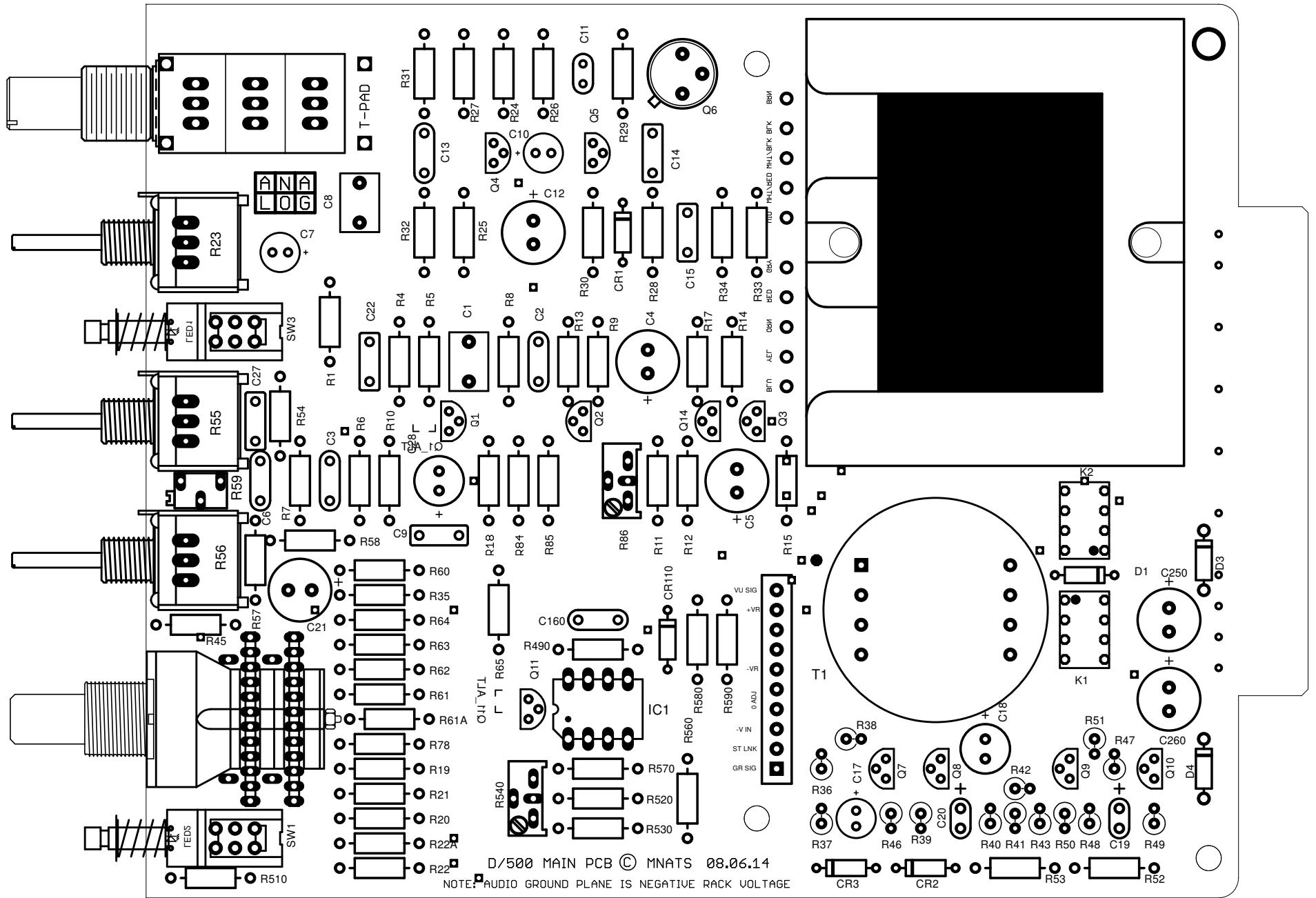


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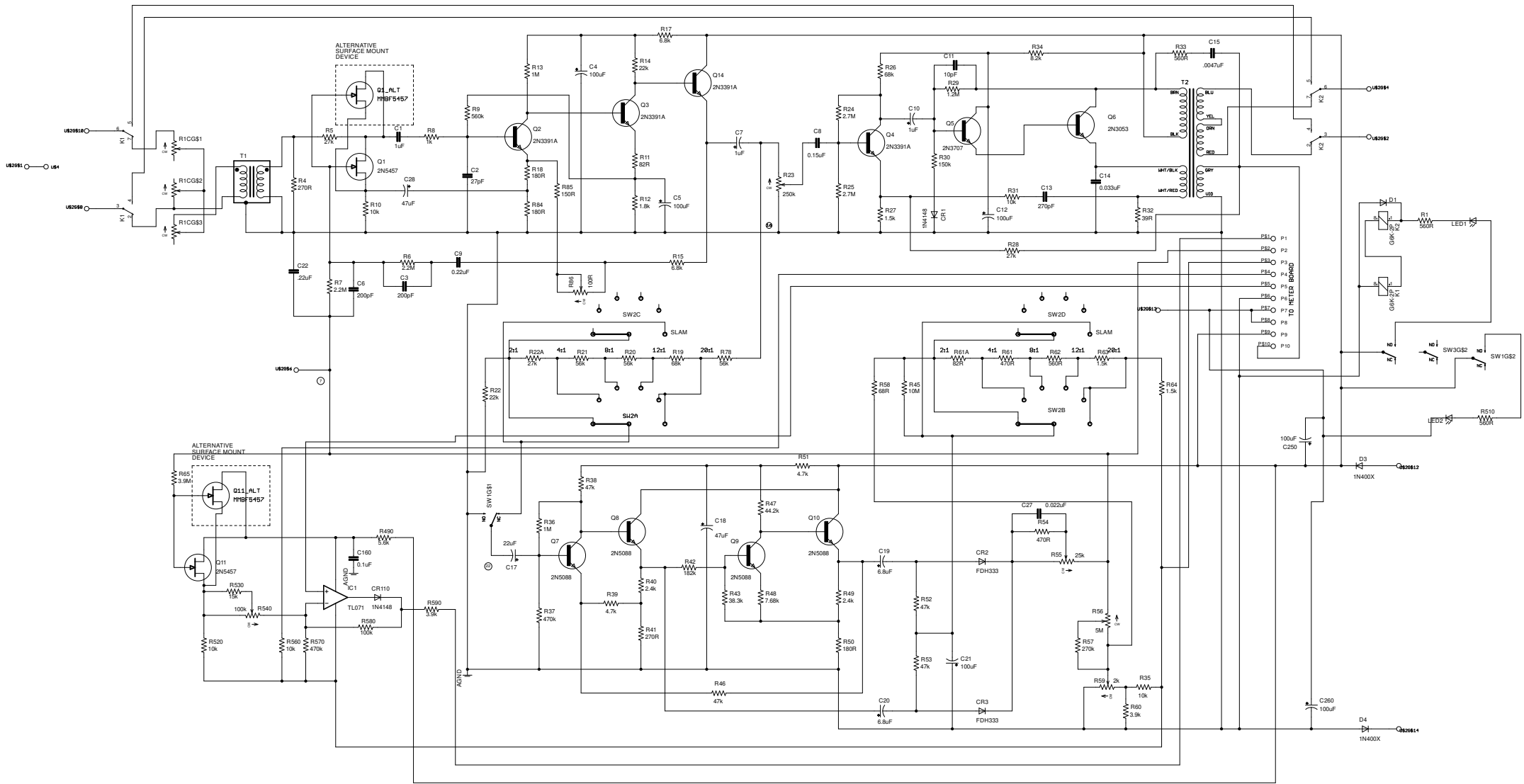


D/500 FET Limiter
PCB Overlay, Schematic and Bill of Materials



D/500 MAIN PCB © MNATS 08.06.14

NOTE: AUDIO GROUND PLANE IS NEGATIVE RACK VOLTAGE



D/500 Main PCB Bill of Materials

Quantity	Part	Value	Device	Part Number	Package	Notes
1	C15	.0047uF	CAPACITOR, FILM		CAP2_RECT	OBSERVE PACKAGE DIMENSIONS WHEN SELECTING CAPS CAP2 = 0.2" PITCH
1	C22	.22uF	CAPACITOR, FILM		CAP2_RECT	
1	C27	0.022uF	CAPACITOR, FILM		CAP2_RECT	
1	C14	0.033uF	CAPACITOR, FILM		CAP2_RECT	
1	C8	0.15uF	CAPACITOR, FILM		CAP_FILM_5X7.2	
1	C160	0.1uF	CAPACITOR, CERAMIC		CAP2	
1	C9	0.22uF	CAPACITOR, FILM		CAP2_RECT	
1	C4	100uF	CAPACITOR, ELECTROLYTIC		RAD8/3.5	
1	C5	100uF	CAPACITOR, ELECTROLYTIC		RAD8/3.5	
1	C12	100uF	CAPACITOR, ELECTROLYTIC		RAD8/3.5	
1	C21	100uF	CAPACITOR, ELECTROLYTIC		RAD8/3.5	
1	C250	100uF/25V	CAPACITOR, ELECTROLYTIC		RAD8/3.5	RAD8/3.5 = 8mm dia, 3.5mm pitch
1	C260	100uF/25V	CAPACITOR, ELECTROLYTIC		RAD8/3.5	
1	C11	10pF	CAPACITOR, CERAMIC		CAP1	
1	C1	1uF	CAPACITOR, FILM		CAP_FILM_5X7.2	
1	C7	1uF	CAPACITOR, ELECTROLYTIC		RAD5/2	
1	C10	1uF	CAPACITOR, ELECTROLYTIC		RAD5/2	
1	C3	200pF	CAPACITOR, CERAMIC		CAP2	
1	C6	200pF	CAPACITOR, CERAMIC		CAP2	
1	C17	1uF	CAPACITOR, ELECTROLYTIC		RAD5/2	
1	C13	270pF	CAPACITOR, CERAMIC		CAP2	
1	C2	27pF	CAPACITOR, CERAMIC		CAP2	CAP1 = 0.1" PITCH 5mm Pitch
1	C18	47uF	CAPACITOR, ELECTROLYTIC		RAD6.3/2.5	
1	C28	47uF	CAPACITOR, ELECTROLYTIC		RAD6.3/2.5	
1	C19	6.8uF	CAPACITOR, TANTALUM		CAP1_POL	
1	C20	6.8uF	CAPACITOR, TANTALUM		CAP1_POL	
1	CR1		DIODE	1N4148	DO-35	
1	CR2		DIODE, LOW LEAKAGE	FDH333	DO-35	
1	CR3		DIODE, LOW LEAKAGE	FDH333	DO-35	
1	CR110		DIODE	1N4148	DO-35	
1	D1		DIODE	1N4148	DO-35	
1	D3		DIODE	1N4004	DO-41	
1	D4		DIODE	1N4004	DO-41	USE STANDARD BRIGHTNESS TYPES
1	LED1		LED, 3MM, RED		LED_3MM	
1	LED2		LED, 3MM, YELLOW		LED_3MM	
1	Q1		TRANSISTOR, FET	2N5457	TO-92	
1	Q2		TRANSISTOR, BIPOLAR	2N3391A	TO-92	
1	Q3		TRANSISTOR, BIPOLAR	2N3391A	TO-92	
1	Q4		TRANSISTOR, BIPOLAR	2N3391A	TO-92	
1	Q5		TRANSISTOR, BIPOLAR	2N3707	TO-92	
1	Q6		TRANSISTOR, BIPOLAR	2N3053	TO-39	
1	Q7		TRANSISTOR, BIPOLAR	2N5088	TO-92	
1	Q8		TRANSISTOR, BIPOLAR	2N5088	TO-92	
1	Q9		TRANSISTOR, BIPOLAR	2N5088	TO-92	
1	Q10		TRANSISTOR, BIPOLAR	2N5088	TO-92	
1	Q11		TRANSISTOR, FET	2N5457	TO-92	
1	Q14		TRANSISTOR, BIPOLAR	2N3391A	TO-92	
1	IC1		OP AMP, SINGLE	TLO71	DIP-8	SINGLE OP AMP ONLY, NOT DUAL
1	R29	1.2M	RESISTOR, 1/4W		MF1/4	
1	R27	1.5k	RESISTOR, 1/4W		MF1/4	
1	R63	1.5k	RESISTOR, 1/4W		MF1/4	
1	R64	1.5k	RESISTOR, 1/4W		MF1/4	
1	R12	1.8k	RESISTOR, 1/4W		MF1/4	
1	R580	100k	RESISTOR, 1/4W		MF1/4	
1	R10	10k	RESISTOR, 1/4W		MF1/4	
1	R31	10k	RESISTOR, 1/4W		MF1/4	
1	R35	10k	RESISTOR, 1/4W		MF1/4	
1	R520	10k	RESISTOR, 1/4W		MF1/4	
1	R560	10k	RESISTOR, 1/4W		MF1/4	
1	R45	10M	RESISTOR, 1/4W, CARBON FILM		MF1/4	
1	R30	150k	RESISTOR, 1/4W		MF1/4	
1	R85	150R	RESISTOR, 1/4W		MF1/4	
1	R530	15k	RESISTOR, 1/4W		MF1/4	
1	R18	180R	RESISTOR, 1/4W		MF1/4	
1	R50	180R	RESISTOR, 1/4W		RESISTOR_VERT	
1	R84	180R	RESISTOR, 1/4W		MF1/4	
1	R42	182k	RESISTOR, 1/4W		RESISTOR_VERT	
1	R8	1k	RESISTOR, 1/4W		MF1/4	
1	R13	1M	RESISTOR, 1/4W		MF1/4	
1	R36	1M	RESISTOR, 1/4W		RESISTOR_VERT	
1	R6	2.2M	RESISTOR, 1/4W, CARBON FILM		MF1/4	
1	R7	2.2M	RESISTOR, 1/4W, CARBON FILM		MF1/4	
1	R40	2.4k	RESISTOR, 1/4W		RESISTOR_VERT	
1	R49	2.4k	RESISTOR, 1/4W		RESISTOR_VERT	
1	R24	2.7M	RESISTOR, 1/4W, CARBON FILM		MF1/4	
1	R25	2.7M	RESISTOR, 1/4W, CARBON FILM		MF1/4	
1	R14	22k	RESISTOR, 1/4W		MF1/4	
1	R22	22k	RESISTOR, 1/4W		MF1/4	
1	R57	270k	RESISTOR, 1/4W		MF1/4	
1	R4	270R	RESISTOR, 1/4W		MF1/4	

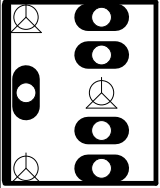
1 R41	270R	RESISTOR, 1/4W		RESISTOR_VERT	
1 R5	27k	RESISTOR, 1/4W		MF1/4	
1 R22A	27k	RESISTOR, 1/4W		MF1/4	
1 R28	27k	RESISTOR, 1/4W		MF1/4	
1 R60	3.9k	RESISTOR, 1/4W		MF1/4	
1 R590	3.9k	RESISTOR, 1/4W		MF1/4	
1 R65	3.9M	RESISTOR, 1/4W, CARBON FILM		MF1/4	
1 R43	38.3k	RESISTOR, 1/4W		RESISTOR_VERT	
1 R32	39R	RESISTOR, 1/4W, CARBON FILM		MF1/4	
1 R39	4.7k	RESISTOR, 1/4W		RESISTOR_VERT	VERTICALLY MOUNTED RESISTORS
1 R51	4.7k	RESISTOR, 1/4W		RESISTOR_VERT	ARE IN GR CONTROL AMP STAGE
1 R47	44.2k	RESISTOR, 1/4W		RESISTOR_VERT	
1 R37	470k	RESISTOR, 1/4W		RESISTOR_VERT	
1 R570	470k	RESISTOR, 1/4W		MF1/4	
1 R54	470R	RESISTOR, 1/4W		MF1/4	
1 R61	470R	RESISTOR, 1/4W		MF1/4	
1 R38	47k	RESISTOR, 1/4W		RESISTOR_VERT	
1 R46	47k	RESISTOR, 1/4W		RESISTOR_VERT	
1 R52	47k	RESISTOR, 1/4W		MF1/4	
1 R53	47k	RESISTOR, 1/4W		MF1/4	
1 R490	5.6k	RESISTOR, 1/4W		MF1/4	
1 R9	560k	RESISTOR, 1/4W		MF1/4	
1 R1	560R	RESISTOR, 1/4W		MF1/4	
1 R33	560R	RESISTOR, 1/4W		MF1/4	
1 R62	560R	RESISTOR, 1/4W		MF1/4	
1 R510	560R	RESISTOR, 1/4W		MF1/4	
1 R20	56k	RESISTOR, 1/4W		MF1/4	
1 R21	56k	RESISTOR, 1/4W		MF1/4	
1 R78	56k	RESISTOR, 1/4W		MF1/4	
1 R15	6.8k	RESISTOR, 1/4W		MF1/4	
1 R17	6.8k	RESISTOR, 1/4W		MF1/4	
1 R19	68k	RESISTOR, 1/4W		MF1/4	
1 R26	68k	RESISTOR, 1/4W		MF1/4	
1 R58	68R	RESISTOR, 1/4W, CARBON FILM		MF1/4	
1 R48	7.68k	RESISTOR, 1/4W		RESISTOR_VERT	
1 R34	8.2k	RESISTOR, 1/4W		MF1/4	
1 R11	82R	RESISTOR, 1/4W		MF1/4	
1 R61A	82R	RESISTOR, 1/4W, CARBON FILM		MF1/4	
1 R1C	600Ω	T-PAD	B51 T-Pad	BOURNS_MODEL_51	HAIRBALL AUDIO
1 R540	100k	POTENTIOMETER, TRIMMER		3296Y	
1 R86	100R	POTENTIOMETER, TRIMMER		3296Y	
1 R59	2k	POTENTIOMETER, TRIMMER	3266X-1-202LF	3266X	
1 R55	25k	POTENTIOMETER	308NPC25K	SERIES_308	
1 R56	5M	POTENTIOMETER	308N5MEG	SERIES_308	
1 R23	250k	POTENTIOMETER	308NPC250K OR 308N250K	SERIES_308	LOG TAPER PREFERRED IF AVAILABLE
1 K1		RELAY, LOW SIGNAL	G6K-2P	G6K-2P	
1 K2		RELAY, LOW SIGNAL	G6K-2P	G6K-2P	
1 CN100		HEADER 10 TERMINAL 0.1" PITCH		10PIN_1_HEADER	
1 S2A	4P6T	SWITCH, ROTARY	71ADF30-02-2-AJS (1/8" SHAFT)	71BDF30-02-AJN	71BDF30-02QAJN (1/4" SHAFT, NON SHORTING)
1 SW1	DPDT	SWITCH, PUSH BUTTON	PBH2UEENAGX	PBH_2U	
1 SW3	DPDT	SWITCH, PUSH BUTTON	PBH2UEENAGX	PBH_2U	
2		SWITCH CAPS FOR PUSH BUTTONS	1RBLK		SELECT COLOR AS DESIRED
1 T1	500Ω:200Ω	TRANSFORMER, INPUT	C-3837-1	INPUT_TRANSFORMER_1.13	HAIRBALL AUDIO
1 T2	50Ω+50Ω:150Ω+150Ω	TRANSFORMER, OUTPUT	EA11148	EA-5002	HAIRBALL AUDIO
?		KNOB .50"DIA .125"SHAFT	OEJL-50-1-6 or OEDL-50-1-6		SELECT KNOBS ACCORDING TO
?		KNOB .50"DIA .250"SHAFT	OEJL-50-1-5 or OEDL-50-1-5		POT SHAFT SIZE
2		20mm/0.79" Nylon Standoff			FOR METER BOARD
2		SCREWS/NUTS/LOCK WASHERS FOR ABOVE			
2		25mm/1" SCREWS/NUTS/LOCK WASHERS			TO SECURE OUTPUT TRANSFORMER
1		TO-39 HEATSINK FOR 2N3053			



3E90 AD1

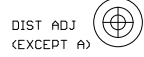
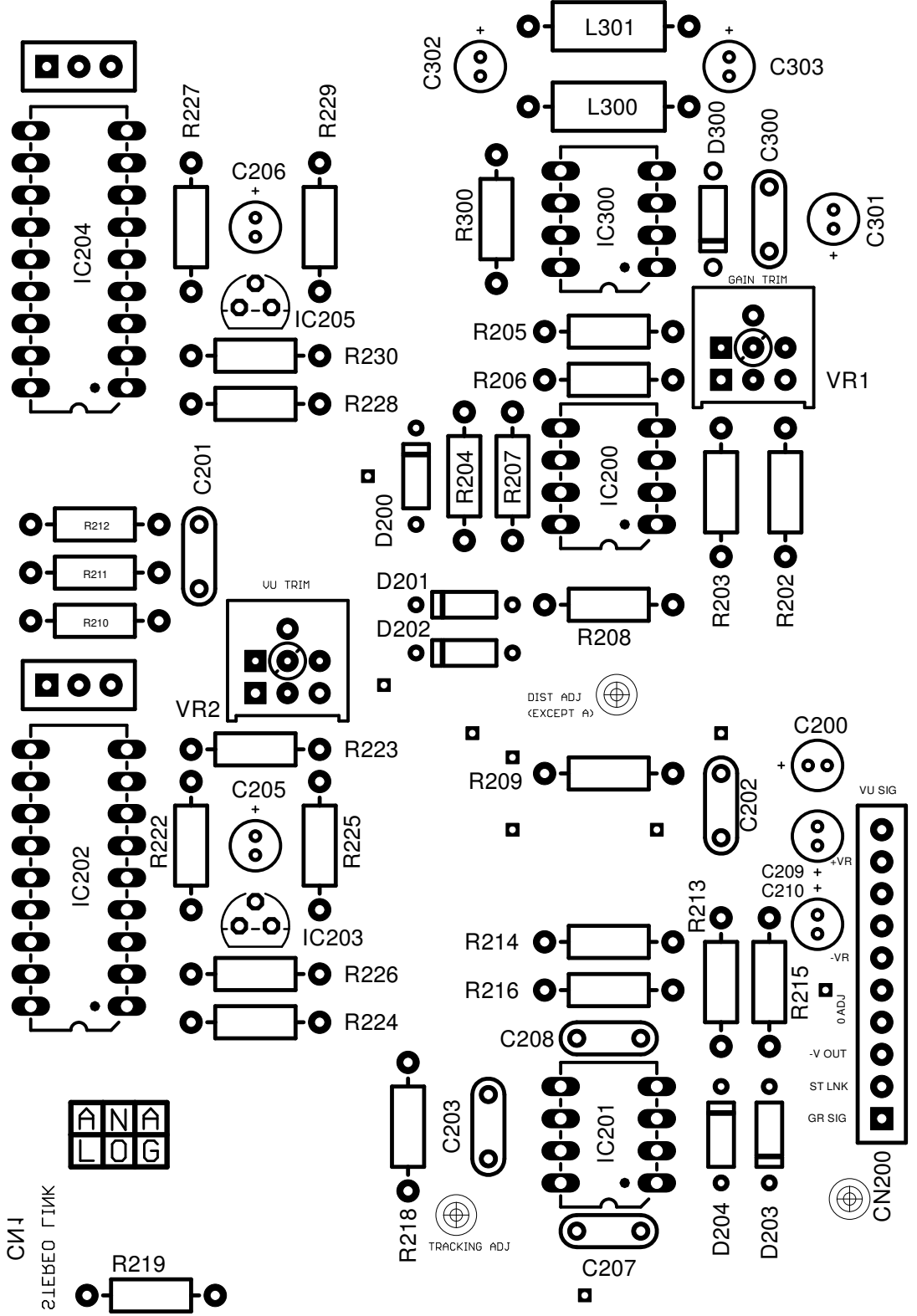
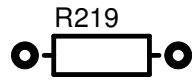
FET/500 METER BOARD © MNATS 25.05.14

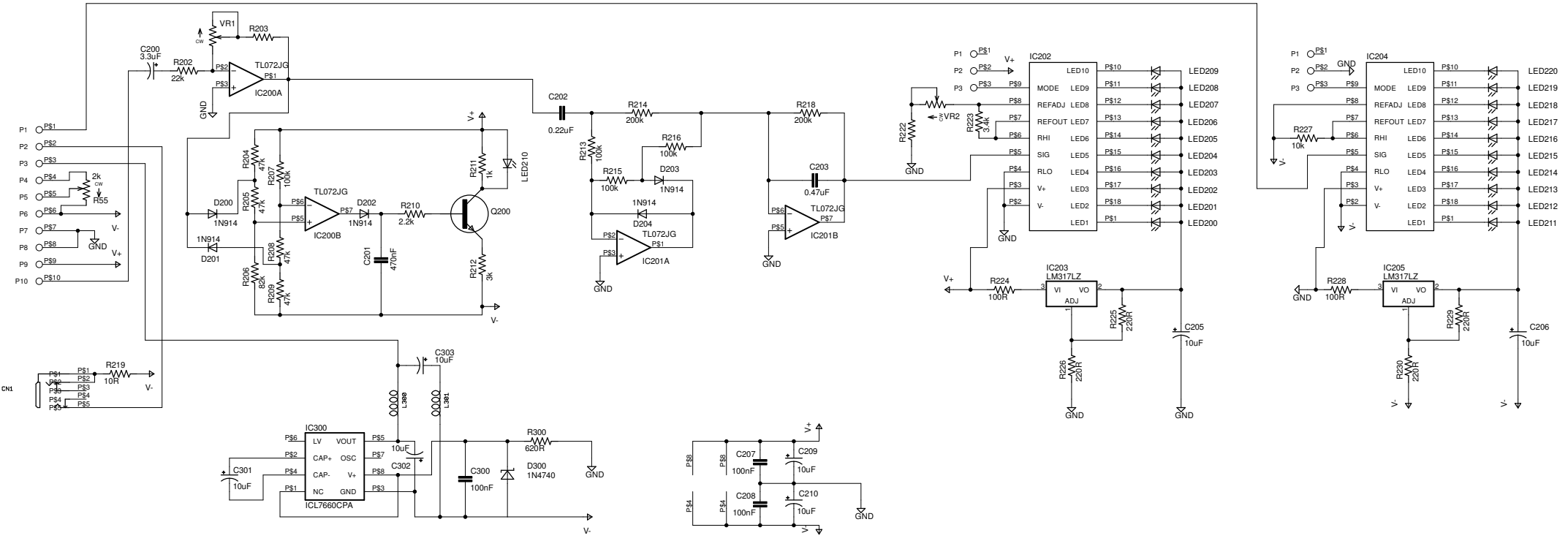
- LED200
- LED201
- LED202
- LED203
- LED204
- LED205
- LED206
- LED207
- LED208
- LED209
- LED210
- LED211
- LED212
- LED213
- LED214
- LED215
- LED216
- LED217
- LED218
- LED219
- LED220



CN1

2-LEBEO ΓΙΑΚ





D/500 Meter Board Bill of Materials						
For Average Level Meter Response						
Quantity	Part	Value	Device	Part Number	Package	Notes
1	C202	0.22uF	Capacitor, MLCC		CAP2	
1	C207	100nF	Capacitor, MLCC		CAP2	Multi-Layer Ceramic
1	C208	100nF	Capacitor, MLCC		CAP2	
1	C300	100nF	Capacitor, MLCC		CAP2	
1	C205	10uF	Capacitor, Electrolytic	ECE-A1VKS100	RAD4/1.5	5mm height
1	C206	10uF	Capacitor, Electrolytic		RAD4/1.5	5mm height
1	C209	10uF	Capacitor, Electrolytic		RAD4/1.5	5mm height
1	C210	10uF	Capacitor, Electrolytic		RAD4/1.5	5mm height
1	C301	10uF	Capacitor, Electrolytic		RAD4/1.5	5mm height
1	C302	10uF	Capacitor, Electrolytic		RAD4/1.5	5mm height
1	C303	10uF	Capacitor, Electrolytic		RAD4/1.5	5mm height
1	C200	3.3uF	Capacitor, Electrolytic		RAD4/1.5	5mm height
1	C201	470nF	Capacitor, MLCC		CAP2	
1	C203	470nF	Capacitor, MLCC		CAP2	
1	CN1		1/8" (3.5mm) Connector	STX-3120-5B	STX-3120-5B	
1	CN200		10 Terminal 0.1" Long Pins		10PIN_1_HEADER	21mm Total Length
1	D200		Diode	1N914/1N4148	DO-35	
1	D201		Diode	1N914/1N4148	DO-35	
1	D202		Diode	1N914/1N4148	DO-35	
1	D203		Diode	1N914/1N4148	DO-35	
1	D204		Diode	1N914/1N4148	DO-35	
1	D300		Diode, Zener 10V	1N4740	DO-35Z	
1	IC202		LED Display Driver	LM3916	DIP-18	
1	IC204		LED Display Driver	LM3916	DIP-18	
1	IC200		Operational Amplifier, Dual	TLO72	DIP-8	
1	IC201		Operational Amplifier, Dual	TLO72	DIP-8	
1	IC300		Voltage Converter	MAX1044/ICL7660A	DIP-8	MAX1044 Preferred
1	IC203		Voltage Regulator	LM317LZ	TO92	
1	IC205		Voltage Regulator	LM317LZ	TO92	
1	L300	1000uH	Inductor		SMCC_INDUCTOR	
1	L301	1000uH	Inductor		SMCC_INDUCTOR	
1	LED200		Light Emitting Diode, Green		LED_3MM_FLAT	Use Standard
1	LED201		Light Emitting Diode, Green		LED_3MM_FLAT	Brightness Types
1	LED202		Light Emitting Diode, Green		LED_3MM_FLAT	For All LEDs
1	LED203		Light Emitting Diode, Green		LED_3MM_FLAT	
1	LED204		Light Emitting Diode, Green		LED_3MM_FLAT	
1	LED205		Light Emitting Diode, Green		LED_3MM_FLAT	
1	LED206		Light Emitting Diode, Green		LED_3MM_FLAT	
1	LED207		Light Emitting Diode, Green		LED_3MM_FLAT	
1	LED208		Light Emitting Diode, Green		LED_3MM_FLAT	
1	LED209		Light Emitting Diode, Yellow		LED_3MM_FLAT	
1	LED210		Light Emitting Diode, Red		LED_3MM_FLAT	Peak
1	LED211		Light Emitting Diode, Red		LED_3MM_FLAT	
1	LED212		Light Emitting Diode, Red		LED_3MM_FLAT	
1	LED213		Light Emitting Diode, Yellow		LED_3MM_FLAT	
1	LED214		Light Emitting Diode, Yellow		LED_3MM_FLAT	
1	LED215		Light Emitting Diode, Yellow		LED_3MM_FLAT	
1	LED216		Light Emitting Diode, Green		LED_3MM_FLAT	
1	LED217		Light Emitting Diode, Green		LED_3MM_FLAT	
1	LED218		Light Emitting Diode, Green		LED_3MM_FLAT	
1	LED219		Light Emitting Diode, Green		LED_3MM_FLAT	
1	LED220		Light Emitting Diode, Red		LED_3MM_FLAT	Slam
1	Q200		Transistor, Bipolar	2N5088	TO-92	General Purpose NPN
1	R55	2k	Potentiometer, Trimmer	3266X-1-202LF	3266X	Do Not Substitute
1	R203	22k	Resistor, Metal Film		MF1/4	
1	R207	100k	Resistor, Metal Film		MF1/4	
1	R216	100k	Resistor, Metal Film		MF1/4	
1	R213	100k	Resistor, Metal Film		MF1/4	
1	R215	100k	Resistor, Metal Film		MF1/4	
1	R224	100R	Resistor, Metal Film		MF1/4	
1	R228	100R	Resistor, Metal Film		MF1/4	
1	R227	10k	Resistor, Metal Film		MF1/4	
1	R219		Resetable Fuse	RXEF010	MF1/4	

1	R211	1k	Resistor, Metal Film		MF1/4	
1	R210	2.2k	Resistor, Metal Film		MF1/4	
1	R218	200k	Resistor, Metal Film		MF1/4	
1	R214	200k	Resistor, Metal Film		MF1/4	
1	R225	220R	Resistor, Metal Film		MF1/4	
1	R226	220R	Resistor, Metal Film		MF1/4	
1	R229	220R	Resistor, Metal Film		MF1/4	
1	R230	220R	Resistor, Metal Film		MF1/4	
1	R202	22k	Resistor, Metal Film		MF1/4	
1	R223	3.4k	Resistor, Metal Film		MF1/4	
1	R212	3k	Resistor, Metal Film		MF1/4	
1	R204	47k	Resistor, Metal Film		MF1/4	
1	R205	47k	Resistor, Metal Film		MF1/4	
1	R208	47k	Resistor, Metal Film		MF1/4	
1	R209	47k	Resistor, Metal Film		MF1/4	
1	R222	1.2k	Resistor, Metal Film		MF1/4	
1	R300	620R	Resistor, Metal Film		MF1/4	
1	R206	82k	Resistor, Metal Film		MF1/4	
1	VR1	10k	Potentiometer, Trimmer		3386_TOP	Top Adjust
1	VR2	1k	Potentiometer, Trimmer		3386_TOP	Top Adjust