Transport Canada
Transports Canada

TP 14371E

Transport Canada

Aeronautical Information Manual

(TC AIM)

SAR—Search and Rescue

OCTOBER 1, 2026

Canada

Transport Canada Aeronautical Information Manual (TC AIM)

Explanation of Changes

Effective—October 01, 2026

NOTES:

1. Editorial and format changes were made throughout the TC AIM where necessary, and those that were deemed insignificant in nature were not included in the "Explanation of Changes."
2. The blue highlights in the manual represent the changes described in this section.

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SAR—Search and Rescue

1.0 Responsible Authority

1.1 General

Search and rescue (SAR) service in Canada was established in accordance with the provisions of the International Civil Aviation Organization's (ICAO) Annex 12. The Canadian Forces are responsible for conducting SAR operations for aeronautical incidents in Canada.

Aeronautical SAR service is provided through three joint rescue coordination centres (JRCC), located at Victoria, B.C., Trenton, Ont., and Halifax, N.S. The JRCCs control all rescue units in their region through an extensive civil/military communications network. The addresses of the JRCCs are:

VICTORIA

(serving British Columbia and the Yukon)

Joint Rescue Coordination Centre Victoria
P.O. Box 17000 Station Forces
Victoria BC V9A 7N2

Tel. (toll-free within region): 1-800-567-5111
Tel.: 250-413-8933
Tel. (toll-free cellular): ..... #SAR or #727

TRENTON

(serving Alberta, Manitoba, Northwest Territories, western Nunavut, Ontario, western Quebec, Saskatchewan)

Joint Rescue Coordination Centre Trenton
P.O. Box 1000 Station Forces
Astra ON K0K 3W1

Tel. (toll-free): 1-800-267-7270
Tel.: 613-965-3870

HALIFAX

(serving New Brunswick, Newfoundland and Labrador, Nova Scotia, eastern Nunavut, Prince Edward Island, eastern Quebec)

Joint Rescue Coordination Centre Halifax
P.O. Box 99000 Station Forces
Halifax NS B3K 5X5

Tel. (toll-free): 1-800-565-1582
Tel.: 902-427-8200

NOTE:
All JRCCs will accept collect telephone calls dealing with missing or overdue aircraft.

1.2 Types of Service Available

Aeronautical search and rescue (SAR) service is available continuously throughout Canada and the Canadian territorial coastal water areas of the Atlantic, Pacific and Arctic oceans. Canadian Forces SAR units are equipped with helicopters and fixed-wing aircraft to conduct searches and provide rescue services, including rescue specialists (search and rescue technicians) who are capable of parachuting into remote locations. These rescue personnel can render initial medical aid and provide emergency supplies and survival support. The Civil Air Search and Rescue Association (CASARA), a nationwide volunteer organization, assists the Canadian Forces with aeronautical SAR cases.

Workload permitting, joint rescue coordination centre (JRCC) personnel are prepared to present briefings on SAR services and techniques to the public and aviation groups on request. Visits to JRCCs are encouraged, as long as prior notice is provided.

Other major SAR providers in Canada include:

(a) The Canadian Coast Guard, which has primary responsibility for marine incidents along Canada's ocean coasts, in all waterways in the Arctic, and in the waters of the Great Lakes St. Lawrence Seaway System;

(b) Provincial and territorial governments, which, through their police service, respond to SAR incidents involving persons on land, or on inland waterways;

(c) Parks Canada's warden service, which is responsible for ground or inland water SAR within National Parks;

(d) Trained volunteers across Canada who also play a key role in providing SAR services to the public.

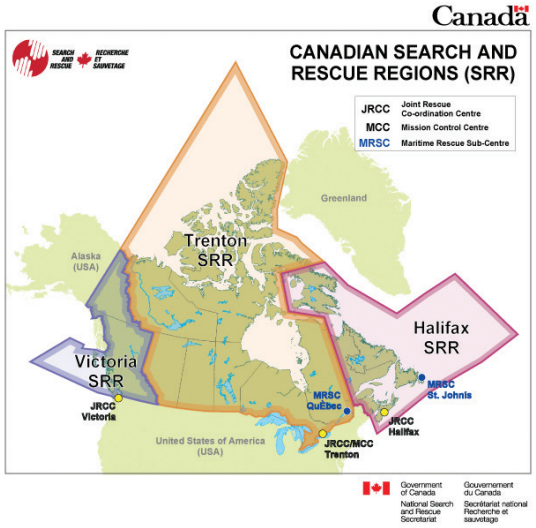
As mutual aid is one of the strengths of Canada's SAR system, the JRCCs may call upon any of these other providers, as well as the private sector, to assist with an aeronautical SAR case.

1.3 Search and Rescue (SAR) Agreements

Two bilateral agreements relating to aeronautical search and rescue (SAR) exist between Canada and the United States. The first permits public aircraft of either country that are engaged in aeronautical SAR operations to enter or leave the other country without being subject to normal immigration or customs formalities. The second agreement permits vessels and wrecking appliances of either country to render aid and assistance on specified border waters and on the shores and in the waters of the other country along the Atlantic and Pacific coasts within a distance of 30 NM from the international boundary on those coasts.

In situations not covered by the agreements above, requests from the United States for aircraft of their own registry to participate in a SAR operation within Canada may be addressed to the nearest joint rescue coordination centre (JRCC). The JRCC would reply and issue appropriate instructions.

Figure 1.1—Search and Rescue Regions (SRR)



2.0 Flight Planning

2.1 General

In addition to signals from emergency locator transmitters (ELTs), the flight plan and flight itinerary are the primary sources of information for search and rescue (SAR) operations. Therefore, proper flight planning procedures must be followed and the filed routes adhered to in order to ensure early detection and rescue.

In Canada, the area covered in a visual search will typically extend to a maximum of 15 NM on either side of the flight-planned route, starting from the aircraft's last known position and extending to its destination. In mountainous regions, search areas will be defined to best suit the terrain and the planned route of flight. It is therefore critical to the safety of pilots that they maintain their route as planned, and advise air traffic service (ATS) of any en route change or deviation as soon as practicable.

Refer to RAC 3.0 for details relating to filing and closing various plans or itineraries.

2.2 Request for Search and Rescue (SAR) Assistance

As soon as information is received that an aircraft is overdue, operators or owners should immediately alert the nearest joint rescue coordination centre (JRCC) or any air traffic service (ATS) unit, giving all known details. The alerting call should not be delayed until after a small-scale private search has taken place. Such a delay could deprive those in need of urgent assistance at a time when it is most needed.

2.3 Missing Aircraft Notice (MANOT)

When an aircraft is reported missing, the appropriate joint rescue coordination centre (JRCC) will issue a missing aircraft notice (MANOT) to the air traffic service (ATS) units that are providing services in or near the search area. MANOTs will be communicated to pilots planning to overfly the search area by notices posted on flight information boards, orally during the filing of flight plans, or by radiocommunication.

Pilots receiving MANOTs are requested to maintain a thorough visual lookout and, insofar as it is practicable, a radio watch on 121.5 MHz when operating in the vicinity of the track the missing aircraft had planned to follow.

Once a MANOT has been issued, a major search effort will be initiated. Such an operation will be published in a NOTAM, and will involve a large number of military and civilian aircraft flying in a relatively confined area. Aircraft that are not participating in the search will be requested to keep a sharp lookout for other traffic, report any probable crash sightings to a flight information centre (FIC) or JRCC, and remain clear of active search areas, if possible.

On termination of the search, another MANOT will be issued and designated as final.

Table 2.1—Initial MANOT Message Required Information

Required Information			Example	
A.	MANOT number Type of MANOT	– SAR operation – JRCC responsible	A.	MANOT SIX SAR-FSOX Initial-JRCC Victoria
B.	Type of Aircraft	– Registration – Colour	B.	Cessna 180 C-FSOX red with white wings and black lettering
C.	Number of crew and/or passengers		C.	Pilot, plus 3
D.	Route		D.	Fort St. John to Abbotsford
E.	Departure date/time (local)		E.	1 May—10:00 PST
F.	Last known position (LKP) date/time (local)		F.	Prince George 1 May—11:31 PST
G.	Fuel exhaust time		G.	Fuel exhaust time 1 May—15:00 PST
H.	Frequency of ELT		H.	121.5 MHz and 243 MHz

2.4 Aiding Persons in Distress

When a pilot observes an aircraft, ship or vessel in distress, the pilot shall, if possible:

(a) keep the craft in sight until his presence is no longer necessary;

(b) report the following information to the joint rescue coordination centre (JRCC) or air traffic service (ATS) unit:

(i) time of observation,

(ii) position of craft,

(iii) general description of scene, and

(iv) apparent physical condition of survivor(s).

NOTE:
See SAR 4.8 concerning the obligations of an aircraft to render assistance to ships or vessels in distress.

Pilots should be familiar with the distress signal that may be used by small craft. It consists of a rectangular, fluorescent orange-red cloth panel on which a black square and disc are displayed.

Figure 2.1—Distress Signal Panel

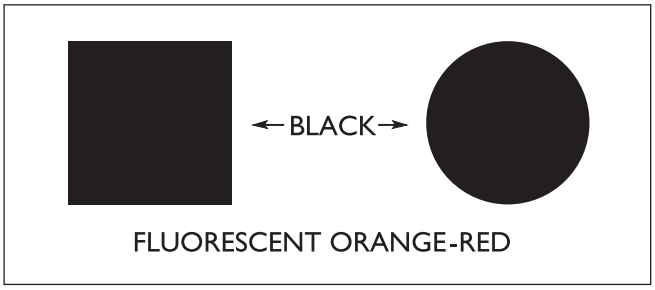
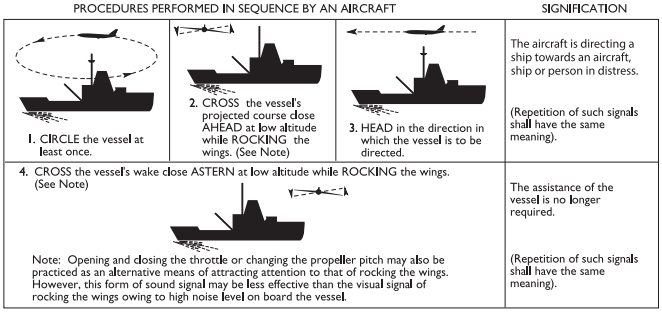


Figure 2.2—Procedures for Signaling Vessels



3.0 Emergency Locator Transmitter (ELT)

3.1 General

Emergency locator transmitters (ELTs) are required for most general aviation aircraft (see CAR 605.38). They operate on a primary frequency of 121.5, 243, or 406 MHz, and help search crews locate downed aircraft to rescue survivors.

Pilots are strongly encouraged to switch from old analog 121.5 MHz ELTs to the newer 406 MHz digital ELTs since position information from a 406 MHz ELT is calculated and relayed to the appropriate joint rescue coordination centre (JRCC) for action. The 406 MHz beacon is associated with a unique user; therefore, identification is rapid and resolution of a false alarm may only require a few phone calls. In addition, activation of a 406 MHz ELT is detected by satellites, whereas, a 121.5 MHz signal relies on the aircraft being within the range of an air traffic service (ATS) facility or on another aircraft passing by at high altitude. Search and rescue (SAR) response could be delayed for several hours when a 121.5 MHz ELT is activated. Survivability decreases with time and, on numerous occasions, lives have been saved as a result of the early detection possible with a 406 MHz beacon. The 121.5 MHz signal common to all ELTs also produces a distinctive siren-like tone that can be heard on a radio receiver tuned to this frequency. This signal helps incoming SAR responders pinpoint an aircraft's position. During routine operations, hearing a 121.5 MHz signal may also alert pilots to the inadvertent activation of their ELT. Therefore, pilots should briefly monitor the frequency after each flight to ensure their ELT is not emitting a signal.

Properly maintained ELTs with serviceable batteries should provide continuous operation for a minimum of 24 hr at a wide range of temperatures. Batteries that remain in service beyond their recommended life may not provide sufficient power to produce a usable signal. ELTs that contain outdated batteries are not considered to be serviceable.

All ELTs currently operating on 406 MHz can be detected by COSPAS-SARSAT satellites. It is vital to note that effective February 1, 2009, COSPAS-SARSAT satellites will only detect 406 MHz ELT signals. A 406 MHz ELT is now required to ensure that the COSPAS-SARSAT system is automatically notified in the event of an aircraft crash. However, 121.5 MHz signals are still used for short-range location during SAR operations.

3.2 Types of Emergency Locator Transmitter (ELT)

There are five types of emergency locator transmitter (ELT):

(a) *TYPE A or AD (automatic ejectable or automatically deployable)*—This type automatically ejects from the aircraft and is set in operation by inertia sensors when the aircraft is subjected to a crash deceleration force acting through the aircraft's flight axis. This type is expensive and is seldom used in general aviation.

(b) *TYPE F or AF (fixed [not ejectable] or automatic fixed)*—This type is automatically set in operation by an inertia switch when the aircraft is subjected to crash deceleration forces acting in the aircraft's flight axis. The transmitter can be manually activated or deactivated, and in some cases, may be remotely controlled from the cockpit. Provision may also be made for recharging the batteries from the aircraft's electrical supply. An additional antenna may be provided for portable use of the ELT. Most general aviation aircraft use this ELT type, which must have the function switch placed to the "ARM" position for the unit to function automatically in a crash.

(c) *TYPE AP (automatic portable)*—This type is similar to Type F or AF, except that the antenna is integral to the unit for portable operation.

(d) *TYPE P (personal)*—This type has no fixed mounting and does not transmit automatically. A manual switch is used to start or stop the transmitter.

(e) *TYPE W or S (water-activated or survival)*—This type transmits automatically when immersed in water. It is waterproof, floats, and operates on the surface of the water. It has no fixed mounting. It should be tethered to survivors or life rafts.

3.3 Installation and Maintenance Requirements

Installation of an emergency locator transmitter (ELT), as required by CAR 605.38, must comply with Chapter 551 of the *Airworthiness Manual*.

For maintenance, inspection, and test procedures, refer to CAR 605 and CAR 571.

3.4 Emergency Locator Transmitter (ELT) Operating Instructions (Normal Use)

Pre-flight

(Where practicable):

(a) inspect the emergency locator transmitter (ELT) to ensure that it is secure, free of external corrosion, and that antenna connections are secure;

(b) ensure that the ELT function switch is in the "ARM" position;

(c) ensure that ELT batteries have not reached their expiry date; and

(d) listen to 121.5 MHz to ensure the ELT is not transmitting.

In-flight

Monitor 121.5 MHz when practicable. If an ELT signal is heard, notify the nearest ATS unit of:

(a) position, altitude and time when signal was first heard;

(b) ELT signal strength;

(c) position, altitude and time when contact was lost; and

(d) whether the ELT signal ceased suddenly or faded.

Pilots should not attempt a search and rescue (SAR) operation. If unable to contact anyone, pilots should continue attempts to gain radio contact with an air traffic service (ATS) unit, or land at the nearest suitable aerodrome where a telephone is located.

NOTE:
If the signal remains constant, it may be your ELT.

Post-flight

Listen to 121.5 MHz. If an ELT is detected, and your ELT has not been switched to "OFF", deactivate it. For those ELT models that do not have an "OFF" switch, disconnect and re-set the unit per the manufacturer's instructions. Notify the nearest ATS unit or joint rescue coordination centre (JRCC) of the time the signal was first heard, the actions you have taken and whether the signal has ceased or is on-going. If you still hear an ELT on 121.5 MHz after you have deactivated your ELT, it may not be yours. Notify the nearest ATS unit or JRCC.

3.5 Emergency Locator Transmitter (ELT) Operating Instructions (Emergency Use)

Emergency locator transmitters (ELTs) in general aviation aircraft contain a crash activation sensor, or G-switch, which is designed to detect the deceleration characteristics of a crash and automatically activate the transmitter. However, it is always safest to place the ELT function switch to "ON" as soon as possible after the crash, if practicable.

Geostationary satellites will detect an unobstructed 406 MHz ELT within minutes of activation; there are no satellite-based means of detecting a 121.5 MHz signal. In addition to geostationary satellites, polar orbiting low altitude satellites continually overfly Canada and will also detect a 406 MHz beacon within 90 min of activation, producing a position report.

Some military and commercial aircraft also monitor 121.5 or 243 MHz and will notify air traffic service (ATS) or search and rescue (SAR) agencies of any ELT transmissions they hear.

In case of emergency, do not delay ELT activation until flight-planned times expire, as such delays will only delay rescue. Do not cycle the ELT through "OFF" and "ON" positions to preserve battery life, as irregular operation reduces localization accuracy and will hamper homing efforts. Once your ELT has been switched to "ON", do not switch it to "OFF" until you have been positively located, and the SAR forces have directed you to turn it off.

If you have landed to wait out bad weather, or for some other non-emergency reason, and no emergency exists, do not activate your ELT. However, your aircraft will be reported overdue, and a search will begin if the delay will extend beyond:

(a) 1 hr past the estimated time of arrival (ETA) filed on a flight plan; or

(b) the SAR time specified, 24 hr after the duration of the flight, or the ETA specified on a flight itinerary.

To avoid an unnecessary search, notify the nearest ATS unit of your changed flight plan or itinerary. If you cannot contact an ATS unit, attempt to contact another aircraft on one of the following frequencies in order to have that aircraft relay the information to ATS:

(a) 126.7 MHz;

(b) local visual flight rules (VFR) common frequency;

(c) local area control centre (ACC) instrument flight rules (IFR) frequency listed in the *Canada Flight Supplement* (CFS);

(d) 121.5 MHz; or

(e) high frequency (HF) 5 680 kHz, if so equipped.

If you cannot contact anyone, a search will begin at the times mentioned above. At the appropriate time, switch your ELT to "ON", and leave it on until search crews locate you. Once located, use your aircraft radio on 121.5 MHz (turn the ELT off if there is interference) to advise the SAR crew of your condition and intentions.

ELTs and the COSPAS-SARSAT system work together to speed rescue. The ELT "calls for help"; COSPAS-SARSAT hears that call and promptly notifies SAR authorities, who then dispatch help.

NOTE:
Delays in activating your ELT will delay your rescue.

3.6 Maximizing the Signal

If the emergency locator transmitter (ELT) is a portable model with its own auxiliary antenna, and can be safely removed from the aircraft, it should be placed as high as possible on a level surface to reduce obstructions between it and the horizon. Raising an ELT from ground level to 2.44 m (8 ft) may increase the range by 20 to 40 percent. The antenna should be vertical to ensure optimum radiation of the signal. Placing the transmitter on a piece of metal, or even the wing of the aircraft, if it is level, will provide the reflectivity to extend transmission range. Holding the transmitter close to the body in cold weather will not significantly increase battery power output. In addition, as the body will absorb most of the signal energy, such action could reduce the effective range of the transmission.

If the ELT is permanently mounted in the aircraft, ensure that it has not been damaged and is still connected to the antenna. If it is safe to do so (i.e. no spilled fuel or fuel vapours), confirm the ELT's operation by selecting 121.5 MHz on the aircraft radio and listening for the audible siren-like tone.

NOTE:
Since aircraft are easier to see than people are, the search will be conducted to locate the aircraft first. If the aircraft lands in an uninhabited area, stay with the aircraft and the ELT. If possible, have smoke, flares or signal fires ready to attract the attention of search crews who are homing to the ELT. Smoke, flares and signal fires should be sited with due regard for any spilled fuel resulting from the crash.

3.7 Accidental Emergency Locator Transmitter (ELT) Transmissions

To forestall unnecessary search and rescue (UNSAR) missions, all accidental emergency locator transmitter (ELT) activations shall be reported to the nearest air traffic service (ATS) unit, or the nearest joint rescue coordination centre (JRCC), giving the location of the transmitter, and the time and duration of the accidental transmission and the ELT shall be switched off. ELT alarms trigger considerable activity within ATS and SAR units. Although some accidental ELT transmissions can be resolved without launching SAR or Civil Air Search and Rescue Association (CASARA) aircraft, such as a properly-registered 406 MHz beacon, the JRCCs will adopt the safe course. Promptly notifying ATS or a JRCC of an accidental ELT transmission may prevent the unnecessary launch of a search aircraft. If promptly reported, there is no charge or penalty associated with the accidental triggering of an ELT.

3.8 Testing Procedures

When originally installed in an aircraft, and when parts of the emergency locator transmitter (ELT) system are moved or changed, an ELT will be tested in accordance with CAR 571. Every few months, or as recommended by the manufacturer, pilots should test their ELT. Testing procedures for ELTs will vary depending upon the type.

3.8.1 406 MHz Emergency Locator Transmitters (ELTs)

Since the digital emergency signals from 406 MHz ELTs are detected almost immediately by COSPAS-SARSAT satellites, the transmitters should never be activated in their operational mode except in an emergency.

406 MHz ELTs should only be tested in accordance with the manufacturer's instructions. Most 406 MHz ELTs are equipped with an integral self-test function. The manufacturer's instructions describe how to carry out this self-test and interpret its results. The instructions should be followed closely to avoid false alerts. Activation of the self-test will transmit a 406-MHz, digitally-altered test signal to the Canadian Beacon Registry. If the ELT is appropriately registered, the test signal will cause an e-mail to be sent to the address on file. This will confirm both a successful self-test as well as the status of the registration. The self-test function may also transmit a 121.5 MHz test signal. In this case, ensure that the test is conducted at the top of the hour (UTC) within the first five minutes.

3.8.2 121.5/243 MHz Emergency Locator Transmitters (ELTs)

Any testing of an ELT that operates only on 121.5 MHz or 243 MHz shall only be conducted during the first 5 min of any UTC hour, and restricted in duration to not more than 5 s.

Such tests can be done between two stations separated by at least half a kilometre, or by a single aircraft, using its own radio receiver.

Two-station 121.5/243 MHz ELT test:

(a) position the aircraft about one-half kilometre from the tower, FSS or other aircraft that will monitor 121.5 MHz. Ensure the listening station is clearly visible from the aircraft, as ELT transmissions are line-of-sight. Intervening obstacles, such as hills, buildings, or other aircraft, may prevent the listening station from detecting the ELT transmission.

(b) using the aircraft radio or other pre-arranged signals, establish contact with the listening station. When the listening station confirms that it is ready, switch the 121.5/243 MHz ELT function to "ON". After no more than 5 s, turn the ELT function switch to "OFF". The listening station should confirm that the ELT was heard.

(c) reset the ELT function switch to "ARM".

(d) tune the aircraft radios to 121.5 MHz to confirm that the ELT stopped transmitting.

(e) if the listening station did not hear the ELT, investigate further before flying the aircraft.

When conducting the two-station test at a busy airport, take due regard of tower or FSS workload. Keep the voice radio transmissions to a minimum. If the "listening" station does not hear the ELT transmission, it may be necessary to move the aircraft to another location on the airfield to conduct the test.

It will often be impractical to coordinate a 121.5/243 MHz ELT test with a tower, FSS, or other aircraft. In such circumstances, pilots can use the following procedures to test their ELTs. Such tests are to be conducted in the first 5 min of any UTC hour, and test transmissions must be limited to 5 s or less.

Single-station ELT test:

(a) tune the aircraft radio receiver to 121.5 MHz.

(b) switch the ELT to "ON" just long enough to hear the tone, and immediately return the function switch to "ARM".

NOTES:

1. It is best to have another person in the cockpit to ensure the minimum "on-air" test period.
2. Do not exceed the 5 s "on-air" time.
   (a) recheck 121.5 MHz on the aircraft receiver to ensure that the ELT stopped transmitting.

When conducting a single-aircraft test, it is possible that the aircraft radios will hear the ELT output, even though the ELT power transistor is defective, and will not be detected by a receiver half a kilometre away. However, this test will uncover a totally unserviceable ELT, and is better than no test.

NOTE:
While all 406 MHz ELTs also transmit a 121.5 MHz homing signal, testing of 406 MHz ELTs must follow the manufacturer's instructions provided with the unit.

3.9 Schedule of Requirements

The following schedule outlines the requirement to carry an emergency locator transmitter (ELT). Gliders, balloons, airships, ultralight aeroplanes and gyroplanes are exempt, as are aircraft operated by the holder of a flight training unit operating certificate that are engaged in flight training, and operated within 25 NM of the departure aerodrome. Additional exemptions are contained in CAR 605.38.

Table 3.1—ELT Requirements

Column I	Column II	Column III
Aircraft	Area of Operation	Minimum Equipment
1. All aircraft except those exempted.	Over land	One ELT of type AD, AF, AP, A, or F.
2. Large multi-engine turbo-jet aeroplanes engaged in an air transport service carrying passengers.	Over water at a distance from land that requires the carriage of life raft pursuant to CAR 602.63.	Two ELTs of type W or S, or one of each.
3. All aircraft that require an ELT other than those set out in item 2.	Over water at a distance from land that requires the carriage of life raft pursuant to CAR 602.63.	One ELT of type W or S.

If an ELT becomes unserviceable, the aircraft may be operated according to the operator's approved minimum equipment list (MEL). Where no MEL has been approved, the aircraft may be operated for up to 30 days, provided:

(a) the ELT is removed at the first aerodrome at which repairs or removal can be accomplished;

(b) the ELT is promptly sent to a maintenance facility;

(c) and a placard is displayed in the cockpit stating that the ELT has been removed, and the date of removal (see CAR 605.39).

Despite these exemptions, all pilots are reminded of the rugged, inhospitable terrain that covers much of Canada.

CAUTION:
Although some flights without ELTs may be legal, they are not advisable.

ELTs are designed to speed rescue to survivable crashes, and they should function automatically. However, if you are aware of their capabilities and limitations, you can improve the performance of your ELT, and thus assist search and rescue (SAR).

4.0 Aircraft Emergency Assistance

4.1 Declaring an Emergency

An emergency condition is classified in accordance with the degree of danger or hazard being experienced, as follows:

(a) *Distress*—A condition of being threatened by serious and/or imminent danger and requiring immediate assistance.

(b) *Urgency*—A condition concerning the safety of an aircraft or other vehicle, or of some person on board or within sight, which does not require immediate assistance.

The radiotelephone distress signal, MAYDAY, and the radiotelephone urgency signal, PAN PAN, must be used at the beginning of the first distress or urgency communication, respectively, and, if considered necessary, at the beginning of any subsequent communication.

4.2 Action by the Pilot During Emergency Conditions

Pilots should:

(a) precede the distress or urgency message by the appropriate radiotelephone signal, preferably spoken 3 times;

(b) transmit on the air-ground frequency in use at the time;

(c) include in the distress or urgency message as many as possible of the following elements:

(i) the name of the station addressed (time and circumstances permitting),

(ii) the identification of the aircraft,

(iii) the nature of the distress or urgency condition,

(iv) the intention of the person in command, and

(v) the present position, altitude or flight level, and heading.

NOTES:

1. The above procedures do not preclude the possibility of the following courses of action:

(a) the pilot making use of any available frequency, or of broadcasting the message;

(b) the pilot using any means at his/her disposal to attract attention and make known his/her conditions;

(c) any person taking any means at his/her disposal to assist the emergency aircraft.

2. The station addressed will normally be that station communicating with the aircraft.

3. International emergency frequencies are 121.5 and 243.0 MHz. In Canada, 126.7 MHz should, whenever practicable, be continuously monitored in uncontrolled airspace. When aircraft are equipped with dual very high frequency (VHF) equipment, it is strongly recommended that frequency 121.5 MHz be monitored at all times.

4. 121.5 MHz may also be used to establish communications when the aircraft is not equipped with the published frequencies or when equipment failure precludes the use of normal channels. See COM 1.12 for information about communicating with air traffic service (ATS) on 121.5 MHz.

4.3 Transponder Alerting

If unable to establish communication immediately with an air traffic control (ATC) unit, a pilot wishing to alert ATC to an emergency situation should adjust the transponder to reply on Mode A/3, Code 7700. Communication with ATC should be established as soon as possible thereafter.

In the event of a communication failure, the transponder should be adjusted to reply on Mode A/3, Code 7600, to alert ATC to the situation. This action does not relieve the pilot of the requirement to comply with CAR 602.137.

In the event of unlawful interference, the transponder should be adjusted to reply to Mode A/3, Code 7500, to alert ATC to the situation (see RAC 1.9.8).

4.4 Radar Alerting Manoeuvres

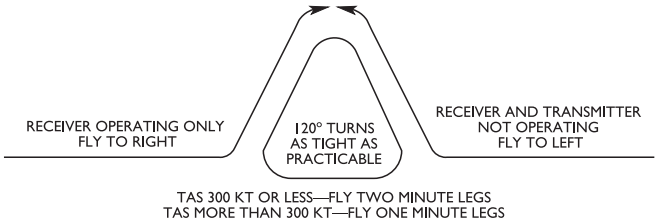
RAC 1.5.7 describes the radar assistance that is available through Canadian Forces facilities; however, when lost or in distress and unable to make radio contact, a pilot should attempt to alert all available radar systems as follows:

(a) activate the identification, friend or foe (IFF) system and selective identification feature (SIF) to EMERGENCY;

(b) guard emergency frequencies;

(c) fly two triangular patterns as depicted, resume course and repeat at 5-min intervals.

Figure 4.1—Radar Alerting Manoeuvres



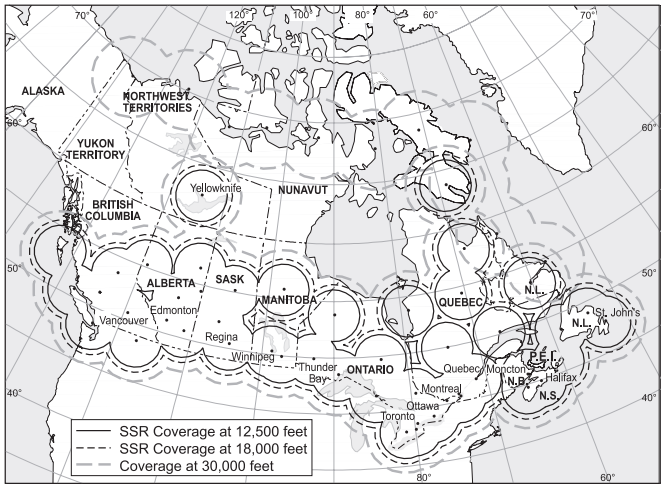
Since the greater the altitude of the aircraft, the better its chance of being detected, low-flying aircraft should attempt to climb. Also, if flying in limited visibility or at night, landing lights and navigation lights should be turned on to assist the interceptor.

Once radar contact is established, and if it is possible to do so, a rescue aircraft will be dispatched to intercept. Upon successful interception, the interceptor and distressed aircraft should attempt radio contact. If this is not possible, use the visual interception signals (see SAR 4.7). If, in a particular case, it is not possible for the Canadian Forces to send out an intercepting aircraft, flying the triangular pattern will serve to position the distressed aircraft and thus narrow any search area.

NOTE:
The opportunity for an aircraft to be detected by radar increases with altitude.

Figure 4.2 shows the area of radar coverage in Canada provided by both Department of National Defence (DND) and NAV CANADA installations. Pilots should be aware that if they are flying in an area outside of radar coverage, flying a triangular pattern for alerting purposes would not be a valid manoeuvre.

Figure 4.2—Canadian Radar Coverage Provided by NAV CANADA and DND



4.5 Emergency Radio Frequency Capability

Where an aircraft is required by the laws of Canada to install two-way very high frequency (VHF) radiocommunication equipment, no person shall operate that aircraft unless the radiocommunication equipment is capable of providing communication on VHF aeronautical emergency frequency 121.5 MHz.

A person operating an aircraft within a sparsely settled area, or a Canadian aircraft over water at a horizontal distance of more than 50 NM from the nearest shoreline, should continuously monitor the VHF aeronautical emergency frequency 121.5 MHz unless:

(a) that person is carrying out communications on other VHF aeronautical frequencies; or

(b) aircraft electronic equipment limitations or essential cockpit duties do not permit simultaneous monitoring of the two VHF aeronautical frequencies.

4.6 Interception Procedures (Canadian Aviation Regulation (CAR) 602.144)

(1) No person shall give an interception signal or an instruction to land except

(a) a peace officer, an officer of a police authority or an officer of the Canadian Forces acting within the scope of their duties; or

(b) a person authorized to do so by the Minister pursuant to subsection (2).

(2) The Minister may authorize a person to give an interception signal or an instruction to land if such authorization is in the public interest and is not likely to affect aviation safety.

(3) The pilot-in-command of an aircraft who receives an instruction to land from a person referred to in subsection (1) shall, subject to any direction received from an air traffic control unit, comply with the instruction.

(4) The pilot-in-command of an intercepting aircraft and the pilot-in command of an intercepted aircraft shall comply with the rules of interception set out in the *Canada Flight Supplement* [and repeated in Schedules I and II].

SCHEDULE I

PROCEDURES TO BE FOLLOWED IN THE EVENT OF INTERCEPTION

An aircraft which is intercepted by another aircraft shall immediately:

(a) follow the instructions given by the intercepting aircraft, interpreting and responding to visual signals [in accordance with Schedule II];

(b) notify, if possible, the appropriate air traffic services unit;

(c) attempt to establish radio communication with the intercepting aircraft or with the appropriate intercept control unit by making a general call on aeronautical emergency frequency 121.5 MHz and repeating this call on emergency frequency 243.0 MHz, if practicable giving the identity and position of the aircraft and the nature of the flight; and

(d) if equipped with a transponder, select Mode A Code 7700, unless otherwise instructed by the appropriate air traffic services unit.

If any instructions received by radio from any sources conflict with those given by the intercepting aircraft by visual or radio signals, the intercepted aircraft shall request immediate clarification while continuing to comply with the instructions given by the intercepting aircraft.

SCHEDULE II

SIGNALS FOR USE IN THE EVENT OF INTERCEPTION

Table 4.1(a)— Signals Initiated by Intercepting Aircraft and Response by Intercepted Aircraft

Series	Intercepting Aircraft Signal	Meaning	Intercepted Aircraft Response	Meaning
1.	DAY—Rocking wings from a position in front and, normally, to the left of the intercepted aircraft, and after acknowledgement, a slow level turn, normally to the left, on to the desired heading.	You have been intercepted. Follow me.	AEROPLANES: DAY—Rocking wings and following.	Understood; will comply.
	NIGHT—Same and, in addition, flashing navigational lights at irregular intervals. DAY or NIGHT—Flares dispensed in immediate vicinity.		NIGHT—Same and, in addition, flashing navigational lights at irregular intervals.	
	NOTES: 1. Meteorological conditions or terrain may require the intercepting aircraft to take up a position in front and to the right of the intercepted aircraft, and to make the subsequent turn to the right.		HELICOPTERS: DAY or NIGHT—Rocking aircraft, flashing navigational lights at irregular intervals, and following.	
	2. If the intercepted aircraft is not able to keep pace with the intercepting aircraft, the latter is expected to fly a series of racetrack patterns and to rock its wings each time it passes the intercepted aircraft.		**NOTE**: Additional action by intercepted aircraft is prescribed in SAR 4.7, Schedule 1.	
2.	DAY or NIGHT—An abrupt breakaway manoeuvre from the intercepted aircraft, consisting of a climbing turn of 90 degrees or more, without crossing the line of flight of the intercepted aircraft.	You may proceed.	AEROPLANES: DAY or NIGHT—Rocking wings. HELICOPTERS: DAY or NIGHT—Rocking aircraft.	Understood; will comply.
3.	DAY—Circling aerodrome, lowering landing gear, and overflying runway in direction of landing or, if the intercepted aircraft is a helicopter, overflying the helicopter landing area. NIGHT—Same, and in addition, showing steady landing lights.	Land at this aerodrome.	AEROPLANES: DAY—Lowering landing gear, following the intercepting aircraft, and if, after overflying the runway, landing is considered safe, proceeding to land. NIGHT—Same, and in addition, showing steady landing lights (if carried). HELICOPTERS: DAY or NIGHT— Following the intercepting aircraft and proceeding to land, showing a steady landing light (if carried).	Understood; will comply.

Table 4.1(b)—Signals Initiated by Intercepted Aircraft and Response by Intercepting Aircraft

Series	Intercepted Aircraft Signal	Meaning	Intercepting Aircraft Response	Meaning
1.	**AEROPLANES:** DAY—Raising landing gear while passing over landing runway at a height exceeding 300 m (1 000 ft) but not exceeding 600 m (2 000 ft) above the aerodrome level, and continuing to circle the aerodrome. NIGHT—Flashing landing lights while passing over landing runway at a height exceeding 300 m (1 000 ft) but not exceeding 600 m (2 000 ft) above the aerodrome level, and continuing to circle the aerodrome. If unable to flash landing lights, flash any other lights available.	Aerodrome you have designated is inadequate.	DAY or NIGHT—If it is desired that the intercepted aircraft follow the intercepting aircraft to an alternate aerodrome, the intercepting aircraft raises its landing gear and uses the Series 1 signals prescribed for intercepting aircraft. If it is decided to release the intercepted aircraft, the intercepting aircraft uses the Series 2 signals prescribed for intercepting aircraft.	Understood, follow me. Understood, you may proceed.
2.	**AEROPLANES:** DAY or NIGHT—Regular switching on and off of all available lights but in such a manner as to be distinct from flashing lights.	Cannot comply.	DAY or NIGHT—Use Series 2 signals prescribed for intercepting aircraft.	Understood.
3.	**AEROPLANES:** DAY or NIGHT—Irregular flashing of all available lights. **HELICOPTERS:** DAY or NIGHT—Irregular flashing of all available lights.	In distress.	DAY or NIGHT—Use Series 2 signals prescribed for intercepting aircraft.	Understood.

4.7 Downed Aircraft Procedures

4.7.1 Ground-to-Air Signals

Even if no ELT or distress signal has been received, a visual search will commence at the time indicated in the flight plan or flight itinerary. The search in Canada will typically extend up to 15 NM on either side of the flight-planned route, starting from the aircraft's last known position and concluding just beyond its destination. In mountainous regions, the search area will be defined to best suit the terrain and route of flight.

Some searches may last at least 24 hr before rescue is accomplished. Make the accident site as conspicuous as possible. Searchers will be looking for anything out of the ordinary, and their eyes will be drawn to any unnatural feature on the ground. The aircraft has the best chance of being spotted if large portions of its wings and tail are painted in vivid colours. Keep the aircraft cleared of snow.

As soon as possible after landing, and with due concern for spilled fuel or vapours, build a campfire. Collect a large pile of green material (e.g. tree boughs, fresh leaves, grasses) to quickly place on the fire, should an aircraft be seen or heard. Three signal fires forming a triangle is the standard distress signal, but even one large smoky fire should attract the attention of searchers.

One of the best high-visibility items now available on the market is a cloth panel of brilliant fluorescent colour, often referred to as a "conspicuity panel." It is staked to the ground during the day and used as a highly effective ground signal. It can also be used as a lean-to shelter and can supply some warmth as a blanket. Other means of attracting attention are reflecting sunlight using signal mirrors or shiny pieces of metal during daylight; or using flashlights, headlamps, strobes, or even camera flashes during hours of darkness.

The following symbols are to be used to communicate with aircraft when an emergency exists. Symbols 1 to 5 are internationally accepted; 6 to 9 are for use in Canada only.

Table 4.2—Ground-to-Air Visual Signals to Be Used in Case of Emergency

N0.	MESSAGE	CORE SYMBOL
1.	REQUIRE ASSISTANCE	V
2.	REQUIRE MEDICAL ASSISTANCE	X
3.	NO or NEGATIVE	N
4.	YES or AFFIRMATIVE	Y
5.	PROCEEDING IN THE DIRECTION	↑
6.	ALL IS WELL	LL
7.	REQUIRE FOOD AND WATER	F
8.	REQUIRE FUEL AND OIL	L
9.	NEED REPAIRS	W

NOTES:

1. Use strips of fabric or parachutes, pieces of wood, stones or any other available material to make the symbols.
2. Endeavour to provide as big a colour contrast as possible between the material used for the symbols and the background against which the symbols are exposed.
3. Symbols should be at least 8 ft in length or longer, if possible. Care should be taken to lay out symbols exactly as depicted to avoid confusion with other symbols.
4. A space of 10 ft should separate the elements of symbol 6.

4.7.2 Survival

Ability to assist the search can depend on the success of survival efforts. The emergency equipment detailed in CARs 602.61, 602.62 and 602.63 emphasizes being prepared for the geographical location and anticipated seasonal climatic variations.

If the aircraft lands in an uninhabited area, stay near the aircraft; the search is to locate the aircraft. Past experience has demonstrated that persons with a knowledge of survival techniques have saved their own and others' lives. Similarly, survivors invariably comment that a better knowledge of how to stay alive would have been invaluable.

There are several good books on survival skills widely available from bookstores and through the Internet.

The Emergency section of the CFS contains procedures to follow when sighting a downed aircraft, a ship in distress or when receiving an ELT signal.

4.8 *Canada Shipping Act, 2001* (2001, C. 26) EXTRACT—PART 5, SECTIONS 130–133

SEARCH AND RESCUE

Designation of rescue coordinators

130. (1) The Minister may designate persons as rescue coordinators to organize search and rescue operations.

Power of rescue coordinators

(2) On being informed that a person, a vessel or an aircraft is in distress or is missing in Canadian waters or on the high seas off any of the coasts of Canada under circumstances that indicate that they may be in distress, a rescue coordinator may

(a) direct all vessels within an area that the rescue coordinator specifies to report their positions;

(b) direct any vessel to take part in a search for that person, vessel or aircraft or to otherwise render assistance;

(c) give any other directions that the rescue coordinator considers necessary to carry out search and rescue operations for that person, vessel or aircraft; and

(d) use any lands if it is necessary to do so for the purpose of saving the life of a shipwrecked person.

Duty to comply

(3) Every vessel or person on board a vessel in Canadian waters and every vessel or person on board a vessel in any waters that has a master who is a qualified person shall comply with a direction given to it or them under subsection (2).

Answering distress signal

131. (1) Subject to this section, the master of a vessel in Canadian waters and every qualified person who is the master of a vessel in any waters, on receiving a signal from any source that a person, a vessel or an aircraft is in distress, shall proceed with all speed to render assistance and shall, if possible, inform the persons in distress or the sender of the signal.

Distress signal—no assistance

(2) If the master is unable or, in the special circumstances of the case, considers it unreasonable or unnecessary to proceed to the assistance of a person, a vessel or an aircraft in distress, the master is not required to proceed to their assistance and is to enter the reason in the official log book of the vessel.

Ships requisitioned

(3) The master of any vessel in distress may requisition one or more of any vessels that answer the distress call to render assistance. The master of a requisitioned vessel in Canadian waters and every qualified person who is the master of a requisitioned vessel in any waters shall continue to proceed with all speed to render assistance to the vessel in distress.

Release from obligation

(4) The master of a vessel shall be released from the obligation imposed by subsection (1) when the master learns that another vessel is complying with a requisition referred to in subsection (3).

Further release

(5) The master of a vessel shall be released from an obligation imposed by subsection (1) or (3) if the master is informed by the persons in distress or by the master of another vessel that has reached those persons that assistance is no longer necessary.

Assistance

132. The master of a vessel in Canadian waters and every qualified person who is the master of a vessel in any waters shall render assistance to every person who is found at sea and in danger of being lost.

Aircraft treated as if vessel

133. Sections 130 to 132 apply in respect of aircraft on or over Canadian waters as they apply in respect of vessels in Canadian waters, with any modifications that the circumstances require.