

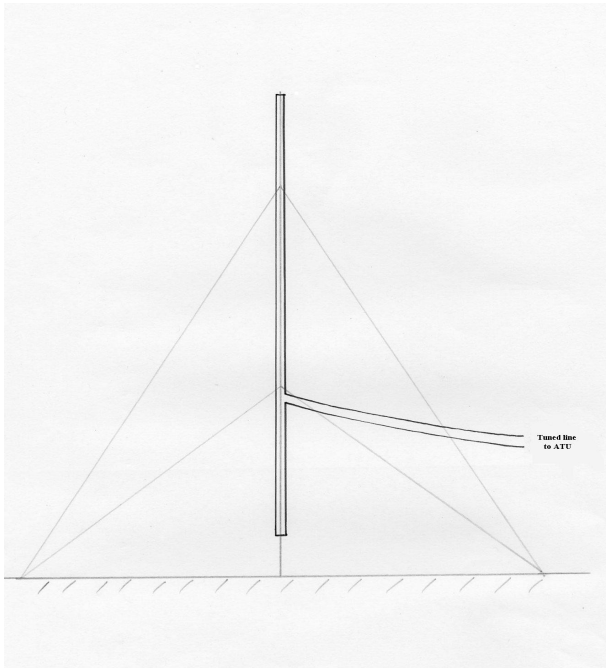
The published details of this very broad bandwidth tunable h.f. vertical antenna are included in :  
the 'International Antenna Collection 2' handbook edited by Dr G Brown PhD  
and published by the RSGB / ARRL ISBN 190508601-6

### **RXO-Unitenna** by G3RXO

Published by NZARTS in "Break-In" May/June 2002

While in New Zealand I needed a portable all band h.f. antenna and conceived the following design which produced surprisingly good results.

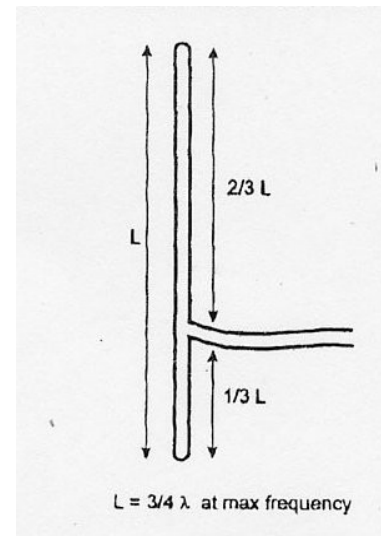
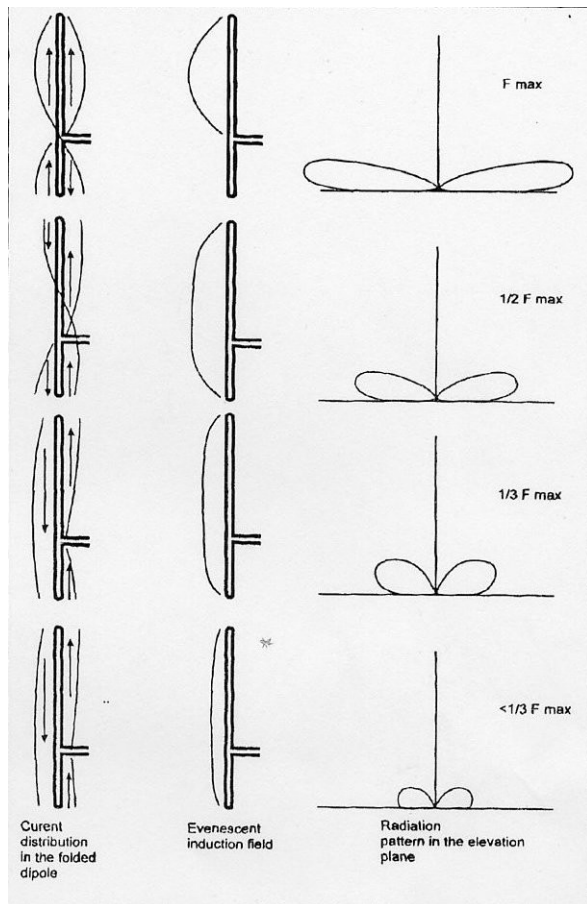
1. Consider a vertical dipole, it's current distribution and resultant polar diagram.
2. Consider it as a folded dipole.
3. Consider it's current distribution and polar diagram if it is fed off centre.



The dissimilar currents in the two elements of the dipole are within one evanescent induction field and therefore cumulative as to radiation.

This can give rise to an overall current distribution and polar diagram which changes very little with change of frequency.

4. By feeding at approximately 1/3 of the way along the dipole the current distribution and polar diagram vary approximately from that of a vertical dipole to that of a vertical quarter wave over a frequency range of some 3:1. For example, from 7 mhz through to 21 mhz.
5. Above the antenna's maximum useable frequency the polar diagram becomes split and of high angle.
6. As the applied frequency is reduced below it's normal range the polar diagram remains much as for a vertical quarter wave, but with diminishing efficiency, although still useful over a frequency range of some 4 : 1.



7. Since the antenna is a closed loop it is less susceptible to static.
8. It requires no radials and therefore incurs no ground losses.
9. It is fed with a tuned line which should be as perpendicular to the antenna as possible.
10. Variation of the feed point to about 25% from the antenna's end results in slightly better current distribution, but reduced bandwidth. The optimum point is around 30 -35% from the end.
11. It is cheap to produce, lightweight, portable, unintrusive and has virtually no power limits.

The original antenna was made of regular single core conductor taped down each side of lengths of plastic waste pipe and guyed with bricklayers line. A mechanically improved version was made with standard 450ohm tuned line on a telescopic fibreglass pole

Practical example dimensions are a 10m dipole, fed 3m from the bottom, with the bottom about 1m above ground, to cover 21 to 7 mhz continuously with full efficiency.

Pro rata for other frequency ranges, so a 7m tall version for 30 to 10 mhz, 20m tall for 10 to 3.5 mhz, etc

This antenna has been found to be extremely quiet of background noise and very effective almost solely at low angles and long range.

G3RXO

For a broadband LF antenna see ~ [www.standardtrees.co.uk/RXO-LFtenna.pdf](http://www.standardtrees.co.uk/RXO-LFtenna.pdf)