A preamp is of no value

By Bill Smith
hcdx list, July 28, 2000

Preamps to 30 MHz are correctly used to
1. increase the signal amplitude (loudness) or
2. overcome combining and distribution loss.

Example 1. best applies to inefficient receiving antennas such as the many loop and traveling wave designs.

Example 2. typically applies to feeding multiple receivers with a single antenna such as during DXpeditions or similar distribution situations.
Passive splitters typically lose 3 dB per port; that is a two way splitter will deliver 3 dB less RF to each receiver than if the antenna was directly fed to the receiver.
Four way passive splitters typically lose 5 dB and so on.

The human ear commonly will just detect a 3 dB amplitude change.
Unless the receiver is broken, or of poor design quality, seldom, if ever, will a preamp improve signal-to-noise (s/n or s/n ratio) performance below 30 MHz.
A preamp used thus will increase the signal amplitude -- and the background noise -- by the same amplitude, but it *will not* improve the signal readability over noise.

Try this very simple test.
Disconnect the antenna from the receiver and listen to the background noise. What you hear is noise generated within the receiver.
Now connect the antenna. Did the noise level increase?
If so, the receiver is operating to its ability to hear any signal arriving on the antenna.
The receiver's ability to hear the weak one is entirely limited by atmospherics and noise picked up by the antenna.
A preamp is of no value. It increases both the signal and the noise by equal amounts.
There is *no* improvement in signal to noise performance.

Do not be enthused nor spend money on a HF or SW preamp just because the manufacturer claims a 0.5 dB 'noise figure' or some such number.
Below 30 MHz a five to eight, or ten, dB receiver noise figure is more than sufficient.
Fact is, a preamp may actually harm your receive capabilities by introducing noise, mixing and intermodulation products that could easily cover weak signals otherwise receivable.

A resonate or more efficient antenna will return many, many more dividends in the earphones than any expensive, highly touted preamp. The best dollar ever spent on a listening system is on the antenna itself.
Another fact, unless you want to listen below 2 MHz, a firewall filter eliminating or greatly reducing signals below 2 MHz may improve your receiver internal performance on shortwave. This is especially true of some solid state receivers.
Finally, you purists reading this, please save your flames. This is not a textbook on s/n et all. It cost the gentle reader exactly what he or she paid for it.

73 from Bill Smith, W5USM "Shortwave Since 1950"