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|  <b>North American Model Boat Association</b><br><b>Official Rule Book – Update</b> | Update # | <b>2020-2</b>  |
|  | Date     | <b>6/21/20</b> |

Enclosed you will find the latest Rule Book updates. To keep your Rule Book current and up to date, please make the page replacements listed below. If you feel that you have missed any updates please call the Executive Secretary to get an additional copy and/or for clarification of current revisions. Proposals

**Section**

**Summary of changes**

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Remove pages: iii - vi (*dated various*)  
 Insert pages: iii - vi (*dated 6/21/20*)

Updates needed for below changes

13 - Official Courses

Remove pages: 1 - 3 (*dated various*)  
 Insert pages: 1 - 4 (*dated 6/21/20*)

Changes from proposals sent out in April 2020 Propwash:  
 - Proposal 1: Clarification of milling patterns (original Rule B.2, now Rule B.5, moved to end to flow with other rules in same area)

18 - Heat Racing

Remove pages: 1 - 2 (*dated 6/30/19*)  
 Insert pages: 1 - 2 (*dated 6/21/20*)

Changes from proposals sent out in April 2020 Propwash:  
 - Proposal 1: Clarification of milling patterns (Rule D.2)  
 - Proposal 3: Ability to combine heats (Rule B.5)

27 - Gas

Remove pages: 1 - 2 (*dated 6/30/19*)  
 Insert pages: 1 - 2 (*dated 6/21/20*)

Additions from proposals sent out in April 2020 Propwash:  
 - Proposal 2: Rules for Gas Outboard Tunnel (Rule D.4)

Insert pages: 11 (*dated 6/21/20*)

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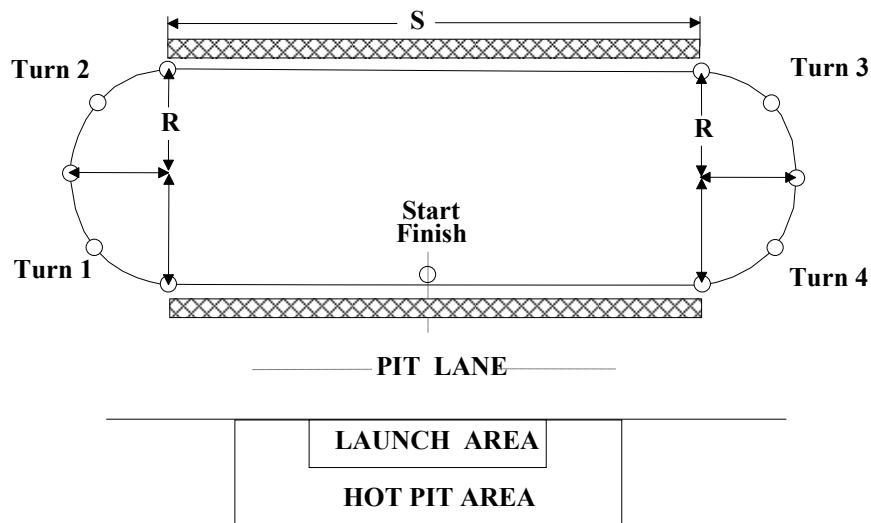
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## A. BUOYS

1. Buoys will be any object non-injurious to boat hulls such as styrofoam or plastic that floats at least 50% out of the water, is clearly visible, brightly colored (red, orange, or yellow), and securely fastened to their position. In no event will a buoy be less than six inches or more than 12 inches in diameter. Buoys must float a minimum of five inches above the water.

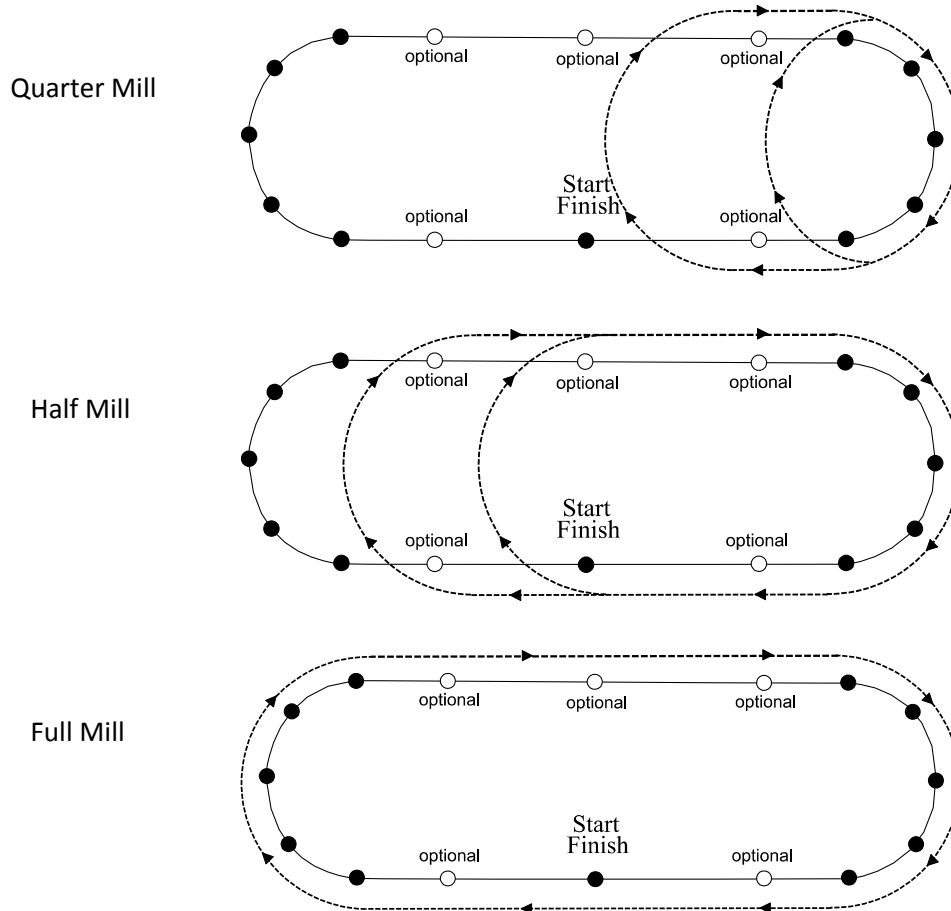
## B. TERMINOLOGY

1. The area between the shore and the front straight is known as the pit lane. This lane should be considered present during all events, whether marker buoys are set up or not and the drivers entering or leaving the launch area are encouraged to drive their boats in this lane.
2. The shaded area between the turns will be referred to as the front and back "straights" or "chutes" respectively.
3. The section within the course marker buoys is referred to as "within the course" or as the infield.
4. The buoys at each end of the straights/chutes are referred to as the "entrance buoys" of the turns. The buoys at the beginning of the straights/chutes are referred to as the "exit buoys" of the turns.



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5. Mill patterns will be Quarter, Half, Full, or a combination of these (see diagrams below).



## C. REGULATION COURSES

### 1. General

- a. The course will be defined and measured as follows:
  - i) There will be a minimum of three laps required in the total race distance for all classes.
- b. The turns will be clockwise and be defined as follows:
  - i) Turns of 90 degrees and 135 degrees which have a 15 foot to 30 foot radius must be marked by a minimum of two buoys. Radius turns of 30 feet or larger must have additional buoys to a maximum of five being used to adequately define the turn.

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- ii) Turns of 135 degrees or more will be marked by a minimum of three buoys for radii between 15 feet and 30 feet. For radii over 30 feet, additional buoys to a maximum of five to adequately define the turn will be used.
  - c. A legal course for NAMBA Heat Racing and Oval Time Trial records must be either one in which each buoy is surveyed and placed in a fixed position, or one which is measured and has the straightaway marked by a solid fixture on each end. This fixture can either be on the water or on two sides of the lake so that a line can be drawn across to set the straightaway end positions. The radius will then be measured from these fixed straightaway end positions, and will apply to all turn buoys. The lines or devices that are used for measuring will be at the site during a race in the event that anyone should desire to verify the measurements or placement of a buoy.
- 2. One Mile - Six Lap Record Course
  - a. The course will be one mile in total length for all classes.
  - b. The course will be six laps for all classes.
  - c. The radii used when establishing this course will not exceed 50 feet or be less than 15 feet.
  - d. Five buoys will be used to define the turn, except on 15 foot radii turns which may use three buoys.
  - e. When optional straightaway buoys are used, a maximum of three buoys will be used for each straightaway.
- 3. Other Courses
  - a. There may be special courses listed within specific class/racing type sections (e.g. electric, offshore, etc.). See individual sections for details.



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#### D. COURSE MEASUREMENT

##### 1. Mathematics of course

Course length **C** = number of laps **N** x lap length **L**

Lap length **L** = 2 x length of straight **S** + total length of turns **T**

Total length of turns **T** =  $\text{Pie} \times (2 \times \text{radius of turn } \mathbf{R} + \text{buoy width } \mathbf{B})$

Radius of turn **R** (to center of buoy)

##### 2. Formulas

###### a. Length of course

$$C = N \times ( (2 \times S) + 3.1416 \times (2 \times R + B) )$$

###### b. Length of straight

$$S = .5 \times ( (C / N) - 3.1416 \times (2 \times R + B) )$$

###### c. Radius of turns


$$R = .5 \times ( ( (C / N) - (2 \times S) ) / 3.1416 ) - B )$$

###### d. Examples

One mile - Six lap course (all measurements in feet):

$$5280' = 6 \times ( (2 \times 318.12') + 3.1416 \times (2 \times 38.42' + .75') )$$

| Course length (C) | Laps (N) | Turn Radius (R) | Buoy Width (B) | Straight (S) |
|-------------------|----------|-----------------|----------------|--------------|
| 1 mile (5280')    | 6        | 15'             | 6" (.5')       | 392.1'       |
|                   | 6        | 30'             | 9" (.75')      | 344.6'       |
|                   | 6        | 38.42'          | 9" (.75')      | 318.12'      |
|                   | 6        | 50'             | 9" (.75')      | 281.74'      |
|                   | 6        | 50'             | 12" (1')       | 281.35'      |

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## A. GENERAL

1. An R/C model powerboat heat will consist of the simultaneous scheduling of two or more boats for a race. The number of heats constituting a race is determined by the number of entries and time available, however, a minimum of three rounds is required with ties to be broken by the fastest time.

## B. HEAT RACING PROCEDURES

1. Each heat race will consist of three distinct phases:
  - a. Pit Time
  - b. Clock Time or Mill Time
  - c. Course Time or Race Time
2. The heat starts with the first phase: a two-minute period or Pit Time for starting engines, launching and releasing boats. A starting clock, placed in full view of all drivers (or and adequate audio system) and requiring no less than 30 seconds to complete one sweep, will be started. If all boats are on the water you can go onto the 30-second clock with drivers approval. Contestants will mill on the course in a designated milling pattern until the end of Clock Time. Drivers should pace their boats during Clock Time so as to arrive at the starting line at full throttle simultaneously with the expiration of the Clock Time which constitutes the start of Course Time.
3. There must be a minimum of three prepaid entries on compatible frequencies to make a class and/or race. There will be no more than eight boats in one heat.
4. Heat racing records can only be set at and during NAMBA sanctioned heat races.
5. At any time during the event, the Contest Director may move contestants in a particular class with no bias to fix unbalanced boats per heats due to scratches and/or no shows. This includes the combining of small heats into one, as long as the combined heat is similar in size to any remaining heats for that class in that same round.

## C. PIT TIME

1. A Pit Time of two minutes is allowed for the starting of all engines and to allow all boats to be launched.

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2. If no entrants have started engines and are under way at the expiration of Pit Time, the heat will be declared “No Contest”. All drivers will be awarded zero points, a DNS.
3. Boaters who are in the hot pits will not be permitted to pre-start their motors prior to the start of Pit Time. Once the heat is in progress, boaters that did not get started and boaters not participating in that heat will not be permitted to start their motors in the hot pit area.

#### D. CLOCK TIME (MILL TIME)

1. Clock Time will be initiated at the expiration of Pit Time and no boats may be launched or released after commencement of Clock Time.
2. Milling procedures during Pit Time and Clock Time:
  - a. Boats on the course awaiting the expiration of Clock Time will follow the mill pattern in a clockwise direction and around the course buoys in the specified milling pattern, to be set at the discretion of the contest officials (see Rule 13.B.2). Not following the mill pattern will draw a driver infraction with a one lap penalty being assessed.
  - b. During the last five seconds of Clock Time (aka "committed"), all boats must adhere to the lane they are currently established in. They must maintain a straight course or established lane if in a turn. Zigzagging, "S" turns, or fishtailing to delay crossing the start line will draw a driver infraction with a one lap penalty being assessed. Boats will not cut thru the course (continue milling course) during the last 5 seconds to delay in jumping the start or a 1 lap penalty will be assessed. During mill time boats can be assessed a lane infraction for blatant lane violations as described in Rule 17.B.3, regardless of boat speed.

#### E. COURSE TIME (RACE TIME)

1. Course Time will commence with the expiration of Clock Time and will not exceed five minutes. Any boat not completing the required number of laps in this time will receive a DNF and be ordered off the course.
  - a. The exception to this is where there is active racing between two or more boats, and adverse course and/or weather conditions exist that would prevent normal racing speeds for most boats in that class. In such cases at the sole discretion of the CD, “Course Time” may be extended to eight minutes

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## A. GENERAL RULES

1. Gas racing rules are intended as a supplement to the general racing rules of NAMBA. In the case of a conflict, the Gas racing rules will prevail.

## B. CLASS SPECIFICATIONS

### 1. G Class Rules

#### a. General Engine Specifications

- i) Engines in this class shall be highly mass-produced as evidenced by the process used to manufacture the major components. The cylinders and crankcases shall be die-castings, with cylinder and head as a one-piece unit. Examples of such engines are Zenoah, Chung Yang, Kawasaki, Homelite, and U.S. Engines.
- ii) Secondary parts such as water jackets, nose cones, drive components, shim plates, intake manifolds, carburetors, headers, pipes, etc. do not come under the “highly mass produced” rule. Major components such as cranks, rods, pistons, cases, ignition systems, cylinders, and cylinder heads do fall under the rule and must be parts of the original motor manufacturer. Interchanging of major parts from one engine series to another is legal as long as the parts used were available on another engine from the same manufacturer
- iii) Modifications are allowed to major and minor components. However, major components may only be modified by removing material. Adding material or parts to modify an engine's major components will be illegal. The only exception to this rule is that a cylinder may be modified to accept (add-on) a water jacket.
- iv) Induction systems must be piston-ported. Modifications incorporating induction systems other than piston-ported systems are illegal. Engines must be naturally aspirated. Tuned exhaust and intake systems are the only allowed method of altering cylinder pressures.
- v) Engines in this class must employ spark-induced combustion. Glow plug or compression-induced combustion is illegal.
- vi) Recoil starters must be included on the original engine and must be retained on engines in this class.

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vii) Displacement is the swept volume of the engine, which is the cross sectional area of the cylinder multiplied by the stroke of the engine and two displacement ranges will be offered within this class:

(a) G-1 will include engines from 15 to 25.99 cubic centimeters.

(b) G-2 will include engines from 26 to 35.99 cubic centimeters.

b. Fuel Specifications

i) Gasoline having an octane rating no higher than 100 must be used in this class. Gasoline is a mixture of hydrocarbons with no nitrogen bearing compounds. Ethers or alcohols may be added commercially as oxygenating agents. It can be mixed with oil in any proportion for lubrication, but no other additives are allowed that were not in the fuel as originally manufactured.

ii) To enforce this rule, a protest may be made to the contest director any time during the contest. Protests must be accompanied by a \$10.00 protest fee that will be awarded to the sponsoring club. The offending racer will be made to use the protesting racer's fuel for the duration of the contest. If the fuel is unacceptable to the offending racer, fuel from a neutral party must then be used by both the offending racer and the protesting racer. In this situation, the neutral party would be awarded the protest fee in payment for the fuel.

2. GX Class Rules

a. General Engine Specifications

i) Engines running in this class will not be required to fall under the "industrial" rule. Displacement is the swept volume of the engine, which is the cross sectional area of the cylinder multiplied by the stroke of the engine and three displacement ranges will be offered within this class:

(a) GX-1 will include engines from 15 to 25.99 cubic centimeters.

(b) GX-2 will include engines from 15 to 35.99 cubic centimeters.

(c) GX-Twin will include two engines or an engine with two cylinders with a maximum displacement of 64.00 cubic centimeters.

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#### 4. GAS OUTBOARD TUNNEL

##### a. Hull Specifications

- i) The tunnel must connect two outer hulls or sponsons which are unbroken and must also run the full length of the hull. Picklefork designs are acceptable. Outrigger configurations are not acceptable.
- ii) Length must be between 40 and 55 inches, which does not include the motor or hardware.
- iii) No hull will be allowed to have a recessed or picklefork bow which exceeds 30 percent of the overall boat length. Airslots in the center hull must be subtracted from the overall hull length.

##### b. Engine Specification

- i) Engines must conform to NAMBA Class GX-2 specifications (see rule B.2 in this section) except those noted below.
- ii) The engine must be two-stroke and naturally aspirated.
- iii) Any method of starting the engine is allowed, i.e. pull-start, electric starters, or belt start.
- iv) All engines must have a canister muffler, tuned pipe, or custom exhaust that meets the current NAMBA Db levels, as defined in Section 10 – Rule B.
- v) Engine, drive shaft, propeller, and single skeg/rudder will be defined as a complete unit that can be attached to and removed from the hull as one unit and must pivot together as the only means of steering the boat. No secondary rudder allowed.
- vi) Engine must be mounted to transom which must be 90 degrees to the tunnel.

##### c. Appearance:

- i) A close to scale driver with at least the head and shoulders must be provided unless proof of a reclining driver is offered as in OPC hulls. Boats without drivers must be painted to include a darkened windshield to resemble a closed-in cowl appearance.
- ii) Real or fictitious sponsor name on each side of deck or cowling is required