

**Lone Star Region PCA
Performance Driving School
Instructors Guide©**



Lone Star Region of the Porsche Club of America
September 2008



The purpose of this Instructors Guide is to assist all our Performance Driving School (PDS) Instructors to gain a better understanding of the program, its objectives, logistics and particular drills. This form of the PDS Handbook was originally written for and by the Lone Star Region in 2008 and incorporates the input from many sources within PCA, BMW CCA and SCCA, for which many thanks.

In addition to the material in this Handbook, we suggest you visit the Lone Star Region website at www.lsrpca.com/ax/ax.html



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1 INTRODUCTION

Thank you for volunteering to be an instructor at our LSR PCA Performance Driving School and AutoCross! You are the key to a successful and fun weekend for our students and a quality learning event. You will really be able to apply all your experience to make some Houstonians better drivers, and maybe help save a life or two.

This Instructors guide is designed to help us offer consistent and quality instruction at our school in a SAFE environment.

As this is the first time our club is organizing this PDS, you will notice not everything will run as smoothly as you may be used to at other events. We count on you to improvise where needed and make this an unforgettable experience for all participants. We also look forward to your constructive criticism and input.

We expect approx. 50 student participants, 25 instructors and 25 general volunteers for the October 10-12 event.

If you have any questions or comments please contact:

- Joost Perquin / 832-419-4655 – ccc@perquin.net
- Matt Kucharski / 832-494-7807 - kucharskimb@yahoo.com
- Jim Robertson / 713-724-7071 – jrobertsonbmw@mac.com

1.1 Safety First

Nothing we do during the Autocross School should compromise your safety, our students' safety, our students cars, and the facilities we are using. Students need to learn that they are responsible for ensuring safety at the event, please emphasize this. Anytime you see a condition which you consider unsafe you should stop the proceedings until the condition is fixed. If you have a student who refuses to drive within reasonable limits or ignores safety instruction stop and have a serious discussion with him or her! If the conversation fails to correct the student behavior, stop the proceedings and get the Chief Instructor who will ask the student to leave.

1.2 Teach Car Control

The school is not about speed it is about learning car control, always keep your students within their limits. You are responsible to insure they drive within limits. This does not mean that there won't be slipping and sliding, some may even spin. When this happens, stop things and discuss what happened and how to avoid the loss of control. Please do not push a student to do more than they are comfortable with; in the car control school, slower is almost always better.

1.3 Keep Cars Spaced

During all of the drills keep plenty of space between the staged cars and those involved in the drills. We have allowed plenty of time for the driving drills and there is no rush at

all. Take time to talk with each student before and after their runs. Keep things moving at a relaxed, comfortable pace.

1.4 Check Your Students' Cars

During the course of the day observe the gauges on your students' cars especially the Temperature and Oil gauges. Let's make sure we have no overheating or oil related failures! Also, as you move from car to car, look at tires for proper inflation and roll over. You will be teaching in your students' cars. Before the driving drills, ask each student to check the oil level and tire pressure before we start.

1.5 Get to Know your Students

Please take time to get to know your students and what their expectations are for the course. You have everything to do with them achieving those expectations! Find out how well your students know their cars and how comfortable they are with them, again you can really help with this.

1.6 Let the Student know What is Coming

Spend time talking about what is next, walk each exercise and talk about the point of the Drill. Make sure you are clear and ask for question all the time. If you see that someone is confused, stop and help them. It is important to keep everyone actively engaged in the class.

1.7 Self-Critique

Rather than you critiquing each run and maneuver ask your students what they thought of the run and how they think they can improve. It does two things: it makes your student think critically about their performance, an invaluable skill in autocross, and it helps calibrate you on how to help you student improve.

1.8 Be Positive!!

This is a lot on information crammed into a day, it is entirely possible people can overload! Focus on the positive aspects of your student's performance and improvement. Suggest alternative ways of doing things rather than saying something was done wrong. Keep in mind some of these drills can be frightening to a novice driver; that's to be expected. Let them know it is OK. Above all keep students within their limits this will help insure a positive learning experience.

1.9 Have Fun Yourself

Teaching Car Control is a lot of fun, enjoy it. You will be making friends with a whole new group of people that you will hopefully see at our future Autocross and Drivers Education events. And, for sure your students will remember you and the time you spent helping them become better drivers! REMEMBER, YOU WERE ONCE A NOVICE, TOO!

2 Curriculum

2.1 Friday Evening Classroom (6:00 – 9:00 PM)

6:00 - 7:00	Dinner provided by LSR PCA	
7:00 - 7:15	Introductions and overview of the School	Joost Perquin
7:15 - 7:30	What happens at an Autocross?	Matthew Kucharski
7:30 - 7:45	AX Rules & Regulations	Jim Robertson
7:45 - 8:00	Car preparation, Driving position	Jim Robertson
8:00 - 8:30	Driving and Handling Dynamics	Jim Robertson
8:30 - 8:45	Review of Saturday Driving Session	Joost Perquin
8:45 - 9:00	Wrap up and Questions	Jim Robertson et al.

2.2 Saturday Car Control Clinic Driving Drills (8:00AM – 4:00PM)

8:00 - 8:15	General Meeting of all the Students	Joost Perquin
8:15 - 8:45	Technical Inspection of Student Cars	(by instructors)
9:00 - 9:50	Driving Station 1	
9:50 - 10:40	Driving Station 2	
10:40 - 11:30	Driving Station 3	
11:30 - 12:30	Lunch (provided by LSR PCA)	
12:30 - 1:20	Driving Station 4	
1:20 - 2:10	Driving Station 5	
2:10 - 3:00	Driving Station 6	
3:00 - 3:15	All Student Meeting	(recap, questions, review of Sunday)
3:15 - 4:00	Autocross Course Set up	(Required for students)

2.3 Sunday: Practice Autocross (8:00AM – 4:00PM)

Instructors and volunteers, together with the student participants will run a mini Autocross at the Gulf Greyhound Park venue.

Instructors and volunteers run for free.

3 Performance Driving School Objectives

3.1 Friday Night: Classroom

3.1.1 Objectives

At the end of this session the students will have an understanding of Car Control terminology and basics and what an autocross is and how it is conducted. They will review basic car control, oversteer and understeer, hand placement on the wheel, looking ahead, etc.

3.1.2 Lesson Plan:

- Introduction to autocross, a competitive and social event
- Tech. Inspection, what is inspected
- Walking the course
- Driving position, not necessarily what you would do for the street
- Driving
- Working
- Basic car control, hand placement on the wheel, traction circle to introduce oversteer and understeer
- Car preparation for the autocross
- What to bring to an autocross
- Have fun!

3.2 Saturday: Driving Exercises

3.2.1 Objectives

Understand the Tech. Inspection process, proper seating position and hand position. Gain an understanding of braking points, oversteer and understeer, how to determine the correct apex, trail braking, and coordinating steering/throttle and braking.

3.2.2 Lesson Plan

- Tech. Inspection on each car
- Skid pad (understeer and oversteer)
- Slalom drill
- Braking point drill
- Pitch and Catch
- Accident Avoidance drill
- Setting up an autocross course

3.3 Sunday: Practice Autocross

3.3.1 Objectives

Put the previous two days of lessons and drills together. Learn to walk the course and develop a plan of attack. Working at an autocross. Learn to manage car dynamics, and look ahead.

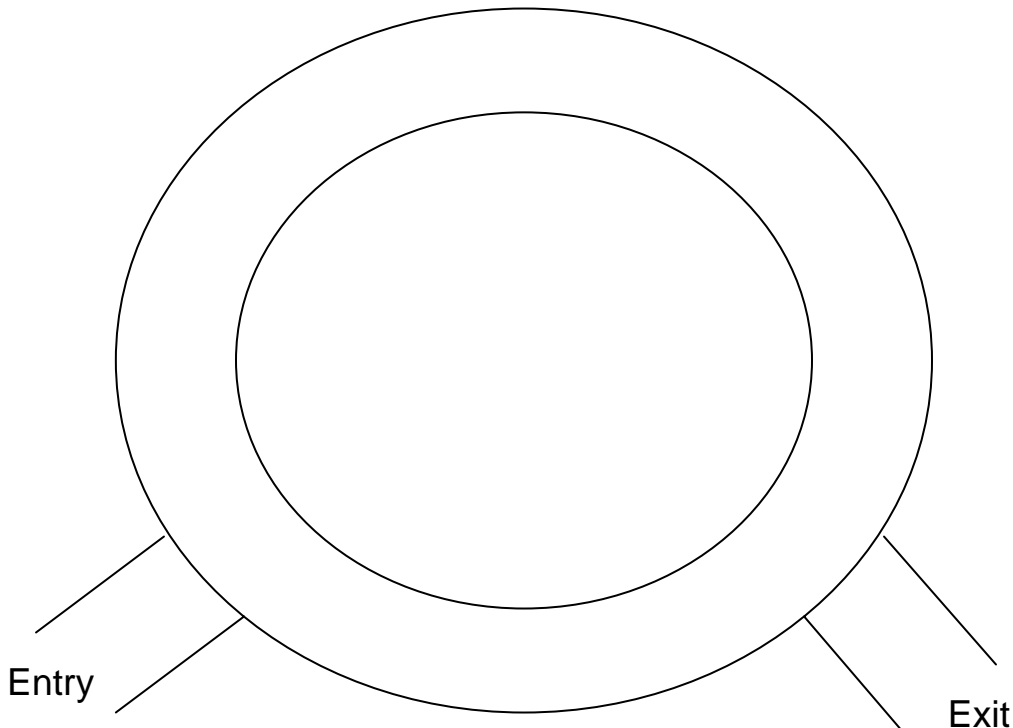
3.3.2 Lesson Plan

- Walking the course with instructor, do's and don'ts
- Ride along with an instructor for the first run
- Talk about the ride along and how fast things happen
- Student to drive the course with an instructor and discuss the results, what worked well what could be improved.
- Instructors to ride along in Sessions 1 and 2 as requested by the student after that.
- Follow-up session with each group, impressions, was it as expected, what surprised you, etc.
- Survey of the autocross school.

4 Car Control Clinic Drills

4.1 Wet Skid Pad Drill

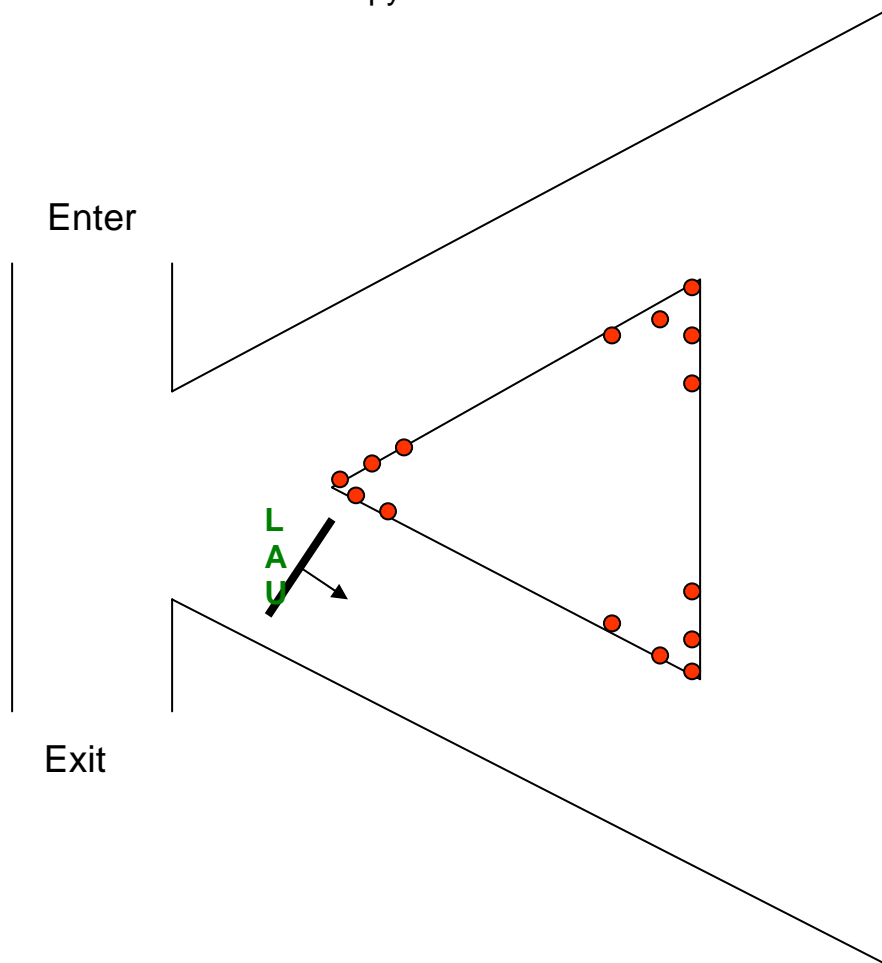
The Skid Pad inner circle diameter is to be 150 feet the outer circle is approx. 210 feet. Use pylons to create the circle and put a separate entrance and exit for the drivers.



SAFETY FIRST – Keep the staged cars well back of the skid pad to avoid a collision in the event of a skid!!!! The purpose of this drill is to learn weight transfer to the front of the car by lifting off the throttle, and weight transfer to the rear of the car by pressing on the throttle. For at least the first run by each student the instructor should ride along for six revolutions. During the first run the instructor should gradually get the student up near the limits of traction, maintaining a steady throttle until you feel the car beginning to lose traction. On subsequent runs again use approximately six laps but get the car up to the limits of traction and then lift off the throttle and experience oversteer. Warn the student ahead of time that the car may spin but that is perfectly OK and VERY instructive. On the third run again get the car up to the limits of traction and this time apply throttle, fairly strongly, and experience understeer. On the fourth and fifth runs allow the student to control the car using both steering and throttle, and see if car direction can be controlled with the throttle only! Be sure to mix the direction of the runs both from a learning perspective and a tire wear perspective!

4.2 Braking Point Drill

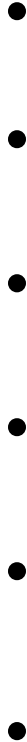
The outer legs of the triangle should be approximately 200 feet per leg with a separate entry and exit. Place three braking point reference cones at the end of each straight. The course is a series of pylons.



SAFETY FIRST - Keep the staged cars well back of the course and keep students within their capabilities!! This drill is designed to teach proper braking points. The object is to accelerate hard all the way until the braking point, using maximum brakes. Work with the student on maintaining full throttle until the braking point where the student should be right at the limit of the brakes or into the ABS. Use the braking reference cones to go deeper before braking, slowly progressing the student to deeper braking points. Take 3 – 4 laps at a time reversing direction between! Talk about brake application in a straight line good apex, and early application of throttle. ALSO, during this drill practice a few launches as if starting an autocross, pick one straight away and have the students practice a launch. Don't do too many launches as these are tough on clutches!

4.3 Slalom Exercise

The slalom course is made up of six pylons spaced approximately 60 feet apart. Students will circle the top pylon and return in the opposite direction. The staging and entry area should be well back of the course.



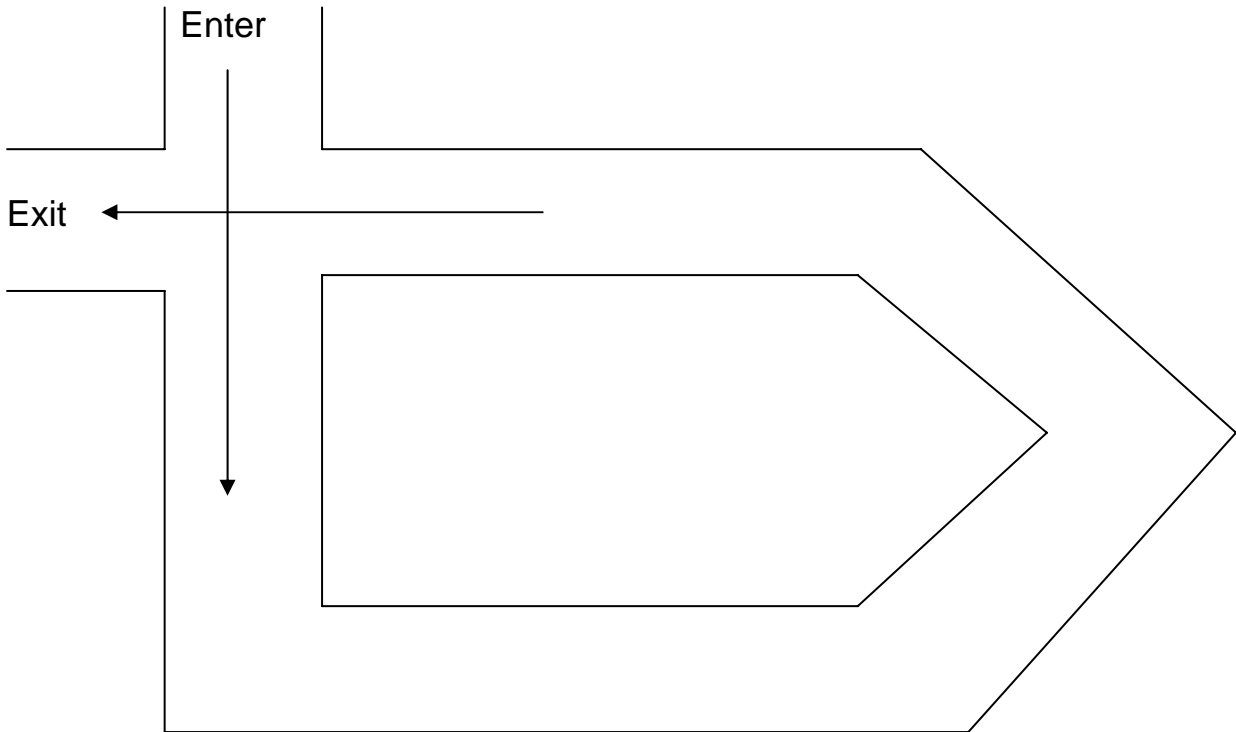
Staging and Entry

Exit

SAFETY FIRST – Keep the staging and entry area well back of the course to avoid collisions!!!! In this driving drill the student will enter the course and slalom to the last pylon and return to the exit. On oversteering car work of smooth constant application of throttle, emphasize braking and throttle lifts are in a straight line! On an understeering car use throttle lift to counteract the understeer. Teach the student to turn **BEFORE** the car reaches the pylon to allow time for human reaction time, and the car to respond to the input.

4.4 Apexing Drill

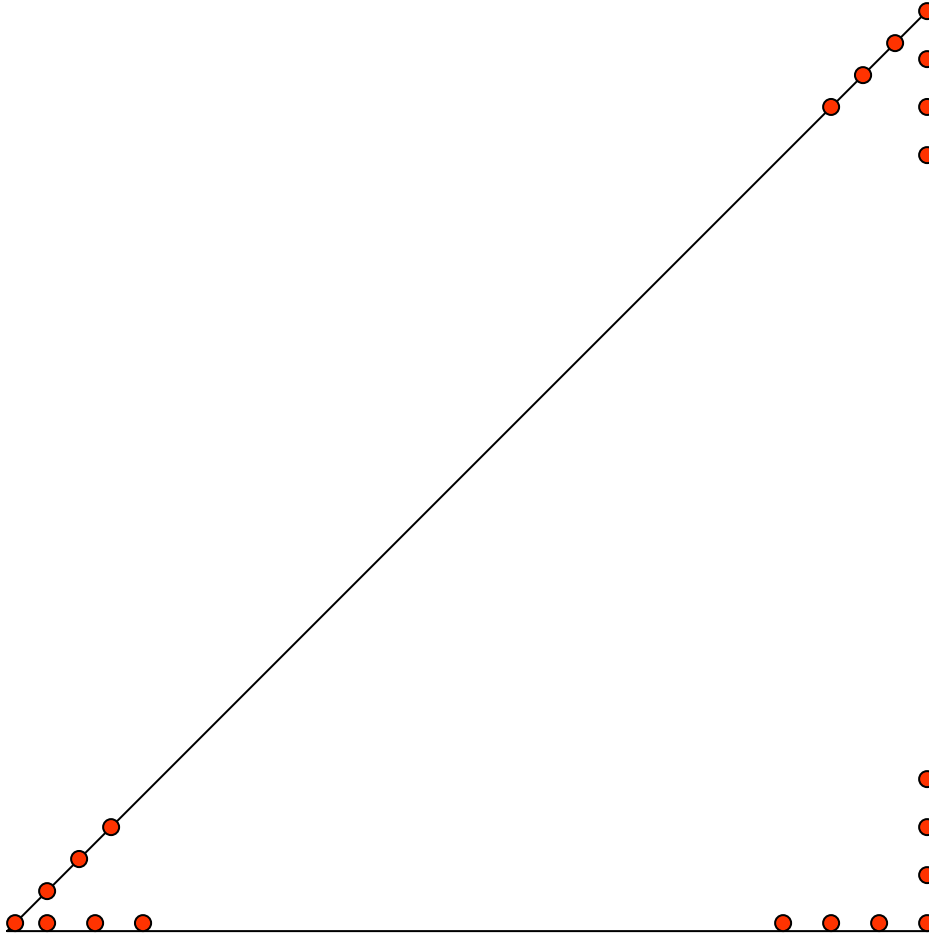
This course is set up with pylons and is approximately 150 feet on the long sides and 100 feet on the short straight side. Apex pylons should be added to the turns.



SAFETY FIRST – Keep the staging area well clear of the course and insure the student slows well before the exit!!!! The purpose of this exercise is to teach late apexes in both a standard and a very late apex turn. The key points to make are to get most braking done in a straight line before the turn, apply the throttle smoothly before turn in and maintain continued throttle while completing the turn. For both the square corners a late apex should be selected, place an apex cone for the students references. For the pointy turn a very, very late apex is called for so the apex cone is well after the vertex of the course! Students should learn to stay wide entering into turns especially on the pointy turn. Cycle through the course four or five laps at a time and then exit and talk about what happened. The students will make 4 – 6 runs through the course.

4.5 Pitch & Catch

This drill is set up as a right triangle about 75 feet on the longest side. Each corner of the triangle represents the inside of a varying degree turn. The goal of the drill is to “pitch” the rear of the car beyond its adhesion limits and reliably “catch” it in order to turn. Start relatively slow and pitch the back of the car, the sequence is GAS, TURN, LIFT, GAS. With some gas on before starting the turn, turn the wheel and hold it in a constant position near the limit, lift off the gas enough to pitch the back end out and then gently get back on the gas to stop the pitch! You will practice this skill at one of the corners at first, then progress to all three corners until your student does it comfortably and in control.

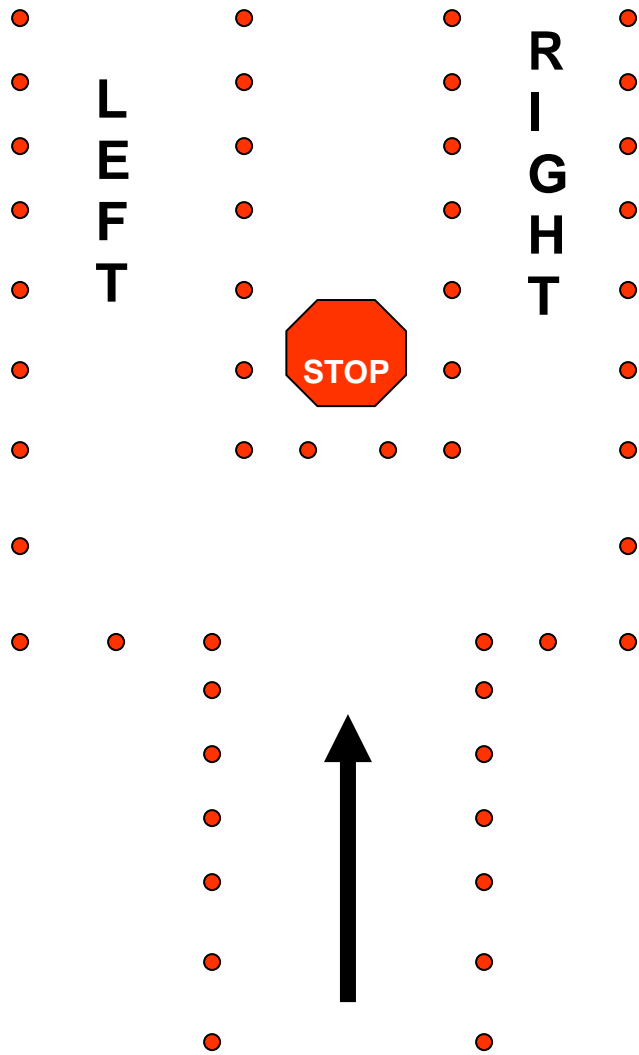


SAFETY FIRST - Keep the staged cars well back of the exercise and out of the way of spinning cars!!! Also, pay close attention to your students, this can be a scary exercise and disorienting!

Also, pay attention to the condition of your student's car gauges and tires.

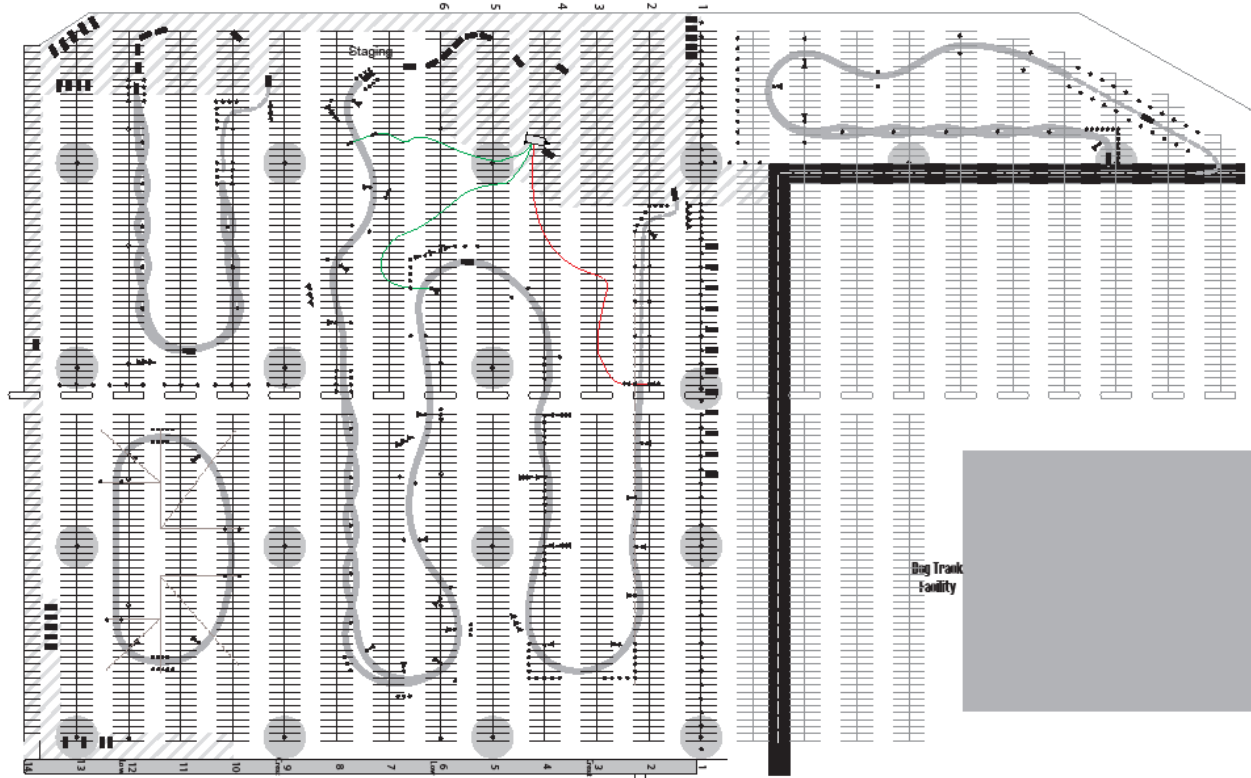
4.6 Accident Avoidance Drill

This drill is set up as indicated on the diagram, and will require a flag person to direct the student left, right, or to stop. Each student drive down a traffic lane of cones with an instructor. At the end of the lane a flag person will indicate to the student to go left, right, or stop. As the drill progresses you can increase the speed of the car and the flag person can wait longer to signal. The goal is to teach accident avoidance through car control rather than panic braking. Remember there are three car control actions at work here, the initial turn or stop, if turned getting the car straight in the new lane, and possibly an oversteer or understeer correction.



SAFETY FIRST - Remember to keep the flag person well back as cars will be skidding and spinning on this drill! Make sure you build up on this drill and don't push your student too hard, this one is tough to master! Keep things well under control and within the reasonable limits of your Student!
Keep the staged cars and spectators well back of the drill!

5 Practice Autocross Map



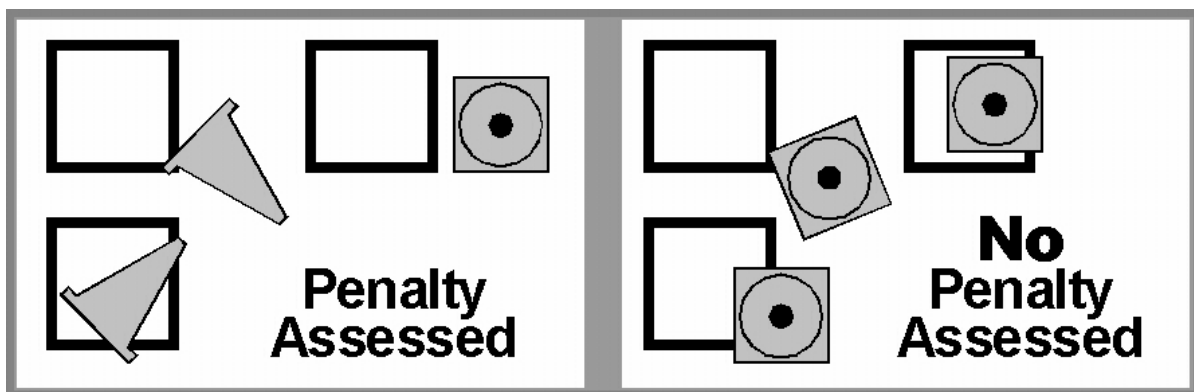
6 Corner Working

6.1 Instructions

- While at Registration, please report to the “Chief of Workers” to get a work assignment. When its your turn to work, get to your station as soon as possible.
- One person holds the red flag, unfurled, (but not flapping around) ready to be used.
- The same person holds the radio, with the volume turned up enough that instructions can be heard (particularly by the person with the flag). **The correct channel is 735.**
- The other people are the runners (not the person with the red flag) that check cones, and put them back in their boxes.
- Stay alert and remain standing (not sitting or squatting) when a car is on the course.
- Red flag when instructed to do so, or to avoid metal-to-metal contact (i.e. car stalled in course, 2nd car quickly approaching). Do not red flag for inattentive corner workers. It is their job to NOT to get hit. When it is time to red flag a car, quickly move to where the oncoming driver can see you and vigorously wave the **red flag** to stop the car. However, do not get too close to the car. More than one station may need to wave the flag in order to catch the driver's attention.
- No minors are allowed at corner worker positions.
- **The use of cell phones, or video/camera equipment by corner workers is prohibited.**

6.2 Penalties

- If a car misses a gate, i.e. does not go to the correct side of a cone, that is a DNF. However, if the driver hits the cone marking the side of a gate, that counts as a cone penalty, not a DNF.
When in doubt, do not call in a penalty.
- When calling in a penalty, use your corner number and try to **be as specific as possible about both the penalty and the car.** For example "This is corner 1. Car number ESP 42 is a DNF"; or "The red Mustang hit two cones at corner 3"; "Car ESP 42 DNF'd - they missed the last cone in the slalom at corner 1." This is especially important when calling in a DNF. Make sure you receive confirmation from timing and scoring that they heard the penalty.
- Cones when hit by a car (the **Down or Out Rule**):



If a cone is still upright, and any portion remains within the box, it is not a penalty. If it is upright and completely out of its box, it is a penalty. If a cone is knocked over, it is a penalty. Pointer cones (those originally lying down) do not count as a penalty when struck by a car. Remember to place each cone back in its box, or as close to its original position as possible.

Safety comes first; **DO NOT RUN IN FRONT OF A CAR TO REPLACE A CONE**. It is your job NOT to get run over. Do not flag a car if a cone is out of place. It is the driver's responsibility to stop, inform the corner workers, and proceed off the course at a slow speed that does not impede other cars. He will then be given a rerun. However, if that driver hit the cone, or the cone is not out of place, the **driver will not receive a rerun**.

6.3 Photographers

Photographers, whether video or still photographers, are **NOT ALLOWED IN ANY HOT AREA**.

A **hot area** being defined as anyplace where a spectator is not normally allowed, **including Grid**.

See your Course Map for the designated "photo area"

6.4 Novice Instructional Course

Walk-throughs at course start ~8:30am and ~12:45pm

7 Times & Places:

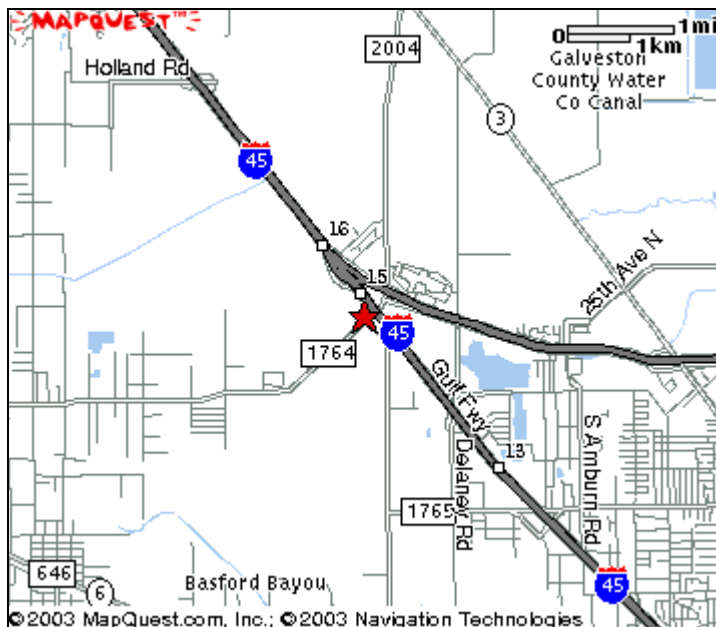
7.1 Porsche of North Houston

MANDATORY classroom sessions for students will be held on Friday evening at **Porsche of North Houston**, located 18111 North Freeway, Houston, TX 77090, phone: 281-944-2122.

Food and drinks will be served from 6-7 pm, with a classroom session from 7-9pm. Those students not present during the classroom session will not be allowed to run on Saturday or Sunday. No exceptions, no refunds.

7.2 Gulf Greyhound Park

Events on Saturday and Sunday will be held at Gulf Greyhound Park (GGP), located one block west of I-45 south at Exit 15, 30 miles south of Houston and 15 miles north of Galveston in La Marque, Texas.



The event is staged at the GGP parking lot.

8 Glossary of Terms

Apex - this is the point at which you are closest to the inside of the turn.

Autocross - single lap moderate speed competitive driving events emphasizing handling, driving skill, and education. Cars are separated and no passing allowed. Instruction is provided at every event.

Driver's Ed events (DE's) - these events are similar to time trialing with no timing.

Neutral Steering Position - holding the steering wheel with your hands at approximately 3 and 9 o'clock position – IRRESPECTIVE of which direction the front wheels are pointing i.e. it is possible to be holding the wheel in the neutral wheel position even while taking a corner with the front wheels turned off straight ahead.

Oversteer: - when the back end of the car loses traction and the tail comes out. Caused by: weight transferred to the front wheels by braking or lifting off the gas. Cured by: getting more weight onto the rear wheels by gently applying more gas

LSR-PCA Car Control Clinic - held a few times a year these are non-competitive learning events. These 3-day events consist of an evening classroom chalk-talk; a full day of car control exercises; and an all day, instructional, non-competitive autocross.

Shuffle Steering - a technique to avoid crossing your arms when turning the steering wheel and to ensure complete control of the wheel. It is based on keeping your left hand on the left half of the wheel and your right hand on the right half. As you turn the wheel you pass it from hand-to-hand in order to maintain a neutral steering position.

Tech Inspection - a safety check performed on your vehicle by LSR-PCA Tech inspectors at a driving event prior to you participating in that event. This is not a good time to discover problems with your car's systems because no repair facilities are available. Be sure to have your car checked by your mechanic BEFORE the driving event, and only consider Tech Inspection as a final safety check on the day of the event.

Threshold Braking - utilizing your vehicles brakes with maximum efficiency without locking-up a wheel by applying firm pressure and increasing the pressure as the suspension sets until you feel the tires about to lock up. Past this point, you will feel the ABS or lock the wheels.

Time Trials - the next step up from autocrossing in the driver-training program. This higher speed, timed events require a special permit and instruction. They feature continuous laps with restricted passing on a parking lot course or racetrack.

Track-out point – is where you complete the turn by moving to the furthest outside edge of the track after passing the apex

Turn-in point - this is where you stop driving in a straight line and start the turn from the outside and head toward the apex.

Type I turn - leads onto a straight; most important; enables you to maximize the speed you carry onto a straight.

Execution: Late turn in – late apex – accelerate towards the apex – track out fully while still accelerating

Type II turn – at the end of a straight; 2nd most important; enables you to maintain your speed to the end of the straight;

Execution: Early turn in – early apex - straight line braking across the track towards the apex – off the brakes before the apex.

Type III turn - any other turn(s) that does not fit the definition of Type I or Type II; least important turn as not much time can be made up through here. Execution: Adopt the smoothest line that sets you up for the Type I turn following it – just get through it!

Understeer: - when the front end of the car loses traction and the car will not turn.

Caused by: weight transferred to the rear wheels by accelerating reducing front wheel grip.

Cured by: getting more weight onto the front wheels by gently lifting off the gas and unwinding the steering.

Volunteers - since this is a club of volunteers, there are many opportunities for you to expand your fun by helping at events, writing articles and taking photographs for the Witness or organizing and running events. The behind the scenes folks are no different from you - regular people that share a love for having fun with their Porsches. We strongly encourage you to participate in the variety of events this great club offers. Get involved, have as much fun as you can stand. We hope you'll soon discover that the magic of the Porsche marque is reflected in the enthusiasm and integrity of the membership of LSR-PCA.