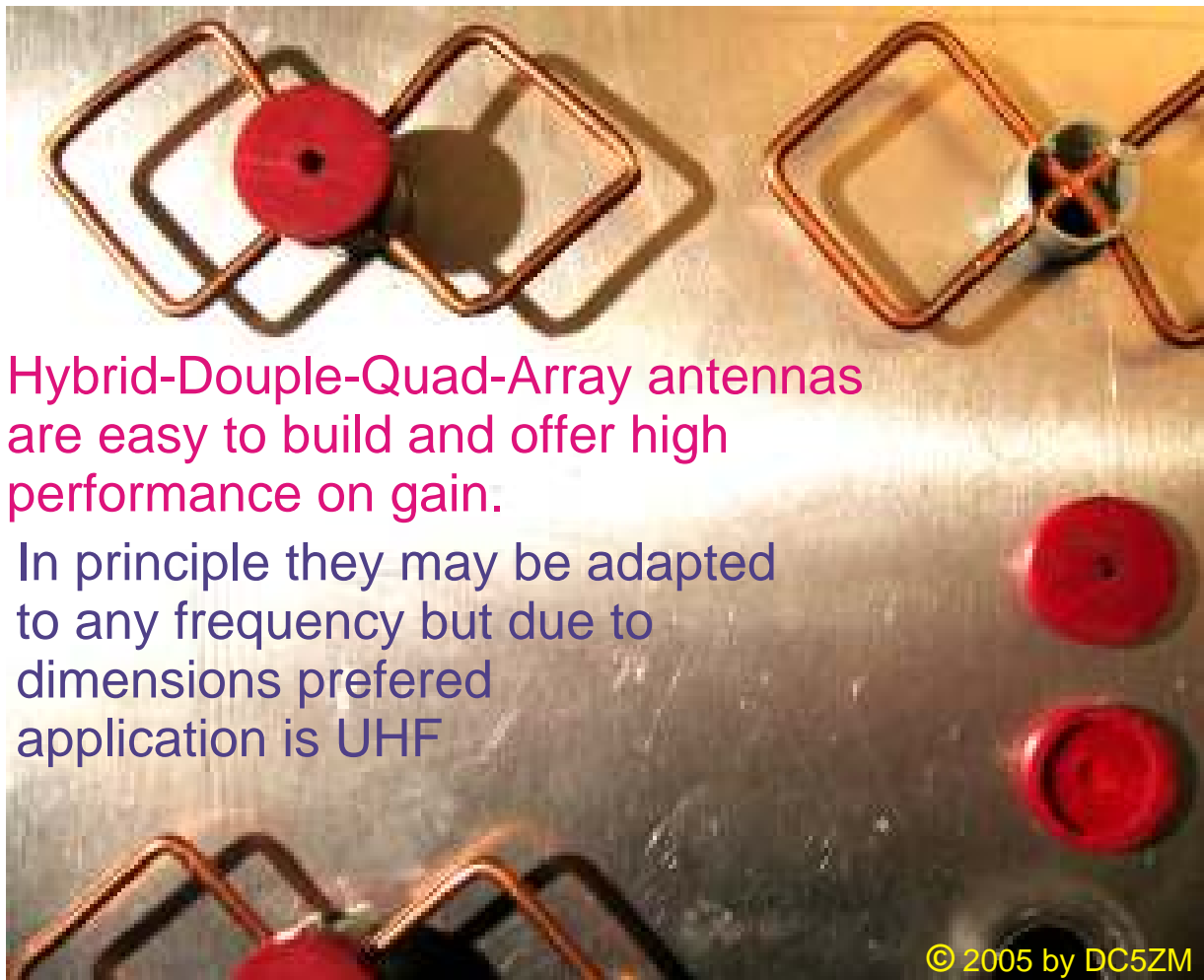


Hybrid-Double-Quad-Array Antennas



Hybrid-Double-Quad-Array antennas are easy to build and offer high performance on gain.

In principle they may be adapted to any frequency but due to dimensions preferred application is UHF

The goal of this article is to show how construction can be made easy using cheap material like cables and pvc-pipes applied for electrical house installations available at any homestore. Reflectors work fine with any kind of metal plates or pcb.

The electrical impedance of a single double-quad-element varies with diameter of element wire and with distance to reflector plate. So you also may succeed with standard 75 Ohms coax cables. The proof of the pudding is in the eating !

But watch velocity factor v . Electromagnetic waves run on light speed in vacuum and free air only.

Moving in dielectrics like isolation material in coax cables slows down speed and shortens the wavelength (greek: λ). This effect will be taken in consideration by multiplying light speed c with velocity factor v .

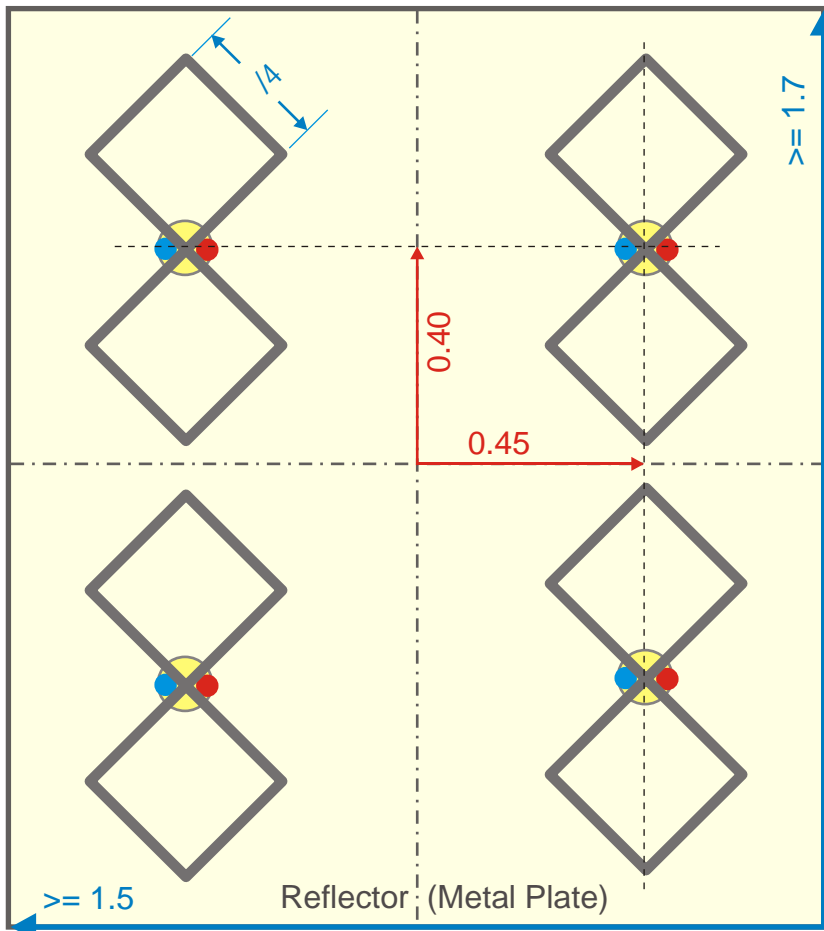
Figures on page 2 to 4 offer general hints for construction. For bending double quad elements you may use a pair of flat nose pliers. But bending is more convenient when using a self made gauge. For construction of the slot milling tools should be available. When applying hard wood or plastic material even a regular circular saw will do it.

On sheets 5, 6 and 7 you'll find detailed dimensions for building a 13cm and a 23cm antenna fine for ATV,FM,SSB,Packet or WLAN.

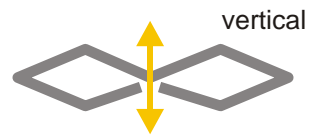
PS: The author welcomes any feedback working with antenna.
Please mail your personal experience to:

weber.reinhardt@t-online.de

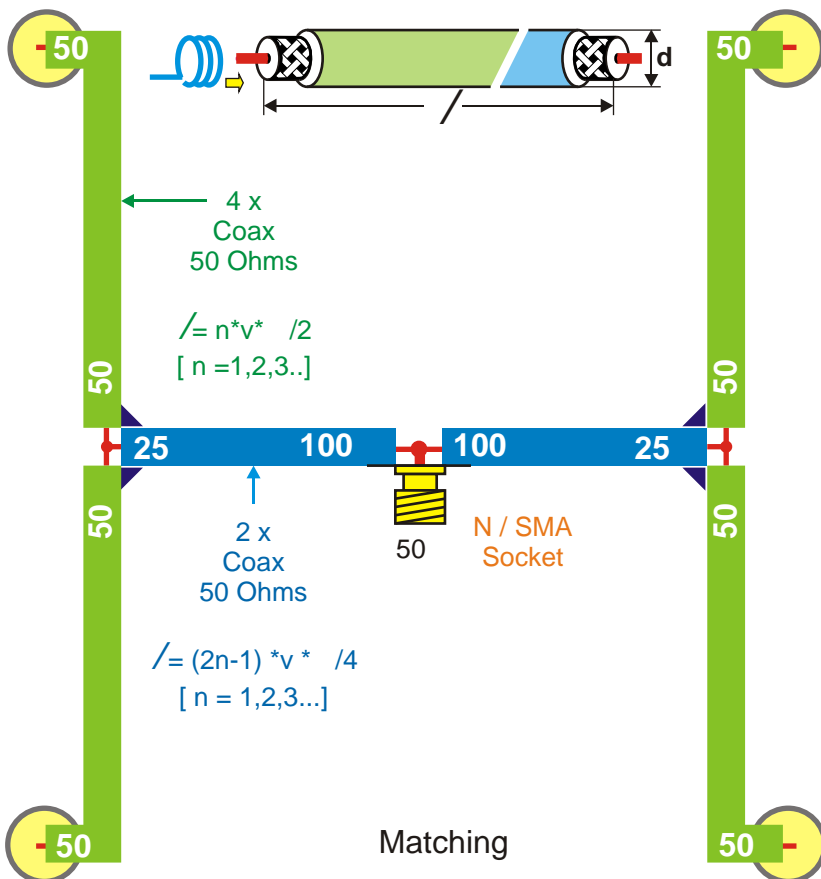
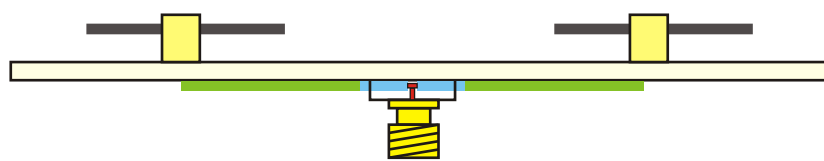
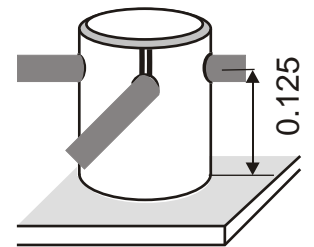
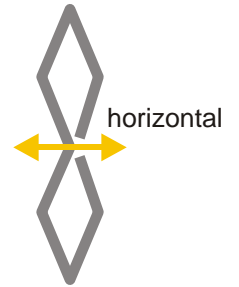
Hybrid-Double-Quad-Array Antennas



Gain
approx.
15dB_D / 17dB_i



Polarisation



Wavelength
 $= c / f$
 $c = 2.99 \cdot 10^8 \text{ m/s}$

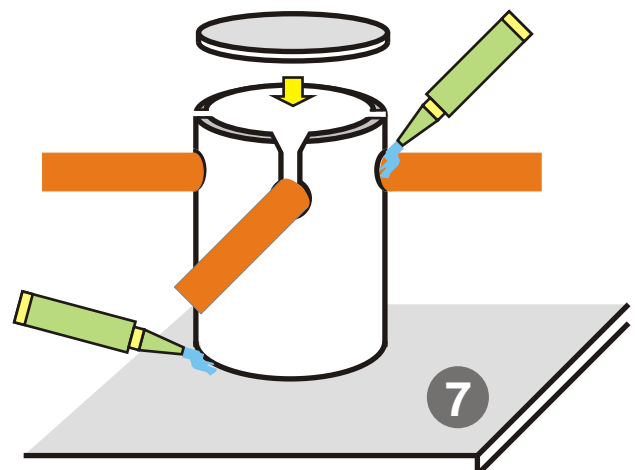
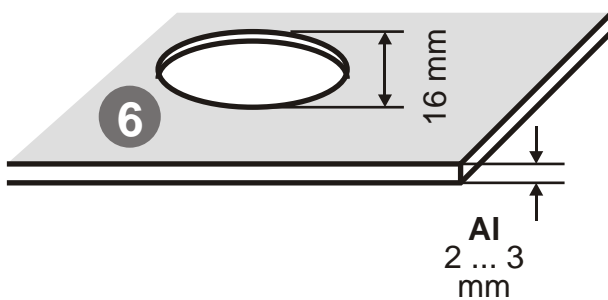
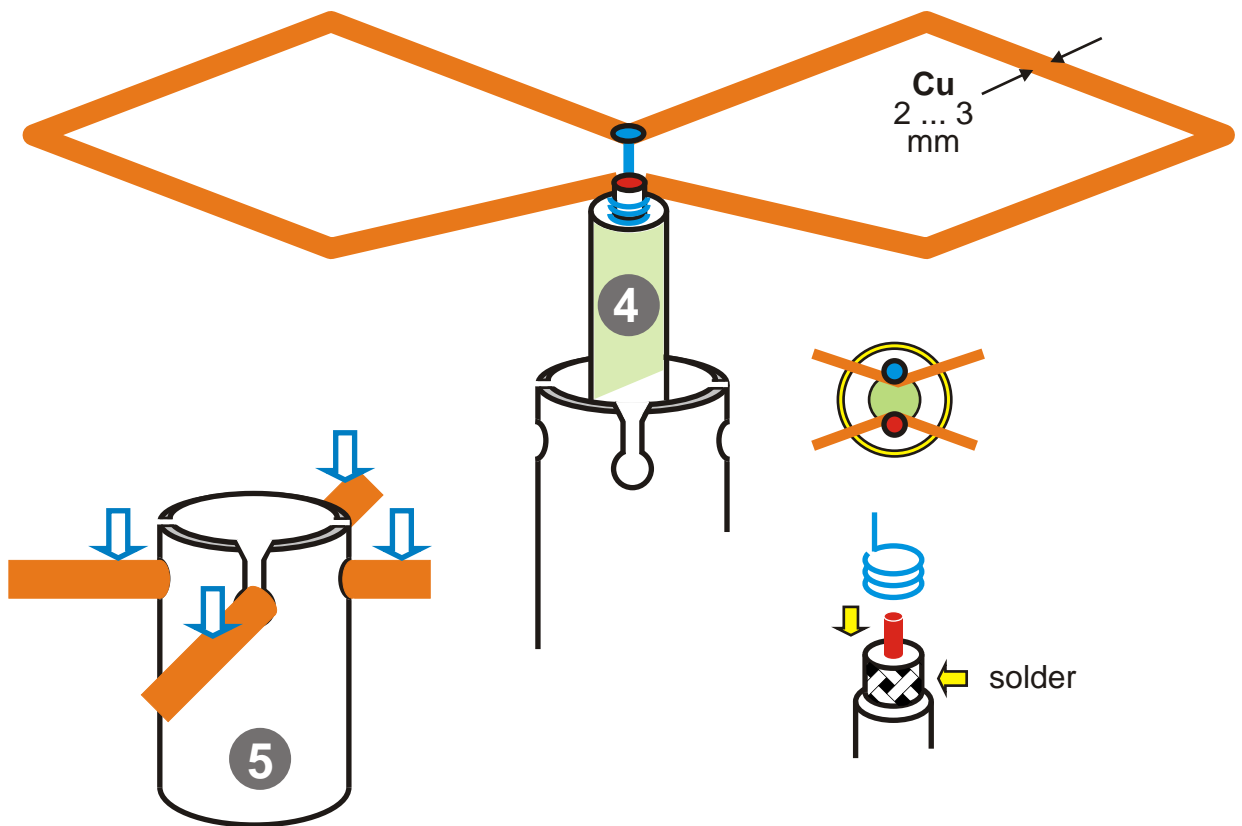
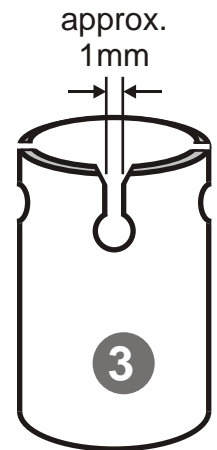
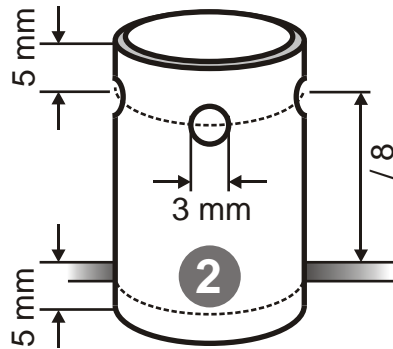
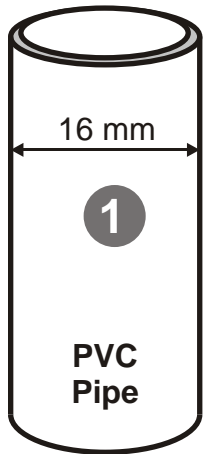
Coax Cables

RG188
 $v = 0.71$ $d = 2.6 \text{ mm}$

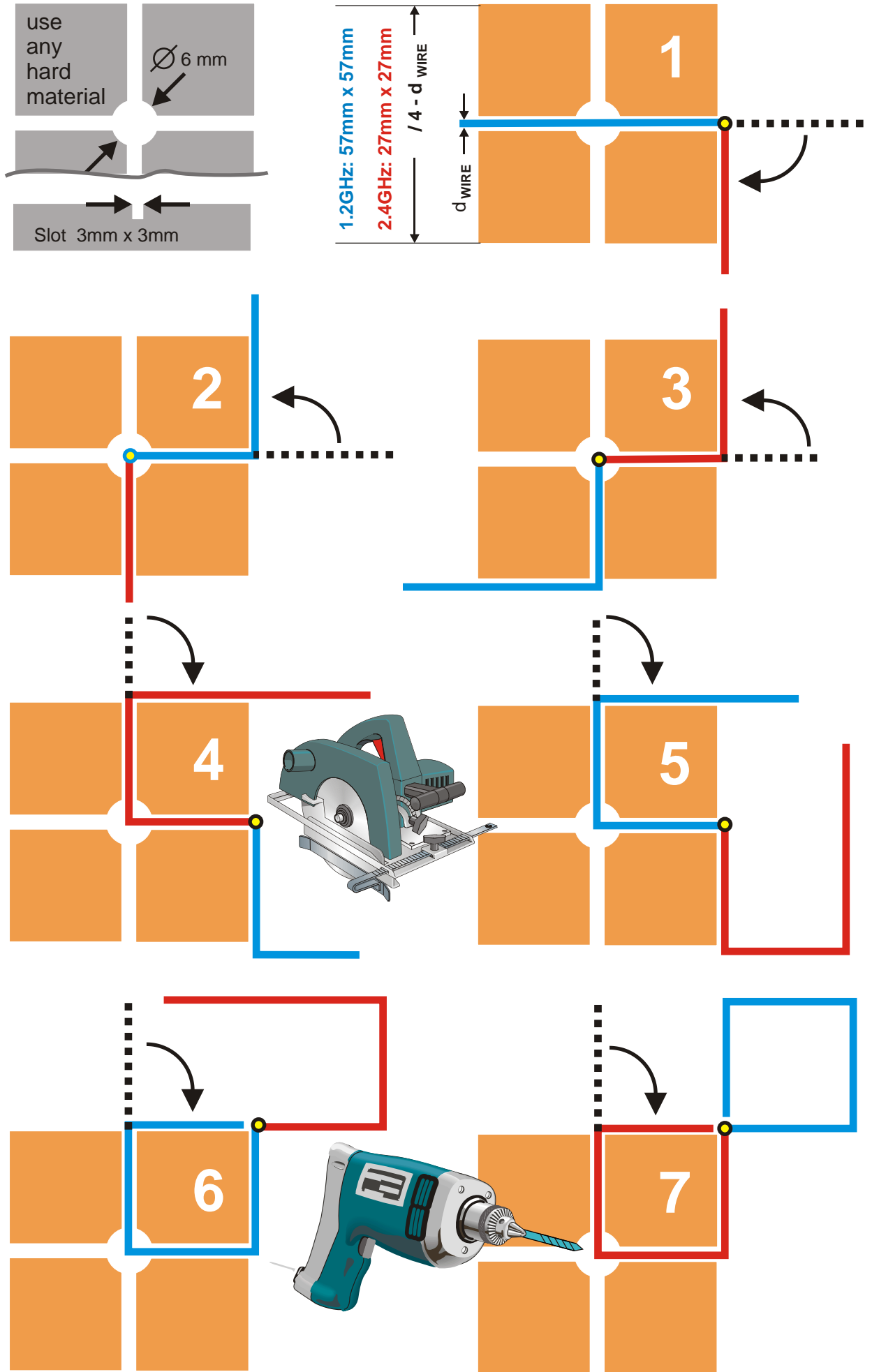
RG58
 $v = 0.66$ $d = 4.95 \text{ mm}$

Aircell7
 $v = 0.83$ $d = 7.3 \text{ mm}$

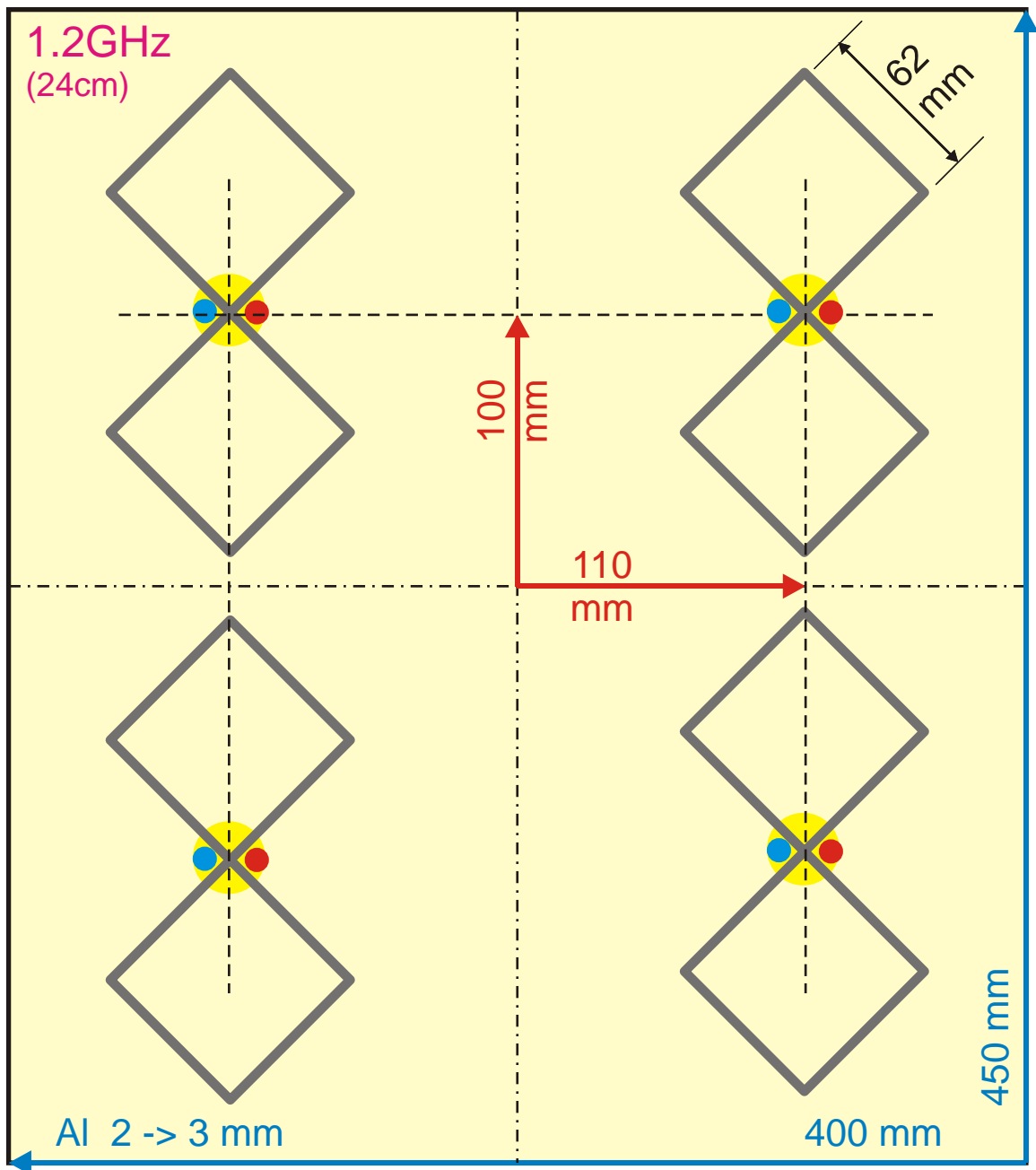
Construction Hints



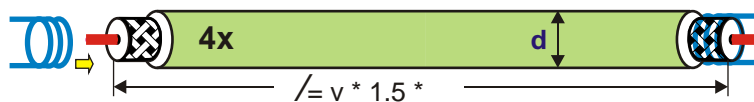
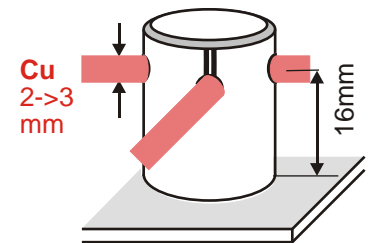
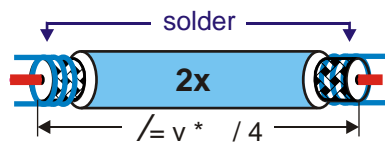
Bending Gauge for Quad Elements



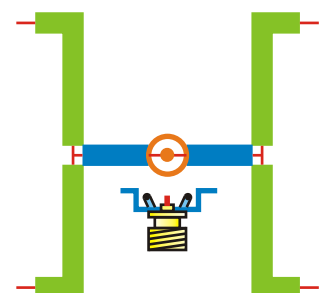
Hybrid-Double-Quad-Array Antenna for 1.2 GHz



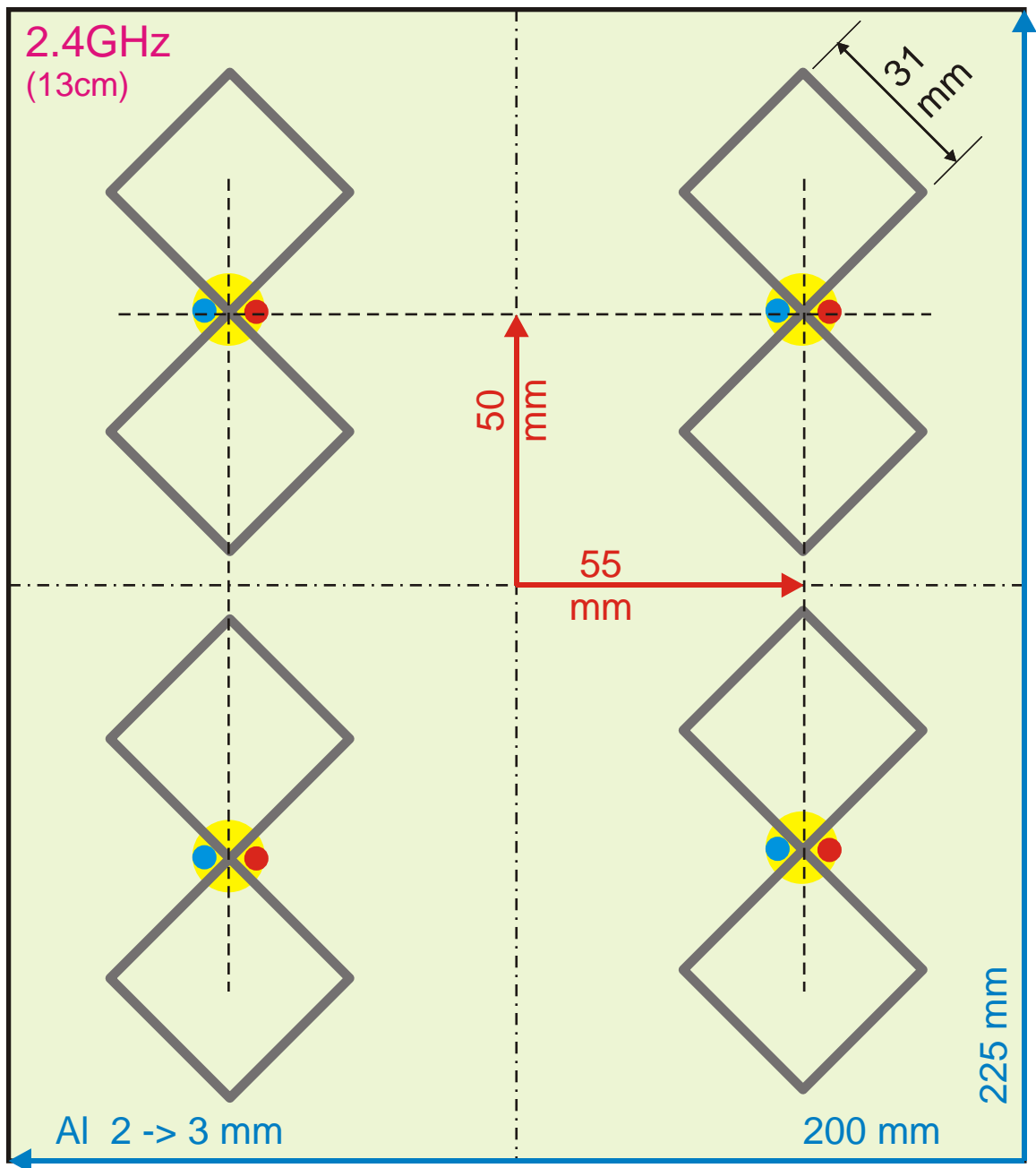
Gain: approx. 14dB_D
 f = 1.2 GHz
 = 249.2 mm



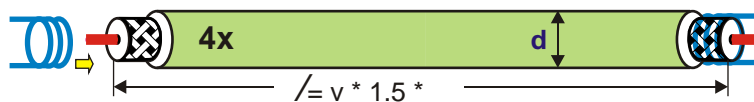
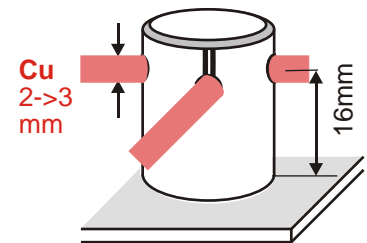
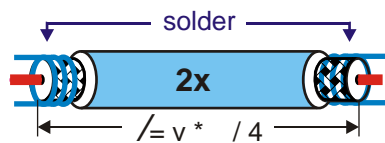
Coax Type	LOSS dB/100m 1.3 / 2.3 GHz	d/mm	v	v * 1.5 *	v* /4
RG188	110 / -	2.6	0.70	265.4 mm	44.2 mm
RG58	65 / 100	4.95	0.66	246.7 mm	41.1 mm
Aircell7	26 / 38	7.3	0.83	310.2 mm	51.7 mm



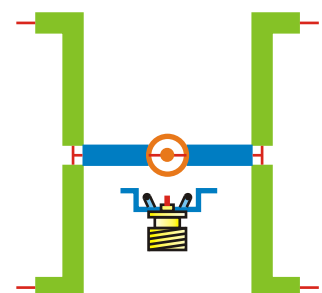
Hybrid-Double-Quad-Array Antenna for 2.4 GHz



Gain: approx. 14dB_D
 f = 2.4 GHz
 = 124.6 mm



Coax Type	LOSS dB/100m 1.3 / 2.3 GHz	d/mm	v	v * 1.5 *	v * 1/4
RG188	110 / -	2.6	0.70	132.7 mm	22.1 mm
RG58	65 / 100	4.95	0.66	123.4 mm	20.6 mm
Aircell7	26 / 38	7.3	0.83	155.1 mm	25.9 mm



Hybrid-Double-Quad-Array Antenna for 2.4 GHz

