

QRSS Keyer

Written by Hans Summers

Monday, 02 November 2009 07:37 - Last Updated Sunday, 18 December 2011 09:33

This is a simple QRSS call sign keyer based on a program space AVR microcontroller.

I can program this chip [online](#) or [buy one](#) with your call sign, full name or abbreviated e.g. "UPL". If able

The keyer has the following features:

- + Choice of speed 12wpm, 6wpm, QRSS with 1s, 3s, 6s, 10s, 15s or 20s "dits"
- + Automatic 12wpm call sign insertion in QRSS messages, every 10 minutes
- + 750Hz sidetone output
- + Positive-going keying output



Pinout

To the right, see the pinout of the chip. The basic supply voltage range is at least 3-6V. power consumption

Pin 1 of the IC (top left) is identified by a small dimple in the chip, but I have added a blob of white paint

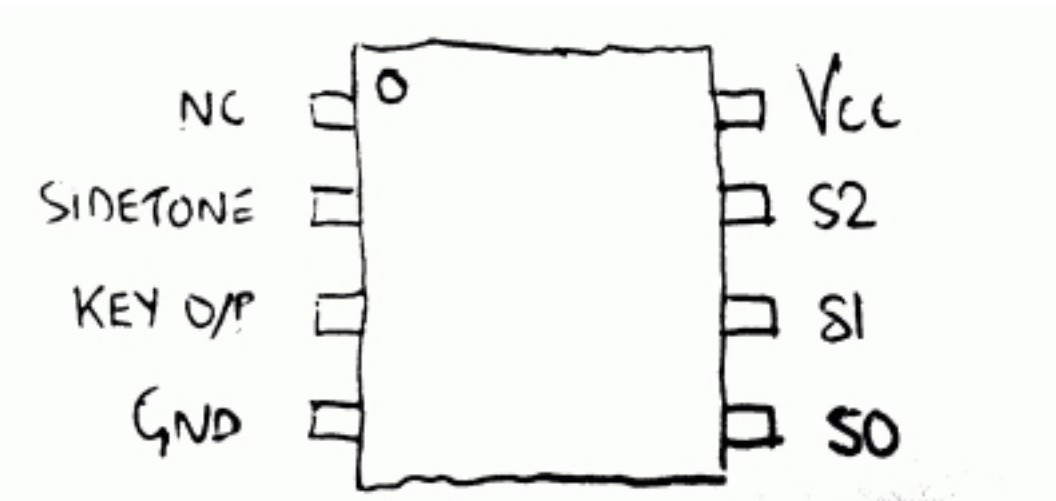
Pin 1 is the "Reset" input to the processor and can be connected to Vcc, or left unconnected.

S0, S1 and S2 inputs select the keying speed and should be connected to GND or Vcc as per the table

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Keyer speed selection

The table below shows the available keyer speed. I have also produced a version A, which has 50wpm and 60wpm settings suitable for meteor scatter experiments.

S2	S1	S0	Keyer speed	Keyer speed (A)
0	0	0	12 wpm	
0	0	1	6 wpm	
0	1	0	QRSS 1	
0	1	1	QRSS 3	
1	0	0		
1	0	1		
1	1	0		
1	1	1		
1	1	0		
1	1	1		
1	1	1	QRSS 20	

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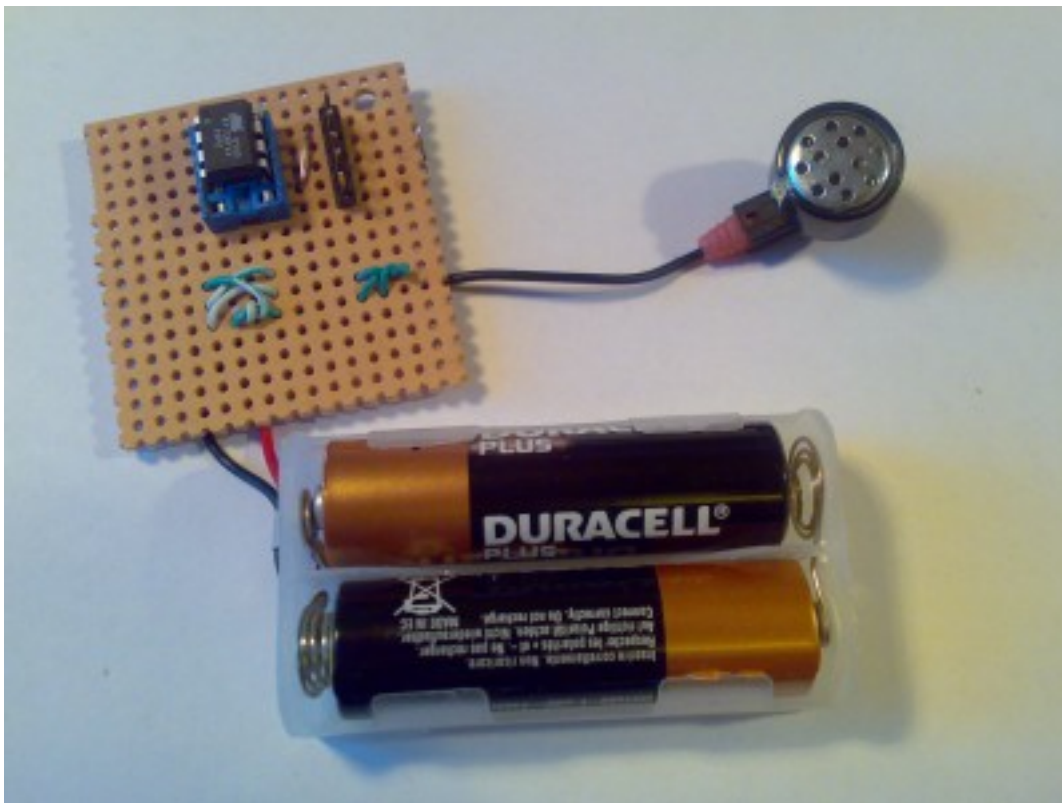
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NOTE: the microcontroller is clocked using the internal 9.6MHz RC oscillator. Being RC based, this is inherently inprecise. This means the actual keying speeds and sidetone could differ by a few percent from the values shown in the table above.

Source code

Here is the [source code](#) , written in C. This is the same code used in the [QRSS Kit](#) .

Finally here's a picture showing my programmer board and test set-up. I power this off two AA batteries in series (3V). I have connected one earpiece (half a pair of poundland headphones) to pin 2 via a 100-ohm resistor, so that I can hear the sidetone and make sure I've programmed the message correctly.



Shipping Problems

All was not well with my attempts to provide QRSS keyers at low cost to encourage as much QRSS experimenting as possible. Initially I offered these chips at a not-for-profit price of £2,

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which is about what I estimated it would cost to buy the ATtiny13 chips in low volume, pay the shipping on them, keep a small stock, buy some envelopes and some UK 1st class stamps. Unfortunately, the Royal Mail would disrupt my attempts, and I'm not just talking about the postal strikes due to Pay & Conditions disputes.

The first round of QRSS keyer chips, I packaged in short cuts of the plastic chip tubs that integrated circuits are often supplied in, then put these into a normal white envelope. Unfortunately one recipient reported back that his envelope had arrived torn in half, with a humble letter of apology from the Royal Mail, but nevertheless no QRSS Keyer chip inside. Presumably the bulge in the middle of the envelope must have caused it to get caught in some piece of Royal Mail machinery in some sorting office somewhere. Another recipient reported that his was fine, except that he'd had to go to his local sorting office to collect it, and pay a postage surcharge because the applied 1'st class stamp was deemed insufficient. I should explain that in the UK, a standard letter is defined as no bigger than A5-sized, and no more than 5mm thick. Any bigger than that, and one must buy a more expensive "Large" stamp. Definitely the bulge in the middle of those envelopes was more than 5mm.

So the next round of QRSS keyer chips, I packaged differently. This time I wrapped them in foil and stuck them to a piece of paper, then put that into a more industrial style of stronger-looking brown envelope. Now unfortunately several people gave feedback about the Royal Mail having converted the chips into Surface Mount Devices! I learn something new every day: now I know that the Royal Mail put all their mail under a steam roller in the sorting offices. Some work with the pliers could unbend the chip pins, so I am told. See below for some photos of the result (Left: Dave G8XUL; Middle, Right: Charles G3OTH).

{gallery}qrsskeyer/post{/gallery}

The chips are now sent in nice padded Jiffy-bag envelopes, and use the chip tubes, see the [on line shop](#)