Configure Mortty's K3NG CW Keyer sketch for CW SideTone

Written by: Larry K8UT 2022-08-27
Thanks to: Robert K8RGI for his initial process description

The K3NG CW Keyer sketch can produce CW sidetone from an Arduino Nano, but there is no room for a sidetone speaker inside Mortty's miniature case. To facilitate CW sidetone from Mortty v4, N8AR and K8UT replaced the stereo (two conductor - dot and dash) paddle jack with an A/V (three conductor - dot, dash, and spare) paddle jack - creating an easy method for getting sidetone audio out of the Mortty case to an external speaker.

Enable Sidetone in the K3NG CW Keyer sketch:

1. Download and install the Arduino IDE from the www.arduino.cc website
2. Download and unzip the **`Mortty CW Keyer sketch_Mortty_v4_only`** ZIP file from the HamProjects website
3. Launch the Arduino IDE
4. Navigate to the **`k3ng_cw_keyer_master\k3ng_keyer`** directory and open the **`k3ng_keyer.ino`** source code file
5. With the CW_Keyer code displayed, from the list of include files across the top row of the editor, open the file **`keyer_features_and_options_mortty_regular_with_potentiometer.h`**. (HINT - there is a drop-down arrow at the top-right margin for listing all of the files)
6. Locate the statement **`#define OPTION_SIDETONE_DIGITAL_OUTPUT_NO_SQUARE_WAVE`** and comment it out with two **`//`** slashes. (near line 103?)
7. Compile and upload the modified sketch to Mortty (for help with this step, see instructions in the Mortty documentation)

Modify Mortty for an aux audio output:

1. Remove Mortty's Output end cap (the end with the speed pot and LEDs)
2. Slide the circuit boards out of the case by pushing on the USB and Paddle connectors on the Input end of the case. (NOTE: Pulling on the Speed Pot will unnecessarily separate the circuit boards and complicate re-assembly!)
3. Read the pin designation on the Mortty printed circuit board (the large board) to locate **D4** - the sidetone output pin.
4. **Mortty v4 only:** Solder a jumper or a low wattage resistor* on the bottom of the board between points **D4** and **TP1** (test point 1). Press the resistor flush against the board so that it will fit in the case.
    a. *Jumper or low wattage resistor value: The CW Keyer sketch provides adequate sidetone volume into a small 8 ohm speaker using a wire jumper. However, if you plan to use an amplified speaker, you should replace the jumper with a voltage dropping resistor. K8RGI used a 47K ohm resistor to drive his amplified speaker.

5. **Mortty v3 and earlier versions:** Solder a wire to connector **D4.** Solder a second wire from the **GND** pin of the Mortty printed circuit board. Drill a hole in Mortty's case to extend these wires outside the case to your external speaker.
6. Reassemble the Mortty CW Keyer

Connect Mortty's Sidetone output to an external speaker/amplifier:

- **Mortty v4 only:** - TP1 on the Morrty board connects to **Ring 2** of the paddle input port. You will need an A/V style TRRS (Tip, Ring1, Ring2, Sleeve) plug to extract that signal to your external audio equipment. (TRRS Plug and Cable: See the Mortty order page for an example of a TRRS plug and cable. *Mortty v4 Optional Output Cable pack.)*
- **Mortty v3 and earlier versions:** Connect the two wires from step #5 above to your speaker.

Configure your logging program for Winkey Sidetone: CW Sidetone is an option in most logging program's configurations for Winkeyer. You may need to enable sidetone and then close/launch the logger for sidetone to start working.