Prepared for the Victoria Division

THE CATAMARAN "MISS NYLEX"

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INTRODUCTION

The catamaran Miss Nylex was developed to compete in the International Catamaran Challenge Trophy Race. This competition is decided every 2 years for what has become known as The Little America's Cup. The trophy was donated in 1960 by the Sea Cliff Yacht Club of New York initially for competition between England and America. It was won from Denmark by Australia in 1970, and in 1972 the Sorrento Sailing Club had to mount a defence of the trophy against a challenge from America. This became the beginning of the story of Miss Nylex, when, in early 1971, a syndicate was formed under the sponsorship of the Nylex Corporation to build a boat to enter for selection to contest defence of the trophy in 1972. The story stretches out over a period of 5 years and has led to the development of a rigid aerofoil rig which is close to the optimum for windward performance. In this paper I shall concentrate on the differences between Miss Nylex and other 'C' class catamarans so as to give the maximum amount of detail regarding those features which are unique.

TROPHY COURSES AND DESIGN CRITERIA

Before going on with the description of the boat itself and the special features of its rig and construction I will describe the nature of the competition, and the basic type of boat which is used. In Fig. 1 I have shown a sketch of a 'C' class yacht. This particular sketch was used in our original proposal to Nylex Corporation for sponsorship and as can be seen we did not at that stage contemplate using a wing mast. We illustrated a boat which was very similar to Quest III which had won the trophy from Denmark the year before. In designing a boat of this type one only has to take account of a few basic rules as shown in the first illustration.

- The overall length must be a maximum of 25 feet.
- The overall beam must be a maximum of 14 feet.
- The area of the rig must be a maximum of 300 square feet.
- The hulls must be parallel and equal in size.
- One of the two crew members is allowed to use a trapeze.

Within these broad restrictions the designer is free to create any configuration which he feels will outperform his competitors. The match is sailed over a set course. This is shown on our next illustration (Fig. 2).

Every challenge match since 1965 has been conducted over a course of this shape and length. Basically it is a 3, 4, 5 right angle triangle and the total race distance is 19.5 nautical miles (22.5 statute miles or 36 kilometres). It is carefully laid in relation to the wind so that from the first to second mark the boats have to sail directly into the wind, they then sail on a beam reach at right angles to the wind for 3.2 km (2 miles) and back to the starting point on a broad reach for a distance of 4 km (2.5 miles). The legs of the course are then traversed in the order shown, until the boats complete the full race distance.

The first important criteria in designing the boat is to understand fully the demands of this particular type of course. From the results of previous matches we have determined the proportion of total race time for which the boat has been on each point of sailing. This is shown in the column at the right hand side of the table in (Fig. 2) and it will be seen that nearly half of the time is spent beating directly into the wind and the next longest time is spent broad reaching. Also in this illustration is a chart which is showing the length of time spent at different boat speeds. The 'C' class catamaran is capable of a speed of 44 km/h) 27 or 28 miles per hour), that is about 24 knots, but it will be seen from this chart that most of the time is actually spent sailing in the vicinity of from 6-14 knots. The very high band at 10-11 knots is due to the time spent beating to windward. Together these charts illustrate that having a boat which will perform well when beating into the wind is a primary requirement. In the initial design stages of Miss Nylex the syndicate agreed that we should make every effort to build a boat which would excel in this area.

The first detailed task in the design was to analyse the drag forces acting of the boat when beating to windward. Of necessity many of the values established are approximations. No reliable data exists for many of the small factors involved in these summaries but as with many such engineering exercises a reasonable estimate of the absolute value coupled with a fair guess of the differences between the various types of configuration is sufficient to direct a decision as to the most likely direction in which to improve design.

Before discussing these factors I should point out one of the basic relationships between the forces acting