

amateur receivers suffering from interference from other domestic devices and making it harder to hear distant, weak stations.

First we need to be a bit more careful to consider the ways in which equipments are affected.

Direct pickup

The 'field strength' (the correct term for the strength of the radio wave) may be too high for the affected equipment. This can be more of a problem at VHF and UHF.

Cure: Reduce the field strength. Move the transmitting antenna further away, eg to the far end of the garden – so long as it is not then closer to the neighbours. It also helps if the antenna can be mounted high up, above other house wiring and TV antennas.

RF conducted from the transmitter along mains cables

RF signals may leak out of the transmitter along its power supply leads.

Cure: Prevent RF signals leaving the shack along cables by fitting suitable filters on the power leads to the transmitter. This may be necessary on both the low voltage DC leads and the mains lead. This will also assist in reducing imported interference affecting the amateur receivers.

RF from the antenna being picked up by various wires and conducted into affected devices

Cure: Move the antenna away from the house (see direct pickup, above). Fit filters on the leads into the affected device.

RF being fed back into the mains earth wires.

Cure: Sort out the earthing arrangements in the shack.

If someone tells you that you are causing interference to their television



Resolve the problem before transmitting any more

Earthing

IN THE RADIO SHACK there are two separate reasons for earthing equipment, especially transmitters.

1. As with all equipments that are not specially made to be 'double insulated', an earth is needed for safety reasons. **This earth must not be removed.** Most amateur equipment is not double insulated.

2. Current always flows round a closed circuit or loop. Many antennas have only a single wire feed – the centre of the coaxial cable. There must be a return path for the current and this is

What kind of earth do I need on my simple station?

A one metre length of copper pipe ought to be enough. Hammer it well into the ground as close to your shack as possible. Make sure you don't try to knock it through a drain or a buried cable, and that it isn't in anyone's way.



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normally the earth. If the transmitter is earthed to the mains, then this RF signal will flow in the mains earth and via the house wiring to the other appliances in the house and possibly to the neighbours as well.

RF in the mains earth can be avoided, or at least minimised, by providing an RF earth in addition to the normal mains safety earth. This is done by knocking a metal spike in the ground close to the point where the feeders enter the house. This is connected by heavy gauge wire directly to the transmitter or, if fitted, the wall socket terminating the feeder to the amateur antenna.

To limit RF flowing into the mains anyway, all 3 mains leads – live, neutral and earth – need to be filtered. This is best done using a ferrite ring filter, which the mains lead is simply wrapped round. Ideally there should be about 20 turns, so it might be necessary to use 4 rings with 5 turns on each.

Choice of antenna

AT HF ANOTHER very effective option is to use a balanced antenna such as a dipole. A balun will be needed if coaxial feeder is used, and the RF on the earthed outer of the feeder is minimised if the feeder drops symmetrically away from the dipole; that is if it drops at right angles and not alongside one of the dipole halves.

End-fed HF antennas always need an effective RF earth path. Even so, the feed-end has a high current or voltage and is prone to cause EMC problems such as direct pickup and pickup by mains and telephone wiring. If an end-fed antenna cannot be avoided due to space restrictions, it is best to run the feeder down the garden and feed the antenna from the far end, ie away from the house. A good earth on the feeder braid at the feed point is important.

Power and modes of transmission

THE MORE POWER a station runs, the more likely problems are to occur. At power levels used by Foundation licensees the likelihood of problems is not high, but it is not insignificant either.

The different modes, AM, FM, SSB and data tend to cause different levels of interference. The modes which have a constant level output are far less likely to be a problem.