Each year there are a large number of Search and Rescue (SAR) phases declared, with many requiring substantial effort to resolve. Many pilots have discovered that the comforting phrase, *"it can't happen to me"*, is far from correct. If you prepare adequately for all eventualities you will be better able to deal with any emergency situation in which you may find yourself and thus enable AusSAR, which is responsible for aviation and maritime SAR in Australia to offer you better assistance. To help you in this preparation, the following guide is suggested.

PLANNING

Select the route which gives you short legs between the best visual fixes, and the least rugged terrain. Make sure that your maps cover the entire route. Always wear a watch. Remember, that external navigation aids, such as GPS, should be cross-checked using other navigational methods to ensure its accuracy.

If your planned flight crosses high country or large water expanses, consider the alternative routes that may be used in conditions of adverse weather. Remember the problems of rising ground in deteriorating meteorological conditions.

Make sure you get a forecast - it costs you nothing. Take special note of the weather, freezing level, significant cloud cover and expected visibility. Relate the forecast to your planned route and the nature of the terrain.

Ask for assistance from a briefing officer if necessary and tell someone what you are doing.

If the weather is not suitable, consider using an alternate route or postponing the flight. Consider discussing the situation with someone else with aviation experience.

If you are making a VFR Flight, plan to arrive at least 10 minutes before the end of daylight, or earlier, if your flight time is more than 1 hour, or if the terrain or the weather could reduce the light. If you are delayed, make sure that your departure is not too late to meet this requirement.

Break your flight into route segments, measure distances carefully and use a computer to find time intervals. Do not guess or give just one time interval. Either lodge a flight plan or leave a flight note with a responsible person. Plan a realistic SARTIME and don't forget to amend it if you are delayed for any reason. Provide a destination telephone number on your flight plan or flight note. If a pilot or one of the passengers has a mobile phone, provide that number as well.

HELPING SEARCH AND RESCUE

Should you have to make a forced landing, many of the planning hints mentioned previously will help AusSAR find you quickly, for example:

- the search will take account of the forecast and actual weather conditions;
- the search will be based on the information you gave in your flight notification form or flight note, plus, if necessary, the performance figures of your aircraft;
- the area which will be searched first will normally be 10 miles either side of your planned route and;
- any position reported by you en-route will do away with the need to search earlier sections of your route and thus reduce search time.

Other things which you can do to help yourself and the AusSAR organisation in these circumstances are:

- stay with your aircraft (see also "Hints for Survival" pages);
- carry a heliograph or mirror to signal search aircraft by day and an electric torch for use at night; (heliographs are available at most army disposal stores or camping stores)
- carry matches or a cigarette lighter, a pocket compass, knife and first aid kit, and wear warm clothing in winter (a space blanket is a cheap lightweight alternative to a blanket)
- always carry water, and take extra supplies if you are flying over hot arid areas; and
- carry a 'survival food kit' of high calorie food items (eg, sweets, raisins, nuts, Vitamin C tablets, etc) packed in a small waterproof container.

Read the other survival hints in ERSA EMERG Section and in the succeeding pages of this Guide.

REMEMBER - IT CAN HAPPEN TO YOU -
BUT IT NEED NOT BE A TRAGEDY

A pilot who does not hold an instrument rating or who is flying an aircraft not equipped for instrument flight has no place in adverse weather. However, there are many occurrences where VFR pilots find themselves in weather which is below the minima specified for Visual Meteorological Conditions (VMC).
Such occurrences are generally the result of poor planning for safety and too frequently end in tragedy.

VFR flight in weather which is below VMC is NOT PERMITTED.

When weather begins to deteriorate, monitor the changes carefully and consider possible alternative action. If you have already planned an alternative route, decide when to divert.

BROADCAST YOUR INTENTIONS

Government and licensed aerodromes and many ALAs are shown on WACs, VTC's and VNC's. Note which aerodromes lie close to your track and which may be suitable for an precautionary landing.

Decide how and/or when you will make a firm decision to continue or turn back.

Plan your immediate flight path so that you remain well clear of cloud and heavy rain AT ALL TIMES. There have been many occasions when pilots have not intended to fly into cloud but, through inadequate planning, their flight path has inadvertently taken them into cloud.

When you become aware that any element of the weather is about to FALL BELOW THE VMC MINIMA - DO NOT HESITATE, TURN BACK IMMEDIATELY. BROADCAST YOUR INTENTIONS. DO NOT leave your decision until the weather has already fallen below VMC Minima.

ALWAYS BROADCAST YOUR INTENTIONS

Distress beacons have been used in aviation for many years and, with some flights now being conducted without the lodgement of flight plans or notices or reporting progress, there is increasing importance on having an effective distress beacon as a means of last resort to alert the SAR system that you are in grave and imminent danger. A distress beacon is a useful alerting and localisation aid should you be required to call for assistance. The following information is provided to give you an understanding of the different types of beacons available and their use.

ALERTING THE SAR SYSTEM WITH DISTRESS BEACONS

Distress beacons are detected by other aircraft who may be monitoring 121.5 MHz or by the Cospas-Sarsat satellite based system which provides distress alerting and location information to search and rescue (SAR) authorities in the aviation, maritime and land environments. The Cospas-Sarsat system, which has been in operation since 1982, was originally designed to service a discrete distress frequency on 406.025 (generically stated as 406) MHz but the requirement was expanded to include a reduced service on the aviation distress frequency of 121.5 MHz. In the case of the latter, the physical characteristics of the radio frequency and the output signal mean that there is coarser resolution with beacons operating on this frequency compared to those operating on the higher frequency.

Australia, through AusSAR, is responsible for operating the regional Cospas-Sarsat ground segment in the South West Pacific region.This is done by monitoring satellite intercepted signals from three ground stations in Albany (WA), Bundaberg (QLD), and Wellington (NZ). With 121.5 MHz signals, the three elements in the process (ie the beacon, the satellite and the ground station) must be in view of each other. This introduces delays in the SAR system responding. With later technology 406 MHz signals, the satellite has the capacity to time tag the digital information and repeat it when it is next interrogated by a ground station or pass the information via satellites in geo-stationery orbit over the equator to provide a near instantaneous alerting function.

BEACON TERMINOLOGY

There have been a number of conventions used in the past to describe the various types of distress beacons that have been available in the market place. The current practice is to use Electronic Locator Transmitter (ELT) to describe those that are fitted to an aircraft, Emergency Position Indicating Radio Beacon (EPIRB) to describe those that are designed to float when immersed in water, and Personal Locator Beacon (PLB) to describe the portable units that are designed for personal use. Many GA operators carry the PLB variant.

COMPATABILITY OF OLDER TECHNOLOGY BEACONS

The 1960s saw the emergence of aviation distress beacons that operated on 121.5 MHz. These beacons meet the FAA TSO C91 standard and provide an audible tone on the frequency with the likelihood that other aircraft or air traffic services in the area would intercept it and become aware that an aircraft is in distress. A large number of aircraft still operating in Australia are fitted with this standard of ELT. These older beacons are not covered by the Cospas-Sarsat system and continue to rely on the aviation sector for SAR alerting purposes.

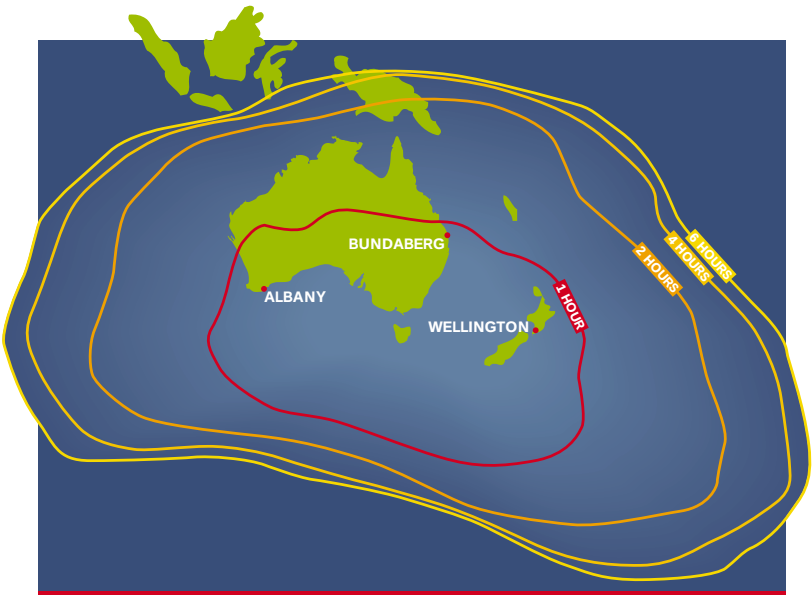
When a decision was taken to extend the Cospas-Sarsat system to include 121.5 MHz, the standard pertaining to aviation beacons was revisited and a new standard (FAA TSO C91A) was set making the beacon emission suitable for intercept by satellite. The FAA standard for 406 MHz beacons is TSO C126. These standards are reflected in CAR 252A.

COMPARISON OF DISTRESS BEACONS

The 121.5 MHz beacons in current production are relatively lightweight and inexpensive. They provide an affordable alternative to the more expensive 406 MHz beacons (which are now available with an embedded GPS so that they can automatically report the beacon position in digital form via the satellite system when activated). A comparison of the two beacon technologies is shown in Table 1.

As a result of the location of the three ground stations servicing the Australian region, there are approximately fifty satellite passes serviced per day by AusSAR which results in a typical coverage area and average times for detection of a 121.5 MHz beacon.

	121.5 MHz	406 MHz
LOCATION ACCURACY (Design Specification)	15 - 20 km	2 - 3 km
COVERAGE	Local - the beacon, the satellite and the LUT must be in sight of each other.	Global - the satellite has the capacity to store the information and repeat it for subsequent processing.
SIGNAL POWER	0.1 Watt	5 Watts
SIGNAL TYPE	Analog audio signal with no identification feature and subject to high false alert rate due to interference signals.	Digital with encoded identification of beacon registered owner and capacity to overlay externally provided or embedded GPS position.
ALERT TIME	Depends on location and varies from 2 hours to the system being ineffective outside coverage areas with ambiguous fix positions often being provided on the first pass.	Near instantaneous with GEOSAR assisting to provide alerting data if a LEOSAR is not in range. The exception is polar regions where very short delays can be expected.
DOPPLER LOCATION	One satellite pass but an ambiguous fix position until resolved by other means or another satellite pass.	Single satellite pass
GPS LOCATION (if fitted)	Functionality not available	160m accuracy
HOMING	Aircraft and vessels use the 121.5 MHz audio signal for homing.	These types of beacons simultaneously transmit on 121.5 MHz for homing purposes.



THE TYPICAL COSPAS-SARSAT COVERAGE AREA AND AVERAGE TIMES FOR DETECTIONOF A 121.5 MHz DISTRESS BEACONS IN THE AUSTRALIAN AREA

The major implications for general aviation aircraft operating in Australia using 121.5 MHz beacons is that if the beacon is of the older type, then there is a reliance on other aircraft to detect the 121.5 MHz signal and raise the alarm. This may be problematic in many parts of Australia as only the larger commercial aircraft regularly monitor this frequency. If the beacon is Cospas-Sarsat compatible, the system will generally detect the signal but produce an ambiguous fix position either side of the satellite pass. Follow-on passes, collateral information, or the use of aircraft to investigate both possible positions are used to refine the correct distress beacon position.

This evolution takes time and the accuracy of the Cospas-Sarsat derived position is less accurate than with the more technically advanced 406 MHz beacon which usually provides an accurate position on the first pass. These beacons are also encoded with the details of the registered owner and, through the GEOSAR supplementary repeaters, provide near instantaneous advice that an emergency situation exists prior to a Cospas-Sarsat satellite pass. If an embedded GPS is fitted, a position will be passed along with this initial alert advice. The time critical nature of an adequate response is a major consideration when considering the safety of life.

USING DISTRESS BEACONS

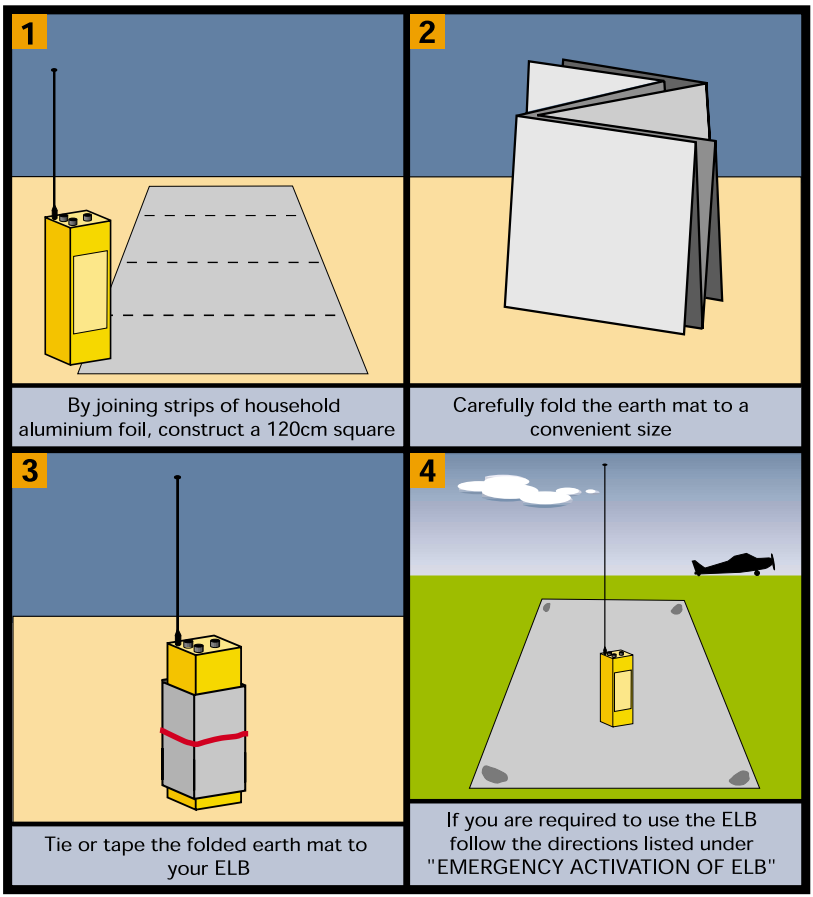
If you are in the WATER, and your beacon is buoyant, the beacon should be activated IN THE WATER and allowed to float to the end of the lanyard.
You should ensure that the aerial is substantially vertical. DO NOT attach the lanyard to the aircraft, but rather a person or liferaft.

In situations where you are forced to use a non-buoyant distress beacon in a water survival situation, ensure that the beacon is kept dry. The beacon will operate successfully from inside a plastic bag, and should be located just as close to the water as possible. If you raise the beacon high above the water, the beacon's effectiveness will be reduced.

For operations over LAND, you will get the best performance from an ELT by operating it while still installed in the aircraft as long as the fixed aerial remains attached. If there is any doubt about the integrity of the system, then it should be removed from the aircraft and used in the manner described below for PLBs.

PLBs are most effective when placed on a flat surface on the ground in an exposed position. Space blankets or aluminium foil make good earth mats to optimise the signal with the active beacon being placed in the middle. It is suggested that if you carry a beacon you also carry sufficient household aluminium foil to make a 120cm square earth mat for use in emergencies.

You should always activate your distress beacon if you are in grave and imminent danger regardless of whether you can optimise its performance as described above. Modern distress beacons have been detected by other aircraft and the Cospas Sarsat system in very marginal conditions.


1
By joining strips of household aluminium foil, construct a 120cm square
2
Carefully fold the earth mat to a convenient size
3
Tie or tape the folded earth mat to your ELB
4
If you are required to use the ELB follow the directions listed under "EMERGENCY ACTIVATION OF ELB"

IN THE EVENT OF BEING FORCED DOWN OR SOME INSTANCES DITCHING

ACTIVATE THE DISTRESS BEACON IMMEDIATELY

- Where the beacon is permanently installed, activate the beacon in situ, or if there is some concern about the integrity of the installation, remove it and use it as described below.
- Where a non-permanent ELT or a PLB is being used, select a site for the activation of the beacon. If possible, the site should be elevated, clear of trees, boulders, etc and reasonably close to the aircraft.
- Place the beacon on a flat surface and use an earth mat if available. You may consider placing the beacon on the wing of the aircraft or other reflective metal surface if there is no earth mat available or the terrain is inhospitable to any other option.
- If required, secure the beacon with rocks, sticks, tape, etc so that the aerial remains substantially vertical.
- Remain clear of the beacon. Obstacles near it will distort the radiation pattern.
- A beacon which is damaged or under wreckage may still transmit some signal so always activate it.
- To avoid confusing direction finding equipment on search aircraft, avoid activating two or more beacons within 1NM of each other. If two or more beacons are available, their use should be rationalised to extend the alerting period.
- In the event of a search, an aircraft may drop a radio to you. Walk away from the beacon to avoid interference on the radio transmission frequency. DO NOT switch off the beacon UNLESS instructed to do so.

CARE AND STORAGE OF DISTRESS BEACONS

Because an air traffic services unit or AusSAR will declare a Distress Phase immediately it is made aware that a beacon signal has been detected, it is most important that care is taken by pilots and technical staff to ensure that beacons are not activated accidentally.

Owners of Beacons are asked to observe the following:

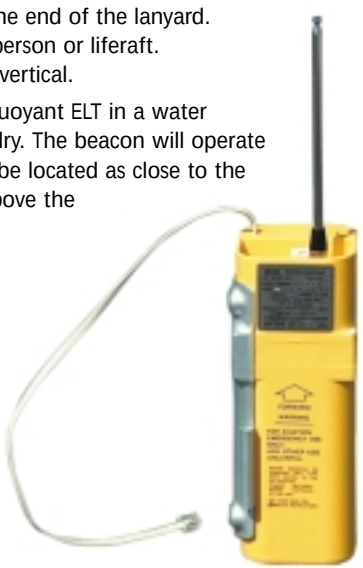
- READ and ADHERE to the operating and general instructions issued by the manufacturer.
- Ensure that impact operated beacons are switched 'OFF' except when arming is actually required.
- Most PLBs have a self-test function that should be used rather than testing the beacon on the operational frequency.

- If operational testing of ELTs is required, the beacon SHOULD NOT be operated for more than five seconds with the preferred procedure being that the test is conducted within the first five minutes of the hour. Longer tests are required to be conducted in a screened radio test cage. BEFORE operational tests for any period are conducted, operators must contact AusSAR (1800 815 257) to gain approval.
- ALWAYS notify the air traffic service provider or AusSAR if a beacon has been activated inadvertently. Early advice will assist in the continued efficiency of the SAR system.
- While performing maintenance on an aircraft, have a VHF radio tuned to 121.5 MHz to detect any inadvertent activation.
- Monitor 121.5 MHz on start-up and shut-down. A knock while parked or a heavy landing may activate some impact operated beacons.
- Keep PLBs in a handy position and brief passengers on their location and use in the case of emergency.

An Emergency Locator Transmitter, or any variant, is a useful search aid should you be forced down and require assistance. However, to obtain maximum benefit from your beacon and to assist the search aircraft, it is necessary to observe a few guidelines for activating your ELT.

If you are in the WATER, and your beacon is buoyant, the beacon should be activated IN THE WATER and allowed to float to the end of the lanyard. **DO NOT** attach lanyard to aircraft, but rather to person or liferaft. Adjust the bridle so that the aerial is substantially vertical.

In situations where you are forced to use a non-buoyant ELT in a water survival situation, ensure that the beacon is kept dry. The beacon will operate successfully from inside a plastic bag, and should be located as close to the water as possible. If you raise the beacon high above the water, the beacon's effectiveness will be reduced.



For operations over LAND you will get the best performance from a beacon operating from its permanent installation in the aircraft or from operating it on the ground on an EARTH MAT.

An EARTH MAT can be a SPACE BLANKET or similar material with a reflective surface. A simple inexpensive earth mat can be made by joining household ALUMINIUM FOIL to make a 120cm square. It is suggested that, if you carry an ELT, you make a foil earth mat, fold it and tape it to you ELT. To use the earth mat,

unfold it and place it flat on the ground, holding the edges down with rocks or earth. Switch on your beacon and place in the centre of the earth mat, alternatively place ELT on wing of aircraft.

IN MANY CASES, USING AN EARTH MAT WILL INCREASE THE EFFECTIVE RANGE OF YOUR EMERGENCY LOCATOR TRANSMITTER

TRANSMISSION OF SIGNALS

- The pilot in command of an aircraft shall transmit or display the signals specified in this Division according to the degree of emergency being experienced.
- The signals specified in relation to each successive degree of emergency may be sent either separately or together for any one degree of emergency.

DISTRESS SIGNALS

- The distress signal shall be transmitted only when the aircraft is threatened with grave and immediate danger and requires immediate assistance.
- In radio telegraphy, the distress signal shall take the form of **SOS (... – – – ...)**, sent 3 times, followed by the group DE, sent once, and the call sign of the aircraft, sent 3 times.
- The signal specified in the above may be followed by the automatic alarm signal which consists of a series of 12 dashes, sent in one minute, the duration of each dash being 4 seconds, and the duration of the interval between consecutive dashes being one second.
- In radiotelephony, the distress signal shall take the form of the word "MAYDAY", pronounced 3 times, followed by the words "THIS IS", followed by the call sign of the aircraft 3 times.
- By other means the distress signal shall take one or more of the following forms:

A. the Morse signal **... – – – ...** with visual apparatus or with sound apparatus;

B. a succession of pyrotechnical lights, fired at short intervals, each showing a single red light;

C. the two-flag signal corresponding to the letters NC of the International Code of Signals;

D. the distant signal, consisting of a square flag having, either above or below, a ball or anything resembling a ball;

E. a parachute flare showing a red light;

F. a gun or other explosive signal fired at intervals of approximately one minute.

URGENCY SIGNALS

- The following signals, used either together or separately, shall be used by an aircraft for the purpose of giving notice of difficulties which compel it to land without requiring immediate assistance:

A. the repeated switching on and off of the landing lights;

B. the repeated switching on and off of the navigation lights, in such a manner as to be distinctive from the flashing lights described below;

C. a succession of white pyrotechnical lights.

- The following signals, used either together or separately, shall be used by an aircraft for the purpose of giving notice that the aircraft has a very urgent message to transmit concerning the safety of a ship, aircraft or vehicle, or of some person on board or within sight:

A. in radiotelegraphy, 3 repetitions of the group **XXX (– .. – – .. – – ..–)**, sent with the letters of each group, and the successive groups clearly separated from each other, and sent before the transmission of the message;

B. in radiotelephony, 3 repetitions of the words PAN, PAN, sent before the transmission of the message;

C. a succession of green pyrotechnical lights;

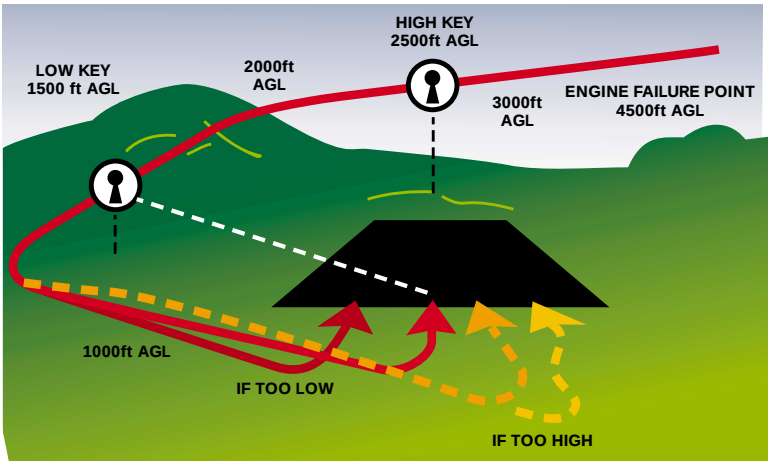
D. a succession of green flashes with signal apparatus.

SAFETY SIGNALS

- The safety signal shall be transmitted when an aircraft wishes to transmit a message concerning the safety of navigation or to give important meteorological warnings.
- The safety signal shall be sent before the call and:

A. in the case of radiotelegraphy shall consist of 3 repetitions of the group TTT (– – –), sent with the letters of each group and the successive groups clearly separated from each other; and

B. in the case of radiotelephony shall consist of the word "SECURITY", repeated 3 times.



INITIAL CHECK

Hold Altitude	Aim for best glide speed
Mixture	Rich
Carburettor heat	Full hot
Fuel On **Pump** On	**Change tanks**
Trim	To best glide speed

FIELD SELECTION

Wind -	Determine direction
Surroundings -	Power lines, trees
Size & Shape -	In relation to wind
Surface & Slope	
S(c)ivilisation -	Close proximity if possible

FMOST CHECK

Fuel	Contents, pump on, primer locked
Mixture	Up & down range, leave rich
Oil	Temps & pressures green range
Mags switch	Left then right back to both
Throttle	Up & down range, then close

MAYDAY CALL & SQUAWK 7700

"Mayday Mayday Mayday
Sydney ZFR a Piper
Engine Failure
3nm west of Picton 4500 feet
attempting to land on road"

Any other useful information such as number of passengers etc.

BRIEF YOUR PASSENGERS

FINAL ACTIONS

Fuel	Off
Mixture	Close
Mags	Off
Harness	Tight
Door	As required
Master switch	Off
Caution	If flaps are electrically operated

STAY WITH YOUR AIRCRAFT

It is much easier for air search observers to spot an aircraft than a walking survivor, and this applies whether your aircraft is still in one piece or not.

However, there are two exceptions to this rule:

- If your aircraft is completely hidden from air observation by trees or undergrowth, etc try to find a clearing where you can set up signals for search aircraft.
- If you are absolutely certain that a town, settlement, road or homestead is within reasonable distance, you could walk out – but if you do, leave notes for a land search party telling them what you are doing and leave a trail which they can follow. See signal codes, page 334.

WATER

Salvage your water supply, conserve it as much as possible and augment it if you can, by rain, dew, river water or any other means. For example, dig down in the middle of the sandy bed of a watercourse to locate a soak, or distil salt water by holding a cloth in the steam of boiling water and wringing it into a container.

Water is more important to survival than food – you can comfortably do without food for 48 hours or more, but lack of water causes dehydration and only one-fifth of the body's fluids (about 11 litres) can be lost if an individual is to survive.

Under desert survival conditions, the preferred method, after a forced landing, is to wait until your are extremely thirsty before drinking at all and then to drink at the rate at which sweating is taking place. This method ensures that there is little impairment in efficiency and wastes no water. You can also save water by reducing sweating, eg: by keeping in the shade, not exposing the skin to sun or hot winds and resting during the day. If water supplies have to be restricted, do not take salt or eat salty foods.

DO NOT drink URINE under any circumstances.

Minimum water requirements per person to maintain the correct balance of body fluid, when resting in the shade, are:

Mean temperature (Degrees C)	35	32	30	27 or below
Litres per 24 hours	5	3.5	2.5	1

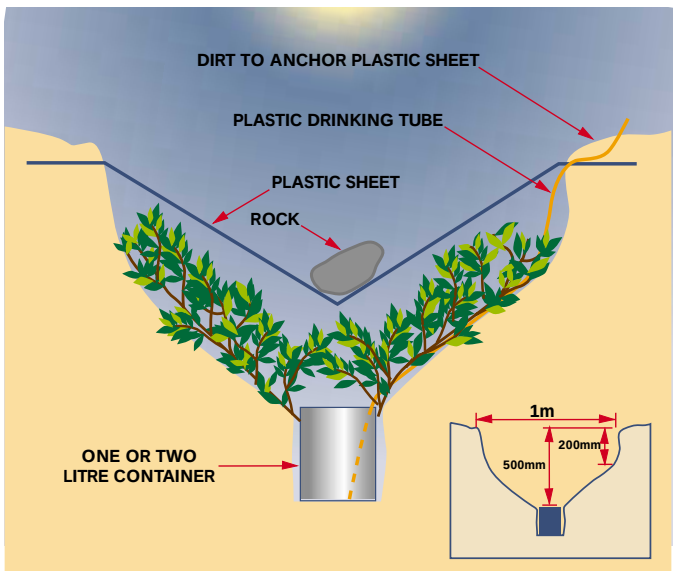
(Mean temperature is usually about 8°C below daily maximum)

If you do decide to walk out you will double the body's need for water. In desert or semi-desert areas, walk only at night or in the early morning. For every 4.5 litres of water carried, you should be able to walk 32 kilometres at night in these types of terrain.

DO NOT DRINK SALT WATER

EMERGENCY WATER STILL

To supplement supplies, an emergency water still, requiring the carriage of some equipment, can extract small amounts of water from soil that looks quite dry, if set up in this manner.



Foliage (if available) should be placed as illustrated around the container under the plastic sheet. Clear polythene which 'wets' easily is best for the purpose but ordinary clear kitchen polythene sheet (or preferably the thicker 100µm variety such as is laid down before concrete floors, etc., are poured) is satisfactory, particularly if its surface is roughened so that the droplets of water will cling to it more easily and will not be wasted by dropping off before they run down to the point of the cone. It is wise to cut the sheets to size and roughen them with sandpaper before they are stored in the aircraft, rather than waiting until one is stranded somewhere in the outback. If a 'nesting' set of containers is obtained and the sheets and tubing rolled inside them, a very compact bundle can be made. But see that it is very well wrapped – it may have to lie around in the luggage compartment for a long time before it is needed.

SIGNALING

If you have a Locator beacon, operate it as described in "EMERGENCY ACTIVATION OF DISTRESS BEACONS (on page 320)".

Collect wood, grass, etc., and build several signalling fires – preferably in the form of a triangle. Use oil from the engine and tyres to make black smoke. Unless there is ample firewood in the area, do not light fires until you hear or see search aircraft, or until desperate. Be careful to have a fire break between the fires and your aircraft. Try to have the fires downwind from the aircraft.

Conserve your batteries if the aircraft radio is undamaged. After one attempt to contact an airways operations unit, do not use your transmitter until you hear or see search aircraft. Maintain a listening watch, as search aircraft may broadcast information or instruction in the hope that you can receive. Make a note of, and call on the overlying controlled airspace frequency. And watch for contrails.

Make signals on the ground using the 'Search and Rescue Ground Signals illustrated' in this section and in the EMERG Section.

Aircraft may fly over your notified route on the first or second night. Light the fires as soon as you hear them, and if possible keep them burning all night.

If you do not have a heliograph or a mirror, try to remove some bright metal fittings from your aircraft for signalling – any flash seen by the aircraft will be investigated.

GROUND - AIR VISUAL SIGNAL CODE FOR USE BY SURVIVORS		
NO	**Message**	**Code Signal**
1	Require Assistance	**V**
2	Require Medical Assistance	**X**
3	Proceeding in this Direction	→
4	Yes or Affirmative	**Y**
5	No or Negative	**N**
	If in doubt use International Symbol	**SOS**

GROUND - AIR VISUAL SIGNAL CODE FOR USE IN CIVIL EMERGENCIES		
NO	**Message**	**Code Signal**
1	Require Fodder	**FF**
2	Require Evacuation	**III**
3	Power Failure	**VI**

HYGIENE

To remain in reasonable condition, you should take as much care as possible to avoid accidents or illness. The following hints may help:

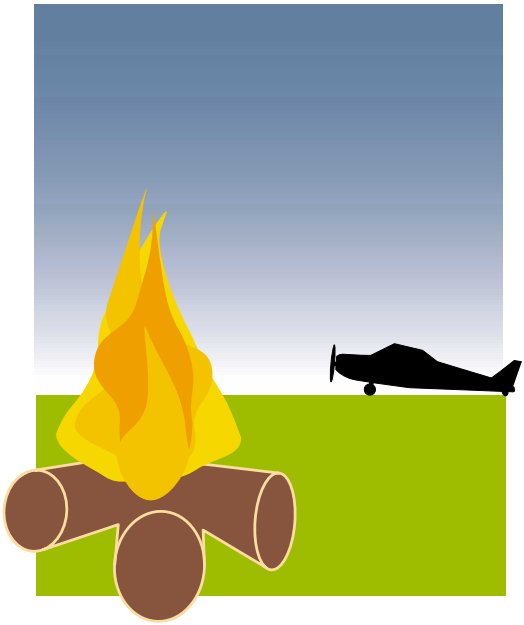
- keep your body and clothes as clean as possible;
- always wash your hands before eating;
- dispose properly of body wastes, garbage, etc., in trenches;
- if possible, sterilise or boil water and cook food to avoid gastric troubles;
- avoid activities which may lead to injury;
- keep your clothing dry;
- keep your head covered when in the sun; and
- do not sleep on the ground – make a raised bed with aircraft seats, wood and dry leaves, etc.

SHELTER

Some type of shelter is essential whatever type of terrain you have come down in. If your aircraft is not badly damaged, it may be used as a shelter, otherwise you should use whatever is available from the aircraft and, by the use of trees, etc., rig up a temporary tent as protection against the weather.

FIRES

You may find that a fire is essential for warmth, cooking, drying clothes, distilling or purifying water, etc. If there is plenty of wood available this should prove no problem, but otherwise you may have to improvise a stove from a can or other container. Fuel for such a stove could be oil or fat, using a wick, or petrol and a 75 mm layer of fuel-impregnated sand.



RADIO FAILURE

In the event of communication failure, MAINTAIN TERRAIN CLEARANCE THROUGHOUT ALL PROCEDURES.

ACKNOWLEDGMENTS BY AN AIRCRAFT

In Flight

- During the hours of daylight: by rocking the aircraft wings.

  NOTE: This signal should not be expected on the base and final legs of the approach.

- During the hours of darkness: by flashing on and off twice, the aircraft's landing lights or, if not so equipped, by switching on and off twice, its navigation lights.

On the Ground

- During the hours of daylight: by moving aircraft's ailerons or rudder.
- During the hours of darkness: by flashing on and off twice, the aircraft's landing lights or, if not so equipped, by switching on and off twice, its navigation lights.

IF VFR OCTA

STAY IN VMC

- BROADCAST INTENTIONS (assume transmitter is operating and prefix calls with "TRANSMITTING BLIND")
- REMAIN VFR OCTA AND LAND AT THE NEAREST SUITABLE NON-MBZ AERODROME. REPORT ARRIVAL TO ATS IF ON SARTIME OR REPORTING SCHEDULES. SEARCH AND RESCUE TELEPHONE NUMBER 1800 815 257.
- IF IN CONTROLLED/RESTRICTED AIRSPACE OR IF IFR IN ANY AIRSPACE SQUAWK 7600 IF TRANSPONDER EQUIPPED. LISTEN OUT ON ATIS AND/OR VOICE MODULATED NAVAIDS. TRANSMIT INTENTIONS AND NORMAL POSITION REPORTS [IFR ONLY] INTENTIONS (assume transmitter is operating and prefix calls with "TRANSMITTING BLIND")

AND

- IF IN VMC AND CERTAIN OF MAINTAINING VMC STAY IN VMC AND LAND AT THE MOST SUITABLE AERODROME. (NOT SPECIAL PROCEDURES IF PROCEEDING TO A GAAP). REPORT ARRIVAL TO ATS.

OR

- IF IN IMC OR UNCERTAIN OF MAINTAINING VMC

NOTES:

- Initial and subsequent actions by the pilot at the time of loss of communications will depend largely on the pilot's knowledge of the destination aids, the air traffic/air space situation and meteorological conditions en-route and at the destination. It is not possible to publish procedures that cover all radio failure circumstances. The following procedures ensure that Air Traffic services and other traffic should be aware of the pilot's most likely actions. Pilots should follow these procedures unless strong reasons dictate otherwise.
- In determining the final level to which a pilot will climb after radio failure, ATC will use the level provided on the Flight Notification, or the last level requested by the pilot and acknowledged by ATC.

INITIAL ACTIONS

IF NO CLEARANCE LIMIT RECEIVED AND ACKNOWLEDGED

Proceed in accordance with the latest ATC route clearance acknowledged and climb to planned level.

IF A CLEARANCE LIMIT INVOLVING AN ALTITUDE OR ROUTE RESTRICTION HAS BEEN RECEIVED AND ACKNOWLEDGED

- Maintain last assigned level, or minimum safe altitude if higher, for three minutes, and /or
- Hold at nominated location for three minutes, then
- Proceed in accordance with the latest ATC route clearance acknowledged and climb to planned level.

IF BEING RADAR VECTORED

- Maintain last assigned vector for two minutes, and
- CLIMB IF NECESSARY TO MINIMUM SAFE ALTITUDE, to maintain terrain clearance, then
- Proceed in accordance with the latest ATC route clearance acknowledged.

IF HOLDING

- Fly one more complete holding pattern, then
- Proceed in accordance with the flight plan or the latest ATC clearance acknowledged, as applicable.

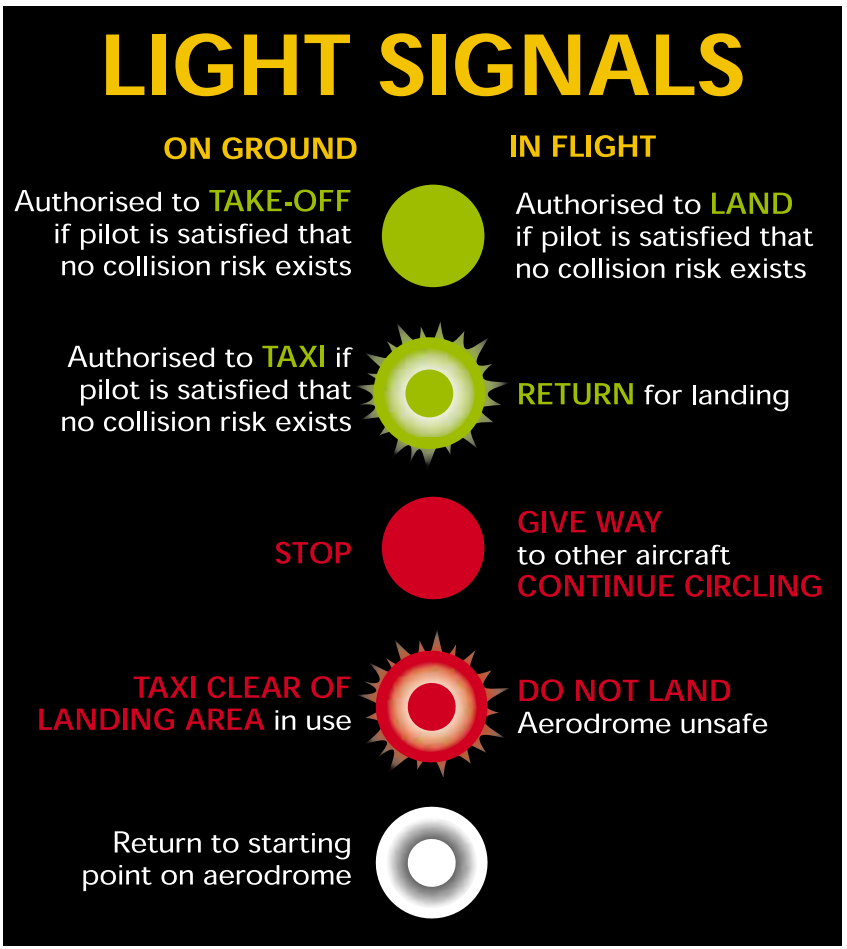
DESTINATION PROCEDURES

Track to the destination in accordance with flight plan (amended by the latest ATC clearance acknowledged, if applicable).

Commence descent in accordance with standard operating procedures or flight plan.

SPECIAL PROCEDURES – GAAP

Carry out general COM Failure procedures. Enter GAAP control zone at 1500FT or as detailed in ERSA. Track via the appropriate General Aviation approach points. Proceed to overhead the aerodrome at that altitude. Ascertain landing direction, descend to join desired circuit at circuit altitude via the downwind entry point (remain clear of other circuit). Proceed with normal circuit and landing, maintain separation from other aircraft. Watch for light signals from the tower.



If your aircraft is fitted with a Navigational Aid, selecting the appropriate frequency and listening for instructions may be a possibility. Generally speaking this is one of the most effective ways of proceeding safely.

When tower is active follow normal procedure. Watch tower for light signals.

COMMUNICATION AND NAVAID FAILURE

In the event of complete failure of communications and navigation aids, MAINTAIN TERRAIN CLEARANCE THROUGHOUT ALL PROCEDURES and proceed as follows:

IF VFR OCTA

STAY IN VMC. BROADCAST INTENTIONS (assume transmitter is operating and prefix calls with "TRANSMITTING BLIND"). REMAIN VFR OCTA AND LAND AT THE NEAREST SUITABLE NON-MBZ AERODROME. REPORT ARRIVAL TO ATS IF ON SARTIME OR REPORTING SCHEDULES.

IF IN CONTROLLED/RESTRICTED AIRSPACE OR IF IFR IN ANY AIRSPACE

SQUAWK 7600 IF TRANSPONDER EQUIPPED. LISTEN OUT ON ATIS AND/OR VOICE MODULATED NAVAIDS. TRANSMIT INTENTIONS AND NORMAL POSITION REPORTS [IFR ONLY] (assume transmitter is operating and prefix calls with "TRANSMITTING BLIND"). IF PRACTICABLE LEAVE/AVOID CONTROLLED/RESTRICTED AIRSPACE AND AREAS OF DENSE TRAFFIC. AS SOON AS POSSIBLE ESTABLISH VISUAL NAVIGATION. LAND AT THE MOST SUITABLE AERODROME. (NOTE SPECIAL PROCEDURES IF PROCEEDING TO A GAAP). REPORT TO ATS ON ARRIVAL.

EMERGENCY CHANGE OF LEVEL IN CONTROLLED AIRSPACE PROCEDURES

When it is necessary for an aircraft in controlled airspace to make a rapid change of flight level or altitude because of technical trouble, severe weather conditions, or other reasons, the change will be made as follows using urgency message format, stating level changes involved and diversions if applicable.

- SQUAWK SSR CODE 7700
- TRANSMIT: PANPAN, PANPAN, PANPAN
- AGENCY BEING CALLED
- AIRCRAFT IDENTIFICATION
- NATURE OF URGENCY PROBLEM
- INTENTION OF PERSON IN COMMAND
- PRESENT POSITION FLIGHT LEVEL OR ALTITUDE AND HEADING
- ANY OTHER USEFUL INFORMATION

A FLIGHT MAY BE DECLARED A MERCY FLIGHT WHEN;

When an urgent medical, flood or fire relief or evacuation flight is proposed in order to relieve a person from grave and imminent danger and failure to do so is likely to result in loss of life or serious or permanent disability and the flight will involve irregular operation, a Mercy flight must be declared.

A mercy flight must only be declared by the pilot in command and the factors/risks that the pilot in command must consider in the declaration, commencement and continuation of the flight are detailed in ENR 1.1-91 77.1.1.

A flight must not be declared a Mercy flight when;

- it can comply with the applicable regulations and orders; or
- operational concessions to permit the anticipated irregular operations can be obtained.

In these cases, the flight should be notified as Search and rescue (SAR), Medical (MED), Hospital Aircraft (HOSP), Flood or Fire Relief. Special consideration or priority will be granted by ATC if necessary.

A Mercy flight must not be undertaken when:

- alternative means of achieving the same relief are available; or
- the crew and other occupants of the aircraft involved will be exposed to undue hazards; or
- relief or rescue can be delayed until a more suitable aircraft or more favourable operating conditions are available.

In assessing the justification of risks involved in a Mercy flight, the pilot must consider the following;

- the availability of alternative transport or alternative medical aid; or
- the weather conditions en route and at the landing place(s)
- the distance from which it should be possible to see the landing place;
- the air distance and the type of terrain involved;
- the navigation facilities useable and the reliability of those facilities (such as facilities may include landmarks; etc);
- the availability of suitable alternate aerodrome
- the availability and reliability of communications facilities
- the asymmetric performance of the aircraft;
- whether the pilot's experience reasonably meets the requirements of the mercy flight;

- the effect on the person requiring assistance if the flight is delayed until improved operating conditions exist;
- whether the flight is to be made to the nearest or most suitable hospital; and
- the competence of the authority requesting the Mercy flight

The pilot in command of a Mercy flight must:

- give flight notification as required for a charter flight and identify the flight by the term "MERCY FLIGHT". This notification must include the reason for the Mercy flight and reference to any rule or regulation which will not be complied with;
- specify reporting points or times when contact will be made;
- specify the special procedures intended or special assistance required of the ground organisation; and
- limit the operating crew and the persons carried in the aircraft to the minimum number required to conduct the flight.

If the Mercy flight applies only to a portion of the flight this must be stated in the flight notification. If a normal flight develops into a Mercy flight, the pilot in command must take appropriate action.

The pilot in command must submit an Air Safety Incident Report (ASIR) on any Mercy flight undertaken, summarising the aspects of irregular operation which caused the operation to be considered under the Mercy flight provisions and the factors which led to the decision to make the flight. This report must include the name and address of the authority requesting the Mercy fight and, in medical cases, the name of the patient.