

# **A Waterproof Shielded Housing for Active Short Monopole Antennas**

by

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## Introduction

Making a waterproof housing for an active antenna can be just as demanding as making the antenna itself, but with average mechanical skills and materials from a local hardware store the task can be made quite simple.

### Waterproof Outer Housing

Borrowing from some ideas used in the construction of the AMRAD active LF antenna (1), a simple waterproof outer housing made with standard PVC plumbing fittings was devised. The housing is made in two parts, a lower and an upper. The lower portion of the outer housing, which is shown in Fig. 1, consists of a 2.5" cap, a 1.75" MPT to Slip PVC adapter, a 1/2" long section of 1.25" sch 40 PVC pipe, and a 6" long section of 2.5" sch 40 pipe. The 2.5" size was chosen as a standard 3.25x2.125x1.125" aluminum box will snugly fit inside. All of these pieces are cemented together using PVC cement.

The upper portion of the outer housing, which is shown in Fig. 2, consists of a second 2.5" PVC cap, a .75" to .5" PVC reducer bushing, a .5" PVC cap, and a section of .5" sch 13.5 PVC pipe of the desired length to fit the antenna. All of these parts are cemented together using PVC cement, as with the lower portion of the outer housing. These two portions can then be slipped together and sealed with RTV or any suitable sealant so that it can be disassembled later if needed.

This assembly can be mounted at the end of a section of 1.25" pipe using a metal or PVC coupler, and the pipe, which serves

as a mast, can also be used for the ground connection. The RF cable and any other needed wiring can then be passed through the pipe and exited at an appropriate point using a 1.25" plumbing tee.

### Shielded Inner Housing

Shown in the top view of Fig. 4, the shielded inner housing is made from a standard 3.25x2.125x1.125" aluminum box, which is made by Bud, LMB, and Hammond and which is available from a wide variety of distributors. The box is fitted with a standard SO-239 coaxial connector on one end, though any connector can be used, along with a 10-24 bolt, lock washer, and nut to be used as a grounding post. Feedthru filters may be added for those designs that require a separate wire (or wires) for power and tuning.

The opposite end is fitted with a 1/2" PVC electrical fitting. The antenna proper is a piece of 1/2" copper pipe, cut to whatever length is desired. A short collar made from 1/2" sch 40 PVC pipe is used to make a firm fit between the copper pipe and the PVC fitting, which will require some filing or other means to achieve the needed inner diameter.

The centre view of Fig. 4 shows the shielded inner housing assembled with the antenna, and the lower view shows the inner shielded housing inserted into the upper portion of the waterproof outer housing.

### References

1. Gentges, F., "The AWRAD Active LF Antenna," *QST*, September 2001, pp. 31-37.



Figure 1 - Upper Portion of Waterproof Outer Housing:  
Exploded View (left) and Assembled View (right)

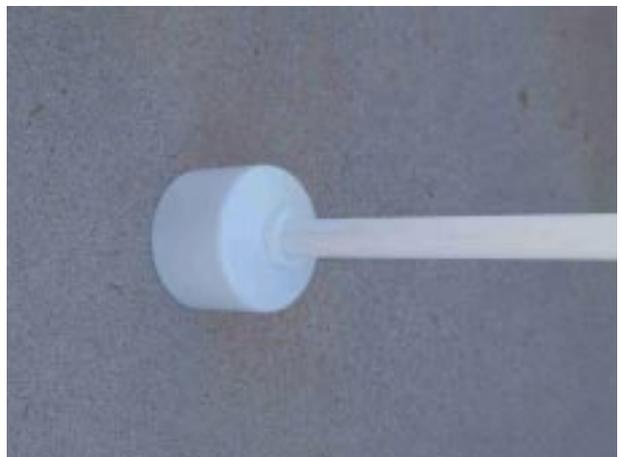
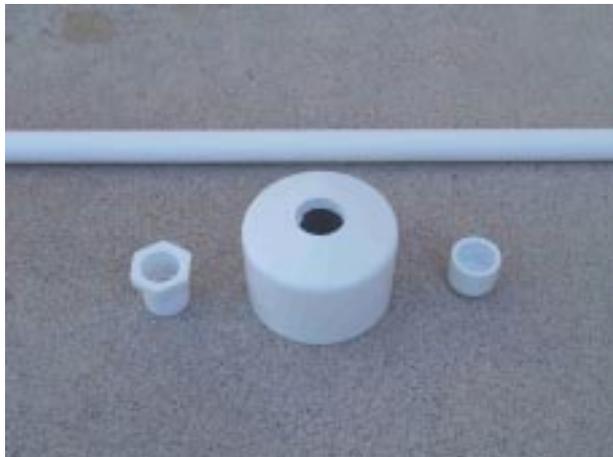


Figure 2 - Lower Portion of Waterproof Outer Housing:  
Exploded View (left) and Assembled View (right)



Figure 3 - Assembled Waterproof Outer Housing

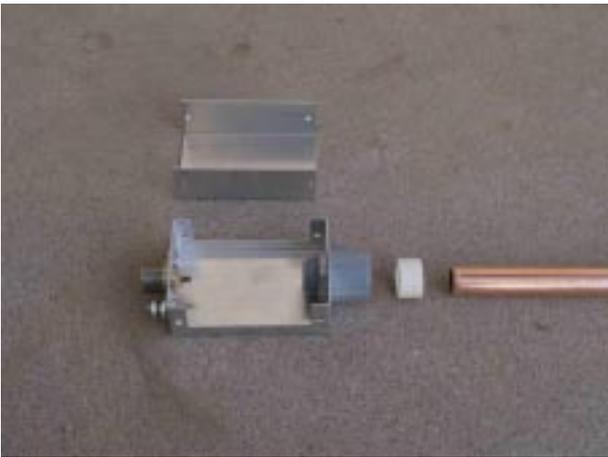


Figure 4 - Shielded Inner Housing:  
Exploded View (top), Assembled  
View (centre), Inserted into Upper  
Portion of Outer Waterproof  
Housing (bottom)