going offshore an additional chest high lifeline can be tied between the boom gallows knees and the upper or aft lower shrouds. They provide a strong support to grab when coming aboard from the dingy. A fishing reel can be installed on the boom gallows stanchions. An auto pilot bracket can be attached to the boom gallows stanchions. They provide a support when taking celestial sights by leaning elbows over the gallows cross piece. When entering a port the helmsman can sit on the top of the stern rail and rest his arms on the gallows while steering with one foot. It is a place to install a life ring, an outboard engine and the list could go on.

Bowsprit: One of the major concerns for buyers considering the Bristol Channel Cutter and Falmouth cutter is the long bowsprits. The major advantage of the bowsprit, other than adding to the lovely lines, is the increase to the "J" measurement. The longer "J" permits the boat to carry more sail area. It increases the angle of the headstay which makes a longer sheet lead all of which permits the boat to point higher into the wind. This increase in headstay angle also works well with roller furling because the sheet lead is nearly 90 degrees to the headstay. When the head sail is roller reefed the sheet lead does not change leaving a good sail shape.

The downside is that no one wants to go out on the bowsprit in anything but mild weather. There are several ways to solve this problem. The first is a quality roller furling system. With this method only one sail is set on the roller furling headstay and it is used from light to strong winds. As the wind increases the sail area is reduced by rolling it up until there is no sail left. The staysail remains set and provides the necessary drive. Today, roller furling and reefing system are built to high standards and will be trouble free if properly used and maintained. There in no need to go out on the bowsprit. If conditions are real light and a drifter or light weight Genoa is required it can be set aft of the roller furling headstay and raised "free flying". This would require that the tack be connected to the snap shackle on the bowsprit but in such light conditions it would not be a problem. If the snap shackle pin has a line leading back on deck the sail can be released without going out on the bowsprit.

If you are still a purest and want to use a hanked on Yankee sail with a down haul then a close pattern heavy netting can be lashed between the Whisker stays, below the bowsprit, to walk on. Never walk on the bowsprit, instead walk on the netting, straddling the bowsprit. The netting will stretch and the lifeline will be above waist height if a pulpit is installed. In the 20 years we have been building these boats no owner has complained about the bowsprit, probably because they realize the advantages outweigh the disadvantages.

Storage Area: Another important factor on a cruising vessel is the amount to storage space available. Surprisingly, many larger boats have far less storage space than the Sam L. Morse Co. boats. It is advisable to compare the boats you are considering purchasing by counting of the number of lockers and bins and there estimated size or square footage.

Conclusion: I would like to conclude with a few comments about the Lyle Hess designed, Sam L. Morse Co. Built boats for the people who are not familiar with the traditional design and its sailing performance.

- The Bristol Channel Cutter and the Falmouth Cutter have recorded remarkable speeds and passages. There are many recorded passages in excess of 180 nautical miles a day. One such passage was on a Falmouth Cutter "POPEYE" that made 200 nautical miles from noon to noon sailing from Ensenada, Mexico to Cabo San Lucas, Mexico. The Bristol Channel Cutter, "XIPHIAS" sailed 3,200 nautical miles in 22 days for an average speed of over 6 knots. Read about other major accomplishments in the brochure.
- Both boats have remarkable windward sailing ability. They both can point 30 degrees to the apparent wind or 45 degrees on the compass.
- Both vessels are exceedingly seaworthy with proven ocean crossings and are capable of sailing anywhere in the world.
- Because of the design and size of these boats they are delightfully fun for a day sail within the harbor or can be provisioned and cross oceans.
- All the critical systems of the boats are designed for ease of service and maintenance.
- Unlike modern designs today, the proven interior layout does not compromise comfort at sea or at anchor. If the buyer wants to modify the standard interior we can easily meet your needs.
- The Sam L. Morse Co. has been in business for over 20 years building and improving the same two vessels. The two top shipwrights have been building these same boats for over 18 years.

Our goal is and has always been to create a sincere but beautiful offshore cruising vessel. To summarize, a quote by Ferenc Mate from his book, THE WORLDS BEST SAILBOATS. "I might as well start off by telling you that the Bristol Channel Cutter and the Falmouth Cutter are the most beautiful 28 foot and 22 foot sailboats in the world".

We encourage you to visit our factory and meet Dick and Tommy our two long-term shipwrights who will be building your boat for you. Take your time and wander around inside and outside the boats and see, first hand, how we hand craft these fine vessels.

- Is the mast tapered at the top to reduce weight and windage? Based on the height of the mast, does it have double spreaders for additional strength?
- Marine heads come in many various types and costs, what is being installed on the boat you are considering?
- This list could go on for pages but take the time to look closely and compare.

Deck Space: Your boat should have wide working decks. This makes it easy to drag sail bags back and forth as well as a safe area for a good foot hold when moving fore and aft. Sam L. Morse Co. has up to 24 inch wide decks on the Bristol Channel Cutter and 20 inch wide decks on the Falmouth Cutter.

Bulwarks: Bulwarks are like a short wall going around the sheer of the boat. They keep your feet and other items from sliding over the side. To be effective they should be tall as possible without looking out of place or disturbing the sheer line and they must drain as quickly as the water comes aboard. Sam L. Morse Co. boats have 7 1/2 inch tall bulwarks with an inch gap underneath for rapid draining.

Dinghy Storage: Surprisingly, buyers rarely consider where they will store a dinghy on deck. The Bristol Channel Cutter and Falmouth Cutter will take a 7' 4" hard dinghy on the foredeck, inverted over the Scuttle Hatch or it can be set in chocks on top of the cabin. If a longer dinghy is needed a 9 foot one can be used on the BCC but it covers the bitts. We are now producing CHERUB a 7' 4" lapstrake rowing and sailing dinghy that fits perfectly on both the BCC and FC.

Interior Insulation: Fiberglass does not have any insulation qualities. Its not uncommon for a boat to "sweat" in warm climates. This "sweating" often results in the growth of mold and algae. This can be a serious problem on a boat if an interior liner where you cannot access. The Sam L. Morse Co. insulates there boats under the coach roof, under the decks and down the side to the waterline. Inside the lockers and bins can be insulated as an option.

Cockpit Size: A large cockpit is great when entertaining or lounging under the sun but it can be hazardous if it can hold too much water if a breaking sea comes aboard. Most importantly is that the companion way have a bridge deck so that any water that goes into the cockpit will not enter into the boat. One cubic foot of water weighs 64 pounds and this can add up quickly in a large cockpit. The cockpit well should be small and equipped with a cover so it can be used for sleeping outside.

Steering Methods: A boat can be steered by a wheel or a tiller. The wheel is usually used on larger boats with large cockpits and tillers on smaller ones. The advantage of the wheel is that there is less strain on the helmsman than the tiller. The disadvantage is that the pedestal and wheel are not removable and are always in the way. The other downside is that there are many working parts that can fail. If it fails it is usually during periods of stress like in a storm. If a boat with a wheel is selected be sure that repairs can be easily made at sea and that there is a tiller back up. There will be less problems with rack and pinion or worm gear designs.

The Sam L. Morse Co. uses a tiller because a wheel would take up too much room. The advantage of the tiller is that it can be removed when sailing with a wind vane, autopilot or while at anchor leaving the entire cockpit open for sleeping or lounging. Since the tiller is directly attached to the rudder the helmsman has a better feel of the performance of the yacht. Also, it is easier to steer the boat in close quarters when picking up a mooring or anchoring. The downside to the tiller is that it swings in a wide arc when hand steering and has a direct load line to the rudder.

Accessibility of the hull: Any vessel that goes offshore should have access to every square inch of the hull. This is not only necessary in case of an emergency but for inspection and cleaning. This is one problem with many boats built with liners, there is no access behind the liner without cutting it out. The Sam L. Morse Co. has access to every square inch of the hull except behind the ice box where there is insulation between the hull and ice box liner.

Engine Access: Equally important is being able to access the engine on both sides, top and bottom in any sea condition. The larger the access area the easier the job will be. It is a bonus if there is a light installed as well. The Sam L. Morse Co. boats engine compartment is so large that a person can crawl inside to access the back of the engine and stern tube without difficulty. The engine access is from inside the boat and repairs can safely be made in any weather.

Lifeline Stanchions: Lifeline stanchions are provided to keep the sailor aboard in rough seas. The sea conditions may be such that the person may be thrown against the lifelines with considerable force. The stanchion and lifelines must be strongly installed and capable of standing up to this force. The Sam L. Morse Co. uses 28" high, double walled stainless steel stanchions

circumference and few other places. This gives little if any additional strength to the boat. As the liner is reduced in size and becomes more modular the more contact it has with the hull adding to its strength.

There are two things to consider here. First, is the ability to bond both the outside and inside of the liner to the hull. Is it accessible or is it only bonded to the outside which provides only half the strength? Next, is the gel coat ground away before bonding to the hull? If not the builder is bonding to gel coat which is like gluing to paint. The more bonding material used and larger the area bonded will distributes the strength over a wider area.

The Sam L. Morse Co. does not use liners. We build our interior out of marine plywood in progressive segments so that each piece is individually fitted and bonded to the hull on both sides as well as inside and outside. The only concern with this building method is should the wood become constantly exposed to moisture rot could develop. To prevent this all the wood is sealed before it is installed and after. Most all builders use marine ply for their bulkheads and use the same sealing methods. I hope.

Using marine plywood furniture also permits the builder to make changes to the interior layout for the buyer. This may seem trivial but there aren't two Sam L. Morse Co. boats yet built that are exactly alike. For those who would prefer a liner we have a two part liner for the Falmouth Cutter available and would result in a reduction in price.

DECK CONSTRUCTION AND INSTALLATION: The deck, like the hull should be strong and properly bonded to the hull to last the lifetime of the boat.

Deck Construction: To build a deck out of solid fiberglass would be uncommon because the results would be extremely heavy. So builders use cores in the deck to provide the strength and stiffness required. Most builders use balsa wood as a core material because it is light, inexpensive and simple to use. The major advantage using this light weight core material is less weight. The disadvantage is that the core material is extremely water absorbent if water enters through a bolt or screw hole. This could result in separation and dry or wet rot. Also, it has poor compression strength. That is, if a piece of hardware is through bolted the bolt or its nut could pull through the skin as the core material compresses when the nut is tightened. To prevent this from happening builders use a high compression material at the location where cleats, winches, etc. will be located. Some builders use solid fiberglass and others use plywood. If the buyer knows where he will install the dinghy, life raft or other unexpected hardware they can have the builder install the plywood or additional fiberglass at this location. If there is a need to add something later, a large back up plate must be used to distribute the pressure and even then it will compress in time as the hardware is put under stress.

The Sam L. Morse Co. uses only marine plywood for their core material because it has excellent compression and stiffness characteristics. Double thickness is used at the bitts, mast locations and anywhere excess loads are expected. The results is a structurally stiffer deck where hardware can be installed at any location. The disadvantage is if excessive moisture enters into the plywood core it could also rot. In the 20 year history of the Sam L. Morse Co. there are no reports of a deck having rot or separation. A major reason for this is that plywood is not nearly as moisture absorbent as other core materials. Another disadvantage to the plywood core is it is heavier. That would be of concern to the racer but the little additional weight would have little effect on the boats performance and the additional strength might be appreciated when the weather shows it's worst.

Hull to Deck Joint: The deck adds to the strength of the boat. No matter how strongly the deck is built it is only as strong as the method used to attach it to the hull. There is a big difference between the methods builders use to connect the deck to the hull. Some use an out turning flange, some a vertical connection and others an in turning flange. The out turning flange is usually small or narrow because it would stick out too far beyond the hull if it were wider. The in turning flange is more popular because it adds strength to the sheer line; the wider the flange the stronger the sheer. The problem with this method is it costs more to build the molds because it must be in two parts so the "piece" can be removed. The wider the flange the more surface on which to set the deck so the joint will be stronger. On a wide flange the deck can be through bolted, staggering the bolts so they are not in line. The wide flange provides a larger surface area for the bonding material.

Some boats have a small flange and after the deck is set in place the joint is fiberglassed over. This is an excellent method as long as the flange is wide enough to provide structural support for the deck and the fiberglass bonding is heavy and on both sides.

The Sam L. Morse boats use an in turning flange. The Bristol Channel Cutter uses 3-1/2" flange, the Falmouth Cutter uses a 2-1/2" flange. The deck is first set in place then 1/4" holes are drilled every 5" staggered from side to side. The deck is then raised and cleaned before ample amounts of 3M5200 marine sealant is applied. Then the deck is bolted in place using 1/4" stainless steel bolts, back up washers, lock washers and nuts. In the 20 year history of the company there has never been a leaking deck to hull joint reported.

BALLAST: Most all boat builders are now using lead for their ballast. The controversy is should the ballast be internal or external?

The *swept back* keel used on Sam L. Morse boats is similar to the *cutaway* keel. It has about the same wetted surface forward but without the notch or cutaway. The keel continues sloping back to the stern where the outboard rudder is attached. This keel shape will ride up onto the reef without an abrupt stop. Since the rudder is attached to the end of the *swept back* keel and sets several inches higher than the bottom, it is protected from damage during a grounding or collision. If, by chance, it is damaged it can be removed and repaired in the water. This hull shape will point as high into the wind as any cutaway keel.

Transom or Pointed Stern: There are two basic stern designs, the *Transom* stern is flat while the *Pointed* stern isn't flat. If the shape of the pointed stern is similar to the bow entry it is called a Double Ender.

Pointed Stern: The advocates of the *pointed* stern claims it is safer in a stormy following sea because it will break or split the wave when it hits the stern. There is no doubt that a pointed stern is going to part a short following sea. I say short because that is all it will do is separate a wave that is about 3 feet high. Because the pointed stern extends considerably further aft of the waterline, which gives lift, the stern will bury deeper into the wave before the boat will lift. Now the wave is further over the boat before it will break.

The *pointed* stern will lose a considerable amount of effective waterline length lift because the waterline turns inward toward the centerline eliminating lift in this area. The *pointed* stern has less carrying capacity for the same deck length.

Transom Stern: The *transom* stern is a flat surface at the back of the boat. It has the advantage that it will provide lift sooner in a tall following wave. It uses every bit of its waterline length for lift and has much more carrying capacity for the deck length. Admittedly, the *transom* stern will be subject to slapping in short following seas, this however, is not a danger to the vessel.

Lyle Hess designed his boats to be sea kindly. He accomplished this through the shape of the hull. By adding more reverse curve to the Garboard and widening the transom, the boat has flatter floors and less deadrise. The transom stern boats designed by Lyle Hess will be more comfortable at sea and at anchor than the pointed stern.

Topsides Surface Area: This is the total area exposed to the wind and seas that is above the waterline. This surface area is constantly exposed no matter how strong or how light. Every sailboat ever built has a point where "the exposed surface area exceeds the windward driving forces of the minimum sail area set". An example: If you were caught on a lee shore with the wind increasing in strength and you had your storm sails set so you could drive the boat off the lee shore but she would sail no better than 90 degrees to the wind you would have reached the point where surface area exceeds the driving force of the sails. This problem increases rapidly as the surface area increases or the wind increases. Similarly the driving forces improve as the surface area is less or winds decrease. So it would be best to have a boat with minimum amount of exposed surface area. Boats that are most apparent are split rigs such as ketches with a large cabin. The boat less likely to have a problem would be a sloop or cutter with a flush deck (if the freeboard is not too high).

HULL CONSTRUCTION: There are two ways to have a fiberglass hull constructed, cored or solid fiberglass.

Cored Hulls: The primary purpose for a cored hull is lightness and stiffness. The hull gets a thin layer of fiberglass, about 3/16" depending on the builder. This is followed by about 5/8" of light weight core material, which also varies with the builder. This is all followed by another thin layer of fiberglass, about 1/8". The results is a hull that is about 1" thick, about 5/16" of total fiberglass and 5/8" core material. This hull will be light and hold its shape well because it is stiffer than if it were only 5/16" fiberglass.

This construction method has the disadvantage that it has less impact resistance than a thicker solid fiberglass hull. That is, if the cored hull boat hit a log or any heavy object it may be penetrated easier than if it were the same total thickness in solid fiberglass.

We also know that osmosis now exists in fiberglass boats, which means that water will ingress through the hull. All builders are attempting to use modern materials to retard this from happening but the truth is it still happens only more slowly. What will happen to the core material if it is absorbent? Visit some boat yards and talk to the yard's owner to find out if blistering is more prevalent on cored hulls than solid hulls.

What happens when two different materials, fiberglass and core material, are bonded together. Will they react differently under different temperate conditions? Will they expand and contract differently? Will there be eventual separation? Will the cored hull be as easy to repair as a solid fiberglass hull?

Another concern is the interior furniture is bonded to the inner liner or inner hull which is separated from the outer hull by the core material, will they move differently when under the stress of rough seas over the years of offshore sailing? How do you install a thru-hull fitting in a cored hull for strength on longevity?

These are all questions that most builders will have answers for, but unfortunately, even they don't know the answers until time passes and it is proven otherwise.