Long-Boom Trimming Yagis: An Accumulation of Data

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Frequency-Sweep Graphs

This document is a reference collection of graphs to accompany the main document of the same title. It contains frequency-sweep graphs of 31 DL6WU Yagi models from 10 to 40 elements and 41 frequency-sweep graphs of Test-series Yagi models from 10 to 50 elements. The latter series bears the identification label "LB," which is not a copy of my initials, but an abbreviation for "long-boom."

Caution: Since there are two graphs for each model, each version of each series of Yagis occupies a full page in order to make the graphs legible. Therefore, as a PDF document, this one is quite long. However, all graphs used the most compact format and lowest color count feasible to minimize file size.

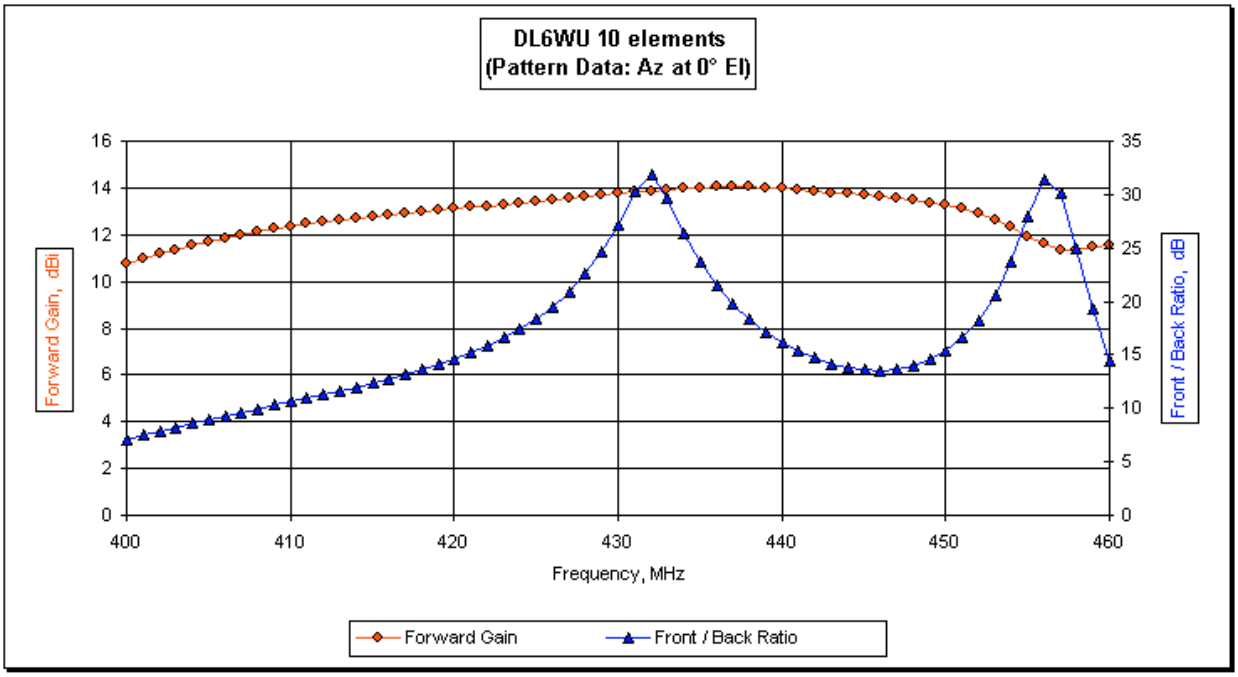
All models use 4-mm (0.1575") diameter elements for inter-series consistency. All models use a design frequency of 432 MHz. All frequency sweeps run from 400 to 460 MHz. This range encompasses the 70-cm amateur band that extends from 420 to 450 MHz. The unequal extensions of the sweep beyond the band edges recognize that for most Yagi designs, operating parameters fall off more slowly below the design frequency than above it.

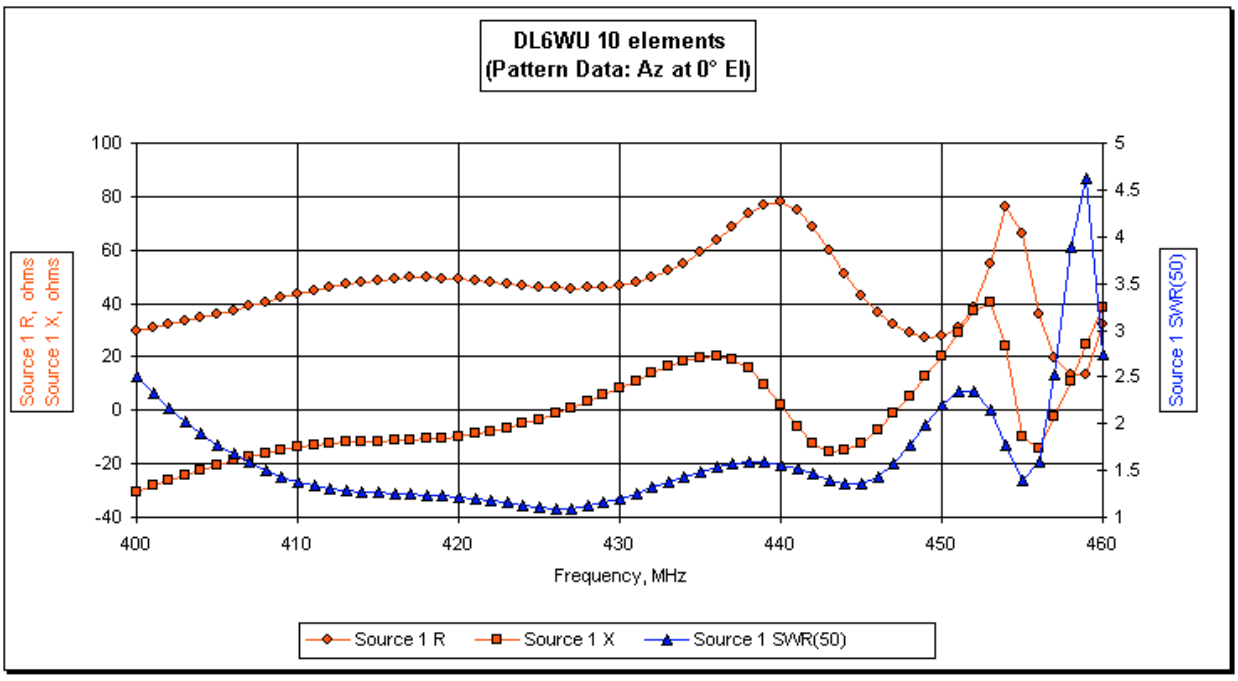
All frequency-sweep graphs are based on EZNEC Pro/4 (NEC-4) models of the subject Yagis, with sweep data produced via EZ-Plots from AC6LA. The first graph for each version of each series traces the free-space forward gain in dBi and the 180° front-to-back ratio in dB. The second graph for each version of each series tracks the source or feedpoint resistance and reactance, along with the 50-Ω SWR value. Above 450 MHz, these values fluctuate widely, resulting in some high values on some graphs. However, like the front-to-back ratio, the pattern of peaks and nulls varies with the number of elements in each series and differs as well between series.

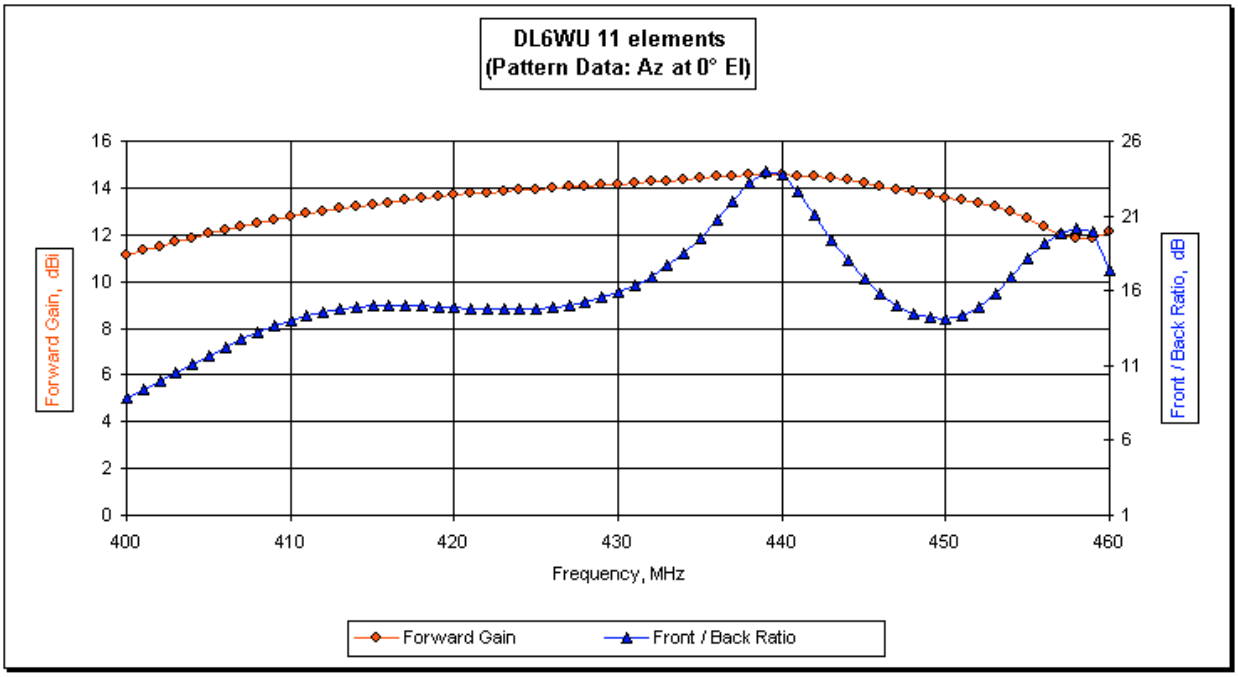
The details of long-boom trimming Yagis are locked within the data patterns. This set of graphical data is but a small part of what one might develop with enough time and energy. One might, for example, survey each series of Yagis using different element diameters, adjusting the required element lengths for primary performance at the design frequency and for the closest approximation of the frequency sweep range that is possible with the selected element diameter. In addition, one may choose other algorithms and design criteria than the ones used for these models and described in the main document. In addition, one might also carry out the design of pseudo-trimming Yagis--in which one varies only a small subset of element lengths and/or spacing from one number of elements to the next--for the same boomlength range (about 2 to 14 λ).

As the main document has noted from place to place, a number of our near classical assumptions about long-boom Yagis may require re-evaluation based on detailed studies of Yagi performance characteristics. The data in the graphs on the following pages are only a small step in that direction. However small it may be, I hope that it is a useful step.

DL6WU-Series Yagi Graphs: 10-40 Elements



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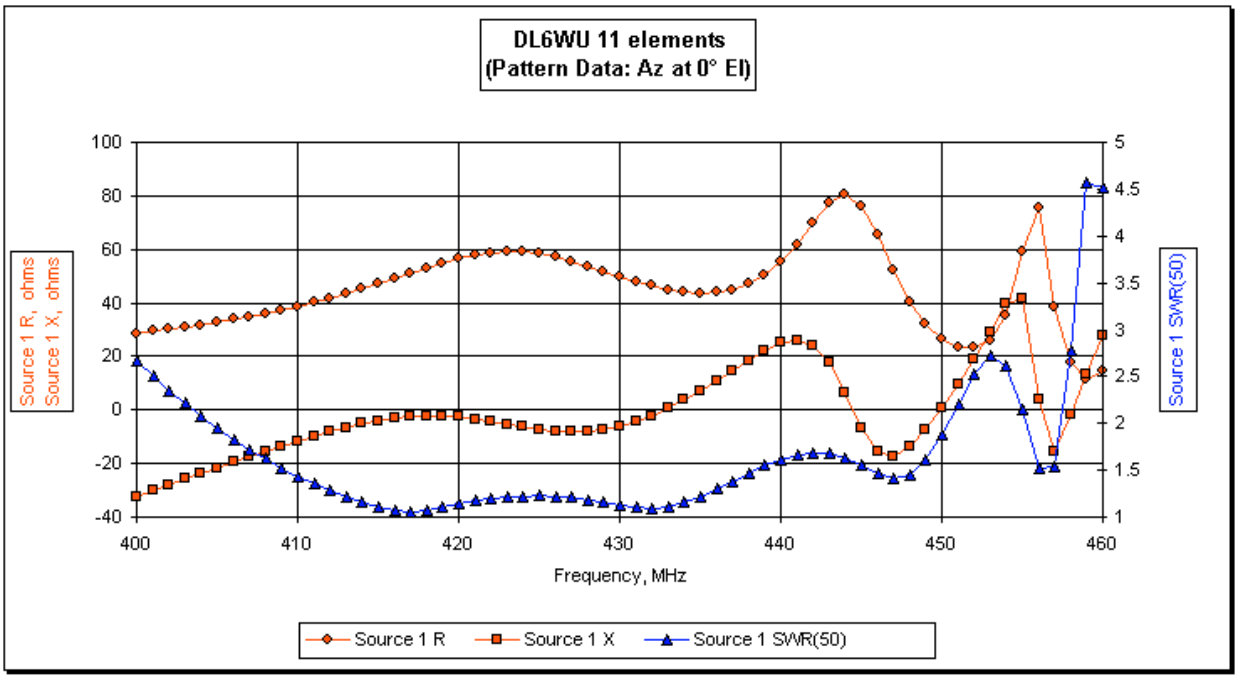
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio


DL6WU 11 elements
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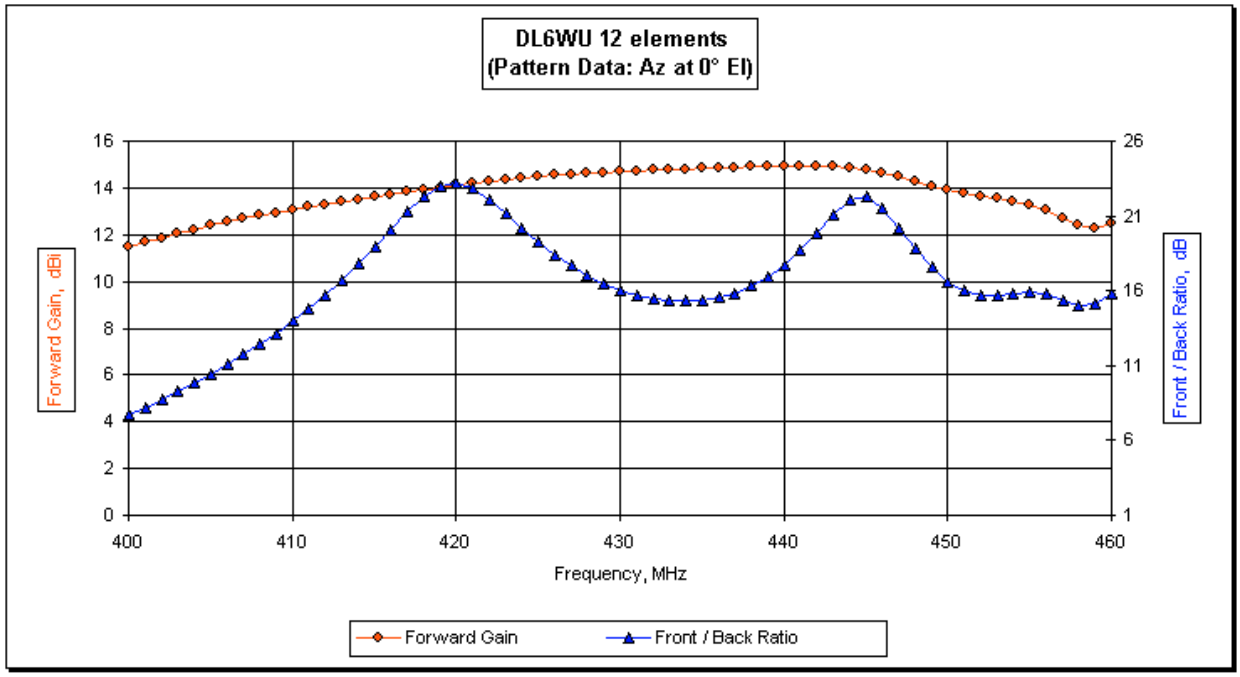
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)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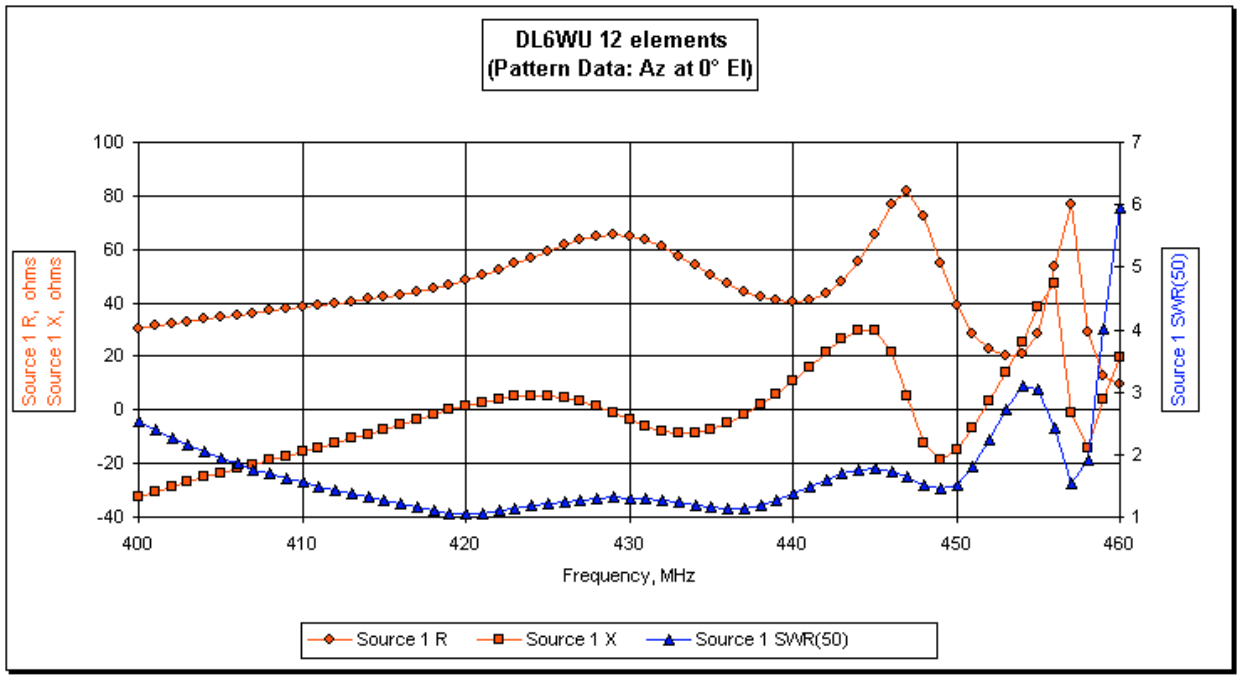
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio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Source 1 SWR(50)
Frequency, MHz
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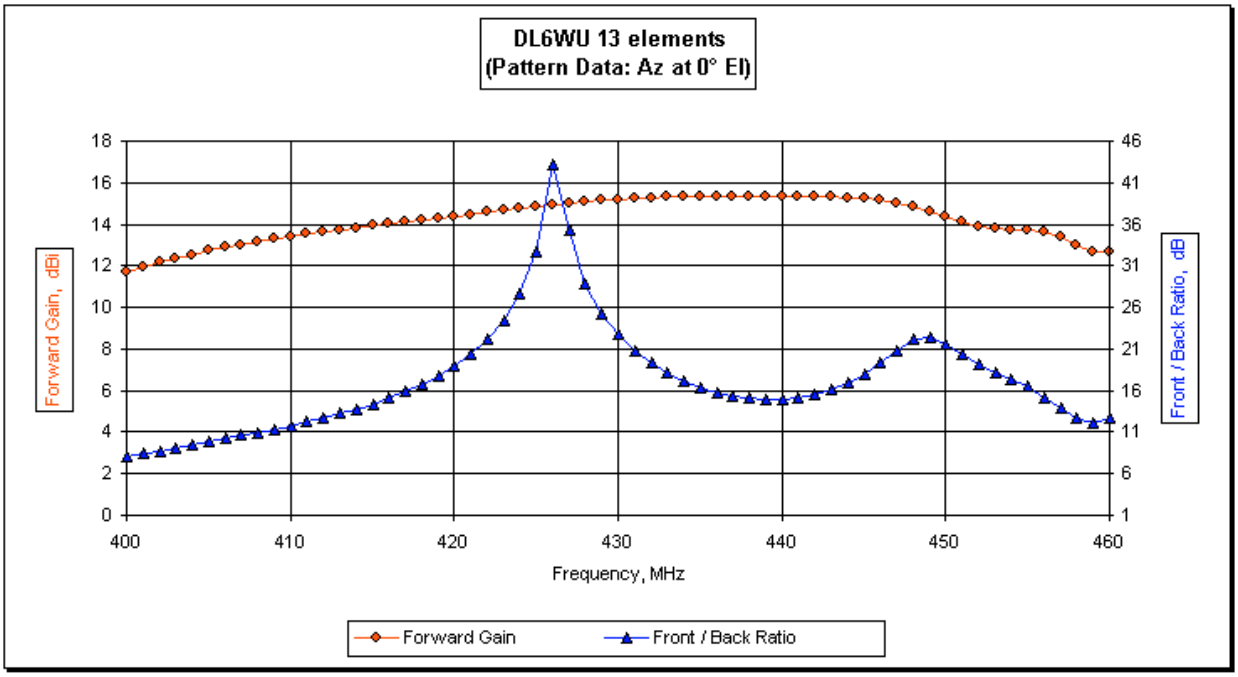
Source 1 X
Source 1 SWR(50)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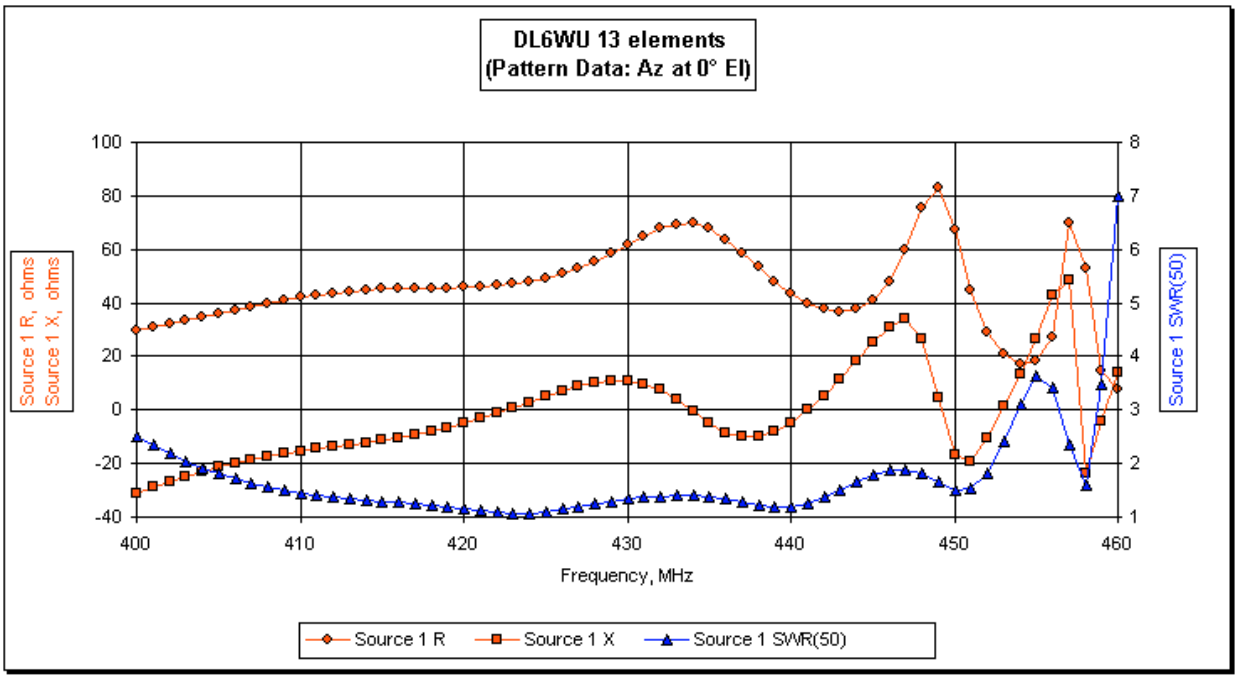
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Source 1 SWR(50)
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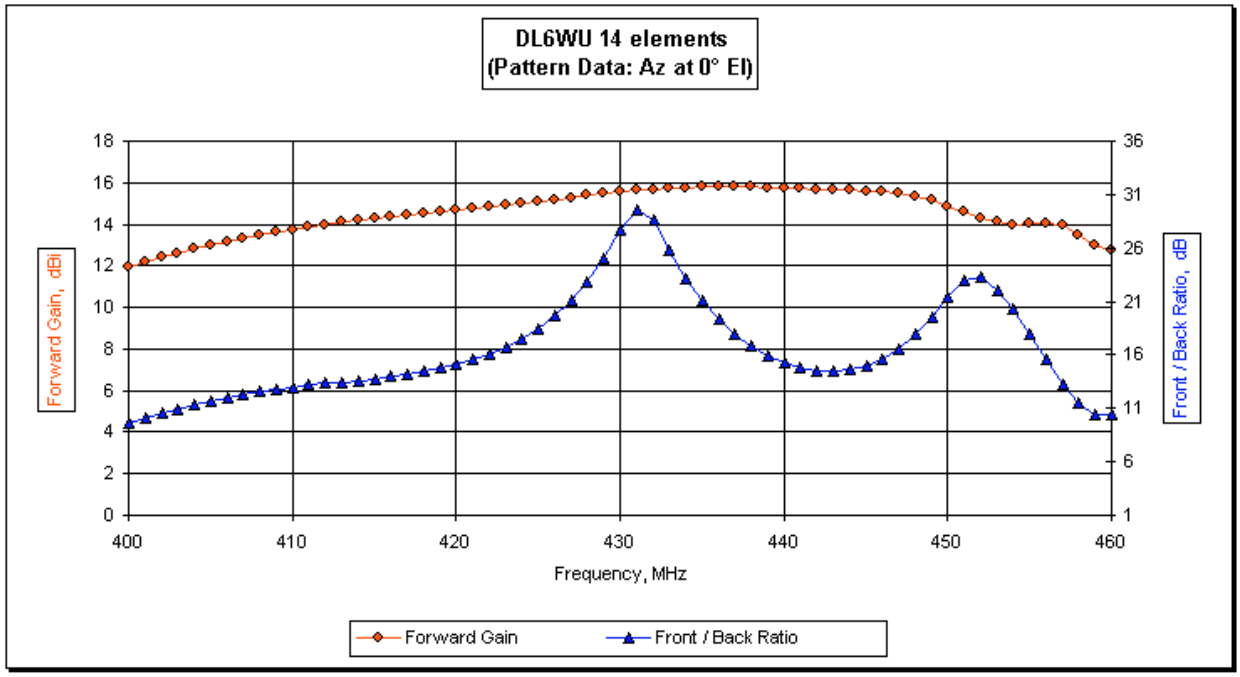
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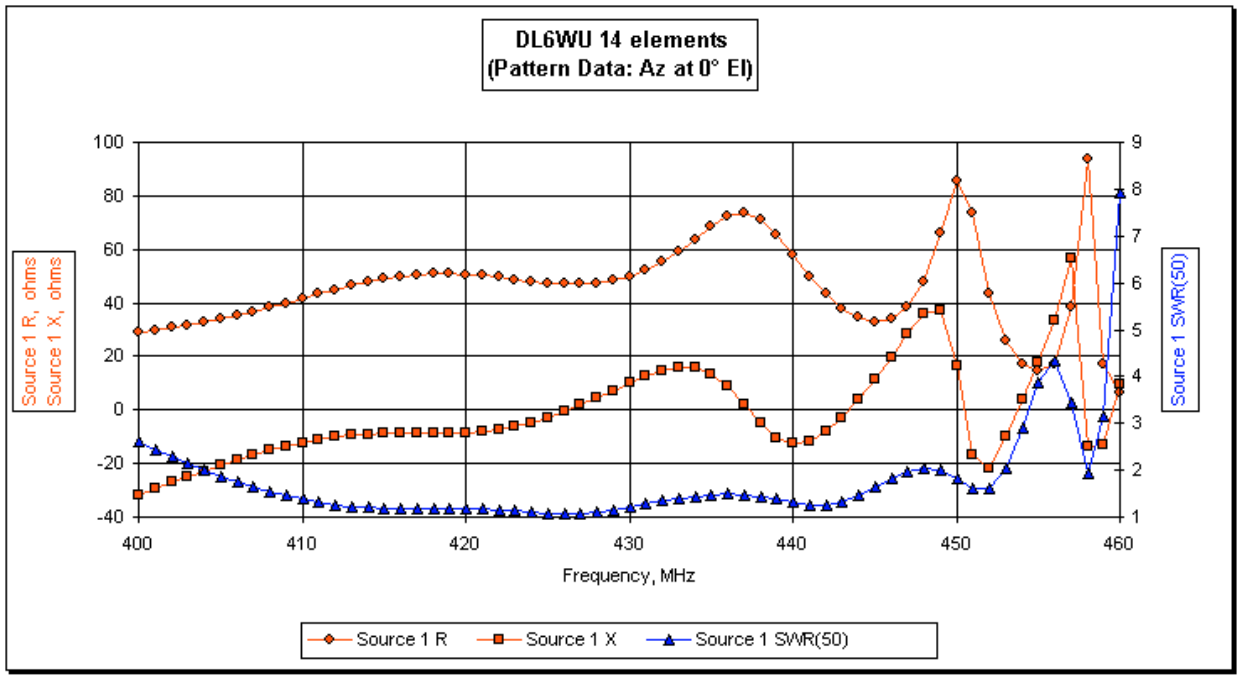
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio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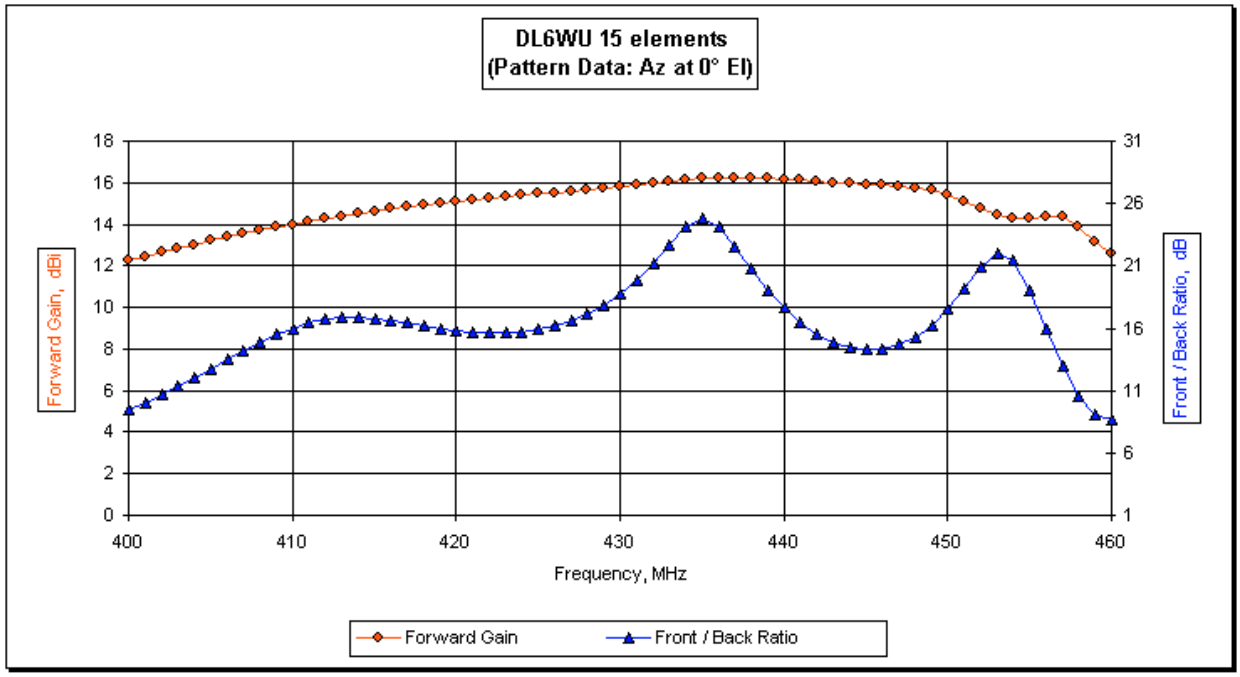
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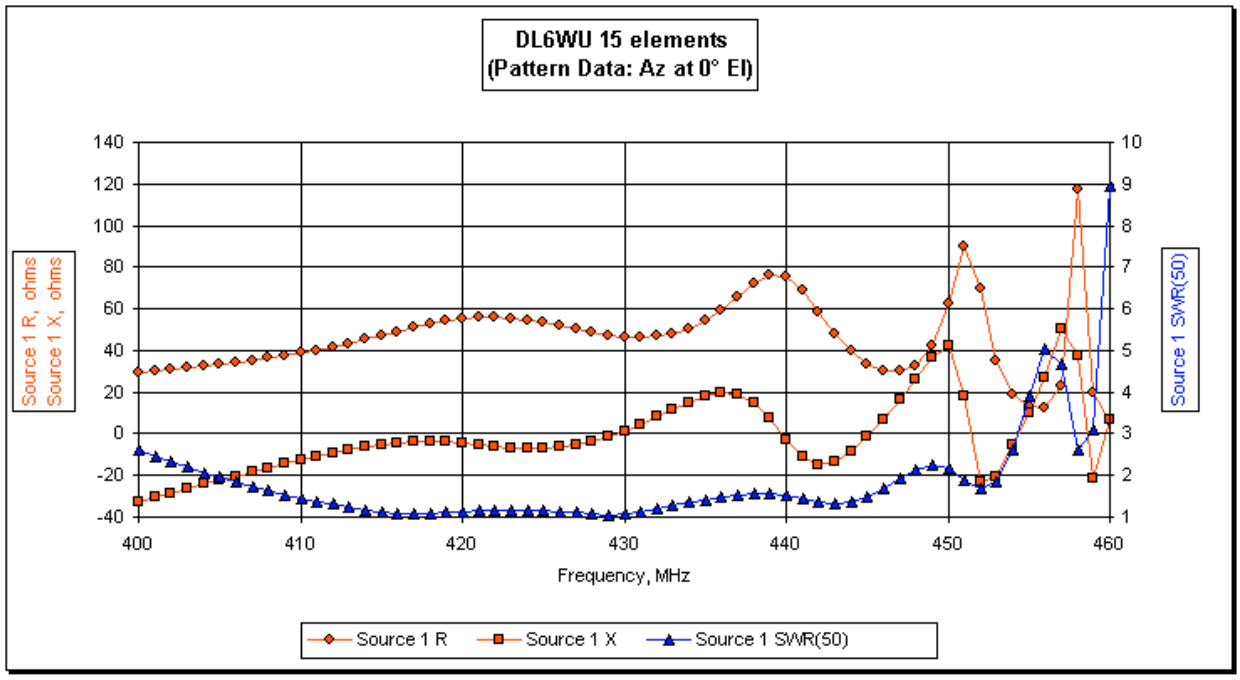
Frequency, MHz
Forward Gain
Front / Back Ratio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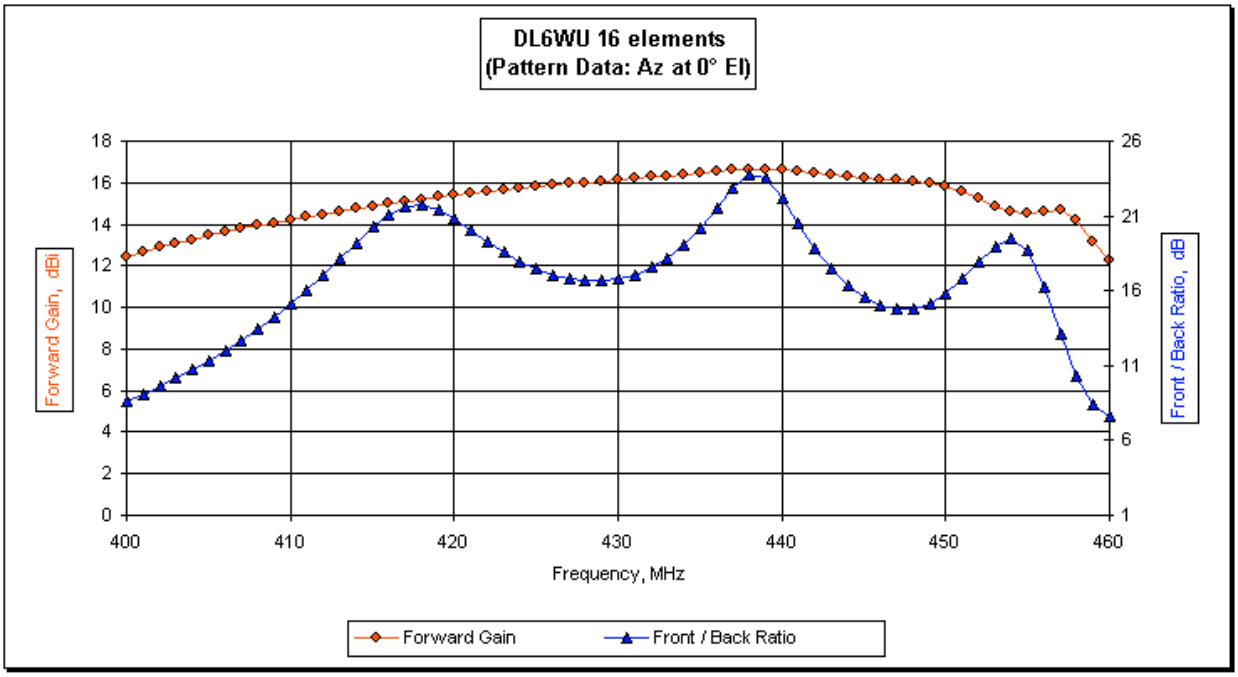
Source 1 R
Source 1 X
Source 1 SWR(50)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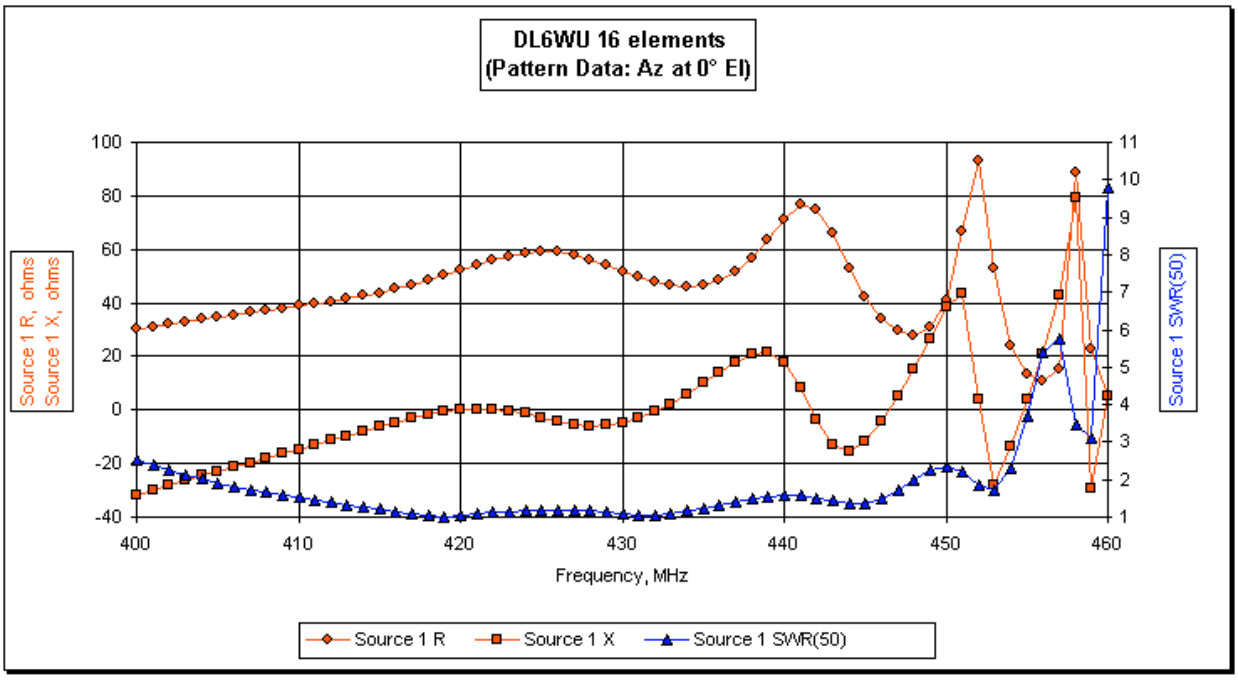
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio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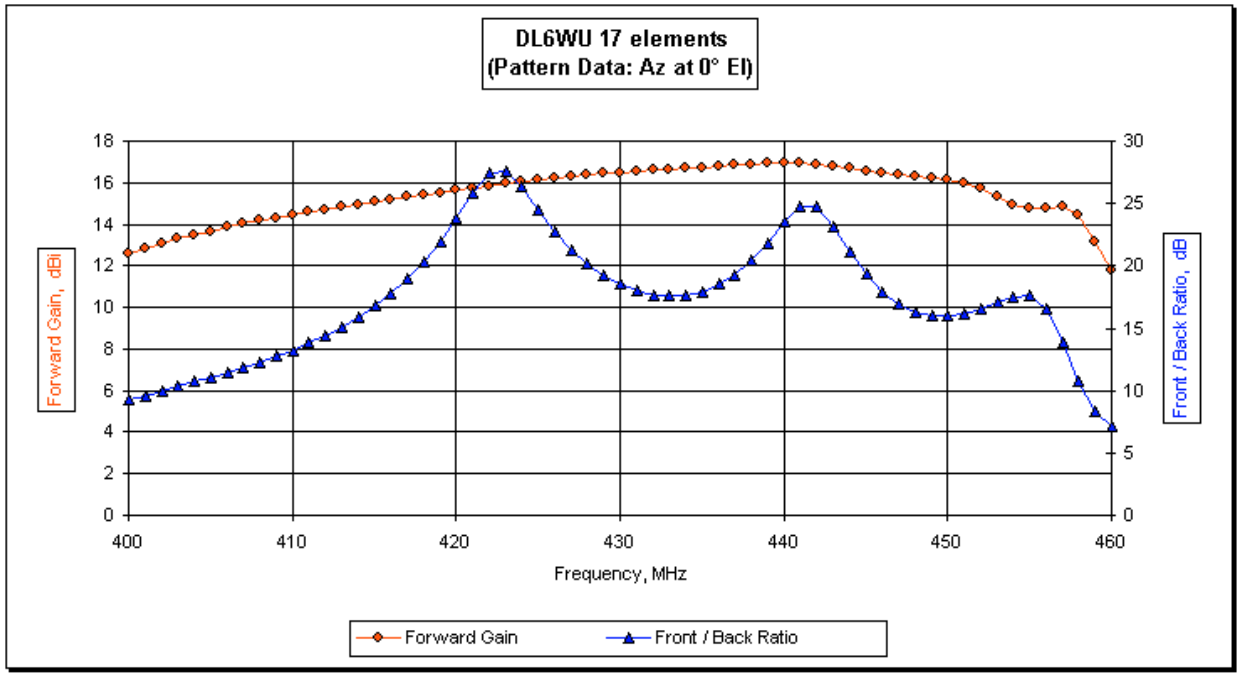
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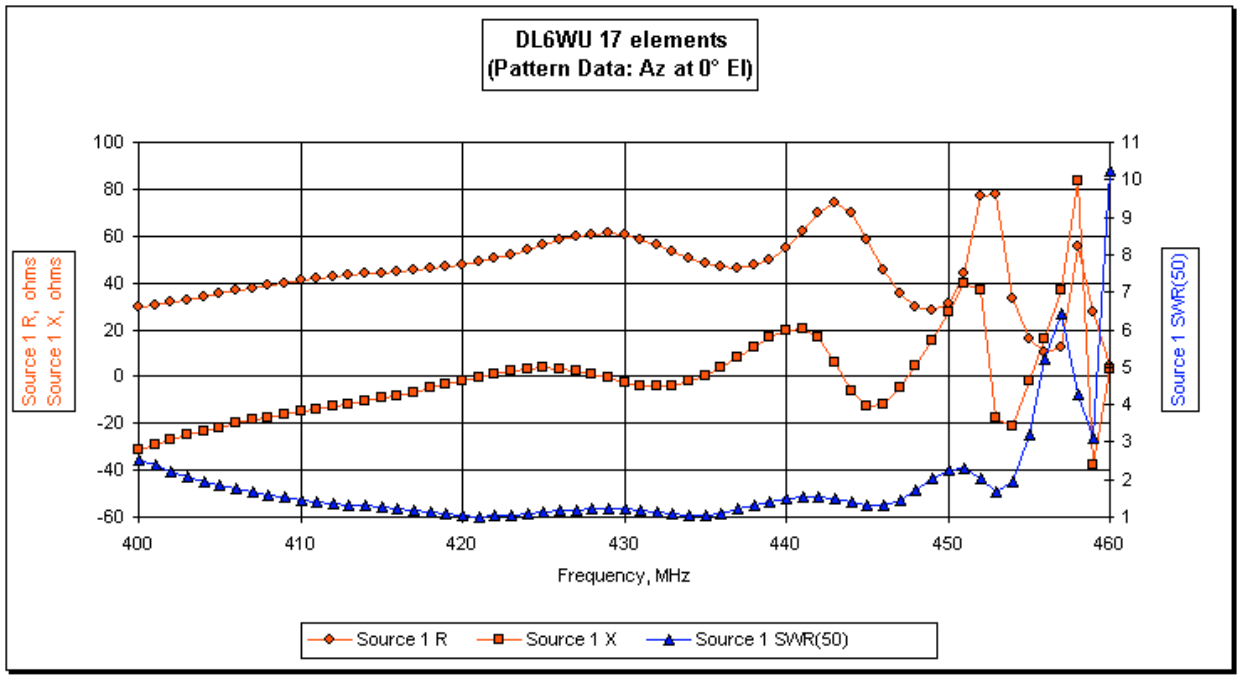
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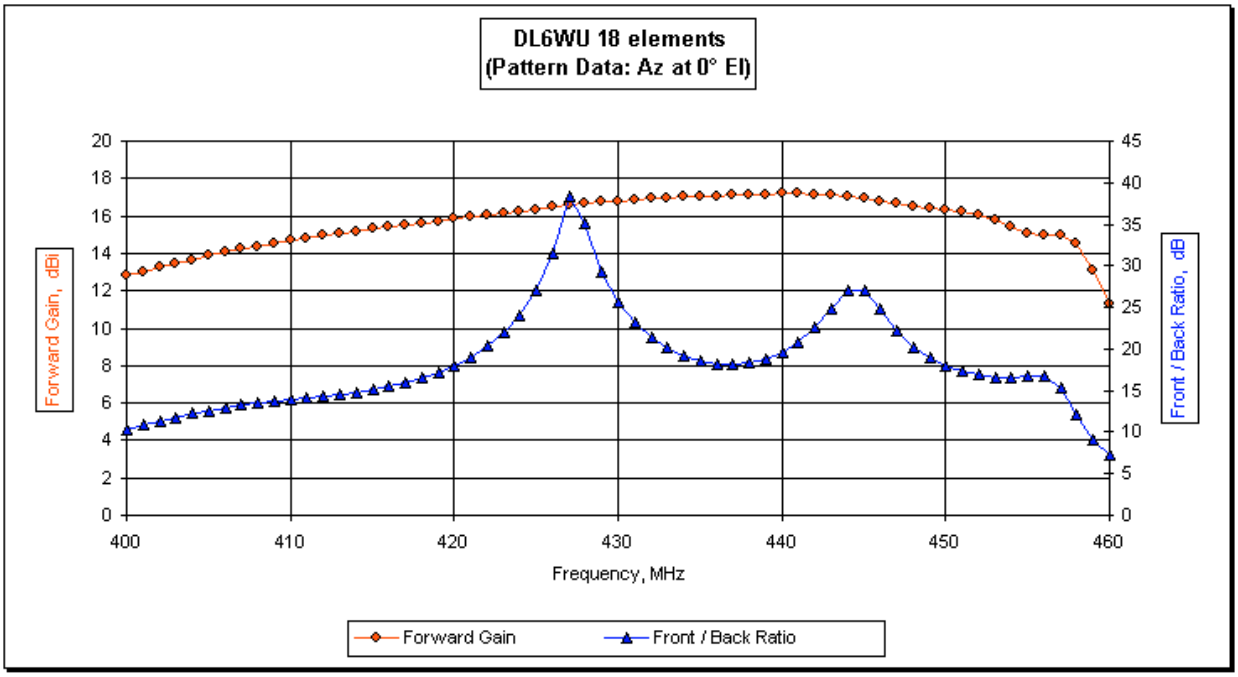
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Forward Gain
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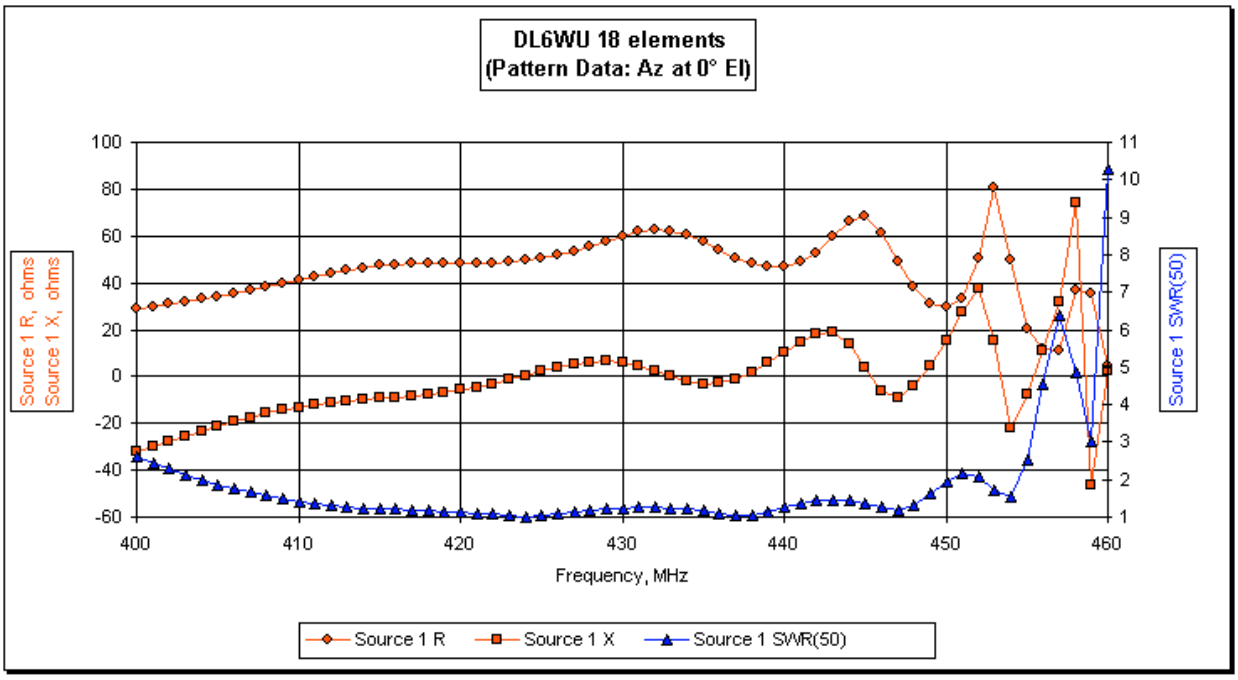
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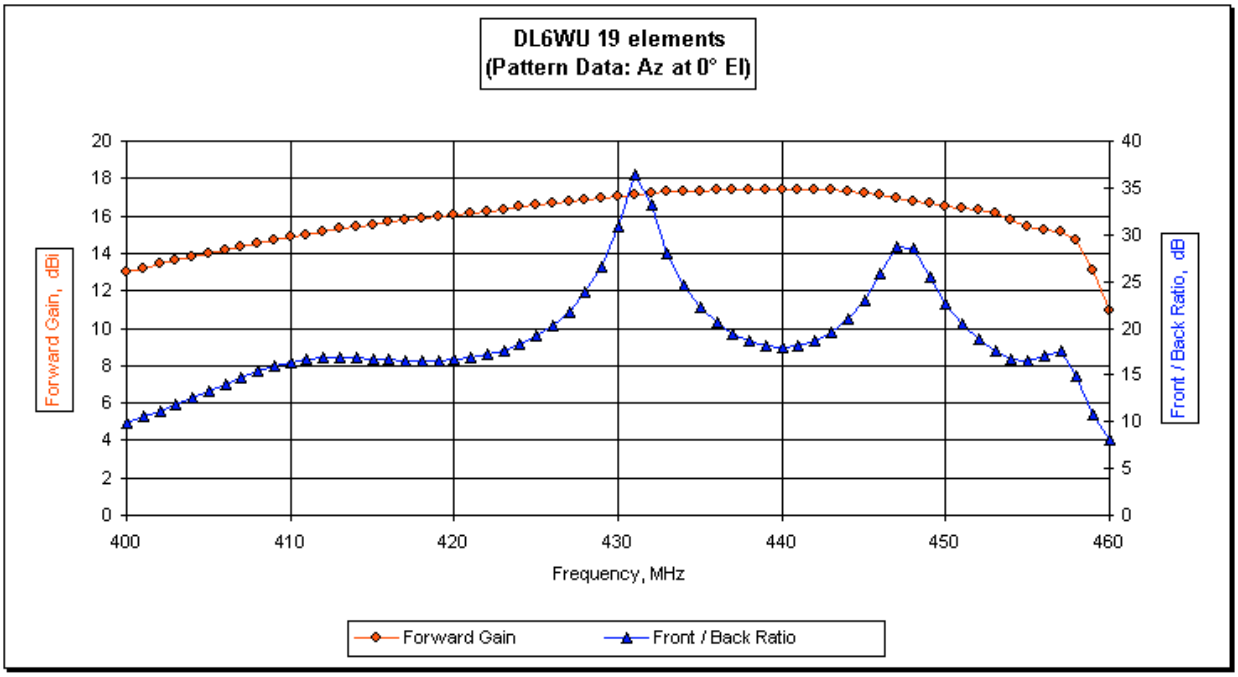
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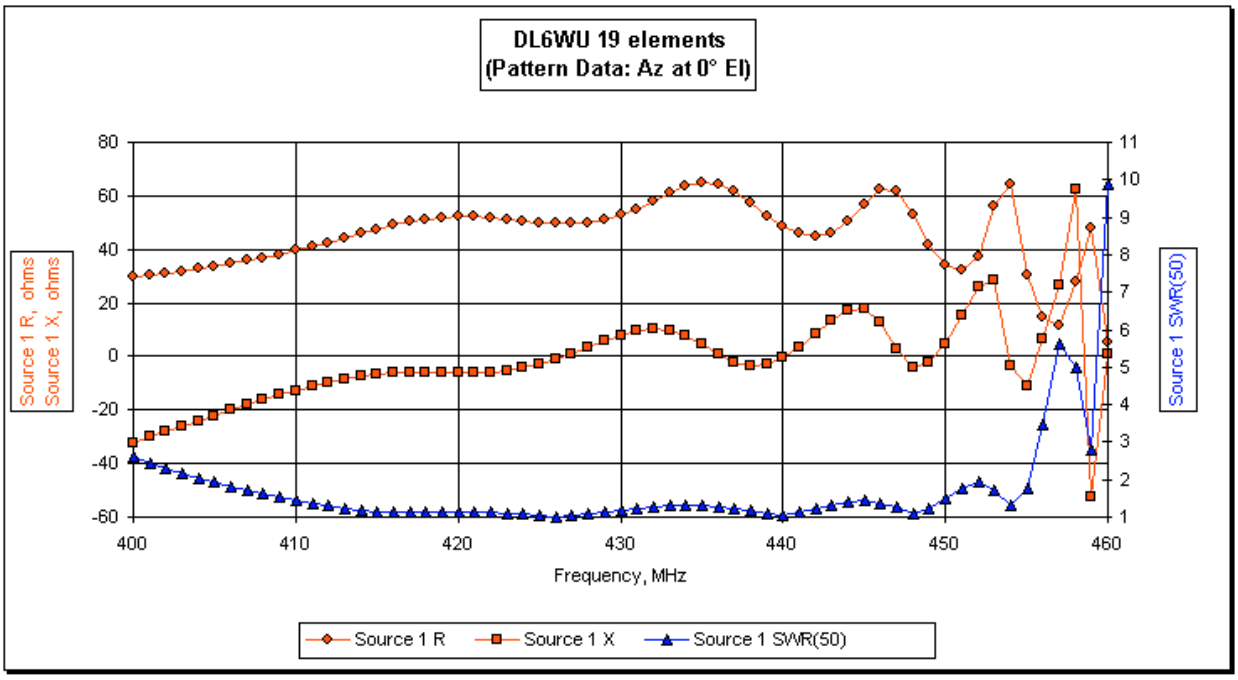
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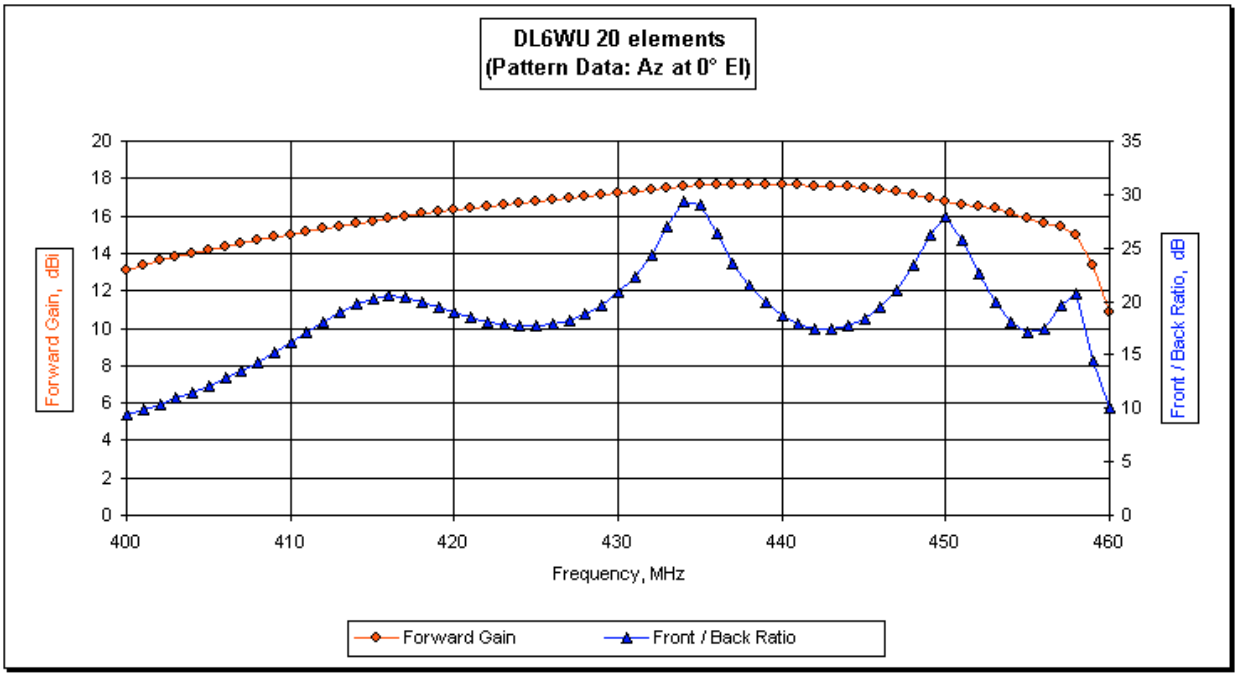
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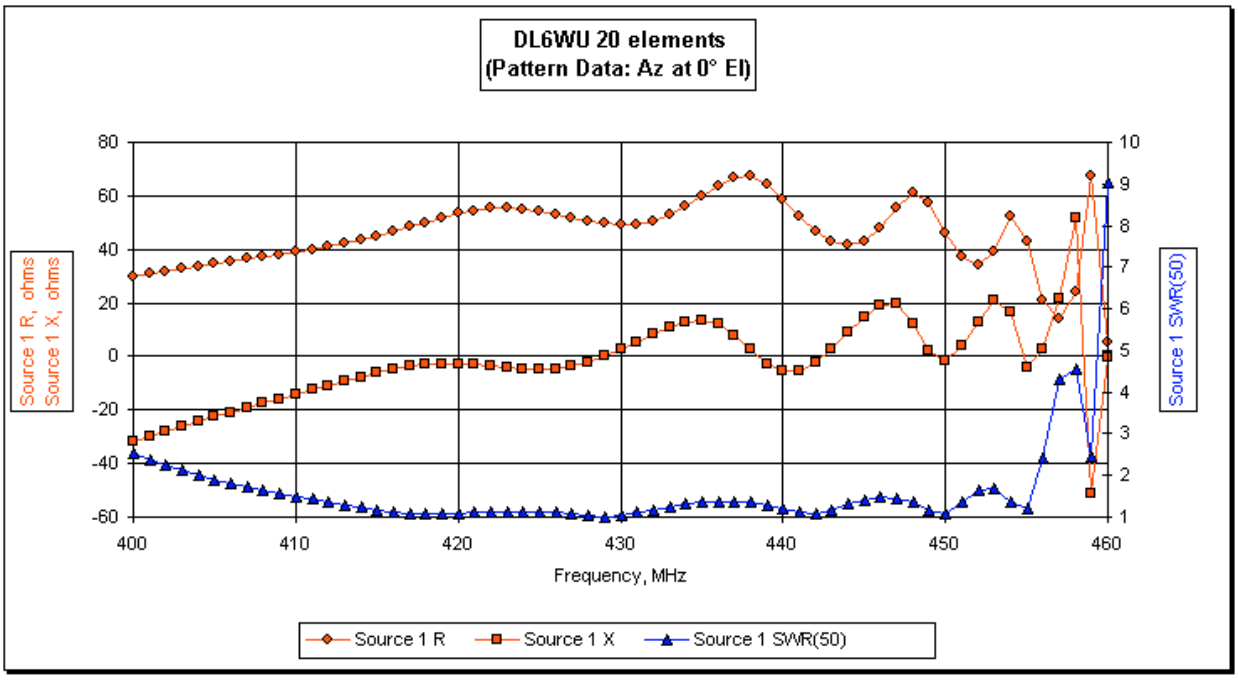
Frequency, MHz
Forward Gain
Front / Back Ratio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Frequency, MHz
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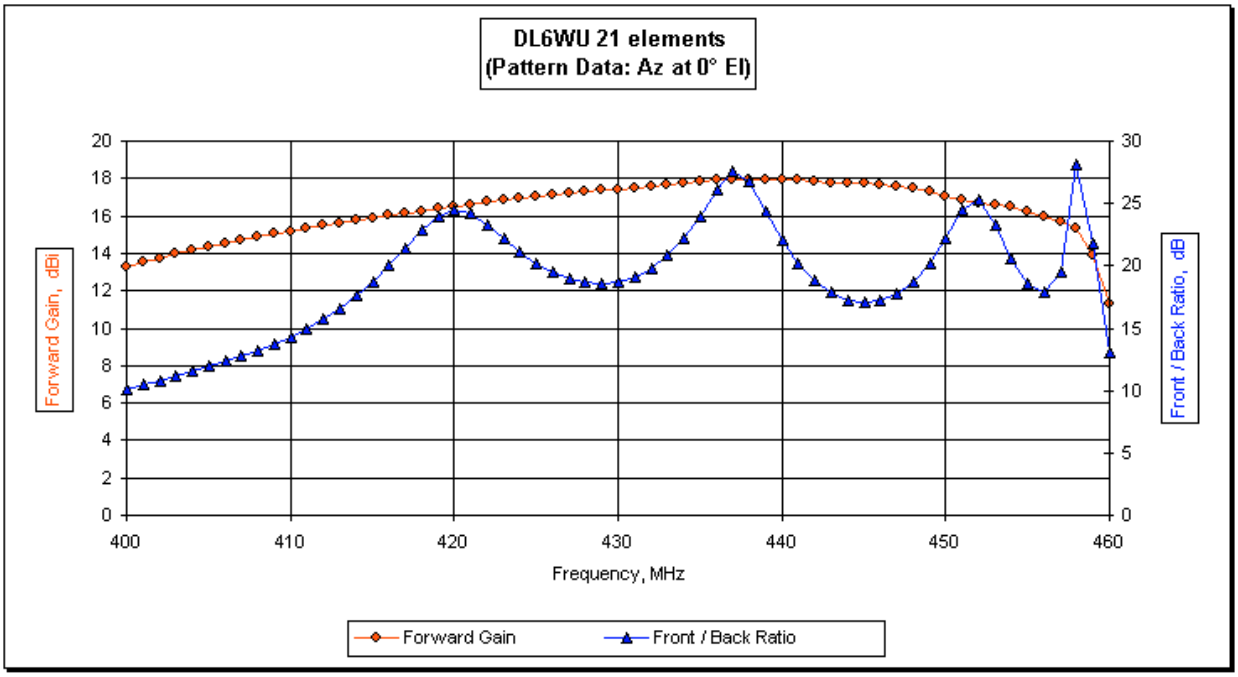
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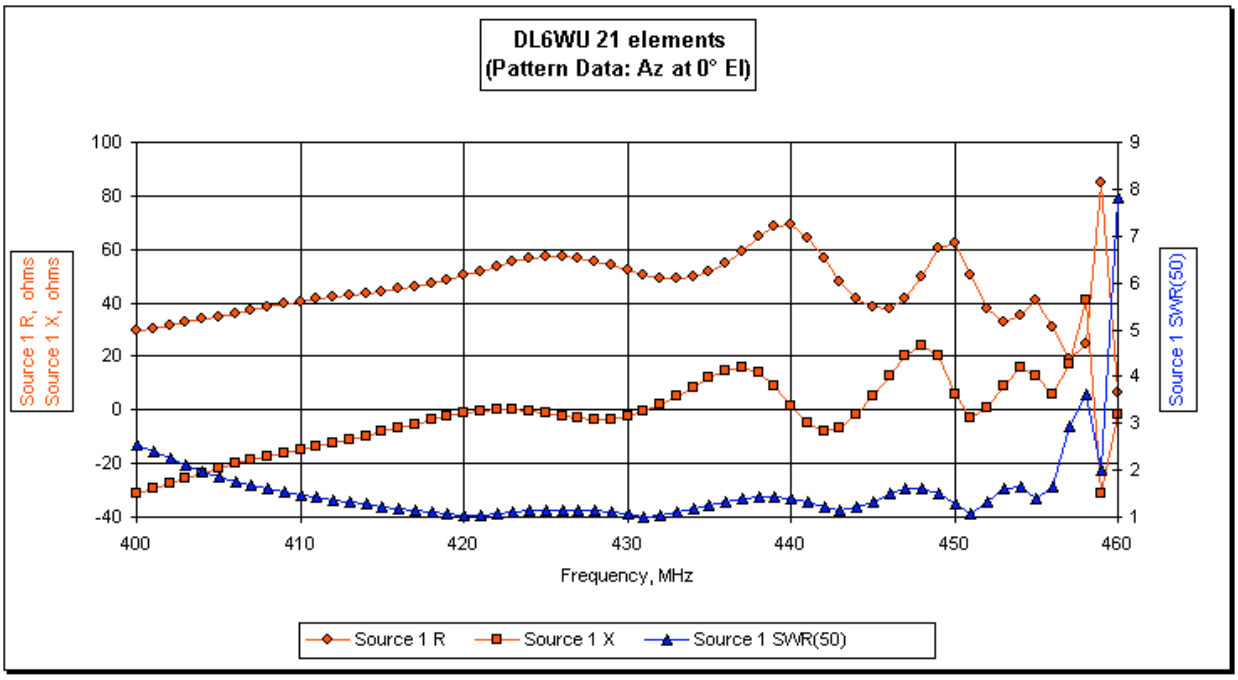
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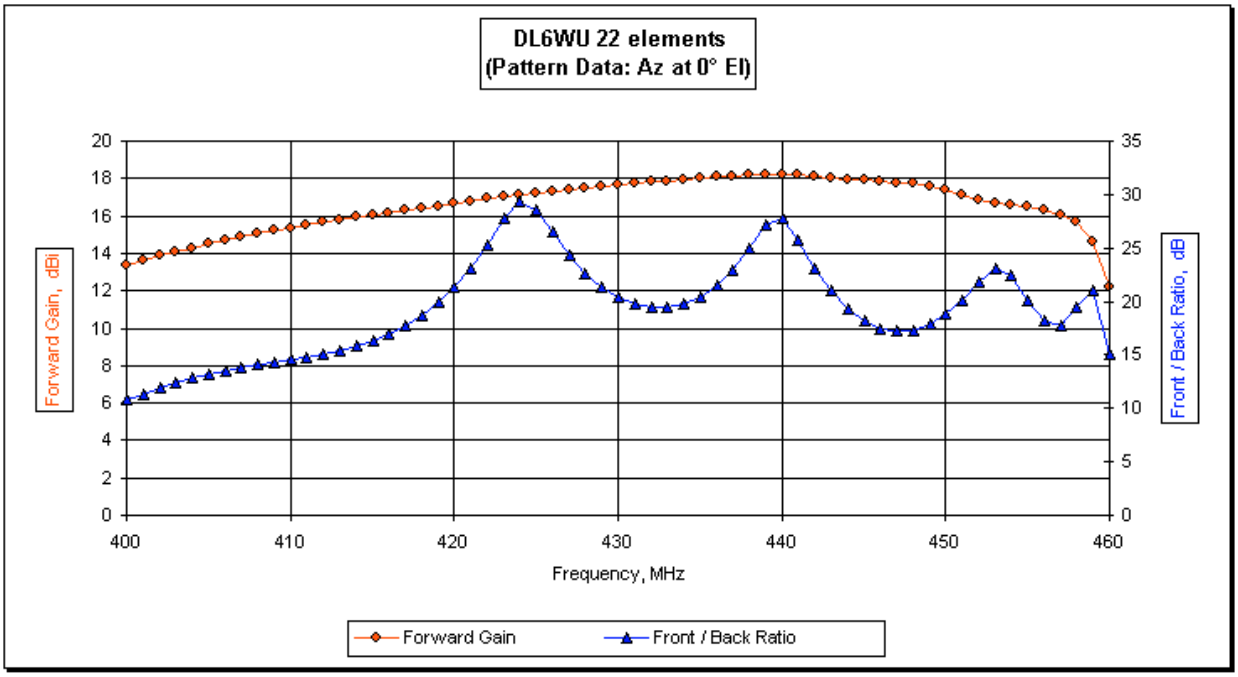
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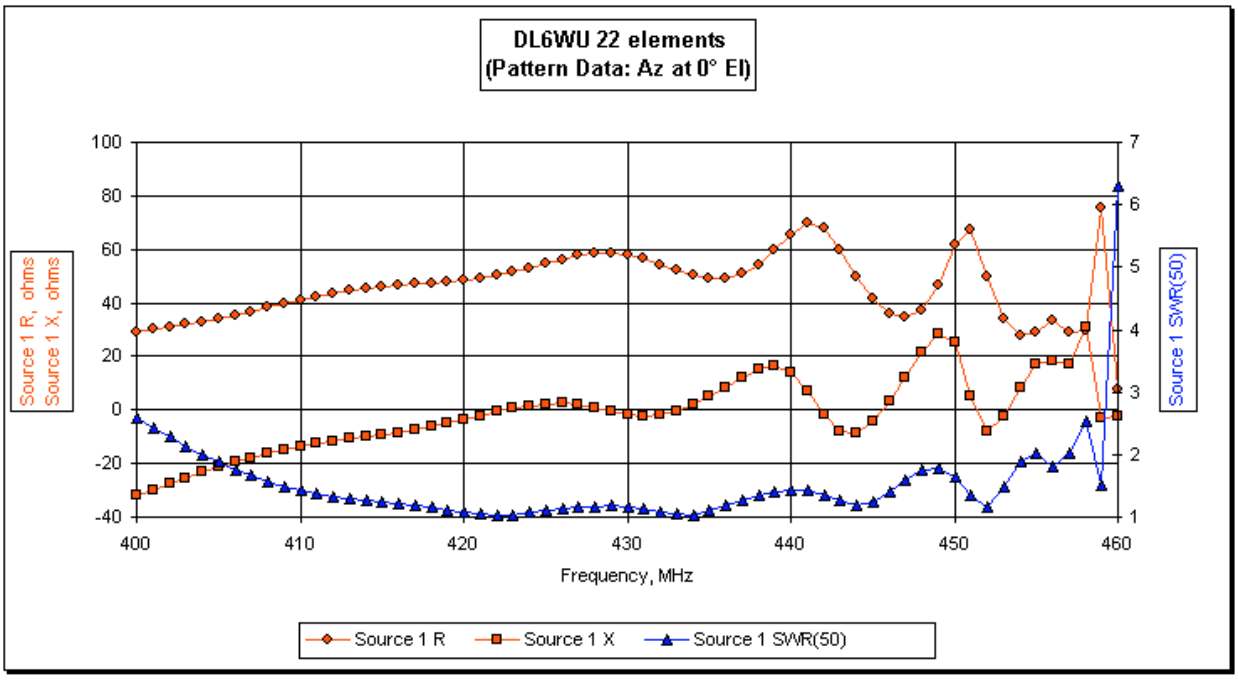
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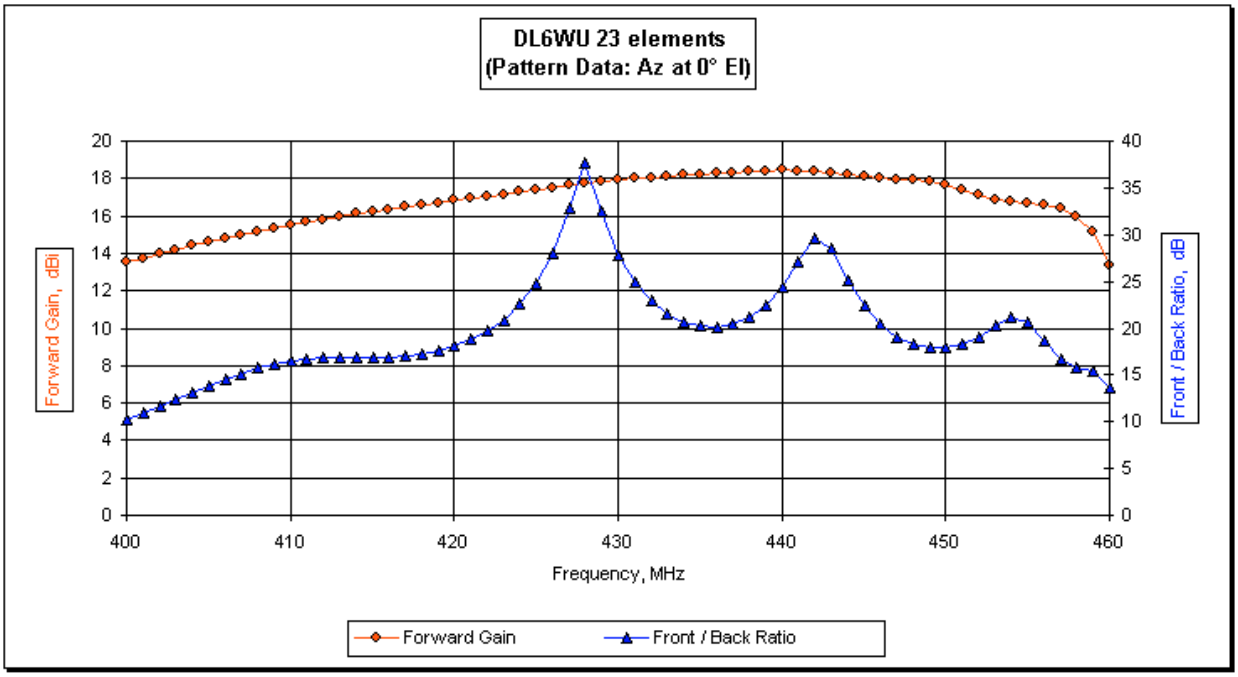
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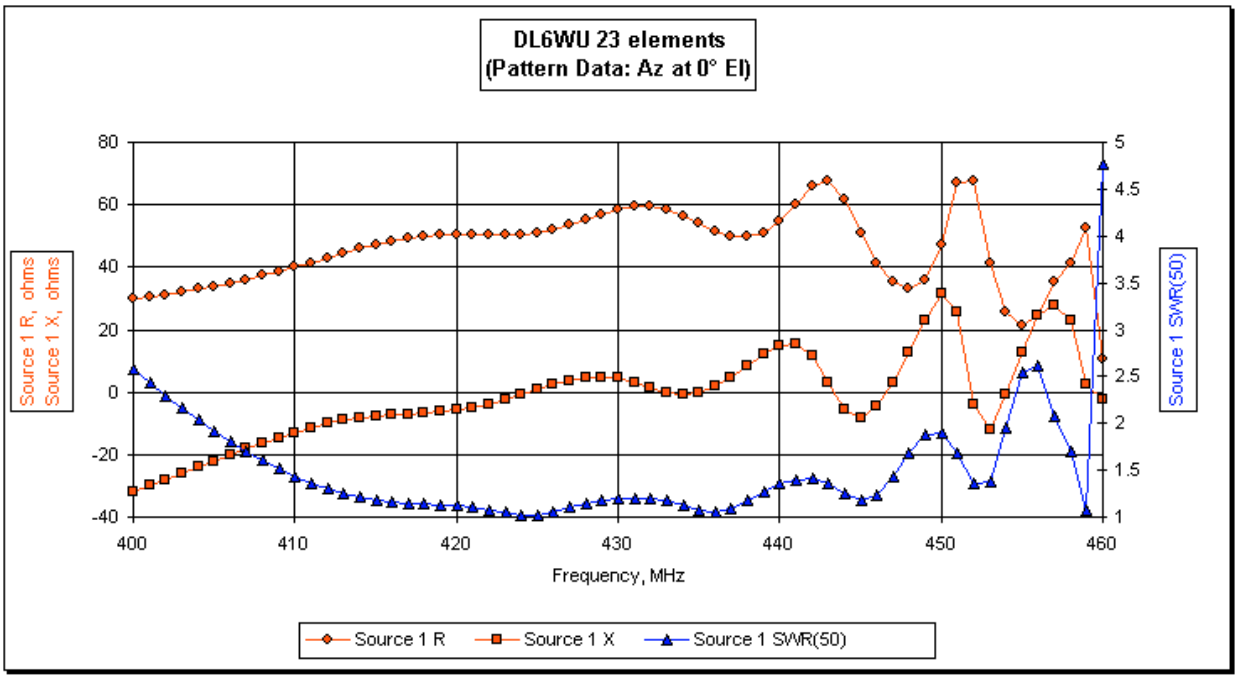
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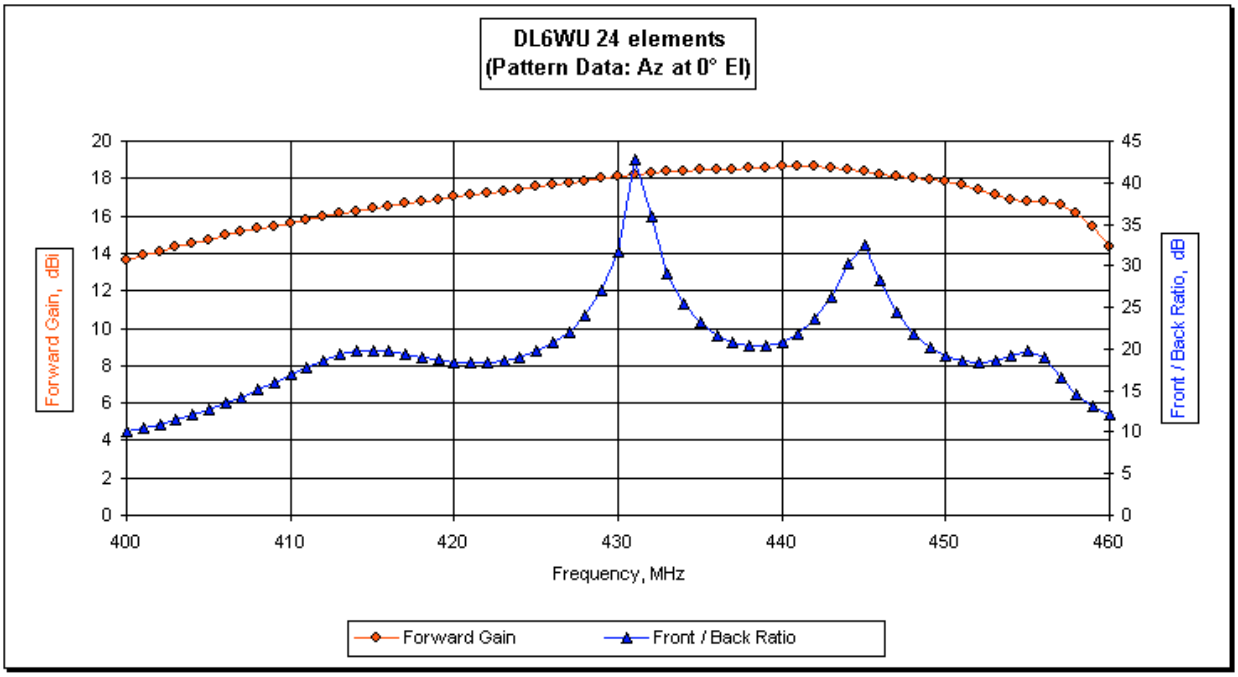
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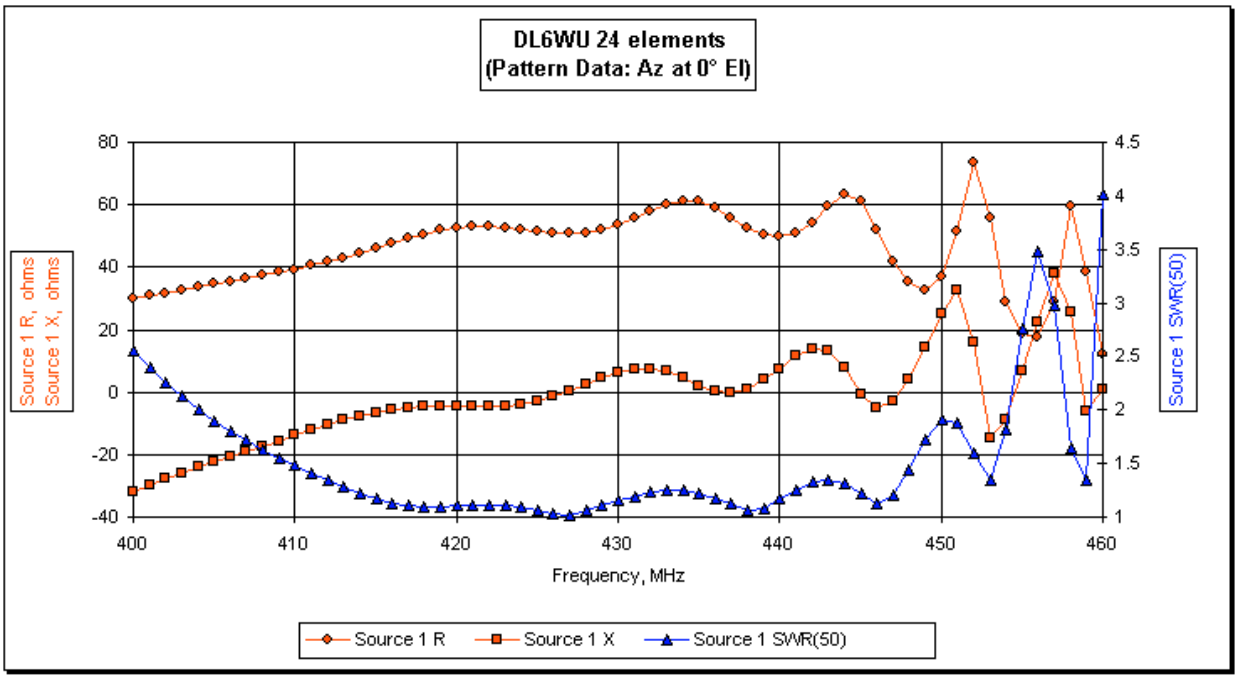
Forward Gain
Front / Back Ratio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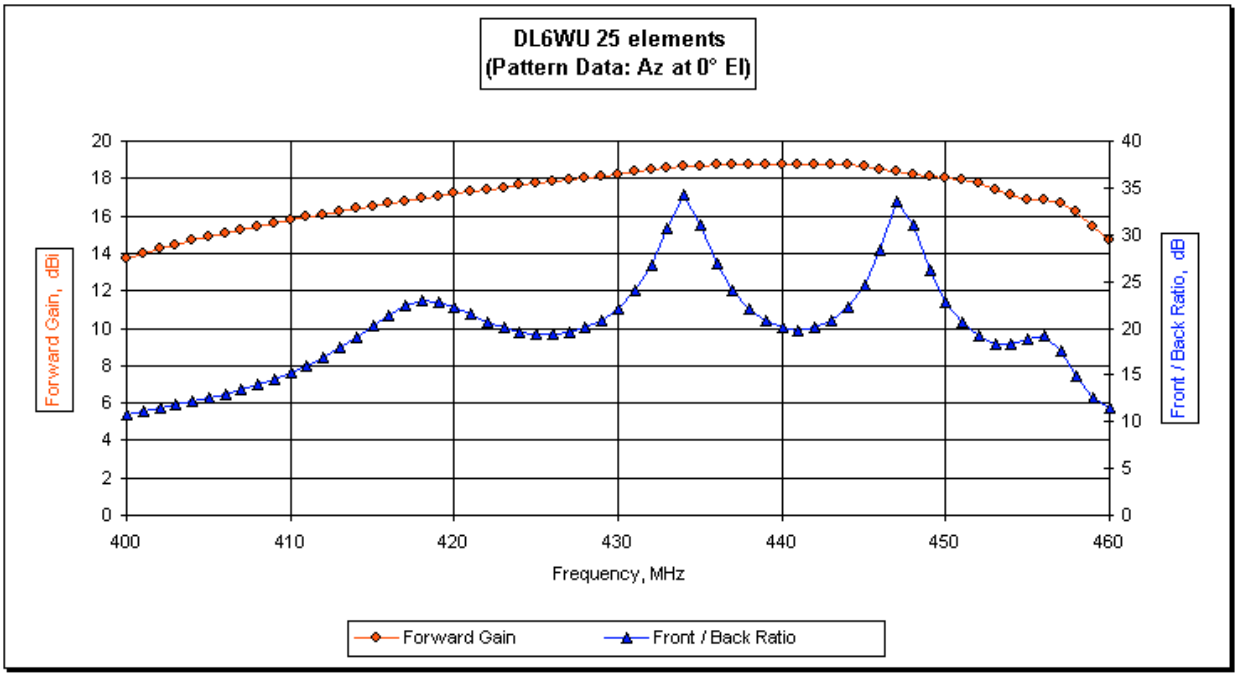
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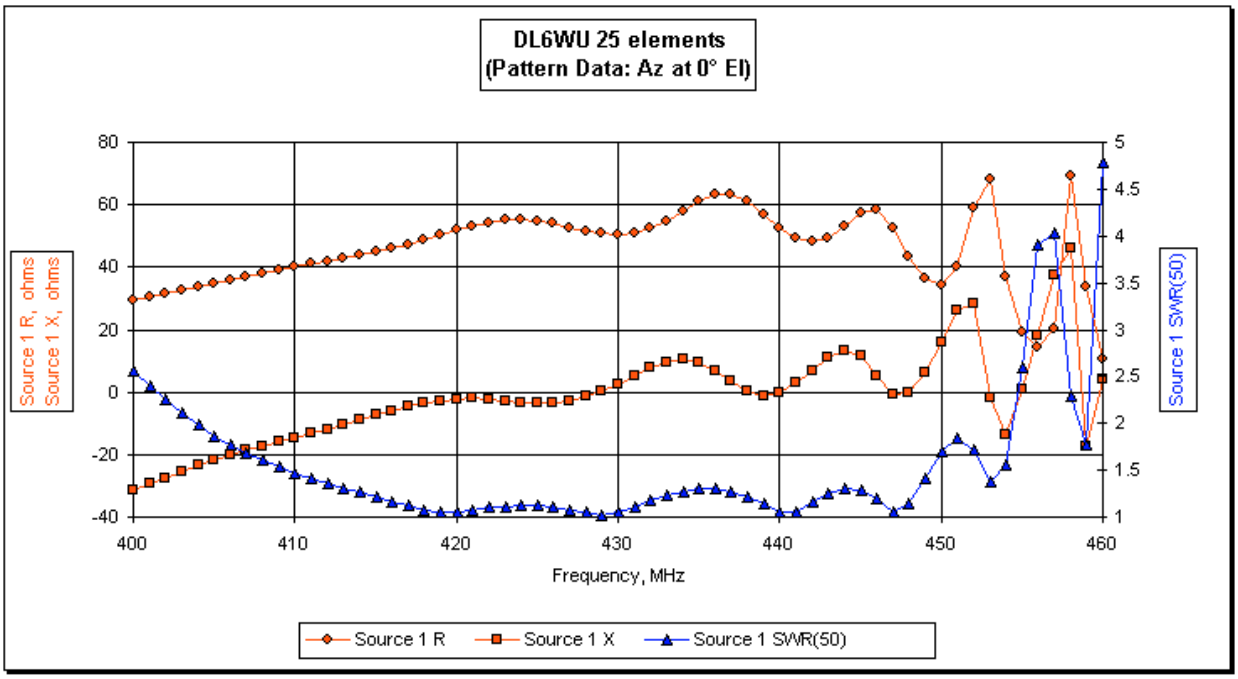
Front / Back Ratio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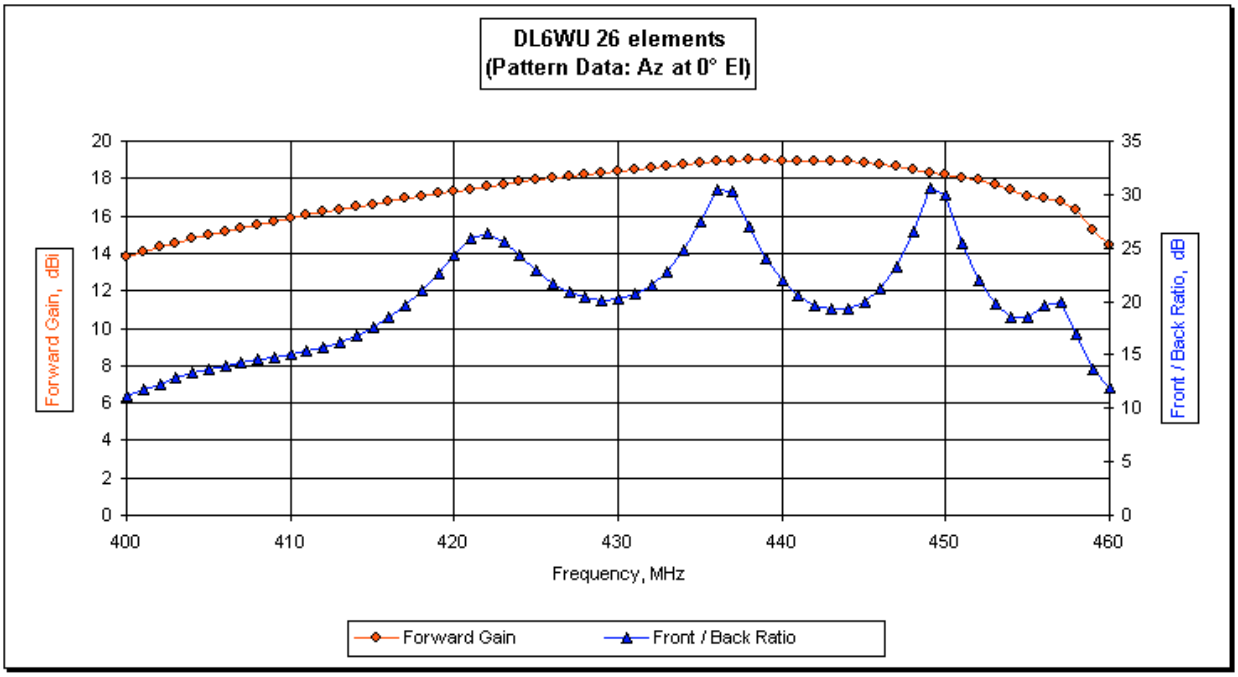
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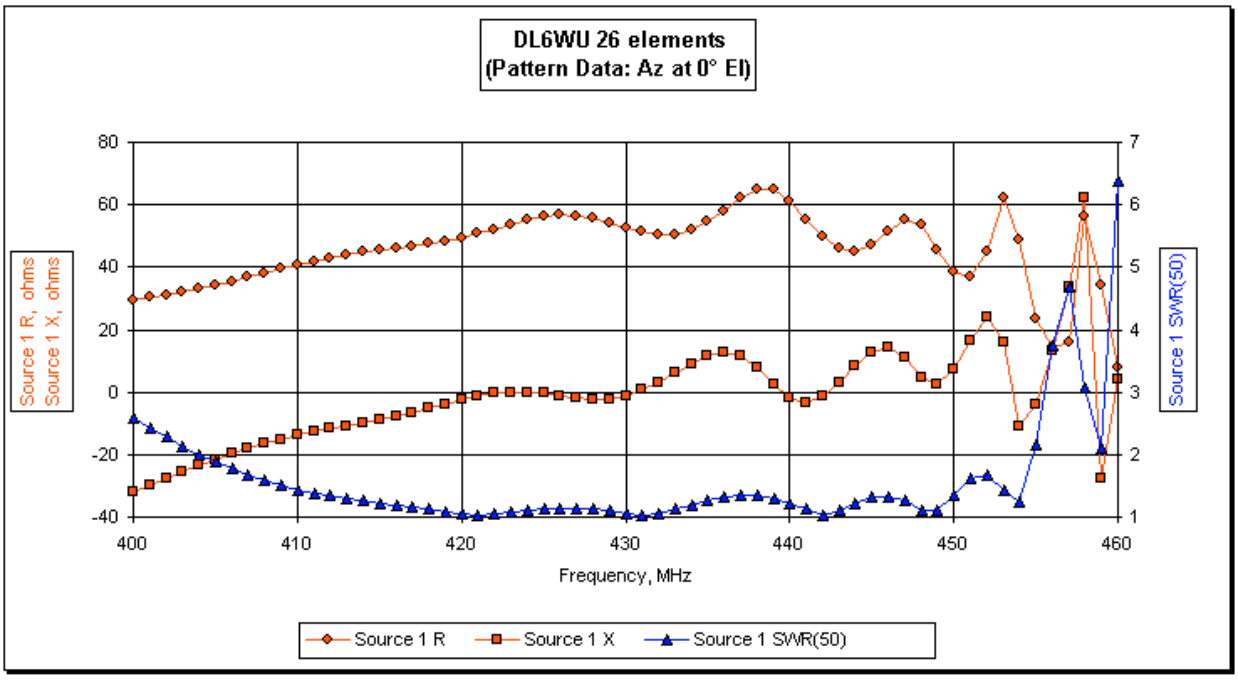
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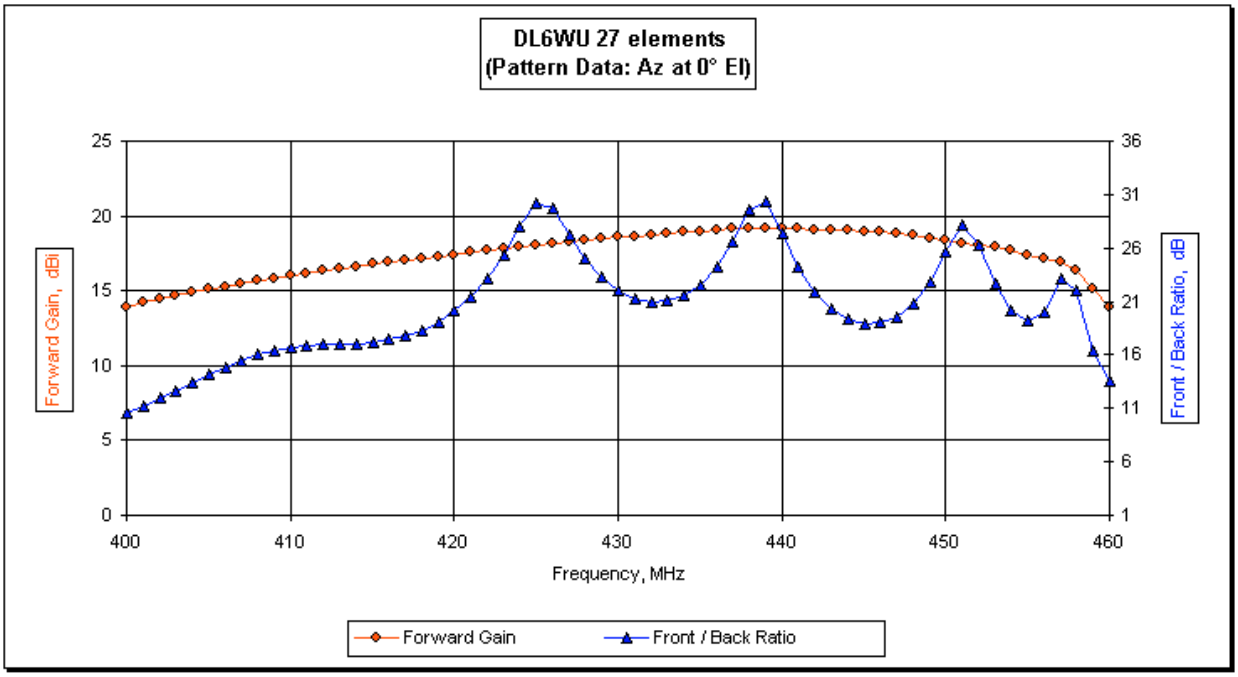
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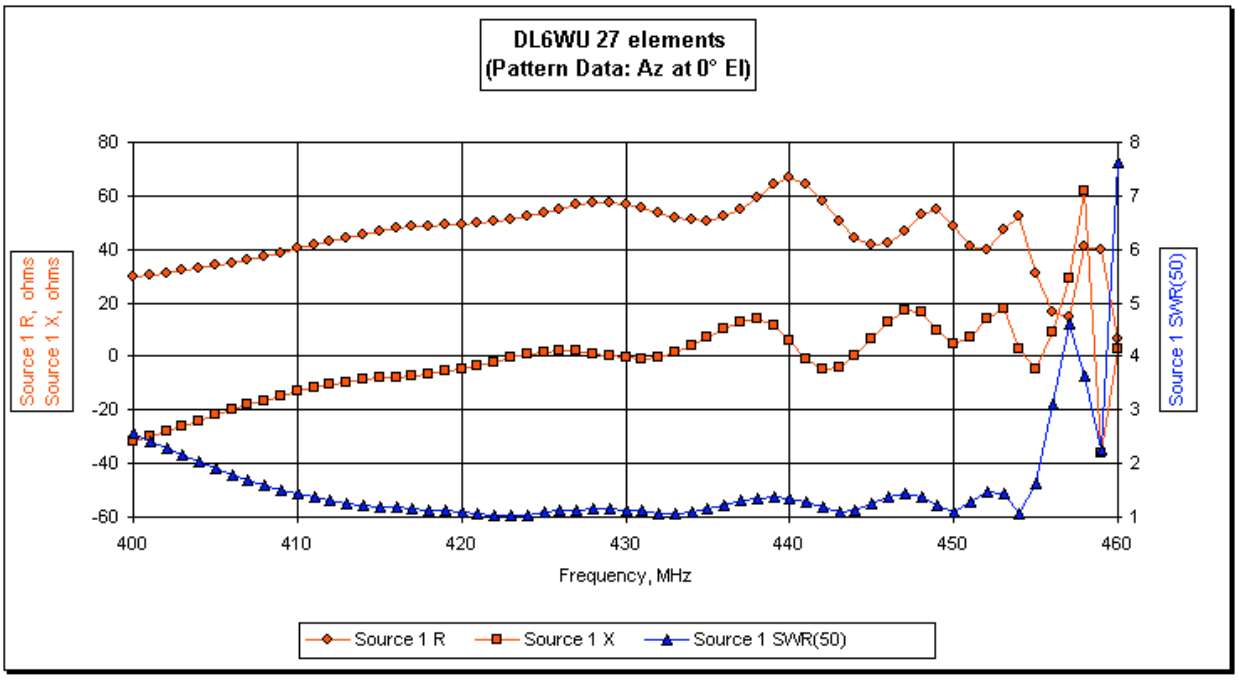
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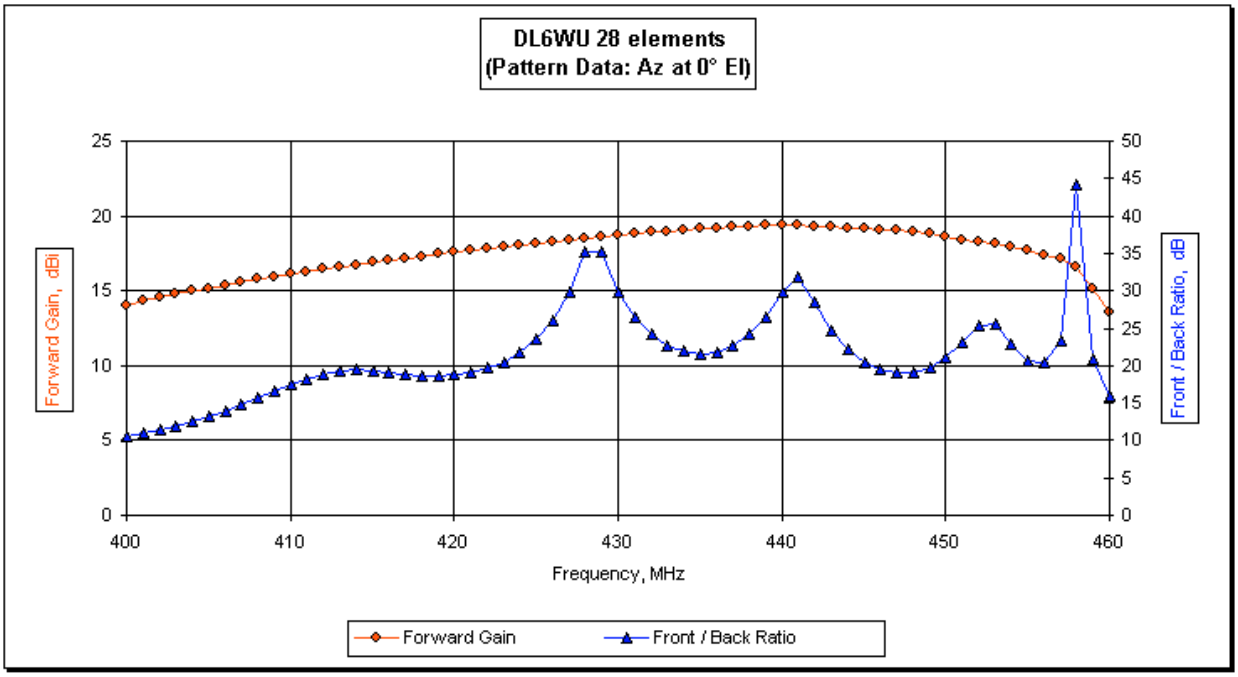
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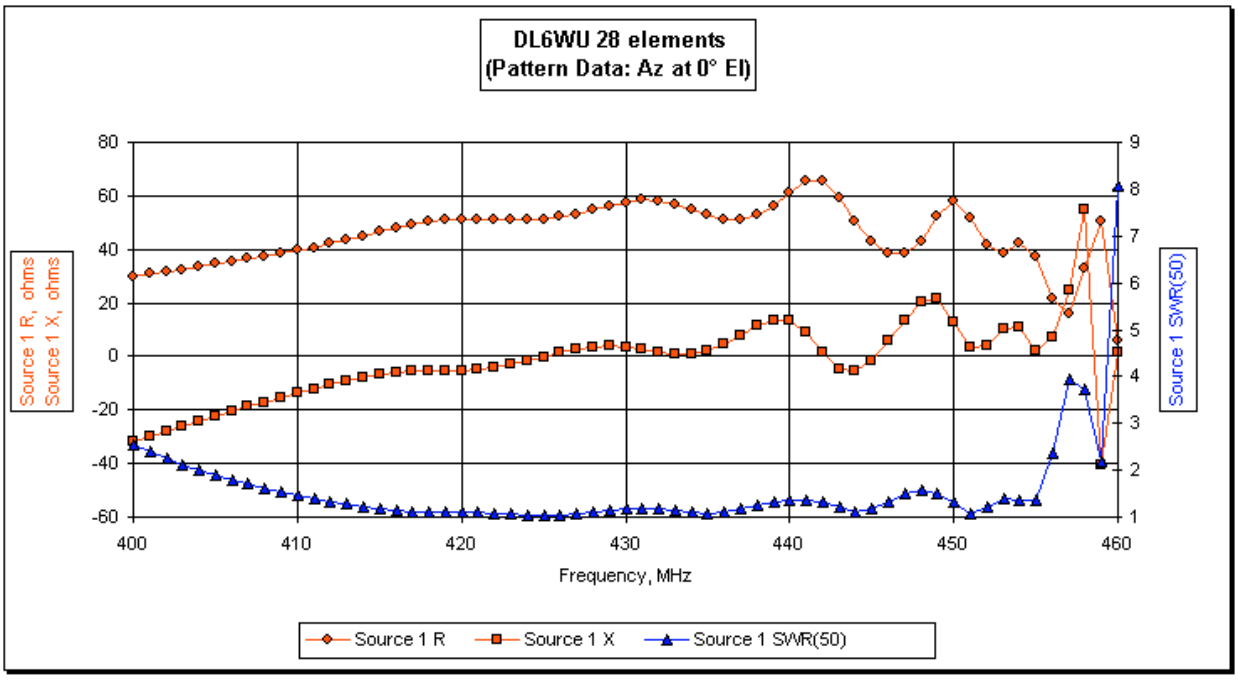
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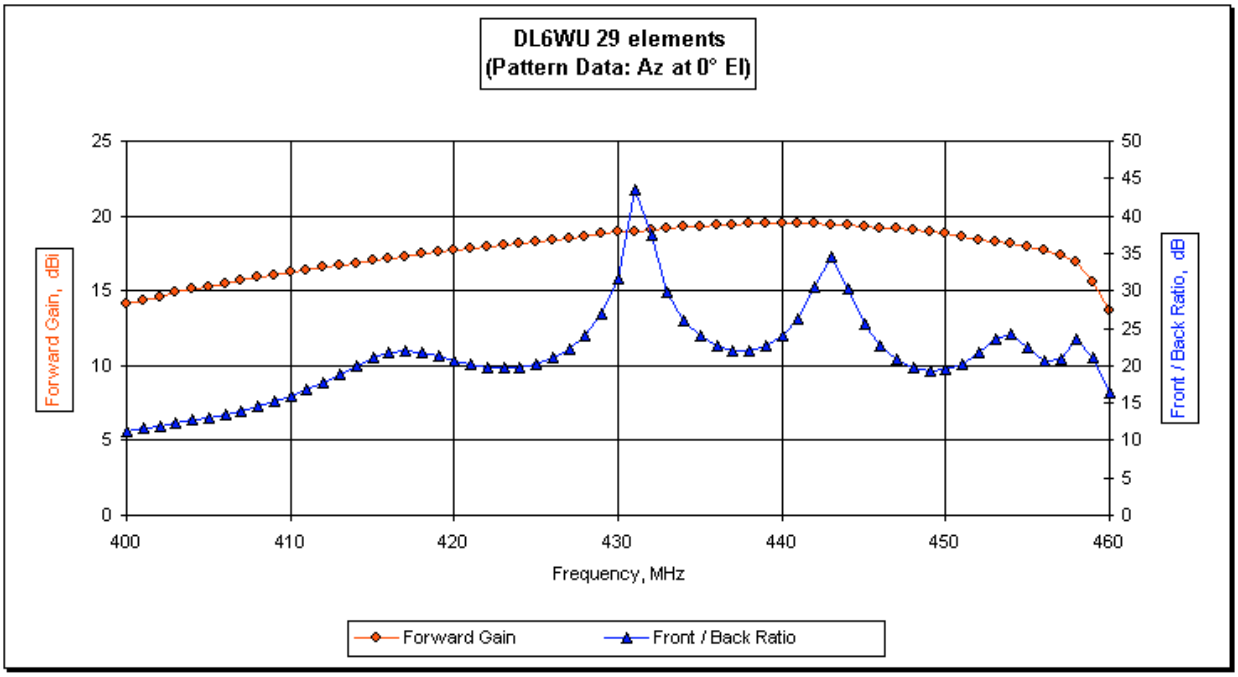
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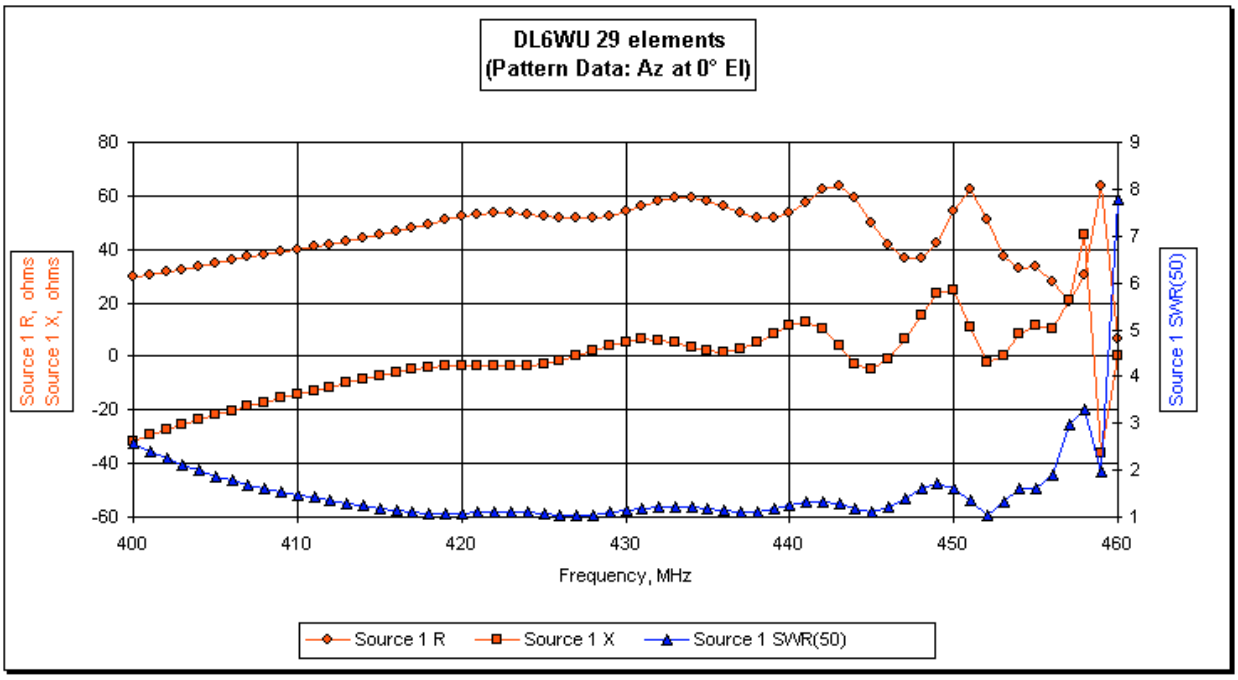
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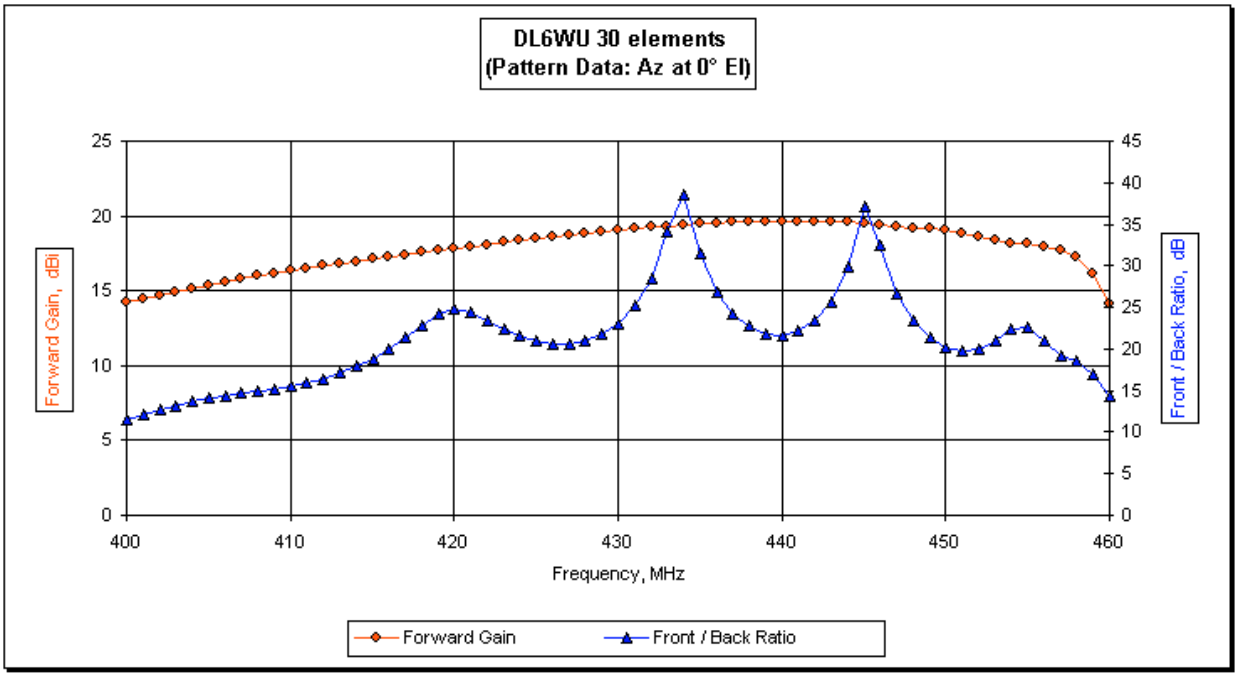
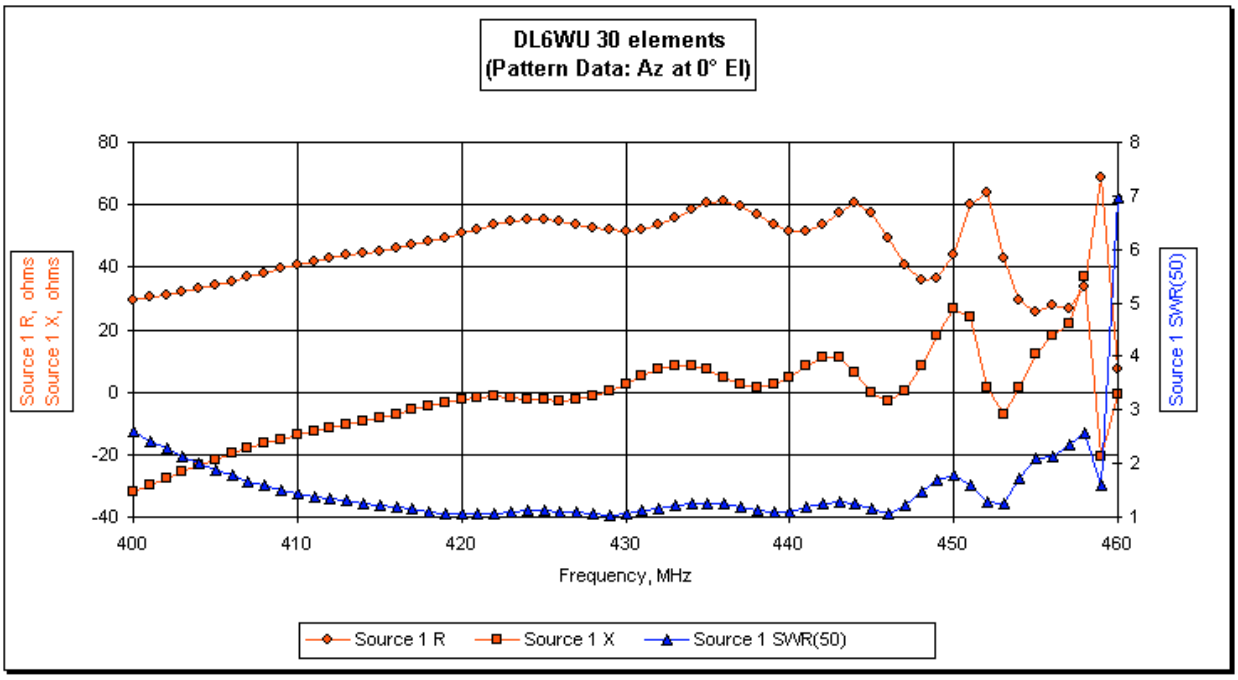
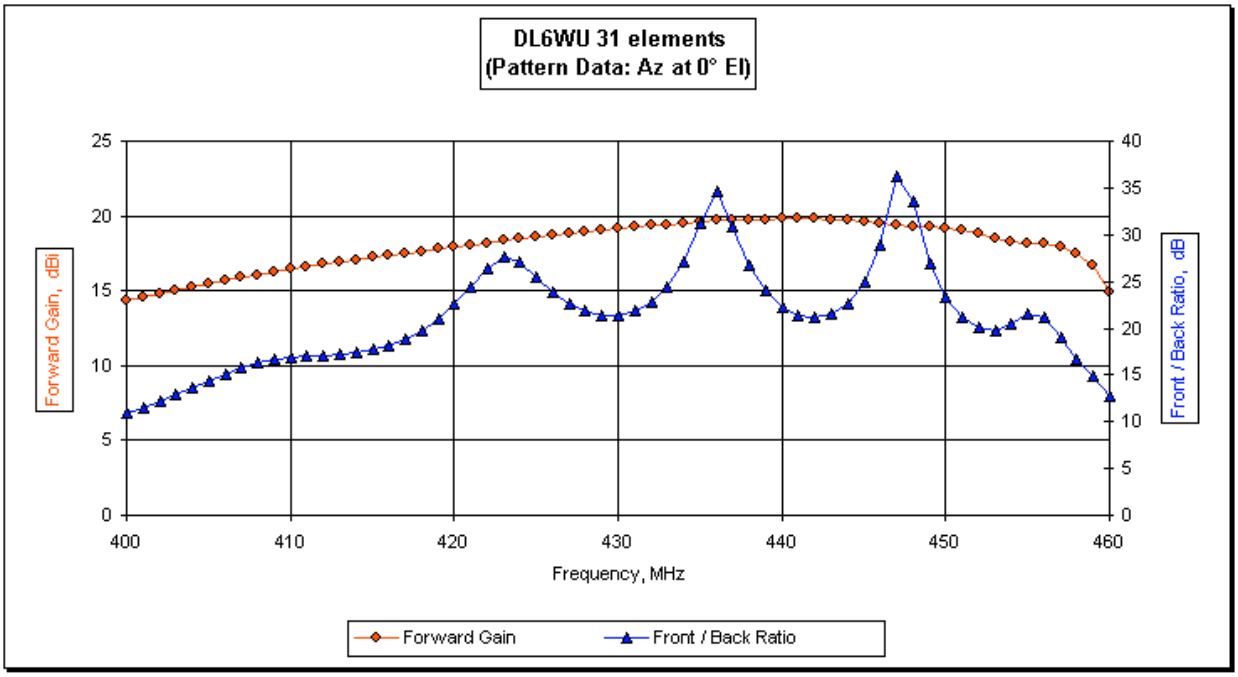
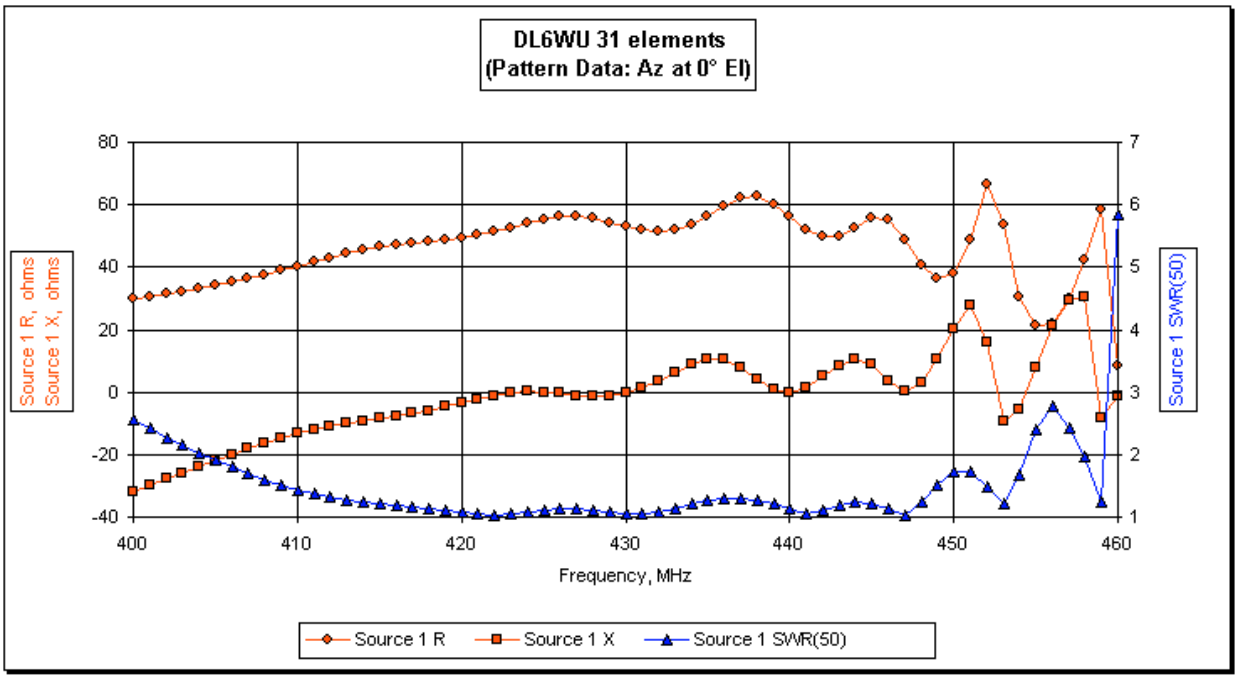
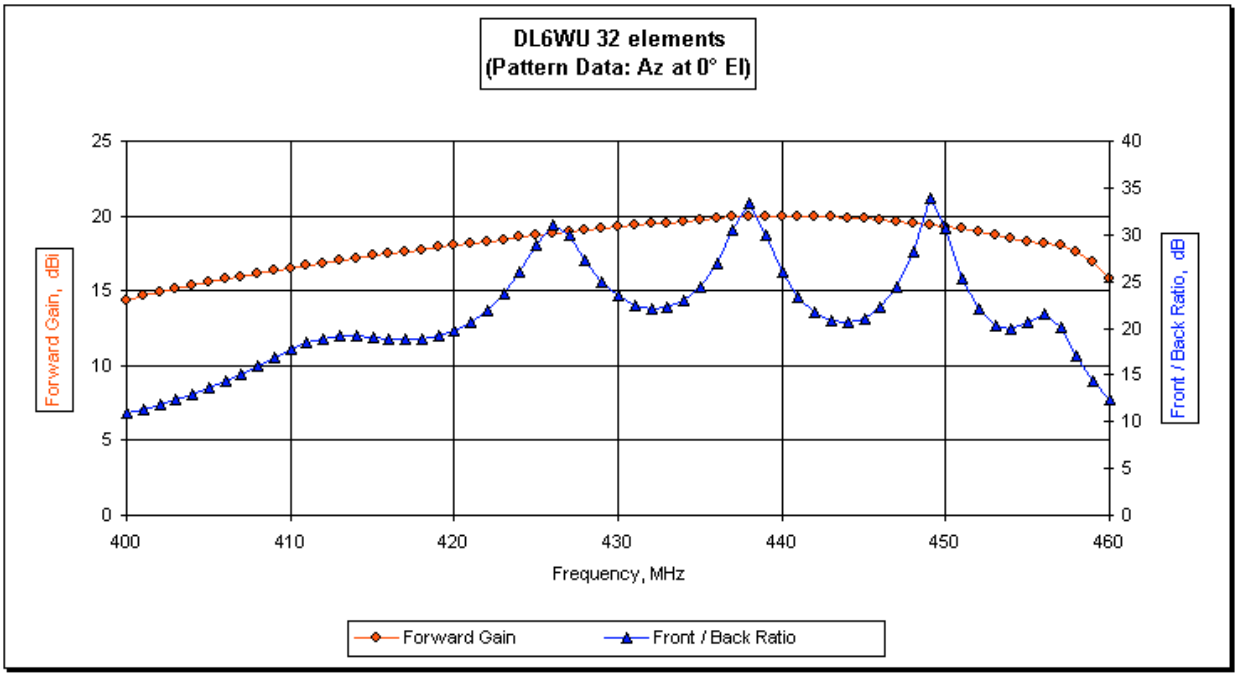
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

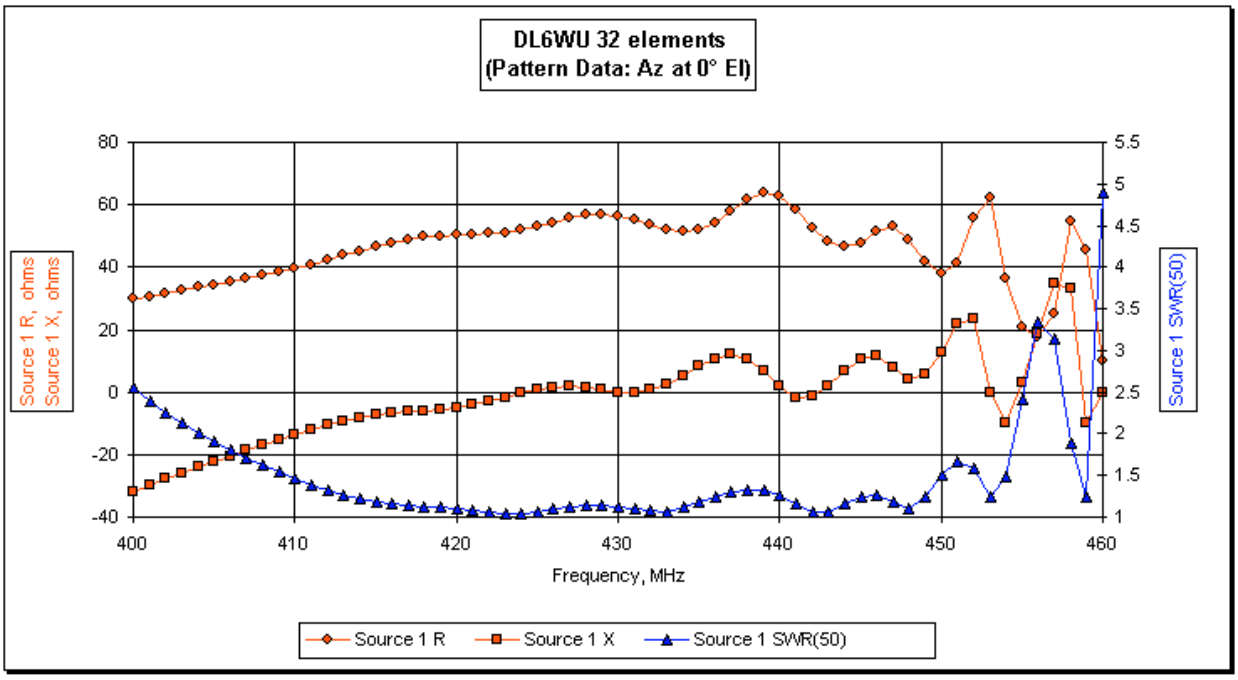

DL6WU 30 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

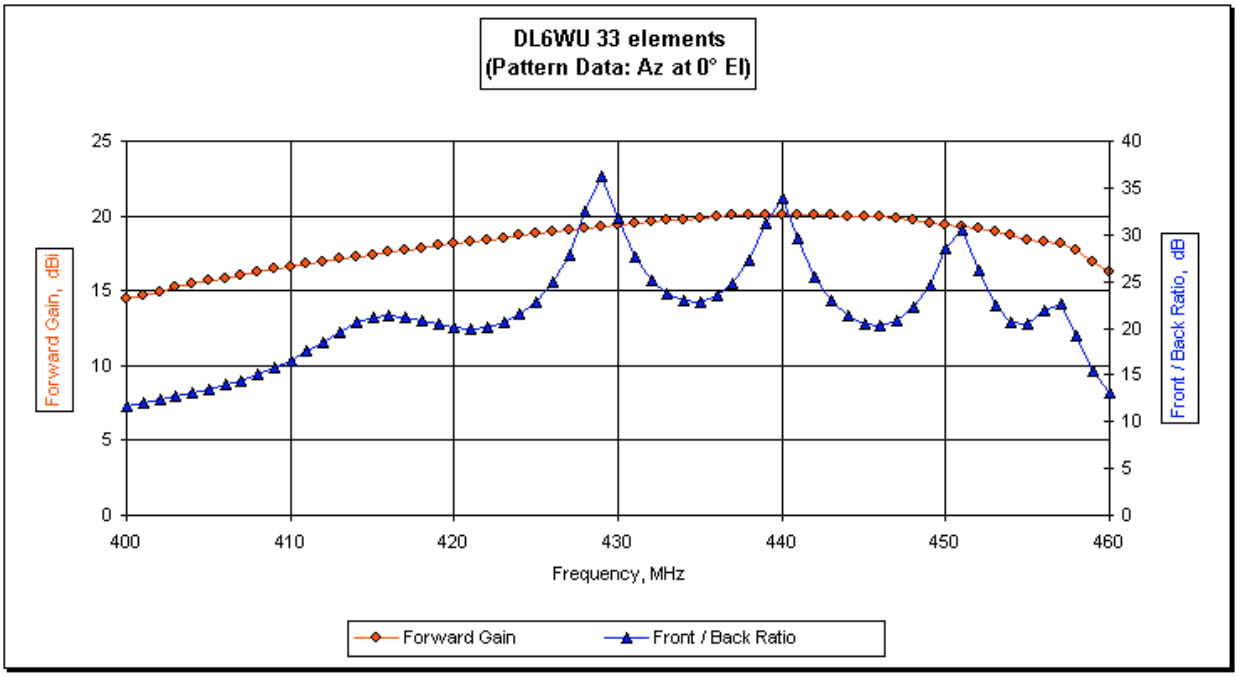

DL6WU 30 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

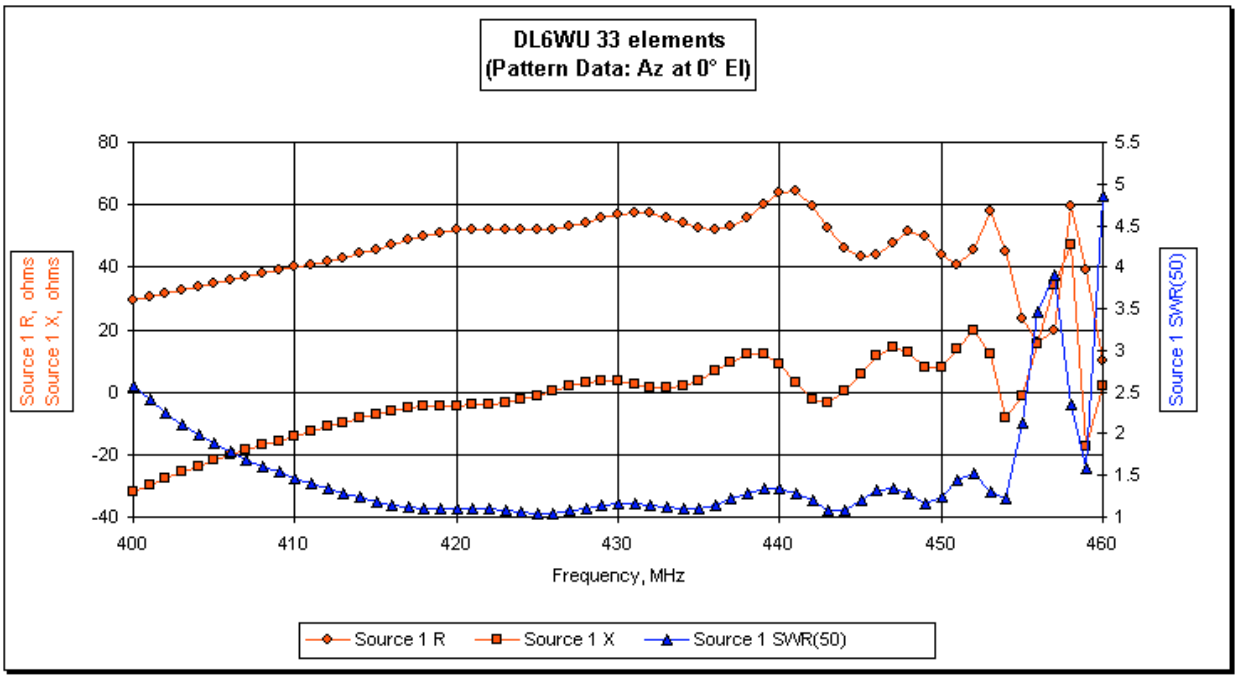

DL6WU 31 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

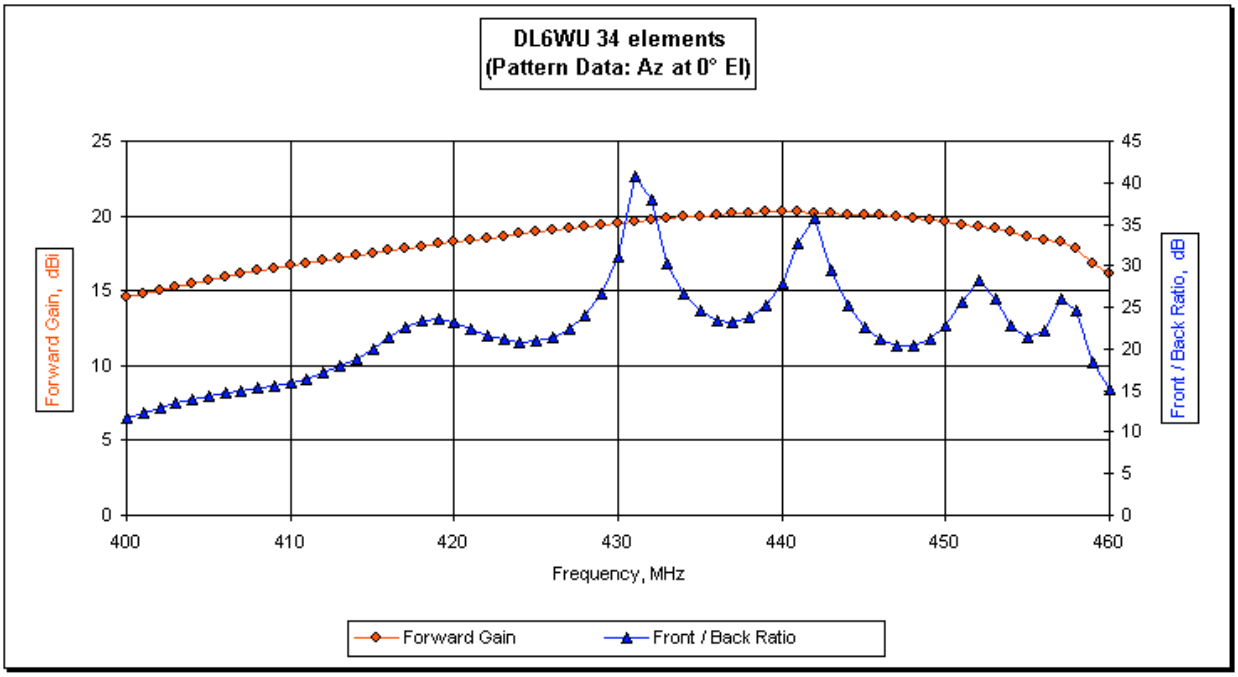

DL6WU 31 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

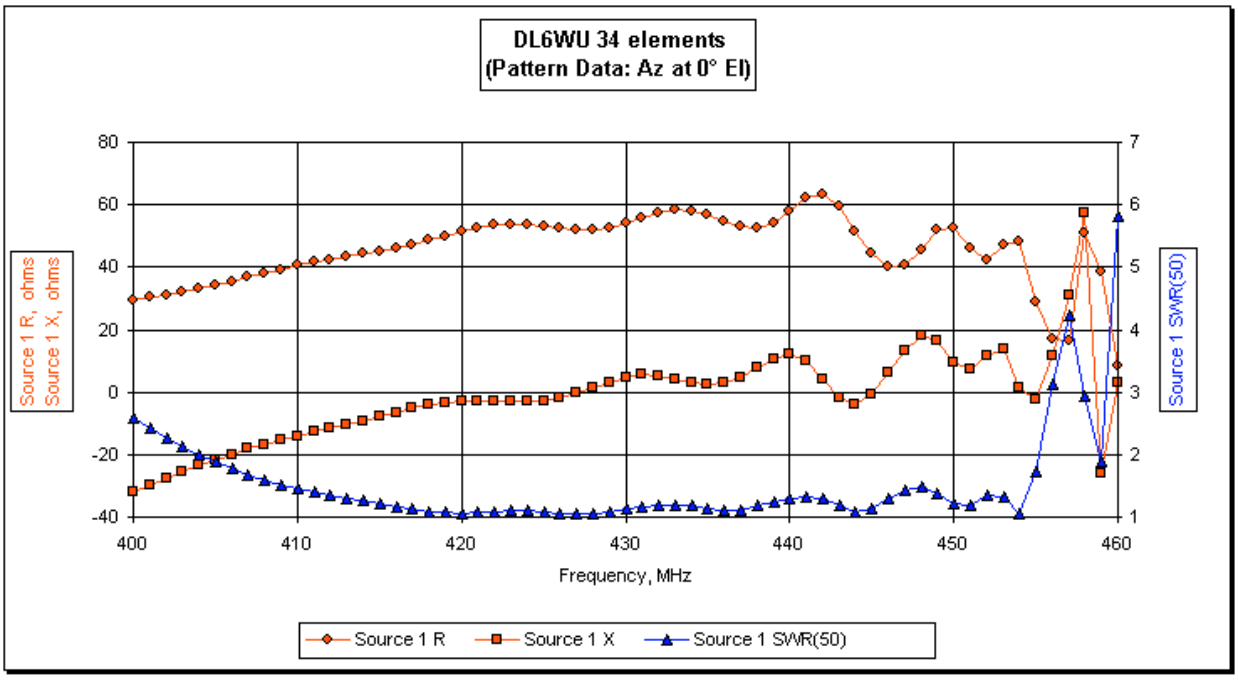

DL6WU 32 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

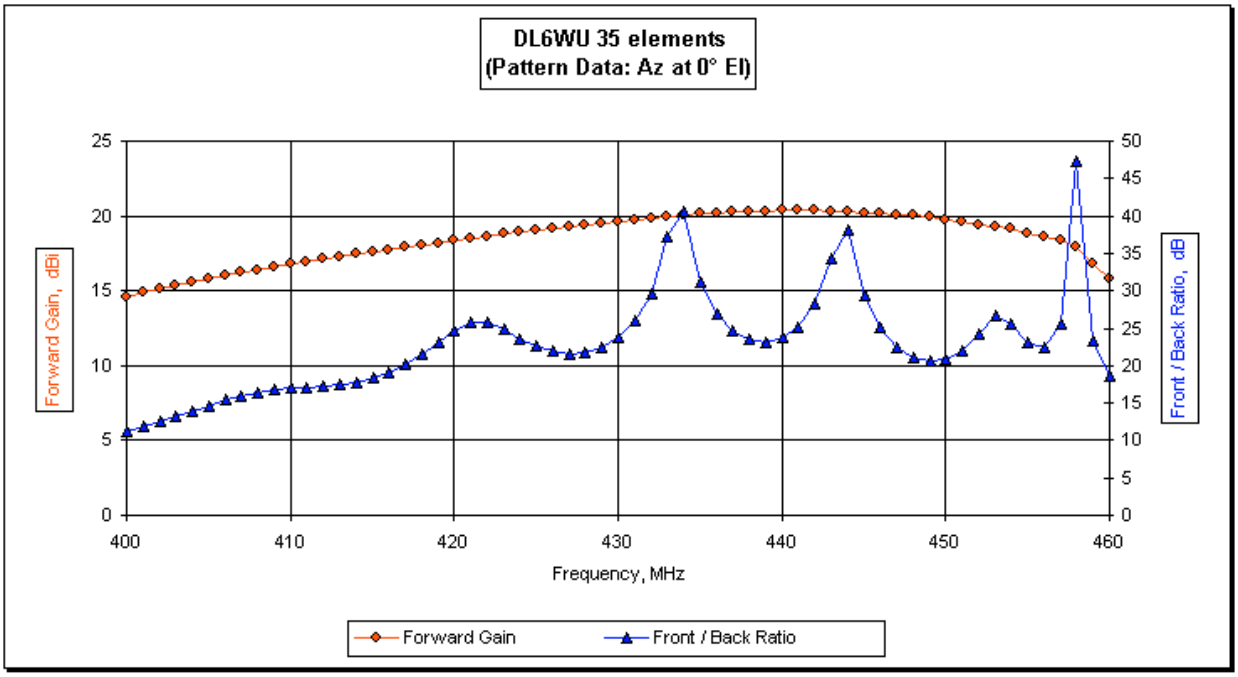

DL6WU 32 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

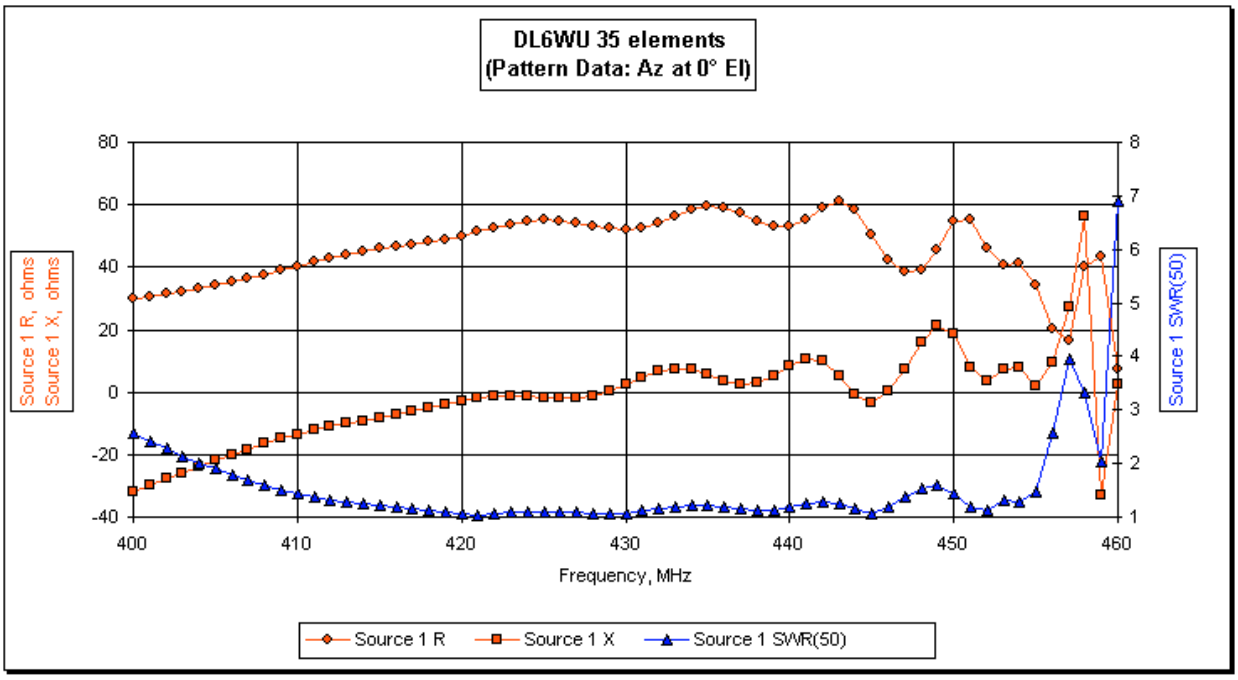

DL6WU 33 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

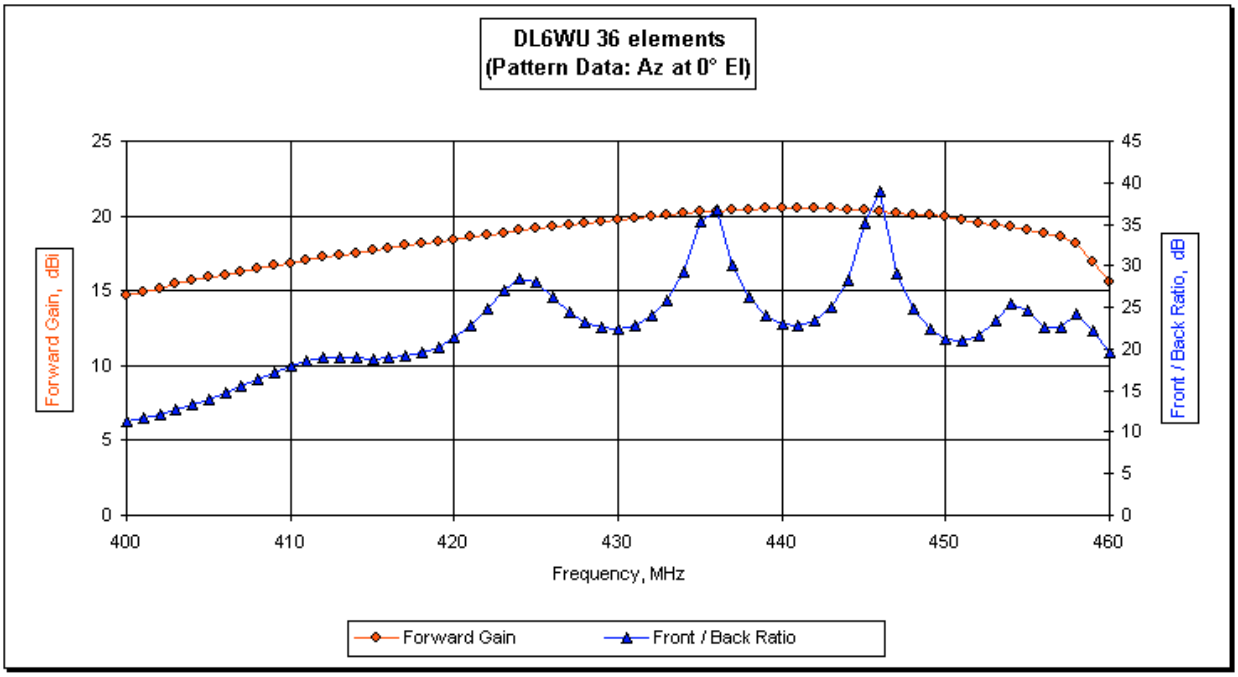

DL6WU 33 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

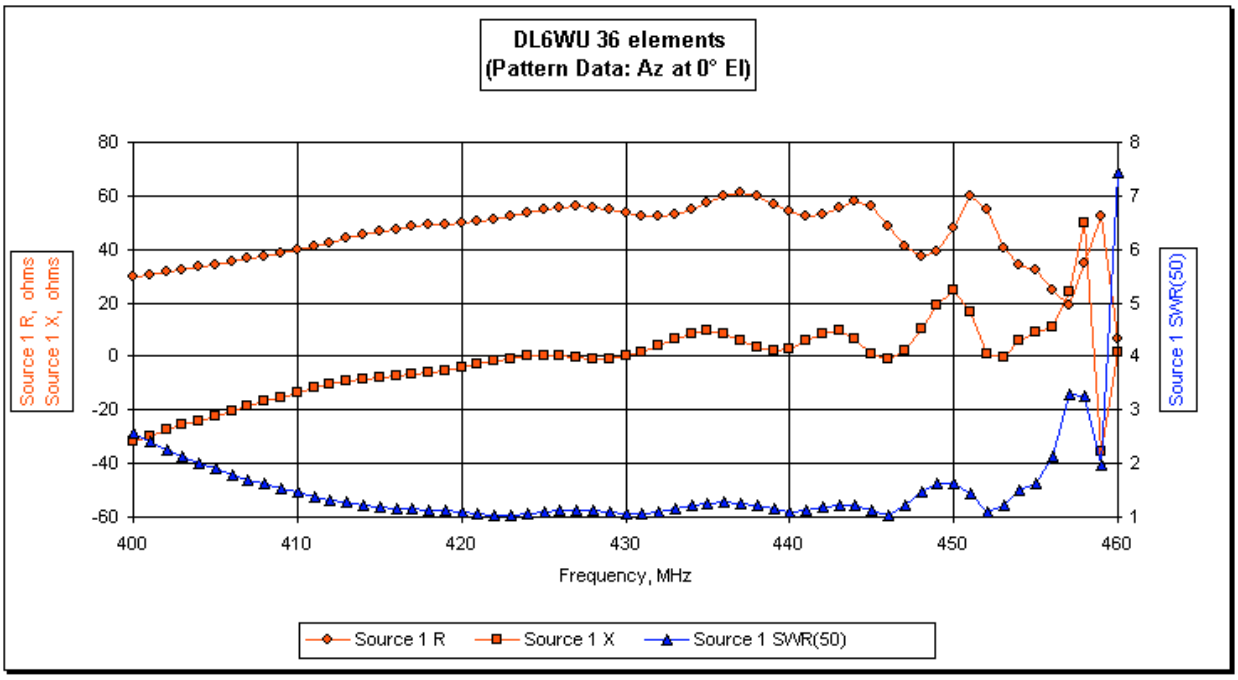

DL6WU 34 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

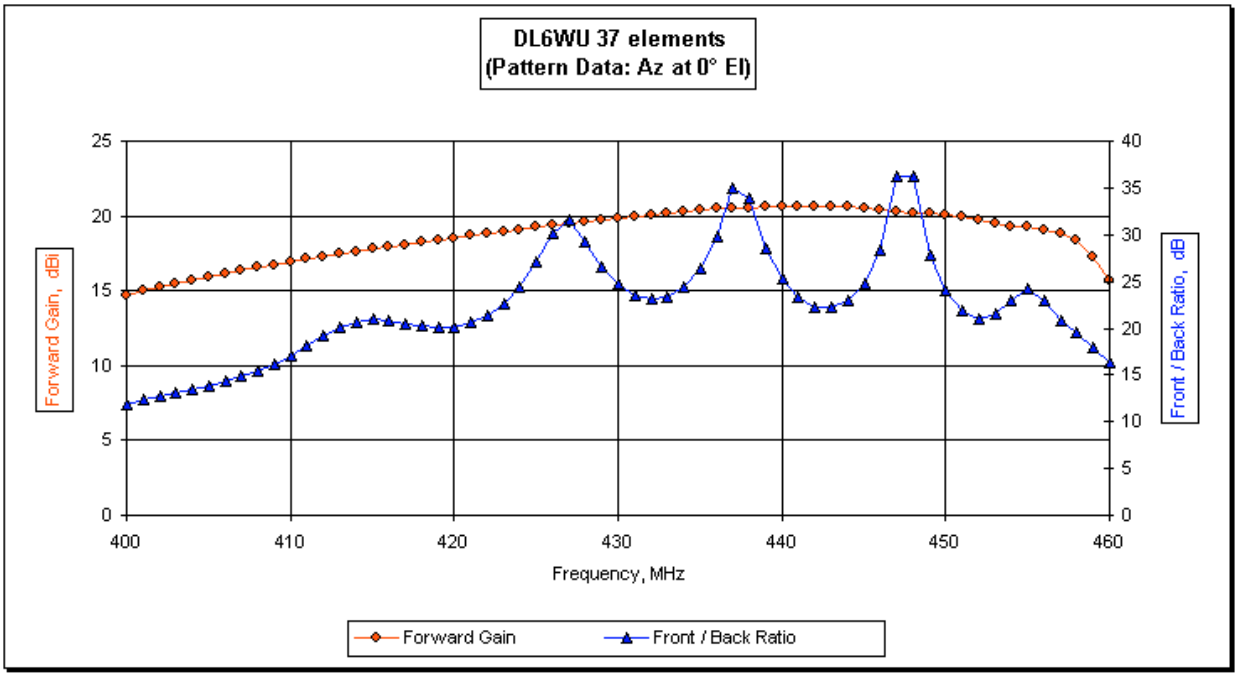

DL6WU 34 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

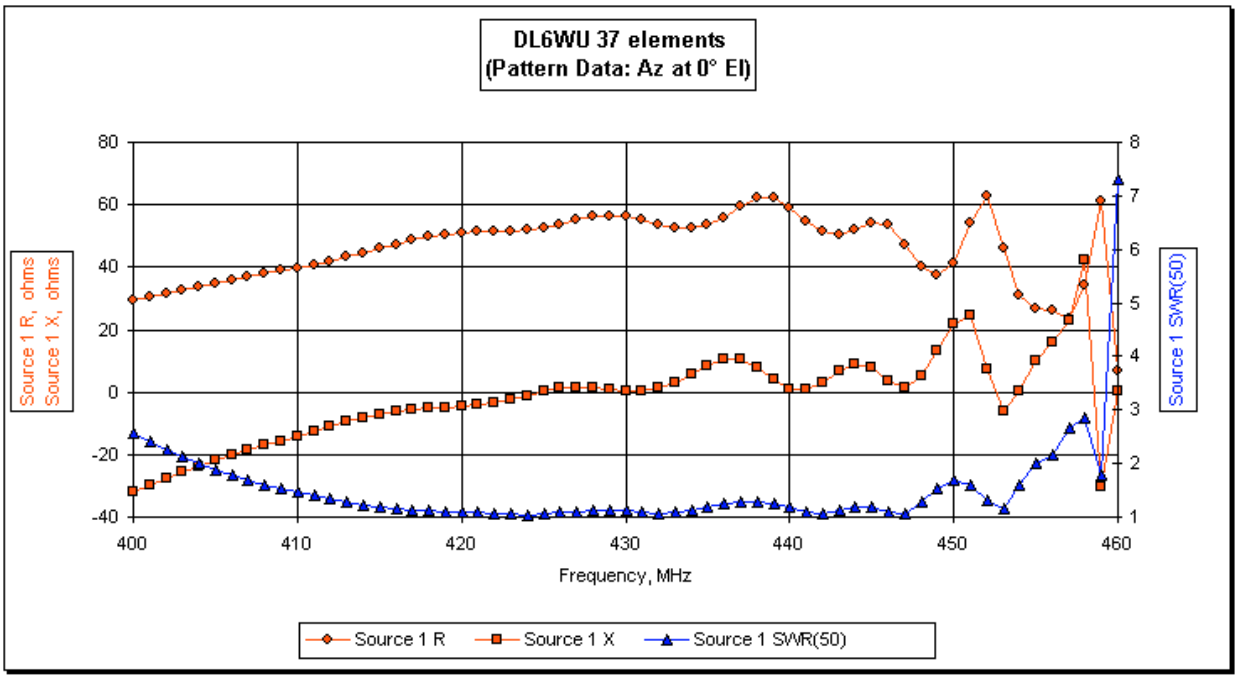

DL6WU 35 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

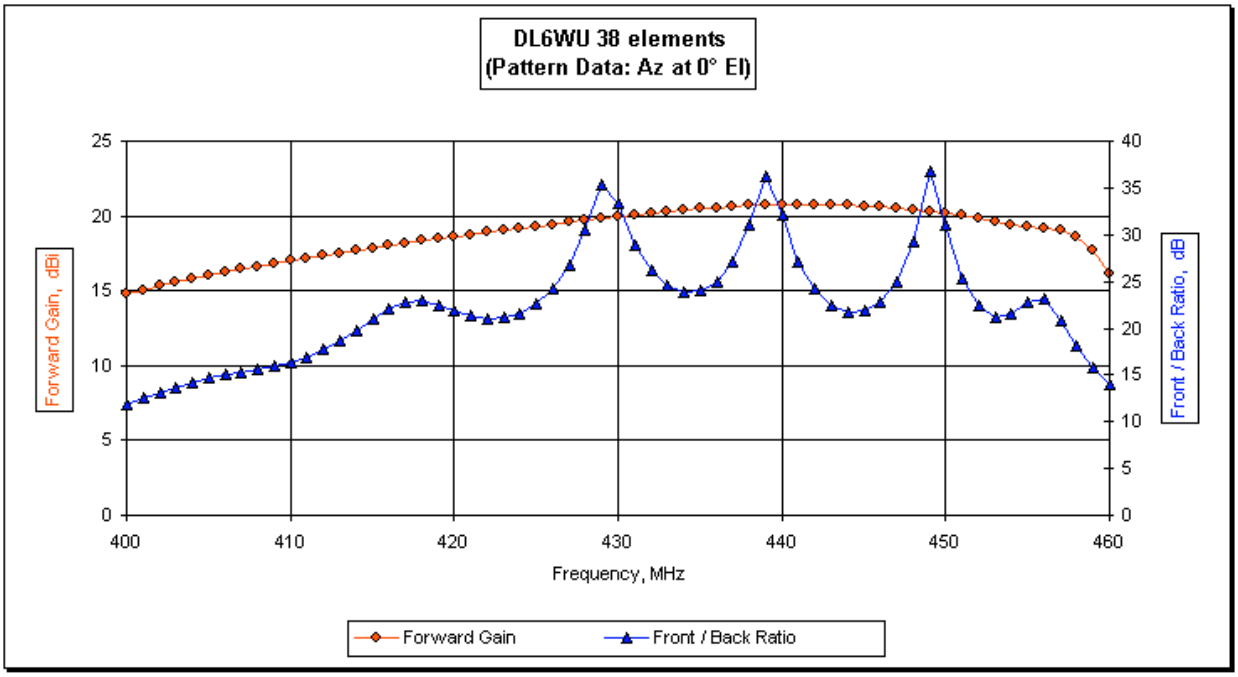

DL6WU 35 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

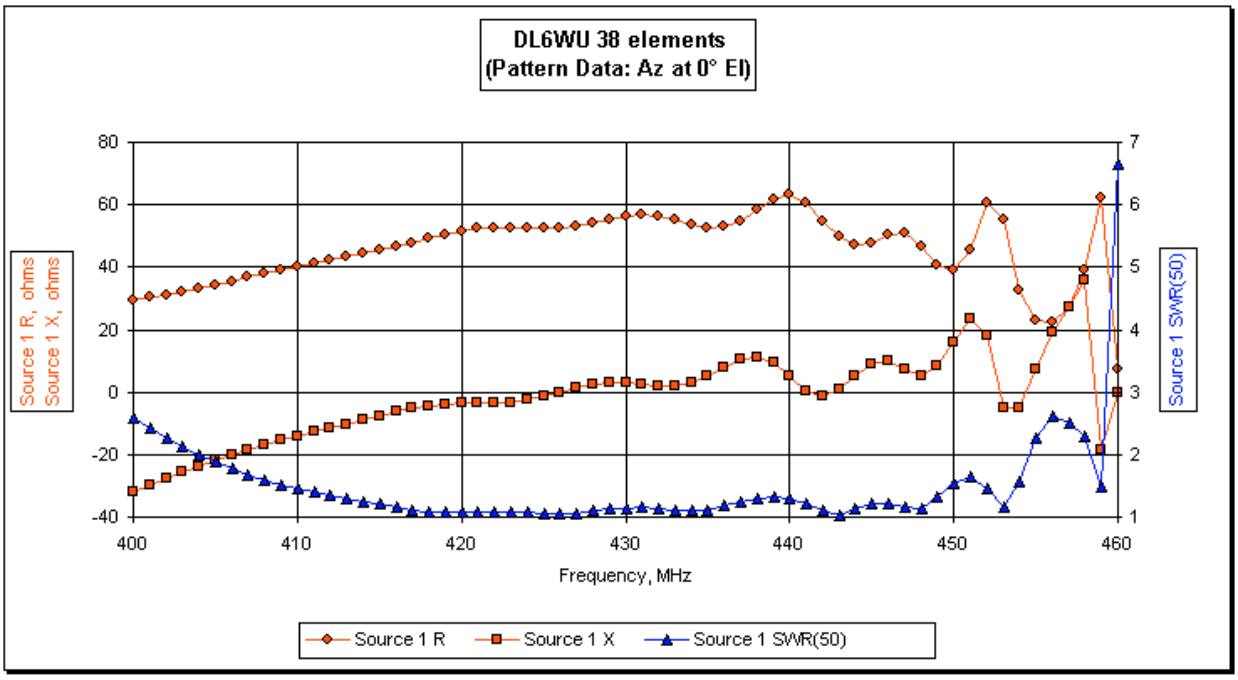

DL6WU 36 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

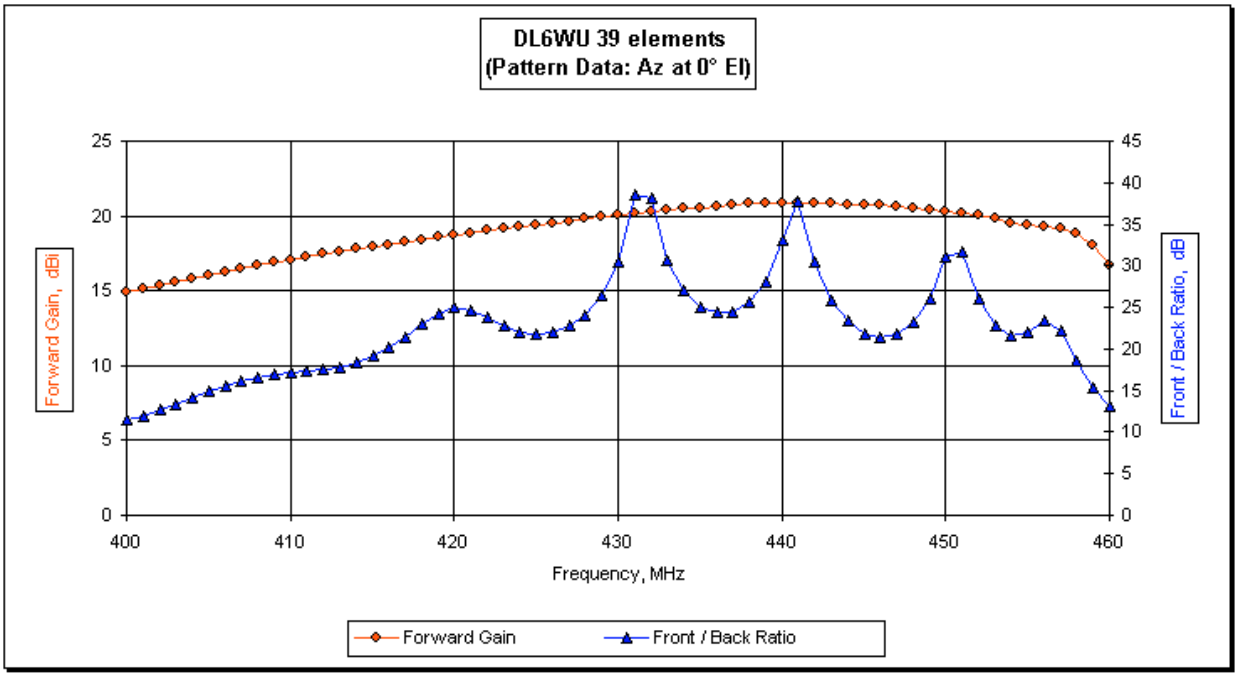

DL6WU 36 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

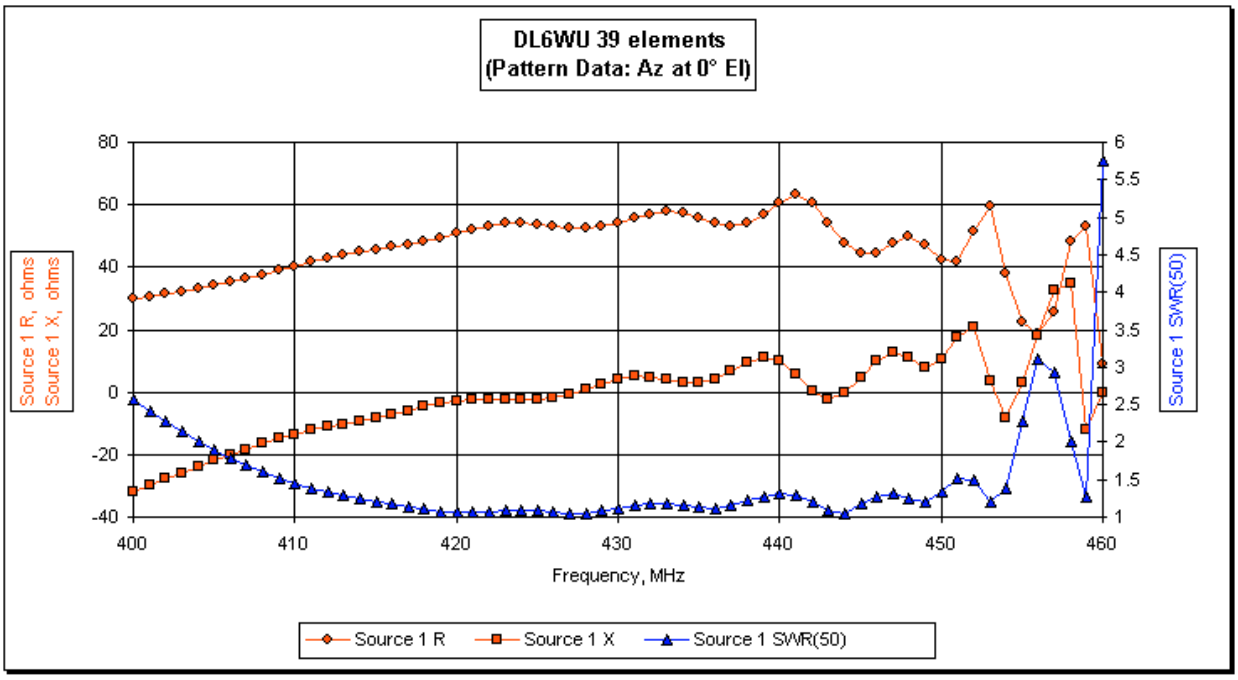

DL6WU 37 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

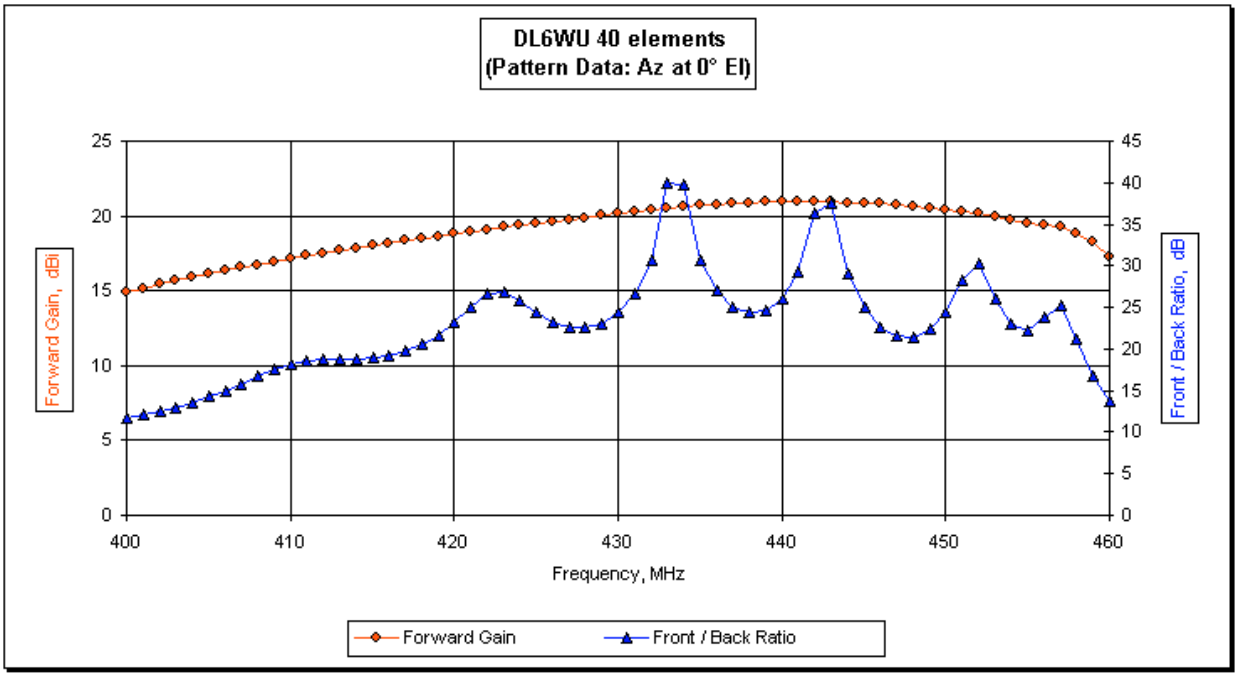

DL6WU 37 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

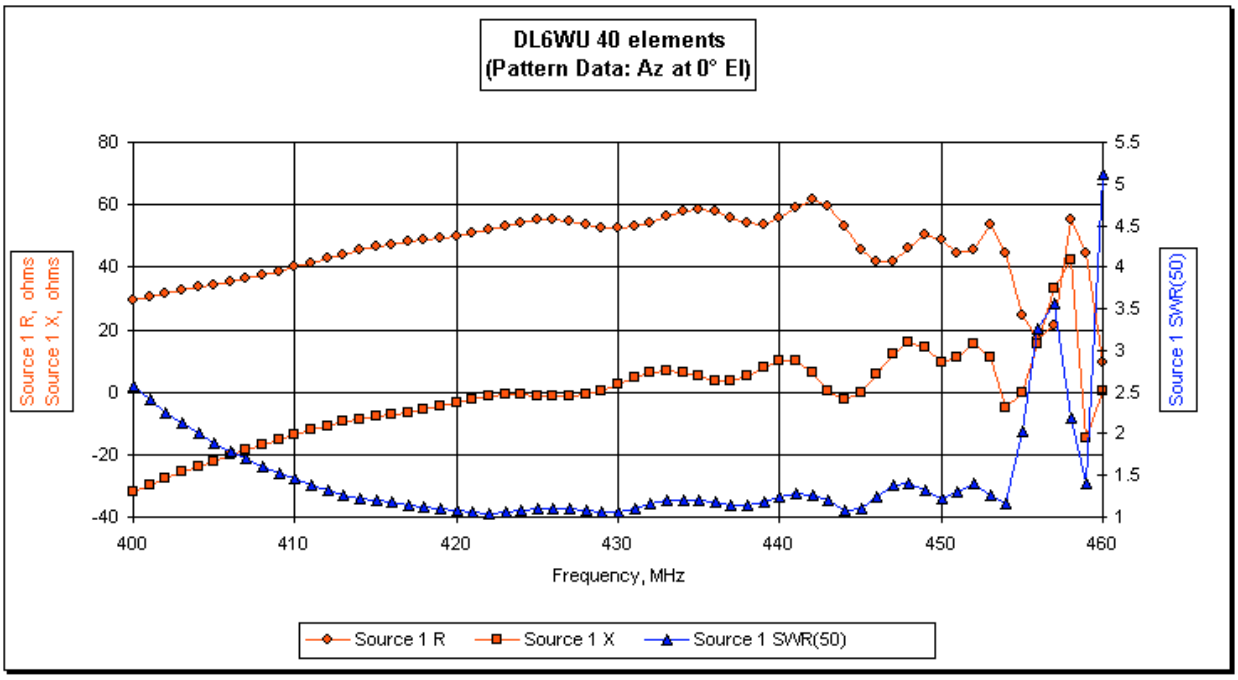

DL6WU 38 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio


DL6WU 38 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

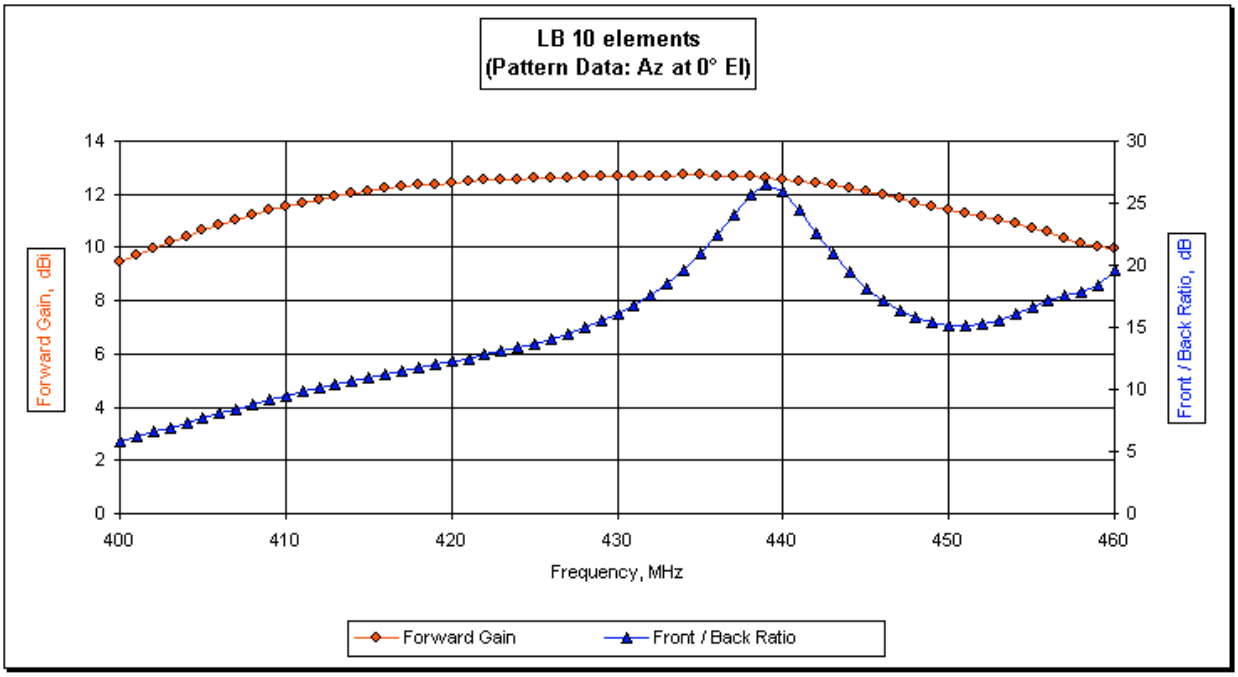

DL6WU 39 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

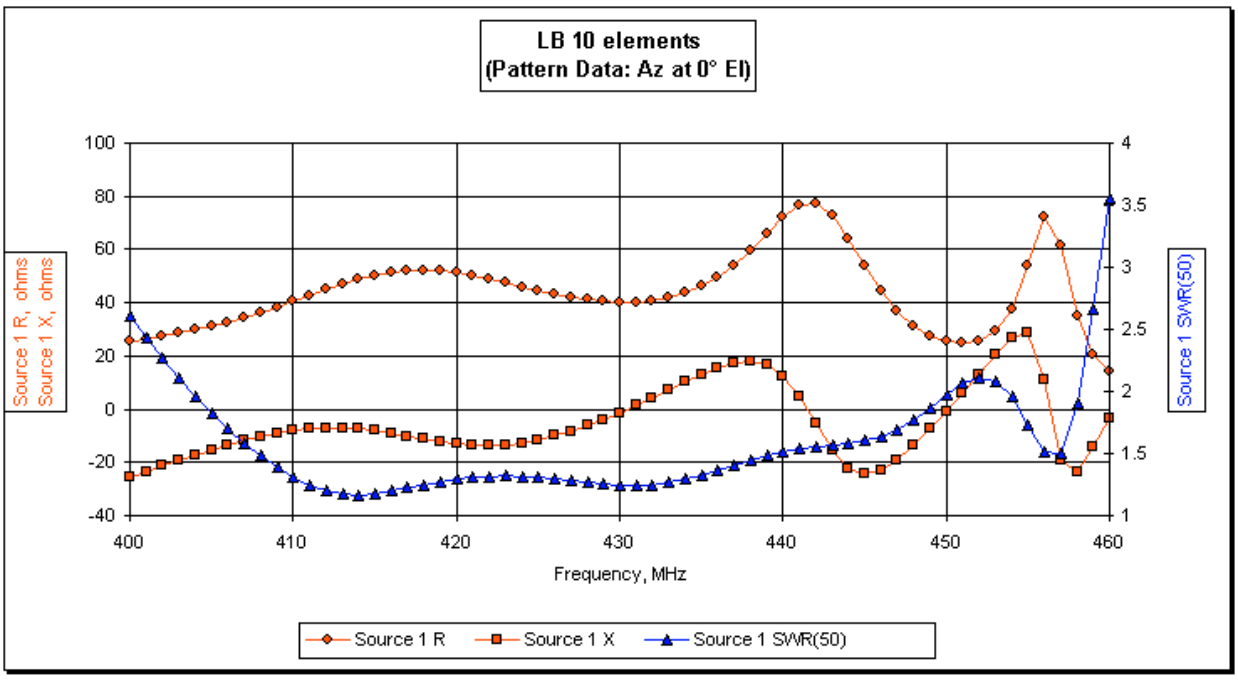

DL6WU 39 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

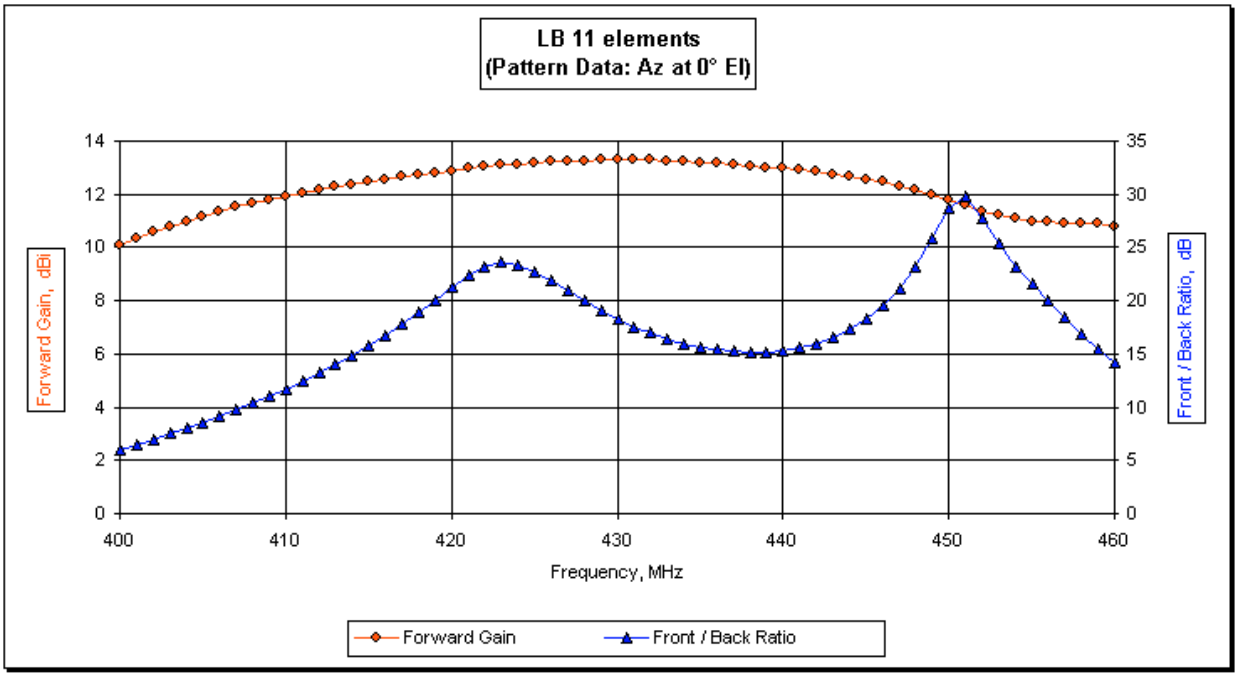

DL6WU 40 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

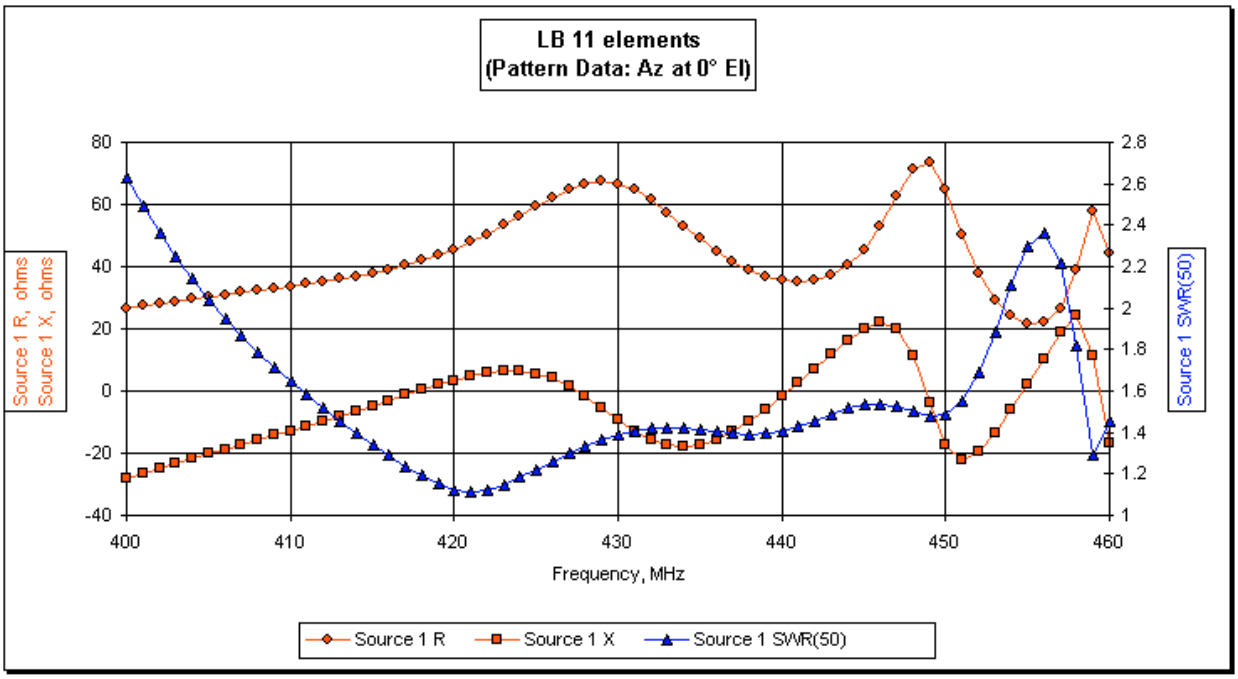

DL6WU 40 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

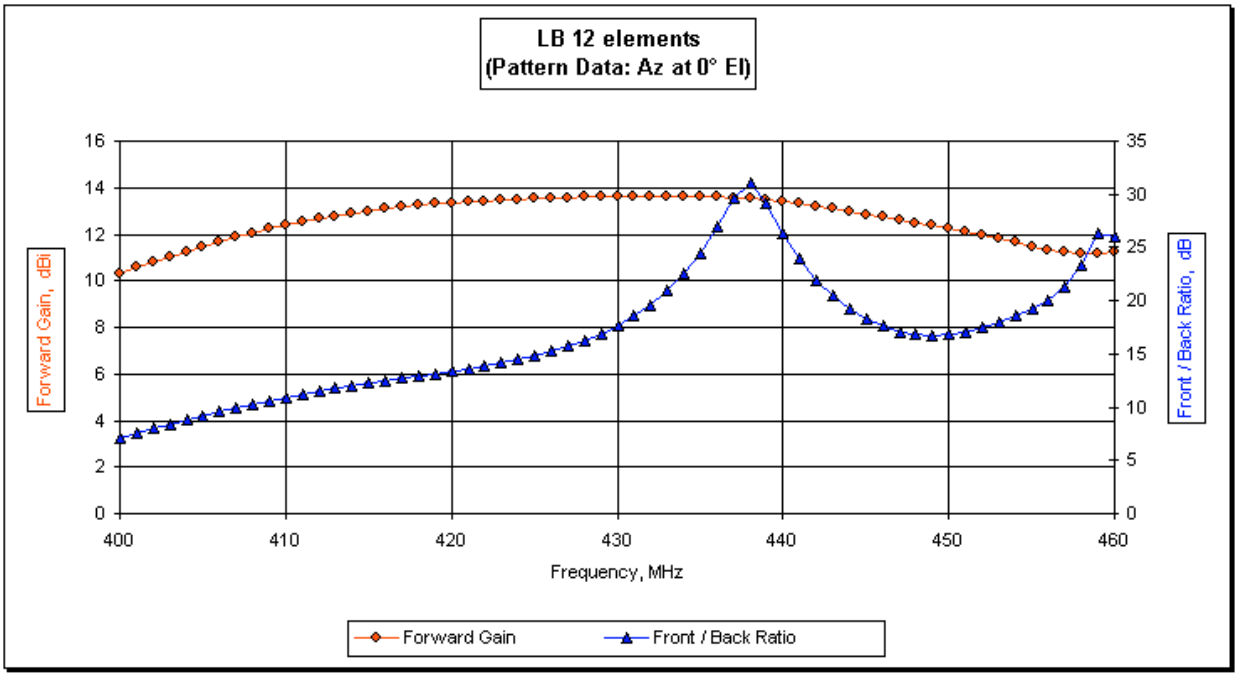
Test (LB)-Series Yagi Graphs: 10-50 Elements

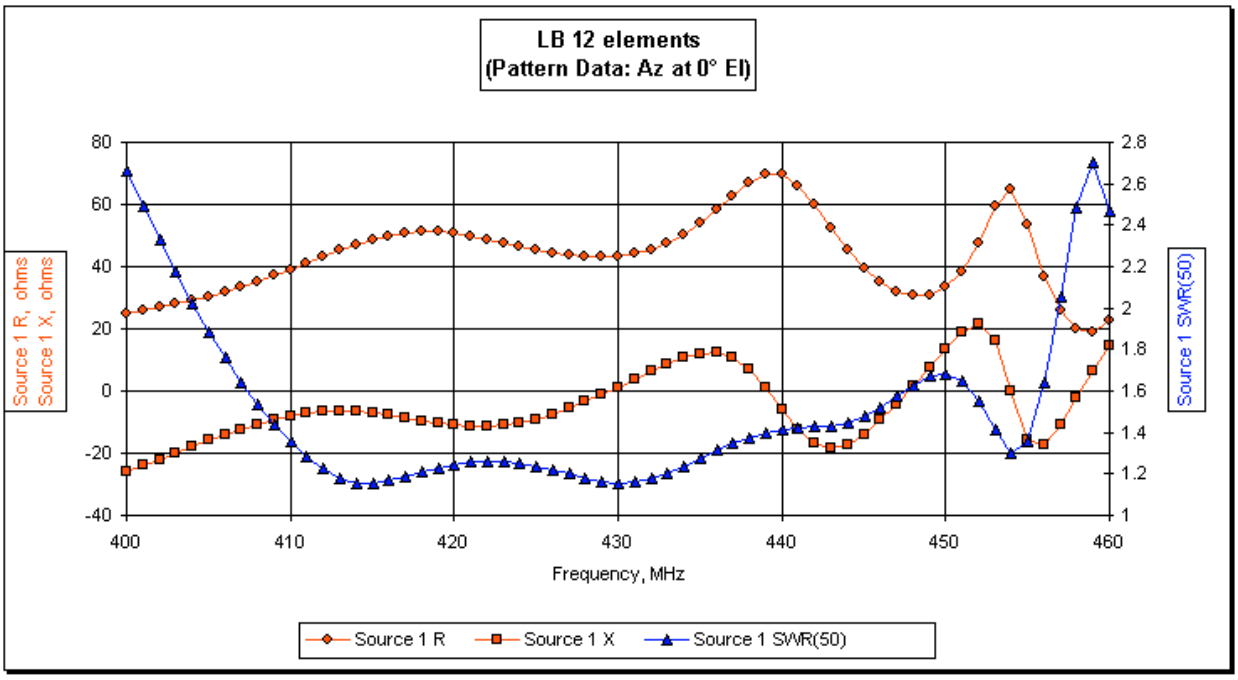


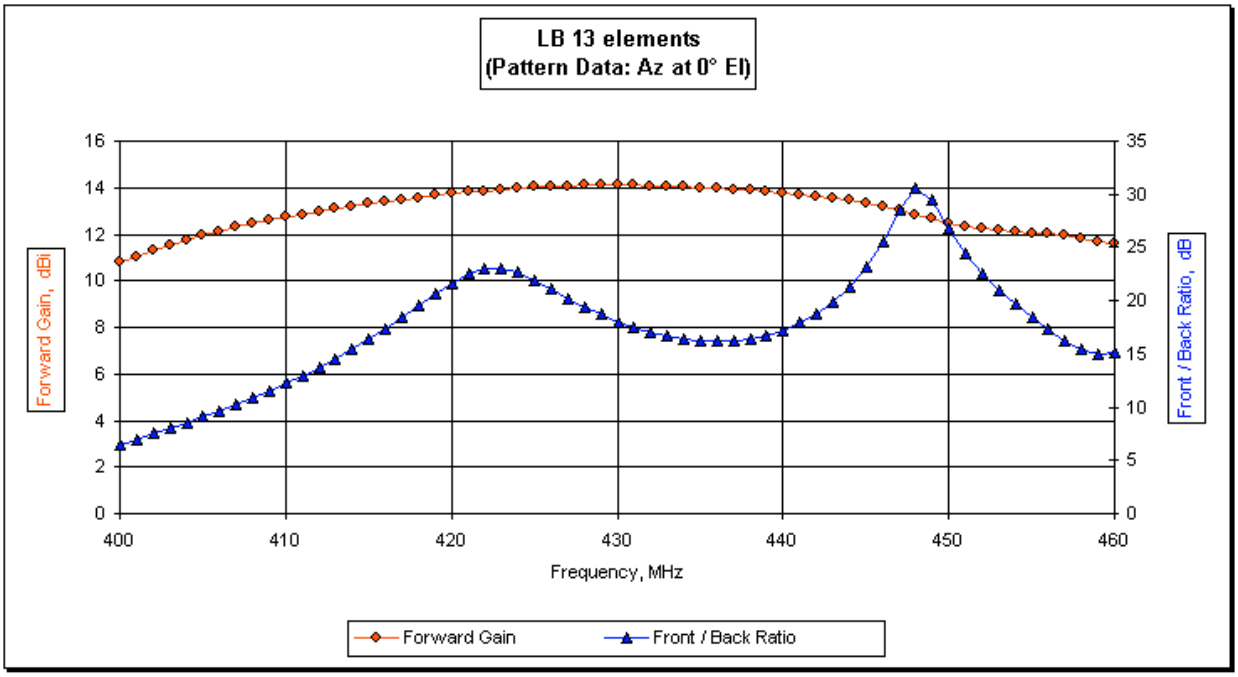


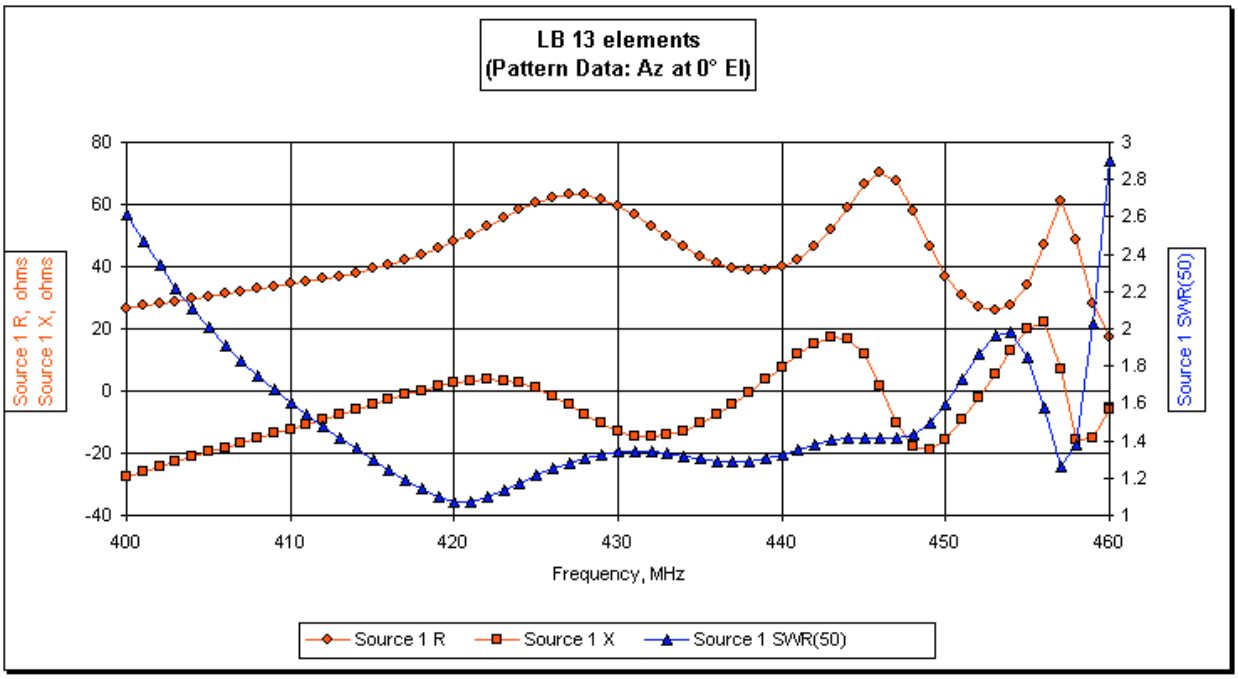

LB 11 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

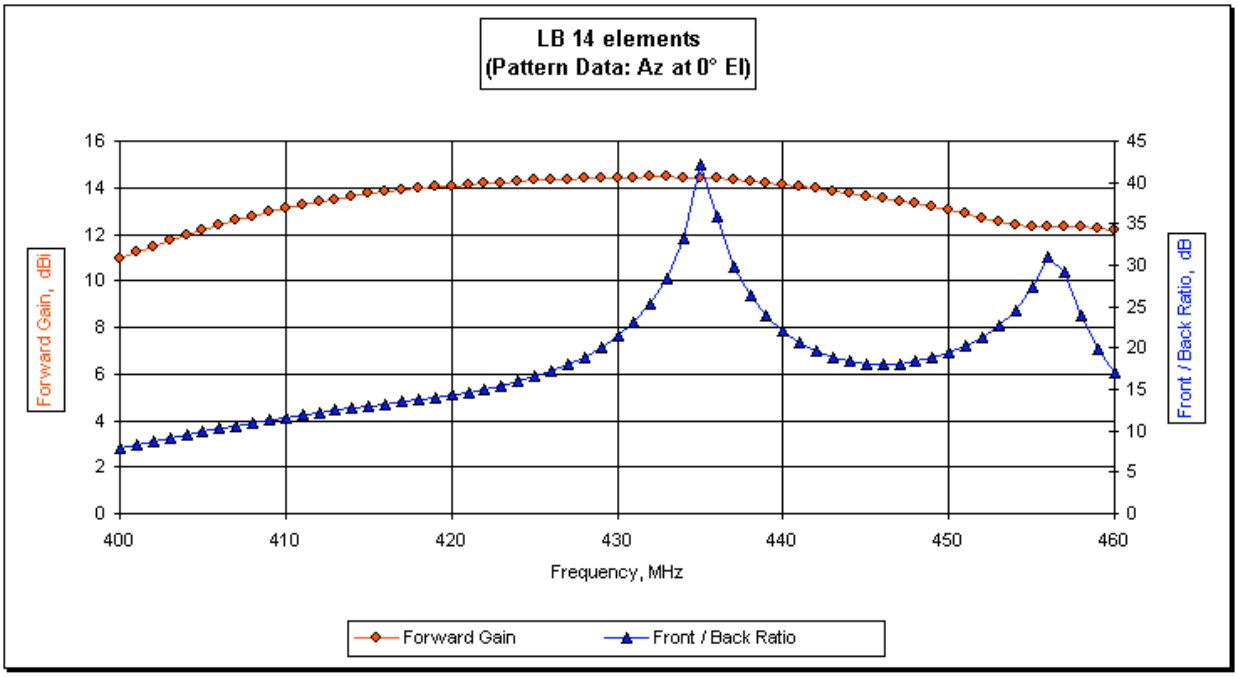

LB 11 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

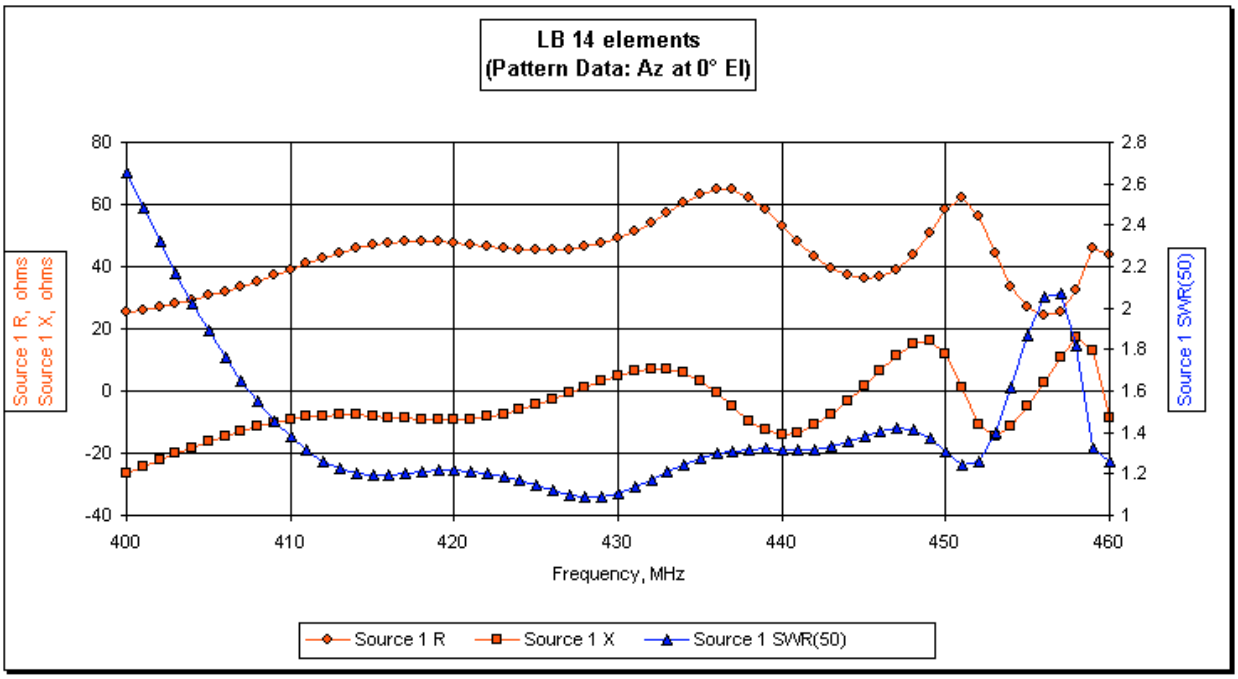

LB 12 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

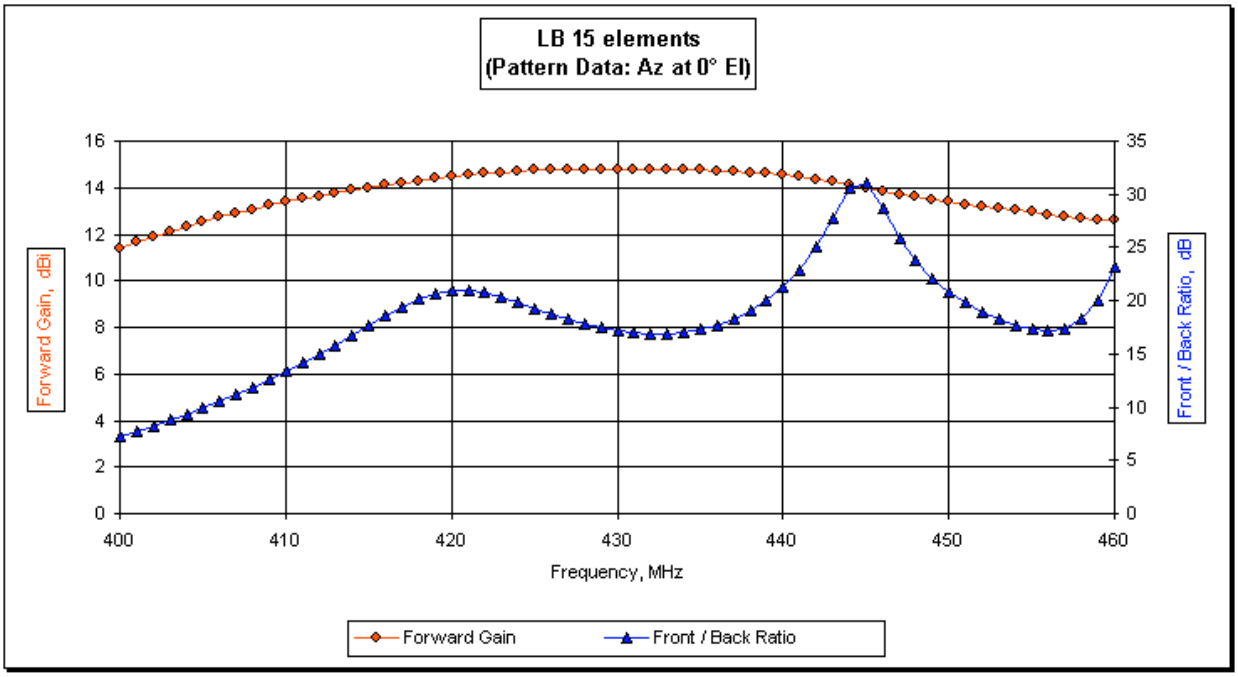

LB 12 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

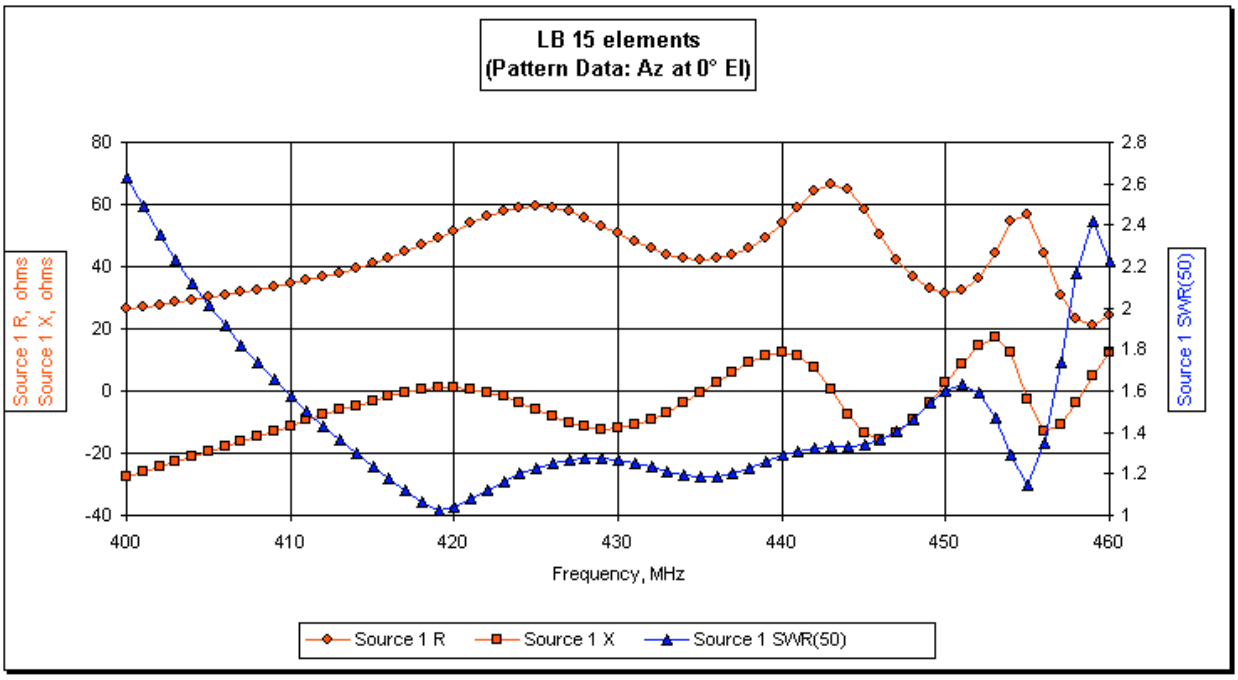

LB 13 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

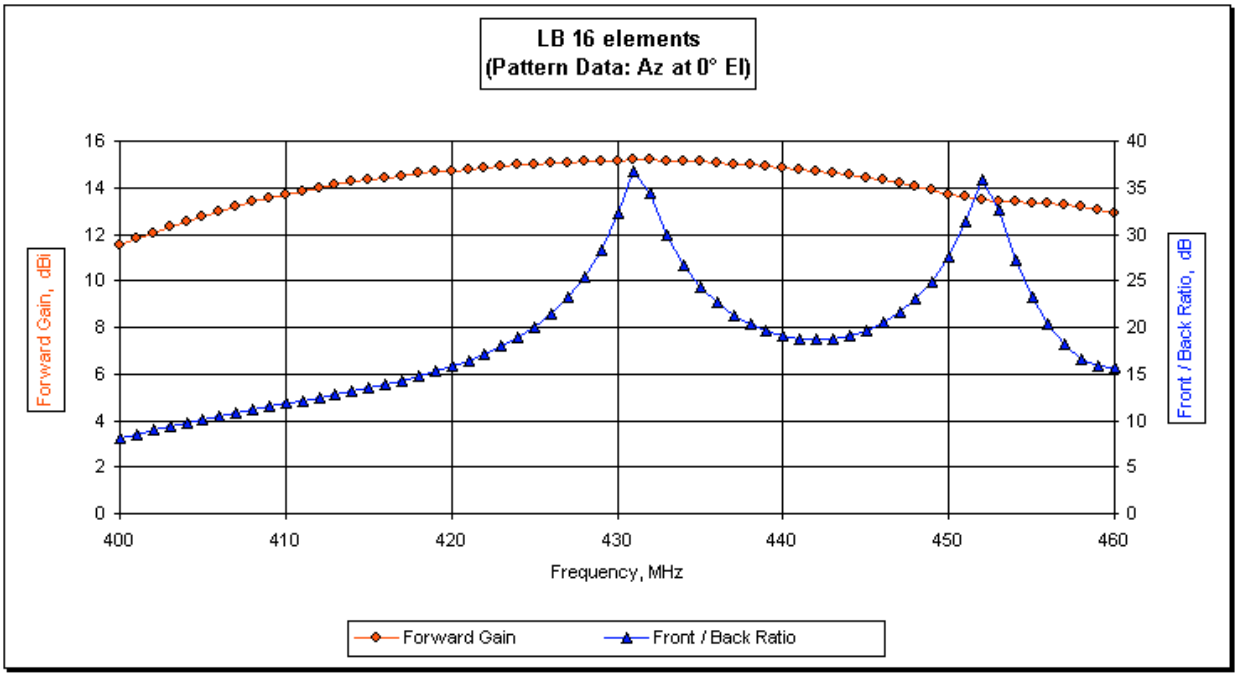

LB 13 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

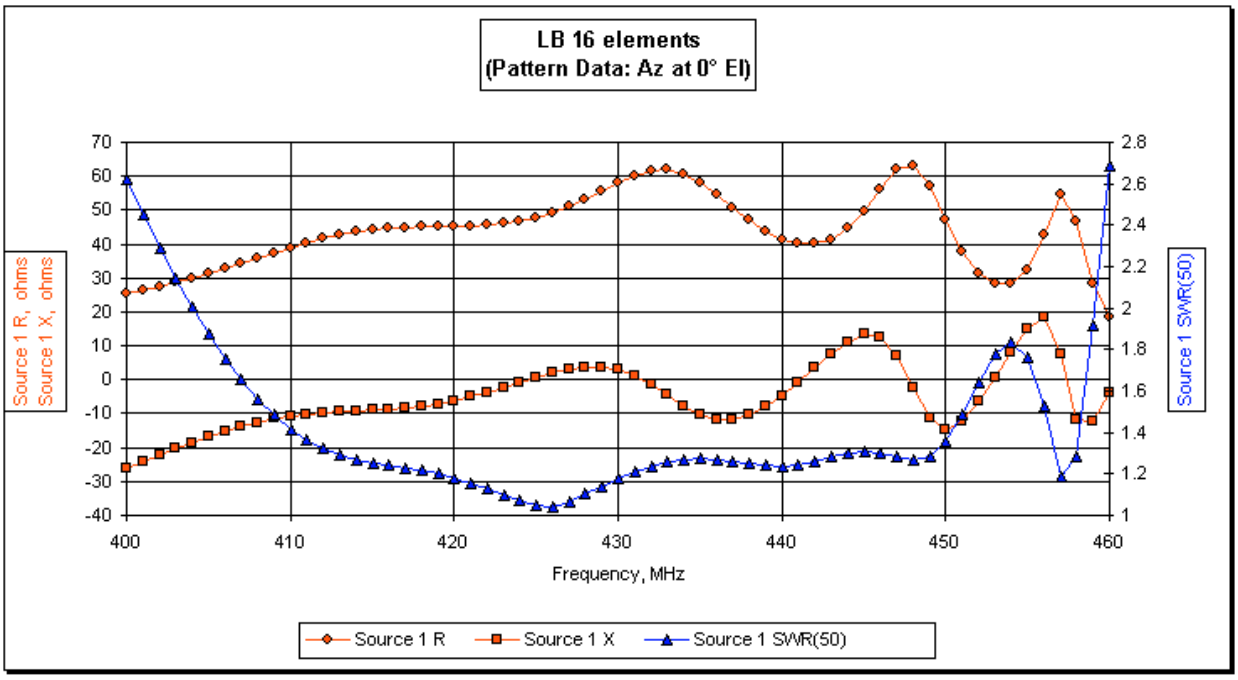

LB 14 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

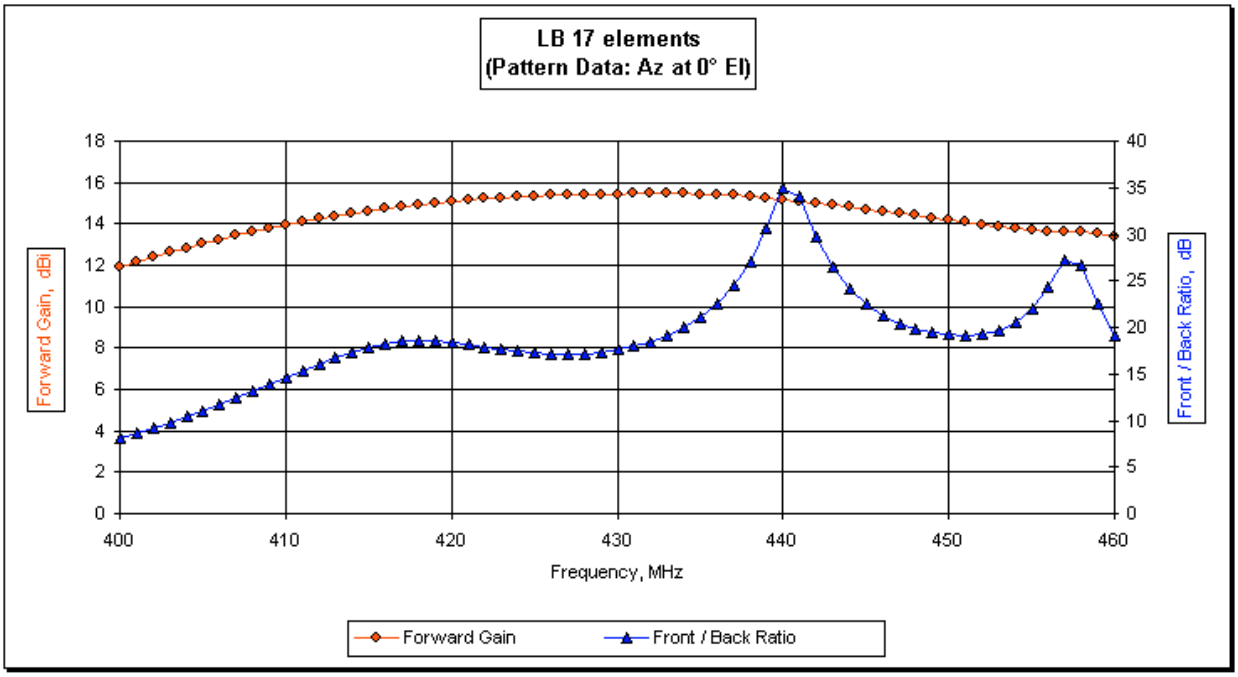

LB 14 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

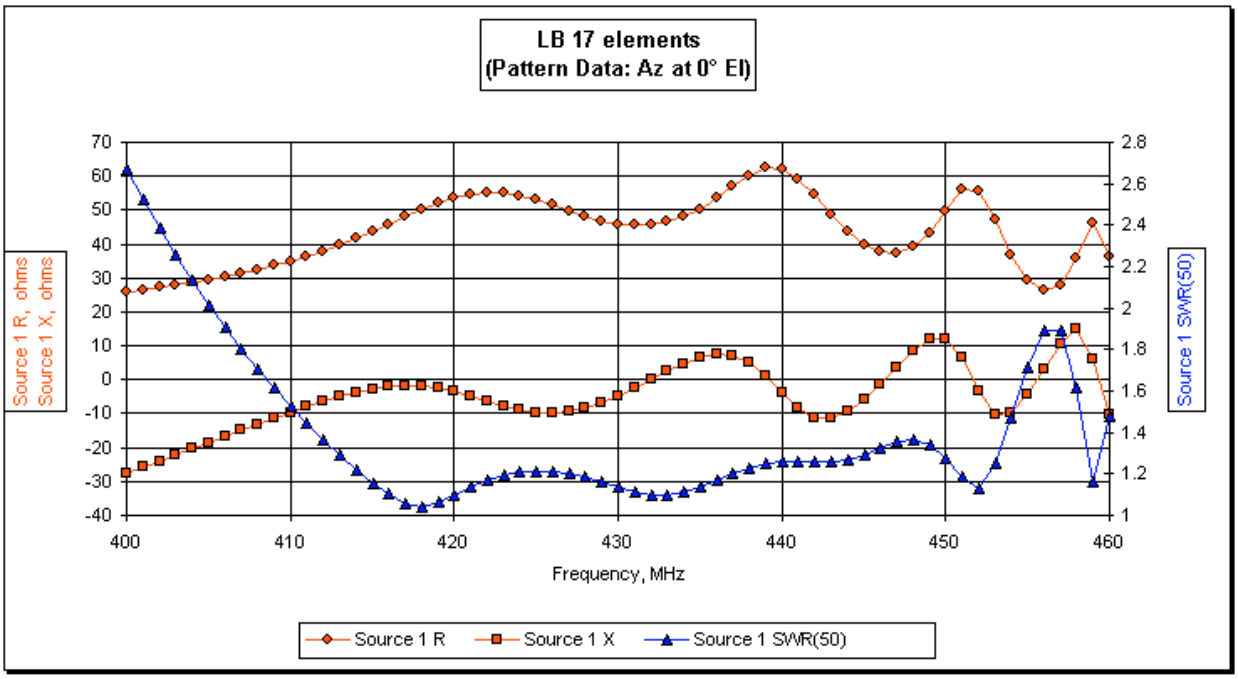

LB 15 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

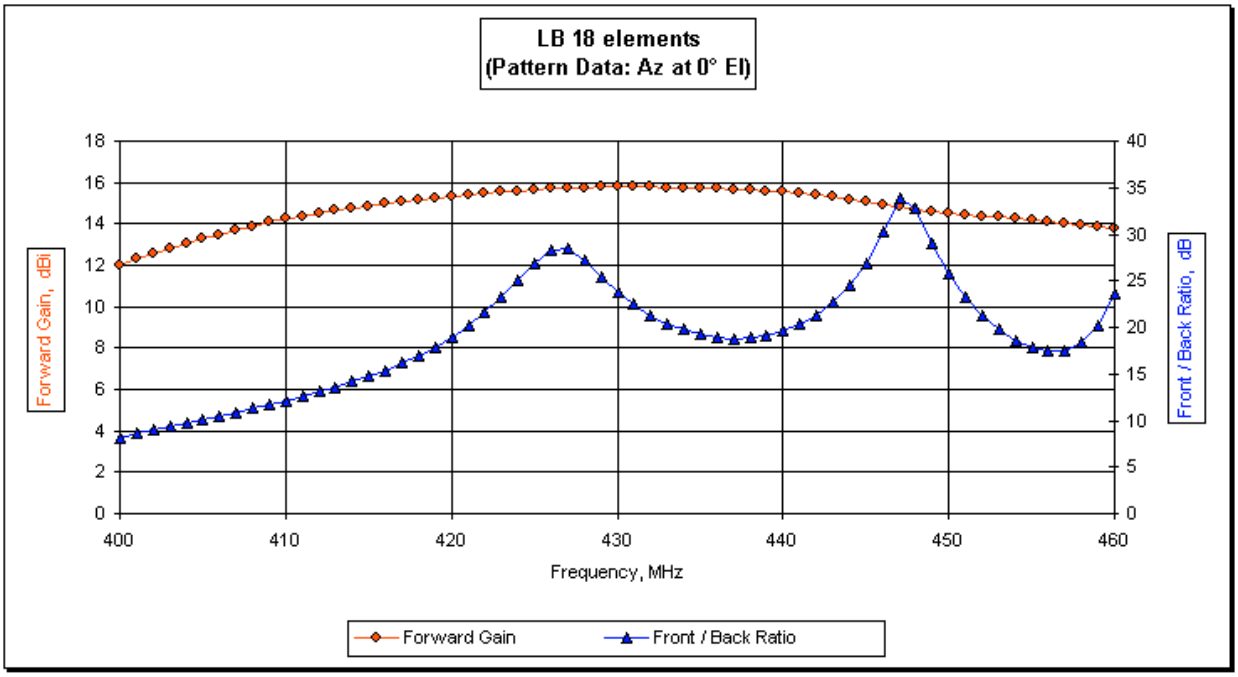

LB 15 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

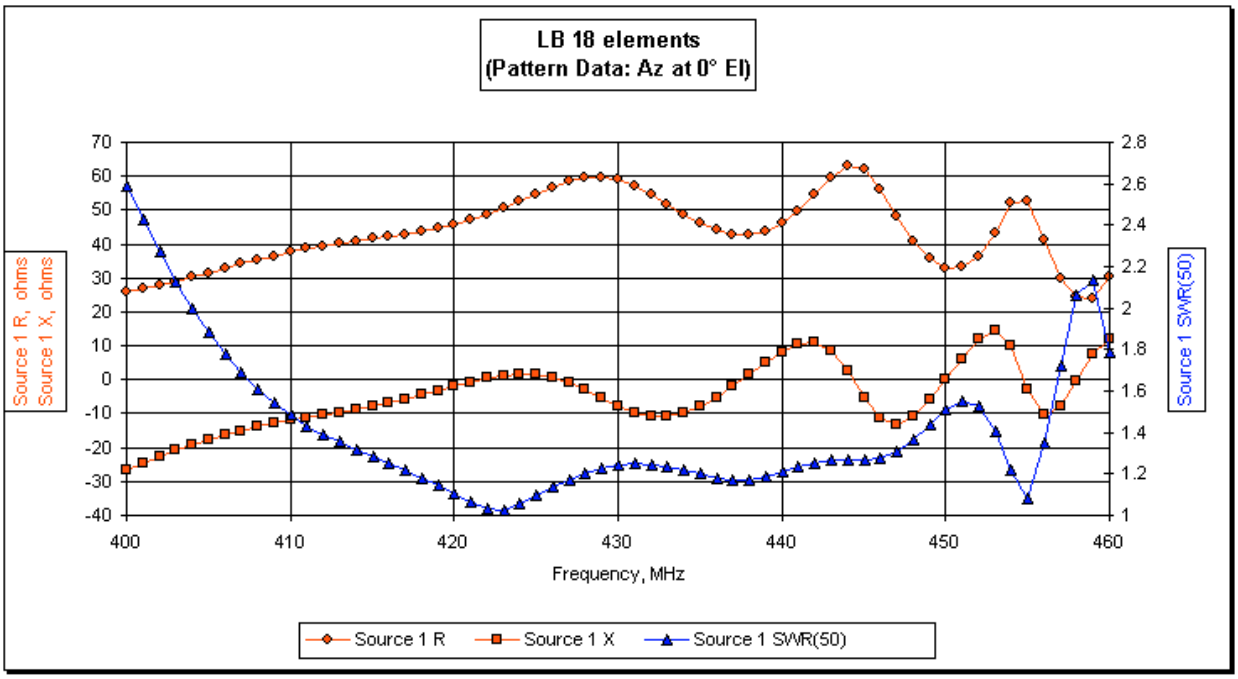

LB 16 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

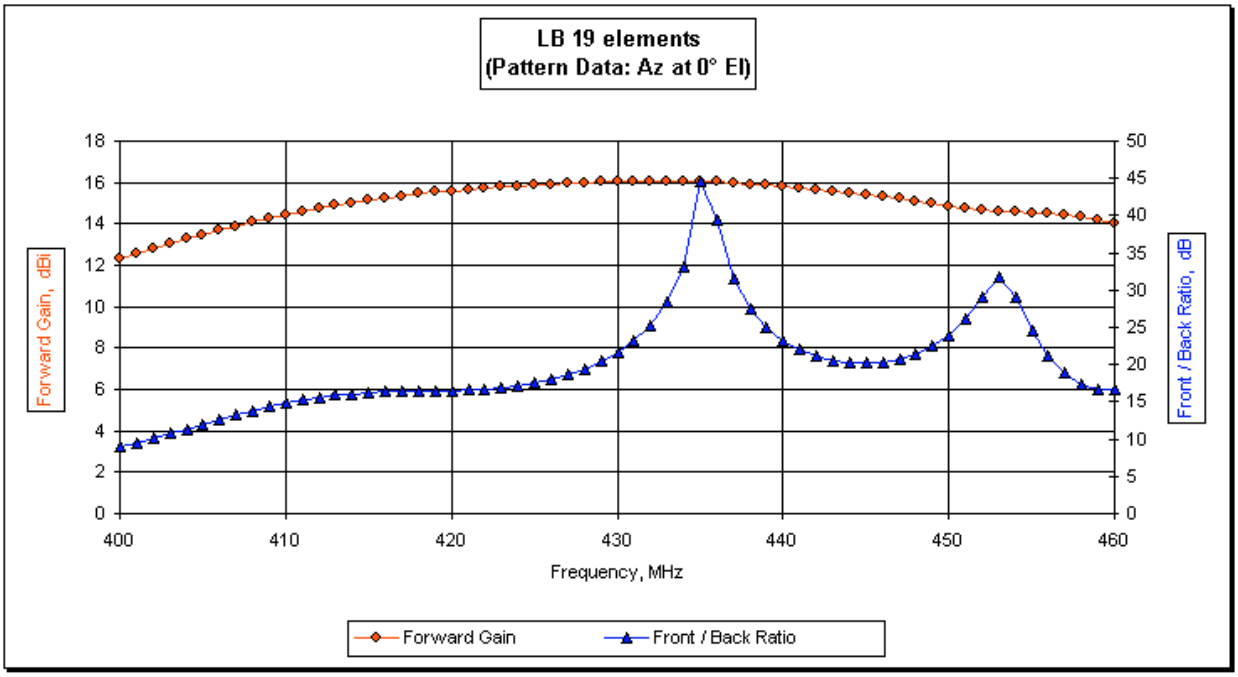

LB 16 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

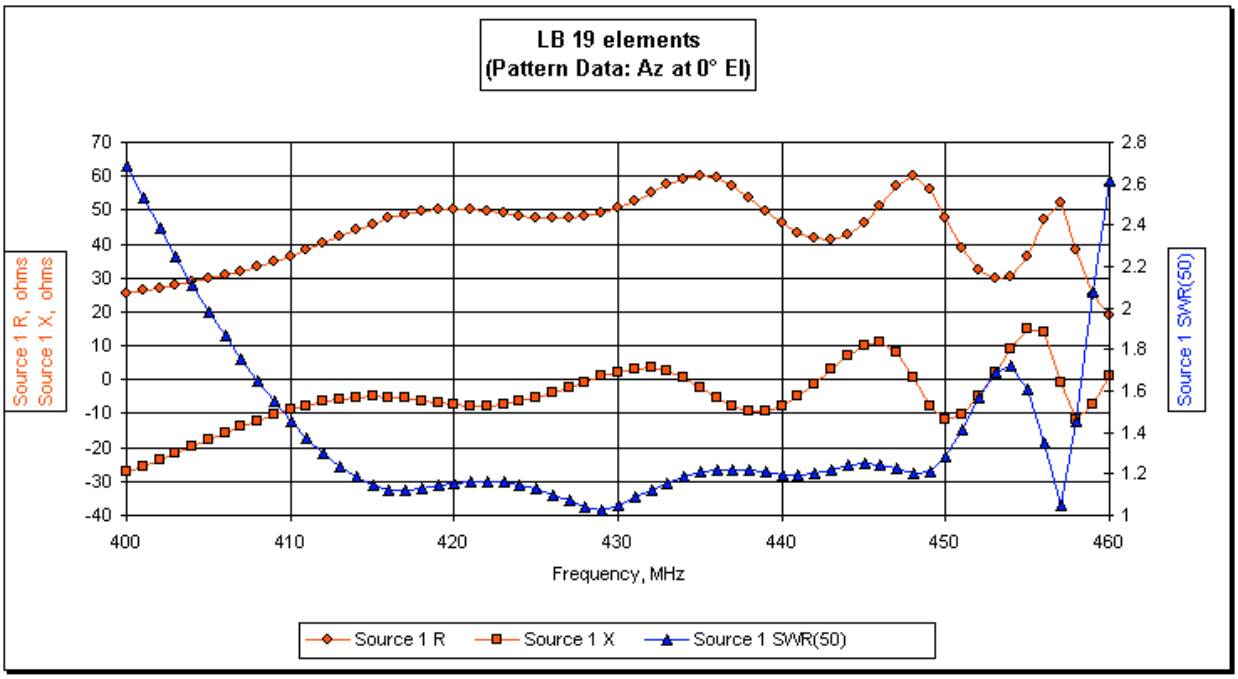

LB 17 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

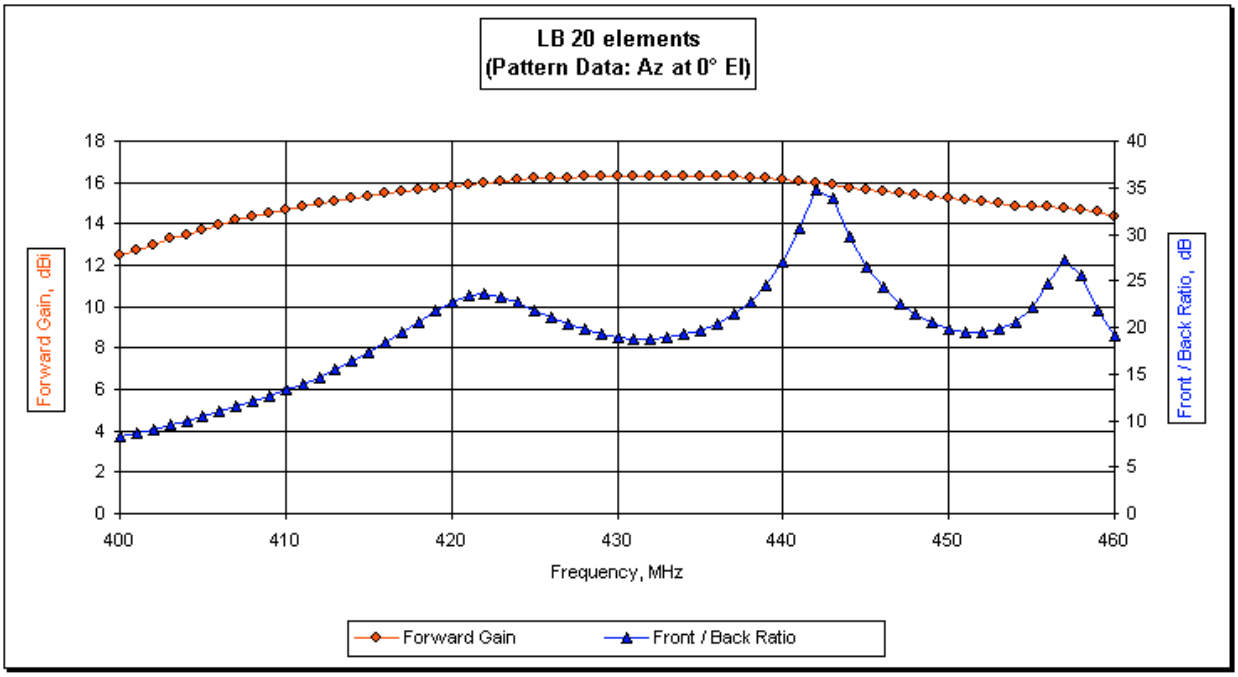

LB 17 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

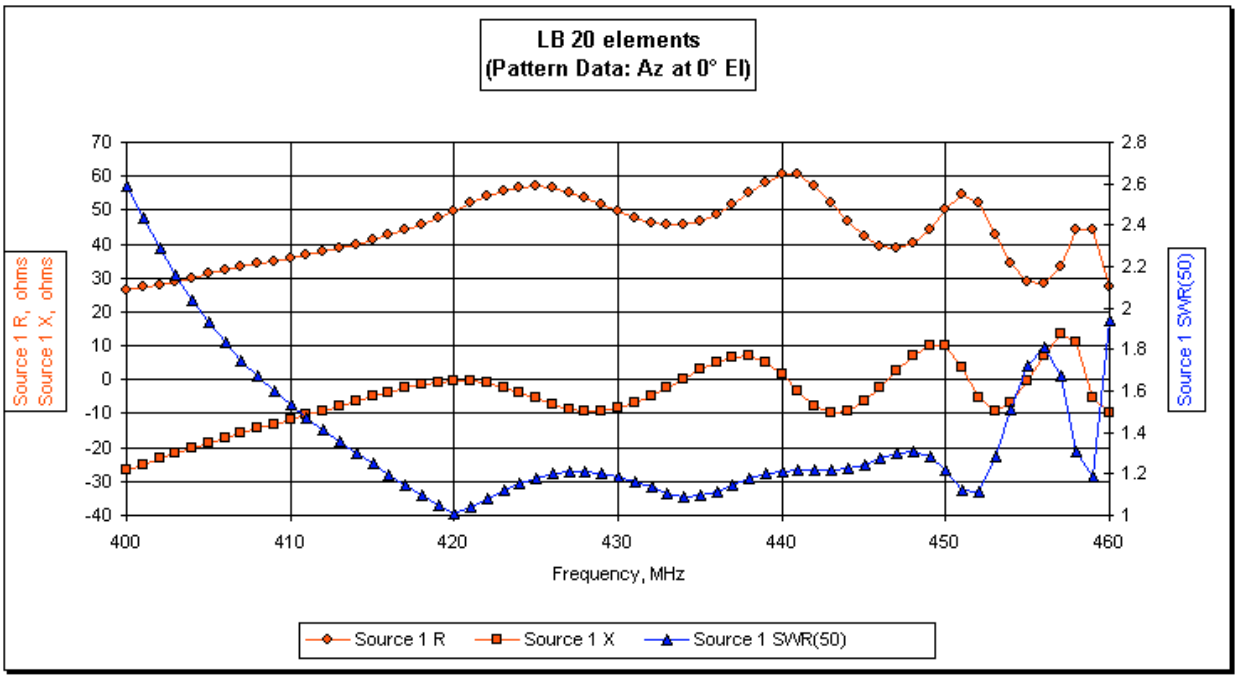

LB 18 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

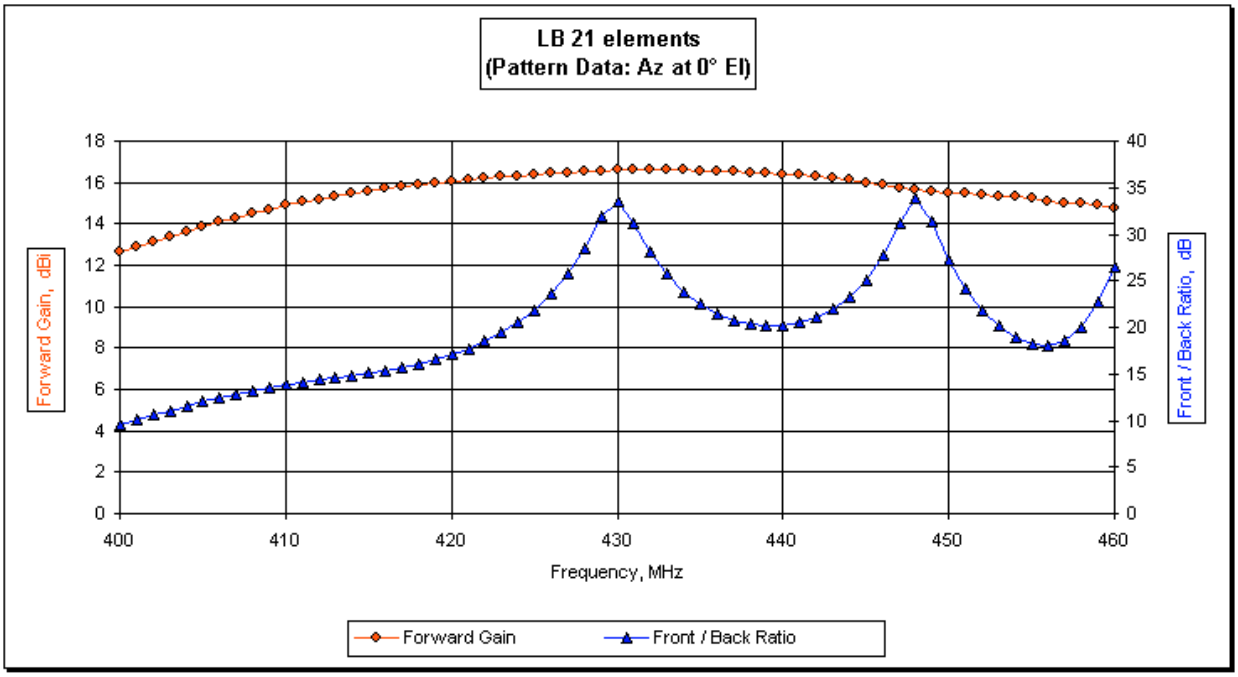

LB 18 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

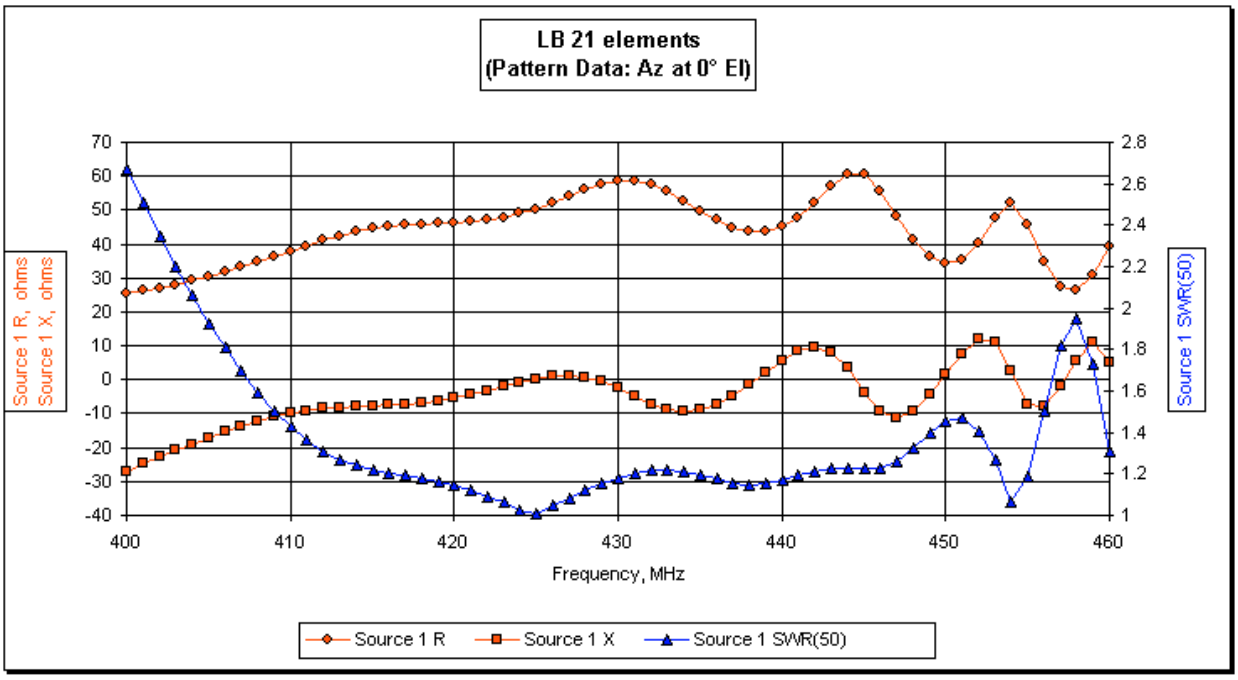

LB 19 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

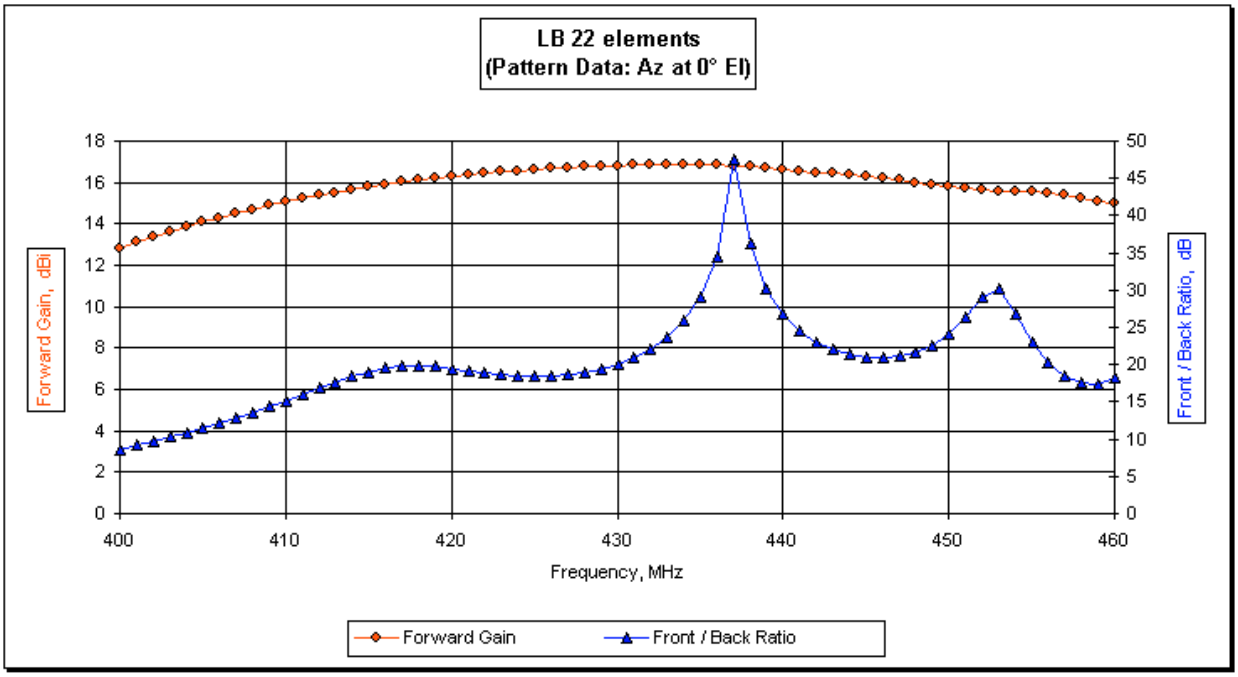

LB 19 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

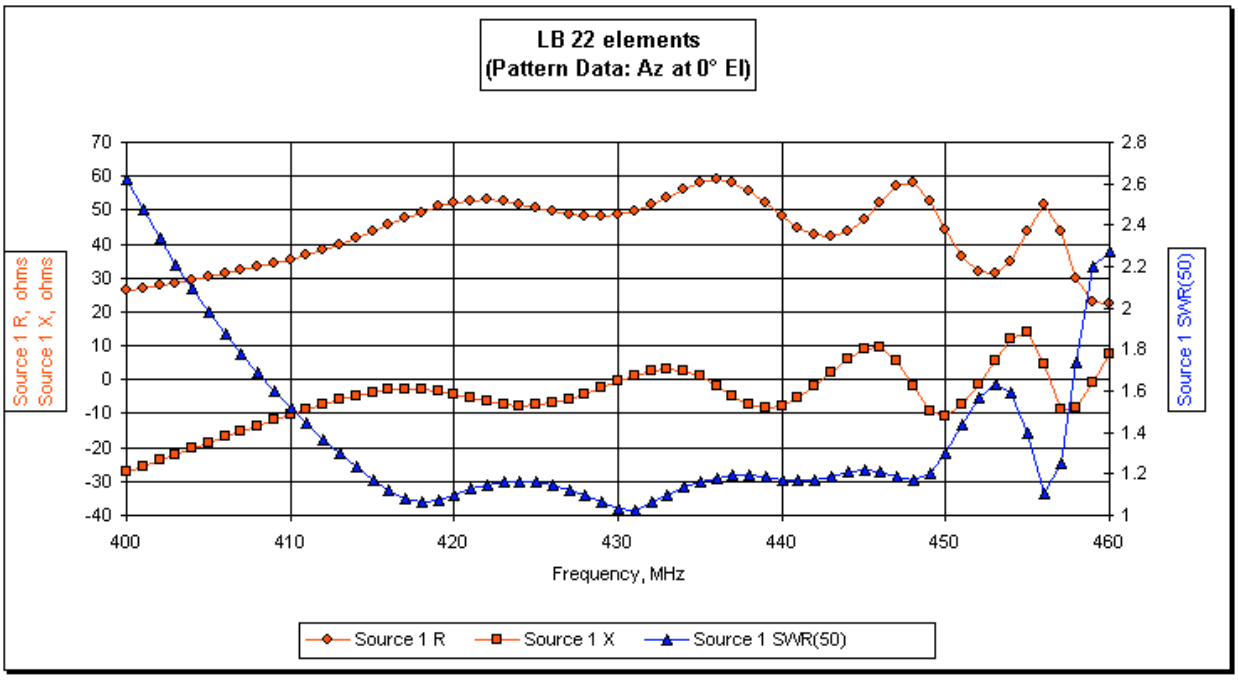

LB 20 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

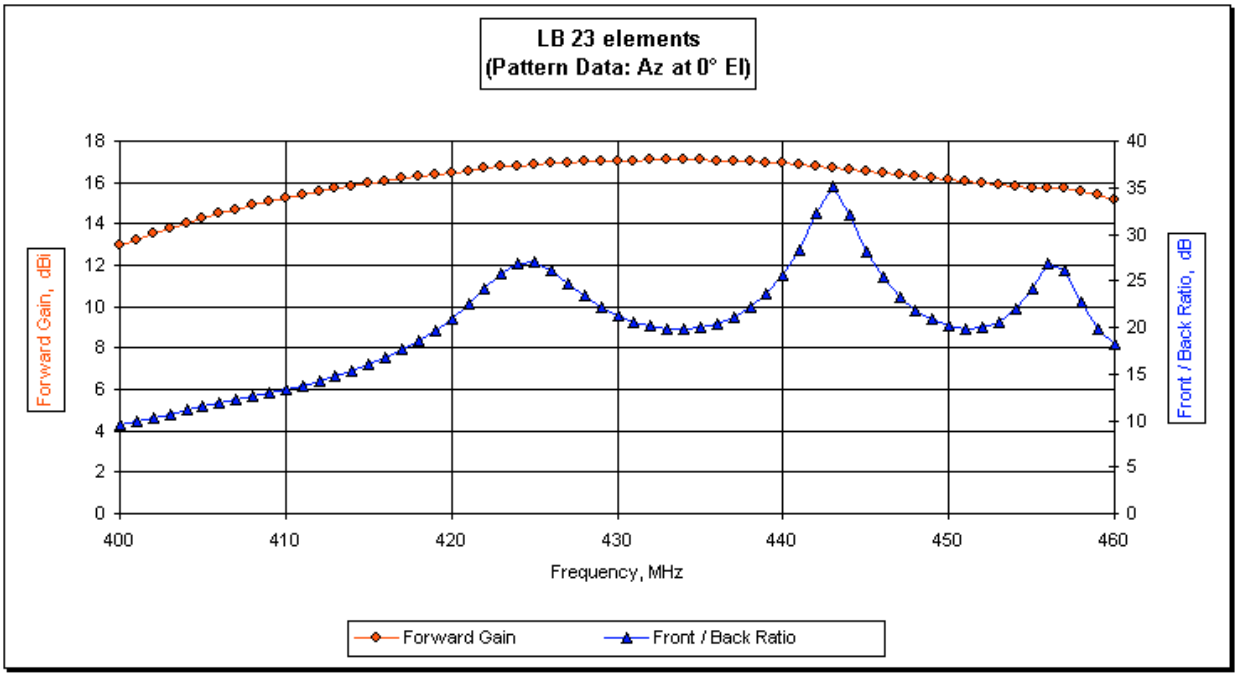

LB 20 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

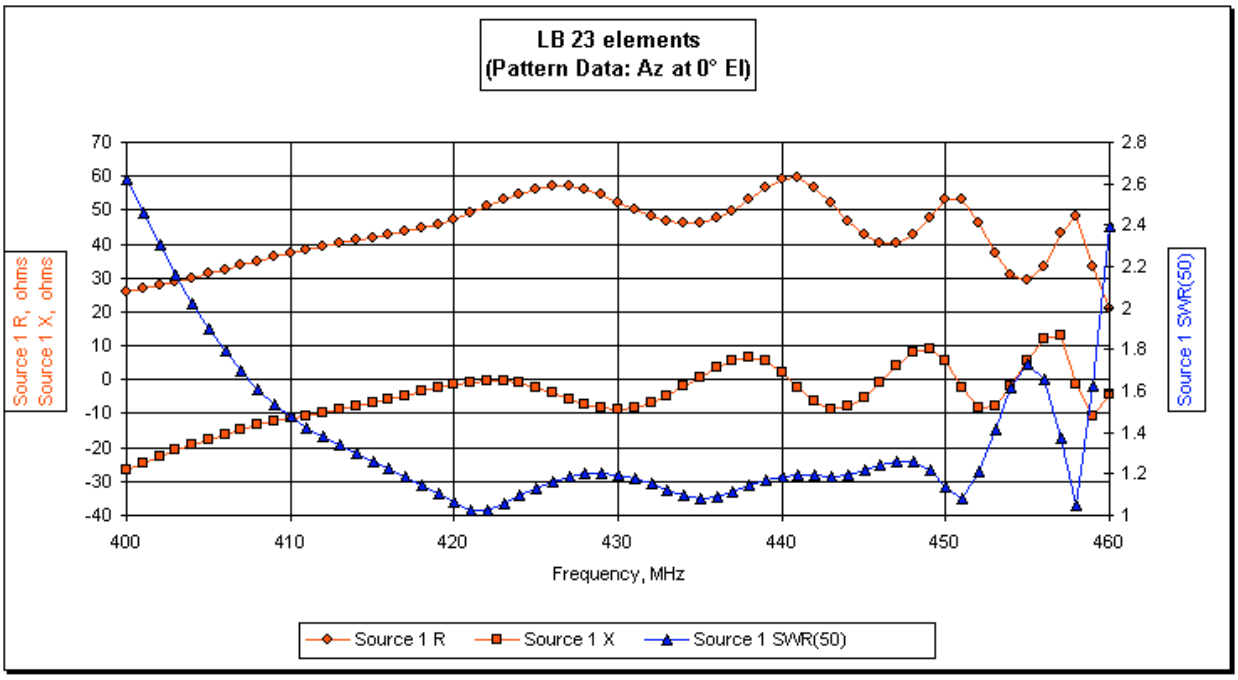

LB 21 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

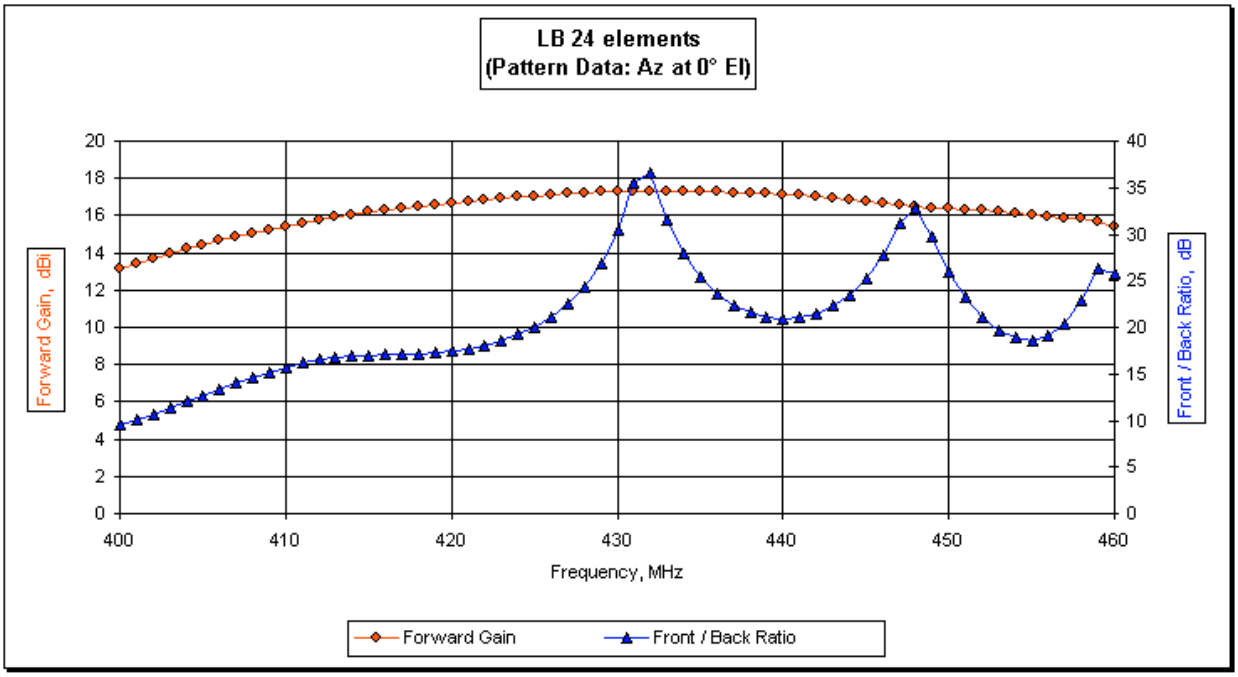

LB 21 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

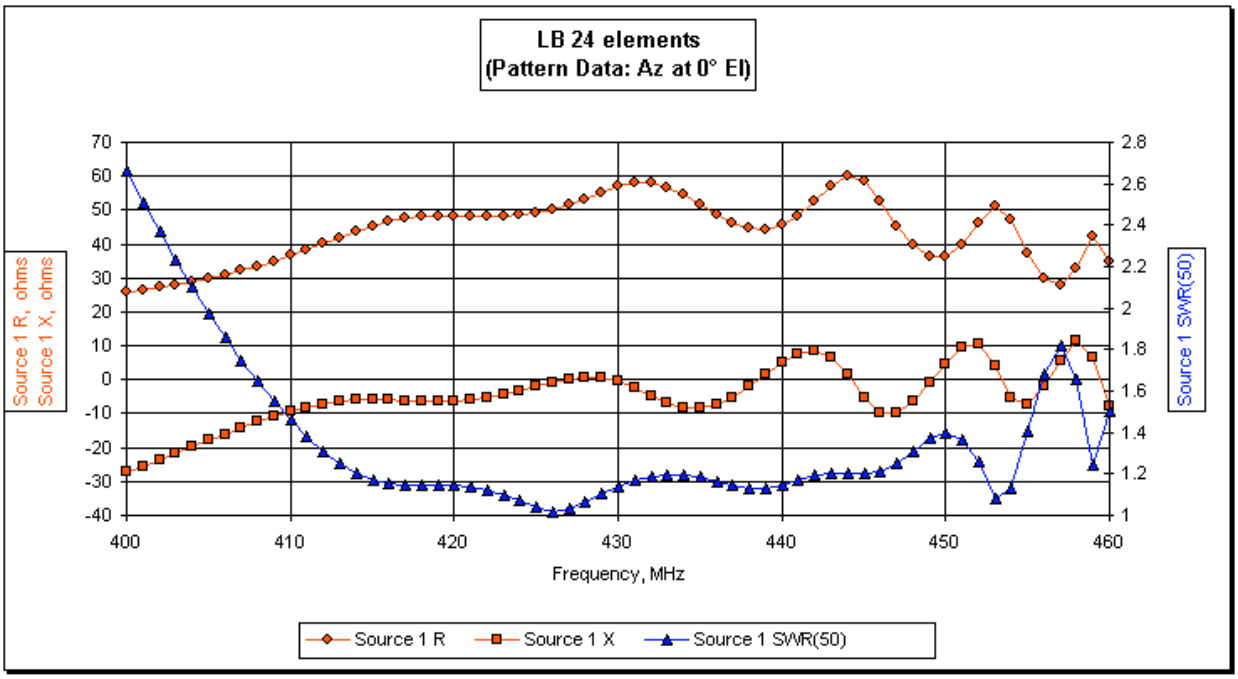

LB 22 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

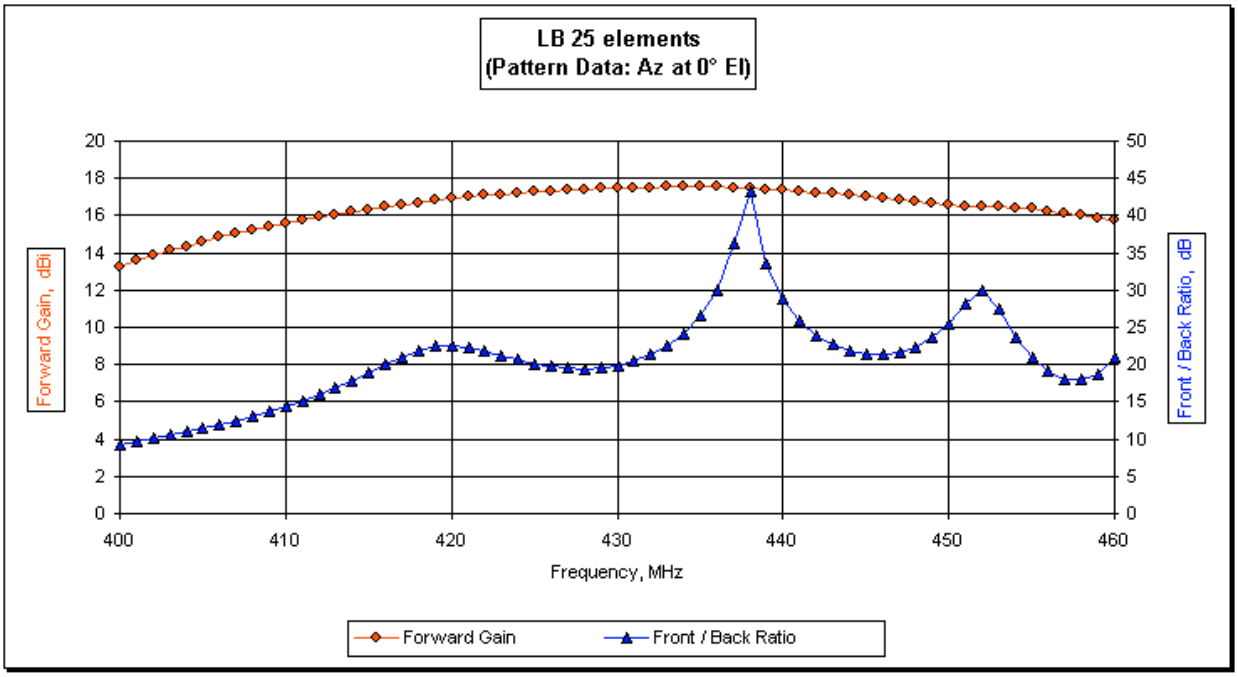

LB 22 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

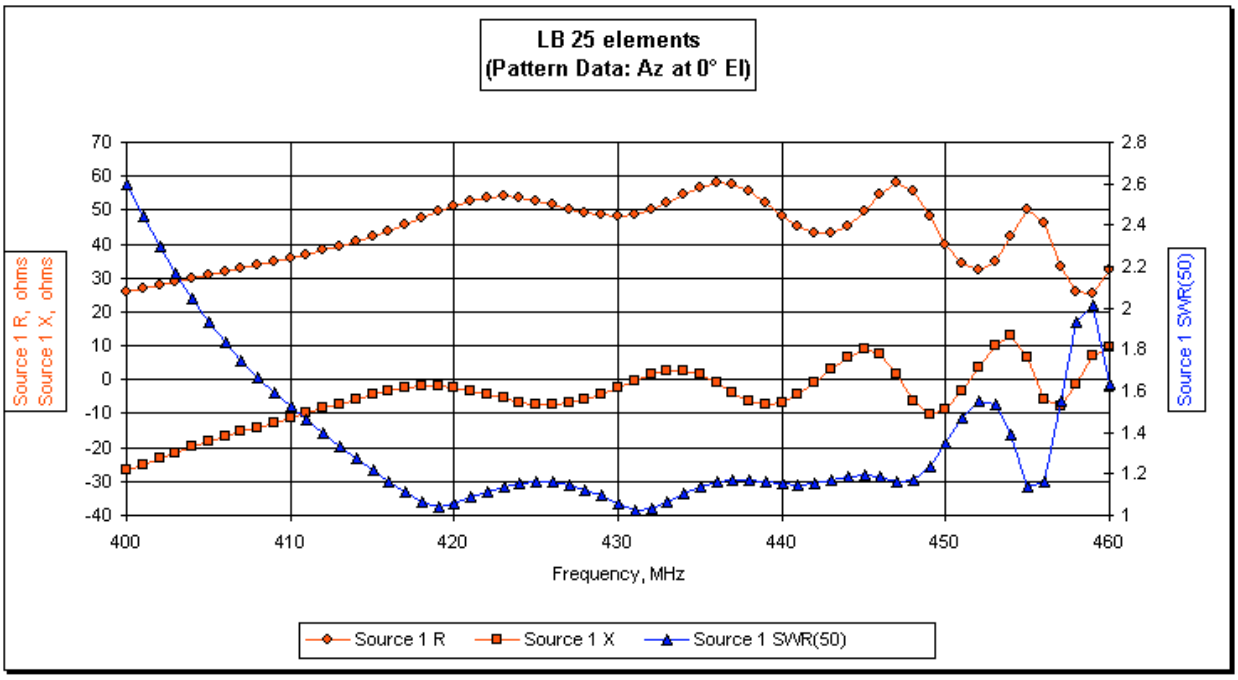

LB 23 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

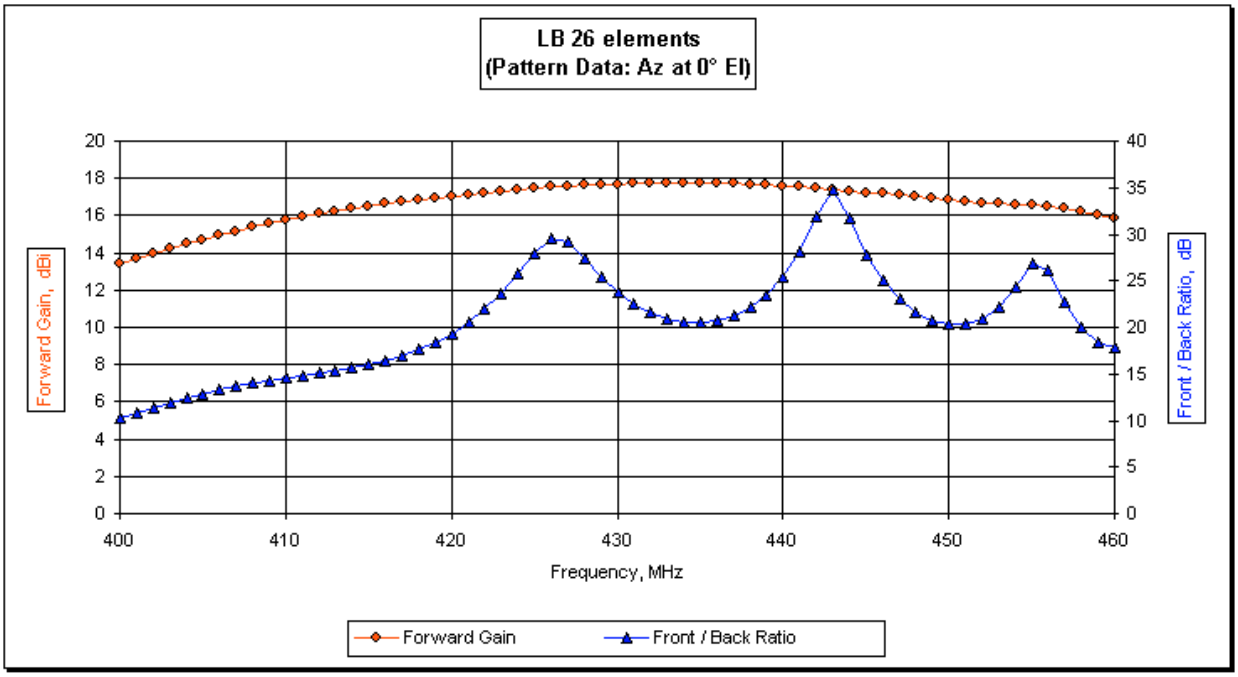

LB 23 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

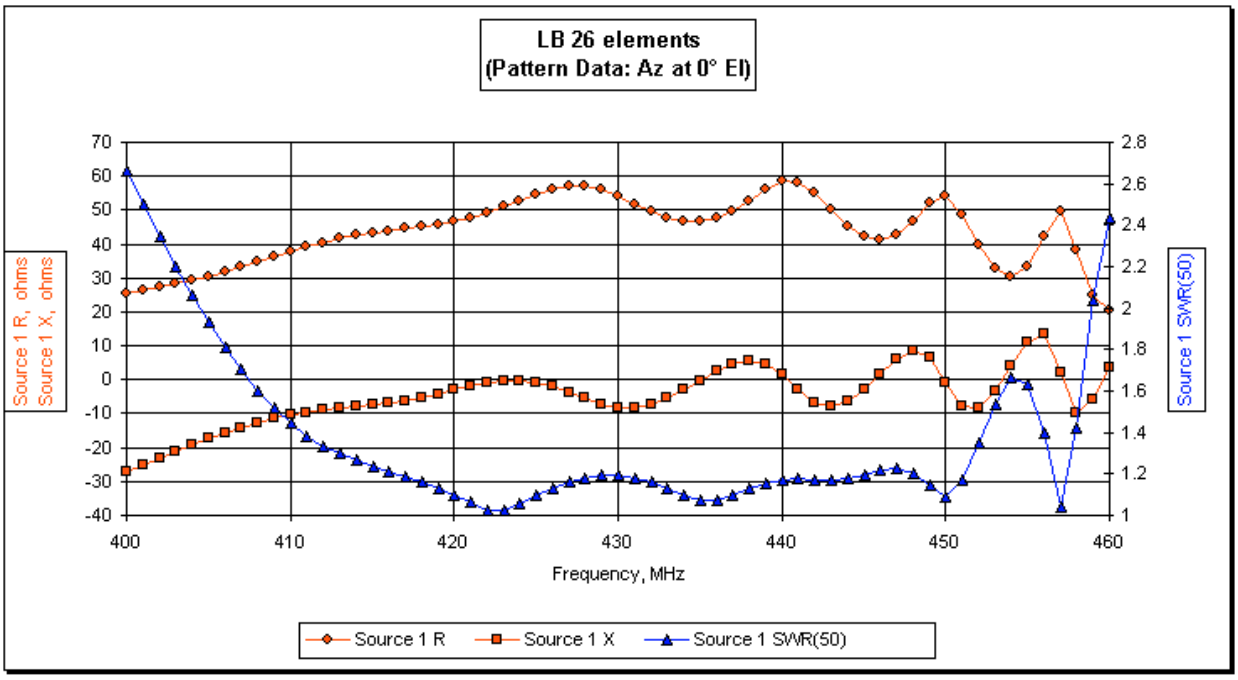

LB 24 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

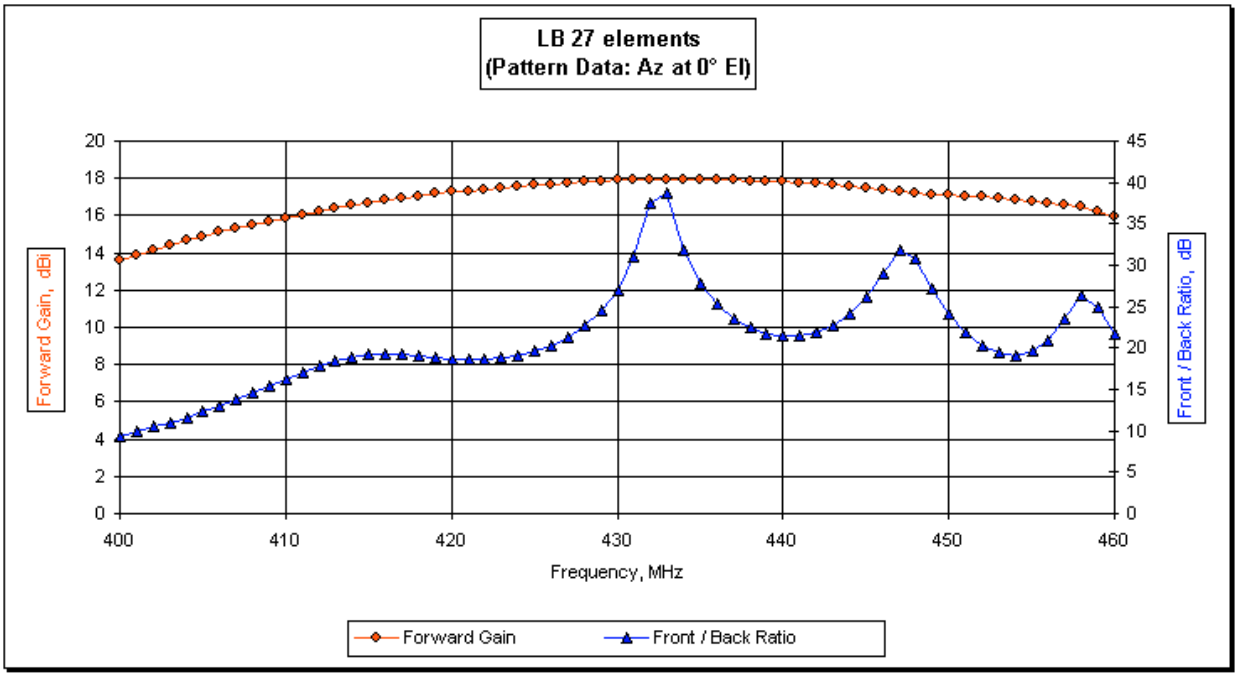

LB 24 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

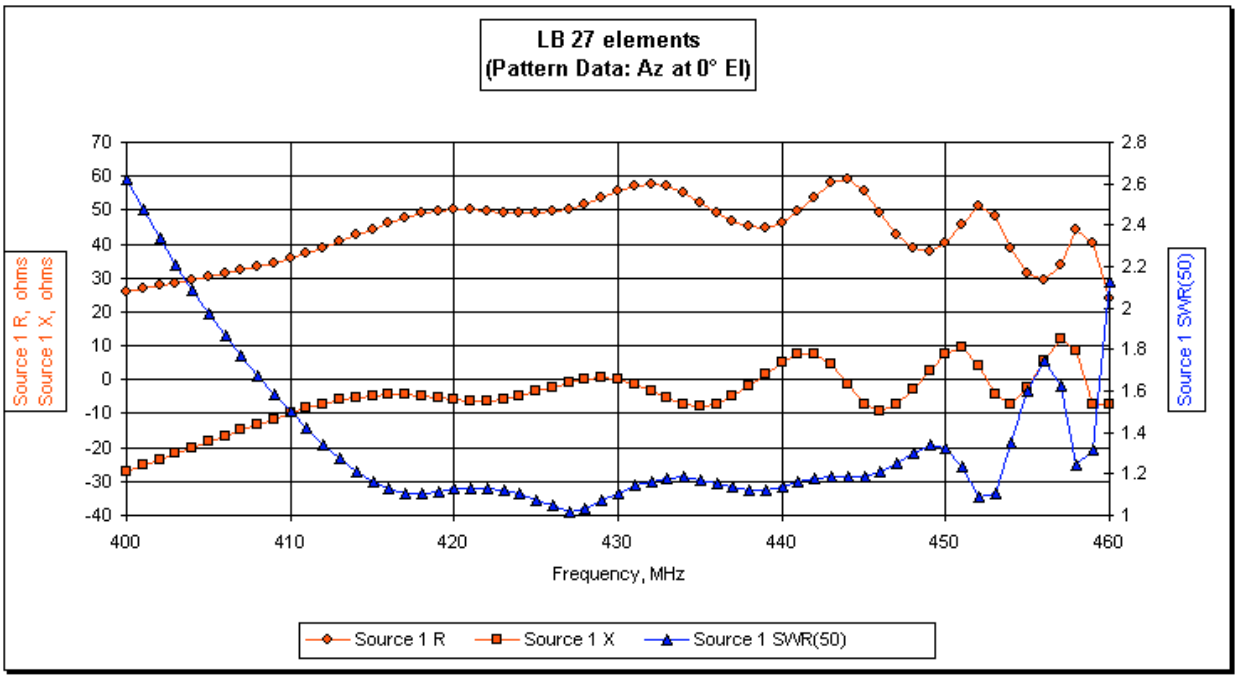

LB 25 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

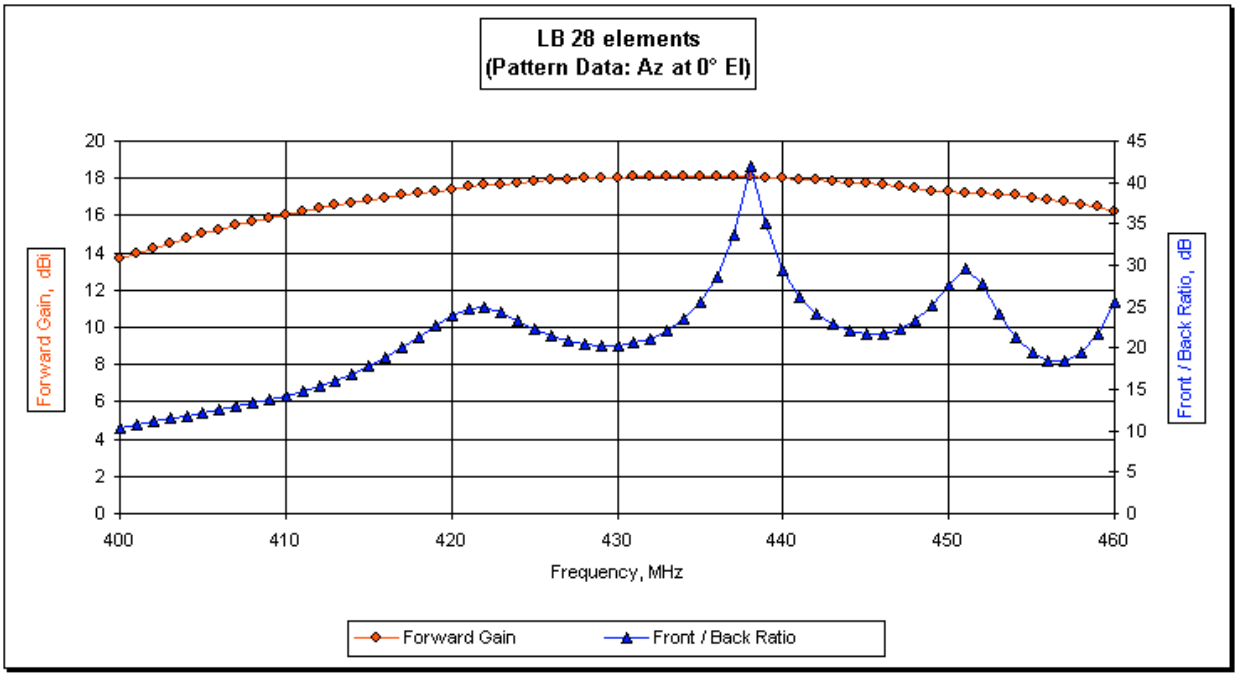

LB 25 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

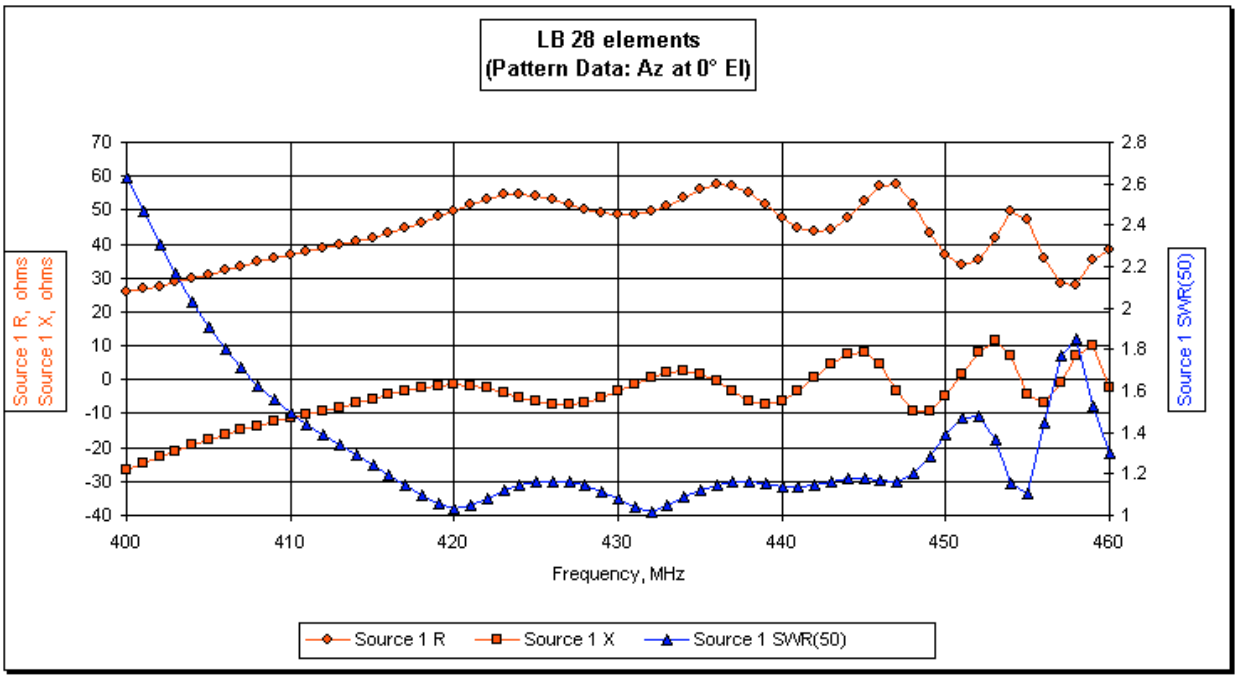

LB 26 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

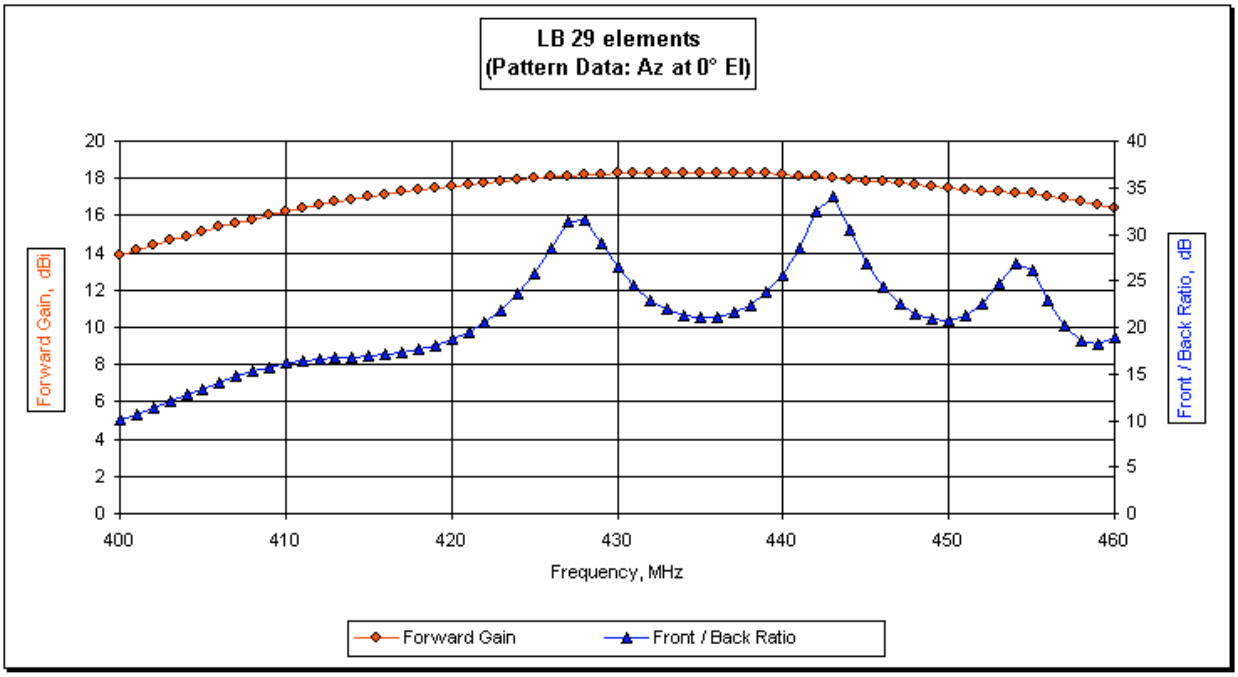

LB 26 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

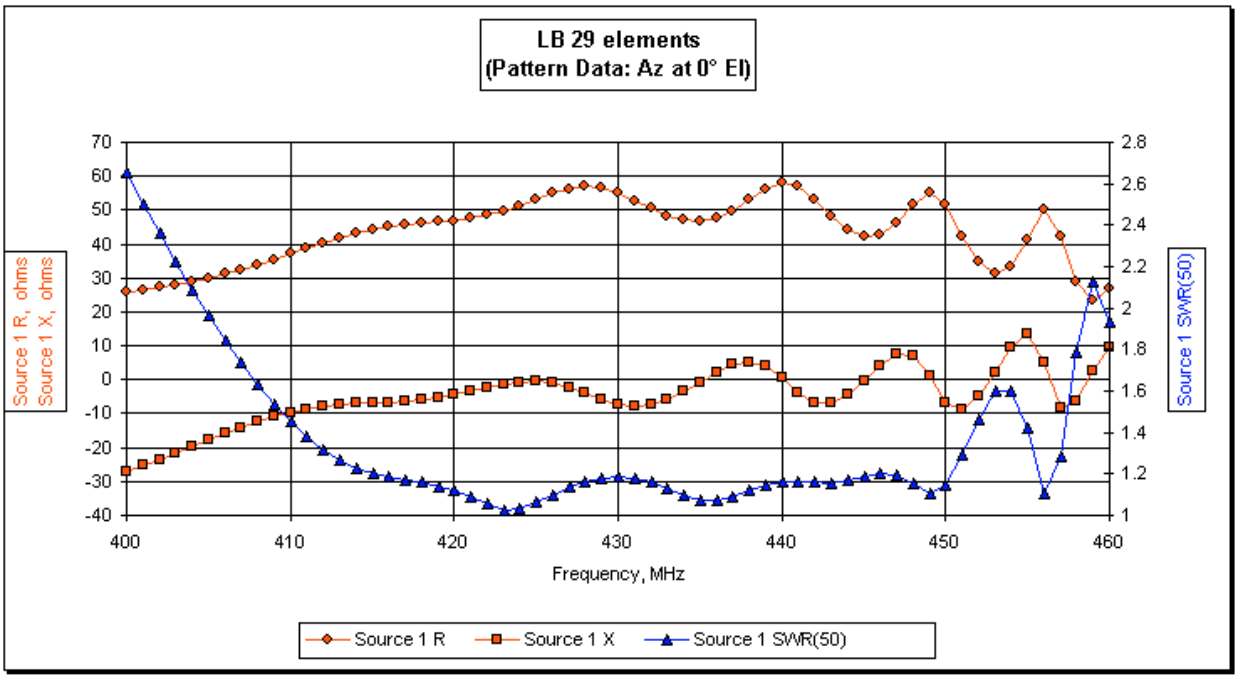

LB 27 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

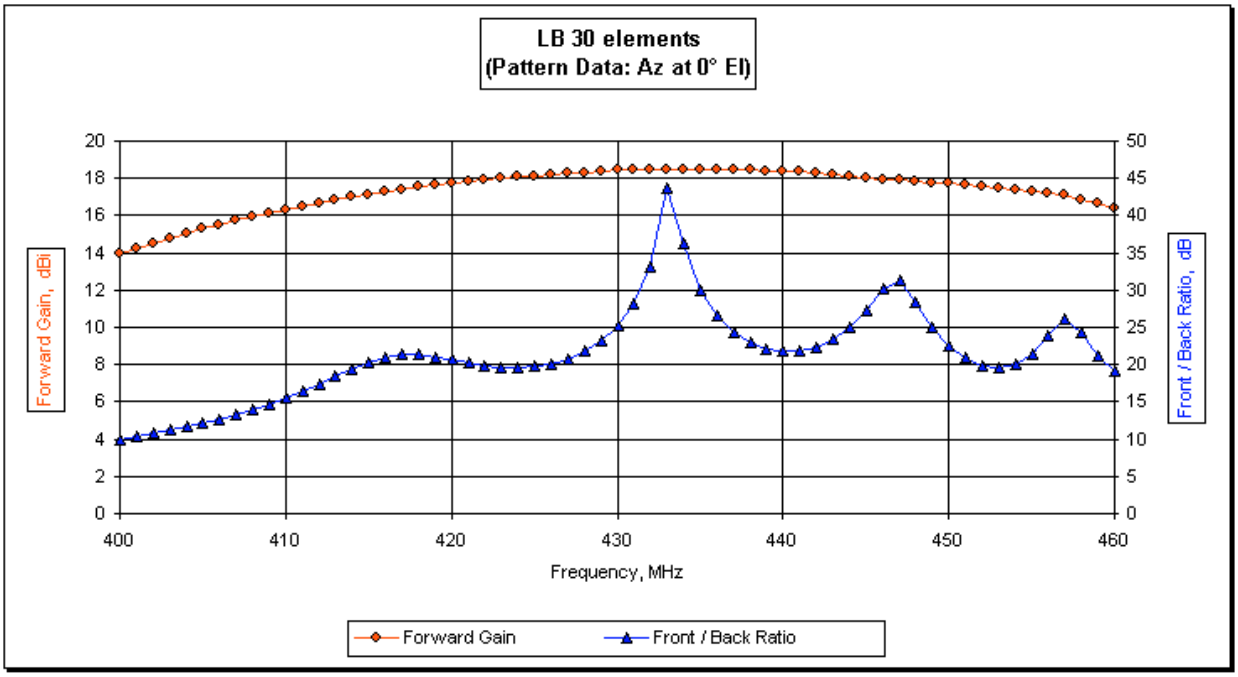

LB 27 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

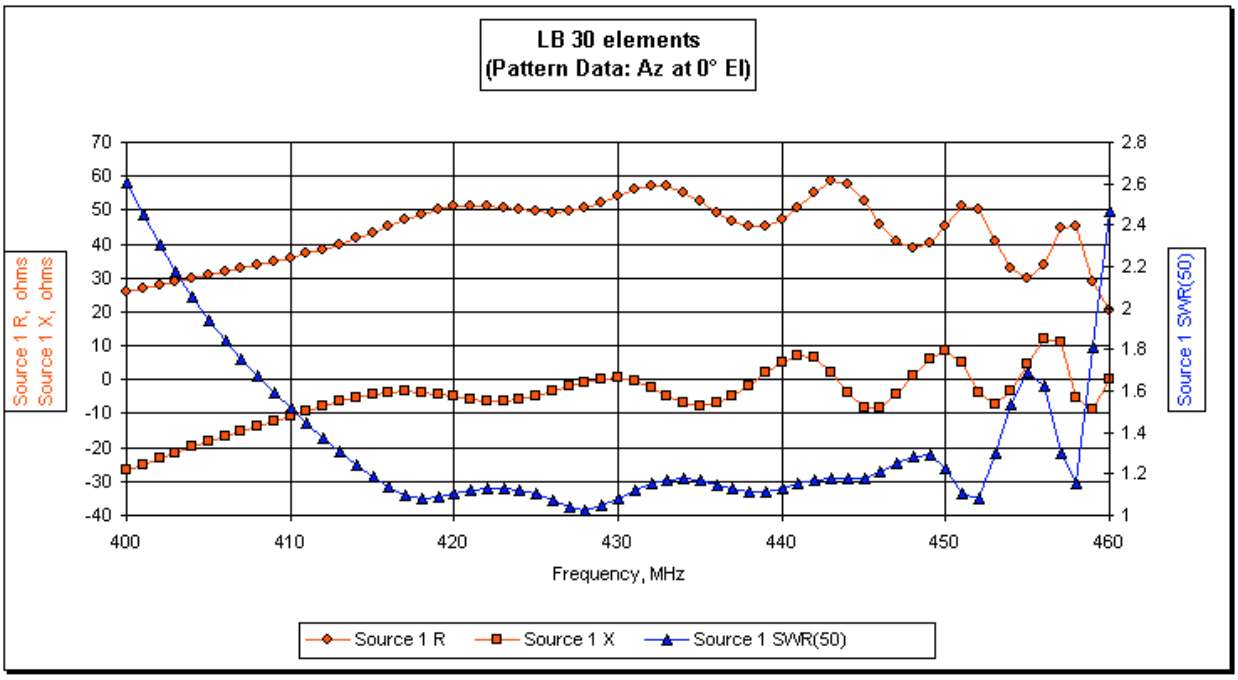

LB 28 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

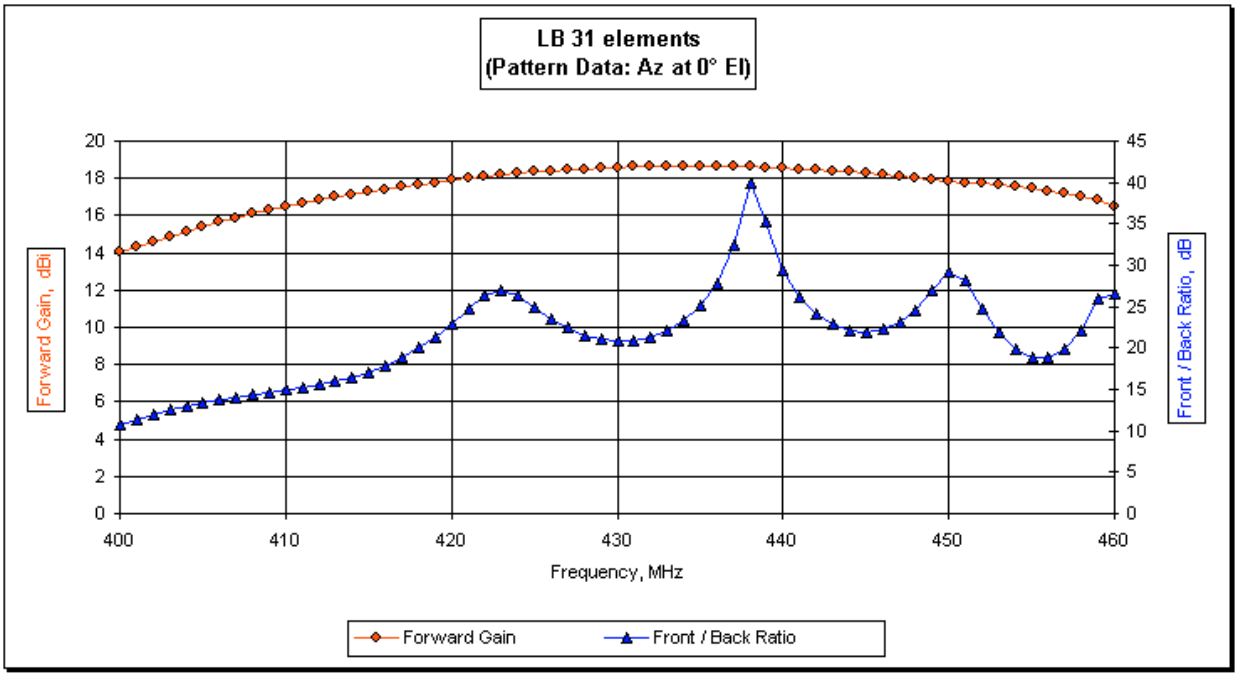

LB 28 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

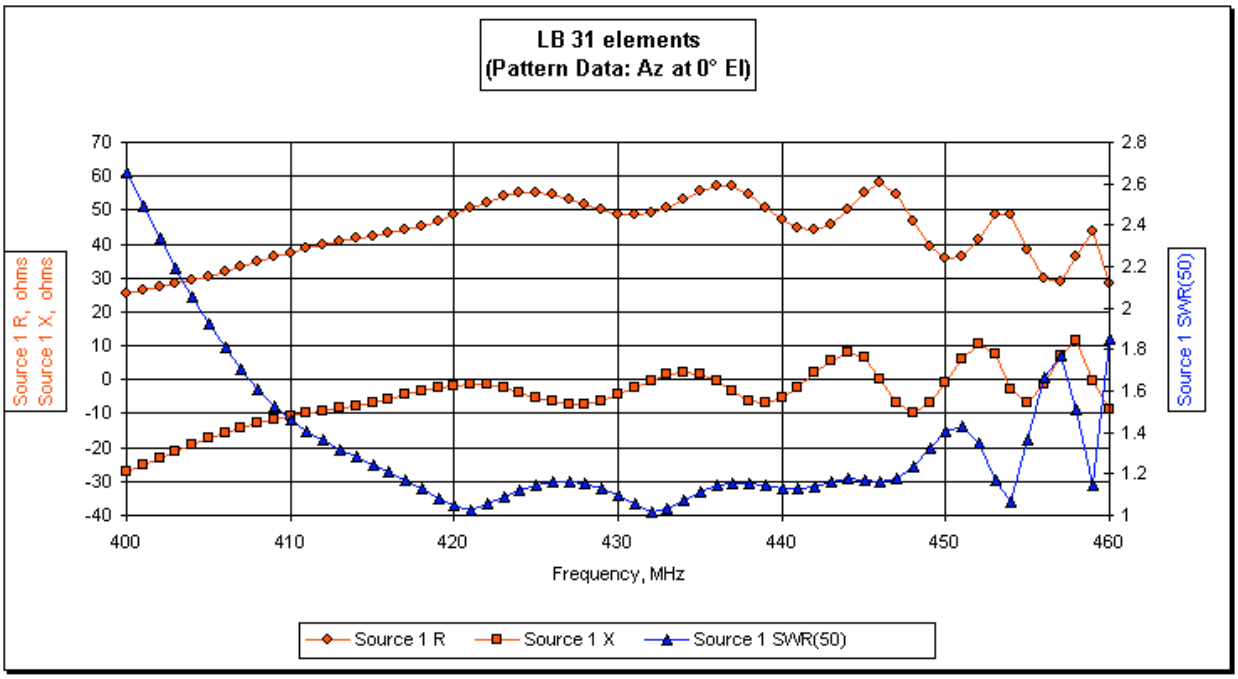

LB 29 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

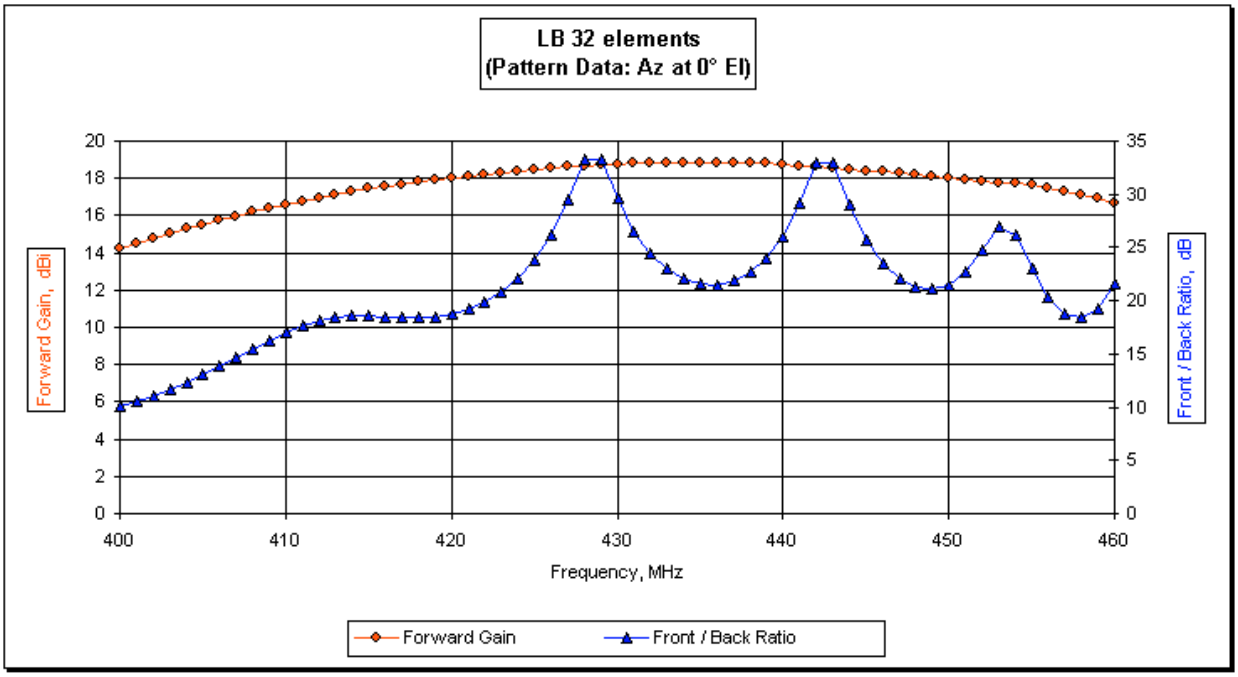

LB 29 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

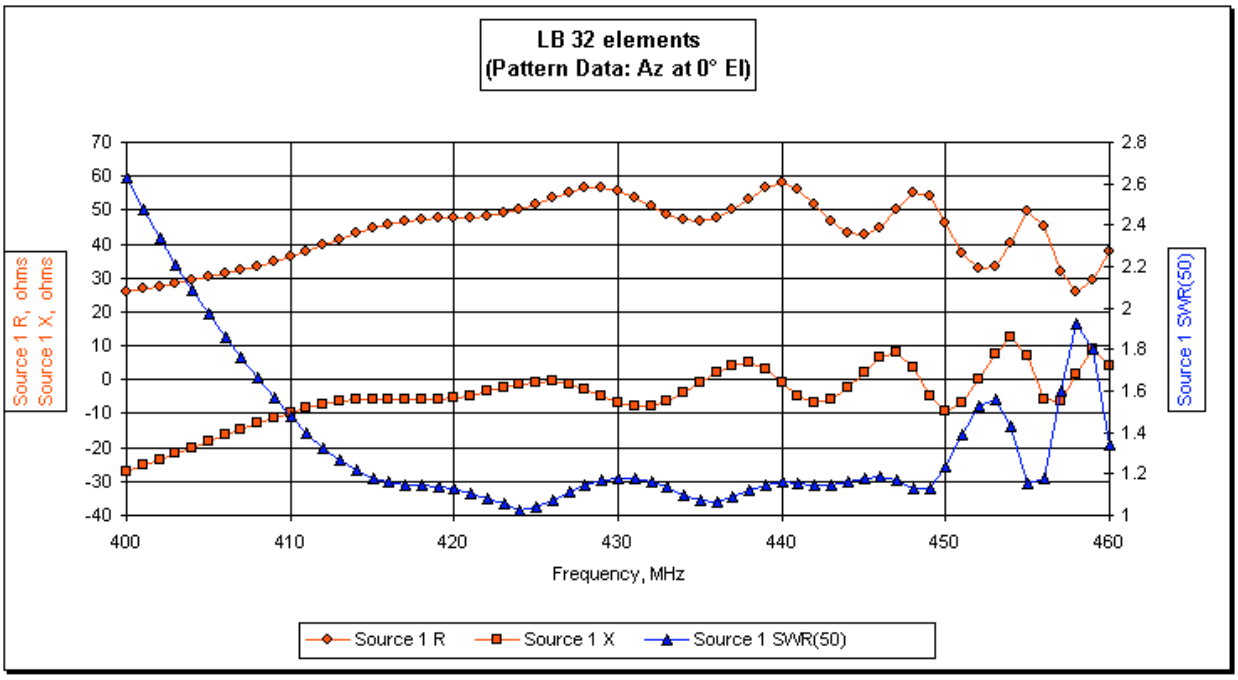

LB 30 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

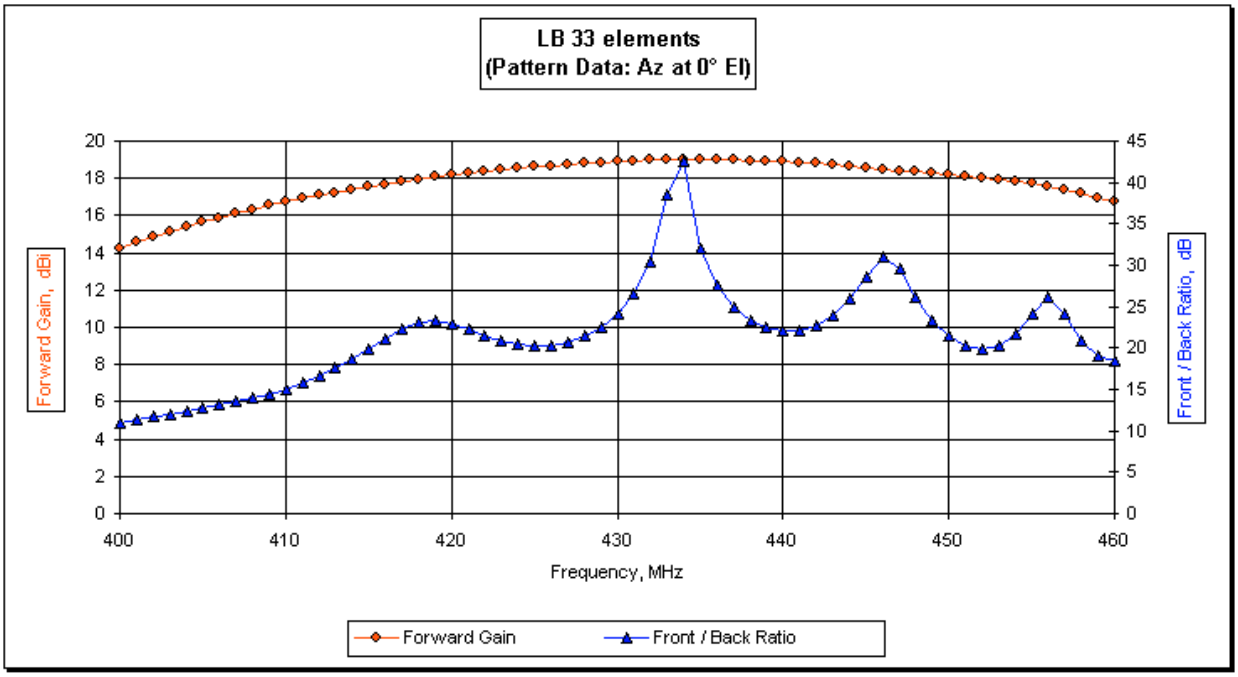

LB 30 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

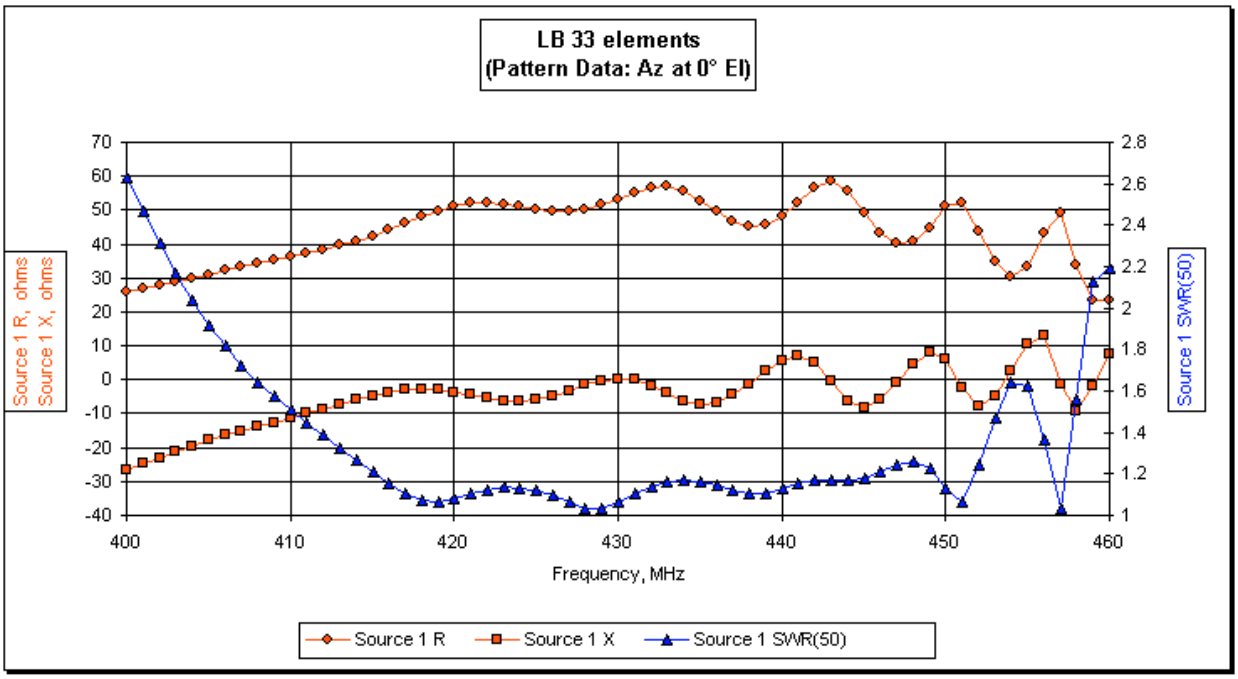

LB 31 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

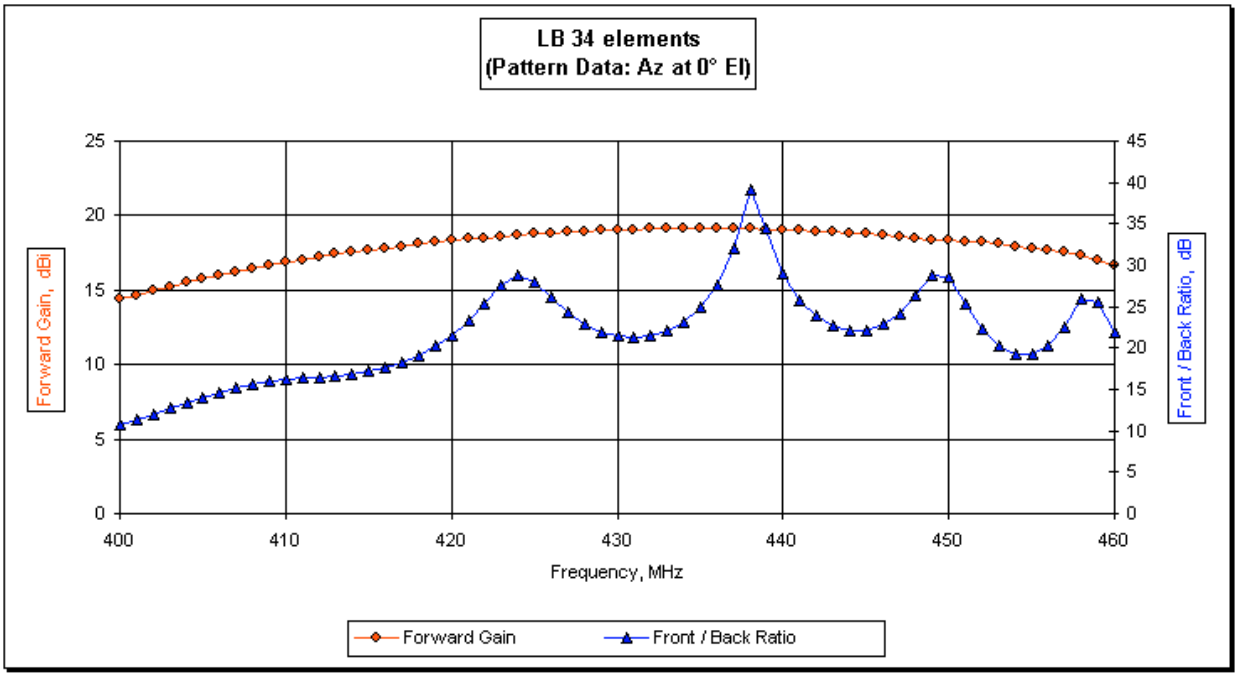

LB 31 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

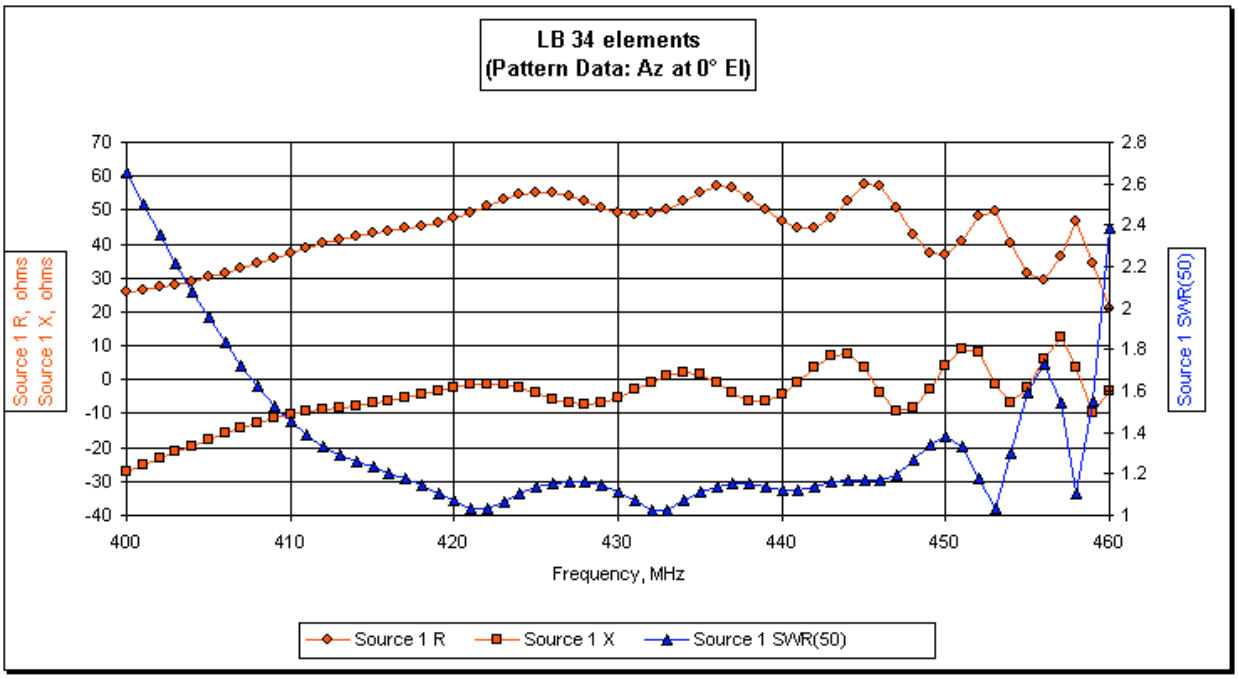

LB 32 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

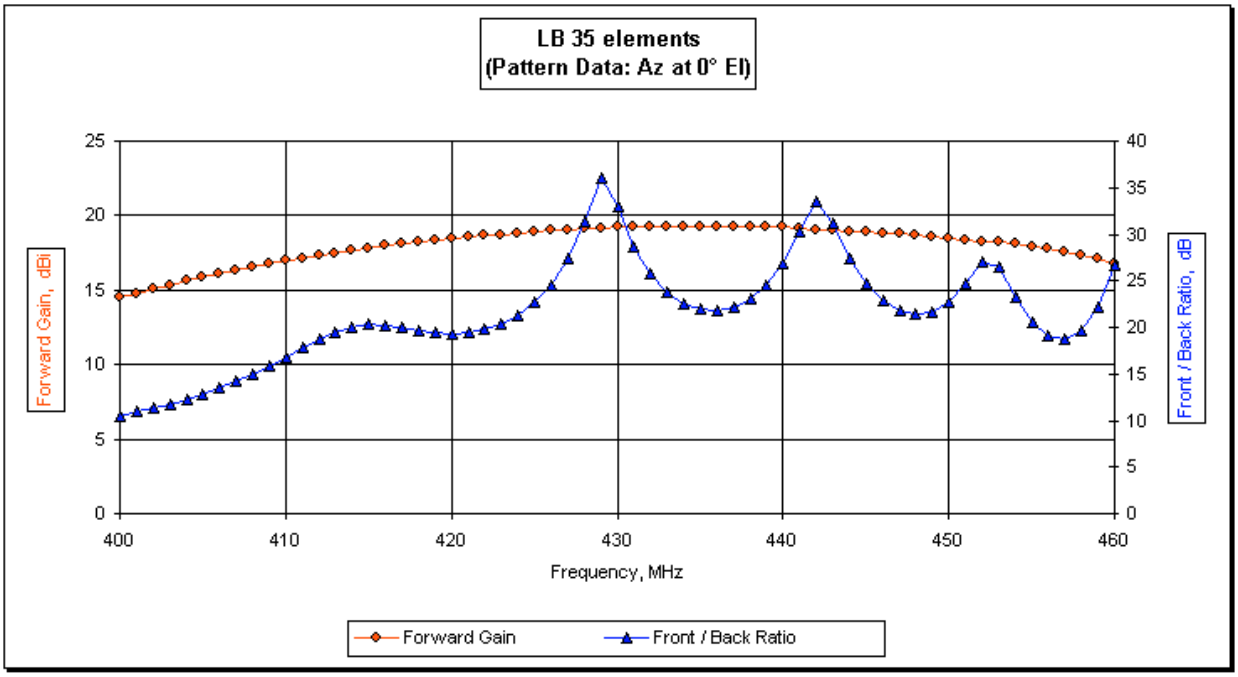

LB 32 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

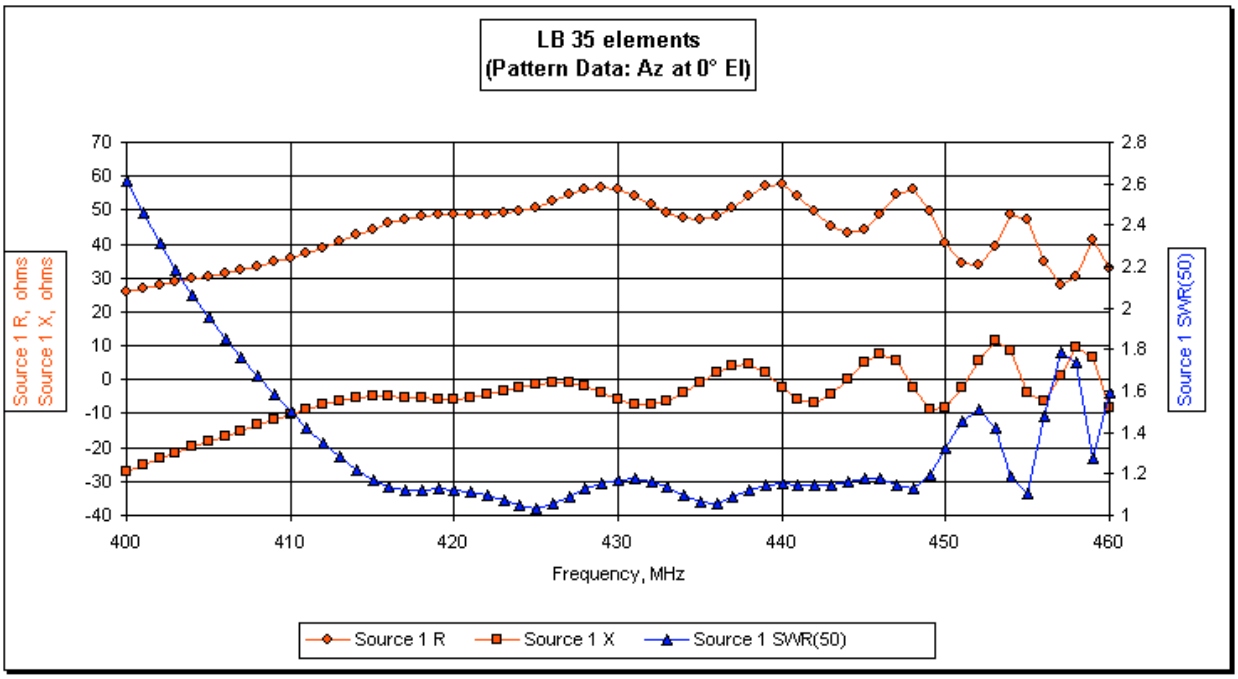

LB 33 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

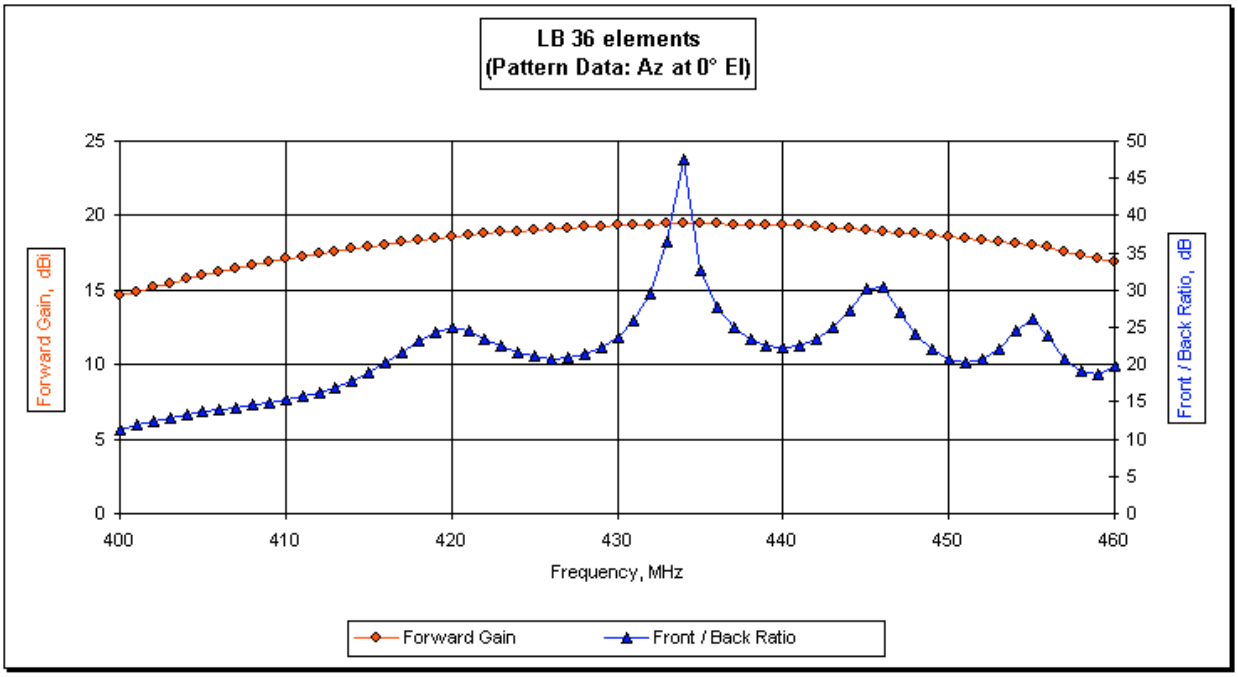

LB 33 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

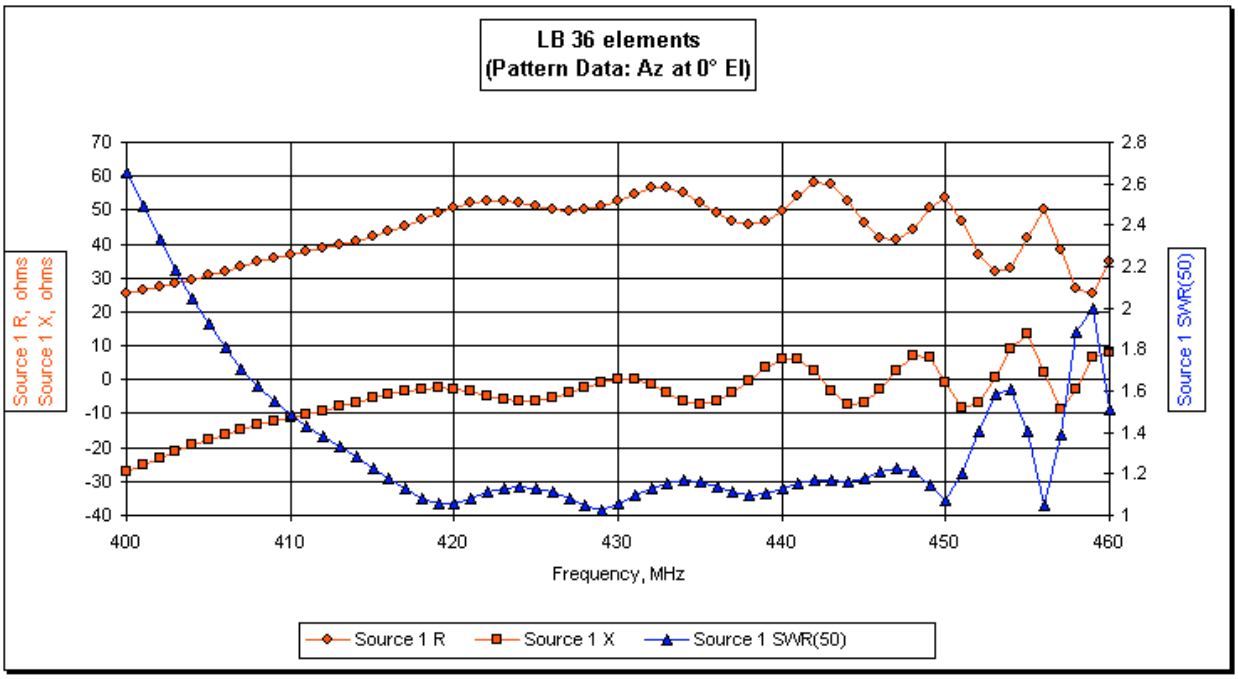

LB 34 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

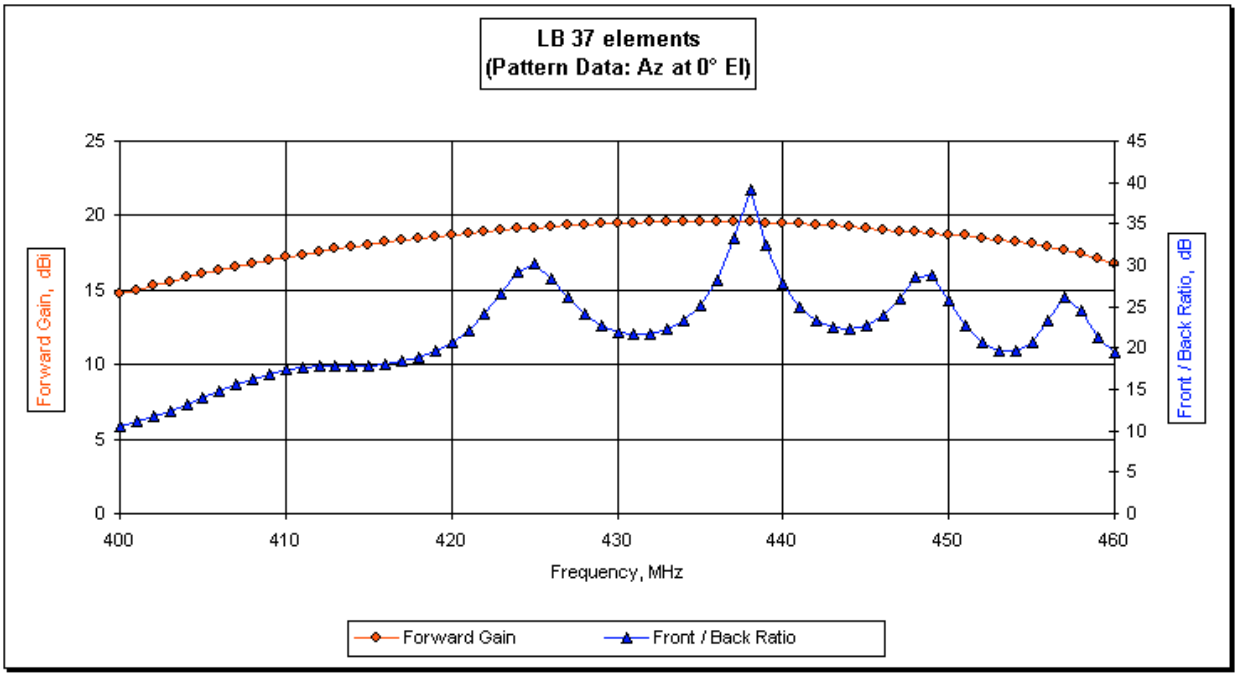

LB 34 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

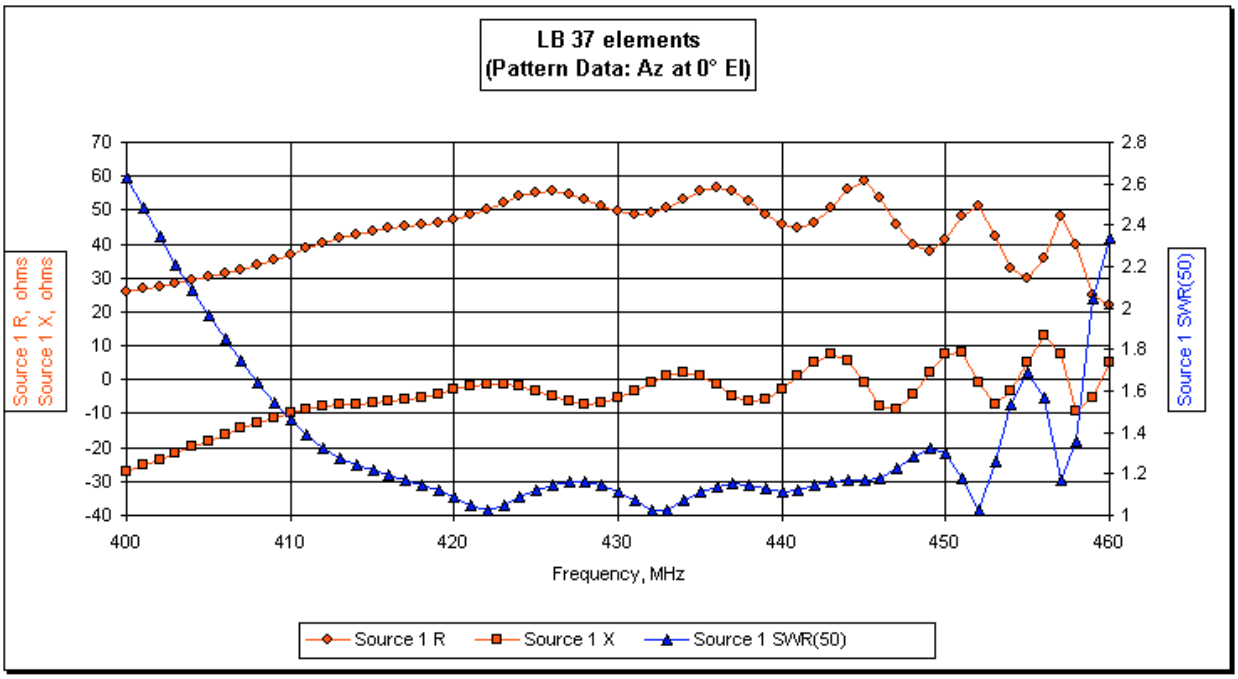

LB 35 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

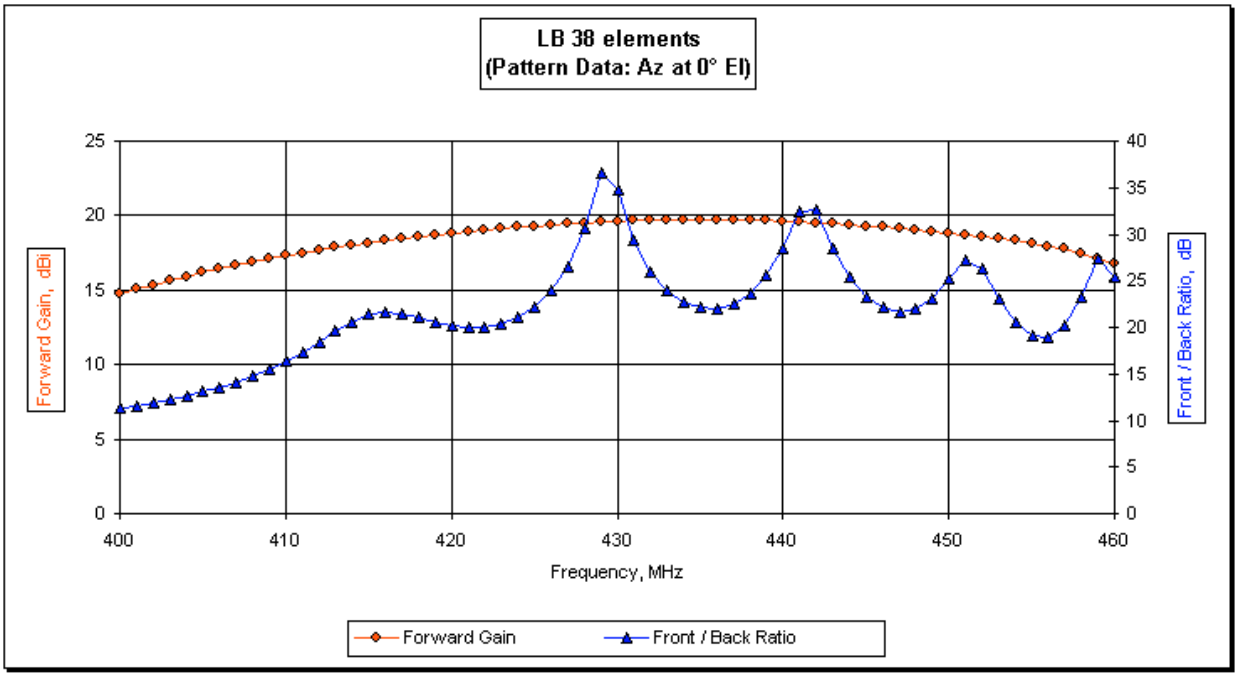

LB 35 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

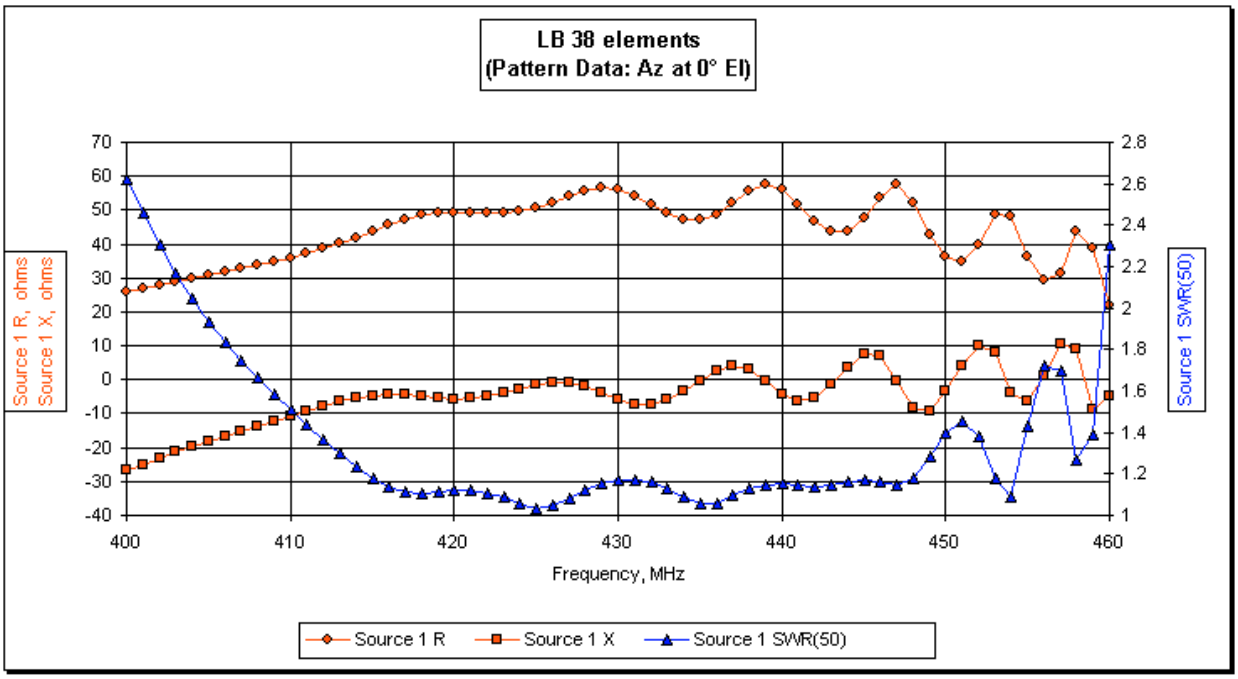

LB 36 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

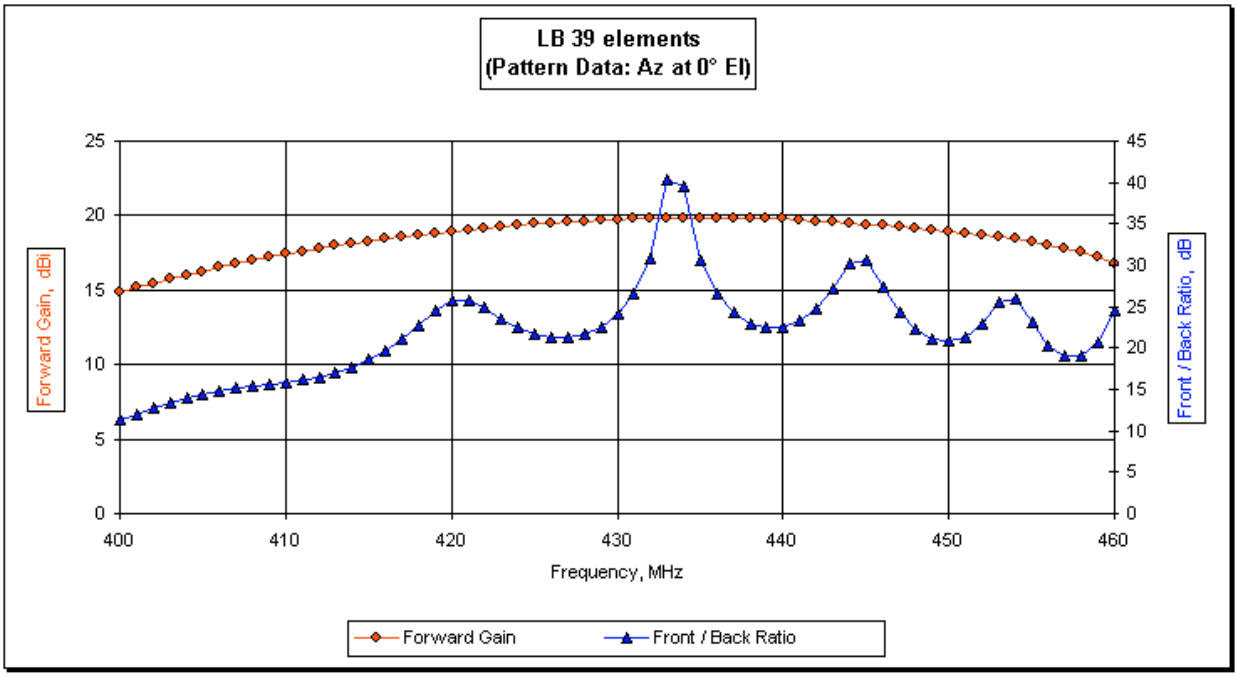

LB 36 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

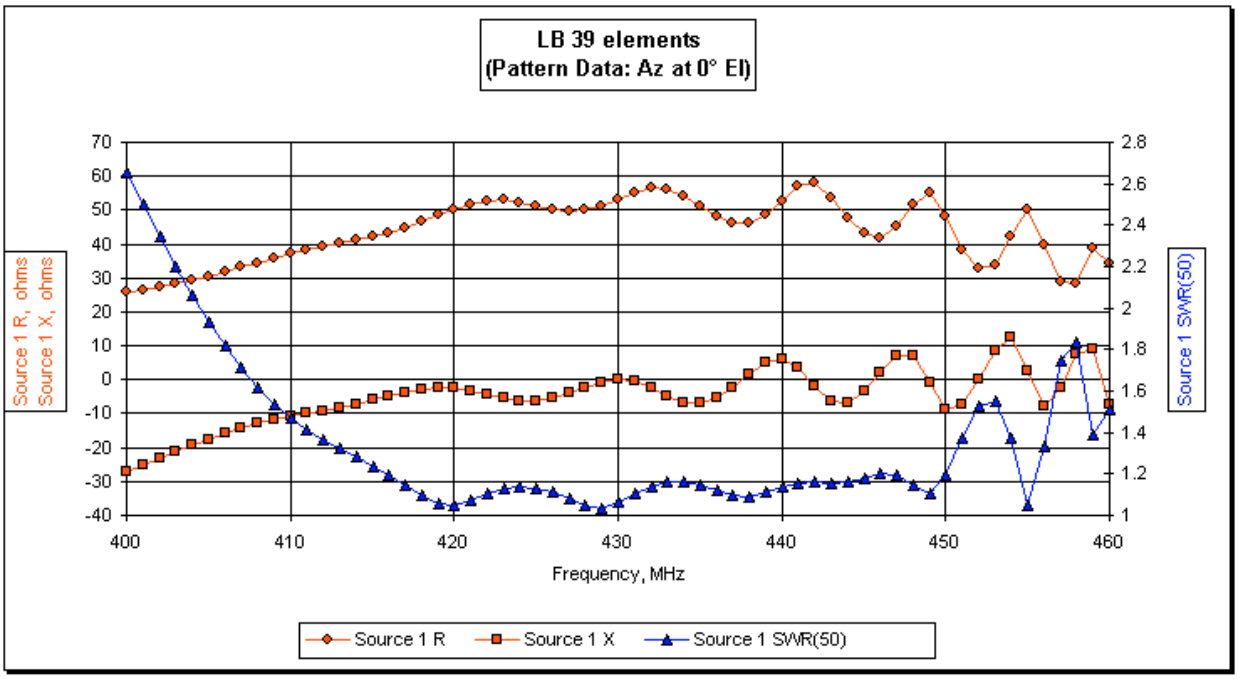

LB 37 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

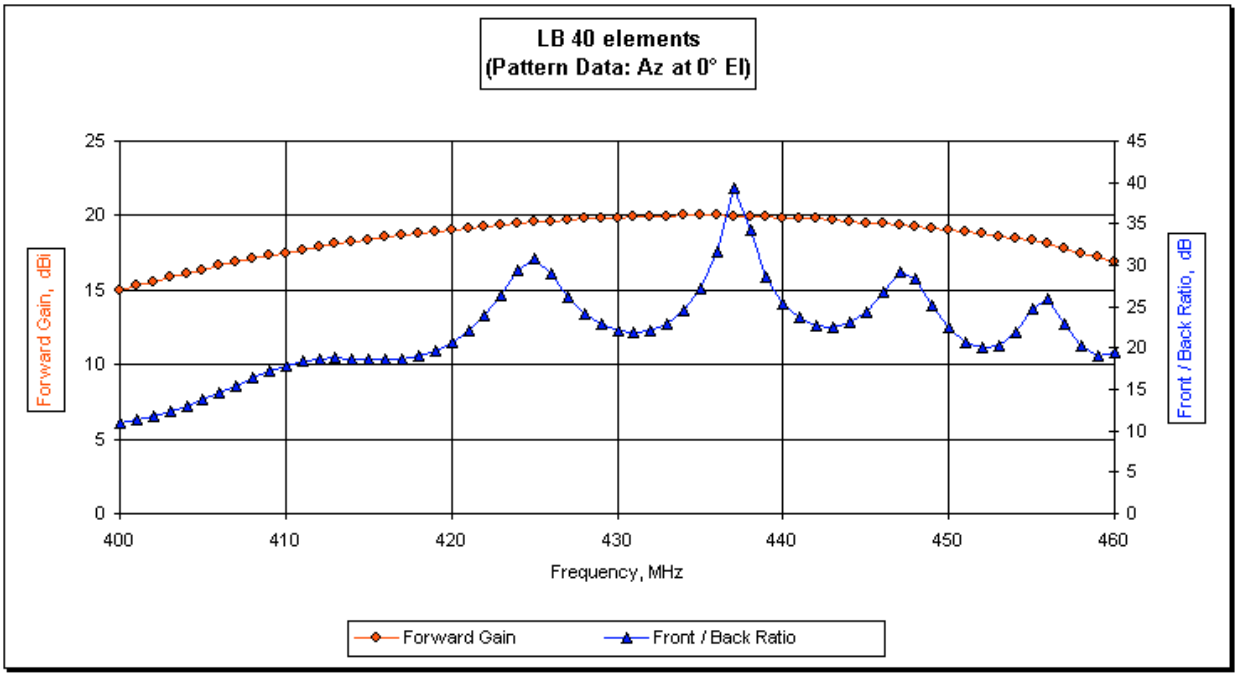

LB 37 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

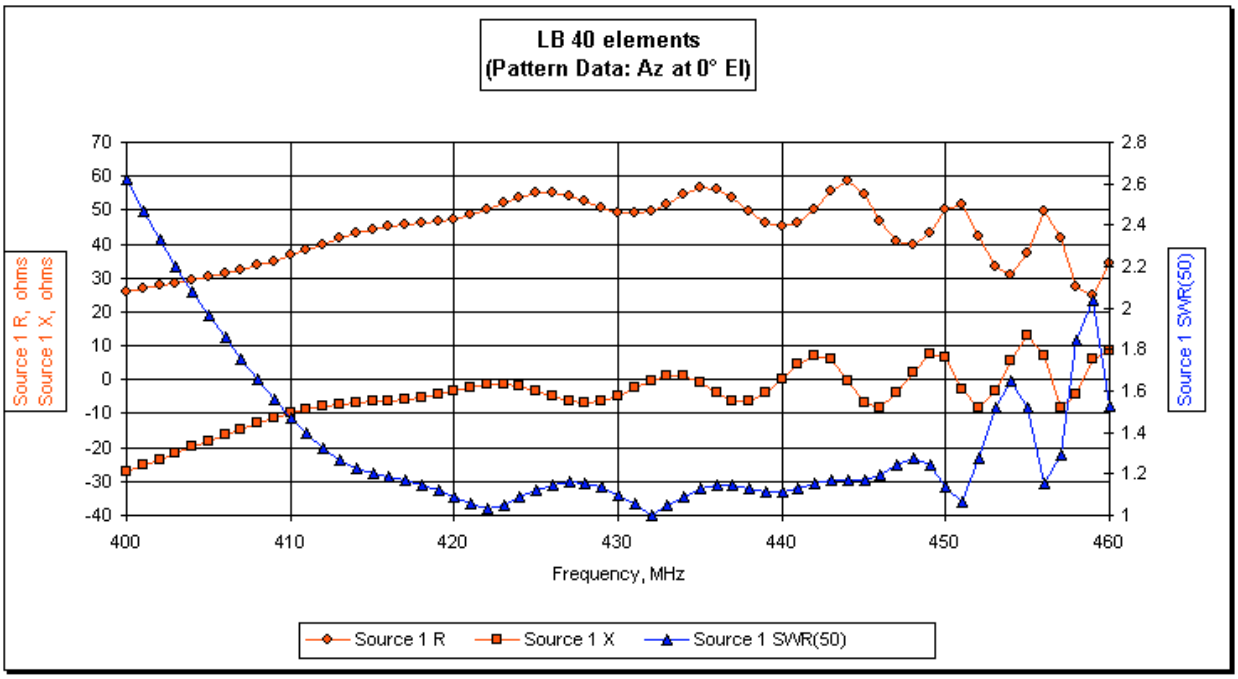

LB 38 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

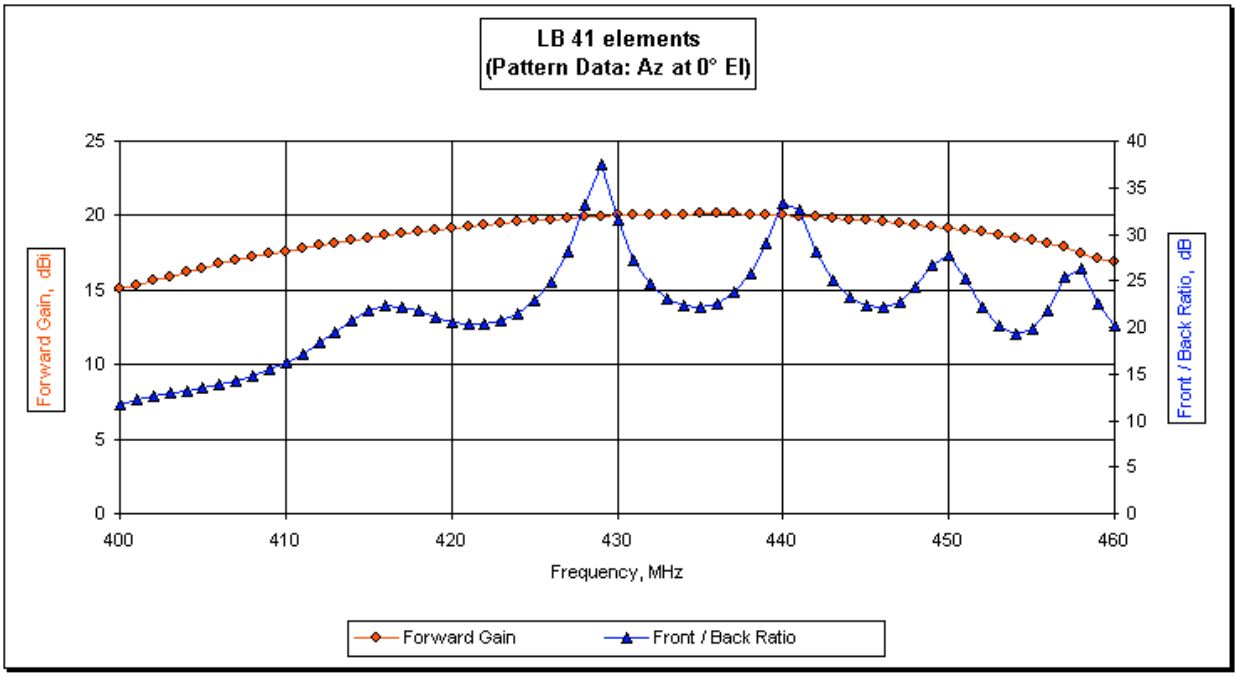

LB 38 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

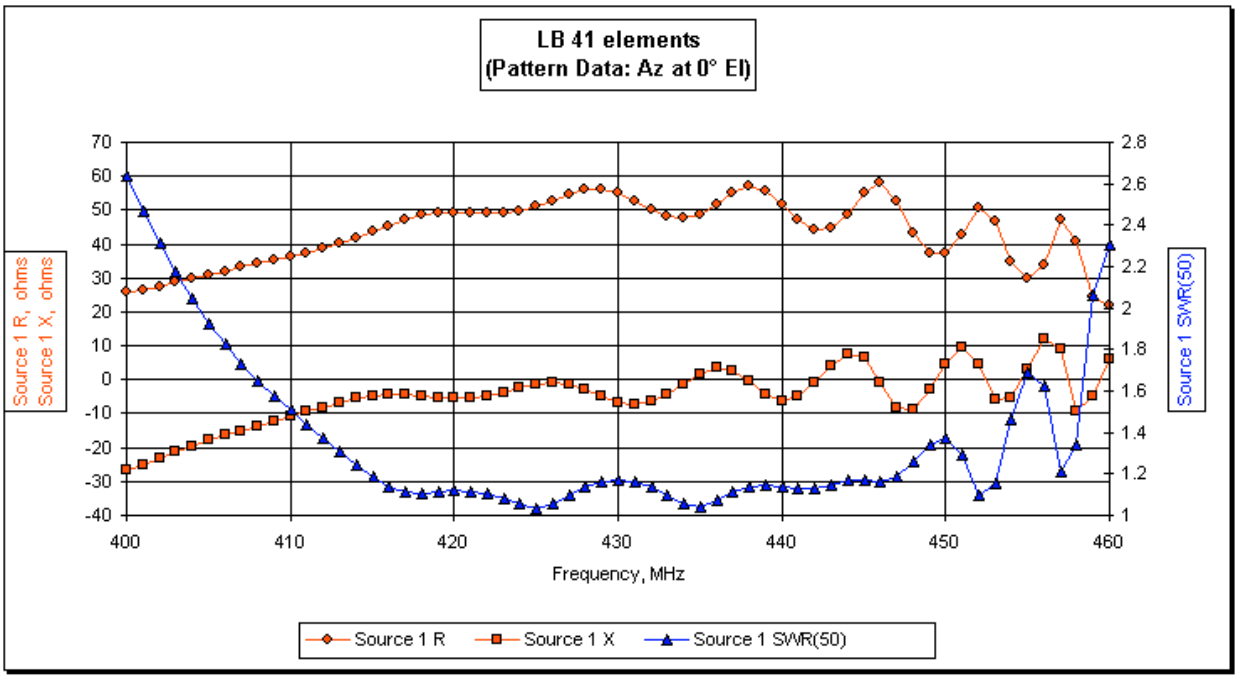

LB 39 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

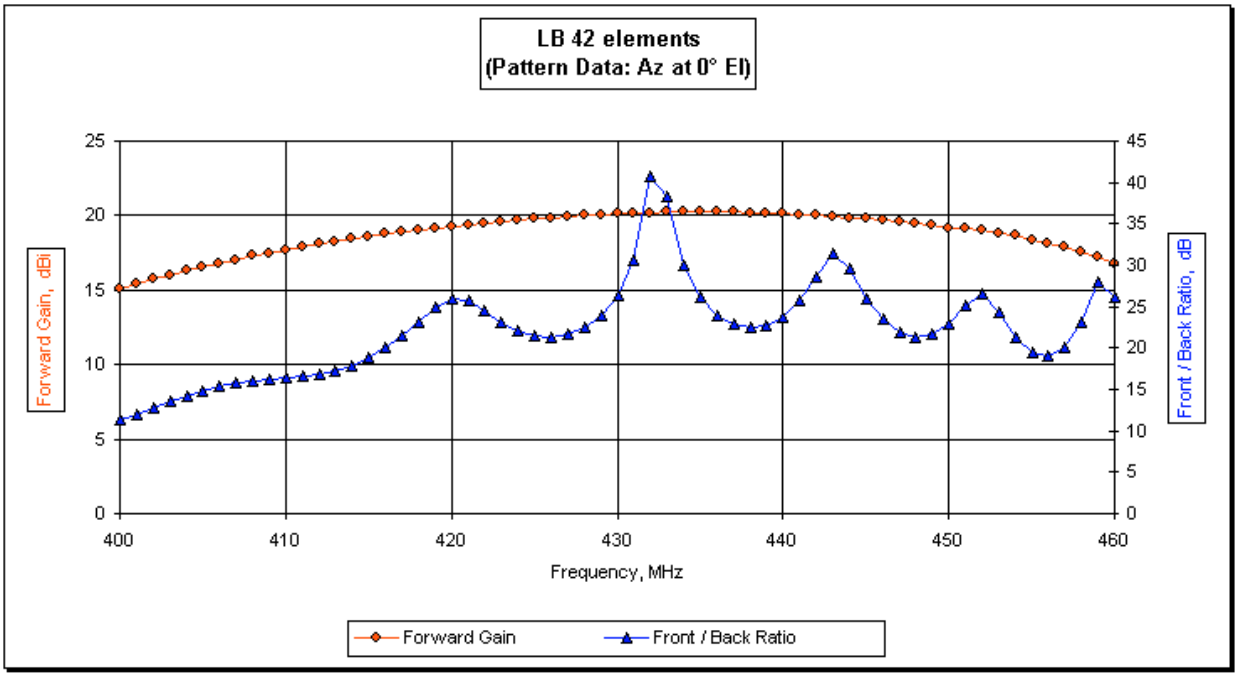

LB 39 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

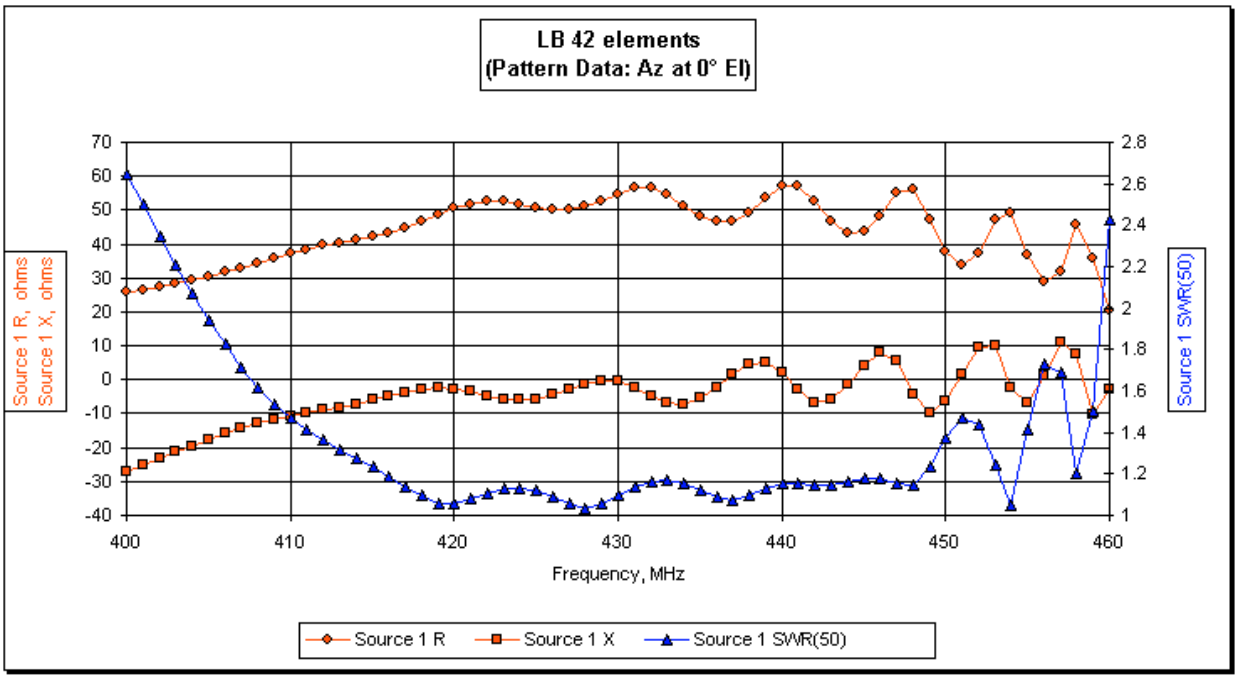

LB 40 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

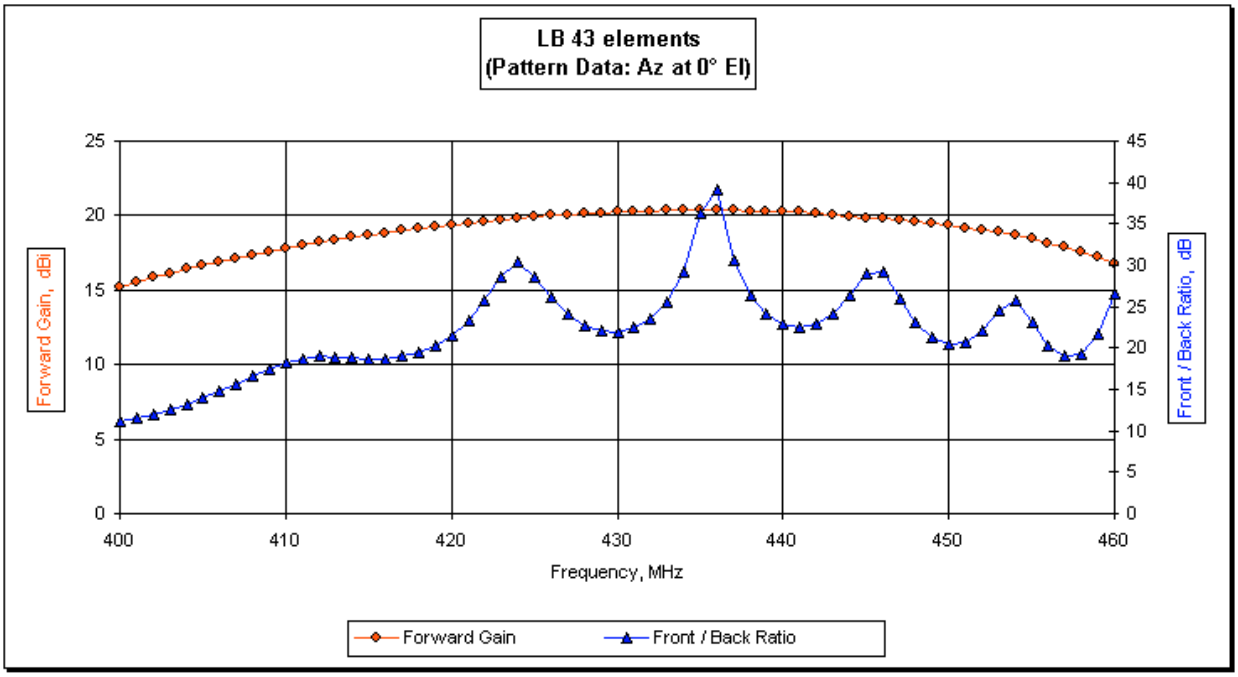

LB 40 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

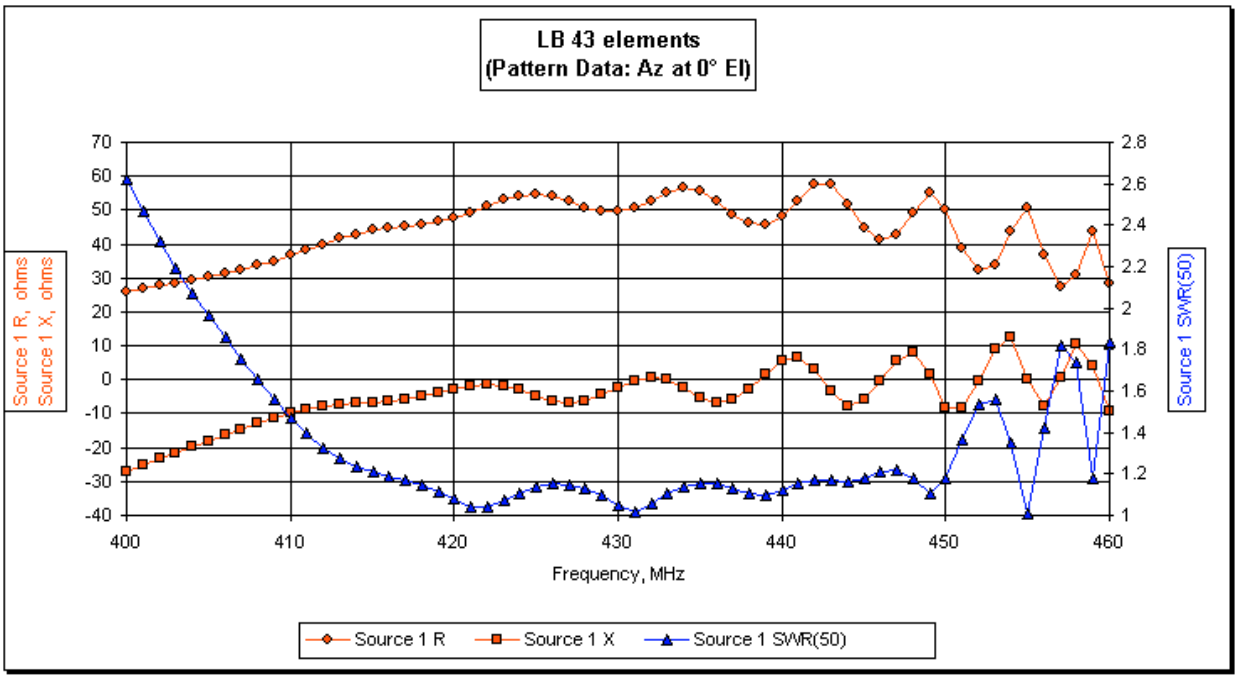

LB 41 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

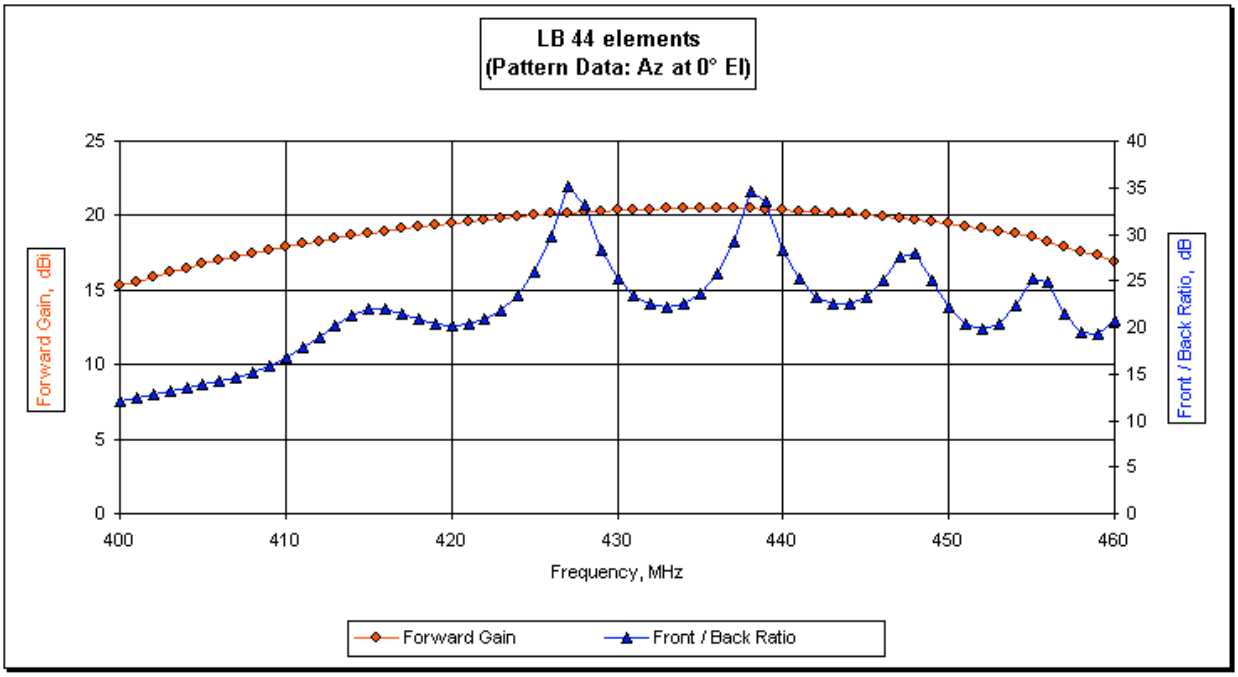

LB 41 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

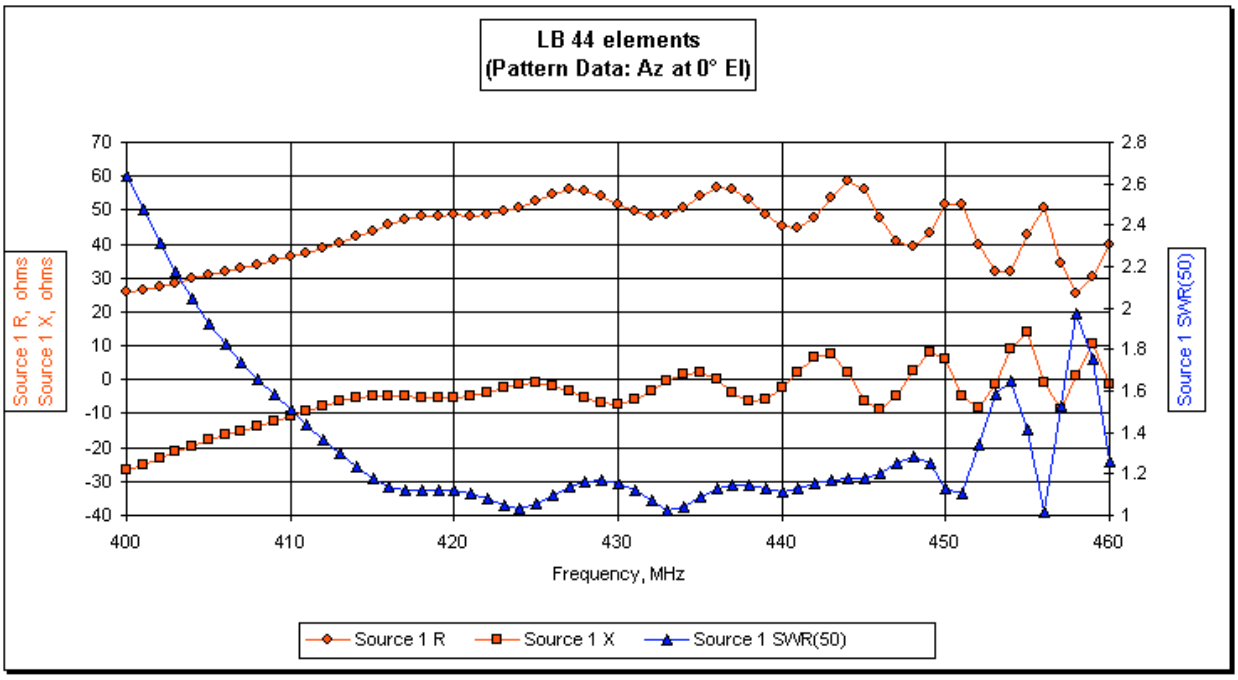

LB 42 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

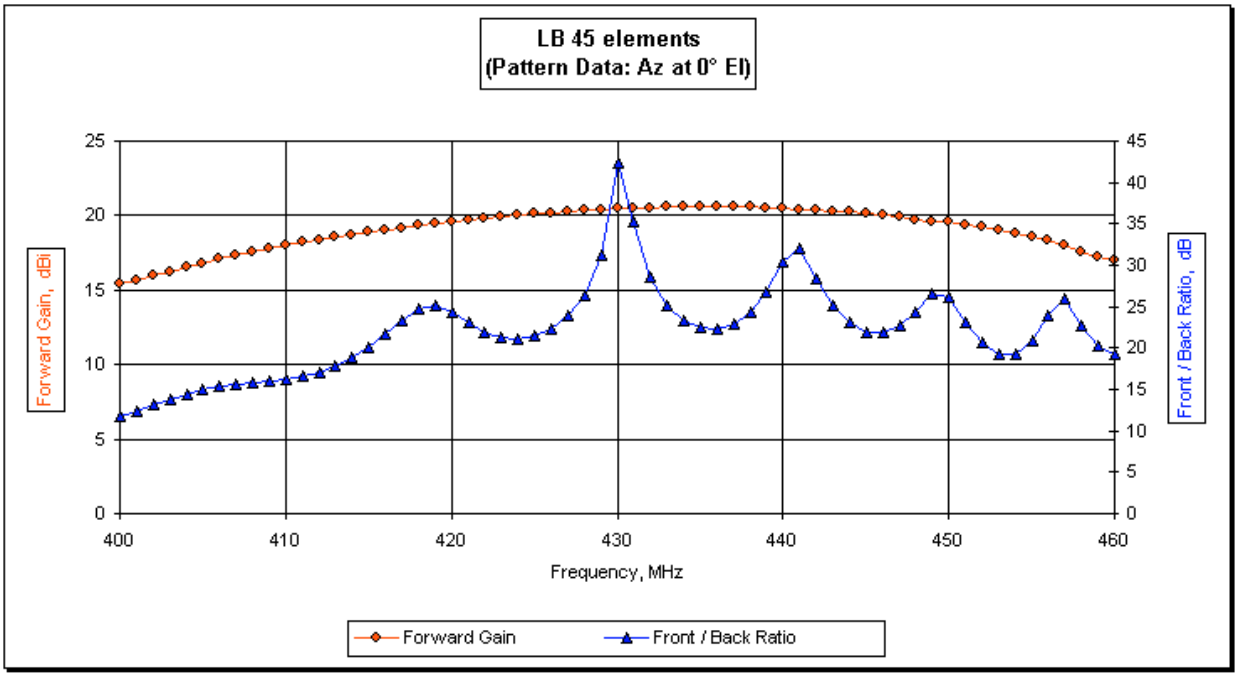

LB 42 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

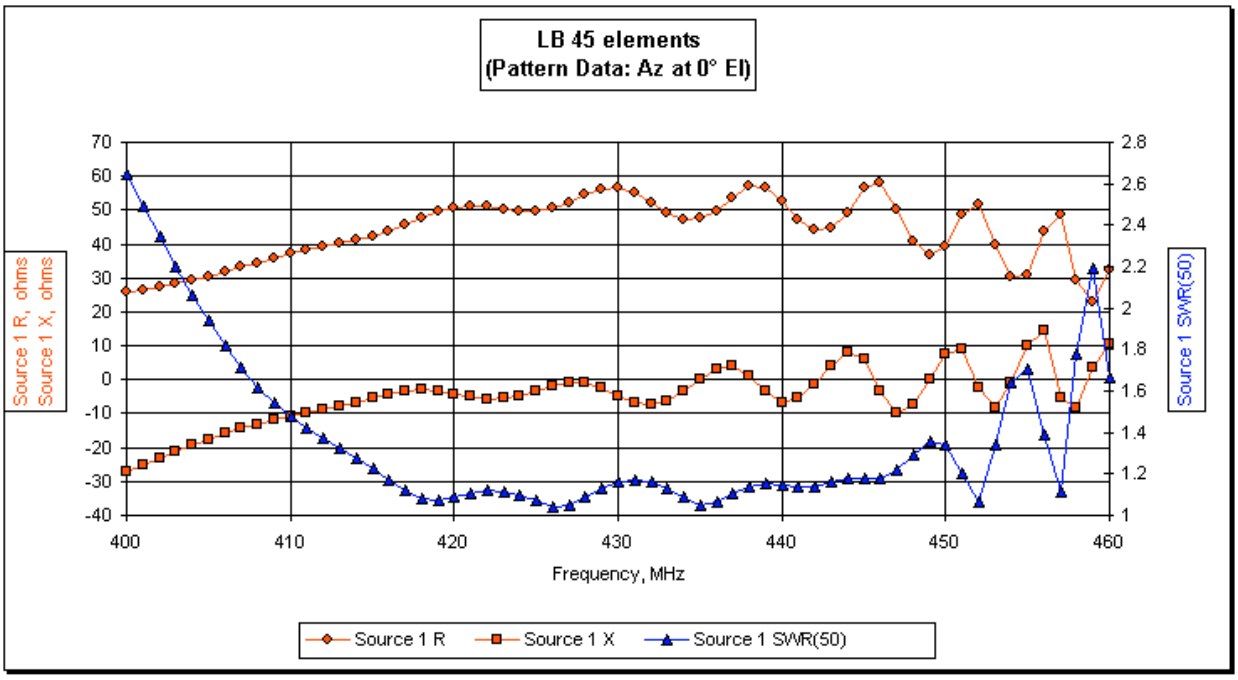

LB 43 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

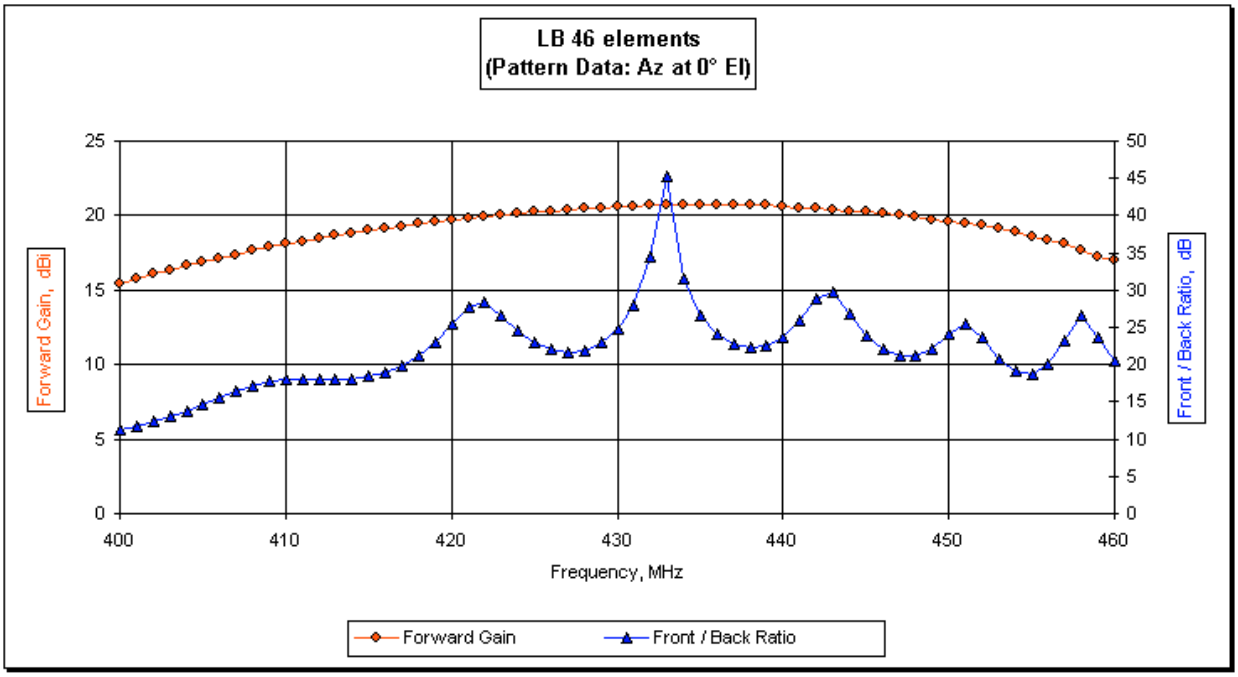

LB 43 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

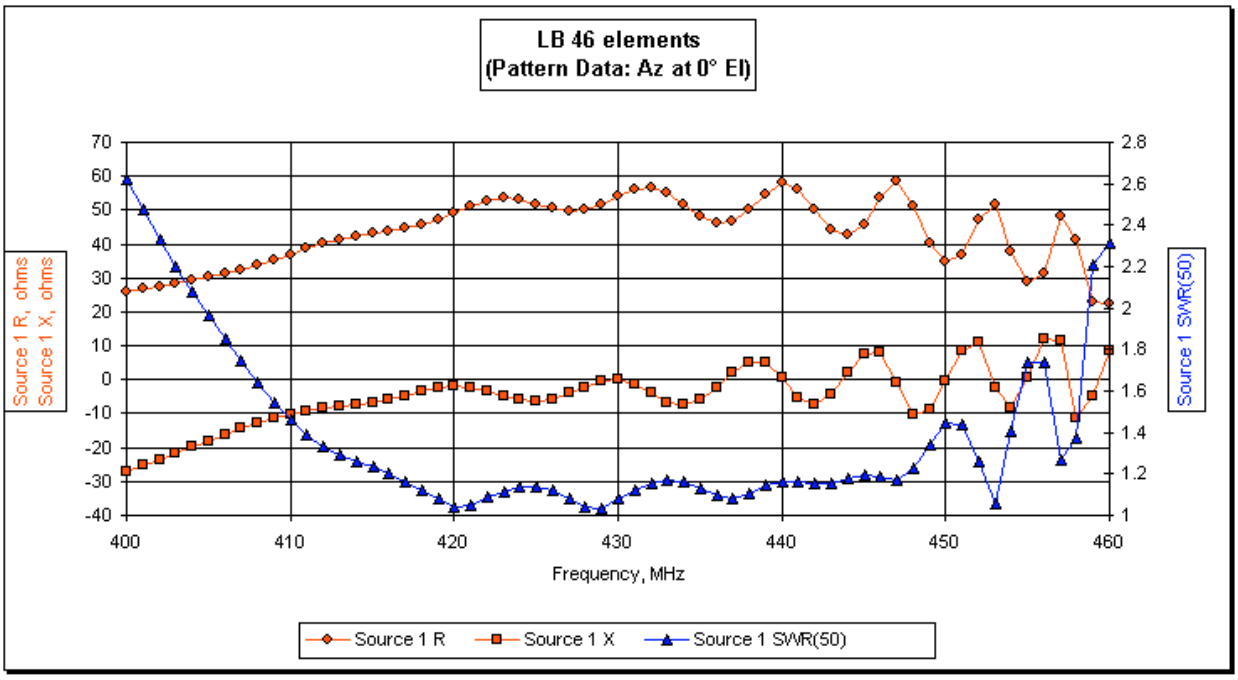

LB 44 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

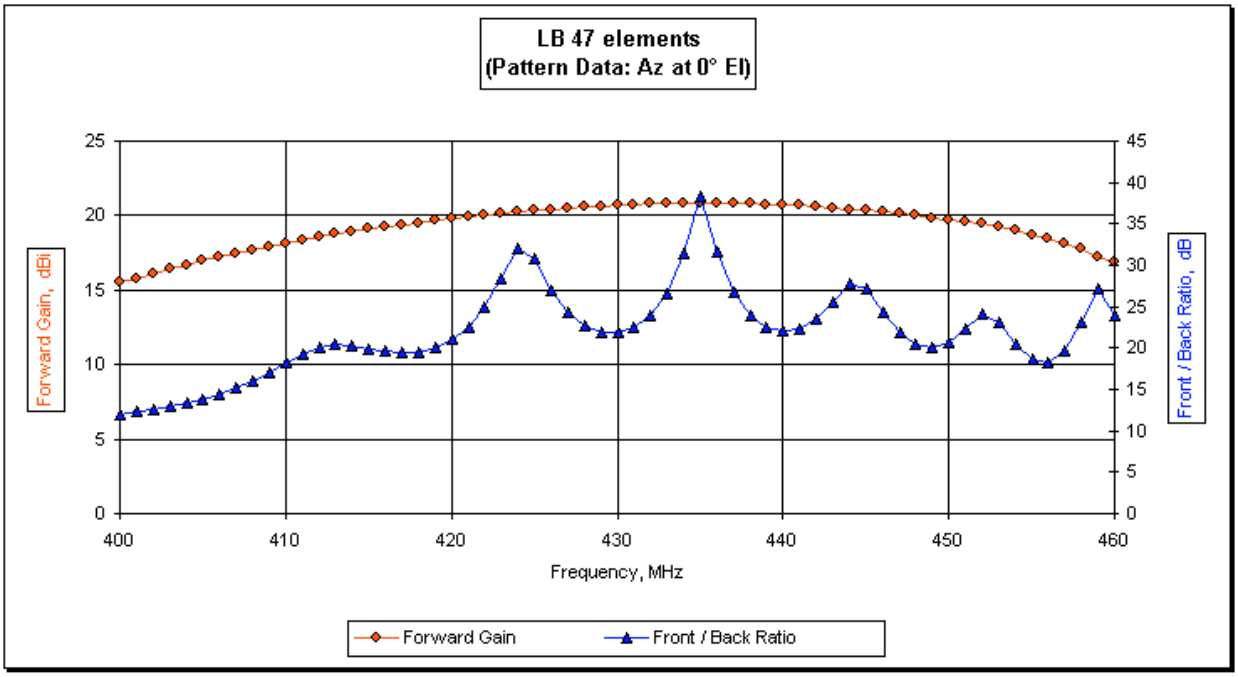

LB 44 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

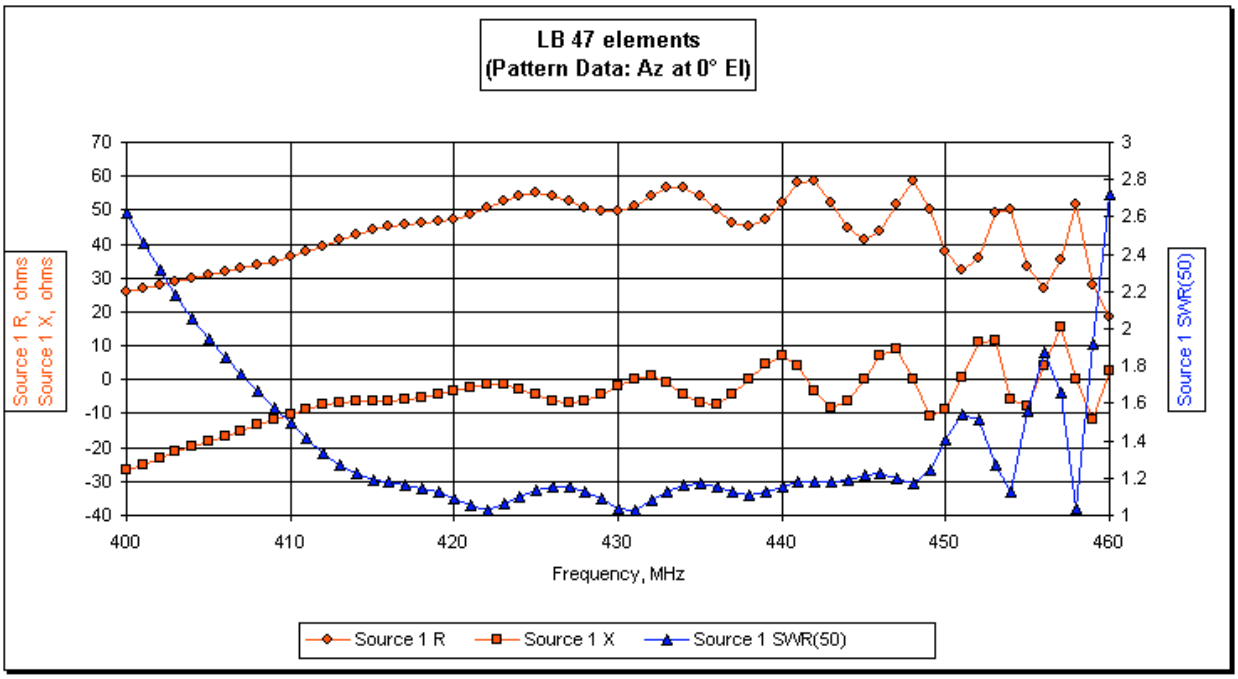

LB 45 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

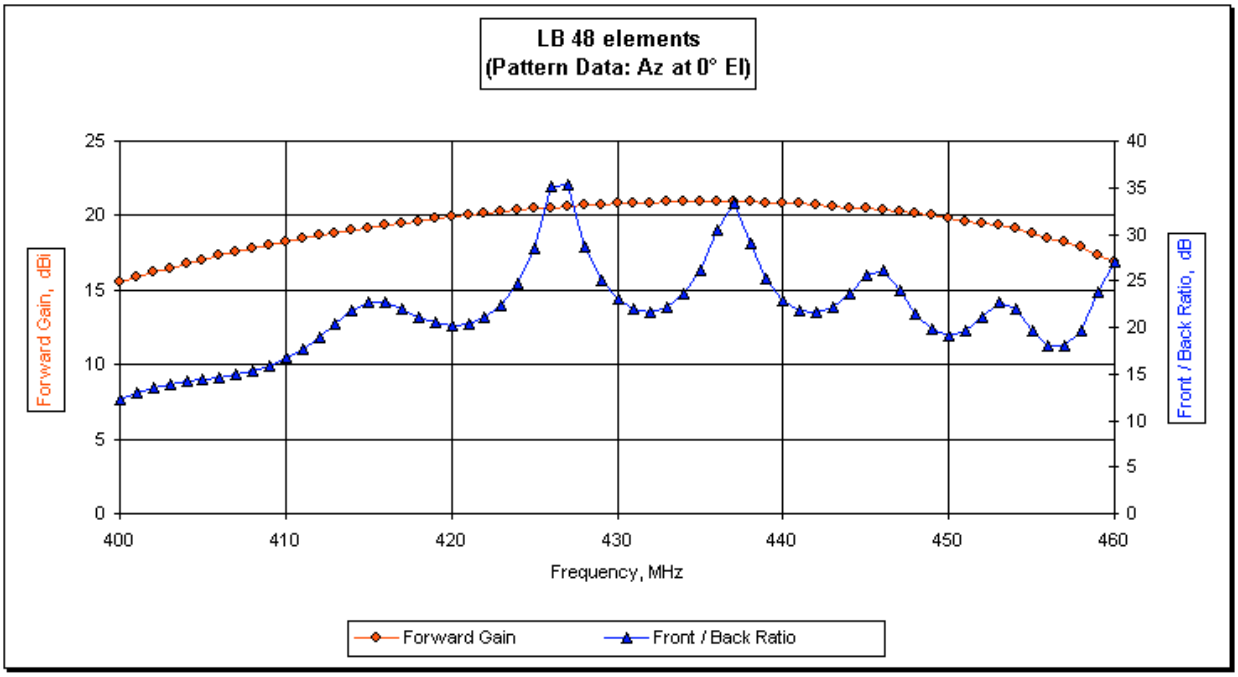

LB 45 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

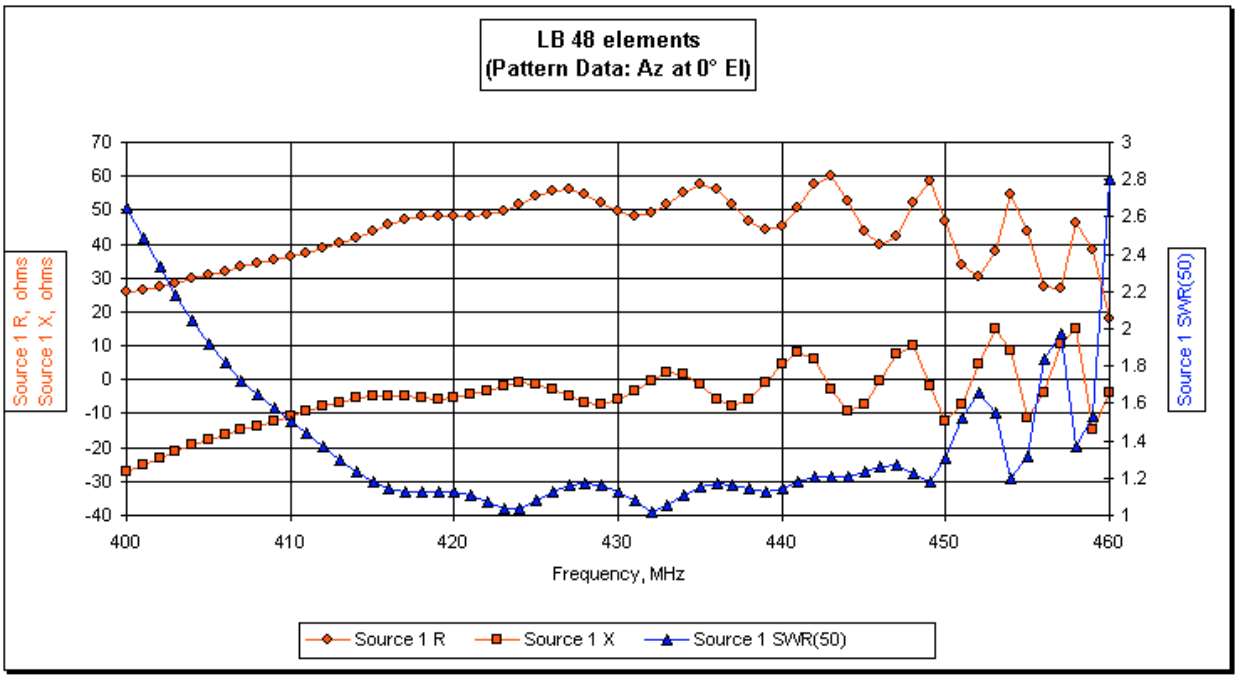

LB 46 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

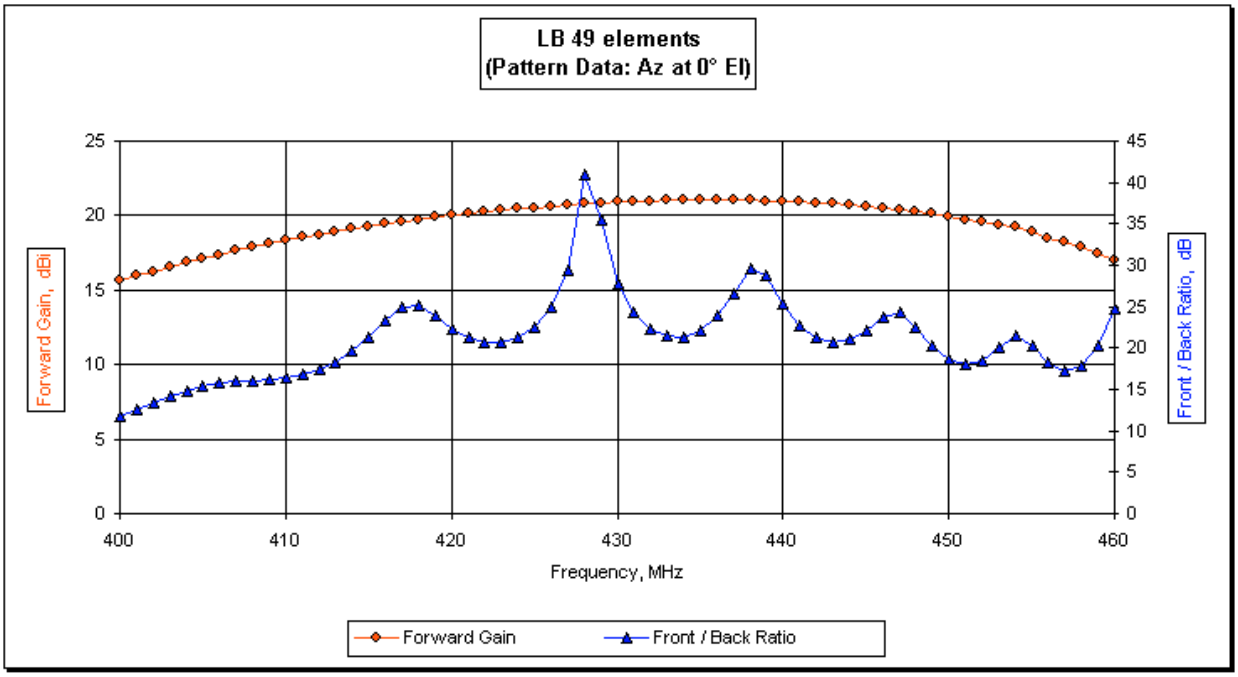

LB 46 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

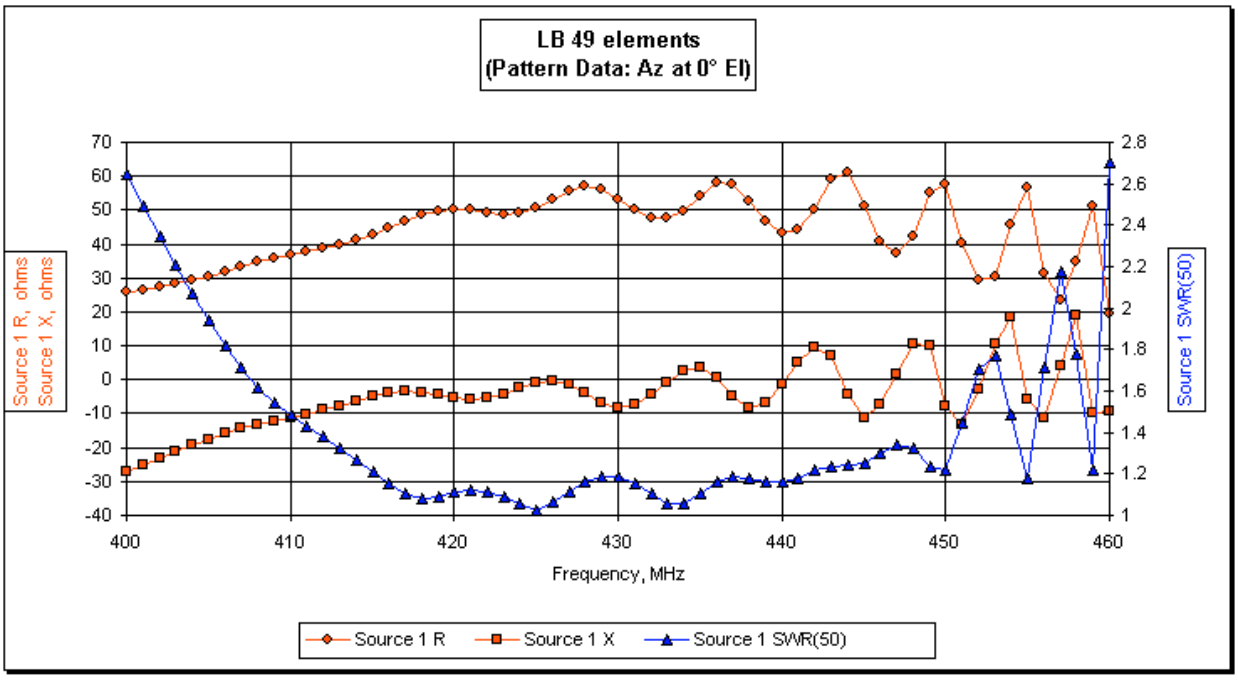

LB 47 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio

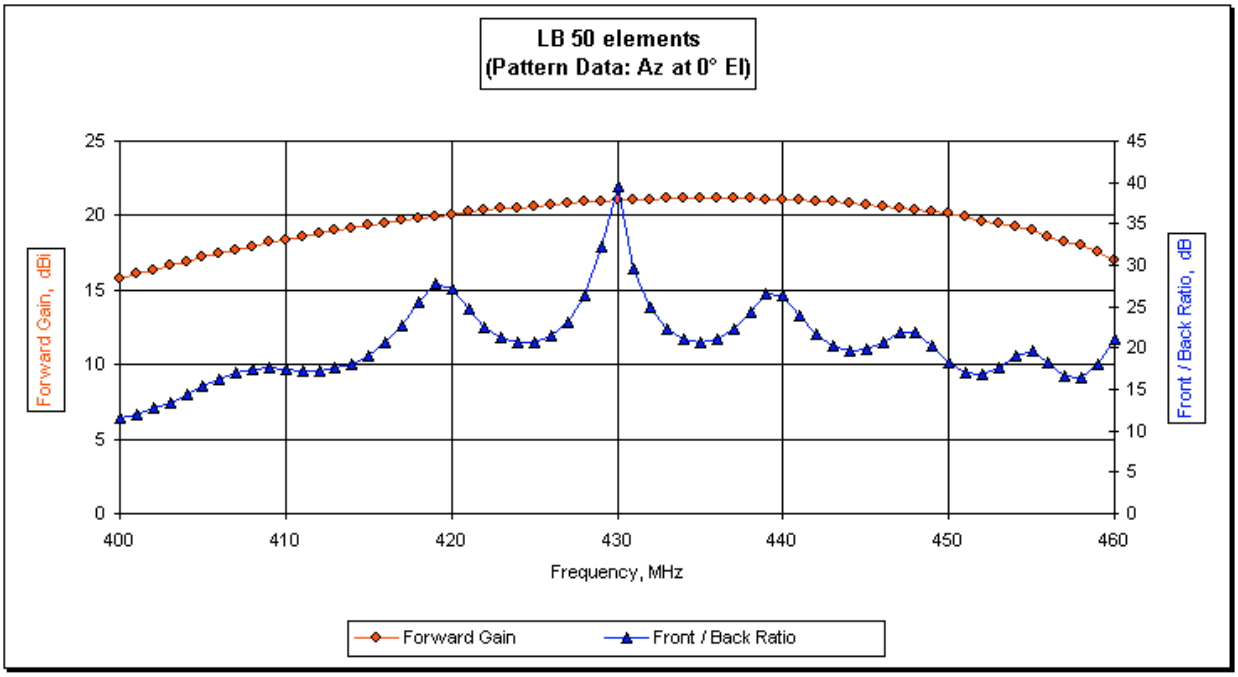

LB 47 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)

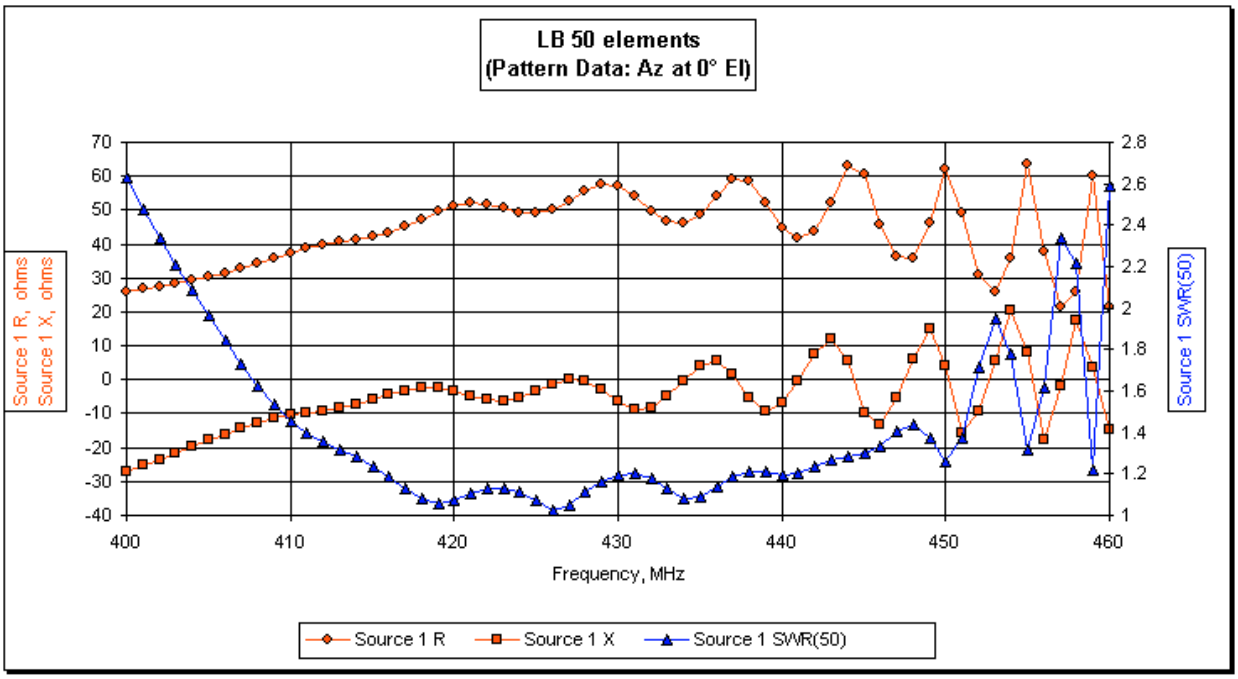

LB 48 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio


LB 48 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)


LB 49 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio


LB 49 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)


LB 50 elements
(Pattern Data: Az at 0° El)
Forward Gain, dBi
Front / Back Ratio, dB
Frequency, MHz
Forward Gain
Front / Back Ratio


LB 50 elements
(Pattern Data: Az at 0° El)
Source 1 R, ohms
Source 1 X, ohms
Source 1 SWR(50)
Frequency, MHz
Source 1 R
Source 1 X
Source 1 SWR(50)