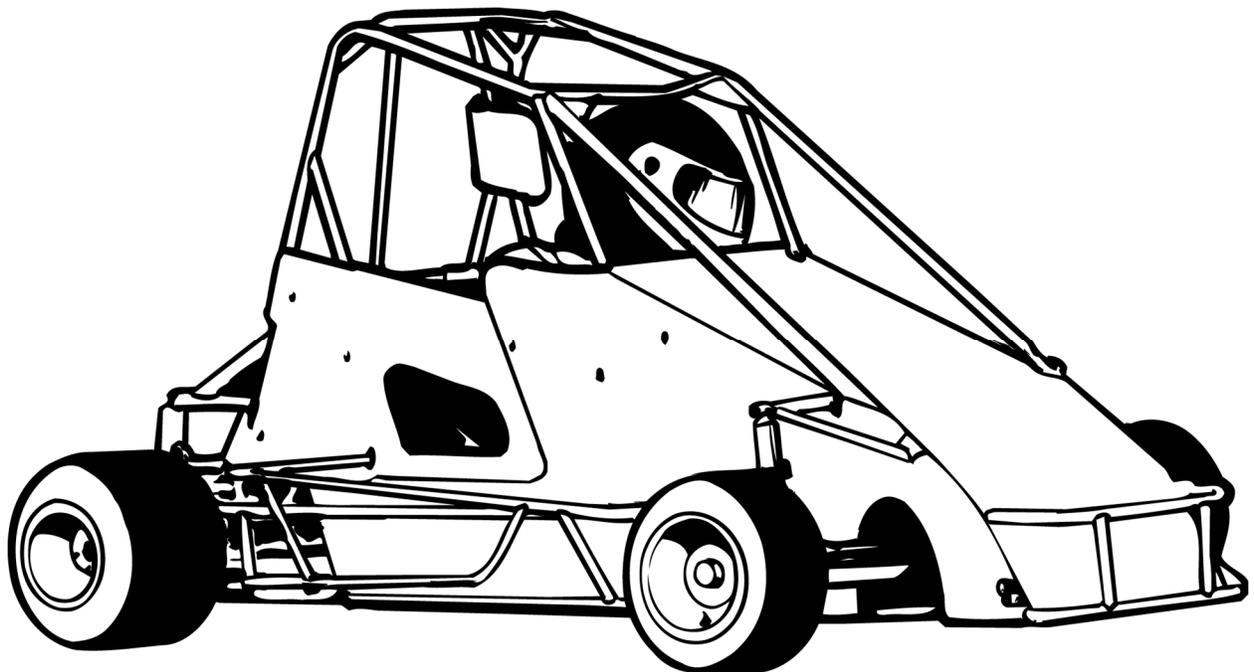




# ROOKIE TRAINING



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# Rookie Training Outline

So, you've decided to become a race car driver. This guide outlines the Rookie Training program run by the North Carolina Quarter Midget Association (NCQMA).

The purpose of this program:

- To have fun.
- To instruct drivers in the basic procedures of quarter midget racing.
- To promote driver safety from a driver's viewpoint.
- To offer all drivers an opportunity to improve their driving techniques through non-competitive and competitive practice sessions with qualified adult supervision.
- To train new-comers in handler and driver safety.
- This class is not here to teach you how win. It is here to teach you how to race.
- To have fun!

## SESSION ONE

### Welcome

#### Introductions

Mission Statement: "The purpose of our organization is to provide and maintain a clean, safe, and healthy sport to be enjoyed by father, son, mother, and daughter in relationship with better sportsmanship. To teach younger generations the handling of mechanical devices, coordination, alertness, and the ability to operate motor driven vehicles. Finally, to impress the younger generation with the ideals of fairness, generosity, and sense of responsibility without envy to others."

**It's about the kids.** Remember to set a good example in regards to sportsmanship. Congratulate other drivers. Get to know and help other handlers. Have fun and lots of patience.

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#### Volunteering Responsibilities

- Work detail / Opening and closing duties – See policy to avoid fines.
- Chief Steward - Learn procedures and rules. Be on time when assigned to keep show moving along.
- Corner Worker – Turns #1 thru #4 based on starting position. Be safe. No stop watches, cameras, or cell phones. Work together and help each other. Be animated when trouble occurs. Always protect your fellow corner worker.
- Pit Stewarding – Learn pit stewarding procedures. Check each car and driver carefully for seat belt snugness, brakes, wrist restraints, and transponder.
- Tower – Learn how to score races and other tower duties. Learning to score will help your understanding of line-ups and finishing order.
- Safety – Learn what is required for safety inspections.
- See "Race Day Volunteer Positions – Job Descriptions" on page 36.

Become involved in your club. Sign up for committees (page 37). NCQMA is what you make it!

#### Grounds Tour

##### Practice Procedure Explanation

- Significance of signing-in.
- Fire extinguisher placement.
- Must have flagger if more than two cars at a time.
- Be courteous of others and allow everyone track time.
- See NCQMA track practice rules.

##### Sign-ins

- Costs, when and where.
- Sign-in drivers and all handlers, get arm bands and pill draw for starting/ qualifying position.

## Staging

- Which lane to stage car.
- Pit cart logistics.
- Pit Stewards and Chief Stewards.

## Safety Gear and Equipment

- Helmet, neck collar, gloves, arm restraints, suit, shoes.
- Safety Belts
- On/Off switch

## Restrictor Plates

- Red plate is for initial phase of Rookie Program; Blue plate is for the secondary phase of the Rookie Program.
- Must meet USAC specifications:
  - Red Rookie (Honda): 0.3125" (5/16") maximum
  - Blue Rookie (Honda): 0.4375" (7/16") maximum
  - Red Rookie (Animal): Briggs Animal Long Slide #555732; overall length=1.825, .285 max throttle travel; black USAC restrictor plate-3 hole .2510; gear ratio-5.15 (33/28) w/ Briggs gear box (6.07)
  - Blue Rookie (Animal): Briggs Animal Long Slide #555728; overall length=1.800, .310 max throttle travel; black USAC restrictor plate-3 hole .2510
- How to install.

## Safety Cars - Remove Chains

## Flags and Safety Lights

- Green - go, go, go.
- Yellow - caution, slow down, no passing.
- Red - stop immediately.
- Black - go to pits immediately.
- White - One lap to go.
- Checkered - the race is over.

## Entering and Exiting the Track

- Gas on the right, brake on the left.
- Stay above blend line when entering.
- Stay high on track and wave left hand to signal other drivers when exiting.
- Keep both hands on steering wheel at all times except when exiting.

## Restricted Areas

- Must be a USAC & NCQMA member, 16 years old, and signed-in with an armband to be in pits.

### Walk-thru

- Show drivers how to enter track, staying above blend line.
- Proper line around the track.
- Flag stand and lights. Explain flagger's role to drivers.
- Exiting the track from high line with hand signal.

### Pit Safety

- Entering at a safe speed.
- Getting in pit box.
- Handlers beware of cars on pit row.

### Strap Drivers in Cars

- Check helmet fit.
- Be sure belts are tight and that driver can see.
- Be sure driver can reach and operate on/off switch without looking and understands its use.
- Verify that driver does not have gum/ candy in their mouth.

### Simulated Lap

- Entering and exiting track stopping in pit box.
- Gently roll car on its side, be sure driver keeps their hands on the steering wheel.
- Be sure driver understands that they cannot hold car up.
- Enter and exit track.
- Go to scales.
- Scale Car
- Red Rookie - 5-16 years old, 250 pounds with fully suited driver.
- Blue Rookie - 5-16 years old, 250 pounds with fully suited driver.

### Question and Answer

## SESSION TWO

### Set-up Cones

### Review Flags and Track Safety

#### Signals

- Fingers drawn across throat - turn off switch and stop.
- Hand or rolled flag held flat in downward motion - slow down.
- Hand held flat in upward motion or rolled flag moved in a circular motion - speed up.
- Arms extended outward in an opening and closing motion – move up to car in front of you or as indicated.
- Finger pointed to top of head - think about what you are doing.
- Hand or flag pointed to rear end - go to back of pack.

#### Individual Laps with Cones - Start and Stop on Track

- Properly strap driver in car and be sure brakes work properly.
- Tap driver on head to switch on.
- Correct line.
- Obeying flagger and signals. Give driver red flag to verify that they know what to do, including on/ off switch by feel.

#### Individual Laps - Entering and Exiting

- Stay above blend line when entering track.
- Obey flags/ signals.
- Accident avoidance via cone throw.
- Use hand signal when exiting.
- Slow down pit row to pit box.
- Stay on track if you have no brakes. Use switch.

#### Individual Laps - Passing Another Car

- Same as 1, 2, and 4 above.
- Pass another car underneath coming out of turn.
- Go across scales.

#### Line-up Instruction

- Hot laps - single file
- Hot laps - double file
- Restarts

#### Question & Answer

## SESSION THREE

### Review

- Flags and signals
- Entering and exiting

### Rules

- Chief Stewarding
- Signaling driver

### Corner Working Safety and Responsibilities

- Wait for caution before going over wall.
- Do not try to stop a car.
- Protect other corner workers.

### Multi-Car Practice with Cones

### Patience with your Driver

### Line-up for Green Flag Start

- Paper numbers on front and back of kids.
- Run thru various scenarios to instill understanding.

### Multi-car Practice without Cones for Green Flag Starts

### Role of Pole Sitter

### Restarts using Number Board

### Switch Drivers by Flagger

Black flag one car at a time, have cars re-enter track at back of pack.

### Question & Answer

## **SESSION FOUR**

### Review

- Flags and signals
- Entering and exiting the track
- Lining-up

### Pill Draw for Paper Numbers

### Line-up Practice

- Starts
- Restarts using line-up board

### Mock Race

### Race Day Explained

### Remember Transponders & RaceCeivers

### Question and Answer

### Rookie School Questionnaire

Homework: Keep reviewing and encourage your driver!

**SEE YOU AT THE RACES!**

# Race Day Schedule & Times

## **Saturday Schedule**

*Unless Otherwise Noted*

8:00AM to 9:30AM Open Practice – First 15 minutes of each hour are set aside for rookies

9:00AM to 9:45AM Sign-Ins in Tower

10:00AM Mandatory Driver/Handler Meeting

10:30AM (or after monthly Club Meeting) Racing Begins

## **Tuesday Night Schedule**

*Unless Otherwise Noted*

9:00AM to 5:30PM Open Practice

5:00PM to 5:45PM Sign-Ins in Tower

6:00PM Mandatory Driver/Handler Meeting

6:15PM Racing Begins

## **Friday Practice**

Friday practice will be available each Friday before a scheduled race. The lights will be used if necessary. The cost of participation is \$5 per family which will be collected at Saturday sign-ins.

## NCQMA RACE DAY SCHEDULE 2016

March			
Date	Race	Notes	Time
5th	TN-Nashville Ice Breaker		
5th	NCQMA Work Day		10:00 AM
11th-12th	Dixie Shootout Series #1 - Nashville, TN-MCQMRA	Batch Q	8:30 AM
19th	NCQMA Promo Day		10:00 AM
April			
Date	Race	Notes	Time
2nd	NCQMA Rookie Training		9:00 AM
9th	NCQMA Champ Race #1 (club Mtg)	Single Q, Club Mtg	10:00 AM
15th-16th	Dixie Shootout Series #2 - Cumming, GA-NGQMA	Batch Q	8:30 AM
23rd	NCQMA Champ Race #2	Batch Q	10:00 AM
May			
Date	Race	Notes	Time
14th	NCQMA Champ Race #3 (club mtg)	Single Q, Club mtg	10:00 AM
21st	NCQMA Champ Race #4 - HVY 160 Cup	Batch Q	10:00 AM
27th-29th	Dixie Shootout Series #3-#4 -NCQMA(DOUBLE)	Batch Q	8:30 AM
28th	NCQMA Champ Race #5	Batch Q	8:30 AM
June			
Date	Race	Notes	Time
7th	NCQMA Summer Race #1	Pill Draw	6:00 PM
10th-11th	Dixie Shootout Series #5 -Nashville, TN-MCQMRA	Batch Q	8:30 AM
14th	NCQMA Summer Race #2	Pill Draw	6:00 PM
18th	NCQMA Promo Day		10:00 AM
21st	NCQMA Summer Race #3	Pill Draw	6:00 PM
25th	NCQMA Champ Race #6- Honda Cup(club mtg)	Batch Q, club mtg	10:00 AM
23rd-26th	Pikes Peak - USAC National		
July			
Date	Race	Notes	Time
7th-10th	INDY, Brickyard - USAC National		
12th	NCQMA Summer Race #4	Pill Draw, club mtg	6:00 PM
19th	NCQMA Summer Race #5	Pill Draw	6:00 PM
22nd-23rd	Dixie Shootout Series #6 - Metro, GA-MAQMA	Batch Q	8:30 AM
30th	NCQMA Champ Race #7-Lt. 160 Cup (club mtg at 5 PM)	Batch Q, Night Race, club mtg	3:00 PM
Aug			
Date	Race	Notes	Time
6th	NCQMA Champ Race #8-Jr. Animal Cup (club mtg)	Batch Q, Night Race, Clb mtg	3:00 PM
9th	NCQMA Summer Race #6	Pill Draw	6:00 PM
13th	NCQMA Champ Race #9-Rookie Extravaganza	Batch Q, Night Race	3:00 PM
16th	NCQMA Summer Race #7	Pill Draw	6:00 PM
18th-21st	Pocono - USAC National		

23rd	NCQMA Summer Race #8	Pill Draw	6:00 PM
Sept			
Date	Race	Notes	Time
2nd-4th	Dixie Shootout Series #7-#8 -Huntsville, AL-HQMA(DOUBLE)	Batch Q	8:30 AM
10th	NCQMA Champ Race #10-Sr. Animal, WF Cup (club mtg)	Batch Q, Clb mtg	10:00 AM
16th-17th	Dixie Shootout Series #9 - Cumming, GA-NGQMA	Batch Q	8:30 AM
24th	Rain Date		TBD
Oct			
Date	Race	Notes	Time
29th-2nd	Las Vegas - USAC National		
1st	NCQMA Champ Race #11 (club mtg)	Heat Races, Club mtg	10:00 AM
8th	NCQMA Promo Day		10:00 AM
15th	NCQMA Champ Race #12	Batch Q	10:00 AM
22nd	NCQMA Champ Race #13	Heat Races	10:00 AM
Nov			
Date	Race	Notes	Time
4th-5th	Dixie Shootout Series #10 - Metro, GA-MAQMA	Batch Q	8:30 AM
12th	NCQMA Champ Race #14 (club mtg)	Heat Races, Club mtg	10:00 AM
19th	NCQMA Work Day		10:00 AM
23rd-26th	Carolina Fall Nationals	Batch Q	TBD

- Registration is required for all races.
- Region races and national races will follow their own schedule and times.

LEGEND:

NCQMA Championship Races

NCQMA Summer Races

Dixie Shootout Races

USAC National Races

NCQMA Work Days

NCQMA Promo Days

NCQMA Rookie Training

# Time Limit Policy

Due to certain situations including, but not limited to, inclement weather, time constraints, and large car counts, NCQMA may need to impose time limits on races.

- Time limits will be communicated at the Driver/Handler Meeting by the Chief Steward.
- Time limits may be adjusted or removed during the race event, but will remain the same for all heat races or group of main event races.
- The NCQMA time clock is located on the scoring tower building.
- The time clock will be started at the initial green flag start of a race.
- In a race, the time clock will be stopped under red flag condition, but will not be stopped under yellow flag conditions.
- If the time limit expires under green flag conditions:
  - The race will end at the next flag, either the checkered flag or yellow flag.
  - If a yellow flag is displayed due to a caution, the cars will be lined up based on the scoring order. Cars that received a DOT or strike will be placed in their appropriate position.
  - Once cars are in the correct order, the checkered flag will be displayed and the race is officially over.
- If the time limit expires under a yellow flag condition:
  - The race will be restarted.
  - The race will end at the next flag, either the checkered flag or yellow flag.
  - If a yellow flag is displayed due to a caution, the cars will be lined up based on the scoring order. Cars that received a DOT or strike will be placed in their appropriate position.
  - Once cars are in the correct order, the checkered flag will be displayed and the race is officially over.

**If you have any questions about this policy or require further clarification, please see an NCQMA official.**

*NOTE: Time Limit Policy is Subject to Change*

# Basic Race Day Rules

(Please refer to your current USAC Rulebook for complete rules and regulations.)

- Drivers and Handlers must be present at the Driver/Handler meeting. Random roll call will be taken. If the Driver or the Handler is not present, the Driver will start at the rear/tail of the field in the Main Event in which you qualify.
- Nobody under the age of 16 years old (drivers included), is allowed in the hot chute area while cars are on the track at any time.
- Only handlers that are USAC members and have signed the insurance waiver and received a wristband are allowed in the hot chute area.
- Absolutely, no open toed shoes are allowed in the hot chute or on the racing surface.
- Bicycles, scooters, skateboards, etc. are not allowed within the fenced track area, including the paved pit area, during practice and/or racing.
- There is to be no running of engines or fueling under the covered staging area.
- There will be two (2) line-up lanes in the covered staging area. The next class or practice session needs to be lined up in a lane in the covered staging area ready to take the track.
- Pit carts must be removed from the covered staging area after a car is in line on the ground and put in the pit area.
- Using the staging area as a pit area is not permitted.
- No cars are allowed to pit in the hot chute.
- When there are more than three (3) cars on the racetrack, a flagman is required.
- When there are more than three (3) cars on the racetrack, the track caution lights will be used.
- When there are more than three (3) cars on the racetrack, corner workers are required.
- After practice or racing is over, all cars must exit the hot chute area and proceed into the pit area.
- Tail cones must be on the car at all times.
- Please be courteous to all handlers and drivers during practice sessions by making all adjustments to cars in the hot chute.

NOTE: Basic Racing Rules are Subject to Change

Revised 1/25/15

# Track Practice Rules

NCQMA members MUST sign-in and sign-out on the form in the Scale House when practicing and put fire extinguishers while cars are on the track.

Track practice will be open for NCQMA members ONLY, but NCQMA members may bring a maximum of two (2) non-NCQMA member guests.

## Practice Hours:

Mon-Tues-Thurs-Fri-Sat	9:00 AM – until dark
Wed	9:00 AM – 5:00 PM
Sun	1:00 PM – 5:00 PM

These are the **only** open practice times unless posted otherwise on the website.

Practice is allowed during daylight hours only and overhead track lighting cannot be used for practice. (Exception: Overhead tracking lighting may be used on Friday nights before scheduled events).

When there are more than three (3) cars on the racetrack, a flagman is required. Track caution lights may be used during practice sessions.

There is NO parking inside the fence on the paved pit area.

Each regular NCQMA member family will receive a key that permits access to the following:

- Track Entrance gate
- Restrooms
- Scale House

The key is to only be used by the family to whom it is registered.

There is no fee to practice during daylight hours listed above; however, there will be a \$5 fee to practice at any time (day or night) on Friday prior to a scheduled event.

Each NCQMA member is responsible for any damage(s) done during his/her practice session.

During winter months, the track is open for practice when the temperature is ABOVE 40 degree Fahrenheit. When the temperature is 40 degrees or below, the track is closed. Restrooms may/may not be closed in the winter months. BOD will send notifications of restroom status.

Revised 1/25/15

# Qualifying Rules

## ***Single Car Qualifying***

- Transponders are required for single car qualifying.
- If a car enters the track with no transponder, it will be given a No Time (NT).
- It is the HANDLER'S responsibility to make sure the transponder is charged and properly secured to the car; however, if there is an error in the reading of the transponder with the Moscore system, the car will be red flagged and stopped on the track as soon as possible to remedy the problem by replacing the dysfunctional transponder with one that is functioning properly. Qualifying will then resume allowing the car to get all warm-up and qualifying laps. If the issue is not caught before the car leaves the track, the car will be allowed to re-qualify after the next two cars, but no adjustments may be made to the car prior to re-qualifying.
- If competitor supplied transponder or rental transponder does not function properly, handler will have opportunity to replace with transponder from tower that does function properly. Competitor will have one opportunity to replace transponder and return to qualifying. If rental transponder from tower, competitor will have unlimited opportunities to replace transponder and return to qualifying.
- Single car qualifying will consist of three (3) warm-up laps and two (2) timed laps, the fastest of the two (2) timed laps will be considered the qualifying time.
- If driver does not complete a timed lap, s/he will receive a "no time."

If a mechanical problem occurs while pushing the car off for qualifying, such as the chain falling off, a loose wheel, muffler disconnected, etc., the driver will receive a No Time (NT). Once a car has been pushed off, turning on the fuel is the only allowable repair.

## ***Batch Qualifying***

Batch Qualifying will consist of a maximum of 4 cars on the track at the same time for 1½ minutes. Each lap will be recorded and the best lap time will be used as the qualifying time. If there is a tie in qualifying times, the second fastest lap time for each driver will be used to break the tie.

- Transponders are required for batch qualifying.
- If a car enters the track without a transponder, it will be given a No Time (NT).
- It is the HANDLER'S responsibility to make sure the transponder is charged and properly secured to the car; however, if there is an error in the reading of the transponder with the Moscore system, all cars will be red flagged and stopped on the track as soon as possible to remedy the problem by replacing the dysfunctional transponder with one that is functioning properly. Qualifying will then resume.
- A Handler from each car on the track will be required to corner work during the qualifying session.

No car will be allowed to enter the track after the green flag has dropped to begin the 1½ minute qualifying session.

During yellow and/or red flag conditions, the clock will be stopped.

If a driver receives two (2) Dead on Track calls (DOTs), his/her qualifying session is over and the best lap time prior to the 2<sup>nd</sup> DOT will be used as the qualifying time.

If a car loses its tail cone, a red flag will be thrown and the car will be charged with a Dead on Track (DOT). The tail cone will be removed from the track surface, and the qualifying session will then resume. If the car is under the required weight when crossing the scales, s/he will receive a DQ; however, if the car meets the weight requirements when crossing the scale, his/her fastest qualifying time will stand.

If a car liberates fluids on the track, a red flag will be thrown and the clock will be stopped to determine which car has liberated the fluids. The car which liberated the fluids will be black flagged, must exit the track, and will receive a DQ for qualifying. The remaining cars will resume their qualifying session once the affected track surface area is cleaned.

If a driver enters the hot chute during the 1½ minute qualifying session, his/her qualifying session is over. No changes can be made to the car during the 1½ minute qualifying run.

***\*\*These rules are subject to change once scoreboard is repaired.\*\****

January 2013

# USAC APPENDIX IV

## 2012 .25 Midget Rookie Program (Updated November 8, 2011)

### 3701 Rookie Procedures

- A. **The Rookie Class is to train new drivers to understand basic racing rules and to be able to handle themselves and cars in a safe manner. The Rookie class is not for perfecting racing skills, abilities or techniques. Extended competitive racing in the Rookie Class once the fundamentals are learned is not to be allowed.**
- B. The Rookie program is divided into two phases. The initial Red Rookie phase is intended to orient the child with safety, communication and racing procedures so that they understand what is expected of them before they enter the track, while on the track and leaving the track. The training is outlined in Section 3702. When Red Rookies have displayed their understanding of these basics, they move to phase two of the Rookie training.
- C. The secondary Blue Rookie phase is to obtain experience in racing with others at a faster speed and to gain confidence in the car and their abilities.
- D. The minimum age for a Rookie will be five years for racing and four and one half years for practice and training only. (4 ½ year olds may not practice or train during an event) There is no age differentiation between Red and Blue Rookies, as all ages must pass through each phase.
- E. Each Rookie handler, upon joining a club shall present the drivers birth certificate to the Secretary of the club and the “official age” of the driver shall be entered in the permanent records of the club. Copies of these records shall be forwarded to the USAC National Office.
- F. At the Clubs discretion, the Club President may issue a log book and Rookie Driver’s Card.
- G. Rookies and their parents shall receive from the National office, their picture ID badges. Rulebooks can be acquired on the USAC website.
- H. A driver may be moved to the Honda 120/Animal class at any time directed by the Club President or Rookie Director.

### 3702 Rookie Training

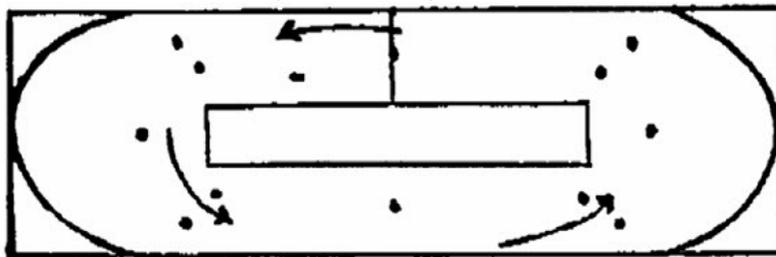
- A. Rookie Training by a competent instructor must be completed by all new drivers. Minor changes can be made to this outline to conform to local conditions. Any driver not trained by the clubs Rookie Trainers must pass a test given by his local Club’s Rookie Committee before he enters into the Rookie Class. The Rookie driver must be a USAC member to be covered by club insurance during training periods.
- B. Purpose of Rookie Training Program
  - a. Instruct drivers in the basic procedures of .25 Midget racing.
  - b. Promote driver safety from a driver’s viewpoint.
  - c. Offer all drivers an opportunity to improve their driving techniques and skills through non-competitive practice sessions with qualified adult supervision.
  - d. Train new drivers AND handlers in driver safety and track safety.
- C. Instructor’s Guide
  - a. Rookie trainees, especially juniors, have limited concentration and stamina. Each phase of instruction should be limited to a maximum of 15 minutes time, followed by a short break and/or an actual on-track practice.
  - b. Rookie trainees should not be allowed onto the racing surface until the instructor has made sure that every precaution has been taken to ensure the Rookie trainee’s safety. Each car should be safety checked to be sure that all equipment is installed and working correctly. Extra attention should be paid to the on/off switch, location, operation) safety belts, brakes, roll cage (proper clearance). New handlers often have little experience with race cars or safety equipment.
  - c. The Rookie Trainee should be completely instructed on how to stop the car safely in the event of trouble or unease with car speed. Rookie Trainees should have a full understanding of all flags and

hand signals prior to driving on the track. The meaning of the red, yellow and black flags are VERY important, as well as where you want the Rookie Trainee to stop when shown a red flag. The Rookie Trainee should be shown that the steering wheel is his or her **"BEST FRIEND"**, and that they should only take their hands off of it when operating the on/off switch or signaling to leave the track. Gently roll the car over on its side while they are belted in the car to carefully show them that they can't "Hold Up" the car or prevent a rollover. This procedure can make many Rookie Trainees nervous, so assure them that they are safe, and remind them to never take their hands off the wheel. Let the Rookie Trainee know that you are not interested in how fast they can go in the initial training sessions, but want to get them used to the car being in motion and how to handle the car. Don't push speed on them, but whatever speed they drive at, try to have them remain at a consistent speed and not "let up" or "Breathe it" in the corners. For some drivers, it may be helpful to limit the gas pedal travel for the first few training sessions, especially with bringing along an apprehensive driver as well as an overly aggressive one.

- d. The instructor must always remember that he/she is dealing with children and keep all explanations as simple as possible. Small whiteboards with dry erase markers are a valuable tool in explaining situations, as are small die cast cars. Rookie Trainees need to build confidence in both themselves and their cars. Whenever possible, praise can bring results far greater than the instructor's expectations. The instructor must have great patience when the Rookie Trainee has had repeated mistakes or has trouble understanding the subject matter at hand. Additional patience and attention will be needed with younger trainees. To keep a Rookie Trainees attention, you will have to meet them half way by becoming their friend, but still remain aloof enough to command their respect. Keep the conversation on their level, but don't talk down to them. Find time to know the trainee, find out their fears and appreciate them as being quite real in their minds, while working to alleviate them with rational explanations. Build up their confidence by passing yours on to them.
- e. Parents should be encouraged to attend, participate and listen to all verbal instruction, and to ask questions whenever they are unsure or don't understand any instruction or point. Parents should NEVER be allowed onto the track while their child is driving. This tends to make the Rookie Trainee self-conscious and prevents them from fully concentrating on doing their best. Parents cheering can be distracting enough to cause an accident. Further, parents need instruction themselves on how and when to enter the racing surface.

#### D. Helpful Training Tips

- a. Pylons – Rookie Trainees can be helped immensely by the use of pylons. Use pylons in the first training session on track to establish the driving pattern. Twelve pylons are recommended for this lesson. (See Illustration below) One pylon is placed on either side of the track in the straight-aways, approximately 7-8 paces from the wall and in the centers of the straight-aways.
- b. One pylon should be placed in each corner, about a car width up from the infield line towards the center. Place the remaining 8 pylons in 4 "gates" of two pylons, between each corner and straight away. Basically the cones will direct the Rookie Trainee around the racing "groove" in a proper pattern. Instruct the Rookie trainee that they are to drive around the outside of the pylons in the middle of each straight away, in between the "gate" pylons, and as close to the infield line in the corners, inside that pylon. Again, this puts the Rookie Trainee in a good pattern, and helps to eliminate the usual corner pinching that is common with new drivers. It also helps to "walk" the Rookie Trainee around the track in the pattern that you want them to learn.



- c. Reactions to Sudden Hazards – The Rookie trainee should be able to react to sudden hazards appearing in front of the car by the third training session. If the instructor stands in one of the corners or elsewhere, with a pylon hidden from the Rookie Trainee. When the car approaches, the pylon is flipped into the path of the car. (It is recommended that this is practiced without cars first to make sure that you don't hit a car or Rookie trainee with the pylon.) This exercise will help the instructor to judge the reflexes of the driver and indicate to the Rookie Trainee that he/she must be constantly alert while on the track. NOTE: Sometime prior to this exercise, pylons should be shown to the Rookie Trainee's so that they understand it is made of soft rubber and will not hurt them.
  - d. These tips are shown as aids in the instruction of the Rookie Trainee. Other demonstrations and instruction may be devised. However, caution and safety must always be at the forefront. Nothing should be done that will cause the Rookie Trainee to lose confidence. Don't make tests too difficult, and even if a driver fails a test the first few times, first point out what was done correctly and offer praise, while gently pointing out the mistakes in a friendly manner.
- E. Flags, Hand Signals and Safety
- a. **Flags** - Every Rookie Trainee & handler MUST know the meaning and color of each flag. A Rookie Trainee should not be allowed on the track until they have shown they know the meaning of each flag. Let them know that flags and hand signals are the only way handlers and officials can communicate with them while the car is moving on the track.
    - i. **RED** Stop Immediately
    - ii. **YELLOW** Caution, Slow Down, No Passing
    - iii. **GREEN** Start, Increase Speed, Go
    - iv. **BLACK** Disqualified, Go To Pits
    - v. **WHITE** One Lap to Go, Take One Lap
    - vi. **CHECKERED** Race is complete
    - vii. **GREEN & YELLOW**
      - 1. Held Vertically and Parallel, One In Each Hand Denotes "Form-Up" Side By Side For Original Start.
      - 2. Held Together In One Hand Overhead Denotes Restart In Single File.
    - viii. **BLACK and YELLOW** All Cars Slow Down and Exit Track
  - b. **Hand Signals and Their Meanings** - Rookie Trainees must be able to recognize these important Hand signals. Give examples of the use of each hand signal:
    - i. **Finger drawn across throat in slashing motion** – Turn off switch and stop.
    - ii. **Hand held flat in downward motion** - Slow down.
    - iii. **Thumb and index finger in open/close motion** - Give it more throttle.
    - iv. **Any flag held in furred position w/one or more fingers held above it** – Take number of laps indicated by fingers, then take action required by flag.
    - v. **Arms extended to the front in an opening & closing motion** - Move in or out as indicated.
    - vi. **Hand or flag pointing to rear end** - Move to the back of the pack.
  - c. **The Car and Safety**
    - i. **Safety Equipment and Its Purpose**
      - 1. Switch Location and purpose.
      - 2. Brake Operation and purpose.
      - 3. Safety Belt Reasons for use, how tight?
      - 4. Helmet What type, why & when worn, how snug?
      - 5. Visor What type, why & when worn.
      - 6. Jacket What type, why they are required.
      - 7. Roll Cage Purpose; height.
      - 8. Gloves Purpose; what type used.
      - 9. Fire Wall Purpose; why it must be extended below belly pan.
      - 10. Bumpers Purpose; importance of not having any broken parts.

11. Nerf Bars Purpose; importance of not having any broken parts

**ii. Car Safety, Dos and Do Nots**

1. The car is definitely not a toy. It is not to be played with in the usual sense of the word.
2. Obey the flagger. He is in charge out on the track. Do not take signals from the pit area **during an event**. (Explain why: disqualification, taking eyes away from track can cause accidents, etc.)
3. Keep in mind what you are doing...not what you did last week or what you will do tomorrow.
4. Do not watch or wave to the spectators, mother or father. Keep your eyes on what is happening on the track in front of you.
5. Do not chew gum or candy while driving. If involved in an accident, you could choke.
6. Before leaving the pit area for the track, always check your safety equipment to be sure it is in operating condition. Be sure your visor is clean and pulled down. Your helmet must be tight. Be sure your safety belts, neck collar, and gloves are tight. When checking your belts try to pull the lap belt first then the driver's right side shoulder belt then the drivers left side shoulder belt. When tightening your lap belts snug them up enough that you cannot get your finger under them. No more than one or two fingers under the belts under your shoulder belts.
7. Check your RaceCeiver to make sure that you can hear clearly
8. Always keep your switch in the "off" position when the car is not in use.
9. Do not remain in the car during refueling operation.
10. Drivers should be cautioned to keep elbows and hands inside the car at all times.

**iii. When leaving the pit area and coming out onto the track:**

1. Look for other cars already on the track; do not break into flow of traffic stay above white line.
2. If flagger is on duty, await their signal before coming out onto the track.
3. Do not drop into the flow of traffic already on the track. Let the pack go by before dropping down to run your pattern.
4. Do not "play" with other drivers on the track. "Fooling around" can cause accidents.
5. Tell your handler, should they attempt to refuel you on the track that they can refuel only in the pits, and only with driver out of car.
6. If someone is standing in the on chute or pit lane area – **STOP**; do not run him or her over.

**iv. When leaving the track to enter the pit area:**

1. Look quickly behind you for other cars before turning out of the traffic pattern.
2. Hold left hand up on the inside to signal to other drivers that you are pulling out and going to pits.
3. After leaving the traffic pattern, move up to the wall and follow it around until you reach the entrance.
4. The car handler should be waiting at the pit entrance for his driver.
5. Upon reaching the pit entrance, drive slowly to pit position, turn off switch and apply brake. Be sure to allow room for any other cars that may also want to exit the track.
6. Watch out for other drivers, handlers and cars as you go to your pit position.

**v. Safety in the Pit Area**

1. Fuel & Extinguishers:
  - a. Before practice or racing make sure all fire extinguisher are in their proper location.

- b. Whenever a car is being refueled, the driver is to leave car and stand to one side – this applies at all times.
  - c. Handlers should not smoke while refueling.
  - d. There will be no refueling on the track or in the “infield”. Refuel in the pit area only.
2. Playing and/or roughhousing: No playing in the pit area or out on the track. Drivers could be hit by cars, etc.
  3. Always stay near your car unless you have permission from your handler to leave the area. Always tell your handler where you will be...you could miss an event.
  4. When watching the program always remain “behind” the fence. Do not sit on exposed walls at the entrance to the track or pit area.
  5. Do not attempt to help push a car off/onto the track. Let the adult handler or owner tend to that chore.
- F. On-Track Training Procedures
- a. Set up pylons/cones as shown in illustration
  - b. Test your Rookie Trainee’s knowledge of the meanings of the flags.
  - c. Explain the basic hand signals to your students.
  - d. Track Walk. Explain: (Instructor/Driver only).
    1. Staging area line-up, point out driver/handler only line, never drive into staging area, etc.
    2. Describe hot chute/pit area parking according to number.
    3. Begin walking out onto track “on chute”, point out flagging positions for practice/qualifying, point out white “blend line” STAY ABOVE!!
    4. Join pattern through gate pylons, point out where instructor would like student to drive: around outside of straightaway pylon, through next gate, below turn pylon, etc. During walk ask driver where they think they should go next to see if they are getting the idea. If needed walk 1 or 2 more times around.
    5. Show driver how to leave the track. Demonstrate the hand signal and where to drive, high in turns, etc. When leaving track have hand on switch ready to stop.
    6. Show where to park/stop to get ready for qualifying, and where to stop to leave pits – “pit gate”.
  - e. Suit up driver: In car talk. After belting in:
    1. Describe steering wheel as the driver’s best friend, “buddy”. “You never let go of your buddy unless you need to turn car on or off, or signal to leave track” (And, of course, to hold a checkered flag.)
    2. Tip car over on side – ask driver to hold up the car – show them that they **cannot** hold up car, **SO DON’T LET GO OF YOUR BUDDY**, your hand could be smashed.
    3. Point out gas and brake pedals – demonstrate.
    4. Point out switch and its function – Ask driver to look you in the eyes and remove hand from steering wheel to turn switch on. Hands back on the wheel. Drill your driver several times until driver can confidently switch on & off. Example:
      1. Switch on (no peeking) – hands back on wheel.
      2. Switch off (no peeking) – hands back on wheel.
      3. Switch on (no peeking) – hands back on wheel.
      4. Switch off (no peeking) – hands back on wheel. (No fair if you peek.)
    5. Ask driver if they are ready to drive! And ask if they have any questions?
    6. Retest them on flags and hand signals.
    7. Disengage drive axle spline if possible or take the chain off and tell driver you are going to push them around the track without engine running, to see if they remember where to drive.

8. Push around track. Ask if they have any questions. See if they are ready to try with engine running. Explain: When handler starts pushing and taps you on the head, turn switch on, Drive!!
9. PUSH THEM OFF.
- f. Drive pattern through and around pylons. As driver's speed and pattern improves, begin removing pylons, remove gate pylons in pairs first, leaving straightaway and corner pylons for last. Once all pylons are removed and driver shows he/she can run pattern, stop them and praise them for what they have accomplished. "You are doing great; see, you are so good you don't need the cones anymore."
- g. Take a break – many kids will be pooped by this point and need time to think about what they have accomplished. This is a good stopping point:
  1. For lessons during the week after school – this may be the end of the first lesson.
  2. For lessons on weekend – (with more than one student) you could switch to next driver and go through the drills with them.
- h. Possibly Second Session: Experienced driver required.
  1. Suit up and review switch drill, flags, and hand signals.
  2. Have student drive along to see if he/she remembers what was learned in the first session. If positive, then proceed to passing game. If negative, place corner and straightaway pylons to help reinforce last session. Usually the pattern will come back to the driver quickly.
  3. Test reactions to sudden hazards on in order to see if driver is ready to have another car on the track with them. Remember to remind driver that the cones are made of soft rubber; do not let them know you will be throwing one out in front of them.
  4. The Passing Game: At this point an experienced driver is necessary. Have both cars stop in the turn, single file, and describe how you want the rear car to pass the front car, on the inside coming out of the turn. (The handlers can demonstrate by pretending they are cars and passing each other). Emphasize that they cannot pass on the outside, and how that would cause an accident if tried.
  5. Start the passing game by instructing the experienced driver to be the first to pass, and to slow down once they have passed the student. The student will likely be slow and tentative, and this will make it easier for the two cars to drive single file. Once the experienced driver has passed the student, have them slow down so the student may pass. Continue this exercise until the student is passing with confidence. In many cases this will be a good time to stop – Ask if they would like a break. Having achieved confidence with another car on the track, many students will realize they want to continue training. Some students, especially the very young, may not want to continue. Emphasize that they are the "boss" in the car and they don't have to drive if they don't want to.
- i. Third Session: Experienced driver required.
  1. Review all that has been learned so far to reinforce the ideas of pattern, passing, flags, and hand signals (on track also). Stop the cars at start/finish line.
  2. Describe the form-up flags, green and yellow vertically, side by side, for a double file start, the two flags together in one hand vertically for single file restart. Describe "forming-up" by placing the student on the pole and indicating where on the track you want them to drive, low in turns and straights, leaving room on the outside for the #2 car. Emphasize that the pole car controls the pace and needs to watch where they are going, not the other car! Tell them to be steady on the speed, don't speed up and slow down.
  3. Describe the form-up flags again to reinforce.
  4. Describe the switch position signals and what to do, i.e., pole car moves forward, outside car falls in behind to switch positions, outside car becomes pole car.

5. Qualify the student and have them exit the track. If they make a mistake, give them another chance to qualify, reinforce what they have learned. If successful tell them that the training is complete. They may need to come back one more time for full review and graduation. Or if you feel they are ready to race –
- j. Fourth Session
  1. Review and practice all previous sessions: Form-up, switching positions, exiting procedures, qualifying, etc.
  2. Have a 10-15-lap race with other experienced drivers. (Always let your student be the one to carry the checkered flag at the finish of the race.)
  3. Graduation and presentation of certificate.
  4. For the driver's first race it is fun to tie a red rag to the cage (rookie flag) have the trainer and club officers sign it and at the end of the day take it off the car and let the driver know they are a full fledge racer.

### **3703 Rookie Program Committee**

- A. Each Club of USAC shall have a Rookie Committee staffed by the Chief Steward, Club President, Technical Director, Safety Director, and Rookie Instructor. If one of the committee members is absent, an alternate should be picked, at a given race day. The committee will monitor the progress of each driver in the Rookie class. If it is the opinion of the committee a driver is capable of graduating into the Honda/Animal class, the committee shall notify the Handler verbally, sign the Rookie Card and duly note it in the logbook. During the three race probationary period, a Rookie may be returned to the Rookie class for obvious reasons.
- B. The Rookie Committee shall render all possible aid to the Rookie handler: advising on purchase of cars, engines and other equipment to help avoid pitfalls.
- C. Checking legality of engines purchased during the Rookie training, in the event that a Rookie handler has purchased an illegal engine and this fact is discovered by the Rookie Committee, the owner shall be advised that he has one race day to bring the engine up to legal specifications.

### **3704 Rookie Racing**

- A. The Rookie Class shall be a recognized class by USAC and shall run under the Honda 120/Animal engine rules at all USAC races. The Rookie Class shall be divided into the Red and Blue divisions only, which may be which may be combined if necessary to make a class.
- B. Illegal Honda engine parts shall be confiscated but the suspension shall not be levied against handlers or drivers for the first offense only. 2nd Offense follows the engine suspension, 30 days suspended from Rookie. Rookie Class participants shall be required to install a restrictor plate on their carburetor. Any alteration to Rookie restrictor plates or slides– 1st Offense automatic 30-day suspension. 2nd offense shall be 1-year suspension. SEE Appendix I, Section 732
- C. No more than eight cars may be entered in any Rookie race.
- D. One safety man will be present at each corner for every Rookie race, outside of wall
- E. If a Rookie driver makes an infraction of a racing rule and a call is made, the driver shall be put to the back of the restart lineup, not given a black flag. An explanation shall be given to the driver by the Track Director of what they did wrong and why it should not be done. Rookie drivers will not be eliminated from races for receiving multiple driving infractions (STRIKES).
- F. Infractions such as liberating fluids, dropping safety parts, etc., are not driving infractions and drivers should not be given a second chance before disqualification. These infractions will result in immediate disqualification.
- G. On the first day of Rookie competition, the driver shall be entered in all races at the back of the lineup of the race for which he has qualified regardless of qualifying position. An orange piece of cloth or ribbon should be affixed to the roll cage to notify other drivers and handlers this is the driver's first race out of training.

### **3705 Graduation of Rookie Drivers**

- A. The Rookie Class is a learning class, so as soon as the Rookie driver is proficient at line ups, racing in traffic, and the other needed skills to race in a competitive class, they shall be moved to the Honda 120/Animal classes.
- B. A Rookie driver must participate in at least three events before graduating to a competitive (Honda 120/Animal) class. One of these three events must be in the Red Rookie class.
- C. Clubs should hold a small ceremony to make the advancement of a Rookie driver into the Honda 120/Animal classes.
- D. On the first day of competition in the Honda 120/Animal class, the new driver shall be entered in all races at the back of the pack for which they qualified, regardless of qualifying position.
- E. All graduating Rookie drivers shall be on probation for three events and shall not be allowed to compete in any class above Honda 120/Animal Class until he has participated in three Honda 120/Animal events to acquire the necessary experience involved in handling a car in other classes.
- F. Once a Rookie is graduated to Honda 120/Animal and completes his/her probationary period, they may not be returned to the Rookie class except if there is a lapse in the participation of a driver, they may be moved back to Rookie for a trial period if Rookie Committee feels it necessary.

# Technical Information

**All competitors must conform to the USAC rule book and all NCQMA rules and regulations. Failure to do so will result in penalties as described by NCQMA and/or USAC.**

Fuel/Oil Policy: When competitor supplied fuel is being used, track fuel **must** be purchased at the Wilco Hess station at 995 Peeler Rd, exit 71 off of I-85.

A controlled sample of fuel purchased the day of the race event will be used to test fuel throughout the day. All competitors **must** purchase 87 octane fuel.

Anyone found using illegal fuel or fuel/oil additives will be disciplined according to the NCQMA Fuel Testing Policy.

# Quarter Midget Baseline Chassis Setup

The following steps are intended to help handlers understand the basic steps required to setup their quarter midget chassis. Actual settings are not provided as they are different for each brand and model of car plus the class the driver is racing in.

<p><b>1. Tire Pressures</b></p>	<p>Each time the car is setup make sure to put the tires at the pressure you will race them to make sure that any other measurements taken are relative to how the car will be raced. For asphalt this can be anywhere from 10 to 14 lbs for the right sides at the start of a race and between 5 and 8 for the left rear and 8 to 10 for the left front.</p>
<p><b>2. Approximate Ride Heights</b></p>	<p>Put the car on a level flat surface and then set each corner to the height you want it in race trim. Even though this step will be repeated later it is important to do it now at this point also to ensure the next steps are accurate. Choose whether or not to complete these steps with or without driver and then always do it the same way for uniformity. Because this is kids racing and they are not always easy to find doing without driver is the most common. This means that comparing ride heights with other handlers may not always be a proper apples to apples comparison but it will make sure your process is consistent. If you were to measure from the bottom of the car to a level surface underneath your left side heights are going to be somewhere around <math>\frac{3}{4}</math> to <math>1\frac{1}{2}</math> inches while the right side will be about <math>1\frac{1}{2}</math> inches. All car manufacturers have different settings they prefer and I recommend following those.</p>
<p><b>3. Square the car</b></p>	<p>Most often this is done by taking off the wheels and hubs and placing the car into a set of alignment bars. While some setups result in the rear axle being slightly out of square, for a baseline start with it parallel to the lower roll cage bar in front of or behind the engine. Be careful to measure precisely using squares to your level surface for references to make sure your measurements on each side are consistent. Even <math>\frac{1}{16}</math>th of an inch in variance will make a big difference. Adjust your rear radius rods accordingly to put the axle square.</p>
<p><b>4. Square birdcages</b></p>	<p>Most brand cars are designed so that the rear bird cages or "bearing carriers" are positioned so that the two radius rod mounting points are directly above / below each other. If a line was drawn from the top point to the bottom and continued to your level surface it would be perpendicular to the level surface. Not being square can result in some funny rear axle steering movement as it travels up and down. This is also adjusted by lengthening and shortening the radius rods, again be careful to either make equal adjustments on top and bottom or to re square the rear axle when you are finished.</p>

<b>5. Set Axle Lead</b>	Next the front axle lead is measured by tape measuring from the outside edge of the front axle with wheels in straight position (if they were on the car) back to the rear axle with the table parallel to the outside frame rail of the car. There is a big difference is brands of cars with this setting. Anything from the right side shorter by a quarter inch to the right side longer by a whole inch. This is adjustment by lengthening or shortening the front radius rods. Making sure to adjust the top and bottom rods evenly on the side adjustments are made.
<b>6. Set Caster Camber</b>	Caster can be set with either a caster / camber gauge or an angle finder. Use an angle finder to measure the angle from the top of the spindle bolt to the bottom parallel to the length of the car front to back. Right front caster is usually set somewhere between 2 and 5 degrees. Caster is adjusted most often by shortening or lengthening a single radius rod on that corner of the car. Tiny adjustments make a big difference. Most front axles have a caster split built into them so setting the caster is done on a single corner and the LF will be what it will be.
<b>7. Set Front Alignment</b>	The Toe-In / Toe-Out is set next so that the front wheels are parallel with each other while the car is in the alignment bars or has the wheels on it on a level surface.
<b>8. Final Ride Heights</b>	With all the wheels and tires back on the car and back on your level surface check the tire pressures one more time then re-measure to make sure each corner of the car is set to the desired height.
<b>9. Wheel Spacing</b>	Make sure the wheels are moved in or out to the desired position for each corner. This usually means the left sides are tucked in as far as legally possible (not inside the side nerf bars) and right rear in the middle of its adjustment range.
<b>10. Scale the car</b>	Using anything from accurate bathroom scales to electronic scales put each wheel on its appropriate scale pad and record the weights. Make adjustments to the coil spring collars or torsion bar adjusters to each the Cross Weight or Left Rear Split you are looking for. Make sure to make 4 equal adjustments all the way around the car. This will ensure that the ride heights remain where they should be. For example if the cross weight is 50% (LR + RF) / Total and you are looking for 54% then put 1 turn in the LR and RF (clockwise) and take a turn out of RR and LF (counter-clockwise).
<b>11. Practice</b>	Put the car and driver on the track

## Quarter Midget Chassis Glossary of Terms

Ackerman Steering:	As the front wheels turn through the corner the left front turns a sharper corner than the right front. Ackerman is the principle of creating steering geometry so that as the driver turns the steering wheel the left front will turn more than the right. Some quarter midgets have a set amount built in to the spindle and others leave it adjustable.
Alignment Bars:	These devices are used to line up the front and rear axles for squaring and to set the toe for the front wheels. After the wheels are taken off the car the rear axle and front spindles are placed into the appropriate fixture.
Axle Lead:	This measures how far out of square an axle is set in the car. Most car builders recommend setting the rear axle with no lead so that when at ride height it is perfectly perpendicular to the cars main frame rails. Front axle lead anywhere from 0 to 3/4 inch is commonly found on various cars, this would be the right side of the axle forward of the left. Front axle lead is determined by measuring from the outside edge of the rear axle forward to the outside edge of the front spindle and comparing the two sides of the car.
Baseline Setup:	Refers to basic starting points for your chassis setup and includes a setting for each of the variables that can be adjusted. Every type of car uses different baselines and many have different baselines for different type of tracks based on banking, grip, surface, etc. A common practice is to always revert the car to its baseline for the upcoming track so you know exactly where you are when it's time for adjustments.
Bicycling:	This what a car is called when it goes up on two wheels. In the center or exit of a corner a car with too much side bite or grip can transfer enough weight to lift the two left side tires.
Birdcage Timing:	The birdcages, or "bearing carriers" are the free-floating pieces on the rear axle that connect the axle to the rest of the car. For suspension systems that use two radius rods to join the birdcage to the car frame the "timing" or bird cage angle is important to car setup. Even after the axle is squared it should still be checked. Most cars are designed so that the upper and lower arms are mounted directly above one another. This is because the shock is also connected to the birdcage and if the timing is off then as the car goes through travel the shock mount could rotate forward / back or up / down and create unpredictable results by "jacking" weight onto or off that corner.
Body Roll:	This is what the car does as it is turned into and goes through the corner. How much the body rolls does not change how much weight transfers but affects how fast and where it transfers from and to the different corners of the car.
Camber:	Describes the angle of each front wheel and tire if you were looking at the car directly from the front. It is measured in degrees and can be negative or positive. Negative camber means the top of the tire is leaned in towards the car and positive camber means the top of the tire is leaned out away from the car. A small amount negative camber is used on the right front tire of quarter midgets to keep the tire from rolling over when it gets loaded during cornering. Left front tires are usually straight up or have a smaller amount of positive camber. Some cars have specific camber adjustments in their spindles and others are adjusted by using different sized tires on the two sides.

Caster:	This is angle of the part of the front spindle that it rotates around. Looking at the spindle bolt or "king pin" from the side of the car. If the top is leaned backwards it is known as positive caster and if the top is leaned forward it is negative caster. Too much positive caster and the car will be hard to turn, not enough and it can be very "twitchy" or "darty" for the driver. Most quarter midget axles have a "caster split" built into them of 2 to 5 degrees or so, so that more positive caster can be run on the right front and less positive, 0, or even a small bit of negative caster on the left front. Besides providing tracking and driver feel caster does two other important things. When wheels are turned with caster in them the ride height for that corner is changed so the corner weight is adjusted or "jacked". In addition negative camber is added or "gained" as a wheel with positive caster is turned.
CG Height:	Center of Gravity Height, refers to the center mass of the car. The higher the CG Height the more body roll will occur. Most important at two points, directly above the front and rear roll centers. If a line was drawn from the front CG Height and rear CG Height it should be parallel with a line drawn between the front and rear roll centers to provide unbound body roll.
Corner Weights:	When setting up the car it is important to set the corner weights. This means actually weighing each corner of the car on a scale adjusting them by changing the ride heights for each corner. Every car manufacturer has different recommendations for their car that should be followed depending on the springs and shocks that are used.
Cross Weight:	This term refers the percentage calculated by adding the diagonal combination of left rear and right front corner weights and dividing by the entire car weight. Depending on whether the car is locked or not and depending on how much it is using the LF tire changing the cross weight will either tighten or loosen the car up. Different cars react different.
Durometer:	Device used to measure the hardness of the rubber on a tire. The readings can be used to compare different compounds of new tires or to track the life of an existing tire that will get harder over time until it is no longer an effective tire.
Gas Shocks:	Shock absorbers or "dampers" that have a small chamber in them filled with nitrogen to keep pressure against the shock oil so that bubble are not created when the shaft goes in and out.
Gear Ratio:	A measure of the actual RPM reduction from the engine to the rotating rear axle. It is calculated by dividing the number of teeth on the axel gear by the number of teeth on the engine gear and multiplying that by the engine's gear box reduction ratio. For Honda engines this is 6.0 and for DECO engines it is 5.73. For example a 30 engine gear with a 25 axel gear would be $25 / 30 * 6 = 5.00$
Locked:	Refers to the type of left rear wheel hub used. A locked car uses a hub that directly connects the wheel to the axel while an unlocked car connects the wheel to a hub with a free spinning wheel bearing. A locked car uses both rear wheels to drive the car and an unlocked car uses only the right rear. A locked car is more stable and tighter in the corners but will scrub speed on the straights.
Loose:	Describes the cars handling when it wants to turn more than the driver is trying to turn it. Also known as over steer.
Panhard Bars:	The suspension link that locates each axle laterally in the car. One per axle, this normally straight bar with rod ends connects on one end to the axle and the other on the chassis frame. The center of this bar determines both the height and left to right location of the roll center for that particular end of the car.

Pattern:	The line around the track that the drivers takes the car. Low in the corner and high in the straight for asphalt tracks. Different tracks have different preferred patterns with small differences like how close to the wall the car should be, how far down the straight the car should be before it turns, and just where in the corner the driver should apex. A driver can also adjust their pattern to accommodate the car's handling. Different classes sometimes have different patterns because of the power differences.
Push / tight:	A car with this handling condition does not turn as much as it should. It's hard to get down to the bottom of the corner in the middle and hard to keep off the wall coming out. It results from the rear tires having more grip than the front. In addition to being hard to keep off the wall this condition can also bog down the motor exiting the corner.
Rake:	The difference in ride heights from the back to the front of the car. Positive rake means the rear of the car is higher and is common for asphalt tracks.
Rear Split:	The difference between the two rear corner weights. Expressed as a single number it is usually expressed as how much more the left rear corner weighs than the right rear. Negative rear split would means the right rear corner weighs more than the left rear.
Ride Heights:	This measurement describes how far the bottom of the chassis from the ground. It is taken at each corner of the car. Some manufacturers recommend taking from cross tubes while others measure directly from the underside of the frame. It is important to track and maintain proper ride heights so the chassis geometry stays as intended.
Roll Center:	The imaginary point of the chassis that it pivots "over" as is rolls into and out of the corners. Each car has a front and rear roll center. For most QM suspension types it is determined by find the center of the panhard bar for each end of the car. Typically raising the roll center results in less body roll and loosens the car while lowering it lets the body roll more and tightens it up.
Scaling:	Process of determining how much static weight is on each corner of the car while it is just sitting there. It is done by sitting the car on four individual scales or scale pads.
Scrub Radius:	The imaginary line between the center of a front tire contact patch and the axis that it pivots around when the wheel is turned. Newer cars tend to have a much shorter scrub radius that results in easier steering and potentially less speed "scrubbed" off through the corner.
Shock Valving:	The inside make up of a shock that determines how easy or hard it is to push it in or extend it out. Straight valved shocks are the same in both directions while split valve shocks require different levels of force to move them in from moving them out. The higher the shock number the stiffer it is "valved." Shocks determine how fast weight is transferred from corner to corner in a car, now how much weight is transferred. Heavier valved shocks are typically required for heavier and faster cars.
Spring Rate:	The wire thickness, coil diameter, and number of coils a spring has determine the rate of a spring. It is measured as how many pounds of force are required to compress the spring one inch.
Squaring:	Process of making sure the rear axle of the car is perpendicular to the frame of the car and that front axle is parallel with that. An axle accidentally out of alignment will cause undesired steering.

Stagger:	Difference in circumference between the two rear tires. When the rear axle is locked up it is important to have the proper amount of stagger so that the rear tires can work together through the corner and not fight each other and scrub speed. Since the outside tire has to go around a bigger circle it requires a bigger size because the same axle is turning both tires at the same time.
Sway Bar:	A rigid bar that connects one corner of the suspension to the other on the same end of the car. Also called an Anti-Roll bar its purpose is to provide roll stiffness to lessen the amount of body roll into and out of a corner.
Tilt:	The difference in ride heights from the right side of the car to the left side. Positive tilt means the right side of the car is higher than the left. Negative tilt would mean the left side is height. A car with 1/8 inch of tilt would mean the right side of the car is 1/8 inch higher than the left.
Tire Compound:	Type of rubber used to construct the contact surface of the tire. Every manufacturer has different letter codes to designate the hardness and type of rubber. Softer tires are stickier and provide traction faster but will wear faster and can become too sticky. Harder tires last longer but take longer to "come in" and don't always provide enough traction. The right tire depends on the track surface, class of quarter midget, and chassis setup used.
Tire Pressure:	Measurement of how much air is in the tire, expressed in pounds per square inch or PSI. Right side quarter midget tires on asphalt are typically between 10 and 15 psi while left sides are typically below 10.
Tire Temps:	Handlers will often measure and record the surface temperature of the contact area of each tire when a practice or race run is completed to help them make setup adjustments to balance the chassis. Extreme temperatures on a single tire usually indicates a setup that is not balanced.
Toe In / Out:	Toe refers to one of the front wheel alignment adjustments. Looking at the front wheels from the top of the car if they are parallel to each other then the toe is set to zero, the most common setup for a quarter midget. Toe In means the front of the tires are pointed to each other and Toe Out means the front of the tires are pointed away from each other. Too much Toe either direction will scrub speed from the car but a slight bit of Toe Out can provide some steering stability, especially for newer drivers.
Torsion Bar	A rigid bar that is mounted on each corner of the car so that when the chassis goes up and down it twists and absorbs force like a coil spring does. Very common on dirt cars and older quarter midgets.
Weight Percentages:	Used to record corner weights when scaling a car. Left side percentage, Rear percentage, and Cross Weight are all calculated by adding the two appropriate corner weights and dividing them by the total.
Wheel Offset:	Used to describe how a particular width wheel is divided between its "inside" and "outside" halves. For two piece wheels it is the width of each half while one piece wheels are described by their total width and the distance between the plate where the hub mounts and the inside edge. For example an 8 inch wheel with a 3 inch backspace.
Wheel Spacing:	Refers to where the wheel is positioned on its axle in relation to inside or out. Right rear wheel spacing is a common adjustment for then handling of the car. Moving that wheel in tightens the car while moving it out can loosen the car.

## NCQMA Rookie FAQs

Q: What is the best way for me to connect with other members when we are not at the track?

A: If you use Facebook, be sure to join the "NCQMA Families" group there (type the name of the group into your search and it should come up). This is a great place to ask any questions you may have, find items for sale, and reach out to other members.

Q: I'm really confused and nervous about all this. It's so overwhelming. How can I remember what we're supposed to do on race day?

A: Don't ever be afraid to ask our veteran members for help! They all remember what it was like starting out and being overwhelmed with it all. Luckily, we have a great group of families ready to answer your questions and help you out however they can.

Q: What else do we need (beyond the obvious car, pit cart, helmet, driving suit, etc)?

A: Here's a list of some things that we found we needed/wanted/were nice to have:

- RaceCeiver (small radio that allows the officials to speak to the racers on the track) and earbuds (and don't forget fresh batteries!)
- Furniture dolly (you can purchase these at Lowes or other home improvement stores) to easily move the car around
- Painter's tape (to use to put paper numbers on the car and to hold earbuds into your racer's ears)
- Small battery operated fan (not a necessity, but many racers will use them while sitting in their car in the staging area on hot days)
- Extra set of radius rods (these are usually the first casualty of wrecks on the track, so having spares is a good idea. Many people will color-code them with tape so you can easily tell which rod is the correct replacement)
- Heat gun with a scraper and/or a grinder to use to clean your tires
- Small bucket to catch what you scrape off of the tires

Q: How do I remember what I volunteered for and when my child is supposed to race?

A: You'll see people taking pictures of the volunteer sign-up sheet and the race order sheet, this is a great way to keep up with everything!

Q: How do I know what position my child is starting in?

A: Starting positions can be determined by pill draw, randomly-generated order, single car qualifying, batch qualifying or heat races. Check the schedule or watch your email the week before a race for information on which method will be used that week. After the positions are determined, head to the Snack Shack at the back of the track and walk up the stairs to the porch area. The starting order for your race will be posted there. Once you see what position your child is starting in, get 4 paper numbers matching that position. You will tape these on the car using masking/painter's tape (make sure they are secure and won't come off during the race!). The numbers go on each side of the tail cone, on the front of the car and on the driver side (just in front of where the driver sits). Make sure your child knows what paper number they are as this is the number that is referred to in the race (don't worry, they'll use your child's name if he/she doesn't respond to the number).

Q: Why did somebody hand me this yellow vest right before my child's race?

A: If your child starts in the top 4, then you will be a "corner worker" for that respective turn (starting first, turn 1; starting 2nd, turn 2, etc.). If it's your first race, just let someone know that you're new and they'll help you out with what to do. Essentially, you're just there to help out during the race (get cars turned around and restarted after a spin, grab safety equipment if needed, etc.)

Q: Last week there was one red rookie race, this week there are 2. What's going on?

A: Because the red rookies are the newest drivers, we don't like to put too many on the track at a time. Per USAC rules, if there are 8 or less red rookies signed up to race, then there will only be one race. Any more than that and they will be split into 2 races (or more if necessary to have no more than 8 red rookies on the track at a time). Although 8 cars is the rule, USAC also allows tracks to choose to run less rookies at their discretion.

Q: What are the different volunteer positions and what do I have to do?

A: Regarding volunteer positions on raceday:

- Volunteer help is ALWAYS appreciated in the Snack Shack! Just head over and ask what you can do to help.
- Descriptions for other volunteer positions: <http://ncqma.com/job-descriptions/>
- You can ask someone in the tower what the responsibilities of the different positions are and let them know that you're new. You can always "shadow" someone to find out what to do.
- Two of the best (and easiest) ways that new volunteers can help out are flipping lap cards (so the flagman knows what lap number they are on) and working the RaceCeiver radio (tell drivers to put their hands up for RaceCeiver check, say "Yellow yellow yellow" for cautions, say "Red red red" for red flag, and help drivers get lined up correctly - the tower director will tell you what to say for that).
- If you volunteer for a class that has multiple races (i.e. heat and feature races, more than 1 red rookie race, etc.) make sure you plan to be at your volunteer post for ALL races that that class is on the track.

Q: Are we ready to move up yet?

A: Remember that you must have approval from the rookie director before moving your child from Red Rookie to Blue Rookie or from Blue Rookie to a competitive class. Also, for your very first race or when you do move up, be sure to let the tower director know when you register because you will need to start in the back of the field for that race.

Q: I have other questions. Who do I talk to?

A: NCQMA contacts: <http://ncqma.com/contact-us/>

Q: I don't understand that call by the official. What are the USAC rules?

A: USAC rules are here: <http://www.usac25.com/#!/rules/c1gwo>

Q: I don't understand the schedule, why are there dates with different locations?

A: NCQMA schedule: <http://ncqma.com/schedule/>, If the location on the schedule lists a different location for that date (Nashville, TN; Braselton, GA; etc) then there is no race at NCQMA that weekend. Many of our members will be traveling to the races at those other tracks on those dates for our Regional Series races. You can travel and race, practice at NCQMA, or just take a break that day!

Q: Where do we park/pit when we come to race?

A: There are designated pit areas along the sides and back of the property and you may park in any spot that does not already have a name painted at the front of it (spots with names have been reserved). If you want to reserve a spot for the year, there is a \$50 yearly fee and you will need to fill out the NCQMA Parking Fundraiser Form which can be found on the website. Spots reserved in November are valid for the following year.

Q: Can I leave my trailer and/or camper at the track? Can we camp overnight?

A: Yes, you will need to fill out the NCQMA Parking Fundraiser Form to reserve your spot and pay a \$50 yearly fee. If you are leaving a camper/trailer at the track for a long period of time, you may be asked not to park in the grass or to plan to trim the grass around it yourself. We have some families who leave their campers and trailers at the track the entire racing season and also some who camp just on the racing weekends.

Q: Can I get water at the track for my RV/camper?

A: Yes, in order to fill your camper's fresh water tank, you will need to find someone who has a key to the water spigots (there are 2 spigots, 1 on each side of the track). Just ask a few members and they can tell you who to look for that has a key. Then you can either back your camper up to one of the spigots or fill a portable tank. There is a \$10 fee for this.

Q: Can I get electricity at the track for my RV/camper?

A: Yes, there are 12 electrical hook ups available. 6 on the hot chute side and 6 on the scale house side. They are \$15 a day, \$30 for the weekend (Friday/Saturday). If not unhooked by 9am Sunday morning you will be charged an additional \$15. They are on a first come, first served basis. There will be NO extension cords run across the roadways. If you choose not to park (or there is not any space left) in the area close to the electrical hook ups, then you will need to plan to bring a generator to use instead.

Q: Can we camp in a tent at the track?

A: Yes, as long as you are an NCQMA club member, or staying with a member, you may stay in a tent. However, all tents must be taken down at the end of the weekend. Another thing to keep in mind is that the track does have restroom facilities but no showers.

## Race Day Volunteer Positions – Job Descriptions

Position	Duties & Responsibilities
Chief Steward	<p>Officiates the races with the assistance of corner and tower spotters. Cannot be affiliated with any drivers in the event they are working. Officiating includes designating strikes, DOTs, etc. Does have the authority to disqualify drivers for situations described in the USAC rulebook. Must be familiar with the current USAC rulebook.</p>
Corner & Tower Spotters	<p>Helps the Chief Steward determine when calls must be made on the track. Watch the race and give input and feedback when necessary. Cannot be affiliated with any drivers in the event they are working. Must be familiar with the current USAC rulebook.</p>
Pit Steward	<p>In charge of staging lanes. Coordinates with the Chief Steward and tower to send cars out to the racetrack. Checks safety items to make sure drivers and cars are ready to race. Items to check, but not limited to: brakes are functioning, RaceCeiver is functioning, arm restraints and seat belts are fastened properly, steering wheel fully attached.</p>
Head Scorer	<p>Records the order of cars crossing the start/finish line for each lap of a race. Keeps track of the number of strikes for each car that is involved in an incident. Keeps track of cars that enter the pit lanes and how &amp; when they exit. Determines the finishing order of a race. Head scorer will verify the finish with all other scorers. If other scorers have questions or mistakes, the head scorer will make the final decision. Must be familiar with USAC scoring procedures. Rules and procedures for scoring are found in the current USAC rulebook.</p>
Scorer	<p>Records the order of cars crossing the start/finish line for each lap of a race. Keeps track of the number of strikes for each car that is involved in an incident. Keeps track of cars that enter the pit lanes and how &amp; when they exit. Determines the finishing order of a race. Must be familiar with USAC scoring procedures. Rules and procedures for scoring are found in the current USAC rulebook.</p>
RaceCeiver	<p>Communicates with drivers during the race. Duties include helping to get the cars lined up for the initial start and for re-starts; notify drivers of caution flag, red flag and black flag.</p>
Lap Card Flipper	<p>Accurately reports the lap count during the race using lap cards. The cards are displayed to the flagger at all times. Laps should begin with the total laps to be run and work down to the last lap. This person is in the tower and will make sure the laps are correct with the help of the race scorers.</p>
Scale House Steward	<p>After qualifying and heat races, all cars must go over the scales. The scale steward will record the total weight (drive and car) for each competitor and verify they meet the requirements for their class. These are posted in the scale house and can be found in the current USAC rulebook. Heavy class drivers must be weighed in normal street attire to ensure they meet the minimum weight of 100 lbs. This weight should also be recorded.</p>

# Committee Commitment Form

The NCQMA Board of Directors **requires** every NCQMA family to commit to active participation in one of the six committees at NCQMA. Full member participation is required to ensure that NCQMA is a successful, fun-filled club.

## Description of NCQMA Committees

**Publicity/Special Events Committee:** will assist in coordinating Promotional Day(s), coordinate community and awareness events, coordinate fun track events and activities, and work to increase community involvement and awareness of NCQMA.

**Trophies & Awards Committee:** will be responsible for ordering, obtaining, and distributing awards and trophies including, but not limited to, Rookie first race trophies, Feature Win stickers, plaques, Top 3/Fast Time plates, Track Record Plaques, Carolina Cup trophies, Carolina Fall Nationals trophies, banquet awards, and other awards/trophies.

**Fundraising Committee:** will coordinate and engage in fundraising efforts on a regular basis (such as 50/50 raffles, silent auctions, raffles, bake sales, selling merchandise, etc.) to raise money for targeted club activities or track improvements.

**Sponsorship Committee:** will work to secure corporate sponsorships and billboard sponsors through the targeting of community businesses and quarter midget/racing-related businesses.

**Yearbook Committee:** will work throughout the year to gather data and pictures; will solicit funds through ads and other fundraising efforts to provide funding for yearbooks and end-of-year driver gifts and championship apparel; and will create a finished yearbook documenting a year of memories.

**Banquet Committee:** will secure a banquet facility; will be responsible for invitations, RSVPs, collection of attendee fees, will coordinate the banquet and award ceremony; and will participate in fundraising efforts to offset costs.

**Please complete, detach, and return to Kim Hodge Secretary**

NCQMA Member Name: \_\_\_\_\_

Email Address: \_\_\_\_\_

*I would like to volunteer to be a member of the following committee(s):*

<input type="checkbox"/> Publicity/Special Events	<input type="checkbox"/> Sponsorship
<input type="checkbox"/> Trophies & Awards	<input type="checkbox"/> Yearbook
<input type="checkbox"/> Fundraising	<input type="checkbox"/> Banquet

Rev. 12/21/13

# NCQMA Rookie Checklist

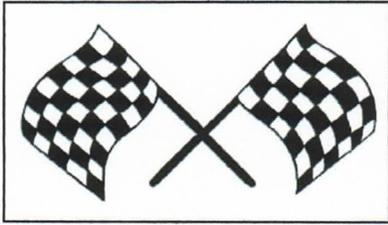
USAC Driver Number: \_\_\_\_\_

USAC Driver Name: \_\_\_\_\_

**REQUIREMENTS:** In order to graduate from the Rookie Program the Handler must get approval from the Rookie Committee that the driver is ready to be moved up to a competitive class and the handler must have worked with the race day official / volunteer listed below. Please get signatures from the director of each area that states you have meet the criteria listed below. If any of the directors are unavailable, any Board member can explain the duties of the different areas and may sign in the director's place.

Rookie Graduation Requirements	Signature
Handler has approval of Rookie Committee to move driver up to competitive class. Log Book will not be signed until the rest of the criteria below has been met.	Rookie Director
Handler has worked with the Director of Timing & Scoring and has read the USAC scoring tower procedures. The handler must know the duties of scoring, announcing, lap counting, recording race/qualifying results, etc.	Tower Director
Handler has worked with the Pit Steward and understands the Pit Stewarding procedures.	Pit Steward
Handler has worked with the Safety Director. Handler understands the safety item checklist and has read the safety section in the USAC Rulebook.	Safety Director
Handler has worked with the Chief Steward and has read and understands the duties of the Chief Steward as listed in the USAC Rulebook.	Chief Steward
Handler has worked with the flagger and understands the flagging duties. Handler has read the flagging portion of the USAC rulebook. In addition, the role of flagging / lineup board person has been explained.	Flagger
Handler has performed cornering and understands the cornering duties and safety related procedures (i.e., location of fire extinguishers, helping fellow corner workers, etc).	Rookie Director
Handler has worked in the scale house and is aware of the USAC driver/class weight requirements. Handler has participated in the technical inspection procedure.	Tech Director

# Driver "Homework" Activities



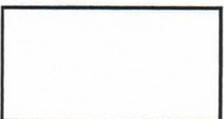
**Match the flag with the meaning of the flag**

Color Me  
Red



Color Me  
Green

Color Me  
Yellow



**Slow Down**

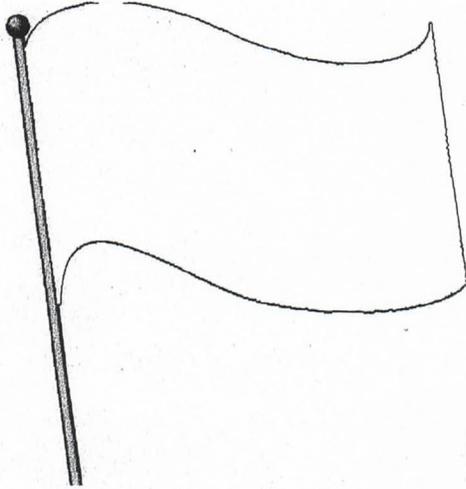
**Start of Race**

**End of Race**

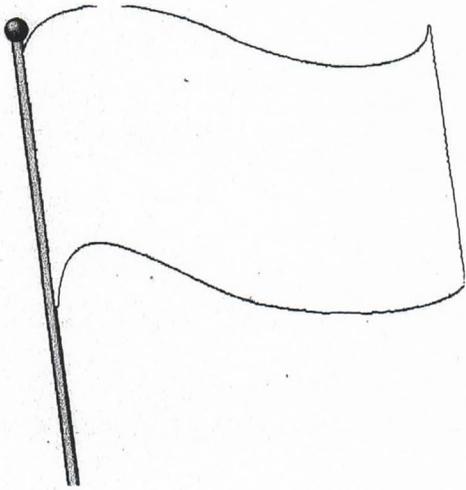
**One Lap to Go**

**Go Off the Track**

**Stop Where You Are**

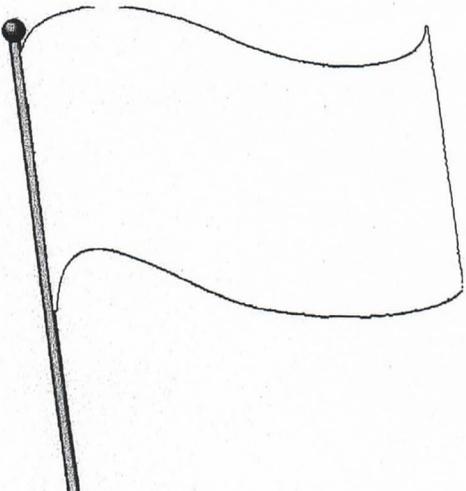


This flag means  
**GO, GO, GO!**



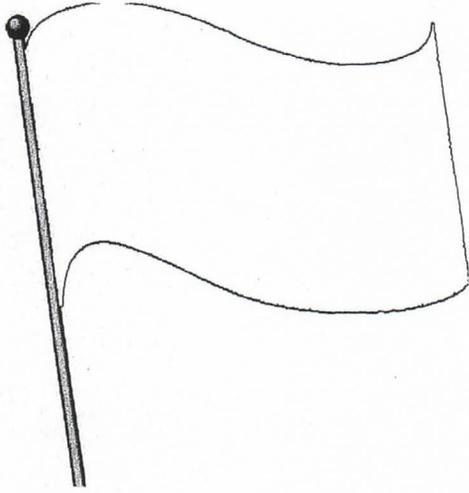
This flag means **STOP!**

Put your foot on the brake pedal to  
stop the race car immediately!



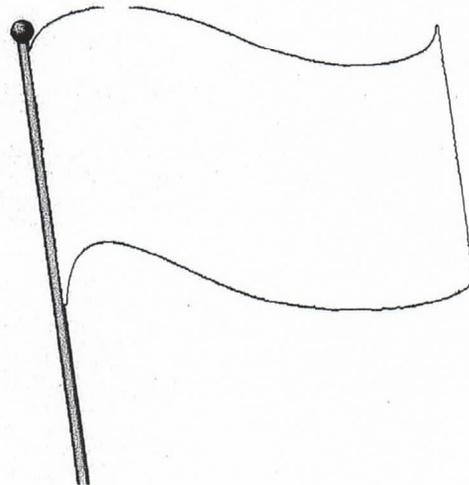
This flag means  
**CAUTION!**

Slow down and don't pass any cars.



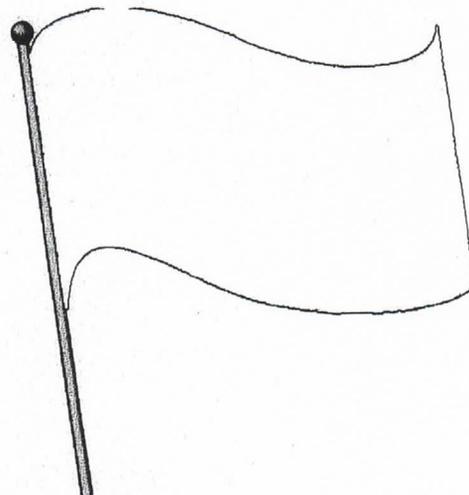
This flag means  
**DISQUALIFIED!**

You must drive your car off of the race track immediately.



This flag means  
**ONE LAP TO GO!**

There is going to be just one more lap in the race.



**CHECKERED  
FLAG!**

The race is over

**Fill in the blanks with the words from the word bank.**

When the flagger shows you the \_\_\_\_\_ flag, he wants you to stop immediately.

When the flagger shows you the \_\_\_\_\_ flag, you should go off the track.

When the flagger wants you to slow down, he shows you the \_\_\_\_\_ flag.

When the race starts, the flagger shows you the \_\_\_\_\_ flag.

When the flagger waves the \_\_\_\_\_ flag, it is the end of the race.

When the flagger waves the \_\_\_\_\_ flag, there is one more lap to go in the race.

The person who holds all the flags is called the \_\_\_\_\_.

**Word Bank**

Flagger	Checkered	Red
White	Black	Yellow
	Green	

## Matchbox Car Racing

Place the following numbers on matchbox cars: 1, 2, 3, 4, 5, 6

Write a starting line-up on a piece of paper, chalkboard or dry erase board:

1      2

3      4

5      6

Have your driver place the cars in that order.

Mix the numbers in the line-up, for example:

3

6

2

1

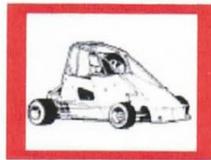
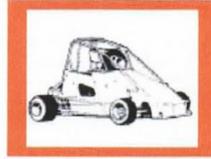
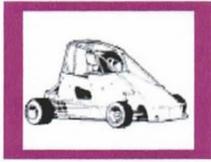
5

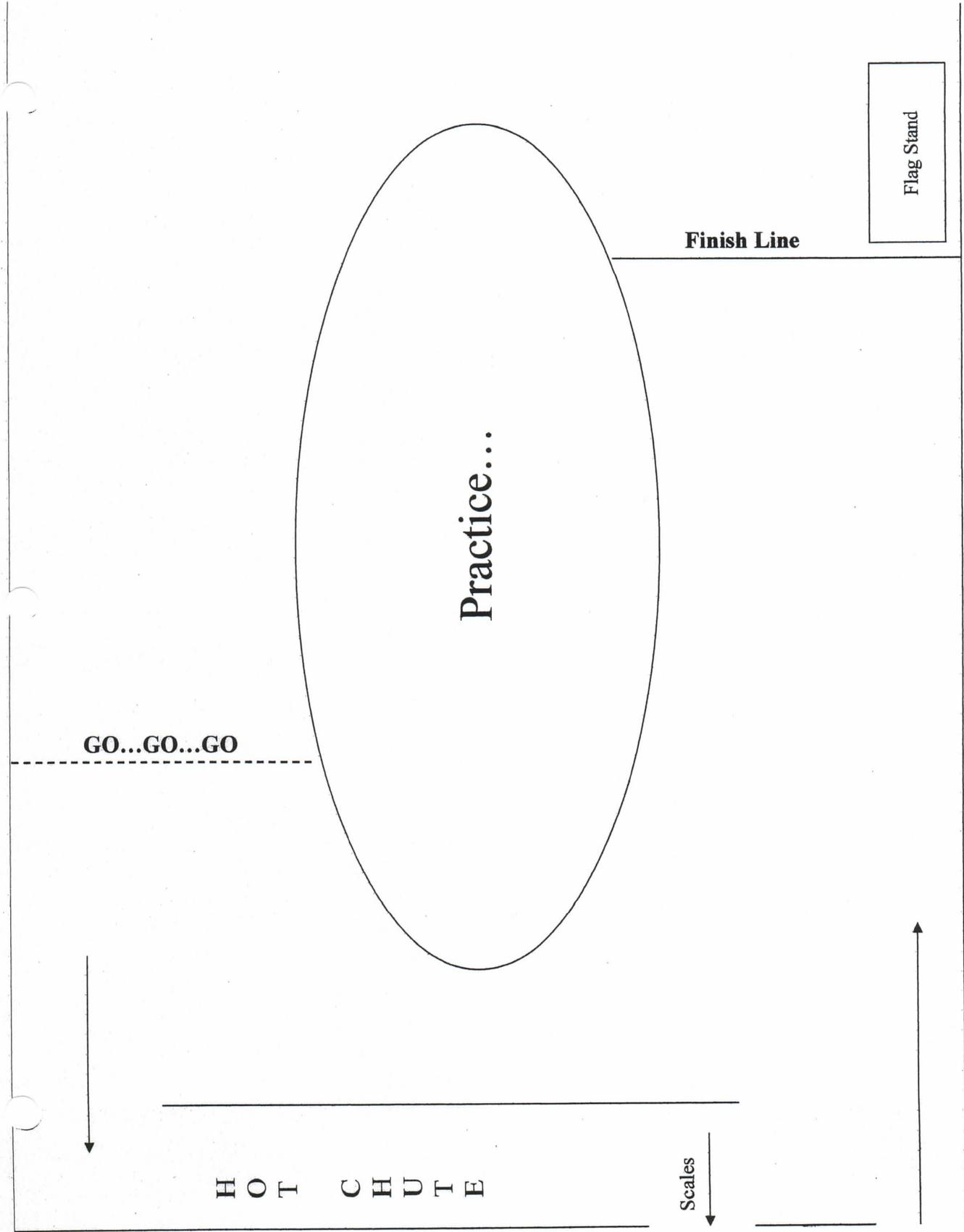
4

Have your driver place the matchbox cars in the restart order. Let the driver know that if they are car 6, they line up behind car 3.

Remind your driver that on a restart the cars line-up in the order that they crossed the start/finish line on the last completed lap. They must line up in the order which is posted on the line-up board.

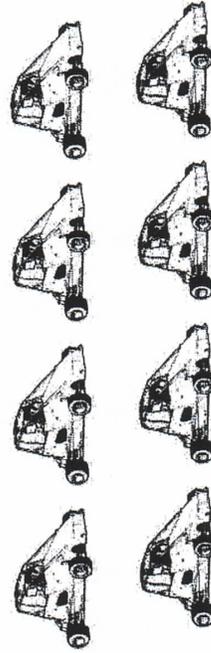
This is good practice and will help the children with their training. They will get used to looking for the numbers.





GO...GO...GO

Double File Lineup...  
(start of race)



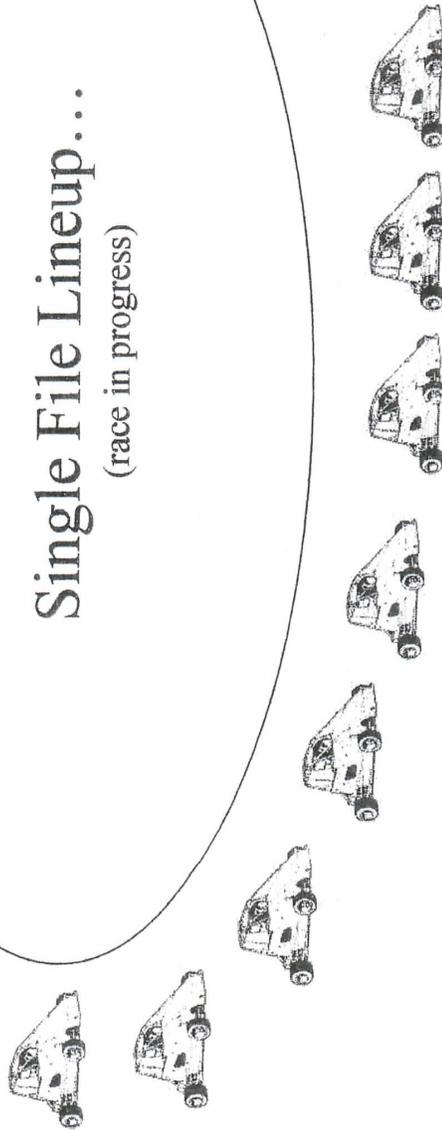
Flag Stand

H O T C H U T E

Scales

GO...GO...GO

Single File Lineup...  
(race in progress)



Flag Stand

H O T C H U T E

Scales

# NCQMA Rookie Training Program Evaluation

In an endeavor to continually improve our program, we ask that each family take a few minutes to complete this course evaluation. We appreciate your comments and will review them carefully. We look forward to racing with you in the near future.

Instructor: \_\_\_\_\_ Date: \_\_\_\_\_

	Low				High
Did the training meet your expectations?	1	2	3	4	5
Was there enough time spent on the race track?	1	2	3	4	5
Was there enough time spent with procedures and rules?	1	2	3	4	5
Was the length of the course sufficient?	1	2	3	4	5
Were the written materials complete and helpful?	1	2	3	4	5
Was the instructor effective?	1	2	3	4	5
Was the overall training well-coordinated and presented?	1	2	3	4	5
Would you recommend this training to others?	1	2	3	4	5
Overall class rating?	1	2	3	4	5

What parts of training did you think were well done?
What parts of the training do you think could use improvement, if any?
What would make this training even better?
Other comments?