<box orange |**Under Construction**> VE7HZF is editing this section, please do not edit it until this notice is taken down. </box>

Station Assembly, Practice and Safety

HF Station

Some of the components shown above may be integrated into one device, and others may be optional. But if all are included, this is how they should be connected.

- The **transceiver** takes the audio from the microphone and creates a modulated radio signal. Typical HF radios can output about 100W of power. Hams with their advanced ticket can feed that into...
- The **amplifier** takes the radio signal from the transceiver and amplifies its power to 1 kW or even 1.5 kW.
- From there, the signal may contain higher frequencies (called harmonics) that are not desirable, so it goes through a **Low Pass Filter**, which passes low frequencies and filters out high ones.
- After that, the **SWR Bridge** measures how much of the signal is reflected back toward the radio from the antenna system. We saw earlier that the length of the antenna needs to match the frequency we use. When the match isn't perfect, some of the radio signal “bounces” at the antenna back to the radio, which isn't good for the equipment. The **SWR Bridge** measures this.
- A trick we use to protect the radio equipment is to add a **Tuner**. This device uses varying combinations of capacitors and inductors (more on this later) to match the impedance of the antenna system to the radio (more on that later). Although there is still reflection at the antenna back toward the radio system, the tuner will “protect” the radio from it.
- An **Antenna Switch** is a handy piece of equipment to quickly switch between antennas without having to disconnect and connect coax connectors.
- Because of their size difference, it's usual to have a multiband antenna that will work on 20m, 17m, 15m, 12m, and 10m (and maybe even 6m), and a second antenna for 40m, 80m (and maybe even 160m).
- Where as a **tuner** for the upper band is optional if the antenna is well designed, the lower bands (specially 80m and 160m) are very wide compared to their frequencies so it's practically impossible to have an antenna that will work over the entire band. For that reason, a tuner for these bands is pretty much mandatory.
- The **Dummy Load** is a 50Ω resistor that can dissipate all the power from the radio without converting any of it into a radio waves. It's useful for test purposes or to tune an amplifier.

All that being said, it's possible to go on HF with a transceiver that has an small integrated tuner in it, and a single antenna. It'll just be a matter of knowing which frequencies your system can transmit on, and stay within them.

<box blue 80%> For the next few sections, review the Wave Modulation page. You should understand:

- the difference between the *baseband* signal and the *carrier*, and how they combine to form a *modulated* signal.
- the difference between *AM* and *FM*

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FM Transmitter

- The **microphone** picks up the sound wave carried by the air and converts them into a weak electrical signal (
- The **speech amplifier**
- The **modulator** uses the base band signal to change the carrier oscillator frequency in the next stage.
- The **oscillator** generates a stable sine wave signal at the rest frequency when no modulation is applied. Its frequency changes linearly when fully modulated with no measurable change in amplitude.
- The **frequency multiplier** changes increases the frequency by a factor of 2, 3, or 4. This is so that the oscillator frequency can be lower than the frequency transmitted at the antenna.
- The **amplifier** increases the power of the signal to be transmitted by the antenna.

The positive peak of the message signal generally lowers the oscillator's frequency to a point below the rest frequency, and the negative message peak raises the oscillator frequency to a value above the rest frequency. The greater the peak-to-peak message signal, the larger the oscillator deviation.

FM Receiver

Questions