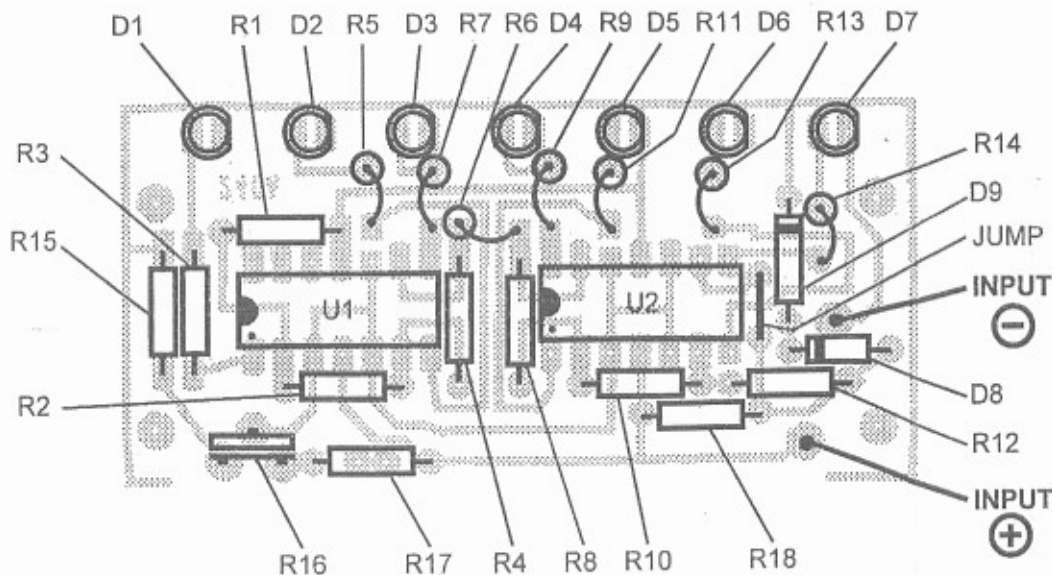


- () R2,R4,R6,R8 1K RES (BRN BLK RED)
- () R10,R12, R18 1K RES (BRN BLK RED)
- () R3,R5,R7,R9 330 OHM RES (ORG ORG BRN)
- () R11,R13,R14 330 OHM RES (ORG ORG BRN)
- () R16 1K OHM TRIM POT
- () R17 4.3K RES (YEL ORG RED)
- () R1 18K RES (BRN GRA ORG)
- () R15 1.5K RES (BRN GRN RED)

- () D1,D7 RED LED
- () D2,D6 YELLOW LED
- () D3,D4,D5 GREEN LED
- () D8,D9 1N914 or 1N4148
- () U1,U2 LM324 IC
- () PC BOARD 080-00240A

LED	LED	LED	LED	LED	LED	LED	
1	2	3	4	5	6	7	
.25 VOLT STEPS	4.25	4.5	4.75	5.0	5.25	5.5	5.75

NOTE: FLAT SIDE OF LED'S IS INDICATED ON DRAWING.



VM-1 COMPLETE PARTS LIST

- (1) 18K RES (BRN GRY ORG)
- (1) AUTO PLUG
- (7) 330 OHM RES (ORG ORG BRN)
- (2) 1N914 DIODES OR 1N4148
- (2) RED LED'S
- (2) YELLOW LED'S
- (3) GREEN LED'S
- (2) 14 PIN IC SOCKETS
- (1) PCB # 240A
- (8) 1K RES (BRN BLK RED)
- (1) 4.3K RES (YEL ORG RED)
- (2) LM324IC
- (1) 1.5K RES (BRN GRN RED)
- (1) 2.2K RES (RED RED RED)
- (1) 1K VERT TRIM POT
- (1) 680 OHM RES (BLU GRY BRN)
- (1) 8.2 RES (GRY RED RED)
- (1) 7.5 ZENOR IN5236 or IN4737
- (1) 5.1 ZENOR OR IN4733 OR IN751

SPECIAL NOTICE

IF YOU WANT TO BUILD YOUR KIT FOR **5 VOLT OPERATION** - USE THIS INSTRUCTION SHEET. (FOR 8 OR 12 VOLTS - USE PROPER SHEET.)

ASSEMBLY INSTRUCTIONS

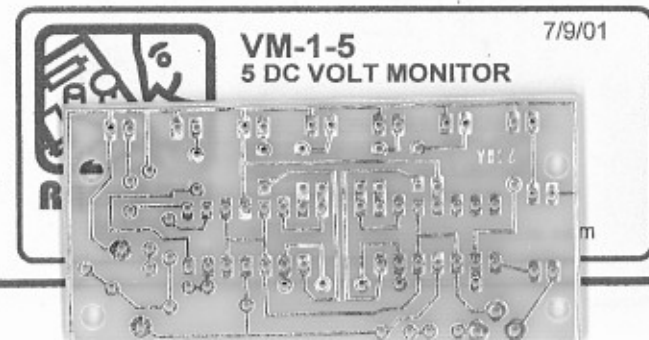
PLACE ALL THE PARTS ON THE FIBERGLASS SIDE OF THE PC BOARD AND SOLDER ON THE METAL SIDE.

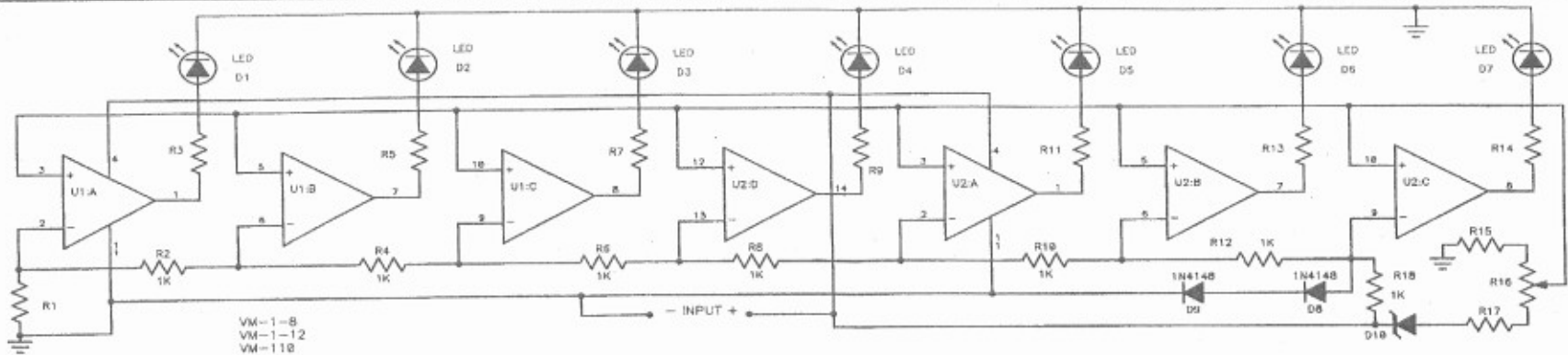
- () INSERT AND SOLDER ALL RESISTORS
- () INSERT AND SOLDER D8, D9, U1 & U2 (WATCH POLARITY)
- () INSERT AND SOLDER R16 TRIM POT
- () INSERT AND SOLDER THE LED'S AND JUMP (WATCH POLARITY OF LED'S)

VERY CAREFULLY CHECK ALL OF YOUR WORK BEFORE YOU APPLY POWER TO YOUR KIT

CONNECT YOUR COMPLETED KIT TO 5.0 VOLTS. ADJUST R16 UNTIL #1, 2, 3, & 4 ARE "ON". CHECK OPERATION BY ADJUSTING THE INPUT VOLTAGE, AND CHECKING THE RESULTS AGAINST THE VOLTAGE CHART.

BY ADJUSTING R16 YOU CAN SET THE CENTER LED TO LIGHT FROM 4.5 VOLTS TO 6 VOLTS. YOU CAN ALSO SELECT A DIFFERENT COLOR SEQUENCE FOR THE LED'S TO BETTER SUIT YOUR SITUATION.



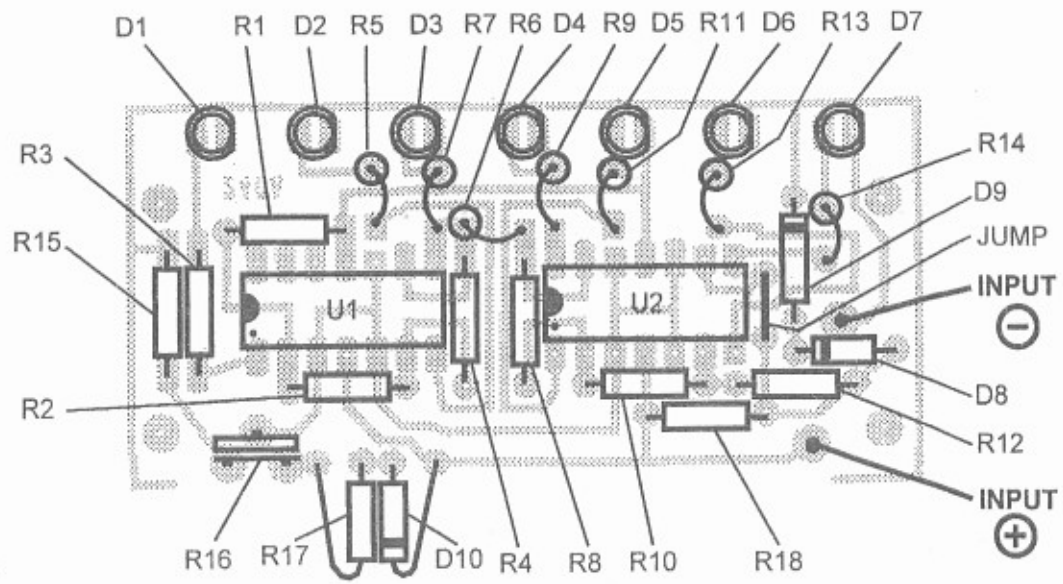


- | | |
|---|-------------------------------------|
| () R2,R4,R6,R8 1K RES (BRN BLK RED) | () D1,D7 RED LED |
| () R10,R12, R18 1K RES (BRN BLK RED) | () D2,D6 YELLOW LED |
| () R3,R5,R7,R9 330 OHM RES (ORG ORG BRN) | () D3,D4,D5 GREEN LED |
| () R11,R13,R14 330 OHM RES (ORG ORG BRN) | () D8,D9 1N914 or 1N4148 |
| () R16 1K OHM TRIM POT | () D10 5.1 V ZENOR 1N4733 or IN751 |
| () R17 4.3K RES (YEL ORG RED) | () U1,U2 LM324 IC |
| () R1 18K RES (BRN GRA ORG) | () PC BOARD 080-00240A |
| () R15 1.5K RES (BRN GRN RED) | |

.25 VOLT STEPS

LED	LED	LED	LED	LED	LED	LED
1	2	3	4	5	6	7
7.25	7.5	7.75	8.0	8.25	8.5	8.75

NOTE: FLAT SIDE OF LED'S IS INDICATED ON DRAWING.



SPECIAL NOTICE

IF YOU WANT TO BUILD YOUR KIT FOR **8 VOLT OPERATION** - USE THIS INSTRUCTION SHEET. (FOR 5 OR 12 VOLTS - USE PROPER SHEET.)

ASSEMBLY INSTRUCTIONS

PLACE ALL THE PARTS ON THE FIBERGLASS SIDE OF THE PC BOARD AND SOLDER ON THE METAL SIDE.

- () INSERT AND SOLDER ALL RESISTORS
- () INSERT AND SOLDER D8, D9, D10, U1 & U2 (WATCH POLARITY)
- () INSERT AND SOLDER R16 TRIM POT
- () INSERT AND SOLDER THE LED'S AND JUMP (WATCH THE POLARITY OF THE LED'S)

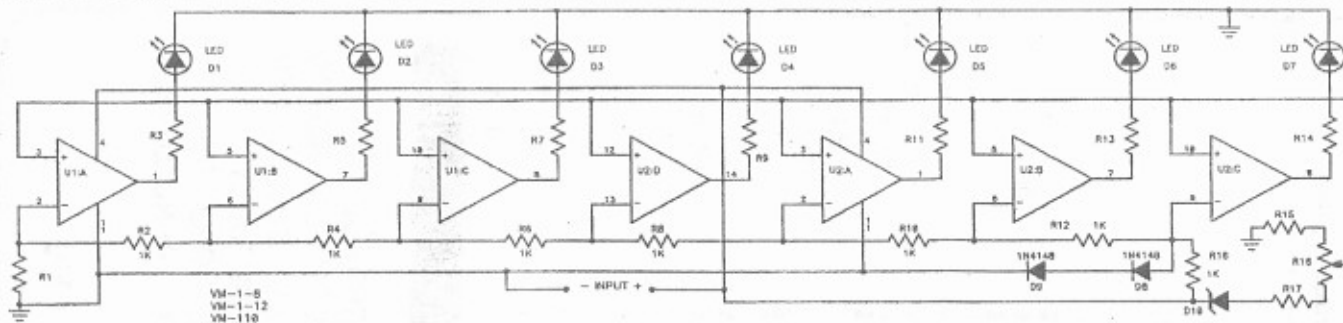
VERY CAREFULLY CHECK ALL OF YOUR WORK BEFORE YOU APPLY POWER TO YOUR KIT.

CONNECT YOUR COMPLETED KIT TO 8.0 VOLTS. ADJUST R16 UNTIL #1, 2, 3, & 4 ARE "ON". CHECK OPERATION BY CHECKING THE INPUT VOLTAGE, AND CHECKING THE RESULTS AGAINST THE VOLTAGE CHART.

BY ADJUSTING R16 YOU CAN SET THE CENTER LED TO LIGHT FROM 7.5 TO 9 VOLTS. YOU CAN ALSO SELECT A DIFFERENT COLOR SEQUENCE FOR THE LED'S TO BETTER SUIT YOUR SITUATION.

VM-1-8 11/20/98
8 DC VOLT MONITOR

ELECTRONIC RAINBOW INC.
 6227 COFFMAN RD.
 INDIANAPOLIS, IN 46268
 317-291-7262 FAX 317-291-7269
 INTERNET: www.rainbowkits.com



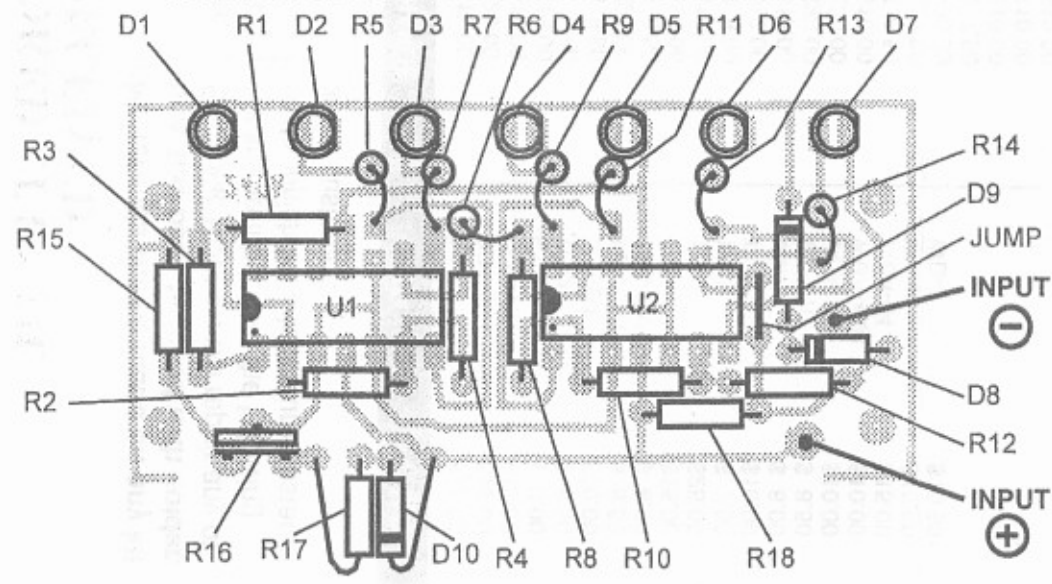
Source Voltage: +12.4 vDC, under load.

U1 PIN VOLTAGE	U2 PIN VOLTAGE
1 -- 10.34 V.	1 -- 0.0
2 -- .38 V.	2 -- 1.05 V.
3 -- 1.0 V.	3 -- 1.0 V.
4 -- 12.3 V.	4 -- 12.3 V.
5 -- 1.0 V.	5 -- 1.0 V.
6 -- .55 V.	6 -- 1.23 V.
7 -- 10.12 V.	7 -- 0.0
8 -- 10.12 V.	8 -- 0.0
9 -- .72 V.	9 -- 1.39 V.
10 -- 1.0 V.	10 -- 1.0 V.
11 -- ground	11 -- 0.0
12 -- not used	12 -- 1.0 V.
13 -- not used	13 -- .88 V.
14 -- 11.18 V. not used	14 -- 10.29 V.

- | | |
|---|--------------------------------------|
| () R2,R4,R6,R8 1K RES (BRN BLK RED) | () 8.2K OHM RES (GRA RED RED) |
| () R10,R12,R18 1K RES (BRN BLK RED) | () 18K OHM RES (BRN GRA ORG) |
| () R3,R5,R7,R9 470 OHM RES (YEL VIO BRN) | () D1,D7 RED LED |
| () R11,R13,R14 470 OHM RES (YEL VIO BRN) | () D2,D6 YELLOW LED |
| () R16 1K OHM RESTRIM POT | () D3,D4,D5 GREEN LED |
| () R17 4.3K RES (YEL ORG RED) | () D8,D9 1N914 OR 1N4148 |
| () R1,R15 SEE CHART | () D10 7.5 V ZENOR 1N5236 or 1N4737 |
| () 680 OHM RES (BLU GRA BRN) | () U1,U2 LM324 IC |
| () 1.5K OHM RES (BRN GRN RED) | () PCB BOARD 080-00240A |
| () 2.2K OHM RES (RED RED RED) | () CIGARETTE LIGHTER PLUG |

	LED 1	LED 2	LED 3	LED 4	LED 5	LED 6	LED 7	R1	R15
1 VOLT STEPS	9	10	11	12	13	14	15	2.2K	680 OHM
.5 VOLT STEPS	10.5	11.0	11.5	12.0	12.5	13.0	13.5	8.2K	1K
.25 VOLT STEPS	11.25	11.5	11.75	12.0	12.25	12.5	12.75	18K	1.5K

NOTE: FLAT SIDE OF LED'S IS INDICATED ON DRAWING.



SPECIAL NOTICE

IF YOU WANT TO BUILD YOUR KIT FOR 12 vDC OPERATION - USE THIS INSTRUCTION SHEET. (FOR 5 OR 8 VOLTS - USE PROPER SHEET.)

ASSEMBLY INSTRUCTIONS

PLACE ALL THE PARTS ON THE FIBERGLASS SIDE OF THE PC BOARD AND SOLDER ON THE METAL SIDE.

- () INSERT AND SOLDER ALL RESISTORS
- () INSERT AND SOLDER D8, D9, D10, U1 & U2 (WATCH POLARITY)
- () INSERT AND SOLDER R16 TRIM POT
- () INSERT AND SOLDER THE LED'S, AND JUMP (WATCH THE POLARITY OF THE LED'S)

VERY CAREFULLY CHECK ALL OF YOUR WORK BEFORE YOU APPLY POWER TO YOUR KIT.

CONNECT YOUR COMPLETED KIT TO 12.0 vDC. ADJUST R16 UNTIL # 1, 2, 3, & 4 LED'S ARE "ON". CHECK OPERATION BY CHECKING THE INPUT VOLTAGE, AND CHECKING THE RESULTS AGAINST THE VOLTAGE CHART. USE THE PROPER SCALE.

BY ADJUSTING R16 YOU CAN SET THE CENTER LED TO LIGHT FROM 11.5 TO 12.5 VOLTS. YOU CAN ALSO SELECT A DIFFERENT COLOR SEQUENCE FOR THE LED'S TO BETTER SUIT YOUR SITUATION.

VM-1-12 7/11/01
12 DC VOLT MONITOR

ELECTRONIC RAINBOW INC.
 6227 COFFMAN RD.
 INDIANAPOLIS, IN 46268
 317-291-7262 FAX 317-291-7269
 INTERNET: www.rainbowkits.com

NO REPAIR WILL BE LOOKED AT UNTIL REPAIR COST IS RECEIVED

ATTENTION KIT BUILDER:
BEFORE SOLDERING ANY
BOARD MAKE SURE YOU
HAVE THE ABILITY TO
COMPLETELY ASSEMBLE
THE KIT PROPERLY!

RETURN POLICY:
Electronic Rainbow will
refund purchase price on
any unopened kit **LESS**
postage and a 15%
restocking fee.

**NO refunds will be made on any kit
that has been touched with solder.**
Electronic Rainbow will repair any of
our kits sent back for the following
costs, which includes return postage
to the customer:

KIT#	CHARGE	KIT#	CHARGE	KIT#	CHARGE
AA-1	\$10.00	INT-2	ONE UNIT \$15.00 TWO UNITS \$20.00	SB-1	\$15.00
AC-1	\$15.00	IR-2	\$10.00	SDF-1	\$15.00
AD-8	\$15.00	LCD-T1	\$15.00	SLG-1	\$15.00
AP-1	\$10.00	LD-1	\$ 8.50	ST-1	\$10.00
APC-1	\$15.00	LG-2	\$ 8.50	TC-2	\$ 8.50
CA-1	\$10.00	LPS-1	\$25.00	TEL-B1	\$10.00
CID-1	\$25.00	MB-2	\$ 8.50	TEL-LITE	\$ 8.50
CL-1	\$10.00	MW-1	\$15.00	TEL-SW1	\$ 8.00
COD-K1	\$12.00	NC-1	\$15.00	TIR-1	\$15.00
DIS-1	\$35.00	OSC-2	\$ 8.00	TM-1	\$25.00
DJGB-2	\$ 8.00	OVA-1	\$10.00	TP-1	\$ 7.50
DJRB-2	\$ 8.00	PNS-1	\$15.00	TT-16	\$10.00
DF-222	\$ 8.50	PRC-1	\$20.00	VM-1	\$ 8.00
DSSA-1	\$17.50	PTG-1	\$20.00	VM-110	\$ 8.50
DT-3	\$ 8.00	RADIO-232	\$10.00	VOX-1	\$10.00
DTMF-1	\$25.00	RB-2	\$ 8.50	WBA-4&6	\$10.00
ET-1	\$ 8.50	REC-2	\$15.00	WBA-64	\$15.00
ETC-2	\$ 8.50	RFA-1	\$30.00	WA-2	\$15.00
FC-1	\$12.50	RP-1	\$ 7.50	WD-2	\$10.50
GT-10	\$15.00	RSD-1	\$10.00		
FMST-100	\$15.00	RS-232	\$10.00		
IA-1	\$10.00	RX-1	\$12.00		
INP-1	\$15.00				

IT DOESN'T WORK.....NOW WHAT?

If assembled properly, all kits will work, almost all of the kits we receive
for repair have assembly errors!

Here are some of the common errors we find:

1. Parts in wrong holes.
2. Solder shorts
3. Parts in backwards
4. Parts which are not soldered or have cold solder joints.
5. Wires which are "frayed" & touching other parts.

It is very difficult to objectively check your own work. Have someone else look over your completed kit. This can save a lot of time, frustration and money. If you need technical assistance, you are welcome to write or call. If you must return a kit we must charge for our technicians time. If a part is found to be defective, your repair fee will be refunded. We cannot warrant the kit builders ability, only the parts. No kit will be repaired if it has been modified or if mounted in an enclosure other than our own.

For repair send your kit to:



Electronic Rainbow Inc.
6227 Coffman Rd.
Indianapolis, IN 46268
317-291-7262
FAX 317-291-7269

INTERNET:
www.rainbowkits.com

COPYRIGHT© 1998 by Electronic Rainbow Ind. Inc.
6227 Coffman Rd. Indianapolis IN 46268
All Rights reserved. No part of this publication may be
reproduced without the written permission of Electronic
Rainbow Ind. Inc. Printed in USA

8/24/98