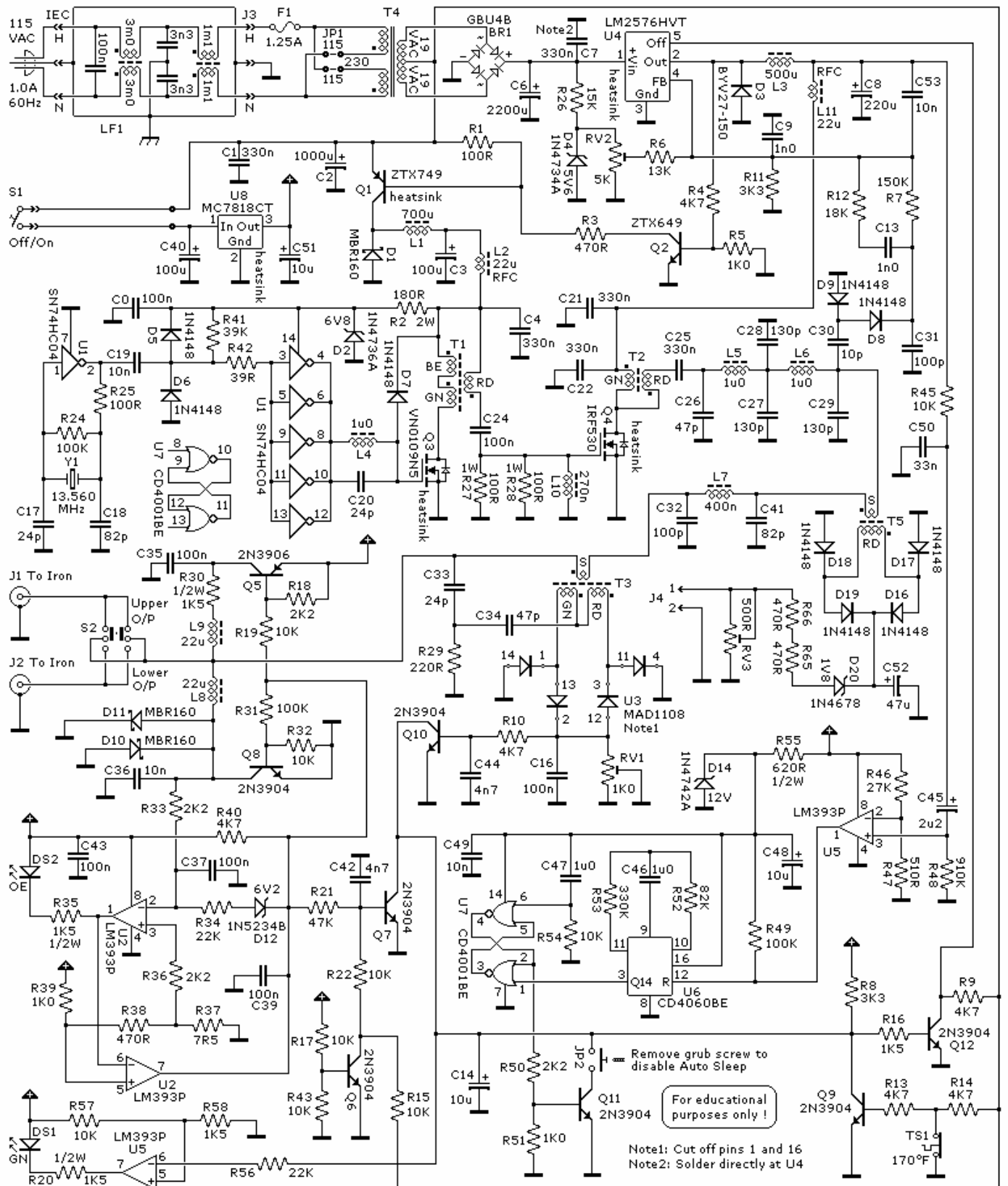
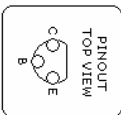


# MX-500P-11 SCHEMATIC DIAGRAM

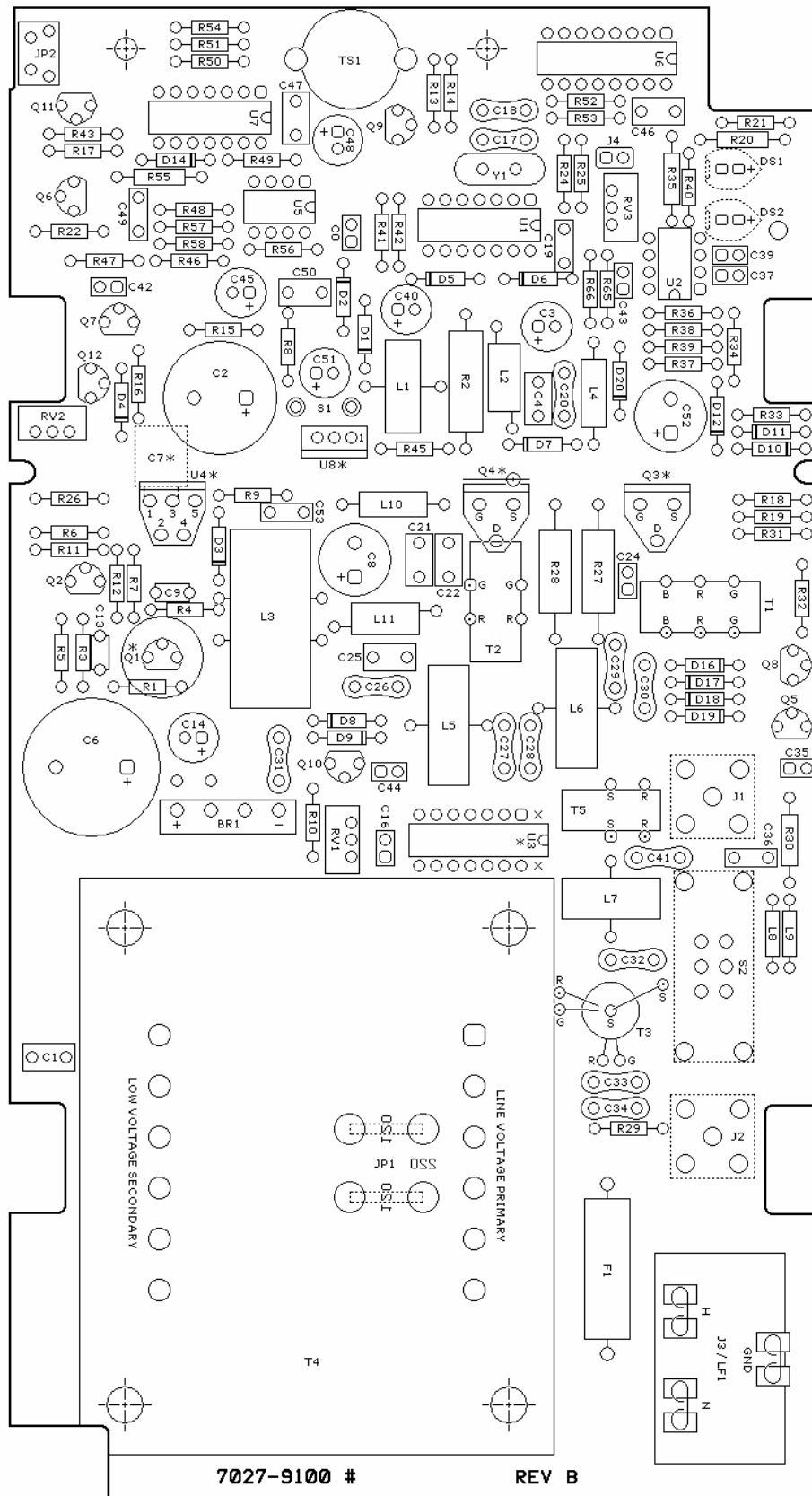


# **MX-500P-11 CIRCUIT BOARD PARTS PLACEMENT DIAGRAM**



For educational purposes only !

**NOTES:**  
 \* SOLDER C7 DIRECTLY TO U4 PINS 1 & 3 ON REAR OF PCB  
 \* MAKE U3 INTO A 14 PIN IC BY CUTTING OFF PINS 1 & 16  
 \* SEMICONDUCTORS Q3 Q4 U4 U8 & Q1 HAVE HEATSINKS  
 \* Q4 IS DOUBLE SHIELDED & INSULATED FROM HEATSINK  
 \* Q3 IS INSULATED FROM HEATSINK



## MX-500P-11 CIRCUIT BOARD PARTS LIST

BR1	Bridge Rectifier 4A 100V (GBU4B)	D7	Small Signal Silicon Diode (1N4148)
C0	100nF 63V 5% Polyester (WIMA MKS02 PCM2.5)	D8	Small Signal Silicon Diode (1N4148)
C1	330nF 63V 5% Polyester (WIMA MKS2 PCM5)	D9	Small Signal Silicon Diode (1N4148)
C2	1000uF 35V Aluminum Electrolytic	D10	Schottky Rectifier 1A 60V (MBR160 or SR160)
C3	100uF 35V Aluminum Electrolytic	D11	Schottky Rectifier 1A 60V (MBR160 or SR160)
C4	330nF 63V 5% Polyester (WIMA MKS2 PCM5)	D12	Zener Diode 6.2V 500mW (1N5234B)
C6	2200uF 50V Aluminum Electrolytic	D14	Zener Diode 12V 1W (1N4742A)
C7*	330nF 63V 5% Polyester (WIMA MKS2 PCM5)	D16	Small Signal Silicon Diode (1N4148)
C8	220uF 63V Aluminum Electrolytic	D17	Small Signal Silicon Diode (1N4148)
C9	1n0F 200V 10% Ceramic (CK05Bx102K 200V)	D18	Small Signal Silicon Diode (1N4148)
C13	1n0F 200V 10% Ceramic (CK05Bx102K 200V)	D19	Small Signal Silicon Diode (1N4148)
C14	10uF 35V Aluminum Electrolytic	D20	Zener Diode 1.8V 500mW (1N4678)
C16	100nF 63V 5% Polyester (WIMA MKS02 PCM2.5)	DS1	Green Rectangular LED 2x5mm
C17	24pF 500V 5% SilverMica (CM05ED240J03)	DS2	Orange Rectangular LED 2x5mm
C18	82pF 500V 5% SilverMica (CM05ED820J03)	F1	Time Delay Fuse 1.25A/250V (LittleFuse 239)
C19	10nF 200V 10% Ceramic (CK06Bx103K 200V)	J1	PCB Mounted Connector Female Type F
C20	24pF 500V 5% SilverMica (CM05ED240J03)	J2	PCB Mounted Connector Female Type F
C21	330nF 63V 5% Polyester (WIMA MKS2 PCM5)	J3	PCB Mounted Female Quick-Connects
C22	330nF 63V 5% Polyester (WIMA MKS2 PCM5)	J4	Unshrouded Header Two Pin 0.1 Inch Pitch
C24	100nF 63V 5% Polyester (WIMA MKS02 PCM2.5)	JP1	Line Voltage Selection Strapping on PCB
C25	330nF 63V 5% Polyester (WIMA MKS2 PCM5)	JP2	Miniature PCB Mount Pushbutton Switch
C26	47pF 500V 5% SilverMica (CM05ED470J03)	L1	700uH Toroidal Inductor Many Turns
C27	130pF 500V 5% SilverMica (CM05ED131J03)	L2	22uH RF Choke 6-Port Bead
C28	130pF 500V 5% SilverMica (CM05ED131J03)	L3	500uH Toroidal Inductor 94.75 Turns
C29	130pF 500V 5% SilverMica (CM05ED131J03)	L4	1u0H Inductor DRWW
C30	10pF 500V 5% SilverMica (CM05ED100J03)	L5	1u0H Toroidal Inductor 16.75 Turns
C31	100pF 500V 5% SilverMica (CM05ED101J03)	L6	1u0H Toroidal Inductor 16.75 Turns
C32	100pF 500V 5% SilverMica (CM05ED101J03)	L7	400nH Toroidal Inductor 10.75 Turns
C33	24pF 500V 5% SilverMica (CM05ED240J03)	L8	22uH Inductor DRWW
C34	47pF 500V 5% SilverMica (CM05ED470J03)	L9	22uH Inductor DRWW
C35	100nF 63V 5% Polyester (WIMA MKS02 PCM2.5)	L10	270nH Inductor DRWW
C36	10nF 200V 10% Ceramic (CK06Bx103K 200V)	L11	22uH RF Choke 6-Port Bead
C37	100nF 63V 5% Polyester (WIMA MKS02 PCM2.5)	LF1	Two Stage Line Filter (Delta 03SEEG3H)
C39	100nF 63V 5% Polyester (WIMA MKS02 PCM2.5)	Q1*	PNP 1 Watt Transistor (ZTX749)
C40	100uF 35V Aluminum Electrolytic	Q2	NPN 1 Watt Transistor (ZTX649)
C41	82pF 500V 5% SilverMica (CM05ED820J03)	Q3*	N-Channel Power MOSFET (VN0109N5)
C42	4n7F 63V 5% Polyester (WIMA MKS02 PCM2.5)	Q4*	N-Channel Power MOSFET (IRF530)
C43	100nF 63V 5% Polyester (WIMA MKS02 PCM2.5)	Q5	PNP Small Signal Transistor (2N3906)
C44	4n7 63V 5% Polyester (WIMA MKS02 PCM2.5)	Q6	NPN Small Signal Transistor (2N3904)
C45	2u2F 50V Dipped Tantalum	Q7	NPN Small Signal Transistor (2N3904)
C46	1u0F 63V 5% Polyester (WIMA MKS2 PCM5)	Q8	NPN Small Signal Transistor (2N3904)
C47	1u0F 63V 5% Polyester (WIMA MKS2 PCM5)	Q9	NPN Small Signal Transistor (2N3904)
C48	10uF 35V Aluminum Electrolytic	Q10	NPN Small Signal Transistor (2N3904)
C49	10nF 200V 10% Ceramic (CK06Bx103K 200V)	Q11	NPN Small Signal Transistor (2N3904)
C50	33nF 63V 5% Polyester (WIMA MKS2 PCM5)	Q12	NPN Small Signal Transistor (2N3904)
C51	10uF 35V Aluminum Electrolytic		
C52	47uF 63V Aluminum Electrolytic		
C53	10nF 200V 10% Ceramic (CK06Bx103K 200V)		
D1	Schottky Rectifier 1A 60V (MBR160 or SR160)		
D2	Zener Diode 6.8V 1W (1N4736A)		
D3	Fast Avalanche Rectifier 2A 150V (BYV27-150)		
D4	Zener Diode 5.6V 1W (1N4734A)		
D5	Small Signal Silicon Diode (1N4148)		
D6	Small Signal Silicon Diode (1N4148)		

Continuation and notes on next page...

## MX-500P-11 CIRCUIT BOARD PARTS LIST

R1	100R 1/4W 5% Carbon Film	R65	470R 1/4W 5% Carbon Film
R2	180R 2W 5% Carbon Film or Metal Film	R66	470R 1/4W 5% Carbon Film
R3	470R 1/4W 5% Carbon Film		
R4	4K7 1/4W 5% Carbon Film	RV1	Linear 1 Turn Trimpot 1K0 1/2W (Bourns 3386)
R5	1K0 1/4W 5% Carbon Film	RV2	Linear 1 Turn Trimpot 5K0 1/2W (Bourns 3386)
R6	13K 1/4W 5% Carbon Film	RV3	Linear 1 Turn Trimpot 500R 1/2W (Bourns 3386)
R7	150K 1/4W 5% Carbon Film		
R8	3K3 1/4w 5% Carbon Film	S1	Power Switch 15A 125VAC (C&K Series CA)
R9	4K7 1/4W 5% Carbon Film	S2	PCB Mount DPDT Slide Switch
R10	4K7 1/4W 5% Carbon Film		
R11	3K3 1/4W 5% Carbon Film	T1	Transformer Toroidal 9uH Each Winding (Three Windings With 10.75 Turns Each)
R12	18K 1/4W 5% Carbon Film	T2	Transformer Toroidal 9uH Each Winding (Two Windings With 10.75 Turns Each)
R13	4K7 1/4W 5% Carbon Film	T3	Current Transformer Toroidal 6uH Secondary (Primary 1.75 Turns, Secondary 9.75 Turns)
R14	4K7 1/4W 5% Carbon Film		
R15	10K 1/4W 5% Carbon Film	T4	Line Transformer 38VAC Secondary With CT (Metcal Part No: MP100-2-536XA 5600-0025)
R16	1K5 1/4W 5% Carbon Film	T5	Current Transformer Bifilar Toroidal 12uH Sec (Primary 1.75 Turns, Secondary 54.75 Turns)
R17	10K 1/4W 5% Carbon Film		
R18	2K2 1/4W 5% Carbon Film	TS1	Overtemperature Switch 170F Normally Closed (Selco OA-170-PCB US-602 S)
R19	10K 1/4W 5% Carbon Film		
R20	1K5 1/2W 5% Carbon Film	U1	Hex Inverter (SN74HC04N)
R21	47K 1/4W 5% Carbon Film	U2	Dual Voltage Comparator (LM393P)
R22	10K 1/4W 5% Carbon Film	U3*	Array Of 8 Independent Diodes (MAD1108)
R24	100K 1/4W 5% Carbon Film	U4*	3-Amp Step Down Switcher (LM2576HVT)
R25	100R 1/4W 5% Carbon Film	U5	Dual Voltage Comparator (LM393P)
R26	15K 1/4W 5% Carbon Film	U6	14-Bit Binary Counter & Oscillator (CD4060BE)
R27	100R 1W 5% Carbon Film or Metal Film	U7	Quad 2-Input NOR Gate (CD4001BE)
R28	100R 1W 5% Carbon Film or Metal Film	U8*	Voltage Regulator +18V 1A (MC7818CT)
R29	220R 1/4W 5% Carbon Film		
R30	1K5 1/2W 5% Carbon Film	Y1	Crystal 13.560MHz HC49U (ECX-1570 XX)
R31	100K 1/4W 5% Carbon Film		
R32	10K 1/4W 5% Carbon Film		
R33	2K2 1/4W 5% Carbon Film		
R34	22K 1/4W 5% Carbon Film		
R35	1K5 1/2W 5% Carbon Film		
R36	2K2 1/4W 5% Carbon Film		
R37	7R5 1/4W 5% Carbon Film or Metal Film		
R38	470R 1/4W 5% Carbon Film		
R39	1K0 1/4W 5% Carbon Film		
R40	4K7 1/4W 5% Carbon Film		
R41	39K 1/4W 5% Carbon Film		
R42	39R 1/4W 5% Carbon Film		
R43	10K 1/4W 5% Carbon Film		
R45	10K 1/4W 5% Carbon Film		
R46	27K 1/4W 5% Carbon Film		
R47	510R 1/4W 5% Carbon Film		
R48	910K 1/4W 5% Carbon Film		
R49	100K 1/4W 5% Carbon Film		
R50	2K2 1/4W 5% Carbon Film		
R51	1K0 1/4W 5% Carbon Film		
R52	82K 1/4W 5% Carbon Film		
R53	330K 1/4W 5% Carbon Film		
R54	10K 1/4W 5% Carbon Film		
R55	620R 1/2W 5% Carbon Film		
R56	22K 1/4W 5% Carbon Film		
R57	10K 1/4W 5% Carbon Film		
R58	1K5 1/4W 5% Carbon Film		

### \*NOTES\*

Solder C7 directly to U4 pins 1 & 3 on rear of PCB.  
 Make U3 into a 14 pin IC by cutting off pins 1 & 16.  
 Semiconductors Q3 Q4 U4 U8 & Q1 have heatsinks.  
 Q4 is double shielded and insulated from heatsink.  
 Q3 is insulated from heatsink.

! MIRROR VIEW THROUGH BOTTOM OF PCB FOR TROUBLESHOOTING PURPOSES !

