



# Summerland Amateur Club Foundation Module 6

for the AMC Foundation & Practical Syllabus V10

## Interference

### Syllabus Assessment Objectives

7.1	Recall that broadcast radio and television receivers can suffer interference from local sources other than radiocommunications transmitters. These sources include electrical and electronic equipment and high voltage electricity supply lines.
7.2	Recall that interference to other radiocommunications services, including broadcast radio and television reception, can be caused by the faulty operation of radiocommunications transmitters.
7.3	Recall that radiocommunications transmitters can be the source (but not necessarily the cause) of interference to nearby electronic and radio equipment. Recall that technical solutions can generally resolve the interference.
7.4	Recall that the ability of electronic or radio equipment to operate properly, without interference, in the presence of electromagnetic radiation, such as radiocommunications transmissions, refers to the EMC of the equipment. This is also known as the equipment's radiofrequency immunity.
7.5	Recall that radiocommunications transmissions that are the source of interference, may be induced into nearby electronic or radio equipment through conduction along electrical mains wiring or from direct pickup by the equipment.
7.6	Recall that interference resulting from EMC problems may be dependent on the power, frequency and type of emission of the radiocommunications transmitter and its distance from the affected equipment
7.7	Recall that interference resulting from EMC problems can be minimised by careful selection and siting of antennas.
7.8	Recall that some transmission modes are more likely than others to cause objectionable interference to broadcast radio and television reception and to telephones.
7.9	Recall that the immunity of most types of equipment can be increased by fitting suitable filters in external cabling such as antenna, power supply or interconnections between equipment. Recall that the filters should be fitted as close to the affected devices as possible
7.10	Recall how to construct a simple RF "choke" filter using a ferrite rod or toroid.
7.11	Recall that the function of the RF earth connection in an Amateur station is to provide a path to ground to minimise RF currents entering the mains earth system and causing interference to other electronic equipment. Identify, from supplied diagrams, the symbol representing an earth connection.
7.12	Recall that EMC problems have the potential for causing neighbourhood disputes. Understand the need for diplomacy, the sources of advice available and the role of the ACMA.
7.13	Recall that a licensee must not operate an Amateur station if its operation causes harmful interference to radiocommunication services.

## Resources

CARS Foundation Powerpoint slide – EMC download here - <http://www.g0mwt.org.uk/training/courses/foundation.htm>

WIA Foundation Manual Chapter 7

## SARC Education Module Content

Electrical and electronic equipment, high voltage electricity supply lines and other local sources can cause interference to broadcast radio and television receivers.

Radiocommunications transmitters can be the source (but not necessarily the cause) of interference to other radiocommunications services and nearby electronic and radio equipment. Technical solutions can generally resolve the interference. The interfering radiation is called electromagnetic interference.

### EMI - Electromagnetic Immunity

This is the ability of electronic or radio equipment to operate properly, without interference, in the presence of strong electromagnetic radiation fields, such as might occur near an amateur radio antenna.

### EMC - Electromagnetic Compatibility

This is the ability of sensitive electronic equipment to function correctly close to other electronic equipment.

Radiocommunications transmissions that are the source of interference, may be induced into nearby electronic or radio equipment through electrical mains wiring or from direct pickup by the equipment itself. This may be managed by changing the location of the other equipment, radio station, feed lines and antennas.

Interference to other equipment can be minimised by careful selection and positioning of antennas. For example, do not place your antenna right beside your TV antenna, or point a VHF or UHF Yagi at your neighbour's TV antenna.

Some transmission modes are more likely than others to cause objectionable interference to broadcast radio and television reception and to telephones. Particularly those transmissions on frequencies close to commercial operations or resonant with them.

Suitable filters in external cabling such as antenna, power supply or interconnections between equipment can assist in the equipment's immunity. These filters should be fitted as close to the affected devices as possible. This leaves as little as possible of the cabling to be affected.

A simple RF “choke” filter may be constructed using a ferrite rod or toroid.



RF currents can be prevented from entering the mains earth system, and causing interference to other electronic equipment, by providing a RF earth connection to your station. This must be separate from the Mains earth connection.



The symbol represents an earth connection.

EMC problems have the potential for causing neighbourhood disputes. These can frequently be solved by diplomacy. Consider showing what you are doing with your amateur station. The ACMA is a source of advice when problems occur that cannot be resolved.

You must not operate an Amateur radio station if its operation causes harmful interference to other radiocommunication services.

**Question 1:**

**What can cause interference to broadcast radio and television receivers:**

- A) Electrical equipment
- B) Electronic equipment
- C) High voltage electricity supply lines
- D) All of the above

**Question 2:**

**An example of a device with good EMC would be:**

- A) a transmitter that causes lines on a TV receiver in the next room
- B) a computer operating as normal near a transmitting transceiver
- C) a radio that “clicks” when the refrigerator light comes on
- D) a LED light on an unplugged phone charger that turns on when you transmit



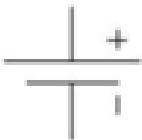

**Question 3:**

**When would it be best to contact the ACMA?**

- A) After you have installed your 70cm Yagi antenna on the pipe mast
- B) When your neighbour first approaches you about possible TV interference
- C) You want approval to install a 10m antenna tower in your backyard
- D) When all reasonable attempts to resolve a dispute over your transmissions have failed

**Question 4:**

**Which of the following is the accepted symbol for an earth connection?**

A		B	
C		D	

**Question 5:**

**Your transmissions are causing interference to your neighbour’s TV reception. You must:**

- A) Stop transmitting until you can fix the problem
- B) Swap to another antenna and keep transmitting
- C) Immediately notify the ACMA
- D) Increase power to see if the interference increases