

How to Use an Antenna Analyzer

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How to Use an Antenna Analyzer

- The basics
 - Impedance
 - Reactance
 - Resistance
 - SWR
 - Efficiency and SWR
 - Use in conjunction with EZNec for “the rest of the story” . . .

How to Use an Antenna Analyzer

- Why use an antenna analyzer?
 - Avoid “costly” mistakes when pruning
 - Check your antenna against mfg. published specs
 - Tune antenna
 - Tune feedline
 - Tune phasing “stubs”
 - Troubleshoot problems
 - Education – “demystify” your antenna system
 - See if an antenna tuner will have the range you need
 - See if you are expecting too much from an antenna and re-adjust your strategy based on hard facts

How to Use an Antenna Analyzer

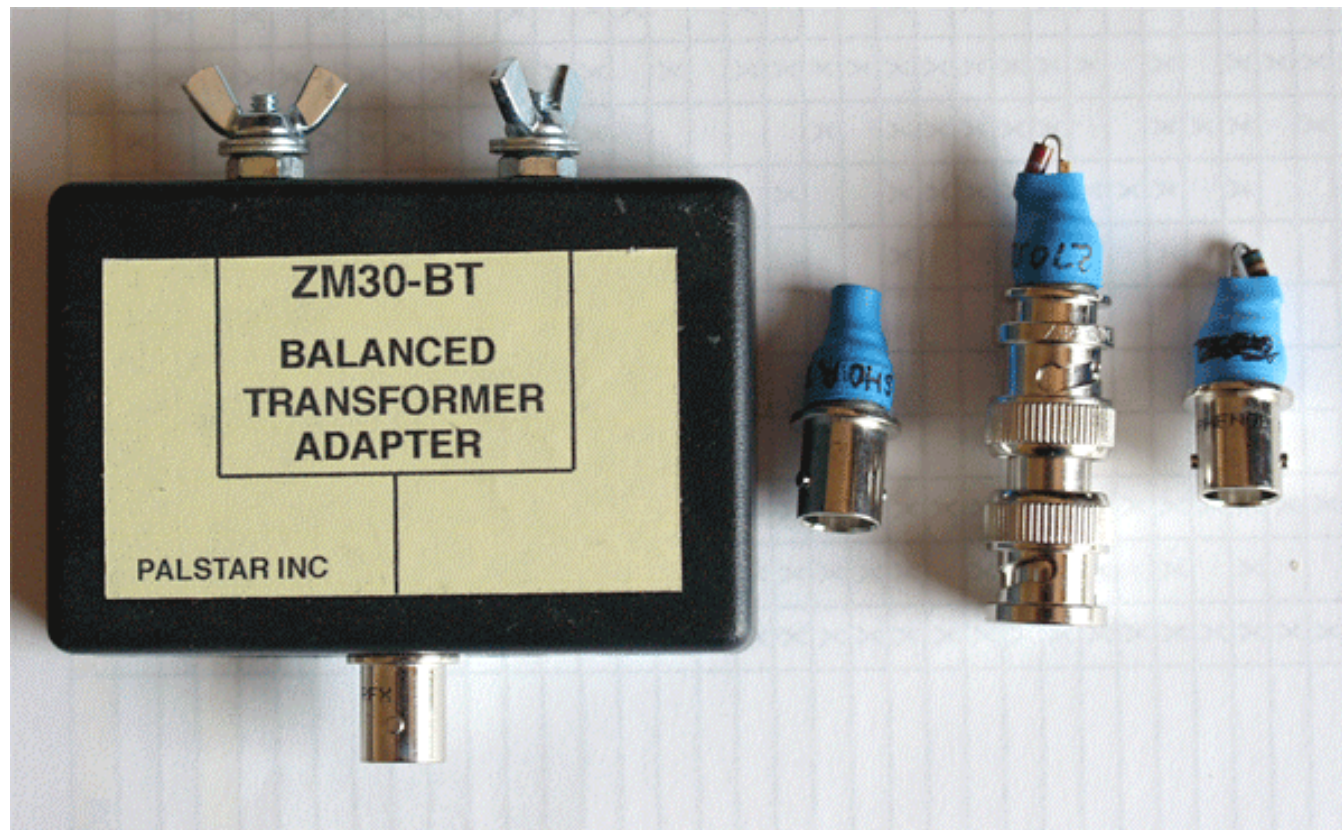


PALSTAR ZM-30



MFJ 269

How to Use an Antenna Analyzer



PALSTAR ZM-30 – comes with ladder line transformer and
XXXXXX

How to Use an Antenna Analyzer

Both Can Measure:

- Antenna bandwidth (SWR across frequency)
- Feedpoint impedance
- Ground loss
- Coax cable loss
- Adjust tuners and amp tuned circuits and measure loss
- Measure phasing lines
- Impedance of transmission lines
- Measure balun loss
- Inductor Q
- Magnetic loop resonance and SWR

How to Use an Antenna Analyzer

- Major Differences
 - MFJ-269
 - Covers VHF and UHF
 - Line length in degrees and feet
 - Palstar ZM-30
 - Has Serial port and can scan from PC
 - Has better battery access and feels more stable and “solid” as far as build quality is concerned

How to Use an Antenna Analyzer

- MFJ features
- Palstar features

How to Use an Antenna Analyzer

- Monoband Antennas
 - Full sized monoband antennas will be more broadbanded
 - Shortened monoband antennas will be more narrow banded
 - The SWR and Reactance curves will be “simpler” and “more predictable” for a properly working monoband antenna
 - Full sized monoband antennas offer less of a “compromise” solution

How to Use an Antenna Analyzer

- Multiband Antennas
 - Usually more narrow band than a full sized monoband antenna
 - Require special tuned circuits (L – C components or design of the radiators to achieve the same effect)
 - Have very complex SWR and reactance curves

How to Use an Antenna Analyzer

- Tuning feedlines
 - Coax length and resonance
 - Ladder line

How to Use an Antenna Analyzer

- Arrays and tuning “stubs”

How to Use an Antenna Analyzer

- Multiband Dipole – Alpha Delta DX-LB
 - 20 khz on 160M
 - 40 khz on 80M
 - 300 khz on 40M

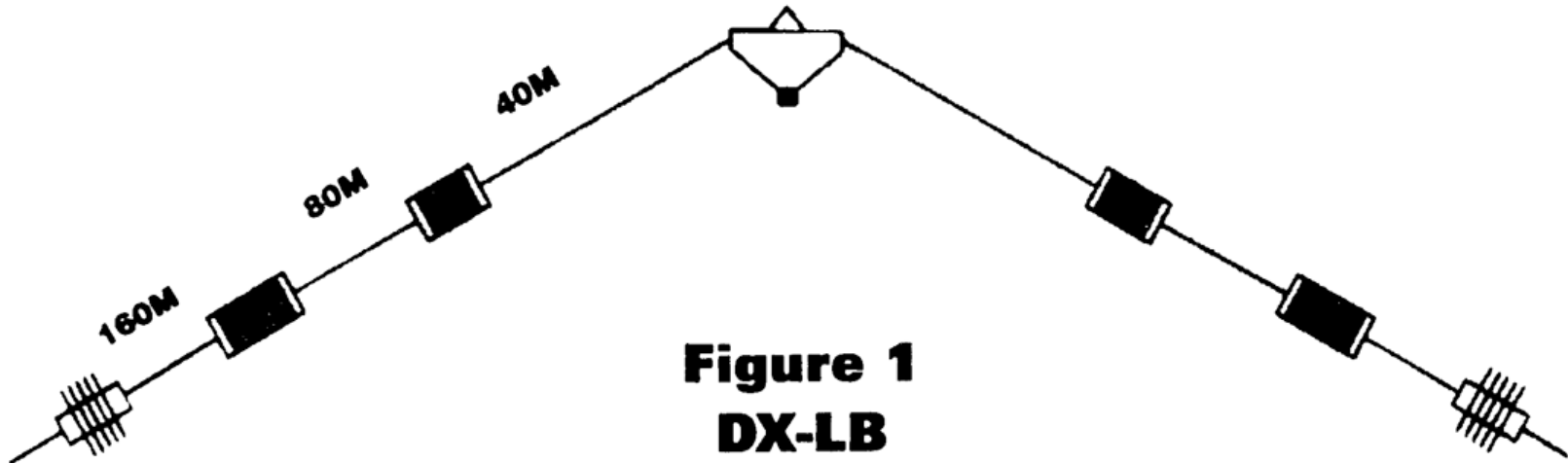
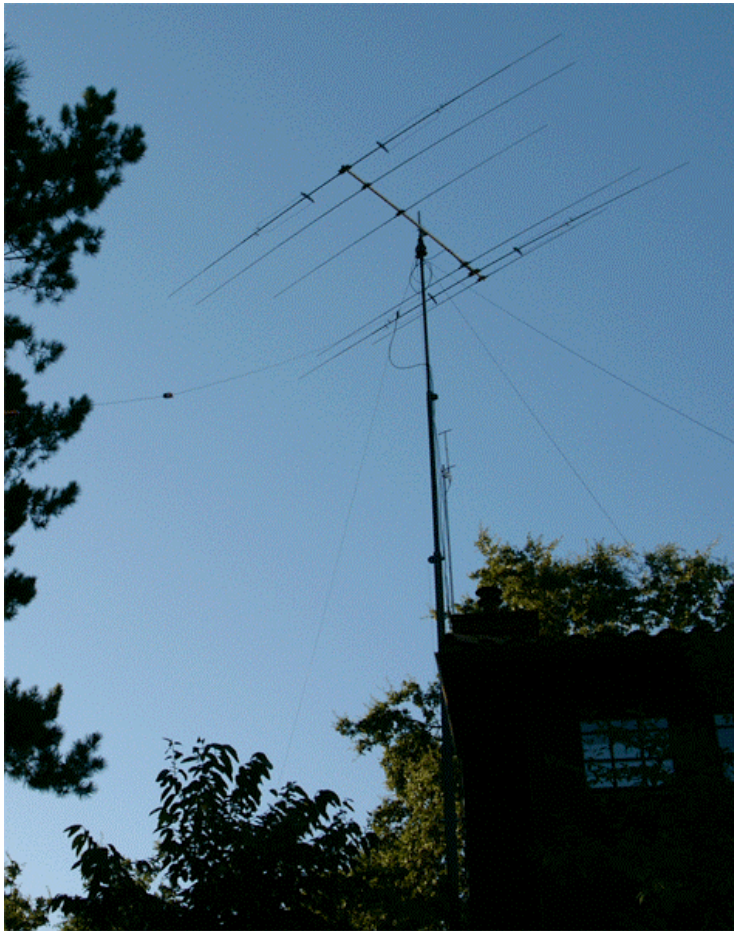


Figure 1
DX-LB

160-80-40 Meter Dipole Antenna - Fully Assembled - Only 100' Overall Length

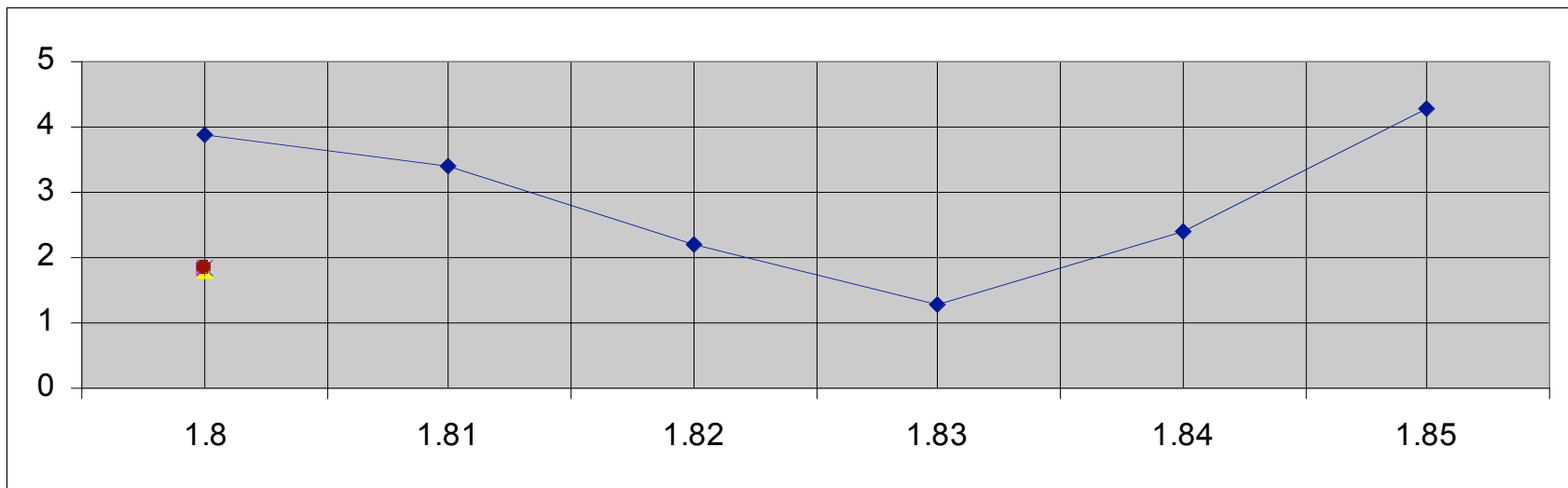
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- Multiband Dipole – Alpha Delta DX-LB



How to Use an Antenna Analyzer

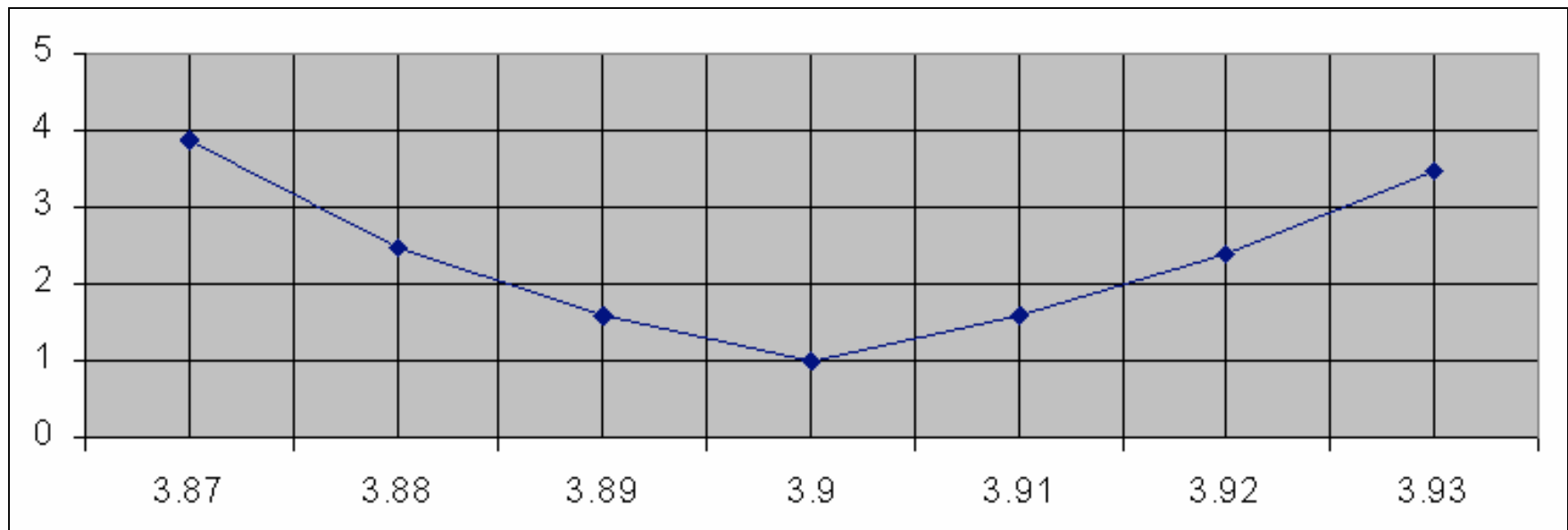
- DX-LB on 160M
 - Matches manufacturers specs – 20 khz bandwidth on 160M



BTW – had to write down data point readings by hand and enter them in Excel

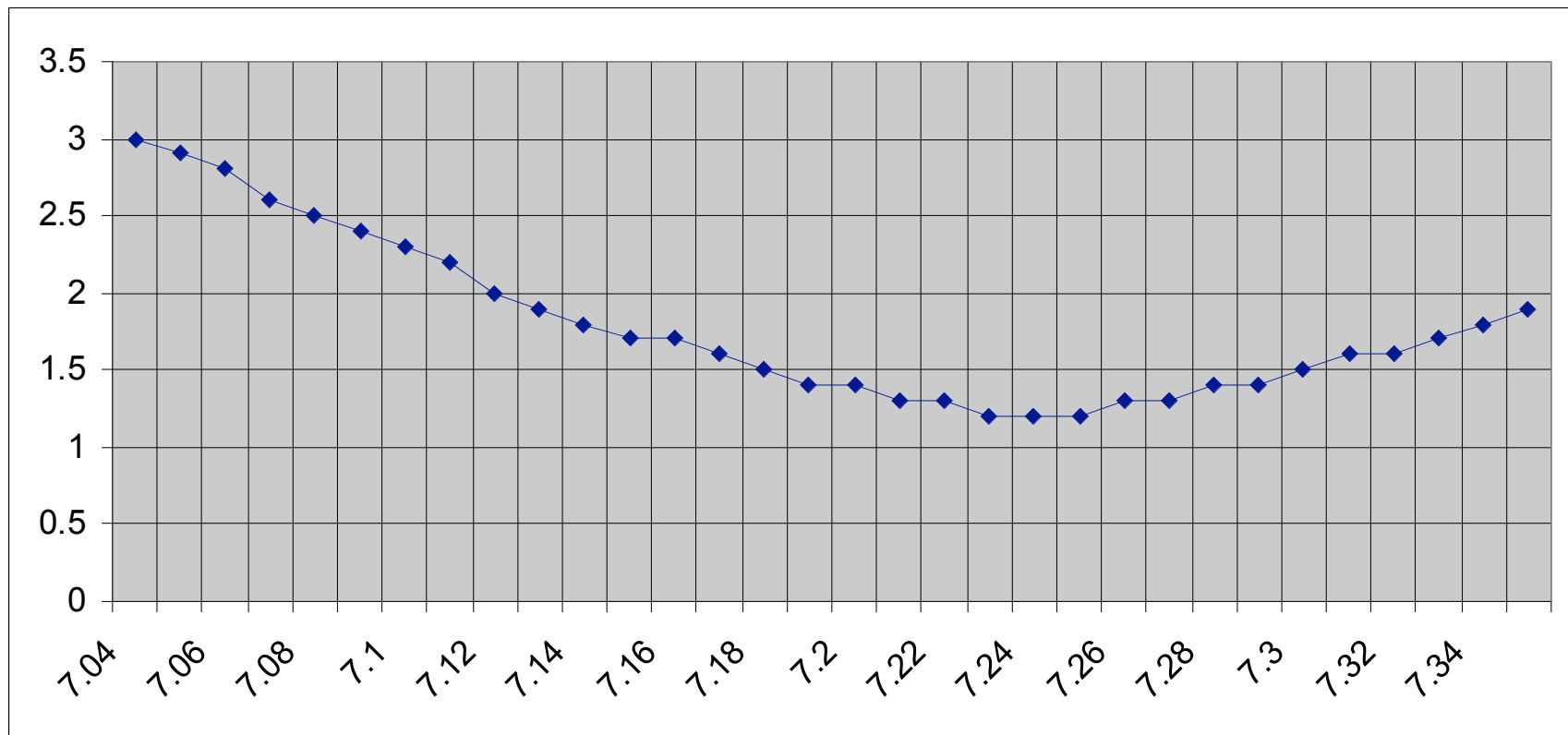
How to Use an Antenna Analyzer

- DX-LB on 80M
 - As advertised, 40 khz bandwidth on 80M



How to Use an Antenna Analyzer

- DX-LB on 40M
 - Also as advertised on 40M - 300 khz bandwidth



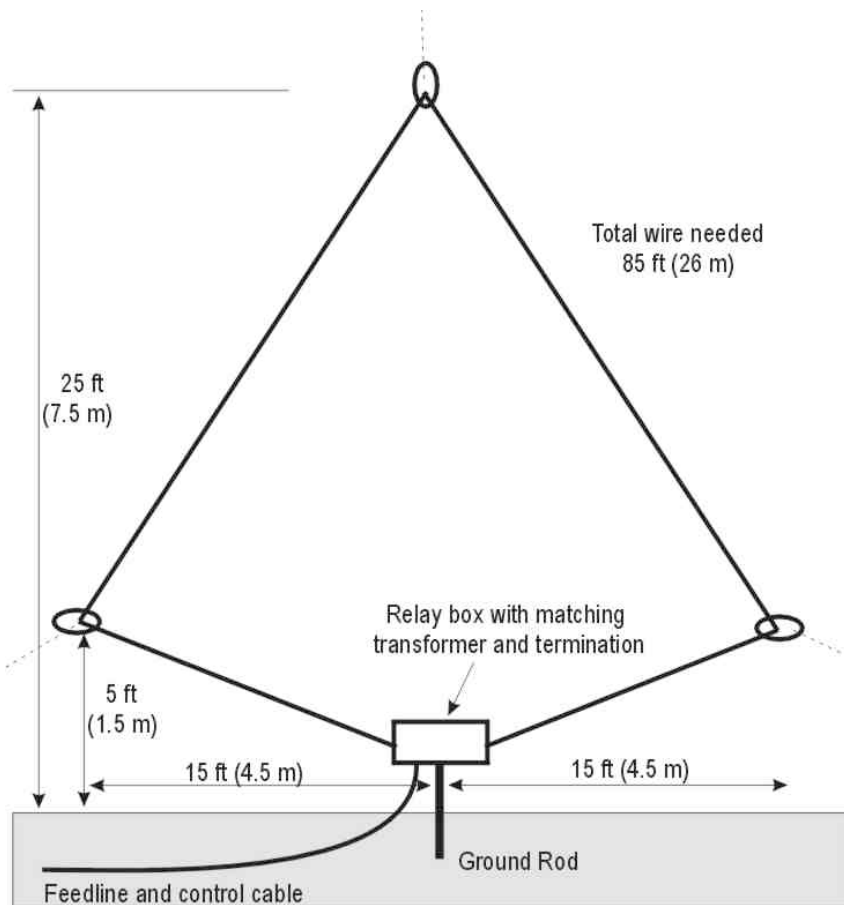
How to Use an Antenna Analyzer

- Force-12 “Ruby” 2M / 70CM SHVD
 - Advertised bandwidth of 1.4:1 for more than 20 mhz
 - I verified that this is true with my MFJ-269 analyzer
 - I Found that performance wise (simplex 2M QSO between Lafayette and Petaluma) it is “comparable” to my Diamond X50. It is half the size and built like a tank. You could stack these vertically more easily than an X50.



How to Use an Antenna Analyzer

- K9AY Loops – Receive Only Antenna



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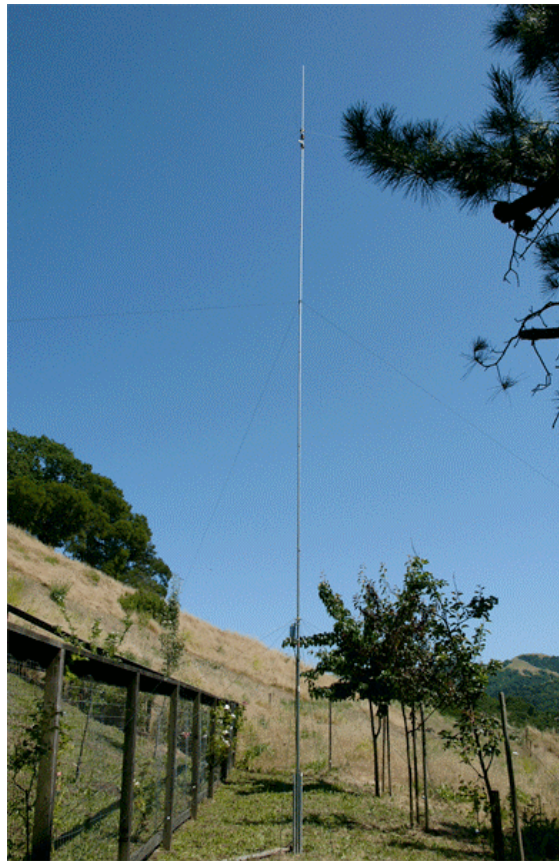
- K9AY Loops – Receive Only Antenna
 - Wanted to see if the terminating resistor really did affect the SWR, since you are changing the antennas impedance
 - It does – but very subtly – 10 positions that range from 1.1:1 to 1.7:1

How to Use an Antenna Analyzer

- Cutting Phasing Lines / Stubs

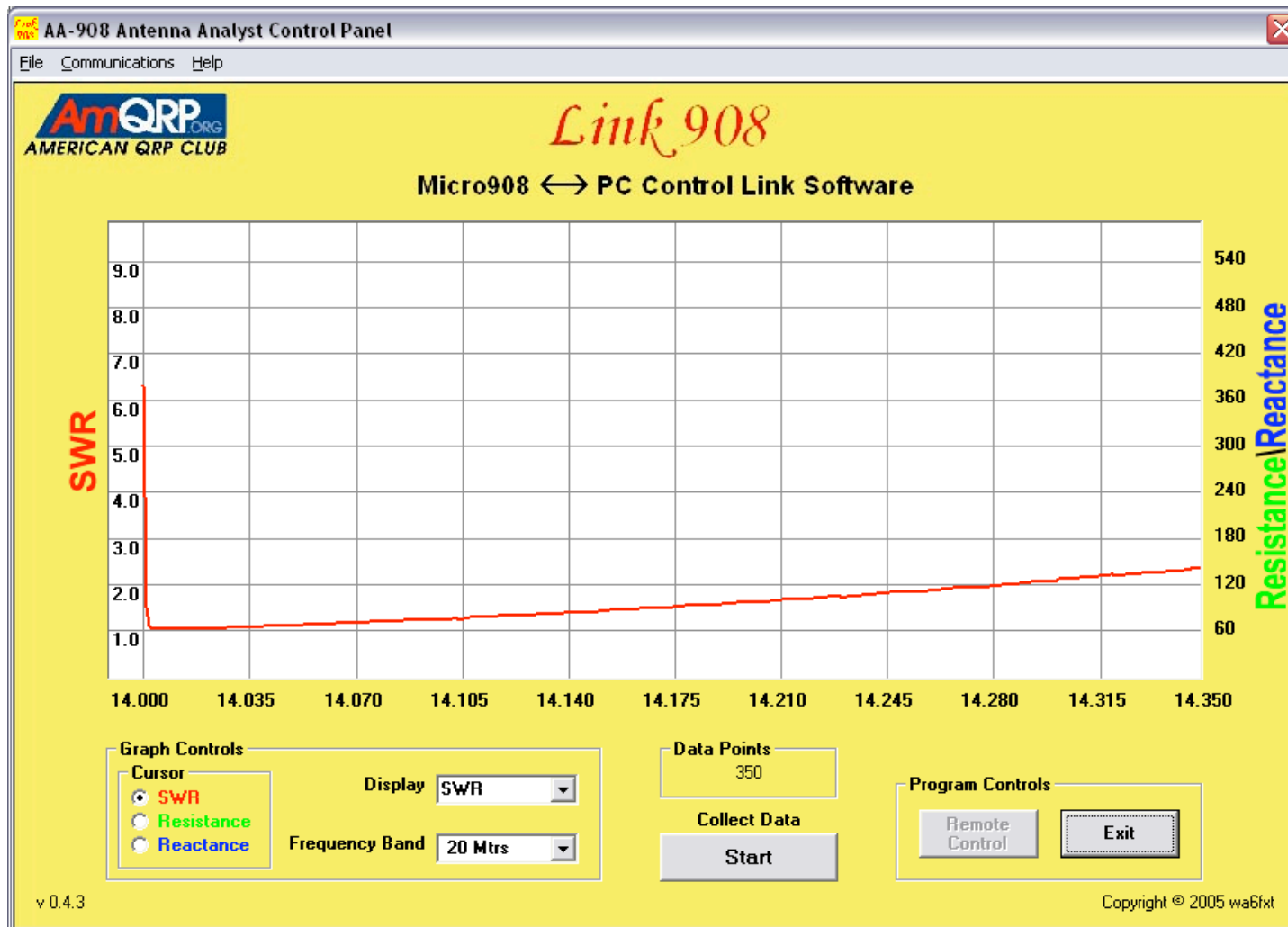


- Tune radials

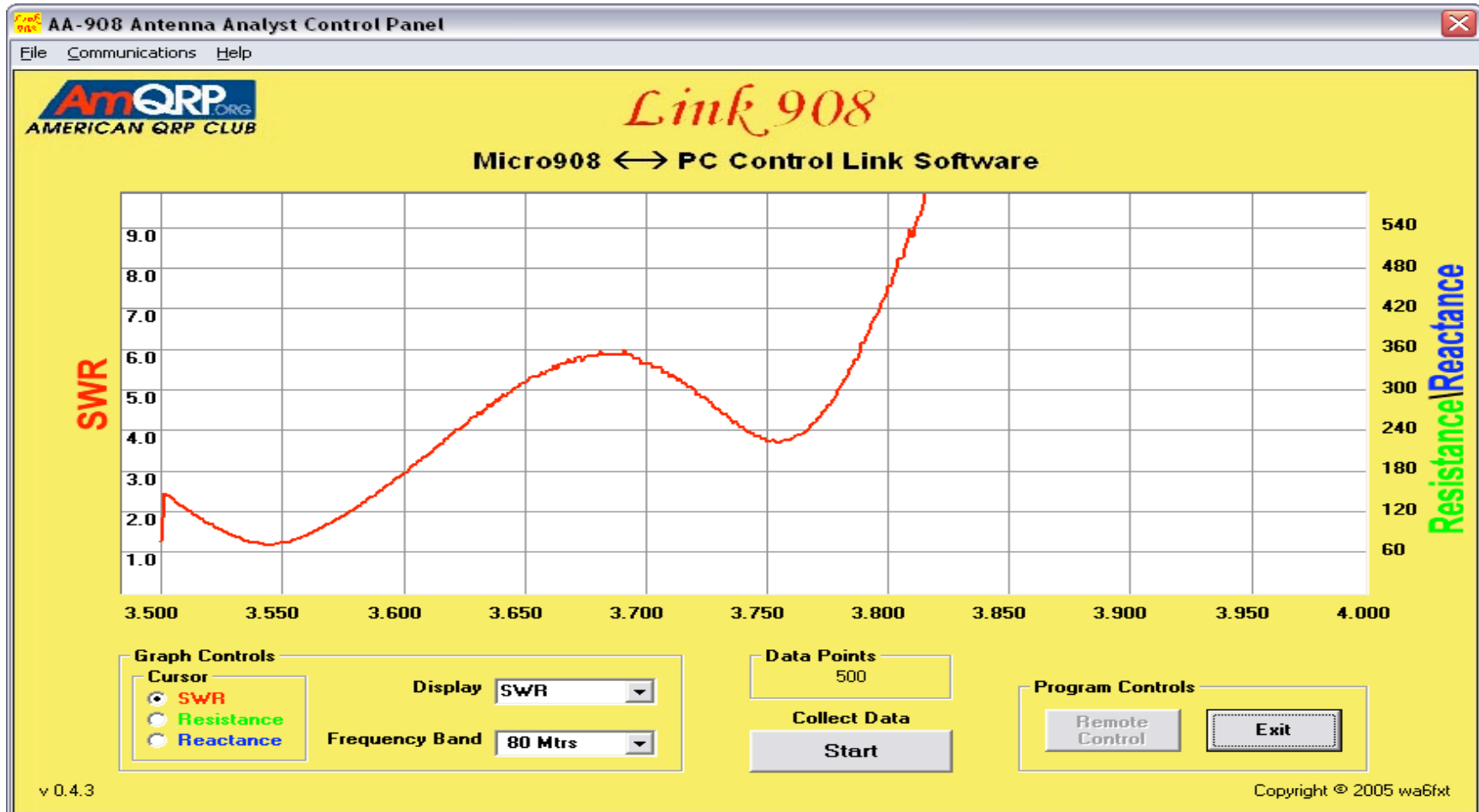


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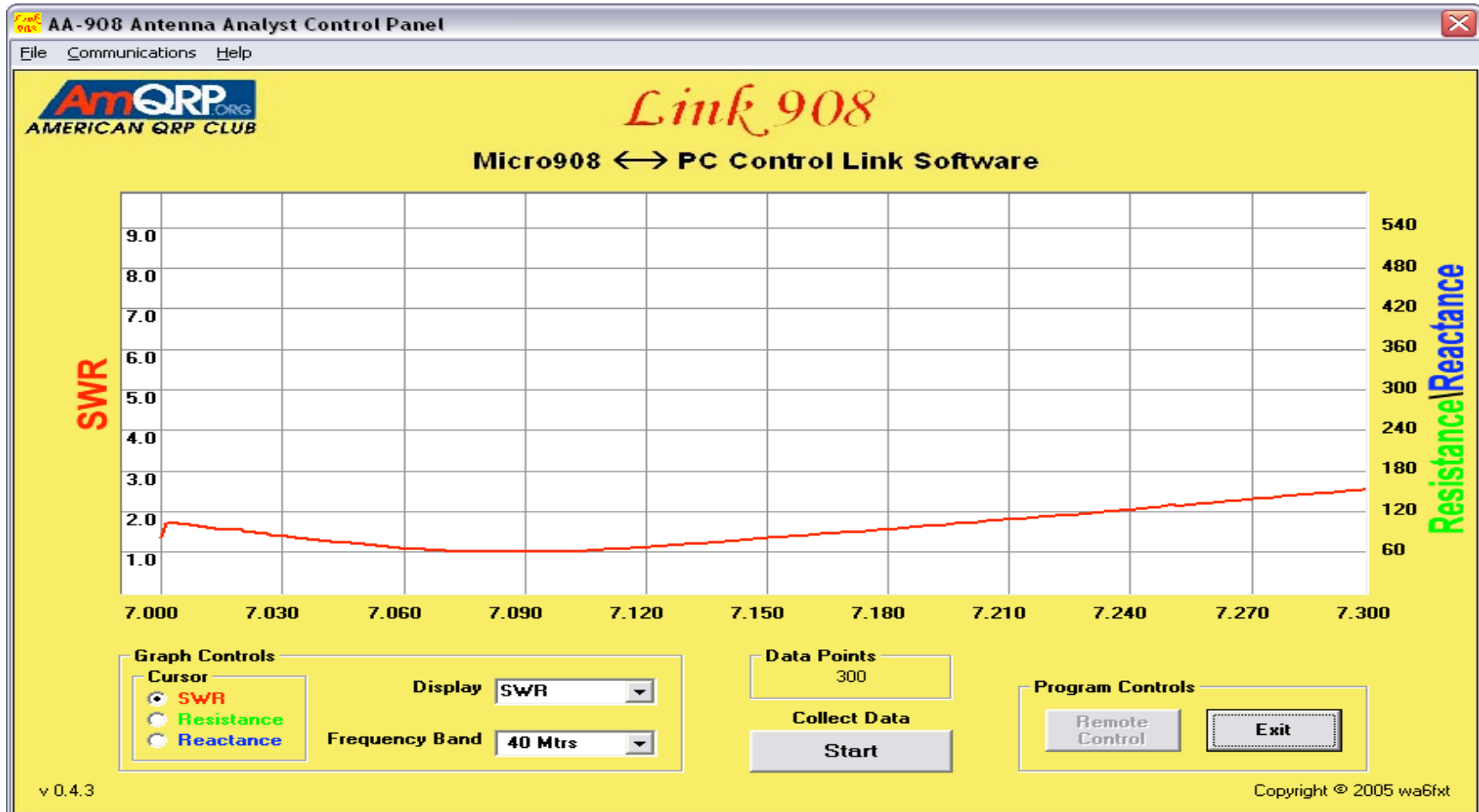
- Force-12 C3SS – Automatically Scanned & Plotted for 20M



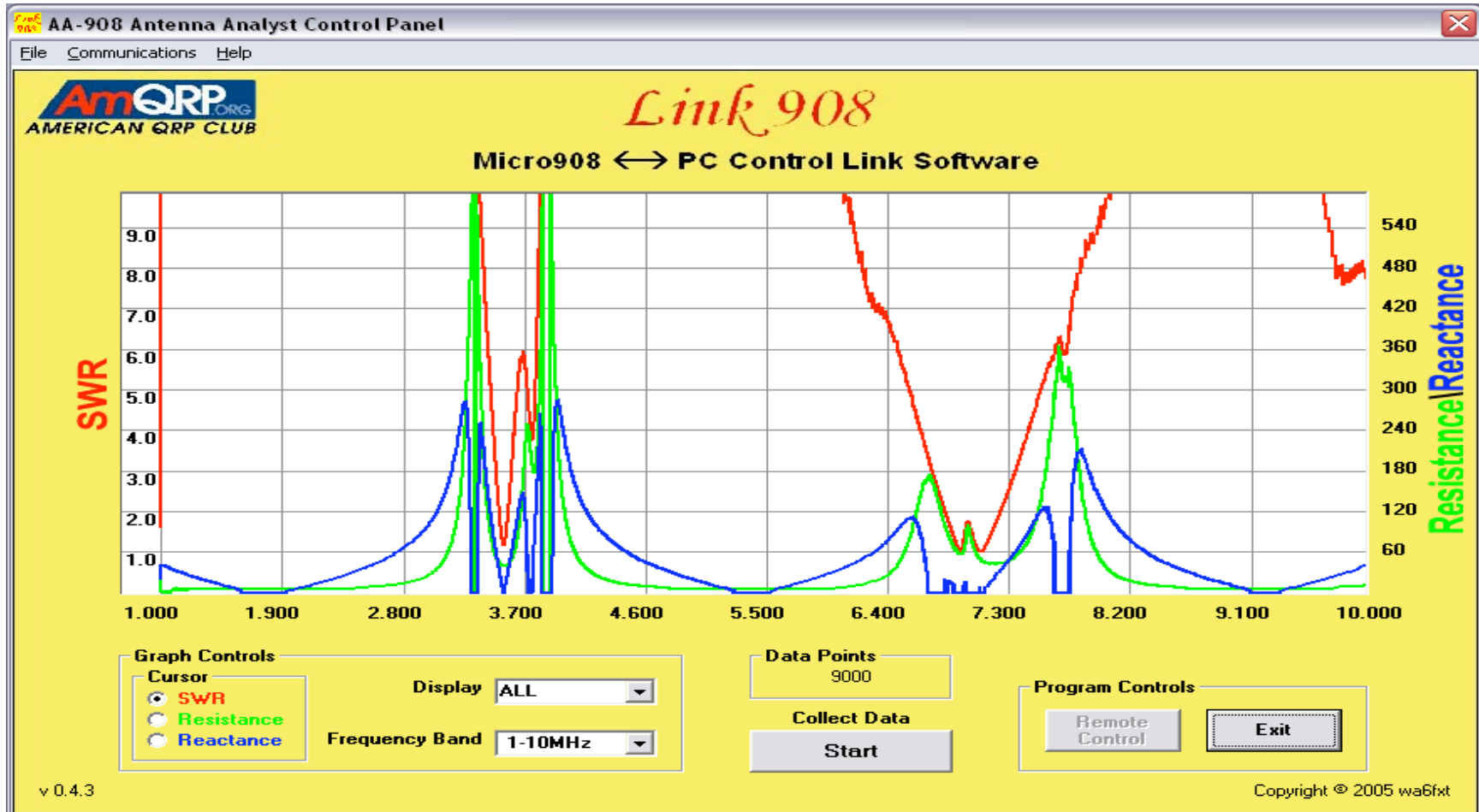
Ma8040v – 80M



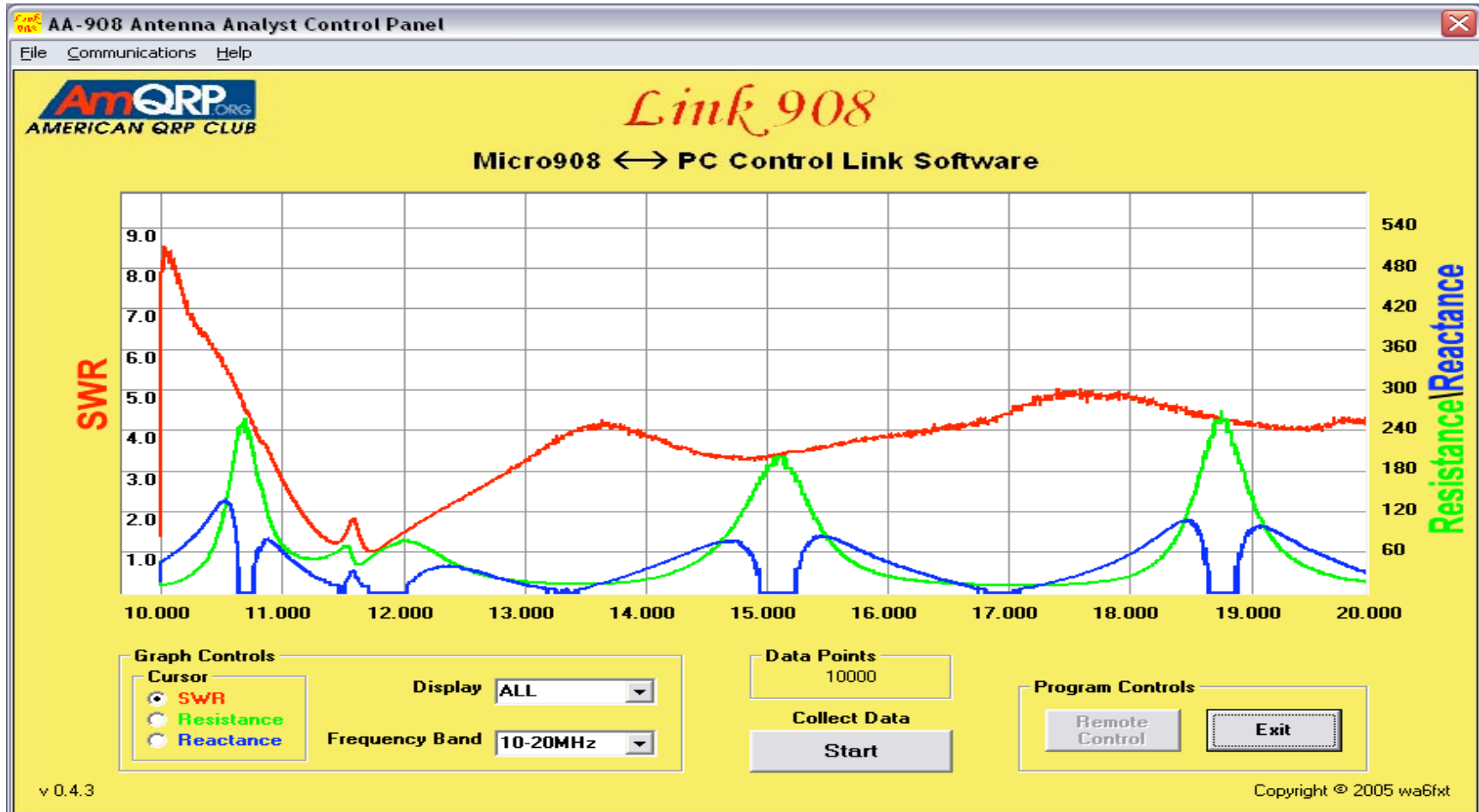
Ma8040v – 40m



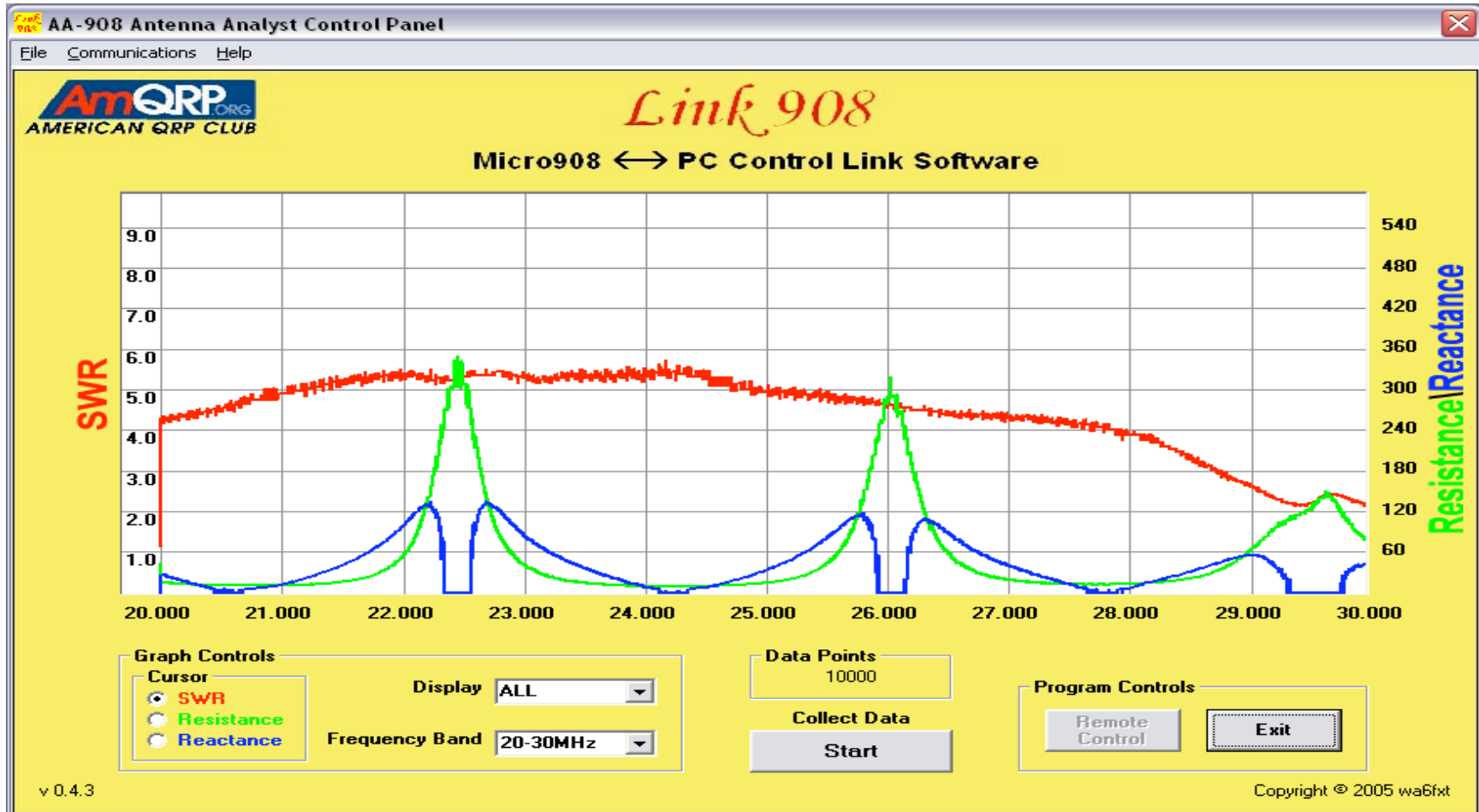
Ma8040v – 1 -10mhz



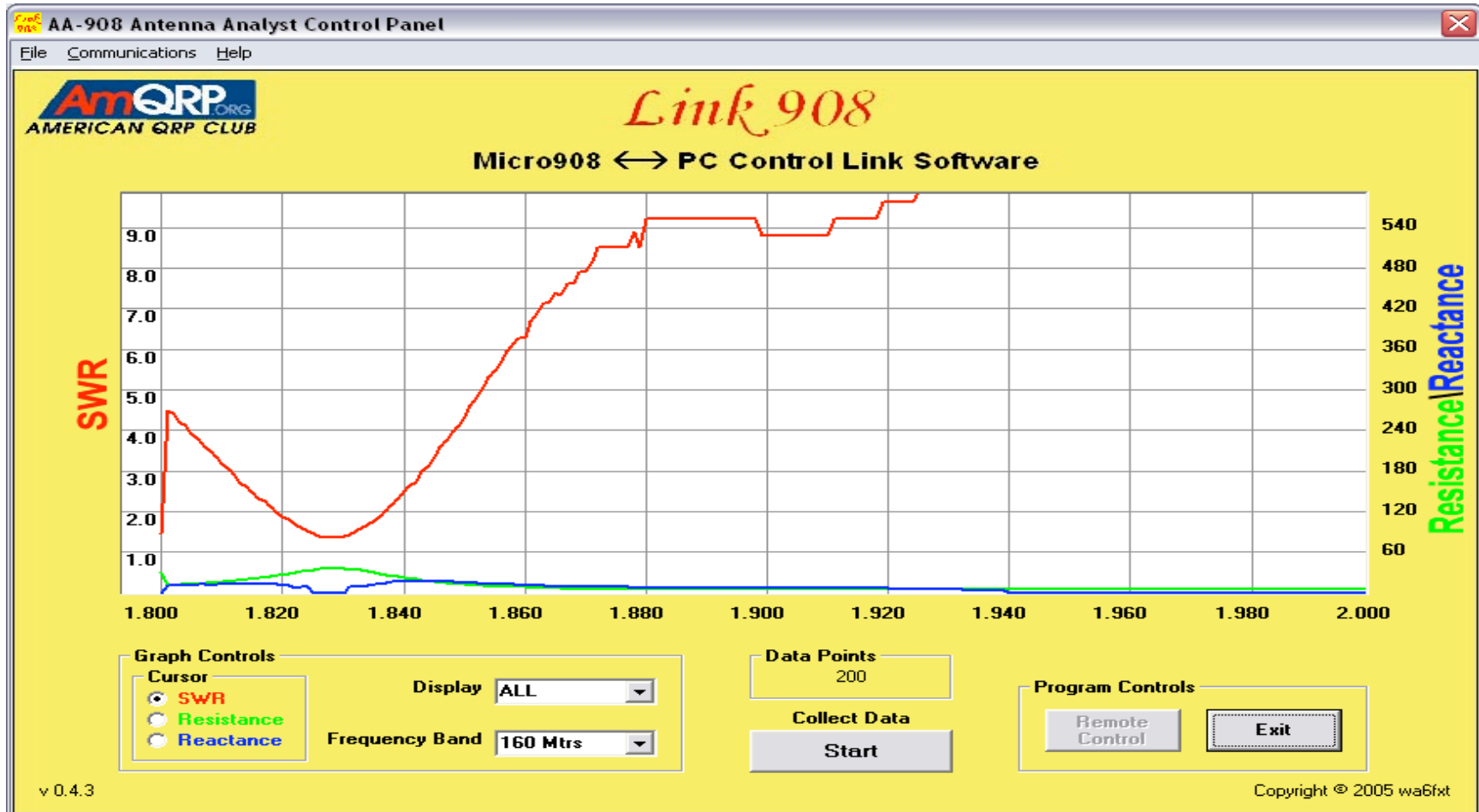
Ma8040v – 10 – 20 mhz



Ma8040v – 20 -30 mhz



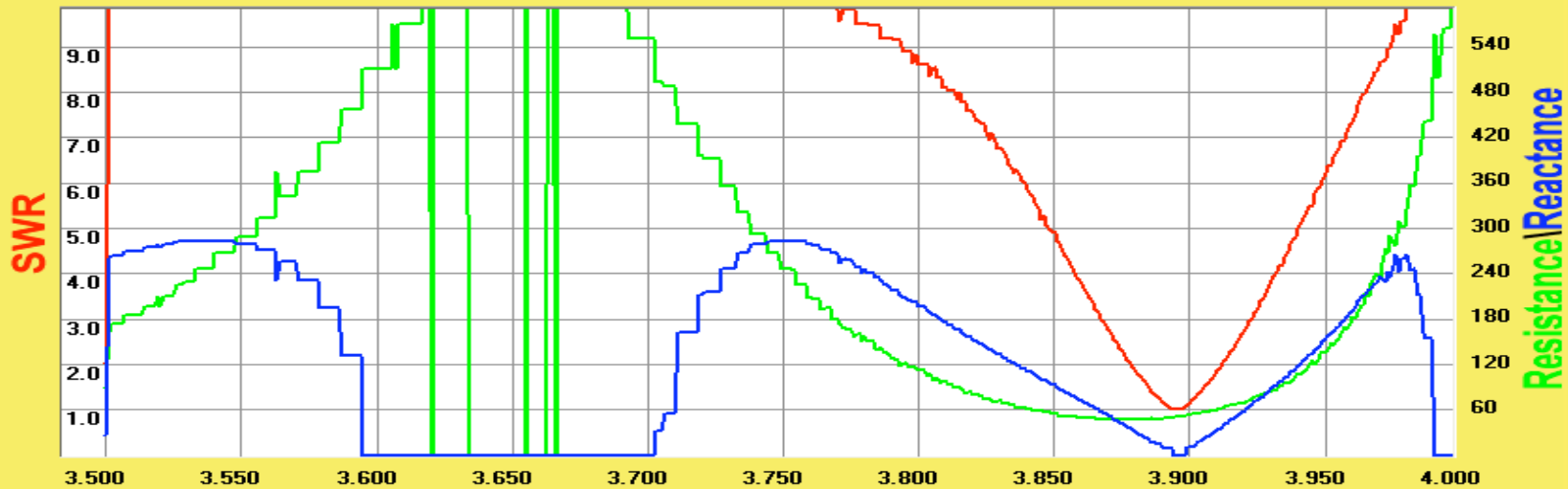
Dx-lb 160





Link 908

Micro908 ↔ PC Control Link Software



Graph Controls

Cursor

- SWR
- Resistance
- Reactance

Display ALL

Frequency Band 80 Mtrs

Data Points 500

Collect Data

Start

Program Controls

Remote Control

Exit

Dx-1b 40m

