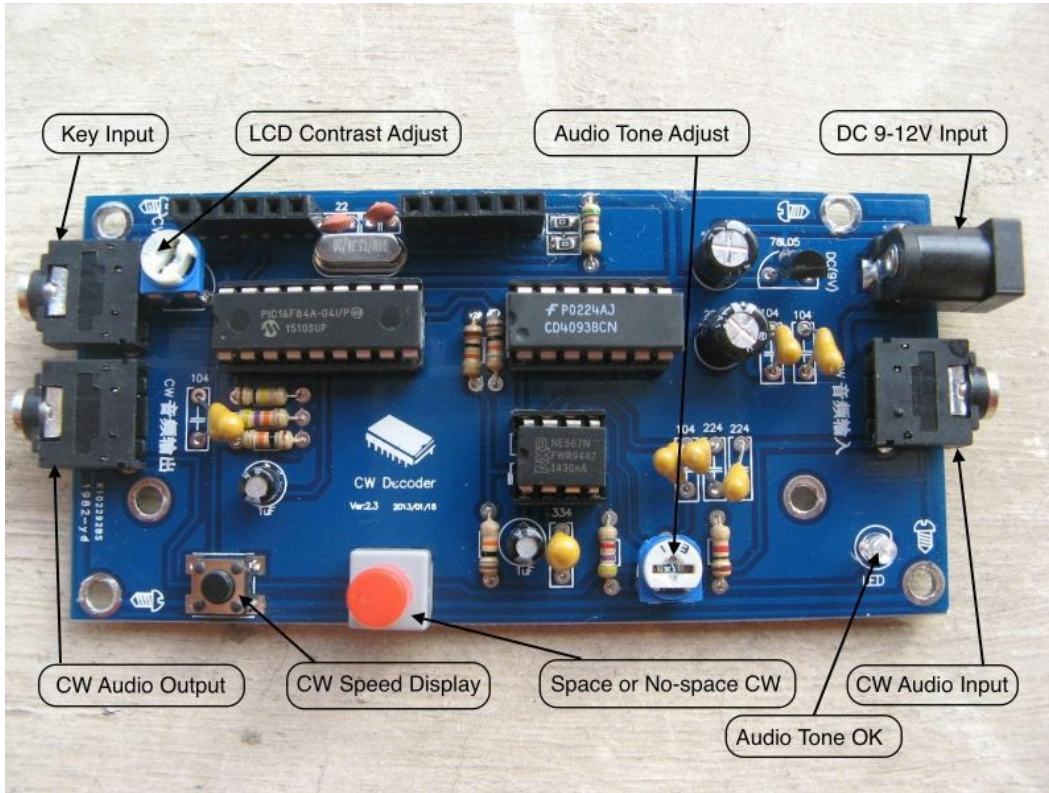


CW Decoder -- [cw decoder from banggood, inc](http://www.banggood.com)

YOUTUBE - Video <https://www.youtube.com/watch?v=jMVEp35KCF8>





Original Article from QST August '99 -- http://www.ik3oil.it/project_eng.htm && [PDF](#)

Another clone based on - IK3OIL CW Decoder

Original Article from the web @<http://www.qsl.net/wb8rcr/cwreadr.html>

Intro

In recent months, I've been playing a bit with PICs. It's interesting business, but sometimes it's hard to figure out where it makes sense to apply the beasties. Francesco, IK3OIL, had an article in the **August '99 QST** on a Morse decoder using a PIC16F84. The circuit is pretty simple business, and has a lot in common with many other PIC/LCD projects. Indeed, it seems like there are lots of things that have a PIC and an LCD and some input circuit. For most of these projects the circuitry is about 90% common. Francesco has the information on his reader on [his website](#).

I had agreed to do a presentation on PICs at the local [radio club](#), and this seemed to be a nice project to show off. Further, a local friend, N8ERO, also had an interest in this circuit, so we set off to build our flavor of this thing.

Design Choices

I made a couple of choices on how this thing should be designed, based on stuff I had and what was cheap. First, it seemed to me that a nice, large display was a good thing for a CW decoder, and [B.G. Micro](#) has this gorgeous, 40X1, backlit LCD for like \$7. The thing is 7" long so it makes a very nice display.

The BG Micro LCD1010 (Optrex DMC40131) turns out to be an extended temperature display, so I needed to provide a source of negative voltage to get good contrast. I ended up making a little charge pump from a 555, although something like an ICL7660 would probably have been a better choice, but I didn't have one. I did experiment with using the negative supply from a MAX232, which worked well, but seemed like gigantic overkill.

The 555 won't swing rail to rail and thus doesn't make the best charge pump in the world on a 5 volt supply. In fact, the result was marginal ... it was barely enough and probably wouldn't work on another display. N8ERO used cross coupled CMOS gates to drive a charge pump which worked a lot better.

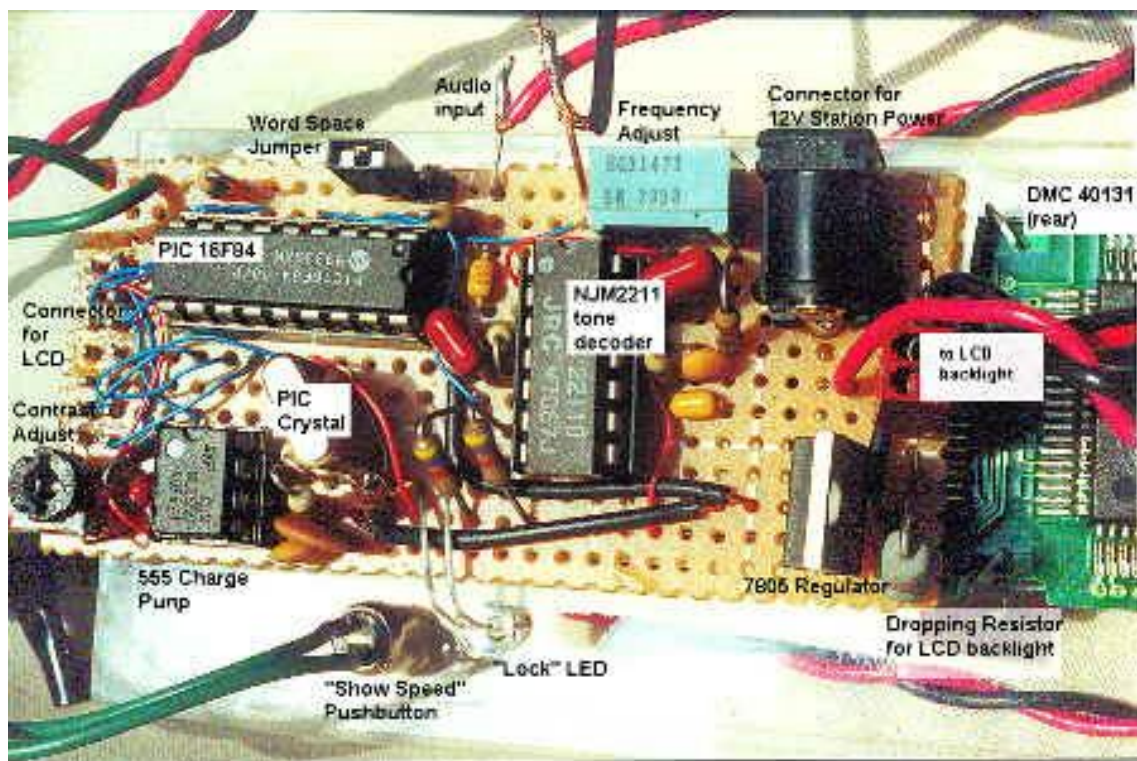
I also have a more or less standard connection between the PIC and an LCD. I modified Francesco's program to use this connection. This allowed me to test the software on test circuits I had on hand before building the actual circuit board for the decoder. All of my projects involving PICs and LCDs use this same connection.

Francesco used a 567 to detect the CW note. I didn't have one on hand, and a trip to the local Radio Shack also came up empty. Rather than wait for mail order, I decided to press an NJM2211 into service. It took a little math and more experimenting, but it works pretty well. This part is overkill for this circuit, and I have no evidence that it works any better than Francesco's original. In fact, N8ERO used the 567 with pretty much the same result. He has some interesting improvement ideas on this part of the circuit that may turn out well... News at 11.

The final change was updating Francesco's CW table. Since there was plenty of memory available in the PIC, I added codes for all the CW characters I could find. (Did you know that in a few places, the same Morse character can represent different letters??) Also, since the LCD I had included both upper and lower case letters, I changed the display of some of the prosigns to make a little more sense. For example, I made the AS character display as a lower case 'w'.

If I recall, there was only one character that Francesco left out that I ever heard on the air. But for the club demo, I programmed another PIC to send a rather long message in Morse to the decoder, and having some special characters turned out to be nice for that purpose.

Construction



The unit is simple enough that I simply wired it point to point on a perfboard. On the left is a 7X2 header (B.G. Micro ACS1019) which allows the entire circuit to be plugged into the back of the LCD.

I chose a 7805, instead of a 78L05, because the backlight draws considerable current. That is

also the reason for the 1 watt resistor.

a closer view.



Front View



Rather than figure out how to cut a neat hole for the display, I simply mounted the whole shooting match on a piece of Plexiglass which replaced the front panel in a B.G. Micro CAS1003 case. Our local hardware store sells off scraps of Plexiglass real cheap. Many of these scraps are perfectly adequate for making front panels, bezels, etc., and typically a piece big enough for a half-dozen panels costs a quarter or 50 cents. OK, maybe it's not the most beautiful thing in the world!

Ready for
Operation



Here's the unit nestled between the other rigs at WB8RCR. Notice the display matches that of the 2100H and 706MkII. (Although as you can tell, I'm really not all that big on the cosmetics <g>, but it might make a difference to someone whose shack is in the living room).

Ok, for the curious, and because I don't have another picture of the shack on the site here:

Icom 2100H (Whiterook keyer hidden to the right)	Icom 245 (for packet)
2N2/40	Icom 706MkII
MFJ 1274 TNC	MFJ 971 Tuner
CW Reader	Square Brass
Bencher paddle partly visible	Racer

Not shown: NC-20 (on loan), HTX-202, Icom Q7A, SMK-1, a couple of Fireball 40's, Pixie II, a really ugly homebrew 15 meter rig, and the K1 (on the way as of this picture).

Additional LINK -
http://va3ndo.tripod.com/CW_MORSE_DECODER.html