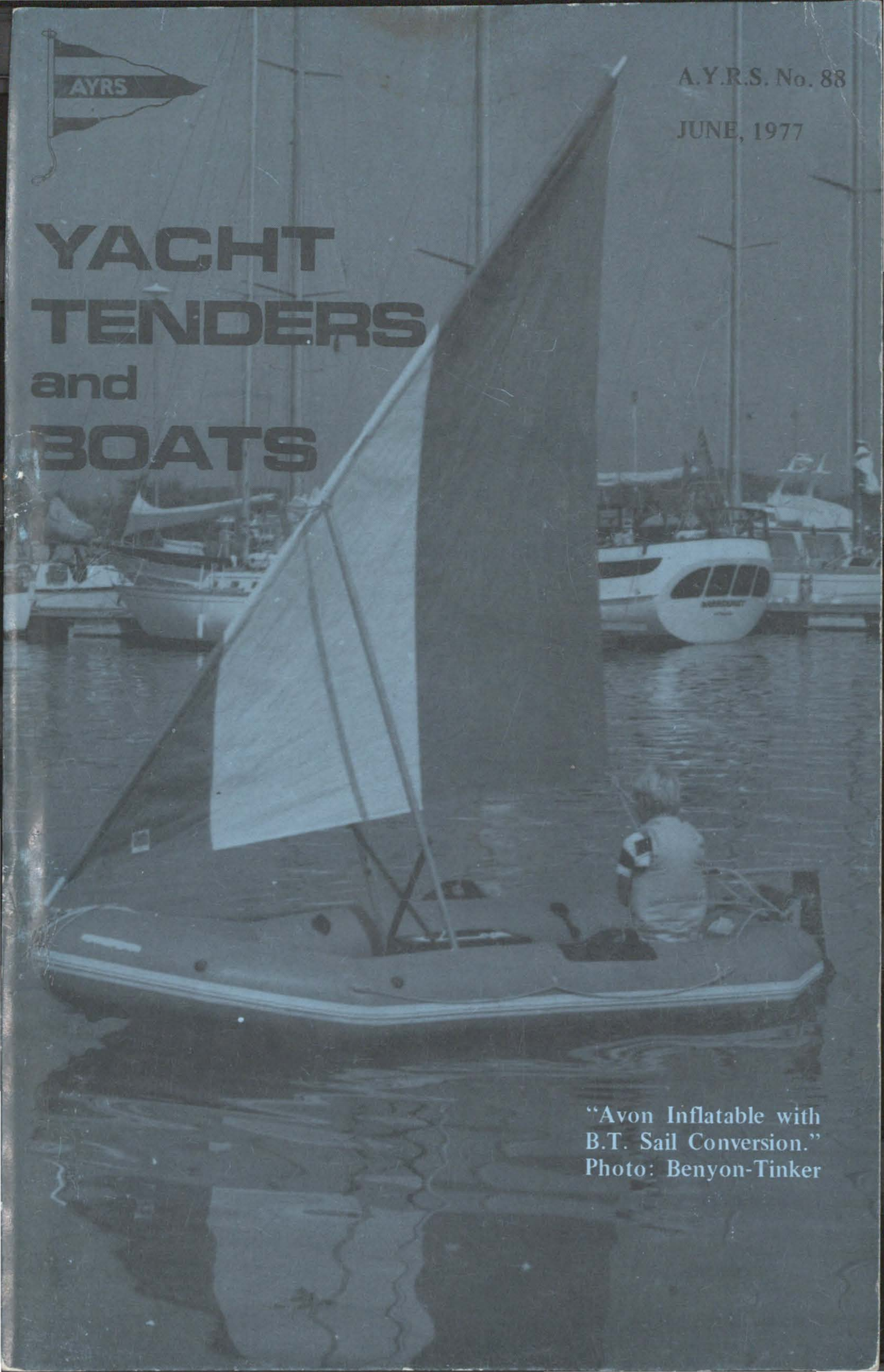


A.Y.R.S. No. 88

JUNE, 1977

YACHT TENDERS and BOATS



"Avon Inflatable with
B.T. Sail Conversion."
Photo: Benyon-Tinker



Tender "Tenders"



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YACHT TENDERS AND DINGHIES

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ACKNOWLEDGEMENTS

The contents of this book have come together over a period of years of living with dinghies.

Much of the information came from lectures during my three years at the Nautical Training College, H.M.S. Worcester. These were probably based on admiralty manuals.

While I have not quoted from other books, I have read much on the subject of small boats and these must be the source of some information. More has come from A.Y.R.S. members at discussion and sailing meetings.

Useful Books:

Home Boatbuilding from Bell Woodworking, Leicester, U.K.

Nichol's Seamanship & Nautical Knowledge from Brown, Son & Ferguson, Glasgow, Scotland.

Practical Boat Owner Magazine (I have all copies).

Sailing Boats of the World by Rhonda Budd.

Simple Boat Building by Geoffrey Prout (Brown & Ferguson).

The Theory & Practice of Seamanship by G. L. Danton.

It seems that very little research has gone into the design of yacht tenders; it has mainly been development by experience. If this number helps with the choice of a suitable boat and prevents duplication of some past faults, it will have succeeded. I hope that it will bring together ideas for further improvements.

R. Michael Ellison,
Master Mariner.

WHAT DOES A TENDER HAVE TO DO?

By Michael Ellison

The Oxford Dictionary defines a "tender" as 'vessel attending larger one to supply her with stores, convey orders, etc.' The International Collision Regulations describe a vessel as "Every description of water craft, including non-displacement craft and sea-planes, used or capable of being used as a means of transportation on water."

We do not intend to study regulations, but we must narrow the field to the tasks that a yacht's tender should do, we can then consider how it can best serve its purpose when altered to meet other requirements such as stowing on deck without adding windage or being transported on the roof of the family car.

When he heard of this publication, Doug Scott, Commodore of Castle Cove Sailing Club, whose members keep their yachts on exposed moorings in Portland Harbour, said "Remember that you are talking about tenders, and not safety boats or lifeboats." You will find a chapter set apart to discuss the adaption or conversion of a tender into a lifeboat, but first let us consider the intended use of the boat.

It has been reported that more people drown going from and to their yachts in tenders than are lost at sea. To take the alarm from that statement, it has also been pointed out that more motorists drown in their cars than all those lost in yachting accidents. It seems desirable to look very carefully at all the boats available to make certain that they are as safe for their purpose as they possible can be without impairing their usefulness.



"Awaiting their owners at Castle Cove, shortest boat is 6ft. Parent yachts are out on their moorings."

The primary task of a tender is normally to transport the crew and stores to and from the parent yacht. The conditions under which this task must be performed will vary greatly and the boat must be usable during average adverse weather; for instance, a yacht at anchor in a sheltered bay during a cruise should be able to land crew members and even if the wind increases, an experienced hand should be able to return. The ability of a tender to cope with rough weather must depend on her area of normal use—a yacht which is used in sheltered water might use an inflatable dinghy which can not be used in open water—on the odd occasion that the dinghy cannot be used she might berth alongside in port or arrange to hire a suitable local boat during her visit to an exposed locality.

Fortunately, large crews usually sail on larger yachts, and more space is then available to stow the tender. The biggest problem comes with a large crew on a parent craft between about 24 and 32 feet (7 to 10 metres), length. Yachts below about 24 feet are usually able to find space alongside and can slip into shallow water without difficulty. Offshore, they are usually manoueverable and light enough to be able to transfer stores or a man without using a rigid dinghy.

Yachts larger than about 24 feet are usually less strong in relation to their displacement than smaller craft and they must avoid contact with similar or larger vessels in open water. Even a slight swell will roll two yachts together so that they could be holed and even sink. If it is necessary to pass anything that can't be thrown from one vessel to another, a boat becomes essential. Petrol or oil can be transferred by throwing a container overboard to be picked up by the receiving craft, but people or food need more careful treatment.

Dramatic and exotic uses perhaps come once in the lifetime of the average tender. Its every weekend task is to be hauled down the beach or slipway, tied to a pontoon or post while stores are loaded, perhaps to **wait**, bumping other boats or the shore while the owner makes a last-minute telephone call or parks the car. Next it must **convey** its crew and cargo to the parent yacht **without getting them wet**.

Having arrived alongside she must not tip up while the crew disembark, she must not scratch or mark the parent yacht. When towed astern, she must not blow up under the counter, sheer from side to side or try to climb on board. When lifted on board, she must not break the owner's back, obscure the view, cover the handrails, present windage to slow progress or prevent the working of the sails.

When needed again, she must be ready, her oars and crutches (rowlocks to some readers!) must be to hand, and if an engine is used, it ought to be available from a dry stowage. As there is not usually any such place as 'dry stowage' on a yacht of less than 30 feet after a rough passage, no engine should ever be regarded as indispensable. Engines can be very reliable and in

a previous number, I noted that the Italian 'Whitehead' outboard now has a completely waterproof ignition system and I thought this might be a great stride forward. Sadly, I must pass on that a member has been waiting over two months for spare parts and he reports that it is difficult to start when warm. Perhaps one day, one of the makers with an excellent service record will fit waterproof ignition Even if the ultimate power unit arrives, accidents will continue and engines will be dropped overboard, stolen or otherwise not be available when needed. An engine can be very important, but when considering "what a tender has to do" the ability to proceed under oars is of prime importance. This build-up for an apparently obvious statement "to be able to row" is deliberate; a great number of tenders now available, seem difficult to row, the position and measurements are wrong, the oars are usually too short and often the boat will not hold her course with the wind on one side. Lower down the list, we can enter 'proceed by sculling,' this is something that needs practice, so that it can be used as a means of propulsion if one oar is broken or perhaps a wrist injured. To be satisfactory a fair amount of lateral resistance is needed to resist the sideways sweep of the oar when sculling; this is a feature which also keeps a boat on course when rowing.

The tender must be able to take out an anchor—the race rules for cruising yachts often specify a kedge anchor, but in fact, if your yacht has accidentally run aground the stage is set for a possible disaster, and the requirement will be to take the largest anchor available as far towards deep water as the lines on board will allow and in the shortest time possible. Running aground happens to some people more than others depending on the nature of the waters they sail—on a rocky steep coast with deep water close in shore, usually a West coast, the first time will probably be the last. On an East coast with shallow water extending far out to sea, fog can be frequent, there is a temptation to cut corners, and tides can be uncertain—under these conditions and while navigating rivers and estuaries, even careful and experienced seamen sometimes stick. Having run aground the action taken sorts the men from the boys, and, given sound equipment, a suitable tender and a crew who work together, the yacht can usually be refloated, even on a falling tide. It is bad seamanship as well as bad navigation to go aground on a lee-shore and if there are breakers, no tender yet devised will be of much help.

There are numerous secondary jobs a tender will be used for. These range from scrubbing round the waterline or clearing obstructions from the propeller or water intake (which requires a stable platform), to acting as stowage for ropes, fenders and even spare sails so that an extra berth can be used on board.

Summary:

The Tender Must:

Carry the crew and stores safely.

Keep its occupants dry.

Be seaworthy with a reduced experienced crew.

Summary continued:

Be convenient to row.
Be safe under modest power.
Be stable enough for general duties.
Be light in weight.

Design Requirements

"Different Ships—Different Long Splices" used to be the sailing ship expression. Your requirements for an ideal tender will depend on the order of priority you give to the tasks it must perform and others that you will undoubtedly add—shallow draft so that you can leave the beach with dry feet, ability to fold so that it can stow on deck or in the garage roof at home, are just two examples.

Having established the tasks that your boat must do, the next step is to decide on a satisfactory shape having regard to the space available. The chosen means of propulsion will have an important bearing on design, the tender must be capable of being rowed but perhaps under normal conditions an outboard is always used, or sails may be desirable.

Design must suit the materials available but it seems best first to establish what the tender has to do, then to consider the restrictions and limits imposed by space, storage problems ashore, the need for the boat to be carried for long distances over a shingle beach. Perhaps the tender will be used to tow the parent craft with a larger-than-normal outboard: this will require an extra-strong transom and towing points—extra strength almost certainly means more weight, but more space may not be available; the choice of design must take account of special needs.

Weight is a problem that has to be constantly in mind, every desirable feature that is added to the outline idea of the perfect tender has the penalty of adding weight. If a very light craft bumps on a beach or against a wall, there is little energy and thus little damage. Our tender must be able to bash into hard objects not only with its own light weight, but with a full load on board. Unfortunately, every extra ounce of weight built-in, has to be lifted, carried and dragged both through the water and ashore throughout the life of the boat. On the other hand, if the boat does not have a proper towing eye in the stem and a really secure attachment for her painter, she may well be lost, and the weight saved will have cost her full value.

The argument for adding weight can well be extended to proper bilge keels incorporating grab handles when the boat is inverted, and the inclusion of buoyancy if the boat does not have a number of inflatable compartments, or does not have a quantity of expanded foam in her construction.

When a parent craft has an alongside berth, perhaps on a marina, the tender does not have to withstand the regular beach work likely to be needed when the yacht is kept out at a mooring. It must still meet all the requirements while cruising, but it need not be quite so rugged. It may be preferable for a boat on moorings to have two tenders, one solid and heavy

boat to work from the beach or club which can stay at the moorings while the parent craft is away. This brings problems of mooring the tender ashore and leads to temptation of having a boat on board the yacht which is not suitable for use as a tender because it is too light.

To think of a boat as being too light is difficult to accept when it has to be lifted and carried, and the importance of saving weight has been stressed as so important. The problem only arises when it is necessary to row the boat against a breeze or hold her steady in one position, as for example when adjusting the engine. The problem is a real one with inflatable craft and there could be a case for using some form of water ballast in a false keel. There has been a case of a yacht stranded on a sandbank in an estuary, and the crew had to abandon her. The wind was blowing from the shore, it was dark and raining. Their inflatable dinghy was blowing steadily out to sea until one of the crew managed to make a hole in the bottom and allow the inside to fill with water—a desperate measure in a desperate situation, which anyone who has had to row an inflatable against the wind will understand only too well.

Craft Available

A careful look at any group of cruising yachts will show how very popular inflatable tenders have become. In general, they meet all but two of our list of requirements—they cannot be considered as convenient to row, and they are not very good at keeping the occupants dry.

Inflatables come in various qualities ranging from excellent down to some highly dangerous, but inexpensive objects which are only suitable for filling with water and use ashore as childrens' paddling pools. Even the excellent quality inflatable boats can be greatly improved by adding solid floorboards and longer oars, both these items being readily available because their makers appreciate the advantages — the penalty, as ever, is the extra weight and the space to stow them. In the 1969 'Round Britain Power Boat Race' the lowest powered boat to finish was an inflatable with a rigid bottom called, "Psychedelic Surfer." There was enough flotation in the bottom section to support the crew, engines and fuel, and inflated tubes round the outside, kept the crew dry and provided light-weight sides and a partial deck. Since 1969, inshore rescue boats have been brought into use, using the same principle but incorporating self-filling tanks in the bottom to provide stability at rest and low speeds. As speed increases the tanks empty by self-bailing.

A look at any club dinghy park, or a look round any yachting centre, will show a large number of inflatable tenders, left fully inflated. Most makers recommend winter storage, lightly inflated in a dry space, such as an attic or garage roof, but when kept outside, sunlight is the enemy of inflatable craft—indeed, the main reason for the change from the earlier black material to the present grey or white is the improved resistance to ultra-violet light. If the tender is always kept fully inflated, does its owner really need an

inflatable? Often one sees an inflated boat travelling on the roof of a car; this must indicate that deflating and packing such a boat, and subsequent reflatting are tedious and difficult, even to the extent that the extra windage on the car and the inevitable damage to the boat by chafe are the lesser of the two evils.

If you can accept that your tender does not need to fold into a bag, it is possible to have a proper rigid-bottom boat with inflatable sides. When stowed on deck the sides can be deflated leaving the bottom with a total depth of about 9 ins. A prototype of such a tender was shown at the 1976 Southampton Boat Show, and was available at the Players Speed Trials at Portland where a number of A.Y.R.S. members took the opportunity to try her. This boat started as a smaller version of the "Force Four" and is called "Force Three." Force Four is a speedboat for water-skiing and runabout, with a speed of over 20 knots, pushed by an outboard of 25 to 40 horsepower. From the same stable, the 'Force Three' has a rigid bottom and inflatable sides, and the makers claim that she is "designed to row, power, sail or waterski" and also that she is 'car-toppable.' Unfortunately, the ability to waterski comes under the heading "numerous secondary tasks a tender may be used for" and the ideal shape for water-skiing is not the best for sailing. An engine large enough for water-skiing becomes unreliable when working for long periods within the five or six knots speed limit reasonably imposed in most harbours to prevent just such tearaways imposing noise and wash on others. There is also the problem of lifting the larger engine on and off the parent yacht and providing the petrol.

The prototype 'Force Three' measures 9ft. 3ins. and we tried her under oars and sail. She can carry three people easily and with proper oars, she should row well. Under sail she proceeded in a slightly bow-down attitude which may be difficult to cure, and she made quite a lot of leeway even with the dagger board fully down—this latter fault will almost certainly be corrected on production models by fitting a wider dagger board. The mast is in two parts which slot together and insert into a luff pocket on the sail; her sailing ability seemed satisfactory for a tender which requires stability rather than high speed.



"Prototype Flatacraft 'Force 3', being pulled up the beach. Not a job for one person even without the engine.

If the "Force Three" or similar craft are to be developed as yacht tenders, the addition of reasonably deep bilge keels with good hand holding positions seems highly desirable, even perhaps essential. They will often be stowed over a cabin top, covering the yacht's ordinary hand-holds; should they ever capsize, the present polished bottom would prove very difficult to hold onto. Such bilge keels would provide the lateral stability previously mentioned as being desirable when rowing or trying to scull, and as a final bonus they protect the bottom when pulling the boat up a beach. Such bilge keels are a design requirement for every satisfactory tender that might be lifted on board and stowed upside down on deck or which may possibly be capsized during use or mis-use.

The "Force Three" and "Force Four" are manufactured by Flatacraft Ltd., 1183 Melton Road, Syston, Leicestershire.

A.Y.R.S. member, Fred Benyon Tinker has been developing and building sailing inflatable boats for many years. Many readers will know his white sailing catamarans, which Ken May has adapted into a trimaran first using a "Sheerwater" main hull and also a "Tornado" main hull. While it is fun to sail from a beach and useful for another secondary job for a tender by keeping the children happy, the small inflatable catamaran does not seem to be a satisfactory tender because stores can not be stowed inside it and due to its beam, it is almost impossible for one person to row. As a trimaran, it becomes a day boat and can no longer be deflated and stowed away. It can, however, come alongside without harm to either craft and is dry and stable.

Fred also makes inflatable sailing dinghies, a 12 foot version called "Tamborine" was tested at the A.Y.R.S. sailing meeting in 1972 and mentioned in "Airs 4." Fred has contributed to many of our publications, including number 69 on multihull safety and he has been building special inflatable boats for many years. He has now developed a "sailing kit" for his own design of inflatable folding tender, which also fits the standard "Avon" inflatable dinghies and he is prepared to supply these to anyone interested. (see page 56).

The present tenders available from Benyon Tinker Inflatable Boat Services, Bridge Road, Lymington, Hampshire, England, are the "Tramp" and "Terrier." The "Terrier" is available as a kit for home completion at a useful saving in cost. In addition, special boats can be produced to meet any unusual requirement that an owner may have to meet. The tenders when assembled are 9 feet overall, beam 4ft. 6in., draft of the sailing "Terrier" is 2 feet with the board down and the hull weight 65 lbs. including the rigid bottom which is arranged to fold amidships. The "Tramp" weighs in at 56 lbs., both have separate inner tubes inside the outer skin of the boat so that shape is maintained in the event of a puncture. Wood transom, floorboards, oars, etc. are standard and outboards up to 4 horsepower are satisfactory. Assembly time is about four minutes and deflated the packed "Tramp" measures 42ins. x 18ins. x 102ins. and the "Terrier" comes down to 54ins. x 31ins. x 12ins. These boats are made from neoprene/nylon fabric, coated with pure white Hypalon.

"TRAMP"



The 'Tramp' folded complete with floorboards. It takes about 3 minutes to get into operation without sails.

Photo from Benyon-Tinker.

A RACE ACROSS MILL BAY DOCK



“A race across Mill Bay Dock, Plymouth, for competitors in the 1974 ‘Round Britain’ Race in their Tenders, shows how popular inflatables are.”

THE BUSSELL PATTERN PRAM DINGHY

(Castle Cove, 1976)



'Pram dinghy or yacht tender, seen at Castle Cove, September, 1976 (Dorset).

"Ben" the elderly boatman at the cove, acting as night watchman; said the Bussell pattern 'pram, was designed about 55 years ago by a man of that name who lived locally.

The specimen at Castle Cove was, Ben said, about five years old and was one of two built by "Kingsbridge Boatbuilders" of Bridport. As the other boat had been stolen some years ago it was, as far as he knew, the only surviving example of the design.

Ben also said that the craft would take up to five adults in the following configurations:

- 1 person rowing from centre seat.
- 2 row from bow seat, 2nd in stern.
- 3 row from centre, 1 in bow and 1 in stern.
- 4 2 row from centre, 1 in bow and 1 in stern.
- 5 persons—it seems doubtful if rowing is possible.

Graeme Ward

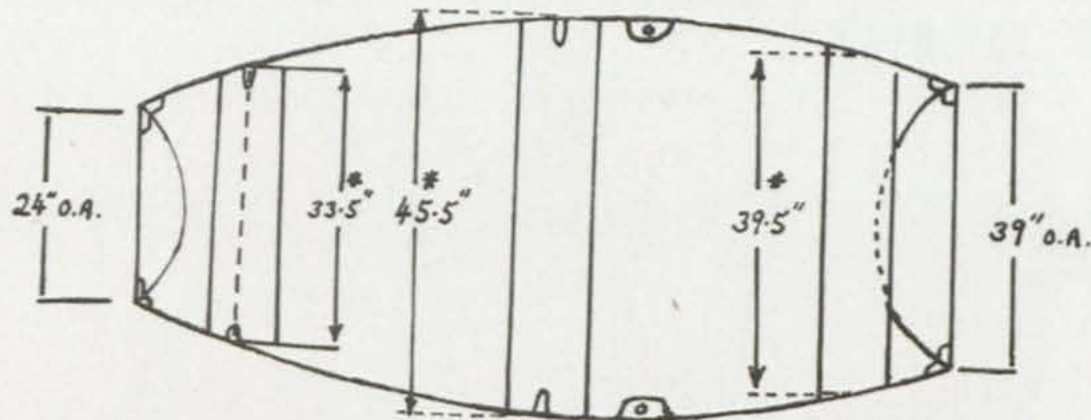
Editors Note: We noted this boat in Portland Harbour in use in quite choppy conditions and she seemed the minimum size to be reasonable for use as a tender. She also seemed similar to great numbers of yachts boats of a few years ago and for interest, Graeme Ward took the following measurements for us.

Full details for building your own 'lapstrake' pram dinghy were published in "Simple Boat-Building" by Geoffrey Prout and published by Brown, Son & Ferguson, Glasgow.

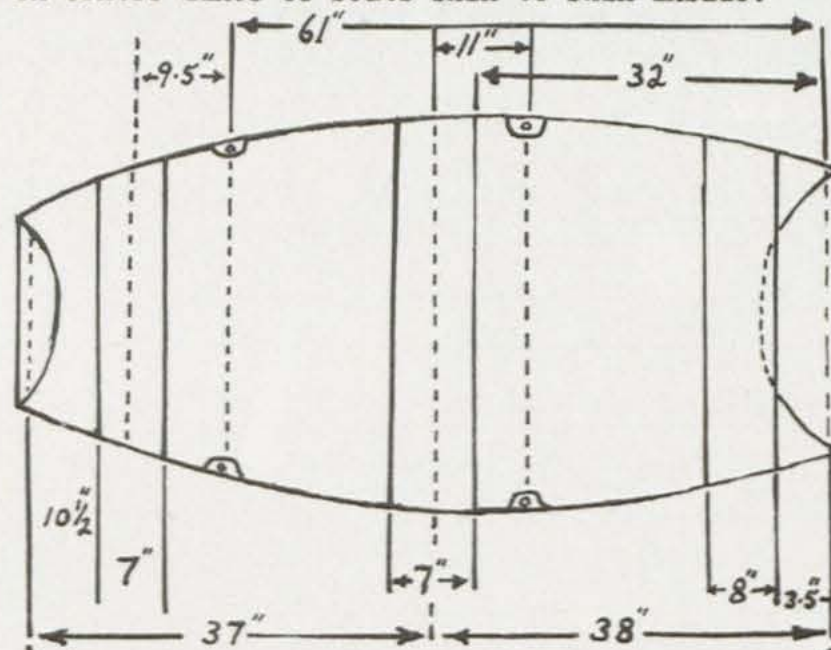
THE BUSSELL PATTERN PRAM DINGHY

Specifications

Overall length 6' 9", Maximum Beam 4' 0".

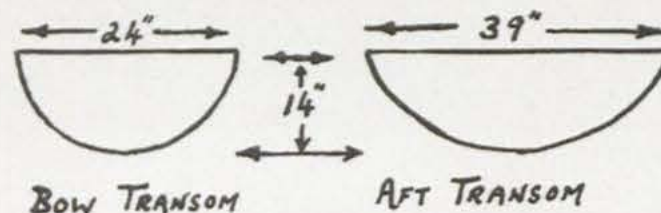


* on centre lines of seats skin to skin inside.



This line on transom inside @ seat level.

Knees at the corners and on two forward seats.

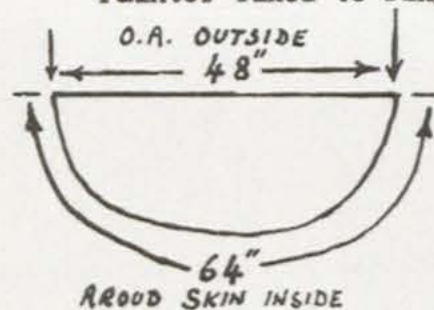


BOW TRANSOM

AFT TRANSOM

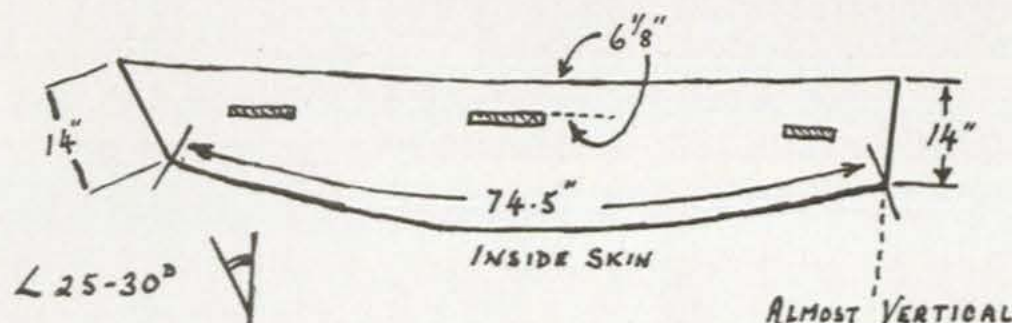
No painter or sculling grooves.

Painter fixed to ring bolt on front transome.



AROUND SKIN INSIDE

Section on c.l. of middle seat.



9 approx. equal strakes each side of keel line.

Folding Boats

For a great number of years, the folding yacht tender has been very popular and one of the best known was made by Prout. Prout Brothers are still very active in the yachting business and their address is The Point, Canvey Island, Essex. Unfortunately, demand for the folding boat dropped off as inflatables became popular, and production ended. There is a continued interest in the folding boats and the construction could be improved using some of the new materials that were not available to the original builder. If interest continues to increase, production may well be resumed on a small scale. There were two sizes, both had a folding wooden frame and canvas as an outer skin.

Barry Bucknel designed a popular tender to fit across the deck of his multi-hull; this boat has a foam filled plywood bottom which is rigid and buoyant enough to support the crew and it has canvass sides which fold up with a wood frame around the gunwhale and folding struts to support it. This boat has a dagger board and sail, is very popular with children and can just carry a very small outboard. It is not strong enough for a powerful man to row in an energetic manner but could probably be adapted. This boat came before inflatables were built with rigid bottoms, it has the advantage of a hard bottom when landing on a beach and the strength when sandwiched between other craft. Because the sides are vertical, it does not scoop water over the bow and sides like an inflatable, but the wood gunwhale and bow are less kind to the paintwork of the parent yacht.

Development work has been proceeding and Fred Benyon-Tinker has evolved a new method of making inflatable boats from relatively flat panels instead of the normal sausage like tubes. One advantage of the flat shape would be to deflect water outwards and thus keep the crew dry; however, one advantage of the round tube type is that it *seems* stable. People entering can step on the "side" and the boat does not turn over, in fact, they step on the middle of the side and not on the edge of the boat or the part that would be the gunwhale if the side came straight up. Recovering a person or large object from the water over the side of an inflatable is possible but it is not possible on an 'ordinary' boat (always climb in over the stern).

When deciding which type of boat will best meet his requirements, the yachtsman must sort the points into the order that come nearest to fulfilling his personal needs, and then look at the materials available. It is best to decide on the perfect boat and then if money is limited, find out how close you can get to this boat by home building or purchasing a similar alternative rather than obtaining another type which is not suitable. If you need an inflatable and can not afford a new one, it is much better to try for a used boat of the proper size than to make do with one that is too small. There are some very cheap inflatable boats on the market; these are almost always a total waste of money and work out much more expensive than any other. Some of the small ones should be restricted to use as paddling pools for children. Kits, materials and instructions are now available to enable the home

builder to complete his own inflatable, but this is something to consider with caution.

Arrange the following points in order as needed on a tender to meet your own needs, and add at least two more features to help it match the previous list of jobs it has to do:

The Tender Must:

Be strong enough for its use.

Last for a reasonable time.

Support the crew if flooded or punctured.

Have bilge keels which double as hand holds.

Really strong attachment points for two painters.

.....

.....

The bilge keels protect the bottom when the boat is on the beach, they reduce leeway and improve directional stability while towing or rowing. The hand holds can replace the hand holds the dinghy will cover when stowed upside down on the cabin top, they give something to hold onto if the boat should ever capsize and can be used for lashing to the car roof or trailer. If they are designed as part of the boat from the start, they can be used to provide some of the necessary strength and need not add much to the total weight or the draft.

The need to secure the painter seems so obvious as hardly to warrant a mention, unfortunately, some builders seem to hope that their boats will break adrift so that they can sell you another one. If you tow your boat with only one rope and it breaks, most insurance companies will refuse to meet any claim that results. The ideal is to have a ring low down on the stem or bow of the boat on the outside for the tow rope, with a second strong point inside for the painter, perhaps at the breasthook. This is not very satisfactory for towing because the rope chafes on the gunwhale.

Some of the types in use

Boat owners move about to such an extent that a look round your local boat club dinghy park or jetty will not necessarily indicate the type of craft most suited to the local waters. In spite of the great variety of boats in general use many yachtsmen are not using the type that could best meet their special requirements.

If you do not wish to build and maintain your own boat it is quite important to select one that can be serviced and repaired locally. Most wood and G.R.P. craft can be repaired anywhere. Some inflatable boats come with their own comprehensive do-it-yourself repair kit and others can be vulcanised at your nearest motor tyre repair specialist. A few have to be returned to the maker. Some of the moulded plastic type boats, usually with a double skin, cannot be repaired at all, except with sticky tape as an emergency measure.

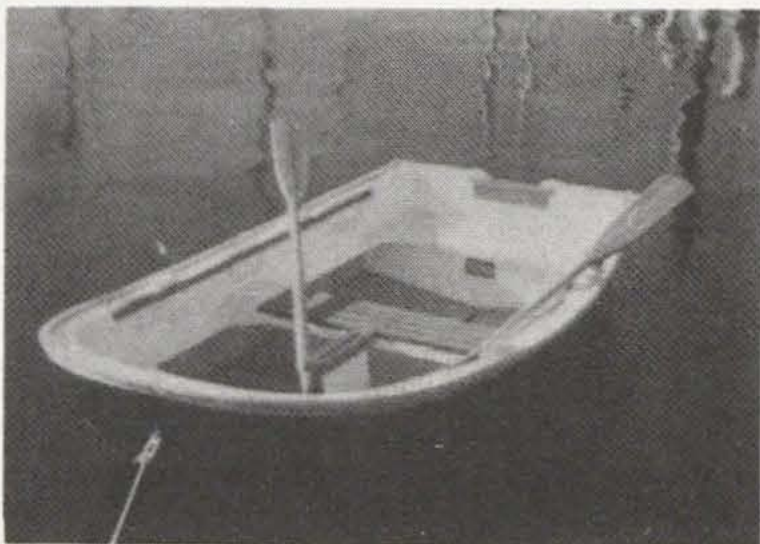
LINDH 7-11

The Lindh 7-11, Originally 7ft. 11ins. (2.4 metres) long, now increased to 8ft. 1ins., a fibreglass boat with a unique bow design (U.S.A. Patent. No. D-205,484). Bow shape apart, it is interesting to note measurements, especially the weight which increased from 75lbs. to 96lbs. This is partly due to a change from mahogany woodwork to teak, which will last very much longer without any maintenance.

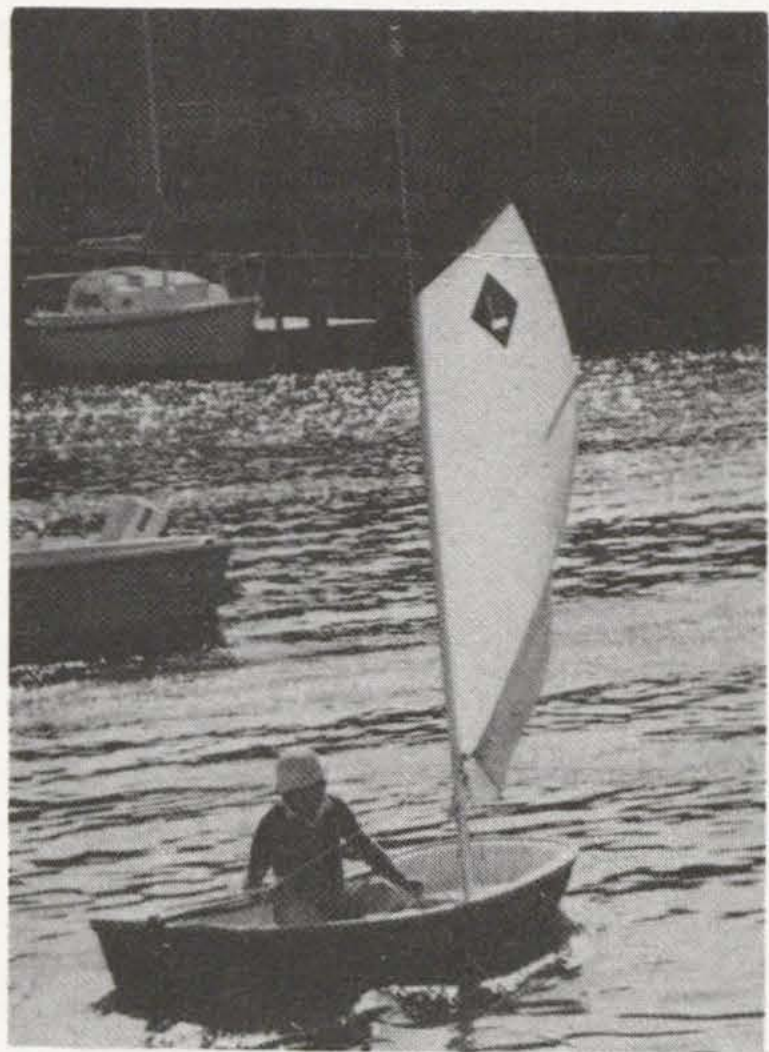
There are no bilge keels to give hand holds when on deck, but this is a feature that you will probably have to fit yourself. There is a hand hold in the skeg and the makers are on the right track with their list of standard features:

(From their Sales Leaflet)

The Lindh 7-11, retains the basic patented* hull design originally introduced in 1964, and now offers an all new moulded interior with teak joinery. The combination of hull form and moulded interior results in a most versatile yacht-tender, which is unsurpassed in its rowing, towing and sailing characteristics.



The outstanding bow design is the secret behind such un-matched performance, allowing for added carrying capacity and comfort for doing ship chores or just having fun. The Lindh 7-11 with its strong but lightweight fibreglass construction and full length teak handrails makes for an easily handled boat for stowing on deck or car topping.



Only the finest materials available are used throughout the construction of the Lindh 7-11. The moulded gunwhales are fully cushioned with soft canvas covered foam offering protection on both the sides and upper edges. Positive floatation is provided by foam high under the gunwhales.

The Lindh 7-11 sailing model is the best sailing yacht tender available. Although the full bow increase capacity for general ship chores, the flat planing bottom allows for low resistance and gives exciting sailing performance that is perfectly balanced. The attractive moulded centreboard trunk with teak cap set into the centre seat is, unlike wooden boxes, leak-proof.

The simple sailing rig, consisting of a two piece foam filled aluminium mast and boom, stores inside the hull and is easy to set up and handle by any member of the crew whether young or old.

Rowing Model—\$595.00. (about £345).

Standard Features: Full bow design that stays dry and gives larger carrying capacity, low towing resistance, attractive interior moulding, strong gunwhale construction, canvas over foam fender guard, positive poured foam under gunwhale, teak handrails on gunwhale inner edge, fore and aft rowing positions, fore and aft seat hatches and storage areas, raised centre seat with teak slats, oarlock storage under seat slats, replaceable teak transom wear strips, moulded wear strips on hull bottom, moulded skeg with teak end cap and safety hand hole, bow ring, single skin bottom for easy maintenance and repair.

Sailing Model—\$845.00. (about £490)

Standard Features: All standard features of rowing model, plus: two piece foam filled aluminium mast, aluminium boom, moulded in mast step, leak proof moulded centreboard trunk with teak cap, centreboard, rudder, dacron sail, necessary hardware.

Available Custom options: (price on request).

Teak floor boards, lifting rings, spray hood, canvas cover, canvas mast sock, custom colours.

All prices are F.O.B., Newport, Rhode Island. Specifications and prices are subject to change without notice.

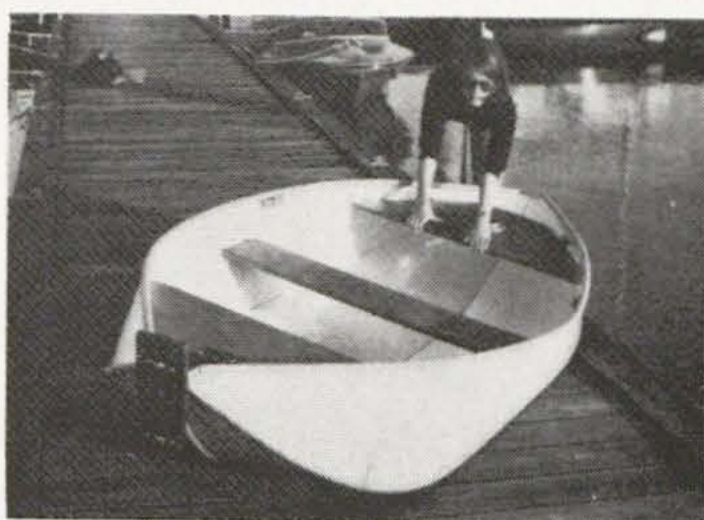
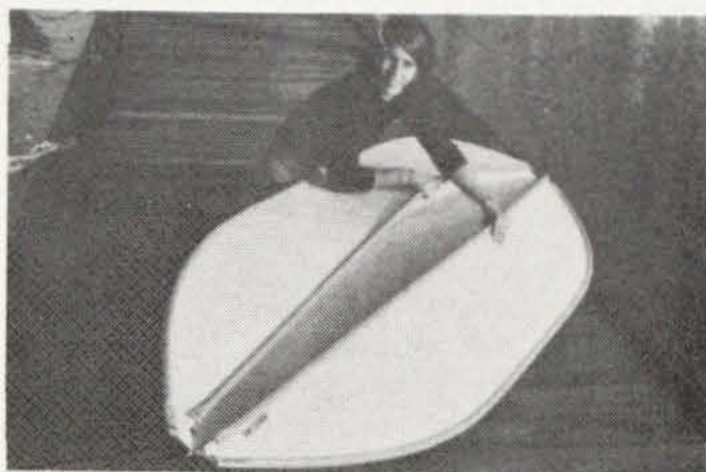
Brenton Reef Yachts, P.O. Box 227, Newport, Rhode Island 02840.
Telephone: (401) 847-5505.

Folding

A great number of folding boats have been produced. Some, like the Prout folding tenders, fold completely flat. Others, like the 'Puffin,' designed by Barry Bucknel specially for use as a tender, have a rigid bottom and folding sides. The two mentioned have been built and sold in considerable numbers but many quite satisfactory designs have been produced in small numbers and are not widely available. Advertising and marketing add so much to the cost that many small builders prefer to rely on a local demand and not the worry of increasing despatch costs or obtaining regular supplies of satisfactory raw materials.

"BANANA BOOT"

The German "Banana Boot" is an example of a boat that folds flat and can carry quite a useful load.



"BANANA BOOT"

Details from: Tribell GmbH, Adolfstrasse, 4-6, 2 Hamburg 76, West Germany.

Length: 9ft. (2.74m).
 Beam: 4ft. 4ins. (1.14m).
 Depth: 1ft. 8ins. (.53m).
 Folded: 7ins. (.18m).
 Weight: 49lbs. (22kg.) (empty).
 Max. Disp.: 650lbs. (295kg.).

An interesting Folding Boat. Can have a small sail with leeboards and suitable for outboards up to 3 h.p.

Plywood

Plywood is probably the most popular material for home builders, the material is used for floorboards in the inflatables and can be used for folding boats also. The classified advertisement pages of most boating magazines contain lists of kits and plans for plywood boats to meet most requirements. Usually they can be built in the time the salesman claims, but often only by someone with a well laid out building shed with the tools readily to hand. Often time has not been allowed for important details like paint or varnish inside the bouyancy tanks. Note that on a boat built by A.Y.R.S. members the plywood was treated with wood preservative on one side of the boat and not on the other. The glue failed on the side with the preservative and we learnt to add the preservative after the wood has been glued together.

Many of the yachting magazines also have their own stock plans of plywood and other tenders for home building. 'Small Boat' of Link House, Croydon, Surrey. CR9 2TA, England, have featured plans and instructions from a 6 foot pram by Percy Blandford in October '75 upwards. In the February 1976 issue, they featured building an aluminium dinghy but the plans used were those for a plywood boat. The building instructions given could be used to make any boat designed for plywood construction from aluminium and most home builders will be limited to single curves but aluminium boats can have rounded shapes with double curvature.

In the U.S.A. the publication "National Fisherman" frequently feature plans and instructions for building all sorts of boats, including tenders. Their address is: National Fisherman, Camden, Maine 04843.

We have chosen to show a 'Jack Sprat' tender, available from Jack Holt Ltd. as a kit for home building. This is one of a range of rowing and sailing boats they supply and the extensive range of 'Holt Allen' fittings probably include everything a boat could need. The complete "Jack Sprat" kit cost £69, plus £5 carriage in England.

JACK SPRAT PRAM DINGHY KIT, Designed by Jack Holt.

A dinghy with a big heart, because it is built to carry four adults and two children with reasonable freeboard, especially as it is only 7ft. 6ins. long, 4ft. 3ins. Beam, and only weighs about 60lbs. We found it was equally at home with a little 1 h.p. outboard or one as large as 5 h.p.—mind you, with the larger outboard, you had to go easy on the throttle—as for rowing, very manageable and fairly danced over the water, especially with only one aboard.

We have made a complete kit which consists of all wooden parts, machined to shape so there is very little fitting involved and the kit is complete right down to the last screw, therefore there is no problem about buying resin, glass tape and rowlocks. Once you open the cardboard box, you won't have to buy any other parts to finish it. With the panels cut to shape and the stitch and glue method (which is wiring the panels together) the prettiness and shape of this dinghy is assured.

Being double chined and having quite a large rocker, the boat is extremely stable. We have made it so stable that you can moor it to the side of your cruiser and can paint or scrape your boat with little fear of the dinghy capsizing.

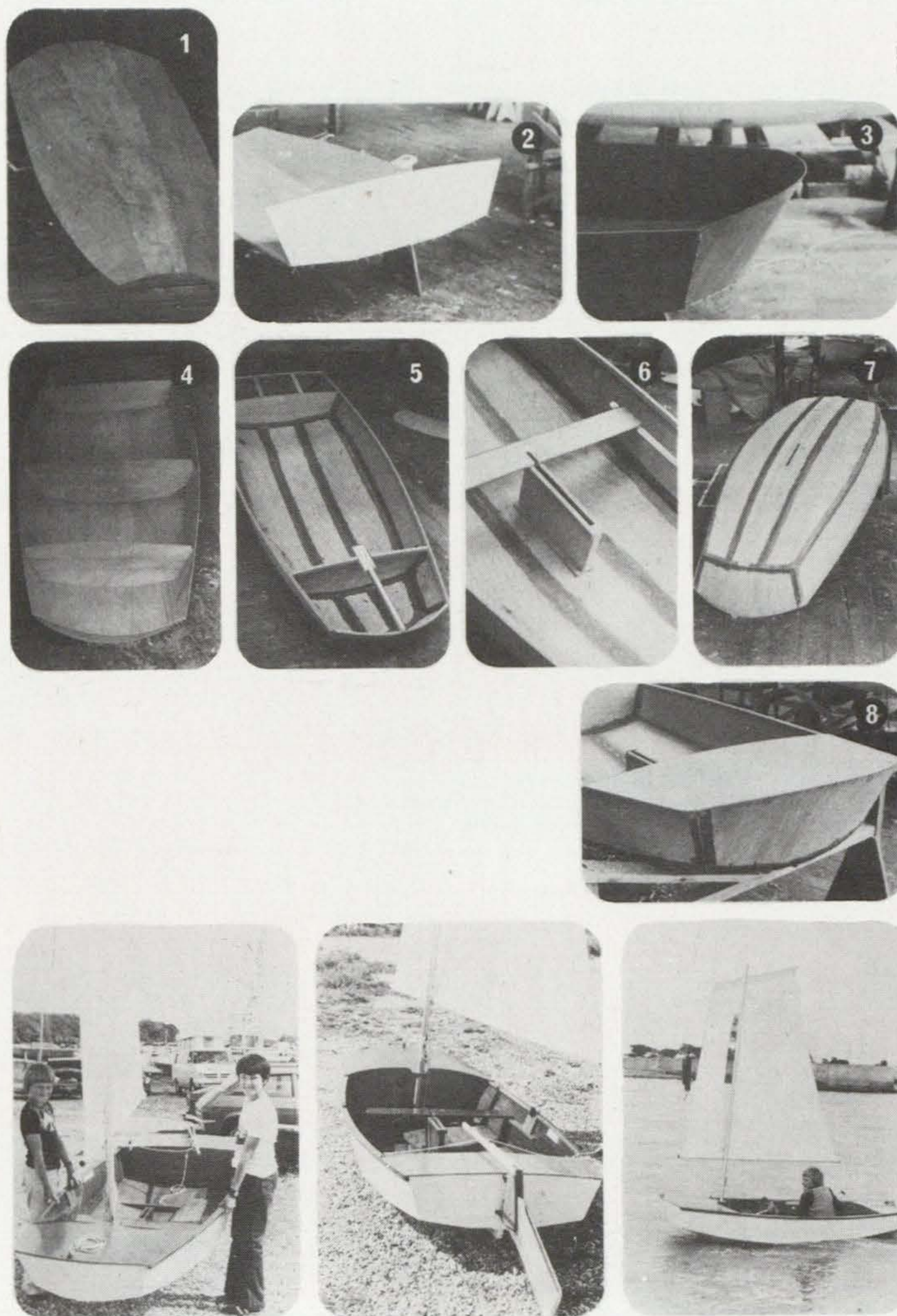
No more worries about launching trolleys and after all your beautiful varnish work—you will not feel like dragging it down the beach—it is so light, you can put it on your shoulders.

If you feel like building a boat without problems, then this is simple and very worthwhile.



BUILDING A "BUMBLE BEE"

Children's sailing dinghy/yacht tender complete unassembled kit—all pre-cut wood parts/glue/fastenings/spars/sails/fittings, etc., £113.00. The 8ft. 5ins. "Bumble Bee" weighs about 60lbs. without equipment.
British Road/Rail delivery of kit — £5.



Jack Holt Ltd., The Embankment, Putney, London. SW15 1LB.
Tel: 01-788 9255.

Inflatables

The range of craft available is considerable, from military patrol boats to build it yourself kits. The material is important and should withstand sunlight and oil, should not tear easily and must glue together well. The air pressure required inside seems to vary from 2 to 4 lbs. per sq. inch, the lower the pressure the better. The air valves should be reliable and allow rapid deflation as well as inflation.

As an example, we feature the Benyon-Tinker 'Tramp,' the boat sailing was made in 1968. The weight in this case is 56 lbs. (25 kg.) without the mast and sail. When the halyard is released the yard and sail lower along the boat and the masts fold forward, the yard is in two parts so that it fits within the boat when not in use. (Refer to pages 10 and 11).

Mr. Benyon-Tinker has developed a sailing kit for the Avon range of inflatables including a centreboard case as illustrated. It is not difficult to glue the case into position, but it does leave a slot in the boat. If for any reason, the sail is discarded a patch can be put over the slot. Many people, perhaps with bitter experience of leaking centre board cases, will not entertain a slot in the bottom of their dinghy. It is still possible to obtain rather modest performance under sail by fitting leeboards over the sides. A tube through the rowlocks extending across the boat is a satisfactory way to locate and secure the boards. The rudder or a steering oar can be fitted to the out-board bracket.

Details of this and the B.T. range of inflatables are available, send postage to B.T. Inflatable Boat Services, Bridge Road, Lymington, Hampshire, SO4 9BZ, England. (Photographs, see Front Cover and Page 56).

Craft Available

The 'Sport Yak' illustrated is made from polyethylene, it has a length of 7ft. 3ins. (2.21 m.) and a beam of 3ft. 9ins. (1.14 m.), including the rubber covered fender where the upper and lower mouldings are joined. Depth to the fender is 11ins. and to the rounded deck edge (with the forward 'spray shield' removed) the depth is 1ft. 3ins. (38 cm.).



Really this is a rigid boat of the same design as an inflatable. There is an air space between the two 'skins' of the boat so that she can support the crew when flooded and her empty weight is about 43 lbs. (20 kg.).

Advantages over an inflatable are that it deteriorates less in sunlight and it costs a lot less to buy. It has a moveable wood seat that allows the person rowing to trim the boat to balance the load being carried. It will carry two crew and some stores or it can carry three in calm water. The makers supply two wooden spoons which the salesman calls oars, as may be seen, they are ideal for children to learn with — adults can make steady progress, but more in the manner of a paddle steamer than an oarsman. It does not often happen, but an inflatable boat can be torn by a nail projecting from a wall or one I met was ripped by a butterfly nut on the windscreen of another inflatable that came alongside. The polyethylene seems much tougher. (Prolonged exposure to bright sun makes polythene brittle).

The main problem with the 'Sport Yak' that has been given to my sons is that it is difficult to repair. After years of use the bottom has cracked and torn so that lots of sticky tape is needed to keep the water out of the double bottom. In fact the boat has given some years of satisfactory service and could be replaced with a new one for £90 in January, 1977. Having rounded sides like an inflatable does tend to slop spray on board, presumably it is an easy shape to mould.

THE YACHT TENDER

By S. Coleman-Malden

A.Y.R.S. Committee Member, Shaun Coleman-Malden made the following observations on the general use and usefulness of his and other tenders.

"The Yacht Tender," so called by the vendor, often with the spurious prefix "Ideal," is generally known as the "blasted dinghy." Yet it has a soul!

After a few shiny weeks, 'queening' it over the other dinghies, it quickly sinks to the shameful, sordid, half-sunk state of her sluttish sisters, with whom she rubs shoulders, or bashes and bangs, at the whim of the weather, until her master returns.

This can be any time, day or night, and instead of a smile, a caress, "how nice to see you Darling," its a glare, rough manhandling and "the damn things full of water, again."

Water in it is always the dinghy's fault. The usually inadequate 'painter' is frequently an odd bit of line, it is too thick to tie but was once a "good halyard." It has chafed and been knotted. It is rotting. It is too short. Should it be too thin, it will fail. Nobody ever buys a dinghy painter. The dinghy

may revolt at the awful conditions under which she is expected to await, patiently, her master's pleasure. She breaks adrift Immediately, a hue and cry starts. No escaping slave from a plantation overseer could be hunted so relentlessly.

Its sufferings, strandings, dragging, bumping and transportation back to its moorings are too horrible to dwell upon. Generally, a week 'adrift' is a year off its life.

If a dinghy could speak, the following would happen:

- 1) The formation, immediately, of a "Dinghy Union"
- 2) Within a few days, a strike for:
 - a) Better living conditions.
 - b) Better Housing.
 - c) Better Working conditions.
 - d) Better maintenance.

and a lot more for the "underprivileged."

Yachting would grind to a halt and there would be banner waving deputations from the S.P.D. (Dinghies). Looked at in this light, we realise that dinghies are:—Shamefully neglected, misused, overloaded, expected to do the impossible and blamed for everything. After this, they are ignored.

The "well to do" yacht owner carries a selection of differing types of dinghies on deck or at his marina, to satisfy his need of the moment, similar to a harem proving superior to a single wife.

If you are "married" to a single dinghy, it should, more or less, conform, for general 'usability' to the following criteria evolved from many dinghies over many years.

- 'Solid' Dinghy:
- 1) Up to 9 feet (2.75m.), Pram, NOT a stem bow (dangerous).
 - 2) Beamy, flat-floored, and flared.
 - 3) Good and pronounced sheer.
 - 4) Sharp turn to the bilge and strongly reinforced in the area of the turn (extra timbers).
 - 5) Shape is important, particularly up to 9 feet at least, because the boat will mostly be overloaded, overstressed and will be performing the equivalent of "storm" conditions if there is much wind or sea, considering its size, load and high centre of gravity. (1 or more sitting on the thwarts).
 - 6) Seats should have supports under the centre to the keelson. This prevents seats bending when loaded, loosening the fastenings, knees and flexing the sides of the boat causing it to leak.
 - 7) Eye for towing painter should be low on exterior of bow.
 - 8) Painter should be long, light, soft and bouyant except that it should NOT exceed the length of the boat if using an outboard.

Notes on the Solid Dinghy

A side deck for the length of the boat is very useful to keep the water out but should have some means (holes, scuppers, etc.) to let bilge out when the boat is tipped up to empty it.

A very wide or movable centre seat to help trim the boat.

A useful dodge is to fix a net between the front seat and the bow, along the sides between seats and under the stern seat. This keeps shopping, cameras, hand bags, sweaters, etc. out of bilge water, also out of the way of feet.

The bow of a small stem dinghy has little bouyancy. It acts as a foil immediately it is immersed, causing bad towing, and can easily roll the boat over if there is any weight in the front. A lot of bilge water surging about has a similar effect.

With a pram one can often row ashore and step out "dry footed;" at low tide she can toboggan down over the mud to the waters edge.

A sculling notch, or rowlock, on the stern is most useful. It is particularly nice to be able to stand up and scull up a narrow creek in the marshes and see where you are going. We have a rowlock mounted on a block that fits into the Seagull engine bracket.

When towing at sea, a small drogue on the tow rope, just outside the stern of the yacht is very useful. In an emergency, particularly in a "man overboard" case, drop the painter over the side and the dinghy won't blow away fast. (With an inflatable it is essential; I have tried it with our 9ft. Redcrest in Poole Harbour and it works).

Good fendering **all** around (and extra on the bow and each quarter) is essential. It must be firmly attached. I have yet to find a better method than drilling through the side of the boat and binding the "D" section rubber firmly in place irrespective of its normal fixing method.

The word "Usability" I like, for it describes the general, every day, practical ability of the boat to do all kinds of duties in varying weather. A good general purpose "usable" boat is much, much better in the long term than a boat specially developed in one direction. The "High speed runabout" can't be rowed when the engine stops and is "under employed" with a Seagull.

To be able to sail your tender is really worthwhile. Most dinghies will accommodate a centre board of some kind but the rig should be simple, all the spars must go **inside** the boat when folded down. The rig should be **low**, the sail must come down instantly the halyard is let go. The "usability" calls for an ability to tack and run in sheltered waters, to save using the outboard, for children to learn, and everyone to enjoy, not a racing dinghy.

The "Lymington Scow" is a really excellent example of this type of boat although it is more suited to yachts over say 12 tons T.M. Because of its weight and size.

Inflatables

My experience is almost entirely based on a 9 foot (2.75m) Avon 'Redcrest,' the first lasted 10 years and was replaced in 1976 with another 'Redcrest.' We also have a 3 year old "Campari Tender II" (Price, £52, approx. in 1976).

The 'Redcrest' has been excellent, giving 10 years of reliability. One or two leaks only. Very safe, very stable, rows badly without floor. The floor improves the boat considerably, but is a nuisance to carry on the yacht, car etc., and adds to the risk of leaks, especially in the floor when you go aground. For this reason, we rarely use our floor and have had very little trouble at all.

We have used our Avon extensively with mostly, a Seagull "40+" longshaft, recently with a "40—" (standard shaft) in England and France.

Changing from a 'solid' dinghy to a windbag was disconcerting and the Avon took a lot of getting accustomed to, everything is different.

The inflatable is a very good rescue or emergency boat. You can jump straight into it from the deck of a yacht, and an exhausted person in the water can be "rolled" and "struggled" in over the side, but it is very difficult to climb into it if you are in the water.

The bow dodger is most useful, very good on the old (black) Avon, poor and flimsy on the new (grey) Avon.

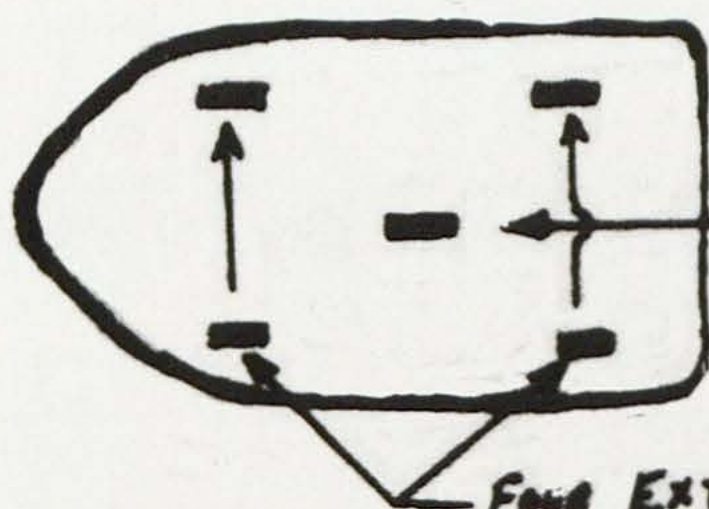
In rough weather/sea, rowing can become impossible, but one must assess a dinghy's capability and act in the light of the circumstances. A weighted or even flooded inflatable is more controllable than one flying high before the wind. A drogue or sea anchor can be invaluable and takes up little space.

I carry engine tools, plugs, shearpins, oil, spare line, folding grapnel, etc., in a kit bag, spare clothes, etc., in another lashed in the boat.

If the Avon is "soggy," perhaps through a drop in temperature, the engine tends to bend backwards and we run a line from the bow to the highest point on the engine. This absorbs torque and reduces the excessive strain on the stern.

In rough weather, we sit in the bottom of the boat. (You can easily be thrown out if you sit up high!) Under severe conditions, I should remove or deflate the centre seat. Trim is very important.

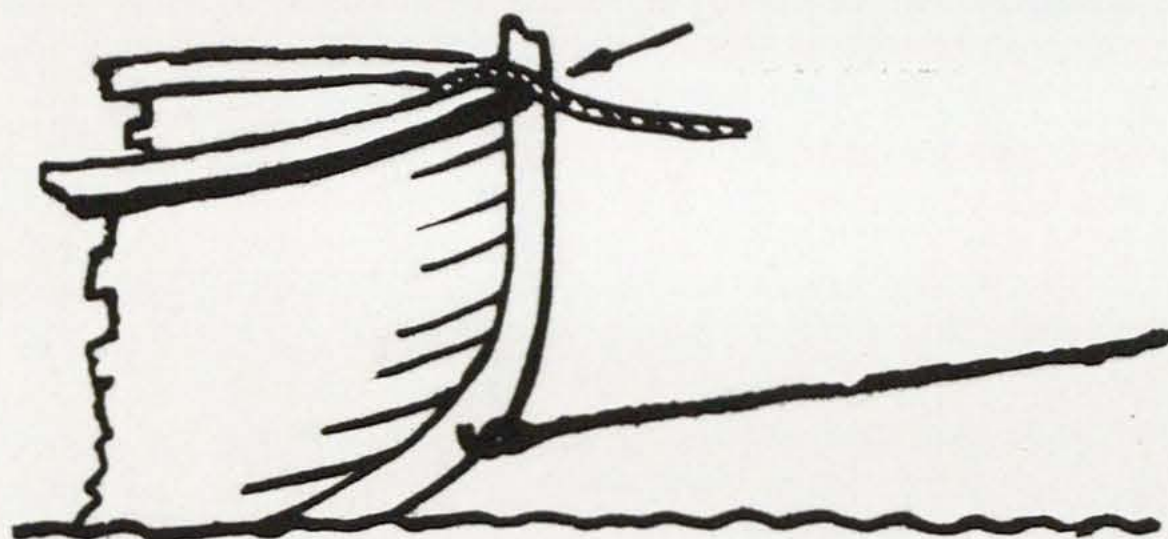
Now, after all these years, we have become used to our Avon and trust it,



STANDARD SINGLE HAND GRIP
ON BOTTOM OF INFLATABLE.

FOUR EXTRA HAND HOLDS. IF HAND HOLDS
FITTED BY MAKERS ARE NOT SECURE PULL THEM OFF NOW.

Tow Line chafes Gunwhale and pulls
bow down causing boat to yaw.



Tow Line Lifts Bow

Lower Line is hard to recover from boat.

and know most of its peculiarities. I am very fond of it.

It is useless bashing into the waves when under power. It seems best to throttle down until you are just slowly making headway and climb over or across the seas. The engines are absolutely trouble free. Seagull service, when needed, is splendid.

Notes

I had my (black) Avon fitted with 4 extra handles on the bottom; most useful when having to carry it along a sea wall or 'cat walk' in a wind.

The servicing of the boat is now a problem, and expensive. Originally one sent it back to Avons and they made a small charge, plus a charge for any work done. Now it must go to one of their "Officially appointed service agents." These appear to vary very considerably in their ability, willingness, etc. For my part, I am unwilling to send £200 worth of boat to an unknown set up and hope for the best.

The outboard bracket is effective, but most awkward to stow away, and can cause damage. I modified it to a "fold away" or "demountable" model with great success, it stows in the engine spares kit bag. Avons were shocked when I told them, but after 10 years, there has been no trouble.

Outboard Bracket Modification for Avon

Cut out the tubes separating the two curved side members. Next remove the wood plate to which the outboard clamps. You now have 2 side members and one (or two) plates, i.e. 3 (or 4) separate pieces. Now drill out holes in the wood and metal lugs, say 5/16 ins. Obtain 4 long brass 1/4ins. bolts (or use studding and rivet the nuts to form bolts) 4 wing nuts to fit the bolts and 8 plain large brass washers.

Re-assemble as before but without the cross struts and 'Bingo'! it's finished.

The tendency to over develop the tender into a 'speed boat' is to be deplored. By all means have an inflatable high speed boat. It provides one aspect, only one, supremely well.

To put a Bermudian rig on an inflatable makes it sail quite well; better than the average lug sail rigged tender, but the effort to ape a "racing dinghy", the high unsuitable sail plan for children, etc., produces a very poor "racing dinghy," a heavy tender, an expensive boat and a limited usability.

The 'Campari' I have found unsatisfactory. It is too small, unseaworthy, dangerous to enter and all too easy to leave. After 3 years, and very little use indeed, the bottom, or floor, leaks and it fills up (It is then a little more stable). It rows very badly, I have not chanced using an outboard on it. Children could, in my view, come to grief in it on an exposed beach.

Editors Note: Having owned an Avon 'Redstart' (smaller than 'Redcrest') and a small yellow 'Campari' I can endorse the above comments in full, but would add that the stem of a boat adds a lot of lateral resistance which is needed when sailing and helpful when rowing.

THE TENDER UNDER SAIL

The traditional dinghy and yacht tender, they were almost the same boat, was of heavy construction and usually carried a gunter rig.

Self Righting

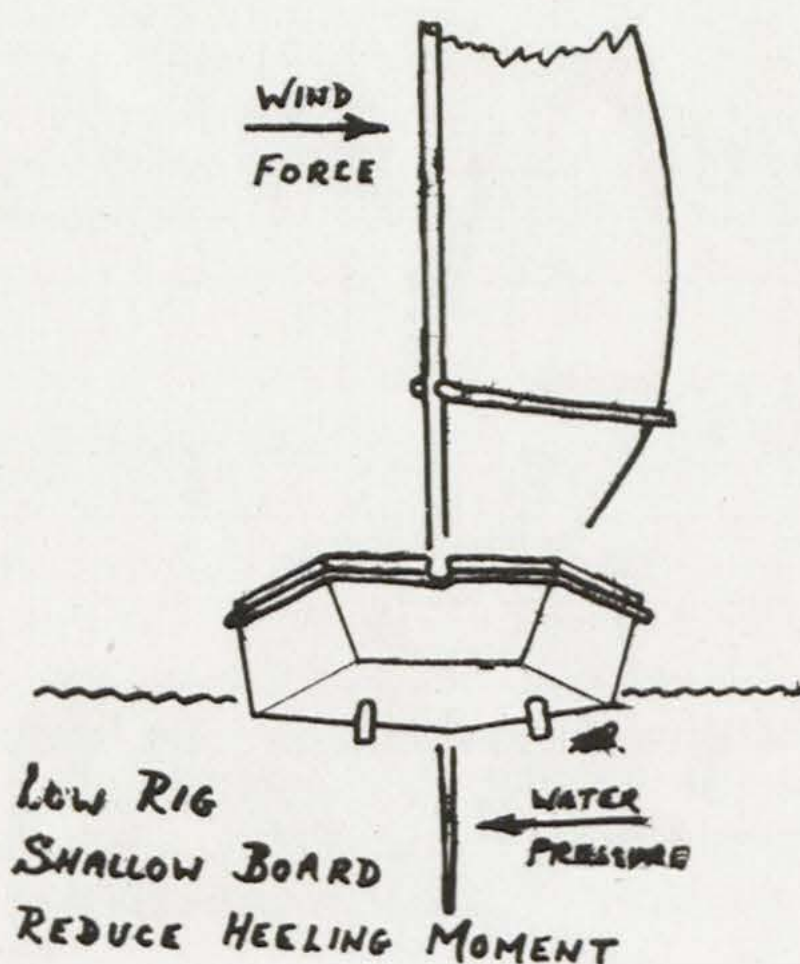
The modern racing dinghy separated from the 'yacht tender' design when Uffa Fox and others developed the lighter 'diagonal' method of construction and high Bermudian rigs which the crew had to keep upright by means of skill and judgement. Capsize is no longer a potential disaster to a racing boat, because their light weight combined with bouyancy high up on the sides of the boats make it possible for the crew to right the boat and sail on after a capsize.

Many traditional boats did not have bouyancy tanks. A great number more have tanks but when flooded the top of the centreboard or daggerboard case is below the waterline and they can not be bailed out unless a towel or shirt is stuffed into the slot. Most rigid yacht tenders will act like this if they are equipped for sailing because bouyancy tanks and a daggerboard case extending almost to deck level would prevent the boat from being stowed over obstructions on the yacht, for example the cabin top ventilators.

In the 'old days,' perhaps as recently as 1965, if a yachtsman observed a boat on its side he would alter course to see if help was needed. So often now he finds the crew right the boat, sail circles round him giving rude signs and disappear to the beach that he waits for a long time before offering help. The self-rightable boat is a welcome improvement but it does mean that those of us who sail the other type must be even more careful always to sail with regard to the weather conditions, our ability and the load in the boat.

Sail Area

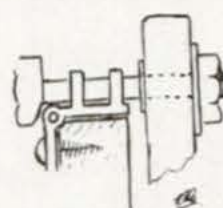
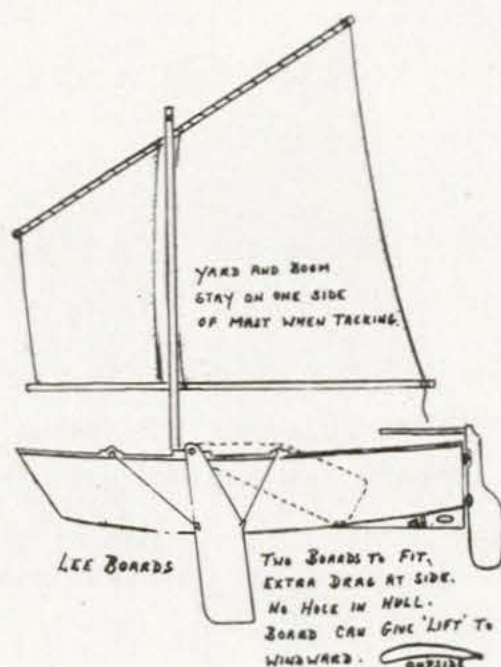
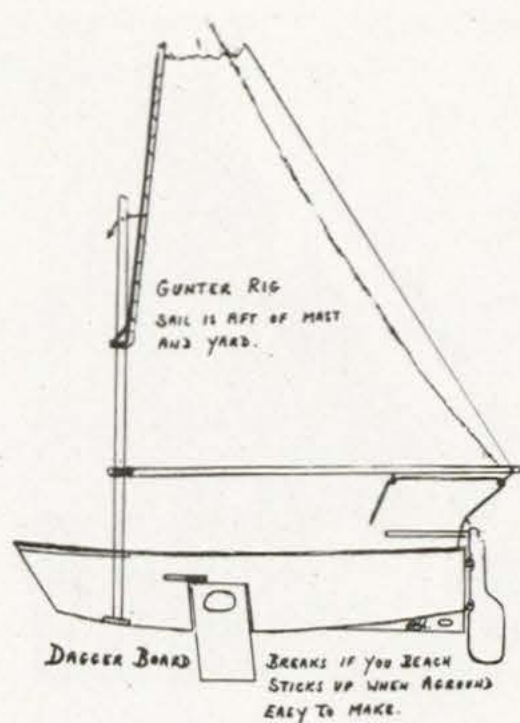
It seems a pity to drift about on a perfect day with a gentle breeze using



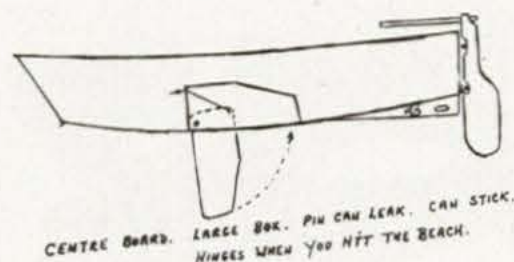
a tiny rag of sail because the designer of the boat is worried that a fool will buy one, hoist full sail on a gusty day and drown. Resulting publicity is bad for sales and a yacht tender does not need a reputation for speed or winning races. The sail area should be modest and should be easy to reef, if the designer pays attention to having two deep sets of reef points that can easily be used when the breeze is moderate or the boat is being sailed by children and if the sail can be lowered at once when needed, as when coming alongside or if hit by a gust, then the boat will be useful as a tender and if people do drown it will be their own fault for carrying too much sail. When the sail luff is sewn as a tube that fits over the mast the sail cannot be lowered when reefed even if area can be reduced by cutting the bottom panel of cloth and raising the boom up the mast. To say that sail area should be "modest" is like saying that a boat is "fast"—quite meaningless unless a comparison is given. Unfortunately ability to carry sail depends on the beam and design of the dinghy, an 11 foot dinghy or 9 foot pram with 3ft. 6ins. beam should well be able to carry 65 square feet of sail on spars that will just stow within the boat using a gunter or standing lugsail rig.

Keel Area

A haystack will drift down wind and so also will a tender. To proceed on a chosen course requires a hull with much greater resistance to sideways travel than it has to forward movement. This 'lateral resistance' should be provided by an area of at least 4% of the sail area. The stem of a dinghy and the skeg and bilge keels help but unless these are rather deeper than usual, causing problems on deck and on the beach, it will be necessary to have a board. The board for a boat with 65 square feet of sail should have about four square feet of area in the water, it can be a leeboard, daggerboard or centre-board, they each have advantages when compared with the others.



HINGE MUST ALLOW BOARD TO
SWING OUT AS WELL AS AFT. LASHING WILL DO.



The Rig

The racing dinghy can rely on the crew sitting out as 'movable ballast' to keep her upright. It is desirable to sit to windward when sailing any boat when the crew weight is such a high proportion of the total displacement but sitting on the gunwhale of an open boat is not regarded as good practice. On merchant ships, only fools and Liverpool firemen sat on the rails and Liverpool firemen went with the last of the coal burning ships. Most of the fools have dropped off but a few survive. In order to reduce the capsizing moment of the sail while still having a reasonable area, it is necessary to have a low rig that extends along the boat low down. The gunter and lug rigs allow this at the expense of having an extra spar along the head of the sail. As the mast, yard and boom can all be of about the same length they offer the advantage of being easy to stow within the boat. Due to the twist in the sail, because the yard cannot be kept to windward parallel with the boom, these rigs are not as efficient at sailing close to the wind as the Bermudian sail.

Other rigs have been used. The Bermudian with the top part removed, if the sail can be held out by a stiff batten or small yard like the old Dutch barges, the mast can be shortened for the loss of only the top triangle of sail. The dipping lug is efficient and low but the sail has to be lowered and hoisted again on the lee side of the mast every time the boat tacks, the lateen rig has the same problem. Some satisfactory tenders use a lateen rig with the yard hung between two tubes to form a tripod, (refer to the rig by Benyon-Tinker on the front cover). Another rig uses the dipping lug with the boom projecting forward of the mast to the tack and with the sail cut to form a jib and mainsail. As well as keeping the area low down the area of the forward sail relieves the load on the sheet making it lighter for children to use. Some rigs use a jib or foresail and others use a single sail with the mast as far forward as it conveniently can be. The area of the jib is likely to be small, it can be useful when tacking and it provides an extra rope for a child to hold but otherwise the yacht tender is probably better with a single sail or with a rig that only needs one halyard and one sheet, the less there is to look after the more satisfactory the final result is likely to be.

MATERIALS AVAILABLE

Timber

The traditional European boat is clinker or 'lap strake' construction, usually with pine or mahogany planks and oak frames.

Clinker

The boats are built over formers and each pair of planks is shaped and then steamed to get the wood soft enough to bend to the required shape. The frames are also steamed and are rivetted into the boat after the planks. Many yards still build boats in this way as an important part of training apprentices but the boats are expensive due to the need for sound seasoned timber with each plank running the whole length of the boat.

These boats can give years of service, even 40 years with care. They are strong and because the wood only bends to a fair curve they are usually seaworthy. The problems are the weight, difficult to repair properly, difficult to clean out and varnish or paint without which they will not last long and, most important for a tender stowed on deck for long periods—the wood must be kept damp, because it shrinks when dry and the boat will leak, often very badly, until the planks swell again.

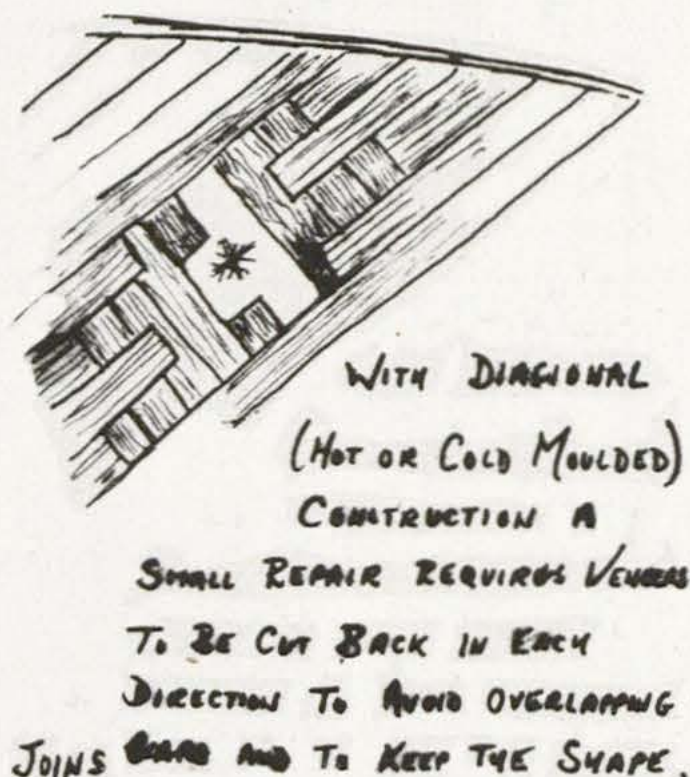
Wood Planks

Carvel construction no longer seems to be used for small boats probably because of the time needed to fit the planks and the inconvenience of caulking. Other materials can produce a boat of the same shape with superior results.

Diagonal

'Modern' glues and the need to build very light but also very strong hulls for flying boats and seaplanes led to the development of 'diagonal' construction. Usually three but sometimes five veneers of wood are laid over a former or plug with a layer of glue between each layer. Fairy Aviation and later Fairy Marine of Southampton specialised in this method of building using heat to cure the glue and 'set' the timber. This became known as 'hot moulded' construction and many people referred to 'diagonal construction' as "cold moulded" to indicate a boat of this type built without heat. Vessels for the British Royal Navy from open boats to small minesweepers were built of diagonal planks using thicker veneers with tar and canvas between the layers of timber. Quite recently, there has been an increased in the popularity of this method of building for quite large yachts in the U.S.A., the present name is the WEST system, 'WEST' stands for wet epoxy saturated timber. Epoxy is a very strong and waterproof glue, many varieties are available. In the U.S.A. the Gougeon brothers of 706 Martin Street, Bay City, Michigan 48706 supply materials and information for building by the WEST system, which they have been developing for some years. In England, a somewhat similar glue is available in quantity from the Borden Chemical Company of 61 Commercial Road, Southampton, SO1 0GG. EL 5 Resin with EHA 30 Hardener, 2 : 1 by weight. In the U.S.A., red cedar veneers are preferred, this is a very light wood, resistant to rot and able to take up the glue. This timber is at present more expensive than teak in the U.K. and other woods are being tried.

Diagonal Construction produces a hull which is very light for its strength. For a production run of boats the frames are added to the completed hulls,



if a single boat is being built the frames can be part of the mould that gives the boat its shape. Because the skin is strong and holds its own shape the ribs and stringers mainly spread the loads from local areas such as the seats, centre board or rudder and they can be well spaced making it easy to clean and maintain the boat.

Probably the main disadvantage of diagonal construction is the difficulty in making satisfactory repairs.

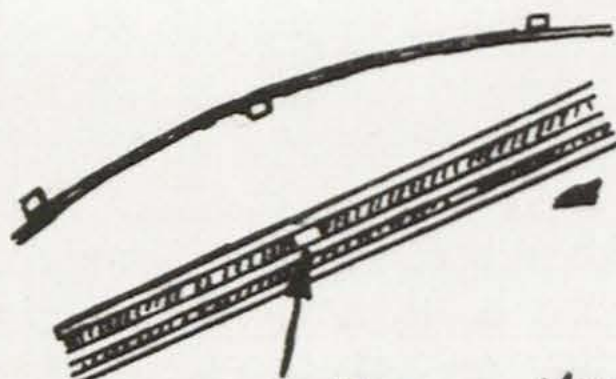
Plywood

As a boat-building material, plywood can be regarded as flat sheets of ready made diagonal construction material. For a box, plywood would be as satisfactory as if it had been moulded. Boats are usually curved and these necessary changes of direction cause problems to the designer of plywood boats. As soon as a sheet of plywood is bent, the veneer on the inside of the bend comes under pressure and the veneer on the outside is under tension. The load increases as the thickness of the ply and the amount of bend. Further problems met by the designer for plywood construction is that the material will not take a double curve which is desirable towards the bow. The plywood can be twisted into segments of a cone and clever use of this fact, used with bends in plywood sheets enable some designers to produce very pleasant and useful boats of the material.

Mass production of plywood sheets enable the factory to sell sheets of well glued material at a price far below the cost to an individual of the materials alone if bought in small quantities, and the sheets come in standard sizes and graded according to their quality. An amateur or small builder can obtain a plan, obtain the material locally and build a satisfactory boat. If this sounds like the perfect answer beware before buying as there are a few snags.

Marine grade and exterior grade plywoods use the same glue. The type of wood on the exterior and interior layers may be the same or different but this will be known by the salesman. The main difference is the gaps between the wood on the inside of the sheet.

If you look along the edge of a sheet of plywood looking at the end grain of the interior wood, you will probably observe gaps. The size of the gaps is governed by the quality code for the wood. Even if no gap is visible from any edge of a sheet, one may be found when the sheet is cut. Gaps between the interior timbers of plywood have two very unfortunate effects on boats—when you bend the sheet to its designed shape the curve is sharper at the gap, the gap is almost certain to run across the curve,



**GAPS BETWEEN VENEERS OF
PLYWOOD PREVENT FAIR CURVES
AND SPREAD WATER AND ROT**

because the inner and outer grain will have been chosen to run along the direction of bending. The second problem is moisture—a tiny scratch in the paint will allow water to seep into the wood and build up inside the hollow between veneers. Plywood boats which look perfect from the outside, may have serious problems due to the timber inside going soft. Plywood boats may last for many years and be quite satisfactory, but it is important that the builder keeps a careful watch on his material.

Sometimes plywood strips are used for diagonal boat building as mentioned before. This allows compound curves and reduces the stress in each part of the ply. Some larger plywood dinghies may have a section at the bows built by this diagonal method to obtain curves that plywood sheets will not accept.

G.R.P. or Fibreglass

Fibreglass is a trade name, but it has been mis-used to describe boats of all sizes made up from strands of glass bonded together and made watertight with resin. In the early days the importance of details like temperature control during setting were not fully appreciated and a number of boats with an outer skin like coconut matting were produced. There are still 'bad batches' due to errors in mixing chemicals and the use of out of date or badly stored components. Slowly the words "low maintenance" are replacing "no maintenance" on the sales sheets.

Without question G.R.P. is a great stride forward from the traditional wood construction. It can be lighter and stronger, less expensive to produce, less likely to leak and not difficult to repair. With all these advantages it is hard to understand why so many badly-designed boats have been built. Perhaps it is because price and salesmanship have such a bearing on success that many excellent designs have gone and a few of the less satisfactory have been sold in great numbers. Please do not take account of the numbers sold when considering if a dinghy is suitable for use as your tender.

When building a boat either woven cloth or chopped matt or a combination of both will be used. If a boat is to be strong but also light in weight, only cloth would be used; it will be thick in places where loads are high and thin where its only purpose is to keep the water out. The outside layer of resin, the gel coat, which is applied to the mould after the release agent, contains a colouring pigment dictated by fashion and the salesman. The pigment is in fact an impurity which adds weight to the boat and can allow tiny amounts of moisture to enter the skin. Without the pigment, you would be able to see the air bubbles which may remain. A careful builder spends a lot of time getting the glass cloth completely wet while a man in a hurry may produce a hull more like a foam sheet. Bubbles can in fact be detected by looking through the hull towards the sun or a powerful light. To make a really good job of building your own boat, you could leave out the colouring pigment and paint the hull afterwards. Unfortunately to obtain a good finish it is best to build inside a mould and to make the mould takes longer and costs more than a complete boat built of other materials. The difficult part of

building a G.R.P. boat without a female mould is obtaining an acceptable finish on the outside. (You also need a building with excellent ventilation and a minimum temperature of about 60° F.)

Aluminium

Aluminium is one of the best materials for building boats. It is light and strong and it requires very little maintenance. Aluminium is an alloy and there are probably as many grades as there are types of tree. Some grades will be excellent for one purpose and quite unsuitable for another. It may be that the best grades for use in salt water are difficult or unsuitable for welding because the best aluminium yacht tenders always seem to be of rivetted construction. One problem with aluminium boats that has not been a worry to me is the importance of keeping all brass or copper well away; many paints are not suitable but polyurethane paints are satisfactory and paint is purely for decoration anyway. The second problem that I have found over many years of using an aluminium tender is not directly concerned with the material—the dinghy has a sharp point at the bow and each quarter and these constantly try to dig holes in the topsides of parent yachts. I have owned a heavy clinker tender that could bump without marking the paint. I fit fendering round and over the corners but they get knocked off, are heavy and expensive.

Although aluminium is very light, it is slightly soft so that floorboards have to be fitted on bearers and bouyancy tanks must be provided to make sure that the boat does not sink.

Other Materials

Almost any material can be used to build a boat. I have used a boat made from exterior grade hardboard which lasted for several years and seemed quite safe. Cow hides and polythene bags have been used and have served a purpose. Our purpose is to obtain a tender to meet our listed requirements, one should look at as many materials as possible but there seems to be a band of acceptable options. The two main limiting factors are cost and weight, ultra light strong boats are usually expensive, the best value for money and the 'boat to beat' in this class is the inflatable. Inexpensive boats, like the hardboard example, are usually heavy. For some purposes, for example when the yacht has two tenders, one of which is left on the mooring and does not have to be lifted on board or dragged up the beach, some extra weight is acceptable. If this is the case, more boat can be obtained for ones money and a few boats have been built of Fer-A-Lite, a type of ferro cement that is popular with builders of yachts of that material. It is quite wise and fairly common for amateurs who build their own yachts to start with the tender so that they get the knack of working with their chosen material. There is no record of how many never proceed beyond the dinghy stage.

If you need a very light tender and a suitable inflatable is not obtainable for the available funds, the most satisfactory answer will probably be a canvas boat, either with a wood frame that can fold to stow on board or with

a rigid bottom and canvas sides that fold. The Puffin as designed by Barry Bucknell for Polycell Prout Ltd., unfortunately this boat is no longer available to buy new.

CARE, MAINTENANCE AND REPAIRS

The tender represents an investment and you trust it with your life. It deserves some care and more attention than most owners are prepared to give. The amount of care used will to some extent govern the repairs needed and the chosen construction material will dictate the need for maintenance.

Aluminium

Aluminium boats probably come nearest to the no-maintenance line, some care is needed to see that floorboards are intact and odd brass nuts are not left in the bilge. They dent if bashed hard on rocks and they can be difficult to repair; it is usually necessary to rivet a patch over a serious hole but the only common fault is a leaking rivet and this can be cured with epoxy glue, at least as a temporary measure.

G.R.P.

'Fibreglass' boats repay the careful user by lasting for unknown years into the future. To some owners, time is money and they prefer not to waste it on maintaining a simple dinghy. To these people the boat will give long and reliable service, it will not suddenly break up or sink but slowly chips in the surface will spread to cracks, any wood protecting the gunwhale will decay, the boat may twist out of shape, become heavy and start to leak. Frost will cause such a boat to delaminate and leak and it becomes a case of repair by replacement. Chips in the outer surface of the boat should be filled and touched up with paint as soon as possible, when the outer skin is cracked, water can seep into and along the strands of glass. Once inside, the moisture is reluctant to evaporate out again even after weeks under cover, you can detect the water by weighing the boat from time to time. Once the water is inside the skin a hard frost starts the destruction so for a long life, protect the boat from water. If the boat is regularly stored upside down on a rack or chocks so that she does not twist, and an occasional coat of wax or polyurethane paint is applied to the bottom, the hull should remain sound. The wood needs treating as a wooden boat with coats of varnish or paint each year. Any parts of the boat that are glassed on after the hull was lifted from the mould should be inspected from time to time because flexing of the hull under load may cause these to crack loose, this may apply to the attachment for the crutches (rowlocks, but refer to parts of a boat!) and the painters. Bouyancy tanks can leak or come loose.

An emergency repair to a thin part of the hull can be made by pushing the cracked glass back into shape and covering with sail mending tape or plaster from the first aid box. The thicker parts near the stem and bottom of the boat can be patched, an outside patch can be held with self tapping

screws or small bolts. Cement is one of the few materials that will stick to moist fibreglass and set hard to make a watertight repair to parts of the boat that do not flex.

A permanent repair can be made when the boat is dry, the weather is at least mild and materials are available to complete the job. Repair kits are readily available and have detailed instructions but they have a limited shelf life and require that the boat is dry, for this reason, it does not seem wise to have such a kit stored in the bilge somewhere 'in case its needed.' A pack of two tubes of epoxy glue such as 'Araldite' or 'Marinetex' may well be useful, epoxy sticks well to polyester even if some moisture does remain. Most yachts have this material with the repair kit anyway so nothing extra is needed for the tender.

Timber

Wooden Dinghies of all types respond well to 'T.L.C.'—Tender Loving Care—to see that they start the season freshly varnished or painted, traditionalists may still apply tar to the bottom. Water inside a boat while afloat will do no harm but water in a boat on the land imposes a load in a direction that pushes the planks or skin away from the frames and stringers and this can strain the fastenings. In an ideal world, dinghies with wood plank construction are kept stowed supported by shaped chocks and protected from the sun by a canvas cover, the bung will be out but there will be a little water swilling about in the bilge to keep the planks tight. Boats of diagonal construction do not leak if they become too dry and the same care is not essential to the well being of the craft, probably they are best stored upside down and if varnished, they will appreciate protection from the sun.

An emergency repair to a timber boat can be quick and easy, our seafaring forefathers carried lead patches which they hammered to the required shape and nailed into place. Very useful for bullet holes when the natives are unfriendly; modern racing yachts are required to carry soft wood plugs for the same purpose so times do not change much. As saving weight is so important, patches of thin plywood or canvas can be used, preferably set over a sealing compound although thin foam or soft cloth can be used to form a seal between the patch and the hull. The patch can be nailed or screwed to the hull but with a diagonal construction boat it will be necessary to have a pad or block on the inside, or an alternative is to use bolts with washers under the nuts. An emergency repair means using material that is to hand and again cement can be satisfactory but glue requires dry timber.

Permanent repairs are best made with the same materials as the original, the most difficult is diagonal construction because strips of wood have to be cut back in each direction. Plywood is probably least trouble because of the lack of compound curves. The holed part can be cut back to sound wood and a piece of ply of the same thickness scarphed in. A pad or strips of plywood can be fitted inside as 'doublers.' Permanent G.R.P. repairs to wooden hulls are not usually satisfactory because the moisture in the wood weakens

the bond, especially as wood expands or contracts depending on the amount of water it is holding. G.R.P. sheathing on the outside of a wood hull may prolong its life by two or three seasons but the bond usually fails. Nylon and polypropylene applied with epoxy glues have been used with better results because the material allows some movement. Sheathing is done with the wood dry and the boat will not be of much value as a tender if it has to be kept that way.

LIVING WITH SOME PROBLEMS

A.Y.R.S. member, Reg Frank kindly sent the following notes, or observations,

Stolen Boats

Reg keeps his yacht on the East coast where the tide goes out for a long way. His trolley is useful to take the dinghy to the water. He complains that it is not possible to leave an inflatable on moorings which dry as 'people' will walk out and steal them but solid dinghies can be left on the mooring. An inflatable was also stolen from his club while the owner was inside. I experienced the same trouble when my Avon 'Redstart' was stolen from the deck of my yacht while I was soundly asleep below after a long passage. I then learned that the insurance company WILL NOT PAY for loss of any tender if the name of the parent yacht is not painted on it—mine was not, but it will be in future! A few members have a large patch placed on a prominent part of their new inflatable, this aids identification and discourages a thief who prefers to take a boat in 'normal' condition. Reg plans to obtain a 'solid' dinghy to keep on his mooring.

Security

Reg Frank reports: Having been caught out with the Avon not inflated on two occasions when people were in danger of drowning in the vicinity, I now always make a point of having it alongside the yacht when I am on board. When I go to the club the first job is to inflate the dinghy and put it on its wheels. I can run with it across the beach, row across the creek and reach people cut off by the tide—they often are where I moor!

When help is needed, it is needed quickly and it takes 10 minutes to inflate the Avon. If any reader can devise a foot operated pumper to inflate an Avon in three minutes hard, then they have a product with a world wide sales potential. I am wondering how to incorporate a big bellows into the cockpit sole, with long pipes. Couple up to both inlet valves, push the Avon overboard with painter secured and pump.

Dinghy Carrier

Simple two-wheeled carrier made for an Avon but can be made to use with any tender.

I was too confident and carried gear with sharp edges and cut a hole in the dinghy floor. I could use floor boards but then the axle might chafe the

rubber between the axle and the floorboards, so I had the idea of a net. I secure the net over part of the dinghy and stow gear which will not chafe under the net. Gear which will cut or chafe stows on top of the net. (Rowers feet can go under the net).

For weekend use, I carry all my gear, food, etc., in a rucksack on my back and, the dinghy is nearly empty. Afloat, put the ruck sack into a plastic sack and lash it down. Put the wheels and axle with the bellows and tie them down.

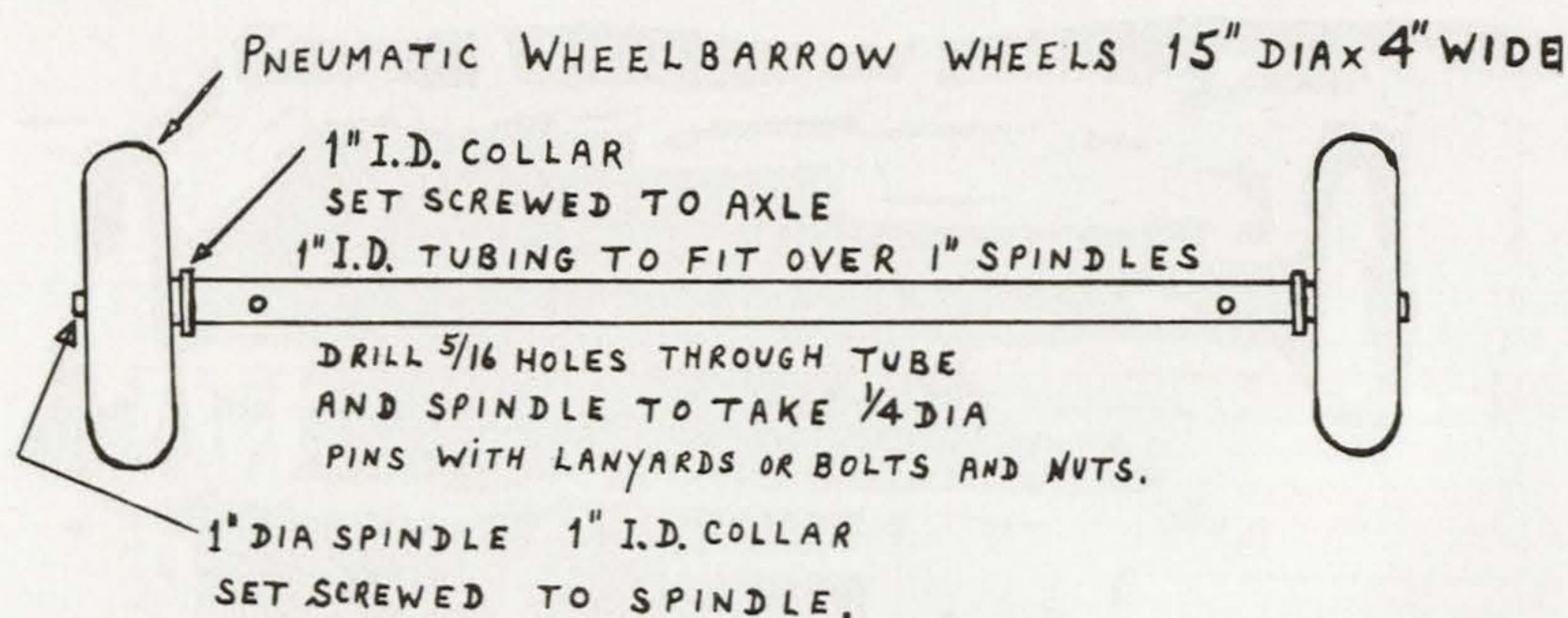
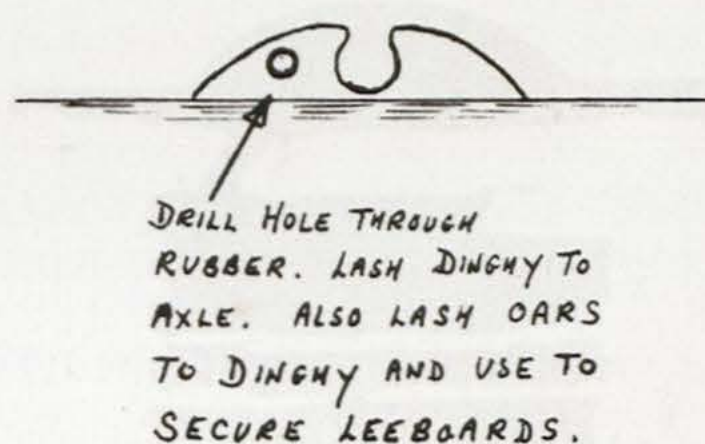
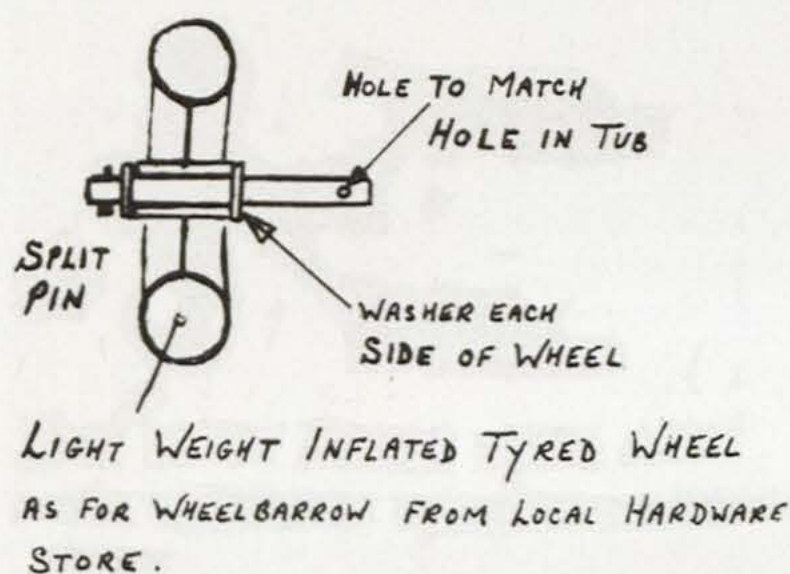
I go out and come in across breaking swell so dinghy is sometimes overturned. It is vital to secure all the gear and for gear which can be spoiled by water to be in a waterproof sack.

Avons are fine dinghies but very wet.

TWO WHEELED DINGHY CARRIER

Axle tube can be aluminium, stainless steel, electric conduit or galvanised pipe long enough for the tyres to clear the dinghy by about 3 ins. each side, (6 ins. in all).

If used with the dinghy upright, a hole should be drilled in each rowlock to secure the lashing. Wood blocks with padding could be added to the axle to prevent chafe but the advantage of simplicity and the ease of stowing on board are reduced.



be hand held with a turn round the dinghy thwart. Towing from ahead should only be tried when it is too rough to tow alongside and the fact that it is rough makes towing more difficult. The boat must be carefully trimmed and the throttle moved very slowly to avoid rapid changes in pull or direction. High powered outboards are usually intended for speed boats and will normally have propellers quite unsuitable for towing, best results will be obtained from a slow running propeller, probably driven by a four or six horsepower engine, eight if the horses are small or the boat large.

If you wish to take out an anchor or run a rope to a distant post or another yacht, there is a difficult and a less difficult way to go depending on the tide and wind.

When the anchor is to be taken downstream, it should be put in or tied under the boat and the line slacked out from the parent yacht. If the destination is up tide, the end of the line should be secured in the boat and the rest of the line or chain coiled down with the anchor on top secured to the transome with a release peg or knot, if it is too heavy to lift over without risk of upsetting the boat. When ready, the boat is rowed away, the anchor is dropped in the desired position and the line is paid out as the boat returns downstream to the yacht. If anchoring a person on the yacht should indicate the direction and distance to the dropping position by signals to the boatman.

When taking a line across the tide, I find it best to pay out line from the yacht and from the boat which rows away as quickly as possible heading partly upstream.

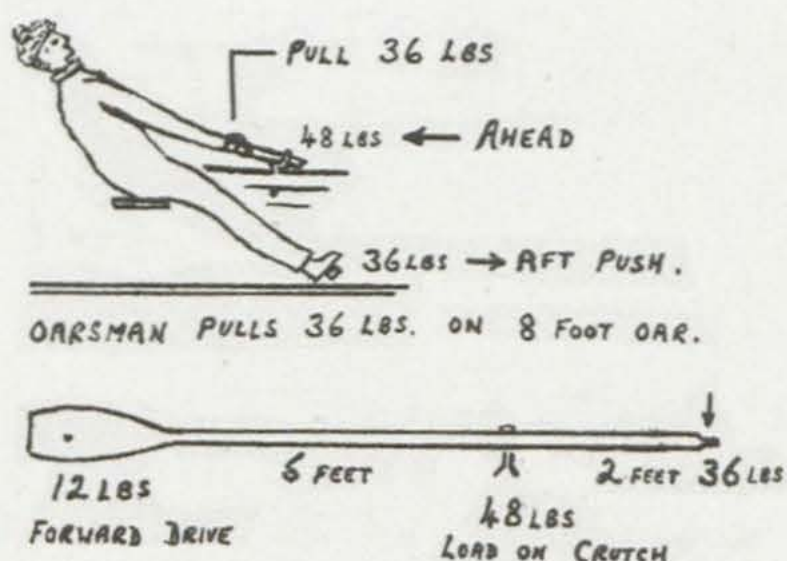
Landing in Waves

Landing on an exposed beach even in settled weather can be difficult. Like so many other things, it is a case of practice and experience making the manoeuvre look easy while in fact, local knowledge of obstructions and variations in depth which alter the wave formation are important factors. Even on a calm day, waves usually break on the beach and these can not be seen from seaward.

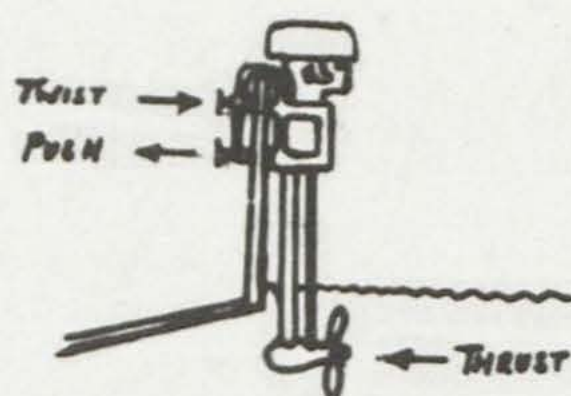
If it is necessary to land on an exposed beach, the best way is to turn the boat round head to the waves when clear outside the breakers. First check that all loose gear is secure. If there are two people in the boat one can steer with a spare oar or paddle—the rudder will be useless. Anyone in the boat who is not rowing or steering should sit on the bottom. When ready, the boat should be rowed backwards to the beach pulling firmly ahead just as the breaking crest approaches. Many books advise waiting until a wave larger than the usual ones has passed before starting for the beach, the idea is that waves follow a pattern and the following ones will be less high. My own observations seem to indicate two or three large waves together.

The only time that I have capsized in surf was after several days of landing from my yacht by shipping the outboard and rowing. I decided on a calm

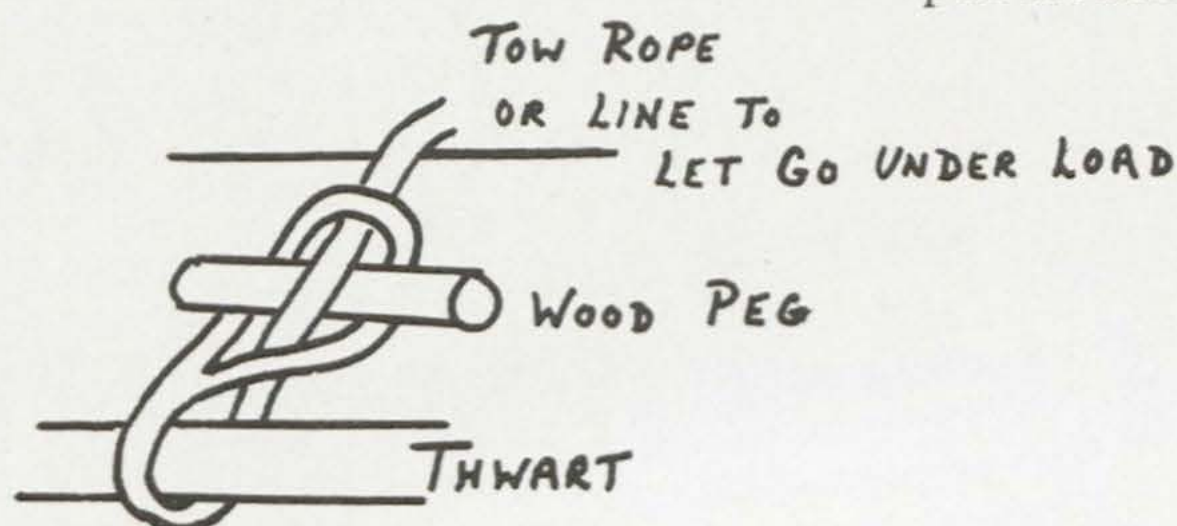
day that I could power out through the breakers. At the wrong moment the bow swung and quite a small wave rolled the boat over. Since then I have rowed out beyond the breakers but, like most weekend yachtsmen, I seldom anchor off an exposed beach and I need much more practice before I could be considered competent.



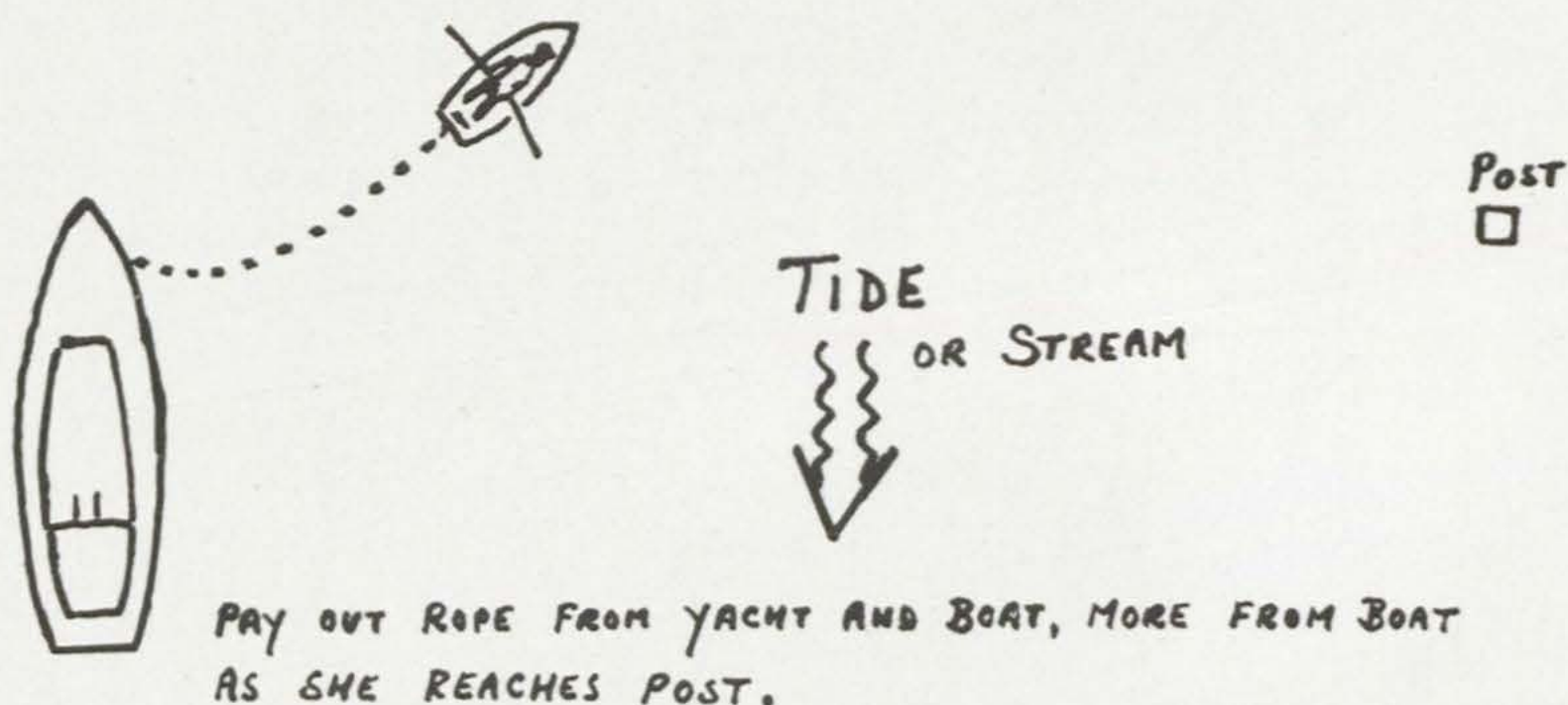
12 lbs. is the amount available to move the boat. If the rower does not push aft with the same load as the pull he will fall off the seat.



The transome takes a twisting load when an outboard is fitted. The upper knees should be secured by bolts, not nails, to withstand the pull aft and vibration.



The wood peg can be used to let go the anchor without leaning over the stern of the dinghy which could be dangerous.



SOME FURTHER PROBLEMS

By Michael Ellison

Many of the problems found when using small boats can be reduced or eliminated by careful preparation and maintenance. To row well, the oarsman must be comfortable and have oars of a reasonable length. The length of the oars is limited by the internal length of the boat, it must be possible to stow the oars inside the boat and oars in two parts are not usually satisfactory. People who row to earn a living use long oars and take steady slow strokes—this is not because they are tired, it is the best and fastest way to row. There should be plenty of weight inboard of the crutch or rowlock, so that the oar is balanced and energy is not wasted lifting the blade from the water after each stroke. Rowing should not mainly use the arms, they should be kept straight during each stroke. To row correctly, it must be possible to push against something with your feet, boats designed for rowing have adjustable stretchers, which are positioned to suit the size of the oarsman. Other boats can be adapted by putting a block of the right thickness ahead of the aft seat or by using a loop of rope of the correct length tied to the rowers thwart.

When using an outboard the weight should also be evenly distributed and the crew should be comfortable. With many boats this requires that an extension is fitted to the tiller of the outboard, with 'Seagull' outboards, some owners include a motorcycle twist grip throttle control to the extension which just pushes into the standard tiller with a long throttle cable.

Overloading

Most of the horror stories we hear about small boats are caused by overloading and hurry. Time and tide do not wait but two journeys in safety are better than having to swim part of the way. These "accidents" would in the aircraft world be put down to "pilot error," it is necessary to use the craft within the limitations imposed by its design. We start off with the fact that one cubic foot of water weighs 62½ lbs. and that volume must be displaced to support that weight of boat and her cargo. The amount of 'reserve buoyancy' depends on the conditions and the shape of the craft, it is lack of suitable reserve that causes the problems. Allowance must be made for some water to be shipped by the loaded boat and this sorts out the box boats from the well designed craft—some boats scoop up the wave tops from passing yachts while others bob over waves like a cork. Once again the weight distribution within the boat is important, loads, including people, should be as low down and as near the middle of the boat as possible.

Floorboards

A good boat, regardless of its construction material, will have floorboards. These boards are not only to collect dirt and hide the keys when you drop them—they distribute the weight of local loads over a wide area of the boat to prevent distortion and protect the bottom from sharp objects such as

engines and anchors. A strut from the keelson to the middle of the thwarts is also an excellent idea to take the load off the sides of the boat and if the builder forgot to include one, it is a good idea to put one in. Often the centre-board case is designed to do this.

Lashing loose equipment to the boat has been mentioned, this is important on every day ferry jobs as well as the exciting dash through the surf. Harbours and rivers around the world are littered with lost outboards which would probably still be working if they had been secured by a line. The line on an outboard must be long enough to allow it to be lifted, it can not prevent the engine dropping — it may get in the way and help it to drop — but if it falls overboard, it is not lost.

Lost Rowlock?

A 'rowlock' is either cut out of the upper strake of the boat or bonded onto an inflatable and so is secure. A crutch fits into a hole and is easy to lose, the fact that many people call this portable piece of equipment a rowlock is no help when it gets lost—this is a situation that requires improvisation. If in dire straits, you may be able to make a proper rowlock by cutting a slot in the gunwhale, but there are less drastic measures which have proved satisfactory. A bolt, rod or spike may be available which will fit into the hole — if so, the oar can be lashed to it and used as a thole pin. A wire can be passed up through the hole, round the oar and back to be secured. A thin piece of rope might pass through the hole and lash to the oar. One strand could be removed from a thicker rope, the painter for example, and used for the same purpose. If you have tried all this, it must be difficult to scull over the stern (no fitting?) so try using the painter to hold the oar over the bow and scull backwards. On some boats, this is possible—why not find out if it will work for you? The best time to improvise on your boat is next time you go out, before the real need arises.

Towing

Towing from a tender while rowing can be quite surprisingly effective, I have towed a six ton sloop for many miles both in open water and in harbour. The best way is to use a reasonably long line and keep the boat moving with steady strokes. The tow line must be ready to let go **at once** from the boat and must lead astern all the time.

Towing from a tender with an outboard is difficult and can be highly dangerous. Without doubt the best way is to lash the tender securely alongside and keep the outboard running ahead while steering with the yacht's rudder. To tow from ahead the tow line must be kept clear of the engine and lead astern. The towing boat can very easily be capsized if the line is not kept leading astern and the line should not be secured to the engine due to the need to be able to release it at once if the engine should fail or if for any reason the tow should come towards the beam. I have towed by leading a light line from a 'G' clamp on one quarter through an eye at the end of the tow rope and back through a 'G' clamp on the other quarter to

THE TENDER AS A LIFEBOAT

Let us consider the requirements for a yacht lifeboat and then decide how a tender can be fitted to meet these needs.

The ideal design will be different for different areas of use. If a boat is to be used instead of a liferaft, it will have to be very well designed and carefully stowed on board. In an ideal world the stowage for the tender and liferaft would be part of the original design of the yacht and it is considerably less difficult to think of a combined craft suitable for use as a lifeboat which can be quickly and easily launched under adverse conditions if the parent vessel is designed with this in mind.

The larger the parent vessel, the easier it becomes to stow a tender and it seems a good idea to concentrate our attention where the need is greatest. Yachts under 20 feet have made extended cruises and crossed oceans but every weight has to be carefully stowed and a conventional liferaft seems the best answer for 'pocket' cruisers unless the tender is designed as a part of the main yacht as already mentioned. The weight and windage of even an inflatable on the deck is probably unacceptable and could be dangerous. Above say 45 feet more space is likely to be available and the problem alters as more crew are likely to need to be considered; as such yachts are likely to make extended passages the need for a lifeboat may still be present in preference to a liferaft but it is probable that there will be space on board for a tender as well as the lifeboat so that the need to combine the role of yacht tender in harbour with that of liferaft while on passage is not so urgent.

A large majority of long distance cruises and offshore passages are made by monohull yachts between 30 and 40 feet (9 to 12 metres) overall length with a crew of four or less—our convertible tender, liferaft (= lifeboat) must stow on such a yacht.



Not a good time to try unfolding the lifeboat

Photo by the Author
(Taken in the Pacific)

Naturally the lifeboat must be expected to survive in conditions so rough that the parent yacht has swamped. This fortunately is a situation more common to bad dreams than real life. Most yachts can survive severe storms, often with broken windows, broken masts, blocked fuel filters and stoved in hatches. Under these conditions, it is best for the crew to stay with the yacht if they can, but it is important to have a means of escape if necessary.

The two most common reasons for a crew to wish to abandon ship are probably first, collision and second, fire. Collision includes hitting objects, particularly deck cargo, washed overboard and lost from cargo ships—I have observed a complete cargo container covered in seaweed and floating with about 6 inches freeboard adrift in the Atlantic; any monohull hitting such an object would be lucky to survive. Even a large log could cause damage too serious for the pumps and emergency repair kit to be effective.

With the parent yacht in an emergency situation the crew will either man the pumps and rig collision mats or fight a fire as may be appropriate. If the lifeboat is not ready for instant use, it will have to be prepared for launching, every available person is needed elsewhere and if time is needed to prepare the tender, this might make the difference to saving the yacht.

Boat Drill

On well run ships, fire practice and boat drills are held regularly and a yacht should not be an exception, the crew should be able to wake up from sleep and proceed with a routine without having to think or ask questions. A good routine is to detail one or two of the crew to launch the boat first and then proceed with helping to save the yacht. Excepting gas and petrol spread over the bilge all fires start as a small fire and it is hard to advise leaving the fight to launch the boat—the final decision will depend on the crew available and should be made by the person who was awake in charge of the watch and not instantly by someone aroused from sleep. All these depend on the number and experience of the crew on board, they are also factors that dictate the design requirements for a lifeboat and its stowage.

The Launch

Launching and transferring to the lifeboat can often be the most difficult and dangerous part of the rescue, there must be a dire emergency or the crew would not wish to abandon ship. It must be possible to launch quickly, in the dark if necessary. Some rules include “under adverse conditions” with the previous two. During a storm offshore the movement is wild and waves sweep over the yacht when she is not in distress, anything that is not very securely lashed will be washed overboard. To suggest that two or even four people should be able to proceed with a routine launch is to ignore the power of nature. If the lashings are released, the boat will almost certainly be washed overboard hopefully to remain secured by its painter. To survive these extreme conditions the emergency craft must be strong enough to withstand a knock such as striking the guard rail. Some yachtsmen suggest that the painter should have a “weak link” so that if the parent yacht sinks

the line will break rather than take the boat to the bottom with her. Unfortunately loads imposed on the boat when towing or jerk loads after launch in rough water may exceed the load needed to submerge her and if the line is deliberately left weak, there should be some other means of attachment. Perhaps more important is to ensure that the lifeboat can be 'let go' by the crew, this requires consideration at the "drawing board" stage because the tenders normal towing painter will be out of reach.

Compared with a launch in rough water the ordinary launching of the lifeboat should not prove difficult but the lighter the package, the less the problem. Every effort must be made to keep the weight as low as possible, this feature and the need to have the boat stowed as nearly ready for use as practical must be kept constantly in mind, every part that folds is likely to add weight and take time to assemble.

The Emergency Kit

The contents of the emergency pack again need to be considered against the area of probable use. An average cruise will probably never exceed 50 to 100 miles from a shipping lane. For passages across the Pacific or South Atlantic the requirements will be different and a second container could be prepared to carry the extra food and water that might be needed.

With present inflatable liferafts, the emergency pack is an optional extra. During past seasons, a number of members have had to use their rafts and a further number, including the author, have had their rafts inflate by accident. With the British made rafts the automatic inflation device seems very reliable indeed but a disturbing number of flares and first aid kits have proved unusable due to water in the packs. This seems especially to be the case when the raft is stowed in a fibreglass container, a discussion brought forward is the ideas that the painter acts as a wick to draw water into the container and that variations in temperature cause pressure differences inside the container which draws in moist air, from which the moisture later condenses.

Whatever the reasons, it seems that the liferaft pack is not as reliable as it might be and for reasons of space, weight and cost, it is not comprehensive. A solution to this problem would be to have one emergency pack for the yacht packed in a bouyant container like a portable ice box. This pack, which would float, could contain all the distress equipment except the fire extinguishers and fire blanket, and it could be stowed in a cockpit locker adjacent to the cabin entrance or just inside the doorway. The advantage of this arrangement is that the contents can be inspected and items like torch batteries changed. It also saves some of the cost and provides a much more comprehensive pack with more and larger flares than carried in a liferaft.

British multihull yachts when racing offshore are strongly recommended to carry their emergency pack in a locker which can be opened, even if the yacht has capsized to 110° or 180°. If multihull builders could be persuaded

to fit such lockers as standard the yachts would not be allowed to race without them. They are required to be able to launch the liferaft whether or not the parent yacht has capsized and a lifeboat would need therefore also to meet this requirement. The saving grace of a multihull yacht is that it will normally not sink even if flooded or capsized, although a few builders do produce multihulls without the small amount of buoyancy necessary to ensure this. Owners of such yachts are most strongly urged to modify them before sailing offshore. This affects our lifeboat design because if the yacht is not in immediate danger of sinking, more time should be available to prepare and launch. The exception must be a serious fire or explosion.

The equipment in the raft has two functions, to keep the crew alive and to provide means of rescue. Rescue can be achieved by attracting attention to the plight of the crew by any means; radio, rockets, bright orange colours, marker dye. All means should be considered and included or rejected according to their effectiveness, allowing for their reliability, size, weight and cost. (Refer to list at back of book, page 51).

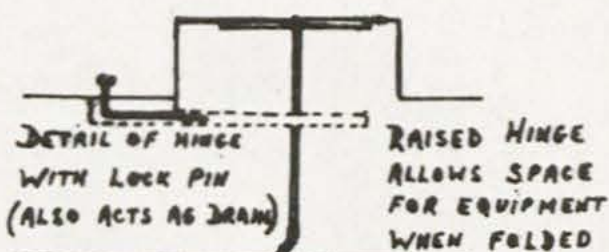
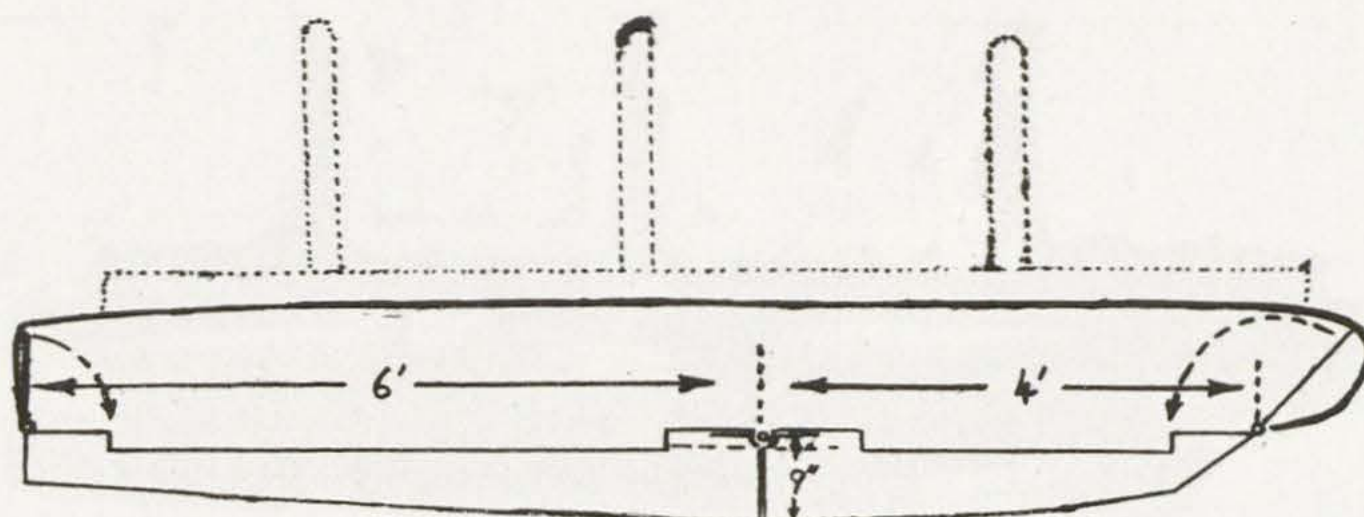
The list includes items carried by merchant ship lifeboats using the benefit of the experiences of many hundreds of lifeboat voyages during two world wars. In those days, radar was not available; a radar reflector could easily be made to stow round the outside of the container or be included in the raft, but this would probably have little practical value due to the lack of height. A useful device not often carried by yachts is a daylight signalling mirror—a heliograph can be very effective if the sun is shining.

To keep the crew alive first requires protection from cold in temperate zones and from the sun in the tropics. Cold can kill very quickly, perhaps one hour in British coastal waters for a person in the sea normally dressed. (It is important to keep clothes on, even wet they retain some warmth). To keep the crew warm requires a dry space with protection from the wind. Present liferafts give excellent protection from the wind, but any moisture inside flows to the depression formed by the crew members sitting or lying on the bottom.

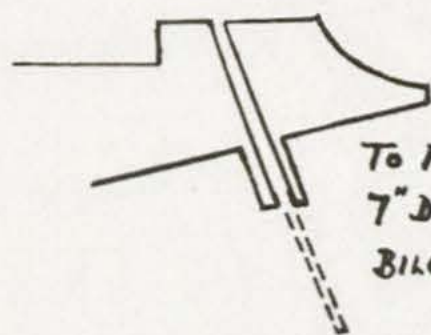
The survival kit for the crew includes first aid kit, water; food and on a long voyage a fishing line might be useful. Even if rescue within a few hours is almost certain, a supply of boiled sweets, preferably barley sugar, will encourage the crew and improve morale.

The craft itself may require some help, the less the crew have to do for the boat the better, but consider the following from the lifeboat equipment list:— a bucket, a bailer, a sea anchor with rope, a gallon of vegetable or fish oil (This is dripped over the side and prevents the waves from breaking and swamping the boat), light bouyant heaving line, jack-knife with tin opener and lanyard. Other equipment to be considered is a repair kit and bellows if the boat is fully or partly inflatable.

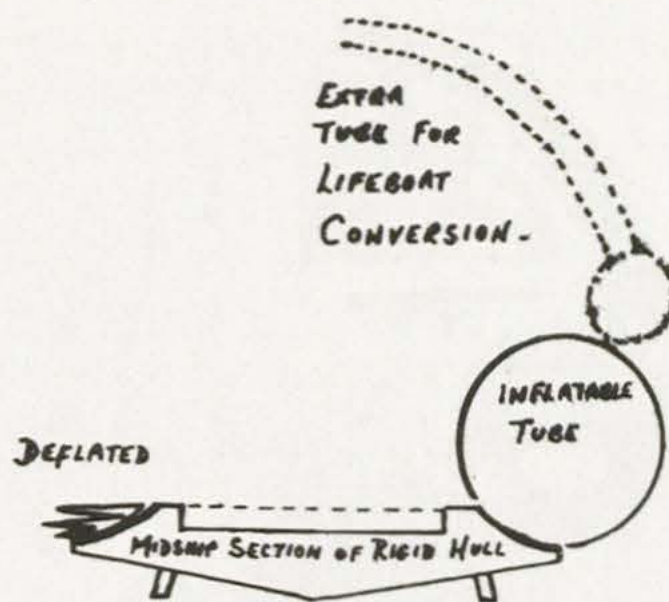
It is quite possible to attach, by lacing or other means, a second buoyancy tube with self-righting hoops and cover to a modern production inflatable tender and we have seen that kits are available to give a fair performance under sail. This solution has advantages but because of the extra bulk, it will no longer stow in the 'normal' locker. On a great number of production yachts the stowage allocated to the inflatable is totally unsuitable if there is any need for haste while extracting it. Sometimes it needs two strong men to extract the thing from its bag and sometimes the only stowage is the forward bunk which has no other use at sea due to the movement of the yacht. None of this is acceptable for something that may be needed in a hurry in the dark or with part of the yacht on fire; therefore, it needs to be on, or immediately available to the deck. The specially prepared inflatable dinghy would need to be packed in a flat shallow bag with a 'rip open' join in the top, secured perhaps by velcro and the whole thing stowed on the cabin top or aft deck. It might fold in half and stow against the rails but this requires strong rails and would be exposed in a 'freak' storm of the type that would carry away a canvas spray dodger. Stowage will depend on deck space and the freeboard of the yacht. A type of boat which is growing in popularity has a rigid bottom and inflatable sides as described in the chapter on 'Design Requirements.' Such a boat would seem to offer quite a satisfactory answer for a number of yachts and is well worth detailed consideration.



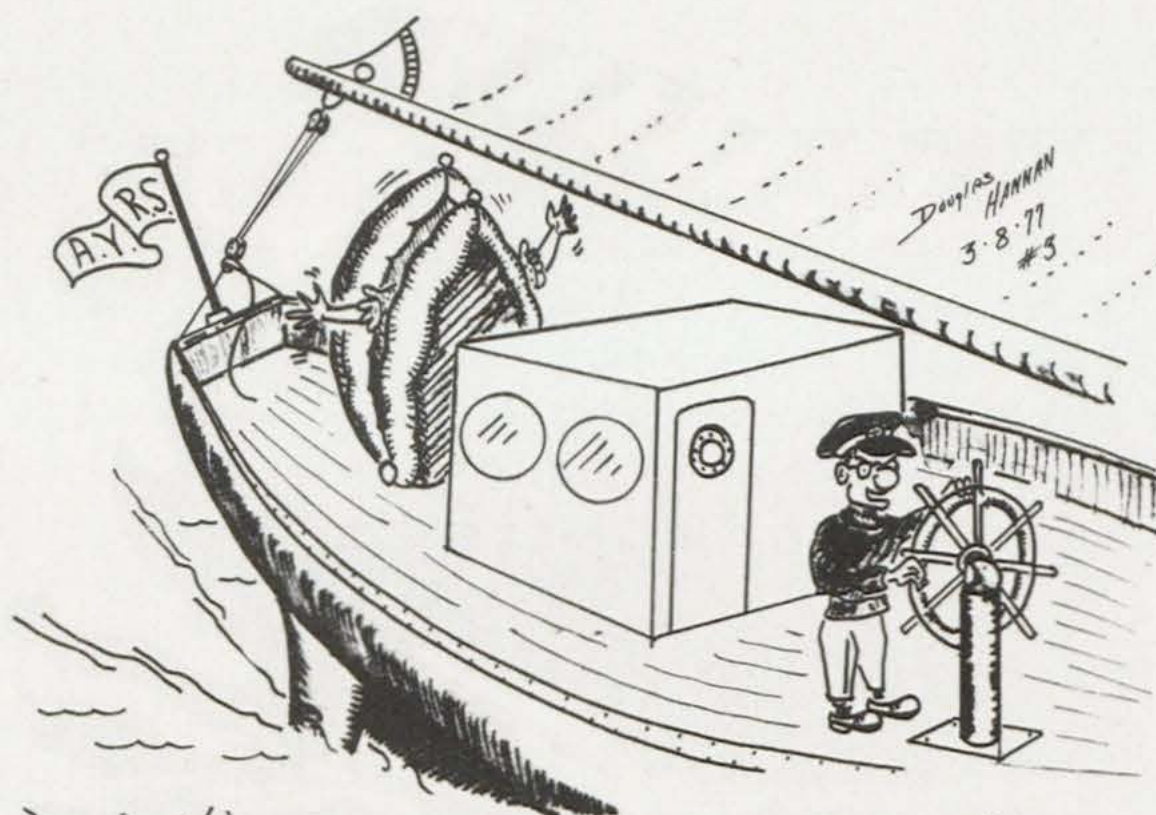
PIN CAN NOT BE LOST BUT
INFLATED TUBES SHOULD HOLD
BOAT IN 'OPEN' POSITION.



TO IMPROVE SAILING PERFORMANCE
7" DEEP BOARDS LOWER THROUGH
BILGE KEEL / HAND HOLD.



The rigid bottom of the dinghy should provide positive buoyancy so that it will float and support the crew if the inflation fails to be automatic. If four crew average 160lbs. each, that needs 640lbs. of floatation. This can probably be achieved by 11 cubic feet of bouyancy allowing for the weight of foam and a fibreglass or aluminium outer skin. (Plywood or moulded wood are alternatives). With an 11 foot 'bottom' 4 feet broad, the depth need only be 3 ins. If we allow for curves and for the deflated tubes and stowage of the oars, it should be quite possible to get a complete tender stowed upside down over the cabin top with a height increase of only 9 ins. except for the bilge keels which will double as hand rails. If the curve of the bottom of the boat is the same as that of the cabin top the keel/hand rail need not project higher than 9ins. total so that the boom of a sailing yacht could still pass clear.



Margret! Would you check out that automatic inflating "tender" that we just purchased? There is a heavy weather alert out!

The cabin top on many cruisers is not 11 feet long and in that case, it may be desirable to include a fold in the rigid bottom, perhaps to reduce the length to six feet at the expense of some extra height. (Height = windage. Windage reduces windward performance of sailing boats, especially in strong winds).

Introducing a fold into the rigid bottom of the boat is not very serious from an engineering or construction angle, it adds cost and weight and may crease the inflatable tube. The main drawback is likely to be the very serious difficulty in trying to fold it open in a strong wind. Unfolding with a clear space down wind, as on a power cruiser, should be quite possible but with a sailing yacht the boom is almost certain to get in the way. It would be reasonable to launch a rigid-bottom inflatable tender of this type with an added upper buoyancy ring and self righting hoops automatically inflated, and with the normal inflation tubes deflated, to be blown up manually by the crew when time permits. This would save the cost and weight of fitting the emergency inflation equipment to the part of the boat which would be in regular use under normal cruising conditions.

Having part of the boat with positive buoyancy means that the interior can be self draining and provides a firm base for the crew to lie or work on. Bilge keels and a centre board can be fitted to the rigid structure to provide lateral resistance when afloat and hand holds on board. It becomes less difficult to secure as lashing or quick release points can be built on as part of the dinghy.

Equipment for the Lifeboat

We need to save weight and cost. We need reliable equipment that is easy to use. Most satisfactory will be the gear that is used every day in harbour, the crew will be familiar with it and it will work. It is possible to double up the uses for some equipment, the oars can slot together to make a mast and yard, the canopy could be used as the sail. Discussion among A.Y.R.S. members shows, however, that most yachtsmen prefer equipment designed especially for its purpose and are prepared to accept the extra weight of separate oars with comfortable handles; the mast may well be two halves which slot together, but it should be the tenders regular mast with a reef in the sail if necessary to clear the canopy. The crew might be glad to have both protection from the sun and a sail at the same time.

Below is listed as equipment, the gear needed to maintain the boat rather than the crew; this will depend on personal needs, but try to find a repair material that does not start "with both parts completely dry . . ." The bucket and/or bailer are able to collect drinking water from rain via the sail or canopy. A compass could be most useful if there is not time to collect the yachts compass. (It could also be most useful on the tender to find the club on a foggy day, surprising how few people carry a pocket compass . . .). The list can go on and on, you are adding weight and cost — if you can manage without it, then leave it behind. You can make a sea anchor from the sail or a bucket, but with a lightweight craft, reduction of drift may be very important and a purpose made drogue would be preferable.

List of Lifeboat Equipment

(From an old British Merchant Ship List).

Axe	(2) Main purpose, to cut falls if boat fails to release.
Bailer	
Buckets	(2) One large enough to hold lamp, to signal with.
Compass	An efficient compass in binnacle with light.
Crutches	One and a half sets. (Single banked—one oar per seat).
First Aid	Kit in watertight box.
Flares	Six red hand flares, 2 parachute flares, 2 smoke floats.
Heliograph	Daylight signalling mirror.
Knife	Jackknife with tin opener.
Lamp	With oil for 12 hours. (Usually used colza oil).
Lifeline	Becketed round outside of boat.
Light	An electric torch with 2 spare batteries and bulbs.
Lines	Two light buoyant heaving lines, 10 fathoms.

List of Lifeboat Equipment continued:

Matches	2 boxes of wind proof matches, watertight boxes.
Oars	A full single banked complement + 2 spare and steering.
Oil	One gallon in container to attach to sea anchor (Fish oil).
Painters	Two, One secured forward and one with toggle release.
Plugs	2 for each plug hole secured by chains.
Provisions	Each person: 3 quarts of water, 1 lb. biscuits, 1 lb. of barley sugar, 1 lb. of condensed milk.
Pump	One hand pump, easy to clear, with hose and strum box.
Sails	Mast with wire stays, sails coloured orange.
Sea Anchor	(Refer to sketch on page 52).
Rudder, Tiller and Boat Hook.	

Motor boats carried half the complement of oars and no sail but had an extra boat hook. All the equipment not stowed in lockers to be lashed down except the boathook.

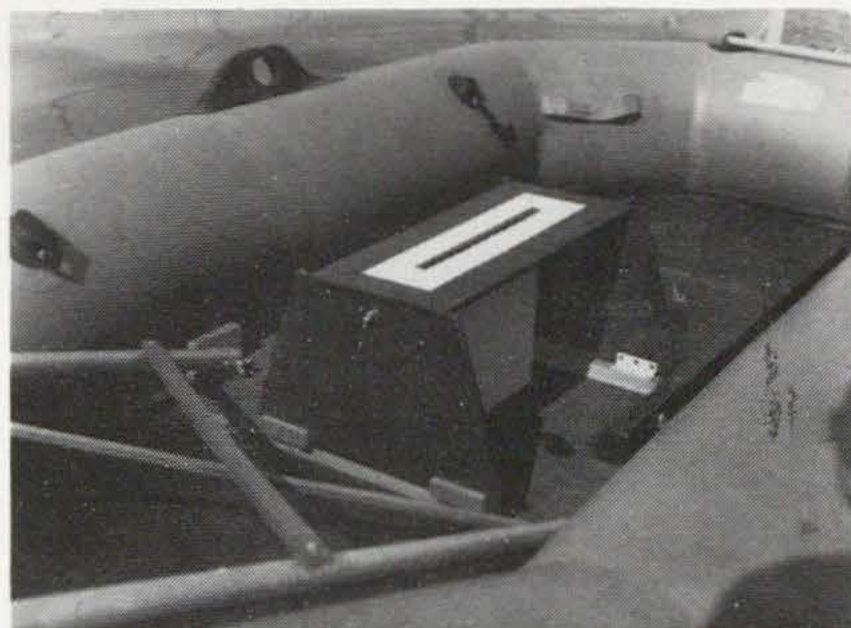
The above list is for boats with a displacement of up to 20 tons, larger than many of the parent yachts we are considering. Most of our equipment will be smaller, but a person needs to drink the same no matter how small the boat and distress flares must be just as bright to be seen.

A cover or canopy is a most important item which must be included to protect the crew from exposure. A blanket would be most useful, 'space blankets' are now available that fold flat and do not absorb water—made by 'Thermos.' Otherwise, remember to take some with you when you abandon ship—don't stand around on the burning deck with your finger in your mouth wondering what to take with you—think about it now, or when you next wait for a train. Most people never need to abandon their yachts, ever. If you sail with someone who has had to leave in a hurry, you will find everything ready in case lightning should strike twice, it is well worth learning from other people's experience and making a few preparations.

AVON DINGHY WITH BENYON-TINKER CONVERSION



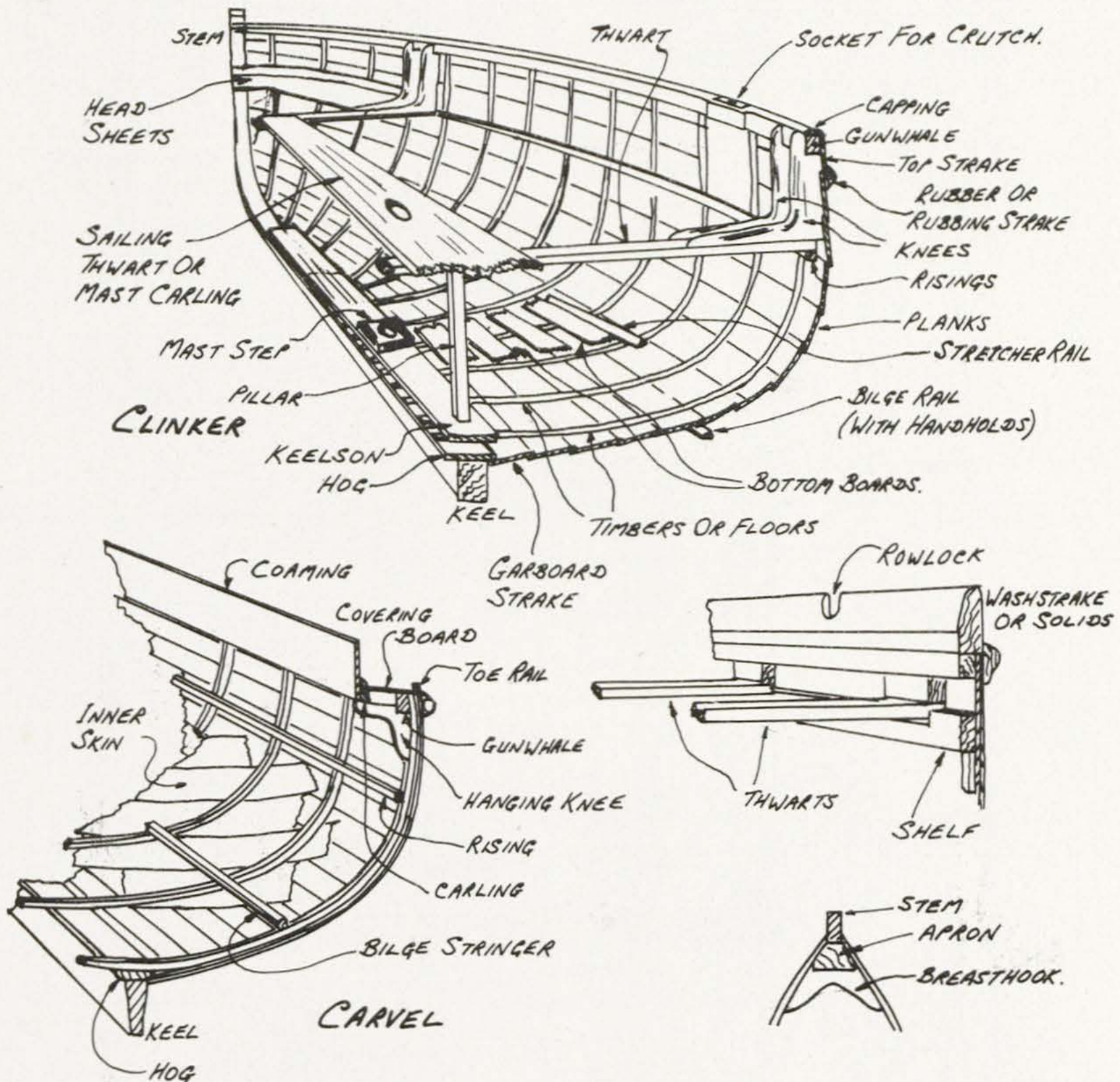
"Centreboard folded down."



"Centreboard and Seat ready for use."

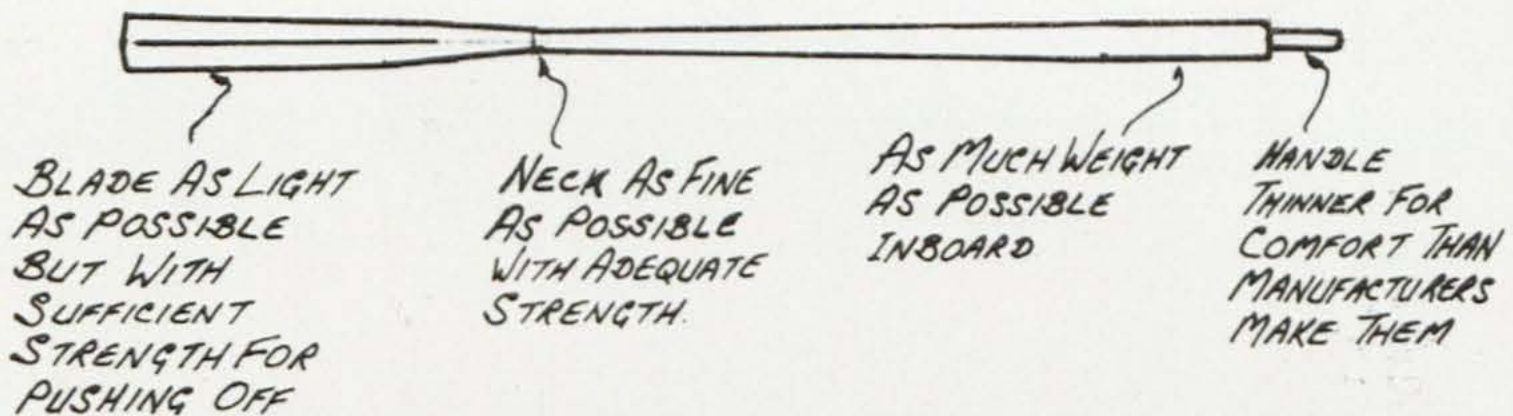
THE PARTS OF A BOAT

By Mike Hardcastle, 13/11/76.



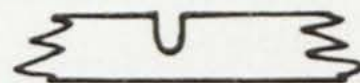
OARS AS A MEANS OF PROPULSION

By Mike Hardcastle, 13/11/76.



PROPORTIONS OF A REASONABLE OAR.
LENGTH TO SUIT BOAT WIDTH AND FREEBOARD.

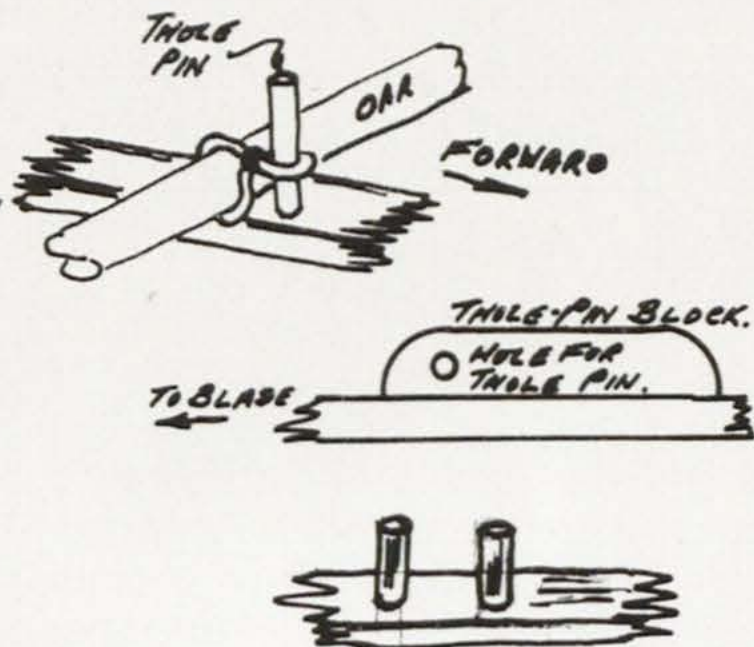
ROWLOCKS. SPACES CUT IN BOATS WASHSTRAKE TO WORK THE OARS IN.



CRUTCHES COMMONLY CALLED ROWLOCKS. TWO TYPES: CENTRE AND OFFSET PIN. USE LANYARDS AND CARRY A SPARE.

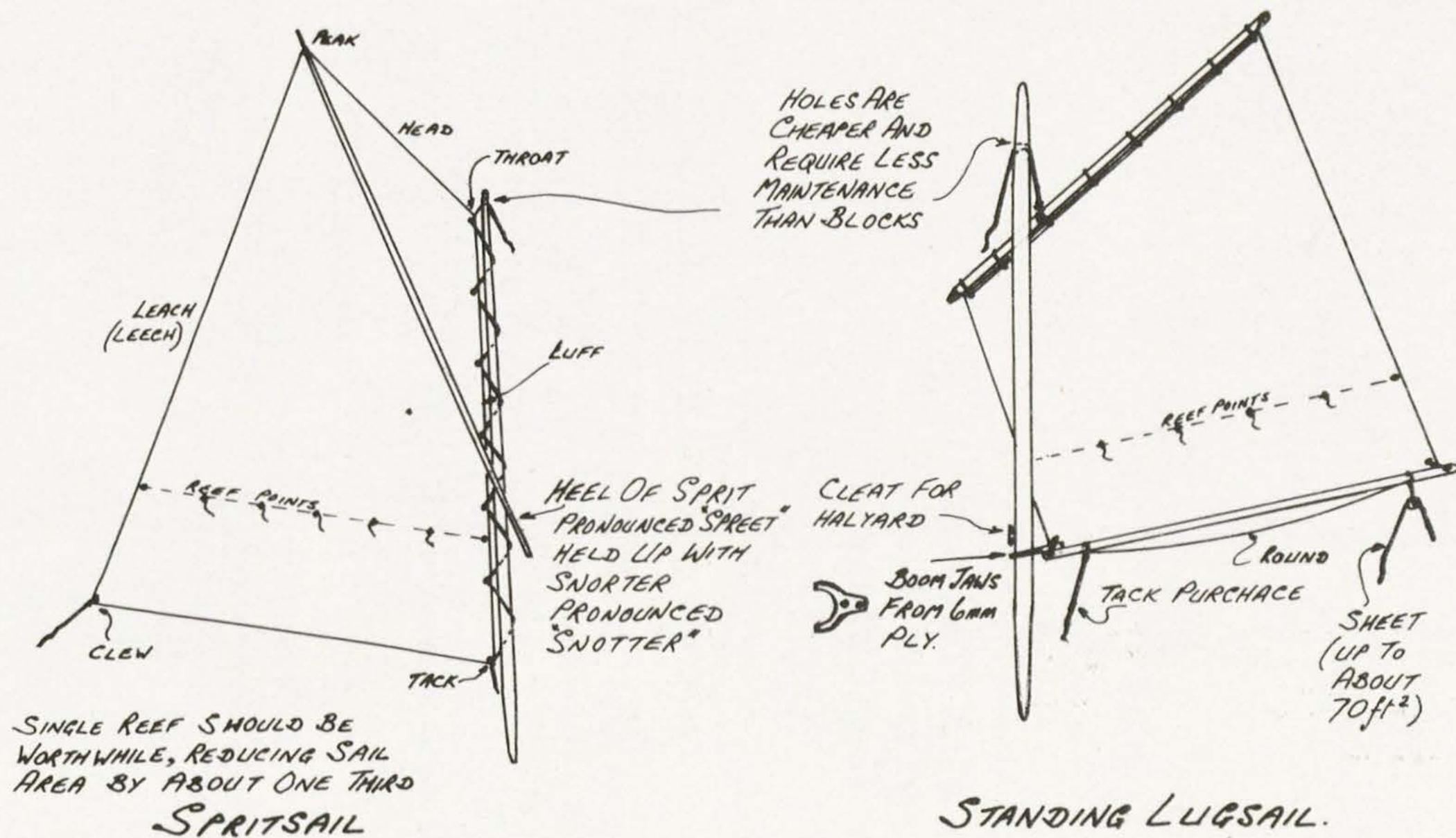


THOLE-PIN USED SINGLY WITH A SIMPLE LASHING OR WITH A THOLE PIN BLOCK OR "BULL". USED IN PAIRS WITHOUT LASHING. DISADVANTAGE WITH THOLE-PIN BLOCK: OARS CAN NOT BE FEATHERED.



SAILS AS A MEANS OF PROPULSION FOR TENDERS

By Mike Hardcastle, 13/11/76.

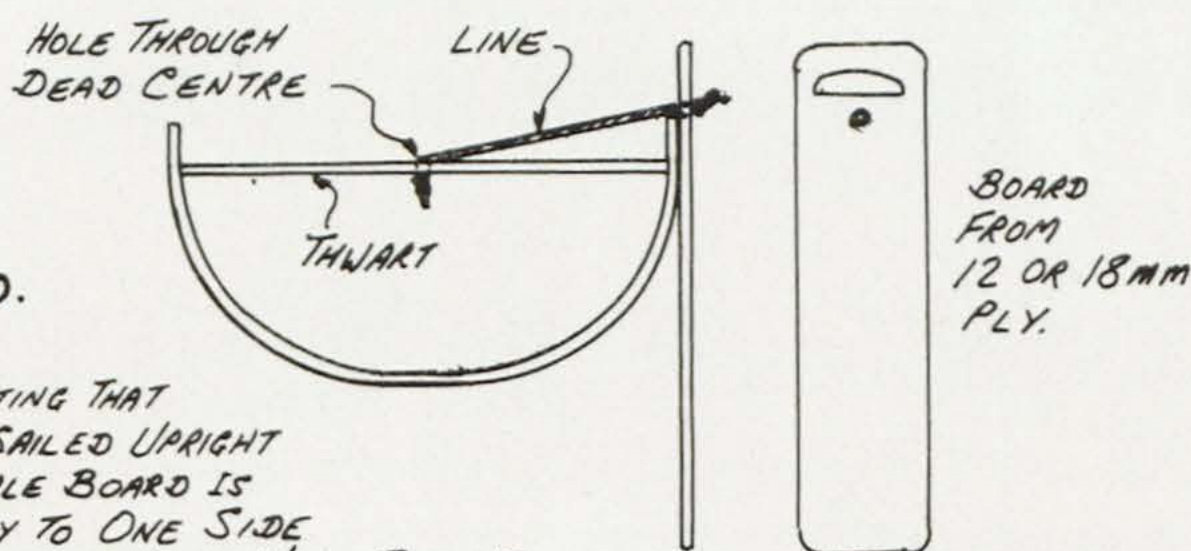


BOTH OF THESE RIGS SHOULD BE ALLOWED TO PIVOT FREELY BY STEPPING MAST THROUGH PLAIN HOLE IN THWART.

AIDS TO SAILING TENDERS

By Mike Hardcastle, 14/11/76.

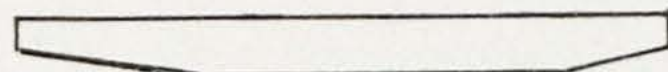
SIMPLE LEEBOARD.



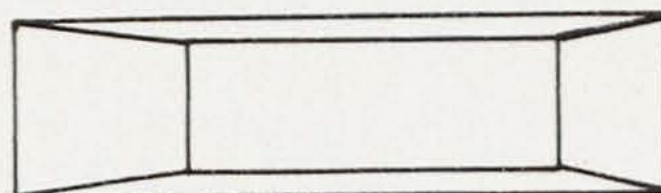
IT IS WORTH NOTING THAT
IF A BOAT IS SAILED UPRIGHT
AND IF A SIMPLE BOARD IS
FIXED SECURELY TO ONE SIDE
IT NEED NOT CHANGE SIDES WHEN TACKING

SCULLING NOTCH OR CRUTCH
IN TRANSOM MAY BE USED
WITH OAR FOR STEERING

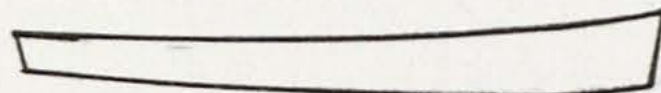
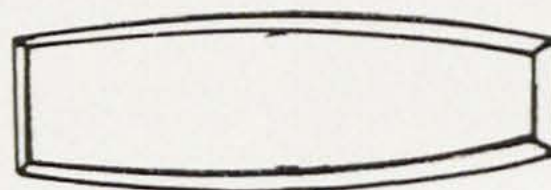
SIMPLE TYPES. (ALL WITH MIDSHIP SECTION)



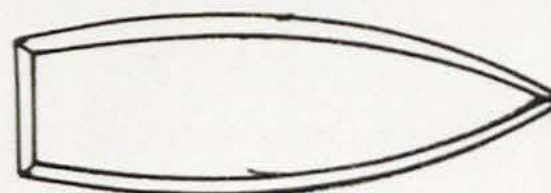
SCOW



PUNT OR SAMPAN



SKIFF OR SHARPIE



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SOME ADDRESSES

Inflatable Dinghies (British Addresses).

Avon Inflatables—Avon Rubber Co. Ltd. Inflatable Products Division, Dafen, Llanelli, Dyfed SA14 8 NA, Wales (+ overseas).

Beaufort Air-Sea Equipment Ltd., Beaufort Road, Birkenhead, England. (+ overseas).

B. T. Inflatable Boat Services—Bridge Road, Lymington, Hants., England.

Campari Ltd.—26/28 Somerton Road, Cricklewood, London NW2 1RY. (Italian Product).

Dunlop Ltd. GRG Division—Cambridge Street, Manchester M60 1PD England. (+ overseas).

Flatacraft Ltd.—1183 Melton Road, Synston, Leicester LE7 8JT, England.

Tomos Nederland B.V.—18 High Street, Crewe, Cheshire, CW2 7BN. England.

Kits:

As advertised in your local yachting press, also:

Jack Holt Ltd., The Embankment, Putney, London SW15 1LB. A catalogue of Holt Allen fittings with a complete range available through chandlers shops in U.K. and overseas.

Bell Woodworking Co., Leicester, England—Kits from 8 feet to 25 feet.

Folding Boat:

Tribell GmbH, Adolfstrasse 4-6, 2 Hamburg 76, W. Germany.

“Puffin” is no longer available.

Prout Brothers, The Point, Canvey Island, Essex, may resume production of their folding boats.

Fibreglass Dinghies:

Your Local Boatyard, also:

Brenton Reef Yachts, P.O. Box 227 Newport, Rhode Island 02840 for the ‘Lindh 7–11.’

Magazines — that have published dinghy plans:

National Fisherman, 273 Elm Street, Camden, Maine 04843, U.S.A.

Practical Boat Owner, Hatfield House, Stamford Street, London SE1 9LX.

Small Boat, Link House Publications, Dingwall Avenue, Croydon, Surrey CR0 7LG.

Yachting Monthly, Kings Reach Tower, Stamford Street, London SE1 9LX.

Yachts and Yachting, 196 Eastern Esplanade, Southend-on-Sea, Essex, SS1 3AB.

Yachting World, I.P.C. Transport Press Ltd., Dorset House, Stamford Street, London S.E.1.

SUMMARY

By S. Coleman-Malden

We treat our dinghies with curses, not care.

Now try and imagine the life of a dinghy... chuck it on the bank for the winter, leave it in the sun, any old paint that's left over will do.

The R.S.P.C.A. would never permit a dog to be treated like a dinghy.

The dinghy is a hub most of our sailing revolves around, its availability and its usability.

We have met £5,000 yachts unable to do something or go somewhere because they haven't got a £50 dinghy, even a £5 dinghy.

Dinghies are moored with contempt, and we blame them for getting trapped under jetties, hung up by their painters, worst of all leaking.

The best small dinghies seem to be carefully thought out, 'one off', home built by people of experience.

INFORMATION AND IDEAS ARE WELCOMED BY THE A.Y.R.S.

If you have a suggestion for any improvement, please send it in.

Improvements needed?

- | | |
|-----------------------|--|
| Inflatables: | Rapid manual inflation and deflation.
Better shape to keep the crew dry.
Some means to discourage theft. |
| Rigid Boats: | To reduce the weight.
Combined bilge keels and hand holds. |
| Folding Boats: | Perhaps a return to folding boats.
with positive buoyancy via folding sides? |
| Lifeboat?: | A low cost conversion for a conventional tender
seems desirable. |
| Yacht Sales!: | We need to persuade buyers of cruising yachts
to ask for proper stowage for the tender. |

SOME OTHER A.Y.R.S. PUBLICATIONS

CRUISING CATAMARANS. . . £6.00 or \$16.00. 320 Pages, New Edition April, 1977. Illustrated with Drawings and Photographs. A History of Catamaran Design and Development. This edition has a soft art paper cover, it contains information from the First Edition and Back Numbers.

BOUND BOOKS

DESIGN FOR FAST SAILING. . . £7.95 or \$22.00. 320 Pages, Illustrated. Written by Edmund Bruce and Harry Morss. Chapters on Sailing Performance Factors, Designing for Speed to Windward, Forces, Onboard Instruments. Knowledge of Advanced Maths. is not necessary to understand this book.

SELF STEERING. . . £2.25 or \$5.00. Illustrated with Photographs and Sketches. Covers Developments and Designs of Wind Operated Gears.

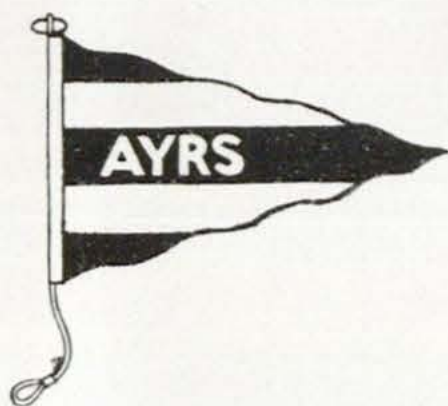
THE SINGLE HANDED ATLANTIC RACES. . . £1.15 or \$4.00. (71), 108 Pages. Illustrated. Covers The 1960, 1964 and 1968 Races. Supplement for 1972 Race.

DEEPWATER SEAMANSHIP. . . £1.15 or \$4.00. (75). 92 Pages. Illustrated. Mainly about the 1970 Race Round Britain for Yachts with 2 Crew, giving details and suggestions for Sailing with Small Crews.

RUDDER DESIGN FOR SAILING YACHTS. . . £1.75 or \$4.00. (79) 80 Pages. Illustrated. Details of Rudder, Shapes and Area. Design Examples and Calculation of Stresses.

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