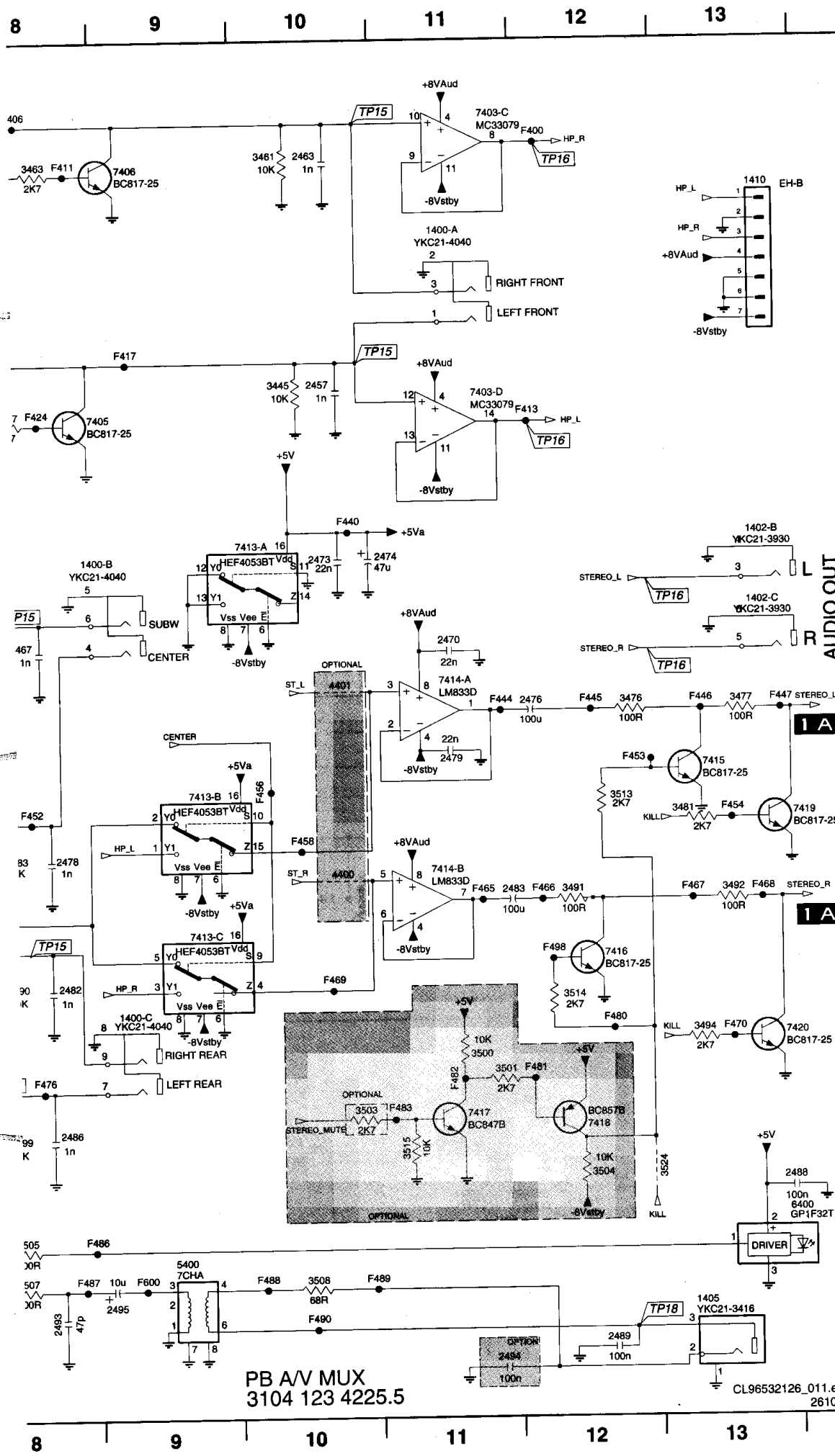
A  
B  
C  
D  
E  
F  
G  
H  
I

1 2 3 4 5 6 7



 ELECTRONIC VOLTMETER  
**DC VOLTAGES MEASURED IN STOP MODE**  
**KILL: -8V DURING PLAY**  
**5V DURING STOP, NEXT, PREVIOUS**





PB A/V MUX  
3104 123 4225.5

- 1300-10 E1
- 1300-11 E1
- 1300-12 E1
- 1300-13 E1
- 1300-14 F1
- 1300-15 F1
- 1300-16 F1
- 1300-17 F1
- 1300-18 F1
- 1300-20 G1
- 1300-21 G1
- 1300-22 G1
- 1300-4 D1
- 1300-7 E1
- 1301-1 H1
- 1301-11 I1
- 1301-12 I1
- 1301-3 H1
- 1301-4 H1
- 1301-5 H1
- 1301-6 I1
- 1301-7 I1
- 1400-A A11
- 1400-B D9
- 1400-C G9
- 1402-B D13
- 1402-C D13
- 1405 I13
- 1410 A13
- 2450 B6
- 2452 A2
- 2453 A3
- 2455 B4
- 2456 B7
- 2457 C10
- 2458 C6
- 2459 A4
- 2460 B2
- 2461 C6
- 2462 A7
- 2463 A10
- 2464 A6
- 2465 D6
- 2466 D7
- 2468 E6
- 2469 E2
- 2470 D11
- 2471 E2
- 2472 E3
- 2473 D10
- 2474 D11
- 2475 F6
- 2476 E12
- 2477 E6
- 2478 F8
- 2479 E11
- 2480 F5
- 2481 G6
- 2482 G8
- 2483 F11
- 2484 G5
- 2485 H6
- 2486 H8
- 2487 H5
- 2488 H13
- 2489 I12
- 2490 D7
- 2491 I2
- 2493 I8
- 2494 I12
- 2495 I9
- 3442 B7
- 3444 C4
- 3445 C10
- 3446 C7
- 3447 C8
- 3448 C4
- 3451 C4
- 3452 B2
- 3453 C6
- 3454 A4
- 3455 A4
- 3456 A7
- 3457 A8
- 3458 C3
- 3459 A4
- 3460 C3
- 3461 A10
- 3462 A7
- 3463 A8
- 3464 A6
- 3466 D7
- 3468 D4
- 3469 D8
- 3470 D7
- 3471 E6
- 3472 E1
- 3473 E2
- 3475 E6
- 3476 E12
- 3477 E13
- 3478 E4
- 3479 F4
- 3480 F7
- 3481 F13
- 3482 F5
- 3483 F8
- 3484 F7
- 3486 G4
- 3487 F7
- 3488 G7
- 3489 G4
- 3490 G8
- 3491 F12
- 3492 F13
- 3493 G5
- 3494 G13
- 3495 H4
- 3496 H7
- 3497 H7
- 3498 H5
- 3499 H8
- 3500 G11
- 3501 G11
- 3502 H5
- 3503 H10
- 3504 H12
- 3505 I8
- 3506 F3
- 3507 I8
- 3508 I10
- 3509 G2
- 3510 C6
- 3511 C1
- 3512 C1
- 3513 F12
- 3514 G12
- 3515 H11
- 3516 H2
- 3517 B7
- 3518 B3
- 3519 B3
- 3520 I2
- 3521 I3
- 3522 I2
- 3523 H3
- 3524 H13
- 3525 F1
- 3527 G2
- 4400 F10
- 4401 E10
- 5400 I9
- 6400 H13
- 7400 A2
- 7401 B2
- 7402 A3
- 7403-A A6
- 7403-B B6
- 7403-C A11
- 7403-D C11
- 7404 C7
- 7405 C8
- 7406 A9
- 7407 A7
- 7408-A E5
- 7408-B D6
- 7408-C G5
- 7408-D F5
- 7409 D7
- 7410 F7
- 7411 G7
- 7412 H7
- 7413-A D10
- 7413-B E9
- 7413-C F9
- 7414-A E11
- 7414-B F11
- 7415 E13
- 7416 G12
- 7417 H11
- 7418 H12
- 7419 F13
- 7420 G13
- 7421 G3
- 7422 I3
- 7423 I3
- F400 A12
- F401 A3
- F403 A5
- F404 A6
- F405 A7
- F406 A8
- F408 A5
- F409 A7
- F410 A7
- F411 A8
- F412 B4
- F413 C12
- F414 B2
- F415 B5
- F416 B7
- F417 B9
- F418 B5
- F419 B1
- F420 B7
- F421 B6
- F422 B1
- F423 C7
- F424 C8
- F425 C1
- F428 C1
- F430 C1
- F432 C1
- F433 C6
- F434 D4
- F435 D7
- F436 D8
- F437 D3
- F438 D7
- F439 E2
- F440 D10
- F441 E6
- F442 E6
- F443 A4
- F444 E11
- F445 E12
- F446 E13
- F447 E13
- F448 E1
- F449 E5
- F450 F6
- F451 F6
- F452 F8
- F453 E12
- F454 F13
- F455 E1
- F456 E10
- F457 F7
- F458 F10
- F459 F4
- F460 F5
- F461 F6
- F462 F7
- F463 G4
- F464 G7
- F465 F11
- F466 F12
- F467 F13
- F468 F13
- F469 G10
- F470 G13
- F471 G1
- F472 G4
- F473 G1
- F474 H6
- F475 H6
- F476 H8
- F477 H5
- F478 G1
- F479 H7
- F480 G12
- F481 G12
- F482 H11
- F483 H11
- F485 I2
- F486 I8
- F487 I8
- F488 I10
- F489 I10
- F490 I10
- F491 G2
- F497 H1
- F498 G12
- F499 A3
- F500 H3
- F501 I2
- F502 I3
- F503 I2
- F600 I9
- F601 E1

## 7. DIAGNOSTIC SOFTWARE : SCRIPT INTERFACES

### 7.1 DEALER SCRIPT

#### 7.1.2 Contents of Dealer Script

#### 7.1.1 Purpose of Dealer Script

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

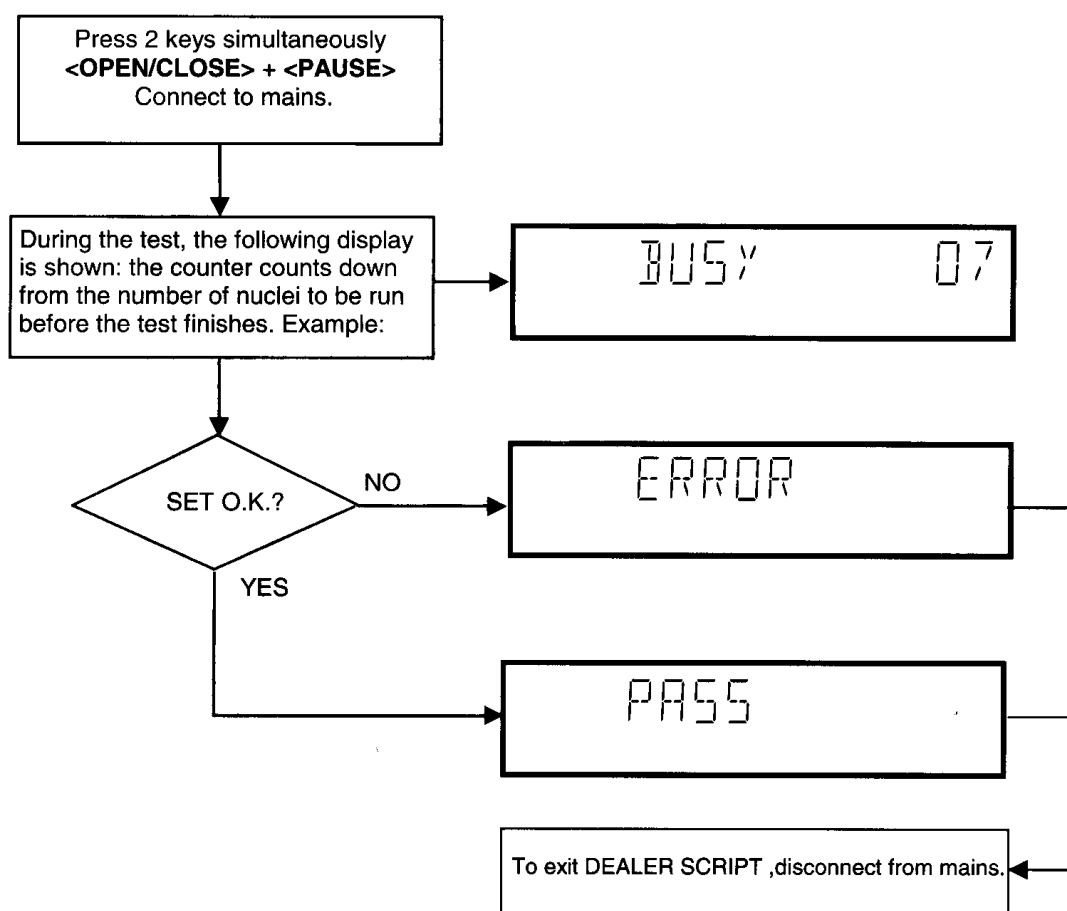
The dealer script executes all diagnostic nuclei that do not need any user interaction and are meaningful on a standalone DVD player.

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

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

CL 96532065\_001.eps  
120799

Figure 7-1



CL96532126\_013.eps  
261099

Figure 7-2

7.2 PLAYER SCRIPT

7.2.4 Survey

7.2.1 Purpose of Player Script

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

7.2.2 Contents of Player Script

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

7.2.3 Structure of Player Script

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

1. Interactive tests: this part of the player test depends strongly on user interaction and input to determine nucleus results and to progress through the full test. Reading the error log and error bits information can be useful to determine any errors that occurred recently during normal operation of the DVD player.
2. The loop test will perform the same nuclei as the dealer test, but it will loop through the list of nuclei indefinitely.

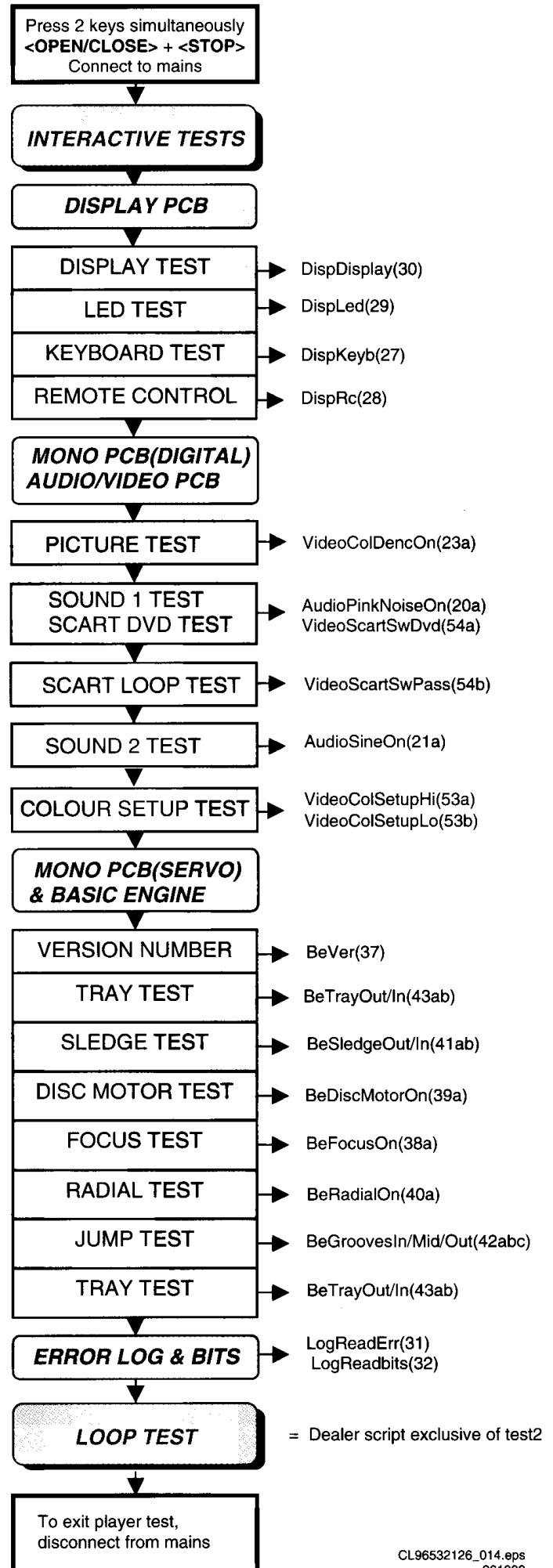


Figure 7-3

### 7.3 INTERACTIVE TESTS

#### 7.3.1 DISPLAY PCB

##### DISPLAY TEST

The display test is performed by nucleus DispDisplay. By putting a series of test patterns on the local display, the local display is tested. To step through all different patterns, the user must either press PLAY (pattern is ok) or PAUSE (pattern was incorrect) to proceed to the next pattern. The display of patterns is continued in a cyclic manner until the user presses NEXT. If the user presses NEXT before all display patterns are tested, the DispDisplay nucleus will return TRUE (display test successful).

##### LED TEST

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

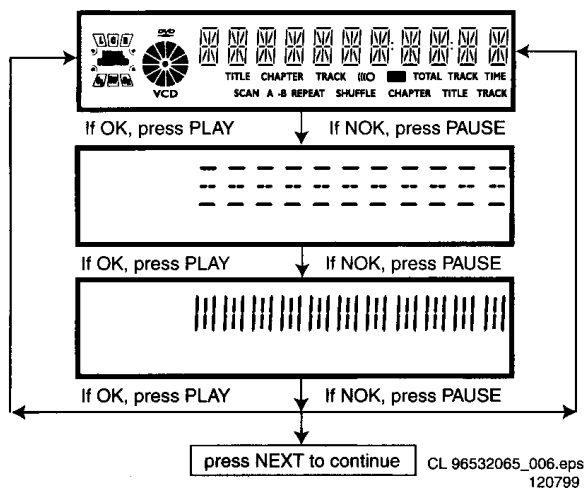


Figure 7-4

##### KEYBOARD TEST

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

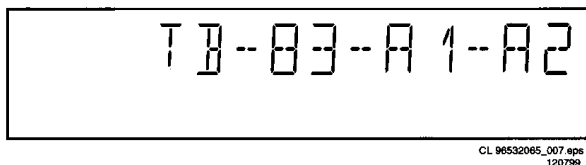


Figure 7-5

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

key id.	key
0	PLAY
1	NEXT
2	PREVIOUS
3	PAUSE
4	STOP
5	OPEN/CLOSE
6	3D-SOUND
A	STANDBY

CL96532126\_015.eps  
261099

Figure 7-6

If any keys are detected more than once (due to hardware error), the key-code is displayed twice (or more), with the second digit increased by 1. If the user does not press all keys minimally once (in any order), the DispKeys nucleus will return FALSE and cause an error in the overall result of the player script.

The user can leave the keyboard test by pressing the NEXT key on the local display of the DVD player for at least one full second.

The result of the keyboard test is shown on local display as follows:



CL 96532065\_009.eps  
120799

Figure 7-7

Or



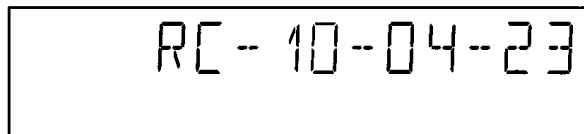
CL 96532065\_010.eps  
120799

Figure 7-8

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

##### REMOTE CONTROL TEST

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



CL 96532065\_011.eps  
120799

Figure 7-9

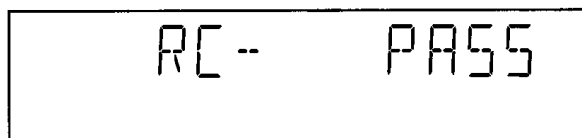
In this example 23 is the hexadecimal code of the pressed RC key. The user can leave the remote-control test by pressing NEXT on the local keyboard of the DVD player. The remote control test is successful if a code was received before the user pressed the NEXT key; pressing the NEXT key before pressing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

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

RC Key id	Hexadecimal code
STANDBY	C
STOP	31
PLAY	2C
PLAY BACKWARD	2D
PAUSE	30
STEP FORWARD	F6
STEP BACKWARD	F5
FORWARD	28
FORWARD 4X	DF
FORWARD 8X	E0
BACKWARD	29
BACKWARD 4X	DE
BACKWARD 8X	DD
SLOW	22
SLOW 2	D8
SLOW BACKWARD	23
SLOW BACKWARD 2	DB
NEXT	20
PREVIOUS	21
CURSOR UP	58
CURSOR DOWN	59
CURSOR LEFT	5A
CURSOR RIGHT	5B
OK	5C
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
TOGGLE	C8
ANGLE	85
AUDIO	4E
SUBTITLES	4B
SUBTITLE ON/OFF	E3
ROOT MENU	54
TITLE MENU	71
MENU	D1
SETUP MENU	82
OSD ON/OFF	F
RETURN	83
RESUME	D7
SCAN	2A
SHUFFLE	1C
REPEAT	1D
A/B REPEAT	3D
TOGGLE SCART	43
OPEN/CLOSE	42
FTS	FB
KARAOKE	E4
OPTION	FA

CL 96532065\_012.eps  
120799

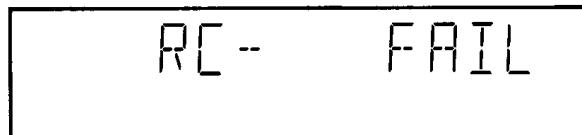
Figure 7-10



CL 96532065\_013.eps  
120799

Figure 7-11

Or



CL 96532065\_014.eps  
120799

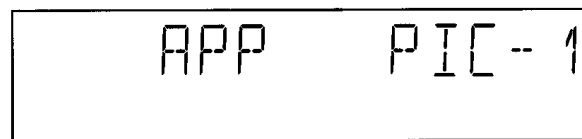
Figure 7-12

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

7.3.2 MONO PCB DIGITAL PART

**PICTURE TEST**

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



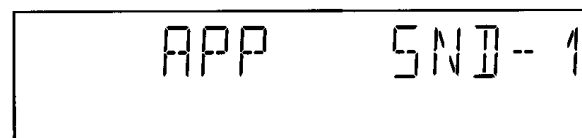
CL 96532065\_015.eps  
120799

Figure 7-13

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

**SOUND 1 & SCART DVD TEST**

The first soundtest is performed by starting a pink noise sound that needs confirmation from the user (nucleus AudioPinkNoiseOn); the display will show the following message very shortly:



CL 96532065\_016.eps  
120799

Figure 7-14

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

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



Figure 7-15

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



Figure 7-16

The internally generated colour bar is still available on the CVBS and Y/C outputs. And the pinknoise-signal is still available on the cinch audio outputs. By pressing the PREV button, the internal generated colour bar becomes visual again. The test can be left by pressing the NEXT key for more than one second.

**SOUND 2 TEST**

The second soundtest is performed by producing a sine sound (nucleus AudioSineOn). The signal can be stopped by pressing the STOP-key. The display will show the following message:

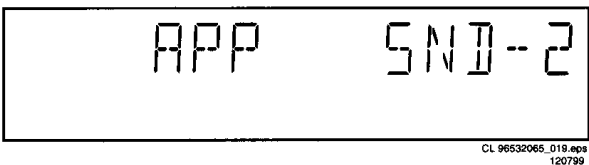


Figure 7-17

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

**Colour set-up test**

The colour set-up test is performed by putting the internally generated colour bar in different settings on the TV screen. The first colour bar will be displayed in setting 1. The display will show the following message:

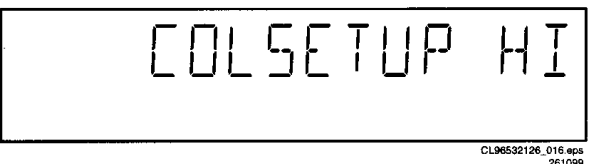


Figure 7-18

By pressing the NEXT button, you can go to the second setting. The local display indicates:

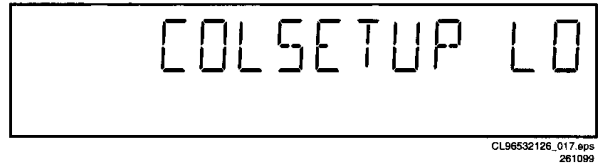


Figure 7-19

By pressing the PREVIOUS button, the colour bar with the first setting becomes visual again.

By pressing PLAY the user confirms the test, pressing PAUSE will indicate that something went wrong. The test can be left by pressing the NEXT key for more than one second; if the user presses NEXT without pressing PLAY or PAUSE first, the result of this test will be TRUE (colour set-up ok).

**7.3.3 BASIC ENGINE**

**VERSION NUMBER**

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

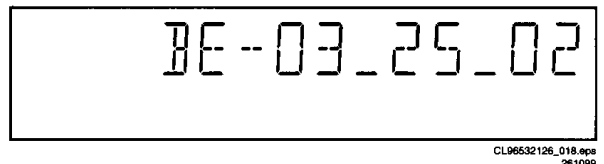


Figure 7-20

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

**TRAY TEST**

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

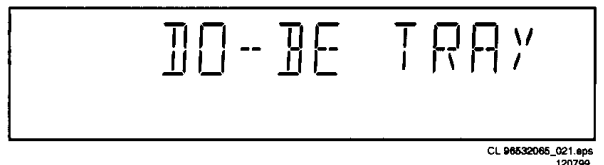


Figure 7-21

By pressing PLAY or PAUSE the user can toggle the position of the tray. Note that this test will not contribute to the test result of the Basic Engine. Pressing NEXT will proceed to the next test, after the tray has been closed (by the software) if it was open.

**SLEDGE TEST(visual test)**

The second Basic Engine test tests the sledge; the user can move the sledge as many times as desired by using PLAY (nucleus BeSledgeOut) and PAUSE (nucleus BeSledgeIn). Pressing NEXT on the local keyboard proceeds to the next test. Note that this test will not contribute to the test result of the Basic Engine. The local display will look as follows during the sledge test:

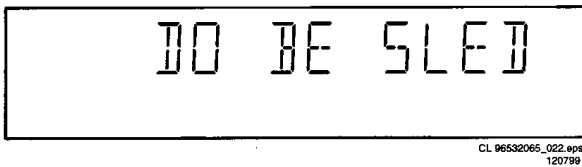


Figure 7-22

**JUMP TEST(listening test)**

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

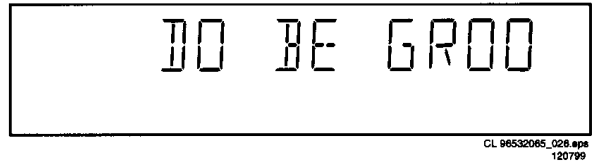


Figure 7-26

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

**TRAY TEST**

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

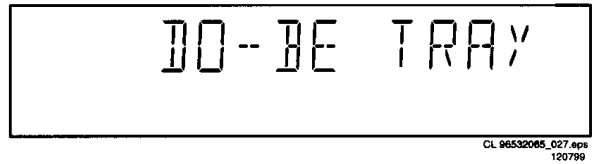


Figure 7-27

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

**DISC MOTOR TEST(visual test)**

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

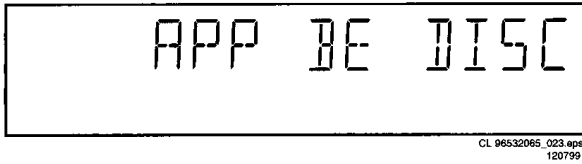


Figure 7-23

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

**FOCUS TEST(visual test)**

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

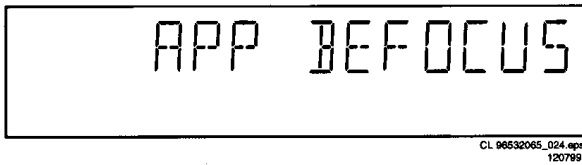


Figure 7-24

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

**RADIAL TEST(visual & listening test)**

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

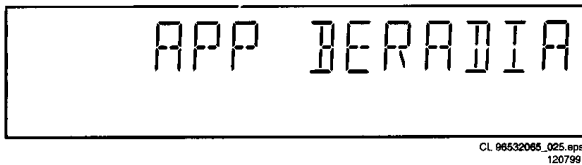


Figure 7-25

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

**ERROR LOG**

Reading the error log and error bits information can be useful to determine any errors that occurred recently during normal operation of the DVD player. Reading the error log is done by nucleus LogReadErr. The display during the errorlog readout looks as follows :

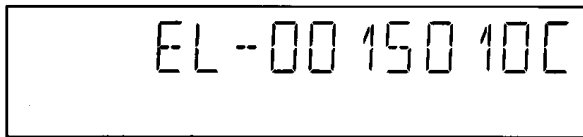
CL96532126\_019.eps  
261099

Figure 7-28

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

recent. By pressing NEXT on the local keyboard, the user can proceed to the next test.

**ERROR BITS**

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

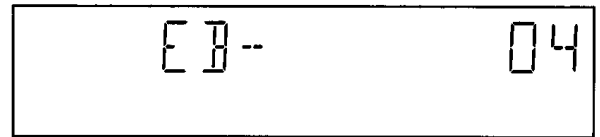
CL96532126\_020.eps  
261099

Figure 7-29

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

See table below:

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



7.3.4 LOOP TEST

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

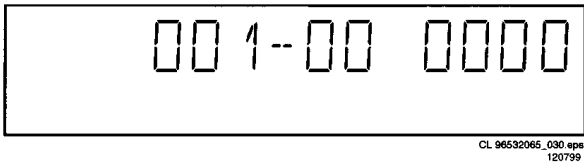


Figure 7-30

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

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

CL 96532065\_031.eps 120799

Figure 7-31

The loop test will perform the same nuclei as the dealer test, but it will loop through the list of nuclei indefinitely. The display of the DVD player will display not only the three digits indicating correct/faulty modules and the last found error code (as mentioned, faults are detected as far as they can be within the scope of the diagnostic software), but also a loop counter indicating how many times the loop has been gone through. Example:

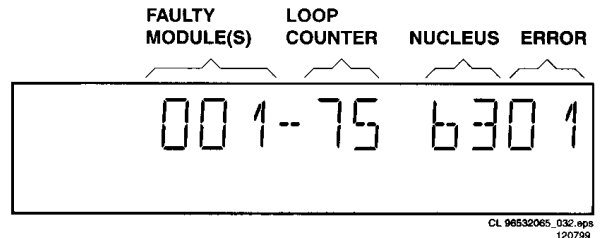


Figure 7-32

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

**ERROR CODES LOOP TEST**

ERROR CODE	NUCLEUS NUMBER	ERROR DESCRIPTION
0601	6	Calculated checksum of FLASH is not correct
0901	9	The DVD DRAM is faulty
1101	11	I2C bus busy before start
1102		NVRAM access time-out
1103		No NVRAM Acknowledge
1104		NVRAM reply time-out
1201	12	I2C bus busy
1202		I2C bus not working
1203		Slave controller not responding
1204		Slave response is not correct
1301	13	Parity error from basic engine to serial
1302		Parity error from serial to basic engine
1303		No communication between serial and basic engine
1304		Communication time-out error
1601	16	The SDRAM is faulty
5201	52	I2c bus busy
5202		I2c bus not working
5203		Colour setup controller not responding
5204		Colour setup controller response not correct
5401	54	I2c bus busy
5402		I2c bus not working
5403		Scart switch controller not responding
5404		Scart switch controller response not correct

Figure 7-33

## 8. Servicing DVD module and MONO board

### 8.1 Replacing DVD module

The DVD module(Basic Engine and the mono board) has to be exchanged completely in case of failure. A new module for

DVD750/001 can be ordered with codenumber 3104 129 51980.

Return the defective unit complete assembled in original package to Philips Consumer Service in Eindhoven

### 8.2 Reprogramming of new mono boards.

**Caution**

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

After replacement of the mono board, all the customer settings and also the region code will be lost. Reprogramming of the mono board will put the player back in the state in which it has left the factory, i.e. with the default settings and the allowed region code.

Reprogramming is limited to 25 times.  
When the counter reaches 25, reprogramming is not possible anymore  
Reprogramming will be done by way of the remote control.  
Put the player in stop mode, no disc loaded.  
Press the following keys on the remote control:  
<PLAY> followed by numerical keys <1> <5> <9>  
The display shows: “- - - - -”  
Press now successively the following keys : <0><0><1> <0><0><0><0><0><0><0><0><0>  
This is only valid for DVD950/001,DVD950/002, DVD955/002 and DVD956/002.

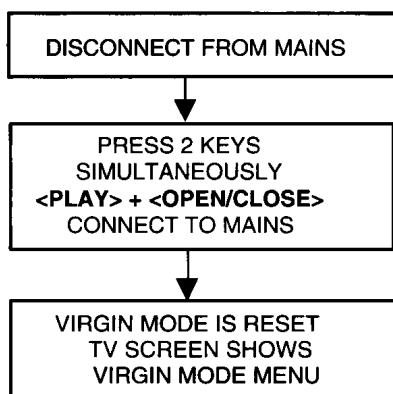
Press <PLAY> again.  
The TV screen will become BLUE during a short time to confirm that the digital board has been reprogrammed, then the set goes to standby mode.

CL96532126\_022.eps  
261099

Figure 8-1

### 8.3 Reset of Virgin Mode

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

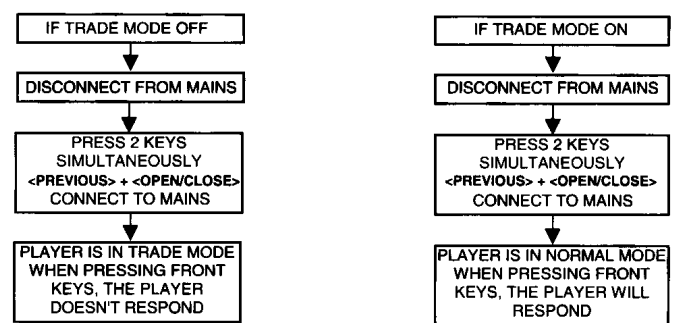


CL96532126\_023.eps  
261099

Figure 8-2

#### TRADE MODE

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



CL96532126\_024.eps  
261099

Figure 8-3

## 9. Test instructions Display board

### 9.1 Display board

#### 9.1.1 Introduction

These test instructions are written for all versions of the display PCB 3104 123 42230.

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

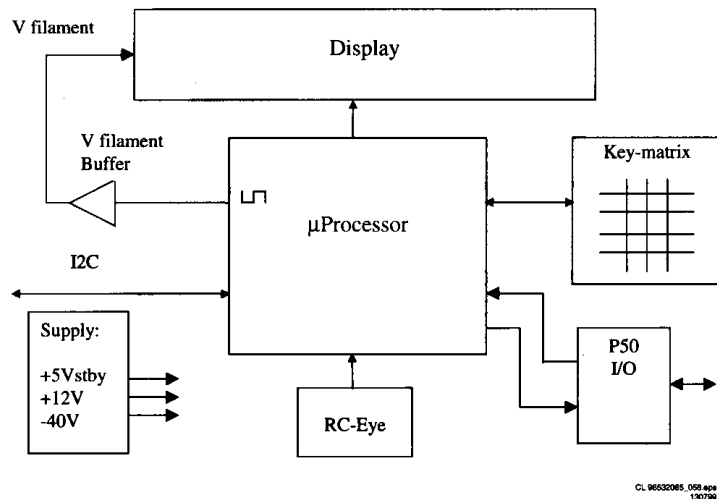


Figure 9-1

#### 9.1.2 Functionality description:

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

Other slave functions are:

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

#### 9.1.3 General

- Oscilloscope measurements have been carried out using a Philips PM3392A.
- Impedance of measuring-equipment should be > 1MΩ.
- To do correct measurements we recommend to use supply 3122 427 21370, which is used in all "second generation B" DVD-players. Make sure that the main 3.3V has a 0.7A load.

#### 9.1.4 Reset

Check next reset timing with an oscilloscope at pin 10 of (processor).

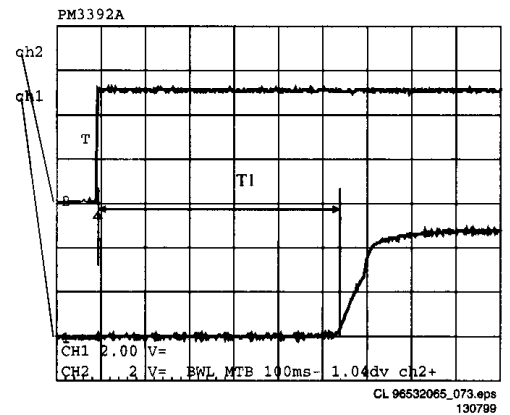


Figure 9-2

Timing: 400msec < T1 > 700msec.  
CH1: +5Vstby voltage at power on.  
CH2: Voltage at pin 10.

#### 9.1.5 Display steering

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

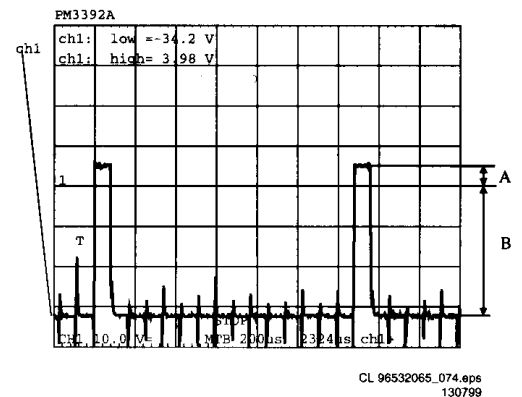


Figure 9-3

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

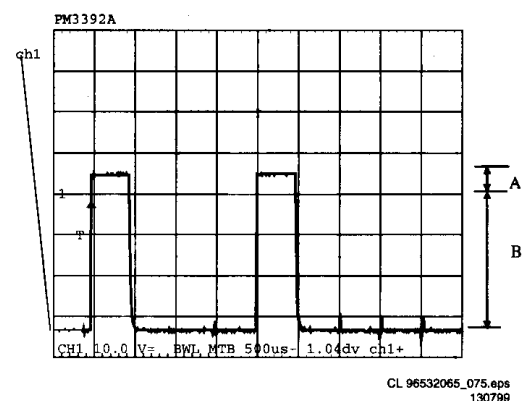


Figure 9-4

## Test instructions Display board

Level A: +4V5 (10%)

Level B: -33V (10%)

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

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

See the Slave URS how to send a display command.

1. Check the voltage at the P50 output connector 1118-5: 4V9 (5%).
2. Check also the uP P50 input (uP pin 20): 5V (5%).
3. Connect the P50 line (connector 1118-5) to ground.
4. Check again the uP P50 input (uP pin 20): <0V3.

### 9.1.6 Key-matrix

Connect an extra 10k( pull-up to pin 36 en 37 of the (P and check next matrix scanning at these pins.

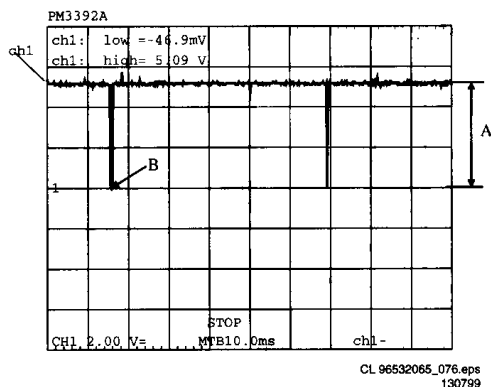


Figure 9-5

Level A: 5.0V (7%)

Level B: 0V (200mV)

Check matrix scanning from pin 26 until 33 of the (P.

The results should be the same as the diagram above.

### 9.1.7 I.R. receiver

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

### 9.1.8 Karaoke interface

The karaoke interface (4 lines) is a single direction communication.

This means that it consists of four uP output lines.

The interface can be checked by setting or resetting these output-ports via the I2C bus.

Send next command via the I2C bus:

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

### 9.1.9 P50 interface

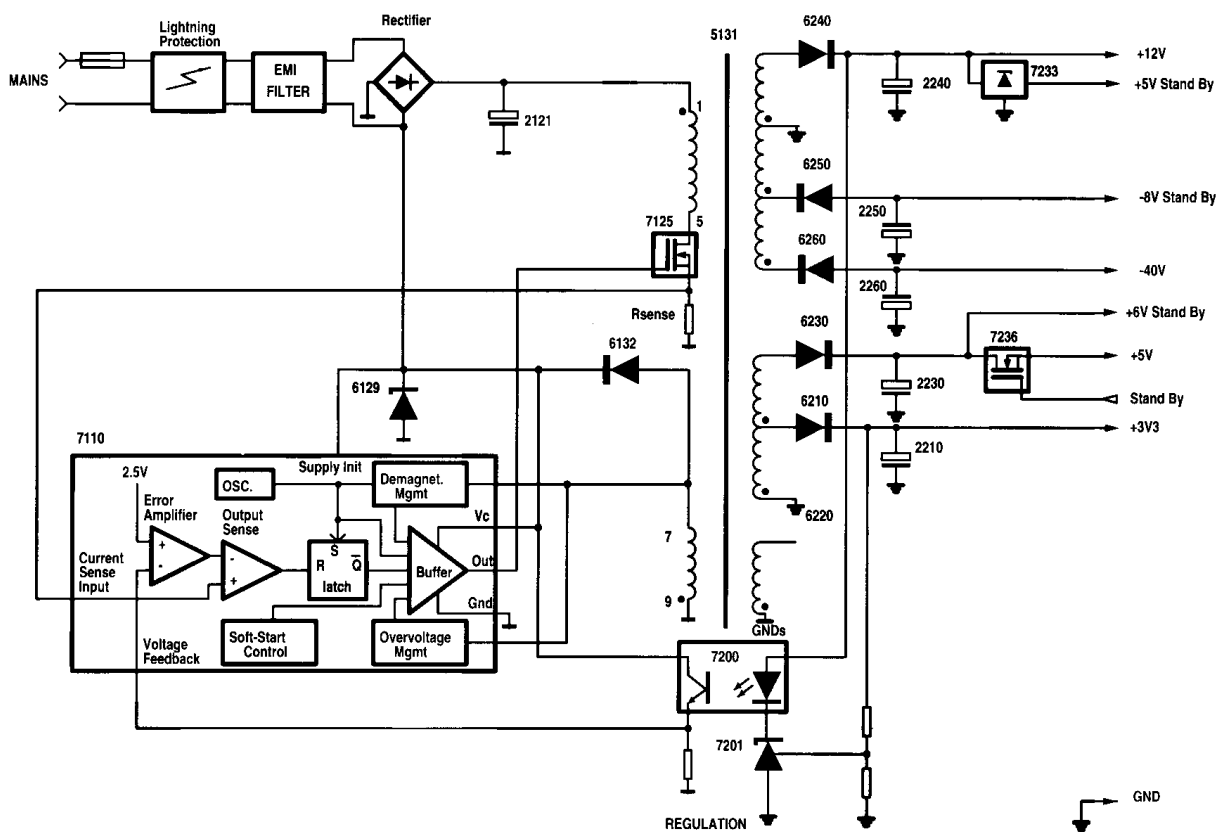
P50 is a bi-directional serial interface, which is used for communication between video equipment. For European sets, this communication goes via pin 10 of the scart-bus. In other regions, it can be a cinch bus at the back of the set.

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

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

# 10. Current mode power supply 30PS203

## 10.1 Blockdiagram



CL 96532065\_064.eps  
130799

Figure 10-1

### 10.1.1 Function description of the current mode power supply

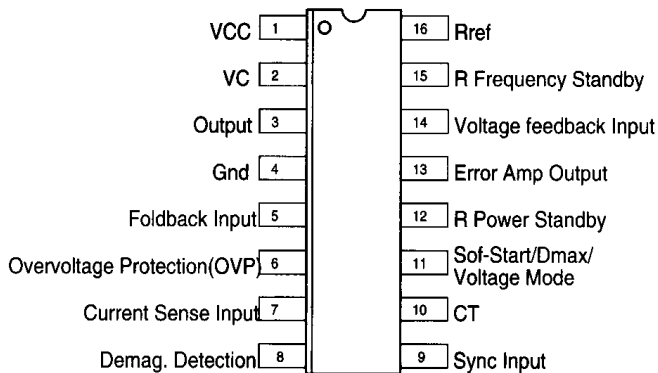
MOSFET 7125 is used as a power switch controlled by the controller IC 7110. When the switch is closed, energy is transferred from the mains into the transformer. This energy is then supplied to the load when the switch is opened. By control of the switched-on time, the energy transferred in each cycle is regulated so that the output voltages are independent of load or input voltage variations. The controlling device MC44603P is an integrated pulse width modulator. A clock signal initiates power pulses at a fixed frequency. The termination of each output pulse occurs when an analogue of the inductor current reaches a threshold established by the error signal. In this way the error signal actually controls the peak inductor current on cycle-by-cycle basis.

can also be used for driving a bipolar transistor in low power converters. It is optimised to operate in discontinuous mode but can also operate in continuous mode. Its advanced design allows use in current mode or voltage mode control applications.

### 10.2 General description of MC44603

The MC44603 is an enhanced high performance controller that is specifically designed for Off-line and dc-to dc converter applications. This device has the unique ability of automatically changing operating modes if the converter output is overloaded., unloaded, or shorted. The MC44603 has several distinguishing features when compared to conventional SMPS controllers. These features consist of a foldback facility for overload protection, a standby mode when the converter output is slightly loaded, a demagnetisation detection for reduced switching stresses on transistor and diodes, and a high current totem pole output ideally suited for driving a power MOSFET. It

### 10.3 Pin connections



CL 96532065\_065.eps  
261099

Figure 10-2

## 10.4 Blockdiagram of MC44603

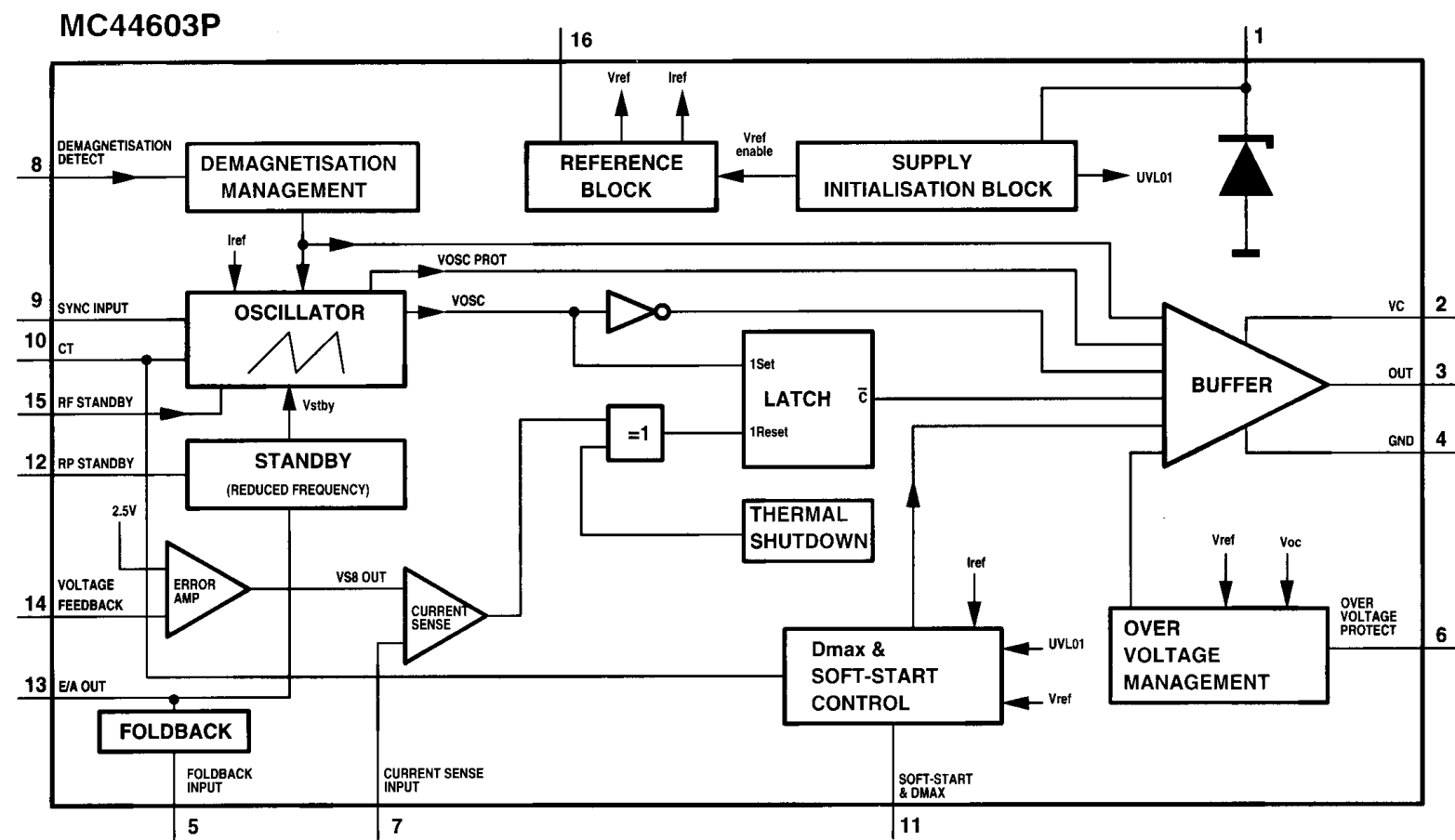
CL 96532065\_066.eps  
130799

Figure 10-3

## 10.5 Pin function description

**Pin function description**

Pin	Name	Description
1	VCC	This pin is the positive supply of the IC. The operating voltage range after start-up is 9.0 to 14.5 V.
2	VC	The output high state (VOH) is set by the voltage applied to this pin.
3	Output	Peak currents up to 750 mA can be sourced or sunk, suitable for driving either MOSFET or Bipolar transistors.
4	Gnd	The groundpin is a single return, typically connected back to the power source.
5	Foldback Input	The foldback function provides overload protection.
6	Overvoltage Protection	When the overvoltage protection pin receives a voltage greater than 2.5V, the device is disabled and requires a complete restart sequence.
7	Current Sense Input	A voltage proportional to the current flowing into the power switch is connected to this input.
8	Demagnetisation Detection	A voltage delivered by an auxiliary transformer winding provides to the demagnetisation pin an indication of the magnetisation state of the flyback transformer. A zero voltage detection corresponds to complete core saturation.
9	Synchronisation Input	The synchronisation input pin can be activated with either a negative pulse going from a level between 0.7V and 3.7V to Gnd or a positive pulse going from a level between 0.7V and 3.7V up to a level higher than 3.7V. The oscillator runs free when Pin 9 is connected to Gnd.
10	C <sub>T</sub>	The normal mode oscillator frequency is programmed by the capacitor CT choice together with the Rref resistance value. CT, connected between Pin 10 and Gnd, generates the oscillator sawtooth.
11	Soft-Start/Dmax/Voltage-Mode	A capacitor, resistor or a voltage source connected to this pin limits the switching duty-cycle. This pin can be used as a voltage mode control input. By connecting Pin 11 to Ground, the MC44603 can be shut down.
12	RP Standby	A voltage level applied to the RP Standby pin determines the output power level at which the oscillator will turn into the reduced frequency mode of operation (i.e. standby mode). An internal hysteresis comparator allows to return in the normal mode at a higher output power level.
13	E/A Out	The error amplifier output is made available for loop compensation.
14	Voltage Feedback	This is the inverting input of the Error Amplifier. It can be connected to the switching power supply output through an optical (or other) feedback loop.
15	RF Standby	The reduced frequency or standby frequency programming is made by the RF Standby resistance choice.

Figure 10-4

## 10.6 Operating description

The input voltage  $V_{cc}$  (pin 1) is monitored by a comparator with hysteresis, enabling the circuit at 14.5V and disabling the circuit below 7.5V. The error amplifier compares a voltage  $V_{fb}$  (pin 14) related to the output voltage of the power supply, with an internal 2.5V reference. The current sense comparator compares the output of the error amplifier with the switch current  $I_{sense}$  (pin 7) of the power supply. The output of the current sense comparator resets a latch, which is set every cycle by the oscillator. The output stage is a totem pole, capable of driving a MOSFET directly.

### 10.6.1 Start-up sequence

#### t1: Charging the capacitor at $V_{cc}$

C2129 will be charged via R3123 and R3134, C2133 and C2111 via R3129. The output is switched off during t1.

#### t2: Charging of output capacitors

When the input voltage of the IC exceeds 14.5V, the circuit is enabled and starts to produce output pulses. The current consumption of the circuit increases to about 17mA, depending on the external loads of the IC. At first, the capacitor at the  $V_{cc}$  pin will discharge because the primary auxiliary voltage, coming from winding 7-9 is below the  $V_{cc}$  voltage. At some moment during t2, the primary auxiliary voltage reaches the same level as  $V_{cc}$ . The  $V_{cc}$  voltage is now determined by this primary auxiliary voltage.

#### t3: regulation

The output voltage of the power supply is in regulation

#### t4: overload

When the output is shortened, the supply voltage of the circuit will decrease and after some time drop below the lower threshold voltage. At that moment, the output will be disabled and the process of charging the  $V_{cc}$  capacitor starts again. If the output is still shorted at the next t2 phase, the complete start-and stop sequence will repeat. The power supply comes in a hiccup mode

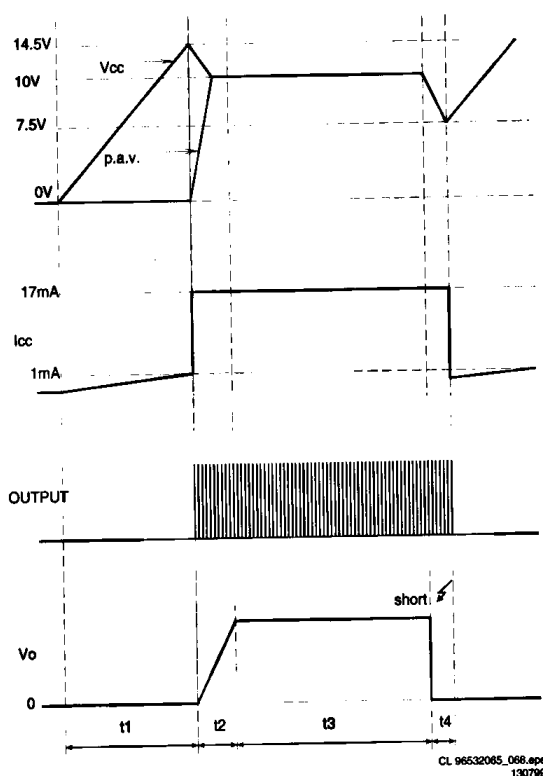


Figure 10-5 Start-up sequence

## 10.7 Regulation

Figure B shows the most relevant signals during the regulation phase of the power supply.

The oscillator voltage ramps up and down between V1 and V2. The voltage at the current sense terminal is compared every cycle with the output of the error amplifier  $V_{comp}$ . The output is switched off when the current sense level exceeds the level at the output of the error amplifier.

1. TimeON phase : A drain current will flow from the positive supply at pin 1 of the transformer through the transformer's primary winding, the MOSFET and  $R_{sense}$  to ground. As the positive voltage at pin 1 of the transformer is constant, the current will increase linearly and create a ramp dependent on the mains voltage and the inductance of the primary winding. A certain amount of energy is stored in the transformer in the form of a magnetic field. The polarity of the voltages at the secondary windings is such that the diodes are non-conducting.
2. TimeDIODE phase : When the MOSFET is switched off, energy is no longer supplied to the transformer. The inductance of the transformer now tries to maintain the current which has been flowing through it at a constant level. The polarity of the voltage from the transformer therefore becomes reversed. This results in a current flow through the transformer's secondary winding via the diodes, electrolytic capacitors and the load. This current is also ramp shaped but decreasing.
3. TimeDEAD phase : when the stored energy has been supplied to the load, the current in the secondary windings stops flowing. At this point the drain voltage of the MOSFET will drop to the voltage of C2121 with a ringing caused by the Drain-Source capacitance with the primary inductance.

The oscillator will start a next cyclus which consists of the described three phases. The time of the different phases depends on the mains voltage and the load.

TimeDEAD is maximum at an input of 400VDC and minimum load, it will be zero at an input of 100VDC and overload.

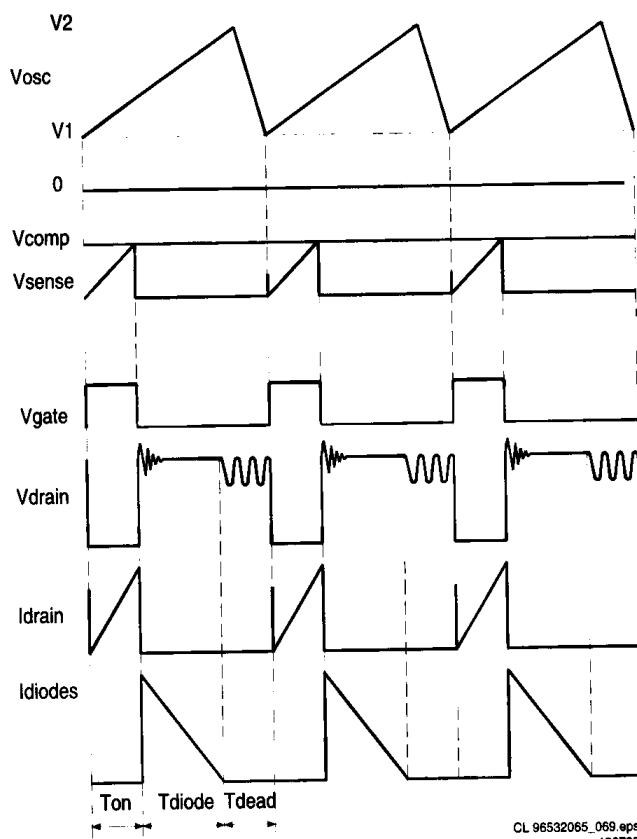
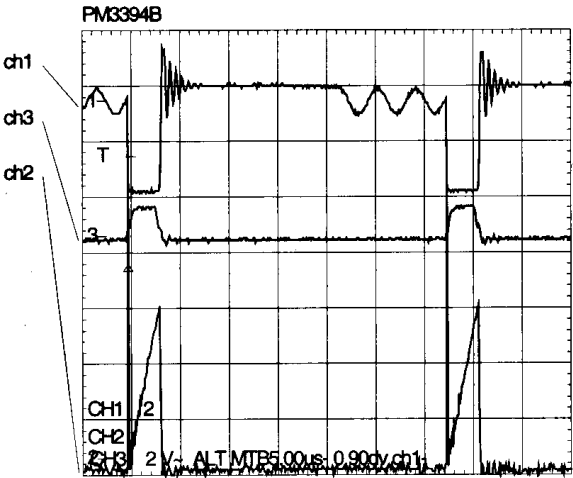
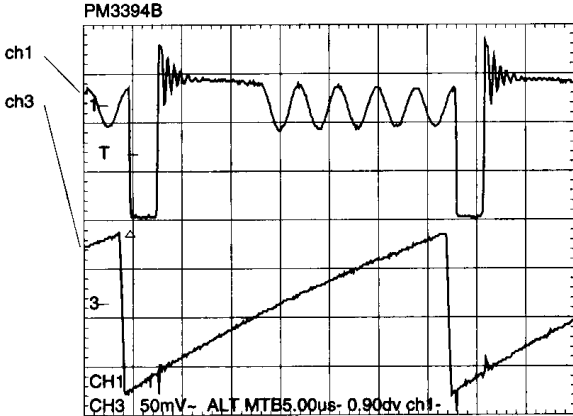


Figure 10-6 Regulation

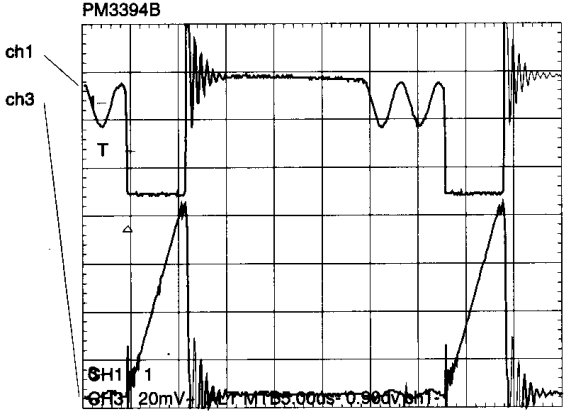
10.8 Oscillograms



ch1 : Drain voltage  
 ch2 : Drain current  
 ch3 : Gate voltage



ch1 : Drain voltage  
 ch2 : Oscillator voltage



ch1 : Drain voltage  
 ch3 : Sense voltage

Figure 10-7



10.9 Circuit description

10.9.1 Input circuit

The input circuit consists of a lightning protection circuit and an EMI filter. The lightning protection comprises R3120, gasarrestor 1125 and R3124. The EMI filter is formed by C2120, L5120, C2125 and C2126. It prevents inflow of noises into the mains.

10.9.2 Primary rectifier/smoothing circuit

The AC input is rectified by rectifier bridge 6120 and smoothed into C2121. The voltage over C2121 is approximately 300V. It can vary from 100V to 390V.

10.9.3 Start circuit and Vcc supply

This circuit is formed by R3123, R3134, C2129, D6129, R3129, R3111, C2133 and C2111. When the power plug is connected to the mains voltage, the stabilised voltage over D6129(24V) will charge C2133 via R3129. When the voltage reaches 14.5V across C2111, the control circuit of IC7110 is turned on and the regulation starts. During regulation, Vcc of IC7110 will be supplied by the rectified voltage from winding 7-9 via R3135, D6132 and C2133.

10.9.4 Control circuit

The control circuit exists of IC7110, C2102, 2104, 2107, 2109, 2110, R3102, 3103, 3104, 3107, 3108, 3109 and 3110. The frequency of the oscillator is defined by C2102 and R3110. Power switch circuit This circuit comprises MOSFET 7125, Rsense 3126, 3127 and 3128, R3125, C2127, L5125, R3112 and R3113. R3125 is a pull-down resistor to remove static charges from the gate of the MOSFET.

10.9.5 Regulation circuit

The regulation circuit comprises opto-coupler 7200 which isolates the error signal from the control IC on the primary side and a reference component 7201. The TL431(7201) can be represented by two components:

- a very stable and accurate reference diode
- a high gain amplifier

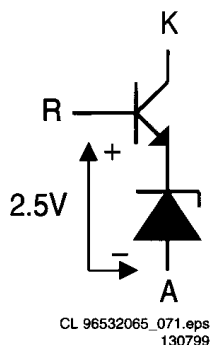


Figure 10-8

TL431 will conduct from cathode to anode when the reference is higher than the internal reference voltage of about 2.5V. If the reference voltage is lower, the cathode current is almost zero. The cathode current flows through the LED of the opto-coupler. The collector current of the opto-coupler flows through R3106, producing an error voltage, connected to voltage feedback pin 14 of IC7110.

10.9.6 Demagnetisation

The auxiliary winding (7-9) voltage is used to detect magnetic saturation of the transformer core and connected via R3101 to pin 8 of IC7110. During the demagnetisation phase, the output will be disabled.

10.9.7 Overvoltage protection circuit

This circuit consist of D6114, C2114, R3115 and R3116. When the regulation circuit is interrupted due to an error in the control loop, the regulated output voltage will increase (overvoltage). This overvoltage is sensed on the primary winding 7-9. When an overvoltage longer than 2.0 (s is detected, the output is disabled until VCC is removed and then re-applied. The power supply will come in a hiccup mode as long as the error in the control loop is present.

10.9.8 Secondary rectifier/smoothing circuit

There are 5 rectifier/smoothing circuits on the secondary side. Each voltage depends on the number of windings of the transformer. The +5Vstby power supply is derived from the +12Vstby by voltage regulator 7233, C2233 and L5233. The -5V voltage is regulated by voltage regulator 7259 and will be switched off via D6256, T7256 and T7255 during standby (control signal STAND BY is high). When jumper 4250 is mounted instead of this circuit, a supply voltage -8Vstby will be present at pin 9 of connector 0205. -5V is used in DVD730 MK II, DVD 930 MK II and DVD710. -8Vstby is used in DVD750 and DVD950. The +5V power supply is derived from +6Vstby by the loader-up circuit formed by MOSFET 7236, reference component 7237, R3236, R3237 and C2239. This voltage will be switched off during STAND BY via T7235. The 3V3 power supply is regulated by the control loop (7201, 7200, 7110) of the switched mode PSU.

# 11. List of abbreviations

SIGNAL NAME	DESCRIPTION		
0/6/12	Scart switch control signal A/V board.	Y_ENC	Buffered Luma input from DVD monoboard
B	0V : loop through (AUX to TV), 6V : play 16:9 format, 12V : play 4:3 format	Y_OUT	Luma output to S-Video output buffer
B/C SWITCHING	Buffered Video input Blue from DVD monoboard	YCVBSIN_AUX	Luma or CVBS input from AUX-scart
	Circuit for bi-directional switching of Blue and Chroma on dual scart. Switches between virtual ground (75 ohm) and video output buffer.	YCVBSIN_TV	Luma or CVBS input from TV-scart
BC_AUX	Blue or Chroma input from AUX-scart	YCVBSOUT_AUX	Luma or CVBS output to AUX-scart
BC_TV	Blue or Chroma output to TV-scart	YCVBSOUT_TV	Luma or CVBS output to TV-scart
BO	Blue output from RGB video processor		
BOUT_TV	Blue output to TV-scart		
C_ENC	Buffered Chroma input from DVD monoboard		
C_OUT	Chroma output to S-Video output buffer		
CENTER	Control signal from monoboard to switch STEREO OUTPUT cinch to mono.		
CVBS	Buffered Composite video input from DVD monoboard		
DC_OFF	Control signal to switch off -8Vstby and +12Vstby during standby		
DIG_OUT	Digital out		
FBIN_AUX	Fast blanking input from AUX-scart		
FBOUT_TV	Fast blanking output to TV-scart		
G	Buffered Video input Green from DVD monoboard		
GIN_AUX	Video input Green from AUX-scart		
GO	Green output from RGB video processor		
GOUT_TV	Video output Green to TV-scart		
HP_L	Headphone left output		
HP_R	Headphone right output		
HSYNC	Horizontal synchronization for RGB video processor.		
KILL	Kill control signal for audio outputs and for soft mute of DAC		
LIN_AUX	Audio input left from AUX-scart		
LIN_TV	Audio input left from TV-scart		
LOUT_AUX	Audio output left to AUX-scart		
LOUT_TV	Audio output left to TV-scart		
LRCLK	Left/Right clock		
P50	Bi-directional interface used for communication between video equipment		
PCM_CLK	Audio system clock for DAC		
PCM_OUT[0:2]	Audio serial output data		
R	Buffered Video input Red from DVD monoboard		
RCIN_TV	Red or Chroma input from TV-scart		
RCOUT_TV	Red or Chroma output to TV-scart		
RIN_AUX	Audio input right from AUX-scart		
RIN_TV	Audio input right from TV-scart		
RO	Red output from RGB video processor		
ROUT_AUX	Audio output right to AUX-scart		
ROUT_TV	Audio output right to TV-scart		
SCL	I2C bus clock		
SCLK	Audio serial bit clock		
SDA	I2C bus data		
ST_L	Stereo left output (not used)		
ST_R	Stereo right output (not used)		
STEREO_L	Audio cinch output left		
STEREO_MUTE	Control signal from monoboard to switch on stereo mute circuit (option)		
STEREO_R	Audio cinch output right		

## 12. IC-descriptions



# STV6410

## AUDIO/VIDEO SWITCH MATRIX

- I<sup>2</sup>C BUS CONTROL
- STANDBY MODE

### VIDEO SECTION

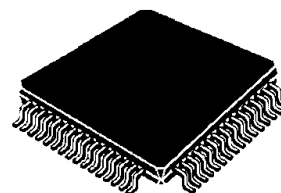
- 5 CVBS INPUTS, 4 CVBS OUTPUTS (ONE WITH SELECTABLE CHROMA TRAP FILTER)
- 5 Y/C INPUTS, 3 Y/C OUTPUTS
- 6dB GAIN ON ALL CVBS/Y AND C OUTPUTS
- 1 Y/C ADDER
- 2 RGB/FB INPUTS, 1 RGB/FB OUTPUT WITH 6dB ADJUSTABLE GAIN
- VIDEO MUTING ON ALL THE OUTPUTS
- 3 SLOW BLANKING INPUTS/OUTPUTS
- SYNC BOTTOM CLAMP ON ALL CVBS/Y AND RGB INPUTS, AVERAGE ON C INPUTS
- BANDWIDTH : 15MHz
- CROSSTALK : 60dB Typ.

### AUDIO SECTION

- 5 STEREO INPUTS, 4 STEREO OUTPUTS (TWO WITH LEVEL ADJUSTMENT)
- MONO SOUND OUTPUT
- MONO SOUND CAPABILITY ON TV OUTPUTS
- AUDIO MUTING ON ALL THE OUTPUTS

### DESCRIPTION

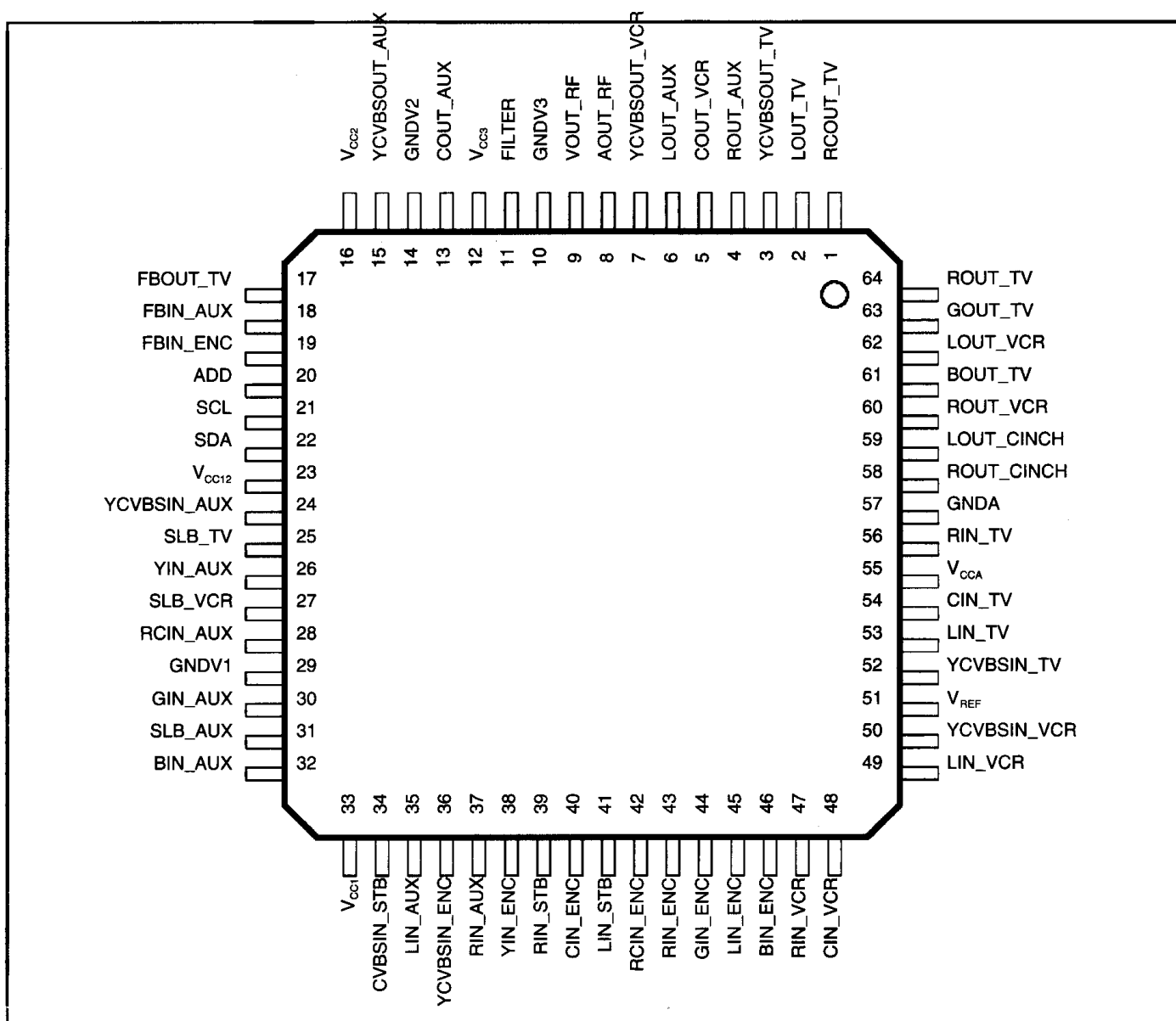
The STV6410 is a highly integrated I<sup>2</sup>C bus-controlled audio and video switch matrix, optimized for use in digital set-top box applications. It provides all the audio and video routings required in a full three scart set-top box design. It is also fully pin compatible with STV6411, the two scart version.



TQFP64  
(Plastic Quad Flat Pack)

ORDER CODE : STV6410D

**PIN CONNECTIONS**



6410-01.EPS

**PIN LIST**

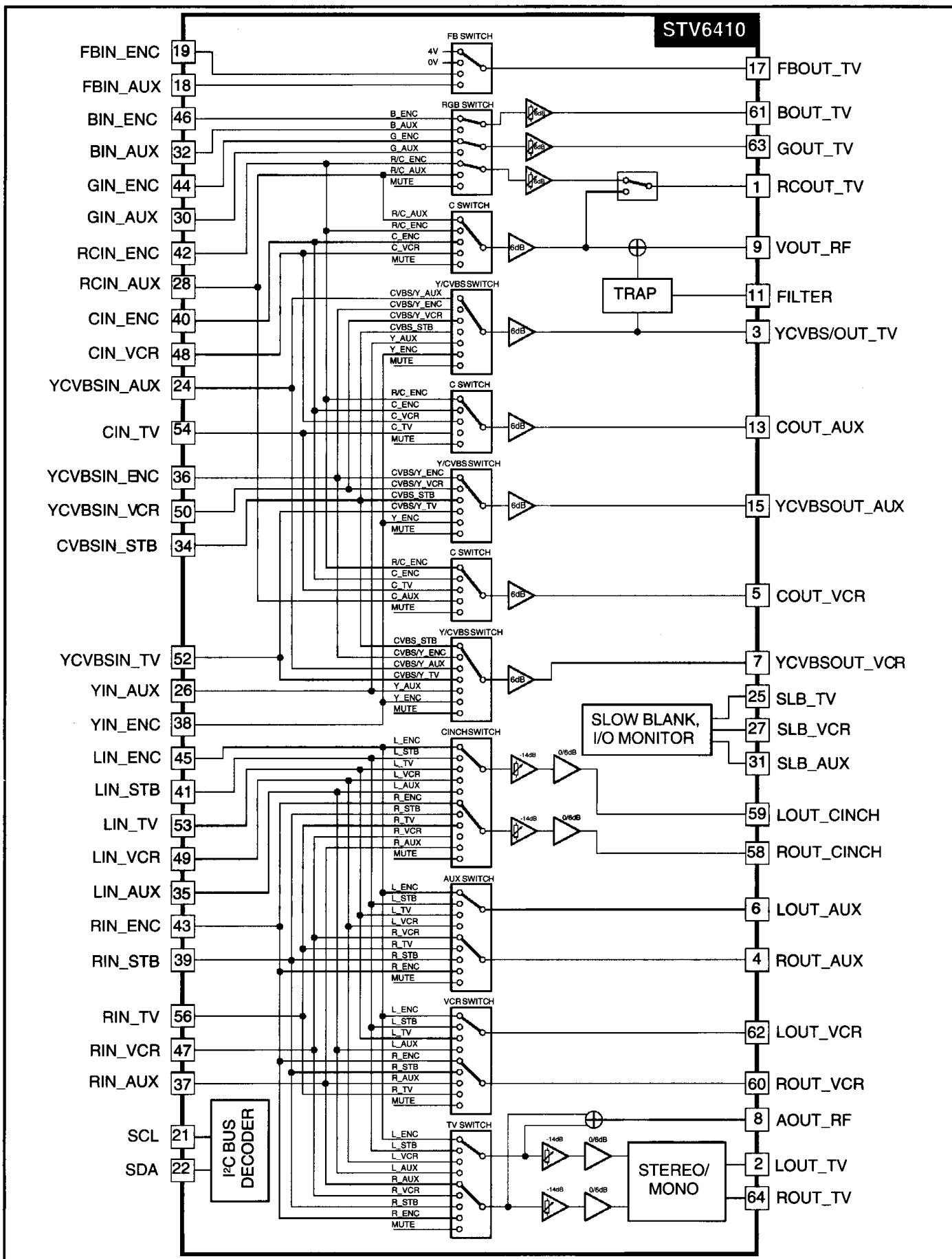
Pin Number	Symbol	Description
1	RCOUT_TV	Red/chroma Output, to TV Scart
2	LOUT_TV	Audio Left Output, to TV Scart
3	YCVBSOUT_TV	Y/CVBS Output, to TV scart
4	ROUT_AUX	Audio Right Output, to AUX Scart
5	COUT_VCR	Chroma Output, to VCR Scart
6	LOUT_AUX	Audio Left Output, to AUX Scart
7	YCVBSOUT_VCR	Y/CVBS Output, to VCR Scart
8	AOUT_RF	Audio (L+R) Output to RF Modulator
9	VOUT_RF	Video (CVBS) Output to RF Modulator
10	GNDV3	Video Switches Ground 3
11	FILTER	Chroma Trap Filter
12	V <sub>ccv3</sub>	Video Switches Supply 3 (8V)
13	COUT_AUX	Chroma Output, to AUX Scart
14	GNDV2	Video Switches Ground 2
15	YCVBSOUT_AUX	Y/CVBS Output, to AUX Scart

6410-01.TBL

## PIN LIST (continued)

Pin Number	Symbol	Description
16	V <sub>CCV2</sub>	Video Switches Supply 2 (8V)
17	FBOU <sub>TV</sub>	Fast Blanking Output, to TV Scart
18	FBIN <sub>AUX</sub>	Fast Blanking Input, from AUX Scart
19	FBIN <sub>ENC</sub>	Fast Blanking Input, from Encoder
20	ADD	I <sup>2</sup> C Bus IC Address Programming
21	SCL	I <sup>2</sup> C Bus Clock
22	SDA	I <sup>2</sup> C Bus Data
23	V <sub>CC12</sub>	Slow Blanking Power Supply (12V)
24	YCVBSIN <sub>AUX</sub>	Y/CVBS Input from AUX Scart
25	SLB <sub>TV</sub>	Slow Blanking Input/Output from TV
26	YIN <sub>AUX</sub>	Y Input, from AUX Scart
27	SLB <sub>VCR</sub>	Slow Blanking Input/Output from VCR
28	RCIN <sub>AUX</sub>	Red/Chroma Input, from AUX Scart
29	GNDV1	Video Switches Ground 1
30	GIN <sub>AUX</sub>	Green Input, from AUX Scart
31	SLB <sub>AUX</sub>	Slow Blanking Input/Output from AUX
32	BIN <sub>AUX</sub>	Blue Input, from AUX Scart
33	V <sub>CCV1</sub>	Video Switches Supply 1 (8V)
34	CVBSIN <sub>STB</sub>	CVBS Input from STB
35	LIN <sub>AUX</sub>	Audio Left Input, from AUX Scart
36	YCVBSIN <sub>ENC</sub>	Y/CVBS Input from Encoder
37	RIN <sub>AUX</sub>	Audio Right Input, from AUX Scart
38	YIN <sub>ENC</sub>	Y Input, from Encoder
39	RIN <sub>STB</sub>	Audio Right Input, from STB
40	CIN <sub>ENC</sub>	Chroma Input, from Encoder
41	LIN <sub>STB</sub>	Audio Left Input, from STB
42	RCIN <sub>ENC</sub>	Red/Chroma Input, from Encoder
43	RIN <sub>ENC</sub>	Audio Right Input, from Encoder
44	GIN <sub>ENC</sub>	Green Input, from Encoder
45	LIN <sub>ENC</sub>	Audio Left Input, from Encoder
46	BIN <sub>ENC</sub>	Blue Input, from Encoder
47	RIN <sub>VCR</sub>	Audio Right Input, from VCR Scart
48	CIN <sub>VCR</sub>	Chroma Input, from VCR Scart
49	LIN <sub>VCR</sub>	Audio Left Input, from VCR
50	YCVBSIN <sub>VCR</sub>	Y/CVBS Input from VCR Scart
51	V <sub>REF</sub>	Voltage Reference Decoupling
52	YCVBSIN <sub>TV</sub>	Y/CVBS Input, from TV Scart
53	LIN <sub>TV</sub>	Audio Left Input, from TV Scart
54	CIN <sub>TV</sub>	Chroma Input, from TV Scart
55	V <sub>CCA</sub>	Audio Switches Supply (8V)
56	RIN <sub>TV</sub>	Audio right input, from TV Scart
57	GND <sub>A</sub>	Audio Switches Ground
58	ROUT <sub>CINCH</sub>	Audio Right Output, to CINCH
59	LOUT <sub>CINCH</sub>	Audio Left Output, to CINCH
60	ROUT <sub>VCR</sub>	Audio Right Output, to VCR sCart
61	BOUT <sub>TV</sub>	Blue Output, to TV Scart
62	LOUT <sub>VCR</sub>	Audio Left Output, to VCR Scart
63	GOUT <sub>TV</sub>	Green Output, to TV Scart
64	ROUT <sub>TV</sub>	Audio Right Output, to TV Scart

**BLOCK DIAGRAM**



6410-02.1P5

## RGB video processor with automatic cut-off control and gamma adjust

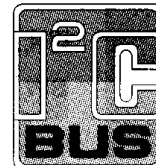
## TDA4780

### FEATURES

- Gamma adjust
- Dynamic black control (adaptive black)
- All input signals clamped on black-levels
- Automatic cut-off control, alternative: output clamping on fixed levels
- Three adjustable reference voltage levels via I<sup>2</sup>C-bus for automatic cut-off control
- Luminance/colour difference interface
- Two luminance input levels allowed
- Two RGB interfaces controlled by either fast switches or by I<sup>2</sup>C-bus
- Two peak drive limiters, selection via I<sup>2</sup>C-bus
- Blue stretch, selection via I<sup>2</sup>C-bus
- Luminance output for scan velocity modulation (SCAVEM)
- Extra luminance output; same pin can be used as hue control output e.g. for the TDA4650 and TDA4655
- Non standard operations like 50 Hz/32 kHz are also possible
- Either 2 or 3 level sandcastle pulse applicable
- High bandwidth for 32 kHz application
- White point adjusts via I<sup>2</sup>C-bus
- Average beam current and improved peak drive limiting
- Two switch-on delays to prevent discoloration during start-up
- All functions and features programmable via I<sup>2</sup>C-bus
- PAL/SECAM or NTSC matrix selection.

### GENERAL DESCRIPTION

The TDA4780 is a monolithic integrated circuit with a luminance and a colour difference interface for video processing in TV receivers. Its primary function is to process the luminance and colour difference signals from a colour decoder which is equipped e.g. with the multistandard decoder TDA4655 or TDA9160 plus delay line TDA4661 or TDA4665 and the Picture Signal Improvement (PSI) IC TDA467X or from a feature module.



The required input signals are:

- Luminance and negative colour difference signals
- 2 or 3-level sandcastle pulse for internal timing pulse generation
- I<sup>2</sup>C-bus data and clock signals.

Two sets of analog RGB colour signals can also be inserted, e.g. one from a peritelevision connector (SCART plug) and the other one from an On-Screen Display (OSD) generator. The TDA4780 has I<sup>2</sup>C-bus control of all parameters and functions with automatic cut-off control of the picture tube cathode currents. It provides RGB output signals for the video output stages. In clamped output mode it can also be used as an RGB source.

The main differences with the sister type TDA4680 are:

- Additional features, namely gamma adjust, adaptive black, blue stretch and two different peak drive limiters
- The measurement lines are triggered by the trailing edge of the vertical component of the sandcastle pulse
- I<sup>2</sup>C-bus receiver only. Automatic white level control is not provided; the white levels are determined directly by the I<sup>2</sup>C-bus data.
- The TDA4780 is pin compatible (except pin 18) with the TDA4680. The I<sup>2</sup>C-bus slave address can be used for both ICs. When a function of the TDA4780 is not included in the TDA4680, the I<sup>2</sup>C-bus command is not executed. Special commands (except control bit FSWL) for the TDA4680 will be ignored by the TDA4780.

RGB video processor with automatic cut-off control and gamma adjust

TDA4780

BLOCK DIAGRAM

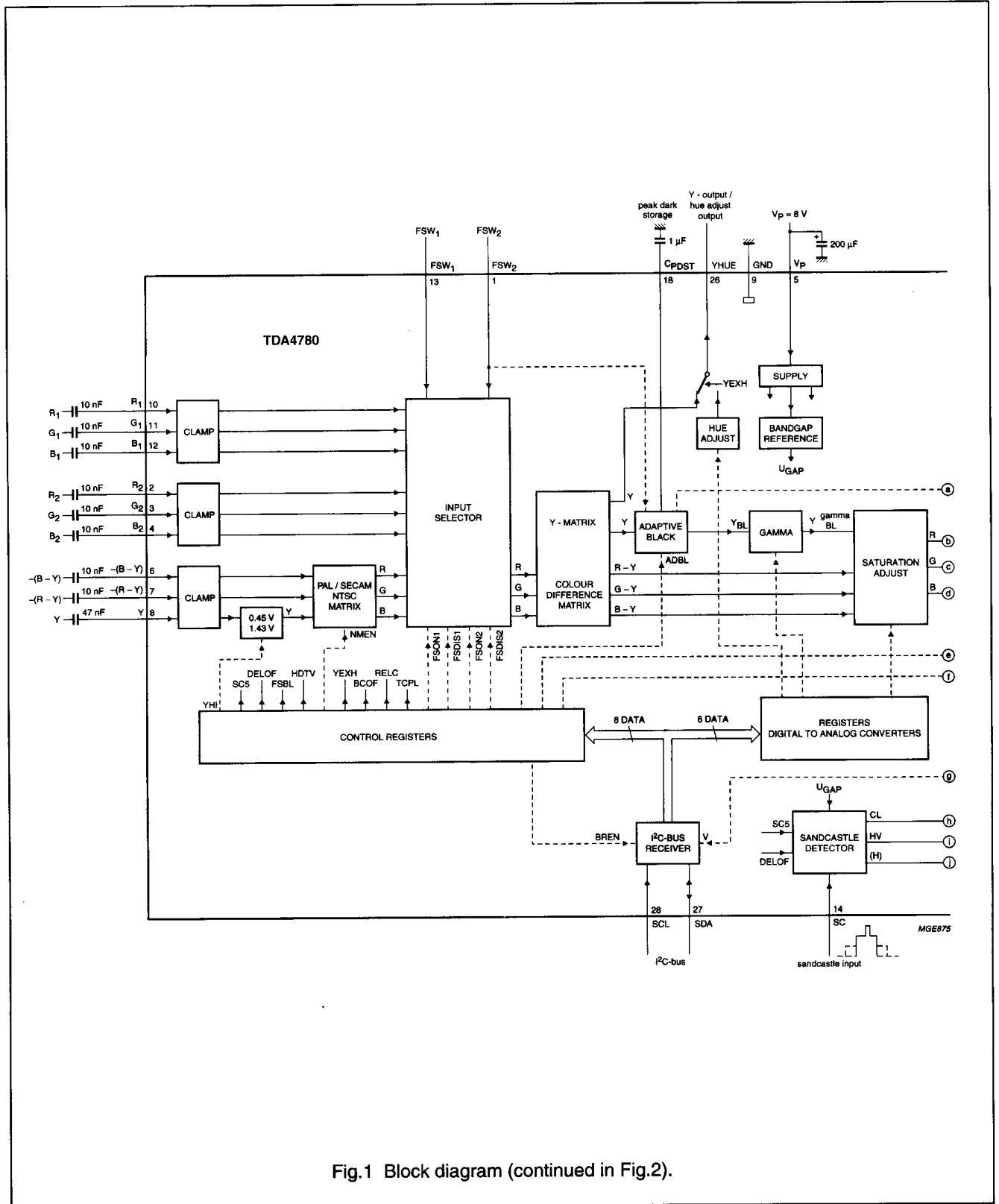


Fig.1 Block diagram (continued in Fig.2).



# RGB video processor with automatic cut-off control and gamma adjust

TDA4780

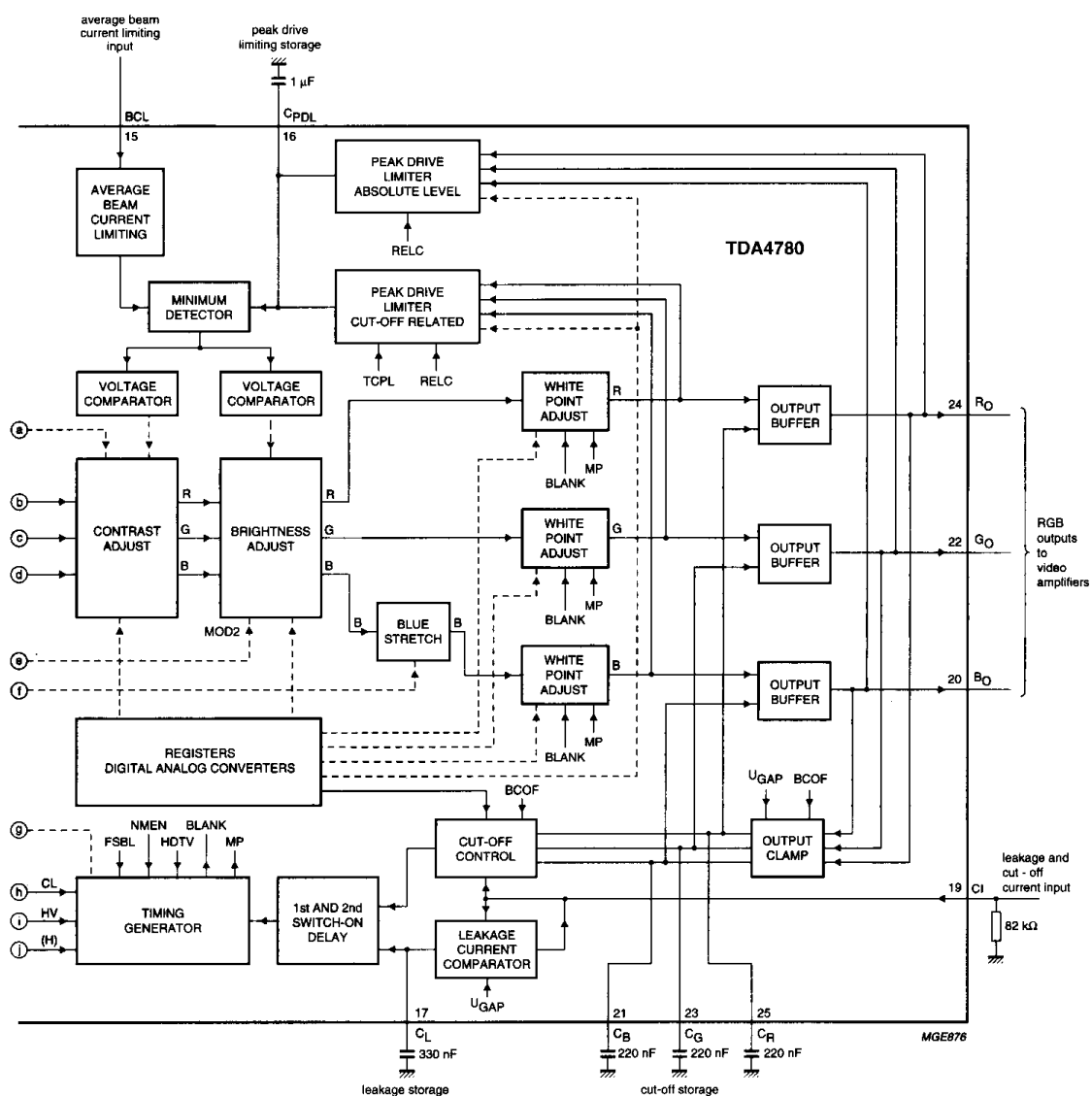


Fig.2 Block diagram (continued from Fig.1).

RGB video processor with automatic  
cut-off control and gamma adjust

TDA4780

## PINNING

SYMBOL	PIN	DESCRIPTION
FSW2	1	Fast switch 2 input
R2	2	Red input 2
G2	3	Green input 2
B2	4	Blue input 2
VP	5	Supply voltage
-(B - Y)	6	Colour difference input -(B - Y)
-(R - Y)	7	Colour difference input -(R - Y)
Y	8	Luminance input
GND	9	Ground
R1	10	Red input 1
G1	11	Green input 1
B1	12	Blue input 1
FSW1	13	Fast switch 1 input
SC	14	Sandcastle pulse input
BCL	15	Average beam current limiting input
CPDL	16	Storage capacitor for peak limiting
CL	17	Storage capacitor for leakage current compensation
CPDST	18	Storage capacitor for peak dark
CI	19	Cut-off measurement input
BO	20	Blue output
CB	21	Blue cut-off storage capacitor
GO	22	Green output
CG	23	Green cut-off storage capacitor
RO	24	Red output
CR	25	Red cut-off storage capacitor
YHUE	26	Y-output/hue adjust output
SDA	27	I2C-bus serial data input/acknowledge output
SCL	28	I2C-bus serial clock input

## RGB video processor with automatic cut-off control and gamma adjust

TDA4780

### FUNCTIONAL DESCRIPTION

#### Signal input stages

The TDA4780 contains 3 sets of input signal stages for:

1. Luminance/colour-difference signals:
  - a) Y: 0.45 V (p-p) VBS or 1.43 V (p-p) VBS, selectable via I<sup>2</sup>C-bus.
  - b)  $-(R - Y)$ : 1.05 V (p-p).
  - c)  $-(B - Y)$ : 1.33 V (p-p).

The capacitively coupled signals are matrixed to RGB signals by either a PAL/SECAM or NTSC matrix (selected via I<sup>2</sup>C-bus).
2. (RGB)<sub>1</sub> signals (0.7 V (p-p) VB), capacitively coupled (e.g. from external source).
3. (RGB)<sub>2</sub> signals (0.7 V (p-p) VB), capacitively coupled (e.g. videotext, OSD).

All input signals are clamped in order to have the same black levels at the signal switch input. Displayed signals must be synchronous with the sandcastle pulse.

#### Signal switches

Both fast signal switches can be operated by switching pins (e.g. SCART facilities) or set via the I<sup>2</sup>C-bus. With the pin FSW<sub>1</sub> the Y-CD signals or the (RGB)<sub>1</sub> signals can be selected, with pin FSW<sub>2</sub> the above selected signals or the (RGB)<sub>2</sub> signals are enabled. During the vertical and horizontal blanking time an artificial black level equal to the clamped black level is inserted in order to clip off the sync pulse of the luminance signal and to suppress hum during the cut-off measurement time and eliminate noise during these intervals.

#### Saturation, contrast and brightness adjust

Saturation, contrast and brightness adjusts are controlled via the I<sup>2</sup>C-bus and act on Y, CD as well as on RGB input signals. Gamma acts on the luminance content of the input signals.

#### Gamma adjust

The gamma adjust stage has a non-linear transmission characteristic according to the formula  $y = x^{\text{gamma}}$ , where  $x$  represents the input and  $y$  the output signal. If gamma is smaller than unity, the lower parts of the signal are amplified with higher gain.

#### Adaptive black (ADBL)

The adaptive black stage detects the lowest voltage of the luminance component of the internal RGB signals during the scanning time and shifts it to the nominal black level. In order to keep the nominal white level the contrast is increased simultaneously.

#### Blue stretch (BLST)

The blue stretch channel gets additional amplification if the blue signal is greater than 80% of the nominal signal amplitude. In the event the white point is shifted towards higher colour temperature so that white parts of a picture seem to be brighter.

#### Measurement pulse and blanking stage

During the vertical and horizontal blanking time and the measurement period the signals are blanked to an ultra black level, so the leakage current of the picture tube can be measured and automatically compensated for.

During the cut-off measurement lines (one line period for each R, G or B) the output signal levels are at cut-off measurement level.

The vertical blanking period is timed by the sandcastle pulse. The measurement pulses (leakage, R, G and B) are triggered by the negative going edge of the vertical pulse of the sandcastle pulse and start after the following horizontal pulse.

The IC is prepared for 2f<sub>H</sub> (32 kHz) application.

#### Output amplifier and white adjust potentiometer

The RGB signals are amplified to nominal 2 V (p-p), the DC-levels are shifted according to cut-off control. The nominal signal amplitude can be varied by  $\pm 50\%$  by the white point adjustment via the I<sup>2</sup>C-bus (individually for RGB respect).

---

## RGB video processor with automatic cut-off control and gamma adjust

---

TDA4780

### Automatic cut-off control

During leakage measurement time the leakage current is compensated in order to get a reference voltage at the cut-off measurement input pin. This compensation value is stored in an external capacitor. During cut-off current measurement times for the R, G and B channels, the voltage at this pin is compared with the reference voltage, which is individually adjustable via I<sup>2</sup>C-bus for each colour channel. The control voltages that are derived in this way are stored in the external feedback capacitors. Shift stages add these voltages to the corresponding output signals. The automatic cut-off control may be disabled via the I<sup>2</sup>C-bus. In this mode the output voltage is clamped to 2.5 V. Clamping periods are the same as the cut-off measurement periods.

### Signal limiting

The TDA4780 provides two kinds of signal limiting. First, an average beam limiting, that reduces signal level if a certain average is exceeded. Second, a peak drive limiting, that is activated if one of the RGB signals even shortly exceeds a via I<sup>2</sup>C-bus adjusted threshold. The latter can be either referred to the cut-off measurement level of the outputs or to ground.

When signal limiting occurs, contrast is reduced, and at minimum contrast brightness is reduced additionally.

### Sandcastle decoder and timer

A 3-level detector separates the sandcastle pulse into combined line and field pulses, line pulses, and clamping pulses. The timer contains a line counter and controls the cut-off control measurement.

Application with a 2-level 5 V sandcastle pulse is possible.

### Switch on delay circuit

After switch on all signals are blanked and a warm up test pulse is fed to the outputs during the cut-off measurement lines. If the voltage at the cut-off measurement input exceeds an internal level the cut-off control is enabled but the signal remains still blanked. In the event of output clamping, the cut-off control is disabled and the switch on procedure will be skipped.

### Y output and hue adjust

The TDA4780 contains a D/A converter for hue adjust. The analog information can be fed, e.g. to the multistandard decoder TDA4650 or TDA4655. This output pin may be switched to a Y output signal, which can be used for scan velocity modulation (SCAVEM). The Y output is the Y input signal or the matrixed (RGB) input signal according to the switch position of the fast switch.

### I<sup>2</sup>C-bus

The TDA4780 contains an I<sup>2</sup>C-bus receiver for control function.

### ESD protection

The Pins are provided with protection diodes against ground and supply voltage (see Chapter "Internal pin configurations"). I<sup>2</sup>C-bus input pins do not shunt the I<sup>2</sup>C-bus signals in the event of missing supply voltage.

### EMC

The pins are protected against electromagnetic radiation.

# 13. Spare part list

## MECHANICAL PARTS LIST

1	310412708790	FRONT ASSY DVD950/001/002
1	310412710100	FRONT ASSY DVD955/002
1	310412710080	FRONT ASSY DVD956/002
14	482245910887	BADGE PHILIPS ASSY
23	482245413252	DVD LOGO
50	310412405370	VOLUME KNOB 950/001/002
50	310412709960	VOLUME KNOB 955 & 956/002
82	310412952560	LOADER ASSY 2B Eu 3.1(SERVICE)
151	310412123920	COVER DVD950/001/002
151	310412709950	COVER DVD955/002
151	310412709940	COVER DVD956/002
251	482246211174	LEG SILVER DVD950/001/002
251	482246242159	LEG SILVER DVD955 & 956
252	482246211174	LEG SILVER DVD950/001/002
252	482246242159	LEG SILVER DVD955 & 956
253	482246211174	LEG SILVER DVD950/001/002
253	482246242159	LEG SILVER DVD955 & 956
254	482246211174	LEG SILVER DVD950/001/002
254	482246242159	LEG SILVER DVD955 & 956
301	482232110249	SBC1201 MAINS CABLE
309	310412523280	USER MANUAL DVD950/955/956
313	482232111357	AUDIO CORD SET
314	482232161847	21 SCART CABLE
316	482232161579	VIDEO CORD SET
318	312814711110	IRT ASSY PACKED
RC2550/01(DVD950)		
318	312814710550	IRT ASSY PACKED
RC2553/01(DVD955)		
318	312814710540	IRT ASSY PACKED
RC2552/01(DVD956)		

## ELECTRICAL PARTS LIST

### CONNECTIONS

8006	310415711190	CWAS FLEX DVD 22 130 32S
8007	310415711200	CWAS FLEX DVD 16 130 32S
POWER SUPPLY UNIT 30PS203/00		

### Miscellaneous

0009	482226511253	FUSE HOLDER 2P
0101	482226531015	MAINS INLET
1120	482225330383	19181 (2,5A)
1125	482225260151	DSP-501N-A21F

### Capacitors

2101	482212613695	82PF 1% NP0 63V
2102	532212610733	680PF 5% 50V
2104	532212610223	4,7NF10%X7R 63V
2106	482212233735	27NF10%X7R 63V
2109	532212231865	1,5NF10%X7R 63V
2110	482212422652	2,2UF20% 50V
2111	482212614585	100NF 10% X7R 0805 50V
2113	482212233127	2,2NF10%X7R 63V
2114	482212614585	100NF 10% X7R 0805 50V
2121	482212411907	100UF 20% 400V
2125	222237065222	2N2 10% 400V
2126	222237065222	2N2 10% 400V
2127	482212614525	47PF 5% 1KV
2129	482212423057	4,7UF 20% 50V
2131	482212614497	2,2NF 20% 250V
2133	482212440207	100UF20% 25V
2201	482212233496	100NF10%X7R 63V
2202	482212614585	100NF 10% X7R 0805 50V
2210	482212412343	4700UF 6.3V
2230	482212422779	1000UF 10V
2233	482212441584	100UF 20% 10V
2239	482212441584	100UF 20% 10V
2240	482212481147	470UF20% YK 25V
2250	482212441545	220UF20% 16V
2251	482212233799	1NF10% B 1KV
2260	482212480637	3,3UF20% 100V

### Resistors

3101	482211652304	82K 5% 0,5W
3102	482205120223	22K00 5% 0,1W
3103	482205120362	3K60 5% 0,1W
3104	482211683933	15K 1% 0,1W

3105	482211683933	15K 1% 0,1W
3106	482211710361	680R 1% 0,1W
3107	482205120184	180K00 5% 0,1W
3108	482211710965	18K 1% 0,1W
3109	482211713577	330R 1% RC12H 0805 1,25W
3110	482211710833	10K 1% 0,1W
3111	482205120229	22R00 5% 0,1W
3112	482211710353	150R 1% 0,1W
3113	482205120339	33R00 5% 0,1W
3115	482205021002	1K00 1% 0,6W
3116	482211711448	180R 1% 0,1W
3120	482211621217	1MA/423V 800V
3122	482211713515	2R7 3W AC03 WW
3123	482211652251	18K 5% 0,5W
3124	482211683872	220R 5% 0,5W
3125	482205021002	1K00 1% 0,6W
3126	482211681753	4R7 5% 0,5W
3127	482211680176	1E 5% 0,5W
3128	482211680176	1E 5% 0,5W
3129	482205021003	10K00 1% 0,6W
3131	482205110274	270K00 2% 0,25W
3134	482211652251	18K 5% 0,5W
3135	482211713636	6R8 5% SFR16
3136	482205110274	270K00 2% 0,25W
3201	482205120109	10R00 5% 0,1W
3202	482211711141	1K80 1% 0,1W
3204	482211711504	270R 1% 0,1W
3205	482211711145	4K70 1% 0,1W
3206	482205120008	0R00 JUMP. (0805)
3233	482205021002	1K00 1% 0,6W
3235	482211652244	15K 5% 0,5W
3236	482211711145	4K70 1% 0,1W
3237	482211711145	4K70 1% 0,1W
3260	482205120109	10R00 5% 0,1W
4121	482205120008	0R00 JUMP. (0805)
4125	482205120008	0R00 JUMP. (0805)
4128	482205120008	0R00 JUMP. (0805)
4250	482205120008	0R00 JUMP. (0805)

### Coils

5120	482215753348	FILTER CHOKE ASSY CU15D3
5125	482215711411	100MHZ
5131	482214611138	SWITCH MODE TRAF0
5210	482215711722	6,8UH 20% 7,7X9,5
5230	482215751462	10UH 10% 4X9,8MM LAL04T100K
5233	482215751462	10UH 10% 4X9,8MM LAL04T100K
5240	482215751195	1 UH 20% 4X9,8MM AXIAL
5259	482215751462	10UH 10% 4X9,8MM LAL04T100K

### Diodes

6110	482213042606	BYD33J
6111	482213042606	BYD33J
6114	482213042488	BYD33D
6120	482213083707	SINB80
6129	532213080122	BZX84-C24
6132	482213042488	BYD33D
6210	482213011577	PBYR1080
6230	482213011577	PBYR1080
6250	482213042488	BYD33D
6260	482213042606	BYD33J

### Transistors & IC's

7110	482220915684	MC44603AP
7125	482213063787	STP4NA60FI
7200	482213091451	CQY80NG
7201	482220917373	KA431LZTA
7233	532220986445	LM7805CT
7235	482213042705	BC847
7236	482213011578	STP16NE06
7237	482220917373	KA431LZTA

## HEADPHONE & STANDBY PANEL

### Miscellaneous

1111	482227613114	STANDBY SWITCH
1201	482226731453	HEADPHONE SOCKET

### Capacitors

2200	482212614585	100NF 10% X7R 0805 50V
------	--------------	------------------------

2201	482212233926	12PF 50V
2202	532212231647	1NF10%X7R 63V
2203	482212614585	100NF 10% X7R 0805 50V
2204	482212614585	100NF 10% X7R 0805 50V
2206	482212233926	12PF 50V
2207	532212231647	1NF10%X7R 63V
2209	482212614585	100NF 10% X7R 0805 50V

**Resistors**

3150	482205120101	100R00 5% 0,1W
3200	482205120109	10R00 5% 0,1W
3201	482210121199	10KX2 20% 0,025W
3202	482205120229	22R00 5% 0,1W
3203	482205120109	10R00 5% 0,1W
3205	482205120229	22R00 5% 0,1W
4001	482205110008	0R00 5% 0,25W
4002	482205110008	0R00 5% 0,25W
4003	482205110008	0R00 5% 0,25W
4004	482205110008	0R00 5% 0,25W
4005	482205110008	0R00 5% 0,25W

**Diodes**

6103	482213082978	LED LTL-16KPE-P
------	--------------	-----------------

**IC's**

7200	482220962059	TCA0372DP1
------	--------------	------------

**DISPLAY PANEL****Miscellaneous**

4	310412405420	FTD HOLDER
1100	482227613114	SWITCH, PUSH BUTTON
1101	482227613114	
1102	482227613114	
1106	482227613114	
1107	482227613114	
1108	482227613114	
1109	482227613114	
1110	242254098423	RES CER 8MHZ CSTS*MG03
1113	272217107167	VFD 14-MT-26GNK 121*17 (FTB)B

**Capacitors**

2100	482212233575	220PF 5% NP0 63V CASE 0805
2101	482212233575	220PF 5% NP0 63V CASE 0805
2102	532212232531	100PF 5%NP0 50V
2103	532212232531	100PF 5%NP0 50V
2105	482212612105	CER2 0805 X7R 50V 33NF PM5
2106	482212411947	10UF 20% 16V
2107	482212612105	CER2 0805 X7R 50V 33NF PM5
2108	482212612105	CER2 0805 X7R 50V 33NF PM5
2109	482212612105	CER2 0805 X7R 50V 33NF PM5
2110	482212612105	CER2 0805 X7R 50V 33NF PM5
2111	482212612105	CER2 0805 X7R 50V 33NF PM5
2114	532212232658	22PF 5% 50V
2115	532212232658	22PF 5% 50V
2116	482212612105	CER2 0805 X7R 50V 33NF PM5
2117	482212411947	10UF 20% 16V
2122	482212612105	CER2 0805 X7R 50V 33NF PM5
2123	482212411947	10UF 20% 16V
2124	319802842290	ELCAP 5MM 35V 22U PM20 COL A
2125	532212232658	22PF 5% 50V
2126	482212411947	10UF 20% 16V
2128	532212231647	1NF10%X7R 63V
2129	319802842290	ELCAP 5MM 35V 22U PM20 COL A
2130	319802842290	ELCAP 5MM 35V 22U PM20 COL A
2201	482212612105	CER2 0805 X7R 50V 33NF PM5
2211	532212232531	100PF 5%NP0 50V

**Resistors**

3100	482205120223	22K00 5% 0,1W
3101	482205120273	27K00 5% 0,1W
3102	482211710834	47K 1% 0,1W
3103	482211711149	82K 1% 0,1W
3104	482211710837	100K 1% 0,1W
3105	482205120008	0R00 JUMP. (0805)
3106	482211711503	220R 1% 0,1W
3107	482205120008	0R00 JUMP. (0805)
3108	482211711149	82K 1% 0,1W
3109	482205120472	4K70 5% 0,1W

3110	482205120472	4K70 5% 0,1W
3111	482205120472	4K70 5% 0,1W
3112	482205120472	4K70 5% 0,1W
3113	482205120472	4K70 5% 0,1W
3114	482205120109	10R00 5% 0,1W
3115	482205120472	4K70 5% 0,1W
3116	482211711149	82K 1% 0,1W
3117	482211711152	4R7 5%
3118	482211710833	10K 1% 0,1W
3119	482211710833	10K 1% 0,1W
3120	482205120471	470R00 5% 0,1W
3121	482205120472	4K70 5% 0,1W
3122	482205120109	10R00 5% 0,1W
3123	482211710833	10K 1% 0,1W
3125	482205120109	10R00 5% 0,1W
3130	482205120109	10R00 5% 0,1W
3131	482211711152	4R7 5%
3132	482211713577	330R 1% RC12H 0805 1,25W
3133	482205120109	10R00 5% 0,1W
3134	482211713577	330R 1% RC12H 0805 1,25W
3135	482211711503	220R 1% 0,1W
3136	482205110102	1K00 2% 0,25W
3137	482211710833	10K 1% 0,1W
3138	482205120471	470R00 5% 0,1W
3139	482205120472	4K70 5% 0,1W
3140	482211710833	10K 1% 0,1W
3142	482211713577	330R 1% RC12H 0805 1,25W
3143	482211710833	10K 1% 0,1W
3144	482211710837	100K 1% 0,1W
3145	482211710833	10K 1% 0,1W

**Diodes**

6100	482213010654	BAT254
6101	482213011666	BZX284-C8V2
6102	482213010794	BZX284-C10
6104	482213083757	BAS216

**Transistors & IC's**

7100	482213060511	BC847B
7101	482213060511	BC847B
7102	482213060511	BC847B
7103	482213060511	BC847B
7104	310412394530	IC ROM SLAVE DVD950
7105	482213040855	BC337
7106	482213041246	BC327-25
7107	482213060511	BC847B
7108	482213060511	BC847B
7109	482213060373	BC856B
7110	482221230842	TSOP1736SB1
7112	482220931257	MC79L24ACP

**AUDIO/VIDEO PANEL****Miscellaneous**

1300	482226511154	FLEX CONNECTOR (22P)
1301	482226511103	FLEX CONNECTOR (16P)
1303	482226710994	Y/C OUT SOCKET
1304	242203300334	SCART CONNECTOR 42P
1400	242202605015	MULTICHANNEL AUDIO OUT 6X
CINCH		
1402	482226511566	STEREO OUT CINCH SOCKET
1405	482226731729	DIGITAL OUT SOCKET

**Capacitors**

2308	482212233575	220PF 5% NP0 63V CASE 0805
2314	482212441584	100UF 20% 10V
2337	482212233575	220PF 5% NP0 63V CASE 0805
2351	482212614585	100NF 10% X7R 0805 50V
2352	482212614585	100NF 10% X7R 0805 50V
2353	482212440769	4,7UF20% 100V
2354	482212614076	220N 25V, P8020
2355	482212440769	4,7UF20% 100V
2357	482212440769	4,7UF20% 100V
2358	482212233575	220PF 5% NP0 63V CASE 0805
2359	482212440769	4,7UF20% 100V
2360	482212613692	47PF 1% NP0 63V
2361	482212613692	47PF 1% NP0 63V
2362	482212614585	100NF 10% X7R 0805 50V
2363	482212614585	100NF 10% X7R 0805 50V



3378	482205110102	1K00	2%	0,25W	3483	482211710833	10K	1%	0,1W
3394	482205120471	470R00	5%	0,1W	3484	482211712955	2K7	1%	0,1W 0805
3395	482205120472	4K70	5%	0,1W	3486	482211710837	100K	1%	0,1W
3397	482211710834	47K	1%	0,1W	3487	482211711503	220R	1%	0,1W
3398	482205120472	4K70	5%	0,1W	3488	482211712955	2K7	1%	0,1W 0805
3399	482205120562	5K6	5%	0,1W 0805	3489	482205120562	5K6	5%	0,1W 0805
3400	482211711927	75R	1%	0,1W	3490	482211710833	10K	1%	0,1W
3401	482211711927	75R	1%	0,1W	3491	482205120101	100R00	5%	0,1W
3402	482205120472	4K70	5%	0,1W	3492	482205120101	100R00	5%	0,1W
3403	482211711927	75R	1%	0,1W	3493	482211710833	10K	1%	0,1W
3404	482211711927	75R	1%	0,1W	3494	482211712955	2K7	1%	0,1W 0805
3405	482211711927	75R	1%	0,1W	3495	482211710837	100K	1%	0,1W
3406	482211711927	75R	1%	0,1W	3496	482211711503	220R	1%	0,1W
3407	482211711927	75R	1%	0,1W	3497	482211712955	2K7	1%	0,1W 0805
3408	482211711927	75R	1%	0,1W	3498	482205120562	5K6	5%	0,1W 0805
3409	482205120471	470R00	5%	0,1W	3499	482211710833	10K	1%	0,1W
3410	482205120471	470R00	5%	0,1W	3502	482211710833	10K	1%	0,1W
3411	482211711927	75R	1%	0,1W	3505	482205120101	100R00	5%	0,1W
3413	482211710834	47K	1%	0,1W	3506	482211710833	10K	1%	0,1W
3414	482205120472	4K70	5%	0,1W	3507	482205120101	100R00	5%	0,1W
3415	482205120223	22K00	5%	0,1W	3508	482211712521	68R	1%	0,1W
3416	482205120339	33R00	5%	0,1W	3509	482211710834	47K	1%	0,1W
3417	482205120471	470R00	5%	0,1W	3510	482211711152	4R7	5%	
3418	482205120101	100R00	5%	0,1W	3513	482211712955	2K7	1%	0,1W 0805
3419	482205120101	100R00	5%	0,1W	3514	482211712955	2K7	1%	0,1W 0805
3420	482211711149	82K	1%	0,1W	3516	482211711152	4R7	5%	
3421	482211711504	270R	1%	0,1W	3517	482205120101	100R00	5%	0,1W
3422	482205120472	4K70	5%	0,1W	3518	482211712955	2K7	1%	0,1W 0805
3423	232273465609	RST SM 0805 RC12H	56R	PM1 R	3519	482205120562	5K6	5%	0,1W 0805
3424	482205120223	22K00	5%	0,1W	3520	482205120472	4K70	5%	0,1W
3425	482211711927	75R	1%	0,1W	3521	482205110102	1K00	2%	0,25W
3427	482205120472	4K70	5%	0,1W	3522	482205110102	1K00	2%	0,25W
3429	482211711927	75R	1%	0,1W	3524	482205120008	0R00	JUMP.	(0805)
3431	482205120471	470R00	5%	0,1W	3525	482211710833	10K	1%	0,1W
3432	482211711927	75R	1%	0,1W	3527	482211710834	47K	1%	0,1W
3433	482205120008	0R00	JUMP.	(0805)	3600	482205120472	4K70	5%	0,1W
3434	482205120101	100R00	5%	0,1W	3601	482205120472	4K70	5%	0,1W
3435	482205120101	100R00	5%	0,1W	3602	482205120472	4K70	5%	0,1W
3436	482211710353	150R	1%	0,1W	3603	482211710837	100K	1%	0,1W
3437	482205120101	100R00	5%	0,1W	3604	482211711449	2K2	1%	0,1W
3438	482205120101	100R00	5%	0,1W	3605	482205120472	4K70	5%	0,1W
3439	482205120101	100R00	5%	0,1W	3606	482205120561	560R00	5%	0,1W
3440	482205120101	100R00	5%	0,1W	3607	482205120562	5K6	5%	0,1W 0805
3441	482205120101	100R00	5%	0,1W	3608	482211710837	100K	1%	0,1W
3442	482205120101	100R00	5%	0,1W	3609	482205120822	8K20	5%	0,1W
3444	482211710833	10K	1%	0,1W	3610	482205120472	4K70	5%	0,1W
3445	482211710833	10K	1%	0,1W	3611	482205120472	4K70	5%	0,1W
3446	482211712955	2K7	1%	0,1W 0805	3612	482211710833	10K	1%	0,1W
3447	482211712955	2K7	1%	0,1W 0805	3613	482211712955	2K7	1%	0,1W 0805
3448	482211710833	10K	1%	0,1W	3614	482211710833	10K	1%	0,1W
3451	482211710833	10K	1%	0,1W	3615	482211711152	4R7	5%	
3452	482205120008	0R00	JUMP.	(0805)	3616	482205120472	4K70	5%	0,1W
3453	482211710833	10K	1%	0,1W	3617	482211710833	10K	1%	0,1W
3454	482211710833	10K	1%	0,1W	3618	482205110102	1K00	2%	0,25W
3455	482211710833	10K	1%	0,1W	3619	482211710833	10K	1%	0,1W
3456	482205120101	100R00	5%	0,1W	3620	482205110008	0R00	5%	0,25W
3457	482205120101	100R00	5%	0,1W	3621	482205120472	4K70	5%	0,1W
3458	482205120008	0R00	JUMP.	(0805)	3622	482211710833	10K	1%	0,1W
3459	482211710833	10K	1%	0,1W	3623	482205120472	4K70	5%	0,1W
3460	482205120008	0R00	JUMP.	(0805)	3624	482211710833	10K	1%	0,1W
3461	482211710833	10K	1%	0,1W	3625	482205110102	1K00	2%	0,25W
3462	482211712955	2K7	1%	0,1W 0805	4301	482205120008	0R00	JUMP.	(0805)
3463	482211712955	2K7	1%	0,1W 0805	4304	482205120008	0R00	JUMP.	(0805)
3464	482211710833	10K	1%	0,1W	4305	482205120008	0R00	JUMP.	(0805)
3466	482211711503	220R	1%	0,1W					
3468	482211710837	100K	1%	0,1W					
3469	482211710833	10K	1%	0,1W	<b>Coils</b>				
3470	482211712955	2K7	1%	0,1W 0805	5400	482215770601	100UH	(920927085A)	
3471	482205120562	5K6	5%	0,1W 0805					
3472	482211711152	4R7	5%		<b>Diodes</b>				
3473	482205120008	0R00	JUMP.	(0805)	6300	482213010648	BZX284-C5V6		
3475	482211710833	10K	1%	0,1W	6301	482213083757	BAS216		
3476	482205120101	100R00	5%	0,1W	6302	482213083757	BAS216		
3477	482205120101	100R00	5%	0,1W	6303	482213083757	BAS216		
3478	482211710837	100K	1%	0,1W	6400	482213010845	GP1F32T		
3479	482205120562	5K6	5%	0,1W 0805	<b>Transistors &amp; IC's</b>				
3480	482211711503	220R	1%	0,1W	7300	482213060373	BC856B		
3481	482211712955	2K7	1%	0,1W 0805	7301	482213060511	BC847B		
3482	482211710833	10K	1%	0,1W	7302	482213060511	BC847B		



7303	482213060511	BC847B	
7304	932213486668	LF80C	
7305	932213558671	IC SM STV6410AD	(ST00) Y
7306	482213060511	BC847B	
7307	482213060511	BC847B	
7308	482213060511	BC847B	
7309	482213060511	BC847B	
7310	482213060511	BC847B	
7311	482213060511	BC847B	
7312	482213060373	BC856B	
7313	482213060511	BC847B	
7314	482213042804	BC817-25	
7315	482213042804	BC817-25	
7316	482220916256	TDA4780/V4	
7320	482213060511	BC847B	
7321	482213042804	BC817-25	
7322	482213060511	BC847B	
7324	482213042804	BC817-25	
7325	482213060511	BC847B	
7326	482213060373	BC856B	
7327	482213060511	BC847B	
7328	482213060511	BC847B	
7329	482213060511	BC847B	
7330	482213060511	BC847B	
7331	482213040959	BC547B	
7332	482213060373	BC856B	
7333	482213041246	BC327-25	
7334	482213060511	BC847B	
7335	482213060511	BC847B	
7336	482213042804	BC817-25	
7337	482213042804	BC817-25	
7400	482220917398	LD1117DT33	
7401	482220917423	UAD1328T	
7402	482213042804	BC817-25	
7403	482220932071	MC33079D	
7404	482213042804	BC817-25	
7405	482213042804	BC817-25	
7406	482213042804	BC817-25	
7407	482213042804	BC817-25	
7408	482220932071	MC33079D	
7409	482213042804	BC817-25	
7410	482213042804	BC817-25	
7411	482213042804	BC817-25	
7412	482213042804	BC817-25	
7413	532220911296	74HC4053N	
7414	482220930095	LM833D	
7415	482213042804	BC817-25	
7416	482213042804	BC817-25	
7419	482213042804	BC817-25	
7420	482213042804	BC817-25	
7421	482213042804	BC817-25	
7422	482213044568	BC557B	
7423	482213060511	BC847B	