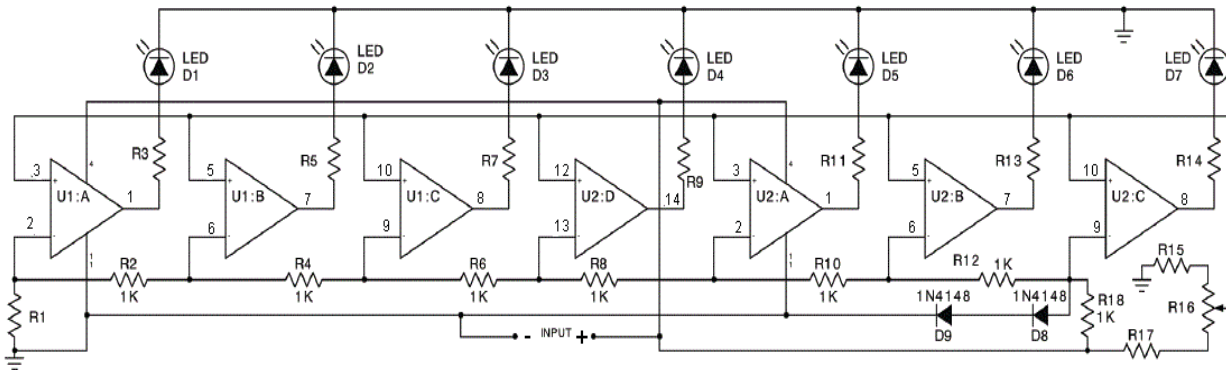


## VM-2 COMPLETE PARTS LIST

- |                               |                                  |
|-------------------------------|----------------------------------|
| (1) 18K RES (BRN GRY ORG)     | (1) 4.3K RES (YEL ORG RED)       |
| (7) 330 OHM RES (ORG ORG BRN) | (2) LM324IC                      |
| (7) 470 OHM RES (YEL VIO BRN) | (1) 1.5K RES (BRN GRN RED)       |
| (2) 1N914 DIODES OR 1N4148    | (1) 2.2K RES (RED RED RED)       |
| (2) RED LED'S                 | (1) 1K VERT TRIM POT             |
| (2) YELLOW LED'S              | (1) 680 OHM RES (BLU GRY BRN)    |
| (3) GREEN LED'S               | (1) 8.2 RES (GRY RED RED)        |
| (2) 14 PIN IC SOCKETS         | (1) 7.5 ZENOR IN755 or 1N4737    |
| (1) PCB # 373                 | (1) 5.1 ZENOR OR IN4733 OR IN751 |
| (8) 1K RES (BRN BLK RED)      |                                  |



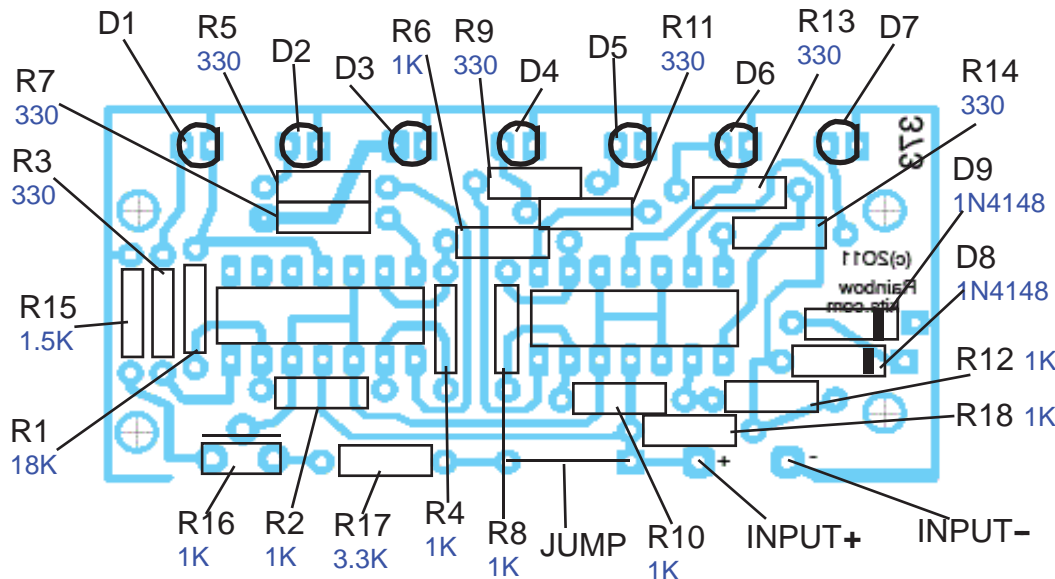
- |                 |                            |
|-----------------|----------------------------|
| ( ) R2,R4,R6,R8 | 1K Res (BRN BLK RED)       |
| ( ) R10,R12,R18 | 1K Res (BRN BLK RED)       |
| ( ) R3,R5,R7,R9 | 330 Ohm Res (ORG ORG BRN)  |
| ( ) R11,R13,R14 | 330 Ohm Res (ORG ORG BRN)  |
| ( ) R16         | 1K Ohm TRIM Pot            |
| ( ) R17         | 3.3K Ohm Res (ORG ORG RED) |
| ( ) R1          | 18K Res (BRN GRA ORG)      |
| ( ) R15         | 1.5K Res (BRN GRN RED)     |

### Watch Orientation on these Parts

- |              |            |
|--------------|------------|
| ( ) D1,D7    | Red LED    |
| ( ) D2,D6    | Yellow LED |
| ( ) D3,D4,D5 | Green LED  |
| ( ) D8,D9    | 1N4148     |
| ( ) U1,U2    | LM324 IC   |
| ( ) PC Board | 080-00373  |

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

**NOTE: Flat side of LED's is indicated on drawing.**



## 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 AND 'JUMP'
- ( ) INSERT AND SOLDER DIODE'S D8, D9, U1 & U2 IC LM324 (**WATCH POLARITY**)
- ( ) INSERT AND SOLDER R16 TRIM POT
- ( ) INSERT AND SOLDER THE LED'S (**WATCH POLARITY - FLAT SIDE IS NEGATIVE**)

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

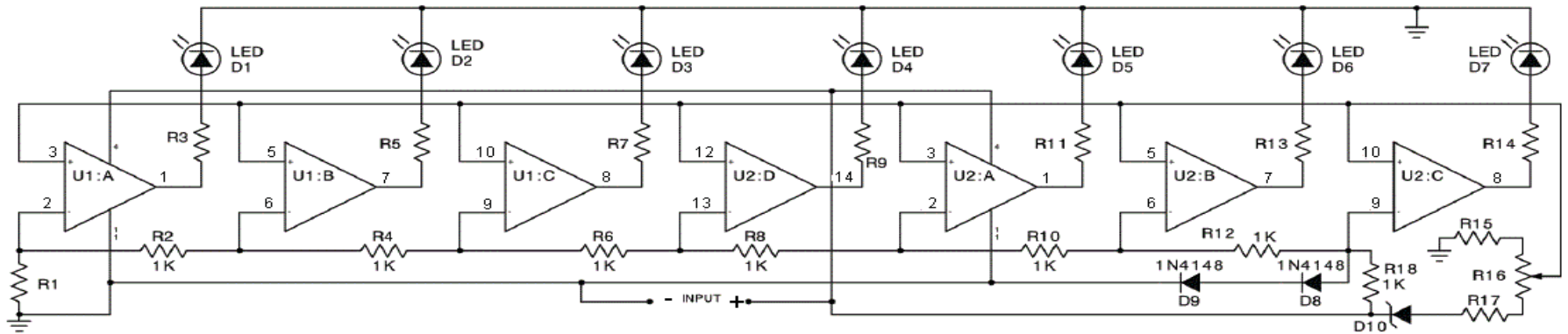
CONNECT YOUR COMPLETED KIT TO 5.0vDC. ADJUST R16 UNTIL # 1, 2, 3, & 4 LED'S ARE "ON". CHECK OPERATIONS BY CHECKING THE INPUT VOLTAGE, AND CHECKING THE RESULTS AGAINST THE VOLTAGE CHART.

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



VM2-5 10-10-2011  
**5 VOLT DC MONITOR**  
 Rainbowkits.com LLC  
 2238 West U.S. Highway 36  
 Danville, IN 46122  
 317-745-5602 FAX 317-745-5604  
[www.rainbowkits.com](http://www.rainbowkits.com)

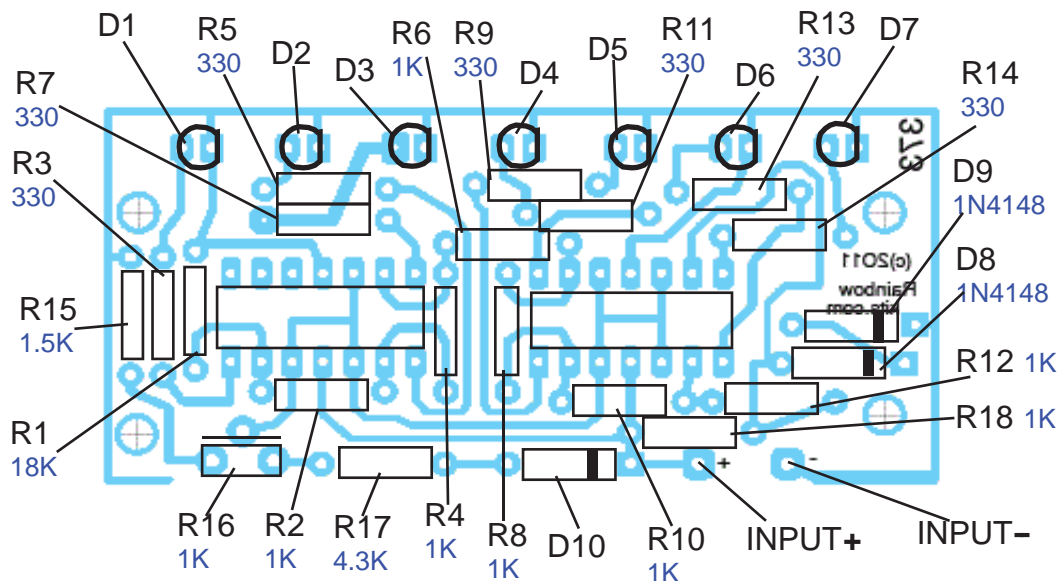




- |   |   |
|---|---|
| ( ) R2,R4,R6,R8 1K Res (BRN BLK RED)      | <b>Watch Orientation on these Parts</b> |
| ( ) R10,R12,R18 1K Res (BRN BLK RED)      | ( ) D1,D7 Red LED                       |
| ( ) R3,R5,R7,R9 330 Ohm Res (ORG ORG BRN) | ( ) D2,D6 Yellow LED                    |
| ( ) R11,R13,R14 330 Ohm Res (ORG ORG BRN) | ( ) D3,D4,D5 Green LED                  |
| ( ) R16 1K Ohm TRIM Pot                   | ( ) D8,D9 1N4148                        |
| ( ) R17 4.3K Ohm Res (YEL ORG RED)        | ( ) D10 5.1 V Zener 1N4733 or 1N751     |
| ( ) R1 18K Res (BRN GRA ORG)              | ( ) U1,U2 LM324 IC                      |
| ( ) R15 1.5K Res (BRN GRN RED)            | ( ) PC Board 080-00373                  |

.25 Volt Steps	LED 1 7.25	LED 2 7.5	LED 3 7.75	LED 4 8.0	LED 5 8.25	LED 6 8.5	LED 7 8.75
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**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 DIODE'S D8, D9, D10  
U1 & U2 IC LM324 (**WATCH POLARITY**)
- ( ) INSERT AND SOLDER R16 TRIM POT
- ( ) INSERT AND SOLDER THE LED'S

(**WATCH POLARITY - FLAT SIDE IS NEGATIVE**)

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

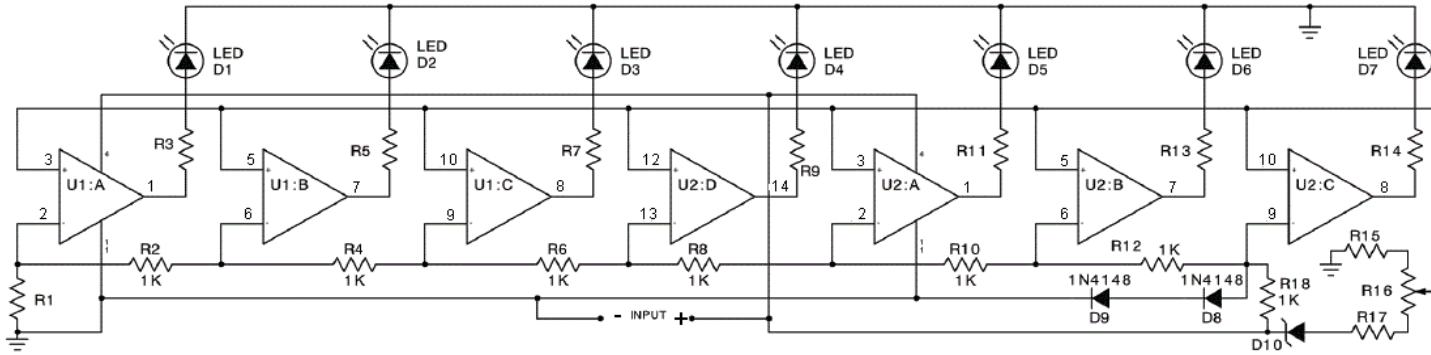
CONNECT YOUR COMPLETED KIT TO 8.0vDC. ADJUST R16 UNTIL # 1, 2, 3, & 4 LED'S ARE "ON". CHECK OPERATIONS BY CHECKING THE INPUT VOLTAGE, AND CHECKING THE RESULTS AGAINST THE VOLTAGE CHART.

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



VM2-8 1-14-2011  
**8 VOLT DC MONITOR**  
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 www.rainbowkits.com

Source Voltage = 12.4 VDC

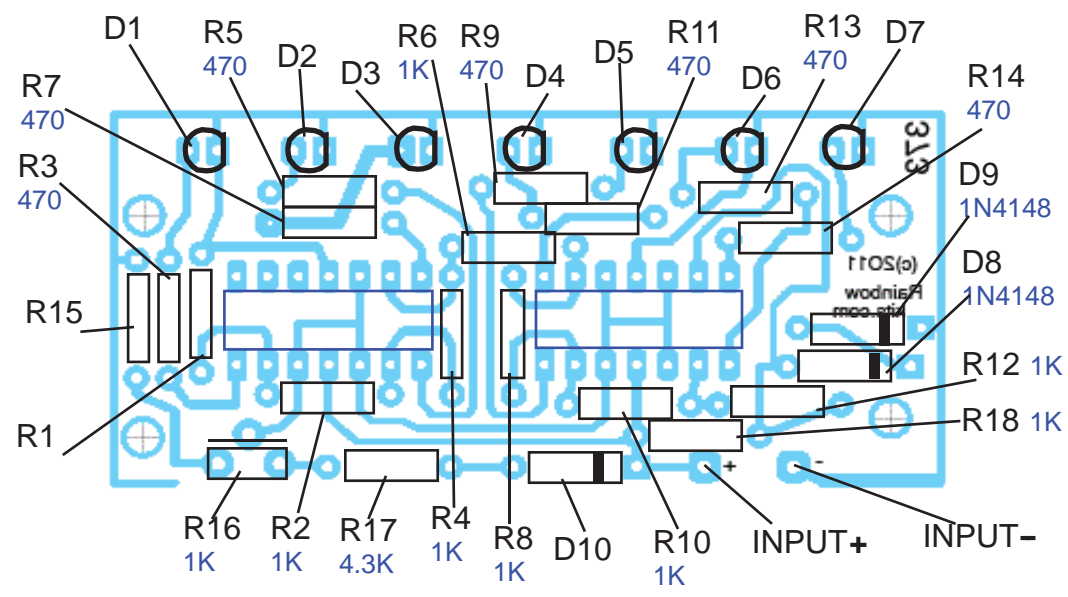


U1 Pin Voltage		U2 Pin Voltage	
1	10.34 V	1	0 V
2	.38 V	2	1.05 V
3	1 V	3	1 V
4	12.3 V	4	12.3 V
5	1 V	5	1 V
6	.55 V	6	1.23 V
7	10.12 V	7	0 V
8	10.12 V	8	0 V
9	.72 V	9	1.39 V
10	1 V	10	1 V
11	GND 0 V	11	GND 0 V
12	Not Used	12	1 V
13	Not Used	13	.88 V
14	Not Used	14	10.29 V

- |  |   |
|--|---|
| ( ) R2,R4,R6,R8 1K Res (BRN BLK RED)       | <b>Watch Orientation on these Parts</b> |
| ( ) R10,R12,R18 1K Res (BRN BLK RED)       | ( ) D1,D7 Red LED                       |
| ( ) R3,R5,R7,R9 470 Ohm Res (YEL VIO BRN)  | ( ) D2,D6 Yellow LED                    |
| ( ) R11,R13,R14 470 Ohm Res (YEL VIO BRN)  | ( ) D3,D4,D5 Green LED                  |
| ( ) R16 1K Ohm TRIM Pot                    | ( ) D8,D9 1N4148                        |
| ( ) R17 4.3K Ohm Res (YEL ORG RED)         | ( ) D10 7.5 V Zenor 1N4737              |
| ( ) R1, R15 See Chart                      | ( ) U1,U2 LM324 IC                      |
| 680 ohm (BLU GRA BRN) - 1.5K (BRN GRN RED) | ( ) PC Board 080-00373                  |
| 2.2K (RED RED RED) - 8.2K (GRA RED RED)    |   |
| 18K (BRN GRA ORG)                          |   |

	LED 1	LED 2	LED 3	LED 4	LED 5	LED 6	LED 7	R1	R15
.25 Volt Steps	7.25	7.5	7.75	8.0	8.25	8.5	8.75	18K	1.5K
.5 Volt Steps	10.5	11	11.5	11.75	12	12.25	12.5	8.2K	1K
1 Volt Steps	9	10	11	12	13	14	15	2.2K	680

**NOTE: Flat side of LED's is indicated on drawing.**



### SPECIAL NOTICE

IF YOU WANT TO BUILD YOUR KIT FOR **12 VOLT 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 DIODE'S D8, D9, D10  
U1 & U2 IC LM324 (**WATCH POLARITY**)
- ( ) INSERT AND SOLDER R16 TRIM POT
- ( ) INSERT AND SOLDER THE LED'S

(**WATCH POLARITY - FLAT SIDE IS NEGATIVE**)

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

CONNECT YOUR COMPLETED KIT TO 12.0vDC. ADJUST R16 UNTIL # 1, 2, 3, & 4 LED'S ARE "ON". CHECK OPERATIONS 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 4.5 TO 6 VOLTS. YOU CAN ALSO SELECT A DIFFERENT COLOR SEQUENCE FOR THE LED'S TO BETTER SUIT YOUR SITUATION.



VM2-12 1-14-2011

**12 VOLT DC MONITOR**

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