

# **ARDF 80m Transmitter**

## Construction Manual

Version 1.01

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# Introduction

The transmitter described here was developed by Les Tocko, VA7OM, and Joe Young, VE7BFK. It has evolved from being a simple beacon for receiver testing to its present state with accurate timing that makes the transmitter suitable for use in the new international ARDF sprint and fox-or competitions. The final stage of this evolution described in this manual includes a new printed circuit board layout by Dave Miller, VE7PKE, and preparation of a complete kit of parts to simplify construction.

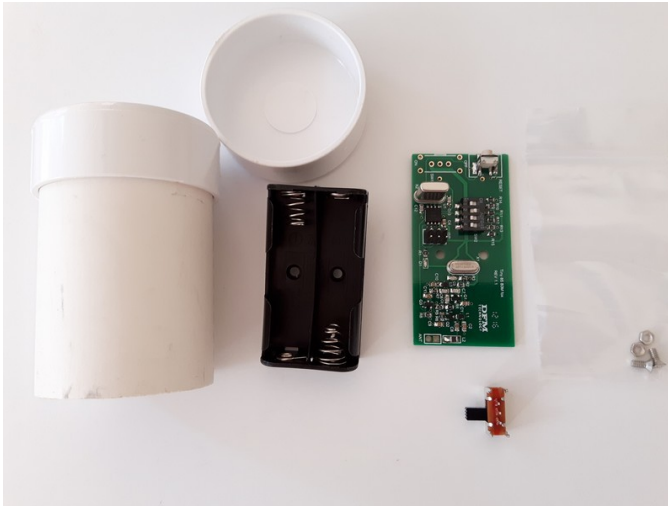
The transmitter kit and a receiver kit are being made available to support a series of ARDF promotion presentations given by Keith Witney, VE7KW, Amel Krdzalic, VA7KBA, Les Tocko, VA7OM, and Joe Young, VE7BFK in the spring of 2016. The microcontroller is supplied programmed with the user's choice of fox ID and callsign ID.

A description of the microcontroller software and memory programming is available in a separate manual.

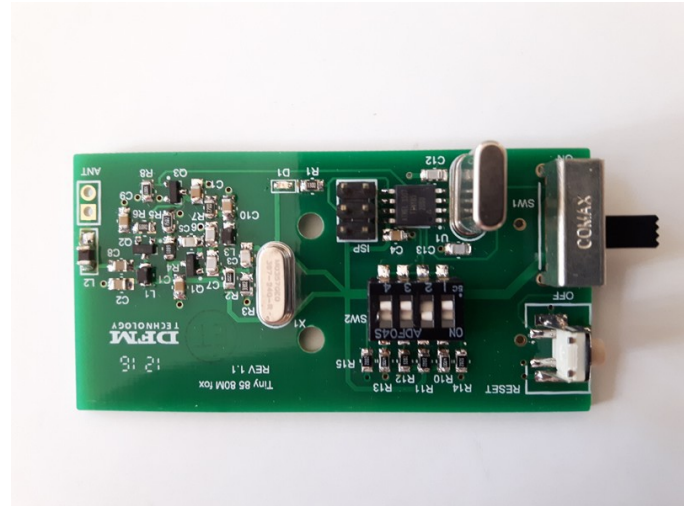
Features of the transmitter:

- Provided with a moisture-resistant, PVC pipe, enclosure.
- Operates from 2-AA cell battery, total current depends on antenna, approximately 10 mA.
- Switch programming of 4 operating modes: Sprint slow, Sprint fast, beacon, standard timing
- The “it's working” indicator LED stays off after first few seconds to conserve battery.
- A callsign ID is sent with high-speed Morse code in the first cycle of operation, then sent again every 30 minutes thereafter.
- For the Sprint modes (12 seconds transmit/48 seconds off) the timing starts from power-on or release of reset, the on-time interval is automatically determined by the fox number: fox 1 starts immediately after reset release, fox 2 starts 12 seconds later, fox 3 24 seconds later, etc.
- For the standard timing (1minute transmit/4minute off), the transmitting starts on reset release regardless of which fox number is programmed.

## Assembling the transmitter



**Figure 1. Transmitter kit parts**

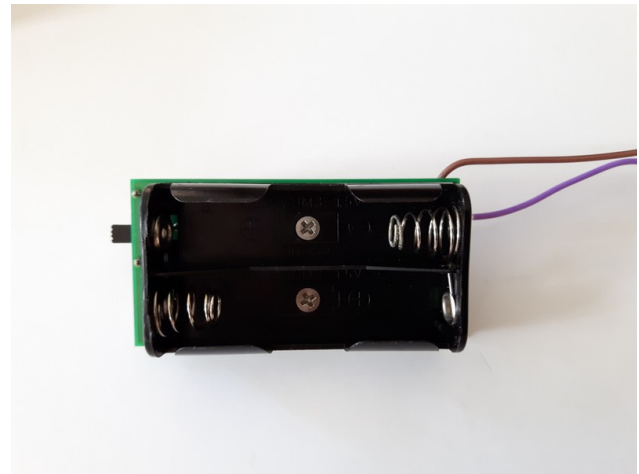


**Figure 2. Mount power switch**

The kit is supplied with a single printed-circuit board with most of the components already mounted. The user needs only to mount the power switch, battery holder, and antenna on the board. Then place the assembly into the enclosure.

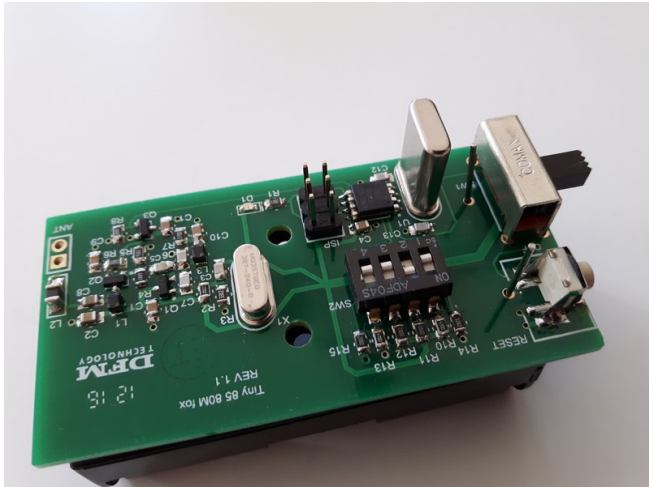


**Figure 3. Mount battery holder**



**Figure 4. Battery holder fastened**

Place the battery holder leads into their PCB holes. Then, fasten the holder to the board using the two #4 screws and nuts. Then, solder the holder leads and trim off the excess lead length.



**Figure 5. Solder, trim battery leads**

Prepare the antenna and counterpoise wires. It is suggested that flexible, light, insulated, 22 GA, hookup wire be used. The vertical antenna wire is 2m long, the counterpoise wire is about 1m long. Solder the longer antenna wire to the square board pad (nearest to inductor L2) and the counterpoise to the other pad. There are two slightly different layouts of the circuit board which are shown in the appendix, but they are electrically identical.

To prepare the enclosure provided in the kit, drill a hole in one end cap—say 1/4”—to allow the antenna and counterpoise wires to exit. A small screw eye or hook can be installed on the opposite end—pre-drill the mounting hole for the screw eye with a 1.15mm drill.



**Figure 6. Prepare housing.**



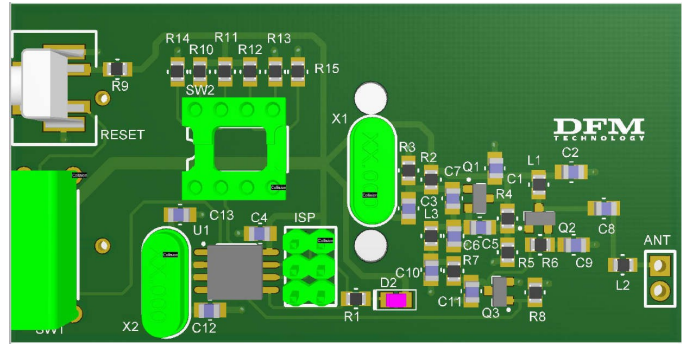
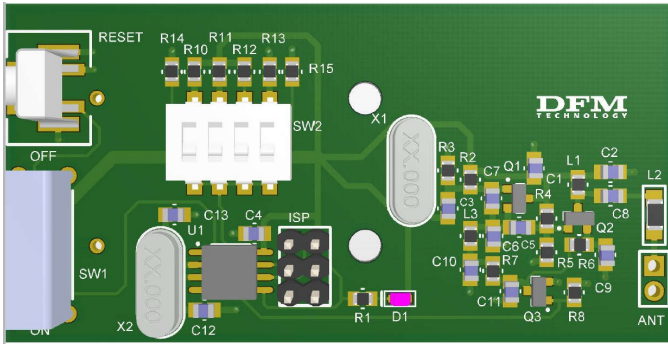
***Figure 7. Transmitter deployed***

To make a water-resistant deployment, feed the vertical antenna wire through the screw eye and hang the free end from a tree branch or other support. Leave the counterpoise dangling below.

Another deployment arrangement is to have the transmitter on the ground with the counterpoise flat along the ground and the vertical antenna suspended from a branch.

It has been observed that the vertical element should be kept well clear of branches and leaves over its entire length for maximum range of reception.

# Appendix 1 – Board Layouts



# Appendix 2 – schematic

