

Guide To

DIGITAL TELEVISION

Broadcasting for the next millennium

The launch of digital television services on terrestrial, satellite and cable during 1998 will be the most exciting development in television since the change from black and white to colour.

This guide has been written to give you a deeper understanding of digital television and the reception issues surrounding it.

What is digital broadcasting?

Digital broadcasting is a new, more efficient way of transmitting television services. It allows much more information than before to be transmitted.

Digital television will offer:

- More programmes
- Sharper and clearer pictures with cinema quality, widescreen programmes
- Improved CD quality sound
- On screen electronic programme guides to help the viewer select and personalise their viewing choice
- Interactive services

There are at least three types of digital television delivering terrestrial, satellite and cable television services.

Digital Terrestrial Television

Digital terrestrial television is due to launch during the last quarter of 1998. The implementation of a 3 phase transmitter roll-out plan during the next 18 months will give coverage to most of the UK.



Digital terrestrial television will be transmitted through the current transmitter network and be received in most cases through the same aerial that is used currently for existing analogue services such as BBC and ITV. All you need is a digital terrestrial set-top box receiver or a new integrated digital television with a built in digital terrestrial television decoder.

Digital terrestrial television will carry around 30 new programmes, a mixture of free and pay TV programmes. It will offer the existing analogue programmes, BBC, ITV, Channel 4, Channel 5 and S4C plus a number of new free programmes such as BBC News24, BBC Choice and ITV2. In addition there will be a further 16 programmes from the new terrestrial licensee, British Digital Broadcasting. More details of digital terrestrial programme services are given later in this guide.

Digital Satellite Television

Digital satellite television is due to launch during mid 1998 from BSkyB with nationwide coverage. Digital satellite television will be beamed down from a new ASTRA satellite at an orbital position of 28.2° East. To receive BSkyB's digital satellite signals you will probably have to change your dish to a new smaller digital dish and you will need a new LNB. For digital satellite reception the dish must be positioned for the new orbital position, so if you still wish to receive the existing analogue (non BSkyB services) and new digital signals then you will need two satellite dishes. You will also need a new BSkyB digital satellite set-top box receiver or a new integrated digital television with built in digital satellite television decoder.



BSkyB's digital satellite television services will offer up to 200 new channels, a mixture of new basic and premium services, including a large number of subscription and pay per view services, near-on-demand movies (the same title starting every 10 or 15 minutes) and enhanced football coverage. BSkyB will also offer new interactive services via a modem in conjunction with British Interactive Broadcasting.

Digital Cable Television

Digital cable television is due to launch nationally towards the end of 1998 and will offer around 200 new channels.

Digital cable television will be transmitted via the existing cable TV lines and be operated by the major cable organisations. You will need a new digital cable set-top box receiver linked to your current television or new digital television with built in digital cable receiver/decoder. For further information, contact your local cable operator.



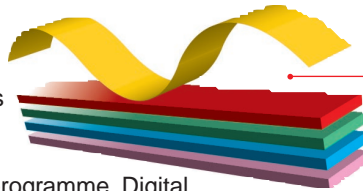
Next, let's have a look at digital terrestrial television in a little more detail.

What is the difference between analogue and digital terrestrial television?

Currently television signals are broadcast in an analogue format, as an electrical wave. Using analogue technology, frequencies are allocated to individual broadcasters with a single channel needed for each television programme.



Digital technology makes better use of the available airwaves and can therefore squeeze several programmes into the same TV channel which is currently only broadcasting one analogue programme. Digital technology will allow several programmes to be broadcast within the same TV channel, all with high quality sound and vision.



stations. Further relay transmitters may be added later.

The Independent Television Commission has stipulated that the roll out of the transmitters be implemented in three phases: a minimum from launch, followed by an additional number within eight months, and more within 16 months.

Digital signals can compress many more channels into the same frequency width that is currently used by just one traditional analogue transmission.

Digital broadcasting will transmit much more information than the current analogue system by converting sound and pictures into binary digits (zero's & ones) or 'bits'. These 'bits' are then compressed so that only the data needed to pass on the difference between each picture frame is sent, cutting out repetitive information and improving quality.

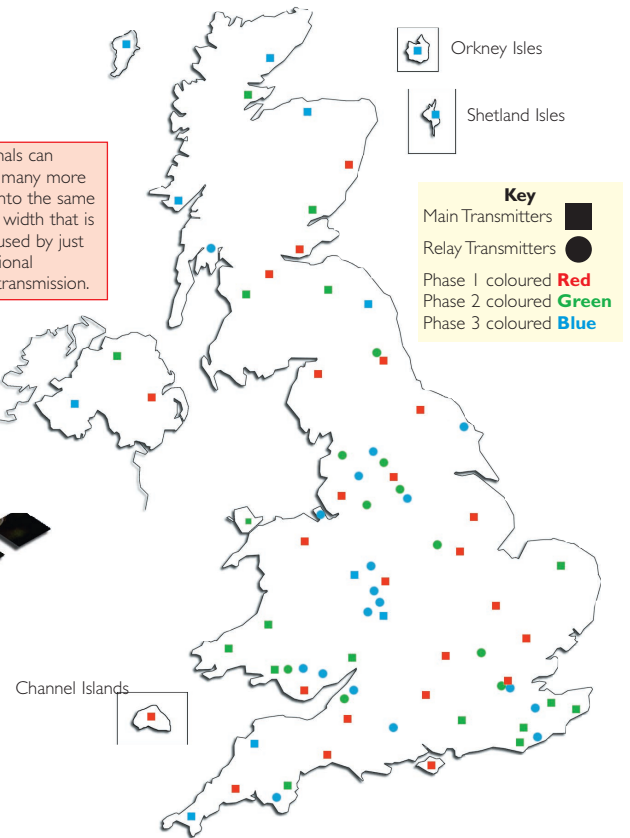


For example, in a picture of a yacht sailing across the sea on a sunny day, a great deal of the scene, such as the sky, the sun and the water, will hardly change for hundreds of frames. The only movement is the yacht and the occasional seagull. With digital compression only the parts of a frame that have changed are constantly transmitted, saving space on the airwaves.



How will digital terrestrial television be transmitted?

In the UK terrestrial television broadcasting uses the UHF frequency spectrum 470-860MHz. This spectrum is split into groups of 8MHz which are characterised by a set of channel numbers (refer to the following table). Digital signals will also be transmitted in this frequency spectrum through the current transmitter network. It is planned to transmit digital signals from all 51 main transmitter sites and 30 low power relay



Phase 1 Broadcasting Stations from which the Licensed Service must be broadcast from the Commencement Date

- Crystal Palace
- Sutton Coldfield
- Winter Hill
- Wenvoe
- Pontop Pike
- Sandy Heath
- Emley Moor
- Belmont
- Caldbeck
- Waltham
- Durriss
- Mendip
- Rowridge
- Hannington
- Black Hill
- Craigkelly
- Bilsdale
- Divis
- Caradon Hill
- Stockland Hill
- Tacolneston
- Fremont Point
- Oxford
- Moel-y-Parc

Phase 2 Broadcasting Stations from which the Licensed Service must have commenced broadcasting by the latest eight months after the Commencement Date

- Sudbury
- Ridge Hill
- Angus
- Rosemarkie
- Blaenplwyf
- Carmel
- Llanddona
- Presely
- Beacon Hill
- Dover
- Midhurst
- Heathfield
- Darvel
- Limavady
- Bluebell Hill
- Guildford
- Kilvey Hill
- Nottingham
- Lancaster
- Saddleworth
- Bristol I.C.
- Fenham
- Idle
- Hemel Hempstead
- Sheffield
- Selkirk
- Brighton (Whitehawk Hill)

Phase 3 Broadcasting Stations from which the Licensed Service must have commenced broadcasting by the latest sixteen months after the Commencement Date

- Salisbury
- Tunbridge Wells
- Reigate
- Brierley Hill
- Bromsgrove
- Fenton
- Larkstoke
- Malvern
- Bressay
- Eitshal
- Keelylang Hill
- Knock More
- Rumster Forest
- Aberdare
- Pendle Forest
- Storeton
- Bristol K.W.
- Hastings
- Pontypool
- Rosneath
- Chatton
- Plympton
- Chesterfield
- Keighley
- Olivers Mount
- Torosay
- The Wrekin
- Redruth
- Huntshaw Cross
- Brougher Mountain

Frequency	Group	Channels	Aerial Colour Code
470-606MHz	A	21-37	Red
582-734MHz	B	35-53	Yellow
686-860MHz	C/D	48-68	Green
614-860MHz	E	39-68	Brown
470-860MHz	W	21-68	Black

Digital terrestrial television programmes will be delivered via six frequency channels or 'multiplexes'. Each multiplex will have the capacity to carry up to approximately 20Mb/s, the equivalent of 4-7 TV programmes. The full digital service will use all 6 channels, but service areas for digital transmissions will differ with existing analogue coverage. Digital multiplexes may have different powers due to the constraints of fitting the new channels alongside the existing analogue channels without causing interference. This means that service areas will differ between different digital channels or multiplexes. For most transmitters multiplexes 5 and 6 will be radiated at lower power than the others, and these are expected therefore to have a poorer coverage than multiplexes 1-4.

Who will operate the multiplexes'?

The multiplexes will be operated by the Digital Multiplex Group, or the DMUX Group. The Group consists of the existing terrestrial broadcasters, BBC, ITV, Channel 4, Channel 5, S4C, Teletext UK and British Digital Broadcasting (BDB).

The existing terrestrial broadcasters BBC, ITV, Channel 4, S4C and Channel 5 are guaranteed space on the first three multiplexes and will offer mainly free to air programmes without subscription. They have plans to offer the following sort of programmes:



BBC

BBC1, BBC2 with more widescreen programming plus a new rolling news service BBC News24, BBC Choice and BBC Inform data service.



ITV

As per the existing ITV service but with more widescreen broadcasts plus new complementary ITV2 services.



Channel 4

Existing Channel 4 programmes in widescreen plus a brand new Channel 4 Movie Channel.



SDN

S4C Digital Networks have not yet announced their programme plans.



Channel 5

Existing Channel 5 Programmes will be broadcast in both analogue and digital.

OnDigital

OnDigital

Formerly British Digital Broadcasting, this partnership between Carlton Communications and Granada Group have been granted the licence to operate multiplexes 4-6. They are planning to offer a mixture of free and subscription channels which include:

- Carlton Select
- UK Horizons
- Carlton Films
- UK Gold
- Granada Plus
- UK Style
- Granada Good Life
- Carlton Public Eye

- Granada TV Shopping
- Carlton Entertainment
- Granada Sports Club
- Sky One
- Sky Screen 1
- Sky Screen 2
- Sky Sports 1
- UK FM Radio Station

Can I receive Digital Terrestrial Television?

With digital reception, the picture will either be perfect or non-existent. There will be no weak, snowy pictures. In most cases, a reasonable picture on the existing aerial is a fair guide to successful reception of digital; however if you know you are in a fringe area or have a noisy picture you may not be able to receive some or all of the new digital services. Contact a professional aerial installer for further information.

How do I receive Digital Terrestrial Television?

To receive a digital signal, you will need either a digital terrestrial set-top box receiver or an integrated digital television with a built-in terrestrial decoder.



A digital terrestrial set-top box receiver is used with your existing analogue TV. The most basic form of decoder will receive free programmes from the existing broadcasters. The basic decoder will also have an

electronic on-screen programme guide to guide the viewer through the multitude of options available and enhanced Ceefax and Teletext pages with high resolution graphics. The set top box will be easy to set up and will link to the TV, VCR and aerial socket and be operated by a remote control.



If you also wish to receive BDB's subscription programmes you will need a BDB smart card and to subscribe to BDB.

Will I need a new aerial to receive Digital Terrestrial Television?

Where possible, new channels close to those used for the analogue services will be used. This allows the same receiving antenna to be used for the digital signal. However, in some areas of the country the digital signals will be transmitted 'out of group' to the current analogue signals. In these cases, a new UHF wideband aerial may be necessary for reception or a slight adjustment to the existing aerial. In addition, in fringe and overlap areas you may need to change your antenna direction and point it at a different transmitter to receive a satisfactory digital service.

Can I use a set top or indoor aerial to receive Digital Terrestrial Television?

In strong reception areas a set top or indoor aerial can be used to receive digital signals, however the best quality reception will always be obtained on an external aerial, mounted either on the chimney or wall.

Will I have to pay for all digital terrestrial television programmes?

No, is the simple answer. As long as you have a set top box or an integrated digital terrestrial television, BBC1, BBC2, ITV, Channel 4 and Channel 5 will be free of charge. The other programmes available will be via subscription or pay-per-view.

Do I have to watch digital terrestrial television?

No, or not at least until well into the next century. It is the long term goal of the government to switch off analogue transmissions sometime in the future and transfer all television channels to digital frequencies. This is not likely to happen for the next 10-15 years. In the meantime the BBC, ITV, Channel 4 and Channel 5 must simulcast, i.e. transmit 80% of their programmes both as analogue and digital.

Do I need a widescreen television to watch digital terrestrial television?

For digital transmissions, all the main broadcasters have given their commitment to making and transmitting lots of widescreen programmes.



If you don't have a widescreen TV, you will still be able to see digital widescreen broadcasts either in 'letterbox' format, with black bands at the top and bottom of the screen or...



...a 'centre cut-out' where the sides of the widescreen picture are cropped.

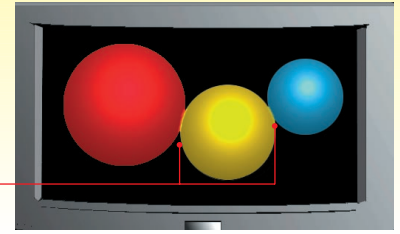


However, a widescreen television will give the best digital rendition of the new medium.

Will I be able to record digital terrestrial programmes with my existing VCR?

Yes, but like satellite, you will only be able to record the programme which is selected on the set-top box receiver. For example, you will not be able to watch one digital programme and record another on a different multiplex. To record any digital programme the digital receiver must be switched on and the right multiplex selected. You can however watch an analogue programme and record a digital programme and vice versa.

The play back of a digital recording will lose some of its original quality. This is because the VCR will introduce some of the limitations of analogue TV such as 'Dot crawl' (fuzzy edges between brightly coloured parts of the picture) and...



...'Cross-colour interference' (flashes of colour that appear on scenes containing black and white check patterns). Also, some widescreen properties may be lost on playback.

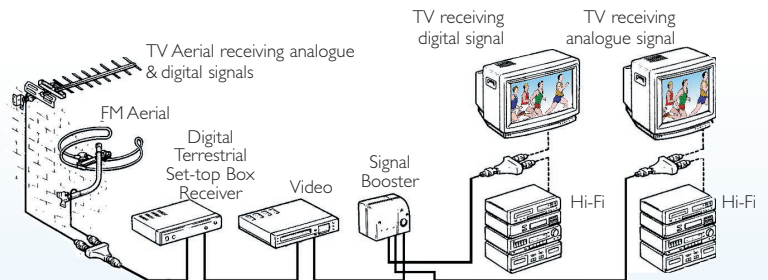


Can I receive digital satellite television as well as digital terrestrial television?

If you wish to receive both digital satellite and terrestrial, as well as needing a satellite dish and LNB, you will also need another type of smart card and a special module to add to the digital terrestrial set-top box receiver. Alternatively you could use a separate digital satellite set-top box receiver.

Can I distribute a digital terrestrial signal around the home?

Yes, it is possible to distribute a digital terrestrial signal and existing analogue signals around the home, by using a signal booster as shown in the diagram. However, like with satellite, you will only be able to distribute the programme which is selected on the set-top box receiver.



For further information on terrestrial television reception and distribution please see the Maxview 'Guide to Terrestrial TV&FM Broadcasting'. Copies of this guide are available **FREE** of charge from the Maxview Customer Helpline on 01553 811000.

To keep you informed and up to date with the latest developments in digital television, Maxview have joined the Digital Television Group. The Group has been formed by paying members which include approximately 70 of the UK's major communications, television and electronics companies, to provide an industry wide forum to facilitate the introduction of digital television services in the UK.

All of the information in this 'Guide to Digital Television' is correct at time of publication. However, details are subject to change. Produced independently by Maxview.

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