



# San Diego Ship Modelers' Guild

1306 N. Harbor Drive

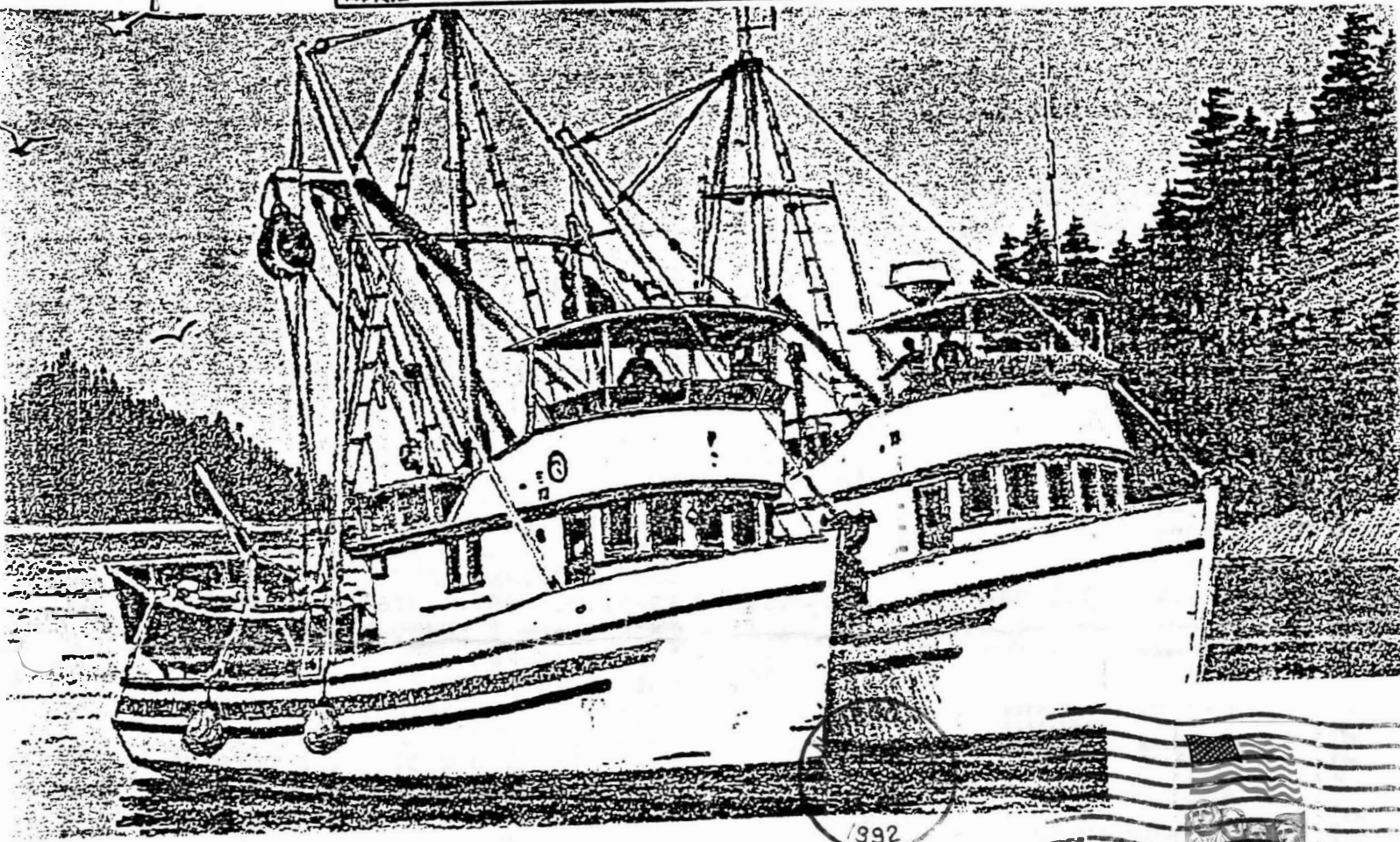
San Diego, CA 92101

APRIL

VOL. 16

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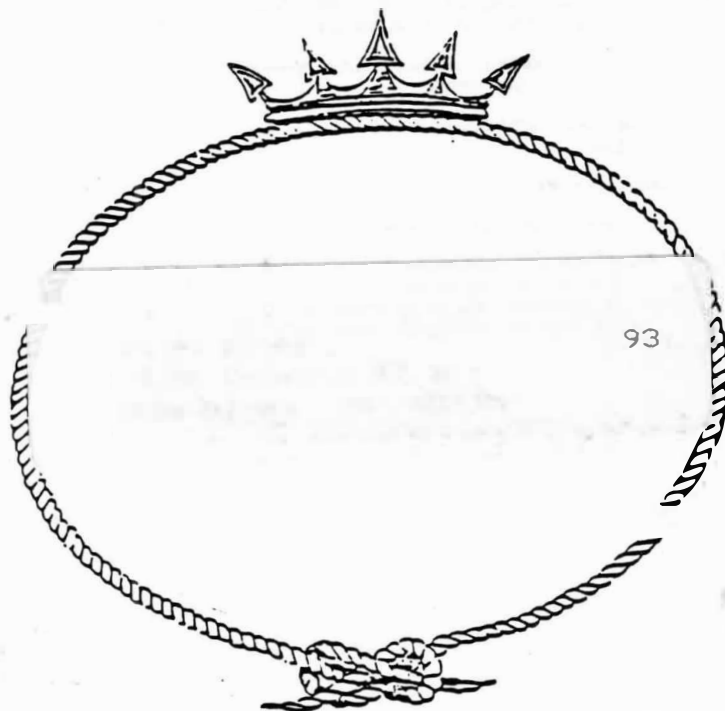


## April

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5	6	7	8	9	10	11
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26	27	28	29	30		

## April

4 GUILD RY SAIL PTV PRACTICE  
 5 POWER RY SAIL POINTS PM  
 11 GUILD RY SAIL PTV PRACTICE  
 12 POWER PRACTICE  
 18 GUILD RY SAIL PTV PRACTICE  
 19 POWER PRACTICE  
 23 09:00 SPRING SAIL REGATTA SB & USIA  
 26 09:00 SPRING SAIL REGATTA SB & USIA





IT NEVER SEIZES TO AMAZE ME, WHEN EVER WE MAKE A PURCHASE THAT REQUIRES ASSEMBLY OR SOME SORT OF USE INSTRUCTIONS, NO MATTER HOW MANY TIMES WE READ THE BOOKLETS, PAMPHLETS OR WHATEVER THE MANUFACTURES SUPPLIES US WITH, TO FACILITATE OUR END OF THE SO CALLED BARGAIN---YOU KNOW YOUR GOING TO BE IN FOR A SUPER CHALLENGE----TAKE FOR EXAMPLE YOUR VCR--- WITH SPECIAL ATTENTION TO THE DARN CLOCK!!! THE SAME THING HAS HAPPEN WITH MANY MODEL SHIP KIT INSTRUCTIONS, AND TO THE TOPIC AT HAND, HAVE YOU EVER HAD A NEED TO READ UP ON SILVER SOLDERING---WHAT IS THIS MUCK??? WHEN I TRY IT I FRY WHAT EVER I PUT THE TORCH TO. BUT NOW WHEN YOU HAVE SOMEONE SAY LIKE; PHIL MATTSON, WHO BRINGS ALL HIS INSTRUMENT OF CREATION AND SHOWS YOU BIT BY BIT HOW IT IS DONE, AND ANSWERS YOUR INQUIRES, AND PUTS YOUR FEARS TO REST, THIS IS ANOTHER THING ---- I FOUND MYSELF LISTENING TO PHIL'S DEMONSTRATION AND ALL OF THE SUDDEN POW!! IT HITS LIKE A TON OF BRICKS. PHIL WAS FILLING IN THE BLANK SPACE THAT THE IDIOT WHO WROTE MY SOLDERING TORCH INSTRUCTIONS LEFT OUT -AND I BELIEVE WE HAVE IT ON TAPE, YOU SEE I CHOOSE TO STAY IN THE BACK GROUND AND CHECK THE NEW TAPE EXPERIMENT I TRULY BELIEVE IT TO BE A NEW MEDIUM FOR COLLECTING INFORMATION THANK YOU PHIL

FOR THE LAST TWO MEETINGS WE'VE BEEN HAVING A FULL HOUSE ON MEETING NIGHT. WITH LOTS OF MODEL BOATS AND STUFF FOR SHOW AND TELL, AT THE LAST MONTH'S MEETING THE FOLLOWING MEMBERS BROUGHT MODELS:

MIKE RIVERA  
VACUUM FORM MARINA R/C  
NORM HIATT  
MERRIMACK CSS VIRGINA  
ROYCE PRIVETT  
BLUE NOSE STATIC  
DANIEL M. LE PAGE  
USS GEORGE PHILIP

**PRESIDENT**  
BOB CRAWFORD /redacted/  
**VICE PRESIDENT**  
BOB WRIGHT

**TREASURER**  
ED WHITE

**EDITOR**  
MIKE RIVERA /redacted/  
**COMMITTEE**

BOB WRIGHT /ICdGICd/  
ED WHITE /ICdGICd/  
JIM HARRIS /ICdGICd/  
BOB O'BRIEN /ICdGICd/

**SCHEDULE OF ACTIVITIES:**

BUILD MEETING THIRD THURSDAY OF MONTH. 7:00 P.M. SOCIAL  
7:30 P.M. MEETING

STATIC WORKSHOP - EVERY OTHER TUESDAY 7:00 P.M. TO 9:00 P.M. ABOARD THE PERRY SEABELEY.

R/C OPERATION- SATURDAY MORNINGS  
MODEL YACHT POND

ANNUAL REGATTA- THIRD WEEKEND JUNE.

**MEMBERSHIP:**

DUES ARE \$15.00 ANNUALLY

WE STRONGLY ENCOURAGE ALL TO JOIN SAN DIEGO MARITIME MUSEUM AS AN EXPRESSION OF APPRECIATION FOR THE FACILITIES THEY PROVIDE US.

WALTER E. BRIESE  
 USS VINCENNES, USS J.P.JONES  
 DAVID M. MANLEY  
 USS SAN DIEGO/USS ALABAMA  
 MEGAN N. LINI  
 UNSPECIFIED AS OF YET,CARGO  
 SHIP  
 DAVID J. ARMBRUSTER  
 DUMAS 1930 CHRIS CRAFT  
 RUNNABOUT  
 GORDON JONES  
 DREAMIN',AS USUAL!!!  
 ED WHITE  
 DORY , AGAIN?  
 EARL A. KRALOVIC  
 BUILDING A 9CYL.  
 AIRCRAFT RADIAL ENGINE  
 BOB CORNELL  
 MEDLEY (SCHOONER) R/C  
 DOUG MCFARLAND  
 ATLANTIS STERN CABIN  
 JOHN F. FLUCK  
 BILLINGS KIT STATEN YACHT  
 PHIL MATTSON  
 USS BENNINGTON/ SILVER  
 SOLDER DEMONSTRATION  
 BOB WRIGHT  
 SAILOR BUILT MODEL  
 (UNKNOWN)

I LIKE TO THANK ALL OF THOSE  
 WHO PARTICIPATED IN SHOWING  
 WHAT YOU ARE UP TO.....SO FAR  
 NOT TWO OF THE SAME MODELS AT  
 THE MEETING NIGHT---SO FAR SO  
 GOOD.

PAT EDWARD VISITED US AT THE  
 LAST MEETING AND EXTENDED HIS  
 INVITATION FOR THE GUILD TO  
 PARTICIPATE AT THE DEL MAR FAIR  
 THIS SUMMER IN R/C & STATIC  
 DISPLAY---WE EXPRESS OUR INTEREST  
 AND OUR CONCERNS AND PAT WAS  
 ABLE TO ANSWER ALL OUR QUESTIONS.  
 SO IF YOU ARE INTERESTED IN  
 PUTTING SOMETHING TOGETHER  
 LET US KNOW. TIME IS RUNNING  
 OUT FAST.....SEE DESIGN IN  
 WOOD PAMPHLET.

IN SEPTEMBER THE MARITIME MUSEUM  
 WILL BEGIN DOCENT TRAINING -  
 -AS YOU WELL KNOW THIS PEOPLE  
 ARE VOLUNTEERS AND THEIR VALUABLE  
 HELP KEEP'S THE MARITIME MUSEUM  
 AND ITS HISTORY IN THE PUBLIC  
 EYE.... IF YOU HAVE AN INTEREST  
 IN BECOMING A DOCENT AND LIKE  
 TO MEET LOTS OF PEOPLE FROM

LOTS OF PLACES CONTACT THE SAN  
 DIEGO MARITIME MUSEUM THESE  
 CLASSES WILL LAST 10 WEEKS AND  
 THEY WILL TAKE PLACE ON TUESDAY  
 AT 10:00 A.M.....

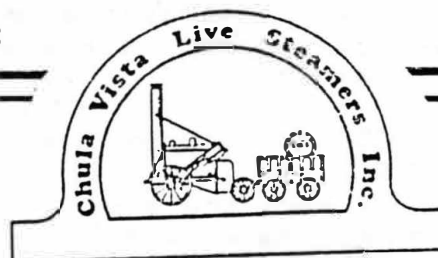
MODELER OF THE QUARTER IS BEING  
 DISCUSSED WE WOULD LIKE YOUR  
 INPUT IF YOU WISH TO PARTICIPATE.

GREAT ART OF SAIL---IS A MUST,  
 DON'T MISS THIS OPPORTUNITY  
 TO SEE THESE BEAUTIFUL PAINTINGS  
 AND MODELS....

IF YOU ARE LOOKING FOR THAT  
 SPECIAL STUFF THAT ONLY YOU  
 KNOW, BUT YOU CAN'T DESCRIBE  
 IT--BUT YOU KNOW IS OUT THERE--  
 - EARL KRALOVIC WHO IS BUILDING  
 A MODEL 9 CYLINDER RADIAL AIRCRAFT  
 ENGINE---THAT'S ANOTHER STORY--  
 -EARL TELL'S ME THAT K-SURPLUS  
 SALES, 1403 CLEVELAND AVE, NATIONAL  
 CITY, PHONE 474-6177, HAS A  
 LOT OF GOOD STUFF, OF COURSE  
 YOU MUST USE YOUR HIGHLY TRAINED,  
 FINELY DISCRIMINATING--WARP  
 MODEL MAKER'S EYE.

THANKS, EARL

MIKE



## CHULA VISTA LIVE STEAMERS



1992

Welcome to the exciting world of live steam railroading.  
 The Chula Vista Live Steamers is a non-profit educa-  
 tional organization interested in building and safely  
 operating scale model equipment.

Location: Reh Park  
 4548 Sweetwater Road  
 Chula Vista, California

January	February	March
S M T W T F S	S M T W T F S	S M T W T F S
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

JANUARY	FEBRUARY	MARCH
1 MONDAY 2 TUESDAY 3 WEDNESDAY 4 THURSDAY 5 FRIDAY 6 SATURDAY 7 SUNDAY 8 MONDAY 9 TUESDAY 10 WEDNESDAY 11 THURSDAY 12 FRIDAY 13 SATURDAY 14 SUNDAY 15 MONDAY 16 TUESDAY 17 WEDNESDAY 18 THURSDAY 19 FRIDAY 20 SATURDAY 21 SUNDAY 22 MONDAY 23 TUESDAY 24 WEDNESDAY 25 THURSDAY 26 FRIDAY 27 SATURDAY 28 SUNDAY 29 MONDAY 30 TUESDAY 31 WEDNESDAY	1 THURSDAY 2 FRIDAY 3 SATURDAY 4 SUNDAY 5 MONDAY 6 TUESDAY 7 WEDNESDAY 8 THURSDAY 9 FRIDAY 10 SATURDAY 11 SUNDAY 12 MONDAY 13 TUESDAY 14 WEDNESDAY 15 THURSDAY 16 FRIDAY 17 SATURDAY 18 SUNDAY 19 MONDAY 20 TUESDAY 21 WEDNESDAY 22 THURSDAY 23 FRIDAY 24 SATURDAY 25 SUNDAY 26 MONDAY 27 TUESDAY 28 WEDNESDAY 29 THURSDAY 30 FRIDAY	1 MONDAY 2 TUESDAY 3 WEDNESDAY 4 THURSDAY 5 FRIDAY 6 SATURDAY 7 SUNDAY 8 MONDAY 9 TUESDAY 10 WEDNESDAY 11 THURSDAY 12 FRIDAY 13 SATURDAY 14 SUNDAY 15 MONDAY 16 TUESDAY 17 WEDNESDAY 18 THURSDAY 19 FRIDAY 20 SATURDAY 21 SUNDAY 22 MONDAY 23 TUESDAY 24 WEDNESDAY 25 THURSDAY 26 FRIDAY 27 SATURDAY 28 SUNDAY 29 MONDAY 30 TUESDAY 31 WEDNESDAY

April	May	June
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APRIL	MAY	JUNE
1 MONDAY 2 TUESDAY 3 WEDNESDAY 4 THURSDAY 5 FRIDAY 6 SATURDAY 7 SUNDAY 8 MONDAY 9 TUESDAY 10 WEDNESDAY 11 THURSDAY 12 FRIDAY 13 SATURDAY 14 SUNDAY 15 MONDAY 16 TUESDAY 17 WEDNESDAY 18 THURSDAY 19 FRIDAY 20 SATURDAY 21 SUNDAY 22 MONDAY 23 TUESDAY 24 WEDNESDAY 25 THURSDAY 26 FRIDAY 27 SATURDAY 28 SUNDAY 29 MONDAY 30 TUESDAY 31 WEDNESDAY	1 THURSDAY 2 FRIDAY 3 SATURDAY 4 SUNDAY 5 MONDAY 6 TUESDAY 7 WEDNESDAY 8 THURSDAY 9 FRIDAY 10 SATURDAY 11 SUNDAY 12 MONDAY 13 TUESDAY 14 WEDNESDAY 15 THURSDAY 16 FRIDAY 17 SATURDAY 18 SUNDAY 19 MONDAY 20 TUESDAY 21 WEDNESDAY 22 THURSDAY 23 FRIDAY 24 SATURDAY 25 SUNDAY 26 MONDAY 27 TUESDAY 28 WEDNESDAY 29 THURSDAY 30 FRIDAY 31 SATURDAY	1 MONDAY 2 TUESDAY 3 WEDNESDAY 4 THURSDAY 5 FRIDAY 6 SATURDAY 7 SUNDAY 8 MONDAY 9 TUESDAY 10 WEDNESDAY 11 THURSDAY 12 FRIDAY 13 SATURDAY 14 SUNDAY 15 MONDAY 16 TUESDAY 17 WEDNESDAY 18 THURSDAY 19 FRIDAY 20 SATURDAY 21 SUNDAY 22 MONDAY 23 TUESDAY 24 WEDNESDAY 25 THURSDAY 26 FRIDAY 27 SATURDAY 28 SUNDAY 29 MONDAY 30 TUESDAY 31 WEDNESDAY

July	August	September
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JULY	AUGUST	SEPTEMBER
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October	November	December
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OCTOBER	NOVEMBER	DECEMBER
1 MONDAY 2 TUESDAY 3 WEDNESDAY 4 THURSDAY 5 FRIDAY 6 SATURDAY 7 SUNDAY 8 MONDAY 9 TUESDAY 10 WEDNESDAY 11 THURSDAY 12 FRIDAY 13 SATURDAY 14 SUNDAY 15 MONDAY 16 TUESDAY 17 WEDNESDAY 18 THURSDAY 19 FRIDAY 20 SATURDAY 21 SUNDAY 22 MONDAY 23 TUESDAY 24 WEDNESDAY 25 THURSDAY 26 FRIDAY 27 SATURDAY 28 SUNDAY 29 MONDAY 30 TUESDAY 31 WEDNESDAY	1 THURSDAY 2 FRIDAY 3 SATURDAY 4 SUNDAY 5 MONDAY 6 TUESDAY 7 WEDNESDAY 8 THURSDAY 9 FRIDAY 10 SATURDAY 11 SUNDAY 12 MONDAY 13 TUESDAY 14 WEDNESDAY 15 THURSDAY 16 FRIDAY 17 SATURDAY 18 SUNDAY 19 MONDAY 20 TUESDAY 21 WEDNESDAY 22 THURSDAY 23 FRIDAY 24 SATURDAY 25 SUNDAY 26 MONDAY 27 TUESDAY 28 WEDNESDAY 29 THURSDAY 30 FRIDAY	1 MONDAY 2 TUESDAY 3 WEDNESDAY 4 THURSDAY 5 FRIDAY 6 SATURDAY 7 SUNDAY 8 MONDAY 9 TUESDAY 10 WEDNESDAY 11 THURSDAY 12 FRIDAY 13 SATURDAY 14 SUNDAY 15 MONDAY 16 TUESDAY 17 WEDNESDAY 18 THURSDAY 19 FRIDAY 20 SATURDAY 21 SUNDAY 22 MONDAY 23 TUESDAY 24 WEDNESDAY 25 THURSDAY 26 FRIDAY 27 SATURDAY 28 SUNDAY 29 MONDAY 30 TUESDAY 31 WEDNESDAY



## GUIDE FOR CONTEST JUDGING

### 1. LEVEL OF DIFFICULTY:

Consider how much work and what level of skill was required. For instance;

- A. Is the model scratch-built, or extensively modified kit,
  - or a stock kit?
- B. How small is the scale of the model?
- C. How difficult to work are the materials employed?
- D. To what extent has the modeler portrayed a vessel (riggings, sails, full armament, small gear, fittings, etc)?
- E. Are special effects, such as simulating a weathered or worn diorama used?

### 2. ACCURACY AND UNIFORMITY OF SCALE:

Is the same scale maintained through the model? That is, does every part have the proper dimensions in relative proportion to every other part? The larger the scale, the more precise the model should be.

### 3. EXTENT OF DETAILING:

Are numerous fine details (in relation to the scale) included in the model? Consider such items as painted detail, scarfs, planking butts, fastenings, knows, splices, servings, etc., in addition to fittings and gear.

### 4. NEATNESS AND CRAFTSMANSHIP:

Consider such possibilities as the following;

- A. Are the surfaces of Parts finished to a degree appropriate and convincing for the item represented?
- B. Has excess glue been allowed to remain on the model around the joints?
- C. Are edges and joints even and snug? Corners square?
- D. Are hull lines well fared?
- E. Are parts positioned correctly (parallel), masts straight and in alignment, etc.? Properly sized?
- F. Is rigging taut? In proportion to scale size?
- G. Is paint work neat, with sharp edges and no runs, drips, or brush marks left on the model?

### 5. ORIGINALITY:

In the case of fanciful models, has the modeler shown imagination in the choice of subject or in the manner of its presentation?

### 6. HISTORICAL AUTHENTICITY:

Is the model historically correct in its overall configuration and in the form, location, and color of its details? (This criteria doesn't apply purely to decorative or fanciful models).

### 7. OVERALL IMPRESSION:

How successful or "convincing" is the model in representing that which its maker tried to portray?



AHOY, Fellow  
Ship Modeler's, I  
am here to  
announce the  
annual San Diego  
Ship Modeler's

Guild scale model Regatta on  
Saturday the 20th of June  
1992. It will be a FUN DAY for  
all. There will be some new  
events that will be pure fun.  
It will be a day for all to  
show off our talents and the  
pride that we have in our  
model's.

The competition will  
consist of Static display  
portion, non R/C model's only  
and R/C Static model's, R/C  
civilian and military static  
and running, and a junior  
class in each division, Junior  
class is 17 years old and  
under. The break down for the  
events are;

1. Static model display.
  - a. Non R/C
  - b. R/C

2. R/C operations;

Civilian (Two Classes,  
Large 12.5" and over, and  
Small 12" and less).

- a. Course
- b. Special functions
- c. Docking
- d. Sail By

Tug: (Two classes, Large  
12.5" and over, and Small  
12" and less).

- a. Course
- b. Special functions
- c. Docking
- e. Towing and pushing
- f. Sail By

Military: (Two classes, Large  
12.5" and over, and Small 12"  
and less).

- a. Course
- b. Special functions
- c. Docking
- d. Task Force Sail BY.

To make this all work I  
need your support in this  
effort, I would like as many  
advanced entries as I can get.  
This will help me and the  
Regatta committee get things  
rolling.

#### Entry fees:

Static: (Non R/C and R/C)	
Early	Day of Regatta
\$3.00	\$5.00

R/C:	
Early	Day of Regatta
\$3.00	\$5.00
(Require Frequency Used, Old or New listing)	

Junior entries (All Classes):	
Early	Day of Regatta
\$2.00	\$3.00

Send all entries to:

Daniel M LePage, Regatta  
Commodore  
San Diego Ship Modelers Guild  
1306 North Harbor Drive  
San Diego CA. 92101

## EXHIBITIONS

### The Great Age of Sail: Treasures from the National Maritime Museum

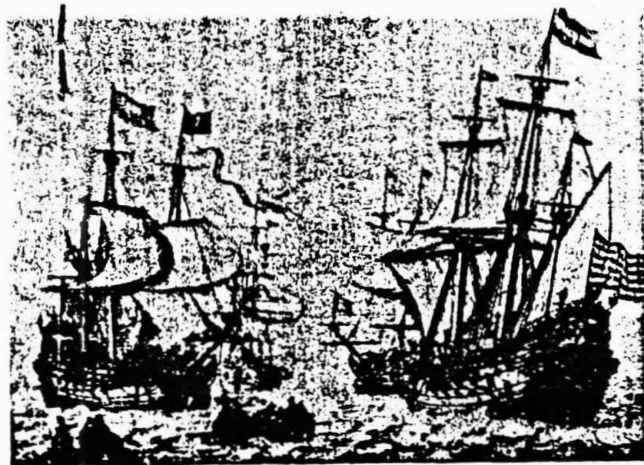
One of the most significant works in the exhibition *The Great Age of Sail: Treasures from the National Maritime Museum* is the massive eight-feet by twelve-feet canvas by Joseph Mallord William Turner, *The Battle of Trafalgar, 21 October 1805*, on view at the museum March 7, 1992 through October 11, 1992.

In 1823 Turner was commissioned by George IV to paint *The Battle of Trafalgar* as one in a series of paintings of British victories to hang in St. James Palace. The battle of Trafalgar established British naval supremacy for one hundred years.

The fleet of thirty-three French and Spanish ships under Admiral Pierre de Villeneuve fought twenty-seven ships under Admiral Lord Horatio Nelson. In September 1805, Napoleon ordered Villeneuve to leave Cadiz and land troops in Naples to support the French campaign in southern Italy.

Nelson intercepted Villeneuve and attacked off Cape Trafalgar on October 21, making his famous signal "England expects that every man will do his duty." The majority of Nelson's ships broke through and shattered Villeneuve's column. When the battle ended at about 5:00 p.m., Villeneuve had been taken prisoner and had lost nineteen to twenty ships and 14,000 men. Nelson had been mortally wounded, but when he died at 4:40 p.m. he was certain of victory. The British lost 1,500 seamen but no ships. As a result of this battle, Napoleon's hopes to invade England were shattered forever.

This exhibition is organized and circulated by the San Diego Museum of Art and is made possible by generous gifts from Mr. and Mrs. Richard A. Cramer, Mr. Walter Fitch, III, Mr. and Mrs. Joseph W. Hibben, Mr. and Mrs. Donald Roon and the Roon Foundation. Additional support has been provided by the Challenger of Record Committee and by an indemnity from the Federal Council on the Arts and the Humanities.



Willem Van de Velde, the Elder, *Two Dutch merchant ships under sail near the shore, in a moderate breeze*, 1649, grisaille on panel. From the permanent collection of the National Maritime Museum, Greenwich, England.

### Set Sail

This five-part lecture series will focus on *The Great Age of Sail: Treasures from the National Maritime Museum* from such fascinating perspectives as shipbuilding, nautical technology, naval battles, and life at sea. These lectures, planned exclusively for museum members, will examine various aspects of the works in the exhibition, from the yachtsman's as well as the maritime historical point of view. All Wednesday lectures begin at 6:00 p.m. and are held in Copley Auditorium. Reservations are required as seating is limited; \$3.00 for members, \$5.00 for non-members. Please call 232-7931, ext. 180 and leave your name, telephone number, and number in your party.

- March 25: Lecture *War at Sea: The Sixteenth to the Nineteenth Centuries*, by Craig Arnold, librarian and editor, San Diego Maritime Museum.

- April 1: Lecture *Navigation and Shipbuilding: The Sixteenth to the Nineteenth Centuries*, by David Brierley, curator, San Diego Maritime Museum.

- April 8: Lecture *Life at Sea in the Age of Sail*, by Robert Ritchie, professor of history, UCSD.

- April 15: Lecture *Exploration, Trade and Empire: The Sixteenth to the Nineteenth Centuries*, by Craig Arnold.

- April 22: 5:30 p.m. Reception Lecture/Gallery Talk *Looking at Maritime Paintings*, by Malcolm Warner, SDMA curator of prints and drawings and co-curator of the exhibition *The Great Age of Sail: Treasures from the National Maritime Museum*; John M. and Sally B. Thornton Rotunda: \$3.00 for members, \$7.50 for non-members.





## James Watt

THOUGH HE IS generally credited with the invention of the steam engine, James Watt was only one of its inventors. He came at a time, however, when previous experimenters had already created workable but flawed machines. He improved on early efforts and made the steam engine completely practical. For this final achievement, Watt won acclaim and financial success.

Watt was born in 1736 in Greenoch, Scotland. At an early age he was apprenticed to a maker of scientific instruments. At age twenty-one he was appointed instrument maker at the University of Glasgow. While working in his shop in 1763, a Newcomen steam pumping engine was brought in for repairs.

Curious about the machine, Watt carefully investigated it to find out the cause for the breakdown. He also tried to find out why the machine ran out of steam so quickly.

Watt concluded that the loss of steam in the Newcomen machine resulted from the injection of cold water to make the steam condense. In the process, the cold water also cooled the cylinder itself. The alternate heating and cooling caused the loss of heat, slowed the process, and wasted power and fuel.

Watt applied his skills as craftsman and technician to work out a remedy for the Newcomen engine. In order to make the machine more efficient, Watt found himself redesigning it. In so doing he forever changed the nature of the steam engine.

Watt decided that the cylinder must always be kept hot, as hot as the steam. Yet, to condense steam, the vessel had to be cooled. To accomplish this purpose, Watt came up with a brilliant idea. In 1765, he invented a separate cylinder called a condenser. He placed the condenser next to the working cylinder. To make the working cylinder maintain its heat better, he fitted a steam jacket around it.

In 1769, Watt was granted a patent for "A New Method of Lessening the Consumption of Steam and Fuel in Fire Engines." This patent is considered one of the most important in the history of technology.

To improve production, Watt entered into partnership in 1774 with an enterprising businessman, Matthew Boulton. Under their firm's name, Boulton and Watt, the steam engine as prime mover became a major business enterprise. The first machine was installed in a coal mine in Tipton, England. The second worked the bellows of a blast furnace in Shropshire.

The machines aroused great public interest for they were more powerful than the Newcomen machine and could sustain their power without frequent breakdowns. English industrialists were particularly impressed that these machines used only a fraction of the coal of the Newcomen machines.

Orders for the steam engine flooded the Boulton and Watt office. The machines were in demand for tin and coal mines. And the widespread application of the steam-powered machines to other industries led to exploitation of fossil fuels such as coal.

To increase business further, the company promoted a policy of "leasing" machines, making them available to customers on a prescheduled fee. Sales soared and the Boulton-Watt steam engine continued its spectacular success.

Throughout his working life, James Watt continued to improve his machine. His inventive genius and his competitors standing in the wings with technologically updated engines spurred him on.

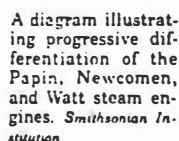
One of Watt's innovations was the use of a mechanical device called a governor. It regulated the speed of the engine and produced a steady motion even when the work load varied.

A major breakthrough came with the introduction of the rotary motion engine. A rod connected the piston to a crank, which is an axle or shaft bent at right angles. The turning of the crank converted the back and forth or reciprocating motion of the piston to a round-and-round motion. The rotary steam engine made it possible to power the wheels of industry, especially textile mills. Watt also attached a heavy wheel, called a flywheel, to the crankshaft to keep the rotary motion steady.

Among Watt's other inventions was the steam engine indicator to measure the engine's performance. And despite his fear of explosions, Watt increased productivity by increasing steam pressure.

In Watt's day, the use of the steam engine had progressed from simply pumping water out of deep mines shafts to become the prime mover for industry.

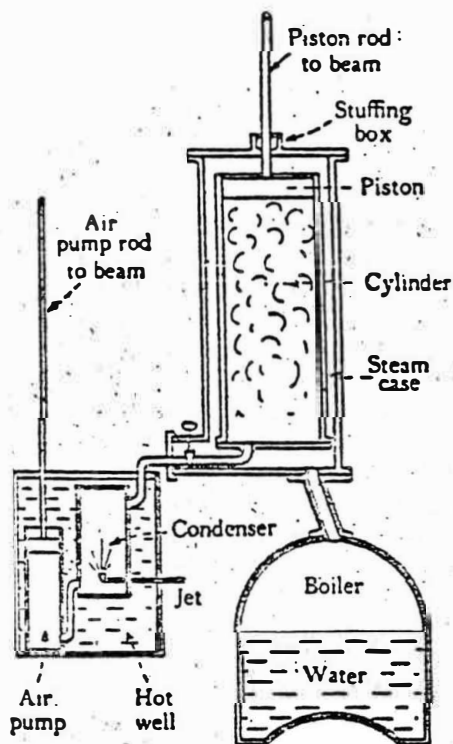
The high-pressure steam engine was the brainchild of a brilliant Cornishman, Richard Trevithick (1771–1833). Building on Watt's work, and less fearful than Watt of explosions, Trevithick devised higher pressure for the steam engine. He thus increased its capacity and speed, leading the way to small fast engines. He also dispensed with reliance on the vacuum. Instead,



NEWCOMEN

Trevithick connected the piston rod directly to a pump or wheel and paved the way for applying steam power to transportation. In 1801, his engine carried the first passengers by steam power

in London. In 1804, he built a steam locomotive that was used on a railway track in Wales. These inventions earned for Trevithick the well-deserved title, "Father of the Locomotive."



# Del Mar Fair

# DESIGN IN WOOD

June 16 through July 5, 1992

