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## Conference report: NAB2001

The NAB2001 conference streams covered broadcast engineering, television management, radio management, business, law and regulation, satellite and telecommunications, multimedia and digital video production.

The NAB is the US broadcasting industry forum that advises the US Government and the Federal Communications Commission (FCC) on issues of importance to the commercial radio and television broadcasting industry. The NAB provides a forum for discussion on a wide range of research, legal and policy issues, technology trends and management techniques for broadcasting and related industries.

This article only covers one area which may be of particular interest to readers, that is, developments in digital radio broadcasting.

### **Digital radio broadcasting**

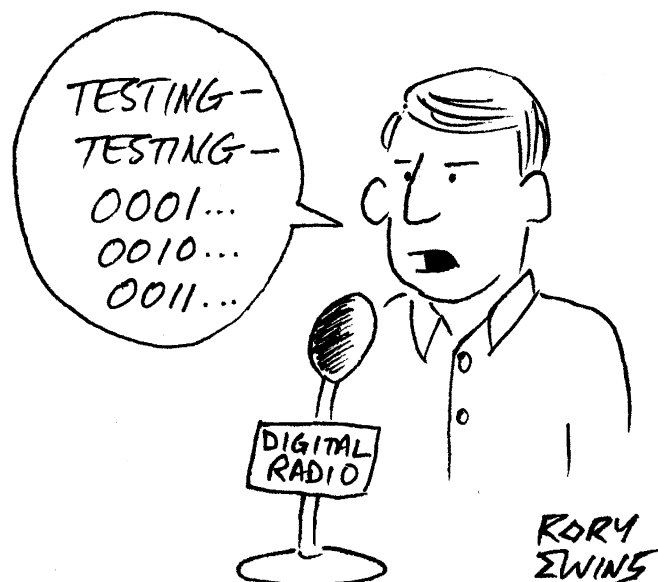
#### **In-band on-channel (IBOC) Digital Radio**

IBOC systems are being developed in the USA as a way of allowing incumbent radio broadcasters to transmit in digital. Previously there were several systems being developed by different companies. These companies have all now merged in to a company named Ibiquity. Ibiquity is working on the development of an

IBOC system for each of the AM and FM bands.

Test transmissions were conducted for both the AM and FM systems in Las Vegas during NAB 2001. Demonstrations of the system were available on request at the Ibiquity stand. Both the AM system and FM system seemed to work well. The audio quality of the FM IBOC system was excellent and did not fail at any time.

However, it should be noted that the reception environment for the analog FM signal did not seem to be particularly challenging and that signal levels were good. The AM IBOC system also worked well. Unfortunately, the host AM station changed program formats from music to talk the week before NAB and was not transmitting very good audio quality on either the analog or IBOC service.



The digital audio coding system being used for Ibiqity has changed from using a system called AAC (adaptive audio coding) to a system called PAC (perceptual audio coding). In a demonstration at the Ibiqity stand of four different audio coding systems it was very difficult to tell the different systems apart. The main advantage of the PAC system appears to be that it is slightly more efficient.

The US National Radio Standards Committee (NRSC) is to commence evaluation of the FM system in June 2001. This evaluation work is expected to be complete late in 2001. Timing for the AM system seems to be behind the FM system by around three to six months. The FCC will then need to proceed with modifying its rules, before services can formally commence. A comment by an FCC representative indicated that they are very interested in the NRSC evaluation, and particularly in the extent to which IBOC is superior to analog services and its compatibility with existing services. The FCC commented that it wouldn't be able to do much until the testing is complete. The FCC is also planning to consider new spectrum options for digital radio as part of the new proposed rule making process.

According to Ibiqity's representatives, they have finished the development phase and are now focusing their efforts on regulatory issues and commercialisation of the system.

Given the timing and processes still to be undertaken, it would seem that the earliest there could be a commercial launch of the Ibiqity system in the US would be in about two years' time, perhaps coinciding with NAB 2003.

### Digital Radio Mondiale (DRM)

DRM is currently undertaking its third program of field tests. These are to be completed by the end of 2001. Early 2002 should see the start of pilot transmissions and May 2003 is the target date for availability of consumer receivers and for the first full time services to commence.

The DRM system is designed for operation in the high frequency (HF), medium frequency (MF) and low frequency (LF) broadcasting bands with a variety of channel bandwidths from 4.5 kHz to 20 kHz. The system uses COFDM multi-carrier modulation. Unlike IBOC systems, DRM requires a clear channel to operate rather than being overlaid on an existing transmission.

A software receiver is under development that would run on a 300 MHz personal computer. The objective is to allow people such as amateur radio enthusiasts to participate in the field trials.

If DRM services were implemented in the HF band (also known as short wave) in Australia they could provide wide coverage of regional and remote Australia.

### Eureka 147

A paper on digital radio roll out in Germany was presented. A key area of interest is that there is to be a campaign promoting digital radio with a budget of US\$8 million. This is a joint initiative of digital radio network operators and public and private program providers.

Parts of the VHF band III is being used for national coverage digital radio services with L band (1.5 GHz) being used for regional and local services. The use of both bands does not present a problem as, all receivers being sold in Germany have dual band tuners covering VHF Band III and L Band.

The paper also discussed the consideration being given to switching off FM analog broadcasts. Decisions on a process for the FM switch off are to be made in 2003. At this stage the Government wants the overwhelming majority of listeners to receive digital radio services by 2010. This means that analog radio transmissions could be phased out between 2010 and 2015.

In a panel discussion, a UK representative said that additional effort was also being put into promoting digital radio in the UK. The prices of receivers are also expected to come down. The cheapest receiver on the market was said to be a £200 receiver called a WaveFinder that is used in conjunction with a personal computer. This receiver sold out quickly and substantially boosted the total number of digital radio receivers in the UK. An attractive feature of the WaveFinder is that it allows the creation of MP3 digital audio files from off-air digital broadcasts.

### Integrated Services Digital Broadcasting – Terrestrial (ISDB-T)

A paper on ISDB-T (the Japanese digital television and radio standard) was presented at the Broadcast Engineering Conference. However, the paper focused on television use of ISDB-T rather than its application for digital radio. ISDB-T services are scheduled to commence in Japan during 2003.

### Conclusion

The most significant developments in broadcasting technology at present relate to digital radio technologies. However, full scale deployment of new digital radio technologies anywhere in the world (other than the already deployed Eureka 147 standard) will not take place until 2003 at the earliest. In countries where Eureka 147 is already deployed, plans for increased promotion should improve take up rates and assist in reducing receiver prices, which have already started to fall. Of the new digital radio technologies DRM may offer significant opportunities for coverage of remote Australia using the HF or short wave bands.

