The Vertical Buddi Beam

on 20m using no Coils.

design by Lou Rummel KE4UYP

In this article I am going to describe a totally new way to construct and use a very old design the two element Yagi antenna. Unlike the traditional Yagi this design does not require a Tower or a boom, it is 100 percent portable and most important high-performance and easy to assemble using standard Buddipole components.

Just like a standard Yagi my design only requires one coax transmission line. But Unlike the traditional Yagi this driven element is not attached to a common boom to the reflector element. Instead the driven and reflector element is a standard vertical Buddistick. Each one mounted on its own tripod or painters pole.

The spacing between the two VersaTee's http://www.buddipole.com/versatee.html equals 16ft. 7" in this modified version of the original design I have completely eliminated the need for using loading coils. The way in which this is accomplished is both simple and efficient. The only modification that is required is to simply lengthen the elevated radial wires. There are several advantages to this design modification. No. 1 the overall efficiency of the antenna is increased due to the fact that the circulating currents that are present in loading coils that converts a percentage of your transmitter power to heat is eliminated. No. 2 advantage is because the overall length of the elevated radial wire is longer this automatically increases the offset even further for the feedpoint. This in turn raises the input impedance even closer to a perfect 50 ohm match.

As a practical example if the direction you wish to transmit is north you would have the Driven Vertical Element north of the Reflector Vertical Element.

The elevated radial for the Driven Element would slope back toward ground heading due north. Directly South of it you would do the same with the Reflector elevated radial .

The advantage of adjusting both the Driven element and Reflector element by frequency is no matter where the antenna is physically located you will always be able to obtain maximum front to back ratio and good forward gain.

This concept may seem unusual but in reality when a standard two element Yagi has been adjusted for optimum front to back ratio the relationship of the Driven element Resonant frequency to the Reflector element Resonant frequency is what actually causes the maximum front to back ratio to occur, having maximum from front to back ratio is considered by most people the optimum setup for a two element Yagi. Using this technique guarantees success every time regardless of the environment that the Vertical Buddi Beam is placed into.

Now to accomplish this successfully **you must** followed these instructions precisely.

First assemble the Reflector element with the elevated radial sloping back toward ground heading in the general direction you wish to transmit to (See diagram-1) and temporarily connect the coax to it.

The Reflector Element vertical uses elements 3,4 in diagram-1 the VersaTee is at 10ft. Above ground element 3 has two 22" arms and the 9ft. 3" whip total length **equals12ft. 11" or 155"** Wire element 4 equals **22ft. 3" or 267" of wire.**

Now adjust the reflector element to the Resonant frequency of 13.65Mhz by lengthening or shortening the elevated radial wire.

After adjusting the reflector elements to **13.65Mhz** remove the coax,
Then place a short jumper wire connecting the elevated radial wire to the vertical element at the VersaTee. **This is absolutely necessary** otherwise the reflector element will not function properly.

Next
Assemble the Driven element **(see diagram-1)** and position it toward the general direction you wish to transmit to with the elevated radial for the Driven Element sloping back toward ground heading in the same direction. Now remove the coax from the reflector element and attached it to the Driven element.

The Driven Element vertical uses elements 1,2 in diagram-1 the VersaTee is at 10ft. Above ground element 1 has two 22" arms and the 9ft. 3" whip total length **equals12ft. 11" or 155"** Wire element 2 equals **20ft. 10" or 250" of wire.**

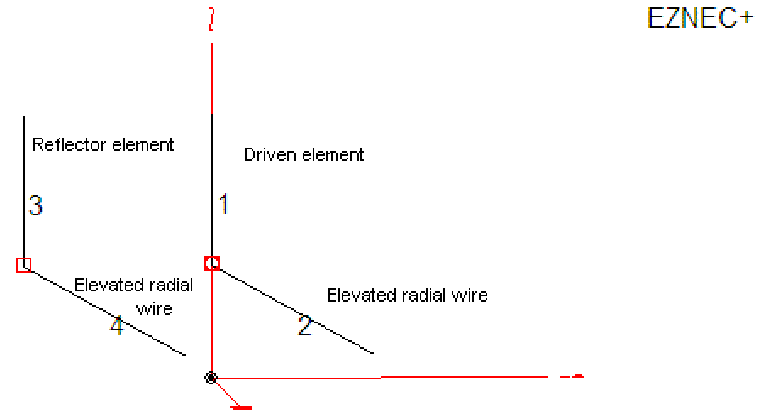


diagram-1

Now adjust the Driven element to the Resonant frequency of 14.170Mhz by lengthening or shortening the elevated radial wire.

That's it you are done and ready to go on the air. Now go and enjoyed this high-performance DX antenna.

Vertical Buddi Beam

Performance specifications

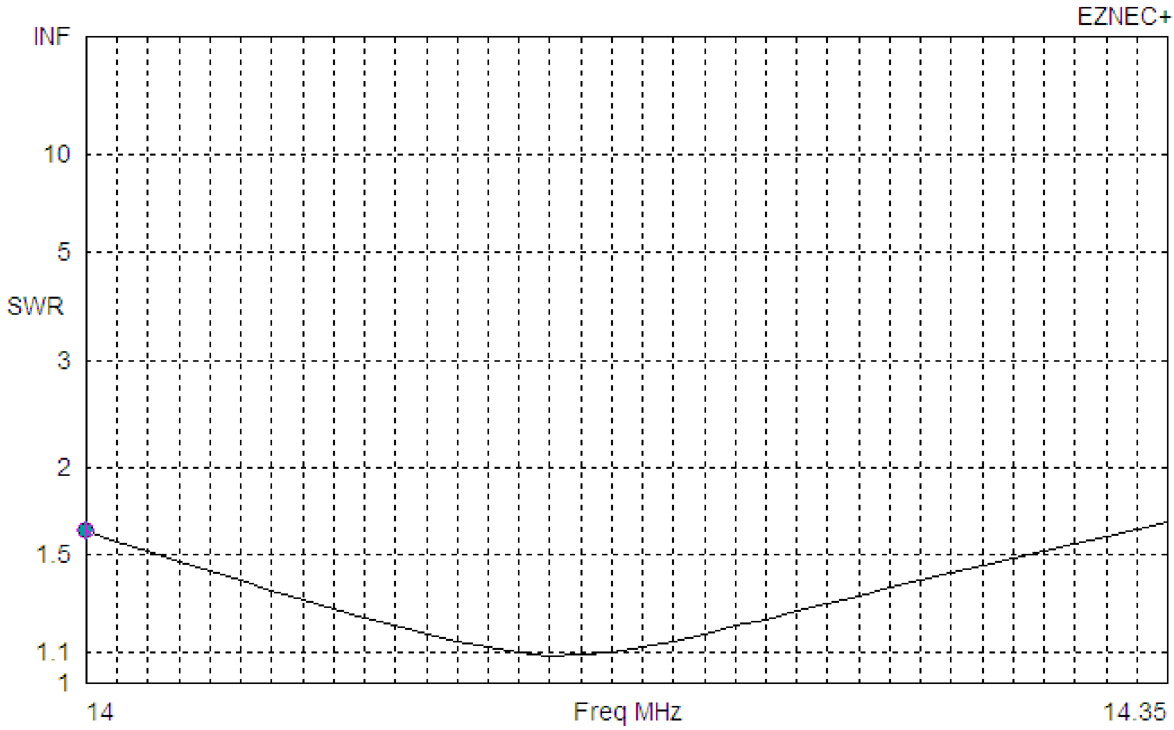
1.09:1 VSWR input impedance= 54.91 Ohms

14Mhz to 14.35Mhz under 1.66:1 VSWR

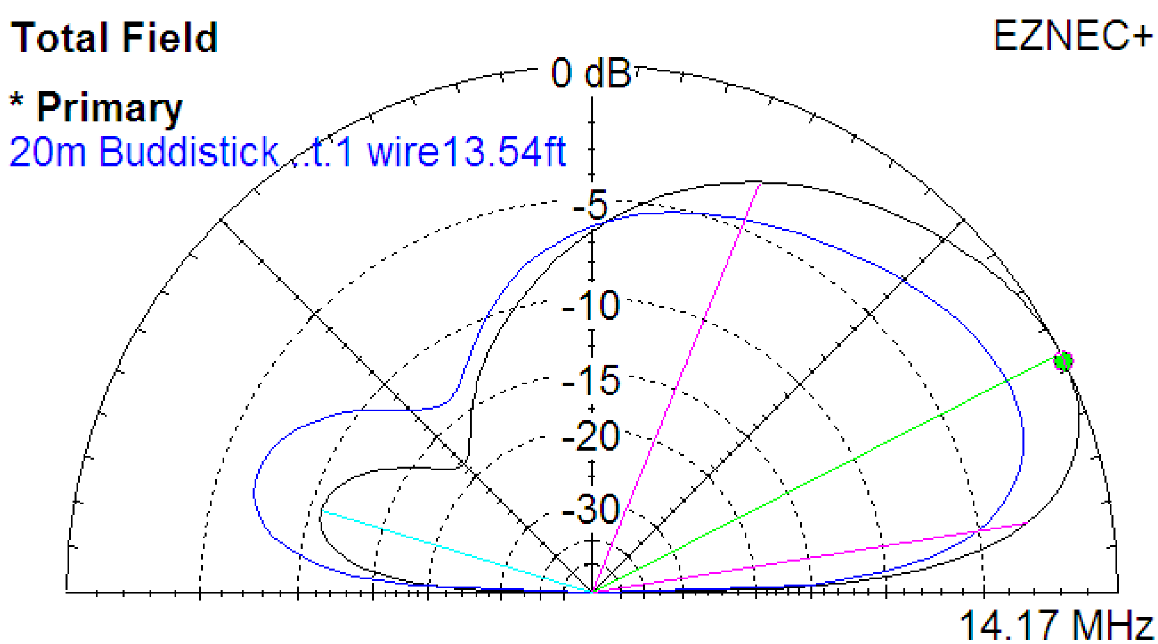
Forward gain= 3.06 dBi @ 26 degrees

Front to Back Ratio= 11.92db

Below is a direct comparison of the Vertical Buddi Beam vs. a standard Buddistick



Freq	14 MHz		Source #	1
SWR	**1.61**		Z0	50 ohms
Z	54.19 at -25.95 deg.			
	= 48.73 - j 23.72 ohms			
Refl Coeff	0.2339 at -79.56 deg.			
	= 0.04237 - j 0.23			
Ret Loss	12.6 dB			



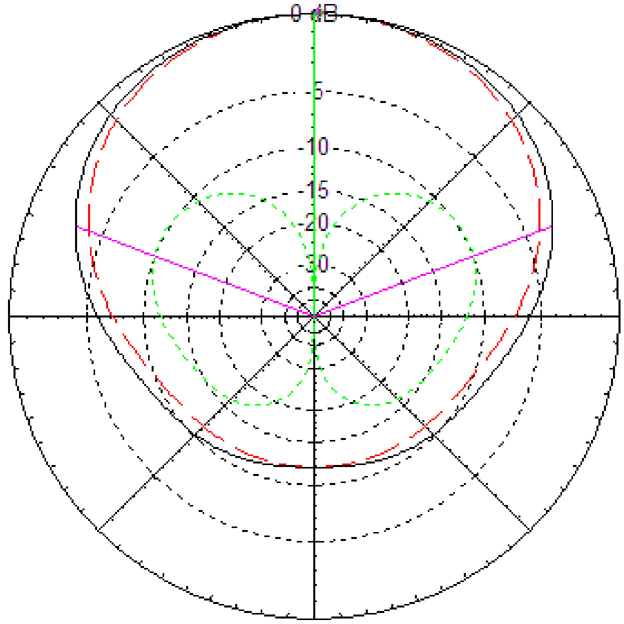
Elevation Plot			Cursor Elev	26.0 deg.
Azimuth Angle	89.0 deg.		Gain	3.06 dBi
Outer Ring	3.06 dBi			0.0 dBmax
				0.0 dBmax3D
3D Max Gain	3.06 dBi			
Slice Max Gain	3.06 dBi @ Elev Angle = 27.0 deg.			
Beamwidth	58.7 deg.; -3dB @ 9.1, 67.8 deg.			
Sidelobe Gain	-7.59 dBi @ Elev Angle = 163.0 deg.			
Front/Sidelobe	10.65 dB			

*** Total Field**

Horizontal Pol

Vertical Pol

EZNEC+



14.17 MHz

Azimuth Plot	
Elevation Angle	26.0 deg.
Outer Ring	3.06 dBi
3D Max Gain	3.06 dBi
Slice Max Gain	3.06 dBi @ Az Angle = 90.0 deg.
Front/Back	11.92 dB
Beamwidth	138.0 deg.; -3dB @ 21.0, 159.0 deg.
Sidelobe Gain	< -100 dBi
Front/Sidelobe	> 100 dB

Cursor Az	89.0 deg.
Gain	3.06 dBi
	0.0 dBmax
	0.0 dBmax3D