

Antenna

This antenna is fast to build: single wire, feeding/termination points at ground level, two ground electrodes or counterpoise wire. Traveling wave -type noise-free antenna, which presents wide frequency range (without tuner), excellent reception and some gain with long wire lengths. Not the best selection for fixed location QRP or DX working. Optional use as open Long Wire with antenna tuner.

Feeding with 1:9 Unun

We feed the antenna with **1:9 unun** (50 to 450 Ω), located low at the antenna feed point. We used here ferrite tube unun.

Using with Terminator

Terminated wire works without tuner on whole frequency range. It also works well on noisy environments. This costs you some decibels drop of performance. We used here 470Ω 140W low-inductance thick film resistor, TO-247 enclosure, **MHP140-470R**. The resistor is cooled with heatsink of 25x60x100mm (2,5 K/W). Terminator can handle continuous carrier power up to 50W.

Using as Open Wire

To use this antenna as open wire, disconnect the terminator (if present) from the antenna wire. Then you need an antenna tuner (ATU). Open wire gives you better performance, especially at the lowest frequencies.

Grounding

This antenna needs a proper grounding at the feed point and also at far point, if terminated. We used here two stainless steel rods, length 800mm. If the traditional low-ohmic grounding is hard/slow to get working, also counterpoise wire below the antenna wire will work well. This artificial ground may be a single wire on ground surface.

Radiation patterns

Vertical radiation pattern depends on the antenna height. With heights of some meters (2-5m) we get high radiation angle suitable for NVIS communication. With medium heights (5-20m) the vertical radiation angle is lower and the antenna suits better for long range communication.

Horizontal pattern is complex and depends on wire length. Typically the horizontal antenna length is about one wavelength of the lowest frequency. Then the pattern is near round on low frequencies (4Mhz) and highly elliptical on highest frequencies (28MHz), with several minor lobes. The peak gain is near to the line of the wire (towards the load end). The minimal noticeable gain 1.3 dBd is with antenna lengths of two to four wavelengths. On eight wavelengths the gain is near 6dBd.

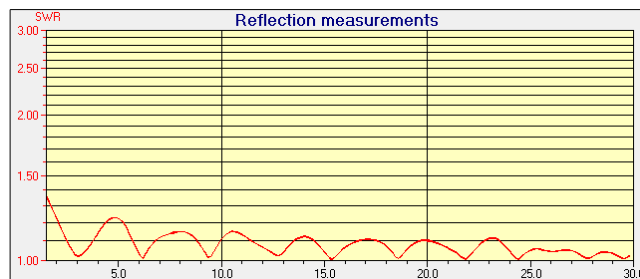
Unun 1:9 and Terminator 470 Ω:



Structural and Radiation Efficiency %, Gain, simulated with NEC:

MHz	Terminated Wire			Open Wire		
	Eff %	R/Eff %	dBi	Eff %	R/Eff %	dBi
4	62	3	-9	100	4	-7
7	63	6	-4	100	9	-3
10	63	10	-1	100	16	-0
14	64	16	+2	100	30	+3
18	69	22	+4	100	33	+4
21	70	25	+5	100	39	+5
24	71	30	+6	100	44	+6
28	72	33	+7	100	48	+7

Measured SWR of Terminated Wire (L = 44m, H = 6m):



Simulated radiation patterns on next page...

