



USING BUILD SCENARIO

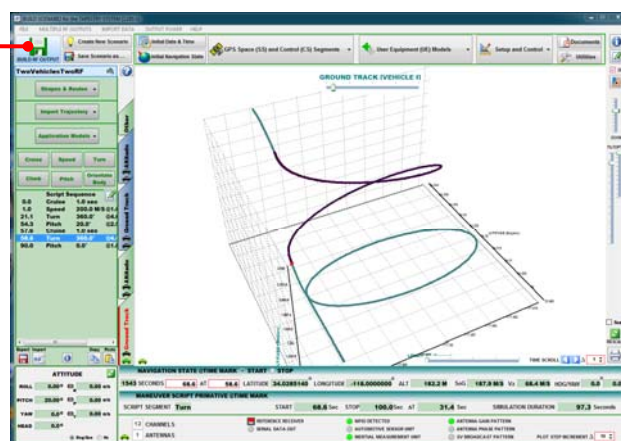
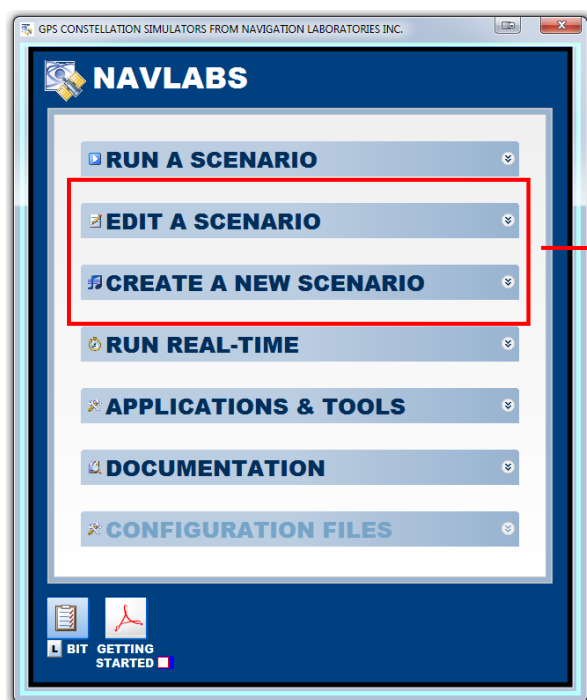
BUILD SCENARIO for the Tapestry System is the Windows Application that constructs and maintains the Scenario Data Base in its entirety.



Access **BUILD SCENARIO** from **TAPESTRY SHELL** on the computer desktop. The **BUILD SCENARIO** Main Form encapsulates all of the functions you will need to productively use the simulator.

The build number can be found in the main pull down menu **Help | About** or on the Main Form title bar.



For additional reference, this document, and other useful documents can be found in:
C:TAPESTRY\DOCUMENTATION



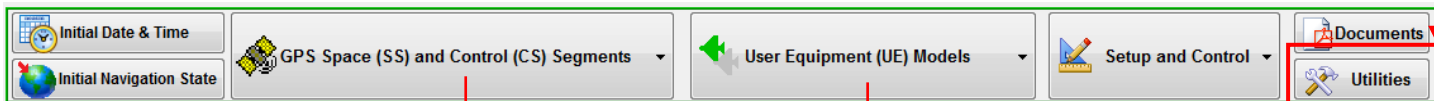
A word about Color Schemes: Tapestry is a multi-RF/Multi-Vehicle system. To keep track of the current vehicle and its models, the ICON  identifies Vehicle I and  Vehicle II. Forms that apply to specific vehicle match the color of the ICON. A Grey form applies to both Vehicles – such as Simulation Start Time .

BUILD SCENARIO MAIN FORM

There are five group-together elements of the **BUILD SCENARIO** Main Form. The **Users Guide** is organized according to these groupings –  to hot link.

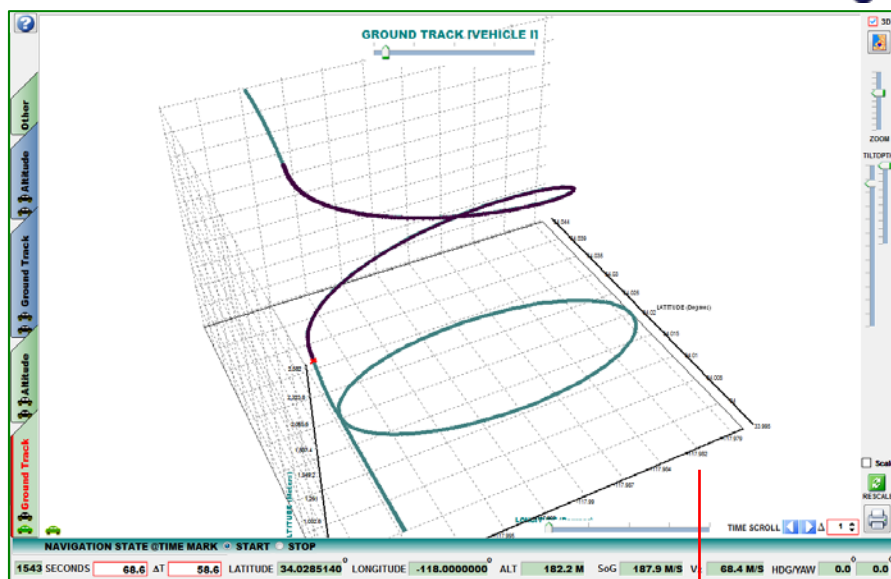
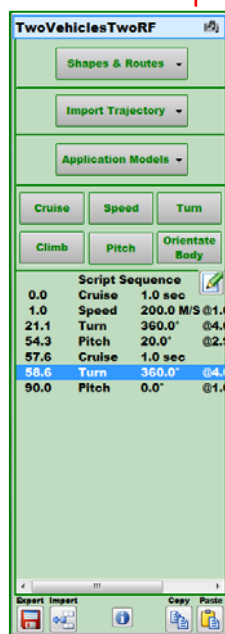


 **TOOL BAR** (PG. 2)



VEHICLE MOTION PANEL

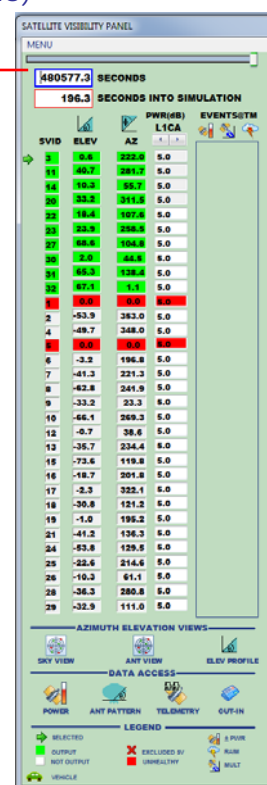
(PG. 9)



 **PLOTTING PANEL** (PG. 19)

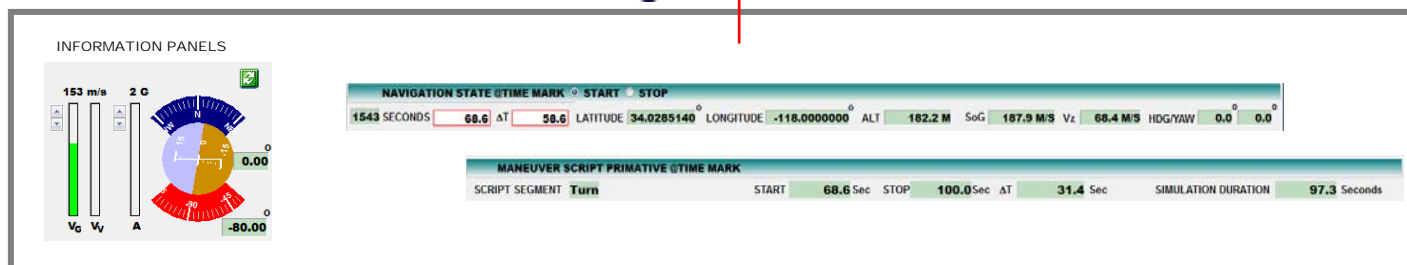
SATELLITE PANEL

(PG. 23)



SVID	ELEV	AZ	PWR(dB)	L1CA	EVENTS(TM)
1	8.8	322.8	5.0		
11	46.7	261.7	5.0		
14	19.2	55.7	5.0		
20	39.2	317.8	5.0		
27	18.4	187.8	5.0		
28	25.3	216.5	5.0		
30	26.5	104.5	5.0		
36	5.0	44.5	5.0		
37	1.1	1.1	5.0		
38	44.3	138.4	5.0		
40	87.1	1.1	5.0		
41	0.0	0.0	5.0		
2	-53.9	263.0	5.0		
3	-49.7	348.0	5.0		
4	-49.7	0.0	5.0		
5	-41.3	321.3	5.0		
6	-42.8	241.9	5.0		
9	-33.2	23.3	5.0		
10	-46.1	269.3	5.0		
12	-0.7	38.6	5.0		
13	-35.7	234.4	5.0		
15	-73.6	119.8	5.0		
16	-18.7	201.8	5.0		
17	-2.3	322.1	5.0		
18	-30.8	121.3	5.0		
19	-1.0	195.2	5.0		
21	-41.2	126.3	5.0		
24	-53.8	129.5	5.0		
25	-22.6	214.6	5.0		
26	-10.3	61.1	5.0		
28	-36.3	280.8	5.0		
29	-32.9	111.0	5.0		

SUMMARY PANELS





BUILD RF OUTPUT

Scenarios must be BUILT before they can be Saved, Edited, or Run. Select this ICON to present the BUILD SUMMARY PANEL



MCODE, L2C, L5 set to MODERNIZED, otherwise LEGACY.



BUILD SCENARIO CONFIGURATION SUMMARY

OPERATIONAL PARAMETERS SUMMARY

SIMULATION START TIME: 1643 66674.0 Seconds
 SIMULATION DURATION: 63.0 Seconds
 RF OUTPUTS: 1
 REFERENCE RECEIVER ENABLED: ☒

GPS LINK CONFIGURATION

LINK: L1 CA, L1 P, L1 M, L1 Y, L2 CA, L2 P, L2 M, L2 Y, L2 C, L5
 FIRMWARE MEMORY MODEL: LEGACY

ANTENNA MODELING SUMMARY

UE POWER-PATTERN ENABLED: ☒
 UE PHASE-PATTERN ENABLED: ☒
 SV POWER-PATTERN ENABLED: ☒
 SLANT RANGE POWER LOSS: ☒

SENSOR OUTPUT SUMMARY

MFO DETECTED: ☒
 BUILD INERTIAL MEASUREMENT DATA: ☒
 BUILD AUTOMOTIVE DATA: ☒
 BUILD SERIAL OUTPUT DATA: ☒

TIME-LINE EVENT SUMMARY

MULTIPATH EVENTS ENABLED: ☒
 RAIM EVENTS ENABLED: ☒

c:\Tapestry\runs\LN200TEST FINISH

GREEN: ENABLED / <CLK> DISABLE

From the SUMMARY PANEL you may verify the initial condition, the number of hardware channels, the frequency links generated, and the configuration of the attached Sensors.

When satisfied, press NEXT.

1. The Scenario Data Base is created in it's entirety.
2. The *just-built* data base is saved.
3. Temporary files are deleted from the Scenario Folder.
4. The Scenario is ready to be RUN.

To QUIT and restore the Scenario to *how-it-was*, use **FILE | Quit** or Windows **Close**.

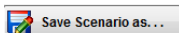


CREATE NEW SCENARIO

Operationally, a **Scenario** is a folder within Windows located off of **c:\Tapestry\Runs**. When a new **Scenario** is created, the contents of the *Default Scenario* are copied into the folder associated with the new Scenario¹.

To create a new Scenario, use the Create-Scenario Wizard. It will handle all of the tasks associated with the creation and initialization of the simulation data base. All that is required is you enter a NAME for the Scenario.

It is recommended you create the new Scenario using TAPESTRY SHELL
[Create a New Scenario.](#)

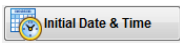


SAVE SCENARIO AS ...

Saves the *CURRENT* Scenario Data Base to another Folder with the Name as specified. The Scenario Name you specify must not already exist.

For experts, the TMP file dBase is saved as the SCN dBase in the Named Scenario. Therefore, no files have been saved in the PARENT folder - whether you do or do not save the parent, these is no effect on the child.

¹ See, "Using the TapShell Application" for other methods of initializing and customizing your new Scenario



INITIAL DATE AND TIME

Enter the Initial Simulation Time in either Time-of-Date or GPS format.

Specify Initial Date and Time

SIMULATION START TIME

DATE: 7/ 3/2011 WEEK: 1643

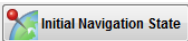
TIME: 6:31:14 PM SECONDS INTO WEEK: 66674.0

☐ USE PC CLOCK

CANCEL APPLY

Click to set to Current Time →

The Initial Simulation time must be at least 1 second into the week. If you are simulating a two Vehicle Scenario, both Vehicles will be constrained to start at the same simulation start time and remain synchronized in time throughout any Scenario.



INITIAL LOCATION

Enter the Initial Simulation Location. Use LLA, ECEF, ECI formats most suitable to your application.

Check for Terrestrial Motion and Projectiles →

Check for Spaceborne Motion →

Initial Vehicle Navigation State (Terrestrial and Spaceborne UE)

INITIAL STATE VECTOR

TERRESTRIAL USER VEHICLES (GEODETTIC)

☒ Use Terrestrial Script Motion Interface

Latitude: N 34 0 0.000 Longitude: W 118 0 0.000 Altitude: 0.000 Meters

Speed: 0.000 m/s Heading: 0.000 Pitch: 0.000 Roll: 0.000

Earth Centered Earth Fixed (ECEF)

X: -2485034.263 Meters Vx: 0.000 Meters/Sec

Y: -4673669.705 Meters Vy: 0.000 Meters/Sec

Z: 3546446.564 Meters Vz: 0.000 Meters/Sec

SPACEBORNE USER VEHICLES (J2000 ECI)

☒ Use Spaceborn Script Motion Interface

X: 4089245.927 Meters Vx: 245.435 Meters/Sec

Y: -3365772.558 Meters Vy: 297.909 Meters/Sec

Z: 3541964.125 Meters Vz: -0.268 Meters/Sec

Gravity / Drag

(Nominal) Space Craft Attitude

☒ Use BODY-to-INERTIAL Direction Cosines & Rates ☐ Nadir Pointing

C_{IB}^B = BODY-to-INERTIAL Direction Cosines [3 x 2 x 1]

Rotation about Body -X Axis [1]: 0.000

Rotation about Body -Y Axis [2]: 0.000

Rotation about Body -Z Axis [3]: 0.000

W_{IB}^B = BODY-to-INERTIAL Rate in BODY

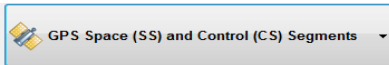
W_{IB}^B : 0.000 0/sec

W_{IB}^B : 0.000 0/sec

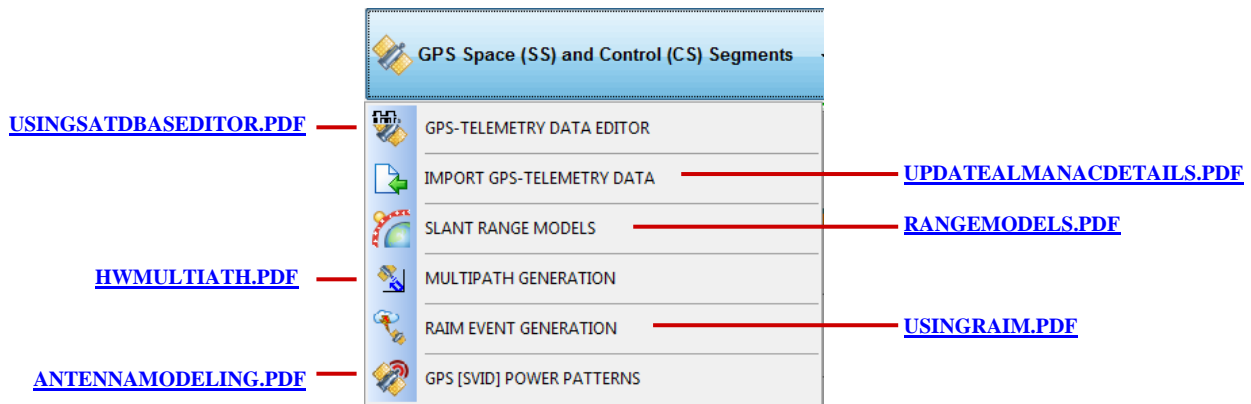
W_{IB}^B : 0.000 0/sec

CANCEL APPLY

$$C_B^I = -W_{IB}^B \times C_B^I$$



GPS SPACE AND CONTROL SEGMENT



The Space and Control Segment is comprised of the elements of GPS responsible for determination of the Satellite Telemetry, the Propagation media, errors associated with Receiver Autonomous Integrity Monitoring (RAIM and T-RAIM), GPS SV Antenna Pattern, and Signal Composition, and Multipath.

The GPS Space and Control Segments (SS / CS) are comprehensively modeled by the TAPESTRY System. This document presents the details of the modeling encapsulated in the REVIEW / MODIFY TELEMETRY Form.

<C:\TAPESTRY\DOCUMENTATION\MANUALS\USINGSATDBASEEDITOR.PDF>

The document provides details of Antenna Modeling and Lever Arms;

<C:\TAPESTRY\DOCUMENTATION\MANUALS\ANTENNAMODELING.PDF>

The document provides details of the Ionosphere and Troposphere modeling and other line-of-sight models.

<C:\TAPESTRY\DOCUMENTATION\MANUALS\RANGEMODELS.PDF>

MULTIPATH and RAIM details can be found here

<C:\TAPESTRY\DOCUMENTATION\MANUALS\USINGRAIM.PDF>

<C:\TAPESTRY\DOCUMENTATION\MANUALS\HWMULTIPATH.PDF>



USER SEGMENT (HOST VEHICLE SENSORS)

[USINGTHEIMUMODEL.PDF](#)

Navigation and Autopilot for
SDLC: HG1700, LN200
AMRAAM: RS422D types

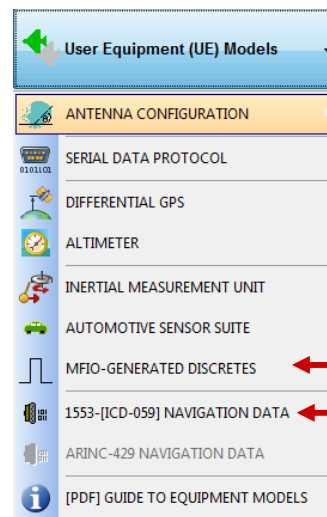
RTCM-104 Type 1,2 & 9 via RS232

[BAROMODEL.PDF](#)

- 4 Discrete Wheel Wheel-Speed Outputs (LF RF / LR RR)
- Odometer Output
- Gyro Triad 0-5 VDC / 50 Ω /Error models
- Accelerometer Triad 0-5 VDC / 50 Ω /Error models

[USINGAUTOMOTIVEMODEL.PDF](#)

[AUXSENSORSHELL.PDF](#)



L₁, L₂, L₅ patterns

[ANTENNAMODELING.PDF](#)

8 Programmable Event Lines & Triggers

[INS059.PDF](#)

TAPESTRY was designed from the outset to combine the GPS line-of-sight data with Auxiliary Sensors that enhance system performance when GPS availability/quality is degraded. The Tapestry System was designed with these types of distributed systems in mind.

As a component of a distributed simulation environment, The Tapestry System provides:

- High Speed Closed Loop Operation for minimal transport delay and maximum update rate.
- ± 10 nanosecond pulse output synchronized with our 1 second GPS rollover.
- Slave operation where we respond to an incoming pulse.
- 10 MHz input/output phase locked to our internal 10.23 MHz OCX.

Additionally, **TAPESTRY** can emulate the outputs of additional auxiliary sensors. Using our proprietary PCI expansion card [**M**ulti **F**unction **I**nput **O**utput **M**FIO] we can produce data and electrical outputs that mimic those from SDLC/RS422D Inertial Measurement Units (IMU). Analog and digital/serial outputs that support automotive sensors such as the SiRFSTAR-I/II.

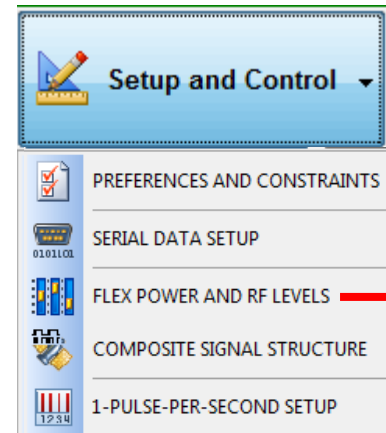


TOOL BAR / PULLDOWNS



SETUP AND PREFERENCES

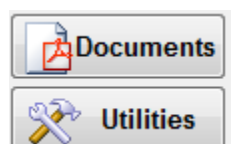
[USING SERIAL DATA.PDF](#)



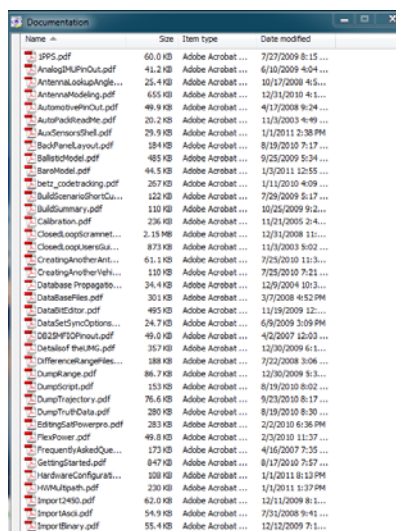
[HARDWARE CONFIGURATION.PDF](#)



MANUALS AND DATA ACCESS UTILITIES



Browse the Documents Folder

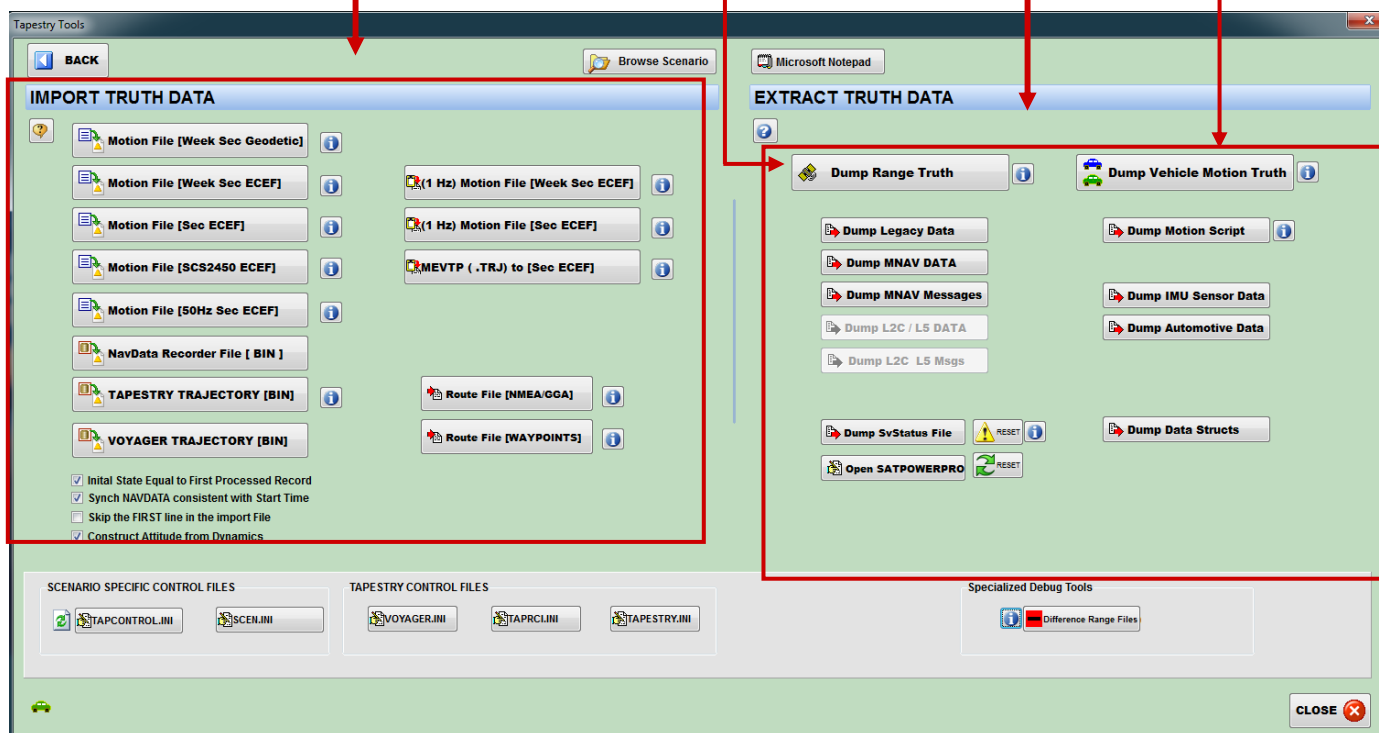


[IMPORT SHELL.PDF](#)

[DUMP TRUTH DATA.PDF](#)

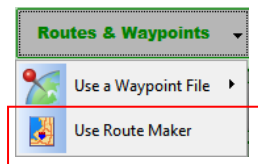
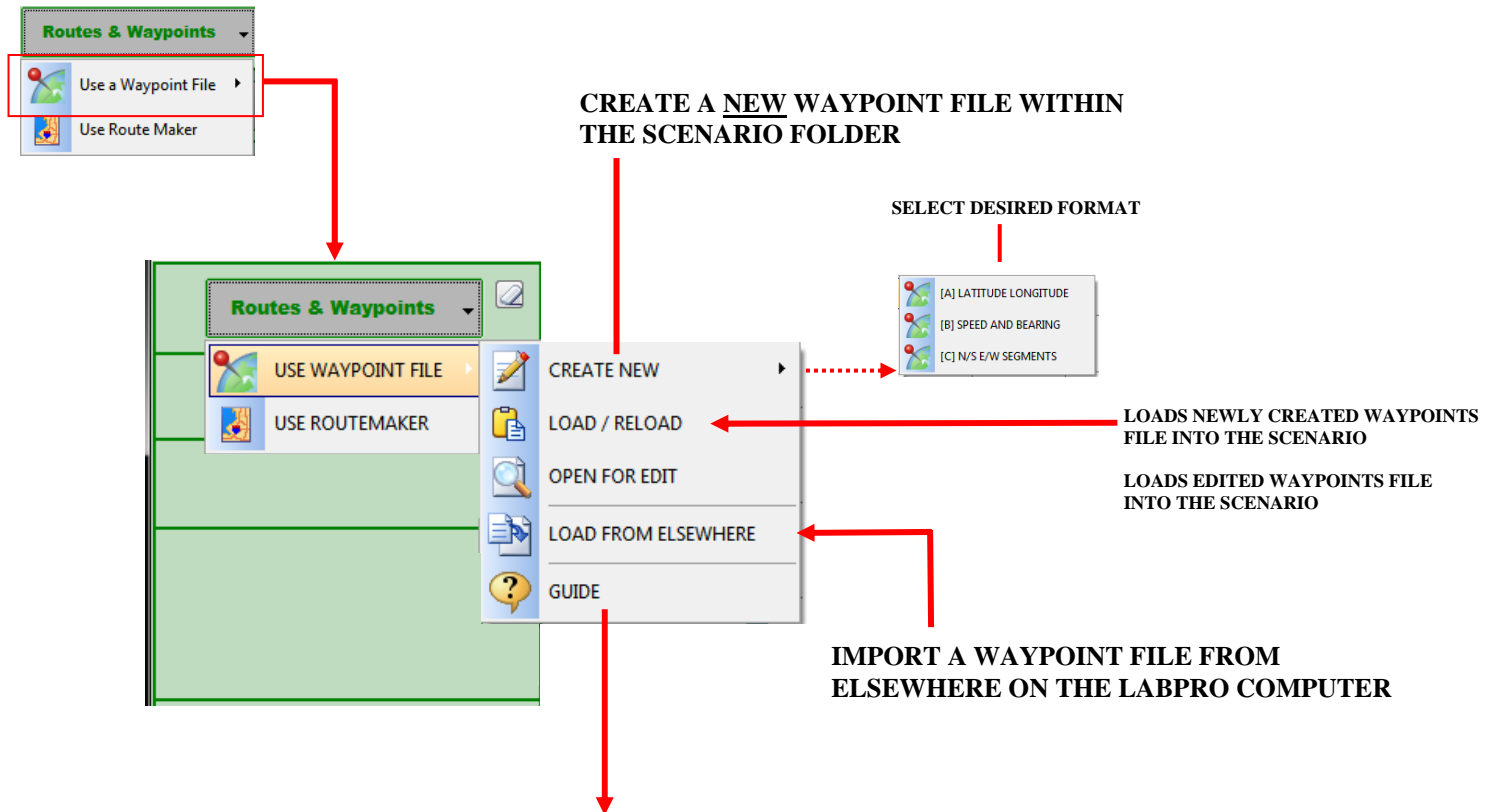
[DUMP RANGE.PDF](#)

[DUMP TRAJECTORY.PDF](#)





ROUTES & WAYPOINTS

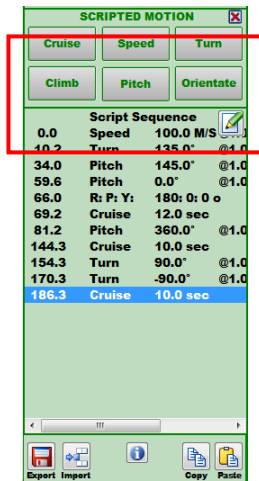


see this document for details: [USING ROUTE MAKER.PDF](#)



SCRIPTED VEHICLE MOTION

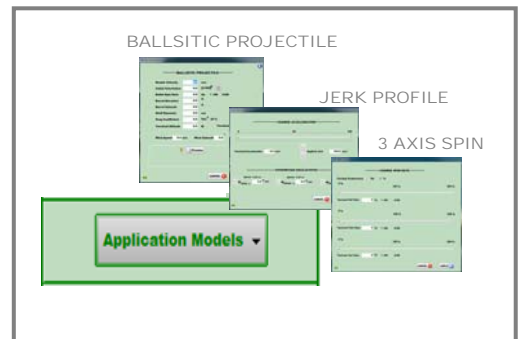
Tapestry provides a highly accurate 6-DOF Vehicle-Motion Generator. Construct a Motion Trajectory for your tests by chaining together maneuver primitives. The maneuver-primitive-chain is collectively referred to as the **SCRIPT**.



MANEUVER PRIMITIVES



PROGRAMMABLE SHAPES



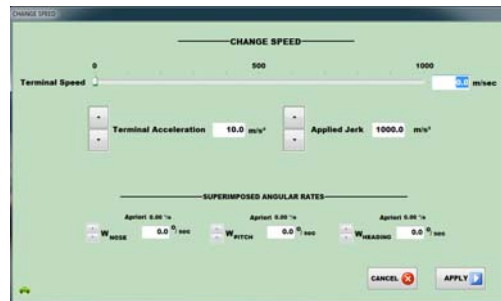
MAINTAIN STATE

- PROGRAMMED
- DURATION



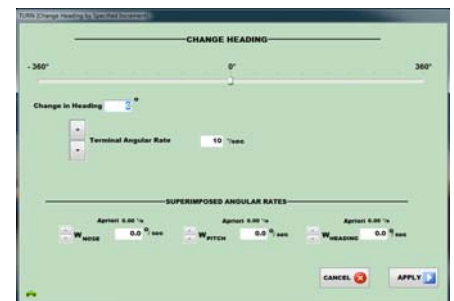
CHANGE SPEED

- PROGRAMMED
- TERMINAL SPEED
 - ACCELERATION / JERK



CHANGE HEADING

- PROGRAMMED
- TERMINAL HEADING
 - BANK ANGLE AND RATE
 - ACCELERATION / JERK



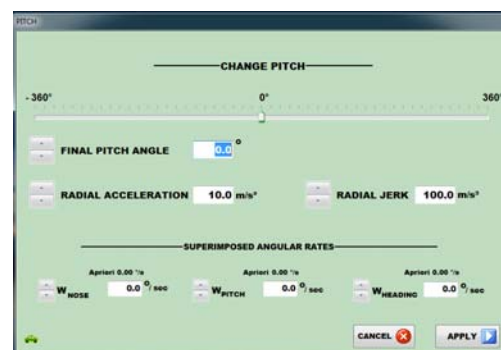
CHANGE ALTITUDE

- PROGRAMMED
- TERMINAL ALTITUDE
 - PITCH ANGLE
 - RADIAL ACCELERATION / JERK



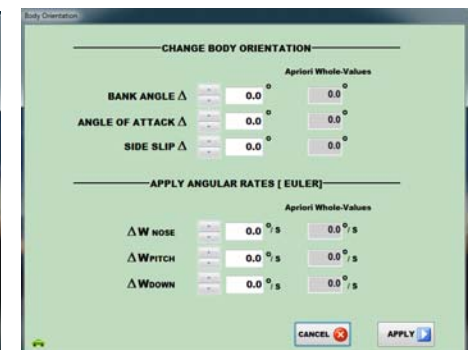
CHANGE PITCH

- PROGRAMMED
- PITCH ANGLE AND RATE
 - ACCELERATION / JERK



CHANGE BODY ORIENTATION

- PROGRAMMED
- ATTITUDE
 - BODY RATES
 - ACCELERATION / JERK





SCRIPTED VEHICLE MOTION

MODIFY SEGMENT



Select desired maneuver primitive

Application Models ▾			
Cruise		Speed	Turn
Climb		Pitch	Orientate Body
Script Sequence			
0.0	Cruise	2.0 sec	
2.0	Speed	200.0 M/S	@1.0
22.1	Turn	360.0°	@1.0
147.9	Turn	-360.0°	@3.0
190.1	Climb	12000.0 M	
317.2	Turn	-180.0°	@1.0
380.2	Turn	-90.0°	@1.0
411.8	Cruise	6.0 sec	
417.8	Turn	90.0°	@1.0
449.4	Cruise	8.0 sec	
457.4	Turn	360.0°	@4.0
489.3	Turn	-360.0°	@5.0
515.0	Cruise	8.0 sec	
523.0	Climb	1232.0 M	@1.0



Use the [Preferences](#) button to specify the maximum acceleration, jerk, and dynamic conditions associated with your simulated vehicle.

MODIFY THE SELECTED MANEUVER PRIMITIVE

SELECTED MANEUVER PRIMITIVE: **TURN** ☐ Coordinated

START TIME: 318.2 Seconds into Week 317.2 Seconds into Simulation

STOP TIME: 381.2 Seconds into Week 380.2 Seconds into Simulation

DURATION: 63.0 Seconds

INITIAL SPEED: 200.0 M/S

INITIAL ALTITUDE: 12006.45 Meters

HEADING CHANGE: -180.000 Deg

RADIAL ACCELERATION: -9.989 M/S²

RADIAL JERK: -99.892 M/S³

Terminal Roll Rate: 0 °/s

Terminal Pitch Rate: 0 °/s

Terminal Yaw Rate: 0 °/s



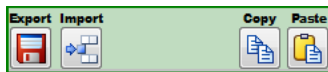
Delete the highlighted segment

Delete ALL segments AFTER selected segment

Delete ALL the segments



SCRIPT EDITOR CONTROLS



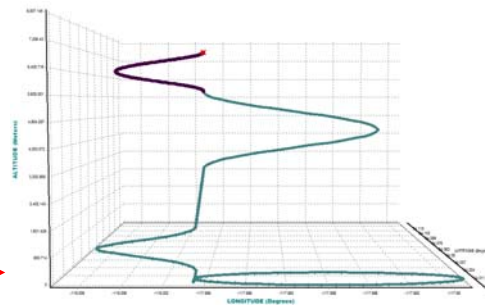
< CTRL C > COPY
< CTRL X > CUT
< CTRL V > PASTE

The Vehicle Motion Panel includes controls and keystroke-macros for use in the construction of the Vehicle Motion *Script*.

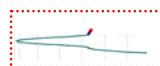
Vehicle Motion Panel



Motion Script
3D view



<SHIFT> ↓ to select



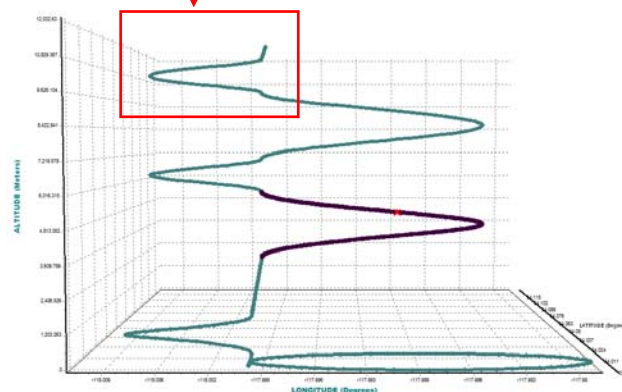
Script Sequence			
0.0	Cruise	1.0 sec	
1.0	Speed	100.0 M/S @1.4	
11.1	Turn	360.0° @1.4	
74.1	Pitch	30.0° @1.4	
79.5	Turn	-360.0° @2.4	
107.0	Pitch	20.0° @1.4	
108.9	Cruise	20.0 sec	
128.9	Spin	250.000°/s	
129.1	Cruise	20.0 sec	
149.1	Pitch	30.0° @1.4	
151.0	Turn	360.0° @1.4	
205.6	Turn	-360.0° @2.4	

Copy PASTE BUFFER into Scenario file

C:\Tapestry\Runs\ExampleCutPaste

AlmanacHistory.txt	6/8/2010 5:17 PM	TXT File
CutManeuverList.Txt	8/9/2010 12:10 PM	TXT File
Description.txt	8/4/2010 2:25 PM	TXT File
L2CMessageProfile.txt	6/8/2010 11:51 AM	TXT File
L5MessageProfile.txt	6/8/2010 11:51 AM	TXT File
ManeuverList1.txt	8/8/2010 11:19 PM	TXT File
ManeuverList2.txt	8/8/2010 11:19 PM	TXT File
ManeuversDump.txt	8/5/2010 12:21 AM	TXT File
PasteManeuverList.txt	10/30/2008 4:33 PM	TXT File

PASTE [PasteManeuverList.txt] into the Script





SCRIPTED VEHICLE MOTION

Use **EXPORT** to select a group of maneuver segments and outputs them into a file than can be **IMPORTED** into *this* or other Scenario's. By construction, when **BUILD SCENARIO** updates the dBase, the **Motion Script** for both Vehicle I and II are saved within the Scenario Folder: [CUTMANEUVERLIST.TXT].

If you want to use this file later, copy it elsewhere so it won't be overwritten. For your convenience, we have created a folder **C:\TAPESTRY\MANEUVERS** for this purpose. When you use the **IMPORT** command, Tapestry will look in this folder first for a segments file.

Script Sequence

Time	Maneuver	Speed	Altitude	Altitude Rate
0.0	Cruise	1.0 sec		
1.0	Speed	100.0 M/S @1.		
11.1	Turn	360.0°	@1.	
74.1	Pitch	30.0°	@1.	
79.5	Turn	-360.0°	@2.	
107.0	Pitch	20.0°	@1.	
108.9	Cruise	20.0 sec		
128.9	Spin	250.000°/s		
129.1	Cruise	20.0 sec		
149.1	Pitch	30.0°	@1.	
151.0	Turn	360.0°	@1.	
205.6	Turn	-360.0°	@2.	

Export **Import** **Copy** **Paste**

C:\Tapestry\Runs\ExampleCutPaste

File Name	Date Modified	File Type
AltmanachHistory.txt	6/8/2010 5:17 PM	TXT File
CutManeuverList.txt	8/9/2010 12:10 PM	TXT File
Description.txt	6/8/2010 2:25 PM	TXT File
L2CMessageProfile.txt	6/8/2010 11:51 AM	TXT File
L3MessageProfile.txt	6/8/2010 11:51 AM	TXT File
ManeuverList1.txt	8/8/2010 11:19 PM	TXT File
ManeuverList2.txt	8/8/2010 11:19 PM	TXT File
ManeuversDump.txt	8/5/2010 12:21 AM	TXT File
PasteManeuverList.txt	10/30/2008 4:33 PM	TXT File

NOTE

ManeuverList1.txt = Vehicle I Script
ManeuverList2.txt = Vehicle II Script

The Entire Script is saved automatically when Build Scenario shuts down

Export **Import** **Copy** **Paste**

Tapestry looks here first for Segment Import Files

Select Maneuver List to Import

Name	Date modified	Type	Size
ClimbingTurn3D.txt	12/8/2009 11:58 PM	TXT File	1 KB
FigureEight_4G.txt	10/30/2008 4:34 PM	TXT File	1 KB
FigureEight_4G.txt	10/30/2008 4:33 PM	TXT File	1 KB
FigureEight_4G.txt	10/30/2008 4:33 PM	TXT File	1 KB
FigureEight_4G.txt	10/30/2008 4:32 PM	TXT File	1 KB
FigureEight_4G.txt	10/30/2008 4:32 PM	TXT File	1 KB

GROUND TRACK (VEHICLE I)

4G Coordinated Turn is inserted into the Scenario.

GROUND TRACK (VEHICLE I)

SCROLL TRAJECTORY

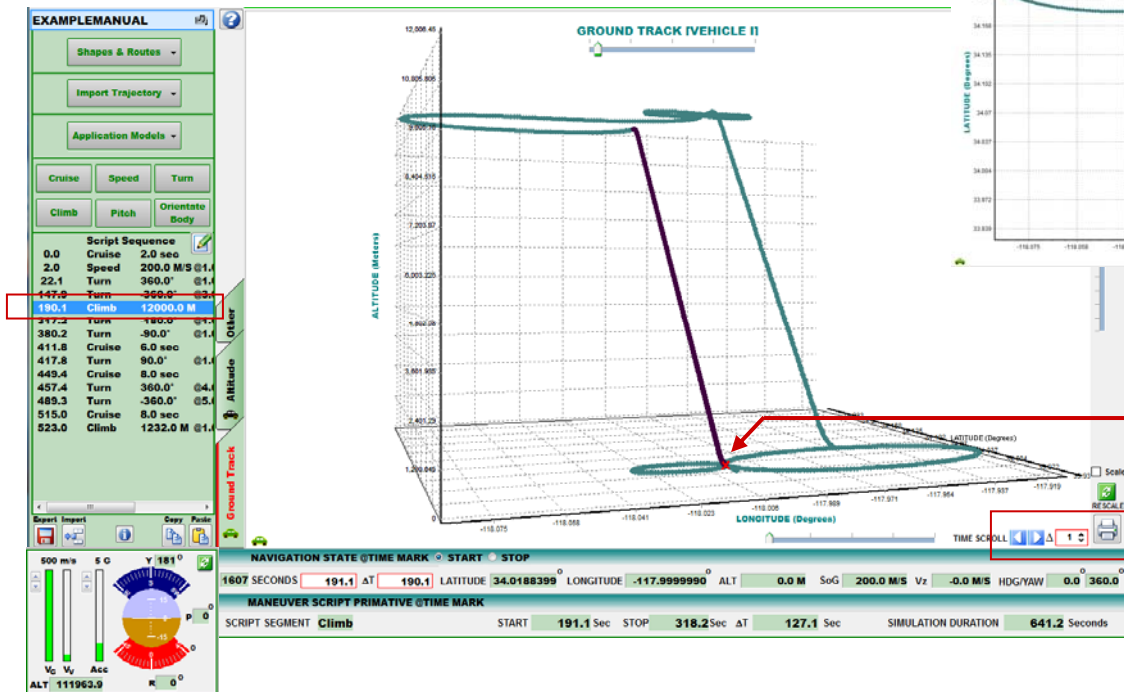
AVIATION STATE (TIME MARK)



SCRIPTED VEHICLE MOTION

MANEUVER SCRIPT

POINT & CLICK / BROWSING / SETTING THE CURRENT TIME



Click on the maneuvers in the script and the entire Main Form will synchronize depending upon the SHOW MANEUVER settings.

BROWSE through the maneuver one-step-at-a-time using the SCROLL control. The selected point on the GROUND TRACK DISPLAY will be marked with a RED CROSS: X



SPACEBORNE MANEUVERS

Tapestry simulates Spaceborne Vehicles in Earth Orbits. Unlike the Terrestrial Maneuvers, Spaceborne Maneuvers are not analytic and a coupled 6th order state vector equation is integrated. The Gravity model used conforms to WGS84 with three harmonics. Drag, spin, orientation, and thrust can all be specified. You may work in ECEF or Earth Centered Inertial (ECI) referenced to the J2000 epoch.

Switch to the Orbital (spaceborne) Maneuver-Keypad by using the **Preferences** or **Location** button and select **Spaceborne Script Motion Interface**. The following Maneuver Keypad will appear from which you access the state vector propagation form .



Check this to display Spaceborne KEYPAD

INITIAL STATE VECTOR

TERRESTRIAL USER VEHICLES (GEOSTATIC)

Use Terrestrial Script Motion Interface

Latitude: 34.000000 Longitude: 118.000000 Altitude: 100000.00 Meters

Speed: 7844.140 m/s Heading: 0.000 Pitch: 0.000 Roll: 0.000

Earth Centered Earth Fixed (ECEF)

X: 2523956.711 Meters Vy: 2059.285 Meters/Sec
Y: -4746868.583 Meters Vy: 3872.950 Meters/Sec
Z: 3602365.854 Meters Vy: 6503.087 Meters/Sec

SPACEBORNE USER VEHICLES (J2000 ECI)

Use Spaceborne Script Motion Interface

(Optional) Space Craft Attitude

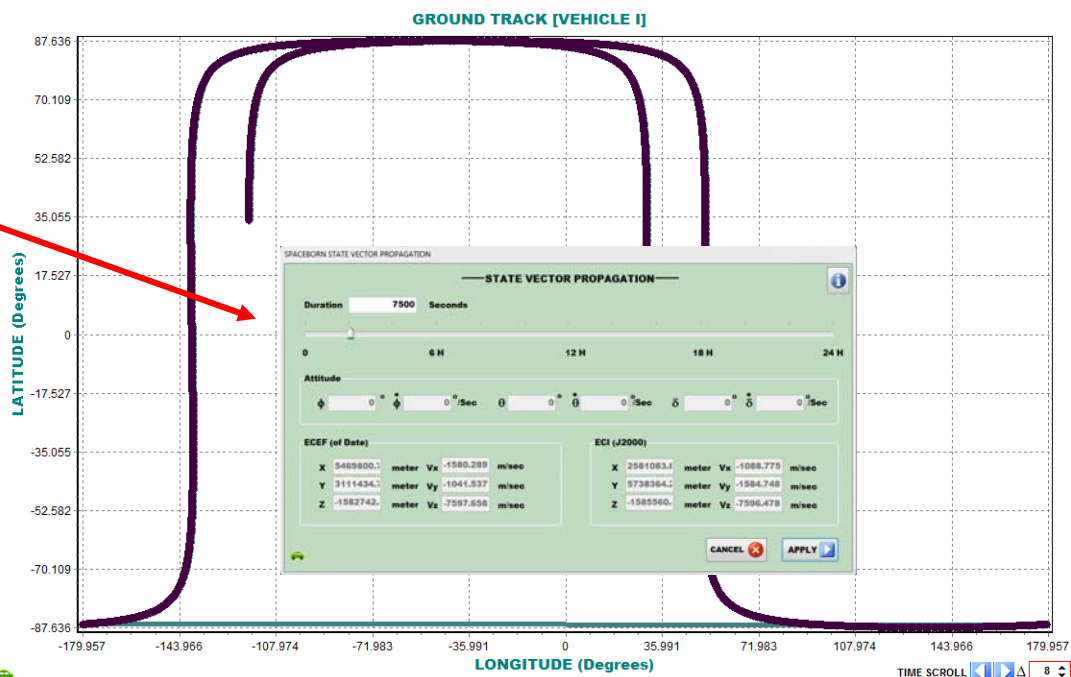
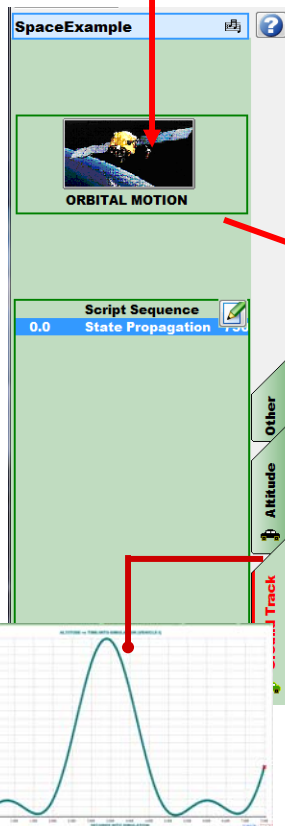
Use BODY-to-INERTIAL Direction Cosines & Rates

Rotation about Body -X Axis [1]: 0.000
Rotation about Body -Y Axis [2]: 0.000
Rotation about Body -Z Axis [3]: 0.000

W₁₂: 0.000 °/sec
W₂₃: 0.000 °/sec
W₃₁: 0.000 °/sec

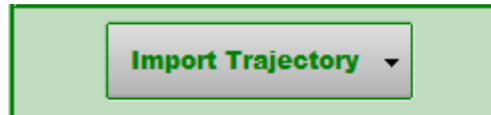
Gravity / Drag

CANCEL APPLY

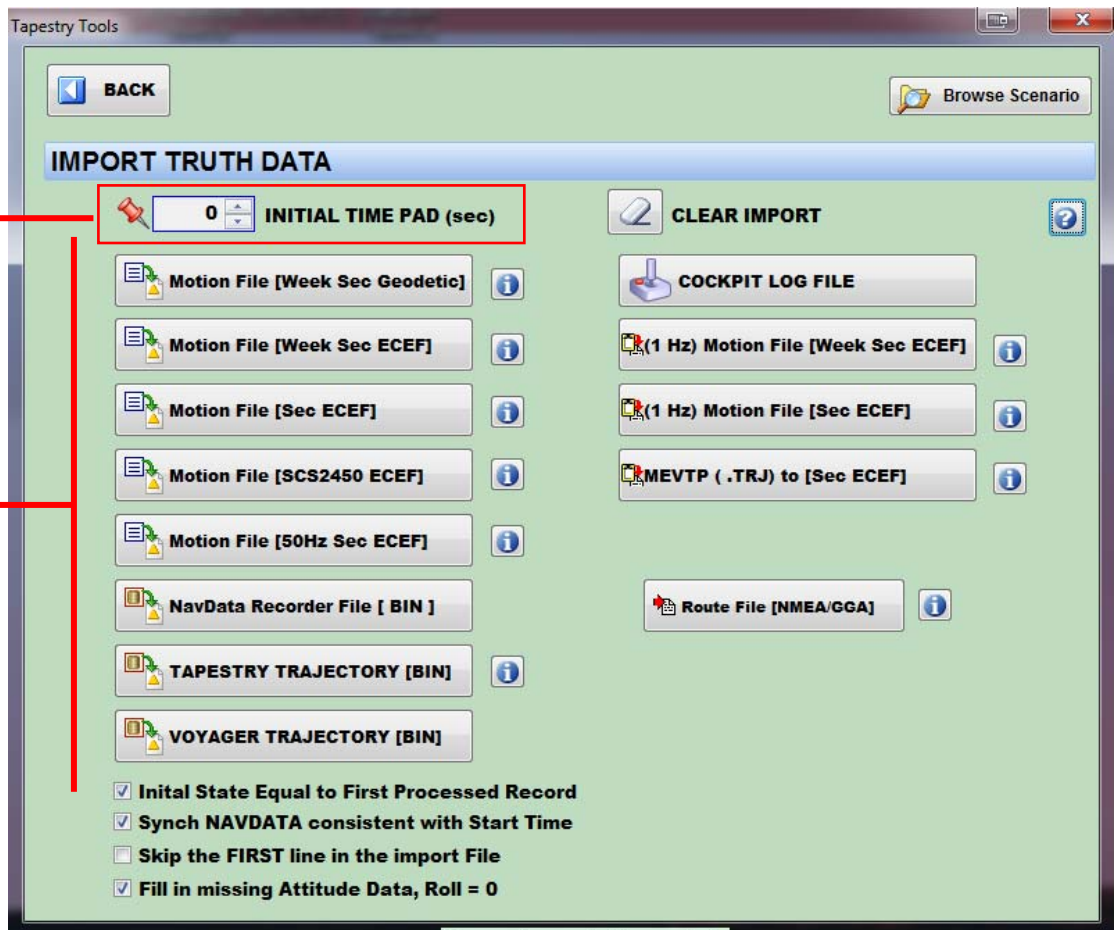




IMPORT VEHICLE MOTION



Insert a (*stationary*) pad to the front of your imported file



IMPORT Vehicle motion is a gateway for the end-user to develop their own motion profile and incorporate it into the Scenario.

See this document for the Format and other Information

[IMPORTTRAJECTORYFILE.PDF](#)



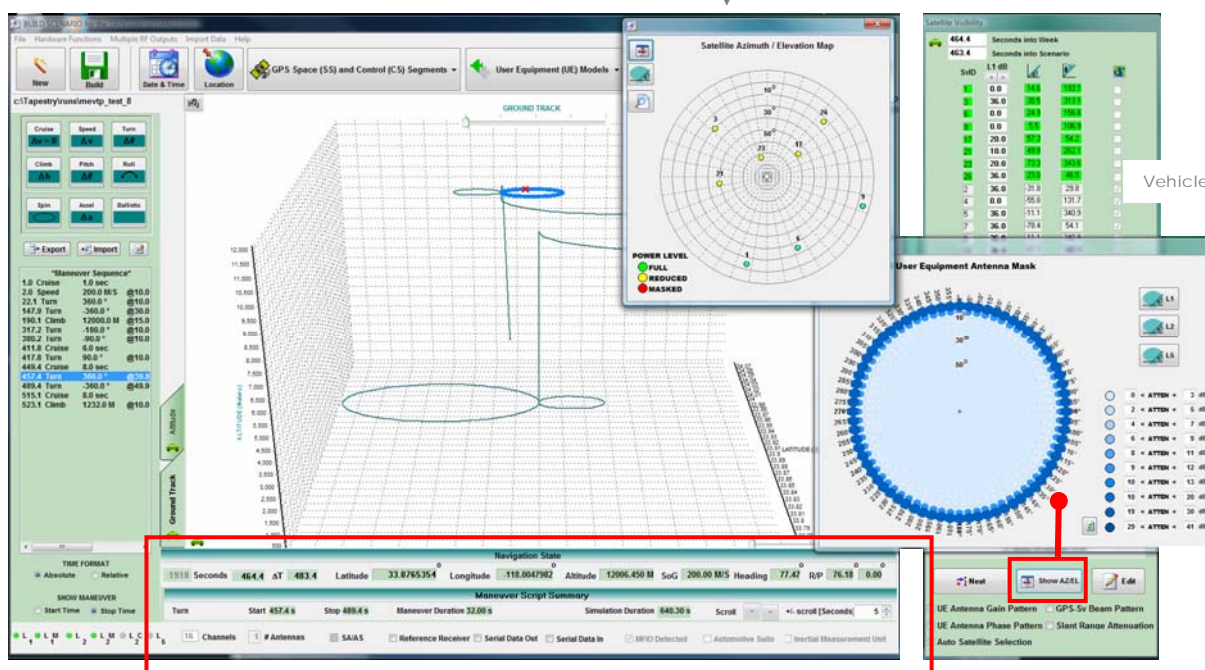
SUMMARY PANELS

DISPLAY PANELS

Clicking on the plot display, the Maneuver Script, the Scroll \pm buttons, or entering the epoch into one of the time edit controls, results in Tapestry synchronizing all of the data forms and displaying a Summary in the **Maneuver Script Summary Bar** and **Navigation State Bar**. These two summary bars are located just below the **Plot Display**.

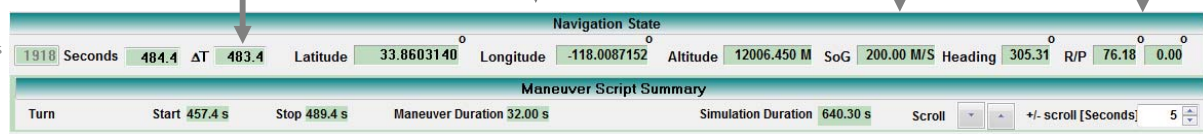
For example, the display captured below (*how the azimuth/elevation plots are accessed is explained in the section on the Satellite Visibility Display*) shows the contents of the GUI at Time = 483.4 Seconds into Simulation.

The AZ/EL map displays the synchronized attenuation given the vehicle dynamics and Antenna Mask (note Vehicle is banked 76° masking the satellites to the NORTH)



Enter the time 483.4 into this (or any of the Time Controls) and the GUI Form synchronizes along with all popup data forms and controls.

Navigation State @ 483.4 seconds



(Bracketing) Maneuver Summary @ 483.4 seconds
Coordinated 4G Turn @ 483.4 seconds (Banked 76°)

Scroll \pm through the Trajectory Data

Set the step size as desired

If you have imported a Vehicle Trajectory, the Maneuver Script Display is replaced with the Import Summary Bar





INFORMATION PANELS

COMPLEX3D

Routes & Waypoints

Import Vehicle Motion

Programmable Shapes

Scripted Vehicle Motion

cycles thru panels →

ATTITUDE

ROLL 0.00° 0.00 o/s
PITCH 0.00° 0.00 o/s
YAW 180.9° 0.00 o/s
HEAD 180.9°

500 m/s 5 G Y 181°

V₀ V_y Acc R 0°

ALT 111963.9

SCENARIO FILE ACCESS

BROWSE

TAPOCONTROLLINE

ANTENNA ASSIGNMENT

RF 1 RF 2 RF 3 RF 4

LINK CONFIGURATION

L₁ L₁ M
L₂ L₂ M L₂ C
L₅

AS-BIT

ECGF

X -2480310.2 M
Y -4673658.1 M
Z 3553362.7 M
VX 26.3 M/S
VY 49.5 M/S
VZ 62.9 M/S

194 m/s 3.0 G H 0°

V₀ V_y Acc R 180°

NAVIGATION STATE @TIME MARK ● START ● STOP

TIME DISPLAY FORMAT

● ABSOLUTE ● RELATIVE

SHOW MANEUVER

● START TIME ● STOP TIME

← Display time in Seconds-into-Simulation or Absolute Time.

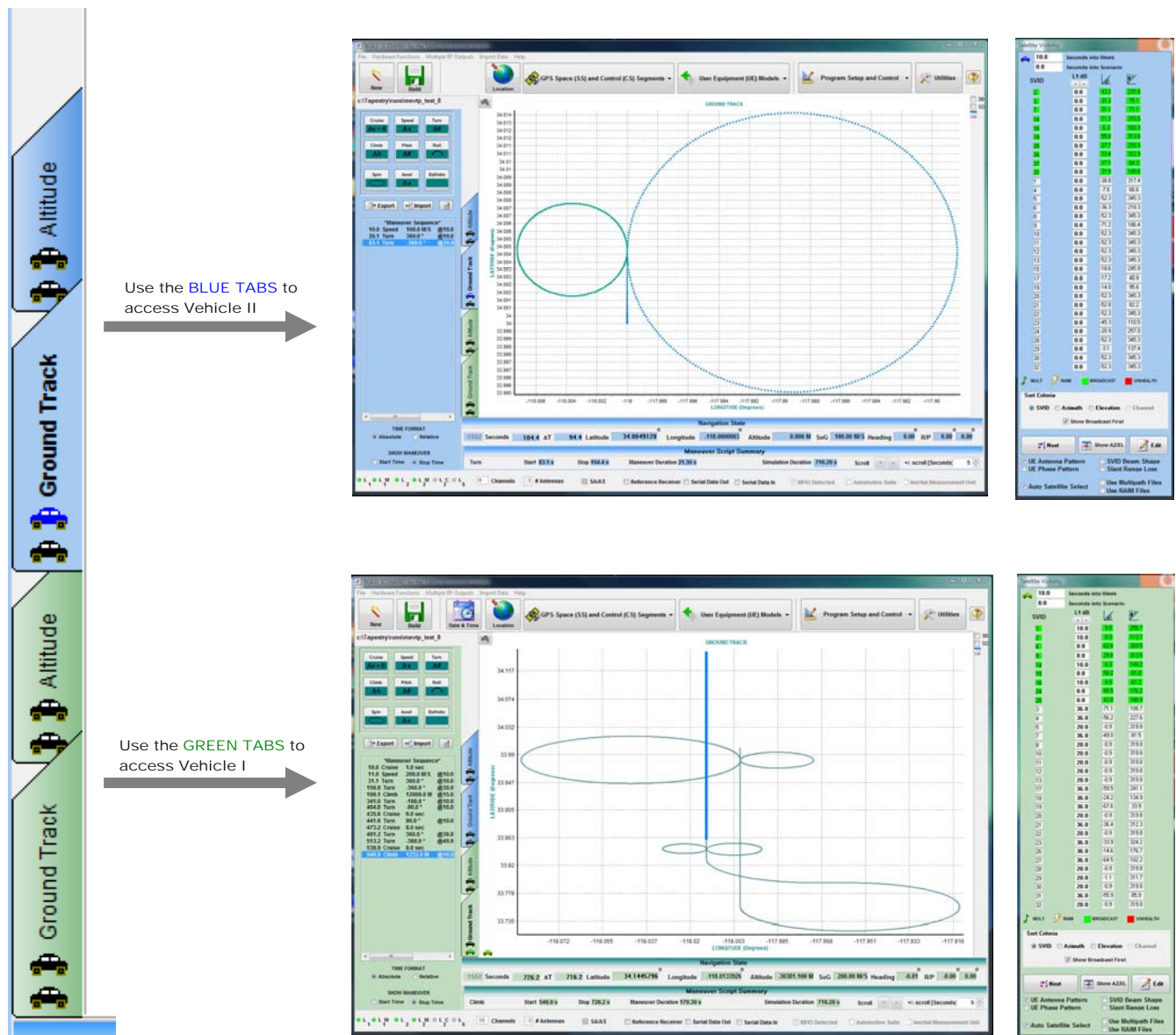
START displays the Initial conditions of the maneuver
STOP displays the Terminal conditions of the maneuver



ELEMENTS OF THE PLOT DISPLAY

The plot display dominates the **MAIN SCREEN** of the **Build Scenario**. For power users creating event driven simulations, the plot screen provides a gateway to advanced functions and displays.

The plot display is synchronized through a mouse-click-handler such that **ALL** data forms, displays, and summary bars will display data associated with the point you have clicked on the screen. You may also browse-in-time through the vehicle motion profile accessing the simulation event timeline.



NOTE: If you don't have multiple RF outputs, the **BLUE TABS** will not be accessible.



PLOTTING PANELS

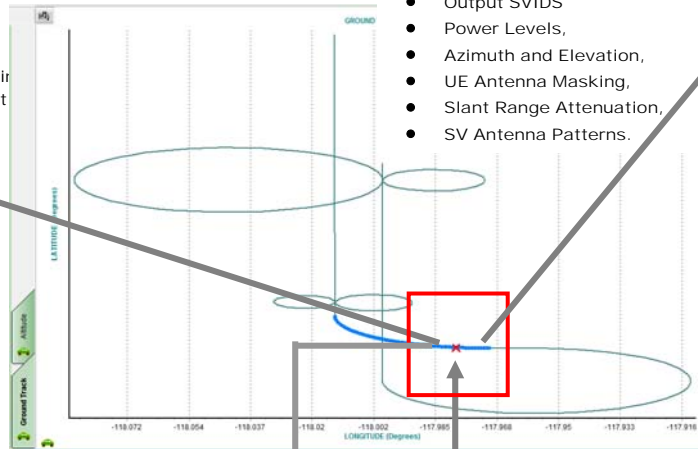
BROWSING

The Plot Display is synchronized with all data forms within Tapestry. The simulation time-line, reflected in the Navigation State Summary Bar, can be browsed in several different ways. As you browse, the complete simulation time line is displayed on;

MAIN FORM

Maneuver Sequence			
432001.0	Cruise 1.0 sec		
432002.0	Speed 200.0 M/S	@10.0	
432022.1	Turn 360.0 °	@10.0	
432147.9	Turn -360.0 °	@30.0	
432190.1	Climb 12000.0 M	@15.0	
432332.0	Turn -180.0 °	@10.0	
432395.0	Turn -90.0 °	@10.0	
432426.6	Cruise 6.0 sec		
432432.6	Turn 90.0 °	@10.0	
432464.2	Cruise 8.0 sec		
432472.2	Turn 360.0 °	@39.8	
432504.2	Turn -360.0 °	@49.9	
432529.9	Cruise 8.0 sec		
432537.9	Climb 1232.0 M	@10.0	

Maneuver containing the "clicked" point highlighted



Satellite Summary at the "clicked" point is displayed:

- Output SVIDS
- Power Levels,
- Azimuth and Elevation,
- UE Antenna Masking,
- Slant Range Attenuation,
- SV Antenna Patterns.

Satellite Visibility			
Seconds into Scenario		Seconds into Week	
SVID	1.1 dB		
1	0.0	36.0	12.0
2	0.0	36.0	12.0
3	0.0	36.0	12.0
4	0.0	36.0	12.0
5	0.0	36.0	12.0
6	0.0	36.0	12.0
7	0.0	36.0	12.0
8	0.0	36.0	12.0
9	0.0	36.0	12.0
10	0.0	36.0	12.0
11	0.0	36.0	12.0
12	0.0	36.0	12.0
13	0.0	36.0	12.0
14	0.0	36.0	12.0
15	0.0	36.0	12.0
16	0.0	36.0	12.0
17	0.0	36.0	12.0
18	0.0	36.0	12.0
19	0.0	36.0	12.0
20	0.0	36.0	12.0
21	0.0	36.0	12.0
22	0.0	36.0	12.0
23	0.0	36.0	12.0
24	0.0	36.0	12.0
25	0.0	36.0	12.0
26	0.0	36.0	12.0
27	0.0	36.0	12.0
28	0.0	36.0	12.0
29	0.0	36.0	12.0
30	0.0	36.0	12.0
31	0.0	36.0	12.0
32	0.0	36.0	12.0

"Clicked" Maneuver summary

Left Click here. The point is marked with a X cross.

Instantaneous NAVIGATION STATE at the "clicked" point is displayed

NAVIGATION STATE SUMMARY

Navigation State																	
1552	Seconds	432437.0	ΔT	436.0	Latitude	33.7942165 ⁰	Longitude	-117.9792781 ⁰	Altitude	-13486.450 M	SoG	200.00 M/S	Heading	-77.56 ⁰	R/P	0.00 ⁰	0.00 ⁰

MANEUVER SUMMARY BAR

Maneuver Script Summary						
Climb	Start 432537.9 s	Stop 432717.2 s	Maneuver Duration 179.30 s	Simulation Duration 716.20 s	Scroll	+/- scroll [Seconds] 5

STEP (Browse) through the TIME-LINE backwards and forwards

TIME-LINE Step size

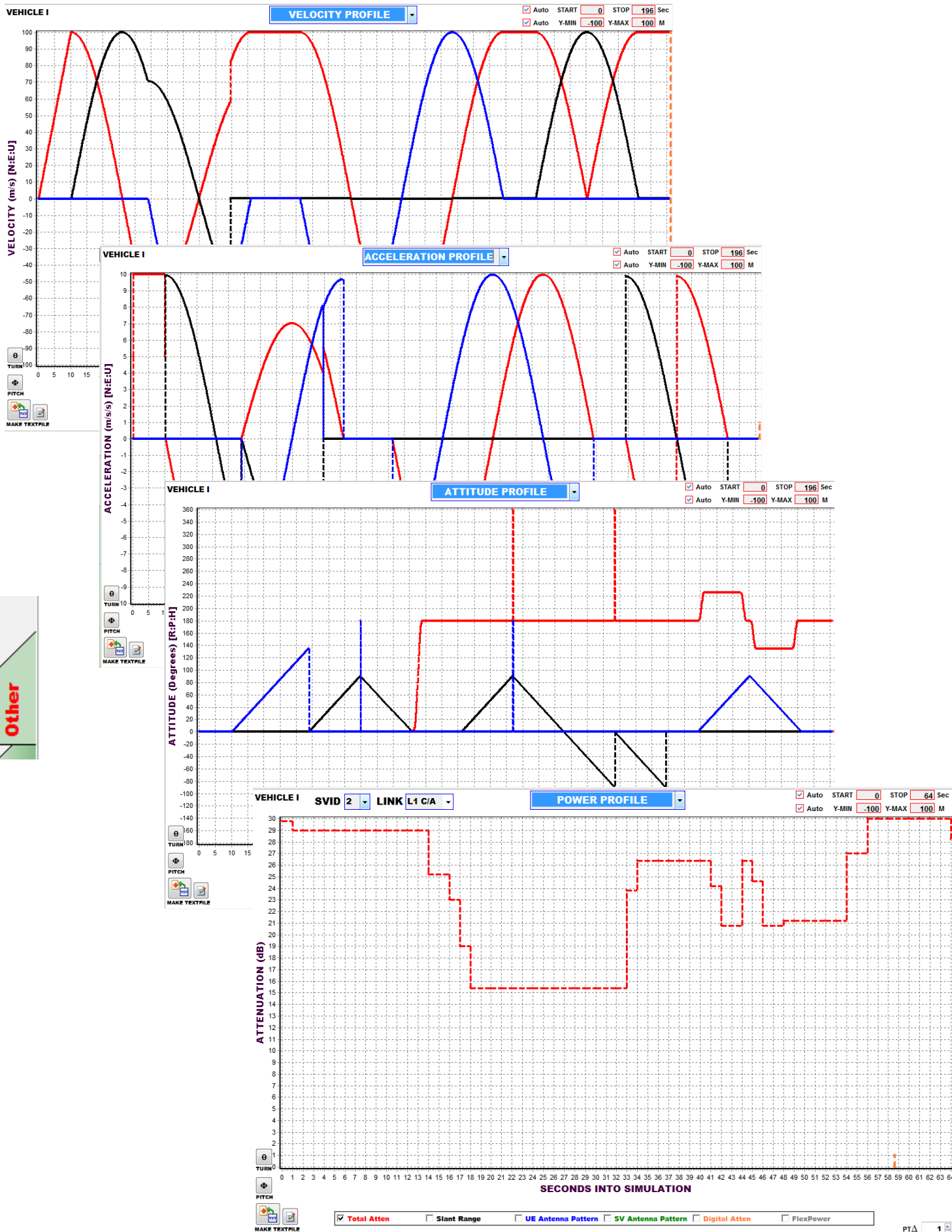
If you have IMPORTED a vehicle trajectory file, the Maneuver Summary Bar is replaced with the **Imported Motion Profile Summary Bar**

Imported Motion Profile Summary			
Source	C:\Tapestry\Trajectories\race4gMOT.DAT 5/11/2009 2:29:00 PM	Duration	3058.90 s

IMPORT TRAJECTORY source



PLOTTING PANELS

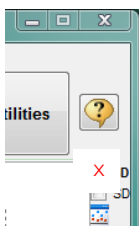




PLOTTING PANELS

3D DISPLAY

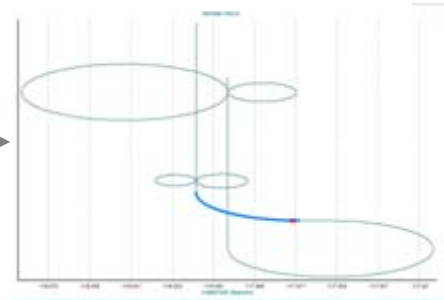
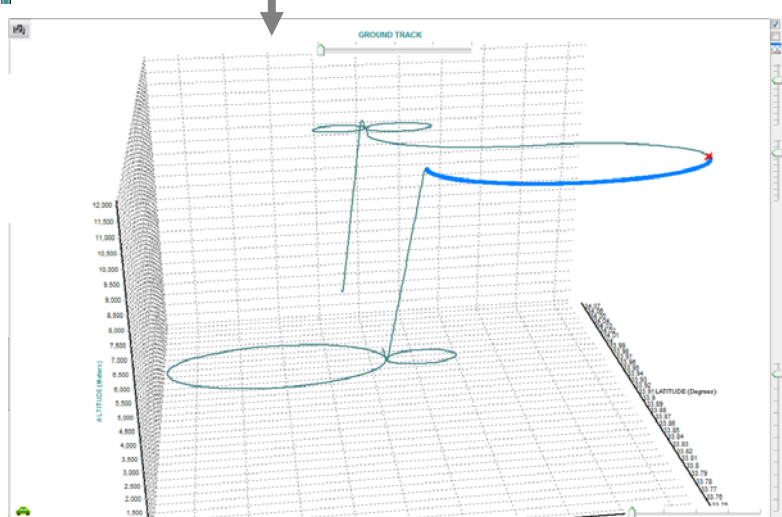
A Three dimensional display is available on the primary vehicle (Vehicle I). To access this feature, locate the CHECKBOX in the upper right hand corner of the Plot Display.



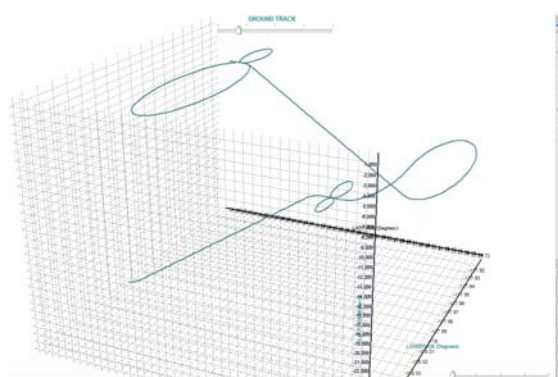
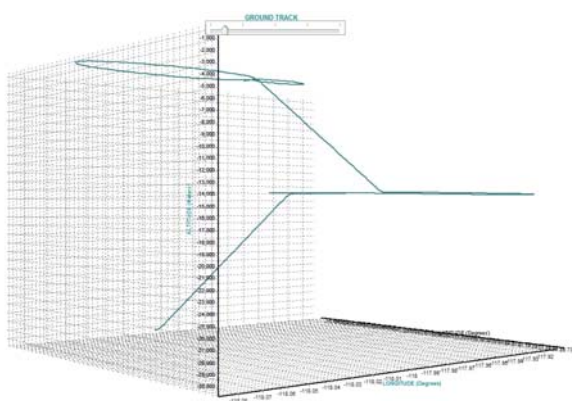
NOTE FROM AUTHOR: If you wrap yourself around a pole in 3D – go back to 2D and click in the center of the plot and the Display will reset!

This is the SAME trajectory as shown on the previous page. 3D plotting provides a more comprehensive display of the flight profile.

(However, the longer the simulation the more sluggish the response)



ROTATE

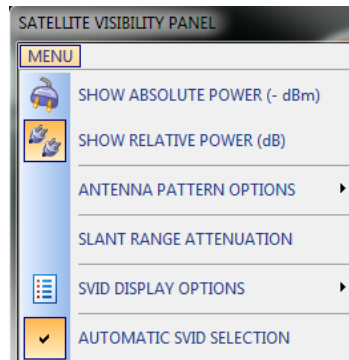


ZOOM

TILT

If you should want a plot of the Vehicle Trajectory, within the **Scenario** Folder you will find the plot display saved as a Windows Media File (WMF) that can be inserted into a document.

PREFERENCES AND MODEL SETTINGS



SATELLITE VISIBILITY PANEL

MENU

241596.3 SECONDS

186.3 SECONDS INTO SIMULATION

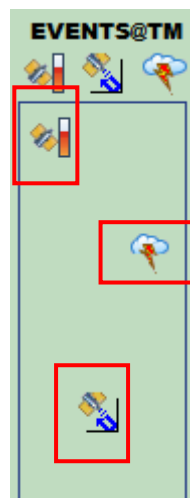
SVID	ELEV	AZ	PWR(dB)	L1CA	EVENTS@TM
10	3.8	42.2	11.7		
12	14.3	181.8	7.1		
15	32.0	96.3	5.7		
18	56.5	214.7	7.0		
21	52.7	301.2	10.3		
24	64.3	344.3	13.6		
29	65.4	326.9	14.0		
30	16.6	186.3	7.5		
1	0.0	0.0	5.0		
2	-1.5	80.1	5.7		
3	-52.4	315.4	13.8		
4	-7.7	81.7	5.6		
5	0.0	0.0	5.0		
6	-28.9	311.7	14.2		
7	-17.1	30.6	12.8		
8	-21.6	61.0	8.1		
9	-15.2	158.3	8.0		
11	-75.8	207.3	15.6		
13	-7.3	20.1	17.2		
14	-18.8	199.8	14.4		
16	-24.6	347.6	14.1		
17	-50.4	135.1	7.9		
19	-28.4	306.2	14.3		
20	-87.9	269.5	14.2		
22	-0.8	221.2	14.5		
23	-44.9	327.5	13.1		
25	-13.8	7.6	18.0		
26	-5.8	183.2	11.1		
27	-9.6	261.8	19.2		
28	-61.5	70.7	8.5		
31	-7.1	275.1	20.4		
32	-60.7	226.4	24.2		

MULTIPATH / RAIM / POWER EVENTS

PROGRAMMABLE POWER
[SETTINGOUTPUTPOWERLEVELS.PDF](#)

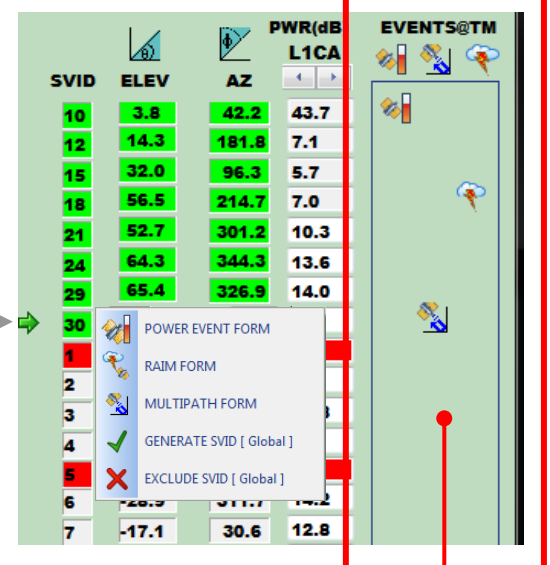
PROGRAMMABLE RAIM
[USINGRAIM.PDF](#)

PROGRAMMABLE MULTIPATH
[HWMULTIPATH.PDF](#)



EVENT IS ACTIVE
WHEN ICON SHOWN

CLICK ON SVID
EVENT POPUP



EVENT WINDOW TIME-LINE

Programming POWER, MULTIPATH and RAIM details;

[SETTINGOUTPUTPOWERLEVELS.PDF](#)

[HWMULTIPATH.PDF](#)

[USINGRAIM.PDF](#)

PROGRAMMABLE POWER LEVELS

PROGRAMMABLE POWER EVENT

TIME OF APPLICABILITY 73.6 ΔT 63.6 Seconds RF OUTPUT 1 ☐ ALL

☒ LOCK SVID CONTROLS

SVID OUTPUT CONTROL

SVID OUTPUT

SATELLITE 2 ELEVATION 6.0° AZIMUTH 187.5°

POWER LEVEL EVENTS

POWER CHANGE EVENT

SATELLITE 2 ☒ ALL

☐ ENABLE EVENT

L₁ 0.0 dB L₂ 0.0 dB L₅ 0.0 dB

Att

TOA 63.6

DURATION ☒ INTERVAL 0 sec ☐ HENCEFORTH

RANDOMIZED POWER PROFILE

SATELLITE 2 ☐ ALL

☐ ENABLE EVENT

TOA 0.0

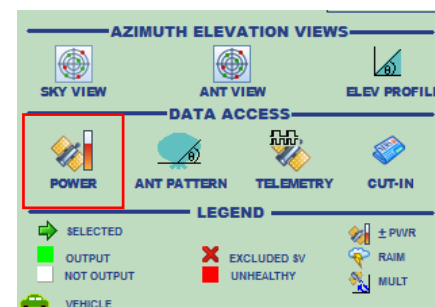
Att

INTERVAL 0.0 sec WIDTH 0.0 sec

☐ RANDOM ☐ RANDOM ☐ RANDOM

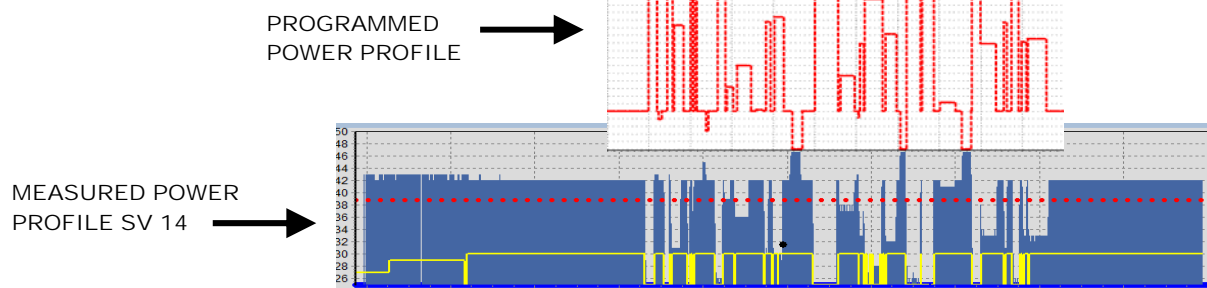
VEHICLE 1

Power can be controlled for L1C/A, L1P, L2P, L2C, and L5, ML1, and ML2.

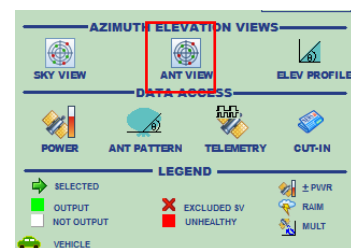
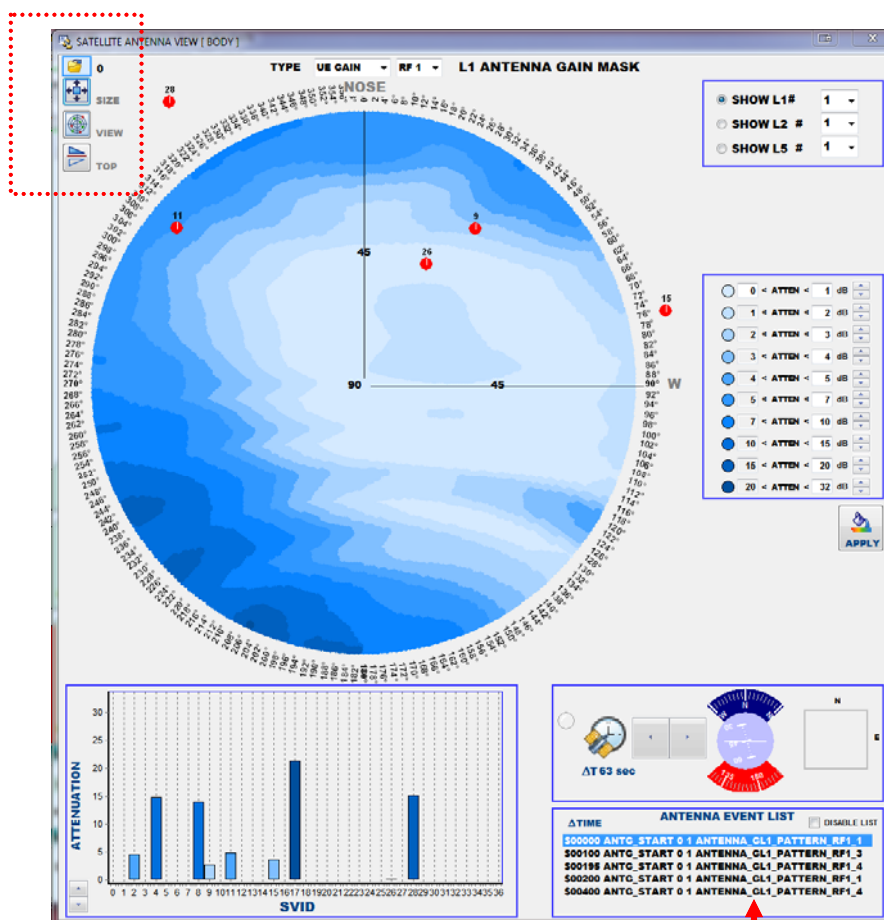


RANDOMIZE power provides a method for simulating a varying power environment due to partial blockage, foliage, or some other attenuation media.

Follow this link for details
[RANDOMATTENUATION.PDF](#)



ANTENNA PATTERN VIEWER



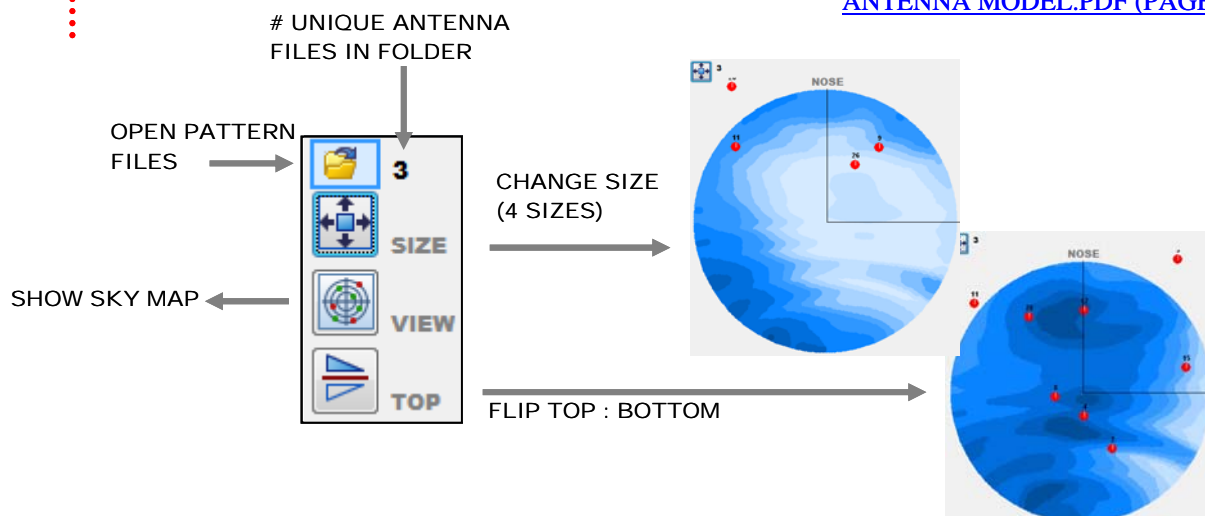
PROGRAMMABLE
BINS

ATTENUATION HISTOGRAM PER SVID

MULTIPLE-ANTENNA EVENTS

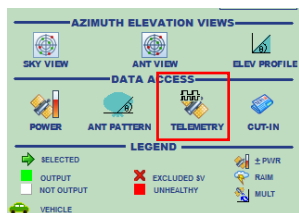
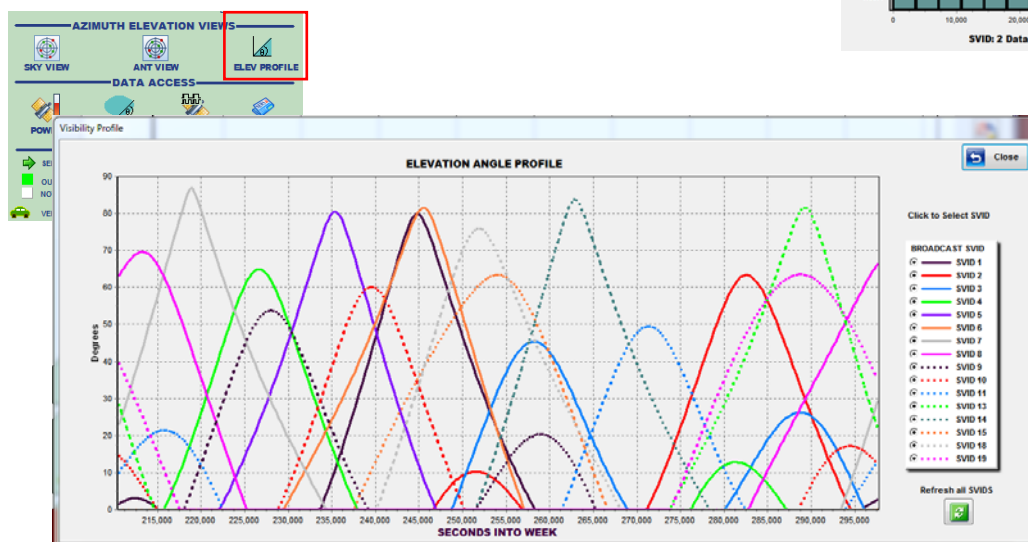
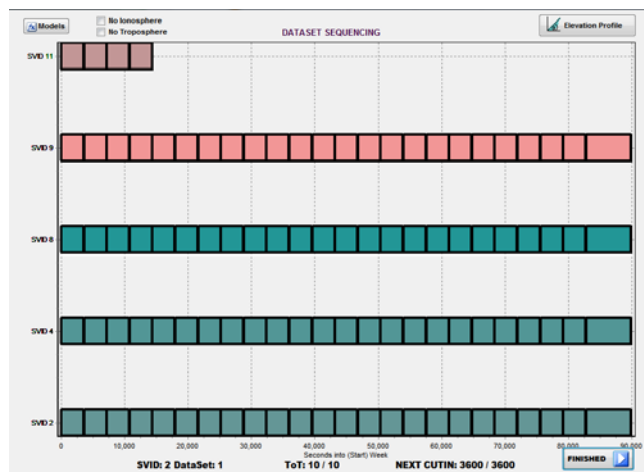
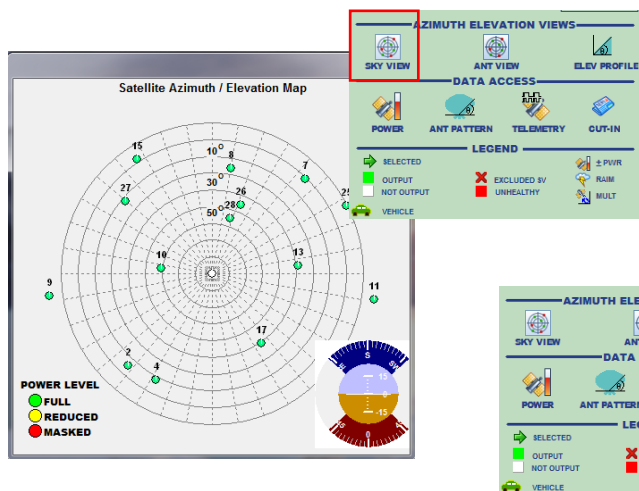
Follow this link for details

[IMPORTING MULTIPLE ANTENNA ATTERNS.PDF](#)
[ANTENNA MODEL.PDF \(PAGE 8\)](#)

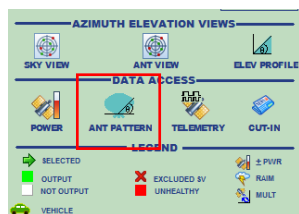




SATELLITE VISIBILITY PANEL
















<C:\TAPESTRY\DOCUMENTATION\MANUALS\USINGSATDBASEEDITOR.PDF>



<C:\TAPESTRY\DOCUMENTATION\MANUALS\ANTENNAMODELING.PDF>

Two Vehicles and the Sensor Models

The Tapestry system can simulate two dynamic vehicles each with their own independent error modeling, parameterization, and host vehicle configuration. The following table differentiates the Tapestry modeling that is vehicle specific from those that are vehicle independent.

Tapestry Modeling For Two Vehicles	Varies per Vehicle	Same per Vehicle	
Start Time			Both Vehicles must start at the <u>same</u> time
Initial State Vector			Vehicles <u>do not</u> have to start with the <u>same</u> initial conditions
GPS Space and Control Segment:			
Telemetry			Data bits and Messages are the <u>same</u> for <u>both</u> Vehicles
Range Models			
SV Antenna Pattern			
RAIM and T-RAIM			Multipath is <u>different</u> for <u>each</u> Vehicle.
Signal Configuration			
Multipath			
User Equipment Models:			
Automotive Dead Reckoning ...			Each Vehicle could have <u>different</u> Sensors. E.g. Vehicle I could have an HG1700. Vehicle II an LN200 SDLC. Or, both could be HG1700 with <u>different</u> error characteristics.
Antenna Gain Pattern			
Antenna Phase Pattern			
Inertial Measurement Unit			
ICD-GPS-059 INS			
Ref. Receiver.....		RF 1	

To facilitate keeping track of which error models apply to which Vehicle, Build Scenario implements the following color scheme throughout the user interface.

1 RF Output

1 Simulated Vehicle denoted by a Green Icon:



2 RF Output

1 Simulated Vehicle denoted by a Green Icon:



1 Simulated Vehicle denoted by a Blue Icon:



When Build Scenario is displaying a vehicle specific data form, the background color of the form will reflect the *Active Vehicle*. To change the *Active Vehicle*, select the appropriately colored Tab on the plot display. In addition, an appropriately colored Vehicle Icon is displayed on forms that apply to a specific vehicle. If a particular data form is in Gray, then this model is independent of vehicle. For example GPS Sub-Frame data; both Vehicles would download the same data bits and messages.

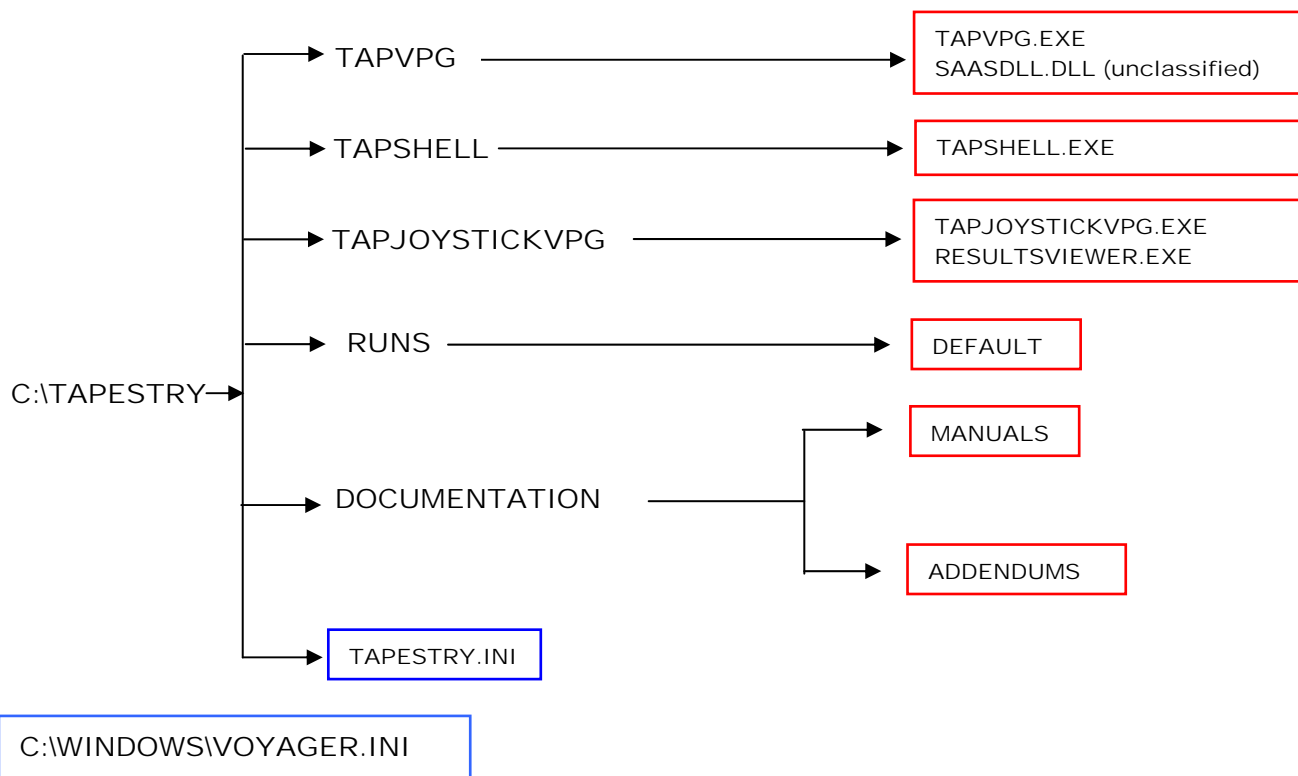


PORTING TAPVPG TO ANOTHER COMPUTER

BUILD SCENARIO for the Tapestry system is a windows application. You may install copies of BUILD SCENARIO on computers within your facility to be used exclusively to create Scenario Folders that can be transferred to the simulation hardware or to support simulator use.

Do so as follows:

HOST MACHINE (Tapestry Simulator)



Create the folder structure shown above on the TARGET Machine – all **RED** items are File Folders and you should copy the entire contents to your machine. – **BLUE** items are FILES that must be copied.

- Set the TARGET machine Resolution to **1900 x 1200**
- Copy any desired SCENARIO FOLDERS from the HOST machine to the TARGET machine. The must hang off the RUNS folder and DEFAULT is required.