

Let's examine each component:

- 1) **Antenna - Couples** the incoming e.m. propagating wave into the receiver.
- 2) **Low-Noise Amplifier - Boosts** the power of the initial signal above the receiver noise.
- 3) **Preselector Filter - Allows only** the frequency band of interest to pass into the receiver (e.g., for FM radio 88-108 MHz).
- 4) **Local Oscillator/Mixer - Translates** the signal from its propagation frequency to a lower, fixed intermediate frequency (IF).
- 5) **IF Amplifier - A high-gain amplifier that greatly increases** signal power (i.e., to a detectable level).
- 6) **IF Filter - Allows only** the signal of interest to pass. Bandwidth is typically that of the desired signal. (e.g., 200 kHz for FM radio, 20 kHz for AM radio).
- 7) **Detector/Demodulator - Extracts** the signal information (or, at least tries to !) from the IF signal.
- 8) **The Recovered Signal $\hat{a}(t)$ -** The receiver's "guess" at what the original signal was. Ideally, $\hat{a}(t) = a(t)$, but channel propagation "uncertainties" and noise make perfect reproduction impossible !

