



Radio Transmitters and Telephones, Information for Telephone Users



Purpose of this leaflet

An ordinary wired telephone is not intended to act as a radio receiver but in some cases, signals from a nearby transmitter may be heard on a telephone. This leaflet explains why this problem occurs and how it can be solved.

Q1. Is my telephone being affected by a nearby radio transmitter?

Some types of telephone can be affected by nearby radio transmitters. For example, telephone users in certain locations may hear:

- * Radio programmes from a nearby BBC or NTL AM broadcast transmitter
- * Radio transmissions from a nearby taxi operator
- * Radio transmissions from a licensed radio amateur nearby.

If this happens, it is the fault of the telephone as an ordinary wired telephone should not respond to radio signals. If you think that a radio amateur's transmissions are affecting your telephone, you can confirm this by making contact with the radio amateur concerned and asking him or her to do some test transmissions. Alternatively, you could write a list of dates and times when the problem occurs. The list could be compared with the "log" which a radio amateur is required to keep under the terms of their transmitting licence.

Such problems can normally be solved but this requires co-operation by all parties involved.

Q2. If a radio amateur's transmissions affect my telephone, is it the radio amateur's fault?

If signals from a radio transmitter are heard on a telephone, this does not mean that there is anything wrong with the transmitter or with the way it is being operated. In nearly all cases the problem is caused by the design of the telephone. A problem called RF (Radio Frequency) *breakthrough* can occur because the telephone is not sufficiently good at rejecting radio signals. If this happens, the telephone is said to lack *RF immunity*.

Many types of telephone currently in use were not designed to have good immunity against unwanted radio signals. Fortunately, the situation is improving for some new telephones (see question 8 below).

Q3. How can "immunity" be explained in a non-technical way?

If a window lets in a draught during windy weather, it could be said that the window has poor "immunity" to wind. As the climate cannot be changed, the window 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, emergency services, public utilities 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 terms of a licence issued by Ofcom. If a telephone 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 licensed operator of a radio transmitter should not be expected to stop using it because of insufficient immunity of a nearby telephone. For example, if a telephone picks up radio broadcasts near a BBC or NTL AM broadcast transmitter, it would not be reasonable to expect the transmitter to be closed down because of this!

Q4. What can BT do?

The following information about BT's policy is based on information given to the RSGB EMC Committee by BT in 1997.

If RF breakthrough occurs on a telephone which is rented from BT, then BT's preferred solution is to exchange it for another model with higher RF immunity free of charge. If the telephone has been sold by BT, then BT will not visit the customer to investigate RF breakthrough unless the telephone is covered by a BT maintenance contract.

If a telephone is sold by BT and suffers RF breakthrough while under warranty, the customer can return it to the point of sale. In this case, BT retail outlets will, if possible, replace such a telephone with another model offering higher RF immunity. Alternatively, they may supply a 'plug-in' RFI filter free of charge if appropriate. If a telephone was sold by BT but is out of warranty and is not covered by a maintenance contract, there is a standard charge for the sale of a 'Freelance' plug-in RFI filter, LJU 10/14A, BT Item Code 877596. These are sold by BT PhoneShops price £7.95 but may not be effective in all cases.

If BT engineering staff require advice or assistance in solving an RFI problem, they or their local maintenance manager can consult BT National Technical Support for RFI/EMC. If some doubt exists about whether the transmitter in question is licensed or not then Technical Support may refer the situation to the Radiocommunications Agency. The RA would not investigate the affected telephone but could check that the transmitter which is causing the breakthrough is licensed and is being operated within the terms of its licence. This could include checking that the field strength generated by the transmitter is not excessive.

Q5. What about non-BT telephones?

In cases of RF breakthrough on a telephone bought from a supplier other than BT, the customer is advised to contact the telephone supplier. If the telephone line is provided by BT, a customer can request BT to fit RF suppression to the line but standard charges will apply and BT does not guarantee that fitting suppression will solve the problem.

Q6. What else can be done?

If a plug-in filter is not effective, it may be possible to cure the problem by winding the telephone cable through ferrite rings. In the case of RF breakthrough from an amateur radio station, the radio amateur is under no obligation to provide a filter or ferrite rings but may be prepared to loan such items. If these are not effective, it will be necessary to obtain a telephone with better RF immunity.

Q7. Is this a new problem?

Telephones have been used near radio transmitters since the 1920s but until the 1980s, there were very few problems with RF breakthrough on telephones. This is because older dial type telephones did not contain the sensitive electronic circuits which are found in modern telephones. Although modern telephones offer many advantages, some have the disadvantage that they are far more prone to RF breakthrough than older types.

Q8. What is being done to improve immunity of telephones?

Following a European Directive on Electromagnetic Compatibility (EMC) in 1989, all electronic equipment including telephones manufactured after 1st Jan. 1996 must meet European EMC standards and carry a "CE" mark. EMC means that different types of electronic equipment are compatible and do not interfere with each other.

There are various EMC standards which require equipment to have a certain level of immunity to signals from nearby radio transmitters. Until 2001, telephones can be tested to a 1992 standard which requires very little immunity. There is also a new EN 55024 standard which requires more immunity and some telephones meet this new standard already but many do not.

Q9. Where can I buy a telephone with good RF immunity?

One telephone which was designed to meet the new EN55024 immunity standard is the Siemens 'euroset' range including the 805s, 815s, 2005, 2010 models. Web site: <http://www.siemenscomms.co.uk>

The RSGB EMC Committee understands that BT was making every effort to ensure that BT telephones meet the new EN55024 immunity standard for several years before 2001.

If buying a telephone from another supplier, it is advisable to choose a supplier who will exchange it for another model if it has insufficient RF immunity.

Technical information

The filters normally used by BT, the LJU 10/14A plug-in filter and the BT80B/RF2 wired-in filter are designed primarily for rejecting medium wave broadcast signals. They can also be quite effective on the 1.8MHz and 3.5MHz amateur bands and in some cases up to 14MHz but they are unlikely to be effective at higher frequencies.

In some cases, RF breakthrough can be reduced by fitting a ferrite ring or a clip-on ferrite core to the telephone cable near the telephone. Answering machines which have a mains power supply unit may also require a ferrite ring on the power cable. Suitable rings are Fair-Rite 2643802702 (available from RSGB). The telephone cable should be wound 12 turns through the ring if possible. Alternatively, 6 turns can be used on a clip-on ferrite core such as Maplin BZ34M. Further details are given in the EMC section of the RSGB Year Book.

Internal modifications to a telephone are not permitted as this would invalidate BABT Approval or type approval.

The new product-specific RF immunity standard for telephones is EN 55024-1. This tests immunity from 150kHz - 1000MHz with a 3V or 3V/m amplitude modulated signal. There is however a transition period during which telephones can be tested to the 1992 edition of the Generic Immunity standard, EN 50082-1. A telephone with little RF immunity can meet this standard because it only requires RF immunity tests from 27 - 500MHz with an *unmodulated* carrier. The 1992 Generic standard is being superseded by a 1996 edition and is due to be withdrawn from 1st July 2001.

Footnote

The Radio Society of Great Britain represents amateur radio in the UK. This leaflet was produced by:

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