

# Quarter Wave Antennas

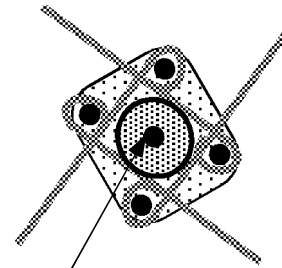
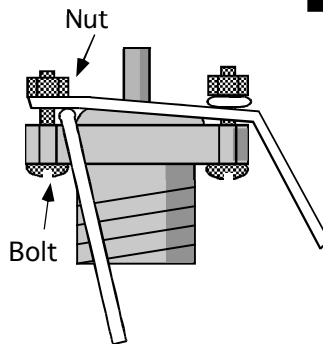
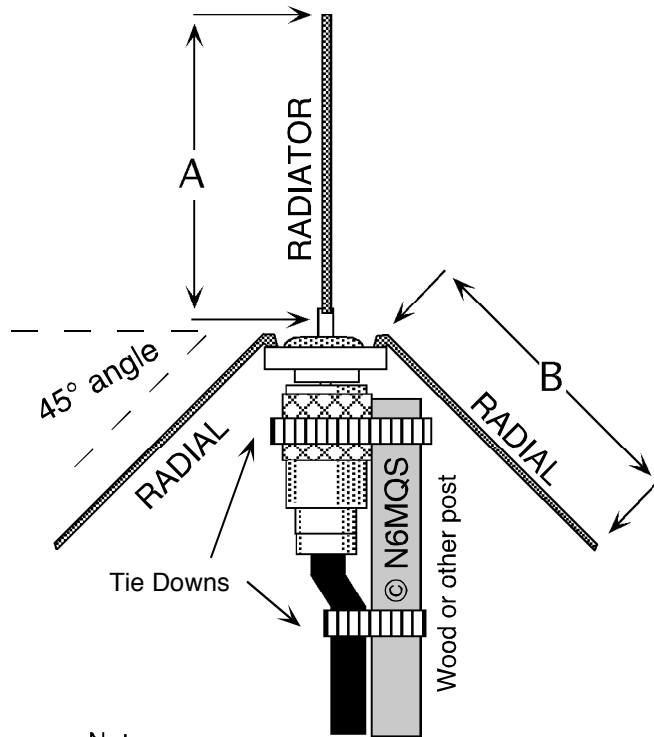
One of the simplest antennas you can build is a quarterwave ground plane antenna. It is small in size and is inexpensive.

The only part you will need to buy is a SO-239 panel mount connector. You can use an old wire hanger for the radiator and radials.

You will need to use your soldering iron or gun to attach the radiator to the center post of the SO-239. File any paint or coating from the radiator wire before soldering. Cut the radiator to the proper length before soldering it. If you can find a short copper tube to help secure the radiator to the SO-239, your antenna will stand up to high winds.

The radials may be soldered or attached with screws. Screws are the easier method if you take the time to overlap them as shown in the diagram. Cutting the radials may be done after the construction is complete.

The radials should be bent to an angle of 45 degrees for 52 ohm base impedance. If the radials are perpendicular to the radiator, the base impedance is approx. 36 ohms. Radials parallel to the radiator have an impedance of approx 75 ohms.



$$\frac{2808}{\text{FREQ}} = \text{RADIATOR LENGTH IN INCHES}$$

$$\frac{2948}{\text{FREQ}} = \text{RADIAL LENGTH IN INCHES}$$

Apply a small amount of sealant around the center pin to prevent water from entering the connector

# FREQUENCY CUTTING CHART

RADIATOR			RADIATOR			RADIATOR		
FREQ	RADIALS		FREQ	RADIALS		FREQ	RADIALS	
28.1	99.93	104.93	144.0	19.50	20.48	423.0	6.64	6.97
28.2	99.57	104.55	144.5	19.43	20.40	424.0	6.62	6.95
28.3	99.22	104.18	145.0	19.37	20.33	425.0	6.61	6.94
28.4	98.87	103.82	145.5	19.30	20.26	426.0	6.59	6.92
28.5	98.53	103.45	146.0	19.23	20.19	427.0	6.58	6.90
28.6	98.18	103.09	146.5	19.17	20.13	428.0	6.56	6.89
28.7	97.84	102.73	147.0	19.10	20.06	429.0	6.55	6.87
28.8	97.50	102.38	147.5	19.04	19.99	430.0	6.53	6.86
28.9	97.16	102.02	148.0	18.97	19.92	431.0	6.52	6.84
29.0	96.83	101.67				432.0	6.50	6.83
29.1	96.49	101.32				433.0	6.48	6.81
29.2	96.16	100.97	220.0	12.76	13.40	434.0	6.47	6.79
29.3	95.84	100.63	220.5	12.73	13.37	435.0	6.46	6.78
29.4	95.51	100.29	221.0	12.71	13.34	436.0	6.44	6.76
29.5	95.19	99.95	221.5	12.68	13.31	437.0	6.43	6.75
29.6	94.86	99.61	222.0	12.65	13.28	438.0	6.41	6.73
29.7	94.55	99.27	222.5	12.62	13.25	439.0	6.40	6.72
29.8	94.23	98.94	223.0	12.59	13.22	440.0	6.38	6.70
29.9	93.91	98.61	223.5	12.56	13.19	441.0	6.37	6.69
50.0	56.16	58.97	224.0	12.54	13.16	442.0	6.35	6.67
50.5	55.60	58.38				443.0	6.34	6.66
51.0	55.06	57.81				444.0	6.32	6.64
51.5	54.52	57.25				445.0	6.31	6.63
52.0	54.00	56.70				446.0	6.30	6.61
52.5	53.49	56.16				447.0	6.28	6.60
53.0	52.98	55.63				448.0	6.27	6.58
53.5	52.49	55.11				449.0	6.25	6.57
54.0	52.00	54.60				450.0	6.24	6.55

## About Rubber Ducks

The rubber duck antenna on your handheld is not a very efficient antenna. The typical 2 meter rubber duck has a 5 db loss. If you have a 3 watt radio, your rubber duck will only radiate less than 1 watt!!

A quarterwave antenna has 0 db loss and will allow all 3 watts to be radiated!!

## Did you know...

Why we use 52 ohm coax ?

During world war II it was discovered that the minimum amount of material was needed to make a 52 ohm cable. It conserved critical war materials and increased profits for the manufactures!

Thanks to W3JIW for the info!