



**The new
General Radio Service
Handbook**



Government of Canada
Department of Communications

Gouvernement du Canada
Ministère des Communications

of Contents



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Foreword

Recent years have witnessed explosive growth in popularity of the General Radio Service (GRS) band in Canada.

Because this means of low-cost, personal, two-way radio communications (popularly known as "CB") is a limited, shared public resource, it is important that GRS operators know and respect the regulations governing its use. Operators should also try to learn as much as possible about how radio works, good installation and operating practices, handling and solving interference problems and other related subjects.

The federal Department of Communications (DOC) is responsible for the management and proper use of all radio communications services in Canada. It has prepared this handbook to help you derive maximum benefit and enjoyment from GRS. Read it carefully. Then keep it handy for reference.

If you have any questions after reading this publication, get in touch with your nearest DOC district office or write:

Department of Communications
GRS Licensing Centre (General)
Box 2798
Station D
Ottawa, Ontario
K1P 6H4

Introduction

General Radio Service (GRS)?

Welcome to the General Radio Service (GRS, or CB, radio). If you are reading this handbook, you may already be among the one million Canadians who enjoy this means of personal radio communications. Or perhaps you are interested in getting into it.

The handbook will help you better understand GRS and the rules which govern it and will offer you many helpful hints. Its basic objective is to help you derive the most benefit from GRS, while enabling your fellow GRSers to do the same.

At the end of this publication is a series of questions and answers. They are based, to a large extent, on regulations of the federal Department of Communications (DOC), which manages the radio spectrum.

Because the regulations themselves are written in precise legal language, we hope that in this way we can help you better understand the rules. The questions and answers do not, of course, *replace* regulations contained in the General Radio Regulations (GRR). In fact, we encourage you to obtain a copy of the GRR from our Telecommunications Regulatory Service (see address in foreword).

Finally, you will find a self-test, with answers (Appendix D). Try this test. It will help you determine if you know as much as you should about GRS.

What is the General Radio Service (GRS)?

GRS is a simple, low-cost, short-range two-way radio communications service. Its range varies, but will typically be 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 (installed in home and other permanent locations) stations. This means of communications requires the use of an invisible natural resource called the radio spectrum.

The spectrum is simply a range of electromagnetic radiations, of varying frequency and wavelength, travelling at the speed of light.

It is divided into bands, usually characterized according to their frequency or wavelength, and allocated to various kinds of communications services for ships, satellites, TV and radio broadcasters, buses, taxis, trucks, aircraft and many other users.

The frequency of a radio signal is the number of electrical vibrations per second produced by the transmitter. AM broadcasting makes use of frequencies between 535,000 and 1,605,000 cycles per second. Television operates at much higher frequencies. The term cycles per second is expressed as Hertz (Hz). The prefixes Kilo (1,000) and Mega (1,000,000) are used to trim these numbers down to size. Thus, the dial on your AM radio reads from 535 KHz to 1,605 KHz and your TV receiver operates between 54 and 890 MHz.

About half-way between the AM broadcast band and the start of the first TV band lies the General Radio Service (GRS), covering frequencies between 26.960 and 27.410 MHz.

The GRS band is in turn subdivided into 40 channels. Within the common receiving range of any given number of GRS stations, only one conversation should take place on each channel. But any number of others with GRS sets can, however, *listen*. Watch your language. You never know who is listening (including DOC).

Channel 9

Please note that channel 9 is an official emergency channel. Many of Canada's police forces monitor it so they can render quick assistance when required. Don't use channel 9 unless you are faced with a real emergency situation.

Regulating the use of the spectrum

The radio spectrum is a scarce resource. It must be shared among users. DOC is charged with overall responsibility for managing, policing and planning for the orderly development and use of the spectrum in Canada. For the General Radio Service, this means licensing, type approval of equipment, and development and enforcement of regulations.

Organization of the Federal Department of Communications

DOC has its headquarters in Ottawa. Its five regional offices are in Moncton, Montreal, Toronto, Winnipeg and Vancouver. Each regional office supervises a number of district offices, to provide better local service to the public. Your nearest district office will normally be your contact point with DOC on all GRS matters except licensing. See Appendix E for a list of these offices.

Requirements of Licensing

The GRS spectrum is a sort of electronic highway. As with a highway, you need a licence to use it. Licensing brings you into contact with the system of rules and regulations necessary to make any scarce and valuable shared public facility work well.

Licensing embodies a system of identification and controls to identify and locate you if the need arises. Typically, this might involve resolution of an interference problem — whether your set is the cause or the victim! (You might not know it if your set is causing interference. Without identification, the task of locating you and correcting the problem is that much more difficult).

Licensing also allows you to pay your fair share of the cost of maintaining this electronic highway.

Licensing is so important that the **Radio Act** requires that each GRS set you possess or operate must have its own licence. Violations of these provisions are punishable by a fine of up to \$2,500 or imprisonment.

How to Obtain a GRS Licence

You must fill out form 16-855, contained in the free brochure entitled *Obtaining Your Licence*. A copy may be obtained from the dealer that sold you the

equipment, your nearest DOC district office, or directly from the GRS Licensing Centre in Ottawa. (See Appendix E).

Conditions for a Licence

The conditions for a licence are outlined in application forms and the brochures normally provided with them. In essence, the applicant must certify that:

- He or she is a Canadian citizen, landed immigrant or officer of the company in whose name he or she is applying;
- He or she is at least 16 years of age (12, if the licence is for model control operation);
- He or she is not the subject of any legal action concerning the operation of a GRS station;
- He or she has not had a GRS licence revoked by DOC;
- The station will be operated in accordance with the General Radio Regulations and will not exceed the power limits authorized therein;
- The GRS equipment is type-approved by the Minister of Communications for use in Canada, or if the equipment is for radio control of models, is technically acceptable to the Minister for use in Canada.

What is Type-Approved GRS Equipment?

Before GRS equipment can be licensed, it must meet DOC's Radio Standards Specification 136. Testing of a sample unit of each model to be sold is carried out by DOC's own laboratory. Each type-approved set must then have a label or other marking bearing the DOC type-approval number permanently attached to the chassis. It is a nine-digit number. Look for it. You will need it for licensing. It is your guarantee that the set complies with DOC standards, thereby reducing the chances it will cause radio interference.

Your Call Sign

When you obtain your licence from DOC it will contain a call sign, consisting of the prefix "XM" or "XL", followed by a series of digits. This call sign identifies your particular radio and you as the person legally responsible for its proper operation. The call sign must be used for identification purposes whenever you go on the air. If you hear someone on the air who is not using a call sign, you should not communicate with that person (emergencies excepted.) He or she may not be licensed and may be subject to severe legal penalties.

Shopping for your equipment

(If you already have all the GRS equipment you want, you may wish to skip this section.)

General

Before you invest what could be less than \$100, or more than \$1,000 (if you want a high degree of sophistication and many accessories), we suggest you do a little investigation. Learn what controls, accessories and other functions of a GRS radio are essential, which options are desirable or useful for your intended operations and which might be considered frills with which you might wish to dispense.

Get Some Personal Advice

A wise first step would be to visit a neighbour or friend who already uses GRS equipment. Look over his/her installation. Ask questions. Get recommendations about dealers. Shop around before you buy. If you don't know anyone who has a GRS set and you want to seek advice through GRS clubs that may be operating in your area, get in touch with: The Alliance of GRS Operators (CGRSA), Box 894, Oshawa, Ontario, L1H 7N1. CGRSA is a non-profit organization with member clubs in every province of Canada. It also publishes a magazine.

The basic building blocks of any GRS radio station are:

- a **transceiver**, a combination transmitter and receiver, usually supplied with microphone, power cord(s) 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 **electricity source**.

AM or SSB?

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

Most sets still use basic AM. But SSB radios, which usually can operate in the AM mode as well, transmit sound more efficiently, because they concentrate the audio information and radio power into a much "narrower" signal.

An SSB set may well be worth the extra expense if you plan to use GRS a lot, or if a greater communications range is needed.

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 desired stations 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 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 will provide adjustment of receiver sensitivity to effectively weaken the strong signal.

Receiver Selectivity and Sensitivity

Two important characteristics that indicate how good any radio receiver is are its *selectivity* and *sensitivity*.

Sensitivity is the ability of the radio to receive very weak signals clearly. A cheap radio may hear only the strongest of signals. A very good one will pull in weaker stations too.

Selectivity is the ability to screen out signals from adjacent channels. A set with good selectivity can reject a stronger signal from one or two channels away, 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, most signals you hear will be relatively strong. Selectivity will be 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 GRSers are your best source of detailed advice on antennas, but here are some basics.

An antenna is simply an electrical conductor, cut to a special length, (some precise fraction or multiple of the wavelength of the signals with which it will be working), which transfers radio energy out from, or into, your radio. It should be mounted as high and clear of surrounding objects as safety and practical considerations allow.

The most efficient length for a mobile antenna is a quarter wave length (just under 3 metres) long.

But most people choose shorter antennas, which have loading coils to compensate for their shorter length.

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.

Base Antenna

Base (fixed station) antennas 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.

A beam antenna acts like the lens of a flashlight. It concentrates 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, 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.

WARNING:

A major cause of electrocution is an accident during the erection of a CB antenna near high voltage power lines. Make certain that if any part of your antenna structure fell over, it would not touch a hydro wire.

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. RG8/U, a thicker, more durable cable, is best suited for permanent outdoor installations and when 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 soldering instructions very carefully. Sloppy connections are a common cause of poor performance.

Power Source

Most GRS sets operate on 12-volt direct current (12VDC). Since this is the same voltage used by nearly all car and truck electrical systems, electrical installation of a mobile radio is relatively simple. Follow manufacturer's directions and be particularly careful that you don't reverse the connections to the red (positive, or '+') and black (negative, or '-') color-coded conductors at the set's power plug. A mistake could seriously damage your set. Radios designed for use as base stations are often equipped for standard household current. A smaller mobile type set will require an inexpensive AC-to-12VDC power supply when used in the house.

Setting up your station

Proper installation of your station is important

There are many good books on the subject. But if you are not technically inclined, get some help from your dealer, GRS club or other qualified person. Follow manufacturer's instructions, being especially careful that all connections are secure.

Antennas must be properly tuned and matched to your particular radio. Take care that coaxial antenna cable is kept as short as practicable and not exposed to physical damage.

If you are going mobile, mount your set so that it will not interfere with operation of any vehicle controls. You should be able to reach the microphone and all knobs and switches safely, without having to either take your eyes off the road or bend away from a normal, upright position.

At home, set up the radio where noise (such as from the television set) won't interfere. And keep it out of reach of children. It's *not* a toy!

If possible you may wish to locate your GRS station near a telephone. Keep a pencil and pad (or radio logbook) handy.

Protection from Lightning

Your antenna structure should be well grounded. A water pipe, hydro ground, or ground rods 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 precautions.

Lightning arrestors are available to help jump a direct lightning hit to ground.

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

Going on the air

Before you go on the air, it is your duty as the licensee of a radio station to know the regulations. The main rules are summarized, in the form of questions and answers, later in this book.

Think Before You Transmit

Remember that anything said on the radio can be easily overheard by an unknown number of other people. Two-way radio does not offer the privacy of the telephone.

Establishing Communications

If, as a result of prior arrangements, you know that your party is expecting you on a particular channel, tune to that channel and listen to make sure that it is not currently in use. If it is in use, you must wait until the conversation has ceased. Then you may begin by simply calling: (for example) "XM42-101045, this is XM42-657300".

When the other party receives this call, he or she should acknowledge it as soon as possible and you may then proceed with your communication.

At the end of the conversation, each station must sign off, giving its own call sign (e.g., "XM42-657300, out").

If you have made no prior arrangements to meet on a specific channel, you should know that channel 11 is widely used as a call channel (and may become the official call channel) and you may attempt to establish contact here. Once you have made that contact, however, you should move to some other unused channel (not 9) to carry on your conversation.

Effective Radio Communications Techniques

Air time on busy radio frequencies can be a precious commodity. There is no room for long-winded, vaguely-worded messages that tie up channels unnecessarily and delay important calls.

Slow Down and Speak Clearly

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.

Speak at a constant speed. End each word clearly and don't slur words together. The greater the static and background interference level, the more slowly you should speak.

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." (Appendix A contains a full phonetic alphabet like this which can be very useful, particularly at times when communications are difficult.)

Numbers, except whole thousands, should be transmitted by pronouncing each digit separately. As an example, for the call sign XM 42-53156, say: "XM four-two-five-three-one-five-six."

Whole thousands are sent by pronouncing each digit in the *number* of thousands, followed by the word "thousand," as in "one-five-thousand," for 15,000.

Public safety agency dispatchers avoid words or phrases that are comparatively easy to blur or misunderstand, in favor of words that have a more distinct sound or meaning. For example:

Poor	Preferred
Want	Desire
Can't	Unable
Get	Obtain
Send	Forward
Do You Want	Advise if
Tell	Advise
Call and See	Check

Handling an emergency: Channel 9

General Radio Service Channel 9 is reserved for communications involving emergencies.

This usually means situations where something has happened, or threatens 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.

Channel 9 is monitored by a growing number of police forces, as well as individual and club-organized GRS operators. Irresponsible use of Channel 9 diminishes the value of the channel for everyone. But resist the temptation to scold operators abusing the channel. You'll only tie up more air time.

Don't Compete to Provide Help

It is natural to want to help someone in need. But you should never be so anxious to provide help that you interfere with the station best able to handle the situation. The station with the best communications to the area from which the call originates should normally provide help.

Let's take a common occurrence, the reporting of a road accident:

It is natural to become a bit excited. But a calm, detached voice can lessen anxiety and help speed the message to the police accurately and effectively.

All that really counts is that the police, and ambulance crew if necessary, be notified of **WHAT** has happened, **WHERE** and whether or not anyone appears hurt. Until the police have been notified — in as few words as possible — all other information is superfluous.

On the Receiving End

Pass information along to the responsible agency quickly. Don't tell them what to do, or try to second guess anybody. Care should be taken to repeat information exactly as received.

Be patient and courteous to the caller. Telling him or her to "calm down" only gives the impression you don't appreciate the seriousness of the situation.

Considerations like these are particularly important if you become involved in club activity handling messages for a special event or other public service project where accuracy is essential. (Appendix B contains some suggested phrases to aid communications.)

Radio interference

Phonetic Alphabet

Remember always that the radio spectrum is a resource to be shared — among nations and among individuals. Co-ordination and co-operation are key words.

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

To attempt such a design would mean that the equipment would be prohibitively expensive, given the relatively few cases when interference might be caused.

Should you find that you are either experiencing or causing interference, get in touch with DOC. We have a handy booklet entitled "*How to Identify and Resolve Radio-TV Interference Problems.*" It is free. Follow the instructions in it and chances are that your problems will be quickly and easily resolved. If not, contact your nearest DOC district office.

Prevention is Better than Cure

To reduce the chances of interference before it occurs, follow the hints outlined below.

Before you even erect your GRS antenna, remember the importance of good relations with your neighbours. The very fact 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.

So 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 and grounding towers and antennas. 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 is being used.

It would be wise to conduct 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 their channels. Repeat this procedure, while transmitting on *another* GRS channel *well-removed from the one you used the first time*. 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.

Appendix "A"

Phonetic Alphabet

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 Whisky
K Kilo	X X-Ray
L Lima	Y Yankee
M Mike	Z Zulu

Appendix "B"

Procedure Words and Phrases

The following words and phrases, although not comprising a complete guide, should be used wherever applicable, to avoid confusion in radio communication. Slang should not be used.

Word or Phrase	Meaning
Acknowledge	Let me know that you have received and understood this message.
Affirmative	Yes, or permission granted.
Break	Indicates the separation between portions of the message. (To be used where there is no clear distinction between the main text and other portions of the message.) This word is also commonly used to interrupt another GRS transmission or exchange.
Confirm	My version Is that correct?
Correction	An error has been made in this transmission (message indicated). The correct version is . . .
Go ahead	Proceed with your message.
How do you read?	How well do you receive and understand my transmission?
I say again	Self-explanatory (use instead of "I repeat").

Word or Phrase	Meaning
Negative	No. Permission not granted. That is not correct. Or, I do not agree.
Over	My transmission is ended and I expect a response from you.
Out	Conversation is ended and no response is expected.
Channel	Change to Channel . . . before proceeding.
Read back	Repeat all of this message back to me exactly as received, after I have given "over". (Do not use the word "repeat").
That is correct	Self-explanatory.
Verify	Check text with originator and send correct version.
Wilco	Your instructions received, understood, and will be complied with.
Words Twice	<p>(a) As a request: Communication is difficult, please say each word twice.</p> <p>(b) As information: Since communication is difficult, I will say each word twice.</p>

Appendix "C"

Questions and Answers

Important Note

This appendix has been prepared to help you understand the regulations which govern the General Radio Service. It contains a series of commonly asked questions, with answers to them. It does not replace the regulations themselves, however, and has no legal validity.

You are encouraged to obtain an up-to-date copy of the regulations contained in the General Radio Regulations, from:

Department of Communications,
GRS Licensing Centre (General)
Box 2798
Station D
Ottawa, Ontario
K1P 6H4

or from your nearest DOC district office.

Definitions

These definitions will help you better appreciate the questions and answers which follow.

Antenna structure

The antenna's radiating system and supporting structure, and anything mounted on the antenna or structure.

Carrier power

The average power at the output terminals of a transmitter (other than a single sideband unit of a transmitter with a suppressed, reduced or controlled carrier) during one radio frequency cycle, under conditions of no modulation.

GRS station	A station licensed in the General Radio Service (GRS).
Emergency communications	Messages concerning the immediate safety of life or the immediate protection of property.
External radio frequency power amplifier	Any device which is not included by the manufacturer in a type-approved transmitter and which, when used with a radio transmitter as a signal source, is capable of amplifying the signal. (External radio frequency power amplifiers are sometimes known as "linears"). Possession of these devices is illegal and punishable by fines.
One-way communications	A message which is not intended to establish two-way communications with one or more particular GRS stations.
Peak envelope power (of SSB units)	The average power at the output terminals of a transmitter, during one radio frequency cycle at the highest crest of the modulation envelope, taken under conditions of normal (voice) operation.
Person	Either an individual or a corporation.
Single sideband emission (SSB)	An emission in which only one sideband is transmitted. The carrier, or a portion of it, may be present in the emission.
Double sideband emission	An emission in which both upper and lower sidebands are transmitted. The carrier, or a portion of it, may also be present in the emission.
Station address	The place where the station licence is kept or posted (see question 26) where the station records are kept (question 34) and where the primary fixed transmitter, if any, is operated.

Station authorization

A GRS temporary permit or a GRS licence or special temporary authority issued by DOC.

How to get a licence

1. Do I need a licence?

The Radio Act requires that each GRS set which you own or operate must have its own licence.

The only exception to this GRS licensing requirement is for low-power (100 milliwatts) radio units (walkie-talkies).

2. Am I eligible to obtain a GRS licence?

You are eligible to obtain a GRS licence if:

You are a Canadian citizen, landed immigrant or officer of the company in whose name you are applying;

You are at least 16 years of age (12, if the licence is for model control operation);

You are not the subject of any legal action concerning the operation of a GRS station;

You have not had a GRS licence revoked by DOC;

Your GRS equipment is type-approved by the Minister of Communications for use in Canada, or if the equipment is for radio control of models, is technically acceptable to the Minister of Communications for use in Canada.

3. How do I apply for a GRS licence?

You must fill in form 16-855, which is contained in a brochure entitled *Obtaining Your Licence*. The brochure may be obtained from the

dealer which sold you the equipment, the local district office or directly from the GRS Licensing Centre in Ottawa (see appendix E).

Follow the instructions which came with the application form and mail it to the licensing centre.

4. May I operate my GRS station while my application is being processed by DOC?

- a) Yes, if you keep your valid temporary permit at your station.
- b) A temporary permit is valid for the first 60 days only, providing you have mailed your licence application form and licence fee to DOC. Keep it with your station records, along with the receipt showing the purchase date of your set.

5. How do I renew my GRS licence?

- a) DOC will forward a renewal notice to you, advising you when your licence is about to expire. However, even if you do not receive such notice, it is still your responsibility to renew your licence. At least 60 days should be allowed for DOC to process your renewal application.
- b) You must stop transmitting as soon as your licence expires, unless you have already sent your renewal application to DOC.

6. When does my licence expire?

Your licence is valid for a period which does not exceed three government fiscal years (April 1 to March 31) Your licence will therefore expire the third time that March 31 occurs, following the date of issue of your licence. This data is printed on your licence.

7. What kind of operation does my licence allow?

- a) You must obey all the conditions and terms of your licence.

b) A GRS station licence authorizes you to establish and operate a mobile radio station in any vehicle, aircraft or boat registered or licensed in Canada, or a base station at a fixed location within Canada; or while carried on the person (walkie-talkie).

c) If you use separate units at various locations, a separate licence must be obtained for each unit. For example, if you own one unit you may use it as a base station. Or, you may also fit it into your automobile and be covered by one licence. But if you use one unit as a base station and another unit in your automobile, then two licences are required.

If your name, station address, or mailing address changes, you must inform DOC within 10 days. Your notice must include the name and address as it appears on your licence, your new name and/or new address, and your call sign. You must keep a copy of this notice in your station records.

8. What must I do if my name or address changes?

9. May I transfer my GRS licence to another person?

a) Licences are not transferable from one person or company to another. And you must not lend your licence or call sign to anyone.

b) If you sell or give your GRS transmitter to another person, you must not transfer your licence with the transmitter. The new owner of the transmitter must obtain his or her own licence.

How to operate a station

10. On what channels may I operate? a) You may transmit on only the following channels (frequencies):

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

39	27.395
40	27.405

- b) 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.
- c) You may use any channel for emergency communications.
- d) **You must, at all times and on all channels, give priority to emergency communications.**
- e) DOC will not assign any channel for the private or exclusive use of any particular GRS station or group of stations (including those using single sideband). 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, nor 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.
- f) **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.

- g) **Channels 13 and 23: Land and Sea Search and Rescue Operations**
A municipal, provincial or federal official (such as a mayor, police chief or search officer) may broadcast a message "taking over" GRS Channel 13 (for marine operations) or Channel 23 (land operations) for the duration of a specified search and rescue or other similar emergency operation. If you hear such a message, you must not use the channel, until an official message declaring an end to the takeover has been broadcast.

11. How high may I put my antenna?

Because of possible hazards to aircraft, certain restrictions have been placed on the erection of antenna structures in the vicinity of airports. Form 16-30 (Particulars of Proposed Site and Radio Antenna Structures) is to be completed and approved prior to erecting an antenna structure within 3 km of an airport, or if your antenna structure is to be higher than 15 m at any location.

This form can be obtained from your nearest DOC district office (see appendix E) or from the GRS Licensing Centre in Ottawa.

The form will be referred to the appropriate regional office of Transport Canada for comments with respect to:

- (1) Any *potential hazard* the antenna structure may constitute to aircraft flying in the area, or

12. What equipment may I use at my GRS station?

(2) any possibility of interference to *radionavigation facilities*.

a) Your GRS equipment must be type-approved for use in Canada by the Federal Department of Communications, under Radio Standards Specification 136, for a licence to be issued.

b) A plate, stamp or sticker should be permanently displayed on each transceiver or transmitter-receiver combination, showing type-approval number, serial number, manufacturer and model number. If in doubt, enquire at your nearest DOC office.

c) Equipment purchased in the United States may not necessarily be licensable in Canada. Be sure the model you plan to buy is type-approved by DOC. If in doubt, enquire at your nearest DOC office. Type-approval is your guarantee that the equipment will meet DOC technical standards and be less likely to cause interference.

d) You must not make, or have someone make, *any* internal modification to a type-approved GRS transmitter. Any such modification cancels the type-approval. Repairs to equipment are not normally considered modifications as long as defective components are replaced by electrically identical parts without modification or change to the wiring that would, thereby, affect the type-approval of the unit concerned.

It is your responsibility to ensure that your set continues to comply with DOC standards. If your set

needs repair, take it to a reputable dealer or repair shop.

13. How much power may I use?

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.

14. May I use external power amplifiers?

No. The regulations specifically forbid you as a GRS user to even own one.

15. What communications may I transmit?

- a) You may transmit two-way communications only to other licensed GRS stations, including those operated by U.S. citizens authorized to operate in Canada, and to low-power (less than 100 milliwatts) stations which do not require a licence.
- b) You may transmit a tone signal only when the signal is used to make contact or continue communications (examples of circuits using these signals are tone-operated squelch and selective calling circuits.)
- c) You may transmit in a foreign language, as long as you identify your GRS station in the English or French language.

16. What are some of the communications that are prohibited?

You must not use a GRS station:

- In connection with any activity which is against federal or 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 GRS station;
 - To transmit music, whistling, sound effects or any material to amuse or entertain;
 - To transmit any sound effect solely to attract attention;
 - To transmit the word "MAY-DAY" or any other international distress signal, except when your station is located in a ship, aircraft or other vehicle which is threatened by grave and imminent danger and you are requesting immediate assistance;
 - To communicate with, or attempt to communicate with, any GRS station more than 250 kilometers away. (Such communications, commonly referred to as working skip, uses the ionosphere to bounce signals. It deprives others of the local communication for which GRS is intended.)
 - To communicate with unlicensed stations, except low-power exempt stations, or
 - To transmit a false or deceptive communication.
- a) You must not accept direct or indirect payment for transmitting or receiving messages with a GRS station.
- b) You may use a GRS station to help you provide a service, and be paid for that service, as long

17. May I be paid to use my GRS station?

18. How should I use my GRS station in an emergency?

as you are paid only for the service and not for the actual use of the GRS station.

- a) Give priority to emergency communications on all channels at all times.
- b) When you are directly participating in emergency communications, you do not have to comply with the regulations about authorized users, (see Question 19) length of transmissions (see Question 22), and communications with unlicensed stations (see Question 16).

19. Who may operate under my licence?

Anyone who is at least 12 years old and is otherwise eligible for a licence (see Question 2) may operate under your licence (see also Questions 20 and 21).

20. Who is responsible for transmissions made under the authority of my licence?

You are responsible for all transmissions made by you or others under the authority of your licence, including transmissions which are against the regulations. You should therefore be certain that anyone operating under your licence understands and obeys the regulations.

21. Who must not operate under my licence?

- a) You must not permit anyone to operate under your licence who is not allowed to do so under the regulations, *except in an emergency* (see Question 19.)
- b) You must not permit anyone who no longer has a GRS licence to operate under your licence if his or her licence was revoked by DOC.
- c) You must not permit anyone to operate your GRS station if DOC has ordered that person to

cease transmission and the order is still in effect.

22. Do I have to limit the length of my communications?

- d) You must not permit anyone to operate under your licence if that person's most recent GRS licence application was denied by DOC.
- e) If you sell GRS transmitters, you must not allow a customer to operate his/her GRS transmitter under the authority of your licence.

23. How do I identify my GRS communications?

- a) Your messages should be kept as short as possible, to give others a chance to use the channels.
- b) You must limit your exchanges of communications to five consecutive minutes.
- c) At the end of five minutes, you must break for at least two minutes, or until the frequency is clear.

24. Where may I operate my GRS station?

- a) You must identify all your GRS communications by your DOC-assigned call sign at the end of each exchange. A nickname, handle or special identifier may be used *in addition to* – but *not* instead of – your DOC-assigned call sign.
 - b) Your DOC-assigned call sign should be clearly given in the English or French language. The phonetic alphabet may be used as an aid for identification.
- a) You may operate your GRS station in any of the provinces or territories of Canada.
 - b) You may not operate your GRS station on any aircraft or vessel

without permission of the appropriate aircraft or vessel officer.

- c) If your GRS station is outside Canada, you are subject to any applicable laws or regulations governing the location at which you are operating.

Other Questions

25. How long must I keep my licence?

You must keep your valid licence for as long as you possess the set. (The expiry date is printed on the licence.)

26. Where must I keep my licence?

a) You must keep your licence posted at your station.

b) You may photocopy your licence for any lawful purpose.

27. What do I do if I lose my licence?

If you lose your licence, you must request a duplicate licence from DOC. Your request must include your name, address and call sign.

28. Do I need to have a copy of the GRS regulations?

a) You *should* keep a current copy of the GRS regulations in your station records.

b) You must stay up-to-date with changes to the GRS regulations. These are officially published in the Canada Gazette and reported in GRS magazines.

29. What are the penalties for violating the Radio Act or the regulations?

a) 1. A person charged with an offence under the Radio Act is liable, upon summary conviction, to a fine not exceeding \$2,500, or to imprisonment for a term not exceeding 12 months or, in some cases, to *both* fine and imprisonment.

2. Owners or operators of unlicensed stations are subject to prosecution and forfeiture of their equipment. Any person who installs, places in operation, repairs or maintains any unlicensed radio station, either for his own use, or on behalf of another person, is guilty of an offence.

3. A person charged with an offence under the General Radio Regulations is liable, upon summary conviction, to a fine not exceeding \$1,000 and costs, or to imprisonment for a term not exceeding six months.

- b) If it is determined that you have violated the General Radio Regulations or provisions of the Radio Act, the Minister of Communications may also suspend or revoke your GRS licence.

If you receive a DOC notice advising that you are alleged to have violated the regulations, you must follow the instructions given in the notice.

You must follow all instructions given by DOC, which may include restrictions of your operation.

30. How do I answer infringement notices?

31. What must I do if DOC tells me that my GRS station is causing interference?

32. May I make any changes to my GRS transmitter?

a) You must not make or allow anyone else to make *any* internal modification to your GRS transmitter.

b) You must not operate a GRS transmitter which has been modified by *anyone* in any way, including modification to operate on unauthorized frequencies or with illegal power. (Don't confuse *modified* with *repaired*.)

33. Do I have to make my GRS station available for inspection?

a) A radio inspector or any other authorized DOC officer may inspect any radio station at all reasonable times. Such an inspection may cover not only the radio equipment and antenna, but also documents concerning the operation of the station. You must make your station available for such inspections.

34. What records should I keep?

b) "Off-the-air" inspections are routinely carried out by departmental monitoring stations and district offices.

Your station records should include the following documents, as applicable:

- Your licence (or valid temporary permit);
- A current copy of the General Radio Regulations;
- A copy of each response to a DOC infringement notice (See Question 30);
- Each written permission received from DOC.

Appendix "D"

Self-Test

This appendix contains a series of multiple choice questions with the correct answers at the end. It is intended to give you a chance to test yourself on how well you have mastered the material contained in this handbook. Take it first and *then* check the answers. If you miss some of them, go back over the book to see where and why you went wrong. Good luck!

Self-Test

How is your knowledge of the General Radio Service and the regulations which govern its use in Canada?

Test yourself here and find out.

NOTE:

1. Only one answer of the three choices offered for each question is correct.
2. You can check the correct answers by turning over the page at the conclusion of the test.

Questions: Check one (✓) only:

1. Is a separate licence required for each GRS radio transceiver?
- () a) Yes, a separate licence must be obtained for each GRS radio transceiver.
- () b) No, one licence authorizes the holder to own and operate any number of GRS radio transceivers.

- () c) No, one licence authorizes the holder to own and operate two units, one used as a base station and the other as a mobile station (e.g. in an automobile).
2. **What type of GRS equipment is licensable in Canada?**
- () a) Any GRS equipment which is bought in Canada.
- () b) All GRS equipment type-approved by the federal Department of Communications.
- () c) All GRS equipment made in North America or Japan.
3. **Is there any penalty for operating unlicensed GRS stations?**
- () a) No, GRS stations do not have to be licensed.
- () b) No, not if my equipment is type-approved.
- () c) Yes, upon summary conviction, an operator is liable to a fine of up to \$2,500 and costs, or to imprisonment for a term not exceeding 12 months.
4. **May someone else operate your licensed GRS set?**
- () a) Yes, without any conditions.
- () b) No, not under any circumstances.
- () c) Yes, someone else may, provided he/she has my permission, I accept responsibility for his/her operation and the person is over twelve years old.
5. **Who is responsible at all times, for the control and operation of a GRS licensed station?**
- () a) The operator, who need not be the licence holder.

- () b) The licensee, who need not be the operator.
- () c) There is no one responsible.
6. What should you do if you change your name or address?
- () a) Advise the Department of Communications of any such change within 10 days.
- () b) Apply for a new licence.
- () c) Nothing.
7. Should your licence be carried with your GRS set?
- () a) I do not need a licence to operate my GRS set.
- () b) Yes, the licence should be posted in a conspicuous place at the base station or carried by the licensee, in the case of mobile stations.
- () c) No, it is not necessary to carry my licence with my set.
8. Are there any federal government restrictions on the height of the GRS base station antenna?
- () a) No
- () b) No, if the antenna structure is not erected in an urban area.
- () c) Yes, if the antenna structure is erected within 3 km of an airport, and higher than 15 metres at any location.
9. Can you purchase, rent or reserve a specific channel (frequency)?
- () a) I cannot purchase, but I can rent or reserve, a specific channel when I have a good reason to do so.
- () b) No, all channels are to be shared by all licensed GRS users.

- () c) Yes, but it is generally very expensive.
10. Which channel may only be used for communications that involve the immediate protection of lives or property?
- () a) Channel 9 (27.065 MHz)
- () b) Channel 13 (27.115 MHz)
- () c) Channel 23 (27.255 MHz)
11. What should you do if you hear non-emergency users on Channel 9?
- () a) Go on the air and interrupt them.
- () b) I should ignore them, but when it is necessary to handle emergency calls, courteously remind them that Channel 9 is officially limited to emergency calls.
- () c) I should treat it as a normal emergency call.
12. On which channel do provincial or municipal land emergency communications have priority over all other communications?
- () a) Channel 9 (27.065 MHz)
- () b) Channel 13 (27.115 MHz)
- () c) Channel 23 (27.255 MHz)
13. What must you do before transmitting?
- () a) I must listen to make sure I will not cause interference to transmissions already in progress.
- () b) I must request other people to cease transmission.
- () c) Nothing.
14. What should you do if you are uncertain if a call is directed to you?
- a) I should go on the air to see if the call was for me.
- () b) I should not reply until the call has been repeated and understood.
- () c) I should simply ignore the call.

15. When must the assigned call sign be transmitted by a licensed station?
- () a) Only at the beginning of each exchange of communications in which the station is engaged.
 - () b) One never has to transmit the call sign.
 - () c) At the beginning and at the end of each exchange of communication in which the station is engaged, and at the end of each test transmission.
16. Is there any time limit to an exchange of communications between GRS licensed stations?
- () a) No, there is no time limit.
 - () b) No, provided that no one else is requesting the use of the channel.
 - () c) Yes, each exchange of communications between licensed GRS stations shall not exceed a duration of five consecutive minutes.
17. Does the law provide a penalty for use of obscene, indecent or profane language on-the-air?
- () a) Yes, it is a serious offence and could cost one a fine of up to \$1,000 and costs, or imprisonment for a term not exceeding six months.
 - () b) No, but it is strongly recommended one not use such language.
 - () c) There is no penalty for the first offence, and a small one for the second offence.
18. What must you do if an inspector of the federal Department of Communications asks to inspect your station?
- () a) I should ask for time to consider the request.
 - () b) I should agree immediately and show the inspector my installation and licence.

- () c) I should refuse and call the police.
19. **What should you do if you are causing interference to a TV or AM/FM radio receiver?**
- () a) I should insist that the owner of the affected equipment endure the interference.
- () b) I should take the steps necessary for prevention of further interference.
- () c) I should immediately sell my GRS equipment and cancel my licence.
20. **May you use a linear amplifier (booster) to increase the power of your GRS set?**
- () a) Yes, if I want to communicate for a distance greater than 10 kilometres.
- () b) Only in rural and remote areas.
- () c) No. The regulations forbid me, as a GRS user, from owning one.
21. **What sources of helpful information are available to GRS users?**
- () a) GRS clubs, GRS equipment dealers, friends, the federal Department of Communications, books, magazines, and so on.
- () b) Only the Department of Communications should be consulted.
- () c) Only GRS clubs can provide information.
22. **Does the federal Department of Communications (DOC) encourage the formation of volunteer groups to respond to emergencies?**
- () a) No. DOC discourages the formation of volunteer groups to respond to emergencies.
- () b) Such groups are not useful.
- () c) Yes. But these should be

Appendix

co-ordinated with safety organizations in a given area for maximum efficiency.

23. What is the main disadvantage of the beam antenna versus the omni-directional antenna?
- () a) There are none.
 - () b) Generally more expensive and more likely to cause interference. Not particularly appropriate for communications with a mobile station.
 - () c) It has less "gain", distorts signals and is only good for 30 km.
24. Are power microphones necessary?
- () a) Yes, in all cases.
 - () b) No
 - () c) In some cases, they could be necessary (i.e. a handicapped person), but in general they are not.
25. What should you do to ensure that you are not going to cause interference to your neighbours and thereby damage neighbourhood relationships?
- () a) I should get written permission from my neighbours to operate my GRS set.
 - () b) I should never use my set in the evenings.
 - () c) I should buy type-approved equipment, install it properly, and notify my neighbours when I first go on the air, so that we may identify and correct any problems as quickly as possible.

End of test: Re-check your answers and then see how you did by turning the page.

Correct Answers

- | | | | | |
|------|-------|-------|-------|-------|
| 1. a | 6. a | 11. b | 16. c | 21. a |
| 2. b | 7. b | 12. c | 17. a | 22. c |
| 3. c | 8. c | 13. a | 18. b | 23. b |
| 4. c | 9. b | 14. b | 19. b | 24. c |
| 5. b | 10. a | 15. c | 20. c | 25. c |

Appendix "E"

Department of Communications

Headquarters, Regional and District Office Addresses

Headquarters:

GRS Licensing Centre (General)
Postal Station D
Box 2798
Ottawa, Ontario
K1P 6H4

Director General
Telecommunication Regulatory Service
300 Slater Street
Ottawa, Ontario
K1A 0C8

Regional Headquarters:

Atlantic Regional Office
1222 Main Street
P.O. Box 1290
Moncton, N.B.
E1C 8P9

Pacific Regional Office
325 Granville Street
Room 300
Vancouver, B.C.
V6G 1S5

Quebec Regional Office
2085 Union Street
20th floor
Montreal, Qué.
H3A 2C3

Ontario Regional Office
55 St. Clair Avenue East
9th floor
Toronto, ONT.
M4T 1M2

Central Regional Office
386 Broadway Avenue
Room 200,
Winnipeg, MAN.
R3C 3Y9

District Offices:

Newfoundland
CORNER BROOK, NFLD.
Federal Building
Main Street
P.O. Box 811
A2H 6H6

ST. JOHN'S, NFLD.
Sir Humphrey Gilbert Building
Duckworth Street
P.O. Box 5277
Room 612
A1C 5W1

Prince Edward Island
CHARLOTTETOWN, P.E.I.
97 Queen Street
C1A 4A9

Nova Scotia
HALIFAX, N.S.
6009 Quinpool Road
B3K 5J7

SYDNEY, N.S.
500 King's Road
Room 110
B1S 1B1

New Brunswick
BATHURST, N.B.
159 Main Street
P.O. Box 155
E2A 3Z2

MONCTON, N.B.
1222 Main Street
E1C 8P9

SAINT JOHN, N.B.
189 Prince William Street
P.O. Box 7285, Station A
E2L 4S6

Quebec
CHICOUTIMI, QUE.
942 Chabanel Street
G7H 5W2

MONTREAL, QUE.
2085 Union Avenue
H3A 2C3

NORANDA, QUE.
32 Frédéric Hébert Avenue
J9X 1V2

QUEBEC, QUE.
2 Place Québec
Room 436
G1R 2B5

RIMOUSKI, QUE.
140 St-Germain Street West
Room 206
G5L 4B5

SEPT-ILES, QUE.
701 Boul. Laure
G4R 1X8

SHERBROOKE, QUE.
1650 King Street West
J1J 2C3

TROIS-RIVIÈRES, QUE.
1285 Notre Dame
Room 337
Public Building
G9A 5E3

Ontario
HAMILTON, ONT.
135 James Street South
L8P 2Z6

KENORA, ONT.
100-4th Avenue South
Federal Building
P9N 1Y6

KINGSTON, ONT.

Federal Building
Clarence Street
P.O. Box 633
Room 272
K7L 4X1

KITCHENER, ONT.

30 Duke Street West
N2H 3W5

LONDON, ONT.

451 Talbot Street
Room 1112
N6A 5C9

NORTH BAY, ONT.

222 McIntyre Street West
P.O. Box 596
Room 301
P1B 8J5

OTTAWA, ONT.

473 Albert Street
K1R 5B4

SAULT STE. MARIE, ONT.

421 Bay Street
P.O. Box 727
P6A 5N3

THUNDER BAY, ONT.

33 Court Street South
P7B 2W6

TORONTO, ONT.

55 St. Clair Avenue East
M4T 1M2

WINDSOR, ONT.

880 Ouellette Street
Room 803
N9A 1C7

Manitoba

THOMPSON, MAN.
436 Thompson Drive
R8N 0C6

WINNIPEG, MAN.

386 Broadway Avenue
Room 200
R3C 3Y9

Saskatchewan**REGINA, SASK.**

2101 Scarth Street
S4P 2H9

SASKATOON, SASK.

206 Circle Drive East
S7K 0T5

Alberta**CALGARY, ALTA.**

820-220 4th Avenue S.E.
Bag 2905
Postal Station M
T2P 2M7

EDMONTON, ALTA.

10025 - 106 Street
T5J 1G6

GRANDE PRAIRIE, ALTA.

Federal Building
11117 - 100 Street
Room 202
T8V 2N2

Northwest Territories**FORT SMITH, N.W.T.**

P.O. Box 540
Post Office Building
X0E 0P0

YELLOWKNIFE, N.W.T.

Bellanca Building
P.O. Box 2700
X1A 2R1

British Columbia**CRANBROOK, B.C.**

116-14th Avenue South
V1C 2W9

KELOWNA, B.C.
471 Queensway
V1Y 6S5

LANGLEY, B.C.
3884 - 192 Street
P.O. Box 3396
V3A 4R7

PRINCE GEORGE, B.C.
707 - 299 Victoria Street
V2L 5B8

PRINCE RUPERT, B.C.
Federal Building
Room 227
V8J 1G8

VANCOUVER, B.C.
325 Granville Street
Room 300
V6G 1S5

VICTORIA, B.C.
816 Government Street
Room 224
V8W 1W9

Yukon
WHITEHORSE, Y.T.
201 - 4133, 4th Avenue
Y1A 1H8