

# GOOD RECEPTION: THE BASICS

Radio & Television  
Investigation Service

Fact Sheet 1

For trouble-free reception of television and radio – analogue or digital – a good installation is essential.

## WHAT THIS SHEET COVERS

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The aerial and downlead  
Terrestrial television—Satellite—Radio  
Plugs, sockets and cables  
Aerial amplifiers and ‘boosters’  
Portable radio and television  
What exactly is ‘interference’?  
How do I tell if I’ve got interference?  
Analogue and digital reception—the difference  
Quick check chart

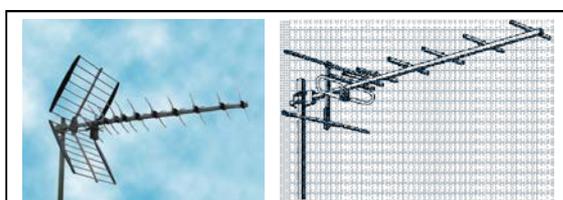
## THE AERIAL AND DOWNLEAD

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### Terrestrial television

For terrestrial TV, the aerial is the key to getting the best results. Very many of the problems reported by viewers turn out to be related to their aerial system. The following points illustrate Best Practice for aerial installations, both for analogue and digital reception.

- Use a good quality, branded aerial of the correct Aerial Group for your transmitter. A CAI\* benchmarked aerial will carry a guarantee of quality both of performance and construction.
- Mount the aerial outdoors, as high as possible – the TV network in the UK is designed to be received on outdoor aerials. Loft aerials only work well if signals are strong and the loft is free of clutter. Certain roofing materials can render loft aerials far less effective, and more susceptible to some kinds of interference. Wet tiles can worsen matters further.
- Keep it well clear of other aerials and metalwork – at least 75 cm.
- Avoid pointing into nearby trees.
- Use the best cable you can for the downlead (eg. satellite-grade double-screened co-axial cable), secure it to the pole and route it into the home so it doesn’t flap about in the breeze. Avoid sharp bends around corners and under tiles etc, and keep it as short as is practical. CAI\* benchmarked cables will carry a guarantee of quality.



Examples of good quality aerials mounted with horizontal polarisation

- Ensure it is correctly aligned, has the right polarisation (elements vertical or horizontal) and is mounted securely.
- Choose an aerial which includes a balun matching device if you are near a main road – it could reduce pick-up of interference from passing traffic.

If your reception has deteriorated recently, check the following:

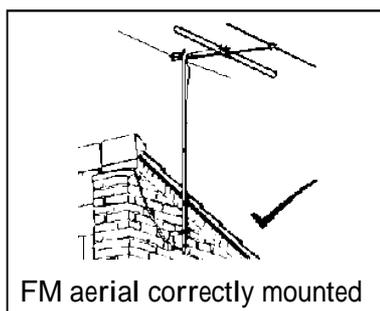
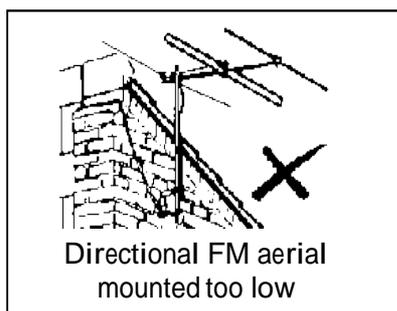
- If your aerial appears damaged or bent, replace it.
- If it seems to have moved but is otherwise undamaged, have it re-aligned and secured.
- If your downlead looks cracked, feels damp or is going green inside the plug, replace it.
- If your aerial is more than 10 years old, its performance may have diminished due to corrosion. This is especially true in coastal locations, where the effective life of an aerial may be less than 10 years. Consider replacing it, and the downlead, at the same time.

## Satellite

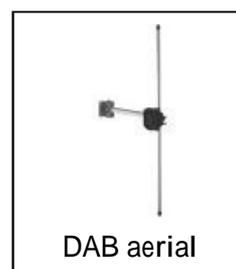
Satellite dishes can move if they are not securely fixed, and can be damaged by wind and debris in exposed locations. Loose cables can move about and eventually break.

## Radio

FM radio aerials mounted outdoors give far better results than indoor types, especially for stereo reception. Directional ones bring in more signal from the transmitter they're pointing at than the 'halo' types, and are strongly recommended unless you want to receive stations which use different transmitters (such as local radio stations from different areas). Halo aerials are also more susceptible to a 'gritty' sounding distortion known as multipath distortion.



Most DAB Digital Radio receivers designed for stereo listening will need an external aerial of some kind. Random lengths of wire rarely give consistent results. Usually a simple vertical dipole will provide good reception, but it needs to be a proper DAB aerial (sometimes called Band III), not an FM one—the two are quite different and are not interchangeable. Tuners with both FM and DAB sections usually have two separate sockets on the back, for this reason.



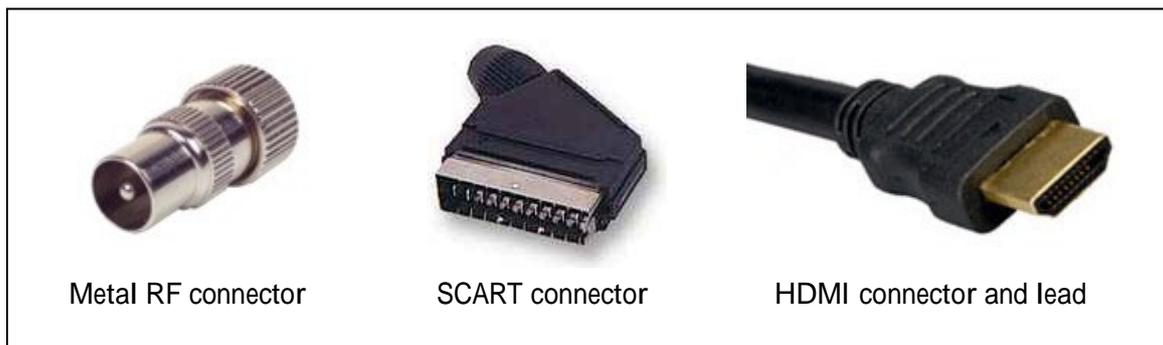
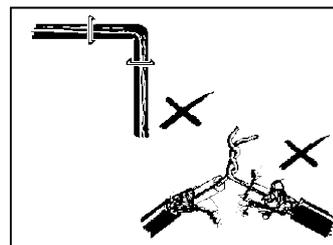
If your TV aerial system isn't working correctly, you can suffer grainy or distorted pictures on one or more analogue channels, and experience break-up of pictures and sound on Freeview. These problems can appear or worsen during wet or windy weather. A faulty radio aerial can cause hissing on FM and distortion and lost reception on DAB digital radio.

\*CAI stands for Confederation of Aerial Industries. We recommend you have your aerial installed or checked by a professional. Installers who are members of the Confederation of Aerial Industries ([www.getmeviewing.org.uk](http://www.getmeviewing.org.uk)) will guarantee their work, and operate to a code of practice. If you are installing an aerial for digital TV, Registered Digital Installers ([www.rdi-lb.tv](http://www.rdi-lb.tv)) are accredited for this work (some are also CAI members).

## PLUGS, SOCKETS AND CABLES

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Make sure the plugs on the ends of cables are secure and not flimsy. They should not be frayed or sharply bent. Also ensure they are plugged firmly into their socket. This applies not only to aerial cables but to interconnecting leads such as 'RF' leads, HDMI and SCART connectors – basically anything that connects your receiving equipment together.



The quality of wall-mounted aerial outlets can have an effect on reception. Those with a screened metal plate are preferred for digital TV, and if signals are known to be marginal, use satellite-grade double-screened co-axial cable for the lead between your aerial outlet and your equipment. Also use metal RF plugs rather than plastic ones.

Use SCART connectors between VCRs, DVDs, Digital set-top boxes etc and the TV set rather than relying solely on RF leads. This not only gives sharper pictures but can reduce the likelihood of 'patterning' type interference where one device interferes with another. Don't just use the least expensive SCART connector you can buy—fully screened ones can perform much better than the cheapest basic types which may be flimsy and can give rise to interference problems between devices they are connected to.

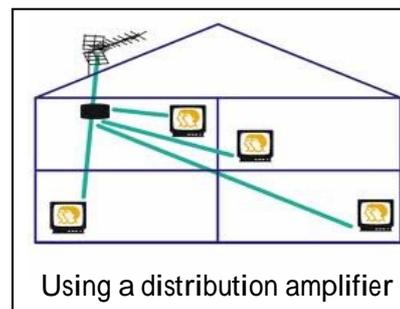
NB. If you use HD equipment you should connect it with HDMI cables rather than SCART ones, otherwise the extra picture quality will be lost.

## AERIAL AMPLIFIERS AND 'BOOSTERS'

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Aerial amplifiers should not be used unless there is no alternative. A better aerial will pull in more signal and may make an amplifier unnecessary. Amplifiers come in three basic types:

- Masthead type consisting of a unit which fits underneath the aerial, powered through the downlead cable from a power supply fitted in the home. Designed for outdoor use.
- Set-back type, used indoors, which amplifies the signal as it goes into the TV equipment.
- Distribution amplifier which splits the signal from one aerial to several different TV outlets.



Sometimes two amplifiers can be combined in a single unit, such as a masthead amplifier which distributes signals to more than one outlet. More sophisticated units can even combine signals from FM and TV aerials and distribute them both together—the two signals are then split again at each outlet.

For weak signals, the masthead type is often much more effective than the 'set-back' type but needs to be properly fitted. Also, it should be a type which is designed and approved for digital TV, and filtered to only allow TV signals to be amplified. Many aerial amplifiers sold for domestic use are not filtered and can be prone to 'swamping' from unwanted signals such as radio communications. This can cause patterning on analogue pictures and break-up on digital TV.



Masthead amplifier kit

All amplifiers can be damaged by nearby lightning discharges, and can even be the cause of neighbourhood interference if they start to oscillate because of water ingress. They also add noise to the signal while they are amplifying it, giving rise to grainy analogue pictures and break-up on digital TV. An aerial alone does not do this. For all these reasons, if your signals are weak, use the most powerful aerial you can before considering an amplifier.

Faulty amplifiers are a frequent source of patterning on TV pictures. If you or neighbours are experiencing such problems, switch your amplifier off at the mains to see if the problem stops. Ask neighbours to do the same. Faulty amplifiers should be replaced.

## PORTABLE TELEVISION AND RADIO

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Reception on portable sets is always compromised if an internal or set-top aerial is used, yet it is common practice. Signals have to pass through the walls of the building, are absorbed by household objects and bounce off metal-work. This can give rise to some unpleasant effects and may mean you have to move the aerial if you change channels. If your equipment has a socket for an outside aerial, you may find reception improves considerably if you use it.

### COMMON PROBLEMS ON PORTABLES WITH INTERNAL AERIALS

Analogue TV: ghosting and unstable pictures, snowy pictures, hissy sound

Digital TV: picture break-up and pixelation (tiny squares), sound break-up

FM radio: hissing and distortion

DAB Digital Radio: burbling and break-up

Portable equipment using an internal aerial is also much more susceptible to interference being caused by other devices in the home or conducted down mains wiring. A mobile phone placed near your radio will soon demonstrate how easily this can happen! This is because there is little to prevent these unwanted signals being picked up by the aerial, whilst signals coming from the transmitter are weakened by passing through walls etc. Because putting the aerial outside reverses this situation, the use of an external aerial can dramatically reduce such interference as well as improve reception. If TV signals are weak, for whatever reason, the more susceptible reception will be to interference, which is why getting the best possible signal is so important.

## WHAT EXACTLY IS 'INTERFERENCE'?

Many people contact broadcasters complaining of interference to their TV or radio reception, when in fact the problem is due to poor reception. Having a good installation will reduce the likelihood of reception problems. All the same, it's important to be able to tell when a problem is caused by interference so you know the best course of action to take.

Interference happens when an unwanted signal comes in on top of the broadcast signal (which itself is good enough) and disrupts your ability to receive it properly. If that unwanted signal isn't present, reception is satisfactory. Interference can be internal – that is, caused by equipment within your home and perhaps even your own TV or radio equipment itself – or external,

which means it is coming from outside your home.

Internal interference problems are normally the responsibility of the householder to solve. Our website and Fact Sheets provide general guidelines as to how you might go about this. External interference may require outside help to solve, and you can usually speed things up by gathering the right kind of information. Our Fact Sheets are designed to help you work out what you can do, both to help yourself and – if need be – to help us. Remember that your internal interference could be the cause of somebody else's external interference. Therefore do make sure that you are not the source of your own interference and perhaps that of others!

## HOW DO I TELL IF I'VE GOT INTERFERENCE?

There are no definite rules to indicate if something is interference or not, but, in general:

If you've had the problem continuously for some time, and especially if it is not affecting neighbours using their own aerials, it is likely to be a reception problem, not interference.

or

If the problem is intermittent and recurring but reception is otherwise satisfactory, and it affects your neighbours' reception at the same time in the same way, it could be interference.

**It is vital that, before assuming a problem is caused by interference, you make certain your own system is working well and that reception problems are not involved.**

## ANALOGUE AND DIGITAL RECEPTION — THE DIFFERENCE

It's important to know if your problems are affecting analogue or digital reception (or both).

- If you get 4 or 5 TV channels, but no more, you are likely to be watching analogue TV. If you can get additional channels which might include BBC FOUR, BBC NEWS, itv2, More4 and other channels, you are using digital TV. With digital you may also be able to receive radio stations through your TV set.
- If your TV set receives digital stations without any external Freeview box it is known as an IDTV (integrated digital TV). It may also display a **digital**  logo. Many such TVs allow you to watch either analogue or digital TV. When starting to investigate a potential reception or interference problem, it's important to know whether analogue or digital reception is disrupted. In some cases both may be affected. See your instruction manual if you're unsure whether you are using your TV in digital or analogue mode when getting the problem.
- If you listen to the radio on FM, MW or LW, and especially if it tunes using a scale and pointer, your radio is analogue. If you can get many more stations which might include BBC 6 music, Planet Rock, UCB UK, then you are using DAB digital radio. Moreover, your radio will display a **DAB** or  logo.

## QUICK CHECK CHART

Before going any further in tackling a problem, there are five basic things to check. Getting these right could save you from wasting time later on. Please work through the chart below.

