

SERVICE MANUAL



Specifications

Topaz AM10 premium integrated amplifier


Power Output:	35 watts (into 8 Ohms)
Frequency Response:	(-3dB) 5Hz - 50kHz
S/N:	(ref 1W) >82dB (unweighted)
THD (unweighted):	<0.01% @ 1kHz, 80% of rated power <0.15% 20Hz - 20kHz, 80% of rated power
Max. Power Consumption:	280W
Input Impedance:	47k ohms
Power amp damping factor:	>50
Bass/Treble controls:	Shelving, ultimate boost/cut +/- 10dB @ 100Hz and 10kHz
Dimensions (H x W x D):	76 x 430 x 340mm
Weight	5.6kg (12.3lbs)

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Important safety instructions

For your own safety please read the following important safety instructions carefully before attempting to connect this unit to the mains power supply. They will also enable you to get the best performance from and prolong the life of the unit:

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with a dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use with only the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over. 
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as the power-supply cord or plug having been damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

WARNING

- To reduce the risk of fire or electric shock, do not expose this unit to rain or moisture.
- Batteries (battery pack or batteries installed) shall not be exposed to excessive heat such as sunshine, fire or the like.

The unit is of Class 1 construction and must be connected to a mains socket outlet with a protective earthing connection.

The unit must be installed in a manner that makes disconnection of the mains plug from the mains socket outlet (or appliance connector from the rear of the unit) possible. Where the mains plug is used as the disconnect device, the disconnect device shall remain readily operable. Only use the mains cord supplied with this unit.

Please ensure there is ample ventilation. We recommend that you do not place the unit in an enclosed space; if you wish to place the unit on a shelf, use the top shelf to allow maximum ventilation. Do not put any objects on top of this unit. Do not situate it on a rug or other soft surface and do not obstruct any air inlets or outlet grilles. Do not cover the ventilation grilles with items such as newspapers, tablecloths, curtains, etc.

This unit must not be used near water or exposed to dripping or splashing water or other liquids. No objects filled with liquid, such as vases, shall be placed on the unit.



The lightning flash with the arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of un-insulated 'dangerous voltage' within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance instructions in the service literature relevant to this appliance.



WEEE symbol

The crossed-out wheeled bin is the European Union symbol for indicating separate collection for electrical and electronic equipment. This product contains electrical and electronic equipment which should be reused, recycled or recovered and should not be disposed of with unsorted regular waste. Please return the unit or contact the authorised dealer from whom you purchased this product for more information.



CE mark

This product complies with European Low Voltage (2006/95/EC), Electromagnetic Compatibility (2004/108/EC) and Environmentally-friendly design of Energy-related Products (2009/125/EC) Directives when used and installed according to this instruction manual. For continued compliance only Cambridge Audio accessories should be used with this product and servicing must be referred to qualified service personnel.



C-Tick mark

This product meets the Australian Communications Authority's Radio communications and EMC requirements.



Ross Test Stamp

This product meets Russian electronic safety approvals.

FCC regulations

NOTE: THE MANUFACTURER IS NOT RESPONSIBLE FOR ANY RADIO OR TV INTERFERENCE CAUSED BY UNAUTHORIZED MODIFICATIONS TO THIS EQUIPMENT. SUCH MODIFICATIONS COULD VOID THE USER AUTHORITY TO OPERATE THE EQUIPMENT.

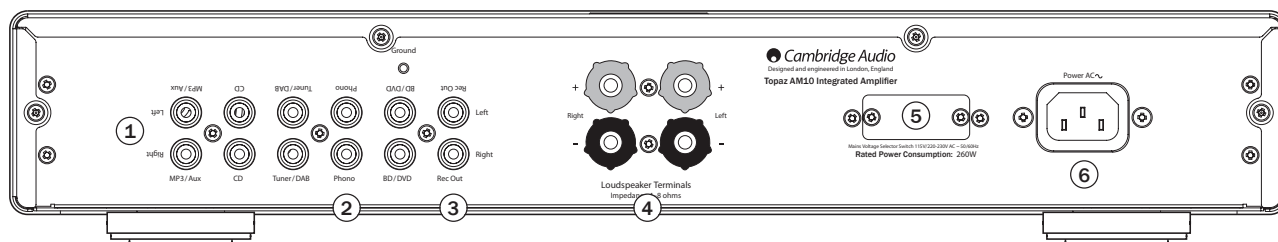


This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Rear panel connections



① Audio inputs

These inputs are suitable for any 'line level' source equipment such as the audio outputs of CD players, BD/DVD players, etc.

② Phono input

This input has a built in phono stage. Record players fitted with Phono Cartridges of the Moving Magnet (MM) or **high output** Moving Coil (MC) type (between 2-6mV output and 30-50k load impedance) can be used. Low output Moving Coil types (<1mV and usually 10-1000 ohm load impedance) cannot be directly connected and will require a matching transformer or head amp. Please consult your dealer for details.

Note: The 'Ground' terminals on both the record player and the AM10 should be connected (where possible) with a ground wire for lowest noise/hum pickup.

③ Rec Out

Connect to the recording input of a tape deck, CD recorder input, etc.

④ Loudspeaker terminals

Connect the wires from your left channel loudspeaker to the Left positive and negative terminals, and the wires from the right channel loudspeaker to the Right positive and negative terminals. In each case, the red terminal is the positive output and the black terminal is the negative output.

Care should be taken to ensure no stray strands of wire are shorting speaker outputs together. Please ensure that the loudspeaker terminals have been tightened adequately to provide a good electrical connection. It is possible for the sound quality to be affected if the screw terminals are loose.

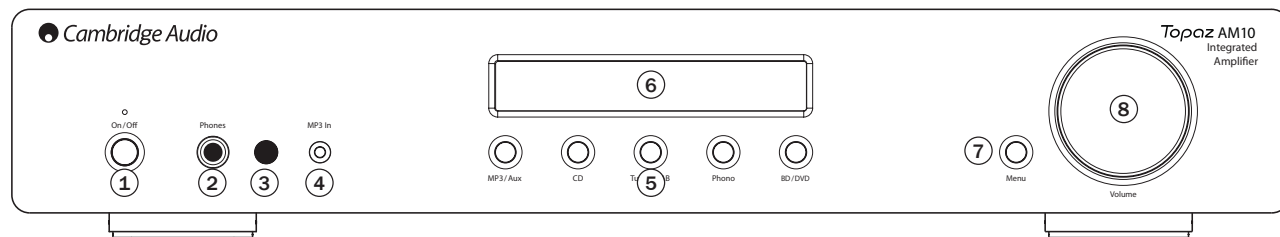
⑤ Voltage select switch

For servicing use only.

⑥ AC power socket

Once all connections are complete, plug the AC power cable into an appropriate mains socket and turn the unit on.

Front panel controls



① Power On/Off

Switches the unit on or off.

② Headphones socket

Allows for the connection of stereo headphones with a ¼ inch jack plug. Headphones with an impedance of between 32 and 600 ohms are recommended.

Note: Plugging in headphones will automatically mute the loudspeaker outputs.

③ Infrared sensor

Receives IR commands from the supplied remote control. An unobstructed line of sight between the remote control and the sensor is required.

④ MP3 input socket

This source input allows you to connect a portable audio device such as an MP3 player directly into the front of the unit using a 3.5mm stereo-jack. Once plugged in, this input is automatically selected, although other inputs can still be selected once a stereo-jack is plugged in. The MP3/AUX button on the front of the unit will select this input whilst a stereo-jack is plugged in.

Note:

- Plugging a source into the front panel MP3 input overrides the Aux input. Simply remove the jack from the front panel to automatically re-enable the Aux input.
- Also note that as the output level of MP3 players tends to be quite low, the AM10 adds 10dB to the current volume setting when (and only when) the MP3 input is selected.

⑤ Input source buttons (MP3/Aux, CD, Tuner/DAB, Phono, BD/DVD)

Press the relevant source button to select the desired input source.

⑥ Display

Used to display information such as the selected input source, volume and tone/balance levels.

Note: When first purchased, the display will have a protective film over the top. Peel this off for a clear display.

⑦ Menu button

Pressing this once will select the Bass option. Pressing a second time will select the Treble option and pressing a third time will select the Balance option. When one of these options is selected, the volume control will adjust the level. If nothing is pressed for a while, the source will be displayed and the volume control will go back to controlling the volume level.

⑧ Volume control

Use to increase or decrease the level of the sound from the outputs of the unit. This controls the volume level of the loudspeakers and headphones. It does not affect the level of the 'Rec Out' output. The volume control will also change the level of bass, treble and balance in the menu options.

Remote control

The Topaz AM10 is supplied with a remote control that operates this unit and its built-in tuner. In addition, the buttons with Blue coloured icons can operate a matching Topaz CD5 or CD10 player.

Always use Alkaline batteries.

CD5/CD10 (Blue coloured icons)

To operate the Topaz CD5 or CD10 players only. For more information, refer to the Topaz CD5 and CD10 user's manual.

Mute

Mutes audio on the unit. Press again to cancel mute.

Volume

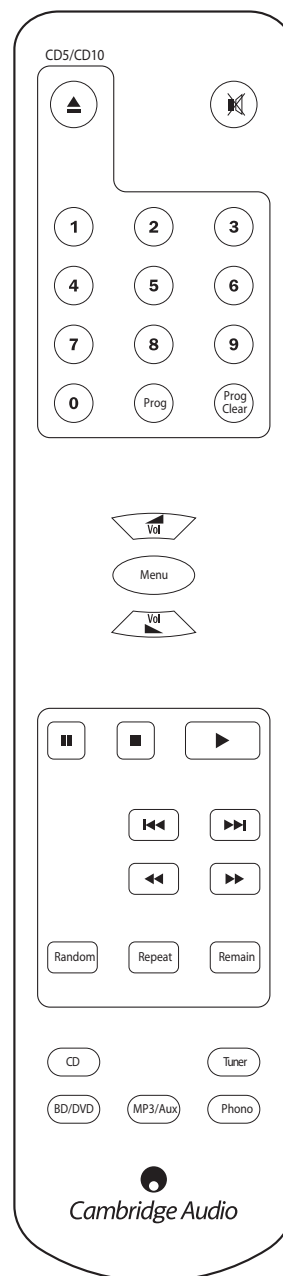
Increases or decreases the volume of the unit. Also used to change the bass, treble and balance settings when these are selected.

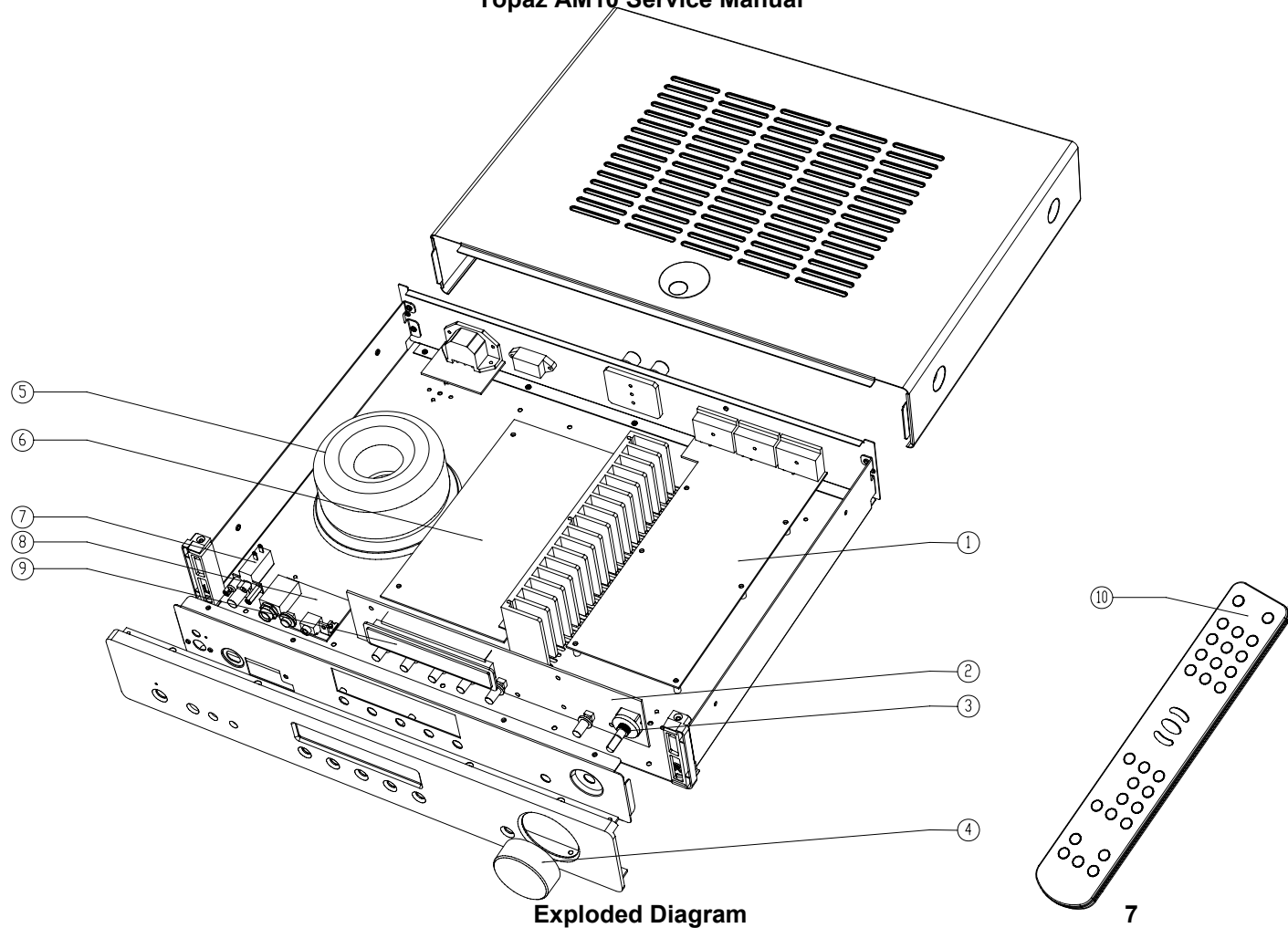
Menu

Toggles between Bass, Treble and Balance options. Use the volume buttons to change the level of the selected option.

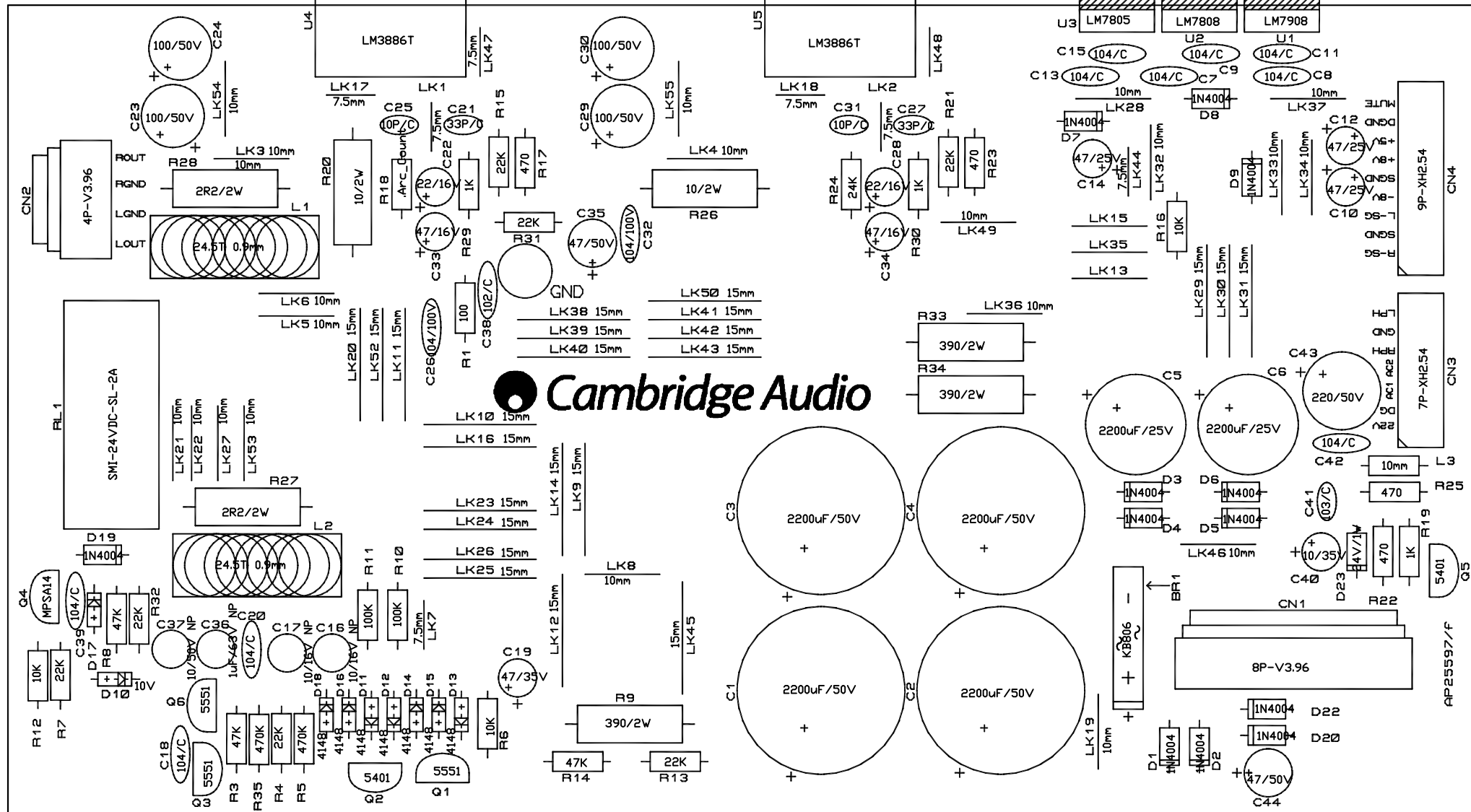
Source buttons (CD, Tuner, BD/DVD, MP3/Aux, Phono)

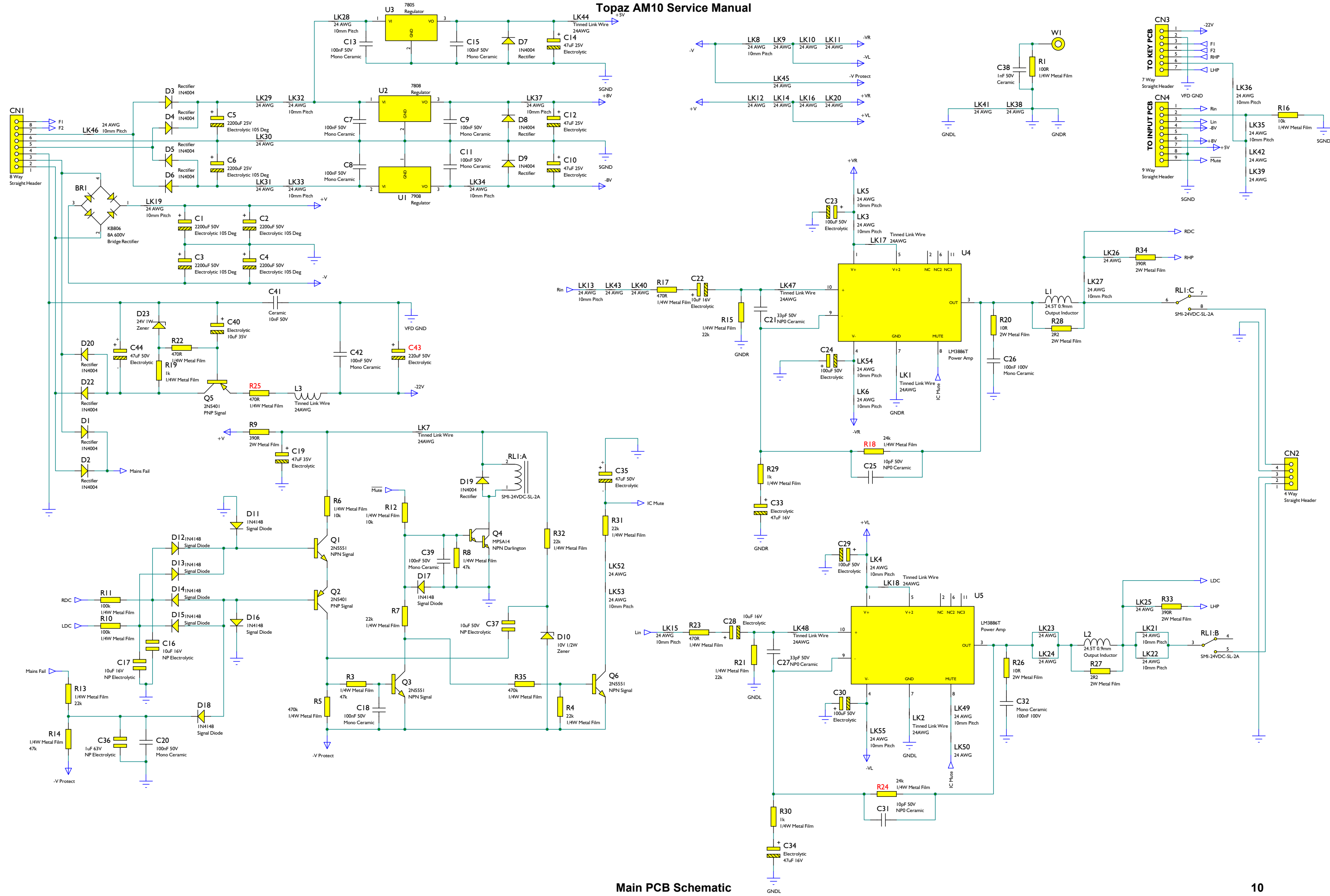
Press the relevant button to select the desired music source.

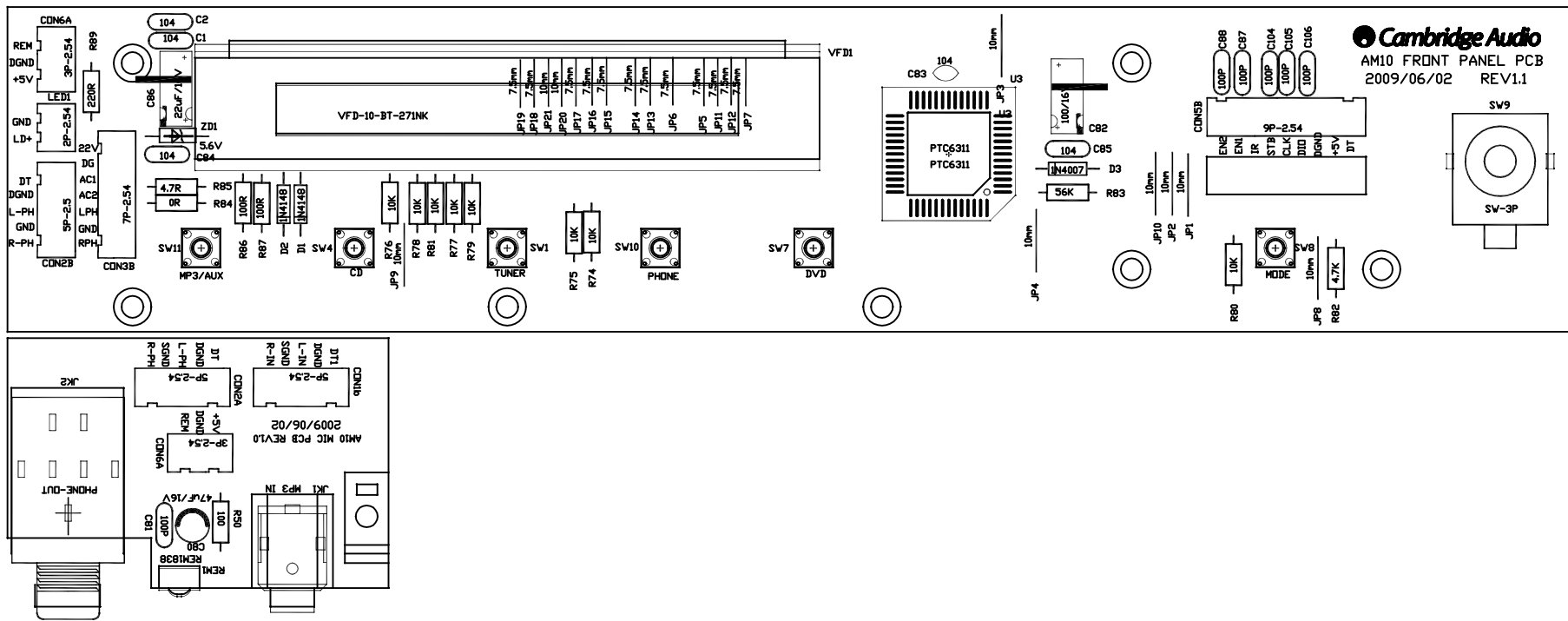


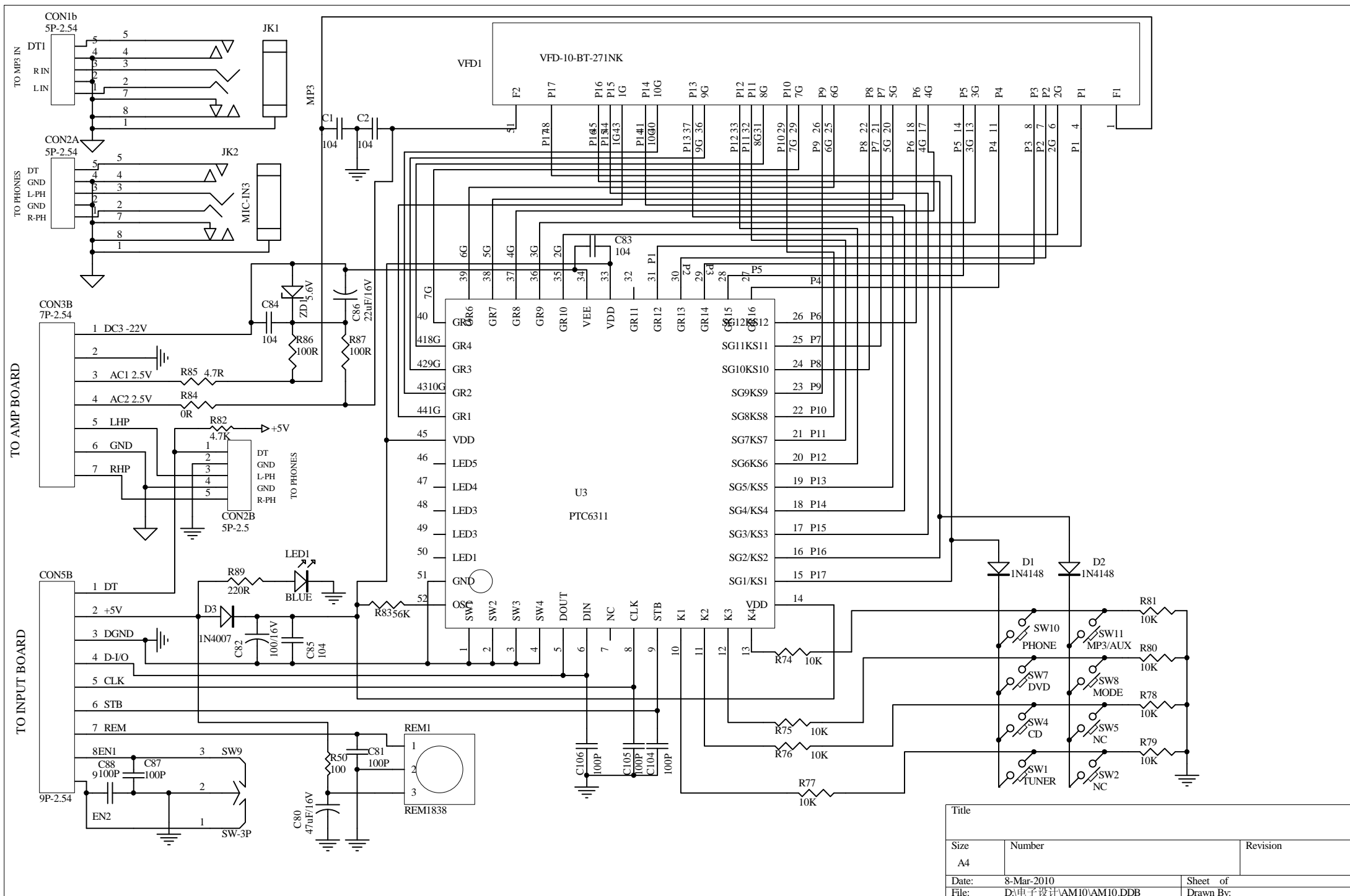


Exploded drawing ref	AP part	Description
1	PZ419	AM10 input PCB assy complete
2	PZ421	AM10 front panel PCB assy with display
3	PZ414	Volume Encoder EC162102E1B-HA1.FB-TYPE D
4	PZ341	Volume pot
5	PZ415	Mains transformer 0-115V-230V OUT:24V*2 11V*2 3.6V*1
6	PZ420	AM10 Amp PCB assy complete
7	PZ416	Mains switch 5A/250V 1P1T- P12 PRONIC-P12
9	PZ412	VFD (Display)VFD-10-BT-280NK Futaba
10	PZ430	Remote control



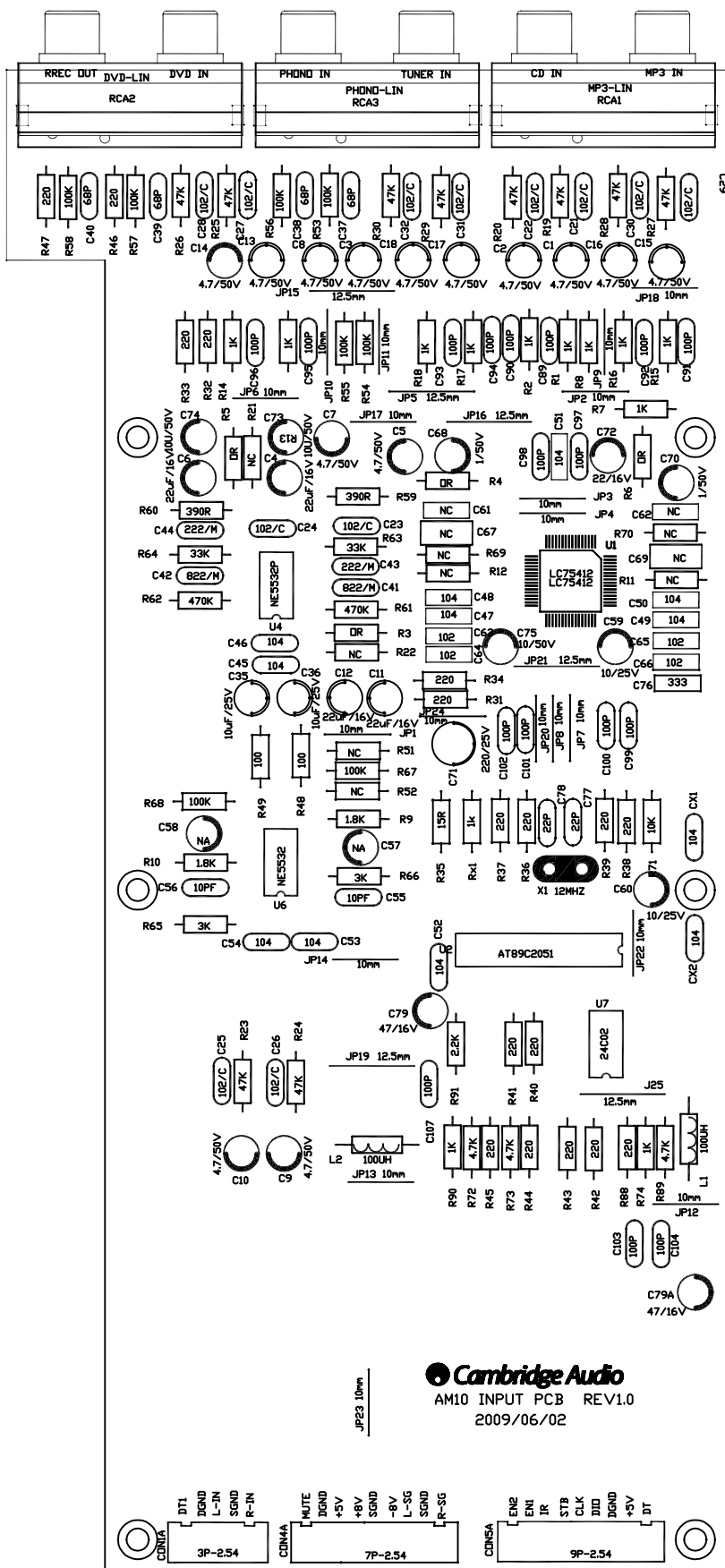


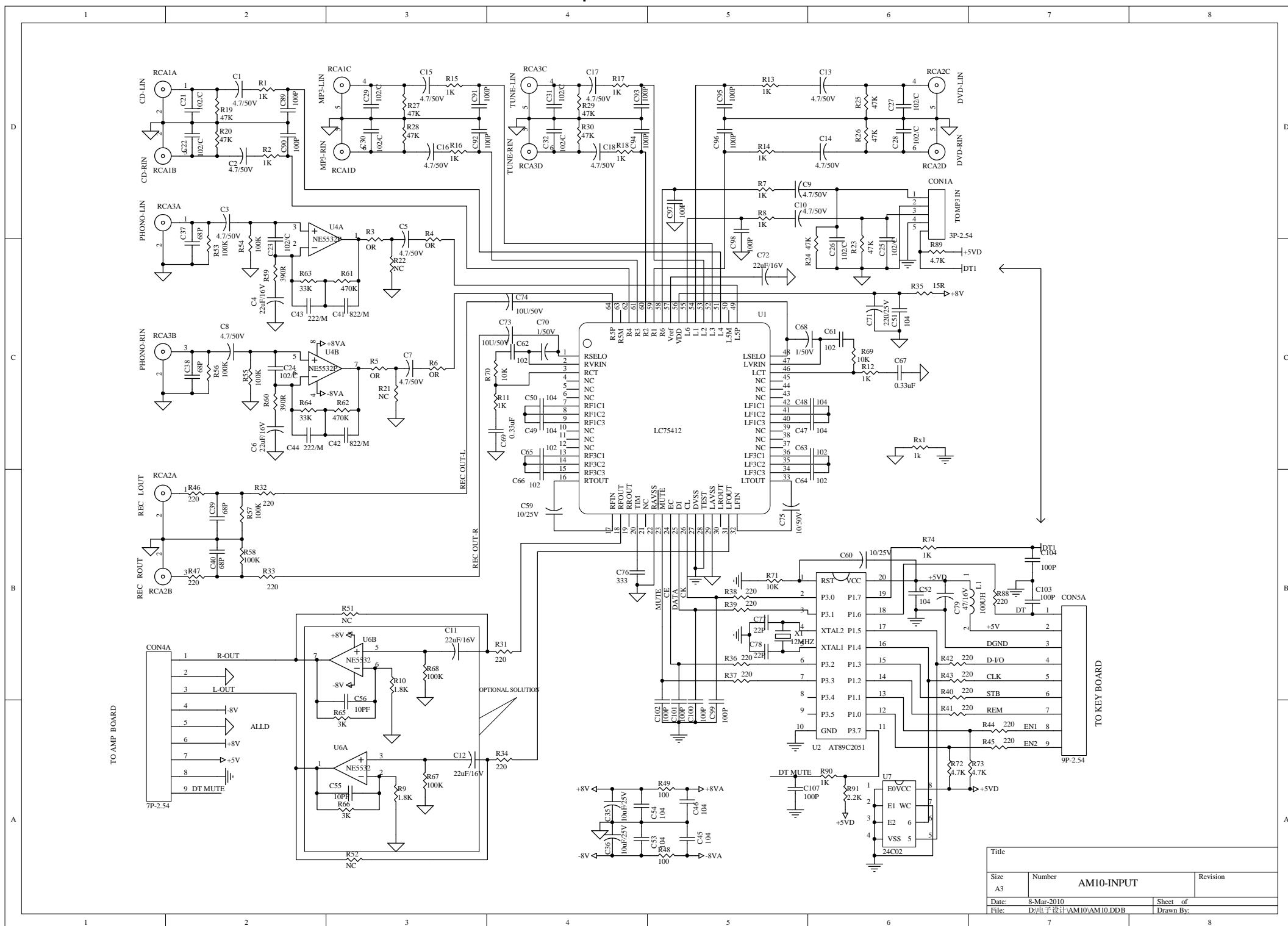




Amp PCB Schematic

Title		
Size	Number	Revision
A4		
Date:	8-Mar-2010	Sheet of
File:	D:\电子设计\AM10\AM10.DDB	Drawn By:

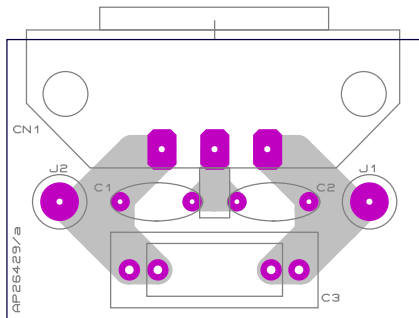


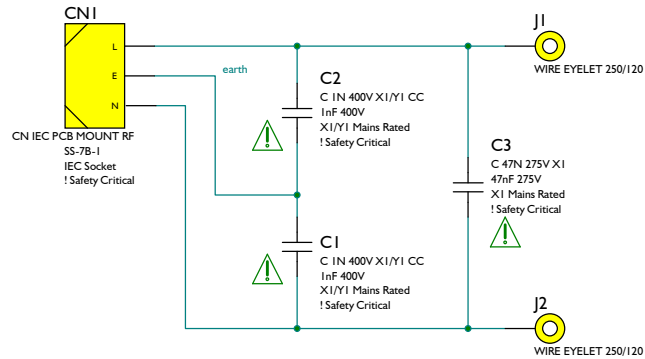


Input PCB Schematic

Title		
Size	Number	Revision
A3	AM10-INPUT	
Date:	8-Mar-2010	Sheet of
File:	D:\电子设计\AM10\AM10.DDB	Drawn By:

Topaz AM10 Service Manual





Fixings for IEC Connector (CN1)



WS1
FXG M3 NUT
M3
Black Hex Nut 5.5 x 2.4mm



WS3
FXG M3 EX-LOCK WSHR
Ex Tooth Lock Washer



SC1
FXG M3X10MM MC PH
M3x10mm MC



WS2
FXG M3 NUT
M3
Black Hex Nut 5.5 x 2.4mm



WS4
FXG M3 EX-LOCK WSHR
Ex Tooth Lock Washer



SC2
FXG M3X10MM MC PH
M3x10mm MC

CP M4 EARTH TAG

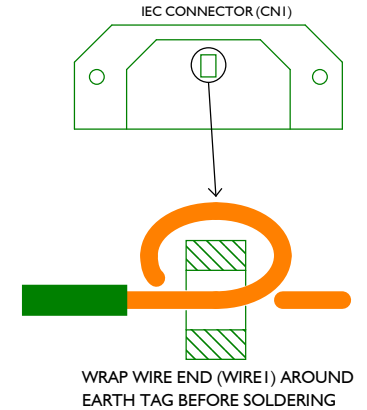


CP1
M4
Earth Tag

WIRE1

WIRE 18AWG

100 mm Long + 5mm Strip crimp end, + 15mm Strip other end
18 AWG Green/Yellow Insulated Wire



Topaz AM10 Service Manual

AM 10 BOM

Pre Amp PCB			Qty	Circuit ref	AP part
001-00013-041	Resistor	MF 1/4W 100Ω F	2	R49 R48	
001-00183-041	Resistor	MF 1/4W 1.8KΩ F	2	R9 R10	
001-00016-041	Resistor	MF 1/4W 100KΩ F	8	R68 R67 R58 R57 R56 R55 R54 R53	
001-00015-041	Resistor	MF 1/4W 10KΩ F	1	R71	
001-00151-041	Resistor	MF 1/4W 15Ω F	1	R35	
001-00014-041	Resistor	MF 1/4W 1KΩ F	13	RX1 R90 R8 R74 R7 R2 R18 R17 R16 R15 R14 R13 R1	
001-00223-041	Resistor	MF 1/4W 2.2KΩ F	1	R91	
001-00222-041	Resistor	MF 1/4W 220Ω F	17	R40-R47 R88 R31-R34 R36-R39	
001-00334-041	Resistor	MF 1/4W 33KΩ F	2	R63 R64	
001-00392-041	Resistor	MF 1/4W 390Ω F	2	R60 R59	
001-00473-041	Resistor	MF 1/4W 4.7KΩ F	3	R89 R73 R72	
001-00475-041	Resistor	MF 1/4W 470KΩ F	2	R62 R61	
001-00474-041	Resistor	MF 1/4W 47KΩ F	10	R23-R30 R20 R19	
001-00034-041	Resistor	MF 1/4W 3KΩ F	2	R66 R65	
001-00000-041	Resistor	MF 1/4W 0Ω F	4	R3-R6	
024-00016-050	Capacitor	RB 1uF/50V Φ5*11 ±20%	2	C70 C68	
024-00017-025	Capacitor	RB 10uF/25V Φ5*11 ±20%	4	C60 C59 C36 C35	
024-00017-050	Capacitor	RB 10uF/50V Φ5*11 ±20%	3	C74 C73 C75	
024-00227-025	Capacitor	RB 220uF/25V Φ8*12 ±20%	1	C71	
024-00226-016	Capacitor	RB 22uF/16V Φ5*11 ±20%	5	C6 C4 C12 C11 C72	
024-00475-050	Capacitor	RB 4.7uF/50V Φ5*11 ±20%	14	C9 C8 C7 C5 C3 C2 C18 C17 C16 C15 C14 C13 C10 C1	
024-00476-016	Capacitor	RB 47uF/16V Φ5*11 ±20%	2	C79 C79A	
027-00101-101	Capacitor	C/C Y5P 101/100V K	15	C91-C104 C107	
027-00102-101	Capacitor	C/C Y5P 102/100V K	12	C21-C32	
027-00010-100	Capacitor	C/C NPO 10PF/100V K	2	C56 C55	
027-00022-101	Capacitor	C/C NPO 22P/100V K	2	C78 C77	
027-00068-100	Capacitor	C/C NPO 68P/100V K	4	C37-C40	
027-00471-101	Capacitor	C/C Y5P 471/100V K	1	U2 20	
029-00102-063	Capacitor	BOX 102/63V J	4	C63-C66	
029-00104-063	Capacitor	BOX 104/63V J	10	C54 C53 C52 C46 C45 C47-C51	
029-00333-063	Capacitor	BOX 333/63V J	1	C76	
026-00222-063	Capacitor	M/C PEI 222/63V J	2	C44 C43	
026-00822-063	Capacitor	M/C PEI 822/63V J	2	C42 C41	
073-00012-000	Crystal	12.000MHZ 30PPM 49S	1	X1	
053-24C02-001	IC EEPROM	AT24C02 DIP8 : ATMEL	1	U7	
053-0AM10-001	IC MCU	AM10 AT89C2051 DIP20	1	U2	
053-05532-001	IC OPAMP	DIP8 NE5532 :TEXAS	2	U4 U6	PZ409 PY259
053-75412-001	IC VOLUME	LQFP64 LC75412W ;SANYO	1	U1	PZ413
066-00100-002	Inductor	100UH 1/2W AL0410 ±10%	2	L1 L2	
118-00041-001	RCA	RCA socket	3	RCA2 RCA3 RCA1	

Display PCB

001-00000-041	Resistor	MF 1/4W 0Ω F	1	R84	
001-00013-041	Resistor	MF 1/4W 100Ω F	3	R50 R87 R86	
001-00015-041	Resistor	MF 1/4W 10KΩ F	8	R74-R81	
001-00222-041	Resistor	MF 1/4W 220Ω F	1	R89	
001-00473-041	Resistor	MF 1/4W 4.7KΩ F	1	R82	
001-00470-041	Resistor	MF 1/4W 4.7Ω F	1	R85	
001-00564-041	Resistor	MF 1/4W 56KΩ F	1	R83	
024-00476-016	Capacitor	RB 47uF/16V Φ5*11 ±20%	1	C80	
024-00226-016	Capacitor	RB 22uF/16V Φ5*11 ±20%	1	C86	
024-00018-016	Capacitor	RB 100uF/16V Φ5*11 ±20%	1	C82	
027-00101-050	Capacitor	C/C Y5P 101/50V K	6	C106 C105 C104 C88 C87 C81	
027-00104-050	Capacitor	C/C Y5P 104/50V M	5	C85 C84 C2 C1 C83	
053-06311-002	IC DRIVER	LQFP52 PT6311 :PTC	1	U3	
045-04007-000	Diode	IN 4007 1A 1000V 52MM	1	D3	
045-04148-000	Diode	IN 4148 0.1A 60V	2	D1 D2	
044-00506-002	Zener diode	5.6V 1/2W ±5%	1	ZD1	
134-01838-000	Remote receiver	IRM1838 2.7V-5.5V 38KHz 3PIN	1	REM1	PZ411
111-00667-000	Switch	6*6MM 4PIN H=7MM	6	SW4 SW7 SW8 SW11 SW10 SW1	
119-00035-050	Mic socket	Φ3.5 CKX3.5-07	1	JK1	
119-00635-007	Phones socket	Φ6.3 CK6.35-06-7P	1	JK2	
085-0AM10-001	VFD	AM10 VFD-10-BT-280NK Futaba	1	VFD1	PZ412
019-00024-025	Encoder	EC162102E1B-HA1.FB-TYPE D	1	SW9	PZ414
242-02420-121	LED	UL1007 L=120MM —3MM	1	LED1	

Mains PCB

031-00014-400	Capacitor	Y1 103/400V M	3	C1 C2	
028-00474-400	Capacitor	X2 474/400V K	1	C3	
122-0AM10-000	AC inlet	IEC socket	1	CN1	
089-0AM10-000	Mains transformer	AM10 IN:0-115V-230V OUT:24V*2 11V*2 3.6V*1	1		PZ415
108-00AM1-001	Mains switch	AM5 5A/250V 1P1T- P12 PRONIC-P12	1		PZ416
112-00230-115	Voltage select	115V-230V 6PIN : L21-22A2 UL/VDE	1		
253-00030-005	fuse	FUSE:T2A L250V	1		

Main PCB BOM

Value	Description/Type	Qty	Component Ident	ManPN	Tolerance	PackageInfo	None P/N	NOTES
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RESISTORS

1	2R2	2W Metal Film	2	R27, R28		1%	20mm Pitch		
2	10R	2W Metal Film	2	R20, R26		1%	20mm Pitch		
3	100R	1/4W Metal Film	1	R1		1%	10mm Pitch		
4	390R	2W Metal Film	3	R9, R33, R34		1%	20mm Pitch		
5	470R	1/4W Metal Film	4	R17, R22, R23, R25		1%	10mm Pitch		
6	1k	1/4W Metal Film	3	R19, R29, R30		1%	10mm Pitch		
7	10k	1/4W Metal Film	3	R6, R12, R16		1%	10mm Pitch		
8	22k	1/4W Metal Film	7	R4, R7, R13, R15, R21, R31, R32		1%	10mm Pitch		
9	24k	1/4W Metal Film	2	R18, R24		1%	10mm Pitch		
10	47k	1/4W Metal Film	3	R3, R8, R14		1%	10mm Pitch		
11	100k	1/4W Metal Film	2	R10, R11		1%	10mm Pitch		
12	470k	1/4W Metal Film	2	R5, R35		1%	10mm Pitch		

CAPACITORS

13	10pF 50V	NP0 Ceramic	2	C25, C31		5%	2.5mm Pitch		
14	33pF 50V	NP0 Ceramic	2	C21, C27		5%	2.5mm Pitch		
15	1nF 50V	Ceramic	1	C38		10%	5mm Pitch		
16	10nF 50V	Ceramic	1	C41		10%	2.5mm Pitch		
17	100nF 50V	Mono Ceramic	10	C7-C9, C11, C13, C15, C18, C20, C39, C42		10%	5mm Pitch		
18	100nF 100V	Mono Ceramic	2	C26, C32		10%	5mm Pitch		
19	1uF 63V	NP Electrolytic	1	C36		20%	5mm Dia		
20	10uF 16V	NP Electrolytic	2	C16, C17		20%	5mm Dia		
21	10uF 16V	Electrolytic	2	C22, C28		20%	5mm Dia		
22	10uF 50V	NP Electrolytic	1	C37		20%	5mm Dia		
23	10uF 35V	Electrolytic	1	C40		20%	5mm Dia		
24	47uF 25V	Electrolytic	3	C10, C12, C14		20%	5mm Dia		
25	47uF 35V	Electrolytic	1	C19		20%	5mm Dia		
26	47uF 16V	Electrolytic	2	C33, C34		20%	5mm Dia		
27	47uF 50V	Electrolytic	2	C35, C44		20%	6mm Dia		
28	100uF 50V	Electrolytic	4	C23, C24, C29, C30		20%	8mm Dia		
29	220uF 50V	Electrolytic	1	C43		20%			
30	2200uF 50V	Electrolytic 105 Deg	4	C1-C4		20%	22mm Dia		
31	2200uF 25V	Electrolytic 105 Deg	2	C5, C6		20%	13.4mm Dia		

CONNECTORS

32	8 Way	Straight Header	1	CN1	B8P-VH		3.96mm Pitch		
33	4 Way	Straight Header	1	CN2	B4P-VH		3.96mm Pitch		

34	7 Way	Straight Header	1	CN3	B7B-XH-A		2.5mm Pitch		
35	9 Way	Straight Header	1	CN4	B9B-XH-A		2.5mm Pitch		

DIODES

36	400V 1A	Rectifier	8	D1-D6, D20, D22	1N4004		DO41		
37	400V 1A	Rectifier	4	D7-D9, D19	1N4004		DO41		1N4001 can be used
38	10V 1/2W	Zener	1	D10	BZX79C10RL		DO35		Any manufacturer can be used
39	75V 150mA	Signal Diode	8	D11-D18	1N4148		D035		
40	24V 1W	Zener	1	D23	BZX85C24RL		DO41		Any manufacturer can be used

INDUCTORS

41	24.5T 0.9mm	Output Inductor	2	L1, L2			Through Hole		AP13772/1
42	24AWG	Tinned Link Wire	1	L3					Inductor silk is on PCB for unit EMC testing

INTEGRATED CIRCUITS

43	-8V 1A	Regulator	1	U1	7908		Through Hole		
44	8V 1A	Regulator	1	U2	7808		Through Hole		
45	5V 1A	Regulator	1	U3	7805		Through Hole		
46	68W	Power Amp	2	U4, U5	LM3886T		Through Hole		

RELAY

47	30V 5A	SPST Relay	1	RL1	SMI-24VDC-SL-2A		Through Hole		
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TRANSISTORS

48	160V 600mA	NPN Signal	3	Q1, Q3, Q6	2N5551		TO92		
49	-150V 600mA	PNP Signal	2	Q2, Q5	2N5401		TO92		
50	30V 500mA	NPN Darlington	1	Q4	MPSA14		TO92		