

ARDUINO FOR HAM RADIO

JIM WILSON AC8NT



ARDUINO HISTORY

Colombian student Hernando Barragán created the Wiring development platform as his Master's thesis project in 2004 at the Interaction Design Institute Ivrea in Ivrea, Italy. Massimo Banzi and Casey Reas (known for his work on Processing) were supervisors for his thesis. The idea was to create inexpensive and simple tools for non-engineers to create digital projects. The Wiring platform consisted of a hardware PCB with an ATmega128 microcontroller, an integrated development environment (IDE) based on Processing and library functions for easy programming of the microcontroller.



*Arduino developer team -
David Cuartielles, Gianluca
Martino, Tom Igoe, David
Mellis, and Massimo Banzi.
Photo Courtesy - Randi
Klett/IEEE Spectrum*

ARDUINO ASSETS

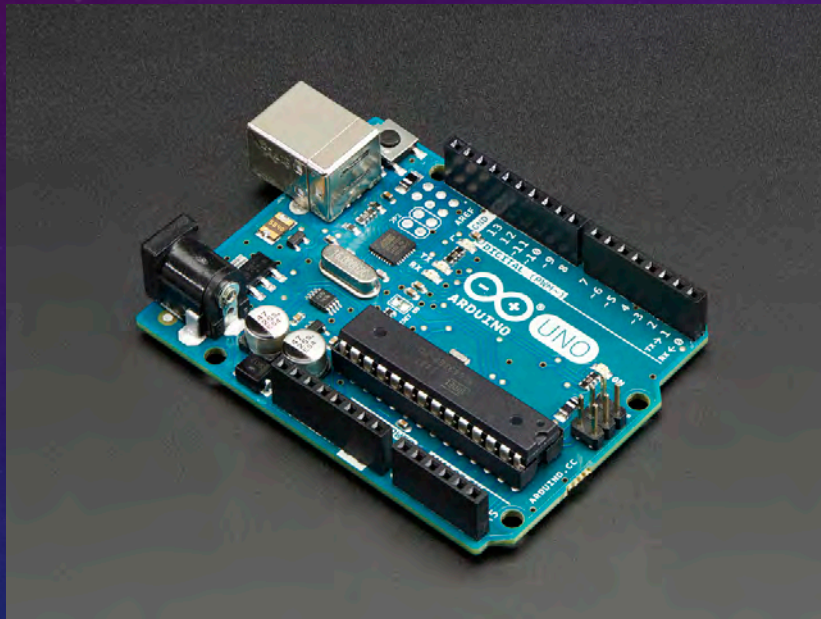
Completely Open Sources- Anyone can build and sell any of its varieties and anyone can make constructive changes and improvements.

Free development software

Mountains of examples and documentation

Inexpensive and powerful

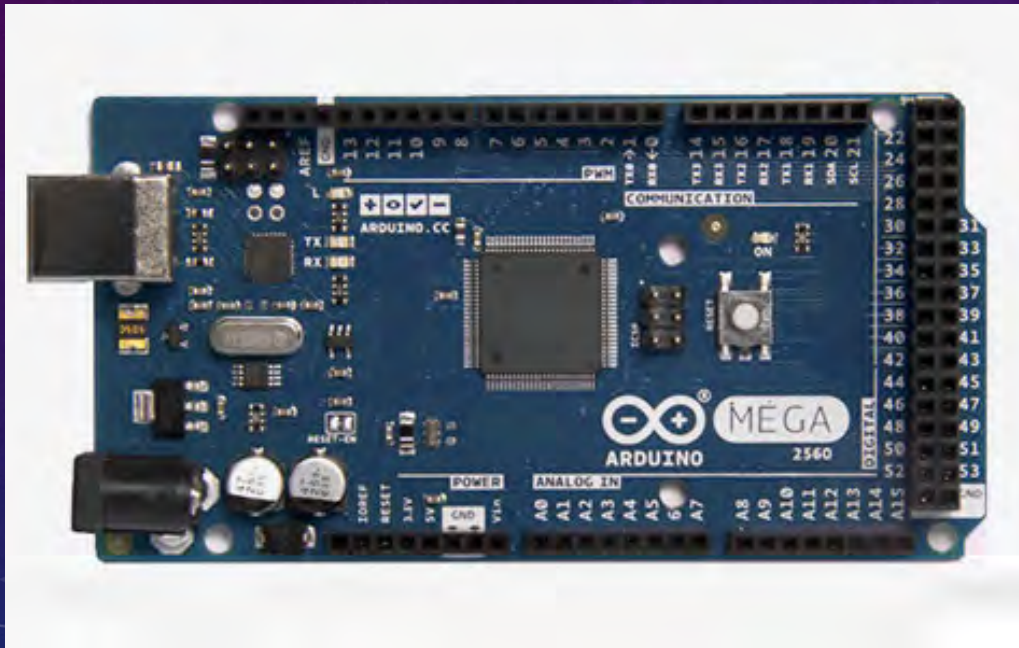
ARDUINO UNO



14 I/O
6 PWM
6 Analog
1 Serial
16 MHz Processor
USB Interface
5 V I/O

\$25

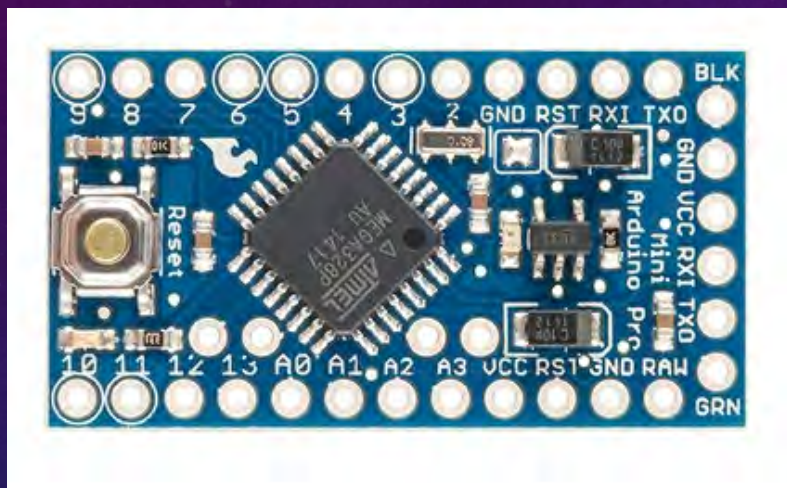
ARDUINO MEGA



54 I/O
14 PWM
16 Analog
4 Serial
16 MHz
USB Interface
5 V I/O

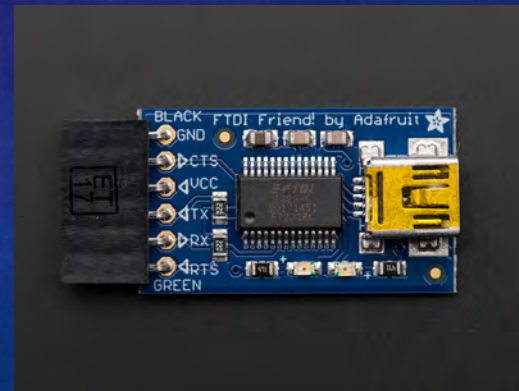
\$46

ARDUINO PRO MINI



\$10

14 I/O
6 PWM
6 Analog
16 MHz Processor 5V
8 MHz Processor 3.3V
Requires FTDI Connection



\$15

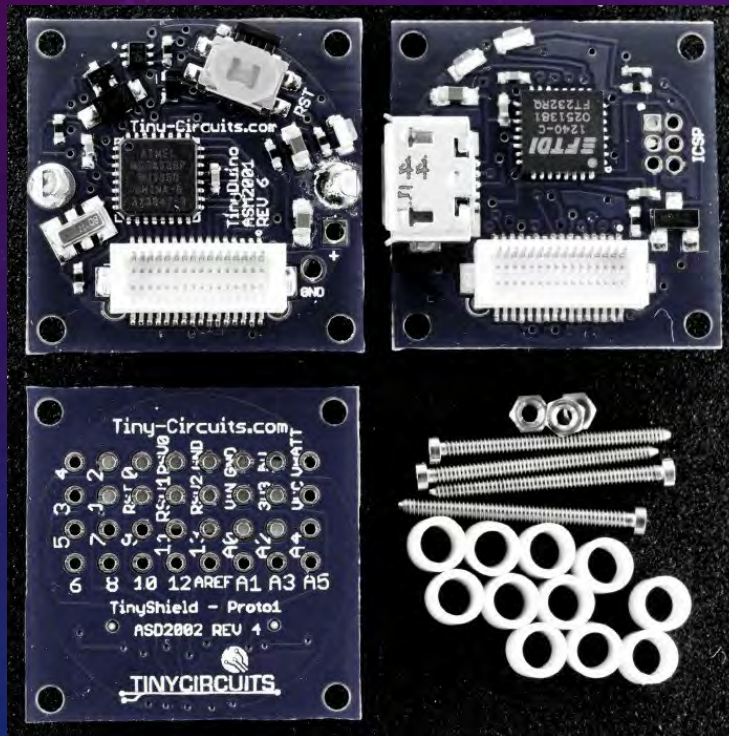
ARDUINO NANO



14 I/O
6 PWM
8 Analog
16 MHz Processor
5V I/O

\$3

TINY CIRCUITS

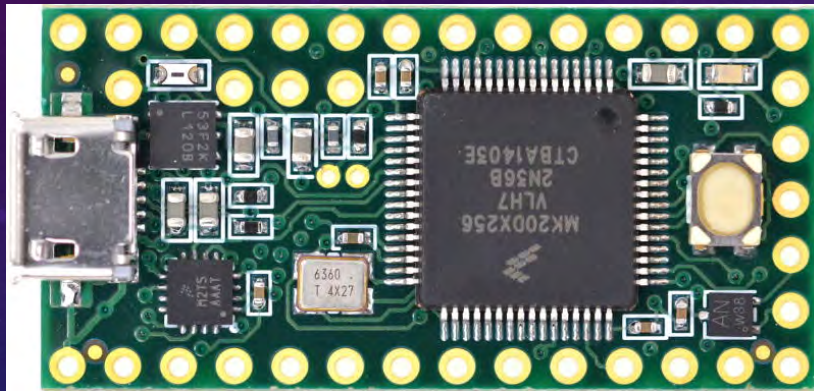


Same I/O as Arduino Uno
8 MHz Processor
Very small (size of Quarter)

\$40

www.tiny-circuits.com

TEENSY 3.2



\$20

34 I/O

12 PWM

21 Analog

3 Serial

2 I2C

1 SPI

72 MHz FreeScale

USB Interface

3.3 V I/O 5V Tolerant

<https://www.pjrc.com/store/teensy32.html>

PARTICLE PHOTON



\$20

18 I/O Mixed

PWM

Analog

2 Serial

1 I2C

120 MHz ARM Cortex M3

Built-in WIFI

USB Interface

5 V I/O

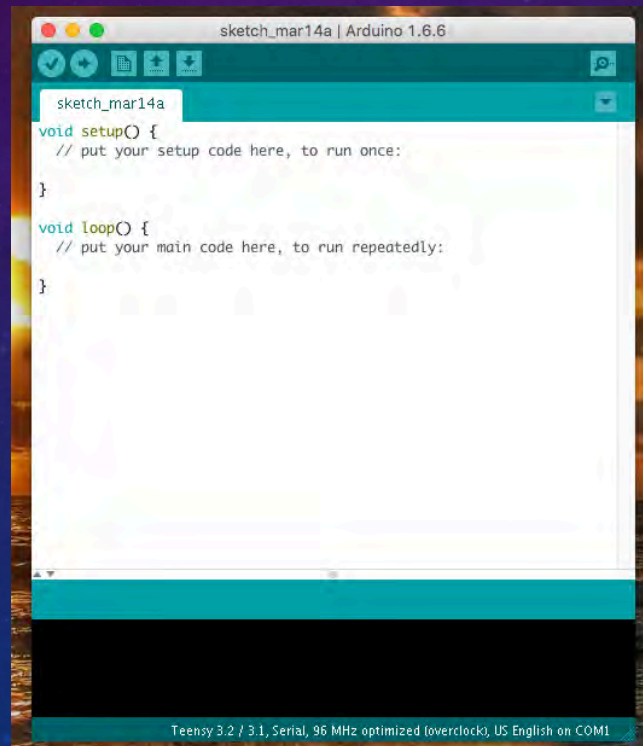
Can be programmed via WIFI

<https://store.particle.io>

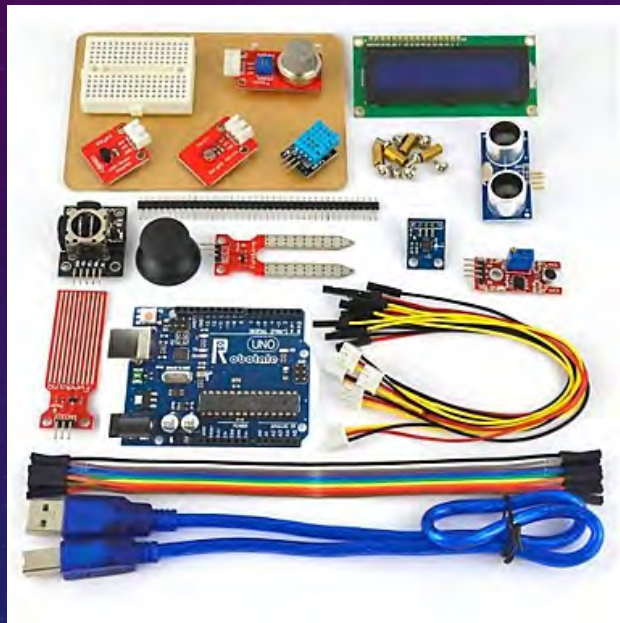
GETTING STARTED

1. Download Arduino IDE (Integrated Development Environment) [<https://www.arduino.cc/en/Main/Software>]
2. Purchase an Arduino Starter Kit – Discussed later
3. Follow startup tutorial [<http://www.ladyada.net/learn/arduino/index.html>]
4. Review Arduino Instructables [instructables.com]
5. Study tutorials and books on “Sketches”
6. Plan your first project

DOWNLOAD IDE



ARDUINO STARTER KIT



\$42

www.miniinthebox.com



\$50

FIRST TUTORIAL



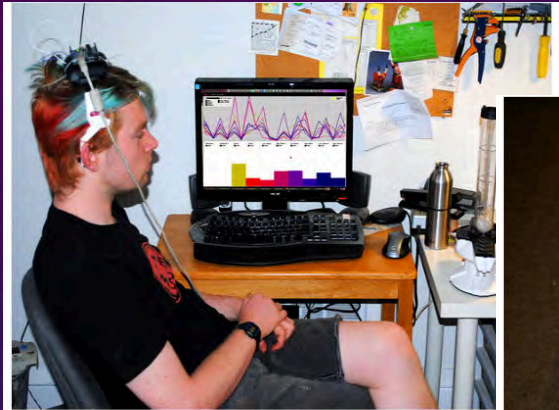
Arduino Tutorial

Learn Electronics using Arduino!

Ladyada.net

<http://www.ladyada.net/learn/arduino/index.html>

INSTRUCTABLES



How to hack EEG toys with arduino

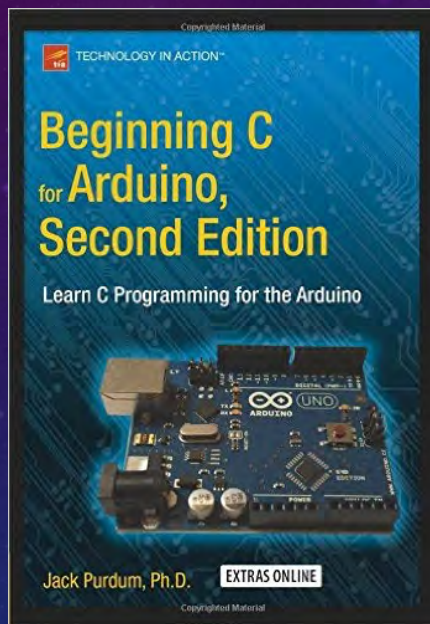


Interface a rotary phone dial to an Arduino



Build Your Own BARBOT

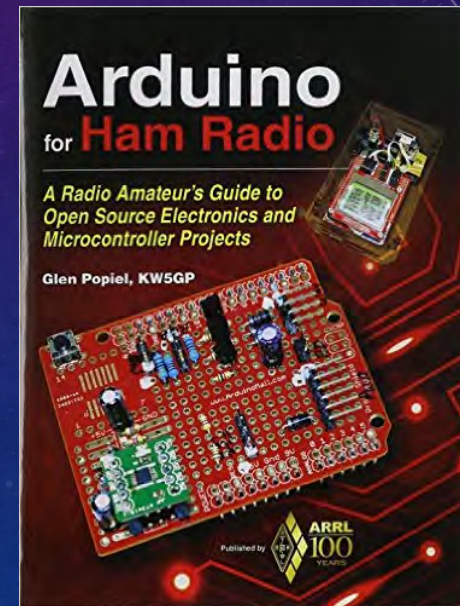
BOOKS FOR LEARNING



\$33

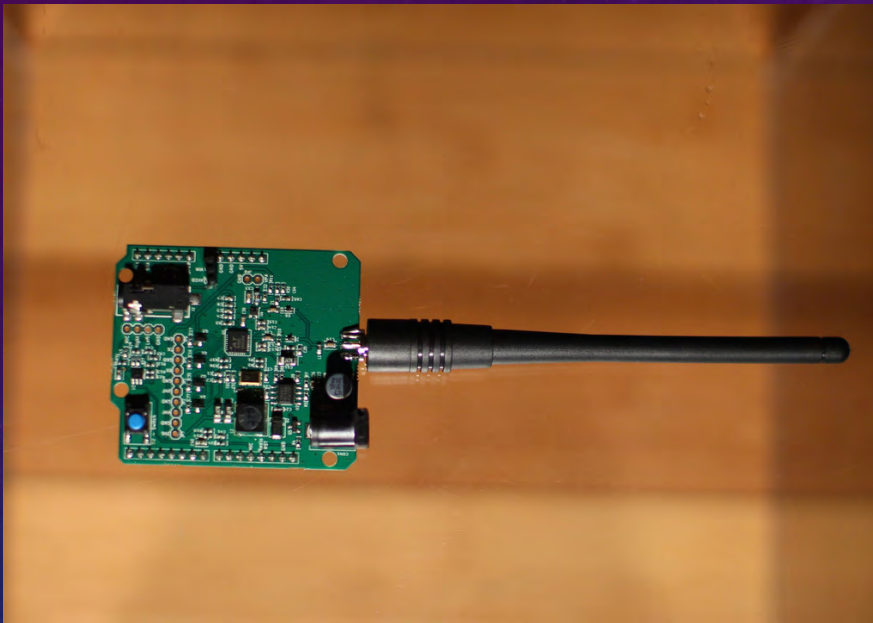


\$30



\$27

ARDUINO RADIO SHIELD



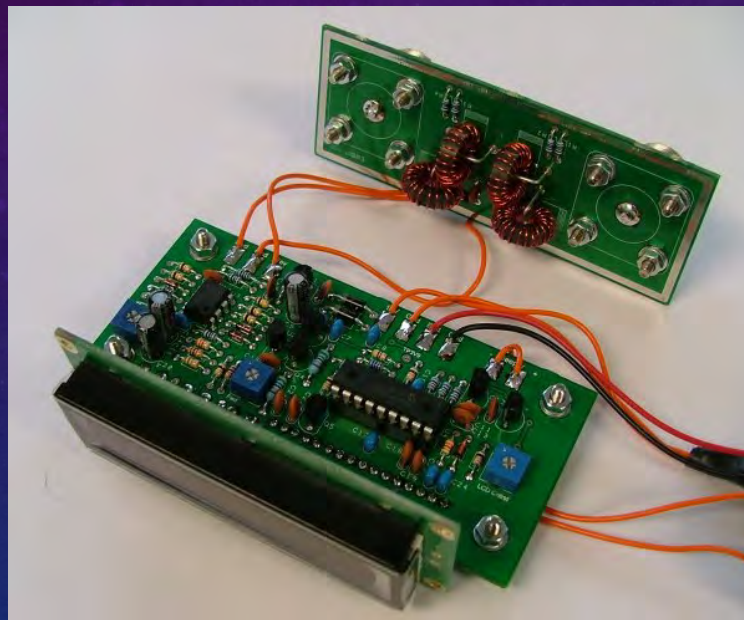
Frequency RX/TX: 134-174MHz, 200-260MHz, 400-520MHz
Channel Bandwidth: Selectable between 12.5KHz and 25KHz
Subaudio Modes: CTCSS, CDCSS (transmit/receive independent)
Advanced Features: Volume, Squelch, VOX, DTMF encode, DTMF decode, tail noise elimination, tone generator, tone detector, RSSI
Input Voltage Range: 5-20VDC

\$100



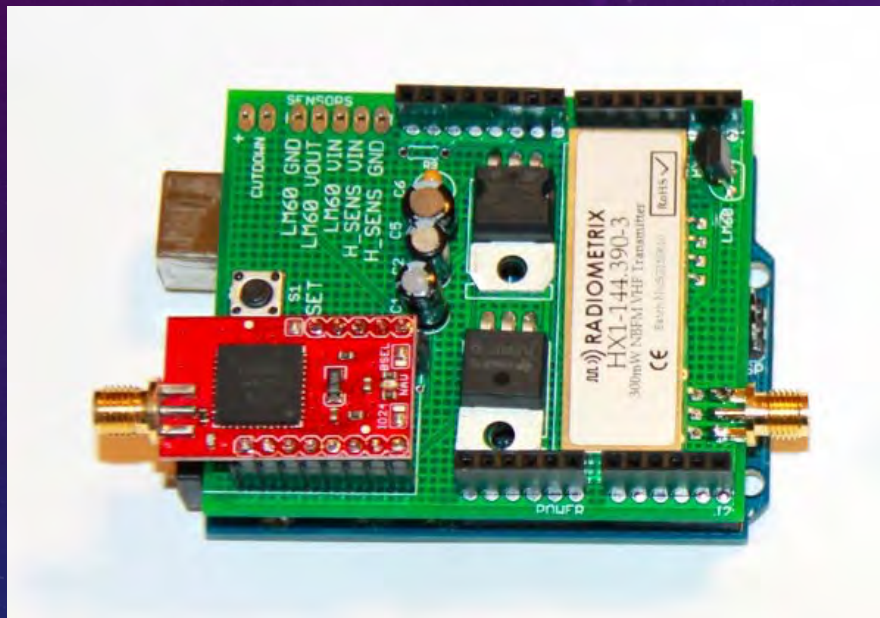
<https://enhanced-radio-devices.myshopify.com>

MODIFIED SWR METER

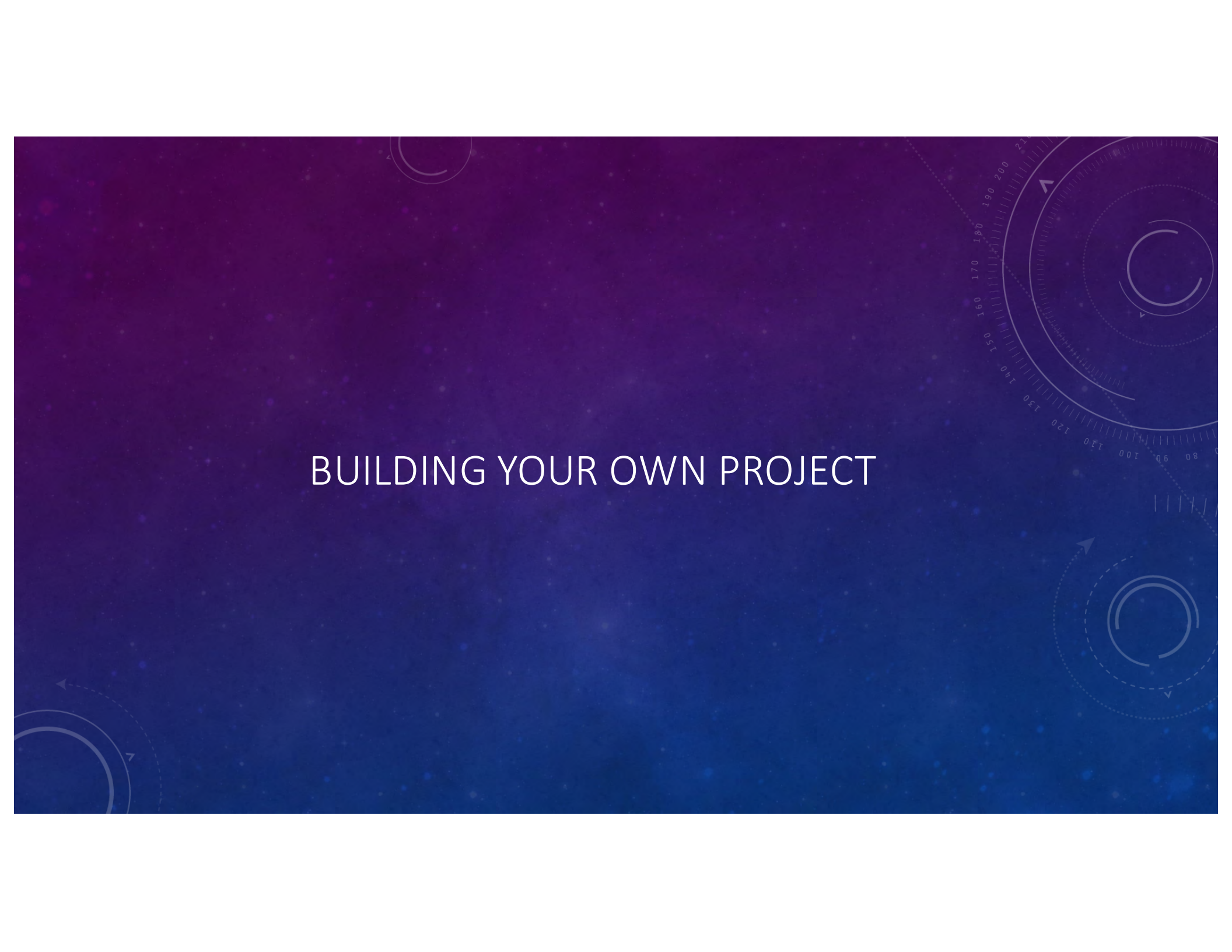


Radio-kits.com \$55

TRACKUINO



<https://github.com/trackuino/trackuino>



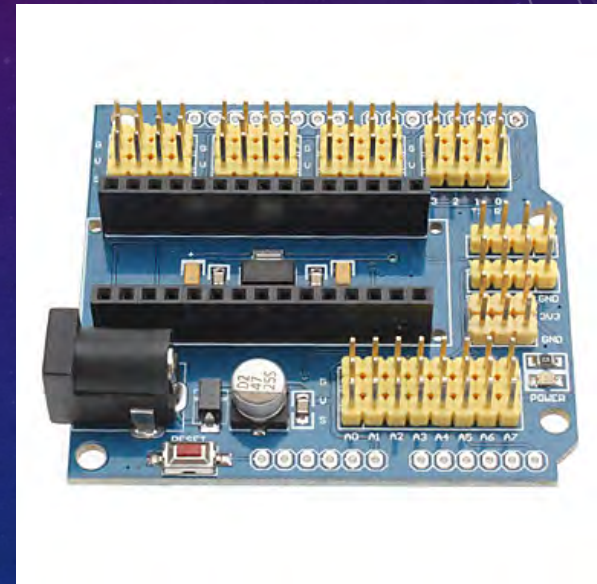
BUILDING YOUR OWN PROJECT

PROTOTYPING SHIELDS



\$10

https://www.adafruit.com/products/2077?gclid=CL6w-_vwMScFYclgQodLtoICA



\$4

www.miniinthebox.com

ALTOIDS PROJECTS

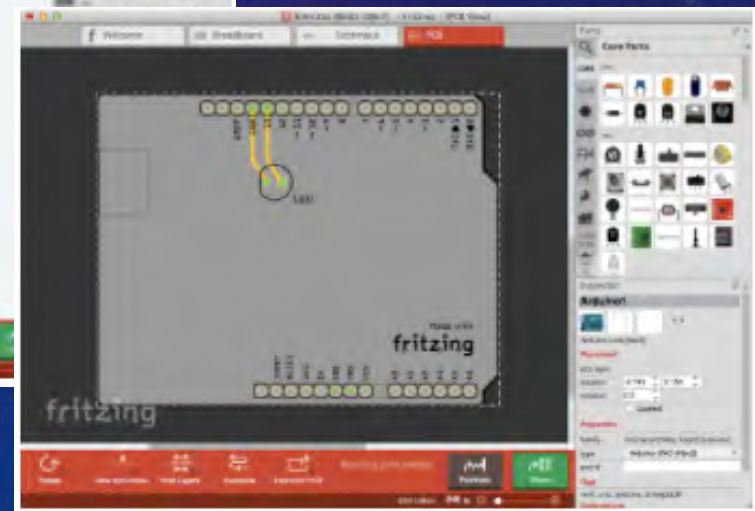
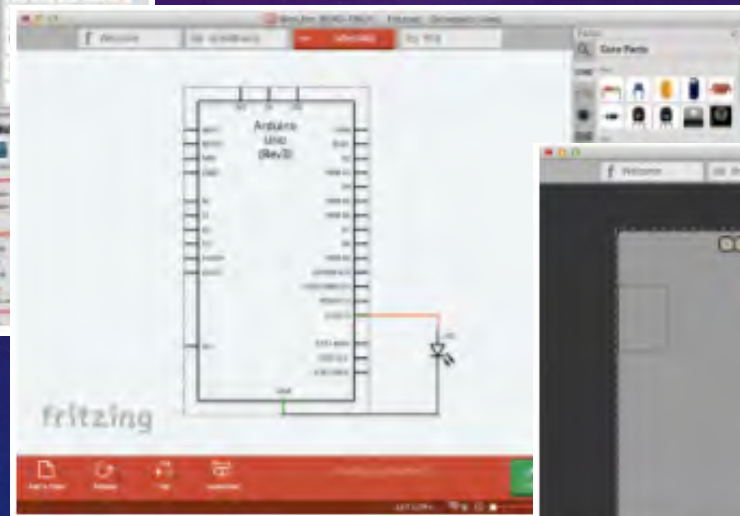


He's taken an Arduino Nano, a cheap AD9850 DDS board, a small screen, and a couple of log detectors, and he has built IN AN ALTOIDS TIN a scalar network analyzer that lets you see the bandpass of a filter. DuWayne (KV4QB)

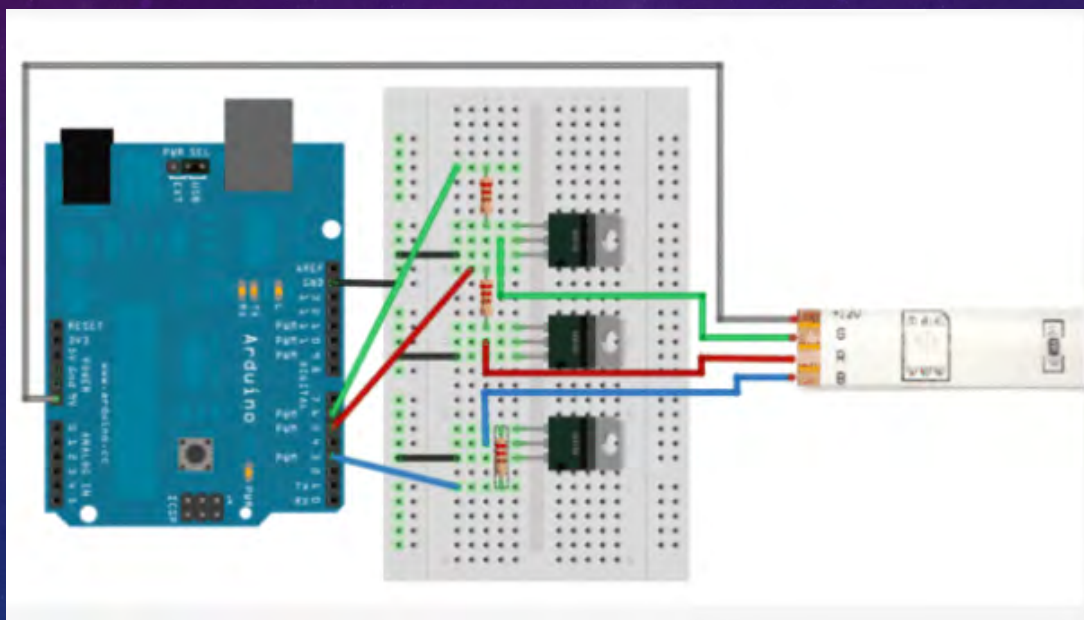
FRITZING



www.fritzing.org



FRITZING LAYOUT



QUESTIONS?

