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# The Russcraft 7

## *A day yacht Down Under*

by John D. Little

Pittwater is a spacious natural harbor situated about three hours' sail north of Sydney, Australia. The eastern shore is crowded with houses, yacht clubs, and marinas. Half a mile across the water, the western side rims the vast Kuringai National Park. This is untouched wilderness, save for a half-dozen tiny communities dotting the water's edge. At the southern end of Pittwater lies Scotland Island, home to a thousand souls. The only way to get to these places is by water. So, those who choose to live there generally have an uncommon love of boats.

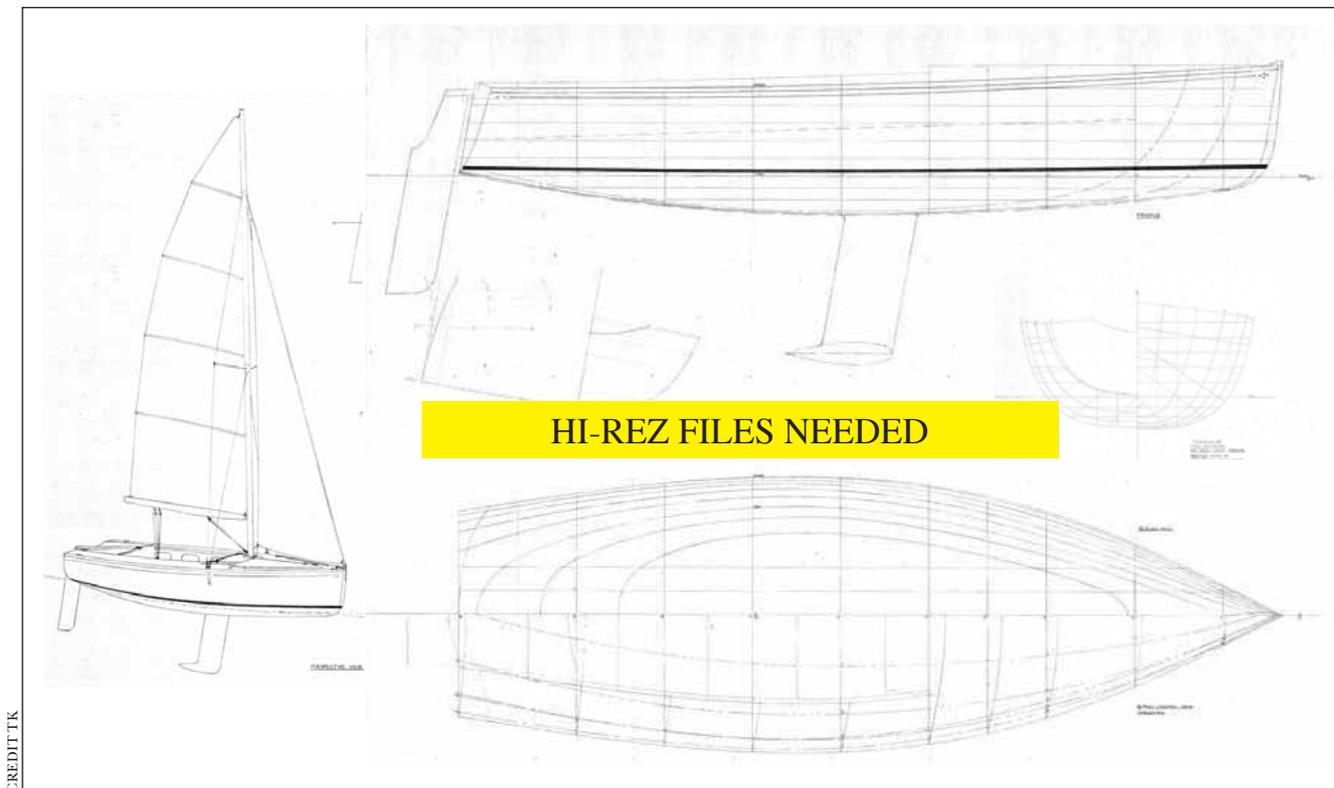
Greg Roberts has lived on Scotland Island for 15 years. He's sailed and built boats all his life, including canoes, rowing sculls, sailing dinghies, and his

outboard-powered commuter boat. All of his boats are made of wood. Once a week Greg has been crewing aboard a Jubilee-class sloop in an informal 'round-the-buoys series. The Jubilees are 18' open centerboarders designed in 1935 as one-design racers. They're lovable, but no match for modern boats. While Greg has enjoyed the Jubilees, at about the beginning of the new millennium he began to ponder the idea of building a day-sailer of his own—something like a Jubilee, only much faster, with more room and “something where I wouldn't get my head knocked off every time we go about.”

Originally he sought an existing design that fit his criteria. He wanted a hull of lightweight, strip-planked construction. The boat would be fast, so as to perform

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well in club racing, but traditional in character. She could be built by a skilled amateur. And she'd be fitted out to be easily sailed with one or two people, but able to take six to eight people on a picnic.

He was attracted to the Tofinou, a French-built, 23' (7m) replica of a 1930s daysailer. He tried to locate plans, but they weren't available to individuals. Then his daughter returned from visiting a boat show in Italy with a brochure for the Bénéteau 25, a one-design racer designed by Bruce Farr. This boat and the Tofinou are wildly dissimilar, but each had elements that Greg sought. The Tofinou is a heavy centerboarder with a traditional canoe body. The Bénéteau is a lightweight rocket ship with a bulb keel and no pretensions of classic beauty. Greg brought these divergent ideas to the Sydney-based designer David Payne.

David had already designed two of Greg's boats: his commuter and one of his two sliding-seat recreational sculls. "Often people have a list of things that are mutually exclusive," says David. "Someone has to draw a line in the sand and say, 'This is what can and can't happen.'" He told Greg that the Tofinou would sail somewhat like a Jubilee. If he wanted higher performance, the boat would have to be lighter. That was fine with Greg, but he still wanted what he likes to call a "day yacht"—a nicely finished wooden daysailer, about 23' in length, that would have classic looks and sail fast.

Initially the boat was to have a centerboard so that Greg would be able to haul her out on his small private

slip. David played around with some drawings, and right from the beginning began to encounter stability problems. "You've got to get lead into the boat to make it stable, and that was proving to be difficult." There was also the question of how the board would be raised and lowered. The usual block-and-tackle arrangement was out because Greg required that the cockpit be free of a protruding case. There would thus be nowhere to attach the lifting apparatus. They explored the idea of hydraulics, but the fearsome expense, plus the potential for things to go wrong, were a deterrent. The final blow to the idea came when they calculated it would take 192 strokes on the hydraulic pump to raise the board. Greg had once owned a 22' daysailer that took 49 pumps. "That was manageable, but 192 is just ridiculous," he says.

David suggested that Greg would probably haul out only once a year, and that he could use the Travelift and hardstand at his yacht club. And so the centerboard was scrapped in favor of a deep fin keel, shaped to a precise foil section, with a bulb on its lower end.

The boat is powered by a fractional sloop rig, with swept-back spreaders doing away with the need for a backstay and runners. Why? "It's the look of the thing more than anything else," says David. "It would look out of place with a masthead rig. It's almost a golden-mean thing getting the look right," he continued, referring to the classic architecture principle. "If the jib is too high it looks wrong, and if it's too low there's too much main. I arrived at it by drawing the rig a couple of times

## Paulownia

**N**amed in honor of Queen Anna Pavlovna of The Netherlands (daughter of Tsar I of Russia), the Royal Princess tree has been known to westerners for more than 150 years. It is native to China, and now more commonly known by its botanical genus name of Paulownia. Until recently the tree was planted primarily as an ornamental flowering tree. In the U.S. *P. tomentosa*, the most cold-tolerant species, was widely planted in the mid-Atlantic states. When I was the wood analyst at the Winterthur museum in the 1970s, I saw several of the trees that Henry Francis duPont had planted decades earlier on this estate near Wilmington, Delaware. Over the years, Paulownia trees “escaped” from cultivation and became naturalized in the region. They were magnets for Japanese buyers. For centuries, Paulownia wood has been prized for the construction of lightweight furniture that does not damage fragile tatami floor mats in Japanese houses.

With the growing popularity of composite construction where lightweight core material is desired, products ranging from surfboards to boats are now beginning to use Paulownia wood. As plantations of Paulownia proliferate around the world, commercial interest in this wood for particle board and paper production is also on the increase.

As with any new product, advertising hype may at times blur reality. Potential buyers may not realize that the genus Paulownia contains several species. Taxonomists, depending on whether they are “clumpers” or “splitters,” recognize as few as six or as many as 17 species. These different species have evolved to grow in varying habitats and climate zones between 20 and 40 degrees north latitude in China. Some species are strictly tropical, while others are adapted to warm temperate regions. With this many differently adapted species, wood variation can be expected. In addition,

several different species are being grown in commercial plantations in countries with as widely different soils and climate as Pakistan and Brazil (currently Paulownia species are planted in at least 20 countries outside China). In some cases the wood from particular plantations has been tested for properties, while in others the advertised properties are for wood from natural Chinese forests (or even for a different species of Paulownia). A final problem arises from the different methods used to propagate Paulownia trees in plantations—for example, seedlings vs. cuttings vs. stump sprouting. These different methods may lead to straight stems with good wood properties or to crooked stems, deformed crowns, and inferior wood properties.

Although most studies suggest that Paulownia wood has good decay resistance, the more reputable reports add “but not in ground contact.” Depending on soil chemistry and climate, some plantation wood may lack even this moderate decay resistance—although it is likely that much of the above-ground decay resistance is due to the natural tendency of Paulownia wood to resist checking and warping.

My advice for those considering the use of Paulownia in boat construction is to thoroughly research the source of the wood. Reputable sources should be willing to provide the Paulownia species, plantation source, method of propagation, and any wood property testing (preferably by an independent laboratory). You also might consider alternatives. Metasequoia (dawn redwood), another tree from China that I have covered in my Wood Technology column in this magazine, has low density, decay resistance, and only one species. Unfortunately, although some experimental plantations have been established, Metasequoia wood is usually only available when a specimen tree is felled.

—Richard Jagels

and rubbing it out until I thought, That’s about where I want it to go. Then I had to get it to balance.”

His approach to the transom was similar. He drew it three different ways, finally deciding, with the client’s approval, on a slight reverse angle. “I just wanted it to be elegant and pretty without being too overstated.”

The final drawings were the product of many weeks of discussion between designer and client. The result meets Greg’s order for a high-quality daysailer of traditional character, but modern in design, with an emphasis on performance. Ease of sailing is another key criterion. Tradition is expressed in laid beech decks and cockpit sole, varnished cockpit coamings, laminated wooden tiller, and bronze hardware. Performance comes from the modern rig, with a slightly roached, fully battened mainsail, high-quality fittings, and the deep keel and bulb.

Greg named the design the Russcraft 7 Day Yacht, in

honor of his father, who used to design and build fast, seagoing motorboats under that brand name.

**I**n 1993 Greg set up on the lawn in front of his waterfront house and began building. The plans called for the hull to be strip-planked in Western red cedar. A shipwright friend who lives on the island suggested that Greg consider a wood that was new on the boatbuilding scene: Paulownia. Originally from China, Paulownia is now grown on plantations in Australia and the U.S. (see sidebar).

Tests by the University of Southern Queensland have shown that Paulownia has better compression and sheer qualities than Western red cedar. This, coupled with the comparative density, at 11 percent moisture content, of 275kg/m<sup>3</sup> (17.7 lbs/cu ft) for Paulownia to 450kg/m<sup>3</sup> (28.09 lbs/cu ft) for cedar, makes Paulownia lighter and stronger. Paulownia has been used for decades in

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China for furniture and musical instruments. One of its virtues is its resistance to rot. In China, 3,000-year-old coffins made of the stuff have been found. For boatbuilding, it is best used as a core to be sheathed in fiberglass. The designer approved the change, and he and the owner have both been very happy with the result; Greg found the Paulownia a dream to work, with excellent gluing qualities.

The planks are 11mm (about  $\frac{3}{8}$ " ) thick, 'glassed inside and out with epoxy-saturated 450gsm (about 14-oz) double-bias fiberglass. The deck and cockpit are of laid beech, epoxy-glued onto a substrate of 7mm (about  $\frac{1}{4}$ " ) marine plywood. For those familiar with beech of the northern hemisphere, its choice for this project needs explaining. The beech used for decks in Australia is of a different family than its northern counterpart; it comes usually from Queensland or Fiji, and is a beautiful, pale timber, a little lighter than teak, but with similar oily qualities.

A large section of the Russcraft's cockpit sole is removable for access to the bilge. Much of the space underneath the sole is filled with foam to ensure that the boat will stay afloat if it is holed. The hull's lateral strength comes from 7mm and 12mm glued-in plywood bulkheads with cutouts to allow for the circulation of air. Bearing in mind the potential for rot in unventilated areas, there's a cowl ventilator in the bow and two louvered ventilators in the cockpit sides beneath the aft deck. While in theory water should never get below, you can check for moisture in the bilge through a bronze screw-out inspection hatch in the cockpit sole.



By now you may be wondering why this comparatively straightforward building project took seven years. There were distractions. Greg became involved in island politics, as president of the island association dealing with the local authority over a number of contentious issues. So for a couple of years he did very little work on the boat.

Most of the time Greg worked alone. When several pairs of hands were needed, a core of friends from the offshore community pitched in. "There are a lot of very skilled people, and people dedicated to wooden boats in Pittwater," Greg says. "For instance, as soon as I faired all the planks, which was easy because of this lovely, easy-sanding material, I put out the word and a team appeared, and we 'glassed the hull in one go."

One of his most valuable helpers was fellow islander Hans Stevelt, who is a naval architect and shipwright. "Often, if I ran into a problem I'd call Hans and say, 'Would you like a cup of coffee, Hans? We solved a lot of problems over cups of coffee.'" Hans saved many hours of laborious lofting by using his CAD program to print out full-sized drawings of the station molds.

After experiencing the cramped cockpit of the Jubilee, with its protruding centerboard case, Greg was determined that this boat would be uncluttered. The spacious cockpit sole is completely clear save for a mainsheet block and a hiking strap. There are no winches. The jibsheets lead through two-part tackles to cam cleats. All halyards exit from



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the mast below deck where their tails stow neatly out of the way. Cave lockers under the side decks are handy for stowing small items. They drain into the cockpit, which in turns expels water through the transom.

Because the deck planks were only 11mm thick, they were glued down without mechanical fastenings. This also fulfilled Greg's desire for a deck without bungs. As each plank was steamed, it was sprung into place over the plywood substrate, but not yet glued down, then held by a row of screws driven alongside the outer edge.

To fit the kingplank, tracing paper was placed over the rough-cut plank ends, the centerline was marked, and the outlines of the plank ends were drawn onto the paper. Working on Greg's kitchen table, Hans Stevelt drew the kingplank onto the paper, showing the nib for each plank end. The paper was then again laid over the planks on the boat, and the nib markings were transferred to the plank ends. The planks were then removed and shaped. A template of the kingplank was made and placed on the boat, glue was applied to the undersides of the planks as they were returned to their former positions on the deck, and the same screws that held them after steaming were used to clamp them while the glue cured. This time, however, they passed through athwartship wooden cleats, which assured that each plank lay flat for gluing. Finally, the beech kingplank was

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shaped to its template and fitted. When the glue had set, the screws and battens were removed and the seams payed with appropriate caulking compound.

Greg estimates that the whole decking process consumed about two weeks' worth of man-hours for two people: not exactly a cost-effective exercise. Still, he considers that the perfectly clean decks have been worth the effort. The cheaper and easier solution would be to use plywood covered with Dynel or fiberglass and finished with deck paint.

The build took so long that the boat, sitting in the open on the northern shore of the island, seemed to become part of the landscape. Now and then the builder received a bit of friendly ribbing from the locals as they passed by in their commuter boats. Greg is not a man to be rushed, but he is dogged. Seven years after work had begun, about 100 members of the offshore community gathered on the beach in front of his house for the launching. Using slings borrowed from the local barge operator, 24 willing men lifted the hull and walked it into the water. With a few sandbags in the cockpit for ballast, Greg used the 3-hp outboard to take her across to the mainland where the keel and rig were installed.

One of the most stressful times in a designer's life, and an owner's too, I imagine, must be when a boat is sailed for the first time. On a fine day toward the end of summer David Payne, Greg Roberts,



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or jibing. The hiking strap on the cockpit sole is a little too far inboard to be useful. Drawing on one of his previous designs for disabled sailors, David has provided a protruding inwale on the inboard edge of the deck as a handgrip. This works so well that I wonder if a hiking strap is needed at all.

Greg has two purposes in mind for the boat: He intends to do some club racing, and he'll also go picnicking in what is one of the most beautiful waterways in the world. That big, clean cockpit could easily accommodate eight people with all their paraphernalia. The boom has been designed so that the gooseneck can be slid up the mast to the "picnic position," giving about 5' of headroom. An awning completes the setup.

And let us not forget the figurehead. That's right, this modern-day yacht has a figurehead. You see, Greg is an accomplished sculptor. Having named the boat PEGASUS III, he made a clay sculpture of the mythical winged horse and, at great expense, had it cast in bronze. It has been widely admired, but I suspect that not everyone will love it. David Payne is not concerned about the quirky appendage. And it does have a practical use: it's a good tacking point for the asymmetrical spinnaker. 

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and I motored out to the mooring where the Russcraft floated as dainty as a gull. This was the first time the designer had seen his creation in the water with the rig in place. "The first thing I look at is the trim," said David as we approached. "Is the stem too much in the water or something dreadful like that?" He paused for a critical moment. "It looks fine."

"Oh, it's lovely," said Greg.

And indeed it is. But how would she sail?

The Russcraft's maiden voyage took place in about 10 knots of breeze. With her narrow waterline, the boat heels quickly at first, then that 1,100 lbs of lead in the keel takes hold and she settles right down. Sailing her is akin to sailing a high-performance dinghy. She balances beautifully on all points, and she is maneuverable: The first time Greg tacked her he put the tiller hard over, as one does with the stately Jubilee. The boat spun so rapidly that he was almost flipped over the side. He wanted a boat that was lively; he got one.

Inevitably, there was some sorting out to do. It's sometimes tricky to prevent the tiller extension from getting fouled up in the mainsheet bridle when tacking

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