600 meter station at WD2XSH/20
Fall 2009

Rudy Severns N6LF, WD2XSH/20

For fall and winter 2009-2010 600 m operation I have rebuilt my antenna and also redone the station. The following is a description of the station at WD2XSH/20 as of October 2009.

Antenna

The new antenna is a top-loaded vertical using a 150' wooden pole for the center support. As shown in figure 1 the top-loading wires extend 300' from the top of the vertical section. The far ends of the top-loading wires are about 90' high.

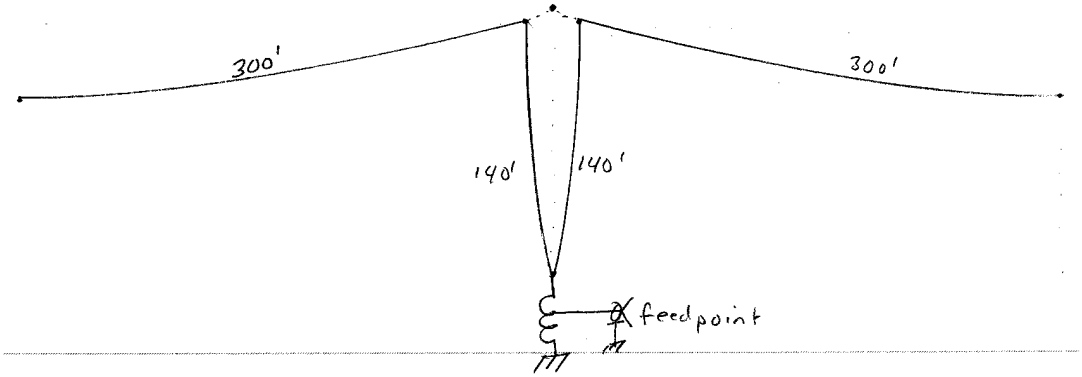

Figure 1, sketch of present 600m antenna.

Photos of the antenna support and the base tuning inductor are shown in figure 2.

Figure 2, WD2XSH/20 600m antenna support and base tuning inductor.

The antenna is self resonant just above the 600m band so the base inductor was adjusted to resonate the antenna at mid-band (about 503 kHz). I adjusted the tap on the loading coil for a good match and a graph of the SWR is shown in figure 3. The antenna was made with #12 stranded, insulated wire.

The ground system uses only thirty two 70' radials. This is much less ground system than I would normally use but I deliberately traded efficiency for match bandwidth. The ground system is in effect a damping resistance. This reduced the efficiency from a possible 50% or better to about 20%. That means I have to run more power to reach the allowed 20W ERP. But I still need only 100W to reach the maximum ERP and it's very handy to be able to transmit anywhere in the band without any retuning. This is a brute force solution to be sure but in this case it works just fine because I can easily generate 100W.

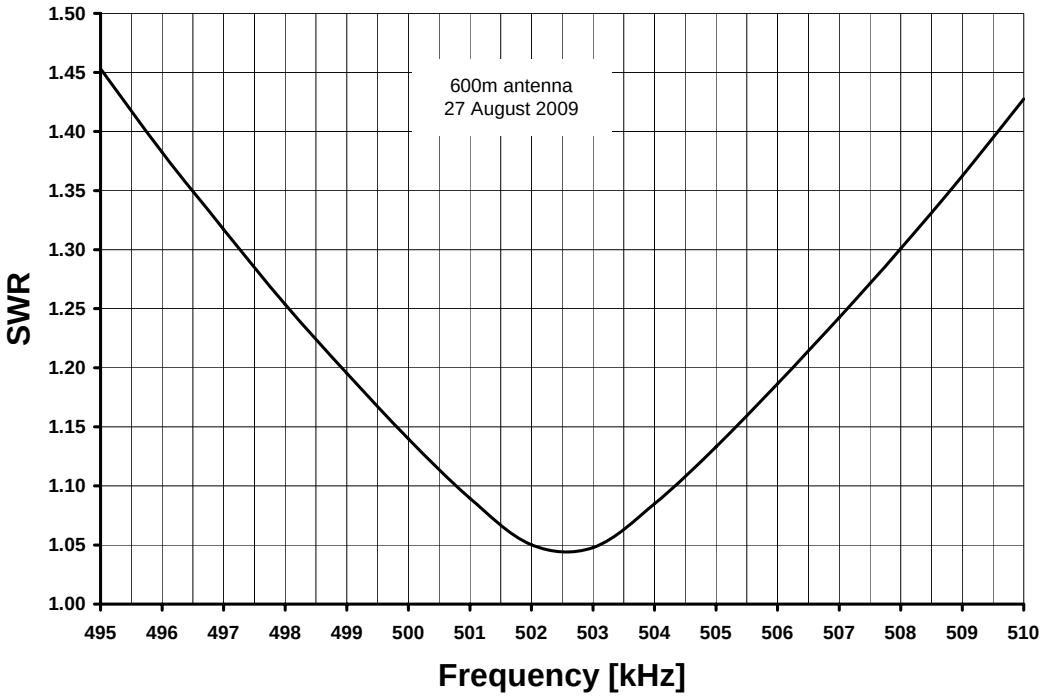

Figure 3, SWR plot for the 600m antenna.

Station Equipment

Figure 4 is a block diagram of the station. The signal source is an HP3336C level generator with a 10 MHz GPS frequency reference. The reference is accurate to a few parts in 10^{11}. The modulation on the HP3336C does not go down to DC so I built a keying unit which uses an electronically controlled attenuator to key the output signal. The keyer is a Logikey K-3. The amplifier is an ENI 1040L. This is a commercial laboratory amplifier capable of 500W output, 10-800 kHz, with 55 dB of gain. Note the use of a low pass filter on the output of the amplifier. The amplifier is pretty good but I really don't want to cause any BCI locally.

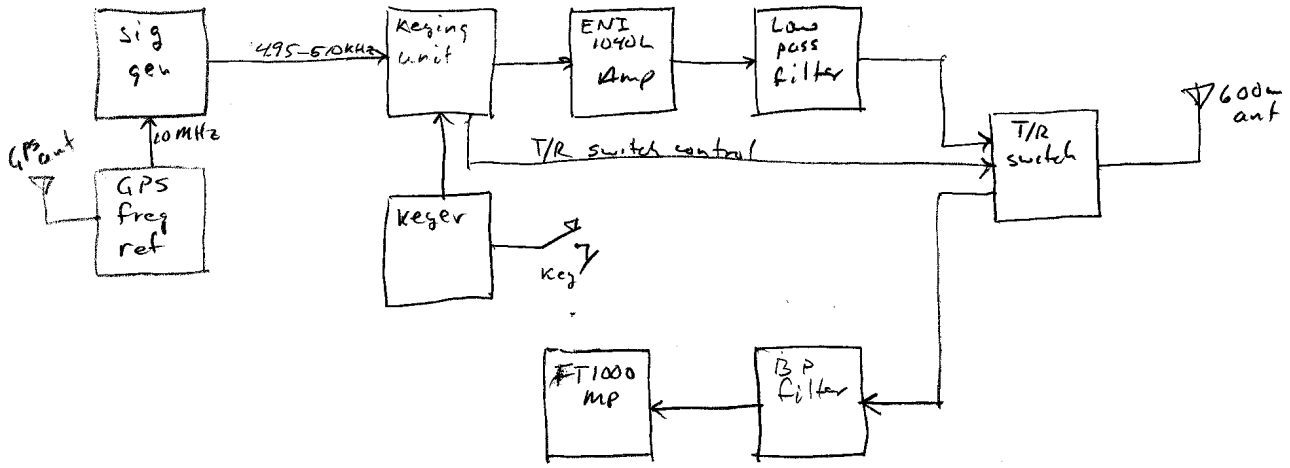

Figure 4, Block diagram of the station at WD2XSH/20

The receiver is a Yaesu FT1000MP with a filter on the input to suppress the local BC stations which have very high levels on this large an antenna.

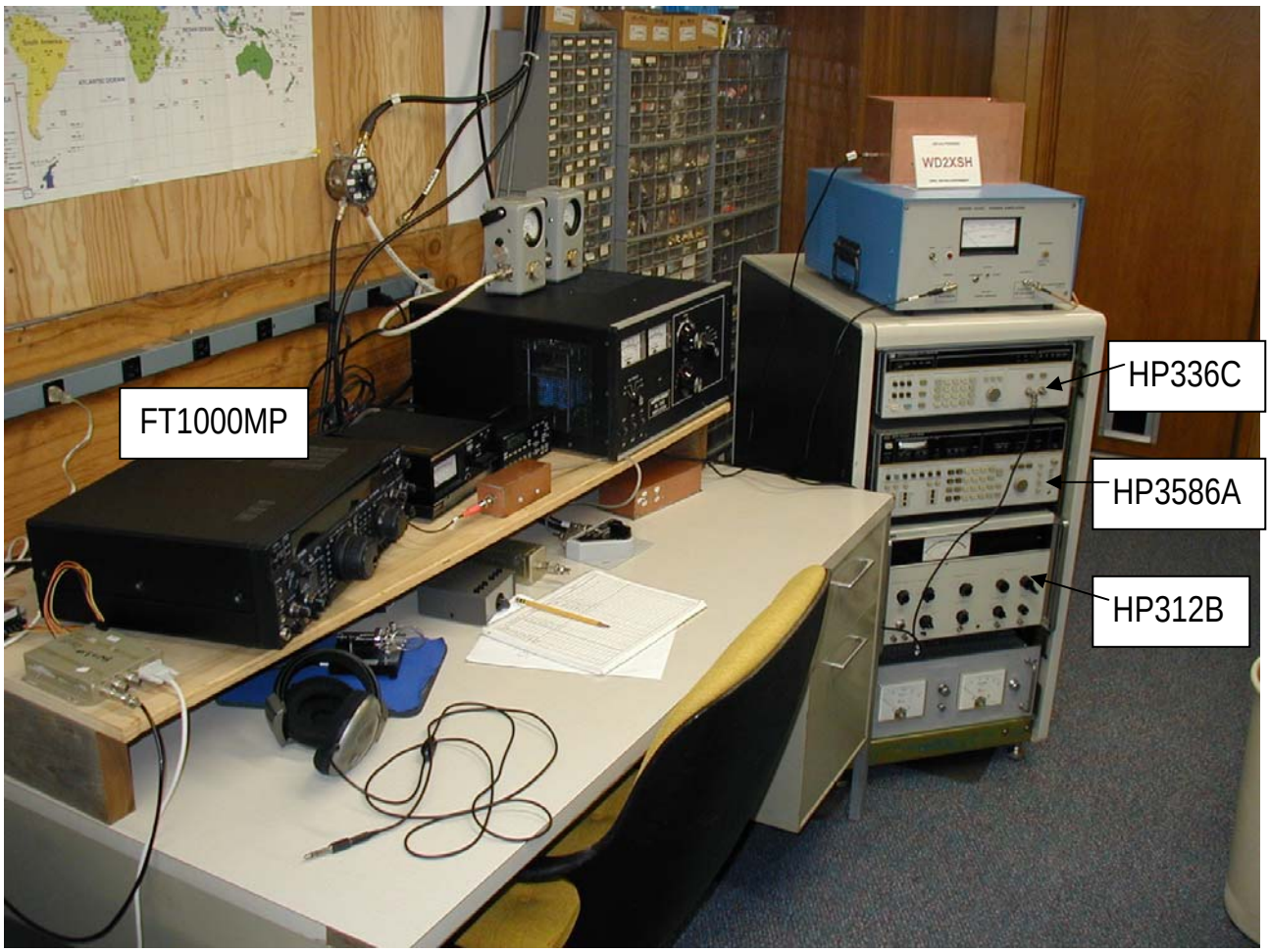

Figure 5, station photo.

Figure 6 Station photo 2.

Figures 5 and 6 are photos of the station. The FT1000MP is the primary receiver and most of the time I use the 250 Hz filter for reception. I also have an HP3586A and an HP312B for receiving. In addition to these receivers I am restoring several LF vacuum tube receivers: RBL-2, RBL-5, RAK-7, BC-453, etc. I hope to have one or more of them on the air this winter to compare to the Yaesu and HP equipment. In addition to the ENI 1040L amplifier I have an ART-13 with the low frequency plug-in. I don't expect to get it on the air this season but perhaps next fall.