## RallySafe Data Collection Software

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RallySafe Overview:

RallySafe is an innovative vehicle to vehicle communication system that transmits hazard warnings via in-car units in competitive motor sports events such as a rally.

The RallySafe unit is an electronic unit fitted to a vehicle for use by the navigator and driver. It incorporates a full colour display, key pad, accelerometer, a radio transceiver, GPS and Satellite communications capabilities. The RallySafe electronic device utilises satellite technology to automatically transmit warnings and vehicle status data from unit to unit and to Race Control.

The system includes an automated hazard warning generated in the event of an accident. This signal is transmitted immediately to following competitors’ vehicles and race controllers. Each in-car unit indicates a competing vehicle’s speed and location in reference to the designated course.

At race control a web based application displays details of all the vehicles including their location on maps, their status and if they need assistance. Event vehicles such as Zero cars, FIVs and MIVs can also be fitted with RallySafe units to enhance coordination of services.

RallySafe Data Collection Overview:

The RallySafe system is based on a series of GPS location points to trigger the timing and enable safety functions and a poly-line display of the stage on a map. The RallySafe Stage Data Collection program is used to record the location of each GPS point so that a “STAGE” file can be created for use in the car units and the race control room displays. It also logs the stages as a series of points taken every second between the Stage Start and Stage End that can be used to generate poly-lines to show the stages on maps such as Google Maps.
It is critical to the operation of the in-car units that each GPS point is accurate and matches the locations of the points as they are physically set up on the course. For example, the Stage Start GPS point should match where the timing beams or start line is actually placed within a couple of metres.

It’s important to record all the points of the event. For example a competitor may not be required to actually stop at the stage stop point, but the Rallysafe unit needs to know the exact location that they cross the flying finish and then also the stop point / start the transport.

This software package is designed to help gather all the necessary information to set up the stages in the Rallysafe car unit. It is designed to run on Windows based PC’s and requires Windows XP or later operating system. For installation instructions please see the Installation section in this handbook.

Please refer to the diagram on the next page for an example of how we need the stages and transports numbered whilst reading the following.

The first sector in an event is normally a Transport to the first stage. This is Stage 0 and begins with Transport Start (Stop Point/ Transport Start).

Transport finishes at the check-in to the first stage with a Transport Finish.

Special Stage 1 starts at the Stage Start Line and finishes with the Flying Finish.

The next transport is Transport 1. This starts at the Stop Point of Stage 1. This is logged as a Stop Point/ Transport Start and ends at the next Stage check-in.

The next stage is Stage 2, followed by Transport 2 etc.

If a Transport has multiple parts, for example goes from a Stage to a Service Point then onto the next Stage, the first part has the same number as the just completed Stage. The continuation from the Service Park to the next stage would continue with that same previous stage number, but with the letter ‘a’, for example: Transport 2a.

In general, Service points and Refuel points are best left out of the stage file unless it is necessary to record competitor times in and out of them. Transports back to Parc Ferme/Service at the end of day should be included.

A Quiet Zone can be used in a Transport where a speed limit must be observed. A Quiet Zone Start must be followed by a Quiet Zone Finish.

A Restriction Zone can be used in a Stage where a speed limit must be observed. This must be followed by a Restriction Finish.

A Chicane can also be used in a Stage. Once the Speed limit has been achieved the OK to continue at speed is given. Again a Chicane Start must be followed by a Chicane Finish.

SOS points can also be added in a Stage.
Overview of the Controls:
The Getting Started Controls

A series of selection and data entry boxes enable data points to be logged. When first started, the screen has many of the controls hidden. Details as follows:

Before any points can be logged we need to ensure the GPS satellite antenna is connected and has established communication with enough satellites to be accurate.

The first steps are to connect the GPS antenna and place it on the car roof. At the lower right of the screen is the Satellite Comms Port section. In most cases the COM port will automatically find the correct port number for the antenna. The speed of 9600 bps is the standard speed at which the UB-353 antennas work so the next box should not need changing. Click on the Open Port button. The Satellite section should open up and after a short time Satellite Lock should be achieved and the Satellite Lock indicator should go green.
If the wrong port is selected there will be no updates. Simply “Close Port”, reselect and “Open Port”. If there are multiple ports to select between, the easiest way to find which port is correct is to leave the dropdown list in place and unplug the Antenna. It will disappear from the list within 10 seconds. When plugged in it will reappear within 10 seconds.

**Note:** while a good signal is received on the dash of a car, for accurate data collection it is strongly preferred to have the aerial mounted in a clear location (Car Roof).

**The first decision: Data Collection Mode**

The next step is to decide which mode of collection you wish to use so that you can enter a name for your Event at the top of the screen. The Data Collection software can be used in two ways. The first is a Manual mode where you drive to each point to be logged, select or enter the correct Stage Number, Point type, Speed Limit and Name. The other mode, Semi-Automatic, uses a blank STAGES file which contains the four basic points for each of 50 stages as a template. In this mode, you Import the blank STAGES file then update each point as you go and add any extra points that you need. Semi-Auto mode saves a bit of typing, but can become confusing with which lines are done and which not.

If you’re going to use Manual mode, enter your Event name now. If you chose to use the Semi-Automatic mode, click the Import File button, select the “blank STAGES.txt” file. When that loads the Event Name will come up as “blank STAGES” you can then change it to your Event name.

The Event Name should be no longer than the space provided and NOT contain any punctuation other than spaces. The Event Name will be used as the start of the Stage and Log file names. The Event Name cannot be changed once points are logged.

With satellite lock and an Event name entered, all the control buttons should now be visible and useable. You are now ready to record points!
Overview of the Controls:
The Stage Point Description Controls

**Stage number:** The current system requires the first transport to be "Transport 0". This is followed by "Stage 1" and then "Transport 1" etc. Note the Stage Number cannot be changed whilst course logging is running. Use the up/down arrows to change the number.

**Stage Point Type:** The drop-down arrow at the right allows you to pick the appropriate point type.

**Speed Limit:** Default – 255. Sets the maximum speed limit for the next stage or transport. When set at 255 then there is no speed limit applied. A speed limit is essential for Quiet Zone, Restriction and Chicane and is independent of the stage or transport limit.

**Name:** This is the Stage description that will appear on the RallySafe car unit screen during event running, it has a maximum of 18 characters.

**Comment:** A road book or other comment can be entered here or a selection can be made from a predefined list of comments. The Comment List can be modified using the Edit the Comment List button. A sub-window will open with a list of comments. See the Comments Editor Window on Page 13 for further details.

All of the above fields are shown in the Stage File View box (upper right) and logged to a file each time the Record Point, Update Point or Insert Point button is selected.

Overview of the Controls:
The Recording Controls

The Record Point button will add a point to the end of the list of points.

The Update Point button will change the details of the highlighted stage point line to those selected in the Description Controls.
The **Insert Point** button will add a line **before** the currently highlighted stage point line.

The **Delete Line** button can be used to remove a line added in error. Highlight the unwanted stage point line and click the button to remove it.

The **Start Logging**, **Stop Logging** and **Pause Logging** buttons control the poly-line logging of the stage map. Logging is normally started and stopped automatically, but sometimes manual control is needed.

**Using the Controls:**

**Getting into the Detail**

The operation of these four buttons depends on which mode you chose to work in, Manual or Semi-Automatic.

Just recapping, the software creates two outputs, one is a STAGE file containing all the fixed points, the minimum being an Event Start, Checkin, Stage Start, Flying Finish & Stop Point for each stage and an Event End. The other output is a number of files (one per stage) that contain the series of location points taken whilst driving the stage that are used to generate poly-lines for the race control room maps.

**Manual Mode**

In an ideal world, you would start at the Official Start or Parc Ferme, record that point, travel to each stage in turn recording each point and poly-line and finish at the end of the event. As you record each point it will be sequentially added to the display and Stage file and be ready for your use to help make road books and event documentation and for Rallysafe to process for the in-car units and race control software.

In reality the job may be done over several days or not in stage order. This is no problem so long as you end up recording all the fixed points and travelling the stages to generate the poly-line. If the software is closed after a session, the stages file can be retrieved by using the “Import File” button and continued where you left off.

In Manual mode, you will record each point as you get to it, so the **Record Point** button will be the most commonly used.

Travel to each point, enter the correct stage number, select the point type using the drop-down arrow at the right of the box and enter the speed limit if required. The text entered into the Name box is what will be shown at the top of the in-car unit. Our convention is as follows:

- **For a Stop Point/Transport Start write:** Transport to SSx e.g. Transport to SS2
- **For a Transport Finish write:** Checked In SSx e.g. Checked In SS2
- **For a Stage Start write:** SSx The Stage Name e.g. SS2 Big Creek
- **For a Flying Finish write:** Stage Complete
- **For a Chicane, RZ, QZ etc. Start write:** Chicane Start or Rest. Zone Start
- **For a Chicane, RZ, QZ etc. End write the same as the Stage Start** e.g. SS2 Big Creek
- **For Way Points and SOS Points write a short description** e.g. SOS Point 1
Way Points are not commonly used. They allow for things like a special stage where competitors do 2 laps and as such pass the stop point twice. The first time round they pass the point as a Way Point, the second time round the in-car unit looks for the Stop Point.

Comments can also be entered for any point. These are only for reference and not seen in the in-car unit or race control software.

You can now click the Record Point button to add that line to the display & file. Each point is added in sequence in the display & file. The lines in the file can be re-ordered once all the points are logged.

When the Record Point button is pressed for a Stage Start Line, course logging will be automatically started. The trip meters will also be reset and started automatically so you don’t need to use the Start Trip button.

When the Record Point button is pressed for a Stop Point / Transport Start, course logging will automatically be stopped. The trip meters will remain active until you stop or reset them manually, or until stopped and reset at the next Stage Start Line.

If you want to change, add or remove a recorded point after making it, you can use the Update Point, Insert Point or Delete Line buttons.

To change a line, highlight it, change the details to suit and then click the Update Point button to update that line for your event. NOTE that the current location will be put into that line, so don’t use Update Point if you are not at that stage point.

To add extra lines for points such as SOS points to the file, highlight the line that will be after the extra point, select the type of point, update the name and comments etc. and then click the Insert Point button.

The Delete Line button can be used to remove a line added in error. Highlight the unwanted line and click the button to remove it.

The Pause Logging button pauses the continuous logging of the vehicle location that is used to generate polylines of the stages on maps. A green Logging Course light above the button will blink whilst logging as long as GPS updates are received. When it is paused it will blink red “Logging Paused” and the button name changes to Restart Logging.

The Pause Logging button should only be used if you need to stop for a long time whilst travelling the stage or if you want to divert off the stage for some reason, such as to look for a good road to get FLV / MIV’s into the middle of a stage. If the logging is paused as you go off stage, it should be resumed at the same place when you come back to continue on stage.

A partially built STAGE file can be imported back into the program using the Import file button. This can also be used for checking a course and confirming accuracy. The stage files are located in the C:\RallySafeStageCreationData\ folder. The file name will be made up of the Event Name plus the following “-STAGE file.txt”
The Trip Meters give you one that starts automatically at the start of stage and one that can be reset to give distance between points.

If a stage is repeated the coordinates can be copied over when the Stages file is built, you don’t have to drive it twice.

A quick example of a basic session in stage order in Manual Mode

- Start at the Parc Ferme
- Connect the antenna
- Start the software
- Open the Coms port
- Enter an Event Name
- Set Stage 0
- Select a Transport Start (Stop Point / Transport Start)
- Enter a Name (eg. Transport to SS1), Record Point
- Travel to SS1 Check In, select Transport Finish, Name - Checked In SS1, Record Point
- Travel to stage 1 start line, select Stage Number 1, select Stage Start Line, enter the stage Name (eg. SS 1 Pioneer), Record Point
- Travel to the flying finish point, Name – Stage Complete, Record Point
- Travel to the stage stop point, Name - Transport to SS2, Record Point
- Travel to the end of transport 1, select Transport Finish, Name - Checked In SS2, Record Point
- Travel to stage 2 start line, select Stage Number 2, select Stage Start Line, enter the stage Name (eg. SS 2 Ada Creek), Record Point
- etc….  

Semi-Automatic Mode

If you haven’t done so, please review the Manual Mode section before reading this section.

Semi-Automatic mode uses a blank STAGES file which contains the four basic points for each of 50 stages as a template. In this mode, you Import the blank STAGES file then update each point as you go and add any extra points that you need.

The blank STAGE file is imported into the program using the Import file button. The blank stage file is called “blank STAGES.txt” and located in the C:\RallySafeStageCreationData\ folder. When it loads the Event Name will come up as “blank STAGES” you can then change it to your Event name.

The process is similar to Manual Mode, but in Semi-Auto Mode you need to travel to each point (not necessarily in order) highlight the point, update the speed limit, name and any comments then click the Update Point button.

**NOTE: DO NOT** use the Record Point button in Semi-Automatic mode.

If you want to add or remove a recorded point after making it, you can use the Insert Point or Delete Line buttons.
To add extra lines for points such as SOS points to the file, highlight the line that will be after the extra point, select the type of point, update the name and comments etc. and then click the Insert Point button.

The Delete Line button can be used to remove a line added in error. Highlight the unwanted line and click the button to remove it.

The Pause Logging button pauses the continuous logging of the vehicle location that is used to generate polylines of the stages on maps. A green “Logging Course” light above the button will blink whilst logging as long as GPS updates are received. When it is paused it will blink red “Logging Paused” and the button name changes to Restart Logging.

The Pause Logging button should only be used if you need to stop for a long time whilst travelling the stage or if you want to divert off the stage for some reason, such as to look for a good road to get FIV / MIV’s into the middle of a stage. If the logging is paused as you go off stage, it should be resumed at the same place when you come back to continue on stage.

A partially built STAGE file can be imported back into the program using the Import file button. This can also be used for checking a course and confirming accuracy. The stage files are located in the C:\RallySafeStageCreationData\ folder. The file name will be made up of the Event Name plus the following “-STAGE file.txt”

The Trip Meters give you one that starts automatically at the start of stage and one that can be reset to give distance between points.

A quick example of a basic session in stage order using a (Blank stages file) Semi-Auto mode

- Start at the Parc Ferme
- Connect the antenna
- Start the software
- Open the Coms port
- Load the Blank stages file (Import file)
- Enter the Event Name
- Select the first line in the Stage View Box
- Update the Name & Speed Limit if required (eg. Transport to SS1), Update Point
- Travel to SS1 Check In, select the next line in the Stage View Box, Update Point
- Travel to Stage 1 start line, select the Stage Start line in the Stage View Box, update the stage Name (eg. SS 1 Pioneer), Update Point
- Travel to the flying finish point, select the Flying Finish line in the Stage View Box, Update Point
- Travel to the stage stop point, select the Stop Point line in the Stage View Box, Update Point
- Travel to the end of transport 1, select the Transport Finish line in the Stage View Box, Update Point
- Travel to Stage 2 start line, select the next Stage Start line in the Stage View Box, update the stage Name (eg. SS 2 Ada Creek), Update Point
- etc....
The Output of your Work:
The data is logged as a text file into the folder:

"C:\RallySafeStageCreationData\"

The STAGE file name will be made up of the Event Name plus the following “-STAGE file.txt”

e.g. C:\RallySafeStageCreationData\Test Event One-STAGE file.txt

The Log Course files (stage poly-line files) will be written to the same folder in ‘csv’ format with a similar name including the event name, stage number and date. There will be one file per stage logged.

e.g. C:\RallySafeStageCreationData\Test Event One-Stage-1-2012-06-20.csv

When you have completed gathering the stage data, please email the files to RallySafe. The Email Results button will send a copy of all the files in the folder directly to the email address: data@rallysafe.com.au. You must be connected to the Internet, but it does not need to use your email program to do this. You don't need to attach the GPS antenna or import the stage file back in if you have just re-opened the program to email the files. It will take a short time to gather all the files, attach them to an email and send it to us. When it is complete is will display the following message box.

Checking a Stage File:

Once the Stage file has been built it can be checked on a map for general conciseness but the course needs to be driven to confirm all coordinates.

To check a file, use the Import file button to load it back into the program.

Select a point in the Stage View Box and the distance to that coordinate is shown in the Coordinates information window below. It will also show the approximate direction to travel to get to that point.
**The Comments Editor Window**

To Add a new comment to the list, type it in the top box and click the Add button. The new comment will be added at the bottom of the list.

To Sort the comments, highlight a comment that you would like to move and use the Move Up and Move Down buttons to place the comment where you would like it.

To Edit a comment, highlight the comment that you would like to change, it will appear in the second box from the top. Make your changes in that box and then click Edit to update it in the list.

Note: You can’t make a second edit of the same comment in the box after you have clicked the Edit button. If you want to make a second change to the same comment, click to highlight the comment in the list again.

To Remove a comment, highlight the comment that you would like to delete and click the Remove button.

To close the window, click the Save and Close Window button.

After making edits, click the Refresh Comment List button on the main screen to make the modifications available.
**Install Procedure**

This software requires Windows XP, Windows Vista, Windows 7 or Windows 8 Desktop, a free USB port and the use of a USB GPS Antenna, Type UB-353.

**To load the software and operate:**

To install software for the UB/BU-353 USB GPS aerial:

Insert disk and select “Windows USB driver”. No other programs are required for the aerial.

To Install the RallySafe Software:

If you downloaded the software, unzip the file “RallySafeDataCollection.Zip” into a temporary folder.
Run the “Setup.exe” in this folder or the Installation CD provided.

The setup will check to see if “Microsoft .NET FrameWork V4” is installed. If not it will request approval to install. This will be downloaded from Microsoft and installed first.

A Start Menu& Desktop Icon will be installed to allow the RallySafe Data Collection to be run.

The first time the program is run a folder will be created on the hard drive named C:\RallySafeStageCreationData\ that is used to hold all the files as they are created.
A copy of the “blank STAGES.txt” template file and the “Comments.txt” file will be written into this folder at the same time.

**Version Number:**
If you click on the Rallysafe logo, the build date for the software you are using will be shown.

**To Update or Uninstall the RallySafe Simulation Software:**

To update to a new version of the software, the old version must be removed before the new version can be installed.

To uninstall the software, use Windows Control Panel / Programs & Features / Uninstall (Windows 7/8) or Windows Control Panel / Add & Remove Programs / Uninstall (Windows XP).

Your existing data files will remain in the C:\RallySafeStageCreationData\ folder.
Hints, Tips and FAQ’s

If you stop for some time whilst in a Stage or Transport it is good to Pause the logging so that the map line files don’t contain too much redundant data. Don’t worry too much if you don’t Pause the logging as you are setting out stage points or go back and forth looking for the best spot to locate a Stage point. It is far better to have some extra redundant data than to forget to Restart the logging and miss some. The redundant data can be relatively easily removed in the RallySafe office.

If your blank STAGES template file gets accidentally overwritten, rename or delete the file blankSTAGES.txt in the C:\RallySafeStageCreationData\ folder and restart the program. The program will write a fresh copy to the folder.
### Example of a completed STAGES.txt file

<table>
<thead>
<tr>
<th>Seq</th>
<th>Stage</th>
<th>Point</th>
<th>Latitude</th>
<th>Longitude</th>
<th>Speed</th>
<th>Screen Display</th>
<th>Comments</th>
<th>Trip</th>
<th>Trip</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>TS</td>
<td>-41.163994</td>
<td>146.162433</td>
<td>255</td>
<td>Transit to Event</td>
<td>Trevor St Intersection</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>TF</td>
<td>-41.168836</td>
<td>146.164059</td>
<td>255</td>
<td>Checked in SS1</td>
<td>Off Ramp from Lovett St</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>SS</td>
<td>-41.166328</td>
<td>146.161524</td>
<td>255</td>
<td>SS1 West One</td>
<td>Off Ramp</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>CS</td>
<td>-41.160077</td>
<td>146.149785</td>
<td>90</td>
<td>Chicane Start 90K</td>
<td>End of Armco</td>
<td>1.23</td>
<td>1.23</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>CF</td>
<td>-41.158372</td>
<td>146.148072</td>
<td>255</td>
<td>SS1 West One</td>
<td>At Sign</td>
<td>1.47</td>
<td>1.47</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>SF</td>
<td>-41.154991</td>
<td>146.143928</td>
<td>255</td>
<td>Stage Complete</td>
<td>Start of Fence</td>
<td>1.98</td>
<td>1.98</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>TP</td>
<td>-41.153958</td>
<td>146.140539</td>
<td>255</td>
<td>Trans to SS2</td>
<td>End of Fence</td>
<td>2.3</td>
<td>2.3</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>TF</td>
<td>-41.152283</td>
<td>146.13994</td>
<td>255</td>
<td>Checked In SS2</td>
<td>Roundabout</td>
<td>2.75</td>
<td>2.75</td>
</tr>
<tr>
<td>9</td>
<td>2</td>
<td>SS</td>
<td>-41.153587</td>
<td>146.14185</td>
<td>105</td>
<td>SS2 East 105KPH</td>
<td>End of Divide</td>
<td>2.98</td>
<td>2.98</td>
</tr>
<tr>
<td>10</td>
<td>2</td>
<td>SF</td>
<td>-41.165224</td>
<td>146.159357</td>
<td>105</td>
<td>Stage Complete</td>
<td>End of Armco</td>
<td>1.94</td>
<td>1.94</td>
</tr>
<tr>
<td>11</td>
<td>2</td>
<td>TP</td>
<td>-41.165915</td>
<td>146.164324</td>
<td>255</td>
<td>Trans to Service</td>
<td>Intersection</td>
<td>2.41</td>
<td>2.41</td>
</tr>
<tr>
<td>12</td>
<td>2</td>
<td>TC</td>
<td>-41.16439</td>
<td>146.163653</td>
<td>255</td>
<td>Checked in Service</td>
<td>Glazing driveway</td>
<td>2.94</td>
<td>2.94</td>
</tr>
<tr>
<td>13</td>
<td>2</td>
<td>TC</td>
<td>-41.16439</td>
<td>146.163653</td>
<td>255</td>
<td>Out - Trans to SS3</td>
<td>Glazing driveway</td>
<td>2.94</td>
<td>2.94</td>
</tr>
<tr>
<td>14</td>
<td>2</td>
<td>TF</td>
<td>-41.166343</td>
<td>146.168219</td>
<td>255</td>
<td>Checked in SS3</td>
<td>Off Ramp</td>
<td>3.52</td>
<td>3.52</td>
</tr>
<tr>
<td>15</td>
<td>3</td>
<td>SS</td>
<td>-41.16649</td>
<td>146.169421</td>
<td>255</td>
<td>SS3 East Two</td>
<td>Third Light pole</td>
<td>2.74</td>
<td>2.74</td>
</tr>
<tr>
<td>16</td>
<td>3</td>
<td>WP</td>
<td>-41.158855</td>
<td>146.196929</td>
<td>255</td>
<td>SS3 Way Point 1</td>
<td>Way Point at Roundabout</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>3</td>
<td>SP</td>
<td>-41.158624</td>
<td>146.214556</td>
<td>255</td>
<td>SS3 SOS Point 1</td>
<td>SOS point at Weighbridge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>3</td>
<td>SF</td>
<td>-41.162667</td>
<td>146.226857</td>
<td>255</td>
<td>Stage Complete</td>
<td>Start of Off-Ramp</td>
<td>2.46</td>
<td>2.46</td>
</tr>
<tr>
<td>19</td>
<td>3</td>
<td>TP</td>
<td>-41.162619</td>
<td>146.231438</td>
<td>60</td>
<td>Trans to SS4 60KPH</td>
<td>At turning circle</td>
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<td>3</td>
<td>TF</td>
<td>-41.162958</td>
<td>146.22227</td>
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<td>Stubbs Road</td>
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<td>SS</td>
<td>-41.162671</td>
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<td>SS4 West Two 80KPH</td>
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<td>SF</td>
<td>-41.159461</td>
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<td>Kimberleys Rd</td>
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<td>SS</td>
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