Richard K. Anderson, Jr. and Todd A. Croteau

Futtocks, Buttocks, and Duck Tails

HAER's Maritime Program

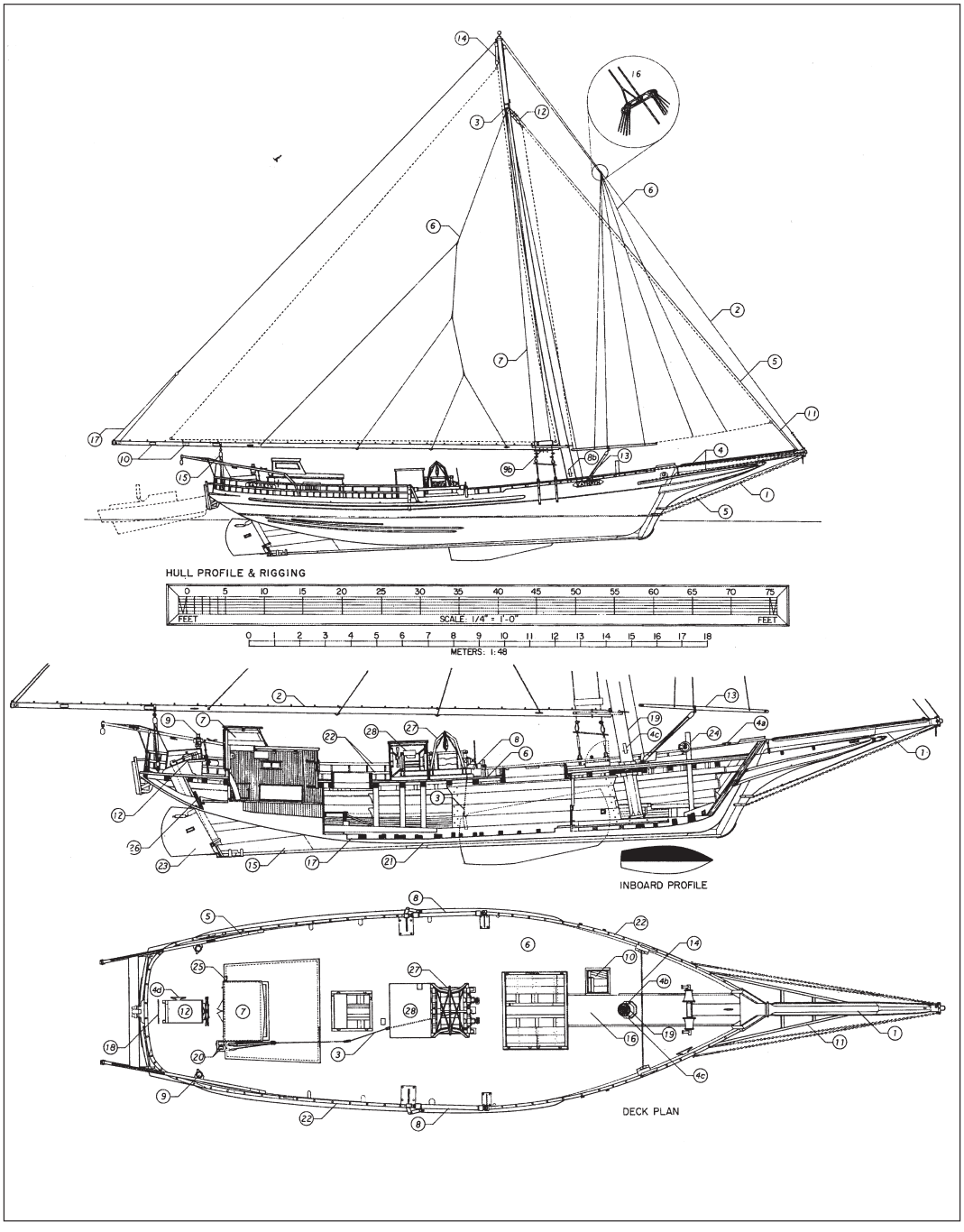
Nationwide interest in maritime history and the preservation or replication of historic ships and small craft has grown substantially in recent years. It has become apparent that physical preservation of large ships will not be feasible in many cases, and that documentation– "preservation on paper"– will prove to be the most reasonable preservation method available. Where physical preservation of a ship is undertaken, in most cases detailed documentation must be made before stabilization, repairs, or other measures can be safely undertaken. Such documentation is also a form of insurance against partial or total loss of a significant vessel should some catastrophe occur to the vessel itself.

Americans have always held an interest in their maritime history; however, efforts to preserve its largest *physical* expression—the ships—have lagged behind preservation of small craft, artifacts, written historical documents, and folklore, with only a few important exceptions. Led by the private and public sectors since the 1960s, the national movement to preserve historic buildings has encouraged a similar movement in maritime history on local and national levels.

The impetus for the development of a HAER Maritime Program lies with the Standards Committee of the National Maritime Heritage Task Force which met between September 1982 and December 1983 under the auspices of the National Trust for Historic Preservation. The HAER Maritime Program was one of several related programs created in response to a 1985 Congressional mandate to "inventory maritime resources, recommend standards for their preservation, and recommend private and public sector roles for that preservation." Vigorous discussion among American maritime museums, professionals, interest groups, and the National Park Service ensued in meeting the goals of this mandate. A national inventory of preserved historic vessels over 40 feet long was completed by the National Maritime Initiative of the NPS, with the cooperation of numerous agencies and museums. In 1987, the National Register of Historic Places published specific instructions for nominating vessels to the National Register. The Historic American Engineering Record produced *Guidelines for Recording Historic Ships* in 1988 in accordance with the established *Secretary of the Interior's Standards for Architectural and Engineering Documentation.* The Museum Small Craft Association began development of guidelines for documentation of historic small craft in 1988; *Boats: A Manual for Their Documentation* was published in 1994 by the American Association for State and Local History. In 1990, the maritime preservation program within the National Park Service published the *Secretary of the Interior's Standards for Historic Vessel Preservation Projects* and *1990 Inventory of Large Preserved Historic Vessels.* Many of these publications were to form a part of the National Trust's planned *Manual for the Documentation of Historic Maritime Resources,* which was to have included guidelines for documenting all types of maritime-related tangible and intangible resources. The Department of Maritime Preservation in the National Trust was disbanded in 1993, and this publication was not issued.

HAMMS

The documentation of historic ships has a long history reflecting the influence of numerous motives, traditions, and important individual authorities. In documenting ships, HAER is building on the work of the Historic American Merchant Marine Survey (HAMMS), a 14-month program administered from 1936 to 1937 by the Smithsonian Institution as part of the Works Progress Administration. Modeled on the HABS program, HAMMS put naval architects and others idled by the Great Depression to work making records of vanishing historic vessels with the intention of providing future naval architects a useful base-line record of American ship design evolution. For its time, it was a monumental effort, and deserves great credit. Of the 426 ves-



Profiles, plans, and sections offer a more standard "architectural" view of a vessel. Profiles delineate the hull form, underwater features, freeboard, spars, rigging, and sails. Inboard Profiles are similar to longitudinal cross-sections showing the vessel from the centerline out. In this case, a small "pushboat" is used for power dredging and is dashed at the stern. Plans show deck arrangements and Sections show the relationship of decks to each other as well as framing details. The 1901 Skipjack Kathryn *is a national historic landmark and one of 22 historic vessels that comprise the only surviving commercial fishing fleet working under sail in the country.* Kathryn's *construction represents a transitional design from round bottom hulls to those with hard chines. Documentation was supported by the Chesapeake Bay Maritime Museum with assistance from the CAMM Sally Kress Tompkins Maritime Internship. Drawing by Shawn Brennan and Martin Peebles, 1995.*

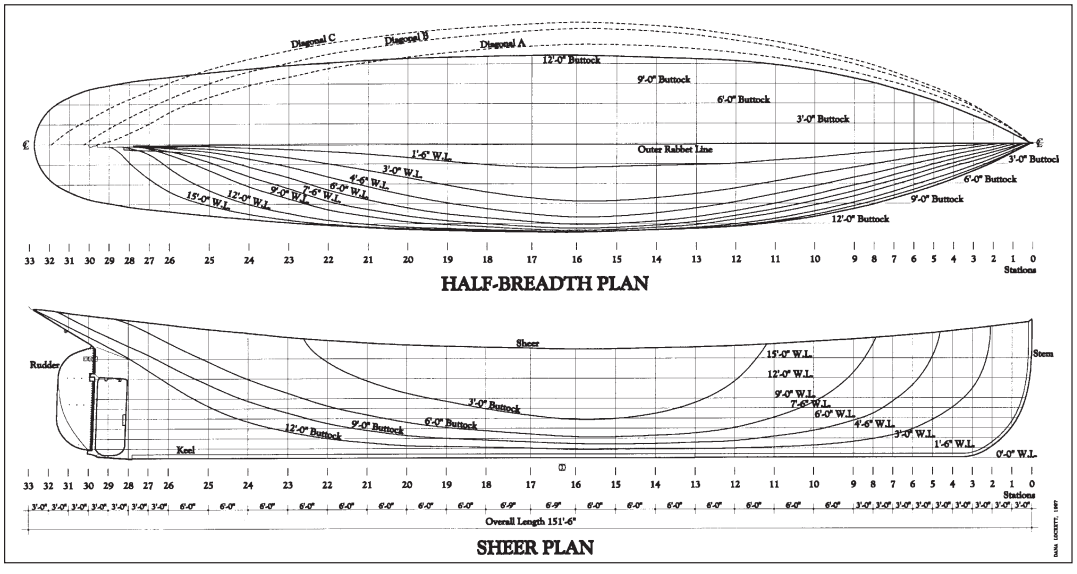
sels included in the survey, only two survive in 2000. (The HAMMS Collection is located in the Division of the History of Technology, National Museum of American History, Smithsonian Institution, Washington, DC. Selected HAMMS drawings were reproduced full-size and published in seven volumes by the Ayer Company of Salem, New Hampshire in 1983.) HAMMS surveys worked from half-models and old drawings as well as extant vessels, and the records vary widely in quality due to the varied skills of HAMMS recorders and the frequent lack of convenient, adequate project verification data in the Survey drawings. Some of the Survey's weaknesses are undoubtedly due to its very short life span and consequent lack of time to refine and stabilize its methodology.

Since the close of HAMMS, hundreds of historic vessels have disappeared without adequate documentation. It is hoped that the HAER program will help prevent similar losses, and in many cases be a prelude to the physical preservation of many worthy vessels for posterity.

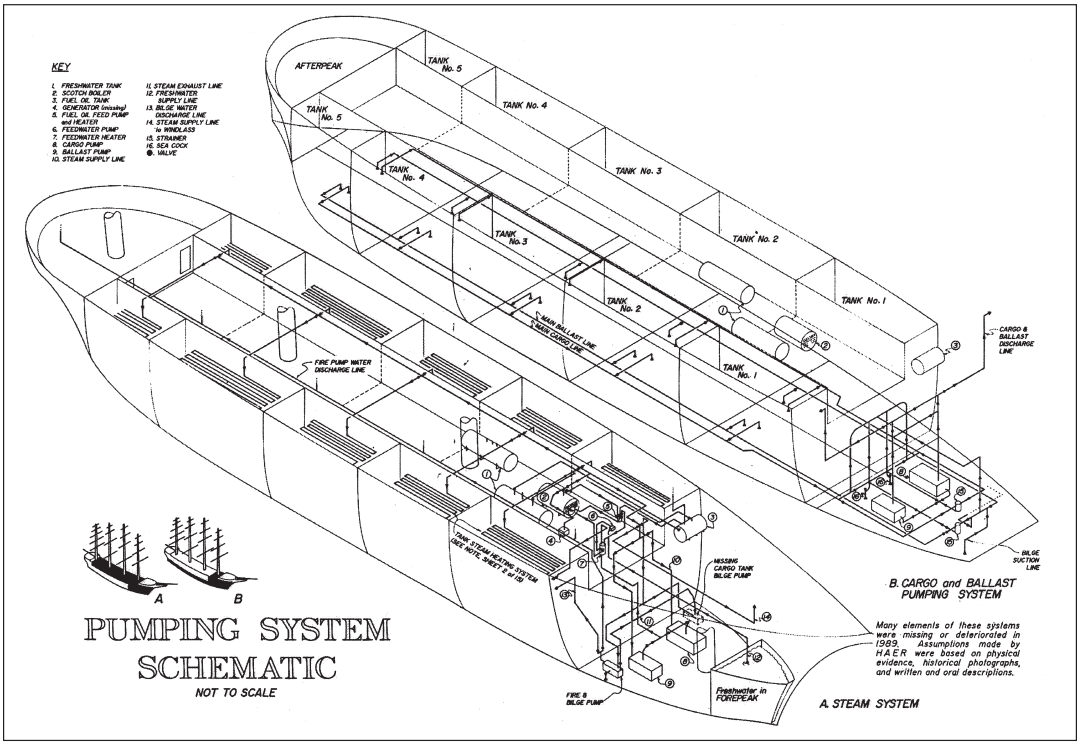
HAER Maritime Documentation

Each component of HAER documentation—drawings, historical reports, and photographs—has inherent strengths the others lack, so that an integrated "package" focused on a specific site or ship becomes a powerful documentary tool; the ship itself is examined and treated as a document every bit as important as historical records. Since all documentary efforts are necessarily selective and interpretive, the HAER guidelines help to elicit and capture the significant aspects of each vessel and present them as clearly as possible.

The main factor determining documentation practice is, of course, significance. HAER documentation focuses on large vessels of national significance as determined by national inventories, other suitable research, or designation by the Secretary of the Interior as national historic landmarks. This scope includes significant survivors of regional and local vessel design. HAER documentation is also site-specific, and records what is significant about each site and vessel. Where design is important—as it is expected to be in the majority of cases—hull shape and/or vessel construction and propulsion is highlighted as significance dictates. Measured drawings may not be required in some cases, since significance may inhere in some non-design facts, such as historical events or associations with important persons. Existing drawings and records



Lines drawings are probably the most definitive and widely used forms for delineating the shape of a vessel. A series of Cross Section measurements are made along the hull similar to slices in a loaf of bread. These sections are then connected with longitudinal lines called Water Lines and Buttock Lines that define horizontal and vertical planes respectively. A Table of Offsets lists the actual measured locations of points along the hull. From the lines or table of offsets a hull can be reconstructed in three-dimensional form. The use of photogrammetry to record the hull measurements saves considerable field time and cost. The drawing shown here depicts the lines of the 1907 ocean-going steam tug Hercules*. Located at the San Francisco Maritime National Historical Park,* Hercules *is a national historic landmark and remains in operating condition, serving as a museum ship interpreting themes of steam technology and San Francisco Bay history. Documentation was supported by the San Francisco Maritime National Historical Park. Drawing by Dana Lockett, 1997.*



Schematic or process drawings interpret a ship's systems or functions. Using axonometric, perspective, or illustrative techniques, HAER can graphically represent how a vessel operates, explain complex movement of cargo, or show how the vessel worked the water. Though often based on field measurements, this type of drawing relies heavily on the historical research component. Utilizing written documents and historic photographs or drawings, HAER delineators can illustrate processes no longer extant or in operation. The 1878 ship Falls of Clyde*, a national historic landmark located at the Hawaii Maritime Center, was originally operated as a four-masted square-rigged cargo ship. Converted to a sailing oil tanker in 1907, it carried bulk petroleum products to Hawaii and molasses back to California in the same tanks. This drawing illustrates the relationship of the pumping system to the complete vessel. Drawings by Todd A. Croteau, 1989.*

may also be sufficient to document historic conditions. Interpreting the vessel's function is also paramount to the understanding of its design and significance. HAER documentation describes the processes performed or the role the vessel plays in its environment.

In general, HAER documentation seeks to document vessels more than 30 feet in length that are floating, or in some manner laid up out of water (e.g., in a dry dock, on a marine railway, as hulks on a beach.). Half-models may also be considered. While documentation of small craft is encouraged and is not excluded from the HAER collection, HAER concentrates on the documentation of larger vessels, principally because they are more susceptible to loss. Small craft—vessels less than 30 feet long—tend to find their way into museums or other protective care much more easily than larger vessels.

The HAER Maritime Program also encompasses a variety of marine resources, in addition to specific vessels. Land-based, maritime-related sites can be documented for HAER using the traditional HAER approach. These sites include lighthouses, shipyards, transfer facilities, seafood industries, and many others. Documentation has also included archeological sites of maritime interest, whether underwater or underground. Preferred resources include substantially intact hulks, whether sunk, buried or beached, and for which contemporary documentary sources (e.g., records, photographs) can be found.

Technology for Drawing Vessels

Vessels possess few straight lines in their design and pose a difficult task for measuring with traditional techniques. HAER is utilizing emerging computer technologies to facilitate recording the complex curvature of ship hulls for lines drawings, expanded hull plans, and other features. Many vessels are surveyed while in dry dock with limited time available for measuring. The use of CAD, photogrammetry, Total Stations (or digital transits), laser scanning devices and three dimensional modeling programs has signifi-

cantly reduced field time for taking lines off a large ship from one week to two days. These tools make it possible to record vessels within a few hours, where tides, dangerous conditions, or other factors may affect field time. The drawback to many of these technologies is that the instruments can only record what they see, whereas the hands-on approach can overcome a variety of obstructions.

The Future of Maritime Documentation

Attempting to document a large variety of vessel types throughout the country, HAER partnered with the Council of American Maritime Museums (CAMM) in 1990 and developed the Sally Kress Tompkins Maritime Internship. CAMM and the Internship promote the documentation of maritime resources nationwide and encourage museums to take the lead in preparing these records. One such activity includes the cooperation of the Mystic Seaport Museum and South Street Seaport, which received a grant from the National Center for Preservation Technology and Training to purchase a Total Station, develop guidelines for its use on vessels, and make it available for use by CAMM member institutions and other qualified groups. HAER is participating in this grant and has recorded 10 vessels since its inception. HAER will continue to encourage contributions of water craft documentation from throughout the country to represent the diversity of America's maritime heritage.

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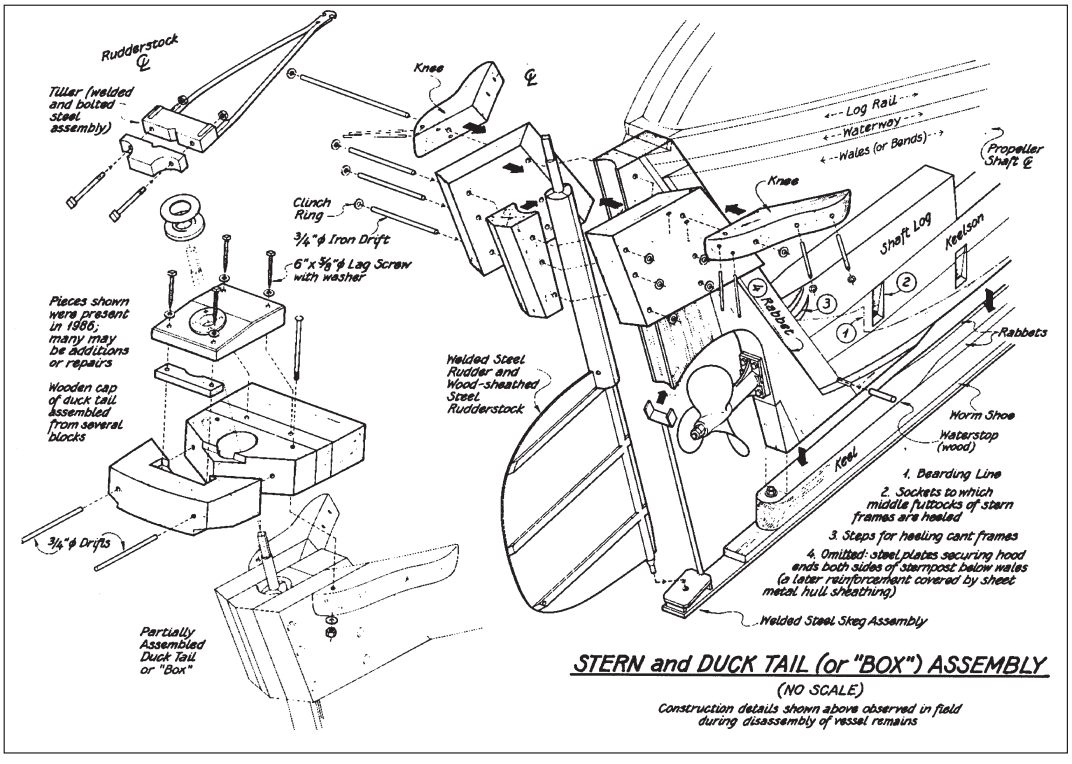

Construction details illustrate the various components, fastenings, and building techniques used in the assembly of a vessel. Regional differences are revealed by material choices and arrangement of parts such as frame futtocks. The 1896 Bugeye Louise Travers *was built by James T. Marsh who was known as the inventor of the "Duck Tail" or "Box" stern. A significant development in ship design, the Duck Tail Stern provided protection for the rudder assembly on sharp-sterned vessels. This vessel was recorded by HAER prior to and during demolition nearly a century after its construction. In 1986 it was considered beyond economical repair and was cut into three sections for study and subsequently burned...but not at sea. Documentation was supported by the Calvert Marine Museum and the National Trust for Historic Preservation. Drawing by Richard K. Anderson, Jr., 1990.*