

Electro-Resales

Mini Keyer 3 – Kit builders guide

Thank you for purchasing this kit from Electro-Resales, we know you are excited to get this Keyer operational, so we have put together this guide to make the construction process as easy as possible, and ensure your success.

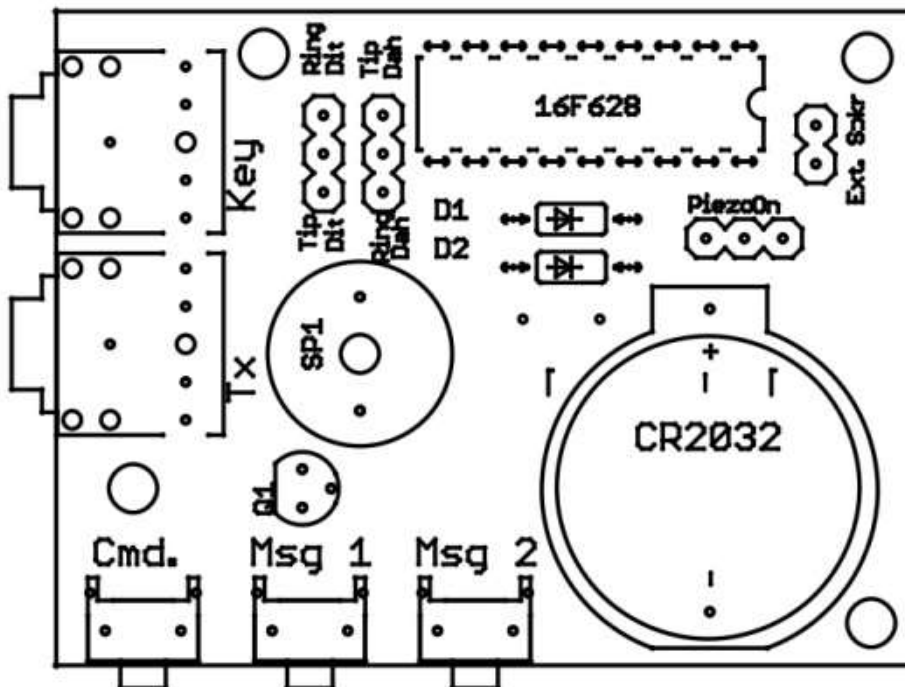
By following our step by step guide you will find the process painless and your Keyer should work first time.

Step One

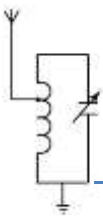
Check the component package – make sure all the parts are included, if not contact us immediately so we can get the needed parts out to you, email us; resalese@gmail.com

Check the package contents against this table;

Part	Quantity	Identification
PCB	1	Small Green double sided board, approx. 2" x 1.75"
3 way Header Strips	3	Black plastic with gold pins
Shorting blocks	3	Black, Red or Blue shorting header
18 Pin DIL IC Socket	1	IC Socket in black plastic, tinned pins
Programmed PIC	1	18 Pin PIC IC – 16F628-04
1N4148 Diodes	2	Gold diodes with black band on one end
Plastic transistor	1	Black Plastic, three leads, marked BS170 or 2N7000
Battery holder	1	Black plastic CR2032 holder
Vertical push switch	3	Metal body vertical push switch with Green button
Piezo Speaker	1	Small cylindrical black sounder with open hole on top side
3.5mm Jack sockets	2	Black and silver flat body jack sockets



After checking the parts take a look at this diagram to get an idea of the parts placement/positions before soldering any parts. It shows clearly the major components.



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Step Two

Start construction by inserting the headers for the Dit/Dah selection options and the Piezo sounder on/off option, per the next diagram;

Insert and solder each header block of three, one at a time – a good trick to make this easy is to push

the header, long pin into a breadboard, then place the PCB over the short pins and solder in place. This ensures the header is mounted square and makes for a neat result. Once the header blocks are in place and you are happy with the alignment. Find the 2 diodes (1N4148) and insert in the board. Make sure that the black band of the diode body matches the line printed on the PCB. Both diodes face or point the same way. Solder in place, see the diagram below:

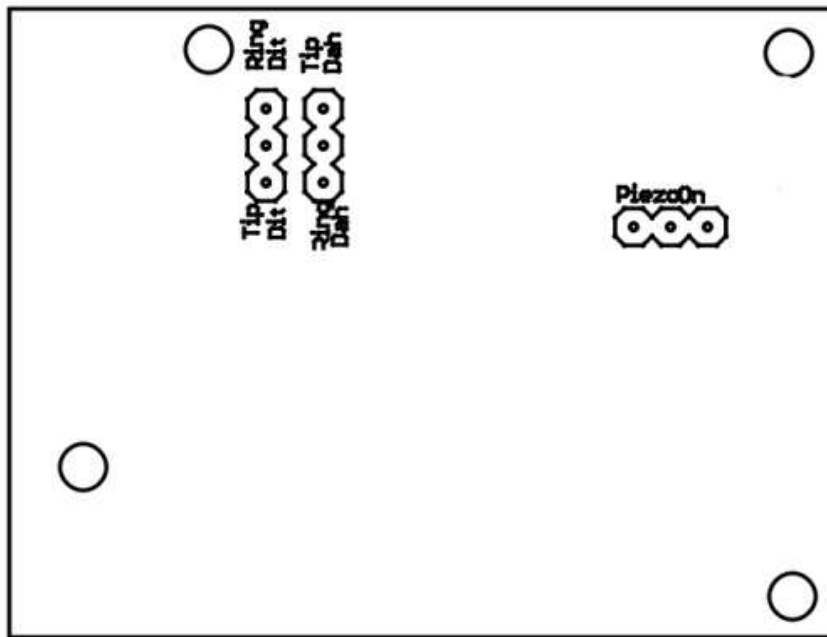
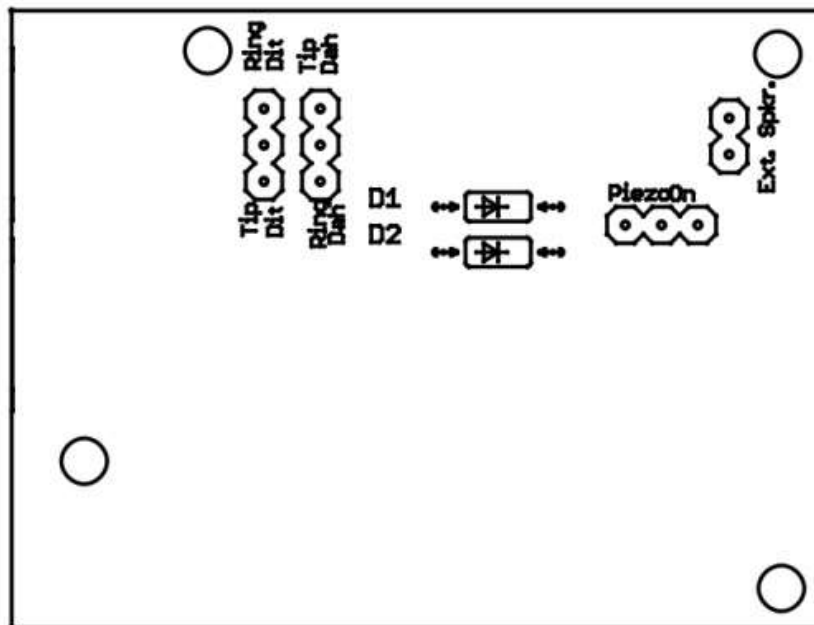
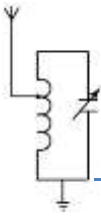


Diagram showing header and diode placement. Once the diodes are soldered in place, insert the 18 pin

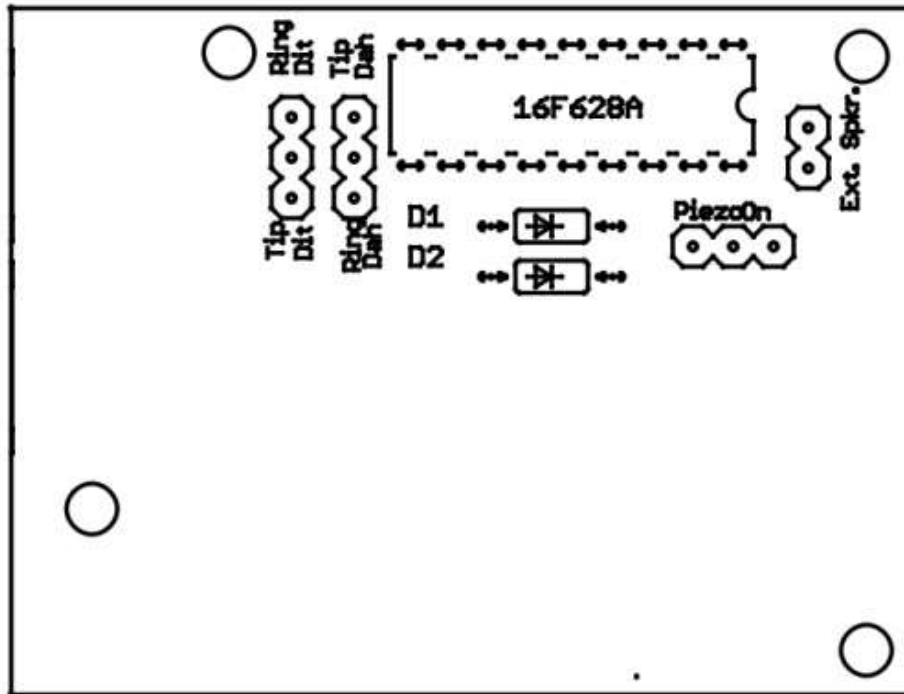


IC holder; make sure to insert this with the notch in the holder matching the notch printed on the PCB.

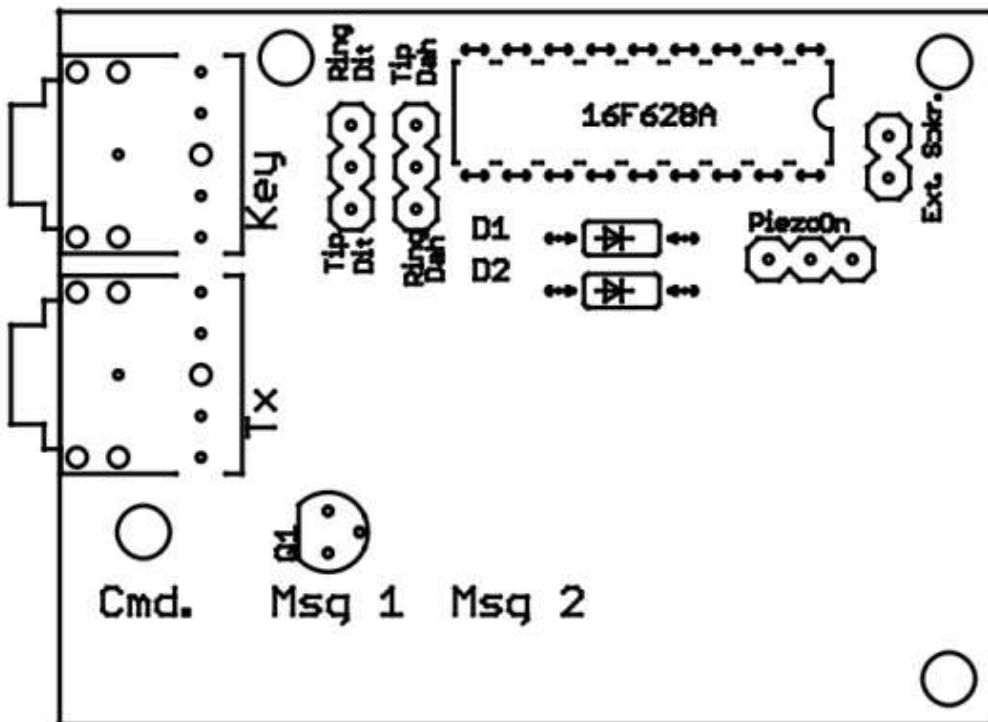
The notch will ensure the PIC will be inserted the correct way round when the time comes to insert the IC.



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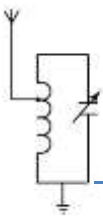
This diagram shows the IC holder in place and the direction of the notch, arrowed;



Step Three

The next step is to add the key and TX jacks these are the same component and only fit one way. Insert each jack separately and solder in place, be careful to make sure the jack body rests flush to the PCB.

After adding the jacks find the switching transistor, this is a small three legged plastic transistor that may be marked either 2N7000 or



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BS170, insert into the board at the position marked Q1. Make sure the flat on the transistor matches the flat printed on the PCB. It may be necessary to pre-bend the leads of the transistor to fit; this can be done with small pliers

Step Four

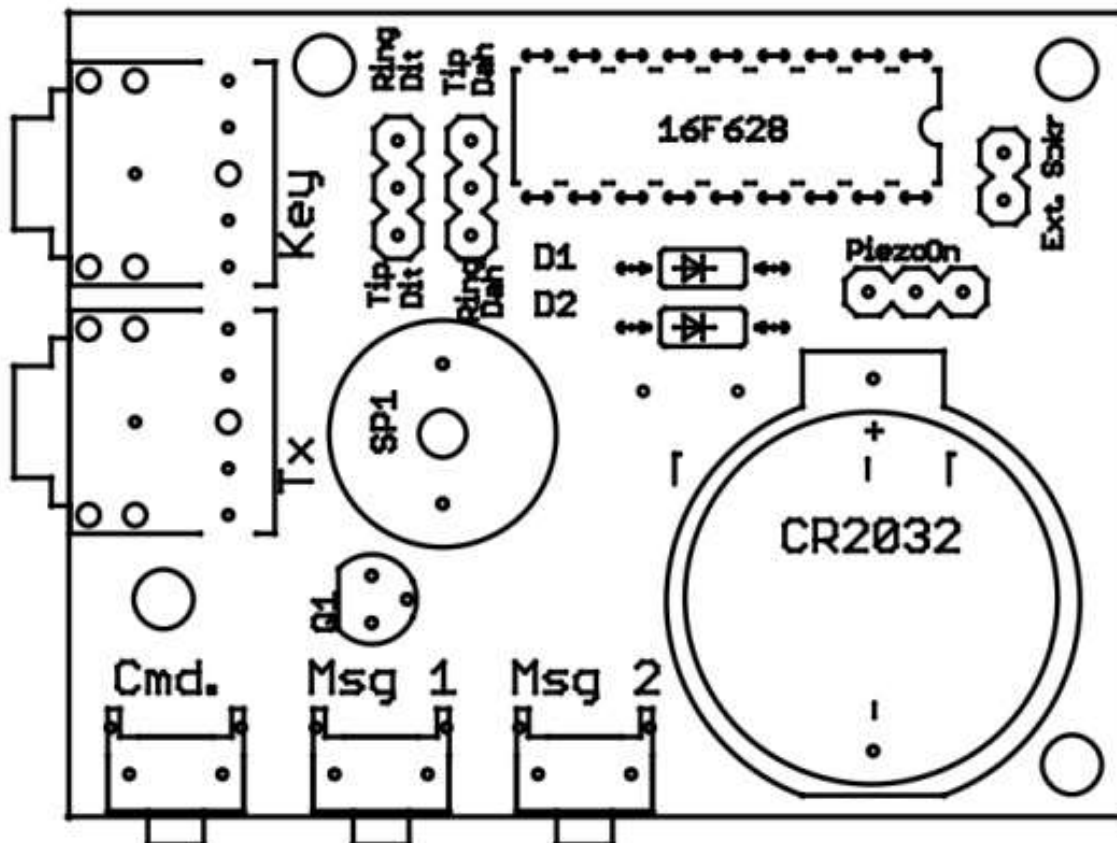
Locate the three vertical mount push button switches. These are fitted at the Cmd., Msg. 1 and Msg.2 positions. The switches have pins for the switch and lugs for mounting. Be careful inserting the switches as it is easy to bend the lugs if too much pressure is applied or the switch pins and lugs are misaligned to the board openings. The lugs can be bent in slightly to ease insertion or even have the mounting lug bend flattened before insertion to make this an easier process.

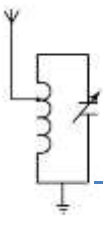
Start by inserting the middle switch and then follow up with the left and right switches. After these are inserted, locate the CR2032 battery holder and insert it in the board so its outline matches the board outline.

The last component to add is the piezo speaker. It is polarized, the positive is marked on the top, removable tab and this lead goes in the top hole on the board, the hole nearest the diodes.

Step Five

The board is now complete and should look like this:





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Before proceeding, carefully check your work. Make sure that the components are correctly positioned and seated properly on the PCB. Flip the board over and in good light and with a magnifier if needed, inspect the solder joints. Look for nice shiny joints and check that no solder bridges or splashes exist. Make sure all joints are soldered – correct any that seem suspect.

Step Six

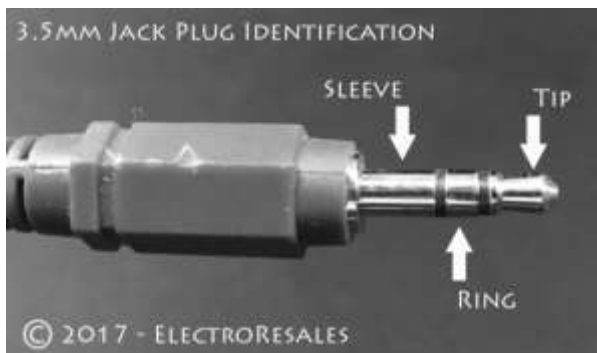
Now is the time to insert the pre-programmed PIC IC. The pins of the IC may need to be bent in slightly so they line up correctly with the socket pin receptacles. The best way to do this is with a Lead straightener tool, but the leads can also be bent in slightly by applying all the pins to the bench as in this image:



Then, applying an equal amount of force to the pins, bend them in slightly. This process does not need a lot of pressure. Once the pins are properly in line, line the IC up with the socket and insert, make sure to have the notch on the IC line up with the notch on the IC holder. Check that all pins are in the socket and none are bent under.

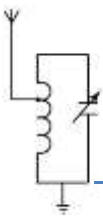
After adding the IC to the board, we now need to set the jumpers. Three jumpers need to be set, first place the jumper on the Piezo ON header so that the center and right hand pins are shorted.

Next, the headers that set the Dit/Dah orientation for your key need to be set. How these are set will depend on how you wire the jack plug to your key. Refer to the picture below of a typical stereo jack;



The Dit paddle can be wired to either the Tip or Ring and the common to the Sleeve, likewise the Dah paddle can be wired to either the Tip or Ring. Whichever way you choose, set the jumpers to reflect your choice by using the shorting links to short the middle pin and the respective outer pin for Tip or Ring per the legend on the PCB on each header. For example if the Dit paddle is wired to the Tip, then the Dah paddle is wired to the Ring. Set

the Tip Dit jumper and Ring Dah jumpers and if wired the other way, set the jumpers in the opposite way.



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Step Seven

Now that the PCB is completed, it's time to add a battery, connect your paddle and try the Keyer out. The battery holder is designed to accept a CR2032 coin cell, insert a suitable battery into the battery holder with the positive side facing up. Insert your paddle in the key jack and you are ready to go!

Start out by checking that operating the paddles generates the Dit & Dah correctly, at initialization the speed may be set slower than you are used to sending. The Keyer has many features to explore, let's start with adjusting the speed.

Press the left most button marked Cmd. On the PCB, you should hear a Morse 'C' (-.-.) from the piezo sounder. This indicates the Keyer is awaiting your input.

Tapping the Dah paddle increases the Morse speed for each tap, tapping the Dit paddle decreases the speed for each tap. Try tapping the Dah paddle five times. After tapping 5 times press the Cmd. Button once more, you should hear the Keyer reply with a Morse 'D' (-..) Indicating it has received the information and stored it. If you hear the Morse '?'(..-..) It means the Keyer did not understand your input, just try once more.

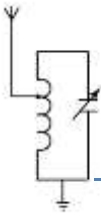
Now try sending some more code, it should send at a faster speed than before. By repeating the above steps, but tapping the Dit paddle you can reduce the Morse speed.

To key your transmitter requires a jack plug and cable be assembled with the Tip of the jack being wired for active keying and the Sleeve to ground. The Keyer output goes low to transmit.

That concludes the construction of the Morse Keyer – the user guide can be downloaded in .pdf format here:

<http://www.strozzi.it/users/carlo/hamradio/iz4kbs-keyer/>

This site also has the Hex and assembly code, plus other license information.



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The small Print

DISCLAIMER

Any person who constructs or works on electronic equipment may be exposed to hazards, including physical injury, the risk of electric shock or electrocution.. These hazards can result in health problems, injury, or death. Only qualified persons who understand and are willing to bear these risks themselves should attempt the construction of electronic equipment. By purchasing this item, the buyer acknowledges these risks.

There is a risk of electric shock, electrocution, burns, or fires that is inherent in the construction and use of electronic equipment. By purchasing this item, the buyer acknowledges these risks.

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