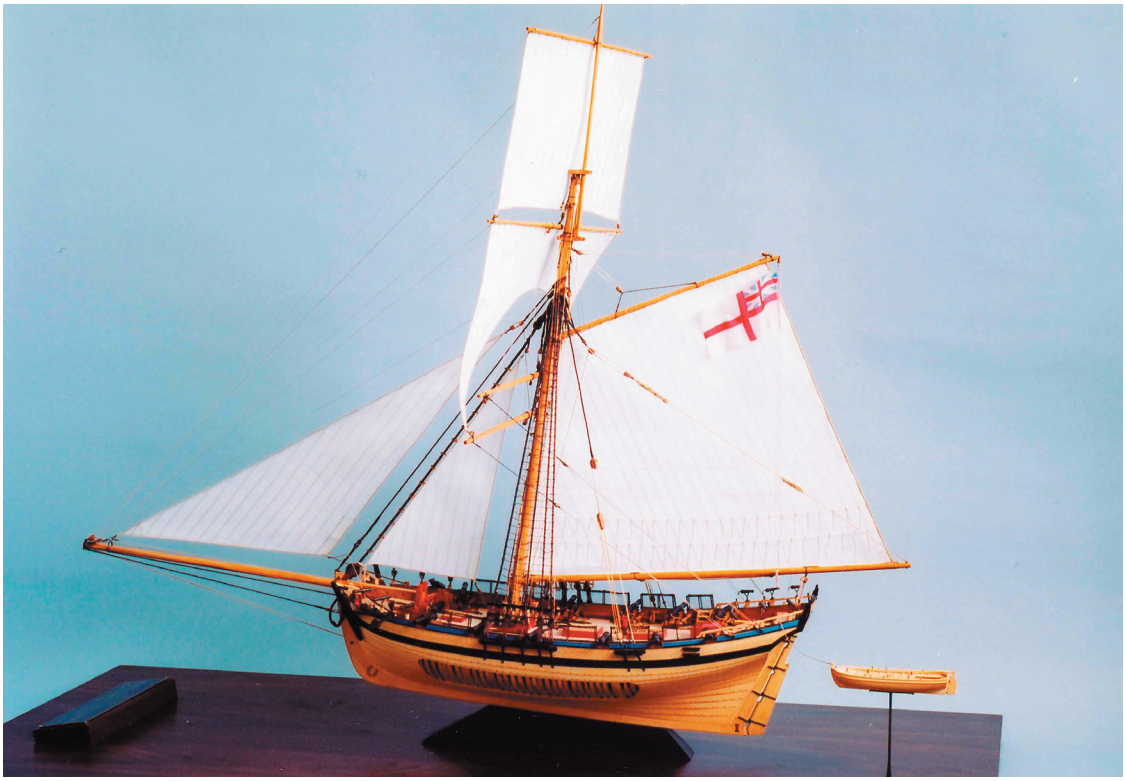


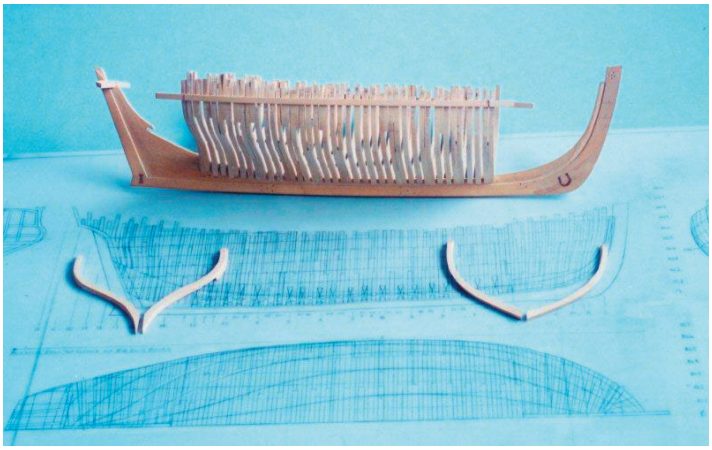
Alert Provenence and Construction

by N. Roger Cole

Research and Plans

Many years before I built *Alert*, I had discussed building a Naval cutter with the late Dana McCalip, long recognized as the North American dean when it came to British Naval Cutters. During that discussion, Dana recommended Peter Goodwin's book, The Naval Cutter *Alert* – 1777, assuring me that Goodwin had already answered any question I could possibly think of. Trusting Dana, I was quietly led as a lamb to the slaughter. After finding a copy of Goodwin's book, I initially simply took a quick look at the material presented and, with Dana's endorsement ringing loudly in my ears, decided that the book looked good; however the proof of a pudding is in the eating and, in this case, building the model — a totally different matter, with a great many unanswered questions.

Prior to building the model, I wrote to Peter Goodwin twice, simply asking about the availability of copies of his plans. No answer was received to either letter. So primarily using material from *Stalkart's Naval Architecture* – specifically a draught of a 60ft Naval Cutter (1781); Kingman, Irving H, Modeling H.M.B. Cutter *Alert* –1777, Nautical *Research Journal* Vol. 29, Number 4, December 1983, pages 173-184 which is based on, and contains Merritt Edson Jr.'s work; and the information and drawings in Peter Goodwin's book, I drew my own hull plans, including lofting all the frames, floors, and futtocks, and produced templates for the stem, keel, and sternpost components.

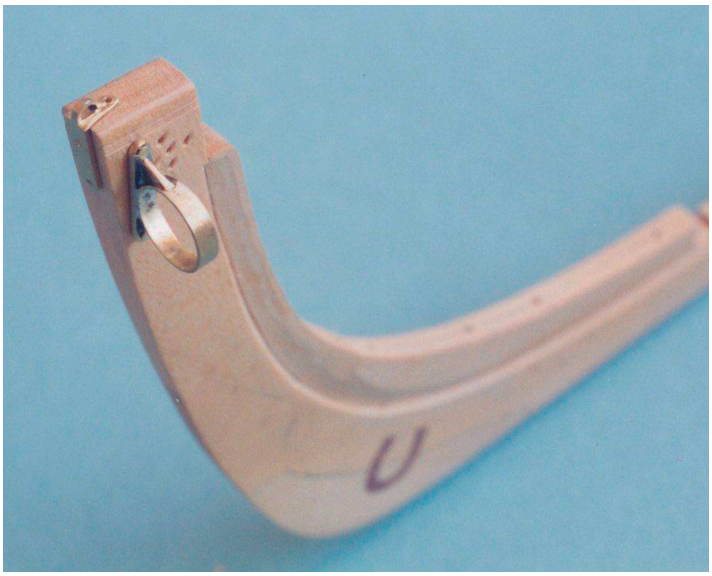


N.R. Cole Photo # 339-08. My plans and the partially framed hull; the bow and stern cants have yet to be installed.

One error that appeared almost immediately in both Edson's and Goodwin's work was the positioning of the lanyard holes in the stem head for the forestay lanyard. In both cases the five holes are splayed right across the entire top of the stem. Had the deadeye lanyard ever been rigged that way, part of the lanyard would have been laying across the reinforcing gusset on the bowsprit retention hoop, mounted to port on the stem head. This would have guaranteed an early failure of the lanyard, with the probable loss of the forestay and, with it, possibly the mast.

There would have also been interference between the forestay deadeye and the routing of the preventer stay to the fastening

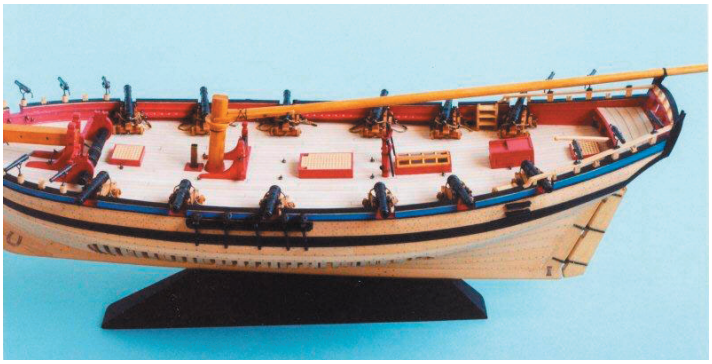
on the top/front of the stem. To allow room for the retention hoop and preventer stay fastening, I relocated all five holes aft to match the vertical spacing on the five-hole forestay deadeye, thereby leaving the lanyard parts parallel, rather than splayed, as before.



N.R. Cole Photo # 333-16. This shows the positioning of the lanyard holes aft of the retention hoop. This hypothesis is supported in photos of the Hawke Model reproduced in Goodwin's book.

While the model was essentially built following the information found in Peter Goodwin's book, The Naval Cutter *Alert* – 1777, there was considerable additional research necessary. This, in part, was due to omissions by Goodwin on matters such as a belaying plan, and the use of hammock cranes and nettings. Nor were shroud trucks (known as fairleads when rigged) used to route lines from aloft down the inside of the shrouds and clear of the ratlines.

While I had no argument with Goodwin's research or the photos, etc., errors in the drawings created a climate where everything in them became suspect. This caused me to verify everything I saw in the drawings, and frequently change or modify what is seen in them. I suspect that Goodwin did not produce the drawings, and that they may have been farmed out to a number of draftsmen.



N.R. Cole Photo # 457-05. This view shows the deck layout on the model. There are differences between it and what is seen in Goodwin's work.

I also made some minor changes to the deck layout because I felt that my layout was more likely, and certainly more workable. In the above photo, starting at the bow, I offset the fo'csle hatch to starboard to clear the bowsprit when it was run in. The main hatch amidships had its front corners modified to lead the anchor cables below deck and allow removing the hatch cover while at sea. With the cables routed through holes in the cover as they were in Goodwin, it would have been very difficult, if not impossible, to remove the cover. The bread room scuttle in Goodwin was right under the feet of the helmsman, and right up against the companionway to the captain's quarters and bread room. I moved it aft where it is on the model. I also added outboard stools for the running backstays, allowing them to clear the hammock nettings. There were many more minor changes along the way.

Environmental Care of the Model

Temperature and Humidity Control

Essentially the ideal environmental conditions as to heat and humidity for this, or any other ship model, are the same as those where a person will feel most comfortable. This was the environment under which the woods were seasoned and the model built. It is especially important that any cased model not be displayed where it is exposed to direct sunlight or U.V. sources, other than for very brief periods, such as when being moved.

Out gassing Protection

Many models have been, and continue to be, seriously damaged by what has generally been referred to as "lead disease", in short this is due to out gassing of acidic vapors from the materials used in the construction of the model and case attacking the materials used in the model.

N.R. Cole Photo # 521-21A. This shows the sacrificial slice of Botticino Marble housed underneath the model plinth.

Protection of this model and its components from out gassing of acid-producing materials utilized in the construction of the model, the display stand, and the case construction materials, was achieved by installing a sacrificial slice of Botticino marble in a recess underneath the black plinth supporting the model. The primary problem is acetic acid out gassing from the woods used in the model and wood used in the construction of the display case. Man-made wood products such as plywood were not used in either construction, nor should they be for the safety of a model. Plywood is notorious for out- gassing numerous undesirable chemicals.

In theory and in practice, the acids attack the marble (a base) and not the model; this chemical action controls the acids circulating in the air inside the case, thus protecting the model and its many components from damage.

The research supporting this idea was based on an article by Dana Wegner, Curator of the United States Navy Ship Model Collection, titled "Lead Corrosion In Exhibition Ship Models:" *Nautical Research Journal*, Vol.43, No. 1, March 1998, pages 32-40.

Materials Employed in the Construction of the Model

The model was constructed of carefully selected and seasoned hardwoods, high-quality metals, fabrics, rigging materials, and finishing products. The construction techniques employed in the building are, in many cases, unique and are expected to provide an extremely long life for the model if it is protected from extremes of heat, humidity, sudden temperature changes, exposure to sunlight, and ultra-violet exposure from any source, especially fluorescent lighting sources.

The following articles regarding *Alert's* planking process were published: "Clenched-lap Planking Over a Framed Hull," *Nautical Research Journal*, Vol. 44, No. 4; and "Coppering a Clenched-lap Hull", *Nautical Research Journal*, Vol. 45, No. 1.

N.R. Cole Photo # 405-19. This photo shows the clenched lap planking with the cutout left open to reveal the framing detail.

Woods

All of the woods used in the construction of the model were seasoned in my home for a very long period of time before being cut for use in the model, with only the very best wood on hand being selected for use in the model.

Columbian boxwood: Hull framing and planking, deck beams, deck furnishings and hatch gratings, along with and one half of the two-piece mouldings used on the model (the other half is Gaboon Ebony).

Virginia Holly: Decking, including the stern platform. The dowels securing the decking were also made of holly and create a very subtle, yet dowelled deck – one where the dowelling more closely matches the bungs used on a full-sized deck; these are almost invisible when viewed under natural daylight.

Degame: also known as Lemonwood, or Lancewood. Spars. In each case this was split to follow the straight grain inherent in degame. It was then squared, eight-, sixteen-sided, and then rounded. Where a curve in a spar was required, for example to replicate the sag in a boom, or the reverse sag in the gaff, it has to be carved into the wood. Degame cannot be bent into shape, it will straighten over time.

Gaboon Ebony: Wales, stern quarter pieces, the stern counter, one half of the two-piece mouldings and cap rails (the other half is boxwood). Windlass barrel, and the two-piece anchor stocks.

Lignum Vitae: Deadeyes, sheaves in all the built-up blocks, shroud trucks, hearts, and lizards.

Sugar maple: Cleats and similar small fittings.

Cypress: Gun carriages.

European Apple: Mainsail, and foresail hoops.

Bamboo: Split and drawn to the required sizes for use as dowels in the framing and hull.

Walnut: Solid black walnut was used for all aspects of the display case, except for the plinths supporting the model and the nameplate. These were both made from Honduras

mahogany and then painted flat black to be unobtrusive. The sacrificial slice of Botticino marble is housed in a cutout underneath the model plinth. An air access space is provided under this plinth.

Adhesives Used

Weldbond™: Weldbond* was used almost exclusively throughout the model wherever an adhesive was required. Weldbond provides a flexible bond permitting movement in the model due to environmental changes, but without the risk of fracturing the glued joints. It also contains a bactericide to prevent moulds, etc.

*Manufactured by Frank T. Ross and Sons Ltd., 6550 Lawrence Avenue East, Scarborough, Ontario M1C 4A7.

The manufacturer advises that their product can be used straight from the bottle or thinned as much as five parts water to one part Weldbond. In a thinned solution, when a dowel is dipped into the glue, the adhesive will wick into the pre-drilled dowel hole, rather than scrape off, as most glue will do when a dowel is driven into the hole. All dowels are a driven fit wherever used.

The point where a seizing or belaying point in a line terminates, including the coiled hanks, is secured by Weldbond, thinned two parts adhesive to three parts water, and was also used as a wash to keep the belayed coils in order. This approach allows disassembly and readjustment of the line should it become necessary in the future if natural stretching of the line should occur. This can occur with changes in the relative humidity. However, before readjustment of the line is considered, the humidity levels to which the model has been exposed should be checked first, and if necessary, adjusted.

Five-minute Epoxy: Epoxy was used on a very limited basis to secure eye bolts that were fitted into blind-drilled holes, including the eye bolts installed in the deck and bulwarks to secure the gun control tackles. In this situation, the shaft of the bolt was first threaded with a Jeweller's die plate, the hole was drilled the same size as the bolt, a very light coat of epoxy was applied, and the bolt was pushed into the hole with any squeezed-out epoxy cleaned up immediately. Once dry, withdrawing these bolts is extremely difficult and will cause damage.

Shellac as a Sealer: Orange Shellac* mixed one part crushed Shellac flakes to six parts Lee Valley™ shellac thinners was used as a sealer on the reef knots securing the mast hoops and jib hanks to their respective sails. This was done to ensure that they do not come loose over time since replacement is a delicate matter with the mast hoops, and the luff of the mainsail in particular being quite difficult to reach with the model complete.

*Manufactured by Lee Valley Tools Ltd. Ottawa, Ontario, Canada. Telephone 1-613-596-0350. The shellac thinner contains ethanol and isobutyl alcohol.

Finishes

Opaque Materials, or Paints, Used on the Model

The opaque colours used on the model were manufactured by Floquil* and were from the now defunct line of Marine Colours. The blue and the red were blended to represent the effects of atmospheric perspective. These colours very closely match the colours seen in paintings and on models displayed in major international maritime museums such as the United States Naval Academy Museum at Annapolis, and the Smithsonian Institution.

*Floquil – Polly S Color Corporation, Amsterdam, NY 12010-9204.

The Bulwarks Red was modified as follows: 79% Bulwarks Red (#818692), 17.5% Slate Grey (#818686), 3.5% Ocean Grey (#818596). This was then thinned with the Marine Line of airbrush thinners (#848601) by approximately 50% to allow airbrushing.

The blue used on the Drift Rails etc. consisted of 28.4% Navy Blue (#818640**), 71.6% Bulwarks White (#818698). This was thinned 50% for airbrushing using the Marine line of airbrush thinners (#848601).

**Note: Do not confuse this with # 818598; also called Navy Blue, but in the Period Ship Line of paints.

N.R. Cole Photo # 455-25. This view shows the use of colour on the model, including that provided by the woods used in the construction. Aerial, or atmospheric perspective was used to mute the colours.

Clear Finishes Used on the Wood

Shellac Used as a Finish

The spars were finished with three coats of a blend of lemon and orange shellac* mixed into a solution, using Lee Valley Shellac thinners*. The formula used was 4 ounces of finely crushed, or ground, flakes in 10 fluid ounces of the thinner. Each coat was allowed to harden, and was then rubbed down with 1200 grit wet and dry automotive finishing paper. The final coat was rubbed down and given a coat of Renaissance Wax as a final preservative.

Items such as blocks were also finished with Shellac. These, if they were built-up blocks, were brushed with two coats of shellac before assembly, with any excess shellac wicked off onto paper towel, and then given a third coat. Smaller carved blocks were dipped into the shellac while suspended on fine enameled copper wire; the excess shellac was wicked off onto paper towel, and the blocks were hung to dry. This process was repeated three times, and the holes were reamed with a fine five-sided reamer to clear any shellac out to allow the line to pass through easily.

*Manufactured by Lee Valley Tools Ltd. Ottawa, Ontario, Canada. Telephone 1-613-596-0350. The shellac thinner contains ethanol and isobutyl alcohol.

Clear Floquil Finishes

All other areas of the model, inside and out, including the underside of the deck, were given three clear coats of a blend of Floquil* finishes. These came from the Model Railroad line of finishes.

The blended finish was created using the following percentages: 65% Flat Finish (#110015), 5% Retarder (#R2), 10% Crystal Coat (#110004), and 20% Diosol (#150001). This mixture was further thinned for airbrushing with Diosol.

*Manufactured by Floquil – Polly S Color Corporation, Amsterdam, NY 12010-9204

Wax

Renaissance Wax. Manufactured by Picreator Renaissance Products, Picreator Enterprises Ltd., 44 Park View Gardens, London, NW4, England. This was used as a final finish on all clear-coated wood surfaces to provide protection and a soft sheen to the finish. Conservators in British Museums use it on a wide range of artifacts.

Metals

Free turning brass* was used to produce all the turned items on the model, including the twelve six-pounder cannon barrels and the twelve ½-pounder swivel gun barrels. There were also numerous small thimbles, eye bolts, etc. produced from the same brass. This material literally turns like butter on a well-setup lathe.

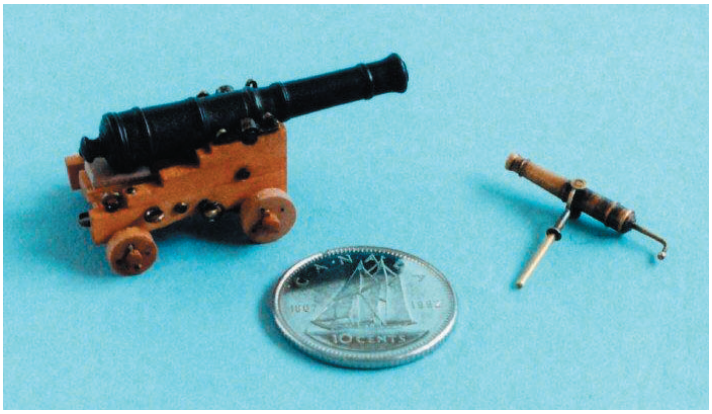
*This is composed of 58% copper, 40.5% zinc, and 1.5% lead. (General Engineering Workshop Practice.)

Free turning, or cutting brass is available from Blue Ridge Machinery and Tools, Inc.

See: www.blueridgemachinery.com

Pattern Turning

Items such as the gun barrels, belaying pins, and smaller repetitive items were turned on one of my Unimat™ lathes fitted with a pattern-turning attachment developed and built by me.

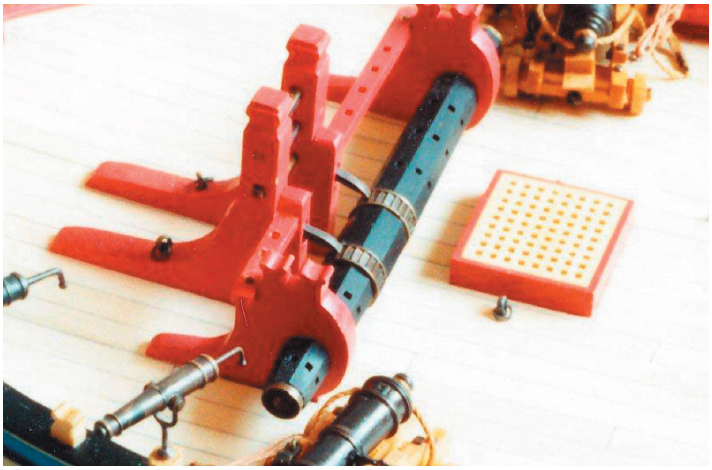


N.R. Cole Photo # 454-13. A completed six-pounder cannon and a half-pounder swivel with a Canadian dime for scale, the same size as an American dime. Both were produced using the pattern-turning attachment. The swivel has yet to be oxidized.

The process, including the development of the attachment, and the methodology employed to turn the gun barrels, thereby ensuring that they were all identical, was published in a series of three articles in *Seaways Ships in Scale* magazine. See: Volume XII, No. 4, pages 50–61, Volume XII, No. 5, pages 40–44, and Volume XII, No. 6, pages 46–52.

A Simple Dividing Head

A home-built dividing head, based on a degree wheel, allowed me to cut the ratchet teeth on the windlass and jeer winch ratchets. The development of the tool, and the machining process were published in an article titled: Making and Using a Simple, Inexpensive Dividing Head. Nautical Research Journal, Vol. 47, No. 1, March 2002, pages 3–13.

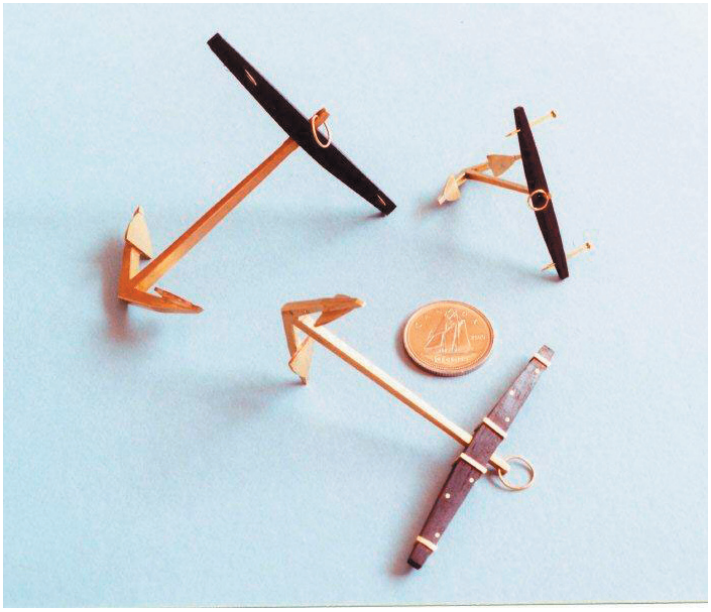


N.R. Cole Photo # 486-21 M. The windlass aboard Alert *showing the ratchets cut using a simple dividing head. The fo'csle hatch offset to starboard is also seen. This offset allowed easy access to the fo'csle when the bowsprit was run in.*

All Other Metalwork

As is normal on all of my models, all the metal work, except turned work, is created from sheet brass, sawn, filed, drilled, silver-soldered and oxidized, etc. as required. I do not

use commercial fittings of any kind in my work, with the exception of some very fine chain. Some small fittings such as rivets were created from white brass dressmaker's pins or yellow brass Lill Pins™.



N.R. Cole Photo # 483-11A – Anchors under construction. The flukes, or palms were sawn from solid, and then silver-soldered to the anchors, which were also sawn from solid brass. The anchors have yet to be cleaned and oxidized.

My approach to making fittings was published in *Proceedings of the Sixteenth Annual Conference of the Nautical Research Guild*, August 4–6, 1989. The Ship Model Society of Northern New Jersey hosted this conference.

Finishes Used on the Metals

There were two oxidizers used on the metal parts of the model. The first used as a blackening agent, including the gun barrels, was Winox™; an oxidizer obtained from the now defunct Anchor Tool and Supply.

The second oxidizer produced the bronze finish seen on the model identification plaque and on some metal parts of the model, including those on the windlass barrel hardware.

This colour range is obtained by carefully timing the effect of a diluted solution of Hoppes Gun Blue ™ where the ratio of 30% Gun Blue to 70% distilled water was used. This is used at room temperature.

Hoppe's Gun Blue, Airport Industrial Mall, Coatesville, Pennsylvania 19320 manufactures this product; it is available from most gun shops.

Protective Materials Used on Metals

The clear protective finish used on the oxidized metal parts is the same as that used on the wood, Floquil* mixed to the following percentages: 65% Flat Finish, 5% Retarder, 10% Crystal Coat, and 20% Diosol. All of the metal parts were chemically cleaned and were then dipped into the finish while suspended on fine enameled copper wire. Excess finish was wicked away onto paper towel and the part was hung on fine enameled copper wire to allow the finish to harden for a period of 24 hours, before it was handled.

*Manufactured by Floquil – Polly S Color Corporation, Amsterdam, NY 12010-9204

Hammock Nettings and Cranes

While hammock nettings and cranes are not mentioned in Goodwin's work, and not discussed in any of the other cutter material I studied, the French record of the engagement between *Alert* and the French Lugger *Coureur* indicates that when *Coureur* attempted to board *Alert*, her crew were unable to get over Alert's hammock nettings. Further, the French Commander, Chevalier de Rosily, reported that when he had attempted to board "The height of the hammock nettings of the *Alert* thwarted this." He also reported that "…for the hammock nettings of the *Alert*, so useful in combat, must have been a real embarrassment in handling."

N.R. Cole Photo # 486-14. The hull fitted out prior to masting and rigging, shows the hammock cranes and netting.

Chevalier de Rosily's report also confirmed that, at that time, *Alert* carried twelve six-pounder long guns and twelve swivels. The report can be found in an article published in the *Nautical Research Journal*, Volume 26, Number 2, June 1980 titled The Chasse-Maree and the Lugger by Jean Boudriot (translation by H. Bartlett Wells).

The hammock cranes were drawn to scale, and then reproduced into multiple copies on a computer from sketches found in *The Arming and Fitting of English Ships of War 1600* – 1815 by Brian Lavery. The cranes were modified slightly to fit the model. The templates were glued to .015" thick brass, which were individually sawn out, filed, polished and oxidized, and were then fitted with top rails and netting. A lower stem on the cranes was inserted into a hole in the bulwarks.

Note that the two aftermost crane-netting assemblies block access to the boarding steps. When underway, the cranes would be positioned as they are on the model; when either at anchor or alongside, the aft part of the nettings would be lifted out and secured to the middle stanchions, giving access to whichever boarding ladder was in use.

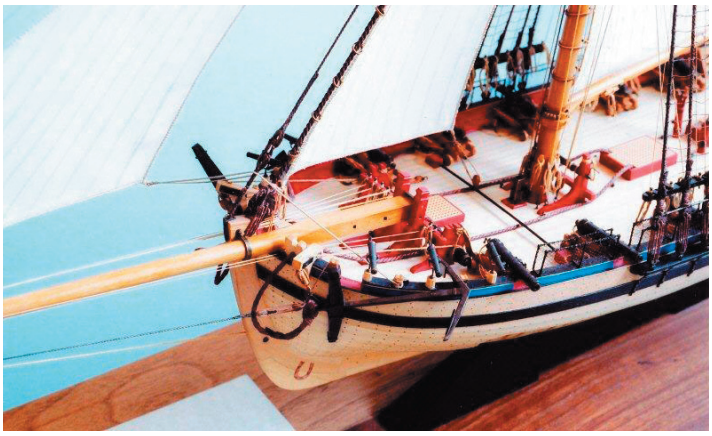
Masting

As mentioned briefly on page 4, under the heading Degame, all the spars were carved from degame which had been split to follow the straight grain inherent in this wood. The spars were squared, eight-sided, sixteen-sided as was done on full-sized spars, and finally rounded.

Most of the spar work was done on my spar jig, or vise. Curves, or sags normally found in spars after usage were carved into the spars. Shellac was used to finish all the spars.

Rigging Materials

Virtually all of the cordage used to rig the model is linen. The smaller sizes were from a stock of linen I purchased many years ago; this stock includes Cuttyhunk brand, along with Belgian and Irish linens. All of these are polished, fine linen thread. In a few cases where very fine seizings or servings were required, a very fine Polyester thread was used, as linen was not available in very small sizes.



N.R. Cole Photo # 558-06. This shows the surgical wire-cored sheet for the jib crossing the forestay preventer. The sheet for the foresail can be seen further aft belayed to its block on the sheet horse.

Almost all the line was laid up on my ropewalk. This included all the hawser, or right laid line, and the cable or left laid line. In addition, the sheets for the foresail and jib are surgical wire-cored line laid up on my ropewalk. This allows the line to hold the sail out in a filled position as though the sail was drawing, and provides a natural looking catenary to the sheets, something rarely achieved with a line on its own.

My approach to rigging techniques, including the colouring of rigging materials was published in Part Nine of the fourteen-part series of articles published between May/June 1986 and the November/December 1988 issues of *Ships in Scale* magazine titled: *Lizzie J. Cox*.

This series discussed the building a model of a fully framed and planked Chesapeake Bay Bugeye and all aspects of its construction.

Colouring Used on the Rigging Components

The colouring agent used on the line is Rit Fabric Dye. These were blended as follows:

Running Rigging

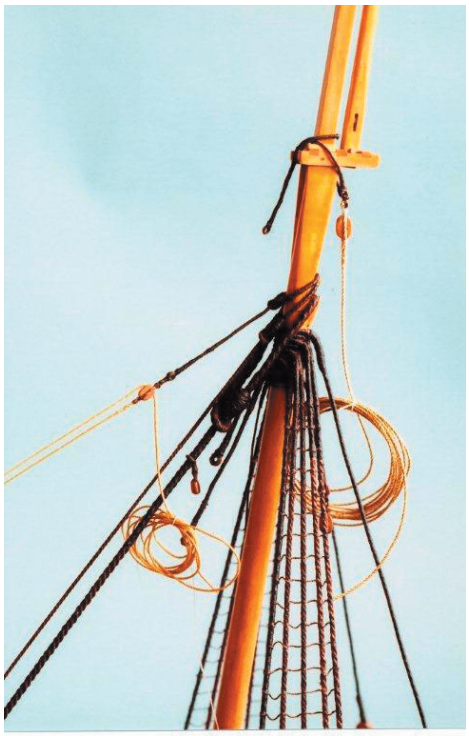
Into 16 ounces of hot water were mixed 1 teaspoon of RIT # 23 Gold, 1 teaspoon of RIT # 39 Pearl Grey, ¼ teaspoon of RIT # 16 Tan. Line was pre-soaked using Kodak Photo Flo as a wetting agent before immersion in the dye mix.

The time soaked was determined by checking for the colour. As all the line on a vessel varied in colour, so there are variations in the colour of the line seen on the model. There would probably never have been a vessel created where all the line was exactly the same shade, even if all of the line was made on the same ropewalk.

Standing Rigging

Into 16 ounces of hot water were mixed 1/2 teaspoon of RIT # 20, Cocoa Brown, 3/4 teaspoon of RIT # 25 Dark Brown, 3/4 teaspoon of RIT # 15 Black. Line was pre-soaked using Kodak Photo Flo as a wetting agent before immersion in the dye mix. The line was left to soak for approximately 7 minutes, depending on the desired shade.

Standing and Running Rigging and the Masthead



N.R. Cole Photo # 521-16A. Standing and running rigging and masthead details. On the early cutters the topgallant mast was stepped aft of the lower mast as shown here, not in front of it as was common on all but the early cutters and a possibly a few other craft. The line coils were installed while the spars were off the vessel, making things easier later.

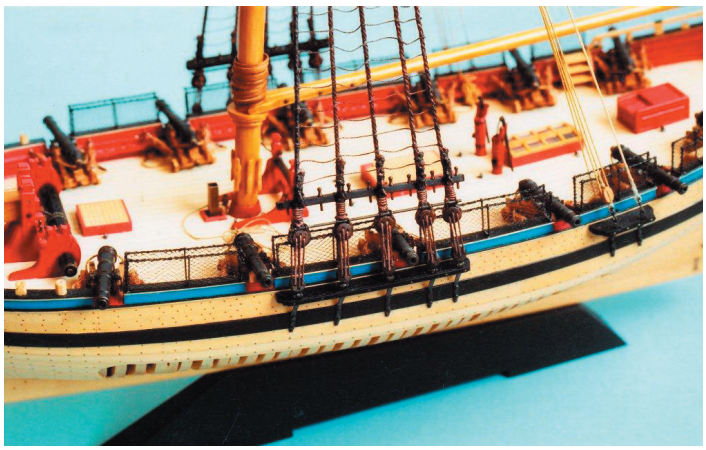
Protective Materials Used on Rigging Components

The protective finish used on the rigging cordage is "Woly" a shoe and leather preservative manufactured in Switzerland by A. Sutter Ltd. 9542 Munchwilen. The two colors used on the model were #5 – Dark Brown, and #64 – Tan. This product was recommended to me by my local shoe repair shop as being the finest preservative available for use with leather and linen cordage used in the manufacture of sewn leather goods. Working in the industry for much of his life, he had never found a better preservative. Regrettably, he advised me that the manufacturer had recently gone bankrupt and that the product is no longer manufactured. I purchased the last two jars of #5 and #64 he had. He suggested that while Tana Shoe crèmes may be another choice, they were not as good as Woly ™.

Belaying Plan

Belaying is not mentioned in Goodwin. The belaying plan seen on the model is a total reconstruction on my behalf bearing in mind that on full-sized vessels belaying was always logical, and with clear leads to the lines. The governing question regarding my belaying plan was always the same "Is it workable, and does it make sense?" Ideas were often modelled with temporary lines to check out my ideas. Many ideas were scrapped.

Belaying is covered in part in Merritt Edson Jr.'s work which is referenced in Kingman, Irving H, Modeling H.M.B. Cutter *Alert* –1777, *Nautical Research Journal* Vol. 29, Number 4, December 1983, pages 173-184 and in numerous articles by the late Dana McCalip regarding cutters and sloops. None of these present a totally satisfactory belaying plan, and include a few ideas that simply were not realistic, or not workable.



N.R. Cole Photo # 521-07A. This view shows the belaying pin racks installed on the shrouds. Also seen is some of the standing rigging, including the shrouds, ratlines and deadeyes.

N.R. Cole Photo # 558-06M. Lines from the bowsprit are belayed to pins in the racks across the forward side of the windlass. These lines are led aft to the racks through Lignum Vitae fairleads mounted on either side of the stem and bowsprit. Lines can also be seen belayed to the shroud-mounted pin racks.

Sailmaking

The sails on the model are made from tracing linen, used in earlier years in the drafting industry. The linen used on this model is believed to be between forty and fifty years old, but is still in excellent condition. Tracing linen is so heavily starched that it resembles Mylar. The way to determine if it is linen is to tear a small edge or corner. If it tears easily and has a weave, it's linen. Mylar is very difficult to tear.

Before use, the fabric had to be carefully washed out in repeated washings in warm water to remove the starch. Once it had been thoroughly washed, it was ironed and was then ready to use.

Carved Formers

Clear pine formers were carved for each sail, and were finished with several coats of clear lacquer, and then waxed to prevent the sails adhering to the formers. Heavy pins were driven into the underside of all the corners.

The sail shapes and all the details, including tablings, reef bands, gussets, etc. were traced onto the ironed fabric from ink drawings, or templates, made on heavy paper. The fabric was removed from the template, reversed, and the details were redrawn onto the second side of the sail, immediately over the detail on the first side. This was done with a very sharp, hard pencil.

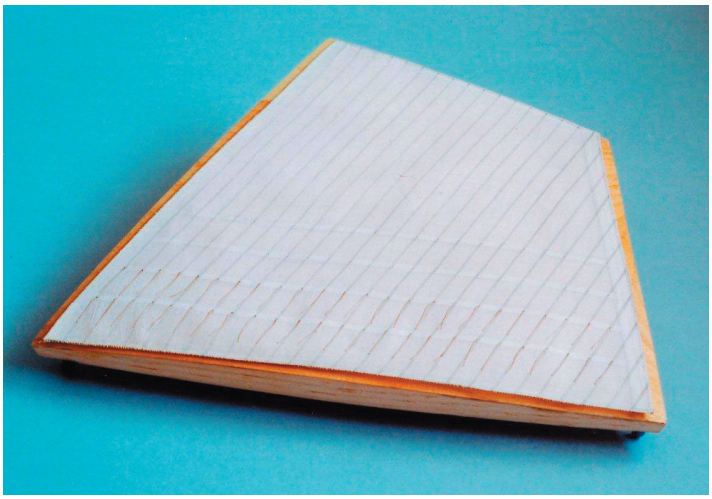
Tablings were folded along the edges of the sails, and were then ironed to lie flat; they were glued down with thinned Weldbond™. Reef bands and reinforcing gussets were also cut and glued in place.

N.R. Cole Photo # 558-24. Carved pine formers over which the sails were moulded into shape.

Stitching

The boltropes were laid out around the tablings, and were seized, or lightly basted in place, and were then glued. The ropes were hand-stitched to the sails using very fine linen thread, applying 26 to 28 stitches per inch, and using shortened, and resharpened beading needles.

Occasionally, during the stitching process, the glue temporarily securing the boltrope prior to stitching would let go due to the handling. When this happened, a small seizing was applied and the rope was re-glued. When I had finished the sewing, a thinned coat of Weldbond™ was applied to bond the rope, sail and stitching together.



N.R. Cole Photo # 558-21. The completed mainsail resting on its carved pine former. It will retain the shape seen when removed from the former.

Finish Used on the Sails

With the stitching completed, the sails were lightly misted with water and formed over the carved wood formers, and were secured there with lines from the cringles, until they dried. Once dry, two coats of Floquil Flat Finish* (#110015) were airbrushed onto the top surface. When dry, the sails were removed from the formers and given two more coats of finish on the inside of the sails; the finish was applied wet to thoroughly soak the fabric. This allows the fabric to retain the desired shape, while appearing natural, without being brittle, or shiny.

This method has proven to be successful on an earlier model. See Ships in Scale, May/June 1995, Scratchbuilding the Santa Maria Part 6, for more on my approach to sailmaking.

*Manufactured by Floquil – Polly S Color Corporation, Amsterdam, NY 12010-9204

Reef Points

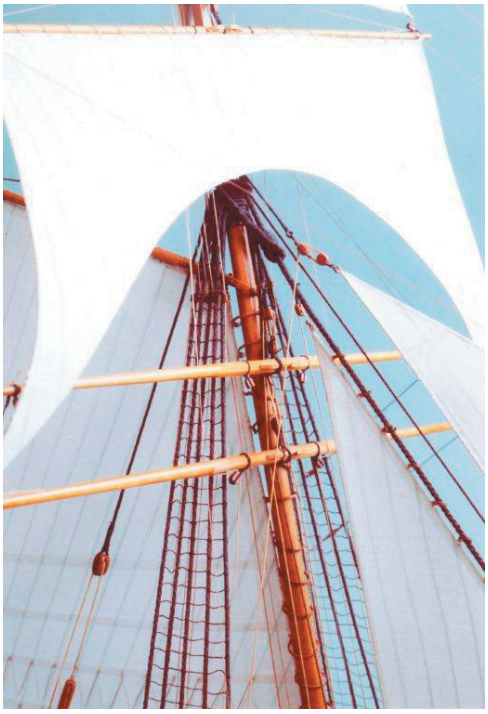
With the sails essentially complete, the reef points were installed where required. These started as short pieces of line, knotted at approximately the middle. These were passed through the sail with a needle, and then a half hitch was loosely tied on the free side. Before tightening, this was slid along the line with the point of a needle, right up to the sail. The knots in the reef points were secured with a very small amount of thinned Weldbond™ and the free ends of the reef points were tacked down following the flow I found on a photo of a real mainsail, with the wind slightly off the port quarter, as is modelled here.

Lacing, and Bending the sails

Once the spars and standing rigging were completed, the sails were installed, starting with the mainsail. It was laced to the gaff and secured to the fore and aft ends of the boom while it was still on the bench. Short lanyards were secured to the luff of the sail with a needle to save doing this in place. The assembly was then put in place, with the parrel, throat and peak halyards set up to secure the gaff at the desired angle, while the parrel and a temporary sheet were set up to secure the boom.

Starting at the top of the sail, the luff was secured to the mast hoops with the lanyards, a laborious process when working between the shrouds. Once all the hoops were secured, the seizings and reef knots used to secure them were sealed with thinned shellac to ensure that nothing would come undone over time. When the shellac had set, the tail ends of the lanyards were trimmed off with a scalpel.

Unfortunately when I did this the first time I managed to put the scalpel right through the mainsail. Thirty hours later I started over with a new mainsail – with no problems.



N.R. Cole Photo # 557-02. A wealth of detail, including the mast hoops seized to the luff of the mainsail. The hanks securing the foresail to the forestay can also be seen.

It should be noted that as the headsails were all loose-footed; *Alert* could never have been sailed wing-and-wing. Hence the square sails for use when running before the wind. There was also a large square sail that was only used under those conditions. A mockup of this sail was tried on the model, but obstructed so much of the detail when rigged; it was not installed on the model.

The other sails were installed with the foresail secured to the foresail rings in the same manner as the previous sail. The other sails were also installed and rigged at this time, with a natural twist to the set of the square sails (when viewed from above).

N.R. Cole Photo # 562-22. Showing the set, or moulding of the sails. This view also shows Alert's *rakish lines to good advantage.*

The Ensign

Flags, or ensigns, flown in the eighteenth century were big by modern standards, although they were reduced in size as the century wore on. Flags were initially made from bolts of bunting that were nine inches wide. From these bolts, flags were sewn together, thus providing proportions based on the number of widths; i.e. 10:18 bolts, or a five to nine ratio. This ratio appears to have been true from 1700 to 1837 when the 1:2 ratio for flags appears to have begun to come into effect. In 1864 the 1:2 ratio became the standard proportion used.

Because of the high cost of bunting, and therefore flags, there are indications that they were not worn at sea. This was to reduce wear and damage; however they were always worn, or flown, when in port, while departing or arriving, on holidays, and upon greeting other ships at sea under certain conditions.

Flags or Ensigns Worn

Royal Navy ships carried four different-size flags, each with a specific use. These ranged from the largest, which was a battle ensign, or number one, with a length, or fly, equal to the moulded beam of the vessel, down to quite a small one flown while at anchor. It also appears that ships also carried a Jack, or National Flag, that was the same size as the one in the upper canton of the number one ensign, although I am still looking for confirmation of that.

The sizes of the ensigns were proportional to the number one or Battle Ensign, with its fly equal to the beam of the vessel, and with its hoist, or width, equal to five-ninths of its fly; the

number 2 or General Service Ensign had a fly equal to the hoist of the Battle Ensign and its hoist five-ninths of that, on down through the number 3 or Storm Ensign, to the number 4 or Anchor Ensign.

The ensign represented here was the number two, or General Service ensign; this was the second largest ensign Alert would have carried. We know from Alert's Service records that she was part of Admiral Keppel's fleet; he was Admiral of the White Squadron – The Home Fleet.

The White Squadron was responsible for the protection of the British Isles and also patrolled the North Sea, the French and Spanish Coasts and the Mediterranean. Therefore Alert wears, or flies, a white ensign.

Flag Making

The ensign was created from raw, natural-coloured Chinese silk. The dyes used in the coloured sections were French fabric dyes. While the process is slow and laborious, it produces effective flags, and ensigns, and is well worth the effort.

The silk is held in an embroidery hoop and then the ensign, drawn onto paper, is taped onto the silk with a piece of waxed paper between the two. Each colour to be dyed has to have its boundary painted with a resist, ensuring that every thread in the silk is blocked. Failure to do so will allow the applied dye to bleed into the adjacent area.

All areas that will be the same colour are treated the same way, at the same time.

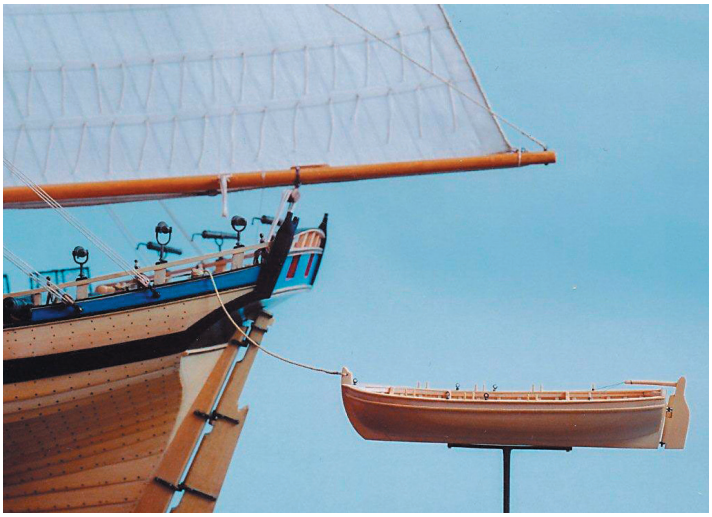
N.R. Cole Photo # 558-21A. The ensign was made of raw Chinese silk, dyed with French dyes. A tricky process, but it provides a good-looking flag.

The dye is applied very lightly with a fine brush and is allowed to flow to the edges of the resisted area(s). The silk is then removed from the embroidery hoop, gently wrapped in a heavy cloth so that the dyed areas do not touch the enclosing material, and the package is steamed for 20 minutes in a double boiler to fix the dye. Once removed from the steamer, the silk is washed in warm water to remove the resist, ironed and then re-installed on the embroidery hoop, along with the drawing, and the waxed paper. The next colour is applied and the steaming process is repeated until all colours have been dyed and fixed.

Once the ensign was completed, it was given a wash in a very dilute solution of Weldbond and water. While still damp, it was draped over wooden dowels to allow it to represent the natural drape of a flag in light airs. Once completely dry, two coats of Floquil Flat finish was airbrushed onto both sides of the ensign. Clips for the halyard were fitted to a short piece of line, which was rolled into the hoist, glued, and lightly stitched. The halyard was then clipped to the ensign and rigged to the end of the gaff and to its cleat on the boom.

For more information regarding my approach to flag making see: Ships in Scale, May/June 1995, Scratchbuilding the Santa Maria Part 6, pages 42-43.

The Longboat

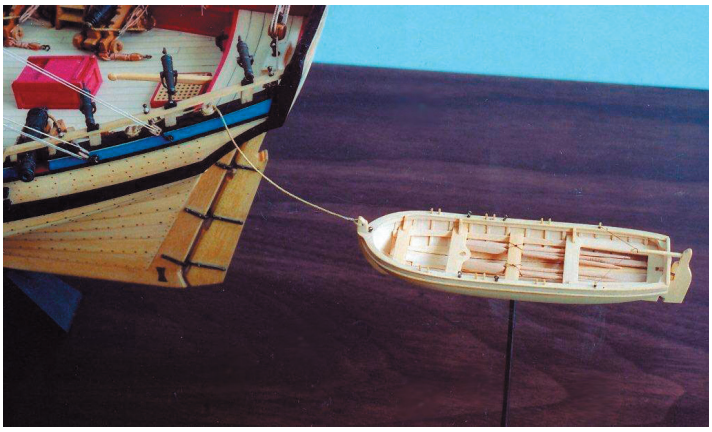


N.R. Cole Photo # 573-35. The longboat is shown being towed. Also visible are the reef points in the mainsail.

The boat was laid up as two square blocks of Columbian boxwood, with a spacer between them equal in thickness to the keel assembly, which would be added later. Lines were marked off on the assembled block and the outer shape was carved. With that done, the interior was roughly hollowed out with a succession of rotary burrs. The three parts of the block assembly was separated and the final hollowing continued. With this completed, the false keel was used as a locator to drill holes into the port and starboard sections. The keel was built, the false keel was laid over it, and holes were drilled to align the dowel holes in all three pieces. Gluing and dowelling the three pieces together assembled the boat. The transom was made and fitted, and then glued and doweled in

place. From there it was a simple matter to fit out the boat with frames, seat risers, thwarts, rudder and oars. All loose gear was secured to avoid loss during passage.

In an attempt to reduce the number of lost boats, the Admiralty had long requested that, if possible, all vessels should hoist their boats inboard while making a passage, rather than towing them. *Alert*, due to her small size and light spars, could not hoist her boat aboard. Even if she could get the boat aboard, there was nowhere to stow it, and still work the vessel and her guns. For these reasons, the boat was undoubtedly always towed as seen in the model.



N.R. Cole Photo # 573-01. This view provides a look inside the longboat with her gear stowed and secured for passage.

The nameplate, mounted on its black plinth was etched into brass plate, using Letraset™ as a barrier. This allows etching away the background, leaving raised letters. Edges, and the back of the plate were protected with a coat of Floquil™ paint. The plate was etched in Ferric Chloride until the desired depth of the letters was reached. The etching process was stopped with a bath of household ammonia and water (50/50). The plate was then washed under running water, and polished with a Brillo Pad ™. It was then oxidized using Hoppes Gun Blue™ to the antique bronze colour seen on the plate.

For more information on making etched, raised-letter nameplates see: Part 13 of the 14 part *Lizzie J. Cox* series published by *Ships in Scale* Magazine, between May/June 1986 and November/December 1988.

Unfortunately since computers came into common use, Letraset ™, used by graphic artists for so long, has become almost impossible to find. A photographic process will achieve the same results using a darkroom-applied resist.

Once dry, the nameplate was given three coats of Satin Finish Krylon™ Lacquer for protection.

With the nameplate installed on its plinth, the model was installed in its Acrylic and black walnut case, which is fitted with concealed lighting in a unit built to fit on top of the Acrylic case, and match the base assembly, albeit slightly narrower vertically for balance. The case was constructed in my shop and was finished with two coats of MinWax™ Polyshades Royal Walnut, followed by two coats of Renaissance Wax™.

Alert is now in a private collection in Chicago, Illinois.