

Lab Overview

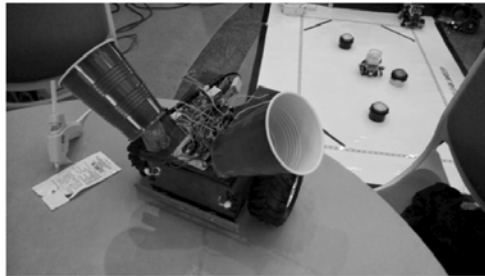
Review of the IMDL Lab

IMDL Fall 2015

Andy Gray

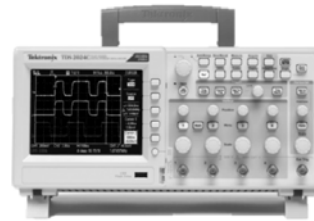
Objectives

- Equipment
- Parts
- Rules
- Labs in the lab
- Safety



Electrical Equipment

- Tektronix Oscilloscopes
 - Probe specific lines on a device to see the type of data being sent
 - Useful for reviewing analog or communication data
- Signal Generator
 - Testing servos, linear actuators, filters
- DC Power Supplies
 - Useful for power devices or boards



3

Electrical Equipment

- Weller Soldering Station
 - Solder your own custom board or to make sensors and cables
- MultiMeters
 - For checking voltage, data, signals, etc.



4

Mechanical Equipment

- Drill Press
 - Fixed Drill / Very powerful
 - Straight holes
 - Allows for a vise or clamp to hold object stationary
 - Not for metal

- Band Saw
 - Useful for cutting wood
 - Used to perform simple cutting to detail work
 - Continuous blade
 - Not for metal



5

Mechanical Equipment

- Scroll Saw
 - Similar to Band saw and Jigsaw
 - Useful for small cuts or intricate curves
 - Not for metal

- Dremel
 - Rotary tool
 - Useful for drilling, grinding, cutting, sanding, routing, and carving
 - Not for metal



6

Mechanical Equipment

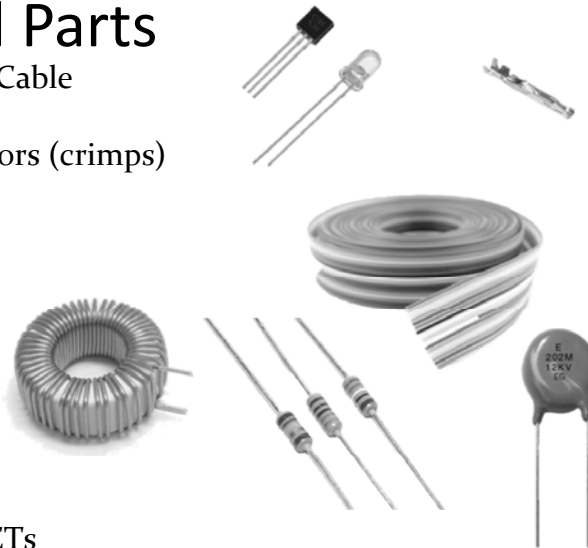
- Digital Calipers
 - Digital and precise ruler at small to medium scale
- Hammers, Screw Drivers, Clamps
 - Have most common tools required



7

Electrical Parts

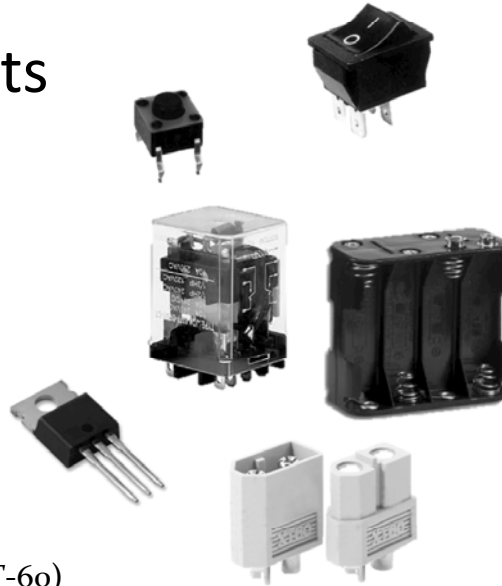
- Wire, Ribbon Cable
- Cable connectors (crimps)
- LEDs
- Resistors
- Capacitors
- Inductors
- Transistors/FETs



8

Electrical Parts

- Linear regulators
- Headers
- Push-Buttons
- Power Switches
- Relays
- AA Battery Packs
- Power Connectors (XT-6o)



9

Mechanical Parts

- Screws, Nuts, Standoffs
 - 4-40
 - 2-56
 - 1", 0.5", etc
- Glues, Epoxies
- Aircraft plywood
 - (1) 12" x 18"
 - (1) 12" x 12"
 - Additional 12" x 18" sheet \$5



10

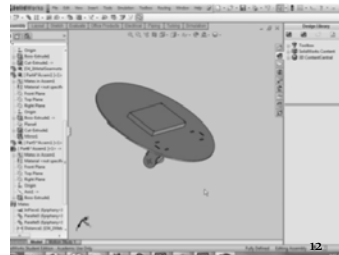
Items not supplied

- Motors
- Wheels
- Brackets
- Batteries
- Motor controllers
- Processing boards
- Raw materials (besides aircraft plywood)

11

T-Tek

- Wood Designs
- Make your design in Solid Works, we can cut it out of wood
- You get a sheet and a half of wood
- Please do not ask questions while we use the T-Tek!!
- Watch Tim Martin's video
 - MIL T-Tech
 - <http://mil.ufl.edu/5666/handouts.htm>

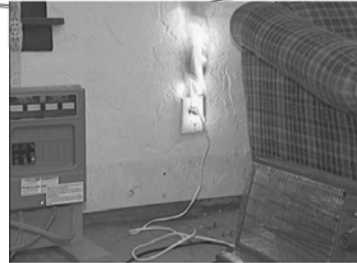


Lab Rules

- Clean up after yourself
- Clean up after yourself
- Clean up after yourself

- Turn things off when you leave – ESPECIALLY THE SOLDERING IRON!!!

- Wear safety glasses when using power tools or soldering



13

Lab Schedule

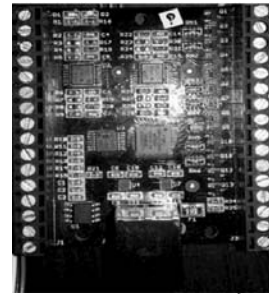
- 3 Mandatory labs
 - Safety training and button/blink LED
 - UART and IR sensor
 - Servo scale with IR/CDS/pot/UART (uC not provided)
- Following weeks are for working on Robot



14

Mandatory labs

- Bring your own microcontroller and use appropriate IDE
- No micro-controller? Issued a DAQ
 - Install Atmel studio prior to class (big file, v 7.0)
 - Chip45boot2 software (latest v 1.13)
 - TA provides skeleton code for DAQ
- Each lab is worth 5 pts



Lab Safety

- http://mil.ufl.edu/5666/handouts/IMDL_lab_safet

EEL 4665/5666: Intelligent Machines Design Laboratory (IMDL) Lab Safety

Cleanliness/Respect:

Student *Cleanliness/Respect* is a subjective assessment of the students' overall attitude in the IMDL laboratory. The cleanliness portion of the category refers to the effort each student puts forth to clean up the machines and work area he/she uses. It is **NOT** the laboratory instructor's job to clean up after the students but rather to instruct them in proper and safe use of the equipment and design methods. The respect portion of this category is used to judge the amount of care the students take when using each piece of equipment and when listening to the laboratory staff. **Arrogant or obstinate behavior has no place in the laboratory and will not be tolerated.** Students who fail to listen to laboratory instructor instructions will be removed from the lab.

General Safety:

The following rules apply to everyone working in the IMDL Lab (NSC 407). They are intended to provide guidelines to working safely in the lab as well as familiarize you with some of the common hazards.

1. **Familiarize yourself with the layout of the laboratory.** Note the location and operation of the exits, first aid kit, and eye wash station.
2. **Get checked out by a laboratory instructor the first time you use each machine or process in the lab. Do not operate any machinery with which you are unfamiliar.** Every tool in the lab has safe operating procedures associated with it. Do not work with any tool in the lab until an instructor has introduced you to its safe operation. Please get checked out even on tools that you have used elsewhere previously. The lab staff knows the idiosyncrasies of our tool set. We would like the opportunity to pass this knowledge on to you. Also, our procedures may require more care than you are used to applying. Only by communicating with you can we exchange information about the safe use of our tools.
3. **Wear all necessary protective gear and clothing when in the lab.**
 - Always wear safety glasses, regardless of what you are working on. Eye hazards always exist and you must always protect your eyes from them.
 - Always wear shoes that completely enclose your feet: no sandals, flip-flops, etc.
4. **Remove all personal accessories and loose clothing that might get caught in moving machinery.** This includes rings, watches, jewelry, personal stereos, lab rags, ties, and open jackets. Anything that hangs loosely from your body can get caught in rotating machinery. Loose garments must not be worn in the lab. Tuck in loose fitting shirts and sweat pants ties. Roll up or remove loose sleeves