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by Ted Williams

Constitution of THE INTERNATIONAL TORNADO ASSOCIATION

- 1 TITLE The full title of the Association shall be The International Tornado Association.
- 2 OBJECTS The objects of the ITA are to promote and further the interests of the Tornado Class throughout the world including :
 - a) To maintain the one-design character of the Tornado Catamaran.
 - b) To co-ordinate and manage the affairs of the class.
 - c) To make recommendations on the control of the class to the International Yacht Racing Union.
 - d) To encourage and co-ordinate national and international competition in the class.
- 3 HEADQUARTERS The headquarters of the Association shall be in London, England and the official language shall be English.
- 4 MEMBERSHIP
 - a) FULL MEMBERSHIP shall be upon payment of the prescribed annual subscription to be open to any owner of a Tornado, or in the case of joint owners to not more than two of them, or in the case of a Tornado owned by a corporation or association to a nominated representative of that organisation.
 - b) ASSOCIATE MEMBERSHIP shall upon payment of the prescribed annual subscription be open to any individuals or club interested in the Tornado class.
- 5 SUBSCRIPTIONS
 - a) FULL MEMBERS The annual subscription shall be £2.00 payable on the 1st January each year to the Association's headquarters in London. A member joining after the 30th September in any year shall not be required to pay any subscription for the following year.
 - b) ASSOCIATE MEMBERS The annual subscription shall be £1.00 payable on the 1st January each year to the Association's headquarters in London. A member joining after the 30th September in any year shall not be required to pay any subscription for the following year.
- 6 MANAGEMENT
 - A. COMMITTEE
 1. The affairs of the ITA shall be managed by the Association Committee which shall be the only body with power to make recommendations to the International Yacht Racing Union for changes in the measurement rules.
 2. The Committee shall consist of the following who must all be full or associate members of the Association :
President Chairman Secretary Treasurer Four others
 3. The Committee shall be elected annually at the AGM and each Committee member shall serve until the conclusion of the following AGM.
 4. In the event of vacancies occurring on the Committee for any reason whatsoever, the Committee shall have the power to co-opt replacements.
 5. Each Committee member shall have one vote. Decisions shall be reached by a simple majority, and in the event of an equality of votes the Chairman of the meeting shall have an additional vote.
 6. Four members shall form a quorum.
 7. The designer, Rodney March Esq, shall have the right to attend and speak at all Committee Meetings but shall have no voting rights unless elected as a committee member.
 8. Fourteen days notice of Committee Meetings must be given to all Committee members and to the designer. The notice of the meeting shall include an agenda.
 - B. GENERAL MEETINGS
 1. The AGM of the ITA shall be held each year in London during the month of November the date, time and place being at the Committee's discretion.
 2. Business at an AGM shall comprise :-
 - a) Chairman's Report
 - b) Secretary's Report
 - c) Treasurer's Report and presentation of accounts
 - d) Election of Officers and Committee
 - e) Election of Hon Auditors
 - f) Proposals, with the exception of those concerning class rules, of which notice has been received prior to the 1st September by the Hon Secretary, who should in turn advise all members of these proposals four weeks before the AGM.

3. Extraordinary General Meetings may be called by the Association Committee, or shall be called by the Chairman upon receipt by the Hon Secretary of a request in writing signed by not fewer than 10 members of the Association.
4. At least four weeks notice, together with a copy of the Agenda, shall be given to all members of any General Meeting.
5. At any General Meeting decisions shall be by simple majority except on matters concerning the Tornado Association Constitution. Alterations or amendments to the Constitution must be carried by a two-thirds majority vote.
6. Voting to be by show of hands unless a poll is demanded by not fewer than three of the members present. At General Meetings both full and associate members may be allowed to join in discussion but only full may vote. In the event of an equality of votes the Chairman shall have an additional vote.
- 7 ADMINISTRATION OF THE CLASS

Recommendations shall be made to the IYRU on the following :-

 - a) Control of the one-design characteristics and quality of the Tornado.
 - b) Appointment and re-appointment of professional builders in each area.
Where the territory is adequately served by one builder, another will not normally be granted the right to build by the IYRU.
- 8 CHAMPIONSHIPS

The ITA Committee shall arrange World, Continental and National Championships of the class as may be required. The ITA Committee may delegate the organisation and running of such championships.
- 9 INTERNATIONAL EVENTS

All international race meetings will be conducted under the IYRU racing rules and the ITA championship rules. The owner of each boat taking part in an international event must be a paid up full member of the Association.
- 10 NATIONAL FLEETS
 - a) Fleets may be formed by Association Members in any region on application to the ITA Committee.
 - b) The ITA Committee shall have the power to approve, disband or amalgamate fleets.
 - c) Fleets may form their own constitution provided that it has been submitted to the ITA Committee for approval.
 - d) Fleets shall nominate a Secretary or other Officer to be responsible for the affairs and conduct of the Fleet to the ITA Committee.
 - e) Fleets may organise such local sailing and social activities as they find necessary within the objects of the ITA.
 - f) Fleets may levy a subscription on their membership to cover their operating expenses.
 - g) In special circumstances the ITA Committee may approve separate fleets for different areas of a country.
- 11 TORNADO CLASS RULES
 - a) Proposals for any alteration or amendments to the class rules shall be submitted to the ITA Committee in writing, and shall be signed by at least five full members.
 - b) An appropriate ballot paper shall be prepared by the Committee and circulated to all full members. To be valid the completed ballot paper shall be received by the Hon Auditors within six weeks of the date of original circulation.
 - c) Proposals shall be deemed carried if two-thirds of votes cast are in favour. The results of the ballot shall be circulated by the Association Committee to all full members forthwith, including a statement by the Hon Auditors of the votes cast.
 - d) The findings of any such ballot on the class rules shall be passed by the Association Committee to the International Yacht Racing Union.
- 12 NOTICE OF MEETINGS AND POSTAL VOTES
 - a) Notice of meetings or ballot papers shall be deemed to be served if posted (by airmail if overseas) to the last known address of the member.
 - b) Non receipt of notices or ballot papers by members, or of postal votes by the auditors shall not invalidate the proceedings of meetings, or the result of a postal ballot.

CONSTITUTION

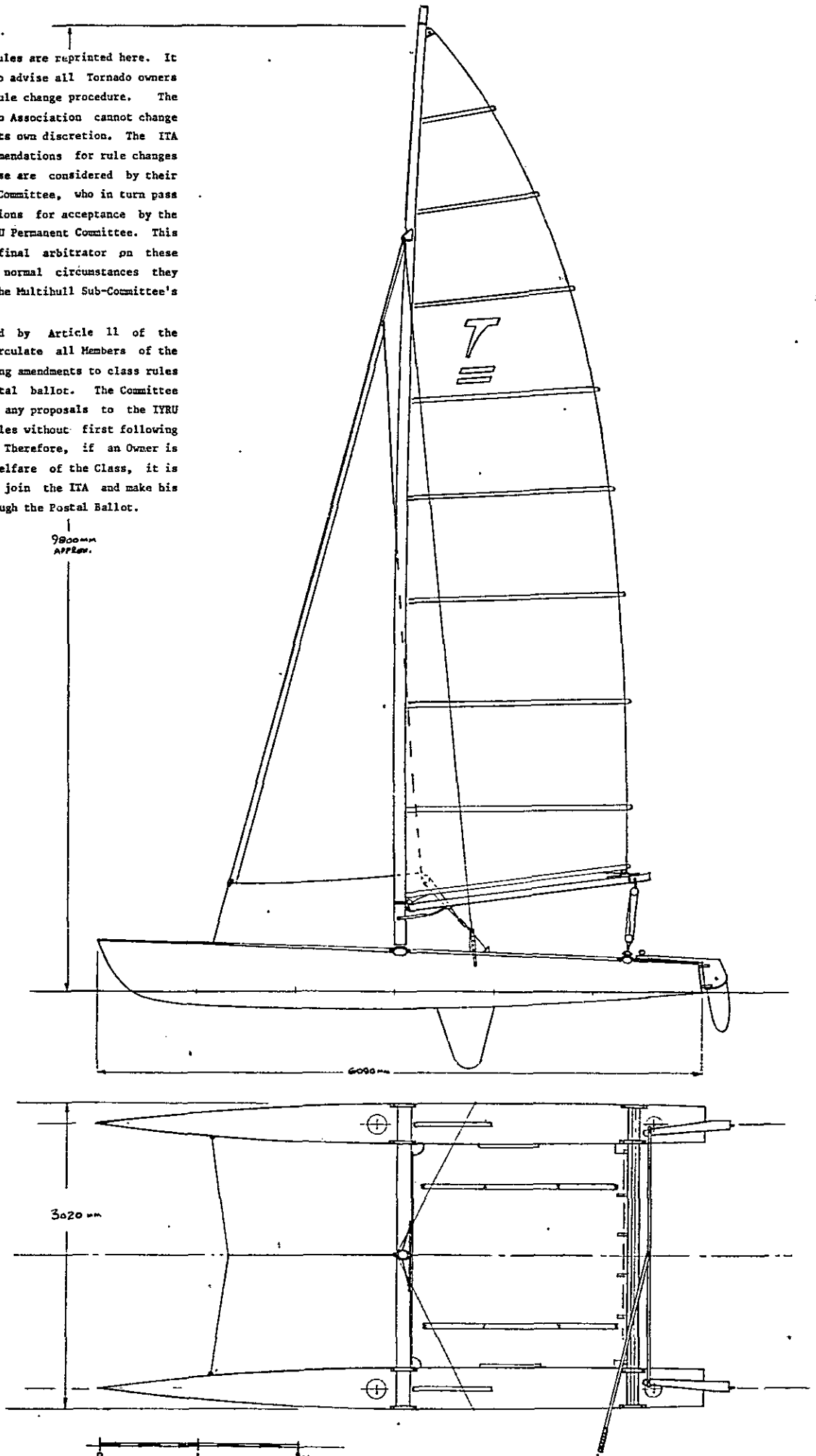
This Constitution may only be amended by motion of an Annual General Meeting as provided in Article 6 (B.5.)

30 November 1971

The complete class rules are reprinted here. It is perhaps helpful to advise all Tornado owners and members on the rule change procedure. The International Tornado Association cannot change the class rules at its own discretion. The ITA can only make recommendations for rule changes to the IYRU and these are considered by their Multihull Technical Committee, who in turn pass on their recommendations for acceptance by the delegates on the IYRU Permanent Committee. This Committee is the final arbitrator on these matters, but in normal circumstances they support and ratify the Multihull Sub-Committee's findings.

The ITA is obliged by Article 11 of the Constitution to circulate all Members of the Association regarding amendments to class rules and conduct a postal ballot. The Committee itself cannot make any proposals to the IYRU concerning class rules without first following this procedure. Therefore, if an Owner is interested in the welfare of the Class, it is imperative that he join the ITA and make his voice effective through the Postal Ballot.

9800mm
APPROX.



INTERNATIONAL TORNADO CLASS RULES

Date of International Status: May 1968

Authority: International Yacht Racing Union, 60 Knightsbridge, London, SW1X 7JX, England

1. GENERAL

- (a) The official language of the class is English and in the event of dispute over interpretation the English text shall prevail.
- (b) These rules shall take precedence over the measurement form and the plans.
- (c) Neither the I.Y.R.U. nor the International Tornado Association accept legal responsibility in respect of these rules or any claim arising therefrom.
- (d) Where there is no National Authority or the National Authority does not wish to administer the class, its function as stated in these rules shall be carried out by the International Tornado Association or its delegated representatives.

2. BUILDING FEE

- (a) The Building Fee is £21.00 sterling and includes the designer's fee of £14.00, the International Tornado Association administration fee of £3.50 and the I.Y.R.U. administration fee of £3.50.
- (b) The amount of the building fee may be reviewed and revised by the I.Y.R.U.
- (c) The building fee shall be paid by the builder on every boat built whether or not the boat is subsequently measured and registered.
- (d) For each boat built, kit made, or set of parts supplied, the builder shall pay to the International Tornado Association headquarters in London, the appropriate building fee as defined.
- (e) An official building fee receipt shall be issued to the builder by the Association. These shall be numbered consecutively.
- (f) The official building fee receipt shall be delivered by the builder to the owner on delivery of the hull, kit or set of parts.
- (g) For the purposes of this rule "builder" shall include a constructor of hull shells and a manufacturer of hull kits or sets of parts.

3. BUILDERS

- (a) Professional builders of the Tornado shall be only those recognised and registered by the I.Y.R.U. and boats or hull kits shall only be built for sale by these builders.
- (b) Recognition shall be subject to review and withdrawal by the I.Y.R.U. and professional builders shall be required to satisfy the I.Y.R.U., through the I.T.A. or the relevant National Authority of their competence to build the Tornado.
- (c) Additional professional builders may be recognised by the I.Y.R.U. at the recommendation of the International Tornado Association and the relevant National Authority, provided that a requirement can be shown for an additional source.
- (d) Bona fide amateur builders shall be permitted.

4. REGISTRATION

- (a) No boat shall be allowed to race in the class unless it has a valid class Measurement Certificate. Application for measurement and registration shall be the responsibility of the owner who shall apply to his National Authority for a sail number and measurement form, submitting at the same time the proposed name of the boat and the building fee receipt.
- (b) Each country shall issue sail numbers which shall be consecutive commencing from "one" and the number shall be preceded by the official national letters. The National Authority shall enter the sail number of the boat on the building fee receipt.
- (c) No two boats in the class registered in the same country shall have the same name.
- (d) The owner should arrange the attendance of a recognised Measurer who shall complete the measurement form and, if satisfied, shall certify thereon that the boat complies with the class rules.
- (e) The measurement form, when complete, shall be returned by the owner to his National Authority, together with any registration fee required by the National Authority. On receipt of these a measurement certificate shall be issued to the owner and a duplicate sent to the International Tornado Association, 4 Cleveland Square, London, W.2, England, giving the sail number, building fee receipt number, and name and address of the owner. The I.T.A. shall then enter the boat on the official class register.
- (f) A National Authority may charge a registration fee.
- (g) Change of ownership invalidates the certificate but re-registration may be effected by returning the old certificate to the National Authority, together with an application in writing containing the name and address of the new owner and the appropriate re-registration fee if any. Re-measurement is not necessary.
The National Authority shall issue a new certificate to the owner and shall send a duplicate to the International Tornado Association headquarters in London. The Association Secretary shall amend the class register accordingly.
- (h) Notwithstanding anything contained in these rules, the International Tornado Association or the I.Y.R.U. shall have the power to refuse or withdraw the certificate of any boat.

5. MEASUREMENT

- (a) This is a one-design class. Measurement tolerances are intended to allow for genuine building errors only and shall not be deliberately used to alter the design. The measurer shall report on the Measurement Form anything which he considers departs from the intended nature and design of the boat, or to be against the general interest of the class, and a certificate may be refused even if the specific requirements of the rules are satisfied.
- (b) Templates used for official measurement or re-measurement shall be issued by the I.Y.R.U.
- (c) Only an official Measurer recognised by the National Authority shall measure a boat, spars, sails and equipment, and sign the declaration on the Measurement Form that it complies with the class rules. Payment for the Measurer's services is the responsibility of the owner.

- (d) A Measurer shall not measure a boat, its spars, sails and equipment, owned or built by himself.
- (e) It is the responsibility of the owner to see that the boat, its spars, sails and equipment is correctly measured and to ensure that they thereafter comply with the current class rules.
- (f) All certified boats shall be liable to re-measurement at the discretion of the National Authority or Race Committee, but only by an official Measurer.
Any boat re-measured at a class meeting and found not to comply with the class rules may be disqualified.
- (g) A certificate shall be invalidated by structural alteration replacement of components, or repair of the boat and the boat shall be re-measured in respect of the affected parts by an official Measurer.
- (h) New sails shall be measured, and registered on the class measurement certificate by an official Measurer.

6. RECOGNITION MARKS

- (a) The sail number and national letters of the boat shall be carved or indelibly marked into the outside of the port transom.
- (b) The sail numbers, national letters and class emblems shall be placed on both sides of the mainsail, at approximately two-thirds of the height of the sail above the boom. Sail numbers, letters and emblems shall sharply contrast in colour with the sail and shall be placed at different heights on the two sides of the sail those on the starboard side being uppermost.
Letters and numbers on the sails shall be of the following minimum size
Height 300 mm; width 200 mm (except figure 1 and letter I).
- (c) Sail makers marks, if any, shall be placed near the tack of sails and shall not exceed 150 mm by 150 mm.

7. MATERIALS

Hulls, centreboards and rudder blades shall be made only of one or more of the following materials: wood, glass fibre, foam plastics, plastic fibres with a modulus of elasticity less than 100,000 kg/cm², resins, paints, glues and normal metal fastenings. Except for such fastenings, all materials when dry to the measurer's satisfaction shall be of high electric resistivity. Equipment may be used by the I.Y.R.U., or its delegated representatives, to detect materials of low resistivity such as metals and carbon fibre and a boat may be disqualified or have its certificate withdrawn if low resistivity is found which the measurer believes cannot be explained by normal metal fastenings or fittings.

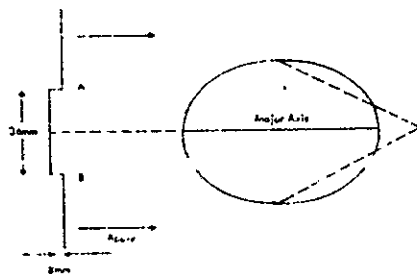
8. HULL MEASUREMENT

- (a) The hulls shall be inverted.
The bow template shall be applied with the projections touching the skin.
Template No. 5 shall be positioned 5 metres abaft the after edge of the bow template (i.e. 6 metres abaft the stemhead length datum which represents the stemhead of a boat built to the mean of the tolerances) and touching the skin at the keel. The bow template shall be adjusted to bring the inscribed datum line in coincidence with a base line which shall be horizontal and pass through the hole in template No. 5.
The remaining measurement stations shall be 0, 1, 2, 3.30 and 4.20 metres abaft the after edge of the bow template, touching the skin at the keel and at each station the template shall be equidistant from the sheerlines.
- (b) The base line shall pass through the holes in the templates and shall clear templates 1, 2, 3.3 and 4.2.
- (c) The sheerlines at all stations shall not be above or below the tolerance marks on the templates.
- (d) Clearance between template and skin or stem shall be not more than 10 mm.
- (e) The skin shall not project beyond the transoms which shall be flat and square across the hulls.
- (f) The hull shall not extend more than 5096 mm nor less than 5070 mm abaft the after end of the bow template.
- (g) The aft surface of the transoms at sheerline level shall be not more than 50 mm nor less than 30 mm forward of the aftermost point of the hulls.
- (h) The difference between the deck centreline separation and the keel centreline separation immediately abaft the main beam shall not exceed 10 mm.
- (i) The distance between deck centrelines shall be not more than 2630 mm or less than 2590 mm.
- (j) The centreplanes of each hull and its centreboard case shall coincide.
- (k) With the deck crown template normal to the deck and square across the hull, the clearance between deck and template shall be not more than 5 mm.
- (l) The difference in length between the diagonals from the tip of each bow to the aft edge of the opposite transom at the inner sheerlines shall not exceed 50 mm.
- (m) The builder shall certify that the boat with full racing equipment, and with both hulls swamped, shall support 160 kg. If the boat is found at any time not to comply with this requirement the certificate shall be invalid.
- (n) No rigging or control devices shall pass through the hull.

9. BEAMS

- (a) The hulls shall be joined by a main beam and rear beam. There shall be no beam or strut attached to the hulls other than the main beam and rear beam.
- (b) The main beam and rear beam each be straight aluminium alloy tube of constant section along its length, except that where a mast-section with integral track is used, the track may be opened, but not cut away, to provide an entry for a trampoline bolt rope. Holes may be drilled in the beams for fastenings.
- (c) The major diameter of the main beam section shall be not more than 135 mm nor less than 112 mm. The minor diameter of the section shall be not more than 91 mm nor less than 74 mm.
- (d) The major diameter of the rear beam section shall be not more than 135 mm nor less than 100 mm. The minor diameter of the section shall be not more than 91 mm nor less than 68 mm.
- (e) The wall thickness of the sections shall be not less than 2 mm.

- (f) The main beam and rear beam shall each be in one continuous piece. They shall be let into the deck and their lower surfaces shall be not more than 35 mm nor less than 25 mm below the inner sheerlines.
- (g) The major axis of the sections shall be parallel to the sheer. The beams shall be rigidly attached to the hulls but shall be easily removable.
- (h) A template, of shape shown below, applied to the leading surfaces of the main beam and rear beam as shown shall touch the beam only at points A and B.



- (i) The rear edge of the main beam shall be not more than 3115 mm nor less than 3095 mm abaft the stemhead length datum, as inscribed on the bow template.
- (j) The front edge of the rear beam shall be not more than 5344 mm nor less than 5324 mm abaft the stemhead length datum, as inscribed on the bow template.
- (k) The main beam shall be fitted with a strut and tie; the underside of the tie in way of the strut shall be not less than 235 mm nor more than 255 mm below the underside of main beam; the line of the tie shall meet the underside of the main beam not less than 970 mm nor more than 1122 mm from the centreline of the strut; the tie thickness shall be not less than 3 mm; the leading edge of the tie may be rounded but not sharpened, to not more than 1.5 mm from the leading edge; the strut shall be of circular cross-section of diameter not less than 24 mm. The maximum deflection of the beam in any direction over its full length at rest, without the mast being stepped, shall not exceed 15 mm.
- (l) Any device for adjusting the main beam strut or tie shall remain locked whilst racing.
- (m) There shall be no fairings.

10. TRAMPOLINE

- (a) A trampoline shall cover the area between the main beam, rear beam and inner sheerlines, except that a maximum gap of 130 mm is allowed along the fore and aft centreline and around the perimeter for lacing.
In addition to these gaps and the necessary lacing eyes, holes not exceeding 0.1 square metre in total area are allowed in the trampoline. The area of each hole shall be taken as the area of the enclosing rectangle. (A net trampoline is not permitted.)
- (b) There shall be no trampoline or other covering whatsoever in front of the main beam or behind the rear beam except that the trampoline material may be wrapped round the beams.
- (c) If the trampoline is wrapped round the main beam in the form of a sleeve, the sleeve including any lacing shall extend not more than 185 mm aft of the front of the beam, and shall not incorporate any padding. Double trampolines are prohibited.

11. CENTREBOARDS

- (a) Two centreboards shall be fitted, one in each hull. Each centreboard shall pivot about one point only, relative to the hull, and shall be capable of being raised completely so that it does not project below the line of the keel. The line of the keel shall be the continuation of the keel line in way of the centreboard case. The pivot point shall be aft of the line of the under-water leading edge of the centreboard and not more than 100 mm from it.
- (b) Dagger boards are prohibited.
- (c) In the fully down position the under-water profile of each centreboard shall not overlap or be more than 10 mm away from the centreboard template, both ends of which shall touch the keel line.
- (d) In the fully down position the front edge of each centreboard at the line of the keel shall be not more than 2485 mm nor less than 2465 mm abaft the aft edge of the correctly positioned bow profile template.
- (e) The maximum thickness of each centreboard shall not exceed 29 mm. In the fully down position the maximum thickness of each centreboard at the line of the keel shall be not less than 25 mm.
- (f) The surface of each centreboard below the line of the keel shall nowhere be concave. The cross-sections of each centreboard shall be substantially symmetrical about its fore and aft centrelines.
- (g) The centreboards shall have no moving parts.

12. RUDDERS

- (a) In the fully down position the profile of each rudder blade shall not overlap nor be more than 10 mm away from the rudder blade template, the forward top edge of which shall be above the line of the keel.
- (b) The rudders shall be hung on the transoms on normal fittings and shall have devices to retain them in the event of a capsize.
- (c) With the rudders in the fore-and-aft position the centre planes of each hull and its rudder shall coincide.
- (d) Dagger and fixed rudder blades are prohibited.

13. WEIGHT

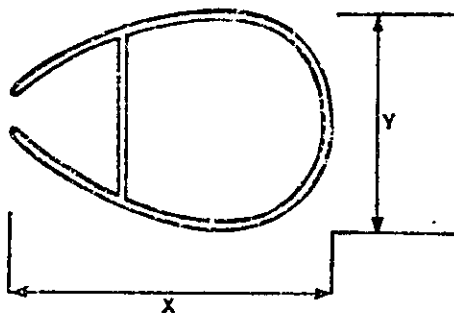
- (a) The total assembled weight of hulls, correctors if any, main beam, rear beam, trampoline, centreboards, rudders, tillers, connecting arm, tiller extensions, main sheet track or wire horse, main sheet traveller or slide, jib sheet stop(s), and all fittings bolted, screwed, or permanently fixed to the boat shall be not less than 127 kg nor more than 145 kg when in dry condition to the measurer's satisfaction. Not included in this weight are spars, standing or running rigging, sails, and all other loose or easily removeable gear.

Correctors shall be attached inside of the main beam or immediately beneath the main beam in each hull or on the outside of the main beam.

- (b) If correctors are altered or removed the boat shall be re-weighed by an official measurer and a new certificate obtained.

14. MAST

- (a) The mast shall be an inherently straight aluminium alloy extrusion of constant section, with integral track and of the general shape shown below



Dimension X shall be not less than 112 mm nor more than 135 mm and Y not less than 74 mm nor more than 91 mm measured externally. The wall thickness shall be not less than 1.8 mm.

- (b) The extrusion may be tapered above a point 7190 mm from the lower end of the mast extrusion and the track opened or cut away below a normally positioned sail entry point, but the shape shall be not otherwise altered.
- (c) Tapering shall be only achieved by cutting a single "V" slot down the front of the section, closing it and making a single continuously welded butt joint. The girth of the mast at the bottom edge of the top measurement band shall be not less than 240 mm and the taper shall not be hollowed.
- (d) The forestay and shrouds shall be attached to the mast at a single point, within 40 mm of the extrusion surface and not more than 7190 mm nor less than 7140 mm from the lower end of the mast extrusion.
- (e) The trapeze wires shall be attached to the mast and not to the standing rigging. The attachment point shall be not more than 50 mm from the attachment point for the shrouds and forestay, and may be the same point.
- (f) The mast shall be stepped on the centreline of the boat and its vertical centreline shall intersect the main beam in any position to which the mast may be rotated.
- (g) A measurement band shall be painted round the mast with its top edge not more than 390 mm nor less than 340 mm from the lower end of the mast tube extrusion. A second measurement band shall be painted with its bottom edge not more than 8915 mm above the top edge of the first. (Measurement bands shall be in a colour contrasting with that of the spar.)
- (h) When stepped, the lower end of the mast extrusion shall be not more than 90 mm above the top of the main beam.
- (i) With the mast horizontal and simply supported at the bottom end of the extrusion and at the bottom edge of the top measurement band only, the mast weight bearing on the support at the top band shall be not less than 10.5 kg. This weight shall be measured with gooseneck, running rigging and normally attached diamond rigging, but without shrouds, forestay and trapezes, and all slack in the mainsail and jib halyards shall be pulled to the butt so that the sail attachment fittings are against the upper halyard sheaves. Halyard tails shall be coiled and attached to the mast butt. With the mast rigging and fittings in the same condition the total weight shall be not less than 23 kg.
- (j) Mast jacks and adjustable mast steps are prohibited.

15. BOOM

- (a) The boom may be of any material, but shall be inherently straight and of constant section throughout its length.
- (b) Excluding fittings, the boom shall pass through a 100 mm diameter circle.
- (c) The weight of the boom including only the mainsheet attachment points and equipment for controlling the mast spanner, tack downhaul, clew outhaul and leech line (but not including the leech line itself) shall not be less than 3.5 kg.

16. STANDING RIGGING

- (a) There shall be one shroud only to each hull, the attachment point being on the outer topsides and not more than 728 mm nor less than 708 mm aft of the after edge of the main beam.
- (b) The mast shall carry one pair of diamond stays only, which shall be rigged below the hounds, and which shall pass over a spreader of unfaired round tube or rod of diameter 15 mm minimum.

The diamonds shall be rigged between external tangs fastened to the outside of the mast. The diamond attachment points on the upper and lower tangs shall be not less than 6000 mm apart. The distance between the diamond attachment point on any tang and the nearest fastening of that tang to the mast shall be not more than 75 mm.

The points of intersection of the diamond wires and the spreaders shall be not less than 790 mm apart measured in a straight line.

- (c) There shall be one forestay only, which shall be attached to a strop between the hulls. The forestay strop attachment point to each hull shall be not more than 50 mm from the inner sheerline and not more than 1990 mm nor less than 1965 mm forward of the after edge of the main beam.
The line of each half of the forestay strop shall not pass above the inner sheerlines when the boat is rigged.
- (d) The point of intersection of the lines of the forestay and each half of the forestay strop shall lie on the centreline of the boat and shall be not less than 838 mm from a straight line joining the inner sheerlines at the points of attachment of the forestay strop to the hulls.
- (e) Struts, stays, or devices which limit the natural fore and aft movement of the forestay and forestay strop are prohibited.
- (f) There shall be no other standing rigging.
- (g) All standing rigging shall be circular in section and shall have no fairings. Rod rigging is prohibited. The minimum diameter of the shrouds, diamond wires, forestay and forestay strop shall be 3 mm.
- (h) Adjusting the standing rigging whilst racing is prohibited. Standing rigging shall be adjusted only by means of rigging screws or turnbuckles, shackles, shroud adjuster plates and lashing. Any of these shall be locked, wired or otherwise firmly secured while racing.
- (i) The weight of the forestay, forestay strop, shrouds, trapeze wires and handles and shackles, rigging links and adjusters used to attach these to the mast and the hulls shall be not less than 1.7 kg.

17. SAILS

- (a) The rig shall consist of mainsail and headsail.
The I.Y.R.U. International Sail Measurement Instructions shall apply where no conflict with these rules arises. Battens shall be removed from the mainsail for measurement.
- (b) The sails shall be of woven material and shall be capable of being stowed in a sail bag of normal dimensions. Windows of unwoven material to a total maximum area of 0.3 square metres shall be allowed in any sail. The area of each window shall be taken as the area of the enclosing rectangle.
- (c) **Headsail**
 - (i) The "triangulation" method of measurement shall be used if the width of the sail at the head exceeds 50 mm. For the purpose of this rule the width at the head shall be measured at right angles to the luff through the highest point of the sail on the luff, to the line of the leech, extended if necessary.
 - (ii) The length of the leech shall be not more than 5435 mm. The length of the luff shall be not more than 5800 mm. The length of the foot shall be not more than 1985 mm.
 - (iii) At a point on the leech 200 mm down from the head, the nearest point on the luff shall be not more than 100 mm distant.
 - (iv) At the half leech point the nearest point on the luff shall be not more than 850 mm distant. The half leech point shall be found by folding head to clew and smoothing the sail out flat.
 - (v) The round on the foot shall be not more than 50 mm from the straight line between the tack and the clew, as defined for the measurement of luff and leech.
 - (vi) Three headsail battens are allowed in the leech only, dividing the leech into four approximately equal parts. Each batten shall be not more than 200 mm in length and not more than 20 mm in width.
 - (vii) The leech shall be in no place convex.
 - (viii) Zip "Velcro" and sleeve luffs are allowed.
 - (ix) The headsail shall be carried on the forestay. The tack shall not extend below the intersection of the forestay with forestay strop.
- (d) **Mainsail**
 - (i) "Head" shall be the highest point of the sail outside the mast; "tack" shall be the point of intersection of the line of the foot with the line of the aft edge of the mast; "clew" shall be the point of intersection of the line of the foot with the line of the leech from above the bottom batten.
 - (ii) The mainsail shall be set within the inner edges of the measurement bands on the mast.
 - (iii) The sail shall be loose-footed and shall be attached to the boom or boom fittings by tack and clew cringles.
 - (iv) The foot, when smoothed out for measurement shall be straight with no shelf or built-in flow.
 - (v) The tack and clew cringles, together with associated roping and sail reinforcement, may extend below the line of the foot, but shall be wholly contained within rectangles of 350 mm by 50 mm.
 - (vi) There may be a full length batten along the foot and not more than 10 others.
 - (vii) There shall be no other battens and no batten may exceed a width of 55 mm or protrude more than 150 mm beyond the leech of the sail.
 - (viii) The battens shall have no moving parts.
 - (ix) The battens shall not incorporate carbon fibres.
 - (x) The distance from head to clew shall be not more than 8650 mm.
 - (xi) The headboard shall not exceed 120 mm in any dimension.
 - (xii) The leech shall be straight or concave between batten pockets and from the top batten pocket to the aft edge of the headboard.
Any hollows in the leech in way of width measurement points shall be bridged with straight lines for measurement.
 - (xiii) At a point on the leech 500 mm down from the head, the nearest point of the luff shall be not more than 385 mm distant, measured across the full width of the sail including the bolt rope.
 - (xiv) At the $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$ leech points the nearest point on the luff shall be not more than 2260 mm, 1955 mm and 1270 mm distant respectively, measured to include the bolt rope.
The $\frac{1}{2}$ leech point shall be found by folding head to clew and smoothing the sail flat.
The $\frac{1}{4}$ and $\frac{3}{4}$ leech points shall be found by folding the clew and head to the $\frac{1}{2}$ leech point and smoothing the sail flat.

- (xv) The distance from the clew to a point on the luff 500 mm from the line of the foot shall be not more than 2355 mm, measured to include the bolt rope.
- (xvi) The mainsail shall be hoisted in the integral luff groove of the mast extrusion, and shall not be fitted with a sleeve or double luff or other fairing device.
- (xvii) When measured and found to be in accordance with these rules, the sails shall be legibly and permanently endorsed with the date of measurement and the measurer's signature. New, or substantially altered, sails shall be measured by a recognised measurer and the details recorded on the official certificate in the space provided.
- (xviii) One leech line only is permitted. This shall run externally through the batten ends or through a sleeve not exceeding 35 mm width from the leech edge.
- (xix) Controls for the leech line and clew shall be mounted on or in the boom only and shall not extend to any other part of the boat.
- (xx) The luff downhaul control shall be mounted only on or in the boom or on the mast, and shall not be inter-connected with any other control.
- (xxi) There shall be no mainsail controls other than the leech line, clew adjuster, luff downhaul, Cunningham eye downhaul, mast rotation control, mainsheet and traveller.

18. MAINSHEET

A mainsheet traveller system is permitted if the traveller runs in a substantially straight line along the rear beam only or on a wire horse attached only to the rear beam.

19. MISCELLANEOUS

No hiking aid shall be allowed except for foot loops, toe straps, trapeze gear and any line for retaining crew position on gunwale. The trapeze gear shall be used only by one person at a time who shall have at least one foot in contact with the boat.

Trapeze gear worn by the crew or helmsman shall be buoyant.

The following are prohibited:

Foresail booming out spars, foresail booms, hydrofoils, outriggers, ballast, suction bailers, keel bands except in way of centreboard slot, rubbing strakes, spray deflectors, chines, and any projection from the skin other than normal fittings.

20. EQUIPMENT

The following equipment shall be carried on board whilst racing:

A paddle not less than 1000 mm long; an anchor of not less than 2.5 kg weight; not less than 30 metres of line; a lifebuoy or personal buoyancy for each member of the crew.

21. PERSONS ON BOARD

The crew (including helmsman) shall consist of two persons

OFFICIAL TEMPLATES

The set comprises

- Bow template
- 0, 1, 3.3 and 4.2 hull templates
- Centreboard template
- Deck camber template
- Rudder template

Effective: 1st March 1974
 Previous issues: 1st March 1973
 1st March 1972
 1st March 1971
 1st March 1970
 1st May 1968

Sail Measurement Instructions

Extracts from Measurement Instructions of the IYRU 1974 as applicable to the Tornado Class.

SECTION III – Sail Measurement

1. General

- (1) Sails shall be measured in a dry state laid on a flat surface with just sufficient tension to remove wrinkles across the line of the measurement being taken.
- (2) Sails shall be flexible, soft and capable of being easily stowed. The body of the sail shall be so constructed that it may be folded flat in any direction, other than in way of windows and corner stiffening as defined below, without cracking or otherwise permanently damaging the sail or its reinforcement. Reinforcement of any fabric having the effect of stiffening the sail is permitted only within a distance from each corner of 150 mm plus 3% of the length of the luff of the sail. Other reinforcement, as a continuation of corner stiffening or elsewhere, comprising not more than two additional layers of material having the same weight as the body of the sail, is permitted provided that it can be folded as described above and is not stiffened by the addition of bonding agents, close stitching, or otherwise. Glued seams shall not be considered as stiffening provided that they can be folded as described above. Normal tabling at the edges of the sail is permitted provided that it is not stiffened.

Class	Maximum permitted distance of "stiffening" from corner of sail (150mm plus 3% of luff length)			Maximum permitted distance of sailmaker's mark from tack (Racing Rule 26 refers)	
	Mainsail	Headsail	Spinnaker	Mainsail	Headsail
Tornado	420	325	—	355	300

- (3) The term "sail" shall be taken to include the headboard, tabling, bolt and foot ropes (or tapes). It shall not include cringles which are wholly outside the sail.
- (4) Where, under the class rules, a window is permitted, or not specifically prohibited, then the area of the transparent material of such window shall not exceed 0.3 m² and shall not be placed closer to the luff, leech or foot than 150mm or 5% of the length of the foot whichever is the greater.
- (5) Openings in the sail, in addition to the normal cringles and reefing eyelets, are permitted provided that the sail is flat in the vicinity of the openings.
- (6) When batten pockets are measured the maximum inside dimensions shall be taken, ignoring the effect of any elastic or other retaining devices. The length shall be taken from the aft edge of the sail.
- (7) Not applicable.
- (8) If the luff of the sail is not attached to a spar or luff wire, a check wire, minimum diameter 1.25 mm, shall be securely fastened to the head and tack cringles. The length of the luff shall be measured with sufficient tension to straighten this check wire.
- (9) Where sails are set on spars, measurement bands shall be marked on the spars, so that they are clearly discernible whilst racing. The inside edges of these bands shall define the limits to which the sail may be set.
- (10) Not applicable.

2. Mainsails

- (1) Definitions
 - (i) Head — The head shall be taken as the highest point of the sail projected perpendicular to the luff or its extension.
 - (ii) Clew — The clew shall be taken as the aftermost part of the sail projected to the foot or its extension.
- (2) Measurements
 - (i) Leech
The length of the leech shall be taken as the straight distance between the head and the clew.
 - (ii) Luff
The length of the luff shall be taken as the distance on the mast between the upper edge of the lower measurement band and the lower edge of the upper measurement band.
For double luff sails which envelop the mast the length of the luff shall be taken as the distance on the mast between the upper edge of the lower band and the highest point of the mast.
 - (iii) Foot — Not applicable.
 - (iv) Cross Widths
The cross measurements shall be the distance from the leech measurement points, as defined below, to the nearest point on the fore edge of the sail including the bolt rope. The points on the leech from which the cross measurements are taken shall be determined bridging any hollows in the leech with straight lines.
The mid-point of the leech shall be determined by folding the head to the clew and the quarter and three-quarter leech points by folding the clew and the head to the mid-point of the leech.

3. Headsails

- (1) The length of the luff shall normally be the distance between the lowest part of the sail on the luff rope at the tack and the highest point of the sail on the luff rope at the head.
Owing, however, to the varying methods of making the corners of headsails, a measurer shall, if he considers that a sail is measured either favourably or unfavourably by this method, use a different method as follows :—
The point of measurement at the tack shall be the point where the extension of the luff meets the extension of the foot, ignoring any round or hollow to the foot, and the point of measurement at the head shall be the point where the extension of the luff meets the extension of the leech, ignoring any round or hollow of the leech.
If the cloth is not permanently attached to a luff wire, the measurer shall be satisfied that the luff cannot be stretched to exceed the maximum dimension permitted by the rules.
- (2) The length of the leech shall normally be the distance between the lowest part of the sail directly below the centre of the clew cringle and the highest part of the sail at the head.
- (3) The length of the foot shall normally be the distance between the lowest point of the sail on the luff rope and the outer edge of the sail directly aft of the centre of the clew cringle.
- (4) The measurement from clew to luff shall normally be between the outside edge of the clew and the nearest point on the luff.
- (5) Centre Measurement — not applicable.

4. Area of Fore-triangle

Not applicable.

5. Spinnakers — Paragraphs (1), (2), (3), (4), (5), and (6).

Not applicable.