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Study Guide for the Restricted Operator Certificate with Aeronautical Qualification (ROC-A)

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Preface

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

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1. Intent

The intent of this document is to provide study information for the ROC-A. Restricted Operator Certificates are issued for life and no revalidation is required. Contact your local district office of Industry Canada if your certificate is lost or requires replacement.

2. Background

An ROC-A is required by operators of radiotelephone equipment on board aircraft and at aeronautical land (fixed and mobile) radio stations using aeronautical mobile frequencies. The radiotelephone equipment at such stations shall be of a type that requires only simple external switching, has a power output not exceeding 250 watts effective radiated power (e.r.p.) – equivalent to 400 watts peak envelope power (PEP) – and where all frequency-determining elements are preset within the transceiver.

3. Candidate Requirements

3.1 Exam

Examinations for the ROC-A are to be conducted by examiners accredited by Industry Canada. These examiners are typically individuals who are engaged in the aeronautical industry.

Please visit Industry Canada's website at www.ic.gc.ca/radio-operator to find an examiner nearest you.

The examination may consist of written, practical and oral exercises. The candidate must satisfy an examiner that he or she:

- is capable of operating radiotelephone equipment;
- possesses a general knowledge of radiotelephone operating procedures and of international regulations applicable to the aeronautical service, specifically those regulations relating to the safety of life; and
- possesses a general knowledge of the *Radiocommunication Act* and the regulations made thereunder.

3.2 Eligibility

There are no nationality or age restrictions as to who may take the examination or hold an ROC-A. Candidates must attest that they do not have a disability that would impair their ability to operate a radio station safely.

3.3 Documentation

Identification must be presented at the examination. A valid passport, driver's licence, birth certificate, baptismal certificate, citizenship certificate or landed immigrant identification card will all be accepted as proof of identity, at the discretion of the examiner.

4. Regulations

4.1 Priorities of Communications - Aeronautical Service

The order of priority for transmission of messages in the aeronautical service is:

1. Distress communications.
2. Urgency communications.
3. Communications relating to radio direction-finding.
4. Flight safety messages.
5. Meteorological messages.
6. Flight regularity messages.
7. Messages relating to the application of the United Nations Charter.
8. Government messages for which priority has been expressly requested.
9. Service communications relating to the workings of the telecommunication service or to communications previously exchanged.
10. All other aeronautical communications.

4.2 Privacy of Communications

Radio operators and all persons who become acquainted with radiocommunications are bound to preserve the privacy of those communications. In accordance with subsection 9(2) of the *Radiocommunication Act*, no person shall divulge the contents, or the existence, of communications transmitted, received or intercepted by a radio station, except as permitted by the addressee of the message or his/her accredited agent, or to authorized officials of the Government of Canada, officers of the court or an operator of a telecommunications system as is necessary to forward or deliver the communication. These restrictions do not apply to a message of distress, urgency, safety or to messages addressed to “ALL STATIONS” (i.e. weather reports, storm warnings, etc.).

As outlined in section 9.1 of the Act, any person who violates the privacy of communications is liable, on summary conviction, in the case of an individual, to a fine not exceeding twenty-five thousand dollars or to imprisonment for a term not exceeding one year, or to both, or, in the case of a person other than an individual, on summary conviction, to a fine not exceeding seventy-five thousand dollars.

4.3 Control of Communications

In communications between aeronautical ground stations and aircraft stations, the aircraft station shall comply with instructions given by the ground station in all matters relating to the order and time of transmission, the choice of frequency and the duration and suspension of communications. This does not apply in the cases of distress or urgency communications, where the control lies with the station initiating the priority call.

The operation of an aircraft station is under the control of the pilot or another person in charge of the station.

In communications between aeronautical ground stations and aircraft stations, it is normally the ground station that retains communications control. In communications between aircraft stations, however, the aircraft station **being called** is the controlling station.

If the station called is in agreement with the calling station, it shall transmit an indication that from that moment onwards it will listen on the working frequency or channel announced by the calling station. However, if the station called is not in agreement with the calling station on the working frequency or channel to be used, it shall transmit an indication of the working frequency or channel to be used.

Examples:

(a) Ground station calling an aircraft (the ground station has control of radiocommunications)

PIPER CHARLIE FOXTROT X-RAY QUEBEC QUEBEC
THIS IS
OTTAWA RADIO
GO AHEAD ON TOWER FREQUENCY ONE TWO TWO DECIMAL ONE
OVER

(b) Aircraft calling a ground station (the ground station has control of radiocommunications)

OTTAWA RADIO
THIS IS
PIPER CHARLIE FOXTROT X-RAY QUEBEC QUEBEC
ON FREQUENCY ONE TWO TWO DECIMAL ONE
OVER

(c) One aircraft to another aircraft (the aircraft being called has control of radiocommunications)

CESSNA CHARLIE FOXTROT X-RAY QUEBEC TANGO
THIS IS
PIPER CHARLIE FOXTROT X-RAY QUEBEC QUEBEC
ON FREQUENCY ONE ONE NINE DECIMAL SEVEN
OVER

PIPER CHARLIE FOXTROT X-RAY QUEBEC QUEBEC
THIS IS
CESSNA CHARLIE FOXTROT X-RAY QUEBEC TANGO
CHANGE TO SEARCH AND RESCUE FREQUENCY ONE TWO
THREE DECIMAL SIX
OUT

4.4 Superfluous Communications and Interference

Radiocommunications between aeronautical stations should be restricted to those relating to safety and flight regularity. In accordance with subsection 32(1) of the *Radiocommunication Regulations*, superfluous communication, as well as profane and obscene language, is strictly prohibited.

Any person who violates the regulations relative to unauthorized communications, profane or obscene language is liable, on summary conviction, in the case of an individual, to a fine not exceeding five thousand dollars or to imprisonment for a term not exceeding one year, or to both, or, in the case of a corporation, on summary conviction, to a fine not exceeding twenty-five thousand dollars.

The Act clearly states that all radio stations shall be operated so as not to interfere with or interrupt the working of another radio station. The penalties for doing so are the same as those noted above. The only situation under which you may interrupt or interfere with the normal working of another station is when you are required to transmit a higher priority call or message, for example, distress, urgency or other priority calls or messages.

4.5 False Distress Signals

Paragraph 9(1)*(a)* of the Act clearly states that no person shall knowingly send, transmit, or cause to be sent or transmitted any false or fraudulent distress signal, message, call or radiogram of any kind. Penalties for this offence, on summary conviction, in the case of an individual, can include a fine not exceeding five thousand dollars or imprisonment for a term not exceeding one year, or to both, or, in the case of a corporation, to a fine not exceeding twenty-five thousand dollars.

5. Operating Procedures

5.1 Speech Transmission Techniques

The efficient use of radio depends to a large extent on the method of speaking and on the articulation of the operator. As the distinctive sounds of consonants are liable to become blurred in the transmission of speech and as words of similar length containing the same vowel sounds are apt to sound alike, special care is necessary to ensure their proper pronunciation.

When using radio, the operator should speak all words plainly and clearly to prevent words from running together. Avoid any tendency to shout, accent syllables, or to speak too rapidly. The following points should be kept in mind when using radio:

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

Rhythm: Preserve the rhythm of ordinary conversation and word pronunciation. Also, avoid the introduction of unnecessary sounds such as “er” and “um” between words.

5.2 Time and Date

The twenty-four hour clock system should be used to express time during radiocommunications. Time should be expressed and transmitted by means of four figures, the first two denoting the hour past midnight and the last two the minutes past the hour.

Examples:	12:45 a.m	is expressed as 0045
	12:00 noon	is expressed as 1200
	11:45 p.m	is expressed as 2345
	12:00 midnight	is expressed as 2400 or 0000
	1:30 a.m	is expressed as 0130
	1:45 p.m	is expressed as 1345
	4:30 p.m.	is expressed as 1630

Time is usually referenced to one standard time zone, Coordinated Universal Time (UTC) (often referred to as Greenwich Mean Time (GMT) or zulu time (Z)) to avoid confusion between different time zones. When operations are conducted solely in one time zone, local time may be used.

Where the date, as well as the time of day, is required, a six-figure group should be used. The first two figures indicate the day of the month and the following four figures indicate the time.

Examples: Noon (EST) of the 16th day of the month is expressed as.....161200 E
2:45 a.m. (PST) of the 24th day of the month is expressed as....240245 P

5.3 ITU Phonetic Alphabet

The phonetic alphabet adopted by the International Telecommunication Union (ITU) is used to avoid confusion when transmitting difficult or unusual words. This internationally recognized alphabet should be learned so that it is readily available whenever isolated letters or groups of letters are pronounced separately, or when communication is difficult. Call signs should also be spelled phonetically.

The ITU phonetic alphabet is:

Letter	Word	Pronounced as
A	Alfa	**AL** FAH
B	Bravo	**BRAH** VOH
C	Charlie	**CHAR** LEE or **SHAR** LEE
D	Delta	**DELL** TAH
E	Echo	**ECK** OH
F	Foxtrot	**FOKS** TROT
G	Golf	GOLF
H	Hotel	HOH **TELL**
I	India	**IN** DEE AH
J	Juliett	**JEW** LEE **ETT**
K	Kilo	**KEY** LOH
L	Lima	**LEE** MAH
M	Mike	MIKE
N	November	NO **VEM** BER
O	Oscar	**OSS** CAH
P	Papa	PAH **PAH**
Q	Quebec	KEH **BECK**
R	Romeo	**ROW** ME OH
S	Sierra	SEE **AIR** RAH
T	Tango	**TANG** GO
U	Uniform	**YOU** NEE FORM or **OO** NEE FORM
V	Victor	**VIK** TAH
W	Whiskey	**WISS** KEY
X	X-ray	**ECKS** RAY
Y	Yankee	**YANG** KEY
Z	Zulu	**ZOO** LOO

Note: The syllables to be emphasized are in bold.

Numbers are pronounced as follows:

0 -	ZE-RO	5 -	FIFE
1 -	WUN	6 -	SIX
2 -	TOO	7 -	SEV-en
3 -	TREE	8 -	AIT
4 -	FOW-er	9 -	NIN-er

Decimal - **DAY**-SEE-MAL
Hundred - **HUN**-dred
Thousand - **TOU**-SAND

5.4 Transmission 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:	10 becomes	-	one zero
	75 becomes	-	seven five
	100 becomes	-	one zero zero
	5,800 becomes	-	five eight zero zero
	11,000 becomes	-	one one thousand
	68,009 becomes	-	six eight zero zero nine

Numbers containing a decimal point shall be transmitted as above, with the decimal point indicated by the word “decimal”.

Example:	121.5 becomes	-	one two one decimal five

Monetary denominations, when transmitted with groups of digits, should be transmitted in the sequence in which they are written.

Examples:	$17.25 becomes	-	dollars one seven decimal two five
	$0.75 becomes	-	decimal seven five

Altitude above sea level should be expressed in thousands plus hundreds of feet. Separate digits shall be used to express flight levels.

Examples:	2700	-	Two thousand seven hundred
	FL265	-	Flight level two six five

Aircraft type numbers, wind speed and cloud formation heights are expressed in group forms.

Examples:	Flight 320	-	Flight three twenty
	DC10	-	DC ten
	34BKN	-	Thirty Four Hundred Broken
	Wind 270/10	-	Wind two seven zero degrees one zero knots

Time: Coordinated Universal Time (UTC)

Examples:	0920Z	-	Zero niner two zero zulu
	09	-	Nine minutes past the hour

Aircraft headings are given in groups of three digits. If operating within the Southern Domestic Airspace, the heading is expressed in degrees “magnetic”. If operating within the Northern Domestic Airspace, the heading is expressed in degrees “true”.

Examples:	005 degrees	-	Heading zero zero five
	350 degrees	-	Heading three five zero

Aerodrome elevations are expressed in feet, prefixed by the expression "field elevation".

Examples:	150	-	Field elevation one five zero
	3500	-	Field elevation three thousand five zero zero

5.5 Procedural Words and Phrases

While it is not practical to set down precise phraseology for all radiotelephone procedures, slang expressions such as "OK", "REPEAT", "TEN-FOUR", "OVER AND OUT", "BREAKER BREAKER", "COME IN PLEASE", etc., should not be used. Appendix B contains a list of words and phrases that should be used where applicable.

5.6 Call Signs

A distinctive call sign is assigned to radio stations for identification purposes and should be used at least when initial contact is being established, and again when the communication is concluded. Aeronautical call signs should always be pronounced phonetically.

An aircraft's call sign can be the same as the aircraft's markings. The call sign and markings are assigned to the aircraft by Transport Canada.

5.6.1 Canadian Air Carriers

Canadian air carriers use their assigned company name as a call sign, followed by the flight number or the last three characters of the aircraft registration.

Example: AIR CANADA ONE FOUR NINE

5.6.2 Canadian Private Civil Registration

Canadian private aircraft use the manufacturer's name or their type of aircraft, followed by the last four letters of the registration.

Example: CESSNA-182 GFAC (spoken: CESSNA ONE EIGHT TWO GOLF FOXTROT ALFA CHARLIE)

5.6.3 Aeronautical Ground Stations

Aeronautical ground station identification comprises the name of the airport or its geographical location, followed if necessary, by a suitable word indicating the function of the station.

Examples:

Area control centre	-	Ottawa Centre
Surface movement control	-	Toronto Ground
Flight information service station	-	Ottawa Information
Clearance delivery	-	Edmonton Delivery
Approach control radar arrivals	-	Ottawa Arrival
Approach control radar departures	-	Winnipeg Departure
Precision approach radar	-	Montreal Precision
Community aerodrome radio station	-	Eskimo Tower
Private aeronautical station	-	Radio
Company Dispatch	-	Dispatch

5.7 Radiotelephone Calling Procedure

In general, it is up to the aircraft station to establish communication with the aeronautical ground station. For this purpose, the aircraft station may call the aeronautical ground station when it comes within the operational service area of the station. However, a ground station may also establish communication with an aircraft station within its operational service area.

When an aeronautical ground station receives calls from several aircraft stations at approximately the same time, it decides the order in which these stations may transmit their traffic. Its decision shall be based on the priority status of the messages.

5.7.1 Calling

Before transmitting, operators shall listen to the desired communication channel for a period long enough to satisfy themselves that their transmission will not cause harmful interference to communications already in progress. If such interference seems likely, operators shall wait for the first break in the transmission. A station which has distress, urgency or safety communications to transmit is entitled to interrupt, at any time, a transmission of lower priority that is in progress.

The call sign identifier of the station being called is **ALWAYS** spoken first, followed by the words "THIS IS" and the calling station's identifier.

Single Station Call

When an operator wishes to establish communication with a specific station, the following items shall be transmitted in the order indicated:

1. The call sign of the station called (not more than three times, once if radio conditions are good).

2. The words "THIS IS".

3. The call sign of the station calling (not more than three times, once if radio conditions are good).

4. The frequency on which the calling station is transmitting.

5. The invitation to reply ("OVER").

Example: TORONTO TOWER (repeated up to three times)
THIS IS
CESSNA ONE EIGHT FIVE - FOXTROT ALFA DELTA TANGO
ON FREQUENCY ONE ONE EIGHT DECIMAL SEVEN
OVER

All Stations General Call

When an operator wishes to establish communication with any station within range or in a certain area, the call should be made to "ALL STATIONS" using the same procedure as a single station call.

Example: ALL STATIONS, ALL STATIONS, ALL STATIONS
THIS IS
TORONTO AIR RADIO (three times if necessary)

Multiple Station Call

If more than one station is to be called simultaneously, the call signs of the desired stations may be transmitted in any convenient sequence followed by the words "THIS IS" and the originating station's call sign. In general, operators replying to a multiple station call should answer in the order in which they have been called.

Example: CESSNA FOXTROT NOVEMBER INDIA LIMA
PIPER FOXTROT X-RAY QUEBEC QUEBEC
PIPER GOLF LIMA LIMA DELTA
(All repeated three times if necessary)
THIS IS
TORONTO TOWER (three times if necessary)
OVER

5.7.2 Replying

Operators hearing a call directed to their station shall reply as soon as possible and advise the calling station to proceed with the message with the words "GO AHEAD", or not to proceed with the message with the words "STAND BY", followed by the anticipated number of minutes of delay.

Examples: PIPER FOXTROT X-RAY QUEBEC QUEBEC
THIS IS
TORONTO TOWER
GO AHEAD

PIPER FOXTROT X-RAY QUEBEC QUEBEC
THIS IS
TORONTO TOWER
STAND BY TWO MINUTES

When station operators hear a call but are uncertain that the call is intended for their station, they should not reply until the call has been repeated and understood. When station operators hear a call but are not sure of the identity of the calling station, they should reply immediately using the words "STATION CALLING", the *called* station's identification, and the words "SAY AGAIN" and "OVER".

Example: STATION CALLING CESSNA FOXTROT NOVEMBER JULIETT INDIA
SAY AGAIN
OVER

To terminate communications, simply conclude the transmission with the word "OUT" (which means "conversation is ended and no response is expected").

Example: TORONTO TOWER
THIS IS
PIPER FOXTROT X-RAY QUEBEC QUEBEC
RECEIVED RUNWAY CLEARANCE
OUT

5.7.3 Corrections and Repetitions

When an error has been made in transmission, the word "CORRECTION" should be spoken, followed by the last correct word or phrase and then by the corrected version of the transmission.

Examples: OVER OTTAWA AT TWO SEVEN CORRECTION TWO EIGHT
PROCEED TO DOCK FOUR CORRECTION DOCK FIVE

If the receiving station requires the repetition of an entire message, the operator should use the words "SAY AGAIN". If repetition of only a portion of a message is required, the receiving station should use the following:

1. SAY AGAIN ALL BEFORE ... (first word satisfactorily received); or
2. SAY AGAIN ... (word before missing portion) TO ... (word after missing portion), or
3. SAY AGAIN ALL AFTER ... (last word satisfactorily received).

Examples: VANCOUVER RADIO
THIS IS
STINSON FOXTROT ALFA BRAVO CHARLIE
SAY AGAIN ALL BEFORE "HANGAR"
OVER

WINNIPEG TOWER
THIS IS
CESSNA FOXTROT PAPA DELTA QUEBEC
SAY AGAIN "ALTITUDE" TO "DESCEND"
OVER

MONTREAL CENTRE
THIS IS
CESSNA FOXTROT X-RAY QUEBEC TANGO
SAY AGAIN ALL AFTER "FLIGHT PLAN"
OVER

5.7.4 Message Handling Procedures

When transmitting a message, the radio station operator should:

1. plan the content of the message before transmitting;
2. listen briefly before transmitting to avoid interference with other transmissions;
3. deliver the radio message clearly and concisely using standard phraseology whenever practical.

The message handling format generally consists of four parts:

1. the call indicating the addressee and the originator;
2. the addressee reply;
3. the message;
4. the acknowledgment or ending.

Examples:

Call-up by aircraft

SCHEFFERVILLE RADIO
THIS IS
PIPER FOXTROT ALFA BRAVO CHARLIE
OVER

Reply by ground station

PIPER FOXTROT ALFA BRAVO CHARLIE
THIS IS
SCHEFFERVILLE RADIO
GO AHEAD
OVER

Message - Aircraft

SCHEFFERVILLE RADIO
THIS IS
PIPER FOXTROT ALFA BRAVO CHARLIE
FOUR MILES AT ONE THOUSAND
LANDING SCHEFFERVILLE
OVER

Message - Ground	PIPER FOXTROT ALFA BRAVO CHARLIE THIS IS SCHEFFERVILLE RADIO ROGER WIND - ONE SIX ZERO AT ONE FIVE ALTIMETER - TWO NINER NINER SEVEN OVER
Acknowledgment - Aircraft	SCHEFFERVILLE RADIO THIS IS PIPER FOXTROT ALFA BRAVO CHARLIE ROGER

On subsequent calls, the words "THIS IS" and "OVER" may be omitted and, if no likelihood of interference exists, the call sign for the station being called may be abbreviated as follows:

"SCHEFFERVILLE RADIO BRAVO CHARLIE CONFIRM RIGHT ON SIERRA"

5.7.5 Signal (or Radio) Checks

When your radio station requires a signal (or radio) check, follow this procedure:

1. Call another aircraft or aeronautical ground station on any appropriate frequency that will not interfere with the normal working of other aircraft or ground stations, and request a signal check.
2. The signal check consists of "SIGNAL (or RADIO) CHECK 1, 2, 3, 4, 5. HOW DO YOU READ ME? OVER."
3. Your station identification (call sign) should also be transmitted during such test transmissions.
4. Signal checks should not last more than 10 seconds.
5. When replying or receiving a reply to a signal check, the following readability scale should be used:

1. Bad	(unreadable)
2. Poor	(readable now and then)
3. Fair	(readable but with difficulty)
4. Good	(readable)
5. Excellent	(perfectly readable)

Communications checks are categorized as follows:

Signal check - If the test is made while the aircraft is airborne.

Preflight check - If the test is made prior to departure.

Maintenance check - If the test is made by ground maintenance.

Example: WATSON LAKE RADIO
THIS IS
CESSNA FOXTROT ALFA BRAVO CHARLIE
REQUEST SIGNAL CHECK ON FIVE SIX EIGHT ZERO

CESSNA FOXTROT ALFA BRAVO CHARLIE
THIS IS
WATSON LAKE RADIO
READING YOU STRENGTH FIVE
OVER

6. Emergency Communications

6.1 Emergency Conditions

In the aeronautical service, an emergency condition is classified in accordance with the degree of danger or hazard as follows:

Distress: A condition of being threatened by grave and/or imminent danger and requiring immediate assistance.

Urgency: A condition concerning the safety of an aircraft or other vehicle, or of someone on board or within sight, but which does not require immediate assistance.

6.2 Distress Communications

Distress communications should be conducted in accordance with the procedures outlined in this section. These procedures shall not, however, prevent a station in distress from making use of any means at its disposal to attract attention, make known its position and obtain assistance.

6.3 Frequencies to be Used

The first transmission of the distress call and message by an aircraft should be made on the air-ground frequency in use at the time. If the aircraft is unable to establish communications on the frequency in use, the distress call and message should be repeated on the aeronautical emergency frequency (121.5 MHz), or any other frequency available, in an effort to establish communications with any aeronautical ground station or other aircraft station.

6.4 Distress Signal

In radiotelephony, the spoken word for distress is “MAYDAY”, and it should be used at the commencement of the first distress communication.

The distress signal indicates that a person or station sending the signal is:

1. threatened by grave and imminent danger and requires immediate assistance; or

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

6.5 Priority of Distress

The distress call has absolute priority over all other transmissions. All stations which hear it shall immediately cease any transmission capable of interfering with distress traffic and continue to listen on the frequency used for the distress call.

6.6 Control of Distress Traffic

The control of distress traffic is the responsibility of the aircraft in distress or of the station which relays the distress message. These stations may, however, delegate the control of distress traffic to another station, such as an aeronautical station, which normally has a very efficient interface with air traffic control (ATC) and all search and rescue (SAR) organizations.

6.7 Distress Call

The distress call identifies the station in distress, and such calls shall be sent only on the authority of the person in command of the station. The distress call should comprise:

1. the distress signal “MAYDAY” spoken three times;
2. the words “THIS IS”;
3. the call sign of the aircraft in distress spoken three times.

Example: MAYDAY, MAYDAY, MAYDAY
THIS IS
PIPER FOXTROT X-RAY CHARLIE CHARLIE
PIPER FOXTROT X-RAY CHARLIE CHARLIE
PIPER FOXTROT X-RAY CHARLIE CHARLIE

The distress call shall not be addressed to a particular station and acknowledgment of receipt shall not be given before the distress message is sent.

6.8 Distress Message

The distress message shall follow the distress call as soon as possible.

The distress message should include as many as possible of the following elements spoken distinctly and, if possible, in the following order:

1. the distress signal “MAYDAY”;
2. the call sign of the station in distress (once);
3. the nature of the distress condition and kind of assistance required (i.e. what has happened);
4. the intentions of the person in command;
5. the particulars of its position (airspeed, altitude, heading);
6. the number of persons on board and injuries (if applicable);

7. any other information that may facilitate rescue;
8. the call sign of the station in distress.

Example: MAYDAY
PIPER FOXTROT X-RAY QUEBEC QUEBEC
STRUCK BY LIGHTNING
DITCHING AIRCRAFT
POSITION: 20 MILES EAST OF WINNIPEG
ALTITUDE: 1500 FEET
AIRSPEED: 125 KNOTS
HEADING: 270 DEGREES
ONE PERSON ON BOARD
PIPER FOXTROT X-RAY QUEBEC QUEBEC

Note: If the aircraft can transmit the distress message immediately after the distress call, then items 1 and 2 may be omitted from the message.

6.9 Repetition of a Distress Message

The distress message shall be repeated at intervals by the aircraft in distress until an answer is received or until it is no longer feasible to continue. The intervals between repetitions of the distress message shall be sufficiently long to allow time for stations receiving the message to reply.

Any station that has heard an unacknowledged distress message, and is not in a position to render assistance, shall take all possible steps to attract the attention of other stations that are in a position to assist.

In addition, all necessary steps shall be taken to notify the appropriate search and rescue authorities of the situation.

6.10 Action by Station in Distress

When an aircraft is threatened by grave and imminent danger, and requires immediate assistance, the person in command should direct appropriate action as follows:

1. transmit the distress call;
2. transmit the distress message;
3. listen for acknowledgment of receipt;
4. exchange further distress traffic as applicable;
5. activate automatic emergency equipment (i.e. emergency locator transmitter (ELT)) if available and when appropriate.

6.11 Action by Stations Other than the Station in Distress

An aircraft station that is not in distress should transmit the distress message when:

1. the station in distress is not in a position to transmit the message; or

2. the person in command of the station not in distress believes that further help is necessary; or
3. although not in a position to render assistance, the aircraft station has heard a distress message which has not been acknowledged.

When a distress message is received and it is known that the aircraft is not in the immediate vicinity, sufficient time should be allowed before the distress message is acknowledged. This will permit stations nearer to the station in distress to reply.

6.12 Action by Other Stations Hearing a Distress Message

1. Continue to monitor the frequency on which the distress message was received and, if possible, establish a continuous watch on appropriate distress and emergency frequencies.
2. Notify any station with direction-finding or radar facilities and request assistance, unless it is known that this action has been, or will be, taken by the station acknowledging receipt of the distress message.
3. Cease all transmissions that may interfere with the distress traffic.

6.13 Distress Traffic

Distress traffic consists of all transmissions relative to the immediate assistance required by the station in distress. Essentially, all transmissions made after the initial distress call are considered as distress traffic. In distress traffic, the distress signal “MAYDAY”, spoken once, shall precede all transmissions. This procedure is intended to alert stations not aware of the initial distress call and now monitoring the distress channel that traffic heard relates to a distress situation.

Any station in the aeronautical mobile service that has knowledge of distress traffic, and cannot itself assist the station in distress, shall follow such traffic until it is evident that assistance is being provided. All stations that are aware of distress traffic, and that are not taking part in it, are forbidden to transmit on the frequencies being used for distress traffic until a message is received indicating that normal working traffic may be resumed (cancellation of distress).

6.14 Acknowledgment of Receipt of a Distress Message

The acknowledgment of receipt of a distress message shall be given in the following form:

1. the distress signal “MAYDAY”;
2. the call sign of the station in distress (spoken three times);
3. the words “THIS IS”;
4. the call sign of the station acknowledging receipt (spoken three times);
5. the words “RECEIVED MAYDAY”.

Example: MAYDAY
PIPER FOXTROT X-RAY QUEBEC QUEBEC
PIPER FOXTROT X-RAY QUEBEC QUEBEC
PIPER FOXTROT X-RAY QUEBEC QUEBEC
THIS IS
WINNIPEG TOWER
WINNIPEG TOWER
WINNIPEG TOWER
RECEIVED MAYDAY

6.15 Action by Stations Acknowledging Receipt of a Distress Message

1. Immediately acknowledge the distress message.
2. Take control of the communications, or, specifically and clearly transfer that responsibility, advising the aircraft if a transfer is made.
3. Take immediate action to ensure that all necessary information is provided as soon as possible to the Air Traffic Service (ATS) unit concerned, and the aircraft operating agency concerned (or its representative).
4. Continue to monitor the frequency on which the distress message was received and, if possible, any other frequency that may be used by the station in distress.
5. Warn other stations, as appropriate, in order to prevent the transfer of aeronautical traffic to the frequency of the distress communication.
6. Cease all transmissions that may interfere with the distress traffic.

6.16 Relay of a Distress Message

A distress message repeated by a station other than the station in distress shall transmit a signal comprising:

1. the signal “MAYDAY RELAY” (spoken three times);
2. the words “THIS IS”;
3. the call sign of the station relaying the message (spoken three times);
4. the distress signal “MAYDAY” (once);
5. the particulars of the station in distress such as its location, nature of distress, number of persons on board, etc.

Example: MAYDAY RELAY, MAYDAY RELAY, MAYDAY RELAY
THIS IS
CESSNA NOVEMBER JULIETT INDIA
CESSNA NOVEMBER JULIETT INDIA
CESSNA NOVEMBER JULIETT INDIA
MAYDAY
PIPER FOXTROT X-RAY QUEBEC QUEBEC
STRUCK BY LIGHTNING
DITCHING AIRCRAFT
POSITION: 20 MILES EAST OF WINNIPEG
ALTITUDE: 1500 FEET

AIRSPEED: 125 KNOTS
HEADING: 270 DEGREES
ONE PERSON ON BOARD
PIPER FOXTROT X-RAY QUEBEC QUEBEC

6.17 Imposition of Silence

The station in distress, or the station in control of distress traffic, may impose silence on all stations in the area or on any station that interferes with the distress traffic. It shall address these instructions to "all stations", or to one station only as appropriate.

The station in distress, or the station in control, shall use the expression "SEELONCE MAYDAY".

If it is believed to be essential, other stations near the station in distress may also impose silence during a distress situation by use the international expression "SEELONCE DISTRESS".

Should radio silence be imposed during a distress situation, all transmissions shall cease immediately except from those stations involved in distress traffic.

Examples: Imposition of silence on a specific station by the station in distress. (Cessna C-FNJI is causing interference to distress traffic.)

CESSNA FOXTROT NOVEMBER JULIETT INDIA
THIS IS
PIPER FOXTROT X-RAY QUEBEC QUEBEC
SEELONCE MAYDAY
OUT

Imposition of silence on all stations by a station other than the station in distress.

ALL STATIONS, ALL STATIONS, ALL STATIONS
THIS IS
CESSNA FOXTROT NOVEMBER JULIETT INDIA
SEELONCE DISTRESS
OUT

6.18 Cancellation of Distress

When a station is no longer in distress, or when it is no longer necessary to observe radio silence (i.e. the rescue operation has concluded), the station that controlled the distress traffic shall transmit a message addressed to "ALL STATIONS" on the distress frequency(ies) used, advising that normal working may resume. The proper procedure for cancelling a distress message is:

1. the distress signal "MAYDAY" (once);
2. the words "HELLO ALL STATIONS" (three times);
3. the words "THIS IS";
4. the call sign of the station transmitting the message;

5. the filing time of the message;
6. the call sign of the station in distress (once);
7. the words “SEELONCE FEENEE”;

Example: MAYDAY
HELLO ALL STATIONS, HELLO ALL STATIONS, HELLO ALL STATIONS
THIS IS
WINNIPEG TOWER
TIME 1630 ZULU
PIPER FOXTROT X-RAY QUEBEC QUEBEC
SEELONCE FEENEE
OUT

Note: The procedure outlined above is mainly for the benefit of other stations so they can resume regular service. To ensure that search and rescue stations are advised that a station is no longer in distress, a normal call to the nearest aeronautical station detailing the reasons for cancelling the distress call MUST be made.

7. Urgency Communications

7.1 Urgency Signal

The urgency signal indicates that the station calling has a very urgent message to transmit concerning the safety of an aircraft, ship or other vehicle, or the safety of a person, but which does not require immediate assistance and shall be sent only on the authority of the person in charge of the station.

The urgency signal is “PAN PAN” spoken three times. It should be used at the beginning of the first urgency communication.

The urgency signal and the urgency message may be addressed to all stations or to a specific station.

7.2 Priority

The urgency signal has priority over all other communications except distress.

Stations that hear the urgency signal shall continue to listen for at least three minutes on the frequency which the signal was heard. After that, if no urgency message has been heard, an aeronautical ground station should, if possible, be notified of the receipt of the urgency signal and normal working may be resumed. All stations that hear the urgency signal must take care not to interfere with the urgency message which follows. Stations that are in communication on frequencies other than those used for the transmission of the urgency message may continue normal work without interruption provided that the urgency message is not addressed to all stations.

7.3 Frequencies to be Used

The first transmission of the urgency signal and message by an aircraft should be made on the air-ground frequency in use at the time. If the aircraft is unable to establish communication on the frequency in use, the urgency signal and message should be repeated on the aeronautical emergency frequency (121.5 MHz), or any other frequency available, in an effort to establish communication with any aeronautical ground or other aircraft station.

7.4 Urgency Message

The urgency signal shall be followed by a message giving further information about the incident that necessitated the use of the urgency signal.

When the urgency message is not addressed to a specific station (i.e. all stations) and is acknowledged by another aircraft or aeronautical ground station, the acknowledging station shall forward the urgency information to the appropriate authorities (i.e. air traffic service unit, airport operating agency or its representative).

The urgency message should contain as many of the following elements as required, spoken distinctly and, if possible, in the following order:

1. the urgency signal “PAN PAN” (three times);
2. the name of the station addressed or the words “ALL STATIONS” (three times);
3. the words “THIS IS”;
4. the identification of the aircraft;
5. the nature of the urgency condition;
6. the intentions of the person in command;
7. the present position, flight level or altitude and the heading;
8. any other useful information.

Example:
PAN PAN, PAN PAN, PAN PAN
ALL STATIONS, ALL STATIONS, ALL STATIONS
THIS IS
CESSNA FOXTROT NOVEMBER JULIETT INDIA
LOST, REQUEST RADAR CHECK
POSITION: UNKNOWN
AIRSPEED: 112 KNOTS
ALTITUDE: 1050 FEET
CESSNA FOXTROT NOVEMBER JULIETT INDIA
OVER

Example of reply:

PAN PAN
CESSNA FOXTROT NOVEMBER JULIETT INDIA
THIS IS WINNIPEG TOWER
YOUR POSITION IS 20 MILES SOUTH OF WINNIPEG
WINNIPEG TOWER
STANDING BY

7.5 Cancellation of Urgency Message

When the urgency message which calls for action by the stations receiving the message has been transmitted, the station responsible for its transmission shall cancel it as soon as it knows that action is no longer necessary. The cancellation message shall be addressed to "ALL STATIONS".

Example:
PAN PAN
ALL STATIONS, ALL STATIONS, ALL STATIONS
THIS IS
CESSNA FOXTROT NOVEMBER JULIETT INDIA
CESSNA FOXTROT NOVEMBER JULIETT INDIA HAS BEEN POSITIONED AT
20 MILES SOUTH OF WINNIPEG AIRPORT PROCEEDING NORMALLY
CESSNA FOXTROT NOVEMBER JULIETT INDIA
OUT

Appendix A - Definitions - Aeronautical Terms

Aerodrome

Any area of land, water (including frozen surface) or any other supporting structure used, designed, prepared, equipped or set apart for use, either whole or in part, for the arrival, departure, movement or servicing of aircraft. This includes any buildings, installations and equipment situated thereon or associated therewith.

Aeronautical Service

A radiocommunication service that provides for the safety and navigation and other operations of aircraft, and that may also include the exchange of air-to-ground messages on behalf of the public.

Aircraft Station

A mobile station in the aeronautical service, other than a survival craft, located on board an aircraft.

Aeronautical Operational Control Communications (AOCC)

Communications related to the regularity of flight.

Aeronautical Station

A land station in the aeronautical mobile service. In certain instances, an aeronautical station may be located, for example, on board a ship or on a platform at sea.

Air Traffic Control Service (ATC Service)

A service provided for the purpose of:

a. preventing collisions between:

- aircraft;
- aircraft and obstacles; and
- aircraft and vehicles on the manoeuvring area; and

b. expediting and maintaining an orderly flow of air traffic.

Controlled Aerodrome

An aerodrome at which an air traffic control unit is in operation.

Flight Service Station

An Air Traffic Service (ATS) unit established to provide selected flight services.

General Aviation Communications (GAC)

Communications relating to all civil aviation operations other than for scheduled air service and non-scheduled air transport operations for remuneration or hire.

Ground Control Communications

ATC Service communications provided for the purposes of:

a. preventing collisions on the manoeuvring area between aircraft, and between aircraft and obstacles or vehicles; and
b. expediting and maintaining the orderly flow of aircraft operating on the manoeuvring area.

Private Advisory Service

A communication service offered at controlled aerodromes for use in connection with company business such as the servicing of aircraft, availability of fuel, lodging, etc. Such services shall not include information relating to ATC Service, weather reports, the condition of landing strips, or any other communication normally provided by ATC Service units.

Private Multiple Station

An aircraft or aeronautical station established to provide air-ground multipurpose communications of an operational nature.

Appendix B - Procedural Words and Phrases

Word or Phrase	Meaning
ACKNOWLEDGE	Let me know that you have received and understood this message.
AFFIRM	An expression used in radiocommunication meaning "Yes."
BREAK	Indicates 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.)
CLEARED	Authorized to proceed under the conditions specified.
CONFIRM	Have I received the following ... or Did you receive the message?"
CORRECTION	An error has been made in this transmission (or message indicated). The correct version is ....
DISREGARD	Consider this transmission as not sent.
GO AHEAD	Proceed with your message.
HOW DO YOU READ?	What is the readability of my transmission?
I SAY AGAIN	An expression used in radiocommunication meaning "I repeat for clarity or emphasis."
MAYDAY	An expression meaning "I am in distress." It is the international radiotelephony distress signal. Preferably spoken three times, it indicates imminent and grave danger and means that immediate assistance is requested.
MAYDAY RELAY	The spoken word for the distress relay signal.
MONITOR	Listen (on frequency).
NEGATIVE	No, or that is not correct, or I do not agree.
OUT	Conversation is ended and no response is expected.
OVER	My transmission is ended and I expect a response from you.
PAN PAN	The international radiotelephony urgency signal. Preferably spoken three times, it indicates a condition that concerns the safety of an aircraft or

	another vehicle, or some person on board or within sight, but that does not require immediate assistance.
READ BACK	Repeat all, or the specified part, of this message back to me exactly as received.
ROGER	I have received all of your last transmission.
ROGER NUMBER	I have received your message Number _____.
SAY AGAIN	An expression used to request a repetition of the last transmission.
STANDBY	I must pause for a few seconds or minutes. Please wait and I will call you.
SEELONCE	International expression to indicate that silence has been imposed on the frequency due to a distress situation.
SEELONCE FEENEE	International expression to indicate that the distress situation has ended.
SEELONCE MAYDAY	An international expression to advise that a distress situation is in progress. The command comes from the station in control of the distress traffic.
WILCO	Your instructions received, understood and will be complied with.
WORDS TWICE	(a) As a request: Communication is difficult, please send each word, or group of words, twice;
	(b) As information: Since communication is difficult, I will send each word, or group of words, twice.

Appendix C - Equipment Fundamentals

Maintenance

Microphone and Antenna Connections

There are various types of connectors used to attach cables to the electronic equipment. Each connector requires its own assembly technique. Care should be exercised when repairing or replacing connectors. The main problems with connectors are shorts (when two bare wires are touching either each other or the metal case) or open wires (when the wire is broken inside the plastic shield or outer covering).

All connections should be tight and clean. Where connections are exposed to the weather, they should be protected with a coating of silicone to prevent corrosion build-up and to keep water from getting inside the outer casing of the cable.

Fuses

Electric circuits are protected against overload and short-circuits by fuses, each rated for a given amperage. **Never replace a fuse with one of a higher rating.** That will simply compromise or negate its protective function and create a definite fire hazard.

Fuses (or circuit breakers, if your electrical system is so equipped) act as safety valves. When something goes wrong with a circuit, the fuse for that circuit blows (or the breaker trips off), shutting down power to the circuit. In addition to preventing overheating and possible fire, this action also warns you that there is a problem on the circuit. The fault should be corrected before the fuse is replaced.

Note: Always exercise caution when changing a fuse. Make sure that your hands are dry.

Appendix D - Radio Station Licences

Unless otherwise exempted, all radio stations in Canada must be licensed by the Minister of Industry. Certain conditions exist that exempt aeronautical stations from requiring a radio station licence. Please consult your local district office of Industry Canada for details (See Appendix F).

The licence (or copy thereof) must be made available at the request of an Industry Canada inspector.

The radio station licence generally specifies the call sign of the station, the frequencies to be used for transmitting and any special conditions under which the station should be operated.

To obtain a radio station licence, a completed licence application form with the prescribed fee should be submitted to Industry Canada. To be eligible for licensing in Canada, radio equipment must be type-approved or found to be technically acceptable for licensing by the Department.

Radio station licence fees are due on April 1st of each year. Billing notices are mailed directly to licensees from the Department's headquarters in Ottawa.

Note: Any person who establishes a radio station without a radio authorization is liable, on summary conviction, in the case of an individual, to a fine not exceeding five thousand dollars or to imprisonment for a term not exceeding one year, or to both, or, in the case of a corporation, to a fine not exceeding twenty-five thousand dollars.

Inquiries concerning radio licensing may be directed to any of the district offices of Industry Canada.

Appendix E - Frequency Assignments

The following table indicates, for each frequency band listed, the service and primary use of the band.

Band	Service
108.1000 - 111.9750 MHz	Aeronautical Radionavigation
111.9750 - 117.9750 MHz	Aeronautical Radionavigation
117.9750 - 121.9625 MHz	Air Traffic Control Services
121.9825 - 123.5875 MHz	General Aviation Communications
123.5875 - 128.8125 MHz	Air Traffic Control Services
128.8125 - 132.0125 MHz	Aeronautical Operational Control Communications
132.0125 - 136.0000 MHz	Air Traffic Control Services

Appendix F - Radio Operator Certificate Service Centre

In October 2010, Industry Canada opened a new centralized Radio Operator Certificate Service Centre. The Centre is intended to streamline and improve the delivery of Professional Radio Operator Certificates and the Accredited Examiner Program across Canada.

In addition, a new website was recently launched, which provides an accredited examiner search option for the Restricted Operator Certificate - Aeronautical (ROC-A) and includes a current list of accredited institutions for the training and assessment for the Restricted Operator Certificate - Maritime Commercial (ROC-MC) and the General Operator Certificate (GOC). This website, which can be found at www.ic.gc.ca/radio-operator, also offers various online application forms for accredited examiners and radio certificate holders.

The above-mentioned Centre provides the following services:

- receives and processes applications for an Operator Certificate;
- issues Professional Radio Operator Certificates;
- revalidates and issues replacement certificates;
- manages the Accredited Examiner/Institute Program; and
- responds to examiner and general public enquiries.

The types of Professional Radio Operator Certificates issued by the Centre are:

- Restricted Operator Certificate - Aeronautical (ROC-A);
- Restricted Operator Certificate - Maritime Commercial (ROC-MC); and
- General Operator Certificate (GOC).

Note: The Restricted Operator Certificate - Maritime (ROC-M) was delegated to the Canadian Power and Sail Squadrons in 2000.

The contact information for the Centre is:

Industry Canada
Radio Operator Certificate Service Centre
2 Queen Street East
Sault Ste. Marie, ON P6A 1Y3
Telephone: 1-877-604-7493 or 705-941-2001
Fax: 1-877-604-7491 or 705-941-4607
Email: spectrum.certificates@ic.gc.ca

Hours of Operation: 8:30 a.m. to 4:30 p.m. (Eastern Time)