



INDY
REGION
SCCA

SOLO SCHOOL MATERIALS

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Introduction

What is Autocross/Solo?

Autocross (or Solo, which is the SCCA's name for it) is a precision driving skill contest timed to the thousandths of a second. Competitors take to the "miniature road course" one at a time, which is laid out on an empty airport tarmac or parking lot. Solo emphasizes driver skill over outright speed, so there are a lot of course elements, and they are usually tight. So while the average speed is relatively low, the excitement and fun is still very high! Solo is a great way to learn the limits of your vehicle and your driving skill. It is also a great place to hone those driving skills, and many things learned on a Solo course do translate to panic situations in every day driving on the streets.

Solo is a great way to have fun with your car, make like-minded friends, all in a safe environment for about the same cost as a nice dinner for two.

So you are a Novice...

So what? We were all a novice at one point, and needed help to understand what in the world was happening around us at our first event. Tell someone at the event that you are new, and you will likely get a lot of advice. Autocrossers in general are a friendly bunch, and this is a very social sport. As they say, we came out for the cars, but stay for the people (and friendly competition)!

First off, let's get your expectations out of the way. Expect to get beat at your first event. We all did (Well, most of us). Expect to get lost on course, hit cones, not know what is going on at all times... but most of all, expect to have fun! Autocrossing is very much a learned skill that takes practice and instruction to be the very best. Not everyone is born with the innate ability to instantly be a SCCA National Champion. Many have put in years of practice learning the skills it takes to be the very best in the sport. Good thing is, even if you are slower than most, it is still fun to drive.

Now, your goals for your first event:

- 1) have fun
- 2) find the course
- 3) once you find the course, GO FASTER!
- 4) If you haven't hit a cone or spun out yet, see if you can do that to find the limit of the car!

That's it. Your second event, worry about beating someone, anyone. Your first event is just to get your feet wet and get a feel for what happens.

Prepare yourself

What to bring?

Since Solo events are mostly held in the summer, you will want to prepare accordingly. You will be spending most of the day outside in the elements, so depending on the weather forecast you need to dress accordingly.

Must have:

- A safe car (or share one with a friend). We will get into what constitutes safe later in this manual.
- Entry Fee
- Driver's License
- SCCA Membership (or fill out a weekend membership on site)

Might want to bring:

- Your own helmet (the region typically has loaners available)
- Air tank, or extra air in your tires
- Tire gauge
- Comfortable shoes
- Sunglasses
- Sunscreen
- Hat
- Umbrella
- Chair
- Water (don't get dehydrated!)
- Cooler with lunch or snacks
- Smart phone

These are the basics. As you attend more events, you will learn what works best for you and what is essential for your comfort at each event.

Events typically start very early in the morning, so it is essential to get a good night's rest the night before. You will have a full day of fun the day of the event, and you don't want to be tired... you might miss something important (or a funny conversation).

What happens at an event?

Getting into the site

When you arrive on site, there will likely be a person with a clipboard greeting you as you drive in. They have the event waiver on that clipboard you have to sign, and will give you a wristband. This helps event officials identify event participants that have signed the waiver, which allows them to be on site.

Registration

There will be a central location on site (for Indy Region, its da bus) for registration. You must have a valid driver's license, entry fee and SCCA membership (or fill out a weekend membership on site).

Tech Inspection

Your car must pass a safety tech inspection. There is usually a central location for tech at Indy events (normally near da Bus). The tech inspector will look at/for: Tires (no cords, bulges, abnormalities), wheel bearings (tire and wheel shake), fluids (no leaks), steering and suspension, safety belts, spring return on throttle cable, secure battery, no loose items in the car, responsive brake pedal, car number and class letters, helmet sticker (if you brought your own helmet).

Course Walks

After registration and tech, it's time to take a course walk. While many courses have similar elements, no two courses are typically exactly the same. You will want to walk the course a few times to create your plan on how you want to drive the course (more on this later). There also may be a novice walk given by an experienced driver in the region. You might want to take advantage of this to see if your plan matches up to what the experienced driver sees and suggests.

Driver's Meeting

The driver's meeting is mandatory. At the driver's meeting you will get essential safety information, number of runs, and the run/work order. Pay attention... this isn't the time to socialize!

Your Runs

Finally! Time to run. Line your car up in grid, and have fun!

Course Walking 101: Not just a morning stroll

Social Walk

A lot of people ask how many times to walk the course, and I typically tell them as many as it takes for you to get comfortable. Maybe I'll walk a course 1 or 2 times, maybe 4 or 5 times. The first walk though is normally what I like to call a "social walk". You and a couple of friends catching up with each other, and walking course together while you all point out things about it. Start making general mental notes, get a general shape of the course and enjoy the company of friends. Try to walk a "realistic driving line".

Making a plan

Your subsequent walks can still be with your co-driver to lay out your plan of attack, or you can walk it alone to focus on your plan. This is when the good drivers typically pace distances to give themselves an idea of how an element will feel driving. This comes with experience of walking different courses and time in your vehicle. Eventually you will know if you can take a 5 cone, 65 foot spaced slalom flat out, or if you have to breath the throttle at the end.

You won't remember every cone on the course, as much as you want to try, you won't. And it really isn't necessary. Pick out key cones, and make a list of elements to dissect the course.

For example, this was my rough plan for the 2014 Nationals East course:

- Launch
- Immediate Left, shift when straight (for those that shift gears)
- 90* Right, watch out for the cone on the left at exit, don't track out far
- Brake early and hard, right-left switchback, early apex to big right hand sweeper (bump on exit)
- Enter left 4 cone slalom, kink right to second (grouped) slalom (enter left)
- Give up early in second slalom, shallow right hand entry into R-L-R-L lane change (bump on entry)
- Sweep right, decreasing double apex... apex LATE!
- Enter offset slalom right...be EARLY! Brake HARD at the end
- 90* left, don't track out far (cone on outside)
- Sweep left increasing radius to long right sweeper
- BRAKE HARD (and early) for R-L switchback, then straight to finish

That was a long course, but you get the idea. Pick out your handful of key cones, and go over your list in your head or out loud if it helps you during a run. Go find a video on YouTube to find what this looks like at speed. Just search "2014 SCCA Solo Nationals East Course".

Visualize it!

If you can't run 90-100% of the course in your head, then you probably will throw away a run or two on learning the course. At regional events, this isn't such a big deal if you are getting 4 or 5 runs to nail it. However, it is vitally important especially as you progress to running National events, to be fast right away (if you want to do well). This is done by knowing the course before you run it.

Working Course

Do's

- Report to work promptly.
- Make sure your station has adequate supplies; extra pylons, fire extinguisher, radio, red flag.
- Know your area of responsibility and station number.
- Make sure cones are in their proper place when you get to your station, and check them periodically during your shift.
- Understand the pylon rules (Section 7.9 A, B & C in the rule book) e.g., pointer cones **do not count** if hit (see below), and a car is off-course (DNF for Did Not Finish) if they pass on the wrong side of a cone.
- Pay attention to cars on course for accurate cone counts and your safety. It is best to watch the **back** of the car and the cones themselves to see the wobbling cone which may have left the box.
- Replace cones as soon as possible, another car will be coming through in as soon as 30 seconds. Hustle!
- Be prepared for exposure to sun/rain, wind, heat/cold while on station
- Keep red flag in your hand, unfurled (but not flapping) ready for immediate deployment.
- Stay alert for unexpected pedestrians and vehicles

Don'ts

- Do not use cameras while on station.
- Do not sit down and do not wander away from your post.
- Do not turn your back on cars on course.
- Do not red flag a car unless instructed to do so by the radio person **or** if it is an emergency. However, *if in doubt, err on the side of safety!*
- Do not litter
- Do not pick up hot parts dropped on course because of risk of burns.

A penalty is given if :

- If the cone is knocked over and is out of the box.
- If the cone is knocked over and is in the box.
- If the cone remains standing but is out of the box.

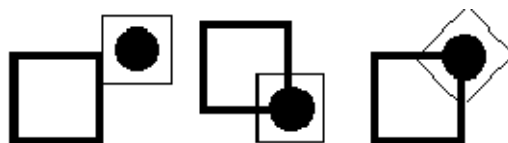
Penalty
Assessed



A penalty is NOT given if :

- The cone remains standing is touching the box
- The cone remains standing and is partially in the box.
- And of course, if the cone remains standing within the box.

No Penalty
Assessed



Car setup advice

Keeping things inexpensive, we'll only talk about things you can do for free, or fairly cheap. After a while, you may want to put more go-fast goodies on your car, but make sure to read the rule book, and stay legal for your category.

But also keep in mind, at this point you can go faster sooner by working on the driver instead of the car.

What you can do Today

Tires: Add some air (+10 psi is a good starting point). The reason for this is to keep your tires from rolling under during hard cornering. But how much is too much? Put chalk on the edges of your tire, in three places around the diameter, and you can see how far over the tire was going during your runs. Bleed out a little if the chalk is still showing on the tread, or add a little more if the chalk has been worn off down the sidewall. The line of worn chalk to remaining chalk should be right at the corner of the tread and sidewall. Keep notes on how many psi you ran, and where the chalk line was, for your next event.

Remember that as you get better and corner harder, you'll need more air to compensate, so keep using the chalk at every event.

Driver Restraint: In order to have good control in driving, you, the driver, have got to stay put. So make sure your seat belt is tight and firm. Some people like to tug hard (fast) on the shoulder strap to engage the lock on the reel.

Driver Location: Most experienced drivers will agree that the best place for your seat - to give you the best control - is seat forward far enough to have your leg slightly bent when the clutch is all the way to the floor, and seat-back reclined or upright to a position that allows you to rest your wrists on the steering wheel when your shoulders are firmly against the seat.

This position allows you to run the full range of steering inputs and foot motion without stretching or moving in your seat, and can have a huge impact on your driving skill.

What you can do before the next event

Alignments cost anywhere from free to \$100, and if you're looking for a cheap way to improve your solo setup, this is a good one.

Some words of caution, first. Manufacturers set their alignments to what they consider to be the most predictable and stable settings. Improving your car's turn-in for autocross may make your car twitchy on the street. So use your own discretion. To get some suggestions, though, ask a driver who has a car similar to yours in weight, wheelbase or front or rear wheel drive.

Top 10 Driving Tips

Autocross driving tips from one of the best in the country – Andy Hollis:

I personally review this often to bring myself “back to basics”.

1) **Position first, and then speed.** Positioning the car perfectly is more important than trying to attain the highest potential speed. For example, you will drop more time by correctly positioning the car nearer to slalom cones than you will by adding 1 or 2 MPH in speed. Same with sweepers (tighter line). Same with 90-degree turns (use the entire track). Also, position is a prerequisite for speed. If you are not in the correct place, you will not be able to go faster. Or at least not for very long!

2) **Turn earlier...and less.** To go faster, the arc you are running must be bigger. A bigger arc requires less steering. To make a bigger arc that is centered in the same place, the arc must start sooner (turn earlier).

3) **Brake earlier...and less.** Waiting until the last possible second approaching a turn and then dropping anchor at precisely the correct place so that the desired entry speed is reached exactly as you come to the turn-in point is quite difficult to execute consistently. Especially when you consider that you get no practice runs on the course, and the surface changes on every run, and you aren't likely to be in exactly the same position with the same approach speed on every run, etc. Better to start braking a little earlier to give some margin of error. And by braking less you can either add or subtract braking effort as you close in on the turn-in point. This will make you consistent and smooth.

4) **Lift early instead of braking later.** Continuing with the philosophy of #3, when you need to reduce speed only a moderate amount, try an early lift of the throttle instead of a later push of the brake. This is less upsetting to the car, is easier to do and thus more consistent, and allows for more precise placement entering the maneuver (remember #1 above).

5) **Easier to add speed in a turn than to get rid of it.** If you are under the limit, a slight push of the right foot will get you more speed with no additional side effects. On the other hand, if you are too fast and the tires have begun slipping, you can only reduce throttle and wait until the tires turn enough of that excess energy into smoke and heat. Don't use your tires as brakes!

6) **Use your right foot to modulate car position in constant radius turns, not the steering wheel.** In a steady state turn, once you have established the correct steering input to maintain that arc, lifting the throttle slightly will let the car tuck in closer to the inside cones. Conversely, slightly increasing the throttle will push the car out a bit farther to avoid inside cones. It is much easier to make small corrections in position with slight variations in the tires' slip angle (that's what you are doing with the throttle) than with the steering wheel.

7) **Unwind the wheel, and THEN add power.** If the car is using all of the tire's tractive capacity to corner, there is none left for additional acceleration. At corner exit, as you unwind the wheel, you make some available. If you do not unwind the wheel, the tire will start to slide and the car will push out (see #6 above).

8) **Attack the back.** For slaloms (also applicable to most offsets), getting close to the cones is critical for quick times (see #1). To get close, we must move the car less, which means bigger arcs. Bigger arcs come from less steering and require earlier turning (see #2). Now for the fun part... When you go by a slalom cone and start turning the steering wheel back the other way, when does the car start to actually change direction? Answer: When the wheel crosses the center point (Not when you first start turning back!) How long does that take? If you are smooth, it takes .25 - .5 seconds. Now, how long is a typical person's reaction time? Answer: about .5 seconds. Finally, how long does it take to go between slalom cones? Answer: Typically on the order of 1 second. Given all of that, your brain must make the decision to begin turning the steering wheel back the other way just **before** you go by the previous cone!!

Since this is a mental issue, a good visualization technique to get used to this is to think about trying to run over the back side of each slalom cone with the inside rear tire of the car. To hit it with the rear tire (and not the front), the car must be arcing well before the cone and the arc must be shallow. Attack the back!

9) **Hands follow the eyes, car follows the hands.** 'Nuf said.

10) **Scan ahead, don't stare.** Keep the eyes moving. Looking ahead does not mean staring ahead. Your eyes must be constantly moving forward and back, and sometimes left and right. Glance forward, glance back. Your brain can only operate on the information you give it.

Bonus Tip: **Don't forget the stuff in between the marked maneuvers!** Too often we think of a course as series of discrete maneuvers. There is typically more to be gained or lost in the areas that are in between. Pay special attention to the places where there are no cones.

Going Beyond Local

Your region is only one of many in a nationwide SCCA Solo program and independent autocross organization network. Expert autocrossers will all tell you that the most important factor in improving your skills is seat-time, seat-time, seat-time. Most of the local "hot-shoes" (everything's relative) can be seen at many events besides their own. But going beyond a local event for the first time can be confusing and a little intimidating. So here's a summary of what those other events are like, as a way of introduction:

Nearby Regions: Often a great place to enjoy an event with more cars and deeper competition, and, in some cases, larger lots and faster courses. A one to two hour drive to these events will give you an opportunity to tune your skills, and sometimes steal the trophies from the locals. You'll see fields of 25 to 200 drivers, depending on the region and event. Some regions have an annual two-day event where winners are determined by combining the best time for each day.

Far Away Regions: Look around online when you are travelling to see if an event is near. Chances are you can show up and find someone to let you drive.

Match Tours: Match Tours are the latest addition to the Tire Rack SCCA National Solo Series. These events are three events in one package. The event is broken into four sessions. Session 1 and 2 are on Saturday. Each consists of a traditional 3 run autocross. The best run from each session will be added together to determine class rankings (basically a mini Champ Tour). Session 3 is another three runs to determine the qualifiers for the Super and Club Shootouts. The top 8 on index per heat qualify for the Super and 9-16 on index per heat qualify for the Club Shootout. Everyone else is eligible for the drawing to be in the Bonus Shootout. Session 4 is the Shootouts.

Championship Tours: This sponsored, nationally run series is held several per year at sites across the country. It is designed to be a traveling look at The Solo National Championships. A two day event; the best times for each day are combined to determine the winners. This is a great opportunity for newer drivers, as a half-day novice school is held the day before, with national champions as your instructors. Contingency sponsors offer cash prizes, as well as tires. Expect to see 100 to 200 drivers.

Pro Solos: Take two parts autocross and one part drag racing, mix thoroughly and you get the Tire Rack® SCCA® ProSolo® Series. Drivers face off, side-by-side at a "Christmas Tree" start, before launching themselves down a straightaway and into mirror image autocross courses. Three rounds of class competition gives drivers 12 total runs, 6 on each course. Not only do these runs determine the class winners, it sets the overall qualifying order for the second part of the event which determines the overall winner. The top qualifiers enter into single elimination brackets and run off until only one remains; the Top Eliminator. The Ladies Challenge pits the top Ladies' qualifiers against one another, while the Super Challenge features the top 32 Open Class competitors in a winner take all battle. There is even a Bonus Challenge where randomly selected non-qualifying drivers can compete for prizes and bragging rights. Competitors earn Challenge points throughout the season toward the Overall Ladies and Open ProSolo® Championships. Class National Championships and the Overall ProSolo® Championships are determined by combining regular season points with points earned at the ProSolo® Finale in Lincoln, Nebraska.

The Solo National Championships: *The largest* U.S. motorsports event, held each year in September. Our current home for the nationals is Lincoln, Nebraska. This is the Mecca of autocross, and for any car enthusiast, a must-see. Each driver competes over two days, but if you have the time, stay for the whole show, as it takes four days to get through over 1300 drivers!

The paddock area alone is a treat to tour; see exotic cars, unlikely cars, classic cars and meet their drivers. Even knowing that your first trip is unlikely to yield a trophy, this is a really fun event which includes award banquets, parties, shenanigans and more bench-racing than you've ever experienced.

References used to create this material

- 1) <http://www.SCCA.com>
- 2) <https://www.tirerack.com/features/solo2/handbook.htm>
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- 3) Andy Hollis' top 10 driving tips as published on the internets.