4 Search and Rescue Information and Procedures

Former *Annual New Zealand Notice to Mariners, No. 4,* published 1 July 2023 is cancelled. Additions and amendments to the former notice are indicated by sidelines.

Authorities: Civil Aviation Authority, Maritime New Zealand, New Zealand Defence Force (Headquarters Joint Force New Zealand)

New Zealand Search and Rescue Sector (NZSAR)

1. The New Zealand Search and Rescue (NZSAR) sector provides assistance to ships and aircraft missing or in distress in the New Zealand Search and Rescue Region (NZSRR). The organisation is based on the utilisation of civilian and military facilities which are coordinated and controlled through the Rescue Coordination Centre New Zealand (RCCNZ).

Note: Towage or salvage operations are not the function of RCCNZ.

Search and Rescue Coordinating Authorities

2. There are only two Coordinating Authorities for Search and Rescue Operations (SAROPs) in the NZSRR; the New Zealand Police for Category I (CAT I) SAROPs and RCCNZ for Category II (CAT II) SAROPS. Both organisations cooperate closely to ensure the response to a search and rescue (SAR) incident is coordinated by the appropriate Coordinating Authority.

Rescue Coordination Centre New Zealand (RCCNZ)

3. RCCNZ is situated in the Avalon Studios, 41 Percy Cameron Street, Lower Hutt and is responsible for initiating, coordinating, and concluding CAT II search and rescue operations within the NZSRR. The RCCNZ Search and Rescue Officer is responsible for coordinating representatives of civilian and military organisations considered necessary in order to cover the requirements for any SAR operation.

	Telephone	Fax	Others
RCCNZ **24-Hour Emergency** **Administration**	NZ: 0508 472 269 Int: +64 4 577 8030 NZ: 04 577 8034 Int: +64 4 577 8034	NZ: 04 577 8038 Int: +64 4 577 8038 NZ: 04 577 8041 Int: +64 4 577 8041	Inmarsat-C (POR): 451 200 067 Email: rccnz@maritimenz.govt.nz
Taupo Maritime Radio (ZLM)	+64 4 550 5280		Inmarsat-C (POR): 451 200 067 Email: maritime@kordia.co.nz

SAROPS are classified as follows:

CAT I	A SAROP coordinated at the local level; including land operations, subterranean operations, river, lake and inland waterway operations and close-to-shore marine operations. Notes 1. The nature of 'close-to-shore' will vary according to the availability of local resources and the need to task national assets. Typically such operations will be within New Zealand Territorial Waters (12 nautical miles). 2. Category I SAROPs typically require the use of local personnel and resources and can be carried out efficiently and effectively at the local level.
CAT II	A SAROP coordinated at the national level; including operations associated with missing aircraft or aircraft in distress and off-shore marine operations within the New Zealand Search and Rescue Region. Note 1. Category II SAROPs typically require the use of national or international resources and may involve coordination with other States.

Close To Shore Rescues

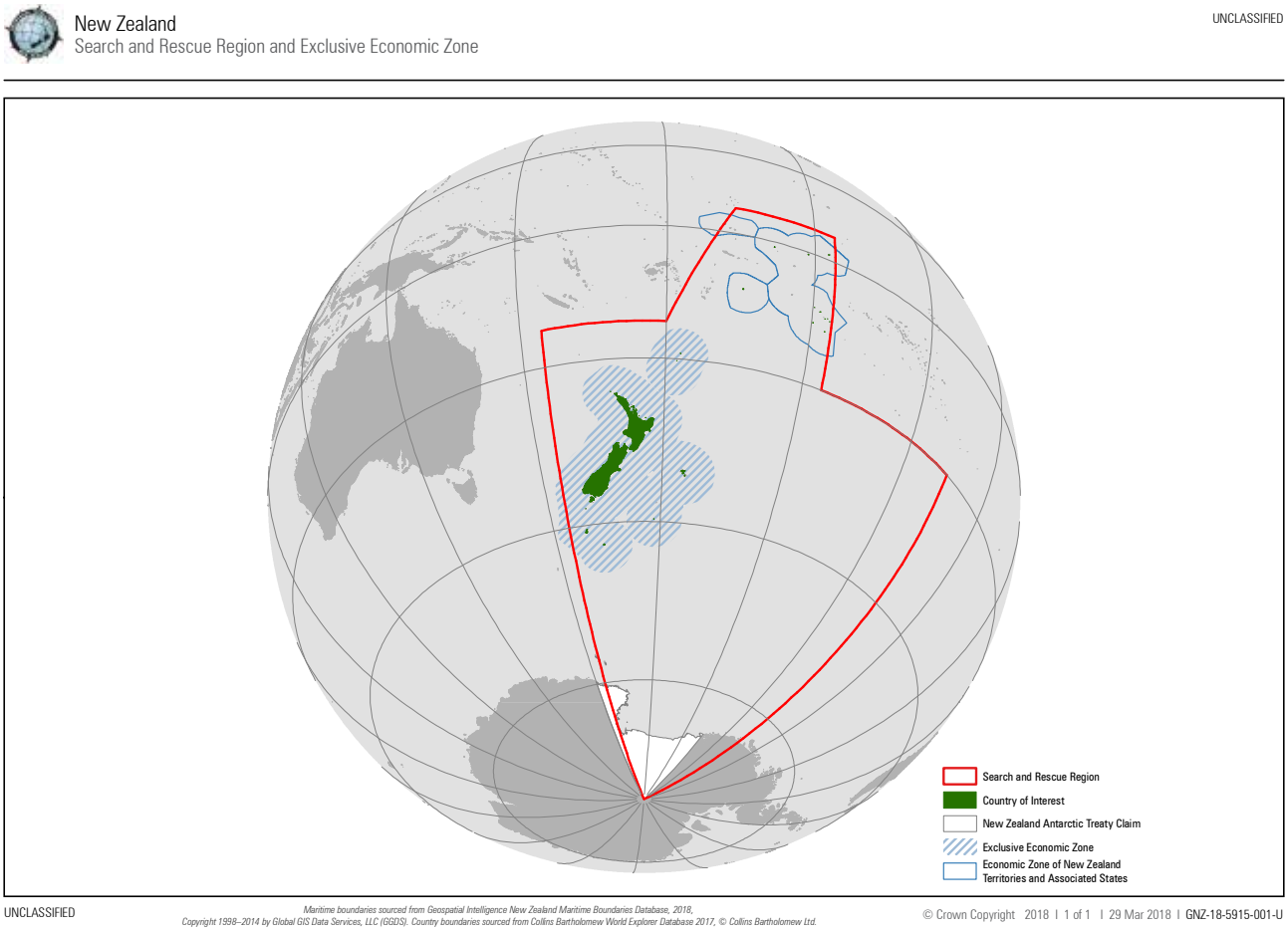
4. The New Zealand Police and RCCNZ are assisted by local organised groups throughout New Zealand to provide voluntary, advisory, and operational assistance to the NZSAR.

New Zealand Search and Rescue Region

5. A diagram of the NZSRR which extends to 90° South, is shown below.

The NZSRR is described by a closed polygon as follows:

Vertex	Latitude	Longitude
1	25° 00'S	163° 00'E
2	25° 00'S	180° 00'E
3	15° 33'S	175° 41'W
4	05° 00'S	171° 00'W
5	05° 00'S	157° 00'W
6	30° 00'S	157° 00'W
7	30° 00'S	131° 00'W
8	90° 00'S	131° 00'W
9	25° 00'S	163° 00'E



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Obligation to Render Assistance

6. Masters of vessels in a distress area should endeavour to give the utmost assistance to persons in distress at sea, and cooperate fully in any SAR operation which is being directed from RCCNZ.

   Section 32 of the *Maritime Transport Act 1994* provides that the master or person in charge of a ship shall, so far as they can do so without serious danger to their own ship, her crew and passengers (if any), render assistance to every person who is found at sea in danger of being lost; an offence is committed by anyone who fails to comply with Section 32. Similar provisions are included in the International Maritime Organization's *International Convention for the Safety of Life at Sea, 1974,* (SOLAS).

Merchant Ship Position Reports

7. New Zealand does not operate a merchant shipping reporting system. New Zealand-owned ships are invited to comply with the International Maritime Organization recommendations which request all ships to participate in other member government merchant shipping reporting systems wherever they exist.

   For more information, see *Annual New Zealand Notices to Mariners, No. 4A* and *No. 4B*.

Guarding of Distress Frequencies

8. The radio watch on the international distress frequencies, which certain ships are required to keep when at sea, is also a vital factor in the coordination of rescue of people in distress at sea. This coordination will not be possible if ships are unable to alert each other, or to be alerted from shore for distress action. Every ship fitted with suitable radio equipment should make its contribution to safety by guarding those distress frequencies applicable for as long as practicable, whether or not required to do so by regulation.

EPIRBs (Emergency Position Indicating Radio Beacons)

9. Modern EPIRBs operating on a frequency of 406 MHz, with a low power homing transmitter on 121.5 MHz, can be located very accurately by the COSPAS-SARSAT/MEOSAR satellite system. The 406 MHz EPIRB has the capability of transmitting unique data containing details such as country of origin, the identity of the vessel and position information derived from either the EPIRB's on-board GPS or the vessel's navigation equipment. This information is transmitted to the ground stations via MEOSAR satellites and then to RCCs via a Mission Control Centre.

   A MEOLUT Local User Terminal has been installed along with two GEOLUTs in New Zealand providing coverage of the New Zealand Search and Rescue Region.

   Ships are reminded that EPIRBs must be registered and any accidental activation of an EPIRB must be immediately reported, preferably through Taupo Maritime Radio. This is purely to establish whether a vessel is in distress, and no costs or prosecution will result from reporting an accidental activation.

Aircraft Used for Search and Rescue Operations

10. Civilian or Royal New Zealand Air Force aircraft may be used for SAR operations. Search aircraft may be equipped with search radar and VHF/UHF Direction Finding (D/F) and homing capability.

Communications between search aircraft and merchant ships will normally be effected on the following frequencies:

156.8 MHz (Channel 16)	FM Voice	International Distress, Safety and Calling Frequency
2182 kHz	AM Voice	International Distress, Safety and Calling Frequency
3023 kHz	USB Voice	Scene of Search
5680 kHz	USB Voice	Scene of Search

Additionally, communications may be established using a signalling lamp or on the following frequencies:

123.1 MHz	AM Voice	Scene of Search VHF
282.8 MHz	AM Voice	Scene of Search UHF
121.5 MHz	AM Voice	International Aeronautical Emergency (VHF) (this frequency should only be used as a last resort)
243.0 MHz	AM Voice	International Aeronautical Emergency (UHF) (this frequency should only be used as a last resort)

Sea Rescue by Helicopter Procedures to Assist with Location by Helicopter

11. When a distress message is received from a ship in distress, or a medical evacuation is required, the rescue authorities may dispatch a helicopter to assist. Once the helicopter is airborne, the speed with which it locates the ship and the effectiveness of its work depends to a large extent on the cooperation of the ship concerned.

    From the air, especially if there is a lot of shipping in the area, it is very difficult for the helicopter pilot to identify the particular ship concerned, unless that ship uses a distinctive distress signal which can clearly be seen.

    Especially useful for helicopters are:

    (a) By day: orange smoke floats, or orange squares with V or circle, Aldis lamp or heliograph.

    (b) By night: Aldis lamp, night flares.

        i) It is essential that the ship's position be given as accurately as possible.

        ii) As many aircraft are equipped with GPS, latitude and longitude may be used.

        iii) Bearings should be described as true or magnetic, and must be given **from** a fixed object, such as a headland or lighthouse.

        iv) The description of the vessel and local weather conditions should be included if time allows.

        vi) Because of operational limitations, helicopters should not be delayed at the rescue scene. On large vessels a clear stretch of deck should be made available as a pick-up area if possible, and marked with a large letter "H" in white.

For all vessels, the following preparations need to be completed to ensure a safe transfer is made:

12. Note: These procedures may be modified on instructions from the pilot if communications exist.

    (a) Lower all masts, derricks, and radio aerials to provide a clear area for the helicopter to conduct the hoist.

    (b) Keep all unnecessary personnel out of the way while the helicopter is conducting hoist operations.

    (c) Under no circumstances must the hoist cable be attached to the vessel, sudden movements could cause the helicopter to crash if this is done.

    (d) Tie down or stow all loose gear which may be blown by the rotor wash, which can be up to 45 knots downwards. This includes hats, fishing gear, beverage cans, and paper. Nothing must be blown into the rotors, or become entangled with the hoist wire.

    (e) Allow the helicopter's rescue equipment to touch the vessel's deck before handling it. This will allow any static electricity charge present to dissipate. However this should be clear of any flammable mixture spillage or
    venting area to preclude a possible fire or explosion from an electrostatic discharge.

    (f) Ensure the person being hoisted is wearing a lifejacket, if at all possible. If it is a patient, they should be made as comfortable as possible, and if conscious, informed of the procedure of rescue.

    (g) When the helicopter arrives, change course to place the wind thirty degrees on the port bow, or as directed by the pilot and continue at standard speed.

(h) At night, floodlights are useful to illuminate the vessel, but they must be facing down.

(i) By day, the vessel should indicate the apparent wind by flag, smoke, or other means, as long as it does not impair the pilot's visibility.

(j) Personnel on the ship, and survivors leaving the helicopter when it has landed ashore, must obey the instructions of the pilot or crew. Approach and leave the helicopter only from forward, in clear view of the pilot, and stay well clear of the after part of the helicopter, in particular the tail rotor and engine exhausts.

Specifications for Helicopters Involved in SAR in New Zealand

13. Civilian Emergency Medical Service (EMS) helicopters are typically the main aviation resource used for medical evacuations from vessels. Typically all are fitted with marine VHF. Mariners should be aware that the ranges of operation and capabilities will vary, influenced by factors such as weather and visibility.

The main type of military helicopter used for SAR duties in New Zealand is the RNZAF NH90. Expect the NH90 to be deployed from Ohakea within two hours' notice to move (NTM).

This helicopter is routinely configured to transport/rescue up to 12 persons at a time at short range (100 NM).

The aircraft transits at 120 nautical miles per hour in fair weather conditions. This equates to transit times into area of operations (AO) of approx.;

– One hour if the search area is within the radius bound by Hamilton–Nelson.
– Allow up to two hours within the radius bound by Auckland–Greymouth–Christchurch.
– Allow up to four hours for Northland and Southland.

NH90 over-water SAR to vessels is dependent on a number of factors, including time of day, weather conditions, the number of persons, and the nature of the rescue and vessel. It is recommended that liaison commences with unit executives as soon as possible once it is believed that NH90 support will be required for over-water SAR.

Preparations may take longer than the stated two hours' NTM due to the potential to have to fit auxiliary fuel tanks.

The Seasprite is also sometimes used, and can rescue up to four persons. The Seasprite does not have a standard callout requirement and therefore would be utilised on an as required and as available basis.

The Seasprite is a maritime helicopter and therefore is fitted with equipment that allows over-water SAR operations at night. Additionally, the Seasprite is equipped with maritime search equipment including radar and forward looking infrared camera.

The Seasprite typically has a 80-100 NM radius of action (ROA), transits speed of 90 knots ground speed and has an endurance of about 2.5hrs (three pax on board).

NH90 and Seasprite helicopters are fitted with marine VHF, UHF and HF equipment. The HF equipment affords messages to be passed via shore.

Medical Evacuation (MEDEVAC) Checklist

14. (a) Craft with medical emergency – name, callsign
(b) Position – lat/long or bearing/distance
(c) Date/time of position
(d) Craft's course and speed
(e) Patient's name, nationality, age, sex, race
(f) Patient can/cannot speak English
(g) Patient's symptoms
(h) Medication given
(i) Medication available
(j) Radio frequencies in use, monitored, or scheduled
(k) Craft description
(l) Local agent and telephone/fax numbers
(m) Last port of call, destination, ETA
(n) On-scene weather and sea state
(o) Assistance required
(p) Other pertinent information

Use of Ships in Assisting to Locate Aircraft in Distress: Masters' Responsibilities

15. Aircraft which ditch cannot be assumed to stay afloat for long, but it should always be assumed that there will be survivors. Masters of ships within reasonable distance of an aircraft in distress should proceed with the greatest possible speed to its assistance.

If a ship receives a distress message direct from an aircraft or liferaft, a D/F bearing should be taken and passed to a maritime radio station and other vessels in the area, together with the callsign of the aircraft, time taken, and position of the ship.

Means by Which a Ship may Receive Distress Signals

16. Ships may receive distress signals in the following ways:
    (a) By Radio Telephony (R/T) on the appropriate international distress frequency; or
    (b) DSC, Radar, ECG broadcasts over SafetyNet and AIS.
    (c) By visual signals.

Radio Telephony (R/T) Distress Signals

17. Can be received from:
    (a) A distressed aircraft still in flight—see Appendix A of this Notice;
    (b) Survivors after the casualty has occurred, by a hand-operated emergency radio transmitter – see Appendix B of this Notice;
    (c) An international GMDSS distress frequency;
    (d) A maritime or aviation radio station; or
    (e) A distress relay from another vessel or aircraft.

    References:

    - For communications between aircraft stations and stations of the maritime mobile service, the provisions of Article 41 of the International Telecommunications Union's *Radio Regulations (Geneva 2012)* are obligatory.
    - For International Regulations on Distress, Urgency, and Safety Signals, see *ADMIRALTY List of Radio Signals, Volume 1,* NP281, (Parts 1 and 2).

Visual Distress Signals

18. Can be received from:
    (a) A distressed aircraft:

    Apart from obvious signs, an aircraft may indicate that it is in distress by firing rockets or shells throwing red lights fired one at a time or at short intervals or by firing a parachute flare showing a red light. Navigation markers dropped by aircraft at sea, emitting white or yellow smoke or flame and smoke, should not be mistaken for distress signals. Low flying is not in itself an indication of distress. Aircraft in distress which are forced to alight on the sea are instructed to do so ahead and in the lee of a ship.

    (b) An aircraft with an urgent message concerning safety:

    An aircraft having an urgent need to notify information relating to its own safety or that of another aircraft or ship, or the safety of any person on board or within sight may use one of the following signals:

    i) A succession of green pyrotechnic signals; or
    ii) A succession of green flashes with signal apparatus.

    (c) A search aircraft:

    When it is necessary for an aircraft to direct a ship to an aircraft or ship in distress, the aircraft will do so by transmitting precise instructions by any means at its disposal. If not by radio or signal lamp, the instructions will be given by carrying out the following manoeuvres:

    i) Circling the ship at least once;
    ii) Crossing the projected course of the ship close ahead at low altitude; and either rocking the wings, opening and closing the throttle, or changing propeller pitch*; or
    iii) Heading in the direction in which the ship is to be directed. If carried, smoke markers may be laid in the direction to proceed.

* Important Note: Due to high noise levels on board ships, the sound of changes in throttle settings and propeller pitch may be less effective than rocking the aircraft, and are regarded as alternative means of attracting attention. Green flares and/or white smoke markers may also be released by NZDF aircraft in the vicinity of vessels to indicate that assistance is required, and that the aircraft wishes to establish communications.

(d) Survivors in the sea:

Survivors in a liferaft or other flotation device may use any of the following signals:

i) Pyrotechnic signals emitting one or more red stars;

ii) Flashing a heliograph;

iii) Flashing SOS or other distinctive signal by hand torch or other signalling lamp;

iv) Blowing of whistles;

v) Fluorescent dye marker giving an extensive bright green colour to the sea around the survivors;

vi) A liferaft may also be located by yellow kite or balloon being flown to support the aerial for the emergency radio transmitter;

vii) EPIRB; or

viii) Hand held marine VHF transceiver.

When Assistance is No Longer Required

19. The following aircraft manoeuvres shall mean that the assistance of the ship to which the signal is directed is no longer required:

Crossing the wake of the ship close astern at a low altitude, and:

(a) Rocking the wings; or

(b) Opening and closing the throttle; or

(c) Changing the propeller pitch.

20. Ships should acknowledge receipt of signals from aircraft by hoisting the answering pennant (red and white vertical stripes), by flashing a succession of "T"s by signal light in morse code, or by making a change of heading to follow aircraft. Ships should immediately set watch on radio distress frequencies. If a ship is unable to comply, it should indicate this by hoisting the flag "N" (blue and white checkered squares), or by flashing a succession of "N"s in morse code.

Use of Aircraft in Assisting to Locate Shipping in Distress: Importance of a Distinctive Distress Signal

21. From the air, especially if there is a lot of shipping in the area, it is very difficult for a pilot to identify the particular ship in distress, unless that ship uses a distinctive distress signal which can clearly be seen. Especially useful are orange smoke floats and/or an orange fluorescent sheet with letter V or circle, during the day, or an Aldis lamp during the day or night. In bright sunlight, a heliograph may also be used. The display of these signals will save valuable time in locating the casualty, and may mean the difference between success and failure.

Providing Ship's Position

22. It is essential that the ship's position be given as accurately as possible. Bearings should be described as true or magnetic, and must be given **from** a fixed object, such as a headland or lighthouse. The description of the vessel and local weather conditions should be included if time allows.

Night Search Technique (see diagram below)

23. This technique takes advantage of the greater visibility of pyrotechnics at night. The aircraft will fly through the search area at between 3000 and 5000 feet and use track spacing of 5 – 20 miles. A green flare will be fired approximately every five-ten minutes and on turning.

When a green flare is sighted, it is most important that the following actions are taken:

(a) Wait for the glare of the green flare to die out;

(b) Fire one red flare;

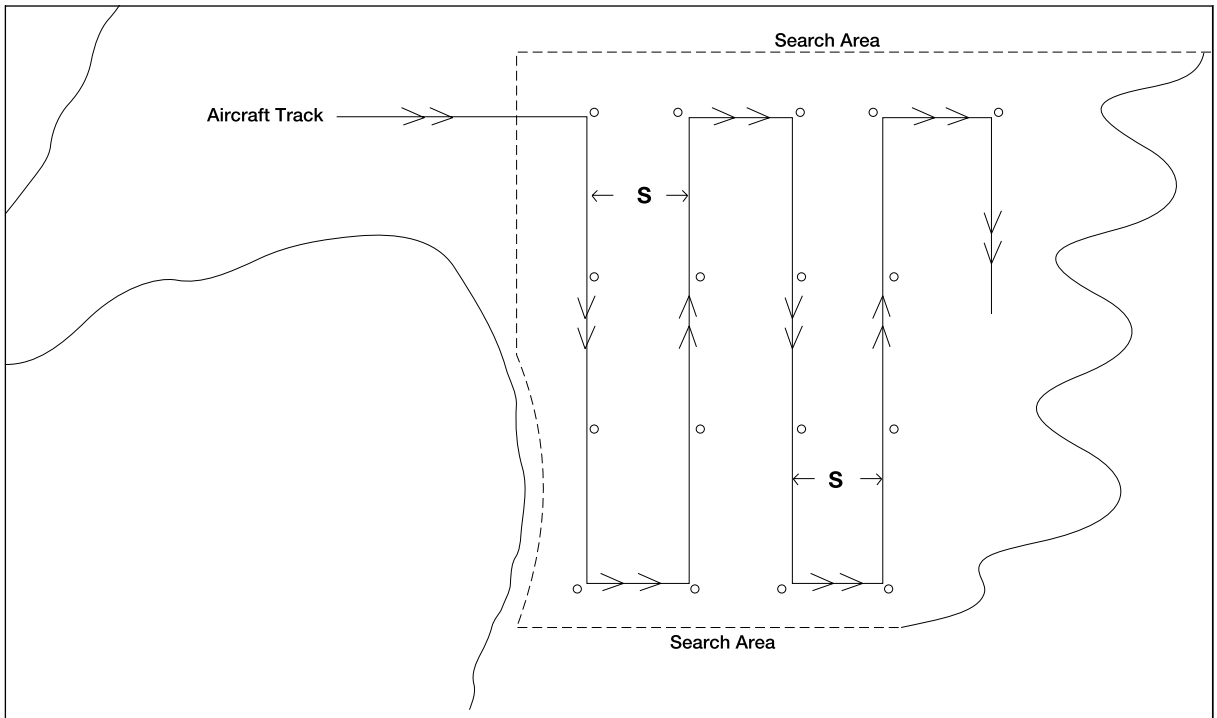
(c) Fire another red flare after about one minute to enable the aircraft to line up on your bearing; and

(d) Fire a third flare when the aircraft is overhead or appears to be going badly off course.

Important Notes:

- Each lifeboat or liferaft should carry at least three red flares.
- If all else fails, use any means at your disposal to attract attention.
- The aircraft will probably drop a marine marker to mark your position **Do Not Touch The Marker** – to do so could result in severe burns or major damage to a liferaft.
- The aircraft may also drop a sonobuoy to act as an electronic marker. Ships may talk to aircraft by recovering the sonobuoy hydrophone hung approximately 30 metres below the sonobuoy and speaking into it in a normal voice. The sonobuoy cannot receive transmission from the aircraft. A written message may also be attached to the buoy or dropped from the aircraft in a small package.

Night Search Technique



The aircraft will fly through the search area at between 3,000 and 5,000 feet, or below cloud if the base is lower. A green pyrotechnic signal will be fired every five to ten minutes, and at each turning point, shown as o in this diagram.

The spacing between adjacent tracks S depends upon the visibility from the aircraft.

Action to be Taken When an Aircraft is Forced to Ditch

24. The captain of a distressed aircraft will be materially assisted in locating a ship if the latter:

    (a) Transmits homing bearings to the aircraft or (if so requested) transmits signal enabling the aircraft to take its own bearings; and

    (b) By day makes black smoke; or

    (c) By night directs a searchlight vertically.

    Ditching an aircraft is difficult and usually dangerous. A ship which knows that an aircraft intends to ditch should, if practicable, try to provide a lee of calm water. This may be achieved by any means at the master's discretion, such as steering on a circular course through 360°.

    An aircraft will usually ditch on the starboard side of a ship and heading into the wind, although, when seas are running high, it may attempt to land along the trough of the seas. In the absence of communication, the former should be assumed.

    At night the ship should floodlight the ditching area as much as possible, without dazzling the pilot, who could lose control at a critical moment. If flame floats are available, six should be laid at 200 metre intervals in line astern to indicate the suggested alighting area.

Ditching Reports from Ships to Aircraft

25. Ditching reports when requested by aircraft should be transmitted in plain language and should comprise the following in the order indicated:

    (a) Unless previously established, position of the ship in lat/long at the time the observation was taken;

    (b) Corrected barometric pressure;

    (c) Surface wind direction in degrees magnetic;

    (d) Surface wind speed in knots;

    (e) Swell length, height, and direction.

    Use one of the following terms:

Swell Length

Term	Criteria
Short	0 – 100 metres
Average	100 – 200 metres
Long	over 200 metres

Swell Height

Term	Criteria
Low	0 – 2 metres
Moderate	2 – 4 metres
Heavy	over 4 metres

    (f) State of sea, specified by one of the terms from the table below, selected according to the average wave height as obtained from the larger well-formed waves of the wave system being observed;

Beaufort Force	Wind speed (Knots)	Sea State	Mean Wave Height (Metres)	Probable Maximum Wave Height (Metres)*
0-1	<4	Calm	<0.2	0.3
2-3	4-10	Smooth	0.5	1.0
4	11-16	Slight	1.0	1.5
5	17-21	Moderate	2.0	2.5
6	22-27	Rough	3.0	4.0
7	28-33	Very Rough	4.0	5.5
8	34-40	High	5.5	7.5
9-10	41-55	Very High	8.0	12.5
11-12	>55	Phenomenal	13.0	>16

* The extreme height may be greater

(g) Visibility (miles or metres);

(h) Amount and height above sea level of base of low cloud (both main layer and any scattered cloud below);

(i) Present weather;

(j) Remarks.

Action to be Taken When Aircraft Survivors are Rescued

26. A survivor from any aircraft casualty at sea who is rescued by a ship may be able to give information which will assist in the rescue of other survivors. Masters should ask the following questions and communicate the answers, together with the position of the rescuing vessel and the time the survivor was rescued, to a maritime radio station:

(a) Did you bale out, or was the aircraft ditched? What was the type and identification of the aircraft, and date and time of the accident?

(b) If you baled out, at what altitude?

(c) How many others did you see leave the aircraft by parachute?

(d) How many ditched with the aircraft?

(e) How many did you see leave the aircraft after ditching?

(f) How many survivors did you see in the water?

(g) What flotation gear did they have?

(h) What was the total number of persons aboard the aircraft before the accident?

(i) What caused the emergency?

Appendix A

Form of Distress Call and Message Transmitted by an Aircraft in Distress:

Aircraft will make distress calls on the air-to-ground frequency in use at the time, but may also make them on maritime R/T calling frequencies.

Aircraft rarely use W/T, but when used for distress will follow maritime procedures.

Distress Communication – **switch to full power** first:

Mayday (preferably spoken three times) followed by as many as possible of the following elements:

(a) Identification of the aircraft;

(b) Nature of distress;

(c) Intention of person in command; and

(d) Present position, altitude, and heading.

Note: The point of ditching could be appreciably different from "present position" depending on the altitude, heading and speed.

Appendix B

Form of Distress Signals from an Aircraft Liferaft:

Survival equipment normally includes either one or a combination of the following radio or visual facilities:

(a) A 406 MHz Emergency Position Indicating Radio Beacon (EPIRB). The 406 MHz frequency is monitored by the COSPAS-SARSAT/EPIRB satellite system alone.

(i) EPIRBs which are buoyant, water resistant, portable devices, normally activated by immersion in water and are capable of being operated away from the aircraft by unskilled persons. By international agreement, this type is mandatory equipment for aircraft on extended over-water flights.

(ii) Emergency Locator Transmitters (ELTs): there are two main types:

- Those attached to the aircraft structure and are either automatically ejected or permanently mounted. Both of these are automatically activated.
- An automatic portable type, which is normally fixed inside the aircraft but can be removed by survivors for use away from the aircraft.

(iii) Personal Locator Beacons (PLBs), which are designed to be carried by survivors and not intended to be fixed to the aircraft. Location of the beacon position is by satellite and/or by aircraft using Direction Finding (D/F) equipment.

(b) Light signalling by means of a lamp and hand key, or handheld reflecting mirror.