Deluxe Touch Paddle Keyer

Build this updated paddle with three outputs for any type of transmitter.

This project is an update to my previous keyer[1] with currently available components. It also includes the ability to interface with just about any transmitter/transceiver in existence. The Keyer output is for modern transceivers with the touch paddle keyer in charge of CW parameters. Paddle output is used when you want to use your transceiver's keyer. And finally, the High Voltage output is for tube rigs requiring high voltage keyer switching using the touch paddle keyer chip.

Circuit Description

The touch paddle is based around the IQS127D, a single channel charge-transfer touch sensor that will operate on 2.95 to 5.5V at less than 30μA. Two of these chips coupled with the popular Norcal 12F629-NCK keyer chip make an impressive touch paddle keyer with a small footprint.

Controls and I/O

Front panel controls include a pushbutton MEM switch for accessing the keyer's setup and memory menu, a SPEED pot, DIT and DAH paddles, a VOLUME pot, and an LED power indicator. The two paddles are fabricated from 1/8-inch copper plate. Cutting templates were temporarily fastened to the plate and the outlines cut with a band saw. All rough edges were filed, sanded, and polished. The paddles were then glued to a fiberglass spacer which is screwed to the vector board. The rear panel features a 12VDC input, HIGH VOLTAGE KEYER OUT, PADDLE OUT, and KEYER OUT jacks.

Touch Switch (U1-U2, IQS127D[2])

The IQS127D is a single channel capacitive proximity and touch device which employs an internal voltage regulator and reference capacitor. The touch sensor is capable of detecting near-proximity or touch. The recommended RC values were tested and were too sensitive as the paddles were detecting near proximity. Capacitors C18 and C19 were added to reduce the sensitivity to sensing touches only. The output is active low and interfaces directly to the dit and dah inputs of U3.

Keyer (U3, 12F629-NCK[3])

The 12F629-NCK is a popular keyer chip from Norcal. The keyer's tone output is connected to a low pass network and audio amplifier U5 which drives a small speaker.

The 12F629-NCK offers:
- Pot or paddle speed control
- Three 40-character memories
- Memories & settings retained without power (EEPROM)
- Iambic A or B keying modes

- Beacon mode
- Low standby power
- Speed range: 4-48 wpm
- Reverse paddle mode
- Bug/Straight key mode
- Auto space mode

Keyer Output (J1)
The keyer chip (U3) output is routed to this 1/8" stereo phone jack. Set the rig to use straight key or external keyer.

Paddle Output (J2)
The DIT and DAH outputs from U1 and U2 are routed to this 1/8" stereo phone jack for using the transceiver's internal keyer. The tip is DIT, and the ring is DAH, and the shell is ground.

High Voltage Keyer Output (J4)
The keyer output is sent to CPC1978 (K1), a single-pole normally open (1-Form-A) solid state power relay rated for up to 800V and 0.75A rms continuous load current (without a heat sink).

Power (U4, 7805)
12VDC power is supplied via J3 and is regulated to 5V by this voltage regulator. Diode D1 has been added for reverse battery protection. The diode is reversed biased by normal polarity when placed in parallel with the circuit. When the voltage is reversed, the diode conducts and clamps the reverse voltage to no more than one diode drop (0.7V).

Enclosure
I chose a small attractive enclosure and was able to fit all the components inside. A printed circuit board would have made it easier and may be made available as time permits.

Assembly
The circuit was built using perforated vector board and point to point wiring. Using the supplied template, cut the vector board to fit. Layout is not critical except for U1, U2, and associated components. U1 and U2 are symmetrically mounted near the dit and dah electrodes so they will have the same sensitivity. I added a sheet of cardboard under the vector board to prevent shorting any components to the enclosure.

Setup and Operation
Keyer setup is accomplished by using different combinations of the paddle and MEM switch. Multiple functions result from multiple switch-press combinations (MEM alone, MEM+DIT, MEM+DAH, MEM+both DIT and DAH). Also, the switches can be pressed and released (PAR) OR pressed and held for two seconds (PAH). This doubles the number of combinations of the three control switches.

Happy building and I hope to hear you on the air!

Allen Baker, KG4JJH
211 Brochardt Blvd.
Knoxville, TN 37934
kg4jjh@arrl.net

Attachments
Attachment 1: Assembly Drawing
Attachment 2: Details and Templates Drawing
Attachment 3: Schematic Drawing
Attachment 4: Materials List
Pictures

Acknowledgements