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Radiocommunication Information Circular

General Radio Service

Canada

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Radiocommunication Information Circulars are issued for the guidance of those engaged in radiocommunications in Canada. The information contained in these circulars is subject to change without notice. It is therefore suggested that interested persons consult the nearest district office of Industry Canada for additional details. While every reasonable effort has been made to ensure accuracy, no warranty is expressed or implied. As well, these circulars have no status in law.

Comments and suggestions may be directed to the following address:

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All spectrum publications are available at Industry Canada's Spectrum Management and Telecommunications Web site:

<http://strategis.gc.ca/spectrum>

What Is the General Radio Service (GRS)?

The General Radio Service (GRS), popularly known as "CB", is a public communications, low-cost, short-range two-way radiocommunication service. The range varies, but is typically about 5 to 15 km, for car-to-car use; 12 to 25 km, for car-to-home conversations and 20 to 40 km between base stations.

Model control is part of the General Radio Service. The frequencies assigned for model control use are listed in the section of this document "[Frequencies Available for Model Control](#)". More information on remote control can be found in Radio Standards Specifications 210 (RSS-210) at <http://strategis.ic.gc.ca/SSG/sf01320e.html>.

Your GRS Equipment

General

Before you operate a GRS radio, we suggest you learn which controls, accessories and other functions of a GRS radio are essential, and which options are desirable or useful for your intended operations.

Get Some Personal Advice

A first step could be to visit neighbours or friends who already use GRS equipment and look over their installations. Ask questions, get recommendations about dealers. If you don't know anyone who has a GRS set, you should seek advice through GRS clubs operating in your area.

The basic building blocks of any GRS radio station are:

- a **transceiver**, a combination transmitter and receiver, usually supplied with a microphone, power cord and mobile mounting bracket;
- an **antenna**, to radiate your signal into the air and pick up those of others;
- a **feed line**, to connect the transceiver to the antenna; and
- an **electrical supply**.

Industry Canada Technical Acceptance Certificate and FCC Type-Approval Labels

A plate, stamp or sticker should be permanently displayed on each transceiver or transmitter-receiver combination, showing an Industry Canada Technical Acceptance Certificate or FCC type-approval number, serial number, manufacturer and model number.

AM or SSB?

The terms AM (amplitude modulation) and SSB (single sideband) describe two different methods of modulating sound impulses from a microphone onto the carrier signal produced by the transmitter. SSB is a more sophisticated and superior form of transmission.

Controls and Features

Basic controls and features of GRS sets are: a power on-off switch, a volume control, a squelch control (to eliminate background noise when no signals are being received), a channel selector, a microphone, a power connector and an antenna connector.

Most sets also have a double-function meter built into the front panel. When the radio is receiving, it reads the relative strengths of incoming signals. On transmit, it gives a visual indication of the power of the signal being sent to the antenna and can often provide the first hint of trouble with transmitter, antenna or feed line.

Other Features

Other features commonly offered on more expensive GRS radios are not essential but, depending on budget and preference, may add considerably to your enjoyment.

A **clarifier** control can tune your receiver a little above or below the nominal frequency of the channel on which you are operating. SSB signals in particular must be very accurately tuned in this manner. Clarifiers may also be known as **Delta Tune** or **Receiver Incremental Tuning (RIT)** controls.

Noise limiter, or **blanker**, switches can help reduce the effects of interference from electrical sources, such as power tools and automobile ignition systems.

If a very strong signal is overloading your radio and distorting the sound, an **RF gain control** may help.

Beware of audio accessories which alter your transmissions, such as preamplifiers, amplified replacement microphones, and speech compressors. Your radio was designed to work best with the microphone supplied. Badly distorted or unintelligible voice transmission is frequently due to misused audio accessories.

Receiver Selectivity and Sensitivity

Two important characteristics for good radio receivers are sensitivity and selectivity.

Sensitivity is the ability of the radio to receive very weak signals clearly.

Selectivity is the ability to screen out signals from adjacent channels. A set with good selectivity can reject a strong signal on an adjacent channel, allowing you to listen to a weak signal on the desired channel. If you live in a metropolitan area with many GRS radios on the air, good selectivity will be important.

Setting Up your Station

Proper installation of your station is important.

Antennas

The best radio in the world is only as good as its antenna. The antenna must be carefully located, installed and adjusted for best results. Reputable dealers and experienced operators are your best source of detailed advice on antennas, but here are some basics.

An antenna is made of an electrical conductor, cut to a special length, which transfers radio energy out of, or into your radio. It should be mounted as high and clear of surrounding objects as safety and practical considerations allow.

Mobile Antenna

The best spot for mounting a mobile antenna, particularly a shortened type, is in the middle of your vehicle roof. It can be a tricky job, perhaps performed best by a professional. But it will result in good performance, assuring an even radiation and pick-up pattern for your antenna.

The most efficient length for a mobile antenna is a quarter wave length (just under 3 metres, or 108 inches long). But most people choose shorter antennas, which have loading coils to compensate for their shorter length.

Base station Antenna

Base station antennas (fixed station) are of two basic types: omnidirectional and beam.

A vertical omnidirectional antenna is best for general use. Besides being economical, it sends and receives equally well in all directions. It should be mounted on a pipe mast or tower, high enough to clear surrounding obstructions, away from hydro lines and telephone wires and as far as possible from television antennas and cable TV equipment to avoid television interference.

A beam antenna acts to concentrate the radio signal in one direction at the expense of all other directions. While sometimes useful, particularly when you wish to communicate frequently over a greater distance in a given direction, beams are generally undesirable for GRS because they increase the likelihood of interference with neighbouring TV, hi-fi and similar electronic equipment. They are not very useful if you wish to communicate with mobile stations. An electrical rotor is required to turn the antenna. While it is facing in any one direction, a call from another area may be missed.

Erecting antennas near high-voltage power lines is the major cause of accidental electrocution. Make certain that if any part of your antenna structure were to fall over, it would not touch a power line.

Protection from Lightning

Your antenna structure should be well grounded. A ground rod driven at least two to three metres into the surrounding soil will do. Although a high antenna will improve your station's range, the higher it is, the more inviting a target it is for a lightning strike and the greater the importance of safety precautions.

Disconnect the antenna from your set if you are leaving home for an extended period of time, or well before a thunderstorm.

Feed Lines

You must use coaxial cable to connect your GRS radio to your antenna. The electrical characteristics of the cable must match those of both your transmitter output circuit and your GRS antenna. Type RG58/U is commonly used for mobile installations. A thicker, more durable cable, such as RG8/U, is best suited to permanent outdoor installations and where longer lengths are required.

All cable runs should be kept as short as possible, because signals weaken as they travel along cable.

Special connectors must be attached to the coaxial cable at each end. Either buy cable with ready-made connections or follow instructions very carefully. Sloppy connections are a common cause of poor performance.

Power Source

Most GRS sets operate on 12-volt direct current (12 VDC). Since this is the same voltage used by nearly all vehicle electrical systems, electrical installation of a mobile radio is relatively simple.

Antenna structures

While radio licences are not required for GRS operators, you must ensure that:

- radio installations are installed and operated in a manner that complies with Health Canada's limits of human exposure to radiofrequency electromagnetic fields;
- prior to installation of significant antenna structures, consultation with the appropriate land-use authorities has taken place; and
- where applicable, antenna structures are marked in accordance with recommendations of Transport Canada.

The Department of Transport does not advise Industry Canada of the approval or marking requirements for such structures. The Department of Transport will however review the Aeronautical Obstruction Clearance form submitted by the proponent of the antenna-supporting structure and will subsequently notify the proponent of the acceptability of the proposal from the perspective of a hazard to air navigation. Aeronautical Obstruction Clearance forms are available from any Department of Transport Aviation Group office. Completed forms must

be submitted directly to the nearest Department of Transport Aviation Group office.

Going on the Air

Before you go on the air, it is your duty as the operator of a radio station to know the rules.

GRS Licence or Certificate

You are not required to have an operator's certificate or radio station licence to operate General Radio Service equipment, including any General Radio Service model-control equipment.

Identification

Industry Canada no longer requires GRS operators to use an assigned call sign for identification. How you identify your station is up to you.

Think Before You Transmit

Remember that anything said on your GRS radio can be easily overheard by others. Two-way radio does not offer privacy.

Some Restrictions

You must, at all times and on all channels, give priority to emergency communications.

Industry Canada will not assign any channel for the private or exclusive use of any particular GRS station or group of stations. Some GRS clubs or individuals regularly monitor or use specific channels of their own choosing. No one has a right to declare that any such channel "belongs" to any group or individual, or to tell another user to vacate a channel on such grounds. Informal local arrangements, however, if made with the general consent of most users in the area - and not abused - may be useful in providing a meeting place for those sharing common interests.

For example:

- Channel 9 may be used only for emergency communications, i.e. communications involving a real or imminent threat to the life or safety of any person, or the immediate protection of property.
- Channel 11 is widely used as a calling channel.
- Channels 13 and 23 are used for land and sea search and rescue operations.
- Channel 19 is used in many areas as a road information channel.

You must share each channel with other users and must not wilfully interfere with conversations already under way. A good basic rule is "listen before you talk". Courtesy dictates that necessary communications should be given preference. Courteous operators will yield to those with messages to pass, information to share, questions to ask or other business to conduct. Many GRS operators use a procedure code to reduce "air time" on congested channels. The procedure code given on **page 10** is commonly used.

Subject to applicable laws or regulations, you may operate your GRS station anywhere in Canada and the United States.

You may not operate your GRS station on any aircraft or vessel without permission of the appropriate aircraft or vessel officer.

The legal RF power output limits, which must not be exceeded by a GRS transmitter, are:

- 12 watts peak envelope power for single sideband;
- 4 watts carrier power for other types of emissions.

Section 30 of the *Radiocommunication Regulations* states that a person may operate radio apparatus in respect of which a radio authorization has been issued only where the person complies with the terms and conditions of the authorization. For example, the use of a power amplifier capable of boosting the output power of your GRS transmitter is forbidden. These devices are also known as linear amplifiers, boots, linears, etc.

Radio Standards Specification 136 (RSS-136) prescribes the minimum technical standards applicable to radio apparatus operating in the General Radio Service. Technical requirements for remote control equipment are found in Radio Standards Specification 210 (RSS-210).

You must not use a GRS station:

- in connection with any activity which is against federal laws, provincial laws, or municipal by-laws;
- to transmit abusive, obscene, indecent or profane words, language or meaning;
- to interfere maliciously with the communications of another station;
- to transmit music, whistling, sound effects or any material to amuse, entertain or attract attention;
- to communicate with, or attempt to communicate with, a GRS beyond the normal coverage range of your station. (Such communications, commonly referred to as "working skip", use the ionosphere to bounce signals.)

Any person who knowingly transmits, or causes to be transmitted, any false or fraudulent distress signal, call or message is guilty of an offense under the *Radiocommunication Act*.

Handling an Emergency

Channel 9

General Radio Service Channel 9 is reserved for communications involving emergencies, that is situations where something has happened, or is about to happen, that presents a threat to someone's property, personal safety or life. The reporting of road accidents, downed power lines, medical emergencies and fires are all examples of situations for which Channel 9 should be used. This, however, does not preclude passing emergency messages on other channels.

Emergency messages must be given priority over all other kinds of communications.

Radio Interference

Prevention Is Better than Cure

In order to reduce interference the Department recommends the following:

- Before you erect your GRS antenna, remember the importance of good relations with your neighbours. The very fact that you have an antenna in your back yard will make you automatically suspect in the minds of some, if they experience almost any kind of interference.
- Try to avoid interference complaints before they arise by making sure your own house is in order. Install your station carefully, keeping all connections snug. Use good grounding techniques for your towers, antennas and GRS equipment. Try to keep both your radio and antenna as far as possible from neighbouring TV or FM antennas, and places where hi-fi and similar equipment are being used.
- Conduct radio and TV reception checks in your own home. Operate your GRS set for brief test transmissions on a quiet channel while someone else checks TV sets in your house on all the channels. Repeat this procedure while transmitting on another GRS channel. Chances are good that if you don't interfere with your own television set, any problems your neighbours may report will lie with their own equipment. However, this is not a guarantee. There is no substitute for a co-operative and cordial approach in resolving interference problems.
- You must not make, or have someone else make, any internal modification to a type-approved GRS transmitter (Technical Acceptance Certification - TAC). Any such modification voids the Industry Canada type-approval. Repairs to GRS equipment are not considered to be a modification when defective components are replaced by electrically identical parts.
- It is your responsibility to ensure that your set continues to comply with standards. If your set needs repair, take it to a reputable dealer or repair shop.

Radio Transmitter Interference to Household Equipment

Telephones, radios, record players, electronic organs, home intercom systems and similar devices may pick up interference from your GRS transmitter. This is known as audio rectification interference.

The equipment may not have been designed to reject radio signals. If only one piece of equipment is affected, it will probably have to be modified to resolve the problem.

It is usually best if modifications are made in the home while the interference is occurring. This will enable the service representative to determine where the interfering signal is entering the equipment.

The fact that the GRS set you have purchased is type-approved does not guarantee it will never cause interference to other GRS stations, to your neighbour's television or radio set, or to other radio services that share the spectrum.

Interference to Telephones

Your GRS signal or nearby radio transmitters can enter a telephone system through the telephone line leading to the house, the telephone wiring inside the house or the wiring inside the telephone itself. In such cases, your local telephone company may be able to install components that suppress reception of the GRS emissions.

Interference to Audio Amplifiers

Generally, turntables, cartridges, tape heads and microphones are the most susceptible. For example, if the only input affected is from a turntable, disconnect the turntable cartridge from the amplifier at the input terminals of the amplifier. If the interference is eliminated, either the cartridge or the wire between it and the amplifier, was "picking up" the radio signal. Proper grounding, good connections, shielding and filtering are often the keys to solving this type of radio signal interference. Often, a "process of elimination" approach must be used.

Should you find that you are experiencing or causing interference, get in touch with your dealer, a service shop or the manufacturer.

More information on interference resolution can be found on Industry Canada's Spectrum Management and Telecommunications Web site at <http://strategis.ic.gc.ca/SSG/sf01378e.html>. This brochure entitled *Cutting Through . . . Interference from Radio Transmitters* is primarily for General Radio Service radio operators. It provides basic information to help you install and maintain your station so you get the best performance and the most enjoyment from it. You will learn how to identify the causes of radio interference in nearby electronic equipment, and how to fix the problem.

Inquiries

If you require more information regarding the General Radio Service, contact your nearest Industry Canada district office. A list of our regional and district offices can be found on Industry Canada's Spectrum Management and Telecommunications Web site at <http://strategis.ic.gc.ca/SSG/sf01742e.html>.

Phonetic Alphabet

People will understand you better if you pronounce your words clearly and slowly. Words of similar length, such as "care" and "pear", which contain the same vowel sounds, tend to sound alike.

When radio conditions are particularly difficult, or if an individual word or name is especially important, spell it out. For example, to get across an uncommon spelling of the surname "Smyth," say: "Surname Smyth. I spell: S-Sierra - M-Mike - Y-Yankee - T-Tango - H-Hotel." The following phonetic alphabet can be very useful, particularly at times when communications are difficult.

A	Alfa	N	November
B	Bravo	O	Oscar
C	Charlie	P	Papa
D	Delta	Q	Quebec
E	Echo	R	Romeo
F	Foxtrot	S	Sierra
G	Golf	T	Tango
H	Hotel	U	Uniform
I	India	V	Victor
J	Juliett	W	Whiskey
K	Kilo	X	X-ray
L	Lima	Y	Yankee
M	Mike	Z	Zulu

Typical Procedure Code

10-1	Receiving poorly.
10-2	Receiving well.
10-3	Stop transmitting.
10-4	OK, message received (acknowledgment).
10-5	Relay message.
10-6	Busy, please standby (unless urgent).

- 10-7 Out of service, leaving air.
- 10-8 In service, subject to call.
- 10-9 Repeat message.
- 10-10 Transmission completed, standing by.
- 10-11 Talking too quickly.
- 10-12 Visitors (non-CBers) present.
- 10-13 Advise weather and road conditions.
- 10-16 Make pick-up at . . .
- 10-17 Urgent business.
- 10-18 Anything for us? (Any assignment?)
- 10-19 Nothing for you, return to base or station.
- 10-20 My location is . . .
- 10-21 Call by telephone or get in touch (but not by radio).
- 10-22 Report in person to . . .
- 10-23 Standby.
- 10-24 Completed last assignment.
- 10-25 Can you contact . . .
- 10-26 Disregard last message.
- 10-27 I am moving to channel . . .
- 10-28 Identify your station.
- 10-29 Time is up for contact.
- 10-30 Does not conform to Industry Canada rules.
- 10-32 I will give you a radio check.
- 10-33 EMERGENCY at this station.
- 10-34 Trouble at this station, help needed.
- 10-35 Confidential information which cannot be discussed on radio.
- 10-36 Correct time is . . .
- 10-37 Wrecker needed at . . .
- 10-38 Ambulance needed at . . .
- 10-39 Your message delivered.
- 10-41 Moving to another channel. Please tune to channel . . .
- 10-42 Traffic accident at . . .
- 10-43 Traffic tie-up at . . .
- 10-44 I have a message for you . . .
- 10-45 All units within range, please report (or identify).
- 10-46 Assist motorist.
- 10-50 Break channel.
- 10-60 What is the next message number?
- 10-62 Unable to copy, use telephone.
- 10-63 Network directed to . . .
- 10-64 Network clear.
- 10-65 Awaiting next message (or assignment).
- 10-67 All units comply.

- 10-70 Fire at . . .
- 10-71 Proceed with transmission in sequence.
- 10-73 Speed trap at . . .
- 10-75 You are causing interference.
- 10-77 Negative contact.
- 10-81 Reserve hotel room at . . .
- 10-82 Reserve room for . . .
- 10-84 My telephone number is . . .
- 10-85 My address is . . .
- 10-89 Radio repairman needed at . . .
- 10-90 I have TVI (television interference).
- 10-91 Talk closer to microphone.
- 10-92 Your transmission is out of adjustment.
- 10-93 Check my frequency on this channel.
- 10-94 Please give me a long count.
- 10-95 Transmit dead carrier for 5 seconds.
- 10-99 Mission completed, all units secure.
- 10-100 Time out for rest room.
- 10-200 Police needed at . . .

Frequencies Available for Model Control

A. For any type of model:

26.995 MHz
 27.045 MHz
 27.095 MHz
 27.145 MHz
 27.195 MHz

The transmitter RF peak envelope power shall not exceed 4 watts for single sideband (SSB) modulation. For double sideband (DSB), digital or frequency modulation, the transmitter unmodulated carrier power shall not exceed 4 watts.

B. Frequencies available solely for controlling the operation of a model aircraft:

The following frequencies are only for radio control of model aircrafts:

Carrier Frequencies (MHz)

72.01	72.03	72.05	72.07	72.09
72.11	72.13	72.15	72.17	72.19
72.21	72.23	72.25	72.27	72.29
72.31	72.33	72.35	72.37	72.39
72.41	72.43	72.45	72.47	72.49
72.51	72.53	72.55	72.57	72.59
72.61	72.63	72.65	72.67	72.69
72.71	72.73	72.75	72.77	72.79
72.81	72.83	72.85	72.87	72.89
72.91	72.93	72.95	72.97	72.99

The transmitter RF peak envelope power shall not exceed 0.75 watt for single sideband modulation.

For double sideband (DSB), digital or frequency modulation, the transmitter unmodulated carrier power shall not exceed 0.75 watt.

C. Frequencies available for the radio control of any type of model other than an aircraft model:

These frequencies are for general usage remote control of any type other than for control of an aircraft model. Voice modulation is permitted for emergency use if it is of the push-to-talk type. The centre or carrier frequencies (30 frequencies spaced in 20 kHz steps) are as follows:

Carrier Frequencies (MHz)

75.41	75.43	75.45	75.47	75.49
75.51	75.53	75.55	75.57	75.59
75.61	75.63	75.65	75.67	75.69
75.71	75.73	75.75	75.77	75.79
75.81	75.83	75.85	75.87	75.89
75.91	75.93	75.95	75.97	75.99

The transmitter RF peak envelope power shall not exceed 0.75 watt for single sideband modulation.

For double sideband (amplitude), digital or frequency modulation, the transmitter unmodulated carrier power shall not exceed 0.75 watt.

General Radio Service (GRS) Channels

Frequency		Frequency	
Channel	Megahertz	Channel	Megahertz
1	26.965	21	27.215
2	26.975	22	27.225
3	26.985	23	27.235
4	27.005	24	27.245
5	27.015	25	27.255
6	27.025	26	27.265
7	27.035	27	27.275
8	27.055	28	27.285
9	27.065	29	27.295
10	27.075	30	27.305
11	27.085	31	27.315
12	27.105	32	27.325
13	27.115	33	27.335
14	27.125	34	27.345
15	27.135	35	27.355
16	27.155	36	27.365
17	27.165	37	27.375
18	27.175	38	27.385
19	27.185	39	27.395
20	27.205	40	27.405

Self-Evaluation Questionnaire

As an operator of a General Radio Service (GRS) station, you must ensure that your station operates according to the applicable regulations and practices. Answer the following questions with true or false:

1. You may use Channel 9 (27.065 MHz) for everyday communications. T F
2. Provincial or municipal emergency communications have priority over all other communications on Channel 23 (27.255 MHz). T F
3. When you receive messages from users on Channel 9 that involve non-emergency communications, you must go on the air and interrupt them. T F
4. You must listen before transmitting to ensure that you will not cause interference to transmissions already in progress. T F
5. You may use a linear amplifier to increase the power of your mobile GRS set. T F
6. Microphones with amplifiers are often necessary for a better modulation. T F
7. Your GRS installation may cause various problems. The following equipment is most likely to be affected: radar, VHF radio (taxi) and microwave oven. T F
8. An aluminium rod buried 2 feet in the ground is considered a proper ground system for the operation of a GRS station. T F
9. Industry Canada may not restrict your hours of operation. T F
10. Industry Canada requires a method of identification for GRS stations even though they are exempted from having a licence. T F
11. No licence is required to operate a GRS station. T F
12. The federal government may impose restrictions on the height of GRS base station antennas. T F

Your neighbour asks you for some advice on how to install a television reception system at home that will reduce the risks of harmful interference. You say that:

13. The use of "rabbit ears" and an outdoor antenna simultaneously does not cause reception problems. T F
14. "Rabbit ear" type of antennas are used to receive signals from local and distant stations. T F
15. For your neighbour's receiving system, coaxial cable is preferable because it reduces the risks of interference. T F

You receive a complaint that your neighbour's stereo system picks up your communications, which can also be heard on the telephone.

16. It is not necessary to check your radio installation. T F
17. The problem is caused by a deficiency in your neighbour's equipment. T F

You receive a complaint that your station interferes with your neighbour's television reception.

18. If your neighbour's television is connected to cable, there is no need to worry about it. T F
19. You should inform your neighbour that this is impossible because you are not using your equipment. T F
20. If you have a directional antenna, it is less likely that your station is the cause of the interference. T F
21. You are not responsible since you were not operating the station when the interference occurred. T F
22. You should take the steps necessary to prevent the interference. T F
23. Since your station does not cause interference in your own television, you can't be responsible for the interference caused in your neighbour's set. T F
24. If your neighbour notices that the interference affects primarily Channel 2, suggest that a low-pass filter be installed between the television and its antenna. T F
25. If the interference affects all the television channels, you will install a high-pass filter between your GRS set and your antenna. T F

You operate a GRS station and you experience harmful interference.

26. If it is electrical interference, you should contact Industry Canada. T F
27. Dimmer switches, electric blankets, aquarium heaters, fluorescent lights and heating pads may cause clicking, humming or buzzing sounds in your GRS receiver. T F
28. Every time your fellow GRS operators transmit, your station experiences cross-modulation effects; this means that they are using a linear amplifier. T F
29. If the signal picked up by your transceiver is accompanied by a high level of noise, you can reduce it by turning down the volume. T F

Answers

1. **FALSE** It may only be used for radiocommunications that involve the immediate protection of lives or property.
2. **TRUE**
3. **FALSE** You should not concern yourself with it, but when you have to transmit emergency messages, you should remind them politely that Channel 9 is officially limited to emergencies.
4. **TRUE**
5. **FALSE** In fact, the regulations prohibit you, even as a GRSer, to have this type of equipment in your possession.
6. **FALSE** Microphones with amplifiers are often a source of interference and overmodulation. In certain cases, they could be required, for example, by someone with a speech impediment.
7. **FALSE** A GRS set is more likely to interfere with televisions, organs, radios and amplifiers.
8. **FALSE** A proper ground system consists of a copper rod buried at least 8 feet into the ground, since frost penetrates to 4 feet. Furthermore, the ground wire should be made of copper tie wire of at least No.12 gauge.
9. **FALSE** If your station causes interference, the Department may restrict the operating hours of your station.
10. **FALSE**
11. **TRUE**
12. **TRUE** If the antenna structure is erected within 3 km of an airport or is higher than 15 meters at any location, contact the nearest Industry Canada office. In certain municipalities in Canada, antenna structures must be approved by the municipality before they are erected.
13. **FALSE** This type of installation is as susceptible to GRS interference as it is to being affected by ghost images.
14. **FALSE** This type of antenna is not adequate to capture signals from distant stations.
15. **TRUE** This type of cable is less prone to pick up undesirable signals.
16. **FALSE** You should check your own installation, in particular the ground system, the standing-wave ratio (SWR) and the adjustment of your preamped microphone (if it's being used).

17. **FALSE** The stereo equipment is not defective. Rather, it lacks immunity. In order to correct this situation, your neighbour's stereo equipment dealer should be contacted. Interference problems with the telephone equipment should be brought to the attention of the dealer or manufacturer, or the telephone company's service centre.
18. **FALSE** You should check your own radio installation and suggest that your neighbour contact the cablevision company.
19. **FALSE** You should inform your neighbour that your station is not in operation and offer to do a test transmission.
20. **FALSE** This type of antenna is more likely to cause interference. The Department may require that a lower gain antenna be used should this prove to be the most acceptable solution to correct interference problems.
21. **FALSE** You are responsible for the control and operation of your station at all times.
22. **TRUE** You should cooperate with the person affected by the interference in order to find a solution to the problem.
23. **FALSE** Owing to the radiation characteristics of antennas, it is possible that your neighbour's reception is affected by signals from your station, while yours is not.
24. **FALSE** The interference is probably caused by the 2nd harmonic generated by the GRS equipment. The low-pass filter is therefore installed between the GRS transmitter and the antenna.
25. **FALSE** This blocking problem can be eliminated by the installation of a high-pass filter between the television and its antenna. If a television preamplifier is used, the filter is installed between the preamplifier and the antenna.
26. **FALSE** You should report the interference to the customer services section of your electric utility company. You can find the telephone number of this service on your electricity bill.
27. **TRUE** These are the most common electrical devices likely to be a source of interference. Note that other electrical appliances can also be a source of harmful radiation. The Department publishes a brochure on how to identify these sources of interference.
28. **FALSE** A linear amplifier is not necessarily involved. In fact, close proximity of high-gain antennas contributes to this cross-modulation problem.
29. **FALSE** You can only reduce it by using the noise limiter.