JR Olympic Campaign Technical Development Areas

The 470 is a double-handed Olympic sailing dinghy that combines athletic performance with a significant technical development component. Unlike many strict one-design classes, the 470 class rules allow teams to optimise and customise key areas of the boat, including rig setup, sail development, control systems, mast tuning, and equipment configuration. Success therefore depends not only on sailing ability, but also on the team's capacity to understand, test, and refine the technical performance of the boat.

At the highest level, marginal gains in equipment setup can translate directly into race results. As a result, elite 470 campaigns require a structured programme of data analysis, equipment development, performance testing, and collaboration with manufacturers and technical partners. This constant pursuit of performance makes the 470 one of the most technically demanding and innovative classes in Olympic sailing, where success is driven by both athlete performance and engineering excellence.

Personal Equipment

Lightweight vs Heavy Harnesses - in different wind strengths it is desirable for crew members to wear heavy/light personal equipment.

Potential for lightweight (titanium?) and heavyweight trapeze metal bars
Potential for small weights to be sewn into the harness

(a) Trapeze harness. The weight shall not exceed 3 kg, measured according to RRS Appendix H.

C.3.3 TOTAL WEIGHT

(a) In accordance with RRS 50.1(b), the total weight of personal equipment worn, excluding trapeze harness and clothing (including footwear) worn below the knee shall not exceed 9 kg, measured according to RRS Appendix H.

Centreboard and Rudder Development

The rudder is what steers the boat. It sits at the back and is controlled with the tiller. When you move it, you change the angle of the flow of water around the stern, which makes the boat turn. In a 470, small rudder movements are important because the boat is very responsive—oversteering slows you down quickly.

The centreboard (sometimes called the daggerboard on other boats) is the vertical fin that drops into the water from the middle of the boat. Its main job is to stop the boat sliding sideways when the wind pushes on the sails. Without it, you'd mostly drift sideways instead of going forward. It doesn't steer the boat, but it massively improves upwind performance by giving the boat "grip" in the water.

What is the best shape for our centreboard? Stiffness vs twist vs drag
What is the best shape for our rudder? Drag vs efficiency

C.8.2 CONDITIONS FOR USE, CENTREBOARD

(a) No part of the **centreboard**, in its raised position, shall project below the **hull**.

(b) Uniform thickness strips of optional material with a minimum length of 300mm and maximum width of 30mm, may be permanently installed and positioned within 35mm from the upper and/or lower edges of the centreboard case, to reduce friction and/or the distance between the centreboard and centreboard case sides.

(i) At the lower edge of the case, the front end of the strips shall be no more than 90mm from the lower front end of the centreboard case slot.

(ii) At the upper edge of the case, the strips shall be positioned to cover at a minimum the length between 300mm and 600mm from the upper front end of the centreboard case slot.

(iii) The thickness of the strip on the port side may be different from that on the starboard side.

(c) Centreboard protective padding of maximum thickness of 10 mm may be installed at the lower front end of the centreboard case slot.

(d) No **fitting** or device shall be attached, installed or applied to the inside of the centreboard case that may cause the centreboard to gybe (angle to windward).

C.8.3 CONDITIONS FOR USE, RUDDER

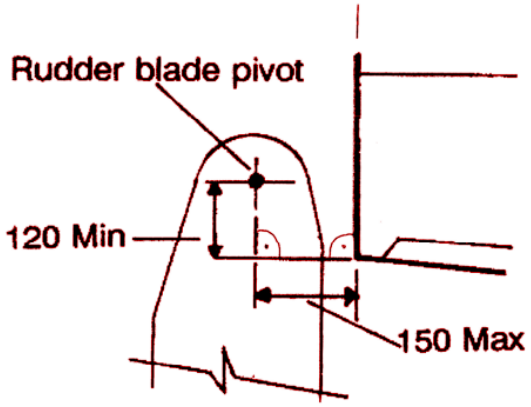
(a) RUDDER

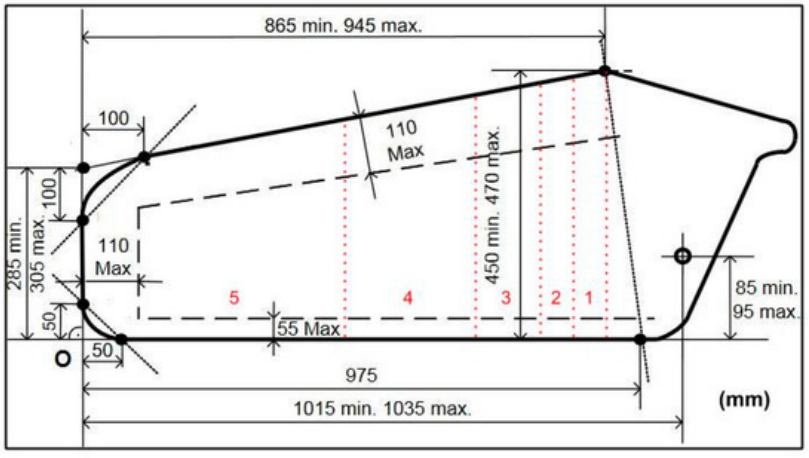
The **rudder** blade shall be in its fully lowered position when *racing*. However, it may be raised momentarily to clear sea weed or other floating objects. For races sailed in shallow water, the Sailing Instructions may prescribe that this rule shall not apply.

(b) RUDDER ASSEMBLY

The **rudder** assembly shall consist of a rudder blade, a rudder stock and a tiller with an optional tiller extension. The rudder blade shall be able to pivot around its axis. The rudder assembly shall be detachable from the **hull.**

When mounted on the **hull**, the rudder blade pivot shall be located at a maximum of 150 mm abaft the transom and its height above the lower corner of the transom shall be a minimum of 120 mm, measured according to the Figure "Rudder Pivot Position".





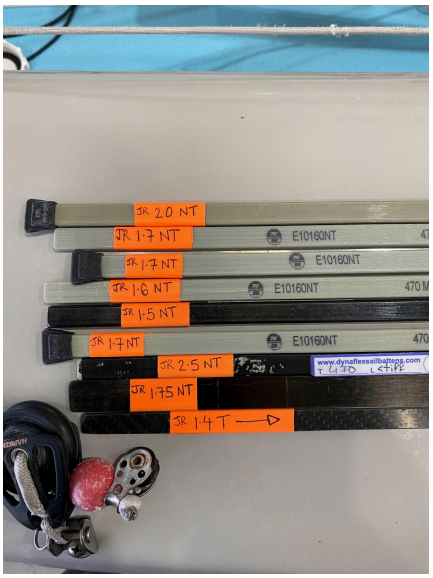
Rudder Stock and Tiller

What are the weight saving options? Material/weight/strength

Battens

Sail battens are the thin, flexible strips (usually made of fiberglass or carbon) that slide into pockets in the mainsail. They might look simple, but they play a big role in how the sail keeps its shape and generates power.

Need to do testing on the following:
Material, stiffness, shape (tapered/non tapered), weight, length, adjustment



Mast

Mast is made up of an aluminium tube with a set of spreaders and a mast foot.

Need to do testing on the following:
Mast foot shape/material/profile/weight
Is there anywhere else in our mast we could take out weight? Spreaders? Or alter the stiffness? What's optimal?

Pumping Handles

These are used by the crew when you are allowed to pump off wire.

Can we make these more ergonomic and comfier to pump off?

Other areas for development:
General weight saving - more use of titanium parts and carbon? Where can we take out weight?
Making parts more aero in general
Rig settings and bend profile? What is the optimum sail shape in different wind strengths? Power vs drag
How can we use more technology in our campaign? Load cells, data collection, modelling

Hull

C.6.1 WEIGHT

Minimum

The weight of the **boat** shall be ..... 120 kg,
measured with the **boat** in dry condition, including compasses, but excluding **sails,** jib luff wire and all **portable equipment**.