COURS BAYVIEW YARDS | PROTOTYPING LAB DESIGN | BUILD | LAUNCH

BAYVIEW YARDS PROTOTYPING LAB

# CAPABILITIES CHART

## ELECTRONICS

| OUTCOME | MACHINE & USAGE | EXAMPLE USE CASE | TECH SPECS | KEY ADVANTAGES |
|---|---|---|---|---|
| Customized add-on boards to dev boards containing all the supportive circuitry needed for your prototype. This can be iterated quickly, receiving boards that afternoon. Two layer prototypes. Breakout boards for sensors to test, low volume duplicates of boards. Customized all-on-one circuit board. Basically if you want a connected device - whether it's wearable, robotic, or something else - this is the machine that would be used. Your IoT prototype can be made on this machine. | Bantam Tools Mill (Original) | Working to build a prototype with an existing dev board, and you need additional peripherals such as sensors, LEDs, and supporting circuitry for voltage regulation and the like. Note that this type of board is usually for the step prior to miniaturization. | Our design recommendations for stable results:<br>20 mil trace width / 10 mil spacing<br>Smallest part size: 0603 (0402 possible)<br>Smallest chip size: SOIC, QFP, QFN (TSSOP possible)<br>Layers: 2 - vias are not plated through-hole, design & plan accordingly<br><br>Material: FR1 Copper clad<br>Size: 4" x 5"<br>Copper cladding: 1 oz<br><br>File input: Gerbers, Eagle .brd, .gcode and .svg | Make multiple prototypes in a single day. Reduce costs and lead times waiting for boards. Test everything needed on boards made by the Bantam Tools Mill, then after the functionality check, order boards from a professional board manufacturer. This machine is also perfect for small batch runs in low quantities. Portable machine, can be brought to different sites and used there. |
| Analyze up to 4 channels. Use the probes to monitor voltages like a classic oscilloscope. Use the probes to sniff the data on UART, I2C, and SPI lines to analyze your embedded communication busses. Compare RF to signals on the same screen. Additionally, be delighted at the new UI & UX experience that the large touch screen on the MSO44 brings! The future of electronics is here at the Prototyping Lab. By the way, this oscilloscope runs on Linux. | Tektronix MSO44 Oscilloscope | Inspect voltage levels. Check your board. Test it against certain edge cases. Analyze packets being sent on communication busses (UART, I2C, SPI). See RF spectrum view and run analysis. Display both RF and signals to correlate time view to debug even further. | 4 channels, 200 MHz, 31.25M record length<br>Arbitrary function generator<br>Serial analysis (RS-232/422/485/UART)<br>Embedded analysis (I2C, SPI)<br>Spectrum View Basic<br>----------<br>Near-Field Probe Set<br>General purpose TPP0250 probes (< 4pF input capacitance, 10x and 2x attenuation) | Compare RF and signals as time-correlated data. This helps tremendously when debugging, and inspecting your board for any extra emittance when sending data through a communications module. Record data to a USB stick, save settings, and save screenshots. This machine greatly helps for analysis at the early prototype stage and can give you a leg up on the next stage. |
| Monitor the current load of your device, or supply a stable voltage supply to your device. This is an excellent way to determine the power usage of your device, and thereby the battery life. The resolution of 10 nA allows for measuring small load currents, for ultra-low power devices such as wearables or sensor nodes. | Keithley 2280S Power Supply | Wearable prototype and need to determine the proper battery capacity to choose (important for size and weight constraints). Monitor the current over time, monitor the current in different modes (such as when your IoT device is transmitting or sleeping), and see the power usage. Alternatively, use the power supply functionality to supply voltage to your prototype. This can be helpful in debugging, when perhaps an unreliable power supply is causing brown-outs. | 32V 6A programmable DC linear power supply<br>Clean output power <1 mV noise<br>10 nA current measurement accuracy<br>Capture load changes that occur at intervals as short as 140 us<br>Supports automated control, monitoring, and data logging | Really versatile test equipment! This one is going to be used often. Decent current supply ability at 6A allows for powering small motors, and power-hungry prototypes. The 10 nA resolution for current monitoring is advantageous for power optimization for wearable devices. We can't wait to see how often this is used for client prototypes. |
| Primary use: Reflow circuit boards with solder paste and components already placed. Secondary use: Dynamically dispense solder paste onto board, dispense conductive ink onto FR-4 substrate. | Voltera V-One | Quick turn soldering and assembly - Mill a board on the Bantam Tools Mill, apply solder paste onto the board, place components onto the board, and run the Voltera reflow profile to heat the solder paste - thereby 'soldering' the components to the board. | Tin Lead (Sn63 Pb37) Profile<br>Soak temp: 180 deg C<br>Soak time: 45 s<br>Peak temp: 220 deg C<br>Peak time: 30 s<br><br>Tin Bismuth Silver (Sn42 Bi57.6 Ag0.4) Profile<br>Soak temp: 140 deg C<br>Soak time: 45 s<br>Peak temp: 190 deg C<br>Peak time: 30 s<br><br>Manual reflow capability as well | Uniform reflow instead of hand soldering |
| Anything you want, we got it, anything you need, we got it, anything at all (for your early electronics prototype that is), we got it! Metcal soldering station, hand-tools, digital and stereo microscope, wire, dev boards, hot-air reflow station, and more. | Electronics Bench Tools | Make your prototype work! Cut wires with the snippers, solder a wire to go from A to B, and then inspect your work under a microscope. | N/A | Everything within an arms reach! |
| Detect RF emissions from your board before advancing to the next stage. Precision digital multimeter to fine tune any adjustments. Stereo microscope to inspect your work. | Testing and Analysis | Microscope especially useful for inspection of correct soldering of components to the board. Test for RF emittance as you iterate your board - allowing you to make changes as you go, instead of receiving the test results and needing a large re-design. Analyze your design for changes, and inspect the results of the work to date. | N/A | As you build your board, you can step through the process and there is a machine / test equipment at each stage to help with more information, testing, and analysis.t |