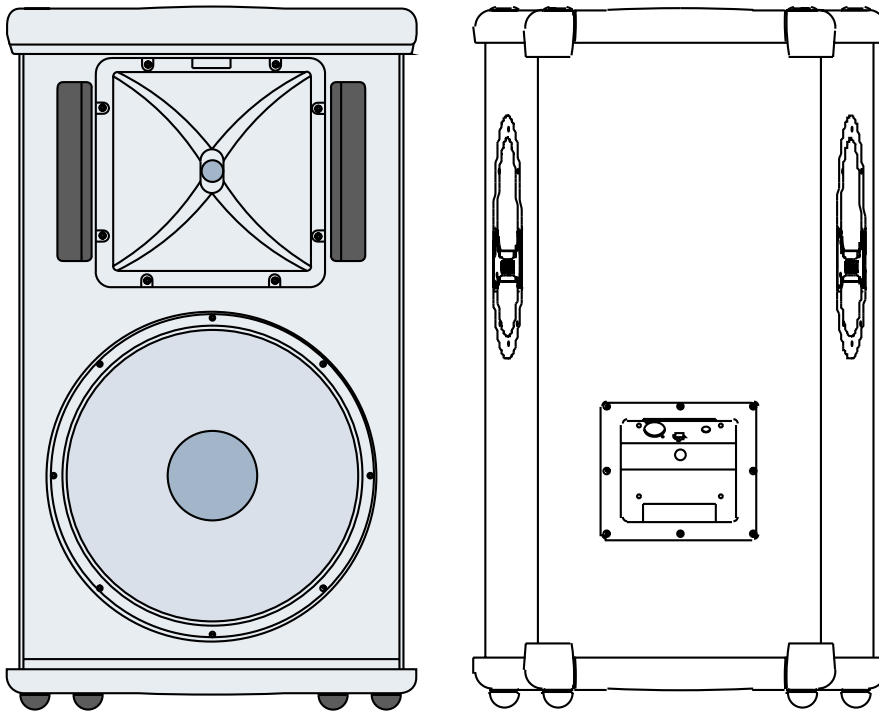


MACKIE®

S500

2-Way Passive Loudspeaker



SERVICE MANUAL

SAFETY

Exposure to extremely high noise levels may cause permanent hearing loss. Individuals vary considerably in susceptibility to noise-induced hearing loss, but nearly everyone will lose some hearing if exposed to sufficiently intense noise for a period of time. The U.S. Government's Occupational Safety and Health Administration (OSHA) has specified the permissible noise level exposures shown in this chart.

According to OSHA, any exposure in excess of these permissible limits could result in some hearing loss. To ensure against potentially dangerous exposure to high sound-pressure levels, it is recommended that all persons exposed to equipment capable of producing these levels use hearing protectors while this unit is in operation. Ear plugs or protectors in the ear canals or over the ears must be worn when operating this amplification system in order to prevent a permanent hearing loss if exposure is in excess of the limits set forth here.



The S500 can produce a maximum SPL of 127 dB @ 1m

<u>Duration Per Day In Hours</u>	<u>Sound Level dBA, Slow Response</u>	<u>Typical Example</u>
8	90	Duo in small club
6	92	
4	95	Subway Train
3	97	
2	100	Very loud classical music
1.5	102	
1	105	Patrice screaming about deadlines
0.5	110	
0.25 or less	115	Loudest parts at a rock concert

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Introduction

	<p>SERVICE ON THIS EQUIPMENT IS TO BE PERFORMED BY EXPERIENCED REPAIR TECHNICIANS ONLY</p> <p><i>CONFIER L'ENTRETIEN AU PERSONNEL QUALIFIE</i></p>	
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This manual contains basic service information. It is essential that you have a copy of the user's manual as this contains the complete operating instructions.

SERVICE TECHNICAL ASSISTANCE

Mackie Designs, Service Technical Assistance, is available 8AM - 5PM PST, Monday through Friday for Authorized Mackie Service Centers, at 1-800-258-6883. Feel free to call with any questions and speak with a carefully-calibrated technician. If one is not available, leave a detailed message and a qualified Mackoid will return your call asap.

DISCLAIMER

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Overview

The S500 is a high-efficiency, extreme-output, 2-way, wide-dispersion sound reinforcement speaker system. The combination of precision-manufactured, high-efficiency acoustic components and high-quality, low-impedance, phase-precise crossover technology allows the S500 to operate continuously at peak output levels safely while providing high-resolution audio.

The components inside the S500 incorporate several state-of-the-art advancements in transducer technology. The compression driver is a new 1.75-inch titanium diaphragm design featuring a 3-slot, low-distortion geometry phase plug. The S500 also features a low-distortion, high-output horn design developed to provide the correct power response and phase alignment characteristics at the crossover frequency. With the resulting 75° x 65° dispersion pattern, the S500 provides very open, natural sound reproduction at extreme output levels.

The S500 produces deep bass through a 15-inch high-efficiency RCF® precision woofer. The magnetic structure designed for the woofer motor is responsible for the system's resulting high sensitivity of 100 dB (1 watt@1 meter). More importantly, the high-efficiency motor provides an extraordinary amount of force that provides complete control of the cone mass. This type of control allows the woofer to deliver extended bass response and to reach the mid-frequency crossover point efficiently.

The S500 frequency response is linear between 65Hz and 18kHz. Protection for the high-frequency driver is provided via an integrated MOSFET circuit that actively monitors and controls the power delivered to the compression driver. There is also a circuit breaker button on the rear control panel designed to protect the woofer from excessive power. The breaker "sees" the amplifier signal being delivered to the woofer and opens when the combination of amperage and voltage exceeds the maximum rated power levels. The breaker switch can be reset by pressing the button.

The rear control panel features both a 1/4" speaker jack and a Neutrik Speakon™ connector, wired in parallel. The S500 cabinet is constructed using both multi-layered plywood and pressure-injected structural resin. The top and bottom sections both have handles for easy movement and relocation. There is an integrated pole-mount on the bottom of the enclosure. In addition, there are two, three-part cast-aluminum handles on each side of the enclosure as well as a full size, oval-punched, weather-resistant steel grille.

The S500 has a 1/4" TS jack and a Neutrik Speakon™ connector, wired in parallel. Use high-quality speaker cable as recommended by the amplifier manufacturer.

The 1/4" TS jack uses the following wiring standard:

- Tip = Signal (+)
- Sleeve = Ground (Shield)

The Speakon connector uses the following wiring standard:

- Pin 1+ = Signal (+)
- Pin 1- = Ground (-)

Specifications

Transducer Specifications

Low-Frequency Transducer	
Diameter	15" (381mm)
Voice Coil Diameter	2.5" (63.5mm)
High-Frequency Driver and Horn	
Diaphragm Diameter	1.75" (44.5mm)
Voice Coil Diameter	1.75" (44.5mm)
Diaphragm Material	Titanium
Power Handling	30 watts rms (long term)
Horn Type	Constant Directivity
Mouth Size	10.6" (270mm) W x 10.6" (270mm) H
Throat Size	1.0" (25.4mm)

System Specifications

Frequency Range (-10 dB)	50Hz-20kHz
Frequency Response (-3 dB)	75Hz-18kHz
Horizontal Coverage (-6 dB)	75° averaged 1kHz-10kHz
Vertical Coverage (-6 dB)	65° averaged 1kHz-10kHz
Directivity Factor; DI (Q) averaged 2kHz-10kHz	10.93 (12.38)
Sensitivity (1W@1m)	100 dB
Rated Maximum SPL@1m	124 dB long term 127 dB peak
Crossover Point	1300Hz
Nominal System Impedance	8 ohms
Power Handling	250 watts rms long term 500 watts peak

Safety Features

- High Frequency: Monitoring and limiting of continuous input power via MOSFET-based electronic circuit
- Low Frequency: Monitoring of amplifier signal delivered to woofer via current breaker switch. Overpowering of the woofer opens the circuit and requires resetting by manually pressing the circuit breaker button.

Physical Properties

Height	32.1" (817mm)
Front Width	19.1" (484mm)
Rear Width	13.9" (352mm)
Depth	18.1" (460mm)
Net Weight	75 lbs. (34kg)
Connector Type	1/4" TS jack and Neutrik Speakon
Enclosure Geometry	
	Trapezoidal, 10° side angles, 18mm multi-layered plywood, top and bottom high pressure resin injected "caps"
Handles	One on top, one on bottom cap, two three-piece handles on each side
Color	Black, PVC coated finish
Grille	Custom perforated oval steel grille with anti-corrosive treatment

Parts List

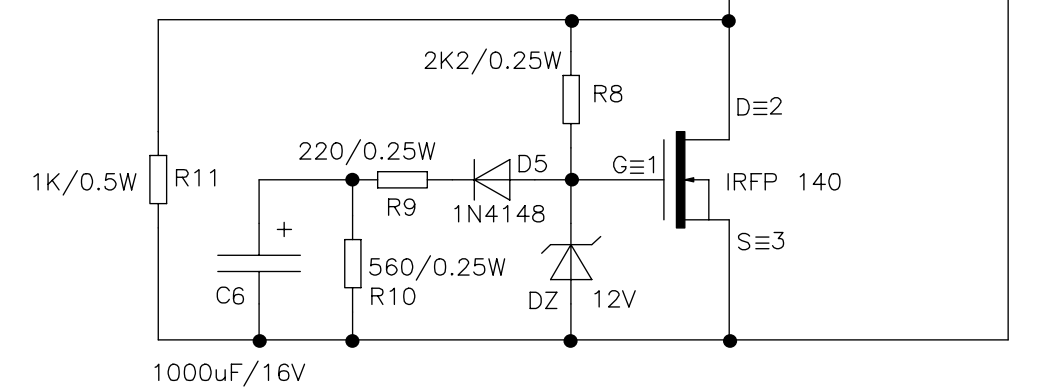
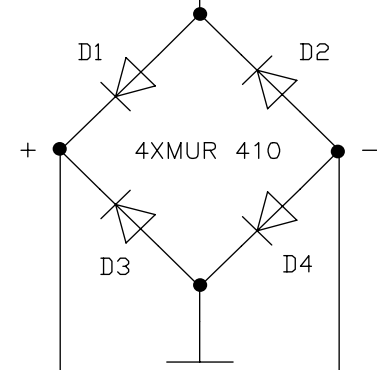
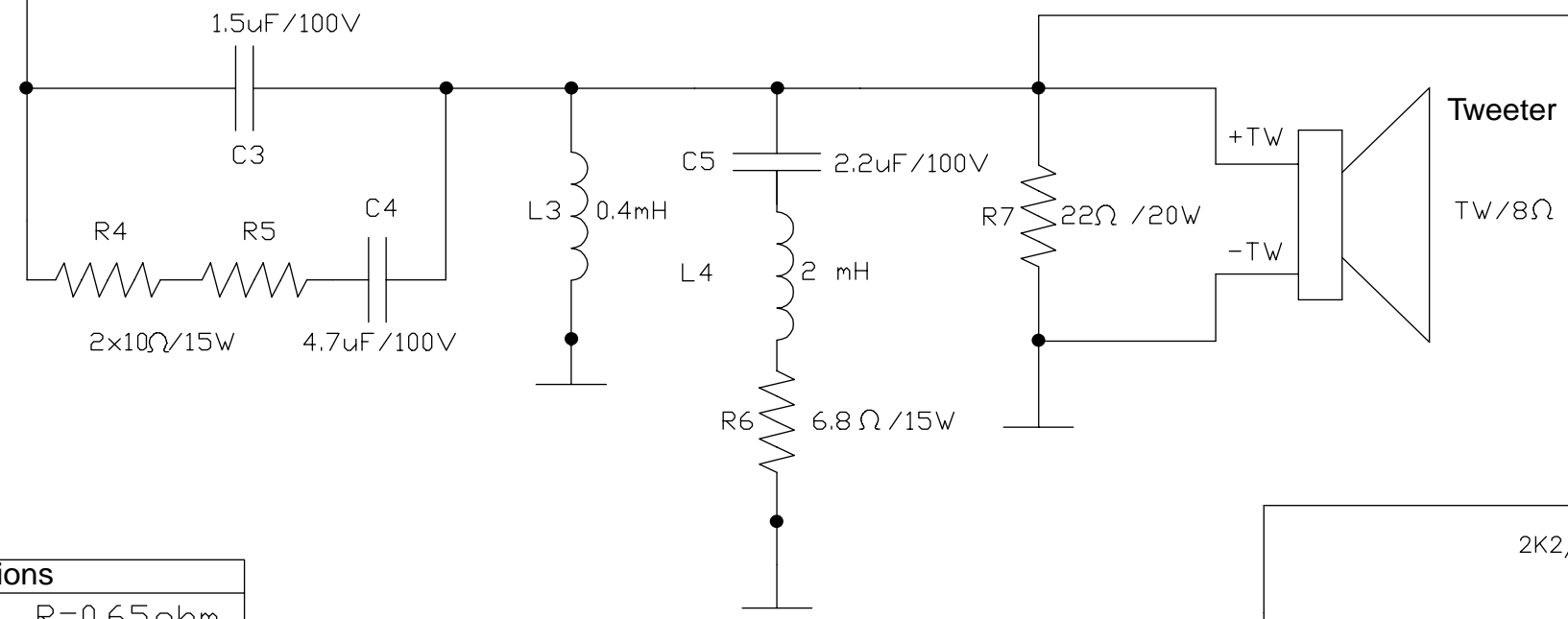
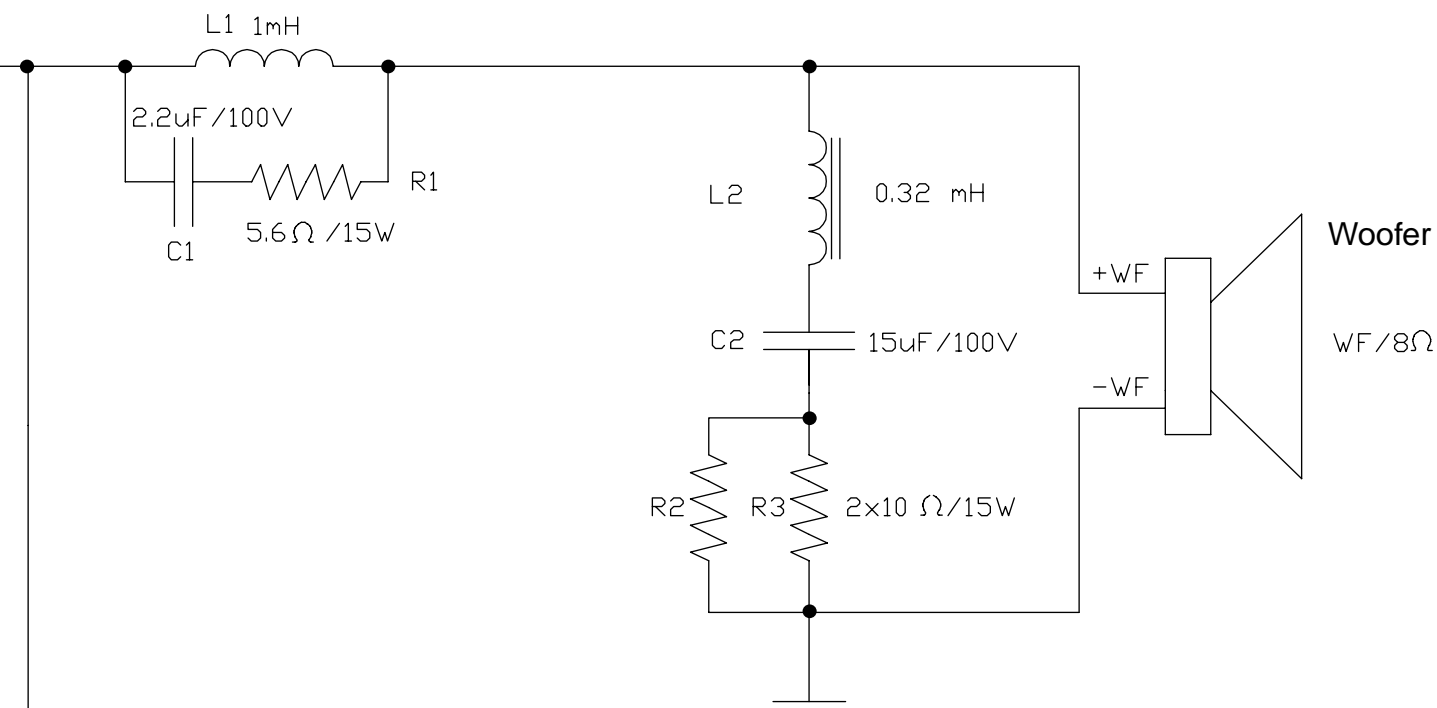
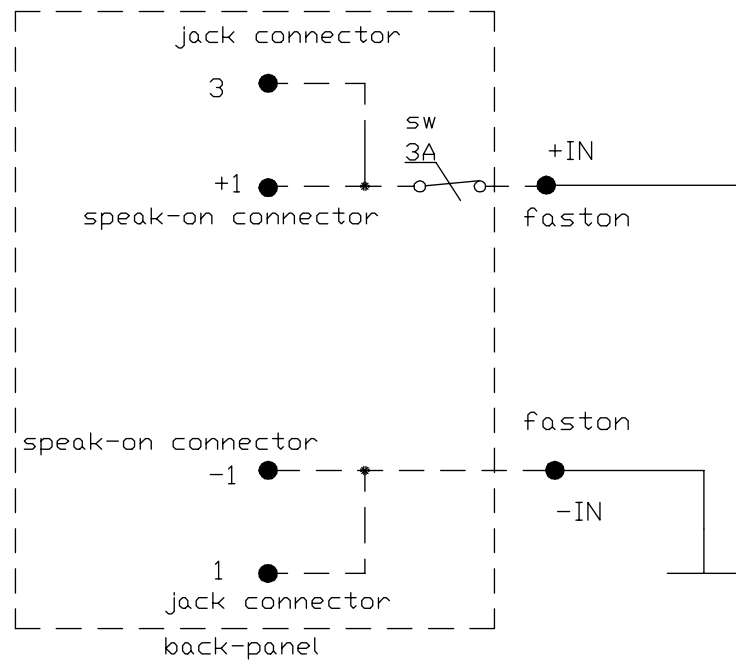
13112050 LOUDSPEAKER S 500

PART#	DESCRIPTION	QTY	COMMENTS
21110330	WOOFER L15-S500	1	
23030400	CROSSOVER ASSEMBLY	1	SEE NEXT PAGE
23103720	CABLE ASSEMBLY	1	
23103910	HANDLE ASSEMBLY	2	
23103930	CASE ASSEMBLY	1	
25110570	TWEETER N 450-S 500	1	
33050380	TERMINAL BOARD	35567	1
33090460	HANDLE CASE	34278	2
33140390	HORN	35416	1
33160360	GASKET FOR HANDLE	36052	2
33161130	GASKET FOR TERMINAL BOARD	30347	1
33221420	PROTECTION GRILLE	34324	1
33221460	INNER PROTECTION PACKAGING	35560	2
33890190	FEET FOR CABINET	34344	4
33900360	BLACK COVER FOR STAND HOLE	34360	1
33920650	HANDLE	34335	2
33920900	BRASS RING	35647	1
33951980	ROUND BLUE RUN-MAN LABEL	34844	1
33951990	BOTTOM BLACK MACKIE LABEL	34891	1
33953030	BLUE S500 LABEL	35462	1
33953050	LABEL WITH SERIAL# AND DATE	35565	1
33953060	IMPEDANCE LABEL	35567	1
33960580	WARRANTY MOD.1712		1
33963280	OWNER'S MANUAL MOD.1803		1
33991010	INNER PACKAGING	34367	4
33994330	INNER PACKAGING	35421	1
33995400	INNER PACKAGING CORNER	33326	0.5
33995460	PACKAGING (BOX)	35562	1
33995630	COVER FOR PACKAGING	35822	0.1
43040030	GLASS WOOL INSULATION SP.30		40
43900580	GASKET "U" SHAPED ESPACE200S		0.1
43900820	GASKET	32181	0
51150353	SCREW V.TC+M4X30 INOX ZNN U7687		8
51150446	SCREW V.TC+M5 X30ZNN U7687		4
51170415	SCREW V.TSC+M5 X10ZNN U7689		8
51190246	SCREW V.TCEI M5 X35 ZNN U5931 6595		8
51190315	SCREW V.TCEI M6 X18 ZNN U5931		4
51240217	SCREW V.TC+AB 2,9X13 ZNN U6954		2
51310415	SCREW V.TC+SL 3,5X18 ZNN 50067	1/2"	4
51310426	SCREW V.TC+SL 3,5X25 ZNN 50221		8
51310535	SCREW V.TC+SL 4X30 ZNN		4
51310545	SCREW V.TC+SL 4X40 ZNN		8
51992015	SCREW V.T1/2T+SL 4,5X20 ZNN 35725		18
52100211	WASHER 4,3X12ZNN 13087	1/2"	4
52100216	WASHER 5,3X10ZNN U6592 50239	1/2"	8
52201004	WASHER 5 DIN6798 0239		4
54302001	HEXAGONAL NUT 35059		2
59025285	BAG 800+300+300X1600 35171		1
83121010	C3P21-010*302-THERMAL SWITCH		1
83412015	C3C12-014F003-STEREO JACK		1
83415001	C3C15-001F004-FEMALE CONNECTOR		1

1/4" JACK
SPEAKON® INPUT CONNECTOR

23030400 CROSSOVER ASSEMBLY

PART#	DESCRIPTION	QTY	COMMENTS
33030770	BOARD C.S.MR 35572	1	
51150230	SCREW V.TC+M3 X14ZNC U7687 50175	1	
52100103	WASHER 3.2X 6ZNC U6592 12272	2	
52301010	WASHER A 3.2 U1751 50234 1/2	1	
53101005	NUT M3 U5588-A-6S 11625	1	
59999992	CABLE TIE T & B M 24	3	
59999995	CABLE TIE T & B M 25	2	
81121029	C1R21-251J221-RES.STR. 1/4W5% 220	1	Resistor
81121034	C1R21-251J561-RES.STR. 1/4W5% 560	1	
81121041	C1R21-251J222-RES.STR. 1/4W5% 2.2K	1	
81121110	C1R21-501J102-RES.STR. 1/2W5% 1K	1	
81244022	C1F44-153J5R6-RES.FILO 15W5% 5.6	1	Resistor, wire-wound
81244023	C1F44-153J6R8-RES.FILO 15W5% 6.8	1	
81244025	C1F44-153J100-RES.FILO 15W5% 10	4	
81244170	C1F44-203J220-RES.FILO 20W5% 22	1	
81412001	C1C12-101K156-CAP.FILM 100V10% 15U	1	Capacitor, Film
81412020	C1C12-101K155-CAP.FILM 100V10%1.5U	1	
81412021	C1C12-101K225-CAP.FILM 100V10%2.2U	2	
81412023	C1C12-101K475-CAP.FILM 100V10% 4.7U	1	
81521053	C1E21-250*102-CAP.ELYTIC. 25V 1000U	1	Capacitor, Electrolytic
81612029	C1L12-202H182-INDUCTOR	1	Inductor
81612048	C1L12-102A651-INDUCTOR	1	
81612049	C1L12-401G701-INDUCTOR	1	
81632017	C1L32-321A231-INDUCTOR	1	
82112001	C2D12-750*151-DIODE 1N4148	1	
82122015	C2D22-101*402-DIODE MUR410	4	
82131050	C2D31-501J120-ZENER 0.5W 12V	1	
82262014	C2T62-313A101-MOSFET IRFP140	1	
83444020	C3C44-020M001-FASTON	6	
83816006	C3A16-006 -HEATSINK	1	



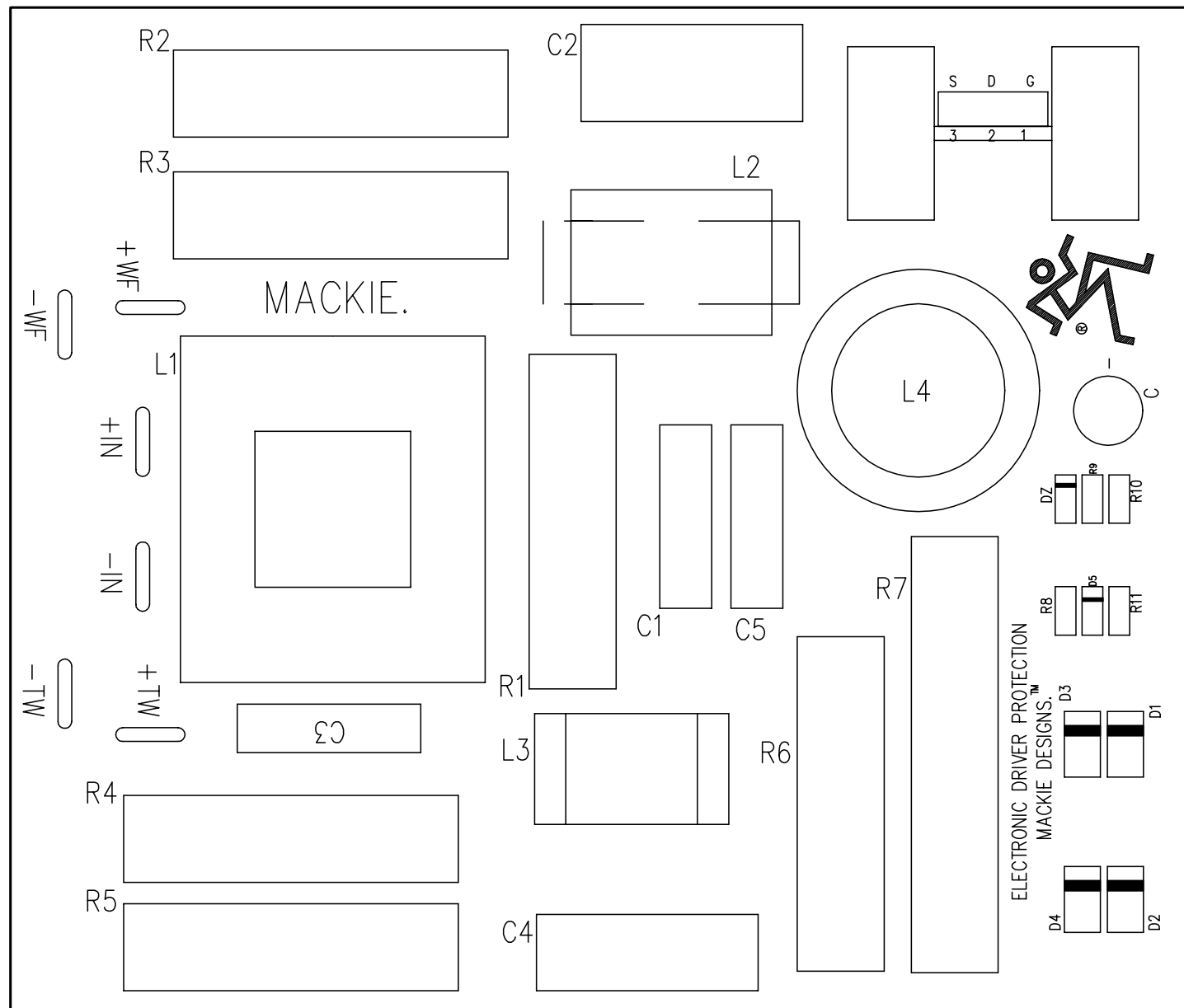
Capacitors	
C1	2.2uF/100V
C2	15uF/100V
C3	1.5uF/100V
C4	4.7uF/100V
C5	2.2uF/100V
C6	1000uF/16V

Semiconductors	
D1 D2	MUR410
D3 D4	MUR410
D5	1N4148
DZ	12V ZENER
FET	IRFP140

Resistors	
R1	5.6 Ohm /15W
R2 R3	10 Ohm/15W
R4 R5	10 Ohm/15W
R6	6.8 Ohm /15W
R7	22 Ohm /20W
R8	2K2 0.25W
R9	220/0.25W
R10	560/0.25W
R11	1K/0.5W

Inductor specifications			
L1	Ø1.12mm	1mH	R=0.65ohm
L2	Ø1.0mm	0.32mH	R=0.09ohm
L3	Ø0.63mm	0.4mH	R=0.7ohm
L4	Ø0.63mm	2mH	R=1.8ohm

SE035572
S500



33030770
S500-L