

## VM-2 COMPLETE PARTS LIST

- |                               |                                   |
|-------------------------------|-----------------------------------|
| (1) 18K RES (BRN GRY ORG)     | (1) 4.3K RES (YEL ORG RED)        |
| (7) 390 OHM RES (ORG WHT BRN) | (2) LM324IC                       |
| (2) 1N914 DIODES OR 1N4148    | (1) 1.5K RES (BRN GRN RED)        |
| (2) RED LED'S                 | (1) 2.2K RES (RED RED RED)        |
| (2) YELLOW LED'S              | (1) 1K VERT TRIM POT              |
| (3) GREEN LED'S               | (1) 680 OHM RES (BLU GRY BRN)     |
| (2) 14 PIN IC SOCKETS         | (1) 8.2 RES (GRY RED RED)         |
| (1) PCB # 373                 | (1) 7.5 ZENOR IN755 or 1N4737     |
| (8) 1K RES (BRN BLK RED)      | (1) 4.7 ZENOR OR IN4732 or IN5230 |

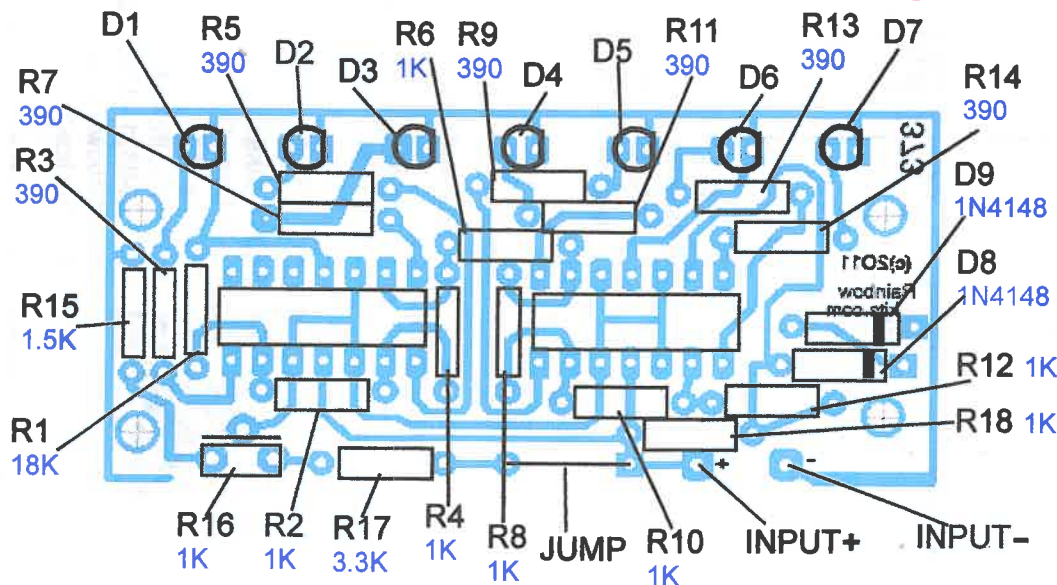
- |                 |                            |
|-----------------|----------------------------|
| ( ) R2,R4,R6,R8 | 1K Res (BRN BLK RED)       |
| ( ) R10,R12,R18 | 1K Res (BRN BLK RED)       |
| ( ) R3,R5,R7,R9 | 390 Ohm Res (ORG WHT BRN)  |
| ( ) R11,R13,R14 | 390 Ohm Res (ORG WHT BRN)  |
| ( ) 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.

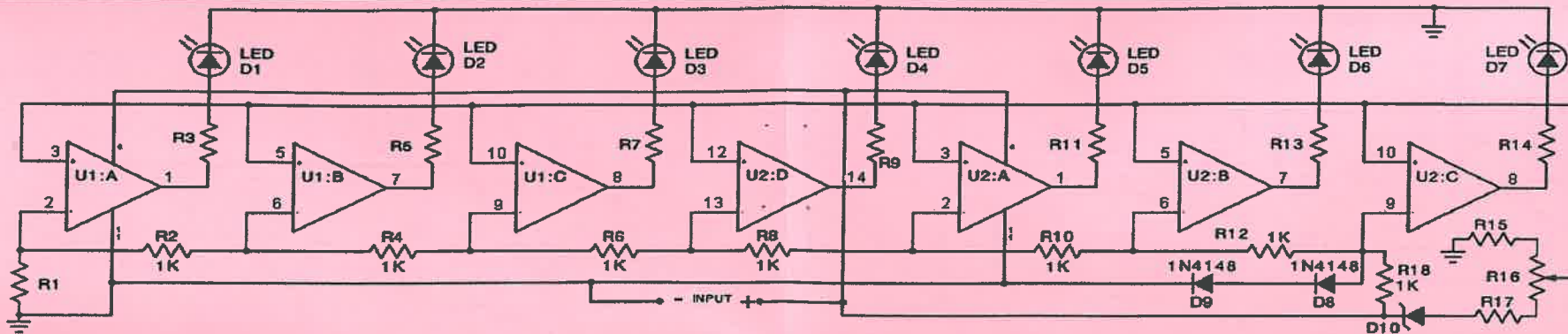
CONNECT YOUR COMPLETED KIT TO 5.0vDC. ADJUST R16 UNTIL # 1, 2, 3, & 4 LED'S ARE "ON". CHECK OPERATIONS BY CHECKING THE INPUT VOLTAGE, AND CHECKING THE RESULTS AGAINST THE VOLTAGE CHART.

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 12-14-2011

**5 VOLT DC  
MONITOR**



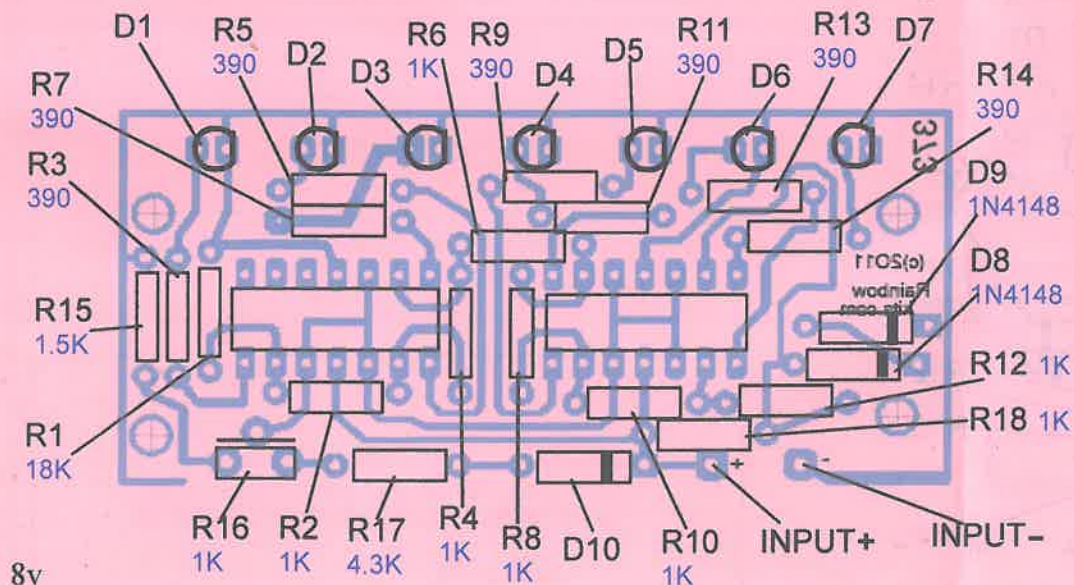


- ( ) R2,R4,R6,R8 1K Res (BRN BLK RED)
- ( ) R10,R12,R18 1K Res (BRN BLK RED)
- ( ) R3,R5,R7,R9 390 Ohm Res (ORG WHT BRN)
- ( ) R11,R13,R14 390 Ohm Res (ORG WHT BRN)
- ( ) R16 1K Ohm TRIM Pot
- ( ) R17 4.3K Ohm Res (YEL ORG RED)
- ( ) R1 18K Res (BRN GRA ORG)
- ( ) R15 1.5K Res (BRN GRN RED)

- Watch Orientation on these Parts
- ( ) D1,D7 Red LED
  - ( ) D2,D6 Yellow LED
  - ( ) D3,D4,D5 Green LED
  - ( ) D8,D9 1N4148
  - ( ) D10 5.1 V Zener 1N4732 or 1N5230
  - ( ) 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
	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.

1. ( ) INSERT AND SOLDER ALL RESISTORS
2. ( ) INSERT AND SOLDER DIODE'S D8, D9, D10  
U1 & U2 IC LM324 (WATCH POLARITY)
3. ( ) INSERT AND SOLDER R16 TRIM POT
4. ( ) 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.

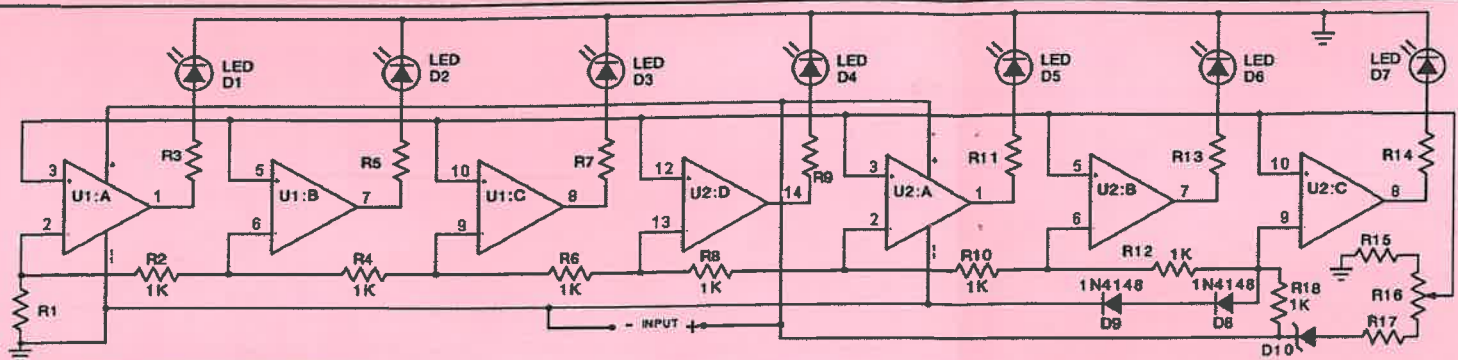
CONNECT YOUR COMPLETED KIT TO 8.0VDC. ADJUST R16 UNTIL # 1, 2, 3, & 4 LED'S ARE "ON". CHECK OPERATIONS BY CHECKING THE INPUT VOLTAGE, AND CHECKING THE RESULTS AGAINST THE VOLTAGE CHART.

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 APPLICATION.

VM2-8

10-14-2013

**8 VOLT DC MONITOR**



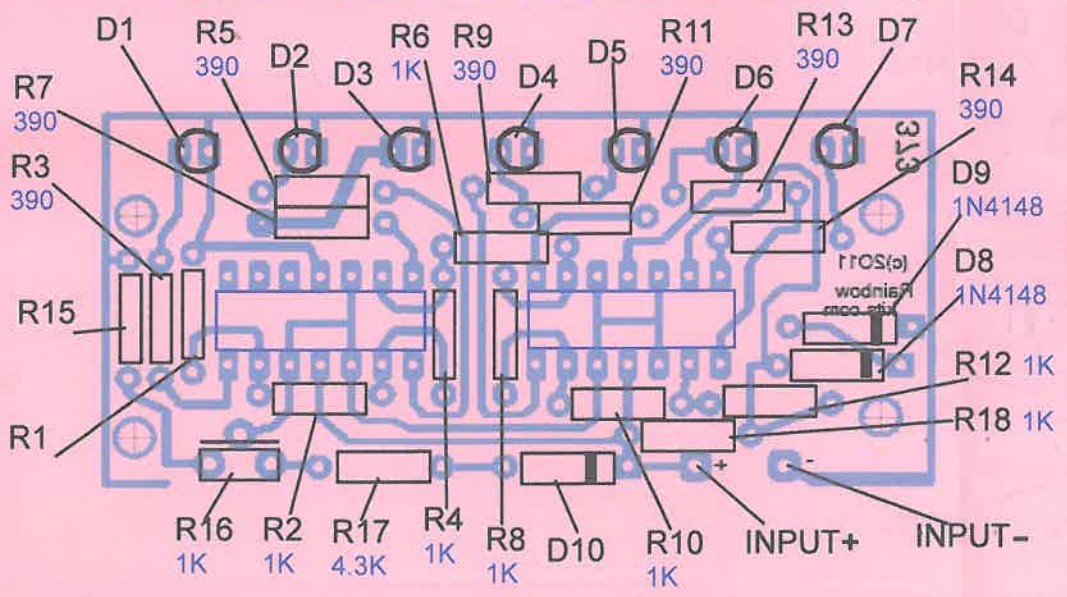
Source Voltage = 12.4 VDC

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)       | Watch Orientation on these Parts |
| ( ) R10,R12,R18 1K Res (BRN BLK RED)       | ( ) D1,D7 Red LED                |
| ( ) R3,R5,R7,R9 390 Ohm Res (ORG WHT BRN)  | ( ) D2,D6 Yellow LED             |
| ( ) R11,R13,R14 390 Ohm Res (ORG WHT 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 Zener 1N4737       |
| ( ) R1, R15 See Chart                      | or 1N755                         |
| 680 ohm (BLU GRA BRN) - 1.5K (BRN GRN RED) | ( ) U1,U2 LM324 IC               |
| 2.2K (RED RED RED) - 8.2K (GRA RED RED)    | ( ) PC Board 080-00373           |
| 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 8 TO 12 VOLTS. YOU CAN ALSO SELECT A DIFFERENT COLOR SEQUENCE FOR THE LED'S TO BETTER SUIT YOUR APPLICATION.

VM2-12                      10-14-2013

## 12 VOLT DC MONITOR

# NO KIT WILL BE REPAIRED UNTIL REPAIR FEE IS RECEIVED

## ATTENTION KIT BUILDER:

Before soldering any parts on the PC Board be sure you have the ability to completely assemble the kit properly.

## RETURN POLICY:

Rainbowkits will refund the 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. Rainbowkits will repair most kits sent back for the following fee. This includes return postage back to you.

KIT #	CHARGE	KIT #	CHARGE	KIT #	CHARGE
AA-1D	\$10.00	EBPHO-8	\$15.00	PTG-1	\$20.00
AC-1	\$15.00	EBTD-9	\$15.00	RBH-3	\$ 8.50
AD-8	\$15.00	EBTS-10	\$15.00	RB-3	\$ 8.50
AP-1D	\$10.00	EBLOG-300	\$15.00	REC-FM2	\$15.00
AP-1W	\$10.00	EBST-11	\$15.00	RELAY-5	\$18.00
APC-1	\$15.00	FC-1	\$12.50	RFA-1	\$30.00
BBH-3	\$ 8.50	FMC-2000	\$15.00	RP-1	\$ 9.00
CA-1	\$10.00	FMST-100	\$17.00	RSD-1	\$10.00
CID-1	\$25.00	GB-3	\$ 8.50	RX-1	\$12.00
CL-2	\$15.00	GT-10	\$15.00	SB-1	\$15.00
DIS-1	\$35.00	IA-1	\$10.00	SDF-1	\$18.00
DJBB-3	\$10.00	INP-1	\$15.00	SLG-1	\$15.00
DJGB-3	\$10.00	INT-2	ONE UNIT \$15.00	STOP-1	\$25.00
DJRB-3	\$10.00		TWO UNITS \$22.00	TG-2D	\$ 8.50
DF-222	\$12.00	IR-2	\$15.00	TEL-LITE	\$ 8.50
DSSA-1	\$17.50	LAS-1	\$15.00	TEL-SW1	\$ 8.00
DT-3D	\$10.00	LCD-T1	\$18.00	TIR-1	\$15.00
DTMF-2	\$25.00	LD-1	\$10.00	TM-1	\$25.00
EBAA-1	\$15.00	LG-2D	\$10.00	TP-1	\$ 9.00
EBAA-SMD-1	\$15.00	MB-3	\$ 9.50	TT-16	\$12.00
EBAP-2	\$15.00	MW-1	\$15.00	VM-2	\$10.00
EBAO-3	\$15.00	NC-1	\$15.00	VM-2 - 110	\$12.50
EBPS-4	\$15.00	OSC-3	\$ 9.00	VOX-1D	\$10.00
EBPS-5	\$15.00	OVA-1	\$10.00	WA-2D	\$15.00
EBLG-6	\$15.00	PNS-1	\$15.00	WD-3	\$10.50
EBCD-7	\$15.00	PRC-1	\$20.00	YB-3	\$ 8.50

## 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" and touching other parts.
6. Kit has been modified from our original design.

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 return a kit we must charge for our technician's time. No kit will be repaired if it has been modified from our original design.