

Radio Transmitters and Domestic Electronic Equipment

Purpose of this leaflet

This leaflet is for the information of householders.

Homes now contain more electronic products than ever before. Although these work as expected most of the time, there are occasions when they don't and this can be puzzling and annoying. This leaflet is intended to help you to identify and solve such problems.

Q1. What can I do if my radio, TV, video recorder or other electronic equipment suffers from interference?

Check the following:

- Are all the controls correctly adjusted?
- Is the outdoor aerial or cable damaged or has either deteriorated with age? (TV Aerial manufacturers recommend replacing an aerial after about 7 years)
- Are neighbours experiencing similar problems? If so, it could be caused by:
 - Unusual weather conditions affecting TV or FM radio reception
 - TV in the UK has switched over to digital UHF channels so this is much less of a problem than it was in the past.
 - Interference from a nearby electric motor or other electrical equipment
 - A fault in a nearby electricity substation or overhead electricity cable
- Is there another type of radio transmitter being used nearby? For example:
 - Police, fire, ambulance and public utilities (gas, water and electricity companies), cellular telephone and radio paging base stations.
 - Fixed and mobile transmitters operated by local authorities, motoring organisations and many small businesses such as taxi operators.
 - Citizens Band (CB) Radio.
 - Amateur radio.

Q2 How could I find out whether a nearby radio amateur's transmissions are affecting my electronic equipment?

To do this, you would need to make contact with the radio amateur concerned and ask him or her to make a test transmission. Alternatively, you could write a list of dates and times when the problem occurs. The list could be compared with the "log" which almost all radio amateurs keep.

Q3 If a radio amateur's transmissions affect my radio or TV, is it the radio amateur's fault?

In most cases, there is nothing wrong with the radio amateur's transmitter or with the way it is being operated. In many cases the problem is caused by the design of the domestic radio, TV, video recorder or other equipment.

A problem called breakthrough can occur because the immunity of the affected equipment is not good enough. This means that the affected equipment is not sufficiently good at rejecting signals which it is not intended to receive.

All radio transmitters operate on allocated frequencies; radio amateurs transmit on frequencies in nationally or internationally allocated amateur radio bands. They are not allowed to transmit on any frequencies which are used for radio and TV broadcasts.

Q4 What do "breakthrough" and "immunity" mean?

If for example a nearby radio transmitter affects a stereo system when it is playing a cassette or CD, this would be a case of breakthrough. The stereo system is receiving radio signals which it is not intended to receive. This indicates that its immunity is not good enough. If a radio transmitter affects the picture or sound on a nearby TV and there is nothing wrong with the radio transmitter or the way it is being operated then this is also called breakthrough. A TV should only receive the wanted TV signal, if it also responds to a nearby radio transmitter, it does not have enough immunity.

Some domestic radios, TVs, video recorders and other electronic equipment still in use, were not designed to have good enough immunity to keep out unwanted radio signals. This also applied to some quite expensive equipment but fortunately, the situation has improved for new equipment (see question 10 below).

Q5 How can "immunity" be explained in a non-technical way?

If new windows are fitted to a house but they let in draughts during windy weather, then it could be said that the windows have poor "immunity" to wind. They may be suitable for use in a fairly sheltered location but not at the top of a hill in a windy part of the UK. As the climate cannot be changed, the windows must be made suitable for the climate, by fitting draught excluders. Clearly, it would be better if these had been fitted by the manufacturer.

Radio waves from many sources such as radio and TV broadcast transmitters, taxi operators and radio amateurs form a different sort of "climate" (The technical term is "electromagnetic environment"). This varies a great deal from one place to another and even from one house to another in the same street. It is controlled by licensing. Most users of radio transmitters in the UK, including radio amateurs, operate under the conditions of a licence issued by Ofcom.

If a radio, TV or other equipment has poor immunity, it may only work properly where the radio wave "climate" is "mild", that is not too near a radio transmitter. Although this "climate" is man-made and can be controlled, the operator of a licensed radio transmitter should not be expected to stop using it just because of insufficient immunity of nearby electronic equipment. Instead, the immunity of the affected equipment should be improved, for example by fitting filters which could be considered as the electronic equivalent of draught excluders on a window.

Q6. If a breakthrough problem occurs, how can it be solved?

Breakthrough problems can normally be solved but this requires co-operation by all parties involved. In most cases, it is possible to improve the immunity of the affected equipment. In some cases, all that is needed is a special filter which plugs into the aerial socket of the radio, TV or video recorder. In other cases, the solution is to wind loudspeaker cables or other cables through ferrite rings. A radio amateur may be able to give advice on how to do this. Suitable filters and ferrite rings are available from various sources including the Radio Society of Great Britain.

Q7. Who pays for solving a breakthrough problem?

In the case of breakthrough from an amateur radio station, the radio amateur may be prepared to provide filters, ferrite rings, etc. on loan but is not obliged to do so.

Q8. Can I call in the Authorities?

Ofcom can be called to investigate problems with radio or TV reception, though the actual investigation is carried out by the BBC. Information is available on the OFCOM web site under "Advice and Complaints". OFCOM can be contacted at:

Ofcom
Riverside House
2a Southwark Bridge Road
London SE1 9HA
Tel: 0845 456 3000 or 020 7981 3040
Web site: <http://www.ofcom.org.uk>

Anyone can report a suspected source of interference to Ofcom, who can check that the nominated transmitter is being operated within the terms of its licence. There is no charge for reporting a source but if a householder wants Ofcom to investigate a reception problem with terrestrial TV digital satellite TV, a video recorder or an FM or DAB radio, a fee may be payable. In general this will be the case if the problem turns out to be a faulty installation or interference from something in the complainant's house but, at the time of writing, the situation is unclear so it would be advisable to enquire before requesting a visit by an engineer.

Ofcom/BBC do not investigate problems with cable television or baby alarms, nor any equipment that is not intended to receive radio signals such as hi-fi systems, computer speakers or telephones.

Q9. What about telephones?

A normal wired telephone (not cordless) should not respond to radio signals from nearby transmitters but some types of telephone have insufficient immunity to avoid breakthrough of radio transmissions.

A separate RSGB information sheet on telephones is available, 'Radio Transmitters and Telephones, Information for Telephone Users', EMC05.

Q10. What is being done to improve immunity of electronic equipment?

Almost all new electronic equipment manufactured or installed after 1st Jan. 1996 must meet European EMC standards. EMC means that electronic systems can operate without interfering with each other. The EMC standards apply to commercial and industrial equipment as well as consumer goods such as radios, TVs, video recorders, home computers, burglar alarms, microwave ovens and washing machines. Such equipment carries a "CE" mark to show that it complies with all applicable European Directives at the date of manufacture.

The EMC standards require equipment to have a certain level of immunity to signals from nearby radio transmitters although this immunity may not be adequate in all cases. The standards also limit the level of interference that electronic equipment such as computers produces on nearby radio receivers.

This leaflet was produced by Radio Society of Great Britain, 3 Abbey Court, Priory Business Park, Fraser Road, Bedford MK44 3WH.

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