

## **"Why isn't WPR-FM in Stereo?"**

Sometimes Wisconsin Public Radio listeners ask, "Why isn't my local FM station running in stereo?" WPR's practice of operating some FM stations in stereo, and others in mono, goes back many years.

A little known fact originating in the early days of FM broadcasting: when a mono FM station adds stereo to its signal, the signal-to-noise performance of the signal deteriorates, and the effective geographical coverage area of that station is reduced. Experience has shown that running stereo reduces a typical FM station's maximum possible range by a third.

If a listener in a fringe area has a stereo/mono selector switch on their receiver, switching to mono mode allows the radio to ignore the noisier stereo parts of the signal and reduces the noise. But the vast majority of modern radios do not have this capability, and will operate in stereo automatically if the stereo signal is present.

If you are interested in the technical details comparing FM mono and stereo modes, see the graph below from the NAB Engineering Handbook. Stereo mode is called "biphonic" in this document.

The signal-to-noise tradeoff is worthwhile for stations with stereo music programming - thus most FM stations run in stereo today. For example, the Wisconsin Public Radio FM stations that carry the News-Classical and HD2 Classical networks operate in stereo at all times.

For this reason, WPR runs the Ideas Network FM stations in mono, except in some cases for the times when they simulcast the news/classical network music programs such as "A Prairie Home Companion". The Ideas Network news/talk/interview program are distributed to the stations around the state in mono, so there would be no point to transmit any of those shows in stereo. But when those stations switch over to simulcast the News-Classical network, they do have two-channel audio and it is considered worthwhile to switch the transmitter to stereo mode.

Why bother with switching back and forth? That point has been debated - there are arguments for both approaches. FM mono mode has the best range and signal penetration. Switching to stereo can be nice for music shows, but it does have the effect of reducing the noise-free coverage of the station to about 2/3 of the mono coverage. Listeners in the remaining 1/3 area will experience greater noise.

Related notes:

The WPR AM stations operate in mono at all times.  
HD digital signals of the WPR stations are all in stereo, but may at times be fed with mono programming.

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**MONOPHONIC, BIPHONIC AND SCA SERVICES**

**TRANSMITTER:** 10 kW ERP  
1000 FT. HAAT  
98 MHz

**RECEIVER:** DIPOLE ANTENNA  
30 FT. AGL  
10 dB NOISE FIGURE

