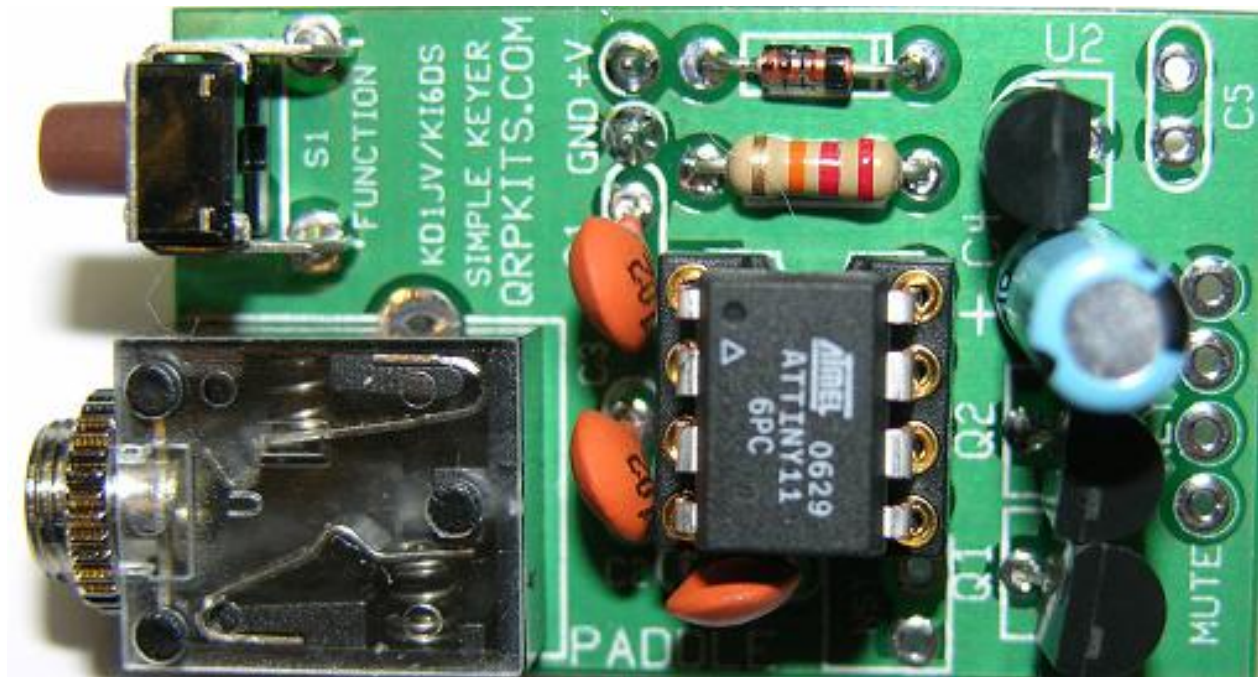# Pacific Antenna Simple Keyer Kit

Specifications and Features:

Speed range of 5 to 30 wpm

Operates in either iambic A or B mode, with B being the default
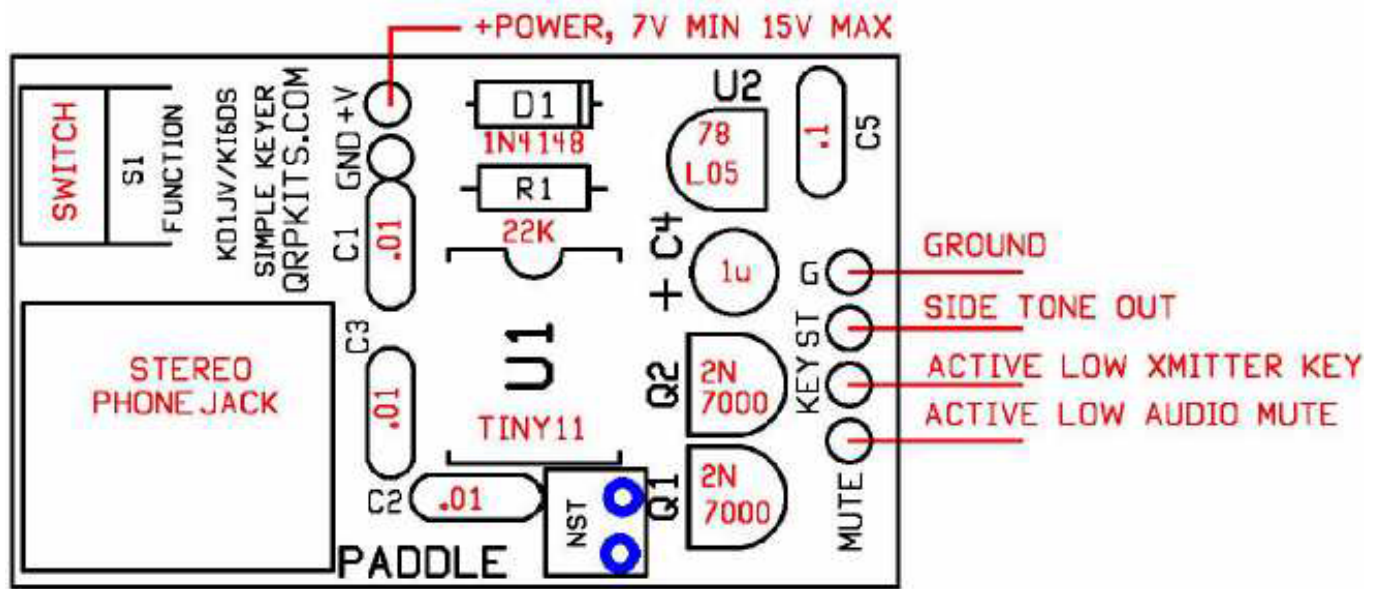
2 message memories

Tune and Beacon modes

Built on a 1 inch by 1.5 inch circuit board

Paddle jack can be used to mount the board or it can be remote mounted.

If panel mounted, only two holes needed

Parts Location Diagram:

Parts and Installation Sequence:

Install the following parts, making sure to check orientation with the diagram above and the board outline as they are installed

1) D1, 1N4148 glass diode, (match band end to board outline)

2) R1, 22K resistor Red/Red/Orange/Gold

3) 8 pin IC socket, (match to board outline)

4) C1, C2, C3 - .01uF (103) capacitor, (orientation does not matter)

5) Phone jack (only fits one way)

6) U2, 78L05 voltage regulator (match to board outline)

7) C4 – 1 uFd electrolyticcapacitor, (match board layout, + on board should be opposite – on capacitor

8) Q2, Q1 – 2N7000 MOSFET (match board layout)

9) C5 - .1 uFd (104) capacitor (orientation does not matter)

10) S1- Mode control switch, horizontal board mounted momentary switch.

11) Tiny13 microprocessor chip (match to board and socket notched end)

Connections:

The paddle jack is wired for "standard" paddle plug configuration of tip dot, ring dash, sleeve ground.

Key: This connects to the rigs straight key input and is active low.

Sidetone:
A Piezo electric speaker (not a buzzer!) can be directly connected to this output.
Note: A low impedance (8 - 32 ohm) dynamic speaker CAN NOT be directly connected.

If the keyer is built into a rig, the side tone can be injected into the rigs audio amp using a low pass filter to smooth out the square wave tone output to make it sound better and to reduce the amplitude from 5 volts peak to peak to something more reasonable. See the schematic on the last page for typical values.

If the rig uses a LM386, generally, one of the input pins is not used. This might be pin 2 or 3. Injecting the side tone (using the low pass filter) into the unused pin will produce volume control independent side tone level.

NST pads:
NST stands for No Side Tone. If your using the keyer with a rig which already generates side tone when transmitting, there is no need for the keyer to do it.

By putting a jumper between the NST pads, this will turn the side tone off when keying a rig. The side tone will still be active when the Function switch is used, as you need that audio feedback when using the switch.

Audio Mute output:
Most of the users of this keyer will not use the audio mute output. This output goes low (ground) before the key output does, and goes back high (open) about 7 milliseconds after the key output goes high (open).

The audio mute output is useful if you building the keyer into your own home brew rig, as it eliminates the R/C delay network normally required in the rigs audio mute circuit.

Using the NST jumper to turn the side tone off when keying will of course defeat the audio mute output. However, if your using the NST jumper, there is probably no need for the audio mute output.

Keyer operation:

The momentary switch is used to access the keyer functions.

Clicking and holding closed the switch for various lengths of time access these functions.

There are five possible functions which are selected using the "Function" Switch.

These are:

1. Send message

2. Set code speed

3. Enter and exit Tune Mode

4. Enter store message mode

Sending messages: (A message must be stored before this function will work)

After a short, quick click of the function switch, tap the Dot paddle to send message 1 or tap the Dash paddle to send message 2.

Once a message has started to be sent, it can be paused, stopped or set to beacon mode.
Note: only message 1 can be used for beacons.

Pause: Close and hold the Dash paddle.

Stop: Close and hold the Dot paddle.

NOTE: these actions will occur after a character currently being sent has finished sending.

Beacon mode:
Click and hold the function button as Message 1 is being sent.

The letter "B" will sound from the side tone when the mode is activated.

There is a fixed 3 second pause between repeating the message.

Closing either paddle during the pause will terminate beacon mode.

In addition, message Pause and Stop can be used during the sending of the message.

Change code speed:
A short, quick click of the switch enters change code speed mode.

There is a short pause to see if you want to send a message, then letter "S" will be sounded by the side tone.

Closing the Dash paddle will increase the code speed, a dot will sound incremented by 1 wpm increments

Closing the Dot paddle will decrease the code speed and a dot will sound each time the speed is decremented.

At the upper and lower speed limits, a double dot (I) will sound.

The change code speed mode will automatically exit after the paddles have been released for about 1 second.

Tune mode:
Tune mode is used when you want to key the transmitter continuously to say adjust an antenna tuner or make a power output measurement.

Click and hold closed the function switch until the letter "T" is sounded by the side tone (about 1 second)

To key the transmitter on, tap the Dash paddle closed.

To turn the transmitter off, tap the Dot paddle closed.

Repeat as needed.

To exit Tune mode and return to normal operation, click the Function switch.

Entering Messages:

Click and hold the function switch closed until the letter "M" is sounded by the side tone, about 1 second after the tune mode annunciation of "T".

A message of up to 29 characters (including word spaces) may now be entered via the paddle.

If you exceed the maximum character limit, "EM" will sound and you will have to start again, making the message shorter.

If you have a 2X3 call, you won't be able to quite fit a 3x3 CQ into the memory.

"Ideal" timing of 7 dot times for character space and 21 dot times for word spacing is used to determine the completion of a character or word space.

To insure a word space in inserted, it is best to pause slightly longer they you would otherwise between words.

Click the Function switch when you are finished entering the message.

The message will repeat so you can check for timing errors. If you need to re-enter the message, click the Function button and "EM" will sound.

If the message was entered correctly, tap the Dot paddle to store the message in location 1 or the Dash paddle to store in location 2. "MS" (message stored) will sound and normal operation will resume.

Straight key mode:

If a mono plug is in the paddle jack at power up, the keyer will go into straight key mode.

In this mode, there is no need for the function switch, so it is disabled. This function allows using an external contest keyer if desired.

Schematic: