FUN on the Bus with the FUNKeYer!

What the heck is it? The **FUNKeYer** is a simple Morse code keyer with a bit of a twist. It doesn't require a soldering iron to build it. It also has a two FUN Morse code game modes and another two modes where it acts as a simple keyer. I have designed it with machined pin sockets for inserting the parts, pre-soldered the sockets AND cut and pre-bent all the parts for easy insertion without (hardly) any tools at all. Builders with nimble challenged fingers will find a small pair of needle nose pliers quite useful..and builders with ocular noseeum the teenie tiny numbers and letters syndrome would find a small lighted hand magnifier a welcome sight. A small flat bladed jewelers screwdriver to nudge pins into holes can also come in handy.

The 4 modes of operation are:

THE main mode for FUN on the Bus

Mode#1: The FUNKeYer 2 BUTTON KEYER

When you apply 9 volt battery power for the first time, the **FUNKeYer** starts up in Mode#1. It spins its wheels until you press the middle white button tactile switch which serves as the memory switch. Let it spin a bit as it is randomizing internally. Press the button and the **FUNKeYer** will beep once to tell you it is now in Mode#1. The side tone frequency will be set randomly between 500 and 2000Hz. It also picks a random 7 letter secret word from an internal table. Now you can send dits and dahs to your hearts content on the red topped tactile switches and the **FUNKeYer** will complete each dit and dah perfectly as per the speed setting on the trimmer potentiometer. Take away the power and reapply and it will automatically power up in Mode#1 with the same side tone frequency and secret word.

FUN: With 55 FUNKeYers built and running on the bus, the audio of all the side tones and callsigns and secret words will cram the cilia I your ear with signals like a pileup at a Dxpedition! Pick a signal and follow it for a bit to sort the secret word and call sign out from the din. Move on to another 'station'... who can dig out the most stations?

Mode#2: The FUNKeYer straight key keyer

If you find it challenging to send Morse code using the coordination of two fingers then Mode#2 might be more to your liking. Power the unit down, then PRESS & HOLD all three push buttons while you reapply power will cause the **FUNKeYer** to change modes. Once power is up again, release all the buttons and the **FUNKeYer** will sound out with 2 quick beeps telling you it is now in Mode#2. This is the straight key mode. It still has a random side tone frequency and secret word but now the dah switch works as a straight key. Pressing the memory switch causes the FUNKeYer to send the secret word......then add you call sign to make a BBQSO. Use the 2 button paddle mode or the straight key mode. Give a sharp listen for the neighboring sounds and secret words and try to pick out the calls and words that go together from the audio pileup....

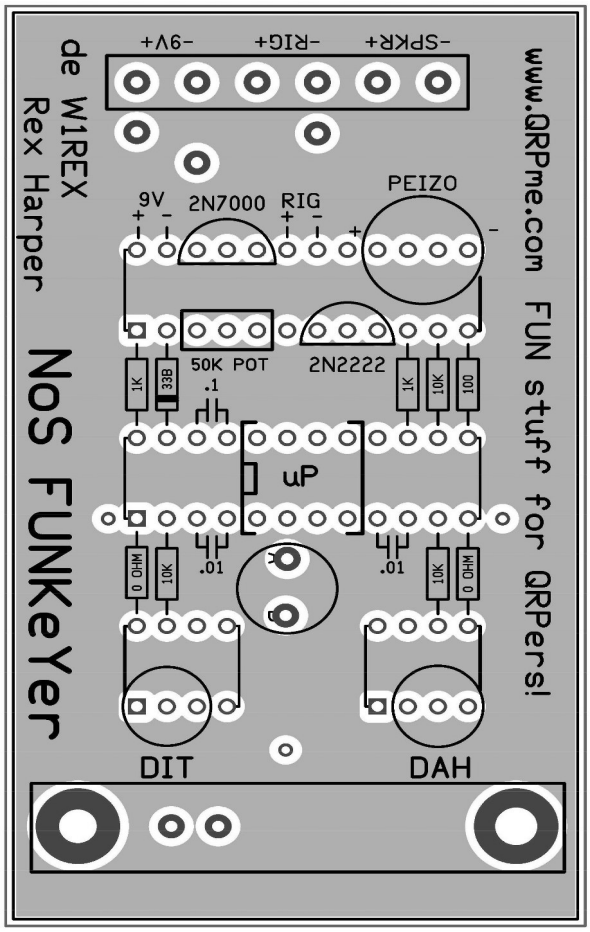
Mode#3: 2 button keyer is back to being a regulr 2 button keyer with the side tone frequency = 700Hz and the memory button ='CQ CQ CQ DE'

Mode#4: straight key is again similar to Mode#3 but with straight key operation instead of 2 button keyer operation.

Silk Screen layout for the FUNKeYer

There are a couple of notes about the build:

1. 9 volt battery, 2N7000, Peizo, Zener diode and microprocessor are all polarity sensitive parts. Install them to match the outlines and markings on the silk screen.
2. The .1 and .01 caps are very loose as to the capacitance value installed so for the ease of building the FUNKeYer on the bus, I have kitted all 3 caps as the same value...(.1uf)
3. The 3rd tactile switch, with the white button, is Initialize/Start and the memory keying switch.
4. The microprocessor chip (up) usually comes with a little spread outward on the pins. You should VERY GENTLY bend the lead a little more perpendicular for ease of insertion into the socket pins. You can bend them one at a time with pliers or lay the chip on its side and bend all 4 pins in on one side just a little and then do the same for the other side.



OK Let's have some FUN and build it!

IMPORTANT HINT: Putting a component in the machine socket holes and simply mashing down on it to seat it in place will just cause the part to crumple up if the component leads(s) are not actually started into their proper center holes on the socket pin. Gently wiggling the component & leads back & forth while gently pushing it down will reveal whether or not the component leads are started properly. You can feel it when the leads find their actual socket holes. THEN & ONLY THEN do you push down on the component with a little authority to seat the leads down into the socket holes.....

THIS method to build the FUNKeyer without problem...is to work from the center out to the edge of the board TO ELIMINATE height interference issues.

PARTS LIST: in order of installation by (STEP#)

(1) = 12F1840 pre-programmed FUNKeYer microprocessor
(8 pin plastic DIP IC on a piece of anti-static black foam)
{NOTE: IC has polarity mark so match orientation w/silk}

(2) = .1uF caps (QTY=3) marked 104 on one side...
(little yellow bodied caps with .1” spaced leads)

(3) = 1N5231 zener diode
(a tiny glass diode pre-bent for .4” spaced hole spacing)
{NOTE: MATCH orientation on silk screen}

(4) = 1K resistors (QTY=2) tan body (BRN-BLK-RED)
(see a resistor with a tan body, it's a 1K)

(5) = 10K resistors (QTY=3) blue body (BRN-BLK-ORG)
(see a resistor with an ORANGE stripe, it's one of the 10Ks)

(6) = 100 ohm resistor blue body (BRN-BLK-BRN)
(by process of elimination, the last resistor must be a 100!)

(7) = 2N2222 transistor
(plastic TO-92 with the skinny .050” spaced leads)
{NOTE: MATCH transistor orientation on silk screen}

(8) = 2N7000 FET transistor
(2nd plastic TO-92 with the bent leads for 3 .1” spaced holes)
{NOTE: MATCH transistor orientation on silk screen}

(9) = 50K trimmer potentiometer
(a small black and white trimpot with built in thumb-wheel)

(10) = tactile switches (light touch) (2)
(little round tactile switch with red button top)

(11) = Piezo buzzer
{NOTE: MATCH + polarity mark orientation on silk screen}

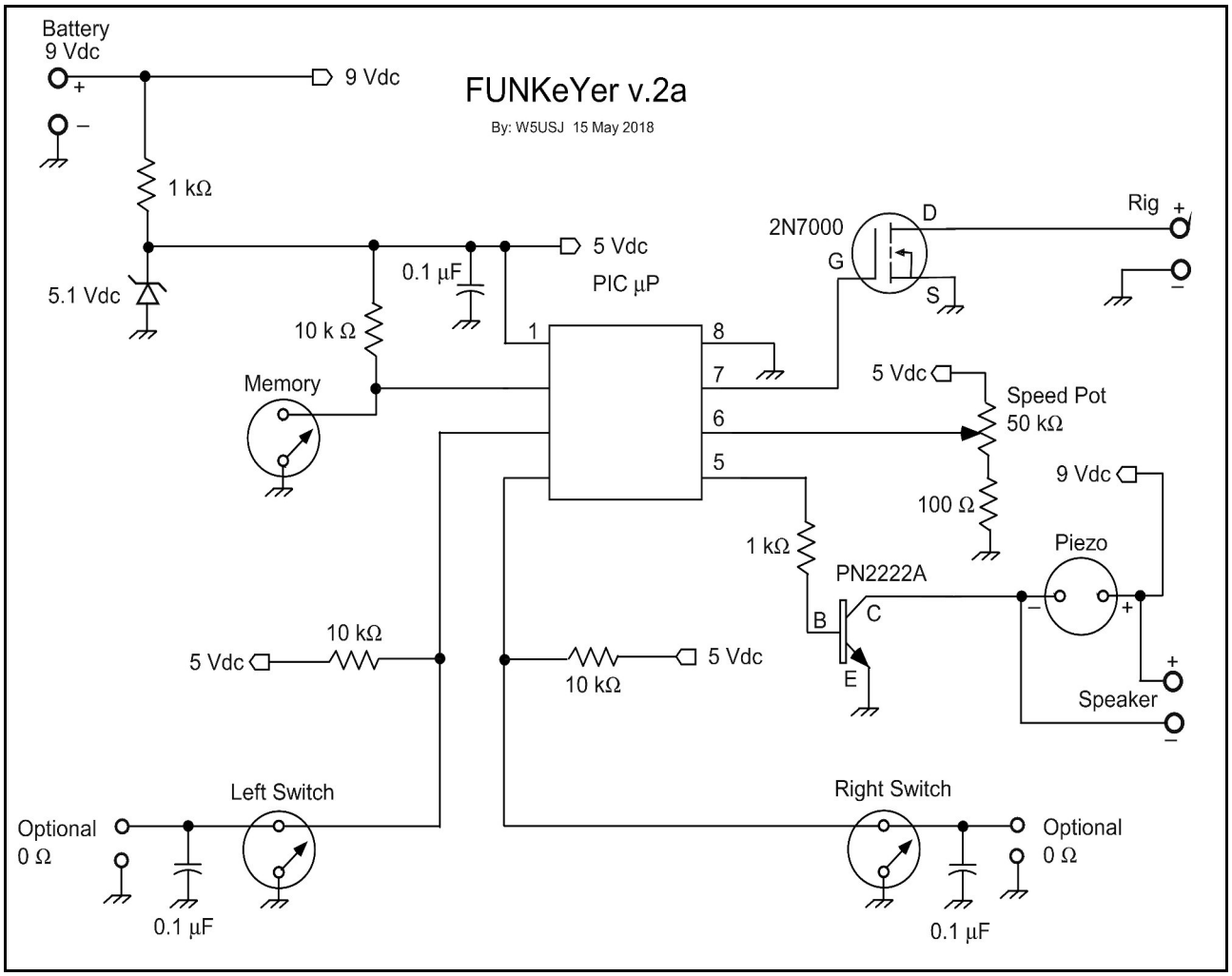
(12) = 9 volt battery snap
{NOTE: MATCH +RED/-BLACK leads with marking on silk screen}

Once you visually inspect to check your work against the build picture, you can install the 9 volt battery into the snap and GO!

Modes 1 & 2 are intended as entertaining diversions to your long bus ride home from the Dayton Hamvention. Once you are back home, you can shift to modes 3 & 4 to use the FUNKeYer as a actual simple keyer to your rig. You can connect the output of the 2N7000 to act as a key device fto your rig.

DO NOT hook it up to a high voltave keying lino on say a vacuum tube rig without providing appropriate isolation. The 2N7000 with easily key most typical QRP rig.

Latest FUNKeYer Schematic



The FUNKeYer was conceived, designed, programmed and kitted for you by Rex Harper W1REX
www.qrpme.com