



Courtesy: Polk Audio

Hi-Def Radio Fights Death Star

By Ken Reitz, KS4ZR

Even before the first XM and Sirius satellites had been launched, land based AM and FM broadcasters, through their once powerful lobby the National Association of Broadcasters (NAB), sought to stop satellite radio in its infancy by setting up legal roadblocks. The FCC consistently dismissed them.

The NAB doubted the public's interest in buying expensive add-on receivers and coughing up a monthly payment for the service. But to date more than 11 million people have done so in only four years. Broadcasters clung to their tradition of carrying local weather and traffic information. Satellite radio added them. The broadcasters fell back on their 100 year relationship with professional and college sports. But XM wrapped up Major League Baseball in a 10 year contract while Sirius picked up the National Football League. And, as if to cement their new dominance, both satellite companies broadcast the major college conferences in a full schedule of football and basketball games.

Satellite radio has proven attractive to individual personalities who have turned their considerable following into even more paying subscribers. Howard Stern began his much ballyhooed run on satellite in January. Bob Edwards, dumped by National Public Radio as too old, has enjoyed a full year at his new home on XM Public Radio. Both have a new found freedom on satellite: Edwards from the poor judgment of radio network management and Stern from the constraints of FCC decency standards.

With virtually all new car radios now satellite capable and the soaring popularity of home based satellite receivers, terrestrial broadcasters have become less relevant. Is there help on the

horizon? Could some new technology bail out the sinking ship? Will there be any help from the FCC?

IBOC HD Radio

In 1998 the FCC authorized radio industry interests to develop a system of transmitting digital signals on the AM and FM bands. This industrial consortium of broadcast entities from manufacturing, engineering and programming is known as iBiquity. They produced a digital broadcast scheme for the AM and FM bands called In-Band On-Channel (IBOC), which is promoted in the radio industry by the more brand friendly term "HD Radio." The trick was to be able to transmit this new digital mode at the same time as the analog signal, as mandated by the Commission. HD Radio was to provide a "hybrid" method which bridges the distance between an all-analog AM and FM world to one which is totally digital. Amazingly, it works. Sort of.

Emphasis on early development of the system has been on the FM band where it works quite well. The FM signal is not susceptible to skywave skip and generally reflects the analog signal contours. It's a different story on the AM band. Those in the immediate metro area of an HD AM transmitter will receive an HD Radio signal, giving it an audio quality equal to today's analog FM. But, since AM is mostly a cacophony of voices from hyperventilating sports announcers, political pundits and preachers with precious little music to test the beauty of HD Radio, why bother?

Additionally, fears of interference from IBOC signals on AM carriers in an already packed band has forced the FCC to prohibit HD transmissions after dark. No wonder nobody's talking it up.

IBOC Reality Check

It's been nearly two years since the first HD Radio experiments at WAMU-FM, a Washington, D.C. National Public Radio (NPR) affiliate. As of this writing there are more than 13,000 radio stations in this country (excluding nearly 4,500 translators, boosters and low power FM broadcasters). A little over 1,100 stations are licensed by iBiquity to transmit HD Radio with just over 700 actually on the air, but only 140 of those are transmitting a second HD channel (multicasting). There are a few pockets



Yamaha RX-V4600 high-end, Hi-Fi stereo receiver/amp has HD Radio tuner built-in, is satellite radio ready, handles up to 7 audio sources and pumps 130 watts into 7 speakers. A lot of modern radio for \$1,899. (Courtesy: Yamaha)

of HD Radio and multicasting activity, typically around the major metro areas of the US. Atlanta, for example, has 21 FM stations broadcasting in HD (with 6 of those multicasting); Boston has 20 (with 4 multicasting); Chicago 26 (14); Los Angeles 21 (7); and New York 17 (6).

The big delay, for once, is not because of FCC bureaucratic foot dragging. In fact, once a station has a permit from the FCC to transmit HD Radio, the Commission typically approves a station's request to multicast within a week. And, instead of piles of complicated forms, the Commission requires only a simple letter explaining what the station plans to transmit.

The big delay is the cost of the HD Radio transmitter. A simple retro-fit or modification can't be done to existing equipment and the HD Radio transmitter typically costs \$150,000. This is a substantial investment for even the most well-heeled commercial FM outlets and a barrier simply too high for most independent public radio stations.

HD Radio Technicalities

The two big selling points for HD Radio are clarity of signal (equivalent to audio heard on a compact disc) and multicasting. A third less talked about feature is "text scrolling" similar to that seen on satellite radio receivers which shows the station call sign, frequency, song data (title, author, performer, label, etc.) and any other data the station may wish to send such as weather warnings or traffic information.

To be able to do all of this the iBiquity technology was tested last year in over 75,000



Kenwood KTC-HR100 HD Radio tuner "black box." Use this with any Kenwood radio which is "HD Radio ready" and you'll be listening to multicasting and HD Radio sound. MSRP: \$399.99 (Courtesy: Crutchfield)



New stand-alone HD Radios are just now coming onto the market. This analog/HD radio from Radiosophy brings HD Radio to your desktop, bedside table, or remove the tuning unit and hook it up to your stereo. Has a mobile adaptor kit. MSRP: \$269. (Courtesy: Radiosophy)

hours of over-the-air broadcasts on a number of radio stations across the country. The digital signals were transmitted as sidebands of the host analog carrier running a variety of bit rates in the transmissions. The primary HD audio was a channel streaming 96 kbps. Secondary channels streaming 48 kbps were perceived as having equal audio quality by test listeners. Initial tests indicated that interference to other adjacent broadcast signals was minimal.

In the hybrid period, while analog transmissions continue, broadcasters may transmit up to five different programs, only one of which will likely be in HD. The other music channels, talk/news channels, weather/traffic information, or radio reading services occupy less bandwidth per additional channel than the primary HD channel.

After the hybrid period when all broadcasts are supposed to be digital, stations may transmit as many as eight channels. It's doubtful, however, that any stations will multicast that many channels because of the lack of content, the extra costs of station equipment and workers, or just the notion that stations wouldn't want that much competition to their own primary source of income and listenership.

New Digital Landscape

Obviously, it's early days in the HD Radio industry and, while there may be little happening in your area, there are big things to come. National Public Radio, via its satellite downlink to its extensive affiliate list, has launched five



Boston Acoustics offers this Receptor HD Radio table top model was selling at \$499 but the price was slashed to help fuel demand. Available now from Crutchfield (\$279.99 + shipping) and C.Crane (299.95 free shipping). (Courtesy: Boston Acoustics)

full time feeds for use by member stations. The programming channels will feature Classical, Jazz, Adult Alternative, Electronica & Folk music, and news/talk. Public Radio International (PRI) will feed three services to subscribing affiliates: classical, BBC World Service and BBC Mundo (Spanish). Affiliates belonging to both networks could choose from all available services as well as adding their own programming to make up a customized line-up.

Commercial stations are also feeling their way around this new era. WPOW-FM, Miami, FL, a dance Top 40 station, for example, is multicasting a second channel of similar music without commercials. It's hard to imagine how long that will last.

Current commercial radio program providers are hopping on the HD Radio multicas bandwagon. Jones Radio Network announced this past August the launch of 11 satellite delivered radio formats and ancillary services to be customized by client stations and fed directly into auxiliary HD Radio channels. No extra on-site talent needed.

All of this gives us an insight as to how commercial and public stations will handle the extra channels. Regardless of whether they are commercial or public supported, the extra programming will be satellite fed and run through automated broadcast equipment.

What You Need to Tune In

You'll need an HD-Radio-ready receiver to tune in. You can use a car radio (see Kenwood EZ500 review on page 70), buy a new HD capable receiver such as the Yamaha RX-V4600, the Radiosophy tuner/radio or Boston Acoustics table-top Receptor (see photos). The advantage of the Radiosophy tuner/radio is that you can pop the tuner unit out of the speakers and hook it up to your existing stereo to tune in HD Radio stations. You can also use an optional DC adaptor and use the unit in your car, RV or on a boat. All of these units tune analog AM and FM stations as well.

Listeners in large metro or suburban areas will possibly need a small amplified antenna such as the Winegard SharpShooter (see reviews on page 71) to deal with multipath distortion. Listeners 30+ miles from the HD transmitters will need an outdoor antenna. Any VHF-TV antenna will do, since the FM band is wedged in between channels 6 and 7. It may help to have the antenna on a rotator and possibly a mast-mounted preamp to get a stronger signal to prevent digital drop-outs.

Rural listeners will have the hardest time getting a lock on the HD signal. A large FM-only antenna will be required, with a mast-mounted preamp and a rotator. The vagaries of seasonal reception will still apply and stations which come in without difficulty during most of the year may disappear or have trouble staying locked during the summer months when tropospheric ducting comes into play.

Last Word

Aside from the technical problems of potential interference on both the AM and FM bands when a maximum of stations are broad-

casting in the hybrid mode, there are several other issues yet to be considered: What will be the cutoff date for total conversion to digital radio? What will become of small, nearly insolvent AM stations which struggle to make expenses, let alone invest in expensive digital transmission equipment? How will low power, listener-supported community FM stations find the money for conversion? Will this truly be a rebirth of broadcasting or will it end up more like cable TV: more and more channels broadcasting the same content over and over?

One really bright spot for consumers is that our existing and expensive stereo systems are not made obsolete by the move to digital radio. As with satellite radio, we can simply add an HD Radio tuner to the auxiliary input of our stereos and start listening.

It will likely be many years – industry sources say 10 or more – before we live in an all digital radio world. In the meantime, there will be an unprecedented period of interest in the AM and FM bands as manufacturers introduce new radios, stations attempt to get out of their programming ruts, and listeners have more choice in what they hear for free.

www.ibiquity.com/hdradio/hdradio_hd-stations.htm

To find HD radio stations in your state, go to the above website, click on your state and print out the results. Check in often for updates.

TABLE MODEL RADIOS:

Boston Acoustics Receptor HD Radio
Available now
\$279.99 from Crutchfield: 800-955-6000
\$299.95 from C.Crane: 800-522-8863
www.bostonacoustics.com

Polk Audio I-Sonic Entertainment System HD Radio (XM capable)
Available late spring
\$599 from Polk Audio
www.polkaudio.com

Radiosophy MultiStream Radio
Available late spring
\$269.00 from Radiosophy: 877-443-7234
(Mobile adaptor kit: \$30)
www.radiosophy.com

AUDIOPHILE HOME HD RECEIVERS:

Audio Design Associates Quadri-Tune
Available summer '06
\$2,800 from Audio Design: 800-HDAUDIO
www.ada-usa.com

DaySequerra
Available summer '06
\$3,000 from DaySequerra: 800-922-8001
www.daysequerra.com

Rotel HD Radio
Available summer '06
No price or product info available
www.rotel.com

Yamaha RX-V4600 HD stereo receiver/amp
Available now
MSRP \$1,899