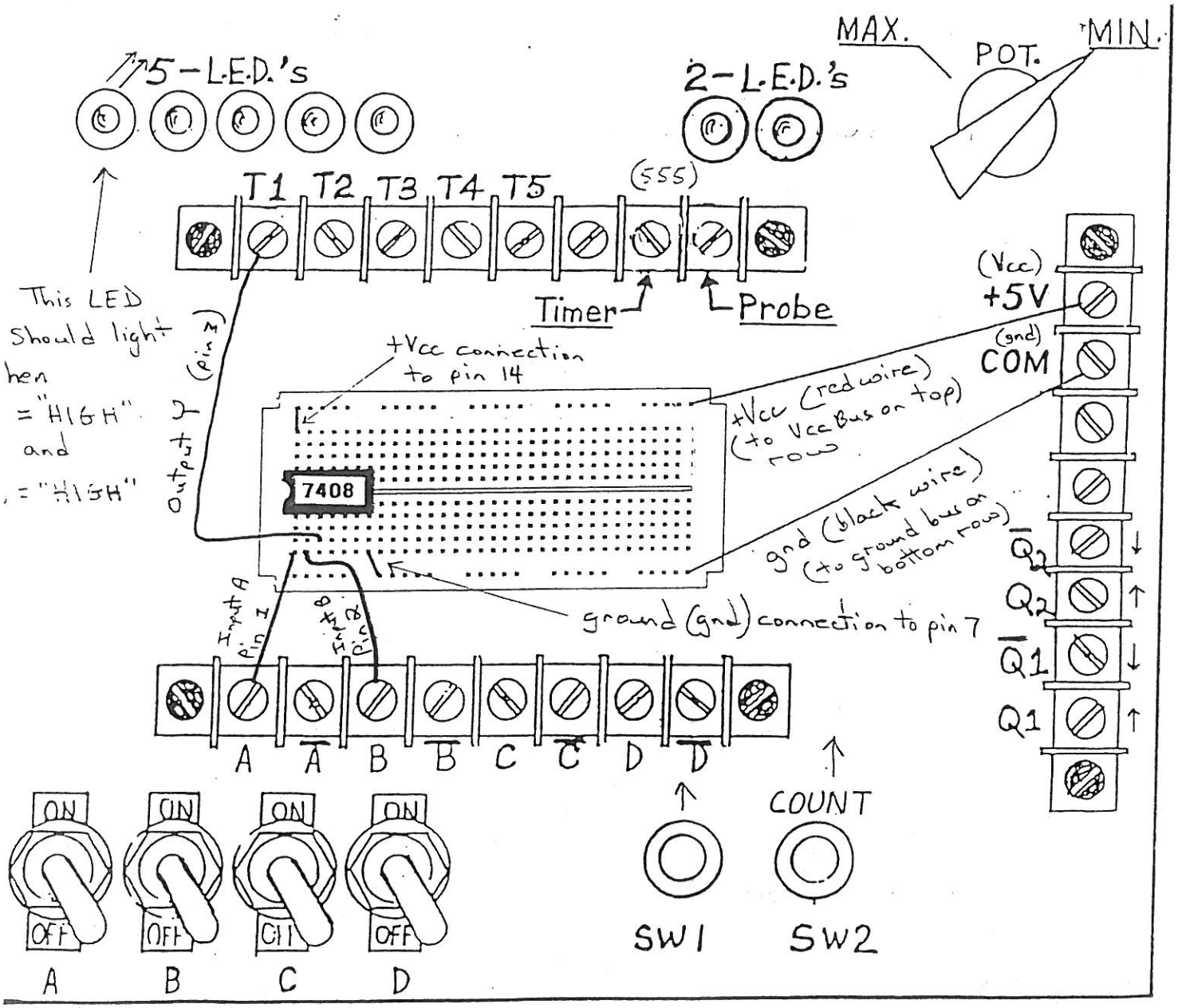
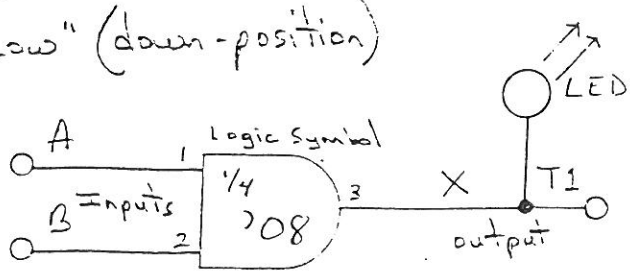
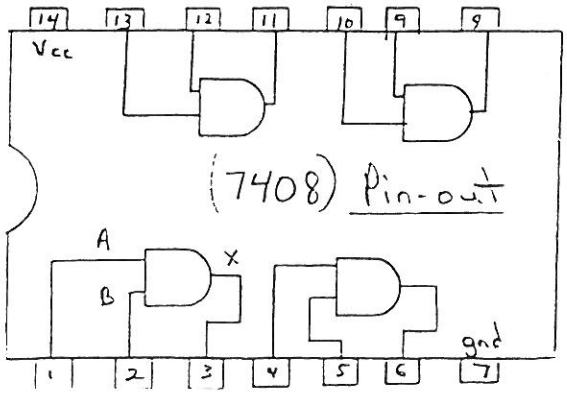
Lab #0: Digital Trainer

Example Wiring for Digital Trainer using 7408 (AND gate)



Input A
ON = "High" (up-position)
Off = "Low" (down-position)





EMT1250 Lab Troubleshooting Steps

The following problems are listed in order of frequency of occurrence.
[1 = most often, 6 = least often]

Note: The order in which you check these may vary depending on the situation.

Problem 1) **Bad Wiring**

Cause: wrong connection

Solution: Check breadboard and/or schematic for correctness and make proper connection(s).

Problem 2) **Vcc and/or Gnd not connected**

Cause: Wrong connction

Solution: Check this and make proper conncetion(s).

Problem3) **Incorrect Chip Placement**

Cause: Chip is placed in breadboard backwards or up side down.

Solution: Make sure that chip is placed over center gap correctly and pin 1 is in the lower left corner.

Problem 4) **Pin(s) Bent under**

Cause: Pin(s) wer not in placed in hole(s) in breadboard when IC was inserted.

Solution: Close visual examination should reveal fault, straighten pin(s) and re-insert chip if faulty.

Problem 5) **Defective Holes in breadboard**

Cause: Manufacturing defect, overuse, or usage of oversized wire

Solution: Move chip to different part of breadboard and do not use same hole(s) again.

Problem 6) **Bad Chip**

Cause: Maufacturing defect which is extremely unlikely or chip has been connected in wrong manner to power supply and has become damaged.

Solution: Ask to replace it.

If you encounter a problem, do not call the CLT or Instructor unless you have checked all six of the possible problems listed above.

Recommended practice: Use **RED** wire for all **Vcc** connections, **BLACK** for all **Ground** connections, and use as many **different colors** as possible for the other connections. This color coding of wires helps tremendously when troubleshooting.

When wiring circuits on the breadboard make sure **the AC cord of your digital trainer is disconnected**. This will prevent possible shock hazards and damage to the integrated circuits.

FYI: Vcc=5.25 Volts, IC = Integrated Circuit [or "chip" for short], TTL = Transistor-Transistor Logic(74XX), for all logic gates [7408=AND, 7400=NAND, 7432=OR, 7402=NOR gate]
Vcc=> pin 14 and Gnd=>pin 7 in TTL.