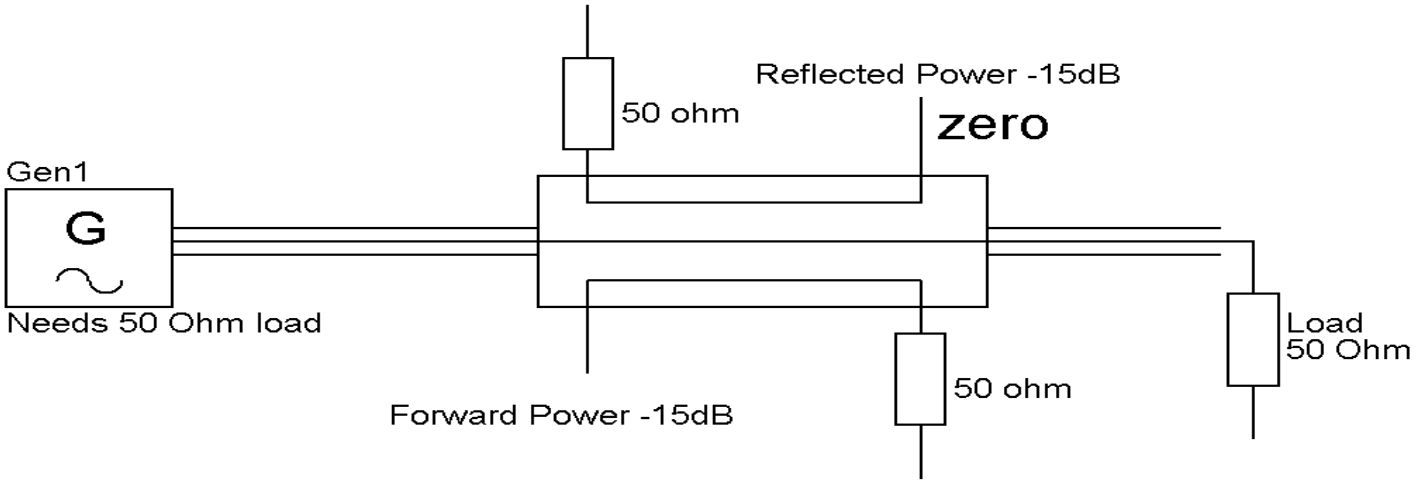
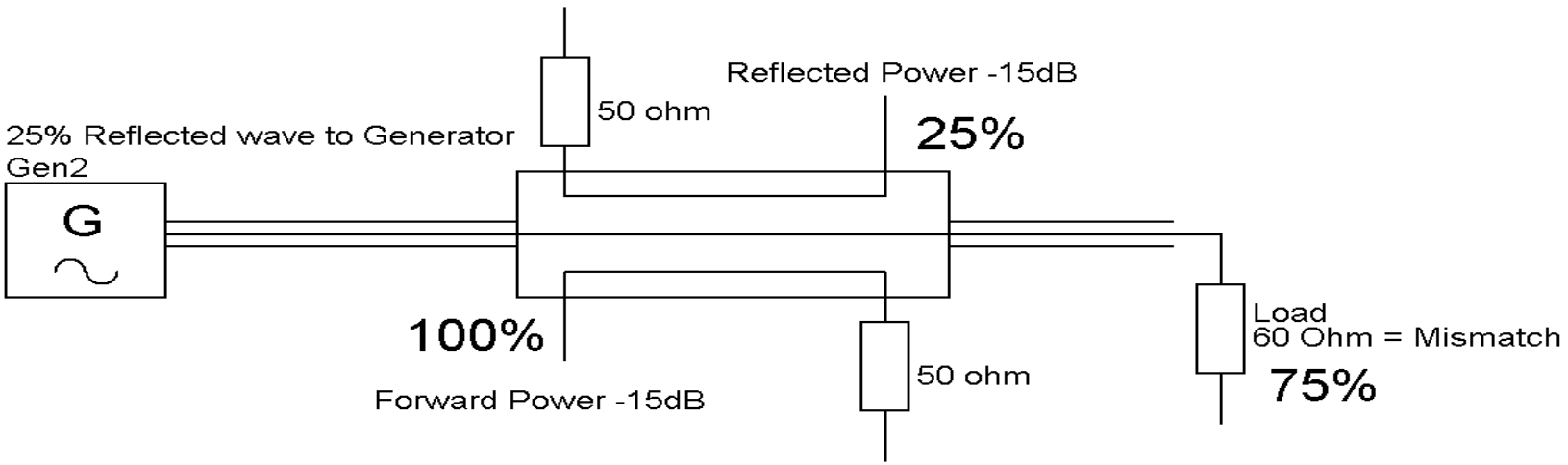
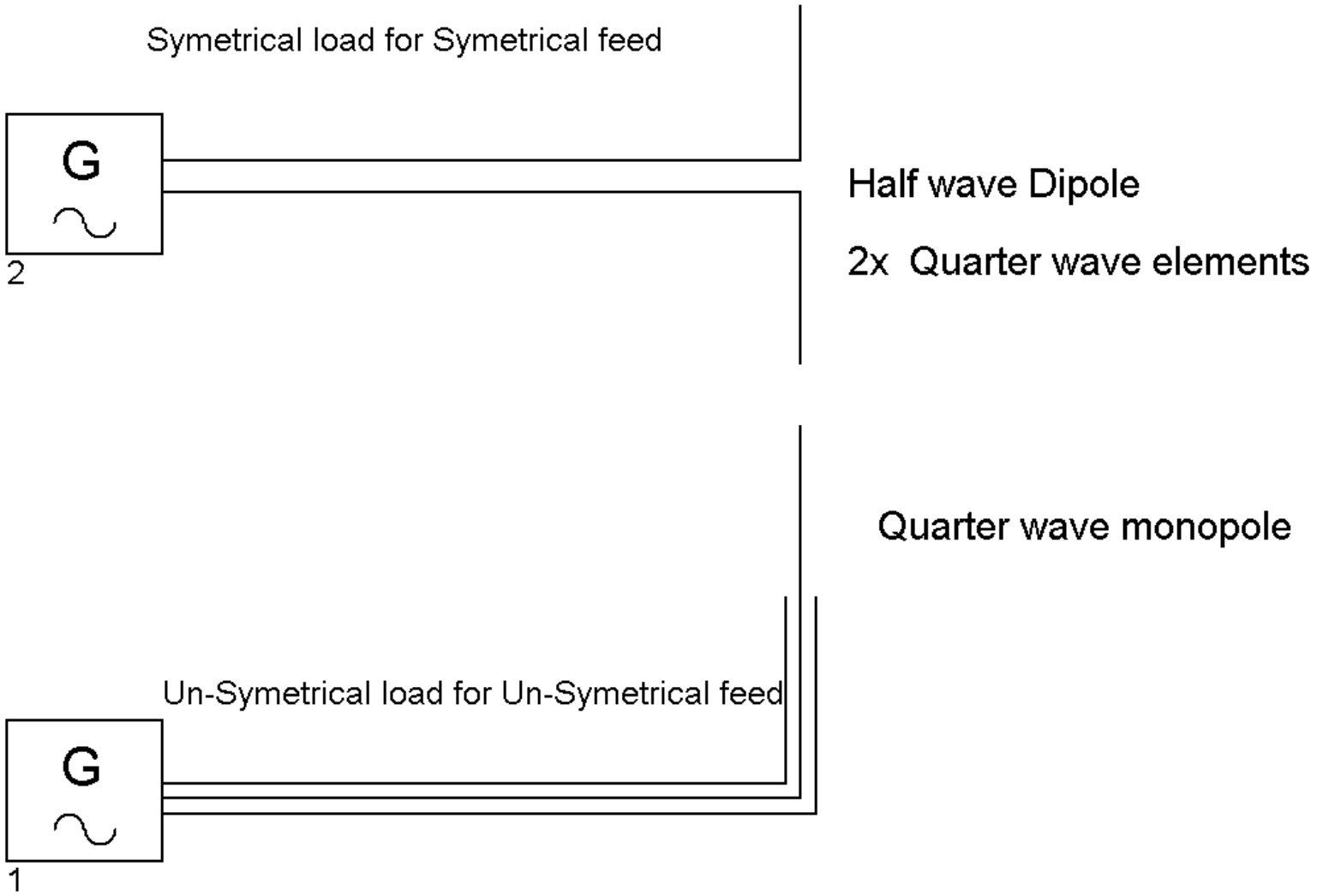
Antennas

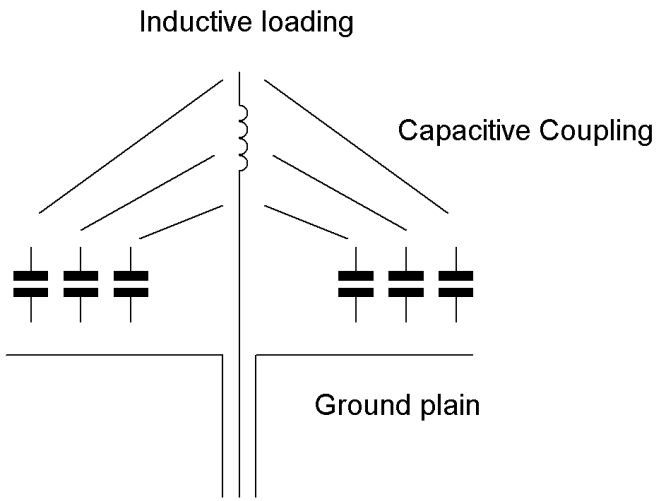
Peter Wright 2005

Directional Coupler



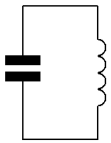


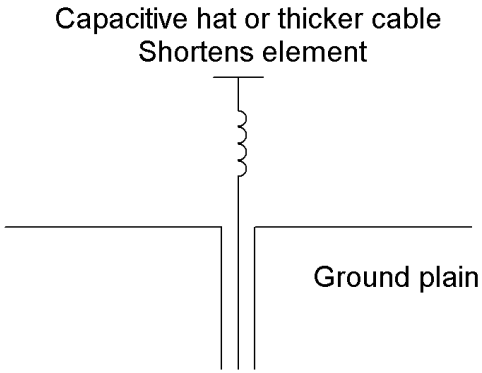

Symetrical load for Symetrical feed
G
2
Half wave Dipole
2x Quarter wave elements
Quarter wave monopole
Un-Symetrical load for Un-Symetrical feed
G
1



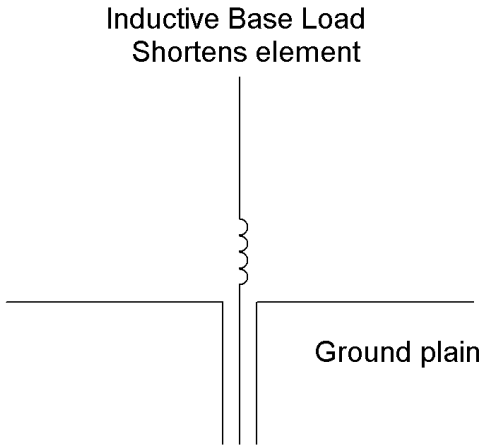
How is an antenna Resonant ?

Optimum Q



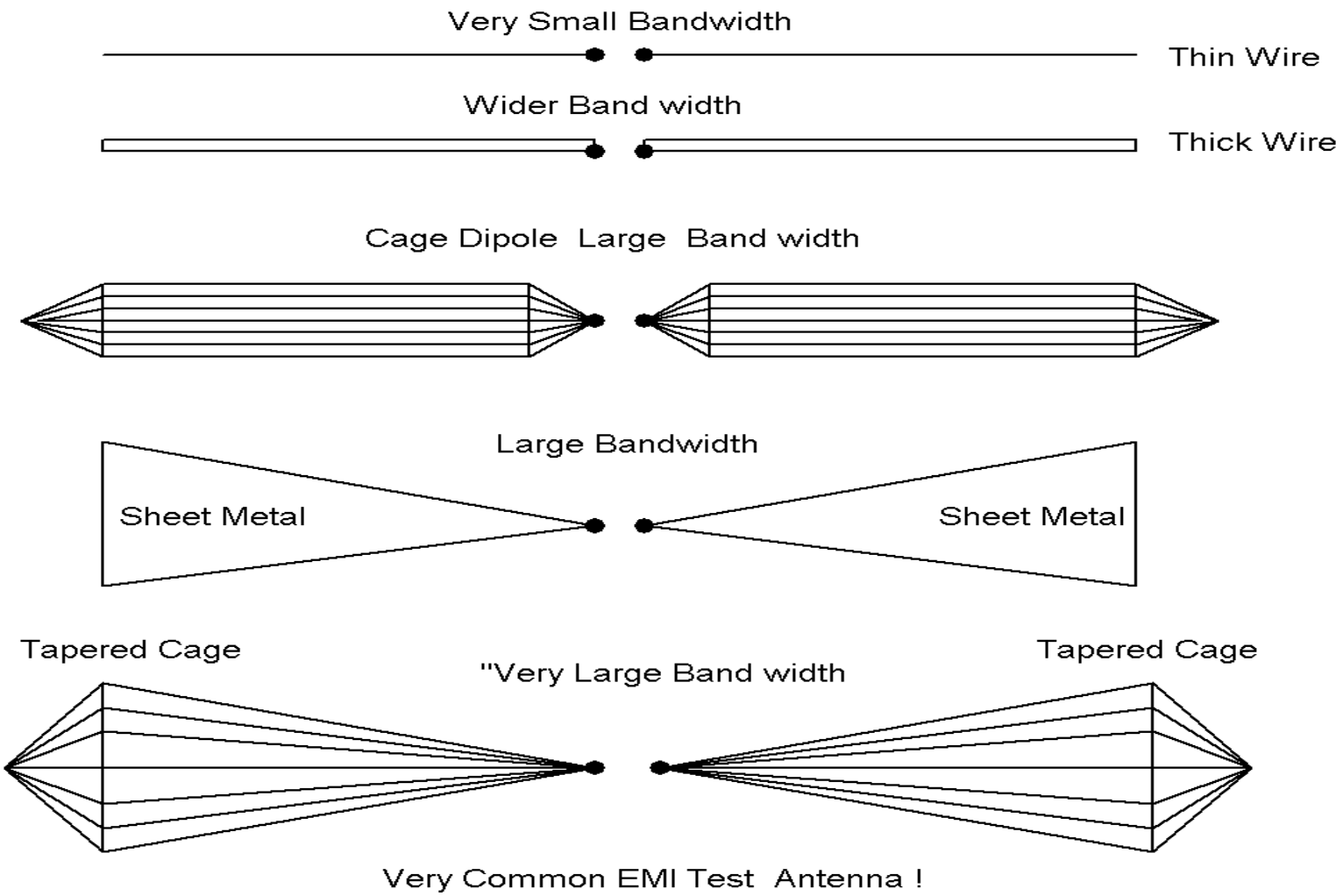


C May be increased



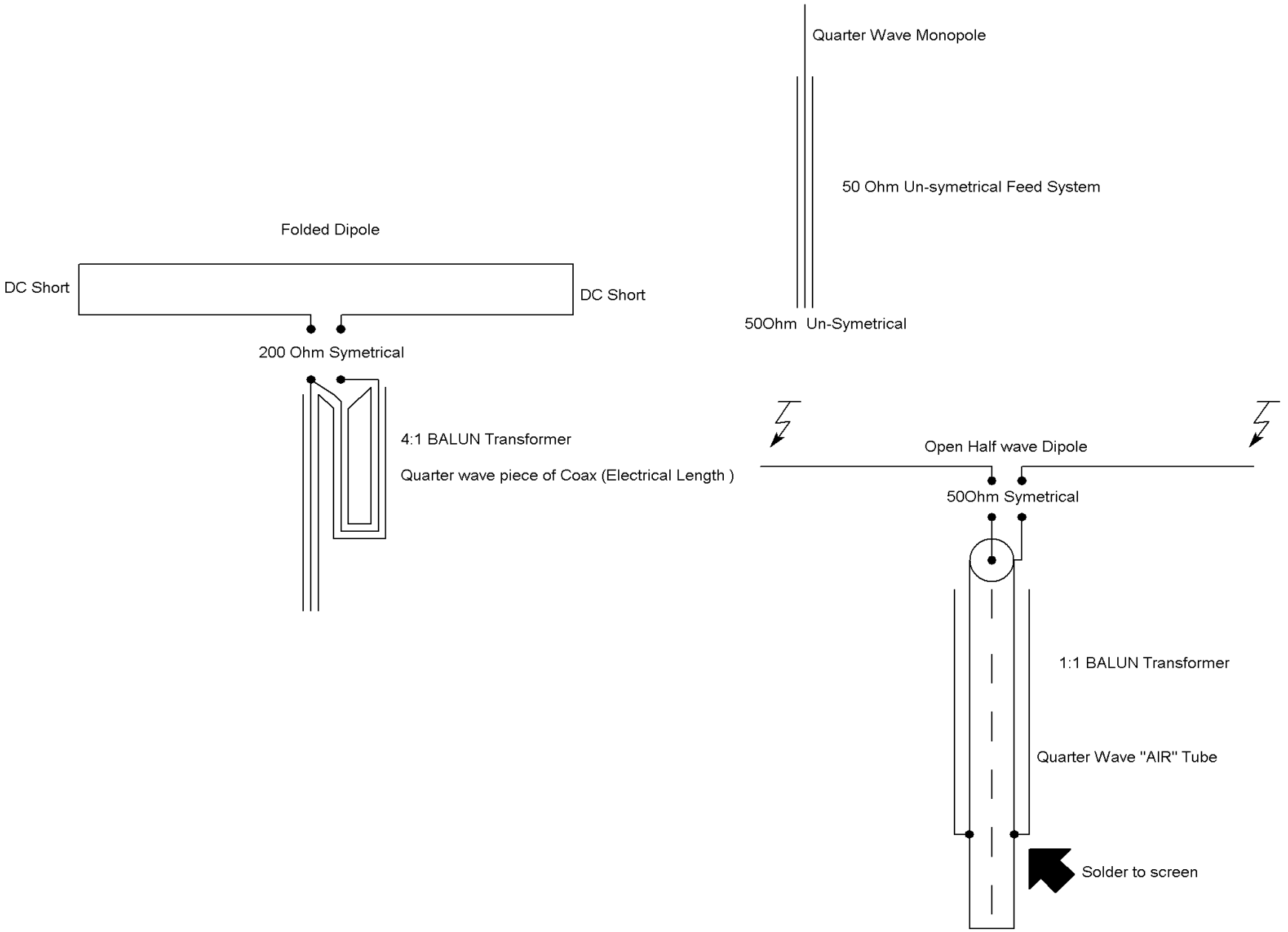
L may be increased

Element Thickness to Frequency bandwidth

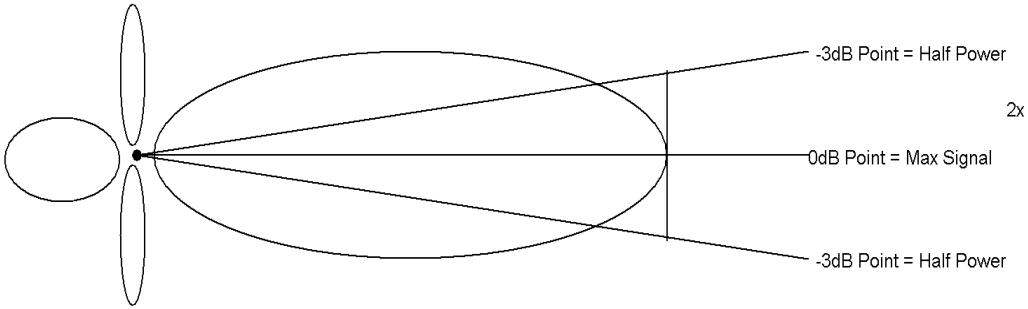


Basic Rules

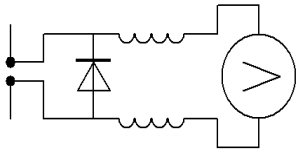
- Antennas are Resonant at design frequencies and their Harmonics however with different beam radiation patterns
- Antennas may be stacked or grouped together for more gain however the feed Impedance needs always to be matched to the Generator !


Quarter Wave Monopole
50 Ohm Un-symetrical Feed System
50Ohm Un-Symetrical
Folded Dipole
DC Short
DC Short
200 Ohm Symetrical
4:1 BALUN Transformer
Quarter wave piece of Coax (Electrical Length)
Open Half wave Dipole
50Ohm Symetrical
1:1 BALUN Transformer
Quarter Wave "AIR" Tube
Solder to screen

Calculation of Beam Width



2x the Half Power Angle = Beam Width



Signal Strength detector

Simple Dipole

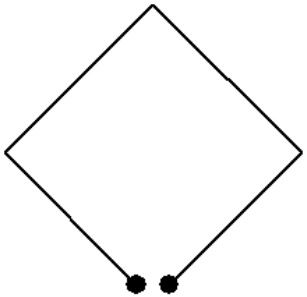
50 Ohm

Folded Dipole

200 Ohm

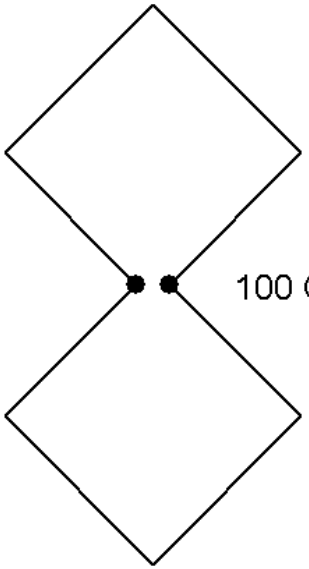
Quad

Each Leg a Quarter Wave length



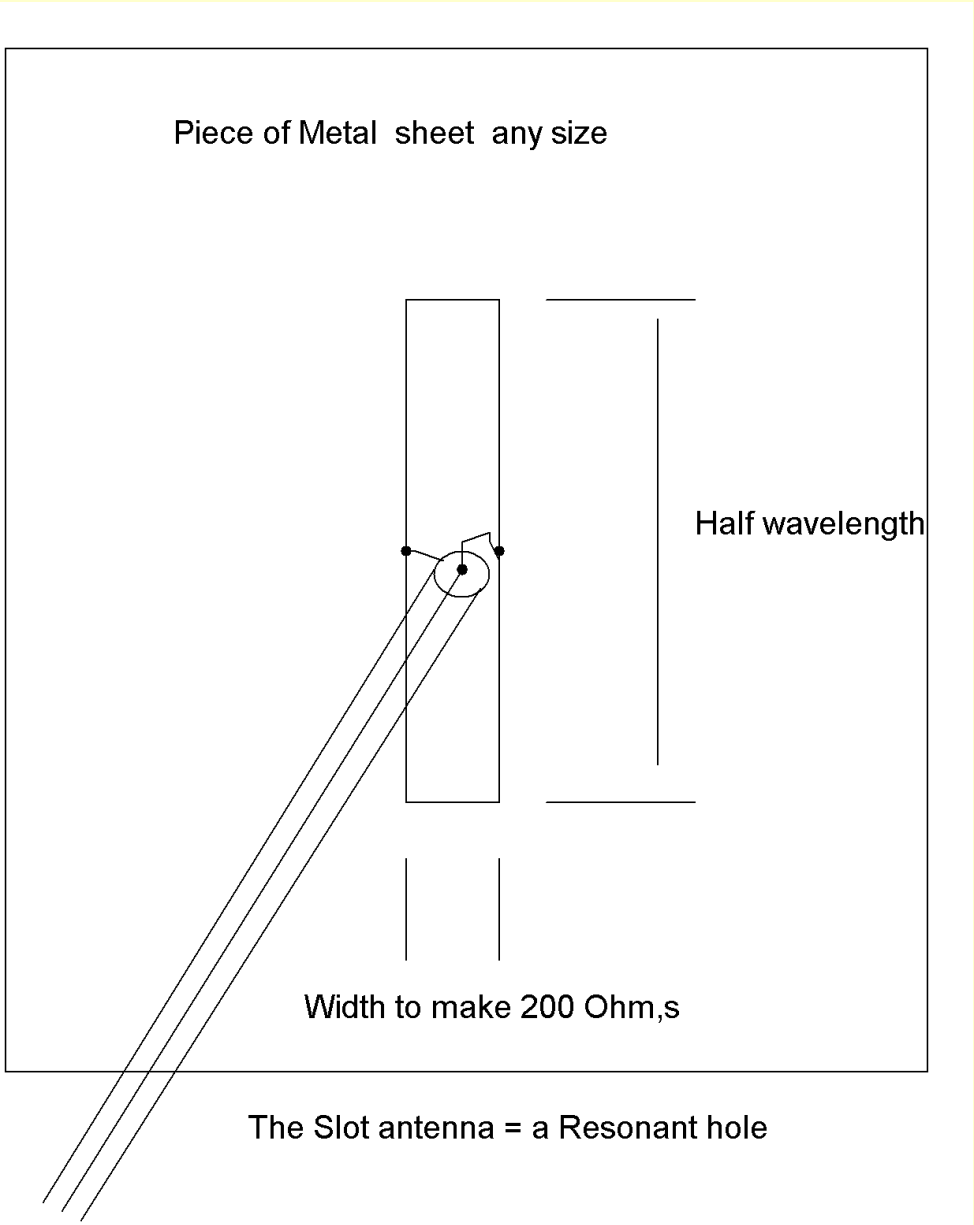
200 Ohm

Double Quad

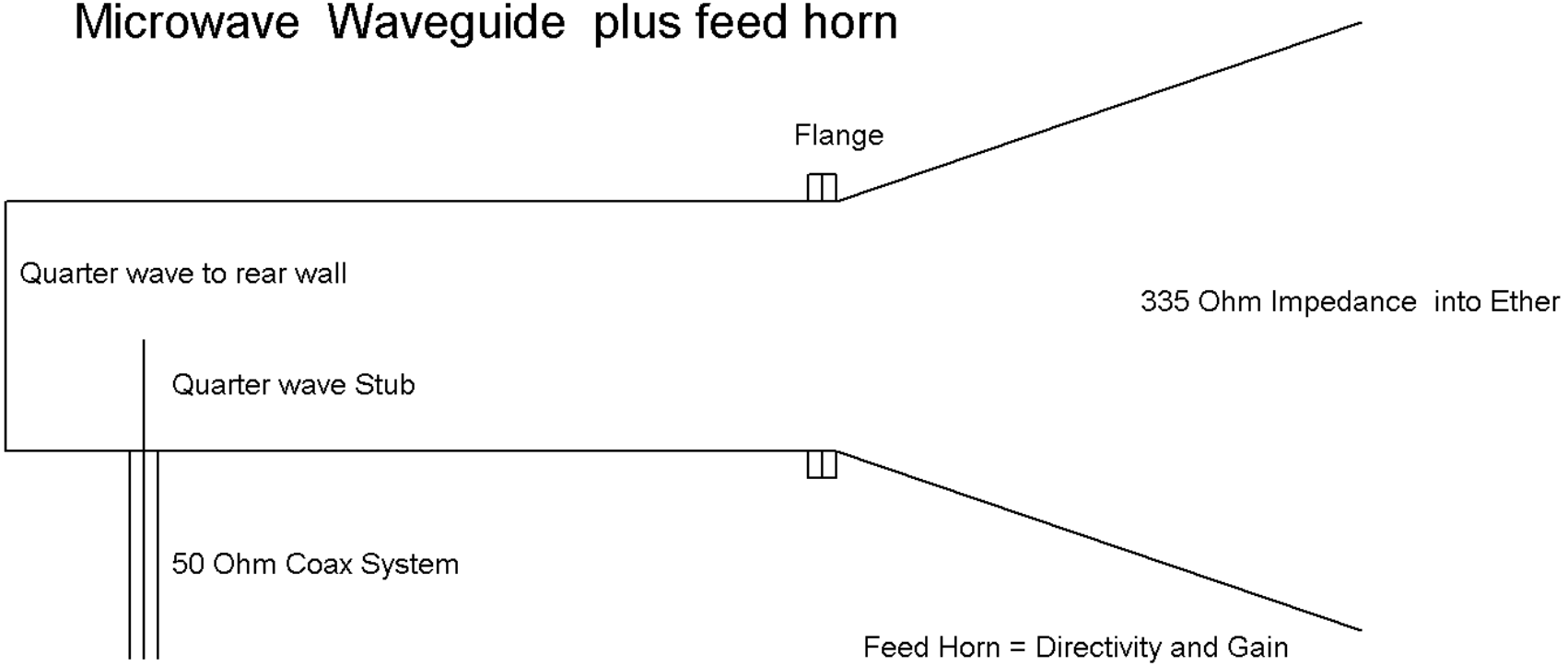


100 Ohm

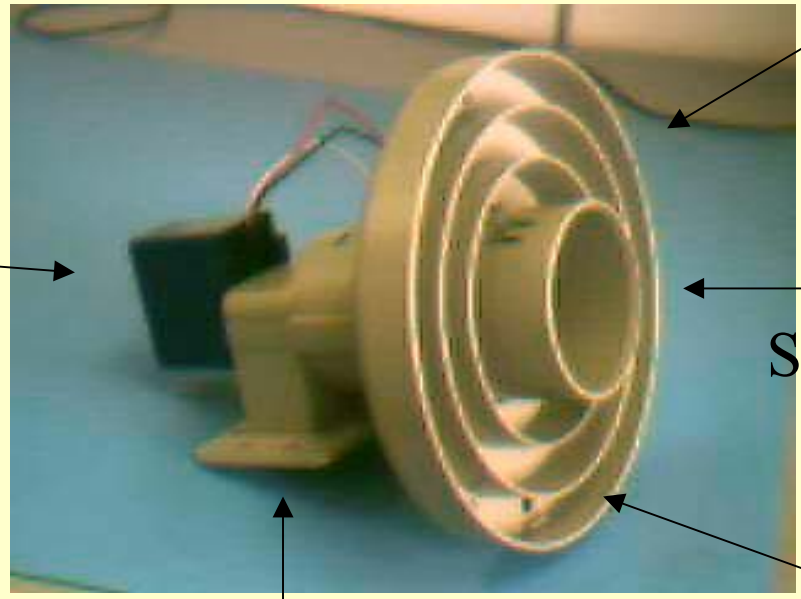
Directivity again with Reflectors and directors


Piece of Metal sheet any size
Half wavelength
Width to make 200 Ohm,s
The Slot antenna = a Resonant hole

Microwave Waveguide plus feed horn



Sectoral Horn Parabolic

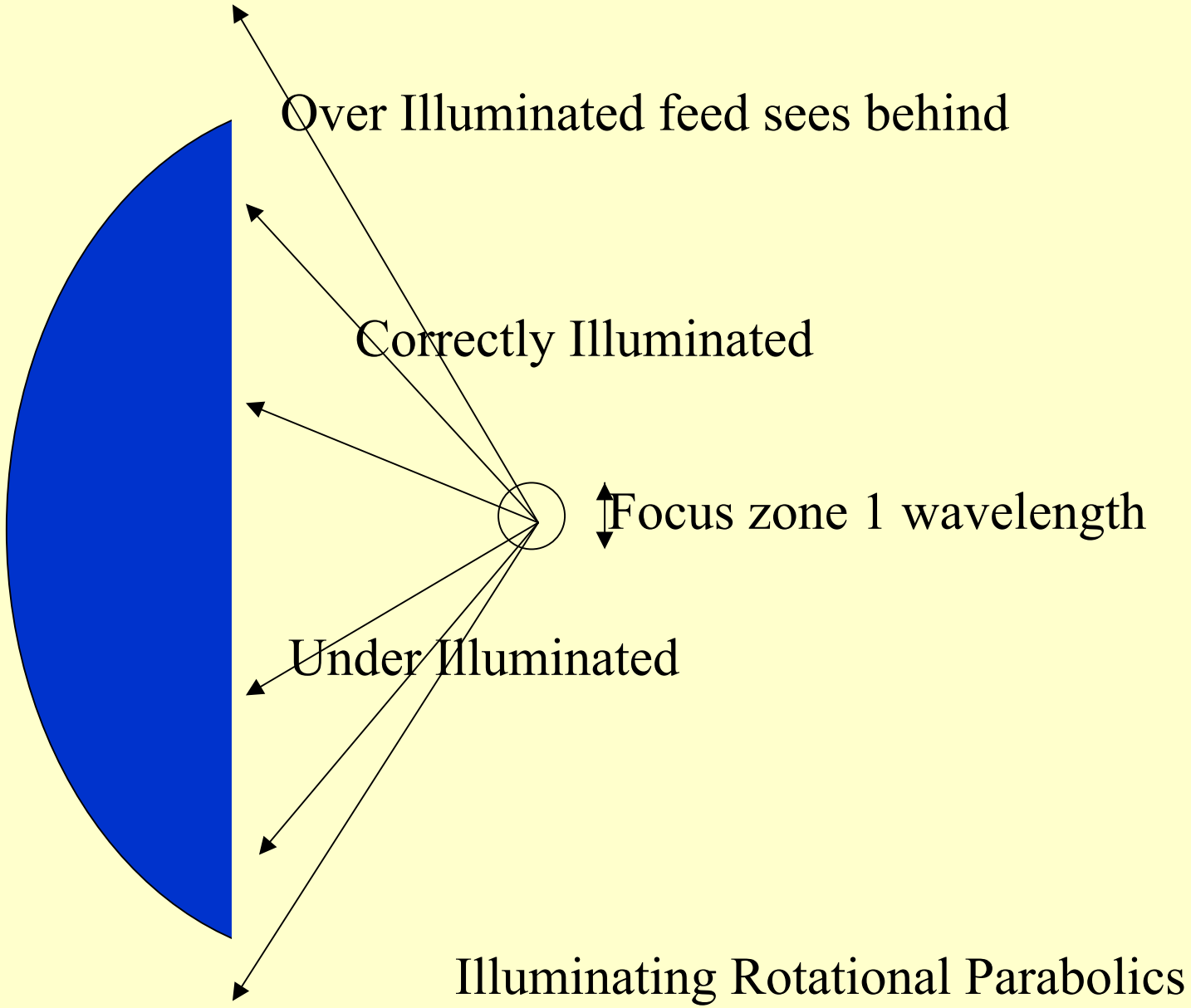


Probe motor

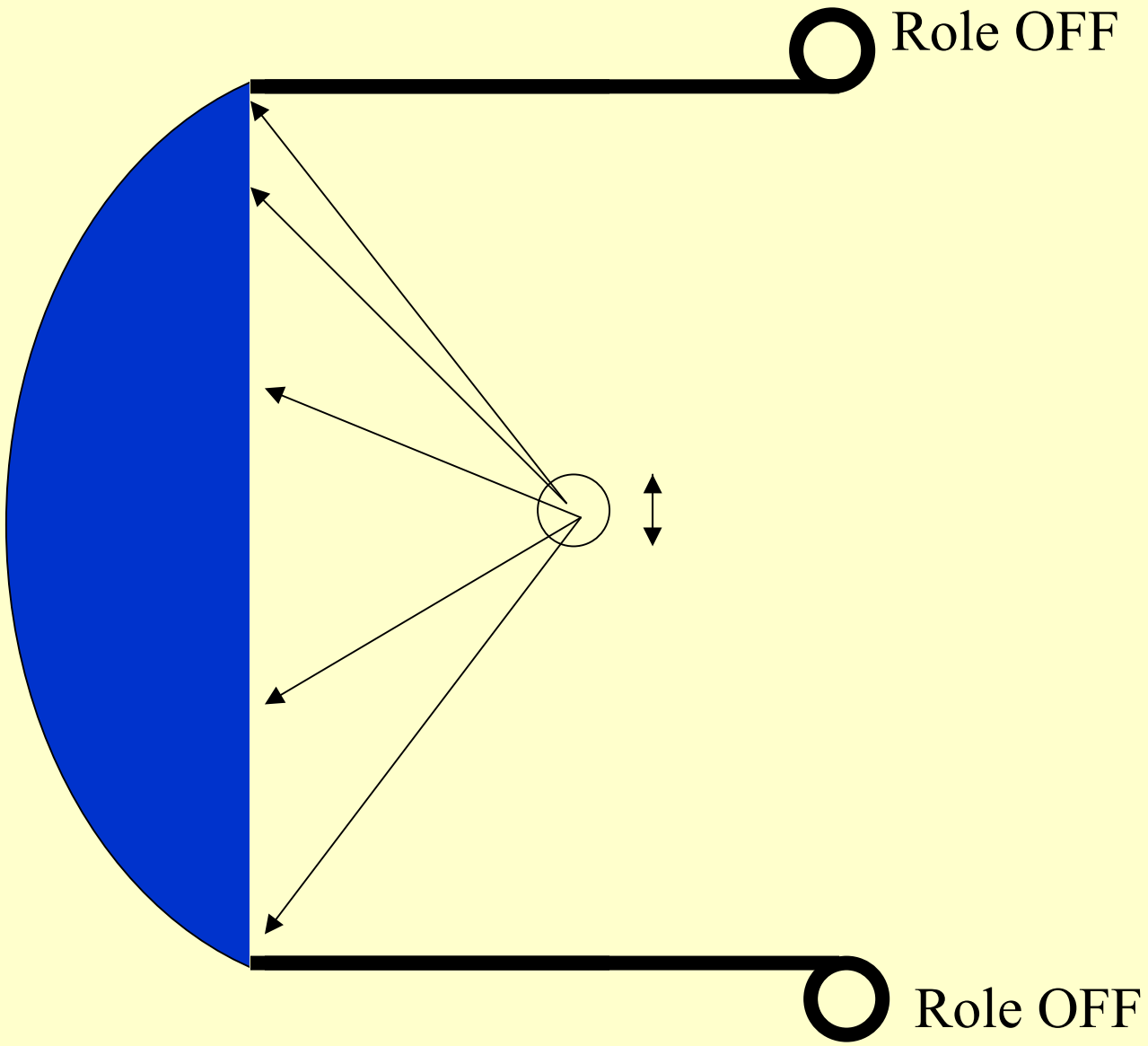
Signal

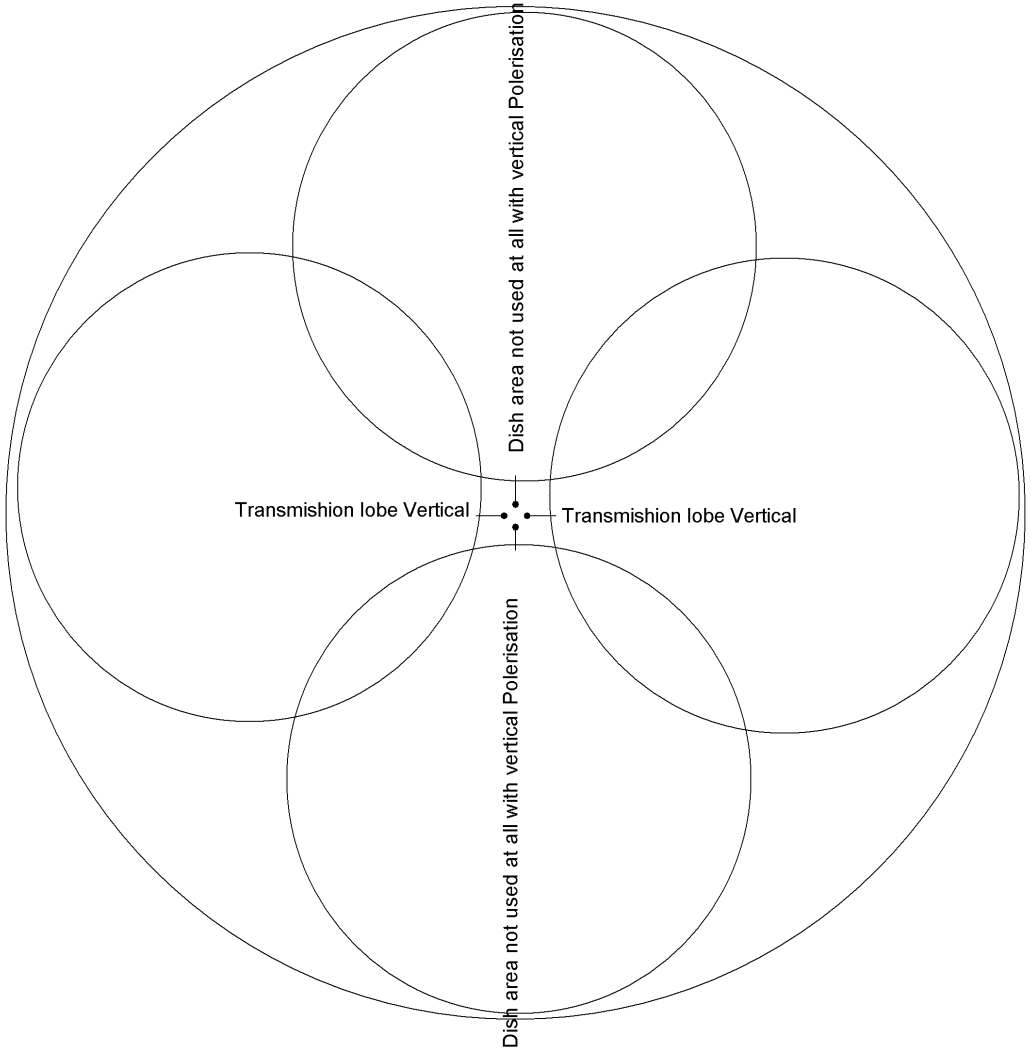
Beam angle

Wave guide flange


Over Illuminated feed sees behind
Correctly Illuminated
Focus zone 1 wavelength
Under Illuminated
Illuminating Rotational Parabolics

Using a Side Wall

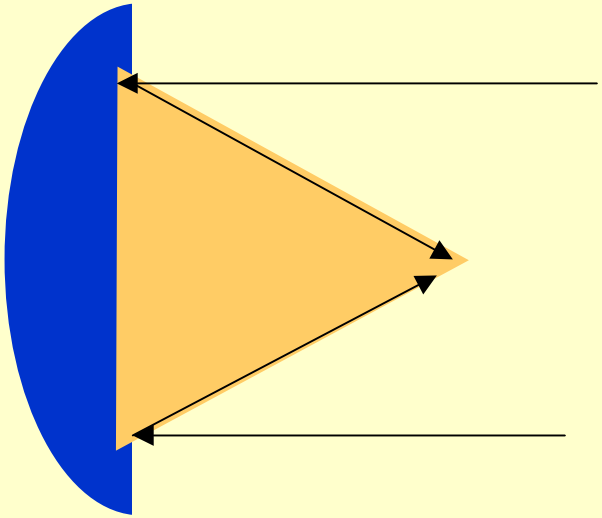




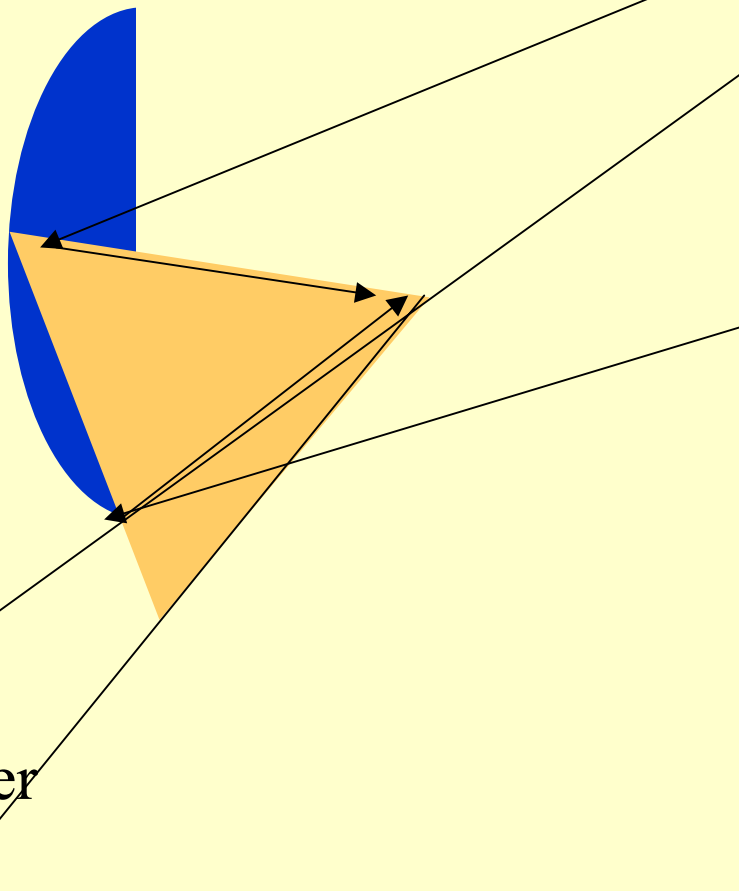
Illumination of a Rotatioal Parabolic dish with V or H

Offset Focus = Lower Gain , See,s Background

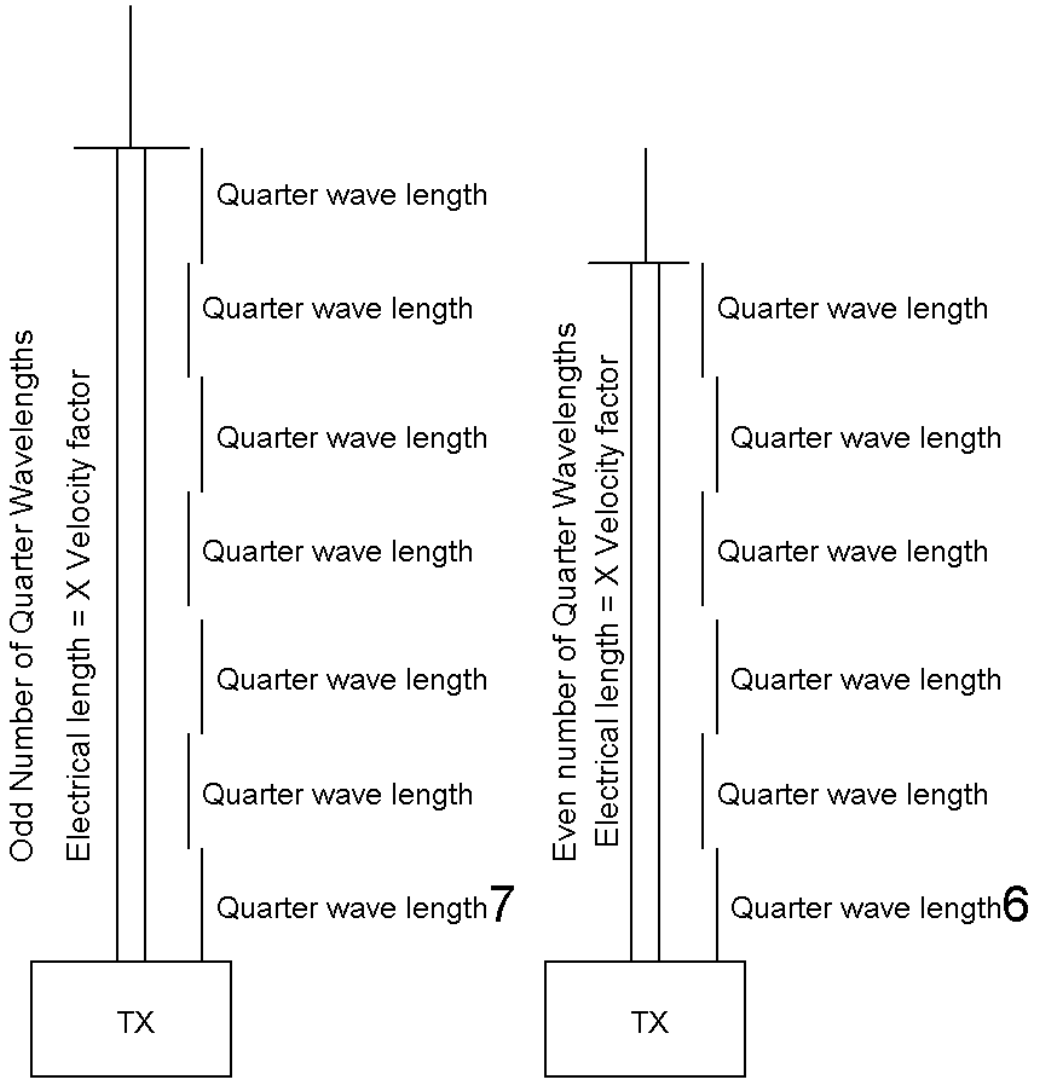
Signal to noise Rises !



Central focus= Full gain no 300°K



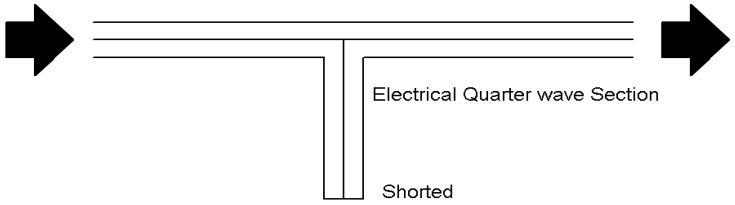
Spill over



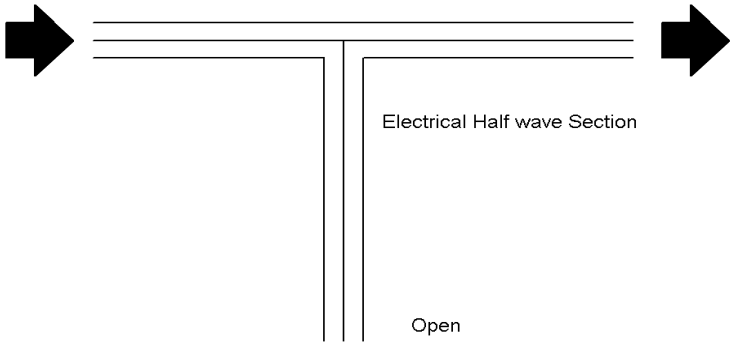
Correct Electrical match Here the coax feed is Ressonant

The Antenna has no funktion the cable will get hot

Coax cables when resonanant are the wort thing that can happen to an engineer !!

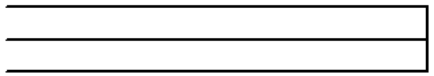


A Quarter wave "Shorted STUB" is Resonant at its Electrical Length frequency and so filters out an unwanted Sig

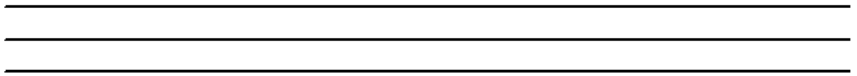


A Half wave " OpenSTUB" is Resonant at its Electrical Length frequency and so filters out an unwanted Signal

Coaxial and parrallel lines



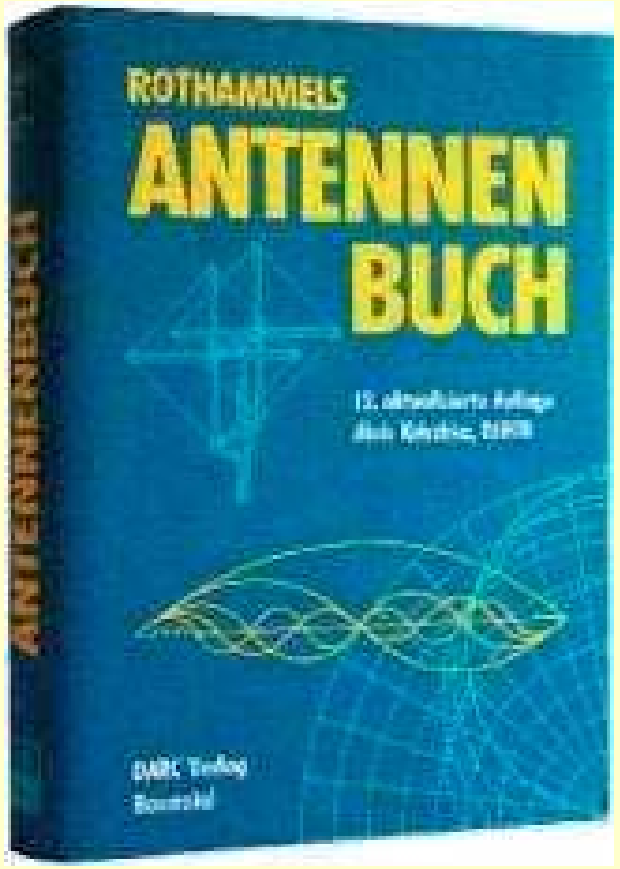
Quarter wave section resonant when shorted



Half wave section resonant when open

A Dammed good Book

- Karl Rothammel Antennenbuch




End