The J-POLE ANTENNA

Many amateurs begin their exploration into the benefits of antenna design by first learning that an effective station consists of more than a high dollar radio. It begins with a radio and a well matched antenna. When these amateurs start looking for a low cost antenna, they seem to tuurn to some form of end fed antenna which is most often thought of as being a version of a dipole. But until the J-pole was explored and defined as more than a wire end fed antenna, it was very much hidden and obscure. That is until one amateur put together a well written article which was published in the now defunked "73 Amateur Radio Today" magazine. And please don't forget the beginning of the design. A long wire end fed antenna in a J design flown behind the great Zeppelins.

I was discussing with Roy (W6LRT) the problem I was having with my copper J-Pole and he suggested I look at the idea of a double J-Pole. I was wondering "WHAT IN THE WORLD IS A DOUBLE J-POLE?" Roy was kind enough to retrieve the article from his "stash" of magazines, copy it and mailed it to me. As I read the article I was impressed. Roy managed to push me into publishing this article on the website when he mentioned the design of the Copper J-Pole was taken from the original Zep design used by Germany pre-WWII. Please enjoy the following.

John Post (KE7AX) defined another way to design an end fed antenna by making it out of copper tubing. Obviously his version of the Zep antenna was intended to be for the higher frequencies in the 2 meter and up range. And some will contest this article by saying they were using the copper J-Pole long before this article was published. This article does not contest that, it was simply a document that was read by many amateurs who then tried the design and found it was truly the antenna they had been looking for. From there the use of the J-Pole took off like a rocket.

The following are excerpts from his article published in February 1992 edition of the aforementioned 73 magazine.

"Remember those novice days when you ran your 40 meter dipole on 15 meters? Have you had your eyes on one of hte fancy new dual-band radios? Does your idea of putting up two separate antennas and running two feedlines pour cold water on your enthusiasm? Well, if you enjoy home-brewing, this may be your cup of tea!"

That introduction kind of sets the tone. Really? a "Fancy New Dual-Band Radio?" Was there ever a time when a dual or multiple band radio did not exist?

John goes on to write: "Since I was making a J-Pole (or "Copper Cactus" as he calls it), for the 2 meter band, I decided to try the antenna on 440. I was pleasantly surprised to find that it worked reasonably well . However, I was concerned because the SWR curve didn't bottom out. After making several changes I plotted new SWR curves, and decided on the dimensions shown in this article. You can change the dimensions, but be careful! Changing the dimensions will change both bands."

"One thing is certain; It's hard to beat the cost and fun you will have building the Copper Cactus."

Johns' final version of the J-Pole is actually two J-Poles on top of each other. One mounted upwards like the tradional antenna and the other inverted and mounted below. The feed line is attached to the antenna in a way very much like the traditional J-Pole. And he calls it his "Double Cactus."

The article defines all the measurements, materials and dimensions for the typical J-Pole. An intersting note is that he (John) writes after cleaingin the copper pipe with sandpaper, you may paint it any color you like. I never thought of painting my J-Poles, but it makes sense in that it keeps the oxidation down and presents an attractive image of the antenna where ever you have it mounted.

The last portion of the article defines the "Double Cactus" with the following comments: "This is for those who love BIG antennas. It is built using the same basic procedures as above. However instead of a 90 degree connector, buy two "T" fittings. Also cut the matching sestions 1/2 inch longer. And instead of buying only one 10 foot length of 1/2 inch copper tubing, buy two. "

The antenna is above and below, a miror image of each other. The antenna is mounted to a tower by way of a 1 and 1/2 inch diameter piece of PVC. Drill two holes to slip the antenna DOWN in to and mount the feed line to the upper section of the Double Cactus.

His summary of the new "Couble Cactus" performance is as follows: "When comparing this antenna to the standard J design, we found a stronger signal report on both bands. The reports weren't much stronger - maybe one or two S-Units - but you may find this antenna meets the need better.

John credits the help of his friends (Bob K7KUC and Tom WA2PHW who just had to try out his new software MININEC program written by Brian K6STI. Together these three performed some comprehensive testing comparing a standard J-Pole mounted on top of his tower to the perfomance of the Double Cactus mounted lower and on the side of the tower. They found the the radiation pattern to be "close" to other antennas of a similar design. (This again re-affirms that he (John) is not claiming to be the designer of the J-Pole or other versions of the double cactus). His double cactus had a major lobe similar to other antennas and a radiation angle that was very high as was seen with the standard J design. However he notes "The Double Cactus ssems to have a flatter angle of radiation when compared to the standard J design. The SWR curve are fairly flat, usually less than 1.5 to 1 across the band from 145 to 148 and 440 - 450.

He concludes his article by writing he has been using the J and Double Cactus for two years, and has not seen a change in the SWR curves. And "You should enjoy many years of happy dual-banding with the Copper Cactus."

Ok, so now point of this article was to inform and hopefully give the reader some ideas on designing and making changes to your standard antenna design you may be using. I am sure John did his homework before jumping and sweating and soldering copper tubing together.

And after publishing this article, the use of the copper J-Pole and individual variations of the basic design really took off. So when you build your next J-Pole, think of this article and consider the idea of making a Double Cactus, or your own variation. Have Fun!!