



MOTOROLA
Americas Parts Division

RLN-4510A

7.5 VOLT UNIVERSAL BATTERY ELIMINATOR

DESCRIPTION

The RLN-4510A 7.5 Volt Universal Battery Eliminator is designed to allow the service technician to operate 7.5 volt portable radios without a battery pack and simulate different battery conditions. The RLN-4510A is designed to operate from either a fixed or variable DC power supply capable of supplying 12 volts or more at a current of 3 Amps or greater. The RLN-4510A connects to the radio via a battery eliminator cable.

The RLN-4510A Battery Eliminator employs a silicon controlled rectifier (Q2) as a crowbar to prevent over voltage from reaching the radio. When a voltage greater than 10.0 volts from the output of variable regulator U1, the zener diode VR2 conducts and causes the SCR (Q2) to fire. This clamps the output of the supply and blows the fuse thereby protecting the radio from over-voltage. Two ceramic capacitors, C6 and C8, are employed to prevent RF from firing the SCR (Q1). Capacitor C1 is used to suppress voltage transients when the source is turned on.

In addition to over-voltage protection, the RLN-4510A Battery Eliminator prevents reverse polarity from damaging the radio. If reverse polarity is applied to the input, the silicon diode (VR1) will conduct and cause the fuse to blow.

The RLN-4510A connects to the radio via a battery eliminator cable which plugs into the power out jack (J1). (Refer to the radio service manual for the appropriate model number). Banana jacks provide a convenient way to measure the voltage being applied to the radio and the current being drawn by it.

OPERATION

Attach the appropriate battery eliminator cable to output jack (J1) of the RLN4510A Battery Eliminator.

With the power supply turned off, connect the output from the supply to the input of the RLN-4510A Battery Eliminator, double banana plug - P1, observing polarity. The OUTPUT switch should be in the OFF position. Turn on the power supply and check that the output voltage is between 12 to 15 volts. Be careful not to exceed the maximum of 20 volts. If the supply has current limiting, adjust it for approximately 3 Amps. Attach the radio.

Measuring Voltage:

The radio's operating voltage may be measured with a DC voltmeter connected to the VOLT METER bananas jacks (J2) on top of the RLN-4510A. Voltage measured is independent of the position of the OUTPUT switch.

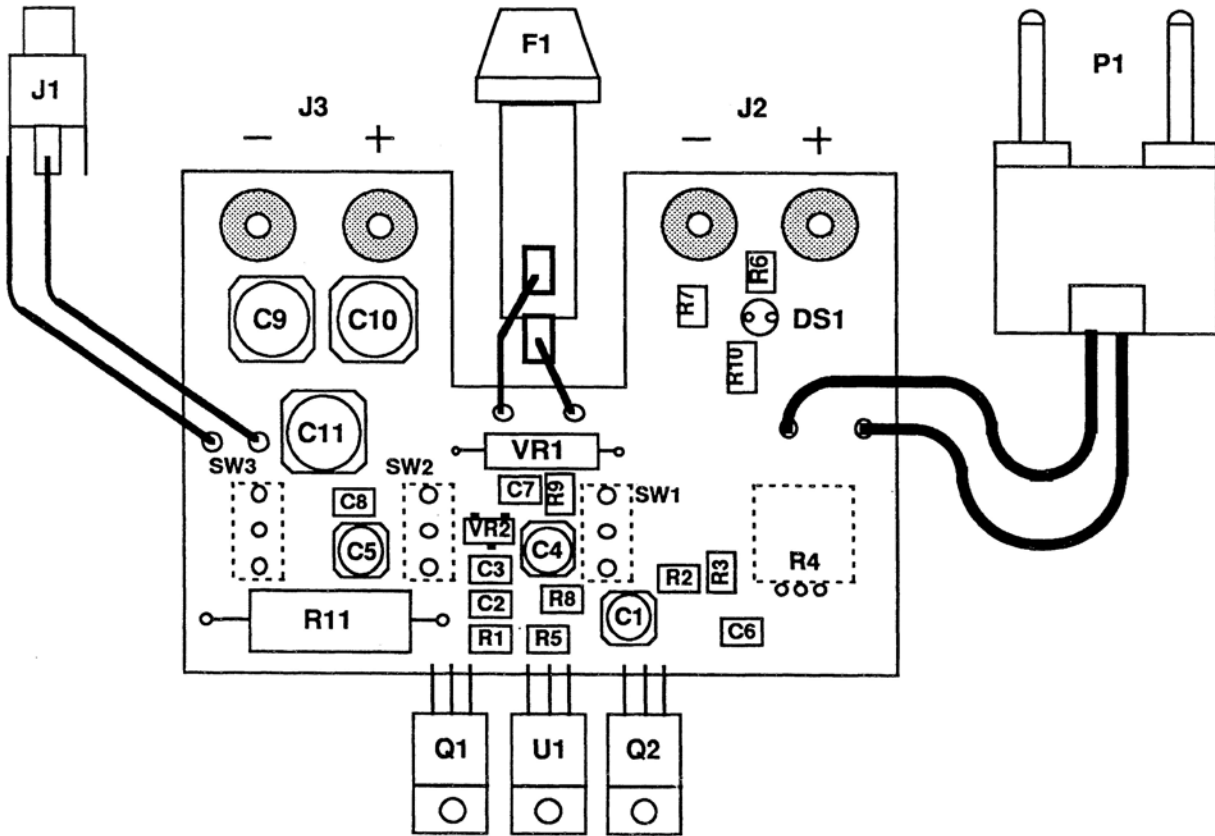
Measuring Current:

The radio's operating current may be measured with a DC voltmeter connected to the CURRENT METER bananas jacks (J1). The SHUNT switch should be in the IN position and the OUTPUT switch in the ON position. In this configuration, the radio's operating current is equal to 10 times the voltage measured by the DC voltmeter at the CURRENT METER bananas jacks. For example, if the CURRENT METER voltage is 0.1 volts DC, then the radio's operating current = $10 \times 0.1 \text{ A} = 1.0 \text{ Amp}$.

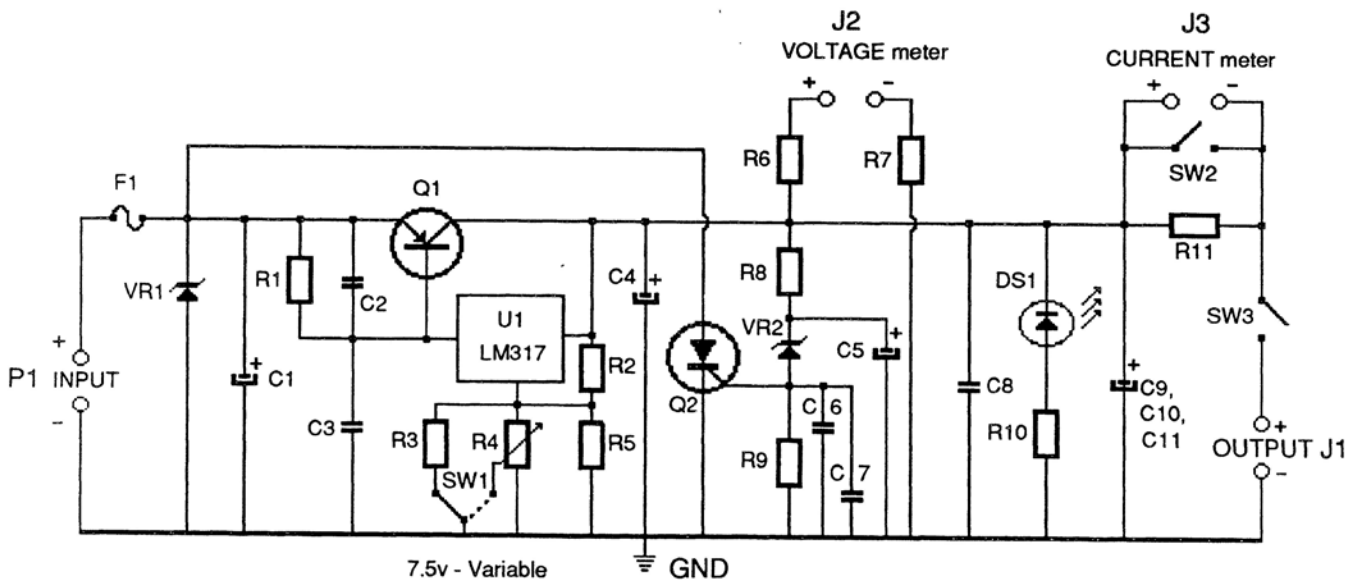
CAUTION:

Continuous Transmit (or other continuous high current application) in excess of 30 minutes of will exceed the heat dissipation capability of the Battery Eliminator and cause thermal shutdown. However, no damage to the unit will occur and it will reset automatically after sufficient cooling.

Component Side View



Electrical Schematic



Parts List

REF SYM	MOTOROLA PART NO.	DESCRIPTION	REF SYM	MOTOROLA PART NO.	DESCRIPTION
Capacitor, Fixed:					
C1, C4, C5	2380090M38	33 μ F, \pm 20, 35V	R6, R7	0611077A74	1000, \pm 5, 1/8W
C2, C7	2113740B49	100 pF, \pm 5, 50V	R8	0611077A38	33, \pm 5, 1/8W
C3	2311049A04	.33 μ F, \pm 10, 35V	R9	0611077A76	1200, \pm 5, 1/8W
C6, C8	2113741A45	.01 μ F, \pm 5, 50V	R10	0611077A82	2200, \pm 5, 1/8W
C9, C10, C11	2380090M33	330 μ F, \pm 20, 25V	R11	0680374E95	0.1, \pm 1, 10W
Light Emitting Diode:					
DS1	4880379B06	LED	SW1, SW2, SW3	4080338A95	Switch: Toggle, SPDT
Fuse:					
F1	6500061688	4 Amp	Integrated Circuit: Regulator, LM317T		
Connector Receptacle:					
J1	0980374E94	Power Receptacle	U1	5105469E18	
J2, J3	4600863924	Binding Post, Black	VR1	4880397A21	Diode: Rectifier, 1N6279
J2, J3	4600863925	Binding Post, Red	VR2	4880140L15	Zener, 10V
Connector Plug:					
P1	2883619K01	Double Banana Plug	Non-Referenced Items, (Qty):		
		Transistor:	0980389A34	Fuseholder	
Q1	4800869807	PNP, M9807	1483820M02	Heat Conductive Insulator (3)	
		SCR:	1580374E72	Housing, Top	
Q2	4884348P01	MCR69	1580374E73	Housing, Bottom	
		Resistor, Fixed: ohms	3680337A83	Knob	
		unless otherwise stated	0210971A04	Nut, M3 (3)	
R1	0611072A19	56, \pm 5, 1/4W	0310907A10	Screw, M2.5 x 0.45 x 6 (6)	
R2	0611077A59	240, \pm 5, 1/8W	0310907A19	Screw, M3.0 x 0.5 x 8 (3)	
R3	0611077A92	5600, \pm 5, 1/8W	0484180C01	Shoulder Washer (3)	
R4	1880374E06	Variable 5K, Linear	2900834053	Solder Lug	
R5	0611077A83	2400, \pm 5, 1/8W	4282018H15	Strain Relief	
			1082465B01	Test Wire, Black	
			1082465B02	Test Wire, Red	
			4280393A40	Tie Strap (3)	