

Receiving Digital Terrestrial Television



RTÉ NL

Introduction

Digital Terrestrial Television (DTT) infrastructure has been rolled out across much of the country by RTÉNL, in preparation for the launch of digital television services by broadcasters. Coverage will extend to all of the country on a phased basis before the end 2012 to facilitate the switch off of the current Analogue Terrestrial Television (ATT) system. DTT offers:

- More television channels
- Radio services (including RTÉ's DAB-only services)
- Improved video and audio quality
- Enhanced teletext

Prior to ATT switch-off, the available electromagnetic spectrum can facilitate four DTT multiplexes. This will rise to six DTT multiplexes once ATT is switched off at the end of 2012. The six DTT multiplex system will deliver up to 50 standard definition television services (a mixture

of free-to-air and pay services), radio and digital teletext. It will also provide a migratory path to high definition television.

RTÉNL will deliver DTT signals to practically every home in the country but to avail of these improved services the viewer/householder will also have to take some action. Each home will need:

- A traditional television set in good working order and a compatible* Set Top box (STB); or
- A compatible integrated Digital Television (iDTV); AND
- An efficient antenna or aerial, properly installed to ensure that reliable and consistent signals are received and delivered to the STB or iDTV.

* the STB or iDTV must conform to the Irish DTT receiver specification (please www.rtenl.ie for details)

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The following guide answers viewers' frequently asked questions.

Do I need a different antenna for digital television?

Digital television will be transmitted on the UHF band. In general, an existing UHF antenna that is used to receive an existing UHF service, will also receive the digital transmissions. A list of transmission sites, together with frequencies, are given in Table 1, on page 7 of this publication. An antenna of the correct



Typical UHF Antennas

channel group can be used to receive either the existing analogue or the new digital transmissions. If you can already receive a good signal for an existing UHF service, then it is quite likely that you already have a suitable antenna, but please check the list in Table 1.



Typical VHF Antenna (will not receive digital)

Why is a good antenna important?

Most reception problems are due to an inadequate or poorly-installed antenna so it is important, therefore, to get this right. Signals are at their strongest close to the transmitter site. They get progressively weaker the further one travels from the site. Hills, tall buildings and other obstructions can limit coverage in certain areas. In areas of weak signals, it is important to position the antenna carefully to ensure that it can receive the available signals to best effect.

As traditional analogue television signals become weaker, the viewer notices a deterioration in picture quality as it becomes more and more "snowy". Digital signals are different as there is no difference in picture quality produced by

strong signals close to the transmitter site and relatively weak signals further away. Beyond a certain point, however, the signal becomes too weak and the decoder is not able to produce a picture at all.

In some areas, DTT transmissions are of higher powers than current analogue services broadcast from the same transmitter sites. In fringe reception areas, some installations may have a mast-head amplifier in place to boost the analogue signal. In cases where DTT signals are stronger than the analogue signals, mast-head amplifiers may overload. In such cases, the amplifier should be removed from the installation.

Do I need a different antenna for digital television?

In short, a good antenna is one that is best suited to a particular location. In many locations, an indoor antenna may suffice. In others, an antenna can be installed in

the attic. In others, an outdoor antenna will be required. Antennas fall into one of four categories as follows:

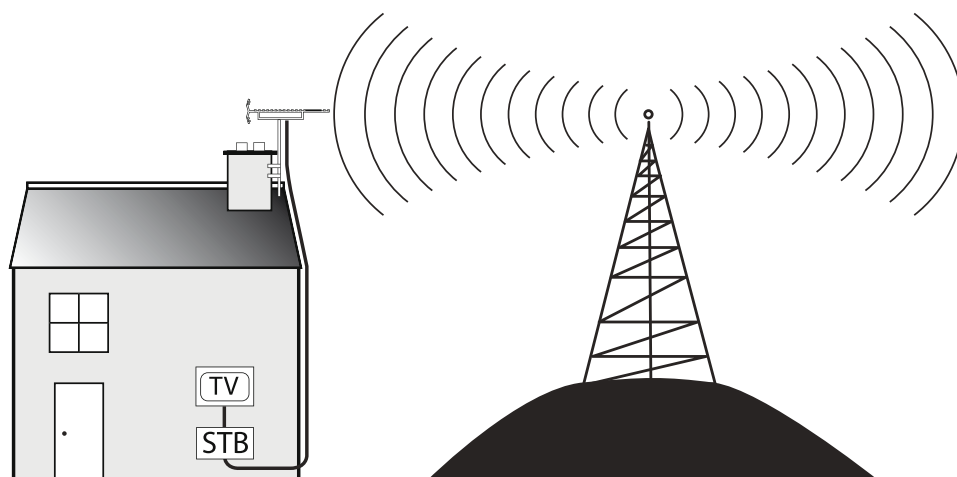
- | | |
|-------------------|--|
| Category 1 | Should provide adequate DTT reception even for homes on the fringes of coverage areas. |
| Category 2 | Intermediate standard, suitable for use within the coverage area. |
| Category 3 | Minimum standard required for good coverage conditions. |
| Category 4 | Recommended where better wideband performance is required. |

Table 2, on page 7, shows the recommended minimum gain figures for each category of antenna.

What are the desirable characteristics of a good antenna installation which enable it to provide the best possible picture on a television set?

The antenna should be aligned correctly in the direction of the transmitter site so as to amplify the incoming signal and avoid,

where possible, signals from any other source.



What is meant by antenna polarisation?

Television signals are transmitted in either the horizontal or vertical plane. The antenna must, therefore, be installed either vertically or horizontally as required in order to be able to receive the signals.

Vertically polarised antennas have their elements pointing towards the ground i.e. they are “vertical”, whereas horizontally polarised antennas have their elements parallel to the ground or “horizontal”. The polarisation of each transmission station is given in Table 1 on page 7.



Vertical polarisation antenna.



Horizontal polarisation antenna.



Horizontal polarisation antenna.



Vertical polarisation antenna.

Fitting the Antenna

For external antennas, these should be mounted using suitable galvanised wall brackets, spaced in accordance with the manufacturer's recommendations and instructions. As an alternative, special lashing kits (which should also be galvanised) are available for attaching mounting poles to a suitable chimney, without having to drill any holes. Again

these must be installed in accordance with the manufacturer's instructions. A pole up to 1.8m in length can be 25mm in diameter, with a wall thickness of 1.2mm. Beyond this length, the pole should be 51mm in diameter and 1.6mm-2.0mm thick. It is recommended that poles and brackets should be galvanised to EN ISO 1461:1999.

What about cable?

A good quality cable is most important. Poor quality cable will lose a lot of the incoming signal and will allow "noise" or other unwanted signals to combine with the wanted signals, causing interference. Don't spoil the installation with cheap cable: use a low loss type. When attaching a cable, feed it up from underneath so that rain does not run in to the connection box. Use self-amalgamating tape to waterproof any holes where water may enter.

Leave any drain holes that there may be in the bottom of a box free for condensation, to drain out and make sure the drain holes, if any, are not obstructed by the cable etc.

The antenna should be connected to the STB using good quality cable, such as CT100, conforming to the standard EN 50117-1 1997.

What sort of connectors should be used?

Where possible, "F" connectors should be used. These are easy to fit and must be screwed into place giving a good, reliable fit. For a demonstration of how to fit an F connector, please go to: <http://www.youtube.com/watch?v=2gvZx2C8nnY&feature=related>

Where a traditional co-ax plug is required, these should be attached to the cable as shown below. Please note that there should be a *very slight kink* in the core of the cable to ensure a tight fit.



Co-Ax plug before assembly showing slight kink on centre core to maximise contact

Should I install the antenna myself?

Having chosen the right antenna for the particular location, according to the antenna categories above, and using quality cable, as also discussed above, it is possible for any competent person to erect an antenna. Anyone contemplating erecting an antenna

should, however, comply with the Health & Safety Authority's Working at Height Regulations. If in doubt or having any concerns about undertaking an antenna installation, please ask a professional installer to do the work for you.

How do I set up the antenna?

Once the antenna is installed, either externally or internally in an attic, it must be properly aligned with the transmitter station it is intended to receive. The most effective way of doing this is to use a signal strength meter. There is a wide range and quality of meters available. The cheaper ones will merely give an indication of the presence of a signal while the aerial is adjusted, whereas the more expensive will give information on signal quality.

If you do not have a signal strength meter, please use the iDTV or STB's internal signal quality indicator to line up the antenna. This will be found within the Setup Menu

of the receiver concerned. Complete the installation and connect the aerial to the STB and television set, or direct to an iDTV. Consult the manufacturer's instructions on setting up the STB or iDTV. Ask a friend/family member to watch the signal strength indicator while you slowly rotate the antenna through an arc of about 60° across the general direction of the transmitter station. By doing this a number of times, the person viewing the television set will be able to determine the point at which the antenna is correctly lined up with the transmitter station. Make sure to tighten all brackets once the line up is complete.

Will I need a separate antenna to receive Boxer's DTT offering?

The answer is No. You will only need one antenna to receive the national television services and Boxer's channels, should you choose to subscribe to these. If you

can only receive services on two or three multiplexes, it is highly likely that there is a problem with the quality of your antenna installation.

If I'm not satisfied with the results of my installation what should I do?

Contact your local television dealer or antenna installer, in the first instance. You

may also contact [RTÉNL](http://www.rtenl.ie) via our website www.rtenl.ie for more general advice.

Table 1 - Transmission Station Locations, Channel Numbers, and Polarisation

DTT Television Channel Table		Coordinates		Analogue			DTT				Aerial Group		Polarisation		
		E	N	RTE1	RTE2	TV3	TG4	P 1	B1	B2	B3	Analogue		DTT	Combined
CAIRN HILL	Longford	218700	284300	40	43	46	50	47	41	44	51	B	B	B	H
CLERMONT CARN	Louth	309850	315850	52	56	66	68	53	57	63	60	C/D	C/D	C/D	V
HOLYWELL HILL	Donegal	238450	417100	23	26	29	33	30	25	32	35	A	A	A	H
THREE ROCK	Dublin	317550	223150	29	33	35	35	54	58	61	64	W	C/D	W	H
KIPPURE	Wicklow	311566	215473	E	H	62	59	54	58	61	64	C/D	C/D	C/D	H
MAGHERA	Clare	151750	191150	E	H	66	68	48	65	67	55	C/D	C/D	C/D	H
MT. LEINSTER	Wexford	282700	152550	F	I	26	23	45	39	42	49	A	B	W	H
MULLAGHANISH	Cork	121399	81899	D	G	27	31	21	24	28	25	A	A	A	H
SPUR HILL	Cork	164445	67053	53	57	60	63	45	66	68	49	C/D	E	W	H
TRUSKIMORE	Sligo	175850	347375	I	G	60	63	53	57	52	56	C/D	C/D	C/D	H
WOODCOCK HILL	Clare	153343	163466	39	42	45	49	47	41	44	51	B	B	B	H
DUNGARVAN	Waterford	218150	90750	53	57		63	55	59	62	65	C/D	C/D	C/D	H
GREYSTONES	Wicklow	327000	212600	53	57		63	52	56	66	68	C/D	C/D	C/D	V

Table 2 - Antenna Recommended Minimum Gain Figures

Aerial Category	Description	Group A (Ch 21-37)	Group B (Ch 35-53)	Group C/D (Ch 48-68)	Group E (Ch35-68)		Group K (Ch21-48)		Group W (Ch21-68)		
		10dB	11dB	12dB	11dB	12dB	Ch 35-47	Ch 48-68	Ch 21-36	Ch 37-48	Ch 37-52
1	Locations at the edge of coverage area	10dB	11dB	12dB	11dB	12dB	11dB	10dB	10dB	11dB	12dB
2	Intermediate coverage areas	7.5dB	8.5dB	10dB	8.5dB	10dB	8.5dB	7.5dB	7dB	8.5dB	10dB
3	Minimum requirement for good reception	6dB	7dB	8dB	7dB	8dB	7dB	6dB	5dB	7dB	8dB
4	Recommended where wideband reception is required	Not Applicable									

Gain figures in dB relative to a dipole

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