Astromechs & Arduinos

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R2 BUILDERS CELEBRATION VI
AUGUST 23-26, 2012
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Overview

- Arduino Architecture
- Official Models & Variants
- Pros & Cons
- Getting Started
- Blink & Beyond
- Astromech Examples

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Arduino Architecture

- AVR Micro Controller
  - Alf-Egil Bogen & Vegard Wollem
  - RISC
- Integrated Development Environment
  - Based on Processing
  - JAVA Runtime Environment
- Arduino UNO - 328p
- Arduino Mega - 2560

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ATmel AVR MC Architecture

Watchdog Timer

Clocks

Debug & ISP

Memories

Program Flash (32KB or 256KB)

DATA SRAM (2KB or 8KB)

EEPROM (1KB or 4KB)

AVR CPU (131 or 135 instructions)

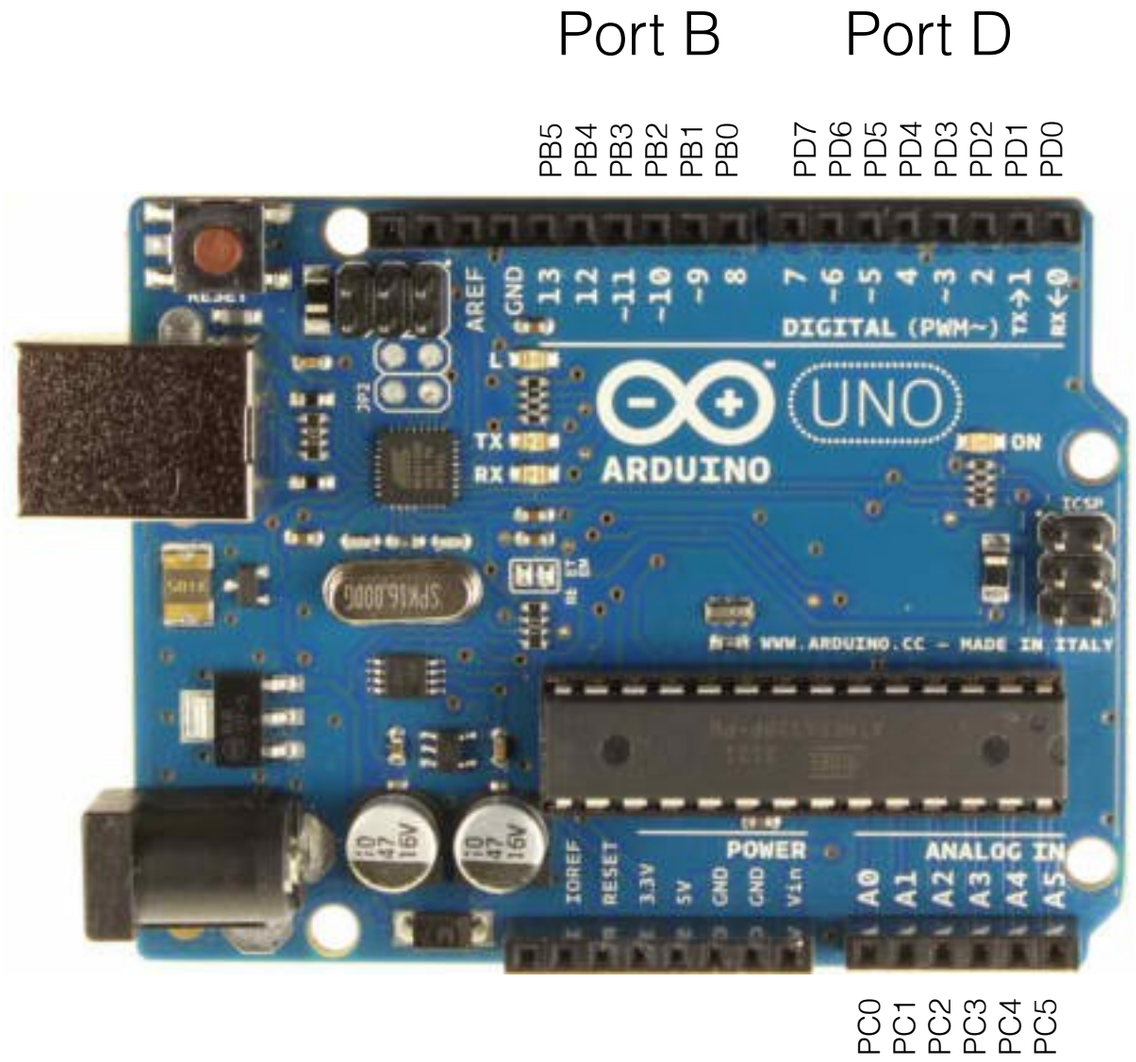
Configuration Fuses

Peripherals

IO Ports
Timer/Counters
USART
TWI (i2C)
SPI
ADC

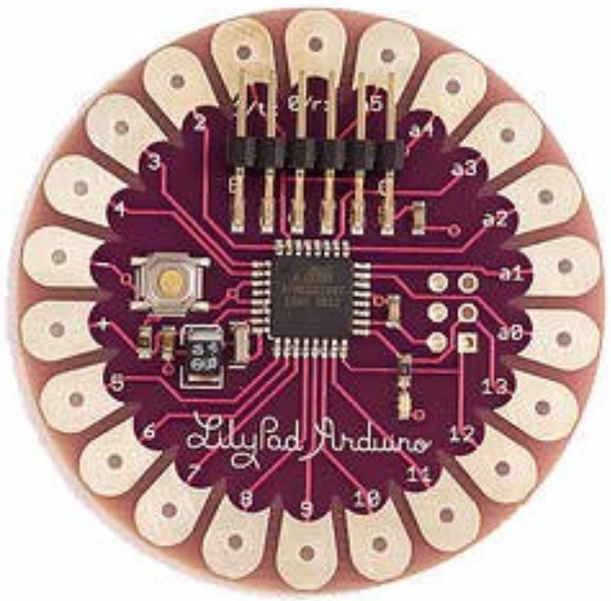
Arduino UNO Architecture

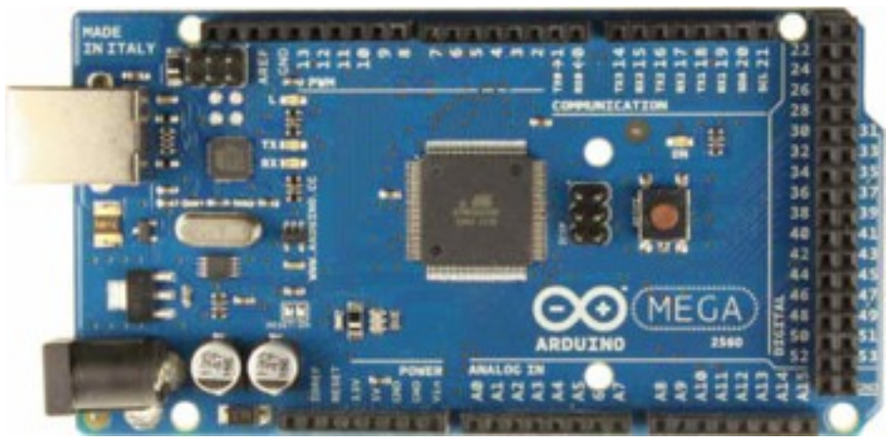
- Standardized Header placement
- USB B
- 2.1mm Power
- Auto Power Switching
- +5V & +3V3 Regulators
- 328p=Low Power
- 3 Port Sets (B,D & C)
- A0-A5 = D14-D19



Official Models & Variants

- UNO & MEGA 2560
- Leonardo - integrated USB controller
- Nano v3
- Sparkfun Pro Micro 5V 16Mhz (3v3 8Mhz)
- LillyPad
- Build Your Own
- Clones





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Pros & Cons of Arduino

- An AVR development board
- Standardize connections for Shields
- Easy to use microcontroller with a nice IDE
- Evolving as we speak
- Millions in use
- Inexpensive $5 (CPU) to $60

- Single Threaded *
- Limited Speed (20Mhz)

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Getting Started

- UNO R3 or Mega 2560 R3 is recommended
- Download IDE from Arduino.cc
  - v1.0.1
  - OSX, Linux
  - Windows requires driver installation
  - Frequently Updated Revisions
- Install IDE
- Create Personal Arduino Directory
  - Additional Libraries
  - Sketch Development

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Blink & Beyond

- Default Loaded Sketch
- IDE Examples as Starting Points
- Frequently Used Libraries
  - LedControl
  - Wire
  - SoftSerial

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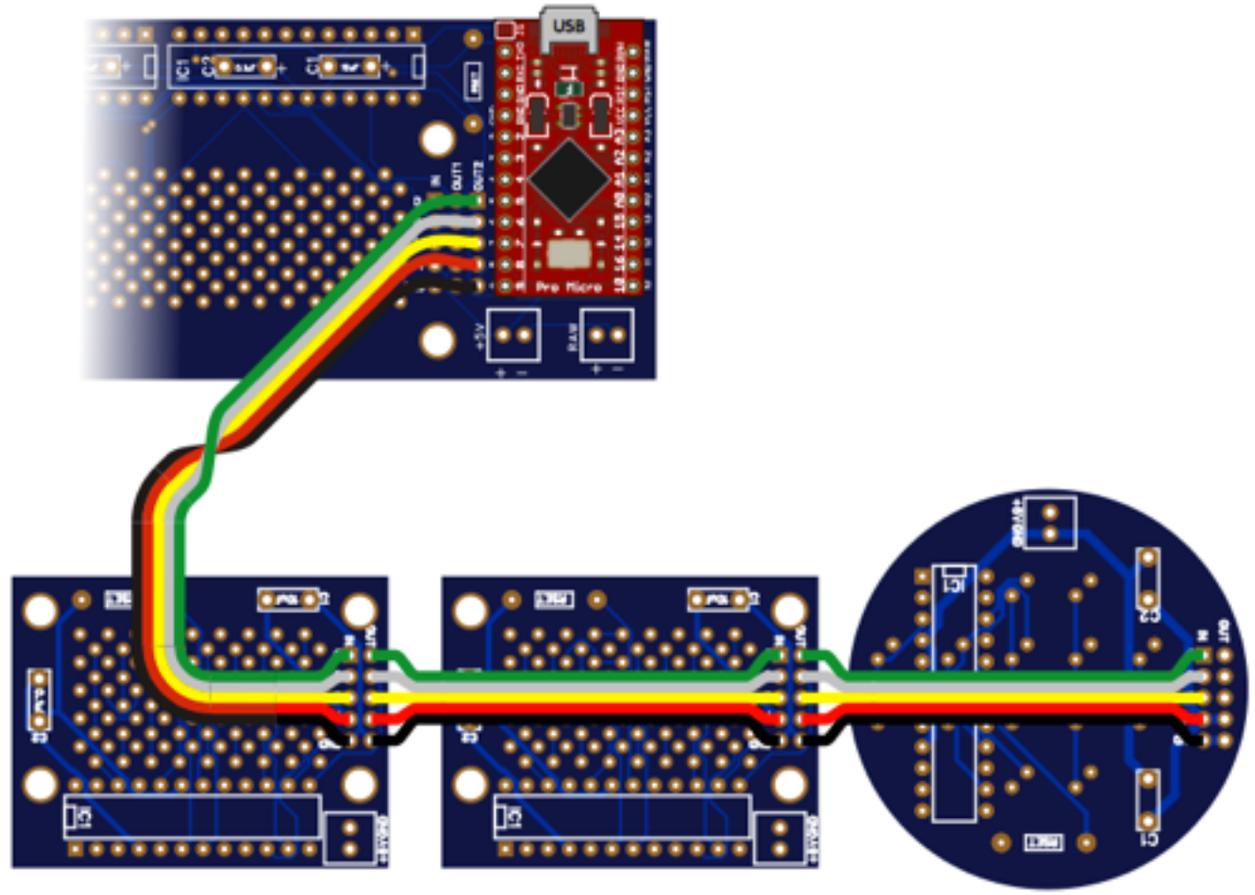
Teeces

- Simple
  - Maxim 7219 Matrix
  - Chainable bus
- Revolutionary
- Expandable
- Onboard ProMini
- Multiple Buses
- Easily reconfigurable & customizable
- http://barrettandcarly.com/blog/elec/



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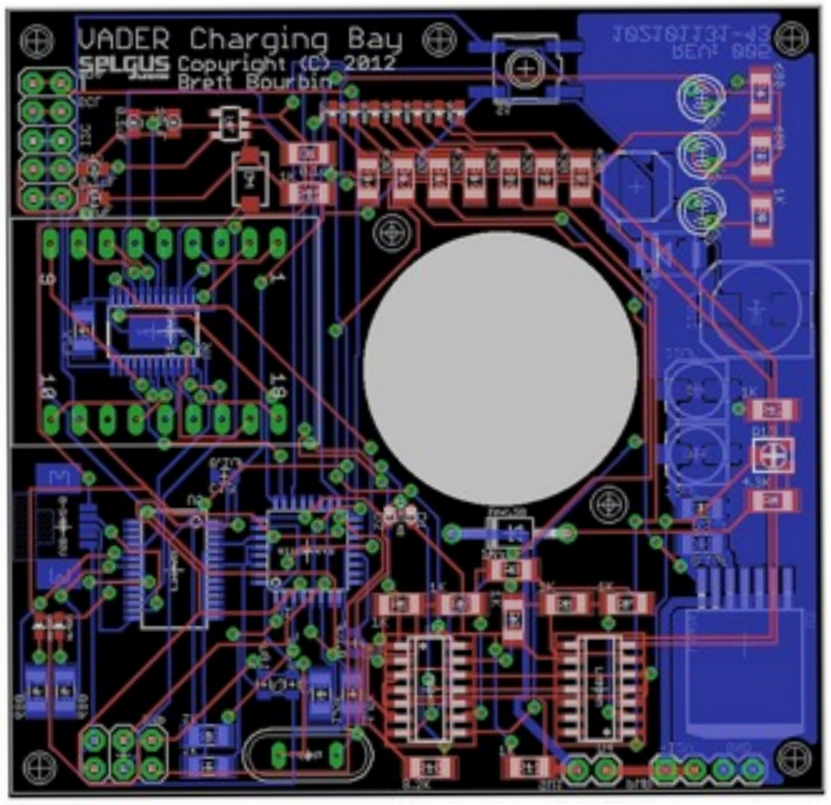
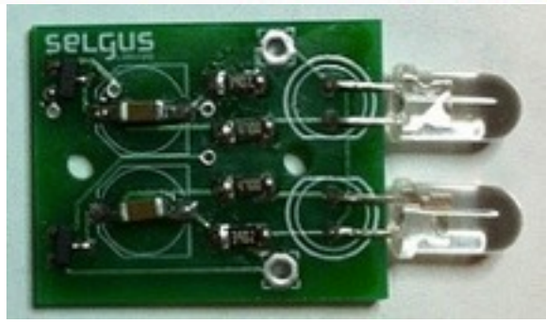
Selgus

- vader Charging Bay
  - Onboard 328p
  - Charging & Monitoring
  - Customizable



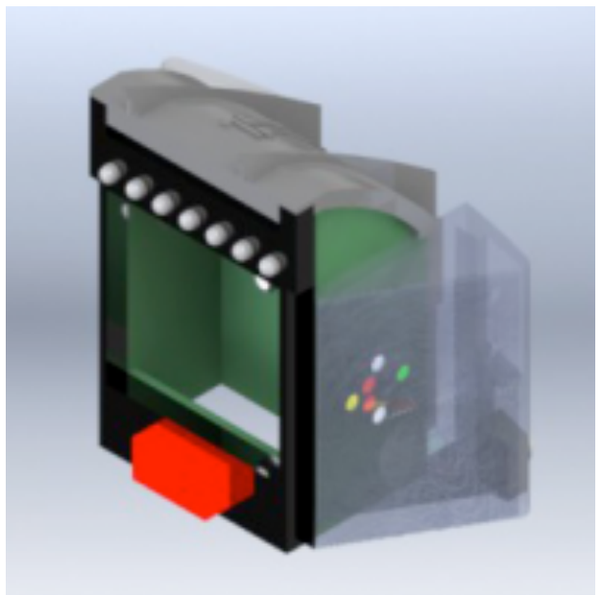


- LFS Logic

- vader Fusion System Control

RotoPod

- Periscope Lighting System
- Onboard 328p
- Switch Selectable Modes
- Power it & go



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Ardu-D2

- http://code.google.com/p/ardu-d2/
- Collection of Open Source Libraries
- Sound Jukebox
  - WAV Shield
  - Rogue Robotics rMP3
- Teeces Logics
  - Random Display
  - Scrolling Text/Symbols
- PPM Decoder
- Syren Serial Motor Controller
- SSC32 Servo Controller
- Various Utilities
  - PING Sensor
  - Line Voltage/Charge Level

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Royal Engineers of Naboo

- Charging Bay Indicators (7219)
- A&A Data Port Logics (7219)
- RSeries Astromech Controller System
- RSeries VCSensor
- FX i2C Shield
- HoloProjector i2C RGB LED GOBO
- Brooks Booster FX System
- All files released CC v3 SA BY

Q & A

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