

## Cornerstone Electronics Technology and Robotics Week 24 Couplers and Molex Connectors

- Administration:
  - Prayer
  - Turn in quiz
  - Build a +5 volt voltage regulator with a +9 volt source
  - Determine how many red LEDs can be placed in series and still be lit from a +9 volt source. Now try green then yellow LEDs.
- Continue soldering Sandwich PCB, switches, battery snap, and tube LEDs
- Building Robots for Beginners, **Chapter 20, Coupler continued:**
  - Attaching Lego wheel to a motor shaft with couplers:
    - Clean aluminum tubing in soap and water; dry with pipe cleaners and a heat gun set on low. DO NOT touch tubing immediately after drying w/ the heat gun, it is **HOT**.
    - Cut one #6 Lego axle in half.
    - Put on vinyl gloves.
    - Clean Lego cross axle in isopropyl alcohol; dry with paper towels.
    - **Epoxy Safety Rules:**
      - Avoid contact with skin and eyes.
      - Do not ingest.
      - Use in well ventilated area.
    - Mix equal parts of epoxy together on cardboard.
    - Epoxy Lego cross axle into tubing.
    - Chip or sand off excess epoxy.
    - Drill out excess epoxy from motor shaft end using 1/8" drill bit.
    - Mark hole for set screw (about 5 mm from motor end of coupler).
    - **Drill Press Safety Rules:**
      - Route cord away from the bit or cutting area.
      - Never hold a small work piece in one hand and the drill in the other.
      - Use a "V" block for supporting round stock such as tubes or rods when drilling.
    - Use 5/64" drill bit to drill hole.
    - Check 40 threads per inch with thread gauge.
    - Tap hole with 4-40 (#4 screw with 40 threads per inch) tap.
    - Insert set screw.
    - Install motor and wheel.
- Electricity and Electronics, Robot Building for Beginners, **Chapter 22, Soldering and Connecting Continued:**
  - Installing Molex KK Connectors
    - Survey photos on pages 405-408 in text.

## **Electronics Technology and Robotics I Week 24**

### **Molex Connectors Lab 1 – Adding Molex Connectors**

- **Purpose:** The purpose of this lab is to connect the Molex connectors and troubleshoot the Sandwich PCB.
  
- **Apparatus and Materials:**
  - Molex Connectors
  - Sandwich Parts including PCB
  
- **Procedure:**
  - Check for unsoldered and unconnected leads.
  - Make sure the red wire of the battery goes to the positive pin on the Molex power switch connector. The other pin of the Molex power switch connector should be wired to the positive voltage bus.
  - Connect all motors, switches and battery snap (without the battery).
  - Measure the power off and power on resistance:
    - Put multimeter on battery snaps with the battery not connected. Turn on and off the power switch. The off position should read infinite and the on position should read between 5,000 and 50,000 ohms.
    - Cover the photoresistors with your hand; the resistance of the circuit should be quite high.
    - Expose the photoresistors to light; the resistance should be low.
  - Power up the circuit board.
  - Check performance and troubleshoot.