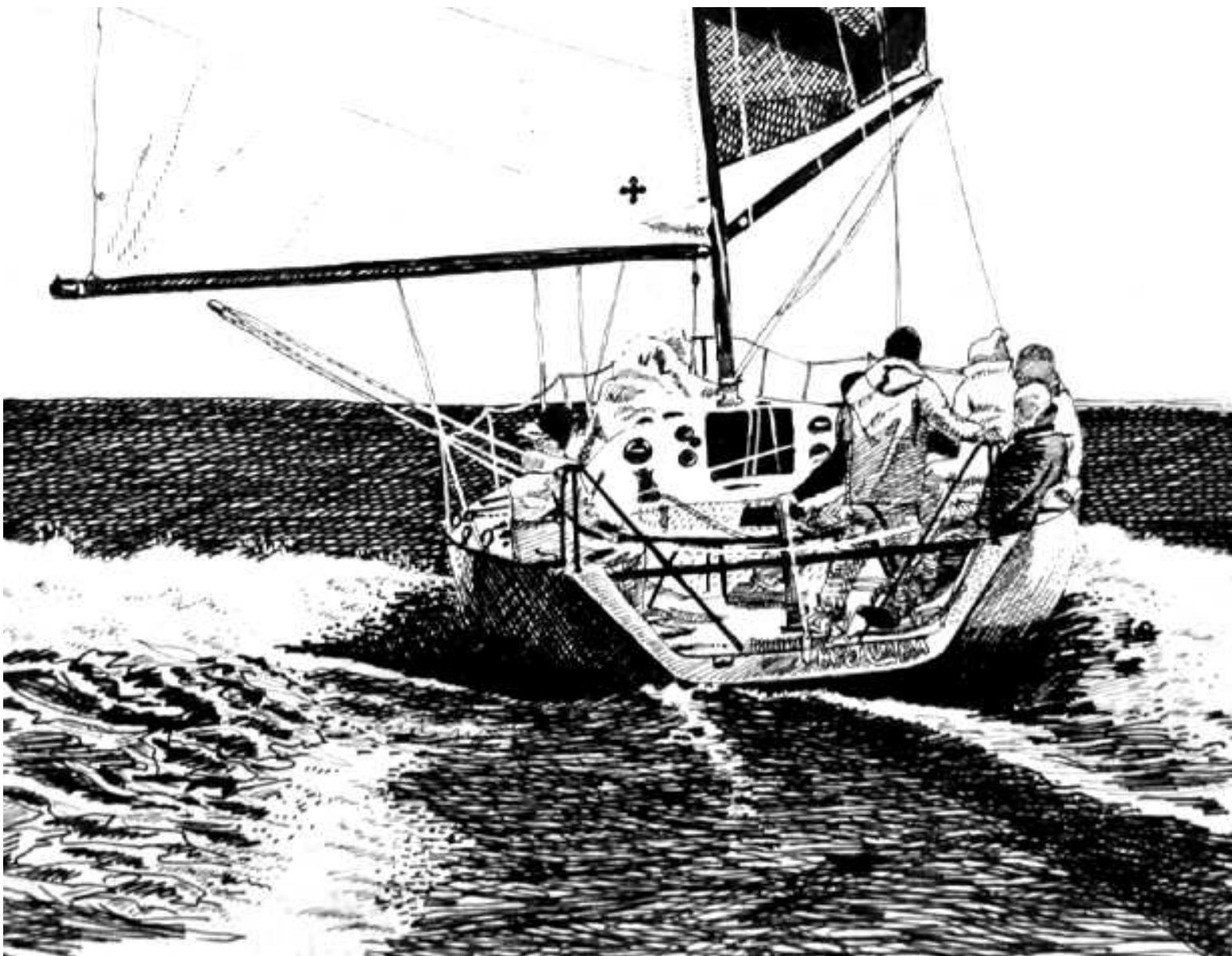


LIGHT BRIGADE



**the New Zealand
school of yacht design
light displacement and multihull
yacht evolution in the Southern
Antipodes -19th to 21st Century**

Gary Baigent



light brigade - the New Zealand school of yacht design - July 2006 - copyright Gary Baigent - copyright lines drawings rest with the designers



Greg Elliott designed light displacement *Pig Hunter* at speed near Rangitoto Island

Gray Hudson

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light brigade – the New Zealand school of yacht design 19th –21st Century

Gary Baigent

1. destroying the old order

HEAVILY BALLASTED keel yachts are too weighty to be fast even in winds just short of a gale - but even then they are not fast - and are therefore justifiably ridiculed because in such conditions the yacht, sails and gear become very difficult for the crew and helmsman to handle. But this knowledge was not always so – in fact heavy boats almost without exception, have been considered the norm in the history of pleasure yacht sailing. The exceptions when light displacement boats gained a short period of acceptance with yachting people were rare and could be considered almost aberrations of normal yachting behaviour.

But although heavy boats in heavy winds are almost uncontrollable, rolling, broaching, burying their bows or getting pooped by overtaking following seas, light displacement boats and the even lighter multihulls handle such sea conditions well and sail faster with less effort and with reduced loads on hull, sails and gear. They also require less sail area for their high performance and they steer far more easily than their heavyweight counterparts. This heavy boat struggle is well illustrated by the grimacing image of Chris Bouzaid (below) struggling at the helm of a famous champion, but often broaching, US designed, heavy displacement Sparkman and Stephens *Rainbow 11*.



Heavy yachts adhere to Froude's Rule where speed is limited by the waves created by the yacht – as they go faster, they sink lower and lower into the wave troughs they have built for themselves – and to go beyond this limiting theoretical hull speed, heavy boats require either huge seas from astern to push them along or an overpowering amount of extra wind force on their distorted sails to provide power for speed - which, invariably places dangerously high loads upon their rigs.

The breakthrough from this heavy boat approach that created an impression worldwide began when New Zealand light displacement boats appeared in the 1970's, particularly the IOR (International Offshore Rule) centreboarders (actually daggerboarders to be correct) from Bruce Farr, Laurie Davidson, Paul Whiting and Jim Young. Horrified traditionalists comparing these lightweight designs with classical heavy displacement boats from the USA like those from Dick Carter or Sparkman and Stephens, found the New Zealand big dinghy



Bruce Farr's centreboard One Ton design *Mr. Jumpa*

Jenny Farrell

boats to have about as much beauty as military weapons – to them they looked ugly, austere and threatening – and especially so when they were aggressively sailed by crews who were seemingly intent on destroying the old order. Downwind surfing had special appeal to these new “Mulleties” (a derogatory, traditional term suggesting loud, hard crews from fishing Mullet boats) – but upwind performance was also depressing to owners of outmoded, outpaced heavier designs.

But although these iconoclasts had the appearance of something dangerously new, they were in reality, an evolution of 1960's designs from Bob Stewart, John Spencer, Jim Young and Des Townson. So although *avant garde* light boats were admired by only a few, they were hated by the majority of conservatives – however it was in this controversial period that light, fast yachts became known world-wide as synonymous with New Zealand.

It would be difficult to find any activity more bound by restrictions than yachting. Rules in the past were set by wealthy traditionalists who were determined to keep yachting a rich man's sport. But the New Zealand-type yacht arose from working class origins, from people who were equally determined to be free of rules, one design restrictions and conformity. This latter attitude inhibited most US and English yachting designs because they were mostly boring production boats with no room for development. And in their stagnation the joy of pure (read fast) sailing had been forgotten, yachts had become merely status symbols. Conversely the New Zealand racing lightweights broke free from displacement hull speeds and tradition by outrageously planing like an overblown sailing dinghy. Under sail these dancing lightweights became alive – and they retained this almost magical force even when swinging on a mooring. And to the open minded the best design examples had a beauty that was more than the piecing together of lightweight yacht components into a radical form. Many disagreed. It took numbers of years before Northern Hemisphere yachtsmen (but not the French, Scandinavians and a few enlightened, but ostracized, Englishmen) to realize keel boats could exceed their theoretical hull speed,



Murray Ross designed lightweight R930

in fact they didn't know this was possible until they were jolted awake by the first French single handed light displacement Open 60 yachts.

But in the 1970's the light brigade from New Zealand was seen as a major threat to yachting health by establishment legislators and like the US Sandbaggers a century before (the Sandbagger period was another of those times when lightweight design ran too fast for the "wise men" in power) legislation was introduced to suppress and ban this boat type. As a result of the 1970's establishment reaction, lightweight advocates from the Southern Antipodeans scathingly viewed the people behind the Rule as reactionaries who were determined to ban all yacht design performance advancement.

And that is why in the 1980's New Zealand designers and sailors turned their backs on the IOR and stepped aboard indigenous high performers from Farr, Young, Davidson, Birdsall, Ross and Elliott. Young commented, "Specializing under rules produces horrible boats. Rule makers have done more harm to yachting than religion has done for mankind. Under a rule it is best to be just fast enough to beat the rest – something New Zealand designers found out the hard way under IOR. In reality everyone is trying to go slow. But that is what the majority want – they would like sports cars but invariably end up with family saloons. Also, under a rule, once someone designs a successful boat that fits the rule, suddenly all designs become the same, few are different. Looking at it objectively over a period of time, at first, like sprats, they all rush off, then most of them come back to the same spot."

Although they would like to think differently most yachting people are not experimentalists and when confronted with inventive types become frightened and confused – and can only handle them by making criticism. Consistently throughout the 175 odd years before the 1980's the leaders of controlling yacht clubs have stopped any development that encouraged high performance – it has been suggested that in the early years this was probably because of dour religious upbringings.

"The most innovative inventions," wrote Garry Hoyt in the US publication *Yacht Racing/Cruising*, "that have brought major changes in the 20th Century yachting, have come from two ex-surfers with absolutely no formal training in yacht design: Hobie Alter and Hoyle Schweitzer – who designed the breakthrough Hobie cat and the windsurfer."

Similarly in New Zealand autodidacts have been a major influence in changes of yacht design direction – "New Zealand's shining light in self education is Bruce Farr," said Young, "he has done his own thing all his life, left school at 17 and has never stolen any ideas from anyone."

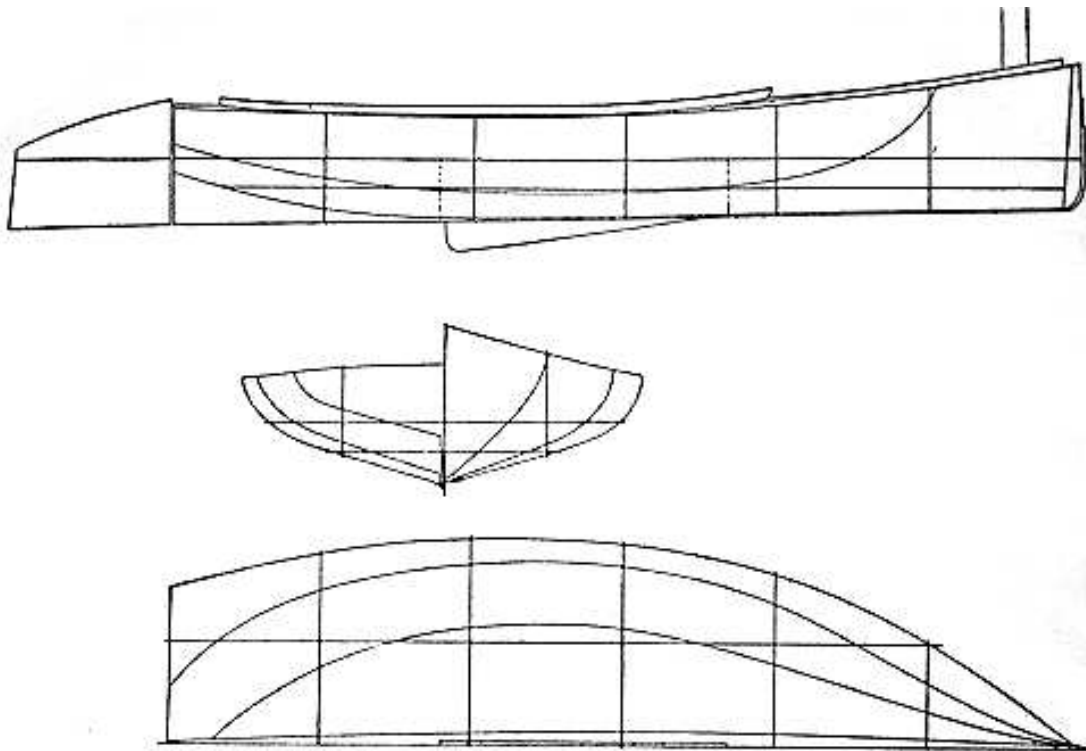
However besides the damaging hierarchical restraints from overseas conservatives, the history of New Zealand light displacement yacht development has also been undermined by local anger and jealousies – perhaps this approach is inevitable and also necessary for progress. It is only in blatant suppression of movements that the situation loses control. The more unfair the umpire, the more determined the iconoclast becomes – so in the long run that is healthy too. Now with the emphasis and overwhelming acceptance throughout the yachting world of building lighter and lighter monohull and multihull designs, the circle has turned 180 degrees and the early New Zealand philosophy beginning with the light centreboarder IOR designs has now been carried much further and has become an unquestioned and established order in itself.

2. origins and influences

IT IS ACCEPTED that this change occurred after the 1970's but the movement of light boats did not originate from this country, as now some patriots would believe – instead it began with the North American 1836 Sneakbox and a little later the Sandbagger – the first Sandbagger appeared in 1852 and was derived from a fishing boat design. This was *Truant*, designed by Robert Fish which went to England that year and easily

beat all the English keelboats on the Thames estuary. This was unacceptable to wealthy keelboat owners and went purposely unrecognized – dismissed because *Truant* was a development of a small working class fishing boat – and also haughtily discounted because the design was not the product of English empire builders.

The 20 – 24 foot Sandbagger and the flat bottomed New Haven Sharpie developed first from oyster boats into high profile (in the Sandbagger's case) and very popular classes in Long Island Sound, Narragansett and Massachusetts Bays and were considered (among realists) to be the fastest boats in the world for their size.



Bob Fish's Sandbagger *Truant*

The idea of shifting ballast, as used on the Sandbagger, dated back to fast sailing by necessity privateers and slavers. Sandbaggers carried clouds of sail, had extreme beam half that of their length, carried a large centerboard and were sailed by tough crews both on and off the water. What was annoying to owners of heavier keelboats is that these rough extremist designs thoroughly disproved the rule that the speed of a vessel was in mathematical proportion to its waterline length. Sandbaggers revealed that performance above that figure could be attained with a short waterline as long as there was enough stability in their wide beams (along with crew and sandbags stacked along the weather rail) to carry a large sail area – now length was no longer a gauge for speed. But Sandbaggers and crews were not popular for revealing this new reality and by breaking the “rules” established by deep water port keelboat owners, these high sail carrying, light displacement, dish shaped cross section boats were soon banned from competition.

The less extreme, much less flared but similar New Zealand Mullet boat appeared in Auckland first as fishing craft, then as racing boats – but 30 years after US developments – and like the Sandbagger, also had a tradition of hard fighting crews. The Mullet boat was designed for netting in the upper reaches of the Waitemata Harbour, hence the shoal draft (2 feet with the centerboard up and 6-7 feet with it down). The early examples were 26 – 28 feet long with an 8 or 9 foot beam, had plumb bows and sterns and a well cambered keel. Instead of sandbags stacked on the weather rail, the Mullet boat carried 30 cwt. (about 1.25 tonnes) of lead or



above: New Zealand centreboard Mullet boat *Komuri* in Motions Creek - opposite: Mullet boat on the Waitemata

pig iron stowed along the keel in the bilges – which was often shifted (illegal during racing but done anyway) by a hard working crew below.

Although the hull form was dinghy-like (the main feature being its wide beam) its displacement was not dinghy- light for the Mullet boat was solidly built in single skin kauri planking over steam bent ribs – but with its large sail plan the Mullet boat was a good performer, especially downwind in a blow – and one of the reasons the traditional class remains popular today.

Centreboard carrying, shallow hull, semi-planing craft were owned by sailors who could not afford professionally built keel yachts – but if they could build their own boats and pile on the sail, have hull stability to carry that sail power, then they became very exciting racers and, even though naval historians like Howard Chapelle and Basil Greenhill considered changing work boats to racers destroyed original design intentions, such craft, nevertheless became very popular. But on the eastern seaboard of USA conservative keelboat owners with more stable, safer but slower yachts were not happy – they considered Sandbaggers to be freaks and the crews dangerous outlaws who simply wanted only speed, liked to take chances and to gamble by betting even their shirts on their respective boats' performances.

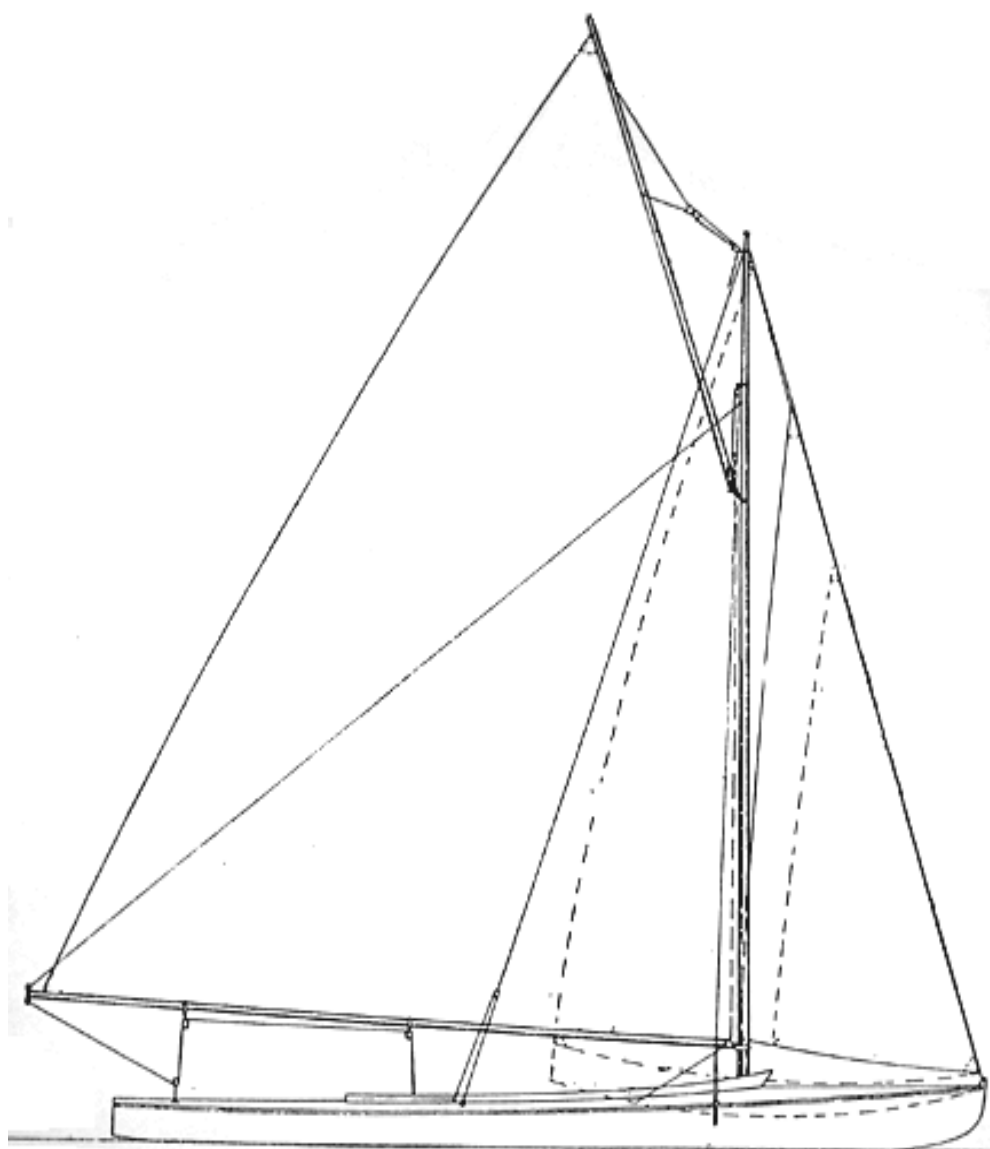


However, the uncouth and loud centerboard class was unconcerned with neither one thing nor the other cruiser/racers but offended keelboat committees moved to halt the Sandbaggers cheap, high performance – and by the early 1870's the Sandbagger and crews had become *persona non grata*.

Nevertheless North Americans continued to sail both large and small, light, shallow hull designs – but now without shifting ballast. In time these shoal draft yachts became American establishment and accepted – a peculiar reversal, almost an aberration of tradition elsewhere – and something that would not occur until more than a century later in New Zealand.

Eventually this approach worked against US sailors. By being unable to increase the power of their craft allowed deep keeled, heavy displacement English/Scottish cutters like *Madge* to win against centreboarders. *Madge* beat the “skimming dish” designs in light winds and sloppy seas and “cutter cranks” hoped this would reduce popularity of shallow draft boats – but were disappointed.

By 1894 Nat Herreshoff had designed advanced thought, light displacement, bulb keel, separate rudder yachts like *Dilemma* and an extreme skimming dish named *Alpha* – both of which looked very much like racing monohulls belonging to the late 20th century. He also produced the outrageously fast 24 foot catamaran *Amaryllis*. Later US development went further into rule beating monohulls with unballasted scows like *Hades* and *Outlook*, designed by W. Starling Burgess. If the skimming dishes appeared extreme to keelboat sailors, the



Logan designed very light displacement Half Rater

scows were almost beyond contemplation. Some of them were lightly built and lasted only a few races (a contrast to the long lived skimming dishes) and so they were also quickly, and expectedly, banned from club racing.

In the early 1890's Dixon-Kemp introduced a rating rule in the Northern Hemisphere to enable less affluent sailors to enjoy racing. The smaller Raters, the Half and One Rater, unballasted centreboarders were also built in New Zealand along with a Rater development which became famously known as the Napier Patiki and these light and long (22 - 26 feet) performance boats were instrumental in changing attitudes to fast sailing.

Until only recently in New Zealand the Napier Patiki/One Rater design was virtually unknown - except by a few old sailors who had heard about them when they were boys. Nearly all information about these radical boats is their oral history. *Maka Maili* was probably the first of the Rater/Patiki types in New Zealand but the history of this boat is unclear - some say that this clinker hulled craft was imported on a US ship probably in the



Maka Maili on the Manukau Harbour

mid-1890's, and others that the boat was built here to US plans – anyway the boat was not a New Zealand native. Soft bilged, clinker built *Maka Maili* differed to the following Napier Patikis because the latter were all hard turning, round bilge designs and of carvel construction - a continuation of Auckland designs from the Logan and Bailey brothers - which in turn were very similar to the Dixon-Kemp Half and One Raters. Also at the same time on the other side of the world the English Thames Raters appeared, and they were very similar craft (also considered extreme and freakish) plus another US class of the 1890's – 1900's called Sonder boats, which were of the same ilk, then came the bad boy US lake scows – and all of them would have planed, although in those days it was called skimming and other similar words.

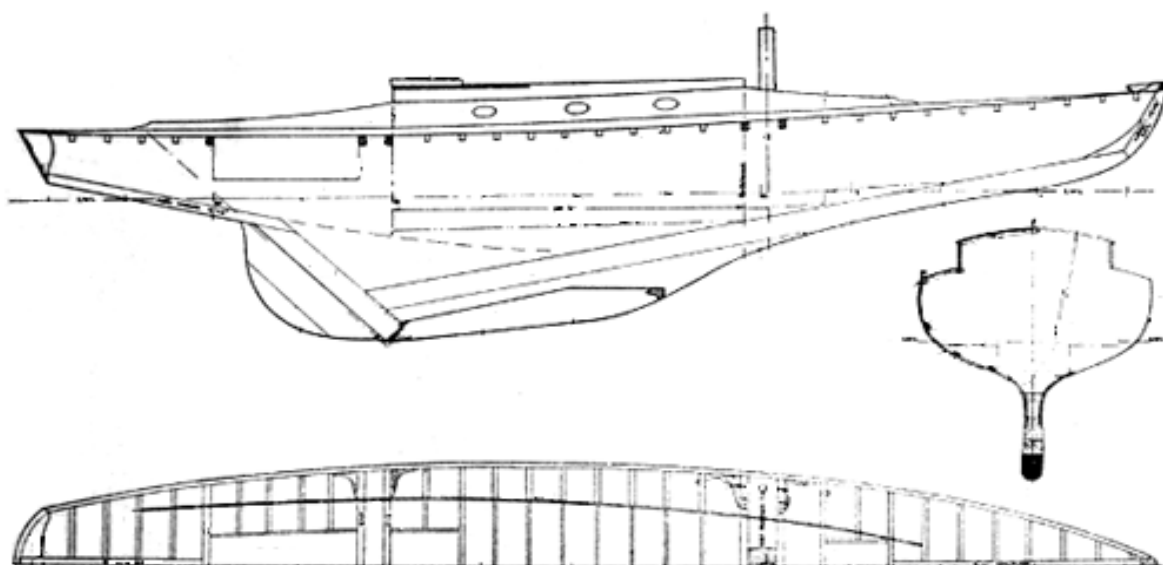
So it would be pleasing to claim the New Zealand Napier Patikis as the original planing design but it can be seen that this is untrue – although this country was probably the first to accept planing, unballasted hull designs in reasonable numbers because the Napier fleet was large, and certainly pioneered planing and semi-

planing, light displacement, ballasted keelboats in the 1950's - '60's. But conversely in New Zealand there were numbers of heavy, expensive, keelboat owning reactionaries steeped in the English tradition who abhorred the idea of big planing dinghies (especially when these designs sailed circles around their larger boats) - class behaviour it seems was/is universal in all maritime countries; wealthy, powerful conservative versus the uncouth, antagonistic worker to put it simply - but the latter owned the more advanced, sophisticated design.



Scandinavian influence *Norsemen*

The first English light displacement designs appeared in the 1890's with unballasted One, Half and Thames Raters - while the first genuine English light displacement, (but no planer) ballasted yacht arrived in the 1930's when Jack Laurent Giles designed *Maid of Malham* for John Illingworth. Illingworth wanted something radical - and got it in an ugly, short ended yacht that exploited the RORC rule with a mast head rig, small footed, high aspect ratio mainsail and large headsails. This rig was implemented because the foretriangle rated 85% of its actual area and was therefore cheap compared to the mainsail. The mast was stepped well aft so headsails could be large and provide the major driving force. Illingworth was a free thinker convinced that light displacement was the way to gain high performance and he was obsessive in keeping weight out of his boat. In 1947 he had *Myth of Malham* built with the lines again drawn by Jack Giles but the rest was handled by Illingworth. The hull was kept light by a complicated construction method pioneered by Giles: fore and aft



planking on a diagonal skin over steam bent ribs on stringers with further laminated frames inside – the outer skin was originally unglued and relied on countless fastenings. *Myth of Malham* was unattractive but simple, light, machine-like (there was considerable carping by the competition that it was stripped out and also very ugly) but annoyingly *Myth of Malham* won everything offshore powered by the unusual masthead rig that Illingworth had experimented with on *Maid of Malham*. But although Illingworth's *Myth of Malham* was well known to New Zealanders the boat had no influence on the development of light displacement yachts in this country. Aside from differences in the big headsail rig, *Myth of Malham* was narrow beamed – whereas the first, original, modern (1960) native design from the Antipodes, the Stewart 34 *Patiki*, was like a wide, big dinghy (based on the Mullet boat) with rig equally balanced between main and headsail and with the mast stepped forward.

However New Zealander Jack Brooke's *Whitewings* was very similar to *Myth of Malham* and he audaciously put his name to the design – as he did with the impressive *Gleam* built during the Second World War – but *Gleam* was a straight copy of the US moderate to light displacement, long keel Yankee 30 - no original Antipodean thought here.

In the 1950's Jim Young designed a moderate displacement yacht called *Tango*, the first cruising boat built in New Zealand with a separate keel and separate rudder, (but 50 years after the similarly configured Logan racer *Sunbeam*) – however this was radical yacht design thought in the 1950's and the boat was considered most unusual and looked at with suspicion. Young said there was little English influence in *Tango*, instead he was more impressed with the Argentinean German Frers Snr. Although the reverse sheer he admitted, came from Jack Giles. Later he drew his truly New Zealand original, the NZ37, a class which became famous because of the superbly sailed and prepared *Namu*, owned by Flap Martinengo,

The designs of Dutchman E.G. van de Stadt were well known to informed New Zealanders when he drew revolutionary light displacement Metre yachts *Zeeslang* and *Black Soo* in 1956 (on which, incidentally, John Spencer based *Scimitar*) – the Dutch design had a deep draft keel with a bulb and a separate rudder, a very advanced design and still modern in appearance. Light displacement Scandinavian boats also had influence here, but these were long keel, integral rudder designs and therefore somewhat retrograde; the stretched *Ariel* of 1959, built in Swanson by the Lidgards, was a New Zealand example.

The first New Zealand IOR (International Offshore Rule) yacht, Brin Wilson's *Rebel*, was a direct copy of US designer Dick Carter's *Rabbit* and John Lidgard's *Runaway* was heavily influenced by Sparkman and Stephens Swan designs (Swanson Swangards they were called here) – as too were the S&S-like designs from Des Townson when he departed from his earlier New Zealand philosophy of his big dinghy *Pied Piper*. These IOR yachts were contrary to what had been developed, first in planing dinghies, then in light displacement keel boats in this country so they achieved little success. Since they were followers and not originators, they could expect nothing more.

3. considered freakish

NEW ZEALAND CREWS who sailed on indigenous Patiki centreboarders dating back to the mid 1890's, found it difficult to convince listeners of this exceptionally fast planing boat's true performance. The design was actually too far ahead of its time for its own good and was considered by critics as a skimming fool. Like the Mullet boat the Patiki owed something to the US wide, shallow hulled Sandbagger and also to Dixon-Kemp's rating boats. The US inspired or imported *Maka Maili* made a big impression on the Manukau Harbour and Ray Grant remembered his father John Grant being thought very far fetched when he tried to describe his experiences aboard this 28 foot centreboarder. John Grant first stepped aboard *Maka Maili* when he was 10 years old as bailer boy and was on the boat when it famously planed at a 13 knot average from Waikowhai to Onehunga Wharf. *Maka Maili* was the top boat there until the Logan designed 24 foot *Ngaroma* arrived. By that time John Grant worked on the *Huia* rafting kauri logs from Manukau heads to Parker Lane's sawmill - and in his spare time writing yachting articles for the *Onehunga Gazette*.

Tom McKnight had a long involvement with Auckland Regatta organization and clearly remembered a



Napier Patikis on Aruhiri Lagoon prior 1931 earthquake



Robert Logan designed 1898 Patiki, *Mercia*

Henry Winkelmann

1909 Logan Patiki, the 27 foot *Maroondah* taking the gun ahead of formerly unbeatable A Class keeler *Ariki* one windy Anniversary day. But the ease in which unballasted designs won races was too much for the yachting officials of the time and bad feelings arose between the ballasted and unbalanced factions. The Auckland media took the committee view and sycophantically printed that Patikis spoiled competition; this created an angry reaction to the unballasted boat crews which resulted in them being ostracized from race clubs. The favoured classes were the heavier Mullet boats: 20 to 26 foot lengths and this left no room for the spectacular Patikis and Rater boats like *Aoma*, *Bellbird*, *Mercia* and *Doreen*.

Alf Lock's brother Ernie was an apprentice working with Jack Logan, Arch Logan's son. Jack became a household name in New Zealand winning over a number of years in his unbeatable, radical, scow-like 18 footer *Kotuku*. Ernie was aboard a Logan Rater/Patiki when it sailed three circles around the crack A Class *Rainbow*. The hulls of these Logans were of thin Tasmanian cedar in seam batten/carvel construction, light enough for 16 year old Ernie and Jack to lift the mid-20 foot hulls by themselves. Bailey & Lowe and also Collings & Bell built a number of Patikis to in-house designs and the former builder/designers established a standard with their One Rater *Laurel* when it won the first of the popular (among spectators but not club officers) Waitemata Rating boat series in 1901, beating Robert Logan's champion *Mercia*.

Ray Grant joined the Manukau Yacht and Boating Club in the 1920's, a period when the club was strong with over 200 members and financial enough to own among other designs, three Patikis. Mixed fleet racing on the Manukau was competitive and although a number of privately owned Patikis were launched to beat *Maka Maili*, then *Ngaroma*, few succeeded. Patikis were considered freakish but no other design could beat them and crowds would gather at race days to make side bets.

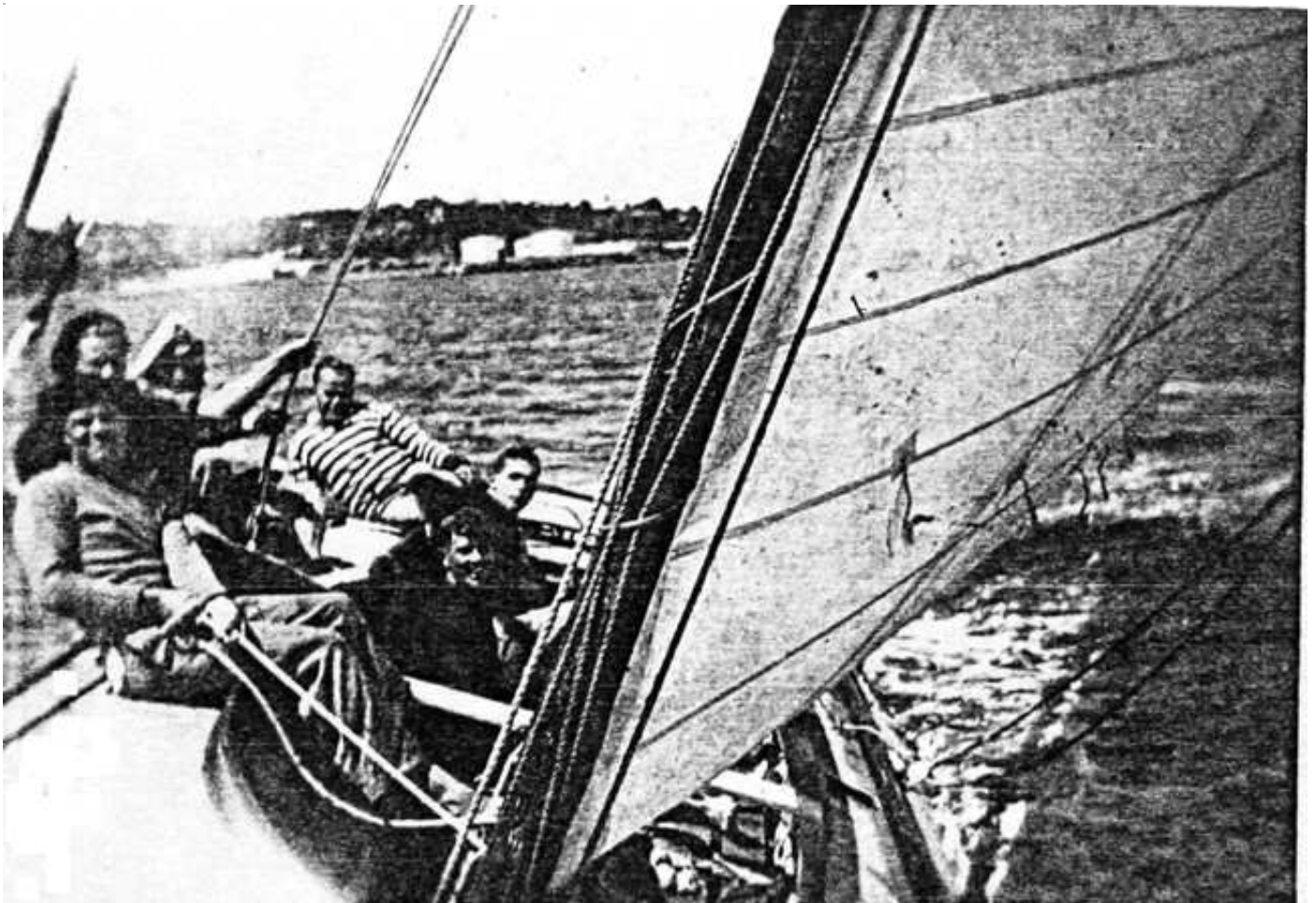
Patiki enthusiast A.H. McCarthy once sailed his Bob Farquhar designed 27 foot *Sayonara* over a measured five miles when it was timed to cover the distance in 10 minutes 58 seconds. He was adamant that in squalls *Sayonara* touched 40 miles per hour – a speed so great that audiences just shook their heads. McCarthy claimed the shorter and less speedy *Ngaroma* averaged 30 miles per hour over three miles on the Manukau. Although these claims seem excessive, even today, there was no doubt that these lightweight flatfish were exceptionally fast and decades ahead of their time. They readily planed on their after sections, something that was not generally accepted worldwide until the 1930's when Northern Hemisphere writers came to terms with the then, radically new planing International 12's and 14's from Uffa Fox – who was the first to cleverly exploit dinghy rules.

The term patiki: (Maori for flounder or flatfish) encompassed a number of centerboard yacht sizes and types; even the Arch Logan designed M Class of the 1920's, a heavy and wide beamed clinker boat, was called a restricted 18 foot Patiki. But it was the Napier Patiki that established the name and type – although they did not appear on the Ahuriri Lagoon until 1905 – 06. These were not local designs either but imports from Auckland, the first being the 22 foot clinker hull *Edith*, built by Bailey & Lowe. Prior to that arrival (*Edith* caused a lot of interest when the centreboarder was first seen beating at high speed across the Lagoon) the Napier fleet consisted of more pedestrian ballasted centreboarders – but popularity for the new design was immediate and soon afterwards Arch Logan's *Ngaroma* was imported, then *Maroondah*, followed by Bailey and Lowe's *Sunray* – these fast, new boats inspired locals to begin designing and building their own speedsters – so that quickly the name Patiki became established and synonymous with Napier.

The Napier Patiki had an elegant appearance with a fine bow, low freeboard, hard turning bilges and planing after sections. The design was refined and planed easily downwind under its hollow spars in a gaff rigged mainsail, boom footed jib plus a spinnaker. Sail area was large, sometimes extreme for the lightweight hull and the Patiki relied on wide beam, crew stacked to weather plus very light displacement to accelerate away from gusts and stay upright. Even though the transom rudder was shifted under hull to stop ventilation (first with

Maroro in 1906) it was too small for control in hard reaching conditions; then the crew could only keep on course by constant trimming of the sails. So two rudders were fitted on some boats under each bilge to counter this problem – a practical solution and something the US lake scows of the same period also had in common. Perhaps there was knowledge of this rudder setup brought to Napier from the US or maybe it was just a local innovation. Also at the same time there was a Logan brothers' English Rater plan which had two bilge slung rudders with one forward of the other.

Arch Logan's son Jack obviously knew about US scows because his skimmers, the Unrestricted 18's *Komutu* and *Tarua* were of that shape but unlike US scows, his carried one large and deep rudder for control. Logan's boats were called skimmers in New Zealand and were considered very extreme – but Jack disagreed and said his father's turn of the Century Patikis, Raters and scow bowed *Southerly Buster*, were better examples of advanced yacht design and lightweight construction. Logan One Raters gained local and international reputations so that crack examples like 1899 *Mercia* and later *Zeelandia* were exported or built from plans in Australia and South Africa. *Southerly Buster* was built here, travelled to Sydney, beat the top Australian boats, then went on to England.



Napier Patiki Kahurangi

With their large size and extreme rigs, Napier Patikis were expensive to build and maintain. Only a few survived in original condition after the Depression years and many Napier boats were damaged during the 1931 earthquake – when the Ahuriri Lagoon drained and became filled with debris. After that catastrophe the remaining examples were forced to sail in the open sea, where large Pacific rollers played havoc with their light construction. Crews related that they could see the movement of the waves rolling along the insides of the hulls – and so many Patiki backbones were broken, like the meticulously maintained *Veronique* which was too damaged to be repaired, and so was burnt.

Kahurangi, a 1924 Bob Farquhar design, was trailered to Wellington where it raced in the 1940 Centennial Regatta. The crew, two of whom were crippled, provided amusement to onlookers who gathered about the strange craft making comments as it was being launched. There was a complete *volte face* among them however when *Kahurangi* hoisted sail to quickly disappear out to the race course where the strange boat and funny crew thrashed the fleet, beating the top Wellington keeler by half an hour. During one squall *Kahurangi* was clocked at 30 miles per hour by a powerboat running alongside. *Kahurangi* was taken to Wellington to display Patiki performance in the vain hope that the class might become established there – but churlish locals were convinced, no matter how impressively the design performed, that Wellington wind and sea conditions would be too much for the fragile looking harbour racer from the north – they were probably correct.

Ian Cross from Auckland's North Shore who later restored the boat commented, "One must bear in mind that these boats were very lightly constructed and though mostly 27 foot long by 9.5 feet beam - a pretty large boat - had only 3/8th inch thick planking. When dry two men could lift the completely rigged boat up, though I would not say carry it about." Although Cross was one of the few to keep the Napier Patiki name alive into the mid 1950's, unfortunately by the end of the Second World War nearly all these special boats were gone, fallen to pieces, or smashed with stones as they lay discarded along Napier and Auckland beachfronts.

4. vicious rulecheater

AT THE TURN OF THE 20th CENTURY the Logan Brothers built an extreme, high performance keelboat, a development with similarities to the Patiki types but one which was considerably larger with long overhangs – and instead of a centerboard, carried a deep draft bulb keel – this was the 30 foot Linear Rater, *Sunbeam*, (below) a yacht that was unbeatable against other keel boats (except in a lumpy sea) and so fast (like other avant garde designs, was too good for its own good. The result was that *Sunbeam* was jealously denounced as a vicious rule cheater and a class killer. *Sunbeam*'s bulb fin keel and separate under hung rudder was the first keel boat in New Zealand with that configuration – and more than 50 years ahead of its time. However the Logans knew of Nathaniel Herreshoff's work for he had developed the world's first bulb keel/separate rudder yacht with *Dilemma* in 1891; a light displacement design that so fast it was banned from competition - the pretext being that fin keels were structurally unsound.

The Logan boat was launched in 1899 – so the brothers were not producing an original – but Auckland club reaction was the same as in the USA. *Sunbeam*, like *Dilemma*, had a fine, light hull with ballast in the bulb keel, carried a tall and large rig like *Dilemma* but which in New Zealand conditions, contributed to making *Sunbeam* pitch sharply in Hauraki Gulf seas. This was seen as a major fault by influential critics and as usual, the media followed status quo lines so that the radical Logan design lost favour. So the disappointed owners sold *Sunbeam* to Australia where the yacht did extremely well – indeed the more open minded Australians appreciated all the champion Logan and Bailey & Lowe designs like the Patiki and Rater craft that arrived there: *Meteor*, *Aoma*, *Mercia*, *Sunbeam* and *Coorya* - and thought New Zealand designers and builders were a class above everyone else.



Logans' *Sunbeam*, 1899

Henry Winkelmann

Nat Herreshoff had definite influence on the Logans because after he designed his famous *Gloriana* in 1891, the world's first spoon bowed design, Arch Logan launched his first design, also named *Gloriana* the following year – which has to be more than a coincidence. But whereas Herreshoff's *Gloriana* was a break with tradition, Logan's had the old type clipper bow, deep forefoot and slack bilges. Then of course, Logan's later *Sunbeam* was very much like *Dilemma*.

Herreshoff was instrumental in designing American One Raters (as was Harold Sibbick) – these were light displacement ballasted keel boats around 30 feet overall and different in that respect to the unballasted, around 25 foot, One Raters in New Zealand. Herreshoff also designed revolutionary catamarans, easily the most high performance craft of the time, based on Pacific outriggers and double canoes – which again, were considered too freakish to be acceptable and were outlawed by the majority of the US Eastern seaboard sailing clubs.

Unlike US yachts, English designs had a tradition of being heavy, long, deep and narrow, the result of an old rule that measured beam twice – hence their Plank-on-edge cutter types. Not all English designs were this shape; George Watson (who designed *Madge*) drew yachts to the opposite of this rule and his famous *Britannia* had a spoon bow with the forefoot cut away, no slack bilges but full bodied at the waterline. The yacht was called ugly at first, then set a standard that lasted half a century; in New Zealand Logan's 1898 *Rainbow* followed



Sunbeam revealing her separate rudder and bulb keel, 1899

Henry Winkelmann

Watson's ideas and Lou Tercel's *Ranger* of the 1930's was another – although being mostly of Scandinavian Knud Reimers' 75 square metre influence.

After *Sunbeam*, Logan drew a less extreme 30 Linear Rater named *Heather* and although this design was praised as a more wholesome yacht, it was retrograde in design terms: the long keel/rudder was one unit, a less efficient feature and a return to old ways – but *Heather* was an attractive yacht, an all rounder that sailed well, not spectacularly fast like *Sunbeam* but one that appealed since it did not threaten extinction of normally accepted yachts of the time.

5. western prejudices

EARLY WESTERN EXPLORERS to the Pacific were astonished when they saw Pacific outrigger canoes with their asymmetrical main hulls, bows and sterns the same and rigs that were shifted from one end to the other when the canoes came about – or shunted. To Westerners they appeared frail craft, sticks and string, yet their performance was almost incomprehensible. Bougainville wrote, "Though we ran at seven or eight knots, yet the pirogues (canoes) sailed round us as if we were at anchor." And a passenger on an English ship beating into a strong Gilbert Island (Kiribati) current noted, "It took us nine days to cover the distance yet several Gilbert canoes, one of them 70 feet long, beat up in only one night."

Westerners found it difficult to understand outriggers (or proas) because they did not conform to Western sailing ideas of the time and island designed craft were dismissed again as freaks. Although they may have appeared peculiar the development of the Pacific proa and double canoe was really highly traditional and an extremely conservative process. For example: any sailing improvement invented from one village was claimed or patented by that village, outsiders who copied would be scorned and ostracized – by their own people as well – until forced by conformity to return to their original and inferior setup. With this rigidity it took many decades of incremental change for the flying proa to develop to the point of excellence it finally achieved.

Double canoes were more understandable as tying two hulls side by side with crossbeams (although rarely found in the West) was an ancient construction method: Egyptians used such craft to carry granite blocks down the Nile to Aswan – and Polynesians were sailing double canoes by the 5th Century and had discovered, explored and colonized the whole of the Pacific long before Europeans set eyes upon it. However European sailors thought Pacific craft incapable of planned ocean voyages – even though the evidence of migration was in right in front of them. Westerners' preference was for slow, unwieldy, box-like trading craft – rather than fast, airy, heathen contraptions. But not all Westerners perceived Pacific craft to be threats to Western intelligence – hence the enlightened comments from explorers and some missionaries. But even in the 20th Century some academic, but nautically weak theorists like New Zealander Andrew Sharp, stated categorically that Pacific settlement was the result of accidental voyages – and gained many believers.

It is only in recent years that modern interpretations of Pacific craft has been accepted by the boating public – but multihulls still carry connotations of uncivilized, savage origins, still not considered proper yachts.

6. first New Zealand multihull

IN 1896 TWO BOYS, Watty and Reginald Houghton launched an 11 foot catamaran into the Waitemata. Although it did not race, it proved to be fast and stable and encouraged the two brothers to design a 16 foot version. The boys were still attending school so it took them until 1902 before the second example was completed and sailing. The Houghtons knew about Polynesian outriggers and had become interested in multihulls after building canoes from bateau plans published in *Boys Own Annual*. Noting how efficiently canoes passed through the water they decided it was logical to connect two canoes together to make a sailing platform. Their 16 foot hulls had plumb bows and sterns with narrow, flat bottoms that carried almost hull length keels which flared to three plank clinker construction to the gunwhales. The mast was stepped on the forward part of the bridge deck and carried a healthy sized gaff mainsail of 200 square feet with a boom only 2 feet shorter than the boat length; there was also a jib and staysail. The seven and a half foot wide bridge deck beams were bolted through the hull frames while more long bolts continued right to the keels. Each rudder had a short arm with connecting bars that in turn carried a long tiller. The catamaran performed exceptionally well being faster than any other craft of or near its size. But the long keels made the craft slow to tack but conversely, gave very good tracking when sailing at speed. Apart from another catamaran built by a shipwright named Frazer in the same period only spasmodic and isolated multihull activity occurred in New Zealand after the Houghton brothers. An exception was the clever and innovative Stanley Mander (father of medalist Peter Mander) from Christchurch who built an 18 foot catamaran in 1933 which sailed so fast that no-one was interested in racing against it for it could do three laps of the estuary course to other centreboarders two.

7. butter boxes

RETURNING FORCES after the Second World War found sailing appealing so large numbers of small boats were built. The war produced New Zealanders who had become used to drill and being looked after, used to



X Class *White Heather* crew 1949 – left to right: Roy Dixon, Jim Young, Frank Dixon, Jack Kendall

authority and conformity (unlike the colonial rebels from the Great War) and although peace brought a change, this attitude remained general throughout the country. Anything that opposed authority was construed as communistic and anti-establishment. However individualism combined with a relaxed attitude appeared in New Zealand yacht design and sailing.

“It was different in those days,” said Laurie Davidson, “very pleasant and very social. You would sail at one club on Saturday, say Richmond, then at Devonport the next, Tamaki, Point Chevalier and so on. It was bloody good. I got to know all the classes and crews and because each class began at a certain time, you learnt the schedule and knew when to be ready for your own race. Racing then was competitive but it was kind of fun, not like today where everything is very serious. The blue ribbon class was the X Class and Sam Mason, Jim Young then Dave Marks were the top sailors but Marks was beaten by Peter Mander from Christchurch who designed outstanding boats and had an excellent crew with his brother. The Manders were hot boys in their own turf but when they came to Auckland they beat us too. New Zealand yachting did not stop at the Bombay hills you know. Yacht design for me then was just a hobby. I didn’t get into it professionally until 15 years later. Up until then I drew for my own mates and myself. I designed my first boat straight after leaving school – that was the M Class *Myth* – launched in 1947. By most standards the boat was radical and it caused some controversy. I was very keen, polished the boat with fine paper and won every race bar one that season. The officials found a

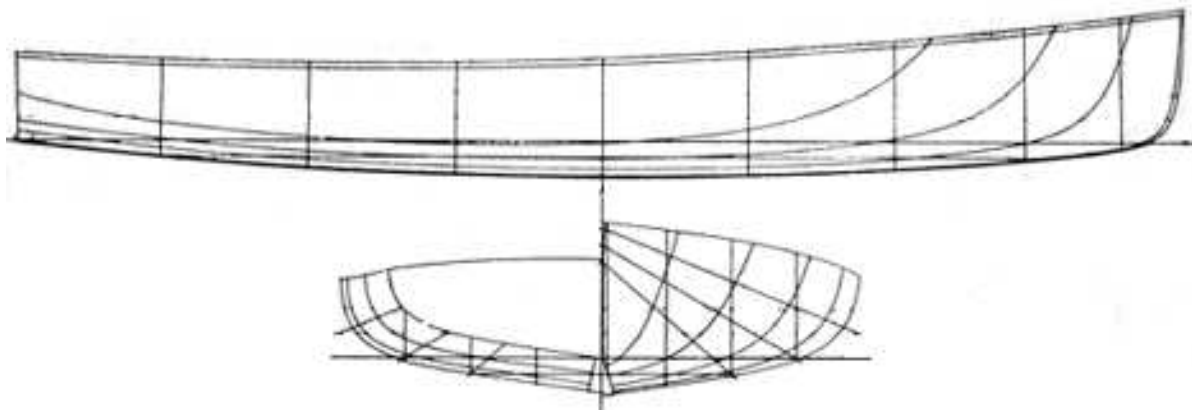
few things wrong, nothing with the shape but with the scantlings so they cancelled my certificate at the end of the season. I went home for the winter and rebuilt her. That was okay. I said 'watch me now' and won everything – never been done before."

The Mander boys came from a unique sailing family. Original thinking was encouraged by their free thinking father Stanley and they grew up designing special dinghies. Graham Mander was considered "a clever, shifty chap" because of his "suspicious" backyard modifications to his Z Class Takapuna dinghy. Peter wrote later in his biography, "Even though literature on overseas yachting development invariably came from Britain, the Northern Hemisphere influence amongst sailors here is minimal – and the reason that multitudes of overseas dinghy designs are not here is because they are duller than comparable craft sailing in New Zealand."

This attitude was not accepted by Anglophiles here and the Manders were construed as, "Upstart estuary people with their deplorable bunch of butter boxes." This had no effect on the brothers who were full of bright schemes, were hard sailors but they were seen as a threat to established behaviour of the day and some blatant victimization occurred regarding their altered Idle Along when members of an Auckland regatta conference were determined to get the boat rejected – and were successful.

8. against the grain

IN THE LATE 1940'S Bill Couldrey had a considerable influence on young sailors who designed and built their own boats. Couldrey would run an expert eye over drawings, make friendly comments and give advice. This was a tradition that started with Baileys and Logans, who had taught Couldrey who in turn passed it on to Jim Young who later influenced Bruce Farr and Greg Elliott. With some Couldrey advice Dave Marks and John Sharp built their International 14 and 18 footers in which they introduced a new boat building technique (after de Havilland Mosquito aircraft wooden construction) using thin layers of thin wood, cold moulding instead of traditional metal fastened clinker or carvel planking. The Lidgards and the Whitings were other nautical



Bill Couldrey designed 18 footer

families who passed on influences; Paul Whiting being encouraged by his father D'arcy who in turn passed on benefits during his partnership with Muray Ross. This was a tradition that was unique to New Zealand and was a contrast to overseas approaches where yachts were designed by a few professional marine architects whereas here designing and building went together and belonged to the man-in-the-street.

In 1945 George McKeown from Point Chevalier, used a sharp axe, hammer and handsaw to build in his backyard an 18 foot skimmer, *Skip It* – critics thought him a joke but two years later he designed and built *Moocher* and then in 1949 the 18 foot by 8 foot *Rockem*. These last two boats were very beamy and also very fast, so potent and unusual that they were banned from 1949 World Championships. The influential and liberally



X Class on Lyttleton Harbour

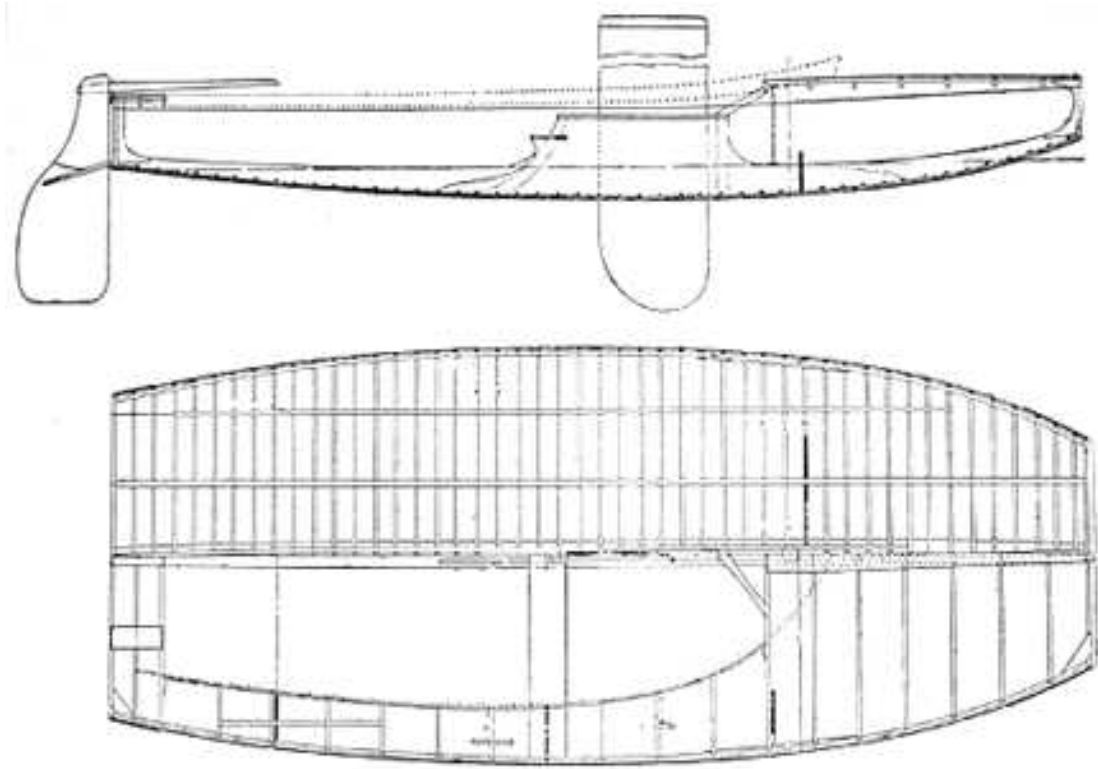
minded yachtsman Harry Julian however, supported and crewed with McKeown before Julian bought Jack Logan's champion 18 foot scow/skimmer *Komutu*. McKeown was yet another of those New Zealand innovators who suffered because he was too far ahead of his time.

"The New Zealander," wrote Ken Searle in *Sea Spray*, "is a rugged individualist and has in general, developed his own classes and rules. Speed dictates planing hulls, lighter construction and the introduction of the multihull. If, as a result, we have lost something in seaworthiness or length of life, who cares? If the craft falls to bits under hard driving, we can build another, better one tomorrow. It is the law of survival of the fittest."

Jack Logan's 18 *Komutu* became a milestone New Zealand design and several skimmers based on *Komutu* were built but none performed to the standard of the original boat. *Komutu* had a scow-like bow but in many ways resembled the Napier Patiki especially in its shallow skimming dish hull. *Komutu* was sold to Julian but the new owner had little success for Logan, like a number of New Zealand designer/builder/sailors, was able to extract top performances from his own creation.

Although the X Class was the high profile one with some of the best local talent involved, the 18's were the most intensely developed. The X's were restricted and as a result, some tortured boat shapes appeared. This was because the midship beam was wide and a number of designers tried to fit fine ends to that beam. "Some of the X's looked like snakes that had swallowed apples," said Davidson who had designed *Arrow*, the fastest in class.

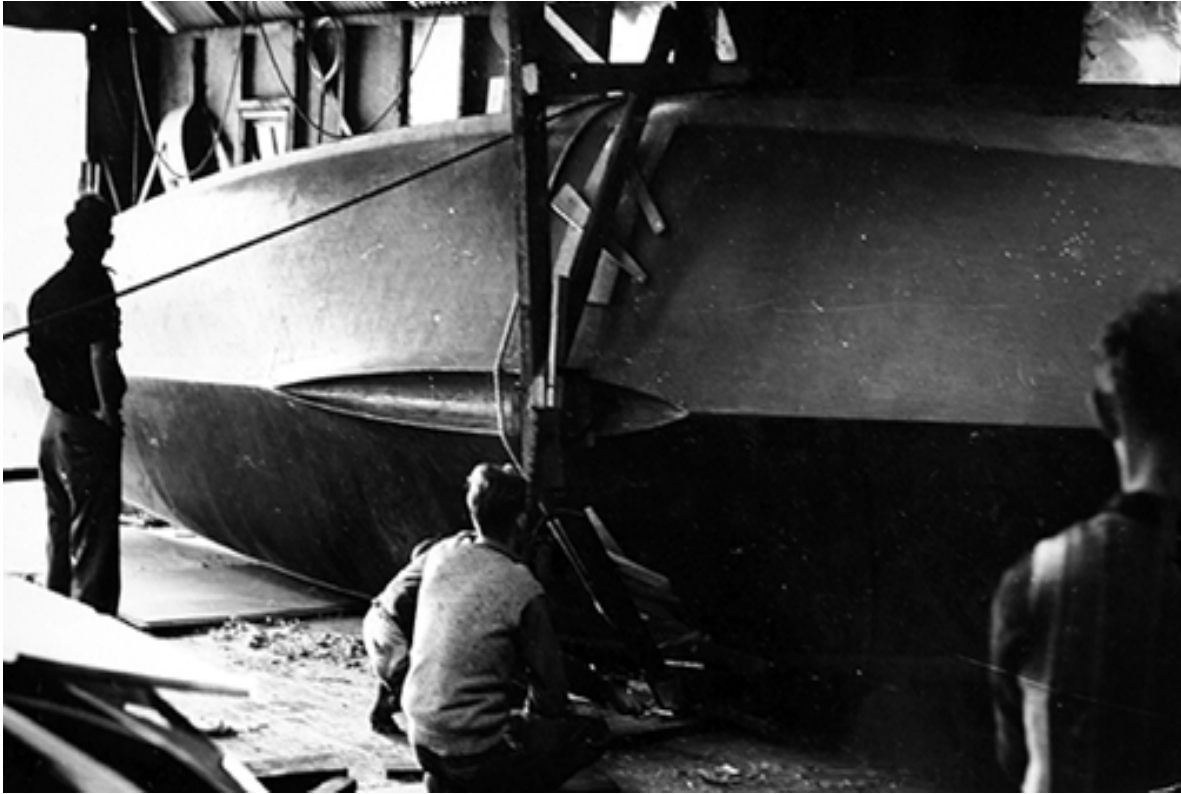
The bright team of Marks and Sharp drew and built *Envy*, an extreme, lightweight 18 with a small rig and sailed by a small crew; it was constructed in kaiwaka, South Island cedar but it did not perform well. Davidson took over and redesigned it placing a larger rig aboard and doubling the crew. With Davidson as skipper *Envy* became local champion but the increased rig and crew placed higher loads onto the boat than what



above: Jack Logan designed skimmer/scow 18 foot *Komutu* - below: *Envy* crew 1953: Laurie Davidson 3rd left



was originally intended and it broke down sometimes. Then Davidson designed *Daniel Boone*. “Everything about *Daniel Boone* is new and calculated to make the average yachtsman raise a howl of protest,” wrote a reviewer in *Sea Spray*. “Perfect stressing and fine laminations have taken place of strength through weight, as is the case in conventional hulls. She is as light as a feather and like the thoroughbred she is, takes a power of handling. There are obvious physical limits to speed at which even a planing 18 foot hull can be driven.”



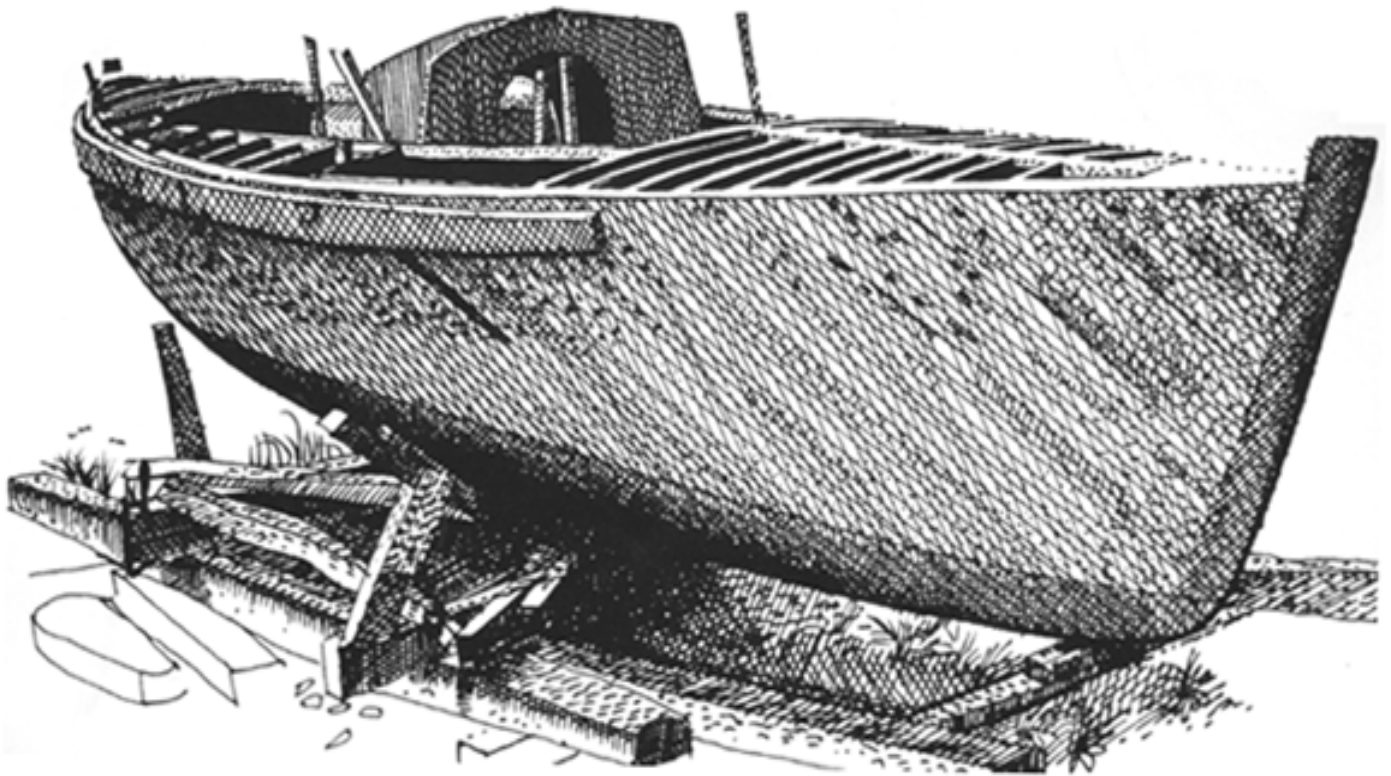
above and opposite: Jim Young's *Fiery Cross*

Thin layers of glued wood in dinghies had been developed by Dave Marks but it was Jim Young who first used this building technique in a large yacht by constructing a very advanced light displacement yacht with a canting keel (over 30 years ahead of its time). This yacht *Fiery Cross* was based on theorist drawings from L. Francis Herreshoff and was built in two layers of diagonally laid kauri planks that were glued along with countless copper fastenings, on deep stringers. “I was going against the grain using glues and double diagonals, it wasn't the done thing, not the way any self respecting builder would approach a job,” said Young.

Working part-time while he built commissioned yachts in his Little Shoal Bay yard it took him five years to complete the yacht and *Fiery Cross* was not launched until late 1958 – coinciding with the launching of another light displacement yacht *Ariel*, a Scandinavian 30 Square Metre design by Knud Reimers, commissioned by Jim Lidgard. *Ariel* however, had been altered from original Reimers plans and had been lengthened to 50 feet and was carrying more lead “to wet the long overhangs.” Contrary to Young's thin double diagonals that were glued and fastened, *Ariel* was built in three layers but also epoxy glued with the addition of metal fastenings. No-one then, trusted all glue, no metal.

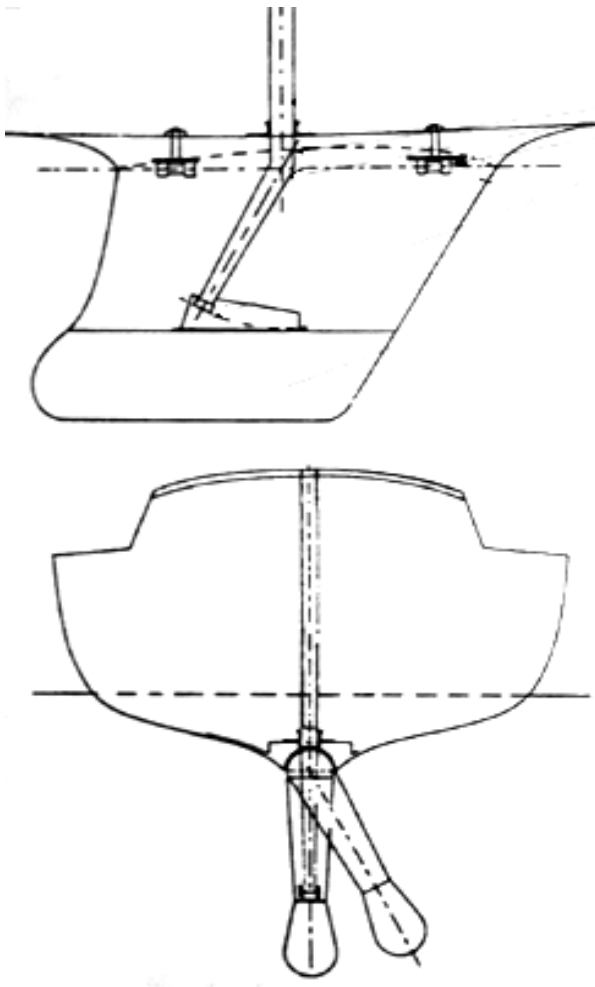
“When Des Townson and I first sailed *Fiery Cross*,” said Young, with the keel unpinned (I sailed her after launching with it fixed vertically as if she was a normal keeler) we were very tentative, thought the boat would

flop over to leeward and we gingerly went about the process of unlocking the keel. You have to remember that no-one had done this before – it was completely new territory for us. But there was no problem because of course, there was plenty of ballast even with the keel to leeward; it was just higher internally in the boat. We would sail gently along, unpin, the keel would swing leeward, we'd lock it then tack and the keel would be set up properly for the new board.



Compared to yachts of today *Fiery Cross* was shallow draft – 45 long x 7 ft 6ins beam x 6 ft 3ins draft – we didn't know about these things then, really *Fiery Cross* should have had 9 foot draft. My idea was that the canting keel (we called it a pendulum keel) would make our narrow overall beam act as if it was eleven feet wide. But I have changed my mind now, narrow boats with a swing keel are not as fast as wide beam, form stability boats because there is not as much leverage with the narrow hull compared to that of the wide hull with its flared, shallow and flat bottomed hull.

Interestingly I felt that *Fiery Cross* sailed better to windward in light airs with the keel in the supposedly wrong place, flopped to leeward – that is because the keel was really vertical to the water surface and therefore making best use of the boat's shallow 6 foot draft, the boat heeled over above it and the sails nicely to sleep and at their best shape. But set up this way we found we had weather helm - in those days I was experimenting with early New Zealand spade rudders and they were, we know now, too small (I still broke quite a few stocks) – then *Fiery Cross* wanted to go into irons and if we ended up in this position, we'd sit there feeling foolish, not going anywhere. Conversely with the keel canted to windward in light air conditions, *Fiery Cross* had lee helm and wanted to bear away. All this is obvious and commonsense today from what we have learned on sailboards, but then it was a different story. However because *Fiery Cross* was very narrow for its long length and even though

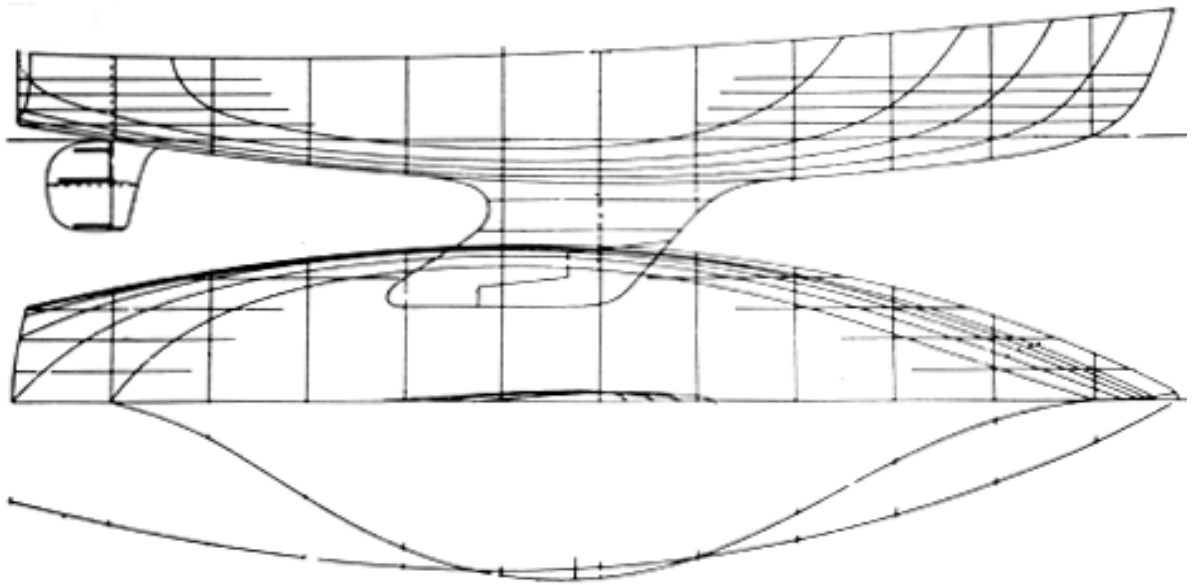


Canting keel mechanism on Fiery Cross

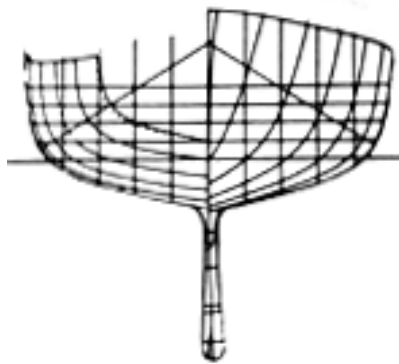
the rudder was small, we didn't suffer the broaching problems of the wide beamed Stewart 34's. *Fiery Cross's* canting keel was looked at aghast in those days and because officials considered the boat had moving ballast (it did) was therefore considered illegal. I wasn't allowed to race the boat with the keel unpinned and some years later, when I sold *Fiery Cross*, the new owner wouldn't have a bar of the swinging keel and demanded it be locked up permanently before he took over the boat."

9. first native?

THE FIRST TRUE 20th Century New Zealand native light displacement keelboat was drawn at the end of the 1950's by Bob Stewart and launched in 1960. This was the Stewart 34 *Patiki*, designed for Peter Colmore-Williams. Stewart said he based the yacht on the 26 foot Mullet boat in which he took Mullet boat beam and hull profile and stretched it to create his 34; this produced a light displacement yacht in which he placed 1.25 ton in its keel as opposed to the centreboarder's slightly less weight placed in blocks internally. It also carried considerably less sail but in the modern, inboard manner – a contrast to the enormous overhanging sail plan of the Mullet boat. The reason for lighter ballast was to lessen loads on hull connections and reduce interior



Robert Stewart's 34



reinforcement. Also Colmore-Williams, involved at an early date with plastics, knew that a clean interior would make it easy for the design to go into fiberglass production.

Stewart had drawings of William Tripp and Philip Rhodes day racers from USA that were similar in hull form to *Patiki* – in fact the Rhodes hull shape was absolutely identical – so the Stewart design was not the New Zealand original that historically has been accepted. Although the first S34 was called *Patiki* it had little resemblance to the 1900's designs from Napier – although the means of gaining form stability with the shape of hard turning bilges was similar. The Stewart hull was dinghy looking but the run aft was curved, like most keel boats of the time, however it was flat enough for the boat to plane downwind. Also the S34 was very high wooded compared to the low wooded, elegant, flush or near flush decks of traditional yachts – and this was made to appear even more so on the Stewart by it having a raised cabin (called a dog box in NZ) to gain standing headroom. This point was a very important requisite but it was something that marred the very pleasing hull form.

Stewart's *Patiki* was built by John Lidgard in three layers of quarter inch kauri over stringers, glued with epoxy with the addition of fastenings of threaded and clenched nails, similar to what he had done with his cousin Jim's *Ariel*. The three new light displacement yachts, *Fiery Cross*, *Ariel* and *Patiki* had similar wood building approaches but none bit the bullet like Marks and Sharp had done with their revolutionary all glue,

thin wood dinghies. However John Lidgard's less venturesome philosophy still brought forth harsh criticism from established builders along the waterfront – eliminating rebating was considered a sacrilege.

Stewart researched Illingworth's masthead rig for the 34 and moved main and headsail inboard for easier handling and chose a spar large enough to handle the calculated loads without being too heavy; he was able to get a considerable amount of sail aboard his light displacement craft.

"Beam of course gives displacement," explained Stewart, "which means ability to carry sail and to hold that sail up into the wind so that maximum drive is extracted, but it also increases resistance. Displacement also gives stability and increases resistance in most conditions Good freeboard makes a boat dry and roomy and improves sailing lines when heeled, but on the other hand raises the centre of gravity and reduces stability and also increases windage."

The Stewart 34's were very fast, both to windward and spinnaker running in fresh conditions. But the original rudder was too small and too shallow for the boat's wide beam when sailing upwind and down; soon the Stewart 34 gained a reputation for being the first of the light displacement boats to unpredictably broach the rudder out of the water and lying on its side while skidding sideways amidst foam. This was an image that gleefully heartened older sailors who preferred classic yachts and who disliked the high wooded design and its new light displacement approach to sailing. However remedies were quickly put into place to rectify this failing:

"Pioneer's rudder in Dixon's shed, reshaping Stewart's original design, adding depth for more efficiency and control. Enthusiasm, intense competition amongst Stewarts forcing radical changes. Bill (not interested in second place) Miller hoping for dramatic improvements. Foil boffin Dixon convincing all visitors that his high lift/low drag profiles were beyond question Race day, savage forecast, hydrodynamicist's head down with flu, or food poisoning, (not fear) slept 14 hours – Maid Marion adamant that he is not going racing.





"Mast has a kink in it, looks bloody awful."

"That's the way it came back after Durgan used it – when the sails are up, looks okay," says Miller, "let's get away. you blokes."

"Lucky the mooring lines are tight, we're still in gear, almost sunk the poor dinghy."

"Plenty of wind above the bridge – still want to carry the No 1, Bill?"

"Put up the big one and we'll set the kite too for a quick run down."

"The big one?"

"There's only one and that's the big one – if you don't get that kite up soon Vause, we'll be starting with Akarana instead of Ponsonby."

"Watch that starboard winch, the handle hasn't a lock."

"We don't have quick divers on our boat either Bill."

"Is that kite right up? About time too, gybe it, then drop it, we're running out of time."

"We'll stooge around here for awhile – what's happening with that pole, trying to spear a Kestrel, you guys?"

"That's the way they always carry it – there's big *Innismara*, she's starting with us."

"Good, we'll have her for breakfast – where's the rest of the Patikis?"

"Must have believed the forecaster for a change. The big spinnaker you reckon Bill?"

"The only one to use downhill." (This is going to test Dixon's rudder.)

"Minute fifteen to go – take up on the vang Vause but get ready to let it go quick later." (nervous laughter)

"Doesn't look like *Innismara* is bothering with her kite."

"Pole aft a bit, call me down Keith we'll make it. Get it up."

"It's not to the top – sheet, sheet, sheet her in – is it right up? – that was good work ease the main."

"Whooooeee, we've planed away from the whole fleet."

"We'll have to come up to get around No 9 – let the pole forward. Whoops, not too much, sheet in, sheet in, hurry up – shit, let go the main okay get get it back, that's more like it."

"Whoooooee fourteen knots!!! (feels like the boat's going to explode.)

"If we start to round up, let the main go, hang on to the kite sheet, it's no bloody good collapsing the kite Shiiit!!! "Drop the main, aaaaahhhhh!! – oh well, we're well up to windward of the the mark now (sniggering) that pole can come aft a bit, watch the jockey pole – well saved – you don't need it now we're running square anyway."

"Squall coming – look at that Birdsall, wouldn't like to be on that – whooooooops!! – (banging, crashing, shouting, cockpit's full of water up to my knees).

"Drop it John ... can't you reach the shackle? Let go the topping lift (Vause leaning out parallel to wind torn sea, fingers groping).

"I have it but it won't budge."

"Let the guy run, that's all you can do now, you'll have to undo the knot Keith – let the halyard go Mike, Got it, good, stuff it down the hatch."

"There's a lot of water below – probably came through the sink." (sniggers)

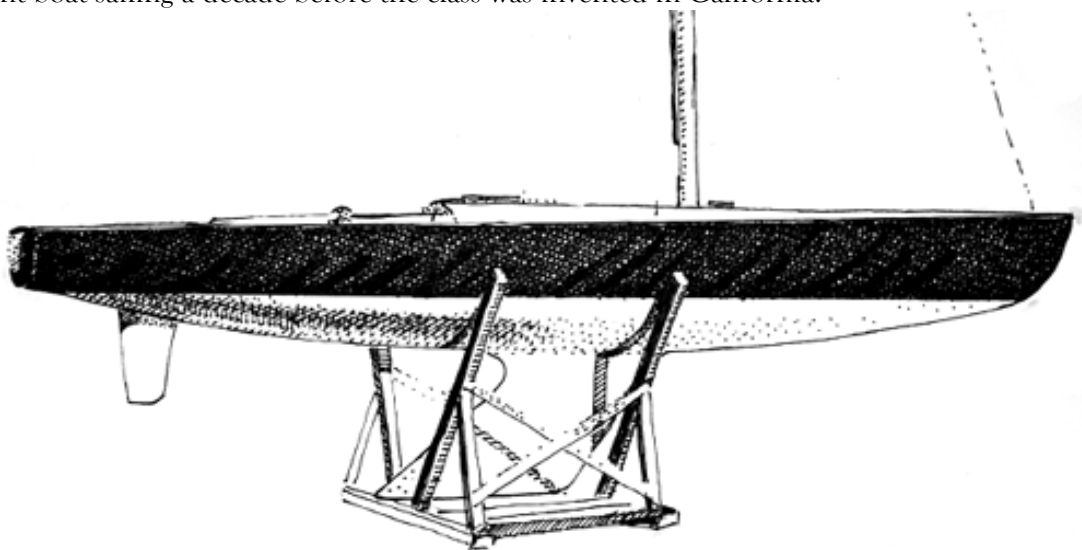
"Y'know, this rudder doesn't feel too good feels like it's coming apart It can't come apart can it Vause? you put it together."

"Put up the No 1 for the time being while they get the kite sorted Okay, when you guys are finally ready, put the small kite up, we can still win this race."

10. fall to bits

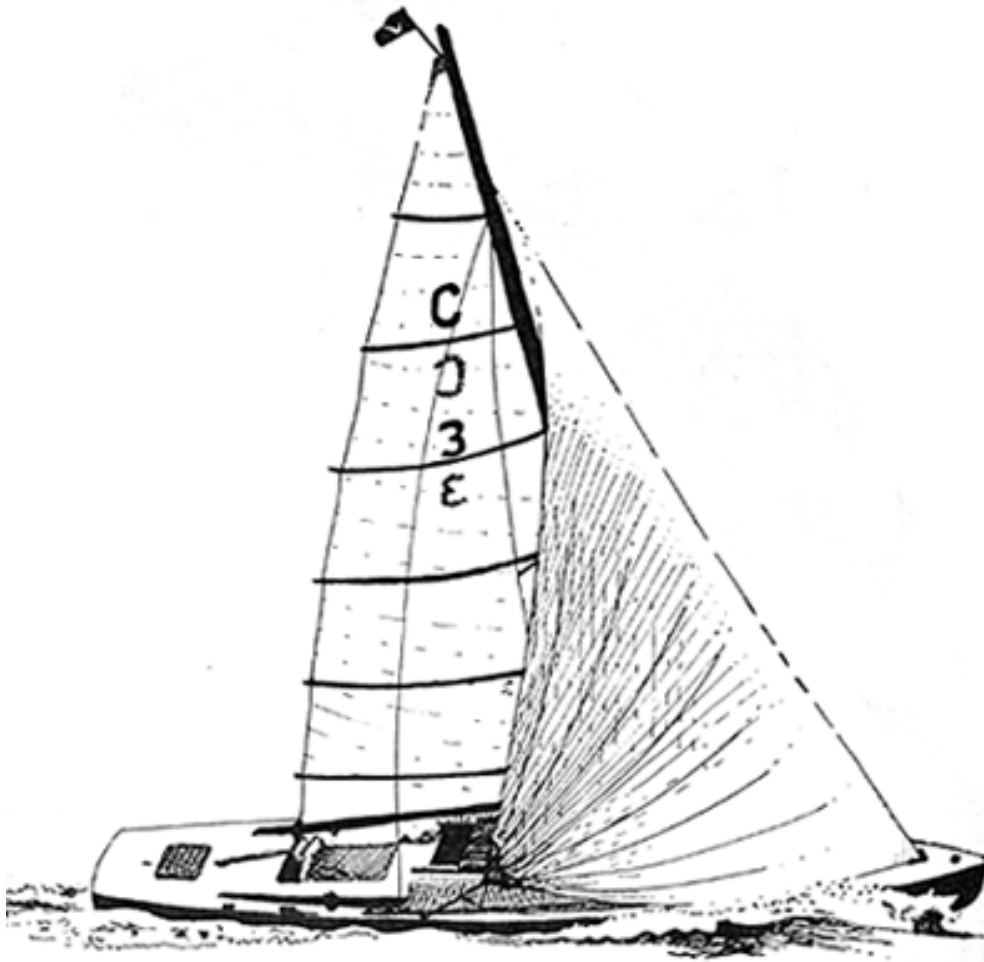
THE SECOND NEW ZEALAND light displacement design was another 34 foot yacht named *Vim*, launched in 1961 and designed by 27 year old Peter Nelson who was a dinghy sailor attempting his first keel yacht. If the Stewart 34 was more than influenced by US designers Rhodes and Tripp, then *Vim* should be recognized as the rightfully first NZ native light displacement design – although she was only a one off - whereas there was a large fleet of S34's built.

Compared to the Stewart 34, *Vim* had less beam and less rocker, a low wetted surface area planing hull, flush deck, fractional rig with a full battened main and almost half the displacement - *Vim* was an ultra-light displacement boat sailing a decade before the class was invented in California.





opposite and above: Peter Nelson's ultra- light displacement C Class *Vim*



Vim was constructed by Keith Atkinson, formerly a traditional boat builder, in five layers of thin mahogany veneers over stringers, glued with formaldehyde and initially held together until the adhesive cured by “half a million staples, removed later by 19 blokes pulling them out.” The high cambered deck was a lamination of four thin skins of plywood that was stiff enough to eliminate deck beams. “By later standards *Vim* was overbuilt,” said Nelson, but in 1961, when ocean racing was just getting started here, the boat was considered dangerously light. A measurer, curious to see what was going on, came round to have a look while we finished her off. He shook his head and said, ‘No bronze fastenings, you’ll just put her in the water and she’ll fall to bits.

Nelson’s philosophy in designing *Vim* was an easily driven hull with minimum sail for high performance – so *Vim*’s hollow spruce mast was only 40 feet overall and 36 foot off the deck, simply stiffened and stayed with a single set of swept spreaders, upper and lower shrouds and a set of runners for forestay tension. The sail area was considerably less than *S34* totaling 350 square feet and the number of sails carried was also small. In profile, *Vim*’s keel was similar to *S34* and carried a similar weight (2800lb for *S34*) in a swelling bulge but the difference in overall displacement between the two yachts was that *Vim* at 5800lb was not much more than half that of *S34*. The Stewart design relied on beam and stiff, powerful hull shape for stability whereas narrow, not powerful *Vim* required ballast low and deep for hers.

Nelson emphasized that Jack Brooke's long keeled *Glennis*, launched in 1954 and his much earlier 1940 *Gleam* were important influences to him. And *Gleam* was a very close copy of the US Yankee 30. Like *Vim*, *Gleam* was a C Class yacht measuring 34 feet overall, light displacement (5600lb with 3000lb ballast) and notwithstanding the old fashioned long keel, was considered a high performer. Brooke attributed *Gleam*'s speed to the easily driven, narrow hull which required little sail area to reach maximum hull speed. Also in terms of wood laminating, *Glennis* was influential. Although only the floors were laminated, the hull being single skinned, this was the first time such a technique had been used on a large yacht and it gave confidence to others contemplating building in this manner. Marks and Sharp built *Glennis* and therefore laminating inside was nothing new to them after their experience in moulding their International 14's - "but all the old boys looked at what was going on and shook their heads at the folly of such construction." But *Vim*'s performance after launching was outstanding, taking 10 guns out of 11 starts, won its division on a windy Regatta day and was fourth to finish in the entire fleet of the Squadron's Round the Island race. Plus I found out some years later when the boat had been sold to Garry Colebrook, who generously loaned us the yacht, how the easily driven hull was a luxury in open water night passages:

'The seas began to build along with the wind. Both girls were now leaning over to leeward from the cockpit retching into the speeding white water a few inches from their noses. Soon they went miserably below. Nearing midnight with Cape Colville on our beam, *Vim*, which does not carry a large sail plan, was becoming overpowered, although in the gusts still stood up well, thanks to her deep ballast, heeling only a few more degrees than usual and powering on, still balanced and with no weather helm. But there was more wind coming so Jim went forward, lifeline attached as *Vim* is fine bowed, has no fixed lines nor even a pulpit and sports a highly cambered foredeck. Working carefully, the moon had gone behind clouds, he made the sail change. Even with the small working jib set, *Vim* drove on at the same speed for the wind continued to increase, shouldering her long bow over the wave tops and plunging at speed into the troughs, throwing sheets of water to leeward. But regularly now, with solid green water coming over and pouring from the foredeck I could hear, because the forward hatch was being overcome, the noise of water spilling below. I handed the helm to Jim, went below and forward to lash it tight, running a double line from hatch to floor and bouncing it tight - this crushed the rubber seal and stemmed the flow to few drops. At first, in these seas I had gritted my teeth, remembering jackhammer rides in other designs in similar conditions but *Vim*'s narrow forward sections just shushed into the waves with no jarring whatsoever.

After an hour or so the smudge of Great Barrier grew larger, the seas eased a little in this north easterly and although we still pitched into some large ones, the worst was over. When the shape of False Head appeared, we eased sheets and bore away onto a close reach for Wellington Head. *Vim* immediately accelerated onto a plane, making a steady and continuous 12 knots, sliding smoothly over the now beam seas and as she rolled her weight into the troughs, throwing sheets of phosphorescence toward the gloom of Little Barrier. Soon the moon appeared again and lightened the seascape and when Wellington Head slid by on our beam, I was disappointed the sailing was over. Three in the morning - that means we'd crossed in six and a half hours, give or take a few minutes and most of that hard on the wind."

The aesthetically minded Des Townson was another young designer impressed by the Stewart 34; he was fascinated by light construction techniques used in the de Havilland Mosquito aircraft and carried this approach over to his cold moulded dinghies and then to his successful and light displacement 22 foot keelboat Pied Piper design; this was not round bilged (like his very attractive dinghies) but a semi-chined hull with flattish after sections that carried to a dinghy-wide stern; the design was fast and attracted many young sailors to the class. People marveled at his patience and dedication; he worked in isolation listening to classical music and if



Townson Pied Pipers on Hauraki Gulf

Gray Hudson

yachting visitors interested in what he was doing arrived at his building shed, he refused to open the door and no matter who stood there, told them to go away.

Townson's later lightweight and Spartan 26 foot yacht *Serene*, a round bilge design very much like one of his dinghies enlarged, but built using the hot moulded technique, was very fast and quickly gained a reputation as a giant killer. Young remembered having difficulty in beating *Serene* to windward in his much larger *Fieri Cross*.

But Townson was also enamoured with heavy Sparkman & Stephens and Dick Carter designs, especially liking their consistently good windward performance under a wide range of sailing conditions. Consequently he underwent a fundamental change in the late 1960's and discarded his light displacement approach when designing *Moonlight*.

This 36 foot yacht attracted considerable attention in One Ton trials (all moderate to heavy displacement boats) when helped along by a top crew of Peter Mulgrew, Alan Warwick and Roy Dickson. *Moonlight* was likened to an S&S design with the ends shortened and having no tumblehome. Although Townson gained good windward performance with *Moonlight*, the boat, like all moderate to heavy designs suffered while broad reaching and running – on this point of sail one critic had it that “it wanted to go every way except downwind.” Also gone was his earlier but modern dinghy-type fractional rig and because of IOR penalties, the roached fully battened main. In retrospect, although Townson gained much media attention and a larger reputation during this short period (Olin Stephens remarked how impressed he was with *Moonlight*) Townson's switching to heavy, slow IOR type designs was considered by others to be that he'd turned his back on the excellent pioneering developments achieved with his earlier light, big dinghies. Albeit these lightweights were not as fashionable worldwide as IOR,



Heavy displacement designs Dick Carter's *Waianiwa* and Townson's *Moonlight*

then, but today, those heavy boats are looked upon as anachronisms and all modern keelboats follow what Townson had begun with *Pied Piper*, Nelson had with *Vim* and Stewart with his S34.

11. iconoclasts

ALTHOUGH NEW LIGHT DISPLACEMENT designs were breaking heavy boat tradition with young designers like Davidson, Young, Marks, Townson, Birdsall, Stewart, Brooke and Nelson being loosely influenced by Bill Couldrey and had started to make their own mark developing light craft, John Spencer arrived from a different environment and training. Spencer was an architect, and his dinghies were of sheet plywood, chined versions of British designs, namely the work of Uffa Fox. Spencer's *Cherub* was very similar to Fox's *National 12* with its deep chest and straight run in the after sections. However converting the *National 12*'s hull form to sheet plywood created some limitations and resulted in excessive buoyancy forward. To keep the first *Cherub* on level trim, the crew was forced to sit forward of the shrouds – a point that Spencer later emphatically denied saying that that was just Jim Young talk. However he soon overcame the problem by modifying the keel shape, forcing an arc into the bottom after sections and *Cherub* suddenly became very fast on all points of sail – to the disappointment of detractors.

Young was also very impressed by Uffa Fox's *International 14* and *International Canoe* and when Fox was commissioned to design the *Tornado 18* for the Olympics, Young built and launched an example, then realized “that Fox must have had a bad day for it was a bloody awful boat: tender, deep chested with a deep, straight run and because it only had five foot beam and little form stability, once it lay over a little, there was no righting effect. The rudder was steel and had lee helm – or felt like it. His *Flying 15* and *30* were also flops. Fox was an overrated designer and went off the rails after his excellent first two designs – but who were we to question such an icon.”

After *Cherub* Spencer designed a light displacement plywood keelboat called *Adrienne* which lacked hull stability and therefore was poor to windward. By the early 1960's Spencer had learned from his mistakes and designed the beautifully proportioned 35 foot *Scimitar* for Alan Vause, a light displacement, single chine keel boat of sheet plywood that was exceptionally fast downwind. *Scimitar* carried a deep draft keel constructed in

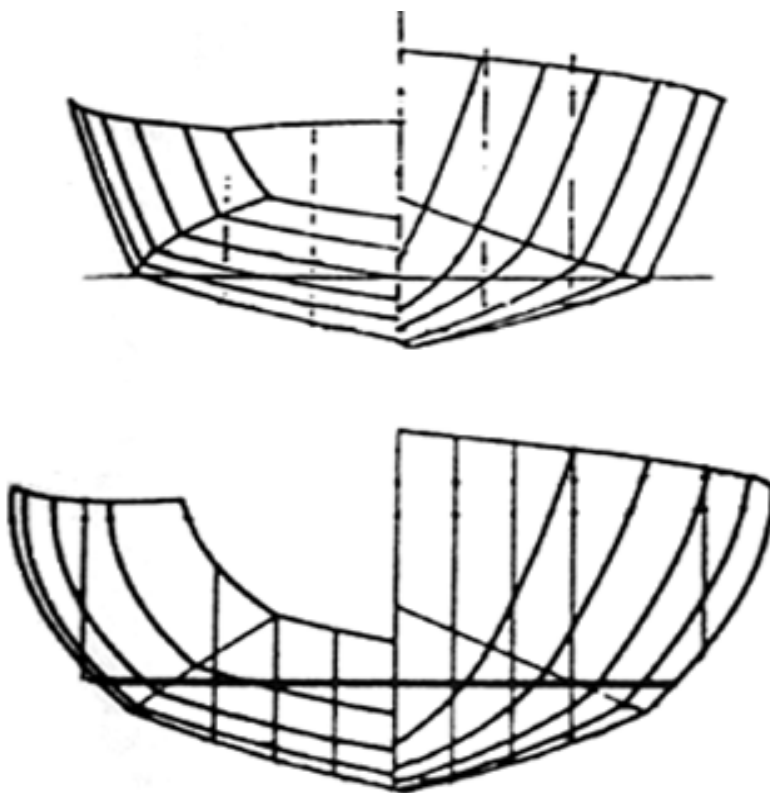


Spencer designed lightweight surfer *Sirocco*

sheet metal which thickened at the bottom for lead ballast to be low down, similar to what Fox had done on his Flying 15. This helped *Scimitar's* stability when the yacht heeled but it was still not a very impressive windward performer, according to Young.

If Spencer had been influenced by Fox with his dinghy, his keelboats had similarities not only with the Dutchman Van de Stadt's *Black Soo* but also to Englishman Jack Holt's Yachting World Keelboat (Diamond) – the latter was a 30 foot flush deck, open cockpit dinghy yacht that was also likened to a double chined version of Fox's Flying 30. The Diamond was narrow, extremely light, (one tonne) had a bulb keel and carried a small amount of sail area on a bendy three quarter rig with a radical (then) full battened main. In a decent breeze, the Diamond could easily plane downwind and reaching and made a great impression on the Solent when it first appeared winning some prestigious races.

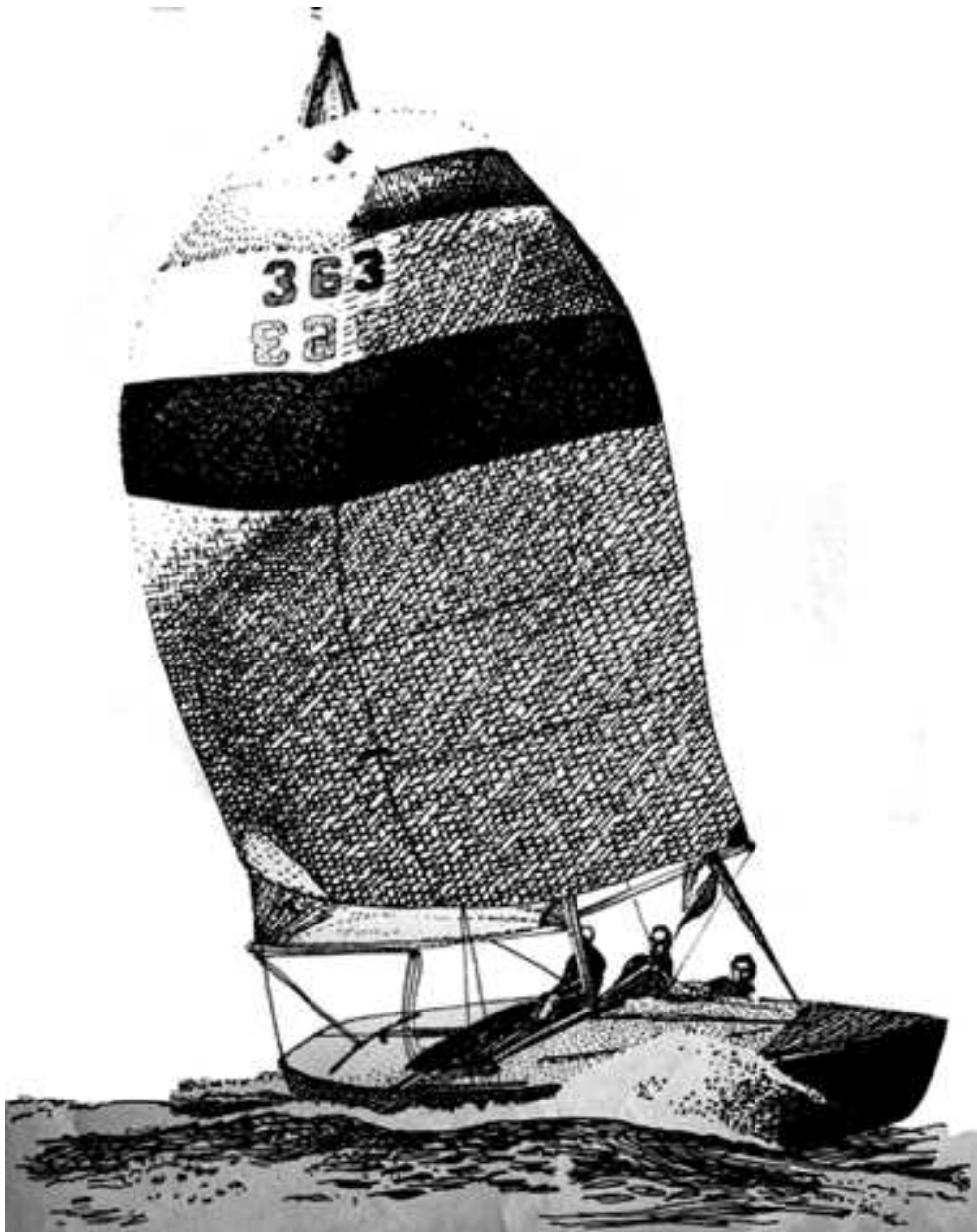
Sirocco's hull was right up with the play but the rig was conventional masthead with the usual short battens and while the Diamond was a flush decked, open cockpit daysailer, *Sirocco* had the expected, but less ugly on this occasion, New Zealand style dog box cabin. The Diamond, although no great success in terms of numbers in the UK, was very strong in Australia and a fleet of about a dozen was built in Auckland. They were popular in the Southern Antipodes because of their speed and because they were affordable and yet quite a large yacht.



top: Spencer's very big dinghy *Infidel* – below: IOR compromised *Buccaneer*

"I first saw one when we were running up Motuihe Passage on a gloomy overcast afternoon while returning from the Barrier. Rangitoto Island was visible as a misty outline when the fog and mist occasionally lifted. It was only interesting sailing because we were almost home and were meeting numbers of other yachts doing the same after the weekend. All yachts were running at a similar speed, appearing and disappearing in the cold haze as the visibility changed, then out of the mist astern a flush decked yacht appeared with three crew standing waist deep in the central cockpit. No cabin I thought, who would go sailing in a stripped out thing like that? I was pretty conservative then having mixed with tradition loving yachties. This phantom yacht quickly ran us down. "Yachting World Keelboat," announced Colebrook – he had read about them because our boat *Myth* was a Van de Stadt design also encouraged by Yachting World magazine. Sailing at a higher angle than us the big day boat quickly disappeared into the murk, then soon after reappeared on the opposite gybe, slicing past, although not planing, just going through the water very fast, well ahead of us plodding along and I watched it effortlessly pass all the other boats in sight to disappear in the direction of an unseen Auckland. I went quickly from sneering disdain to a believer, a spark of enlightenment in the cold fog - that's the sort of boat I want, I thought, who cares if you have to sleep on the floor.

With light displacement designs arriving, traditional Squadron members became grumpy and annoyed and some refused to race against the new boats. Bressin Thompson, an influential Squadron man, withdrew his famous yacht *Prize* for two seasons in protest. So a separate light displacement division was formed "which removed the unwanted from the ranks of normal yachts," said Young, "but acrimony increased among Squadron members when the light boats excelled in big fleet passage races where long reaching legs



[Yachting World Diamond](#)

let them stretch out to win by embarrassing margins. Furthermore the Stewart 34 enjoyed performance both up and downwind that was equal to a 40 foot yacht, again disproving the accepted adage that length gave speed – which made it very unpopular.”

Spencer scored a major coup when wealthy industrialist Tom Clark (who had successfully campaigned a black painted Scimitar class yacht named *Saracen*) commissioned him to design a radical 67 foot version. This was *Infidel*, a true ULDB (ultra light displacement boat) ahead of its time and which became recognized as Spencer’s best yacht. The boat was built light, people noticed that the deck flexed and the interior was completely Spartan and stripped out – something that many thought complete madness on a large yacht. But not only did *Infidel* have the expected high downwind speed and exceptional reaching power under a huge, flat,



Spencer's best, the first sled, *Infidel/Ragtime*

masthead sail, it also could beat top yacht A Class *Ranger* upwind – and that was a bitter pill for the old guard to swallow.

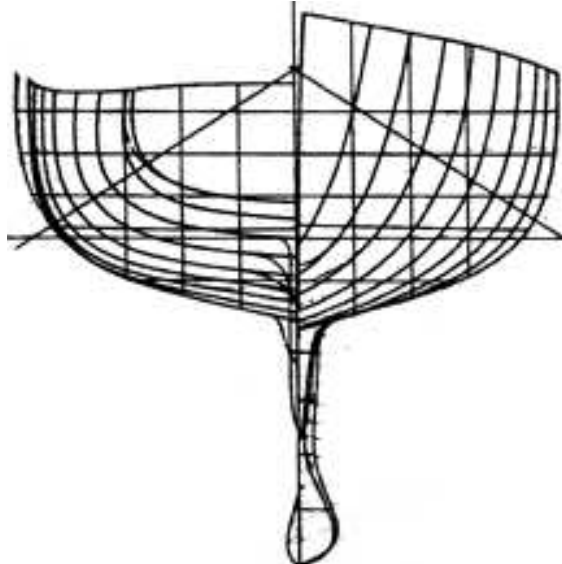
It was high profile owners like Clark and architect Neville Price (who bought Clark's old boat *Saracen* then later commissioned Australian Ben Miller to design ULDB *Volante*) who understood light displacement advantages, were unprejudiced and had the wealth to campaign extensively; it was from their successes that LD yachts became acceptable in Auckland. But after *Infidel* Spencer changed course and compromised with the IOR; unfortunately this produced mediocre results in comparison to his earlier original and strong statements. Clark went further asking him to draw a maxi 73 foot yacht; this was *Buccaneer* which was big and impressive but not in the same purist LD class as *Infidel* – which was sold to California, had a name change to *Ragtime* (became recognized as one of the first, if not the first of the downwind sleds) and caused a sensation in winning, with much surfing panache. Transpac Races to Hawaii.

The influence of the IOR and the RORC (Royal Ocean Racing Club) had a retarding effect in the development of the New Zealand yacht especially when the IOR became fashionable here. Then local yacht racers who sought to represent NZ were not courageous enough (or too intimidated by overseas fashion) to commission yachts from local designers. Instead they clamoured for US designs from Sparkman & Stephens, Carter and later Doug Peterson – so local designers like Davidson and Lidgard could only find acceptance by drawing similar boats to those from the US. But copying, always less than original, was, and is doomed - so they made little impression.

12. Count Martinengo

IN 1966 FLAP MARTINENGO wanted a fast Gulf racer and asked Young to design it for him; a moderately light, moderately rigged, mid 30 foot yacht so Young drew him the first New Zealand 37 – which had moderate displacement by local standards but light by those from overseas. Like *Fiery Cross*, Martinengo's soon to be famous yacht *Namu* was built in two diagonals of glued kauri over stringers and steam bent ribs – but later versions of the NZ37 went to three layers of kauri and reduced reinforcing – this was true cold moulding resulting in a clean interior. Young drew the keel with the trailing edge raked aft to neutralize a vortex formed by the water flow near the surface and it had a bulb which flared into the fin – not a true bulb for it was flat on the bottom for gridding. In 1966 knowledge of soft leading edges to keels was unknown so *Namu's* keel had a sharp entrance which, in retrospect was incorrect for the keel's best performance.

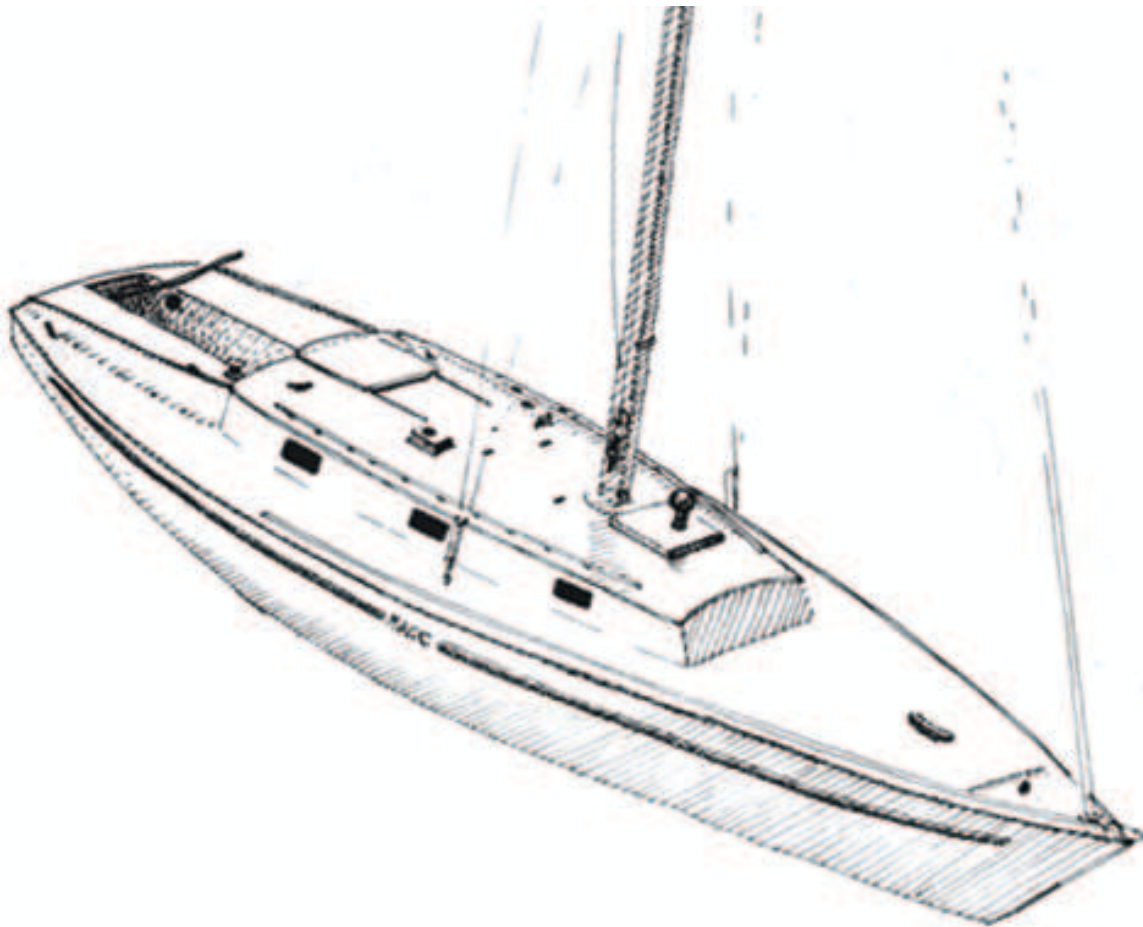
Martinengo was very wily and very weight conscious and once expressed great displeasure to the heft of *Namu's* hatch, which had been built by a young Ron Holland (an apprentice boat builder before he later got into yacht designing) and in those days Holland could do nothing but suffer the humorous but unforgettable sniping of Martinengo's slings and barbs. *Namu's* interior, because of the Martinengo's weight fixation, was completely bare, except for squabs, and after races in which Martinengo invariably won, he would go from boat to boat with a kettle asking for water – but this was refused in mock but sometimes genuine anger. His Westhaven custodian abode was very social and sailors would rather visit the raconteur than go to the yacht clubrooms after races: "The prize for finishing first consisted of a dozen bottles of champagne, all packed in a wooden crate, each one wrapped in straw. We duly took delivery of this vintage brew and, being teetotalers at that time to a man,



Young's NZ 37



above: Flap Martinengo checking an easterly blow - below: Birdsall's centreboarder *Magic*



we unpacked it and stowed it under our bunks not knowing that the right thing to do was to shout the other competitors. This no doubt raised a few eyebrows and caused us to be cast in an unfavourable light. We went to the prize giving at the hotel the next day and were presented with the cash prize, which we proceeded to put in our pockets and not spread it around the bar. This further increased our unpopularity but of this we were blissfully ignorant.”

Martinengo was not a wealthy man and at *Namu's* launching claimed he could not afford alcohol and so supplied tea and cakes instead. He did not believe in insurance, looked after his boat carefully, never got involved in luffing matches and won by considerable cunning and sailing skills, even beating 67 foot *Innismara* once in a gale. He picked up Jim Young's top crewman Col Read by falsely telling Read that Jim was not sailing that day. Young on *Notre Dame* (another NZ37) angrily seeing Read aboard *Namu*, purposely sat on *Namu* giving Martinengo dirty air, but Martinengo cunningly whispered to Col Read to shout out that he was very angry with Jim for not picking him up, which Read did and Young, attempting to justify himself, lost sailing concentration allowing Martinengo to slip free and to win the race – plus to take the wagered bottle of gin from Young as well.



Bo Birdsall's *Rhubarb*

“He spent time preparing his boat and had an extremely good relationship with his crew,” remarked Bo Birdsall, “he explained everything that was going on and kept everyone happy telling anecdotes – in this way he introduced a lot of people into yachting. In his younger days he was a socialist, very much to the left politically and this was especially so during the depression years. As a result he enjoyed beating yachts owned by wealthy people, often much larger than *Namu* and he did this because of his hard-won fishing years around the Gulf with his brother Whisk. Writers of the day were astonished at the number of times he won and credited him with mystical powers and other such nonsense.”

Bo Birdsall himself belonged to a tradition of a New Zealand worker who also had a consuming interest in yacht architecture. This approach soon established him as a yacht designer who liked long, narrow, light

displacement, round bilge yachts (somewhat like Young's masthead rigged NZ37 but lighter and with a fractional rig) that produced high performance both up and downwind. He designed for pleasure, firstly for himself (*Rhubarb* was the result) then for friends who liked his boats and knew they could get a design for a reasonable price. Birdsall was innovative and unafraid to go out on a limb; he designed an asymmetrically hulled C Class catamaran and also the first New Zealand light displacement centerboard yacht; this was *Magic* and it was sailing years before the revolutionary and iconoclastic New Zealand IOR centerboard lightweights hit the headlines.

below: [Bernie Schmidt's *Innismara*](#)

[Gray Hudson](#)



Bernie Schmidt began building his own design in a Penrose shed in the early 1960's. He had strong ideas of his own but in many ways this new boat was similar to his earlier Young designed and built 42 foot *Shemarra*. But the new boat was extremely long in proportion to *Shemarra* and yet light displacement - and became the 67 foot *Innismara*. Schmidt built it in strip planked, nailed kauri with convex edges but without fiberglass sheathing - which was considered unacceptable construction by local wise men - however despite criticisms of amateurism, he worked on and finally finished *Innismara* nearing the end of the decade. *Innismara* was radical, very long, thin and flat with a deep draft keel. Young when he first saw the yacht in the Penrose shed thought, "Poor old Bernie, looks like this will bend itself in half, going to be a dog - but I was wrong." And John Vause, crew on Miller's Stewart 34 *Pioneer*, called her "the long pointed tube with sails." The yacht was fast, designed for reaching and running and on these points of sail the long waterline and lightweight hull excelled. Schmidt wanted to take the yacht offshore but official criticism along with rejection of the design and construction destroyed his plans - *Innismara* instead became a regular Gulf racer and performed far beyond what critics believed possible. Again retrospectively, the construction method and design, called dangerously bad by officials, has survived well for *Innismara* is still alive and has logged many hard miles under its keel.

Another of this individualistic school was Jan Kessell, an enthusiast who devoted all his attention into whatever field currently held his interest and in 1972 his attention was centred on a light displacement 37 foot yacht for his own use.

This yacht *Hornblower*, like Birdsall's *Rhubarb*, was built to beat Flap Martinengo's *Namu* and to achieve this near impossibility, Kessell introduced some original features previously not seen in Auckland designs. *Hornblower* was built in two diagonal layers of kauri over a small number of frames and floors and at 6000 lbs displacement with a ballast ratio of 51%, this radical design was ultra-light. It was launched after two years of dedicated construction. The boat had a deep, near 6 foot draft keel and carried a fractional rig on a 41 foot mast. The deck profile curved evenly from foredeck to cabin in a single line rather than follow the abrupt, clumsy shape that was seen on many New Zealand cabin designs at that time.

Hornblower as expected was a fast boat but Kessell still could not beat Martinengo in *Namu* - so his renaissance interest strayed after a year to other projects and so he sold *Hornblower* to car racer Jim Boyd. Boyd wanted to push the lightly reinforced *Hornblower* hard in fresh conditions so he increased strength in the light interior framing, keel mounting and mast base. Weight increased by a few hundred pounds but *Hornblower* was still very light for its length and capable of 16 knot speeds under spinnaker. But out of 26 races against Flap Martinengo, *Hornblower* was beaten 25 times "and that win was only because I beat Flap off the cuff one day," said Boyd, "I'm sure if we had swapped boats, he would have still won them all. Nevertheless I held it over him for 15 years until he died."

[opposite: Jan Kessell's light displacement *Hornblower*](#)

13. canoe hulls

THE MODERN MULTIHULL originated from Hawaii at Waikiki where an ex-aircraft engineer from the Second World War named Woody Brown designed and built with his partner Alfred Kumalae, the very light 2000 lb catamaran *Manu Kai*. This 40 foot cat was so light that it was launched by a group of friends picking it up and carrying it to the surf.

The idea of using wooden aircraft building techniques (the de Havilland Mosquito was spruce and balsa) in yacht construction was unheard of in 1947 but the two builders made use of Brown's aircraft training so that



Manu Kai combined traditional Polynesian voyaging design with modern aeronautics very well. Two surfing friends Rudy Choy and Warren Seaman along with Kumalae (CSK) then designed and built the 46 foot *Aikane* which was the first ocean racing catamaran from the group; it was the result of beach cat experience, guesses and intuition but *Aikane's* performance was too much for local keelboat acceptance, *Aikane* having left an 83 foot monohull over the horizon astern in one Hawaiian race. Subsequently *Aikane* was refused entry into the Transpac Race (Los Angeles to Honolulu) but sailed unofficially anyway and crossed the line first. This rebellious act by a highly unconventional craft angered organizers and they enforced, from then on, that multihulls would not be allowed to race, even unofficially, in the following Transpacs.

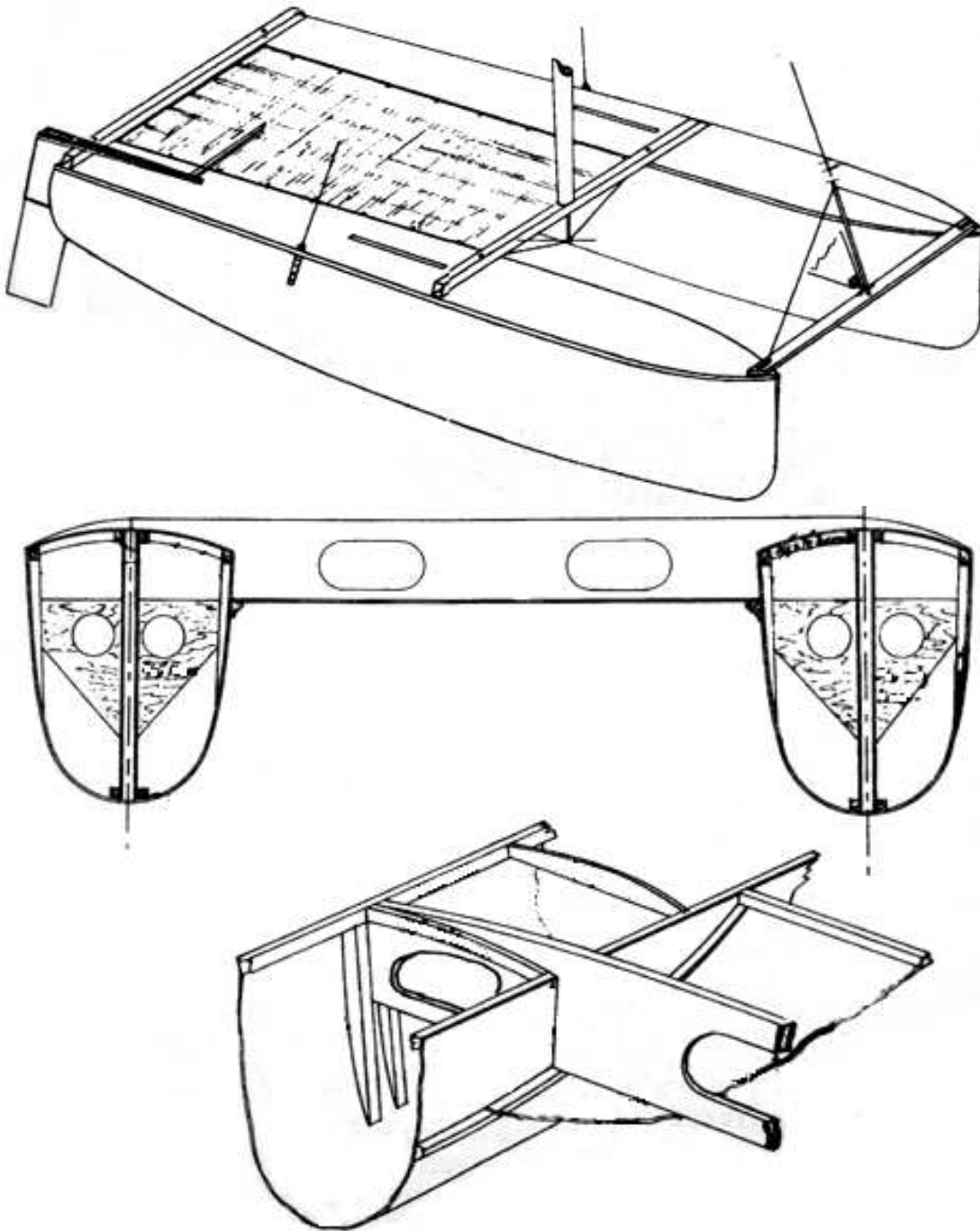
The first modern trimaran was designed and built by a Russian immigrant to USA, Victor Tchetchet in 1945. This day sailing 24 foot tri would be the first modern trimaran but by sailing too fast it became unpopular with local clubs. After Tchetchet's arrival, a few other US trimarans were built but they too fell foul of authorities by either winning too much or breaking down. It was not until the late 1950's that extrovert Arthur Piver's first trimaran was launched, *Frolic*, a 16 foot collection of angular, box-like structures held together by timber plank beams with a TV antenna as a mast and the sails made of taped together mylar. *Frolic* looked like a pile of yellow scrap but immediately transformed into something alive when the sheets were hauled in and the boat accelerated to ten knots in only a few boat lengths. Because of this rebellious speed, Piver quickly gained numbers of young disciples and started the trimaran phenomenon. His boats, built by the thousands around the Pacific, represented a new philosophy but because his influence tended to be appreciated by young and nearly penniless sailors, this influx was seen as a threat by the cautious, generally wealthy yachting establishment. Attempting to gain recognition and acceptance (a hopeless cause) Piver and his followers made the mistake of being over-enthusiastic about trimaran performance, claims became extreme and some statements that trimarans could not capsize, sailed at 24 knots and that traditional skills were not required to build or sail them, were unacceptable.

Although built to plan smaller Piver designs were excellent performers, many clients botched plans with their own ideas. Instead of fitting accommodation into hulls they did the opposite and built hulls around enormous living areas. These aberrations would not tack or go to windward and were justifiably denounced as some of the worst boats on the water. But when well built and well sailed Piver trimarans humbled expensive keelers, this reaction turned to hatred.

Piver visited New Zealand in the early 1960's when he crossed the Pacific in 35 foot *Lodestar*; this was the first modern trimaran ocean crossing and this feat, plus Piver's extrovert behaviour and claims created considerable interest in Auckland. But Young, who was open minded and interested in multihulls and went along to meetings, was not impressed and was further annoyed with the reverence shown to Piver. "Anyone who doubted him was considered a skeptic and unscientific," said Young, "Piver made a silly claim that his trimarans would not capsize whereas catamarans would. He was also going to get on a wave when he left New Zealand and surf across the ocean to Cape Horn but in reality, he and his crew pulled out and landed at Wairoa - where Piver gave *Lodestar* to his crew and flew back to the USA. He also gave the impression that *Lodestar* had done 400 miles in a day but when asked what was his highest 24 hour run? he replied, 160 miles - but then added they had done 100 miles in an eight hour period. And then *Sea Spray's* John Mallitte, who was Piver's agent here, ran a biased trimaran versus catamaran article in the magazine (actually the only boating one in the country in those days) and this in my opinion, did great damage to New Zealand's multihull development of the 1960's. I was disappointed because keelboat improvement could only be described as hair splitting whereas multihull advancement was like splitting logs."

14. kitty catamaran

THE HOUGHTON BROTHERS turn of the 20th Century catamaran had similarities in size, beam and shape to the UK Prout Brothers famous and early Shearwater catamaran of 1954. The Prouts, as did the Houghtons, had first noted the benefits of canoe hulls and the Prouts' 16.5 foot Shearwater had canoe bow and mid sections but a cut short after section making a full transom – if the hull had continued to a canoe stern the boat would have been around 20 feet long. Full transoms had a benefit of reducing pitching, something canoe hull sterns have a tendency to do. The Shearwater was very important and had a worldwide effect in terms of catamaran



Young's Kitty catamaran

design. In the USA *Tigercat*, a very fast, powerfully rigged and Prout-like platform catamaran designed by Robert Harris made a large impression; even dyed-in-the-wool monohull sailors and journalists complemented its performance.

The successful *Shearwater* had a similar effect on Jim Young and inspired him to design a 16 foot moulded ply catamaran for New Zealand conditions but John Peet, a local dinghy sailor, saw more possibilities in a shorter 12 foot design; then the boat could race in the unrestricted 12 foot dinghy class – and so he convinced Young to draw a smaller version. Young built a mould and Peet laid up the first example in two very thin layers of kahikatea (white pine) veneers. Young had learned that no fastenings should be used and the reliance on glues was the only way a light boat like a catamaran could survive hard driving – if metal fastenings were used, the boat fell to pieces under sailing loads.

The new cat named *Kitty* was launched in 1958 and it arrived when the Auckland sailing public was receptive to a different type of boat. *Kitty* catamaran was quite a different departure from the usual centreboarders and had the attraction of greater performance, so it quickly became popular, both in New Zealand and overseas. Peet entered the boat with his son David in Q Class trials and won all five, then won the Inter-Dominion Championship – but the demoralized fleet and members quickly voted the catamaran out of class. Similarly three 12 foot *Kitty* catamarans were refused entry in an 18 footer Invitation race with the Flying Squadron. All the same, the entered the racing and Peet's cat crossed an unofficial and unpopular first, beating all the highly touted 18's.

To carry the weight of two crew on 12 foot hulls the design needed wide, buoyant hull forms, shapes that compromised high speed with load carrying and although they remained the fastest 12 footers in New Zealand and capable of being driven extremely hard with spinnakers, longer, slimmer hulls would have gained even greater speed with less effort.

Peet had seen that a smaller boat would be more popular and make better racing and he was right. Young saw a great future in catamarans in the early 1960's and designed the first cruising model with V shaped hulls forward and U shaped sections aft, similar to that of *Kitty* catamaran but unlike the smaller design he placed a conventional big headsail, small main on the 29 foot cruising catamaran. One of these, *Nine Tails*, owned by ocean sailor Tony Armit, capsized in fresh winds in the Motuihe Passage after he had tied a knot in the genoa in an attempt to reduce sail area since he had no storm jib on board.

"At about the same time," said Young, "Australian trimaran designer Hedley Nicol was lost at sea in one of his own designs and a few months later Lock Crowther lost his brother while he and three crew tested the new racing trimaran, 33 foot *Bandersnatch*. The establishment and the media attacked with a vengeance, damning all multihulls and creating a sensational impression that lasted for decades. In the 1960's there was too much controversy surrounding multihulls for me to continue work in this field. Because of capsize and losses at sea, they tended to be looked on as heretical and if you showed too much interest in them, you were considered in the same light as a communist or something."

"A number of multihulls capsized because they carried keelboat rigs, large overlapping masthead genoas in the mistaken belief that because such configurations were well known and popular, they would be best for multihulls. And this was obviously incorrect and I made the same mistake too. Headsails need to be small with standing rigging set up tight to stop forestays sagging and sails becoming too full; this blows the light catamaran bows to leeward when the boat is beating in a seaway and produces a lee helm effect – while the full force of the wind overpowers the sail and encourages a capsize – unless the sheets are thrown off."

15. southern influence

LIGHT WEIGHT SECOND generation Shearwater catamarans were built in New Zealand in the early 1960's but a step forward came when the refined A Class single handed catamarans appeared in 1965. Previously the first light catamaran was the 14 foot *Falcon* designed and built by George Hoerr in Wellington which was una rigged and a contrast to Kitty and Shearwater sloop rigged platforms that were popular. Compared to these earlier designs the A Class boats were finer hulled and much lighter, in fact half the weight of the 12 foot Kitty.



Wing mast rigged McKinven A Class *Catalanta*



Lyttleton A Class catamaran

This gave them an advantage in light weather and when it breezed up, the 150 lb boats could be held down by crew hiking or using trapezes. Graham Stanton from Christchurch built first a hard chine 14.5 foot cat named *Kitten* – the fastest cat in New Zealand at that time, then he drew and built a true, full 18 foot length, International A Class he named *Scat* in late 1965. This was long and light and made earlier Shearwater and Yachting World catamarans appear like cruisers. *Scat* was an important design and ahead of its time; it had the magical lightweight catamaran quality of sailing smoothly at speed without wave noise or spray. Ian McIntyre, also from Christchurch, sailed a Stanton A Class *Safari* which had tensioned plywood hulls that were more elliptic V in cross section shape than the semi-circular U sections of Stanton's *Scat*. *Safari* had a sloop rig whereas *Scat* was a tall una setup with six stays – both boats however sailed at similar speeds.

Tensioned or tortured plywood construction was claimed to be first used by the Gougeon brothers, Meade and Jan, in Lake Michigan when they constructed an experimental design in 1963. But the simple, stitch and tape 1930's Mirror dinghy from the UK predated the Gougeons by some decades and was very popular - and it was this success that set multihull designers thinking along tensioned ply lines. In 1966 the Gougeons built an ultra-light 7.6 meter trimaran *Omega* in tensioned ply. *Omega* won everything it came up against, tacking both upwind and down like an ice boat, (the brothers knew about ice boating from hard Michigan winters and were probably the first to introduce this downwind sailing technique to multihulls) - *Omega* even beat 25 foot C Class catamarans in light weather conditions. Again it was a repeat of the old scenario, the light newcomer was too good for its own good and trimarans were outlawed from C Class competition – a political action that today the struggling C Class catamaran competition and officials perhaps might wish they had reconsidered.

In 1964 John Mazzotti from the UK designed and built a B Class catamaran named *Manta* out of 4mm ply and as a result, *Manta* was light, fast and attractive with hulls having a fine V entry changing to full, but still Vee section aft, a distinction that is typical of tensioned ply hulls.

Stanton, working on his own in Christchurch built his tensioned ply A Class *Safari* early the following year while Mazzotti on the other side of the world deigned his very elegant A Class *Unicorn*. With *Unicorn* Mazzotti dispensed with the mid hull stringer he had used on *Manta* and instead forced the unformed hull into a deck jig, then the transoms and bulkheads were pushed in to create the correct shape, then glued and glassed to hold it all together.

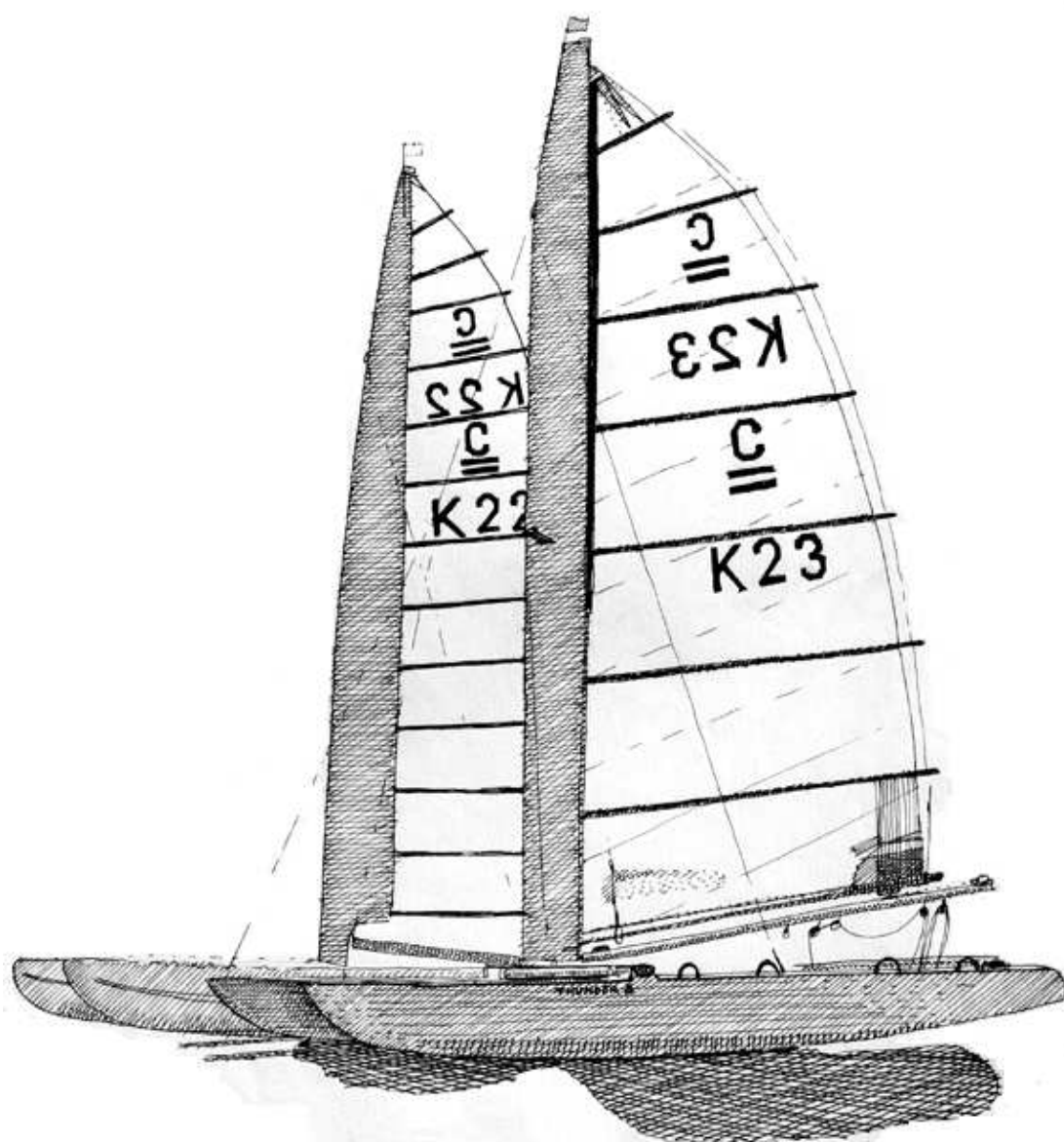
In Auckland Ron Given, Malcolm Tennant and Ken Fay had moved up (actually forced to move because of Stanton's faster designs) from heavier Shearwater and Yachting World catamarans to their own group designed lightweight A Class. Unlike Stanton's tensioned ply A's, these boats were built in French carvel, two layers of 2.4 mm plywood laid in strips square to the centerline and running from gunwhale to gunwhale (called football jersey construction by some) except in the sharp bow sections where they were forced to layup from keel to gunwhale instead. Aside from these short areas this method produced true semi-circular shapes throughout the hull length and the rounded decks were built similarly. Given's *Hustler* had an all up weight of 60 kgs (150 lbs) and with the high A Class sail area, these Auckland singlehanders were spectacular performers and the beginning of a thriving class.

Given's first experience on multihulls came after sailing with Arthur Piver when hew came to Auckland; then he and his brother John built two 16 foot Piver Frolic trimarans but were disappointed with the windward and the slow tacking performance. So Ron Given drew and built an 18 foot trimaran *Pisces* with a trapeze, a boat that was an improvement on the Frolic and one in which he took second place in the 1965 One of a Kind series. Two years later sailing his new A Class *Hustler* he won OOAK in a fleet of 28 entries. But Aucklanders gained knowledge the hard way when competing with the Christchurch based, more advanced and confident Stanton who told the group their daggerboards were far too small, inferring that his own were twice their size. The Aucklanders acquiesced to his greater experience and built larger boards – and were surprised when they first saw *Scat* and *Safari* that the Canterbury boats had normal sized daggers - Stanton went out and smugly trounced them with their overly large, draggy foils.

Bruce Farr at this early stage of his designing career was also involved with A Class and be drew and built *Rascal* for Douglas Haig. This had chined hulls in the after sections that curved into rounded shapes then narrowed to very fine entries with a knuckle. Although built with Farr's expertise with carefully aligned layers of



Ron Given with his lightweight A Class *Hustler* hull 1967



B Class catamarans *Manta* and *Thunder* from the UK

1/10th plywood, these frame and stringer constructed hulls were heavier than the 38 lb French carvel Auckland group platforms.

In the 1967 New Zealand winter Stanton courageously took A Class *Safari* with Scat's bendy una rig plus a newly built ultra-light C Class (25 x 14 feet) with a sloop rig to the UK to compete in IYRU trials and C Class championships. He was up against formidable competition in C Class for English designers Mazzotti, Shaw, March and MacAlpine-Downie had competed and collaborated with their designs to finally develop MacAlpine-Downie's very powerful, wing masted *Lady Helmsman*.

Australian multihull developments in the late 1960's were in larger classes than in New Zealand. Smaller cats were present in Australia but their 25 foot C Class catamarans were high focus and revolutionary with the Cunningham's wing mast/soft sail *Quests* and Roy Martin's totally wing rigged, hard sail *Miss Nylex*. Aside from a couple of C Class attempts, New Zealand catamaran popularity belonged in the smaller, less expensive, less



Stars Travel, failed but impressive venture into C Class catamarans

sophisticated classes like Given's 14 foot, stitch and tape, hard chined Paper Tiger. The original design was drawn on Weetbix box lining paper, the mould was built by Fay who also designed the daggerboards and rudders and upon it appearing on the Waitemata, the Paper Tiger was an immediate success and since then over five thousand have been built.

16. work of art

DAVID BARKER FROM Takapuna beach finished his art training at the Conservatory of Auckland in the early 1960's then was accepted into a fellowship program at the East/West centre at the University of Hawaii. He had sailed a Young designed Kitty catamaran at Takapuna and had become fascinated with multihull performance and design so in Honolulu he studied Hawaiian beach and ocean racing catamarans from Brown and Choy. But Brown was scathing about sea surviving qualities of Barker's sketch pad catamaran designs claiming they would not last an hour in Hawaiian wave conditions. Barker listened, went sailing on Choy cats and after a three year period in the islands, evolved a new set of drawings for his own catamaran.

In the late 1960's it was not possible in New Zealand to acquire polyester resin without an import licence so Barker shifted to Sydney to build his 40 foot foam and glass catamaran *Sundancer*. Naturally this design had CSK Hawaiian influence but Barker's hull cross sections were different in that they were symmetrical (although they looked asymmetric because they were mounted sloping outwards) whereas the CSK cats remained with their asymmetric and pointy hull cross sections. Barker's hulls were also more rounded and carried daggerboards whereas the CSK cats had none relying on their deep pointy hulls to act as foils. Barker was adamant that his cat must go to windward and not be just a Hawaiian reaching machine. Also unlike any CSK design, *Sundancer* had a rotating mast, was three quarter rigged with a fully battened mainsail. Compared to the fixed, masthead rigged CSK's *Sundancer's* sail area was moderate (600 square feet) but Barker kept the weight





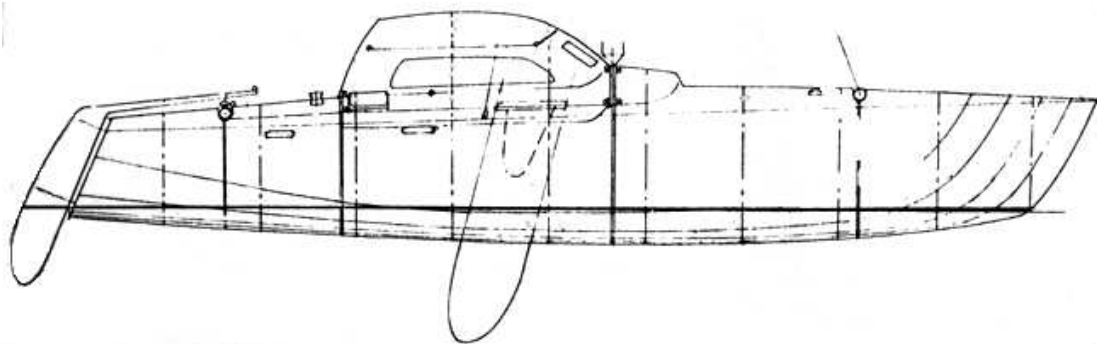
David Barker helming his own designed and built *Sundancer*

David Pardon

down and the Spartan 40 x 17 foot cat displaced only 5800 lb – that meant sail area was adequate to power the light boat at speed.

Upon launching in 1969 and some test sailing Barker took *Sundancer* on a cruise to Hobart then up to the Great Barrier Reef and later crossed the Tasman to Auckland. Barker and his very modern, sleek *Sundancer* created a lot of yachting discussion around the waterfront: “This is a new type of animal, is no clunky altered Piver dog that sails sideways, looks dangerously fast, the owner is an artist, does great paintings so they say, boat had already proved itself crossing the Tasman, survived some big winds I hear, it has appeared right smack in the middle of anti-multihull talk amongst proper sailors, still going strong, but Barker’s one of those unsettling believers, you know he means business, talks the talk, written articles in the latest *Sea Spray*, draws romantic pen and inks the wife loves and he’s got that laconic, confident attitude that’s disturbing, don’t say anything stupid about multihulls around him, mate.”

Nevertheless there was still a strong anti-multihull swell surviving and *Sundancer* entered the 1971 Balokovic Cup race only by crossing the start half an hour after the fleet had gone, catching the bulk of them on the beat to Cow and Calf then proceeded to mow down the leaders including local champion 73 foot *Buccaneer* on the reach to Canoe Rock (where *Sundancer* touched 22 knots) and to finish miles ahead in Auckland. Some



- above: Barker's Sundancer - opposite: Farr's breakthrough 727 design

of the owners with expensive boats were scathing about the “@#%\$&# catermerang” after that and when Barker said he intended to do a Pacific cruise on *Sundancer* and that he hoped to start with the 1971 Auckland/Suva fleet, the wise men on the race committee blocked him from doing so saying that *Sundancer* “would break up the moment it got past Great Barrier Island.” This further motivated a determined Barker who went over his boat thoroughly making sure it was safe and race ready; he started the race an hour after the fleet departure, overhauled them and set an unofficial record for the 1150 mile race of five days and ten hours. Second in was big S&S *Ta'aroa* several hours behind but the race committee ignored *Sundancer's* splendid performance and recognized only *Ta'aroa's* slower, but also record breaking time. It was predictably similar to the reception the CSK cats received when crossing first in Transpac races so Barker consoled himself that he was in good company.

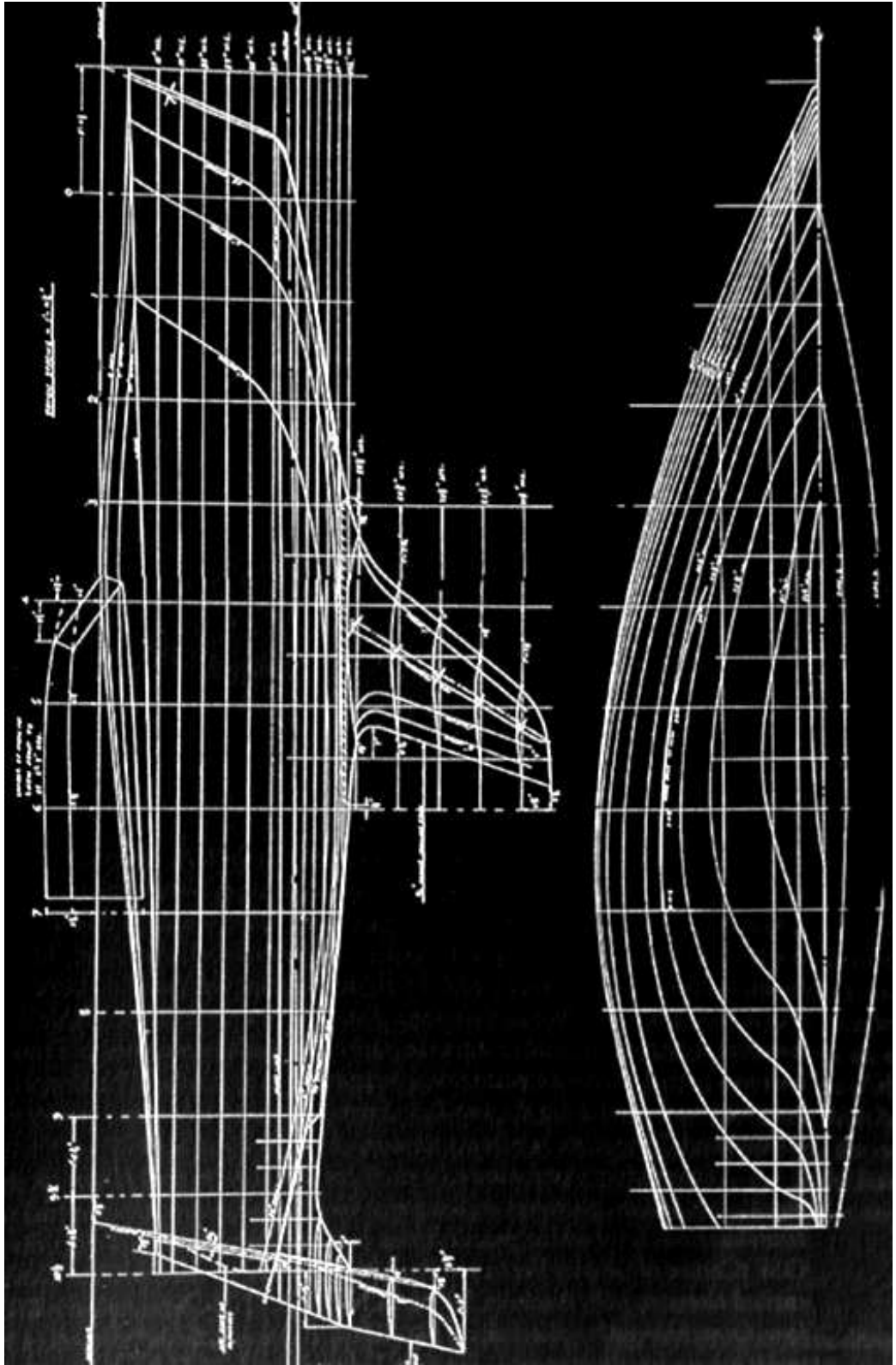
17. Farr's big dinghy

IN THE LATE 1960'S local boatbuilding was in a depressed state. Chris Bouzaid had won the One Ton Cup in *Rainbow 11* but although this performance put New Zealand ocean racing on the map, the win had come in a Sparkman & Stephens design.

Consequently if New Zealanders were serious about winning after *Rainbow 11*, they sought only designs from overseas, preferring them to local designers in which few, if any racing sailors had confidence. This was a period towards the end of the RORC Rule to which *Rainbow 11* had been designed and constructed. Because light moulded building using glues as fasteners was contrary to RORC thinking, *Rainbow 11* was built the old way in heavy thick planks and ribs – which leaked. Young said, “The RORC encouraged construction method, just because it was heavy, did not necessarily mean it was strong. Also, where was the glory in winning in a foreign design?”

Bruce Farr arrived in Auckland from the fishing harbour of Leigh. He had theories counter to proven principles of the day beginning from wins in his own designed and built International Moth in 1965; in 1966 he produced a small catamaran and the next year his first keel boat for a Royal Akarana Yacht Club competition. This boat was-similar to his later *Titus Canby* but in 1968 the conservative Akarana judges were unimpressed – or more likely terrified by its looks and considered it in their terms, “too way out.”

As an 18 year old Farr worked with Young as a boatbuilder and draftsman and at the same time designed 12 and 18 footers during nights and weekends. In 1971 after leaving Young's boat shed he designed bargain basement racer *Titus Canby* for Rob Blackburn; this design revealed a philosophy that was unacceptable to many people but Farr was unswerving in his direction and remarked in *Sea Spray* magazine: “Displacement means expense and anyway I prefer light displacement – I'm looking for enough stability and weight for good windward sailing but I still want a boat that is light enough to plane and surf downwind.”





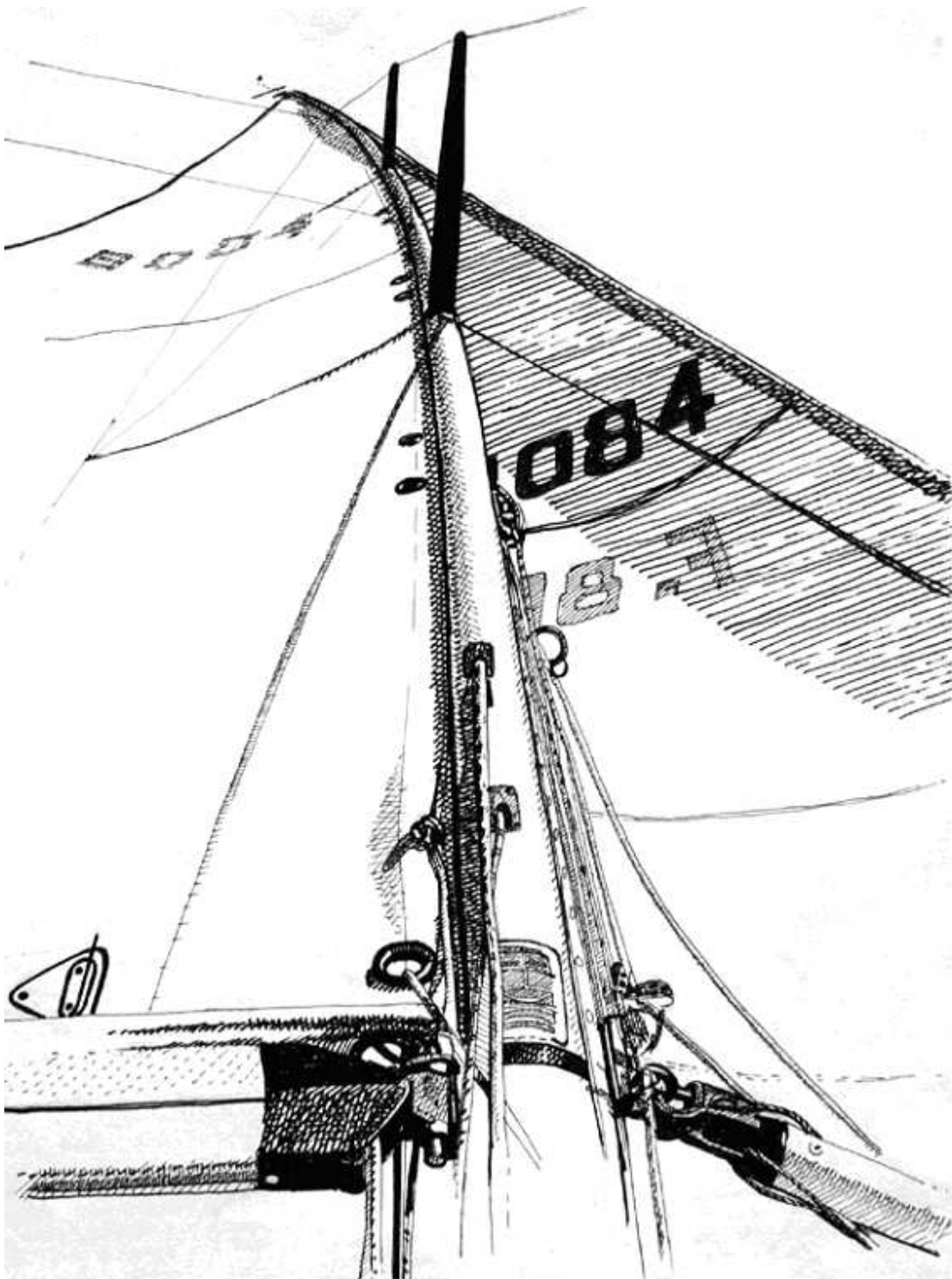
Farr's *Fantzipantz* forerunner of 727

David Pardon

Titus Canby was a Half Ton design but radically different to the normal shape of boat; it had broad after sections for fast reaching and running while the forward sections were fine for wedging through the Hauraki Gulf chop. Like Stewart, Spencer and Young, Farr drew a keel with weight down low with a swelling fin bottom but unlike the more established local designers whose rigs were usually masthead, (excepting Townson's *Pied Piper* and Nelson's *Vim*) Farr had a fractional 7/8ths rig on *Titus Canby* and this carried a small headsail and for the times, a relatively large main. The yacht looked very different and critics were angered by the threatening change and were quick to point out faults – often of a minor and superficial nature, “poor paint quality,” sneered one sailing lawyer, but truthfully, *Titus Canby* was a high wooded and blocky looking with a long cabin almost equal in height to hull freeboard. It was not a beautiful yacht but it was a practical one for Gulf racing and cruising – it was also very fast and rudely flashed its broad transom to the 1972 Half Ton fleet.

Farr had blithely drawn his first offshore design with an eye cocked only casually towards the IOR; he was just drawing boats the way he thought they should be, drawing on experience learned from designs of Stewart, Young, Spencer and Townson – he had no intention of being the *enfant terrible* of the yachting world – or so he said on the record.

In 1972 he drew a Quarter Ton yacht *Fantzipantz* that was later altered in a minor way to become the Farr 727. He did not know it at the time but 727 45 *South* was to become the pivotal point, the seminal design of the New Zealand-type yacht which was to force radical changes worldwide in attitudes towards sailing. This design was a development of his big dinghy approach first seen in *Titus Canby* and although other dinghy types such as the Swedish group designed *Robber* and the UK's Jones/Knights' *Odd Job* had pointed out possibilities in



New Zealand-type bendy rig on French Quarter Tonner

this direction, none had scored high enough in international competition to create a major design shift. But *45 South* impressed everyone at Deauville in France for the 1975 Quarter Ton Cup by winning three of the four race series. The French media, always quick to sight the *avant garde*, called the boat a revelation and the debut of a new era – they were right.

Although *45 South* was Farr's first serious attempt at an IOR design he still adhered to his earlier approach. The boat was designed entirely for speed with little bending or distortion of hull shape to make IOR rating gains – blatant distortion would slow the boat and was unacceptable. Compared to *Titus Canby*, 727 had more beam, sail area, a dinghy-like $\frac{3}{4}$ rig on a Bavstock mast with fixed, swept spreaders. The low boom for the large, low aspect ratio main appeared unusual to international crews and upon arrival in France the yellow Farr was considered so weirdly different it was considered a no threat. The English skipper of *Minestrone* watching the two Farr's *45 South* and *Genie* being rigged commented, "There are two boats we won't have to worry about."



Stephen Jones/Jack Knights light displacement *Odd Job* from the UK.

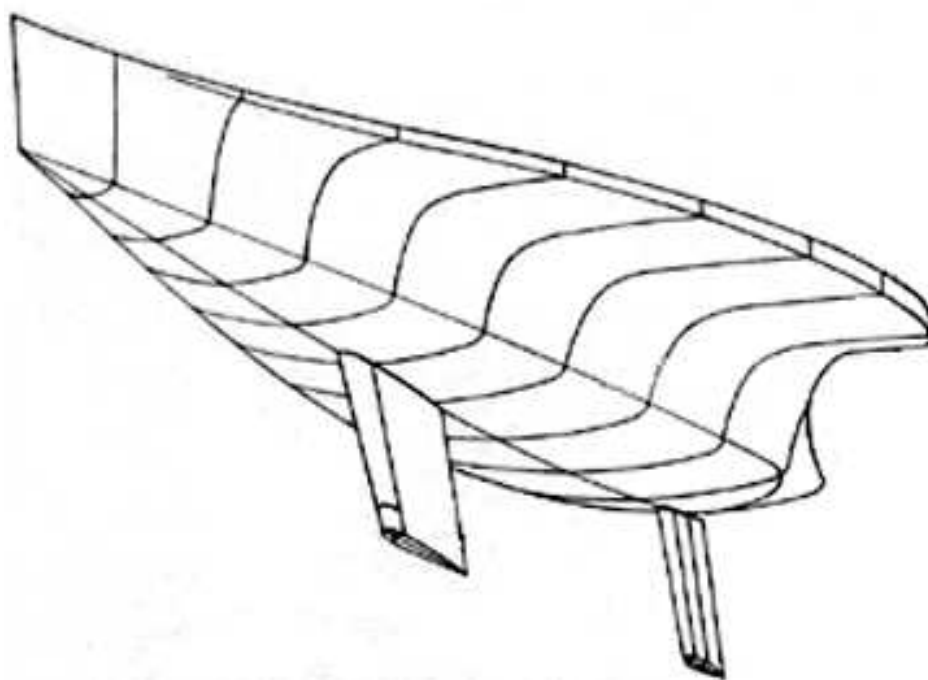
One of the UK's most free yacht design thinkers at this time was Gordon Trower who had just graduated from a design course at the Southampton College of Technology and his outrageous Quarter Ton design *Warbird* was considered such a threat to the Rule makers that journalists like Jack Knights, wrote of him being such a threat to the IOR that he was intentionally trying to destroy it. Which was not the case, but made good headlines. Trower's *Warbird* made the New Zealand designers work look middle class. And although he was dismissed as just too extreme, his designs had influences in later Antipodean non-Rule developments.

Trower designed *Mach 1* in 1973, an extremely wide beam, bow piercing, tall rigged, light displacement 29 foot IOR monohull, then a year later continued the theme with Quarter Ton *Warbird*. Although New Zealand was at that time turning into a hotbed of creative yacht designs, the English too, have a historical reputation of brilliant, eccentric and creative thinkers in yacht design. He wrote:

"*Mach 1* was very long, very light and very wide because of its large wings. The length was gained by a slim, low, wave-piercing bow that got round the mathematics of the IOR which interpreted the rated length as much,

much shorter than it actually was. The design never got built because the ORC wouldn't apply the IOR as defined and fell back on the "intentions" of the rule that my bow design turned the length measurement formulae inside out (the length waterline was 29' for a rated length of about 20'). *Warbird* followed the concept of lightness and wide wings but was shorter than *Mach 1* with wings fashioned around the aft girths so that the measured length was significantly reduced. But again the Council felt that this opportunity, though much less significant than was the case for *Mach 1*, took a particular, previously not used advantage. It became necessary to modify the wings aft with a saw to satisfy the ORC that the benefit was adequately modest."

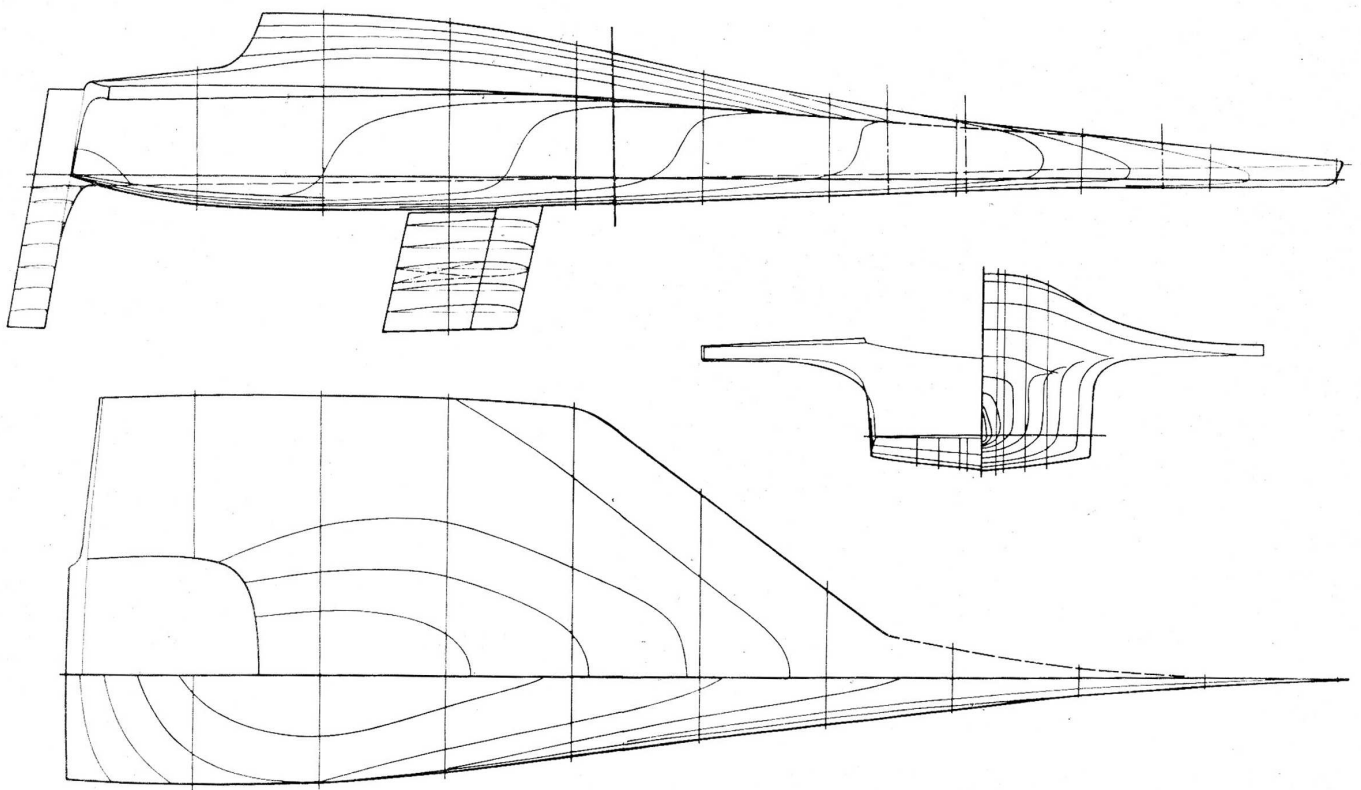
"The design was different in many ways. The light displacement resulted in a planing performance, though this was marred in several ways. The hull was light enough that it could be lifted easily by a person at each end. But unnecessary weight was added with the deck. All of these factors increased weight and pushed upwards the centre of gravity. As a result I found myself redesigning the keel so that the wing shaped bulb was



Also from the UK came Trower's *Warbird*

heavier for (just) adequate stability. The raised weight marred performance but *Warbird* did well in Cowes Week in an untuned first outing. *Warbird* featured several innovative features within the constraints of the rules: Two thirds of the keel took the form of a trim tab, adjusted on deck, the bulb was of winged form, the bow plumb and hull extremely flared. The rig was of a particularly high aspect ratio with extreme round in the mainsail luff, the mast bent fore and aft and athwartships to suit - this gave additional unmeasured sail area. Alas the rule was changed within months of her building, banning hollow in the flare - and it was not feasible to re-design."

"I have always been passionate about light displacement and so looked at ways that the IOR could be manipulated to make this possible. When *Warbird* was underway, with similar principal dimensions to *Mach 1* except that it was much shorter, a rule was introduced that limited the crew to four for the Quarter Tonner. My response to this was to get some 18 stone rugby players/wrestlers on board with weight jackets, but the crew had already been defined by the owner - which was lightweight, totalling no more than 240kg which made things tough and increased the amount of ballast carried in the bulb/wing and therefore overall weight."



above: Trower's very radical *Mach 1* - opposite: l'enfant terrible, Farr's *45 South* – looking quite pedestrian by comparison

Returning to New Zealand developments, *Titus Canby's* keel allowed it to sit on the bottom for grid work but *45 South's* was deeper, narrower with a purist hydrodynamic tip that had no considerations for working practicalities, just performance. To get the minimum CGF (Centre of Gravity Factor) under IOR, keel weight on *45 South*, unlike *Titus Canby*, was carried closer to the hull. Farr said for *Sea Spray*, "Light displacement relies largely on hull form for stability rather than ballast. But if the keel is too small, the boat will be blown sideways and if it is too big, the boat trips over itself and goes sideways anyway. My keel is quite large by displacement standards with a tapering profile from keel top. Being of high aspect ratio, it lifts the keel centre of effort under the boat and decreases heeling moment. And having weight up under the hull gives a better Centre of Gravity Factor; this produces a better sea boat because keel weight is concentrated closer to the boat's centre of pitch."

For speed the waterline was long, entry fine, run aft flat carried to a wide stern. Compared to the fleet at Deauville *45 South* was not very wide which allowed it to handle sloppy sea and flukey wind conditions well; an area where light displacement boats usually perform poorly. A crack Auckland crew of Dickson, Woodroffe, Martin and Crockett aboard *45 South* was able to extract speed in both light and breezy conditions – but other crews had reservations about the constant rig tweaking required for boat performance.

In 1972 the $\frac{3}{4}$ rig was viewed with alarm; considered bendy, fragile and dangerous. The preferred rig was heavy masthead with small main and large numbers of headsails. Each one had to laboriously changed in varying wind strength. Farr changed that rigid attitude with *45 South* and proved that big dinghy fractional rigs on an 18 footer-type bendy mast was not dangerous and easy to handle. Everything was controlled from the cockpit and in heavy weather the rigs were self regulating. Instead of dragging different sized headsails forward on a masthead



yacht, the New Zealanders either allowed the mast to bend, flattening the big main or put in a reef. Also reduced loads aboard a $\frac{3}{4}$ rigged yacht allowed the deck gear to be lighter and cheaper.

Anyone dabbling in light displacement and bendy fractional rigs was dismissed as eccentric. Sparkman & Stephens had experimented with fractional rigs in 1973 on *Prospect of Whitby* but had kept ratios between main and headsail similar to masthead designs – and achieved nothing. Farr was more extreme with large main/small headsail setup and revealed the IOR could be different – even though he designed and developed his concept first and then made it fit the Rule.

Light boats lift over big seas whereas heavy boats plough. Sparkman & Stephens boats of the late 1960's were heavy and had the centre of effort well forward to offset rounding up to weather as they plunged deep into waves and buried bows. Offwind heavy boats required more than one person on the helm and to gain speed large areas of sail had to be carried - but because of their designs and weight, they could never go past theoretical hull speed. The Antipodean dinghy/yacht was a complete contrast; so simple and basic New Zealanders found it difficult to comprehend why the rest of the yachting world considered them extremists (it took a decade before the roles were universally and completely reversed). At Deauville, crews on conservative Quarter Tonners were often frustrated by light boat performance and US designer Bruce Kirby sailing on his own design *Fred Jr.* wrote of this frustration in a US yachting magazine: "A couple of boats had laid off across our stern while we were being held high and now were on our lee beam with a much better angle to the line. One of them was *Genie*, sister to *45 South*. In the brisk beam reaching she was moving fast with her light, dinghy-like hull picking up every wave while the medium displacement boats like ours, only managed to grab every second or third one. The annoying part was that at the finish, the two New Zealand boats were first and second even though they had been buried at the last mark before the wind filled in."

18. an affront to challenge

AS A RESULT of *45 South*'s win the following year brought intensive design and building activity in Auckland. Farr had started something with the 727 which set other local designers thinking of ways to improve the concept and Paul Whiting, Davidson and Young fielded thoughts for large fleet 1976 competition. Farr turned his



opposite: Farr designed *Jiminy Cricket* – an extrapolation of *Prospect of Ponsonby*

attention to the One Ton Cup sized yachts because Noel Angus, an individualistic local skipper from Ponsonby, could see that a scaled up dinghy-type yacht version would have advantages among the predominantly heavy designs of One Tonners – although it was almost considered an affront to challenge established Sparkman & Stephens, Doug Peterson, Ron Holland and Gary Mull designs.

Angus commissioned Farr's first IOR race boat but not a full blown competition yacht because he asked for compromises. This was similar to an earlier situation when Farr was asked to design Admiral Cup design

Gerontius – but *Prospect of Ponsonby* as the new design was called, was light displacement whereas the 42 foot *Gerontius* was decidedly moderate. Ballast ratio on the One Tonner was higher than earlier designs while hull shape was more extreme in depth and fineness forward while having a long and wide stern which was overhung – the latter a feature that picked up sailing length when heeled but which received minimal rating increase. The rig was 13/16ths with a very bendy Sheerline mast carrying a backstay but no runners.

Prospect of Ponsonby was immediately fast on the water, matching to windward and running the Peterson One Ton design *Streaker* owned by the famous Chris Bouzaid while pulling away on reaching legs. Also the boat had good light weather performance where formerly the Farr designs had shown a weakness. Farr said, “I’m happy with the light displacement approach because it produces boats competitive with moderate or heavy displacement but much nicer. That’s important to me – these boats are tremendous fun to sail. I can’t imagine myself sailing a heavy displacement One Tonner. I’d get bored and want out of it.”

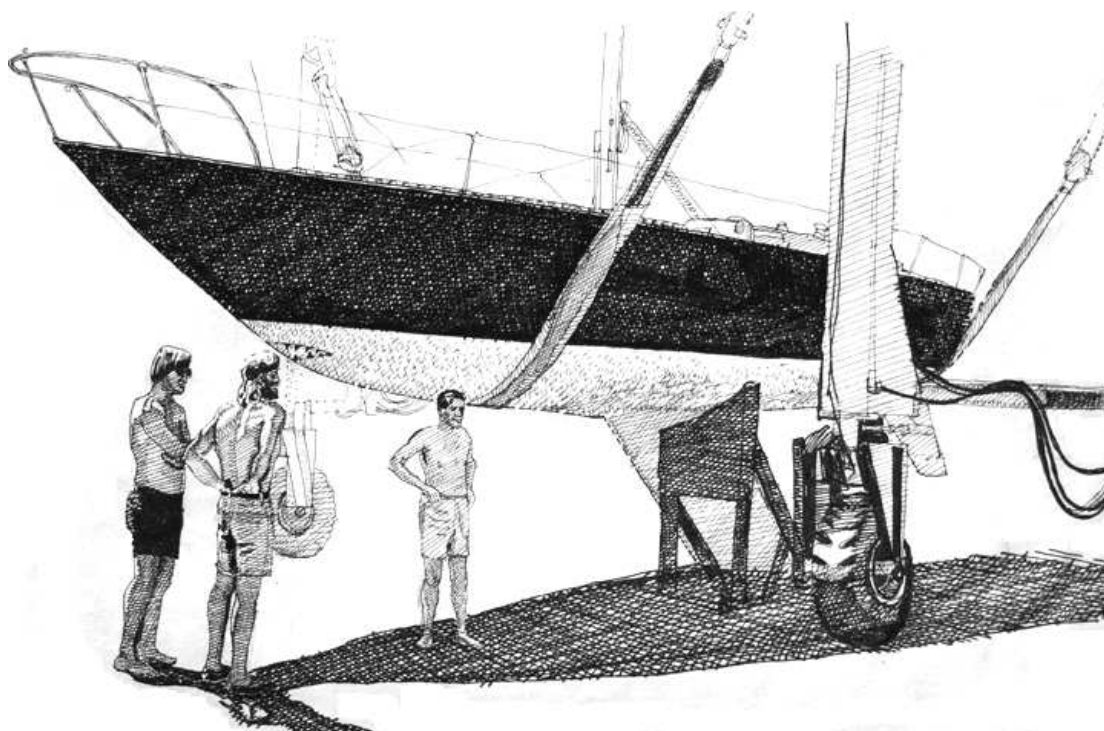
Prospect of Ponsonby turned out to be a breakthrough design, taking five guns in five starts in One Ton trials. In Sydney it was also top scorer beating 1974 One Ton Cup winner *Pied Piper*, a Peterson design skippered by the US’s flamboyant Ted Turner. With this high profile information revealing Antipodean supremacy, there was a *volte-face* among Auckland skippers, whereas formerly they had sneered at local designers, suddenly the light switch had been thrown; now they clamoured for new Farr designs.

If *Prospect of Ponsonby* had been successful when Farr had made concessions to cruising in drawing the design, prospects were much greater when Stu Brentnall, a top Stewart 34 skipper and Graeme Woodroffe from 45 *South*, asked Farr for new racers, giving him a free hand. But Farr made little or no changes with the new boats; he was confident with the original design and the two new, stripped out One Tonners, *Jiminy Cricket* and *The Number* had only minor cockpit and transom differences.

Recognition of local light displacement designs had arrived but countering this move, animosity arose between the two differing factions with heavy yacht advocates angrily prophesying the demise of the new lightweights in strong winds and heavy seas during the upcoming New Zealand One Ton trials. But the new Farr boats dominated the series and in a heavy weather middle distance race, took, along with Young’s light One Tonner *Checkmate*, all the top places. In conditions with winds to 60 knots, where the heavy brigade had felt assured the lightweights would break up, it was not the light designs that failed but the heavy boats who all retired – forcing them to swallow their own bitter bile.

The two new Farris then went to Marseilles for the One Ton Cup and between them, won all the breezy races but struggled to stay in touch with the heavier yachts in the flukey Mediterranean conditions, finally finishing in fourth and fifth overall.

Another New Zealand designer, Ron Holland came into prominence during this period. He had served as a young apprentice with Keith Atkinson in Browns Bay and had crewed on local offshore yachts. Being in the same locality as John Spencer he became involved with Spencer’s designs when Spencer was commissioned by US shipping magnate George Kiskaddon to design a 21 metre light displacement schooner named *New World*. Holland worked on a smaller 7 metre schooner test version of the larger yacht, also built by Atkinson and was then invited to San Francisco by Kiskaddon when model *Great Hope* was shipped to the US. Although starting with the New Zealand light displacement school, Holland changed direction when he met in the States the moderate to heavy displacement designers Doug Peterson and Gary Mull. He worked closely with Mull designing the 12.8 metre *Improbable* – and got Atkinson the job of building the kauri yacht in New Zealand. *Improbable* was a distinct break with the usual US type designs – dinghy-hull shaped and meant to excel in downwind sailing as well as being a good windward performer. But compared to Antipodean designs



US Gary Mull design, New Zealand built *Improbable*

Improbable was heavy and when the deep bodied, red yacht with its unusually large, dinghy-type transom rudder was exported from here, unimpressed Aucklanders, now well versed with light displacement theory and hull design, foresaw that *Improbable*, although somewhat dinghy hull shaped with a broad transom, was too heavy to show any real pace in downwind conditions. This proved to be true and although US observers considered the boat as a surfing big dinghy compared to their usual yacht type, and although Holland wrote entertaining articles relating to racing and deliveries aboard the Mull design, the boat was not fast and not the breakthrough success the group had thought during early brainstorm sessions. However it was important because *Improbable* was a compromise, a go between that of Antipodean lightweights and the usual heavy displacement yachts from the USA, an educational boat that introduced US sailors to what was possible in lighter designs – although this would not be properly brought home to them until a couple of years later when Farr's *ne plus ultra* centreboarder *Mr Jumpy* was sold to the States. That boat was extreme and almost incomprehensible to US eyes.

After having a great time aboard *Improbable*, Holland worked and crewed with Peterson on his winning *Ganbare One Tonner* (in itself a cautious breakthrough design) and then continued similarly and successfully along moderate to heavy displacement, fine ended, masthead rigged IOR designs like *Golden Apple*. Holland did not belong to the New Zealand school and soon his boats were overshadowed by the more radical Farr and Whiting designs.

19. Chance revolution

THE WINNER AT Marseilles was *Resolute Salmon*, a Britton Chance design from USA, crewed by experts including the designer, and skippered by Dick Deaver. *Resolute Salmon* was a very special yacht and revealed another undiscovered IOR direction, for *Resolute Salmon* was a centreboarder and the first to win a series.



Britton Chance's One Ton Champion centreboarder *Resolute Salmon*

Jonathon Eastland

Centreboard yachts were popular in the USA and were encouraged by IOR with a rating bonus of extra draft without penalty. Lifting board designs required ballast to be carried inside the hull and relied heavily on hull beam and shape to provide stability. An advantage of the centerboard was that it allowed a more optimum performance foil shape, a contrast to a conventional lead keel which was shape compromised by the large amount of lead it was required to contain. Another advantage was offwind the board could be raised, reducing wetted surface area and drag. Chance had uncovered a performance gold mine and Farr studied the design carefully. *Resolute Salmon's* hull was very deep and fine forward, one of the reasons the yacht sailed well in light winds and sloppy sea conditions off Marseilles. Compared to Farr's design the waterline was relatively short but the sail area was very large. Chance at the same time was in the middle of his radical 12 metre *Mariner* campaign following his line of development where the shape of the hull "fooled" the water into thinking the waterline was longer. He achieved this successfully on *Resolute Salmon* but was disastrously wrong with *Mariner* which looked like it sailed with a bone in its tail.

By having a fairly full fore body on *Resolute Salmon* he moved the bow wave forward and the corresponding stern wave further aft. By filling in the stern overhang he found that when the yacht heeled, the starting point of the lee quarter wave was delayed, and by having a beamy, powerful hull shape, this allowed the yacht to be stiff to windward. However there was one major fault and that was sailing downwind in fresh conditions, running with a big following sea. Although the boat had a very high ballast ratio, the power of the internal ballast was just below the centre of buoyancy so that *Resolute Salmon* had to heel ten degrees or more before the ballast stiffened the boat up. Sailing downwind under spinnaker it would start rolling and then go into a broach. The stern was small and contributed to broaching whereas the New Zealand designs were dinghy-wide and had firm after sections to provide stability – and their low aspect mainsails and $\frac{3}{4}$ spinnakers reduced rolling problems because the centre of effort was low. And since the light yachts were close to planing, speed steadied them as well. Peterson commented, "The Farr boats run hot and cold but I was surprised how well they could hang in there to windward."

The next venue was Auckland and Farr considered some changes but did not want to spoil areas of his design where they were superior to make gains where they were less efficient. Ballast ratios could be increased, length shortened and more sail carried; that would make the new boat stiffer and faster to weather in light conditions but for windy conditions the balance he had was good and he decided not to sacrifice reaching performance displayed by his designs in the Mediterranean.

20. Auckland school

FARR'S SUCCESS in the 1975 Quarter Ton Cup set Davidson looking closely at the design. "I was impressed by the 727 but didn't think it a great boat. I had a good knowledge of the IOR and thought I could improve on 727 so I designed *Fun*. Farr's boat was long overall and as a result of the Rule, short on sail area. That seemed disproportionate. *Fun* however was short on waterline, 45 kgs heavier and big in sail area. Since there was a loophole in draft measurement if you had a centreboard, I decided to put one in, whereas 727 was a keelboat."

Davidson visited Chance when Chance had been researching centreboard boats before he drew *Resolute Salmon*. One of them was *Fous de Vous* which had twin boards similar to Bruce King's *Terrorist*, a brilliant design

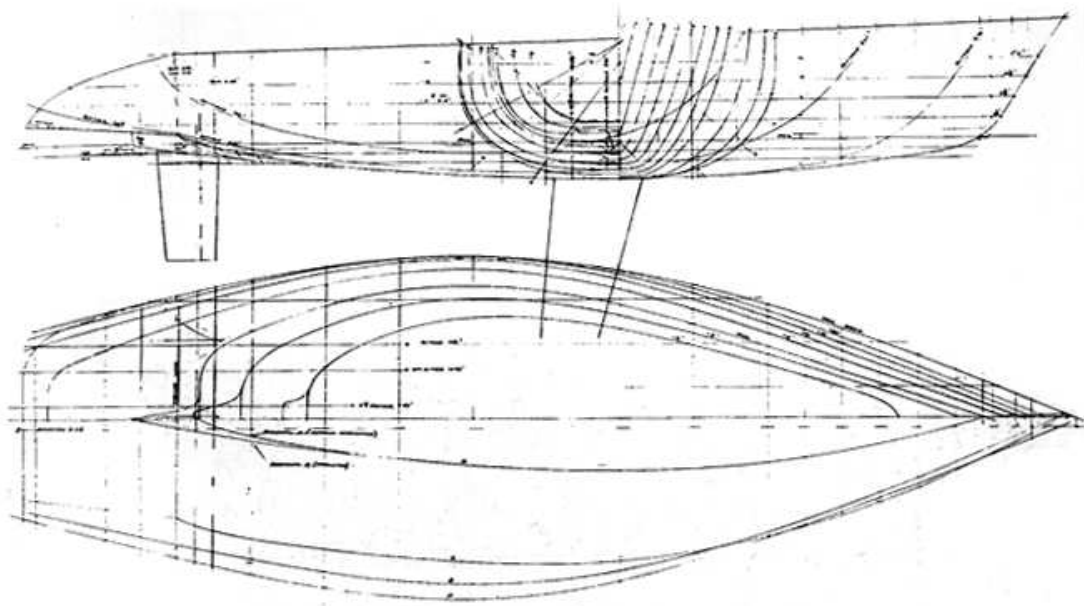


Perfectionist John Rea building *Fun*



above: Walker and Davidson with trailerable *Fun* - below: *Fun* at Corpus Christi





Fun lines

that almost took the One Ton Cup two years earlier. Davidson showed Chance his moderately heavy Half Ton designs *Tramp* and *Blitzkrieg* and Chance commented, as a result of his recent test, that the Davidson keels were too big – and that was proven to be right.

Chance's board yachts were moderate to heavy displacement but Davidson with *Fun* in 1976, introduced a daggerboard to light displacement and started a new trend. *Fun* was a beautifully proportioned design, Davidson knew he was onto something and he and Alan Walker took the boat to Corpus Christi, Texas for the Quarter Ton Cup, trailering the yacht from Oregon to the Cup venue, periodically stopping and sailing the boat on the way. Observers noted that *Fun* was the fastest at Corpus Christi but the skilled designer/sailor Davidson became ill and could not helm his creation – so *Fun* did not achieve full potential. All the kudos that year went to another New Zealand lightweight, Paul Whiting's *Magic Bus*.

21. Whiting and Ross

EARLIER IN 1976 Murray Ross, a dinghy sailor from Javelins and Flying Dutchman, approached Farr asking for a Quarter Tonner. Farr wanted to give Ross a modified *45 South* but this was not what Ross had in mind – so he went to Whiting instead. This young designer was fascinated by yacht architecture and at school had spent time carving half models under his desk. From the age of 14 he was designing, often awakening his younger brother Tony at midnight with his pencil scratching. When his teacher claimed that bloodhound was a type of dog he was incredulous and later told his father D'arcy, "Everyone knows *Bloodhound* is a Camper and Nicholson design, the largest yacht steered by a tiller and owned by the Duke of Edinburgh."

Ross wanted maximum downwind and reaching speed from the proposed boat, but more sail area than Farr's 727 for light conditions and better performance to windward – an area where he had noticed the Farr design suffered. Ross also wanted to bring new dinghy sail handling concepts to the new design, for example: the headsails were to have wire luffs which were flown free behind the forestay and were to be tensioned with a drum winch below deck. And the construction of the boat was to be in Airex foam core and sheathed in fiberglass – a method that was new to this country in 1976. The result was *Magic Bus*, a single purpose racing



Magic Bus at Corpus Christi

D'arcy Whiting

boat with a very Spartan interior, so minimal that one crew member wisecracked that, “it was a relief to come up on deck.”

In New Zealand trials *Magic Bus* won easily over Farr, Mull, Peterson, Holland and Lidgard designs; only in close reaching did the Farr 727's show equal or better performance with *Pinto*, skippered by 18 foot sailor Ted Bland, narrowly beating *Magic Bus* in one race. Whiting said, “The reason for being overtaken while shy reaching was my own mistake – when setting up *Bus* to gain a good rating allowance, I placed too much weight forward. But with weight removed from the bow, *Bus* was faster. It verified that bow down trim, although beneficial for rating, affected performance too much to be worthwhile.”

At Corpus Christi *Magic Bus* and *Fun* arrived together, both lightweights looking similar in profile with long raking transoms, wide sterns and huge mains and small headsails – a contrast to the rest of the large fleet. A few overseas designers had ventured into fractional rigs but with headsails and mains of similar areas, more of a non-masthead approach. *Fun* differed from *Magic Bus* because of no hull distortions, longer waterline, narrower overall beam and more sail – while being the world's first lightweight centreboarder. *Magic Bus* won the first two races, sailing upwind with the best moderate to heavy displacement boats but stretching away easily on the offwind legs. *Fun* came second in race one and sixth in the next, always fast, especially broad reaching when the breeze freshened and the board was lifted. The Farr 727's were outclassed and found it difficult to keep in touch upwind – although their reaching performance lifted them belatedly through the fleet. *Magic Bus* won convincingly and was the only light displacement boat able to stay with the masthead yachts in winds under five knots. Davidson was a little disappointed after the series and said, “*Magic Bus* won with Murray Ross steering but after the contest was over, they struggled to sell the boat in the USA and in the end gave her away for ten grand US, whereas, and this was the proof of the pudding, we sold *Fun* for twice that. Next year *Fun* was North American Champion and *Magic Bus* was nowhere – they needed Ross and the Kiwis to make her go.”



above: Whiting Quarter Ton Champion *Magic Bus*

22. midnight builders

THE NEW ZEALANDERS returned knowing they had been successful revolutionaries; they had broken free from the typical IOR mould and knew there was more to explore and develop along light displacement theme. Auckland yachting talk was fast and the times were heady. However they also knew of the unpopularity of light displacement big dinghies and had also heard from the Northern Hemisphere of unrest among the IOR's Technical Committee – who wanted to stop the light boat trend.

But in Auckland this was ignored and the movement charged ahead. Heavy displacement was history and Auckland designers were not going back to archaic thinking. Whiting designed a Half Tonner named *Candu*

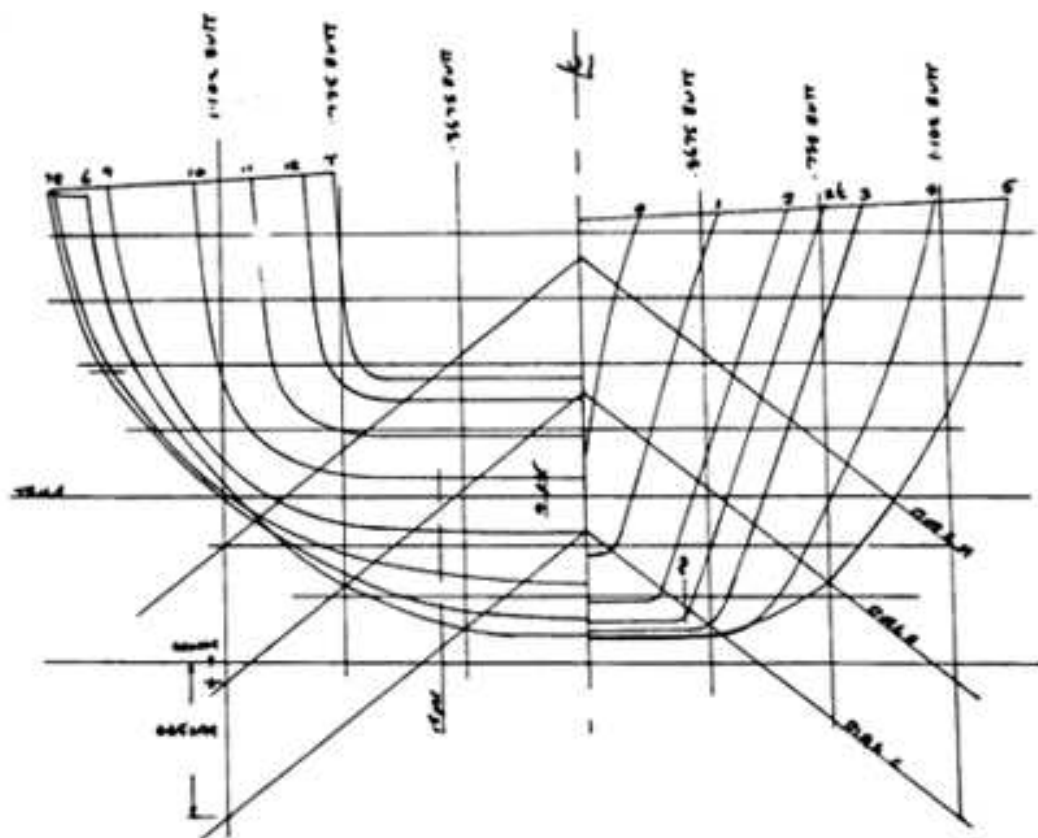
11 along *Magic Bus* lines for Ian Gibbs – then found after 1976-77 IOR changes, that broad New Zealand sterns had been heavily penalised to increase rating by half a foot. Nevertheless he started almost immediately working on a new version for the *Magic Bus* team; he shortened the boat (which would make it slower) but managed to keep displacement down – which allowed *Candu 11*'s keel and had 15% more area. All ballast was internal, like Davidson's *Fun* and similarly Chance's *Resolute Salmon* – with 1000kgs of lead packed around the daggerboard case. Whiting explained, "The main advantage of the board is that it reduces pitching, a result of not having the weight of the keel low down. This is particularly important on the fine bowed Newspaper Taxi and gives a smoother ride

In light winds the crew found it preferable to keep the board down while reaching to counter leeway but flat running, the board was almost fully raised. Compared to *Magic Bus*, Newspaper Taxi had the mast further forward; Whiting wanting to push close to cat una rig territory (giant mainsail, no headsail) but was limited by having to keep a reasonable aspect ratio for headsails and to retain some length in the spinnaker pole. Ross had spinnakers launched through a specially designed pulpit with sails stored in sail cloth tubes below deck. This kept crew off the fine bowed foredeck and allowed fast spinnaker hoists or last minute drops. Whiting chased everything possible regarding hull shape in the Rule and Ross went beyond accepted rig and sail handling areas.



Whiting's Newspaper Taxi

John Mallitte



top: distorted Rule lines of *Newspaper Taxi* – below: *Newspaper Taxi* launching



Newspaper Taxi's semi-cat rig: large mainsail, small headsail

Newspaper Taxi's mast was very thin with less windage than Farr competition and had less rigging with spreaders angled forward so shrouds were in-line with the mast.

The boat was campaigned as intensively as it had been built, was completely Spartan below, was tuned up three nights a week, raced on whatever club course was available at weekends and competed against 14 Half Tonners in New Zealand trials, taking four guns and one second.

23. Joe Louis knockout

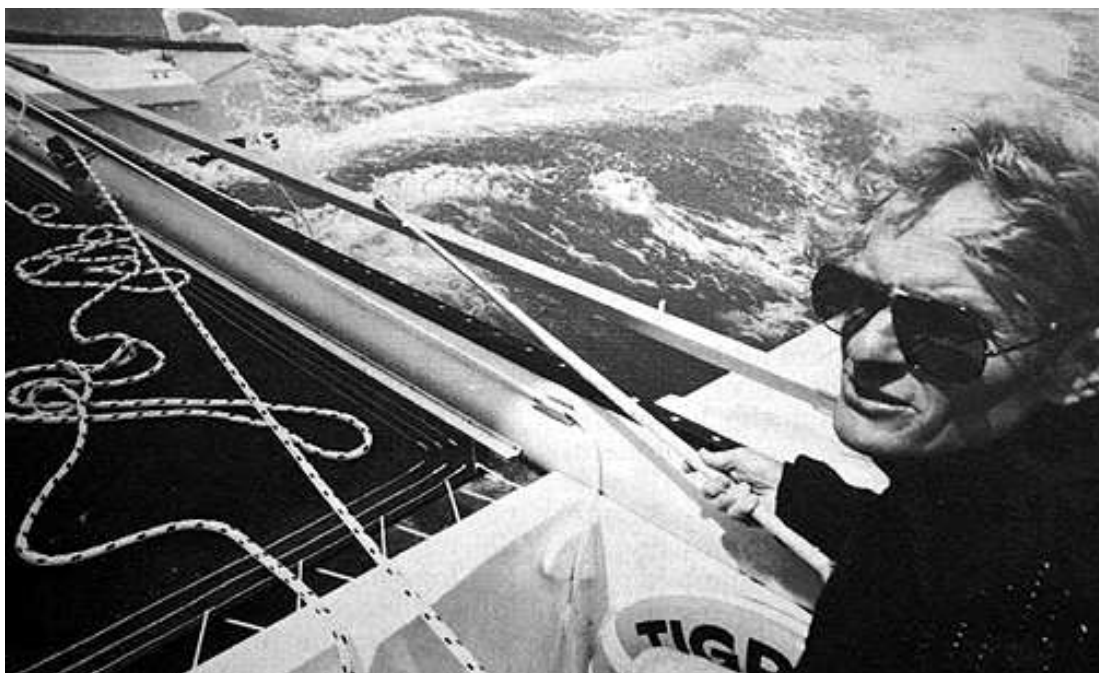
FARR, SEEING HIS 1976 Half Ton design *Cotton Blossom* outpaced by the Whiting design and also penalized in the wide stern by the Rule, Farr drew the first of his 1977 boats, a Three Quarter Ton keelboat named *Joe Louis* (owned by French boxing champion Eric Simian) and helmed by Flying Dutchman champion Yves Pajot. Like Whiting, Farr traded some speed for a shorter hull and more sail area, then cleaned up the after girth station by getting rid of the step in the run, while the sloping stern used on *Cotton Blossom* was replaced with a

more vertical one. *Joe Louis* was an important transitional design in that it was the first of a long line of similar but evolutionary Farr designs that were to follow and also because it was one of the earliest Farr yachts to be not built in wood; it was constructed in foam sandwich with Kevlar sheathing. *Joe Louis* easily won the Three Quarter Ton Cup at La Rochelle that year by being consistently fast in strong and light winds. An enthusiastic Simian sent Farr a crew autographed print of *Joe Louis* hailing him "the King of Speed."

French designers like Jean Berret, Joubert and Nivelte and Philippe Briand were quick to see advantages in breakthrough Southern Hemisphere designs and two French yachts at La Rochelle were in the Farr/Whiting/Davidson style. These were *Oesophage Boogie* by Berret and *Drakkar* by Joubert and Nivelte; both were very light and wide beamed. *Drakkar* had a large daggerboard which upset the measurers because of marginal stability – the boat was very fast but lost its rig in the third race. The Berret design won three races and was recognized as the fastest in the fleet but it lost out by doing poorly in a light air race. Another board boat there was the US Chance design *North Star*, a light weather specialist in the same mode as *Resolute Salmon* but in strong winds, like the One Ton design, it spent a lot of time broaching. Farr's *Joe Louis* in comparison to *Oesophage Boogie* and *Drakkar* was lighter but narrower and won only one race. None of the established US designers made it into the top six.

24. open wing deck design

AUSTRALIAN MULTIHULL DESIGNER Lock Crowther had appeal in Auckland with some Kraken 33 and 40 racing trimaran designs plus his racer/cruiser 40 foot catamarans being built here. Local multihull designers like Young (still interested despite early bad press), Ron Given and Malcolm Tennant had gained recognition few larger cruising catamarans. Given designed his own 36 foot lightweight racing catamaran *Tigress* in 1971, an open wing deck design like an enlarged Paper Tiger; it looked extreme and observers were impatient to see it line. Given, Tennant had drawn larger designs but his examples also took time to build; multihull sailors invariably had little money and usually built their own yachts. Tennant had earlier built a few Australian B2 Class Stingray

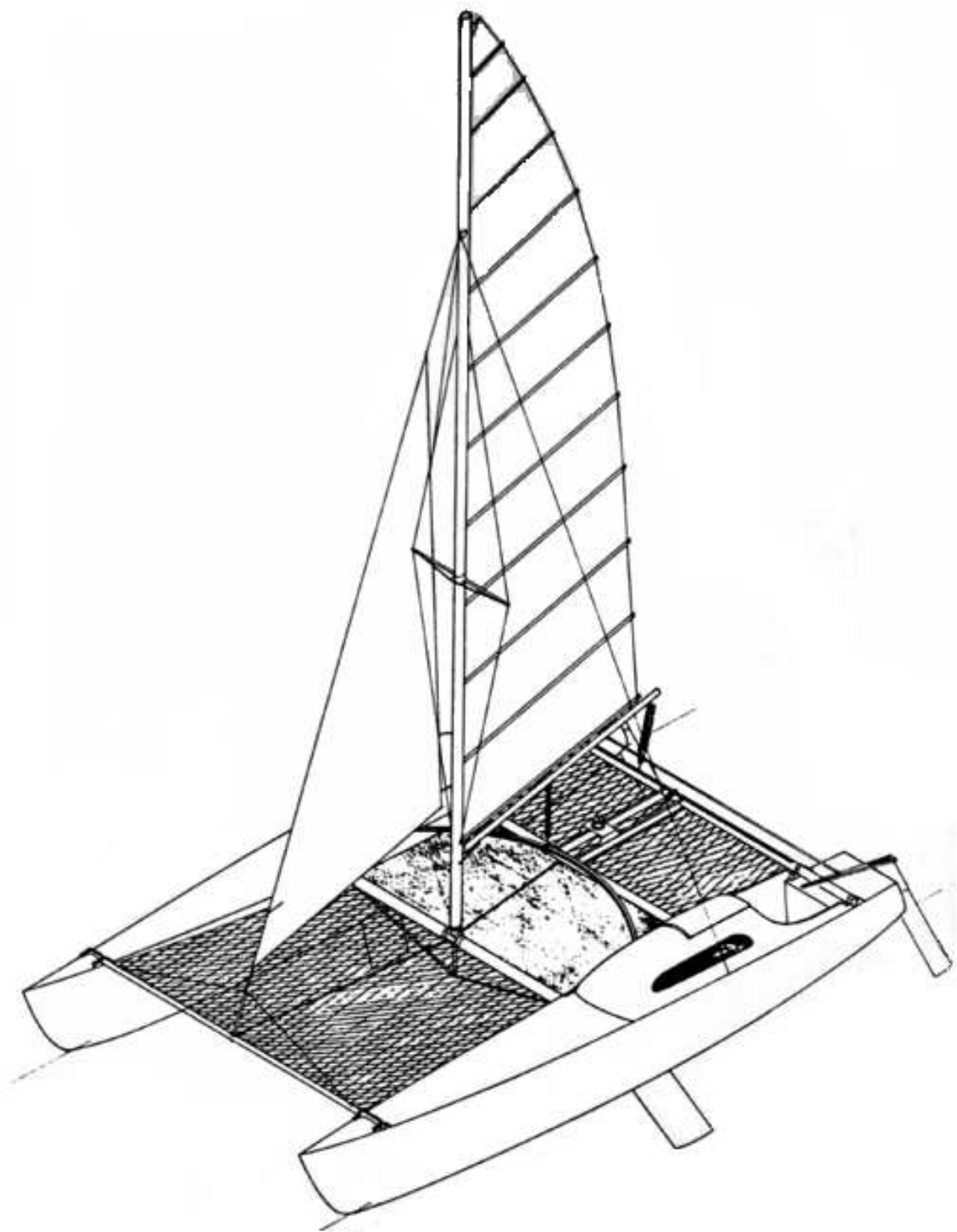


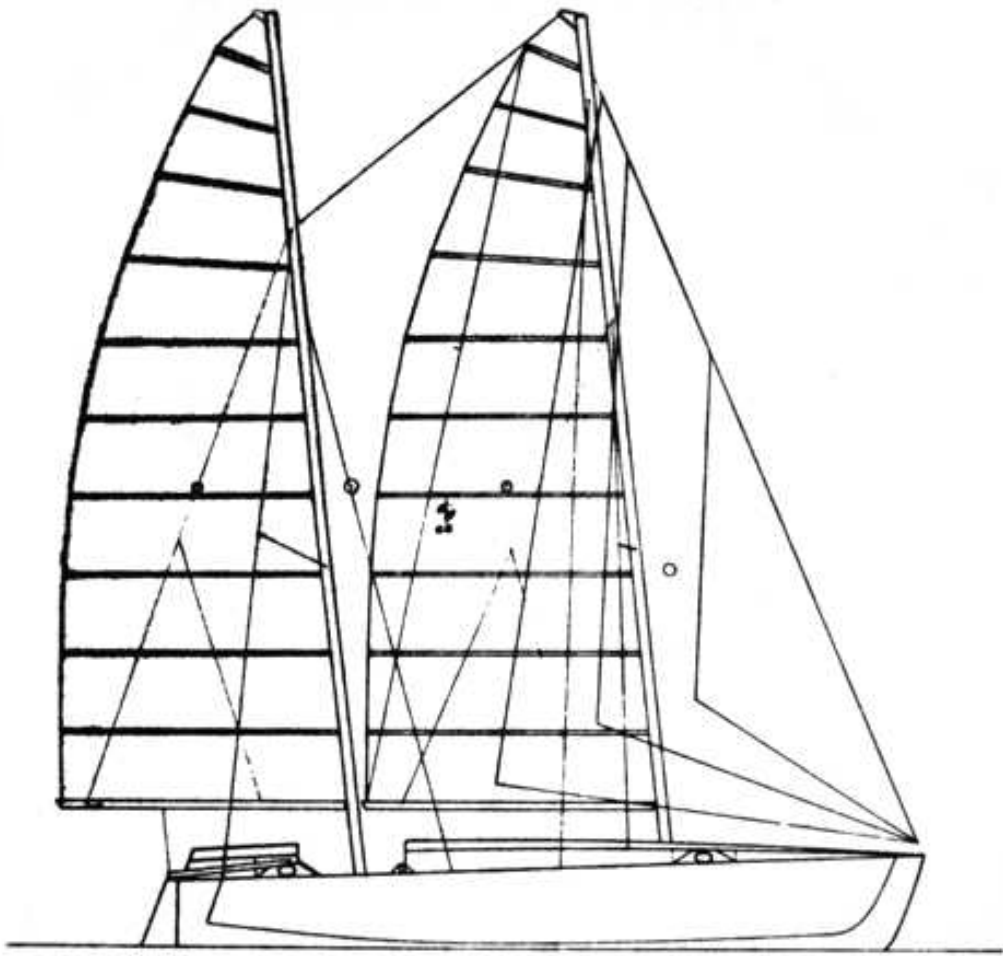
Ron Given sailing his big Paper Tiger design *Tigress* at speed



Early Tennant Great Barrier Express design *Excalibur*

catamarans and tried unsuccessfully to get the class established here; then he designed a cruising 36 foot catamaran named *Vorpal Blade* – but the owners took a decade to construct the boat. In 1972 he published his ideas on a 9.8 metre high performance wing masted catamaran he named *Bamboo Bomber* which had flared and stepped hull topside shapes with blister cabins fore and aft of the central cockpits; the boat looked a bit weird and spacecraft-like and nothing came from it. However in late 1972 I asked him to redraw the concept, clean up the lines by discarding the stepped cross section hull shapes and the result was an attractive and very modern (for those days) racing design – two examples of which began construction soon afterwards. Both yachts *Supplejack* and *Superbird* were launched in 1977 and were built in tensioned ply like large versions of the (then) Olympic class *Tornado*. Both wing masts ended up heavier than intended and made the light platforms pitch in some sloppy seaways and light winds – but given sufficient wind power to drive through waves, both yachts were very fast. Continuing loosely to the *Bamboo Bomber* theme he had first shown in *Sea Spray*, Tennant drew a clean looking, aft cockpit, blister cabin 8.5 meter racing/cruising catamaran named *Great Barrier Express* - which Tennant said was inspired by a Hawaiian beach cat developed by Mickey Munoz. Compared to the second version of *Bamboo Bomber*, *Great Barrier Express* had more rocker in hull underwater profile (for easier tacking) and sloping transom hung rudders which could be lifted, whereas *Bamboo Bomber* rudders were fixed down and under hung. The latter rudders also sloped and had skegs – retrospectively bad mistakes – as too was the





Jim Young's *Bladon Racer* trimaran - opposite: original Great Barrier Express

sloping GBE rudder design – which tended to lift the sterns and push down the bows when sharp helm movement was made - later versions had vertical rudders to counter that problem. The original Great Barrier Express built and owned by Richard Pilkington was launched in early 1977 beating the Bamboo Bombers into the water. The cat had sensational speed and quickly became known as a giant killer; it was also instantly popular and went into production at Pilkington's boatyard.

An early 32 foot trimaran *Atria* was designed by Jim Young for Dooley Wilson and launched in 1964. This yacht had classical sheer in the main hull and because of this low freeboard amidships, placed the beams too close to the water surface, an early multihull design mistake, for the beams slowed the boat when driving through waves – a common problem with trimarans at that time. Wilson raced *Atria* in Tauranga for some years and then sailed it to Wellington where it was sold. Then in the mid 1970's Young designed Wilson a 40 foot open wing deck trimaran named *Bladon Racer*; called a sketch for it was neither ketch nor schooner because both masts and mainsails were the same height and carried the same sail area in two roached, fully battened mainsails. "This was a low sail plan which kept the centre of effort down and reduced the tipping moment," said Young. Although Young drew water ballast to be carried in the windward float to provide extra power, this was not fitted by Wilson. In the clever drawing, tanks which were linked to the centre board cases, could fill or empty to produce either buoyancy or lever arm weight.



Wing mast on Tennant designed Bamboo Bomber *Supplejack*

The original group of Given, Tennant and Fay had broken up by the early 1970's; Given and Fay, who had collaborated on the Paper Tiger had split over disagreements with the design when it went into production which culminated in a court case. Then Tennant's Great Barrier Express and Given's Gulf Tiger competed for the quite lucrative fast cruising/racing catamaran market – and earlier friendship quickly evaporated. The Great Barrier Express hull was based closely on tensioned ply Bamboo Bomber and was round bilged while Given's Gulf Tiger continued his Paper Tiger theme with hard chined hull cross sections. The GBE was more performance oriented with the elliptical shaped cross section hulls having less wetted surface area than the flat sided, chined Given design. The after sections of Gulf Tiger were almost flat like a planing hull dinghy. The two also differed in rig design; Given aiming his Gulf Tiger to the average sailor by keeping the rig simple with a non-rotating mast and similar (although spreaders were much wider) to bendy, fractional setups of New Zealand dinghies – while Tennant drew a rotating mast and a high aspect ratio B Class catamaran-type rig for his design, making it higher performance and requiring some extra skills to handle. Given supporters were adamant that large spinnaker carrying Gulf Tiger would be the faster yacht – but were proven wrong.

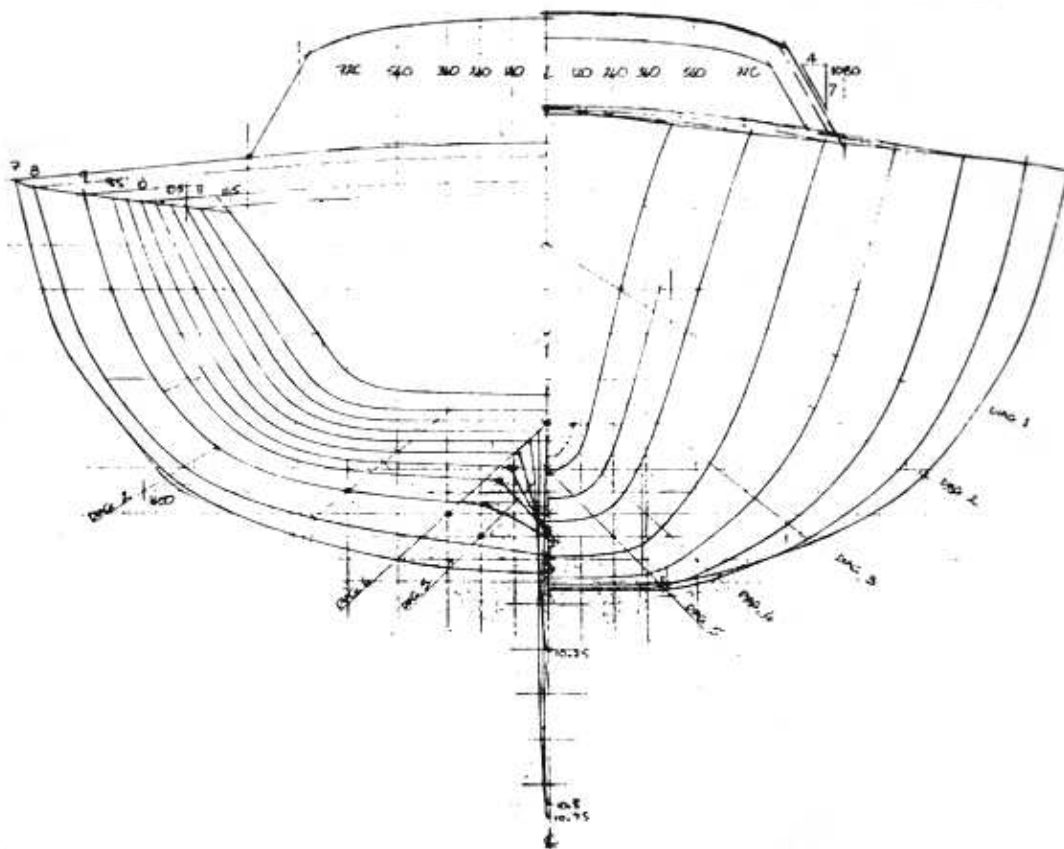
Many club members considered open wing deck, lightly constructed multihulls outrageous and that these designs were nothing more than overblown day sailers with afterthought accommodation – which was correct. Duncan Stuart, who owned Kraken 40 *Krisis*, cracked, "If you close your eyes when on *Supplejack's* deck and step onto the trampoline, you can't tell any difference."

With the success of the Great Barrier Express design Tennant was pressured by people with a non-surfer-type philosophy into making a larger hull design with more accommodation. So Tennant drew the Turrissimo version which was more inflated in hull cross section, higher wooded and slightly longer than the GBE. After the sleek lines and minimalist earlier surfer inspired boat, Turrissimo appeared gross to some eyes but Tennant had listened well – if people thought accommodation more sensible than balanced aesthetics, then he was going to give it to them – and fat Turrissimo turned out to be a faster sailer than its appearance belied.

25. hot property

FARR AND WHITING successes produced intense boating activity in Auckland in 1977 and a number of special lightweights were built, namely for the prestigious One Ton Cup. Farr continued his *Joe Louis* direction with a long, fine bowed, easily driven hull which was clean with little rating distortions. Unlike *Joe Louis* his latest design made a gain via the IOR rating loophole by having a daggerboard or, as Farr called it, a lift keel for this board carried an amount of ballast inside. Upon launching these “centreboarders” were quickly found to be more efficient to windward than his earlier keel boats – and also better downwind in light airs, previously the weakest point of the Farr types. Farr was hot property now and four of his One Ton examples were built in Auckland: *Red Lion*, *Mr. Jumba*, *Smir-Noff-Agen* and *Jenny H*, all cold moulded, wooden construction of three skins over closely spaced stringers. Farr had an empathy with wood and achieved a lightweight result but draftsman Roger Hill remarked, “The old boy network was unhappy and quite jealous of Farr’s fantastic timber sense and they particularly didn’t like this young upstart telling them what to do. They were all waiting for the day when they could say, “I told you so” – and that day eventually did come. Graeme Woodroffe was determined to have *Mr. Jumba* built down to the bone and he’d turn up at Tim Gurr’s to plane bits of wood down. Gurr was surprisingly patient; he must have done an excellent job for *Mr. Jumba*, although the lightest of them all, had no below: [Farr’s One Ton Champion design *Red Lion*](#)





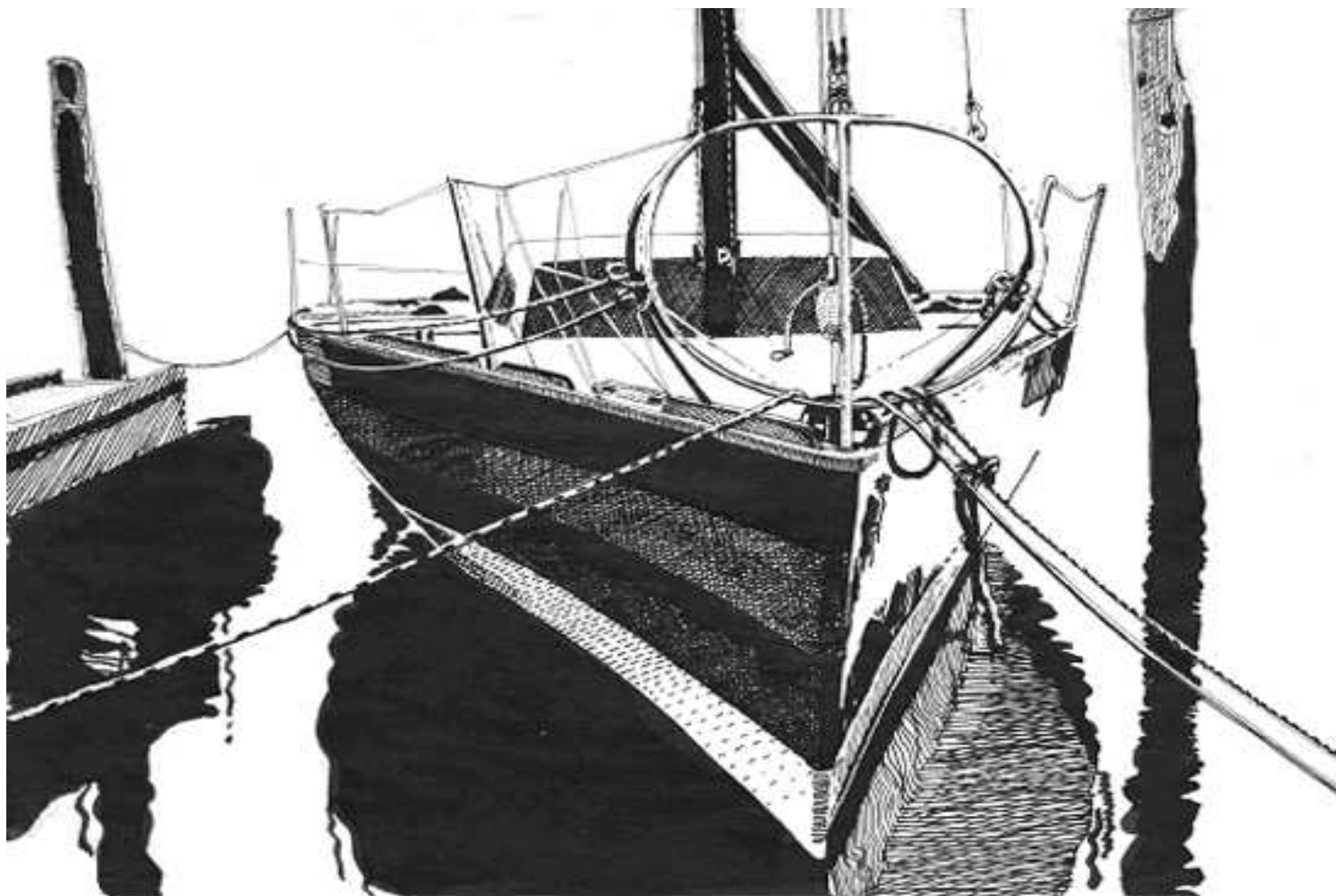
Farr's One Ton centreboarder design

structural failings. Woodroffe was serious about winning: no beer, spirits or greasy food aboard his boat.”

Whiting and Ross were forced to decide whether to continue the Half Ton *Newspaper Taxi* campaign or enter into the larger, higher profile class with a new boat. Overseas observers and journalists had been very impressed with Whiting’s Quarter Ton Champion *Magic Bus* and Edward Brewer wrote in *Sail*, “A One Ton version of *Magic Bus* would be really something.” But Davidson was critical, “Paul Whiting’s designs are join up the dots boats and they aren’t pretty. But it took courage to do what he did in the forward sections because, with the extreme hollow on the waterline, he had to get deep volume in that area, and that was very cleverly done. But I think the overall effect was horrific and his boats were no good unless Murray Ross was sailing them.”

The *Bus/Taxi* team chose the larger, more glamorous class and Whiting drew a design that followed *Newspaper Taxi* lines; the result was *Smackwater Jack*. In contrast to the Farr board boats this big lightweight carried all ballast internally like a mullet boat with just enough weight (90 kgs) to sink the board. All the Farr boats carried up to 270 kgs in their boards because Farr wanted all the stability possible and calculated his yachts to have the same stability with the boards fully down as his earlier keel boat designs.

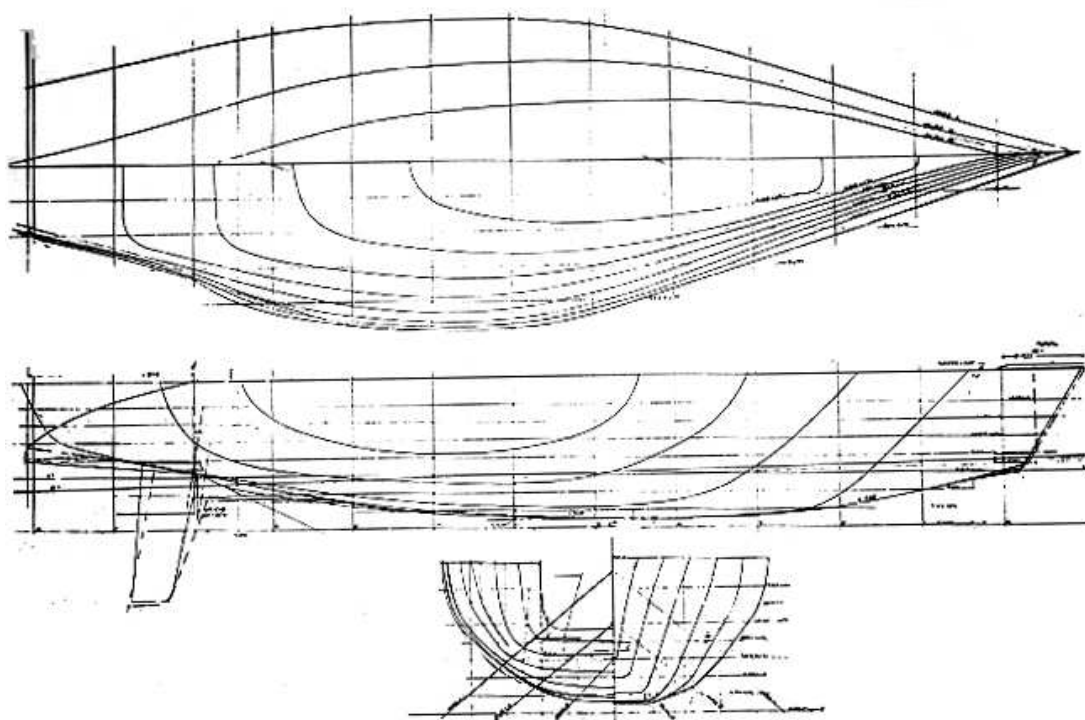
Young had designed only one IOR yacht by the mid 1970’s, *Mama Cass*, an extremely wide beamed Half Ton design, owned and built by his friend Merv Elliott, father of Greg. The hull had pronounced flare which provided extra power and stability with the crew sitting on the rail and made *Mama Cass* the fastest windward sailing Half Tonner in Auckland in 1972. It was also one of the earliest keel boat designs to have this “sport



Whiting's Smackwater Jack

boat" configuration. But Greg Elliott was not impressed because he thought *Mama Cass* far too heavy to perform in anything but strong winds. Young continued this thinking with a One Tonner named *Checkmate* which had a waterline based on his famous NZ37, plus flared sides and hull distortion for Rule advantage. *Checkmate* did not reach the standard Young envisaged so he radically redesigned it by cutting the fiberglass yacht in half, keeping the bow and worked long hours fitting a new after section. Also discarded was the keel which was substituted by a weighted board which, originally, automatically gybed 3 degrees to weather and gave a definite advantage when beating.

The new board boats showed marked superiority over older fixed keel designs in Auckland trials. Crews found the board designs had to be sailed at a freer angle than fixed keelers for the foils to work; this produced more water speed over the boards and extra lift and took them to the first mark in the lead. However if pinched or in broken air with no room to free-off, then conventional keel designs were superior. Board boat crews also discovered they could use flatter sails than before and could carry full sail in 30 knots apparent wind. The mains were not reefed but were twisted off to reduce heel. Critics of light displacement had expected them to break or capsize during windy and miserable trials - but were disappointed. News that the Auckland fleet had split into two divisions traveled overseas so even ambitious US or European sailors could see little incentive in shipping outmoded keelers to Auckland for the One Ton Cup. Doug Peterson visited here "to sap the brains of



Whiting's *Smackwater Jack*

the locals," before he drew *B195* for Australia but observers thought his moderate effort a mistake, "Unless you go to the absolute extreme, push the Rule to the limits, these days you'll only end up second best," reported Jenny Farrell in *Sea Spray*. No-one was building fixed keel yachts – which some of the rear guard thought frighteningly off course. Particularly incensed was the Sydney Yacht Club and clamoured for self righting tests. So three board boats: *Smackwater Jack*, *Smir-Noff-Agen* and *Heatwave* (Young's ex-*Checkmate*) were selected for pull down checks to see if they would come up again – but to the chagrin of critics, all passed, vindicating the designers but still leaving antagonism between the two camps.

Smackwater Jack after launching, began by easily beating the newly revamped and impressive heavy displacement S&S 50 foot design *Corinthian* in light winds – which annoyed some of the blazer wearing set. Ross thought the *Smackwater Jack*'s daggerboard definitely helped the boat sail very high to windward in the light conditions but was quick to downgrade conventional boat owner fears by adding, "I'm not sure they are that big an improvement – if you put a keel on any of the new boats, they would be just as potent." After the first Dunhill trials, which *Smackwater Jack* won, the rear guard set out to stop the yacht and *Smackwater Jack* was disqualified because of not having a category 2 safety certificate, then later was found to have insufficient cabin headroom. This meant late night alterations but this was nothing the crew was not used to (the boat, once the bare hull was received, was put into the water in five weeks) so the attractive original cabin shape was torn apart and a boxy adaptation made to meet the rules which would allow them to sail in the One Ton trials – which they also won. Later came the Southern Cross trials and the Whiting/Ross boat was expected to compete but the team was broke. Ross was frank, "We would have entered if only to get some more tune-up races but we couldn't afford the \$150 entry fee." In the One Ton Cup, even though critics and disgruntled competitors of other conventional yachts had tried to thwart *Smackwater Jack*, the boat was still expected to take the Cup – but *Red Lion* won the series with a 2,1,1,4,3 placings. Moderate to light winds suited the light boats but a heavy



Paul Whiting contemplating his One Ton creation *Smackwater Jack*

Jenny Farrell

weather race inflicted damage: *Jenny H* fell off a wave and fractured a forward ring frame which allowed topsides and stringers to collapse, Australian Farr board boat *Hecate* withdrew while *Red Lion* and *Smir-Noff-Agen* revealed damage when examined after the race and *Smackwater Jack* leaked and gave up.

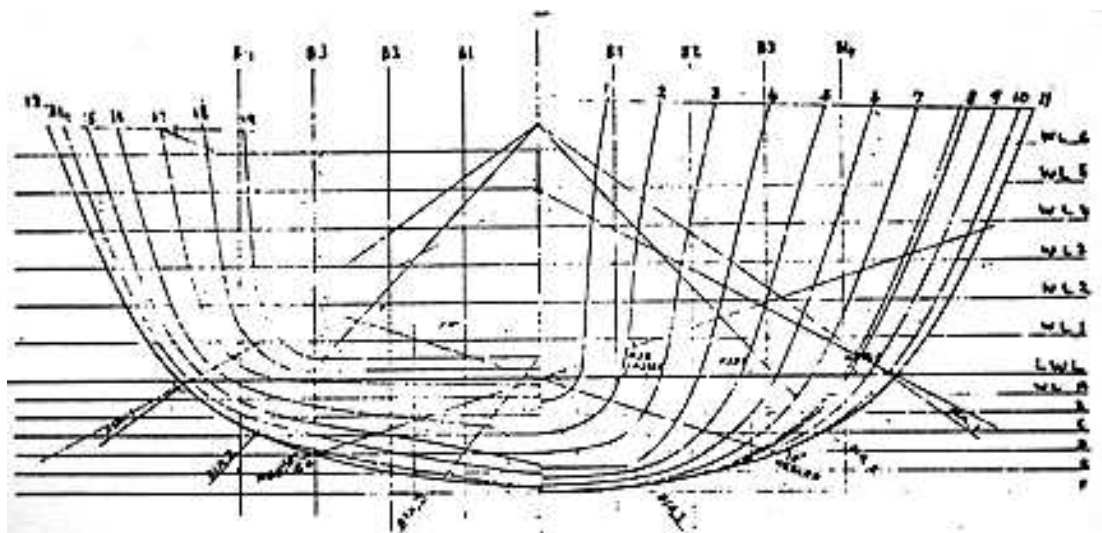
This damage was perfect calibre ammunition for those who abhorred the new wave yachts and special emphasis was made on “capsizing” when the light boats broached under spinnaker. At one stage the Lidgards on *Smir-Noff-Agen* set a spinnaker in 50 knots of wind – so it was not surprising that the boat wiped out. The Australian Farr *Wild Turkey* was alongside surfing at 18 knots under main and jib alone and when they saw the Lidgards set their spinnaker and immediately get flattened, expected to never see the sistership again – but *Smir-Noff-Agen* recovered and went on to win the race. Jim Lidgard said to *Sea Spray*, “If we lift the board too far when off the wind, we start to roll but no more than a conventional keelboat. We had a couple of broaches but that was crew fault.”

Young’s *Heatwave* had rig problems, “Just before the 350 mile start in a rising south easterly gale, we fractured a spreader. Greg Elliott went up the mast to make a quick repair but by the time we got going, the fleet was out of sight in driving rain. Then strands parted on the forestay but everyone wanted to carry on, so we did, risking the rig, slogging on our own to Canoe Rock – to see committee boat *Sirdar* heading for shelter. We headed out to Channel Island knowing we were well back and after rounding near dusk, we set the spinnaker. The log reached 22 knots with the boat lit up like daylight from phosphorescence as we charged through the night. At daybreak we had caught the fleet and were very close to the leader. Seeing us overtaking them and into fourth place forced them to also set spinnakers. Everyone was pushing hard and it was a wild ride. We had a few broaches – but then later the wind fell away. *Heatwave* was not good in the light and I made our situation worse



Farr's *Jenny H* and Whiting's *Smackwater Jack* at Cape Colville.

Jenny Farrell



Young's Heatwave



Young's Heatwave

Jenny Farrell

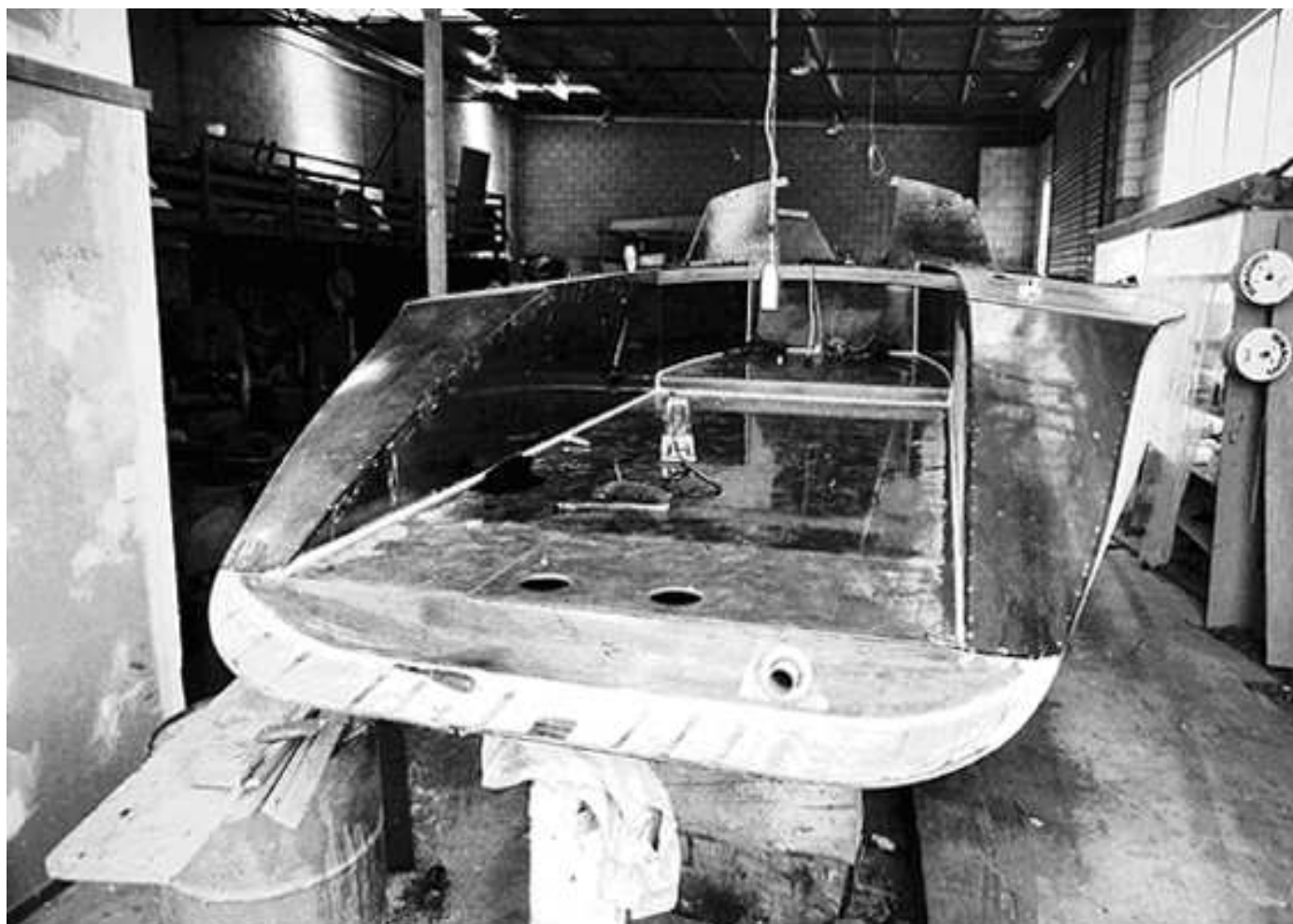
by going the wrong side of the course – and so we ended up a poor fifth. But I was happy, we had shown that *Heatwave* was the fastest of them all in a blow.”

The intellectual and controversial UK yachting journalist Jack Knights reported in *Yachts & Yachting*, “The reaction begins. Much was made of the light daggerboard designs broaching during the One Ton Cup, the called it capsizing and emphasis was made of boats heading for shelter, pumping and bailing as they went. Farr admitted he had made a mistake, going over the line regarding the amount of reinforcing required for the ring frames, an admission that was pleasurable to the old guard. The Australian delegate to the ORC asked for new race to be made to ensure adequate strength in future yachts. Soon afterwards the scantling rules were increased. Aside from *Heatwave*, which was glass, all the daggerboard boats were built in wood but after new rulings, few IOR boats were constructed of this material. Instead new boats were of more expensive high technology products the day of the affordable IOR yacht was gone.”

26. a class above

IN EARLY 1977 Davidson designed a Half Ton yacht *Waverider* that followed the theme established in Quarter Ton *Fun*. Farr, seeing his Half Ton *Cotton Blossom* outclassed by Whiting's *Newspaper Taxi*, drew *Gunboat Rangiriri* – but Whiting and Ross decided to vacate the Half Ton series, sold *Newspaper Taxi* to Australia (where the new crew sunk it) and concentrated on the larger *Smackwater Jack*.

Davidson's approach with *Waverider* was different to Farr and Whiting. Like *Fun*, all ballast was carried internally in lead bricks bolted to the floor like a chocolate bar but the major difference was his hull design which was narrower with less depth forward than the others. By having less beam Davidson believed his boats had less inclination to get out of balance during fresh sailing conditions and would not lift its stern or bury its bow when overpowered – which he felt was possible with the more asymmetric hull plan forms of Farr and



Davidson's dinghy-type stern on Half Ton *Waverider*

Tim Gurr

Whiting. *Waverider* looked small and narrow with low freeboard, shorter than *Gunboat Rangiriri* but had more sail. *Waverider*'s low hull made the coach roof appear prominent; it was there to satisfy the Rule's high headroom requirement but in spite of this, *Waverider* was a beautiful yacht and set an aesthetic standard and appearance that was to be emulated by a number of successful French designers. And like *Fun*, it was expertly built by John Rea in exceptionally light timber construction: two veneers that totaled 9mm over many stringers and frames. The stern was wide and low to provide power upwind and easy surfing downwind while topsides were slightly flared to get crew weight outboard. The deck was plywood on wooden beams and the rudder was fully retractable, like it was on *Fun*.

Gunboat Rangiriri was similar to One Ton *Red Lion* but proportionately was beamier, heavier and carried more sail to be competitive in the light winds of Sydney. Ron Holland's first daggerboard yacht, a tiger striped *Silver Shamrock 111* skippered by Harold Cudmore, was similar to his fixed keelers – which turned out to be a disadvantage. *Waverider*, skippered by Tony Bouzaid with Helmer Pedersen alongside, was fastest, especially across and downwind – but in a long distance race the leaders, the Farr *Swuzzlebubble* and *Waverider* fell into a hole; *Gunboat Rangiriri* (Peter Walker) won with a consistent 5,1,2,2,2 series.



Waverider and Gunboat Ragiriri 1977

below: original *Waverider* before 1978 hull changes

John Mallitte



27. lay over on its side

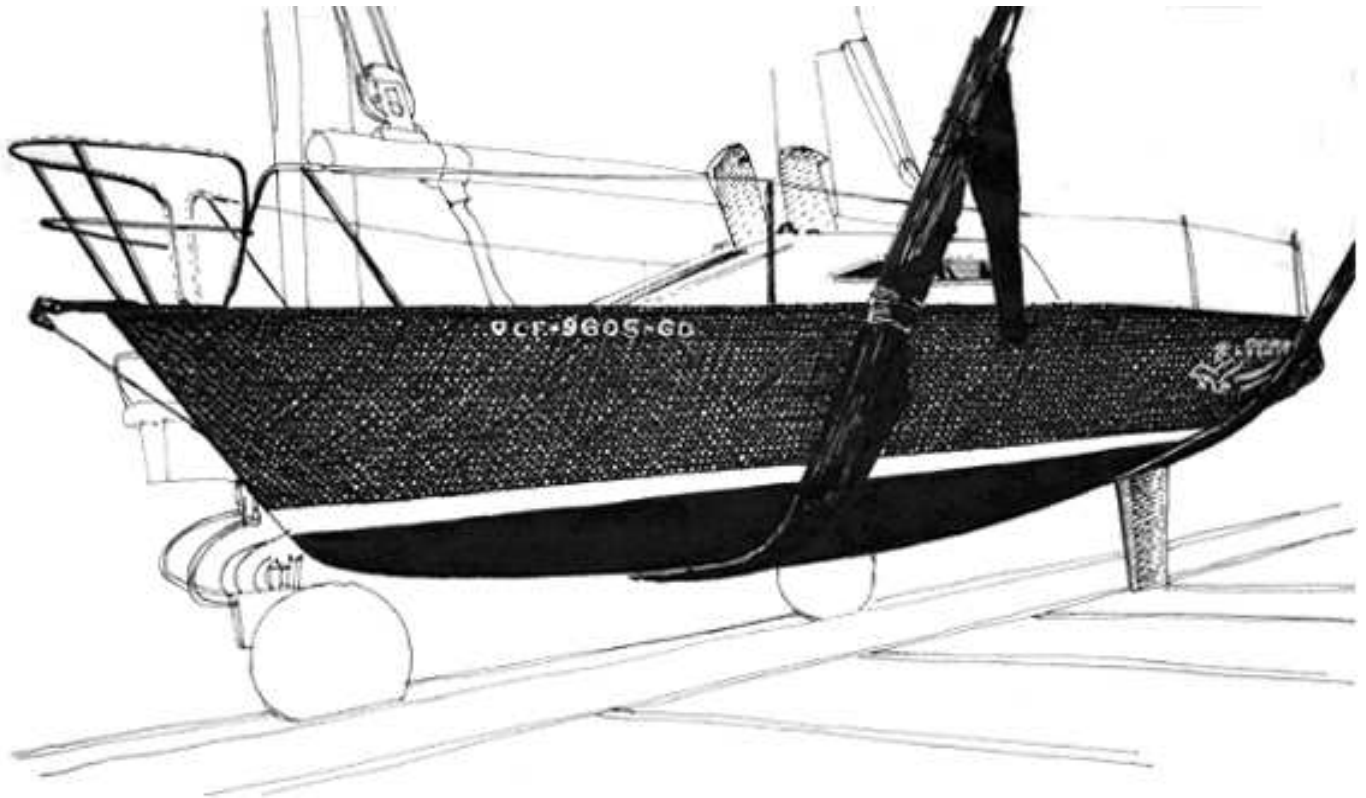
AFTER SYDNEY and new penalties *Waverider* was prepared for 1978 by Davidson deepening the amidships area and fairing it out fore and aft. Bouzaid and Pedersen set up a new rig and sail combination and honed *Waverider* before shipping to England. In a fleet of 50 yachts, 11 were centerboard designs but only three were considered in contention: *Waverider* and two French designs, *Anke* from Michel Joubert and *Jaunac* by Jean Berret. Two British fixed keel boats were also considered but once racing began *Waverider* was the fastest, upwind and down. While beating the main was sheeted down to leeward so the sail pumped. Although contrary to accepted sail trim, *Waverider* was exceptionally fast in this mode, sailing freer than masthead designs but moving faster through the water which created lift for the daggerboard. The wind never rose above 12 knots, a strength some European journalists thought would lay the New Zealand boat on its side but in response Davidson growled, "If there had been a decent blow, *Waverider* would have stamped even more her superiority over the fleet. Really the ORC has over-reacted to the results of the 1977-78 Southern Hemisphere results where centerboard boats cleaned up. But this was not the case at Poole where racing from a variety of designs was very close. There has been no conclusive evidence found that ultra-light will alter the trend of IOR racing – indeed at one stage the fixed keel Jones designed *Indulgence* looked certain to take the Half Ton Cup."

In spite of penalties being introduced to further slow the New Zealand lightweights, Davidson was in demand. The French were particularly impressed with *Waverider* and picked up on the design continuing their own development so that later French designs gained a stranglehold on Cup Championships. US dinghy sailor John McClaurin wanted a flat hulled New Zealand daggerboard yacht and asked Davidson for a Three Quarter



Davidson and Tony Bouzaid after winning Half Ton Cup, Poole – opposite: Davidson's purple *Pendragon*

Ton version. The reply was *Pendragon* which naturally was a development of *Waverider*, again built lightly in wood by Tim Gurr and when it was finished in Auckland, shipped to the States. *Pendragon* won the Three Quarter Ton Cup held in the light airs of British Columbia, beating special designs from Chance, Holland and others in conditions the light boat was not expected to excel. Again the IOR was angered and unimpressed and the next list of penalties increased *Pendragon's* rating by a full two feet - so much for Davidson's attempt at diplomatic reality after winning the Half Ton Cup.

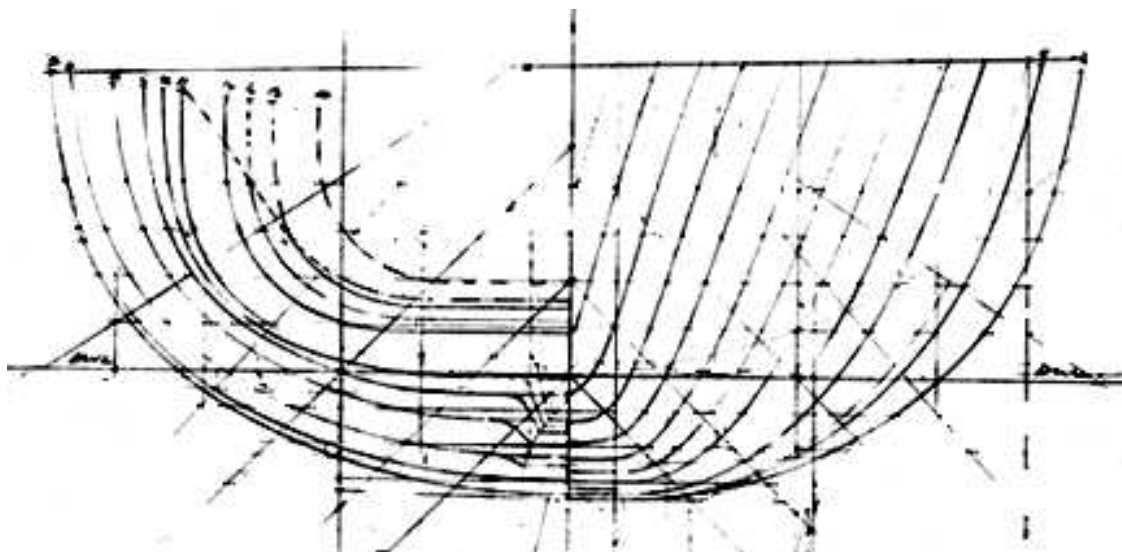


28. the last hurrah

BUT IT WAS NOT all over. Davidson was determined that his champion Three Quarter Tonner *Pendragon* could still excel, be made to rate, still be competitive and not become an obsolete design the IOR hoped the new penalties would achieve. Davidson gave much thought to audaciously turning the formerly full size 34 foot Three Quarter Ton *Pendragon* into a small One Ton *Pendragon* – which would normally be a metre longer. He made this step up by putting on a taller mast, increasing mainsail area and adding a bow sprit to handle larger headsails. More ballast was loaded inside and the daggerboard size was increased.

Purple *Pendragon* became a small, light, One Tonner with a large amount of sail yet still retained its lifting foil; the only board boat at Newport for the 1979 One Ton Cup series. Ron Holland's latest three quarter rigged *Indulgence* arrived from the UK with a crack crew and an upwind reputation; pundits expected this yacht to take the Championship in the 12 boat fleet. But compared to *Pendragon*, *Indulgence* was slow off wind, a point of sail the Davidson design could not be touched and yet upwind *Pendragon* was still fast enough to stay with the longer, heavier yacht designs. Defending Champion *Tilsaig's* German crew were unhappy with the light winds of the area and even more annoyed that the New Zealand designs had not been banished from IOR competition. After prize giving, where *Pendragon* came out an easy, but unpopular winner, the crew returned to find a boot hole through the light plywood deck.

"To make *Pendragon* go up a class," explained Davidson, "I went out onto a limb but it paid off. It was a unique situation but in hindsight, the boat could have performed even better if the daggerboard had been a thicker section. Although it was deep and of high aspect ratio, the thinness of the foil reduced *Pendragon's*



Pendragon's fore and aft lines – opposite: Fauroux's Bullit surfing

windward performance. But it did not matter for the board era was finished and there would be no more lifting foil development under IOR.”

McClaurin sold *Pendragon* to Zeke Dooghy who towed the dinghy/yacht across the USA to Newport – where the Americas Cup was being challenged. Mid-West police thought the strange purple yacht on a trailer was illegal traffic because Dooghy had no permit but he exonerated himself by saying he was “representing the United States and going to Newport to beat the Australians.” Nearby a couple of onlookers, peering up at *Pendragon* remarked, “It’s definitely not a boat; there’s a hole going right through the middle of it.”

After that success Davidson went back to thinking about his Champion Half Ton *Waverider*. The only way he could make it rate for the Half Ton Cup was to increase displacement, add lead to the hull mid section, fair it back and pin the board down. Farr’s *Swuzzlebubble* was brought up to rate by replacing the board with a keel and also adding displacement amidships. Now that they were heavier, the two antipodean designs were not so responsive nor as fast as before – but were still light in comparison to the fleet in Holland that year. *Waverider* still won, had done it two years running and *Pendragon* had taken the Three Quarter Ton Cup and then the One Ton Cup during the same period. But it was the last hurrah for the New Zealand school for con tenuous penalizing had eventually affected their superiority. It was the end of an era and the beginning of a period when French designs would dominate IOR racing – until Farr came back in the mid 1980’s with competitive moderate displacement designs.

29. after work racers

AUCKLAND HELD the 1980 Quarter Ton Cup but the champion, somewhat unexpectedly was not a local design but a French yacht *Bullit*, designed by Jacques Fauroux. This was the second version of *Bullitt* for the first one had won the Cup the preceding year. Fauroux’s 1980 design not only beat the Farr, Davidson and Whiting designs, but trounced them on their own territory. Farr was especially disgruntled suspecting the French boat of Rule cheating. *Bullit* was very long overall, full bowed, narrow on the waterline, yet fuller than the kiwi boats under the mast, dish shaped in cross section and very wide on deck – Farr could not see how the bow would lift when sailing, yet still measure bow down to rate. In the mostly very fresh conditions of the competition, *Bullit*



just planed away, embarrassing the fleet during downwind legs. Fauroux had designed the second boat for 1980 racing but knew that the next year such a boat would be penalized out of fleet.

After that defeat New Zealand interest in IOR rapidly waned. Local sailors turned their backs on the IOR and concentrated their attention to the new Auckland movement in yacht design: fast, proportionately inexpensive (compared to IOR designs) non-Rule yachts designed gleefully along speed producing parameters that previously had been discouraged under IOR with penalties which verged upon banishment.

The changeover began in 1979 but earlier designs along unrestricted lines had occurred when Farr designed the 11.6 (Farr 38) plus various Birdsall and Hal Wagstaff examples. In 1977 *High Spirits* appeared, a collaboration between Richard Endean and Wellington part-time designer Wagsaff. Endean wanted an uncompromising fast sailer for Auckland conditions, in fact he wanted the fastest 28 foot monohull in New Zealand and having been impressed with Wagstaff's wide beamed, flared hull Harmonic 24, wanted the designer to continue this small boat theme on the new boat with a narrow waterline that rose to a wide beam on deck, where human ballast could be used for sail carrying power. Endean asked for more flare like that of a 505 dinghy and sent Wagstaff some rough drawings of what he had in mind. Eventually Wagstaff completed the *High Spirits* drawings basing it on a winning Leander R Class dinghy he had designed after the Second World War. Endean considered the boat, "Wagstaff's best ever with its sweet waterline sections and its arrival was the turning point in local acceptance of purely fast yachts and the beginning of rejection of IOR." Wagstaff however, considers *High Spirits* one of his lesser designs compared to his other work. But the *High Spirits* approach was picked up by Young, Ross and Elliott – although Elliott was dismissive of the yacht listing: the times his later *Outsider* had beaten *High Spirits*. But Young especially praised the boat and freely admitted that it had influenced him when he designed the Young 88.

Noel Angus, who commissioned Farr to draw *Prospect of Ponsonby*, had been impressed by Birdsall yacht design and he asked for a racer/cruiser that could be taken offshore. Birdsall drew him 39 foot *Ponsonby Express* which was launched in 1979. This long, narrow lightweight immediately dominated class by taking 20 wins out of 25 races. But *Ponsonby Express* disappeared while cruising around Fiji after an Auckland/Suva race with no



Wagstaff 's *High Spirits* - opposite: Ross 780 *Freeway*

trace of crew or wreckage found - conjecture was that leaking gas had caused an explosion but no-one had any proof of that occurrence.

In Christchurch a team that included boat builder Ian Franklin asked Davidson to produce a to-the-limit trailer sailer and Davidson responded with an attractive 7.8 metre daggerboard yacht named *Stormrider*. This highly developed dinghy/yacht owed a lot to early New Zealand trailer sailer designs, the first of which was a multi chine 1958 design from Jack Brooke; this concept was picked up by Dick Hartley, an unashamed copyist always alert for new ideas and he drew his successful line of 16 to 20 foot Hartleys. Later Young and Given developed the first water ballasted trailer sailer types – designs that were aimed at family sailing and not racers (although Greg Elliott owned a 1978 Young 5.7 metre boat named *Gimmick* that had extra crew and no water ballast) but Davidson's *Stormrider* was different and had the appearance of a scaled down *Pendragon* but without the IOR bumps, hooks or distortions. Franklin built *Stormrider* lightly in wood of two cold moulded skins. The boat weighed 1050 kgs, 50 kgs over the 7.8 metre class minimum weight and in Lyttleton *Stormrider* quickly

gained a fast reputation. Davidson had started something with a flat out trailer sailer. Another designer who was early into seeing that there was an opening in performance versions of trailer sailers was Harold Evans who produced the winning 780 *Express*, a chined plywood boat that was really a single purpose racer, and a design that was quickly condemned as unfair and unsporting by the normal trailer sailer fleet.

After the One Ton Cup in 1977 Ross broke partnership with Whiting (the following year Whiting was lost with three crew in *Smackwater Jack* in the Tasman Sea) and turned to designing on his own. The recent movement towards fast trailer sailer boats appealed to him so he drew his own 780 naming it *Freeway* – and like Davidson's *Stormrider*, *Freeway* was drawn to the limit of the trailer sailer measurements: the bow and stern was

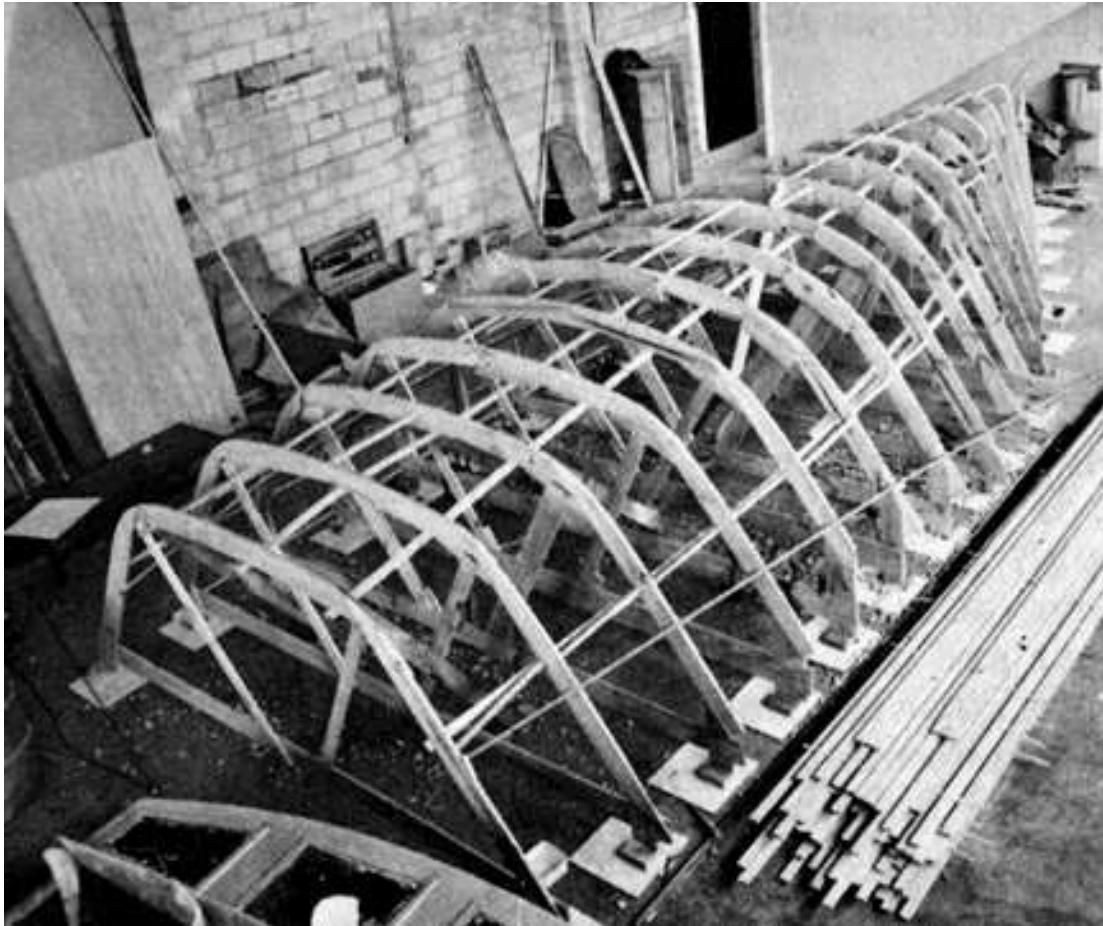




Davidson's 780 *Stormrider* on Lyttleton Harbour

plumb to gain maximum waterline length, the boat's weight was to the lightest displacement of 1000 kgs and sail area went to the edge of the allowed limit. If Evans' 780 *Express* was thought of as overkill then Ross's was like the Mafia had moved in.

Davidson and Ross then moved up a size with Ross drawing a 930 version and Davidson a 10 metre design he called the Wednesday Night Racer; this boat was commissioned by Frank Stephenson for short handed sailing and was named *Fantail*. The hull cross section was U to semi circular shape, was narrow amidships and had a deep keel for stability - and the design was the first of a long line of increasingly longer, and successful yachts that Davidson was to draw in the next few years. He also took the semi-circular hull sections to his famous (but heavy displacement) America Cup design *Black Magic*. The Ross 780/930 types oriented not to thin, deep keeled, light displacement yachts but to light dinghy types - but they too were semi circular at the amidships hull cross section that changed to flattened U shapes at the stern - visually you thought of the Wednesday Night

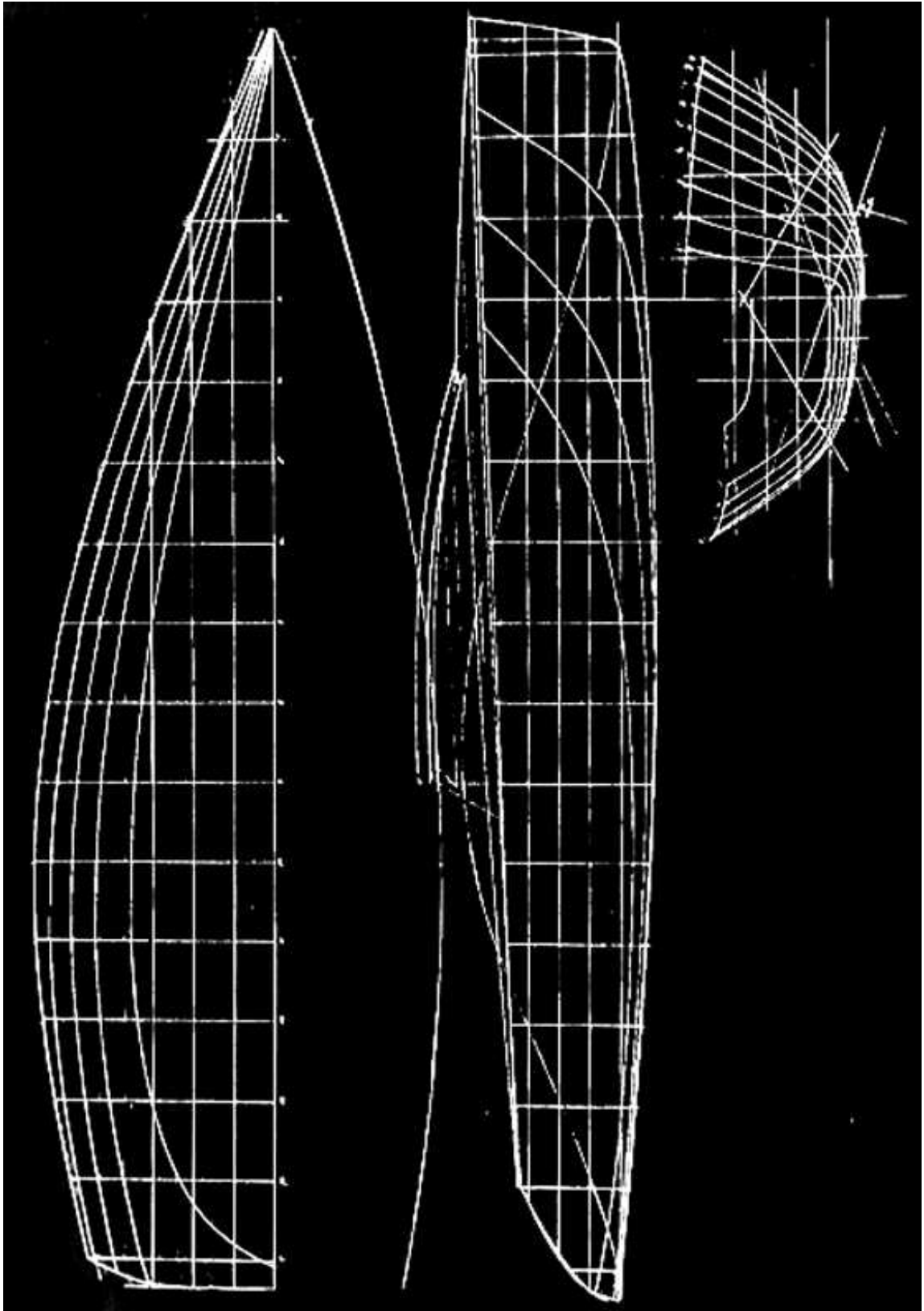


Young's radical Rocket 31 ready for strip planking at Cookson Boats

Racer as a keeler and the 930 as a dinghy because the first 930 example had a daggerboard, had internal ballast around the board case and relied on crew sitting on the hull weather rail to provide extra righting moment.

Simultaneously Young drew a very radical design called the Rocket 31, an ultra -light big dinghy with a narrow waterline and highly flared sides so that the yacht in cross section looked like a skimming dish. Young explained his reasons for going to an extreme type of monohull design, "All racing boats are faster with the crew sitting on the rail. If you have a large deck beam with flared hull sides and the crew lined up to windward along the outmost edge, that provides a powerful lever for stability - plus the flared hull sides to leeward leaning on the water surface also provide more stability. Matched with enough ballast for self righting, this makes a fast and exhilarating boat to sail. If you save weight in hull construction using the lightest modern materials, you increase the stability relative-to-weight of a normally built yacht while simultaneously reducing resistance. Then you can increase sail area to match and end up with an even faster boat."

Consequently the Rocket 31 carried a large footed, high roach mainsail with full battens, the mast was stepped well forward to accommodate the big main while correspondingly, because of the near catboat sail configuration, the headsail was small. A deep draft lifting keel was drawn with weight carried low in a foil shaped plate. This allowed a reduction in lead compared to conventional keel design, yet righting moment stayed the same. The first Rocket 31 was built in strip planked kahikatea, one of the earliest, if not the first to use this construction method in New Zealand. This type of building was introduced by West System's Arnie Duckworth, a live-wire US immigrant always searching for innovative boat building techniques. The first Rocket,



Young's original Rocket 31 lines

Positive Touch had speed to spare over any class yacht plus larger yachts as well. Again Young's audacity created antagonism similar to what had occurred during the IOR centerboard era. Aircraft carrier-like overall beam seemed excessive, even to some who crewed on IOR lightweights and the high roach, fully battened main was too multihull-like, *Positive Touch* became "the boat they love to hate." Young shrugged it off, he was used to people being suspicious of something new. Later he summed up the time, "New Zealand is an isolated and small community and the Rocket 31 made only a slight impression here – and consequently no impact on the rest of the yachting world – that is until I designed a Mark 2 Rocket version for a New Zealander living in the UK. This model was exactly the same except the topsides were slightly more rounded and instead of being a wooden core hull, was built in lightweight foams and high technology laminates along with titanium fittings on deck."

This special lightweight, *Camp Freddie*, made a big impact in the UK, winning every regatta and was line



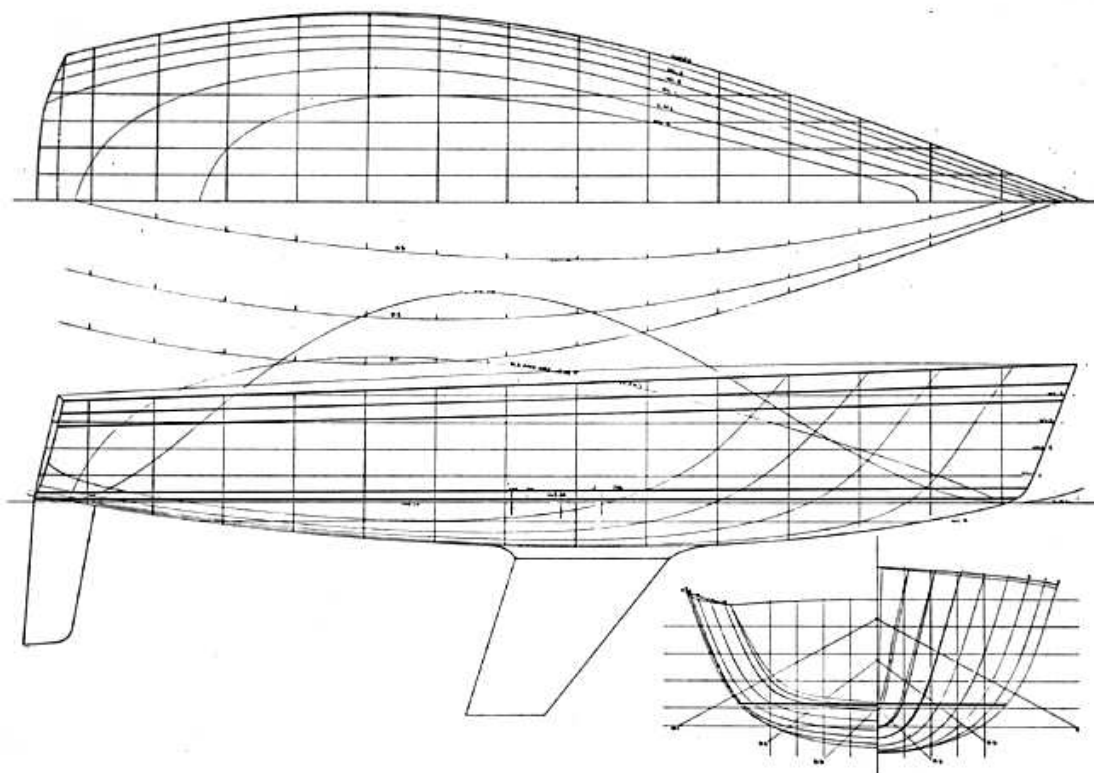
Young's Rocket 31 design *Positive Touch*

Shane Kelly

and handicap winner at 1995 Cowes Division 1. Also this New Zealand design was the first to produce an awareness in the UK of this type of boat and soon afterwards *Seahorse* magazine ran a competition for a similar class: the Whitbread 30. At the same time worldwide there was much interest in "sport boats" and since then the J30, Melges 24, Farr's Beneteau 25 and Mumm 30, Finot/Conq's Open 750 and many others have appeared. But Young did it first. Later he designed a third version, a slightly shorter 30 foot/9.30 metre Rocket with even greater beam and flare especially for the Auckland/Russell Coastal Classic Race – the resulting and aptly named *Extreme* has won its division on five consecutive times.

Returning to the 1980's, Davidson's *Fantail* sailed to the top of the fleet by a sharp crew headed by ex-18 foot skipper John Lasher, never caught on in Auckland either. Popular designs were production yachts: Ross 930, Young 88 and Farr's Noelex 30 – large numbers of these designs were built and quickly sold but Rocket 31 and Wednesday Night Racer were not production boats, they being sold only as plans – and did not find a receptive public. Most sailors did not want to be bothered with boat building anymore; the economy was buoyant and they preferred to pay money for an immediate yacht package that produced high performance.

below and opposite top: Young 88's



The Ross 930 was at first a daggerboard boat and fast with the designer steering, but was later changed to a fixed keel design because the original was criticized for being flighty and tender in fresh winds when crewed by less skillful sailors. Ross gave his impressions of the two types, "I'm generally pleased with the 930's performance across and downwind but the board version has to be carefully sailed on the wind in a strong breeze. I've sailed both versions and the keelboat is certainly different and better to windward. The Young 88's give us a lot of flak but on time have only beaten us once. We've beaten Davidson's Wednesday Night Racer *Fantail* at times but the Young 88 is quicker upwind to 10 knots with their light genoa and us with our small self tacker, apart from that though, we do okay. All types have their day and all are quick downwind."

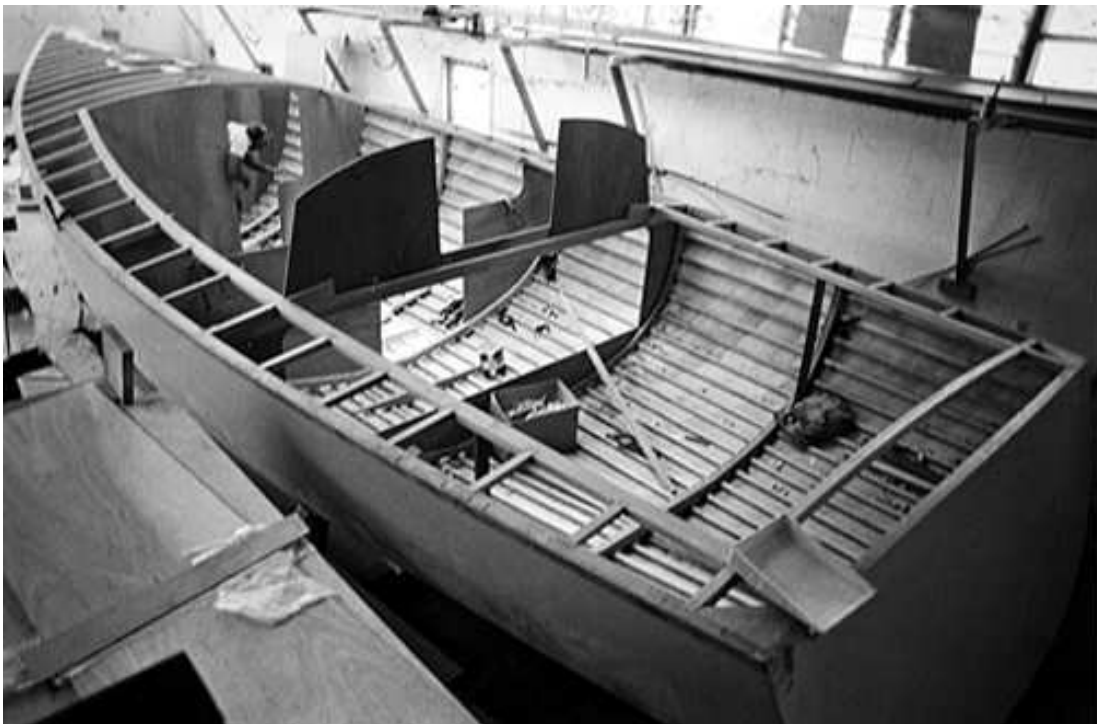
The Ross 40 was drawn in 1981 (before the R930) and was built in strip plank cedar by Ewen Guy and then glassed both sides in epoxy. This first boat *Urban Cowboy* was launched and promptly gathered many first to finish honours as well as setting new records for owner Bruce Robinson – who was a past member of the crew on *Magic Bus* and *Smackwater Jack* and as a result of this spectacular showing, with many sailors talking about the *Urban Cowboy*, this prompted Gulf Racing Yachts to start production (in foam core/glass instead of cedar/glass) of the design.

All Ross designs: 780, 930, 40 and later the 830 and 630, were very light displacement and of a similar theme in hull shapes, fast reaching and running yachts, points of sail Ross felt most Hauraki Gulf racing entailed. His designs were composed of long, fine entries going to rounded mid-sections that then flattened to wide U shaped transoms, shapes that would plane offwind – and by the 1980's a typical light displacement New Zealand formula. To windward he was satisfied with a good average performance – but *Urban Cowboy* gave a bonus by proving excellent on that point of sail as well.



Ross 930 *Je Suis un Rockstar*

Shane Kelly



Ross established a reputation for high performance monohulls but some churlish critics grumbled that he had gained this recognition, but had not recognized, the earlier contributions made by Paul Whiting when the two had been in partnership - then Whiting did the design, Ross the rig and helming; it was a very successful combination not only for winning but also because Whiting, a quiet but confident person in his radical, light displacement conviction, became media exposed and recognized because of the skillful and extroverted Ross.

Ray Beale as a boy was very impressed with Des Townson designs: "He was my mentor - I loved the Mistral dinghy and thought *Serene* beautiful." Even while in the sixth form, Beale built a Pied Piper named *Cheetah* but altered the (somewhat clumsy) original keel shape to suit his own strong ideas. The improved appendage and Beale's skill resulted in *Cheetah* being undefeated for two years - which impressed the class so much that the Beale keel was adopted by the fleet. Then he built a Townson Starlight and finding it strange and heavy after *Cheetah*, audaciously altered the keel, rudder and rig on that as well. This time the more conservative Starlight class found his improvements unacceptable and his boat was banned. "Later I did similar things to a Townson 28 - with similar reactions - before finally deciding I'd better quit fiddling with other designers' boats and do my own."

His first yacht was in 1977, a 35 foot keel yacht, and two, *Katenga* and *Assassin*, were built from this plan in thin, moulded wood. These yachts were light to moderate displacement and since Beale admired Townson and Stewart, they had balanced hulls with even volumes fore and aft. Beale explained his approach to design, "Really today I'm doing versions of Stewart's hull with a big, three quarter rig with the main set well forward. Stewart was a genius even if he put a bad rudder on the first 34. Young is another genius, he's done it all - when I was a boy I used to slosh through the mud at Needles eye just to watch him work, a real pleasure. Even today, if you put a big rig on his NZ37, or a Stewart 34, you would have a very quick boat."

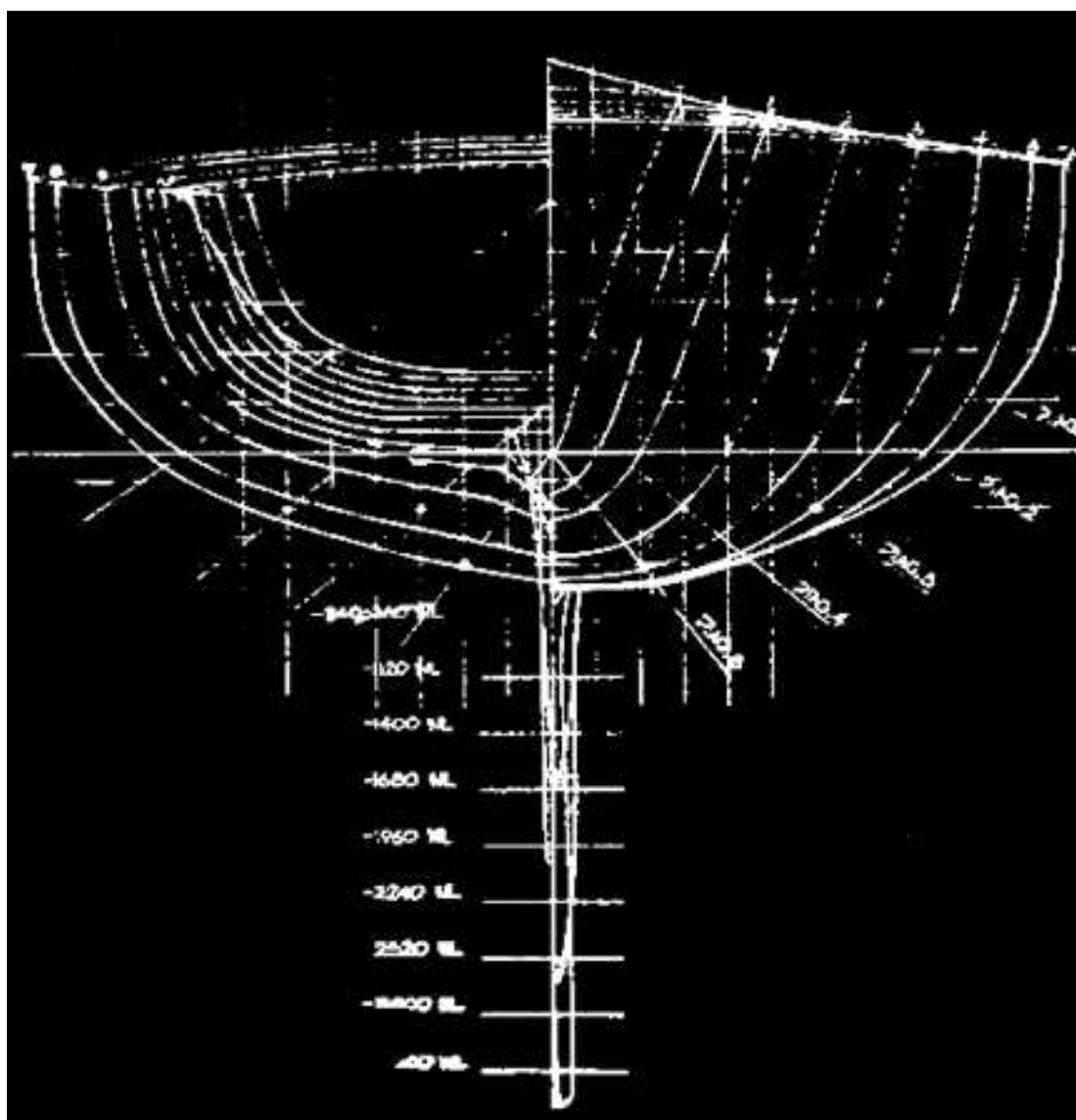
opposite top: Ross 40 Satellite Spy - left and below: Ray Beale's designed and self built *Relentless*



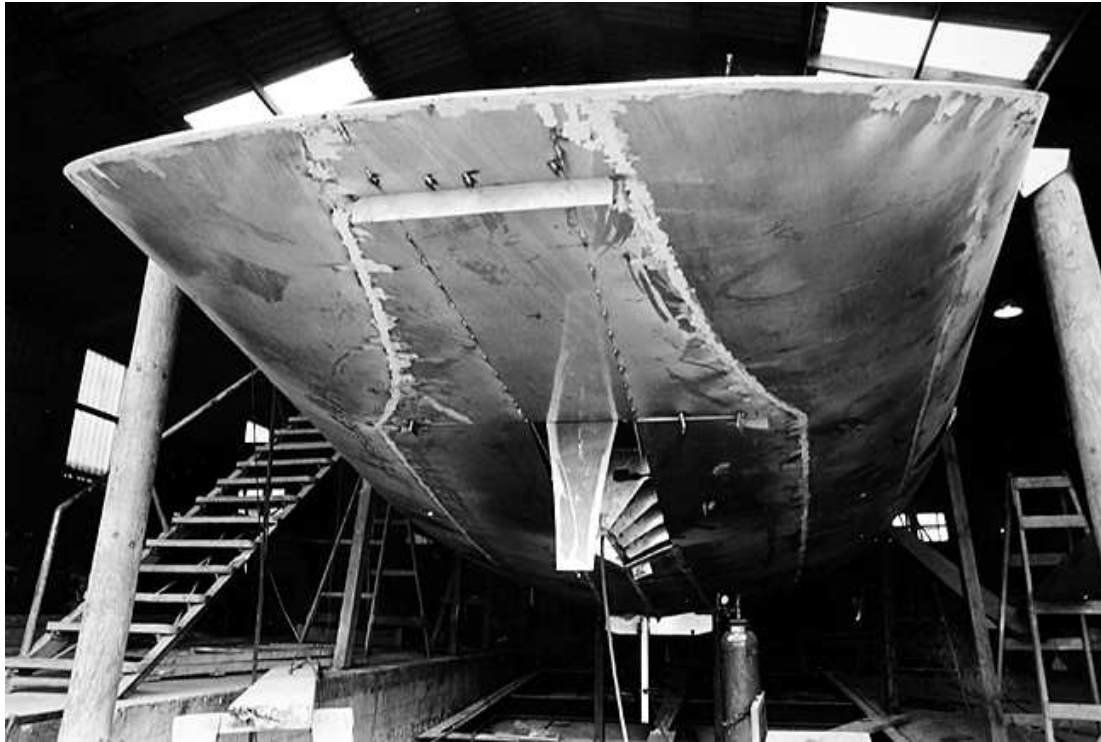
30. more than a yacht

FARR'S WHITBREAD RACER, the patriotically named *Ceramco New Zealand* was financed by Tom Clark's pottery company – the main purpose was to design a yacht aimed at taking line honours in the Southern Ocean legs. Farr explained in *Sea Spray*, "Line and handicap honours are obviously contradictory when racing under IOR as virtually all characteristics introduced to lower rating, also reduce performance. *Ceramco New Zealand* is a boat designed first of all for speed but at the same time, speed without receiving rating penalties." He and Peter Blake decided the largest light displacement boat capable of being handled by a small crew was 68 feet (20.4 metres). To reduce penalties Farr extended beam and depth measurement points then drew a sharply sloping transom. The result was something more than a yacht, a beautifully shaped, elongated big dinghy, proportionately the narrowest of any of Farr's designs.

Originally the big yacht was to be built in wood but McMullen and Wing argued for alloy construction and gave a competitive price. Blake was against the material having endured miserable experiences aboard an



Farr's Whitbread line honours racer Ceramco New Zealand



Farr's Ceramco New Zealand at McMullen and Wing – below: surfing into the Waytemata





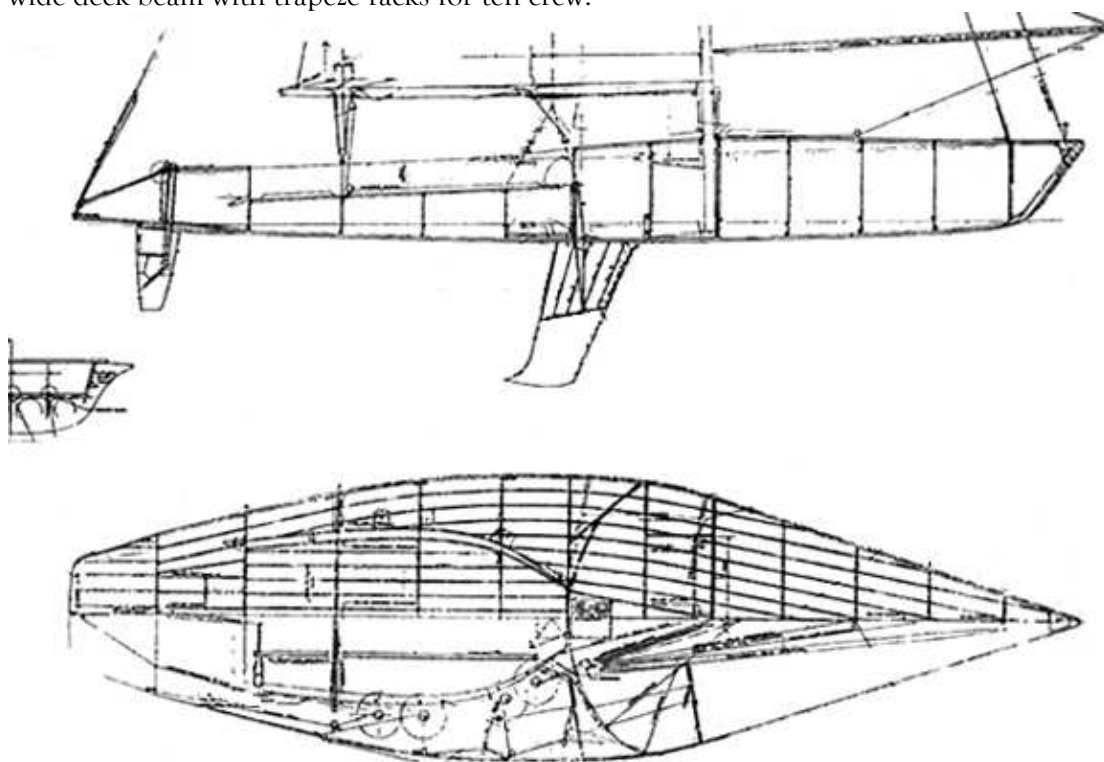
English alloy yacht but later changed his mind. Farr knew about the material from his alloy Disque d'or 111 and wasn't opposed to it but thought expense would be too great. His great experience and expertise was in wood and he wanted the yacht to be built in a wooden manner: wide spaced, big frames with close stringers. But McMullen and Wing convinced both Farr and Blake that their proven many transverse frame method was correct, they having built as number of alloy yachts in this manner: *Escapade*, *Wai-Anwa*, *Inca*, *Corinthian*, *Vago*, *Anticipation* and most recently the Davidson designed *Shockwave*. Farr admitted that building in wooden style in alloy would have been difficult especially welding near closely spaced stringers – McMullen was adamant that it would have been a nightmare. In the end Farr was pleased with the quality and final weight of the then, latest material, Marinel framed, 5083 plated yacht.

The Farr 68's *raison d'être* was for fast reaching and running in Southern Ocean storms, meant to surf hard in huge swells. Blake (who at that time was in a light displacement mode) said in *Sea Spray*, "We didn't want a boat that was totally rating oriented because they tend to get mean tempered when conditions get severe. That's when we've got to get going." *Ceramco* did that twice registering 316 mile and numbers of 280 – 300 mile daily runs – although the German Frers designed maxi *Flyer* beat *Ceramco* on elapsed time on Southern Ocean legs, setting a record 327 miles in 24 hours. *Ceramco* took the Roaring Forties Trophy (a handicap prize) on these legs, often leading the larger and heavier Frers 76 on the water in hard conditions but it was the dropping of the rig during the first leg that kept the Farr design out of the final placings. In the end the maxi proved faster so the decision to keep the Farr design a light displacement smaller maxi driven by fewer crew, was wrong – although it was a near miss – and in reality no miss at all because *Ceramco New Zealand's* light displacement

approach was a forerunner to what was to occur later with the 65 foot Whitbread/Volvo 60's and the even later Volvo 70's.

31. light extremists

LONG, NARROW WATERLINE lake racers from Farr had much in common with *Ceramco New Zealand*. The first of these Centomiglia Lake Garda boats: 13.5 metre (44 foot) *Grifo* and *Farmeticante* were designed soon after the Farr 68 and although proportionately much lighter displacement, looked like a fined down *Ceramco*, bearing similarities in hull and rig. The radical difference was their narrow waterlines which flared quickly to wide deck beam with trapeze racks for ten crew.



Farr's wood constructed Centomiglia Lake Garda design

Ultra-light displacement yachts developed first in Auckland with Spencer and then at Santa Cruz USA with Bill Lee and George Olsen. These yachts, designers and crews were not concerned with rating rules or conventional yacht design – speedometers read up to 20 knots and up to 100 ULDB's raced on Wednesday nights at Santa Cruz with no race committee, no corrected times, no protest rooms or finishing guns.

In Trans- Pacific races these boat types took top placings and set records – but Lee's unconventional 67 foot *Merlin* was both damned because it had “an unfair advantage downwind” and praised by the more liberal sailors. But the conservatives had the power and IOR penalties were introduced in 1981 to slow the ULDB's down; mainly by forcing the light designs to carry more weight in ballast aboard – or not sail at all. Maximum rating was set at 70 feet IOR which was the same as the heavy maxis, a figure which smaller *Merlin* and *Infidel/Ragtime* exceeded by a considerable margin. But *Merlin* complied for the 1981 Transpac and still won surfing at 24 knots and coming within 45



US West Coast ultra-light displacement boat, Bill Lee's *Merlin*

seconds of her 1977 record when she was in original displacement form - this confounded the legislators who thought they had tamed the light boats.

Farr, Davidson, Young and other New Zealanders were critical, not of USA's West Coast ULDB high downwind speed but on their poor windward performance – plus they didn't like their simplistic masthead rigs. In a decent wind while beating ULDB's heeled excessively and went sideways – this failing was unacceptable in New Zealand. The innovative French designer of light displacement boats, Guy Ribadeau-Dumas, who designed record breaking Open 60 *Credit Agricole* and small, lightweight maxi *Charles Jourdan* for the Whitbread Race, maintained US ultra-lights were too narrow to have enough power when not surfing.

Farr's lake boats *Grifo* and *Farmeticante* followed Californian philosophy but not being sea boats, were much lighter – the rigs were New Zealand big dinghy with high aspect ratio mainsails, bendy $\frac{3}{4}$ rigs with masthead genoas for light winds and spinnakers. To get down to weight Farr went to variable thickness three skin wooden construction laid over deep, narrow stringers and box frames. The skins were thicker on hull bottom but thinner in lightly loaded sections but in areas where strength was required, in mast and keel areas, box ring frames and girders were placed. These two boats are probably the world's most highly developed examples of lightweight wooden construction. The complete craft displaced 1900 kgs. The following year Farr was commissioned to design an 11.5 metre yacht with wings like Farr's early 18 footers. This time Farr went to Kevlar and Nomex honeycomb core construction to produce (by US builder Mike Lindsay) the extremely light 1275 kgs OPNI (Object Planet Non-Identifie) for owner Alain Golaz. With this extreme yacht, Golaz took the Championship in 1983.

Farr's lake racers were capable of sailing faster than wind speed but to do this they had to be sailed flat and free upwind, then they attained 11 knots - while downwind in fresh conditions, with the spinnaker pole forward on the forestay, they reached speeds of 23 knots. Pushing for even more speed Golaz had his team remove the ballast on OPNI - now, with no lead aboard, the boat relied upon its wide deck beam and crew on the rail to keep the boat upright, changing OPNI into really a large version of a Napier Patiki or One Rater.

32. greatest influence

BY THE END of the 1970's Davidson, Whiting, Young and especially Farr had between them the greatest influence on yacht design evolution. All international racing yacht designers were forced to comprehensively change from accepted moderately heavy displacement, canoe bodied, masthead rigged yachts to dinghy-oriented designs with reduced displacement and more powerful, dinghy-like sterns - even though the ORC tried to halt this movement. Rigs became dinghy-fractional with crews having to learn to rig, tune and sail in the antipodean manner, and sloping skeg rudders disappeared, replaced with high aspect ratio blades with steep leading edges. Deep deadrise and bustle also disappeared, replaced with shallow, light, beamy hulls with more form stability - and stern overhangs increased to gain more speed when the yacht heeled, just like in the old days; interiors were stripped out and ballast/displacement ratios rose, draft increased while internal ballast was carried to obtain a lower rating.

But in the early 1980's the ORC introduced a change to hit the Davidson style crease in the afterbody - a clever sidestep which produced a rating gain - and another for long overhanging transoms. Long sterns in the

[Young 35 Honeywell](#) - a development of the Y88



1970 decade first appeared in 1973 when UK designer Stephen Jones launched his Quarter Tonner *Odd Job* for yachting journalist Jack Knights to sail. In hard downwind conditions crew weight could be placed aft to keep the bow up – but in 1981 this had changed. French designers had taken over the New Zealand lightweight position and because the long, heeled waterline French designs meant more speed, they too had to be slowed.

With Rule changes Farr's then new and aptly named 11 metre *Freefall* design changed from fast reaching and downwind performance to an all round design: heavier, shorter, shallower in draft but with increased sail area. Farr had been forced to move from really light displacement by the Rule and with *Freefall*, he made a (grudging) peace with the IOR – as the IOR made with him. It was the beginning of a new era – and what followed was a long list of successful, moderate displacement Farr designs.

But the moderate designs (in both displacement and also philosophical sense) lacked the excitement, high speed surfing, crew passion, (and also fear) and revolutionary rapid development of the board era. The IOR had succeeded in producing a fleet of conservative boats that were good to windward and good in light airs, but which had no real speed downhill. However in New Zealand and in compensation, designers and sailors who were fed up with Rule restrictions re-channeled their energy into the hot, new area of high performance, non-Rule yachts. This was where they saw the future and they were right – and not long afterwards, the IOR disappeared from world yachting.

33. hothouse development

GREG ELLIOTT DREW impressions of his first boat *Outsider* when his brother Bruce asked Jim Young to design a 26 foot stub keeled centreboarder – but Young procrastinated – so Greg Elliott decided to try designing it himself. Later he showed his ideas to Young who was impressed but could see mistakes and like Bill Couldrey earlier, gave his advice to the young aspiring designer redrawing every second section to get the right volume. Elliott at that time was doing a five year boat building apprenticeship with Chas Bailey constructing, influential to Elliott, Birdsall and Stewart designs but he was soon putting in six hours on *Outsider* at Spam Farm after his normal days work. He repeated this process religiously for nine months until the yacht was finished.

On *Outsider* Elliott placed the mast well forward to make a very large high roach mainsail with a small headsail – like Whiting had done with *Newspaper Taxi*. After launching the brothers raced it locally beating much larger yachts, then cruised it round North Island – but after the circumnavigation Elliott decided the stub keel/centerboard was inadequate for the windward performance he desired so he replaced it with a deep, fixed bulb keel. This increased displacement changing a moderately light boat into something heavier at 1500 kgs displacement. With 680 kgs ballast in the bulb keel performance improved and in Elliott's skilled hands *Outsider* gained a reputation as a fast boat. But with this success Elliott suddenly disclaimed that he had any help or influence from Young and the older designer felt an injustice had occurred, he having revealed his hard won design philosophy and received in return no recognition. To make the situation worse *Outsider* was often mistaken for a Young design – and this was more embarrassment.

The New Zealand big dinghy school had evolved as a result or in spite of the IOR of the mid 1970's. Under IOR overdoing lightness increased rating and forced a reduction in length and sail area to be within the Rule – but in a non-IOR design light displacement penalties did not exist, therefore Young's 88 had a wide stern for upwind power and downwind speed, a Mama Cass-type fine entry with wall sides forward to produce good windward abilities, flared sides amidships and aft and a fairly large sail area carried on a fractional rig.

Production boatbuilder Roger Land was interested in the 88 and Elliott was employed to plank the plug. At the same time in spring 1980, the more extreme Rocket 31 was being constructed a few doors away at Terry Cookson's. Once the 88 plug was finished and moulds made, Elliott decided to build an 88 named Skitzo,



above and opposite: Elliott's 26 foot *Outsider*

Gray Hudson

but he cheekily built it without full glass specifications. This naturally produced a lighter hull and as a result, when racing the other 88's, Skitzo won everything – which in turn upset the correctly built 88 fleet.

Later Elliott designed his first 5.9, a potent little trailer yacht with a plumb bow, lifting bulb keel, big main, fractional rig – to many observers a small version of Young's Rocket 31 - and from 5.9 all his next designs resulted: *Party Pro*, *Peacemaker*, *Future Shock* and others.

For a period Elliott worked at Cooksons building Farr IOR boats – regularly he argued with Mick Cookson about the blind acceptance of IOR designs; he was also annoyed to be block sanding distorted IOR hull shapes which he felt were fundamentally wrong and was angered with the general reaction amongst the wealthy against the New Zealand type of non-IOR boat which he believed in. Later he talked Mick Cookson into building a female mould for his *Peacemaker* and put it into short production. But before this occurred he constructed his own 13.8 metre *Party Pro*, strongly built in cold moulded wood, designed for ocean racing with all his ideas on unrestricted high performance going into the design; the result was an unattractive creation with a reverse sheerline on deck, vertical bow, deep keel plate (called an Elliott jandal by detractors) and an overall humpbacked, pugnacious effect. Elliott himself called it “a bit of a mongrel” – an ambiguous comment that may have meant it had rugby league mongrel, meaning it was tough and uncompromising or perhaps that it was a mixture of a number of other designers ideas. He enjoyed the stir the yacht produced among the local experts and claimed he had caught Davidson lurking about the boat, when it was on the hard, walking around it with a tape measure. “An outright bloody lie,” said Davidson later, “I saw him on deck, went over to say hello and he arrogantly turned his back on me.”



Young was also critical and at the same time praising of Elliott, “*Party Pro* was a steal from my own designs, but this was hidden by the extreme reverse sheer and the clumsy look of the boat, one of the ugliest on the Waitemata – but it performed very well, was stiff to windward and powerful on a reach.”

Gray Hudson gave Elliott his first commission with Sea Biscuits and considered him a gifted, brilliant yacht designer/sailor and pointed out, “Elliott’s *Party Pro*, before it was lost on a Fijian reef, had been beaten by only one yacht in its life – and that was the Farr Whitbread maxi *Atlantic Privateer*, a yacht almost twice the size of *Party Pro*.”

When *Party Pro* grounded and was smashed by surf on Amoedeo Reef, it was Hudson who organized a replacement fund for the devastated Elliott who had poured his heart and soul into the building of his wooden ocean racer.

Compared to *Party Pro*, Elliott’s later designed keelboats *Midnight Oil*, *Peacemaker*, *Pig Hunter*, wing mast rigged *Excess* and *Sneaky Frog* were attractive designs that claimed top positions in Auckland fleets. But a number of Elliott yachts suffered keel losses, and *Gatecrasher* lost her appendage twice. The keels were high aspect ratio, deep draft, shoe and bulb designs attached to hulls by keel bolts through narrow flanges – and suffered from movement. Fortunately yachts remained upright after ballast disappeared – saved by wide dinghy shaped hulls, light rigs – and nursed to safety by crews who did not panic.

Young was very critical again, “No matter how much it has been hushed up, the bloody keels fell off. Traditionally keels used to be the strongest part of a yacht, now on some designs they are the weakest. Deep bulb keels are the key to high performance on a monohull, therefore it is the responsibility of the designer to provide



Elliott 5.9

Gray Hudson



Elliott's Party Pro

Gray Hudson

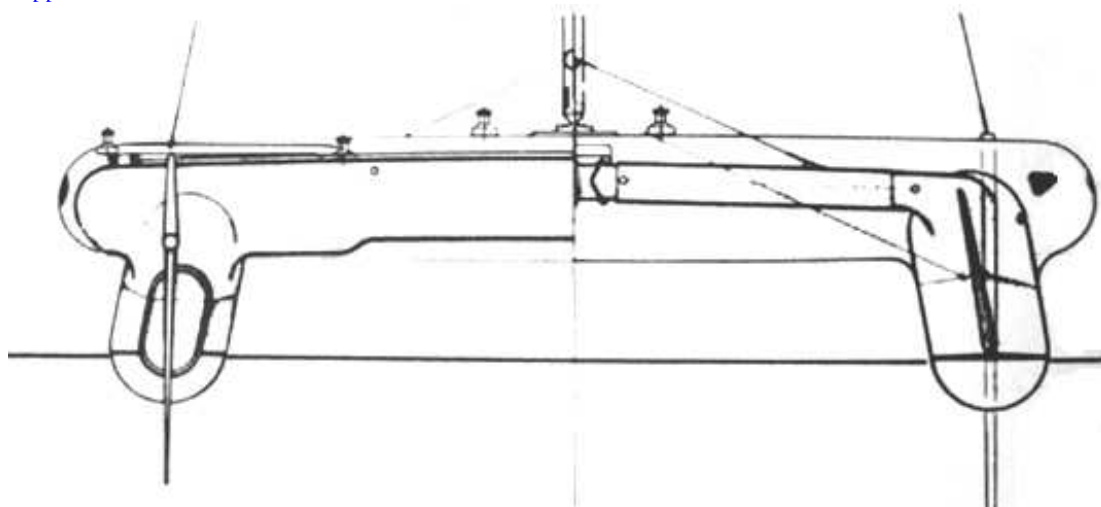
correct engineering – but some keel attachments are fizzing, electrolytic time bombs ready to go off.” Elliott – responded, “I’m doing my own thing working in the industry and I go by results, like five New Zealand sailing records. The critics can’t keep up so there is some bitterness. I admit there have been a few problems along the way but honest reasons for failures – like hitting the bottom in one case, being dragged across a bar – which is what happened to one of my yachts in Australia.”

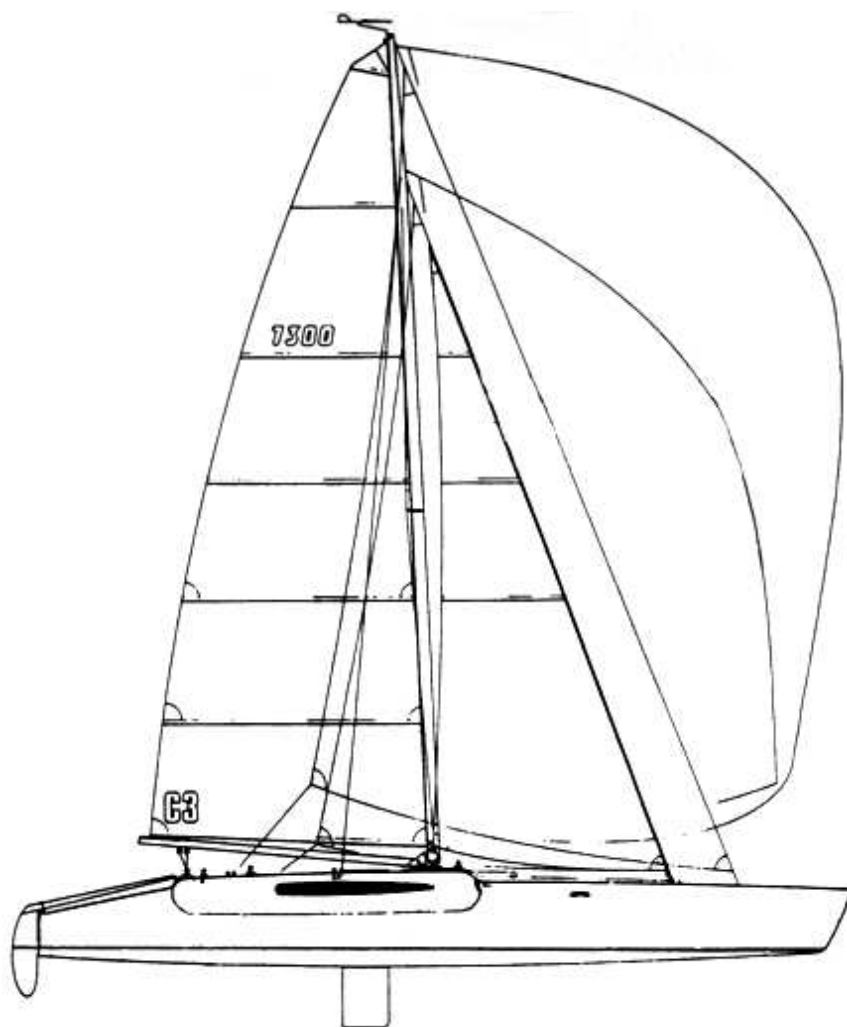
34. the best luxury

RON GIVEN WAS commissioned in 1983 by a group of three to design an uncompromising racing 12 metre catamaran capable of beating Dave Barker’s 17.4 metre catamaran *Sundreamer*. Barker had sold 12.8 metre *Sundancer* and had designed an outer worldly 18 metre catamaran named *Stratosphere* for a client. From the quarter length mould built and used on *Stratosphere* (ingeniously used for top, bottom and fore and aft sections – plus also using the hull mould for the accommodation pods) Barker made improvements, fining down and raking the bow sections and reducing the length of the sterns to make his 17.4 metre cat. *Stratosphere* tended to throw a continuous fine spray from the blunt bows (because the quarter mould produced the same bow shape as the sterns) and although Barker initially argued the merits of broad parabolic bow sections over sharp entries, later decided that his proposed *Sundreamer* would be wasting sail energy and therefore losing boat performance. On the new boat he laid up a high technology laminate that resulted, after many hours of shorthanded boat building, in a light 4.8 tonne displacement. And since it carried similar sail area to the larger, heavier *Stratosphere*, Barker’s new boat was exceptionally fast. He explained, “My criteria is always simplicity – which is an object worth pursuing so there is a lack of equipment and gear aboard my cats, which are strictly racers; they don’t have popup toasters for I find that sailing efficiency is the best luxury. *Stratosphere* can travel over a distance with a two knot advantage over *Sundancer* but with *Sundreamer*, I am aiming for a four knot increase.”

When Given’s 12 metre design *Split Enz* was launched, *Sundreamer* competed against her for the first time in a light weather Auckland/Te Kouma race with both finishing seconds apart – but in the fresh winded 1985 Coastal Classic (Auckland/Russell) *Split Enz*, against popular soothsaying, fulfilled the designer’s prophesy that an out and out racer with a high Bruce Number will beat lower power to weight ratio boats, no matter how long or large. I was on board *Sundreamer* to witness this:

“The wind swung to the north east and quickly increased in strength. We lifted the No. 2 and dropped the lightweight Mylar No. 1 before it was destroyed by the hardening gusts. *Sundreamer* quickly took in the wind below and opposite above: Barker’s 17.4 metre *Sundreamer*





power when the headsail was cranked in and accelerated like an express, moaning vibrating and throwing hard driven spray from the leeward bow while nearby, the rest of the huge fleet appeared to be sailing backwards. We were convinced that this hard wind would show up failings in *Split Enz* for the Given design had built a reputation of being astonishingly fast, but also fragile. *Sundreamer* was churning up huge twin wakes and Barker complained of very heavy weather helm – so we hoisted the windward daggerboard to allow the boat to pivot more on the leeward one. Usually he liked to reach with both boards halfway down so as to stop loading up the rudders but at 25 knots of boat speed he had to accept helm weight in preference to imploding the daggerboard – which had occurred the year before. *Sundreamer* felt at times to be going beyond full power, ploughing the over-pressed leeward hull through waves and exploding them into mist. Surely no other boat could travel this fast, but *Split Enz*, which had only been 100 metres ahead at the wind change, was now growing smaller – an almost unacceptable image to the crew of New Zealand’s purportedly fastest yacht but something we could do nothing about.”

Given’s *Split Enz* predated the French Formula 40 multihull class by nearly two years and although lighter and carrying less sail area: 1550 kgs and 88m² compared to F40 1800 kgs and 90m², came uncannily



Given's *Split Enz*

close to the F40 Rule. In Auckland some excitement was generated on joining the European F40 circuit while the enthusiastic Cook brothers from Christchurch were committed to constructing a F40 catamaran. Tennant was churlishly unimpressed by F40 designs, which were running hot in Europe at the time; he was more involved in publicizing his recently commissioned Bladerunner 43 design, a racing catamaran that was lighter, carried more sail, had full headroom in the hulls and was also cheaper - because it was built in strip planked cedar core and not high technology cores and laminates. This first Bladerunner was named *Ultraviolet* and was likened to a 43 foot day sailer with light, narrow hulls, deep, fine plumb bows which broadened elliptically to U shaped sterns. Decks were highly cambered and the transom hung vertical rudders exited through swallowtail stern scoops. The third Bladerunner *Afterburner* was stretched to 45 feet, sometimes beat *Split Enz* but after the 1993 Auckland/Tauranga Race *Afterburner's* owner Alister Russell decided to make some radical modifications; this entailed cutting the 45 foot hulls in half and adding sections to stretch the boat to 52 feet - visually this improved proportions and overall appearance of the yacht. Beam remained the same but alloy beam connections were double sleeved to withstand higher rig loads and increased torsional bending. Later beam was increased to 30 feet (9.30 metres). By utilizing carbon fibre in the new rotating mast and Kevlar in the giant mainsail, *Afterburner's* weight increased by only 300 kgs over original figures - therefore loads were not increased significantly. The new mast was a daunting 94 feet (28 metres) tall, raked sharply and carried enough sail to increase Bruce Number (square root of sail area divided by cube root of displacement, imperial measurement) from an already high 1.87 to a frightening 2.4 - or even 2.5 including 40 m² jib blade. This

headsail was to be dropped in any breeze for Tennant calculated new *Afterburner* would lift its weather hull in only 5 knots of wind. He also made a point of removing his name from the design. But the all carbon and expensively constructed spar collapsed during light wind trials. Ironically the crew of *Split Enz* acquired the earlier rig and promptly set a new Coastal Classic record in 1993. After that *Afterburner*'s replacement mast went down to a slightly more moderate 82 feet.

In 2000 Russell put the boat up for sale and US West Coast sailor Bill Gibbs arrived here to buy New Zealand's fastest yacht and ship it back to California. Since then he and his local amateur crew and the big cat have gained media attention through many wins at various race circuits including three consecutive line honours in the prestigious 128 mile Newport/Ensenada.

"Stretched *Afterburner* is a bit of a beast. She is neither nimble nor a sports car. I compare her to an 18 wheeler truck or a freight train. The boat goes straight at speed really well, even tacks okay. It is the sensation of power that is so intoxicating. She has more power than any other boat I've sailed, which raises a number of sailing issues to much higher levels of importance, starting with helm balance. With the sails' centre of effort (CE) being forward of the centre of resistance (CR) of hulls and foils, you get lee helm. With really big sails you get a lot of lee helm. CE aft of CR and you get weather helm. CE moves with sail trim, sail change or course change. On *Afterburner* CR moves aft with daggerboard depth increase. Over 15 knots wind and she becomes uncontrollable (very high tiller loads) without adjusting the daggerboards to balance the helm. The first time I rounded a weather mark in 18 knots true she almost threw me overboard from the shift of slight weather helm to strong lee helm. We adjust boards before course changes now. Of course as racers, a balanced helm is faster since using the rudders to steer straight is slow.

Afterburner changes from a Caterpillar to a butterfly when she lifts a hull. The hull rises, the helmsman's butt is 15 feet in the air, the ride smooths out, she heads up another 5 degrees, speeds up 2 knots and flies. Awesome! Her leeward hull has a few appendages at the waterline, bridles and wires etc, not especially clean; they all contribute to the spray/roostertail we kick 40 feet into the air at speed. Competitors have looked back to



Above: Tennant's original 45 foot *Afterburner*



above: Californian *Afterburner* - below: Bill Gibbs and crew aboard *Afterburner*



see us coming on at speed with comments like, "There's a ball of spray coming up fast." Luckily the weather hull stays nice and dry.

There are a few flaws with her current design. The mast rotation is limited to plus or minus 45 degrees, we could use more downwind. The mainsail is a bear to get up and down - I plan to switch to ball bearing cars. Likewise daggerboards are hard to lift and drop. She wracks a bit until the de-twisters are tightened. She has a lot of spaghetti holding the mast up. California winds are lighter than Auckland's - lots of 15 and under - we go years without reefing. We can handle up to 25 by depowering like a beach cat. I think *Afterburner* is happier here."

35. intense brief life

DIGBY TAYLOR was a New Zealand household name after his Whitbread Round the World efforts in the Davidson designed *Outward Bound* and Farr *NZI Enterprise*. *Outward Bound* was winner of the small boat division but *NZI Enterprise* lost its mast, forcing a retirement after the third leg. Ambiance aboard was not good and after that debacle Taylor withdrew from sailing and media attention to concentrate on his computer design business. As an academic exercise in late 1986 he tried his hand at computer yacht design. Few, if any, had entered this field in New Zealand at that time and Taylor eagerly showed his results of a 16 metre (52.5 feet), narrow, Melbourne/Osaka racing monohull to Davidson - who saw mistakes and suggested improvements. This resulted in immediate performance jumps in printout figures and the final design was computer drawn in two days in early December - with building beginning soon after.

"I would give up sailing rather than sail another Farr design; *NZI* cost us heaps - we went to get a professional approach, wanted detail which is worth having but ended up doing it ourselves - we got promises rather than performance But we'd done a deal price and I guess we got what we paid for. This time I went to Laurie with some sail area to displacement numbers and made a drawing with him; this I showed to people and potential sponsors but got not much reaction. I was very interested in computer yacht design, (which was radical and modern thinking then - but of course not now) bought Autoyacht software and although I still had no sponsor, took Laurie's numbers, put them on computer and weather analysis of the Melbourne/Osaka course and worked with Bill Webb on a velocity prediction program. We came up with a narrower beam and a different sail area; I found an enthusiastic sponsor and told Laurie that the design was partly his, partly mine but that I was not confident and lacked design experience, couldn't afford to pay him but could he help me with the design, you just give me instructions sort of thing. I didn't know proportions but he had his own numbers of course; he fiddled the lines to fit his numbers (it was better to do this than rely on velocity predictions) and he was always right - he was better than the computer. Anyone who asked me questions after that, I referred them to Laurie. The final boat was totally different to Davidson's *Jumpin' Jack Flash* but station 3 was similar. The result was an unreal yacht which had spare performance."

However it was a last minute effort to make the Melbourne/Osaka start on March 21. Many observers felt Taylor was courting fate. Even so the hull, foils and rig were finished in less than ten weeks and the yacht, named *Castaway Fiji*, was launched in early March - allowing only two weeks to get to Melbourne. The design was long on the waterline with a narrow overall beam of 3.8 metres, carried a deep bulb keel with a draft of 2.9 metres and was ultra-light displacement - very similar to an enlarged version of Peter Nelson's *Vim* - although Davidson likened it to a round bilge version of Spencer's *Infidel/Ragtime* with the Spencer chine replaced by a hard turning bilge like a BOC yacht. But because of the Melbourne/Osaka Rule and unlike the BOC designs, *Castaway Fiji* had no water ballast and so lacked that extra sail carrying power of the round the world singlehanders. However with its masthead rig, sail area was enough to



above and opposite: Taylor/Davidson Melbourne/Osaka lightweight *Castaway Fiji*

give the yacht a high sail area to displacement ratio of 27 (most yachts of that period had a figure around 20) - and from computer prediction figures, would be as fast as *Outward Bound* to weatherf and faster than maxi NZI downwind.

“With a new boat as radical as *Castaway Fiji*, there is concern that there may be a structural problem or defect. But after the rough Tassman crossing we had begun to develop confidence with our boat. We decided to go two hours on two hours off. Sailing alone at these speeds in the middle of the night on a 16 metre lightweight was a wonderful experience. I couldn’t let go of the helm, my tiredness forgotten and Colin got four hours extra rest before I shouted to him for breakfast. Later in the day the wind strengthened to 35 knots; *Castaway Fiji* surfed along doing what she was built for but two or three hours after dark the small moon was obscured by cloud and the complexion of the sailing changed. It was time to drop the spinnaker - we did not want to lose the rig in a wild broach at more than 20 knots. The speedometer had been pegged at its maximum



for stretches of 15 minutes at a time. In the dark we did a good takedown in 25 knots of wind and I heaved a sigh of relief.”

That was the last sight Taylor saw of his crew because later *Castaway Fiji* flipped in the dark after colliding with something and ripping off the keel. Taylor, asleep, was thrown forward from his bunk, struggled out the hatch and then clung to the yacht’s transom until rescue came. In Auckland accusations flew: the keel bolts had been incorrectly sized, or incorrectly fitted and Taylor had been suicidal in rushing the launching of *Castaway Fiji*. However there was no evidence, save for distant Orion photographs taken of the inverted hull and protruding keel bolts to base claims. Inadequate boat preparation may have been the reason for the loss of crew and boat but in apportioning blame people forgot that the examining bodies of human endeavour are not armchair rules but the elements, which find feeble humans no contest.

Yacht surveyor and designer Ray Beale pointed out his views: “The extreme keels with their mean little flanges – such as Taylor’s boat, numbers of Elliott’s and also Gray Dixon’s keel on Alan Mummery’s *Ice Fire*, can’t be engineered to stay on boats. More will fall off. Lead to steel doesn’t work and I’ve seen *Ice Fire*, Ross’s *Blast Furnace* and numbers of Elliotts regularly up on the hard, their keels working. And yet the original steel cased keels done by Spencer and Stewart 30 years ago, some of which have had shocking groundings, are still on the boats. Also these thin fore and aft keels are not good in a hard breeze; I’ve seen Elliott’s *Sneaky Frog*, *Excess* and the E9 get bowled over in a wind – they can’t get enough way on and have too much above water windage so they go over – you pay your price. Of the extreme boats the ones I’m most impressed with are Jim Young’s *Rocket 40* over in Sydney, quicker than a maxi downwind and easily the fastest 40 footer around – and Murray Ross’s *M1*; that boat is miles faster than Elliott’s *Party Pro* and even beats Woodroffe’s big Davidson.



Although of short life *Castaway Fiji* made a performance impression but the yacht will be remembered more for its infamy than its speed – however *Castaway Fiji* was one of the earliest of the short handed lightweights to appear in this country – and that makes it an important milestone. Although ending in tragedy, one has to admire the vision and determination of Taylor to push to the boundary edge – this pioneering attitude is where real progress, even with mistakes, is made.

36. monster versus multihull

WHEN NEW ZEALAND challenged in 1988 for the Americas Cup with a giant version of a Farr designed Lake Garda racer, it caught Americans unprepared and when the New York State Supreme Court declared the challenge valid, Sail America rushed into a program. Although maritime America was annoyed by the unconventional challenge, it really came at an opportune time – for racing pedestrian 12 metre yachts in the light winds of Southern California would have been a plodding and disastrous spectacle. Michael Fay's bid changed all that but also backfired because the Deed of Gift allowed for a more performance oriented craft than even the 90 foot waterline New Zealand monohull.



opposite: on deck *Castaway Fiji* - above: Farr's monstrous New Zealand KZ1

Margaret Hicks

Antipodean sailors convinced themselves the race would be biased towards New Zealand because development of lightweight, big dinghy types belonged to this country and few, if any, US designers were as advanced as Farr along these lines. Confidence was such that when word came America was replying to the giant monohull with a catamaran, even that was considered a disadvantage when compared to the big Farr's high performance. Dimensions of New Zealand KZ1 were intimidating: 90 foot waterline, 133 feet overall, 21 foot draft keel, 150 foot carbon mast and 6000 odd square feet of sail carried to windward with 16000 downwind. This was a design definitely pushing into new territory – and was supposed to reach maximum speed in only 8 knots of true wind speed. In 4.5 knots of wind the monster achieved 11 knots and once during trials sailed at 22 knots in 20 knots wind speed – but this was on the limit of the big boat's ability to handle the forces.

The after guard comprising of top New Zealand sailors including Barnes, Ross and others were convinced that the extraordinary yacht would live up to computer prediction figures of maintaining 16 to 18 knots reaching in 12 knots of true wind while carrying its enormous genneker (it actually exceeded these printout figures in reality) and thought that this performance was something the multihull incapable of doing. Also *Stars & Stripes* would not carry a spinnaker and would therefore be easily beaten downwind – while the catamaran would be weak to windward plus being slow to tack. Cautionary words revealing 25 foot C Class catamaran performance that reached the after guard ears were quickly discounted, although Farr initially had advised the challenge team that a multihull would be faster. Builder Steve Martin somewhat naturally did not want to know about anything multihull and sports broadcaster Peter Montgomery thought the “telemetry of the big boat sounded pretty impressive” and that it was hard to imagine anything sailing faster. Fay and Johns convinced themselves that a multihull would be ineligible to compete - while cynics here commented that when it comes to winning the US was renowned for putting roller skates under goal posts.

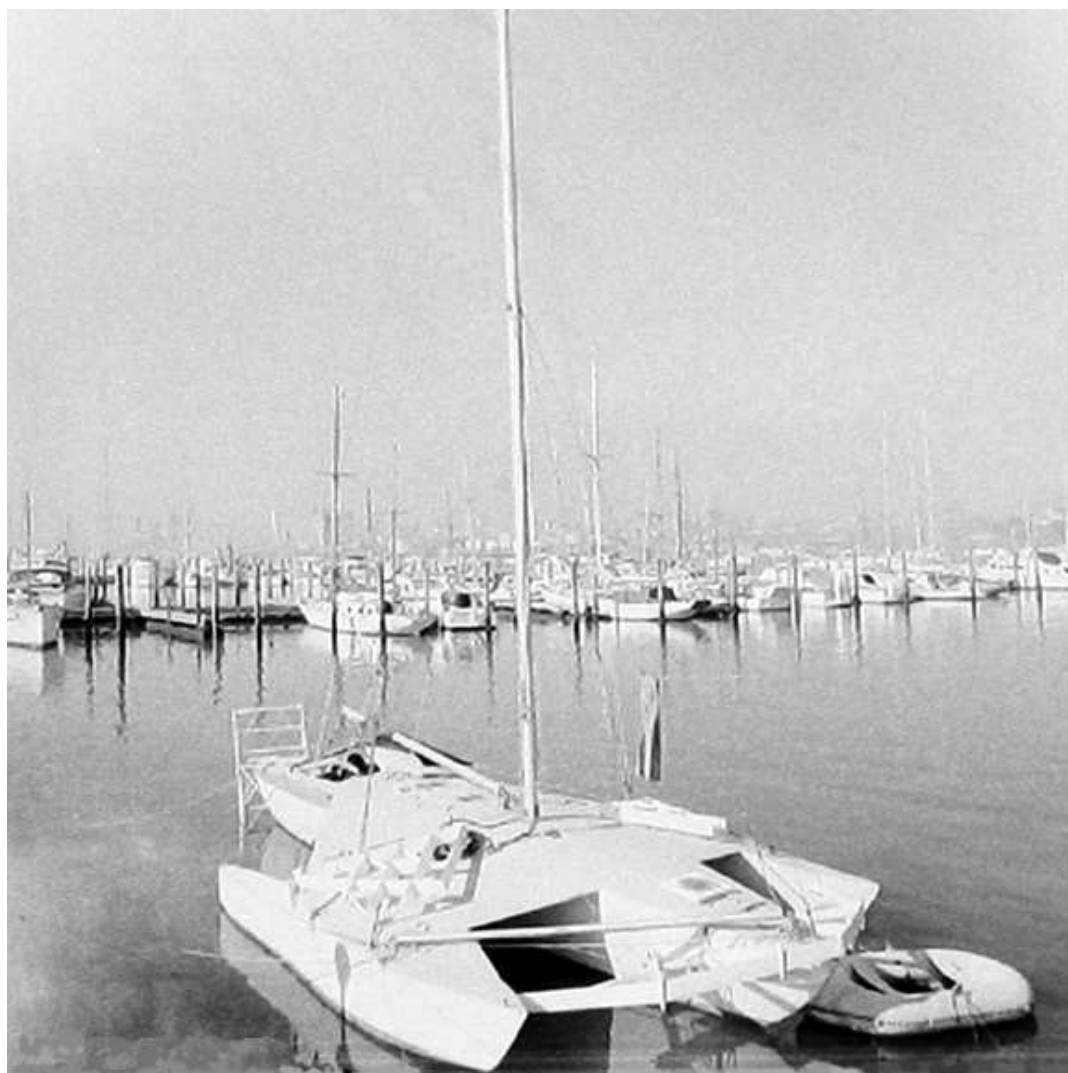
Dennis Conner at first wanted an enormous soft sail on *Stars & Stripes*. To him hard wing rigs were something that did not belong on proper yachts – but in trials the two sister catamarans with their two differing rigs revealed the undoubted superiority of the hard wing over the more conventional, but considerably taller soft sail setup; this was such that Connor could not ignore the Bert Rutan masterpiece - and so he changed his mind. Tennant, visiting San Diego, saw both cats competing and ran down to the end of the wharf to get a closer view: “I knew it was a mismatch, not only for KZ1's sake but for the soft sail cat too. From 300 metres astern and also to leeward, the hard rigged cat sailed through the lee of the other and one kilometer up the bay was 200 metres in front – and the same distance to windward – goodbye New Zealand I thought.”

37. yachts that fly

HYDROFOIL SAILING yachts are not new for some of the earliest pioneering designs were built at the beginning of the 20th Century. Perhaps the most successful early design was Gordon Baker's *Monitor* which was launched in 1955 as a US Navy funded experimental boat and which achieved 30.4 knots over an established distance. Since then there have been a number of successful amateur designed foil boats, both aeroplane and canard types built in the UK and USA. The 1970 A Class catamaran based *Mayfly* with foil platform designed by Phil Hansford and the Grogono brothers B Class based *Icarus* were important historical developments from the UK - while in the US two canard types (bow steering): Sam Bradfield's *Neither Fish nor Fowl* and Don Nigg's *Flying Fish* launched in the late 1960's and early '70's, were also ground breaking examples. It is interesting that these well sorted designs appeared often without the knowledge of similar work being undertaken in isolation by the others.

During the same period Californian David Keiper launched his own design and backyard built *Williwaw*. This was the first ocean going foil yacht and he realized the foiler's potential by crossing the Pacific to New

Zealand. *Williwaw* had four sets of ladder foils hinged off the quite Piver-like, quite narrow beamed, 31 foot trimaran platform; bow and rudder foils and two off the short floats. *Williwaw* was light at 2100 lbs and Keiper claimed 20 knots speeds even with five people aboard on San Francisco Harbour. But daily Pacific mileage was not high, about the same as a cruising monohull. *Williwaw* had a low masthead rig which was well below the standard of development he had achieved with the hull/foil platform. Consequently, in light airs, the low powered rig could not compensate for foil and strut drag, so the boat was slow. In such conditions he would lift the foils but then had the problem of lowering them again when the wind came up.



Keiper's *Williwaw* with foils folded, in Westhaven after Pacific crossing

Keiper pioneered ocean crossing in a hydrofoil and proved that foils could work - with the unexpected bonus that they gave a particularly comfortable ride in big seas, when he maintained, in savage conditions, they had stopped his boat from pitch poling when surfing into the backs of large waves.

One of the first foil yachts built in New Zealand was Noel Fuller's 14 foot *Sabrina* launched in 1976. This boat had foils which were a combination of flotation and foil; that is the 45 degree angled, triangular profile foils were thick at the top that then tapered to points at the bottom. The beams were hinged to allow fore



Fuller's 14 foot foiler *Sabrina*

Twink McCabe

and aft movement which altered the angle of attack of the float/foils – more angle for lighter winds when more lift was required and conversely less angle when the breeze was stronger – usually this angle was set up and locked before setting sail. There was no inverted T rudder foil to provide stern lift so *Sabrina* could not fly completely clear of the water – it was a foil stabilized yacht rather than a true flying hydrofoil.

A disadvantage of low aspect ratio foil/floats is lack of draft in light airs; this failing gave *Sabrina* just an average to poor windward performance. According to Fuller, in a breeze the windward foil held the boat down, reduced pitching and gripped the water to cut leeway from wave action, (this is a debatable theory) while the leeward foil, immersed flush with the sea surface, provided lift to counteract power of sails and the heeling moment. *Sabrina* has a low freeboard main hull with not much buoyancy so when traveling fast in waves and swells, the doughty designer was often underwater.

Fuller: “On a foil stabilized yacht, the angle of the foils is used to generate a force that exactly opposes the heeling force of the sail and at the same time, supplies lateral resistance. In a properly balanced out yacht, this relationship holds out over all wind strengths. On my next design the foil area and the reserve area above the water will be equal (even when hit by a strong gust) to the entire displacement of the boat. Just imagine trying to push a board floating on the surface, straight down, punching it with your fist – you’d probably break your hand. On the new design once the foil starts moving forwards, or even backwards, it begins to generate dynamic

lift and the boat comes back to its normal angle of heel. I've proved this sort of thing happens on my small boat *Sabrina*."

Young: "What boat is that?"

Rhodes: "It's a small 14 foot stabilized canoe. He sailed it to the Bay of Islands."

Young: "You sailed it to the Bay of Islands! My word!"

Fuller: "One of the things I discovered on that sail is that in strong winds and in large waves, well, for *Sabrina* they were large, the windward foil holds you down. When the lee foil comes clear in a trough, the windward foil still holds you steady. This results in a foiler sailing in a more vertical position than a cat or a tri. The other advantage is that the foils go through the waves with far less resistance than floats and this gives a very comfortable ride, no rolling and reduced pitching."

Young: "Does the boat make much leeway?"

Fuller: (caught off guard and slightly offended)

Rhodes: "Come on, it makes plenty."

Fuller: "Well *Sabrina* has low aspect ratio foils which act like hydroplanes. They are fairly inefficient but my new design has much higher aspect ratio foils that I've proven perform much more efficiently. Nevertheless, water does escape from its scooping action. The new boat will rectify that problem."

Yachting theorist and author Ross Garret put foils on an A Class catamaran and the boat flew in 1977; but it was a short lived experiment for the wooden foils collapsed and Garret, having proved that the concept worked, did not, to my knowledge, continue development of the craft. Leon Talaic was another who built an early New Zealand foil yacht; this was a canard design with bow steering named *Mish* and it carried no mainsail but a large headsail – this design also had momentary success.

Ocean racing in foil yachts began in 1979 when France's Eric Tabarly launched 54 foot long by 60 feet wide trimaran foiler *Paul Ricard* for the first Transat en Double – where the big foiler finished a very close second. Then soon afterwards Tabarly took *Paul Ricard* across the Atlantic to set a new record, which had been set at the turn of the 20th Century by the enormous three masted *Atlantic*. The whole concept of the yacht was very experimental and Tabarly's commitment and courage in taking the brand new boat offshore, left many observers flabbergasted. Normally foil yacht development was something that amateurs experimented with and it occurred in small pockets of the UK and USA but the French were quick to sponsor and explore performance opportunities in large scale versions and quickly took the lead in this field. *Paul Ricard* was built in aluminum and of aeroplane configuration with an inverted T foil rudder and 45 degree foils set at the bottom of very fine floats, but the boat was a heavy seven tones and because of this was more a foil stabilized yacht than a flying foiler – nevertheless the foils lifted most of the main hull clear in fresh winds and *Paul Ricard* once averaged 25 knots over a long reaching leg to outdistance a fleet of 85 foot maxi multihulls.

From sailing and seeing mistakes in Fuller's *Sabrina*, I built a 6 x 6 metre trimaran flying foiler named *Flash Harry* in late 1981. This boat had deep asymmetrical dagger foils protruding through the small floats at a 40 degree angle and set with an angle of attack of 4 degrees; the rudder was an inverted T so as to lift the stern section of the boat and keep it level and not bow high as it did on *Sabrina*. Also I wanted good windward performance (plus the expected high speed while reaching and running) and discovered a performance bonus that, because of my lack of sailing foiler experience, happily found when beating in fresh winds that *Flash Harry* would lift clear of the water and climb higher to windward at the same time. But this was not the case at first. The original B Class catamaran wing mast rig from *Boadicea* was of large chord and a heavy 50 kgs and although *Flash Harry* would lift off while reaching, the boat often tripped and buried. It was not until a new, slightly smaller chord and very much lighter 20 kgs wing rig was built that this failing was halted, now the boat would



6 metre square foil trimaran *Flash Harry*

Margaret Hicks

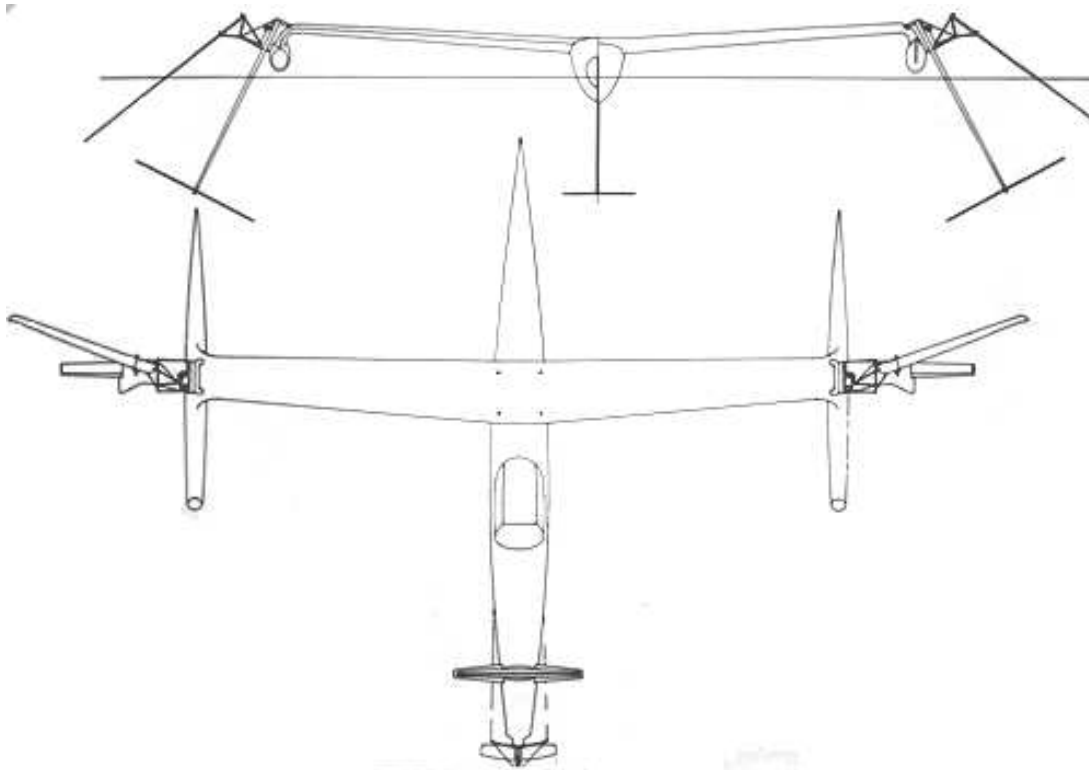
lift off on any point of sail in winds above 12 knots – below that wind strength *Flash Harry* sailed like a conventional trimaran, but always with a light, airy feeling.

Another who caught the flying boat affliction was David Knaggs, an ex-Great Barrier Express sailor who knew about speed under sail. He designed and built a set of high aspect ratio foils and mounted them in aeroplane configuration (stern steering) on a Paper Tiger catamaran in 1985. This *Flying Tiger* was similar to the UK designer Hansford's *Mayfly*, but differed in that the Knaggs' platform had the extreme high aspect ratio, deeply immersed main foils mounted at 35 degrees dihedral (*Mayfly*'s and *Flash Harry*'s were at 40) and were set at a high angle of attack, originally at 7 degrees then later altered to 3.5 degrees, (*Mayfly*'s were at a shallow 2 degrees) – high angle equals high lift but also retains high drag, so a compromise has to be worked out on fixed

foils. On *Flying Tiger* these deep foils set at 7 degree angle provided an early lift off in light winds and gave a soft and cushioned ride through waves; Knaggs calculated everything regarding his design, engineering and construction and built all the components to perfection. He describes his first sail:

“On setting the foils for the first time in calm waters and about 10 knots of wind, I was surprised to find the boat taking off so soon, despite the Paper Tiger’s small sail area, as the mainsheet was trimmed in on a reach. As the boat accelerated and climbed higher, the most striking impression was the silence and complete lack of any impression of power, despite the building apparent wind strength. Every gust caused the boat to fly higher, in marked contrast to the lee bow down of a catamaran at high speed. In more than 12 knots of wind, a takeoff while sheeted hard in on a close hauled course, was easy. Provided speed was kept down by luffing, the boat would fly to windward with most of the leeward foil immersed, the leeward hull just touching the wave crests and the weather foil mostly out. Lateral stability picked up strongly with extra heel in gusts; the waves passed unfelt.”

However he was plagued with the boat crashing at high speed (above 25 knots) – in spite of the acute forward rake of the foils that theoretically halted ventilation; this occurred on any point of sail except going to windward. Even different foil designs and varying numbers of ventilation fences did not improve this crashing situation. So after taking developments to conclusion on the surface piercing foils on the catamaran, Knaggs turned to the trimaran/aeroplane configuration for his new design – a boat he drew in 1986: 18 feet long and including the angled inverted T foils set outboard of the floats, 30 feet wide (5.5 x 9 metres) – an elegant, low and wide craft. He built a wing mast that bent sideways when rotated to flatten the mainsail as speed increased.



Knaggs Flying Foiler

Launching the Knaggs *Flying Foiler*

Deep camber was required for power at low speeds as no headsail was carried, but once flying the main had to be flattened. Adjustments needed to be automatic so the new foils were combined with a sensor (in appearance two foils per side) mounted outboard on a neatly designed mechanism that actuated a shaft set inside the strut – this altered a small flap on the foil trailing edge and this provided more or less lift and kept the boat flying at a regular angle. Knaggs warned: “You must keep everything simple. If you’re not careful you can find yourself going berserk with complex answers that just load the boat down with junk. But this was a revelation. Now I could scream down the face of a wave without worrying about the foils washing out or the boat burying.”

Sailing *Flash Harry* provided great amusement so the obvious next project was to build a larger version; this new boat, *Misguided Angel*, had the same aeroplane configuration as *Flash Harry* and the Knaggs’ *Flying Foiler* and measured initially 10.6 metres by 12 metres beam (35 x 40 feet), was single beam with inward canted floats and had twin masts set halfway out on the beam from the main hull. This was similar to the US designed Greg Ketterman Hobie trifoiler except that his masts were set at the extreme beam of the craft above the floats. Unfortunately this setup on *Misguided Angel*, although successful on some points of sail, in that the two mains totalled a large sail area and the centre of effort was low (which produced great speed), but very poor when beating to weather in a decent breeze. The problem was the half wishbone and heavily carbon reinforced booms flexed and this allowed the sail clews to move forward and upward, belying the sail shape and allowing unacceptable leech fall off.





top: *Misguided Angel* with bi-plane rig – above: with single wing mast, new beam and floats

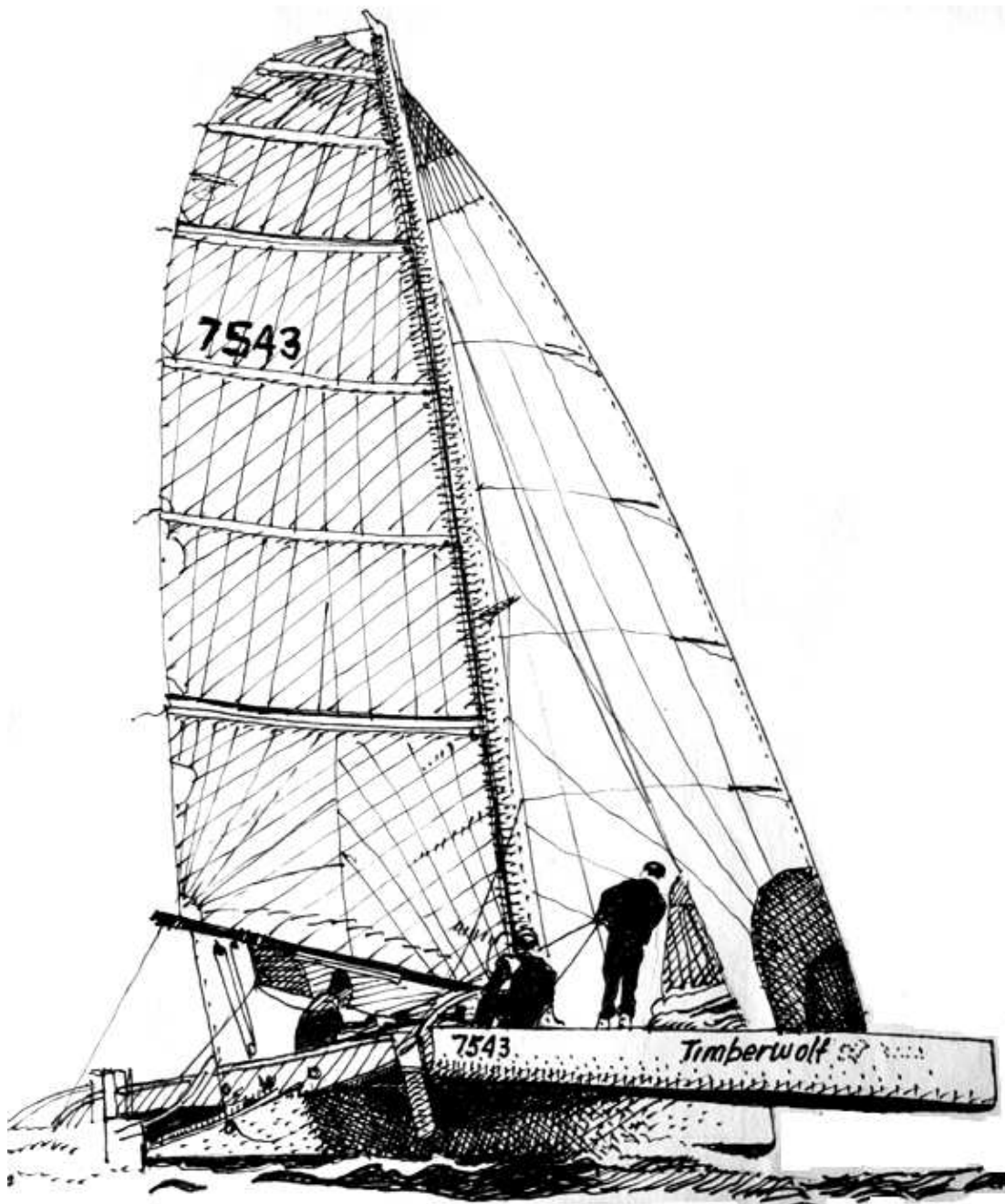
Jacques de Reuck

After that I decided to make radical and successful changes, scrapped the bi-plane rig, built a tall 15.5 metre single wing mast, built a new beam and new floats, plus adding a scoop to the transom to stretch the boat to 11.3 metres overall.

Contrary to ladder foil trimarans, aeroplane configured platforms with single asymmetric foils set through each float and with an inverted T foil rudder astern, go to windward well in heavy airs and especially well in light conditions – when they skim along like thistledown and steer as if on rails. In a stronger wind and in a seaway with the leeward foil and T rudder imbedded at speed through the water, these boats are very steady, don't pitch like conventional light catamarans and seem to grip the water so that a smooth ride is produced - and this allows for better efficiency from the more stable sail rig.

38. like a dragonfly

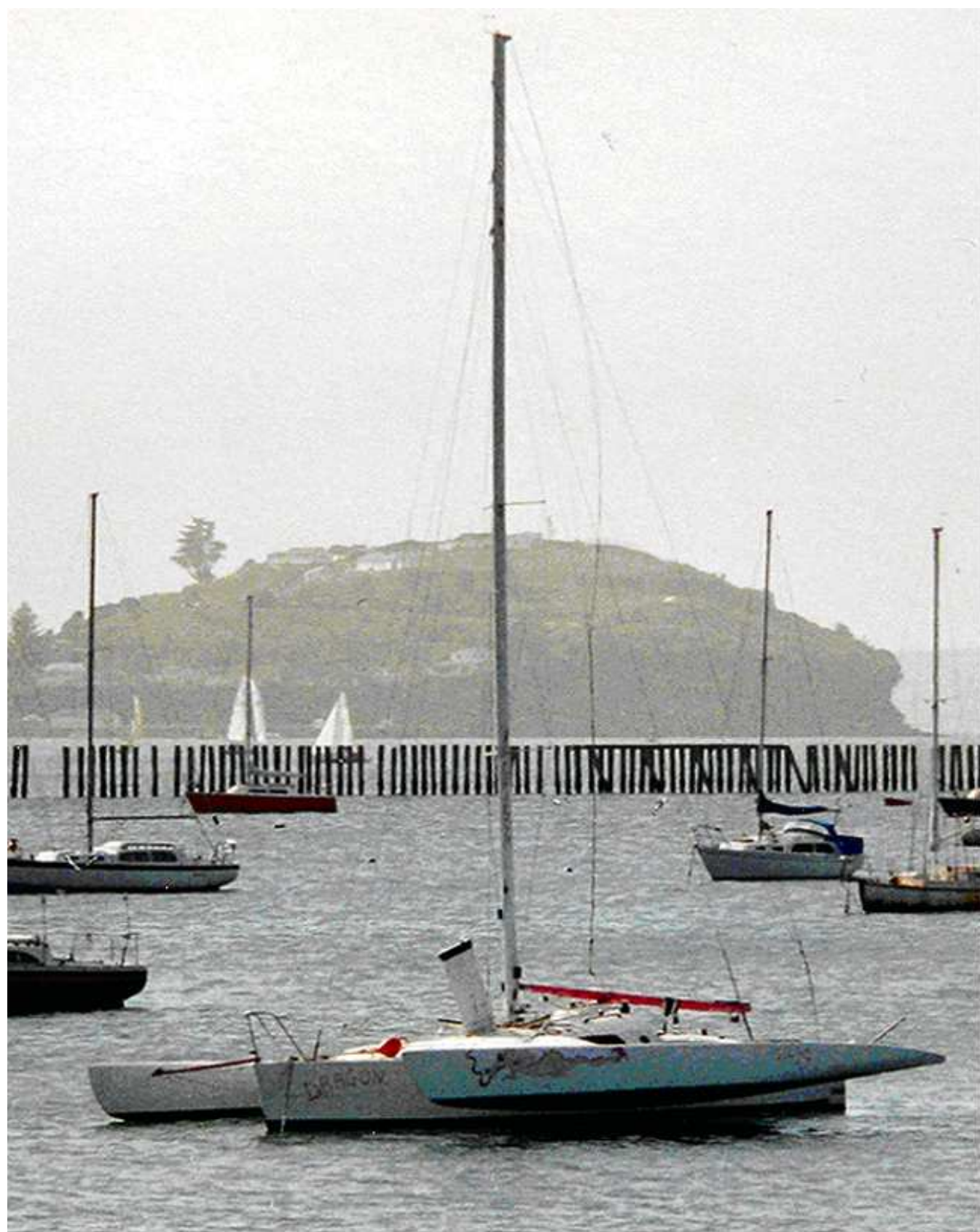
IN THE LIGHT airs of the 1991 Auckland/Tauranga Race, *Split Enz* beat New Zealand's fastest yacht *Afterburner* but the second boat home ahead of *Afterburner* and the large and new Elliott 17 metre monohull *Future Shock*, was a small 8 metre Tauranga built trimaran named *Dragon*. This lightweight craft (590 kgs) was designed by Chris Cochrane and was constructed with the rig and sails plus the cabin top coming from a secondhand Flying 18 (the inverted 18 hull was used for the cabin) while the extended floats came from a Tornado catamaran; the main hull however was Cochrane's own design and was built in new plywood while the rudder and daggerboards came from outdated helicopter blades. Cochrane's approach was classical old New Zealand style, scrounging and building in his spare time until the craft was complete and upon launching he delightedly found he had assembled a trimaran that could equal wind speed upwind and go one and a half times wind speed on a reach - plus also having the expected magical trimaran high performance in light airs. Later he sold *Dragon* to Auckland and began work on an extrapolation



above: Cochrane's extrapolation of *Dragon*, *Timberwolf* - opposite: Cochrane's aesthetic and original *Dragon*

of this boat, slightly larger and with slightly more accommodation than *Dragon* but still a purist and minimal racing design: this was *Timberwolf*.

Both *Dragon* and *Timberwolf* plus the earlier two Tennant Bamboo Bombers *Supplejack* and *Superbird*, also his trimaran *Demon Tricycle* and of course the first two decades of the Olympic Tornado as well as John Tetzloff's *This Way Up* and my own *Misguided Angel*, were built in tensioned ply and then sheathed in epoxy laminates of glass, Kevlar and carbon fibre. Although considered an archaic method of construction by professional builders,



this method allows the amateur to build lightly but also for a reasonable price, yet still end up with a strong enough craft. Arnie Duckworth, the livewire motivator in the establishment of West epoxies in New Zealand, had this to say at a forum on light yachts and construction: "I still think that compounded ply is a good, fast, easy way of getting a shape. And it's probably not the worst form of construction in terms of considering specific mechanical properties too. For example, tortured ply Tornadoes are still as good as anything else they've come up with, including the latest multihulls (this is the early 1990's) and their building methods, they're still competitive and still win their share of races. Speaking of honeycombs on the other hand, a lot of honeycomb 18 footers have not been entirely successful either, I don't think any of those

boats have gone through a season without major structural repairs – and the weight of them is not really all that light either. If people complain of wood soaking up water, well, the Nomex 18's find it hard to keep the water out too. A phenomenon of honeycomb is that sometime or other you get some water in there, now there is an area of negative pressure and any pressure that you have in the laminate is a very strong force – it sucks the water through and the result is the forcing off of the skins attached to the honeycomb."

Chris Timms: "We are right now building another tensioned ply Tornado and it's absolutely amazing, in this case we know what we're trying to build, a shape that is well known. This is our sixth boat, twelfth hull so we've had some practice and now they're so bloody easy to build it's bordering on the ridiculous. It takes three days to get your hull, all glassed up, the right shape, damned near fair and that's three half days really. When we first started building fold up Tornadoes, we achieved some horrible results purely because we didn't know what we were looking for. If the directions said, "put a bulkhead in there," we pushed it down, forced it in and what did we get? – when it came out of the jig there was a bloody great ridge where the bulkhead had been forced into the hull. Then we got a little bit smarter – you realize you don't need to push bulkheads hard down, you just slip them in gently, trim a little here, bog it a little there, little dodges like that make all the difference."

39. red dinghy on steroids

FOR THE 1992 Americas Cup Farr broke with the accepted norm and went his original way in designing NZL-20 – the red dinghy on steroids as it was termed here. The decision for this direction came after sorting through a matrix of 200 different sized boat designs and weights. NZL-20 was designed to compete on a San Diego course which included two reaching legs, not the simplistic Americas Cup windward/leeward course of today – therefore Farr was depending on the 135 and 110 degree legs to allow his big dinghy to have a speed advantage over heavier boats – and this turned out to be true. Farr explained, "You are in a lightweight hull, small sail area corner of the Rule, almost on your own, where everyone else has gone heavy with large sail area." But he felt comfortable with his now well established philosophy. And because he and Bowler had opted for a beamy, light/medium displacement boat while the other designers went narrow and heavy – four tonnes heavier than the New Zealand boat – meant that he had to concentrate intensely on building a minimalist hull that was pared to the bone. In terms of conservative Americas Cup history, NZL-20 looked radical, like a giant racing dinghy with an open transom, its winches and tracks set on the cockpit floor, plus it carried a bow sprit – no-one had seen anything like it before. Bowler went over the design removing anything superfluous and concentrated on using the least amount of material in the construction. The open cockpit was to the maximum of the Rule dimensions and any weight removed from the hull was placed in the keel – which in itself was radical – a twin foil tandem configuration with a bulb between the blade tips. This tandem keel resulted from Farr, Bowler, Steven Morris and Neil Wilkinson doing the engineering and it was the only tandem setup that functioned correctly at the Louis Vuitton Challenge. Most syndicates attempted differing versions at one time or the other but all failed. For example: Dennis Conner had dire problems on *Stars&Stripes* that were due to poor placement



Farr's radical and daring AC design as a big dinghy, NZL20

of the fins which resulted in excessive weather helm – and so his attempt was dropped. Farr said, “If [the tandem keel] was simple, everyone would have done it. It is far from simple.”

On NZL20 it is thought that the forward of the two blades supporting the long lead bulb, could rotate like a forward rudder or canard (and required some cleverly designed engineering to implement) while the after blade had a trim tab large enough to be called a rudder hung behind the deep foil. By having two blades with the bulb between them, this allowed a greater depth than a single, conventional fin keel setup – which is shorter because the bulb takes up room at the tip – whereas the tandem's fin leading edges went almost to the very limit of the four metre draft allowed by the Rule. Another small gain was the slight reduction of the thickness of these blades but only because NZL20's bulb was lighter than the competition. But there was more turbulence and drag resulting from the tandem design and overall the gains would have been slight and required some careful design to compensate compared to the simpler single keel setup. But Farr and company made it work extremely well and *Spirit of Australia's* Iain Murray, who was involved with the Australian boat's tandem keel (which was not impressive) thought NZL20's performance was unbelievable and it encouraged the Australians to keep on working on their problematical setup. The New Zealand boat was thought “very dangerous” by German Frers and Philippe Briand said, “NZL20 was a pure designer's boat, like Farr's early skiffs.”



NZL20's keel/rudder bearing detail

NZL-20 liked flat water and 6 to 10 knots of breeze; in these conditions some opposition crews thought the boat unbeatable. It appeared that NZL-20 pointed lower than the opposition but sailed at the same speed but “magically” the boat lifted out to windward - so some crews thought it useless to race against NZL-20 in the early stages of the Louis Vuitton Cup. The reason for this “magic” was that the New Zealand yacht made less leeway than the others and this was because the tandem keel was doing what it was designed to do. Beating to windward with the trim tab and the rudder set up at just the right angle (too much and speed dropped, too little and windward height was lost) the boat appeared to almost crab sideways upwind [- while on reaches and runs the red skiff had a speed advantage over single keel/separate rudder designs - but only because NZL-20 was lighter, skiff shaped and the crew work superb. However the tandem keel yacht’s Achilles heel was in a cross swell when the boat seemed to lose directional stability and started to wander, then it lost speed because the helmsman had to work the rudder more to keep on course. Because tandem blades and rudder are closer together than conventional keel/rudder designs, the rudder has less leverage than a normal one set further aft. Another failing was lack of feel to the helm and it required some skillful steering to keep the boat at its best. Rod Davis was very critical of the tandem setup while tactician David Barnes was a strong advocate for the design - perhaps, retrospectively thinking, it would have been better had they swapped positions - Barnes the more open minded and flexible would have been better suited to the unconventional craft and design.

Two of three keel concepts were used in the round robins while a third was being considered late in the finals - Farr described them all as being totally different. Changing keels (this took six days) meant shifting the mast forward but this was not a problem for the boat had been designed to accommodate this from the start. The mast required shifting because the centre of lateral resistance moved forward with the tandem setup so consequently NZL-20 had smaller headsails. A fourth tandem design was used for the finals and Farr said, “I would have loved to have done even a fifth - it would have been different again and also faster.”



Farr's revolutionary tandem keel on the lightest of the 1982 AC designs: NZL20

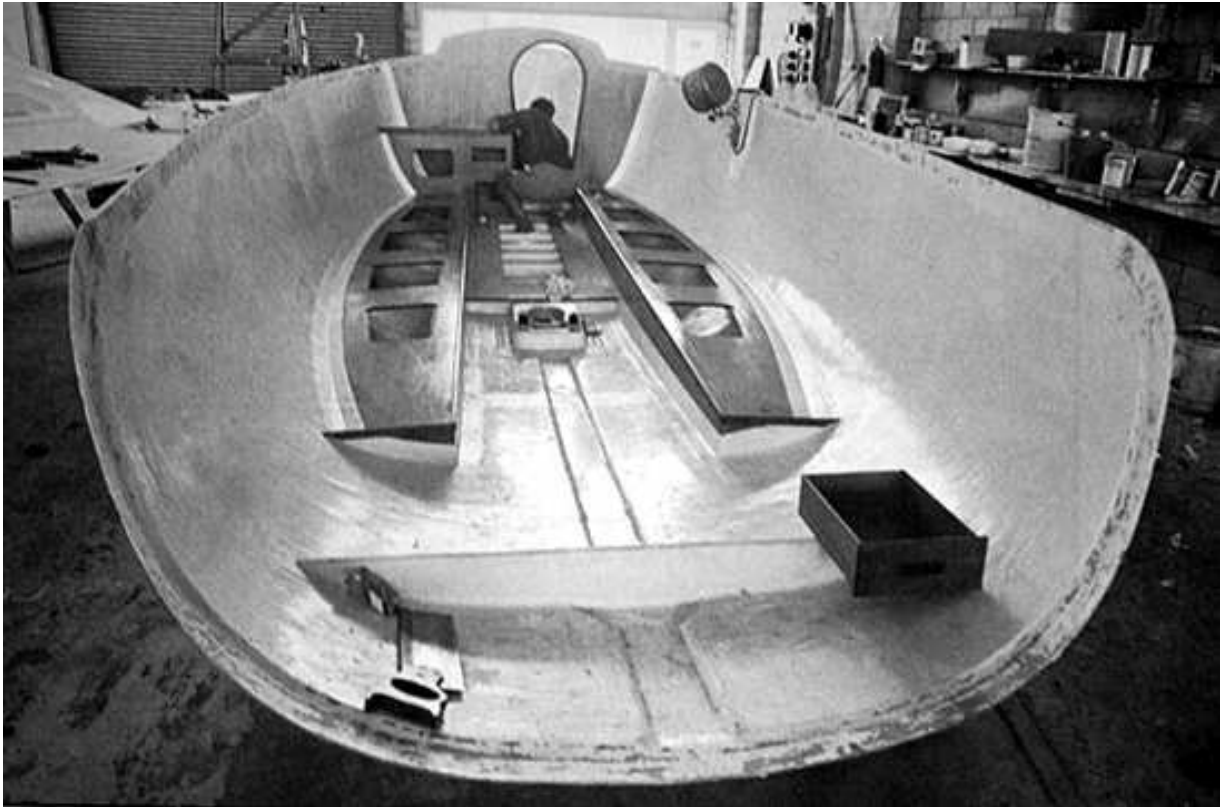
A theory about NZL-20 losing the Louis Vuitton final after being called cheats over the bow sprit affair by a desperate Paul Cayard, who was 4 to 1 down in *Il Moro di Venezia* (this protest defied logic then and makes even less sense now – hence the IYRU's overturning of the ruling later that year) and besides the team and management meltdown (Fay was nervously preoccupied with the upcoming wine box scandal) and also besides the asinine after-guard changes made by Blake that further compounded the fall of team morale, was that the spectator fleet had increased in the latter stages of the competition and the greater numbers chopped up the surface of the race course. This definitely did not help the tricky-to-steer skiff and affected the sophisticated foils which did not work as well as when the course was more settled - so NZL-20 got slower. Another view put forward by *Sailing World's* Henry Hood was that, "the kiwi boat, because it had less ballast, lacked power when the wind was above 12 knots – also to gain stability with the light boat, Farr had flatter sections through the hull and this increased surface area for the amount of sail carried. Therefore below six knots the boat was not fast."

40. Wednesday Night Racer theme

FOLLOWING THE SUBDUED excitement after the appearance of 34 foot Wednesday Night Racer and other fashionable late 1970's light sporting boat designs, Davidson drew a slightly larger design called the Dash 34, not so low in freeboard as *Fantail* and therefore a little heavier. Tim Gurr built a similar version as did Ray Haslar with his famous *Jive Talkin'*. Apparently around 40 Dash 34's were built in Canada," said Brett Bakewell-White who was working as a draftsman for Davidson at that time, "but Laurie unfortunately did not make a bean from the production run."

Then Davidson went further on the Wednesday Night Racer theme with a 42 foot version (*Mr. Roosevelt*, *Brunelenski*, *Spitfire* and others) then he pushed even further towards big boat lightweights with a 50 footer that became Graeme Woodroffe's *Jumpin' Jack Flash*.

"Woody wanted a 50 foot boat that would sail above its rating in Hawaiian conditions," said Bakewell-White, "he wanted a downwind boat and *Jumpin' Jack Flash* ended up a pretty nice downwind boat but it lost out

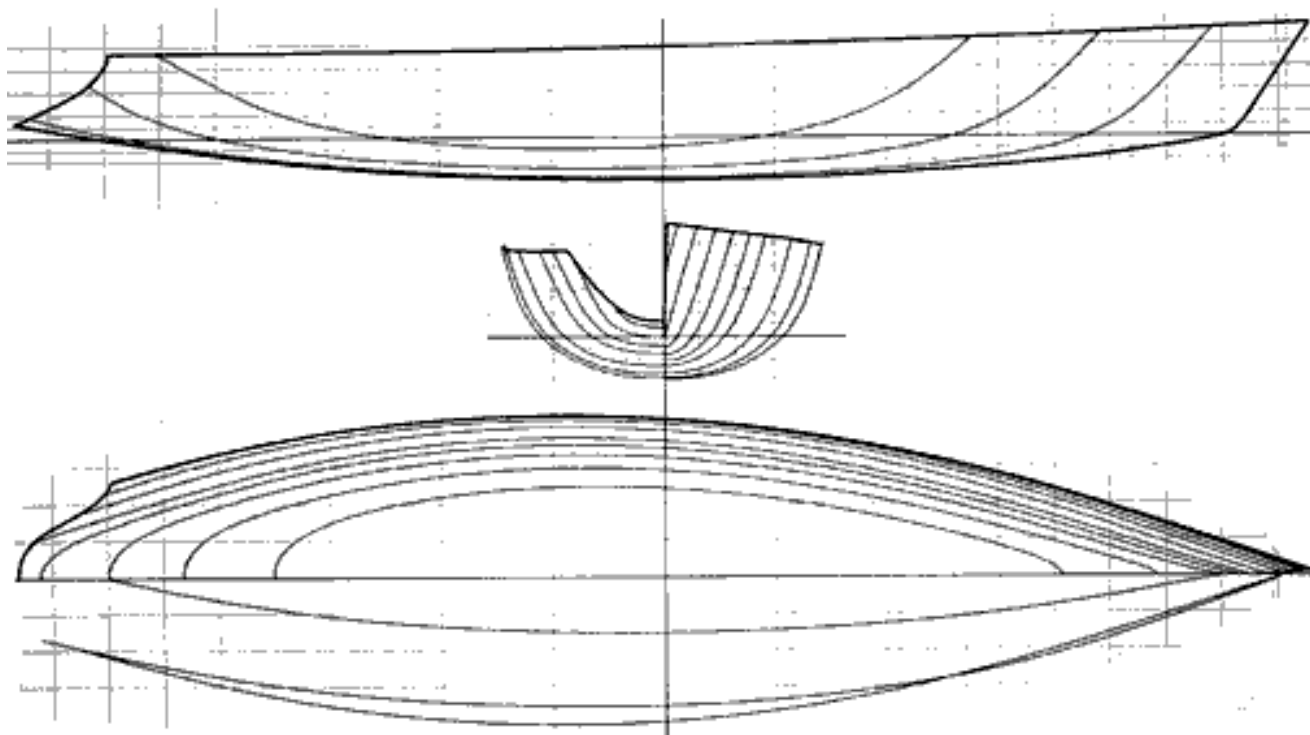


sailing upwind. Woody then sold *Jumpin' Jack Flash* and immediately had a second version taken from the Auckland mould – this was *Honky Tonk Woman* extended to 52 feet with a scooped transom. This boat today is still racing under varying different names in Australia. Another sister was *Night Raider* which differed from the others by having a masthead rig. Woodroffe then wanted an even longer version and suggested to Laurie that the latest hull be cut in half and a section added to the middle. This particularly annoyed Laurie and he said it would only work if the joined sections were padded out and faired in, but Woody disagreed and went ahead anyway –and that is why for a number of years *Starlight Express* had a flat section amidships with no curve in her profile,” said Bakewell White.

The aesthetically minded Davidson, irked by the quick and nasty extension approach, warned Woodroffe that the boat would look wrong by sitting too low in the water. He therefore refused to draw lines for the yacht, just a sail plan plus basic dimensions. Soon afterwards two other long versions were built but were constructed correctly to Davidson's recommendations: this was Woodroffe's *Emotional Rescue* which differed from the others by having a bulb keel (taken from *Castaway Fiji's* mould, but attached differently) – and the other yacht *Omni* which went to Hong Kong. Then *Starlight Express* ended up languishing in Sydney to be later sold in a sorry condition to Stewart 34 sailor Chris Packer who brought it back to Auckland - where it hit a rock in Man-o-War Passage. Packer was determined to put the boat right and when it was hauled out, he was somewhat horrified to see the keel wobbling under the crane slings.

Opposite above: Davidson's 34 foot Wednesday Night Racer – opposite below and this page below: his 42 foot *Mr. Roosevelt*





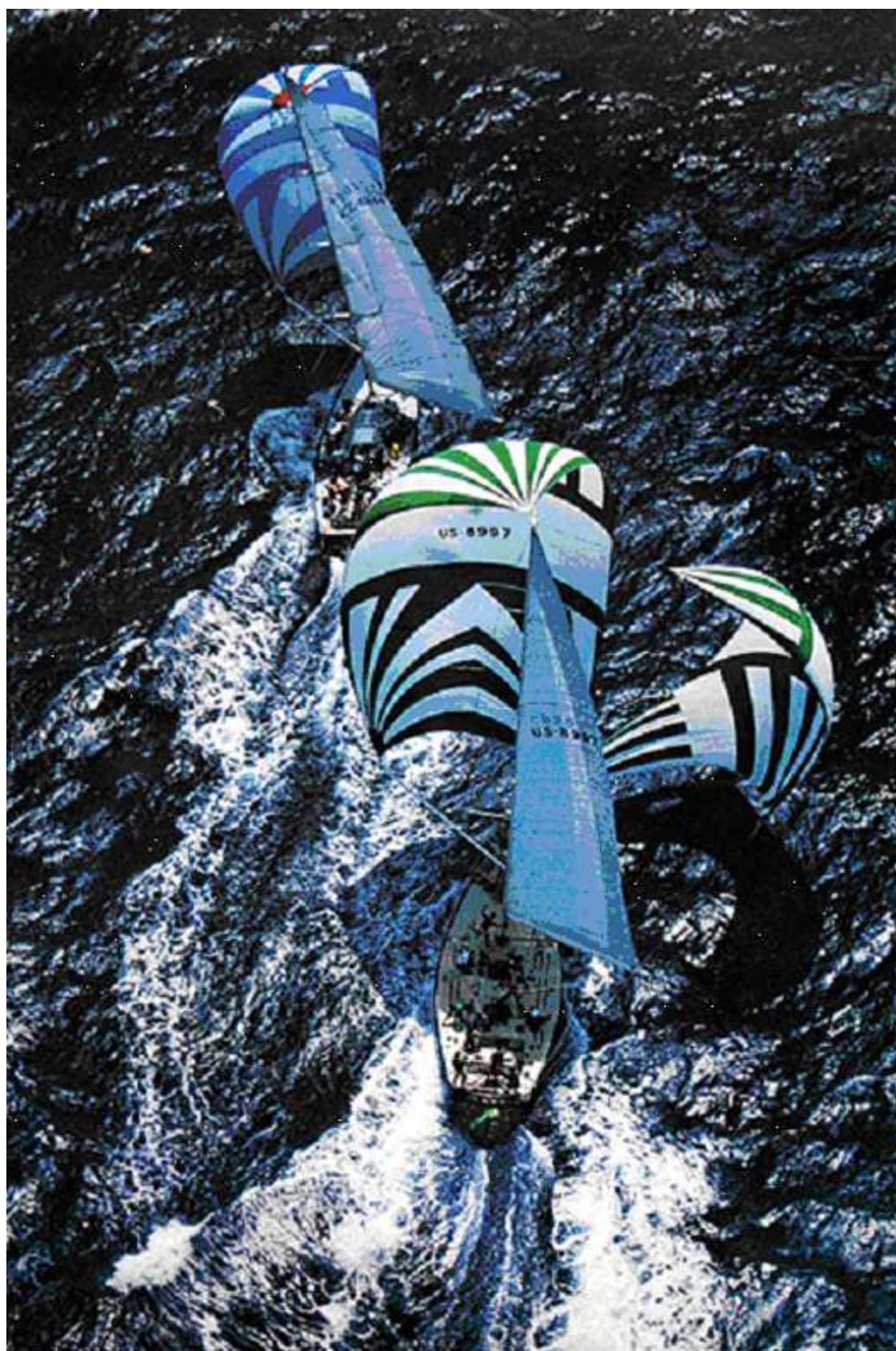
above:: lines of *Starlight Express* opposite: *Jumpin Jack Flash* leading heavy displacement *Bullfrog*, a Peterson design

Not only was it loose but it was also bent and twisted off by 20 degrees – it took a crew four days hard work to remove with a chainsaw.

Lloyd Stephenson, a loyal builder of Davidson designs, then repaired and updated the boat while also doing a proper job of gluing foam and glass to the bottom and fairing out the flat section that Davidson had been so annoyed about. A smaller but deeper keel was built and the floppy steel keel supporting channel that ran down the middle of the hull was removed and replaced with a foam, timber, glass and Kevlar rib – which made the hull stiffer, mainly because formerly the steel had been bolted only at the ends whereas the composite replacement was epoxied in uni-directional Kevlar along its total length.

“The changes were a revelation,” said Bakewell-White, “*Starlight Express* as a result would now be recognized as one of the longest lived and one of the most successful offshore New Zealand campaigners having been in numbers of Kenwood Cups, gone to Japan and Hong Kong and done the China Sea Races, numbers of Sydney/Hobarts and competed in endless Auckland club races - only the *Lexcen Anticipation* would come close to her. The yacht has had six rigs, four keels and five rudders in her life and has sailed under IOR, then IMS and finally IRC Rules, under which the latter she won a Sydney/Hobart Race.”

“A beautiful light weather day for the Te Kouma Race. *Starlight Express* revels in the conditions, leads down to the bottom of Waiheke. Woody’s *Emotional Rescue* out of sight behind in second place. *Starlight* runs out of wind and sits motionless while the whole bloody fleet runs her down making sure they keep clear of *Starlight*’s hole - all disappear through Ruthe Passage. *Starlight* dead donkey last. This is too much for Tony Park who goes below in utter disgust, gets a chicken from the fridge and sits on the leeward bunk scoffing it. Packer goes nuts with this defeatist attitude, storms below to abuse Park, who, stung by the vitriol throws the half eaten chicken at Packer’s face. Both begin punching each other around the cabin. Rest of crew shocked by behaviour,



but also laughing behind their hands. This episode now known as “the battle of the leeward chicken.” Woodroffe makes the scene even more intolerable by finishing and coming back home. *Starlight* still dead donkey last. *Emotional Rescue* sails arrogantly past in opposite direction while beautiful women on board flash their white derrieres at us, the hapless crew on *Starlight* - never to be forgotten.”

Davidson has continued what he began with Wednesday Night Racer by designing even larger yachts: the 66 foot *Antaeus* and the 72 foot *Cassiopeia*. “All these lightweights are an evolution of *Fantail*,” said Bakewell-White, “all go fast, are easy to short hand, are easily driven and slip along powered by only a moderate amount of sail.”

41. quod erat demonstrandum

Unheard of monohull performance occurred with the first change from heavy displacement IOR maxis like *Steinlager 2* and *Fisher & Paykel* to the Whitbread 60's. The 60's brought shifting water ballast, deep draft keels and light displacement. Ross Field, who had been on both types, had his eyes opened on the Whitbread 60 *Yamaha*. “When the wind was up you didn't need much sail up to get the W60's going. Beating towards Prince Edward Island with 35 -45 knot winds we had a storm jib and three reefs in the main – yet the boat was going very fast and taking terrible punishment. After rounding Prince Edward we went onto a reach with full main and jib top – with the wind freshening and coming aft. All of the W60's were close together, within 20 miles of each other. We put on the big 2.2 oz. spinnaker; it was pitch black so everyone was on deck. *Yamaha* just took off reaching 30 knots, mostly underwater and it was freezing bloody cold. We were holding on for grim death and I kept thinking we would never have had such an amount of gear up nor have had such speed in any other boat – and also that it would only be a matter of time before we arsed out. It was time to get the spinnaker down but the spinnaker sock got stuck. Three guys were on the bow trying to pull it down. We held it like this for 15 minutes in 45 knots of wind and huge seas, then we broached and the boat lay on its side, the crew flapping like flags off the foredeck. The boat wouldn't come up but we got the spinnaker off and it still wouldn't come up. It felt like we'd been lying there for an hour but it was probably only ten minutes. Finally a big wave pushed the boat upright and also downwind at the same time. I was beside myself thinking the competition would all be sailing away. We put the jib back on. Now we were only doing 19 -20 knots and not the continuous 25 knots of before. But at the end of the day, everyone had done roughly the same thing, broken spinnaker poles and other gear. *Intrum Justia* had done the most miles and she'd done that by sailing low with no spinnaker.

By the bottom of Tasmania we were carrying a small spinnaker, two reefs in the main, wind blowing 35 – 40 knots and you couldn't move forward in the boat. Everyone was aft and the boat was doing 22 – 23 knots and sustained this for almost five hours – which completely exhausted the whole crew. I wiped the boat out in a moment of poor concentration. I was absolutely exhausted after all this time on the knife edge. Murray Ross gave me a good look and said, “You'd better have a sleep.” So I took his advice and collapsed on the sails in my full wet weather gear.”

42. wing mast schooner

DURING THE LONG hours of an Auckland/Fukuoka Race Greg Elliott and Tom McCall discussed the design and construction of a yacht for themselves, a line honours machine built purely for speed with no compromises, no thoughts for IMS, a very light displacement schooner with an emphasis on reducing drag rather than piling on sail power to gain performance.

What came out of the building shed was a low freeboard, 16 metre by 4.5 metre beam by 4 metre draft schooner which had a narrow waterline that moderately flared to a wide deck; accommodation was minimal – “There's no luggage aboard,” said Elliott. The yacht was light: built of carbon and Kevlar over balsa core and



Elliott's lightweight 16 metre schooner *Primo* - opposite: Bakewell-White 6.50 metre *Wildcard*

25mm foam – Elliott said the weight was 7 tonnes but observers thought it less because the 9 square metre wing masts heeled the boat over during gusts while it sat in the marina. The keel was like an Open 60's, a thin blade with a 3 tonne bulb and everything was as they had planned, kept minimal to reduce wetted surface and drag. A balancing board forward of the foremast was used when sailing to windward (to reduce weather helm) and this was lifted when reaching and running. The rotating wing masts, borrowed from the decades of development from multihulls, had no spreaders (naturally) just diamonds to reduce complexity and allowed Kevlar instead of rod rigging – which knocked two thirds off the weight of a conventional, fixed rig setup. Elliott had already had experience of wing masts from placing them on two earlier designs: *Excess* and *Sneaky Frog* - but as often seemed

to be the case with monohull setups, the masts did not rotate enough (around 45 degrees) to gain the most advantage of these rig designs – nevertheless, they were a huge improvement in wind flow and reduced drag compared to fixed masts. Multihulls with their wide staying bases can, if necessary, rotate their masts to 90 degrees, or even further, when sailing downwind. The schooner's mainmast was raked aft more than the foremast to improve helm balance and to allow room for a gennaker to be set between them.

The boat was launched as *Elliott Marine*, then later became *Primo*; it was found to be a difficult boat to race around buoys (as expected) but easy to sail on passages when it could be carefully tuned up to make fast crossings at very high average speeds winning five coastal races, line honours in the Round North Island Race, averaged over 13 knots to Russell in the 1996 Coastal Classic and set a new Auckland/Kawau monohull record of 2 hours and 2 minutes. In the 1996 Melbourne/Osaka it was easily the fastest in fleet, led virtually the whole race but lost radio communication and was pipped at the line by an hour and a half from not covering, and not knowing the position of, the Australian lightweight Inglis/Murray designed sloop *Wild Thing*.

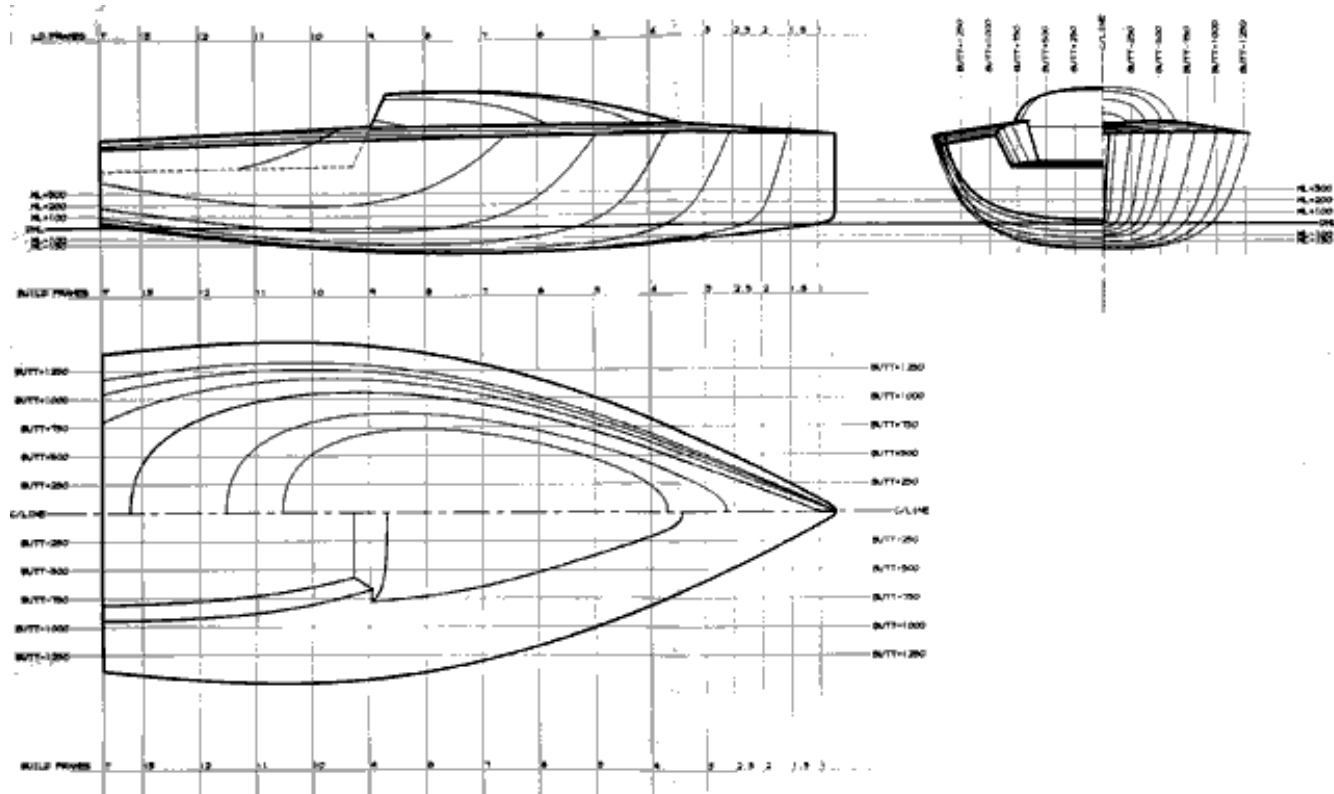
43. the pirate Chris Sayer

IN EUROPE, especially France, the ground breaking Mini-Transat Races for huge sail carrying, lightweight 6.50 metre yachts has encouraged development and innovation to produce very special monohulls; a hotbed of yacht design progress years ahead of conventional Rule-type yachts - and this has carried through to the Open 50 and 60 monohulls which appear just lengthened and enlarged versions of the 6.50 metre boats. But aside from Taylor's short handed *Castaway Fiji* and Elliott's wing masted schooner *Primo*, New Zealand has been slow to become involved in this field of single and double handed yacht types. Here the tradition of team appeal has been dominant and there has been a fixation in match racing and Americas Cup - also for many years there has been harsh peer criticism of short handed sailing and this has also stifled development. Even Greg Elliott disparaged the 6.5 metre designs calling the few French and New Zealand boats built here, "Crazy, expensive Mullet boats."

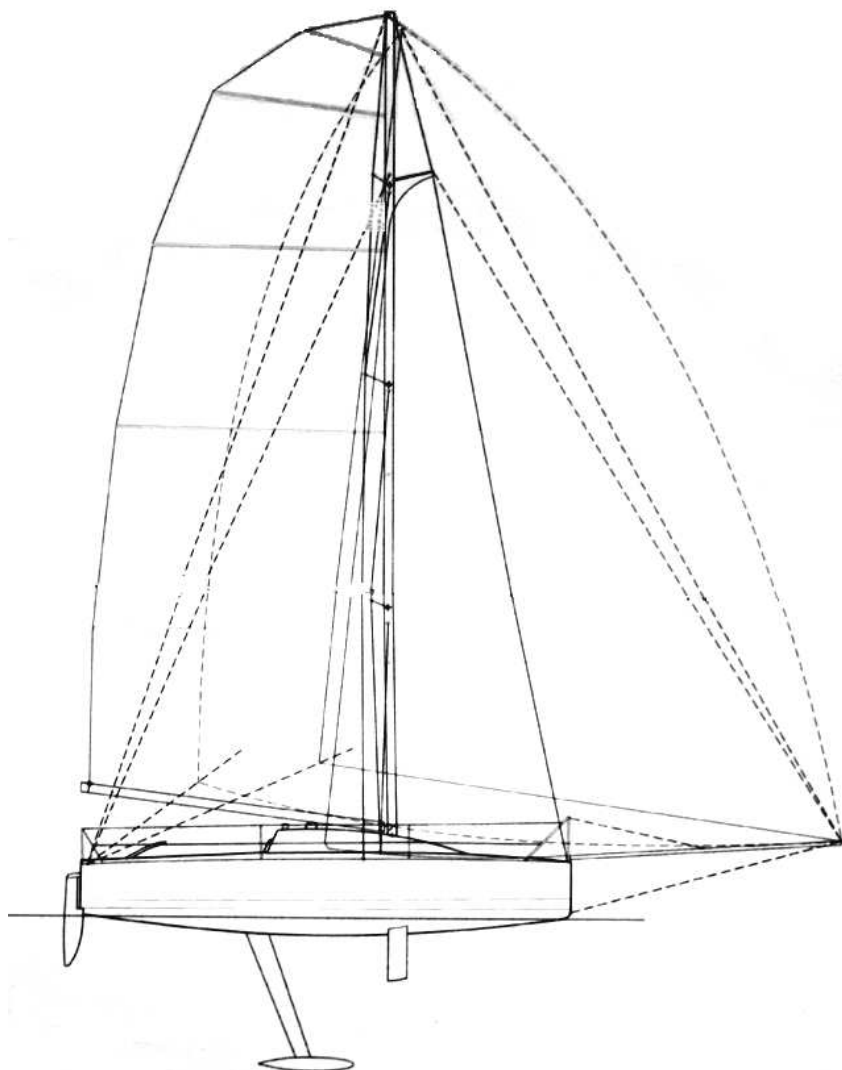
Chris Sayer, undeterred by negativity, completely self motivated and an Auckland exponent of the 6.5 Class, built on his own three 6.5 designs, the first being *Navman*, a strip planked cedar boat with an inclining keel (a Sayer stipulation), a design from formerly traditionalist John Wellsford and in which Sayer came out of nowhere to take third overall in the 1999 Mini Transat. The next two boats were from Brett Bakewell-White. Two boats because the second 6.5 was lost in the Tasman during trials when the boat collided with something solid and ripped the keel off. Undaunted Sayer, upon stepping ashore from a rescue ship, immediately began building a third from the same mould, working long hours and losing weight from his already slim frame, to get the boat launched in time for the 2003 Mini-Transat. However last minute rule changes in France made his Southern Hemisphere qualification ineligible so the determined Sayer was forced to sail the race as a wildcard entrant, hence the boat name *Wildcard*, to gain another (but unofficial) third place. The French press, somewhat sympathetically named him *Chris le pirate*.

Before race start the US web site *Sailing Anarchy* took Sayer's side and published well meaning but biased anti-French criticism of race establishment perfidy - (this was during the time of the simplistic "you're either with us or against us" attitudes promoted by President Bush concerning the US invasion of Iraq and resulted in France being perceived by mainstream US media as almost an enemy, an attitude that even rubbed off on the anarchist site (how anarchic can it really be?), this forced the diplomatic and outwardly easy going Kiwi to suffer a difficult time in France – especially as his boat was observed in pre-race competition to be among the fastest, if not the fastest, in fleet.

Compared to the carefully constructed cedar core *Navman*, *Wildcard* was built (again expertly by Sayer) in the latest technology foams and laminates and was therefore very light at 870 kgs, fully 200 kgs lighter than the

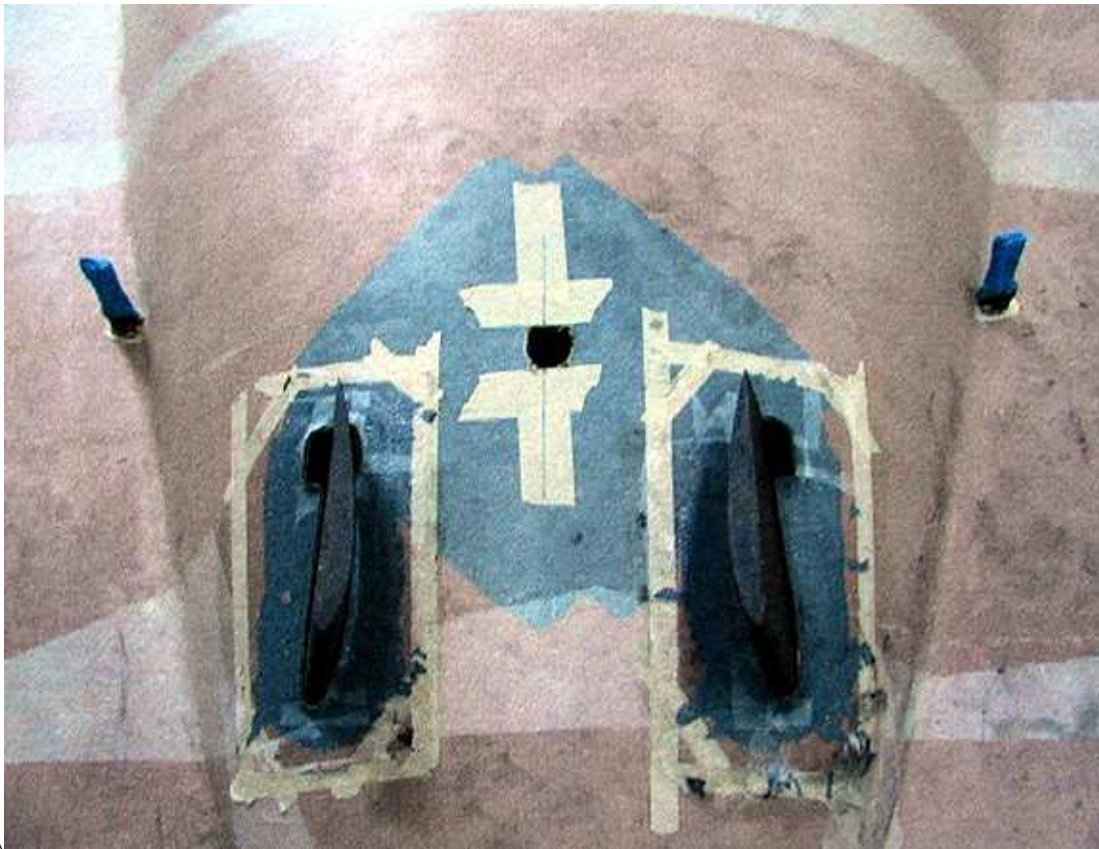


previous page: *Wildcard* lines and self righting test – below: *Wildcard*'s large rig and canting keel profile



first boat; this made for an easily driven hull and also one that was less likely to bow bury when reaching and running hard; whereas in similar conditions *Navman* had a tendency to slow up and stop - and even though *Wildcard* had a taller, big roached and more powerful mainsail, the boat kept its fine bow up and sliced on through waves. *Wildcard*'s masthead/forestay rig designed by Chris Mitchell was novel and different and allowed a high roach headsail to be carried – also a Mitchell designed tweaker system was used to bring the the masthead halyard to be brought down to three quarter height when using the smaller headsail – this allowed only one halyard to be carried, reducing weight aloft. Sayer observed in the top ten finishes in the race, all were quite different, some radically different but that in the end all boats seemed to have a similar performance and finished close together.

Mini- Transat designs are sometimes called porcupines because of the number of appendages protruding from their hulls and *Wildcard* was no exception and Sayer, being fascinated by foil design and positioning remarked that in certain fast sailing downwind conditions, *Wildcard*, with its keel inclined at its maximum to



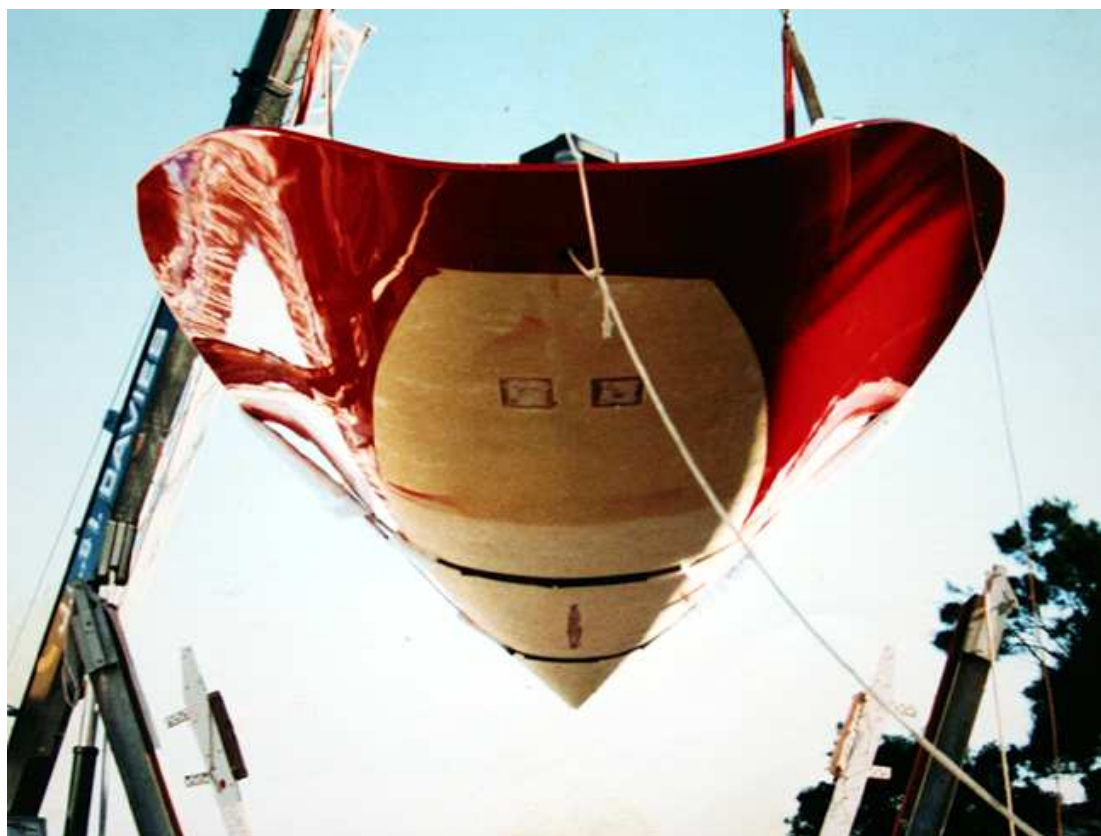
Wildcard's angled asymmetric foils set in the forward sections of the hull

windward, would, if the boat was heeled to leeward by a rolling wave, suddenly lift up and plane to even greater speeds on the near horizontal canted keel, the bulb almost breaking the water surface. Now he is thinking of fitting curved, inclined foils through the hull bilges on his next boat (be it a 6.50 or an Open 40, 50 or 60) to further enhance this performance gain.

44. Maximum Elliott

ADAMANT BEFORE THE RACE that his two mast rigged *Elliott Marine* would win the Melbourne/Osaka, Elliott was completely devastated when the yacht was beaten by the Australian design *Wild Thing* – as a result one would have thought that Elliott would have learned not to make grandiose predictions before events occurred - but he still retained his enthusiasm for his own boats and announced it emphatically when he, and Clay Oliver, designed the maxi monohull, the 100 foot *ICAP Maximus* for Bill Buckley and Charles St. Clair-Brown. This somewhat dream-like commission (in that it was for a virtually unrestricted, monster racing machine) a lightweight maxi built in carbon fibre with a canting, retractable keel and a rotating wing mast, huge sail area, and which was launched, after being expertly built by Cookson Boats, with some hoopla and retrospectively, some over-inflated optimism.

Elliott however, has been absolutely correct in his attitude to rating rules announcing, in words to the effect, that if you do the opposite to the rule's intention, you will end up with a fast boat - and added there seemed to be almost a conspiracy from rule makers to encourage slow boats. Well, New Zealand designers have heard that before.

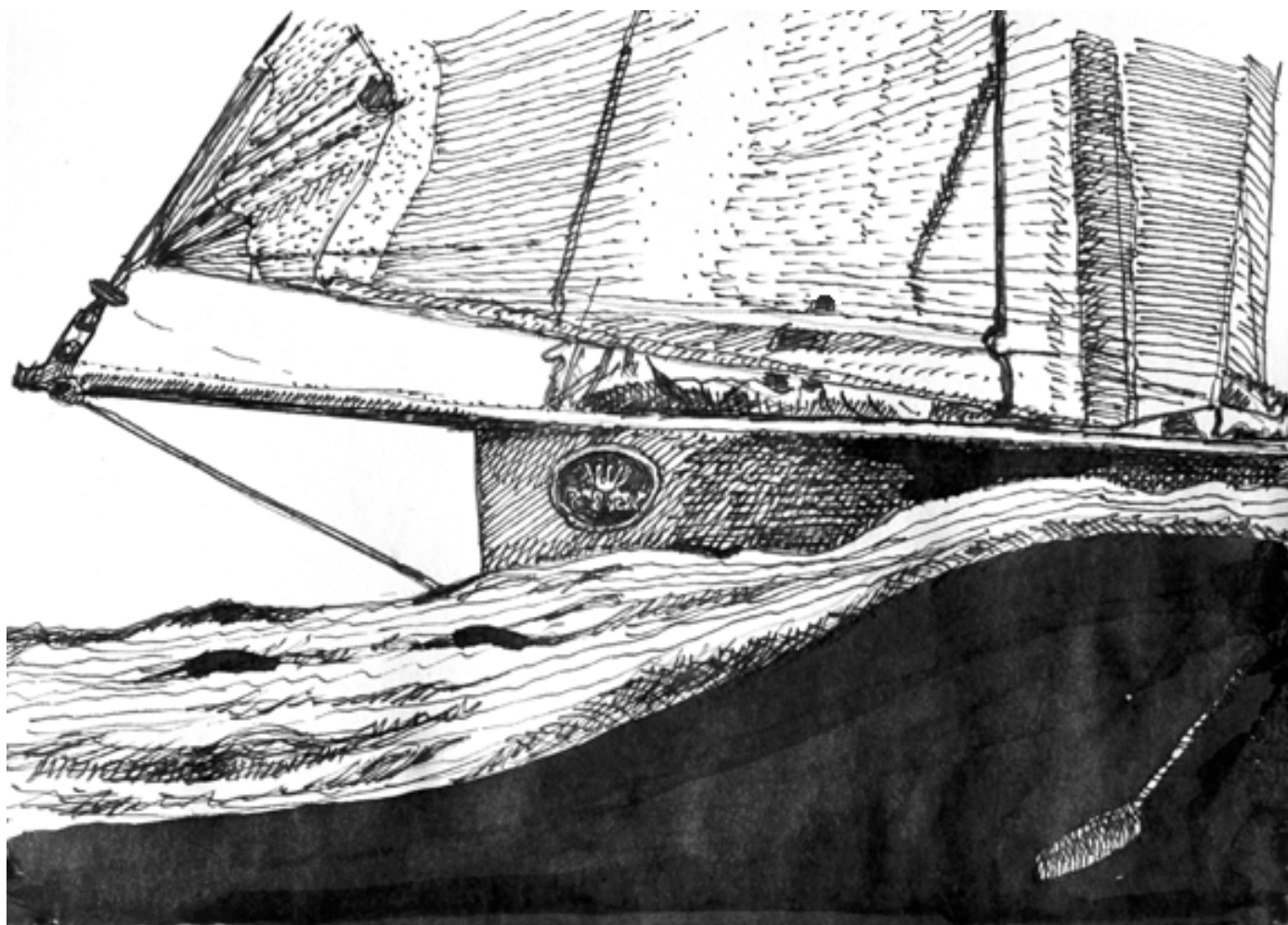


Extreme hull flare on Young designed Rocket 40 BuckleUp

Arnie Duckworth

Oliver and Elliott had teamed up before with Philippe Briand when they designed 140 foot *Mari Cha IV*, which became the world's fastest monohull. *Maximus* therefore had similarities to *Mari Cha IV*, both were huge except that the two mast rig on *Mari Cha IV* was fixed while *Maximus* had a single rotating wing. The smaller yacht had a leaner look with a very fine bow and very narrow waterline beam while both boats flared to wide decks; this was something that had started with Whiting's *Newspaper Taxi*, Wagstaff's *High Spirits* and which became extreme on Young's Rocket designs 25 years earlier. Elliott too had early flared hulls with his large 55 foot *Future Shock* and it has been a hallmark of his designs ever since. Young made comments that he did not see the point of flared decks on large yachts like *Future Shock* in that crew weight on the rail had little affect on the righting moment, whereas smaller, lighter yachts like *Taxi*, *Smackwater Jack* and his Rockets, gained considerable power with crew weight stationed there. However Elliott's *Maximus* has a flared hull and wide deck primarily to keep dangerous white water off and most importantly, to provide a wide staying base for the wing mast. Elliott explained, "I was looking for more reserve stability in the hull so that when it was hard pressed it would gain volume. Sure, you get an increase in drag, but the stability goes up accordingly a better boat at sea when driving hard because that gives you more lift."

His approach to staying the wing mast was simple three point, like that developed earlier by wide beamed multihulls - but Elliott had the foresight to see there was no reason why these rig types could not be put on monohulls. French Open 60 monohulls like Yves Parlier's *Aquitaine Innovations*, had used such setups but Elliott was the first New Zealander to use them here on monohulls *Excess* and *Sneaky Frog*, double wing masted *Primo* and single wing mast *ICAP Maximus* plus his own latest boat, the oxymoronically named *Kiwi Coyote*. In terms of complexity, Elliott argues, "A simply stayed wing mast is far simpler than that of a multi-stay



arrangement seen on an IMS boat with all the rig tension and compression that goes with it.” But traditionalists consider wing masts frighteningly modern, unreliable, complex and unsafe (same with canting keels) but they must speak quietly for all mast types can fall down; unfortunately that is what occurred twice to *Maximus*.

Keel placement on Elliott’s recent designs is also different; they are placed in the back third of the hull profile the reason being to provide fast reaching and running performance; to get good upwind speed and pointing he places a canard forward of the mast/masts.

St. Clair Brown said, “We wanted a maxi yacht with the maximum righting moment and a very high power to weight ratio, a boat that would be fully powered up in low speed winds.” And so the team spent many hours pouring over Clay Oliver’s velocity predictions (VPP) - St. Clair Brown remarked that they would not have built the yacht unless they were happy with the results. The keel could be canted to 50 degrees providing enormous righting moments (most canters go only to 40 degrees) and also could be retracted to reduce its considerable draft of near 20 to 13 feet. The forward canard had a trim tab on the trailing edge to further improve windward performance. The 128 foot double spreader wing mast could rotate to 60 degrees on either tack. Elliott has always been very secretive about weight, sail area and measurement figures for his yachts, rarely to never publishes information, just describes the designs as “very light” or “the boat is a bullet” or “most technically advanced yacht” and such like - *Maximus* was no exception - but because the design made an impression throughout the sailing world, sail area and displacement figures have proudly slipped out.



Canting keel problems for *Maximus*

One hundred foot *Maximus* raced 142 foot *Mari Cha IV* in an Atlantic Challenge race soon after launching with the lead swapping back and forth between them; when the wind freed *Mari Cha* had a 20 mile lead and, according to Richard Bouzaid who was aboard *Maximus*, they chased hard, gennaker reaching at speeds between 20 and 28 knots, then when it came time to reduce sail, they had keel canting problems resulting from faulty electronics and as they struggled to lower the gennaker, the wind and sea suddenly built until *Maximus*, now with a jib top, was surfing at 30 knots. At the finish *Mari Cha IV* crossed the line at the Needles four hours ahead but owed 14 hours to *Maximus* on time.

In the light airs 2005 Fastnet Race *ICAP Maximus* was outstanding, sailing so efficiently that the boat created her own wind even in glassy conditions and continually stretched her lead over the closest competitor, the other 100 foot maxi, Australian *Scandia Wild Thing*, to take line honours in the 600 mile race finishing 15 hours ahead of *Scandia*. Later *Maximus* set a monohull Round the Isle of Wight record.

So the big yacht was living up to expectations. At 2006 Cowes Week they came up against the new Volvo 70 *ABN AMRO ONE* designed by Juan Kouyoumdjian, which they managed to beat, but only by a narrow margin. St. Clair Brown remarked later that he was astounded by *ABN AMRO ONE*'s performance and correctly prophesized that nobody would beat her in the upcoming Volvo Round the World Race. But he took an unusually conservative stance (considering he was on an avant garde design himself) with his comment that, "It's just a complete anomaly, it's just a disaster for IRC and crazy for yachting and I think Mike Sanderson will be the first to admit that when you get a situation like this with a boat such as *ABN AMRO ONE* that's winning by such a ridiculous margin, it does the sport of yachting no good at all."

Kouyoumdjian would perhaps have astounded St. Clair Brown even more after the race when he stated in words to the effect that the Volvo 70 designs would be even higher performance if they hollowed out the canting bulb and turned it into a hull. But maybe not, St. Clair Brown knew about multihulls having raced a Tornado and previously owning a large Crowther trimaran. Further fuel was thrown on the fire when Bill Lee, designer of the famed Transpac lightweights announced that big cats or tris would be a better choice for the race by being safer to sail for the crews, plus being faster, than the V70's.

However today *Maximus*, after expensively losing one complete rig and then later, dangerously breaking another in the 2006 Sydney/Hobart and injuring a number of the crew in the process, is for sale; perhaps because of the huge expense of campaigning the boat but also because yachts like the very high performance Volvo 70's, although some examples suffered keel problems, have nevertheless stamped their extreme machismo position onto world yachting acceptance, while newer but less extreme and with less flair Reifel Pugh 100 footers have overtaken, or perhaps because of winning performances, even dated the somewhat unlucky, radical *Maximus*.

Latest news has it that Buckley has bought out St. Clair Brown's share of the yacht and the boat, back in Auckland in Lloyd Stevenson's shed, will be re-equipped with a new fixed, conventional mast while two new, fixed depth, canting keels will be built, a 5 metre one for delivery and a deeper 7 metre draft one for racing. And although the problematical wing mast will be gone and the fixed rig more reliable, the move is however retrograde - the high performance IMOCRA 60 monohulls have perfected wing mast rigs to the point where they are considered normal in fleet - and perhaps more perseverance was required for *Maximus* because the fixed rig will be less efficient than the aerodynamic, pivoting wing mast setup. However the replacements of the original lifting and hydro dynamically draggy keel (from the ill fitting telescope junction) will undoubtedly be an improvement.

45. strange machines

WHEN ROB DENNEY, a New Zealander living in Australia, was looking for new approaches to rig designs and technology in masts, he wrote about his enthusiasm for unstayed Aero type rigs from the UK (a long main boom which extends forward around a mast socket and continues on to headsail tack) and he was pleasantly surprised by the positive interest his article produced – but also was equally surprised by the strength of the negativity expressed by some designers, spar manufacturers and sailors. To them this rig was anathema because it threatened their businesses, also it was highly unconventional and looked dangerous and required radical changes of thought to handle the new concept. But it was not really new. The balestron rig was used by a number of French designers in the 1970's and '80's: Paul Lucas on his attractive racing 5.5 metre monohulls and Phillipe Briand with his revolutionary 75 foot *Elf Aquitaine 11* catamaran - which was equipped with a frighteningly large chord balestron/wingmast setup. Elf was second boat home in the 1984 Transat much to Pajot's disappointment but later set a Mediterranean record crossing. Also the astonishingly experimental large proas of Guy Delage appeared at this time with balestron rigs. However the Delage and *Elf Aquitains* rigs were stayed conventionally (albeit with a complex system of movable shrouds and stays) whereas Denney was inspired by the later Aero rig cruising yacht interpretation because it was unstayed and devoid of any rigging. However the Aero rig's inability to carry spinnakers or large reaching sails was one of the many reasons that annoyed racing sailors used to conventional yachts. Also this rig design meant that less crew was required to sail the boat and this did not appeal either - short handed or solo sailing in that period was always considered too far out in left field for many yachtsmen. Denney called his adaptation of the free standing balestron rig the easy rig because Aero rig would not license their technology to him; this was very fortunate he remarked because their adaptation turned out to be half the weight of the original UK design.

In New Zealand Arnie Duckworth (from Adhesive Technologies, called West System in those days) had a tall 52 foot unstayed wing mast placed in his 32 foot Beale designed monohull *Westpoint*; this too was looked at with suspicion. And perhaps rightly so for the reinforcement built in to the canter levering support mast area produced a very heavy rig – although Duckworth defended his design claiming that a conventional rig with wire rigging and spreaders, would weigh the same, almost. A number of his friends disagreed and thought the boat very unpleasant to sail because of this excessive weight aloft. Later Duckworth had the rig shortened (it actually broke while motoring into waves) and then sailed it across the Tasman to Sydney where he had established another West System factory, somewhat quieting the nay sayers.

Denney, who worked for three years at West System's and knew Duckworth well, understood these problems and looked further into placing a minimalist lightweight, (read carbon) simple rig on the most minimalist of fast yacht designs: the proa. This multihull type, compared to the avant garde of racing multihulls, the 60 foot ORMA trimaran with its towering wing mast, huge sail area, high technology construction materials, its sophistication and complexity, has also, of course, extreme cost. Only a wealthy few of world sailors, or large corporations, could afford the expense of building and maintaining such a boat. Whereas the proa and its unstayed rig, placed on a small dimensioned, (yet still long platform) was what Denney aimed for: less weight, less sail area, less load, less drag, less winches, less crew, less cost and most importantly, high and easy speed. At the end of the day the proa is the lightest and least material carrying multihull, therefore it has the potential to be the worlds fastest as well. Denney built a 7.5 x 5 metre version for his first foray into this new design field: the rigged, empty boat ended up a very light 130 kgs whereas a similarly sized Farrier 25C trimaran (itself quite a light boat) weighed half a tonne. Denney also parted from the norm (if you consider a proa normal) by placing the rig in the longer leeward hull and the accommodation in the shorter windward one – it was still a flying outrigger-type platform but the weights were now divided 60/40% between the two hulls: that virtually ruled out

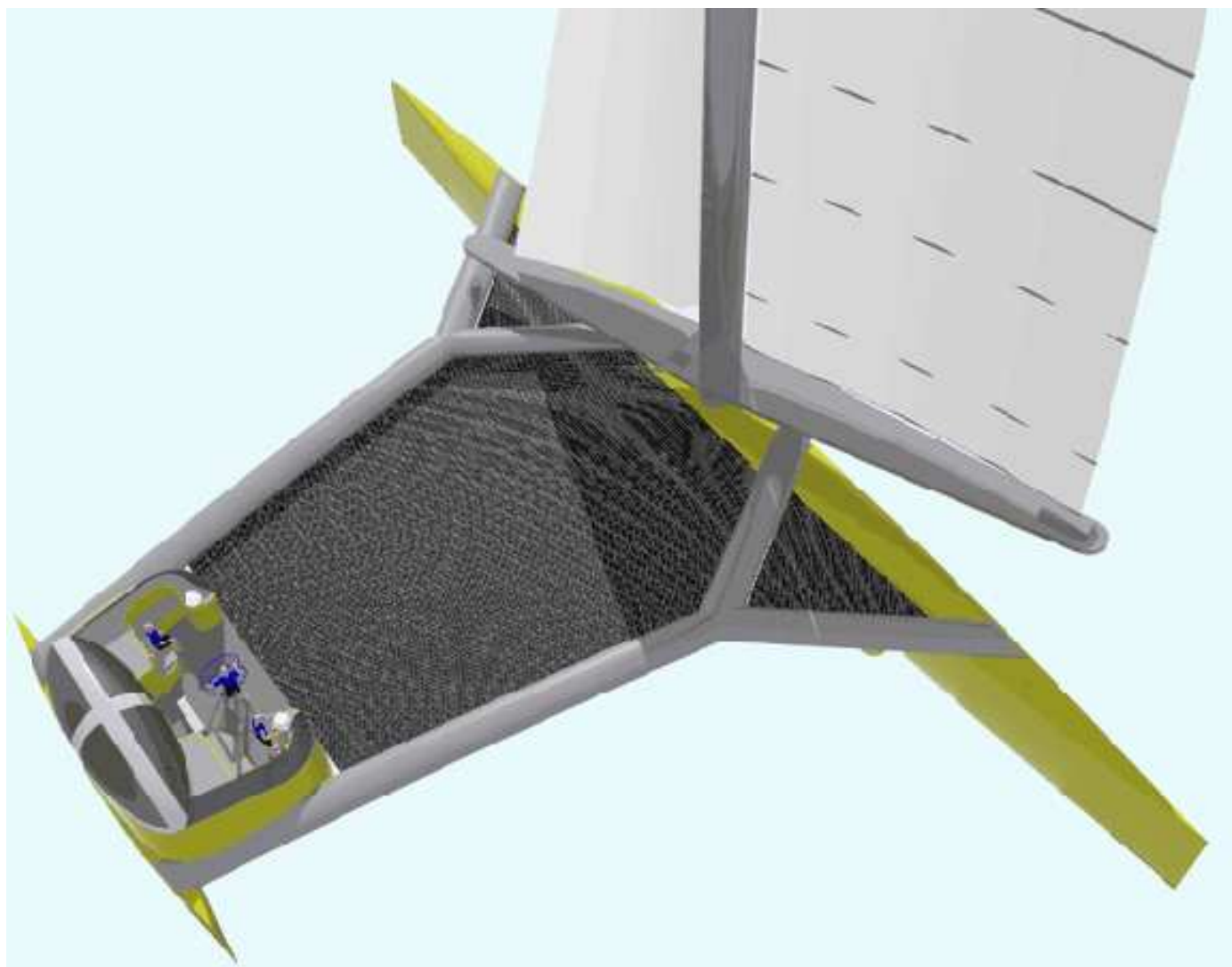


Freestanding wing mast on Arnie Duckwoth's Beale 32 *Westpoint*.

the capsize problem from being caught aback; it also considerably reduced capsizing over the leeward hull because of the crew/accommodation weight in the flying aka. A true Pacific flying proa (with traditional athlete crew) has a displacement distribution of 75/25% making it have far less righting moment (and more likely to capsize) than Harryproa and hence, less maximum speed potential. This capsizing problem has been an inherent one in the past with proas and probably the main reasons they have not gained in popularity. Also to Western eyes, proas look strange machines, difficult to comprehend, plus they have received considerable bad press over the years and are still considered Pacific heathen contraptions by the majority of Western sailors. But today, with sailors looking at and accepting different hull design configurations, this attitude may be changing. The first successful Western proa (the Pacific Islanders had of course, perfected the proa many centuries before) was Dick Newick's famous *Cheers* which came third in the 1968 OSTAR. Unlike the Pacific outriggers which usually carried their small floats to windward and had their crew and accommodation plus the rig set on the large leeward hull, Newick's *Cheers* had the opposite of Polynesian designs: accommodation and twin masts set in the larger, but same length windward hull and her float to leeward. Newick was naturally concerned about capsize and his boat with equal sized waterline hulls was similar to a catamaran but with the rig placed on the windward hull instead of, like a cat, in the middle of the connecting beams. For the caught aback problem with proas, Newick had a sponson built at deck level beside and part of the accommodation hull – if the boat went over, this high buoyancy area halted the boat inverting. But Denney broke into new territory with his clever and unusual layout placing accommodation in the smaller outrigger float. It seems an obvious solution to increasing the righting moment and power by having this extrapolation of an ancient Pacific design. Indeed all recent proa configuration speed record designs are like this, steering, rig handling and basic accommodation in enclosed cockpits in the small windward hull.

For generations there has been animosity set up between monohull and multihull sailors, then for a short IOR period in the 1970's, centreboarders against keel boats, then there has been a division between catamaran and trimaran, (but this has been low key and mostly humorous) lately there has been keelboats against canting keelboats (which has become vitriolic) - but the factions between the differing proa designs has escalated to a point far more intense than the other categories put together, proa against proa, almost like brother against brother in a civil war. The differing schools of thought intensified between the "traditional" Pacific flying proa platforms with their wire stayed rigs from Russell Brown in the US (not the Atlantic leeward proas like Newick's *Cheers*, although even their advocates thought Pacific designs dangerous and voiced it) - and the Denney-type Pacific proa called Harryproas from Australia with their accommodation weight in the outrigger hull while having the unstayed rigs in the longer, but uninhabited main hull. Although the differences sound slight they are in actuality very much different. Denney considers traditional Pacific proas, although works of art, only suitable in warm latitudes and that they necessitate great expertise (read Polynesian/Micronesian/Melanesian athletes) to sail, and strongly advocates his own designs as a far better solution. Having confronted the US camp with this commentary, his dry humoured, practical and anarchic school of thought has infuriated them. Perhaps the most damning for the US proas is that their guru, the very skilled Russell Brown, (son of famed trimaran designer Jim Brown) who has ocean travelled extensively in his 36 and 37 foot Pacific proas *Jzerro* and *Kauri* has, after originally writing in *Wooden Boat* that his proa designs were suitable for ocean crossings, now backtracked and refutes earlier claims. He does not recommend that they be used for this purpose. The largest problems seem to be the old capsize bugbear and having to reduce sail at night (plus shifting ballast to the windward float) with the added danger that the rig could come down in an accidental gybe while running, hence the dropping of the main at night for safety. The rig is naturally stayed on both sides





above: Denney's unique Pacific proa platform with free standing wing mast balestron rig on a proposed 33 metre design
 previous page: an Atlantic proa, the altered Newick design (disowned by the designer) the 55 foot *Eterna Royal Quartz*

of the platform but the leeward side is from the sponson but this is too narrow based for mast staying solidity. However Russ Brown, completely in tune and vastly experienced with his boats having designed and built them, feels there are few sailors capable of keeping his proa type on its feet and the rig erect. Therefore now he discourages others from taking his designs offshore - and hence the result that there are small numbers of his sailing designs in existence.

On the other hand the secure and safer to handle, freestanding rig Harryproa models are quite popular, relatively proa speaking, with examples sailing and being built in a number of countries - and Denney has let this be known Anzac style, pointing out US Pacific proa design deficiencies - to the horror and disgust of the somewhat spiritualistic Brown proa advocates.

There are two difficult and inherent problems with a two way proa design: the hulls have to be mirror images fore and aft (true canoe shapes) and this does not usually lend itself to the best designed hull for speed or reduced pitching, but there are solutions. A proa does not have to tack, it changes ends, therefore the hulls need

little or no rocker (on the Denney designs) and that design shape reduces pitching. With pitching reduced the typical multihull broad transom is also unnecessary and as a fine proa hull passes easily and quickly through the water anyway - so speed is hardly affected. The stern squatting of conventional multihull shapes can be countered by having very light displacement and the rigs and foils close to or centred in the hulls. Similarly to the symmetrical hull, the rudders have to go both ways and that means either ogival sections (same fore and aft mirror cross section) which again is not as efficient in terms of proper foil shape - or alternatively, the rudders can be made airfoil but must be able to turn 180 degrees or, alternatively again, the rudder not in use can be lifted. Shunting proas with too many adjustments requiring to be made during course changes, (remember the sails have to swing through 180 degrees too) makes the movement complicated - everything has to be done correctly at the right time otherwise the Law of Murphy arrives. Denney's solutions have been arrived at through hard won trial and error. Shunting on his designs now can be made almost as fast as a conventional yacht tacking. To many people however, his unique platform design on his successful cruising boats produces a craft that appears very strange and odd looking, almost ugly (enthusiasts disagree stating that with time this vision will change) but the same platform concept on his sleek racing designs looks elegant and almost Pacific outrigger traditional, albeit a modern streamlined version.

Of particular interest is his 15 metre (50 foot) single handed race design. This boat is nearing completion and has some very impressive figures in terms of lightness (550 kgs), wetted surface areas and power to weight figures (Bruce number for empty boat of 2.3), yet the sail area is not large nor the mast very tall - so there is little chance this boat will be a slow performer. His unstayed rig is a carbon wing mast (a successful specialization of Denney's) with a single high roached mainsail, no headsails - but Denny has designed and engineered the mast to be height adjustable; the top half can be telescoped over the lower section to reduce windage (and sail area) in heavy wind and sea conditions. This sounds an excellent idea but also perhaps, a little scary to implement. However the clipper ships did it so why not? And Denney is not afraid to experiment and not afraid of failure either. If the telescoping rig does not work out, he will find another solution.

The long leeward hull carrying the mast has two rudders set close by on the beams with no connection to the hull; they can kick up in both directions and can be lifted vertically and still be steered; interestingly the after one is lifted while the forward one steers. This hull, because it has little or no rocker and is very narrow, does not require more than one foil to reduce leeway. Denney likes his steering/foil solution but admits that there is some turbulence set up by waves and also accepts there are tip losses from the surface piercing appendages. But it is a workable, safe and non-complex solution to the proa problems of rudder placement and design shape.

46. folding Farrier's

Cheekie Monkee from the Pacific Northwest was not what New Zealander Ian Farrier had in mind when he designed his unique line of folding, cruising trimarans. In fact he was slightly horrified. All his designs performed well because they were quite light trimarans but they were geared for the family type boat owners who wanted to go beyond monohulls but were concerned with safety and did not want to be frightened by multihull capsize problems. And because Farrier was/is a perfectionist, a meticulous plan maker with a philosophy geared towards moderate performance and comfort aboard his boats, the serendipitous result was that, simply because they were trimarans, they ended up as fast sailors. However *Cheekie Monkee* was something else. Farrier had an excellent reputation from his production boats and was concerned that this hotted up version of his F31, might sink this carefully gained reputation like a lead keel so he pointedly made sure that people knew this was a boat that was not his design anymore.

Farrier came from an engineering background but had dropped out of university to go sailing on a lengthened Piver Nugget, adventurously singlehanded it up to Auckland from Christchurch. Later having an



Cheekee Monkee's foil overpowered broken beams and detached float

unpleasant time aboard a cruising monohull he realized he would have been better off sticking with his tri. But this was 30 years ago and an infamous period when a number of multihull disasters had occurred with capsize and broken beams and as a result, loud mainstream and rabid nautical media coverage. However Farrier, yet again another New Zealand autodidact with no formal yacht design training, knew that trailerable monohulls could also capsize, swamp and sink and felt strongly that there was a market for a well designed trailer trimaran and began working on his own design. He was critical of the structural weaknesses in John Westell and Arthur Piver folding trimaran versions and started making models of folding parallelograms, then built a prototype 18 foot tri incorporating his folding ideas. Having spent long hours perfecting his folding mechanism he knew he was on to something and because he jealously guarded his secrets, patented the design - the thought of people copying was particularly abhorrent to him. Farrier prides himself on producing very detailed building plans sometimes spending a year on finalizing one set, therefore he is very critical of other designers' plans, calling them inadequate and, because he is so meticulous in drawing up his own and covering all questions a potential owner may ask, has the advantage of very few of his designs being modified. This has resulted in a Farrier folding



top: Farrier tri being unfolded at sea – above: Farrier's latest all carbon race trimaran, the F35C undergoing early trials

tri being instantly recognizable. After the success of the 680 and 720 he moved to the US where Corsair Marine produced over 450 F27's – later refinements produced the F9A (F31) and F25, both being extrapolations of F27.

Cheeky Monkee was a Catch 22 version of his F31. Farrier had been scathing in his criticism of high performance multihulls saying that this was “something anyone could do and to get a fast boat - you just put on a large rig, build lightweight and have no accommodation, plus also suffer the ease of capsize and have no resale value too,” Actually some courage and conviction is required to build such a craft - remember Jim Young's comment: “Everyone wants sports cars but invariably, once the real decision time comes round, they end up with family saloons.” Farrier nevertheless hypocritically denounced *Cheeky Monkee* and others like it but also worked on it at the same time, building new carbon beams for the boat. Nautical web sites were quick to point out this discrepancy and posted pithy comments along with images of *Cheeky Monkee* with one float torn off and parked at a marina. Apparently the angled foils provided excessive lifting moments in fresh winds and seas, snapping the float at the junctions of beams to floats. Some heavy weather images show the trimaran being driven very hard and sailing very fast with plenty of sail aloft and with the boat taking a savage beating – so it is understandable that things begin to go pop. Since people were breathing heavily on his designs (and making mistakes), Farrier produced, after many months of his usual rigorous research and design development, an all carbon, high performance F35C to counter the bad press resulting from *Cheeky Monkee's* breakage; the new design looks a formidable, expensive craft, low wooded, greater beam proportionately to his earlier design, tall, rotating wing mast, large sail area and other high performance solutions of which he was formerly very critical.

Conclusion - Brett Bakewell-White

What a fantastic period of yachting development, the likes of which we will never see again. Volvo 60's and 70's seem like an obvious extension of the New Zealand school and there is absolutely no doubt that the 60 class was completely dominated by Farr. His recent Open 60 "Virbac" is also showing tremendous promise.

The NZ school must mention the likes of Kevin Dibley, Ian Vickers, and Steve Thompson, who continue with the dinghy concept and are now selling and building worldwide - maybe not quite the innovators of the earlier period, but definitely disciples. I think that the advent of the computer has meant that the days of breakthrough schools of thought are pretty much gone.

The other area is the New Zealanders at the forefront of structural design, High Modulus and SP Systems rule the world of marine composites, all kiwis. Adhesive Technologies Chris Timms and ATL's Arnie Duckworth introduced ground breaking resin systems and new lightweight building products. These guys may not be designers in the pure sense of the word, but they are responsible for the designers being able to refine and pursue their ideas to the limits. The reality is that boats have now become so complex that no one designer can produce a complete boat now and these consultant designers have become an essential part of the design process - along with the specialist spar designers, systems designers, and occasionally the aero/hydrodynamicists.

Perhaps one of the most ironic twists is that the kiwi designers that terrorized the establishment with their designs of the 1970's are now well and truly the 'establishment'. It is also perhaps strange that Farr with all his success has continued to pursue the lightweight concept in the Americas Cup class - and this has failed, whilst Davidson, who was the first to go long and heavy, succeeding in the zone that they had earlier rebelled against. Davidson was employed by Farr during the NZL20 campaign and he recommended the long and heavy approach, but Farr rejected it and pursued the 'skiff-on-steroids' approach. The failure of NZL20 in the heavy displacement Americas Cup is I feel a valid commentary for this book as well.”

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