

ARTICLE X - SPECIFICATIONS

1. GENERAL

X.1.A. The official Plans of the Windmill Class Association are hereby incorporated into these Specifications and they govern unless specifically overruled by any part of these Specifications. The Windmill Class Sloop must be constructed in accordance with the Plans and Specifications. The provisions of the Plans and Specifications are not optional unless specifically stated to be optional.

X.1.B. The purpose of the Plans and Specifications is to protect the one design classification of the Windmill, and to prevent unfair advantage one boat might gain over another through the use of materials, fairing, or other differences which would tend to make one Windmill possess inherent advantages over another, other than the individual skill of the skipper and crew.

X.1.C. It is the goal of these Specifications to produce boats of equal speed. It is the intent to prohibit the building of a faster boat, thereby giving unfair advantage. This goal and intent shall guide the Development Committee in their approving of professionally built boats and all others in building their personal boat.

X.1.D. All builders or owners are hereby notified that any attempt to circumvent or otherwise take unfair advantage of the restrictions outlined herein are subject to penalty. This statement is meant and intended solely for the protection of the Windmill Class Association, and should not be interpreted otherwise.

X.1.E. Should there be questions concerning the meaning or intent of these specifications, the Chief Measurer or the WCA Rules Committee will clarify such questions upon request. All requests for rulings should be addressed to the WCA and they will be forwarded. The Chief Measurer's ruling is binding until and unless overruled by the Rules Committee or Governing Board. A Rules Committee ruling is binding until overruled by the Governing Board or the membership. Restrictive rulings prohibiting a past practice are effective immediately upon all who have notice of them. Permissive rulings permitting what has not been general practice or usage are effective only when published in Joustier.

X.1.F. A boat is not a Windmill Class sloop until it has been measured for conformity to the Plans and Specifications by a Measurer and approved by the Chief Measurer, who will then issue an official Measurement Certificate. If in the opinion of the Measurer the boat does not fairly represent a Windmill within the spirit of the Plans and Specifications or if the boat or its rigging is considered unsound, weak or unseaworthy, the Measurer will recommend that a Measurement Certificate not be issued. Appeals from the Measurer's judgment may be made to the Chief Measurer whose ruling is binding unless overruled by the Rules Committee or the Governing Board. After the Measurement Certificate is issued all changes must be certified by a Measurer and approved by the Chief Measurer.

X.1.G. The WCA will issue Plans, registration number, measurement sheets and Specifications as a package. The price of these articles will be set by the Executive Committee. The Executive Committee has the authority to adjust the price of Plan packages sold to affiliated WCA's in foreign countries as may seem in the best interest of the WCA.

X.1.H. The Plans and the plan package are available from the WCA Secretary.

X.1.I. The Plans and Specifications are subject to revision and interpretation only as provided for by the Constitution, By-Laws and Specifications of the WCA. The responsibility for keeping abreast of these revisions and interpretations rests solely with the purchaser of the Plans and Specifications and owners of Windmill class sloops.

X.1.J. Professional Builders are defined as any persons who build a hull for sale as a new or unused boat and are subject to the following provisions:

X.1.J.1. They must have all details of their construction approved by the Development Committee prior to advertisement or sale of the first boat of an identical series. The prototype or first hull of any boat

advertised or offered for sale as a Windmill must be measured and accepted by the WCA prior to such sale. Any subsequent changes must be approved by the Development Committee. If a particular facet of construction does not prove satisfactory in service, it shall be the duty of the Development Committee to withdraw approval until satisfactory changes have been made by the builder.

X.1.J.2. Professional builders must add the actual cost of Windmill Plans and registration to the total cost of the purchased boat. A royalty fee for fiberglass fabrication is also required for each hull so fabricated. The Plan package cost and royalty is payable to the WCA prior to issuance of the Plan package and registration number. All builders shall consider the Plan package as part of the completed boat and as property of the buyer at the time of sale.

X.1.J.3. It is strongly recommended that professionally built hulls be measured and approved prior to sale, as a hull is not a Windmill until it is officially approved. Professional builders may not measure their own construction nor may they offer weight certificates, except as advisory.

X.1.J.4. Durability is of the utmost importance in the professional manufacture of Windmills. A purchaser has the right to expect long, trouble-free service from a professionally built boat. The WCA has an obligation to its members to insist that professional builders live up to their responsibilities.

X.1.J.5. The Development Committee, with the concurrence of the Executive Committee, can, after measuring a fiberglass hull and observing the builder's methods of construction, approve a professional builder for the Windmill Class Association, with the following provisions:

X.1.J.5.a. That all subsequent boats built from these molds be approved with the actual WCA measurement and carry with them a measurement sheet identical to the first boat measured and approved.

X.1.J.5.b. That no boat produced from these molds and approved in this manner can be the subject of a measurement challenge except relating to weight, or relating to a portion of the boat which has been altered.

X.1.J.5.c. That one boat per calendar year or one boat per 20 produced in any one calendar year, whichever is greater, (selected at random) be measured to assure compliance with plans and specifications. This remeasurement need not match precisely with the measurements attached thereto. However, they must be within the tolerances specified in these Bylaws. If any remeasurement indicates that the boats are not within specified tolerances, no additional boats produced by the builder will be approved until corrections are made to the molds and measurements are taken of a boat produced from the corrected mold and found to be within tolerance.

X.1.J.5.d. Regardless of any remeasurement outcome, no boat already assembled (i.e. hull and deck bonded), including the boat measured, shall be declared illegal nor shall any boat previously constructed by the builder be declared illegal or become the subject of a measurement challenge except as noted in paragraph (b) above.

X.1.J.5.e. None of the foregoing is intended nor would serve to limit the measurement of sails, rudders, and daggerboards or the weighing of the boats at sanctioned or other regattas where these or other measurements are either required or deemed appropriate.

X.1.J.5.f. If the builder chooses to construct a new mold, it is recommended that the boat from which the new mold is to be taken be measured prior to making the new mold. Regardless, the first boat produced from any new mold must be measured to assure conformance.

X.1.K. If alterations are made which affect more than one half of the hull, or are sufficiently extensive to so warrant, in the opinion of the Rules Committee, a new number shall be awarded and the Sloop shall be considered new as of such date. Such altered boats shall be remeasured and re-registered subject to the restrictions and governing measurements then in force. Registration along with the payment of current fees must be obtained in the usual manner.

X.1.L. The registration number assigned by the WCA must be carved, burned or molded clearly into the surface of the keel directly aft of the daggerboard well or optionally on the starboard aft side of the daggerboard well. Hull registration numbers now required by the Federal Government of professional builders may be used in lieu of the foregoing providing they clearly include the WCA registration number.

X.1.M. Fittings are optional except as noted herein, on the Plans or in the By-Laws.

2. MATERIALS

X.2.A. The Windmill Class Sloop is traditionally constructed of wood, as shown on the Plans. However, alternate materials have been approved for use. Only those alternate materials specifically mentioned in these Specifications may be used and they may only be used for the applications specifically mentioned.

X.2.B. Stock sizes and materials specified on the Plans in the List of Materials are requirements of these Specifications for wooden boats and where applicable to other construction.

X.2.C. The boat and its components may not be stiffened by other materials except as approved herein.

X.2.D. Wood Construction

X.2.D.1. The suggested hull materials, unless noted, are mahogany, fir, spruce, and cedar. Use best grade, clear lumber. Plywood shall be suitable for marine use.

X.2.D.2. Other woods may be substituted for the suggested materials but they shall be or reasonably similar weight, stiffness and durability.

X.2.D.3. Balsa and other similarly weak woods shall not be used for framing or planking.

X.2.D.4. All parts of the hull or spars must be bonded with the highest grade liquid resorcinol resin or epoxy (waterproof, not water resistant) glue. The thwarts and mast step should only be screwed in place.

E. Fiberglass Construction

X.2.E.1. Fiberglass as a material for hull, rudder and daggerboard construction is approved. Fiberglass is defined as fiberglass reinforced plastic as commonly used in fiberglass boat construction.

X.2.E.2. Sandwich construction may be used in fiberglass construction. However, since prevention of the delamination of the filler material from the fiberglass skin is a critical design problem, builders must obtain the approval of the Development Committee for their particular sandwich construction. Maximum thickness of bottom or sides is one inch. Minimum densities of filler materials are: end grain balsa, 6 pounds per cubic foot; polyurethane foam, 8 pounds per cubic foot; polyvinyl chloride foam, 4 pounds per cubic foot. Flat grain balsa shall not be used. Other filler materials may be used with the approval of the Development Committee.

X.2.E.3. Fiberglass may be used to protect or stiffen all wood construction except the spars. The mast may be protected by fiberglass only at the thwart level.

X.2.F. Aluminum - Aluminum is an approved material for the mast, boom, tiller and tiller extension, whisker pole and rudder cheek plates.

X.2.G. Dacron - Woven cloth of Dacron, a registered DuPont trade name, or of similar chemical composition is an approved material for the sails. This is intended to exclude Mylar and Kevlar (both also DuPont trade names) and similar materials.

X.2.H. Stainless Steel - Stainless steel is to be used for the standing rigging. It is also an approved material for halyards, the tiller and tiller extension, whisker pole, rudder cheek plates, and traveler.

X.2.I. Fasteners, fittings and sheets may be of any material normally used in marine construction.

X.2.J. Other sections of the Specifications may permit these or other materials to be used in specifically described applications.

X.2.K. Composite construction. The specifications for composite construction, informally known as the Harbinger Scantlings, and described in "Construction Manual for the Composite Windmill", are incorporated herein by reference.

3. HULL

X.3.A. The Measurer's official offsets for the hull and related tolerances are given on the official plans.

X.3.B. The official offsets define a fair hull.

X.3.C. The official offsets are to the exterior of the finished hull. All full width and height measurements of the hull exterior are to be made to the projected intersections of the hull's plane surfaces, not to the physical surface of the keel or chine if rounded.

X.3.D. The hull shall be set up for measurement with the foremost part of the stem precisely at Station Zero. For hulls where the foremost part of the stem cannot be determined such as in fiberglass construction, Station Zero shall be exactly one-half inch aft of the foremost point of the hull excluding the deck and gunwales.

X.3.E. The distances between stations are exact dimensions except for Station 5.

X.3.F. Station 5 is at the aft face of the transom at the sheer height.

X.3.G. The overall length of 15 feet 6 inches has a tolerance of plus one-half inch and minus one inch so the distance between Stations 4 and 5 must reflect this tolerance.

X.3.H. Due to the allowed rakes of the stem and transom, the heights and widths of the keel and chine at Stations Zero and 5 shall be taken where they intersect the stem and the transom.

X.3.I. The tolerances permitted on the official hull offsets are sufficiently generous to permit the average craftsman to build a hull which will measure, but the prudent builder who feels capable may strive to build what he or she feels is a faster hull by building as close to the limits of the tolerances as possible. Such practice, however, is at the builder's risk should the hull not measure in. There are no tolerances on the tolerances.

X.3.J. Wood Construction

X.3.J.1. The transom may be made of solid wood, planked or laminated.

X.3.J.2. The framing and planking of the transom allows three alternatives:

X.3.J.2.a. It may be constructed as shown on the Plans.

X.3.J.2.b. It may be constructed of 3/4" material with no transom cheek frames or transom stiffener.

X.3.J.2.c. It may be constructed of 1/4" material with the transom cheek frames and transom stiffener plus an added piece, a transom top stiffener of 3/4" thick wood 1-1/2" wide running from sheer to sheer.

X.3.J.3. The following parts are optional:

- a. The transom knees
- b. The aluminum cut-water
- c. The deck beams
- d. The breastplate
- e. The keel doubler, when a metal mast step or other provision is made to spread the load on the keel
- f. Permanent screws and nails

X.3.J.4. The wood material may be finished with varnish, paint or epoxy saturation techniques.

X.3.J.5. Any part or all of the hull may be covered with fiberglass or a plastic laminate such as Formica, 1/16 inch thick maximum, provided no compromise is made in the size or quality of materials specified.

X.3.J.6. Side flotation tanks are required for all hulls built starting with #5408. Tanks shall extend from the approximate location of the forward deck beam to station four, and may continue to the transom if desired. Side tank plywood material thickness is 3/16 inch minimum. The thwart brace configuration where it intersects the hull bottom may be altered to permit airtight construction. As an alternate, the thwart brace may terminate at the tank wall accompanied by a bulkhead within the tank. The bulkhead at the middle thwart brace shall be structurally strong enough to carry the loads imposed by the chain plates. The inside wall of the tank may be affixed to either side of the deck coaming as long as the farthest inboard projection does not exceed established minimum deck widths. The sides of the tanks should slope inwards approximately paralleling the hull sides but not to exceed a 10 degree vertical slope. Where a tank is installed the bottom stringer may be eliminated or reduced to 3/4" x 3/4" and relocated halfway between the keel and the bottom of the tank. The bottom of tank may be bonded to the hull with fiberglass tape and epoxy resins or affixed to a 3/4" x 3/4" stringer along the hull inside of the tank. The tanks shall be airtight. Tanks should be vented with drain holes with plugs and/or access ports.

X.3.J.7. Decking other than that shown on the Plans and referred to in the Specifications is illegal.

X.3.J.8. The bottom stringer may be terminated forward of Station One.

X.3.J.9. The shape of the aft side of the stem is optional.

X.3.K. Fiberglass Construction

X.3.K.1. The present wooden hull is to be considered as the standard for strength, performance and general appearance.

X.3.K.2. The interior of the fiberglass Windmill shall conform to the wooden boat in deck and thwart seat dimensions. Variations in other details of interior layout may be authorized by the Development Committee.

X.3.K.3. The WCA recommends that fiberglass covered wood be kept to a minimum throughout the hull construction.

X.3.K.4. Minimum thickness of the outer edge of the rub rail is 1/2 inch. The rub rail, or the outer 1/2 inch, should be replaceable (optional).

X.3.K.5. Thwart braces shall be equal or superior in strength to 1/2 inch marine plywood. Thwarts made of wood shall be replaceable.

X.3.K.6. The keelson, chine and sheer clamps, deck coaming, stem cutwater, transom cheeks and stiffener, and daggerboard well stiffener and cheeks may be omitted providing the hull construction is structurally strong without these members.

X.3.K.7. Sufficient reinforcement shall be made at all places where hardware is attached. The shroud chain plates may have internal reinforcement anchoring them into the hull or deck molding.

X.3.L. Hull Center of Gravity. To prevent excess bottom loading (adding ballast or constructing the hull in such a manner as to cause its center of gravity to move lower), the minimum center of gravity for the hull is 17 inches above the base line (hull in measuring attitude).

X.3.M. Minimum Hull Weight

X.3.M.1. The weight of the hull only, in dry condition, shall not at anytime be less than 198 pounds. Dry means dry to the satisfaction of the measurer.

X.3.M.2. Hull only comprises the hull, including the protective finish, optional built-in flotation tanks, any permanently affixed buoyancy material and fixed hardware permanently attached.

X.3.M.3. The hull only weight may also include removable flotation which is to be separately weighed and added to the hull weight without the removable flotation so as to obtain the final hull only weight.

X.3.M.4. Permanently attached hardware must be of normal size and must be functional in the judgment of the measurer. The only exception to this rule is compensating ballast used to bring the hull up to the minimum weight.

X.3.M.5. Hull only weight shall exclude spars, rudder, tiller, daggerboard, running and standing rigging, sails, anchor and anchor line, life preservers, paddle, portable or built-in pumps, sheets and all control lines or ropes.

X.3.M.6. If the weight of the hull only is less than 198 pounds, the difference shall be compensated for by adding ballast. The maximum allowable compensating ballast for all hulls built starting with #5408 shall be 15 pounds. The compensating ballast shall be permanently attached to the underside of the front thwart on the centerline of the boat. All Windmills meeting the minimum weight with or without ballast shall meet the center of gravity requirements.

X.3.M.7. The measurer must witness the weighing, satisfy himself as to the accuracy of the scales used and record the hull only weight, noting the separate weight of any removable flotation material which is credited towards the minimum hull weight. The weight of this removable flotation material shall be noted on the measurement certificate.

X.3.N. The hull shall have sufficient flotation, removable or permanently installed, to safely support hull weight and two crew members when capsized. Location of the flotation low in the chines is recommended. If buoyancy is provided by built-in air tanks, there shall be a minimum of two separate tanks, with each tank able to provide the safety specified above, or if fiberglass construction, foam shall be inserted within the tanks to provide the required safety. Flotation material may be sandwiched between fiberglass layers, subject to approval of the Development Committee. See also X.2.E.2 and X.3.J.6. No other flotation is allowed to be affixed to the bottom.

X.3.O. Struts (bracing for the purpose of stiffening the bottom) between the Thwart Braces or the aft end of the Daggerboard well to the bottom stringer and/or chine are permissible. All such struts must be permanently fastened and non-adjustable.

X.3.P. The bottom of the hull between the keel centerline and the chine, measured athwartship, must be within 1/4 inch of being a straight line.

X.3.Q. The width of the daggerboard well must be uniform throughout the entire length.

X.3.R. Bumpers (blocks of hard rubber or similar material) are allowed at each end of the daggerboard well

for the purpose of protecting the edges of the daggerboard. When installed each bumper shall not encroach on the normal slot dimensions by more than 3/4 inch. The bumpers shall not be permitted to wear a groove in themselves more than 1/2 inch deep as they then become an illegal gasket.

X.3.S. Lining the inside of the daggerboard well with synthetic material (such as outdoor carpet) is permitted for the purpose of protecting the daggerboard finish. Such lining must not extend lower than 1 inch above the bottom of the daggerboard trunk slot. Maximum thickness of the liner is 3/8" uncompressed.

X.3.T. Hiking straps are optional, but sliding seats, hiking boards, trapeze rigs and other artificial methods of supporting the skipper's or crew's weight to balance the boat are prohibited. This does not prevent the use of any kind of line or cord attached to the boat near the deck line.

X.3.U. Modifications to the hull bottom for viewing the daggerboard or rudder are not permitted.

X.3.V. Thru-hull suction bailers are permitted. Sufficient bailing apparatus, however, must still be carried to permit bailing a swamped boat. Transom bailers are permitted, but the total maximum open area shall be not more than 24 square inches. Material and method of installation are optional.

X.3.W. Wearplates may be fastened to the inside of the hull planking between chine, bottom stringer and keel. The wearplates are to be strips no thicker or stiffer than 1/8 inch wood, a maximum of 3/4 inch wide and spaced no closer than 1/4 inch, with 1/2 inch clearance to the stringers. Attention is directed to consideration of stick-on vinyl pads to accomplish the same purpose.

X.3.X. The traveler must be of either wire or rope. Suggested size and material are: 3/32 diameter, 7 x 19, stainless steel wire; or 1/4" Dacron line. The type of traveler is optional but it must be secured to or pass through the deck, gunwale or rubrail at a distance not to exceed 24 inches from the aft face of the transom. Athwartship travel may be adjusted while racing.

X.3.Y. Multiple jib fairlead tracks are permitted.

X.3.Z. Thwarts (seats) may be made of solid wood or of alternate layers of endgrain solid wood, separated or joined, for the purpose of beautification. Hinging as a compartment cover is allowed.

X.3.AA. Lightening holes (holes intended to reduce hull weight) are not allowed in the thwart braces. Compartment holes, notches for whisker poles and holes for attaching fittings are allowed, provided such holes do not significantly reduce the structural strength of the thwart braces. Holes in the thwart braces for the passage of control lines shall not exceed the line diameter by more than 1/4 inch.

X.3.BB. The opening in the thwart seat should be large enough to prevent chafing of the mast and it is permissible to cut out the forward thwart to accommodate the swing of the boom vang, but if larger than 4 x 4 inches, the edge of the opening must be reinforced by an equivalent weight of material removed in order to strengthen the thwart.

X.3.CC. The shape of the thwart braces as shown on the Plans will be followed.

X.3.DD. Barber haulers are permitted.

4. SAILS

X.4.A. Rules pertaining to the use of sails while racing are given under Racing Rules (Art. XV).

X.4.B. Sails may be of woven Dacron type materials (X.2.G defines Dacron).

X.4.C. The official class insignia (the size is shown on the Plans) shall appear on both sides of the mainsail. Insignia should be back-to-back and located just above the top batten pocket, in the center of the sail.

X.4.D. The registration number issued by the WCA shall appear on both sides of the mainsail. The numbers shall not be less than 10 inches high and of 1 1/2 inch wide strips. The numbers should be located between the middle and top batten with the numbers on one side lower than the other. Sail numbers may be of any color or colors provided that each color strongly contrasts with the sail.

X.4.E. Letters to designate the nation under which the boat is registered may be worn.

X.4.F. (deleted)

X.4.G. After measuring, stamping and certification of each suit of sails, the owner is obligated to inform his fleet measurer of any changes or alterations which would materially affect the dimensions and specifications of his sails.

X.4.H. Sails are subject to remeasurement and to cancellation or approval at any time.

X.4.I. All owners and sailmakers are hereby put on notice that any attempt to circumvent or take unfair advantage of the simple restrictions outlined herein shall leave them open to disqualification of any such sails. This provision is solely for the protection of the WCA and it shall be exercised stringently.

X.4.J. Spinnakers are not permitted.

X.4.K. Adjustment of the clew outhaul, tack downhaul and Cunningham of the mainsail is permitted at any time provided the maximum length of the luff (16'0") and foot (9'-5") are not exceeded. Adjustment of the halyards is permitted at any time. All other means of artificially changing the shape or length of the foot, leech or luff of either the jib or mainsail while racing is prohibited.

X.4.L. No extra battens or other means of artificially stiffening the leech or roach of either sail shall be used.

X.4.M. The use of a transparent window, of reasonable size, in the main and/or jib is permissible. Based on today's practices, a reasonable size for sail windows is something less than 4 square feet.

X.4.N. Mainsail

X.4.N.1. There are three measurements to be made on each mainsail. They are:

- a. Measurement of the width of the headboard
- b. Measurement of the length of the leech
- c. Measurement of the girth taken at the mid-points of the luff and leech.

X.4.N.2. The maximum width of the headboard, measured perpendicular to the luff, shall not exceed 6 inches.

X.4.N.3. The mainsail shall be equipped with head, tack and clew grommets. The distance from the center of the grommets to the edge of the sail cloth, not including the bolt rope, shall not exceed one inch. In the case of the head grommet the fore and aft location is not controlled. The maximum length of the leech, measured from the center of the grommet in the headboard to the center of the grommet in the clew, shall not exceed 17'-8" when stretched under a direct line pull of 5 pounds. This dimension is to be taken with the battens in their respective pockets.

X.4.N.4. The maximum girth shall not exceed 6'- 0" at the midpoints of luff and leech. The midpoints of the luff and leech are determined as follows: Fold the headboard to the tack superimposing the headboard and tack grommets. Stretch the sail snugly while holding the headboard and tack grommets together and crease

the sail where it forms its natural fold. This point should be marked by the measurer with an indelible pencil at the outside edge of the boltrope. The leech is folded and marked in a similar manner. The distance between these so-determined points shall not exceed 6'- 0".

X.4.N.5. The luff of the mainsail shall under no circumstances be stretched beyond 16 feet while racing. The 16 foot dimension is the distance between the center of the grommet in the head of the sail and the center of the grommet in the tack of the sail. So that this distance will be maintained for all to see, permanent bands 1 inch wide in a contrasting color shall be placed around the mast. The centerlines of the bands shall be located as follows:

X.4.N.5.a. 46-1/2 inches maximum up from the theoretical top of keel, the centerline of the prime reference band is placed. Six inches below this, the centerline of a second band may be placed.

X.4.N.5.b. Sixteen feet (16'- 0") maximum above the centerline of the prime reference band the centerline of the upper prime reference band is placed. Six inches below this band, the centerline of a fourth band may be placed.

The secondary set of bands six inches lower than the prime bands is optional. The center of the grommet in the tack of the sail will be adjacent to or above the band which is located 16 feet below that band which is adjacent to or immediately above the center of the grommet in the head of the sail. This implies that the center of the grommet in the tack of the sail will not be positioned below the prime reference band unless the center of the grommet in the head of the sail is lowered a full 6 inches to the secondary band, at which time the tack of the sail may be lowered to the lowest secondary band.

X.4.N.6. The foot of the mainsail shall not be stretched beyond 9'- 5". To permit checking, a permanent band one inch wide shall be placed around the boom in a contrasting color with the centerline of the band being 9'- 5" from the aft face of the luff groove or sail track with the boom perpendicular to the mast. The centerline of the grommet in the clew of the mainsail shall not be set aft of the centerline of the boom reference band.

X.4.N.7. Loose-footing the mainsail is prohibited.

X.4.N.8. The mainsail tack must be positioned as close as possible to the mast and boom so that each boltrope continues in a nearly straight line as it leaves the sail slot. Only one mainsail tack grommet is allowed.

X.4.N.9. Battens for the mainsail shall be three in number and have the following maximum lengths: Upper - 18"; Middle - 27"; Bottom - 24". These battens are intended to approximately divide the leech into equal parts. Maximum width of battens shall be 1- 1/2 inches.

X.4.N.10. If a cunningham cringle is installed in the mainsail, it shall be no more than 10 inches from the center of the tack grommet and no more than 3 inches from the luff of the mainsail. It may be no more than 1 inch in diameter. In lieu of a grommet the cunningham device's point of attachment may be sewn directly to the sail. The bolt rope may be removed from the luff of the mainsail between the cunningham and tack grommets.

X.4.O. Jib

X.4.O.1. The maximum dimensions for the jib are: luff: 12' 3"; foot: 6' 4"; leech: 11' 6". The jib's vertical measurement shall be no more than 12' 3/4".

The maximum depth of the jib including the roach shall be measured as follows: The midpoint of the foot is determined by folding the jib vertically and superimposing the tack and clew, lightly stretching the material while holding the tack and clew together to produce a natural fold, then crease the sail on the roach. This marks the midpoint of the foot. The head of the jib is then held firmly with two pounds of tension while a measurement is taken from the measurement point of the head to the lowermost edge of the roach at the

midpoint. This dimension shall not exceed 12' 3/4". This specification is to take precedence over any other specifications insofar as any conflict is concerned.

X.4.O.2. The foot, luff and leech dimensions shall be measured to measurement points at the head, tack and clew. The proper location of these measurement points shall be as follows:

X.4.O.2.a. Head: The measurement point shall be located 5/8" maximum from the luff and leech of the sail.

X.4.O.2.b. Tack: The measurement point shall be located 7/8" maximum from the luff and roach in the foot of the sail.

X.4.O.2.c. Clew: The measurement point shall be located 7/8" maximum from the leech and roach in the foot of the sail.

X.4.O.3. All jibs shall have a wire luff which must be permanently affixed at the head and tack of the jib. A lashing consisting of multiple turns and knotted to itself is considered adequate. The intent of this provision is specifically to eliminate adjustable jib luffs. Adjustment of the length of the luff of the jib during any sanctioned event is prohibited.

X.4.O.4. Jib attachment devices which completely house the forestay are prohibited.

X.4.O.5. The point of attachment of the jib tack at the deck shall be aft of the point of attachment of the forestay.

X.4.O.6. There shall be no battens in the jib.

X.4.O.7. The roach of the foot of the jib shall be a fair curve.

X.4.O.8. The jib may be sheeted inside or outside the shrouds.

5. MAST and BOOM

X.5.A. Wood Construction

X.5.A.1. A mast or boom of wood construction shall be as shown on the Plans except as modified herein.

X.5.A.2. Both mast and boom must be of 2 piece or multiple laminate construction. Orientation of laminations is optional. Minimum density of wood is to be twenty pounds per cubic foot.

X.5.A.3. The mast and boom may have a hollow for running halyards and outhaul internally not to exceed 0.5 square inch in each. The enlargement of the bolt rope slot to 1/2" width and one inch depth is recommended for this purpose.

X.5.A.4. The wood mast must not be externally grooved for halyards.

X.5.B. Aluminum Construction

X.5.B.1. The use of aluminum alloy extrusions for mast or boom construction is approved. All requirements of the Plans apply to aluminum construction except as specifically stated in this section.

X.5.B.2. The length of the mast and boom and the placement of fittings shall be the same as specified for wooden spars.

X.5.B.3. The aluminum extrusions must meet the following criteria:

X.5.B.3.a. The mast below the tangs shall be not less than 2 1/4" fore and aft and not less than 1 7/8" athwartships, nor greater than 2 3/4" fore and aft nor greater than 2 5/8" athwartships.

X.5.B.3.b. The boom shall not be greater than 3" vertically and not greater than 2 1/2" athwartships.

X.5.B.3.c. The mast extrusions may be tear-dropped shaped sections as well as round sections with an external luff groove track that is securely attached to the after part of the mast. Measurement of the fore and aft dimension shall include the mast section plus the track section.

X.5.B.4. Both the mast and boom sections must have provisions to accept the bolt rope.

X.5.B.5. The alloy and temper shall be such that the section is suitable as a spar without further tempering.

X.5.B.6. The alloy should be of a type considered resistant to salt water corrosion or the spar should be anodized. Having both provisions is preferred.

X.5.B.7. The weight of the keel stepped mast shall be a minimum of 14 pounds including permanently attached hardware. An equivalent thwart stepped mast shall weigh a minimum of 13 1/4 pounds. For measuring purposes permanently attached hardware is defined as the standing rigging, two halyards, and hardware for the halyards.

X.5.B.8. The center of gravity of the mast with permanently attached hardware shall be at least 105 inches up from the measuring point on the theoretical top of keel whether the mast is keel stepped or thwart stepped. Stays, shrouds and halyards shall be pulled towards the foot of the mast and taped to the mast when measuring the center of gravity.

X.5.B.9. The luff boltrope groove on aluminum masts may be cut away for the purpose of allowing sail entry and for halyard exit blocks. Such interruptions shall not exceed 9 inches in length. It would not be permissible to entirely remove the luff groove below the gooseneck.

X.5.B.10. The aluminum mast need not float.

X.5.B.11. External tangs shall be attached to the aluminum mast in a similar fashion as the wood mast, namely at 15' 8" plus or minus 1/2" above the theoretical top of keel. Shrouds and forestay attached internally intersect the mast section at this same location.

X.5.C. Internal halyards and outhauls are permitted.

X.5.D. The start of the mast taper (optional on the aluminum mast) is 15' 8" above the theoretical top of keel. The aft side of the mast is to remain straight. Mast sections that comply with X.5.B.3.a may begin taper below 15' 8".

X.5.E. The boom may be tapered as the owner pleases so long as the boom and hardware constitute a seaworthy configuration. The top of the boom is to remain straight except for the sail entry cutout at the gooseneck, which may not exceed 9 inches in length.

X.5.F. A rotating mast is prohibited.

X.5.G. Spreaders and jumper stays are permitted, but both must be made a permanent part of the mast.

X.5.H. Non-rigid spreaders on the mast are prohibited.

X.5.I. A mast puller or pusher is prohibited.

X.5.J. The mast may be stepped on the keel or atop the forward thwart if suitable bracing is installed. If the mast is stepped on the thwart, the measurement bands and other dimensions will be located according to

measurements taken from the theoretical top of keel.

X.5.K. The theoretical top of keel shall be the top of the keel of a properly built wood hull. The keel doubler is not considered a part of the keel and it must be compensated for. In a fiberglass hull the theoretical top of keel shall be 1 3/8 inches above the bottom of the keel on the exterior of the hull.

X.5.L. Mast wedges or chocks will be permitted if the mast is stepped on the keel but no other means of artificially bending the mast other than a boom vang, spreaders, halyards and main sheet will be permitted.

X.5.M. Roller reefing of the boom is prohibited.

6. STANDING RIGGING

X.6.A. Shrouds and forestay shall be of stainless steel wire. Suggested diameter of standing rigging is 3/32" diameter, 1 x 19 lay. Forestay minimum size is 3/32" wire, with a maximum length of 15'4" measured from the intersection with the front surface of the mast to the bearing point of the attachment to the boat.

X.6.B. Standing rigging must be as shown on the Plans. The forestay at the deck may be adjusted plus or minus 2 inches fore and aft from the nominal location shown on the Plans.

X.6.C. No backstay is allowed.

X.6.D. The shrouds must be attached to either (1) the aft side of the middle thwart brace and pass through the deck, (2) the deck or (3) the hull except that the attachment must be inside the sheer line and pass through the deck.

X.6.E. Adjustment of the forestay, shrouds, spreaders or jumpers during a race is prohibited. Automatic adjustment by use of shock cord, rope or other elastic material is prohibited.

X.6.F. Mid-stay adjusters on the mast are prohibited.

X.6.G. An equalizer between the jib stay and the forestay is prohibited.

X.4.K. Adjustment of the halyards is permitted at any time.

7. RUNNING RIGGING

X.7.A. The main sheet must have a minimum of two running parts between the aft end of the boom and the traveler and not more than one running part from any other point on the boom.

X.7.B. A JC strap is not legal. (A JC strap is a device for holding the boom outward).

8. WHISKER POLE

X.8.A. Size, material and type of whisker pole are optional.

X.8.B. The whisker pole length may be adjusted during a race.

X.8.C. Only one whisker pole may be carried in the boat.

X.8.D. When used, the whisker pole must be seated home against the mast and cannot be held in any other position by hand, either by skipper or crew (holding the jib outboard by hand is permissible). Flying the

whisker pole by seating the yoke or other inboard end fitting of the pole in an adjustable loop of line is not permitted. When the pole is in use the inboard end fitting shall be in contact with the mast.

9. DAGGERBOARD, RUDDER and TILLER

X.9.A. The daggerboard and rudder may be made of wood and/or fiberglass. Wood construction may be solid, planked or laminated.

X.9.B. (deleted)

X.9.C. The edges of the rudder and daggerboard may be protected by fiberglass, inserts of metal or other suitable material provided the specified measurements are adhered to.

X.9.D. The chamfer on the edges of the rudder is 1-1/2" maximum as shown on the Plans. The chamfer on the edges of the daggerboard is 3" maximum. The word "chamfer" as used here does not necessarily define a plane surface. The chamfered areas may be faired as desired within the limit specified.

X.9.E. The Daggerboard

X.9.E.1. The weight of the daggerboard shall not exceed 17 pounds. Bottom loading is not permitted. As a simple test it is required that the board float in a horizontal attitude when it is placed in water.

X.9.E.2. The size and shape of the daggerboard stop and handle are optional, but they must not exceed 8 inches above the board as shown on the Plans. The bottom of the stop must be positioned so that the 44 inch maximum daggerboard projection dimension (wetted length) is not exceeded.

X.9.E.3. The daggerboard may not be canted through the use of wedges (jibing boards are not allowed).

X.9.E.4. Closing the daggerboard slot in the bottom of the hull while racing is prohibited. This rule is intended to specifically rule out daggerboard plugs and gaskets.

X.9.E.5. The G dimension on the Plans applies to both the leading and trailing edge.

X.9.E.6. An alternative "short" daggerboard may be constructed which is identical to the profile shown on the Plans, except that the layout distance from the dimension point to the daggerboard tip shall be 50" (no tolerance) and dimension J (tip width) shall be 7.5". The bottom of the stop for the "short board" must be positioned so that a 34" maximum daggerboard projection (wetted length) is not exceeded.

X.9.E.7. The corners of the daggerboard tip may be rounded to a maximum radius of 3/4".

X.9.E.8. The daggerboard thickness is to be 3/4", with a maximum thickness of 15/16" and a minimum thickness of 5/8" with no thickness requirements within 3 inches of the outside edge.

X.9.F. The Rudder

X.9.F.1. The leading edge of the rudder above the apex shall be straight and it shall be parallel (within 1/8") to the transom and not more than 2 1/2" from the transom. It must also project above the top of the transom. Fittings may not be recessed into the leading edge.

X.9.F.2. The apex of the rudder must be within 1/4 inch of the keel reference point. The keel reference point is defined as the point on the leading edge of the rudder which is intersected by the continuation of the straight line of the bottom of the keel (with the rudder in its normal sailing position).

X.9.F.3. All measurements except the blade depth (dimension F on the Plans) shall be made using the leading edge above the apex as the base line and the apex as the base point. The blade depth (dimension F)

shall be measured from the keel reference point. Tolerances shall be as shown on the Plans.

X.9.F.4. The thickness of the rudder below the waterline shall be $3/4$ plus or minus $1/16$ inch. The waterline is defined as the line between the apex and point A as shown on the Plans.

X.9.F.5. The shape of the aft edge of the rudder above point A is optional. Below point A the shape shall be as shown on the Plans.

X.9.F.4. The thickness of the rudder below the waterline shall be $3/4$ plus or minus $1/16$ inch. The waterline is defined as the line between the apex and point A as shown on the Plans.

X.9.F.6.A. An optional "B" plan rudder may be used but must comply to rules X.9.F.1. and X.9.F.2.

X.9.F.6.B. All measurements shall be made using the leading edge below the apex as the base line and the apex as the base point.

X.9.F.6.C. The shape of the rudder above the apex base point as defined in X.9.F.2. is open. The planform below the apex base point must comply with Drawing "Planform V-7" and the following points:

1. The width at the apex measured at a right angle to the leading edge - 8"
2. The width at the bottom measured at a right angle to the leading edge - 5"
3. Depth below the apex - 26"
4. Straight leading and trailing edges.
5. Radius at the forward corner at the bottom - max of 2.5"
6. Radius at the aft corner of the bottom - max of 1"
7. Angle to the transom is controlled by extending the leading edge up 12" past the apex, and measuring back $2\ 5/16$ ".
8. On dimensions 1,2, & 3 the tolerances are +0", -1/2"
9. On dimensions 4 & 7 the tolerances are +/- $1/4$ "
10. The "B" plan rudder has no chamfer requirements or thickness requirements.
11. If used in a kick-up or daggerboard (cassette) system, while racing the rudder must be fixed in a position laid out by these rules.
12. Recommended thickness at the waterline is 1", with a NACA 0012 section.

X.9.G. The Tiller

X.9.G.1. The tiller must pass over the transom of the boat.

X.9.G.2. The tiller shall not extend forward of the aft thwart brace. Common length of the hiking stick is 30 inches but the length is considered optional. The tiller and hiking stick material is optional.

X.9.G.3. A rubber lanyard may be used to help center the tiller amidships.

$$V = 7$$

