

Indoor Loft TV Aerial Installation Guide - DIY Tips

If you're installing an indoor TV aerial in a loft, this installation guide provides DIY help, tips and advice on how to get the best Freeview reception and on mounting indoor TV aerials in an attic.

In reality, if you live more than about 20 miles from a main UHF TV transmitter, fitting a loft TV aerial is unlikely to provide perfect analogue TV or Freeview reception. In fact, indoor Freeview aerials may give poor reception even in locations quite close to a television transmitter, depending on local terrain. For example, the presence of nearby obstructions or screening from trees may result in a weak television signal or a Freeview reception problem leading to picture break up.

Install Loft Aerials for Freeview & Analogue TV Reception

The loft aerial installation tips on this page assume you don't have access to a TV signal strength meter, which would make alignment much easier.

Before you install an indoor aerial, ask your neighbours whether they get good reception using a loft aerial for Freeview TV. If they are still using analogue TV, check whether the picture is free from noise on all channels (a weak signal gives snowy or grainy picture). If they get a weak TV signal or problems with Freeview reception, then installing a high gain *external* TV aerial is advised. Get the aerial fitted by a local CAI installer.

If a indoor TV aerials appear viable, you can crudely check signal strength in your loft by trying a portable TV and a set-top aerial inside your attic.

Check TV Aerial Compass Bearing

When installing the temporary set top TV aerial, get the bearing to your TV transmitter by entering your postcode into the [Wolfbane Digital TV Coverage Estimator](#) and check Freeview coverage maps for your area. Find out whether your local TV transmitter uses Horizontal or Vertical polarisation and the compass bearing from your location. TV aerial polarisation is defined in the Wolfbane 'POL' column.

Then use a compass to find the TV transmitter bearing from your property. Install the temporary loft aerial by moving it around your attic to get the best picture on all channels whilst pointing it in the direction of the transmitter.

If a set top TV aerial installation gives good reception when mounted in your loft on all analogue TV channels, then a DIY indoor high gain aerial should provide excellent results. Also check whether your Freeview box works on the temporary set-top aerial and that all multiplexes can be received. If DTT reception is poor in your attic, install an outdoor roof TV aerial instead.

For analogue TV reception prediction coverage maps by UK postcode

<http://www.wolfbane.com/cgi-bin/tva.exe?>

For Freeview TV reception prediction coverage maps by UK postcode

<http://www.wolfbane.com/cgi-bin/tvd.exe?>

For a full list of UK TV transmitters and the Freeview aerial group required for best reception

<http://www.dtg.org.uk/retailer/transmitters.html>

Indoor Aerial Pros and Cons

Fitting indoor loft TV aerials generally results in less than half the signal strength of an external roof mounted aerial due to the attenuation of roof tiles and roofing materials. There is also a reduction in received signal strength resulting from the lower height when installing indoor aerials compared to roof top aerials.

However, to DIY install a indoor aerial in a loft does have some advantages. For example, it suffers no weather damage, rain ingress or plastic UV degradation from the sun - so there some benefits in installing indoor aerials over the 10 year life expectancy of a roof-top aerial in the UK. Loft aerials also provide aesthetic advantages and where restrictive covenants exist in the deeds of a property forbidding external installation, fitting a high gain wideband loft aerial for TV reception may be the only viable option.

Poor Indoor Aerial Reception Scenarios

Where the direction to the TV transmitter means that an indoor aerial needs pointing through solid walls rather than tiles in your loft, UHF signal attenuation can be much higher. If you are in a row of houses and the aerial has to point through **multiple party walls and roof-spaces**, then you can expect very poor reception and weak TV signal levels from your attic aerial, even quite close to the transmitter. A low noise masthead aerial amplifier will help in these circumstances, especially if you're using a long cable run from the aerial.

http://www.dastv.co.uk/Single_Output_Masthead_Amps.php

For better results, consider installing a high gain Freeview TV aerial - roof mounted (if permitted).

Installing indoor aerials for TV may also give a poor signal if:-

- Metal foil roof materials or attic linings have been used in your property.
- The path to the TV transmitter is partially or totally obstructed by nearby hills or building/s.
- The path to the TV transmitter is directly through nearby tall trees.

- Your loft aerial installation points through a neighbour's roof space and they have a junk filled attic!
- The aerial has to be installed behind water tanks or close to pipes which will de-tune it.
- The TV transmitter serving your area transmits on high number UHF channels (channel numbers above 40) which suffer much greater signal loss through roof tiles and walls. TV channels or DTT multiplexes on high UHF frequencies (Ch50 - 68) can be badly attenuated if you install a loft aerial.

CAI Aerial Benchmarking Standards

The **Confederation of Aerial Industries** (CAI) undertake aerial benchmarking (which involves the formal testing and evaluation of TV aerials from all manufacturers). The CAI then apply benchmark standards of 1 - 4 to aerials which meet their strict quality guidelines. In general, **standard 1 CAI benchmarked aerials** will work best in weak Freeview reception areas and **standard 2 aerials** will be slightly inferior - but are still a good choice for average signal areas.

The installation of a CAI benchmarked TV aerial of standard 1 or 2 will improve Freeview reception over standards 3 and 4 types. For a definitive list of CAI approved and benchmarked aerials by manufacturer [click here](#) to visit the DTG website.

Fitting the Best Loft Aerial

Choosing and installing the best indoor TV aerial in your loft depends entirely on where you live in the UK and available space. The UHF channel allocations of many UK television transmitters require wideband TV aerial installation, especially for good Freeview reception (DTT), whilst other regions allow the use of aerials optimised for a narrow band of UHF frequencies, even for Freeview. See <http://www.dtg.org.uk/retailer/transmitters.html> to find the best type of digital compatible TV aerial for your particular region of the UK.

If in doubt, fitting a **high gain wideband TV aerial** which will receive all UHF TV channels and work in all areas is the best solution. It's worth noting that a **Log Periodic TV aerial** will typically work better than a "yagi aerial" when installed in a loft, since it is less susceptible to impulse interference pickup from central heating thermostats and mains wiring which can cause picture freezing problems. Log Periodic TV aerials also offer very flat gain characteristics, so will pick up all UHF channels equally well, although their signal gain is a little lower than a high gain multi-element array such as the Triax 52 wideband aerial.

http://www.dastv.co.uk/Triax_Unix_52_Wide_band_digital_freeview_aerial_215.php

For weak Freeview signal areas, a 52 element digital compatible wideband aerial is a good choice for attic mounting in all UK regions. These are a good choice for fringe area reception and weak signal areas for boosting Freeview reception.

Since you can expect a 10dB signal loss by fitting TV aerials in your loft, you should always try to install a **high gain aerial** wherever possible to help counteract losses through the tiles and roof. Always install a decent aerial, rather than a cheap aerial with a signal booster. It is just as important to buy quality double screened FT100 or CT100 satellite cable to feed your indoor loft aerial as large signal losses can result from older supposedly "Low loss" TV cables.

Where Freeview and analogue TV reception is on a narrow group of channels a TV aerial optimised for those channels will outperform a high gain wideband aerial. For example in London and areas served by the Crystal Palace transmitter, a Group A high gain TV aerial is the best choice for all Freeview DTT and analogue TV channels and will give better reception than installing an equivalent wideband aerial from Crystal Palace.

Masthead Aerial Amplifiers

When considering loft aerials in a fringe TV reception area for Freeview, installing a high gain masthead TV amplifier **at the aerial** may significantly improve Freeview reception especially if a long coaxial cable aerial down lead is required. For regions with a poor TV signal, install a fully screened masthead amplifier with around a 16dB gain (maximum) in the loft about 1.5 metres down the coaxial cable from the aerial.

When choosing a masthead amplifier pick one that gets its power up the coaxial cable like these

http://www.dastv.co.uk/Fringe_WB1214_Single_Standard_Masthead_Amplifier_360.php

These units are well built, offer adjustable gain (10 - 20dB) and are fully screened against interference. The Vision masthead amplifiers also feature ultra low noise amplification stages, which particularly suited to improving Freeview reception in poor TV signal locations.

If interference problems occur with any masthead amplifier, we recommend installing a TVI filter between the TV aerial and the masthead amp.

Tips for Fitting Indoor TV Aerials

Positioning indoor aerials in any loft is surprisingly critical in order to get the best Freeview signal quality and analogue television pictures free from noise, ghosting and interference.

Top TV Aerial Installation Tip:

If your received TV signal is strong, try fitting a 12dB TV signal attenuator to help lower the signal so that the optimum position for the aerial in the loft can be found. Install a portable TV temporarily in the loft to find a "sweet spot" giving the best reception on all TV channels and highest Freeview signal quality from your indoor aerial.

Here are some more useful DIY installation tips on how to install an effective indoor TV aerial in your loft for Freeview and analogue TV reception: -

- **Loft Signal Test** - Install a portable TV in the attic to accurately align the loft aerial for the best signal on all channels. Feed the aerial with a temporary piece of double screened CT100 coaxial cable. Concentrate on improving the signal from the weakest TV channel - this may be Channel 5 if it runs low power. When aerial alignment is complete, disconnect the portable TV and temporary cable and remove it from the loft. Connect the loft aerial to your main TV using the shortest possible length of double screened FT100 satellite cable.
- **Aerial Alignment Tips** - In strong signal areas, buy a 12dB signal attenuator and use it to assist in aligning the indoor aerial for least picture noise and ghosting on analogue TV channels. The attenuator will make the TV picture noisy, making it easier to find the best install position for the TV aerial in the attic. In some very strong signal areas close to a transmitter, a 6dB attenuator and 12dB attenuator may be needed in series (making 18dB of attenuation) to get noise to appear on the picture. Always disconnect the attenuators when loft aerial alignment is completed. If you don't want to buy attenuators, one crude but effective way of lowering the received signal to assist in optimising the aerial is by partly removing the TV plug from the television aerial socket until the picture goes noisy. Then make sure the plug can't move or completely fall out whilst you find the best location for the aerial in the attic with the clearest picture and least picture noise.
- **Freeview Signal Quality** - If you have an existing Freeview installation, temporarily place your Freeview receiver in the loft feeding the portable TV and align indoor aerials for the best Freeview signal quality indication on the weakest digital multiplex. Check the DTT signal quality of all channels is above 50% and if necessary re-align or move the aerial slightly to get all digital TV multiplexes at acceptable signal quality (over 40 - 50%). If one or more digital multiplexes is not receivable try changing your aerial for one with a higher gain and [standard 1 CAI aerial benchmark](#). Remove the Freeview receiver when aerial installation is complete.
- **Finding Reception Hot Spots** - When carrying out any indoor TV aerial installation, try all areas of the loft as "reception hot spots" can often be found inside a roof which give significantly better reception, just moving the aerial a few feet from side to side or up and down can make a huge difference to TV reception.
- **Check for Ghosting** - When fitting the indoor aerial in your loft, always check for ghosting on all analogue TV channels. If your area is known for multi-path TV ghosting problems, then always install a high gain wideband aerial with the best front to back ratio and mount it as high as possible in the attic.
- **Installing an Indoor TV Aerial** - Installation of any loft aerial should be well away from pipes. In addition, never point loft TV aerials directly through attic water tanks or a very poor signal will result.

- **Signal Attenuation Through Brick Walls** - Avoid pointing indoor TV aerials through brick walls at all costs. For example, if one area of your attic has tiles in the direction of the transmitter and another area has a brick wall in that direction, undertake TV aerial installation in the part of your loft where it points solely through tiles with the least number of other obstructions from (for example) multiple party walls or the roofs of other houses.
- **Aerial Height** - Try to install the TV aerial as high as possible in the loft, well well away from any 240V power cables and lighting circuits. This is particularly important for Freeview reception, where noise pickup from household appliances and light switches can momentarily freeze the picture.
- **Effect of Loft Materials** - Keep the rods (elements) of the indoor aerial clear of wooden rafters and attic metalwork. If necessary, use nylon string to anchor the aerial in between wooden rafters, pointing it precisely in the correct direction. Nylon garden twine is suitable, but make sure the aerial mounting is secure and cannot move.
- **Mounting a Loft Aerial** - Alternatively, for secure TV aerial installation fit a proper aerial bracket. A suitable loft mounting bracket (for indoor use only) is available from Satcure.
- **Aligning the TV Aerial** - Always adjust loft aerials on the weakest TV channel first. This could be Channel 5 where it is transmitted on lower power, or the TV station on the highest UHF channel number. Bear in mind that the highest UHF channel number suffers the greatest signal loss through the loft roof tiles and brickwork as it is the highest UHF frequency.
- **Aerial Elevation** - When mounted in its final position in the attic, the end of the aerial (furthest from the coaxial cable feed point) should be tilted up slightly by about 1 degrees from horizontal for best results.