

# Betatech Instruments K11 Keyboard Keyer User's Guide

## Overview

K11 is a keyboard keyer which is used to generate morse code from an ordinary PS/2 computer keyboard. The board has a buzzer so it can generate an audible side tone. Without an HF transceiver, this keyer can be used as a code practice keyer. It can also be used as an electronic keyer for an iambic paddle. This feature is useful, for example, if you have an older rig that doesn't have an electronic keyer function. A special function, macro F8, will make this keyer to function as a beacon controller. Beacon mode is useful if you are setting up a propagation beacon, or a hidden transmitter for a fox hunt event, for example.

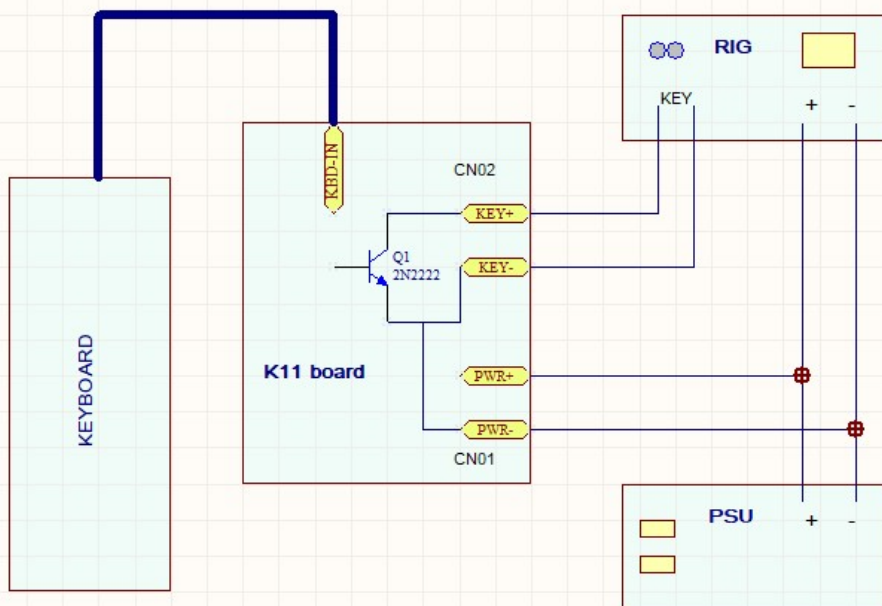
This board uses a Freescale 68HC908 microprocessor, enabling it to boot as quickly as you power it up. Therefore, you don't have to wait for a slow boot process, like if you are using a computer. You can start QSO as soon as you hear a station you want.

## Wiring the Keyer Board

- The PS/2 connector:            Connect to the keyboard
- Power terminal:                Connect 12V positive (+) and negative (-) from the power supply
- Key terminal:                  Connect this terminal to the transceiver (rig). Observe the correct polarity (Key and Gnd). Do not reverse the polarity since the circuit is an open collector circuit and can only conduct electrical current in one direction.

## Powering the Board

The following is the block diagram for connections. Inspect for the correct labels on the board:



Once powered up, the LED light on the board will flash once, followed by a "V" (dit dit dit dah).

## Initial Programming

When you receive the board, all the function keys are blank. You will need to provide your callsign and whatever macro you want the keyer to record.

1. Adjusting your WPM speed
  1. Press F11 to slow down or F12 to speed up your keying speed
  2. Press 'V' to test and hear if the WPM speed is suitable for you
  3. Once comfortable speed is reached, press F10, then F12. Your WPM speed will be recorded and the K11 board will use this WPM speed upon power up.  
If you adjust the speed (i.e. pressing F11 or F12 but recording sequence -- F10, F12 sequence is ignored), the next time the board starts up, it will use whatever WPM speed is currently in the flash memory.
2. Programming Your Callsign (F1)
  1. Once the board is powered up. Press F10 to enter programming.
  2. Press F1 to start callsign programming
  3. Enter you callsign (e.g. KC8ZZZ)
  4. Press F1 to end programming
3. Programming Macros (F2 to F8)
  1. Press F10 to enter programming
  2. Press F2 (or any function keys from F2 to F8 that you want to assign)
  3. Enter your macro (e.g. TNX FR UR CALL = UR RST IS)
  4. Press F2 (or any function keys from F2 to F8 that you pressed before) to end programming
4. Erasing a Macro  
If needed (e.g. you need to erase a beacon macro in F8), you can erase a macro by not entering anything during macro programming. For example, if you want to erase F8, you have to press F10, then F8, then F8.

NOTE: You cannot embed a function call in another function, e.g. calling F1 from within F2.

## Using the Keyer

Using the keyer is pretty straightforward. All keypresses will be translated into morse code as if you were using a straight key. All letters have to be lowercase (caps lock will not function) and all other keys like Pg Up, Pg Dn, etc will not work either. You have a 32-character buffer inside the keyer (you can keep pressing the keys even before the keyer is done generating the complete code).

Functions to remember:

- F1 – Calls CQ in the following format, "CQ CQ CQ DE <callsign> <callsign> K"
- F2 to F7 – Your own macro definitions
- F8 – Beacon mode macro
- F9 – Toggle TX/RX (key will be held down by the K11, use this when tuning your antenna, or zero beating your operating frequency, e.g.)
- F10 – Program macro command (and record keyer speed)
- F11 – Reduce speed
- F12 – Increase speed
- <Esc> – Cancels the current buffer (erases whatever you have typed into the buffer)
- <Space> – Inserts a gap between characters
- Left <Ctrl> – Generates a dit

Left <Alt> – Generates a dash

NOTE: It is best that you write down your macros and tape it near your rig for quick reference.

Prosigns to remember:

AR	: or ;
SK	} or ]
AS	{ or [

IMI	? or /
DN	" or ‘
BT	+ or =

NOTE: It is best that you create small stickers with the above prosigns and stick them on the appropriate keys for ease of use.

### Beacon Mode

Beacon mode allows you to control a beacon transmitter using the K11 board. This is useful, for example, if you want to set up a propagation beacon, or a hidden transmitter for a fox hunt event. There are endless possibilities for the usage of a beacon controller.

The K11 will enter beacon mode through the following:

1. On Power Up: if F8 macro is programmed, then the board will wait for the user to press <Esc> key. If there is no <Esc> keypress after approximately 3 seconds, then the board will start executing F8 continuously. <Esc> will terminate the beacon before or after the automatic F8 is executed.
2. Manually: If the user terminates automatic F8 execution (as described above), the board will function as normal. However, if the user presses F8, then the continuous execution of F8 macro will resume.

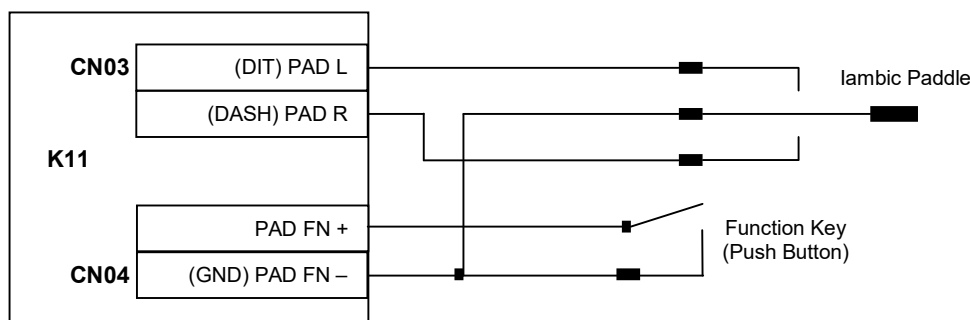
To operate the beacon controller, just program the board with an F8 macro. You can then remove the keyboard and use the K11 board to control your beacon unit without the keyboard. The K11 will start keying your transmitter system as soon as it is powered up.

For a propagation beacon, the typical message used is usually something like this:

“VVV VVV DE KC8ZZZ KC8ZZZ K”.

To make the board operate normally (does not engage beacon mode on power up), you need to erase beacon macro: Press F10, then F8, then F8.

### lambic Paddle Support



lambic paddle can be connected to the terminals available on the board.

1. F1/F2 Macro: Pressing function key briefly followed by a DIT paddle press will result in the execution of F1 macro. Brief function key press followed by a DASH will result in the execution of F2 macro.
2. WPM Adjust: Pressing function key for approximately 3 seconds will result in the board sounding a "V" which indicates that you are in WPM adjust mode. Pressing DIT will increase WPM followed by another "V". Pressing DASH will decrease WPM followed by another "V". Once comfortable speed is reached, you can press the function button momentarily and the board will sound an "R". You can also leave the board for 3 seconds without doing anything (in the WPM adjust mode) and the board will exit out of the WPM adjust by sounding an "R". The new WPM will be recorded into flash memory and used the next time the board powers up.

NOTE1: Iambic paddle as well as function button are not provided with the board purchase.

### CW Zero-Beat Using the Side Tone

CW zero-beat will ensure that you are transmitting at exactly the other station's frequency. This will tell him/her that you are addressing him, no matter how narrow his/her CW filter is. To do this, tune the TUNING dial (on your transceiver) so that the received tone matches the tone generated by the K11 board. Normally you can do this by turning the VOX OFF, and then pressing F9 button (on the keyboard) once (this is similar to closing your CW key).

There are two sources of reference tone on the board: The 3 kHz audible buzzer and 800 Hz square wave pulse at TP1. You will have to take into account the setting on (or design of) your transceiver. Your transceiver need to have the CW signal received translated into output tone for comparison with the reference signal. You will have to take into account your rig's "CW offset" in calculating the beat frequency difference.

To use the 800 Hz square wave signal generated at TP1, you will need to inject it into your rig AF amplifier in order to utilize it as the 800-Hz beat frequency reference. Note that this is a 5 V square wave signal and may need low pass filtering to obtain a pure sine wave signal.

### Product Support

*A note on electromagnetic compatibility:* This product has been designed with a special care given to the electromagnetic compatibility. However, this design consideration may not be sufficient in all cases. If you are experiencing a really bad RF in the shack or other RF induced problems with the product, you may be unable to operate your station correctly with the keyer.

Technical support is available on our website or via email. It is recommended that you use the email address for correspondence.

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