

Digital Terrestrial TV

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Using digital compression technology several terrestrial channels can be squeezed into the space previously occupied by one analogue channel. This is possible because the DVB (Digital Video Broadcasting) standard, which has been chosen for digital TV in Europe, relies on tried and tested MPEG-2 compression techniques. MPEG-2 is a method by which only the parts of the picture that change between individual frames are recorded as data. In this way approximately five or six 'multiplexed' digital channels can occupy the same amount of bandwidth as a single analogue channel. Importantly, this frees up valuable TV bandwidth that can be then used for other applications such as mobile telephony.

Rugged format

DVB-T, the name given to the digital terrestrial TV standard adopted for Europe, is a particularly rugged format. A multi-carrier system using Coded Orthogonal Frequency Division Multiplexing (COFDM) it is designed to work well in heavily built up areas such as towns and cities. Here analogue TV systems traditionally suffer from 'multi-path echo signal' problems, commonly seen as 'ghosting' effects on a TV screen. This is caused by reflected signals arriving at the receiving antenna at different times.

DVB-T, on the other hand, can actually add together these various 'out of phase' signals to reassemble perfect pictures and sound. Whereas analogue TV can not be received by a moving receiver, with digital television there's the option of providing crystal clear terrestrial TV signals to cars, buses, trams, trains and even hand-held TV sets. Successful DVB-T tests have so far been carried out in Germany in

slow-moving city trams as well as in high speed cars travelling in excess of 170 miles per hour (see future technology section for more information). The number of carriers used for DVB-T varies from country to country. Whereas the UK has adopted a 2k system other countries have opted for the wider spectrum 8k system. Tests have shown, however, that the 8k system does not necessarily offer great advantages in areas, such as in the UK, where there is a regional television system.

Nevertheless, both versions offer considerable advantages over North America's digital TV standard, ATSC. A much less complex single carrier system it is nowhere near as robust as DVB-T and is also less well equipped to deal with multi-path interference.

All over the world

DVB-T networks are already on-air in the UK and Sweden and will shortly be launched in Australia, Germany and Spain. In the UK, which was the first country anywhere in the world to adopt digital terrestrial TV, over 411,000 homes are now linked to the service (status: 31st September 1999).

Since November 1998 viewers in the UK with an ONdigital DVB-T set-top box have been able to receive all five of the existing terrestrial TV services (BBC1, BBC2, ITV, Channel 4 and Channel 5) as well as subscription based channels from other broadcasters such as Sky and the BBC.

Today in Sweden all major channels transmit digital terrestrial TV including SVT1, SVT2, SVT24, SVT Regional, UR, TV8, Canal +, NolleTTan TV and Skenekanalen. TV3, TV4, Kanal5 and Kunskaps-TV will be added very soon.

Despite being headquartered in

Geneva, Switzerland the Digital Video Broadcasting Project has members worldwide. Field trials for DVB-T applications are currently planned or underway in Brazil, China and Hong Kong. The Singapore Broadcasting Authority (SBA) became the latest organisation to adopt DVB-T when it announced in May of this year that the standard had passed a series of field trials successfully.

Digital terrestrial TV products

Importantly, as DVB-T is an open, rather than proprietary, standard which also offers a high degree of commonality with DVB-S (Satellite) and DVB-C (Cable) variants. This means manufacturers are able to use similar chip-sets and components across the world thus helping to keep costs down both for the broadcaster as well as the end-user.

Nokia currently offers two DVB-T set-top boxes for both of Europe's digital terrestrial TV markets. In the UK there's the Nokia Mediamaster 9850 T while in Sweden there's the Mediamaster 9820 T. Capable of receiving all of the UK's 30 digital terrestrial TV channels the DVB 9850-T boasts ONdigital's embedded Mediaguard conditional access system with smart card reader and built-in modem. For Sweden the similar looking 9820 T is based on the software platform Open TV, also comes with a built-in modem and is compatible with both 2K and 8K COFDM signals.