

APPENDIX 1 – MANDATORY EQUIPMENT LIST Life Saving Items

Items marked with * are personal items, the numbers to be carried vary with the number of persons on board the rowing boat.

Item	Qty	Specification
Life Raft	1	<p>Shall be of sufficient capacity to accommodate all boat crew</p> <p>Shall comply with ISO 9650 type 1 (group A or B) with the >24 hour equipment pack</p> <p>Shall be within service date for the duration of the race</p> <p>Shall be securely stowed on deck and accessible if the boat should become inverted</p> <p>Shall not be stored in a sealed compartment</p>
Grab Bag - to be stowed in a waterproof bag and located so it can be accessed even if upside down. All items in this grab bag are extra to similar ones mentioned in the rest of this kit list	1	<p>Personal Locator Beacon 406MHz EPIRB (PLB) 3 x red hand held flares</p> <p>1 x orange smoke floating flare</p> <p>2 x red rocket flare</p> <p>1 x strobe flashing light</p> <p>1 x waterproof signalling torch with batteries 1 x signalling mirror</p> <p>1 x signalling whistle</p> <p>2 x TPA (Thermal Protective Aid)</p> <p>6 x breakable light sticks</p> <p>2 x sponges</p> <p>1 x knife (Swiss army pocket knife or similar) * 500ml water per person</p> <p>* 1 chocolate bar per person</p> <p>Glucose sweets</p> <p>60 x seasickness tablets</p> <p>1 x Cat. C first aid kit</p> <p>Any personal medication</p> <p>Recommended:</p> <p>A small hand-operated watermaker Handheld GPS</p> <p>Sat phone</p> <p>Competitors should place their passport, cash and a current debit or credit card in the grab bag. These should be carefully waterproofed</p>
Life Jacket	1*	<p>CE approved (or national equivalent)</p> <p>Shall have gas inflation with either manual or hydrostatic operation. Those using soluble pellets/triggers are not allowed</p> <p>Shall include light, whistle, crotch strap, spray hood and reflective tape and be marked externally and internally with boat and crew member name</p> <p>An inflation test should be carried out on all lifejackets (orally inflate and leave for 24 hours) to test they hold air and stay inflated</p>
Safety Harness and Line	1*	<p>A CE approved (or national equivalent) 3-point harness is mandatory</p> <p>To be worn by all rowers whilst on deck</p>
Safety Clothing	1*	Waterproof survival suit or dry-suit SOLAS B approved
EPIRB	1	<p>Minimum Requirement - 406 Mhz Cat 2 Manually deployable EPIRB with an operating life of at least 48 hours at -20c</p> <p>Recommended - 406 Mhz Cat 1 Manually deployable EPIRB with hydrostatic housing with an operating life of at least 48 hours at -20c</p> <p>EPIRBs shall be mounted in such a position that is easily accessed if the boat should become inverted, namely a cabin bulkhead above the waterline</p>
PLB	1*	<p>Each crew member shall have a PLB which is worn at any time they are not in the cabin.</p> <p>Personal Locator Beacon 406MHz EPIRB (PLB)</p>
Tracking device provided by the Race Organiser (cost included in race entry fee)		These shall be fitted and activated in San Sebastian
Flares	1 Pack	<p>To be carried as a minimum (in addition to those in the grab bag – 3 red hand held, 1x orange floating smoke, 2x red rocket):</p> <p>2 x red parachute flares</p> <p>2 x red handheld flares</p> <p>4 x white parachute flares 6 x white handheld flares</p> <p>2 x orange smoke flares (handheld or buoyant) 1x laser flare</p> <p>It is recommended that one white handheld flare is stowed in a secure location which is easily accessible should the flare be required in a hurry</p> <p>All flares, apart from the laser flare must be purchased in La Gomera from Atlantic Campaigns, unless a satisfactory Dangerous Goods Notice of shipping can be provided.</p>
Fire Extinguisher	2	1 Kg dry powder in date
Medical Kit	1	See Appendix 2 for minimum mandatory requirement
Sea Sickness tablets		Take extra of these as personal preference for seasickness
Daylight signalling mirror	1	Kept handy in accommodation cabin (in addition to mirror in grab bag)
Safety Markings		<p>Inside each accommodation cabin and on the corresponding external wall the number 1 (port side) and number 2 (starboard side) shall be clearly marked in characters a minimum of 15cm high</p> <p>The purpose of these markings is to allow clearer communication between people outside and inside the cabin in the event of capsized</p>
Reflective Tape		Retro reflective tape shall be applied to prominent areas of the boat and along the forward edge of the oar shaft to improve visibility at sea. Patches of retro reflective tape shall also be applied along the waterline of the boat.
Knife	03-Apr	All rowers on deck shall be within reach of a knife and they should be fitted on bulkhead walls adjacent to the opening side of the cabin hatches

A knife is to be mounted inside each accommodation cabin

A marine-specific knife is highly recommended

All knives require lanyards of a minimum of 2 metres of thin line, with a carabiner attaching it to the boat

Throwing Line 1 Purpose made and immediately accessible in the cockpit

Electrical Requirements

Item	Qty.	Specification
AIS Radar Transponder	1	Either stand alone or linked to the GPS This unit shall be able to send and receive information
Satellite Telephone	2	One unit dedicated to DO and race HQ calls only and the second as a back up and for all media/personal calls Iridium system Shall be configured to send and receive text messages Shall include a means of charging and have a robust external marine antenna fitted to allow the phone to be used inside the cabin when hatches are sealed Each telephone must have at least one spare battery and an independent means of charging (such as a portable solar panel) should be available Iridium go and similar systems do not replace a separate handset but may be used as a backup to the mandatory 2 handsets
VHF	1	Fixed VHF DSC unit with external antenna VHF's shall be of the multi channel variety – which are able to receive a range of marine band channels
Handheld VHF	1	Waterproof handheld unit with battery charger and spare batteries
GPS	1	1 fixed GPS unit
Handheld GPS	1	1 (minimum) waterproof handheld GPS with spare batteries
Electric Watermaker	1	Permanently installed Solo and Pairs Class Boats shall use a Katadyn Power Survivor 40E, Spectra or Schenker Trios, Fours and Five Class Boats shall use a Spectra or Schenker only
Manual Operation Watermaker	1	A separate unit to the main watermaker operated by hand, even if electric watermaker has a hand option. This item to be easily removable

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For Solo and Pairs Class Boats using a Katadyn Power Survivor 40E as a main electric operation watermaker, a Pur 6 shall be permissible as a backup manual operation watermaker

For all Boats using a Schenker or Spectra as a main electric operation watermaker a Katadyn Survivor/Pur 35 shall be required as a manual operated watermaker

Navigation Light	1	This shall be a tri colour LED or other similar high efficiency light visible for 2 nm Navigation light shall be mounted on the forward cabin top on a pole minimum height 1.5m, maximum height 2.0m above waterline
Internal Light	2	LED or other high efficiency type lamps. Shall be mounted one in each cabin Red option recommended

Electrical Systems

Battery	Min 2	Minimum 60AH capacity each - deep cycle gel or marine grade AGM batteries The batteries shall be securely fastened in place on the centre line of the vessel and be secure when inverted NOTE – Due to recent Marine Guidance Notice issued by the MCA, we will no longer allow the use of Lithium batteries in the race All batteries installed in the boat at the time of the race start shall be new (in that they shall not have been used on a prior crossing)
Battery Monitor	1	Shall be able to measure amps, volts and amp hrs All crew members may be required to demonstrate knowledge of its use
Fixed Solar Panels		To provide a minimum of 100W peak in any combination of size(s) that suits your vessel
Switch panel	1	You shall be able to switch off individual items of equipment when not in use
12 Volt charging socket	1	Used to recharge satellite phone and other portable items

Wiring

All power supply (battery connection) wiring shall be compliant with the following specification. All other cabling (e.g. antenna cables, data cables) to be in accordance with manufacturers specifications. All cables shall be insulated to 300V and to 100°C. PVC insulation shall meet this specification.

The minimum conductor size shall be 1.0mm² (17 AWG). For high current applications such as the watermaker, VHF radio and solar panels the conductor size shall be increased such that the maximum voltage drop in the cable is 0.5V. The conductor size required to achieve this shall depend upon the current requirement of the application and the length of the cable. The table below gives the required wire size for some typical cable lengths and equipment current consumptions

Application	Maximum current per circuit Amp	Maximum length from battery	Meters
General Circuits	1.8		7.5
VHF, Watermaker - long cable	8		7.5
VHF, Watermaker - short cable	8		3.5

Solar panels - long cable	10	6
Solar panels - short cable	10	3

Notes:

The total length of the cable is twice the length from the battery, since there are two wires to complete the circuit.

AWG stands for American Wire Gauge.

Interpretation of stranded specs. E.g. 19/0.25 means there are 19 strands each with a diameter of 0.25mm. Remember that area is given by $Area = \pi r^2$ where r is the radius and π is 3.14. So the cross sectional area of 19/0.25 wire is $19 \times 3.14 \times (0.25/2)^2 = 0.93mm^2$.

Water Containers

Ballast/emergency water container Each ballast/emergency water container shall be no greater than 10 litre capacity and refilled with salt water immediately should the fresh water be used.

Shall be securely stowed in the lowest possible lockers along the centreline of the boat

Emergency water may only be used after permission has been given by the DO

Water Containers – day use

In addition to the above ballast/emergency water extra containers are required to keep daily drinking water in

Minimum 40L Fours Boats Minimum 20L Pairs Boats Minimum 15L Solo Boats

General Equipment to be Fitted

Item	Qty	Specification
Main Cabin Hatches		<p>Lewmar 60 Lewmar 40</p> <p>These hatches shall be fitted with the hinges located on either the left or the right hand side, such that the hatch opens sideways in the athwart ships plane and not vertically up or down</p> <p>1 x Lewmar Ocean 30 (Aft cabin rear hatch) or 1 x Lewmar Self Supporting Round 450mm (Aft cabin rear hatch)</p> <p>Other hatches may be accepted – at the race organizer’s discretion – provided that the competitor/builder can supply evidence that they meet or exceed the same ISO standard as the above hatches</p>
Rudder Assembly	1	<p>Pintle/gudgeon must be fitted with a strong, secure backing plate</p> <p>Shall have a means of securing the rudder to the pintle/gudgeon and the rudder shall be permanently attached to the boat by a lanyard</p> <p>Rudder stops shall be fitted to limit rudder travel unless rudder travel is already limited by boat design</p> <p>The rudder should not extend more than 600mm below the skeg, excluding the Ocean 2 design of boat, due to design and hydraulic steering needs</p>
Sliding Seats		<p>1 per rowing position</p> <p>When choosing your seats and rails please remember the tolerances required for ocean rowing</p> <p>All seats shall be attached to the boat with lanyards</p>
Foot Plates		1 per rowing position
Rowing Gates		<p>2 per rowing position</p> <p>Each shall be fitted with a strong, secure backing plate</p>
Oars		<p>Minimum 1 pair per rowing position plus 1 additional spares pair</p> <p>The area measurement of the oar blades shall not exceed 1530cm²</p> <p>Carbon/Hollow Spruce, no lighter in construction than Sutton/Concept or Xcell. Due to oar breakages in previous races, we strongly recommend sweep oars rather than sculling oars</p> <p>All oars engaged in rowing gates shall also be attach to the boat by a lanyard</p> <p>All oars, including spares, shall be of a one-piece design At least 1 Pair of Oars per team MUST be new</p>
Manual Operation Bilge Pump (fixed)	1	<p>Minimum capacity for fixed bilge pump is 40 litres/minute (based on 1 meter lift at 45 strokes/min)</p> <p>All hose used in the installation of the suction and disposal pipes shall be of a non-collapsible type</p> <p>Shall have an easily accessible handle. Detachable handles shall be secured to the Boat with a lanyard</p> <p>Shall be mounted so that in the event of capsize the cabin can be pumped dry from the beam or transom whilst the boat is inverted and the cabin hatches sealed shut</p>
Jackstays		<p>To run the full length of the cockpit and be securely fastened 25mm wide webbing or plastic coated 5mm Ø wire</p> <p>An additional jackstay or barrier is to run the length of both sides of the cockpit at approx shoulder height when seated</p> <p>It is recommended that an additional mid level jackstay or barrier is fitted running the length of the boat between the gunwhale and shoulder height jackstay/barrier</p> <p>If lashing ropes are fitted to jackstays these shall be no longer than 10cm and have a breaking strain equal to or better than that of the jackstay they are securing (this is to include any knots used)</p> <p>A dated certificate of fitting is required from the boat builder. If this is outside of 3 years, or cannot be supplied, a new jackstay will need to be fitted</p>
Grab Lines		<p>Shall be positioned along the outside of the hull for the full length of the boat. They should extend down the hull side a minimum of 300mm – so as to be reached from the water</p> <p>Rope shall be soft, minimum 8 mm Ø</p> <p>Grab lines shall be securely fixed and capable of supporting the weight of two rowers</p>

It is recommended that a collapsible liferaft ladder or similar is fitted at each end of the cockpit, one on each side to aid rowers entering the boat from the water

Towing Eye	1	Towing eye to be fitted to the bow of the boat with strong secure backing plate
Towing Eye Strop	1	A strop made of rope (min 12mm Ø) is to be fitted which is long enough to reach into the cockpit, with metal eyelet spliced into each end This enables the anchor/towing line to be tied on from the safety of the deck area without having to reach over the bow
Retrieval Line	1	A line 2.5x the length of the strop shall be attached to the strop to facilitate recovery of the anchor/towing line from within the deck area.
Stern Bridle and Fixing Eyes		There shall be an arrangement at the stern such that a bridle may be fixed and drogues or lines run from the stern without affecting the rudder
Compass	1	The stern bridle shall reach back into the cockpit and have retrieval lines 2.5x the length of the bridle attached to facilitate recovery of the anchor/towing line from within the deck area Illuminated and permanently / securely fixed and located so that it is visible from the rowing positions. Boats with speakers are to ensure that the compass is not hampered by them ALL BOATS WILL BE REQUIRED TO ADJUST THEIR COMPASSES AND PRODUCE THEIR DEVIATION CARD PRIOR TO RACE START.
Ventilator (minimum)	2	To be watertight and of the screw down variety and mounted at low level below or level to the aft main access hatch and either side of the aft well on bulkhead Push close solar ventilators shall only be permitted if provision is made to be able to fully close/seal the vent internally from within the cabin (i.e. addition of watertight screw down hatch lids) Ventilators shall not be fitted to the exterior of either cabin tops
Deck Hatches/Access access hatches		Watertight – lids should be fitted to the boat with lanyards to prevent them washing away We recommend Henderson TCL Type 4 round screw on hatches

General Equipment – To Be Stowed

Food and Stores		It is a mandatory requirement to start with sufficient food: 90 days for solo rowers 70 days for pairs 65 days for trios 60 days for fours 55 days for fives Not all food shall be freeze dried, a minimum of 20% shall be wet rations which are ready to eat meals and does not include snacks. This is to be packed separately from other rations The Race Organiser shall ask you questions about your calorie budgets and dietary planning as part of your Compliance Inspection. 60 kcal per kg of bodyweight per person per day Example: * For a 90kg rower, 60kcal x 90 gives a daily requirement of 5400kcal per day * For a 60kg rower, 60kcal x 60 gives a daily requirement of 3600kcal per day.
Cooker	1	Minimum single gas burner – any suitable cooker for use at sea – and capable of being securely mounted during cooking Shall include at least one set of spare parts
Cooking Gas		The gas cooker shall be capable of being securely mounted for cooking outside the cabin Each Solo Boat shall carry a minimum of 400g Each Pairs Boat shall carry a minimum of 800g Each Trio Boat shall carry a minimum of 1200g Each Fours Boat shall carry a minimum of 1600g Each Fives Boat shall carry a minimum of 2000g Gas calculations need to be shown at Advisory Inspection and given to the Race Organiser together with a calorie plan by the 1 st September
Matches/Lighters		Sufficient to last the duration - recommend army windproof / waterproof matches Turbo lighters and long handled gas lighters are recommended. Each lighter and pack of matches should be individually waterproofed
Eating, Drinking and Cooking Utensils		Sufficient for your needs Long handled spoon recommended
Bucket	3	30 cm buckets each with lanyard attached through the bucket itself and NOT to the handle Tough builders buckets recommended
Bilge Pump – Handheld	1	Minimum capacity 0.5lt/stroke Suction hose shall be of the non-collapsible type, able to reach into all compartments of the boat
Para Anchor Assembly (min)	1	Complete assembly includes: 2.75m (9') or 3.65m (12') Ø Para Anchor Para anchor line (minimum 70m x 14mm Ø octoplat nylon) Swivel shackle to attach para anchor to line Buoyant retrieval line (minimum 8mm Ø polyprop floating line 25m longer than para anchor line) Shackles are to be secured with cable ties Carabineers are not acceptable
Drogue (min)	Min 2	Recommendation: three of varying sizes the smallest should be 60 cm. Ø

Towing Line	1	Minimum 50m x 12 mm. Ø octoplat nylon This line shall be in addition to the 70m para anchor line and the 30m anchor line
Anchor, Chain, Shackle and Rope	1	Anchor with proven holding ability equal to or in excess of a 5kg standard anchor 10m of 6mm chain 30m of 12mm Ø nylon rope The anchor assembly shall include shackles to join chain to anchor and rope as necessary Collapsible anchors must be assembled within 20nm of the finish
Waterproof Clothing	1*	Shall be waterproof, windproof and breathable and shall comprise of a waterproof top and waterproof trousers. It shall be designed for sailing and suitable for the task. Smock style shells are recommended
Flashlight	2	Water resistant with spare bulbs and batteries
Foghorn	1	Orally operated is recommended. If aerosol at least one spare canister to be carried
Sun-block		Enough for all crew members for at least 90 days of various factors 16 and above
Sunglasses	2	2 pairs each rower UVA and UVB protection
Sun Hats	2	Two sun hats each rower One hat each shall cover the back of the neck
Charts		Admiralty Charts: 1869 Gran Canary to El Hierro 4012 North Atlantic Ocean (Southern Part) 2064 Antigua Or equivalent coverage from other chart supplier Charts shall be waterproof or laminated
Flags	3	Official race flag (provided by AC) Courtesy flag for Antigua Courtesy flag for Gomera Quarantine flag

Item	Qty.	Specification
Tool Kit (to include as a minimum)	1	150mm adjustable spanner 150mm pliers
	1	250mm mole grips
	1	Junior hacksaw
	1	
	1	Pack of junior hacksaw blades Stanley knife
	1	Pack of Stanley knife blades Small hand drill
	1	
	1	Pack of metric drill bits
	1	Set of spanners to fit all sizes of nuts/bolts onboard
	1	5 piece screwdriver set
	1	Set of Alan keys
	1	Hammer
	1	Multimeter (including spare battery) shall measure volts, amps and resistance and you shall know how to use it
	1	Any additional specialized tools for each piece of equipment carried

Epoxy repair kit, marine sealant Products that 'set' underwater

Spares – as a minimum each boat shall carry the following

Electrical Spares	Lamps to fit any non-LED lights (Compass, Torches, etc.) Replacement fuses/fuse wire for all equipment on board Electrical connectors and wire Cable Ties
Batteries	Sufficient quantity to run all handheld equipment that requires batteries: GPS Multimeter VHF Satellite phone Torch
Tape	Self-amalgamating tape Duct tape Reflective tape
Bilge Pump Spares Kit and Diaphragms	To fit your brand of fixed bilge pumps Includes spare handle
Watermaker Spares Kit	As recommended by watermaker manufacturer to include the minimum of the following parts: <i>Schenker Smart 30</i> Spare Shurflo pump Spare relay Spare pressure Switch Spare filter Biocide to 'pickle' watermaker on arrival in the Caribbean <i>Spectra</i> Spare Shurflo pump Spare filter Biocide <i>Katadyn 40E</i> Seals Repair Kit Pressure relief valve kit (Cleaning valve) Spool valve kit Biocide <i>Katadyn 35 Survivor</i> Spare seals Kit Biocide

Lifejacket CO2 Bottles	1*	Spare gas canister for each lifejacket
Steering Spares		Line, pulley blocks, etc.
Rowing Seat Spare Parts and Runner Spares		Bearings, wheels, axles, etc.
Rowing Gate Spares		Gates, pins, washers, etc.
Rudder Spares		Suitable for your specific rudder type Have a plan to repair/replace your rudder
Additional Shore Side Equipment		
Fenders	2	Suitable for protecting the boat when tied alongside both at the start and finish ports Should show boat's name. Competitors must be aware that boats may be rafted together when berthed at the start and finish. Therefore teams must ensure that they have adequate sized fenders to provide protection to prevent damage to theirs and others boats by protruding outriggers, etc. Teams should carry a minimum of 2 inflatable fenders onboard

Non-Mandatory but Highly Recommended Equipment

Item		Specification
Personal Cleaning Materials		Materials to maintain personal hygiene (wet wipes, soap, toothbrush, toothpaste, tooth picks, floss)
Small Portable Solar Panel/Solar Charger	1	To be used for additional/emergency charging of satellite phone, iPods, cameras, etc. In addition to the solar panel specifically for the satellite phone Ensure the panel has the correct fittings to be compatible with your devices
Waterproof Camera	1	
Trailer	1	For towing around in your home country but not a mandatory req. for rules
Solar Shower		
Mask/Goggles and scraper	2	For cleaning the hull
Routing Charts		For planning purposes reference should also be made to the following charts but it is not necessary to laminate or carry them on board: 5124(1) North Atlantic Ocean Routeing Chart – January 5124 (12) North Atlantic Ocean Routeing Chart – December 5095 North Atlantic - for facilitating Great Circle Sailing
Padding for Rowing Seats		Recommended foam sandwich (6 layers of sleeping mat stuck together) which can be cut and shaped to prevent sores Sheepskin and expensive seats are not recommended
Gloves / Handgrips		
Thermos Flask & Thermal Cups		
Individual Water Bottles		
Binoculars		
Extra Baby Wipes		Allow 6 per day per person minimum
Lighters		Turbo and long handled lighters each packed individually and waterproofed
Musical Entertainment		Portable waterproof bluetooth speakers are recommended Deck speakers are expensive, drain power, add weight and may compromise navigation and are not recommended Headphones are not recommended as they isolate rowers from the noises of the boat which are often critical warnings
EFOY Fuel Cell		To be secured against inversion and have adequate ventilation