Department of Communications
Ministère des Communications

general radio service

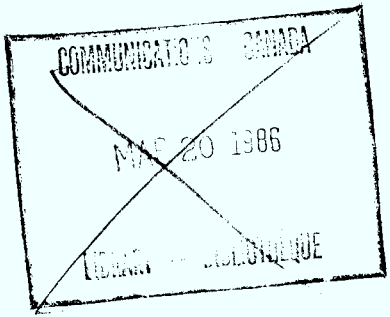
HANDBOOK

DON'T GET ELECTROCUTED

EACH YEAR WE HEAR OF SOMEONE BEING ELECTROCUTED WHILE "ERECTING A GRS ANTENNA. THE UTMOST CAUTION SHOULD BE OBSERVED TO AVOID ANY PART OF YOUR ANTENNA, TOWER OR GUY WIRES FROM COMING INTO CONTACT WITH ELECTRICAL POWER LINES.

BE CAREFUL!

GENERAL RADIO SERVICE HANDBOOK



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FOREWORD

The Department of Communications has developed this handbook as part of its efforts to ensure the orderly use of the electromagnetic spectrum—an important natural resource belonging to all Canadians. In addition, some technical information is provided on use of equipment and methods dealing with interference to radio and television reception. A number of questions frequently asked by General Radio Service licensees are also answered.

The operating procedures are based on those formulated by the International Telecommunications Union (ITU). Use of correct procedures by operators is necessary for the efficient exchange of communications. The regulations governing the use of radio in Canada are outlined in the:

General Radio Regulations, Parts I and II

Ship Station Radio Regulations Parts I, II and III, and Air Regulations

Enquiries concerning this handbook may be directed to any Department of Communications regional or district office or to:

Telecommunication Regulatory Service
Department of Communications
Ottawa, Ontario.
K1A 0C8

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History

The history of radio dates back to before 1901, when Marconi received the first trans-Atlantic wireless message at Signal Hill, St. John's, Newfoundland. Since that eventful day, radio has mushroomed into a vital part of the communications mosaic in all advanced countries. Originally, it was employed primarily as a means of ship-to-shore communications. Later, during the 1920's, broadcasting developed.

Early in the 1920's, amateur experimental radio stations conmmenced operation. While there were only seven Canadian amateur radio certificates in force in 1920, close to 60 were issued the following year and today there are close to 14,500. Use of radio in Canada has been growing by leaps and bounds ever since.

The General Radio Service was introduced in Canada in 1962. During 1963 there were approximately 13,500 GRS licences issued, in 1965, over 36,000. Latest figures indicate a total of 800,000 GRS licences in force.

In April 1969, the Federal Department of Communications was formed. One of its mandates was responsibility for administration of the Radio Act and Radio Regulations.

Radio Spectrum

In the present trend toward an information oriented society, the role played by radio communications is important. Efficient use of the radio frequency spectrum is therefore a prime requisite if it is to contribute

to the development of our society. The spectrum is somewhat different from other natural resources and is characterized by the following properties:

1) it is used, not consumed, and is being wasted when not used effectively;
2) it has dimensions of space, time and frequency and all three are inter-related
3) its utilization is decreased by pollution from interference.

Being a national as well as an international resource, the use of the radio spectrum is of continuing importance. It may be compared to a new farming area. At first the purchaser will work the rich lowlands where he can work with tools he already has; as the need grows, he starts tilling some of the marginal land. In some areas he finds new techniques are needed and that soil conditions are favourable to new crops. He gets additional help and soon the day arrives when all the land is allocated and in partial use. There are no more green fields to meet ever-growing demands.

It is a time for re-evaluation, re-appraisal and re-direction of effort. The farmer must concern himself with the science of agriculture, the economics of farm yield and the realities of the existing assignment of land.

Man's utilization of the radio spectrum has reached such a point of development and therefore re-appraisal has begun. A

fundamental objective of the Department of Communications is to ensure the equitable use of the radio spectrum by safety services, national defence, business, data handling, education, personal communications and entertainment.

The Radio Act contains statutory controls exercised by the Government of Canada over the use of radio by providing for the licensing of all classes of radio stations and prescribing the certificate qualifications of radio operators. The Radio Act delegates authority to the Governor in Council and Minister of Communications to make regulations for the administration and control of the use of radio in Canada and provides penalties for violations of these regulations.

The General Radio Regulations Part I contain the regulations made by the Governor in Council pursuant to Section 6 of the Radio Act.

Part II of the GRR contain regulations made by the Minister of Communications pursuant to Section 7 of the Radio Act.

Copies of these documents and amendments may be obtained from Printing and Publishing, Supply and Services, Ottawa, Canada, K1A 0S9.

Licensing

The current fee for a GRS licence is $13.50 for a maximum of three fiscal years. Licences may only be issued to persons sixteen years of age or older; twelve years of age for model control operation.

In the case of the General Radio Service, licences are issued at Department of Communications District Offices. A GRS licence is normally valid for a maximum of three fiscal years and expires on the 31st of March, three years following the 1st of April of the fiscal year in which it was issued. For example, a licence issued on April 1, 1977 expires on March 31, 1980; if it were issued on February 2, 1978 it would still expire on March 31, 1980. A government fiscal year is from April 1st to March 31st the following year.

A General Radio Service station licence authorizes the licensee 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). The same unit may be used at one or more of these locations. However, if the licensee uses separate units at various locations, a separate licence must be obtained for each unit. For example, if a licensee owns one unit he may use it as a base station and may also fit it into his automobile and be covered by one licence. But if he uses one unit as a base station and another unit in his automobile, as a mobile, then two licences are required.

Licences are not transferable from one person or company to another; you may not "lend" your licence or call sign to anyone,

General Radio Service station licences may only be granted to persons over the age of sixteen years. (Twelve, if the licence is for model control operation).

Low-power radiotelephone units (Walkie-talkies) with an input power to the final radio frequency amplifier stage not exceeding one hundred (100) milliwatts, operating on General Radio Service frequencies (26.97 27.27 MHz) are exempt from licensing. They must, however, be used as if they are licensed General Radio Service stations and must comply with all the applicable operational rules and regulations.

The licence, or a copy thereof, for a radio station should be posted in a conspicuous place at the base station or carried by the licensee in the case of mobile stations or walkie-talkies.

Remote Control Frequencies

Remote control frequencies are: 26.995; 27.045; 27.095; 27.145 and 27.195 MHz. Frequencies available solely for controlling the operation of model aircraft are: 72.080 MHz; 72.240 MHz; 72.400 MHz and 72.960 MHz. Transmitting frequencies must be maintained within plus or minus 1,360 Hz of any authorized frequency. No departmental recognition is given to any local arrangement which favours the use of a specific channel, or channels by a particular user group, such as hotels, garages etc.

Radio Equipment

Your GRS radio equipment must be type-approved by the Department of Communications under Radio Standards Specification 136. Each type-approved unit must have a label or other marking bearing the Department of Communications type-approval number permanently attached to the chassis.

If you are not sure that the equipment you intend buying is type-approved, enquire at the nearest Department of Communications district office.

Antenna Structure

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 Structure) is to be completed where:

1) the structure is to be erected within a two mile radius of the centre of an airport;
2) is in the area extending from the two mile radius to the three mile radius and in excess of 50 feet above the surface of the ground at the site; or
3) is beyond the three mile radius and in excess of 75 feet above the surface of the ground at the site.

Installation and Servicing

No General Radio Service equipment may be installed or operated until a licence has been granted by the Minister of Communications.

No radio station, unless of an exempt category; i.e. input power of 100 milliwatts

or less, may be established, installed or operated without being licensed. In fact, no person may have in his possession radio apparatus consisting of a reasonably complete and sufficient combination of radio appliances (receivers, transmitters, power supplies, antennas, etc.) intended for or capable of being used as a radio station except under authority of a radio station licence. Ideally, applicants should decide on the type of equipment, obtain a licence based on their decision and then purchase the equipment.

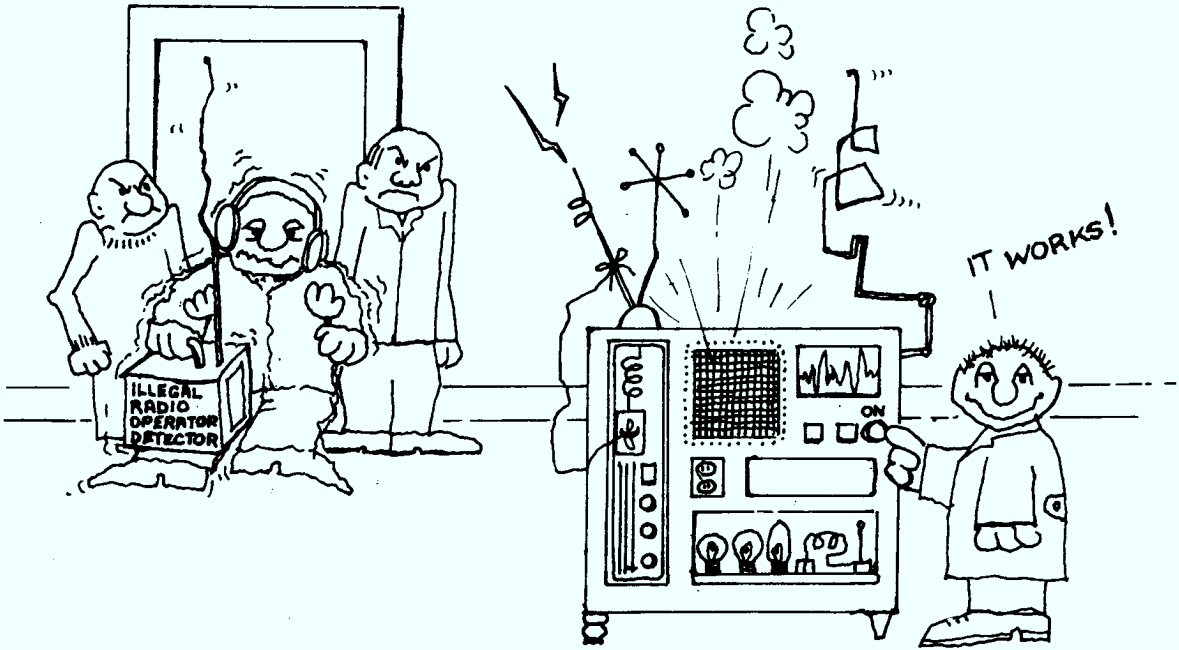
Owners or operators of unlicensed stations are subject to prosecution and forfeiture of their equipment. Upon summary conviction, an owner is liable to a fine of up to $2,500 and costs or to imprisonment for a term not exceeding 12 months.

Any person who installs, places in operation, repairs or maintains any unlicensed equipment either for himself or on behalf of another person is guilty of an offence. The onus is on the person doing the installation or repairs to satisfy himself that the equipment is properly licensed.

Repairs to equipment are not normally considered modifications as long as defective parts are replaced by electrically identical parts without modification or change to the wiring and without affecting the type-approval of the unit concerned.

Inspection of Stations

A radio inspector or any other authorized officer of the Department of Com-


ILLEGAL
RADIO
OPERATOR
DETECTOR
ON
IT WORKS!

munications may inspect any radio station at all reasonable times. Such an inspection may cover not only the radio equipment and antenna, but also all other associated apparatus, record books and other documents concerning the operation of the station.

Infringement Report

"Off-the-air" inspections are routine functions carried out by departmental monitoring stations and district offices. If a station is found to be operating improperly (e.g. off frequency, over-modulating, using incorrect operating procedures such as improper identification or excessive calling, unauthorized types of communications, exceeding the five minute communication time limit, etc.) an infringement report will be sent to the licensee of the station involved. This report is intended as a warning that the station is not being operated in accordance with licensing requirements and that immediate steps should be taken to correct the fault.

Secrecy of Communications

GRS operators and other persons who become acquainted with non-broadcast radiocommunications are bound to preserve the secrecy of correspondence. No person shall divulge the contents of, make use of, or even acknowledge the existence of correspondence transmitted, received or intercepted by a radio station, except to the addressee of the message or his accredited agent, or to properly authorized officials of the Government of Canada, a competent legal tribunal, or an operator of a telecommunications system as is necessary for the

furtherance or delivery of the communications. The foregoing restrictions do not apply to messages of distress, urgency or safety or to messages addressed to "ALL STATIONS", weather reports, storm warnings and notices to navigation.

Any person who violates the secrecy regulation is liable, on summary conviction, to a fine not exceeding $2,500, or to imprisonment for a term not exceeding 12 months or to both fine and imprisonment.

Communications with Whom

Your GRS station may be used to carry on a two-way radio conversation with:

1) another GRS station licensed in the name of the same licensee;
2) another GRS station licensed in the name of a different licensee;
3) a tourist radio station (U.S. citizen authorized to operate in Canada);
4) a low power (less than 100 milliwatts) unlicensed station.

As a rule of thumb, licensed stations shall be used only for communication concerning the business activities and personal affairs of the licensee. Consult the latest amendment of the extracts from regulations listing the purposes for which your GRS station may be used.

Language

Profane and offensive language is strictly prohibited.

Identification

Each licensed General Radio Service station is assigned a call sign. All GRS call signs commence with the letter XM, fol-

lowed by a series of digits; the first two of which identify the DOC district office issuing the licence.

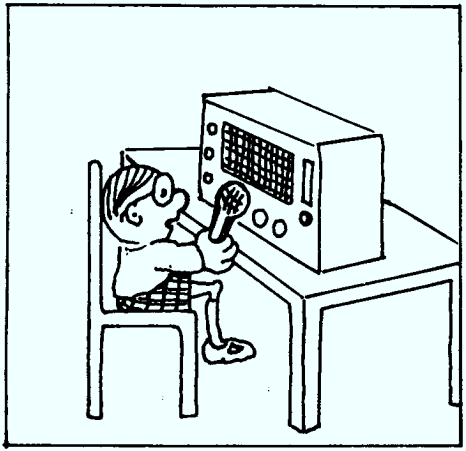
Each licensed General Radio Service station shall transmit its full assigned call sign at the beginning and at the end of each exchange of communications and at the end of each test transmission. For your own protection, do not abbreviate your call sign when using it under the above circumstances. If you are proud of your station and its operation there is no need to hide its identity!

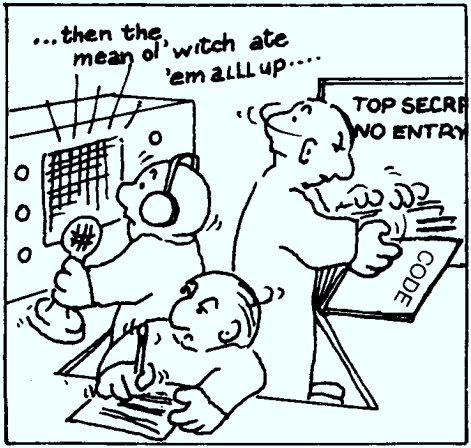
Interference

One important thing for all radio station licensees and operators to remember is that inter-station interference is a two-way street. You may be causing interference to others without knowing it, or be on the receiving end of interference. When this happens, the usefulness of proper identification will become apparent. Without adequate identification the task of locating an interfering transmitter is substantially complicated.

Remember also that this unknown source of interference may not only affect your GRS reception, but may interfere with television reception during a crucial play-off game or, worse still, when your spouse is viewing a favourite day-time soap opera or movie of the week.

Almost 50 years in the business of tracking down sources of inductive and inter-station interference has taught departmental inspectors that the key-word in resolving all




...then the mean ol' witch ate 'em aLLL up....
TOP SECR
NO ENTRY
CODE

interference investigations is "co-operation". Invariably, if a co-operative attitude is adopted by all persons concerned, the interference can be cleared up expeditiously. Alternatively, a frustrating neighbourhood feud may erupt, serving no purpose other than to prolong the interference and possibly shorten the life expectancy of the participants.

For more technical information on interference, refer to Appendix A.

Speech Transmission Techniques Word Spelling

The efficient use of radiotelephony depends to a large extent on the method of speaking and the articulation of the operator. The distinctive sounds of consonants are liable to become blurred in the transmission of speech and words of similar length containing the same vowel sounds are apt to sound alike. So special care is necessary in their pronunciation. Professional radio operators follow these rules: Speak all words plainly and end each word clearly, to prevent words from running together. Avoid any tendency to shout, to accent syllables artificially, or to talk too rapidly. The following points should be kept in mind when using radiotelephony:

SPEED—Keep the rate of utterance constant, neither too fast nor too slow. Remember that the operator receiving your message may have to write it down.

RYTHM—Preserve the rythm of ordi-

nary conversation. In separating words so that they are not run together, avoid the introduction of unnecessary sounds such as "er" and "um" between words.

The words of the International Telecommunications Union (ITU) phonetic alphabet should be learned thoroughly so that, whenever isolated letters or groups of letters are pronounced separately or when communication is difficult, the alphabet can be easily and fluently used.

A-ALFA	J-JULIETT	R-ROMEO
B-BRAVO	K-KILO	S-SIERRA
C-CHARLIE	L-LIMA	T-TANGO
D-DELTA	M-MIKE	U-UNIFORM
E-ECHO	N-NOVEM-	V-VICTOR
F-FOXTROT	BER	W-WHISKY
G-GOLF	O-OSCAR	X-X-RAY
H-HOTEL	P-PAPA	Y-YANKEE
I-INDIA	Q-QUEBEC	Z-ZULU

Examples:

When using the phonetic alphabet, the name "EUREKA" would be spoken as Echo Uniform Romeo Echo Kilo Alfa.

Transmissions of Numbers. All numbers except "whole thousands" should be transmitted by pronouncing each digit separately. "Whole thousands" should be transmitted by pronouncing each digit in the number of thousands followed by the word "thousand".

Examples:

Number	Transmitted as
10	One Zero
75	Seven five
100	One zero zero
583	Five eight three
5000	Five thousand
5800	Five eight zero zero
11000	One one thousand
25000	Two five thousand
28143	Two eight one four three

Signs denoting monetary denominations when transmitted with groups of figures, should be transmitted in the sequence in which they are written.

Examples:

As written	As spoken
$17.25	Dollars one seven decimal two five
.75	Seven five cents

Procedure Words and Phrases

While it is not practical to lay down a precise phraseology for all radiotelephone procedures, the following words and phrases should be used where applicable. Words and phrases such as "OK", "REPEAT", "HOW IS THAT", etc., or slang expressions 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	I hereby indicate the separation between portions of the message. (To be used where there is no clear distinction between the text and other portions of the message.) Or word used to interrupt a transmission.
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	Self-explanatory
I SAY AGAIN	Self-explanatory (use instead of "I repeat").
NEGATIVE	No, or permission not granted or 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 coding, check text with originator and send correct version.
WILCO	Your instructions received, understood, and will be complied with.
WORDS TWICE	(a) As a request: Communication is difficult, please send each word twice. (b) As information: Since communication is difficult, I will send each word twice.

Calling

Before transmitting, every operator shall listen for a period long enough to satisfy himself that he will not cause harmful interference to transmissions already in

progress. If such interference seems likely, he shall await the first break in the transmission. Remember that the name or call sign of the station being called is spoken first followed by "this is" and your own station's identifier. A station having a distress, urgency or safety message to transmit is entitled to interrupt a transmission of lower priority.

Item	Spoken
Call sign (not more than three times)	XM 420530
The words	THIS IS
Call sign of the station calling (not more than three times)	XM 422113
Invitation to reply	OVER

General calls to "ALL STATIONS" are not permitted in the General Radio Service, but in an emergency a call may be made to "any GRS station" in a specific location as required:

> "ANY GRS STATION IN TOWNSVILLE, THIS IS XM FIVE THREE ZERO NINE SEVEN ONE, OVER".

Such a call could be used by a motorist requiring assistance on the highway; it must

not be used just to see who is "on-the-air".

Replying

An operator hearing a call directed to his station, shall reply as soon as possible, and advise the calling station to proceed with his message using the words "GO AHEAD", or "STANDBY", followed by the anticipated number of minutes delay. Do not simply ignore the call. This can result in unnecessary calling, thus using up air time that could be needed by other stations.

As a general rule, operators replying to a multiple station call should answer in the order in which they have been called.

When an operator hears a call but is uncertain that the call is intended for his station he should not reply until the call has been repeated and understood.

Termination of Contact

When a contact or conversation is finished each station shall transmit its own call sign in full and the word OUT.

Example: XM FOUR TWO ZERO FIVE THREE ZERO, OUT XM FOUR TWO ONE ONE THREE EIGHT, OUT.

Test

On-the-air tests of General Radio Service transmitters should seldom be necessary. When they are necessary they should be short (not more than ten seconds) and special care should be taken not to interfere with actual communications.

A test transmission should consist of

spoken numerals (ONE, TWO, THREE, FOUR, etc.) followed by the call sign of the station making the test.

Example: TEST, ONE, TWO, THREE, FOUR, THIS IS XM THREE ONE ONE NINE SEVEN FOUR, OUT.

In radiotelephony communications the readability of signals is usually referred to in accordance with the following scale. It should be remembered that readability is not synonymous with loudness; a loud signal can be completely unreadable, while a comparatively weak signal without interference can be perfectly readable and understandable.

1—Unreadable
2—Readable now and then
3—Readable but with difficulty
4—Readable
5—Perfectly readable

Example:

YOUR SIGNALS READABILITY THREE

Log Keeping

General Radio Service stations are exempt from keeping a station log or record of station activities. However, a well kept log is an asset to the operations of any radio station and can be the best form of protection in case of interference complaints incorrectly laid against your station. If you decide to keep a log it should contain the following information:

1) time;
2) call sign of station called or communicated with;
3) frequency (or channel) used;
4) duration of the communication, together with a brief description of topic.

Unacceptable Transmissions:

When you operate you should remember that you are sharing the bands with other GRS operators and that other people may be listening. For this reason the use of obscene, indecent or profane language is a serious offence.

These types of transmissions result in numerous complaints to DOC which have to be followed up. This of course is an unnecessary cost to you as a taxpayer. Here again, self-policing and the use of common sense can alleviate the problem to a great extent.

Penalty

Any person who violates the regulations relative to unauthorized communications or profane language is liable, upon summary conviction to a penalty not exceeding $1,000 and costs, or to imprisonment for a term not exceeding six months.

Priority of Communications

Distress—A distress signal (MAYDAY) indicates that the station sending the signal is:

1) threatened by grave and imminent danger and requires immediate assistance, or

2) aware that a ship, aircraft or other vehicle is threatened by grave and imminent danger and requires immediate assistance.

Urgency—An urgency signal (PAN) indicates that the station calling has a very urgent message to transmit concerning the safety of a ship, aircraft or other vehicle or of some person on board or within sight.

Safety—The safety signal (SECURITY) indicates that the station calling is about to transmit a message concerning the safety of navigation or giving an important meteorological warning.

INTERFERENCE

Love thy Neighbour

To keep interference to television and radio reception to a minimum, there are several points to remember. First and foremost, as mentioned previously, it is extremely important to maintain a good relationship with your neighbours. The mere fact that you have an antenna extending from your roof makes you suspect when interference is experienced.

Housecleaning

As far as your own GRS transmitter is concerned, there are many things you can do to ensure it is not transmitting harmonics or spurious emissions.

—Conduct television and radio reception checks with a friend in your immediate neighbourhood (preferably next door) on all your frequencies; chances are good that if you do not interfere with his sets your transmitter is clean.

—Get to know a radio amateur or a more experienced GRS Operator—either could be a valued source of advice.

—Ensure that your equipment is properly installed, including a good ground rod and the shortest possible ground lead.

—For your own protection, avoid installing antennas near high tension hydro lines; in addition to the danger involved, the interference from these lines would probably adversely affect your reception.

Filters

It is important that you become familiar with the use of high-pass and low-pass filters. These filter networks are designed to pass a given range of radio frequencies while attenuating (reducing) all others either lower or higher (depending on which filter is employed). It is necessary that the input and output impedance of the filter match that of the equipment involved and the antenna feed-line.

High-Pass Filters

Although wave traps and stubs (a stub consists of a piece of ordinary television lead-in wire, 300 ohm ribbon, cut to the wave-length of the interfering signal, one end is connected to the receiver terminals and the other end left open) may be used to attenuate undesired or interfering signals, in most cases it is preferable to use a high-pass filter installed on the TV set. Wave traps and stubs only attenuate a specific frequency or narrow band of frequencies while a high-pass filter tends to reject all frequencies below its cut-off frequency.

If interfering signals are getting into the TV receiver by means other than the antenna feed line, the high-pass filter cannot attenuate them. A high-pass filter is useful

only when the interfering signal is entering via the TV feeder and the frequency is such that it falls into the attenuation band of the filter. To be really effective, the high-pass filter should be mounted inside the cabinet at the front-end of the TV set with very short leads.

Low-Pass Filters

Many of the things said about high-pass filters also apply to the use of low-pass filters, only in reverse. They normally are installed between the transmitter output and the antenna feed line. It is desirable for the operator of a transmitter to have his low-pass filter complement the TV viewer's high-pass filter. In other words, theoretically there should be no interference (provided there are no 27 MHz I.F. TV sets in the immediate area) if the low-pass filter at the transmitter passed only frequencies below 40 MHz and blocked the radiation of all frequencies above 40 MHz while the high-pass filters on nearby TV receivers blocked all signals lower than 40 MHz and passed all signals over 40 MHz. With this in mind most low-pass filters are designed to have a cut-off frequency around 35 MHz; which gives a little overlap between the two filters.

Cross-modulation, audio rectification and swamping

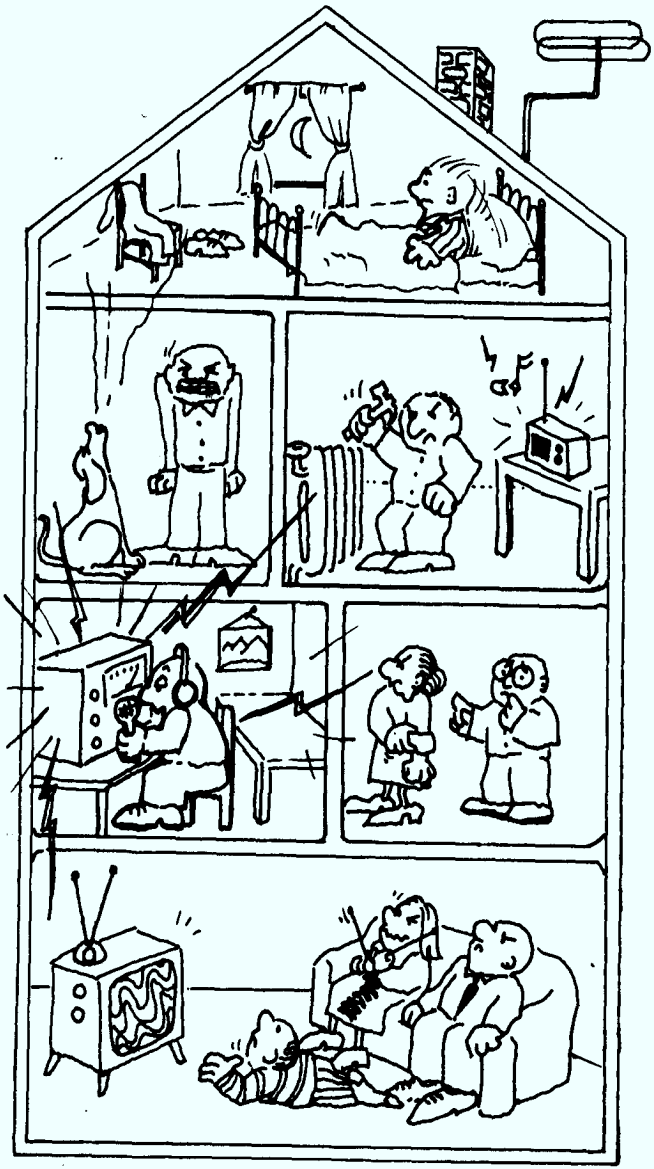
These terms are often considered as synonymous and describe a common phenomenon whereby a strong (local) radio frequency signal is rectified (audio content separated from radio frequency envelope) and super-imposed on a desired signal. This can take place anywhere in the circuitry of

a television set, radio receiver or audio reproduction equipment, such as tape recorders and record players. Solid state equipment is more susceptible to audio rectification than tube-type equipment.

Cross-modulation refers to the rectification and mixing of two or more separate signals externally to the receiving equipment, usually at a point where the surfaces of two dissimilar metals make contact, e.g. —loose splices in an old antenna or metallic clothes line; mesh beneath stucco; metal foil vapour barrier and pipe; loose ground rod clamp on antenna or telephone installation.

When audio rectification occurs within the receiving equipment a complete cure is difficult and often entails complete shielding of the receiver components as well as installation of suitable R.F. by-pass capacitors (100-500pF). In addition, if the desired signal frequency reaches the receiver via the power line cord, the installation of a through line filter in the power line should help.

The foregoing comments are intended only as an introduction or general guide to suppressing interference known to be caused by a local signal. These techniques should be carried out by a competent technician. More explicit technical information may be obtained from any Departmental District Office by requesting copies of circulars TRC19 and TRC21.



Harmonics

There are two kinds of harmonics, those generated in a transmitter and those generated externally to it. The latter type are the most confusing to the TV interference investigator and are probably the hardest to cure due to the difficulty in locating their source. These harmonics are often encountered in the frequency range of 27 to 50 MHz. The fundamental frequency is the lowest frequency and the higher frequencies are called harmonics, the second harmonic being twice the fundamental; e.g. the second harmonic of the GRS band (27 MHz) is CH 2 TV (54 MHz). The low order harmonics will produce the strongest signals, they will get progressively weaker as the harmonics get higher. Often the cure for harmonics is a high-pass filter on the television set, but this will depend on whether the transmitted signal is rich in harmonics that fall on TV channels. If this is the case a high-pass filter will have little effect.

I.F. Interference

The intermediate frequency (I.F.) of television receivers can be a problem. Many older sets have an I.F. in the 27 MHz range and nearby transmissions in the 27 MHz band can be readily accepted via the I.F. circuit. Newer TV receivers with an I.F. in the 40-50 MHz range also are susceptible to strong signals in that band.

QUESTIONS MOST FREQUENTLY ASKED BY GRS LICENSEES

Question What is "skip"?

Answer A transmitting antenna radiates sky and ground waves. A portion of the sky-wave is reflected back and forth between the ionosphere and the earth in a skipping fashion that follows the curvature of the earth. This "skip" process permits long distance radiocommunication in certain high frequency radio bands.

Question What is ground wave coverage?

Answer The ground wave is that part of the total radiation that is directly affected by the earth and its surface features. On GRS frequencies the ground wave normally covers the "line of sight" and usually does not exceed 25-30 miles.

Question If a GRS station is affected by interference, will the DOC investigate it?

Answer A GRS licence is issued on a no protection basis and under normal circumstances interference complaints are not investigated.

Question Why is it illegal to play music on the air?

Answer Broadcasting stations are licensed to provide information and entertainment to the public including the transmission of music,

whereas GRS stations are licensed only for two-way voice communication or for use in model control activities.

Question May Canadian GRS stations work C.B. stations in the U.S.?

Answer Working a C.B. station in another country is against international regulations.

Question How often should a GRS station be identified?

Answer A GRS station must transmit its complete assigned call sign at the beginning and end of each exchange of communications.

Question Is there any regulation concerning the use of power microphones?

Answer No. Power mikes are acceptable provided they are not driven hard enough to overmodulate the transmitter and therefore cause interference.

Question Do hand held transceivers operating within the GRS band have to be licensed?

Answer A licence is not required if the single antenna element does not exceed five feet in length and the power input to the final stage does not exceed 100 milliwatts.

Question Why doesn't DOC publish a list of GRS licensees, call signs, addresses, etc.?

Answer The cost of consolidating, computerizing and publishing such a list is prohibitive. As well, not all GRS licensees want their names and addresses published.

Question What is the legal output power limit of a GRS transmitter?

Answer The RF output power is 12 watts peak envelope power for single sideband and four watts carrier power for other types of emissions.

Question Can I change my transmitter/receiver without re-applying or notifying DOC?

Answer Yes. Provided you replace your licensed equipment with equipment type-approved under Radio Standards Specification 136.

Question How can I determine if the equipment is type-approved?

Answer 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 district office.

Question What penalties are provided for violation of the regulations pertaining to the General Radio Service?

Answer A person charged with an offence for violation of a regulation under this section is liable upon summary conviction to a fine not exceeding One Thousand Dollars and costs, or to imprisonment for a term not exceeding six months.

Question When submitting fees to whom do I make a cheque or money order payable?

Answer The Receiver General of Canada.

Question Does anyone "own" a frequency or channel?

Answer No. All frequencies or channels are available on a shared basis, however Channel 9 (27.065 MHz) is to be used only:

(a) for radiocommunications that involve the immediate protection of lives or property; or

(b) to establish communications with other stations.

Question What can I do about stations that use profanity or obscene suggestive language?

Answer We recognize that this can be a problem. Unfortunately the General Radio Service is often misused by persons making annoying and obscene transmissions at random. You can assist us in discouraging this type of offence by not talking to these people as any sign on your part of indignation, fear or interest only encourages future transmissions of this nature. Keep a log of those transmissions and report to DOC.

Question What could happen if my set operates off frequency

Answer You may interfere with other GRS users or other portions of the radio spectrum. Your first indication would probably be in the form of an infringement report from one of the DOC monitoring stations.

Question How many days have I in which to notify the DOC of a change of address?

Answer The licensee should advise the nearest district office of any change of address within 10 days.

Question What is the maximum time a GRS'er should occupy a frequency.

Answer A rule of thumb . . . the most important rule of all . . . is to *keep messages as short as possible.* However if your business cannot be terminated in a relatively short period you are allowed five minutes after which time you must break for at least two minutes or until the frequency is clear.

Question My licence was issued on February 28, 1974 and indicates an expiry date of March 31, 1976. I thought licences were good for three years?

Answer Licences are valid for periods not to exceed three years and normally expire on the 31st of March three years following the 1st of April of the Government fiscal year (April 1st to March 31st) in which they are issued. *With recent amendments to the Regulations, licences may be issued for shorter periods if it should become necessary or expedient to do so.*

Question I have three units. Do I need a licence for each?

Answer Yes. Unless the General Radio Service equipment is of the low power hand carried variety which is exempt from licensing.

Question I don't like some of the regulations. What can I do to have them changed?

Answer Probably the most effective way would be to belong to a group representative of the majority of General Radio Service licensees throughout our country whose officials would be in a position to negotiate for changes with our Department on a national basis.

Question Are linear amplifiers permitted in the G.R.S.?

Answer No.

Question How do I obtain a tourist card to use my G.R.S. equipment while in the U.S.?

Answer Write to: Federal Communications Commission,
334 York Street,
Gettysburg, Pa. 17325 U.S.A.

requesting form 410B.

Question Can I operate a set licensed to someone else ?

Answer Yes, providing you have the licensee's permission and he accepts responsibility for its operation.

Question Why are we not permitted to purchase a set in the U.S. and operate it in Canada

Answer All transmitting devices must be type-approved for use in Canada.

Question At what age would a person first be eligible to obtain a GRS licence?

Answer 16. (12 if licence is for model control operation)

Question Is the application an official document?

Answer Yes, all information shown must be correct.

Question Must the holder of a GRS licence be a Canadian?

Answer A Canadian citizen or a landed immigrant.

Question Can we use the ten code and can DOC provide us with a copy of the ten code?

Answer This department does not recognize the ten code.

Question Can I communicate with unlicensed Walkie-Talkies (under 100 MW)?

Answer Yes.

Question For how large an area can this equipment be licensed?

Answer Stations are licensed for the area in which they will be operating. If you move permanently from one part of the country to another, you should report to the nearest DOC office.

Question May I change my radio from the house to the car, or replace it without notifying the Department?

Answer Yes. The stipulation is that replacement equipment be type-approved for use in the General Radio Service.

Question Can a nickname be used after proper identification has been made?

Answer Yes; however, full and proper identification must be made at the beginning and end of each transmission.

Question Why can't we work skip?

Answer The General Radio Service is only intended to provide a communications service within the ground wave coverage area of the station.

THE FREQUENCIES AND CHANNEL DESIGNATORS AUTHORIZED FOR USE BY GRS OPERATORS

Frequency in megahertz (MHz)	*Channel Designator*	*Use*
26.965	1	Working
26.975	2	"
26.985	3	"
27.005	4	"
27.015	5	"
27.025	6	"
27.035	7	"
27.055	8	"
27.065	9	distress and calling
27.075	10	Working
27.085	11	"
27.105	12	"
27.115	13	"
27.125	14	"
27.135	15	"
27.155	16	"
27.165	17	"
27.175	18	"
27.185	19	"
27.205	20	"
27.215	21	"
27.225	22	"
27.255	23	emergency (see note)

Note:— Provincial or municipal emergency communications shall have priority over all other communications on the frequency 27.255 MHz.

Frequency in megahertz (MHz)	*Channel Designator*	*Use*
27.235	24	Working
27.245	25	"
27.265	26	"
27.275	27	"
27.285	28	"
27.295	29	"
27.305	30	"
27.315	31	"
27.325	32	"
27.335	33	"
27.345	34	"
27.355	35	"
27.365	36	"
27.375	37	"
27.385	38	"
27.395	39	"
27.405	40	"