STICKY-BEAKERS SPECIAL:: *Selecting a Receiver*

There are many different makes and models of shortwave radios, and they vary greatly in cost, features, size, complexity, and other factors. There is no one "right" shortwave radio for everyone. **The best shortwave radio for you depends primarily on your listening interests.** However, there are some features and specifications you should look for in any shortwave radio you consider.

Fundamental Considerations

Frequency coverage. Shortwave frequencies are usually considered those from the upper end of the AM broadcasting band, 1700 kHz, up to 30 MHz. The minimum frequency coverage you should look for is 540 kHz to 30 MHz. Most shortwave radios sold today also tune down to 150 kHz, covering the longwave band.

Frequency readout. Most shortwave radios sold today have a digital display showing the frequency the radio is tuned to. A few radios, usually less expensive models, have an analog "slide rule" frequency readout that does not indicate the precise frequency the radio is receiving. It can be very difficult and frustrating to find a station on a specific frequency without a digital display, so a **digital frequency display should be a "must"** for any shortwave radio you're considering. However, an analog readout shortwave radio can make a good, inexpensive "spare" radio for traveling, etc.

Modes. Some shortwave radios tune only AM mode stations, and these can be satisfactory for listening to most shortwave broadcasting stations. However, SSB is used by a few broadcasting stations in addition to ham, aeronautical, military, and maritime communications. A shortwave radio that can receive **SSB in addition to AM will greatly expand your listening options** on shortwave.

Selectivity Options. Selectivity is discussed in more detail below, but you need to consider how many selectivity bandwidths you can select. Some portable receivers allow you to choose between "wide" and "narrow" selectivity bandwidths, while some desktop shortwave radios have as many as five selectivity bandwidths. **Narrow selectivity bandwidths let you reduce interference** from stations on adjacent frequencies, although the audio quality of the desired station will be reduced as the selectivity is narrowed.

Antenna Connections. Some portable radios come with a built-in telescoping antenna but have no provision for an external antenna. Other portable shortwave radios have a jack that let you connect an external antenna. Most tabletop shortwave radios have connectors for external antennas. These usually include connectors for antennas using 50 ohm coaxial cables and others for antennas using ordinary insulated "hook-up" wire. **External antennas normally give better reception than built-in antennas**, although built-in antennas are usually satisfactory for listening to major international broadcasting stations. However, built-in antennas give poor results inside buildings with steel frames, like a high-rise condominium or apartment buildings. In such cases, the ability to connect an external antenna (even if it is only a few feet of wire) can make a significant improvement in reception.

Special Features and Controls

Here are some of the terms you need to understand when buying a shortwave radio. These terms are used to describe the features and controls found on shortwave radios:

Audio filter. This circuit rejects certain audio frequencies in the audio output of a receiver. A *bandpass* filter will pass a certain band of audio frequencies but reject others. A *low pass* filter will reject all audio frequencies above a certain frequency. A *high pass* filter rejects all audio frequencies below a certain frequency.

Automatic gain control (AGC). This circuit adjusts the gain of the receiver to maintain a relatively constant level of audio output from the receiver regardless of changes in the strength of the received signal. Some AGC circuits let you select how fast it reacts to a change in signal strength, such as a "slow" or "fast" AVC. This circuit is sometimes called an *automatic volume control* (AVC).

Beat frequency oscillator (BFO). A circuit that produces an internally-generated carrier to allow reception of SSB, CW, and FSK signals.

Crystal lattice filter. This device improves selectivity by increasing rejection of signals on adjacent frequencies.

Digital signal processing (DSP). Circuitry in which analog signals, such as audio or radio signals, are converted into digital form, manipulated and processed while in digital form, and then converted back to analog form.

Dynamic range. A measure of the strongest received signal that a receiver can handle with overloading or distortion. It is measured in decibels. A minimum satisfactory measurement is 70 dB; over 100 dB is preferred.

Memories. These allow storing of frequencies of favorite stations. Some receivers allow storing of mode, receiver bandwidth, etc., in addition to frequency.

Noise blanker/limiter. This circuit reduces noise due to electrical equipment, lightning, neon lights, etc. Noise limiters are simpler circuits that limit the maximum strength of noise pulses, while more complex noise blankers actually silence the receiver during noise pulses. While this circuits can help reduce noise, they cannot eliminate noise and often introduce some audio distortion.

Notch filter. A notch filter removes a very narrow slice from a received signal, either from the radio frequency itself ("RF notch") or from the audio output ("audio notch") of the receiver.

Passband tuning. A circuit that allows you to move the selectivity bandwidth above or below the frequency to which the radio is tuned. This is often helpful in reducing interference.

Product detector. This is a beat frequency oscillator with enhancements for improved SSB and CW reception.

RF attenuator. This circuit reduces the sensitivity of the receiver in discrete steps, such as 10 or 20 decibels.

RF gain. A control that permits the sensitivity of a receiver to be continuously varied.

Scanning. This feature lets the receiver automatically tune through a desired frequency range, stopping on all frequencies where a signal is present. This feature is sometimes not too useful on shortwave, since atmospheric noise can also mimic a radio signal.

Selectivity. The ability of a shortwave radio to reject signals on frequencies adjacent to the desired station. It is usually expressed as a bandwidth measured at 6 dB rejection points ("6 dB down" or "-6 dB"). For example, a selectivity specification of "6 kHz at -6 dB" means any signal outside the 6 kHz bandwidth will be reduced in strength by at least 6 dB (in other words, the interfering signal is only one-fourth as strong as it would be otherwise). Typical good selectivity measurements at 6 dB points are 6 kHz for AM, 2.5 kHz for SSB, and 0.5 kHz for CW.

Sensitivity. The ability of a shortwave radio to respond to weak signals. It is measured in microvolts (mV). The lower the measurement in microvolts, the fainter the signal the radio can receive.

Squelch. This quiets the receiver audio until the strength of a received signal exceeds a desired level.

Synchronous detection. A circuit that replaces the carrier in a received AM signal with an internally generated replacement to reduce the effects of fading.

Variable bandwidth tuning. This circuit allows the selectivity of a receiver to be continuously varied.

Recommended Receivers

Yaesu FRG 7 and Kenwood R600
are ideal for starters $ 200—$300 Range

Digital models like the FRG7000, FRG7700 and R1000
are often available in the $ 400—$600 range.

More Recent Models, with micro-processor-control are great value. We often have pre-owned models available from $ 600 +

Yaesu FRG8800

Icom IC 71

Kenwood R2000

Kenwood R 5000

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AR5000 $5300

AR8600 $2195

VR5000 $2250
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