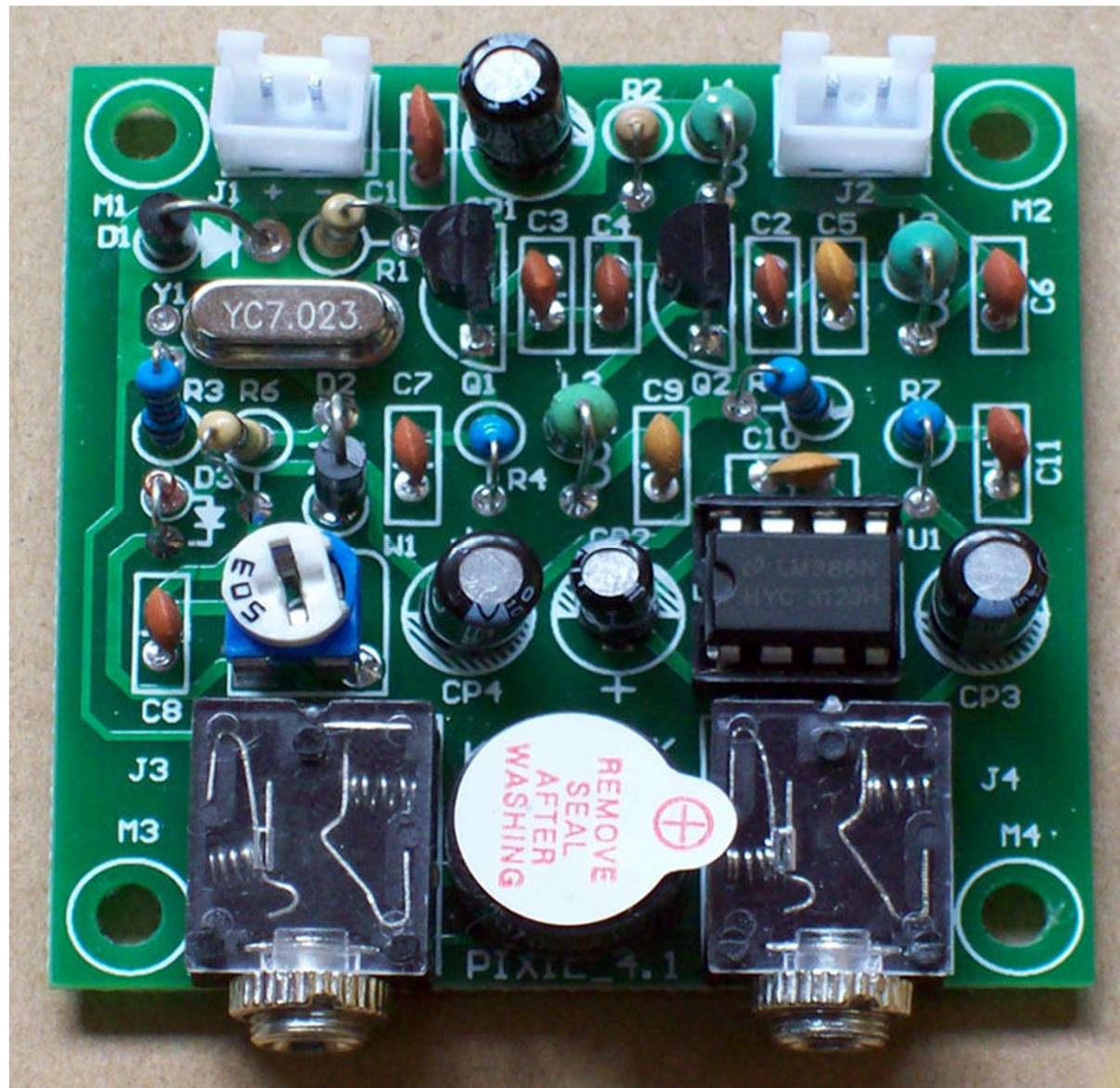


# PIXIE 40 meter KIT ver 4.1



## **The PIXIE 40 Meter QRP Kit, Version 4.1**

By RJ Mere, N1QX

I've purchased a dozen of these kits to be used as part of a learn-to-solder-and-build-your-own-kit class, or to raffle off at several of our New England Radio Discussion Society (NERDS) meetings. Despite the lack of documentation, these turned out to be very easy kits to put together, and make a great DIY project for new hams. Hams with a Technician or General ticket should replace the 7.023 crystal with a 7.050 crystal to be within their allowed frequency on 40 meters.

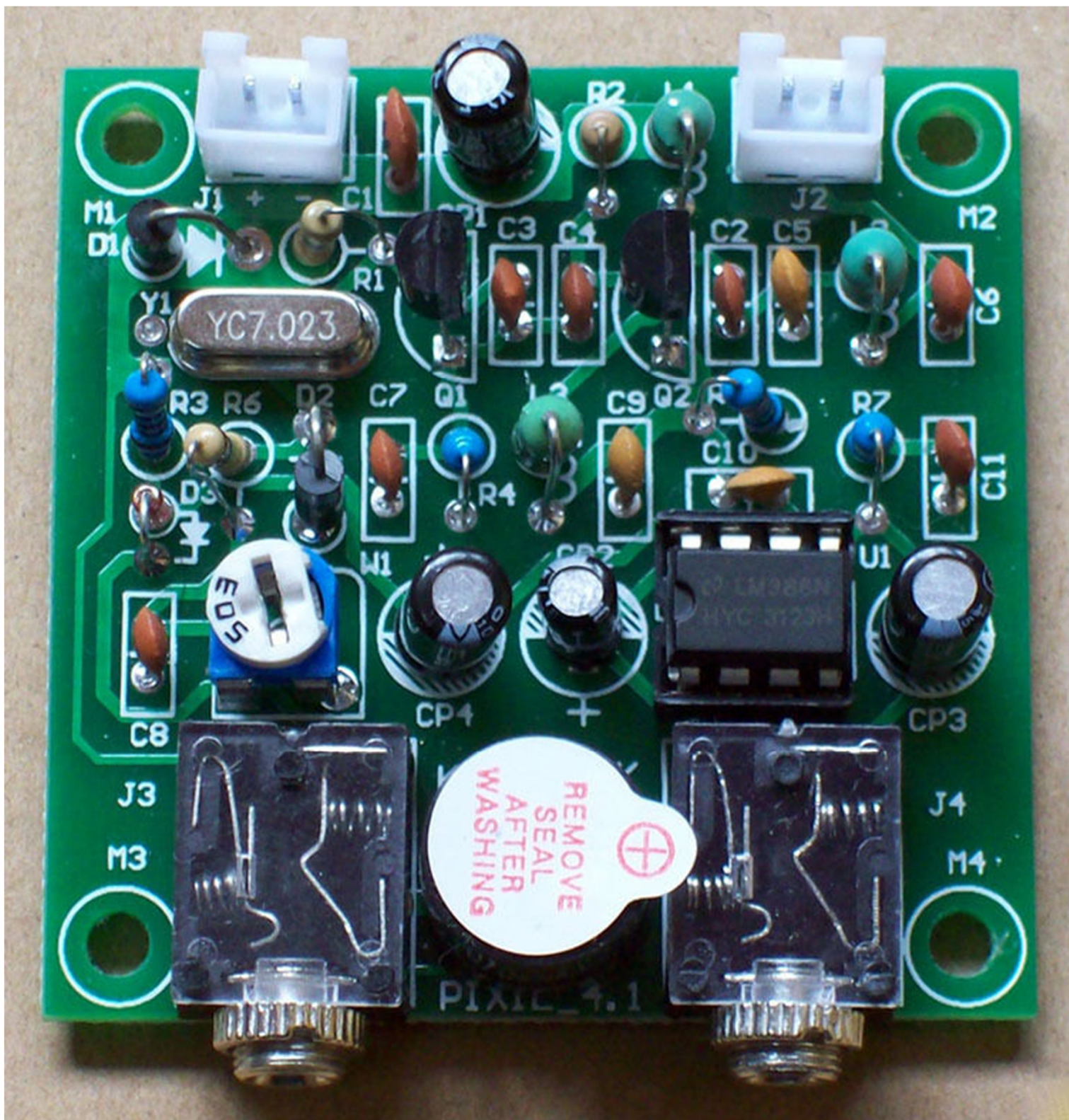
I have a few observations about these kits to improve them:

1. The PIXIE 4.1 does not provide audio control for the speaker/headset. For safety, that has to be installed at the speaker or on the headset.
2. The Pezio buzzer could use a off/on switch when using this kit in stealth mode.
3. It will drain the power source if the battery is left connected while not in use. A shut-off switch should be installed on the positive feed from the battery. While we are on this topic, a fuse should also be installed on the feed line to these kits.
4. This kit is not compatible with the iambic keyer, so it's straight key only (or you could use the "dit" paddle of an iambic keyer as a straight key!)

One final note, this kit does not come with an enclosure. If you've always wanted a 3D printer (RJ raises hand), this might be the excuse you needed to buy it. Amazon and eBay both offer the "Forty-9er" 40 meter kit with an enclosure for a few bucks more.

73, RJ Mere, N1QX





# Inventory PIXIE 4.1

## Component listing

1/4W Fixed resistor		Electrolytic capacitor	
R1	47K	CP1	100uF /16V
R2	33K	CP2、CP3、CP4	10uF /16V
R3	1K	晶体管	
R4	470欧	D1、D2	1N4001
R5	10K	D3	1N4148
R6	100K	Q1	9018
R7	10欧	Q2	8050
Adjustable resistance			
W1	47K (473)		
Fixed inductance			
L1	22uH	集成电路	
L2	1uH	U1	LM386 (DIP8)
L3	100uH	晶体	
capacitance		Y1	7.023MHz
C1	0.1uF (104)	其他元件	
C2、C4、C8、C11	100nF (103)	J1	DC
C3、C7	100pF (101)	J2	Q9(BNC)
C5、C6	470pF (471)	J3	3.5mm (KEY)
C9、C10	0.047uF (473)	J4	3.5mm (PHONE)
		PCB ×1	
51 ohms resistor/test with load			

PIXIE 'micro-power' Telegraph  
Transceiver Kit Instructions  
by  
Stan Wilson, Jr., AK0B

# China Pixie on Ebay

Quality of the parts was high. The solder ability of the silk screened PCB was excellent. The xtal was 7.023 MHz. Schematic is complete including a parts layout and parts list. I always have trouble reading the colors on china resistors, but used my free VOM from Harbor Freight again no problem there. It uses a 1N4001 as a varicap so should be able to set the CW offset with no problem. The transistors were 9018 I believe that is a S9018 and the output transistor was 8050 which I think also requires an S, S8050. I have not succeed in down loading a data sheet on either transistor, but google says they are both available. For some reason my Windows 8 refuses to let me get them. But know from years past just about any NPN transistor will work in the Pixie. I have many different types in my junk box, so may end up with a 2n2222, 2n3904 or 2n4401. A 4401 I think will allow me to run more output. I have not installed all the parts yet, may replace the output rf choke (22 uH) with a 4:1 coil which will give a better match to a 50 ohm pi network. A first time builder should have no problems in doing the assembly. I use a small temperature controlled soldering iron and radio shack silver solder. No coils to wind, the 3 inductors required are supplied and commercial. I plan to use one for 80 meters, color tv xtal and need to change C5, C6 and L2 to values for 80 meters. For trouble free assembly check every part with both the schematic and parts list, take your time. Install the connectors last. I do resistors, caps, diodes, transistors and connectors in that order. One in your mail box costs less than a movie ticket. I plan to buy another one and see if I can it work on 20 or 17 meters.

Have Fun.

Stan AK0B

W9ifz (at) yahoo.com

This is a very small volume of a simple 40 meter band micro-power amplitude telegraph transceiver, 9V square battery or external 7-12V DC power supply.

A brief introduction:

### Key Indicators

- Power supply: 9V-12V (Recommended 9V laminated battery)  
Antenna: 50 ohm, unbalanced
- Frequency range: transmitter local oscillator frequency: 7023kHz; receive local oscillator frequency: about 7023-7026KHz
- Headphones: low-impedance headphones Transmit power: 0.8W (using a 9V power supply), 1.2W (12V power supply)
- Suppress spurious (harmonic):-20dB

## Circuit schematic

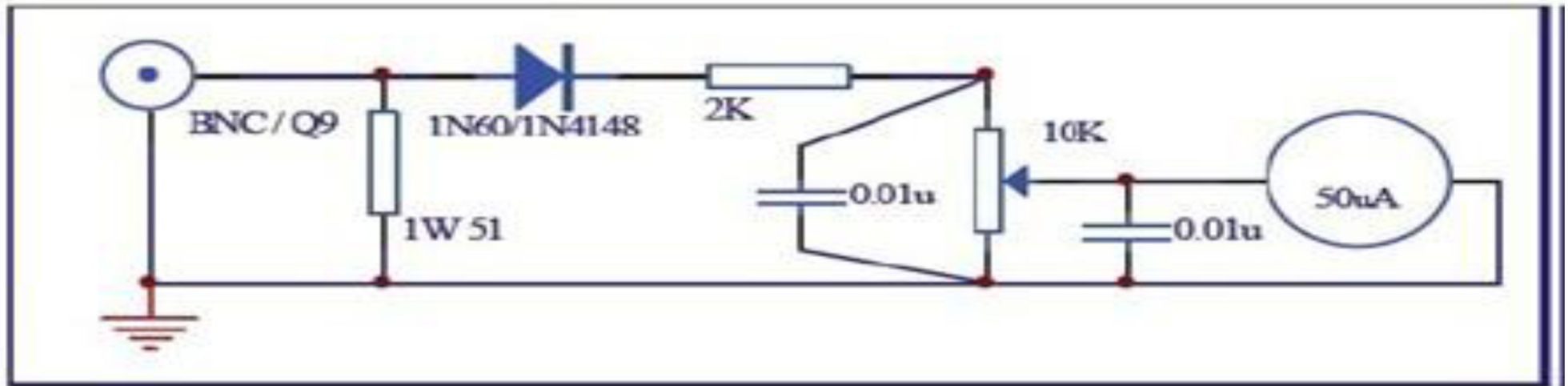
See the last page of the document accompanying drawings, Q1 and surrounding components constituting a typical Colpitts oscillator and keeps oscillating (the oscillation signal leaks around 1mW) when receiving the local oscillator signal is directly coupled through a capacitor to Q2. Emission state (the key is pressed), Q2 as a class C amplifier, the amplified signal via 0.01uF capacitor coupled to a pi-type low-pass filter, and then sent to the antenna; reception state (key release), Q1 element around the beat oscillator (BFO), D2 coupled with high voltage and reduce capacitive pressure is increased with the ends of the DC, the local oscillation frequency can be increased to approximately 0-3KHz 7.023MHz reception signal can be easily carried out bats frequency. Q2 is biased in the non-linear region (think transistor is nothing more than two back-to-back second diode incorrect), the signal received by the antenna with the BFO signal mixer, mixing the audio signal obtained after the 0.1uF capacitor coupling posed to the LM386 audio power amplifier,



the audio signal amplified by the 10uF capacitor across the LM386 5 feet straight evacuation headphones. The key control not only the LM386-off of the power supply is switched D2 varactor bias, so that the capacity of the type of state change.

### Debugging method

The end of welding should check whether there is a short circuit, and if not, with 9V laminated battery connected to the headset, not to take the antenna, under normal circumstances should hear a slight "rustling" sound, connected to the antenna noise increases or you can hear some signal, the whole current of less than 10mA. This receiver should be normal.



High-frequency power meter circuit diagram with 1W 50 ohm dummy load

And then connected to the high-frequency power meter with a dummy load reference circuit diagram (above), the "KEY" at both ends of the short-circuited, the headphones should be quick and silent, high-frequency power meter output. Transmit state machine current 40-100mA. The launch 0.5 meters in the next put a shortwave / medium wave radio, check all the receive frequency range, in addition to the carrier frequency and multiplier should not hear the other signal generated by the "shoes". For any other signal (howling), indicating the presence of high-frequency instabilities. Schedule gives a DC reference voltage of each of the main elements of the transmitting and receiving state.

表：Q1、Q2、U1 各引脚在发射与接收状态下的直流参考电压（单位：V）

Pin	管脚	Q1 (9018)			Q2 (8050)			U1 (LM386)							
		e	b	c	e	b	c	1	2	3	4	5	6	7	8
Receive	接收	4.0	2.2	9.0	9.1	9.1	9.0	1.3	0	0	0	2.5	4.9	2.5	1.3
Emission	发射	3.2	2.3	7.4	0	0	7.4	-	-	-	-	-	0.6	-	-

The absence of a simple high-frequency power meter, optional two machines on the hair, such as can normally receive another keying signal, that is, to determine the initial machine properly. Never without a dummy load or antenna to transmit signals directly to avoid damage to the circuit!

Shell selection and installation:

Beautiful metal casing not only shoes considerably, and can effectively shield near interference. Optional shell a lot, for example, metal cans, aluminum boxes, medical elongated aluminum case. To pay attention in the choice of the box open as convenient as possible, because the battery run out need to be replaced.

## Recommendation for use:

The confidential achieve better results, set up the antenna performance can not be less than the total length of the half-wave horizontal dipole antenna, in conjunction with the use of Simple Balun, (the antenna should be as far away as possible from sources of interference, such as fluorescent lamps, computer monitors, switching power supplies and other equipment , as far as possible with a coaxial cable as a feeder to reduce the possible receiving interference), using the highly sensitive Walkman headphones, as far as possible the small morning radio interference (especially weekends and holidays in the morning) or late at night to listen to the SSB signal and CW signal at the best possible sound (tone).

## BOARD ASSEMBLY

Please refer to the map, the height of the device, the first low-high, the first years after the principle followed by the welding device.

The identification of the color ring resistance ceramic capacitors

Color ring resistance, the most common accuracy of 5% and 1% accuracy 5% accuracy for 4 color wheel, 1% accuracy of the five-color rings

Read as follows: general pF capacitance of ceramic capacitors (10R -12 power F) units, some products using direct labeling, such as 1000p, 220p, etc.: more in exponential notation, such as:

102,221 the first two digits are significant figures of capacitance, after a number is followed by adding a zero number, such as 102 valid number is 10,2 indicates that the following Adds 2 0 1000pF; 221 means that the effective mathematical 2,1 followed by putting 1 0, i.e. 220pF.

Marked 62 62pF marked 102, 1000pF



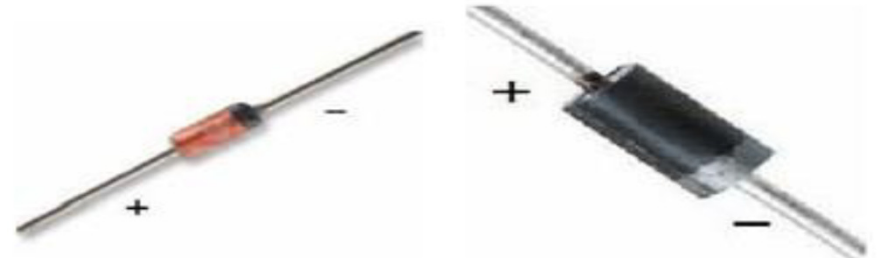
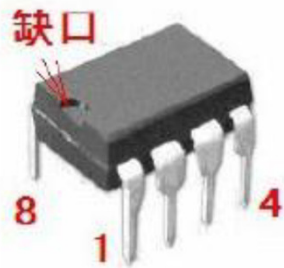
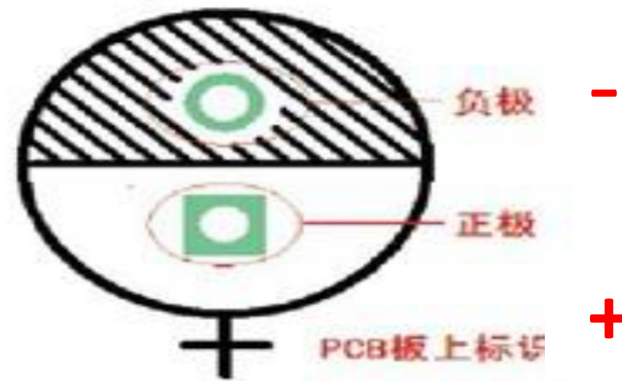
**Mark 62 means 62pF**

**mark 102 means 1000pF**



The polarity of the electrolytic capacitor:

Electrolytic capacitor positive and negative polarity, insert the PCB board installation, make sure that the positive and negative corresponding correct, do not install the wrong.



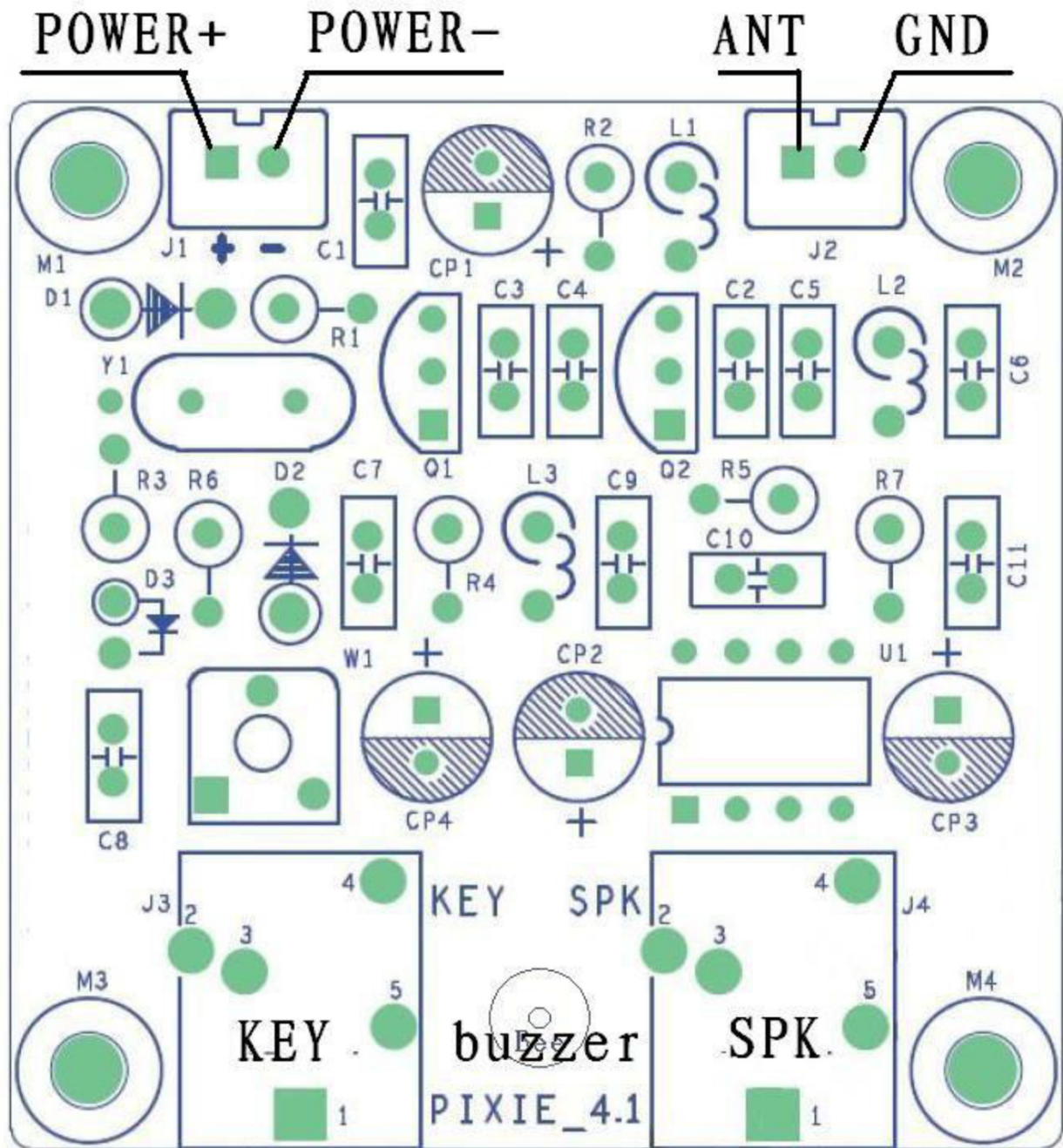
Pin arrangement of 9018, 8050

## DIY QRP Pixie Kit CW Receiver Transmitter 7.023MHz Shortwave Radio

### Feature:

- Power supply: 9V-12V  
(Recommended 9V laminated battery)
- Antenna: 50 ohm, unbalanced  
Frequency range: transmitter local oscillator frequency: 7023kHz; receive local oscillator frequency: about 7023- 7026KHz
- Headphones: low-impedance headphones
- Transmit power: 0.8W (using a 9V power supply), 1.2W (12V power supply)
- Suppress spurious (harmonic):- 20dB Note: This is a DIY kit, you need to have some soldering skills.

**Package included:** 1 x DIY QRP Pixie Kit



PIXIE-4.1 adds a buzzer, buzzer can follow the action key issue Be Be Be's voice, increase transmitters fun. After installing the buzzer, it will consume 20ma of current transmission, you can decide whether to install.

