

VE7BQH 144 MHZ LONG YAGI CONSTRUCTION DETAILS

The VE7BQH 43 ELEMENT LONG YAGI FOR THE LOW END OF THE 2M BAND

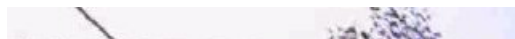
Below is a photo of the long rope yagi installed at W1JJ for use in trans-Atlantic propagation tests.



This 98.5' (32.349 m) long portable antenna was designed by VE7BQH for W0PT. This high gain (19 dbd) antenna is relatively lightweight, inexpensive, and very portable - it can be rolled up for transport. It also has an unusually high Front/Back ratio, which makes it especially good for receiving weak signals when pointed out over a quiet direction toward the moon (such as out over the ocean), and facilitates an operating/equipment position very close to the rear of the antenna (with a very short feedline). The forward gain of this antenna compares very favorably with arrays of four good 13 element yagis; depending on the type of terrain over which it is mounted (near a beach overlooking salt water is the absolute best!), 2m EME contacts with 10-20 stations should be possible - EVEN WITH ONLY 100 WATTS! W0PT indicates that he built this antenna for approximately \$30.

This design uses .125" (3.175 mm) diameter aluminum elements, which are to be supported on two parallel non-conducting lines that will not stretch, such as dacron, Phyllistran or polypropylene (will not work if the antenna is to be left out in the sun for an extended period of time); the lengths shown for the antenna elements will only be correct if .125" diameter rods are used. If you need to aluminum rods of a different diameter for the elements, please contact me or VE7BQH so proper element lengths can be provided. The antenna is meant to be suspended between two end supports, with the two support lines tightened to remove antenna sag. The yagi can be made more horizontal by hanging a third line above the antenna and extending several vertical support lines (such as in the middle and between the middle and ends) down from it to hold the antenna up. However, W0PT reports very satisfactory operation by simply pulling the antenna tight at the two ends (without any further support from above).

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WOPT connected his elements to polypropylene support ropes with plastic cable ties, and then the mechanical connections was sealed with "Plastic Rubber" to make sure the element locations would remain fixed. The intended use of this antenna is to provide gain in a specific direction, such as over a fixed tropo path or toward a particular azimuth where the moon is intended to rise or set. It can be steered somewhat (to adjust for the changing moon declination and corresponding change in azimuth of moonset or moonrise) by moving one end of the yagi (such as moving the end support point between two trees). In an ideal situation, the transmission line to the Driven Element can be kept very short, with the yagi extending out away from the operating position.



NOTE: Be sure to mount the rope yagi at least 12' above the ground. Mounting it lower than this will cause excessive ground absorption, and loss of gain.

VE7BQH 43 Element Yagi Element Layout

ELEMENT	OVERALL ELEMENT LENGTH "	" DISTANCE FROM REFLECTOR
Reflector	40.6152	0
Driven Element	*	12.2883
Dir 1	38.2994	17.2507
Dir 2	37.4868	26.4669
Dir 3	36.7122	39.2276
Dir 4	36.6674	55.0605
Dir 5	36.1396	73.4928
Dir 6	36.1004	94.2884
Dir 7	35.8592	116.9742
Dir 8	35.5766	141.3142
Dir 9	35.5866	167.0723
Dir 10	35.3840	194.0116
Dir 11	35.2068	222.0145
Dir 12	35.1176	250.7263
Dir 13	35.0484	280.3835
Dir 14	34.9630	310.6313
Dir 15	34.8178	341.4701
Dir 16	34.7270	372.8275
Dir 17	34.6670	404.1849
Dir 18	34.5640	435.8144
Dir 19	34.5058	467.7981
Dir 20	34.4646	500.1359
Dir 21	34.3994	532.5916
Dir 22	34.2830	565.4014
Dir 23	34.2564	597.9433
Dir 24	34.2092	630.3938
Dir 25	34.2298	662.8316
Dir 26	34.1738	695.3784
Dir 27	34.0936	728.1672
Dir 28	34.0068	760.7430
Dir 29	33.9732	793.0886
Dir 30	34.0360	825.2943
Dir 31	34.0586	857.7106
Dir 32	34.0776	890.7905
Dir 33	34.0234	923.6640
Dir 34	33.8996	956.4708
Dir 35	33.9336	988.3597

