

INTERNATIONAL 12 METER CLASS, 1938 to 1985

The last great challenge for the America's Cup that was mounted by the 135 ft LOA J-Class yachts took place in 1937, just before the 2nd world war. By the following year, Harold Vanderbilt realised that the big class boats were in decline and that the 70 ft long International 12 Meter Class was going to be the future trial horse for the America's cup races. On account of the war the America's cup series was not resumed until the disastrous British Challenge made by SCEPTRE against COLUMBIA in 1958.

Just how apparently slight the differences actually were between one pre-war progressive design and its successor may be seen by comparing the drawings of NYALA (S&S Design No. 214 in 1937) with VIM (S&S Design No. 279, designed in 1938). VIM at LOA 69'7", waterline 49', beam 12', draught 8'11", was a very similar shape to the one year older NYALA at LOA 68'4", LWL 47', beam 11'5", draught 9'2". The differences shown on the rating certificates show that the differences were millimetres and since the original drawing for VIM is damaged the drawing for NYALA is also shown. VIM proved a near unbeatable combination for almost 20 years! Indeed, she was used as a trial horse for the 1958 series, and having been lightened, re-rigged and strengthened provided such serious competition for the much newer COLUMBIA, built in 1957, that she almost succeeded in acting as the defender. There is little doubt that had she done so she would still have handsomely beaten the English boat SCEPTRE. VIM's lines present classic 12 Meter development and bear close similarities to yachts designed in Europe and America, throughout the previous decades. However, she was the first 12 Meter to have bar rigging and an aluminium mast.

Olin Stephens has called COLUMBIA [S. & S. design no.XXXXX], "really an improved VIM". This was the first 12 Meter to have a reverse canted transom which saved weight. She also had a much shorter keel profile but her lines are a refinement on a long string of predecessors. CONSTELLATION (S&S Design No 1773) was once again a completely different boat to COLUMBIA and her hull proportions differ from COLUMBIA's much in the same way that VIM differed from NYALA while her sail area was some 130 sq ft less. Olin, however, was experimenting at this time with a view to reducing the wetted surface area of the hull and therefore the amount of drag it caused passing through the water. Making an important discovery, he has said, "I had the feeling that wetted surface aft was not as harmful, perhaps, as it was forward, because the water was then already going with the boat." As a result he invented something which was to become an S&S trademark on boats throughout the mid sixties and early seventies - the invention of a bustle, fitted above and aft of the rudder which seemed to act to improve the detachment of laminar waterflow from the hull. At the same time, CONSTELLATION had a radically new rudder shape, differing from the established shape for all previous vessels, which had been a semi-circular segment section. CONSTELLATION's rudder was thinner at the top and broader at the base near the keel. This allowed for the rudder to bite more firmly on less disturbed water, allowing greater control downwind and better laminar flow off the aft end of the blade. CONSTELLATION also experimented with a v-shaped bottom to her keel. All previous boats from DORADE to COLUMBIA had had a U-shaped bottom. Discovery of the advantages of the V-shape in tank testing at the

Stephen's tank at Hoboken improved windward performance and reduced leeway. CONSTELLATION handsomely beat the British Challenger SOVEREIGN in 1964.

When in 1970 the Australians challenged for the America's Cup, Olin decided that there was still much to be learned studying hydrodynamic flows and comparing them to progress that had been made on laminar airflow in aircraft wing development. The result was INTREPID in 1967 (S&S Design No. 1834). Once again the LOA of the boat was slightly shorter (LOA 64'3", LWL 45'6", beam 12', draught 9') and the sail area marginally less. Olin has regarded INTREPID (1967) as his "most innovative 12 Meter". The snubbed knuckle bow was an attempt to reduce weight in the same way that the reverse transom had done on COLUMBIA. The small rudder was moved much further aft and closer to the water line. The keel was shortened and cut away, the trim tab fitted at its trailing end. This tab is used to help drive the boat to windward and to assist in turning her quickly, while the aft rudder is used for steering. INTREPID cost \$750,000 at the time, the most expensive 12 Meter to date. COURAGEOUS, her successor, (1974) was a further development along similar lines. COURAGEOUS had the further innovation (an S&S first) of lowering the boom close to the deck. This was made possible by fitting much of the deck gear and winches below decks. The result was a reduction in the "induced drag" caused by the mainsail, whose effectiveness was greatly improved in the same way that deck hugging genoa jibs created increased airflow. COURAGEOUS' dolphin like underbody proved highly successful and when modified slightly by Ted Hood in 1987 she managed to see off her younger competitors proving unbeatable until 1980 when the S. & S. designed FREEDOM outclassed her. COURAGEOUS, the first 12 meter built of aluminium was also the last 12 wholly designed by Olin Stephens.

The plans for AMERICA II designed, in 1985, represent the culmination of S&S 12 Meter designs. Without the need for a conventional keel and rudder set-up, the lines differ completely from their predecessors. The bow profile uses a U-shaped spoon bow which was favoured in many Meter boat designs circa 1910-20, yet this rapidly changes to a consistently V-shaped section in the mid sections, once again flattening aft of the rudder where an almost traditional counter reaches above the water line, allowing for a flattened run aft and an increased waterline when heeled. The rudder itself is fitted into a small streamlined blister excrescence which effectively is a modified development of the bustle while the winged keel with the lead ballast fitted at the lowest point for maximum stability is in answer to the innovations which had recently been made on Australian Challengers.

Sparkman & Stephens historic record in defending the America's Cup is likely to remain unbeaten. Their J-Class design no. 77, RANGER, won in 1937. 12 Meter designs won in 1958 (COLUMBIA); in 1964 (CONSTELLATION); in 1967 (INTREPID); in 1970 (INTREPID); in 1974 (COURAGEOUS); in 1977 (COURAGEOUS); in 1980 (FREEDOM). It seems improbable that this record will be beaten.