



# San Diego Ship Modelers' Guild

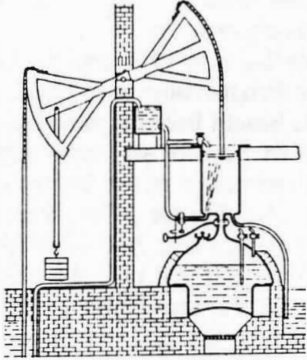
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NEWSLETTER

Volume 24, No. 1



## A Goofy, Powerful Contraption

Bob Crawford announced at the Dec. 8 meeting that he is recruiting members to build a small working replica (not an artistic model) of a Newcomen steam engine. He referred to the clumsy, inefficient but powerful contraption that, employed all over England to pump mine water during the first 75 years of the 18<sup>th</sup> Century, foreshadowed the Industrial Revolution.

Inventor Thomas Newcomen's machine did not use steam under pressure. Instead it relied on the vacuum created when steam is condensed.

From the boiler, steam rises into the cylinder as a weight on the walking beam pulls the piston up to the top. Then the steam valve shuts and a jet of cold water is ejected into the cylinder, condensing the steam to a puddle. Atmospheric pressure pushes the piston down, and a rod attached to the walking beam operates the pump deep underground.

In early engines a small boy was employed to open and shut the steam valve. One such boy soon showed Newcomen how the job could be done just as well by a system of cords tied to the walking beam.

Robert Hewitt recalled seeing an enormous piston for such an engine in a London museum. Ernie Andrews said that he had heard of a Newcomen machine with a 4-foot bore and a 9-foot stroke, which operated at a speed of one stroke per hour.

In 1763, a Glasgow instrument maker named James Watt was hired to repair a working model of a Newcomen engine (just like Crawford wants to build). He was struck by the waste of steam required by the alternate heating and chilling of the cylinder. Watt went on to devise the vastly more useful reciprocating steam engine that powered the railroads, looms and steamships of the Industrial Revolution.

## The Dec. 8 Meeting: Busy and Profitable

The richly paneled, 19<sup>th</sup> Century main salon of the *Star of India*, a reminder that the bark goes back 136 years, was the setting for the December Guild meeting. And although it's an ample space, it was rather crowded for the 18 members who attended on a cold evening in busy December.

First Mate **Jack Klein** called the meeting to order. **Krystoff Bodzon** reported that his promised search for speakers at Guild meetings had snagged **Phil Mattson**. He'll speak at the January meeting, and if not finished the February meeting too.

Urged by **Robert Hewitt** to give news of the Nov. 4-7 Nautical Research Guild conference, **Bob Crawford**, the conference chair, referred to his report in last month's Newsletter and added that financially the conference came out even---"We didn't want to make money and we didn't." Should we try a second act? Too soon to think about that, said Bob. For modelers eager to attend something, he recommends OpSail 2000 in Hampton Roads, Va. on June 16-20. Later in the meeting he urged San Diego modelers to enter their ships in the Western Ship Model Conference & Exhibit on the *Queen Mary* on March 31, April 1 and 2.

He said that the kleptomaniac spotted at the N.R.G. Conference turned out to be a "honcho" from Philadelphia. What he was tempted to steal was a model with no label. "If you ever take another model to an exhibit, be sure to provide an ample label," said Bob.

The conference was extremely well attended, Bob noted: 202 at the reception on Friday and 201 at dinner the next evening. **Jack Klein**, who with **Jackie Jones** managed the sign-in desk, said that at the dinner he had heard high praise for the organization of the conference: "I don't think we had five complaints."

**Bob Wright** praised Bill Forbis for the lengthy photo essay on the conference in last month's Newsletter, and all present clapped thunderously.

Reverting to stolen models, **Fred Fraas** remarked that mentioning a theft in a club newsletter can spread the news to other newsletters with whom we exchange, increasing the chance that the thief can be caught. Phil Mattson revealed that he always carves his name behind or under some ship part that can be removed to prove he is the builder and not somebody else.

Four or five members reported general satisfaction with reviews of their models made at the exhibition by

N.R.G. experts. For \$15 the reviewers, working in pairs, spent around an hour for each model and then wrote detailed critiques running more than a page of single-spaced typing. The N.R.G. discourages putting their actual words into print, so we won't.

A number of members gave Purser **Ed White** \$15 checks for their 2000 dues. All others should do the same.

**Show & Tell.** **Ernie Andrews** brought a thick, long mailing tube containing plans from the Coast Guard Museum in Seattle, which he reported were comprehensive and inexpensive. The plans were for a lightship and a 1993 Coast Guard cutter. Lack of room in the *Star* salon prevented him from unrolling them. He'll do that next month.

Using, among other tools, a digital caliper that works to three decimal points, Robert Hewitt has produced a 3-in. plank-on-frame model of H.M.S. *Snake*, made from plans in Charles Davis's *The Built-Up Ship*. Hewitt's skill in tininess is more spectacular each month. On *Snake* he created an effect of trenails by sprinkling dust sanded from a piece of ebony onto the basswood planks.

*Snake's* bottom is coppered with 1,100 teensy-weensy plates cut from .003" copper (the process was described in the May issue of this newsletter). The crew of half a dozen eighth-inch figures included two on the bilge pump. For the microscopic gluing involved in such work, Robert uses the tips of ordinary ball-topped pins and Weld Bond glue.

Hewitt's next tiny project: a 1-to-500 *Victory*.

There's some doubt whether the schooner *Fair America* was a real ship or just one that was planned. The legend has it that she was built in the 1770s in America and confiscated by the British. In any case, **Jerry Deschenes**, builder of this Show & Tell model, believes that small (68') vessels like this were made to last only five or ten years, so she couldn't have much history.

*Fair America* was built plank-on-frame from a kit Jerry acquired at a Guild auction. A very old kit, perhaps—Jerry says the wood was brittle. The plan required him to install diagonals across the frames, evidently to prevent hogging.

Fred Fraas brought a completed model of the *Lackawanna* built from a Bluejacket kit that he obtained at the March 1996 meeting auction. Fred made the opening bid of \$100, which turned out to be the only bid.

In the Bluejacket catalog the kit for this 1900 two-stacker seagoing tug goes for \$223. Fred says he learned that if Bluejacket builds the model for you, it will charge about 15 times the price of their catalog-listed kits. For the *Lackawanna* this would currently be over \$3,000. Fred pointed out that the brass stanchions alone for the bridge deck rail are priced at \$44 in the catalog.

This led to some discussion of high model prices. Jerry told of a not-particularly-grand model selling for \$25,000. Others made the often-heard assertion that at average prices builders can expect a return of \$1 or less per hour. But, as Jack Klein cracked, "Why clock yourself if you're enjoying it?"

## How Did Our Guild Get Started? With a Kit That Had Only 2 Masts

By Bob Wright

The San Diego Ship Modelers Guild started simply enough. It came about with the building of a cute little model of the brig *Volante* from a Model Shipways kit.

After helping to restore the *Star of India* weekends for several years, I became intrigued with the idea of building a ship model. The *Volante* was my choice because it had only two masts.

While building it in 1971 with the help of my friend Al Hollie, the thought came to me that other ship model builders would benefit from the same type of assistance.

Captain Ken Reynard was most responsible for the quality of the restoration of the *Star of India* and was at that time executive director. When approached about the possibility of having a ship model club meet on board, he was in favor of it. (At that time the *Berkeley* was not in San Diego.) With that assurance, I went to talk to Russ Merrill, who owned the Hillcrest Hobby and Craft Store on Fifth Avenue. He too thought it was a good idea, and knew some ship modelers. A short letter was drafted for the museum and approved. It was quickly granted. The date was 17 August 1971.

The first meeting was held in September or October of that year on the first Friday of the month. We met in the aft cabin (sail locker) of the *Star*, which was at that time the museum's office. Some four or five fellows would attend.

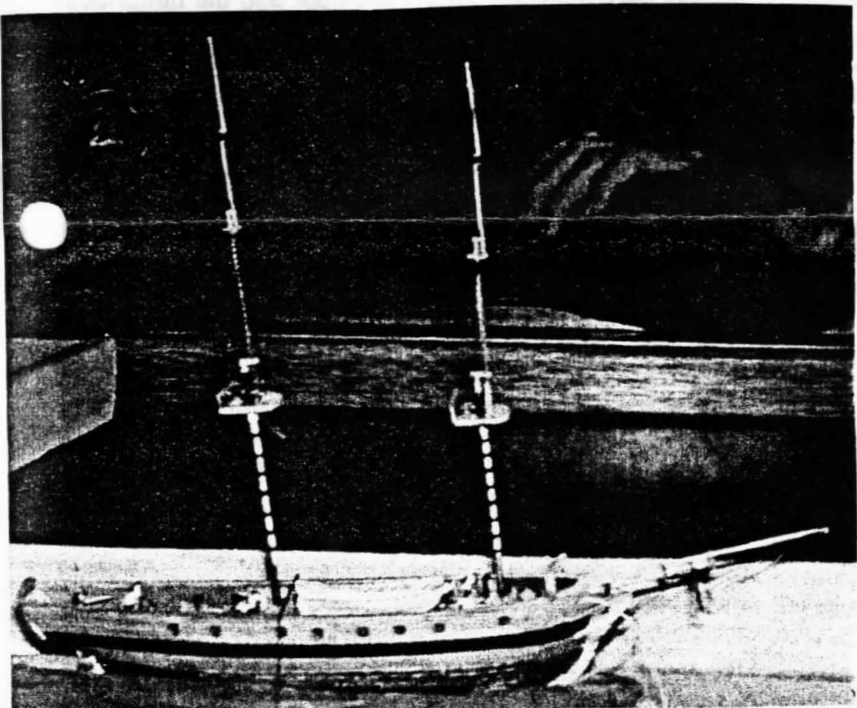
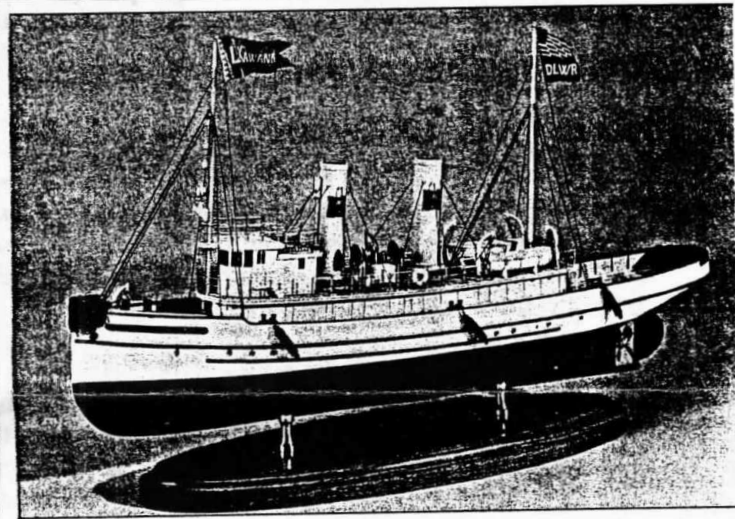
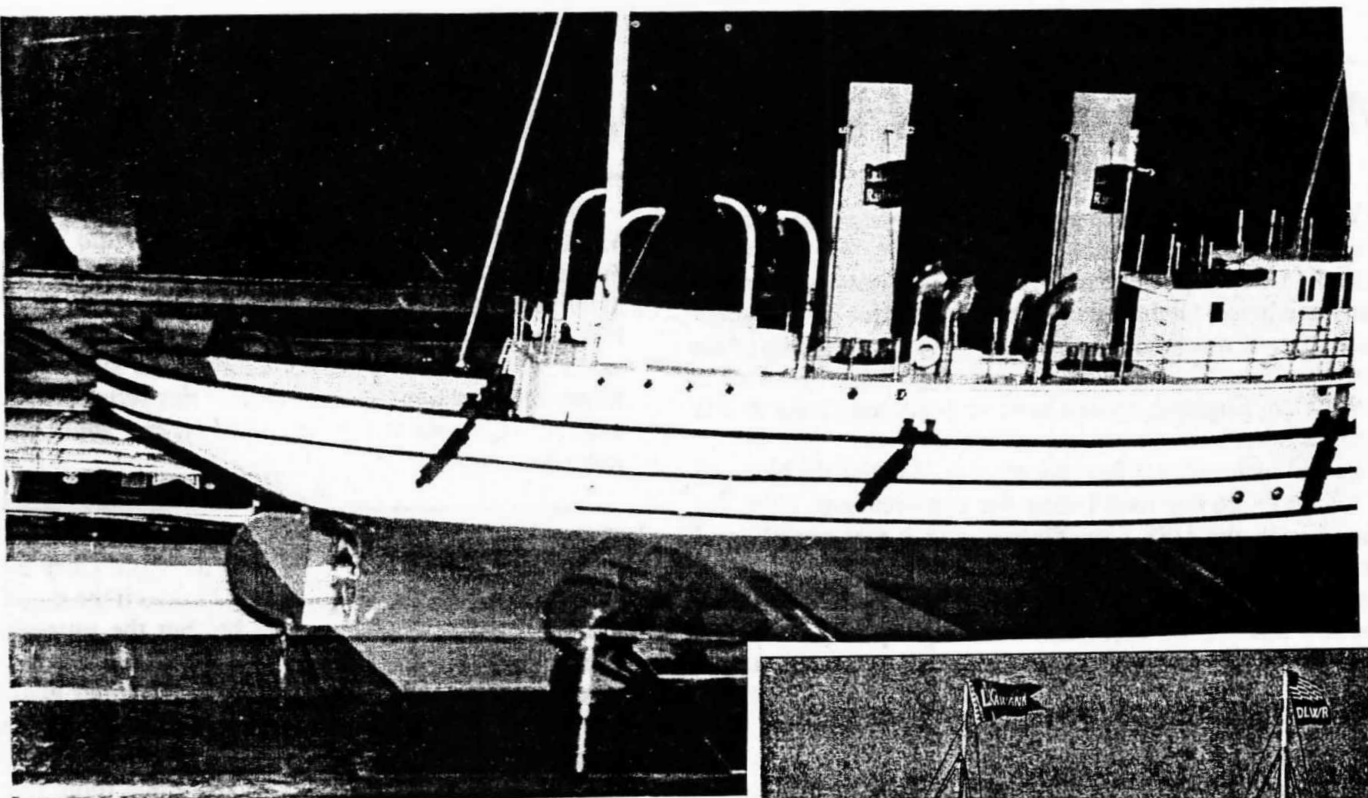
The first year or so the attendance was very low. A couple of fellows who were early members were Stan Tarantino and Bill Benson. Al L'Heureaux started to attend. He was into radio-controlled models. Before that the Guild concentrated on static models. By combining both types of models the membership grew.

Over the past 29 years, the number of members attending the meetings has fluctuated between 15 to 20 or more. Now the meetings are held the second Wednesday on board the ferryboat *Berkeley*. The mailing list of the Newsletter has some 67 names.

Russ passed away about 25 years ago. He would be very pleased to see the success of the Guild now. I sure am.

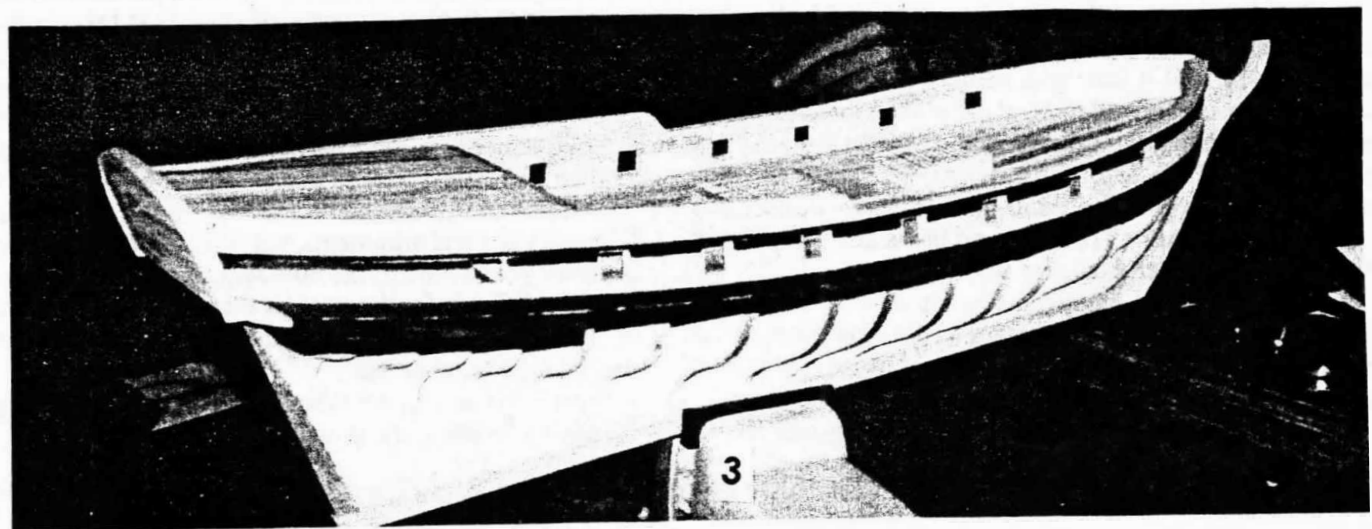
*Reynard's letter read as follows: 17 August 1971*  
*Dear Bob: This is in confirmation of our conversation regarding your request to hold monthly meetings of the Ship Modelers Guild aboard the Star of India. At our Board of Directors meeting on July 20<sup>th</sup>, your proposition was presented to the Board for consideration. As you know, the request was approved with the stipulation that the Ship Modelers Guild join the Nautical Research Guild. Good luck in your endeavor! Sincerely, Captain Kenneth D. Reynard, Master, Bark Star of India.*

**The Editor thanks Bob for this contribution and invites other members with an urge to speak up to send their thoughts to him at 8404 LaRouche, San Diego 92119.**



*From the Dec. 8 Show & Tell*

**Top:** Stern closeup of Fred Fraas's \$3,000 *Lackawanna*; **Inset:** Kit-catalog picture of the same ship; **Left:** a nearly life-size shot of Robert Hewitt's *Snake*; **Below:** Hull of Jerry Deschenes' *Fair America*.





# Where have all the museum ship models gone?

By Ed Quam

I have just returned from a trip to the New England area and visited many of the renowned maritime museums which I visited 15 years ago. The models they had years ago were so many and beautiful that I was excited to go back and see them again, to take notes and to show my wife the creations of the modelers' art. My experiences at the Maritime Museum in Greenwich, England, should have prepared me for the dearth of models here.

We had planned to follow the same path which the Nautical Research Guild trip took before the conference in 1998. We started with the USS *Constitution*, and it was exactly as I remembered it, even to the upstairs exhibit and workshop area for the model builders (though no modeler was there). The few models represented were of high quality, but as we were soon to find out, the museum was more interested in interactive displays and playtime exhibits than in the art of modeling. So, that's the first disappointment, but no big deal; there would be more.

Next was the Peabody Maritime Museum in Salem. I talked to one of the docents and asked if the museum still had the ship model collection. The answer was, "We have a few left, but the museum is changing over to an art collection of the maritime trade." Not many models, since they are not of artistic value was the inference that I was given.

Since my interest was not in porcelain of Asia and paintings, I did not investigate the museum, but went to the Wall American Marine Model Gallery. There I met Sarah and Michael Wall and had a delightful time talking with them. Michael related a similar experience he had at the Maritime Museum at Greenwich. We agreed that most of the museums seem not to want to display models, but interactive displays.

Incidentally, the models that were on consignment in their shop and at the gallery in Mystic were the finest I have seen. The bottom line is if you are ever in Salem, Massachusetts, stop in to see the Walls. See what they have or if you would like to log on to their web site, it is: [www.shipmodel.com](http://www.shipmodel.com).

We continued up the coast to Bath to the Maine Maritime Museum. Once again, nice models, but only a few, including one by Eric Ronnberg, Sr. Most of the collection was designed to tell the story of shipbuilding in Bath. There is nothing wrong with that, but again, I wish there had been more in the way of models.

We decided to spend the rest of our time in Mystic, Connecticut, and New Bedford, Massachusetts. Mystic has grown since I saw it last, and, as always, the museum had much to offer in the way of how life was in the time of iron men and wooden ships. The recreation of the *Amistad* was the highlight of the trip. She was quite a ship and will be sailing during the 4th of July sail-in. Just seeing the construction process was great. There are no plans available, as yet, for the model builder, but there will be.

I was excited at the prospect of going into the ship model display to show my wife the cream of the crop. Well, it was the cream, but only a thin portion. Once again, the bulk of the collection was hidden from view.

We traveled on to New Bedford in a driving rain for our

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*The author is a former member of the Washington Ship Model Society who now resides in Colorado and is a member of the Rocky Mountain Shipwrights. This article originally appeared in that club's newsletter, The Scuttlebutt, and is excerpted here with permission. Ed's experiences on his tour of maritime museums is similar to the trend Gene Larson observed earlier this year and last on visits to museums in England and on our southeastern Atlantic coastline.*

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last stop before getting airborne. I particularly remembered the collection of whaling ships and the *Kate Cory* by Eric Ronnberg Jr. built at 1/2"=1'. Again, I asked if the model was there and was told that it might be, but the museum had achieved its goal of raising money to expand, and the blue whale that beached itself was being put together in skeletal form for an interactive display. Oh, and yes, the model collection that was in the blue whale room is now in storage. We went inside and stumbled on a diorama room that was entirely dark until we opened the door and the lights came on. Behind the diorama was the *Kate Cory*. Success! At least we could see it, but the rest of the display that I had seen years ago was gone. Needless to say, I was disappointed by the scarcity of ship models at all our stops.

## Where do we stand?

So, where does this leave us as a group of artisans? I have a feeling that the curators of museums find our work boring and uninteresting to the general public. If it isn't interactive or doesn't tell a story, it isn't going to have a viewing. I think if we were to present ourselves as artists in multimedia, as well as three dimensions, we might have a better chance at viewing space. Otherwise, our craft will only find room in private collections or as ornaments in restaurants.

Profitable, but hardly what I would think the way we should have our work displayed for the public.

When I asked my daughter what she would do with all the models she would eventually inherit, she said that they would go to a museum. I think they would probably go to a museum storage room.

My hope is that the concern I have voiced in this article will be recognized and that some effort on the part of the maritime museums to display a variety of models is taken seriously. We cannot have them limited as they have been. The casual observer can become the serious builder or collector. The opportunity to see the models is needed. Of course, this will undoubtedly cause controversy in the argument that space is limited and expensive and that a balance between education and information is needed for an exhibition to be effective. These are all valid arguments, but when virtually all maritime museums have limited the number and variety of ship models, it is difficult for those of us who truly enjoy seeing and studying others' work to enjoy the types of exhibits that were available to us in the past.

Who is the audience? Where have the ship models gone? To storage, more is the shame.

# Shop Talk

Items have been piling up in this Newsletter's Shop Talk file for quite a while. It's time to download some of them.

## Tips? N.R.G.'s Got a Million

Jean K. Eckert of the South Bay Model Shipwrights club up north recommended <http://www.naut-res-guild.org> as a profitable place on the Internet for the model ship builder to browse in. "Links to over 1,000 nautical sites," she writes. As the website address suggests, this is the voice of the Nautical Research Guild.

We gave it a shot and found, right off the bat, a list of 1,400 model-building supplies sources. Another heading listed dozens of marine archeology sites, *Arabia* Missouri River Steamboat through Texas A&M Nautical Archeology Program to *Wasa* Museum Stockholm. Still another list names all of the ship modelers clubs in the U.S.

The Shop Notes ranged from constructing a rope walk to building a lathe from a Dremel moto tool. We read the article on milling model ship planks and timbers all the way through, and found it sound and informative.

And that's merely a taste of what [www.naut-res-guild.org](http://www.naut-res-guild.org) offers the modeler.

Another possibly interesting Internet address is <http://www.thisisthat.com>. It's all about glue.

## You're Better Off Buying

Washington Ship Model Society member Ted Williams is a naval architect and author of *Modern Ship Model Construction*, a book loaded with thoughtful advice. Here's a sample:

"One theme I espouse in model building . . . is 'Buy it rather than make it.' This may at first sound odd from a model builder. However, unless you have unlimited time and very little money, you will be better off. My models' material costs for ready-made parts range between \$200 and \$300 per model. I normally work under contract, building models of newer ships that have not been kitted and must be scratch-built. My customers could not afford it if I made all the pieces, and frankly, for many components such as ladders, chocks, railing stanchions and anchors, the bought pieces, with a little touchup, are better than I could make."

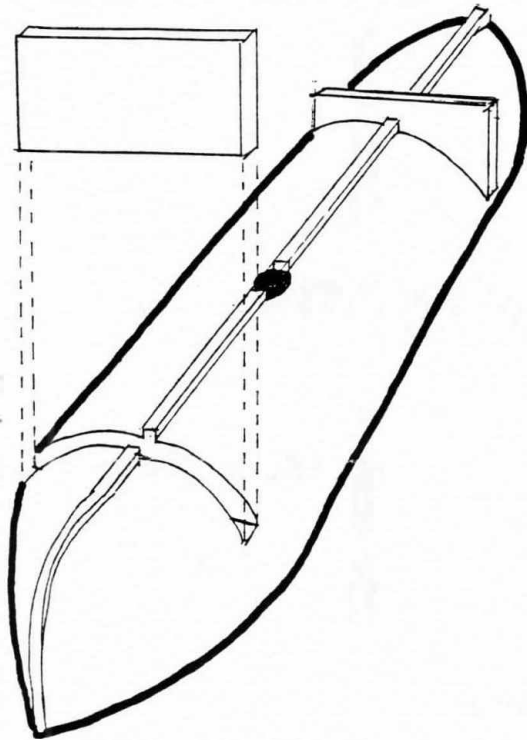
## Xeroxing on Wood

Frank Wilhite, a member of the Ship Modelers Association, produced this nugget: drawings can be transferred from Xerox copies to wood by the application of heat. Same for drawings made by laser jet, but not ink jet. As a source of heat he recommends a special purpose iron available from Woodworkers Supply. The wood image will be a mirror image of the original.

## Neat Trick for Boat Cradles

Fitting a cradle to the bottom of any of Bluejacket's cast brittania ship's boats can be tedious, requiring trial-and-error sawing and filing to achieve the right curve and bevel. An easier way is to fit the boat to the cradle.

This can be done by sawing slots across the boat's bottom and gluing the cradle timbers into them. In the 1/16<sup>th</sup> and 1/8<sup>th</sup> scales, and assuming the cradle timber to be somewhere between 6" and 1' thick on the real ship, this slot can be made to scale with a hack saw that has a kerf around 1/32" wide. (Blades come in various widths.) Of course, before you make the boat's cradle you'll probably have to make a temporary cradle for the boat to



lie in upside down while you saw it. And some kind of clamp to hold it firmly.

While the boat is upside down you might consider drilling a hole halfway along the keel for a small wood or brass dowel that will go into a hole drilled into the boat deck, between the davits. This will position the boat more strongly than glue applied to the thin bottom of the cradles, and be nearly invisible.

## Avoiding Glue for Ladders

Secret dowels have more than one use. You can glue a thin brass rod along the back of a ladder, after filing a slot in the back edges of the steps for the rod to lie in. Bend it at the bottom to the correct angle, and poke it into a hole in the deck. It's a mechanical connection that lets you position the ladder precisely, with no messy glue needed (except a tiny drop at the top end of the ladder).

# THRU THE LUBBERS HOLE



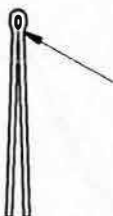
by Robert Hewitt  
"SHANGHAING" A CREW

A FEW MODELERS ASKED ME HOW I MADE THE SMALL FIGURES ON MY SHIPS. SCALES LARGER THAN 1/16" WILL NEED THICKER WIRE BUT ALL ELSE SHOULD BE THE SAME. THE ITEMS I USE ARE:

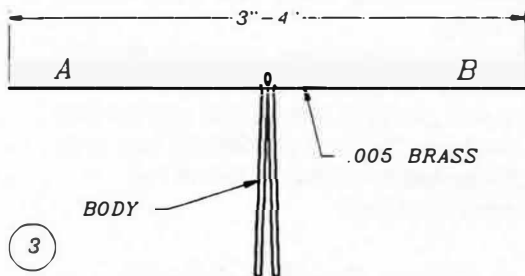
- A) 28 GAUGE BRASS WIRE.
- B) .005 DIA. BRASS WIRE. (BLUEJACKET)
- C) GESSO BY LIQUIDTEX. AT ANY ART STORE.
- D) HEAVY DUTY TWEEZERS, VIOLA #00.
- E) SCALE PICTURE OF A HUMAN. HAVE THIS LAMINATED AT ANY COPY CENTER. I WILL MAKE A COPY TO YOUR SCALE. JUST ASK.



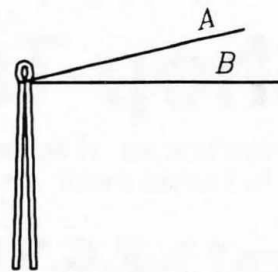
1 BODY. 28 GAUGE BRASS STRAIGHTEN & BEND IN THE MIDDLE.



2 SQUEEZE AT NECK

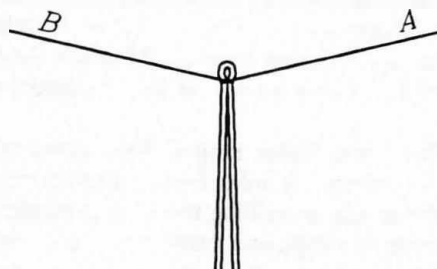


3 LAY A PIECE OF .005 WIRE ON A SHEET OF WHITE PAPER ON THE WORK AREA AND LAY THE BODY OVER IT AT THE NECK AREA.



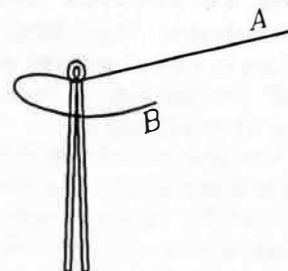
4

HOLD THE BODY DOWN JUST BELOW THE NECK AND FOLD ONE SIDE OVER NECK AND DRAW TIGHT.



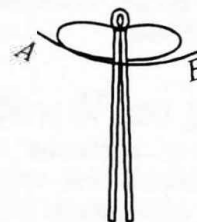
5

HOLD THE BODY DOWN JUST BELOW THE NECK AND FOLD THE OTHER SIDE OVER NECK AND DRAW TIGHT.



6

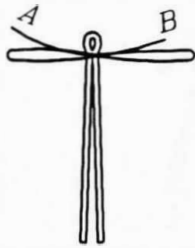
FOLD B WIRE OVER THE BODY. FORMING A LOOP.



7

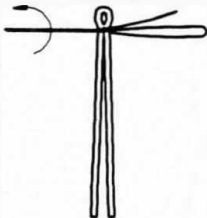
FOLD A WIRE UNDER THE BODY, FORMING ANOTHER LOOP.

8



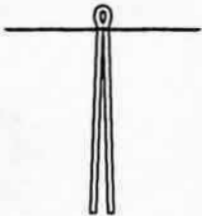
GATHER THE WIRE JUST BELOW THE NECK.

9



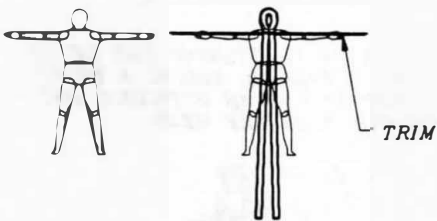
TWIST ONE SIDE TIGHT.

10



TWIST THE OTHER SIDE TIGHT.

11



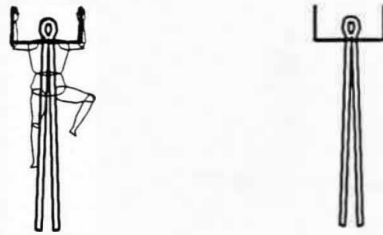
PLACE THE WIRE OVER THE OUTSTETCHED FIGURE AND TRIM THE WIRE TO THE TIP OF THE FINGERS OF THE FIGURE.

12



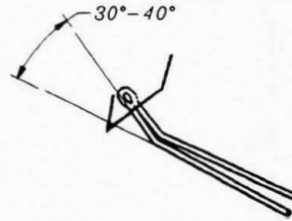
PLACE A DROP OF CYANO OR SILVER SOLDER THE ARMS TO THE BODY. CHECK TO SEE THAT EACH ARM NOW MOVES INDEPENDENTLY.

13



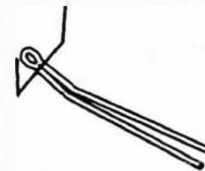
PLACE THE WIRE OVER THE CLIMBING FIGURE AND BEND THE WIRE TO MATCH THE ARMS OF THE FIGURE.

14



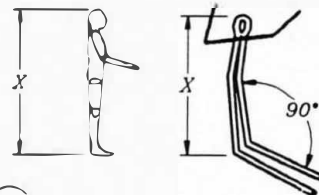
PLACE THE WIRE OVER THE CLIMBING FIGURE AND BEND THE BODY AT THE HIP.

15



BEND THE BODY BACK AT THE WAIST TO FORM A BUTT.

16

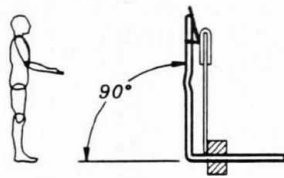


USING THE SIDE VIEW OF THE FIGURE, DETERMINE THE HEIGHT AND BEND THE WIRE AS SHARPLY AS POSSIBLE AT THE ANKLES.

17

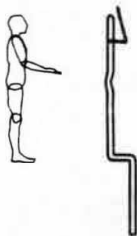


GRAB THE BODY AT THE TOE WITH A THICK PORTION OF THE TWEEZERS.



18

PLACE A SINGLE EDGE RAZOR BLADE ON THE TOE AND BEND THE BODY BACK 90°.



19

THE FIGURE SHOULD LOOK LIKE THIS FROM THE SIDE.



20

GIVE A SLIGHT BEND AT THE KNEE AND CUT OFF ONE WIRE AT THE TOE.



21

POSITION ARMS AND LEGS APPROXIMATELY IN DESIRED POSITION. LEAVE SPACE IF ARM IS TO BE ON THE HIP, AND MOVE AFTER PAINTING, ETC.



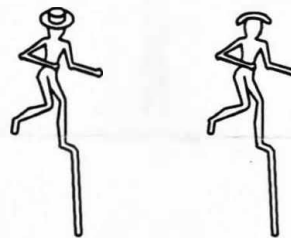
22

BUILD UP BODY WITH GESSO USING A PIN. DO NOT APPLY IN NECK AREA. BUILD UP THE CHEST, HEAD, SHOULDERS AND BUTT WITH 2-3 COATS, ALLOWING EACH COAT TO DRY OVER-NIGHT. MORE COATS MAY BE NEEDED IN THE HEAD AREA.



23

CONTINUE GESSO BUILD-UP WITH A DROP OF GESSO ON THE KNEES, HEELS AND ELBOWS TO MAKE SHARP BENDS. ALSO BUILD UP THE HANDS, BUTT AND FACE.



24

VARIATIONS INCLUDE FLATTENING THE GESSO ON THE TOP OF THE HEAD, ADDING A BRASS RING FOR A HAT OR FOR AN OFFICER'S HAT A BENT WIRE GLUED ON THE HEAD.



25

A SMALL BIT OF PAPER GLUED TO THE BACK FOR AN OFFICER'S COAT. PAINT THE FIGURE WITH ACRYLIC PAINT. I USE A PIN BUT A BRUSH IS USED FOR LARGER FIGURES. LET DRY. FORM TO FINAL POSITION. TOUCH UP AS NEEDED. CUT FRET TO 1/4" LONG. DRILL A HOLE IN THE DECK AND DROP THE FIGURE INTO THE HOLE WITH WHITE GLUE MEN ON RATLINES OR YARDS WILL NEED BOTH FRET'S REMOVED AT THE FEET I RECOMMEND WELD-BOND GLUE FOR THIS APPLICATION.



# Found in the Mail

## Ассоциация судомоделистов

### КОПИЙНЫХ КЛАССОВ

Mister President!


The members of the modelship club of the town Newinnomyssk Stavropol region address to you.

We unite all those who like to build models of ships. We unite grown-ups and teenagers.

We build models of ships of different kinds and purposes. We like to read about the history of the ships. We have a big collection of drawings of ships.

We'd like to make friends with you, to exchange books, drawings, photoes, models. We'd like to know more about modelships and their builders.

Our address: Modelship Club  
Belovo Street 4  
Newinnomyssk  
Stavropol region  
Russia, 357030

 Vyatcheslav Stepanov,  
the President of the Club,  
the Chairman of the Model-  
ship Association of Russia.

(courtesy of Pat Patton) South Bay Model Shipwrights

Dim.	X"=1' ratio	SCALE DIMENSIONS											Plastic Warships			
		ELIDIR 1/2 1/24	3/8 1/32	Viking 5/16 1/38	O Gage 1/4 1/48	S Gage 3/16 1/64	1/6 1/72	HO Gage ~1/7 1/87	1/8 1/96	1/12 1/144	N Gage 1/160	1/16 1/192	1/32 1/384	1/50 1/600	1/60 1/720	
1/8"	0.125	0.005	0.004	0.003	0.003	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	
1/4"	0.250	0.01	0.008	0.007	0.005	0.004	0.003	0.003	0.003	0.002	0.002	0.001	0.001	0.000	0.000	
1/2	0.500	0.021	0.016	0.013	0.010	0.008	0.007	0.006	0.005	0.003	0.003	0.003	0.001	0.001	0.001	
3/4	0.750	0.031	0.023	0.020	0.016	0.012	0.010	0.009	0.008	0.005	0.005	0.004	0.002	0.001	0.001	
1	1.000	0.042	0.031	0.026	0.021	0.016	0.014	0.011	0.010	0.007	0.006	0.005	0.003	0.002	0.001	
1 1/4	1.250	0.052	0.039	0.033	0.026	0.020	0.017	0.014	0.013	0.009	0.008	0.007	0.003	0.002	0.002	
1 1/2	1.500	0.063	0.047	0.039	0.031	0.023	0.021	0.017	0.016	0.01	0.009	0.008	0.004	0.003	0.002	
1 3/4	1.750	0.073	0.055	0.046	0.036	0.027	0.024	0.02	0.018	0.012	0.011	0.009	0.005	0.003	0.002	
2	2.000	0.083	0.063	0.053	0.042	0.031	0.028	0.023	0.021	0.014	0.013	0.010	0.005	0.003	0.003	
2 1/2	2.500	0.104	0.078	0.066	0.052	0.039	0.035	0.029	0.026	0.017	0.016	0.013	0.007	0.004	0.003	
3	3.000	0.125	0.094	0.079	0.063	0.047	0.042	0.034	0.031	0.021	0.019	0.016	0.008	0.005	0.004	
3 1/2	3.500	0.146	0.109	0.092	0.073	0.055	0.049	0.04	0.036	0.024	0.022	0.018	0.009	0.006	0.005	
4	4.000	0.167	0.125	0.105	0.083	0.063	0.056	0.046	0.042	0.028	0.025	0.021	0.010	0.007	0.006	
4 1/2	4.500	0.188	0.141	0.118	0.094	0.070	0.063	0.052	0.047	0.031	0.028	0.023	0.012	0.008	0.006	
5	5.000	0.208	0.156	0.132	0.104	0.078	0.069	0.057	0.052	0.035	0.031	0.026	0.013	0.008	0.007	
5 1/2	5.500	0.229	0.172	0.145	0.115	0.086	0.076	0.063	0.057	0.038	0.034	0.029	0.014	0.009	0.008	
6	6.000	0.25	0.188	0.158	0.125	0.094	0.083	0.069	0.063	0.042	0.038	0.031	0.016	0.010	0.008	
7	7.000	0.292	0.219	0.184	0.146	0.109	0.097	0.08	0.073	0.049	0.044	0.036	0.018	0.012	0.010	
8	8.000	0.333	0.250	0.211	0.167	0.125	0.111	0.092	0.083	0.056	0.050	0.042	0.021	0.013	0.011	
9	9.000	0.375	0.281	0.237	0.188	0.141	0.125	0.103	0.094	0.063	0.056	0.047	0.023	0.015	0.013	
10	10.00	0.417	0.313	0.263	0.208	0.156	0.139	0.115	0.104	0.069	0.063	0.052	0.026	0.017	0.014	
11	11.00	0.458	0.344	0.289	0.229	0.172	0.153	0.126	0.115	0.076	0.069	0.057	0.029	0.018	0.015	
12"	12.00	0.5	0.375	0.316	0.250	0.188	0.167	0.138	0.125	0.083	0.075	0.063	0.031	0.020	0.017	
5'-6"	66.00	2.75	2.063	1.717	1.375	1.031	0.917	0.759	0.688	0.458	0.413	0.344	0.172	0.110	0.092	
2'	24.00	1.00	0.750	0.632	0.500	0.375	0.333	0.276	0.250	0.167	0.150	0.125	0.063	0.040	0.033	
3'	36.00	1.50	1.125	0.947	0.750	0.563	0.500	0.414	0.375	0.25	0.225	0.188	0.094	0.060	0.050	
5'	60.00	2.50	1.875	1.579	1.250	0.938	0.833	0.69	0.625	0.417	0.375	0.313	0.156	0.100	0.083	
6'	72.00	3.00	2.250	1.895	1.500	1.125	1.000	0.828	0.750	0.5	0.450	0.375	0.188	0.120	0.100	
10'	120	5.00	3.750	3.158	2.500	1.875	1.667	1.379	1.250	0.833	0.750	0.625	0.313	0.200	0.167	

We strongly encourage all to join the San Diego Maritime Museum as an expression of appreciation for facilities provided for our benefit.

Dues are \$15 annually (\$7.50 after July 1).

**MEMBERSHIP**

Meetings Second Wednesday of every month. 7 p.m. social, 7:30 p.m. meeting  
Held on board the ferryboat Berkeley.

**SCHEDULE OF ACTIVITIES**

*Founded in 1971 by Bob Wright and the late Russ Merrill*

K.C. Edwards  
Jack Klein  
Ed White  
Open  
Bill Forbis  
Fred Fraas

Guild Master  
First Mate  
Purser  
Log Keeper  
Newsletter Editors

**Officers for 1999**

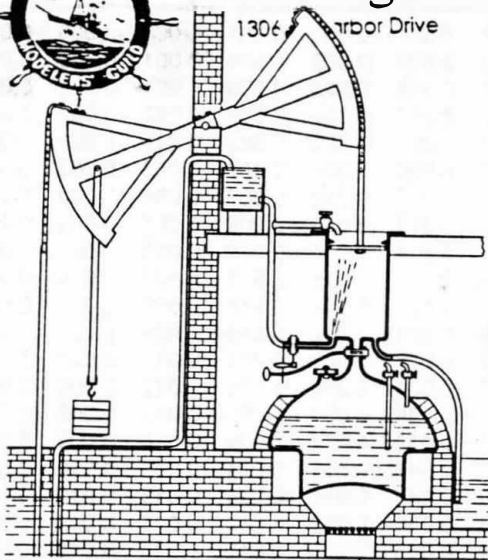
**SAN DIEGO SHIP MODELERS GUILD**



**San Diego Ship Modelers Guild**

1306 Harbor Drive

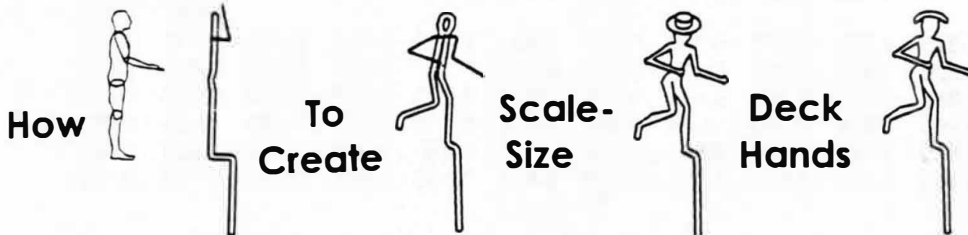
San Diego CA 92101



Fred Fraas  
/redacted/

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**The Guild's Newcomen Engine Project P. 1**



Three Pages of Text and Drawings by Robert Hewitt

January						
S	M	T	W	T	F	S
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16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

**NEXT MEETING**

**NOMINATION OF OFFICERS**

**SHOW & TELL**