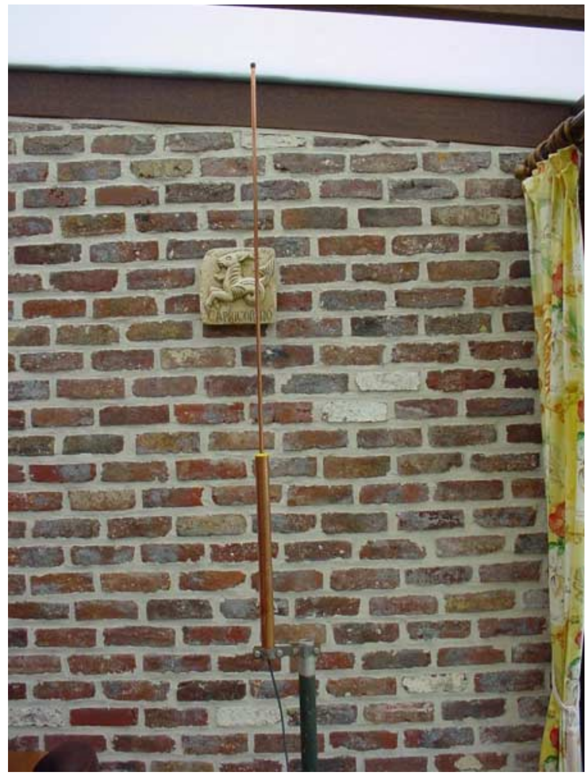
# The SPERRTOPF ANTENNA for the TWO-METER BAND

**By ON4CFC, Pascal Veeckmans** **Translation: By Jef Verborgt**

This month ON4CFC, Pascal Veeckmans, member of the “GARDS“ and notorious antenna builder, will show us how to build a “Sperrtopf” or “Sleeve Antenna” for the two-meter band. The antenna is made from readily available plumbing materials, is built like a tank, and should last for many years even under the most unfavorable weather conditions.

*Photo 1*

*Photo 2*



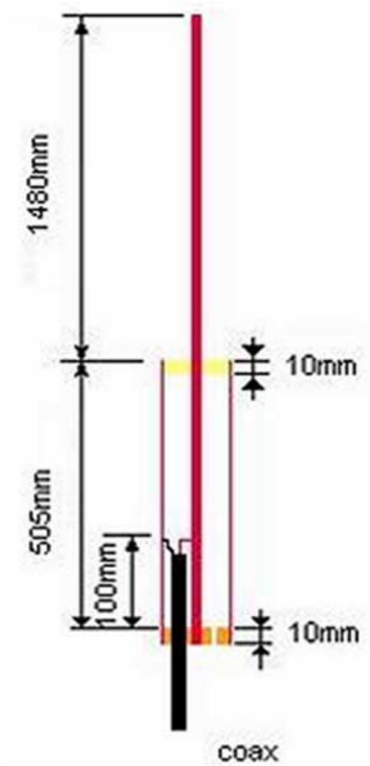
First some history: The Sleeve Antenna was first developed by A. B. Bailey and described in US patent #2184729 in 1937. In its original form, it is a vertical dipole or coaxial antenna where the last quarter wavelength of the coax feeder is enclosed in a metal pipe or sleeve—hence, the name Sleeve Antenna.

In German-speaking countries, a version of this antenna is also known as the Sperrtopf Antenna, which simply means that the sleeve or coaxial pipe acts as a “SPERR“ or choke, and this choking action will avoid RF to flow down on the outside of your coax. So if you suffer from some RF bites on your equipment, this might be the solution to your problem.

The original Sleeve Antenna has the height of a standard half wavelength dipole. The antenna that we describe here today is also related to the J-Pole antenna. This design was originally developed by HB9BBN from Switzerland, who should get all the credit for its design. The Sperrtopf antenna is said to have an improved circular radiation pattern. Its gain should equal the gain of the more common J-Pole antenna.

From the drawing in **Figure 1**, you can see that the radiator is about half a wavelength long and that the bottom part is a quarter wavelength long. The antenna is fed like the conventional J-Pole antenna by sliding up and down the contact points until we find the sweet 50-ohm spot.

*Figure 1: The Sperrtopf antenna schematic*




***Your shopping list:***

- Copper pipe with a diameter of 34 mm and a length of 505 mm.

- Copper pipe with a diameter of 10 mm and a length of 1480 mm.

- Note that the antenna can also be made entirely from aluminum tubing. One should try to refrain from using dissimilar materials in order to avoid bi-metallic corrosion.

- A metal disc preferably made from copper with a diameter of 32 mm and a thickness of 10 mm. This disc should have a tight fit inside the larger copper pipe.

- A plastic disc made from PVC or cut from a breadboard with a diameter of 32 mm and a thickness of 15 mm. This disc should also have a tight fit inside the larger copper pipe. It is very convenient to use a common " hole saw " to cut such a disc from polyethylene breadboard.

- Some small stainless steel screws.

- A rubber cap with a tight fit on the smaller diameter copper pipe.

Most of these building materials will be readily available from your local hardware store. Making the metal disc for the bottom end of the antenna requires the use of a lathe. However do not despair if you do not have access to a lathe. Just use a plastic disc instead and secure the inner pipe by means of a brass bolt. The essential point here is that both copper pipes here should be connected galvanically.

## Building the Sleeve or Sperrtopf antenna:

- Cut the copper pipes to the correct lengths and smooth the edges with some sand paper or a file.

- Drill small holes in the copper pipes to allow soldering of the coax shield and coax center conductor. The correct distances for the holes are 110 mm from the bottom end of the smaller pipe. See Photos 3, 4, and 5.

Photo 3

Photo 4

Photo 5

- The top disc can be made from any plastic like material for example from a bread board and can be cut easily by using a power drill and a common " hole saw ". In the center of this disc we drill a small hole with a tight fit for the smaller diameter copper pipe. See Photos 6 and 7.

Photo 6

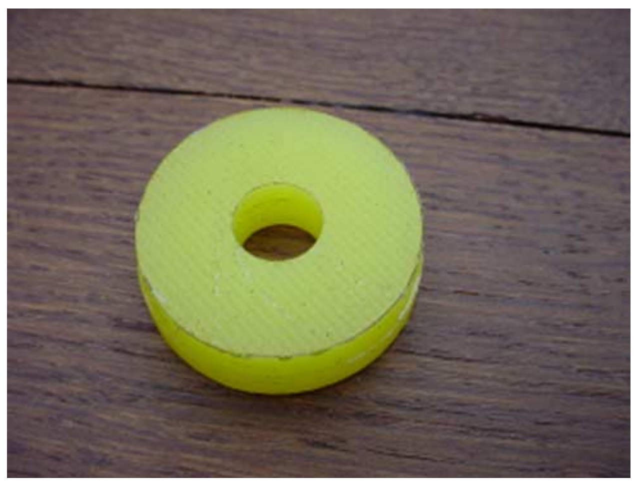
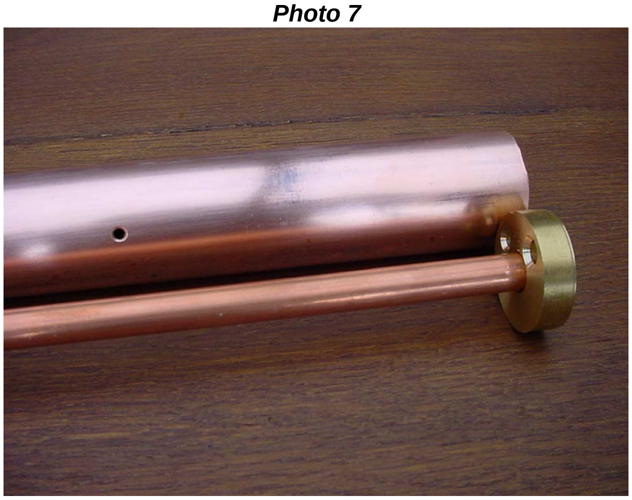


Photo 7



- The bottom disc was made from a 10 mm thick chunk of aluminum using a lathe. Copper would be better in order to avoid bi-metallic corrosion. Unless you are really good at metalworking, you might wish to find a metal workshop in the neighborhood to make this for you. This disc has three holes in it, one in the center for the main radiator (read thinner copper pipe), one hole to allow for the coax to enter the sleeve and one smaller hole to allow for any rain water to get out. (See Photos 8, 9, 10, and 5) If no metal disc can be made or found, just make a plastic one and connect both pipe ends with a brass bolt in order to get a good galvanic contact between the two radiators.

Photo 8

Photo 9

- Mount the two discs on the thinner copper pipe (see Photo 5).

- The coax is now soldered to the two copper pipe as per Figure 1. It does take some "fishing" experience to get the coax shield (after thinning the braid) into the smaller hole of the larger pipe. You might wish indeed to use some fishing line to guide the shield when attempting this tricky part of the mounting exercise.

Photo 10

- The radiator is now mounted inside the larger pipe, the discs are mounted flush with the pipe ends and are secured using some stainless steel screws.

- The top end of the radiator is then waterproofed by using a rubber cap that can easily be found in any hardware store. Of course the rubber cap will enhance the looks of your newly built antenna, which is also important.

The result is an antenna built like a tank (See Photos 1 and 2 at the beginning of this article.) and should give you many years of service. The measured 2:1 SWR bandwidth was from 140.9 MHz to 150.9 MHz. Of course the antenna can easily be scaled up or down for other interesting frequencies.

The gain of this antenna should equal the gain of a standard J-Pole antenna. The design can easily be scaled up for use on the ten-meter band. CB'ers interested in a performing antenna with gain and an omni-directional radiation pattern should also consider building such an antenna. The bottom part (one-quarter wavelength) could be installed underneath the roof for increased mechanical stability and ruggedness. **–30-**


BRIEF BIOGRAPHY OF AUTHOR

**Pascal Veeckmans was born on January 13, 1965 in Tienen Belgium. He is married to Marleen and has a ten-year-old son, Glenn. Pascal, employed by the Belgian army, and is a member of the BAFARA Belgian Air Force Amateur Radio Association. He got his first license in 1996 and passed the Morse code in 1997. That earned him the call sign ON4CFC. Pascal can be heard frequently on the HF band.**

**DR. JEF VERBORGT - Translator of this article - Flemish to English**


***Jef Verborgt*** **was born in 1944 in Belgium. Jef was saved from a certain early death by meningitis by the American soldiers having the first penicillin for which he is still grateful. He went on to obtain a Ph.D. degree in Polymer Chemistry in 1970 at Louvain Belgium followed by a postdoctoral Fellowship with Dr. C.S. Marvel at the** ***University of Tucson*****, Arizona. Jef has been Director of Research for** ***Sigma Coatings*** **for 15 years after which he became Director of the International Business Operations for Marine and Protective Coatings. Jef further held the position as President of** ***Sigma Coatings USA*** **in New Orleans, Louisiana. Jef now lives in Florida. He is married to Marijke from Holland where Jef had lived for some 20 years. He is the father of one daughter and two grandchildren who live in Belgium. Jef says he enjoys fishing, Louisiana food, experimenting with antennas and living in the USA.**