CLUB RACING

DRIVER SCHOOL PROGRAM

STUDENT HANDBOOK

Sports Car Club of America, Inc.
P.O. Box 19400
6700 S. Topeka Boulevard
Building 300
Topeka, Kansas 66619
(800) 770-2055 Fax: (785) 232-7214

Driver School Program

Goals of the School:

The goal of the school is to graduate students whom we will be comfortable racing against. We want to stress safety, predictability, consistency and skill. Lack of speed rarely, if ever, fails a student from school. Lack of safety does. Students need to learn to drive the line, hit the apex and exit points consistently more than they need good lap times. It is much better to see students start slowly, find the line and then gradually increase their speed, than to see them set good lap times by sheer bravado while unsuccessfully trying to get on the line. It is very important to get the basics (line, technique) covered first. This provides a good foundation for accelerated learning later. Students will probably be able to go faster at first by ignoring the basics and simply driving hard, but this drastically limits potential for further development. Also, as speeds increase, it is frequently more expensive, especially when we go to larger race tracks where there are a lot more solid things to hit at a higher speed!

Grading:

Students are graded on a scale from 1 (failing) to 5 (great). We grade on a bell curve – that is to say most of the students should average 3's. We rarely give 1's or 5's. 1 is a failure, 5 would be a truly exceptional student. In other words 3 is a good normal grade. We try to grade in a way that will indicate improvement (or lack of it) as the school progresses. Also, note that we grade according to how the student should be doing at that particular level of the school. In other words, an average student showing an average level of improvement would get all 3's; someone who is totally lost the first session is normal and shouldn't be degraded for a lack of previous knowledge.

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Section 1

TECH INSPECTION

The purpose of tech inspection is to be certain that all cars comply with the required safety regulations found in the GCR. Tech will also check that the car is properly prepared to be on a race track. It is not the responsibility of tech inspection to check non-safety class rules at pre-race tech.

1. Your car must be teched before it enters the course. Current practice is to perform an Annual Tech Inspection before the first race of the year and away from the track. Check local region for approved tech inspectors and locations.

2. Have your vehicle logbook heading and tech sheet (if applicable) filled out and signed before arriving at tech.

3. Ensure all driver's gear is current and ready for inspection. *Read GCR 9.3.19*

    a. **Driver's suit and underwear** (Nomex or approved fire retardant material). A Nomex hood (balaclava) is also required if the driver has facial hair or other hair that protrudes from beneath a driver's helmet.

    b. **Helmet** – Must have a rating of SA 2010 or later, SAH2010, SFI 31.1, FIA 8860-2004 or later, or British Standards Institute BS6658-85 Type A/FR. Snell M (motorcycle)sticker is not allowed. The back of the driver's helmet shall be labeled with a minimum of the driver's name.

    c. **Gloves** - Must be of leather and/or accepted fire resistant material with NO vent holes.

    d. **Shoes** - Must be leather and/or nonflammable material and worn with Nomex socks.

    e. **HANS** (Head And Neck Support) Must have an SFI 38.1 or FIA 8858-2002 or 8858-2010 sticker

4. After successfully passing Tech Inspection, you will receive a tech sticker. This sticker should be placed were indicated by the technical inspector. As a general rule, it is placed on the side of the car visible to the starter stand as the car passes in the racing direction.

5. In the event that your car is involved in an accident on the track or suffers significant damage from going off course, the car must be re-inspected and noted in the vehicle logbook before going out in the next session.

Section

2

PADDOCK

The paddock is defined as the area used for parking race cars and support vehicles and for working on the race cars. The timing tower and pre-grid areas are part of or adjacent to the paddock.

1. No race car engine may be operated outside of **the times indicated in the supplemental regulations, ("supps")** on any day.

2. Each driver is allotted paddock space for his race car **as indicated in the supplemental regulations.** Different tracks have different procedures and allowances for vehicles in the paddock, so check the "supps" carefully.

3. The paddock access road at some tracks (PMI, for example) will be closed to traffic while race cars are on the track. This includes practice, qualifying, and race sessions.

4. Consumption of alcoholic beverages is prohibited until a participant's racing or other duties have been completed for the day. Illegal substances are NOT allowed at any time and their use is subject to penalties as outlined in the GCR. Supplemental Regulations may be more restrictive.

5. Drivers are at all times responsible for the conduct of their crews.

6. Riding on the exterior coachwork of any vehicle in the paddock area is prohibited.

7. Pets are permitted only if leashed or otherwise restrained in a suitable enclosure.

8. Reckless driving in the paddock may result in immediate expulsion from the event and/or grounds.

Section 3

IN THE PITS

The HOT PIT area is defined as the pit lane that runs parallel to the front straight and is connected by access roads to the racing surface.

1. Only credentialed, SCCA licensed crew members are allowed in the hot pits.

2. No driver may have more than 4 attendants in the pits. This number may be decreased at the discretion of the Chief Steward.

3. Minors, fifteen (15) to seventeen (17) years of age, may be issued pit credentials only if they hold the proper minor crew license. All other persons under eighteen (18) years old are prohibited from entering the pit area or any other hazardous area.

4. Unless a car is physically in the pit, only two attendants are permitted beyond the pit lane barrier for purposes of signaling the driver.

5. No smoking is permitted in the pit lane.

6. No refueling of vehicles, unless specifically authorized by the supplemental regulations.

7. Crewmembers are, at all times, under the control of the Pit Marshall.

8. A vehicle, which is no longer able to compete, must be removed from the pit lane as soon as practical.

9. A vehicle, which leaves the track/pit lane and enters the paddock area during the course of a race, may not re-enter the competition without the approval of the Chief Steward.

10. The GCR does not require Pit Crew members to wear long pants, shirt, and shoes in the pit lane, however, it is suggested that appropriate attire be worn. The supplemental regulations, as in this Drivers' School, may require long pants and closed-toe shoes. Be sure to check the published supplemental regulations.

Section

4

ON THE TRACK

1. **DRIVERS MEETINGS:** Must be attended by all drivers.

2. **NO VEHICLE** is allowed on the track at any time without permission of the Chief Steward.

3. **RULES OF THE ROAD**: It is each driver's responsibility to avoid physical contact between cars and always leave racing room for one's competitors.

4. **PASSING**: When a pass is being attempted, the driver attempting the pass has the responsibility of deciding when to pass and to accomplish it safely. Be patient. Think ahead. Learn to set up your passes. Observe where you are quicker than your competitor and employ that knowledge to your advantage. Remember also that, when racing, two cars passing each other frequently slows both cars (side by side, neither car can use the whole road). Sometimes it is more prudent to stay in line with the other car, drafting down the straight, as two cars can go faster than one alone. Take note also that when someone makes a "banzai" late braking move to pass you, it will often slow him down in the corner exit (due to an early apex) so that if you change your line to maximize your exit speed (brake earlier and apex late), you can often re-pass him on the following straight. Remember that as the overtaken driver, you must be aware of cars in your vicinity and have the responsibility of using your mirrors so that you do not block or impede a passing driver. When being overtaken by faster cars you may point them by, but more importantly, be predictable. Point to the side on which you want the other car to pass, remembering that this is only advisory as he may decide to do something else. However, it lets the other driver know that you see him.

5. **HAND SIGNALS**: Each driver has the responsibility for making proper, visible hand signals to inform drivers behind him and to convey problems to workers when they arise. These situations specifically include, but are not limited to, the following:

    a. When exiting the race track onto pit road
    b. When moving slowly or stalled on the track
    c. In the event of a "no start" or starter "waive off"
    d. When being passed by a faster car
    e. When you have come to a stop off the track surface

6. **Starts And Restarts:** For SCCA racing, when the green flag comes out on a start or race restart, the entire track goes green and passing is legal, regardless of one's location on the track (unless there is a local yellow flag where you are). During a full-course yellow situation, the field may be controlled by a pace car, or the race leader. All drivers should safely make every effort to close the gap with the car ahead, forming an evenly spaced single-file line behind the leader. Take care

On the Track, continued:

while under the full course caution--expect to come across emergency vehicles, disabled cars, and workers along the track. Sometimes the entire pack won't catch the lead car before racing is resumed. Watch the flaggers. When they drop the yellows –GO!---the course has gone to green.

7. Unless it is an emergency, always exit the track via the pit lane.

8. If your car has a problem out on the track and cannot return to the pits, follow the corner marshals directions, and place your car where they tell you.

9. In an emergency situation requiring the response of an emergency vehicle on course, a white flag will be displayed standing for two (2) flag stations prior to the vehicle's location as it proceeds along the course.

10. In the event of a red flag, all competitors will stop racing, come to an immediate, **controlled** stop at the side of the track (near a flag station, if possible) and wait for instructions. When released by an Official, (verbally, hand signal, or a black flag) proceed cautiously to the hot pits.

Section

5

DRIVING TECHNIQUES

1. How quickly (efficiently) one can maneuver a car around a race course depends on the tire grip (traction.) Maximizing one's tire grip requires proper car preparation and appropriate driver input. While good car set-up is very important, the techniques and skill a driver uses to negotiate the course are vital to going quickly. The Drivers' School is where a new driver learns and forms habits of the most efficient driving techniques.

2. Begin with a comfortable driving position—all controls within easy reach, hands at 3 and 9 o'clock, and clear visibility in the properly aimed rear view mirrors.

3. You must maintain SMOOTH control to get maximum speed. Your entry into a turn (turn-in point) must be performed smoothly; never jerk the steering wheel abruptly. Time your turn-in point so that the car hits the apex of the turn without having to readjust the car's attitude. You are trying to achieve and maintain balance between the four contact patches with the road.

4. Learn "the line" to drive that most efficiently negotiates each corner, which allows for the smoothest entry and exit, and contributes to the lowest lap times. That line typically begins at the edge of the track (turn-in point), touches the inside curb (apex), and finishes at the edge of the track (track out point), but may be modified to fit track configurations or racing situations.

5. "EARLY APEX" or "LATE APEX" refers to adjusting the geometric apex of a turn to maximize the speed on the preceding straight, or the acceleration at the exit (exit speed.) When learning an unfamiliar track, it is usually safer to plan a late apex, for which you brake earlier and change the car's vector more before than after the apex. In contrast, an early apex requires more turning be accomplished after the apex and sometimes leaves little room to finish the turn while remaining on the track. Other reasons to adjust your apex might be interaction with consecutive turns, setting yourself up to pass another car, or compensating for a handling characteristic of your particular car.

6. Most drivers establish landmarks on the race track to help identify braking points, turn-in points, and apexes. These landmarks can be track signage, pavement irregularities, a corner station, vegetation, etc.

7. Learn to brake aggressively without locking up the brakes (Threshold Braking) in order to minimize the time spent off the throttle and under deceleration. This requires feeling a wheel lock up and adjusting brake pressure accordingly.

Driving Techniques, continued:

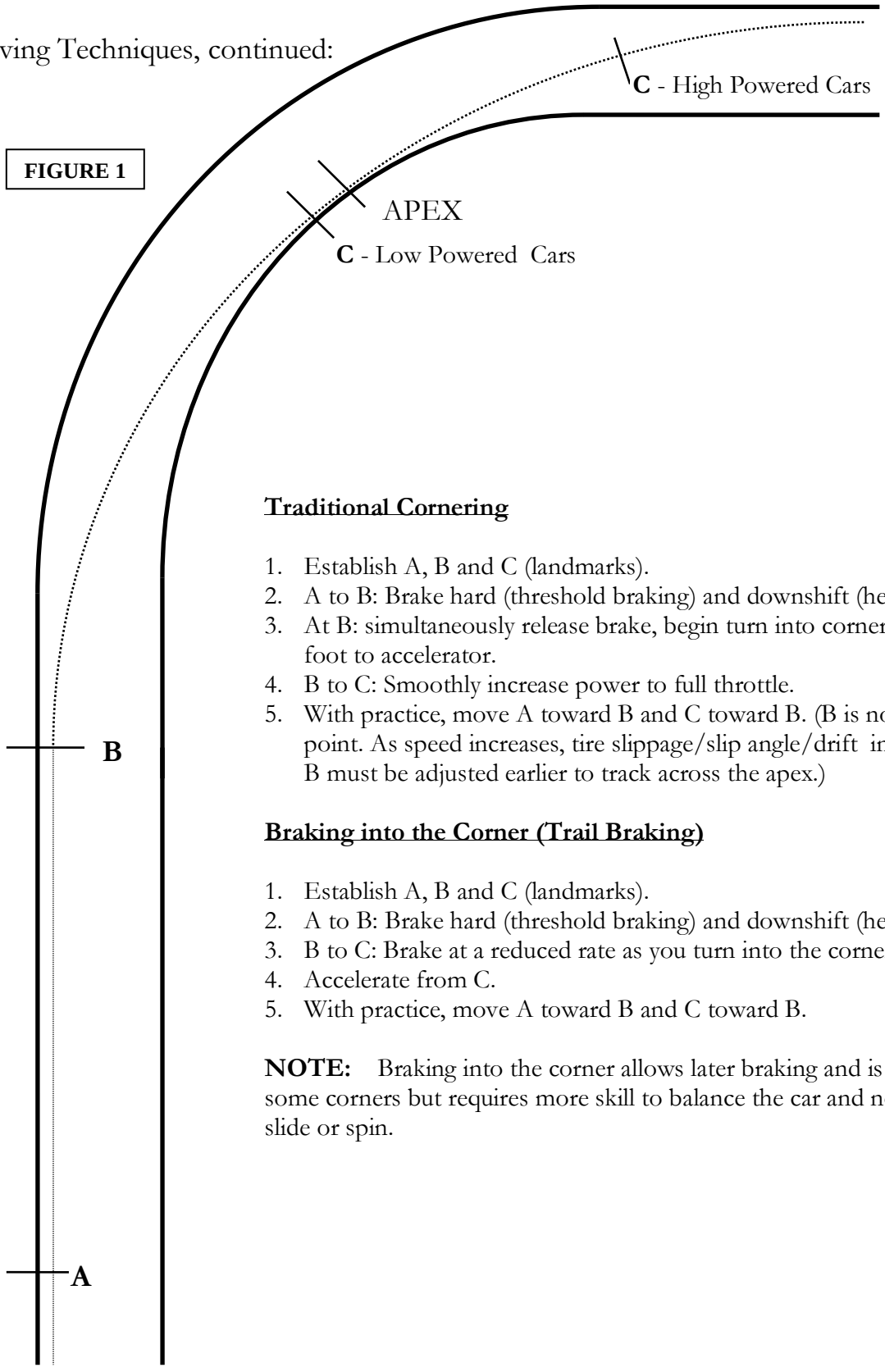


FIGURE 1

Traditional Cornering

1. Establish A, B and C (landmarks).
2. A to B: Brake hard (threshold braking) and downshift (heel/toe).
3. At B: simultaneously release brake, begin turn into corner and move foot to accelerator.
4. B to C: Smoothly increase power to full throttle.
5. With practice, move A toward B and C toward B. (B is not a fixed point. As speed increases, tire slippage/slip angle/drift increases and B must be adjusted earlier to track across the apex.)

Braking into the Corner (Trail Braking)

1. Establish A, B and C (landmarks).
2. A to B: Brake hard (threshold braking) and downshift (heel/toe).
3. B to C: Brake at a reduced rate as you turn into the corner.
4. Accelerate from C.
5. With practice, move A toward B and C toward B.

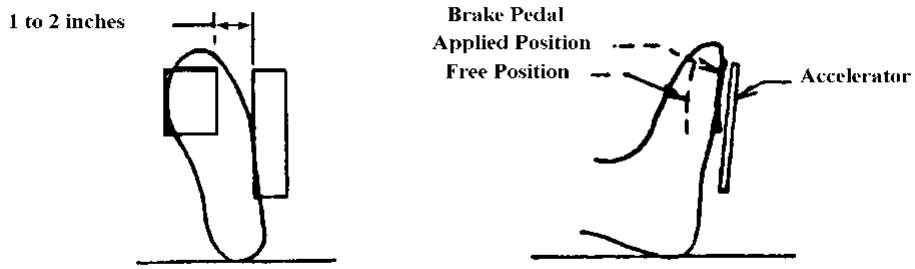
NOTE: Braking into the corner allows later braking and is faster in some corners but requires more skill to balance the car and not start a slide or spin.

Driving Techniques, continued:

8. "HEEL AND TOE" is a method of downshifting smoothly while braking. If performed properly, the engine speed will match the vehicle speed in the lower gear as the clutch is engaged.

HEEL AND TOE SHIFTING

FIGURE 2



a. Most drivers use the ball and outside edge of the right foot, not the heel and toe, to downshift while braking. To do this easily, the brake and accelerator pedals must be positioned so the brake pedal ends up slightly above the accelerator when the brakes are applied. The lateral distance between the pedals should be 1-2 inches, as shown.

b. Brake with the ball of the right foot on the edge of the brake pedal and about half of the outside edge of the right foot over the accelerator pedal as shown. Do not lift the heel off the floor. When the car has slowed enough to engage the next lower gear without over-revving the engine, perform the following as quickly and smoothly as possible:

c. Disengage the clutch. Roll the edge of the right foot onto the accelerator while keeping a constant force on the brake pedal (this is the hard part).

d. While the engine is accelerating, engage the desired gear.

e. When the engine speed matches the transmission input shaft speed, roll the foot off of the accelerator and engage the clutch (this is hard, too). When this matching is done properly the car will not lurch forward and the drive wheels will not lock up.

f. While learning this procedure go down one gear at a time (4th, to 3rd, to 2nd, etc.) When the procedure is mastered try skipping gears. This saves time and wear on the engine and driveline, but the matching process is more difficult.

g. Heel and toe down shifting is very important and not easily learned. If possible, practice in a street machine. Most road cars require pedal position adjustment for easy heel and toe shifting. A piece of wood bolted to the existing pedal may work just fine.

Driving Techniques, continued:

9. CAR HANDLING – Depending on how your car is set up, you will experience on of the following handling characteristics:

   a. Understeer is the tendency of the car to turn less than the front tires are telling it to turn. Also called plow or push.

   b. Oversteer is the tendency of the car to turn more than the front tires are telling it to turn. Also called loose.

   c. Neutralsteer is when the car responds to the front tires as expected.

The following chart may be useful if you want to modify or improve your car's handling characteristics:

ADJUSTMENT		INCREASE UNDERSTEER	INCREASE OVERSTEER
Tire Pressure	Front	Decrease	Increase
	Rear	Increase	Decrease
Tire Section	Front	Smaller	Larger
	Rear	Larger	Smaller
Wheel Camber	Front	More Positive	More Negative
	Rear	More Negative	More Positive
Springs	Front	Stiffer	Softer
	Rear	Softer	Stiffer
Sway Bar	Front	Thicker (Stiffer)	Thinner (Softer)
	Rear	Thinner (Softer)	Thicker (Stiffer)
Weight Distribution		Move Forward	Move towards Rear

*Increasing Toe-in will generally increase understeer (to an extent), but at the sacrifice of straight line speed.

Section 6

FLAGGING & COMMUNICATIONS

1. PURPOSE OF THE F & C TEAM

The purpose of the F&C organization is to provide safe course control by doing the following:

a. Communications with Drivers

1. Informing the drivers, by using flags, lights, or other signals, of the condition of the course, the condition of their cars, or of any unusual conditions affecting the running of the event.

b. Communications with Stewards - through the Communication Network.

1. Informing the Operating Steward and other officials of the course condition (incidents, fluid spills, emergencies, etc.), condition of cars (mechanicals, off-course), or of any situations requiring decisions and/or actions by the race officials (pass under yellow, metal to metal, crowd control issues, etc.)

c. Relaying Steward's Orders

1. Relaying information and instructions from the Operating Steward to the persons operating the various emergency vehicles and equipment around the course (they are also tied into Control by radio) as well as to other corner personnel.

2. Information and Instructions to Drivers such as Red flags, Black flags, furled blacks, mechanical, full course yellow, etc.

d. Undertaking whatever Emergency Action is needed to PROTECT the lives and property of the marshals, drivers, or spectators in the event of an accident.

e. Maintaining a clear course. Keep the race going as unrestricted as possible.

2. Communications between F&C Workers and Drivers

a. Flags - At all corner stations and Starter's Stand, unless otherwise noted

GREEN (Solid Green):

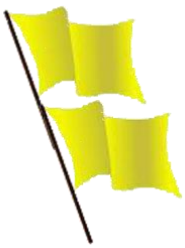
Racing is under way the instant the green flag is displayed. When displayed, the green flag indicates that the course is clear. This flag shall normally be in possession of the Starter only, and shall not ordinarily be displayed at the flag stations around the course.

STANDING YELLOW (Solid Yellow):

Take care, Danger, Slow Down. Incident OFF the track. NO PASSING between the flag and incident.

WAVING YELLOW (Solid Yellow):

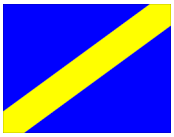
Great Danger, Slow Down, be prepared to stop or change your line. Incident ON the track. NO PASSING between the flag and incident.



DOUBLE STANDING YELLOW (Solid Yellow):

Slow Down — FULL COURSE CAUTION — NO PASSING ANYWHERE ON THE COURSE. Form up single file behind the leader/ pace car. Single standing with single waving is equivalent to Double Yellow but incident is on course.

Cars may pass other cars that are disabled and cannot keep the pace as signified by a raised arm on the part of the driver of the disabled car. **NOTE:** A driver may encounter several flags before reaching the emergency area. The requirements are still the same "SLOW DOWN, NO PASSING."



BLUE FLAG (Blue with Diagonal Yellow Stripe):

Another competitor is following you very closely or is trying to overtake you. This flag may be displayed standing or waving, depending upon the speed with which you are being overtaken.

Flagging and Communications, continued:

SURFACE CONDITION FLAG (Yellow with Vertical Red Stripes):

Take care. Oil has been spilled or a slippery condition exists, or debris is present on the course. This flag is displayed standing

WHITE FLAG (Solid White):

An ambulance, service vehicle, or slow moving (e.g., with mechanical trouble) race car is on the circuit. Take care. This flag shall be shown standing for two (2) flag stations prior to the vehicle. Cars may carefully pass emergency vehicles. A standing white flag shall also be displayed during the first lap of a practice or qualifying session to indicate the location of the flagging stations.

A WAVING WHITE flag at the starters stand, signifies one lap to go.

BLACK FLAG (Solid Black)

CLOSED BLACK FLAG (Furled):

WARNING — you are driving in an unsafe or improper manner. If continued, you shall be given the Open Black Flag.

OPEN BLACK FLAG (Standing):

(With your car number displayed)-Complete the lap you are now on, and then stop for consultation at the location designated by the Chief Steward or the Supplementary Regulations for that event.
OPEN BLACK FLAG with the word "ALL" displayed: All cars proceed directly to the hot pit. Restarts are the same as for a red flag.

MECHANICAL BLACK FLAG (Black with Orange Ball):

There is something mechanically wrong with your car. Proceed to the hot pits at reduced speed. (Displayed only at Starter's stand and black flag station.)

Flagging and Communications, continued:

CHECKERED FLAG (Black and White Checks):

You have finished the race (or practice/qualifying session). Continue your cool down lap and proceed cautiously to the pits. Normally only displayed by Starter, but in some cases (not in races) it will be displayed at a corner station to expedite clearing of the track.

RED (Solid Red):

Come to an immediate, controlled stop, taking care not to endanger you or another car by the manner of stopping. Pull the car to the edge of the track (near a corner station if possible) to the extent circumstances permit. THE SESSION HAS BEEN STOPPED.

NOTE: A Red flag can only be ordered by the chief steward.

LIGHTS INSTEAD OF FLAGS: The Supplementary Regulations shall state where on the course and for what purpose lights shall be used.

STOPPING A COMPETITION: When it is necessary to stop a competition, the Chief Steward may:

a. Order a black flag and an "ALL" sign to be displayed on the Starter's stand; simultaneously, each flag station around the course shall display a black flag. These black flags shall inform all drivers that they shall stop racing immediately and proceed to the hot pits, exercising extreme caution and being prepared to stop if necessary.

b. Order a red flag to be displayed simultaneously at all flag stations. Once a red flag has been displayed, it shall not be withdrawn until all cars have come to a stop. Further instructions shall be conveyed by the Corner Marshalls.

c. Order the Checkered Flag to be displayed to the lead car if fifty (50) percent or more of its scheduled time or distance has been completed.

Flag and Communications, continued:

b. Worker's Hand Signals To Drivers - Given along with flags

1. Go Easy!: Both palms down, hand held stretched in front, repeated up and down motion with arms. Used when there is severe track blockage ahead or conditions require you to reduce speed.

2. Pull Towards Worker: Palms toward worker, scooping motion with hands towards worker. Used when only the worker's side of the track is clear.

3. Push Away From Worker: Palms away from worker, pushing motion away from worker with arms. Used when only side of track opposite worker is clear.

4. Slippery Track Conditions: One arm palm down, moved in a circular motion parallel to the track. When there is an oil or coolant spill on the track.

5. Point Procedure: When driver requests a point, the worker holds out a hand as a stop signal, then makes large, full arm pointing motion at the correct car to pull out onto the track behind.

6. Fire Extinguisher Held Overhead: You are on fire! Pull into corner station if workers are pointing at you. They can put out your fire NOW!

c. Driver's Signals To Workers

1. Engine Running, Want A Point: One arm raised, tells worker engine is still running.

2. Engine Dead, Can't Start: Both arms raised, driver not trying to start car.

3. Acknowledge a Flag: Nod head or wave with one hand (black flags & meatballs only); just check your mirrors for a blue flag. We'll be looking closely for any signal.

4. Problem with car ahead? Point at car ahead leaking oil, blocking, etc. Alerts Corner Marshalls to keep an eye on him.

Flag and Communications, continued:

3. PHYSICAL LAYOUT

a. Chief Of Flagging and Communications in the Control Tower - Communicates with stewards and to all corner stations.

b. Corner Stations:

1. Sufficient number to cover track. Must have complete visibility of entire track.

2. Located for visibility, generally inside of turn.

3. Manned with sufficient workers for common incidents. Minimum of 2 with more at high incident turns.

4. Communications, safety and maintenance equipment. Makes corner station best location if you need immediate help.
   - Phone/radio communications
   - Signal flags, lights or paddles
   - Fire extinguishers
   - Pry bars, brooms, oil dry, etc.; sometimes our own tools

4. RULES WHEN OFF THE ROAD

a. Off Track Excursions

1. Still Moving: Simply 4 wheels off-- continue, merge safely back into traffic.

2. Stopped: Give one arm or two arm signal to workers. Stay in your car until advised otherwise by the corner marshals.

b. Loss Of Power Or Mechanical Failure

1. The corner marshals are in charge, whose job it is to get you back on track if it can be done safely and timely. Pit crew is not to come out and help during a session.

2. Can work on Car if Safe: Safe is either 300 yards away from track or safely behind the corner station itself. The latter is preferred; they may even have tools at the corner station.

Flag and Communications, continued:

c. Serious Incident

1. Corner Workers = First Response: Always with a fire bottle.

2. Emergency Services responds if required: In case of injury potential.

3. Corner Worker or Emergency Services In Charge: If Emergency Services is called, they take charge of the incident. Otherwise, the corner captain is in charge until they are on scene.

4. If Sent To Medical - Go! Sent after serious impacts, rollovers, etc.

d. Flat (Rope) Tow Procedure

1. Helmet: Tow straps break.

2. Gloves: Prevent rope burns (open wheel)

3. Seat Belt: Brakes that did work suddenly don't, or car may roll over!

4. Tell Service Crew of any problems & Paddock location: If you can't steer, or the brakes don't work, let them know **before** you proceed under tow.

5. Keep tow strap taught with light braking as needed.

e. Wrecker/Tilt Bed Procedure

1. Driver should return with Car if possible: Tell wrecker crew paddock location and how to pick up car.

5. MISCELLANEOUS NOTES

a. Common Courtesy: i.e. if you are stuck in the middle of the track with a dead engine and corner workers come to push you off the track, don't drop the clutch and make it a "surprise" push start!

b. Common Sense: "To finish first, first you must finish." Not slowing down for a waving yellow with an on-track hazard can put you in the weeds with the other cars that ignored the flag!

Flag and Communications, continued:

c. Great Reasons To Visit A Corner Station

1. OBSERVE how other drivers drive the corner.

2. LEARN how a corner crew operates.

3. You might even give a new perspective to the corner crew.

Section 7

BASIC CAR PREPARATION

*** Have Car Ready to Race before Coming to School ***

1. Engine Compartment
    a. Clean
        i. Degrease before each race
        ii. Light color paint helps trace oil leaks
    b. Battery
        i. Positive (hot) post covered
        ii. Securely anchored
    c. Overflow Tanks
        i. As required/necessary
        ii. Proper capacity
        iii. Securely anchored, emptied
    d. Wires, Hoses, etc.
        i. Securely anchored
        ii. Away from belts, fans, pulleys, headers, etc.

2. Engine
    a. Clean
    b. Use mild performance engine!
        i. Must be reliable enough to last through school
        ii. Handling, not horsepower, works at Drivers' School
    c. Sound Control Requirements – Refer to supplemental regulations
3. Suspension
    a. Clean
        i. Light colored paint can help locate cracks or failures. Not 100% accurate, but very helpful.
    b. All parts tight (Nut and Bolt check, especially suspension)
        i. Inspect before each race weekend, before each race.
    c. Properly aligned
    d. Brakes
        i. Top quality materials
        ii. Adjust bias (where possible) to lock front brakes slightly before rears.
        iii. Change brake fluid frequently. The higher the DOT number the better it is, but the faster it can deteriorate by absorbing moisture.

Basic Car Preparation, continued:

e. Wheels
   i. Inspect frequently. Paint can help detect cracks.
   ii. Don't over torque lug nuts. Use manufacturer specs.
f. Check for tire clearances and suspension bottoming.
g. If you are running racing slicks, also bring rain race tires or good street radials in case of rain.

4. Driver's Compartment

   a. Clean
      i. Vacuum and remove all debris before race
   b. Seating position critical. Must be able to see/reach:
      i. Steering wheel. Good grip, arms slightly bent
      ii. Kill switch and other controls… within easy reach
      iii. Gauges ... must be able to see at a glance
      iv. Mirrors ... aimed properly and vibration proof
      v. The road ahead (sounds silly but often overlooked)
      vi. Shift lever ... be able to select all gears comfortably
      vii. Pedals ... must be able to heel and toe
   c. Roll bar/Cage must be above head and padded per GCR.
   d. Seat installation per GCR
   e. Harnesses must be securely installed per GCR.
   f. Fire extinguisher/equipment must be securely mounted per GCR.
   g. Ballast calculated and securely installed, see GCR
   h. Recommend sedans leave defroster ducts and blower intact.

5. Body Work
   a. Clean
   b. Must be straight and painted, not primed.
   c. Numbers and letters contrasting color, located and sized per GCR.
   d. Window retaining clips/straps per GCR.
   e. Taped lights (where applicable) per GCR.
   f. Window net per GCR.

6. DRIVER PREPARATION
   a. Get in physical shape to withstand an elevated heart rate in a hot environment for 20 to 45 minutes at a time (the length of typical SCCA races.) A regular aerobic exercise regimen will help keep you in the race to the end.
   b. Understand that dehydration can cause serious negative effects on athletes/racing drivers. Attend to your body's fluid needs with (preferably) water, "sports drinks" or juices. Remember that coffee and alcohol have a dehydrating effect.
   c. Keep your body fueled with adequate food to keep your brain functioning at its sharpest.

Driver Preparation, continued:

d. Carry your health insurance card with you at all times. If you're on medications, carry a medication list, as well as the medications. And for trips out of town, take extra medications in case you're delayed.
e. Keep your tetanus booster current.
f. Bring adequate and appropriate clothing…something cool/warm, rain wear, long pants, etc. For protection from the environment at the track remember to bring a hat, sunscreen, earplugs, sunglasses.
g. Get sufficient sleep to help with the mental challenge of racing.

Section 8

ORGANIZING FOR A RACE

1. The better organized you are before a race weekend, the less work and worry you will have during the event. Develop a checklist that fits your needs. Try to have everything packed, loaded and checked off by Friday morning or earlier. Also, the preceding week is a good time to make sure your driver's gear is complete, and has no holes or tears. Other equipment should also be checked to be in running order, especially those items requiring battery power (radios, cameras, timing devices.)

2. Obtain a good crew to car maintain your car so you can concentrate on driving.

3. Registration Materials:

    a. Briefcase or folder with membership card, Novice Permit or License, (photo ID)

    b. Checkbook/cash/ credit card

    c. Vehicle Logbook

4. Driver's "uniform":

    a. Helmet, HANS, driver's suit, underwear, socks, shoes, gloves, (balaclava, arm restraints)

5. Race Data, Checklists:

    a. Track Map, Event Schedule

    b. Stop watch/in-car lap timer (check batteries)

    c. Clipboard/notebooks
        i. Lap charts, car prep checklists
        ii. Mechanical records (chassis settings and changes/set-up, fuel/oil consumption, repairs and replacements)
        iii. Pit board and/or racing radios

    d. Video camera, data systems, laptop computer

Organizing for a Race, continued:

6. Tools

   a. A basic mechanic's tool box with an accurate tire pressure gauge and torque wrench.

7. Support Materials

   a. Equipment: Hydraulic floor jack, jack stands (don't skimp on quality), four 18" squares of thick plywood, fuel bottles/cans, funnel, water bucket, drain pan (do not dump oil, antifreeze, etc. on the ground ... a waste tank is available).

   b. Supplies: Racer's tape, Engine oil, gear lube, coolant, spark plugs, brake fluid, electrical tape, RTV silicone, rags, paper towels, hose clamps, primary wire, penetrating oil, Windex, engine degreaser, gasket material, neoprene hose, mechanics wire

   c. Parts: Brake pads, belts, bearings, hoses, lug nuts, lug bolts, seals, assortment of bolts, nuts, washers, screws, cotter pins, zip ties, radiator cap, oil filter, thermostat and gasket, brake light bulbs, distributor cap and rotor

   d. Additional items which may come in handy:
   Oil filter wrench, drill and drill bits, wire wheel, riveter, emery paper, magnet, scissors, utility knife, feeler gauge, chalk or crayon

Section 9

RACE WEEKEND ACTIVITIES

1. Registration
   a. Be on time
   b. Have all materials ready, including crewmember names for the crew list
   c. Receive your credentials (wristband or other) and the proof of payment that you will present to Tech for your mandatory Tech Sticker.

2. Tech Inspection

   a. Your car should already have the annual tech inspection completed. If not, expect to spend considerable time accomplishing it at the track, and possibly pay an extra fee.

   b. Have your vehicle logbook heading filled out and signed, tech sheet filled out, and personal safety equipment ready. At the beginning of the calendar year, all driver's gear will be checked, then after that, helmets only.

   c. Make it a practice to weigh your vehicle on the official tech scales before qualifying during regular race weekends. This will confirm for you whether or not you need more ballast to make legal minimum weight. At some point you can expect to be weighed after qualifying or after a race (impound).

3. Track Sessions

   a. Be prepared for your session. Have the schedule posted; know your race group. Listen for your group to be called over the PA or proceed to pre-grid at your scheduled time.

   b. Driver's gear ready and accounted for; helmet visor clean.

   c. Car ready:
      i. Tire pressures set
      ii. Fueled (easy to forget)
      iii. Wheels torqued
      iv. Hood secured
      v. Loose tools and debris removed
      vi. Engine warmed up (first session of the day)

   d. Take support materials to pre-grid as required

4. Driver Preparation

   a. Pre-Race
      i. Empty your bladder
      ii. Avoid a large meal or large amount of fluid immediately prior to driving. However, continue proper intake of fluid during the day to keep hydrated.
      iii. Empty mouth of gum, candy, dentures, etc.
      iv. Empty pockets
      v. Remove jewelry, watches, etc. However, it is advisable to wear a "medic alert" type bracelet, if applicable.
      vi. Wear all safety gear.
      vii. DO NOT RACE if you feel upset, ill, or otherwise "out of sorts".

   c. Race
      i. Pre-grid: when the Grid Marshall raises his/her closed fist (meaning that the 5 minute countdown is done), respond with your raised fist and be ready to pull out on cue.
      ii. As you enter the track for the pace lap, pay attention to the grid marshal acting as the "splitter" assigning you your side of the track for the starting grid.
      iii. When scrubbing tires on the pace lap, use caution for the cars near you. Accidents can happen on the pace lap!
      iv. If the start is aborted, get a hand up immediately to avoid being rear-ended.
      v. On the opening lap, if the field in front of you collapses, have an escape plan.
      vi. Understand how to correct a slide, and if the car spins, remember that the clutch goes in to keep the engine running, brake as necessary, but stay with it and steer as best you can to keep out of the path of oncoming cars and to position yourself to get going again.
      vii. If a hard crash is inevitable "make yourself small", trying to avoid wrist and leg injuries.
      viii. If injured, remain still. If uninjured, wave at the nice corner workers.
      ix. Leave helmet on.
      x. If a fire is present, get out and roll on the ground. Keep rolling. This will help put out any fire and bring the corner workers' attention to the fact that you may be on fire.
      xi. After the checkered flag, the cool down lap can be driven at the speed you choose, but don't forget to give each corner station a friendly wave.

Section

10

SUMMARY

1. **Rules Of The Road:** We are here to have fun while being safe. This is Club racing, not F1, Indy or NASCAR. Take care of each other out on the track. This does not mean we can't be competitive. It means you have to leave the other driver enough room to survive. It means that rough driving that puts one's competitors at risk will not be tolerated. This summary is a good place to quote the directives given to us in the GCR as to our on track conduct.

   "Section 6.11.1 On Course Driver Conduct

   A. Drivers are responsible to avoid physical contact between cars on the race track.

   B. Each competitor has a right to racing room which is generally defined as sufficient space on the marked racing surface that under racing conditions, a driver can maintain control of his car in close quarters.

   C. Drivers must respect the right of other competitors to racing room. Abrupt changes in direction that impede or affect the path of another car attempting to overtake or pass may be interpreted as an effort to deprive a fellow competitor of the right to racing room.

   D. The overtaking driver is responsible for the decision to pass another car and to accomplish it safely. The overtaken driver is responsible to be aware that he is being passed and not to impede or block the overtaking car. A driver who does not use his rear view mirror or who appears to be blocking another car attempting to pass may be black flagged and/or penalized, as specified in Section 7."

2. **Flags:** One cannot over emphasize the importance of flag recognition and adherence. We realize that students are in an unfamiliar, stressful environment and probably struggling to keep up with what they're doing inside the car, but there simply are NO valid excuses for missing flags. The workers spend their time and money so we can play. The least we can do is respect them enough to pay attention to what they are trying to tell us. You may feel safe inside your roll cage, but that flag may be for an unprotected worker who is trying to save the life of one of your friends. Winning a race is simply not worth risking a life.

   Tip: Make your habit to mentally reinforce where the flag stations are on your warm-up lap. A wave or nod to the workers might just get you a new friend or two.

3. **General Driving Practices:** Think! Use warm-up laps to check track conditions such as water or oil on the surface, pavement breaking up, condition of dirt in run-off areas, and the location of manned worker stations. Also, get the feel of your car and get your oil, tires and brakes up to temperature. Be smooth. Jerky or abrupt motions will upset the car. It IS possible to move quickly AND smoothly. Relax! You'll be in a high stress environment, but the more relaxed you are the better you'll be able to feel what the car is doing and the smoother your motions will be. Try to feel the subtle messages your front tires are telling you. Try to be consistent. Make small changes. Don't repeat mistakes. If you have a problem in a particular corner, don't just keep doing the same wrong things. Try something different. If you don't know what to try, just slow down until you can stay on the line, then gradually increase your speed at a rate that lets you stay on line. Knowing where the more and less hazardous areas are if your car goes off will help you assess the risk you can afford to take on particular corners. This is the stuff you learn on a walk-around. It's best to know before you need to know. Have planned contingencies if you make a mistake such as missing a braking point or turn-in point or an apex. The first rule is to survive the corner. Don't worry about trying to get back on line or how fast you're going or how early you can get on the gas. Just survive and figure out what you did wrong and try not to repeat it next time! Use cool-down laps to gradually cool your tires and brakes, drive the line, and give a wave of thanks the corner workers.

4. **Getting Up To Speed:** Think ahead. The faster you go the farther ahead you need to plan. Focus on the next event-- i.e. when you're approaching the braking zone, look for your turn-in point; approaching the turn-in point look at the apex, etc. If things are coming at you before you're ready for them, you either need to focus farther ahead or slow down until you can stay mentally ahead of the car. Always focus ahead. Trying to figure out what you did wrong in that last corner is a good recipe for going off in the next one. Get comfortable with driving right to the edge of the track, and with being a couple of inches away from other cars. Remember, that in most cases, corner exit speed is more important than entry speed, especially on corners leading onto long straights. Sacrificing some entry speed to be able to get on the gas sooner usually gives better lap times. Learn to drive the corners with the tires at their limit of adhesion as much as possible. Practice threshold braking. A comfortable driving position is important to drive your best. Hands should be at about 3 and 9 o'clock with elbows slightly bent. Strive to excel at heel and toe downshifting. Practice in your street car (if it has a manual transmission) until it becomes second nature.

5. **Putting It All Together:** As your speed increases, you will experience increasing slip angles (drifting through the corners.) In other words your car will not be traveling in the exact same direction that it is pointed. Learn to compensate for this. Simply aiming for the apex may get you there at slow speeds, but as speeds increase the slip angles will increase and you will miss the apex unless you aim inside the apex by the amount you would have missed it by. Driving a race car is an athletic process. In addition to learning the rules and techniques it requires practice. There is no substitute for quality track time. Practice, practice, practice. At the end of the day SCCA has a social gathering (free beer, sodas, munchies) for all participants. Come on by and meet your fellow competitors and thank the workers. Have fun!

APPENDIX A, FLAG CHART

Flag Color	Additional Conditions	Flag Location	Flag Meaning	Driver Action Required
Green		Starter's Stand	Track is clear	Race normally
Yellow	Stationary	All Stations	Incident off track — possible danger	Take care — No passing
Yellow	Waving	All Stations	Incident on track — great danger	Slow down — No passing — Prepare for evasive action
Double Yellow	Standing or Waving	All Stations	All corner stations are under a yellow condition	Slow down — No passing anywhere on course — Prepare for evasive action — Safety Car may be on course
Red	Standing or Waving	All Stations	Race is stopped	Stop racing immediately — Controlled stop on track
Black w/"All"	Standing or Waving	Starter's Stand - All Corners	Race is stopped	Stop racing immediately — Proceed to pits
Blue w/stripe		All Stations	Driver close behind you	Check mirrors
Blue w/stripe	Waved or shaken	All Stations	Driver behind you is attempting to pass	Check mirrors - do not block
Yellow w/Red stripes		All Stations	Oil, water or debris on track — Slippery conditions	Slow down — Prepare for reduced traction
White	Standing	All Stations	Slow moving/Emergency vehicle on track	Prepare for evasive action
White	Waving	Starter's Stand	Starting last lap	Race normally
Black	+ Your Car Number	Starter's Stand & Black-flag station	Stewards want to talk to you	Proceed to hot pits ASAP
Black	Closed	Starter's Stand	Warning! You are driving in an unsafe manner	Clean up your act!
Black w/Orange ball	May have # board	Starter's Stand & Black-flag station	There is a mechanical problem with your car	Slow down — Come into pits ASAP!
Checkered		Starter's Stand	Race or session is over	Slow down — Complete lap and enter pits