Bob Greeney, Director Planning and Licensing brings us up-to-date with progress towards digital television broadcasting and the results of testing in Sydney of the two possible systems.

Digital television for Australia

Stop press

The Digital Terrestrial Television Broadcasting (DTTB) Selection Panel unanimously agreed, on 18 June, to recommend DVB-T (the European system) for use in terrestrial television broadcasting in Australia.

The selection panel is comprised of members representing the ABA, the national broadcasters, the commercial networks, the Department of Communications and the Arts

In late 1997, the Department of Communications and the Arts and the Federation of Australian Commercial Television Stations in conjunction with the ABA and the ABC conducted tests of potential digital television technology for use in Australia. These were the first trials of both systems in the one country.

The tests were designed to assist in the process of deciding on the best system for Australia. The laboratory tests were followed by transmission tests of the two competing digital television systems: the American Advanced Television Standards Committee (ATSC) digital television system, called 8-VSB; and the European Digital Video Broadcasting system called DVB. Both are based on the digital MPEG-2 encoding system and have many similarities, but each has chosen a different transmission modulation system.

One of the differences is the channel width. The ATSC system is designed to operate in the American 6 MHz channel system, for integration between the existing 6 MHz analog channels used there. It is also designed for a 60 Hz scanning system. The DVB system is designed for the European 7 MHz VHF and 8 MHz UHF channel system and for a 50 Hz environment. Both are claimed to be adaptable to the Australian situation although neither system can be directly transferred. Australia uses a European analog television system, PAL, but it differs in the channel arrangement for UHF services: Australia uses a unique 7 MHz channel arrangement.

Both systems are intended for use with the existing television spectrum, fitting the new digital services in between the existing analog services. The USA has recently decided to use both the VHF and the UHF bands for its digital television services. The Europeans tend to be using UHF only, although in Germany there will be some use of VHF spectrum as well.

The laboratory tests have shown, and the test transmissions have confirmed, that either system could be used in Australia. Reports on both the laboratory tests and the field test transmissions are scheduled for completion in July when they will be made available to industry.

The field tests in Sydney used the existing television transmission facilities at Artarmon and transmitted on VHF channels 6 and 8. These channels were chosen to test digital system performance in channels adjacent to existing analog television services on channels 7 and 9. No interference to either existing service was detected during the tests.

Test transmissions are proposed on UHF channels to confirm the relative coverage of each system compared with analog television services, and whether each system could operate in a single frequency network configuration.

The single frequency network configuration (SFN) has the potential to achieve significant spectrum efficiency if it proves successful. An SFN might have the main transmitter for an area, for example Sydney, operate on its main channel. The related translators, Kings Cross, North Head, Bouddi, Gosford, Wyong and Penrith, would operate on a common frequency which is different from the main channel. Currently, analog services require a different channel for the main transmitter and each translator.

Sydney has two national and three commercial television services and each service uses seven frequencies to operate their service. There is therefore the potential to reduce this number, to three or four frequencies, as not all translators can share a frequency (Kings Cross and North Head, or North Head and Bouddi, for example could cause interference with each other). It is important to note that, at this stage, there has been insufficient spectrum planning to determine exactly how much spectrum efficiency might be achieved.

Innovations

Which standard for Australia?

Digital terrestrial television is to commence in Australia by January 2001 but before much planning can be done, the standard for Australia must be chosen.

The Government has established a consultative committee which is to oversee the selection of the digital television standard for Australia and the conversion from analog to digital television. It will seek the advice of the DTTB Planning and Steering Committee which will have its membership drawn from senior managers, engineers and planners in Government and in industry. Members of the committee will draw on all of the information available to them to make an assessment of the relative merits of the competing digital television systems and recommend a standard.

The principals of both the ATSC system and the DVB system have held meetings within Australia and overseas. The results and reports of each of the tests conducted on the two systems will help to form an agreed view as to which system is best for Australia. The current process seeks comments from the proposers of each system regarding the test results and further clarification on aspects of the performance of each in the Australian environment. How well each system and its domestic digital television receivers operate in the Australian 7 MHz channel arrangement to deliver high definition television, in both VHF and UHF television spectrum, will be critical to the choice of system for Australia.

In order to meet the January 2001 starting date, the choice of standard will have to made by mid 1998 so that the digital channel plan can be developed by the end of 1998 or early 1999. The digital conversion schemes for the national and commercial broadcasters need to be determined in a similar time-frame, in preparation for the development of digital television implementation plans for each broadcaster. Once a digital channel plan has been completed, broadcasters will be able to negotiate with the Government regarding their implementation plans, and to order transmitters and make necessary arrangements for access to transmission facilities where necessary.

Current status of digital television systems

Both systems are currently operating transmitters. The DVB system has been operating standard definition digital television transmissions in Britain and Sweden. Transmissions have commenced in a number of other European countries, including Italy, Switzerland and Germany. In Japan, a similar system to the DVB system, called Integrated Services Digital Broadcasting (ISDB), has been developed with a major focus on mobile television reception for use in trains and coaches. However, this system is yet to be fully specified (due in late 1999). The DVB system has demonstrated that it can operate in the mobile environment. In the USA, implementation of their digital television broadcasting plan has already started, and transmitters will be operating in their 10 largest markets by 1 May 1999.

Both the ATSC and the DVB systems have specified the need to be able to deliver high definition television and are setting up for the manufacture of HDTV receivers. HDTV receivers for both systems are still at the late pre-production stage, although standard definition receivers for the DVB system have been available for some time for use in satellite delivered television services.