

# PRODUCT SUPPORT MANUAL

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Rev. E

## SR-103

Product No. 2727



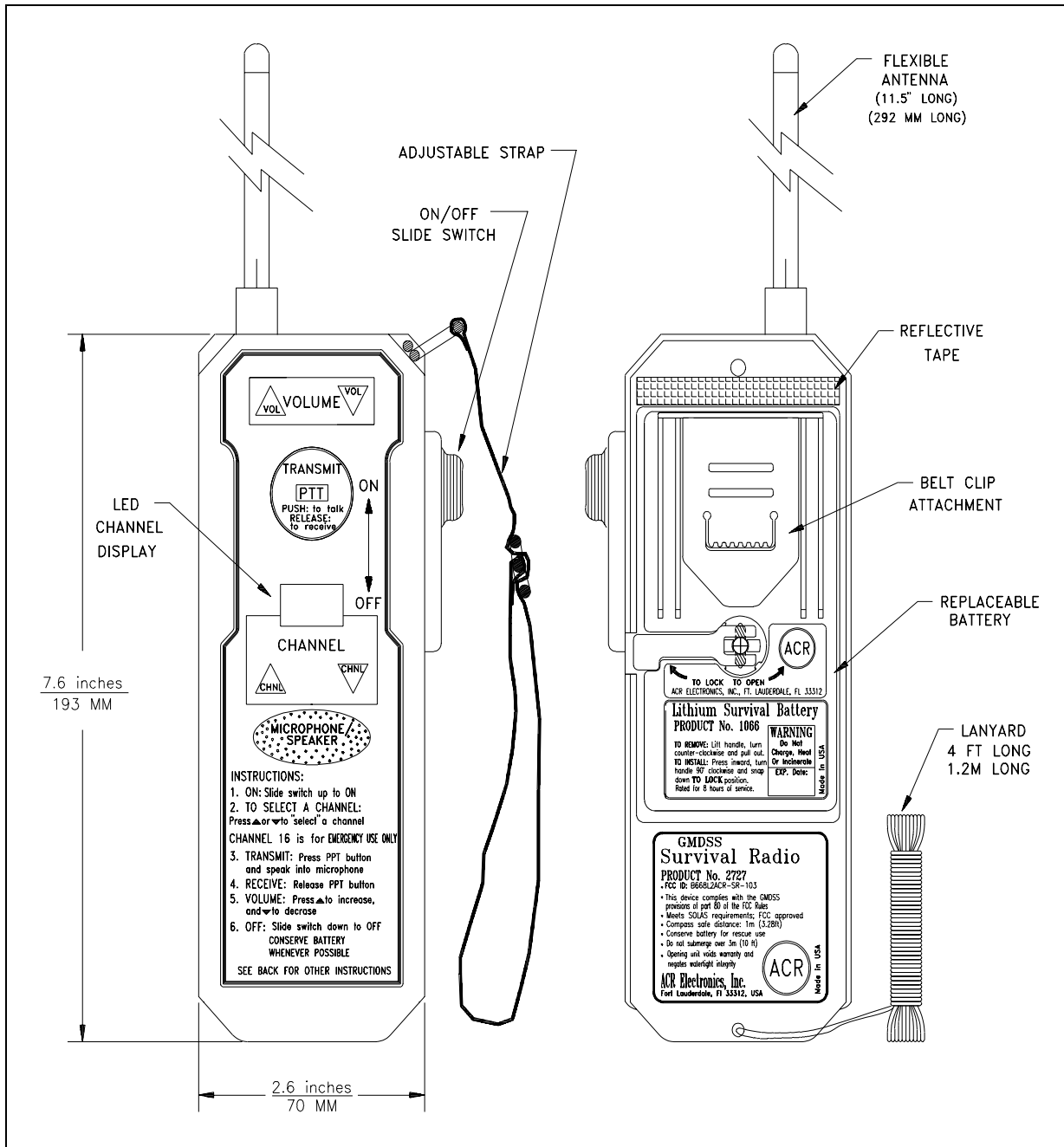
## GMDSS Survival Radio

*This radio meets GMDSS requirements only when used with ACR's Lithium Battery Product No. 1066. The performance specifications listed in this manual are based on the 1066 Lithium Battery as the power source.*

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**FIGURE 1: ACR/GMDSS SURVIVAL RADIO**

## 1.0 TECHNICAL SPECIFICATIONS

### Transmitter

Power Output (ERP)	500 mW $\pm$ 2.5 dB
Frequency Control	Quartz Crystal ( $\pm$ .001%)
Modulation Type	Phase
Max. Modulation	$\pm$ 5 kHz
Audio Bandwidth	300/2500 Hz

### Receiver

Sensitivity (12dB SINAD)	1.0 $\mu$ V
Audio Output	300 mW

### Battery

Type	Primary, Lithium
Storage Life	10 Years
Operating Life under typical duty cycle of 1:9 (i.e., 6 sec T <sub>X</sub> , 6 sec R <sub>X</sub> , 48 sec stand by)	8 hours @ -20°C

Optional MaxCap™ Rechargeable Battery for non-GMDSS use.

### Service Conditions

Temperature	-20°C to +50°C
Altitude	0 to 40,000 ft/0 to 12000 m
Waterproof	3 Meter Depth, maximum up to 5 minutes

### Physical Characteristics

Dimensions (Less Antenna)	
Height	7.6 in/19.3 cm
Width	2.6 in/ 6.6 cm
Thickness	1.7 in/4.3 cm
Antenna	11.5 in/29.2 cm
Weight (includes Battery)	1.0 lb/0.46 kg

CHANNEL	DESCRIPTION	TRANSMIT (MHz)	MODE	RECEIVE (MHz)
01A	Port Operations	156.050	S	156.050
02A	Port Operations	156.100	S	156.100
03A	Port Operations	156.150	S	156.150
04A	Port Operations	156.200	S	156.200
05A	Port Operations	156.250	S	156.250
06	Intership Safety	156.300	S	156.300
07A	Commercial, Intership	156.350	S	156.350
08	Commercial, Intership	156.400	S	156.400
09	Com'l/Non-Commercial	156.450	S	156.450
10	Commercial, Intership	156.500	S	156.500
11	Commercial, Intership	156.550	S	156.550
12	Port Operations	156.600	S	156.600
13	Bridge to Bridge	156.650	S	156.650
14	Port Operations	156.700	S	156.700
15	Environmental	156.750	S	156.750
16	Distress, Safety & Calling	156.800	S	156.800
17	Maritime Control	156.850	S	156.850
18A	Commercial, Intership	156.900	S	156.900
19A	Commercial, Intership	156.950	S	156.950
20A	Port Operations	157.000	S	157.000
21A	U.S. Government Only	157.050	S	157.050
22A	Liaison USCG Only	157.100	S	157.100
23A	Port Operations, Gov't only	157.150	S	157.150
60	Public Correspondence	156.025	S	156.025
61A	Public Correspondence	156.075	S	156.075
62A	Public Correspondence	156.125	S	156.125
63A	Com'l, Port Operations	156.175	S	156.175
64A	Public Correspondence	156.225	S	156.225

<b>CHANNEL</b>	<b>DESCRIPTION</b>	<b>TRANSMIT (MHz)</b>	<b>MODE</b>	<b>RECEIVE (MHz)</b>
65A	Port Operations	156.275	S	156.275
66A	Port Operations	156.325	S	156.325
67	Bridge-to-Bridge	156.375	S	156.375
68	Non-Commercial	156.425	S	156.425
69	Non-Commercial	156.475	S	156.475
71	Non-Commercial	156.575	S	156.575
72	Non-Commercial	156.625	S	156.625
73	Port Operations	156.675	S	156.675
74	Port Operations	156.725	S	156.725
75	Guardband (Rec. only)	-----	R	156.775
76	Guardband (Rec. only)	-----	R	156.825
77	Intership, Port Operations	156.875	S	156.875
78A	Non-Commercial	156.925	S	156.925
79A	Commercial, Intership	156.975	S	156.975
80A	Commercial, Intership	157.025	S	157.025
81A	U.S. Government Only	157.075	S	157.075
82A	U.S. Government Only	157.125	S	157.125
83A	U.S. Government Only	157.175	S	157.175
88A	Commercial, Intership	157.425	S	157.425
WX1	Weather (Receive Only) — NOAA			162.550
WX2	Weather (Receive Only) — NOAA			162.400
WX3	Weather (Receive Only) — NOAA			162.475
WX4	Weather (Receive Only) — CANADA			162.425
WX5	Weather (Receive Only)			162.450
WX6	Weather (Receive Only)			162.500
WX7	Weather (Receive Only) — CANADA			162.525
WX8	Weather (Receive Only) — ENVIRONMENTAL			161.650
WX9	Weather (Receive Only)			161.775
WX10	Weather (Receive Only)			163.275

## **2.0 INTRODUCTION**

### **2.1 THIS MANUAL**

2.1.1 This manual contains necessary information for the operation, maintenance and performance of distress communications utilizing the **ACR/2727** Survival Craft Portable Two-Way Radiotelephone. The user is strongly recommended to read this manual in its entirety. A photocopy of the suggested procedures for distress communications outlined in section 7.0 should be kept with each radiotelephone to aid the designated operator maximize the intelligibility and success of his radio distress request.

### **2.2 PURPOSE .2 PURPOSE**

2.2.1 The Survival Craft Portable Two-Way VHF Radiotelephone (Figure 1) is intended to be used for on-scene emergency communications between survival craft and ship, and survival craft and rescue units. The radio is equipped with a 5 year lithium survival battery pack which is user replaceable. With the lithium battery pack installed, the unit meets all IMO, SOLAS and FCC requirements for survival craft two-way VHF transceivers. An optional rechargeable MaxCap™ battery pack is also available so that the radio may also be used for everyday use.

### **2.3 AUTHORIZATION**

2.3.1 This radio is FCC Type Accepted and GMDSS listed (FCC Part 80.1101) as a survival craft two-way VHF radiotelephone apparatus which complies with the 1988 GMDSS SOLAS amendments. To install the radio on a survival craft, the host ship must have a valid Ship Station License as required by law. To obtain an application for an FCC Ship Station License (U.S. ships), the user should contact the nearest FCC office.

### **2.4 CARRIAGE REQUIREMENTS**

2.4.1 The following carriage requirements apply to all relevant SOLAS ships built on or after February 1, 1992, and to all relevant SOLAS ships as of February 1, 1995. Any vessel may voluntarily carry any number of two-way VHF radiotelephones provided it maintains a valid Ship Station License:

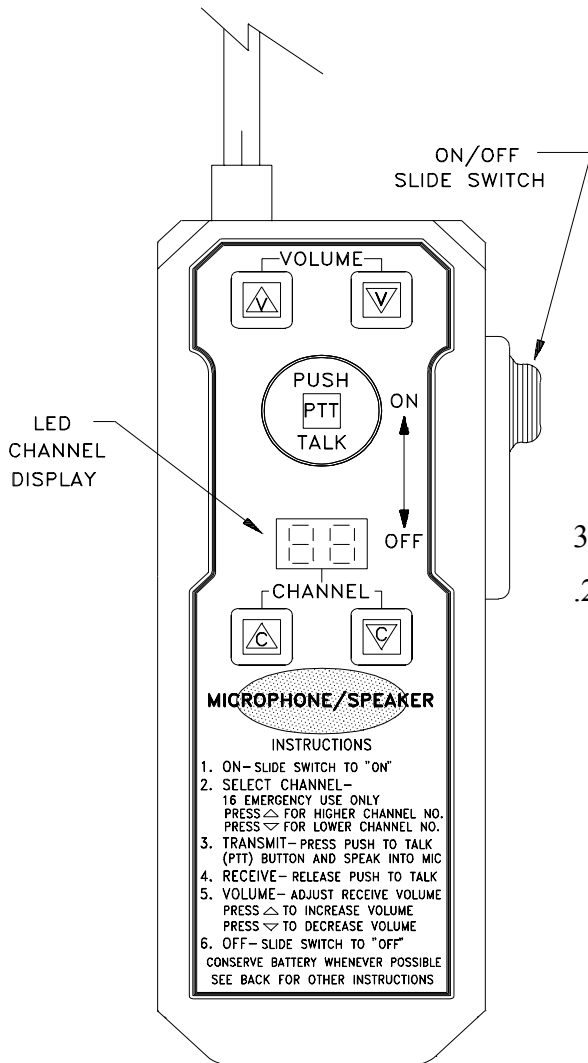
1. A minimum number of two (2) two-way VHF radiotelephones are required for SOLAS cargo ships of between 300-500 gross tons.
2. A minimum number of three (3) two-way VHF radiotelephones are required for SOLAS passenger ships and SOLAS cargo ships of 500 or more gross tons.

NOTE: These carriage requirements are subject to change. For the latest information, please refer to International Maritime Organization (IMO).

## **3.0 OPERATING CONTROLS AND INDICATORS**

### **3.1 OPERATING CONTROLS .1 OPERATING CONTROLS**

All controls (except the ON/OFF switch) are flat panel push types located on the front surface of the radio (see Figure 2, Control Panel).



**Figure 2: GMDSS Survival Radio Control Panel**

**ON/OFF** Slide up to turn ON, and slide down to turn OFF.

**VOLUME ▲** Increases audio output level to maximum.

**VOLUME ▼** Decreases audio output level.

**PTT** Push To Talk activates transmitter while switch is depressed. When switch is released, radio returns to receive mode automatically. (Also refreshes channel display for 1 second.)

**CHANNEL ▲** Switches channels in increasing channel order.

**CHANNEL ▼** Switches channels in decreasing channel order.

### 3.2 OPERATING INDICATORS

#### 2 OPERATING INDICATORS.2 OPERATING INDICATORS

**CHANNEL ▲** This switch includes a RED light which will be illuminated when the radio is ON and the Channel ▲ is selected.

**CHANNEL ▼** This switch includes a GREEN light which will be illuminated when the radio is ON and Channel ▼ is selected.

**VOLUME ▲ ▼** Both of these switches will light up YELLOW when the Push To Talk switch is depressed, indicating that the radio is transmitting.

**PTT** This switch blinks YELLOW at a slow rate to assist operator in locating the PTT (Push To Talk) switch in darkness.

**CHANNEL** Indicates which channel is selected.

#### DISPLAY

**0 1** through **8 8** VHF Marine Band Channels

**- 1** through **- 0** VHF Marine Weather Channels

## 4.0 OPERATION .0 OPERATION



4.1 To activate the unit.1 To activate the unit:

- a) Locate slide switch on upper right side of unit (Figure 1).
- b) Using thumb, push slide switch up to ON position.
- c) Front panel will illuminate and noise will be heard coming from speaker. After 3 seconds, automatic squelch will mute the noise.
- d) To turn unit off, push slide switch down to OFF position.

4.2 To select a channel.2 To select a channel:

CAUTION: To assure ease of operation in an emergency, the radio will be tuned to Channel 16 immediately after it has been turned on. In non-emergency situations, the user *must* select a new channel. Channel 16 should only be used in the event of an emergency.

- a) To select the next higher channel, briefly press the CHANNEL ▲ key.
- b) To select the next lower channel, briefly press the CHANNEL ▼ key.
- c) To select other channels, press and hold either the CHANNEL ▲ key or the CHANNEL ▼ while observing the channel display. Release the key when the desired channel appears on the display.
- d) Certain channels used internationally for duplex operation, have been designated in the United States by the FCC with an “A” suffix as simplex channels. The GMDSS Survival Radio uses simplex (single-frequency) operation only. Therefore, these channels all have an “A” suffix:

01A	04A	61A	64A	78A	81A	
02A	05A	62A	65A	79A	82A	88A
03A	07A	63A	66A	80A	83A	

- e) The channels appear on the display in the following order:

- VHF marine band channels 01A — 28
- VHF marine band channels 60 — 88A
- VHF marine weather channels -1 through -0, display (WX1 — WX10)

The order is rolled over, i.e., WX10 is followed by Channel 1A.

- f) The channel designators are displayed as follows:
  - 1) Simplex only channels — the channel number remains on the display for five (5) seconds after the CHANNEL ▲ or CHANNEL ▼ key is released. The display is then blanked to conserve battery power.
  - 2) Simplex/duplex channels (“A” suffix) — The ACR survival radio uses simplex mode only. After the channel has been selected, the channel number followed by the “A” alternately flash one (1) second each for five (5) seconds. The display is then blanked.

- 3) Weather channels — The display consists of a “-” followed by the single-digit channel number. For WX10, the display shows -0. The display is lighted for five (5) seconds after the channel is selected, then is blanked.
- g) To restore the channel display, press PTT briefly. LEDs will show current channel number for one (1) second (simplex/duplex channels — channel numbers for ½ second followed by an “A” for ½ second).

#### 4.3 To receive a channel and set volume.3 To receive a channel and set volume:

- a) The radio is in receive mode as soon as a channel is selected. Automatic squelch circuit will cause unit to be silent unless a signal is present on the selected channel.
- b) To lower the volume, press the VOLUME ▼ key. Repeated pressing of the VOLUME ▼ key will step through the volume settings until lowest setting is reached.
- c) To raise the volume, press VOLUME ▲ key. Unit will be set to maximum volume.
- d) To receive very weak signals, it may be helpful to turn off the automatic squelch. This may be done by pressing both VOLUME ▲ and VOLUME ▼ simultaneously. Noise will be heard from speaker when squelch is turned off. Pressing any key will restore the automatic squelch.

CAUTION: Operating unit with squelch off for long periods of time will reduce battery life.

#### 4.4 To transmit.4 To transmit:

- a) Select channel as in section 3.2.
- b) Press and hold PTT (Push To Talk) button. PTT, VOLUME ▲ and VOLUME ▼ keys will illuminate.
- c) Speak loudly and clearly into speaker area from a distance of approximately 3" to 6" (7.5 to 15 cm).
- d) Release PTT button to return to receive mode.

#### 4.5 Battery save feature

- a) To conserve battery life, the unit will automatically shut-off following a period of approximately 20 – 30 minutes of idle radio activity

## 5.0 INSTALLATION AND MAINTENANCE 5.0 INSTALLATION AND MAINTENANCE

### 5.1 INSTALLATION .1 INSTALLATION

The Survival Radio and its protective cover shall be packed with the ship's survival craft or in a survival suit. When not packed with a life raft, the radiotelephone should be stored in an accessible place, as close to the survival craft as possible.

## 5.2 MANDATORY TESTING .2 MANDATORY TESTING

5.2.1 Radiotelephones operated within the U.S.A. must be operationally tested on a periodic basis (FCC regulations, part 80, section 80.834, until superseded by section 80.1095). To test the radiotelephone, follow the steps given below (Note: this test requires that a separate VHF marine radio transceiver be used to monitor transmitted and received signals). Any transmissions effected for the purpose of testing the Survival Radio shall be as brief as possible. The recommended test message format is as follows: “<name of station receiving the test message> THIS IS <name of station transmitting this text><station callsign or call letters>.” EXAMPLE: “BLUE DUCK THIS IS MARY JANE WXT599.” When a second radiotelephone or the ship's receiver is utilized to monitor proper operation of the Survival Radio, the test distance between devices should be kept to a maximum and the following message format should be observed: “<name of station transmitting this text> THIS IS <name of station transmitting this text> MOBILE 1.” EXAMPLE: “MARY JANE THIS IS MARY JANE MOBILE 1 WXT599” (NOTE: if the unit to be tested is not on board the vessel containing the fixed station, “UNIT 1” should be used rather than “MOBILE 1”.)

- a. Remove the radio from its survival craft package.
- b. Remove control panel protective cover.
- c. Slide ON/OFF switch up to “ON” position.
- d. Listen for the tone and for the squelch action 3 seconds after activating the unit.
- e. The receiver tunes to Channel 16 automatically when unit is turned ON.
- f. Listen for any activity on the frequency (Channel 16).
- g. If no activity is detected, transmit the test message and have someone monitor the transmission (see above for suggested test message formats).
- h. If the test signal was not heard (full quieting), replace the battery and retest. If the test signal is still not heard (full quieting), have the unit inspected at your nearest authorized service center.
- i. Have someone return the call from the monitoring station (lowest power setting) to verify proper radiotelephone receiver operation.
- j. If a response is not heard (full quieting), have the radio unit inspected at your nearest authorized service center.

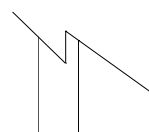
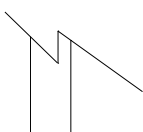
- k. Press the CHANNEL ▼ key to tune unit to any channel (except Channel 16).
- l. Set the monitoring transceiver to the same frequency. (See Table 4.1 for operating frequencies.)
- m. Listen for any activity.
- n. If no activity is detected, transmit the test message and have someone monitor the transmission (see above for suggested test message formats.)
- o. If the test signal was not heard (full quieting), have the unit inspected at your nearest authorized service center.
- p. Have someone return the call from the monitoring station (lowest power setting) to verify proper radiotelephone receiver operation.
- q. If a response is not heard (full quieting), have the radio unit inspected at your nearest authorized service center.
- r. Slide ON/OFF switch to “OFF” position.
- s. Replace control panel protective cover.
- t. Replace unit into its survival craft package.

### 5.3 VISUAL INSPECTION .3 VISUAL INSPECTION

- 5.3.1 Periodically inspect the Survival Radio for damage, cracks and front panel label wear. Wipe off any salt deposits with a damp cloth.

***FIGURE 3: CONTROL PANEL PROTECTIVE COVER***

## **6.0 BATTERY INFORMATION**



***FIGURE 4: BATTERY REPLACEMENT***

***FIGURE 4 BATTERY REPLACEMENT***6.1

Battery Options.

6.1.1 Lithium Survival Battery (Product No. 1066)

The Survival Radio is supplied with a replaceable lithium battery pack. This primary battery pack will operate the radio for at least 8 hours, in compliance with IMO/SOLAS and FCC requirements for a survival craft radio. To maintain compliance with these regulations, the lithium battery pack must be replaced after 5 years or after any use (with the exception of activating the unit for the purpose of testing.)

Additional lithium battery packs may be stored in survival craft along with the radio for extended operating life.

**CAUTION:** The battery is internally fused to avoid fire hazard. Do not immerse in water, short circuit or incinerate.

#### 6.1.2 MaxCap™ Rechargeable (Ni-Cad) Battery (Product No. 1067)

To allow the survival radio to be used in non-emergency situations, a rechargeable battery pack (ACR Product No. 1067), and a MaxCap™ Charger (ACR Product No. 2711) are also available. The rechargeable battery pack will operate the unit for approximately four to six hours. The charger is capable of charging the battery in less than 135 minutes. Refer to charger manual for charging instructions.

**CAUTION:** When the radio is operating with the rechargeable battery pack, it does not comply with the SOLAS/GMDSS regulation for battery life.

#### 6.2 How to replace the battery pack: (Refer to Figure 4)

Simply lift the battery handle, turn it counter-clockwise until it stops and pull the battery out. Replace a fresh battery into the rear of the radio. Turn the handle clockwise until it stops and snap it down to lock into position. Make sure battery is engaged by turning the unit ON and then OFF.

## 7.0 DISTRESS COMMUNICATIONS

### 7.1 The following are a set of observations intended to help the user maximize his success during the course of a rescue where two-way communication is possible:

- a. Transmit only when the channel is clear of activity, or between other stations' transmissions during a distress.
- b. Use the world recognized expression *M'AIDER* or *MAYDAY* to call for help. Note that *MAYDAY* is commonly pronounced as it is read in English, when utilized in English speaking countries. To improve the chances of being understood internationally, it is best to pronounce the above expression two ways:
  1. The internationally recognized way, *M'AIDER* (in French) pronounced phonetically as “*m ě – d ě*” (see any French language instruction book for further details) and,

2. The commonly used pronunciation in English speaking countries *MAYDAY* pronounced phonetically as “*mā – d ā.*”

To prevent the distress signal from being misunderstood, and to improve the intelligibility of the distress call, use the two pronunciations above when calling, for example (also, see example for part c): “*M’AIDER MAYDAY M’AIDER THIS IS MARY JANE WXT599 WXT599 WXT599.*”

- c. Always use the ICAO Convention (Convention on International Civil Aviation) recognized alphabet for spelling.

ICAO recognized alphabet:

A Alpha	N November
B Bravo	O Oscar
C Charlie	P Papa
D Delta	Q Quebec
E Echo	R Romeo
F Foxtrot	S Sierra
G Golf	T Tango
H Hotel	U Uniform
I India	V Victor
J Juliet	W Whiskey
K Kilo	X X-ray
L Lima	Y Yankee
M Mike	Z Zulu

Example: “*M’AIDER MAYDAY M’AIDER THIS IS MARY JANE Whiskey X-ray Tango 599 Whiskey X-ray Tango 599 Whiskey X-ray Tango 599*”

To acknowledge that a transmission has been received and understood in its entirety, simply use the expression “R R R” spoken as “*Romeo Romeo Romeo*” (“R” stands for received). Note: some radio operators use the expression “*Roger*” instead of “*Romeo.*”

- d. Antenna height and range of communications are intimately related. In general, a higher antenna will have a longer range than a similar lower antenna.

The typical range for a transmitting radio held at about 1.2 meters (4.0 ft) above average water level is expected to equal 4.5 kilometers (2.8 statute miles). The receiving shipborne antenna can extend the range if it is mounted high. Airborne receivers greatly extend the above range (over 150 kilometers/100 miles for aircraft flying over 1500 meters/5000 ft).



Because of the above fact, and to maximize the range of the survival craft VHF radiotelephone, the unit should be held as high as possible without endangering the safety of the operator.

COMMENTS (NOTES):

CALL SIGN: \_\_\_\_\_

VESSEL: \_\_\_\_\_

BATTERY EXPIRATION DATE: \_\_\_\_\_