

# Kit Building v2.0

**Joe Cupano, NE2Z**

# Kit Building

- ❓ The biggest challenge in kit building is how do I get started without getting in over my head both financially and taking on too complex of a kit.
- ❓ This presentation is focused on the beginner covering basic tools required and good useful first projects to help get a taste of success quickly.

# The Essentials

# Cut to the Chase



# Ladyada's Electronics Toolkit

PRODUCT ID: 136

**\$100.00**

74 IN STOCK

1

ADD TO CART

QTY	DISCOUNT
1-9	\$100.00
10-99	\$90.00
100+	\$80.00

ADD TO WISHLIST

### DESCRIPTION

## TECHNICAL DETAILS

## LEARN

# Solder Station



- ❑ **Soldering Iron with Adjustable temperature control**
  - ❑ So you can go from standard to lead-free to silver solder.
  - ❑ 1/16" tip which is good for through hole and some larger surface mount assembly
  - ❑ Hakko FX888D (\$99)

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  - ❓ Hakko FX888D (\$99)
  - ❓ Weller WE1010NA (\$100)
  - ❓ Replaces WES51

# Soldering



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- ❓ **Solder sucker and wick/braid -** (\$9) Desoldering vacuum tool and wick



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- ❓ **Solder sucker and wick/braid - (\$9)** Desoldering vacuum tool and wick
- ❓ **Solid-core wire 22 AWG – (\$15)**

# Tools

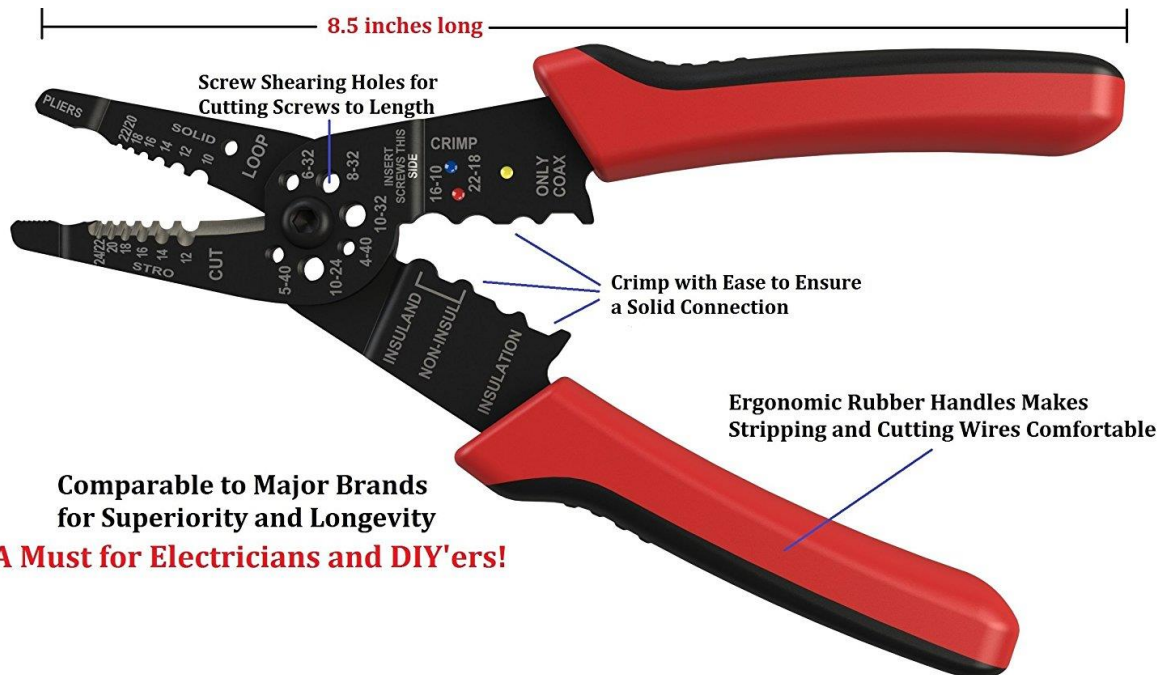
 **Flush Diagonal Cutters – (\$8)**



# Tools

? Flush Diagonal Cutters – (\$8)

? **Wire Strippers - (\$10)**



# Tools



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? **Micro NeedleNose Pliers – (\$9)**

# Tools



- ❑ Flush Diagonal Cutters – (\$8)
- ❑ Wire Strippers - (\$10)
- ❑ Micro NeedleNose Pliers – (\$9)
- ❑ **Brass Wire Sponge – (\$3)**

# Tools



- ? Flush Diagonal Cutters – (\$8)
- ? Wire Strippers - (\$10)
- ? Micro NeedleNose Pliers – (\$9)
- ? Brass Wire Sponge - (\$3)
- ? **Repair Tools – (\$9)**

# Workspace

 **Head Magnifier - (\$9)**



# Workspace



? Head Magnifier - (\$9)

? **Panavise** – (\$17-27)



# Workspace



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? **Panavise** – (\$17-27)

# Workspace

? Head Magnifier - (\$9)

? Panavise – (\$17-27)

? **ESD Mat** – (\$40)



# Test Equipment



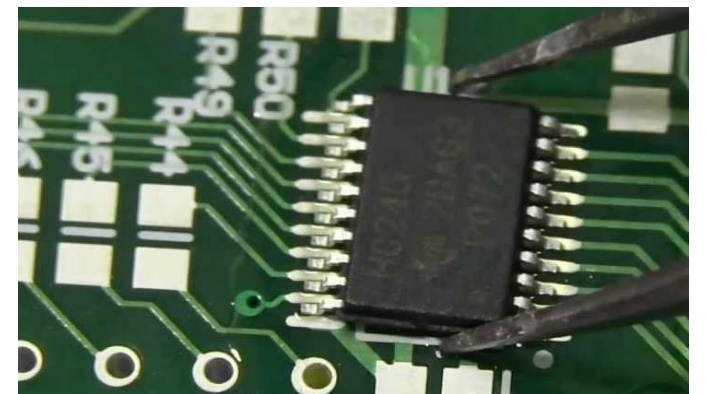
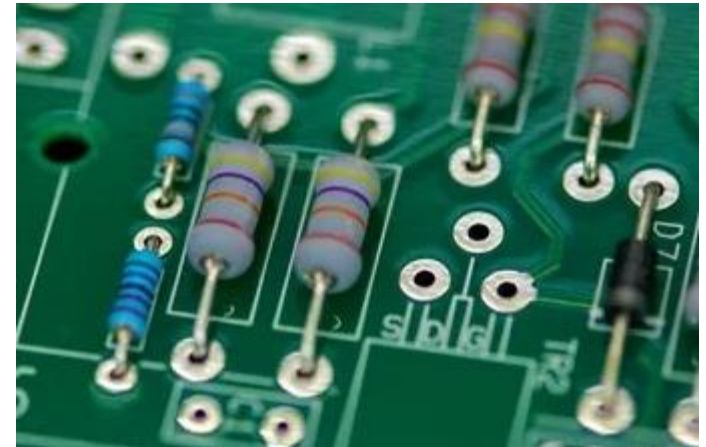
## ? Digital Multimeter

- ? AC/DC High Voltage/Current Rating (10A)
- ? Resistance, Continuity, Diode, Capacitance
- ? Auto and Manual Ranging
- ? Auto fuse (resettable) protection and Auto Power Off
- ? Crenova MS8233D (\$20)

# Building your First Kit

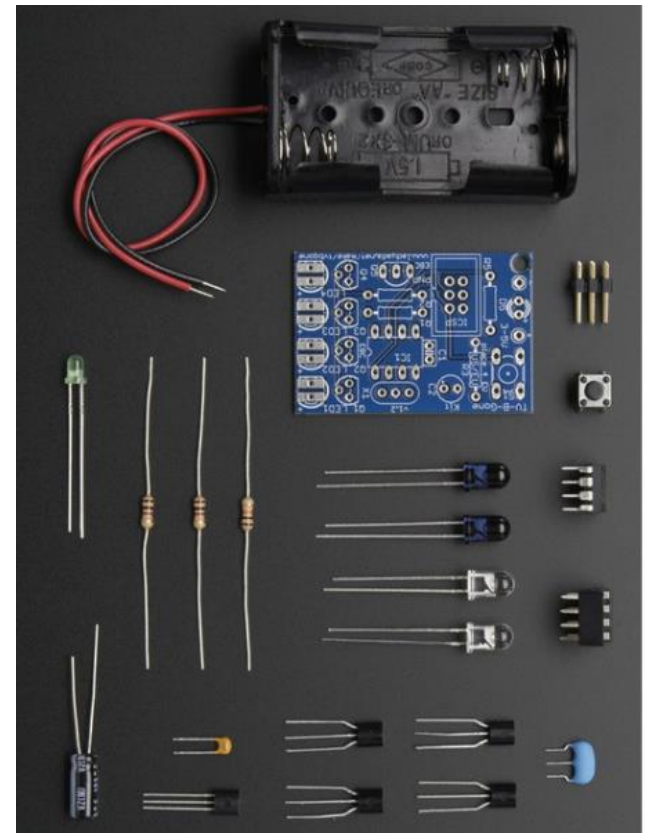
# Choosing a Kit

- ❓ Something simple since the goals developing skills and the “quick-win” experience
- ❓ If cheap enough order two
- ❓ Advertised that it can be completed in an evening
- ❓ Avoid kits with SMT unless comes soldered to board already



# Preparation, Preparation

- ❓ Ensure enough clear space to work
- ❓ Set board in vise for optimal soldering
- ❓ If no brass wire sponge, keep a moist sponge for keeping iron clean
- ❓ Solder Vacuum and Wick at the ready
- ❓ RTFM then RTFM again

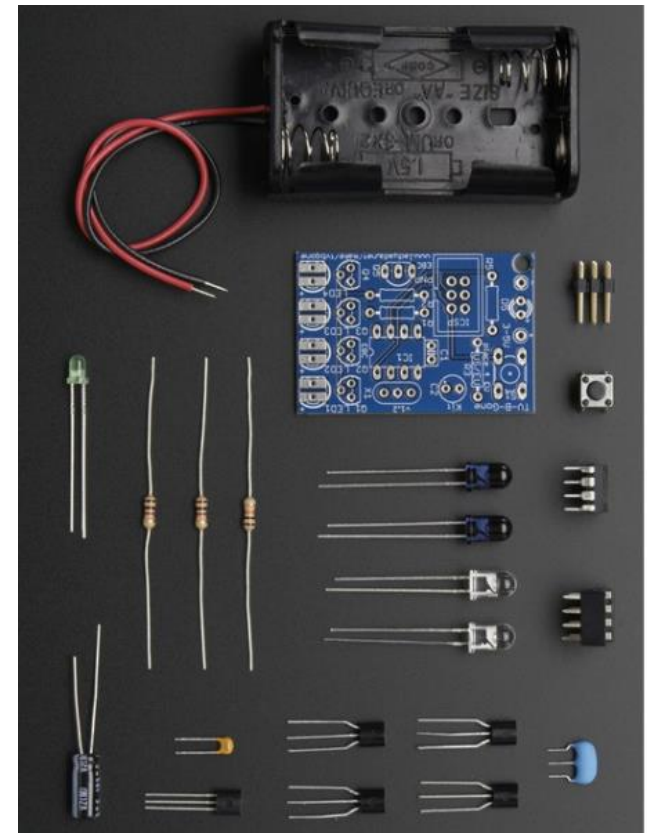


# Getting to work

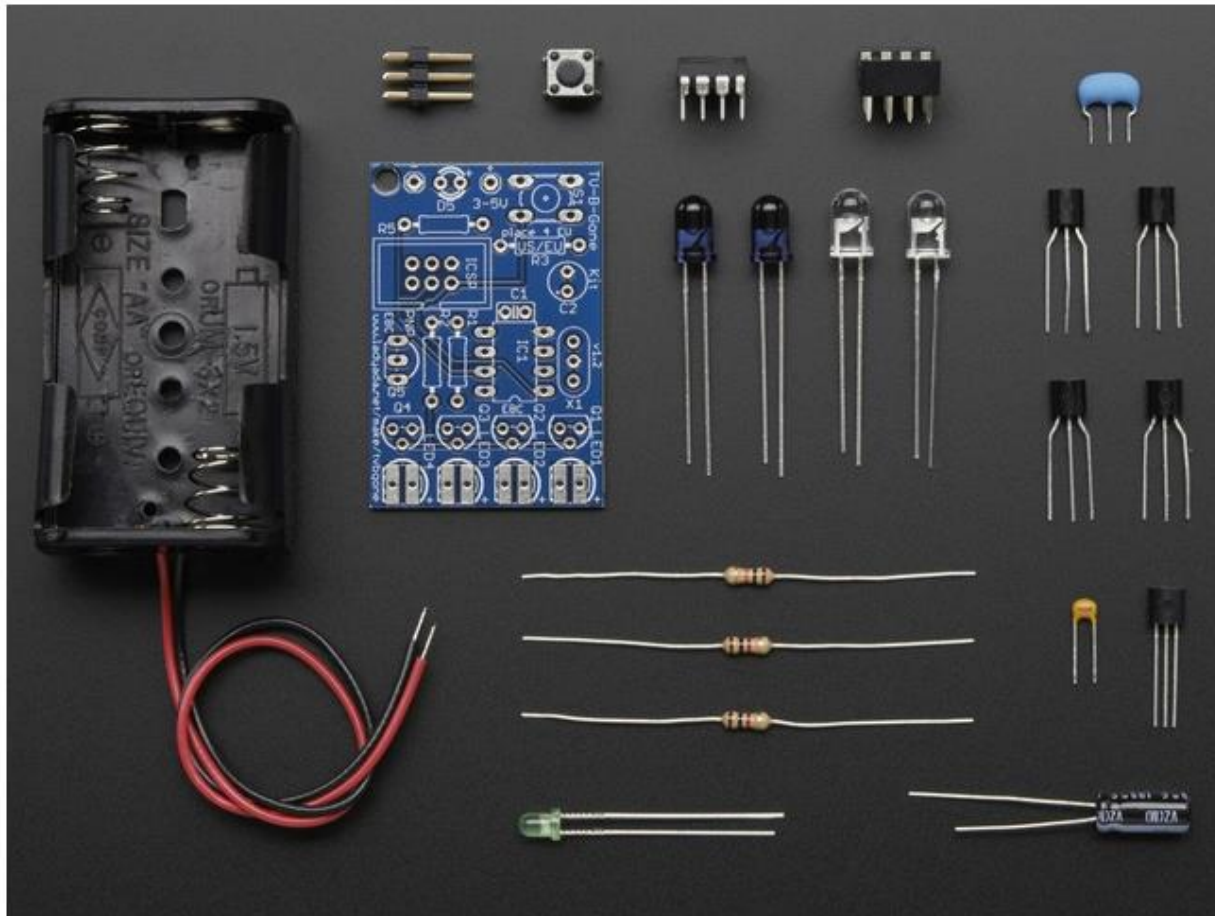
- When no instructions, start with small parts then work to large parts

Resistors	Electrolytic Caps
Inductors	Transistors
Ceramic Capacitors	Bridge Rectifiers
Diodes	Jacks
Crystals	Variable Cap/Res
IC Sockets	Jumpers

- Snip excess leads after you have soldered a grouping of parts and double checked their placement







## TV-B-Gone Kit - Universal v1.2

PRODUCT ID: 73

**\$19.50**

IN STOCK

1

ADD TO CART

QTY DISCOUNT

1-9 \$19.50

10-99 \$17.55

100+ \$15.60

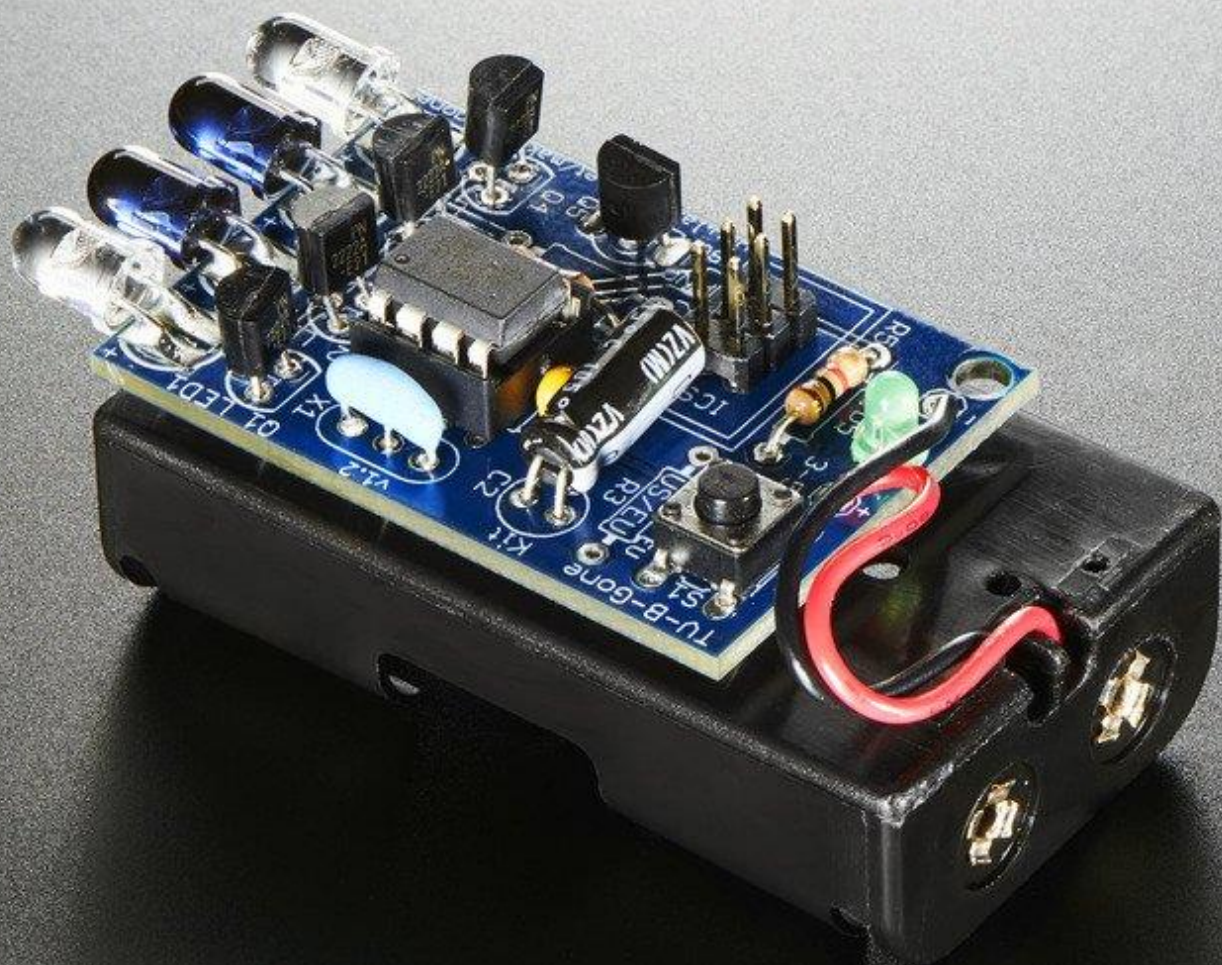
ADD TO WISHLIST

DESCRIPTION

TECHNICAL DETAILS

LEARN

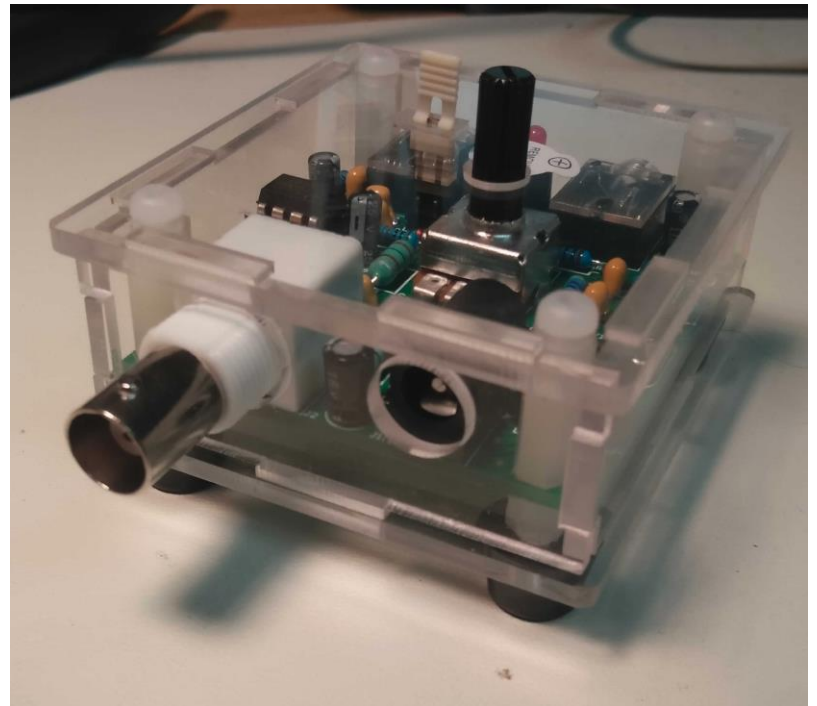




# Simple RF Kit

# S-Pixie 40M CW Transceiver

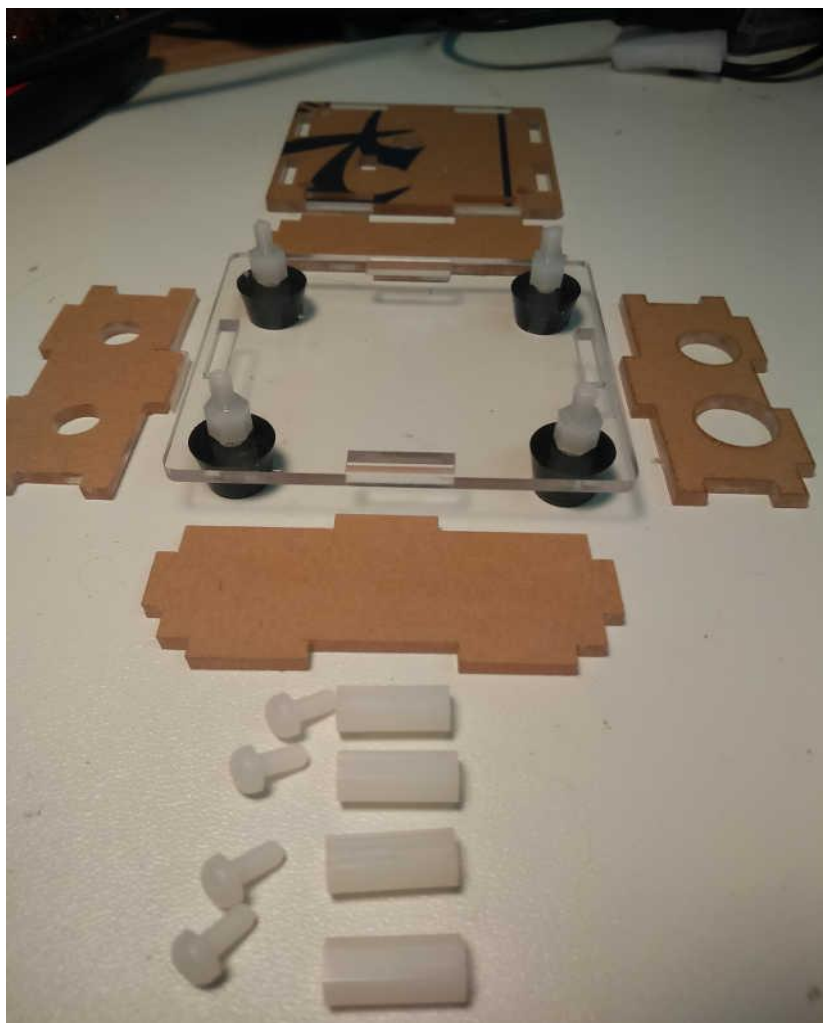
- 7.023, 7.03, or 7.05 MHz
- 1.2 Watts
- ~ \$5 USD



<https://cupano.com>



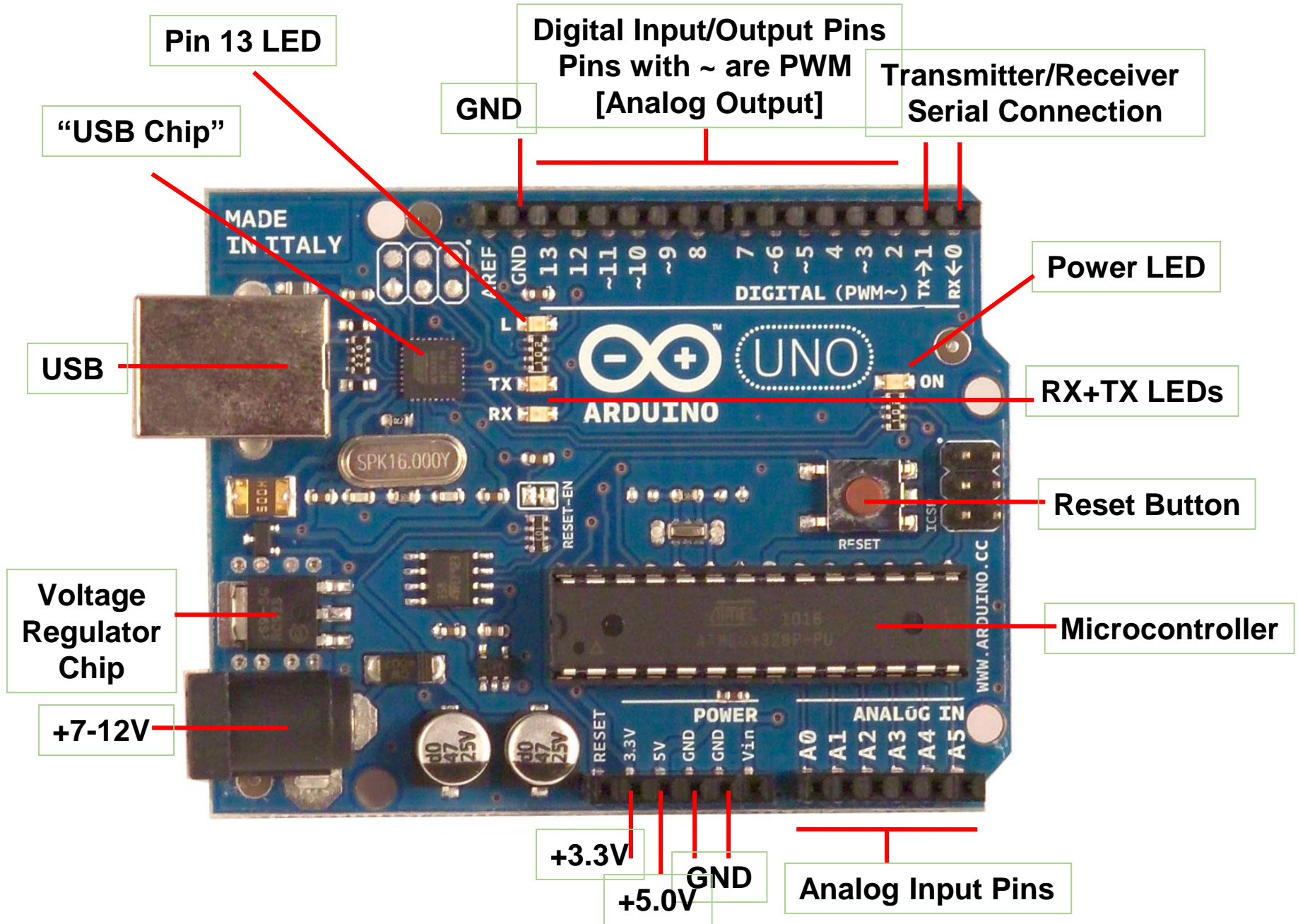




Arduino

# What and why Arduino

- ❑ An open-source electronics prototyping platform based on flexible, easy-to-use hardware and software
- ❑ It has digital and analog inputs and outputs for use with variety of sensors and can affect its surroundings by controlling lights, motors, and other actuators
- ❑ It is programmed using the Arduino Programming Language and the free Arduino Development Environment
- ❑ Projects built with an Arduino can be stand-alone or they can communicate with other devices





## Blink | Arduino 1.0

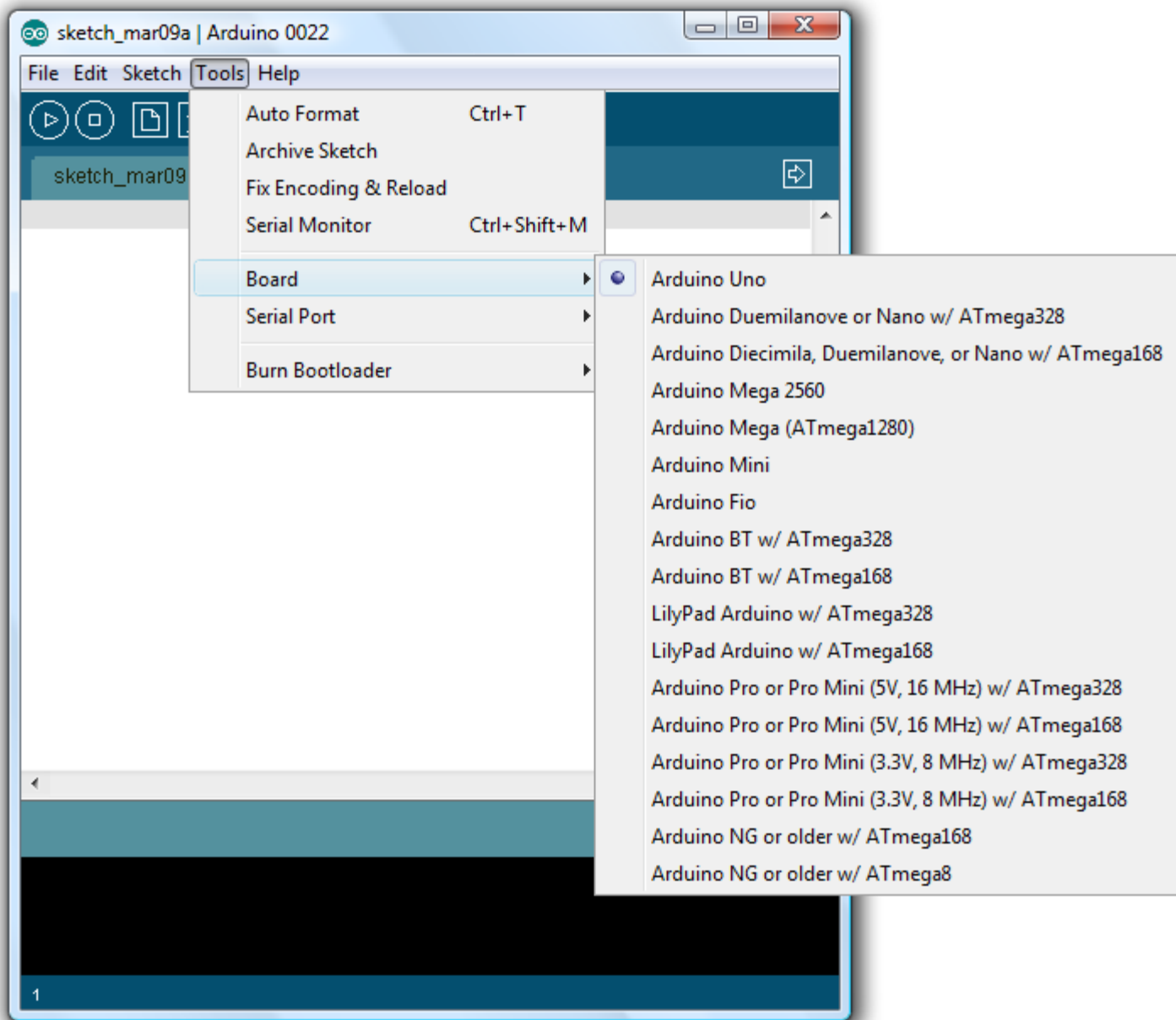


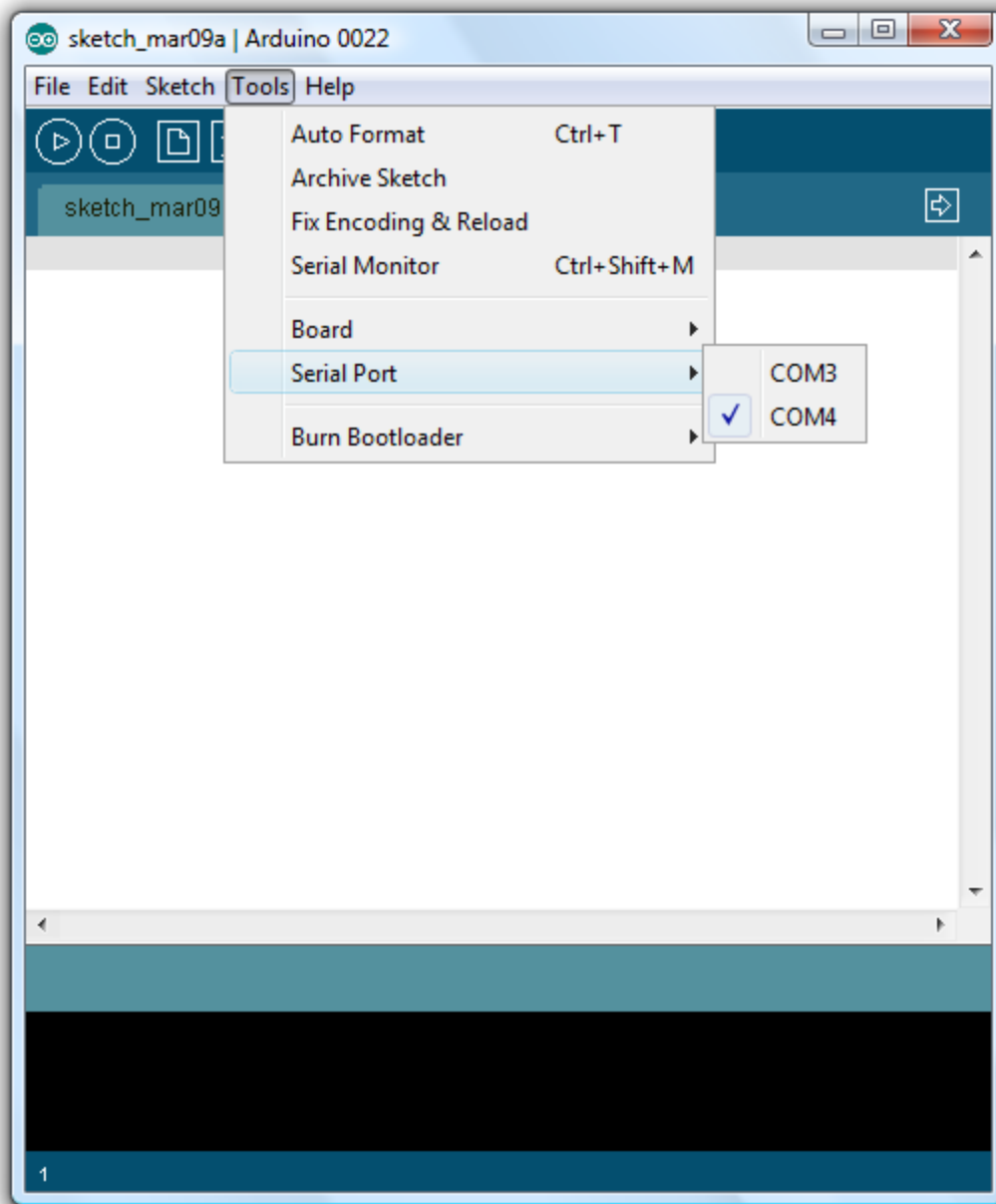
### Blink



```
/*  
  Blink  
  Turns on an LED on for one second, then off for one second, repeatedly.  
  
  This example code is in the public domain.  
  */  
  
void setup() {  
  // initialize the digital pin as an output.  
  // Pin 13 has an LED connected on most Arduino boards:  
  pinMode(13, OUTPUT);  
}  
  
void loop() {  
  digitalWrite(13, HIGH); // set the LED on  
  delay(1000);            // wait for a second  
  digitalWrite(13, LOW);  // set the LED off  
  delay(1000);            // wait for a second  
}
```







RELAY

LAMP

METER

INPUT TRANSFORMER

CONTROL

OUTPUT TRANSFORMER

SPEAKER

Science Fair®  
**150 in ONE**  
ELECTRONIC PROJECT KIT

RESISTORS

25	100 OHM	26	37	38
27	470 OHM	28	39	40
29	1 K	30	41	42
31	2.2K	32	43	44
33	4.7K	34	45	46
35	10K	36	47	48

CAPACITORS

49	100pF	50	61	62
51	100pF	52	63	64
53	0.001 μF	54	65	66
55	0.01 μF	56	67	68
57	0.05 μF	58	69	70
59	0.05 μF	60	71	72

CdS CELL

SOLAR CELL

DIODES

TRANSISTORS

2SA	84
2SB	87
2SC	90

INTEGRATED CIRCUIT

LED DIGITAL DISPLAY

SWITCH

RADIO CIRCUITS

BATTERIES

EXTERNAL CONTACTS

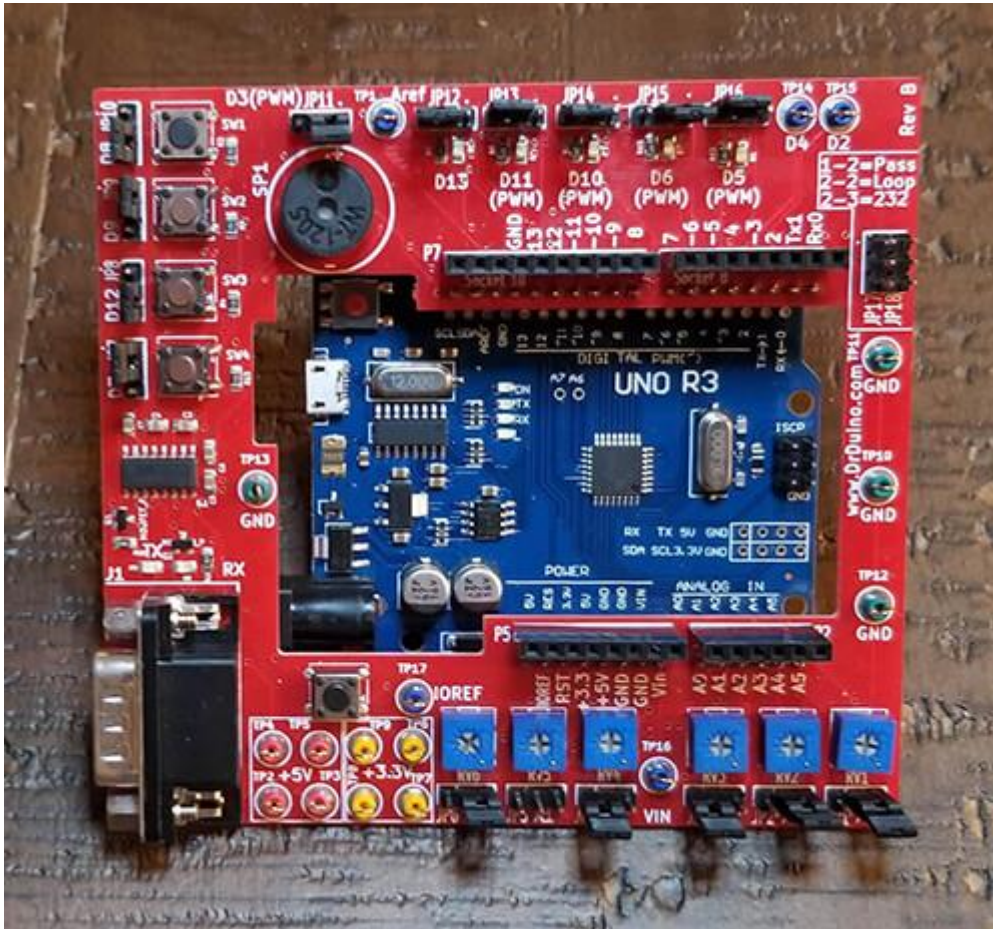
EXTERNAL CONTACTS

124	125
126	127



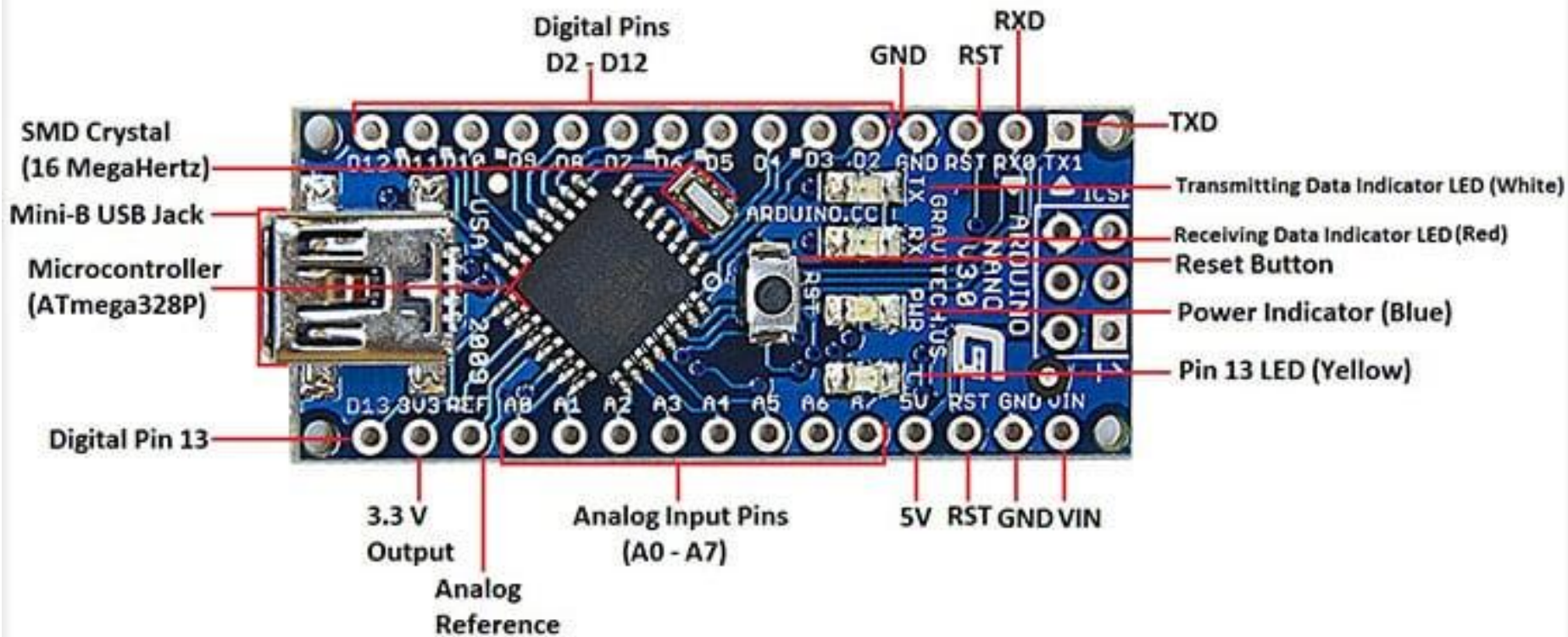


# DrDuino Starter Kit

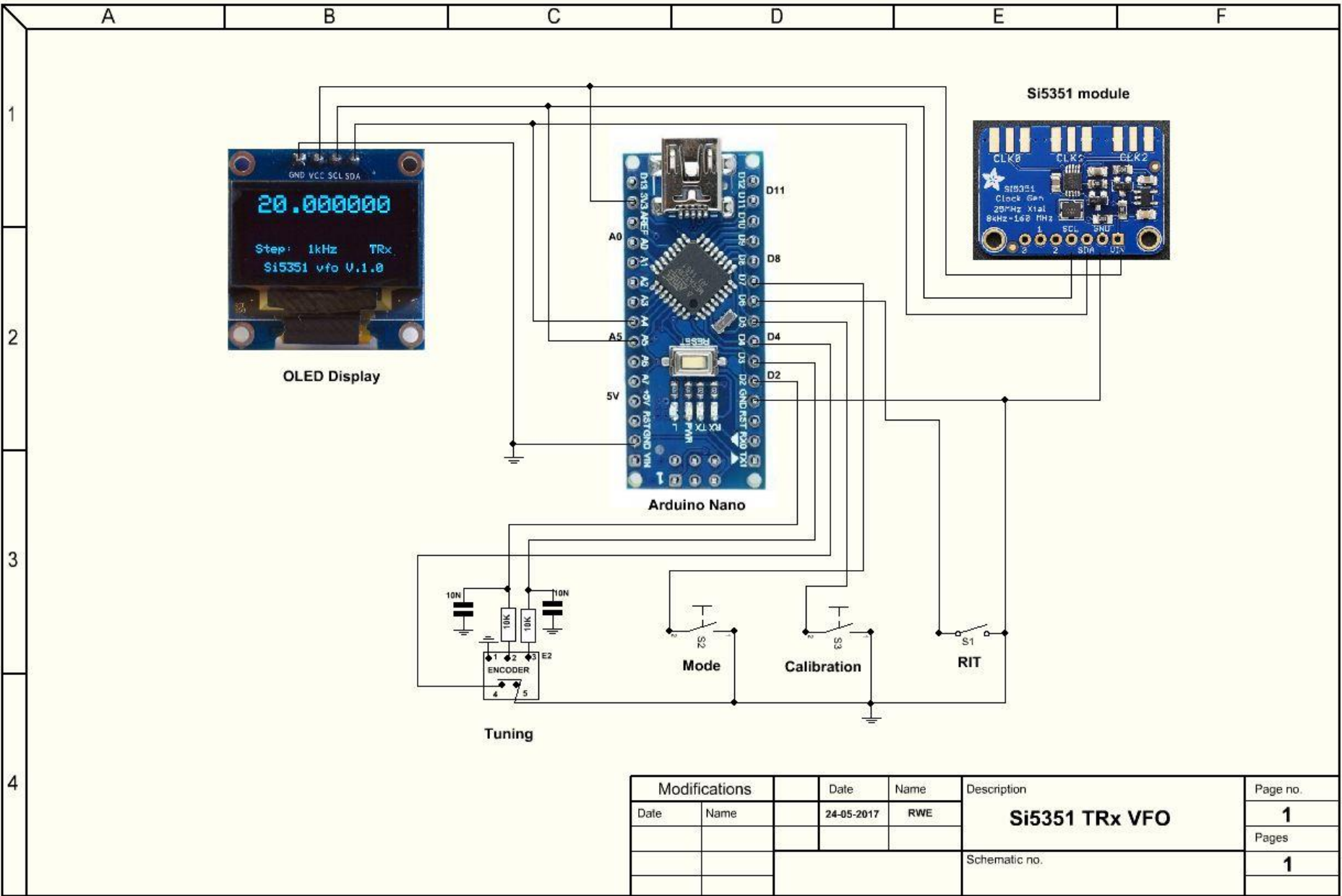


- QST October 2019
- ~ \$60 USD Special

<https://exclusive.drduino.com/DrDuino-FLASH-SALE-QST>

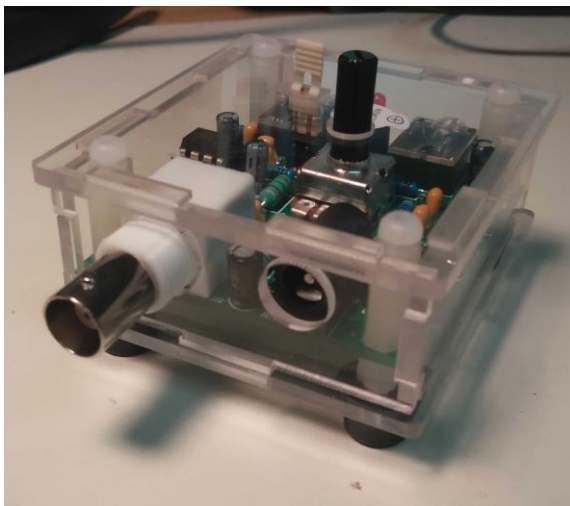
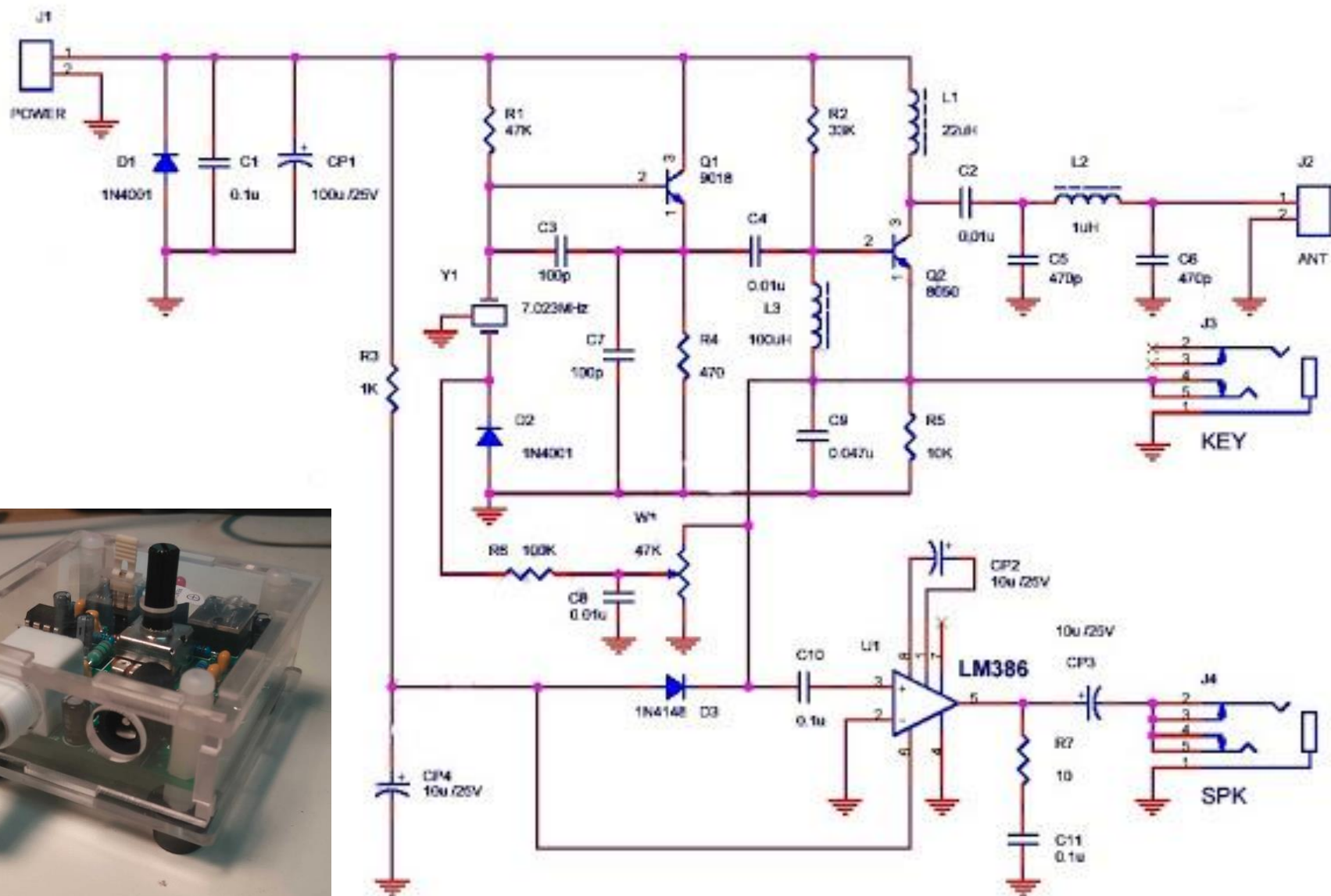


**Arduino Nano**

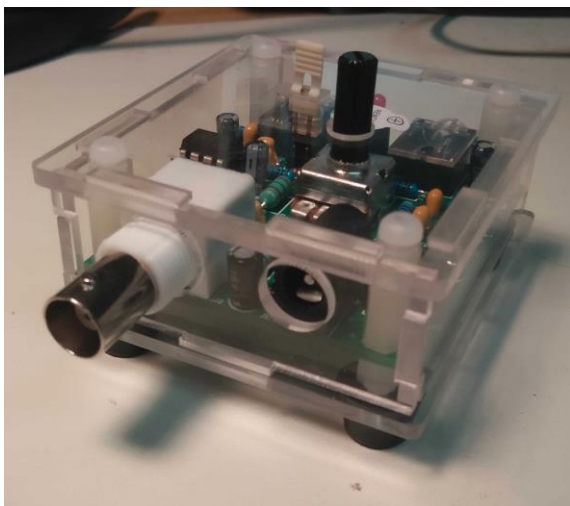
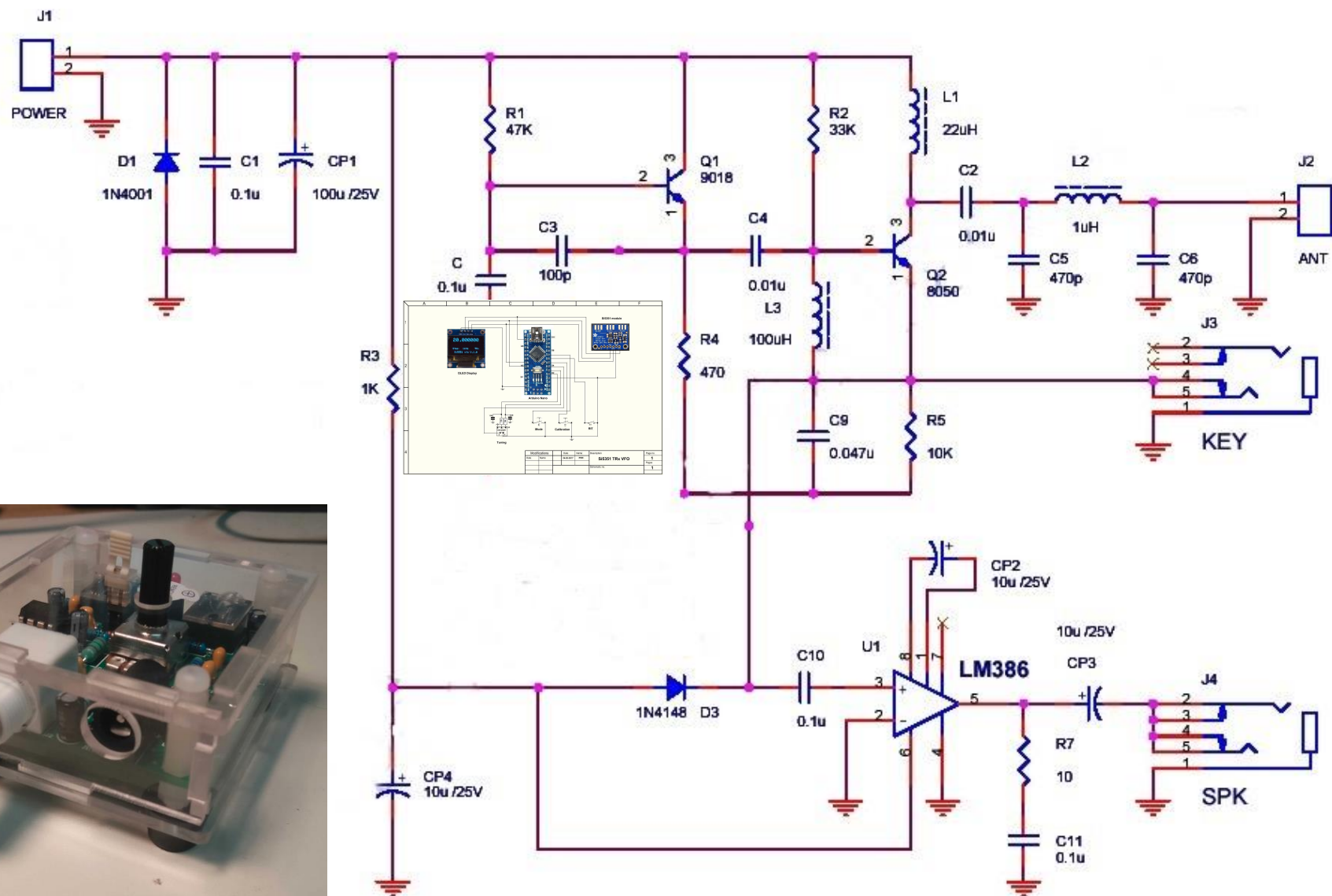


Modifications		Date	Name	Description	Page no.
Date	Name	24-05-2017	RWE	<b>Si5351 TRx VFO</b>	<b>1</b>
					Pages
				Schematic no.	<b>1</b>

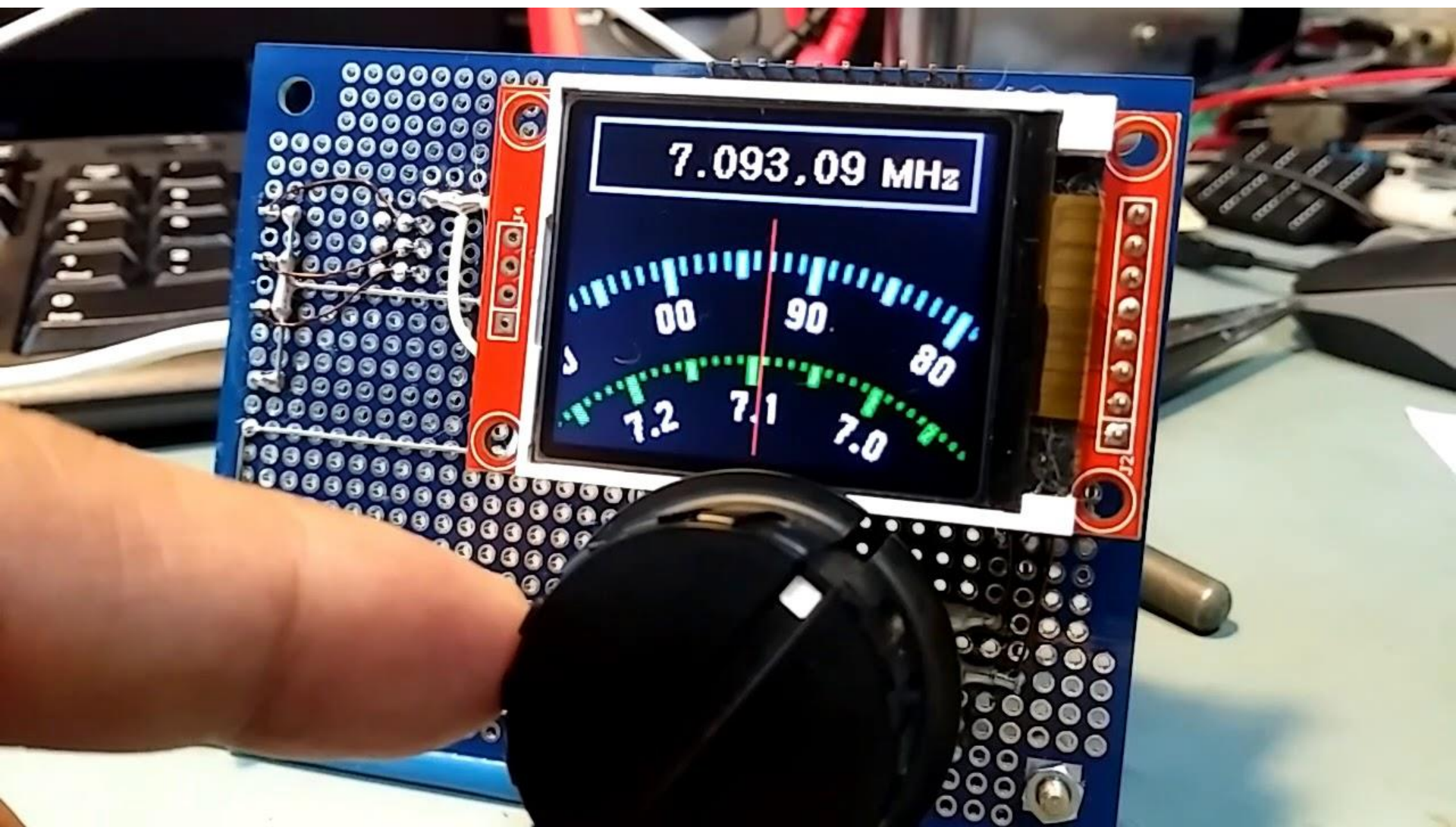




S-Pixie 40M CW Transceiver

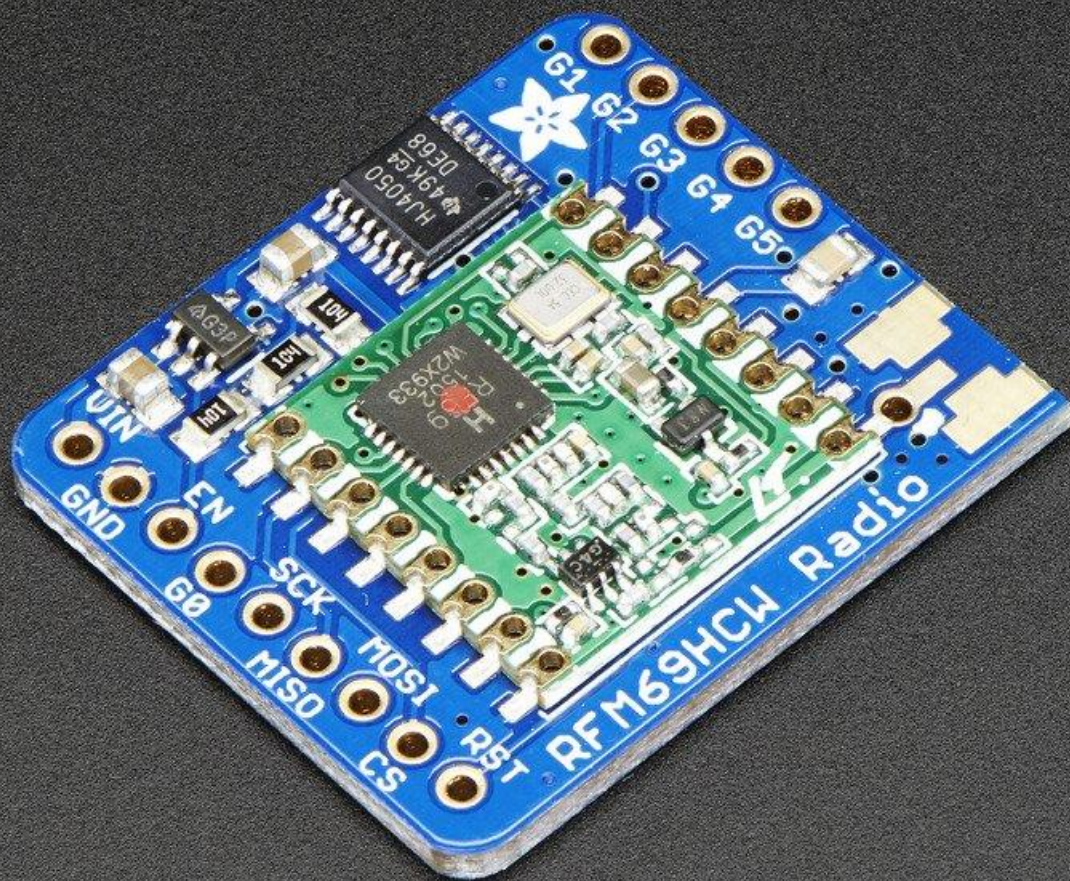






# Arduinos with RF





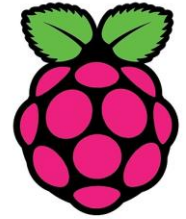




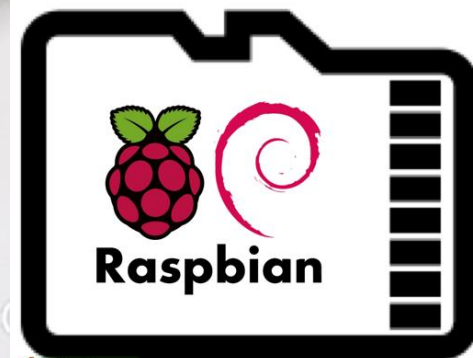
<https://qrp-labs.com>

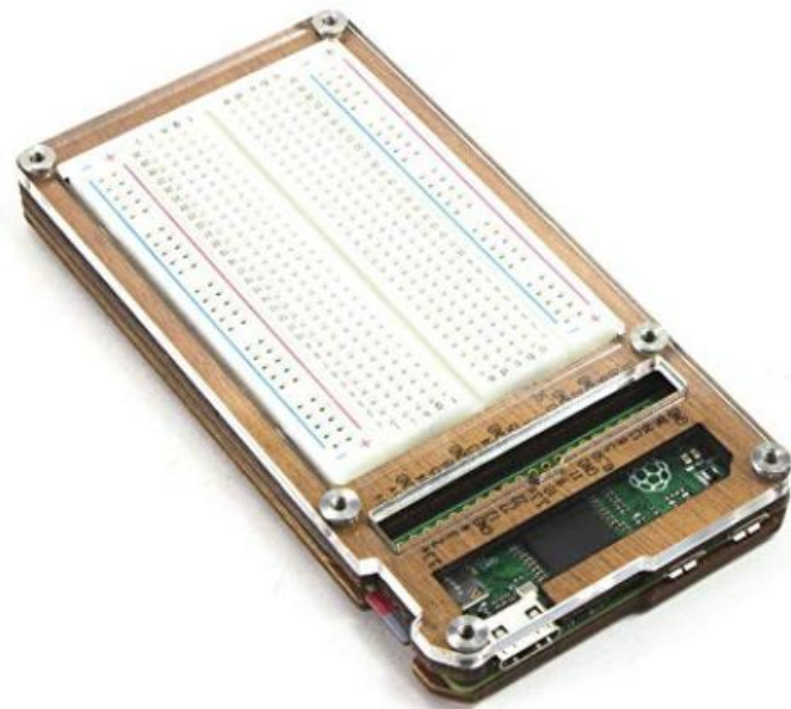
# Raspberry Pi





RaspberryPi





Roll over image to zoom in

## Zebra Zero Plus for Raspberry Pi Zero & Zero Wireless - Wood Plus by C4Labs

by [C4 Labs](#)



12 ratings

Price: **\$9.99** [FREE Shipping](#) on orders over \$25.00 shipped by Amazon or get **Fast, Free Shipping** with [Amazon Prime](#) & [FREE Returns](#)

- Designed and Made in USA
- Compact design compatible with pHATs& access to camera port.
- High quality materials with custom hardware
- Includes Bread Board 8x30 Pin
- Fits Raspberry Pi Zero Version 1.3 & Zero W (not included)

[New \(1\) from \\$9.99](#) & [FREE Shipping](#) on orders over \$25.00



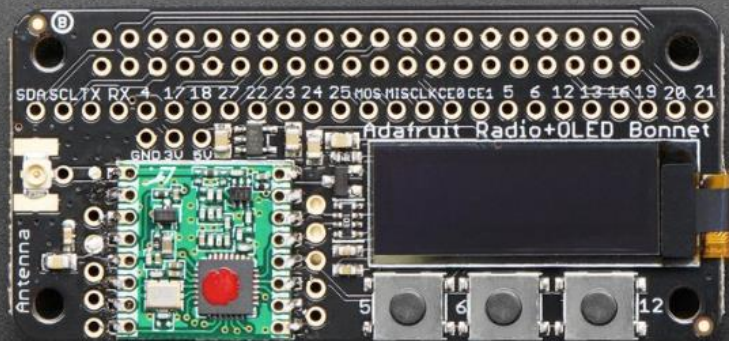
### Electronics Gift Guide

Latest tech gifts

[Shop now](#) »



# “Pi Hats”



## Adafruit RFM69HCW Transceiver Radio Bonnet - 433 MHz - RadioFruit

PRODUCT ID: 4073

**\$19.95**

There are multiple versions of this item. Please  
select one from the options below:

RFM69HCW @ 433MHz

9 IN STOCK

1

ADD TO CART

QTY DISCOUNT

1-9 \$19.95

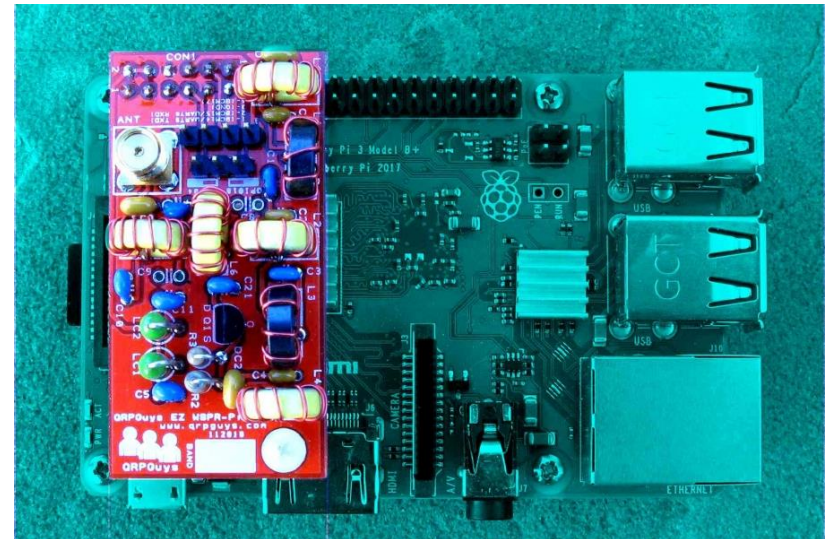
10-99 \$17.96

100+ \$15.96

ADD TO WISHLIST

# RPi WSPR Transmitter

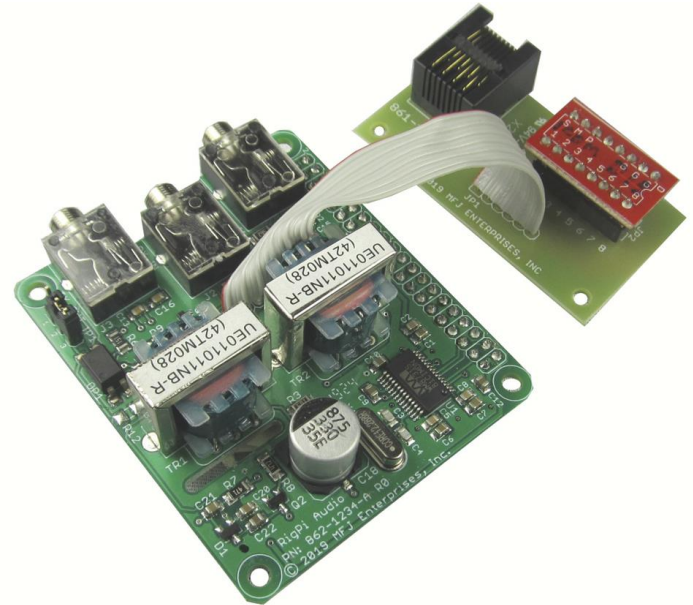
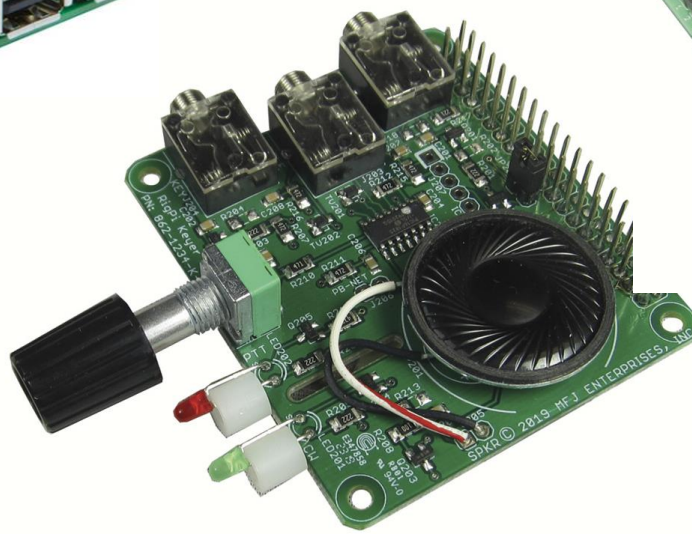
- ❓ Simple WSPR Beacon using RPi
- ❓ Some code and GPIO port to Antenna (0 – 250 MHz)
- ❓ ~ \$20 USD



<http://https://qrpguys.com/ha7dcd-ez-pi-wspr>  
<https://github.com/JamesP6000/WsprryPi>



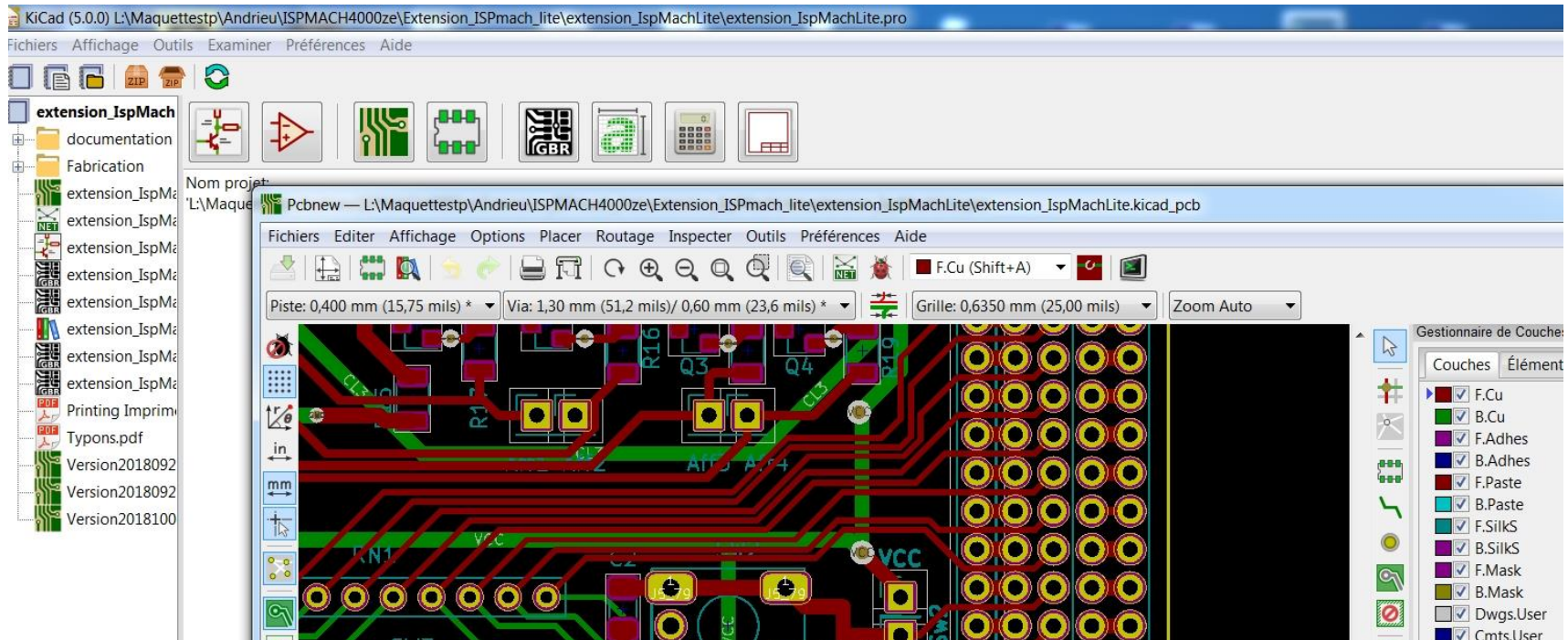
 RigPi



<https://rigpi.net/>

More Advanced topics





# Final Notes

- ❓ Insure your first kit is one that is advertised it can be completed in an evening
- ❓ Build your bench as you build experience
- ❓ New to Arduino, Pi ? Go with starter kits
- ❓ Research, research, research