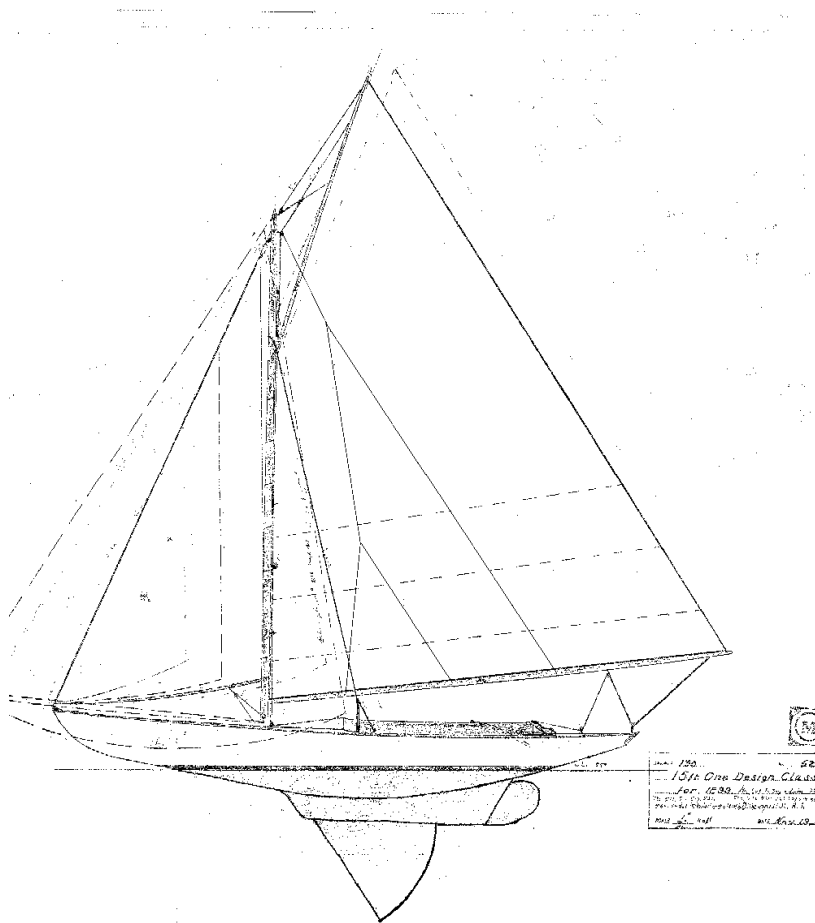




The Herreshoff 15 Is Alive And Well ...



By: Alec E. Brainerd, Bernard H. Gustin, and Steven K. Nagy

This paper discusses the history, restoration, and reproduction of the Herreshoff 15-footers. The first section presents the history of the H-15 class and its evolution through today. It also reviews the Herreshoff Registry, which documents the members of the class and provides a central repository of identification numbers.

The second section discusses the restoration of existing, original boats; and the construction of new members of the class – all from a boat builder’s perspective. The third section presents the issues faced by an owner making design choices for the recent construction of the new H-15 MURMUR.

I. - CLASS HISTORY AND EVOLUTION

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INTRODUCTION

The 15-footer was one of the most popular products of the Herreshoff Manufacturing Company (HMCo). Between 1899 and 1928, ninety-two boats were built to the design. Only the S Boat, with ninety-four examples, and the venerable 12½ with 364 examples, were more sought after. HMCo records reveal that the original H-15 owners included many of the prominent yachtsmen of their era. Today, thirty-two of the original H-15s are known to exist, and new interpretations of the design continue to be built.

HISTORY

The first eleven boats of the Buzzards Bay 15 class were delivered to members of the Beverly Yacht Club (BYC) in Marion, MA for the summer racing season of 1899. Club members, led by Robert Emmons, wanted a better way to conduct regattas than using a handicapping system, and asked Nat Herreshoff to design a boat that could be raced as a one-design fleet. The resulting Buzzards Bay 15 (Fig.1) was the second of the Herreshoff one-designs (after the Newport 30 of 1896), and became quite popular in the early 20th century.

In the spring of 1899, Nat himself delivered the first eleven boats to the BYC, towing the new boats behind his steam yacht SQUIB. The new owners drew lots to determine which boat would be theirs. The boats became the BYC E-Class, and racing commenced using letters as sail numbers. By 1901 the familiar E-xx format for sail numbers was implemented (Fig. 2). E-Class fleet racing continued at the BYC through 1944 (Fig. 3).

Robert Emmons and the BYC played an important role in the history of the Herreshoff Manufacturing Company. Over the years, Emmons and his family owned three H-15s (including FLICKAMAROO, one of the original group); CHUB, one of the first twenty 12½s; a Buzzards Bay 30, MASHNEE; and several others. Not only was Emmons the driving force behind the introduction of the 15-footers, he also was the ring-leader of the group that commissioned the 12½. He was a long-time member and commodore of the BYC, which was the hotbed of one-design racing in Buzzards Bay. BYC was the source of a number of Herreshoff commissions, a key to the success of the company.

One of the most well-known examples of the early boats is FIDDLER (Fig. 4), now owned by the Mystic Seaport

Museum. First purchased by Loring Brooks in 1901 and named NORA, she was acquired by Caroline Dabney in 1903 and re-named FIDDLER. Ms. Dabney successfully raced the boat in the all-women regattas held by BYC, and then passed her on to her son, Augustin Parker. The boat stayed in the family until she was donated to Mystic Seaport in 1959.

DESIGN

Class Variations

The 15-footer is known as a “compromise sloop.” It was originally designed for the shoal waters of Buzzards Bay, and had both a shallow ballast keel and a centerboard. Following the Buzzards Bay 15, a second version called the Newport 15 was introduced, also in 1899. It was intended for use in the deeper waters of Newport, RI and had a keel that was 6" deeper. A third iteration, the Watch Hill 15, was designed by Sidney Herreshoff in 1922, and introduced in 1923 (Figs. 5 – 6). Eleven of these were delivered to the Watch Hill Yacht Club in 1923. They had the basic hull of the Buzzards Bay 15, but with a modified sheer, a Marconi rig, and a pointed-style coaming.

In addition to these three principal design variants, Herreshoff used this hull form in four full-keel, no-centerboard examples. Of these, only Anne and Maynard Bray’s FLICKER (Fig. 7) is known to exist today. The FLICKER design, HMCo # 674, was the basis for the new MURMUR, discussed in this paper.

Hull Design

The hulls of the BB15, Newport 15, and WH15 have a 15 foot waterline and are 24 feet, 6 inches overall with a 6 foot, 9 inch beam. The BB15 and WH15 draw 2 feet 3 inches with the centerboard up, and the Newport 15 draws 2 feet, 9 inches. Displacement is stated as 2,800 pounds, though most builders believe that is somewhat overstated. MURMUR, for example, weighs in at just over 2,400 pounds. The full-keel versions sink a little deeper, extending the waterline to 15 feet, 9 inches.

The H-15 was designed under the then-prevailing Length and Sail Area Rule, which produced graceful, narrow hulls with long overhangs. The America’s Cup yacht COLUMBIA was designed to this rule, and many refer to the H-15 as “Little Columbia.” When heeled over, the waterline length increases, and the boat picks up speed.

As originally conceived, the H-15s were intended for speed and aggressive racing. As a consequence, the long overhangs built to the relatively light Herreshoff scantlings were somewhat fragile, and cracked ribs and keels were not uncommon. Partially as a result of this fragility, the number of boats still in existence is small.

Of the ninety-two originally built, thirty-two are currently known to exist. Bill Beardsley, a Herreshoff owner and E Boat enthusiast from Marion, MA has been following the design for years and believes there might not be any others left to discover. Of these thirty-two, fewer than twenty are still sailing. The others are either in museums or awaiting restoration.

The lightness of the design may explain why so few still exist. Though subject to interpretation, statistics derived from the Herreshoff Registry show that only 35% of the 15-footers are known to exist today. That figure is 55% for the popular S Boats and 12½s. Modern builders working on new or restored H-15s often take measures to strengthen the hulls. Alec will touch on this later in the discussion.

POST-HMCo 15-FOOTERS

Between 1969 and 1994, the Frank Hall Boat Yard in Avondale, RI built twenty-five Watch Hill 15s in fiberglass to the original 1922 design, equipped with aluminum spars and sails of modern materials. These boats are actively raced at the Watch Hill Yacht Club (Fig. 8). Four of the original wooden boats from 1923 still compete at WHYC as well.

As a testament to the enduring appeal of the H-15, about ten new boats have been built in wood over the past fifteen years. Larry Gillen of Kansas City built a Buzzards Bay 15, WHISPER (Fig. 9), in 1993. The late Dave Corcoran and his Bullhouse Boatworks built at least six superb renditions in the late 1990s and early 2000s (Fig. 10). Since then, Alec Brainerd and his Artisan Boatworks have picked up where Dave left off. Alec's Watch Hill 15, KITTY (Fig. 11), is stunning. Just as magnificent is the new MURMUR, which will be discussed in more detail.

DOCUMENTING THE CLASS

The Herreshoff Registry

The Herreshoff Registry, found on the Internet at www.herreshoffregistry.org, is an ongoing project to document the history and status of the sailing yachts built by the Herreshoff Manufacturing Company. Housed on this website are several documents covering not only the entire fleet of HMCo sailing vessels, but specific documents focused on the 12½ and 15-footers. Each boat is classified as found, destroyed, or unaccounted for. Provenance is published where available. The site also contains a searchable database and a growing discussion forum. Database contents are continually updated as revised information becomes available. Your assistance is requested to help keep the information as complete and current as possible.

The Herreshoff 15-footer Fleet Registry

One of the Registry documents focuses on the current status of the entire existing 15-footer fleet. This differs somewhat from the other components of the Registry in that non-HMCo boats built to the design are included as well. There are about seventy existing boats, and including the entire fleet allows owners and aficionados some insight into the totality of the class.

Additionally, this comprehensive list facilitates organized racing (Fig. 12). With multiple fleets, multiple styles, and both new and old boats still competing, there is value in establishing a consolidated fleet registration number encompassing all of the boats. This enables new boats and old to be uniquely identified, aids in the assignment of sail numbers, and helps the class regattas in which many owners hope to participate.

The numbering scheme used to assign a fleet number in this Register is shown in the following table. The Fleet ID can be used to assign a sail number in those cases where a boat does not already have one. In such situations, the format would be, for example:

H-15
100

where "100" is the Fleet ID number.

Many H-15s already have a sail number. Some earlier boats may use their original sail number, and some local fleets, notably the Watch Hill Yacht Club, have an existing numbering scheme. In a few cases, builders and owners may have assigned sail numbers which might duplicate others in the H-15 fleet. All of these sail numbers in no way interfere with their respective boat's unique H-15 register number.

Fleet ID Ranges	Usage
1 – 92	Original HMCo boats, sequenced by hull number.
95 – 104	Identified Herreshoff Manufacturing Company boats without a known hull number.
105 – 109	Earlier boats not built by the Herreshoff Manufacturing Company.
110 – 139	The fiberglass fleet of Watch Hill 15s, built by Frank Hall Boat Yard.
140 – 149	Boats built by Bullhouse Boatworks.
150 and up	Newly constructed boats and any other boats joining the fleet without a hull number, which don't fit into one of the above schemes.

Table 1 - Fleet ID Numbering Scheme

II. - RESTORATION AND CONSTRUCTION¹

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RESTORATION OF ORIGINAL H-15s

Rebuilding a classic yacht with the pedigree of a Herreshoff 15 requires careful consideration, to restore structural integrity without compromising historically significant details of original design and construction.

Structurally speaking, the H-15s were remarkably well engineered for their overriding purpose: racing. Herreshoff's goal was to create the lightest possible hull with the strength needed to carry her sail. Longevity was secondary because newer, faster one-design classes were emerging every year. This balance of strength, weight, and durability was achieved perhaps better by Herreshoff than by any other designer of his era, and is a major reason why his designs have long outlasted their intended life spans.

The size and shape of every structural member of the Herreshoff 15 is specified to an exact dimension, often to the 32nd of an inch. By making each piece exactly the necessary strength, and not an ounce stronger, the builders kept the hull lightweight and strong by transferring loads evenly and widely. Thankfully the Herreshoff archives at MIT's Hart Nautical Collection give us all immediate and easy access to all of NGH's original design details (see Appendix 3).

The best candidates for restoration or rebuild are boats that have received very few repairs over the years. What is remarkable about these boats is that they are perfectly and uniformly worn out. No one piece significantly outlasted its neighbor, and it is sometimes necessary to replace everything. Why would a boat that needs everything replaced be a candidate for restoration at all? They can be easily drawn back to their original hull shape; they come apart easily; and the pedigree, ballast keel, and hardware do not lose their value.

Naturally, in restoring wooden race boats over one hundred years old, we find that each boat's history and condition are unique, so each boat tends to pose unique challenges. Generally speaking, however, from the many original H-15s that have been restored, we have learned that the principal generic issues that arise with these boats tend to be as follows:

-Plank seams widen from excessive drying and swelling. Localized over-caulking causes "hard spots" that leak and can wedge planks away from the frames at the turn of the bilge (Fig. 13)².

-Fasteners deteriorate and lose their hold on softened frames. This causes excessive flexibility in the entire boat, and it is often said that "these old boats are tired." These uniformly tired old boats tend to be the best candidates for restoration.

-Frames are broken and sistered. Sister frames often create "hard spots" either side of the break, and tend to break soon in the same place, leading to a "knuckle" (Fig. 13) in the sectional hull shape. It is always best to remove a broken frame altogether, and to replace it, so as to maintain a structural balance. Sister frames may give old boats a few additional years of life, but ultimately cause problems and complicate the restoration process.

-The sheer of the boat has "hogged" from light construction, long overhangs, and general deterioration.

-Floor timbers have been "crushed" by over-tightening of keel bolts, and continual cycles of drying and swelling. Their connections to the frames have loosened as frame heels deteriorate, causing garboard leaks.

-Deck leaks in inaccessible areas, particularly at the transom, cause rot.

-Concentrated loading at the mast step causes excessive garboard leaks when sailing, and over-tightened shrouds and running backstays can cause localized humps in the sheer line. (We often extend new mast steps over several additional floor timbers to address these issues.)

-Centerboard trunks on any boat are often problematic.

-Interestingly, most problems occur in the transverse structure of the boat, such as the frames and floor timbers. The planking, plank keel, and sheer clamps can often be repaired and re-used.

¹ All figures in this section courtesy of Artisan Boatworks

² Figs. 13 – 18 are based on the restoration of a Dark Harbor 17, but the issues they illustrate apply identically to an H-15.

In addressing these generic issues with original Herreshoff boats, we should credit Ed McClave and Andy Giblin of MP&G with literally “writing the book” on restoration and rebuilds. At Artisan Boatworks we continue to reference their seven-part series of articles in *Wooden Boat Magazine* when undertaking such projects. Our standard procedure for restoring wooden boats, influenced by the work of MP&G, is as follows:

The deck is removed with a chainsaw to provide access to the interior of the hull. This sounds extreme, but knowing that the deck needs to be removed, we turn to the most efficient means at hand. The difference between an efficiently conducted restoration, and one that goes hugely over budget, usually lies with the planning, and in not getting hung up on unnecessary and painstakingly slow removal of parts that will need to be replaced anyway. Even on original boats, the later addition of a plywood deck is generally acceptable, as it will greatly stiffen the hull and prevent future fresh water leaks.

Any prior repairs (such as sistered frames) are removed, and molds are inserted into the hull and aligned with the rotary laser, to restore the transverse and longitudinal shape (Fig. 14). We work with Herreshoff’s original offsets to ensure that a restored boat is exactly the same shape as when she was first launched.

The ballast keel and deadwood are removed, and all of the frames and floor timbers are replaced (Fig. 15). To replace the deck of an old boat, and not replace all of the frames and floor timbers, is irresponsible. On many of our rebuilds, we have ripped off a perfectly good deck less than ten years old in order to access and replace a whole line of broken sister frames.

If the stem or transom need to be replaced, they are (Fig. 16). Then the hull is flipped over for a new plank keel, if necessary, and planking repairs (Figs. 17, 18).

Restoring the planking on original Herreshoff 15s can be accomplished in several ways. The planks can be replaced; they can be removed, repaired as necessary, and then refit; or their edges can be renewed with cedar splines. In all cases, the goal is to achieve tight wood-to-wood seams between the planks, so that a small and uniform strand of cotton can be rolled in and the boat will regain her stiffness as the planking swells.

One of the most important opportunities we have to improve the longevity of original Herreshoff 15s during restoration is to paint every piece of wood thoroughly. Several coats of paint over well prepared and dry wood (especially the inside of the planking and the bilge) help to add dimensional stability by reducing water absorption that can lead to excessive seasonal expansion and contraction (Figs. 15, 19, 20).

From this point on, new construction practices prevail. It is almost never worth saving any of the decking or deck framing under it, as the steel fasteners that, unfortunately, were used in HMCo boats have generally sickened the inside of the oak beams. We always strive to re-use original varnished pieces such as toe rails, coamings, seats, doors, etc. The character of this “antiqued” wood is what ultimately defines the historic value of original boats.

With respect to hardware and rig, we often find that original bronze hardware has been replaced with stainless steel or plastic. When restoring original H-15s, we feel it is important to eliminate all modern hardware, and replace it with appropriate bronze equivalents to replicate Herreshoff originals. Of course the “crème-de-la-crème” on any original Herreshoff yacht is the builder’s plate with its HMCo hull number. If the original plate has been lost, and we are absolutely certain of the boat’s provenance, we can have an exact replica made.

In summary, the challenge when restoring original H-15s is to restore the boats structural integrity efficiently, but avoid short-sighted fixes. We seek to preserve historical significance and pedigree by duplicating original materials and methods, and to give these boats a new future as promising as their successful past.

NEW REPRODUCTIONS

These days, finding original Herreshoff yachts to restore is a real challenge – in the case of H-15s, an almost impossible task. So at Artisan Boatworks we have turned to building reproductions. We can readily build an exact replica using essentially the same materials and construction methods used at the Herreshoff Manufacturing Company in the early 1900s, and the cost is about the same as a restoration.

On the other hand, it is difficult to ignore one hundred years of advancements in boatbuilding technology. Fiberglass or other advanced composite materials aside, the most notable recent innovations in wooden boat construction have been adhesives and coatings: most notably epoxy and cold-molded or laminated wood construction. The strength of wooden boats built using these new technologies is almost entirely in the hull skin, which becomes so strong in and of itself that transverse frames can be eliminated except where necessary for attaching bulkheads.

By changing the classic construction of these designs, there is a certain loss of pedigree and historical significance. For some people, that is of less concern than the benefits. Though we could build a cold-molded H-15, in my opinion, the structural components of any

classic design are as important to the overall visual effect as the sheerline and bow profile. These structural components include steam bent frames, floor timbers, and tapered plank lines.

In his day, NGH was a pioneer in both design and technology—and from this perspective, perhaps the Herreshoff 15s could be thought of as the Melges 24-equivalents of their day. But due to their timeless aesthetic appeal and wholesome sailing characteristics, the H-15s remain in demand today. However, today longevity and reduced maintenance are more important priorities—priorities that can be achieved using new adhesives and coatings that remain generally invisible.

We should recognize the late Dave Corcoran of Bullhouse Boatworks for his lifetime contribution to the survival of the Herreshoff 15s, and especially his adaptation of new technologies in the Herreshoff replicas he built. Many of the building techniques we use at Artisan Boatworks were inspired by our admiration of Dave's work.

BUILDING MURMUR

In building MURMUR, we decided to use epoxy to the fullest extent possible without materially changing Herreshoff's design or construction specifications.

Setup

The Herreshoff Manufacturing Company's well known method of building a temporary mold for every frame is highly efficient for a large crew building many examples of the same boat. However, we have found that this method is not cost-effective on a limited production scale. We continue to build the boats upside down, but build molds only for every third frame, spaced so that control frames coincide with permanent bulkhead locations. This reduces the temporary molds from 34 to only 8 plus the 3 permanent bulkheads (Fig. 21).

Before the mahogany plywood bulkheads are set up, v-grooves are routed in them to simulate the original appearance. They receive three coats of epoxy, door openings are cut, and seat cleats and sole cleats are installed. The stem is laminated to shape on the loft floor with $\frac{1}{8}$ " mahogany veneers, and then a conventional rabbet is cut. Both the transom and transom frame are glued up on a form to the correct radius from four layers of $\frac{1}{4}$ " mahogany plywood, and then shaped in place on the boat (Fig. 22).

Once the molds, bulkheads, stem, and transom are accurately set up using a rotary laser level, the plank keel is laminated in place using three $\frac{1}{2}$ " layers of mahogany. Throughout, wherever Herreshoff specified white oak, with the exception of the frames, we have substituted

laminated mahogany. It is as strong and rot resistant, but far less prone to checking and shrinking.

Next, the floor timbers are glued and bolted to the keel and faired for the frames and planking that are to follow. The rabbet is cut in place along the edges of the plank keel using the floor timbers as a guide, the deadwood and keel are faired, and limber holes are cut in the floor timbers using a 1" core box bit in a router that runs along the rabbet. Completing all of this centerline work before the ribbands and frames are installed allows easy access. If the boat has a centerboard (as of course the vast majority of the H-15s did), it would be installed at this time as well (Fig. 23).

Next, the planking is lined off, and temporary full length "glu-lam" ribbands are bent around the molds. The white oak frames are steam-bent under these ribbands and are riveted to the floor timbers in the conventional manner (Fig. 24). At this point, we have achieved a faired setup, ready for planking. The entire backbone structure, although of laminated mahogany, looks exactly the same as an original Herreshoff 15 once it has been painted.

Planking

Planking can be installed over this setup in any number of ways: in multiple diagonal layers over the steam-bent frames, or by strip-planking over the steam-bent frames and then sheathing with a layer of fiberglass cloth. Either of these methods would be very stable, and so strong that the steam-bent frames would not be necessary. Alternatively, and on several occasions, we have planked the boat conventionally, using carvel cedar planks whose seams were then caulked with cotton and seam compound. This latter method works as wonderfully now as it has for hundreds of years, but has the familiar drawbacks of having to allow the hull to swell and tighten up in the spring, and of seam compound sometimes squeezing out during the process.

The way we planked MURMUR and our previous Herreshoff 15, KITTY, is somewhat controversial, but has been practiced successfully for years by European yards. We used conventional, full thickness edge-glued carvel planks of air dried Northern White cedar—just as Herreshoff specified—but with mahogany garboards, broad strakes, and sheer planks for additional strength. All planks were scarfed to length to eliminate butt blocks, and fasteners were bronze screws as original. We glued the garboards to the keel and floor timbers, then edge-glued the succeeding planks to each other and to the frames (Figs. 25 - 28). Once the hull was bunged and faired, we applied three coats of epoxy to the outside of the planking, followed by conventional oil-based paint.

At this point, some people ask “won’t the planks split apart or cup?” Based on experience, the answer is “no.” The planking is dry when it is hung, and the epoxy is remarkably flexible as well as tenacious. The epoxy barrier keeps the wood from absorbing water from the outside, but the inside is painted only with oil based enamel, so the planking can breathe. With both KITTY and MURMUR, we have found that in the first season the planking swells slightly, achieving the pressure that gives wooden boats their strength, and revealing just the slightest hint of those sweetly tapered carvel plank lines. There is no leaking, no seam compound squeezing out, and no paint cracking or plank cupping.

It is important to recognize that this is still a single-planked wooden boat that must be stored to avoid excessive drying out during the off-season. But the inherent elasticity of cedar, coupled with the flexibility of epoxy and limited water absorption, allows for traditional appearance, increased stiffness, reduced weight from water absorption as the season wears on, and reduced maintenance from the glued seams.

Deck

Once the hull is faired, it is turned upright and the ballast keel is attached. The lead is glued on, and the standard bronze keel bolts are potted in epoxy as with cold-molded construction. The sheer clamps, laminated from three layers of fir using the outside of the hull as a form, are then tapered, beveled, placed inside the hull and riveted through the frame heads and sheer plank. The deck beams are computer lofted to create a fair centerline, laminated in large oversized blanks, and ripped to thickness on the table saw. The whole deck frame is temporarily installed, and the ½" mahogany plywood deck is scarfed together in place (Fig. 29).

The next day, after the glued scarfs have cured, the plywood deck is removed in one single large piece, flipped over, and faired. With the underside facing up, the deck gets flow coated with epoxy, primed, and finish painted. While this is taking place, the entire deck frame is taken apart, sanded, and given four coats of varnish. Also at this time, a third team fairs and paints the entire inside of the hull. It receives two coats of primer, two full top coats, and the visible area (aka, the cockpit) between the watertight bulkheads gets a final third top coat mixed with a flattening agent (Figs. 19, 20).

On assembly day the deck frame, breast hook, and blocking are re-assembled with screws through the beam ends into the sheer clamps. We apply a very small bead of 5200 to the tops of all the beams and to the upper edge of the sheer plank (Figs. 30 - 32), flip the deck back over onto its frame, and fasten it with over one thousand 1" #8 bronze wood screws. The 5200 helps bond the pre-painted deck to the varnished beams, but ideally,

does not squeeze out -- so no clean-up is necessary. The same day, we go around the perimeter of the deck with a router, rabbeting the plywood back ¼" from the outside face of the sheer planks. Into this rabbet we glue a mahogany band that covers the edge of the plywood, and forms an epoxy bond between the deck and sheer plank.

We then fair the top surface of the deck and its edge band to the same standards as the hull. With a long stiff batten and jointer plane, we finalize the sheer line in both profile and plan (Fig. 28), and then lay 6-ounce fiberglass cloth in epoxy over the top of the plywood deck. When the epoxy is almost cured, we skim coat the glass with epoxy fairing compound to fill the weave, and then seal the entire outside of the hull and deadwood with epoxy.

The deck is then faired smooth; its outside corner is given a ¼" radius; and the hull, deck, and keel receive two additional coats of epoxy. Mahogany coamings and toe rails are installed (Figs. 33 - 35) and receive ten coats of varnish, which is then taped off, and the deck receives its paint with flattening agent and non-skid. The topsides get three coats of high-build primer, which is long-boarded to be absolutely fair before the three topcoats are applied. In all, 25% of the labor on a project such as this consists of the surface preparation and coatings: fairing and finish sanding, epoxy, varnish, and paint.

MURMUR’s bronze hardware is all new, mostly exact duplicates of the original Herreshoff pieces supplied by J.M. Reineck, but includes modern, and generally invisible, innovations. All of the blocks, for example, have Delrin ball bearings, and the running rigging is zero-stretch Vectran with a traditional manila-colored cover. The mast is hollow, and glued up in an 8-sided “bird’s mouth” configuration.

In the end, what we have accomplished in building MURMUR is a reproduction of a Herreshoff 15, using modern epoxy adhesive and coating technology to the fullest extent possible, without noticeably altering the design’s spirit or appearance. MURMUR was built at Artisan Boatworks in Rockport, Maine, by three carpenters in less than four months—from late December 2008 to April 2009.

III. - BUILDING MURMUR, AN H-15 REPLICA: AN OWNER'S PERSPECTIVE

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When an admirer of a unique older design, or of a strict one-design class, builds a replica to the original designer's plans, the design and construction issues should be straightforward. True, if one has access to the expertise and experience of restorers of the older boats, one can use their insights about the strengths and weaknesses of the original design to make a replica that is better than the originals. And if new materials or technologies exist, which can be used to make replicas that are stronger and more stable than the originals, as Alec Brainerd has learned to do, these innovations can be used to enhance the design and its construction invisibly. But none of these relatively small refinements changes the basic design of the boat.

But what should an owner do who admires a class that evolved as much over time as the H-15s did, or was built in as many versions as they were? This paper presents the many design choices Alec and I faced before finalizing what MURMUR would be. Then I'll report briefly on how the decisions we made have worked out in practice.

By the way, MURMUR (H-15 # 152 in Steve Nagy's new Register) is named after HMCo # 671, a now-lost Newport 15 of 1907.

DESIGN ISSUES

A Strict Copy vs. A Combination Design

The first and overriding decision we faced was whether to replicate a specific boat or version of the design, or to combine elements from the many different variants of the H-15 in a single boat. For example, since I was committed to the aesthetics and convenience of a gaff rig, we could have made MURMUR an exact replica of an original Buzzards Bay 15 or of a slightly deeper Newport 15. However, both of those variants had centerboards (Fig. 36); from decades of experience sailing 12½s (Fig. 37), I knew I wanted a boat without a centerboard trunk, maximizing space in the cockpit.

This led us to Maynard Bray's H-15 FLICKER, HMCo # 674 (Fig. 7). (HMCo also built # 677 and # 682 to the FLICKER design; these boats are believed lost.) This 1907 no-centerboard variant of the H-15 seemed like a great point of departure, because even with a full keel, at 3¼" her draft is only 13½" deeper than the original BB15s. And since MURMUR will be sailed mainly at Newport, where there's plenty of water, draft isn't an issue.

FLICKER has many distinctive features that made her attractive as a model. Commissioned by her owner as a day-sailer to be hoisted onto his steam yacht, she was designed, it seems, for a longer life than the racing H-15s, as well as to withstand the loads and stresses that would have inevitably resulted from repeated lifting and launching.

In designing # 674's full keel, Captain Nat modified the original design ingeniously: he used the same ballast casting as for the Buzzards Bay boats, but mounted it a foot lower (Fig. 38). He also filled the area where the centerboard slot would have been with lead. As a result, FLICKER carries 250 pounds more lead ballast than the standard H-15s, and it's mounted far lower, making for a much stiffer boat, and hence requiring heavier construction.

Reflecting these differences, NGH drew FLICKER with heavier scantlings than the Buzzards Bay and Newport 15s. Her frames are larger, the floors are taller, the keel and sheer clamps thicker, etc. Maynard feels this more robust design throughout helps explain why FLICKER, which has never been refastened, and is essentially original, has never lost her correct shape, as have so many of the lighter H-15s, which were raced hard.

Based on Alec's building and restoration experience, we decided not to change any of the structural modifications NGH specified for FLICKER. We were confident that Captain Nat would have optimized the design. Though the scantlings were significantly heavier than those of the standard H-15s, it seemed likely that no component would be stronger or heavier than absolutely needed.

So initially, I thought we were going to build a strict replica of FLICKER.

But design # 674 has the rounded oak coamings that NGH used on all the early H-15s (Fig. 39). In that design, small belaying pins are driven into the butt block on the aft face of the forward coaming (Fig. 40) to secure the halyards, which are brought directly from blocks at the base of the mast over the coaming (Fig. 41).

This original 1898 arrangement for securing the halyards seemed to be somewhat awkward because the halyards would be under load while the rig was hoisted, they would inevitably chew into the varnish, and eventually the wood, as they came over the top of the coaming. In fact, several of the owners still sailing original boats have moved their halyard cleats forward of the coaming to address this issue (Fig. 42). But according to some current owners of these early boats, even simply bringing the bitter ends of the halyards over the coaming

and allowing them to rest loosely on hooks while under way still results in damaging chafe.

There was also a purely aesthetic consideration: I preferred the more gently curved mahogany coamings that Sidney Herreshoff adopted for the 1922 Watch Hill 15s, which end in a point, a frame forward nearer the mast (Fig. 43). In fact, NGH had used this design motif of a pointed front end for the coaming near the mast rather than a fully rounded shape at least as early as 1914, adopting it for the forward end of the cabin on the Buzzards Bay 25 MINK Class HMCo # 733 (Fig. 44), and then in the 1914 coaming design for the 12½s (Fig. 45), and their big sisters, the 1916 Fish Class (Fig. 46). In the WH-15, these pointed coamings provided several functional advantages over the older rounded coamings: their shape created a small platform aft of the coaming, which could be used for horizontally mounted cleats (Fig. 36). And the pointed coamings were canted slightly, making for more comfortable seating and diverting water coming over the deck.

From the original HMCo drawings on file at MIT, it appears that even in the 1922 Watch Hill 15s Sidney Herreshoff led the halyards over the coaming, and this appears to be confirmed by such boats as VIKING. So far, I've not been able to identify an original WH15 in which we can confirm that the halyards and the jib sheet were led through the coamings. However, several of the restored original boats now have this feature, and Alec used it on KITTY (Fig. 47) and MURMUR. Naturally this approach completely eliminates the chafe problem.

We did plan to keep the main cockpit modifications NGH designed for FLICKER: as in his 1907 revision of the original 1898 design, we lengthened the basic H-15 cockpit by moving the forward cockpit bulkhead forward by a frame. Alec had already used this Herreshoff innovation in building KITTY (Fig. 48); it makes the boat's cockpit 8'1½" in length fore-and-aft --- 8" (about 9%) longer than the original BB15s. In FLICKER, NGH also widened the cockpit from 4'6" in the original BB15 design to 5'0" by narrowing each side deck. We kept this change as well. Combined with the more open cockpit resulting from the elimination of the centerboard trunk, these refinements make the # 674 cockpit considerably roomier and the boat more comfortable as a day-sailer than the "standard" H-15s.

So, gradually it became clear that I didn't want to build a strict replica of either the earlier boats or FLICKER, adhering rigidly to either design. Instead, we decided to build a design incorporating developments and refinements NGH and his son documented in signed HMCo drawings for different variants of the 15, but that had never been combined before in a single boat. From original HMCo correspondence, I feel this was entirely

consistent with NGH's spirit and practice: he was in the business of accommodating his customers, and tailoring boats to their requests.

Finally, with the help of some friends of our project, we also added a few other features to MURMUR that had never been seen in any 15 before.

Simplifying and Lightening the Rig

When we started figuring out the details of our combination design based on FLICKER, we soon faced a few issues related to the rig. The original 1898 Buzzards Bay boats all had running backstays and solid (as opposed to hollow) masts: their HMCo mast specifications would have led to a bare mast weight of 30.6 pounds.

Presumably at her owner's request, NGH eliminated the running backstays in the FLICKER design, but her shrouds were not swept back: as originally designed, her much heavier, solid mast was robust enough to withstand the forward bending loads on its own. To achieve this, NGH's specifications for the FLICKER mast led to a bare weight of 67 pounds -- a 119% increase over the 1898 originals (Fig. 49). From racing S Boats and BB25s, I knew I wanted to eliminate the runners if we could, especially for single-handing, but I wondered whether this could be achieved with a lighter, finer mast than FLICKER's.

Alec and I approached Halsey Herreshoff and his associate Adam Langerman, and asked them to re-engineer the FLICKER mast for MURMUR, maintaining the original BB15 sail plan and the original dimensions of the BB15 boom and gaff. The goals were to reduce the oversized base diameter and weight of FLICKER's mast, and to improve head-stay tension by sweeping back the shrouds. Our idea was to construct a hollow mast in glued sections, reducing the mast's weight dramatically while increasing its stiffness (Fig. 50); and to eliminate the running backstays entirely, in part by moving the chain plates back one frame (i.e., aft 8") (Fig. 51). These changes entailed no modifications of the spreaders, which are as originally designed; they pivot, allowing the gaff to push the leeward spreader forward when sailing down-wind (Fig. 52). The rest of the rig (except the jib club) was to be exactly as drawn by NGH, including the masthead, hardware, boom and gaff, sail plan, etc.

In short order, Adam and Halsey came up with a design that met all our goals: MURMUR's mast is smaller at the base, 40% lighter in weight, and stiffer than FLICKER's -- though still slightly larger in profile and heavier than the original BB15 mast. MURMUR's new mast design works fine on all points of sail without runners.

	Outside Diameter (in.)	Inside Diameter (in.)	Lbs./Ft. @ Deck	Total Weight (pounds)
1899 3-3/8" Solid Spar	3.375	N/A	1.55	30.6
1907 #674 Solid Spar	5.0	N/A	3.40	67.1
2009 Hollow Spar	4.6	2.4	2.10	41.4

Table 2 - H-15 Bare Spar Weight Comparison

We also planned a more modest update to the jib boom: the earlier 15s and FLICKER had partial jib clubs that started aft of the tack (Figs. 4, 53) and two independent jib sheets that ran back to cleats on the outside of the coamings across from the tiller, and required manual tacking. Consistent with the designs of the BB 25, 12½, and Watch Hill 15, MURMUR's jib boom is full-length. And like those boats, it's connected to a jib traveler, making the jib self-tending.

Streamlining and Enhancing the Deck Hardware

Alec and I were committed to keeping the hardware on MURMUR as simple and easy to use as possible (especially with a view to single-handing) – but also as original to NGH's specifications and patterns as possible. Eliminating the running backstays enabled us to remove all that hardware, and we also decided not to install the originally-specified oar-locks, though we do carry a paddle stored under a side-deck.

Jim Reineck of Hull, MA made all MURMUR's blocks and many other pieces of her bronze hardware. Other bronze fittings for MURMUR were custom fabricated and machined in Rockport, ME. Aside from the stainless headstay and shrouds and related wire terminations, and two stainless spreaders, all of MURMUR's metal deck hardware is bronze.

HMCo used conventional cleats and jam cleats on the early boats. For convenience single-handing, I thought it would be ideal to equip MURMUR with cam-cleats. Merriman had introduced bronze cam cleats (Fig. 54) early-on, but these were relatively small, don't hold line over 5/16" very well, and are very difficult to find now.

Luckily, Jim Reineck, to whom everyone in yacht restoration is already so indebted, has recently designed all-bronze cam cleats (Fig. 55) that – like his other blocks – incorporate Delrin roller bearings and in this

case, Harken-style springs. Maintenance-free, these cleats can be flushed with fresh water, they work perfectly, and they hold very encouragingly under all the loads we've tested so far in up to about 25 knots of breeze. MURMUR was the first boat to sport the new Reineck bronze cam cleats for her halyards and sheets.

Another of Alec's hardware innovations for MURMUR was a custom lifting bronze tiller-to-rudder-stock fitting – replacing what would have been a fixed fitting in an original HMCo H-15 (Figs. 56, 57). This may seem a small item, but it's very convenient while steering, and more critically, during quick tacks – because we decided to lengthen MURMUR's tiller slightly. In most early photos of the original H-15s, it appears that the boats squat slightly in the rear while being sailed. By lengthening the tiller slightly, we effectively moved the helmsman's seating position slightly forward, to a more balanced spot than the original, shorter tiller allowed. This refined tiller socket has exactly the same dimensions and shape as the original NGH/HMCo one.

Interior Joinery

From the original HMCo plans, Steve Nagy's detective work and documentation, and access to many of the original boats, we had a clear idea what the HMCo boats originally looked like: typically the cockpit sole boards were painted, the seats were varnished (Fig. 58), and small doors or a slider closed off the forward cabin (Fig. 59). The HMCo offered a teak floor as an option (Fig. 36), which we adopted. We also copied FLICKER's outboard shelves in unfinished teak.

To add flexibility, Alec mounted two mahogany doors to the cabin area on lift-off quick-release hinges (Fig. 60); we typically keep these doors stored off the boat in summer, when MURMUR is on her mooring (Fig. 61).

Hoisting Shackles / Eyes

For hoisting onto her owner's steam yacht, FLICKER was originally fitted with flush bronze lifting shackles with tie rods to the keel in the fore and aft decks, braced by struts under the deck (Figs. 62, 63). On MURMUR, which weighs 2,430 pounds rigged with sails, we replaced this hardware with bronze lifting eyes potted with epoxy into the plank keel and hidden under the floorboards (Fig. 64). These eyes facilitate launching and hauling the boat where there is a crane or hoist (Fig. 65).

Electric Bilge Pump

Our one concession to modern convenience was the installation of an integrated bilge pump with float switch in the shallow bilge (Fig. 66). This is powered by a modern 12-volt AGM deep-cycle battery, sized like a small motorcycle battery, mounted in the forward cabin, and charged by a small removable solar panel that plugs

into a 12-volt outlet. The pump discharges through an anti-siphon loop, and then down to a small through-hull in the bottom paint just above the water (Fig. 67).

THE RESULTS

Well, that's how we designed MURMUR. What's the result? And how does sailing her compare to the originals?

First, she's very fast, goes on almost no air, and is tremendous fun. The longer, wider cockpit and the open space created by the absence of a centerboard trunk make her ideal for four adults, and up to six will fit comfortably. The lack of runners makes her a dream to single-hand, as do the Reineck cam cleats.

Bruce Avery of Noank, who has owned several original 15s himself and maintained many others and many of the fiberglass 15s as well, sailed on MURMUR in mid-summer 2009. He reports that he found her unique – “every boat is different” – but recognizably stiffer than the centerboard boats – which isn't surprising given the extra 250 pounds of lead keel down one foot lower.

The later pointed coamings have also been a big success: the coaming shape and angle are very comfortable against one's back. And though she's wet in a real blow as all the 15s tend to be, the canted coaming profile deflects a lot of spray.

As to aesthetics, her owner dreams about her. And she has given pleasure to many passing admirers – both experts and beginners (Fig. 68).

What more could one ask?

ACKNOWLEDGMENTS

Quite a number of people were instrumental in gathering the data and providing the insight necessary to compile the information presented in this paper and in the Herreshoff Registry. The authors wish especially to acknowledge Bill Beardsley, Maynard Bray, Halsey Herreshoff, and Jim Reineck. All possess a wealth of knowledge about classic yachting in general, and the 15-footers specifically. All have been extremely generous with their time and expertise. Without the help and insight they provided, this paper would never have been written, and MURMUR would not have been nearly as successful an H-15 reproduction.

REFERENCES

Bray, Maynard & Pinheiro, Carlton; Herreshoff of Bristol; Brooklin, ME; Woodenboat Publications; 1989

Cheever, David; “The Herreshoff Fifteens,” *The Log of Mystic Seaport*, Vol 24, No. 2, Summer 1972; Mystic, CT; Mystic Seaport, 1972

Esterly, Diana Eames; Early One-Design Sailboats; New York, NY; Charles Scribner's Sons; 1979

Hasselbalch, Kurt; Overcash, Frances; and Reddin, Angela; Guide To The Haffenreffer-Herreshoff Collection; Cambridge, MA; MIT Museum; 1997

Rosbe, Judith W.; Images of America - The Beverly Yacht Club; Mount Pleasant, SC; Arcadia Publishing; 2006

Taylor, Roger C.; The Fourth Book of Good Boats; Camden, ME; International Marine Publishing Co.; 1984

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Alec Brainerd is a boat builder and owner of Artisan Boatworks in Rockport, Me. He worked with Dave Corcoran at Bullhouse Boatworks and Taylor Allen at Rockport Marine before starting Artisan Boatworks in 2002. He specializes in building and

maintaining classic wooden daysailers for customers up and down the East Coast. His latest project, MURMUR, was completed in April 2009.



Bernie Gustin is a retired management consultant based in Newport, RI. He has sailed all his life all over the world, and owned many sail and power boats. A Herreshoff enthusiast for many years, he presently owns replicas of the Herreshoff 12½ and Buzzard's Bay 25 (by Joel and Steve White's Brooklin Boatyard), and the new H-15 MURMUR by Alec Brainerd's Artisan Boatworks, described in this paper.



Steve Nagy is an avid Herreshoff enthusiast. He has owned both a 12½ and a Buzzards Bay 15, and has been actively documenting the HMCo sailing yachts for several years. He lives with his wife, Meg, in Pipersville, PA, a small village north of Philadelphia. When not pursuing his avocation, Steve works as an information technology manager for MetLife.

APPENDIX 1 – Existing Herreshoff 15-Footers as of December, 2009

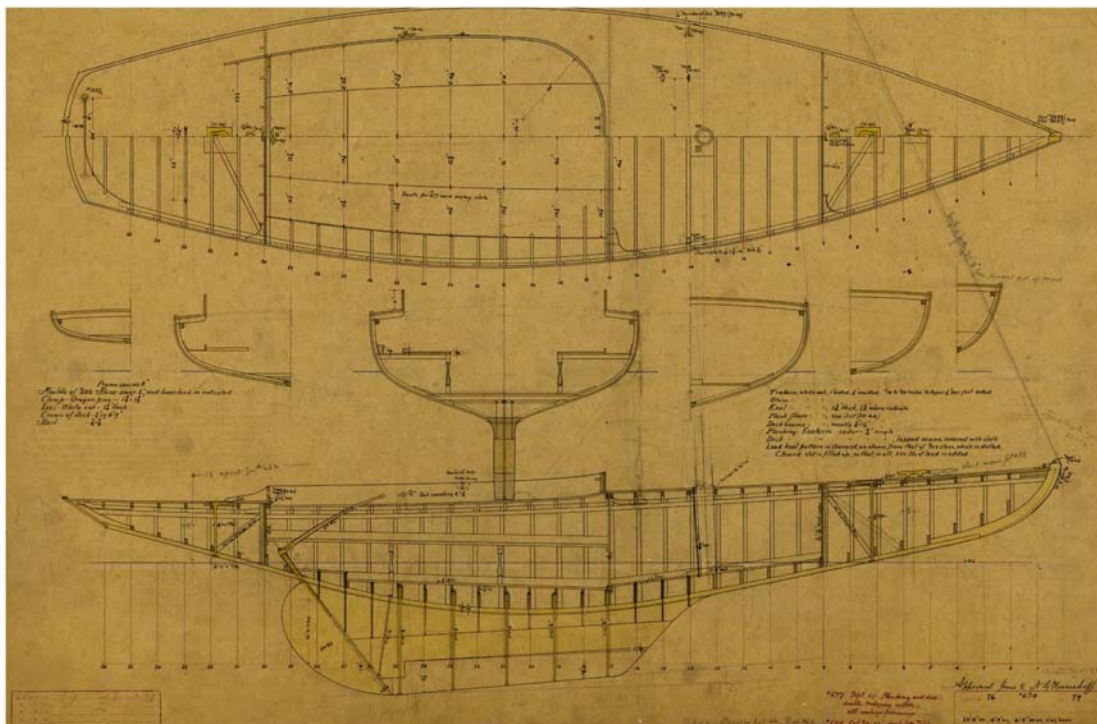
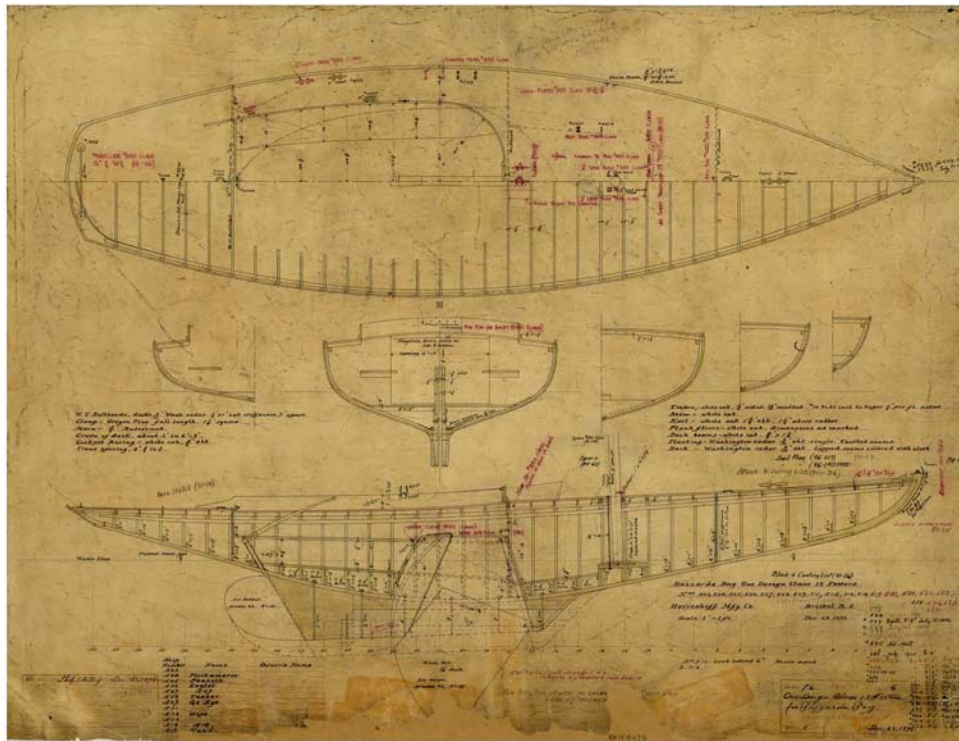
Count	Builder	Year Built	Hull No.	Type	Construction	Rig	Name	Location	Fleet ID
1	Herreshoff	1899	506	Buzzards Bay 15	cedar/oak		Eaglet	Essex, MA	4
2	Herreshoff	1899	513	Newport 15	cedar/oak		Hope	Bristol, RI	9
3	Herreshoff	1899	519	Buzzards Bay 15	cedar/oak		Vixen	Mattapoisett, MA	12
4	Herreshoff	1901	550	Buzzards Bay 15	cedar/oak	gaff	Aurora	Saunderstown, RI	22
5	Herreshoff	1901	554	Buzzards Bay 15	cedar/oak		Fiddler	Mystic, CT	23
6	Herreshoff	1902	588	Newport 15	cedar/oak	gaff	Echo	Marion, MA	32
7	Herreshoff	1905	645	Buzzards Bay 15	cedar/oak		Fancy	Nantucket, MA	35
8	Herreshoff	1905	652	Newport 15	cedar/oak	gaff	Snipe	Marion, MA	39
9	Herreshoff	1907	673	Buzzards Bay 15	cedar/oak		Awahnee	Bristol, RI	48
10	Herreshoff	1907	674	Full Keel BB15	cedar/oak		Flicker	Brooklin, ME	49
11	Herreshoff	1910	693	Buzzards Bay 15	cedar/oak	gaff	Endeavor	Jamestown, RI	55
12	Herreshoff	1914	730	Buzzards Bay 15	cedar/oak		Scout	Wickford, RI	59
13	Herreshoff	1914	731	Buzzards Bay 15	cedar/oak	gaff	Maribee	Cohasset, MA	60
14	Herreshoff	1914	735	Buzzards Bay 15	cedar/oak		Noanet	Fisher's Island, NY	61
15	Herreshoff	1916	785	Buzzards Bay 15	cedar/oak	gaff	Flickamaroo II	Hull, MA	66
16	Herreshoff	1916	786	Buzzards Bay 15	cedar/oak		Ptiloris	Pawcatuck, CT	67
17	Herreshoff	1916	787	Buzzards Bay 15	cedar/oak	gaff	Elf	Oxford, MD	68
18	Herreshoff	1923	880	Watch Hill 15	cedar/oak	marconi	Firefly	Bristol, RI	73
19	Herreshoff	1923	882	Watch Hill 15	cedar/oak	marconi	Worry	Watch Hill, RI	75
20	Herreshoff	1923	883	Watch Hill 15	cedar/oak	marconi	Thistle	Watch Hill, RI	76
21	Herreshoff	1923	884	Watch Hill 15	cedar/oak	marconi	Quest	Mantoloking, NJ	77
22	Herreshoff	1923	885	Watch Hill 15	cedar/oak	marconi	Viking	Watch Hill, RI	78
23	Herreshoff	1923	886	Watch Hill 15	cedar/oak	marconi	Alert	Wickford, RI	79
24	Herreshoff	1923	887	Watch Hill 15	cedar/oak	marconi	Pixie	Watch Hill, RI	80
25	Herreshoff	1923	890	Watch Hill 15	cedar/oak	marconi	Geraldine	Noank, CT	83
26	Herreshoff	1925	919	Newport 15	cedar/oak	gaff	Sea Hawk	Providence, RI	84
27	Herreshoff	1928	1079	Buzzards Bay 15	cedar/oak		Monsoon	Key West, FL	92
28	Herreshoff			Buzzards Bay 15	cedar/oak	gaff	Saelah	Portland, ME	95
29	Herreshoff	1923		Watch Hill 15	cedar/oak	gaff	Emma	Newport, RI	96
30	Herreshoff			Newport 15	cedar/oak	gaff	Lazy Jack	Touisset, MA	97
31	Herreshoff			Buzzards Bay 15	cedar/oak	gaff	Mistress	Watkins Glen, NY	98
32	Herreshoff			Newport 15	cedar/oak		Banshee	Noank, CT	99
33	Frank Hall Boat Yard	1969	1	Watch Hill 15	fiberglass	marconi	Windward	Watch Hill, RI	110
34	Frank Hall Boat Yard	1969	2	Watch Hill 15	fiberglass	marconi	Hussy	Watch Hill, RI	111
35	Frank Hall Boat Yard	1971	3	Watch Hill 15	fiberglass	marconi	Nuance	Watch Hill, RI	112
36	Frank Hall Boat Yard	1971	4	Watch Hill 15	fiberglass	marconi	Blue Bell	Watch Hill, RI	113
37	Frank Hall Boat Yard	1971	5	Watch Hill 15	fiberglass	marconi	Rainbow	Watch Hill, RI	114
38	Frank Hall Boat Yard	1972	6	Watch Hill 15	fiberglass	marconi	Whisper	Watch Hill, RI	115
39	Frank Hall Boat Yard	1972	7	Watch Hill 15	fiberglass	marconi	Firefly	Rhode River, MD.	116
40	Frank Hall Boat Yard	1973	8	Watch Hill 15	fiberglass	marconi	Peregrine	Watch Hill, RI	117
41	Frank Hall Boat Yard	1973	9	Watch Hill 15	fiberglass	marconi	Cactus Pie	Watch Hill, RI	118
42	Frank Hall Boat Yard	1976	10	Watch Hill 15	fiberglass	marconi	Bahama Gal	Watch Hill, RI	119
43	Frank Hall Boat Yard	1978	11	Watch Hill 15	fiberglass	marconi	Island Woman	Watch Hill, RI	120
44	Frank Hall Boat Yard	1981	12	Watch Hill 15	fiberglass	marconi	Summersalt	Watch Hill, RI	121
45	Frank Hall Boat Yard	1982	13	Watch Hill 15	fiberglass	marconi	Superstitions	Watch Hill, RI	122
46	Frank Hall Boat Yard	1983	14	Watch Hill 15	fiberglass	marconi	Mistress	Watch Hill, RI	123
47	Frank Hall Boat Yard	1986	15	Watch Hill 15	fiberglass	marconi	Hi Toots !	Watch Hill, RI	124
48	Frank Hall Boat Yard	1988	16	Watch Hill 15	fiberglass	marconi	Bullwinkle	Watch Hill, RI	125
49	Frank Hall Boat Yard	1989	17	Watch Hill 15	fiberglass	marconi	Diva	Watch Hill, RI	126
50	Frank Hall Boat Yard	1989	18	Watch Hill 15	fiberglass	marconi	Scandal	Watch Hill, RI	127
51	Frank Hall Boat Yard	1991	19	Watch Hill 15	fiberglass	marconi	Damselfish	Watch Hill, RI	128
52	Frank Hall Boat Yard	1993	20	Watch Hill 15	fiberglass	marconi	Tsana	Watch Hill, RI	129
53	Frank Hall Boat Yard	1993	21	Watch Hill 15	fiberglass	marconi	Spica	Watch Hill, RI	130
54	Frank Hall Boat Yard	1993	22	Watch Hill 15	fiberglass	marconi	Goose	Watch Hill, RI	131
55	Frank Hall Boat Yard	1993	23	Watch Hill 15	fiberglass	marconi	Minx	Watch Hill, RI	132
56	Frank Hall Boat Yard	1994	24	Watch Hill 15	fiberglass	marconi	Tight Squeeze	Watch Hill, RI	133
57	Frank Hall Boat Yard	1994	25	Watch Hill 15	fiberglass	marconi	Empyrean	Watch Hill, RI	134
58	Bullhouse Boatworks			Watch Hill 15	cedar/oak	marconi	Orphan	Arundel, ME	140
59	Bullhouse Boatworks	1993		Watch Hill 15	cedar/oak	marconi	Bootleg	Tobey Island, MA	141
60	Bullhouse Boatworks	1995		Full Keel WH15	cedar/oak	marconi	Fredonia	Naushon Island, MA	142
61	Bullhouse Boatworks			Watch Hill 15	cedar/oak	marconi	Ella	New London, NH	143
62	Bullhouse Boatworks			Watch Hill 15	cedar/oak	marconi	Reverie	Duxbury, MA	144
63	Larry Gillen	1993		Buzzards Bay 15	cedar/oak	gaff	Whisper	Fair Haven, MA	150
64	Artisan Boatworks	2008		Watch Hill 15	cedar/oak	marconi	Kitty	Nantucket, MA	151
65	Artisan Boatworks	2009		Full Keel BB15	cedar/oak	gaff	Murmur	Newport, RI	152

APPENDIX 2 – Destroyed or Unaccounted For HMCo Boats

Count	Contract Date	Hull No.	Type	Original Name	Built For	Status
1	9/28/1898	503	Buzzards Bay 15	Vim	F.W. Sargent, Jr.	DESTROYED
2	9/28/1898	504	Buzzards Bay 15	Flickarmaroo	N.F. & W.B. Emmons	UNKNOWN
3	9/28/1898	505	Buzzards Bay 15	Peacock	Robert Winsor	UNKNOWN
4	9/28/1898	507	Buzzards Bay 15	Compress	S.M. Weld	UNKNOWN
5	9/28/1898	508	Buzzards Bay 15	Teaser	Robert W. Emmons, 2nd	UNKNOWN
6	9/28/1898	509	Buzzards Bay 15	Go Bye	S.G. King	UNKNOWN
7	9/28/1898	511	Buzzards Bay 15	Uarda	John Parkinson, Jr.	UNKNOWN
8	9/28/1898	516	Newport 15	Budda	Pembroke Jones	UNKNOWN
9	9/28/1898	518	Buzzards Bay 15	Sis	John S. Fay	UNKNOWN
10		521	Buzzards Bay 15	Kirstie	W.P. Wilson	UNKNOWN
11	6/6/1899	525	Newport 15	Breeze	W.G. Roelker	UNKNOWN
12	6/22/1899	526	Newport 15	Kingfisher	August Belmont	UNKNOWN
13	7/19/1899	527	Newport 15	Nova	C.O. Iselin	UNKNOWN
14	8/19/1898	528	Newport 15		W.C. Whitney	UNKNOWN
15		535	Newport 15	Moya	W. Butler Duncan	UNKNOWN
16	2/9/1900	540	Newport 15	Sand Piper	August Belmont	UNKNOWN
17	3/17/1900	543	Newport 15	Hawk	W. Jannell	UNKNOWN
18	4/4/1900	544	Newport 15	Eaglet	W. Grossinor	UNKNOWN
19	4/5/1901	556	Newport 15	Mistral	A.C. Bostwick	UNKNOWN
20	4/5/1901	557	Newport 15	Twinkle	A. Hemmingway	UNKNOWN
21	6/11/1901	558	Buzzards Bay 15	Ginty	E.G. Bourne	UNKNOWN
22	6/11/1901	559	Full Keel	Little Robin	C.S. Eaton	UNKNOWN
23	12/14/1901	577	Buzzards Bay 15	Cat's Paw	S.D. Warren	UNKNOWN
24	4/19/1902	584	Newport 15	Minvon	Henry F. Lippitt	UNKNOWN
25	7/9/1902	585	Newport 15	Waturus	R. Morgan	UNKNOWN
26	7/16/1902	587	Newport 15	Whisper	E.D. Morgan	UNKNOWN
27	8/18/1902	589	Newport 15	Yacona	Hay C. Pierce	UNKNOWN
28	5/5/1903	609	Buzzards Bay 15		Robert W. Emmons	UNKNOWN
29	6/30/1905	649	Buzzards Bay 15	Toby	Robert W. Emmons	UNKNOWN
30	7/5/1905	650	Buzzards Bay 15	Tinker	Robert W. Emmons	UNKNOWN
31	7/6/1905	651	Buzzards Bay 15	Yalu	R. Codman	UNKNOWN
32	9/22/1905	653	Buzzards Bay 15	Jack	Robert F. Herrick	UNKNOWN
33	9/22/1905	654	Buzzards Bay 15	Jill	Robert F. Herrick	UNKNOWN
34	9/22/1905	655	Buzzards Bay 15	White Caps	L. Minot	UNKNOWN
35	10/2/1905	656	Newport 15	Muriel	Herman Oelrichs	UNKNOWN
36	5/17/1906	661	Buzzards Bay 15	Mongoose	Robert W. Emmons	UNKNOWN
37	6/25/1906	662	Buzzards Bay 15		E.D. Thayer	UNKNOWN
38	2/23/1907	671	Newport 15	Murmur	Frederic Cunningham	UNKNOWN
39	3/5/1907	672	Buzzards Bay 15	Anita	Charles E. Helier	UNKNOWN
40	9/21/1907	677	Full Keel	Dad	Morton F. Plant	UNKNOWN
41	4/28/1908	680	Buzzards Bay 15	Polly	C.L. Harding	UNKNOWN
42	10/23/1908	682	Full Keel	Marjorie	A.J. Gould	UNKNOWN
43	11/14/1908	683	Buzzards Bay 15		A.H. Eustis	UNKNOWN
44	2/26/1909	686	Buzzards Bay 15	Try	Moses Williams	UNKNOWN
45	5/14/1910	700	Buzzards Bay 15	Micoh	Osborne Howes	UNKNOWN
46	9/29/1910	704	Buzzards Bay 15	Pheasant	Robert Winsor	UNKNOWN
47	9/27/1913	726	Buzzards Bay 15	Hyassa	E. Moras	DESTROYED
48	4/3/1914	739	Buzzards Bay 15	Natella	M.A. Whiting	UNKNOWN
49	6/30/1914	740	Buzzards Bay 15	Ann	G.W. Milton	UNKNOWN
50	2/26/1915	763	Buzzards Bay 15	Buzzard	W.L. Peters	UNKNOWN
51	12/15/1915	784	Buzzards Bay 15	Tricoon	J.L. Stackpole	UNKNOWN
52	3/17/1916	809	Buzzards Bay 15	Splash	C.H. Thorn	UNKNOWN
53	4/7/1916	810	Buzzards Bay 15	Venture	M. J. Hitchcock	UNKNOWN
54	1/22/1917	822	Buzzards Bay 15		H.E. Warner	UNKNOWN
55	3/17/1917	823	Buzzards Bay 15	Poiu	Frederick Winsor	UNKNOWN
56	9/9/1922	881	Watch Hill 15	Miss Q.	Thomas D. Thatcher	UNKNOWN
57	9/14/1922	888	Watch Hill 15	How Come	Eden B. Knowlton	DESTROYED
58	9/14/1922	889	Watch Hill 15	Althea	W.C. Robinson	UNKNOWN
59	1/9/1925	920	Newport 15	Mayfly	Robert Goelet	UNKNOWN
60	10/19/1925	968	Buzzards Bay 15	Maureen	Edward I. Cudahy	UNKNOWN
61	11/23/1925	981	Newport 15	Louanna	Frazier Jelke	UNKNOWN
62	2/6/1926	997	Buzzards Bay 15	Nabob II	E.H. Bright	UNKNOWN
63	2/19/1926	998	Buzzards Bay 15	Nancy	Samuel C. Register	UNKNOWN
64	7/1/1926	1016	Newport 15		Ogden Mills	UNKNOWN
65	7/1/1926	1017	Newport 15		Elaine Walker	UNKNOWN

APPENDIX 3 – Original Herreshoff Plans

Plan images courtesy MIT Museum



FIGURES REFERRED TO IN TEXT



Fig.1) BB15 circa 1903;
courtesy Judith Rosbe

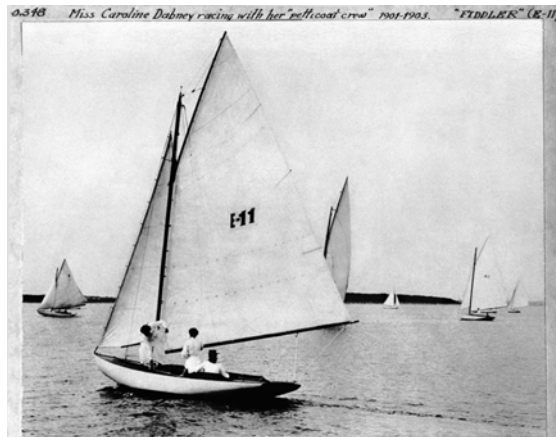


(c) Mystic Seaport, Mystic, CT, #1960.349

Fig. 2) Buzzards Bay regatta, circa 1903;
courtesy Mystic Seaport



Fig. 3) Regatta in Sippican Harbor, circa 1930;
courtesy Herreshoff Marine Museum



(c) Mystic Seaport, Mystic, CT, #1960.348

Fig. 4) BB15 FIDDLER, circa 1903;
courtesy Mystic Seaport

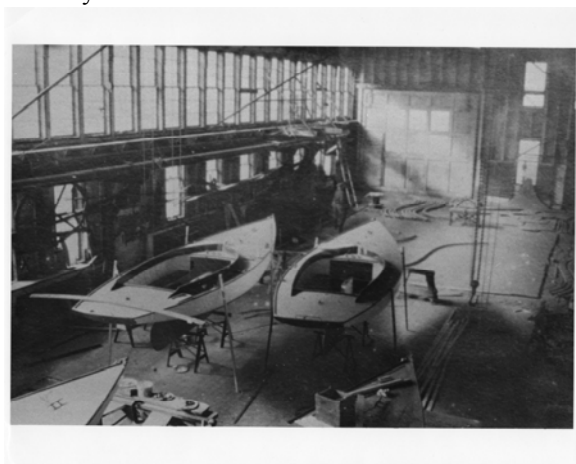


Fig. 5) Watch Hill 15s Being Built, 1922;
Herreshoff Marine Museum



Fig. 6) WH15 JOSEPHINE during sea trials, Dec. 1922;
courtesy Herreshoff Marine Museum



Fig. 7) Full-keel H-15 FLICKER
courtesy Maynard Bray



Fig. 8) WH15 – HI TOOTS!
courtesy Scott Schneider



Fig. 9) BB15 WHISPER
courtesy Erik DeBoer



Fig. 10) Full-keel WH15 FREDONIA
courtesy Tony Howland



Fig. 11) WH15 KITTY
courtesy Artisan Boatworks



Fig. 12) NPT15 ECHO & SNIPE, BB15 MARIBEE
courtesy William Maxwell

Figs. 13 – 35 all courtesy Artisan Boatworks



Fig. 13) Broken frames and sisters



Fig. 14) Using molds to restore hull shape



Fig. 15) New frames primed with red lead



Fig. 16) Stem replacement



Fig. 17) Laminated mahogany stem & plank keel



Fig. 18) Planking repairs



Fig. 19) MURMUR interior paint looking aft



Fig. 20) MURMUR interior paint looking forward



Fig. 21) MURMUR stem, molds, & bulkheads setup



Fig. 22) MURMUR - laminated transom frame



Fig. 23) MURMUR laminated mahogany keel & floors



Fig. 24) MURMUR oak frames & "glu-lam" ribbands



Fig. 25) MURMUR planking



Fig. 26) MURMUR planking



Fig. 27) MURMUR mahogany sheer planks/garboards



Fig. 28) MURMUR fairing with long-boards



Fig. 29) MURMUR- completed hull and deck



Fig. 30) MURMUR deck frame looking fwd



Fig. 31) MURMUR deck frame looking aft



Fig. 32) MURMUR deck frame



Fig. 33) MURMUR coaming forward



Fig. 34) MURMUR coaming aft



Fig. 35) MURMUR toe rails



Fig. 36) WH15 VIKING
Courtesy William Beardsley



Fig. 37) 12½ Cockpit
courtesy Herreshoff Marine Museum



Fig.38) MURMUR Ballast
courtesy Artisan Boatworks



Fig. 39) Rounded coaming of BB15s & Newport 15s
courtesy Maynard Bray



Fig. 40) Belaying pins
courtesy Maynard Bray



Fig. 41) Halyards over the coaming
courtesy William Beardsley



Fig. 42) Halyards moved forward
courtesy William Beardsley



Fig. 43) WH15 QUEST - Pointed coamings
courtesy The Herreshoff Registry



Fig. 44) Buzzards Bay 25 ARIA (ex-WHITECAP)
courtesy Herreshoff Marine Museum



Fig. 45) 12½ pointed coaming
courtesy The Herreshoff Registry



Fig. 46) Fish Class
courtesy Nat Wilson



Fig. 47) WH15 KITTY
courtesy Artisan Boatworks



Fig. 48) WH15 KITTY
courtesy Artisan Boatworks



Fig. 49) Full-keel H-15 FLICKER – note mast
courtesy Maynard Bray



Fig. 50) Hollow “bird’s mouth” mast
courtesy Artisan Boatworks

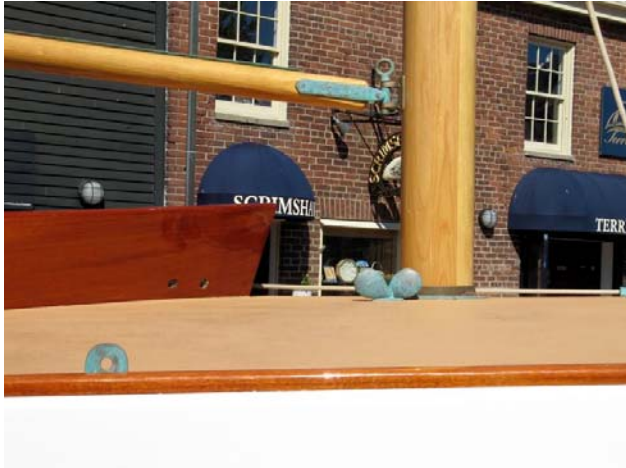


Fig. 51) MURMUR chainplates
courtesy Bernard Gustin



Fig. 52) MURMUR Spreaders
courtesy Artisan Boatworks



Fig. 53) Partial jib club
courtesy William Beardsey



Fig. 54) Merriman cam cleat
courtesy Bernard Gustin



Fig. 55) Reineck cam cleats
courtesy Bernard Gustin



Fig. 56) Fixed tiller hardware - FLICKER
courtesy Maynard Bray



Fig. 57) Lifting MURMUR tiller
courtesy Bernard Gustin



Fig. 58) HMCo interior - FLICKER
courtesy Maynard Bray



Fig. 59) HMCo interior - FLICKER
courtesy Maynard Bray



Fig. 60) MURMUR cockpit looking forward
courtesy Artisan Boatworks



Fig. 61) MURMUR Cabin doors open
courtesy Bernard Gustin



Fig. 62) FLICKER hoisting eye
courtesy Maynard Bray



Fig. 63) MURMUR hoisting eye
courtesy Maynard Bray



Fig. 64) MURMUR hoisting eye
courtesy Bernard Gustin



Fig. 65) MURMUR being lifted
Courtesy Bernard Gustin



Fig. 66) Bilge pump - MURMUR
courtesy Bernard Gustin



Fig. 67) MURMUR bilge pump discharge
courtesy Bernard Gustin



Fig. 68) MURMUR on display
courtesy The Herreshoff Registry