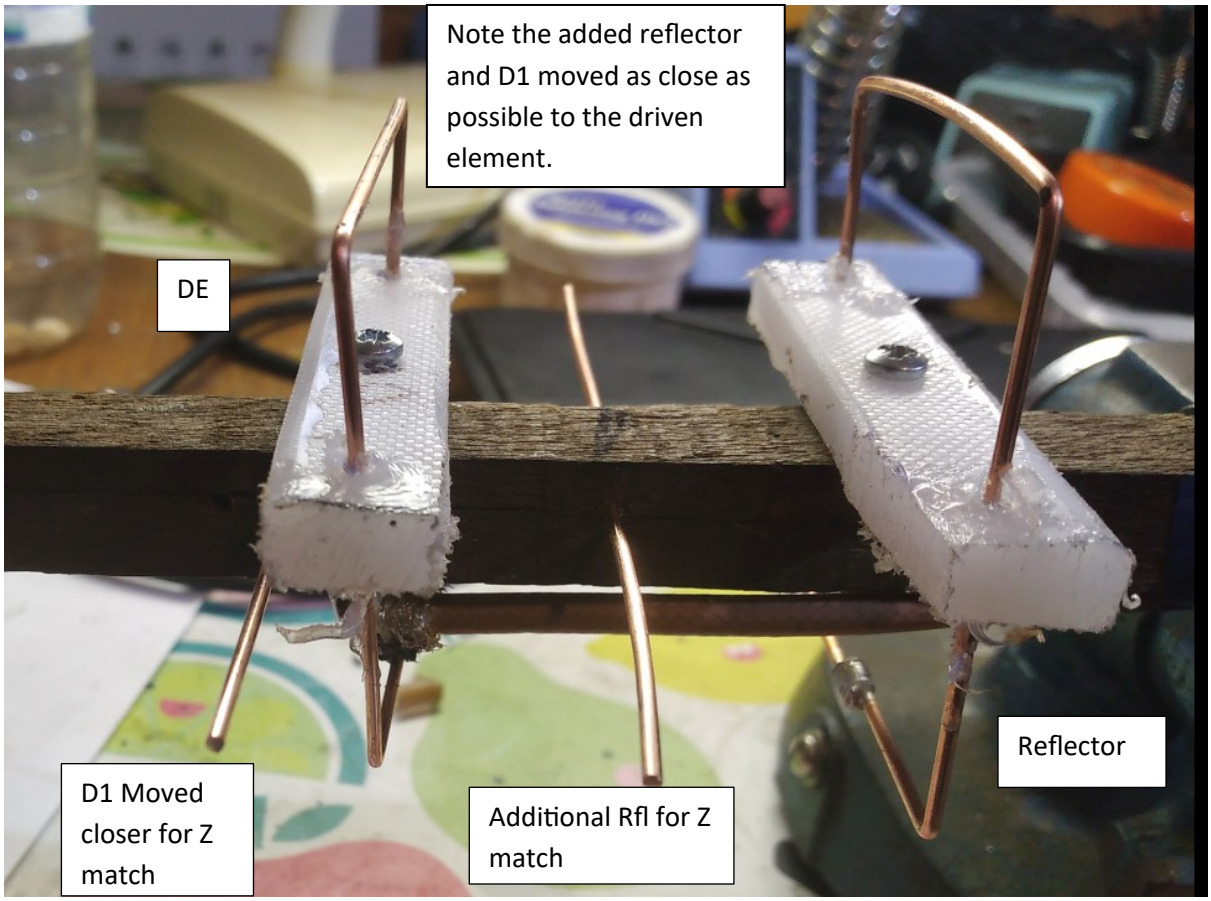
1296 Mhz Quagi antenna By Barry VK2FP

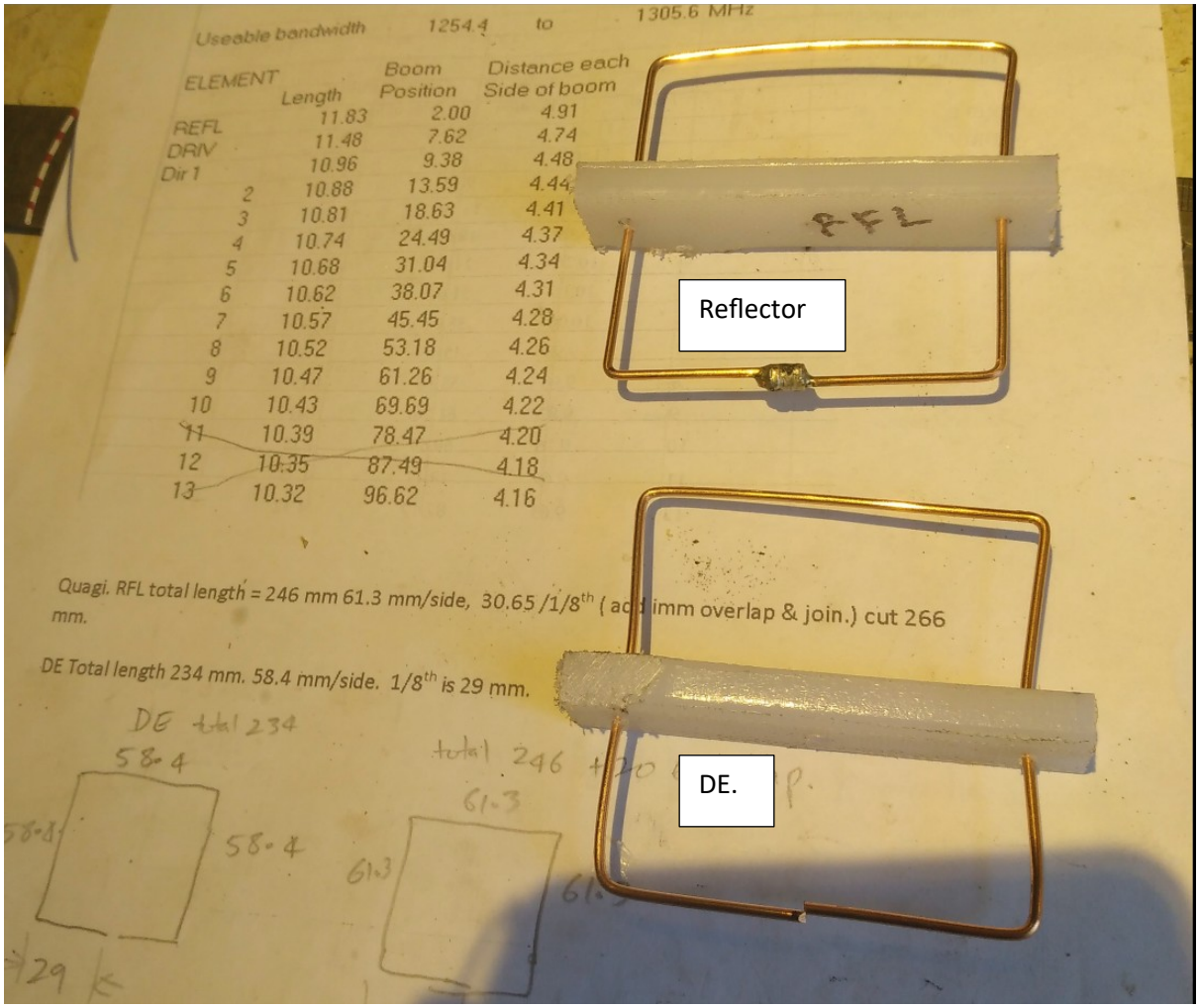
Frequency MHz.			1280			
Wavelength cm.			23.42			quad driven element 234mm total, each side 58.4 mm.
Boom Diameter cm.			2			bottom is 29 mm per section.
Element Diameter mm.			0.165			
Element Thru Boom ("Y/N")			n			quad reflector total length is 246mm, 61.3 mm/side
Boom Length (Metres)			0.75			
Gain (dbd)			12.8			Measured with Nano VNA, SWR at 1296 mhz: 1.04:1 Driven
Thru Boom Correction (cm).			0.00			Element direct fed rg-142 PTFE coax 52 ohm.
Useable bandwidth		1254.4	to	1305.6	MHz	
ELEMENT		Boom	Distance each			
	Length	Position	Side of boom			
REFL	11.83	2.00	4.91			
Refl 2	12.00	8.00		added for impedance matching		
DRIV	11.48	7.62	4.74			
Dir 1	10.96	8.90	4.48	moved closer for impedance matching.		
2	10.88	13.59	4.44			
3	10.81	18.63	4.41			
4	10.74	24.49	4.37			
5	10.68	31.04	4.34			
6	10.62	38.07	4.31			
7	10.57	45.45	4.28			
8	10.52	53.18	4.26			
9	10.47	61.26	4.24			
10	10.43	69.69	4.22			

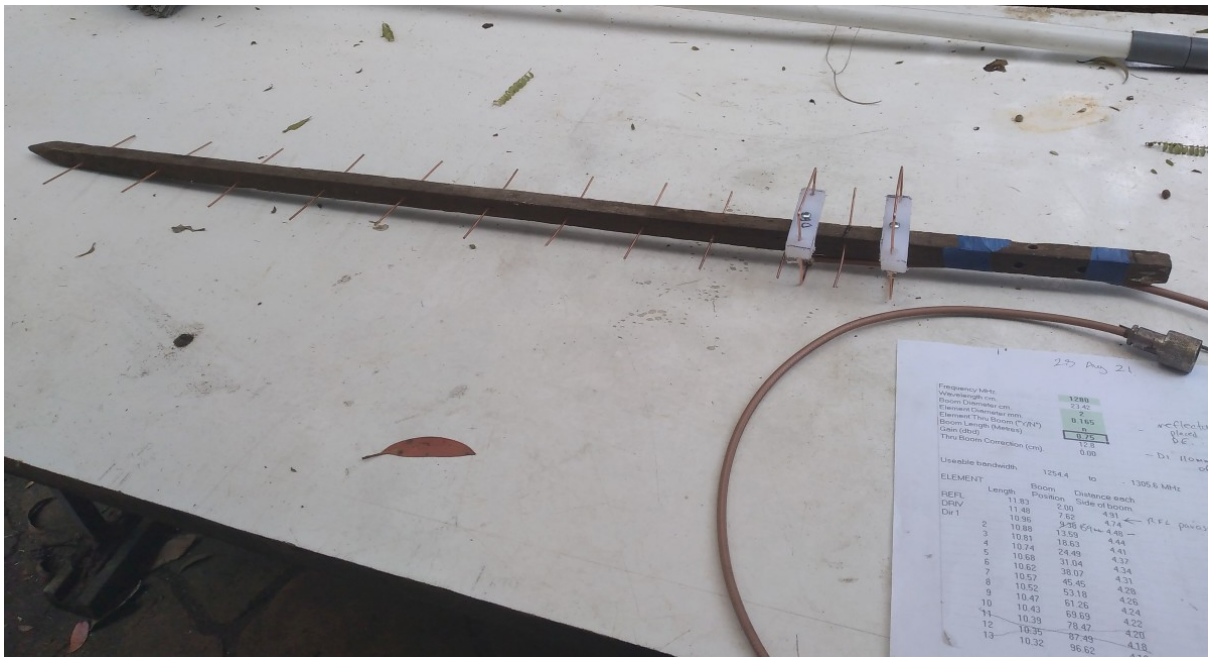
This Quagi is based on April 1977 QST Quagi antenna design and the 1989 ARRL handbook. The software is from DL6WU. I built it on 23 August 2021.

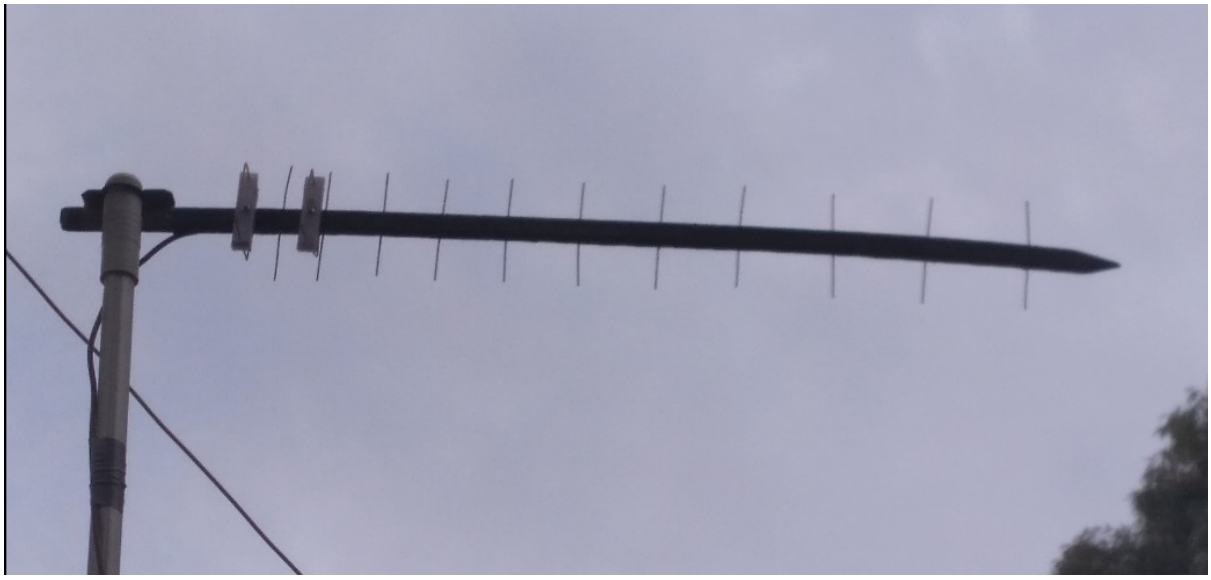
I built this antenna on a tomato stake. The quad reflector and driven element insulators were cut from a cutting board.

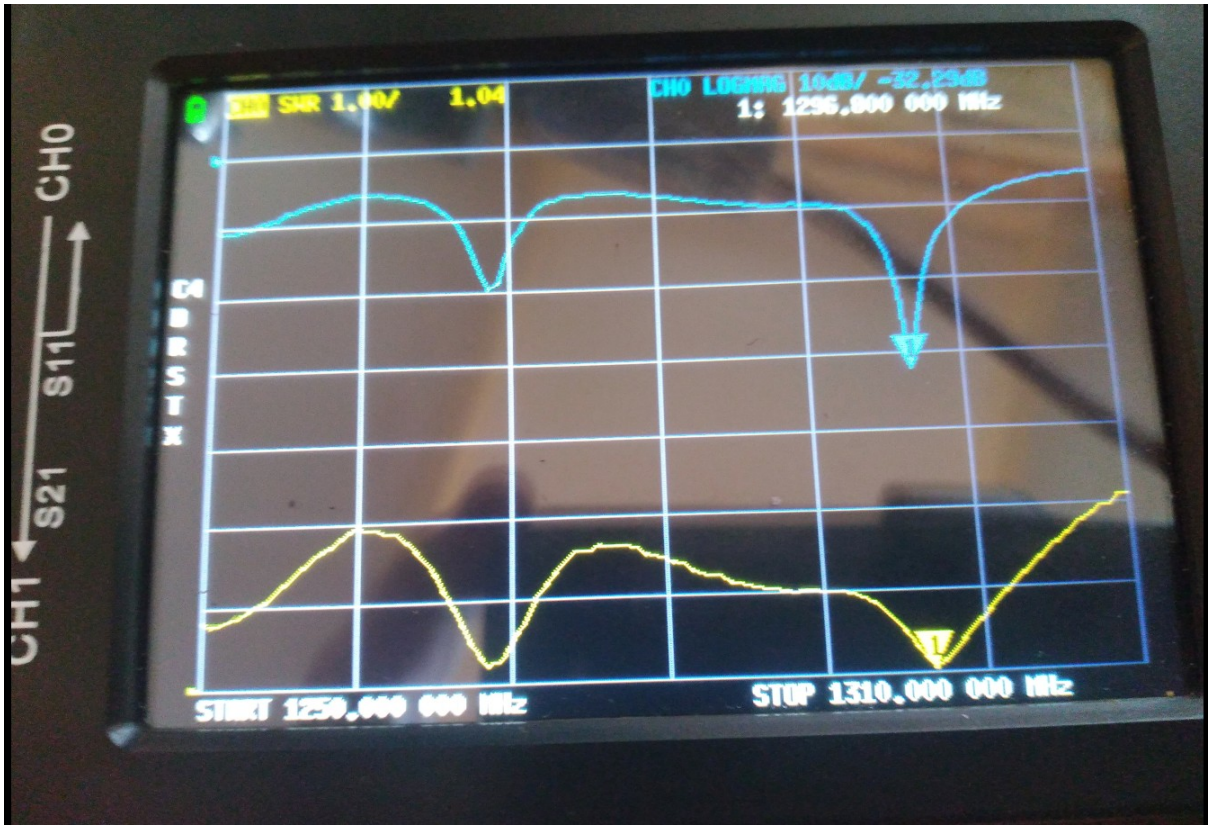
The elements are the inner conductor of RG11 coax, single core, 1.65mm diameter, quite stiff enough for use at this frequency. If you use 3mm brazing rod etc, enter the dimensions in the DL6WU spreadsheet. Thicker elements result in shorter dimensions.
The 1296 MHz Quad-Yagi (Quagi) uses a quad driven element and a quad reflector. (Reflector is 1 wavelength + 5%) The driven element is direct fed with 52 ohm coax. (1 Wavelength at 1296 MHz). I did not use a 1:1 balun. Initial tests showed an SWR around 3:1. By moving DI as close as possible to the driven element, I lowered the SWR to about 1.7: 1. By adding a 2nd reflector 112 mm long spaced 30mm behind the driven element I managed to reduce the SWR to 1.04:1. Unfortunately, the design is quite sharp and the SWR quickly rises to about 1.5:1 at the repeater input frequencies, however, I cut this antenna for use on the Maddens Plains simplex parrot repeater on 1296.85 MHz.


Note the added reflector and D1 moved as close as possible to the driven element.
DE
D1 Moved closer for Z match
Additional Rfl for Z match
Reflector


Useable bandwidth 1254.4 to 1305.6 MHz
ELEMENT Length Boom Position Distance each Side of boom
REFL 11.83 2.00 4.91
DRIV 11.48 7.62 4.74
Dir 1 10.96 9.38 4.48
2 10.88 13.59 4.44
3 10.81 18.63 4.41
4 10.74 24.49 4.37
5 10.68 31.04 4.34
6 10.62 38.07 4.31
7 10.57 45.45 4.28
8 10.52 53.18 4.26
9 10.47 61.26 4.24
10 10.43 69.69 4.22
11 10.39 78.47 4.20
12 10.35 87.49 4.18
13 10.32 96.62 4.16
Quagi. RFL total length = 246 mm 61.3 mm/side, 30.65 /1/8th (add 1mm overlap & join.) cut 266 mm.
DE Total length 234 mm. 58.4 mm/side. 1/8th is 29 mm.
DE tal 234
58.4
58.4
58.4
29
total 246
61.3
61.3
Reflector
DE.






SWR 1.00V 1.04
CH0 LOGMAG 10dB/ -32.29dB
1: 1296.900 000 MHz
CH0
S11
S21
CH1
START 1250.000 000 MHz
STOP 1310.000 000 MHz