

Hybrid quad antenna arrays

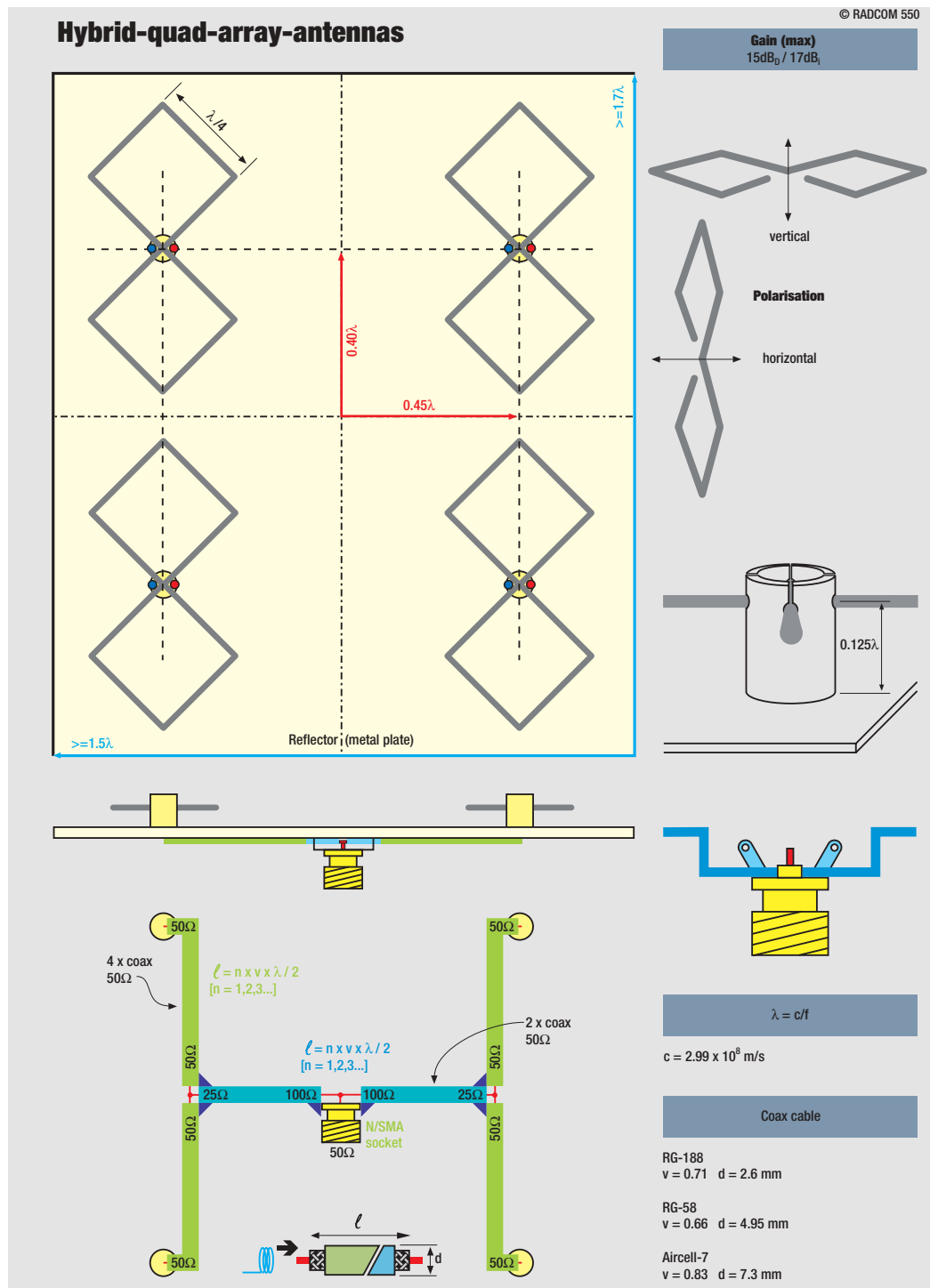
Hybrid quad antennas are easy to build and have high gain. In principle, they may be adapted to any frequency, but there is little doubt that their ideal application is at UHF frequencies.

The goal of this article is to show how construction can be made easy using cheap material available in any hardware store, such as cables and PVC-pipes intended for electrical house installations. Reflectors can be made with any metal plates or printed-circuit board.

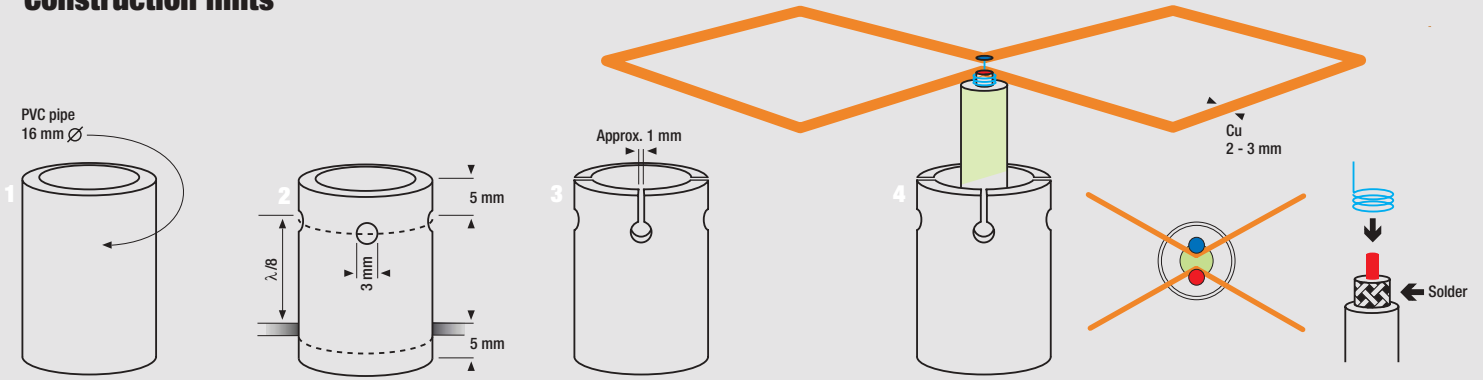
The impedance of a single double-quad-element varies with the thickness of the element wire and with distance to the reflector plate. Consequently, standard 75Ω satellite-type coaxial feeder can be used. Remember to take into account the velocity factor, v . Electromagnetic waves travel with the speed of light in a vacuum (and approximately so in air) only. When travelling in a dielectric as found in a coaxial cable, they are slowed down and the wavelength is shortened. This effect will be taken into consideration by multiplying the speed of light, c , with factor v .

The first three sets of diagrams give general hints for construction. The last two sets give detailed dimensions for building 13cm and 24cm antennas for ATV, FM or SSB.

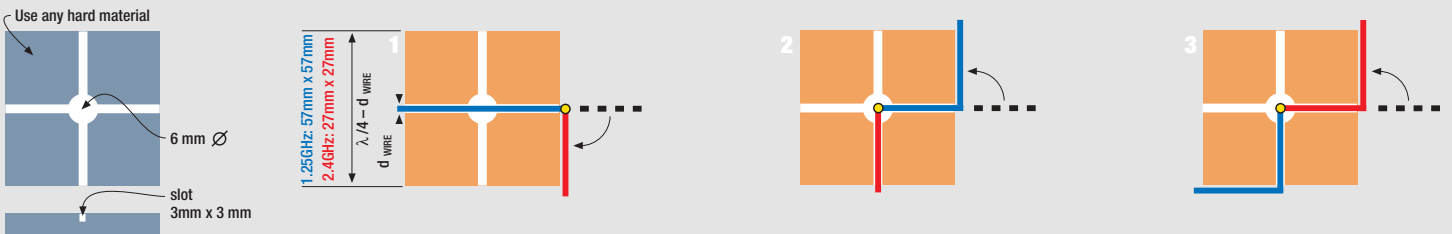
I would be happy to receive any feedback. Please e-mail your experiences of the antenna to me at the address above. ♦



Construction hints

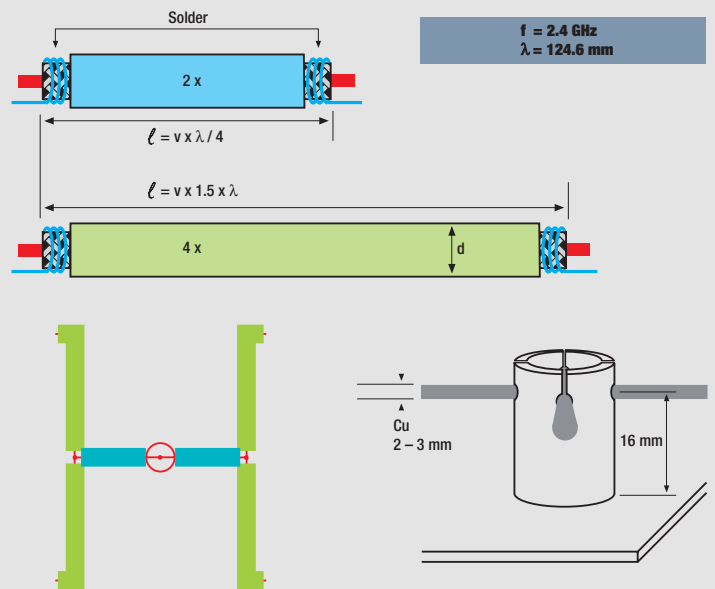
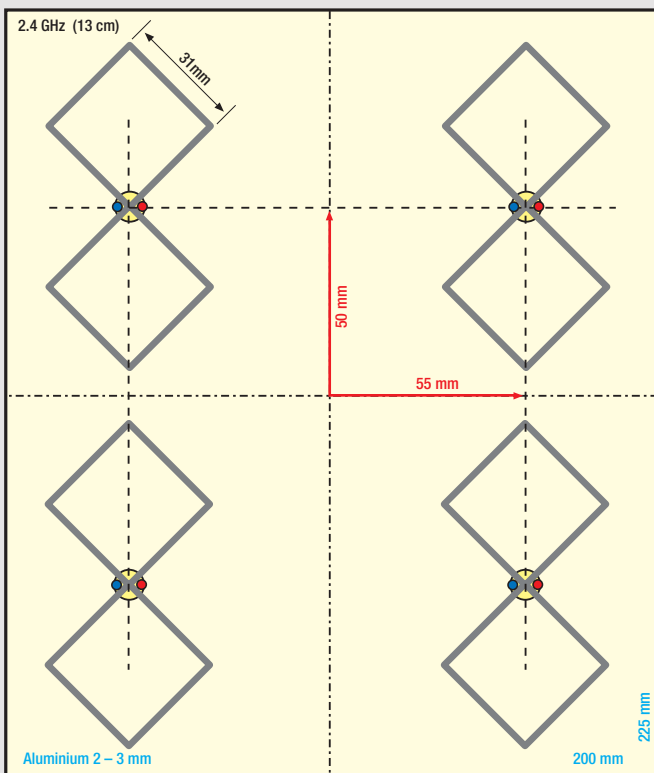


Bending gauge for quad elements

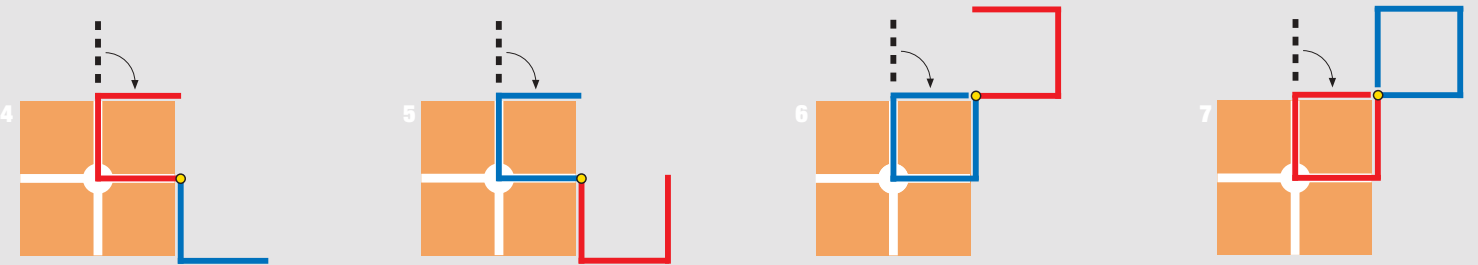
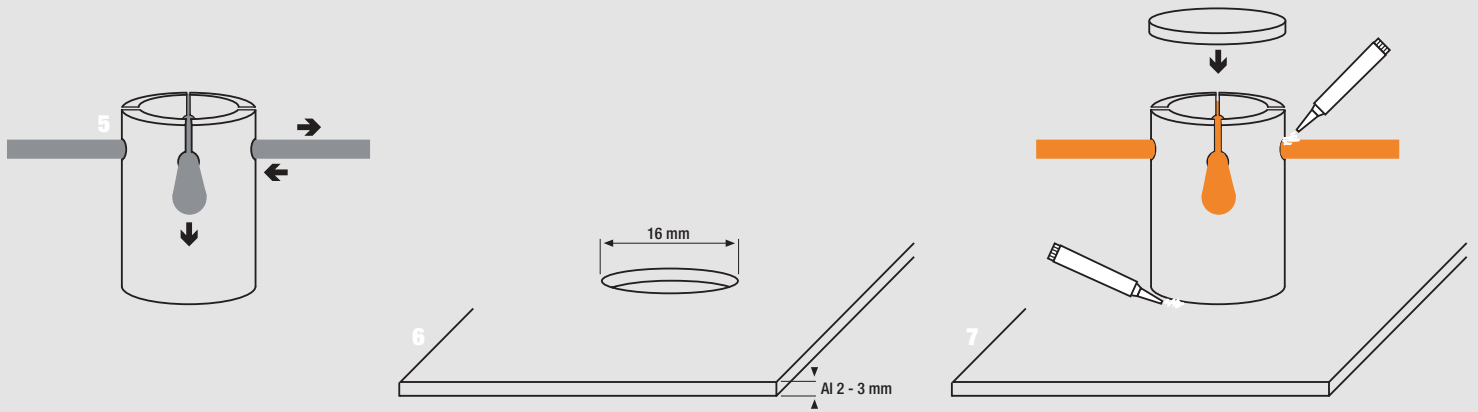


Hybrid-quad-array-antennas for ATV 2.4GHz / G= 15dB

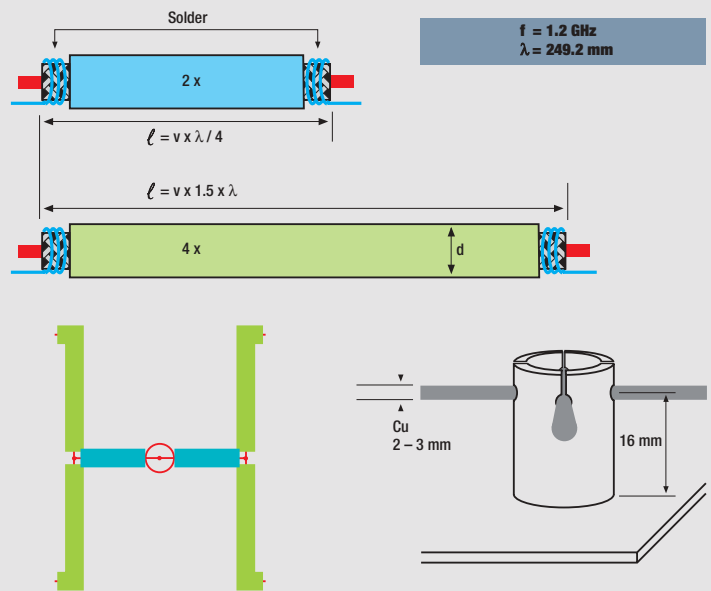
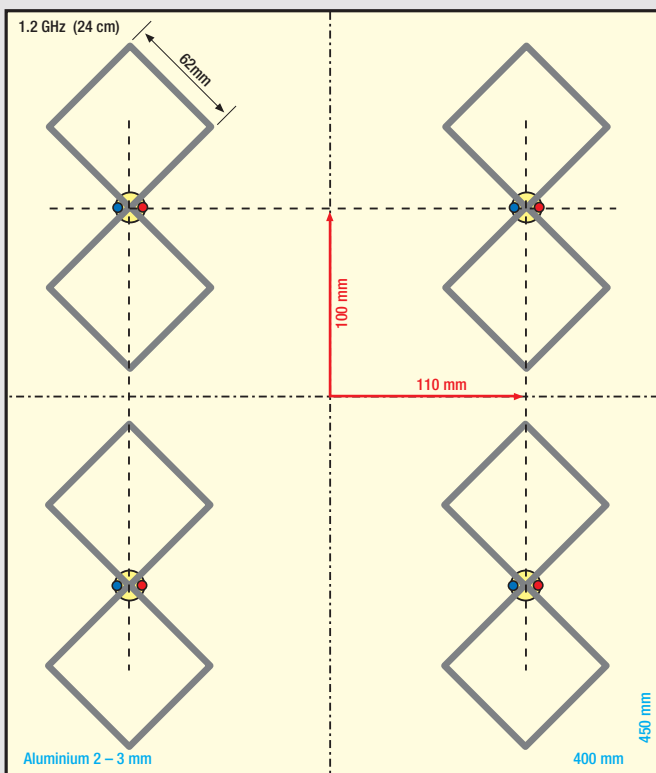
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Coax type	d/mm	v	v x 1.5 x λ	v x λ/4
RG-188	2.6	0.71	132.7 mm	22.1 mm
RG-58	4.95	0.66	123.4 mm	20.6 mm
Aircell-7	7.3	0.83	155.1 mm	25.9 mm



Hybrid-quad-array-antennas for ATV 1.2GHz / G= 15dBd



Coax type	d/mm	v	$v \times 1.5 \times \lambda$	$v \times \lambda / 4$
RG-188	2.6	0.71	265.4 mm	44.2 mm
RG-58	4.95	0.66	246.7 mm	41.1 mm
Aircell-7	7.3	0.83	310.2 mm	51.7 mm