The W5UN 2 Meter QUAGI 97

The W5UN Quagi 97 is a computer optimized quagi derived from the original W5UN Quagi of the early 1980s. The length of the 1997 model has been deliberately shortened to allow it fit on a 24 foot boom. Performance is substantially higher than that of the original antenna. It now compares favorably with yagis of the same length. The two programs used to optimize the updated antenna were AO6 and NEC 2.

This antenna has not been verified by actual construction. Gain and front to back will be as stated below. The only component of the antenna that needs verification is the 50 ohm match. *Who would like to be the FIRST to build the actual prototype model??* Full consultation will be available to the prototype builder during construction. Contact w5un@wt.net if you wish to be the first!

Antenna Characteristics: 23' 9"
11 Element Gain: 13.56 dBd at 144.100 Mhz
F/B : 23 dB

Stacking:

Optimum: E Plane: 13.73'
Optimum: H Plane: 12.86'

Stacking can be reduced up to 90 percent of optimum and still achieve acceptable stacking gain.

Optimum stacking is recommended, however.

W5UN QUAGI 97 Dimensions in FREE SPACE:

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Element      Boom Pos.      El. Length      Material
Reflector     0.0000"       84.37" loop.    #12 solid INSULATED copper wire *
Driven       16.2500"       82.43" loop.    #12 solid INSULATED copper wire *
Dir 1        37.1875"       36.168"         3/16" aluminum rod
Dir 2        70.1875"       36.052"         3/16" aluminum rod
Dir 3       102.5000"       35.817"         3/16" aluminum rod
Dir 4       135.8125"       35.475"         3/16" aluminum rod
Dir 5       169.0625"       35.179"         3/16" aluminum rod
Dir 6       202.8125"       35.090"         3/16" aluminum rod
Dir 7       234.2500"       35.324"         3/16" aluminum rod
Dir 8       264.8750"       35.617"         3/16" aluminum rod
Dir 9       285.0000"       35.108"         3/16" aluminum rod
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* #12 TW insulated solid copper wire is common house wire, found at most hardware and building supply stores. Do not strip the insulation.

The above dimensions may be used for non metallic booms like wood or fiberglass.

If you wish to use a metal boom with through the boom insulated elements, please apply the following correction to the directors only.

The reflector and driven quad elements must remain insulated from the boom.

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Boom Diameter            Correction            Add
0.750" or 19.050MM        10.56%        .0792" or  2.02MM
0.875" or 22.225MM        12.14%        .1062" or  2.70MM
1.000" or 25.400MM        13.66%        .1366" or  3.47MM
1.125  or 28.575MM        15.13%        .1702" or  4.32MM
1.250" or 31.750MM        16.54%        .2068" or  5.25MM
1.375" or 34.925MM        17.90%        .2462" or  6.25MM
1.500" or 38.100MM        19.21%        .2882" or  7.32MM
1.750" or 44.450MM        21.67%        .3792" or  9.63MM
2.000" or 50.800MM        23.91%        .4783" or 12.15MM
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Further information concerning use of metallic booms with insulated 'thru-the boom' mounted elements follows:

PROVEN ACCURATE FOR BOOM DIAMETERS SMALLER THAN .055 WAVELENGTHS. MEASUREMENTS BY DL6WU.FORMULA BY G3SEK.

FORMULA: $C = 12.5975B - 114.5B^2$
C = CORRECTION FACTOR AS A FRACTION OF THE BOOM DIA.
B = BOOM DIA IN WAVELENGTHS
B^2 MEANS B SQUARED

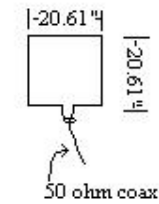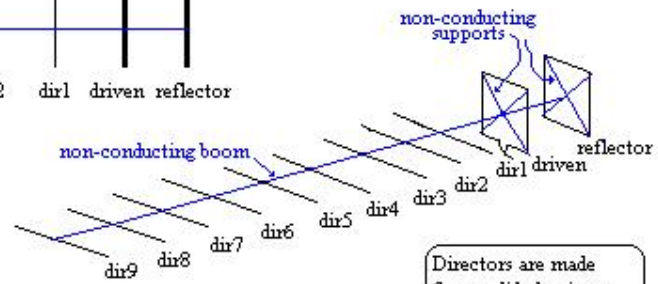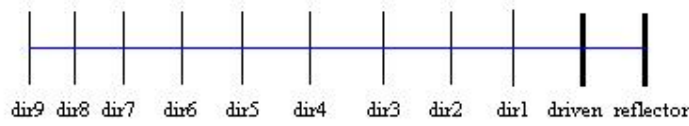2 METERS BOOM DIAMETER CORRECTION ADD 2 METERS.

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0.875" OR 22.225MM     12.14% .1062" OR 2.70MM
1.000" OR 25.400MM     13.66% .1366" OR 3.47MM
1.125 OR 28.575MM      15.13% .1702" OR 4.32MM
1.250" OR 31.750MM     16.54% .2068" OR 5.25MM
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1.500" OR 38.100MM     19.21% .2882" OR 7.32MM
1.750" OR 44.450MM     21.67% .3792 OR 9.63MM
2.000" OR 50.800MM     23.91% .4783" OR 12.15MM
20.000MM               11.04% 2.21MM 28.000MM
14.87% 4.16MM 30.000MM
15.78% 4.73MM 32.000MM
16.66% 5.33MM  38.000MM
19.17% 7.29MM

Insulators can be commercial shoulder insulators and keepers or as simple asheat
shrink tubing with the element held in place by hot melt glue or epoxy glue.
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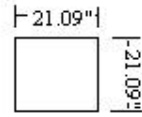
W5UN Quagi97 Antenna

dir9 dir8 dir7 dir6 dir5 dir4 dir3 dir2 dir1 driven reflector

non-conducting supports

non-conducting boom

dir9 dir8 dir7 dir6 dir5 dir4 dir3 dir2 dir1 driven reflector

|-20.61"-|
|-20.61"-|

50 ohm coax

DE - driven el

|- 21.09" -|
|-21.09"-|

REF - reflector

driven and reflector loops are formed from #12 AWG, TW insulated solid copper wire. The total wire lengths are:
driven: 82.43 inches
reflector: 84.37 inches

Directors are made from solid aluminum rods, 3/16" diameter. Refer to the Quagi97 measurement table for length of each element, and spacing between elements.