

DACMAGIC.

Issue Date: November 2008

SERVICE MANUAL – AP25144/1



Specifications:

D/A converters	Dual Wolfson WM8740 24bit DACs
Digital filter	Texas Instruments TMS 320VC5501 DSP upsampling to 24bit 192kHz
Frequency response	20Hz to 20kHz (± 0.1 dB)*
THD @ 1kHz 0dBFs	<0.001% 24bit
THD @ 1kHz -10dBFs	<0.001%
THD @ 20kHz 0dBFs	<0.002%
S/N ratio	-112dB
Total correlated jitter	<130pS
Crosstalk @ 1kHz	< -100dB
Crosstalk @ 20kHz	< -90dB
Output impedance	<50ohms
Output level (unbalanced)	2.1V rms
Output level (balanced)	4.2V rms (2.1V per phase)
Digital input word widths supported	16-24bit**
Digital input sampling frequencies supported	32kHz, 44.1kHz, 48kHz, 88.2kHz, 96kHz
Audio output upsampling	Fixed 24bit 192kHz
Dimensions (H x W x D)	52 x 215 x 191mm (2.0 x 8.6 x 7.6")
Weight	1.2kg/2.6lbs

* Steep filter disabled

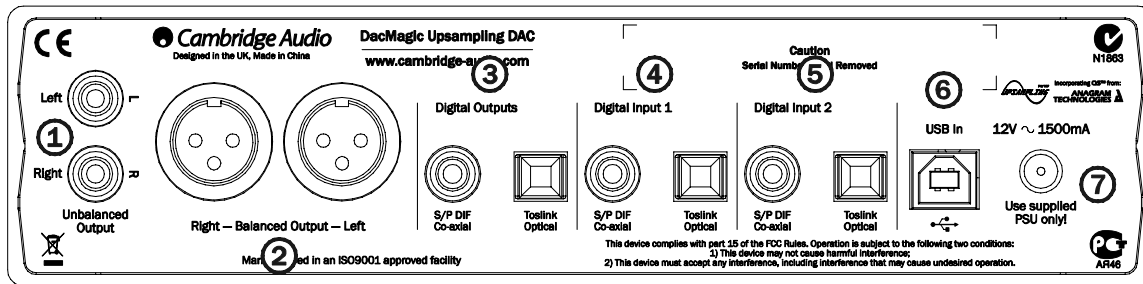
**16bit for USB

CAMBRIDGE AUDIO AZUR DACMAGIC SERVICE MANUAL

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Rear panel connections



1. Unbalanced Audio Outputs

Single-ended conventional stereo outputs for connection to the line-level phono/RCA inputs of an amplifier.

2. Balanced Audio Outputs

The DacMagic also features true balanced (XLR) outputs. This is a higher quality output that can reject noise and interference with equipment with balanced inputs. These balanced outputs are ideally suited for connection to the Cambridge Audio 840A or 840E amplifiers. XLR connectors should be wired as follows:

Pin 1 – Ground; Pin 2 – Hot (in-phase); Pin 3 – Cold (phase-inverted).

3. Digital Outputs

The digital outputs allow a digital recording device to be connected. These outputs loop or pass-through unprocessed digital audio from the selected digital input. Two types are available (both the co-axial and the optical are active concurrently and can be used to connect and run equipment at the same time):

S/P DIF co-axial – to obtain best results, use a high quality 75 ohm digital RCA interconnect cable (not one designed for normal audio use).

TOSLINK optical – use a high quality TOSLINK fibre-optic interconnect cable designed specifically for audio use.

Note: These outputs are pass-through only; there is no upsampling or any other modification done to the LPCM input signal.

4. & 5. Digital Inputs 1 and 2

The DacMagic is fitted with two sets of digital inputs which enable the connection of source components. Each input has both S/P DIF and TOSLINK types fitted.

Only one of the two types for each input should be connected at any one time. If both the optical and co-axial inputs have connections made to them (even if only one is attempting to function), neither will work.

S/P DIF co-axial – to obtain best results, use a high quality 75 ohm digital RCA interconnect cable (not one designed for normal audio use).

TOSLINK optical – use a high quality TOSLINK fibre-optic interconnect cable designed specifically for audio use.

Note: This unit only accepts two-channel LPCM digital audio (e.g. Dolby Digital 2.0). You cannot connect a Dolby Digital 5.1 or a DTS signal as they will not be recognised. If you wish to connect a DVD or similar device, please ensure that the sound output of your player is set to two-channel PCM.

6. USB In

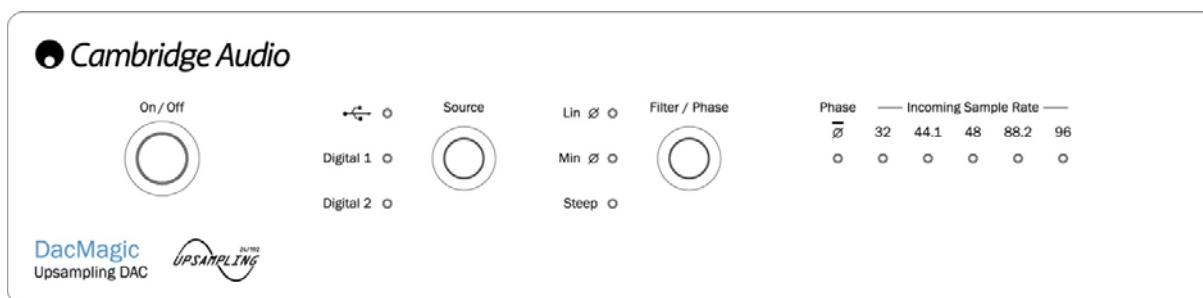
USB 'Type B' input allowing direct connection to a PC via a Type B to Type A USB lead. The DacMagic's operation is independent of your PC soundcard – it will operate whether your PC has a soundcard or not.

7. AC 12V 1.5A Power Adaptor Socket

Once you have completed all connections, plug the supplied power adaptor into the DacMagic.

Important Note: Use the supplied power supply unit ONLY.

Front panel controls



1. Power On/Off

Switches the unit between On and Off.

2. Source

Press to select between USB playback or Digital Inputs 1 and 2. The corresponding LED will light up to show which source has been selected.

3. Filter/Phase Select

Momentarily press to select between three different filter modes: linear phase, minimum phase or steep. The corresponding LED will light up to show which filter has been selected.

4. Phase

Indicates the output phase selected. Press and **hold** the Filter/Phase select button for approximately two seconds to select normal or inverted phase output. When the LED lights up, the phase is inverted by the DacMagic.

If you suspect that your source material or amplifier, etc., is inverting the phase of the musical signal, you can use this function to re-invert the audio and regain absolute positive phase.

5. Incoming Sampling Rate

In the presence of an incoming digital stream, the relevant LED will light up to indicate the incoming digital sampling frequency (between 32kHz and 96kHz LPCM).

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 adaptor 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.

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 power supply adaptor supplied with this unit.

Please ensure there is ample ventilation (at least 5cm clearance all round).

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.



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) and Electromagnetic Compatibility (89/336/EEC) 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.

Ventilation

IMPORTANT – The unit will become warm when in use. Do not stack multiple units on top of each other. Do not place in an enclosed area such as a bookcase or in a cabinet without sufficient ventilation.

Positioning

Choose the installation location carefully. Avoid placing it in direct sunlight or close to a source of heat. No naked flame sources, such as lighted candles, should be placed on the unit. Also avoid locations subject to vibration and excessive dust, cold or moisture. The unit can be used in a moderate climate.

This unit must be installed on a sturdy, level surface. Do not place in a sealed area such as a bookcase or in a cabinet. Any space open at the back (such as a dedicated equipment rack) is fine, however. Do not place the unit on an unstable surface or shelf. The unit may fall, causing serious injury to a child or adult as well as serious damage to the product. Do not place other equipment on top of the unit.

Due to stray magnetic fields, turntables or CRT TVs should not be located nearby due to possible interference.

Electronic audio components have a running in period of around a week (if used several hours per day). This will allow the new components to settle down and the sonic properties will improve over this time.

Power sources

The unit should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power-supply to your home, consult your product dealer or local power company.

Overloading

Do not overload wall outlets or extension cords as this can result in a risk of fire or electric shock. Overloaded AC outlets, extension cords, frayed power cords, damaged or cracked wire insulation and broken plugs are dangerous. They may result in a shock or fire hazard.

Be sure to insert each power cord securely. To prevent hum and noise, do not bundle the interconnect leads with the power cord or speaker leads.

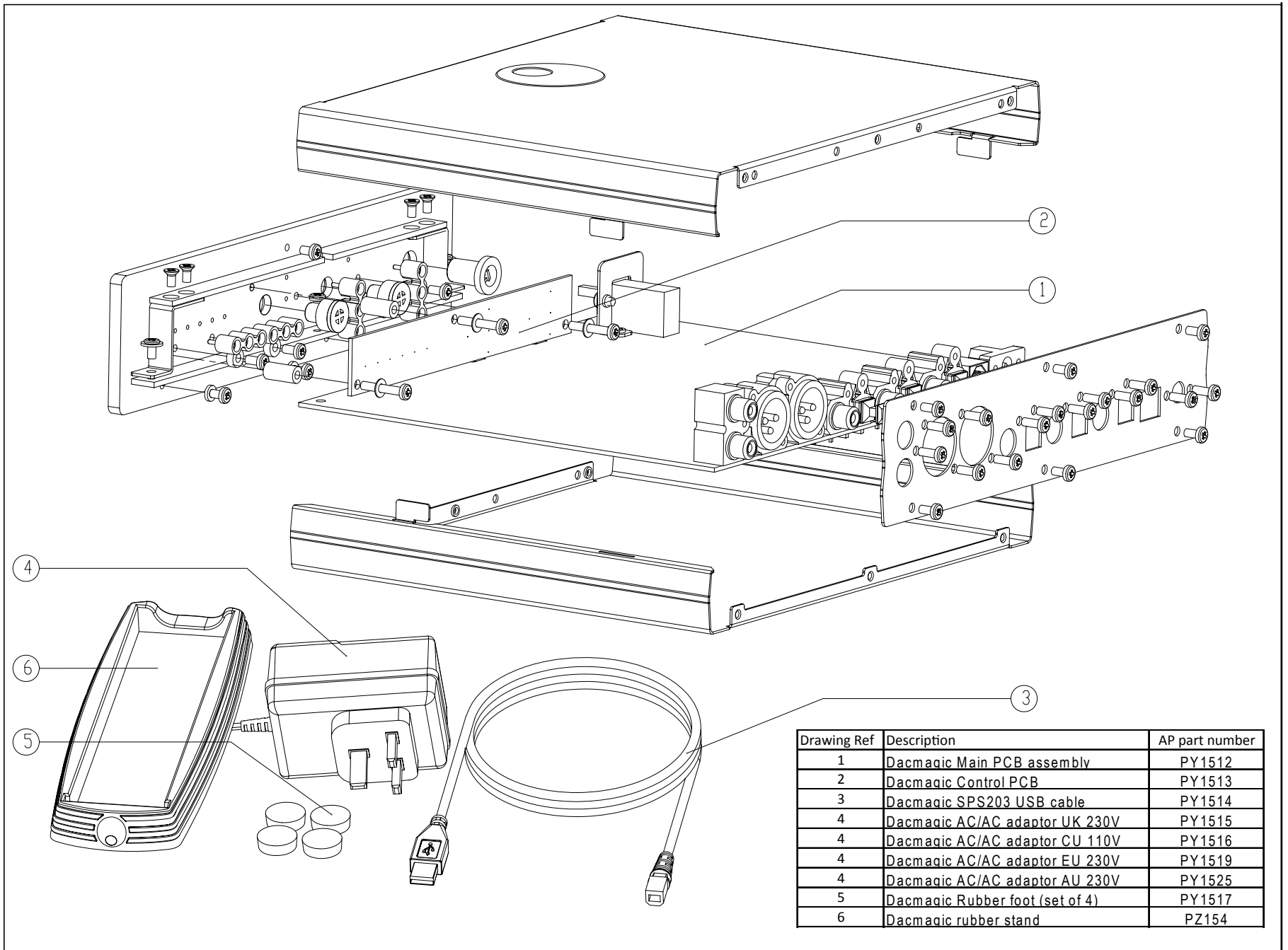
Cleaning

To clean the unit, wipe its case with a dry, lint-free cloth. Do not use any cleaning fluids containing alcohol, ammonia or abrasives. Do not spray an aerosol at or near the unit.

Servicing

These units are not user serviceable. Never attempt to repair, disassemble or reconstruct the unit if there seems to be a problem. A serious electric shock could result if this precautionary measure is ignored. In the event of a problem or failure, please contact your dealer.

Cambridge Audio DacMagic



DacMagic Exploded Diagram

Value	Description/Type	Qty	Component Ident	ManPN	Tolerance	PackagelInfo	Factory P/N	AP P/N
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RESISTORS

1	0R	0805 Thick Film	3	R8, R42, R121		1%	805	
2	0R	1206 Thick Film	2	R62, R78		1%	1206	Rated current 2A
3	NO FIT		1	R67				
4	NO FIT		2	R105, R106				
5	NO FIT		4	R113-R116				
6	NO FIT		1	R129				
7	1R	0805 Thick Film	2	R34, R35		1%	805	
8	1R	1206 Thick Film	4	R83-R85, R403		1%	1206	
9	1R0	1206 Thick Film	2	R108, R109		1%	1206	
10	2R2	2W Carbon	1	R107		10%	20mm Pitch	Standing. Add Sleeving.
11	10R	0805 Thick Film	6	R9, R14, R29, R30, R117, R118		1%	805	
12	10R	1206 Thick Film	1	R59		1%	1206	
13	22R	0805 Thick Film	2	R3, R4		1%	805	
14	22R	1206 Thick Film	1	R79		1%	1206	
15	33R	MNR14	5	R2, R38, R39, R192, R193		10%	MNR14	
16	33R	2W Carbon	1	R5		10%	20mm Pitch	Standing. Add Sleeving.
17	33R	0805 Thick Film	4	R44, R50-R52		1%	805	
18	47R	0204 Melf	6	R10, R33, R36, R47, R104, R172		1%	204	
19	47R	0805 Thick Film	3	R76, R77, R92		1%	805	
20	56R	2W Carbon	2	R400, R401		10%	20mm Pitch	Standing. Add Sleeving.
21	75R	0805 Thick Film	2	R18, R19		1%	805	
22	91R	0805 Thick Film	1	R32		1%	805	
23	100R	MNR14	1	R1		10%	MNR14	
24	100R	0805 Thick Film	14	R7, R11, R16, R17, R20, R22, R24, R25, R28, R56, R80-R82, R88		1%	805	
25	100R	1206 Thick Film	5	R60, R61, R63, R90, R91		1%	1206	
26	100R	MNR14	1	R124		10%	MNR14	
27	240R	1206 Thick Film	1	R402		1%	1206	
28	430R	0805 Thick Film	1	R31		1%	805	
29	750R	0204 Melf	8	R93, R94, R184, R185, R200, R201, R208, R209		1%	204	
30	1K	0805 Thick Film	12	R13, R65, R66, R70, R71, R75, R86, R89, R97-R99, R143		1%	805	
31	1K	0204 Melf	8	R194-R197, R218-R221		1%	204	
32	1K2	0805 Thick Film	1	R111		1%	805	
33	1K5	0805 Thick Film	1	R6		1%	805	
34	2K	0805 Thick Film	2	R87, R125		1%	805	
35	2K	0204 Melf	8	R180, R181, R188, R189, R204, R205, R212, R213		0%	204	
36	2K2	0805 Thick Film	1	R145		1%	805	
37	2K2	0204 Melf	12	R182, R183, R190, R191, R198, R199, R206, R207, R214, R215, R222, R223		1%	204	
38	3K3	0805 Thick Film	2	R21, R23		1%	805	
39	3K6	0805 Thick Film	1	R110		1%	805	
40	3K6	0204 Melf	8	R119, R120, R186, R187, R202, R203, R210, R211		0%	204	
41	8K2	0805 Thick Film	1	R144		1%	805	
42	10K	0805 Thick Film	17	R12, R26, R27, R41, R46, R49, R53-R55, R64, R68, R69, R95, R96, R122, R123, R142		1%	805	
43	10K	MNR14	3	R43, R45, R74		10%	MNR14	
44	47K	0805 Thick Film	8	R37, R40, R100-R103, R174, R179		1%	805	
45	100K	0805 Thick Film	7	R15, R48, R57, R58, R72, R73, R112		1%	805	

CAPACITORS

46	NO FIT		3	C92, C108, C109				
47	NO FIT		4	C117-C120				
48	10pF 50V	0805 NP0 Ceramic	6	C17, C18, C22, C105, C106, C210		5%	805	
49	10pF 50V	1206 NPO	10	C283, C290, C294-C296, C320, C324-C327		10%	1206	
50	22pF 50V	NP0 0805	2	C78, C79			805	
51	100pF 50V	0805 NP0 Ceramic	11	C80-C82, C98, C100-C102, C201, C202, C264, C269		5%	805	
52	150pF 100V	Polypropylene	8	C277, C282, C288, C289, C312, C313, C318, C319		5%	5mm Pitch Box	
53	470pF 50V	COG 0603	1	C88			603	
54	1nF 50V	0805 NP0 Ceramic	3	C11, C13, C104		5%	805	
55	1.5nF 100V	Polypropylene	8	C279, C280, C286, C287, C306, C307, C316, C317		5%	5mm Pitch Box	1114-152062E001
56	10nF 50V	0805 COG	1	C28		5%	805	

Note: resistors, capacitors and other 'generic' components are not usually stocked by the manufacturer. Please obtain these locally.

AUDIO PARTNERSHIP PLC

DACMAGIC BOM (AP22871/3)

57	10nF 100V	X7R Ceramic	5	C90, C91, C107, C110, C111		10%	805		100V dc
58	47nF 16V	ECHU 1206	26	C15, C53-C55, C85, C86, C272-C274, C281, C284, C285, C291, C292, C297, C298, C308-C311, C314, C315, C321, C322, C328, C329			1206		
59	100nF 50V	0805 Ceramic	44	C3, C4, C7, C9, C12, C14, C16, C19-C21, C23, C24, C27, C29, C30, C32-C34, C36, C37, C43, C74, C75, C84, C113-C116, C121, C123-C127, C161-C163, C215, C222, C427, C430, C432-C434		10%	805	1100-104043-400	
60	100nF 100V	Polypropylene	10	C6, C38, C39, C42, C48, C56, C67, C72, C73, C97		10%	7.5mm Pitch Box		
61	100nF 16V	X7R 0603	20	C46, C47, C49-C52, C57-C66, C68-C71		10%	603		
62	100nF 100V	X7R Ceramic	2	C83, C112		10%	805		100V dc
63	100nF 50V	1206 SL	6	C93-C96, C128, C129		10%	1206		
64	330nF 50V	0805 Ceramic	2	C99, C122		10%	805		
65	10uF 35V	Electrolytic	15	C8, C10, C25, C26, C31, C35, C44, C45, C130, C212, C414, C415, C426, C431, C435		20%	5mm Dia	1102-100034-000	
66	10uF 35V	NP Electrolytic	6	C270, C275, C276, C301, C303, C304		20%	5mm Dia		
67	47uF 16V	NP Electrolytic	2	C271, C302		20%	6mm Dia	1105-470014-000	
68	100uF 16V	Electrolytic	1	C103		20%	5.2mm Dia	1102-101014-000	
69	220uF 50V	Electrolytic	1	C401		20%	10.4mm		
70	470uF 16V	NP Electrolytic	6	C1, C2, C40, C41, C293, C299		10%	10mm Dia		
71	470uF 50V	Electrolytic	1	C400		10%	12mm Dia		
72	1000uF 50V	Electrolytic	4	C76, C77, C402, C403		10%	12mm Dia		
73	1000uF 25V	Electrolytic	2	C87, C419		20%	10mm dia	1102-102024-000	
74	2200uF 25V	Electrolytic	4	C5, C89, C424, C425		20%	12.5 mm Dia		

CONNECTORS

75		USB B Type	1	CN1			Through Hole		
76	2x7 Way Header	2.5mm header	1	CN2					Through Hole
77		Single Gold Plated RCA	3	CN3, CN5, CN10			Through Hole	2330-002901E001	Black Insert
78	9 Way	Straight Header	1	CN6			2mm Pitch	2300-009000-000	
79	8 Way	Straight Header	1	CN7			2mm Pitch	2300-008000-000	
80		Male XLR	2	CN8, CN11			Through Hole		
81	8 Way SJN	SJN Cable Header	1	CN9			2mm Pitch		Use AP23724/1 cable
82	Double Gold Plated RCA		1	CN12					TOP WHITE, BOTTOM RED
83	3 Way	Straight Header	1	CN13			2.5mm Pitch	2300-003100-004	
84	9 Way SJN	SJN Cable Header	1	CN14			2mm Pitch		Use AP23725/1 cable
85		DC Jack	1	CN400				2303-003911E300	

CRYSTALS

86	24.576 MHz 3.3V	Oscillator Mod	1	X1			4PINDIL08		< 50ppm
87	NO FIT		1	X2					
88	12MHz	Strip Cut Crystal	1	X3			HC49US		

DIODES

89	NO FIT		1	D1					
90	200V	1.0A SM Rectifier	13	D2, D12, D17, D18, D26-D29, D400-D403, D405	S1D				
91	75V 0.215A	Signal Diode SM	3	D3, D24, D25	BAV99		SOT23		
92	1A 30V	Schottky Rectifier	1	D4	STPS1L30U		DO214		Vf=0.3V If= 1A
93	Blue Azur LED	3mm	12	D5-D10, D13-D16, D19, D20	HFB963M-130			3100-000030-003	H= 6MM (LEG ONLY)
94	1N4148	SMT	4	D11, D21-D23			SOD80		
95	75V 0.215A	Signal Diode SM	4	D31-D34	BAW56		SOT23		

FUSES

96	F2AL	Fast Blow Fuse	1	F400			20mm		
97		Fuse Holder Base	1	F400	PTF78 (or equivalent)	20mm Pitch	4031-780000E000		
98		Fuse Holder Cover	1	F400	PTF78 (or equivalent)	20mm Pitch	4034-780000E000		

INDUCTORS

99	600Z 1.5A	Ferrite Bead 1206	3	FB1-FB3			1206		
100	600Z 1.5A	Ferrite Bead 1206	2	FB4, FB5			1206		
101	330uH 1.5A	Shielded Inductor	1	L1					Must be Ferrite Shielded
102	4.7uH 4A	Shielded Inductor	1	L2					Must be Ferrite Shielded
103	NO FIT		1	L3					

INTEGRATED CIRCUITS

Note: resistors, capacitors and other 'generic' components are not usually stocked by the manufacturer. Please obtain these locally.

AUDIO PARTNERSHIP PLC
DACMAGIC BOM (AP22871/3)

104		USB Audio Interface	1	U1	CM108		SQFP48		
105		INVERTER	1	U2	74HCT14		SO14		
106		VOLTAGE DETECTOR IC	1	U3	BD5231G				
107		OPTICAL RECEIVER	2	U4, U5	APRX179AT				
108	32K X 8	EEPROM	1	U6	24LC256		DIL08		Programmed with AP237262 : Use Socket
109		multiplexer	1	U7	74VHC153		SO16		
110		Quad 2 i/p OR gate	1	U8	74VHC32		SO14		
111	5V 1A	Regulator DPAK	1	U9	7805		DPAK		SMD DPAK type
112		Optical Transmitter	1	U10	APT-X179AT				
113		SPDIF RX IC	1	U11	CS8416		TSSOP28		
114		DC-DC Converter Control	1	U12	MC34063		SO8		
115	TMS320VC5501	DSP	1	U13	TMS320VC5501PGF 300		LQFP176		DSP
116		SCHMITT INVERTER	1	U14	74VHC14		SO14		
117		Quad 2 Input OR	1	U15	74VHC32		SO14		
118		Hex Unbuffered Inverter	1	U23	74HCU04		SO14		
119		24bit/192kHz DAC	2	U54, U58	WM8740		SSOP28	4187-400990-000	PY585
120		Dual Audio Op Amp	4	U55, U56, U59, U60	NE5532D		SOIC08		PY1162
121		Dual Audio Op Amp	2	U57, U61	OP275GS		SOIC08		
122	15V 1A	Regulator	1	U402	7815		Through Hole	4178-150302E600	
123	-15V 1A	Regulator	1	U403	7915		Through Hole	4179-150302-600	
124	5V 1A	Regulator	1	U404	7805		Through Hole	4178-050334-700	
125	3.3V 800mA	LDO Regulator	1	U407	LM1117T 3.3		TO220		PY986
126	Positive	Adj Regulator	1	U408	LM317T		TO220	4131-700301-800	PY103

RELAY

127	9V Coil, 2A Contacts	Low Power 2P2T	4	RL3-RL6	ME2-9B		Through Hole		PY1402
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SWITCHES

128		Tactile	2	SW2, SW4	KPT-1105A		Through Hole	2400-020200-000	
129		POWER SWITCH	1	SW400	PS-11E01				0.5A @ 250V; 1A @ 125

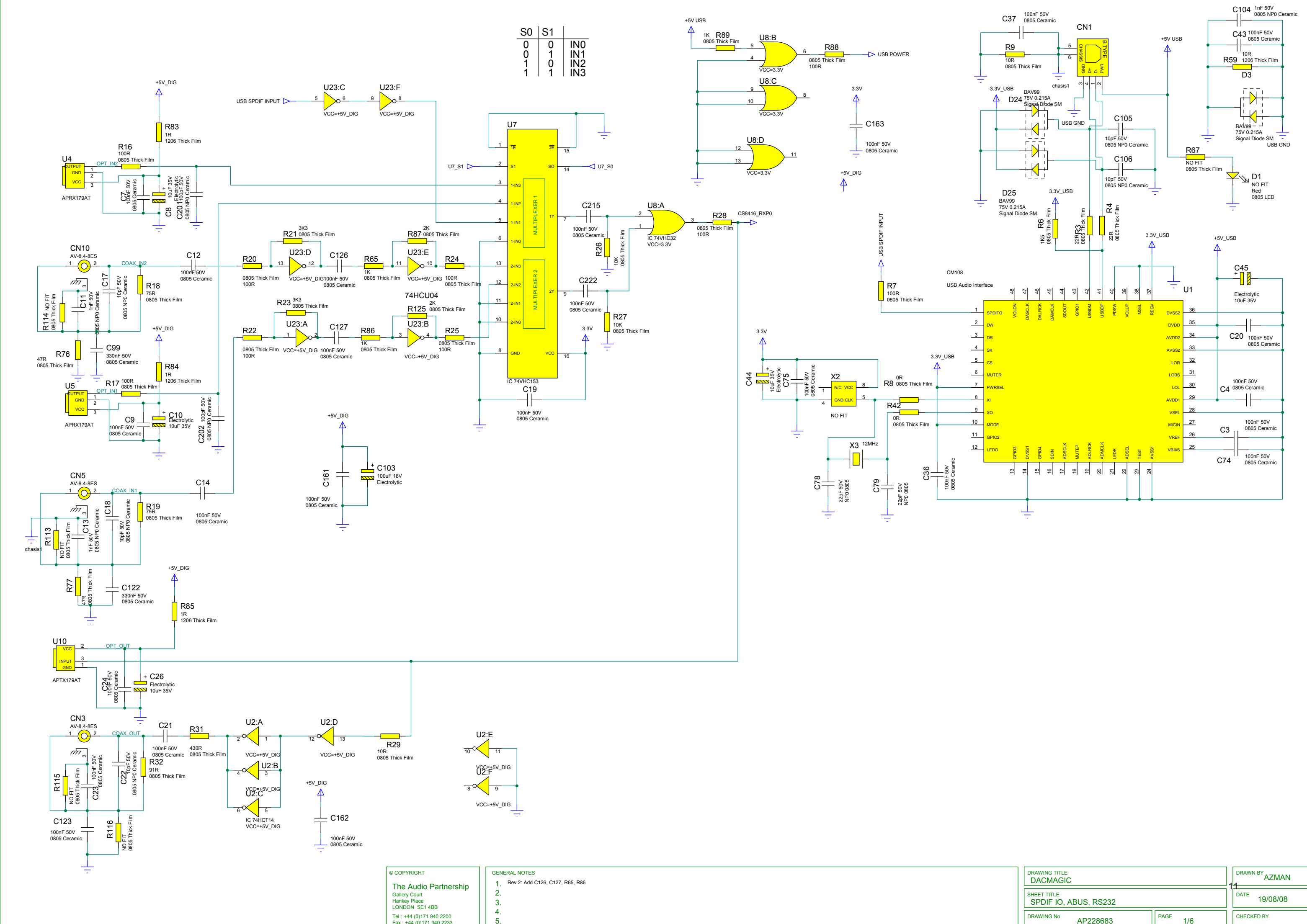
TRANSISTORS

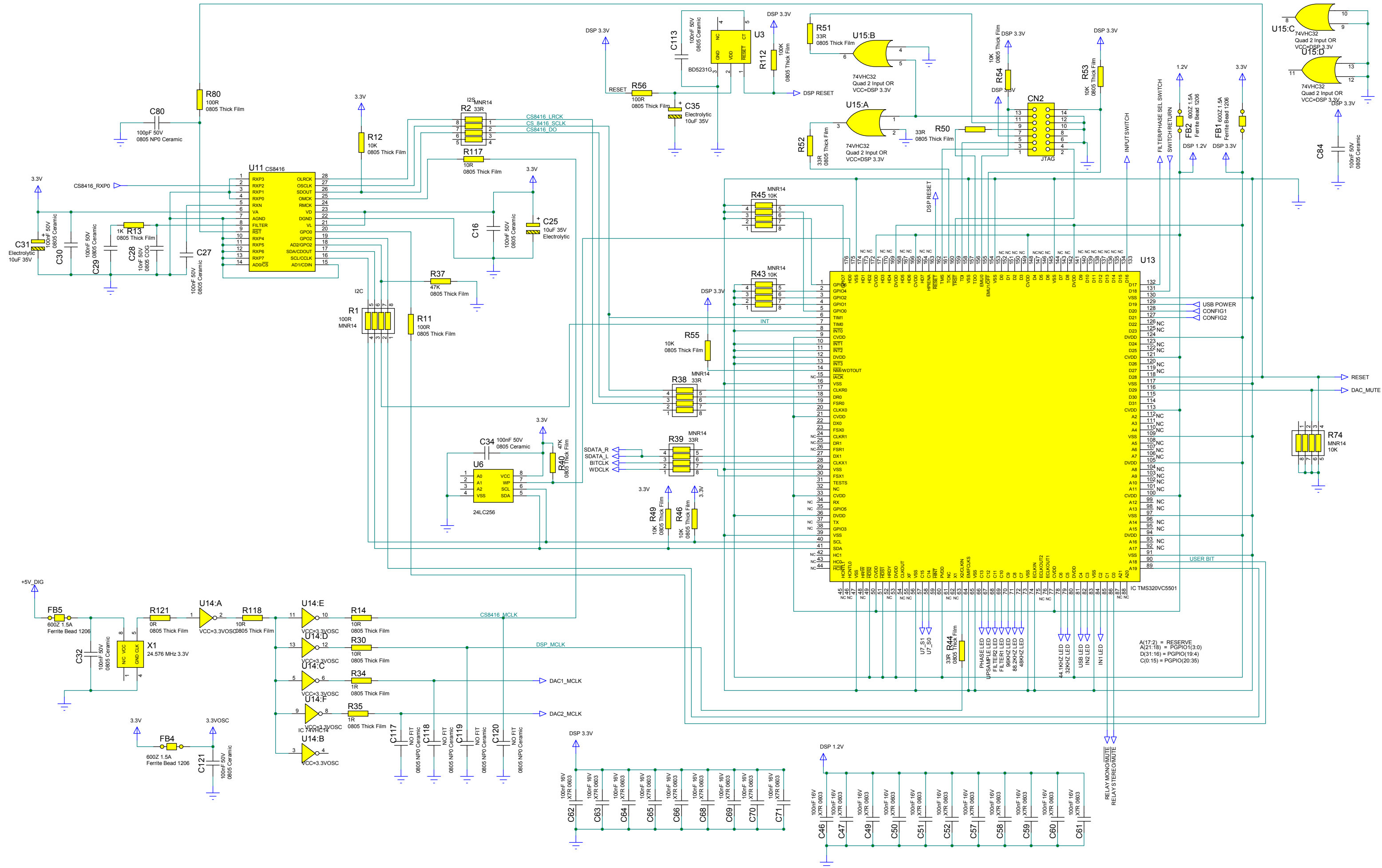
130	45V 300mA	NPN Signal	2	Q1, Q2	BC337-25		TO92	1300-337000-100	PY214
131		NPN Darlington	1	Q4	MPSA14			1300-140000-100	PY1211

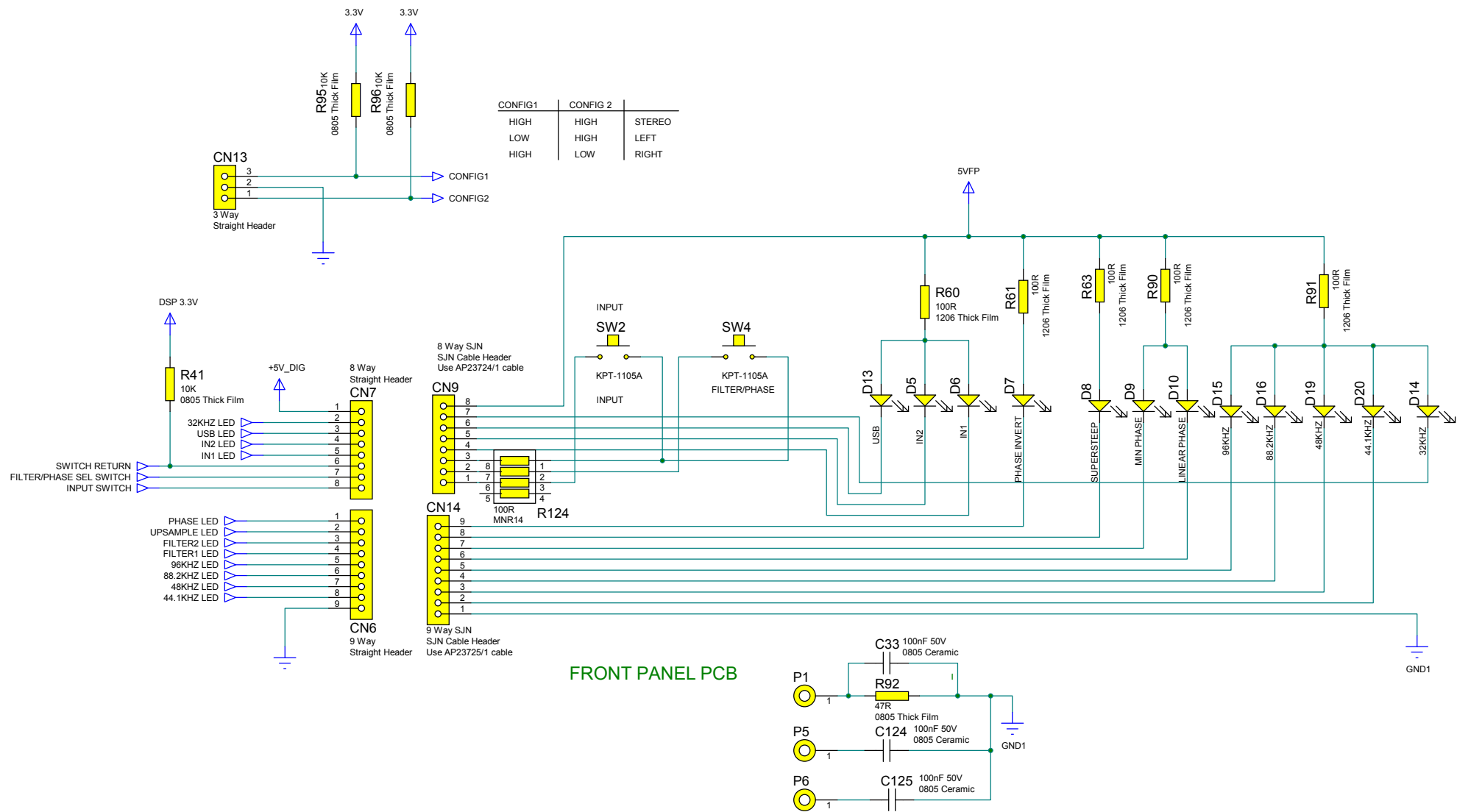
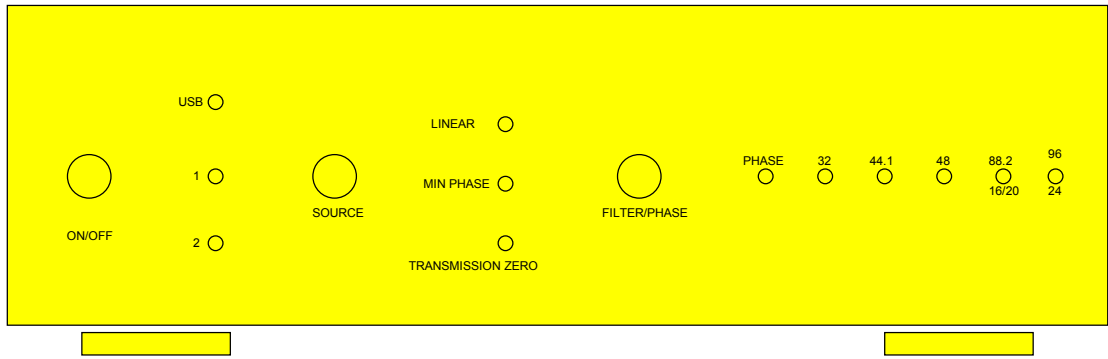
MISCELLANEOUS

132		nylon bush	4	BS1-BS4				4082-000220E000	
133	3 Way	TO220 Heatsink	2	HS1, HS2	AP19208/2				
134	M3x8mm STP	P/H Black Screw	4	SC1-SC4					
135	M3x5mm MC	P/H Black Screw	4	SC5-SC8					
136	TO220	Silicon Pad	4	SI1-SI4					Fix Regulators to Heatsink
137	DIL08 SOCKET		1	SOCKET 1					For U6
138	LED spacer	6.5mm led spacer	12	SP1-SP12	LED-6.5				6.5mm black
139	bracket	PS-11E01 switch bracket	1	SP13					AP228271
140	M3	Black Washer	2	WS1, WS2					Fibre

S0	S1	
0	0	IN0
0	1	IN1
1	0	IN2
1	1	IN3







FRONT PANEL PCB

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GENERAL NOTES
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