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Digital radio broadcasting: where do we go from here?

Digital radio broadcasting (DRB) technology is at an advanced stage. Successful tests in DRB have been conducted both in Australia and overseas. In Europe several digital radio services have been operating since late 1995. But although the new technology seems poised to sweep over us, it may be too early to think about throwing out your old analog receivers.

The story so far. . . .

At the 1992 World Administrative Radio Conference (WARC 92) in Geneva the International Telecommunications Union (ITU) decided to allocate spectrum for the use of satellite and associated digital terrestrial radio broadcasts. The spectrum allocated falls between 1452 and 1492 MHz, also known as the L-band. Considerable work has been done in Europe and Canada in developing a system which operates in the L-band. This system is known as EUREKA 147, which can be used for both terrestrial and satellite transmissions.

In Australia, parts of the L-band are already in use by radiocommunications services. Concerned by the possible effects of DRB services on existing users of this band, the Spectrum Management Agency (SMA) requested advice from the ABA in mid 1995. The ABA, therefore convened an industry task force to examine the implications of digital radio broadcasting in Australia. The Digital Radio Broadcasting Task Force comprised representatives from the ABA, SMA and all sectors of the radio broadcasting industry. Mr Colin Knowles, ABA General Manager, Planning and Corporate Division, acted as chairman for the group. Its aim was to present a report to the ABA on the following:

- the spectrum requirements of DRB and number of channels available within that spectrum;
- coverage areas;
- possible models for national, commercial, community and narrowcasting services;
- delivery models, including both terrestrial and satellite services;
- compatibility of DRB services with existing services sharing the band or in adjacent bands;
- how DRB might be introduced - the effects this introduction may have on analog AM/FM services and the response from consumers; and
- pricing and availability of DRB equipment.

Technical support for the task force was provided by the Spectrum Requirements Working Party, convened specially for this task. The Working Party was chaired by Mr Henk Prins, technical consultant to the Federation of Austral-

Innovations

ian Radio Broadcasters, and comprised representatives from the ABA, SMA and the radio industry. The results of the Working Party's studies are soon to be published as *Digital Radio Broadcasting for Australia: the technical possibilities and spectrum implications.* This paper examines possible ways of implementing the EUREKA 147 system within a large metropolitan area, using Sydney as a case study. EUREKA 147 was selected as the model since at this time it is the only system which operates in the L-band, and is at an advanced stage of development.

In late 1995 the then Minister, the Hon. Michael Lee, established the Digital Radio Advisory Committee (DRAC) to advise him on DRB implementation and policy issues. The ABA Task Force is currently preparing its final report to DRAC, *Final Submission to the Digital Radio Advisory Committee of the Minister for Communications and the Arts.* The report is an overview of the feasibility of operating a digital radio system in Australia based upon technical requirements and policy considerations.

The task force has now concluded its investigation, although it may be reconvened if there are any further issues which need to be addressed.

Analog verus digital?

The Task Force's report contains several recommendations on digital radio systems. It concludes that it is possible to accommodate existing radio services and some additional services (both satellite and terrestrial) within the L-band, provided a minimum of 26MHz of spectrum is available. Digital radio systems will provide certain advantages over analog systems interms of spectrum efficiency and services to the community. More services can be transmitted in a given bandwidth of spectrum using digital technology than using conventional AM/FM technology, and these services will have equivalent or improved audio quality. Packages of distinct services can be combined together and broadcast from a single transmitter. Data can also be transmitted with broadcasting services. Mobile and portable units may receive satellite-delivered radio from a DRB system since it will be possible to receive both satellite and terrestrial services on a single receiver. Satellite delivery will enable consumers anywhere in Australia to receive a selection of radio services.

The market for digital technology

There is strong support from the broadcasting industry which sees DRB as a means of increasing the diversity of programming material available. However it is recognised that from a broadcaster's point of view the introduction of digital technology involves a large initial investment in equipment and delivery infrastructure, and that returns on this investment may be a long time coming.

To stimulate rapid market growth the radio industry has requested that existing broadcasters be granted early access to DRB spectrum, and that a flexible approach to the regulation of program formats be taken to enable broadcasters to find new services which are of interest to consumers. The report suggests that consumers will more eagerly adopt the new technology if a wide range of DRB services is available in the early stages of implementation. Since there will also be an initial cost to consumers in the form of new equipment, the cost of that equipment and its performance will have a large impact on the early acceptance of DRB. Units which are capable of receiving both conventional analog and new digital services will be more acceptable to the public. It is estimated that even if digital technology gains rapid acceptance from consumers, it may take 10 to 20 years before analog services are phased out completely.

Recommendations for future planning

The studies completed to date indicate that DRB is practicable in Australia provided care is taken in implementing new digital systems, but there is still much work to be done. Satellite requirements in the L-band will need to be co-ordinated at an international level, since neighbouring countries will also be seeking to implement satellite services in this band and there is a risk that the amount of spectrum available for use in Australia will be further diminished. The Task Force has recommended that structured DRB planning be undertaken by the ABA, in such a way that the existing (non-broadcasting) users of the L-band are not disadvantaged.

The next step

The future of digital broadcasting in Australia now rests with the Government. An embargo prevents the licensing of any new services in the L-band until a Ministerial decision is made regarding the use of the band. DRAC has prepared a discussion paper on DRB for public comment. The paper will be released in September and will be available on-line at the Department's home page: http://www.dca.gov.au or by phoning (06) 279 1714.