

## How to build a Morse transceiver

Maybe the simplest transceiver ever invented in the world. A useful activity to learn the Morse code; the transceiver can be used with the Morse key described in a separate activity.

**ATTENTION:** While the described device can be freely used for reception, its transmission frequency is in a ham radio band. A radio amateur license is formally required.

**Learning targets:** Get familiar with the soldering of electronic components in an electronic board (PCB) - learn Morse code.

**Materials:**

- Kit Pixie QRP (available online)



- Soldering iron and relative accessories.
- 2.5 mm DC connector, as in the below image



- 9V battery and connector, as in the below photo



- 3.5 mm audio jack to be connected to the Morse key (instruction are provided in a separate activity)



- Ground connection and antenna wire

**Time and preferred place:** 2-3 hours. Soldering irons require the availability of 110/220 V sockets.

**Description:** The "Pixie" is maybe the smallest and simplest existing Morse transceiver. Once every component is soldered on the board, connect the 9V battery to its connector, and the wires of this connector to the DC connector (black wire=negative=external side of the DC connector). With the DC connector it's finally possible to give voltage to the circuit. For the antenna, the kit comes with a BNC connector, to feed a 52  $\Omega$  coaxial cable (eg RG58) towards the antenna. A proper antenna can be built following the instructions for the CB dipole (the total length of the dipole should however be about 21.4 m, since the transceiver frequency is about 7,023 MHz), using a BNC connector in place of the PL259 antenna. Alternatively, instead of a dipole, a vertical wire, 10.7 m long, can be connected to the central pole of the coaxial cable, while the braided shield should be grounded. These antennas are for best performance; for simple reception, any long wire connected to the central pole can work.

The kit can be used by patrols to receive Morse (CW) messages sent by a ham radio operator.

If groups/patrols included radio amateurs, patrols could exchange Morse messages at the camp, between tents or cooking sites.