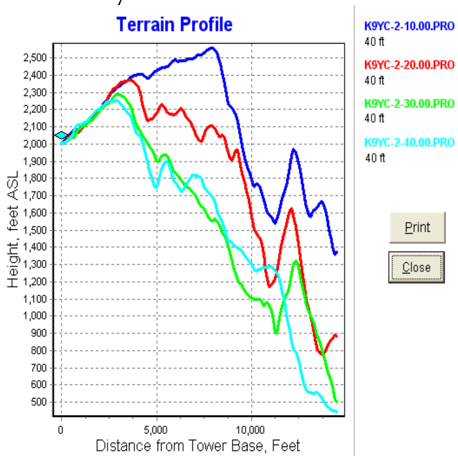
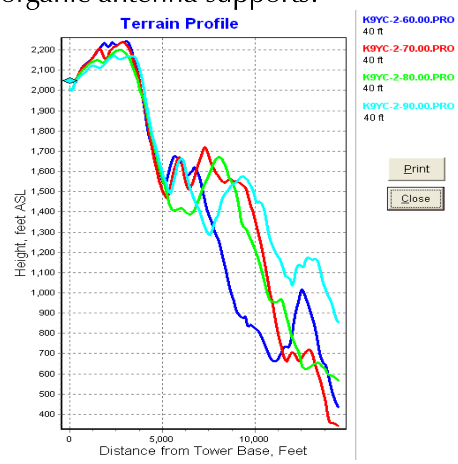
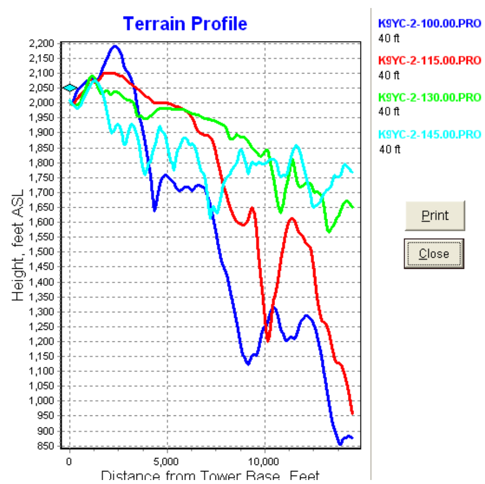
This is an in-progress study I'm doing using HFTA for my new QTH near Santa Cruz. Although I'm at 2,000 ft, I'm surrounded by nearly 270 degrees worth of ridges, to tops of which are typically 100 – 250 ft above me. Needless to say, this presents a challenge. In addition, I have deed restrictions that essentially preclude me putting up a big beam. On the other hand, wires are easy – I've own 8.5 acres of 100+ ft tall organic antenna supports!



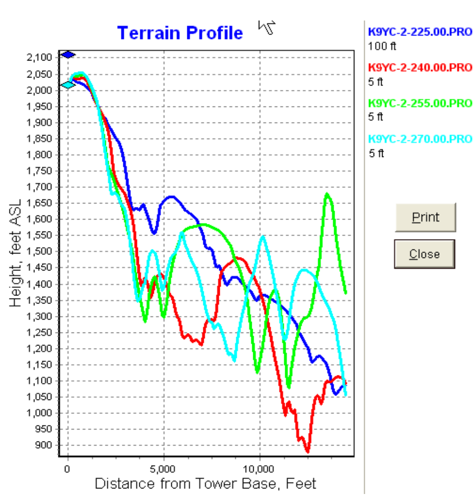
To Europe



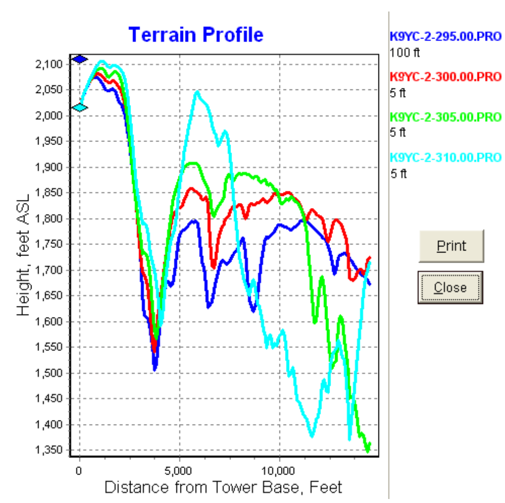
To Canada and US



To South America



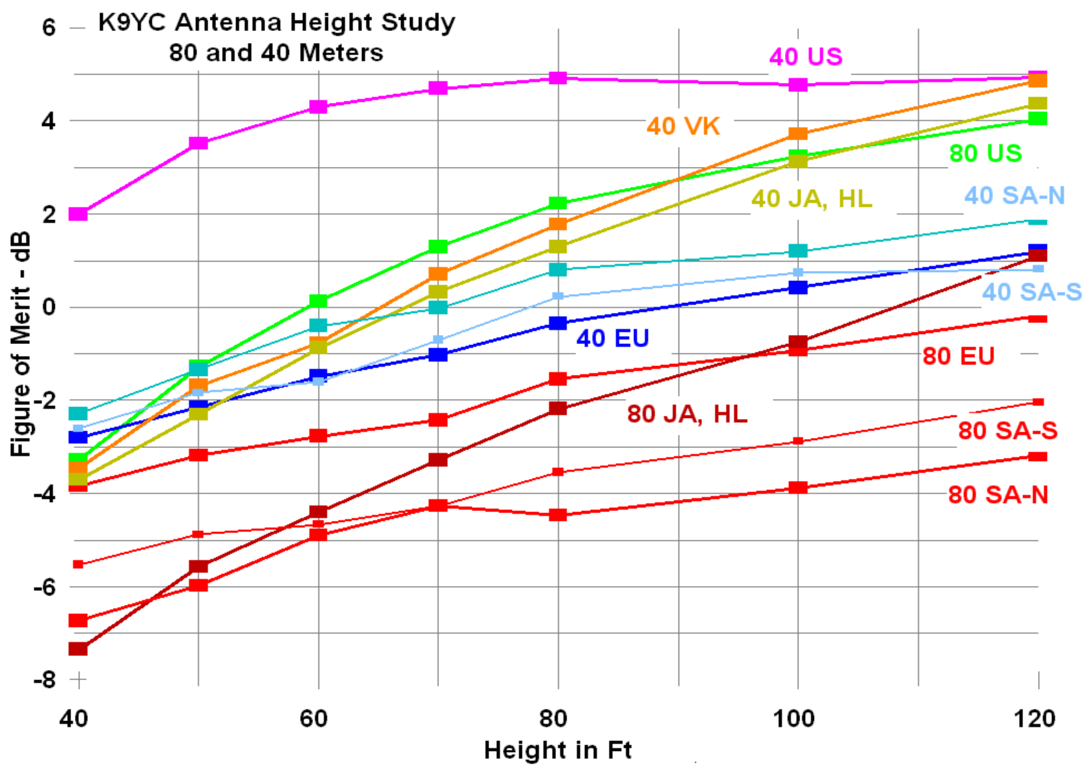
To VK and ZL



To Indonesia, Japan, Korea

Three months of operation with temporary wires at 40 and 60 ft left me convinced that they really need to be a lot higher to make my station competitive, but my friends kept telling me, you've got to run HFTA! So I did. For the most part, the exercise confirmed my suspicions, but with two notable exceptions – I need low 20-10 meters antennas for working the US!

I like to do a lot of modeling, then plot and analyze the results. For this project, I had HFTA make predictions for every 5 degrees of azimuth for a range of antenna heights. I started with 40, 80, 100, and 120 ft. My existing wires are at 40, 60, and 70 ft, and I figure that with a climber, I can get them up in the 100-120 ft range. Once I started seeing some of the results, I added 25, 30, 35, 40, 50, 60, and 70 ft. For each computation, I plugged the "Figure of Merit" number into a Quattro Pro spreadsheet. (I still use it because it is far easier to use to plot graphs than Excel).

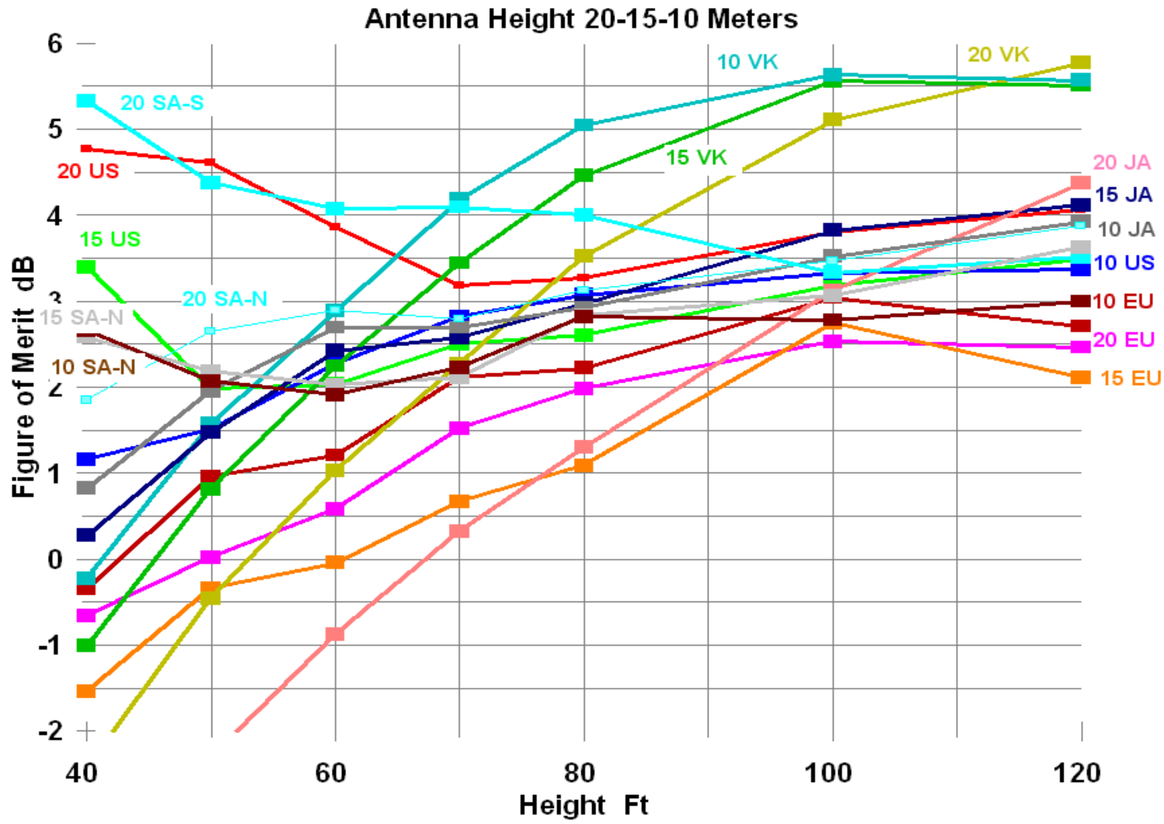


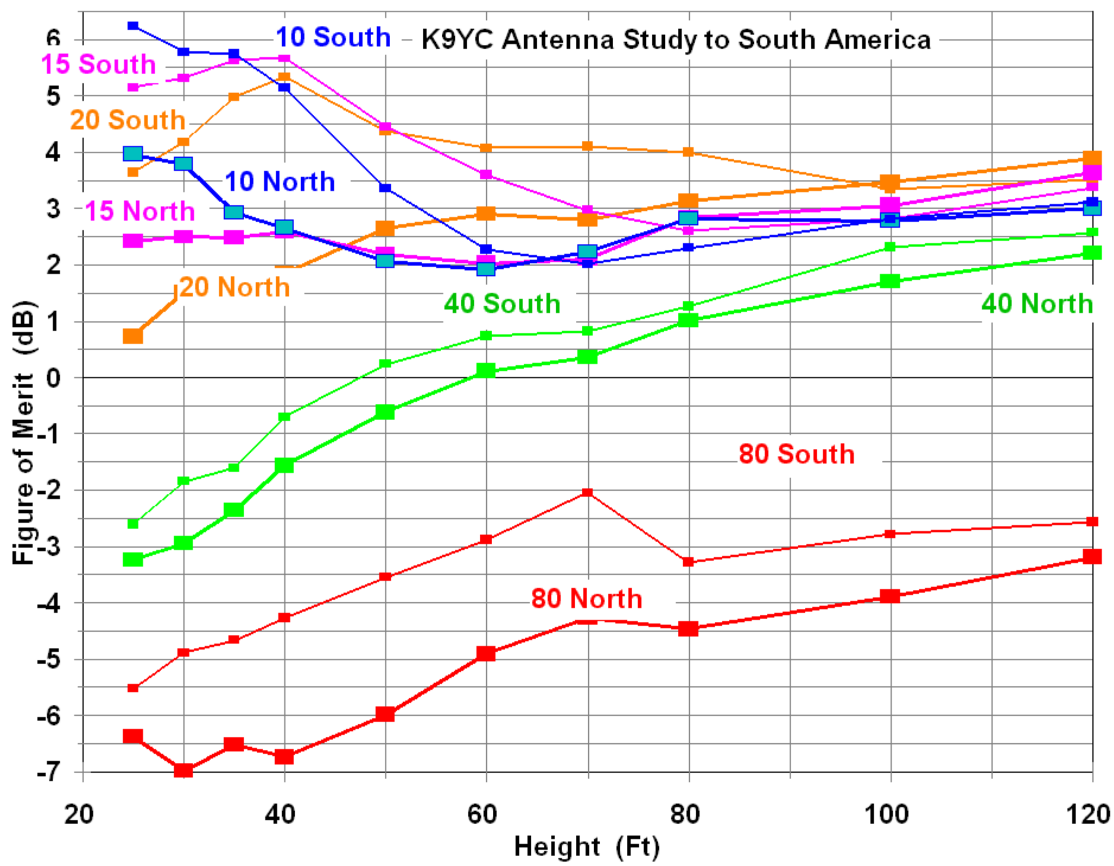
There are no surprises at all in the predictions for 80 and 40 meters – higher is better, period – but the models do help quantify how much (and help me put a dollar value on "another 20 ft" of height when the climber is in the tree. To most parts of the world, higher is also better on 20-10 meters, but with two notable exceptions.

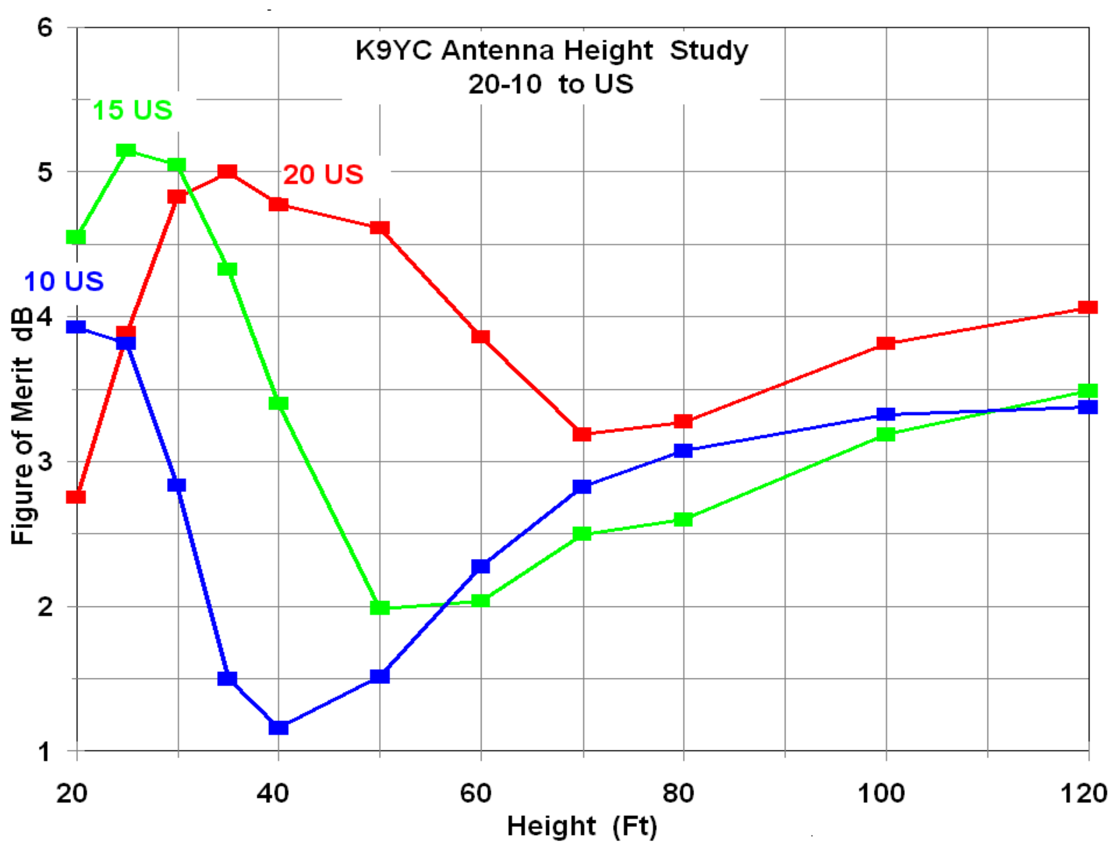
1) To the US, low antennas (30-40 ft) are several dB better, although higher antennas are better when the bands are open at low angles.

2) To the southern half of South America, low antennas are several dB better.

Another very interesting thing that all these "Figure of Merit" plots from the spreadsheet tell me is how well my QTH can work in various directions. I'm also pretty pleased with how the results correlate with what happens on the air. I can work east on 80 with the dipole at about 35 ft, but not very well, especially not without QRO. 40 is better, and my signal is pretty decent in the 1,000 mile range. This is in very good agreement with the HFTA plots.


Antenna Height 20-15-10 Meters
Figure of Merit dB
Height Ft
6
5
4
3
2
1
0
-1
-2
40
60
80
100
120
10 VK
20 VK
20 SA-S
20 US
15 VK
20 JA
15 JA
10 JA
10 US
10 EU
20 EU
15 EU
15 US
20 SA-N
15 SA-N
10 SA-N


K9YC Antenna Study to South America
Figure of Merit (dB)
Height (Ft)
6
5
4
3
2
1
0
-1
-2
-3
-4
-5
-6
-7
20
40
60
80
100
120
10 South
15 South
20 South
10 North
15 North
20 North
40 South
40 North
80 South
80 North



Based on all this, my immediate plan is for the following antennas:

1) A 160/80/40 dipole as high as I can get it in the trees (about 100 ft), broadside to 45°

2) An 80/40 dipole as high as I can get it in the trees (about 100 ft), broadside to ~135°

3) Two 20/15/10 fan dipoles as high as I can get them (about 100 ft), broadside to ~45° and 135°

4) I may add 20/15/10 fan dipoles at about 30 ft, broadside to 70 degrees for SS, and about 135 degrees for South America. These are a lower priority – they're only predicted to be 1-2 dB better than the high dipoles to the US, and the high dipole is clearly better for most DX.

I'm also planning to run the 80/40 dipole on 80 and 160 as a top-loaded long wire (with both sides of the feedline (some old 75 ohm KW twinlead) tied together against a radial system. This will be an alternative to the 160 dipole, and might eventually morph into a dedicated vertical or inverted L. I can adjust the vertical portion to be between 50 and 100 ft. The question for the assembled experts here is, "Based on the elevation profiles, the HFTA results and the fact that I'm surrounded by redwoods, how well should I expect a vertical like this to work at my QTH on 80 and 160?" The big unknowns to me are the influences of the terrain and the trees.

Jim K9YC