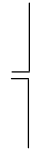
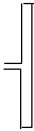
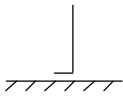
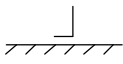
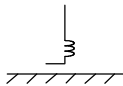
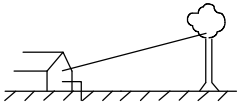

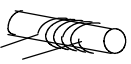
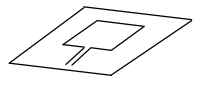


Antenna Examples

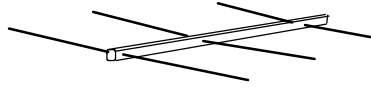
Antennas come in a nearly infinite number of shapes and sizes. Here are a few of the more common ones. Note that many other designs are variations of others.

“Non-directional” Types

Antenna	Impedance	Features
1) Halfwave Dipole 	73+j0 Ohms	Relatively isotropic, simple construction
2) Folded (halfwave) Dipole 	300 + j0 Ohms	Similar to dipole. Higher impedance. Sometimes used in simple vertical arrays.
3) Quarterwave Monopole 	36+j0 Ohms	Similar to dipole. Ground-plane often abbreviated (e.g. case of cell-phone is ground plane)
4) Short Monopole 	R - j X R << 36, X large	Physically shorter than quarterwave monopole, but requires resonating coil and/or matching network.
5) Loaded monopole 	R + j0	Similar to short monopole, but resistive input impedance. Can be engineered to be nominally 50 Ohms.
6) Simple longwire 	Varies Widely	Simple useful design at low freq (e.g. < 30 MHz). Often used for shortwave receivers.
7) Simple large loop 	Varies Widely	Simple, low-cost. Often used for UHF TV antennas.
8) Small ferrite-core loop 	R + jX	Physically small with large effective aperture. Used in portable AM broadcast receivers and some pagers.
9) Microstrip patch 	50 Ohms	Simple, low-cost. Useful mainly at high frequency (e.g. 1+ GHz).

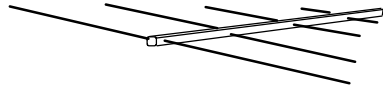
Directional Designs

1) Yagi-Uda



Moderate gain (10 dB)
Good front-to-back ratio.
Relatively simple construction.

2) Log-Periodic



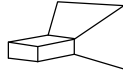
Similar to Yagi-Uda, but
broadband. Lower gain
and less directivity.

3) Corner Reflector



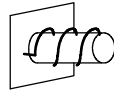
Good "sector-coverage" (i.e.
beamwidth of 90 to 120 degrees
with excellent front/back ratio).
Often used in cell-towers.

4) Horn



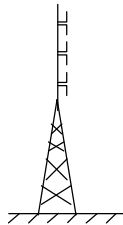
Gains to about 12 dB. Good
illumination pattern for dish
antennas.

5) Helix



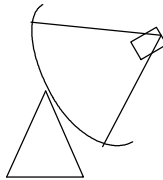
Circular polarization. Moderate
gain, and good illumination for
dish antenna.

6) Linear, vertical array
(tower-mounted dipoles)



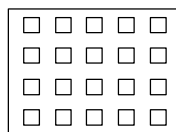
Concentrates power toward
horizon for max range. Used
in public-safety (police/fire/etc.)
Used in cell-towers when array
embdded in corner reflector.

7) Parabolic dish



High-gain, narrow-beamwidth.
Simple, low-cost construction.

8) 2-D Phased-array



High-gain, narrow-beamwidth,
rapid-steering. Relatively high
cost.