

**Interference
from CB and
Amateur
Transmitters**

**This brochure
should be read in
conjunction with the Better
television and
radio reception
booklet**

Resolving Interference
to
Television and Radio Reception
from the operation
of
Citizens Band or Amateur Transmitters

Contents

Section 1 Resolving interference

- 1.0 Why does interference occur?
- 2.0 Identifying the interference
- 3.0 What can be done to resolve interference?
 - 3.1 Things that can be done at the television receiver
 - 3.2 Things that can be done at the radio receiver
 - 3.3 Things that can be done at the transmitter installation
- 4.0 ACA assistance in resolving interference
- 5.0 Further information on interference resolution

Section 2 ACA Policy Statement

- 6.0 Purpose
- 7.0 Background
- 8.0 Legislative considerations
- 9.0 Substantial interference
- 10.0 Policy objectives
- 11.0 Strategies adopted by ACA to achieve policy objectives
- 12.0 Possible outcomes of unresolved interference

Section 1

Resolving Interference

This information brochure aims to assist both the person affected by the operation of a nearby CB or Amateur transmitter and the transmitter operator to resolve television and radio interference problems.

This brochure should be read in conjunction with the *Better television and radio reception: Your self help guide* booklet available free of charge from the Australian Communications Authority (ACA). This booklet is referred to as the "Better television and radio reception" booklet elsewhere in this brochure.

1.0 Why does interference occur?

Interference to television and radio reception can arise from the operation of many electrical and electronic devices. Interference can be caused by electric motors, thermostats and light dimmers; high voltage electricity powerlines; and transmitters such as those used by CB and Amateur operators.

Interference from devices such as electric motors, light dimmers and electricity power lines result from the generation of radio frequency signals by these devices. These interfering signals are essentially radiated on a wide range of frequencies including the frequency of the wanted station.

Interference from CB and Amateur transmitters however generally occurs because the radio and television receiving equipment, including video cassette recorders (VCR), is unable to reject the unwanted CB or Amateur transmissions which are on different frequency bands from those used by radio and television stations. This is a problem known as a lack of radio frequency immunity. Some interference can also occur because of faults in the affected receiving equipment or antenna installation.

The close proximity of the affected receiver and the CB or Amateur transmitter also contributes to these problems.

2.0 Identifying the interference

After it has been determined that television or radio reception is unsatisfactory, it is necessary to identify whether the poor reception results from interference or other factors such as the use of an inappropriate receiving antenna.

Where interference is reasonably suspected it then becomes important to correctly identify the source of the problem. Fortunately, the characteristics of interference from the various sources are sufficiently different to make identification relatively easy.

The "Better television and radio reception" booklet describes with illustrations the various interference problems and the remedies that may be employed to resolve them. The techniques used for resolving interference depend on what is causing the interference. Interference problems involving CB and Amateur transmitters are covered by the booklet in the section dealing with 'radiocommunication transmitter interference'. The illustrations shown in the booklet in the 'Radiocommunications transmitter interference', 'AM broadcast transmitter interference' and 'FM broadcast transmitter interference' sections indicate the differences between good quality television reception and reception marred by substantial interference.

If it is considered that a CB or Amateur transmitter is involved in the interference, the operator concerned should be contacted to assist in conducting tests to confirm the nature of the source.

3.0 What can be done to resolve the interference?

The level of interference observed or heard on a broadcasting receiver is dependent, amongst other things, on the difference between the level of wanted signal and the level of interference. The wanted signal can be improved by having an appropriate external receiving antenna while the interfering signal can be reduced by filters. The connection of an external receiving antenna is the first step towards resolving any interference problem.

Once an antenna has been installed, any interference that remains from the operation of electrical appliances requires the use of suppression devices at the appliance itself. Suppression of appliances is normally best left to professional electricians. Interference from overhead electricity powerlines results from leakage currents across dirty or broken insulators arcing to earth and should be reported to the Electricity Supply Authorities for resolution.

Interference involving CB and Amateur transmitters, in most cases, can be eliminated by the use of an appropriate receiving antenna installation and the fitting of suitable filtering devices to the affected equipment. Transmitter operators additionally need to ensure that the transmitter and its antenna have been properly installed.

Providing maximum separation of the television / radio antenna and the transmitter antenna also minimises the level of CB or Amateur signals and, consequently, the level of interference.

While many instances of this type of interference can be resolved by the affected person alone by reference to the "Better television and radio reception" booklet, it is often

necessary to involve the CB or Amateur operator as some remedial measures may be required at the transmitter.

The location of CB or Amateur Stations can usually be ascertained by their large antennas. CB or Amateur operators can often assist in the correct identification of the particular interference and, where required, the choice of an appropriate filter.

3.1 Things that can be done at the television receiver

Interference may be eliminated or minimised by:

- ensuring that the standard of the receiving installation provides adequate reception in the area. This includes the use of a correctly installed and maintained external antenna and appropriate antenna cabling; and
- ensure that masthead and distribution amplifiers, where used, are fitted with filters designed to minimise interference.

The "Better television and radio reception" booklet provides information on the checks you can make on your equipment and also shows the effects of an inadequate signal. A weak television signal is prone to interference even from low level sources;

- locating the external television antenna as far away as possible from the antenna of the CB or Amateur transmitter; and
- the fitting of appropriate interference filtering devices to the affected equipment. While most interference is resolved by fitting filters in the cable run between the antenna and the television receiver, it is sometimes necessary to fit filters in the electricity mains lead. Use only filters approved by Electricity Authorities. The booklet provides advice on particular measures that can be employed to resolve the various types of interference.

The operator of the CB or Amateur station involved can provide advice about their frequencies of operation and this will assist in the choice of an appropriate filter.

3.2 Things that can be done at the radio receiver

Interference may be eliminated or minimised by:

- ensuring that the standard of the external antenna is sufficient to provide adequate reception for the area; and
- locating the external antenna as far away as possible from the antenna of the CB or Amateur transmitter.

The use of radio receivers with internal ferrite rod antennas will not always provide a sufficient wanted signal level for interference free reception. These receivers should, in any case, be positioned to receive maximum signals.

Some television antennas are able to be used for the reception of FM radio by fitting a 'two way splitter'. More information on this matter may be found in the booklet.

3.3 Things that can be done at the transmitter installation

Operators whose transmitters are involved in an interference problem should participate with persons affected by the interference in the resolution of the problem.

Operators of CB or Amateur transmitters can minimise the potential for interference by:

- ensuring that good engineering practices are followed in the establishment of their transmitter and antenna;
- selecting and locating transmitting antennas for interference minimisation;
- properly matching the transmitter to the antenna;
- employing additional radio frequency filters appropriate for the frequencies of operation;
- utilising a separate radio frequency earth connection.

Operators of Amateur transmitters can further minimise the possibility of interference by:

- reducing the transmitter's output power; and
- selecting a frequency of operation compatible with broadcasting stations in the area.

Where interference is known to be caused, the operator may consider:

- using their transmitters at locations not in the near vicinity of television or radio receivers; or
- using their transmitters other than during prime viewing or listening times.

4.0 ACA assistance in resolving interference

The ACA provides a range of services to assist with the resolution of interference problems.

- The "Better television and radio reception" booklet is available from all ACA offices free of charge. Technical information concerning the installation of television aerials is also available free of charge.
- Additional assistance with individual problems may be obtained by telephoning the nearest ACA office.
- An interference diagnostic service is available to persons affected by the interference or the transmitter operator concerned. This service involves a visit by the ACA. Affected viewers and listeners may apply for this service by completing the questionnaire that accompanies the "Better television and radio reception" booklet and send it to the ACA office closest to them. The ACA will contact the applicant to discuss the problem before arranging a visit. If the ACA visits to investigate an interference, it will provide advice on measures that will eliminate or minimise the interference. ACA visits are conducted in normal business hours, ie Monday to Friday except for public holidays.

Where a visit is made to investigate the cause of interference a prescribed charge is applicable. The ACA will invoice the applicant after completion of the investigation.

A television and radio technician should also be able to diagnose these problems and install appropriate filter devices to remedy the interference.

5.0 Further Information on Interference Resolution

It is important to recognise that radio and television interference involving CB and Amateur transmitters is a shared problem for both the person affected by the interference and the transmitter operator.

In most cases, interference can be resolved by appropriate use of radiofrequency filters at the affected receiver and the use of appropriate and technically sound transmitter installations by the CB or Amateur operator.

Where the interference is not resolved by the parties concerned, the following policy statement indicates the factors that are taken into account by the ACA when handling interference matters arising from the operation of CB and Amateur transmitters.

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Australian Communications Authority Policy Statement

Resolution of Interference

to Television and Radio Reception

involving the operation of

Citizens Band and Amateur Transmitters

Section 2

Policy Statement

6.0 Purpose

This statement sets out the policy of the Australian Communications Authority (ACA) in regard to the resolution of interference to television and radio reception from the operation of Citizens Band Radio Service (CB) and Amateur transmitters.

7.0 Background

A feature of domestic environments is the widespread use of radiocommunications equipment such as television and radio and, under regulation, non-broadcasting transmitters including those used for the CB and the Amateur Service.

Regional broadcasting transmitters and translators have reduced many of the reception difficulties experienced in the past but the use and enjoyment derived from television and radio equipment is still sometimes marred by interference, of one form or another from other electronic equipment.

Interference to television and radio receivers often arises from the operation of nearby CB and Amateur transmitters. Some interference can occur due to the inability of the affected equipment to adequately reject the CB or Amateur transmissions. This inability is usually referred to as a lack of radio frequency immunity. Interference can also arise from the close proximity between the transmitter and the affected equipment as well as from faults in the transmitter.

Equipment standards, specifications and licensing conditions are intended to ensure that CB and Amateur transmitters meet stringent quality requirements. By contrast, radio and television receivers vary in quality and many do not have a high level of immunity.

The policy covered in this paper, which is based on the above considerations, has been developed in consultation with representatives of consumer organisations and the CB and Amateur communities.

8.0 Legislative considerations

This policy supports provisions of the *Radiocommunications Act 1992* (as amended) defines:

Interference in relation to radiocommunications as:

"interference to, or with, radiocommunications that is attributable, whether wholly or partly and whether directly or indirectly, to an emission of electromagnetic energy by a device"

and "device" is defined as:

- "(a) a radiocommunications transmitter; or
- (b) any other transmitter; or
- (c) a radiocommunications receiver; or
- (d) any other thing any use or function of which is capable of being interfered with by radio emission."

The Radiocommunications Act (s197) also makes provision that:

"A person must not knowingly or recklessly do any act or thing likely to:

- (a) interfere substantially with radiocommunications; or
- (b) otherwise substantially disrupt or disturb radiocommunications."

9.0 Substantial interference

The ACA interprets substantial interference as that level of interference that degrades television and radio reception, under normal conditions, by a considerable degree.

10.0 Policy objectives

The objectives of this policy are to:

- (a) promote an understanding of the causes, resolution and avoidance of interference involving the operation of CB and Amateur transmitters;
- (b) promote the principles of self-help in the joint resolution or minimisation of the effects of interference; and
- (c) describe further processes for dealing with unresolved interference.

11.0 Strategies adopted by the ACA to achieve policy objectives

The strategies employed by the ACA to achieve the above objectives are:

- to distribute on request, free of charge, the ACA booklet *Better television and radio reception: Your self-help guide* to persons affected by interference or to those causing interference. Technical literature related to television receiver installation is also available free of charge;
- to encourage operators of CB or Amateur equipment and persons suffering interference to their television and radio services to resolve the problem by mutual agreement and assistance;
- to provide a telephone advisory service for persons who require additional information or who want to discuss their interference problems with an ACA officer;
- to provide a diagnostic service to the affected party or transmitter operator during normal business hours based on a standard fee;
- to promote greater awareness in the service industry of the mechanisms, resolution and avoidance of interference involving the operation of these transmitters by encouraging the inclusion of related subjects in study courses; and
- the development of an Electromagnetic Compatibility (EMC) framework including standards for domestic equipment, particularly in relation to immunity to interference.

In dealing with unresolved interference, the ACA takes account of factors including:

For the television viewer, radio listener and transmitter operator

- whether self help principles have been used to attempt to resolve interference;
- the degree of participation by both affected party and transmitter operator involved in investigating and negotiations aimed at permanently resolving or minimising the affects of the interference.

For the television viewer

- whether the standard of the receiving installation is sufficient to provide adequate reception in the area;
- whether, where employed, additional amplifying devices are adequately filtered;
- whether the location of the external antenna is consistent with minimisation of interference;
- whether the location of the transmitter involved in the interference can be determined.

For the radio listener

- whether the standard of the receiving installation is sufficient to provide adequate reception in the area;
- whether, where appropriate, the location of the external antenna is consistent with minimisation of interference;
- whether the location of the transmitter involved in the interference can be determined.

For the transmitter operator

- whether good installation practices have been followed;
- whether the location of the transmitting antenna is, within practical constraints, consistent with minimisation of interference;
- whether the use of filters would reduce the interference;
- whether, in the case of an Amateur transmitter, the output power of the transmitter could be reduced to resolve the interference;
- whether, in the case of an Amateur transmitter, the frequency of operation could be changed to resolve the interference.

Other factors

- whether additional measures, such as the use of filters at the affected receiver, could be employed to resolve the interference;
- the level of affected television and radio signals;
- the level of unresolved interference;
- whether mediation by the ACA will effect a resolution of the interference;
- whether a referral to a Conciliator is appropriate; and
- whether regulatory action is necessary to prevent substantial interference.

12.0 Possible outcome of unresolved interference

For the affected party:

If the person affected by the interference has not applied relevant measures in an attempt to resolve the interference, the ACA may decide to take no further action to resolve the interference.

For the transmitter operator:

If the transmitter operator has not applied relevant measures in an attempt to resolve the interference, the ACA may decide to restrict the operation of the transmitter or take regulatory action pursuant to the Radiocommunications Act.

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