

Service
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Service Manual

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3141 785 31931

Version 1.1



PHILIPS

SPECIFICATION

AMPLIFIER

1 kHz (low channel - both channels driven)	30 W per channel (8 Ω)
10 kHz (high channel - both channels driven)	30 W per channel (8 Ω)
Total output power	120 W
Signal-to-noise ratio	≥ 60 dBA (IEC)
Frequency response	125 – 16000 Hz
Input sensitivity	
AUX/CDR In	2 V
Microphone	1.5 mV
Output	
Speakers	$\geq 6 \Omega$
Headphones	32 Ω
(1) (6 Ω , 1 kHz, 10%THD)	

CD/MP3-CD PLAYER

Number of programmable tracks	40
Frequency response	125 – 16000 Hz -3dB
Signal-to-noise ratio	≥ 75 dBA
Channel separation	≥ 50 dB (1 kHz)
Total harmonic distortion	$< 0.6\%$
MPEG 1 Layer 3 (MP3-CD)	MPEG AUDIO
MP3-CD bit rate	32-256 kbps (128 kbps advised)
Sampling frequencies	32, 44.1, 48 kHz

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TUNER

FM wave range	87.5 – 108 MHz
MW wave range (9 kHz)	515 – 1630 kHz

TAPE PLAYER

Frequency response	
Normal tape (type I)	125 – 8000 Hz (8 dB)
Signal-to-noise ratio	
Normal tape (type I)	≥ 40 dBA
Wow and flutter	$\leq 0.4\%$ JIS

SPEAKERS

System	1-way; 1 port bass reflex
Impedance	6 Ω
Woofer	1 x 4"
Tweeter	1 x 1.5"
Dimensions (w x h x d)	215 x 349 x 180 (mm)
Weight	2.4 kg each

GENERAL

Material/finish	Polystyrene/Metal
AC Power	110 – 127 / 220 – 240V; 50/60 Hz Switchable
Power Consumption	
Active	110 W
Dimensions (w x h x d)	265 x 310 x 380 (mm)
Weight (without speakers)	6.5 kg

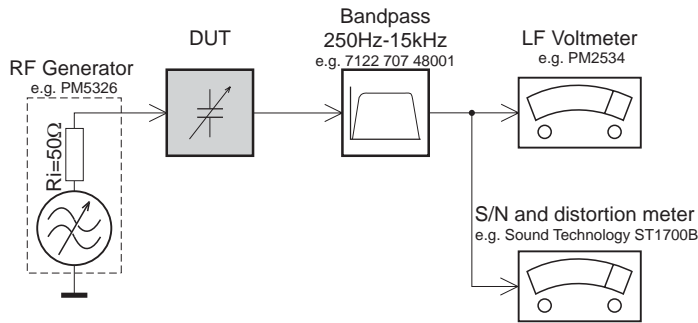
Specifications and external appearance are subject to change without notice.



tecnico

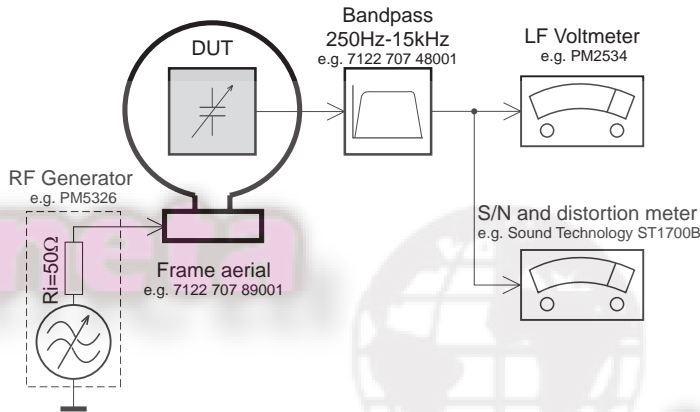
MEASUREMENT SETUP

Tuner FM



Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilotone (19kHz, 38kHz).

Tuner AM (MW,LW)

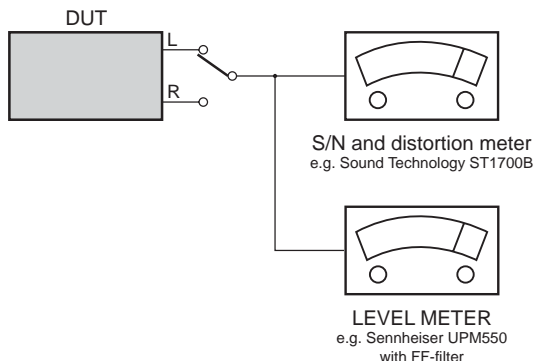


To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday's cage.
Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

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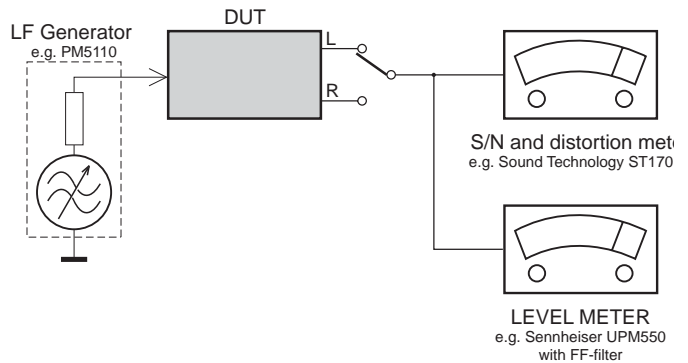
CD

Use Audio Signal Disc SBC429 4822 397 30184
(replaces test disc 3)



Recorder

Use Universal Test Cassette **CrO2** SBC419 4822 397 30069
or Universal Test Cassette **Fe** SBC420 4822 397 30071



SERVICE AIDS

Service Tools:

Universal Torx driver holder	4822 395 91019
Torx bit T10 150mm	4822 395 50456
Torx driver set T6-T20	4822 395 50145
Torx driver T10 extended	4822 395 50423

Compact Disc:

SBC426/426A Test disc 5 + 5A	4822 397 30096
SBC442 Audio Burn-in test disc 1kHz	4822 397 30155
SBC429 Audio Signals disc	4822 397 30184
Dolby Pro-logic Test Disc	4822 395 10216

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



GB

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

Safety components are marked by the symbol .

**CLASS 1
LASER PRODUCT**

INFORMATION ABOUT LEAD-FREE SOLDERING

Philips CE is producing lead-free sets from 1.1.2005 onwards.

IDENTIFICATION:

Regardless of special logo (not always indicated) one must treat all sets from 1 Jan 2005 onwards, according next rules:

- On our website www.atyourservice.ce.Philips.com you find more information to:
 - * BGA-de-/soldering (+ baking instructions)
 - * Heating-profiles of BGAs and other ICs used in Philips-sets
 - * Lead free

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

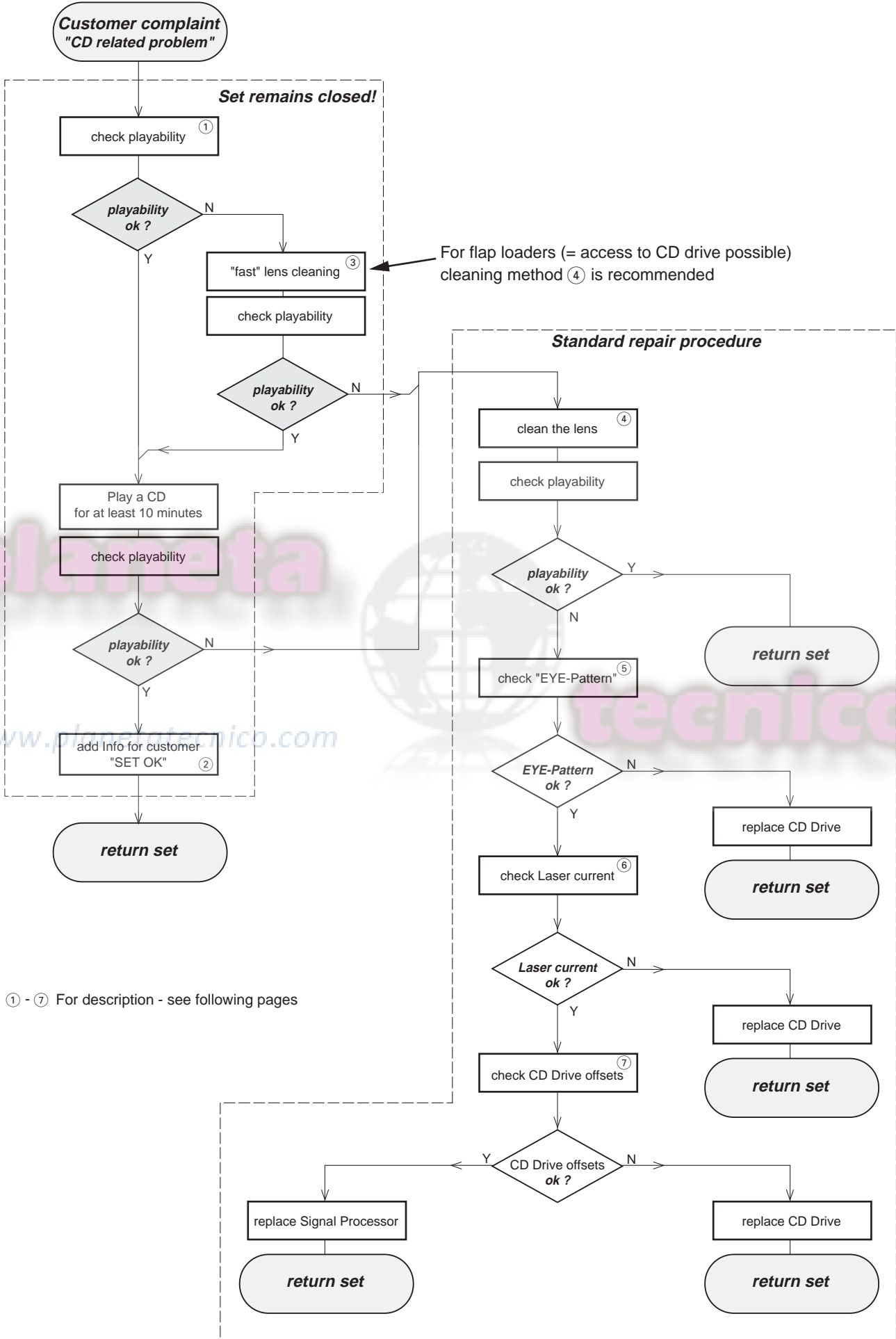
For additional questions please contact your local repair-helpdesk.

SERVICE INSTRUCTION

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

- Route the wire trees correctly and fix them with the mounted cable clamps.
- Check the insulation of the AC Power lead for external damage.
- Check the strain relief of the AC Power cord for proper function.
- Check the electrical DC resistance between the AC Power Plug and the secondary side (only for sets which have a AC Power isolated power supply):
 1. Unplug the AC Power cord and connect a wire between the two pins of the AC Power plug.
 2. Set the AC Power switch to the "on" position (keep the AC Power cord unplugged!).
 3. Measure the resistance value between the pins of the AC Power plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be larger than 4.5 Mohm (For U.S. it should be between 4.2 Mohm and 12 Mohm).
 4. Switch "off" the set, and remove the wire between the two pins of the AC Power plug.
- Check the cabinet for defects, to avoid touching of any inner parts by the customer.

INSTRUCTIONS ON CD PLAYABILITY



① - ⑦ For description - see following pages

INSTRUCTIONS ON CD PLAYABILITY

①

PLAYABILITY CHECK

For sets which are compatible with **CD-RW** discs
 use CD-RW Printed Audio Disc.....7104 099 96611
 TR 3 (Fingerprint)
 TR 8 (600µ Black dot) **maximum at 01:00**

- playback of these two tracks without audible disturbance
 playing time for: Fingerprint ≥ 10 seconds
 Black dot from 00:50 to 01:10
- jump forward/backward (search) within a reasonable time

For all other sets
 use CD-DA SBC 444A.....4822 397 30245
 TR 14 (600µ Black dot) **maximum at 01:15**
 TR 19 (Fingerprint)
 TR 10 (1000µ wedge)

- playback of all these tracks without audible disturbance
 playing time for: 1000µ wedge ≥ 10 seconds
 Fingerprint ≥ 10 seconds
 Black dot from 01:05 to 01:25
- jump forward/backward (search) within a reasonable time

②

CUSTOMER INFORMATION

It is proposed to add an addendum sheet to the set which informs the customer that the set has been checked carefully - but no fault was found.

The problem was obviously caused by a scratched, dirty or copy-protected CD. In case problems remain, the customer is requested to contact the workshop directly.

The lens cleaning (method ③) should be mentioned in the addendum sheet.

The final wording in national language as well as the printing is under responsibility of the Regional Service Organizations.

③

FAST LENS CLEANING (dry brush)

Use lens cleaning CD
 SBC AC300.....9082 100 00043

Insert the lens cleaning CD, press PLAY and follow the voice guide's instructions on the CD.

④

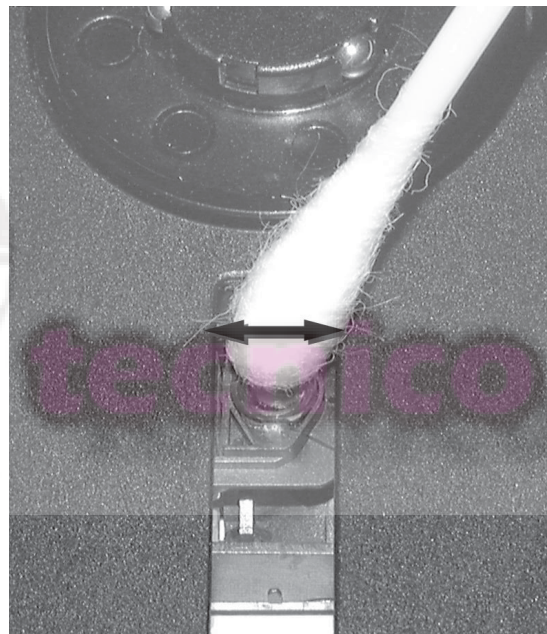
LIQUID LENS CLEANING

Before touching the lens it is advised to clean the surface of the lens by blowing clean air over it. This to avoid that little particles make scratches on the lens.

Because the material of the lens is synthetic and coated with a special anti-reflectivity layer, cleaning must be done with a non-aggressive cleaning fluid. It is advised to use "Cleaning Solvent B4-No2", available with codenumber 4822 389 10026.

The actuator is a very precise mechanical component and may not be damaged in order to guarantee its full function. Clean the lens gently (don't press too hard) with a soft and clean cotton bud moistened with the special lens cleaner.

The direction of cleaning must be in the way as indicated in the picture below.

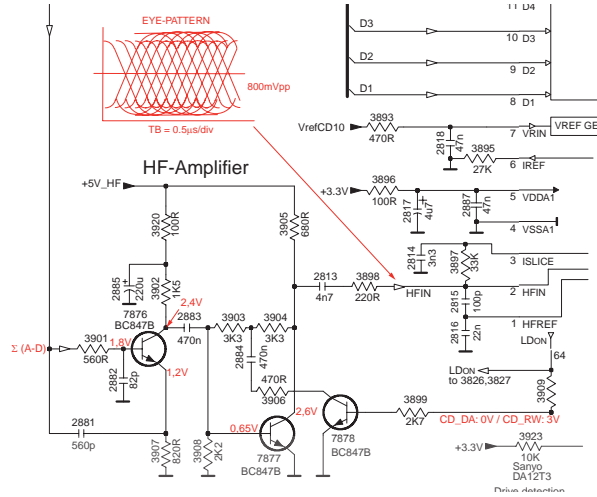


INSTRUCTIONS ON CD PLAYABILITY

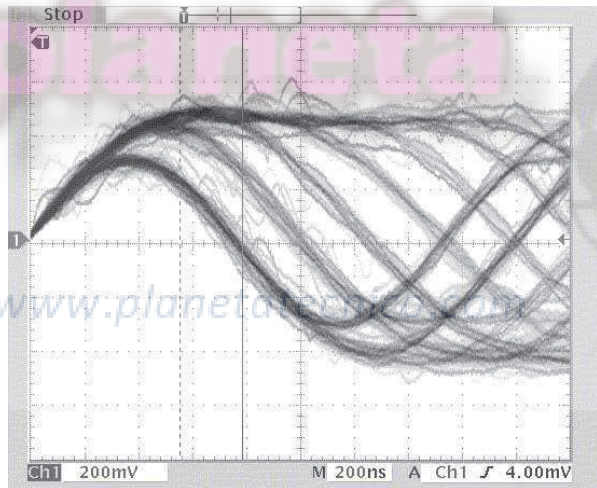
5

EYE-PATTERN SIGNAL – JITTER MEASUREMENT

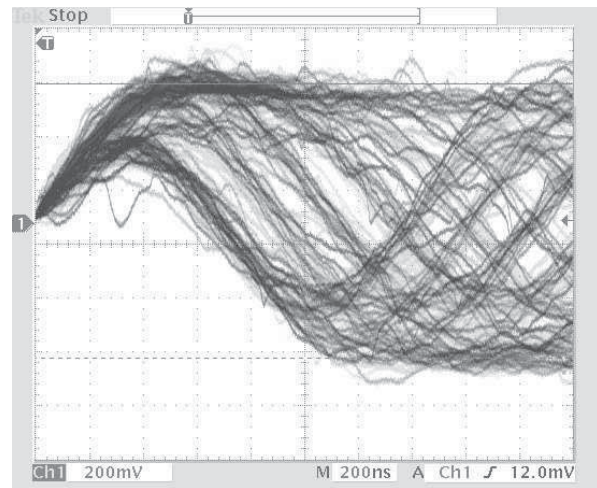
Measure the signal on the input of the Signal processor using an **analog** oscilloscope. Please find the exact measuring point in your Service Manual.



See below examples of the signal. Amplitude should read at least 700mVpp using SBC444A.



good



bad

If the oscilloscope shows a signal like the 'bad' one, and/or the amplitude decreases within 1 minute - the CD drive has to be replaced.

6

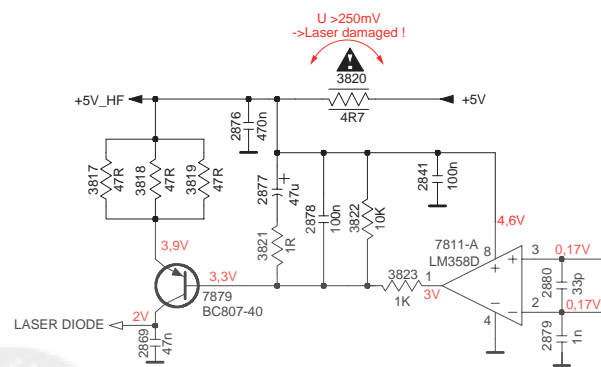
CD DRIVE – LASER CURRENT MEASUREMENT

The laser current can be measured as a voltage drop on a resistor. The resistor is marked in every Service Manual. The value depends on the type of CD drive.

	typical value	most probably defect
VAMxxxx	: 150-230mV	≥350mV
MCDxx	: 170-230mV	≥300mV
DA1x	: 210-250mV	≥350mV
DA2x	: 175-200mV	≥250mV

Use SBC444A (CD-DA) for measurement.

Laser power control



7

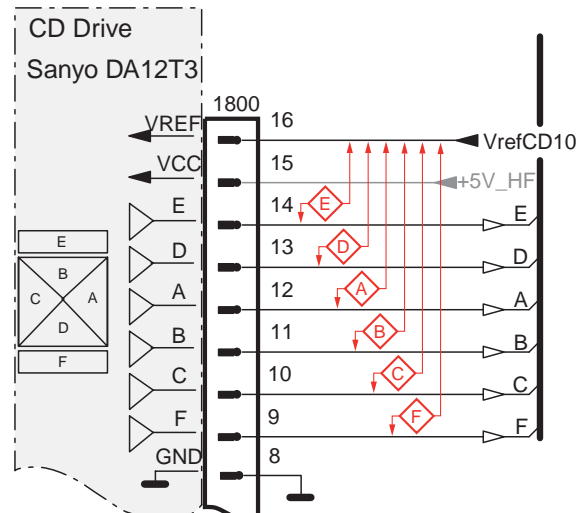
CD DRIVE – OFFSET MEASUREMENT

The photodiodes of the CD-drive may have an offset. These offsets have to be compensated by the signal processor. High offsets can lead to poor playability of some CDs (skipping tracks).

To measure the offset values, start the **Service Test Program** - section "Focus Test" without a CD.

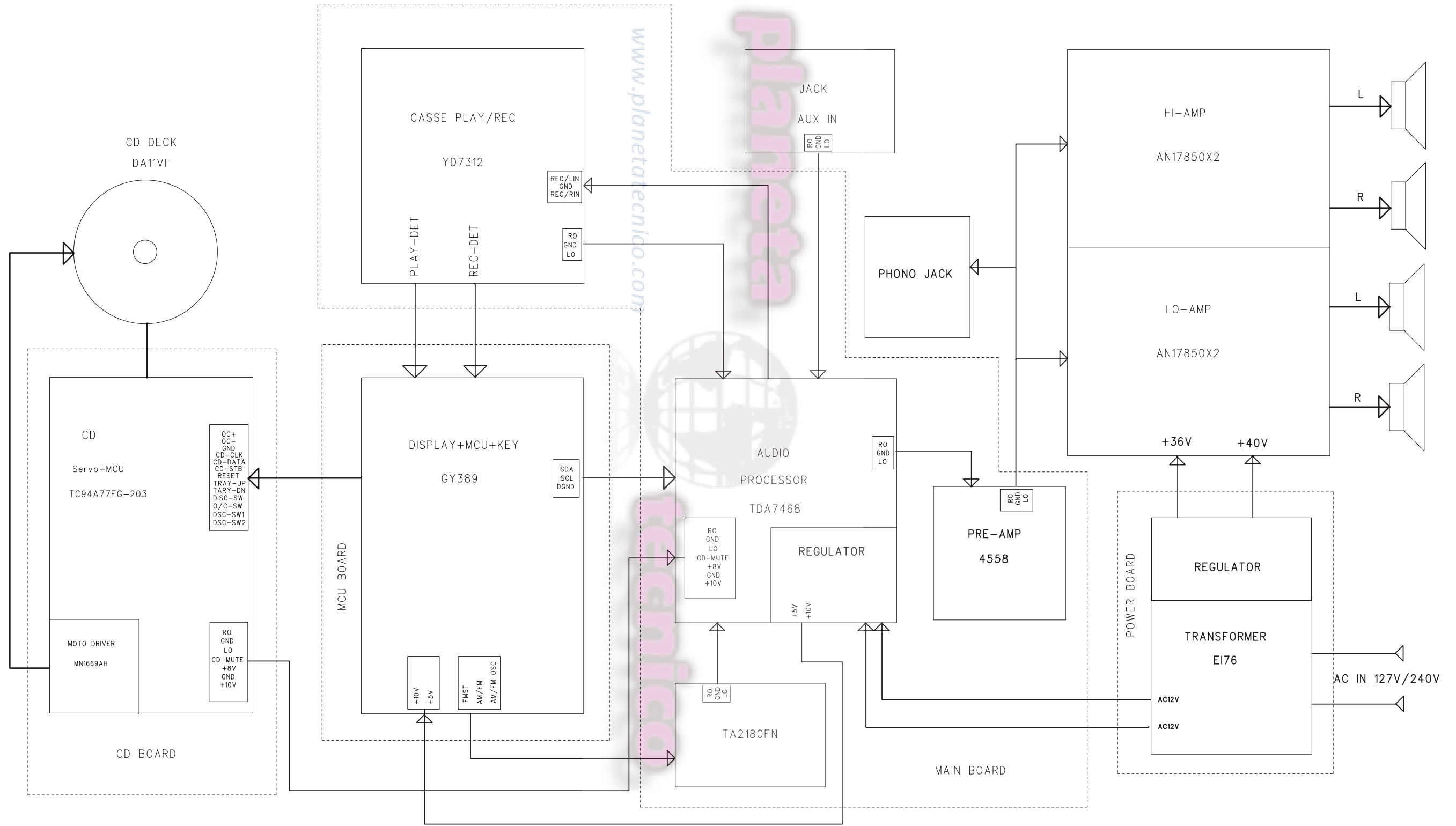
The offsets can be measured with a DC Millivoltmeter directly on the connector (see drawing below). Pin numbering varies from drive to drive.

The values from diode A-D should read $0 \pm 10mV$. Diodes E and F are less critical.

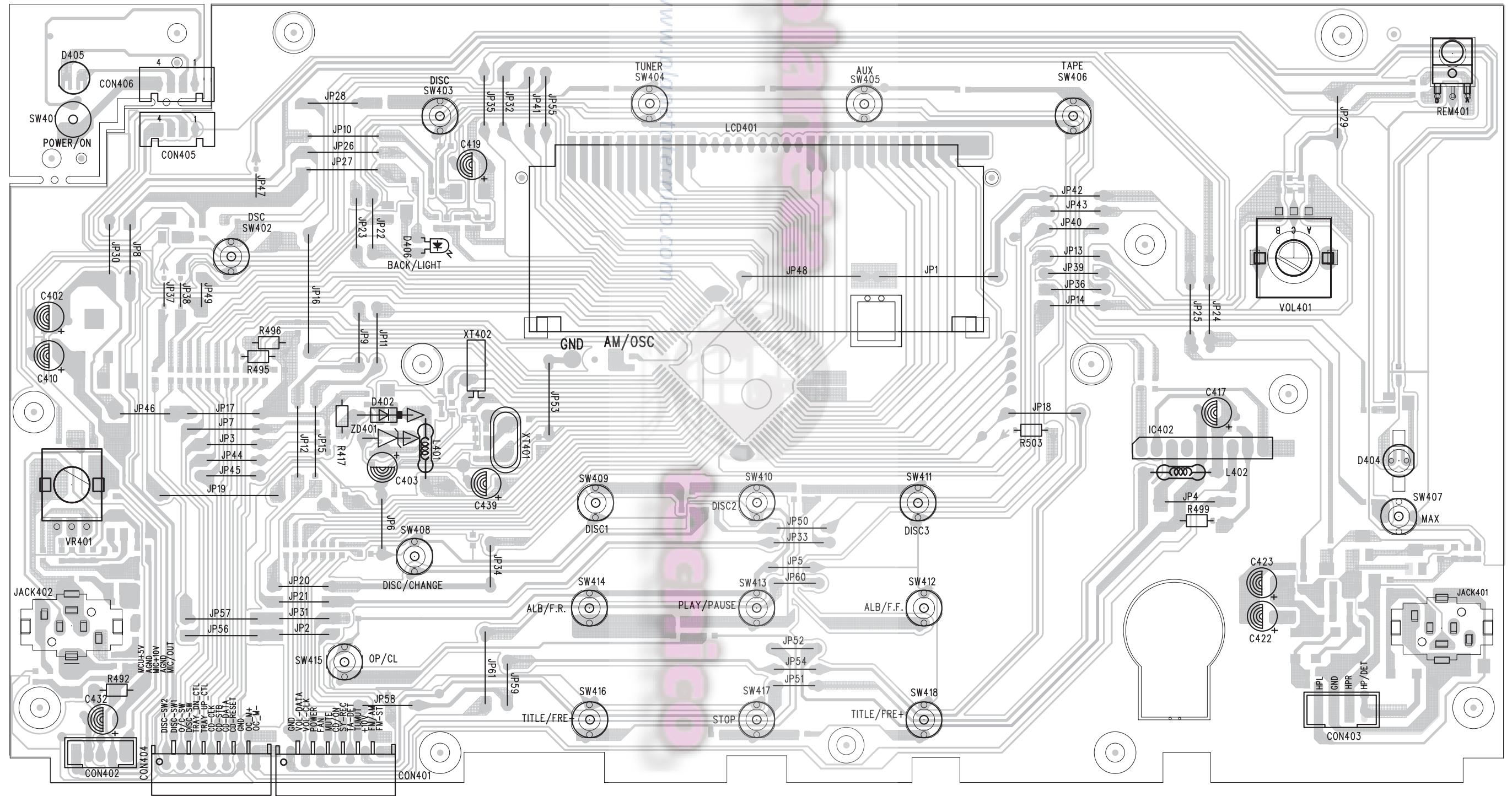


If one of the offsets is higher than $\pm 10mV$ the CD drive has to be replaced. Otherwise replace the Signal Processor.

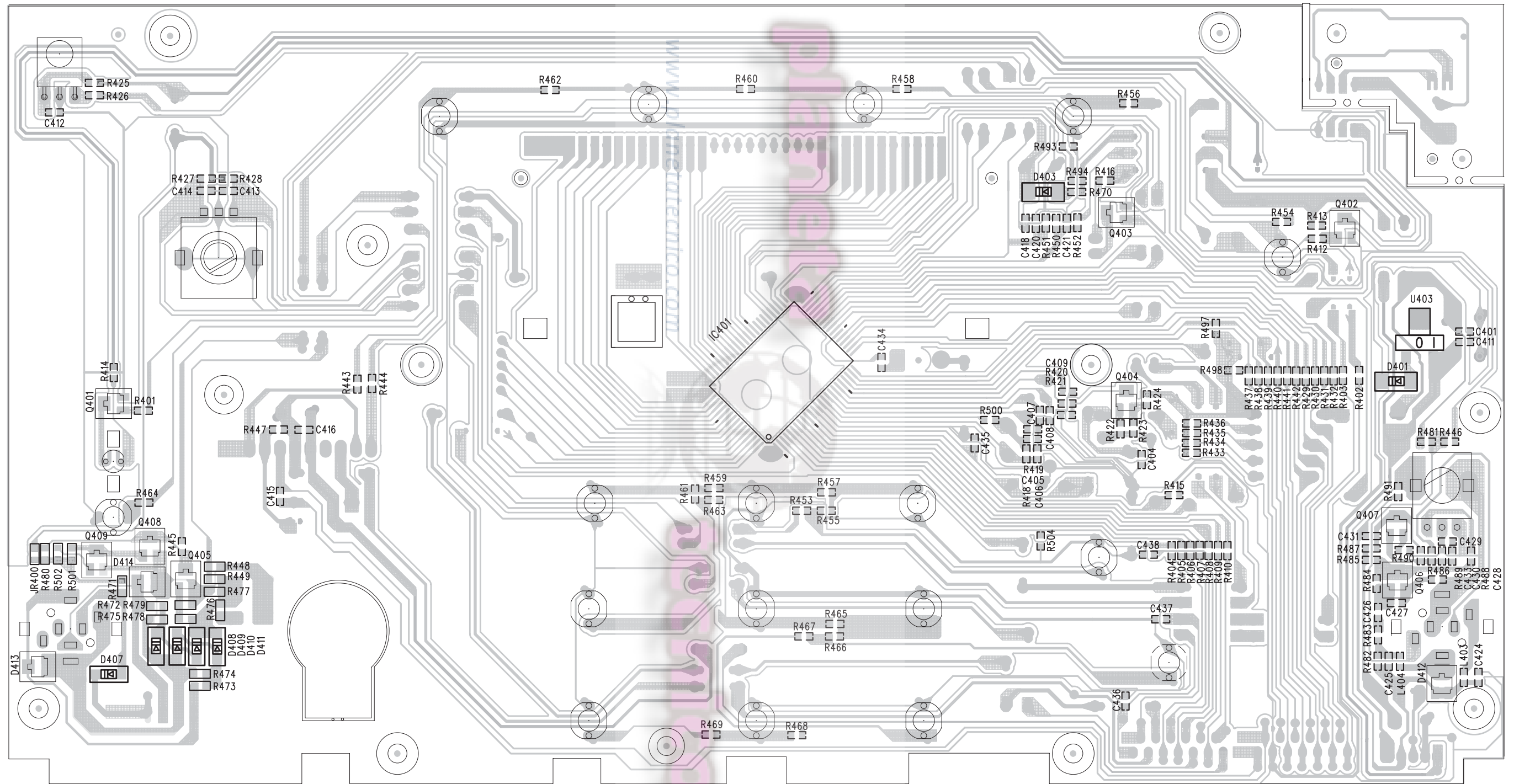
SET BLOCK DIAGRAM



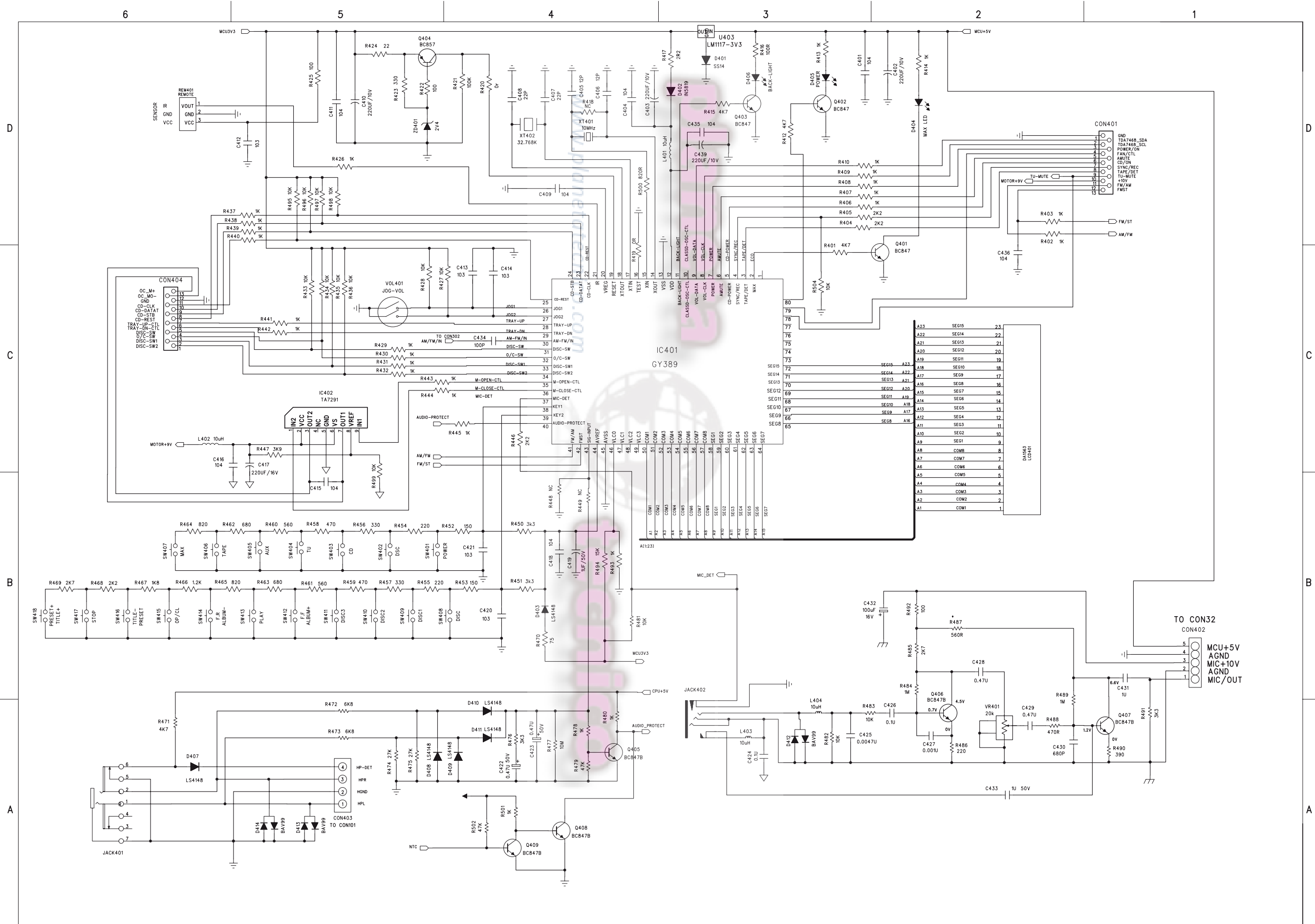
PCB LAYOUT - FRONT BOARD (TOP VIEW)



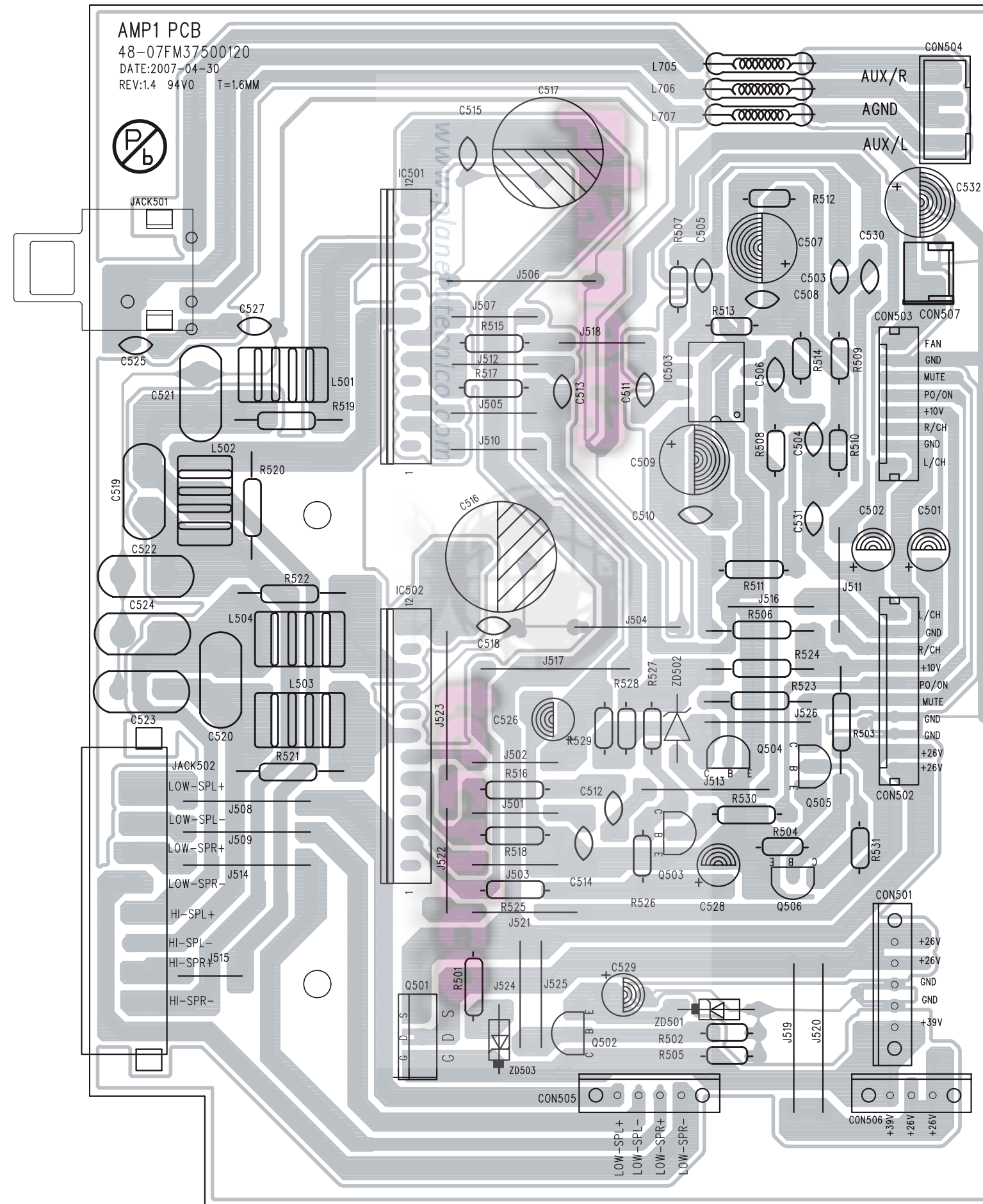
PCB LAYOUT - FRONT BOARD (BOTTOM VIEW)



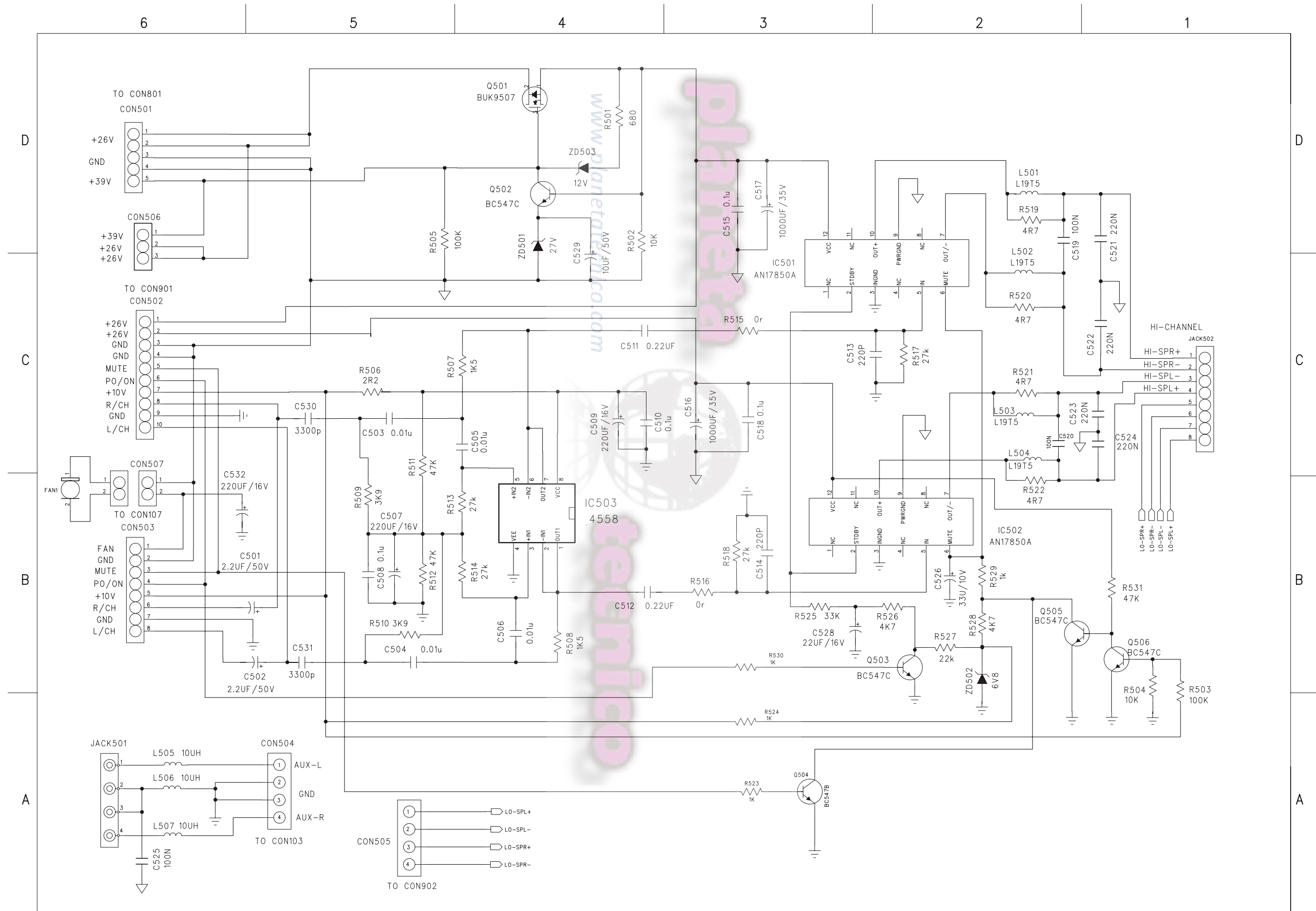
CIRCUIT DIAGRAM - FRONT BOARD



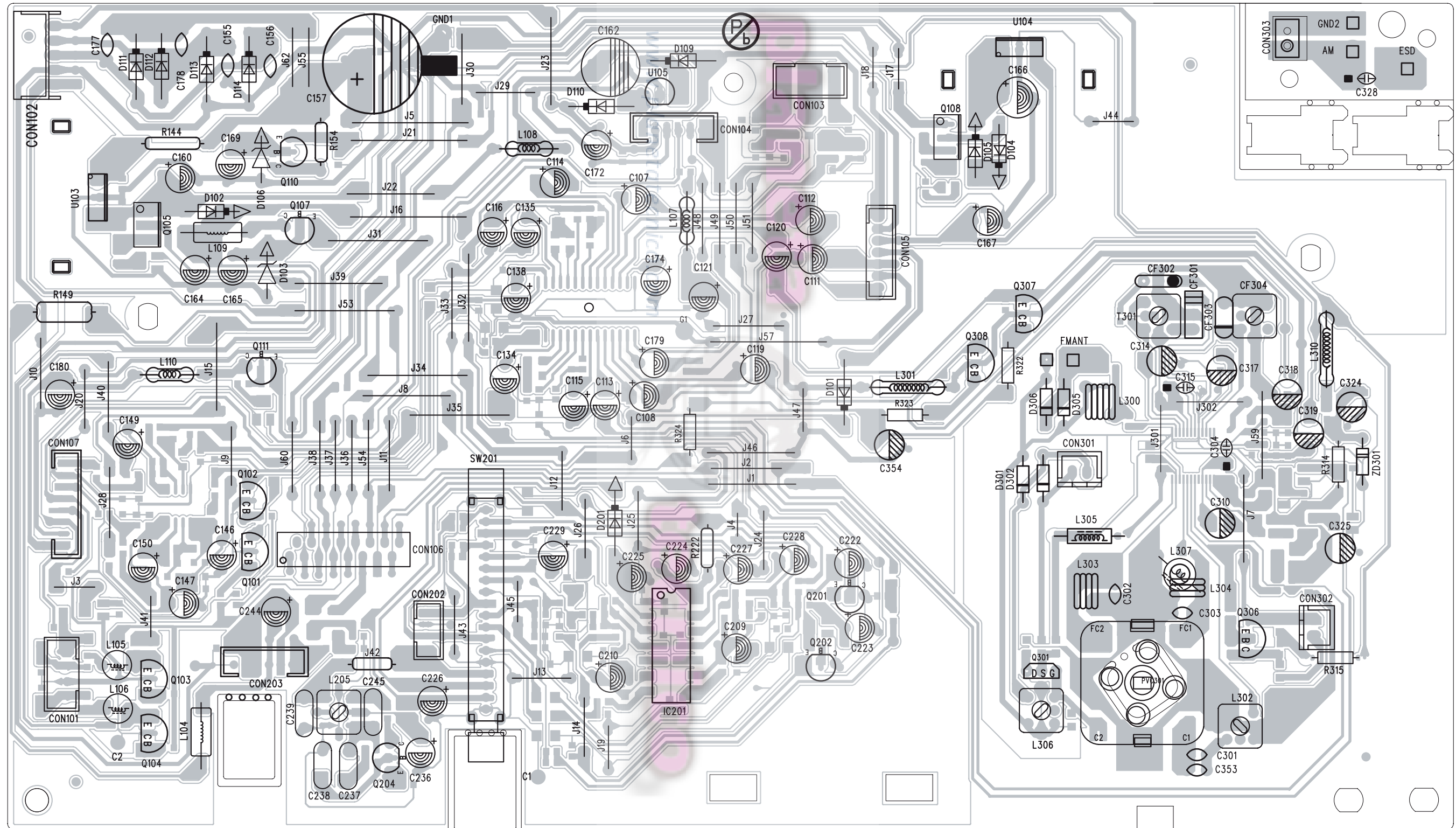
PCB LAYOUT - HI AMP BOARD



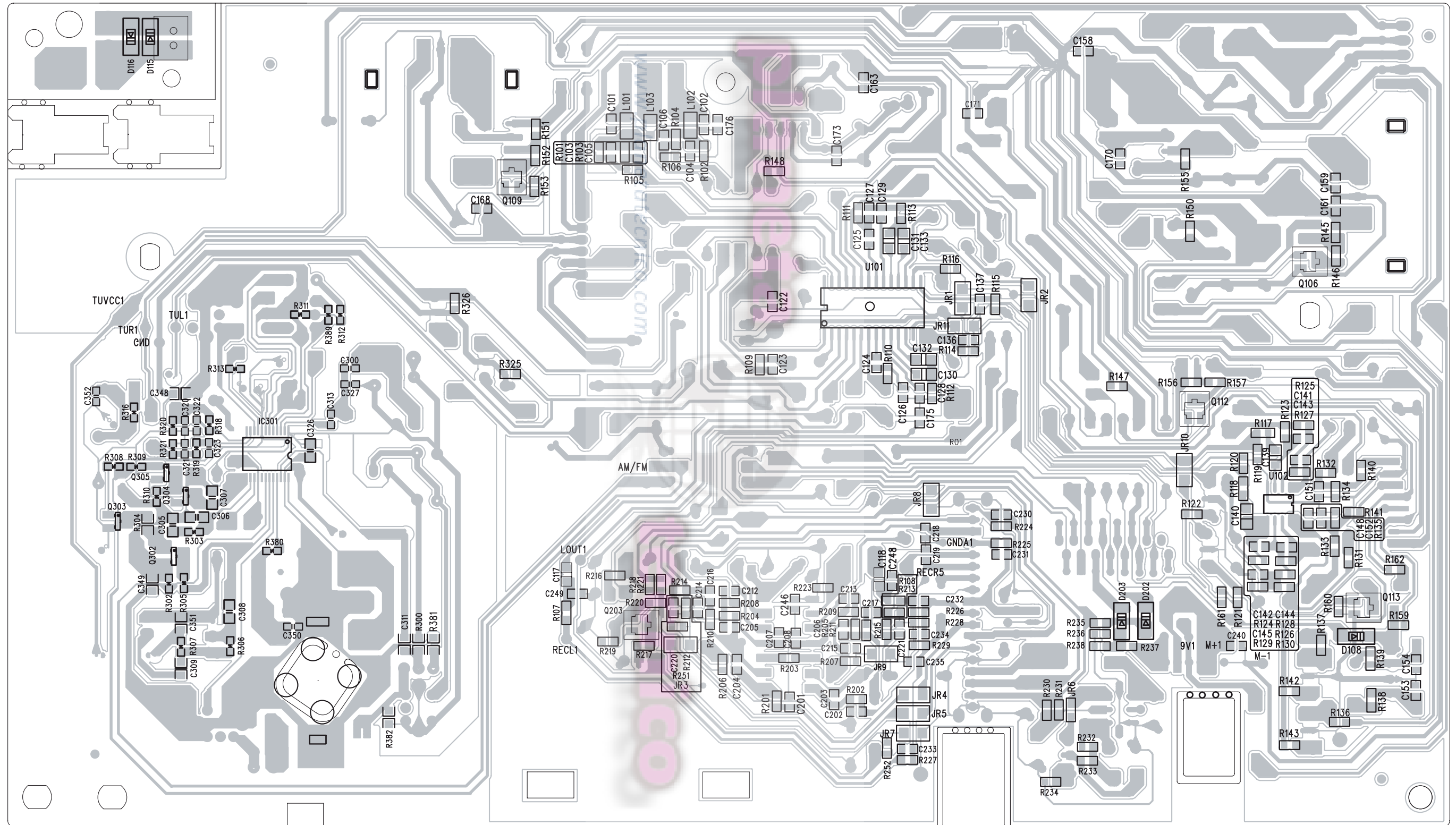
CIRCUIT DIAGRAM - HI AMP BOARD



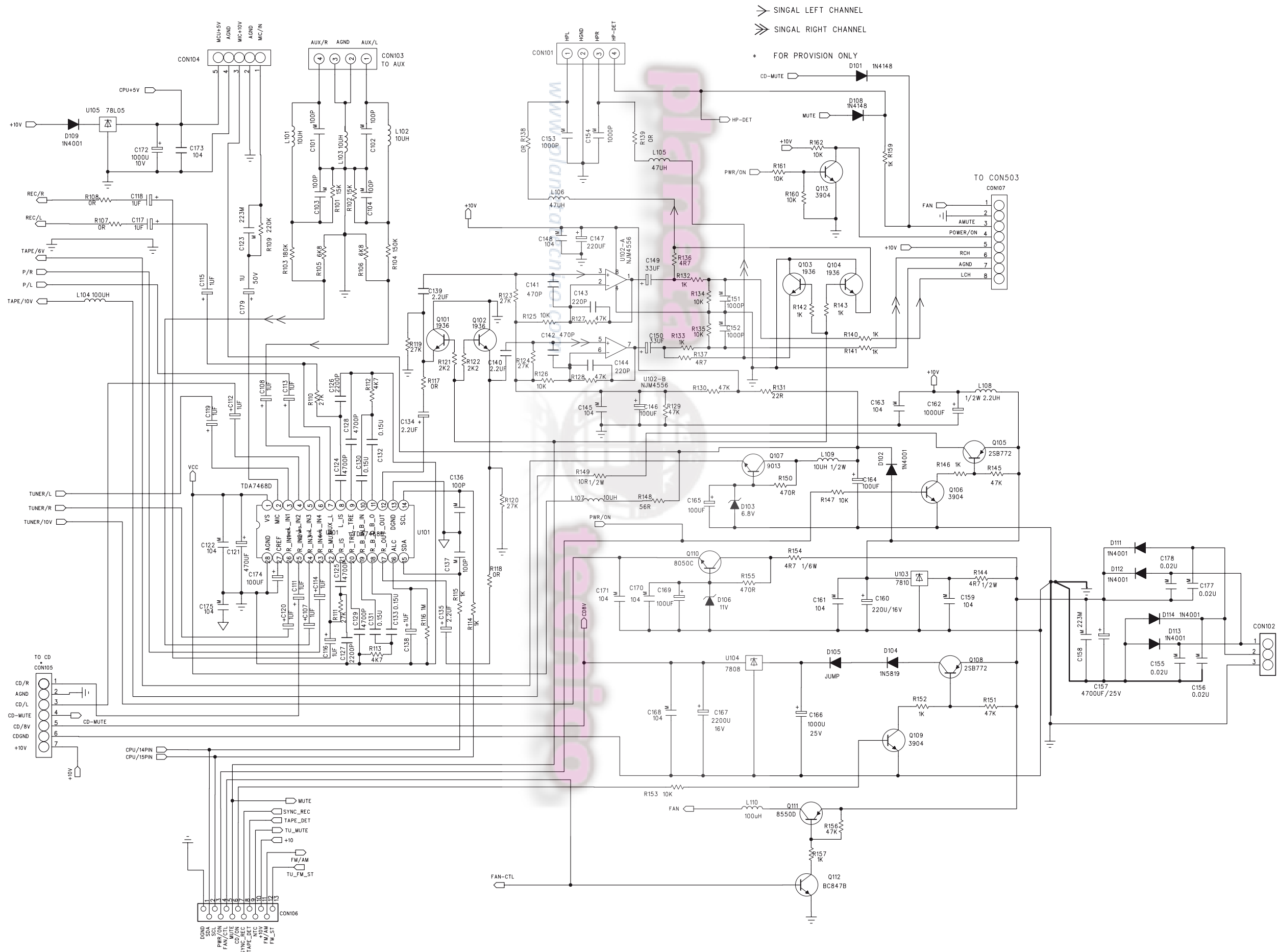
PCB LAYOUT - MAIN BOARD (TOP VIEW)



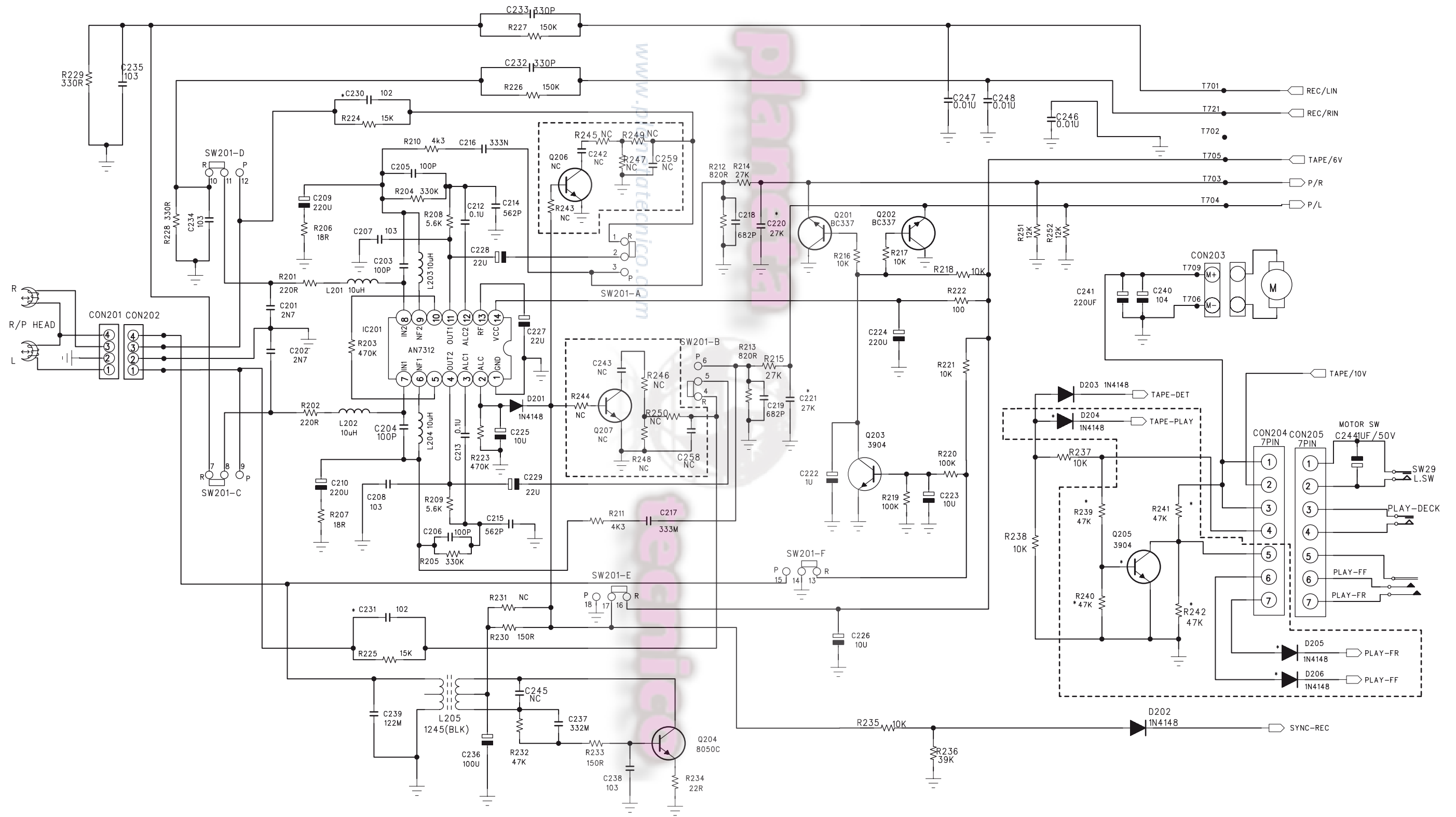
PCB LAYOUT - MAIN BOARD (BOTTOM VIEW)



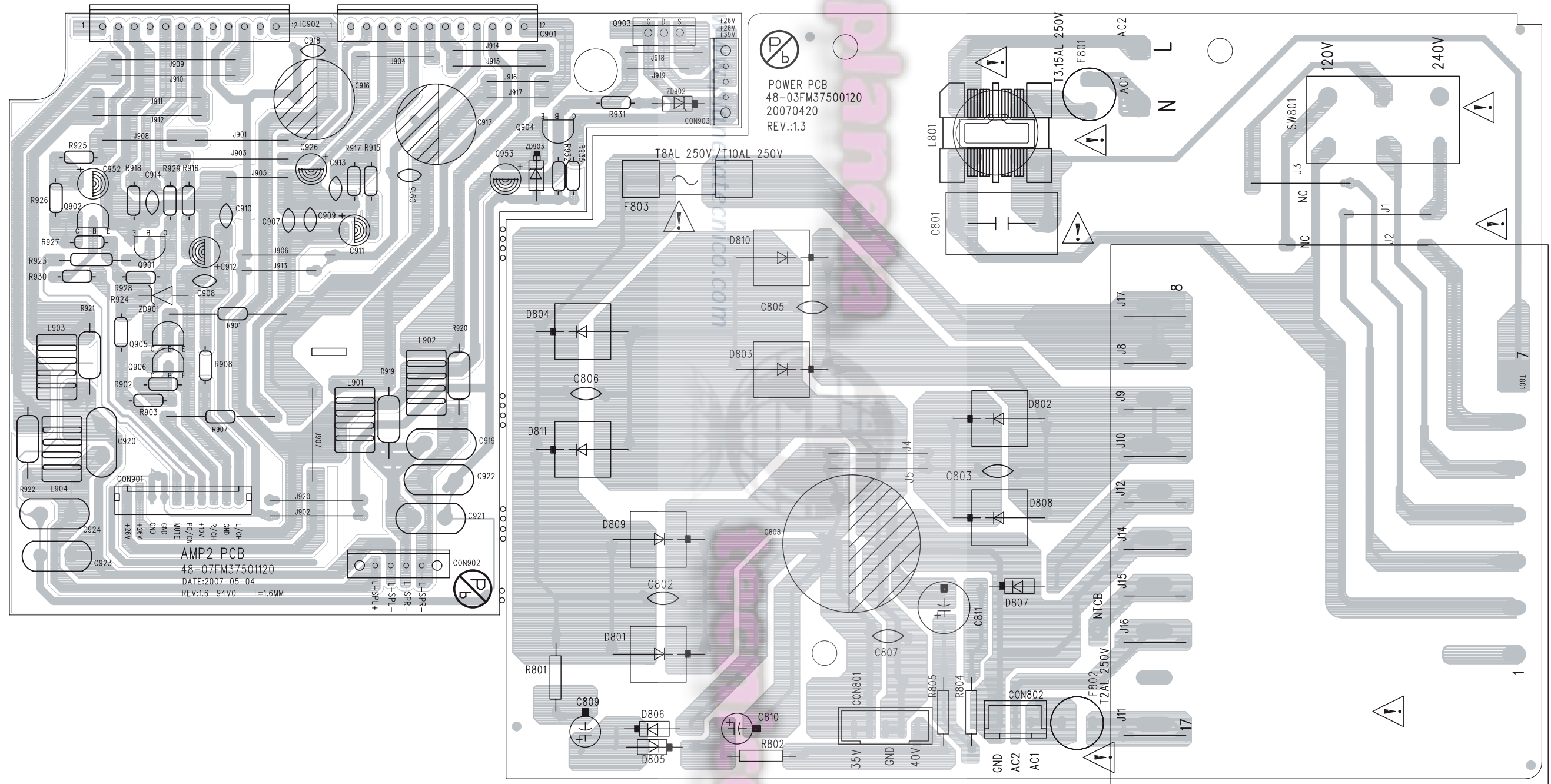
CIRCUIT DIAGRAM - MAIN BOARD



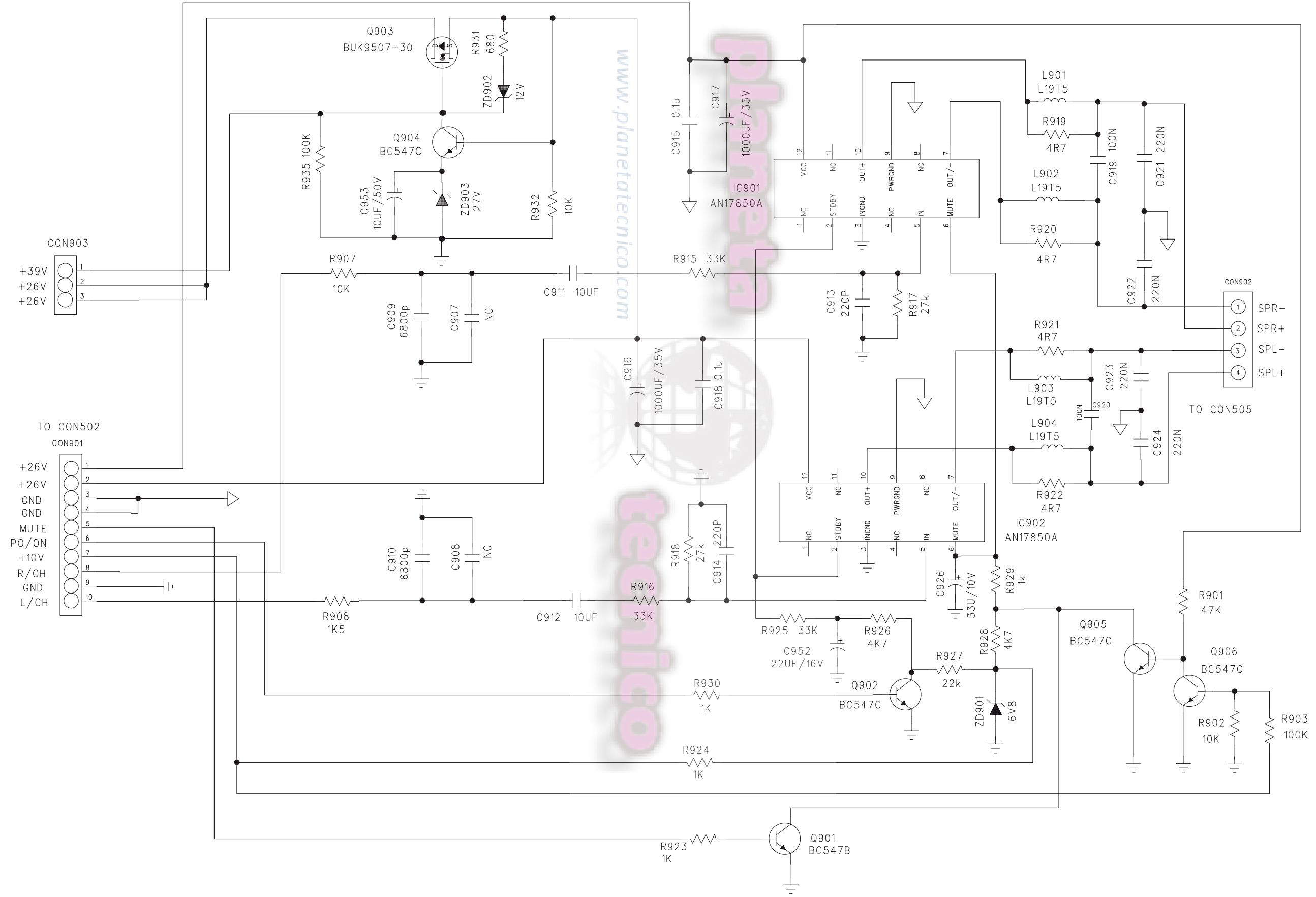
CIRCUIT DIAGRAM - MAIN BOARD TAPE PART



PCB LAYOUT - POWER /LOW AMP BOARD (TOP VIEW)

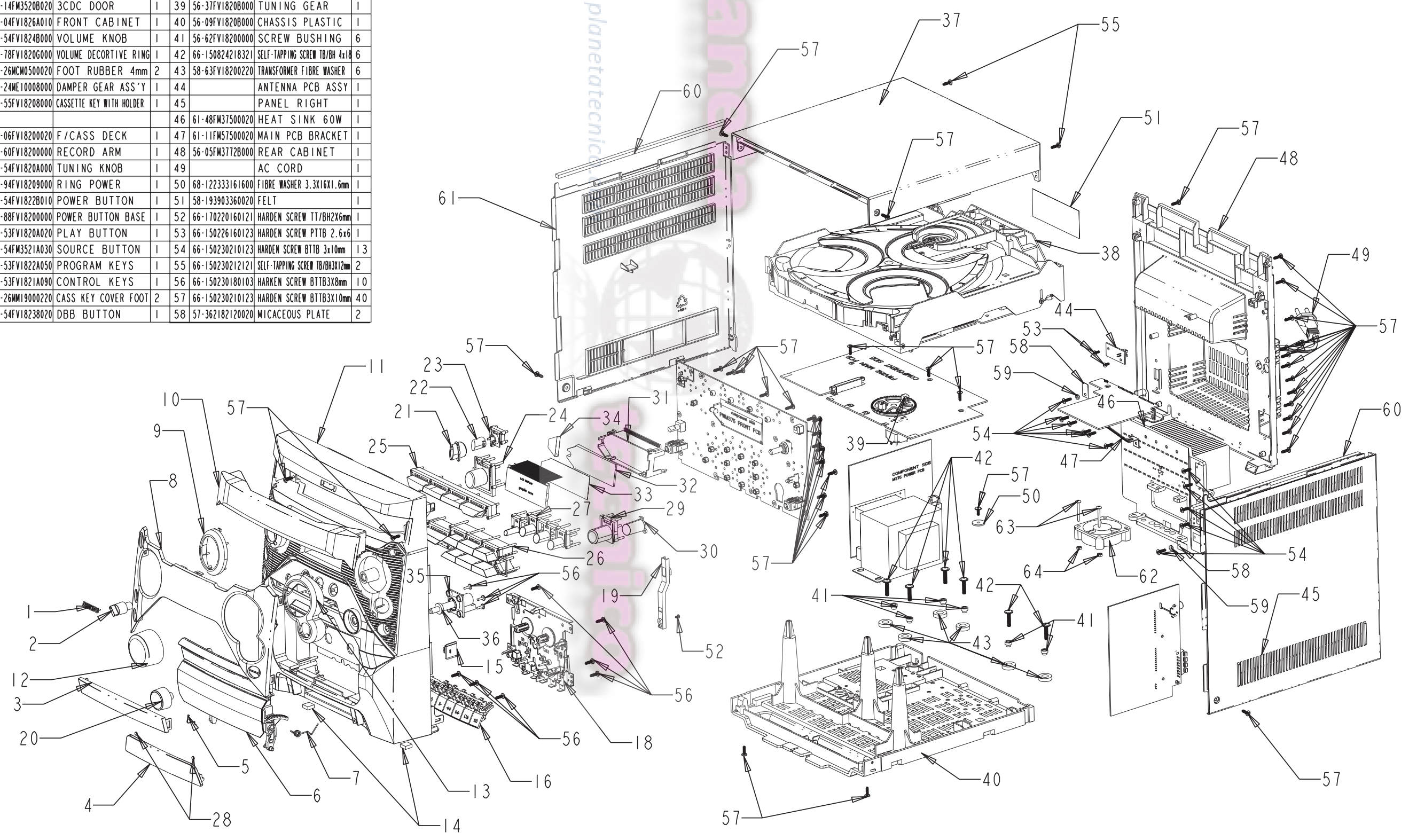


CIRCUIT DIAGRAM - LOW AMP BOARD



SET MECHANICAL EXPLODED VIEW

ITEM	PART NO.	NAME	QTY	ITEM	PART NO.	NAME	QTY	ITEM	PART NO.	NAME	QTY
1	56-58FV18200000	BADGE PHILIPS	1	30	56-94FV18219000	DBB LIGHT GUIDE	1	59	58-67V820000020	SCREW SPACER	2
2	56-54FV1821B000	MIC KNOB	1	31	56-07FV18239000	LCD DISPLAY BRACKET	1	60	58-82FM35200020	SPONGE 253x4x6	2
3	56-57FV18201000	CASSETTE DOOR LENS	1	32	56-57FV18220010	LCD LIGHT GUIDE	1	61		PANEL LEFT	1
4	56-13FV1821A050	CASS KEYS DOOR	1	33	57-26FV18200120	REFLECTION PAPER	1	62	58-44FM37500020	FAN	1
5	61-97MM19000120	CASS KEY COVER SPING	1	34	57-26FV18200020	MIRRON SHEET	1	63	66-120230225321	SCREW MS/BH3x25	2
6	56-13FV1820A050	CASSETTE DOOR	1	35	56-07FV1824B000	TUNING HOLDER	1	64	67-0212310000P0	NUI	2
7	61-97MM3500220	SPRING-RIGHT	1	36	56-79FV1820B000	TUNING SHAFT	1				
8	56-57FV18208010	DISPLAY LENS	1	37		TOP COVER	1				
9	56-78FV1821G000	KEYS DECORTIVE RING	1	38	06-20FM35200000	3CDC MECHA CASING ASS'Y	1				
10	56-14FM3520B020	3CDC DOOR	1	39	56-37FV1820B000	TUNING GEAR	1				
11	56-04FV1826A010	FRONT CABINET	1	40	56-09FV1820B000	CHASSIS PLASTIC	1				
12	56-54FV1824B000	VOLUME KNOB	1	41	56-62FV18200000	SCREW BUSHING	6				
13	56-78FV1820G000	VOLUME DECORTIVE RING	1	42	66-150824218321	SELF-TAPPING SCREW TB/BH 4x18	6				
14	58-26MCM0500020	FOOT RUBBER 4mm	2	43	58-63FV18200220	TRANSFORMER FIBRE WASHER	6				
15	56-24ME10008000	DAMPER GEAR ASS'Y	1	44		ANTENNA PCB ASSY	1				
16	56-55FV18208000	CASSETTE KEY WITH HOLDER	1	45		PANEL RIGHT	1				
17				46	61-48FM37500020	HEAT SINK 60W	1				
18	20-06FV18200020	F/CASS DECK	1	47	61-11FM57500020	MAIN PCB BRACKET	1				
19	56-60FV18200000	RECORD ARM	1	48	56-05FM3772B000	REAR CABINET	1				
20	56-54FV1820A000	TUNING KNOB	1	49		AC CORD	1				
21	56-94FV18209000	RING POWER	1	50	68-122333161600	FIBRE WASHER 3.3X16X1.6mm	1				
22	56-54FV1822B010	POWER BUTTON	1	51	58-193903360020	FELT	1				
23	56-88FV18200000	POWER BUTTON BASE	1	52	66-170220160121	HARDEN SCREW TT/BH2X6mm	1				
24	56-53FV1820A020	PLAY BUTTON	1	53	66-150226160123	HARDEN SCREW PTTB 2.6x6	1				
25	56-54FM3521A030	SOURCE BUTTON	1	54	66-150230210123	HARDEN SCREW BTB 3x10mm	13				
26	56-53FV1822A050	PROGRAM KEYS	1	55	66-150230212121	SELF-TAPPING SCREW TB/BH3X12mm	2				
27	56-53FV1821A090	CONTROL KEYS	1	56	66-150230180103	HARKEN SCREW BTB3X8mm	10				
28	58-26MM19000220	CASS KEY COVER FOOT	2	57	66-150230210123	HARDEN SCREW BTB3X10mm	40				
29	56-54FV18238020	DBB BUTTON	1	58	57-362182120020	MICACEOUS PLATE	2				



MECHANICAL & ACCESSORIES PARTS LIST

2	996510001341	MIC KNOB	CON106	996510005264	13P FFC 1.25mm L160mm
3	994000004584	CASSETTE DOOR LENS	CON701	994000004487	16P FFC 1MM L=170MM
4	996510001335	CASS KEYS DOOR	CON704	994000004457	5P FFC L=200MM(AA)
5	994000004379	CASSETTE KEY COVER SPRING	CON705	996510005265	13P FFC 1.25mm L350mm
6	996510005269	CASSETTE DOOR	FAN1	996510005279	FAN 3700R/MIN JD5015LS1
7	994000001267	SPRING -RIGHT	82	994000003669	CD MECHANISM (SANYO) DA11VF
8	996510005277	DISPLAY LENS	83	996510005261	REMOTE CONTROL
9	994000004588	KEYS DECORTIVE RING	84	996510005263	SPK BOX L+R 4X50W 6R
10	996510005270	3CDC DOOR	85	996510005260	PCBA-3CD "FWM375/78"
11	996510005267	FRONT CABINET	J001	996510009411	14P FFC 1.25mm L160mm
12	994000004582	VOLUME KNOB	J007	994000001192	AM LOOP ANTENNA LAN-031
13	994000004587	VOLUME DECORTIVE RING	T801	△ 996510005262	TRANSFORMER EI76 127/240V /77
15	994000001295	DAMPER GEAR ASS'Y	T801	△ 996510009410	TRANSFORMER EI76 240V/50Hz /05
16	994000004583	CASSETTE KEY WITH HOLDER			
18	994000004374	CASS DECK CS-21SC-820DT			
19	994000004586	RECORD ARM			
20	996510005275	TUNING KNOB			
21	994000004591	RING POWER			
22	996510005276	POWER BUTTON			
23	994000004589	POWER BUTTON BASE			
24	996510005271	PLAY BUTTON			
25	996510005274	SOURCE BUTTON			
26	996510005273	PROGRAM KEYS			
27	996510005272	CONTROL KEYS			
28	996510001331	CASSETTE KEY COVER FOOT			
29	996510001342	DBB BUTTON			
30	996510001344	DBB LIGHT GUIDE			
35	996510009413	TUNING HOLDER			
36	996510005278	TUNING SHAFT			
37	994000001285	TOP COVER			
38	996510005259	3CDC MECHA PART			
39	994000004641	TUNING GEAR			
40	996510009414	CHASSIS PLASTIC			
48	996510005268	REAR CABINET			
49	996510009412	AC CORD SET BS 1.83M /05			
49	△ 996510005266	AC CORD IRAM APP 1.88M /77			
57	994000001277	PANEL RIGHT			
61	994000001276	PANEL LEFT			

Note: Only these parts mentioned in the list are normal service parts.

ONLY FOR FWM375/05**ELECTRICAL PARTS LIST - FRONT BOARD ELECTRICAL PARTS LIST - MAIN BOARD**

D401	996500042437	CH-DIODE SS14 SMA/DO-214AC	C157	996510001309	E.CAP 4700UF 25V +-20% (PH)
D404	994000001234	LED LAMP 3MM (RED)	CF301	994000002857	CERAMIC FILTER SFU450B
D405	994000001234	LED LAMP 3MM (RED)	CF302	996510001947	CERAMIC FILTER LT10.7MA5-A
D406	996510005256	LED LAMP 4mm (WHITE)	CF303	994000005389	DISC. FILTER JT10.7MG33-A
D412	994000004341	SMD DIODE BAV99L	D108	996510009404	DIODE LS4148 (LS-34)
IC401	996510009406	MCU GY389A (OTP)	D111	994000003938	RECTIFIER DIODE RL-202
IC402	996510002119	IC TA7291S	D112	994000003938	RECTIFIER DIODE RL-202
JACK401	994000004543	V/PHONE JACK (BLK)	D113	994000003938	RECTIFIER DIODE RL-202
JACK402	994000004543	V/PHONE JACK (BLK)	D114	994000003938	RECTIFIER DIODE RL-202
LCD401	996510005257	LCD DISPLAY SDH-DA1563-TP-1	D202	996510009404	DIODE LS4148 (LS-34)
REM401	994000004367	OPTIC SENSER FM-6038TM2-5AN	D203	996510009404	DIODE LS4148 (LS-34)
SW401	994000001243	TACT SWITCH	D305	996500039372	SWITCHING DIODE 1SS133-T-77
SW402	994000001243	TACT SWITCH	D306	996500039372	SWITCHING DIODE 1SS133-T-77
SW403	994000001243	TACT SWITCH	IC201	994000004533	IC YD7312
SW404	994000001243	TACT SWITCH	IC301	994000005387	IC TA2180FN
SW405	994000001243	TACT SWITCH	L205	994000004538	I.F.T 10148BK7
SW406	994000001243	TACT SWITCH	L302	996510005254	MW OSC COIL-7MM OH07-821658NP
SW407	994000001243	TACT SWITCH	L306	994000004611	I.F.T 7MM #7M1A2224N
SW408	994000001243	TACT SWITCH	L307	994000003653	BOBBIN COIL WHITE 1 1/2T
SW409	994000001243	TACT SWITCH	PVC301	996510009405	P.V.C 126/20P T443DF-4DF43Z-HQ
SW410	994000001243	TACT SWITCH	Q101	996510001308	TRANS. 2SD1936U
SW411	994000001243	TACT SWITCH	Q102	996510001308	TRANS. 2SD1936U
SW412	994000001243	TACT SWITCH	Q103	996510001308	TRANS. 2SD1936U
SW413	994000001243	TACT SWITCH	Q104	996510001308	TRANS. 2SD1936U
SW414	994000001243	TACT SWITCH	Q105	994000001193	TRANSISTORS KSB772YS
SW415	994000001243	TACT SWITCH	Q106	994000004338	SMD TRANSISTORS PMBT3904
SW416	994000001243	TACT SWITCH	Q107	994000004142	NPN TRANSISTORS 9013G 1W
SW417	994000001243	TACT SWITCH	Q108	994000001193	TRANSISTORS KSB772YS
SW418	994000001243	TACT SWITCH	Q109	994000004338	SMD TRANSISTORS PMBT3904
U403	994000002839	IC LM1117S-3.3	Q110	996500038609	TRANSISTORS 2W 8050C
VOL401	994000001241	ROTARY ENCODER	Q111	996500039346	TRANSISTORS 2W 8550D
VR401	994000001324	ROTARY VOLUME 20K	Q113	994000004338	SMD TRANSISTORS PMBT3904

ELECTRICAL PARTS LIST - HI AMP BOARD

IC501	996510005249	IC AN17850A	Q302	994000003937	SMD TRANSISTORS PMBT3906
IC502	996510005249	IC AN17850A	Q303	994000004338	SMD TRANSISTORS PMBT3904
IC503	996500041829	IC YD4558	Q304	994000004338	SMD TRANSISTORS PMBT3904
JCK501	994000001221	V/RCA JACK 2P	Q305	994000004338	SMD TRANSISTORS PMBT3904
JCK502	996510001315	SPK JACK (R/R/BLUE/BLUE/BLKx4)	Q306	994000002833	TRANSISTORS 9018G
L501	994000001217	AIR COIL 6X18.5T (0.5MM)	Q307	996510001308	TRANS. 2SD1936U
L502	994000001217	AIR COIL 6X18.5T (0.5MM)	Q308	996510001308	TRANS. 2SD1936U
L503	994000001217	AIR COIL 6X18.5T (0.5MM)	SW201	994000004539	PUSH SWITCH
L504	994000001217	AIR COIL 6X18.5T (0.5MM)	T301	994000005392	I.F.T 7.6X7.6MM A702 (YELLOW)
Q501	994000004545	TRANSISTORS BUK9507-30B	U101	996510005250	IC TDA7468D

ELECTRICAL PARTS LIST - MAIN BOARD

U102	994000001201	IC NJM4556AM
U103	996500038611	IC KA7810E
U104	994000000253	IC (SAMSUNG) KA7808
U105	996510003984	IC CYT78L05 (TO-92)

ELECTRICAL PARTS LIST - POWER/LOW AMP BOARD

C801	994000001225	SAFETY CAP 275V 0.22UF -20%
C808	996510005247	E.CAP 4700UF 50V +-20% 85C
F801	994000004599	FUSE RADIAL T3.15A 250V
F802	994000001222	FUSE RADIAL LT 2A 250V
F803	996510005248	GLASS FUSE 5x20mm T8AL/250V
IC901	996510005249	IC AN17850A
IC902	996510005249	IC AN17850A
L801	994000001226	AC LINE FILTER IND. 400UH 3A
Q802	996500038609	TRANSISTORS 2W 8050C
Q803	996510000849	NPN TRANSISTORS 9014C
Q903	994000004545	TRANSISTORS BUK9507-30B
T802	994000000262	TRANSFORMER EI-28 AC230V
U801	996510003984	IC CYT78L05 (TO-92)
Y801	996500039818	RELAY ME-7-006-HSL DC6V AC10A

REVISION LIST

1.0 Manual 3141 785 31930

Initial Service Manual released.

1.1 Manual 3141 785 31931

In this edition, the version /05 has been added.

- 1) Page 8-2 Mechanical & Accessories Parts List updated.
- 2) Page 8-4 have been added with version /05 Eletrical Partslist.

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