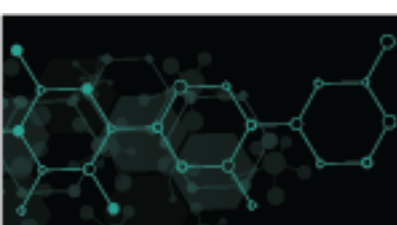




Maritime Communications Plan

2026

Project: Lowlander Pathfinder



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Configuration Page

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List of Abbreviations

Abbreviation	Definition
ADSB	Automatic Dependence Surveillance-Broadcast
AIS	Automatic Identification System
[R]	[Redacted]
CH	Channel
DTG	Date Time Group
ETA	Estimated Time of Arrival
HMCG	HM Coastguard
MACC	Machrihanish Airbase Community Company
MCA	Maritime and Coastguard Agency
NOTMAR	Notice to Mariners
RCC	Range Control Centre
RTB	Return to Base
SATCOM	Satellite Communications
SOLAS	International Convention for the Safety of Life at Sea
UKHO	UK Hydrographic Office
VHF	Very High Frequency (marine radio communications)
WZ	UK Coastal Navigation Warning



1. Applicable and Reference Documents

ID	Definition
RD1	Machrihanish Navigation Risk Assessment, Project: Lowlander Pathfinder

2. Pre-launch Communications

Prior to launch, a series of communications will be undertaken to ensure that all relevant maritime and emergency stakeholders are aware of the proposed activity, the defined maritime safety area, and the planned launch window.

2.1. Stakeholder Notifications

All communications will be coordinated by the Applicant and will be completed sufficiently in advance of the launch date to allow stakeholders to raise any concerns. These include:

- Marine & Coastguard Agency (MCA) Navigation Risk Assessment
- Marine Scotland Marine Licence submission
- UK Hydrographic Office Temporary Notice to Mariners (NOTMAR)

The following stakeholders will be notified with a NOTMAR prior to launch:

- **HM Coastguard (HMCG)**
- **Local harbour authorities** (as applicable)
- **Local commercial fishing organisations / associations** operating in the Machrihanish area
- **Other relevant marine users**, if identified

For a list of these identified stakeholders, please refer to **Annex 1** of the Navigational Risk Assessment [RD1].

Notifications will include:

- Location of the launch site
- Location and approximate size of the sea landing / recovery area
- Proposed launch window (date range and daily time window)
- Duration of maritime activity
- Contact details for the responsible on-scene personnel

2.2. Notice to Mariners

A NOTMAR will be requested and issued via the appropriate authority prior to launch.

The Notice will include:

- Coordinates of the launch exclusion area
- Coordinates of the sea landing and recovery area
- Planned launch window
- Advisory information for mariners to avoid the area during operations



2.3. Internal Communications and Briefings

All vessels and personnel involved in the operation (including recovery vessels) will be briefed prior to launch on:

- The communications protocol to be used during operations
- Primary and secondary communication channels
- Roles and responsibilities for communications with third-party vessels
- Procedures for responding to encroaching vessels
- Procedures in the event of a mission deviation or abort

2.4. Confirmation of Readiness

Prior to the commencement of the launch window:

- Communications equipment on all involved vessels will be checked and confirmed operational
- Contact details for all relevant parties will be reconfirmed
- HMCG will be informed that the operation remains scheduled within the declared launch window

3. Launch Day Communications

On the day of launch, all communications will be coordinated through Exotopic's Range Control Centre (RCC), which will act as the central hub for communications between mission personnel, participating vessels, and relevant maritime authorities.

Communications will be maintained for the duration of the launch window to ensure that situational awareness is maintained and that the defined maritime exclusion area remains clear prior to launch.

The launch will **not proceed** unless all required communications links are active and the exclusion area is confirmed clear.

3.1. Communications Protocols – Launch Control to Boundary/Recovery Vessels

Exotopic's Range Control Centre (RCC) will maintain continuous communication with all boundary and recovery vessels for the duration of the launch window.

Communications will include:

- Confirmation of commencement of the launch window
- Launch status updates (e.g. countdown progress, holds, aborts)
- Confirmation that the maritime exclusion zone remains clear
- Confirmation of launch execution
- Confirmation of vehicle splashdown / landing location
- Instruction to commence recovery operations

Primary communications will be conducted via **VHF marine radio**, using a designated working channel agreed prior to launch. Secondary communications (e.g. mobile or satellite) may be used as contingency.



If communication with any boundary or recovery vessel is lost at any time, the launch countdown will be halted until communications are re-established.

No.	Report	Meaning
1	<Callsign> STANDBY POSITION "#"	Vessel reports current location or designated patrol position.
2	RCC, RANGE OPEN	The Range is open with Land, Sea and Air clearance checks begin/ongoing.
3	RCC, or <Callsign>, For information relating to a rocket launch, please move to CH #	Warning of WZ Notices imminent broadcast on CH #.
4	<Callsign> ON TASK	Vessel is on task and actively engaged on launch operations. Can be coupled with position updates, time or any other relevant information.
5	RCC, All vessels (or Callsign) Report "Range Clear"	Vessels to actively sweep their assigned area using means at their disposal to ensure SOLAS principles.
6	<Callsign>, RANGE CLEAR	Vessel will report Range Clear after visual / electronic / physical checks (as required) are complete and the assigned area is clear. If not clear, vessel may be asked to provide a brief short description of the situation.
7	<Callsign> RANGE NOT CLEAR (x2)	Vessel will report Range NOT Clear at least twice if the observed area has become encroached and followed up with any further information until the situation changes.
8	RCC, "# Minute launch countdown has commenced.	# may be at 10, 5 and at 1 minute points before Launch. Range Control may broadcast additional updates throughout as a secondary task. Range control may count through the last 5 seconds ONLY to keep the frequencies free to allow vessels to report if they need to. Point of Launch is expressed as point "T" with minus and plus timings given as required.



9	RCC, Countdown is ON HOLD at T minus “#”	Range Control has been advised of a delay; the timer may restart at “#” or be reset to another time. Range Control may advise further on reasons to allow vessels to manage their time.
10	RCC, Launch is SCRUBBED	Unlikely that the Launch will go ahead. Vessel will be advised on further actions/plans as required using telephone.
11	RCC, LAUNCH ANOMALY	Vessel to remain safely ON TASK until briefed otherwise.
12	RCC, Successful ROCKET LAUNCH at DTG	Vessels to continue to observe assigned areas and to watch the rocket for any debris or other anomaly. Marine and Space Accident Investigations may require witness statements later.
13	RCC, or <Callsign> SPLASHDOWN at “#” at DTG	Where “#” is given as co-ordinates, can be a centre point with a radius expressed in a clear fashion i.e. “.... radius ½ Nautical Mile” Range Control will be monitoring rocket telemetry. Vessels will likely be visually monitoring events. SPLASHDOWN may be the whole rocket or parts or debris and there may be multiple points or a large area. Vessel involved with recovery operations will give an ETA estimation to recovery point.
14	<Callsign> at SPLASHDOWN point(s)	Vessel reports at SPLASHDOWN and any updates as required as to the status of any recovery operation.
15	<Callsign> RECOVERY COMPLETE/NOT COMPLETE	Vessel reports safe (or otherwise) recovery and provides ETA to safe harbour. RCC will not cease the operation until all vessels report safely alongside or otherwise off task.
16	RCC, Send area status report	Vessel to sweep and check their assigned areas for any debris or anything that may be a hazard to navigation pre or post launch. Post launch, likely to be followed by a Return To Base (RTB) call if and when area is clear.
17	RCC, RANGE CLOSED	The Range may be closed even whilst vessels are at sea. The RCC will continue to monitor



		communications until vessels have returned to safe harbour or report safely off task.
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RCC will repeat back the below reports in highlighted text to ensure clarity of messages passed before logging the message. RCC may repeat some messages and also ask vessel(s) to acknowledge receipt. Procedure words, or PROWORDS are in BOLD text.

3.2. Communications Protocols – Boundary and Recovery Vessels to Encroaching Vessels

Boundary vessels, recovery vessels, and stationed personnel will monitor the defined exclusion area throughout the launch window.

If a non-participating marine vessel is observed approaching or entering the exclusion area, the boundary or recovery vessel will:

- Inform the RCC of the ongoing situation
- Attempt to establish contact via VHF radio
- Inform the vessel of the ongoing launch and recovery operations
- Request that the vessel alters course and exits the exclusion area

All updates on the situation will be reported immediately to the RCC.

If a marine vessel enters or remains within the exclusion area, the launch will be halted until the area is confirmed clear.

No.	Report	Meaning
1	Open communication. Encroaching vessel should return with (Recovery Vessel) <callsign>, this is <callsign> Channel #, Out". Communication will then be established on the working channel.	Open communication. Encroaching vessel should return with (Recovery Vessel) <callsign>, this is <callsign> Channel #, Out". Communication will then be established on the working channel.
2	<Callsign> As per WZ message broadcast at (time). Rocket launch in area bounded by...(positions) from (date and time) to (date and time).	This will provide the encroaching vessel with the information provided within the WZ messages.
3	<Callsign> WARNING . Rocket launch imminent from MACC Airbase. You are entering an Exclusion Zone. Or if recovery vessel <Callsign> WARNING . Splashdown of rocket parts imminent.	Should encroaching vessel not change course to avoid Exclusion or Restricted Zones, a Message Marker will be used to warn the vessel of danger.



4	Recovery vessel report "RANGE NOT CLEAR" RCC to then repeat "RANGE NOT CLEAR" .	Vessels to actively sweep their assigned area using means at their disposal to ensure SOLAS principles.
5	RCC, <Callsign>, vessel X at location '#', being tracked on bearing ...degrees, on course, towards Launch Exclusion Zone/Splashdown Area. Have warned vessel X of danger from launch/splashdown NOTE: Recovery vessel to notify RCC of encroaching vessel name and any other identifying marks or features.	Information will need to be passed to RCC If the encroachment is taking place near the Launch Exclusion Zone it is likely RCC will hear the radio transmission. RCC will acknowledge should this be the case. Should the encroachment be at the splashdown location, the Recovery Vessel will have to relay the message by calling RCC using other means, i.e. satellite phone. Vessel will report RANGE NOT CLEAR at least twice if the observed area has become encroached and followed up with any further information until the situation changes.
6	<Callsign> RANGE CLEAR	Vessel will report Range Clear after visual / electronic / physical checks (as required) are complete and the assigned area is clear.

3.3. Notifications to HM Coastguard (HMCG)

HM Coastguard will be notified by the RCC:

- At the commencement of the launch window
- When the exclusion zone is confirmed clear and the launch is proceeding
- Immediately prior to launch
- Following confirmation of vehicle splashdown
- Upon completion of recovery operations

Any loss of communications with key mission assets or any incursion into the exclusion zone will also be notified to HMCG as soon as practicable.

3.4. Broadcasts

VHF safety broadcasts will be coordinated by **Exotopic's Range Control Centre (RCC)** and issued as follows:

- **T-2 hours**
Initial safety broadcast advising of planned launch and recovery operations and the location of the maritime exclusion zone.
- **T-0 hours**
Broadcast confirming the launch window is active and the exclusion zone is in effect.
- **During launch window**
Broadcasts repeated as required, particularly if marine traffic is observed in the vicinity of the exclusion zone or if the launch is placed on hold.
- **Immediately prior to launch (T-0 countdown)**
Final broadcast advising that launch is imminent and the exclusion zone must remain clear.



- **Post-launch**
Broadcast advising that splashdown has occurred and recovery operations are underway, issued once the recovery vessel confirms splashdown location.
- **Completion of operations**
Final broadcast confirming recovery operations are complete and the exclusion zone is no longer in effect.

Broadcasts may be issued directly by participating vessels on instruction from the RCC or via **HM Coastguard**, as appropriate.

3.5. Mission Deviation

In the event of a mission deviation, including but not limited to:

- Launch hold or abort
- Loss of communications with any participating vessel
- Encroachment into the exclusion zone
- Off-nominal trajectory or unplanned splashdown location

The RCC will immediately:

- Halt the launch countdown (if applicable)
- Inform all participating vessels
- Notify HM Coastguard
- Implement the procedures defined in the Emergency Response Plan

The launch will not resume until the deviation has been resolved and all required conditions for launch are re-met.

4. Contact Information

Table 1 Contact Details

Organisation/Role	Name	Contact #
Launch Operator	Rohan Hean	07783973195
Exotopic Range Coordinator	Cameron McGregor	07983888825
MACC Launch Site Manager	Cara Clements	07767165917
HMCG	N/A	999/112 (Emergency)
Recovery Vessel Primary	TBD	TBD
Recovery Vessel Secondary	TBD	TBD
Boundary Vessel Primary	TBD	TBD
Boundary Vessel Secondary	TBD	TBD



Radio Navigations Warning (UKHO)

N/A

01823 353448

