The ChassisSim Process made Simple

The purpose of this document is to introduce you to the ChassisSim process or way of doing things. Starting to use something like ChassisSim can be a little daunting. The biggest obstacle is how do you do things, and the order in which you should do things. Once this is in place you'll find that things will have a funny habit of working themselves out. Also for best results follow the following to the letter.

Step – 1 : Directory Structure

When getting rolling with ChassisSim you need a Directory structure. This is a place where you will put your car files, your monster files and your circuit files as you are refining them. To this end the following structure is suggested,

C:\ChassisSim Technologies\Models\Car Name\Circuit\Event.

So for example if you have an F3 car for instance and you ran it at the April 2012 Test at Sebring, the directory structure I would suggest is,
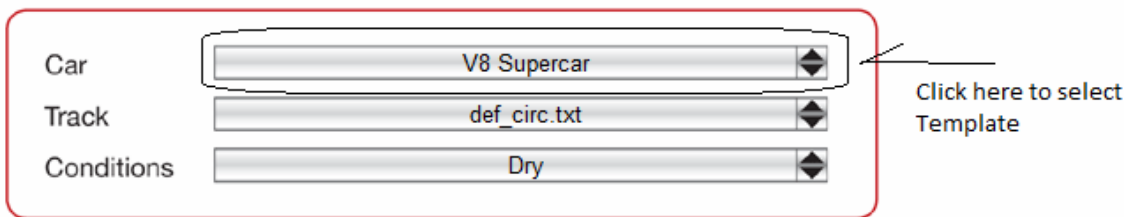
C:\ChassisSim Technologies\Models\F3\Sebring\April_Test_2012

Also the ChassisSim Technologies folder is suggested for the following reasons,
- It locates everything ChassisSim in the same directory.
- There will be no problem with folder permissions and writing temp files

Step – 2 Select an appropriate template and modify it.

The next step is to select a template that most closely resembles your car. You are doing this because it ensures you are adjusting a well sorted model rather than starting from a blank sheet of paper. This is selected from the Car drop down box on the left hand side. This will display the following dialog,
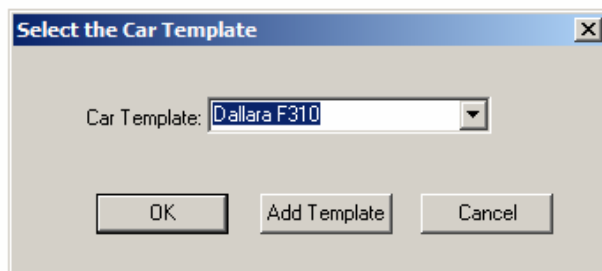
Once you have selected this go to File->Save As and save it in the directory we discussed in Step – 1 and work through the ChassisSim quickstart guide CSim_std_qstart.pdf to put in your vehicle setup.

Step – 3: Create the Monster file

The monster file is a text tab delimeted file that links the data to the simulation model. It is exported at 50 Hz from a flying lap of data and it looks like this,

Without loads,

0	7392.94	-0.03	0.1	4.65	4.87	5.51	5.57	0	100	207.92
1.174	7395.56	-0.03	0.11	5.01	4.58	5.16	4.72	0.03	100	207.99
2.346	7398.33	-0.02	0.11	5.08	4.85	5.98	6.57	0.06	100	208.07
3.52	7401.26	-0.02	0.12	4.83	4.81	10.52	11.16	0.08	100	208.15
4.693	7404.28	-0.02	0.12	3.93	3.96	13.22	13.3	0.09	100	208.24
5.867	7407.27	-0.02	0.12	4.07	3.72	12.74	12.42	0.1	100	208.32
7.042	7410.23	-0.02	0.12	6.22	5.88	13.07	12.63	0.06	100	208.4
8.217	7413.14	-0.03	0.12	5.77	5.69	11.26	11.23	0.02	100	208.49
9.392	7416.04	-0.03	0.12	5.52	5.44	10.26	10.61	-0.01	100	208.57
10.568	7418.92	-0.03	0.11	7.27	6.85	11.73	11.65	-0.03	100	208.65
11.744	7421.78	-0.04	0.11	7.36	6.88	12.43	11.88	-0.03	100	208.73
12.921	7424.61	-0.05	0.11	5.72	5.62	10.39	10.2	-0.01	100	208.81
14.098	7427.42	-0.05	0.11	5	5.05	8.36	8.39	0.01	100	208.89
15.276	7430.27	-0.05	0.11	6.46	6.37	8.75	8.48	0.03	100	208.97
5865.339	7392.94	-0.03	0.1	4.65	4.87	5.51	5.57	0	100	207.92

With loads the file looks like

```
0      7392.94  -0.03 0.1      4.65  4.87 5.51 5.57  0 100   207.92 166.98 157.86 216.53
       202.85
1.22   7392.94  -0.03 0.1      4.65  4.87 5.51 5.57  0 100   207.92 166.98 157.86 216.53
       202.85
4.55   7392.94  -0.03 0.1      4.65  4.87 5.51 5.57  0 100   207.92 166.98 157.86 216.53
       202.85
```

Please note the distance vector needs to have at least 2 decimal places. This is very important.

You will find further information in the document CSim_monster_file_creation.pdf in the help directory.

Step 4: One Touch Modelling features

The one touch modelling feature will provide a first pass of the aeromap and the tyre parameters. If the template is very well sorted, such as the Dallara F310 template this step can be omitted. However if they do need to be completed the document CSim_modelling_in_minutes.pdf will start you of. Also the following tutorials will be useful,

http://www.youtube.com/watch?v=3ottoIu2nIQ&list=UU4W7Lqv3XrQps-RlcR4fEOA&index=2&feature=plcp

and to help dial in the results,

http://www.youtube.com/watch?v=fOf28KwBtpc&list=UU4W7Lqv3XrQps-RlcR4fEOA&index=1

Remember to save the model.

Step 5: Circuit Creation

Once we have a representative model we can now create the circuit. This is covered in the document - CSim_track_creation.pdf . The following tutorial will also be useful,

http://www.youtube.com/watch?v=1ROgqDSousQ

Step 6: Read!

In the ChassisSim help directory you will find the following quick start guides. Read them in this order
1) CSim_std_qstart.pdf
2) CSim_monster_file_creation.pdf
3) CSim_modelling_in_minutes.pdf
4) CSim_track_creation.pdf

5) CSim_aero_model_creation.pdf
6) CSim_tyre_model_quick_start_guide.pdf
7) CSim_tyre_modelling_toolbox_guide.pdf

Some of these we have covered in this document. In summary Documents 1-4 get you going with a solid model you can do beginner to intermediate level work on. Documents 5-7 deal with the advanced modelling features of ChassisSim.

Conclusion

As we can see it's actually a simple and straight forward affair to setup up a ChassisSim model. The process is

- Create your directory structure.
- Choose a template closest to your car and modify it and save the car file
- Create the monster file.
- Run the 1 touch modelling features.
- Create the circuit model.

If you do all these steps you will have a solid car model you can run simulations. It will also serve as the foundation for you to do more advanced modelling as covered in the more advanced quick starts.