

Cric-Key
Assembly Manual v. 1.0

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Introduction

Thank you for purchasing a CRIC-KEY keyer. We hope you will enjoy building it and find it a fun addition to your QRP station. This kit was designed to complement 4SQRP's popular CRICKET series of QRP transceivers with a useful and easy-to build keyer circuit.

High quality, double sided printed circuit board construction is used, with solder mask and silk screened component reference designators. All components are through-hole for easy assembly. The CRIC-KEY can be constructed by beginners as well as experienced builders. Construction time is approximately 30 to 90 minutes, depending on experience level.

Specifications:

The CRIC-KEY circuit is inspired by the iambic keyer design of ZL2PD, utilizing only two common CMOS logic ICs and a handful of passive components. The speed is adjustable from roughly 5 to 50 WPM. The battery is connected to the circuit when the connection cable is plugged in, though the standby current is microamps so that a 9 volt battery will last for nearly a year even when powered on.

First Steps

Before getting started with building the CRIC-KEY, take some time to organize and familiarize yourself with the parts provided and check them against the Parts List. Building over a cookie sheet is recommended to minimize parts being lost. To prevent static damage, it is recommended that the ICs not be removed from their anti-static packaging until you are ready to install them. If parts are missing in your kit, send an email to the kitter listed on the webpage at 4SQRP.com. Replacements will be provided promptly, and free of charge.

It is helpful to acquire the necessary tools and supplies before beginning. These include:

- *Soldering iron – 20 to 30W, preferably thermostatically controlled.
- *Fine 60/40 rosin core solder
- *Diagonal cutters
- *Needle-nose pliers
- *Fine file or emery board

*Flat blade and Phillips screwdrivers

Schematic and Component Placement diagrams are provided as part of documentation package. It is highly recommended to print a copy for reference during construction. As you build, you can check off each construction step as you complete them in order. When you think you are done, you can check the list to verify that all of the parts have been installed.

Step 1 – PCB Separation

Two PC board panels are supplied with the kit. These contain multiple boards separated by V-grooves. These smaller boards may be separated by resting the board on the edge of a table, and pressing down firmly on either side of the V-groove. The boards will snap apart cleanly.

- () Snap off the two adjustment disks and the paddle support from the main PCB.
- () Snap apart the two paddle levers.
- () Once separated, lightly sand the rough edges of the boards until smooth.

Step 2 – Battery Connectors

- () Locate the two battery clips. Obtain a 9v battery. We need to be sure that the spacing of the battery clips on the board is proper so that the battery will attach properly.
- () Hold the battery flat with the terminals pointing away from you and the positive (+) terminal on the right. Snap the battery clips onto the battery, mounting pins facing down, and insert the battery clips through the holes on the board. Be careful not to let the clips touch and short out the battery!
- () Double check that the positive terminal of the battery and the mating female battery clip is at the right. Flip the board over, holding the board down firmly on the battery, and solder the battery clips into place.
- () Remove the battery, and proceed.

Step 3 – Resistors

Insert and solder, and check off each when completed.

	<u>Ref</u>	<u>Value</u>	<u>Color Code</u>
()	R1	1M	Potentiometer
()	R2	100k	Brown-Black-Yellow

- () R3 100k Brown-Black-Yellow
- () R4 100k Brown-Black-Yellow
- () R5 100k Brown-Black-Yellow
- () R6 100k Brown-Black-Yellow
- () R7 10k Brown-Black-Orange

Step 4 – Semiconductors

Be certain that these components are inserted correctly, according to the silkscreen diagram.

- () Q1 IRFD110
Notice that two of the four legs of this MOSFET are bridged. These two legs are oriented at the TOP of the board
- () D1 1N914
- () D2 1N914
- () D3 1N914
- () D4 Red LED
Notice the round rim of the LED has a flat side. This is oriented toward the TOP of the board. After installation, SAVE the leads from the LED!
- () U1 CD4027
- () U2 CD4093
Notice that the ICs are marked with a notch which must be aligned with the silk screened symbol.

Step 5 – Capacitors

	Ref	Value	Type	Label
()	C1	0.22	Monolithic	224
()	C2	0.22	Monolithic	224

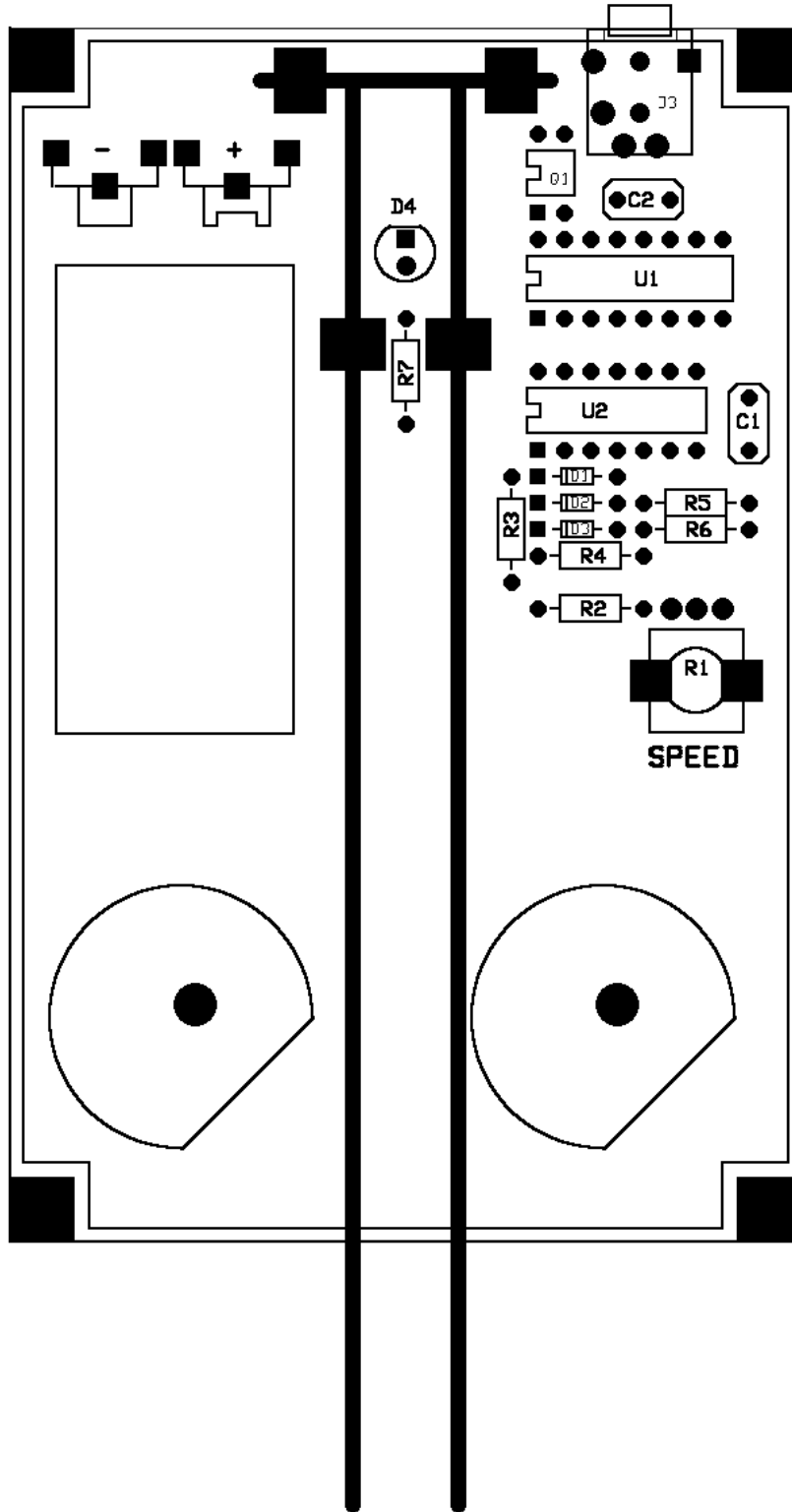
Step 6 - Final Assembly

- () Solder the 3.5mm keyer jack to the board in the J3 position.
- () Locate the tee nut. Lightly sand the faces of the three prongs. Place it face down on the work surface. Take the left paddle arm, and place it, silk-screen side down over the Tee nut, pressing down firmly so that it is seated firmly upon the tee nut. Solder it into place.

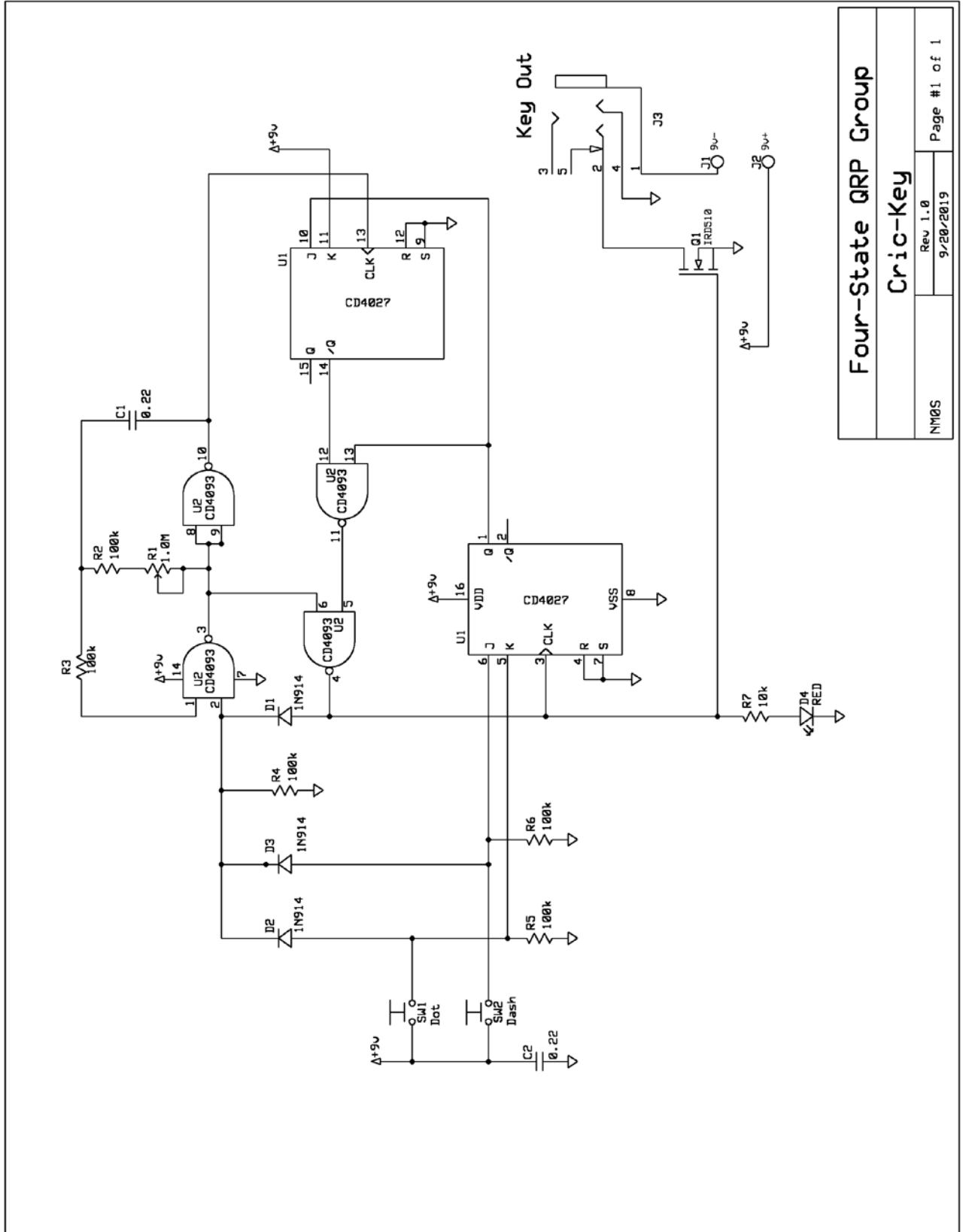
- () Take the two paddle arms and the paddle support bracket. Pre-tin the small solder tabs on the paddle arms, support bracket, and the main PC board.
- () Position the paddle support, the paddle arms on the main PC board. Place the two adjustment disks under the front edge of the paddle arms to support them at the proper height from the main PC board.
- () Use a rubber band or tape to temporarily hold all pieces in place, and then solder the paddle arms to the PC board.
- () Tack solder the paddle support to the PCB at the rear of the board. Readjust this as necessary to make certain that the paddle arms fit flush against the support.
- () Tack solder the paddle arms to the paddle support bracket.
- () Readjust these solder joints as necessary to make certain the paddles are straight and parallel.
- () Take one of the LED leads saved from earlier, and install it through the two through holes at the top of the paddle arms near the ICs.
- () Install the three 1/2" aluminum standoffs to the board using three 1/4" metal screws from beneath the board.
- () Install the flat washer to the center standoff using the remaining 1/4" screw.
- () Install the adjustment disks to the outer standoffs using the 1/4" nylon thumb screws.
- () Install the 5/8" nylon thumbscrew through the tee nut until it just touches the opposite paddle.
- () The PCB may be mounted to a base using the four sheet metal screws and spacers.

You are done!

CRIC-KEY Component Placement



CRIC-KEY Schematic



Four-State QRP Group

Cric-Key

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Parts List

Ref	Value
C1	0.22
C2	0.22
D1	1N914
D2	1N914
D3	1N914
D4	RED
J1	9v-
J2	9v+
J3	Key Out
Q1	IRFD110
R1	1M
R2	100k
R3	100k
R4	100k
R5	100k
R6	100k
R7	10k
U1	CD4027
U2	CD4093

Qty	Description
1	#6 flat washer
1	6-32 T-nut
4	6-32 x 1/4" screw
3	1/2" 6-32 round spacer
2	1/4" 6-32 Nylon Thumb Screw
1	3/4" 6-32 Nylon Thumb Screw
4	#6 x 1/8" spacer
4	#6x 1/2" sheet metal screws