

# BILL SECREST'S SECRET STUFF FOR ROOKIES

Revised 30Dec03

Keys to success: 1. Stay on course! Mark your route sheet to help you; note with a colored marker when a sign is on the left side road, normally most signs are on the right. Draw a colored arrow in the direction of the turn, this will help when the turns come fast and furious and you have no way of knowing in advance when that will be. At the bottom of the page mark a brief outline of the next instruction, located at the top of the next page. If you don't do this you will turn the page too late and miss the turn instruction you were required to make, or worse, failed to have noticed a street sign you're now looking for and drive along with your gut churning hoping you haven't missed it already. If you leave the start as soon as you receive your instructions you will have enough time to mark the first half prior to starting the first leg. You can mark the second half at lunch. This would be a good time to mark any peculiar signs **on the left side of the road, or a pause of something other than the standard 0:15 minute**. If the pause is for 0:30 and you pause for only 0:15 you will end up with a 0:15 minute early score. Very embarrassing. I did this on the 2002 race, along with several other so-called veterans.

2. Stay on speed! As long as you're on speed you're time. Minimize the time you're not at the correct speed - hold your speed as long as possible prior to making a turn or come to a stop. Be safe, but be consistent - don't coast, always use your brakes -coasting gives too much error. You coast longer downhill and shorter up hill and both put you into never-never-land. Hang on to your speed and use your brakes. This will give you a consistent timing factor that you can deal with. Write the assigned speed given from the last instruction at the bottom of the page on the top of the next page. If you don't you may have to turn the page back to rediscover the speed you are supposed to go back to after slowing down for a farmer's hay wagon.

Additionally, don't always be in a hurry to correct for every timing error as they do have a tendency to balance out, i.e. you are six seconds late and you have a stop sign ahead. They usually give you a fifteen second pause to get through a stop sign. If your speed is 40 MPH up to the stop and 45 MPH after the stop that gives you a late timing error of about nine seconds. If you do a simple Stop & Go (no Pause) that usually takes those nine seconds you leave there six seconds early (: 15 minus :09 late equals :06 early). Since you were :06 late into the stop sign and :06 early coming out from it you now have zero error -exactly on time.

**CAREFUL**, if you had a check prior to the stop sign and did nothing you would have received a six second late score. After a while you will get a feel for the location of checkpoints and start minimizing your error in preparation for the checkpoint. But you will still be surprised when you see a checkpoint.

3. Say the New speed! As the Navigator you cannot say the new speed too many times. As the day wears on your driver having driven so many

different speeds will not know mentally what speed they are currently driving. If you ask them they will look at their speedometer and tell you, but otherwise they don't know. If you tell them the new speed for the next instruction they will soon forget. When you actually, finally (some instructions have been 20-30 miles apart, even longer, but I've forgotten just how far) see the next instruction you're working on, tell the driver what you are going to do and say the new speed. When you have executed the maneuver and are accelerating toward the new speed say the speed. When the driver has captured that speed you can then start working on the next instruction. A good technique is to have the driver verbally announce the speed he has just captured. If he says 40 and you're going to 45 that would be a good clue that all is not well. There are two types of Drivers; those that have drove the wrong speed and those that are going to drive the wrong speed. Your job as Navigator is to minimize that occurrence. Then tally your error and make any speed changes as necessary to make up that error. Remember you cannot say the new speed too many times!!!!

4. Mark out each instruction! After you execute an instruction mark it out. Don't wait. Some instructions are identical and failing to mark them out will allow you to do the same instruction twice. This might not put you off course but it will certainly give you a huge timing error.

5. Keep a timing log! Draw a long T on your "plain white, unlined paper" (in compliance with the rules) forming two columns. Mark one late and one early. Keeping track of your early and late times will allow you to balance them out easier. Nearby keep a column for time of day speedometer corrections. Let's say you ran the 50-MPH speedometer calibration run of 20:00 but you ran 20:10. You are :10 seconds late. Either your speedometer is slow or John Classens (Director of Competition) was fast. Makes no difference who's right or who's wrong you have to drive faster on this particular day. You can do-that one of two ways: divide your time by John's time and multiply that times all the speeds he assigns you, i.e.,  $50 \text{ MPH} \times 1.008$  ( $1210 \text{ seconds} / 1200 \text{ seconds} = 1.008$ ) = 50.4. Where is 50.4 on your speedometer face? Don't do this, your score will embarrass you. Better technique - you were 10 seconds late in 20 minutes, or 5 seconds late in 10 minutes, or 1 second late every 2 minutes. If you make up 1 second every 2 minutes that's the same as driving 50.4 MPH! How do you do that? Make a time of day log.

If you start at 10:01 write that down. Two minutes later write down 10:03 underneath and enter 1 second in your late column (I mark 1t to identify where it came from when I do a recapitulation in trying to determine the source of a large unknown score). Don't try to correct a 1 second error unless you see a checkpoint. Let them build up to a number you can deal with - you can usually balance them out at stop signs, if you don't "pause" when late or take an extra "pause" when early. Remember, a check point can occur when you are not ready.

6. Use simple standard language! You must stop at all stop signs but you may or may not actually sit there and use all the allotted time they give you. A stop and go at 15 MPH may only take 2 seconds but they usually give you 15. If you don't sit there you will be 13 seconds early when you

leave. In order that both of you know what's going on use the term "Pause", i.e. "go straight at the stop "PAUSE"", or to make up time "go straight at the stop, "NO PAUSE". Other terms: "Stop & Go", "left curve warning", "hard left curve warning", "left zig zag", "left snake".

Same signs to the right. "Mind the sign" = go to the speed depicted in

the curve warning sign. If the new assigned speed is the same as the sign it helps the driver remember the new speed. "Timed event" - going to a new speed for a specified time then changing to another (or the old) speed. You will do this maneuver a lot; it enables the cars to negotiate the curves at rally speed.

7. Reading the clock! There are two kinds of Navigators: those who have read the clock wrong and those who are going to. Clues: most errors occur when the second hand is in the 7:00 to 12:00 position- 35-59 seconds. Technique: note or write the seconds reading, and what you thought was the minute. Then wait until the second hand goes past one or two O'clock to see what the minute hand **really** says then record the minute, which was one minute **earlier** than what it now says. A lot of the maneuvers are for a particular time - 4:24 or 6:06, whatever. Add that time to the time you've recorded and that's your new time of execution. Adding seconds takes some getting used to, any number greater than 5 in the first column after the 0:?0 means you subtract 6 from it and add 1 to the minute column, i.e.,  $1:46 + 1:24 = 3:10$ . Another way is to keep track of the minutes by making a mark for each one. For long periods I use both methods to keep me from forgetting and driving past my new time of execution. You will at some point get overloaded and forget if you try and keep track mentally - use a crutch.

8. Starting method! There are two ways to start, from a stop or a flying start. You will use both. Remember what I said -minimize your off speed time and you minimize your error, so a flying start is more accurate but sometimes impossible due to traffic congestion or the physical location of the starting point (kind of hard doing a flying start at 50 MPH from a stop sign). From a stop: from your performance chart determine how many seconds you're going to leave early from your assigned or calculated time (at the end of a transient leg, more on this later) and leave that many seconds early. By the time you reach the assigned speed you will be on time **if** your actual acceleration time was the same as the practice time that determined your anticipated error, recorded on your chart.

It usually takes these old cars 25-30 seconds to go from 0- 50MPH and your error is usually 1/3 of that amount. At speeds higher than 40-MPH parasite drag (pushing the cars frontal platform through the air) starts to slow down the rate of acceleration and the actual time from brake release to 1/2 speed is not the real error (that's what they teach you in Rally School). For most cars the timing speed for determining your error to 50 MPH is about 28 MPH,  $45 = 23.5$ ,  $40 = 21$ .

Although it may take your car 25 seconds to get to 50 MPH you are not late 25 seconds you are late about 8 seconds. Imagine a white line across the road and we have two cars. One car is going to cross the white line already traveling at 50 MPH (flying start). Furthermore that car is going to cross that line at exactly 12:00:00. The second car is going to be stopped on the road at the white line and it too has a start time of 12:00:00, but the driver knows his loss time to 50 MPH is 8 seconds. At 11:59:52 the second car leaves the white line accelerating to 50 MPH. The first car is moving toward the white line at 50 MPH but is not there yet. The second car is moving down the road going faster and faster. The first passes the white line at exactly 12:00:00 and is rapidly catching the second car. Finally just as the first car overtakes the second car it too reaches 50 MPH and they both go down the road bumper to bumper, at 50 MPH, both on time, the time being 12:00:17. It took the second car 25 seconds to reach 50 since it had traveled some distance while accelerating to 50 MPH but because it would have been 8 seconds late on the road and since it left 8 seconds early to compensate (11:59:52 plus 0:25 = 12:00:17, it was on time.

Flying start: You need to be going by the designated sign at speed and at the exact time. This will be the exception rather than the rule, as luck as well as judgment is a factor. You will usually be early or late. No problem you are going to be early or late all day, just record your error (the seconds you are early or late past the sign) in your early/late column and start working on the next instruction. If it's a big error fix it then, as a checkpoint can be as quick as 2 minutes away (but no closer) from a start. **Not passing the sign at the exact start time is no big deal, as mentioned.**

**Not passing the start time at the correct speed is something you will have to deal with. Say you go past the sign at 12:00:03 for a noon start time and at 30 MPH instead of the assigned 50 MPH what do you do? Well you know you're late 3 seconds, but you need to note the actual time you went arrived at 50 MPH. Announce the 3 seconds late just in case there is an early checkpoint. Now, if you were 10 seconds going from 30 to 50, you are an additional 2.0 late (30 to 50 = 40 as midpoint speed, or 20 % slow. Ten seconds times 20 % = 2 seconds late. Now you are 5 seconds late.**

9. Losing or gaining time! Use the 10 % method. That is; for every minute you increase or decrease your speed by 10 % you lose or gain 10% of a minute. A minute is 60 seconds, and 10 % of 60 seconds is 6 seconds. So if you increase your speed by 10% you gain 6 seconds; 20% change = 12 seconds, 30 % = 18, etc. Functionally, at this point if you restrict yourselves to three correction factors you will be better off. They are: 10%, 20% and 50%.

The 50% a panic correction in sight of a check point. Lets say you see a checkpoint 1/2 mile away. You're going 50 MPH and you are 10 seconds early. At 50 MPH 1/2 mile takes 36 seconds (60/50 = 1.2 minutes, or 72 seconds/2 = 36). You need a minute and forty seconds to correct at 10% (100 seconds X .10 = 10 seconds), you need 50 seconds at 20% (50 X .20 = .10) and you have only 36 seconds before you pass the timing mark. What do you do? 1/2 speed for **double** the error time, 50 % X 20 seconds = 10 second correction.

**Problem,** you can slow from 50 to 25 in a hurry but you can't get from 25 to 50 in a hurry. In this case you probably only want to spend about 4-5 seconds at 25 MPH then right back up to 50. Otherwise instead of being early you'll make yourselves late. The Navigator is always in control and calls the shots. When you're making a speed change to correct an error the Navigator watches the clock and picks a point to use the second hand (45 seconds, 00 seconds, etc) and says "ready to go to 55 MPH, ready GO". The driver counts how many seconds it takes to get to 55 and remembers he must take that many seconds to slow back down from 55 to 50 when the Navigator says "ready to go back to 50, ready GO". It naturally takes longer to gain 5 MPH than to lose it due to the increase in air drag. Drag is measured by a formula that includes velocity squared ( $V \times V$ ). 50mph X 50mph equals 2500 whereas 20mph X 20mph equals 400. Drag gives a much larger number to deal with at higher speeds. So if it takes 5 seconds to go 50 to 55 with the gas pedal to the floor it may only take 2 seconds if you let all the way off the gas pedal to slow 50. Ease off the gas pedal slowly, make it take 5 seconds to slow down, otherwise you will end up not making up the last  $\frac{1}{2}$  second. After doing this maneuver 20 - 30 times a day pretty soon you have a sizable error.

Another technique is to add your late time in seconds to the given speed you are driving and drive that speed for a time in seconds equal to your given speed. Got it? Explained again with numbers. You are late by 8 seconds and your assigned speed is 40 MPH. Drive 48 for 40 seconds and you will be on time (48 is 20 % greater than 40, so 40 seconds times 20 % = 8 seconds. This is very useful at speeds of 35 and 45 MPH, where a 10 % change would have you drive at 38.5 MPH, or 40.5 MPH. We don't have  $\frac{1}{2}$  mile increments on the speedometer face. Once again, different numbers, assigned speed = 35 MPH. You drive 38 MPH for 35 seconds for a 3 second gain.

10. Timing maneuvers! One of the more common ones is slowing the car down for sharp curves. The instruction will be to slow you from (50MPH) down to 30 MPH, but in order to get you back up to 50 MPH you will be directed to maintain 30 MPH for 1 minute 30 seconds (or some unknown time) and then resume 50 MPH or some other new speed. You can do this several ways. The simplest is to split the sign; go past the sign at 40 as you slow to 30. The theory here is that for the distance prior to reaching the actual sign while slowing from 50 you will be late as you are no longer at 50 and for the distance after the sign that you passed at 40 slowing to 30 you are early as you are faster than 30. And in theory the amount you're early equals the amount you are late and you're on time. This part works great, slowing down by 10-15 MPH, but you have to have your Shit together to split a sign exactly at 32  $\frac{1}{2}$  MPH slowing from 50 to 15 MPH. Technique wise this is how to fix an error here. Lets say you got on the brakes late and passed the sign at 35 MPH, too fast by 2  $\frac{1}{2}$ . That's ok just dip below 15 MPH by  $\frac{1}{2}$  of that amount and go right back to 15 MPH. You would drop down to 13  $\frac{3}{4}$ , as best you could and then 15. Reverse if you were too slow - stop at 16  $\frac{3}{4}$  then right down to 15 mph.

These are approximations to account for the error by the sign but you only use 1/2 of the amount due to the effect of low speeds. The other problem here is the other end of this thing. It's really difficult, without lots of practice to know how many seconds before your one minute thirty seconds is up to start accelerating the car to be 1/2 way up to the new speed as the 1:30 goes by. This is the technique taught in Rally School. It has errors, explained later.

A different technique is to record all your "late" time on speed changes to a higher MPH number and your "gain" from slowing to a lower speed and record these numbers in your plus minus column, when you execute the maneuver exactly at the sign. Example: same instruction but you drive right up abeam the sign **then** slow, with brakes from 50 to 15 mph. This may give you an 8 second gain. Then 1:30 later go from 15 back to 50 MPH this may give you a 4 second loss. So you are 4 early for the maneuver ( 8 - 4 = 4). But it's a lot easier driving to the sign at 50 then braking down to 15 and say well now I'm 8 seconds early, wait for the 1:30 and go back up to 50 MPH and say that made me 4 seconds late and I'm now 4 seconds early for the maneuver (8-4=4), than it is trying to split signs at such a great speed variance. Use whatever works best for you, but you have to have the speed change error numbers calculated by the computer prior to the race. **Warning**-a check point at 15 mph in a "timed event" and 8 seconds fast is tricky to fix - more about this later, over a beer \*See last page for more on this subject, Nov 96.\*

Another timing maneuver is as follows: you are driving 40 MPH looking for a left turn on JONES Ave. Forty five seconds after turning on JONES you are to increase to 50 MPH. OK, first of all you can't make a 90 degree turn at 40 MPH. Probably 15 to 20 depending on the car. When you slow down from 40 to 15 to make the turn you are late because you're not doing 40, so you

record this late time off your turn chart error. Now you've made the turn and started back up to 40. You are late here too as you aren't doing 40 and you get your late time off your turn chart. Let's say you were late 1 1/2 seconds to slow, and 3 seconds late to get back up to speed or a total of 4 1/2 seconds late because you didn't make a turn a 40-MPH. No problem we can always make up time, but we have another problem. What about our 45 seconds then go 50 MPH? This 45 seconds is at 40 MPH and we were doing 15 MPH when we read the second hand clock to start our time. 45 seconds at 40 MPH equals one half-mile (60/40 = 1.5 minutes, = 90 seconds for one mile, or 45 seconds for one-half mile). From this intersection there is an imaginary white line one-half mile down this road. That's the point John wants you to begin doing 50 MPH. If you start from 40 to 50 after 45 seconds at less than 40-MPH average you will be at 50 MPH before you cross the white line. This will cause error. How do you account for all of this? There are lots of ways, for now I'll keep it real simple, this works. Add your late time to the higher speed to the total of your assigned running time and that will get you to the white line. In this case add 3 seconds to 45 seconds - go from 40 to 50 after 48 seconds. There is a more precise way but this is good enough for now. Let's see just where we stand on this "Timed Event Turning Maneuver". We were late

by 1 1/2 to slow to 15, late by 3 getting to 40, we ran at 40 for 48 seconds (45 + 3

= 48) and went to 50 from 40. Getting from 40 to 50 we were late by 1/2 second (from our chart): Finally then, we were 1 1/2 + 3 + 1/2 = 5 seconds late. Go to 55 MPH for 50 seconds and you have corrected that error (50 X 10 % = 5).

11. Transient! You are still on the clock, in competition, but you have no assigned speed. You begin this event at some sign in the route instructions. **Write down your time past this sign!!** Read the clock several times to be sure you have the minute correct, otherwise you will be one minute off when you leave the restart. **You may even verify the minute with the driver. Ten seconds worth of extra effort at this point may eliminate minutes or hours of heartache later.** Now add to it the amount of transient time John has given. From this number add or subtract any late or early times on your log and then subtract the amount of new speed start error at the restart from your performance chart from a stop. If you have been off course and are still late and have not had a checkpoint subtract this late time and leave here on time. If you don't know how late you were watch some of the other car's departure times and see if you can get a consensus and leave there, on a composite time (realizing that if you have already had a previous checkpoint this consensus time would only be relative). Also, look at the mileage figure shown for the transient and compare that to the how much dead time you actually have to gas, eat. Pee etc. If it's in a town figure on getting every traffic light red. Don't make your self late. *New rules, 2001. In order to keep the cars at the specified stops for the public to enjoy, you are allowed to leave at the time allocated to arrive at the restart (shown in ()) and if you don't make it in time ask for a time delay which will be awarded automatically*

12. Times, give me your times! Write down your times as they occur. Write down the time of day that you pass through a checkpoint. Write it on some blank space right on the page of instruction that you are working. Later you can recreate the days work to see just where an error may have occurred. Same thing for beginning a transient zone, write down the time. If you have no times you have nothing to base any evaluations upon. **The hour may not be important but the minutes and seconds are.**

13. Speedometer calibration run! Make sure you always look to see what speed it is being timed at, usually 50 MPH but not always. Write down the exact time of day, to the second as you pass the beginning of the run. Mark down this number on each instruction. Add to this number the time interval from the previous instruction to the next instruction. This gives you the time you should pass that point. Write that actual time down to compare perfect to your actual. Do not tell the driver how he is doing. He will unconsciously speed up or slow down - give you a perfect run and revert back to driving the needle all day and give you a big score at the end of the day. Do not add the time to your running total. If you make a math error it carries all the way to the end and you have no way to discover it. Making a timing correction due to a math error is a good way

to get a big score. One technique is to stop at the beginning of the run if it is a double lane highway, then wait until the clock advances to the charted seconds of your acceleration error. If it's 8 seconds, leave at ??:52. You should pass the next sign exactly on time **IF your acceleration chart number is correct**. The neat thing about this technique is that your watch is now a stopwatch. Forget the minutes (except to keep track of the next due time )just record the seconds, or difference in seconds readings from the published times.

14. Checkpoints! As soon as you see one make any corrections to your time as necessary - don't give up and cross with some error you could have shed by slowing down or speeding up. Once the checkpoint is behind you, you have a **new** slate. Forget any error you may have gotten, you are now on time at this point at least for the next checkpoint you are now working on. There are usually four checkpoints. There are four checkpoint crews but sometimes John will borrow some staff members and have extra crews. Occasionally you will make a loop and go through the same checkpoint twice - either in the same or opposite direction. **Never, never, never, never**, assume that after the forth, or fifth, or sixth checkpoint, with no other instruction to work on except find the end of timed portion sign that there will not be another checkpoint. If there is, you'll get a zero if you stayed on speed.

15. Traffic congestion! Say you're going to make a left turn. You're doing 50 mph and new speed will be 40 mph. You look at your turn chart and figure you'll be 2 seconds late slowing, and 3 seconds late getting back to 40 mph. Trouble! On coming traffic prevents you from making a left turn. Quickly decide to do a stop and go. **Do not slow down** to try to kill time in order that the oncoming cars will pass so you can make your turn! Keep your speed up and act like there is a stop sign in the middle of the road. As soon as you stop note the time. As soon as traffic clears and you start up toward 40 mph note the time. The difference between those two numbers is 100% error. Add to that the error from your stop & go chart to get your total error. Forget the 5-second turn error you had planned on using, you didn't use it.

Estimating distance-converting distance to seconds error is a neat way to solve a traffic congestion problem - a useful tool. Add 1/2 of the value of your assigned speed to your assigned speed. This will give you the distance you travel in one second at that speed, i.e.  $50 \text{ mph} + 25 = 75$  feet/second at 50 mph.  $30 \text{ mph} + 15 = 45$  feet/second (fps) at 30mph. You can also just multiply 1.5 times your speed to arrive at the same answer, ie  $30 \text{ MPH} \times 1.5 = 45 \text{ fps}$ . Use this when you stop short of an intersection due to traffic. There may be three cars in front of you and you have stopped short of the point you were supposed to be traveling at speed to. Let's say your speed was 20 Mph.  $20 \text{ mph} + 10 = 30$  feet/second. 3 cars = 25 feet/car = feet short.  $75 \text{ feet} \div 30 \text{ feet/second} = 2 \frac{1}{2}$  seconds. What do you do with 2 1/2 seconds? Well you started your time hack at the instant you stopped, but you stopped 75 feet short. You started your timing 2 1/2 seconds too soon. Final outcome? Lets say they gave you a 20 second pause at this intersection, in at 20 mph , out at 40 mph. From your chart you see 20 mph to zero = 1 1/2 seconds late. Zero to

40 MPH = 4 1/2 seconds late, or 6 seconds total. 20 seconds to pause minus 6 seconds loss = 14 seconds to kill at that intersection, or somewhere else down the road. When you arrived and stopped 3 cars short you noticed the second hand indicated 30 seconds. First car leaves, you creep forward. 2nd car leaves you creep forward. 3rd car leaves and you are number one - boom you go, time indicates 50 seconds on the clock. Where are you now? 50 - 30 = 20 seconds. They gave you 20 seconds so you're late by the time loss for the stop & go, right? Wrong! Remember we started our time 75 feet or 2 1/2 seconds too soon. Our measured time should have been from 32 1/2 (not 30) seconds on the clock to 50 seconds on the clock, or 17 1/2 total stopped. 17 1/2 plus 6 = 23 1/2 seconds the actual maneuver took. They gave us 20, so 23 1/2 - 20 = 3 1/2 seconds late. By doing this distance estimate and converting to seconds error we avoided a 3 1/2 second rookie error (and a lot of veterans too!). Once again, one half your speed plus the speed itself equals feet/second at that speed. (40 mph + 20 = 60 feet/second at 40 mph.)

You can use this same technique to cross a double lane highway at 50 MPH (or any other speed). Stop at the stop sign, note your time. When clear of the traffic going left to right, cross to the center of the median and stop to clear traffic there. Estimate how many feet you have traveled. Each lane is usually 10 feet plus the breakdown lane of 8 feet. The stop sign is placed about 10 feet before that. At this point you are usually about 75 feet or longer, depending how wide the median is. Now the right to left traffic is clear and you leave, noting your time. Let's say your stop loss 50 to 50 MPH is 13 seconds and they gave you 30 seconds to pause. Your clock read 38 seconds when you stopped. Clear of traffic you crept into the middle and once again clear of traffic you left at seconds 55 on your clock, accelerating to 50 MPH. Where are you, timewise? You had dead time of 17 seconds (55 - 38) and your stop loss was 13 seconds so you lost 30 seconds total, right? Wrong! you traveled 75 feet to the other side of the road. At 50 MPH this takes 1 second (1.5 times the speed = 75 fps, which has to be accounted for. You traveled 75 feet at 75 fps equals 1 second. You must subtract this 1 second from the 17 seconds you used to cross the road. You are now early by one second.

16. End of speedometer calibration run! Although you are noting your progress **by writing down your actual time** as you go by each sign on the calibration run, wait until the final sign to base your calibrations upon. This is due to rounding to the nearest second by the Rallymaster You may be off by six seconds at the next to last sign but the final sign says you have finished only 5 seconds off. On a 20 minute run that would make a difference of 3 seconds per hour to deal with, (20 minutes = 1/3 of an hour. 3 x 6 = 18 seconds error per hour vs. 3 x 5 seconds = 15 seconds/hour). 3 seconds/hour too much for an 8 hour day = 24 seconds of needless error.

17. John Classen teaches in his rally school, the following type maneuver: at CWS (curve Warning sign) 10 decrease your speed to 10MPH for 1:00 then resume 50MPH. He says to cross the sign at 30MPH, 1/2 the speed of 50 down to 10. He then says for the Navigator to begin counting as you approach the end of the 1:00 and that the driver should be accelerating

and just as you reach zero the driver is passing through 30 on their way back to 50 MPH. Well, this late, early, early, late bit works for the on time bit but this maneuver is just plain wrong to actually accomplish accurately! IMPORTANT don't tell anyone and give away my secrets! Ten MPH for 1:00 is also equal to .167 mile (60mph divided by 10mph = 6 min/mile. 1 mile divided by 6 = .167 mile. If you are twice faster than 10 mph (up to 30 on each end) then your average is more than 10 mph. If you average more than 10 mph for 1:00 you will travel more than .167 mile - you will therefore be on a section of the road, past the .167-mile mark at 10 mph instead of 50 mph. So even though you did the maneuver perfectly, you are late. My method mentioned earlier (driving to the sign at speed) generates a similar error for the .167 miles to travel at 10 MPH. Now that you know, measure this out and time it to see your error and use it in the race.

- a. Simple version, try subtracting your late time from the early times and subtract this number from the run time - you'll be close.  
Example: 50 MPH to 10 MPH = 10 seconds early, 10 MPH to 50 MPH = 5 seconds late. Difference is 5 seconds. If the run time is 1:00 then your actual run time will be 0:55 ( 60 sec. - 5 sec. = 55 seconds). This will put you very close to the imaginary white line. If the speed change is higher instead of lower, then add the time Delta (change) instead of subtracting, as above.

If you want to do this exactly right, try this: Using the rally computer obtain your late error when you slow PRIOR to the sign, crossing the sign exactly at the new slow speed. Going from 50 MPH to 10 MPH, as in our earlier example, the late error usually runs from 2 ½ to 3 seconds late. But you start your 1:00 minute at the sign exactly at 10 MPH. Therefore by running for 1:00 you will have traveled exactly .167 mile. Now when you accelerate back to 50 MPH you will be at the right point on the road. Then you total your late error, say 3 seconds to slow, and 5 seconds to go, or 8 seconds total. Speed up to 55 for 80 seconds and you are back on time. This is not a good technique if they have placed a checkpoint within the confines of this timed maneuver, you will be late for the slow prior to the sign error.

18. A similar problem occurs when you have to speed up from 10 mph to 50 mph at a sign, for a given time (say 1:12, which would be exactly 1 mile in a timed event) then change to a different speed. Once again the difficulty is finding the white line that defines the distance (1 mile) you are to travel at that speed. If you wait to the sign to speed up you are going to travel less than 1 mile as you did not maintain 50 mph for that 1:12. Same thing if you pass the sign at ½ speed, 30 mph, you are still less than 50 mph average, you never traveled 1 mile. You are now traveling at the new different speed, and you should still be at 50 mph. It takes a lot of experience and judgment to determine just when to begin your acceleration from 10 mph to 50 mph, prior to the sign to either cross the sign at ½ speed, 30 mph in this case, or at full speed, at 50 mph.

- a. For this maneuver, until your skill proves otherwise, hold your speed at 10 mph until the sign, and then increase to 50 mph, while starting your time at the sign. From your performance chart you see that

you lose 0:05 from 10 to 50 mph. OK, add 0:05 to the run time of 1:12 (1 mile) and run that segment for 1:17, that will get you real close to the white line, if not on it. At this point you would have to immediately change to the new speed, by either the  $\frac{1}{2}$  speed change technique or drive to the end of the time, then brake or accelerate to the new speed and determine your error time from your chart.

19. Remember, you are going to be early and late all day long. Just keep an early/late plus minus chart: fill in those times and do the math prior to a checkpoint - all zeros!

19a. Putting your techniques to work. Remember I said there could not be a checkpoint within 2 minutes of a start, or restart from a transient? What if you arrived at the restart and had 4 minutes to spare. You noticed that the restart from the sign was uphill to 50 MPH, and due to it's location from an intersection there was no way to make a running start, which would be very accurate. You know that your car's performance uphill to 50 is going to be very vague. What to do? You have 4 minutes to spare, and you know that the checkpoint has to be over 1.66 miles away ( $50 = 1.2$  minutes/mile. Then  $2.0 \text{ minutes}/1.2 = 1.66$ ). Leave the sign at 25 MPH ( $1/2$  speed) and drive until it's flat, but before you've traveled for 3.32 minutes at 25 MPH. Find some sign or tree to time to and note your time. Make a U turn and position yourself to make your transient restart from this point. All you have to do now is to calculate that time. Lets say you time yourself for 1:11 and found yourself a shade tree from which to restart. Where are you? Well you know that your car will go from zero to 25 MPH with zero additional chart error up that shallow hill. It was the steep part later at the high speeds you were worried about. If your loss from 0 to 25 MPH was 3 seconds then you traveled 1:08 ( $1:11 - 3 = 1:08$ ) or 68 seconds. If you traveled 68 seconds at 25 MPH you would have traveled 34 seconds at 50 MPH right? Right! From your calculated restart transient time add 34 seconds, and leave the shade tree at that time. Remember to leave 7-9 (whatever your chart time is for 0 to 50) seconds early for your late time to 50 MPH, just as you would have done at the bottom of the hill. I did this once and got a zero at a checkpoint that was only 2 or 3 miles from the restart after lunch. Mine was the only Zero. Everyone else had a bad score from performance or timing error.

20. Oh, one last maneuver, this is for a beer, remember? John frequently has checkpoints within a "timed event" maneuver (I personally think this is against the rules but I try to keep a low profile. The rules state that you must complete an instruction prior to executing a new instruction. It's my contention that by following the Rallymasters recommended technique of crossing a sign of execution at  $\frac{1}{2}$  speed on the way to the new speed, you are by the laws of physics, either early or late, depending on the direction of the speed change as far as determining the exact location of the white line, which terminates that instruction. Therefore you have not completed the instruction prior to the checkpoint. The instruction is not completed until the "timed event is over". Therefore you should not have a check point in this area, that's like having a checkpoint shortly after a turn instruction, without sufficient time or distance to make up the lost time after the turn, but then that is just my two cents

worth.)But I love this checkpoint as that does provide some separation in the final standings. I may be wrong but I look at this as an opportunity to "beat the other couple" as Groucho used to say.

a.The technical way to handle this is as follows; there are three situations you encounter; on time, late, or early. Look first at being on time. Let's say for a speed decrease from 50 mph to 10 mph for 1:00 (which is .167 of a mile, remember?): 1) you are exactly on speed, and you slow to the new speed prior to the sign and your lost time is 0:03 seconds. If you see the checkpoint you know you are 3 seconds late. If you stay at 10 mph you will find the white line to accelerate to 50 mph 1:00 later, but you will get a 0:03 second late score for this checkpoint (assuming everything else has been perfect, and you have to for this comparison). Don't set there at 10 mph for a 3 late, FIX IT! You do this by going to 13 mph (which is instantly, no error), for 10 seconds, then back to 10 mph before crossing the checkpoint, getting a ZERO for that control. That's good, but now you don't know where the white line is located, and you must. To do this simply lose the 3 seconds you gained - slow to 7 mph for 10 seconds before the 1:00 is over, then go back to 10 mph. At the end of your 1:00 you are at the white line and you accelerate to 50 mph. NOW WHAT? Well, you got a zero for the checkpoint, but you are 3 seconds late for the next checkpoint. The 3 seconds, you lost were to help you find the white line, which you did, but they're still time lost and must be made up. What to do? Simple, gain 3 seconds to get a zero for the next checkpoint. Any other technique used for entry into this "timed event" with a checkpoint within, would involve similar speed corrections, as outlined above. Simply stated, fix any errors prior to the checkpoint, unfix what you did prior to the white line timing mark, then re-unfix what you just unfixed to get back on time for the next checkpoint, got it?

21. Doing the JOG. You can have a left or right hand Jog. A Jog occurs when you come to a "T" and the road continues but is displaced a short distance away. Think of two different surveyors laying out a road and agree to meet in the middle. When they arrive at that point they discover they are 100 or 200 feet apart. That's a Jog. Let's say your speed is 45 MPH and the road jogs left (for about 90 feet then goes right) at the "T"(from the other direction) stop. You can't do 45 MPH around two 90 degree turns. Time your stop with a minor pause, 1 or 2 seconds, and go to 15 MPH. That is 1/3 of your required speed so for every 3 seconds spent at 15 you are losing 2 seconds. When you make your right turn note the time and accelerate to 45 MPH. You note that you spent about 6 seconds at 15 mph, WHERE ARE YOU? Well, your time loss was 6 seconds (from your chart) for 45 to 0 to 15 MPH, and you lost 4 seconds while traveling at 15 MPH ( $6/3 = 2 \times 2 = 4$ ). Then you lost 4 seconds going from 15 to 45 MPH. You now have  $6 + 4 + 4 = 14$ . If your short pause was for only 1 second you are on time as  $14 + 1 = 15$  and 15 was the pause time given for the stop sign.

If the speed is 40 MPH I use 10 MPH as my travel speed from one corner to the next. In this case my loss is 3 seconds for every 4 seconds traveled at 1/4 speed.

22. Ignoring the slow down speed in a timed event. Say you missed a turn and are running late, your assigned speed is 50 MPH. The next instruction requires you to slow to 40 MPH for 45 seconds then resume 50. You are late, why slow down if you don't have to? Be careful, timed events are tricky. You can't use the usual technique. Typically you think I'm going 50 vs 40 so I'm 25% fast;  $50/40 = 25\%$  ( $50/40=1.25-1=.25$ ). You then think 25% times 45 seconds makes up 11.25 seconds of your late time, right??? **WRONG!!** Look at the problem this way; 40 mph equals 90 seconds/mile, so 45 seconds is 1/2 mile. It takes 36 seconds to travel 1/2 mile at 50 mph, so your real gain is 9 seconds ( $45 - 36 = 9$ ). Now how do you get this same number, 9, by simple math? The answer is the opposite of what you just did. Instead of  $50/40$ , use  $40/50$ . This give you a percentage of 20%. Multiply .20 times 45 seconds and you get 9 seconds, which we know is the correct answer. Remember this is only for a timed event!!! If you drove 50 MPH vs 40 MPH on the regular road (as opposed to a timed event road) trying to make up time you are actually making up 25%, or 15 seconds every 1 minute, not 12 seconds as in the example we just used for the timed event. 24.

25. That's it for now, subject to the next **revision, which is highlighted in this font**. Good Luck, as that is one of the most important ingredients to your success.

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