EZ RALLY TIMING

- by Gary Starr (rev 10 - 06/22/2009)

Looking for a TSD stock odo timekeeping technique that has the accuracy of a computer yet is so easy anyone can do it with just a clock and 4 function calculator? Try this proven one:

Step 1)

At the odo check, compute and record the corrected minutes per 0.1 mile factors for all the casts of the entire rally in the following format:

TT.TTTT0DDD (for 10 digit calculator) or TT.TTTDDD (for 8 digit calculator)

where TT.TTT(T) is the corrected min/0.1mi and DDD = 001
(DDD is distance in 10's, 1's, 0.1's miles).

Example:

CF (correction factor) = your net mileage @ odo check / official net mileage @ odo check

= 10.25 / 9.85 = 1.040609137

Cast = 40

(Since corrected min/mi = 60 / (cast * CF), then)

CORRECTED MIN/0.1 MI = 6 / (CAST * CF)

= 6 / (40 * 1.040609137) = 0.1441xxxxx

Record for cast 40:

0.14410001 (10 digit calculator - truncate to 4 decimal places, add 3 zeros and a one)

or

0.144001 (8 digit calculator - truncate to 3 decimal places, add 2 zeros and a one)

Step 2)

Enter into memory the factor for the first cast.

Step 3)

Now clear the display (but not memory) and enter your out time in the same format where TT.TT is your out time and DDD is your odo reading at the outmarker (or place where TT.TT is your out time).

Example:

out time = 21.00, odo = 00.0:

Enter into display:

21.00000000 (for 10 digit calculator - out time in minutes, decimal, 5 zeros, odo)
or
21.000000 (for 8 digit calculator - out time in minutes, decimal, 3 zeros, odo)

Step 4)

Now press +, MR (memory recall), =

And presto - you have the TOD clock time TT.TT (e.g. 21.14 min) for the odo mileage DD.D (e.g. 00.1 mi)!!!

(display reads 21.14410001 for 10 digit calculator
or
21.144001 for 8 digit calculator)

Step 5)

Now keep pressing = to match DD.D to your odo

You can now give hacks every 0.1 mile if you wish (like when approaching a control - e.g. 21.28 min @ 00.2 mi, 21.43 min @ 00.3 mi, etc.) with accuracy that will rival a computer. You can easily get 2's or less with a steady driver (Dave Fuss and I got 8 points in 10 controls using this system with just a checkpoint TOD clock and stock odo!).

OR

Just press = enough times to match any odo reading at which you want the time.

Notes:

- When the time exceeds 60 (the hour), just subtract 60 (-, 60, =). Then press +, MR, = to continue for the next 0.1 mi.
- At speed changes press = until the mileage DD.D matches your odo, record the result (entire display), enter the new factor into memory for the new speed, and go back to step 3 using the recorded figure to enter in the display.
- Pauses/gains are done normally (+ pause =, - gain =) followed by +, MR, = to continue for the next 0.1 mi.
- If the official mileage at the outmarker is not zero, just use that mileage for DDD (egg. Use DDD=364 for official mileage 36.4).

Equipment needed:

1. 0.1 mi reading odo.
2. 0.01 minute TOD (time-of-day) clock (0.01 minute checkpoint clock is fine). Make sure you check the INCREMENT to be 0.01 MINUTE - NOT 1/100 second (you could also use a 0.001 minute clock if you ignore the thousandths). Note that a decimal minute clock usually means minutes keep counting past 59 (egg. 60, 61, 62, etc) and doesn't usually mean the increment is decimal parts of a minute! So be careful. Timewise, Alfa, and Zeron all have 0.01 minute clocks.

   - Timewise (lcd) - usually considered the best
   - Alfa (led/lcd)

- Zeron (led/lcd) - only old used ones around anymore
- Seiko
- Manhart
- Exactime
- Meylan (has original digital Seiko model no. 19)
- Clark mechanicals (model 107D)
- Bob Radford Enterprises (dealer)
- Competition Limited (dealer)

3. 4 function calculator with 1 memory (to be class S "unequipped" legal):
    - Separate memory store and memory recall buttons.
    - Battery (can also have solar but must have battery).
    - Memory not lost on auto shut off.
    - Constant memory operations (+, MR, =, =, = adds memory contents 3 times to display but leaves memory unaffected). Most Sharp brand calculators have this.

    Other desirable but not absolutely essential calculator features:
    - Large display digits.
    - 10 digit display.
    - 1 + 2 x 3 = 9 (not 7 - even though 7 is mathematically correct it will drive you nuts)
    - Switch to keep power on all the time (good luck finding it) or at least a very long auto shut off time (most calculators turn off at 6-12 min of no activity). Beware: Some calculators loose their memory after auto power off.
    - = button in corner (e.g. lower right) to minimize accidentally pressing/bumping the wrong button.

<u>A few usage notes:</u>

1) The calculator MUST HAVE the constant memory operations feature:
(+, MR, =, =, = adds memory contents 3 times to display but leaves memory unaffected).

2) For off course situations, stop with the calculator and write down your car's odo reading at where you turn around and also at where you resume on course. Double the difference between these two numbers which is then your off course mileage. Subtract this number from your written down "resume on course mileage" to get the mileage where you started the off course. Now press -, MR, = and keep pressing = until the DDD matches this mileage. The display now shows the time and mileage at the start of the off course. Then add the off course mileage onto the display (+, off course mileage, =) where off course mileage (in the form of DD.D) is entered as 0.00000DDD (think decimal, 5 zeros, off course mileage) for 10 digit calculator or 0.000DDD (think decimal, 3 zeros, off course mileage) for 8 digit calculator. Now add a pause (+, pause, =) of the amount needed for a delay to get back on time (remember to write the delay amount down on a delay slip for next control). Then press +, MR, = and continue pressing = to match DDD to your present odo and continue timekeeping. This entire procedure can be done without stopping the car.

3) Remember the +, MR, = counts as one of the 0.1mi increments. If you pressed = too many times, just press -, MR, = and continue pressing = until you get it straightened out. Then press +, MR, = when you are ready to continue.

4) There's no limit on how many 4 function calculators you can have (so you can have a 2nd one preset up for the next speed if you like).

5) The accuracy is very high but the resolution is only 0.1 mi. This means speed changes between the tenths will get "averaged out" and so the time will not be exact (like a 0.01 or 0.001 reading odo will

do). It is well worth this trade off, however, for class S or SOP since it is so easy and quick to just keep pressing the = button every 0.1 mi., especially during the final mileage to the control (or to just match your odo when you want a time) as compared to other possibly more accurate methods where there are additions, subtractions, or watches to manipulate which take more time, effort, invite mistakes, and/or can't be done as often. Also the times you get with this method are usually accurate enough to beat all S cars anyway on all local events (and you'll be amazed how close these "averaged out" times are).

6) The display right shifts when it zero blanks the rightmost digits (egg. when the tenths of miles flips over to xx.0 the display right shifts and blanks out the rightmost 0's). This takes some getting used to. I experimented with other ways (reversing time and distance on the display, putting the decimal in the distance instead of the time, etc) but I felt they where all more confusing and had many more drawbacks than this way.

7) With mostly 0.1 mile digital odo cars around this system is very compatible and has gotten more popular.

8) For legs which have only one speed this is a great system. Rene Ruel (SCCA national class S champion) told me he uses this method on nationals for the 1st speed of the leg since it is completely accurate until a speed change. Also because on many events there ends up being only one speed on a leg. Steve Gaddy won the 2001 and 2002 SCCA national class S championship using this system. Additions, subtractions, and watch manipulations all make stock odo rallying miserable and unenjoyable for most people (there are always a couple diehards of course). This system eliminates all that.