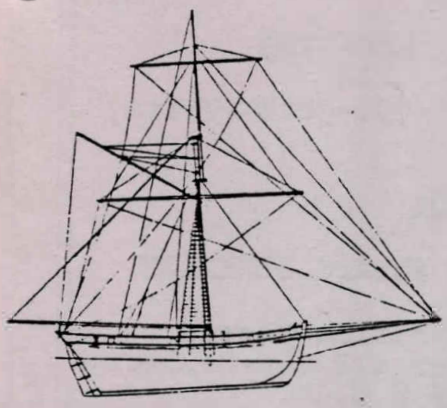
San Diego Ship Modelers Guild

Volume II NEWSLETTER -- May 1978 Number 5



A lovely sunrise, sunny morning, mild;
Calm, the ship still. Soper reported land
Which proved to be a fogbank. He was ril'd!
Cape Pigeons put a turn on, a brisk band
Of thirty birds or forty, as we mann'd
The break o' the poop with scraps. Tonight a green
Light on the starboard bow: so close at hand
A full-rigged ship crept by, that men were seen
And voices heard across the smooth dark strait between.

.... H.G. DIXEY: A Passage in Square Rig

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NOTES from the Last Meeting:

Joe Martin who founded Sherline Products, was invited to our meeting to give a talk and demonstration on his "Sherline Lathe." Besides pointing out all the features and flexibility of the lathe, after the meeting, he put on a practical demonstration in Bill BENSON'S shop topside. Viewing members were permitted to operate the lathe and all of us appreciated Joe taking the time and effort to visit our club. --No new or old business was discussed. The remainder of the time was spent in our usual show and tell with members discussing their models. Thirty-eight attended this meeting.

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MODELS DISPLAYED:

1. Bill BENSON - "Whitby" - 42 yacht; fiberglass
2. Bob BRADY - "Arethesee" -scratch schooner; pl on frame
3. Bill BROWN - "Boier" -Dutch yacht, scratch R/C
4. Al LHEUREUX - "Nautilus" -(Jules Vernes' sub); R/C scratch
5. Russ LLOYD - HMS Diligence - scratch
6. Marc Molling - "Katy of Norfolk"- Virginia pilot boat
7. Doug MCFARLAND - "Patti Ann"- Kit, R/C electric cabin cruiser
8. Roy NILSON - "Lake Bondo" - Scratch R/C electric cargo ship

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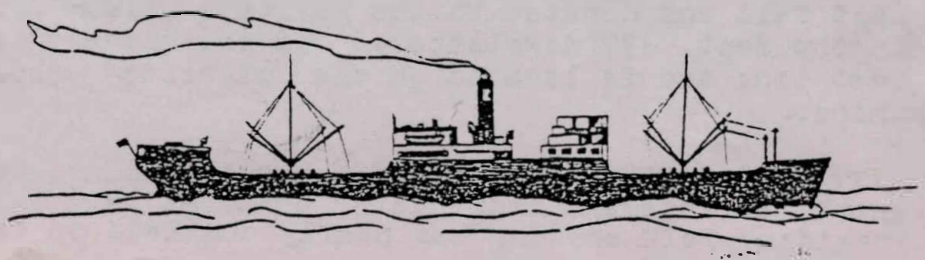
NEXT MEETING: Friday; 19 May - 8:00 PM aboard "BERKELEY"



SAN DIEGO SHIP MODELERS GUILD

Elected Officers

CAPTAIN:	Doug MCFARLAND	/redacted/
LOGKEEPER/ EDITOR:	Fred FRAAS	
PURSER:	Bob BECKER	
STEERING COMMITTEE:	Bill BENSON - Vic CROSBY - Al LEEUREUX	
MEETINGS:	3rd Friday of each month at 08:00 PM aboard BERKELEY	
MEMBERSHIP DUES:	$ 6.00 per year for members of the Maritime Museum Association of San Diego; $12.00 for all non-members. Out-of-state residents may join for $ 6.00.	

Founded in 1971 by the late Russ MERRILL and Bob WRIGHT

EDITOR'S GOOF:

You're probably wondering why the last page of this month's newsletter is printed on last month's "golden" color. In the rush to press last month, the second page of "Fiberglass Fuselage" supplied by Roy NILSON was omitted. The error was not discovered until after the entire printing. So that page with the missing illustrations (#4 & 5; #8 & 9) are included this month. If you save and file these newsletters, please insert this last page between pages 6 & 7 of last month's newsletter and hopefully, the article will make sense. The entire staff apologizes for this omission and I have been assured by them that it won't happen again.

CORRECTIONS To Mailing List:

Dr. Wm. F. EADS zip code is 92109 vice 92106 as listed.
Ed WHITE'S address is San Diego not Coronado.

Any others???

UPDATE on President Polk Hull Display:

From all appearances, not much has been accomplished or added to the builder's (MASSCO) half hull model of President Polk which our guild purchased last fall and donated to the Maritime Museum Assc. of San Diego. (reported in the Sept. '77 newsletter.) If you haven't seen it, it's nearly 12 feet long and is located on the "pierside" aboard BERKELEY, about 'midships.

Recently, Bill BARKER, who attended her launching, was able to obtain the general arrangement drawings or plans as well as three fine photos of President Polk showing her nearly complete on the ways, the

launching, and a real fine shot taken on sea trials. We still hope to get a few more shots of her from NASSCO. In the meantime, Roy NILSON has offered to try and enlarge these photos from 8 x 10 to ???? Once we get this done, the pictures will be framed along with Polk's pertinent "specs," and we should be able to come up with some sort of a plaque stating the display was donated through the efforts of our guild.

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MEETING NIGHT PARKING PROBLEMS:

Some members have complained about parking problems on meeting nights and a couple even suggested having our meetings on a week night other than Friday. Parking has been occasionally congested close to BERKELEY, but of course the county parking lot a block north is never full at that hour and free as well. Understand that parking on the pier is permitted as long as the fire lanes remain open. Also don't block the door entrances. If you're bring down a large model or other "bulky" things for the meeting, a check in advance with the Harbor Patrol should preclude a ticket. Call 291-3900 Ext. 241 and ask the Harbor Patrol Duty Sgt. for an OK.

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ENCINITAS "MINI-REGATTA":

This coming Sunday, May 6th; we will hold a "mini-regatta" at the Lake Shore Gardens in Encinitas, from 10 to 4. About 10 members have "signed" up to go including Phil HEADLEY who will be running his WW II Fleet Submarine which dives and fires torpedoes. Few could blame Phil for running this beautiful model only in fresh water. -- To get there, take I-5 North turning off on Pointsetta. Turn left, crossing over the freeway. The road veers left. Make a right turn at the second entrance along the brick wall & follow to parking (we have reserved parking.) Bring a picnic lunch if you want to spend the day; coffee and cookies have been promised by residents. A covered patio is also available for the static displays. The fresh water pond is large enough for everyone to operate their R/Cs. See you there...

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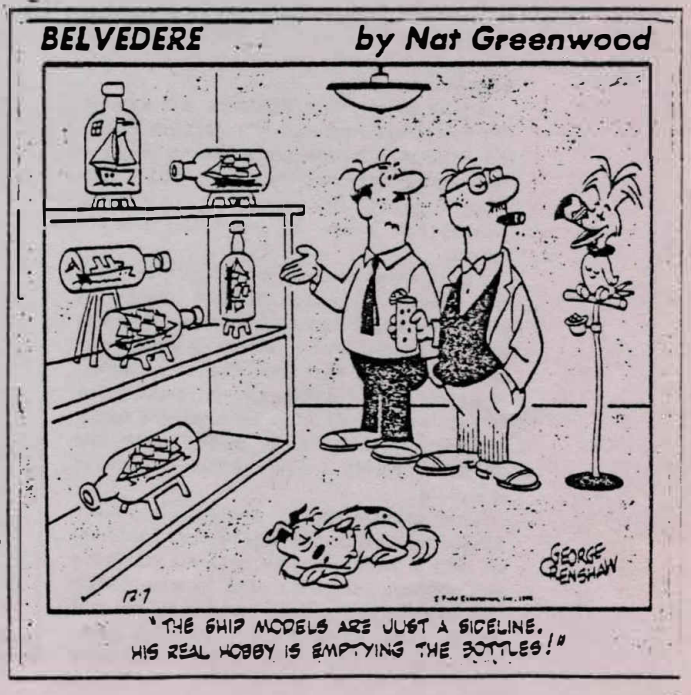
WHAT'S NEW IN CATALOGS:

Had a chance to glimpse at a rather unusual catalog the other day. After writing the firm and enclosing a self-addressed envelope to advise me on the cost, was surprised to discover the catalog in my mail box a few days later, and still don't know the cost, if any. The catalogue would be of interest to anyone in R/C electrics, particularly if you wanted to buy the "whole works." Steam engines, boilers, speed controls, fittings and first quality motors are listed. You may look at your editors copy at the next meeting or write: International Marine Exchange - P.O. Box 847 - Lake Arrowhead, Calif. 92352



Build your own

Vacuum Former

by Gene Thomas

Illustrations by the Author

Dinner will be a little late tonight, the oven's occupied. A look here at the technique of molding your own cowlings.

Vacuum forming came to the model industry some twenty years ago . . . limited to use by kit manufacturers. The scratch builder has had little or no opportunity to experiment with this great medium, except for the small Mattel machine which was too small for anything but minor pieces or Peanut Scale models.

The old addage that "Balsa Flies Better" is not always true, very often a vacuum formed part can weigh considerably less than its balsa counterpart, it will exclude the complex formers, difficult planking and most often the pattern can be carved from a solid block in less time than it would take to build it up and paint it. Formed parts require far less finishing and they therefore make a serious contender for many parts which the average builder might find difficult or impossible to construct from other materials. You will soon find that many of the models you might have wanted to scratch build now come into the realm of reality . . . You can form that crazy cowl, make the canopy, wheelpants, spinner, etc.

The little device we put together can be built from material most people have around the shop, the important elements are common household items: a vacuum cleaner and an electric oven or broiler. Having the above, the rest can be scrounged from friends.

A look at the first diagram will explain the basic requirements of a Vacuum Forming System. The elements shown fall into the commercial category . . . we simply substitute parts and equipment we have around the house for our little sample maker.

For those of you who are unfamiliar with the process, a sheet of thin plastic is stretched and heated on a frame which is then stretched over a pattern, a seal is created around the part and vacuum is applied to extract the trapped air. A combination of vacuum and ambiant air pressure sucks or presses the heated plastic over the pattern forming a near perfect replica of the mold.

This process can be accomplished over a male pattern or the plastic may be formed into a female cavity. Female patterns will produce the best detail, however they are difficult to produce and therefore will not be considered in our discussion here.

As you can see from the exploded view drawing, the vacuum box is simple at best. No dimensions are given, so that you can tailor this device to your own needs.

The basic consideration given to the size of your device should be the dimensions of your oven or broiler. (A series of heat lamps can be substituted and made to any size.) The frame to which the plastic sheet is attached must fit into or under the heat source which is available. The hole in the frame should be about ¼" larger in all dimensions than the box which you will construct.

Glue and nail the box frame from 1"x3" or similar lumber, a plywood or masonite base is attached. The peg board top is nailed or screwed to the frame and a fine wire screen is then taped to the perimeter of the box. 1" masking tape will do. All seams on the box should then be sealed with tape. A thin strip of wood should be nailed around the outside of the box to act as a stop for the frame, which when resting on the stop should be flat and create a single surface across box and frame.

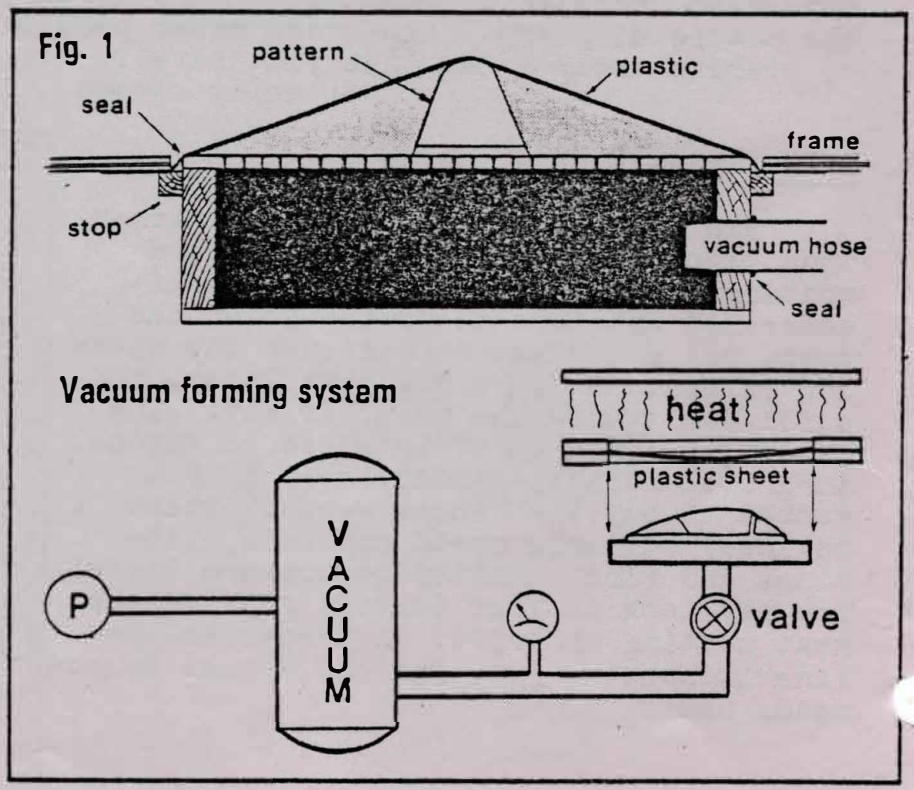
A hole in the side or bottom of the box (bottom will require legs) should be drilled to accomodate the nozzle of a vacuum cleaner hose. If an old hose is used, it could be attached permanently with epoxy. If you are using Mom's new vacuum cleaner, some method of creating a seal around the hose must be provided. Since we are working with vacuum rather than pressure, things will tend to pull into the box, therefore rubber tape, an "O" ring or RTV (Silicone rubber) might be considered. Anything that will create a seal will be suitable.

Plastic sheet, styrene, butyrate and PVC are available from plastic suppliers across the country and should be little or no problem to acquire. Sheets vary in size and thickness depending on material and can be cut up to suit the box you construct.

Get the box, pattern and plastic sheet ready. We will assume you will work in the kitchen (with Mom's permission or when she isn't home). Set the oven thermostat to about 200 degrees. Place a set of blocks (bricks) into the oven to raise the surface of the frame above any grates, etc. we do not want the heated plastic to touch anything inside the oven. Tape the sheet of plastic you intend to form over the hole in the frame. If you have an exhaust fan in the kitchen, turn it on . . . some materials tend to smell when heated.

Keep the vacuum box, vacuum cleaner and pattern as close to the oven as possible. (I sometimes work on the oven door.) A pair of gloves is a necessity. If it is difficult to turn your vacuum cleaner on with your foot . . . a helper should be at hand.

Place the plastic and frame into the heated oven. If your oven has a light it should be on so that you can observe the heating process. At the plastic sheet gets warm it



will distort slowly and finally stretch to its original shape, begin to shimmer and slowly drape into the hole in the frame. This is the critical point in our operation and some experimenting will be necessary to determine the amount of heat required to form the sheet. Different thicknesses will naturally require a differential in time and heat . . .

Try to approximate a ¾" drape. Slowly remove the frame and turn it upside down so that the plastic is now on the *bottom* of the frame and slowly press the frame down over the pattern and box until the frame hits the stops on the box. A seal should be created around the perimeter of the box. Once the frame is down, turn on the vacuum cleaner and press on the frame to maintain the seal . . . the plastic will instantly be drawn down over the pattern forming the part. Let it cool before you attempt to remove it.

Some pieces are more difficult to form than others and will require more or less heat . . . A badly formed sheet can some times be put back into the oven and recycled, particularly where it cooled before it was able to form properly . . . Over-heated sheets that have blow holes in them or have been webbed can not be recycled and should be discarded.

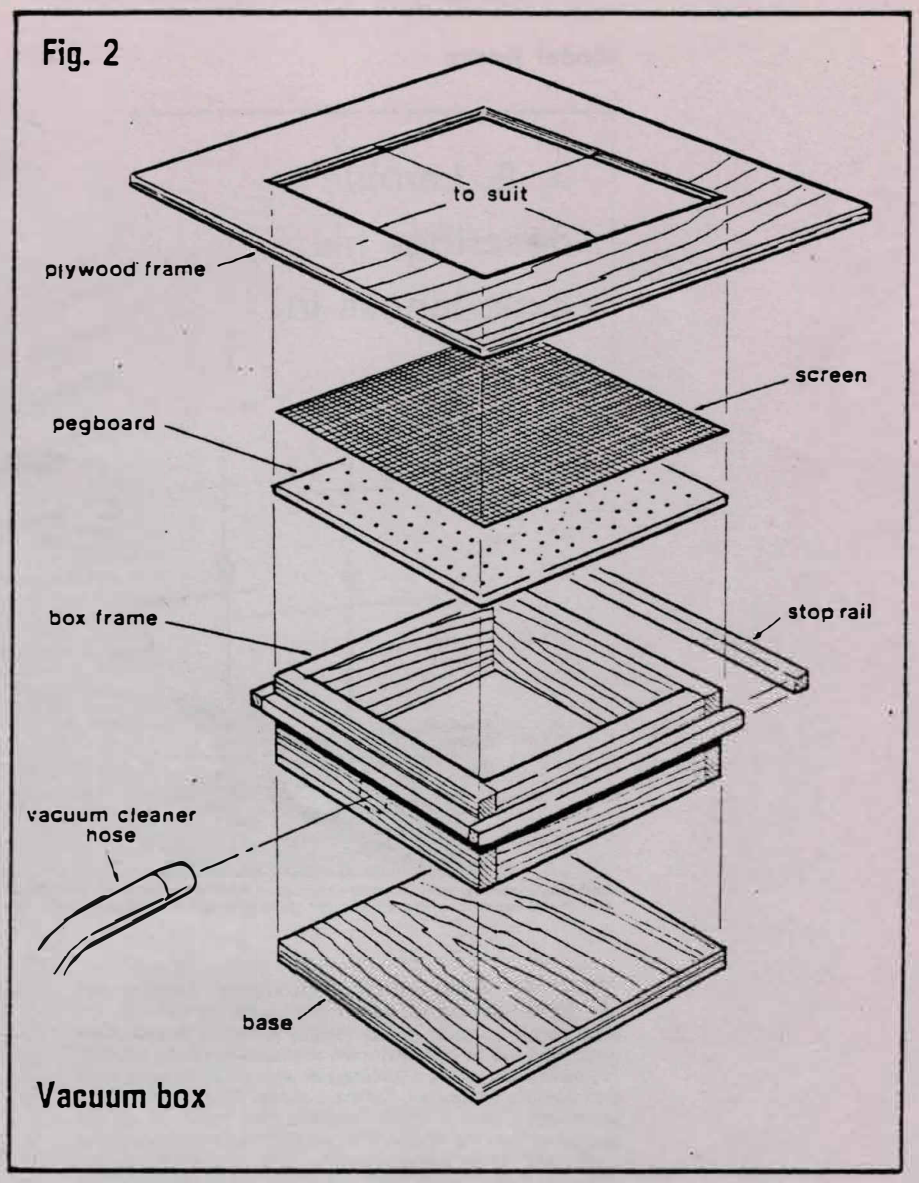
Pattern making is no secret and most model builders have been carving wood from the day one. Solid block or built-up patterns may be used. When designing a pattern remember to make material allowances . . . the formed part will always be slightly larger than the original (material thickness). Plastic may be formed over sanded pine or balsa, however a finish of some sort will allow the pattern to be removed from the molded piece much easier than if it were not painted. Horizontal wood grain will act as an obstacle to pattern removal, vertical grain will not . . . however the finished surface of the part formed will only be as good as the pattern it was formed over.

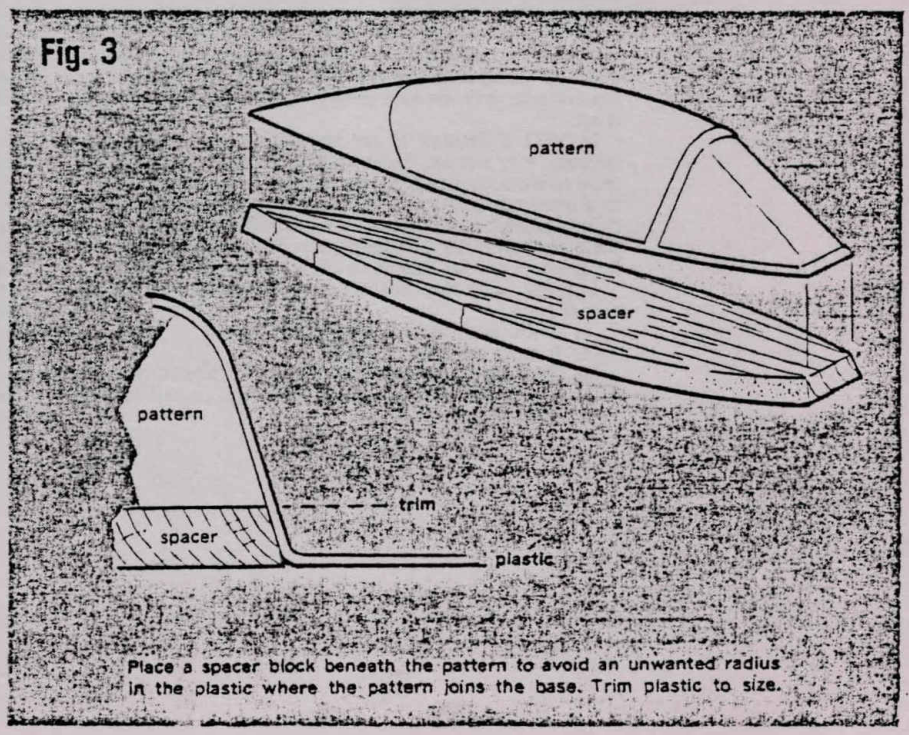
As a general rule, a mold release of some sort should be used . . . Silicon spray or spray wax are suitable mold releases, and will aid pattern removal. Shallow patterns such as wheelpant halves present no problem . . . deeper patterns such as nose cowls may require a little work to release. If an air compressor is available blowing air on the seams will usually do the trick.

All patterns should have some taper to them, vertical surfaces should be avoided where possible. A small wedge can be glued to the end of the pattern which will later be cut away anyway . . . Be patient removing touchy patterns or you stand the chance of destroying both pattern or plastic part.

In all cases the bottom of the pattern should be elevated above the screen surface as a slight radius will result due to the thickness of the material at the base. A piece of balsa should be cut having a slight taper wider than the base of the pattern. It will prevent the undesirable radius from forming at a point where you will want to trim the finished part.

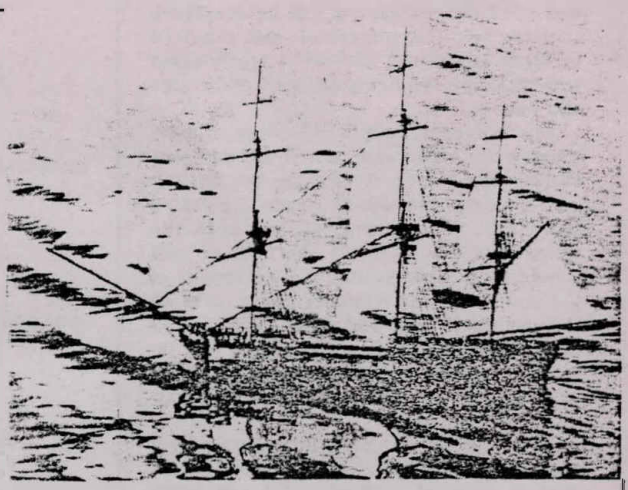
Since this is not a complete course on vacuum forming, we can not give you all the tricks of the trade in one article, however most important points have been covered. It's a great project, limited only to your own resourcefulness. Try it . . . you'll like it!

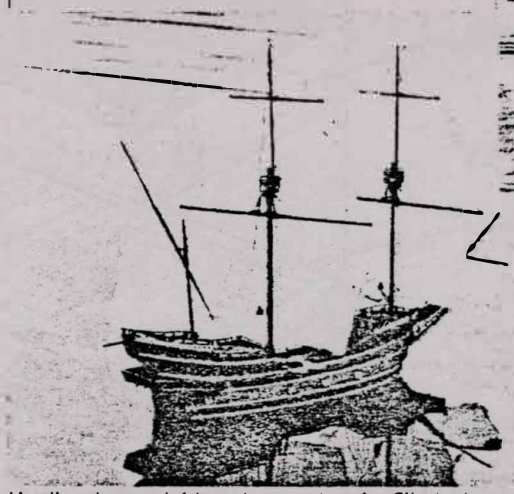




Reprinted from "MODEL BOATS" Oct. '77

J. E. Lamble describes his experiences in





Radio Controlling Square Rigged Ships

Heading pictures: left is authors version of an Elizabethan galleon, 18.5 ins on the waterline, 5.7ins. beam and only 2.3 ins draught at which she was somewhat tender, (original draught was to be 1.8ins)! The other model is the frigate *Euryalus*, running before the wind.

THE 1976 article on 'Pick a prototype', October and November *Model Boats*, followed by Mr T. N. Chapman's account of his topsail schooner *Lorna Anne* prompted me to offer my own experiences in the subject.

I have always had a fascination with square rigged craft and like Mr Chapman, for me a model must work. Many years ago I built a small freelance brig based on an old picture of the brig *Merle*. This taught me two things about such craft: (1) for a small model – 20in. or so on the waterline – building weight is critical if you are to carry enough ballast. You really need as much ballast as boat, and (2) again for these small sizes you will suffer a lack of stability even in light winds, combined with a tendency for the craft to fly up into the wind. These problems can be countered by fitting a sailing keel with the ballast in a bulb at the bottom; give the keel plenty of side area with most of it aft.

In 1972 I decided to try something a bit more ambitious. Why not an Elizabethan galleon? I bought plans from sources ranging from the Science Museum and MAP, to a local book shop. I also took to studying old marine paintings and such. Eventually I disagreed with most of the plans, some for hull shape, some for rigging and some for decoration! So I came to draw up my own version.

Leaving aside the prototype, my requirements for the model were:

(1) It should look true to period.
(2) It must be a sailing model.
(3) As I wished to keep it on display in the sitting room it would have to be fairly small and its sailing keel must be removable.
(4) I wished to be able to sail it fairly frequently so it should be robust – all hardwood construction for instance.
(5) Our local sailing lake is large, deep and accessible only from one side, so it would have to be radio controlled.

Practical problems came immediately. I had chosen $\frac{1}{16}$in. to 1ft as a scale, which for a prototype displacing around five hundred tons gave me a hull 18·3in. long on the waterline, 5·7in. beam and 1·8in. draught. Rough calculations showed that buoyancy might be a problem and I increased the draught by $\frac{1}{4}$in. Subsequent experiment showed that an increase in beam would have been preferable but the extra $\frac{1}{4}$in. was literally a life saver. My galleon would have emulated the *Wasa* on its maiden voyage without it. My advice to anyone picking any unusual model type must be – always do your displacement sums before starting to build and do check the results in the bath just as soon as the hull can be made watertight to the plimsol line.

The hull was built plank on plywood frames. No pins were used, the planks $\frac{1}{16}$in. × $\frac{1}{16}$in. mahogany, tapered where necessary, were steamed to shape and glued in place. When the hull was completely planked it was coated on the inside with epoxy resin to ensure it was watertight and would never come apart. The outside was finished with eight coats of polyurethane varnish, each rubbed down, the last coat being of the matt type. Gun ports etc, were cut after planking. Decks were planked, the camber being obtained by steaming the deck beams to shape before fitting them. Masts and spars were tapered down from dowel or ramin section. The tapering is done

quite quickly by mounting the spar in a power drill chuck. Wrap a piece of medium sand paper round the spar business side inwards. Wearing a leather glove, hang onto the sand paper and switch on. Work the sand paper back and forth along the spar until the requisite taper emerges.

Radio and Sheet Leadouts

Provision for the radio gear and sail winch needs to be made at an early stage. The simplest two channel radio is sufficient as only the rudder needs to be proportional. All the sails are interlinked (there are six) and the sail winch servo just switches forward, stop and reverse. The radio, winch and their batteries are located as low as possible in the hull. Due to the confined space no special waterproofing was possible. Fortunately, the epoxy coating was one hundred per cent and no trouble has been experienced. This layout, however, gave rise to one severe problem. The main yard braces were led directly from the yard arms through leads at the stern of the galleon, as per prototype and thence through the hold forward to the sail winch drums. Should they fray and break, and they did, the task of rethreading in the inaccessible depths of the hold is near impossible. After bitter experience another pair of winch lines was run down the same route. Thus when one line breaks the other can be used to pull a new pair through. I must admit that in my next model I mounted the sail winch vertically and allowed its drums to masquerade as the capstan. Thus the whole operation of bracing the yards across becomes much more accessible and less subject to snags and wear.

Winch and Switching

I used a Monoperm with pile unit for the sail winch. A double drum is needed to handle the port and starboard braces. The winch is very powerful and must be fitted with limit switches to avoid damage to the rigging. These are arranged on the main deck and actuate when a convenient piece of rigging (the main tack) reaches the end of its travel. With the limit switches, motor, batteries, etc, all needing connection to the winch actuator switch, which in turn has to be wired to provide forward and reverse, leads to some fairly hairy catscradles of wires. Eventually I built an actuator on circuit 'strip board' and used an edge connector and an eight strand flat cable to link up (*figure 1*).

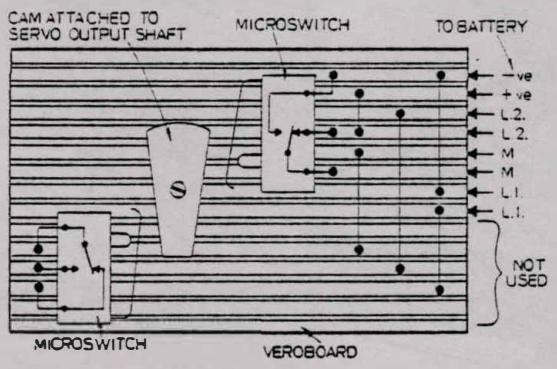
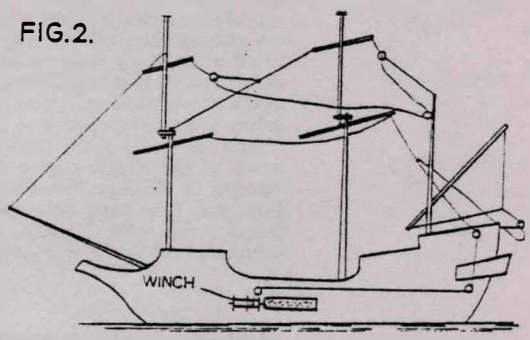


Figure 1 Diagram of practical circuit for actuator.
L 1 Limit switch on port haul of braces.
L 2 Limit switch on starboard haul of braces.
M Motor of sail winch (polarity by experiment).

Running Rigging

The whole layout of the running rigging is cruicial to the sailing performance of the model. All the square rigged yards must brace round in unison and parallelogram rigging is used to achieve this. The topsail yards needing a block in their braces to halve the distance they travel as they are only half the length of the mains'l yards. The lateen mizzen normally billows free but when the main yard is braced right over it tightens a line which pinches the mizzen in (*figure 2*). Special arrangements are needed

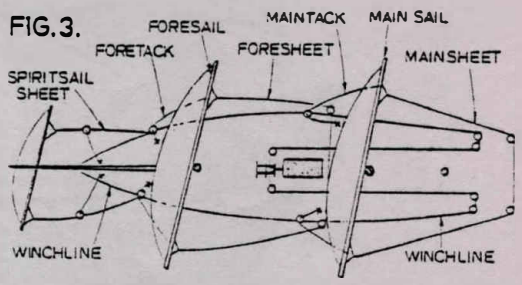
FIG.2.



Arrangement of yard braces – port side only shown, all other rigging omitted

to handle the lower corners of the two courses as these are not controlled by any yard. They also have further to travel both fore and aft than the yard ends in order to achieve a decent set to the sails for reaching and beating to windward (*figure 3*). To achieve this the winch line

FIG.3.



controlling the tacks connects to a block. The tack itself runs from an anchorage on the hull through this block and then to the lower corner or clew of the course. This gives a sort of 'step up' gear to the movement and by experimenting with the anchorage position these sails can be made to set very well.

The yards will brace over to an angle of 48° from the midships position. The angle looks extreme but provides only a limited performance to windward which was probably about all the prototypes enjoyed. At any rate it has proved sufficient to keep the model in bounds on our lake.

To continue with the rigging, the yards are secured to the masts by loops of cord – parrals – as the operating of bracing the yards over is anything but a geometric nicety and the ability of the yards to shift about a bit reduces a lot of the stresses in the rigging.

Sails and Ropes

The sails are made of nylon – the sort sold for covering model aeroplanes. This was cut to size with the tip of a

soldering iron thus sealing the edges (acknowledgements to Mr A. W. B. Prowse – *Model Boats*, January, 1971). Sail cloths are drawn in pencil. The sails need bolt ropes round the edges. This gathers in the sail a little and produces the 'belly' so necessary for a realistic appearance, it also provides strong attachment points round the sail for the various sheets, etc. Sewing these bolt ropes round the sails was for me one of the worst jobs in building the model. I have since found that if nylon woven fishing line is used as a bolt rope it can be welded onto the edge of the sail at the same time that the sail is cut out. Faced with 12 sails on my next model I was very glad to be able to use this dodge.

I leave my reader, if he is still with me, to decide from the photographs whether the model is attractive. It has sailed a lot in its three years of active life and remains sound and in good condition for display. The purist will shriek at its running rigging arrangements but until they invent radio controlled men 1in. high I am unrepentant.

As a follow up to the Galleon, I have also built a scale model of the 36 gun frigate *Euryalus*. This frigate, commanded by Captain Blackwood, scouted for Nelson at Trafalgar. The basic construction was the same as the galleon; this time I could, of course, work from the Admiralty drafts instead of having to make it up as I went along! Apart from my sailing keel no deviations to the hull plan were necessary. Welded bolt ropes were used, of course, and a fairly open sail winch system running along the route of the anchor cable way in the main deck has helped greatly to remove rigging snags. She is quite 'stiff' in a breeze and has a fair turn of speed.

The salient dimensions of the two models are:

	Elizabethan Galleon c. 1570	Frigate *Euryalus* 1797
Scale	$\frac{1}{8}$in. to 1ft.	$\frac{3}{16}$in. to 1ft.
Length on waterline	18·5in.	26·7in.
Beam on waterline	5·7in.	6·9in.
Draught excluding keel	2·3in.	3·0in.
Length overall: Bowsprit to bumkin/driverboom	32·5in.	46.4in.
Height overall	25·5in.	32·5in.
Weight of boat including radio, etc	3lb 15oz	5lb 14oz
Weight of sailing keel	2lb 6oz	5lb 11oz
Total weight	6lb 5oz	11lb 9oz
Total sail area	330sq.in.	546sq.in.

All the pictures below are of the 36 gun frigate *Euryalus*, the same basic construction to the galleon being used. At left top, the chain 'roundabout' which links the capstan to the braces can just be made out on the gun deck, right, bowling along in a stiff breeze, bottom left, note the bumkins which help to spread the fore-sail when braced right over. The gun-port lids are hinged and it is advisable to close them when sailing, right, pictured when nearly complete : a section of the main deck lifts out for access to the radio equipment.