

Richta

Simple Rally Computer



User's Guide

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Introduction

The Richta Simple Rally Computer is an application for Android phones and tablets which is useful to perform the calculations in a time-speed-distance road rally such as those sanctioned by the Sports Car Club of America (SCCA – www.scca.org). This software uses the device's GPS to measure mileage.

About the Name Richta

The name Richta (pronounced rik'-ta) is a play on words, combining the designer/author's first name (Rich) with name of the mechanical calculator used in rallying (the Curta calculator). The original Curta calculators were designed by Curt Herzstark and manufactured from 1946 through about 1966.

Several Android and Apple apps are available under this brand name including rally calculators, odometers, and checkpoint clocks.

Precautions

As with any piece of rally equipment, the rally team should be thoroughly familiar and comfortable with the Richta Simple Rally Computer prior to using it in an event.

This app is designed for the use of a navigator in a time-speed-distance road rally. Do not use this app while you are driving the car.

Background

The Simple Rally Computer (SRC) app was written to address the requirement for a rally computer that is inexpensive, simple to learn and use, yet with enough features for the more experienced competitor. The user interface is modelled after the Zeron 660 or 880 rally computer of yore.

Although this version runs on Android phones and tablets, it is hoped a similar version will be developed for Apple products.

Feedback Welcome

Comments, questions, and suggestions for improvement can be sent to rbireta@gmail.com

Quick Reference

This section is intended for a quick introduction to the application for experienced rallyists and intended for quick reference during an event. Appendix A of this document contains a list of set up instructions submitted by experienced rallyist Gary Starr.

Before the Rally:

Turn on Location Services on your device. Turn off Automatic Date and Time (System Settings, Date and Time). Allow the GPS unit to find satellites and to start recording mileage. If you are planning to let the app keep the clock in sync with GPS time automatically, turn this option on (checkbox in Set Clock) and drive at least 10 seconds until you get a value in the GPS delay field in Set Clock.

It is recommended that you turn off Wi-Fi and turn on Airplane mode in order to maximize battery life.

At Registration:

Select Cents or Seconds mode. Check that your clock is coordinated with the official time of the rally.

At the Start of the Odometer Check:

Press Set Odometer and then zero the applications odometer (Zero Odo, Apply). Ensure the Forward/Reverse/Park button reads "Forward".

At the End of the Odometer Check:

Note the reading indicated on the odometer. Select Menu -> Set Odometer Factor. Enter the official mileage from the odometer check into the Official Odometer field and the mileage indicated into the Indicated Odometer field. Apply. Your mileages will now be corrected to match that of the rallymaster.

Starting a Leg:

Remember: Time, Speed, Distance. Press New Leg button. Set the time you are to start the leg, set your odometer to match the starting distance of the leg and set the speed at which you are to start the leg. Apply. Enter the next speed change into the Next Average Speed field.

Changing Speeds:

While driving to the point of the next speed change, enter your Next Average Speed and tap Done. When you reach the point of the speed change, press the Change Speed button. You can now enter the next speed change into the Next Average Speed field.

Pauses (and Gains, and Time Allowances):

Press Pause Button. Enter time for the pause, gain or time allowance. Apply.

Transit Zones:

In some events, you are told to “take 11 minutes to complete instruction 87” with no average speed. Drive to the start of the transit, and change your speed to 0. (0 really means an infinite speed in this app). Take a pause equal to the amount of the transit, 660 seconds or 1100 cents in this example. Apply. Change your speed to the given CAST at the end of the transit zone.

At a Checkpoint:

Press the Split button to record your time as you cross the line. Use this to double check the time you are given at the check point.

Recovering from Going Off Course:

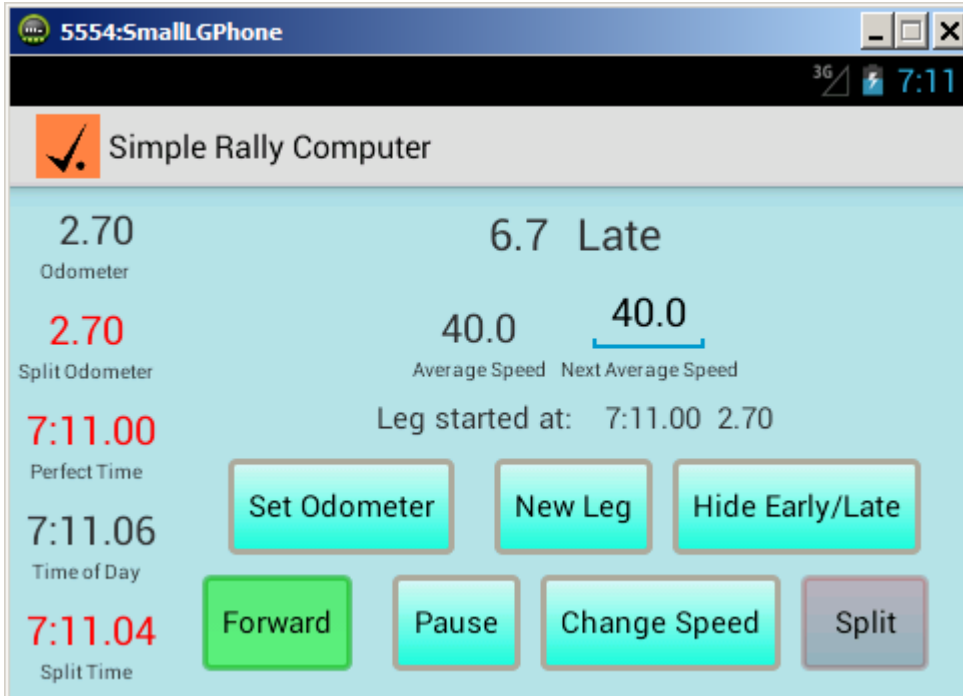
Choose a safe place to turn around. Press the Forward button until it reads “Reverse”. Double back over the course. Note: the Perfect Time will decrement as you drive. When you get back on course press the button now labelled “Reverse” until it reads “Forward”. Take a time allowance and proceed.

Bumping the Odometer:

At times, it may be desirable to slightly adjust the odometer to match the official mileage given. Press the Set Odometer button and match the mileage. Apply. The calculated time is adjusted per the average speed currently set.

Screen Shots and Reference Information

Main Screen



The numbers in the left column are:

Odometer: Your reading of the official mileage.

Split Odometer: Your odometer read at the time the split button was pressed.

Perfect Time: The calculated ideal (perfect) time of day you should be at this point.

Time of Day: The application's opinion of the time of day.

Split Time: The time at which the Split button was pressed. Useful for timing yourself at checkpoints.

There are several buttons which operate on this screen:

Hide/Show Early/Late: Simply blanks the display of whether you are ahead of perfect time or late. (I've had complaints in other applications that one can not turn off the app. This accomplishes that function).

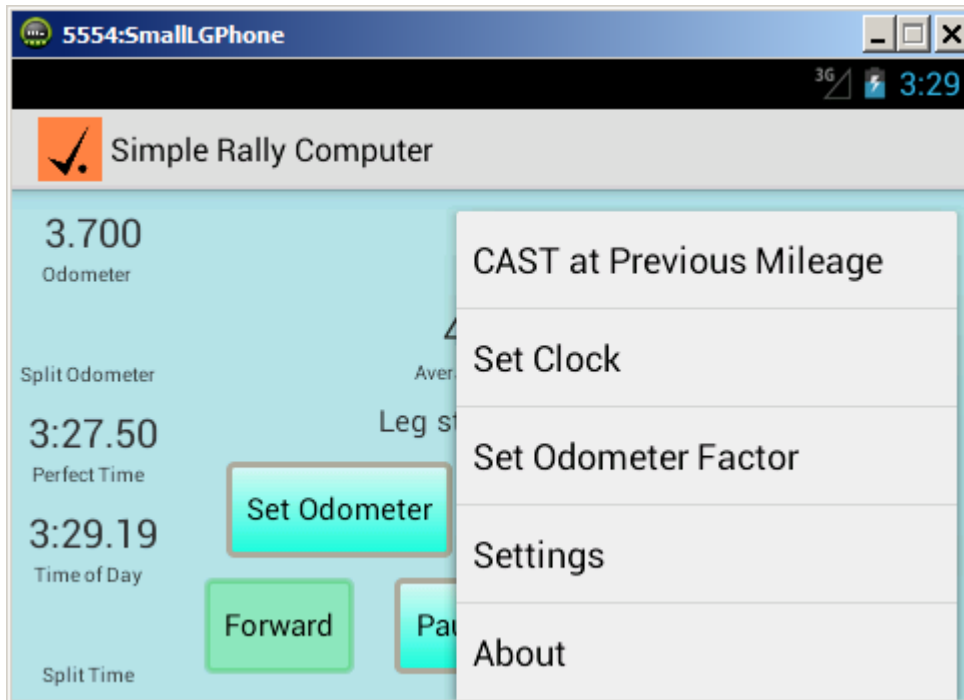
Split: Takes a snapshot of the current time of day, odometer and perfect time and displays them in red..

Forward/Reverse/Park: A sequential button that controls whether the odometer accumulates mileage (Forward), removes mileage (Reverse) or ignores mileage (Park).

The other buttons on this screen are described on the following pages:

Set Odometer (pg. 14)
New Leg (pg. 15)
Pause (pg. 16)
Change Speed (pg. 17)

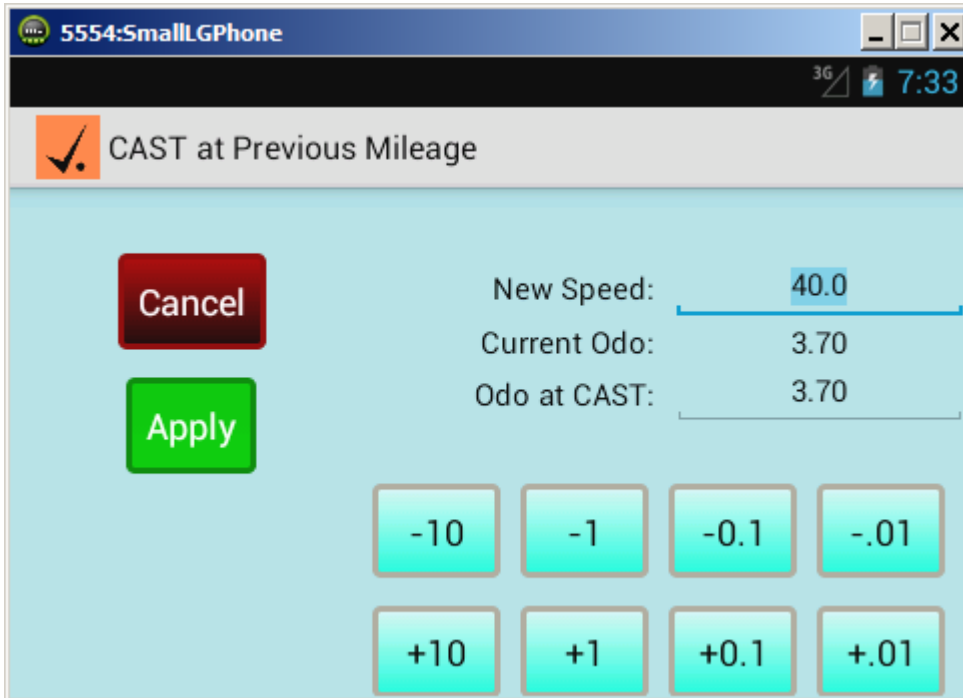
Menu Options



Pressing the Menu button on your device (varies by device) brings up these options.

The About selection displays the version and release of the software. Useful for reporting defects. The other menu option will be discussed on the following pages.

CAST at Previous Mileage



CAST at Previous Mileage is an advanced feature that allows you to correct an action you took without backtracking in the car to correct your error. You can use this screen when you:

- 1) Forgot to change speed at a mileage you have already passed.
- 2) Changed to the wrong speed at the correct location.
- 3) Changed the right speed at the wrong location.
- 4) Changed average speed and you should not have done so.
- 5) Changed the average speed to the wrong speed at the wrong place.

Note: ONLY THE MOST RECENT CAST CAN BE ALTERED (cast value and/or odometer at that cast). Anything else gives unpredictable results.

As an example, assume you are on the rally. At an odometer reading of 10.00 you realize that you should have changed the average speed to 40 at a Stop sign at mileage 8.50. On this screen enter "40" in the field New Speed and "8.50" in the field Odo at CAST. Press Apply. The calculations will be adjusted as if you had originally changed speed to 40 at odometer reading 8.50.

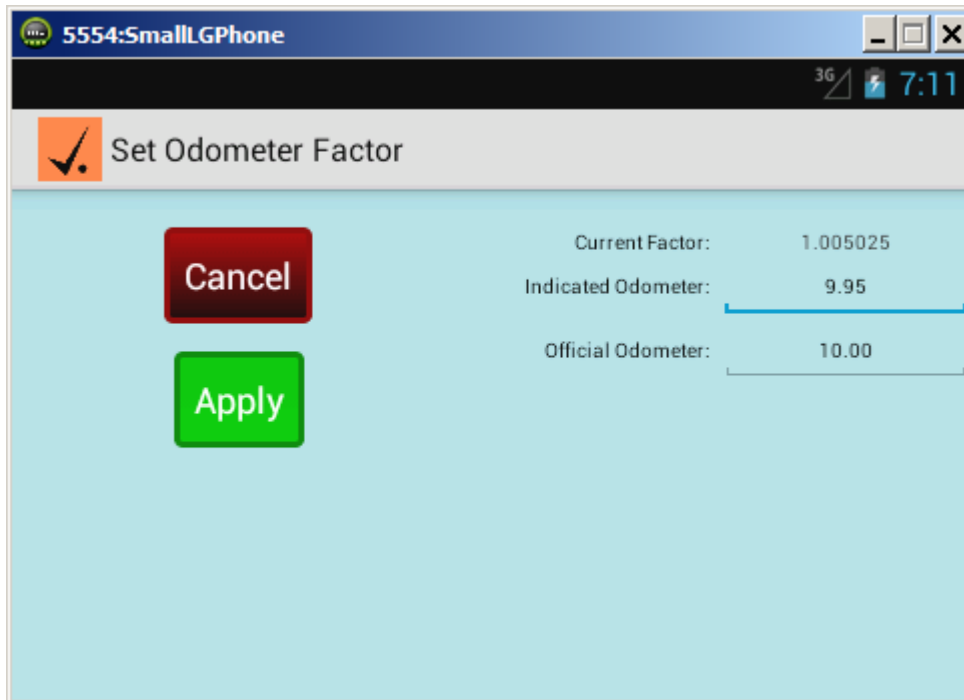
Set Clock



Used to sync your devices clock with the official time. Selecting the checkbox will cause the app to keep the device clock in sync with the time reference from the GPS unit.

Unselecting the box allows you to manually sync your device clock to official time. Use the buttons to adjust the amount of time by which to adjust your clock.

Set Odometer Factor

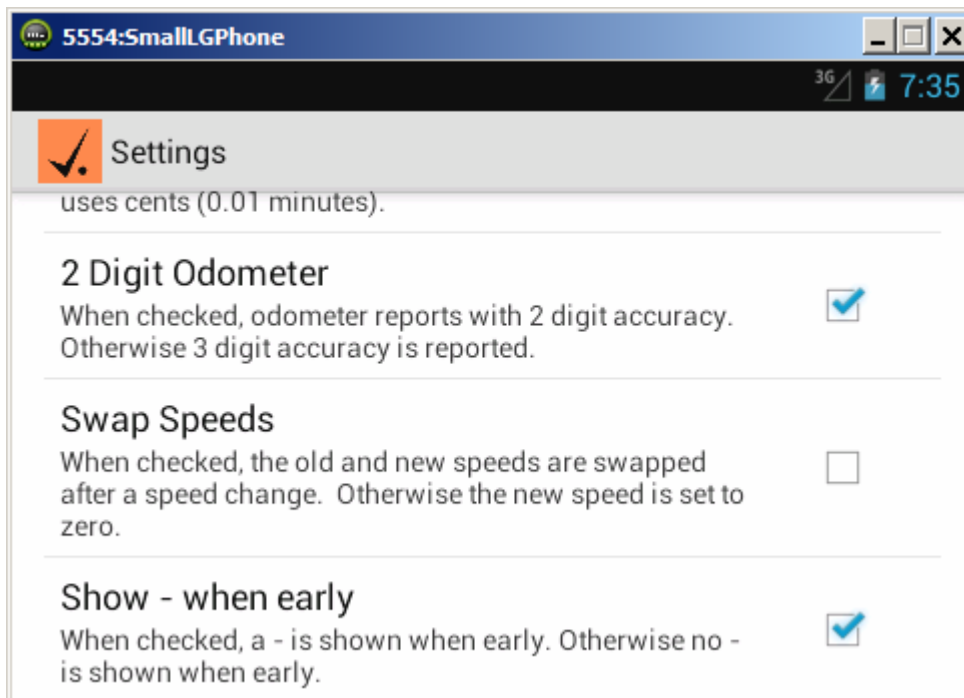
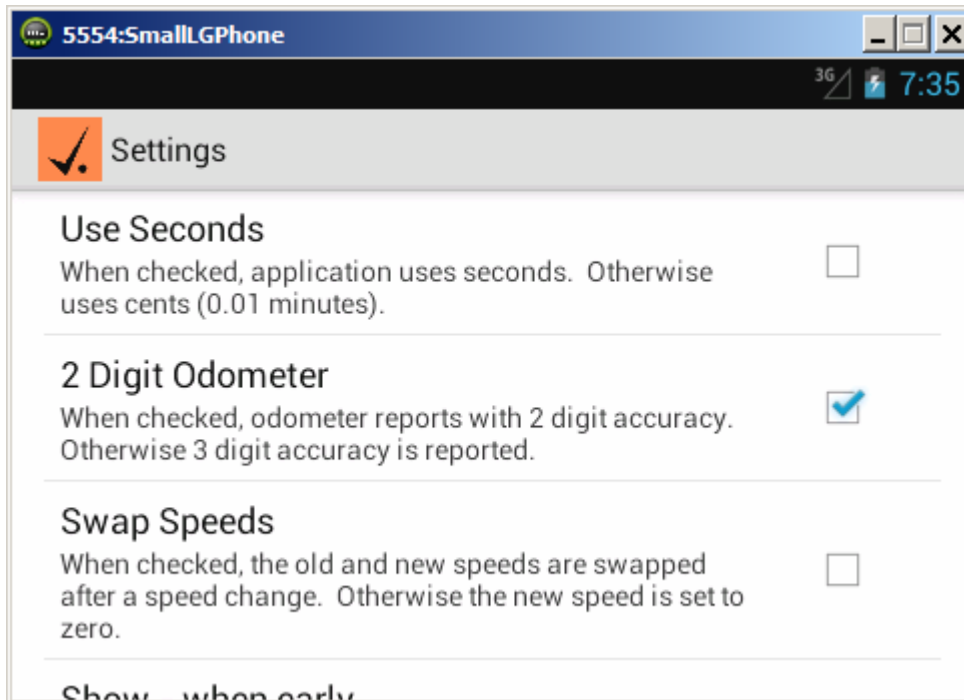


Use this screen to set the indicated and official mileages at the end of the odometer check. The device's odometer will be corrected by this factor.

Leg Review:

(Not yet implemented) Displays a log of the actions you took during each leg of the rally. Useful at the end of the event to figure out where and why your scores deviated from the official times. Also useful for finding any errors the rallymaster may have made in his or her calculations.

Settings



The Settings screen is used to customize the operation of this application. The following Checkbox options are allowed:

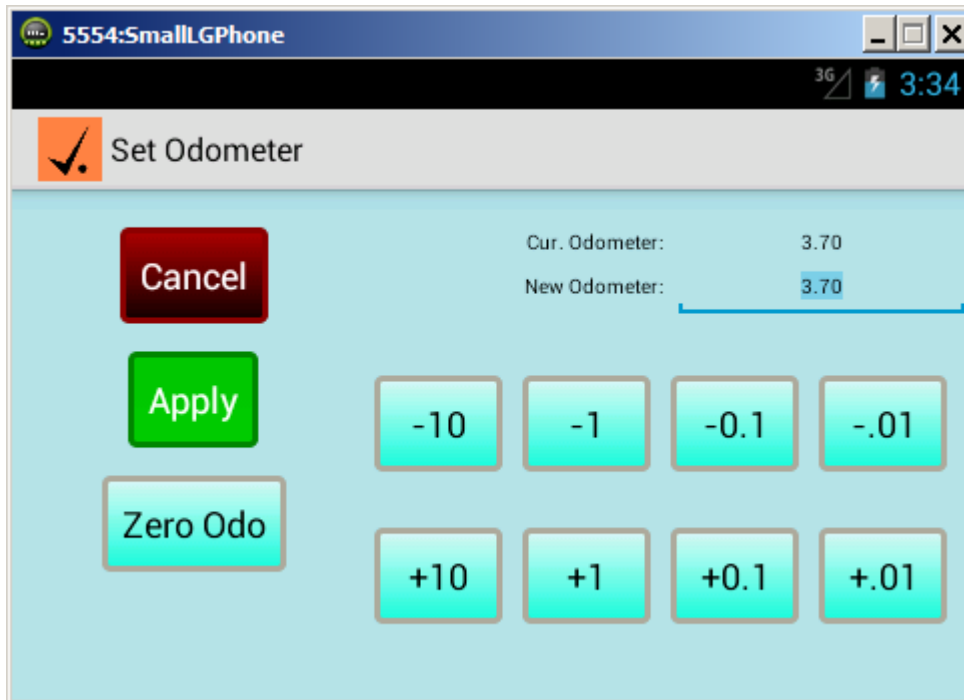
Use Seconds: When checked, the application displays times in the format of HH:mm:ss, where ss is seconds. When not checked, the application displays times in the format of HH:mm.hh where hh is displayed in units of 1/100th of a minute.

2 Digit Odometer: When checked the odometer in the application is shown to the nearest 0.01 mile. When not checked the odometer is shown to the nearest 0.001 mile.

Swap Speeds: When checked the Current Speed is moved to the Next Speed during a speed change operations. When not checked the Next Speed is set to zero after a speed change operations.

Show – when early: When checked a minus sign (“-“) is shown when you are running early. When not checked no minus sign is shown.

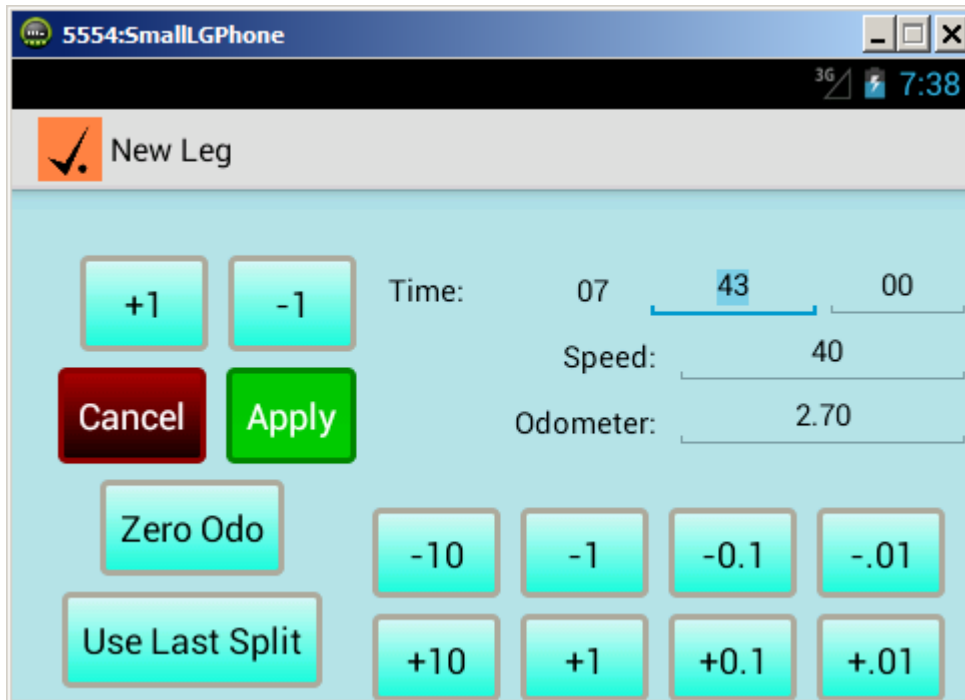
Set Odometer



Use this screen to change your odometer settings. The buttons are used to bump the mileage by the indicated amount.

It is important to note that the Perfect Time is adjusted according to the average speed currently set. If you do not want the ideal time to be adjusted, then change your average speed to 0 before setting the odometer. Remember to change your speed back after setting the odometer.

New Leg



Used at the start of each leg to set the starting time, speed and distance. The +1 and -1 buttons on the top left bump the out time by one minute each time they are pressed. (Both of these buttons will roll the hour forward or back, when appropriate.) The buttons on the bottom right are used to bump the odometer.

The Use Last Split button causes the app to use the most recent split values as the starting time and odometer setting for the new leg. This is useful on events where your arrival time at one checkpoint is the starting time for the next. Simply take a split when you pass the checkpoint and use the Use Last Split on the New Leg screen.

Pause

5554:SmallLGPhone

3G 7:40

✓ Pause, Gain, Time Allowance

Cancel

Apply

Pause(0): _____ cents

Gain(0): _____ cents

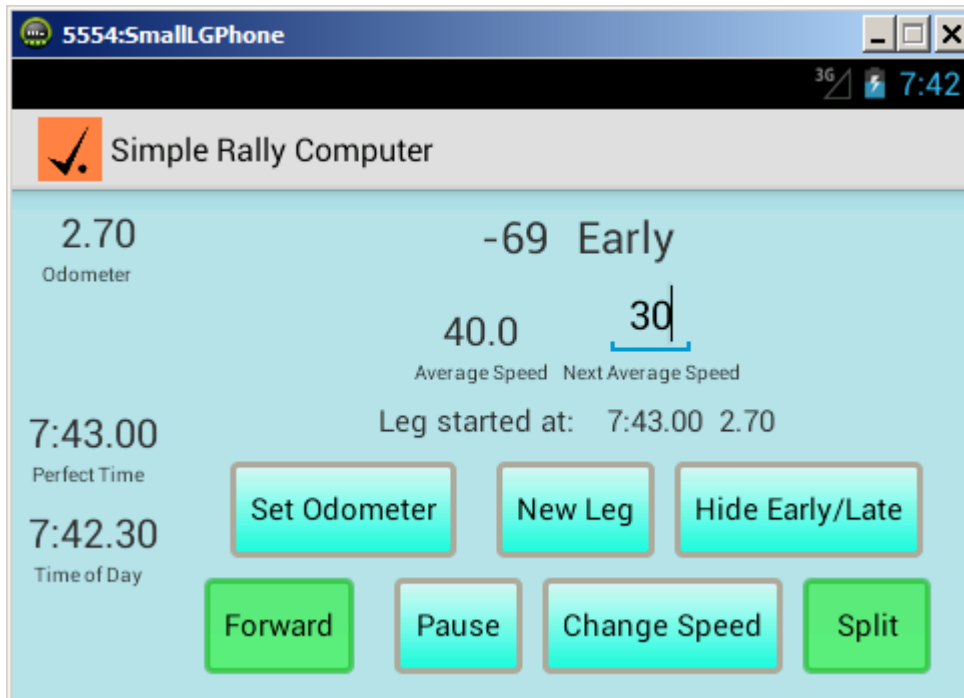
TA(0): _____ cents

-10 min -1 min -10 -1

+10 min +1 min +10 +1

Used to add time to the perfect time (Pause), subtract time from the perfect time (Gain) or to add in a time allowance. The buttons at the lower right only control the amount of the pause.

Change Speed



The speed you are required to average is set on the main screen. The new average speed is pre-entered into the field labelled Next Average Speed, 30 in the example above. When you reach the location at which you are to change speed press the Change Speed button. The Next Average Speed and Average Speed values are swapped if the Swap Speeds setting is set. If not set, the Average Speed is set to the Next Average Speed and the Next Average Speed is set to zero.

Frequently Asked Questions

- 1) This app seems to be locked in landscape mode. How can I change it to portrait mode?

Only landscape mode is supported.

- 2) How does the “Sync with GPS” work?

When enabled, the difference between the time reported in the GPS location messages are collected and the devices clock is adjusted every 10 messages. This amounts to once every 10 seconds with most devices, once per second if using an external GPS receiver such as a Dual 160 or Garmin Glo.

- 3) I'd like to see three significant digits reported in the odometer.

The ability to select three digits was added in 1.11

- 4) Shouldn't a CAST of 0 mean taking an infinite amount of time?

Technically, yes. But the app is coded to treat a CAST of 0 as a “CAST of infinite speed”. Travelling at a CAST of 0 adds no time to the Perfect Time calculation.

- 5) Don't I need to root my device for this app to set the device clock?

Rooting the device is not required. The app doesn't really set the clock. Instead it retains a difference between the device's clock and official rally time and adds this difference before displaying the time of day.

- 6) I do not see logging information.

This function is not yet implemented.

- 7) Will this app drain my battery? How can I maximize battery life? Will I need to charge the device during an event?

To maximize battery life, turn off unneeded radios on your device. This could include Wi-Fi, LTE Data and putting the device in airplane mode. If you are using an external GPS receiver you will need to have the Bluetooth radio on. If you are not using an external GPS receiver you will need to have the GPS (Location) on. Keep the display to the minimum acceptable brightness to maximize battery life. Whether you need to charge your device during an event depends on the specific device and its age. Good practice suggests having a charger available should you need it.

8) The odometer adds mileage when I am standing still. What's going on?

This is an artifact from the GPS radio. Some lesser quality GPS chip sets that are built into phones and tablets display this "jitter effect", where you are told you moved 150 feet one moment, then are told you have moved back the next. This effect is minimized with an external GPS receiver.

9) The app crashes on Android 7.

Android 7 changed the permissions model for applications. On your device start the Settings app, select Applications, select Application Manager, select Simple Rally Computer, select Permissions. Turn on the Location permission.

10) How can I rapidly set the Time of Day in Set Clock?

Set Clock allows you to fine tune the Time of Day clock. To set the time quickly start the Settings app, select Date and Time. Turn off Automatic Date and Time. Select Set Time. Manually set the time. When you release the Done button, the device clock will be set to that time (with the seconds being set to 00).

The specific instructions in the above paragraph can vary with different Android releases and implementations.

Appendix A – How to Set Up the Simple Rally Computer (SRC)

Submitted by Gary Starr – 2/05/2017

- 1) Insure battery is charged. I also recommend car charger be used during the event
- 2) Before launching SRC:
 - a) Turn Location Services on (to high accuracy - GPS)
 - b) Turn off Automatic Date and Time
 - c) Recommend turning Wi-Fi off and Airplane mode on.
- 3) Launch SRC– If the app crashes (“Application Simple Rally Computer has stopped”) see FAQ #9. Android version 6 and later changed the way that application permissions are handled. Permissions are no longer granted at installation time, but instead are checked at run time. The crash is caused because the SRC application does not have the required permissions it needs to read your location via GPS. FAQ#9 describes how to correct this situation.
- 4) Select Cents or Seconds in Settings
- 5) Set Clock to “sync with GPS” if official rally clock uses WWV as the official time reference (note: WWV has same exact time as GPS). Otherwise sync clock to the official rally clock manually. Either way, visually verify it matches official rally clock.
- 6) Select 2 Digit Odometer in Settings
- 7) Select Show Early/Late (to display early/late display)
- 8) Set Forward/Reverse/Park to Forward.
- 9) When ready to begin, follow instructions in Users Guide to do Start Odometer Check, End Odometer Check, Start a Leg, etc. After doing a New Leg or Change Speed, remember to set the Next Average Speed (for the next Cast).
- 10) At controls tap Split at checkpoint sign to verify in-time you get from control workers.

Appendix B - How to re-compute and enter a new Current Factor for Android SRC

Submitted by Gary Starr – 3/22/2017

This appendix describes how to adjust your odometer correction factor during the rally. It assumes you've run the odometer check and set the factor. It is used mid-rally if you find that you want to fine tune the odometer correction factor.

$$\text{Factor_new} = \text{Factor_old} \times ((\text{official_mileage_interval}) / (\text{your_mileage_interval}))$$

Note: You must use mileage intervals rather than the mileage itself. The mileage intervals must be from the section the Factor_old was used - not any previous section where a different (previous) factor was used. You can then set the new Current Factor (in Set Odometer Factor) by setting the Indicated Odometer = 1 and the Official Odometer to Factor_new (when car is stopped). If you're at a point where the mileage also needs to be adjusted to the official mileage (which is usually the case) remember to also adjust it using Set Odometer. You can adjust the mileage before or after setting the new factor as long as you're stopped.

Example:

Your old factor (one still in the SRC that you now want to change) is 1.012345.

During a section where the old factor was being used you had two points where you have both your mileage and the official mileage. Point A: official = 10.11, yours = 10.12; Point B: official = 18.18, yours = 18.22.

$$\begin{aligned} \text{Factor_new} &= \text{Factor_old} \times ((\text{official_mileage_interval}) / (\text{your_mileage_interval})) \\ &= 1.012345 \times ((18.18 - 10.11) / (18.22 - 10.12)) \\ &= 1.0085955 \end{aligned}$$

Now stop the car.

In Set Odometer Factor: Indicated Odometer = 1, Official Odometer = 1.0085955, Apply.
If you're at a point where the mileage also needs to be adjusted to the official mileage (which is usually the case) remember to also adjust it using Set Odometer.

Resume course.

Acknowledgements

The Richta Simple Rally Computer was designed and coded by Rich Bireta. Valuable feedback and field testing were provided by Clarence Westberg, Jim Crittenden, Gary Starr, and Randy Graves. Gary Starr also provided Appendix A.

Software Change Log

0.90 - Initial release for early adopters and tire kickers.

1.11 – January 2017. Significant changes:

- 1) Odometer resolution of 2 or 3 significant digits can be selected in Menu -> Settings
- 2) Time units of seconds or cents can be selected in Menu -> Settings
- 3) A “-“ (minus sign) is displayed in the Early / Late field when you are Early.
- 4) The behavior of the soft keyboard was improved.
- 5) The operation of a speed change at earlier mileage was improved.
- 6) The layouts were improved.
- 7) Labels on the Pause screen were added.
- 8) During a speed change, the former speed is set as the next speed.
- 9) Buttons to add and subtract 1 minute were added to Pause.

1.14 – January 2017

- 1) Correct behave of “Done” button in Set Odometer and Set Odometer Correction
- 2) Correct “Cast at a Previous Mileage” function
- 3) Remove split operation from Time of Day field.

1.21 – February 2017

- 1) Several new options in Settings have been added. You can now toggle the “-“ to be displayed or not before the Early/Late value. You can have the Current Speed and Next Speed swapped after a speed change or have the Next Speed set to 0. You can specify the use of seconds or cents (hundredths of a minute).
- 2) The Seconds/Cents buttons has been removed from the main screen and Pause screens. It has been moved to a Setting.
- 3) Support for passage controls has been added. As you pass a closed, passage control hit the Split button on the main screen. Go to New Leg. Press the Use Last Split button and the split time and mileage will be used as the starting time and mileage for the next leg.
- 4) Minor enhancements:
 - a. The default speed for changing speed at a previous mileage is the current speed.
 - b. The button Start/Start is now Show Early/Late

- c. The documentation has been updated to explain how to rapidly set the time of day and how to correct crashes when running under Android 7.
 - d. Labels for split time and mileage hidden when not in use.
 - e. Two buttons ,+/- 10 min, have been added to Pause.
 - f. Split values are shown in red.
 - g. The Perfect Time is split
 - h. A confirmation is requested when exiting the app.
 - i. Values for starting minute and fraction thereof are edited. An error message is displayed if out of reasonable bounds (i.e. a minute value greater than 60).
 - j. Set Clock: Display tenths of seconds in split times.
 - k. When early or late more than a minute, the Early/Late time is shown as mm:ss.
 - l. Change Speed at Previous Mileage: Zero Odo button removed.
 - m. Set Odometer Correction Factor: the new factor is calculated and displayed immediately as new indicated and official mileages are entered.
- 5) Bug fixes:
- a. Set Clock: Manually adjusted time now updated in real time.
 - b. Change Speed at Previous Mileage: can now do two consecutive operations.
 - c. New Leg: Display of 12 and 1 o'clock hours corrected.
 - d. Change Speed at Previous Mileage: multiple defects corrected.
 - e. The keypad does not display at entry.
 - f. The odometer correction factor calculation has been corrected. The inverse value was used to correct the mileages.

1.30 – May 10, 2017

- 1) Set OCF – the new factor is displayed immediately.
- 2) The size of the current and next speed is increased on tablets.
- 3) The odometer correction factor can now be entered directly.
- 4) New Leg – a decimal point is not allowed in the minutes or cents/seconds field.
- 5) New Leg – entry of a sole decimal point in the odometer field is treated as 0.00
- 6) The New Leg button is moved to the right of the Hide/Show Early/Late button.
- 7) Set OCF – entry of a number with a leading decimal point is allowed.
- 8) The size of the current and next speed is increased to match the odometer.
- 9) Leg start and starting odometer is now persisted.
- 10) The capability to adjust the odometer without affecting the ideal time is added.
- 11) Default values changed for new installations.
 - a. Sync with GPS = true
 - b. Current CAST = 30
 - c. Next CAST = 40
 - d. Show Early/Late = true
- 12) A “+” is shown when early, a “-“ is shown when late.
- 13) A decimal point is displayed in the Early/Late value when using cents.

1.35 – January 14, 2018

- 1) Correct bug that would cause the odometer to miss mileage when not on the main screen.
- 2) Display error message if GPS permission is not enabled.

1.38 – September 28, 2018

- 1) Re-add Appendix B to this document.
- 2) Correct bug reported in New Leg and Set Odometer if the car is moved after The New Leg or Set Odometer buttons are pressed and before the app is returned to the main screen.

Documentation Change Log

Version 1.0 - December 30, 2016

Version 1.14 – January 25, 2017

Version 1.15 – January 26, 2017

Version 1.21 – February 26, 2017

Version 1.30 – May 10, 2017

Version 1.31 – May 10, 2017

Version 1.32 – May 12, 2017 – Added comment in Appendix A regarding app crash.

Version 1.35 – January 14, 2018

Version 1.38 – September 28, 2018