

TIPS FOR TSD RALLYISTS by Gary Starr (rev 6.3 - 11/03/2021)

Preface: **Please note that this article is not a tutorial on how to rally for first timers.** There are rally seminars and instruction books to teach that (although in my opinion the rally books are all outdated, too lengthy, and came out before timekeeping apps were available which all rallyists now use). In my opinion, the best and easiest way first timers can learn how to rally hands down, is to ride along with an experienced person on a real or practice rally. Second best is to attend a rally seminar. This article does assume you have already run at least one real rally and so know the basics and rally terminology. It offers many tips for TSD rallyists of all experience levels. Remember these are tips – not instructions on how to rally.

For TSD Rally Navigators:

1) **Stay on course first:**

- a) It is meaningless to keep on time on the wrong road.
- b) Help your driver with course following. Four eyes are always better than two and it is to your advantage to stay on course also - if you don't believe this just think of the mess you will have with an off-course timing exercise.

2) **Timekeeping:**

- a) Timekeeping is running an app (or a calculator/computer) which does calculations to show how early/late you are while on the rally course, so you can cross checkpoints at the correct time to get a good score. *If this is your first or second rally ever, don't even try to keep time.* Just learn the basics of executing the instructions correctly and not getting lost. Leave Restarts at the correct time and go slightly faster (3-5mph) than the assigned speed (Cast) to make up for stops, tight curves, etc and try to have a fun time. Trying to time keep will be way too frustrating and you will have a miserable time trying to do it. Often beginner rallies have a 1st Timer or SOP (Seat of the Pants) class for those who don't want to time keep or sometimes where timekeeping is not even allowed (so beginners/novices can still compete against each other without allowing timekeeping). Many novices enjoy the SOP class so much they just always run it so they don't have to time keep (which for them makes it more fun). If the rally uses the Richta GPS checkpoint app scoring system, which most rallies now do [ie. all contestants run the "Competitor - Richta GPS Checkpoints" app on their phone for scoring], you immediately get your score displayed after you enter every checkpoint. So when running 1st Timer or SOP classes, when you enter a checkpoint and get a 5 seconds late score, you just speed up a little for the next checkpoint (and of course slow down when early).

However, after running many rallies some novices will have peaked their performance in the non-timekeeping class and now wish to switch to a timekeeping class to get lower scores and be competitive with others in that class. This means they must start timekeeping between checkpoints. The best/easiest thing for timekeeping is use one of the TSD timekeeping rally apps on your mobile device. Most have GPS mileage and a GPS TOD clock right in them (see “TSD Rally Timekeeping apps/equipment available” in appendix A). Many display how early/late you are when you tap a button and some even at all times without tapping anything (these usually put you in Computer class however). Pick a 10 mile road, make up some instructions with speed changes, pauses, controls and go out and practice your timekeeping app weeks before the rally (don't wait until the day before)!!! Also make sure you practice both an off-course excursion with timekeeping recovery and how to handle Time Allowances (personal delays) with your timekeeping app. It WILL happen sooner or later so practice how to handle it now.

- b) A TA (Time Allowance) is used when you get too late to make up the time, like when you go off course or get delayed (perhaps by traffic or a slow car in front of you). TA's are always free (no penalty). With the Richta GPS checkpoint app scoring system, you put your needed TA right into its scoring app (ie. "Competitor - Richta GPS Checkpoints" app) using the TA+ and TA- buttons. For MiRally/Rabbit there is no TA support so the rallymaster at the end needs to manually adjust your scores for possible TA's (although you should write down where they occurred {mileage and amount} to make sure they get accounted for properly in final scoring).
- c) When you don't know where the control is you are going to have to run on-time all the time where controls may be (and run early where controls can never be, like free zones, transits, odo check, and breaks). But use common sense. Don't ever drive so fast that you will go off the road. Going off the road and getting stuck (or crashing into something) is FAR worse than getting a late penalty. Use a TA (Time Allowance) rather than driving too fast and risk going off the road. Also, many R/M's purposely give you extremely twisty/bad roads in a free zone that you can't possibly keep up the CAST on just so you can enjoy them - then they give you a couple miles of straight after it so you can make up the time. Again, if in a free zone or transit, run early if you can to cover these situations.
- d) At breaks the first thing you need to do before even getting out of the car, is figure out when to leave the break area to make it to the restart (and how far away the restart is). During break, both driver and navigator should keep an eye on the time but it is primarily the navigator's job. Refuel before going to break if needed. You may not have time afterwards. Immediately after the break make sure any Bluetooth connections you have (e.g. between all phones/devices that use rally apps, external GPS antenna, mileage pulse generating unit, etc) are still paired and working (start driving to make sure). This can happen when you bring your phone into a break that is too far away from your other Bluetooth devices so you lose pairing. A closed car in direct sunlight may overheat devices (like an external GPS antenna) during a break. Placing a white sheet of paper over them will help this.

3) **Controls:**

- a) Most TSD tours now have many unmanned GPS controls per mile, many/some of them hidden or invisible. On these you must keep moving at Cast until a Restart or new Begin Control Zone. Note you will always get a better score at GPS controls if you are moving at speed (creeping will always give you a worse score). If you must stop for some reason (perhaps an equipment problem, got delayed behind a slow car, or you went off course), you must enter a TA (time allowance) immediately before you proceed since an invisible control may happen at any time (e.g. in the next 10 yards).
- b) If there is a Restart, outmarker, or Begin Control Zone go there quickly and setup. You may not have much time when you arrive there.
- c) Types of controls vary with the event and type of scoring system used but they nearly all use GPS scoring now. In the U.S. the two main GPS scoring systems used are the “Richta GPS Checkpoints” system and “MiRally” system. Richta’s system uses Restart controls where you typically start sections at a car zero time (CZT) plus your car number in minutes, or at the top of the next minute, or a couple of other Flying Start ways. The MiRally system uses Control Zones where you can have similar starts or a special Monte start. Both systems have one or more controls or timing points (within the section or Control Zone) where you get scored which may or may not (secret) be indicated in the route instructions.
- d) MiRally’s Monte start: This system is intended to (a) allow cars to start the Control Zone when they wish (not adhere to a strict TOD start), and (b) solve the problem of multiple cars leaving on the same minute. After the Control Zone start point (which is the outmarker), each car starts one at a time in order of arrival at the top of the next minute and goes the CAST. If another car starts on your minute, you just wait until one doesn’t. When the car gets to 0.1 mile point (there’s no visible control there), the system times them and assigns them an out time to be applied back at the Control Zone outmarker of that time truncated to the top of the last minute (aka drop the seconds). {e.g. crossing at 00:05:00-00:05:59 assigns out time of 00:05:00} It is the contestant’s responsibility not cross the 0.1 mile point too close to the top of a minute.

4) **Miscellaneous:**

- a) Have a “rally bag” that you keep everything in (e.g. 6-8 pencils, pens, 5 highlighter colors, sticky labels, paper, small scissors, routes centerboard, navigator clipboard, any unique mobile devices and GPS receivers for rallying, backup calculator (that has a working battery for night events), small light, duct tape, regular tape, bungee cords, Dramamine, Tums, etc). When you return home from the rally, immediately sharpen pencils and organize everything in the rally bag so it is all ready for the next event. Then all you have to do the day of the event is grab it and go as you know everything is already there and ready!

b) Don't use a phone/tablet device that is too old/cheap. Those tend to not have very good GPS signal sensitivity (although an external GPS antenna will help with that). Keep the device securely mounted for going over bumpy roads up near the windshield for receiving the best GPS signal. Provide backup USB power (with proper cables/connectors for your device) from the car's electrical system through the proper adapter. ***Important:*** If you plug your adapter into the cigarette lighter plug outlet, make sure it fits very tightly where it can't move back at all (test this). Most will wiggle back just slightly by itself or over bumps and then the positive tip won't stay touching it's +12v contact (especially with the spring inside that's already pushing the tip against the plug housing). If too late to get another tighter adapter, duct tape it in place as they are notorious for working loose! No two adapters fit with the same tightness – most are terrible over bumps. The tighter ones usually have 2 or 4 spring loaded buttons or clips on the sides to push against the cigarette lighter plug outlet sleeve (need on both sides, not just one side or it will work loose). ***Once the rally app is running on the device, always leave it in the foreground on the screen for the rest of the rally.*** The rally app must be the only user app running or you will have problems (like missed controls). Note that apps in the background on Androids will stop running and so you are guaranteed to miss controls.

For TSD Rally Drivers:

- 1) If possible (and not illegal), have the main routes used for course following on the dash between driver and navigator so both can see them (so both can double check they are being executed correctly). I see many teams have them on the navigator's lap which is the worst place - driver can't see them - what if navigator reads the wrong one which WILL happen sooner or later? Also, navigator is busy doing timekeeping. This is not to say the navigator might not optionally have his own set of routes on his lapboard to make notes on (like recording odo readings). Just keep the main set used for course following, and being checked off, on the dash where both can see them. Use a clipboard (or 1/4" plexiglass centerboard) bungie corded to the dash defrost vents to hold the board. And for night events have a light mounted on the board. But use common sense. Obviously if you're on a brisk event where it's too dangerous for the driver to look down at the routes, then they need to be on the navigator's lap with him calling them out.
- 2) Drivers check off the dash route instructions yourself (not the navigator) so you can see the next instruction you are currently working on with your own eyes (but navigator should watch to make sure instructions are being checked off properly).
- 3) Highlight in different colors on the routes: Casts and pauses, Restarts and controls, quoted signs. Optional are free zones, transit zones.
- 4) Remind your navigator during the leg when a speed change is about to be done - a smart navigator will appreciate this.
- 5) Always bring to every rally: a wrist watch synchronized to WWV or to the rally master clock (needed at breaks), any rally timekeeping equipment/apps, a separate GPS unit to see upcoming roads (or can use the car's dash GPS if it's not covered up by a routes clipboard), pencils, centerboard/clipboard for routes, optional navigator clipboard/lapboard, compass, a full size spare, lights on the boards if night event, and if a winter snow rally: real snow tires (not all-season), shovel, triangle/flares, 6V lantern, tow strap, x-bar lug wrench, extra warm clothes & mittens & boots. Disconnect passenger air bag if you have to have an object (e.g. rally computer or centerboard) in front of it so it won't get blown into the navigator's face should it go off (my car has a connector just inside the glove box). Obviously, it's better to not have anything in front of the air bag. Many computer teams have their computer mounted in or below the glove box or on the navigator's lap board.
- 6) Go to the end of free zones ASAP without speeding or stopping. There's a reason they are free because you may get delayed in them.
- 7) Leave breaks and begin odo check early - at least 10 minutes minimum - there's ALWAYS something that you'll need extra time for. Note: A restart point may be many miles away from the break which you need to account for. Look where it is in the routes before exiting the car for break, and know your restart time and distance. You also may get delayed on

the way to the restart (traffic, accidents, etc). And re-fuel BEFORE you stop for your break. At any break don't order food that will take longer to get and eat than you have time for (e.g. restaurant is so crowded that food orders will take too long to get the food, etc). Sometimes you may have to skip the break all together because the Restart is a TOD Restart and you're very late.

- 8) Get to the outmarker, Restart, or Begin Control Zone quickly and setup (i.e. don't hang around talking to people or drive too slowly on the way there). Sometimes it's miles away and you may not make your out time. Also occasionally finding the outmarker can be a problem so it's wise to note and measure the distance. When there, double check that your navigator has got things setup properly. He will thank you if they aren't and you sure don't want to mess up the leg before you've even started!
- 9) Record TA's between route instructions where you used them (in case you need them for endpoint scoring corrections).
- 10) Many tours now use instructions presented as "Tulips". A tulip is a diagram of a point along the course (usually an intersection, sign, control, restart, etc). You enter by the dot and leave by the arrow. An example of doing a right at crossroad would be a large plus symbol with a dot on the bottom end of the bottom line and an arrowhead on the end of the line to the right.

Appendix A - TSD Rally Timekeeping apps/equipment available:

(* apps for navigator timekeeping with GPS TOD clock and mileage)

Apple devices:

- App: "CentWatch" decimal minute watch for iPhone, iPad, iPod - free
<https://itunes.apple.com/us/app/centwatch/id424471807?mt=8>
- *App: "Rabbit Rally 2.0" for iOS (only used on MiRallys) - free (Joao Fortes)
<https://apps.apple.com/in/app/rabbit-rally-2-0/id1262789127>
- App: "Checkpoint clock" for iPhone, iPad - (Rich Bireta)
<https://itunes.apple.com/us/app/checkpoint-clock/id549741037?mt=8>
- App: "Competitor - Richta GPS Checkpoints" for iPhone, iPad - free (David Bireta)
<https://apps.apple.com/us/app/competitor-richta-checkpoint/id1448298019>
- App: "Rally Master Richta GPS Checkpoints" for iPhone, iPad (David Bireta)
<https://apps.apple.com/us/app/richta-gps-rally-master/id1466574486>
- App: "Richta GPS - Scoreboard" for iPhone, iPad - free (David Bireta)
<https://apps.apple.com/us/app/richta-gps-scoreboard/id1577035785>
- *App: "Richta" Rally Calculator (Class S) for iPhone, iPad, iPod - (Rich Bireta)
<https://apps.apple.com/us/app/richta/id399728285#?platform=ipad>
- *App: "GPS Rally Odometer" for iPhone, iPad - (Michael Young)
<https://www.msyapps.com/apps/gps.html>
- *App: "GPS Rally Computer - SRC" (might not be allowed in class L) for iPhone, iPad - (Michael Young)
<https://www.msyapps.com/apps/gpscomp.html>
- *App: "TSD Rally Computer" (might not be allowed in class L) for iPad - (Michael Young)
<https://www.msyapps.com/apps/rallycalc.html#sthash.PpkGZoou.dpuf>
- App: "Rally Controls Planner" for iPhone, iPad - (Michael Young)
<http://www.msyapps.com/apps/planner.html>
- All Rally apps by Michael Young
<https://www.msyapps.com/>

Android devices:

- *App: "Rabbit Rally 2.0" for Android (only used on MiRallys) - free (Joao Procopio)
<https://play.google.com/store/apps/details?id=com.rabbitally.nav2droid&hl=en>
- App: "Competitor - Richta GPS Checkpoints" for Android - free (Rich Bireta)
<https://play.google.com/store/apps/details?id=com.richta.cpa2&hl=en>
- App: "Rallymaster - Richta GPS Checkpoints" for Android - (Rich Bireta)
<https://play.google.com/store/apps/details?id=com.richta.rallymaster&hl=en>
- App: "Scoreboard - Richta GPS Checkpoints" for Android - free (Rich Bireta)
<https://play.google.com/store/apps/details?id=com.richta.scoreboard>
- *App: "Richta Rally Calculator" (Class S) for Android - (Rich Bireta)
<https://play.google.com/store/apps/details?id=com.Richta.Calculator&hl=en>
- App: "Richta Road Rally Checkpoint Clock" for Android - (Rich Bireta)
<https://play.google.com/store/apps/details?id=com.Richta.CheckpointClock&hl=en>
- *App: "Richta Rally Computer" for Android - (Rich Bireta)

- <https://play.google.com/store/apps/details?id=com.Richta.Computer&hl=en>
- *App: "Richta Simple Rally Computer" (class L) for Android - (Rich Bireta)
<https://play.google.com/store/apps/details?id=com.richta.simplerallycomputer>
- *App: "Richta Rally Odometer" for Android - (Rich Bireta)
<https://play.google.com/store/apps/details?id=com.Richta.Odometer>
- All Rally apps by Rich Bireta
<https://play.google.com/store/apps/developer?id=Rich%20Bireta&hl=en>

Other hardware devices:

- Dual "XGPS160 - SkyPro GPS receiver" for Apple and Android devices
<https://www.dualgpsolutions.com/explore-by-product/xgps160>
- Garmin Glo 2 GPS receiver for Apple and Android devices
<https://buy.garmin.com/en-US/US/p/645104>
- Rabbit Glo (Wi-Fi GPS receiver for Rabbit Rally app - i.e. Rabbit Box replacement) for Apple and Android devices
http://shop.rabbitrally.com/shop/index.php?id_product=45&controller=product&id_lang=1
- Rabbit Box (wheel probe pickup for Rabbit Rally app - Bluetooth/Wi-Fi) for Apple and Android devices
<http://www.rabbitrally.com/docs/content/rabbit-rally-2-0-competitors/equipment-and-accuracy/rabbit-box/>
- Alfa GPS-Pulser (pulse generator from GPS)
<http://www.rally.cc/gpspulser.htm>
- Centrodyne Vehicle Speed Sensor (VSS) signal products
<http://www.centrodyne.com/products/vss-divider>
- "TSD Rally Runner" Tablet + GPS computer (scca class E/L)
<https://www.3peakengineering.com/motorsport/rally-computers/tsd-rally-runner/>
- Belmog rally instruments, clocks, sensors, accessories (Belgium)
https://www.belmog.com/index.php?route=product/category&path=59_111
- Fastime 500DM decimal minute stopwatch
<https://www.astopwatch.com/products/index.asp?product=fastime-500dm-16-491>
- Timewise Computers (this is the undisputed ultimate scca class E or L equipment – pricey)
<http://www.timewise.us/>
- Alfa (scca class E or L equipment - nowhere near quality of Timewise but way cheaper)
<http://www.rally.cc/>
- Brantz Rallymeters – hugely popular rally equipment in the U.K.
<https://www.brantz.co.uk/>

Old and obsolete equipment:

- "EZ Rally Timing" article (scca class S) using 4 function calculator (G. Starr):
See eztiming5-31.pdf here: <https://www.facebook.com/groups/twincityrallyclub/files/>
- Stevens Rally Indicator (rally circular slide rule for time calculations):
<https://sliderules.nl/mysliderules/detail/stevens-rally-indicator-model-25>
- Halda products:
https://www.belmog.com/index.php?route=product/manufacture/info&manufacturer_id=32
- Guide to old rally equipment:

<http://www.specialstage.com/forums/archive/index.php/t-18082.html>

- Manuals for various older rally equipment:

<http://www.rallyracingnews.com/manuals/index.html>

- “The Road Rally Handbook” by Clint Goss, available in library ISBN 0-9632401-0-2:

Can be seen here: <http://www.goss.com/cattrh.htm>

- “Rallying to Win” by Jean Calvin, available in library ISBN 0393600025:

Can be seen here: <https://www.amazon.com/Rallying-Win-Complete-Guide-American/dp/0393600025>

Appendix B - Some advanced timekeeping notes:

- 1) If your method/class requires distance information to be manually entered/incremented into timekeeping equipment (e.g. SCCA class S or L), select an easy increment of mileage to do periodic time checks at (e.g. every 1/2 mile from the last speed change or control – and every 0.1 mile when approaching a control). Note: In 2018 SCCA changed class L to also allow any electronic app if the distance information is derived solely from GPS signals. With these “distance derived from GPS” apps, you no longer have to enter/increment any distance and many even automatically display how early/late you are at all times.

- 2) If you're told between which 2 instructions the very next control is and its many miles away like after a break, but not exactly where (no control mileage), you can run minutes early to the instruction before the control and stop. Then leave that point at the proper time (which you compute from the official mileage of that instruction, or your odo mileage if you have no official mileage there) and drive the CAST to the control. Note if the instruction is mileage, you can figure all these out right after you receive the routes. Running those minutes early will allow you to slow down to take very twisty places at slow enough speeds so you won't risk going off the road (like on winter events) as well as get by congested areas or unexpected things that take up time. *Keep in mind however, that on tours that have multiple GPS controls per mile often hidden/invisible, you must stay on time all the time there.*

- 3) If you're told the mileage at the very next control and its many miles away like after a break, there's a clever way to get a good score. Run minutes early to 0.5 mile before control and stop. Compute perfect control in-time from control mileage and subtract 1 minute. At that time, CAST 30 MPH all the way to the control. [30 MPH is 2 minutes/mile so going 0.5 mile should take 1 minute - which is when you leave your "stand-off" point (stand-off point is 0.5 mile before control)]. So, going 30 MPH will not only make you arrive exactly on time but will also be slow enough to get you around twisty curves. *Keep in mind however, that on tours that have multiple GPS controls per mile often hidden/invisible, you must stay on time all the time there.*

Appendix C - Course (trap) rally tips:

- 1) Take enough time to figure out trap intersections and double check them.
- 2) Read everything on the critique or timing slip. Often there is info that you'll need for the next leg such as a new Cast, outmarker location, instruction working on, special instructions, etc.
- 3) Highlight Onto's in their own color. Circle the Onto's when they become active, X them off when you lose them.
- 4) Read the critique (description) of the leg to make sure you did the traps correctly for the same reasoning as the rallymaster intended before starting next leg. Precedence is set by the rallymaster, not you (and you may need this knowledge on later legs).
- 5) Never go past the leading edge of an intersection that you're not sure of. Always make sure you slow down enough to accomplish this - stop if necessary before the intersection, not in or past it. An example of this is when you're looking for a sign or road identification that may be down the road on your left or right (you're about to go by). The biggest mistake and waste of time beginners do is driving through intersections and having to back up. This will take 5 times longer to do than if you had stopped before the intersection (not to mention very dangerous).
- 6) Inform your navigator what you are thinking about as to the course and/or traps and when you are going to turn around. Call out loud where you are going and why at every intersection where you are doing an instruction or following the main road, so your navigator can follow your logic (e.g. "I'm following the main road Left at T" or "Main road is right by Protection so I'm going to do the instruction Left"). This will give your navigator the chance to disagree and save you an embarrassing backup or max. - remember you're a team and need to check each other - the smart driver knows this all too well!!! On course rallies call out all curve arrows (either partner) whether the curve arrow determinant is active or not [e.g. "Curve arrow right" or "Curve arrow doesn't count". This will help when you get to the intersection and see the back of a diamond shaped sign in your mirror (oh sh..) but then you remember your partner called it out so you don't have to go back - aren't navigators great who don't keep their heads down?].
- 7) On a difficult SCCA course rally where traps are based on whether an instruction was a Course Directing Action (CDA - see SCCA Road Rally Rulebook - Article 25, A, 4), upon instruction completion, mark to the left of every instruction number (letter) with a + if it was a CDA, or a - if it wasn't a CDA.