

Sony XDR-F1HD

By David A. Rich

Sony XDR-F1HD Radio Tuner
Sony USA
www.SonyStyle.com
1-877-865-7669 or Sony store
7 1/8" x 6 3/8" x 2 3/8"
2 1/2 lbs
List price \$100



In his recent online review (www.ham-radio.com/K6sti/xdr-f1hd.htm), Brian Beezley concluded the XDR-F1HD is the best tuner for analog reception. Brian is the only reviewer still making measurements of FM tuners. The catalyst for improved performance is the DSP signal processing that replaced the analog IF and MPX sections of the analog tuner. Complete measurements are on Brian's website (www.ham-radio.com/k6sti/x_dr-f1hd.htm) to allow you to compare this tuner to the best analog units made from the '60s to '80s.

CHIP SETS

The measured analog performance of the Sony is better than the Sangean HD radio tuners I previously reviewed in *Sensible Sound* (Nov./Dec. '07, p. 12). The Sangean uses a TI DSP chip set; the Sony uses a chip set from NXP (the old Philips Semiconductor). Of inter-

performance, but also software code options that the manufacturer selects change performance. Significantly more technical information is on Brian's website than appears here.

FILTER

According to Brian, the Sony has: "*Adaptive noise reduction* that forms a filter that fits the L-R audio spectrum and follows its changes. The filter suppresses noise between and beyond spectral peaks without restricting audio bandwidth." Brian also identified that the Sony has *threshold extension*, which "suppresses the impulse noise ordinary detectors generate for weak FM signals." Analog PLL detectors have some threshold extension, but with DSP more sophisticated detectors may offer increased extension.

Continuing from Brian's website: "To take full advantage of the processing, the XDR-F1HD does not switch or abruptly blend to mono at low RF signal levels. The Sony can deliver a clean stereo signal with wide channel separation at far weaker signal levels than can any other tuner. The only thing remotely comparable is a Carver tuner with Asymmetrical Charge Coupled Detector."

Take care when comparing an older analog tuner to these DSP units with low input signal levels. Brian reports that with a mono input the "XDR-F1HD begins to invoke a sliding, first-order, lowpass noise filter on L+R signal as the RF level drops below 26dBf. . . The filter is similar to the one in the HDT-1X, which begins at 29dBf and whose corner levels off at 2.9kHz at -3dB. The Sony corner stops falling at 3.2kHz." He found the unit was down 13dB at 15kHz with a 16dBf input.

"the XDR-F1HD is the best tuner for analog reception."

est is the HD functionality achieved in the NXP design by adding an extra chip to what was called *Car DSP* chip. I have long maintained that modern car receivers perform much better than what you find in a \$4000 audio video receiver.

I am doing little here but summarizing Brian's work. Because the functionality of the NXP and TI chips are in the DSP code, a service manual will tell you nothing. Making things even harder is that the datasheets for the HD Radio DSP chips are not publicly available. Brian thus had to do a significant amount of reverse engineering. Making evaluation more complex is the fact that not only do the chip set differences change

When the signal level is high enough to turn off the sliding filter, the stereo frequency response is flatter for the Sony in comparison to the Sangean. Brian's review of the Sangean is found at <http://ham-radio.com/k6sti/hdt-1x.htm>. Sony's *adaptive noise reduction* discussed previously also helps to suppress noise from co-channel interference and multipath distortion at all signal levels compared to the Sangean.

RECEPTION

The Sony and Sangean units received the same number of stations in HD mode at my home despite the differences in chip sets. Note that both tuners use simple version 1980s style RF sections that require alignment, and if the tuner is not correctly aligned you will not get as many HD stations. Making objective measurements of the tuners' HD performance is impossible because no cost-effective HD radio modulator exists.

The Sangean HDT-1X has an S/PDIF output that eliminates DAC – ADC interface to an AV receiver. However, the digital encoding used in HD radio (96kbits/sec with no secondary channel) may obliterate the sonic difference of a digital connection.

The Sangean has carrier-to-noise ratio readout that allows you to best aim your antenna for optimal HD reception in marginal reception areas. Because HD is digital, it is all or nothing. In a marginal area, the tuner may flop back and forth between HD and analog, which is worse than analog alone even with a bit of noise. That is why the Sangean HDT-1X offers forced analog, which is not available on the Sony. The Sangean also has forced mono.

Brian has modified the Sony for forced analog by cutting a trace and adding a switch (see his website) if you want the Sony to be able to have both HD and forced analog reception. Only the trace cut is required if you want to turn the tuner into an analog only unit. The retrofit is only for the experienced amateur or a reliable repair shop even for the one cut, because it is hard to get inside the unit and the traces are small. Obviously, your warranty is toast after the mod.

A cautionary note: The Sony resembles a table radio and becomes rather hot with all the electronics shoehorned into its compact shell. The Sony has ten flimsy buttons on top of the unit, which provide almost all functions. The remote adds only a couple more. The muting is marginal as you scan stations with a small burst of noise as it passes each station.

FEATURES

The Sangean is a full-sized component and feels more solid. All functionality resident on the front panel is a real luxury, though it requires navigating 21 touch controls. All the extra buttons on the Sangean allow for direct entry of a station's frequency, making it much easier to tune a station than using the scan buttons. Buttons also vary in size and shape on the Sangean. You can see where the \$120 difference in price goes.

Unfortunately, the Sangeans have a number of bugs that are identified on Brian's website. Sangean appears unwilling to clean them all up although several updates were issued (which required the return of the unit). A summary of the problems with the HDT-1 series is found on Brian's website. I never found that any of these bugs bothered me, but I did not set any presets or use the AM HD tuner. Brian notes the Sony forgets many user settings if the power goes out for more than a few minutes. Modifications on his website allow the tuner to retain data longer.

If you want to achieve a weak analog signal from a station with HD, you may need the Sangean despite its poorer analog performance to prevent the HD flip-flop problems, provided you do not want to perform dangerous surgery on the Sony. The price of the Sony is about \$120 less at street prices, however, and that difference might go a long way to putting in an outdoor antenna if you and your neighbors find the structure acceptable. A good antenna could turn flip-flopers into solid HD stations, but there are no guarantees. I, however, have found better indoor FM antennas (Audioprism 8500 and Terk FM Pro) do little to prevent the flip-flop, although they can improve your ability to bring in a weak analog signal over a floppy dipole.

The FCC may evaluate increasing the power of the HD signal, but this would increase the noise of adjacent analog stations and may block weaker ones. I would not expect any rule change soon.

Deciding between the Sangean HDT-1X and the Sony is arbitrated by your signal conditions and tolerance for a clock-radio type of thing proximate to your \$2000 preamp. Despite its looks, the Sony appears to be free of the operational bugs the Sangean units have. If you have HD flip-flopers, want a stock unit, and have no desire to install a better antenna, opt for the Sangean HDT-1X. If you want to get a weak analog signal with no HD interference, the Sony must be your choice.

rr