
Emergency Information

Table of Contents

Emergency Information	7-3
Pilot Responsibility and Authority	7-3
Emergency Conditions	7-3
Transponder Emergency Operation	7-4
Intercept and Escort Procedures	7-4
Search and Rescue	7-5
General	7-5
National Search and Rescue Plan	7-5
Coastguard Rescue Coordination Centers	7-6
Air Force Rescue Coordination Centers	7-6
Emergency and Overdue Aircraft	7-7
Survival Equipment	7-7
Ground-Air Visual Code for Use by Survivors	7-8
Ground-Air Visual Code for Use by Ground Search Parties	7-9
Observance of Downed Aircraft	7-9
Obtaining Emergency Assistance	7-10
Two-way Radio Communications Failure	7-12
Aircraft Rescue and Fire Fighting Communications . .	7-17
Discrete Emergency Frequency	7-17
Radio Call Signs	7-17
ARFF Emergency Hand Signals	7-18
Air Traffic Control Tower Light Gun Signals	7-19

CAE SimuFlite

Emergency First Aid	7-20
The ABCs of Emergency CPR.	7-20
Heart Attack.	7-22
Signals	7-22
Actions for Survival.	7-22
Choking	7-23
Emergency Equipment Record	7-24

Credits: The content of this section is reprinted from the Aeronautical Information Manual, Change 2, Effective: January 25, 2001 (www.faa.gov/ATpubs/AIM/index.htm).

Emergency Information

Pilot Responsibility and Authority

The pilot in command of an aircraft is directly responsible for and is the final authority as to the operation of that aircraft. In an emergency requiring immediate action, the pilot in command may deviate from any rule in 14 CFR Part 91, Subpart A, General, and Subpart B, Flight Rules, to the extent required to meet that emergency.

- REFERENCE-14 CFR Section 91.3(b).

If the emergency authority of 14 CFR Section 91.3(b) is used to deviate from the provisions of an ATC clearance, the pilot in command must notify ATC as soon as possible and obtain an amended clearance.

Unless deviation is necessary under the emergency authority of 14 CFR Section 91.3, pilots of IFR flights experiencing two-way radio communications failure are expected to adhere to the procedures prescribed under “IFR operations, two-way radio communications failure”.

- REFERENCE-14 CFR Section 91.185.

Emergency Conditions

An emergency can be either a distress or urgency condition as defined in the Pilot/Controller Glossary. Pilots do not hesitate to declare an emergency when they are faced with distress conditions such as fire, mechanical failure, or structural damage. However, some are reluctant to report an urgency condition when they encounter situations which may not be immediately perilous, but are potentially catastrophic. An aircraft is in at least an urgency condition the moment the pilot becomes doubtful about position, fuel endurance, weather, or any other condition that could adversely affect flight safety. This is the time to ask for help, not after the situation has developed into a distress condition.

Pilots who become apprehensive for their safety for any reason should request assistance immediately. Ready and willing help is available in the form of radio, radar, direction finding stations, and other aircraft. Delay has caused accidents and cost lives. Safety is not a luxury! Take action!

Transponder Emergency Operation

When a distress or urgency condition is encountered, the pilot of an aircraft with a coded radar beacon transponder, who desires to alert a ground radar facility, should squawk MODE 3/A, Code 7700/Emergency and MODE C altitude reporting and then immediately establish communications with the ATC facility.

Radar facilities are equipped so that Code 7700 normally triggers an alarm or special indicator at all control positions. Pilots should understand that they might not be within a radar coverage area. Therefore, they should continue squawking Code 7700 and establish radio communications as soon as possible.

Intercept and Escort Procedures

The concept of airborne intercept and escort is based on the Search and Rescue (SAR) aircraft establishing visual and/or electronic contact with an aircraft in difficulty, providing in-flight assistance, and escorting it to a safe landing. If bailout, crash landing or ditching becomes necessary, SAR operations can be conducted without delay. For most incidents, particularly those occurring at night and/or during instrument flight conditions, the availability of intercept and escort services will depend on the proximity of SAR units with suitable aircraft on alert for immediate dispatch. In limited circumstances, other aircraft flying in the vicinity of an aircraft in difficulty can provide these services.

If specifically requested by a pilot in difficulty or if a distress condition is declared, SAR coordinators will take steps to intercept and escort an aircraft. Steps may be initiated for intercept and escort if an urgency condition is declared and unusual circumstances make such action advisable.

It is the pilot's prerogative to refuse intercept and escort services. Escort services will normally be provided to the nearest adequate airport. Should the pilot receiving escort services continue on to another location after reaching a safe airport, or decide not to divert to the nearest safe airport, the escort aircraft is not obligated to continue and further escort is discretionary. The decision will depend on the circumstances of the individual incident.

Search and Rescue

General

SAR is a lifesaving service provided through the combined efforts of the federal agencies signatory to the National SAR Plan, and the agencies responsible for SAR within each state. Operational resources are provided by the U.S. Coast Guard, DOD components, the Civil Air Patrol, the Coast Guard Auxiliary, state, county and local law enforcement and other public safety agencies, and private volunteer organizations. Services include search for missing aircraft, survival aid, rescue, and emergency medical help for the occupants after an accident site is located.

National Search and Rescue Plan

By federal interagency agreement, the National Search and Rescue Plan provides for the effective use of all available facilities in all types of SAR missions. These facilities include aircraft, vessels, pararescue and ground rescue teams, and emergency radio fixing. Under the Plan, the U.S. Coast Guard is responsible for the coordination of SAR in the Maritime Region, and the USAF is responsible in the Inland Region. To carry out these responsibilities, the Coast Guard and the Air Force have established Rescue Coordination Centers (RCCs) to direct SAR activities within their regions. For aircraft emergencies, distress, and urgency, information normally will be passed to the appropriate RCC through an ARTCC or FSS.

Coastguard Rescue Coordination Centers

Alameda, CA 510-437-3701	Miami, FL 305-415-6800
Boston, MA 617-223-8555	New York, NY 212-668-7055
Cleveland, OH 216-902-6117	New Orleans, LA 504-589-6225
Honolulu, HI 808-541-2500	Portsmouth, VA 757-398-6390
Juneau, AK 907-463-2000	Seattle, WA 206-220-7001
San Juan, PR 809-729-6770	

Air Force Rescue Coordination Centers

Air Force Rescue Coordination Center – 48 Contiguous States

Langley AFB, Virginia Telephone Numbers	
Commercial	804-764-8112
WATS	800-851-3051
DSN	574-8112

Air Command Rescue Coordination Center – Alaska

Elmendorf AFB, Alaska Telephone Numbers	
Commercial	907-552-5375
DSN	317-552-2426

Joint Rescue Coordination Center – Hawaii

HQ 14th CG District Honolulu Telephone Numbers	
Commercial	808-541-2500
DSN	448-0301

Emergency and Overdue Aircraft

ARTCCs and FSSs will alert the SAR system when information is received from any source indicating that an aircraft is in difficulty, overdue, or missing.

Radar facilities that provide radar flight following or advisories consider the loss of radar and radios, without service termination notice, to be a possible emergency. Pilots receiving VFR services from radar facilities should be aware that SAR may be initiated under these circumstances.

A filed flight plan is the most timely and effective indicator that an aircraft is overdue. Flight plan information is invaluable to SAR forces for planning a search and executing search efforts.

Prior to departure on every flight, local or otherwise, someone at the departure point should be advised of your destination and route of flight if other than direct. Search efforts are often wasted and rescues delayed because of pilots who thoughtlessly take off without telling anyone where they are going. File a flight plan for your safety.

According to the National Search and Rescue Plan, "The life expectancy of an injured survivor decreases as much as 80 percent during the first 24 hours, while the chances of survival of uninjured survivors rapidly diminishes after the first 3 days."

An Air Force Review of 325 SAR missions conducted during a 23-month period revealed that "Time works against people who experience a distress but are not on a flight plan, since 36 hours normally pass before family concern initiates an (alert)".

Survival Equipment

For flight over uninhabited land areas, it is wise to take and know how to use survival equipment for the type of climate and terrain.

If a forced landing occurs at sea, chances of survival are governed by the degree of crew proficiency in emergency procedures and by the availability and effectiveness of water survival equipment.

Ground-Air Visual Code for Use by Survivors

NO.	MESSAGE	CODE SYMBOL
1	Require assistance	V
2	Require medical assistance	X
3	No or Negative	N
4	Yes or Affirmative	Y
5	Proceeding in this direction	↑

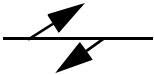
IF IN DOUBT, USE INTERNATIONAL
SYMBOL

SOS

INSTRUCTIONS

1. Lay out symbols by using strips of fabric or parachutes, pieces of wood, stones, or any available material.
2. Provide as much color contrast as possible between material used for symbols and background against which symbols are exposed.
3. Symbols should be at least 10 feet high or larger. Take care to lay out symbols exactly as shown.
4. In addition to using symbols, make every effort to attract attention by means of radio, flares, smoke, or other available means.
5. On snow covered ground, signals can be made by dragging, shoveling or tramping. Depressed areas forming symbols will appear black from the air.
6. Pilot should acknowledge message by rocking wings from side to side.

Ground-Air Visual Code for Use by Ground Search Parties

NO.	MESSAGE	CODE SYMBOL
1	Operation completed.	LLL
2	We have found all personnel.	<u>LL</u>
3	We have found only some personnel.	++
4	We are not able to confirm. Returning to base.	XX
5	We have divided into two groups. Each proceeding in direction indicated.	
6	Information received that aircraft is in this direction.	→ →
7	Nothing found. Will continue search.	NN

NOTE: These visual signals have been accepted for international use and appear in Annex 12 to the Convention on International Civil Aviation.

Observance of Downed Aircraft

Determine if crash is marked with a yellow cross; if so, the crash has already been reported and identified.

If possible, determine type and number of aircraft and whether there is evidence of survivors.

Fix the position of the crash as accurately as possible with reference to a navigational aid. If possible, provide a geographic or physical description of the area to aid ground search parties.

Transmit the information to the nearest FAA or other appropriate radio facility.

If circumstances permit, orbit the scene to guide in other assisting units until their arrival or until you are relieved by another aircraft.

Immediately after landing, make a complete report to the nearest FAA facility, or Air Force or Coast Guard Rescue Coordination Center. The report can be made by a long distance collect telephone call.

Obtaining Emergency Assistance

A pilot in any distress or urgency condition should immediately take the following action, not necessarily in the order listed, to obtain assistance:

1. Climb, if possible, for improved communications, and better radar and direction finding detection. However, it must be understood that unauthorized climb or descent under IFR conditions within controlled airspace is prohibited, except as permitted by 14 CFR Section 91.3(b).
2. If equipped with a radar beacon transponder (civil) or IFF/SIF (military):
 - Continue squawking assigned MODE A/3 discrete code/VFR code and MODE C altitude encoding when in radio contact with an air traffic facility or other agency providing air traffic services, unless instructed to do otherwise.
 - If unable to immediately establish communications with an air traffic facility/agency, squawk MODE A/3, Code 7700/Emergency and MODE C.
3. Transmit a distress or urgency message consisting of as many as necessary of the following elements, preferably in the order listed:
 - a. If distress, MAYDAY, MAYDAY, MAYDAY; if urgency, PAN-PAN, PAN-PAN, PAN-PAN.

- b. Name of station addressed.
- c. Aircraft identification and type.
- d. Nature of distress or urgency.
- e. Weather.
- f. Pilot's intentions and request.
- g. Present position, and heading; or if lost, last known position, time, and heading since that position.
- h. Altitude or flight level.
- i. Fuel remaining in minutes.
- j. Number of people on board.
- k. Any other useful information.

After establishing radio contact, comply with advice and instructions received. Cooperate. Do not hesitate to ask questions or clarify instructions when you do not understand or if you cannot comply with clearance. Assist the ground station to control communications on the frequency in use. Silence interfering radio stations. Do not change frequency or change to another ground station unless absolutely necessary. If you do, advise the ground station of the new frequency and station name prior to the change, transmitting in the blind if necessary. If two-way communications cannot be established on the new frequency, return immediately to the frequency or station where two-way communications last existed.

When in a distress condition with bailout, crash landing or ditching imminent, take the following additional actions to assist search and rescue units:

Time and circumstances permitting, transmit as many as necessary of the message elements in page 7-11 subparagraph 3. above, and any of the following that you think might be helpful:

- ELT status.
- Visible landmarks.
- Aircraft color.

- Number of persons on board.
- Emergency equipment on board.

Actuate your ELT if the installation permits.

For bailout, and for crash landing or ditching if risk of fire is not a consideration, set your radio for continuous transmission.

If it becomes necessary to ditch, make every effort to ditch near a surface vessel. If time permits, an FAA facility should be able to get the position of the nearest commercial or Coast Guard vessel from a Coast Guard Rescue Coordination Center.

After a crash landing, unless you have good reason to believe that you will not be located by search aircraft or ground teams, it is best to remain with your aircraft and prepare means of signaling search aircraft.

Two-way Radio Communications Failure

It is virtually impossible to provide regulations and procedures applicable to all possible situations associated with two-way radio communications failure. During two-way radio communications failure, when confronted by a situation not covered in the regulation, pilots are expected to exercise good judgment in whatever action they elect to take. Should the situation so dictate, they should not be reluctant to use the emergency action contained in 14 CFR Section 91.3(b).

Whether or not two-way communications failure constitutes an emergency depends on the circumstances; in any event, it is a determination made by the pilot. 14 CFR Section 91.3(b) authorizes a pilot to deviate from any rule in Subparts A and B to the extent required to meet an emergency.

In the event of two-way radio communications failure, ATC service will be provided on the assumption that the pilot is operating in accordance with 14 CFR Section 91.185. A pilot experiencing two-way communications failure should (unless emergency authority is exercised) comply with 14 CFR Section 91.185 quoted below:

General. Unless otherwise authorized by ATC, each pilot who has two-way radio communications failure when operating under IFR shall comply with the rules of this section.

VFR Conditions. If the failure occurs in VFR conditions, or if VFR conditions are encountered after the failure, each pilot shall continue the flight under VFR and land as soon as practicable.

NOTE: This procedure also applies when two-way radio failure occurs while operating in Class A airspace. The primary objective of this provision in 14 CFR Section 91.185 is to preclude extended IFR operation by these aircraft within the ATC system. Pilots should recognize that operation under these conditions may unnecessarily as well as adversely affect other users of the airspace, since ATC may be required to reroute or delay other users in order to protect the failure aircraft. However, it is not intended that the requirement to “land as soon as practicable” be construed to mean “as soon as possible”. Pilots retain the prerogative of exercising their best judgment and are not required to land at an unauthorized airport, at an airport unsuitable for the type of aircraft flown, or to land only minutes short of their intended destination.

IFR Conditions. If the failure occurs in IFR conditions, or if “VFR conditions” above cannot be complied with, each pilot shall continue the flight according to the following:

Route.

By the route assigned in the last ATC clearance received;

If being radar vectored, by the direct route from the point of radio failure to the fix, route, or airway specified in the vector clearance;

In the absence of an assigned route, by the route that ATC has advised may be expected in a further clearance; or

In the absence of an assigned route or a route that ATC has advised may be expected in a further clearance, by the route filed in the flight plan.

Altitude. At the HIGHEST of the following altitudes or flight levels FOR THE ROUTE SEGMENT BEING FLOWN:

The altitude or flight level assigned in the last ATC clearance received;

The minimum altitude (converted, if appropriate, to minimum flight level as prescribed in 14 CFR Section 91.121(c)) for IFR operations; or

The altitude or flight level that ATC has advised may be expected in a further clearance.

NOTE: The intent of the rule is that a pilot who has experienced two-way radio failure should select the appropriate altitude for the particular route segment being flown and make the necessary altitude adjustments for subsequent route segments. If the pilot received an "expect further clearance" containing a higher altitude to expect at a specified time or fix, maintain the highest of the following altitudes until that time/fix:

- (1) the last assigned altitude; or
- (2) the minimum altitude/flight level for IFR operations.

Upon reaching the time/fix specified, the pilot should commence climbing to the altitude advised to expect. If the radio failure occurs after the time/fix specified, the altitude to be expected is not applicable and the pilot should maintain an altitude consistent with 1 or 2 above. If the pilot receives an "expect further clearance" containing a lower altitude, the pilot should maintain the highest of 1 or 2 above until that time/fix specified in subparagraph "Leave clearance limit", below.

Leave Clearance Limit.

When the clearance limit is a fix from which an approach begins, commence descent or descent and approach as close as possible to the expected further clearance time if one has been received, or if one has not been received, as close as possible to the Estimated Time of Arrival (ETA) as calculated from the filed or amended (with ATC) Estimated Time en Route (ETE).

If the clearance limit is not a fix from which an approach begins, leave the clearance limit at the expected further clearance time if one has been received, or if none has been received, upon arrival over the clearance limit, and proceed to a fix from which an approach begins and commence descent or descent and approach as close as possible to the Estimated Time of Arrival as calculated from the filed or amended (with ATC) Estimated Time en Route.

Transponder Operation During Two-way Communications Failure.

If an aircraft with a coded radar beacon transponder experiences a loss of two-way radio capability, the pilot should adjust the transponder to reply on MODE A/3, Code 7600.

The pilot should understand that the aircraft may not be in an area of radar coverage.

Reestablishing Radio Contact.

In addition to monitoring the NAVAID voice feature, the pilot should attempt to reestablish communications by attempting contact:

On the previously assigned frequency, or

With an FSS or ARINC1.

If communications are established with an FSS or ARINC, the pilot should advise that radio communications on the previously assigned frequency have been lost giving the aircraft's position, altitude, and last assigned frequency and then request further clearance from the controlling facility. The preceding does not preclude the use of 121.5 MHz. There is no priority on which action should be attempted first. If the capability exists, do all at the same time.

Aircraft Rescue and Fire Fighting Communications

Discrete Emergency Frequency

Direct contact between an emergency aircraft flight crew, Aircraft Rescue and Fire Fighting Incident Commander (ARFF IC), and the Airport Traffic Control Tower (ATCT) is possible on an aeronautical radio frequency (Discrete Emergency Frequency [DEF]) designated by Air Traffic Control (ATC) from the operational frequencies assigned to that facility.

Emergency aircraft at airports without an ATCT (or when the ATCT is closed) may contact the ARFF IC (if ARFF service is provided), on the Common Traffic Advisory Frequency (CTAF) published for the airport or the civil emergency frequency 121.5 MHz.

Radio Call Signs

Preferred radio call sign for the ARFF IC is “(location/facility) Command” when communicating with the flight crew and the FAA ATCT.

EXAMPLE:

LAX Command.

Washington Command.

ARFF Emergency Hand Signals



RECOMMEND EVACUATION - Evacuation recommended based on ARFF IC's assessment of external situation.

Arm extended from body, and held horizontal with hand upraised at eye level. Execute beckoning arm motion angled backward. Nonbeckoning arm held against body.

NIGHT - same with wands.



RECOMMEND STOP - Recommend evacuation in progress be halted. Stop aircraft movement or other activity in progress.

Arms in front of head -
Crossed at wrists.

NIGHT - same with wands.



EMERGENCY CONTAINED - No outside evidence of dangerous condition or "all-clear."

Arms extended outward and down at a 45 degree angle. Arms moved inward below waistline simultaneously until wrists crossed, then extended outward to starting position (umpire's "safe" signal).

NIGHT - same with wands.

Air Traffic Control Tower Light Gun Signals

Color and Type of Signal	Movement of Vehicles, Equipment and Personnel	Aircraft on the Ground	Aircraft in Flight
Steady green	Cleared to cross, proceed or go	Cleared for takeoff	Cleared to land
Flashing green	Not applicable	Cleared for taxi	Return for landing (to be followed by steady green at the proper time)
Steady red	STOP	STOP	Give way to other aircraft and continue circling
Flashing red	Clear the taxiway/runway	Taxi clear of the runway in use	Airport unsafe, do not land
Flashing white	Return to starting point on airport	Return to starting point on airport	Not applicable
Alternating red and green	Exercise extreme caution	Exercise extreme caution	Exercise extreme caution

Emergency First Aid

The ABCs of Emergency CPR

Establish victim's unresponsiveness.

Gently shake victim and shout, "Are you all right?"

Airway

- Open airway: lift chin, tilt head. (*With neck injury, lift chin but do not tilt head.*)
- Look for chest movement.
- Listen for sound of breathing.
- Feel for breath on your cheek.

Breathing

- Head tilt position – pinch victim's nose shut while lifting chin with your other hand.
- Give two full breaths while maintaining airtight seal with your mouth over the victim's mouth.

NOTE: A pocket mask can be used instead, but proper head position and airtight seal must be maintained.

Circulation

Locate carotid artery pulse; hold 10 seconds. If no pulse:

- Begin external chest compressions by locating hand position two fingers above notch and placing heel of hand on breastbone.
- Perform 15 compressions of 1½ to 2 inches at a rate of 80 to 100 compressions per minute. (Count, "One *and* two *and* three *and*..." etc.) Come up smoothly, keeping hand contact with victim's chest at all times.
- Repeat the cycle of two breaths, 15 compressions, until victim's pulse and breathing return. If only the pulse is present, continue rescue breathing until medical assistance is available.

Reproduced with permission. © MedAire, Inc.



MedAire,™ Inc.
Inflight Medical Support

Airway



Breathing



Circulation



B3CRH-EM001i

Reproduced with permission. © MedAire, Inc.

Heart Attack

Signals

- Pressure, squeezing, fullness, or pain in center of chest behind breastbone.
- Sweating.
- Nausea.
- Shortness of breath.
- Feeling of weakness.

Actions for Survival

- Recognize signals.
- Stop activity and lie or sit down.
- Provide oxygen if available.
- If signals persist longer than two minutes, get victim to medical assistance.

Choking

If victim can cough or speak:

- Encourage continued coughing.
- Provide oxygen if available.

If victim cannot cough or speak:

- Perform Heimlich maneuver (abdominal thrusts):
 1. Stand behind victim; wrap arms around victim's waist.
 2. Place fist of one hand (knuckles up) in upper abdomen*.
 3. Grasp fist with opposite hand.
 4. Press fist into upper abdomen* with quick, inward and upward thrusts.
 5. Perform maneuver until foreign body is expelled.
- Provide supplemental oxygen if available.

** If victim is pregnant or obese, perform chest thrusts instead of abdominal thrusts.*



B3CRH-EM002I

Emergency Equipment Record

Emergency Equipment	Location	Date Last Serviced
First Aid Kit	_____	_____
Fire Extinguisher(s)	_____	_____
	_____	_____
	_____	_____
Fire Axe	_____	_____
Life Raft	_____	_____
Life Vests	_____	_____
Therapeutic Oxygen	_____	_____
Overwater Survival Kit	_____	_____
Other	_____	_____
	_____	_____
	_____	_____