

## **How do I improve my NOAA Weather Radio reception?**

### Ways to Improve Your NOAA Weather Radio Reception

The average coverage of any NOAA Weather Radio transmitter is designed to be limited to an area within approximately 40 miles of the transmitter. By limiting the range of the transmitter, NOAA Weather Radio can provide more tailored broadcasts to the area served as well as reducing the number of warning tones sent out over one transmitter site. The actual range and quality of the received signal are dependent on three main factors - the transmitter, location and quality of the receiver, and beam blockage. In general, those living in flat terrain or at sea and using a good quality receiver can expect reliable reception beyond 40 miles. Those people living in cities surrounded by large buildings or living in mountainous areas and using standard quality receivers may experience little or no reception at distances considerably less than 40 miles.

### Transmitter Factors

Quality of the signal being sent to the transmitter

Height of the transmitter antenna

Power output of the transmitter

Poor signal quality being sent into the transmitter will result in poor signal quality being sent from the transmitter. To ensure the signal quality going into the transmitter is of good quality and consistent, monitors are being installed on many NOAA Weather Radio transmitters to report automatically when signal quality begins to degrade. These monitors also automatically report other potential problems at the transmitter site such as power fluctuations, high signal to noise ratios, and even if the air conditioner cooling the transmitter fails.

Since NOAA Weather Radio transmits on the VHF (Very High Frequency) band, the radio signal is a "line of sight" signal. The higher the transmitter antenna is located, the farther it can "see" or transmit. Since the transmitter range is a function of antenna height, height is often used to prevent one transmitter from bleeding over a signal of a nearby NOAA Weather Radio on the same frequency and triggering warning alarm tones for potential severe weather that isn't in the designated listening area.

A third method of reducing the coverage area is by reducing power output of a transmitter. While many commercial radio stations broadcast at 100,000 watts, NOAA Weather Radio broadcasts at a maximum of 1,000 watts.

Even though every effort is made to reduce overlap of two NOAA Weather Radio transmitters on the same frequency, there are times that a distant station broadcasts over the signal of a closer station. There have been times when a transmitter located over 100 miles from the receiver has overpowered the signal from a transmitter located less than 40 miles from the transmitter. While both

transmitters were broadcasting at 1,000 watts, the more distant transmitter was located on a mountain and the antenna was nearly 2,000 feet above sea level while the antenna for the closer transmitter was only 600 feet above sea level. The conditions that allow NOAA Weather Radio signals to travel considerable distances beyond 40 miles are fortunately rare and listeners can be assured that warning alarm tones indicate threatening weather in their local area.

Location of the Receiver

Distance from the transmitter

Type of construction of the building the receiver is in

Proximity of local "electric noise" generators such as electric machinery, high voltage power lines, and even fluorescent lights

Sensitivity of the receiver

As in real estate, there are three important considerations for improving reception - location, location, location! The more distant from the transmitter site, the weaker the signal. Even the type of construction of the building affects NOAA Weather Radio reception. Buildings with steel frames, cinder block or concrete reinforced with rebar, and other signal blocking materials will significantly reduce signal strength and quality at the receiver. Inside the building, "electric noise" from electric motors, high voltage lines, fluorescent lights, and other devices will cause static on your NOAA Weather Radio receiver. Try to locate your receiver as far from any electric devices that may cause interference to get the best signal.

Another important consideration when buying a receiver is its sensitivity to radio signals, this is especially important if you are in a fringe area. A better quality receiver may be able to detect a signal as weak as 0.3 micro volts while a standard receiver may need a signal strength of 0.8 to 1.0 micro volts before you can hear clearly. Compare not only price of the receivers but also their sensitivity.

Beam Blockage

Terrain

Large building in cities

Thunderstorms and other weather factors

Since the radio waves transmitted by NOAA Weather Radio are VHF or line of sight, they can be blocked or weakened if they have to pass through mountains, hills, and large buildings. In fringe areas, even thunderstorms between the transmitter and receiver will affect the signal strength (as well as interference from lightning).

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To get the best possible reception from your NOAA Weather Radio, get the best quality receiver (most sensitive) you can. Ensure you are tuned to the correct frequency for your local area, even though you may be able to pick up a signal

from another NOAA Weather Radio it may not carry watches and warnings for your specific area! Try different areas in your home or business to find the best location for a strong and consistent signal. Generally, near windows will provide you with better reception than if the signal has to pass through reinforced walls. In some locations you may have to install an outdoor antenna to receive NOAA Weather Radio.

#### Outdoor Antenna Installations:

Outdoor antennas can be purchased at many TV, radio, or electronics stores or you can even build your own antenna.

If your NOAA Weather Radio does not have a place to plug in an antenna, you can still benefit from an outside antenna. Solder a "small alligator clip" to the center conductor of the coaxial cable from the antenna and clip to the antenna on your radio.

An inexpensive VHF antenna or scanner antenna mounted near the roof with coaxial or shielded cable to the receiver will provide improved reception for your NOAA Weather radio and allow us to provide you with timely warnings and statements of hazardous weather conditions!