

# **The LKJ Wednesday Night Special Antenna**

by  
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## *A shortened (50 foot) 80 meter dipole radio antenna*

(Note: this is the full length version that is referenced from the BVARC Newsletter – November 2009 short version)

Summary: The LKJ Wednesday Night Special Antenna is a shortened 80 meter, coil loaded, dipole antenna design that allows amateur radio operators with restricted space, to operate successfully on 80 meters. The antenna as shown here can handle up to 1000 watts input.

Like many amateur radio operators I live in a residential subdivision in a one story ranch style tract home. Antenna limitations in an environment of this type include the limited space of a residential lot, deed restrictions and zoning ordinances. In my current station arrangement I use a Hustler B4TV trap loaded vertical antenna to cover 40 through 10 meters, but I lacked an antenna that would allow me to check into the Brazos Valley Amateur Radio Club (BVARC) Rag Chew Net on 80 meters (okay, 75 meters) at 3.910 kHz on Wednesday night at 7:00 PM local time. That is because I had taken down my homebrew vertical, which did cover 80 meters, to install the Hustler B4TV.

While surfing the web I came across a design for a shortened 80 meter antenna that was 50 feet long, as opposed to the normal 80 meter antenna length of 130 feet (see Fig. 1). It used two loading coils, and although a value of 67.83uH was given for the coils, the diameter was not. Since an antenna of this length would easily fit in my backyard, I decided to try and build one, even with the limited information available to me. And, if it worked, it might be of interest to other amateur radio operators and members of the club, who, like myself, lacked an antenna that would allow them to check into the BVARC Rag Chew Net. Since I am known, by my friends, as “The Great Procrastinator” the process I am about to describe took me about two years for inception of the idea to completion. But, I hasten to add it needn’t take you that long. Especially, since I am going to provide you with all of the important details that I lacked.

The first order of business had to be the coils. I had a Henry value but no coil diameter or wire size. I went to Rick Hiller, W5RH, one of the antenna experts in the club, and he came up with a coil design for me, including a diameter. Time passed and I never seemed to get Rick’s design built.

In the meantime, I shared my dream of a shortened 80 meter antenna with everyone that I knew, including the members of the Amateur Radio Campers, a group that combines RV camping and...you guessed it, amateur radio. At one of our campouts in the summertime, Jim McCreary, WB5PNL handed me a coil wound on a piece of PVC pipe. “There”, Jim said handing me the coil, “there is a coil with the 67.83uH value you stated. All you have to do now is wind another just like it and you’re in business.” The coil was different than Rick’s design, in that it had a smaller diameter. It was wound on thin plastic pipe as the form using enamel coated magnet wire. (See Photo 1) In addition, Jim provided me with some additional enamel coated magnet wire and a piece of PVC pipe. It wasn’t long, by my standards, before I had the other coil completed, but then I couldn’t seem to get the whole thing assembled.

Finally, Dave Compton, K5AMA, told me that if I would get all of the parts together he would help me assemble and tune the antenna during one of our campouts. So, on a beautiful fall day we laid out all of the parts and began to assemble. (See Photos 2 thru 4) Once assembled, we hauled it up into the trees and used an antenna analyzer to check the tuning. Much to my dismay it was resonant way outside the amateur ham 80

meter band. So, began the process, assisted by Charles Ellisor, WA5FMK, of taking 6 wire wraps off of the each coil, and then hoisting it back up and checking the tuning. This process had to be repeated six or seven times before we got the antenna to resonate where we wanted it to, which was 3910 kHz, the frequency for the BVARC Wednesday Night Rag Chew Net. (See Photos)

Installed at my house with a 25 ft. push-up pole in the middle, one end attached to the top of the gable on my house and the other end attached to a pecan tree in the back corner of my yard with a 50 ohm 8X feed I was ready to go. For optimum performance an 80 meter antenna should be mounted about 50 feet above the ground. Again, not possible at my location. Lower than this results, they say, in most of the emitted energy going straight up and back down. Not a good thing for DX maybe, but, I thought, ideal for communications on a local net.

The performance result was quite satisfactory. I was able to check into the BVARC Wednesday Night Rag Chew Net running a barefoot 100 watts and be heard by net control and most of those checking into the net. The antenna seemed to “hear” pretty well, also.

When I was requested to be net control operator for the BVARC Wednesday Night Rag Chew Net, I decided to add a linear amplifier to the mix. I purchased a Yaesu FL-2100B linear amplifier at the Belton Ham Fest in 2007. It puts out about 500 or 600 watts on 80 meters, and improved my signal strength so that I am easy copy for most check-ins on the net.

The down side of LKJ Wednesday Night Special Antenna design is that, because it is a shortened antenna, it is very narrow tuning from 1:1.5 at 3910 kHz. At about 100 kc either side of 3910 and you are at 3:1 standing wave. Use of a L-network antenna tuner, like the MFJ Versa Tuner V Model J-989, allows me to tune the rest of the 80 meter band with the antenna.

It is important to point out that the coil design may be varied in diameter, wire size and number of turns as long as the resulting change tunes to the desired frequency.

### **Antenna Specifications:**

Antenna Wire	: #14 gage insulated wire
Overall Length	: 50 feet
Distance for center insulator to coil	: 10 feet
Coil Diameter	: 1.0 inch
Coil Form Material	: thin wall PVC pipe
Coil Specification	: 87 turns of #16 enamel coated magnet wire
Feed Line	: Mini 8X 50 ohm coax
Center Insulator	: ¾” plastic pipe X 4” long with drilled holes
End Insulators	: ceramic egg shape type

### **Project Credits:**

K5LKJ	John Whiteman	Original Idea and Construction
4S7NR	Nadisha	Original Concept
W5RH	Rick Hiller	Coil Design Concept
WB5PNL	Jim McCreary	Final Coil Design
K5AMA	Dave Compton	Final Coil Tuning
WA5FMK	Charles Ellisor	Construction Assistance

**Photos – LKJ Wednesday Night Special**



**1) The Loading Coils**



**2) End Insulator**



**3) The Feed Point**

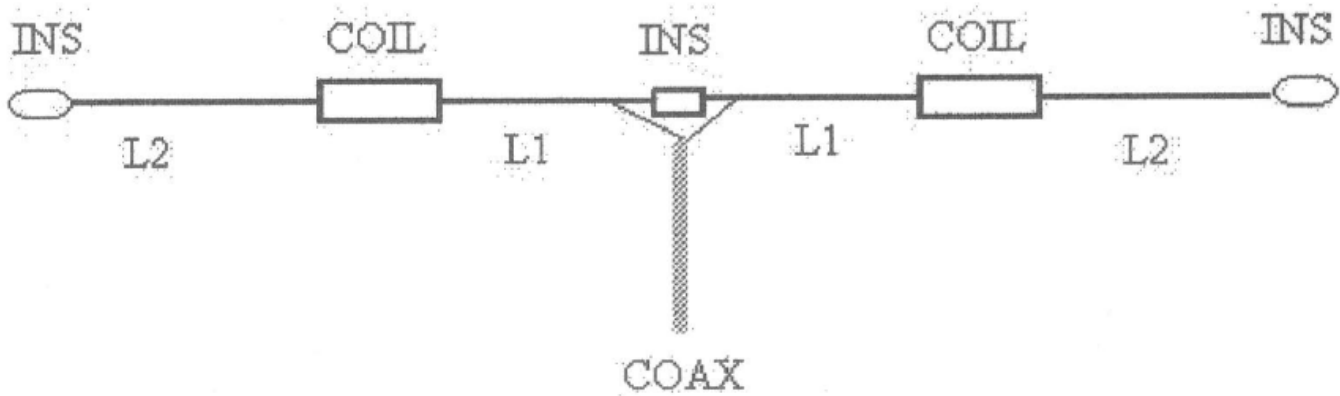


**4) Doing the “detangle”**

# A SHORT DIPOLE FOR 80m

4S7NR

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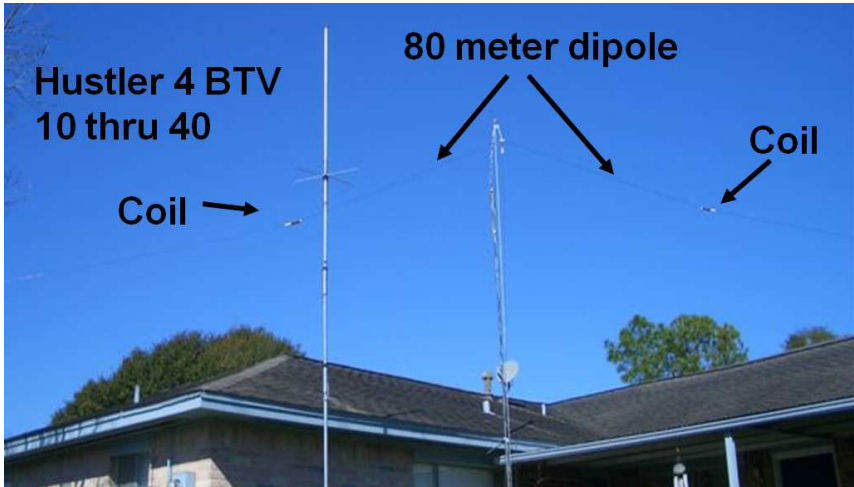


**Figure 1**

# Hanging the Antenna



**Center Support Mast – 25 feet**



**Final Installation**