San Diego Ship Modelers' Guild

2960 Chicago Street, San Diego, Calif. 92117

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June Meeting: Friday, June 17, 1988
7:30 P.M. Social 8:00 P.M. Meeting
Orlop Deck of the *Star of India*

Notes from the May Meeting - Tim Petitt

Roy Nilson showed examples of and described how to make some handy magazine holders for your bookshelf from scrap wood, cardboard and shelving paper. Simply cut scrap wood into strips approximately 1/4 inch thick and 2 inches wide. Using small brads and a little white glue make an "L" shape from two pieces of the wood such that the base and height of the "L" are slightly larger than the base and height of the magazine to be stored. Next attach rectangular cardboard side pieces to the wooden frame with white glue. One corner of the rectangle can be cut off to allow easy removal of the magazines. Now finish off the holder by applying an adhesive backed shelf paper. Color coded labels can also be used to identify the contents of the holder. If there is sufficient interest from the membership Roy has the capability of providing printed labels.

Mike Rivera shared several ideas on hull construction. One method uses a high density house insulation foam which is glued up in lifts, bread-and-butter fashion. The foam can then easily be shaped and glassed over. The form thus produced can be used as a mold master or used as a finished hull by either scooping out the foam from the inside or by disolving it with solvents. (Great care must be taken with this latter method. See safety hints below!) Another application of foam is to back fill a plank on frame hull. In this case the foam is a two part liquid that can be found at Standard Brands or other paint stores.

Mike also shared his technique for making brass and copper ships ventilators. For this Mike uses thin sheet stock which has been annealed - i.e. heated red hot and then allowed to cool slowly. The annealing will help prevent brittleness in the metal. The stock is then pounded into the proper shape using a ballpeen hammer or a large ball bearing. The ball, or other rounded shape forces the metal into a mating depression in a piece of wood or metal, or into the end of a metal tube or pipe. The resulting shape, part of a sphere, can then have a section of smaller diameter pipe soldered to it to form a ships ventilator. Mike said a short cut that he has found useful on occasion is to use the bowl end of a plastic toy pipe.

Hint of the Month Mike Rivera. Power switches can be disguised by concealing them under deck hardware. One example might be the installation of a set of bits over the slider of a deck mounted switch. Another is to install an actuator shaft to the bottom of a ventilator or some other piece of deck hardware such that when the object is pushed down to fit snug with the deck it actuates a switch within the hull.

A number of members mentioned difficulties, past and present, with items ordered from mail order businesses. Several members related stories of orders never having been received, particularly from overseas suppliers. No one had any guaranteed solutions for this problem. It appears to be basically a case of Caveat Emptor. The best bet is to deal with firms having established reputations if possible.

Bob Hanley reported that a total of $100 went into the clubs treasury as a result of the sale of the models donated by Chris Mathews. Again, thank you Chris!!

It was suggested that we have some sort of large cork board made up to hold pictures of Guild members or Guild events for display in the Maritime Museum and at some of our events, such as the Christmas party, the birthday party or at the regatta. Henry Wenc volunteered to built a nice wooden (Teak?) frame for this display, and everyone is invited to contribute photographs.

Doug McFarland donated a beautiful copy of the book "Architectura Navalis Merchantoria" to the Guild library. This book was originally written between 1765 and 1768 by Frederick K. Chapman and is beautifully illustrated with pictues of ships of the period.

Dan LePage provided a regatta update. Dan has sent out news releases to the local newspapers and obtained a number of nice gifts to be given away as door prizes. Anyone intereseted in doing model building demos for the spectators should contact Dan. Three judges from outside the club have been enlisted, but Dan still needs some help in judging from club members.

It was announced that there would be a major swap meet at the pond the day after the regatta. The Argonauts will be participating in conjunction with our joint picnic from 11:00 AM to 3:00 PM. Since some of our outr of town guests may not be staying over until Sunday, if you have something to swap you may want to bring it with you on Saturday as well.

It was recommended that on days when the pond is closed, members could gather at the museum to do volunteer work. Mike Rivera and Bob Crawford will provide additional details later. (See note later in this issue. - Ed.)

Safety Note: Always use protective equipment and wear protective clothing when working with paints or chemicals of any kind. This includes sanding of fibreglass, foam and even wood. Always work in a well ventilated area. Modern technology has provided us the opportunity to expose ourselves to some pretty nasty toxic materials. Be careful!

Museum Work Parties As was suggested at the last meeting, Bob Crawford will be assembling a list of tasks that would be apprporiate for club members to undertake on those weekends when the pond is closed. This could be a good way to not only help the museum, but to enjoy a little comradery with fellow club members. This issue will be discussed further at the next meeting.

Atlantis update Capt. Reuben Baker provided us with a fascinating inside account of the recent events surrounding the seizure of the research vessel *Atlantis* by the DEA under the new "Zero Tolerance" law. This is an example of how a single crew member with even a tiny amount of drugs in his possession can cause the seizure and possibly even the forfeiture of a $65 million research vessel. Fortunately, in the end cooler heads prevailed and the vessel was returned to its owners, the Woodshole Oceanographic Institute. Capt. Baker explained the frustration for him, in that a thorough search was in fact made of the vessel before entering port, but it is virtually impossible to insure that some crew member has not squirreled something away in some nook or cranny. Unfortunately, no matter how well the contraband may be hidden there is a very good possibility that a drug sniffing dog will find it, and under the law as it is currently being applied, the owner of the vessel can not avoid responsibility. Ironically, it would appear that the only way out of this dilemma is for the vessels owner or master to employ dogs also, and there are businesses being formed now to provide that service! As another point of interest, Capt. Baker mentioned that the *Atlantis* is registered as a private vessel. There are certain advantages to this, as opposed to being registered as a commercial vessel. One of these is that the captain need not make use of pilots, tugs or line handlers on the pier when he enters or leaves port. There are also certain tax advantages to this form of registration. But as recent events have indicated there are also drawbacks. A commercial vessel, such as a freighter or passenger ship can not be seized because drugs are smuggled onboard by a passenger or crew member, but a private vessel can!

Models displayed

Bill Kelly-Flemming

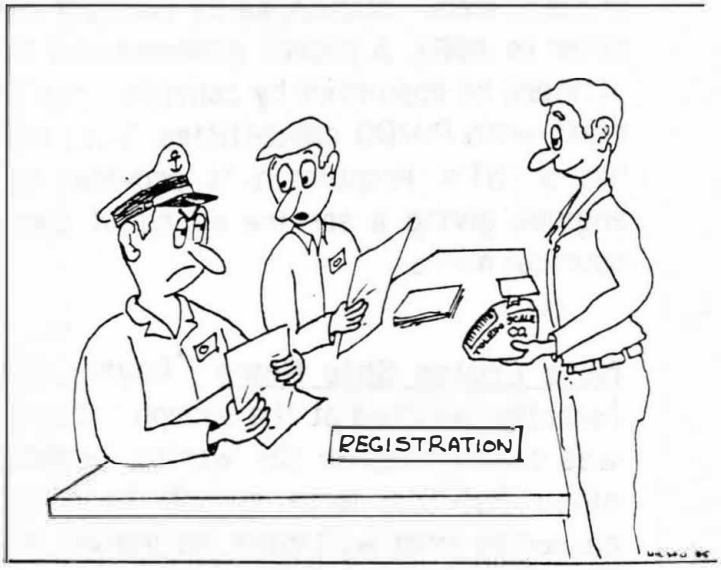
S.S. AzureSeas, scratch built for the staff captain of the ship. Now approx. 60% complete, Bill will have to complete this project in his new home port of Boston. Then comes the challenge of shipping a completed model across country!

San Diego pilot boat, scratch built.

Doug McFarland

Hotspur. Progressing nicely. More work having been completed on the rigging.

SHOW & TELL **by Nilson**



"HE WANTS TO ENTER THE SCALE EVENT"

Whats in a name?

The following names of boats have been observed in San Diego waters over the past six months.

Cirrhosis of the River
Sloop Along Placidly
Sailbad the Sinner
Myot
Pade IV
Knot Pade IV
In Hoc
Inhocuptohere
Tomato Sloop

Club Roster Along similar lines, it has been suggested that it might be handy to make up a new roster of members to include, amoung other things a list of special skills that each member may have - whether these are in connection with a job or profession, or whether they have been developed as a result of a particular interest not related to occupation. For example, we have members who are accomplished machinists, welders, electronics engineers, etc. Individuals with these skills could be in a unique position to provide advice or actual assistance not only to other club members, but possibly also to the museum. At some point during the months to come we will include in the newsletter a form to collect information for a new roster. Copies of the roster will be made available to all those who participate.

Golden Hinde The replica of Sir Francis Drakes gallion *Golden Hinde* will be visiting Southern California during May, June and July. Built in England in 1973, the replica has appeared in many films, including the TV special "Shogun". The ship visited San Francisco in 1975, but this will be its first time in Southern California. The tentative schedule is as shown below. The original *Golden Hinde* circumnavigated the world on a voyage of discovery and plunder from 1577 to 1580. Nothing remains of the original ship which rotted at her moorings more than 400 years ago. No Plans or blue prints were ever found. The replica was constructed on the basis of written discriptions and a few old Dutch and Flemish paintings, together with knowledge of the design and construction of ships of that era.

Schedule

Ventura	May 9 - 18
San Pedro	May 20 - June 30
Marina Del Ray	July 2 - 27

Say What?

The United States Army has taken delivery of the USAV (United States Army Vessel) *General Frank L. Besson* (LSV-1), the first of four 273-foot Logistics Support Vessels. The *Besson* is the first U.S. Army vessel ever to be commissioned. (There have been U.S. Army vessels previously, but none were commissioned. This was because previous Army vessels were commanded by warrant officers who were themselves not commissioned prior to 1987. A recent ammendment to the United States Code provides that warrant officers be appointed by commission.) The LSV-1 is the first of a new class of landing craft with RO/RO capabilities. With both bow and stern ramps they resemble the U.S. Navys LST's. Propulsion is provided by two General Motors EMD 16-1645-E2 diesel engines giving a service speed of approximately 12 knots and a range of over 5000 nautical miles.

More Cruise Ship News Royal Cruise Lines new 40,000 ton *Crown Odyssey* was recently launched at the Joseph L. Meyer Shipyard in Papenburg, West Germany. The ship was constructed in the worlds largest covered graving dock. (Imagine if you will, a single building large enough to completely contain a 40,000 ton ship!) The 1000 passenger liner will make her maiden voyage from London on June 7.

The following is a reprint of an article written for the newsletter in March of 1981.

Calculating Scale Speeds

Most of us who build operating scale model ships will sooner or later want to know if our model operates at the correct scale speed. For some this may become a matter of necessity, since accurate scale operation is frequently a criteria for judging at regattas. However it may not be readily apparent to everyone how scale speeds are calculated. It could be argued, and not without a certain logic, that if a model is built to 1/32 scale, then it should cover a distance which is 1/32 as great as the distance covered by the prototype in the same amount of time. This calculation would suggest that if a Fletcher Class Destroyer could cover 35 nautical miles in one hour, then a 1/32 scale model of the same ship should traverse 1.0938 nautical miles (35 divided by 32) in one hour. Despite the seeming logic of this solution, it would be found in practice that a model moving at this speed would behave in a most "un-scale-like" manner. In fact as we shall see, its scale speed would be a sluggish 6.19 knots. Not exactly the dashing image we would like to project!

To derive an accurate scale speed involves an application of Froude's Law of Comparitive Speeds. William Froude (1810-1879) was an English engineer and naval architect who founded the modern science by which the forces acting on ships are predicted from experiments with geometrically similar models. In the late 1800's it was widely held that tests with models could not be relied upon for predicting the performance of ships. Froude however advocated a more thorough investigation of the laws governing the extrapolation from models to full size ships, and was invited by the Admiralty to explain his proposals. This led in 1870 to a grant for the construction of a ship model testing tank which was the forerunner of the testing tanks now found in all maritime countries. Froude found that the chief components of resistance to motion were skin friction and wave formation, and he showed how the total resistance of a ship could be extrapolated from results of model experiments. His methods in all probability inspired pioneers in aerodynamics to adopt model testing and thus contributed to the rapid development of aircraft design.

Froude's many published papers were reprinted in one volume by the institute of Naval Architects in 1955. We shall draw on one of these papers to investigate his law of Comparative Speeds. The formula developed by Froude for the calculation of the scale speed of a model based on a known prototype can be stated as

$$\frac{V}{v} = \sqrt{\frac{L}{l}}$$

where "V" is the speed of the prototype in knots, "L" is its length in feet, "l" is the length of the model in feet and "v" is the actual speed of the model in knots which is required to give the model the scale equivilent of "V". As can be readily seen, the ratio of "L" to "l" is nothing more than the scale of the model. In other words, if we build a 1/8 inch equals 1 foot scale (or 1/96 scale) model of a 750 foot long cruiser, the model will be 7.8125 feet in length. Therefore "L" = 750 feet and "l" = 7.8125 feet, and the ratio of L/l is 750/7.8125 or 96. We shall call 96 the Scale Factor, "S". Now if we rearrange Froude's

formula we will find that by dividing the speed of the prototype by the square root of the scale factor of the model we can determine the appropriate scale speed. This more useful form of Froude's equation is

$$v = \frac{V}{\sqrt{S}}$$

In the case of our example, if our cruiser has a top speed of 32 knots, then the actual speed of our model, in order to be "in scale" should be

$$v = \frac{32}{\sqrt{96}}$$ or 3.27 knots.

Although this is an accurate figure for the models scale speed, the equation is still not expressed in the most useful form for our purposes. I suspect that very few of us determine in advance exactly what the true speed of our model should be in order to be in scale, and then engineer our model in such a way that it actually moves through the water at exactly that speed. The more common practice is to build the model then see how fast it will go! Once we know how fast it will go we can then make modifications to either speed it up or slow it down. Therefore what we need is a form of the equation that will allow us to measure the actual speed of the model and from this calculate the scale speed. All that is needed to use Froudes equation in this case is the introduction of some units of measurement and the rearrangement of the equation to solve it for a different variable. First let us assume that we establish a straight course which is exactly 100 feet in length. We will want to make two runs over this course, one in each direction, averaging the times in order to eliminate the extraneous effects of wind and current.
Since our course is only 100 feet long we will want to work initially in units of feet per second rather than nautical miles per hour, converting later to knots to slove the equation. One nautical mile is defined as 1/60 of a degree, which is approximately equal to 6076 feet. Since there are 3600 seconds in an hour, one knot is equivilent to 6076/3600 or 1.6878 feet per second. Let us say that we run our course and find that the average time for the two runs is 30.00 seconds. What is our scale speed? Since we covered the 100 feet in 30.00 seconds our velocity is 100/30.00 or 3.3333 feet per second. We know that a knot is equal to 1.6878 feet per second, so our actaul speed through the water is 3.3333/1.6778 or 1.9750 knots. We now have v=1.9750 and S=96 (because our cruiser is 1/96 scale) so all we have to do is solve the equation for V. First we rearrange the equation from

$$v = \frac{V}{\sqrt{S}}$$

to $$V = (v)(\sqrt{S})$$

or $$V = (1.97498)(\sqrt{96})$$

and $$V = (1.97498)(9.79796) = 19.35 \text{ knots}$$

Not happy with that performance we go to work on our model to increase its speed, and on our second set of trials the average time is less than half the original clocking, 14.00 seconds! This is 100/14.00 or 7.14 feet per second, or 7.14/1.69 = 4.22 actual knots. The new scale speed is

$$V=(4.22)(9.80) = 41.3 \text{ knots}$$

Enough to set "Bull" Halseys jowls a-quiver!

We now have the tools we need to determine the scale speed of any model. However making the calculations can be a bit tedious, even with a calculator having a square root function. This is particularly true if we are officiating at a regatta where there are a lot of different scales involved. It would be nice if there were an easier faster method, and in fact there is! Taking advantage of a computers speed in doing this type of calculation I wrote a program which produced the following easy reference chart. It lists scale speeds from 0.5 to 45 knots in increments of half a knot, for ten of the most popular scales. The chart is based on average times over a 100 foot course. To use the chart simply locate the scale of your model across the top, then move down the column until you find the time which is closest to your actual time. Now move across the page either right or left and read your scale speed on the margin.

Let us return now to the example sited at the beginning of this article. We said that if we assumed our 1/32 scale Fletcher Class Destroyer covered 1/32 as much distance as its full sized prototype in the same amount of time, it would have to travel at an actual speed of 1.0938 knots. We can put these figures into our equation to show that

$$V = (v)(\sqrt{S})$$

$$V = (1.09375)(\sqrt{32})$$

$$V = (1.09375)(5.65685) = 6.187 \text{ knots}$$

thereby verifying that this is not an accurate method of determining scale speeds.

We can also verify this fact using our chart. If our actual speed is 1.0938 knots and we know that one knot is equal to 1.68778 feet per second, we can find our velocity, which is (1.09938)(1.6878) = 1.8460 feet per second. To find how long it would take to cover our 100 foot course at this velocity we simply divide 100 feet by 1.8460 feet per second to get 54.17 seconds. On our chart we find under 1/32 scale that the time closest to our actual time is 55.86 seconds, corresponding to a scale speed of 6.0 knots. This is as close as we can get using the chart, but the error is only 0.19 knots! In fact, using the chart will result in a maximum error of 1/4 knot for all speeds up to 45.0 knots.

It is hoped that the information provided here will be useful to the serious modeler in establishing realistic speeds for his or her operating models. Too often the otherwise impressive appearance of a well constructed model is diminished by its failure to operate at scale speeds. It detracts greatly from a model of a 20 knot prototype to see it charging across the pond at a scale 90 knots!

Doug Smay
March 10, 1981

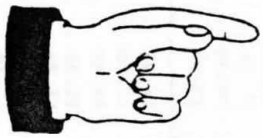
SCALE SPEED CONVERSION TABLE
(CALIBRATED OVER A 100 FOOT COURSE)

SCALE	1/200	1/16 1/192	1/100	1/8 1/96	1/4 1/48	3/8 1/32	1/2 1/24	3/4 1/16	1 1/12	2 1/6	(INCHES / FOOT) (FRACTIONAL)
KNOTS	MIN SEC	MIN SEC	MIN SEC	MIN SEC	MIN SEC	MIN SEC	MIN SEC	MIN SEC	MIN SEC	MIN SEC	KNOTS
23.0	36.43	35.70	25.76	25.24	17.85	14.57	12.62	10.30	8.92	6.31	23.0
23.5	35.66	34.94	25.21	24.70	17.47	14.26	12.35	10.09	8.73	6.18	23.5
24.0	34.91	34.21	24.69	24.19	17.10	13.97	12.09	9.87	8.55	6.05	24.0
24.5	34.20	33.51	24.18	23.69	16.75	13.68	11.85	9.67	8.38	5.92	24.5
25.0	33.52	32.84	23.70	23.22	16.42	13.41	11.61	9.48	8.21	5.81	25.0
25.5	32.86	32.20	23.24	22.77	16.10	13.14	11.38	9.29	8.05	5.69	25.5
26.0	32.23	31.58	22.79	22.33	15.79	12.89	11.16	9.12	7.89	5.58	26.0
26.5	31.62	30.98	22.36	21.91	15.49	12.65	10.95	8.94	7.75	5.48	26.5
27.0	31.03	30.41	21.94	21.50	15.20	12.41	10.75	8.78	7.60	5.38	27.0
27.5	30.47	29.85	21.55	21.11	14.93	12.19	10.55	8.62	7.46	5.28	27.5
28.0	29.93	29.32	21.16	20.73	14.66	11.97	10.37	8.46	7.33	5.18	28.0
28.5	29.40	28.81	20.79	20.37	14.40	11.76	10.18	8.32	7.20	5.09	28.5
29.0	28.89	28.31	20.43	20.02	14.15	11.56	10.01	8.17	7.08	5.00	29.0
29.5	28.40	27.83	20.08	19.68	13.92	11.36	9.84	8.03	6.96	4.92	29.5
30.0	27.93	27.37	19.75	19.35	13.68	11.17	9.68	7.90	6.84	4.84	30.0
30.5	27.47	26.92	19.43	19.03	13.46	10.99	9.52	7.77	6.73	4.76	30.5
31.0	27.03	26.48	19.11	18.73	13.24	10.81	9.36	7.65	6.62	4.68	31.0
31.5	26.60	26.06	18.81	18.43	13.03	10.64	9.21	7.52	6.52	4.61	31.5
32.0	26.18	25.66	18.52	18.14	12.83	10.47	9.07	7.41	6.41	4.54	32.0
32.5	25.78	25.26	18.23	17.86	12.63	10.31	8.93	7.29	6.32	4.47	32.5
33.0	25.39	24.88	17.95	17.59	12.44	10.16	8.80	7.18	6.22	4.40	33.0
33.5	25.01	24.51	17.69	17.33	12.25	10.00	8.66	7.07	6.13	4.33	33.5
34.0	24.64	24.15	17.43	17.07	12.07	9.86	8.54	6.97	6.04	4.27	34.0
34.5	24.29	23.80	17.17	16.83	11.90	9.71	8.41	6.87	5.95	4.21	34.5
35.0	23.94	23.46	16.93	16.59	11.73	9.58	8.29	6.77	5.86	4.15	35.0
35.5	23.60	23.13	16.69	16.35	11.56	9.44	8.18	6.68	5.78	4.09	35.5
36.0	23.28	22.81	16.46	16.13	11.40	9.31	8.06	6.58	5.70	4.03	36.0
36.5	22.96	22.49	16.23	15.90	11.25	9.18	7.95	6.49	5.62	3.98	36.5
37.0	22.65	22.19	16.01	15.69	11.09	9.06	7.84	6.41	5.55	3.92	37.0
37.5	22.34	21.89	15.80	15.48	10.95	8.94	7.74	6.32	5.47	3.87	37.5
38.0	22.05	21.60	15.59	15.28	10.80	8.82	7.64	6.24	5.40	3.82	38.0
38.5	21.76	21.32	15.39	15.08	10.66	8.71	7.54	6.16	5.33	3.77	38.5
39.0	21.48	21.05	15.19	14.89	10.53	8.59	7.44	6.08	5.26	3.72	39.0
39.5	21.21	20.78	15.00	14.70	10.39	8.49	7.35	6.00	5.20	3.67	39.5
40.0	20.95	20.52	14.81	14.51	10.26	8.38	7.26	5.92	5.13	3.63	40.0
40.5	20.69	20.27	14.63	14.33	10.14	8.28	7.17	5.85	5.07	3.58	40.5
41.0	20.44	20.02	14.45	14.16	10.01	8.17	7.08	5.78	5.01	3.54	41.0
41.5	20.19	19.78	14.28	13.99	9.89	8.08	6.99	5.71	4.95	3.50	41.5
42.0	19.95	19.55	14.11	13.82	9.77	7.98	6.91	5.64	4.89	3.46	42.0
42.5	19.72	19.32	13.94	13.66	9.66	7.89	6.83	5.58	4.83	3.41	42.5
43.0	19.49	19.09	13.78	13.50	9.55	7.79	6.75	5.51	4.77	3.38	43.0
43.5	19.26	18.87	13.62	13.35	9.44	7.70	6.67	5.45	4.72	3.34	43.5
44.0	19.04	18.66	13.47	13.19	9.33	7.62	6.60	5.39	4.66	3.30	44.0
44.5	18.83	18.45	13.31	13.05	9.22	7.53	6.52	5.33	4.61	3.26	44.5
45.0	18.62	18.24	13.17	12.90	9.12	7.45	6.45	5.27	4.56	3.23	45.0

SCALE SPEED CONVERSION TABLE
(CALIBRATED OVER A 1 FOOT COURSE)

SCALE	1/200	1/16 1/192	1/100	1/8 1/96	1/4 1/48	3/8 1/32	1/2 1/24	3/4 1/16	1 1/12	2 1/6	(INCHES/FOOT) (FRACTIONAL)
KNOTS	MIN SEC	MIN SEC	MIN SEC	MIN SEC	MIN SEC	MIN SEC	MIN SEC	MIN SEC	MIN SEC	MIN SEC	KNOTS
0.5	27 55.83	27 21.97	19 44.99	19 21.05	13 40.99	11 10.33	9 40.52	7 54.00	6 50.49	4 50.26	0.5
1.0	13 57.91	13 40.99	9 52.50	9 40.52	6 50.49	5 35.17	4 50.26	3 57.00	3 25.25	2 25.13	1.0
1.5	9 18.61	9 7.32	6 35.00	6 27.02	4 33.66	3 43.44	3 13.51	2 38.00	2 16.83	1 36.75	1.5
2.0	6 58.96	6 50.49	4 56.25	4 50.26	3 25.25	2 47.58	2 25.13	1 58.50	1 42.62	1 12.57	2.0
2.5	5 35.17	5 28.39	3 57.00	3 52.21	2 44.20	2 14.07	1 56.10	1 34.80	1 22.10	58.05	2.5
3.0	4 39.30	4 33.66	3 17.50	3 13.51	2 16.83	1 51.72	1 36.75	1 19.00	1 8.42	48.38	3.0
3.5	3 59.40	3 54.57	2 49.28	2 45.86	1 57.28	1 35.76	1 22.93	1 7.71	58.64	41.47	3.5
4.0	3 29.48	3 25.25	2 28.12	2 25.13	1 42.62	1 23.79	1 12.57	59.25	51.31	36.28	4.0
4.5	3 6.20	3 2.44	2 11.67	2 9.01	1 31.22	1 14.48	1 4.50	52.67	45.61	32.25	4.5
5.0	2 47.58	2 44.20	1 58.50	1 56.10	1 22.10	1 7.03	58.05	47.40	41.05	29.03	5.0
5.5	2 32.35	2 29.27	1 47.73	1 45.55	1 14.64	1 0.94	52.77	43.09	37.32	26.39	5.5
6.0	2 19.65	2 16.83	1 38.75	1 36.75	1 8.42	55.86	48.38	39.50	34.21	24.19	6.0
6.5	2 8.91	2 6.31	1 31.15	1 29.31	1 3.15	51.56	44.66	36.46	31.58	22.33	6.5
7.0	1 59.70	1 57.28	1 24.64	1 22.93	58.64	47.88	41.47	33.86	29.32	20.73	7.0
7.5	1 51.72	1 49.46	1 19.00	1 17.40	54.73	44.69	38.70	31.60	27.37	19.35	7.5
8.0	1 44.74	1 42.62	1 14.06	1 12.57	51.31	41.90	36.28	29.62	25.66	18.14	8.0
8.5	1 38.58	1 36.59	1 9.71	1 8.30	48.29	39.43	34.15	27.88	24.15	17.07	8.5
9.0	1 33.10	1 31.22	1 5.83	1 4.50	45.61	37.24	32.25	26.33	22.81	16.13	9.0
9.5	1 28.20	1 26.42	1 2.37	1 1.11	43.21	35.28	30.55	24.95	21.60	15.28	9.5
10.0	1 23.79	1 22.10	59.25	58.05	41.05	33.52	29.03	23.70	20.52	14.51	10.0
10.5	1 19.80	1 18.19	56.43	55.29	39.09	31.92	27.64	22.57	19.55	13.82	10.5
11.0	1 16.17	1 14.64	53.86	52.77	37.32	30.47	26.39	21.55	18.66	13.19	11.0
11.5	1 12.86	1 11.39	51.52	50.48	35.70	29.14	25.24	20.61	17.85	12.62	11.5
12.0	1 9.83	1 8.42	49.37	48.38	34.21	27.93	24.19	19.75	17.10	12.09	12.0
12.5	1 7.03	1 5.68	47.40	46.44	32.84	26.81	23.22	18.96	16.42	11.61	12.5
13.0	1 4.45	1 3.15	45.58	44.66	31.58	25.78	22.33	18.23	15.79	11.16	13.0
13.5	1 2.07	1 0.81	43.89	43.00	30.41	24.83	21.50	17.56	15.20	10.75	13.5
14.0	59.85	58.64	42.32	41.47	29.32	23.94	20.73	16.93	14.66	10.37	14.0
14.5	57.79	56.62	40.86	40.04	28.31	23.11	20.02	16.34	14.15	10.01	14.5
15.0	55.86	54.73	39.50	38.70	27.37	22.34	19.35	15.80	13.68	9.68	15.0
15.5	54.06	52.97	38.23	37.45	26.48	21.62	18.73	15.29	13.24	9.36	15.5
16.0	52.37	51.31	37.03	36.28	25.66	20.95	18.14	14.81	12.83	9.07	16.0
16.5	50.78	49.76	35.91	35.18	24.88	20.31	17.59	14.36	12.44	8.80	16.5
17.0	49.29	48.29	34.85	34.15	24.15	19.72	17.07	13.94	12.07	8.54	17.0
17.5	47.88	46.91	33.86	33.17	23.46	19.15	16.59	13.54	11.73	8.29	17.5
18.0	46.55	45.61	32.92	32.25	22.81	18.62	16.13	13.17	11.40	8.06	18.0
18.5	45.29	44.38	32.03	31.38	22.19	18.12	15.69	12.81	11.09	7.84	18.5
19.0	44.10	43.21	31.18	30.55	21.60	17.64	15.28	12.47	10.80	7.64	19.0
19.5	42.97	42.10	30.38	29.77	21.05	17.19	14.89	12.15	10.53	7.44	19.5
20.0	41.90	41.05	29.62	29.03	20.52	16.76	14.51	11.85	10.26	7.26	20.0
20.5	40.87	40.05	28.90	28.32	20.02	16.35	14.16	11.56	10.01	7.08	20.5
21.0	39.90	39.09	28.21	27.64	19.55	15.96	13.82	11.29	9.77	6.91	21.0
21.5	38.97	38.19	27.56	27.00	19.09	15.59	13.50	11.02	9.55	6.75	21.5
22.0	38.09	37.32	26.93	26.39	18.66	15.23	13.19	10.77	9.33	6.60	22.0
22.5	37.24	36.49	26.33	25.80	18.24	14.90	12.90	10.53	9.12	6.45	22.5

San Diego Ship Modelers Guild
Doug Smay, Editor
/redacted/



San Diego Ship Modelers Guild
Officers for 1988

Master	**Mike Rivera** /redacted/
Mate	**Roger Smith**
Purser	**Bob Hanley** /redacted/
Logkeeper	**Tim Pettit** /redacted/
Newsletter Editor	**Doug Smay** /redacted/
Steering Committee	**Norm Hiatt** /redacted/
	Doug McFarland /redacted/
	Roy Nilson /redacted/
	Fred Fraas /redacted/

Schedule of Activities

Meetings - Third Friday of the month 7:30 PM social, 8:00 PM meeting

Static Workshops - Every other Tues. 7:00 to 9:00 PM aboard the ferry Berkeley

R/C Operations - Saturday mornings Model Yacht Pond

Annual Regatta - Third weekend in June

Membership

Dues are $10 annually, $5 after July

We strongly encourage all to joint the San Diego Maritime Museum as an expression of appreciation for the facilities they provide us.