

Service
Service
Service



Service Manual



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Published by SW 1109 Service Audio Subject to modification

3141 785 36000

Version 1.0



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	Power supply	Tone Control	AF-Amplifier	Loudspeaker	
Active components			BF3602		1
Passive components				2 X 8Ω, 2W	3
					4
GENERAL part:					
Aux in jack type	Ø 3.5mm				5
Loudspeaker filter, high pass	None				6
Loudspeaker filter, low pass	None				7
Power stage protection	Temperature – YES; Short circuit – YES				8
Public address	No				9
INDICATORS:					
Output power or VU-meter	No				11
Frequency response	No				12
Low power (battery)	No				13
					14
ELECTRICAL DATA:					
TONE/EQUALIZER/DBB					
DSC	Balance control		No		15
	Mechanical noise (ISO 1996)				16
	Noise overall (ISO)				17
	Channel difference at -46dB		Type: < 3 dB		18
	Hum (vol.max.-20dB to vol.min.)		Limit: 2mV		19
	Residual noise(volume min)		Limit: 2mV		20
DBB on (Vol.max.-20dB): 100Hz, +6dB (±2dB) w.r.t. 1kHz at DBB on				DBB has no dynamic, fixed to 6dB	21
DBB off (Vol.max.-20dB): 100Hz, -2dB (±2dB) w.r.t. 1kHz at DBB on					22
Input sens.:Nom.	500	mV			23
for 50mW Limit:	600	mV			24
Line outp.: Nom.		mV			25
voltage Limit:		mV			26
OUTPUT POWER:					
Mains operation:	D=10%	2 X 1W 8Ω	Limit: -1dB		27
Battery operation:	D=10%	2 X 1W 8Ω	Limit: -1dB		28
Music power (MPO) / (PMPO):	(acc. to DIN45324)				29
Short term maximum output power:	-		(acc. to IEC 60268-15)		30
Long term maximum output power:	-		(acc. to IEC 60268-15)		31
Headphone output voltage/power:	n.a.				32
Bandwidth FTC – 1dB at:	n.a.		(acc. to FTC/16/1/D/432)		33
Bandwidth DIN – 3dB at:	-		(acc. to IEC 60268-15)		34
Frequency response at Vol. max – 20dB:	typ. 60Hz to 20kHz (±3dB)				35
LOUDSPEAKER (output):					
Low pass crossover frequency:	--	kHz	tolerance:	Hz	36
High pass crossover frequency:	--	kHz	tolerance:	Hz	37
Short term maximum output power:	--	W (acc. to IEC 60268-15)			38
Long term maximum output power:	--	W (acc. to IEC 60268-15)			39
Frequency response at:	--	Hz		kHz	41
REMARKS:					
27 : Measured in Tuner mode;					
28: CD or Tape mode.					

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TAPE function: (ECO-MTF-PA-SD-MS (FE) Module)

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General description:

Tape transport	Tanashin CS-21V-818FDT (VALLAY WOOD)	E Head TDK PH-SY-237	R/P Head Apollo T21V1BBA	1
				2
	Inputs	Outputs	Motor/control	
Active components			Mabuchi EG530AD-9B	3
Passive components				4
				5
	Noise suppression	Magnetic Erase	Recording/PB	ALC
Active components	CSC7323(海威)			7
Passive components	CSC7323(海威)		R/P Head Apollo T21V1BAA	8

Mechanical specification:

Tape speed	4.76 cm/s		Auto stop	Yes	9
Speed control	%		Auto reverse	No	10
Wow and flutter	< 0.48% JIS Unwtd. %		Wind/rewind	Yes	11
Fast wind/rewind (C60)	Nom=150s, Lim<170s		Mono: REC/PB	No	12
No. of tracks	1 (stereo)		Stereo: REC/PB	Yes	13
Mech. noise (ISO 1996)	<38 dBA (play mode)		Mixing	No	14
Noise overall	<46 dBA		Monitoring	Continuous	15
Tape (PB)	IEC I		Remote controlled	No	16
Tape (REC)	IEC I		ECM	No	17
Recording level	ALC (Auto)		Pitch control	No	18
Noise reduction system	No		Cue/review	No	19
Sound improvement system	No				20

Indicators:

Recording level	No	21
Play back level	No	22
Tape counter	No	23

Electrical data:

Bias system FM/AM	AC = 80 kHz ±1.5 kHz	24
RIF switch	No	25
Erase system FM/AM	Permanent Magnet	26
Erasing damping	> 40dB for IEC I at 1kHz	27
Channel separation (IEC1)	> 15 dB at 1kHz	28
Track separation (IEC1)	> 45 dB at 1kHz	29
Frequency response (PB)	125 to 8000 for IEC I at 10dB (6dB for the range of 250Hz to 4kHz)	30
SNR 250nWb/m	> 36dB for IEC I * > 36dB for IEC II **	31
Signal/hiss 250nWb/m	for IEC I for IEC II	32
Signal/hum 250nWb/m	for IEC I for IEC II	33
Channel difference (PB)	< 5 dB (IEC I)	34
Distortion 250nWb/m	< 7 % (IEC I)	35
ALC attack time	< 500 ms (typ. 150ms)	36
ALC release time	> 5 sec. (typ. 15 sec.)	37
Crosstalk	Between forward to reverse track	38

REMARKS: 31: * not according to PQR clause 18.5 class I
31: ** Chromium performance not fulfilled

Amplification Reserve for Tape = 1dB ±2dB
For details, please see specification SH-190 of ECO-MTF-PA-SD (3140 117 14890).

CD-PART: (CD MECHAISM-DA11B3VF)(SANYO)

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Technical description:					
	Input	Output	Motor/control	Logic control	1
Active components			MM1669(Mitsumi)	TC94A29FAG	2
Passive components					3
	Signal processing		HF-preamplifier	Servoprocessor	4
Active components	CSC2157F		CSC2157F	TC94A29FAG	5
Passive components					6
Indicators/Display/Keys:					
Display: Digits LCD for Track No. display					7
Keys: one 4-position slider switch, 6 tact switches on unit, 6 for CD--: Play, Stop, Previous/Search down, Next/Search up, Program/Program review, CD-modes (Repeat/Shuffle)					8
Playability: (acc. To AR 30-05-239)					
	Limit	Typical	Testdisc		9
Wedge	500 μm	700 μm	TNO 7,9 of SBC 444A (7104 099 24990)		10
Eccentric	150 μm	200 μm	TNO 1,24 of 200μm disc (7104 099 24960)		11
Fingerprint	No audible defect		TNO 11of Subchassis 8A		12
Black dot	500 μm	600 μm	TNO 13 of SBC 444A (7104 099 24990)		13
Skew 0.6mm	No audible defect		TNO 1,6 of 0.6mm skew (7104 099 28260)		14
Bad HF track	No audible defect		TNO 8 of Subchassis 8A		15
Heavy fingerprint	No track jumps/plops		TNO 10 of Subchassis 8A		16
Playback position	Horizontal, Normal position (Set is located on a flat surface, floor)				17
- Playback of above mentioned tracks possible without track loss or audible defects. - Double black dot, max. diameter, thin/thick disk is according to PQR or AR 30-05-239) - This unit can playback (only) CD-R or CD-RW discs. For performance specification, please refer to module specification of CD99 (3103 308 52190)					18
Shock resistance: (acc. to AR 13-A6-CD-068)					
± Z axis	5 G				19
± X or Y axis	5 G m				20
Acoustical noise:					
Mode: Play/Pause	35 dBA max. (45 dbA in Search mode)				21
Mode: Jump (Next)	45 dBA max.				22
AUDIO part: (Measured with Audio Signals Disc-1, 7104 078 04911 on Speakers or Headphone socket with nom. load)					
	Typ.	Limit			23
Output level (TNO1)					24
SNR unwd.	60 dB	48 dB			25
SNR wtd. dBA	65 dBA	57 dBA			26
Crosstalk (1kHz)	40 dB	26 dB			27
Crosstalk (10kHz)	30 dB	16 dB			28
Frequency response	+9dB	±2dB	at 100Hz		29
Vol.max.-20dB (DBB on)	+3dB	±2dB	at 10kHz		
THD (1kHz, -6 dB)	0.2 %	2 %			30
THD (10 kHz, -20 dB)	< 1 %	< 3 %			31
Channel difference	2 dB	3 dB			32
Frequency accuracy	-	+/-0.5 %			33
De-emphasis	15μs / 50μs Switchable via Subcode information				34
REMARKS:					
- Amplification reserve for CD = +2dB (±2dB); Ref. Level for CD is a 0dB track instead of a -6dB track.					35

Feature Specification of MP3 CD

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CODEC / COMPRESSION Format Compatibility			
MP3	X		35
MPEG 2.5	X		36
MP3 Pro	X		37
WMA	X		38
AAC	X		39
Playback CAPACITY			
Maximum number of tracks per CD	X		40
Maximum number of albums per CD	X		41
DISC TYPE			
CD-RW	√		42
CD-R	√		43
8 cm	√		44
12 cm	√		45
DISC SIZE (MB)			
185	√		46
225	√		47
650	√		48
680	√		49
700	√		50
ISO-9660 + Joliet			
ISO-9660 + Joliet	X		51
Joliet	X		52
UDF (Direct CD from	X		53
ID3	X		54
Packet writing	X		55
Multi-session CDDA			
Multi-session CDDA	X		56
Multi-session MP3	X		57
Closed session	√		58
Open session	√		59
Finalized disc	√		60
Unfinalized disc	√		61
CDDA + MP3/WMA			
CDDA + MP3/WMA	X		62
MP3/WMA + CDDA	X		63
MP3/WMA + CDDA + MP3/WMA	X		64
CDDA + MP3/WMA + CDDA			
CDDA + MP3/WMA + CDDA	X		65
Video + CDDA	X		66
CDDA + Data	X		67
MP3/WMA + Data	X		68

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BITRATE (kbps)					
64 -192	X				70
8 - 320	X				71
Variable	X				72
Sampling RATE (kHz)					
8	X				73
11.025	X				74
12	X				75
16	X				76
22.05	X				77
24	X				78
32	X				79
44.1	X				80
48	X				81
96	X				82
UPGRADE ABILITY					
MP3	X				83
MP3 Pro	X				84
WMA	X				85
AAC	X				86
SOUND					
Single Channel	√				87
Dual Channel	√				88
Stereo & joint Stereo	√				89
Intensity Stereo	√				90
MS Stereo	√				91
LANGUAGE SUPPORT					
English	X				92
Chinese	X				93
Playlist Compatibility					
WinAmp	X				94
Realjkebox	X				95
MS Mediaplayer	X				96
MusicMatch	X				97

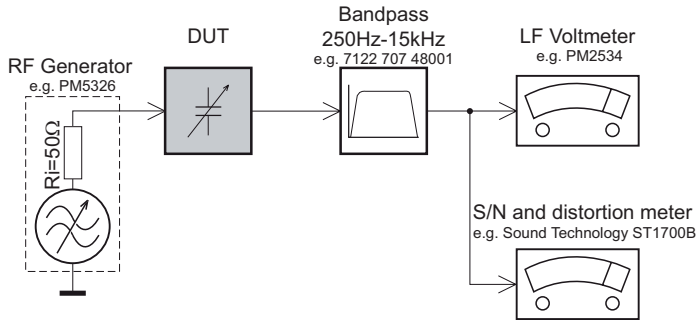
RECORDING PLAYBACK SPECIFICATION:

Sampling frequency/采样率	31 KHZ				
RECORD TIME/复读时间	120S				
PLAY /放音	√				
FD-PLAY/PAUSE 复读/暂停	√				
FL-R/跟读	√				
DIFF/PAUSE 对比/暂停	√				
	REMARK 備註	UP LIMIT 上限	DON LIMIT 下限	NOM 标准	
S/N RATIO 信噪比 (dB)	1kHz, 0 dB (SONY 3 No:23)	55 dB	45 dB	50 dB	1
DISTORTION 失真度 (%)	1kHz, 0 dB	1. 0 %	2. 5 %	1. 5 %	2
PLAYBACK FREQUENCY RESPONSE 复读频率特性	1KHZ	-3 dB	+3 dB	1. 5 dB	3
	125HZ	-2 dB	+2 dB	1 dB	4
	5KHZ	-8 dB	-3 dB	-5 dB	5
	7KHZ	-11dB	-5 dB	-8 dB	6

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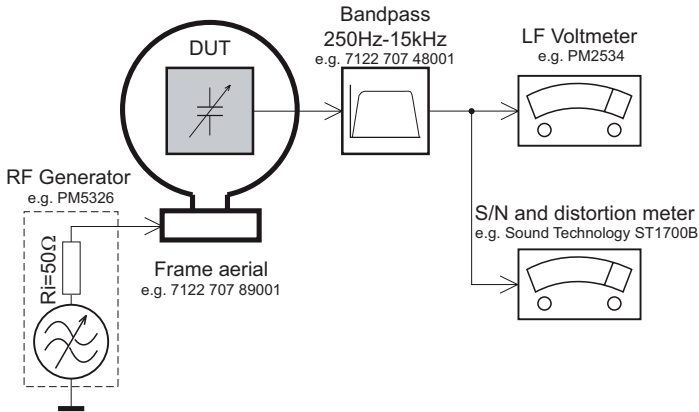
MEASUREMENT SETUP

Tuner FM



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

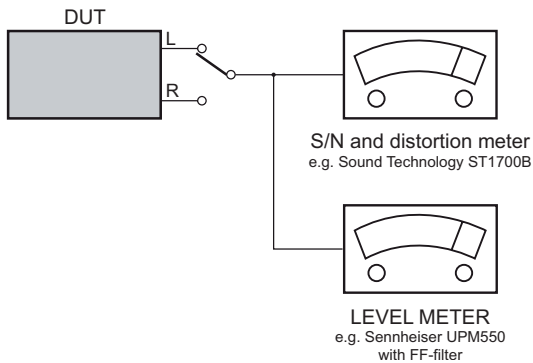
Tuner AM (MW,LW)



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).

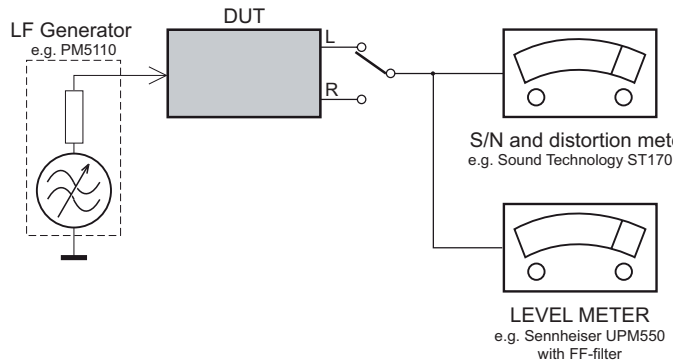
CD

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



Recorder

Use Universal Test Cassette Cr02 SBC419 4822 397 30069 or Universal Test Cassette Fe SBC420 4822 397 30071



SERVICE AIDS

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".

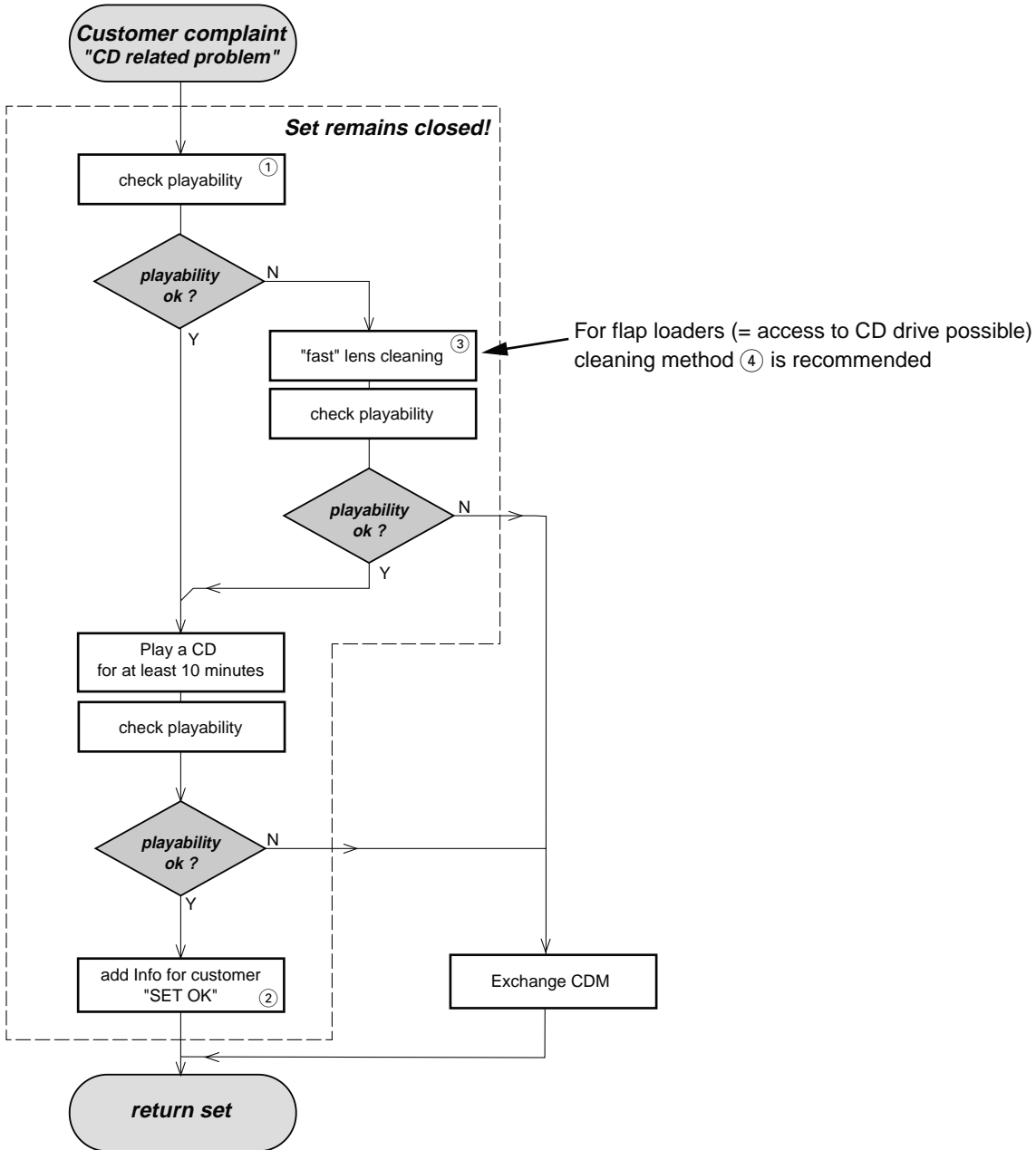
For additional questions please contact your local repair-helpdesk.

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 - ④ 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 Disc7104 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 444A4822 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.

④

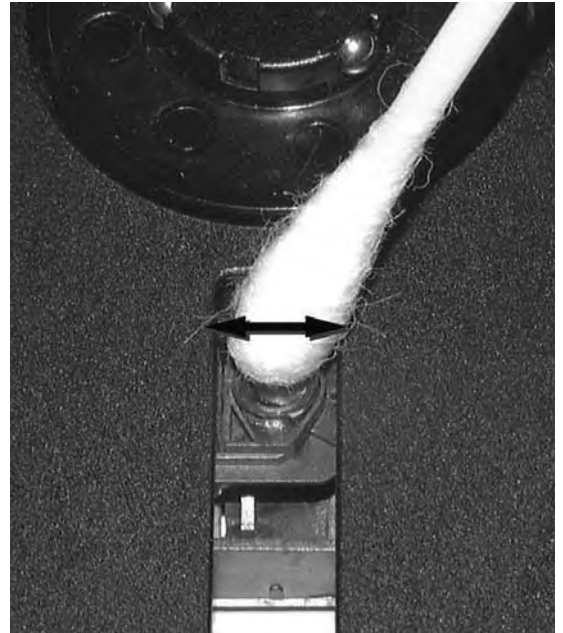
LIQUID LENS CLEANING

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"

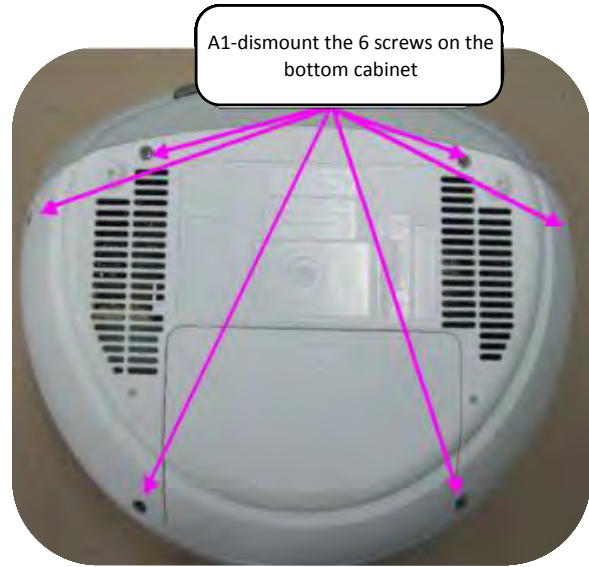
The actuator is a very precise mechanical component and may not be damaged in order to guarantee its full function. Clean the lens gently (don't press too hard) with a soft and clean cotton bud moistened with the special lens cleaner.

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

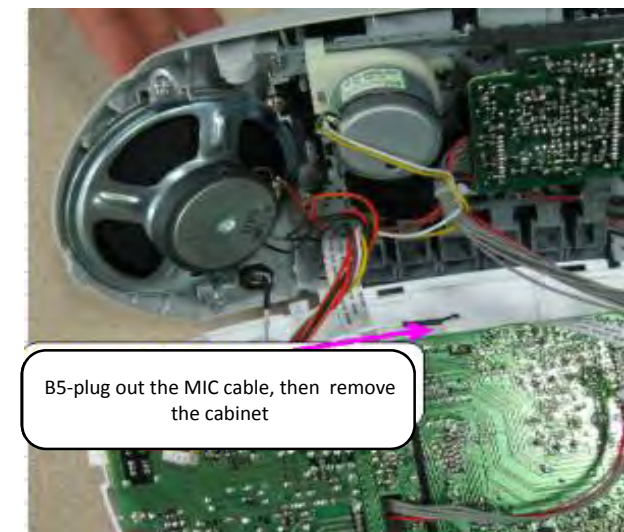
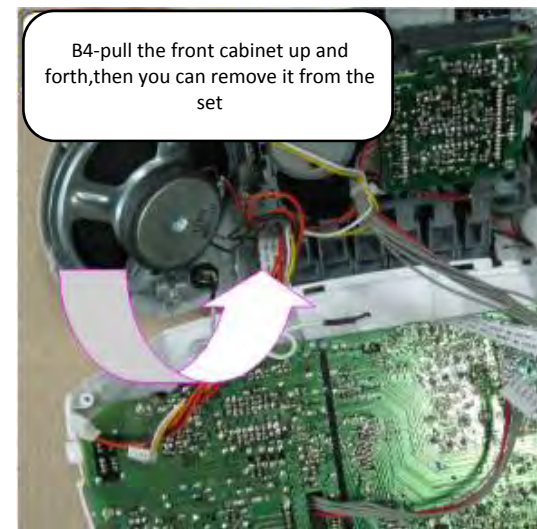
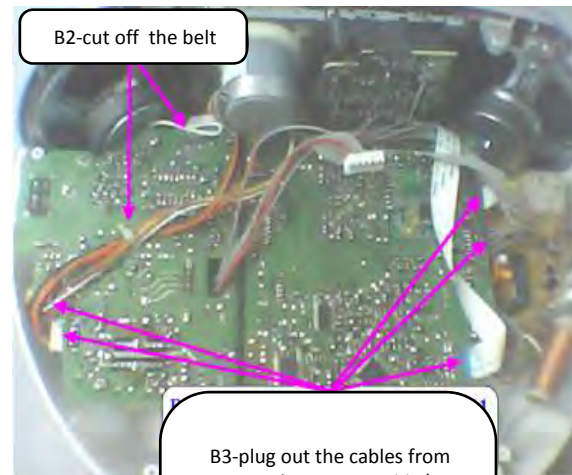
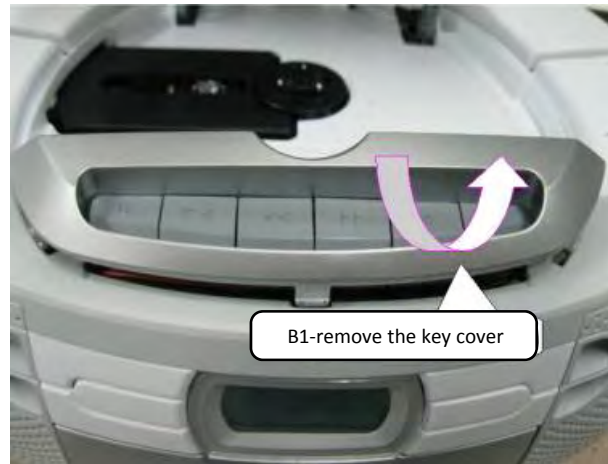


Disassembly diagrams:

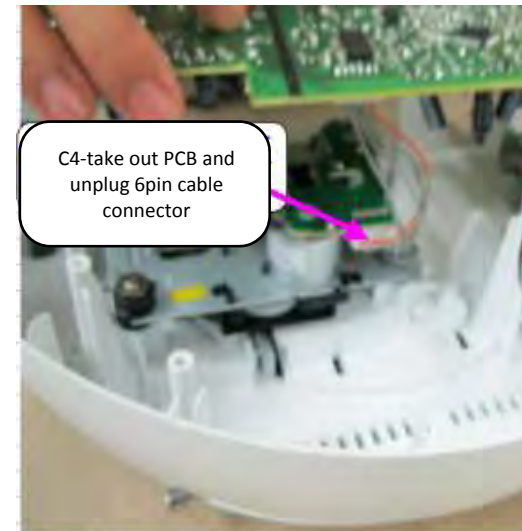
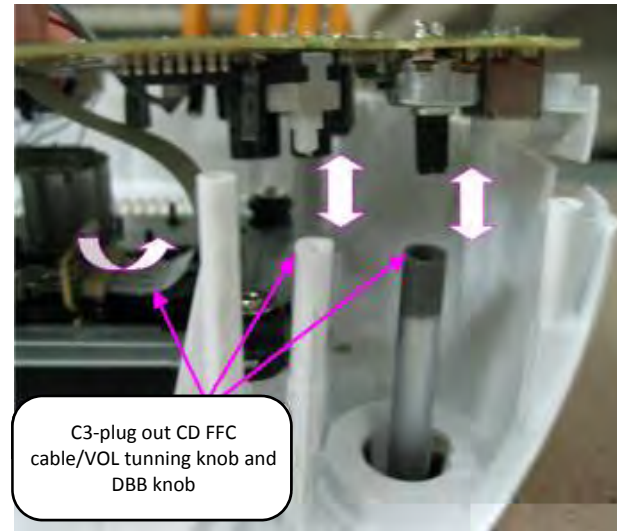
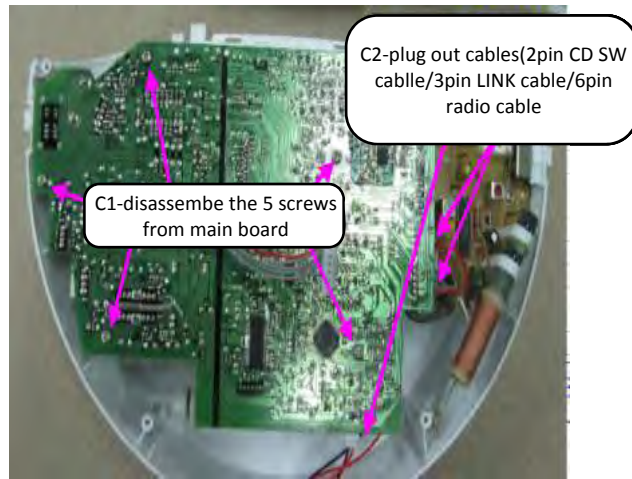
A:Disassemble the bottom cabinet



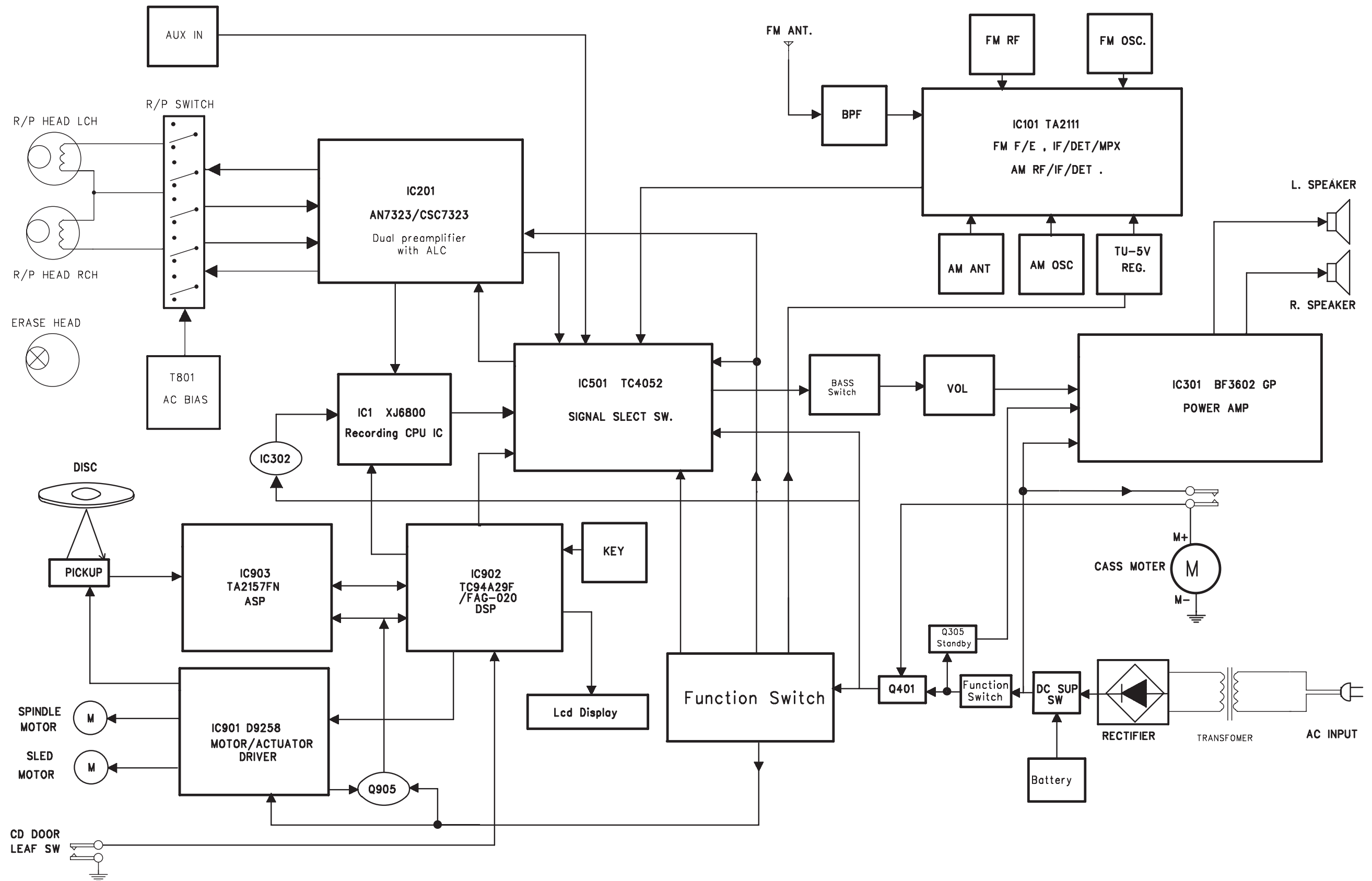
B:Disassemble the front cabinet



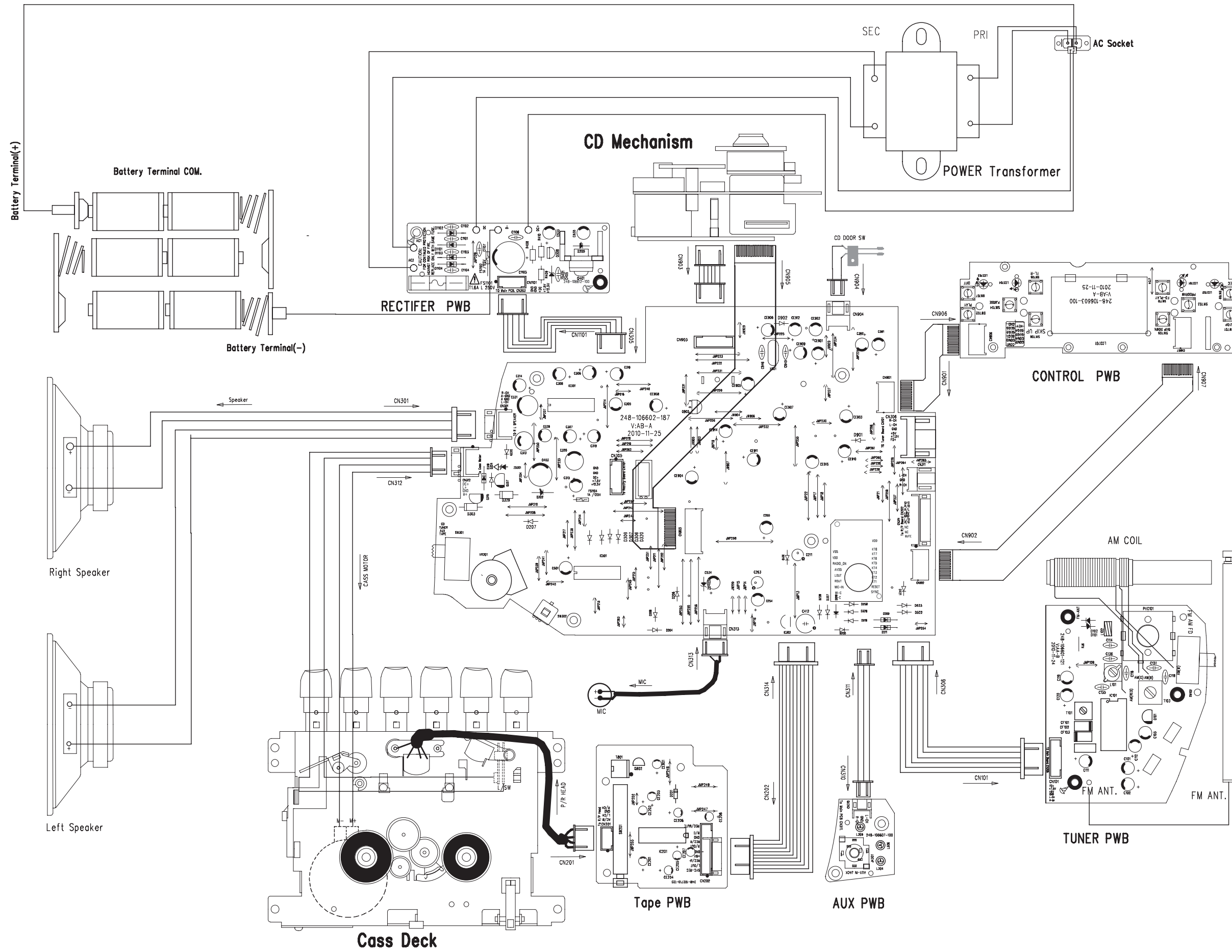
C:Disassemble the Main Board



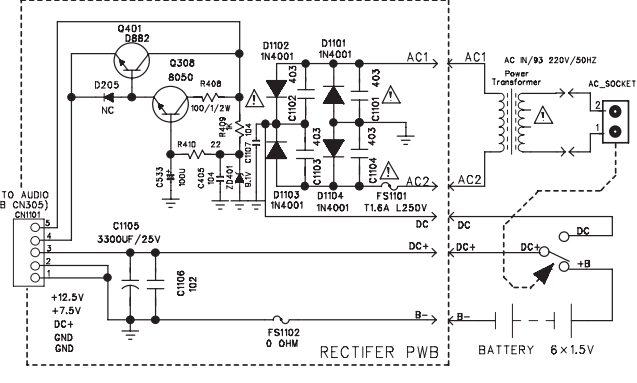
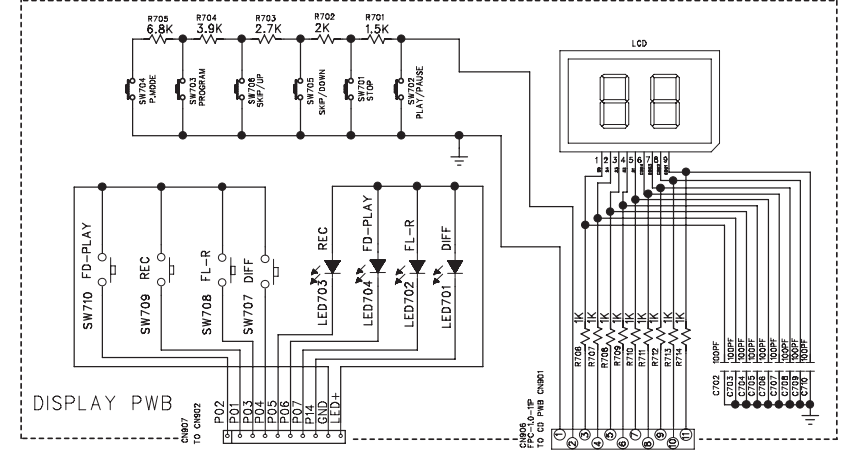
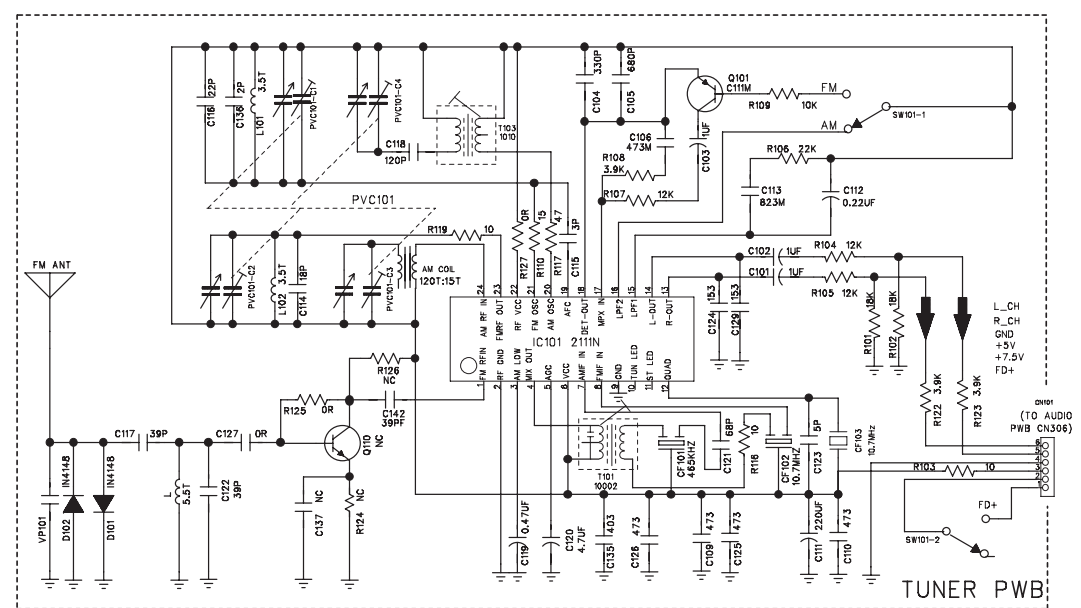
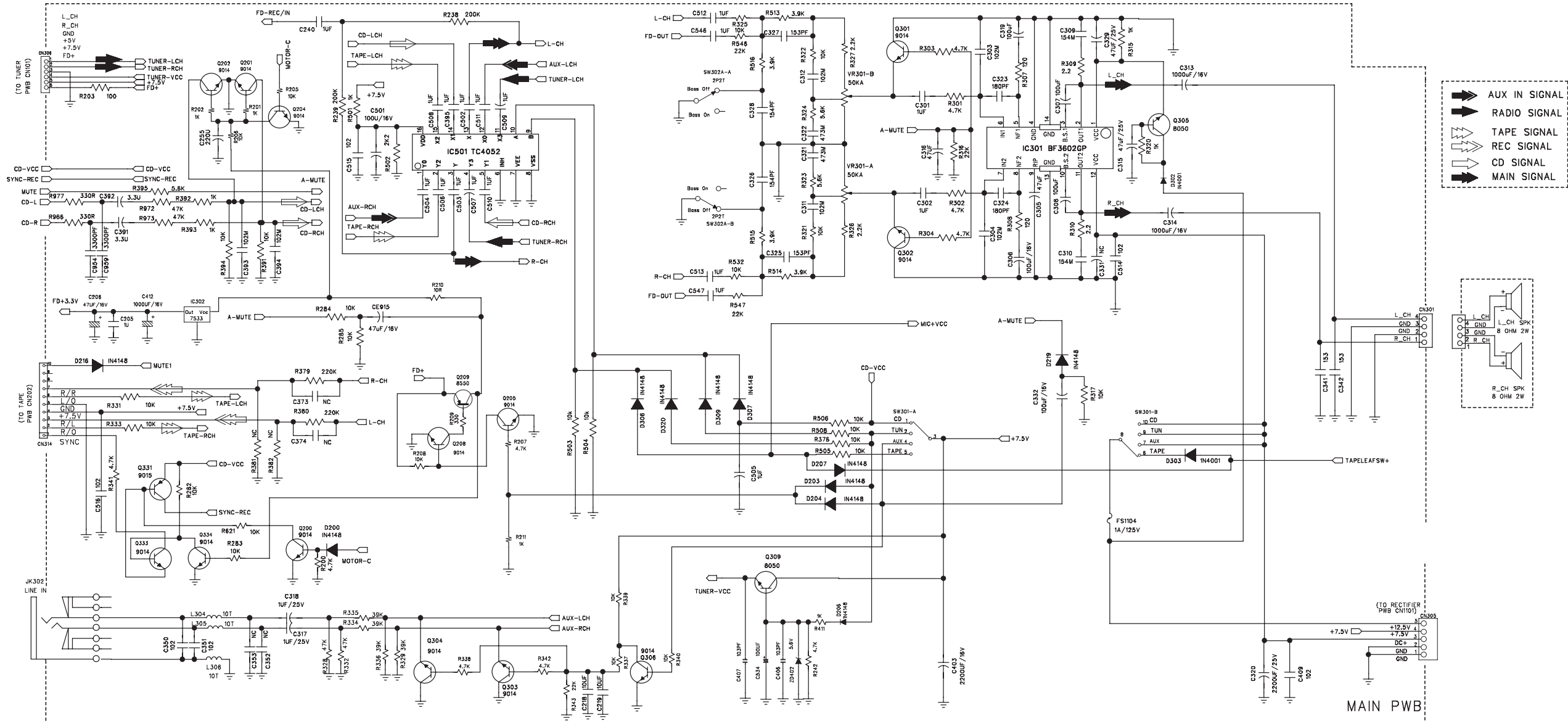
SET BLOCK DIAGRAM



SET WIRING DIAGRAM



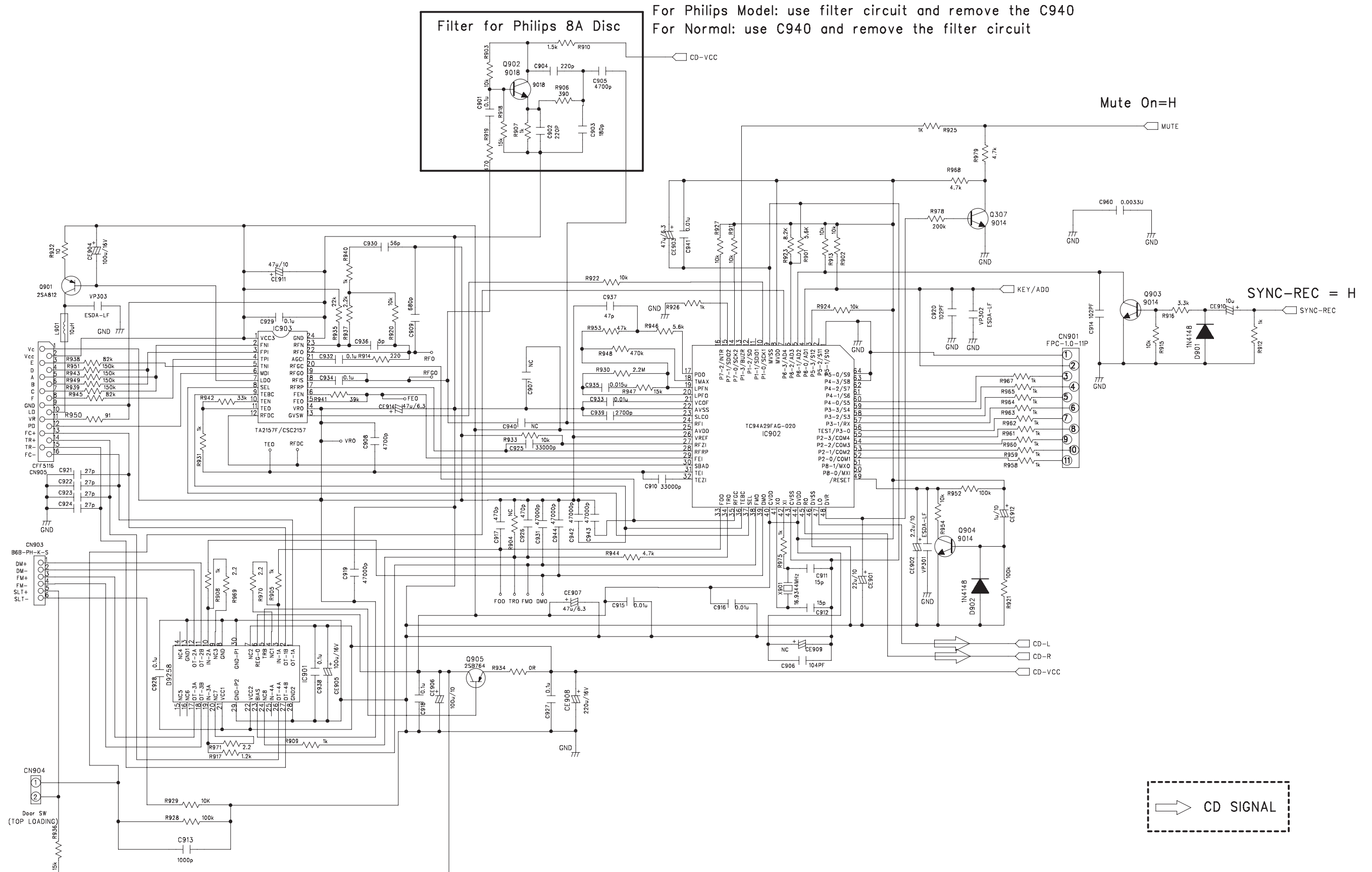
CIRCUIT DIAGRAM - MAIN COMBINED BOARD PART 1



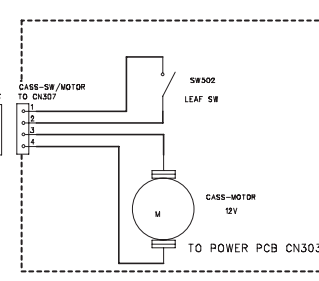
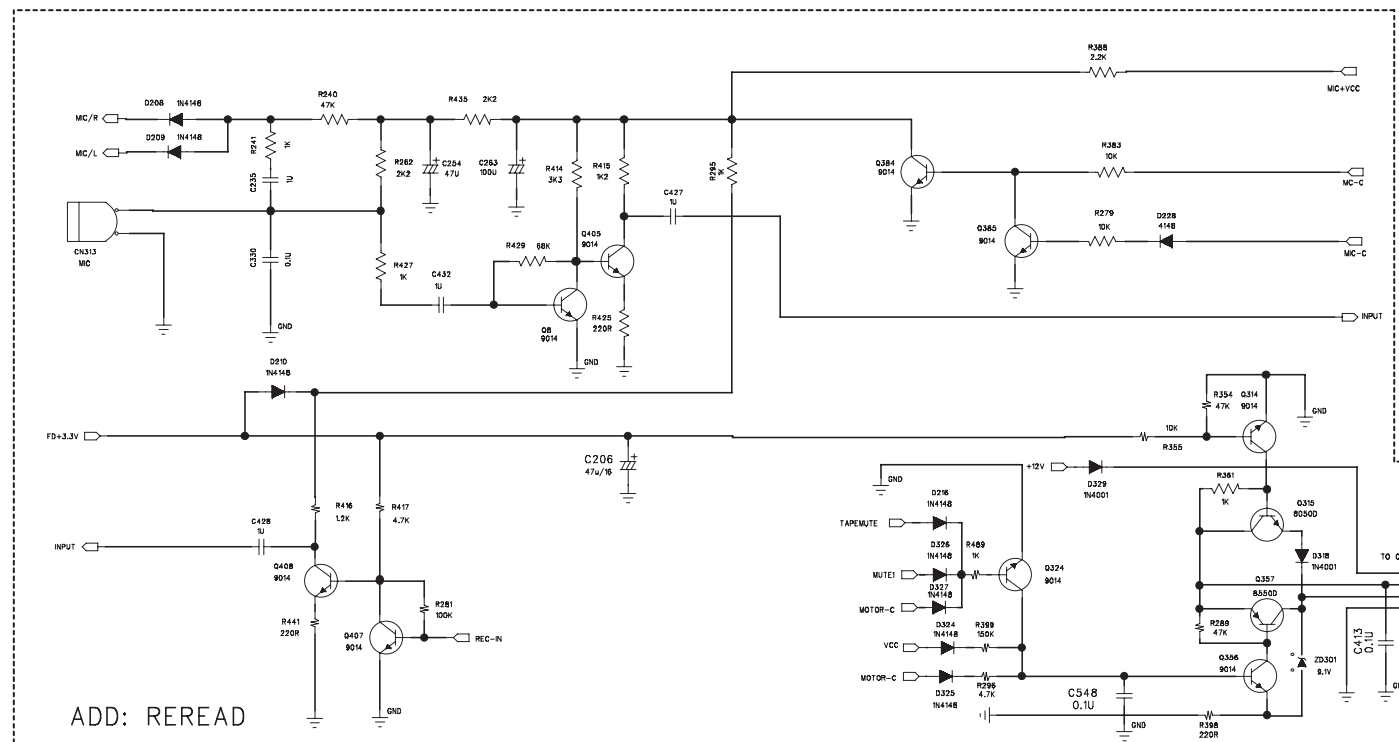
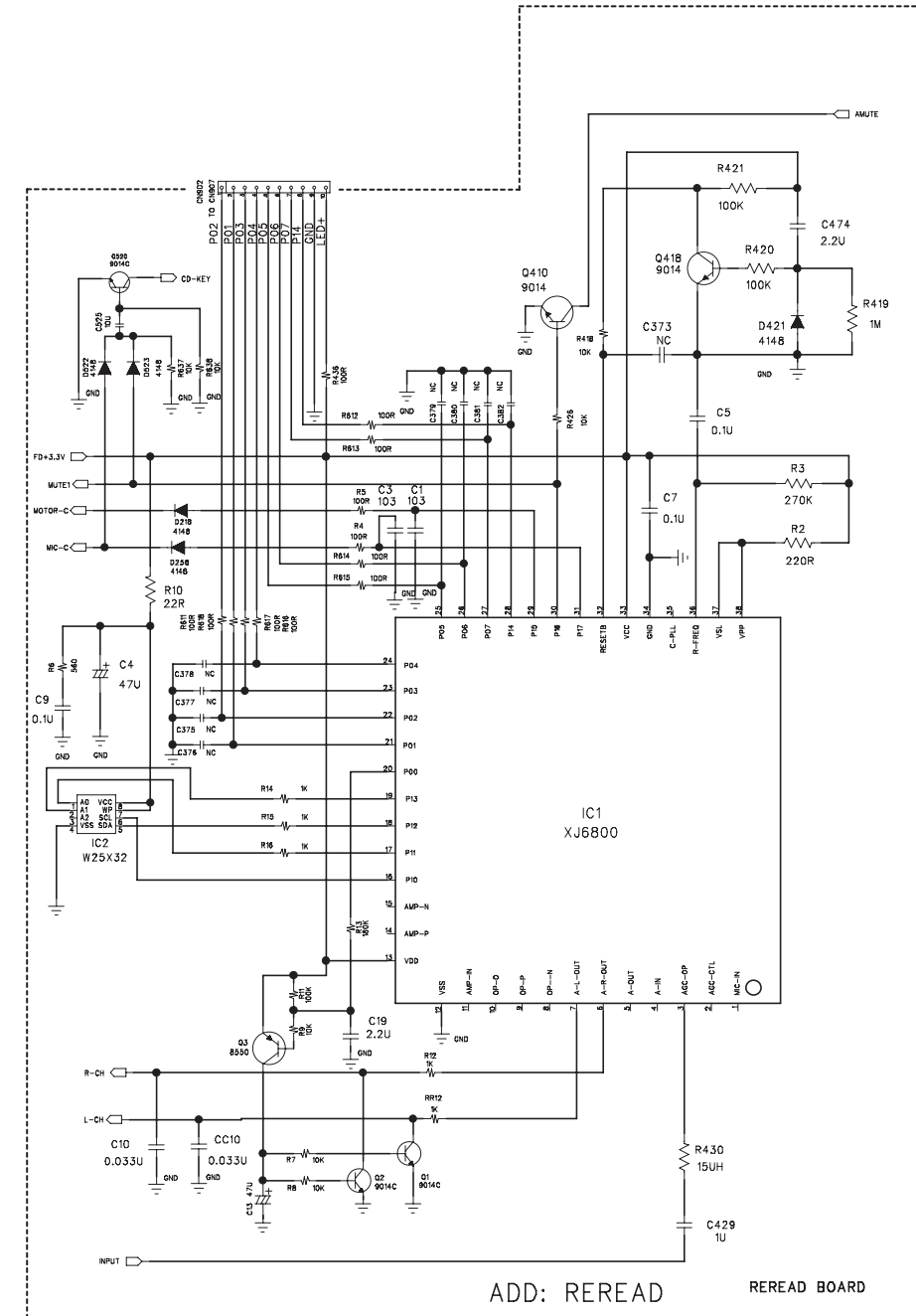
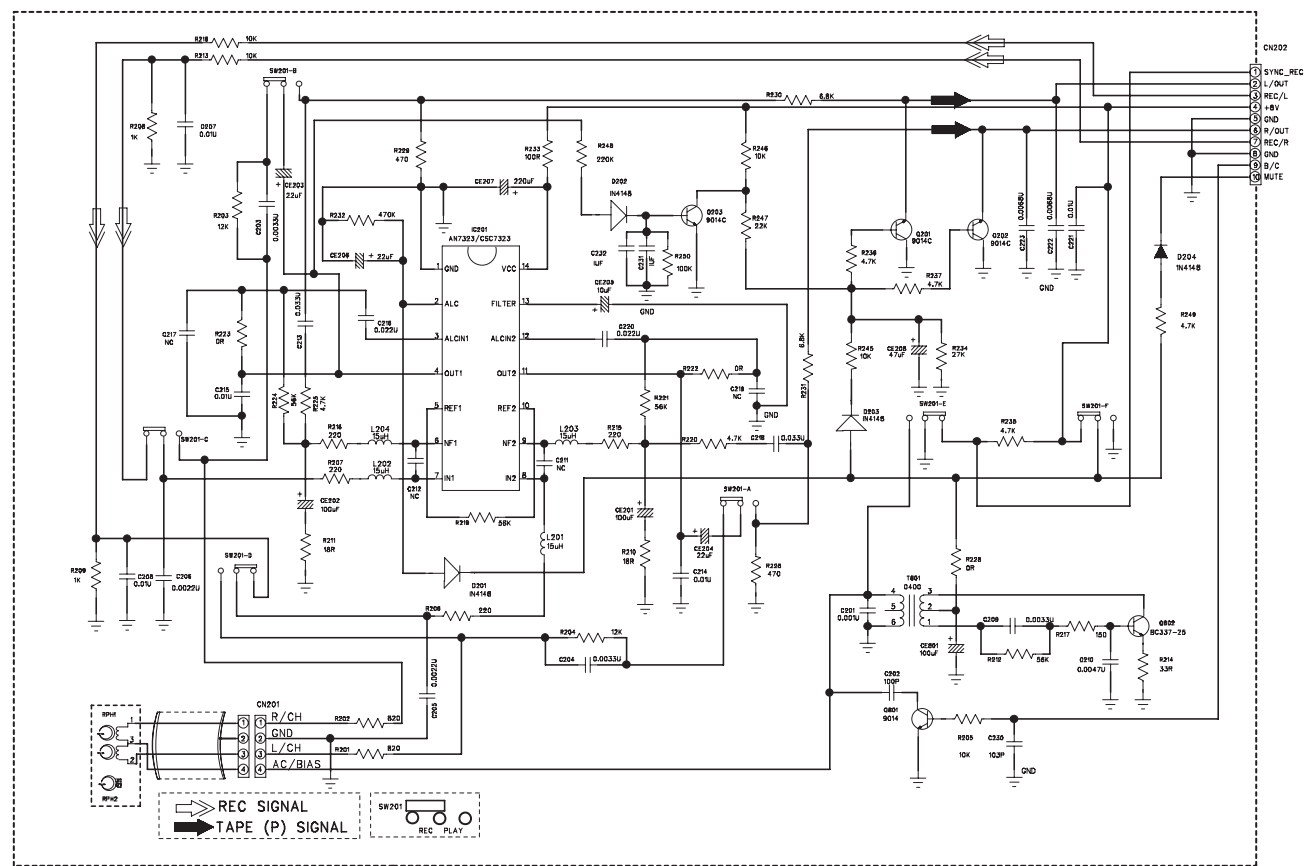
A	B	X;Y	Function
L	L	0	AUX
H	L	1	CD
L	H	2	TAPE
H	H	3	TUNER

- DISCONNECT POWER CORD BEFORE SERVING
- RECOMMEND THE UNIT BE OPERATED BY DC 12V VOLTS DURING TROUBLE SHOOTING
- COMPONENTS MARKED WITH Δ HAVE CRITICAL CHARACTERISTICS. ONLY REPLACE WITH THE COMPONENT OF THE SAME TYPE NUMBER.
- SUBJECT TO CHANGE WITHOUT NOTICE

CIRCUIT DIAGRAM - MAIN COMBINED BOARD PART 2



CIRCUIT DIAGARM - TAPE PART

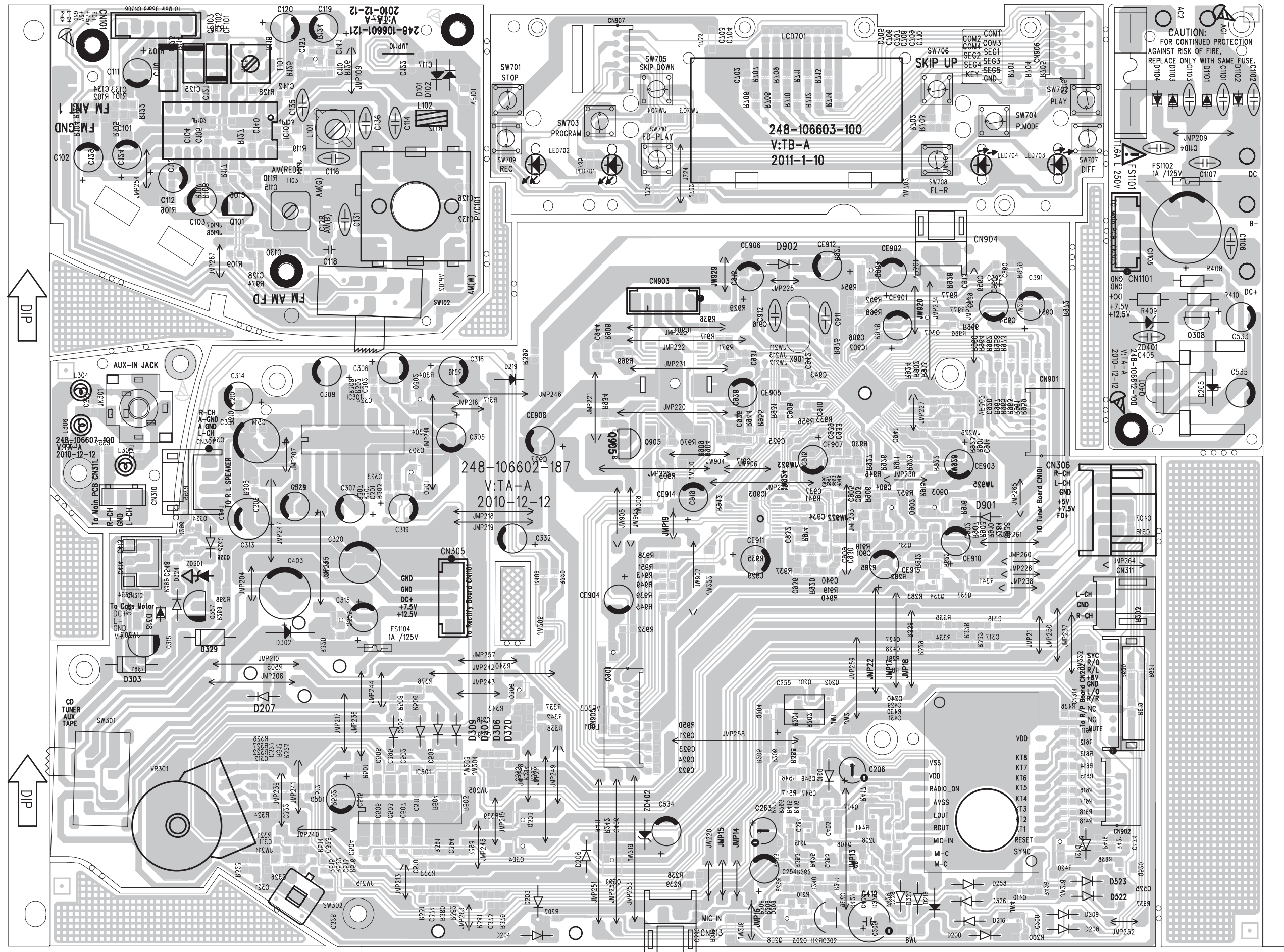


ADD: REREAD

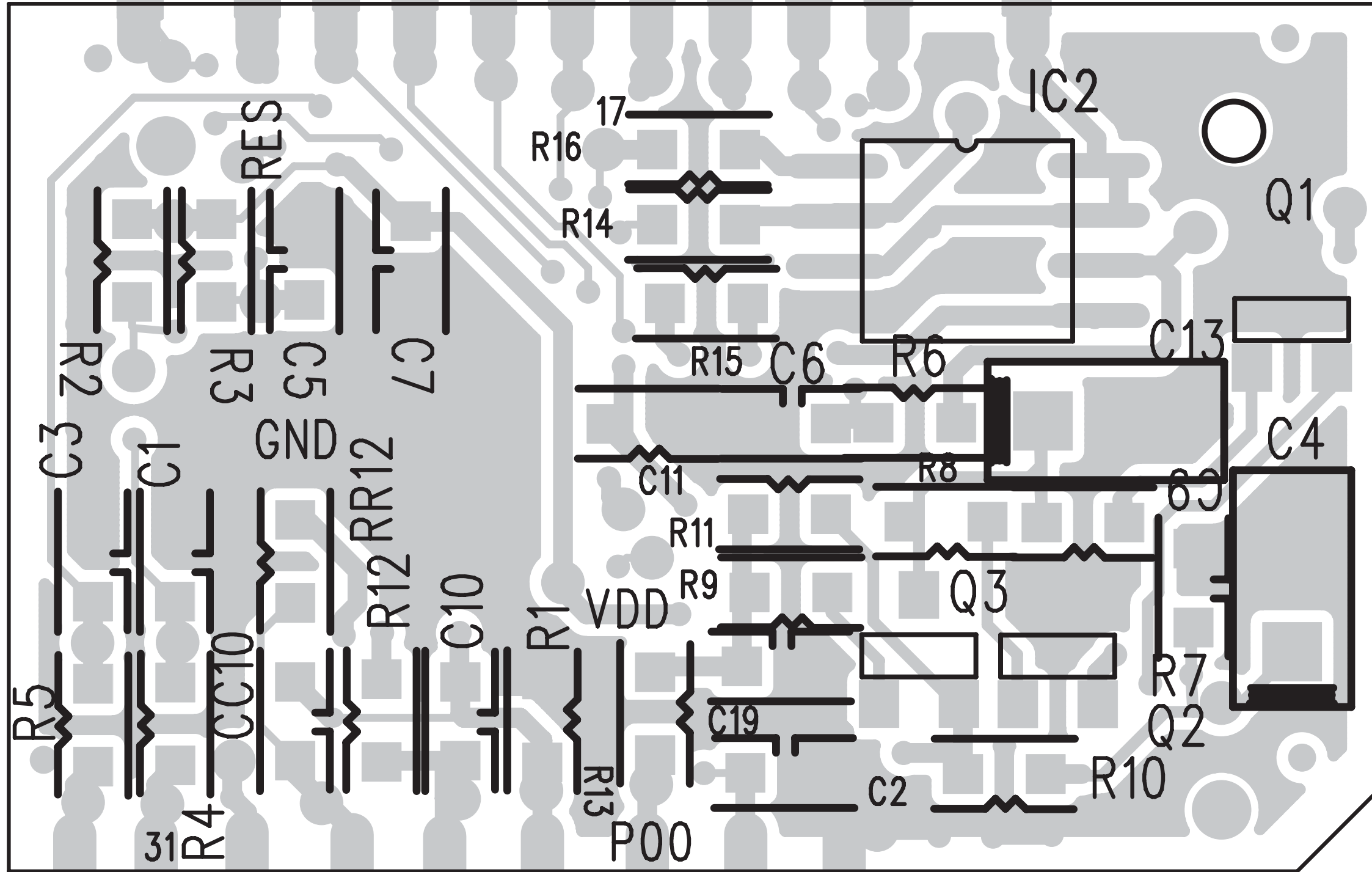
ADD: REREAD

REREAD BOARD

CIRCUIT DIAGRAM - MAIN&TUNER&CONTROL&RECT&JACK BOARD
TOP SIDE VIEW



LAYOUT DIAGRAM - MCD-R690M/CN CPU BOARD



EXPLODED VIEW DIAGRAM

