

SLAARC FIELD DAY 2010

'Low' Band antennas
80 and 40 meters

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Antenna Plan

The low band operating / antenna plan this year is to run two radios continuously, one on 80 meters and one on 40 meters. Each will be equipped with a W3NQN Band Pass Filter to help minimize any interference between the two. This makes it desirable to have antennas that do not require an antenna tuner and provide a 50 ohm load across the entire band. Since this is a field day operation, it is also desirable to have antennas that are easy to erect and provide predominantly high angle radiation in all directions. The solution we are trying this year is to use a single antenna for each band on separate single supports – physically separated as far as practical – perhaps 500 feet apart. Each will consist of the same type of antenna approximately $\frac{1}{4}$ wavelength (33ft on 40M & 66ft on 80M) above ground. Each antenna will be a ‘crossed’ inverted vee. This antenna consists of 2 inverted vees – fed from a single balun, in parallel at the center and orientated 90 degrees (perpendicular) from each other. One Inv Vee is cut long in the band and one is cut short to provide a good match across the entire band. Testing and tuning results:

80 Meter ‘Crossed’ Inverted Vee
Center at 65 ft – ends at 140ft+
“Long” element $64 \times 2 = 128$ ft
“Short” element $58 \times 2 = 116$ ft

40 Meter ‘Crossed’ Inverted Vee
Center at 33 ft – ends at 65ft+
“Long” element $33 \times 2 = 66$ ft
“Short” element $31 \times 2 = 62$ ft

Results

80 Meters: This antenna functioned exactly as planned. It tuned perfectly across the entire 80M band, although predominantly all CW contacts were made between 3.500 and 3.550 while SSB contacts were made between 3.750 and 3.850. When the band was functional this antenna appeared to perform exceptionally well on transmit. It facilitated very high rates of Q's on both CW and SSB but did not perform as well on receive. Contacts were limited by signal to noise ratio on receive. Many pileups left stations calling that could not be copied through the QRN and QRM. There appeared to be an intermittent local source of power-line interference during the day.

40 Meters: This antenna functioned exactly as planned. It tuned perfectly across the entire 40M band, although predominantly all CW contacts were made between 7.000 and 7.050 while SSB contacts were made between 7.130 and 7.250. It facilitated high rates of Q's on both CW and SSB. This antenna worked well but we experienced a "Iron Curtain" on transmit to the West Coast. 6's, and 7's were prevalent with very good copy on receive all through the night but were nearly impossible to work. Although some signals were exceptionally weak on receive this antenna appeared to hear much better than transmit – at least on low angle signals. Many Q's were made with the East Coast, however.

General Comment: No interference was encountered between radios on any band – except perhaps 10 meters. It would have been nice and generated many more Q's to have some more powerful low angle radiation to the West Coast and southwest when 40 meters was 'long.'

Comments from Jim, W8TU

The "Crossed" Inverted Vee antenna's worked very well on 80 meters. My previous personal best CW contact rate was about 45 contacts per hour. With the 80 meter "Crossed" Inverted Vee antenna I was able to sustain 3 consecutive hours with over 60 contacts per hour. I was easily able to command a frequency, call CQ and have multiple stations respond. Four or five calling stations was a normal response.

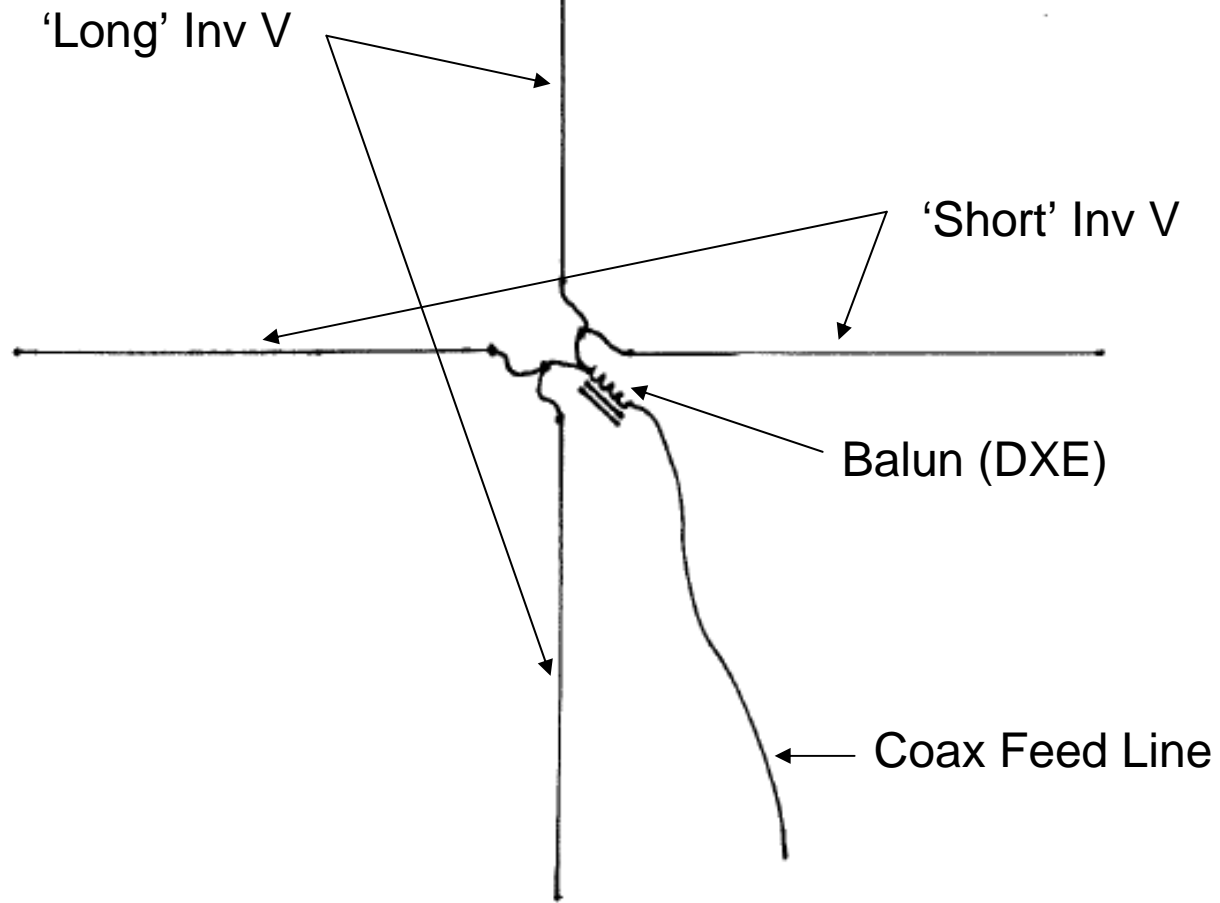
The triband beam worked very well also. After 80 meters closed up on Sunday morning, I moved to 20 meters and reached a personal best CW rate of 90 contacts per hour, peaking 99 during a 20 minute period. As far as CQ response rate is concerned, I had as many as 8 to 10 stations respond at one time.

I understand that others did very well with the 40 meter "Crossed" Inverted Vee as well, achieving over 1,100 contacts. I have participated in many FD Operations since 1967, and only one previous time a group I was operating with reached over 1,100 contacts on 40 meters.

I recognize there was a lot of upfront planning and onsite work to get those antennas up, but they sure did produce and seemed to be worth the effort.

Now that I am a member of SLAARC, I plan to participate in Field Day again next year.

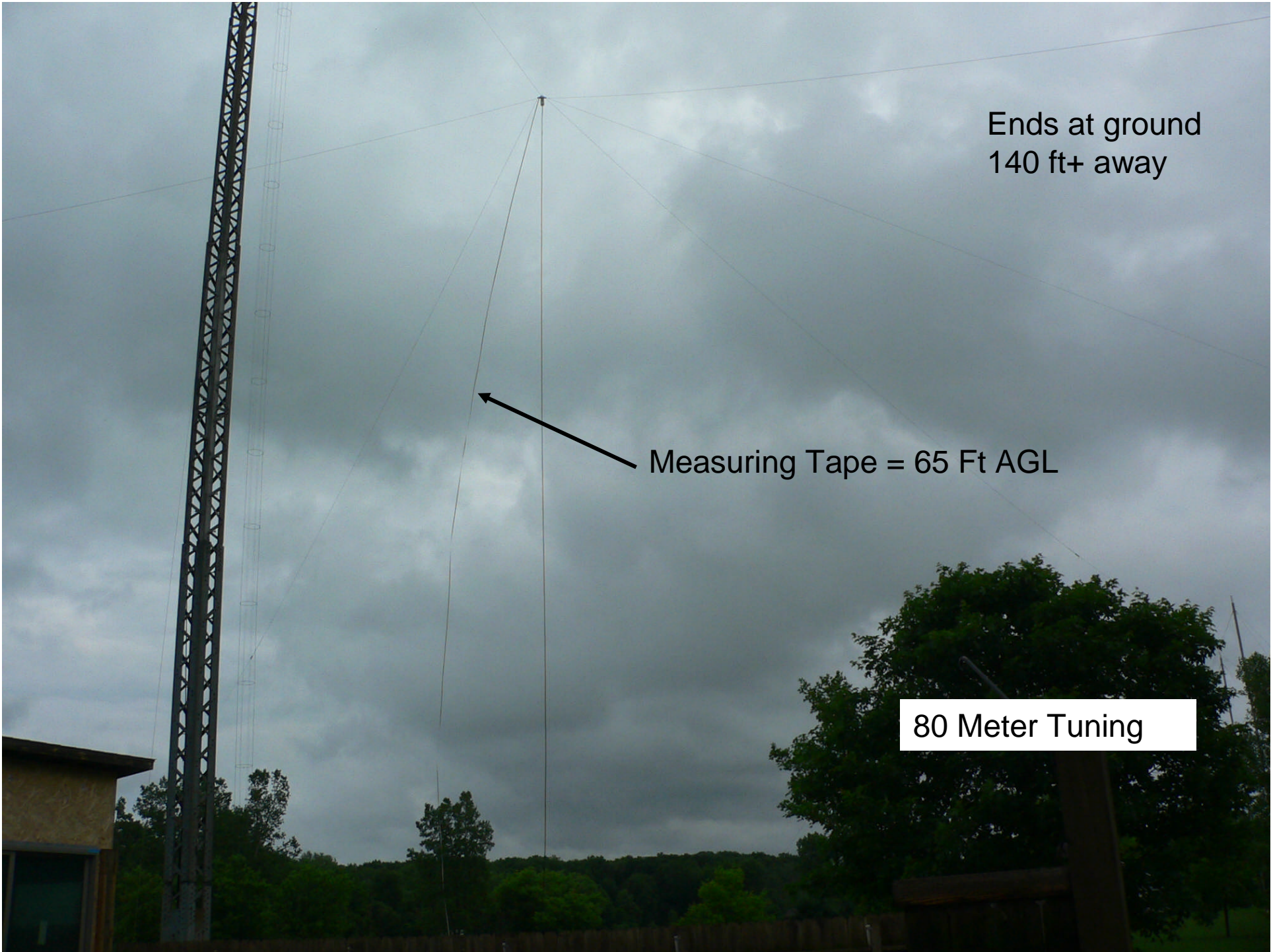
Schematic Sketch of
'Crossed' Inverted Vee Antenna
(as seen from above)

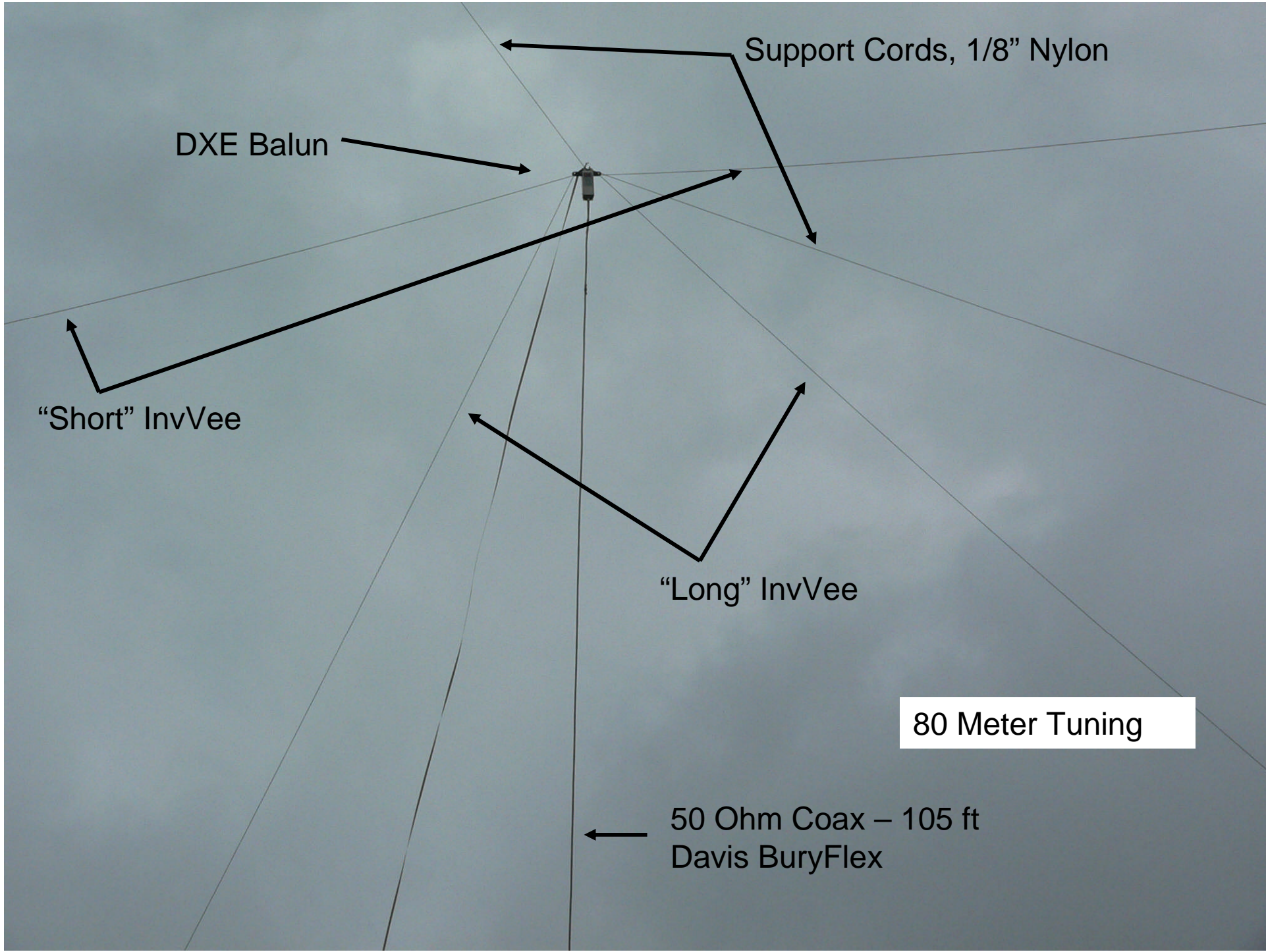


Ends at ground
140 ft+ away

Measuring Tape = 65 Ft AGL

80 Meter Tuning





Support Cords, 1/8" Nylon

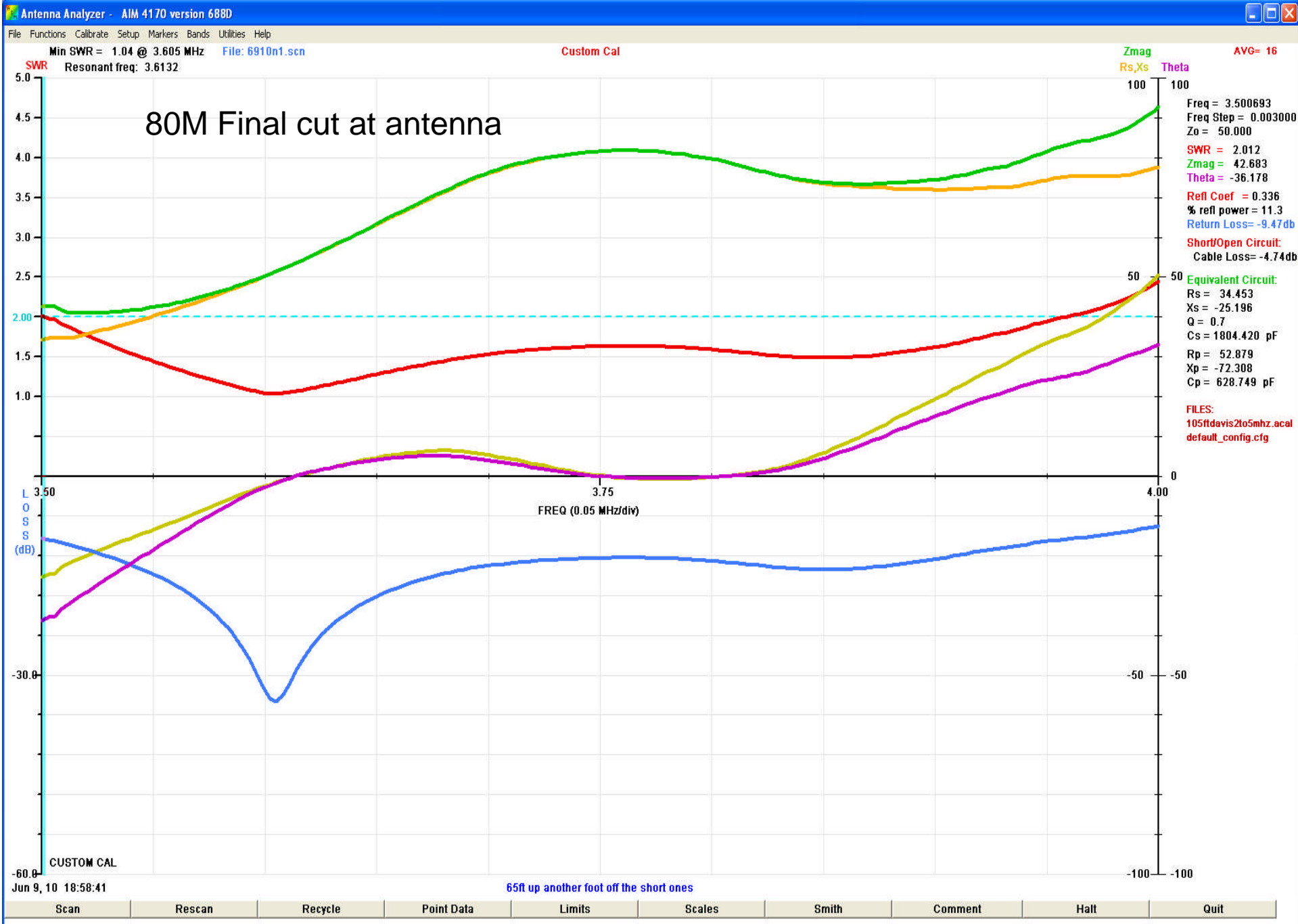
DXE Balun

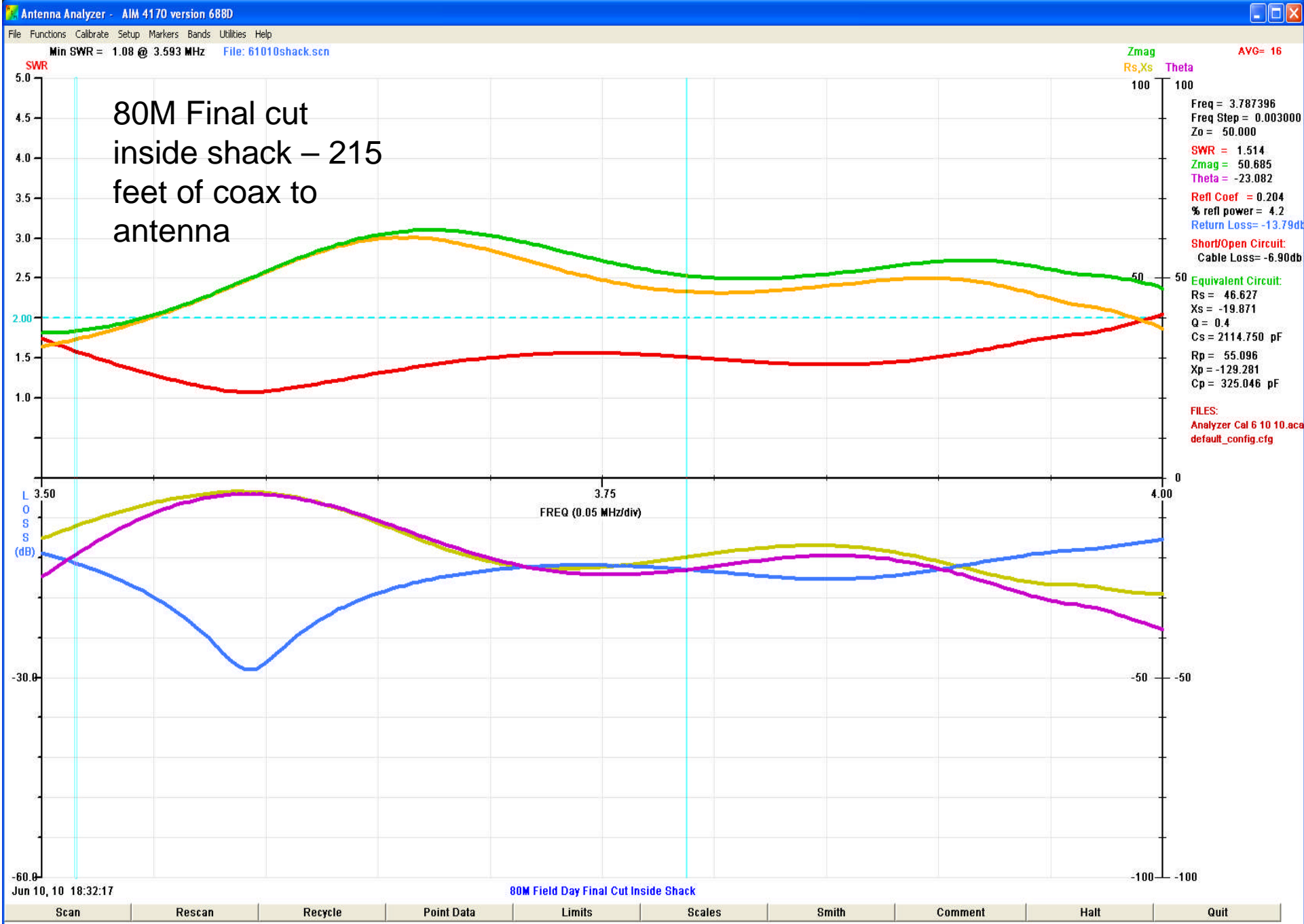
"Short" InvVee

"Long" InvVee

80 Meter Tuning

50 Ohm Coax - 105 ft
Davis BuryFlex



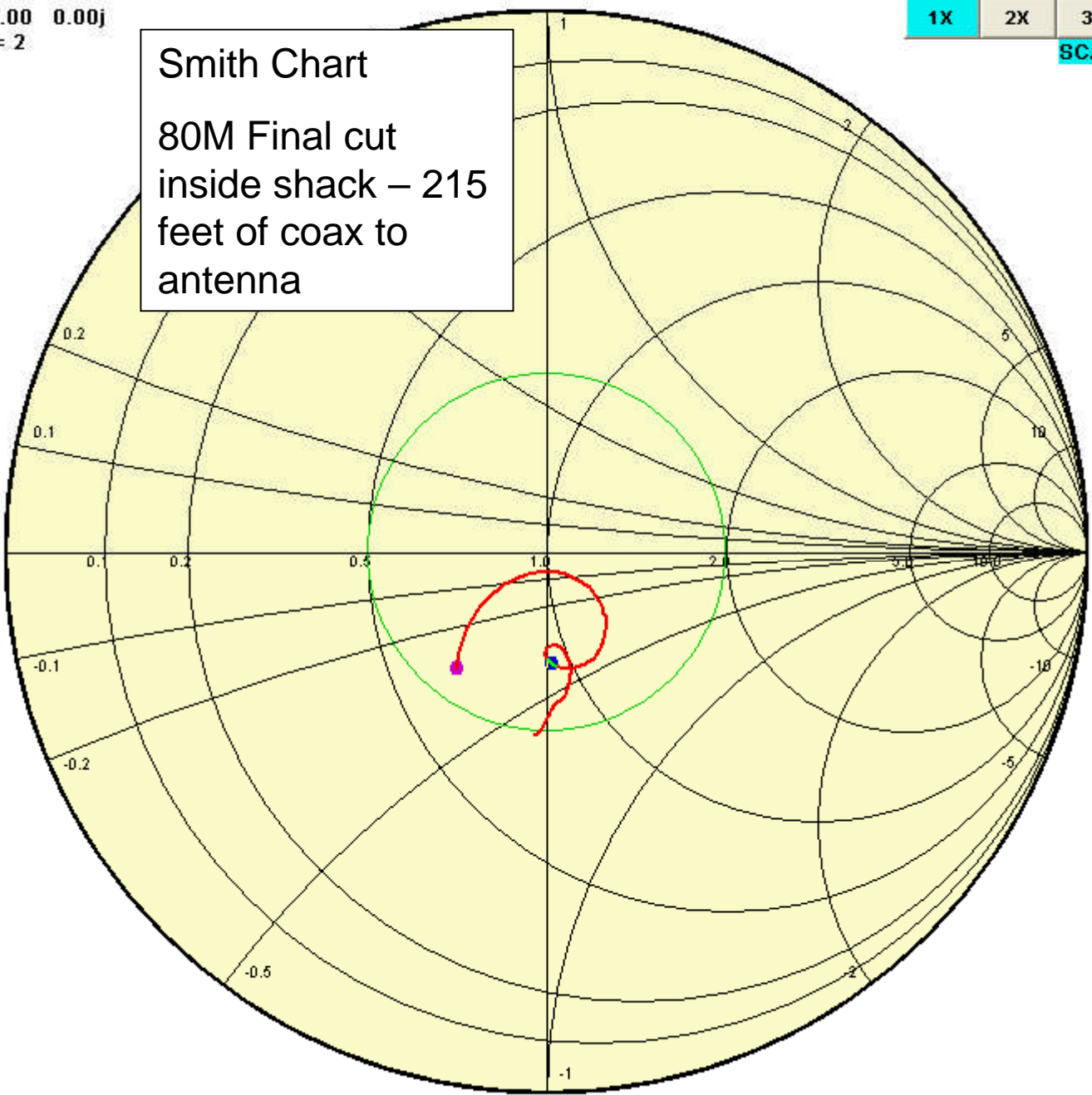


Zo = 50.00 0.00j
SWRref= 2

1X 2X 3X 4X 5X
SCALE

Smith Chart
80M Final cut
inside shack – 215
feet of coax to
antenna

L
O
S
S
(dB)



Length = 43.57 deg

