

Name: _____

Section: _____

Assignment #1 – Soldering Components to PCB

Objective: To develop the skills to correctly place and solder a component to a printed circuit board (PCB) with good, uniformly wetted solder joints.

Components to be soldered on the PCB:

Ref Designator	Part Description	Digi-Key Part Number	MFG Part Number	Qty
C1	CAP TANTALUM 1UF 20V 10% RAD	478-1833-ND	TAP105K020SCS	1
C2	CAP .010UF 50V CERAMIC X7R 10%	BC1078CT-ND	K103K15X7RF5TL2	1
D1,D2, D3, D4, D5, D6, D7, D8, D9	DIODE SGL JUNC 100V 4.0NS DO-35	1N4148TATB-ND	1N4148TA	9
D10,D11, D12, D13, D14, D15	LED 5MM RED CLEAR 632NM 30DEG	160-1682-ND	LTL2R3KEK	6
R1	RES 22K OHM CARBON FILM 1/4W 5%	P22KBACT-ND	ERD-S2TJ223V	1
R3	RES 2.2K OHM CARBON FILM 1/4W 5%	P2.2KBACT-ND	ERD-S2TJ222V	1
R2	TRIMPOT 500K CARBON LAYDOWN(504)	3352P-504LF-ND	3352P-1-504LF	1
U1*	IC PRECISION TIMER 8-DIP	296-1411-5-ND	NE555P	1
U2*	IC 10-OUT DECADE COUNTER 16-DIP	296-2037-5-ND	CD4017BE	1
U1S	SOCKET IC OPEN FRAME 8POS .3"	3M5473-ND	4808-3004-CP	1
U2S	SOCKET IC OPEN FRAME 16POS .3"	3M5463-ND	4816-3000-CP	1
VCC, GND	BATTERY CLIP VINYL 9V W/LEADS 6"	377-1549-ND	HH-3449	1

*Pressed into sockets U1S and U2S respectively – not soldered onto PCB.

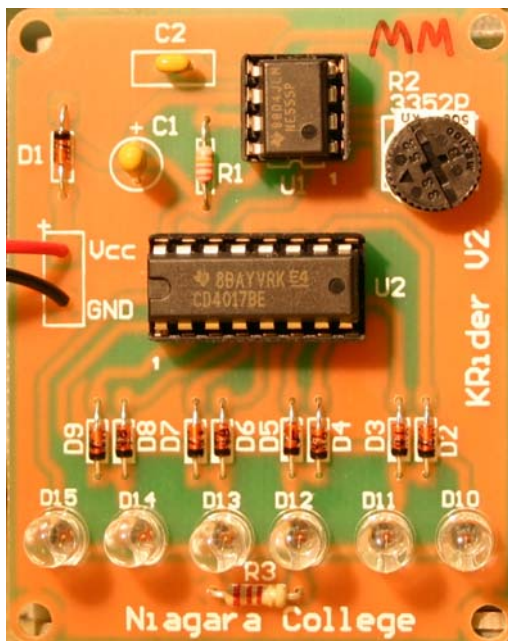


Figure 1 Project board completely assembled.

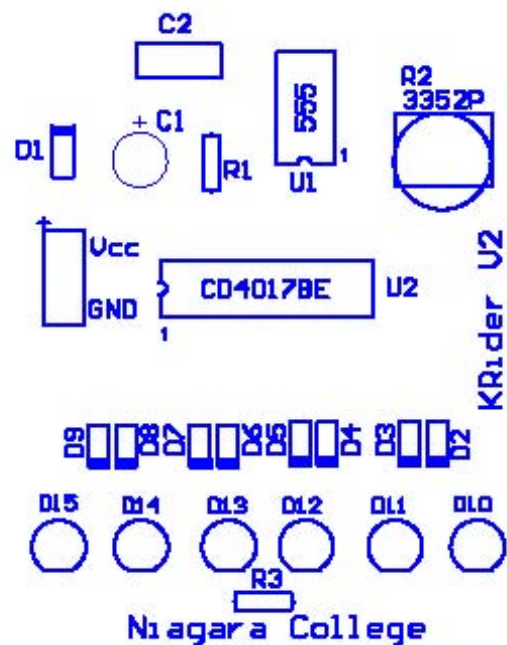


Figure 2 Component Layout - Top View - Silkscreen

BEWARE: The traces are reversed on the solder side.

Procedure:

- 1) Write your name on the marking sheet, found at the end of this document.
- 2) Locate, identify and place all of the required components for this project and in the anti-static tray on your workbench. *If you are missing any components, alert your lab instructor.*

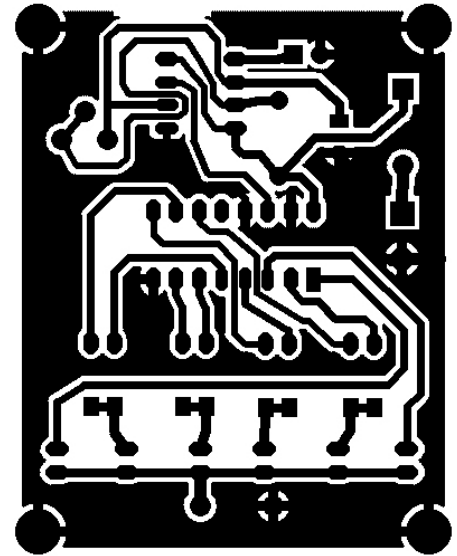


Figure 3 Trace Layer - Bottom View – Solder Side

- 3) Components must be soldered in the following order:

Resistors, Diodes, IC Sockets, Trim Potentiometer, Capacitors, LED's and Battery Clip

****DO NOT SOLDER THE ICs TO THE BOARD – PLUG INTO THE SOCKETS AFTERWARDS**

- 4) Insert one component at a time from the silkscreen side of the PCB, paying close attention to polarity, applying bend allowance and service clinch where necessary. Solder the component onto the appropriate PCB foil pads. ALL COMPONENTS (*except the capacitors*) MUST BE MOUNTED TIGHT TO THE PCB.
- 5) Inspect the solder connection for proper wetting. Trim the component leads close to the PCB, without disrupting solder connection.
- 6) Repeat until complete.

Hints:

- 1) Secure the PCB in a portable bench vise or PCB holder for soldering.
- 2) Inspect each solder joint for uniform soldering and good shiny connections. Also inspect for excessive amounts of solder, solder bridges, cold solder joints (dull and grey) and overheating (lifted pads/traces, wire insulation melted, etc.). Fix bonds as required.
- 3) Use proper bend allowance for component mounting.
- 4) If necessary, strip and tin the leads of the 9V battery clip (they may be stripped and tinned already). Be careful not to cut or nick any of the strands of wire. Always twist the stranded wire in the same direction as the manufacturer prior to tinning.

Caution: Excessive heat on the foil of the printed circuit board may cause the foil pad/pattern to lift from the board. Quick and effective solder feeding skills will prevent this.