

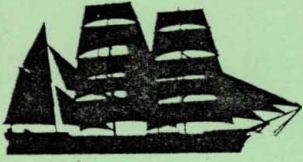


San Diego Ship Modelers Guild

Volume II

NEWSLETTER -- March 1978

Number 3



"We amateur boat builders are like good English tea - our strength really shows when we get in hot water."

--Edward W. Coffin, "Enduring Friendships"

NOTES from the Last Meeting:

"Skipper" Doug MCFARLAND opened the meeting with a new approach for "show and tell." Models were displayed on a couple of tables lined up athwartships across the front center of our meeting room. After Doug covered a few preliminaries, each modeller in turn came up to tell the audience the what, how, why etc. as well as problems encountered with building his particular model. Guest speakers included Bob BRADY, Bill KELLY-FLEMING, Ed WHITE, Lew HARMELING, Gene ARDINGER, Vic CROSBY, and Fred FRAAS. Each presentation was both interesting, and informative with ample amounts of humor sprinkled in as a bonus. --Purser Bob BECKER reported he'd received 16 membership renewals to date. -- Al LHEUREUX then gave a feature presentation of our proposed 1978 First Annual Regatta, describing the entry rules, various classes, objectives and judging which everyone appeared to be in agreement with. (Al has volunteered to act as the Regatta "Commodore".) --Chuck KOHLMYER then spoke on the forthcoming "S. Calif. Regional Model Contest & Show" outlining the contest rules, entry fees, divisions, awards and prizes as well as his experiences encountered from previous shows of this nature. Thirty-four attended this meeting including four of the wives.

MODELS DISPLAYED:

- | | | |
|----|--------------------|--|
| 1. | Gene ARDINGER | - "Half model of 12 meter sloop" |
| 2. | Bob BRADY | - "Knockabout Schooner" - Scratch (3 yrs building) |
| 3. | Vic CROSBY | - "Off Watch" - Foscil scene in a bottle |
| 4. | Fred FRAAS | - "USS GEARING (DD-710) - Scratch; 1/32" scale |
| 5. | Lew HARMELING | - "Tug" - Scratch |
| 6. | Bill KELLY-FLEMING | - "USS PLYMOUTH"- Scratch 1/300 scale |
| 7. | Doug MCFARLAND | - "Norske Love" - Kit; plank on frame |
| 8. | Ed WHITE | - Dory - Scratch (Basswood) |

NEXT MEETING: Friday; March 17th - 7:30PM aboard "BERKELEY"

SAN DIEGO SHIP MODELERS GUILD

Elected Officers

CAPTAIN: Doug MCFARLAND

LOGKEEPER/

EDITOR: Fred FRAAS

/redacted/

PURSER: Bob BECKER

STEERING

COMMITTEE: Bill BENSON - Vic CROSBY - AL LHEUREUX

MEETINGS: 3rd Friday of each month aboard the BERKELEY

MEMBERSHIP

DUES: \$6.00 per year for members of the Maritime Museum of San Diego; \$12.00 for all non-members.

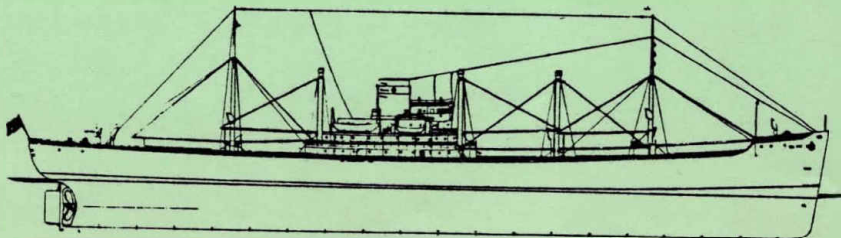
Founded in 1971 by the late Russ MERRILL and Bob WRIGHT

MISSION BAY MODEL YACHT BASIN: -- Complete 1978 Schedule

Three more weekend dates have been added to the 1978 schedule of MBMYB events, as indicated by asterisks from the original schedule printed in the January newsletter. These are dates when the R/C scale (electric, steam and sail) boaters will be "staying at home." Special meets will be on:

April 29-30	** September 2-3
June 3	** September 16
June 17-18	October 28-29
** July 15-16	December 2-3
July 22-23	

We are attempting to secure the MBMYB for September 23rd and 24th to hold our First Annual Open Scale Meet. Saturday, the 23rd will be for R/C scale models only and Sunday, the 24th for static scale and any powered ships not radio-controlled. We hope to attract many out-of-towners and hopefully, the separate days will spare them the necessity of motel/hotel expenses. -- More on this next month.



1978 MEMBERSHIP DUES:

Is your name among the missing from the following list?? If so, then our current records indicate you haven't yet paid your 1978 dues. To date 26 of last members have paid and 5 additional new members have joined. This month's newsletter, as was both the January and February issues, will be mailed to all on our 1977 roster. Since the cost of mailing each newsletter currently amounts to 33¢, the club treasury cannot support future mailings to persons no longer interested in the guild. Therefore the April newsletter will be sent to only those who have paid their 1978 dues.

While your editor is on his "soapbox", you should also be aware of the fact that we can continue a 9 page newsletter only if we have a minimum of 50 members. The reason for this is that our printing costs are reduced from 3½¢ to 2¼¢ per page with the 50 copies per page minimum. Additionally, mailing costs are still 13¢ per newsletter when printed on both sides of each page. A "9 pager" printed on only one side would cost 24¢ in postage driving the costs from 33¢ to 55½¢ or nearly a 70% increase. For these reasons, back issues cannot be later reproduced and mailed to members late in renewing their memberships.

The 1978 dues are \$6.00 per year for members of the Maritime Museum Association, and \$12.00 for non-members. Mail your check to the Purser:

Bob BECKER
/redacted/

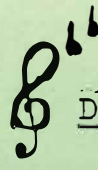
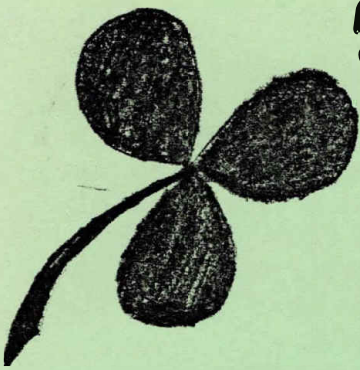
Current members are:

Bob BECKER	John C. MATHEWS III	Bill & Bette THORPE
Bob BRADY	Doug MCFARLAND	Jack TIGHE
Dr. Bill BROWN	Ann MERRILL	Don WESLEY
Vic CROSBY	Roy NILSON	Bob WRIGHT
Dr. "Fritz" EADS	Gerald W. PEARCE	**Phil HEADLEY
Fred FRAAS	Val PETERSON	**Chuck KOHLMYER
Lew HARMELING	Royce PRIVETT	**Mike LEEDER
Carl JOHNSON	Chuck RAUNER	**Arnold OTCHIN
Gordon P. JONES	John SANDS	**E.G. SCHWEITZER
Al LHEUREUX	Doug SMAY	
Jim LIKES	C.A. STERN	** New members

You will note many fine friends and excellent modelers are among the "missing" above. Let's urge them to sign on and come back aboard for 1978.

FOR SALE: Bob KASER is selling his entire collection of ship books. His remaining unsold stock includes: Davis-Build-up Ship Models; Chappelle-History of Am. Sailing Ships/ & Navy, Fulton's "Steam Battery", Conti-SHIP Model Building Manual, Luci - Ship Model Builders Handbook, March-

Sailing Drifters, 34 copies of Nautical Research Journal; 122 copies of "Model Boats" plus a dozen others. Give Bob a call at /redacted/ for prices and additional info if interested.



DOES YOUR MOTHER COME FROM IRELAND??

As last months' newsletter was printed "on pink" for Valentine's Day, this months' comes to you on envious green commemorating St. Pattys' Day. In case you haven't checked your calendar, our next meeting on Friday, 17 March, just happens to also be St. Patrick's Day. So besides bringing your model, better wear something green. "ERIN Go BROUGH!"

FULLERTON SPRING PICNIC/REGATTA:

April 2

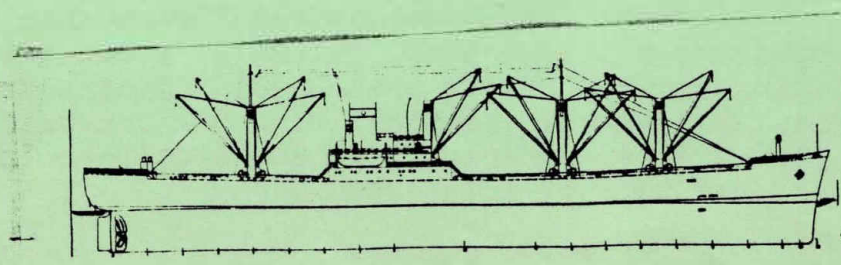
Received word from my Orange county counterpart, Tom PALIN, that they will be having their Spring Picnic/Regatta on Sunday, ~~March 19th.~~ Again, it will be held at CRAIG Park in Fullerton which is just off of the Orange Freeway (Highway 57) & Imperial Highway. (A map was printed in last August's newsletter.) Once again we have been invited to join our Orange county friends. (and you can help yourself to all the food that you bring yourself.) We had a good showing from San Diego last August --how 'bout a repeat performance? Tom advises one word of caution: insure your R/C is an authorized BOAT frequency as aircraft and modified crystals will not be permitted.

EAST COAST MARITIME MUSEUMS:

Planning a trip to the East coast this spring or coming summer? Hope to see some of the maritime museums? Like to have some advance information before you leave? The New York Ship Craft Guild has featured data on one museum in their monthly newsletter, "The Binnacle," which your editor receives. The articles are reprints of material distributed at each museum entrance and in general run from 6 to 10 pages in length. Contact your editor if you'd like to borrow or copy any of the following items:

- August - South Street Seaport Museum - New York City
- October - Mystic Seaport - Mystic, Conn
- December - National Maritime Hist. Soc. - Brooklyn, N.Y.
- January - Battleship Cove - Fall River, Mass.
- February - Navy Memorial Museum - Washington, D.C.

I suspect future issues of the "Binnacle" will feature even more of the museums not listed above. Perhaps, if enough members are interested, the whole series could be reproduced and sold for the costs of printing.



(From the
L.A. Times,
1-4-78)

Last of Old Liberty Ships May Be Preserved as Relic

BENICIA, Calif.—Franklin D. Roosevelt called them "ugly ducklings." To German submariners who torpedoed them, they were "Kaiser's creeping coffins."

But to the thousands of men who sailed on them, they were Liberty ships, the backbone of America's massive sea force that helped crush the Nazi and Japanese war machines in the 1940s.

In an incredible surge of national productivity, 2,742 were mass produced between 1941 and 1945 in 18 American shipyards—the largest number of ships ever built from a single design.

Now, only one authentic Liberty remains—the Jeremiah O'Brien—and

oldtime sailors are working to have the relic of a bygone era preserved as a museum.

The O'Brien, now rusty with peeling paint and a nesting spot for pigeons, lies at anchor 40 miles northeast of San Francisco among 40 ships in the Suisun Bay monthball fleet.

"She may not look like much, but she's in remarkable good condition," said John S. Pottinger, the Maritime Administration's fleet superintendent, who as a merchant seaman sailed on six Liberties, three as chief engineer. "All of that rust is just surface corrosion. A good sandblasting and paint job and she'd look as good as new."

Among the debris on a recent visit to the old ship, Pottinger came across the engineer's log that told of the O'Brien's last voyage, which ended here on Feb. 8, 1946. Other than that, the O'Brien's history is skimpy.

Thomas J. Patterson Jr., regional director for the U.S. Maritime Administration, whose command includes the Suisun fleet, estimates it would cost about \$300,000 to get the O'Brien cleaned up, painted, sealed and moored permanently for display.

Patterson, a former Merchant Marine captain who began his sea career as a cadet aboard a Liberty, said efforts are being made to have the O'Brien declared a historic object—the first step in moving toward the public museum project.

Like Henry Ford's Model T, the Liberties were classics of simplicity, low cost and utility.

Hundreds of thousands of men and women workers in factories in 32 states built the 30,000-plus components that headed for speedy assembly at shipyards on the East and West coasts.

Many were built by the Henry J. Kaiser industrial empire, and that, combined with their slow, 10-knot speed, accounted for one of the nicknames.

The first of the breed was the Patrick Henry, launched 2½ months before the Japanese attack on Pearl Harbor. There were so many of them that the names sometimes seemed far-fetched, such as the Stage Door Canteen—named in honor of a New York recreation club for servicemen.

Liberties carried troops, planes, tanks, guns, gas and bombs to battlefields around the world in the '40s, to Korea in the '50s, and Vietnam in the '60s.

More than 200 Liberties sank from storms or enemy torpedoes, many with heavy loss of life. As hospital ships, they took the wounded home. Some were sunk deliberately to provide a harbor breakwater on the invasion beaches of France.

Then, for more than 20 years they were the backbone of the world's tramp steamer merchant fleets. Finally they were obsolete—to slow, too old and too expensive to operate.

Many were cut up for scrap. Others were sunk deliberately to create artificial ocean reefs to improve fishing in the Atlantic, Gulf and Pacific.

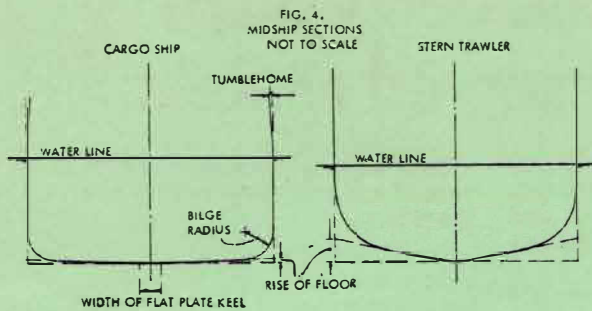
The few other remaining Liberties were modified for a variety of tasks, ranging from oil tankers to radar picket duty off the coastline as part of the nation's early warning system against air attack.

One of the most popular modifications, never made on the O'Brien, was to reinforce the ship with a steel band because of a dangerous and sometimes tragic tendency to break apart during storms. That was because the ships, to speed their construction, were welded and not riveted together.

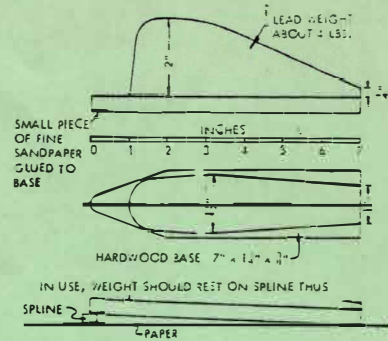
Reprinted from the
Ship Modelers Assc.
Newsltr. (Fullerton)
Thanks, Tom.



(Some "relic")



Part two
(continued
from May
issue)



Thoughts on Lines

by J. W. Holness

THE shapes of various types of hull appear very different but the same general principles apply to them all. Water does not like to go round sharp corners, least of all at speed, so that any hull intended to be driven economically should have smooth fore and aft curves with no abrupt discontinuities. The part of the buttocks rising to the waterline at the stern should be a flattish curve to just above the waterline and as shallow a slope as the hull depth will allow. A very round form of buttock here will tend to encourage a large stern wave.

At the bow, the shape of the waterline is the main consideration, in particular, the angle of entry of the load waterline, see Fig. 1 (May issue). This angle should be no larger than necessary and for fast hulls should be as small as possible, with the maximum beam at the waterline well towards the stern. Width at the waterline is one of the factors that help stability, so small sailing vessels usually have fairly large angles of entry as stability to carry sail is a primary consideration. A sailing vessel also needs beam, a stiff section with a hard bilge, and enough draught to enable her to sail to windward, and must carry some ballast low in the hull or on the bottom of the keel.

The problem of how much beam, ballast and bilge to give a sailing yacht has taxed yacht designers for many years and will probably continue to do so.

Powered cargo ships and the later commercial sailing vessels have a very small rise of floor amidships with a small bilge radius and vertical sides with slight tumblehome above the waterline, see Fig. 4. Most cargo ships have a greater or lesser length of parallel middle-body, i.e. a number of frames amidships have the same shape. Tankers and bulk carriers may have as much as 30% of their length as parallel middle-body whereas a fast cargo liner will have about 10% of her length. Smaller vessels with a greater beam length ratio do not usually have much parallel middle-body, otherwise the ends become excessively bluff. Small working craft such as fishing boats, pilot cutters, and ferries, which travel at high V/\sqrt{L} values do not have any parallel middle body. Such vessels have much greater rise of floor and bilge radius than cargo ships. It is all a compromise between length, narrowness and easy sections for speed, bluff lines for cargo carrying, beam for stability, etc.

Before embarking on the actual drafting of a set of Lines, it is advisable to have some idea of the required displacement. The achievement of this is a matter of trial and error but it is helpful to know the correct prismatic coefficient or C_p for the type. The C_p is the ratio of the underwater volume of the hull to the volume contained in a solid, having the waterline length of the hull and the same section as the midship section. Some guidance figures are given in the accompanying table. Knowing the

C_p , waterline length and desired displacement, the area of the midship section can be calculated.

The easiest way to measuring the area of the sections is to draw a grid of squares to a suitable scale on a piece of tracing paper, place this over the sections and count the number of whole squares and squares half or more within the boundary line. The accuracy of this relies on the accuracy of the grid and the size of the squares. Obviously, the smaller they are the more accurate the result, but if they are too small one goes cross-eyed counting them. To calculate the volume of displacement, the waterline should be divided into an even number of parts, usually ten, and the cross-sections drawn at these points. When all the sections have been drawn, the underwater area of each is measured by the grid method. It is worth plotting a Curve of Areas to check on the fairness of the hull and to see that the areas of the sections have been correctly measured. If the lines appear fair but the spots for the areas will not lie on a fair curve, measure the areas of the offending sections again.

The volume can then be found using Simpson's first Rule:

$$\text{Volume} = \frac{h}{3} (y_1 + 4y_2 + 2y_3 + 4y_4 + \dots + 2y_9 + 4y_{10} + y_{11})$$

for a waterline divided into ten parts. If h is the distance between sections in inches and y_1, y_2, y_3 , etc. are the areas of sections 1, 2, 3, etc., in square inches, the volume is in cubic inches. If the areas are for half the section, the answer should be doubled. The weight of an equal volume of water can be calculated from the fact that one cubic foot of fresh water weighs 62.4 lbs. If the answer comes out less than the weight estimated for the vessel, the Lines must be filled out and the displacement checked again.

An alternative Rule is the Trapezoidal:

$$\text{Volume} = h \left(\frac{y_1 + y_2 + y_3 + \dots + y_9 + y_{10} + y_{11}}{2} \right)$$

This is only accurate for hulls whose curves are very easy, but not for a vessel with a lot of shape as it assumes that the Curve of Areas is a series of straights between sections. Unlike Simpson, it can be used whether the waterline is divided into an even or odd number of parts.

If desired, the position of the longitudinal centre of buoyancy may be found by cutting out the shape of the Curve of Areas in paper and balancing it on the edge of a ruler to find the centroid. This will be in the same fore and aft position as the centre of buoyancy.

As regards the instruments required, to buy the proper equipment would be prohibitively expensive. One can, however, get by quite well with cheaper alternatives. Some kind of drawing board is desirable but this need only be hardboard or thin ply, if it can be rested on a flat surface. Thicker plywood or blockboard is better as it is then stiff enough to be supported on a few points. This is an

advantage if one is using a polished table, as the board can then rest on two or three pieces of wood which are padded underneath. A piece about $\frac{1}{2}$ in. or $\frac{3}{4}$ in. thick should be stiff enough, other dimensions depending on size of model to be drawn.

If a very thin material is used for the board, the paper will have to be fastened to it with Sellotape or masking tape. If any case it is difficult to push drawing pins into ply because of its hardness. Whatever the board is made of, the surface should be smooth and without a prominent grain. In use, it should be covered with two or three layers of smooth, hard, white paper, cartridge paper being the ideal, otherwise the pencil point may follow the grain of the wood. Unless one has a proper drawing board there is little point in having a T-square, though some form of straight edge is almost essential. This can be made from a thin piece of hardwood or plastic and should be the same length as the board.

Much ship draughting consists of drawing curved lines. As many as possible are drawn using a flexible batten or spline of wood or plastic held in place with lead weights. If the line has too much curvature for a spline to follow, a plastic or wood shape, called a 'curve' or 'sweep', depending on type, is used. This may fit only part of the curve to be drawn, so it is necessary to have a selection of different curves.

Stiff splines can be made using selected strips of ramin, carefully sanded, but flexible ones are more difficult and it may pay to buy one or two—they cost about 10/- to 15/-, depending on the type.

Elbows, books and spare hands may be used as a substitute for lead weights but, for serious work, the real thing is required. Five is the minimum number that would be any use, ten would be enough for most things. The accompanying sketch shows the appearance. A foundry will cast them quite cheaply if one provides a pattern and can scrounge enough lead from somewhere.

French curves may be bought quite cheaply and would do for a start although the shapes are somehow not right for ship work. Unfortunately, proper ship curves are expensive, hence most ship draughtsmen make their own in plastic, copying the shapes from their colleagues' curves. The cheapest ship curves to buy are probably a set of Dixon Kemp 'Pears'. These are primarily intended for yacht work but are very useful for drawing sections.

Other items required are two 6 in. set-squares, a good ruler or scale, several pencils, H, 2H & 3H, hard and soft rubbers and some drawing paper. Cartridge paper is best but expensive. White lining paper will do as an inexpensive substitute but any erasing must be done very gently as it is easy to make holes in this paper.

If it is proposed to do much work in ink, a ruling pen is necessary, otherwise a mapping pen will do.

The actual drawing is commenced by very carefully setting out a grid, i.e. waterlines and sections are drawn where the profile will be, waterlines, buttocks and a centre line for the body plan and buttocks, sections and a centre line for the halfbreadth plan. All these will be straight lines either parallel or at right angles to each other. This must be done as accurately as possible, great care being taken to get these lines square to each other, otherwise it will be impossible to fair the lines. It is advisable to draw centre lines and the datum waterline in ink, otherwise they may get lost in the inevitable rubbing out. It is practically impossible to draw a set of lines straight off, without erasing and altering as the drawing progresses. If tracing paper is used, the whole grid can be drawn on the back of the paper so that none of it is lost in rubbing out.

The grid finished, the sheer, keel line, stern and stern outlines are drawn on the profile, followed by the deck outline or sheer line on the halfbreadth plan. These lines

APPROXIMATE VALUES OF PRISMATIC COEFFICIENTS

Type of Vessel	C _p	TUG	0.55—0.65
LINER	0.60—0.68	TRAWLER	0.60—0.68
CARGO LINER	0.65—0.70	MOTOR YACHT	0.50—0.60
CARGO SHIP	0.65—0.85	SAILING YACHT	0.50—0.53
TANKER	0.75—0.85	CROSS CHANNEL	0.57—0.62

largely determine the appearance of the hull so some care should be taken to get them right, particularly the sheer. The midship section is then drawn, the underwater area being calculated as described above. It will be found easier to sketch this in freehand at first until the correct area has been obtained. Next follows the datum waterline and the quarter beam buttock. This is the buttock positioned at about a quarter of the beam out from the centreline. The midship beam and depth for these lines are taken from the midship section and the position of the ends are picked off the profile and halfbreadth plan, respectively. It is probably best to draw the waterline first, then the buttock, adjusting the waterline to suit if necessary. It should be borne in mind that the forward end of the waterline should be no bluffer than necessary and that the part of the buttock rising to the waterline no steeper than necessary and a fairly flat curve. In many types of vessels a short length of buttock near the waterline may be a straight line, faired smoothly into the rest of the buttock.

The shape of the hull is now more or less fixed and it should be considered for a while before proceeding. Any major alterations made now involve much less rubbing out than if made later. It is possible to finish the design off in a number of ways. A good way is to draw a level line at about half the freeboard height, then a waterline one or two below the datum waterline, then sections, one division in from each end of the datum waterline, adjusting the waterlines if necessary. Two diagonals may then be drawn—one through the tuck and one through the turn of the bilge. They should cross the sections nearly at right angles. The remaining sections, buttocks and waterlines are then drawn in any convenient order, followed by the Curve of Areas, rabbit line, etc.

If designing from 'scratch', a Lines Plan will take quite a few evenings work. It is a good plan, when one has got the main lines down, to prop the board up where it can be seen from one's chair. A better idea of how the design is shaping can be obtained by studying it from a distance. For the same reason, it is a mistake to make the drawing too big, so if the intended model is a large one, it is advisable to draw it at a reduced scale such that the hull is not more than about 18 in. long.

If there is a rapid change of shape between adjacent waterlines, sections or buttocks, either they are too far apart or the hull is unfair. Sections in particular should change shape smoothly from one to the next.

A beginner may find splines awkward things to handle, especially if they are stiff. It must always be remembered that the draughtsman, not the spline, decides the shape of the curve, though on the other hand, the spline should not be forced into an unfair curve. The fairness, or otherwise, of a curve may better be seen by looking along it from low down at one end.

For the first attempt it would be better not to design from 'scratch' but to start with one of those model plans that show profile, deck outline and two or three sections and to work this up into a complete plan. An alternative would be simply to copy a drawing. This would give practice in using the instruments. The first design from scratch could well be for a single or double chine hull with straight line sections, thus reducing the number of curved lines to be drawn to five or seven. By the time the beginner has drawn half a dozen or so Lines Plans, he

(Concluded on page 303)

THOUGHTS ON LINES (Continued from page 301)

should have begun to get the hang of it and his finished drawings should bear some relationship to what he had in mind when he started it.

Drawing Lines Plans for a ship design is a satisfying

occupation in itself, so the modeller who wishes to remain one, should beware of getting too interested in the drawing board before he has finished his present model, unless he builds experimental models that do not take long to complete.

Reprinted from the
Ship Modelers Assc.
Newsltr. (Fullerton)
Thanks, Tom PALIN

MODELING TIPS:---

2-Hr Waterline Marker, by Roger Van De Walker.

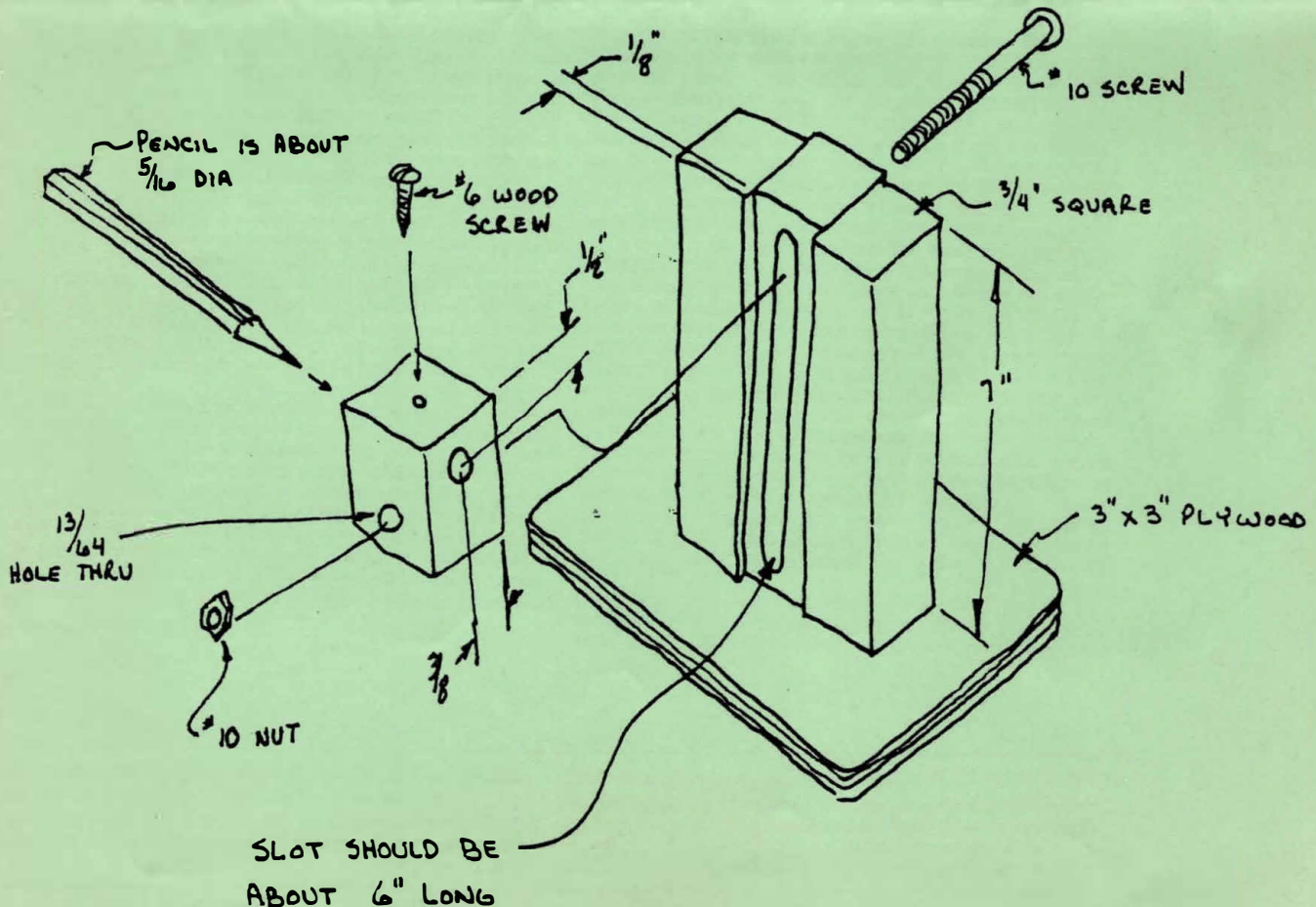
Materials required:

1 piece,	3/4" square pine, etc. x 24" long.
1 "	1/4" or 3/8" plywood, approx 3" square.
1 "	#10 Round head bolt x 2" long
1 "	#10 nut
1 "	#6 wood screw, 3/4" long, (to jamb pencil into place)

Note: 3/4" square stock is 1" x 1" to the man in the lumber yard.

Cut the 3/4" square stock into 3 pieces 7" long. The remaining piece will be about 2 1/2" long and be the pencil holder. Glue the 7" pieces together as shown and drill and file (or router) a 1/4" slot as shown.

In the small piece drill the pencil hole, then sand this piece smaller until it slides up and down in the groove formed in the 7" assembly. Drill a 13/64" hole at right angles to the pencil hole, through, for the #10 screw. Drill a hole slightly smaller than the #6 screw so it breaks into the pencil hole. Glue the 7" assembly onto the plywood and finish the parts as desired.



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Ship Modelers Assc.
Newsltr. (Fullerton)
Thanks, Tom.



PEARLS FROM THE CHEST.

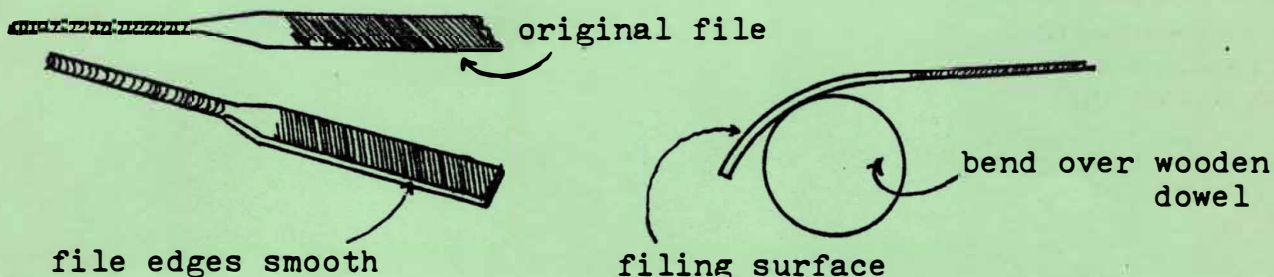
Some tips from members of the crew.

Don't throw away your broken needle files!! I found a use for a small broken pattern-making mill file. The handle and about an inch of cutting surface remained, so I heated it 'til it was bright red in an open flame on our stove. after letting it cool by itself it became soft enough to file off the edges, and to bend it by hand over a one-inch dowel (wood will not mar the cutting surface of the file). I rehardened the file by heating it again to a bright red, and dunking it in cold salt water which made it as hard as before and ready to use. Other files may be re-shaped in same manner for special jobs.

The little file is used for leveling off dowel heads on curved hull planking, getting at inside curves within the hull, and smoothing the garboard strakes without scratching the keel.

P.S. When the file gets dull - re-heat it and bend the other way, and you have a new cutting edge!

--Henry Bridenbecker.



Finishing Tips:--

1. To blacken brass, solder, copper, etc. use "Blacken-It", about \$2.98.
 2. To weather natural wood, use "Weather-It", about \$2.98.
- Both of these available at train shops, and perhaps other hobby shops.

----- Dick Dickensheet.