

***Welcome to the 2018 Amateur Radio Course
Sponsored by the Ottawa Valley Mobile Radio Club***



***Course Coordinator
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Main Objective of this Course is to
Obtain a “Certificate of Proficiency in
Amateur Radio” Issued by:
Innovation, Science and Economic
Development Canada
(formally called Industry Canada)

Certificate of VE3LC



Industry
Canada

Industrie
Canada

Certificate of Proficiency in Amateur Radio

This is to certify that

Norman Rhodes Rashleigh

has obtained the following qualifications:

Basic

12 W.P.M. Morse Code

Advanced

The certificate holder is authorized to operate amateur radio apparatus in accordance with the regulations made pursuant to the *Radiocommunication Act*, and to use the following call signs:

VE3DVF VE3LC

Certificate Number: 1963 [REDACTED]

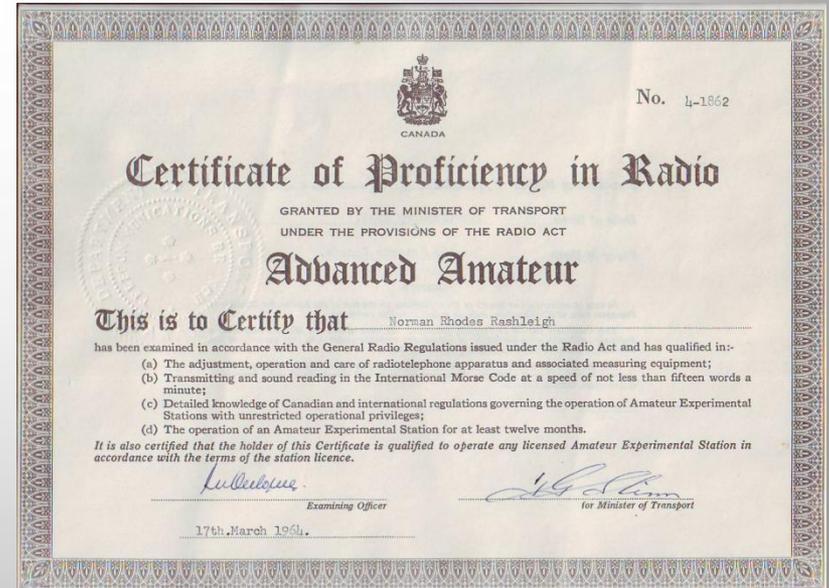
Issue date: 27 November 2000

Hutab Pambrun

Issued by

Canada

Original Certificates Issued by: Transport Canada in 1960's



Amateur Radio

Definition:

Amateur Radio is the use of designated radio frequency spectrum for the purposes of private recreation, non-commercial exchange of messages, wireless experimentation, self training, and emergency communications.

The Canadian Spectrum Chart

[http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwajp/2018_Canadian_Radio_Spectrum_Chart.PDF/\\$FILE/2018_Canadian_Radio_Spectrum_Chart.PDF](http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwajp/2018_Canadian_Radio_Spectrum_Chart.PDF/$FILE/2018_Canadian_Radio_Spectrum_Chart.PDF)



Innovation, Science and Economic Development Canada

Innovation, Sciences et Développement économique Canada



RADIO SPECTRUM ALLOCATIONS IN CANADA

Radio waves use the electromagnetic spectrum. The lowest frequencies have the longest radio waves and the highest frequencies have the shortest radio waves.

Radio waves are characterized according to their frequency, the unit for which is the hertz (Hz). The frequency is determined by the number of complete waves propagated through a medium past a fixed point in one second. Thus, the frequency of a signal whose one wave passes a fixed point in one second is one hertz. A kilohertz (kHz) represents 1000 waves passing a point in one second, or 1000 hertz. One megahertz (MHz) is 1000 kilohertz and a gigahertz (GHz) is 1000 megahertz.

The spectrum is divided into a number of frequency bands, each possessing characteristics peculiar to it which determine the usage appropriate to that band. Each band has been allocated by international agreement at a World Radiocommunication Conference (WRC) to

one or more radio services or for specific usages. Sponsored by the International Telecommunication Union (United Nations agency), WRCs are held to extend, revise and revise frequency allocations among the various uses.

After WRCs, when Canada needs to change, Industry Canada allocates specific frequency bands to services to satisfy domestic communications requirements as shown on this chart. The official regulatory provisions that pertain to frequency allocations in Canada are contained in the Canadian Table of Frequency Allocations and the related spectrum policies.

Among radio spectrum users are broadcasters, taxi, building and other construction trades, air transportation, radio amateur, marine transportation, telecommunications carriers, electrical power utilities, tracking companies, police, and federal, provincial, territorial and municipal departments and agencies.

This chart is based on the 2018 Canadian Table of Frequency Allocations, which was developed from decisions of World Radiocommunication Conferences, including WRC-15. The chart provides a graphic representation of Canadian electromagnetic spectrum allocations.

For further information on spectrum utilization or radio systems/policy matters, contact the Engineering, Planning and Standards Branch, Innovation, Science and Economic Development Canada, Ottawa (e-mail: ic.gc.ca/eng/smt-gst/eng-gouv/eng-gouv-spectrum-radio) or its offices listed in Radiation Information Circular RIC-66.

ATTRIBUTION DES FRÉQUENCES RADIOÉLECTRIQUES AU CANADA

Les ondes radioélectriques utilisent le spectre électromagnétique. Aux fréquences les plus basses correspondent les ondes radio les plus longues et aux fréquences les plus élevées, les ondes radio les plus courtes.

Les ondes radio se caractérisent par leur fréquence, qui se mesure en hertz (Hz). La fréquence est déterminée par le nombre d'ondes complètes franchissant un point fixe d'un support en une seconde. On dit donc d'un signal pour lequel une onde franchit un point fixe en une seconde qu'il a une fréquence de 1 hertz. Le kilohertz (kHz) équivaut à 1 000 ondes par seconde, soit 1 000 hertz; le mégahertz, à 1 000 kilohertz et le gigahertz (GHz), à 1 000 mégahertz.

Le spectre se compose de bandes de fréquences possédant chacune des particularités qui en déterminent l'utilisation. Chaque bande est attribuée à un ou plusieurs services radio ou à des usages déterminés par voie d'accord international, tels que les usages attribués par voie d'accord international aux services radio ou à des usages déterminés par voie d'accord international (CIR 66) Organisées sous l'égide d'une organisation des Nations Unies, l'Union

internationale des télécommunications, les CTR ont pour but d'étendre, d'étendre et de réviser l'allocation des bandes de fréquences.

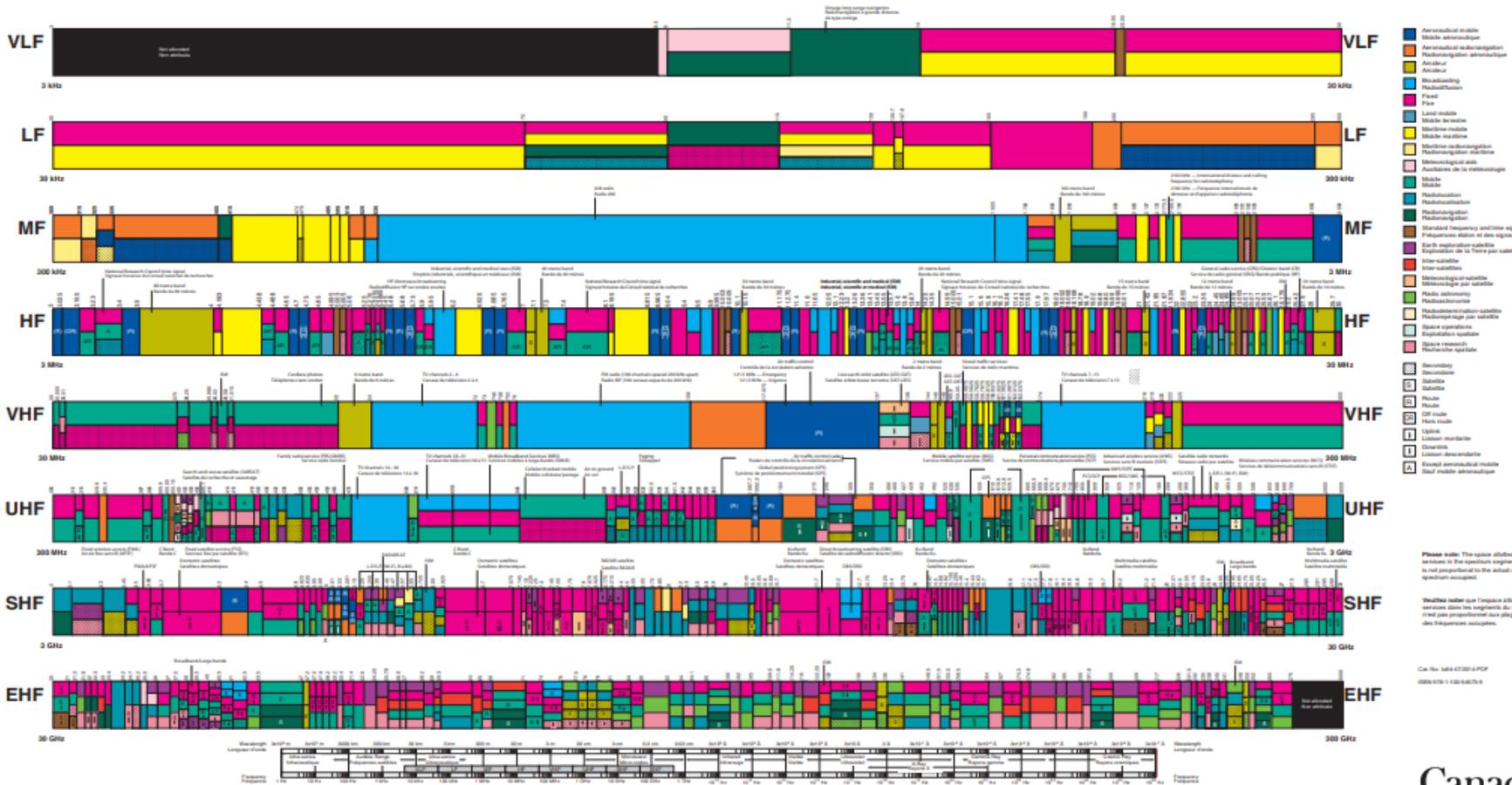
À l'issue de chacune de ces conférences ou quand des changements s'imposent au Canada, Industrie Canada attribue des bandes de fréquences particulières à certains services, de manière à adapter aux besoins du pays les attributions de communications, comme illustré sur le graphique ci-dessus. Les dispositions officielles de la réglementation touchant l'allocation des fréquences au Canada figurent dans le Tableau canadien d'allocation des bandes de fréquences et dans les politiques connexes d'utilisation du spectre.

Parmi les utilisateurs du spectre radioélectrique, on compte le radiodiffuseur, les compagnies de taxi, l'industrie du bâtiment et d'autres secteurs de la construction, les transporteurs aériens, les radioamateurs, les transporteurs maritimes, les entreprises de télécommunications, les services publics d'électricité, les entreprises de camionnage, la police, ainsi

que les ministères ou organismes fédéraux, provinciaux, territoriaux et municipaux.

Ce graphique est fondé sur la version 2018 du Tableau canadien d'allocation des bandes de fréquences, révisé des divers Conférences mondiales des radiocommunications, notamment la WRC-15. Ce graphique représente les attributions de fréquences radioélectriques au Canada.

Pour de plus amples renseignements sur les politiques d'utilisation du spectre ou des services radio, veuillez communiquer avec la Direction générale du génie, de la planification et des normes, Industrie Canada à Ottawa (courriel: spectrum@ic.gc.ca) ou par téléphone au 1-877-975-2739, ou avec l'un des bureaux identifiés dans le Circulaire d'information sur les radiocanons CIR-66.



Please note: This space allotted to the services in the spectrum segments shown is not proportional to the actual amount of spectrum occupied.

Veuillez noter que l'espace alloué aux services dans les segments du spectre n'est pas proportionnel aux plages réelles des fréquences occupées.

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RADIO SPECTRUM (represented in chart above)
SPECTRE DES RADIOFRÉQUENCES (représenté dans le graphique ci-dessus)

➤ **135.7-137.8 kHz**

2200 m

LF

➤ **472-479 kHz**

630 m

MF

➤ **1.800-2.000 MHz**

160 m

➤ **3.500-4.000 MHz**

80 m

➤ **5.332 MHz**

➤ **5.348 MHz**

➤ **5.3585 MHz**

➤ **5.373 MHz**

➤ **5.405 MHz**

60 m

➤ **7.000-7.300 MHz**

40 m

➤ **10.100-10.150 MHz**

30 m

➤ **14.000-14.350 MHz**

20 m

➤ **18.068-18.168 MHz**

17 m

➤ **21.000-21.450 MHz**

15 m

➤ **24.890-24.990 MHz**

12 m

➤ **28.000-29.700 MHz**

10 m

HF

Popular HF Bands



➤ 50.000-54.000 MHz	6 m	} Popular 2 & 6 M bands	VHF
➤ 144.000-148.000 MHz	2 m		
➤ 219.000-220.000 MHz	1.25 m		
➤ 222.000-225.000 MHz			
➤ 430.000 - 450.000 MHz	70 cm	}	UHF
➤ 902.000 - 928.000 MHz (ISM)	33 cm		
➤ 1.240 -1.300 GHz	23 cm		
➤ 2.300 - 2.450 GHz (part ISM)	13 cm		
➤ 3.300 - 3.500 GHz	9 cm	} Exotic Stuff	SHF
➤ 5.650 - 5.925 GHz (ISM)	5 cm		
➤ 10.000 -10.500 GHz (ISM)	3 cm		
➤ 24.000 -24.250 GHz	1.25 cm		

- 47.000 - 47.200 GHz
- 24.000 - 24.250 GHz
- 47.000 - 47.200 GHz
- 76.000 - 77.500 GHz
- 77.500 - 78.000 GHz
- 78.000 - 81.000 GHz
- 81.000 - 81.500 GHz
- 122.250 - 123.000 GHz
- 134.000 - 141.000 GHz
- 136.000 - 141.000 GHz
- 241.000 - 248.000 GHz
- 248.000 - 250.000 GHz

*Very Exotic
Stuff*

EHF

Amateur Radio Activities Include:

- Voice and CW “rag chewing”
- Net operations
- Experimentation & Technical Exploration
- Antennas building
- Propagation and “Dx ing”, Certificate hunting
- Contesting and Radio Sport, QRP ops and clubs
- Digital Communications, eg: APRS, PSK 31, WSJT, RTTY
- Repeaters and Internet Networking
- Satellite communications
- Earth Moon Earth (EME)
- Microwave mountain topping
- Disaster Relief , SAR and Public Service
- DF’ing and Hidden Transmitter hunting

Innovation, Science & Economic Development (ISED) Regulates the Radio Spectrum in Canada including Amateur Radio

**ISED was formally known as
Industry Canada (IC)**

Basic Qualification

- 1) Basic Exam of 100 multiple choice questions from the Basic Q&A Bank.
- 2) 70% pass mark required to provide operating privileges on bands restricted to 50 MHz and above.
- 3) 80% pass mark is known as Basic with Honours and provides operating privileges on all amateur allocations.
- 4) Basic qualification, Honours or otherwise, allows holder a maximum of 250 watts (DC input) transmit power based on commercial design.
- 5) Basic certificate holders cannot be trustees and holders of club call signs or system operators of repeaters or remote stations.

Advanced Qualification

- 1) Is a supplemental level to Basic Qualification (Honours or not)**
- 2) 50 question multi choice exam based on advanced technical knowledge and practices of electronics and radio.**
- 3) 70% pass mark.**
- 4) Allows holder privileges on all amateur allocations if candidate was holder of Basic without Honours.**
- 5) Allows holder to design, build and use own transmitting equipment and transmit High Power.**
- 6) Allows holder to apply and hold extra station call sign certificate as trustee of a club or repeater station.**

Morse Code Qualification

- 1) Optional extra exam and qualification.
- 2) 5 WPM receiving and manual sending proficiency test.
- 3) Not needed domestically for amateur privileges but may still be needed for operating privileges when travelling in other countries.
- 4) Allows holder privileges on all amateur allocations if candidate was holder of Basic without Honours.

Syllabus of Study According to RIC 3 Basic

- 1. Regulations and Policy**
- 2. Operating and Procedures**
- 3. Station Assembly , Practice and Safety**
- 4. Circuit Components**
- 5. Basic Electronics and Theory**
- 6. Feedlines and Antenna Systems**
- 7. Radio Wave Propagation**
- 8. Interference and Suppression**

Syllabus of Study Basic Advanced

- 1) Advanced Theory**
- 2) Advanced Components and Circuits**
- 3) Measurements**
- 4) Power Supplies**
- 5) Transmitters, Modulation and Processing**
- 6) Receivers**
- 7) Feedlines-Matching and Antenna Systems**

Innovation, Science and Economic Development (ISED) Documents that Pertain to the Amateur Radio Service

- **RBR-4 Standards for the Operation of Radio Stations in the Amateur Radio Service**

<http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf01226.html>

- **RIC 3 Information on the Amateur Radio Service**

<http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf01008.html>

- **RIC 9 Call Sign Policy and Special Event Prefixes**

<http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf02102.html>

- **RIC 1 Guide for Examiners Accredited to Conduct Examination for Amateur Radio Operator Certificates**

<http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf01007.html>

- **Radiocommunications Act of Canada**

<http://laws-lois.justice.gc.ca/eng/acts/r-2/>

- **Radiocommunications Regulations**

<http://laws-lois.justice.gc.ca/eng/regulations/sor-96-484/page-2.html#h-6>

And...

- **CPC-2-0-03** Radiocommunications and Broadcasting Antenna Systems

<http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf08777.html>

- **EMCAB 2** Criteria for Resolution of Immunity Complaints Involving Fundamental Emissions of Radiocommunications Transmitters

<http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf01005.html>

- Canadian Table of Frequency Allocations

<http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf10759.html>

And from Health Canada

- **Safety Code 6**, Limits of Human Exposure to Radiofrequency Electromagnetic Energy in the Frequency Range 3 kHz to 300 GHz

<http://www.radiationsafety.ca/wp-content/uploads/2012/06/Safety-Code-6.pdf>