Graphic Simulation Generation Tool (GSGT)

User Reference Guide

October 22, 2026

JVN Tool Suite v15.2.3 Volume 2

Copyright © 2026

JVN Communications Inc.
2111 New Road, Suite 104
Northfield, NJ 08225
609-569-9255
www.jvncomm.com

TABLE OF CONTENTS

1. GSGT Overview 11

2. Getting Started 12

3. System Configuration 13

3.1. Environment Variables 13
3.2. Starting GSGT 13
3.2.1. Version Warning 14
3.2.2. Command Line Options 14
3.2.3. GSGT Modes 15
3.3. Graphical User Interface 16
3.3.1. Menu Bar 16
3.3.2. Toolbar 18
3.3.3. Map Display 19
3.3.4. Status Bar 34
3.3.5. Context Boxes 35

4. GSGT Scenarios 36

4.1. Creating a New Scenario 36
4.1.1. Adaptation Selection 36
4.1.1.1. Single Adaptation 37
4.1.1.2. Multiple Adaptations 38
4.1.1.3. Adding Child Adaptation or Customization File 39
4.1.1.3.1. Adding STARS DMS Report File 39
4.1.1.3.2. Adding STARS Site File or User Defined Macros 42
4.1.1.3.3. Adding Multiple STARS Files 45
4.1.1.3.4. Adding TBFM Adaptation 51
4.1.1.3.5. Adding TBFM Customization File 54
4.1.1.4. Removing Child Adaptation 57
4.1.1.5. ERAM Adaptation File Overrides 58
4.1.2. Scenario Location and Name 59
4.1.3. Weather Selection 60
4.1.4. Scenario Overwrite Warning 61
4.2. Open an Existing Scenario 61
4.2.1. Load Progression Display 63
4.2.2. Scenario File Loading Errors 63
4.3. Edit Scenario 64

4.3.1. Create a New Object 64
4.3.2. Delete Object 65
4.3.3. Edit Object 66
4.3.4. Replicate Object 66
4.4. Save Scenario 69
4.4.1. Scenario Overwrite Warning 69
4.4.2. Save Scenario Before Exit 70
5. Scenario Editor 71
5.1. Preferences 71
5.1.1. Edit Preferences 71
5.2. Sensors 74
5.3. RSIs 75
5.3.1. Create and Edit RSI 75
5.3.2. Edit Objects Associated with Specific RSI 76
5.4. Adaptation Equipment and DS 77
5.5. System Commands 78
5.5.1. Create and Edit System Command 78
5.5.1.1. Message Editor 79
5.5.1.1.1. TCW Messages 81
5.6. Targets 83
5.6.1. Create and Edit Target 83
5.6.1.1. Target - Main 84
5.6.1.2. Target - Dynamics 88
5.6.1.3. Target - Messages 95
5.6.1.3.1. Auto Deriving Target Messages 97
5.6.1.3.2. Edit Prefs 98
5.6.1.3.3. FP Overrides 100
5.6.1.3.4. ICAO Overrides 101
5.6.1.3.5. Manually Creating Messages 105
5.6.1.3.6. Validating Messages (RTCS & TTP) 105
5.6.1.4. Target - Miscellaneous 106
5.6.1.5. Target - Ground 107
5.6.2. Target List Context Menu 109
5.6.3. Target Filters 111
5.6.4. Target Conflict Message 111
5.7. Script Definitions 113
6. Preview 114
6.1. Scenario Preview 115

6.2. Show Flight Path 118
7. Import Functions 121
7.1. Import GSGT Scenario 121
7.1.1. Import NASQuest Site 125
7.1.2. Import NASQuest CSV 125
7.1.3. Import STARS CDR 127
8. Export Functions 130
8.1. Export SDRR 130
8.2. Export GSGT 130
9. Reports and Tools 132
9.1. GSGT Session Log 133
9.2. Sorted Scenario Listing 134
9.3. Message Injection Report 135
9.4. Simulated Target Position 136
9.5. FAV Traversal Report 138
9.6. Simulated Radar Target Count 140
10. Weather Editor 142
10.1. Starting the Weather Editor 143
10.1.1. Command Line Options 143
10.2. Creating a New Weather Scenario 144
10.2.1. Location and Name 144
10.2.2. New Weather Scenario Options 145
10.3. Open an Existing Weather Scenario 146
10.4. Weather Editor GUI 147
10.4.1. Menu Options 147
10.4.2. Toolbar 148
10.4.3. Map Display 148
10.4.3.1. View Menu 148
10.4.3.2. Weather Menu 149
10.4.3.3. GRIB Edit Menu 153
10.4.3.4. Precipitation Edit Menu 155
10.4.3.5. Display Options 158
10.4.3.5.1. Basic Functions 158
10.4.3.5.2. Toolbar 159
10.4.4. Loading Adaptation 160
11. Source Scenario Files 163

11.1. Scenario Components 163
11.2. Targets 164
11.3. System Commands 168
11.4. Preferences 168
11.5. Record Select Indicators 169
11.6. Script Definitions 169
11.7. Active Runways 170
11.8. Restrictions 170
11.9. Pilot Controls 171
11.10. Device Control 171
Appendix A. Acronyms 173

TABLE OF FIGURES

Figure 1. GSGT Processor Login 12
Figure 2. GSGT Processor Desktop 12
Figure 3. Version Warning 14
Figure 4. GSGT GUI 16
Figure 5. Menu Bar 16
Figure 6. About GSGT 17
Figure 7. Scenario Information 18
Figure 8. Toolbar 18
Figure 9. Toolbar Display Control 18
Figure 10. Map Display Menus and Tools 19
Figure 11. Menu Tear-off 19
Figure 12. Background Tiles 20
Figure 13. Map Selection 21
Figure 14. STARS Maps 22
Figure 15. Customized “SAA” map overlay added to Maps 23
Figure 16. Airspace Options 24
Figure 17. Macro Options 25
Figure 18. ARTCC Options 26
Figure 19. FAVs Set Alpha 26
Figure 20. Airport Options 27
Figure 21. Radar Options 28
Figure 22. ADSB Options 29
Figure 23. ASDEX Options 30
Figure 24. WAM Options 30
Figure 25. Site Definition Data 31
Figure 26. Weather Options 32
Figure 27. Find Menu 32
Figure 28. Settings Options 33
Figure 29. Flight Level 33
Figure 30. Zoom 33
Figure 31. Range 34
Figure 32. Status Bar 34
Figure 33. Context Boxes 35
Figure 34. Loading Adaptation List 37
Figure 35. Selecting an ERAM Adaptation 37
Figure 36. Selecting Multiple ERAM Adaptations 38

Figure 37. Adding STARS DMS File 39
Figure 38. Selecting the DMS File Location 40
Figure 39. Selecting the TRACON Folder 40
Figure 40. Selecting a DMS Report File 41
Figure 41. STARS DMS Report File Added 41
Figure 42. Adding STARS Adaptation 42
Figure 43. Selecting the STARS Adaptation Location 43
Figure 44. Selecting the TRACON Folder 43
Figure 45. Selecting a Site File 44
Figure 46. STARS Adaptation Added 44
Figure 47. Adding STARS DMS File 45
Figure 48. Selecting the DMS File Location 46
Figure 49. Selecting the TRACON Folder 46
Figure 50. Selecting a DMS Report File 47
Figure 51. STARS DMS Report File Added 47
Figure 52. STARS Site File or Macro file Added 48
Figure 53. Selecting the Macro File Location 49
Figure 54. Selecting the TRACON Folder 49
Figure 55. Selecting a Macro File 50
Figure 56. Adding TBFM Adaptation 51
Figure 57. Selecting TBFM Location 52
Figure 58. Selecting TBFM Adaptation 52
Figure 59. TBFM Adaptation Added 53
Figure 60. Adding a TBFM Customization File 54
Figure 61. Selecting TBFM Customization File Location 55
Figure 62. Selecting TBFM Customization File 55
Figure 63. TBFM Customization File Added 56
Figure 64. Removing a Child Adaptation 57
Figure 65. Selecting a Scenario Location and Name 59
Figure 66. Selecting a Weather Scenario 60
Figure 67. Scenario Overwrite Warning 61
Figure 68. Opening an Existing Scenario 62
Figure 69. Load Progression 63
Figure 70. Loading Errors 63
Figure 71. Scenario Editor 64
Figure 72. Creating a New Object 65
Figure 73. Object Delete Confirmation 65
Figure 74. Object Editor 66
Figure 75. Replication Editor 67

Figure 76. Replications 68
Figure 77. Save Scenario 69
Figure 78. Scenario Overwrite Warning 70
Figure 79. Save Before Exit 70
Figure 80. Terminal and ERAM Sim Mode Tabs 71
Figure 81. Normal and DYSIM Modes Tabs 71
Figure 82. Preferences Tabs 72
Figure 83. Sensors Tab 74
Figure 84. RSI Editor 75
Figure 85. RSI Exists Warning 76
Figure 86. Filtering by RSI 76
Figure 87. RSI Filter Selection 77
Figure 88. Objects Filtered by RSI 77
Figure 89. Message Editor 79
Figure 90. TCW Message 81
Figure 91. TCW Message Tokens 82
Figure 92. Targets Tab 83
Figure 93. Target Editor Main Tab 84
Figure 94. Route Help 86
Figure 95. Dynamics Tab 88
Figure 96. Override Route 89
Figure 97. Target Event Editor 90
Figure 98. Target Editor Messages Tab 96
Figure 99. Freeze Derived Messages 98
Figure 100. Target Specific Preferences 98
Figure 101. Edit Prefs Attention Icon 99
Figure 102. Flight Plan Override Editor 100
Figure 103. Edit FP Overrides Attention Icon 100
Figure 104. ICAO Flight Plan Overrides Editor 101
Figure 105. ICAO Help page 1 103
Figure 106. ICAO Help page 2 104
Figure 107. Attention Icon 104
Figure 108. RTCS and TTP Message Validation 105
Figure 109. Validation Successful 106
Figure 110. Target Editor Miscellaneous Tab 106
Figure 111. Ground movement editor 108
Figure 112. Target List Context Menu with Multiple Items Selected 109
Figure 113. Target List Context Menu with Single Item Selected 110
Figure 114. Target Filters 111

Figure 115. Target Conflict Warning 112
Figure 116. Script Definitions Tab 113
Figure 117. Preview Options 114
Figure 118. Scenario Preview 115
Figure 119. Preview of Selected Targets 116
Figure 120. Preview Controls 116
Figure 121. Preview Datablock Visibility Manager 117
Figure 122. Target Highlighted within Preview 118
Figure 123. Show Flight Path 119
Figure 124. Target Flight Path 120
Figure 125. Import Scenario 121
Figure 126. Scenario Selection 122
Figure 127. Select Scenario Elements 123
Figure 128. Select Display Items 124
Figure 129. Import Errors and Warnings 125
Figure 130. NASQuest Site Import 125
Figure 131. Import CSV File 126
Figure 132. Import CSV Options 126
Figure 133. CSV Import Status 127
Figure 134. STARS CDR Options 127
Figure 135. Import CDR File 128
Figure 136. CDR Import Status 128
Figure 137. Time Based Targets 129
Figure 138. Time Based Targets - Dynamics 129
Figure 139. Export SDRR 130
Figure 140. Export GSGT 131
Figure 141. Main Reports Menu 133
Figure 142. Scenario Editor Reports Menu 133
Figure 143. GSGT Session Log 134
Figure 144. Sorted Scenario List Options 134
Figure 145. Sorted Scenario List Report 135
Figure 146. Message Injection Report 136
Figure 147. Target Position Report Options 137
Figure 148. Target Position Report File List 138
Figure 149. Target Position Report 138
Figure 150. FAV Traversal Report 139
Figure 151. Target Count Report Options 140
Figure 152. Target Count Report 141
Figure 153. Weather Editor 142

Figure 154. Weather Scenario Name and Location 145
Figure 155. New Weather Scenario Options 145
Figure 156. Select Existing Weather Scenario 146
Figure 157. Menu Options 147
Figure 158. About GSGT 147
Figure 159. Toolbar 148
Figure 160. Map Selection 148
Figure 161. ARTCC Options 149
Figure 162. Weather Data Selections 149
Figure 163. Temperature with Contours 150
Figure 164. Pressure Display 151
Figure 165. Wind Vectors 152
Figure 166. Precipitation Display 153
Figure 167. GRIB Editor 154
Figure 168. Selecting Weather Cells 155
Figure 169. Precipitation Editor 156
Figure 170. Precipitation Intensity 157
Figure 171. Defining Precipitation 158
Figure 172. Pressure Altitude Options 159
Figure 173. Flight Level 160
Figure 174. Zoom 160
Figure 175. Range 160
Figure 176. Loading Adaptation 160
Figure 177. Selecting an Adaptation 161
Figure 178. Adaptation Display 162

1. GSGT Overview

The Graphic Simulation Generation Tool (GSGT) generates scenarios based on National Air Space (NAS) adaptation for simulation of traffic to various Air Traffic Control (ATC) systems. These scenarios can be used as a source of real time inputs to facilitate testing and integration of NAS ATC systems and related subsystems. GSGT employs a Graphical User Interface (GUI) to aid in scenario development and is capable of automatically generating flight data messages.

GSGT has the capability of creating scenarios for dynamic simulation (DYSIM). When launched in DYSIM mode, GSGT generates the initial flight plans and departure messages. All other flight data messages are generated when the scenario is executed.

2. Getting Started

The processor with GSGT installed is configured to boot up to a user login screen. Users can enter a username and password, then press **Enter** on the keyboard.

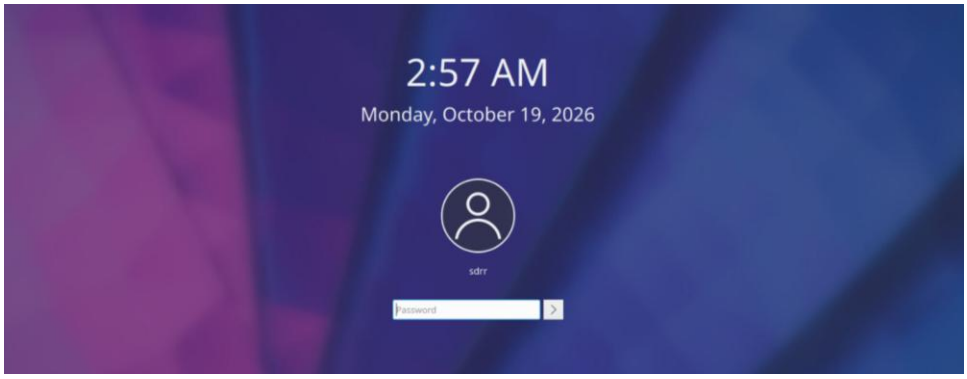


Figure 1. GSGT Processor Login

NOTE: *The 'root' user does not have access to the GSGT commands and utilities. If root access is needed while logged in, the user should either log out and log in again as 'root' or open a terminal window, type* ***su*** *and enter the 'root' user password.*

After a short loading period the KDE desktop will appear.

Figure 2. GSGT Processor Desktop

3. System Configuration

3.1. Environment Variables

GSGT uses environment variables for the locations of source and exported scenario files, weather scenarios, and adaptation data, including En Route Automation Modernization (ERAM), Standard Terminal Automation Replacement System (STARS), and Time Based Flow Management (TBFM) adaptation files.

Table 1. Environment Variables

Variable Name	Description	Default Location
GSGT_WORK_PATH	Location of source scenario files.	/usr/local/gsgt
SDRR_SCENARIO_PATH	Location of exported SDRR scenario files.	/usr/local/scenarios
WX_PATH	Location of weather scenarios.	/opt/wx
ADAPTATION_PATH	Location of adaptation data.	/opt/adaptation

3.2. Starting GSGT

To start GSGT from the command line, enter:

```
> gsgt
```

To launch a GSGT version that is not the default version, enter:

```
> /usr/local/jvn.x.x.x/bin/gsgt
```

NOTE: *Starting GSGT from a command line while inside the scenario directory will automatically open that scenario.*

3.2.1. Version Warning

When a scenario that was previously saved with a different version of GSGT is opened, GSGT will display a warning. The warning shows the current version of the scenario and the version of GSGT that is actively running. If “Continue” is selected, the scenario will be converted to the new version and saved in the new format. If “Cancel” is selected, the scenario will not be opened.

Figure 3. Version Warning

3.2.2. Command Line Options

GSGT can be started with various options which control its operation.

Table 2. Program Parameters

Parameter	Description
`--dysimMode`	DYSIM mode for dynamic scenario execution with the ERAM system.
`--eramSimMode or --terminalMode`	ERAM simulation mode or Terminal mode for dynamic scenario execution without an ERAM system.
`--tcwMsgs`	Includes auto-generated TCW injection messages to work with TCW Controllers.
`--arptView[=airportName]`	Requires TFDM ground adaptation for an airport.
`--proxy=server/port`	Opens GSGT with specific server/port for map tiles.
`--opengl`	Opens GSGT with GSGT Log
`--open`	Opens the GSGT Open Scenario window.
`--new`	Opens the GSGT New Scenario window.

Parameter	Description
`--title="title"`	Changes the title at the top of the window.
`--version`	Display GSGT version.
`--nofullscreen`	Not full screen mode; GSGT will be stared in a window roughly half the size of the screen.
`--help`	Display application parameters.

For example, GSGT can be started in ERAM Simulation Mode:

```
> gsgt --eramSimMode
```

3.2.3. GSGT Modes

GSGT operates in several modes that are tailored to specific functionality.

Table 3. GSGT Operation Modes

Mode	Description
Normal Mode	Normal mode is tailored for creating target scenarios to be exported to SDRR for execution with the ERAM system.
DYSIM Mode	DYSIM mode is tailored for creating target scenarios for dynamic execution using the ERAM system.
Terminal/ERAM Simulation Mode	Terminal or ERAM simulation mode is tailored for creating target scenarios for execution without an ERAM system. The scenarios can be exported to SDRR or executed dynamically.

3.3. Graphical User Interface

The GSGT Graphical User Interface (GUI) includes menu options, a toolbar, and a large map display.

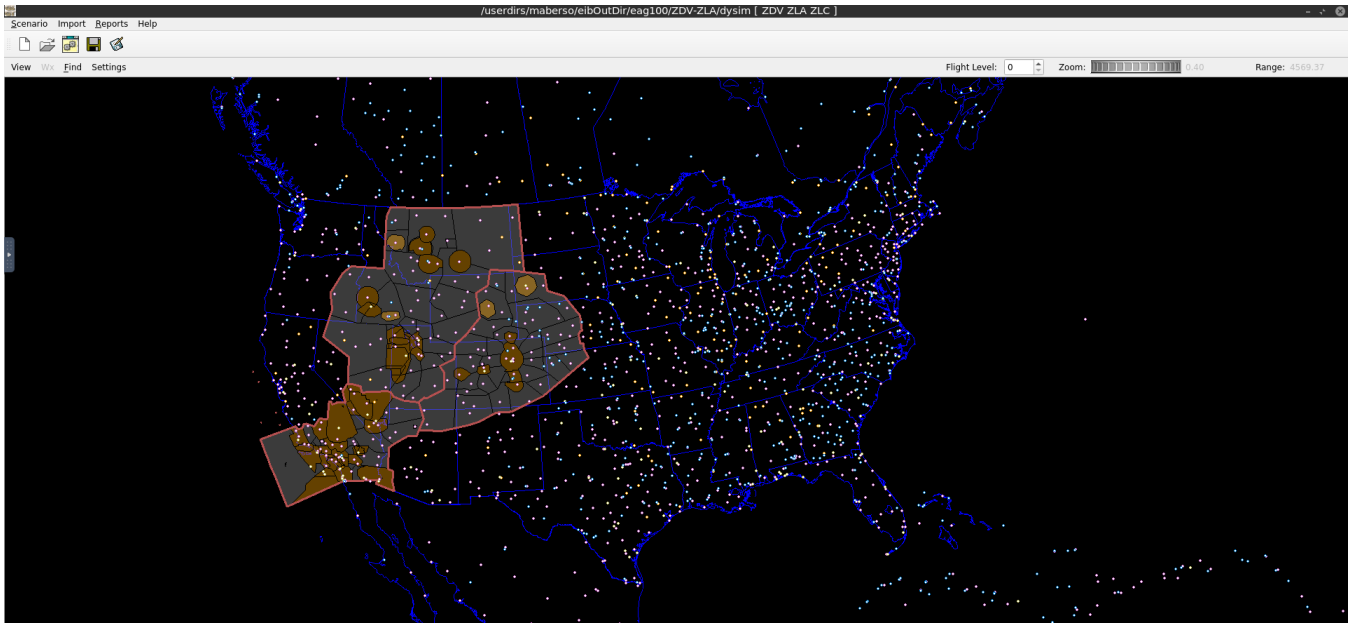


Figure 4. GSGT GUI

3.3.1. Menu Bar

A menu bar is displayed along the top, just below the title of the main GSGT GUI.

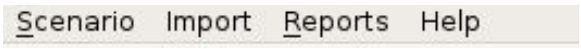


Figure 5. Menu Bar

The menu bar includes the following options:

Scenario

Provides options to create a New scenario, Open an existing scenario, Edit the current scenario, Save the current scenario, Save As the current scenario with a different name, or Exit the GSGT GUI.

Import

The Import menu provides options to import scenario elements from another GSGT scenario, NASQuest, a CSV file, or STARS CDR.

Reports

The Reports menu provides options to generate various reports for the currently open scenario such as: GSGT Session Log, Simulated Target Position, FAV Traversal Report, and Simulated Radar Target Count.

Help

The Help menu provides options to select **About** (F1) and **Scenario Info** (F2). About displays the About GSGT dialog, and Scenario Info displays the Scenario Information dialog.

Figure 6. About GSGT

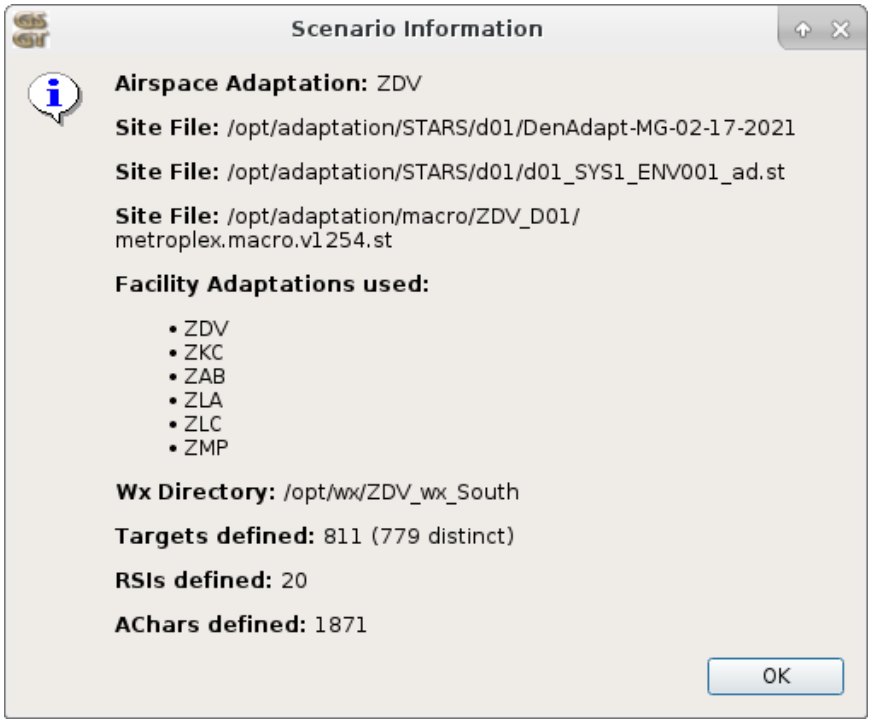


Figure 7. Scenario Information

3.3.2. Toolbar

The scenario toolbar includes icons to create a New scenario, Open an existing scenario, Edit the current scenario, Scenario Manager (in Normal, Terminal, and TGF Modes; Scenario Manager is not available in DYSIM Mode), Save the current scenario, and Save As to select a different name.

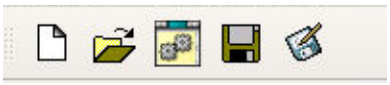


Figure 8. Toolbar

By clicking and dragging the toolbar handle (which looks like a double separator), the toolbar can be docked to either the top, bottom, left, or right of the main GSGT window or it can be left to float above the map display. The toolbar can be displayed or hidden by right clicking anywhere on the main menu bar and selecting **Toolbar**.

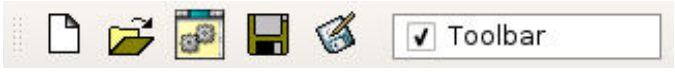


Figure 9. Toolbar Display Control

3.3.3. Map Display

GSGT provides a graphical representation of various adaptation elements on the Map Display. The Map Display also has its own menus, tools, and a status bar (when invoked).

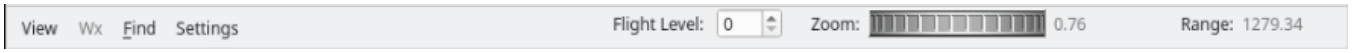


Figure 10. Map Display Menus and Tools

The Map Display menus are:

View

The View menu is used to select geographic and adaptation elements for background display. These elements may be displayed individually or in combinations.

NOTE: *Each menu and submenu has a dashed line at the top. Selecting the dashed line will "tear off" the menu into a new dialog. The menu will remain displayed after a selection is made.*

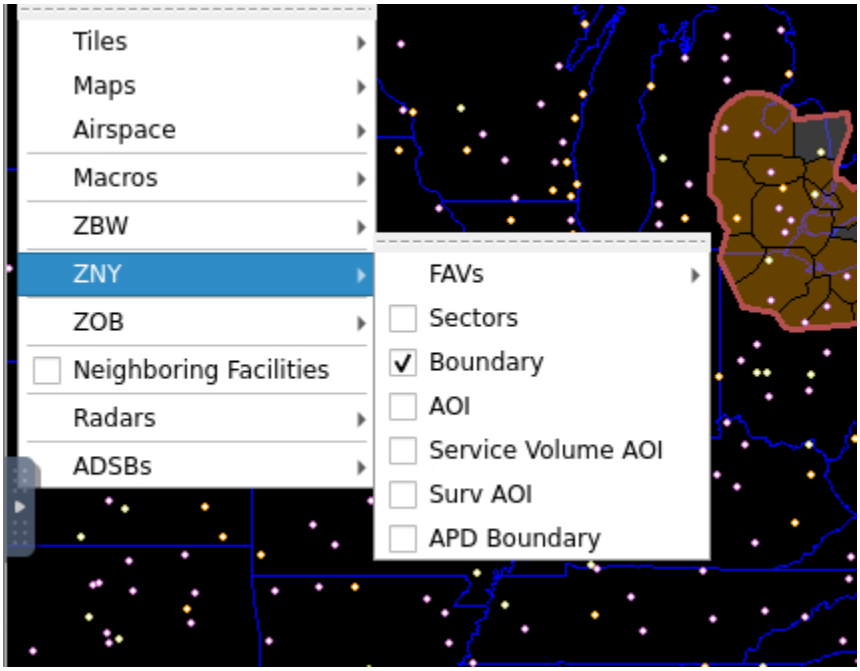


Figure 11. Menu Tear-off

Geographic and adaptation elements available for display are:

Tiles

Background map tiles may be displayed if an internet connection is available. Tile options include Virtual Earth, Open Street Map, Google Satellite, Google Street, Google Terrain, Stamen, and ThunderForest. The default is No Background Tiles.

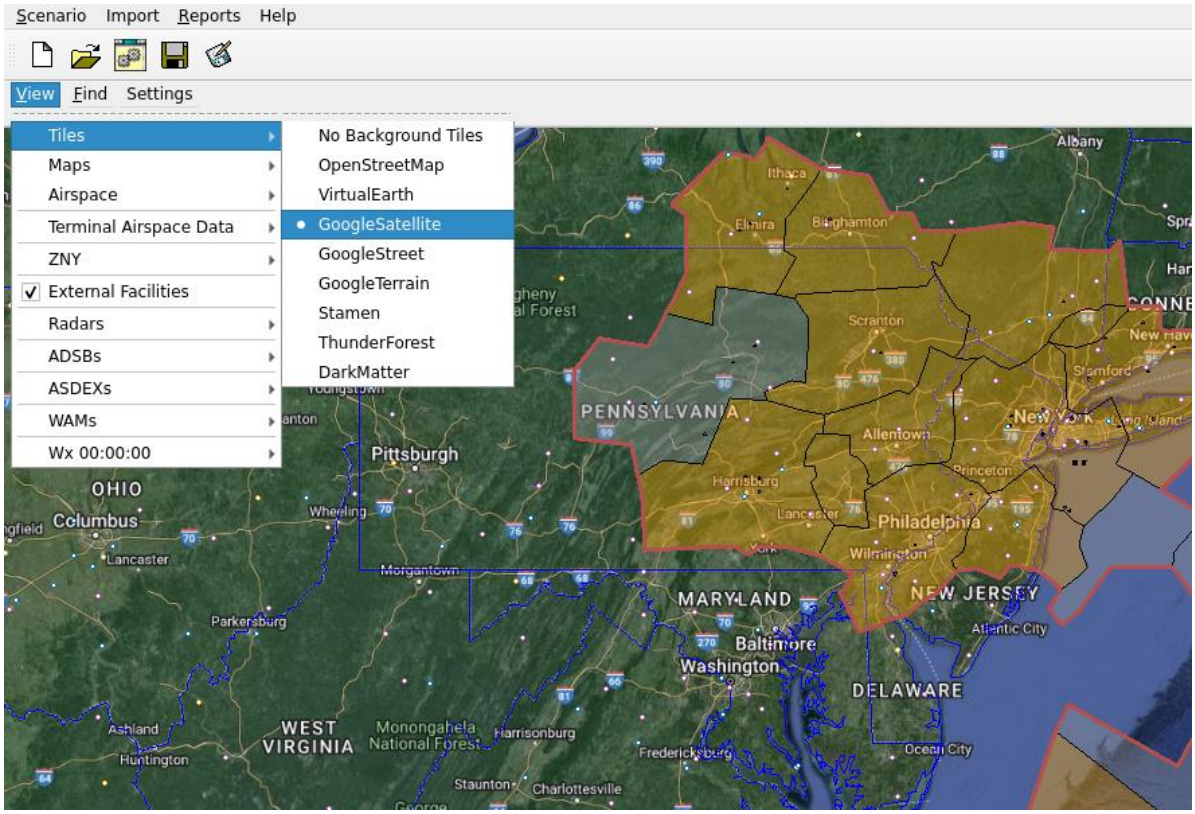


Figure 12. Background Tiles

Maps

Political maps displaying boundaries in blue are available, and include US Map showing state boundaries, Canada showing provinces and territories, and Mexico.

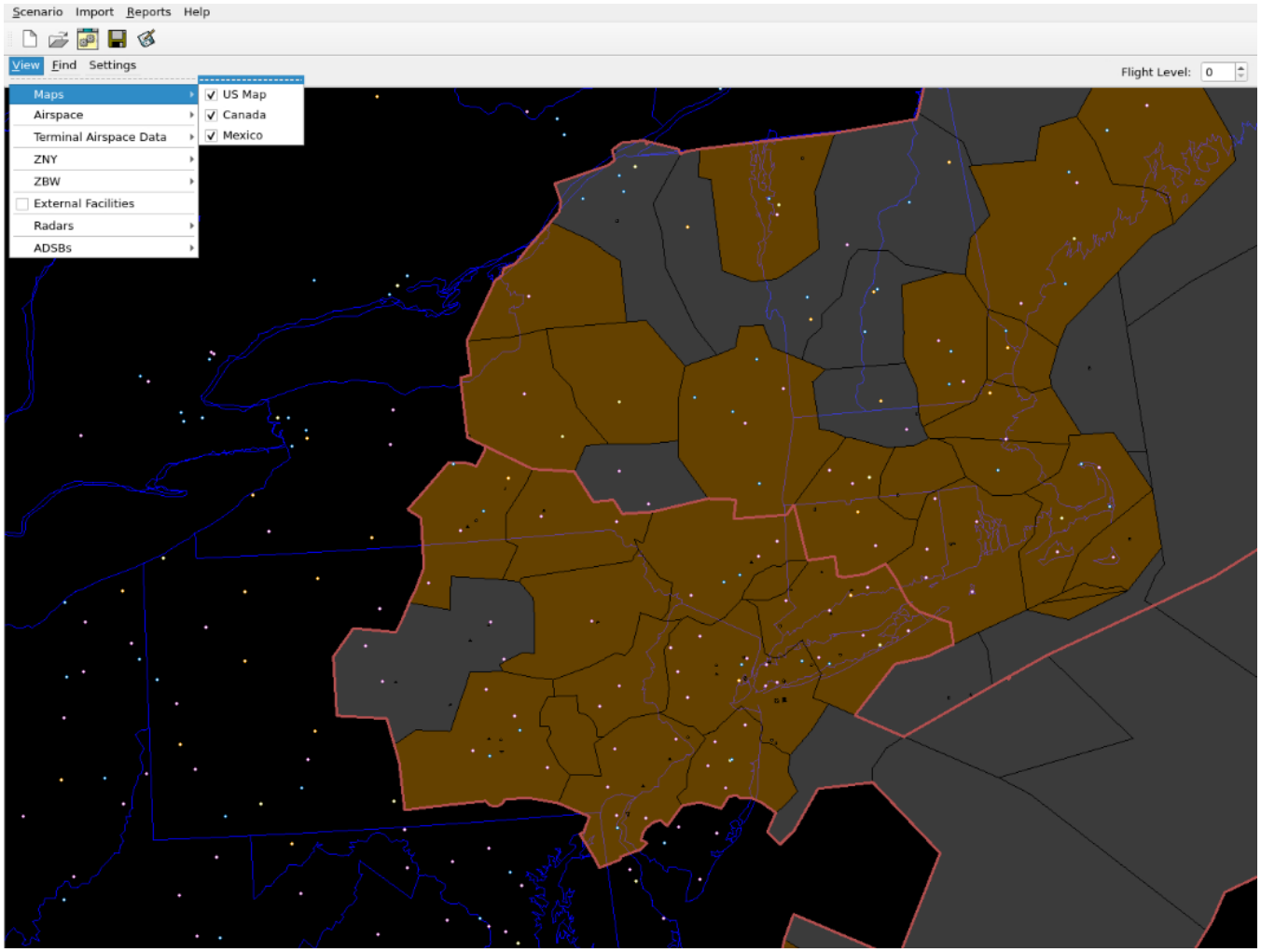


Figure 13. Map Selection

STARS maps may also be available if using a STARS adaptation and running in Terminal Mode. Select the site to display STARS maps. In the figure below, maps for STARS site 'phl' are available.

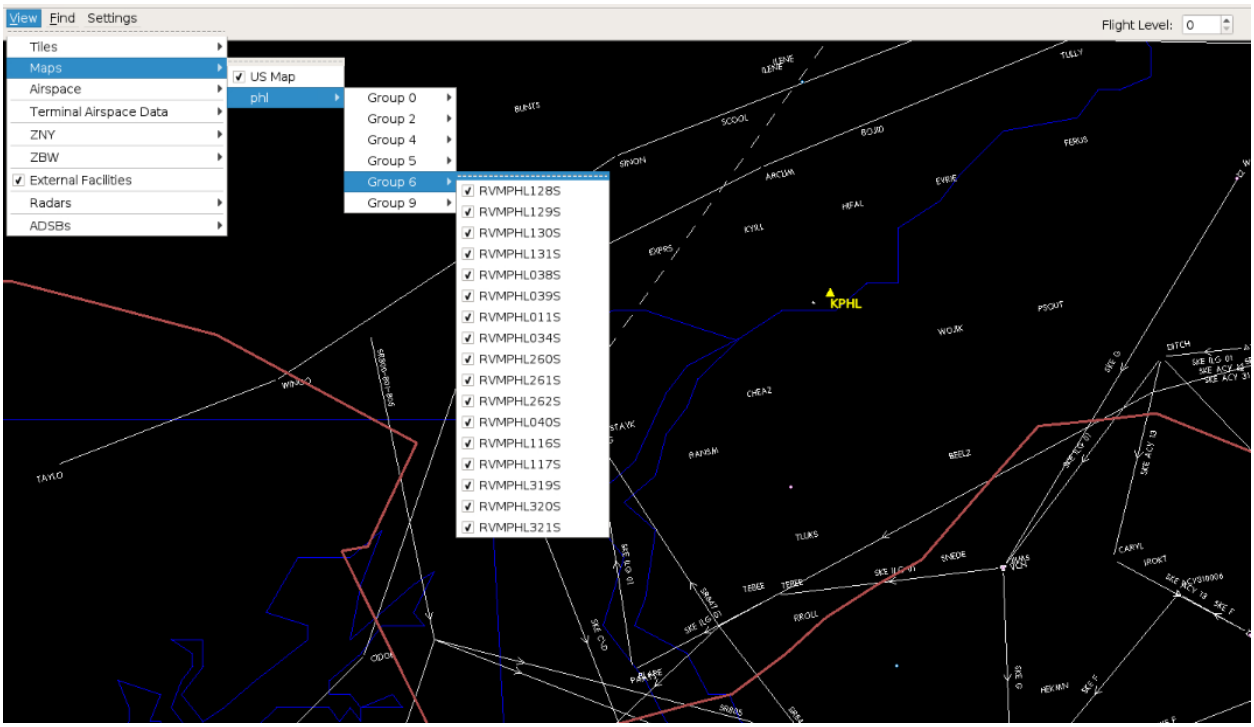


Figure 14. STARS Maps

Customized map overlays can also be added to Maps. This can include simple lines or complex shapes. The example below shows a map overlay for a Special Activities Airspace (SAA). To generate this figure, the map coordinates are added to custom-map.xml file as shown below. The style of the line and the color can be adjusted. For GSGT to add the map option, it must be included in the gsgt.cfg file as shown below.

Example custom-map.xml file:

```
<map>
  <linesegment color="white" style="DashLine">
    <vertex pos="+28:40:00.00,-080:41:00.00"/>
    <vertex pos="+29:52:00.00,-079:21:00.00"/>
    <vertex pos="+29:47:00.00,-079:15:00.00"/>
    <vertex pos="+28:28:00.00,-080:34:00.00"/>
    <vertex pos="+28:40:00.00,-080:41:00.00"/>
  </linesegment>
</map>
```

Example gsgt.cfg file:

```
<config>
  <display height="3000." name="ZBW" projection="stereographic" r0="3438.520"
scale="0.40" tangent="+43:48:34.00,-072:26:24.00" width="3600.">
    <map color="0,0,255" file="maps/us.dat" name="US Map" type="noaamap"
visible="1"/>
    <map color="0,0,255" file="maps/canada.shp" name="Canada" type="shpfile"
visible="1"/>
    <map color="0,0,255" file="maps/mexico.shp" name="Mexico" type="shpfile"
visible="1"/>
    <map color="200,100,0" file="./custom-map.xml" name="SAA" type="xmlfile"
visible="1"/>
  </display>
</config>
```

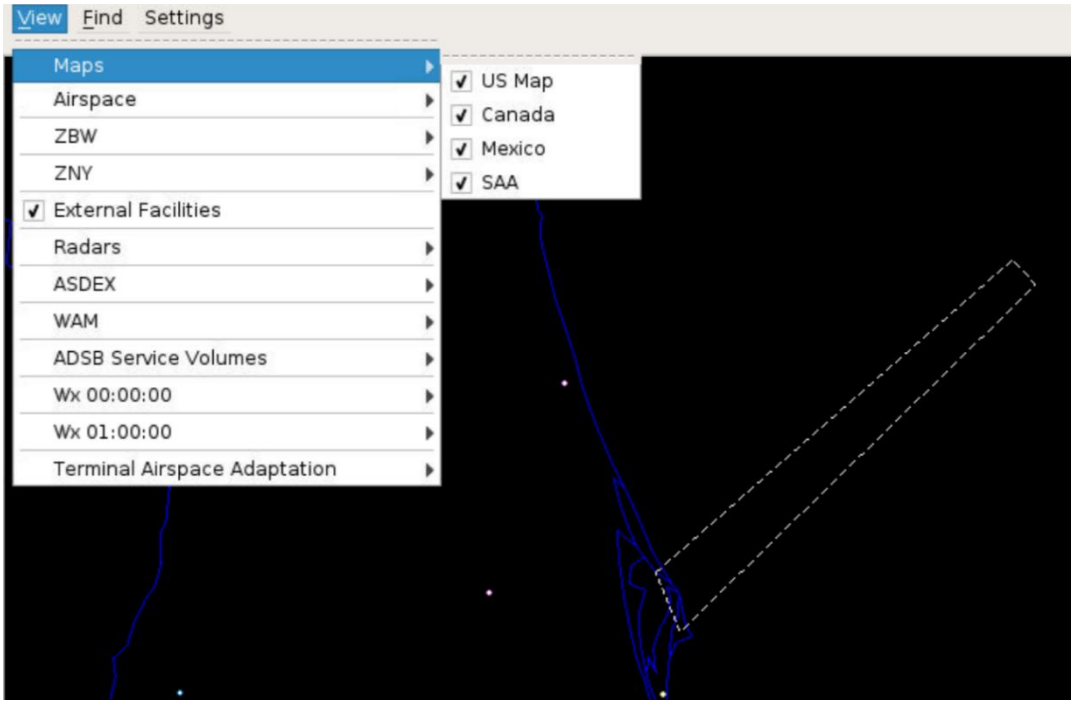


Figure 15. Customized "SAA" map overlay added to Maps

Airspace

Contains submenus with options to display national En Route data, including:

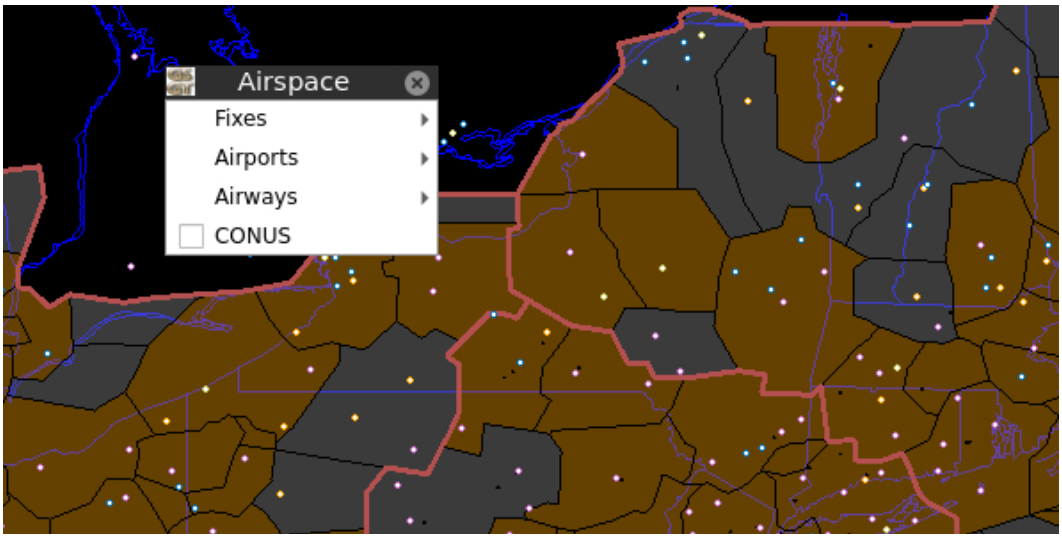


Figure 16. Airspace Options

Fixes

Contains a submenu with the following:

- VORs (white and purple dots)
- VOR Labels (purple letters)
- DMEs (white and olive dots)
- DMEs Labels (orange letters)
- TACANs (white and olive dots)
- TACANs Labels (olive letters)
- NDBs (white and blue dots)
- NDB Labels (blue letters)
- Waypoints (white and turquoise dots)
- Waypoint Labels (turquoise letters)

Airports

Contains a submenu with the following:

- Airports (white triangles)
- Airport Labels (green letters)

Airways

Contains a submenu with the following:

- High Airways (tan lines and turquoise points)
- Low Airways (tan lines and turquoise points)
- Other Airways (tan lines and turquoise points)

Macros

Allows the user to turn macros on or off.

Figure 17. Macro Options

ARTCC Name

Each En Route center adaptation included in the scenario has its own submenu with options to display local adaptation data.

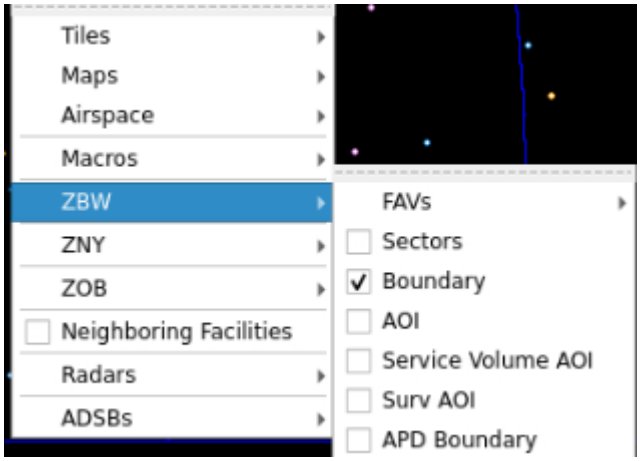


Figure 18. ARTCC Options

FAVs

Fixed Airspace Volumes (gray for ARTCC and orange for Terminal airspace). The visibility can be checked or unchecked to allow the user to change the opacity on the map display.

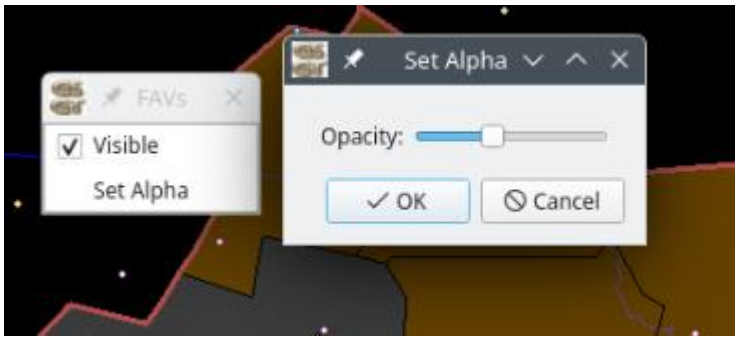


Figure 19. FAVs Set Alpha

Sectors

Contains a submenu with the adapted sector plans (blue lines)

Boundary

Area of responsibility (AOR) boundary (red line)

AOI

Flight Plan Area of Interest (AOI) boundary (green)

Service Volume AOI

ADS-B Service Volume Area of Interest boundary (blue)

Surv AOI

Surveillance Area of Interest boundary (teal)

APD Boundary

(yellow)

Neighboring Facilities

When checked, this option displays adjacent facility boundaries. Colors vary with facility type.

Airport Name

Available when TFDM ground adaptation is included in scenario.xml.

Runway Markings

(green)

Runway Departure Queues

(green)

Gates

(fuchsia)

Fixes

(aqua)

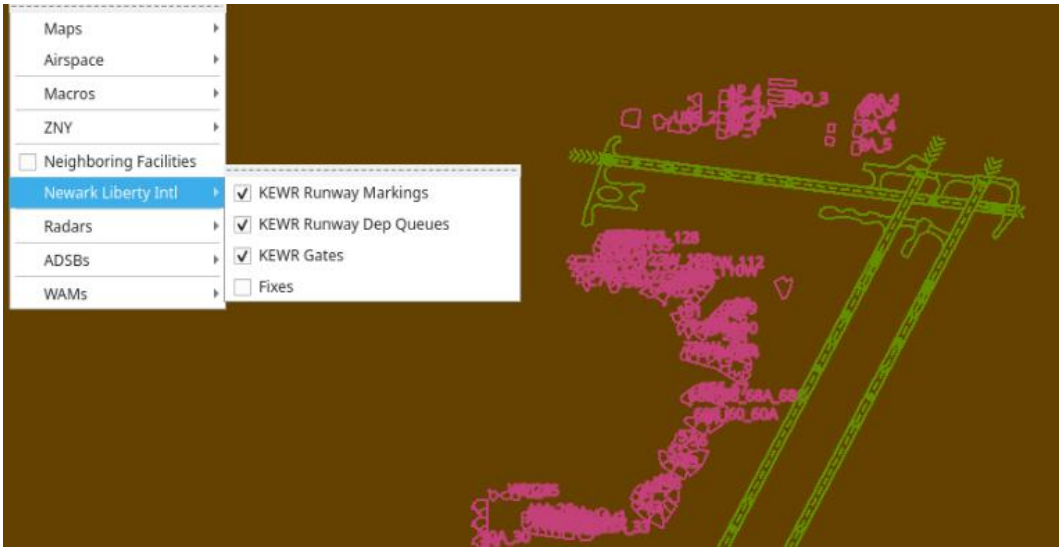


Figure 20. Airport Options

Radars

The Radar submenu lists all adapted radar sites and an option for toggling all radar sites on or off. When a radar site is on, the range is displayed as a circle with a shaded area indicating the coverage area at the selected altitude.

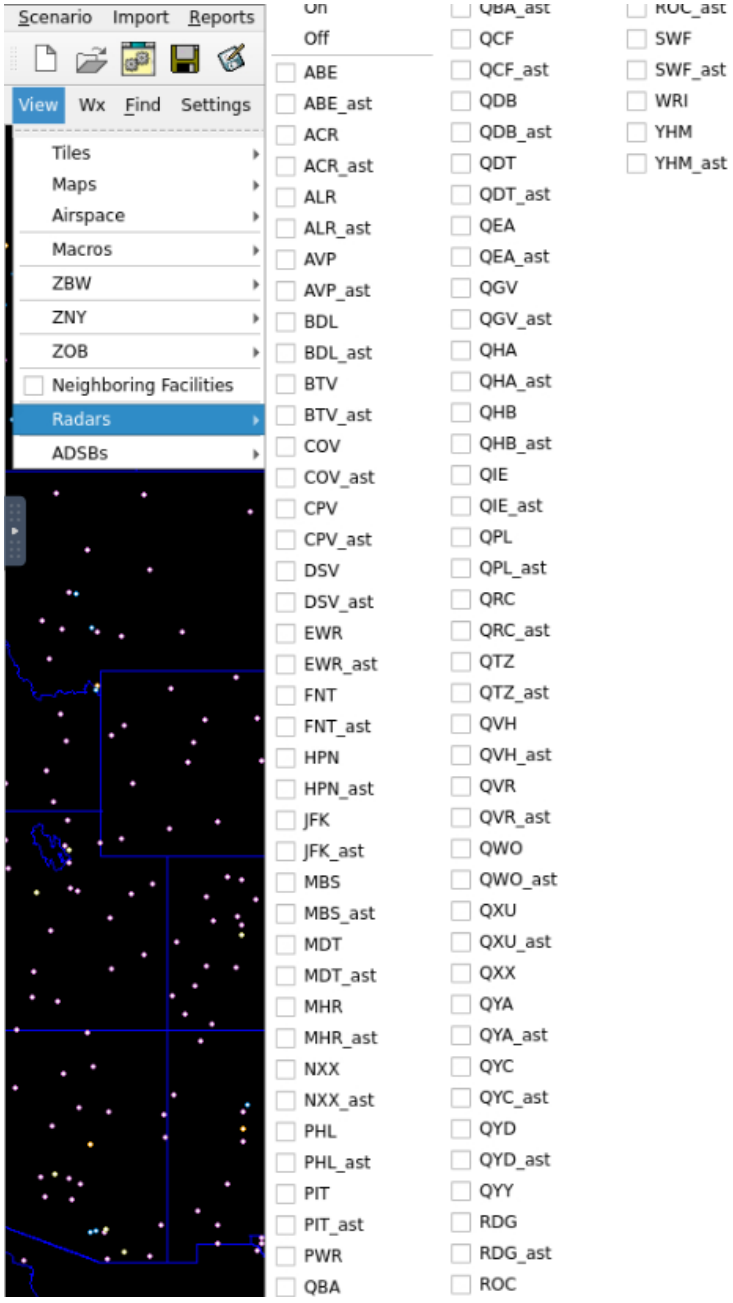


Figure 21. Radar Options

ADSB

The ADSB submenu lists all adapted service volumes and an option for toggling all service volumes on or off. When a service volume is on, the range is displayed as a shaded circle.

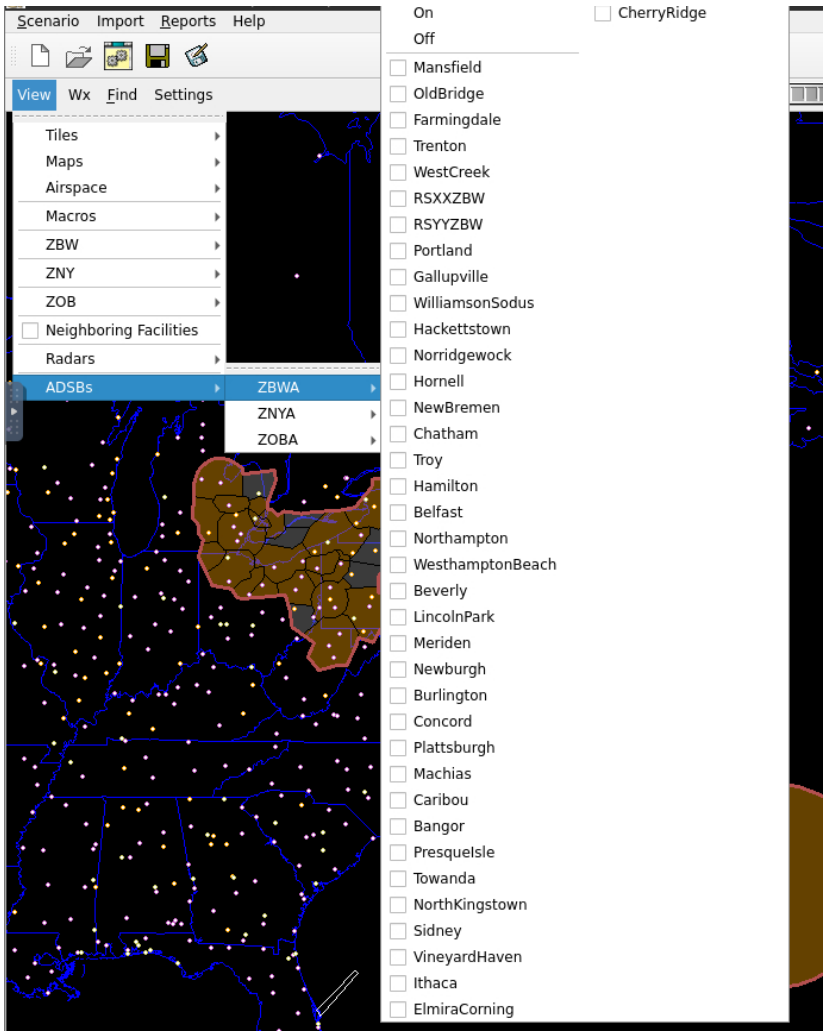


Figure 22. ADSB Options

ASDEX

The ASDEX submenu provides an option for toggling ASDEX on or off. When ASDEX is on, the range is displayed as a shaded circle.

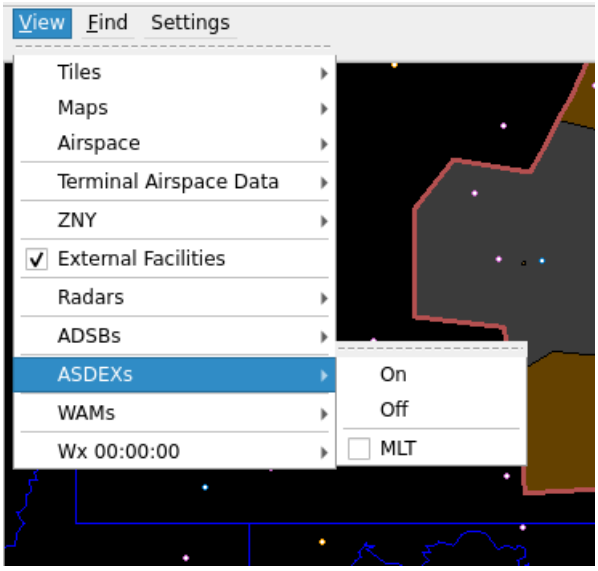


Figure 23. ASDEX Options

WAM

The WAM submenu provides an option for toggling WAM on or off. When WAM is on, the range is displayed as a shaded circle.

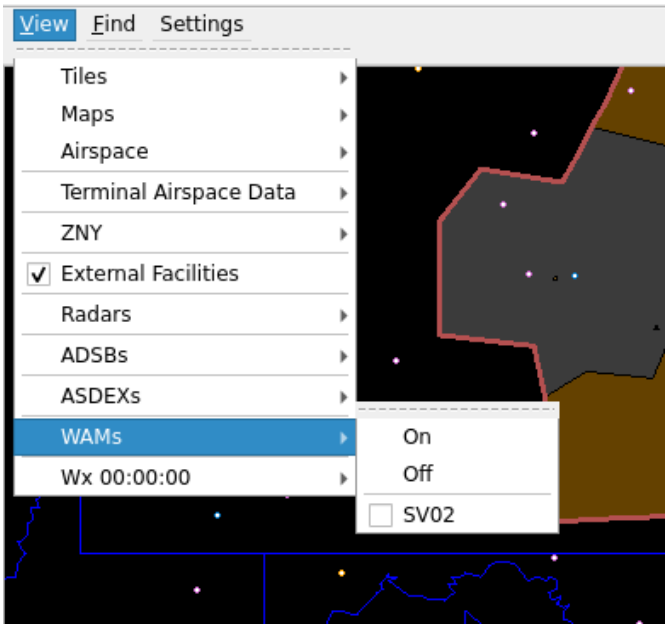


Figure 24. WAM Options

Terminal Airspace Data

Terminal Airspace Data contains a submenu listing all user defined macros and an option for toggling the display of all macros on or off. Terminal Airspace Data also contains:

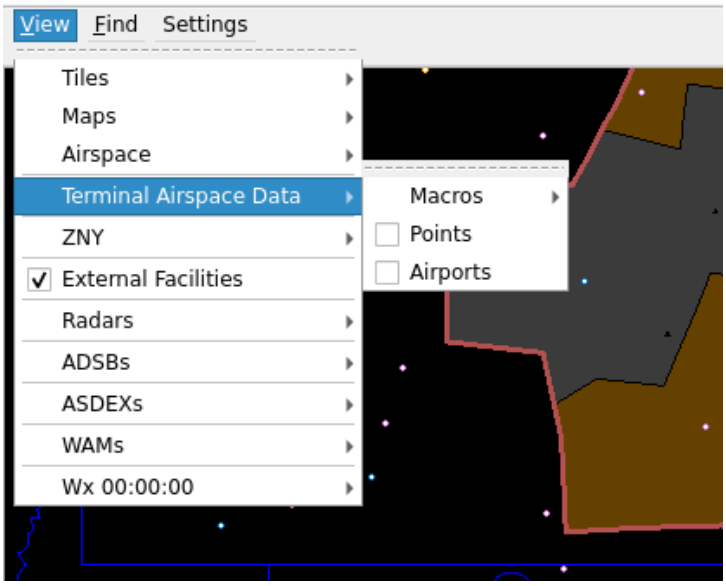


Figure 25. Site Definition Data

Macros

User defined route macros.

Points

(yellow dots)

Airports

(purple triangles)

Wx Maps

WX hh:mm:ss

Select between each of the weather hours in a weather scenario. Then have the option to turn on scalars, which include temperature (various colors) or pressure (gray contour lines) and the option to show contours. Outside of scalars, you can also add wind (white arrow vectors) and precipitation (various colors).

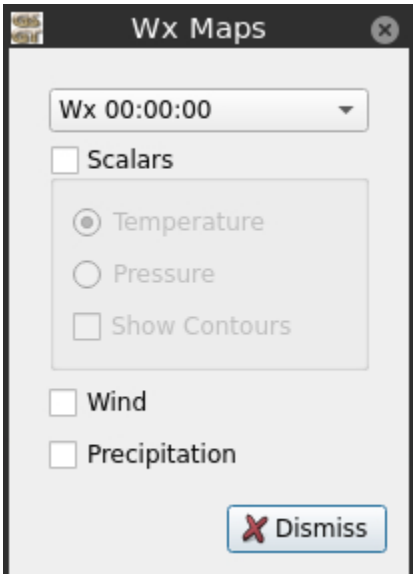


Figure 26. Weather Options

Find

The Find menu can be used to search the adaptation for airspace elements by name. When found, the element(s) are added to the map display and a context box is displayed with details about the element.

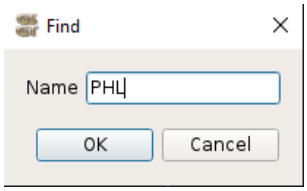


Figure 27. Find Menu

Settings

Clicking on **Settings** displays the following submenus:

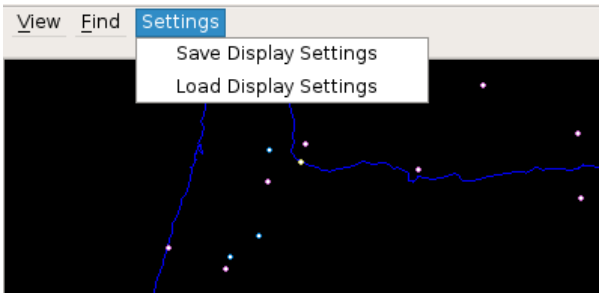


Figure 28. Settings Options

Save Display Settings

Allows saving of preferred display settings.

Load Display Settings

Allows loading of previously saved display settings.

Flight Level

The **Flight Level** tool allows an altitude to be set either by typing the value into the box or by clicking the up and down arrows. Changing the altitude also changes the sector and facility boundaries that are displayed.

Figure 29. Flight Level

Zoom

The **Zoom** tool allows the range of the display to be adjusted using a wheel selector.

Figure 30. Zoom

Range

The **Range** tool displays the horizontal size (in nmi) of the airspace showing in the map display.

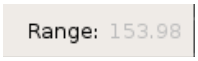


Figure 31. Range

3.3.4. Status Bar

The Status Bar, also referred to as the Measurement Bar, located on the bottom of the main window is used to display measurement information from the map. The bar is automatically displayed and updated upon user action that triggers the measurement information.

To display lat/lon and X/Y system coordinates at any specific point, hold down the **SHIFT** key while mouse clicking a location on the map. Holding down the **SHIFT** key while left clicking and dragging the mouse will display spherical distance in nmi, heading (true and magnetic), and delta X/Y system coordinates.

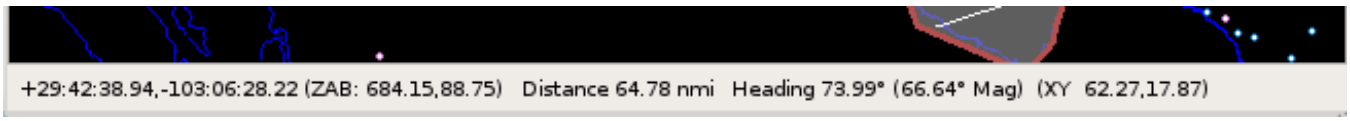


Figure 32. Status Bar

3.3.5. Context Boxes

Holding the SHIFT key while right clicking on any airspace item (such as a Fix, Airport, or FAV) will cause the item to be highlighted and a context box to be displayed. A context box displays information about the airspace item. The contents of each context box depend on the type of item selected and may contain a menu that includes additional data for the selected item.

Right clicking on an item, without holding down the SHIFT key, will highlight the item and display the item name directly on the screen.

A context box can be closed by right clicking again on the item, or by selecting the 'X' button on the window.

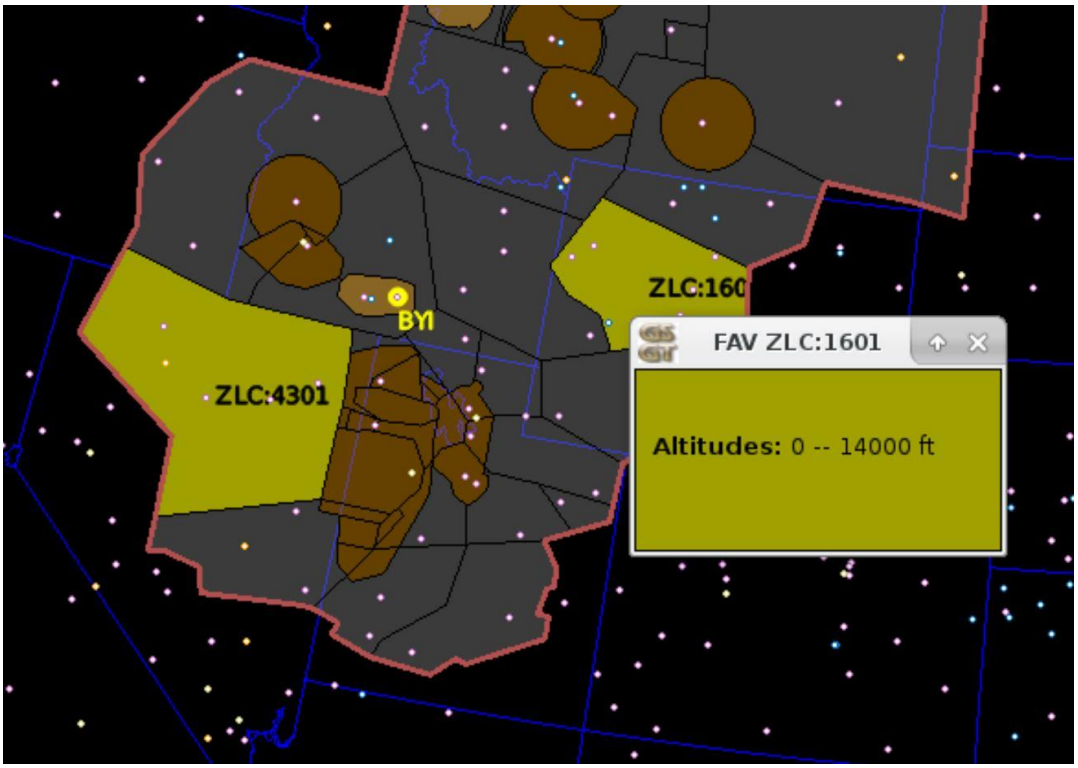


Figure 33. Context Boxes

4. GSGT Scenarios

4.1. Creating a New Scenario

Creating a new scenario generates a blank scenario with no targets, commands or any definitions. A New Scenario Wizard is used to guide the user through selections to create a new scenario by selecting a scenario name, adaptation, and optional weather scenario.

To create a new scenario, select **Scenario->New** from the GSGT Main Window.

NOTE: *If a scenario is already open when the* ***Scenario->New*** *option is selected, the new scenario will be automatically configured to use the same adaptation(s) as the current scenario. If you wish to select the adaptation(s), exit and re-start GSGT without opening another scenario, then select* ***Scenario->New****.*

Back

Goes to the previous screen.

Next

Goes to the next screen.

Cancel

Quits the scenario wizard without creating a new scenario.

4.1.1. Adaptation Selection

NAS adaptation data should exist in subdirectories named eadp (or ERAM), for ERAM adaptation, STARS, and TBFM under the in ADAPTATION_PATH directory. The first screen of the New Adaptation Wizard will display a list of these subdirectories. Expanding the eadp (or ERAM) subdirectory will result in the **Loading** window to be displayed while information about the ERAM adaptation is parsed. Once parsing of the adaption data is completed, the list of available adaptations are displayed.

NOTE: *This step is skipped if another scenario was open before* ***Scenario->New*** *was selected.*

While loading adaptation list a dialog is displayed until all adaptation data information is collected.

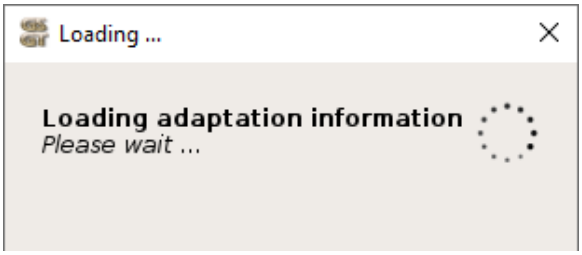


Figure 34. Loading Adaptation List

4.1.1.1. Single Adaptation

At least one ERAM adaptation must be selected. The adaptation is then parsed to create the airspace adaptation objects as well as the facility adaptation information.

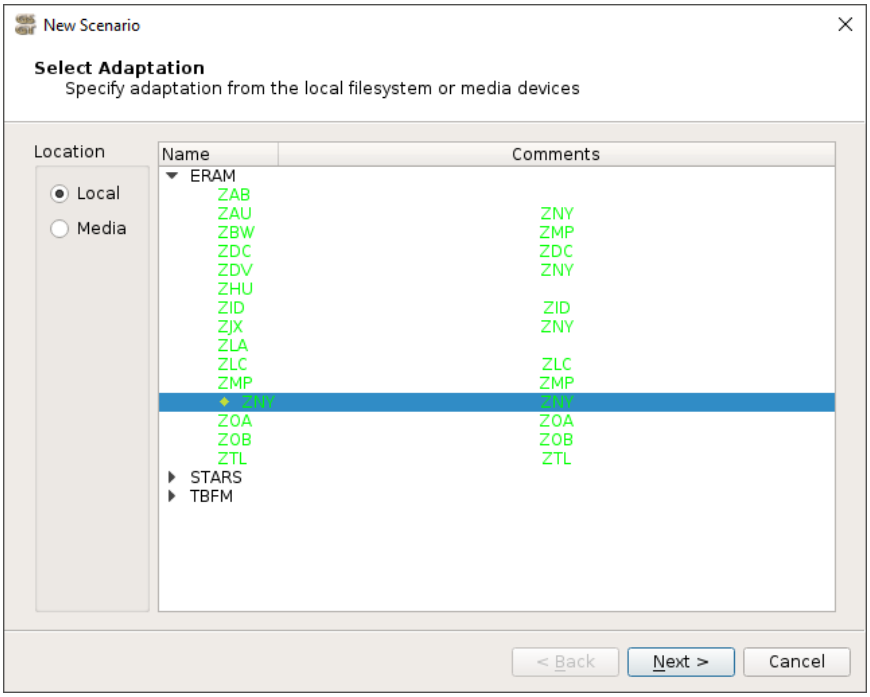


Figure 35. Selecting an ERAM Adaptation

4.1.1.2. Multiple Adaptations

Multiple ERAM adaptations may be selected. The first adaptation selected (marked with a diamond in front of its name) is parsed to create the airspace adaptation objects (which define the entire airspace). All selected adaptations are parsed for their facility adaptation information. To select additional adaptations hold down the **CTRL** key while clicking on individual adaptation names, or hold **SHIFT** key while clicking on the additional adaptation to select a range (all adaptations will be selected between the first and last adaptation selection).

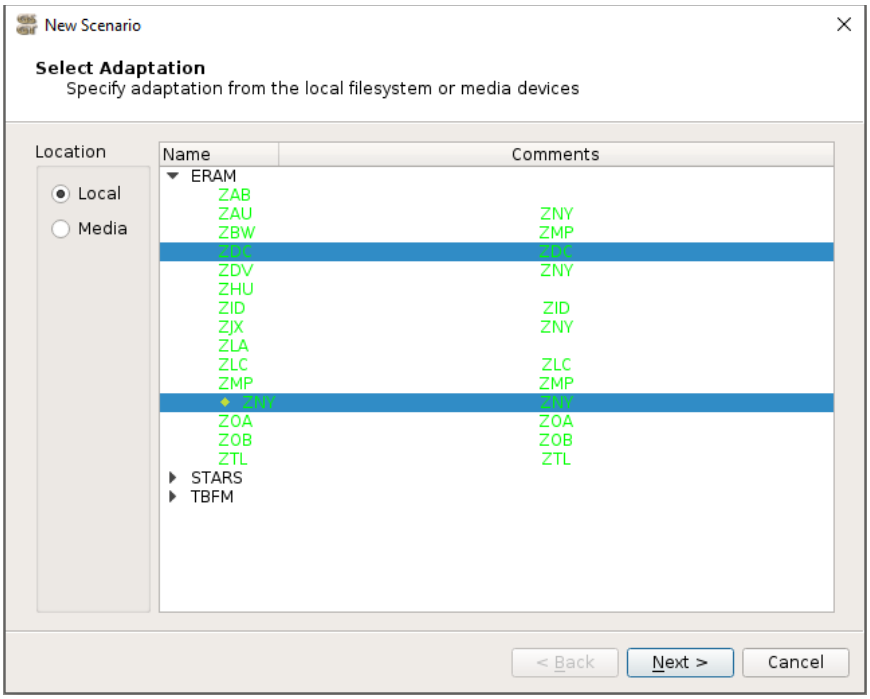


Figure 36. Selecting Multiple ERAM Adaptations

4.1.1.3. Adding Child Adaptation or Customization File

To add child adaptation (STARS, TBFM, etc…) or TBFM Customization, right click on the ERAM adaptation and select one of the available pop up menu options. A file manager window is displayed allowing the user to navigate to the adaptation or customization file. Once the desired child adaptation is selected, click on Choose. The child will appear under the selected ERAM adaptation. This can be done for multiple adaptations, as well.

4.1.1.3.1.Adding STARS DMS Report File

Right click on the ERAM adaptation and select 'Add STARS DMS file'. A file manager window is displayed allowing the user to navigate to the STARS DMS report file.

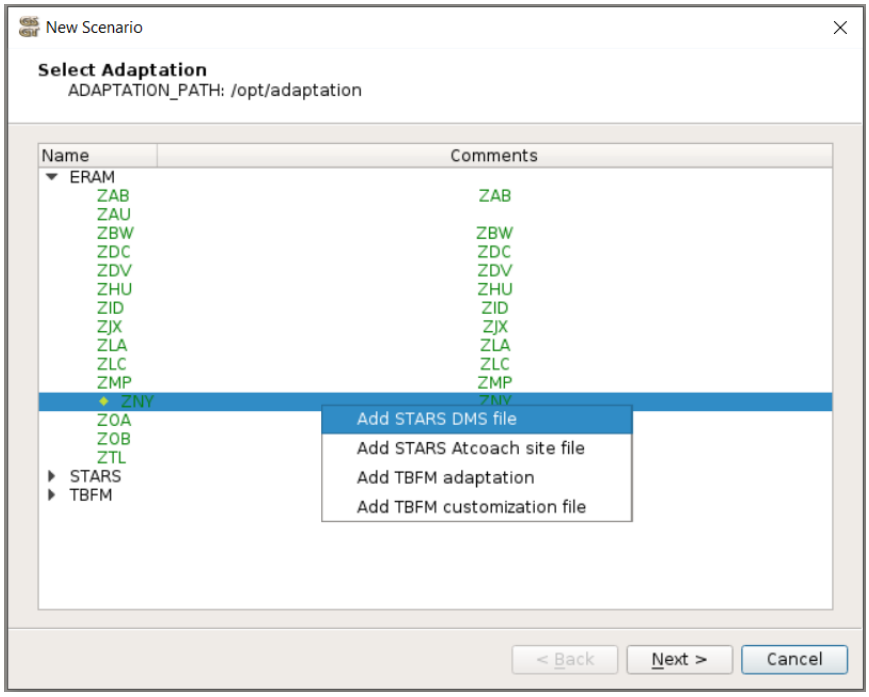


Figure 37. Adding STARS DMS File

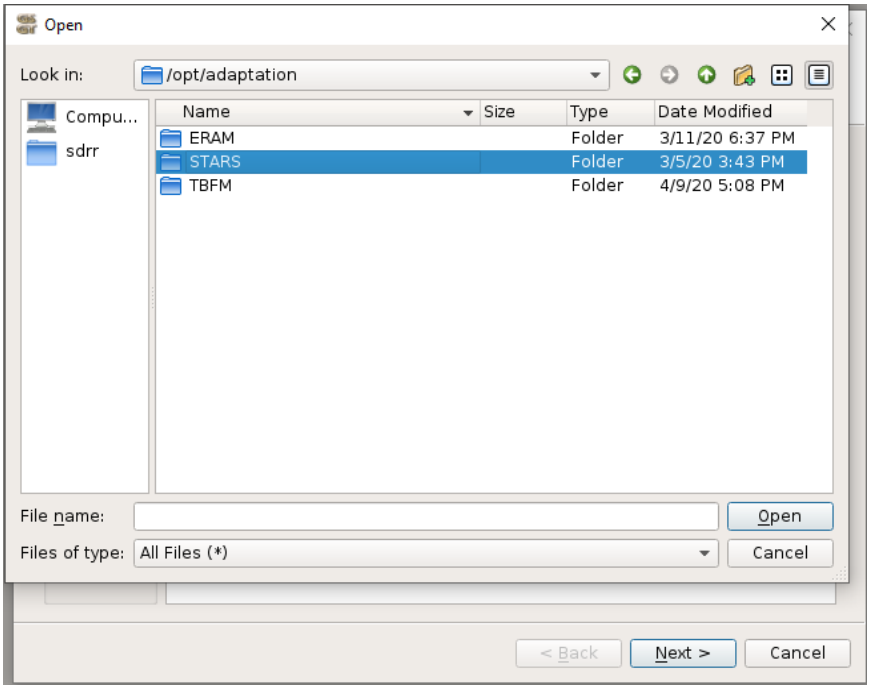


Figure 38. Selecting the DMS File Location

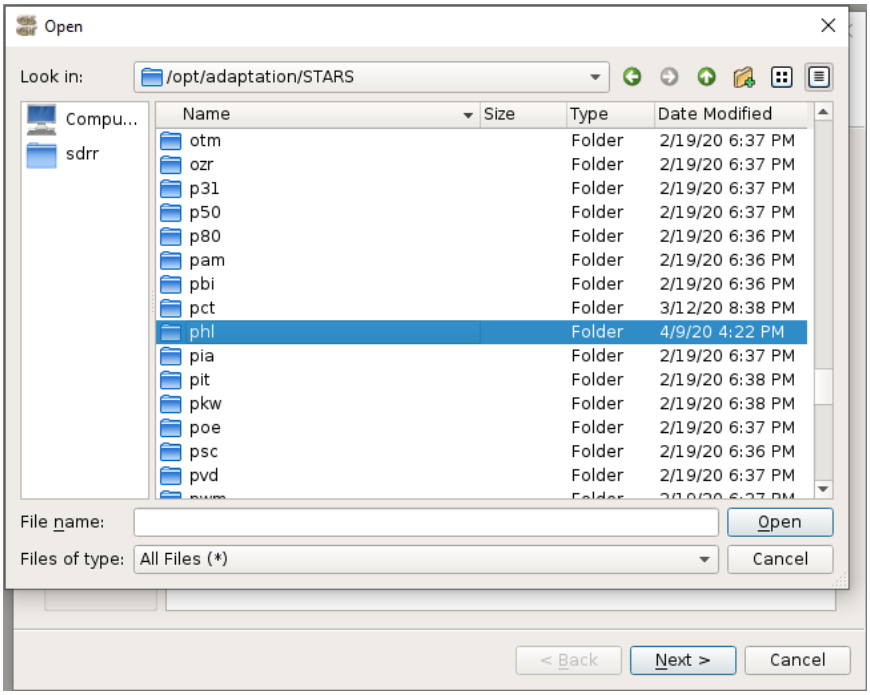


Figure 39. Selecting the TRACON Folder

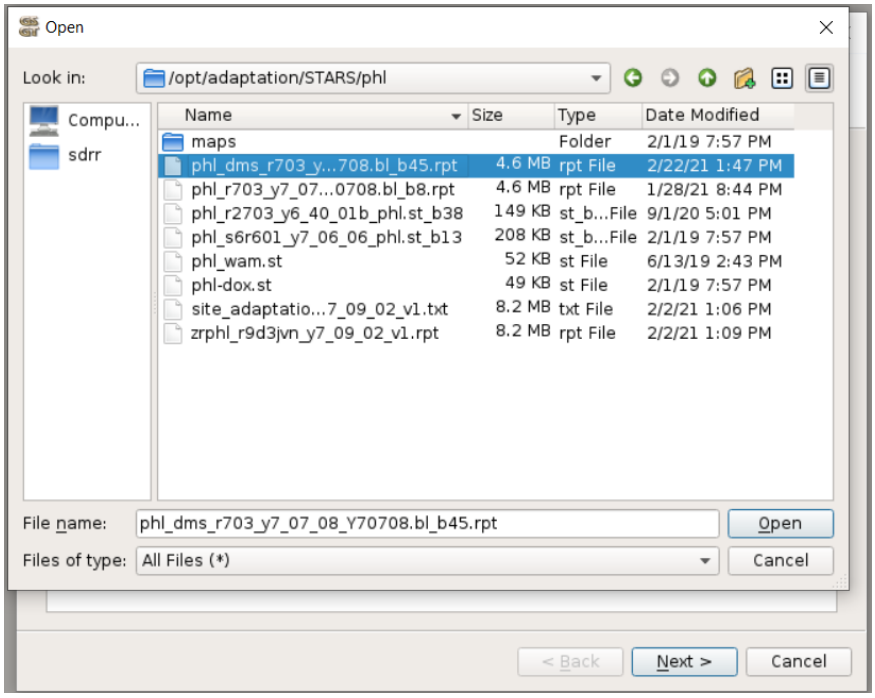


Figure 40. Selecting a DMS Report File

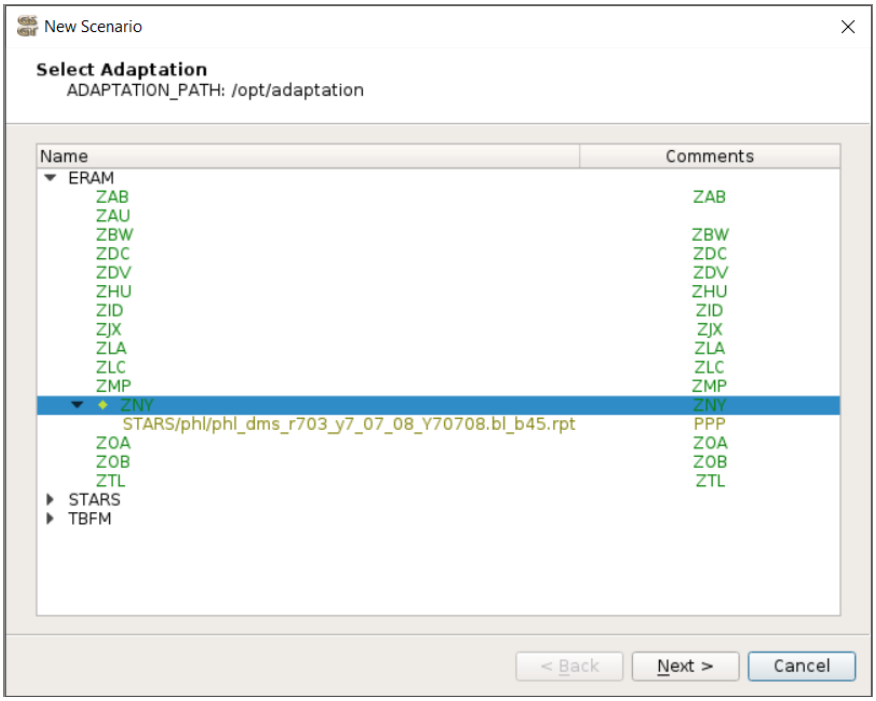


Figure 41. STARS DMS Report File Added

4.1.1.3.2.Adding STARS Site File or User Defined Macros

Right click on the ERAM adaptation and select 'Add STARS ATCoach site file'. A file manager window is displayed allowing the user to navigate to an ATCoach site file or a custom user created macro definitions file. Custom macros can be created for special routes and procedures that can be applied to target dynamics within GSGT.

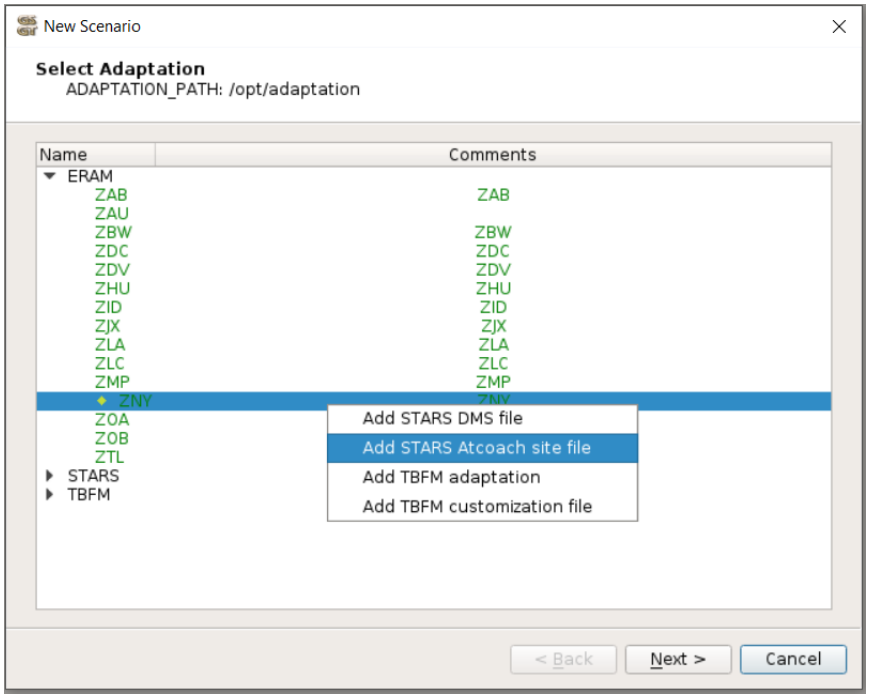


Figure 42. Adding STARS Adaptation

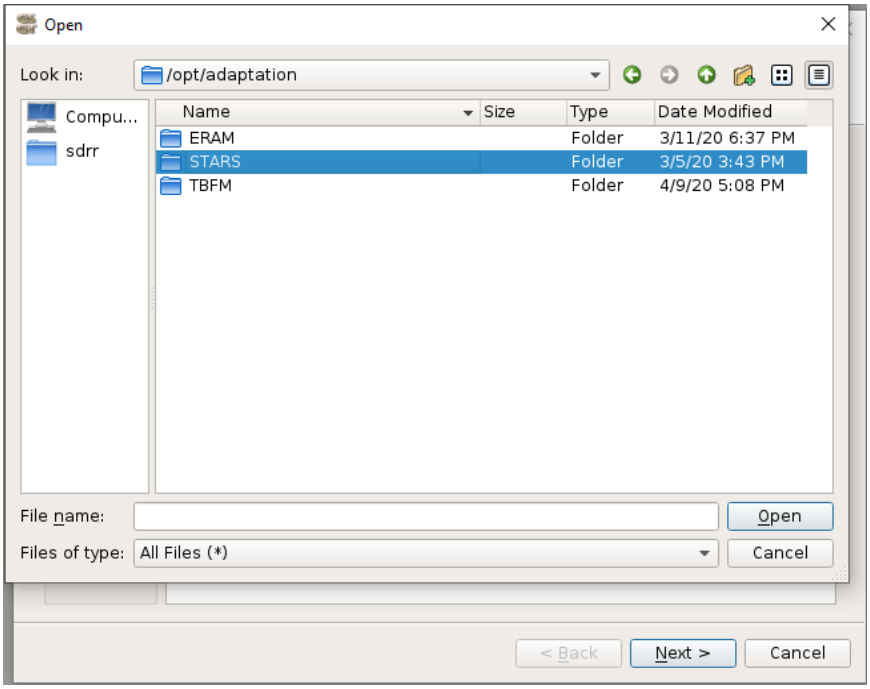


Figure 43. Selecting the STARS Adaptation Location

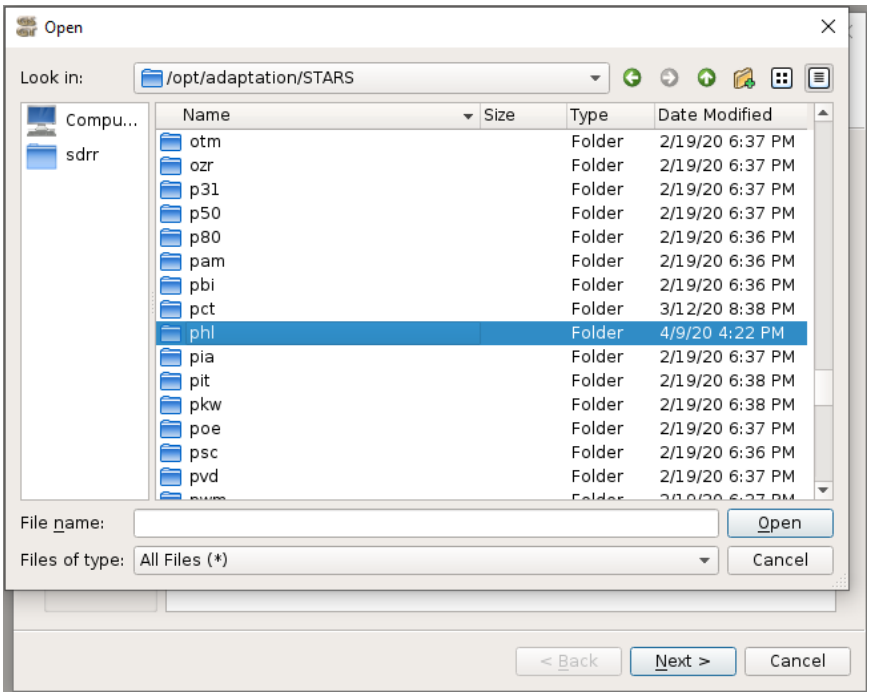


Figure 44. Selecting the TRACON Folder

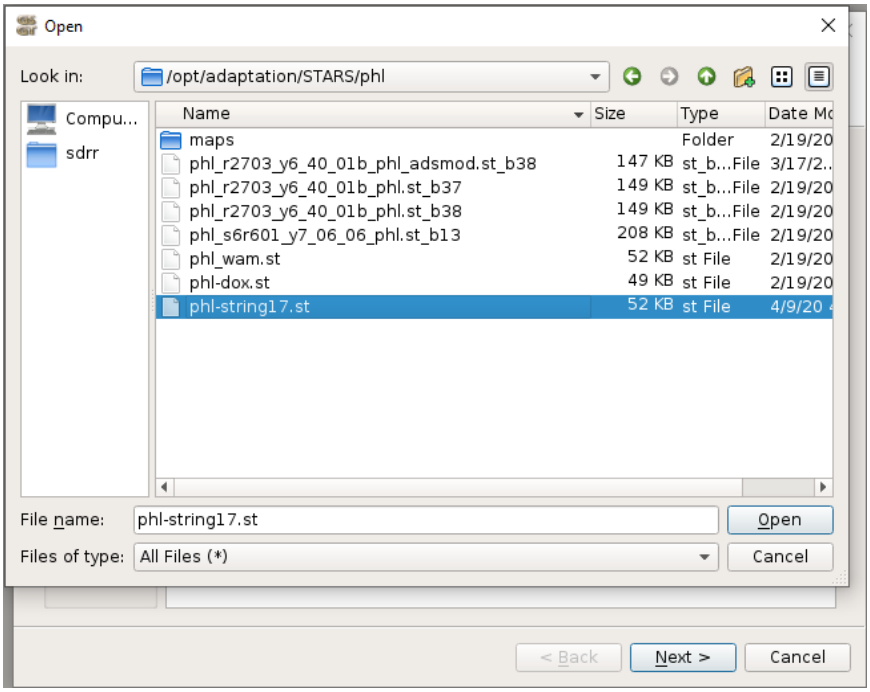


Figure 45. Selecting a Site File

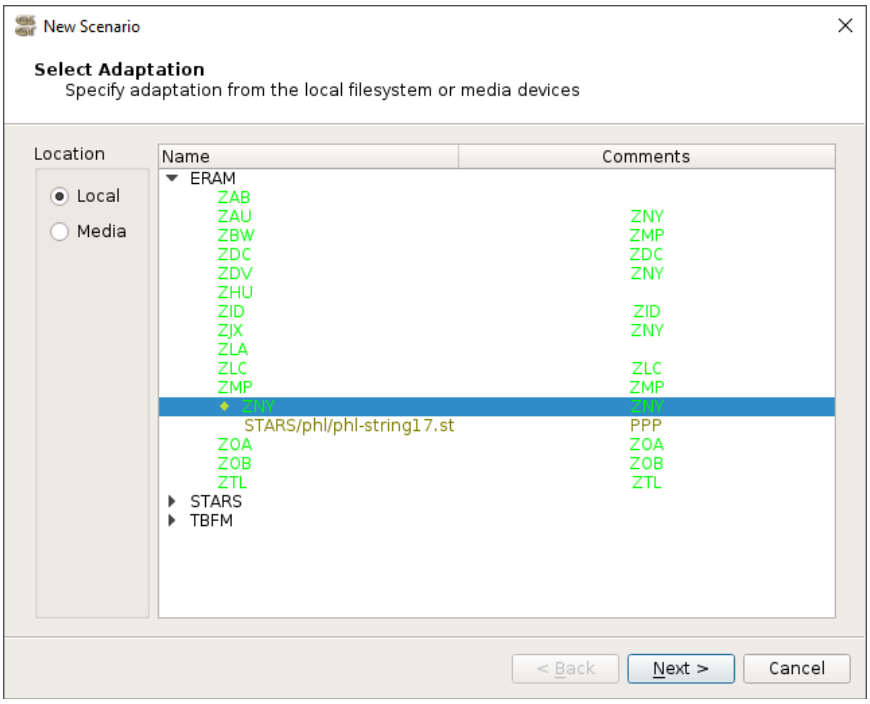


Figure 46. STARS Adaptation Added

4.1.1.3.3. Adding Multiple STARS Files

Right click on the ERAM adaptation and select 'Add STARS DMS file'. A file manager window is displayed allowing the user to navigate to the STARS DMS report file.

NOTE: *When selecting multiple STARS files, the DMS file must be selected first.*

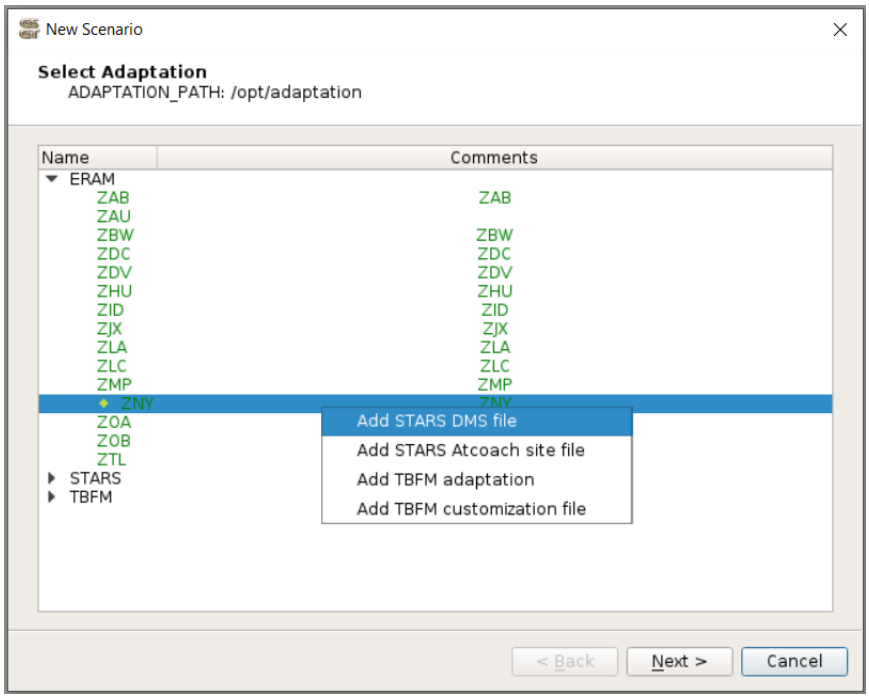


Figure 47. Adding STARS DMS File

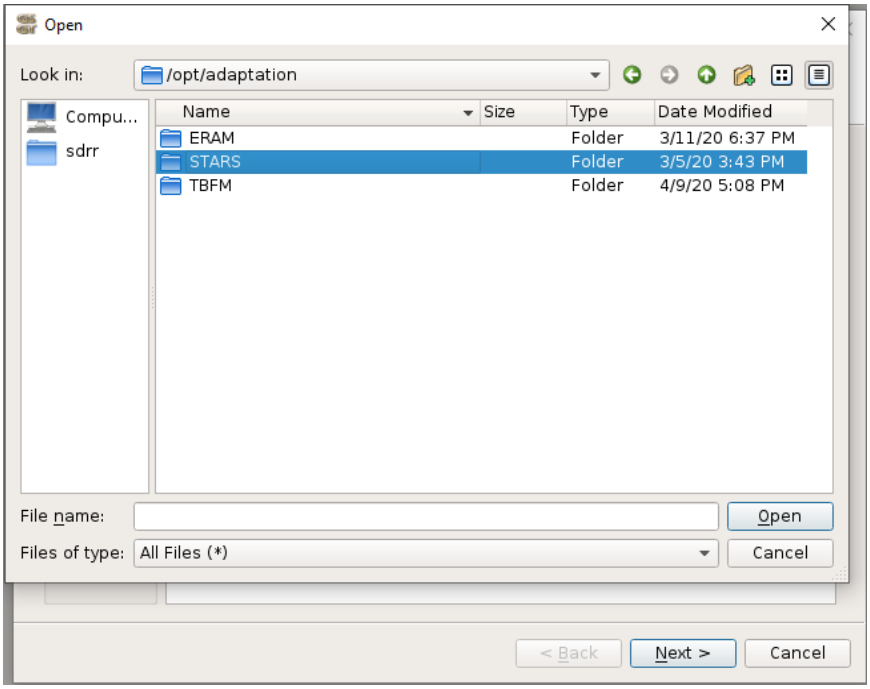


Figure 48. Selecting the DMS File Location

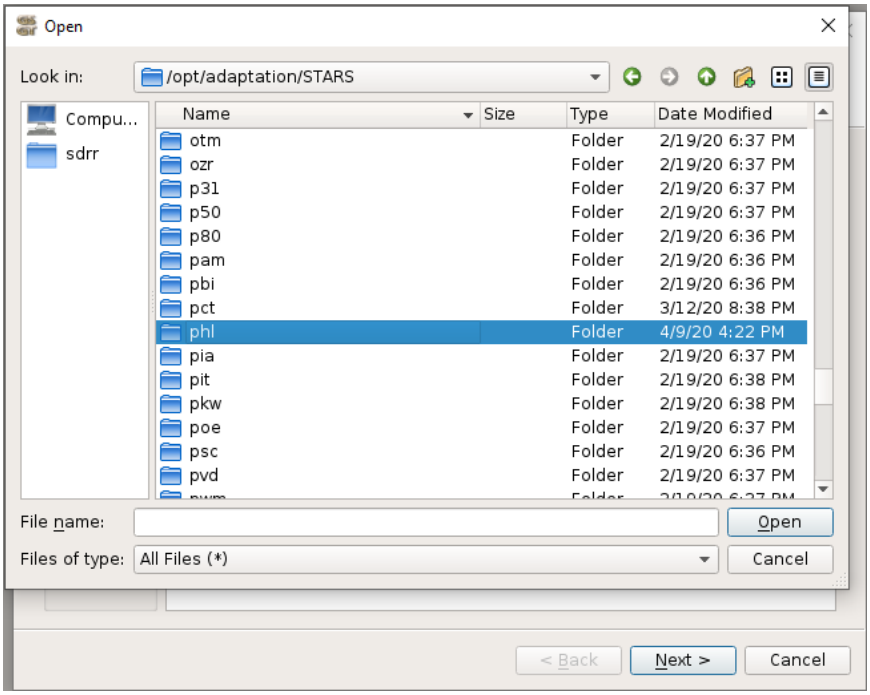


Figure 49. Selecting the TRACON Folder

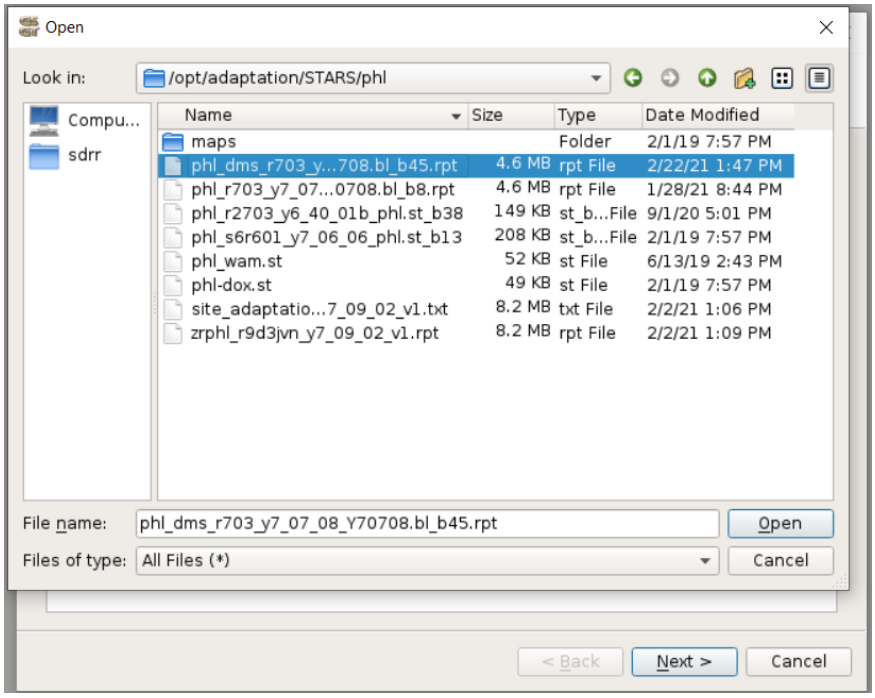


Figure 50. Selecting a DMS Report File

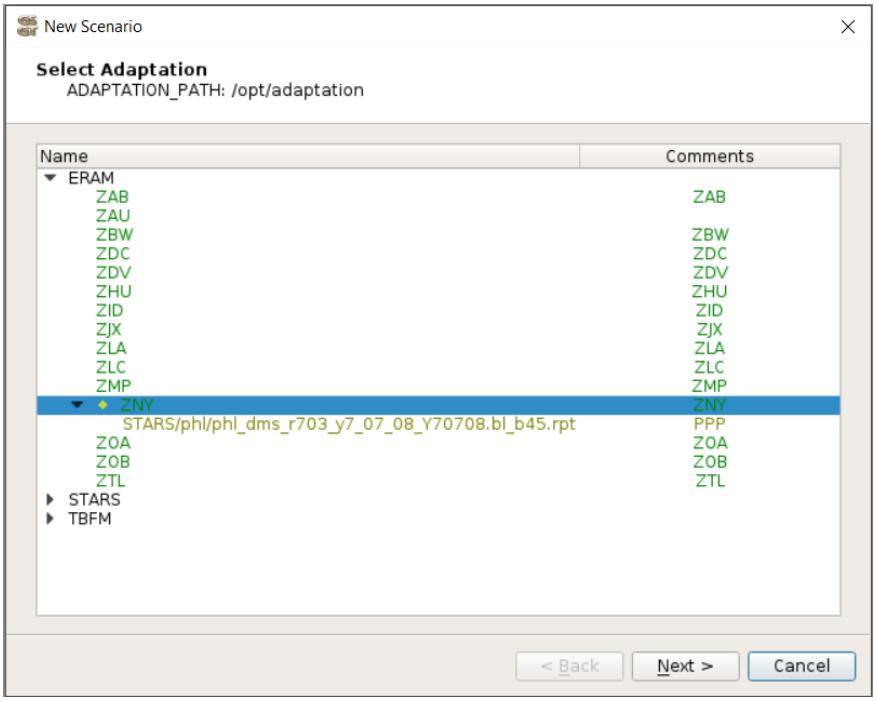


Figure 51. STARS DMS Report File Added

Right click on the ERAM adaptation and select 'Add STARS ATCoach site file'. A file manager window is displayed allowing the user to navigate to an ATCoach site file or a custom user created macro definitions file.

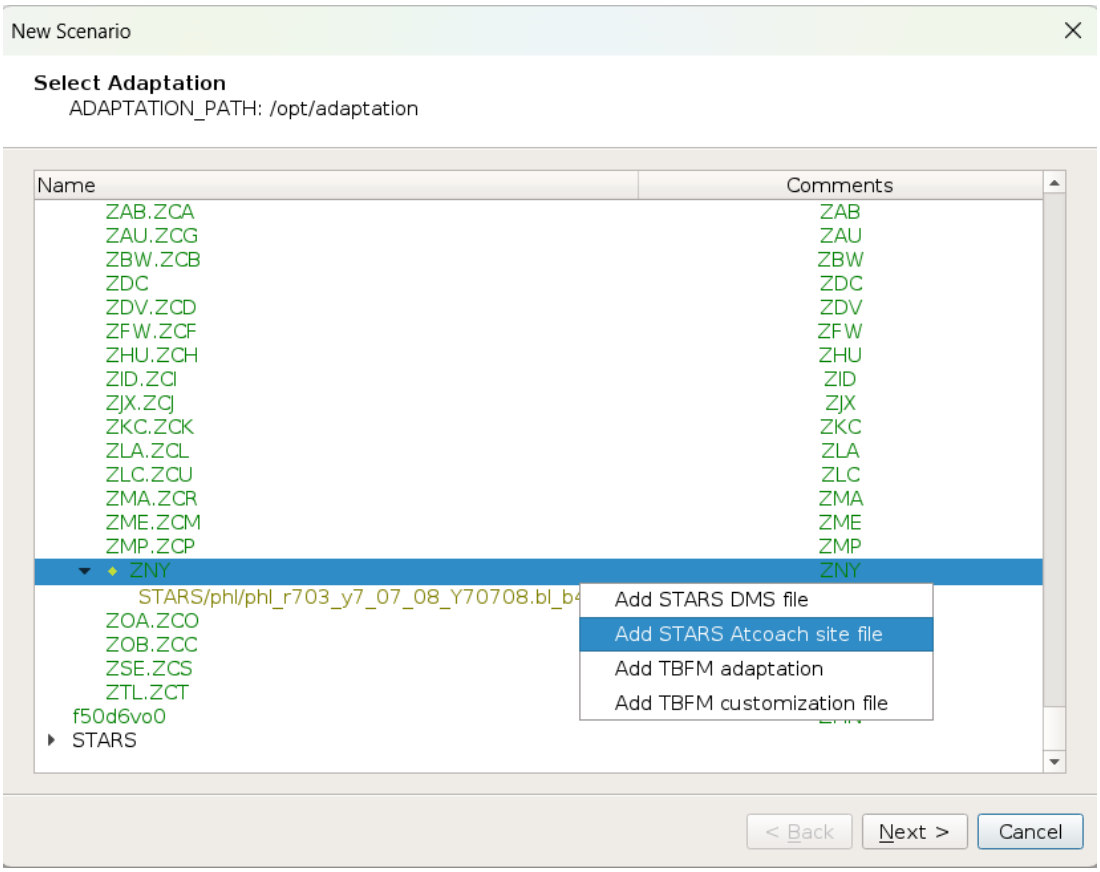


Figure 52. STARS Site File or Macro file Added

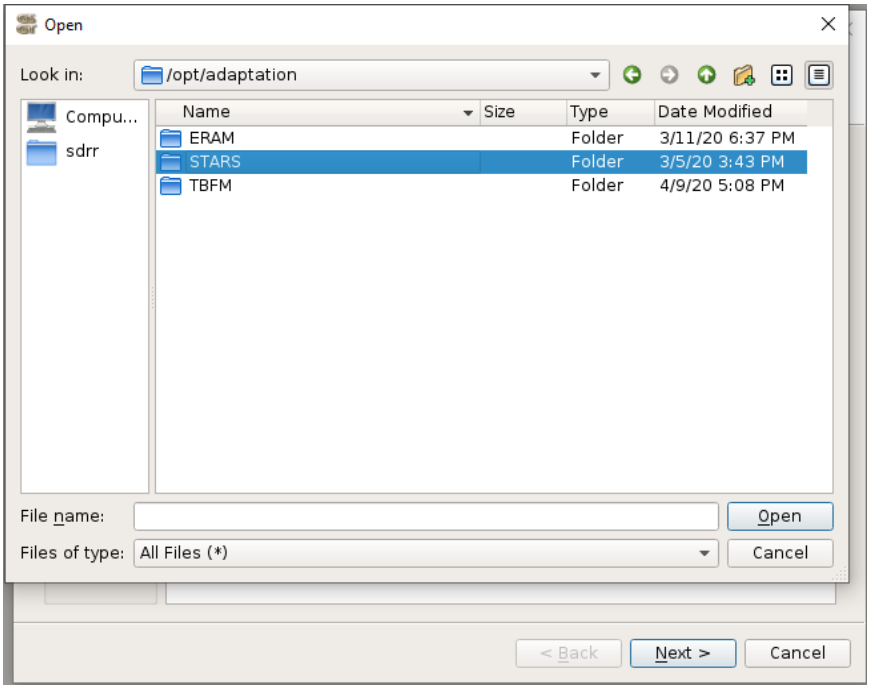


Figure 53. Selecting the Macro File Location

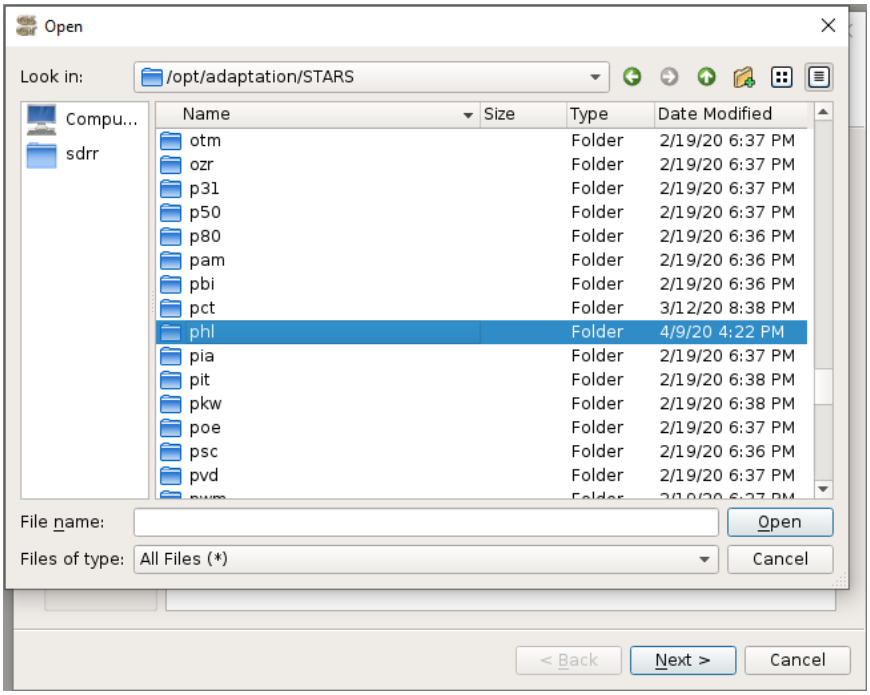


Figure 54. Selecting the TRACON Folder

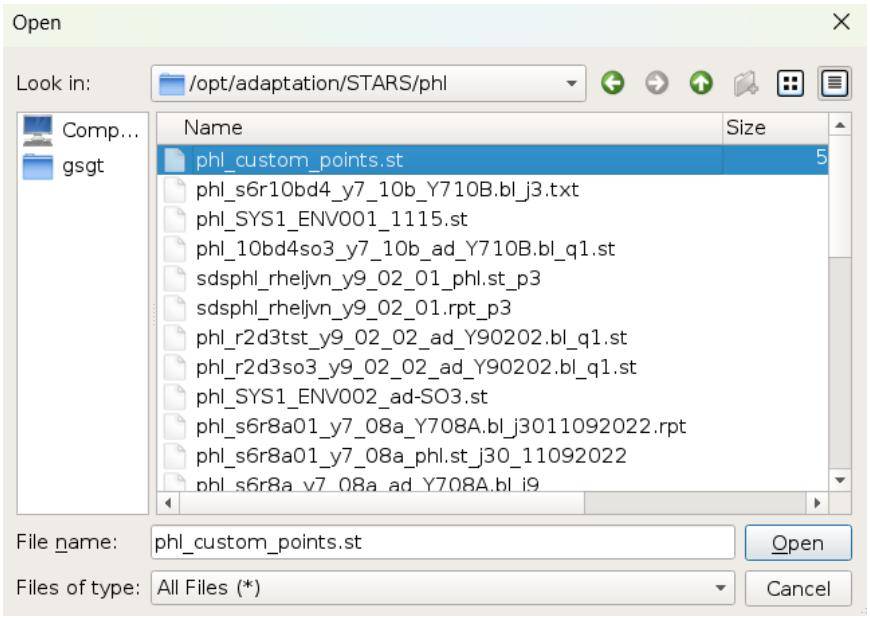


Figure 55. Selecting a Macro File

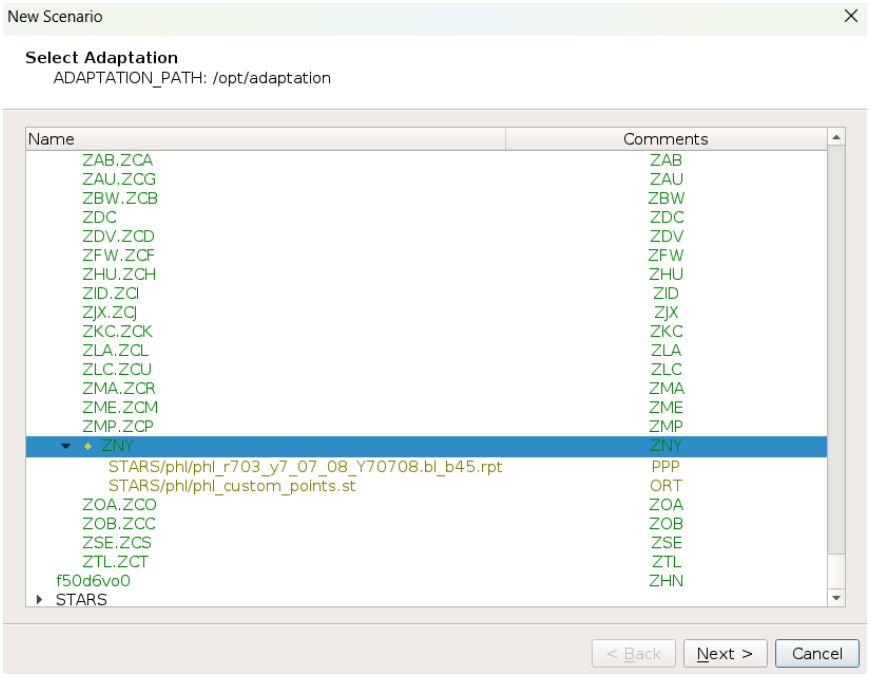


Figure 53. STARS Macro File Added

4.1.1.3.4.Adding TBFM Adaptation

Right click on the ERAM adaptation and select 'Add TBFM adaptation'. A file manager window is displayed allowing the user to navigate to the TBFM adaptation.

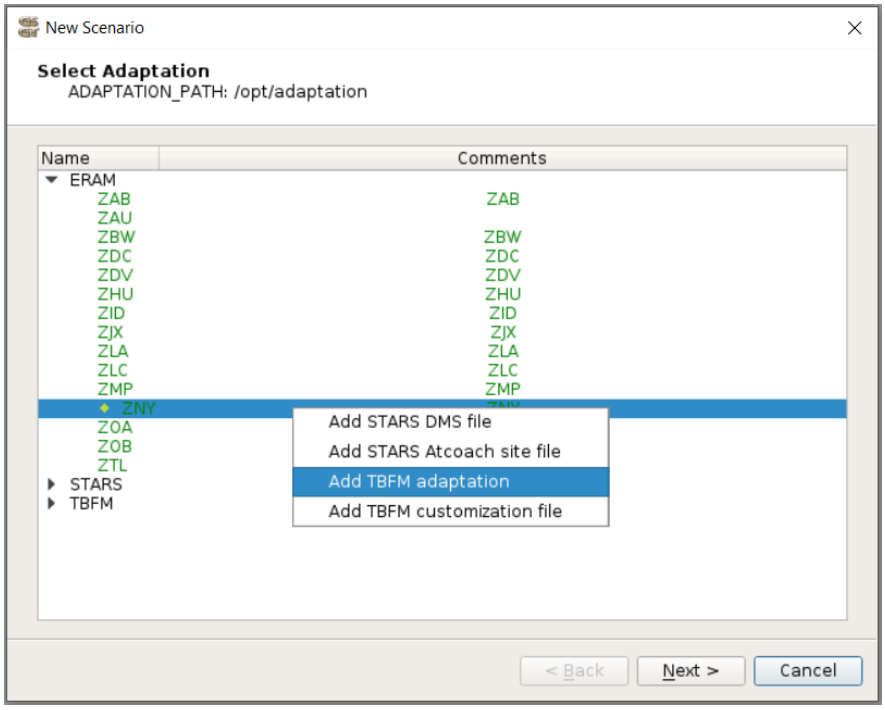


Figure 56. Adding TBFM Adaptation

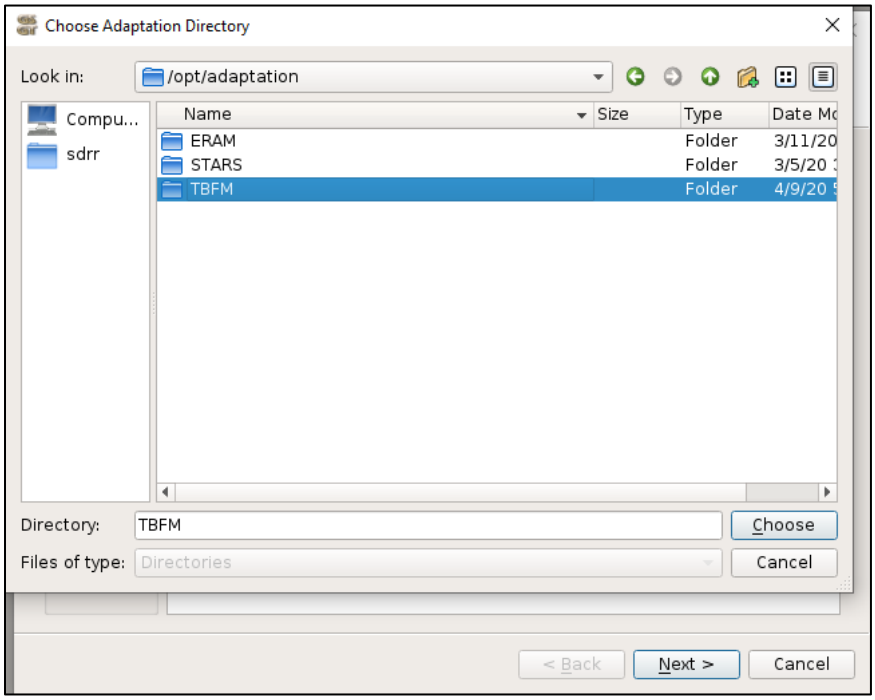


Figure 57. Selecting TBFM Location

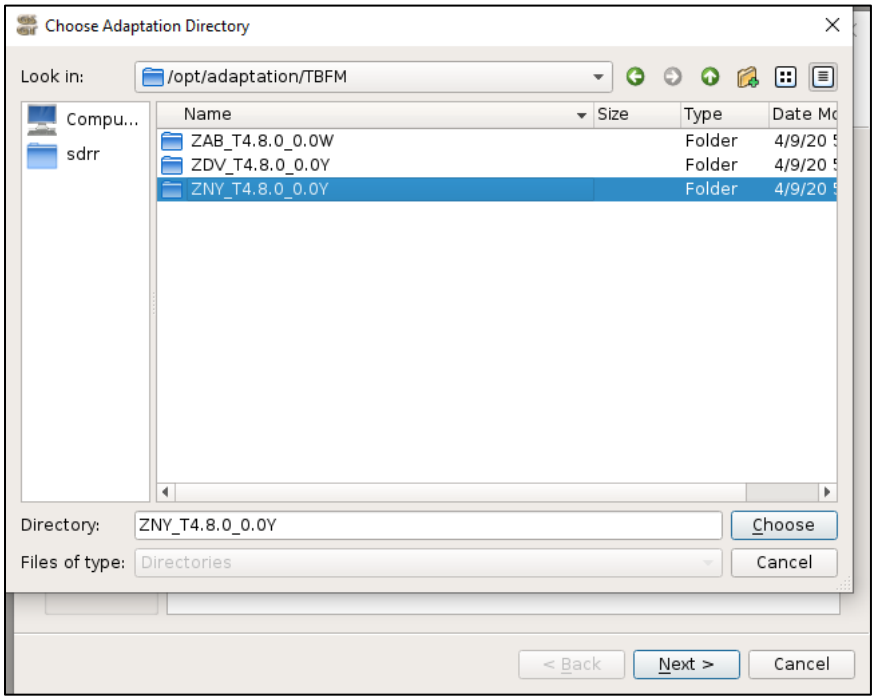


Figure 58. Selecting TBFM Adaptation

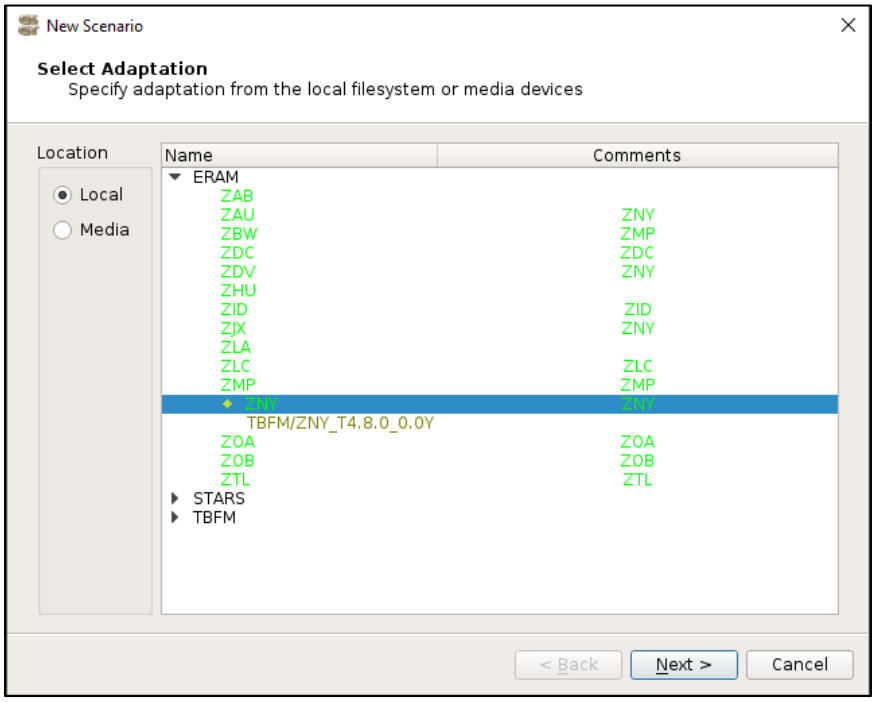


Figure 59. TBFM Adaptation Added

4.1.1.3.5.Adding TBFM Customization File

Right click on the ERAM adaptation and select 'Add TBFM customization file'. A file manager window is displayed allowing the user to navigate to the TBFM customization file. The TBFM customization file is required for TTP airport definitions for TFDM simulation.

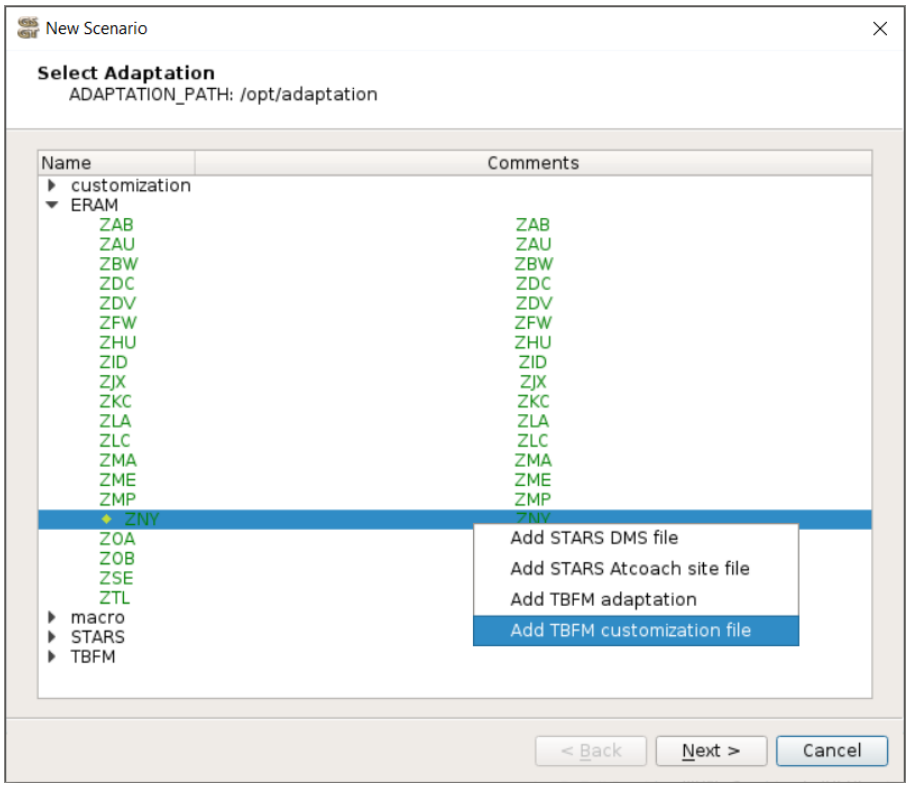


Figure 60. Adding a TBFM Customization File

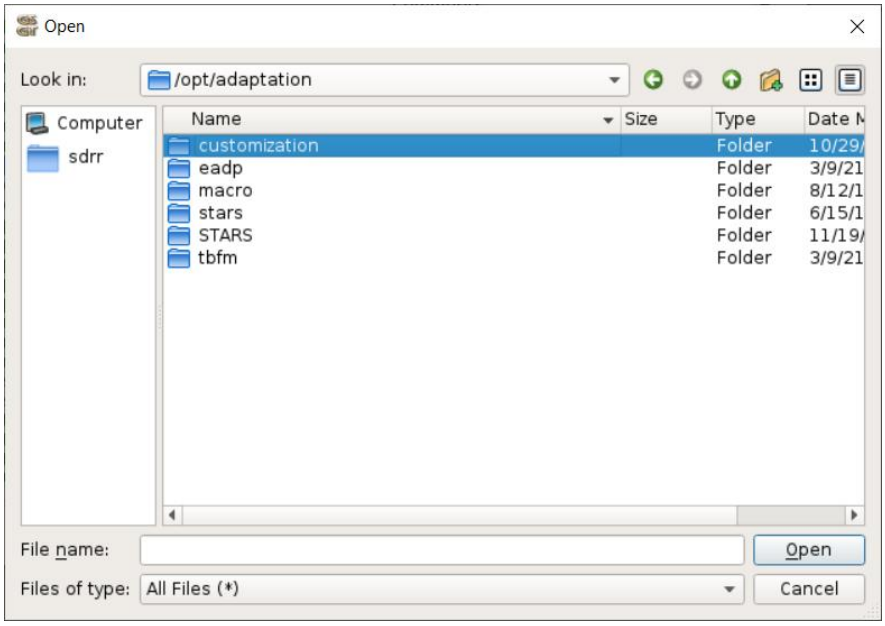


Figure 61. Selecting TBFM Customization File Location

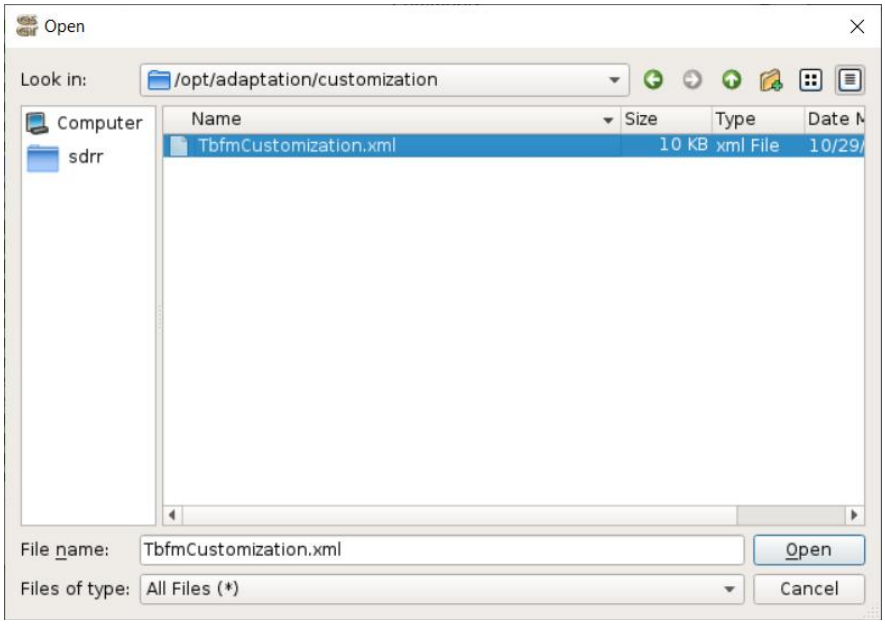


Figure 62. Selecting TBFM Customization File

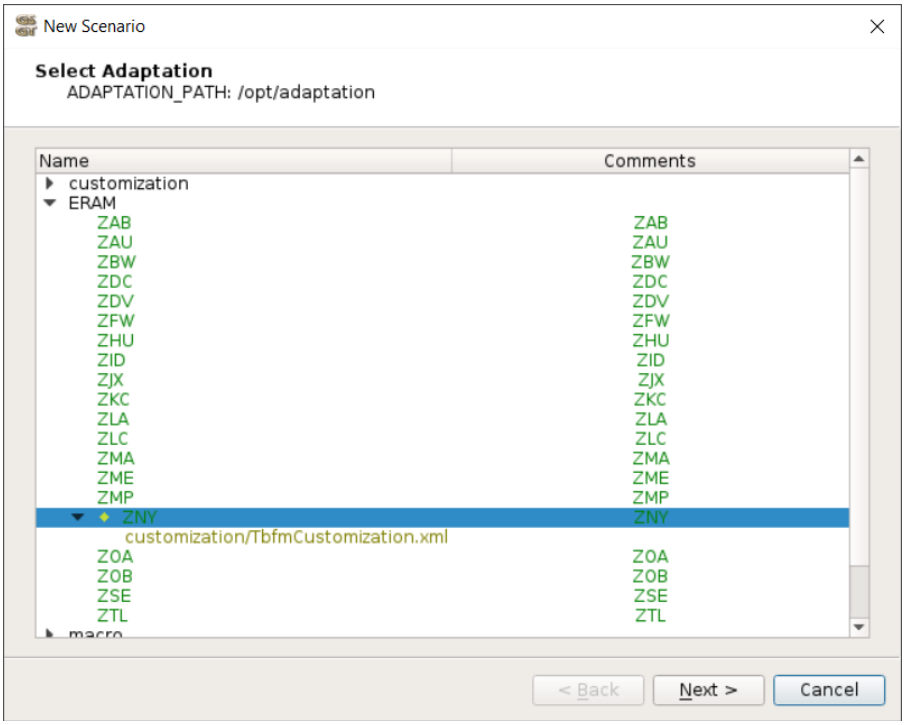


Figure 63. TBFM Customization File Added

4.1.1.4. Removing Child Adaptation

To remove a child adaptation, right click on the child adaptation and select 'Remove'.

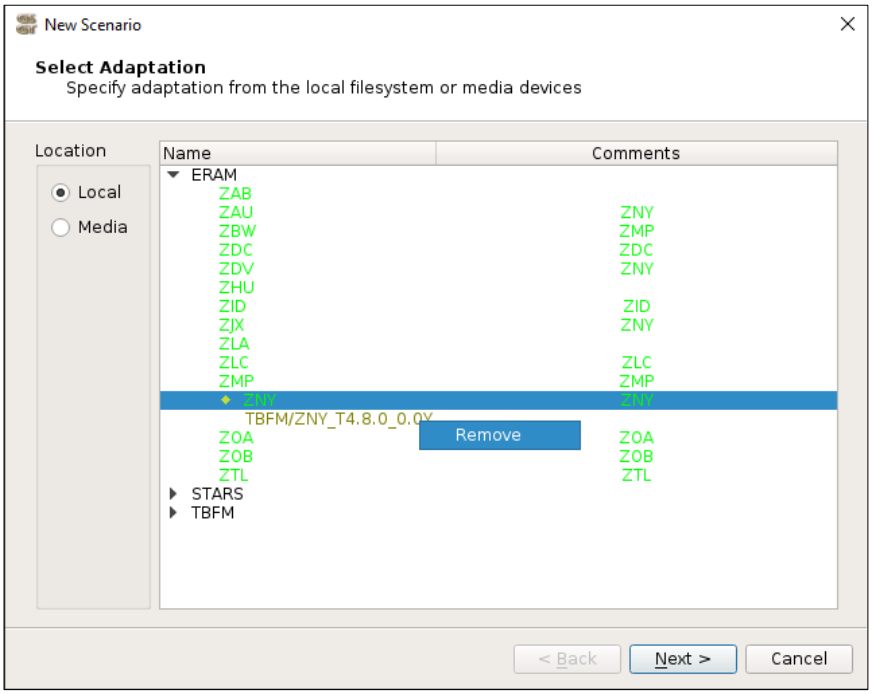


Figure 64. Removing a Child Adaptation

4.1.1.5. ERAM Adaptation File Overrides

Occasionally, there may be a need to override a particular ERAM adaptation file with an informal version. For example, a user may want to modify the restrictions on an arrival route or the attributes of a radar site. GSGT allows a modified file to be specified to replace the file delivered in the local adaptation.

Once the GSGT scenario is saved, the scenario directory is created and a scenario.xml file is written. That scenario.xml file can be edited to add the override sub-element to the eadp stanza where the ERAM adaptation is specified. The value of the override sub-element is the modified informal adaptation file. The override sub-element has one attribute, product, which specifies the delivered file that is to be replaced.

In the example below, the delivered files STAR.xml.75 and Radar.xml.68, located in the ERAM/ZNY_f20e3no0 adaptation directory, will be replaced by the modified files STAR.xml and Radar.xml, located inside the GSGT scenario directory.

```
<scenario version="13.3.2">
  <airspace>
    <eadp dir="ERAM/ZNY_f20e3no0">
      <override product="STAR.xml.75">./STAR.xml</override>
      <override product="Radar.xml.68">./Radar.xml</override>
      <dms file="STARS/phl/phl_s6r8a01_y7_08a_Y708A.bl_j3011092022.rpt" name="PPP"/>
      <tbfm dir="TBFM/ZNY_T4.8.3_2.0"/>
    </eadp>
  </airspace>
...
```

4.1.2. Scenario Location and Name

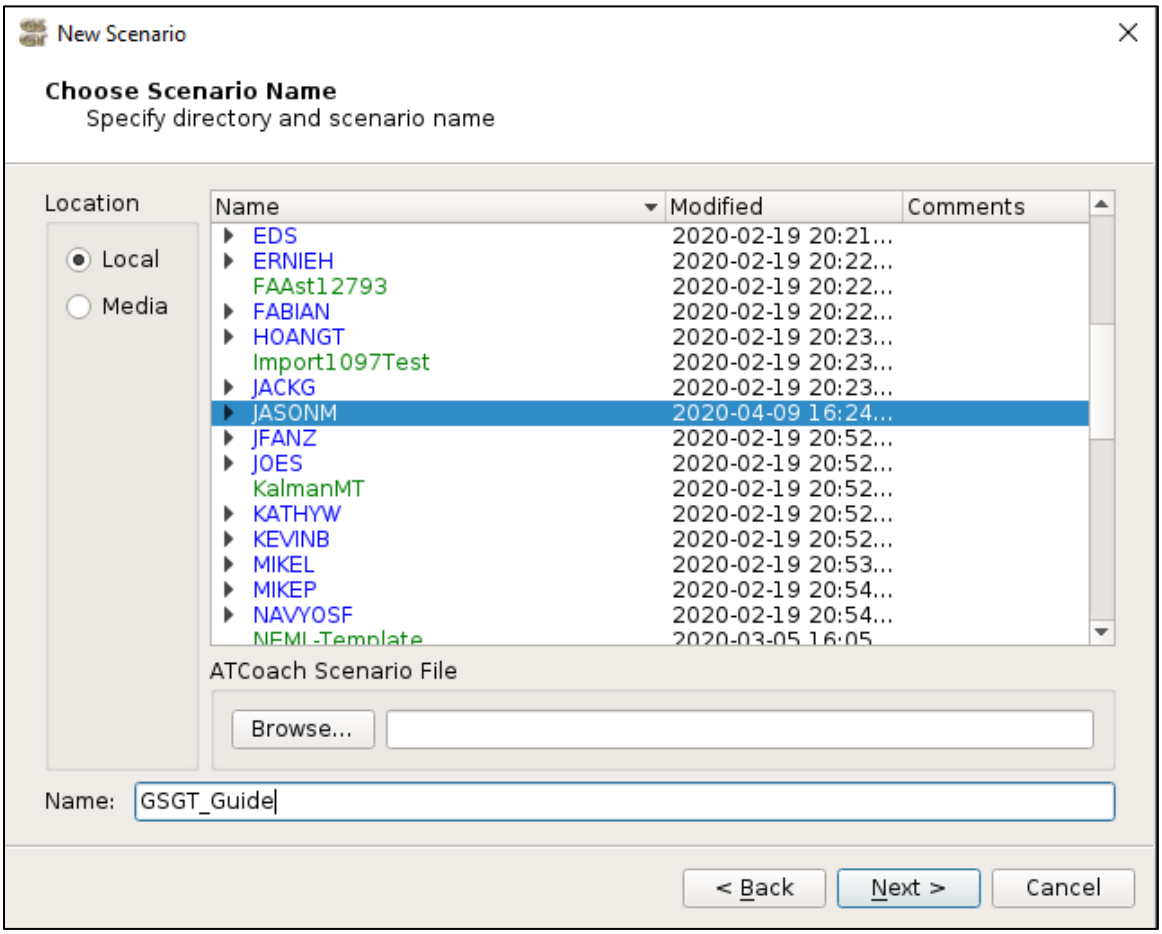


Figure 65. Selecting a Scenario Location and Name

Location Selector

Location of the scenarios, such as default local directory GSGT_WORK_PATH or other media such as CD-ROM or flash drive.

Scenario Name

Scenario name can be an existing scenario name or a new scenario name typed in by the user. The new scenario will be created in the selected directory. Selecting an existing scenario will populate the name for the new scenario, and if user proceeds with creation of new scenario the existing scenario will be overwritten.

NOTE: *Directories are displayed in blue, and scenarios are displayed in green. Read-only directories and scenarios are colored black and gray respectively. Right click on a directory allows the user to create a new directory or subdirectory under the selected directory.*

4.1.3. Weather Selection

Weather files may be selected by clicking or highlighting the desired weather directory. Selecting a weather file is optional.

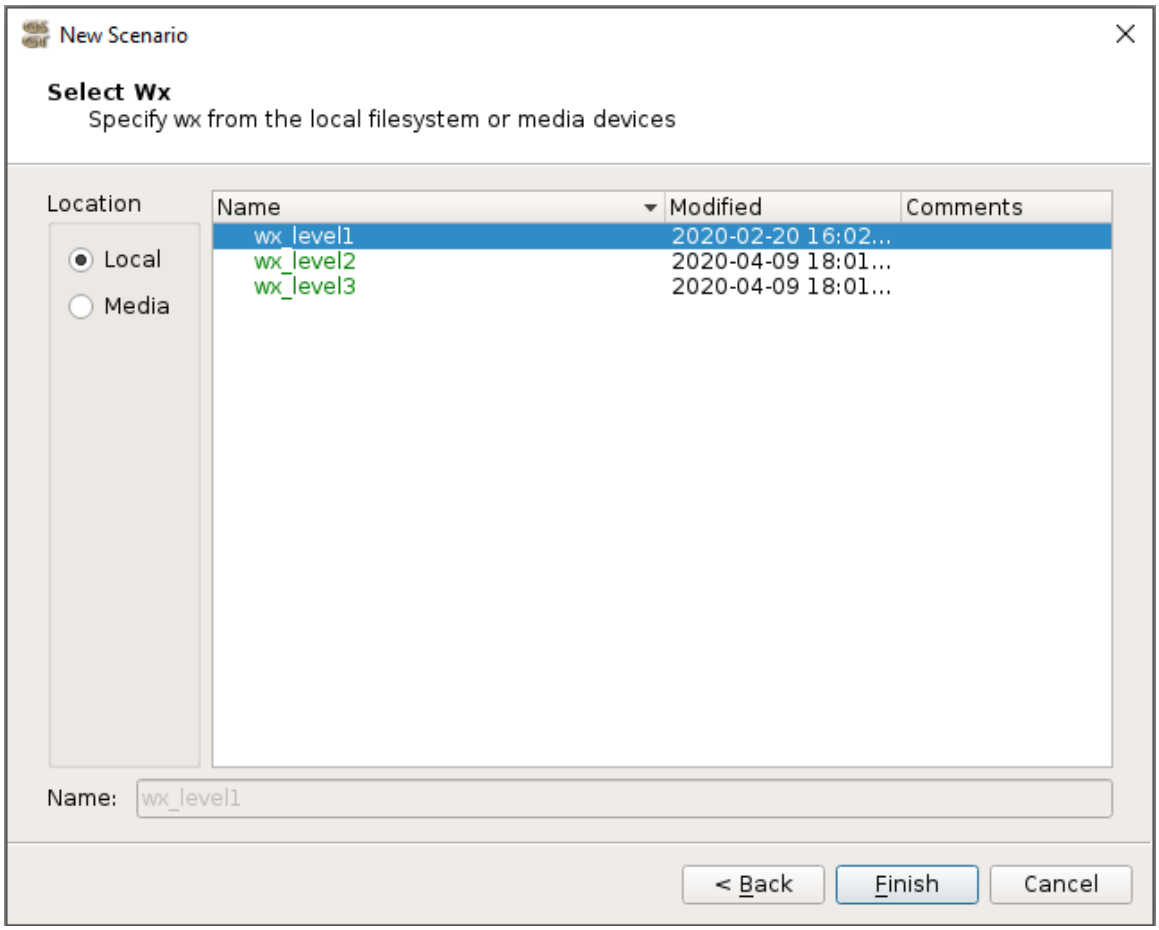


Figure 66. Selecting a Weather Scenario

Finish

Parses the adaptation data and loads the scenario. Not enabled until an adaptation is selected.

Cancel

Cancels creation of the new scenario.

4.1.4. Scenario Overwrite Warning

The warning is displayed to alert the user that a scenario file exists with the same name.

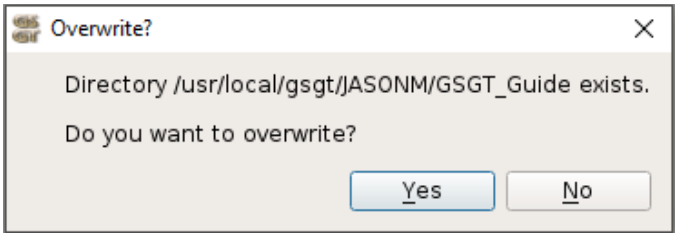


Figure 67. Scenario Overwrite Warning

Yes

Overwrites the existing scenario with the current scenario.

No

Cancels the save scenario operation.

4.2. Open an Existing Scenario

To open an existing scenario, select **Scenario->Open** from the GSGT Main Window.

NOTE: *Starting GSGT Editor from a command line while inside the scenario directory will automatically open that scenario.*

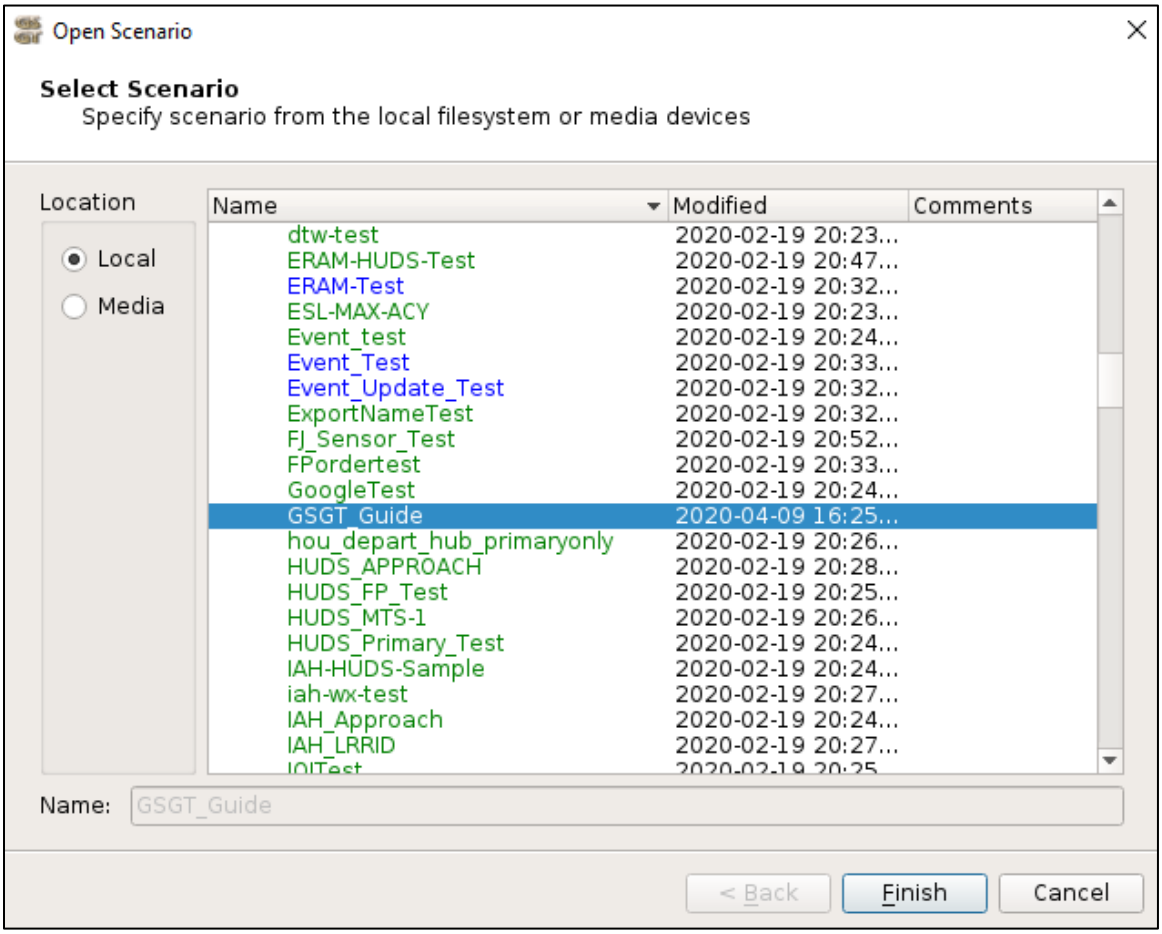


Figure 68. Opening an Existing Scenario

Back

Disabled in this window.

Finish

The selected scenario is opened in the GSGT main window. Enabled after a scenario is selected.

Cancel

Closes the window and cancels scenario open action.

NOTE: *Opening a scenario which uses different adaptation than the current scenario will close the current GSGT session and start a new one. It may take a few seconds for the new GSGT session to appear (depending on system performance).*

4.2.1. Load Progression Display

The window below will be displayed and the step currently being performed will be listed at the bottom of the window. When completed, an adaptation window will be displayed and the scenario can be reviewed or modified.

Figure 69. Load Progression

4.2.2. Scenario File Loading Errors

If there are errors encountered while loading the scenario, the GSGT Session Log will be displayed listing all errors encountered during loading.

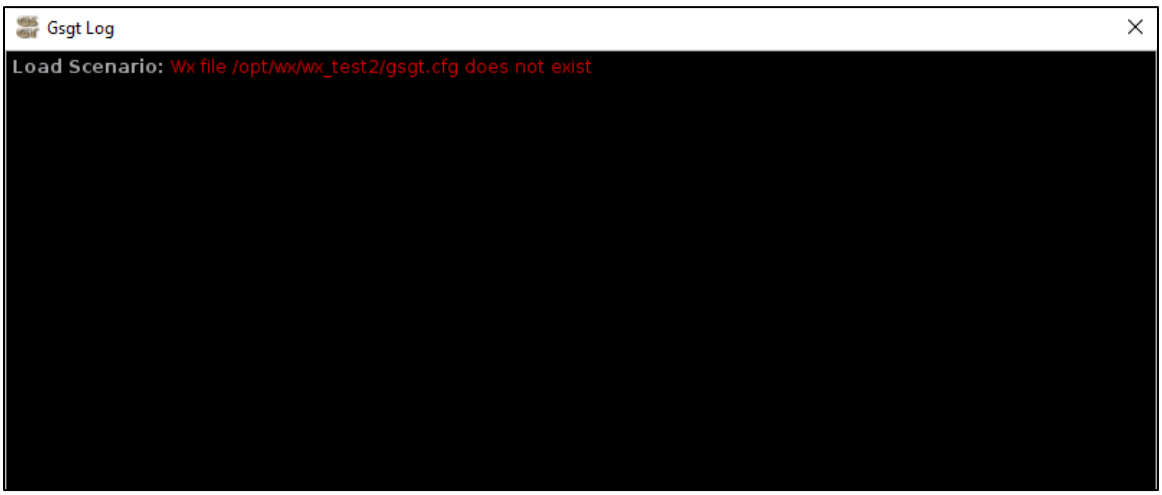


Figure 70. Loading Errors

4.3. Edit Scenario

The main scenario editor window displays a list of objects by type that can be edited. Clicking on an object type displays all of the instances of the object type contained in the scenario, if any.

Select **Scenario->Edit** or use the edit icon from the GSGT Main Window.

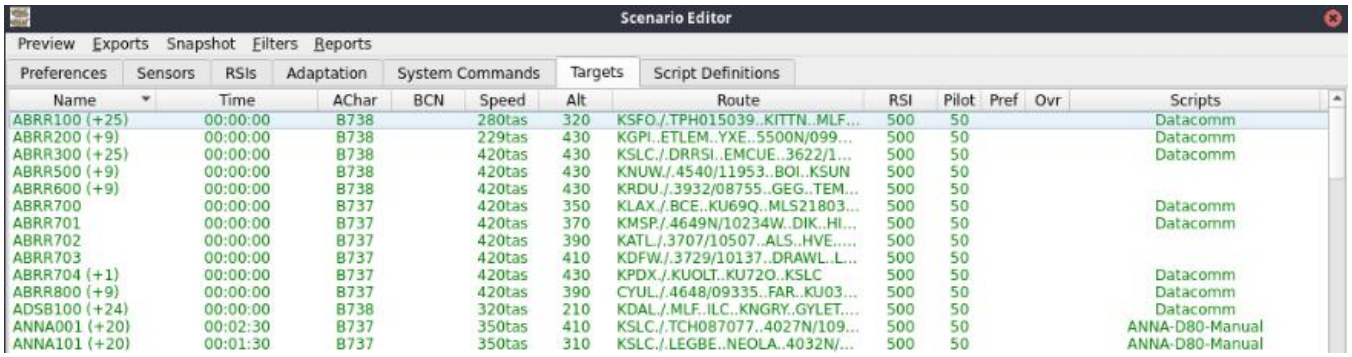


Figure 71. Scenario Editor

Clicking the 'Name' button will toggle between sorting the object instances in ascending and descending order. The triangle in the 'Name' button indicates which ordering will be used after the button is clicked. The same applies for the other buttons.

Other buttons include: Name, Time, Achar, BCN, Speed, Alt, Route, RSI, Pilot, Pref, Ovr, Scripts, and Comments

Scenario Editor also provides the ability to view adapted equipment as defined by selected adaptation(s), such as Sensors and ADS-B Service Volumes.

4.3.1. Create a New Object

To create a new object, right click on the object listing or white space if there are no objects created. A context menu with the option **'New'** is displayed. Selecting **'New'** from the menu opens a dialog window to define the new object.

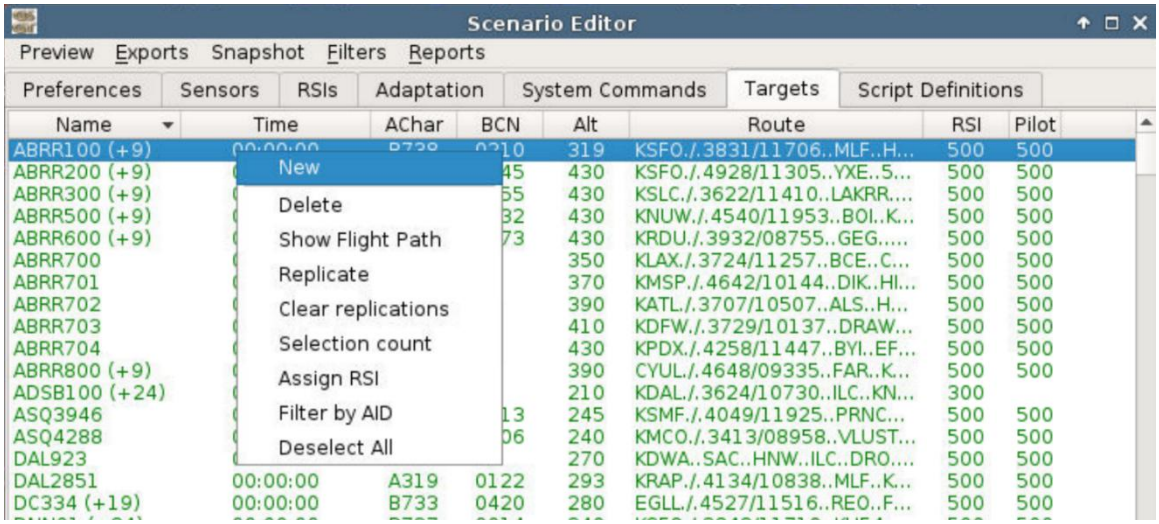


Figure 72. Creating a New Object

4.3.2. Delete Object

To delete an object, right click on an object instance name. A context menu with **'Delete'** (and possibly other options) is displayed. Selecting **'Delete'** from the menu opens a confirmation dialog, asking user to confirm deletion of the selected object(s).

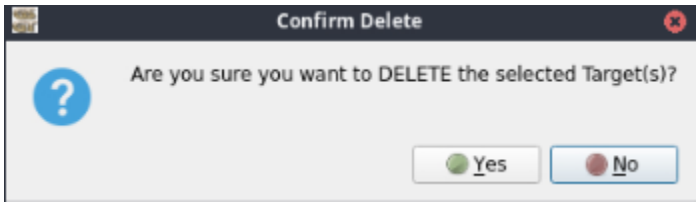


Figure 73. Object Delete Confirmation

4.3.3. Edit Object

To edit an object, double click on an instance name and the editor window will be replaced with the editor dialog for specific type of object instance selected. The example below is a Target editor window.

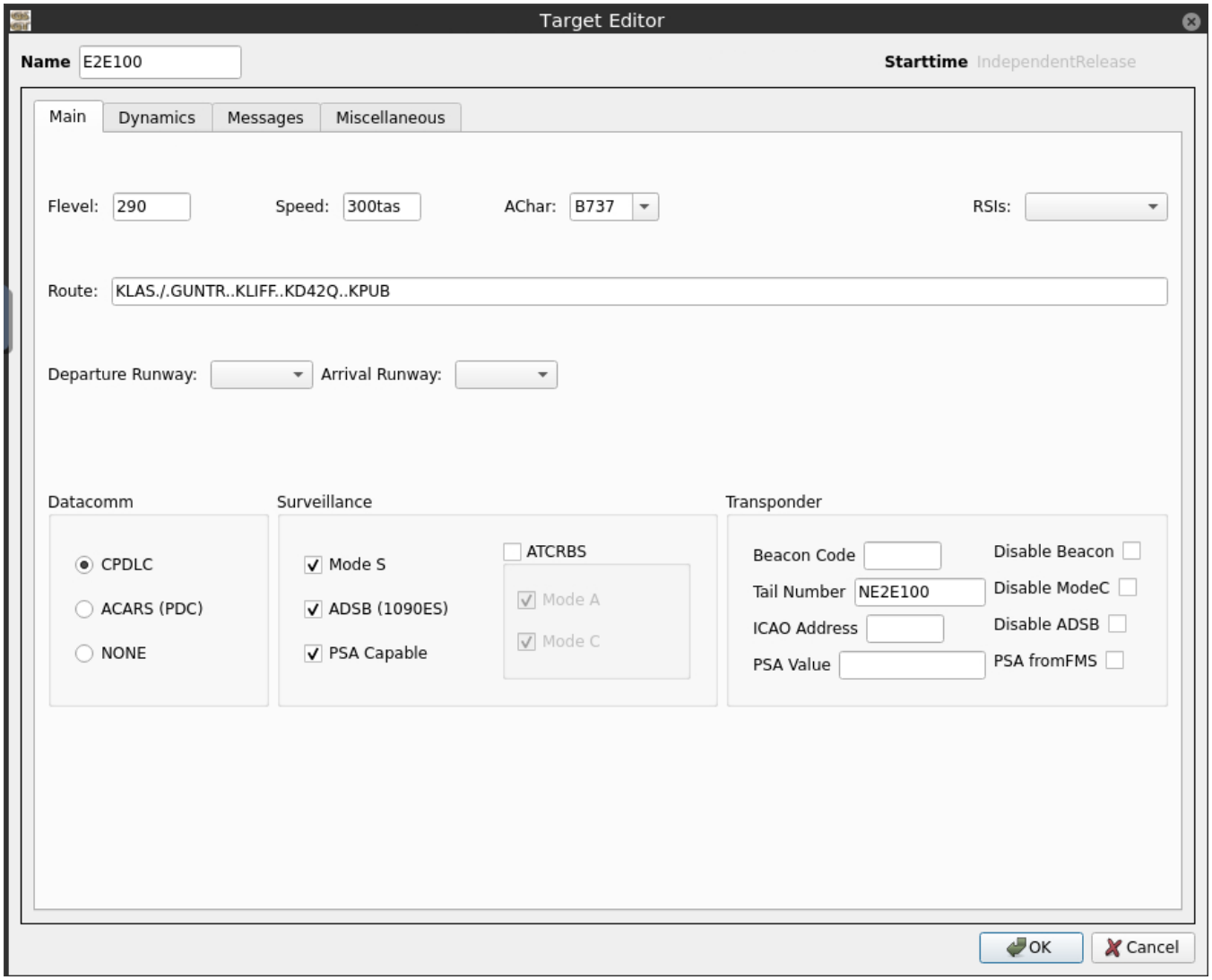


Figure 74. Object Editor

4.3.4. Replicate Object

Replication provides the ability to produce copies of the selected objects such as System Commands or Targets. The replications can be dynamic (not frozen), so that single object manages all its replications

and a change to that object is reflected across all replications of that object. For dynamically replicated targets, all messages and events associated with the original target, will also be generated for each target replication. Alternatively, replications can be frozen, which creates a copy of the original object; therefore, the new objects can be independently modified to specific needs.

The Replication Editor dialog varies depending on whether a System Command or Target is being replicated. As shown in the figure below, the following options are available for Target replications. System Command replication options only allow the user to specify the number of replications and a delta time between replications.

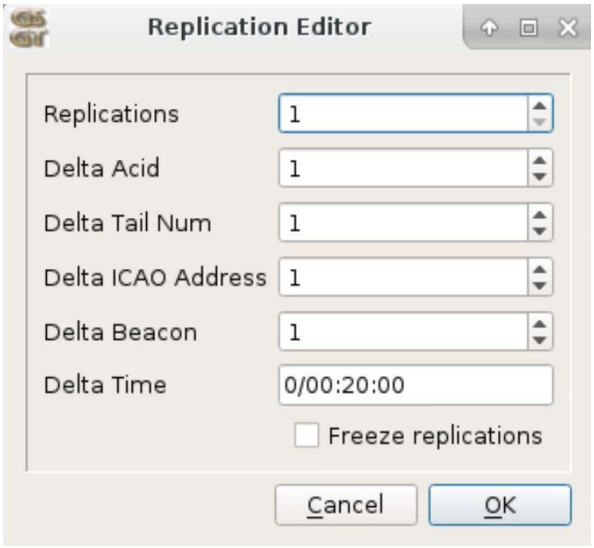


Figure 75. Replication Editor

Replications

The number of replicated objects.

Delta Acid

Delta in Acid between replications. If the base target has the identifier UAL101, and '1' is specified for the Delta Acid, the following Acids are achieved in replications: UAL102, UAL103, UAL104…

Delta Tail Num

Delta in Tail Number between replications. If the base target has the Tail Number N12345, and '2' is specified for the Delta Tail Num, the following Tail Numbers are achieved in replications: N12347, N12349, N12351…

Delta ICAO Address

Delta in ICAO Address between replications. If the base target has an ICAO Address of AB00E9, and

'3' is selected for the Delta ICAO Address, the following ICAO codes are achieved in replications: AB00EC, AB00EF, AB00F2...

Delta Beacon

Delta in Beacon code between replications. If the base target has a beacon code of 1011, and '3' is selected for the Delta Beacon, the following beacon codes are achieved in replications: 1014, 1017, 1022...

Delta Time

Delta in time between replications. The default time is 20 minutes. If the original object has a scenario time of 00:10:00 then the first replication will enter the scenario at 00:30:00.

Freeze Replications

When checked, produces hard copy replications that are no longer tied to the original object. Frozen replications will appear separately in the GSGT Editor list view. Non-frozen replications remain associated with the original.

OK

Adds the specified number of replications to the scenario.

Cancel

Closes the 'Replicate' window without saving changes.

Leaving the pointer over a non-frozen replicated System Command or Target will cause a balloon help to appear with the details of the replication.

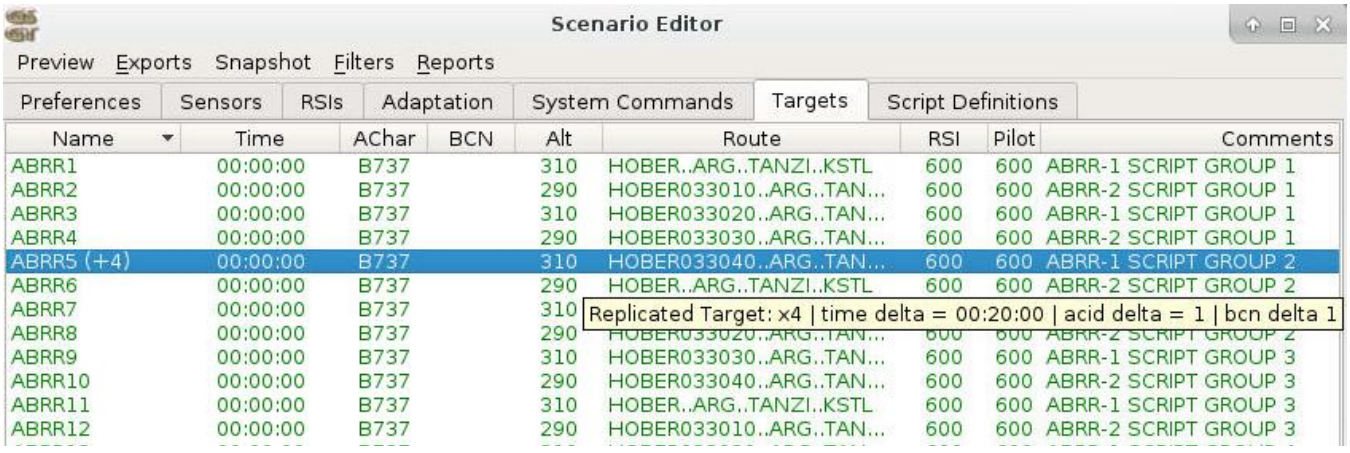


Figure 76. Replications

4.4. Save Scenario

To save current scenario select **Scenario->Save** from the GSGT Main Window.

To save a scenario under a different name select **Scenario->Save As** from the GSGT Main Window. This allows the user to specify the name and location of the scenario files. A directory with the name as the specified in Scenario Name is created in the selected location.

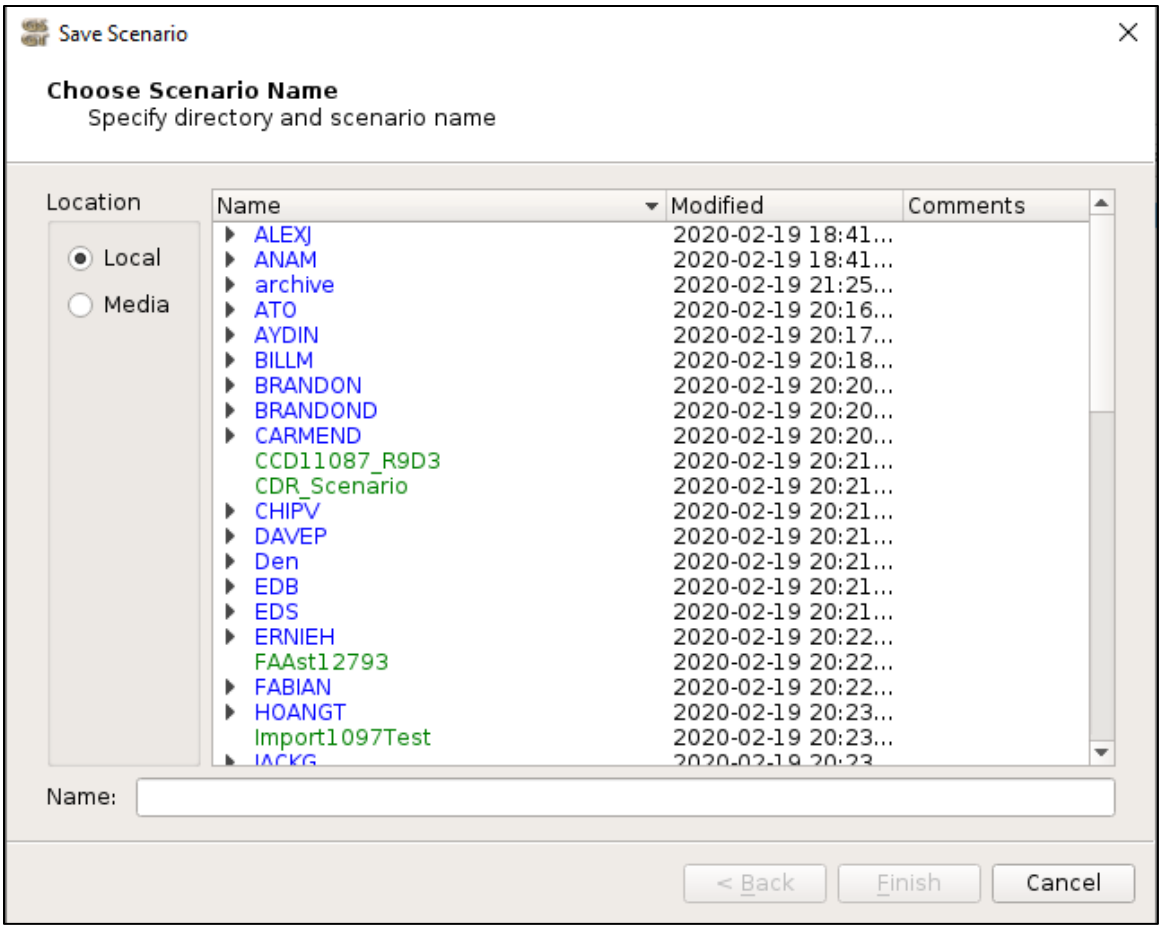


Figure 77. Save Scenario

4.4.1. Scenario Overwrite Warning

When a scenario name is specified in the Save Scenario dialog already exists, the user is prompted to overwrite the existing scenario.

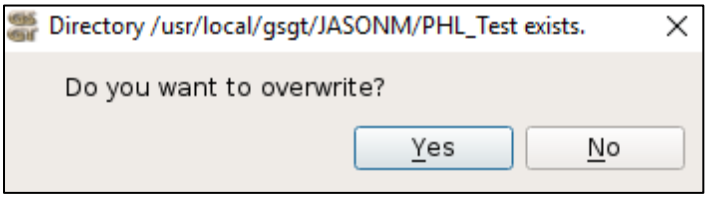


Figure 78. Scenario Overwrite Warning

Yes

The existing scenario file is overwritten.

No

The save action is cancelled.

4.4.2. Save Scenario Before Exit

When the user attempts to exit the GSGT application and unsaved changes have been made to the scenario, the following dialog is displayed.

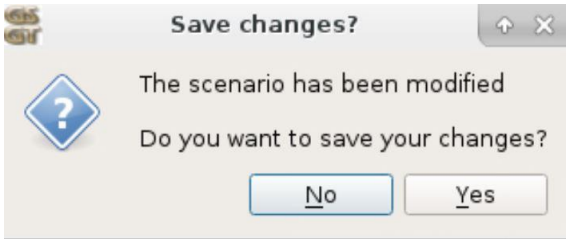


Figure 79. Save Before Exit

Yes

The scenario file is saved and the application is exited.

No

The scenario file is NOT saved and the application is exited.

5. Scenario Editor

The Scenario Editor window is comprised of multiple tabs, including Preferences, Sensors, RSIs, Adaptation, System Commands, Targets, and Script Definitions. Note that not all tabs are available in all GSGT modes. The Sensors and Adaptation tabs display adapted surveillance items and interfacility and display system items, respectively, for reference only. The remaining tabs contain lists of scenario objects by type that can be edited.

Figure 80. Terminal and ERAM Sim Mode Tabs

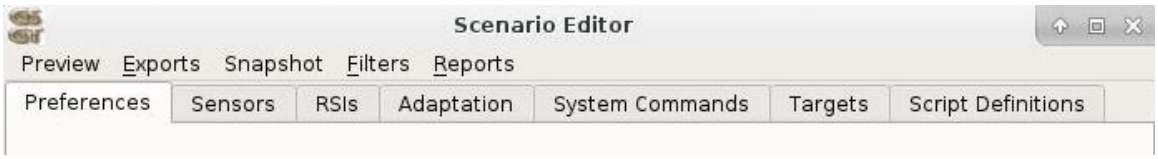


Figure 81. Normal and DYSIM Modes Tabs

5.1. Preferences

Preferences are used to specify timing and other attributes of the scenario. The attributes specified in the Preferences tab are applied to the scenario globally. Some timing parameters can be applied to individual targets through the Target editor; see section 5.6.1.3.2 for more details. GSGT looks for a preferences configuration file called prefs.xml. If prefs.xml cannot be found, standard defaults values are used.

5.1.1. Edit Preferences

To edit Scenario Preferences, click on the **Preferences** tab in the Scenario Editor Main Window.

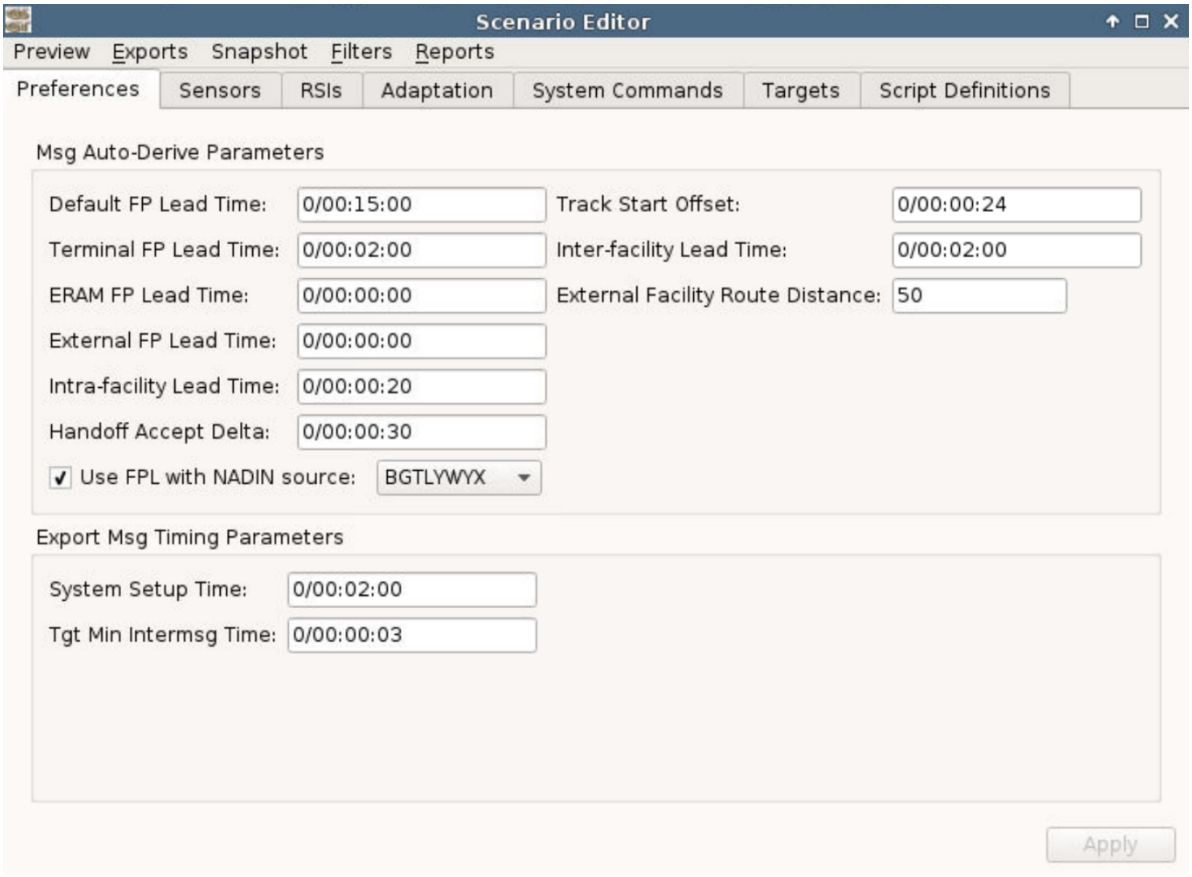


Figure 82. Preferences Tabs

Export Msg Timing Parameters

System Setup Time

No messages will be injected before this time, unless the message is marked as a system setup message. This allows messages such as combine sector and switch activity to be injected prior to any flight data messages.

Tgt Min Intermsg Time

The minimum amount of time between auto-generated messages for the same target. This ensures that messages associated with the same target will not be injected out of order. It is useful in large scenarios, when message injection times tend to be delayed due to equipment injection delays.

Msg Auto-Derive Parameters

FP Lead Time

For auto-generated messages, the amount of time preceding a target start time or preceding a boundary crossing that the fight plan messages will be scheduled for injection. For a departure flight, the initial proposed flight plan will be generated with an injection time that is FP Lead Time prior to the departure time. For an active flight, the flight plan will be generated with an injection time that is FP Lead Time prior to the start of the radar track. If a flight crosses any enroute or terminal facility boundaries, the flight plan generated for each downstream facility will have an injection time that is FP Lead Time prior to the boundary crossing time.

Track Start Offset

For auto-generated messages, the time after a target start time for a flight that starts inside an adapted local facility that the start track message (QT) will be scheduled for injection.

Intra-facility Lead Time

For auto-generated messages, the time before an inter-sector boundary crossing when the initiate handoff message (QN) will be scheduled for injection.

Inter-facility Lead Time

For auto-generated messages, the time before an enroute or terminal facility boundary crossing when the initiate handoff message (TI) will be scheduled for injection.

Handoff Accept Delta

For auto-generated messages, the time between the initiate handoff message and the accept handoff message for both intra-facility and inter-facility transfers of control.

Use FPL with NADIN source

By default, domestic proposed flights are auto-generated with FP messages. With this option selected, all domestic proposed flights are generated using FPL messages injected from the specified NADIN source.

Apply

Save and apply the changes made and close the Preferences editor dialog.

5.2. Sensors

GSGT uses surveillance devices defined in adaptation. Surveillance equipment attributes can be viewed but not modified. To expand the subtree contained in particular type of equipment click on the triangle icon to the left of the item.

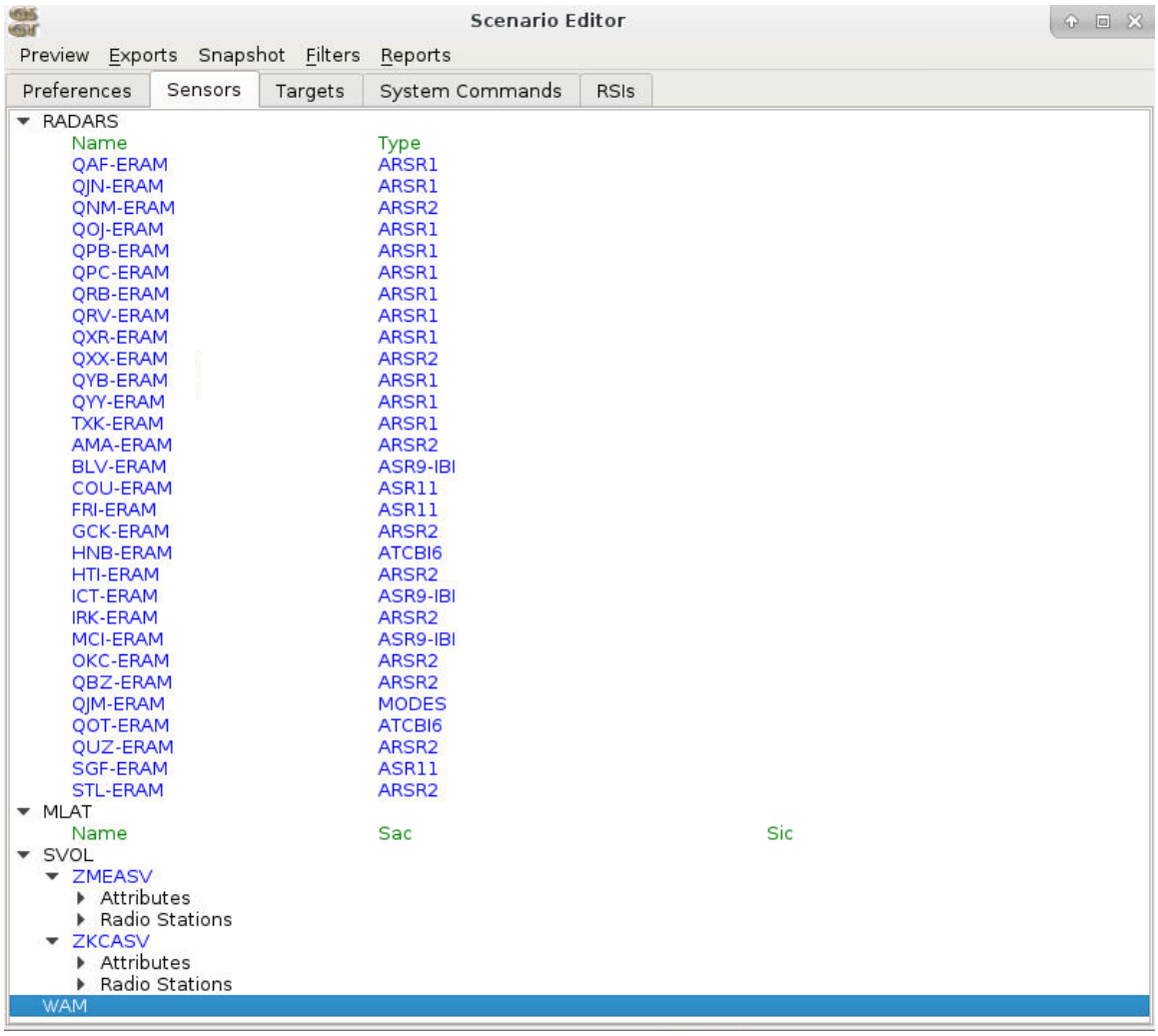


Figure 83. Sensors Tab

5.3. RSIs

Record Selection Indicators, abbreviated RSI, can be used to identify various messages, which can then be selected or filtered during runtime.

5.3.1. Create and Edit RSI

To create a new RSI, click on the **RSIs** object label in the Scenario Editor Main Window and right click the object list. Select **New** from the context menu.

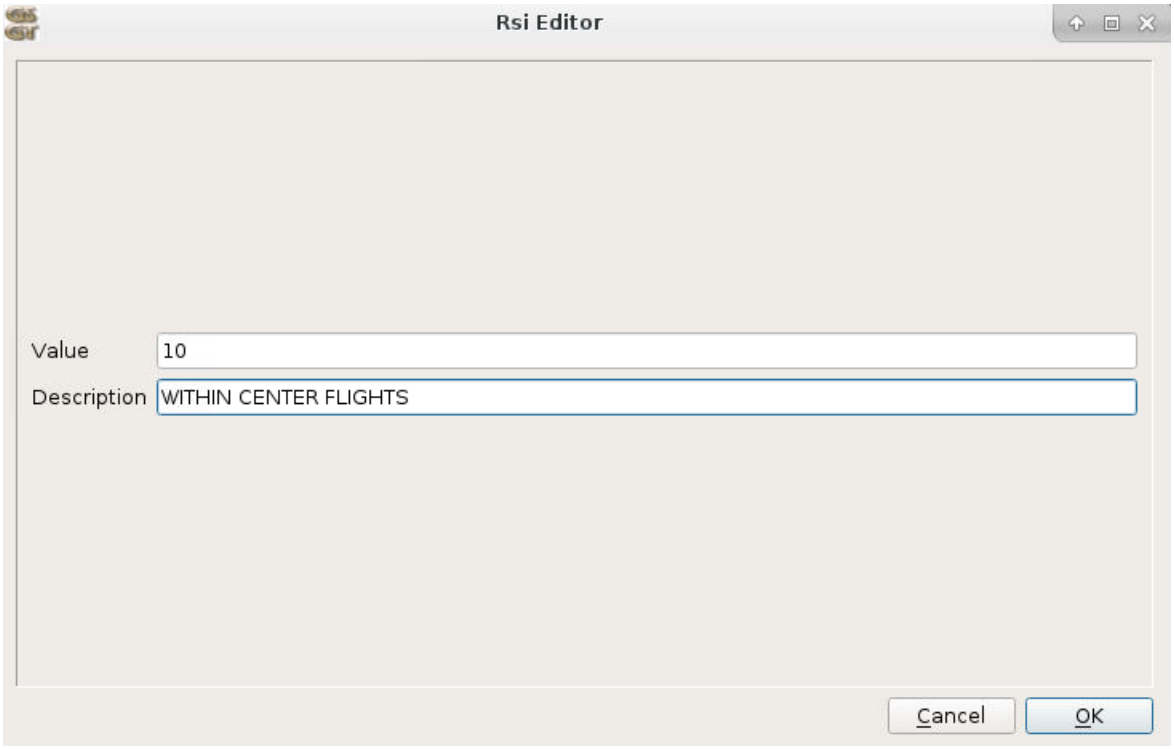


Figure 84. RSI Editor

Value

Any string can be used for the RSI value.

NOTE: *Each string value can only be used for one RSI. A dialog box stating "RSI exists" will appear if the string entered is already being used for another RSI once OK is selected.*

Figure 85. RSI Exists Warning

Description

Text description of the RSI.

OK

Save and apply the changes made and close the RSI editor dialog.

Cancel

Cancel the changes made and close the RSI editor dialog.

5.3.2. Edit Objects Associated with Specific RSI

From the Scenario Editor, left click on Filters, then select Filter by RSI to display the list of RSIs.

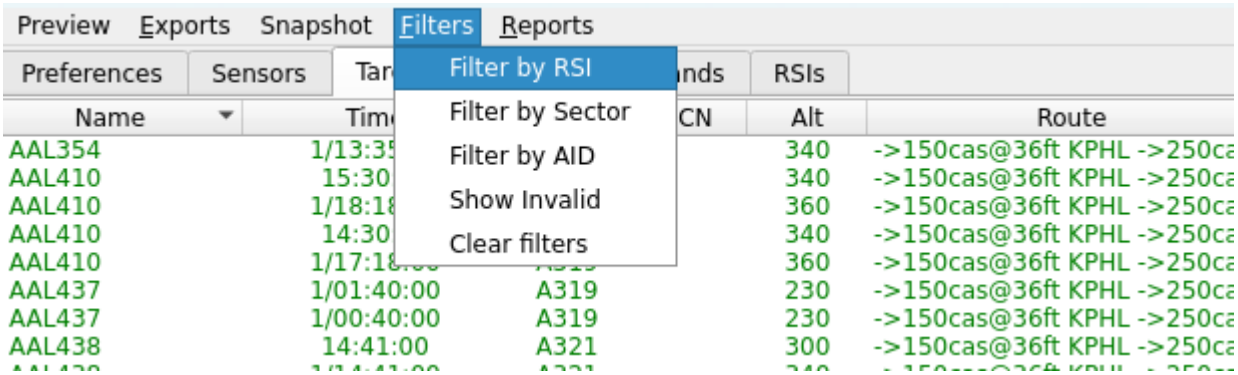


Figure 86. Filtering by RSI

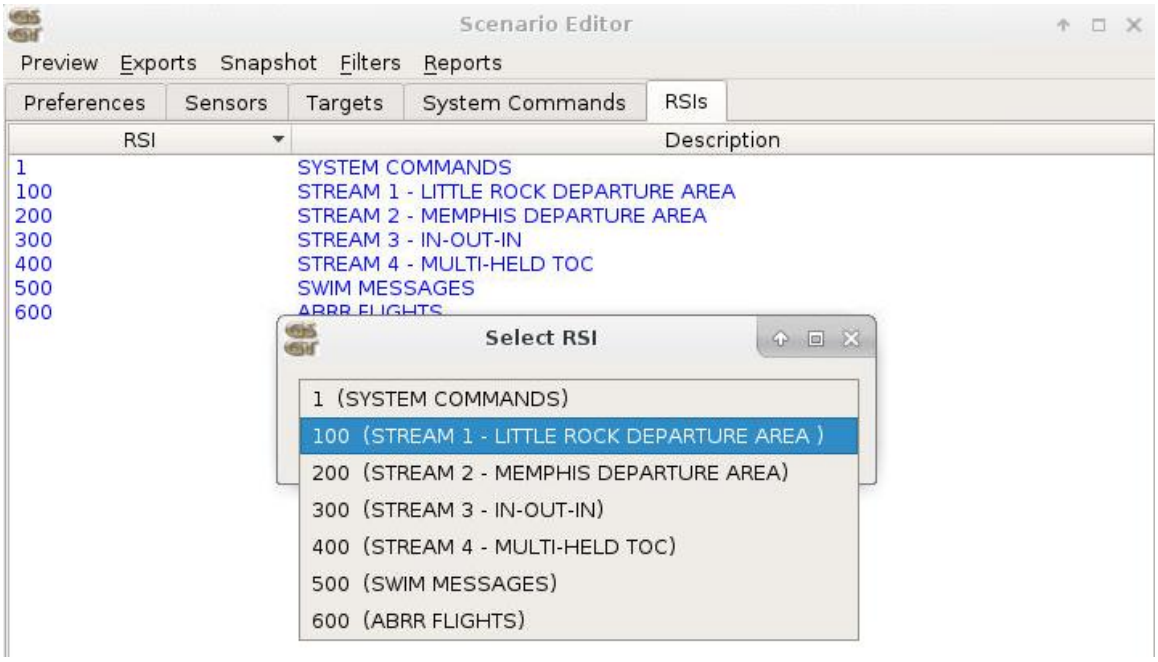


Figure 87. RSI Filter Selection

This filters the scenario editor by the RSI selected.

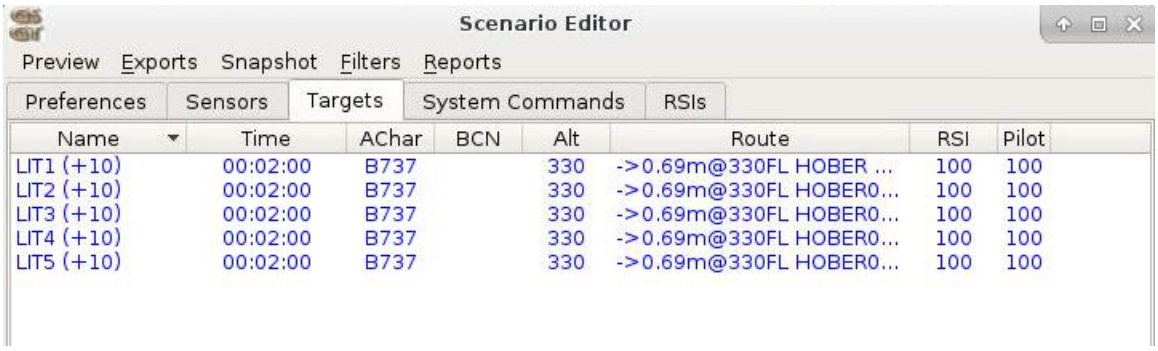


Figure 88. Objects Filtered by RSI

5.4. Adaptation Equipment and DS

GSGT uses equipment devices based on the positions and devices defined in adaptation. Equipment attributes can be viewed but not modified. To expand the subtree contained in a particular type of equipment click on the triangle icon to the left of the item.

5.5. System Commands

Messages defined in the system commands tab are not associated with any Target and can be injected from any supported device. These might be system setup type messages such as combine sector or switch activity. Any message can be scripted, including flight data. The editor supports freehand text editing of messages that allows users to create any valid or invalid message format. Note that flight data messages would have to be scripted without any substitution tokens that reference a particular target, such as AID, CID, GUFI, etc. If target token substitution is needed, the flight data message must be scripted within the Target editor; see section 0.

5.5.1. Create and Edit System Command

Certain system commands require or may be formatted with special characters or values that are represented as tokens. These tokens can be entered into the text of a System Command to be substituted to corresponding hex code or values during the scenario export. The primary reason for these tokens is to provide an ASCII character representation for non-printable character values or for values that are unknown until the export or run time.

Table 4. Special Character Tokens

Token	Description
\d	downward-pointing arrow aka arrival arrow
\u	upward-pointing arrow aka departure arrow
\c or |	clear weather symbol
\o or '	overcast weather symbol
\xHH	arbitrary value, where HH is a two digit hex value
\p	interfacility messages parity error
\e	EOM token
\l	LRC error

NOTE: *Not all tokens may be appropriate in all message types.*

NOTE: *Tokens are not case sensitive; for example, either \c or \C can be used.*

NOTE: *Entering an extra slash before a character will 'escape' it and not generate a special character. For example, the string "\\c" will be exported as "\c" and not as a clear weather symbol.*

5.5.1.1. Message Editor

To create a new System Command, select a message type and appropriate device(s) from the drop downs above the text input area. Enter a message injection time offset and select an RSI, if desired. Type the message contents into the free form text area and press enter or right click and select Save. The new message is added to the message list below the text input area. Some message types will only accept specific formats; for example, rtcsmsg will only accept a message in xml format.

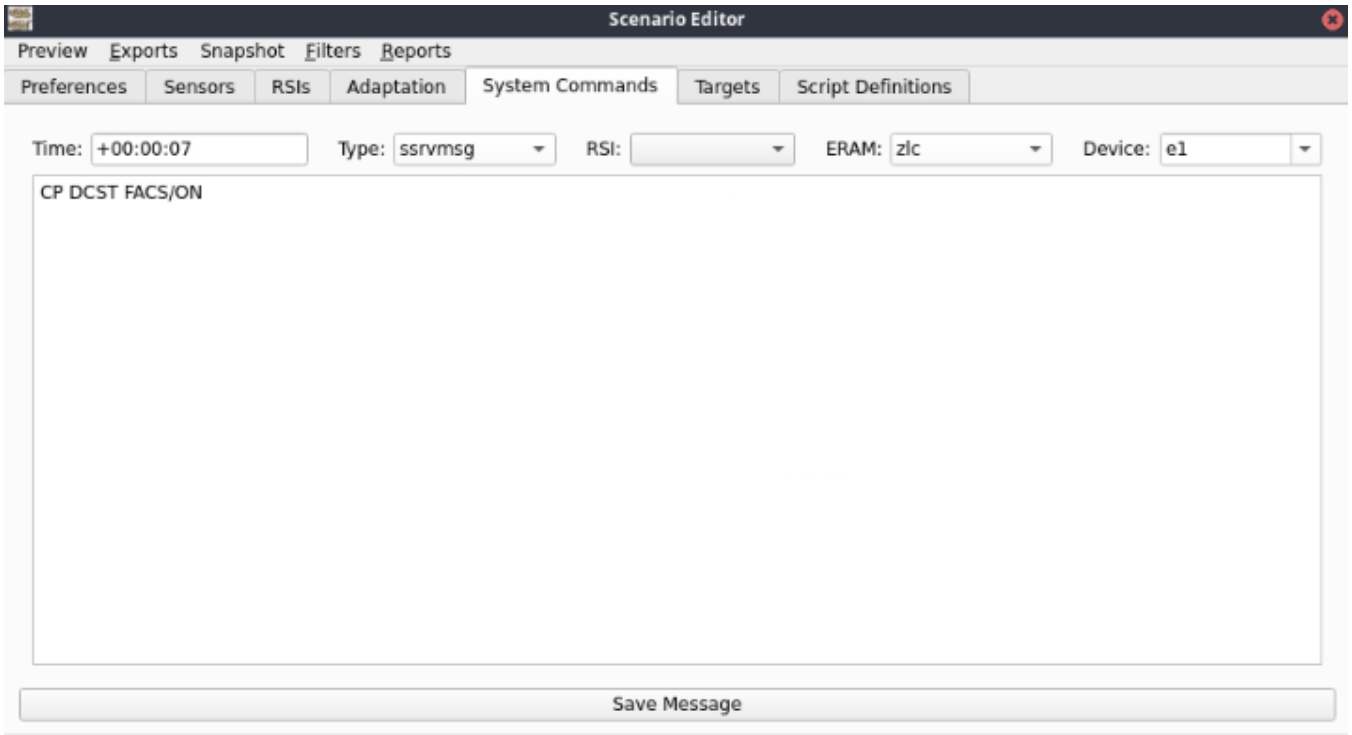


Figure 89. Message Editor

Time

Input box allowing entry of the time the message is to be injected into the scenario.

RSI

Drop down list of RSIs allowing selection of the desired RSI.

Type

Drop down menu allowing selection of the type message to be injected. Depending on the type of message, additional fields will appear for message sources and input devices.

Table 5. Message Types with Facility and Device Fields

Message Type	Facility/Device Field 1	Facility/Device Field 2
ifmsg	Source	Destination
ssrvmsg	ERAM	Device
fdiomsg	ERAM	Device
nadinmsg	Source Address	Destination Address
icaoMsg	Source Fac	Dest Fac
wmscrmsg	Dest ERAM	N/A
tdlsEramMsg	TDLS	N/A
tdlsTfdmMsg	TDLS	N/A
swimmsg	Dest ERAM	TMI
cmsmsg	ERAM	N/A
aigMsg	STARS	N/A
tfmsMsg	N/A	N/A
cpdlcmsg	N/A	N/A
afnmsg	N/A	N/A
rtcsMsg	Airport	N/A
ttpMsg	Airport	N/A
tcwMsg	Facility	Position

Text

Message text. Freeform text area.

5.5.1.1.1.TCW Messages

To create a scripted TCW message, click the Type drop down box and select tcwMsg. Two new options will appear, FAC and Position. Select the appropriate FAC and use the drop down to select a Position. The Position is set to an asterix (*) symbol as default when generating a configuration file with a report file adaptation. Use the message text box area to enter a scripted TCW message with the available tokens for key substitution.

NOTE: *To use scripted TCW messages, the Position needs to match the configuration file position name.*

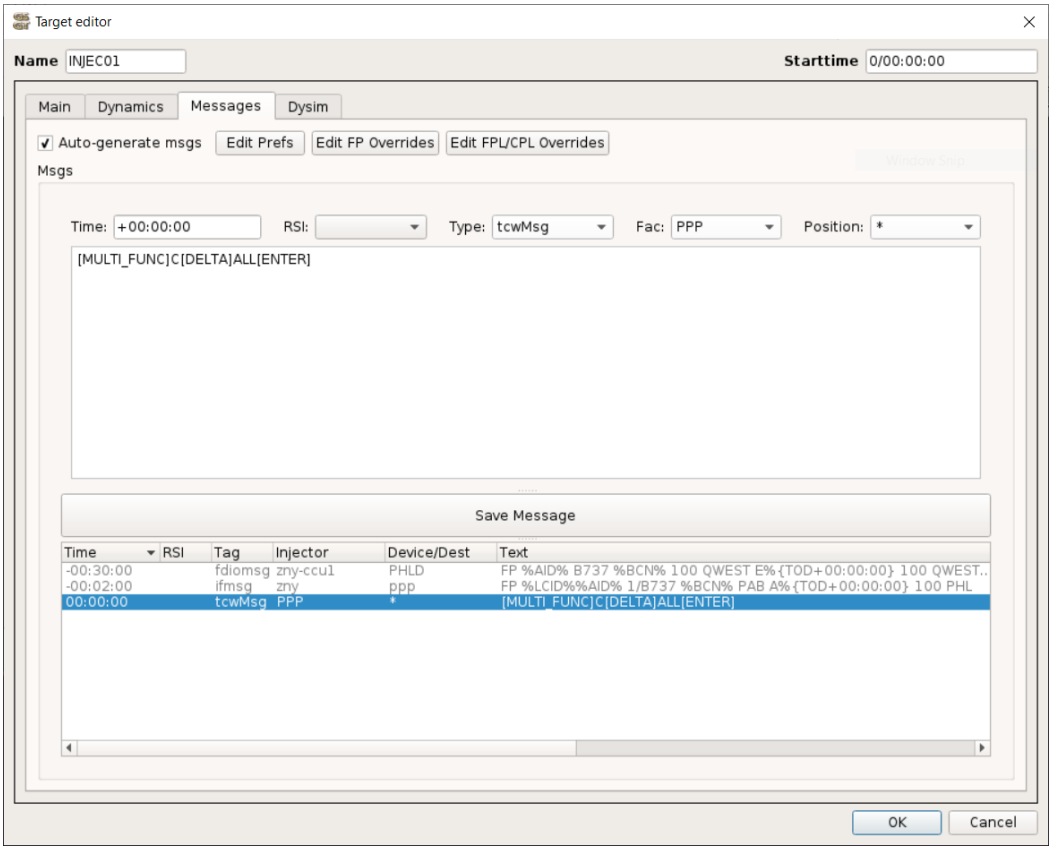


Figure 90. TCW Message

NOTE: *Dwelling the cursor in the message text area when the message type tcwMsg is selected will display the following list of tokens available for key substitution:*

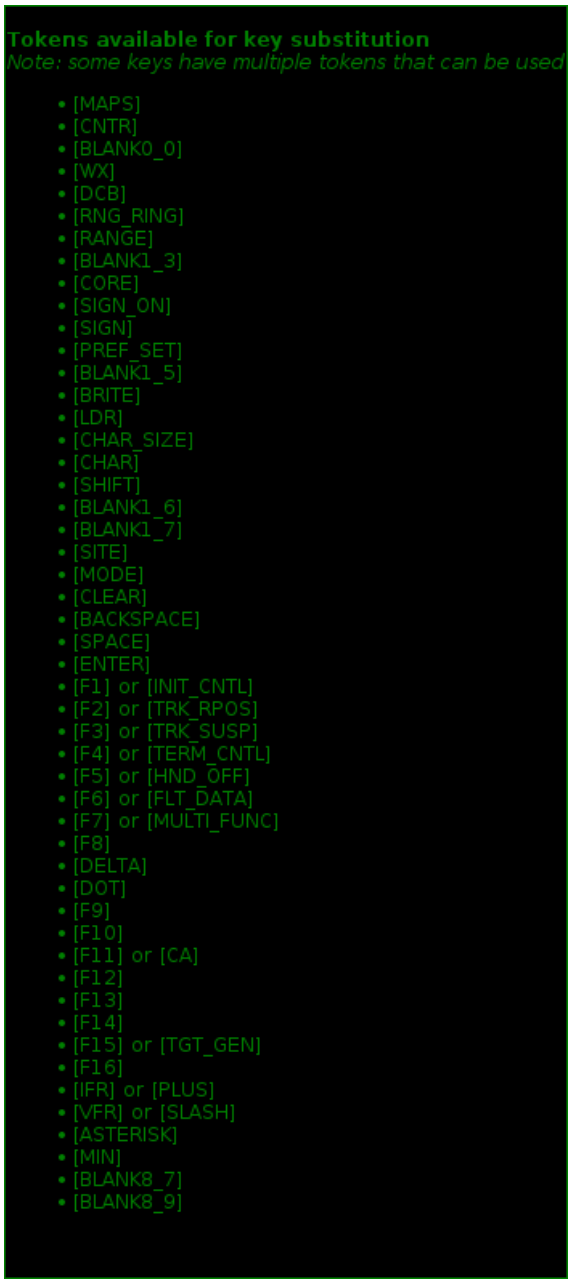
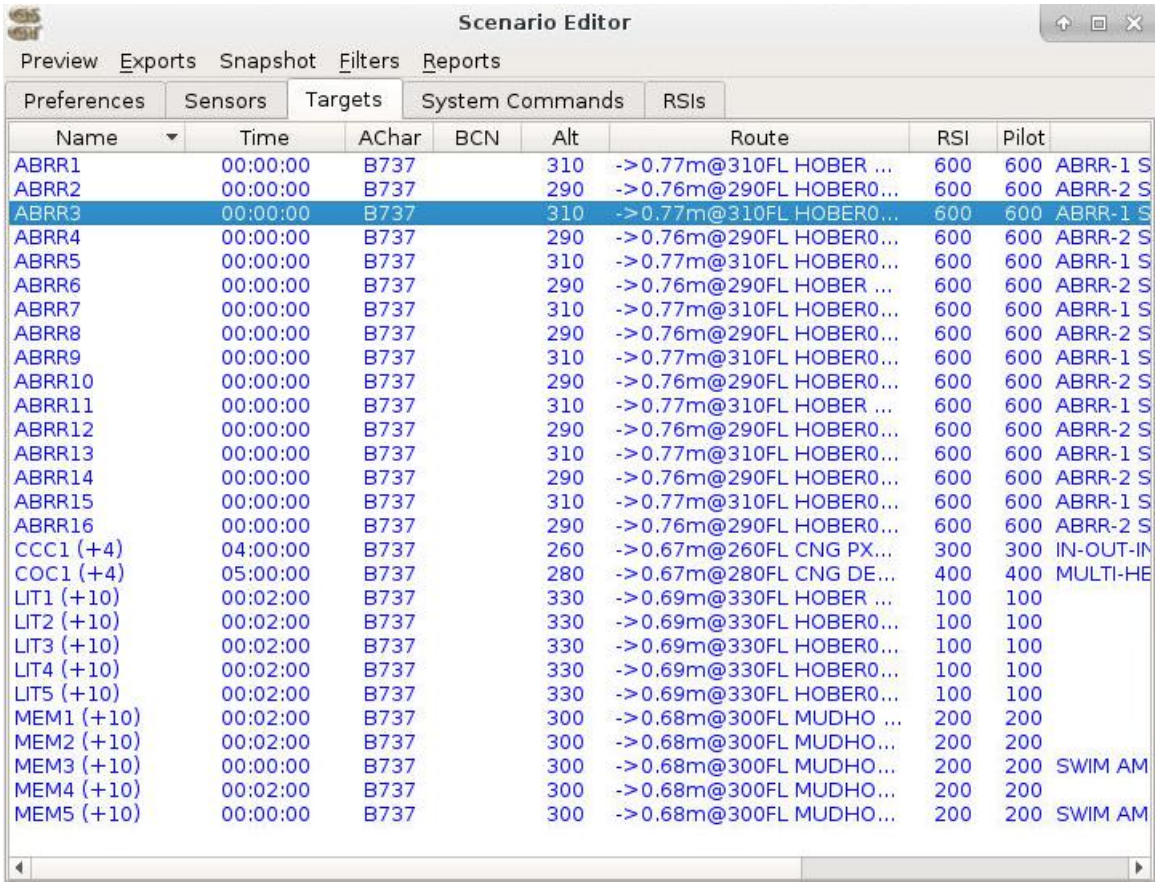


Figure 91. TCW Message Tokens

5.6. Targets

A Target is a representation of a flight with certain characteristics such as aircraft dynamics, equipment, route of flight, and events that control almost every aspect of its identity. The targets also include a set of messages, identical in structure to System Commands, but are associated with that particular target. The messages can be automatically derived based on the characteristics of the target, manually entered or be a combination of both.



Name	Time	AChar	BCN	Alt	Route	RSI	Pilot	
ABRR1	00:00:00	B737		310	->0.77m@310FL HOBER ...	600	600	ABRR-1 S
ABRR2	00:00:00	B737		290	->0.76m@290FL HOBER0...	600	600	ABRR-2 S
ABRR3	00:00:00	B737		310	->0.77m@310FL HOBER0...	600	600	ABRR-1 S
ABRR4	00:00:00	B737		290	->0.76m@290FL HOBER0...	600	600	ABRR-2 S
ABRR5	00:00:00	B737		310	->0.77m@310FL HOBER0...	600	600	ABRR-1 S
ABRR6	00:00:00	B737		290	->0.76m@290FL HOBER ...	600	600	ABRR-2 S
ABRR7	00:00:00	B737		310	->0.77m@310FL HOBER0...	600	600	ABRR-1 S
ABRR8	00:00:00	B737		290	->0.76m@290FL HOBER0...	600	600	ABRR-2 S
ABRR9	00:00:00	B737		310	->0.77m@310FL HOBER0...	600	600	ABRR-1 S
ABRR10	00:00:00	B737		290	->0.76m@290FL HOBER0...	600	600	ABRR-2 S
ABRR11	00:00:00	B737		310	->0.77m@310FL HOBER ...	600	600	ABRR-1 S
ABRR12	00:00:00	B737		290	->0.76m@290FL HOBER0...	600	600	ABRR-2 S
ABRR13	00:00:00	B737		310	->0.77m@310FL HOBER0...	600	600	ABRR-1 S
ABRR14	00:00:00	B737		290	->0.76m@290FL HOBER0...	600	600	ABRR-2 S
ABRR15	00:00:00	B737		310	->0.77m@310FL HOBER0...	600	600	ABRR-1 S
ABRR16	00:00:00	B737		290	->0.76m@290FL HOBER0...	600	600	ABRR-2 S
CCC1 (+4)	04:00:00	B737		260	->0.67m@260FL CNG PX...	300	300	IN-OUT-IN
COC1 (+4)	05:00:00	B737		280	->0.67m@280FL CNG DE...	400	400	MULTI-HE
LIT1 (+10)	00:02:00	B737		330	->0.69m@330FL HOBER ...	100	100	
LIT2 (+10)	00:02:00	B737		330	->0.69m@330FL HOBER0...	100	100	
LIT3 (+10)	00:02:00	B737		330	->0.69m@330FL HOBER0...	100	100	
LIT4 (+10)	00:02:00	B737		330	->0.69m@330FL HOBER0...	100	100	
LIT5 (+10)	00:02:00	B737		330	->0.69m@330FL HOBER0...	100	100	
MEM1 (+10)	00:02:00	B737		300	->0.68m@300FL MUDHO ...	200	200	
MEM2 (+10)	00:02:00	B737		300	->0.68m@300FL MUDHO...	200	200	
MEM3 (+10)	00:00:00	B737		300	->0.68m@300FL MUDHO...	200	200	SWIM AM
MEM4 (+10)	00:02:00	B737		300	->0.68m@300FL MUDHO...	200	200	
MEM5 (+10)	00:00:00	B737		300	->0.68m@300FL MUDHO...	200	200	SWIM AM

Figure 92. Targets Tab

5.6.1. Create and Edit Target

To create a Target, right click on the **Targets** object label in the object list of the Scenario Editor Main Window. Select **New** from the context menu.

5.6.1.1. Target - Main

The Main tab of the Target editor defines the type of aircraft, speed, altitude, flight plan route, runways (when defined), assigned RSI, and equipage such as on-board navigation and transponder types.

When the first and/or last element on the route is an airport, GSGT can model appropriate departure or arrival from/to an airport, including modeling of airport runways. The runways must be predefined using Runways site definition to be available for inclusion.

The Dynamics tab of the Target Editor allows users to enter macros and events to customize a target's flight behavior and the path the target is flying. If no macros or events are specified, the target will fly according to the aircraft characteristics and the filed flight plan route.

Based on the target's route definition, macros, and timed events, GSGT generates track positions and derives appropriate messages such as flight plans and handoffs.

The user can hover the cursor over the Route field to display a Route Help window. The Route Help displays a list of mouse commands and acceptable coordinate formats.

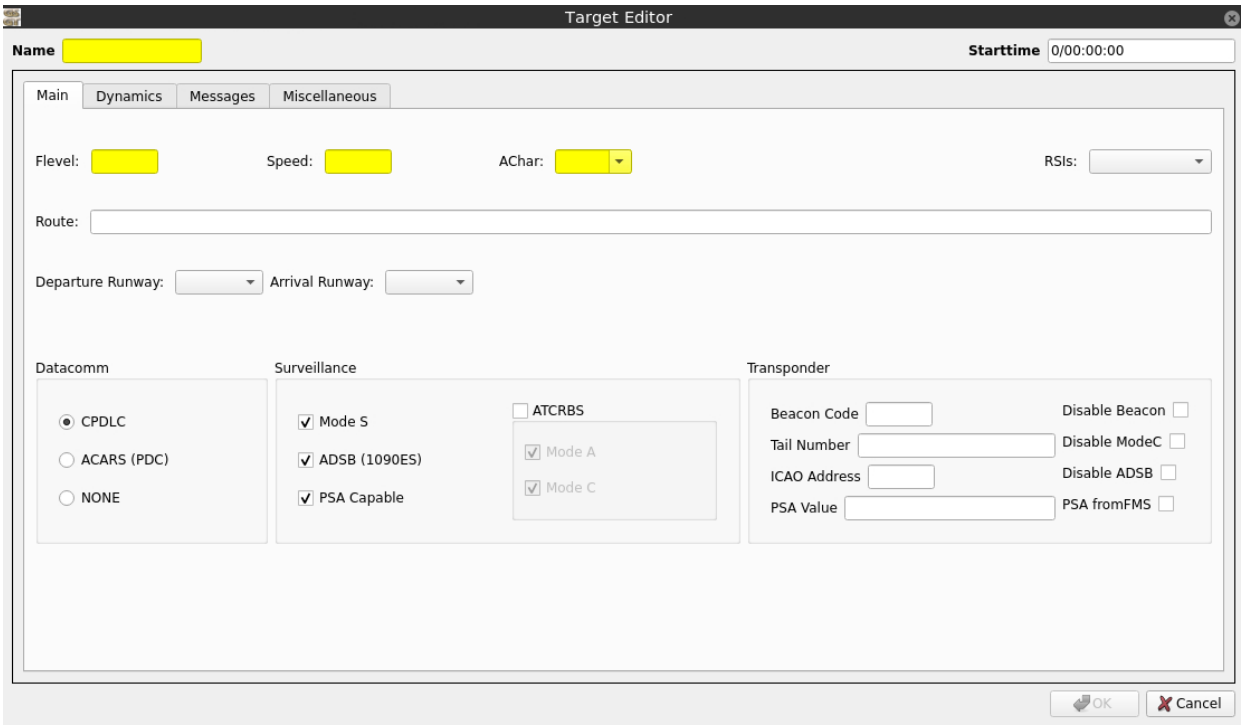


Figure 93. Target Editor Main Tab

Name

Two to seven alphanumeric characters designating the identity of the flight. The first character must be alphabetic and may be followed by any combination of 1-6 alphanumeric characters. The minimum length is two (one letter and one digit). The minimum length for a letter-only name is three.

Starttime

The time at which the target becomes active. The time is specified in days, hours, minutes, and seconds.

Flevel

Flight Level. 1-3 numeric characters designating the flight altitude in hundreds of feet.

Speed

Whole numbers specifying the aircraft speed in knots followed by the characters 'tas' or 'cas' or Mach speed in decimal format either preceded or followed by 'm'. If only digits are entered, TAS speed is assumed. The speed is not validated for the specified altitude or aircraft performance capabilities.

AChar

Drop-down menu allowing the user to select the aircraft characteristics of the target from the adapted aircraft types.

RSI

List of RSI descriptions for this target. Clicking 'Select' will open a scroll down menu allowing you to select the desired RSI.

Route

Text defining the planned flight route of the target. Routes can be made up of airports, fixes, lat/lon points, airways, and more.

The flight route can be entered in two ways, using the point and click feature of GSGT or by manually typing the flight route text. To use the point and click function, click the Route text box, then place the cursor over the desired element such as a fix or an airport and left click the mouse. The element is added to the flight plan and displayed in the Route box. As elements are added to the flight plan, fixes and airports are highlighted in AUQUA, the flight route is outlined in GREEN between fixes, and segments along airways are YELLOW dotted lines.

Point and click adds new elements to the end of the flight plan. To add or remove an element in the middle of the route, manually modify the fix text in the flight plan dialog box or place the cursor after the element (before "." or "..") where the additional elements are to be inserted.

NOTE: *GSGT does not allow delay times to be typed directly in the route text. To create a delay, users must create a new target Delay Event.*

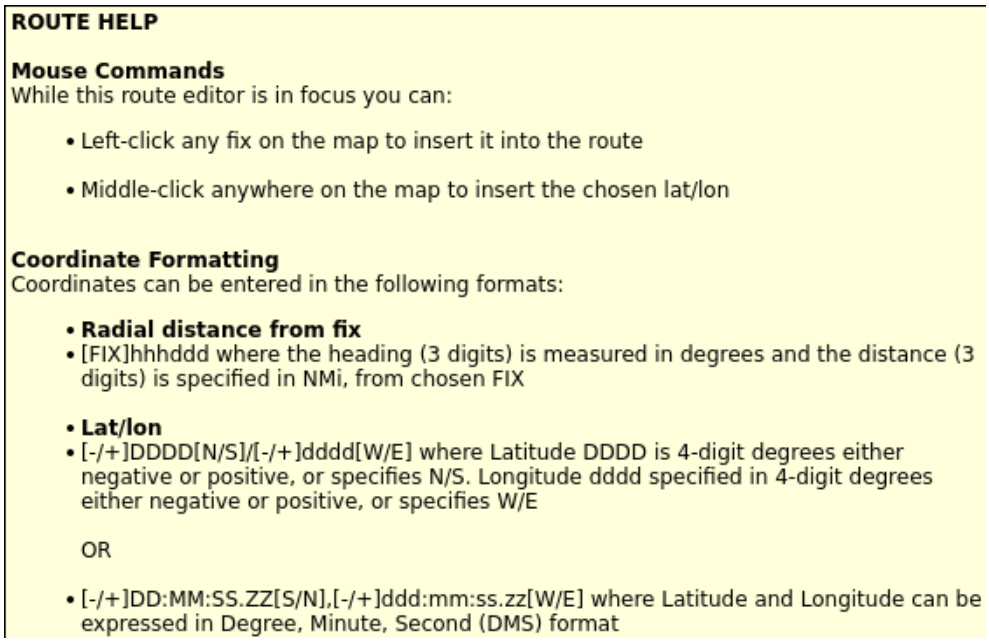


Figure 94. Route Help

Departure Runway

Drop-down menu allowing the user to select an adapted departure runway.

Arrival Runway

Drop-down menu allowing the user to select an adapted arrival runway.

Datacomm Clearance Type

DCL

PDC

None

Surveillance

ATCRBS

Mode3A and Mode C

Mode 3A only

Mode S

Mode3A and ModeC

ADSB (1090ES)

ADSB only

PSA Capable

Makes the flight PSA capable.

Transponder

Beacon code

One to four octal digits designating the beacon code for the aircraft. Values less than four digits will be left-padded with zeroes to reach a length of four. Supplying a beacon code is optional; GSGT will generate beacon codes for aircraft as needed.

Tail Number

Two to seven alphanumeric characters designating the aircraft's tail number. The first character must be alphabetic and may be followed by any combination of 1-6 alphanumeric characters. The minimum length is two (one letter and one digit).

ICAO Address

Six hex digits designating the ICAO address for the aircraft. Supplying an ICAO address is optional; GSGT will generate ICAO address for aircraft as needed.

PSA Value

Flight level for the Pilot Selected Altitude.

Disable Beacon

Disable ModeC

Disable ADSB

PSA from FMS

5.6.1.2. Target - Dynamics

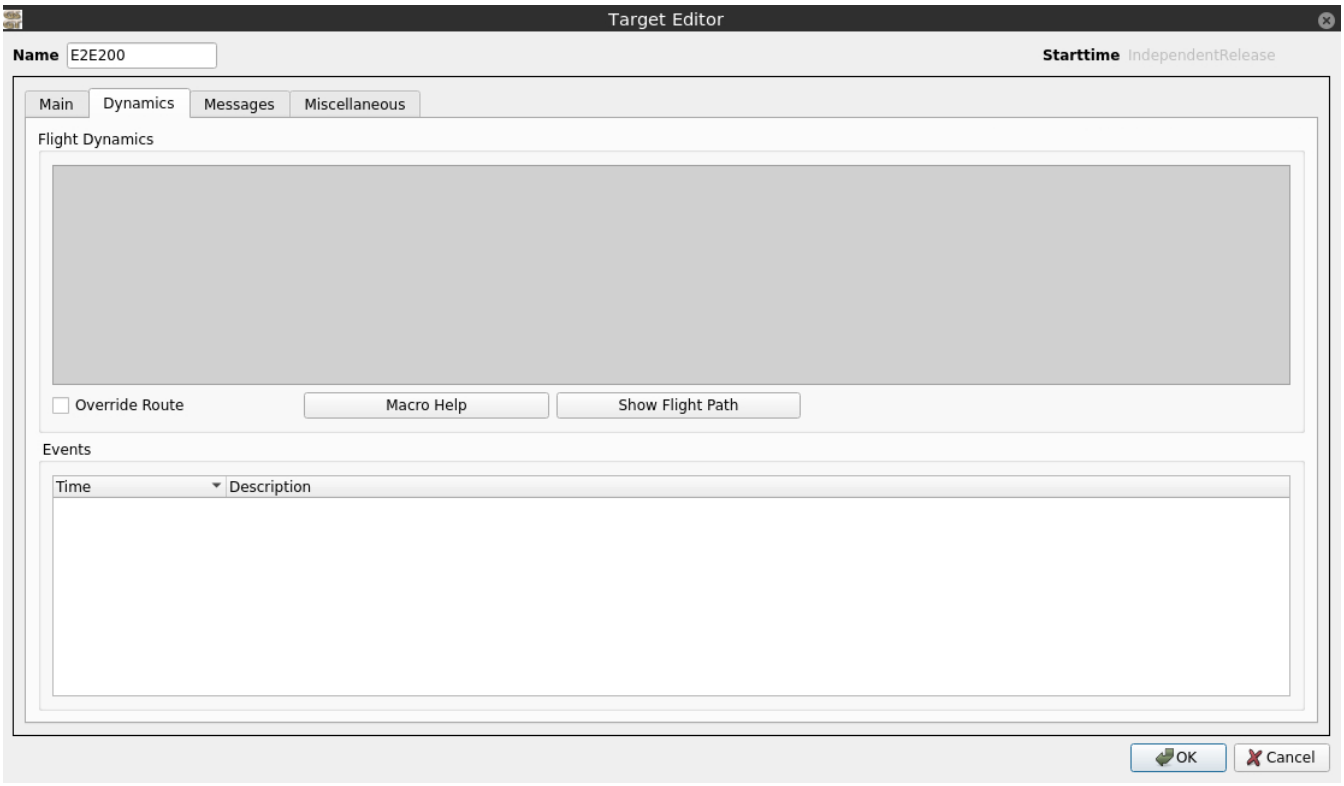


Figure 95. Dynamics Tab

Flight Dynamics

Macro Text Area

A text field where the user can change the path of a flight without changing its filed flight plan route.

Override Route

Checking this box will populate the macro text field with commands derived from the flight plan route. If any changes are made to the macro, the target will fly what is in the macro instead of the filed flight plan.

Show Flight Path

Displays the target's route in the adaptation viewer with a target dynamics information box.

Macro Help

A help box that will give some macro format examples.

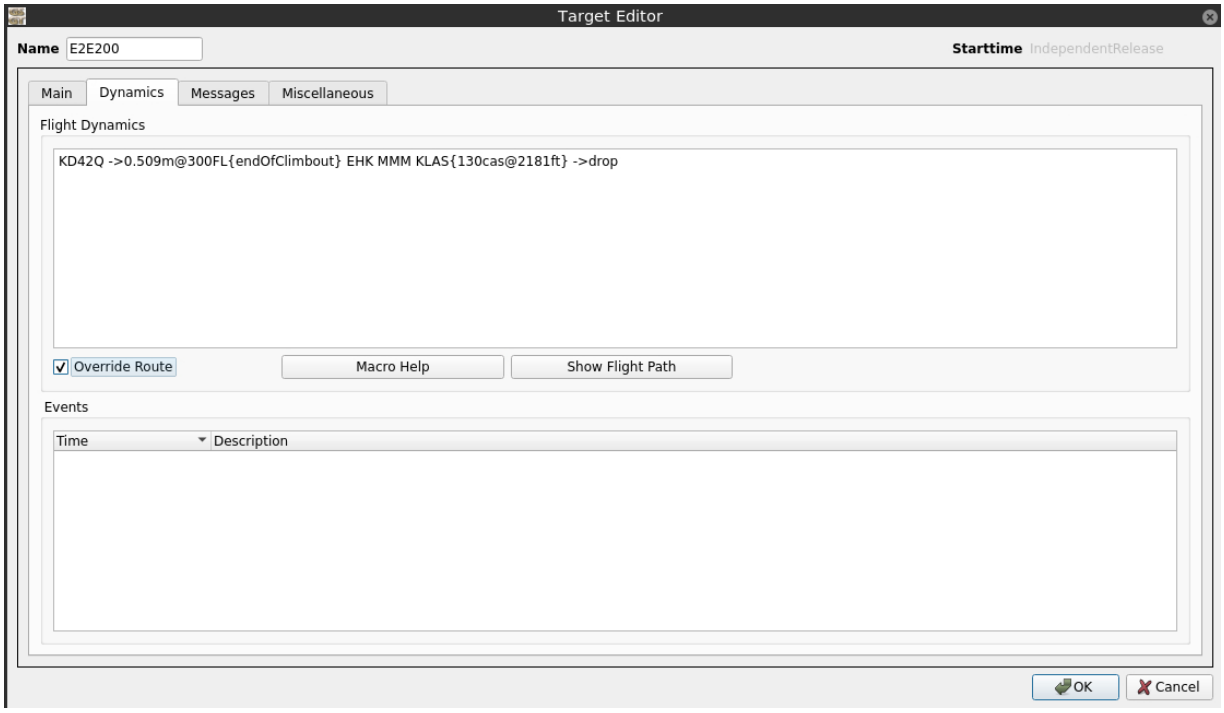


Figure 96. Override Route

Events

List of events that are applied to the target. The list specifies the condition when the event is applied and shortly describes the event. Right click context menu options:

New

Opens the Target Event Editor dialog for a new event.

Edit

Opens an existing target event in Target Event Editor dialog.

Delete

Deletes the currently selected target event(s).

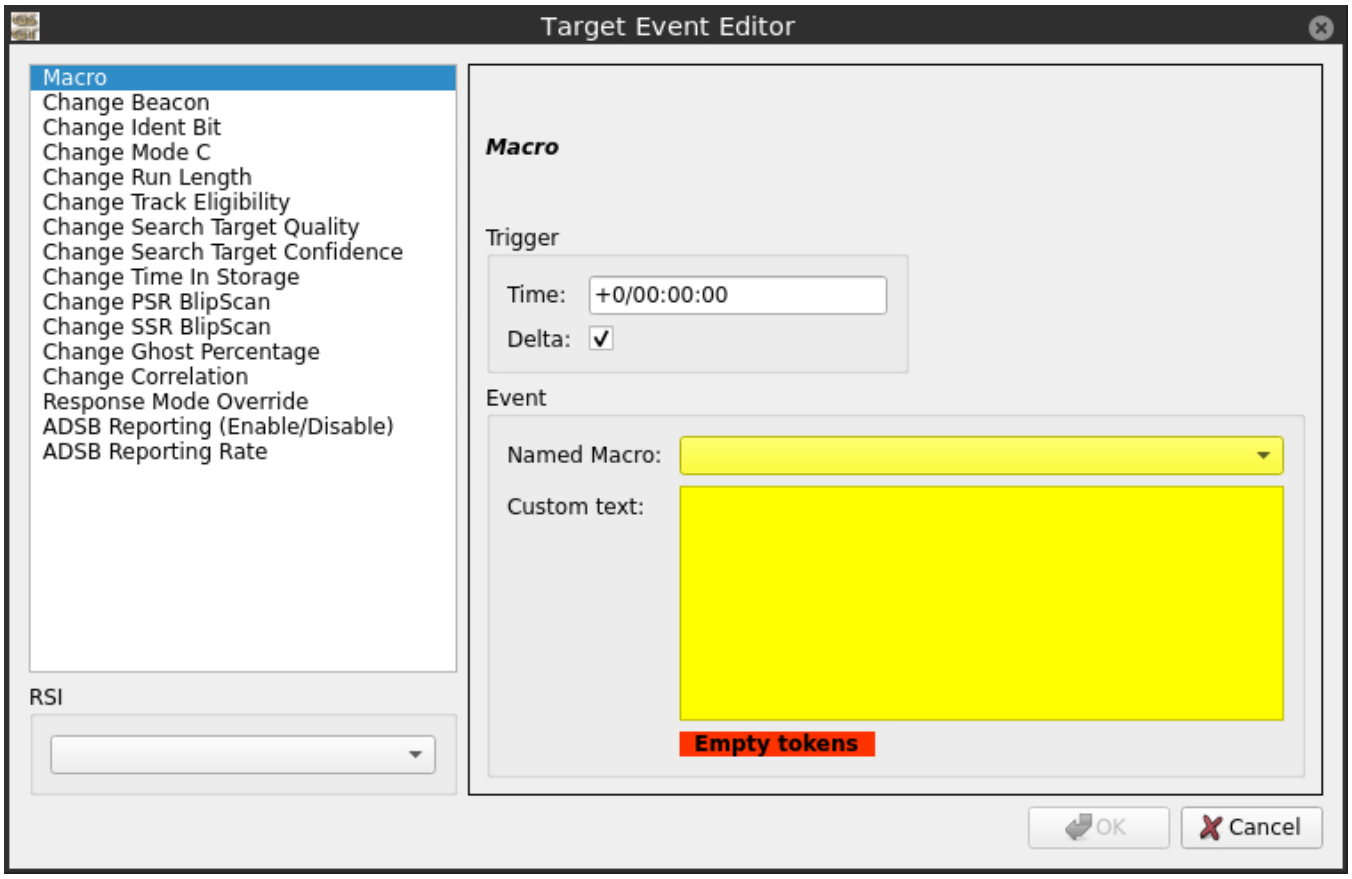


Figure 97. Target Event Editor

Target Events allow users to define a wide range of events that can be applied to a target to perform various tasks or change a target's characteristics. Reference table below describing all available events.

Event Type List

List of available event types that can be defined for the target.

Trigger

Allows user to set the time when the Target Event is performed as an offset of the target start time.

Event

The value(s) that will take effect when the Event is processed. The Drop Target Event does not have a Command value.

Generate Msg

If selected, a message reflecting the changed value will be generated. The text field will remain yellow

for invalid messages. Only valid for ERAM scenarios and only for certain events such as change Acid, Altitude, Beacon, and Speed.

RSI

If selected, the RSI will be tied to the event for that Target. If that RSI is turned off the event will not trigger.

OK

Closes the dialog and creates the specified Event.

Cancel

Closes the dialog and returns to the Target editor.

Table 6. Target Event Types

Event	Description
Macro	Add a custom macro to be injected.
Change Beacon	Changes target's beacon code with option to change Mode 3A, ADSB or both
Change Ident Bit	Sets ident bit to enabled or disabled
Change Mode C	Sets Mode C to enabled or disabled
Change Run Length	Changes target's run length to a specific value
Change Track Eligibility	Changes target's track eligibility to a specific value
Change Search Target Quality	Changes target's search target quality to a specific value
Change Search Target Confidence	Changes target's search target confidence to a specific value
Change Time In Storage	Changes target's time in storage to a specific value
Change PSR Blip Scan	Changes target's primary search return (PSR) to a specific percentage value. When using ATCoach engine, PSR Blip Scan will only apply if its value is set to either 0 or 100.
Change SSR Blip Scan	Changes target's secondary search return (SSR) to a specific percentage value. When using ATCoach engine, SSR Blip Scan will only apply if its value is set to either 0 or 100.
Change Ghost Percentage	Changes target's ghost percentage to a specific percentage value (HCS version only)
Change Correlation	Changes target's correlation

Event	Description
Response Mode Override	Overrides NAS responses such as DR or DX, or NAM responses such as LRM
ADSB Reporting (Enable/Disable)	Enables or Disabled ADSB transponder reporting
ADSB Reporting Rate	Sets ADSB target reporting rate

Custom macro commands can also be scripted as target events. The table below lists the types of macro commands that are available.

Table 7. Custom Macro Commands

Command	Description
VNAV Commands	
->dddcas	Change the calibrated air speed of the target to the value specified.
->dddcas~dddkt/min	Change the calibrated air speed of the target to the value specified at a given rate of change.
->dddtas	Change the true air speed of the target to the value specified.
->dddtas~dddkt/min	Change the true air speed of the target to the value specified at a given rate of change.
->.ddm	Change the mach speed of the target to the value specified.
->.ddm~dddkt/min	Change the mach speed of the target to the value specified at a given rate of change.
->dddcas@dddddft or ->dddtas@dddddft or ->.ddm@dddddft	Change the speed and altitude of the target to the values specified.
->(+\-)dddcas	Change the speed of the target by the specified amount.

->dddddft	Change the altitude of the target to the value specified in feet.
->dddddft~dddd	Change the altitude of the target to the value specified in feet at a given rate of change (in feet per minute).
->(+\-)dddft	Change the altitude of the target by the specified amount.
LNAV Commands	
FIXNAME	Proceed to the fix.
FIXNAME{attributes}	Proceed to the fix and obey additional instructions or restrictions specified as attributes of the fix. Some attributes (such as speed and altitude restrictions) may be combined for the same fix.
Attributes:	
{arpt}	On the first fix, auto-apply departure logic; on the last fix, auto-apply top of descent (TOD) restriction. Not valid on other fixes.
{rw:dd} or {rw:ddA}	In conjunction with {arpt} on departures, use a defined departure procedure for the specified runway.
{ils:dd} or {ils:ddA}	In conjunction with {arpt} on arrivals, perform an ILS approach to the specified runway. This disables TOD processing.
{dddddft}	Cross the fix at the specified restriction altitude.
{<dddddft}	Cross the fix at or below the specified restriction altitude.
{>dddddft}	Cross the fix at or above the specified restriction altitude.
{dddddftBdddddft}	Cross the fix between the specified restriction altitudes. Order is of the restriction altitudes is irrelevant.
{dddcas}, {dddtas}, or {.ddm}	Cross the fix at the specified restriction speed.
{<dddcas}, {<dddtas}, or {<.ddm}	Cross the fix at or below the specified restriction speed.
{>dddcas}, {>dddtas}, or {>.ddm}	Cross the fix at or above the specified restriction speed.
{rf}{dddmag}{turnDir:A}	Perform a radius to fix turn (in the specified turn direction), exiting the fix at the specified heading.

->dddmag	Change the heading of the target to the value specified in degrees from magnetic North.
->dddmag~ddddeg/sec	Change the heading of the target to the value specified in degrees from magnetic North at a given rate of change.
->dddtrue	Change the heading of the target to the value specified in degrees from true North.
->dddtrue~ddddeg/sec	Change the heading of the target to the value specified in degrees from true North at a given rate of change.
->(+\-)ddddeg	Change the heading of the target by the specified amount.
->hold	Hold indefinitely with right hand turns and 1 minute leg lengths.
->hold{legTime:dmin}	Hold indefinitely with right hand turns and leg lengths as specified in minutes.
->hold{turnDir:A}	Hold indefinitely with 1 minute leg lengths and left or right hand turns as specified.
->hold{duration:dmin}	Hold with right hand turns and 1 minute leg lengths for the specified amount of time. Once the duration time has expired, complete the current turn and proceed with the remaining route.
->hold{count:d}	Hold with right hand turns and 1 minute leg lengths for the specified number of laps.
->drop	Drop the target.
Mode3A and Mode C Commands	
->Boooo	Set or change the beacon code.
->BE	Enable the Mode 3A beacon.
->BD	Disable the Mode 3A beacon.
->MCE	Enable Mode C.
->MCD	Disable Mode C.

->RADARE ->RADARD	Enable radar detection. Disable radar detection.
->ADSBE ->ADSBD	Enable ADSB detection. Disable ADSB detection.
Target Attributes	
->set:autoLogon=d	Set the autoLogon attribute to 0, off, or 1, on.
->set:cpdlcResponseMode=<mode>	Set the cpdlcResponseMode attribute to manual or auto.
->set:cpdlcResponseDelay=ddd	Set the cpdlcResponseDelay attribute to the specified number of seconds.
->set:script=name	Set the script attribute to the specified script name.
->set:tdls=name	Set the tdls attribute to the specified TDLS name.
->set:disableTracker=d	Set the disableTracker attribute to 1, disabled, or 0, enabled.
->set:freeText=text	Set the freeText attribute to the specified text. This appears in the datablock of the target.
->clear:<attribute>	Clear the target attribute specified.

NOTE: *A indicates an alphabetic character, d indicates decimal digits, o indicates octal digits, and ~ indicates a rate of change.*

5.6.1.3. Target - Messages

The Messages tab of the Target Dialog lists all non-radar messages associated with the target. The messages can be auto-generated (auto-derived) based on the route of the target or manually created. Messages are defaulted to auto-generate but can be turned off when **Auto-generate msgs** is deselected.

When target is set to auto-generate messages, GSGT will generate all appropriate non-radar messages such as flight plan, start tracking, and handoff control of the flight between controllers and/or facilities as needed.

Additionally, parameters controlling the creation of auto-generated messages can be set in the scenario Preferences or Target Preferences.

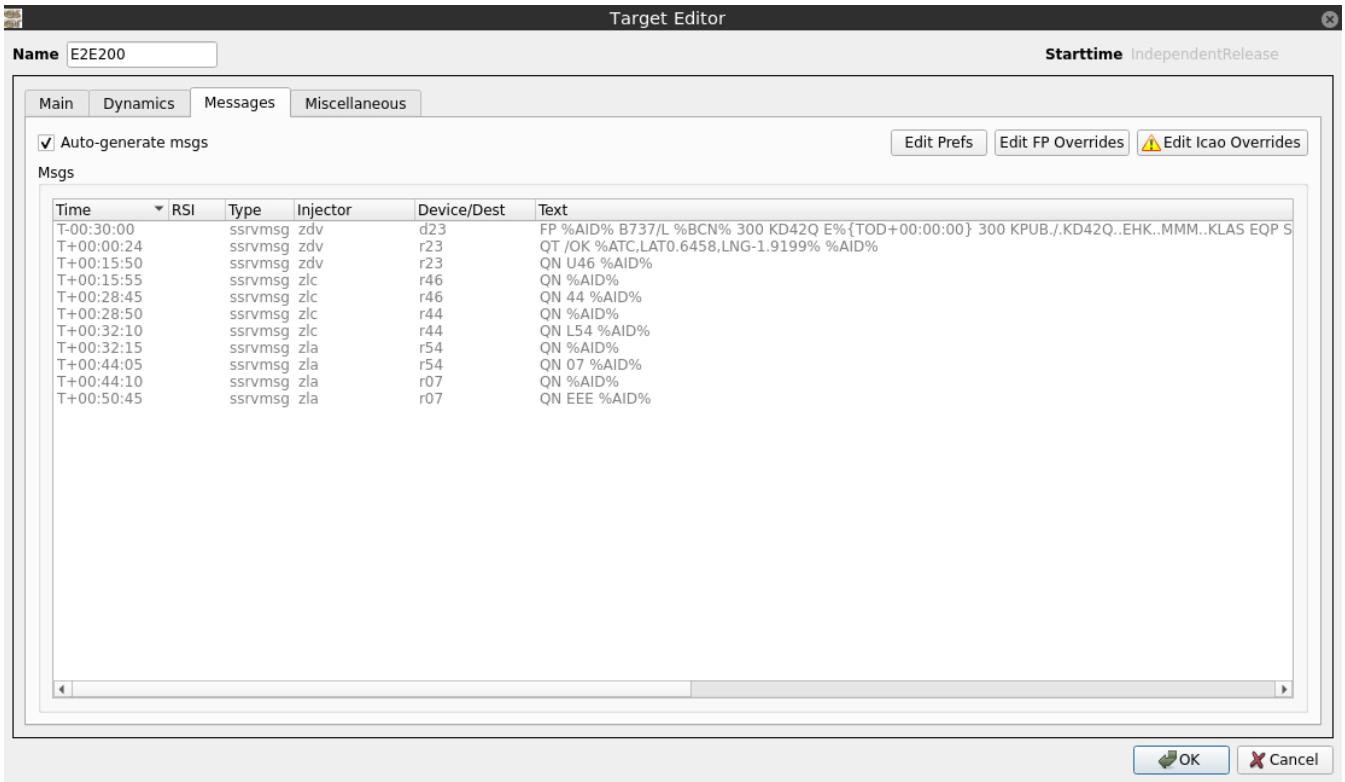


Figure 98. Target Editor Messages Tab

Table 8. Non-radar Message Color Coding

Color	Description
GRAY	auto-generated messages, cannot be edited unless frozen
BLACK	frozen messages

NOTE: *Frozen messages are always associated with the target and are not automatically updated as target characteristics are changed, except for when replicating and changing name and timing of the target. Auto-generated messages on the other hand, are automatically regenerated on every change to the target.*

NOTE: *Once a target enters a 'live' sector, derived messages are no longer generated.*

Auto-generate msgs

Enables auto generation of messages for the target.

Edit Prefs

Set target specific preferences for auto-generated messages.

Edit FP Overrides

Sets override values for auto-generated FP messages.

Edit Icao Overrides

Sets override values for auto-generated FPL/CPL messages.

Msgs

List of non-radar messages associated with the target. Clicking on the 'Time' header will sort the messages in time order. Clicking on 'Device/Dest', 'Injector', or 'Text' will sort appropriate column in alphanumeric order. Clicking on any of these headers twice will reverse the order of the sort.

Double click to edit a frozen message.

Right mouse click context menu options:

Delete

Removes selected message(s) from the list.

Replicate

Opens the Replication dialog, which provides the ability to produce copies of the selected message(s) from the list.

5.6.1.3.1.Auto Deriving Target Messages

When the **Auto-generate msgs** box is checked, GSGT calculates target positions along its entire route and derives appropriate non-radar messages, and then populates the messages list. In order to accomplish this, GSGT runs the simulation engine.

When the **Auto-generate msgs** box is unchecked while there are any derived messages in the list, a dialog box is displayed to confirm whether the derived messages should be saved as frozen messages or removed.

Figure 99. Freeze Derived Messages

5.6.1.3.2.Edit Prefs

Target Preferences override the scenario preferences on a per target basis. To enable override of any particular preference, select and check that preference. When a parameter is checked, its value will be applied to this target only. When unchecked, the general scenario Preference value will apply.

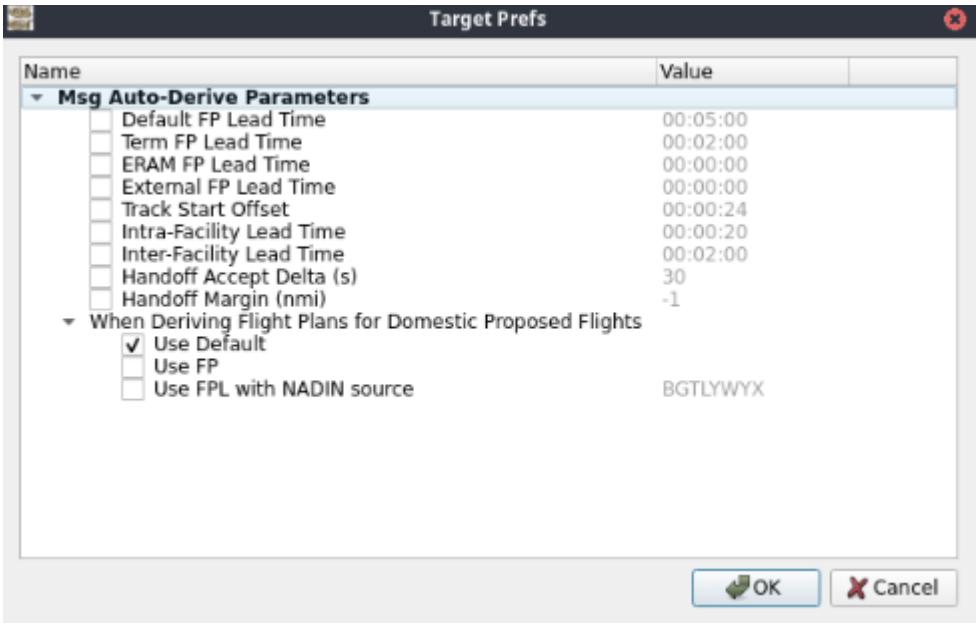


Figure 100. Target Specific Preferences

Parameters in the Target Preferences behave the same as in the scenario Preferences with an exception that target preferences are applied only per target basis. See section 5.1.1 details each preference option.

The section for deriving flight plans for domestic proposed flights is used to override the scenario preferences to force generation of FP or FPL.

Use Default

Uses default setting to generate FP or FPL according to scenario preference.

Use FP

Forces generation of FP regardless of scenario preference

Use FPL with NADIN source

Forces generation of FPL from specified NADIN device regardless of scenario preference. Additionally, in some situations AM messages are auto-derived from source device and with delta time as specified.

When any of the parameters in the Target Preferences Editor are changed from the default, the 'Edit Prefs' button will show an attention icon indicating that values are changed, as illustrated below.

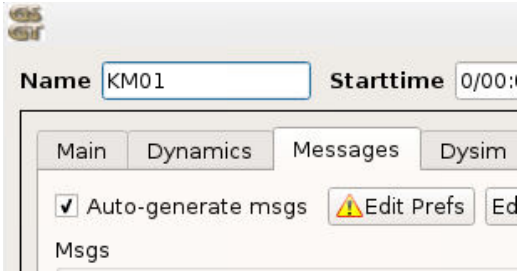


Figure 101. Edit Prefs Attention Icon

5.6.1.3.3.FP Overrides

The parameters in the FP Overrides Editor dialog override values in derived FP messages for this target only. When value is cleared, the default value in derived FP message is restored.

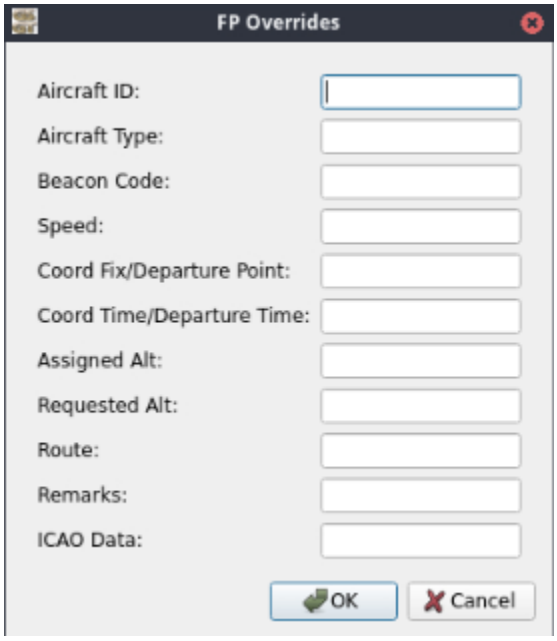


Figure 102. Flight Plan Override Editor

When any of the parameters in the FP Overrides Editor are set to be overwritten, the 'Edit FP Overrides' button will show an attention icon indicating that values are overridden, as illustrated below.

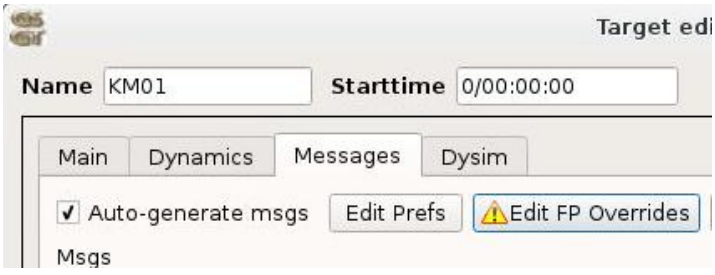


Figure 103. Edit FP Overrides Attention Icon

5.6.1.3.4.ICAO Overrides

The parameters in the ICAO FPL/CPL Overrides Editor dialog override values in derived FPL/CPL messages for this target only. When a value is cleared, the default value in derived FPL/CPL message is restored.

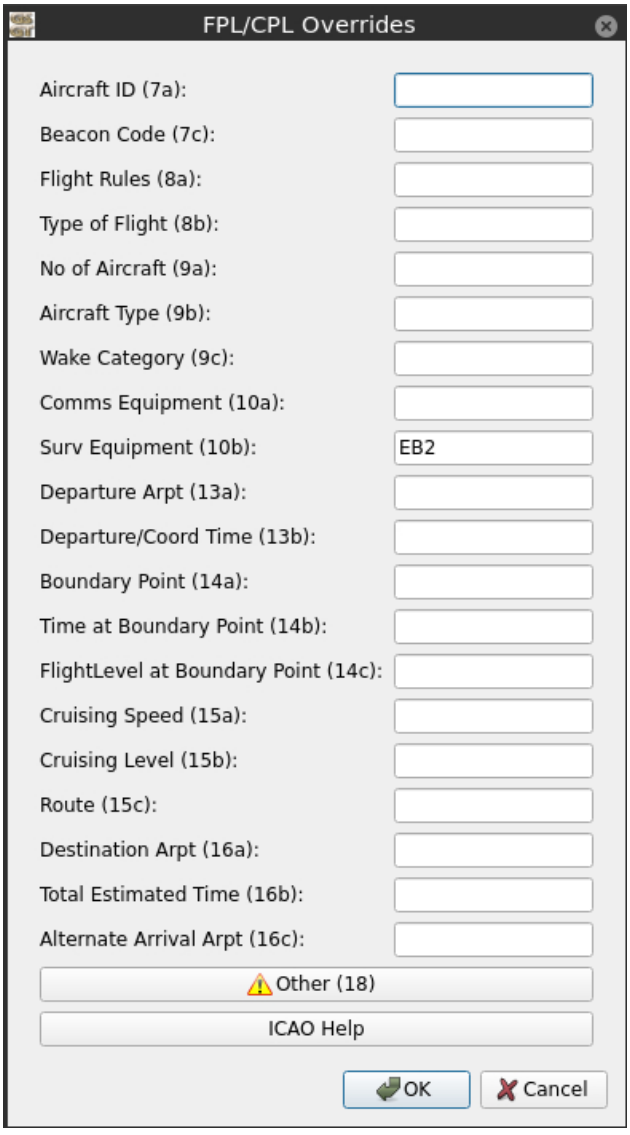


Figure 104. ICAO Flight Plan Overrides Editor

Figure 102. Other / ICAO Field 18 Editor

ICAO Data Overrides

ICAO Data overrides used for generating flight plan messages. ICAO elements can be added by typing the value on the main FPL/CPL Overrides editor or by clicking the checkmark on a field 18 element and typing a value in the Other (18) editor.

Some ICAO data is automatically generated in the flight plan message based on other inputs, such as registration and navigation and surveillance equipage. Entries in the ICAO Data Overrides will override the automatically generated values. The manually entered values are not validated for correctness; it is up to the scenario developer to script the appropriate overrides.

The user can dwell the cursor over the data input boxes in the FPL/CPL Overrides editor or over the field labels in the Other (18) editor to see tool tips. Each key also lists the ICAO field that will be updated in a FPL message and the CMS field that will be updated in a FH message.

NOTE: *There are certain interdependencies between ICAO Data fields. For example, to make a flight eligible for an RNAV route, EQP must include the letter 'R' and PBN must include an 'A', 'B', 'C', or 'D'. For RNP flights, EQP must include the letter 'R' and PBN must include an 'L', 'O', 'S', or 'T'. Also, NAV should include the RNV and/or RNP accuracy for the applicable phase of flight.*

Clicking on the ICAO Help button opens the ICAO Flight Plan Quick Guide document below:

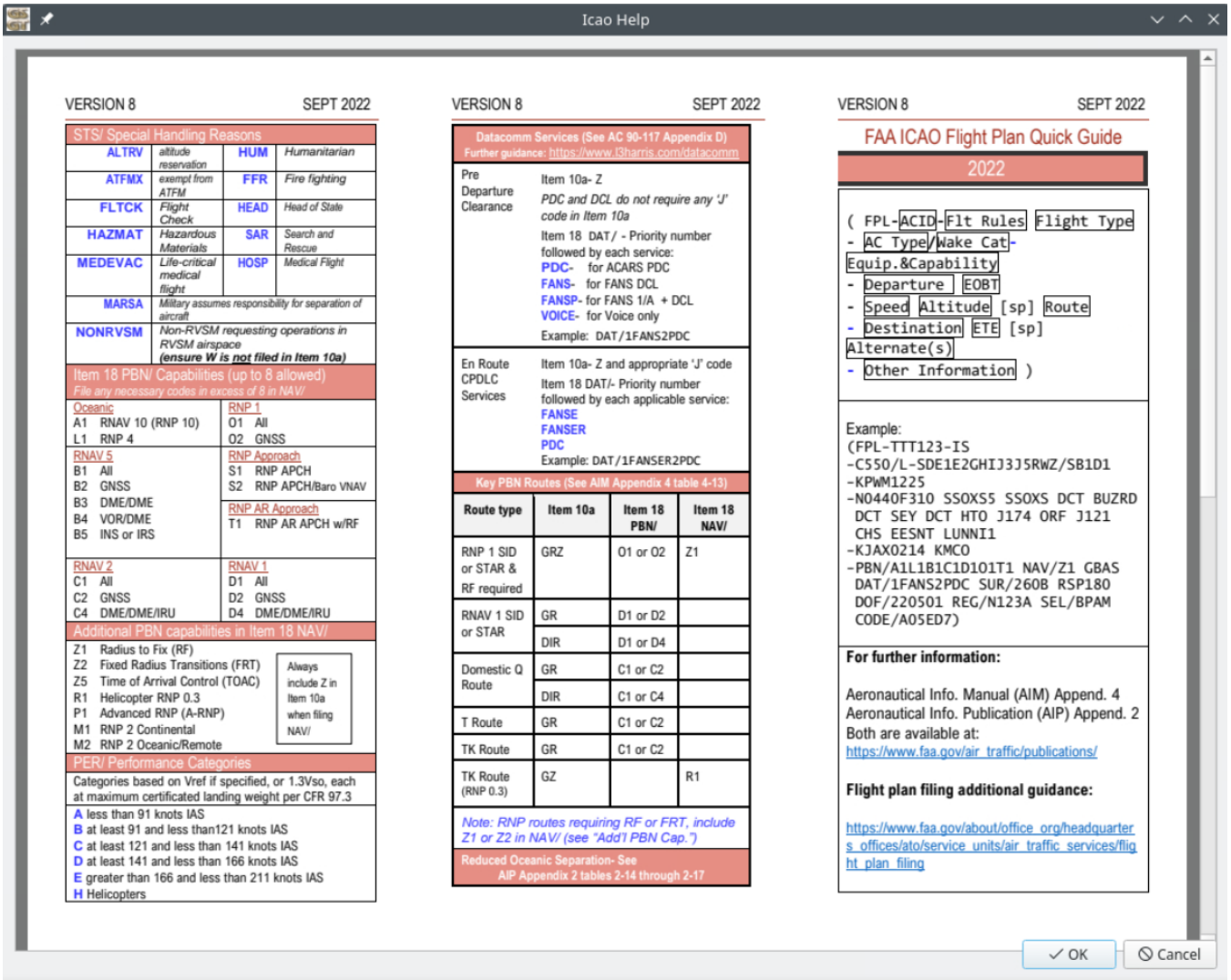


Figure 105. ICAO Help page 1

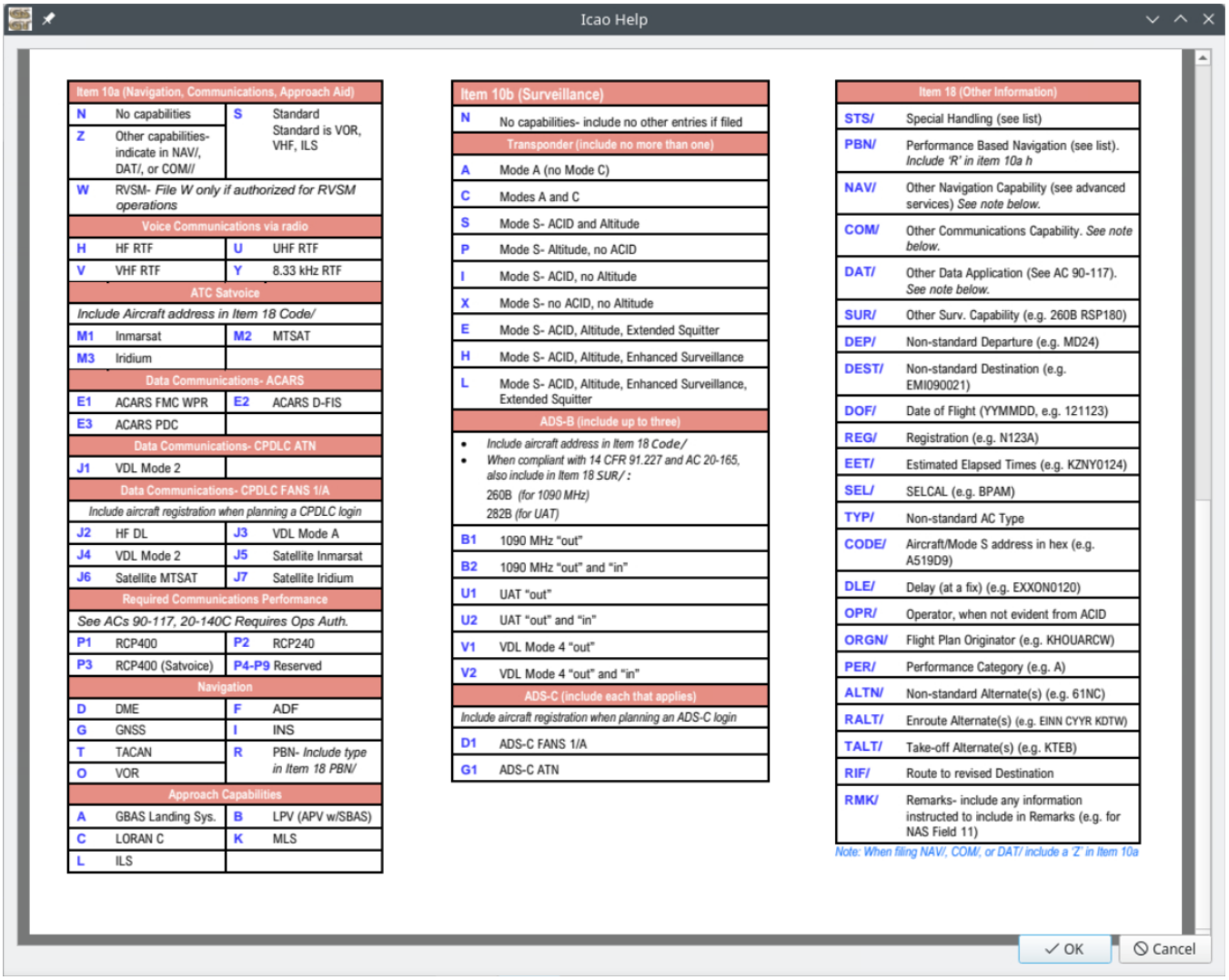


Figure 106. ICAO Help page 2

When any of the parameters in the FP Overrides Editor are set to be overwritten, the 'Edit Icao Overrides' button will show an attention icon indicating that values are overridden, as illustrated below.

Figure 107. Attention Icon

5.6.1.3.5.Manually Creating Messages

Creating non-radar messages for a target works identically as for System Commands with exception that messages are associated with the Target instead of being independent. The same set of message editors is used to edit the messages, which are automatically determined for appropriate type of message.

To create a new target message, select a message type and appropriate device(s) from the drop downs above the text input area. Enter a message injection time offset and select an RSI, if desired. Type the message contents into the free form text area and press enter or the 'Save Message' button. The new message is added to the message list below the text input area. Press 'OK' to update the target. Some message types will only accept specific formats; for example rtcsmsg will only accept a message in xml format.

Flight data messages scripted within the Target editor may include substitution tokens for target identification fields such as AID, CID, GUFI, etc. Upon execution, these tokens will be replaced with the appropriate values for the target.

Messages that are auto-derived cannot be edited until **Auto-generate msgs** is deselected. If the **Auto-generate msgs** is selected after being deselected and the original generated messages were frozen, the messages will be automatically re-derived and in essence making a duplicate message.

NOTE: *Changes made in the Flight Plan Editor do NOT affect the target attributes set in the Target Attributes Editor.*

5.6.1.3.6.Validating Messages (RTCS & TTP)

Manually created RTCS and TTP messages can be validated against the current schema. After creating and saving the message, right click and select Validate <message type>

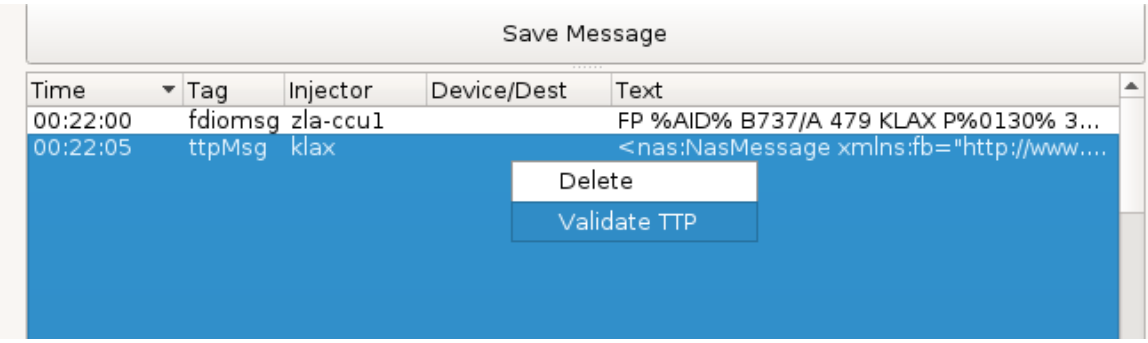


Figure 108. RTCS and TTP Message Validation

A popup box will appear confirming the messages validation or detailing why the message failed validation.

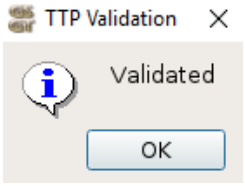


Figure 109. Validation Successful

5.6.1.4. Target - Miscellaneous

The Miscellaneous tab of the Target editor provides the ability to change options for target release behavior, to assign a pseudo pilot position, apply script definitions (see section 5.7), and add comments.

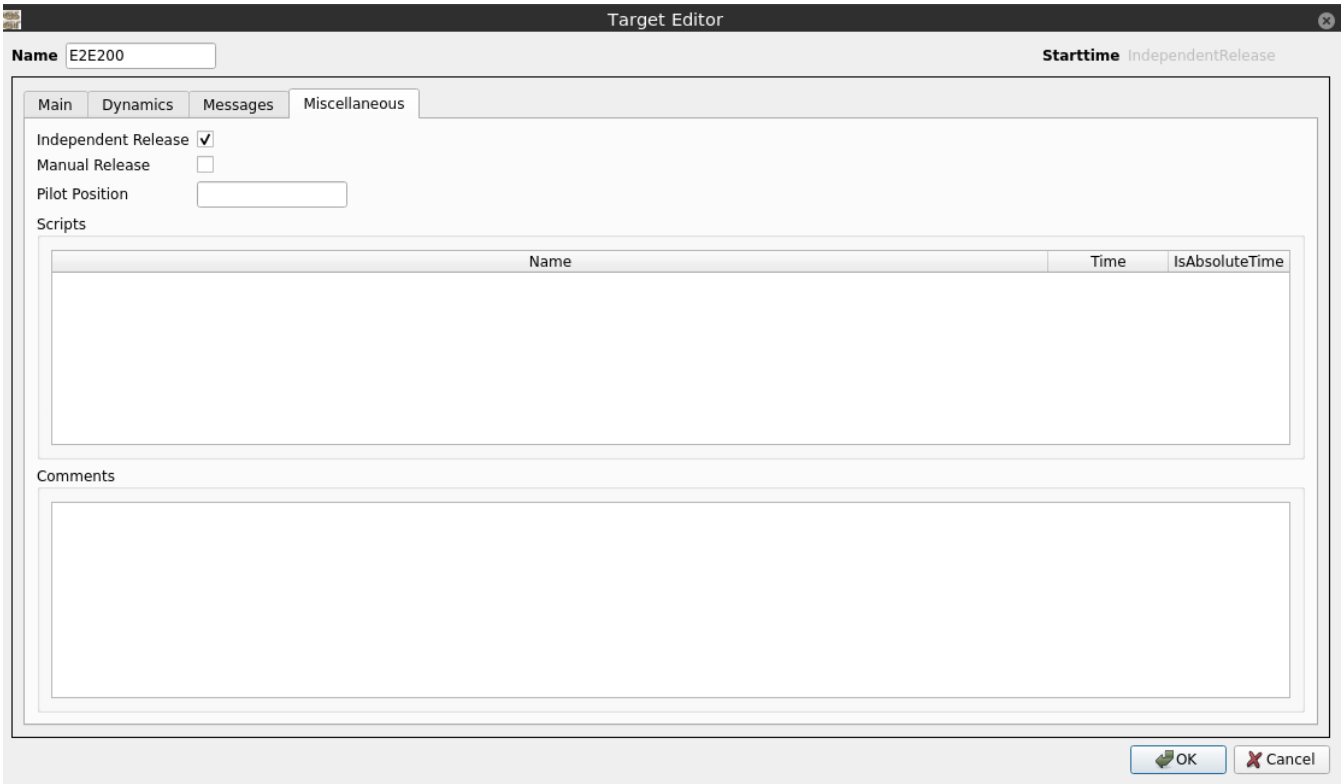


Figure 110. Target Editor Miscellaneous Tab

Independent Release

The target will not automatically become active at the start time. It must be released from simDriver or a pseudo pilot position. The flight will be in the scenario, but no flight data messages will be injected until the user manually injects them.

Manual Release

The target will not automatically become active at the start time. It must be released from simDriver or a pseudo pilot position. Flight data messages will be injected according to scenario timing unless changed by the user.

Pilot Position

Pseudo Pilot assigned to the target (optional).

Script definitions

If a Target has a script defined it will run the script at the time set by the user. The start of the script can be relative to the target start (activation) time or it can be triggered by a particular generated message. The script can be a set of common messages that can be applied to multiple targets without having to script each set individually for each target. This is primarily used for DataComm and TFDM Terminal Publication (TTP) message sets.

Comments

Any comments associated with the target. Comments are not displayed during scenario playback.

5.6.1.5. Target - Ground

The Ground tab allows users to define timing, gates, pre-departure, and post-arrivals surface movements for targets when TFDM ground adaptation is available.

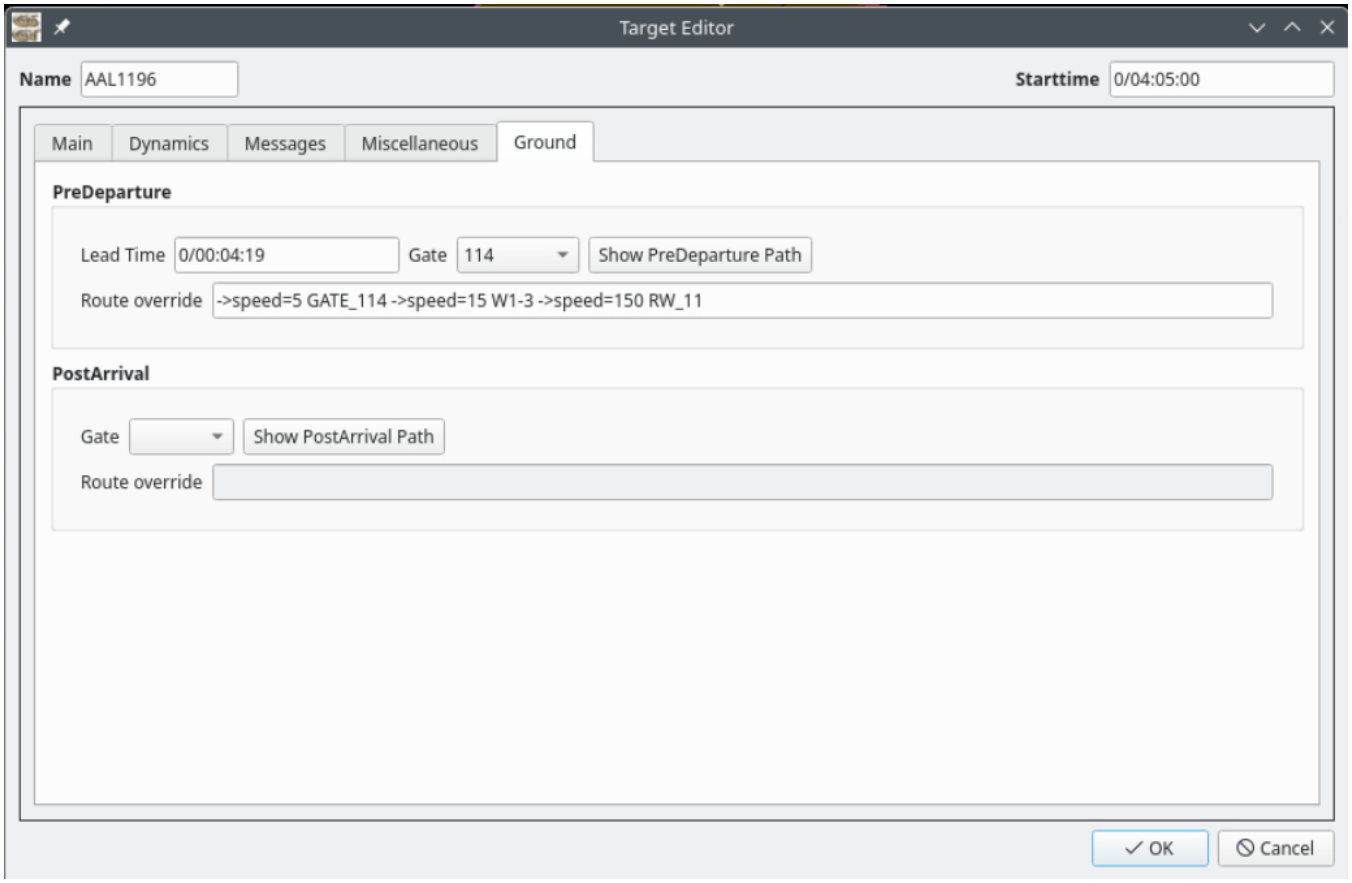


Figure 111. Ground movement editor

PreDeparture

May be applied to flights departing from an airport for which TFDM ground adaptation is available.

Lead Time

A target will appear at the departure gate the specified time prior to starting the push back.

Gate

Users may specify or change the departure gate.

Show PreDeparture Path

Displays the target's surface route from the gate to the departure runway.

Route Override

Allows users to modify the default surface route for a departure flight.

PostArrival

May be applied to flights arriving to an airport for which TFDM ground adaptation is available.

Gate

Users may specify or change the arrival gate.

Show PostArrival Path

Displays the target's surface route from the arrival runway to the gate.

Route Override

Allows users to modify the default surface route for an arrival flight.

5.6.2. Target List Context Menu

Right clicking on selected target(s) in the object tree of the Scenario Editor Main Window opens a context menu with certain actions such as Replicate and Filter by AID.

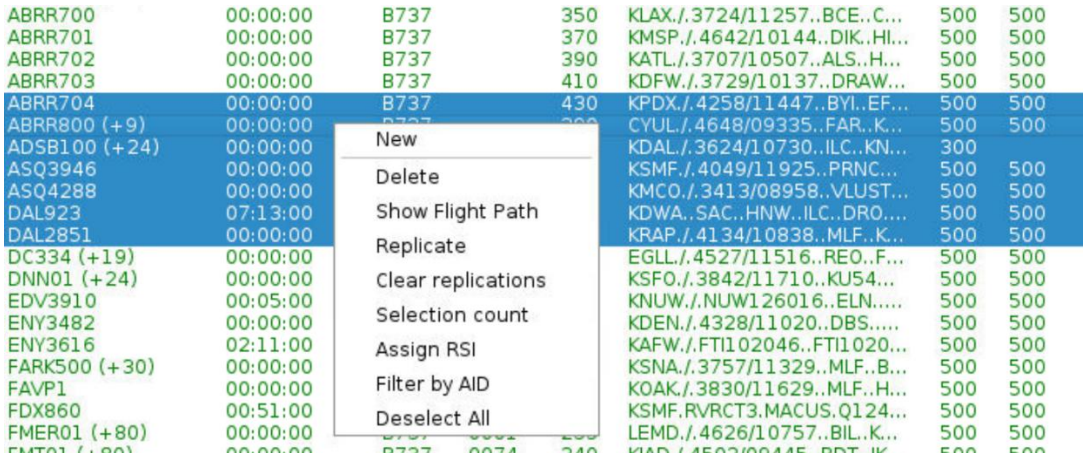


Figure 112. Target List Context Menu with Multiple Items Selected

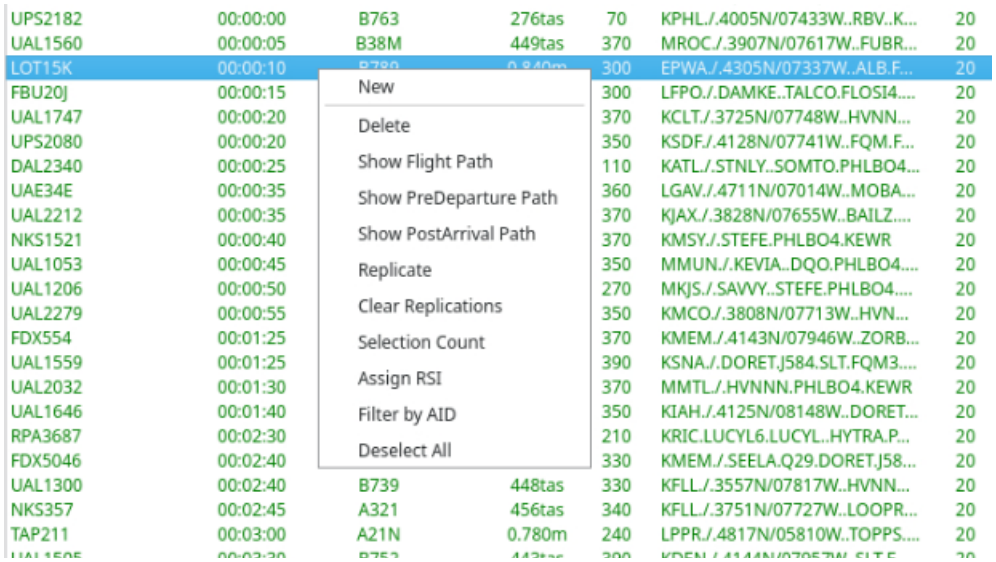


Figure 113. Target List Context Menu with Single Item Selected

New

Display the Target Editor to create a new Target.

Delete

Delete the selected target(s).

Show Flight Path

Display the target's route in the adaptation viewer with a target dynamics information box for selected Targets.

Show PreDeparture Path

Displays the target's surface route from the gate to the departure runway.

Show PostArrival Path

Displays the target's surface route from the arrival runway to the gate.

Replicate

Opens the Replication dialog, which provides the ability to produce copies of the selected target.

Clear Replication(s)

Clears all non-frozen replications, leaving only the original Target.

Selection Count

Displays how many Targets are currently selected.

Assign RSI

Assign the selected Targets the given RSI.

Filter by AID

Filters the Editor with only the selected Target(s).

Deselect All

Deselects each selected target.

5.6.3. Target Filters

Under the Targets tab, targets can be filtered by left clicking on the Filters option. Targets can be filtered by RSI, sector, AID, or invalid.

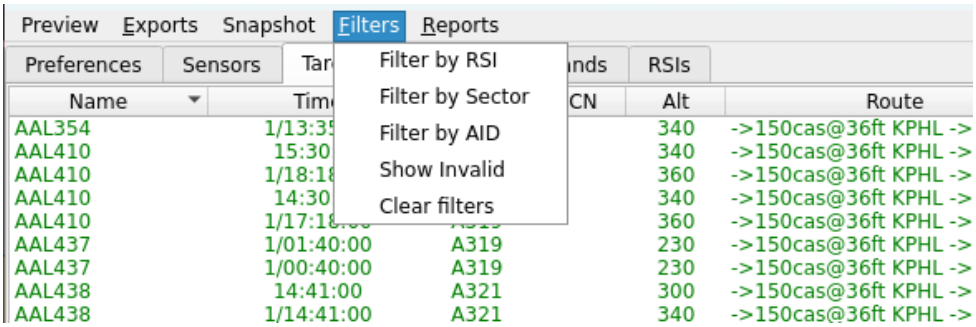


Figure 114. Target Filters

5.6.4. Target Conflict Message

Any modification to the target's beacon code that results in a conflict is reported and must be confirmed by the user.

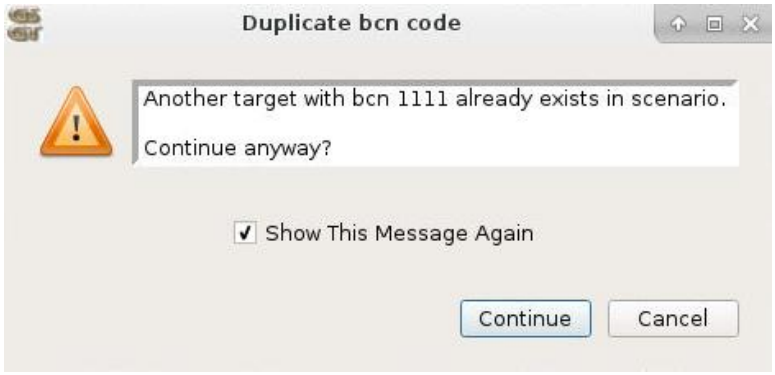


Figure 115. Target Conflict Warning

Continue

Saves the target with a duplicate beacon code.

Cancel

Closes the dialog and returns to the Target editor without applying the changes.

5.7. Script Definitions

Scenario developers can create sets of messages such as DataComm logon scripts or TTP flight updates. The DataComm logon scripts can be edited using the Script Definitions tab of the Scenario Editor. However, the XML formatted TTP messages must be manually edited with a text editor such as **vi**. The script can be a set of common messages that can be applied to multiple targets without having to script each set individually for each target. If a Target has a script defined it will run the script at the time set by the user. The start of the script can be relative to the target start (activation) time or it can be triggered by a particular generated message.

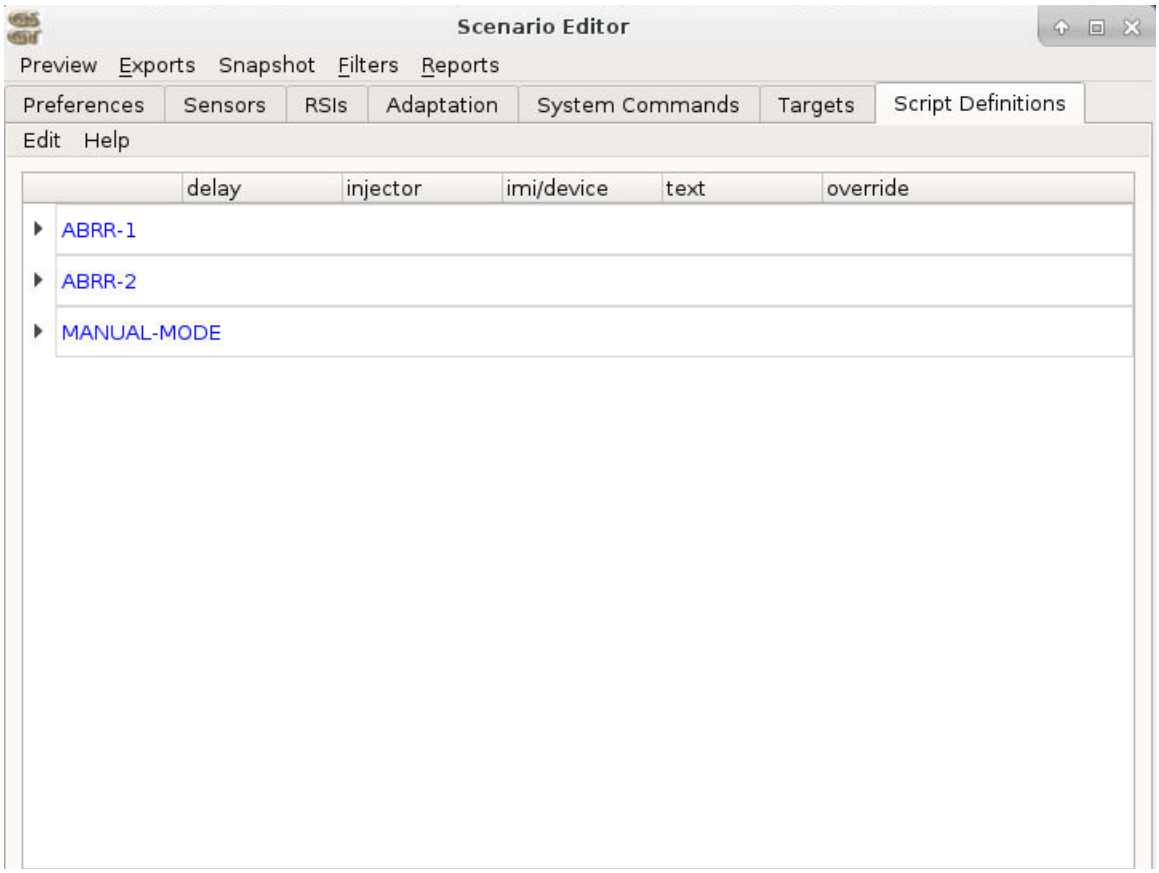


Figure 116. Script Definitions Tab

6. Preview

The Preview function provides a dry-run simulation capability in GSGT where users can visually examine targets defined in the scenario in a time-based environment. Preview simulates the entire scenario if no targets are selected and no filters are in effect. If a filter is in effect, only the targets displayed in the Targets list display will be previewed. If one or more targets in the list are selected (highlighted), only the selected targets will be included in the preview. The Show Flight Path option can be selected for an individual target in the Target list display to preview dynamics and messages along the target's route.

When Preview is invoked, a dialog is presented to select options for the preview, including the time to start the preview and display options. The preview can be started from the beginning of the scenario or at any specific time between the start and end of the scenario. Users can choose to display the datablocks for preview targets and to include preview of manual release targets.

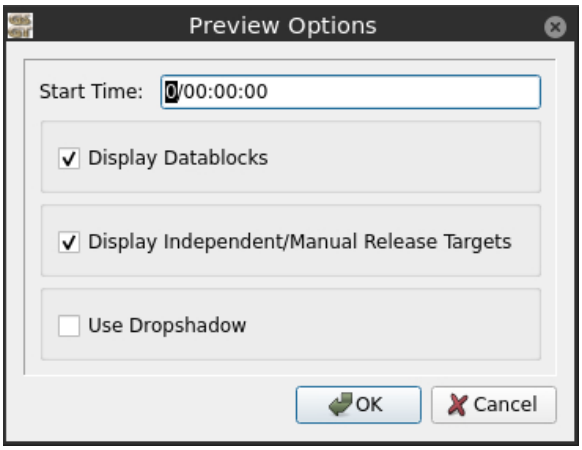


Figure 117. Preview Options

Start Time

Select the time to start the Preview.

Display Datablocks

The selected targets in preview will have datablocks with their callsign, heading, speed and altitude.

Display Independent/Manual Release Targets

If selected, the targets tagged for Independent or Manual Release will inject at their assigned start time.

Use Dropshadow

Adds a dropshadow to the datablocks of the targets on the map.

OK

Begins Preview Mode, starting at the specified Start Time.

Cancel

Cancels Preview Mode.

6.1. Scenario Preview

Preview, also known as Scenario Preview, invokes a graphical display of all or just selected targets, activating at their appropriate time in the simulation. Preview will default to displaying all targets if nothing is selected. To Preview on selected targets, highlight the desired target(s) and click Preview. Preview also displays the messages associated with the targets at the point along the route corresponding to the time at which they would be injected. The target data blocks and displayed messages can be moved using left mouse click and drag to unclutter any particular feature on the display.

To initiate a Preview, select **Preview** from the Scenario Editor and then click 'OK'.

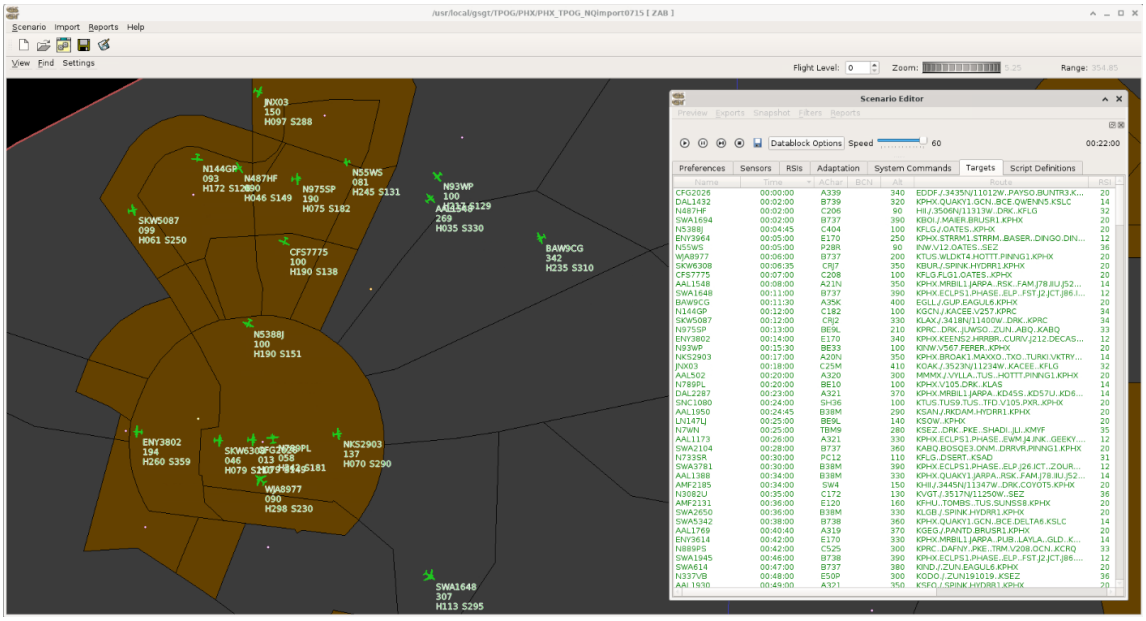


Figure 118. Scenario Preview

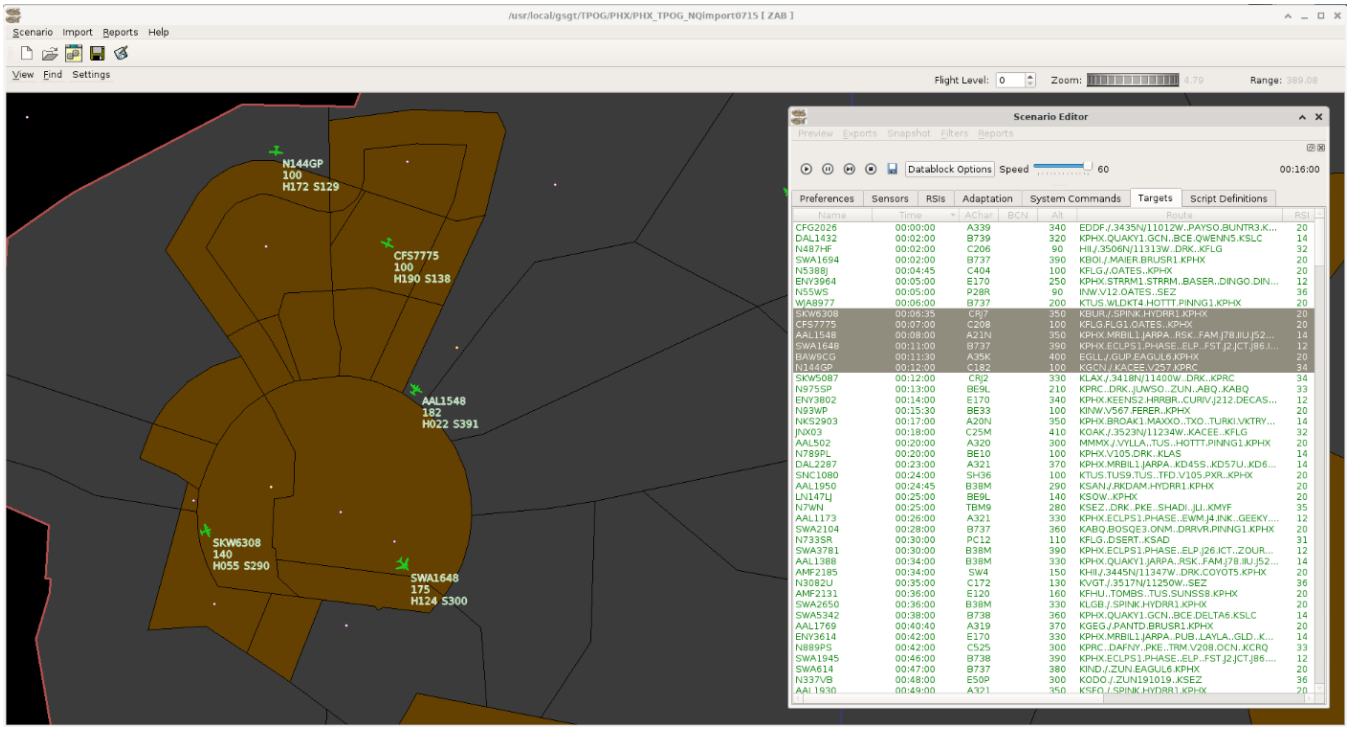


Figure 119. Preview of Selected Targets

When Preview is invoked, the standard toolbar is replaced with a toolbar for controlling the preview. The controls include the ability to start, pause, and step through the preview. Additionally, the preview can be run at a variable speed from 1 (real time) to 60 (1 minute of the sim = 1 second wall clock).

Figure 120. Preview Controls

Play

Starts playing the preview at the specified run speed.

Pause

Pauses the preview.

Step

Steps through the preview at time intervals of Speed value.

Stop

Stops the preview and returns to normal edit mode.

Save

Saves cloned targets.

Datablock Options

Opens the Datablock Visibility Manager to show or hide datablocks for all targets or those tagged with an RSI.

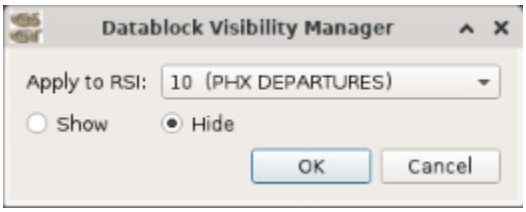


Figure 121. Preview Datablock Visibility Manager

Speed

Specifies the preview rate relative to the time in seconds. Valid range is 1-60 scenario seconds per real time second.

Time

The elapsed time of the preview - current scenario time.

Targets can be highlighted using right mouse click on a target, which toggles the display of the macro route of the flight with each fix being a yellow dot and the yellow lines being the route the target will follow to its next fix. In addition, a context box is displayed with the target details such as its current position, speed, heading, and altitude.

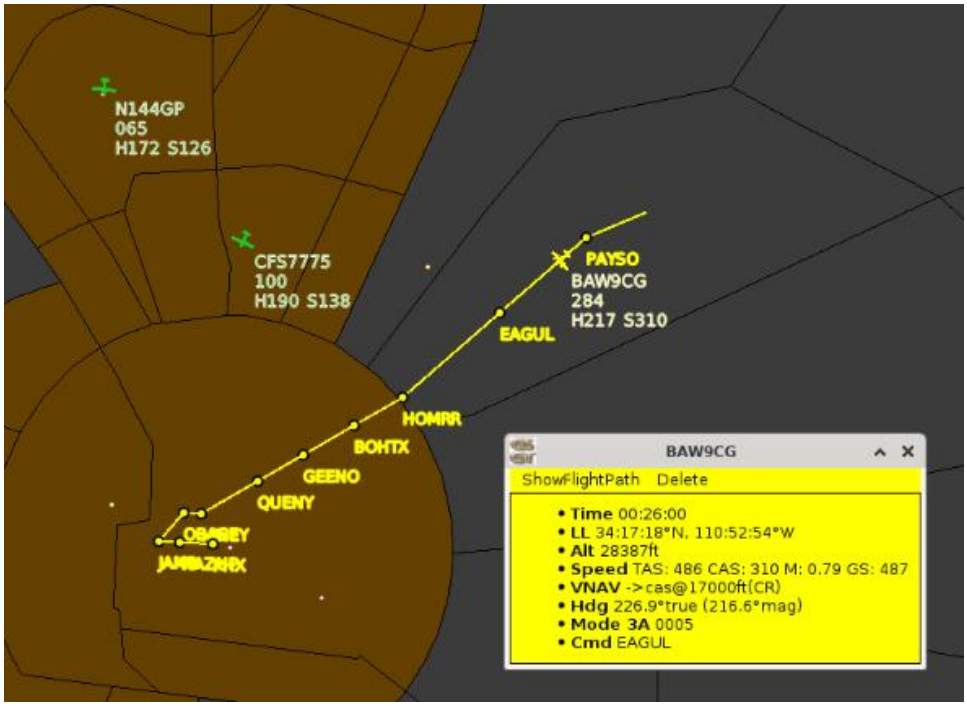


Figure 122. Target Highlighted within Preview

6.2. Show Flight Path

The Show Flight Path function enables previewing targets while editing the scenario. Every target in this mode is previewed independently of other targets and can be moved back and forth along its preview. There are no controls to start or pause the preview. The preview is simply done by mouse dragging the airplane along its route.

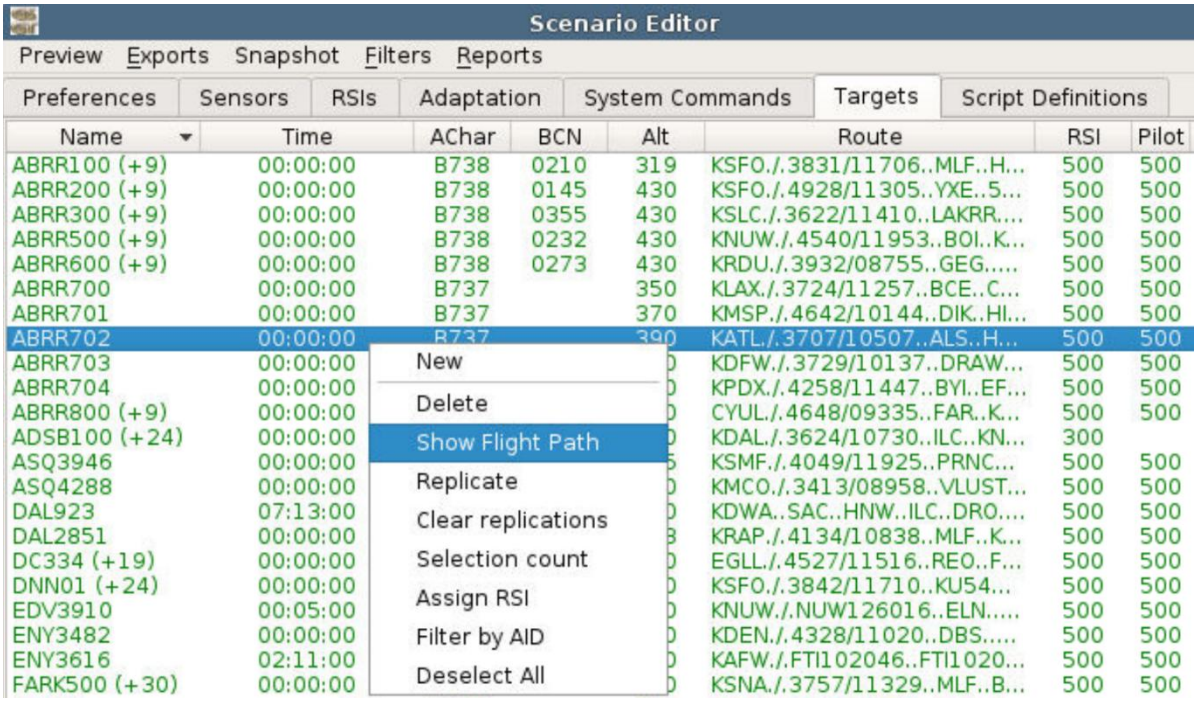


Figure 123. Show Flight Path

While a target is displayed in Show Flight Path preview, its flight plan route is displayed using yellow fixes connected by lines and dashes between segments along airways. Additionally, the target's route of flight, which corresponds to surveillance positions, is displayed using plus symbols. The target's actual route will reflect target events such as holds or heading changes. Also, a context box is displayed with details such as current position, speed, heading and altitude which are updated as the target is dragged along the route. This provides target details at a particular point in space and time. When the dialog is closed or user right mouse clicks on the target, the target exits the Show Flight Path preview.

To start a Show Flight Path preview for any set of targets, from the Scenario Editor window, select single target or group of targets using **SHIFT** or **CTRL** keys and left mouse click. Then right click on the selected targets to open a context menu and select **Show Flight Path**.

Optionally, all non-radar messages associated with the target can be previewed on its route, which are placed at positions corresponding to the time when the messages are injected. To preview messages associated with the target, select **View** button from the target context box and select **Show Messages**. Messages can be moved on the display using left mouse click and drag to unclutter any part of the display.

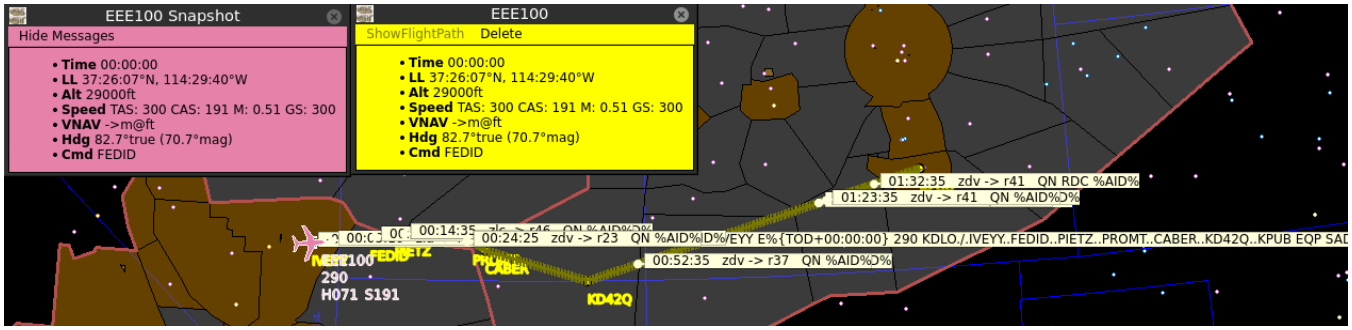


Figure 124. Target Flight Path

7. Import Functions

GSGT includes functionality to import data from several different sources such as GSGT scenarios, directly from NASQuest, from a comma separated values (CSV) file created from Command Message Set (CMS) data, or a STARS CDR file.

Import must be performed in a currently open scenario. Before starting the Import process, users must create a new scenario or open an existing scenario.

7.1. Import GSGT Scenario

The GSGT Scenario import functionality enables the user to import an already existing GSGT scenario into the current scenario, in whole or in part.

To start the import process, select **Import**->**GSGT Sim** from the GSGT Main Window.

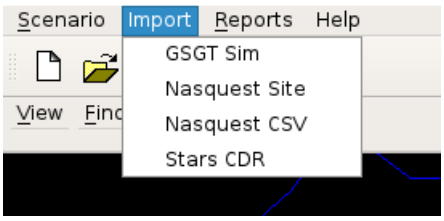


Figure 125. Import Scenario

Select the GSGT scenario to import into current scenario.

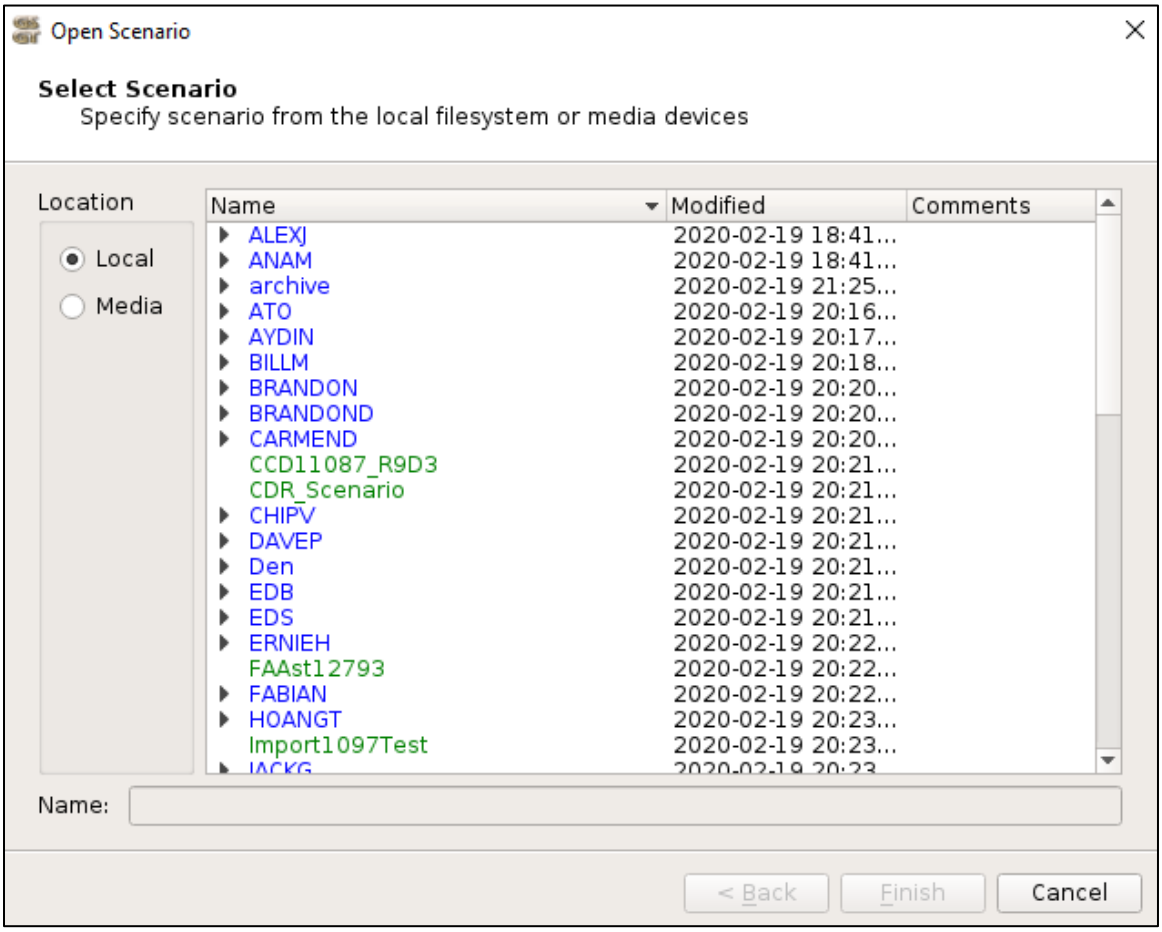


Figure 126. Scenario Selection

Back

Disabled in this window.

Finish

Opens the selected scenario.

Cancel

Closes the window and cancels the import scenario action.

After selecting a scenario, the following dialog is presented which allows the user to select the elements from the scenario to import. The first page allows the selection of preferences (Prefs), record select indicators (RSIs), Targets, System Commands, and Script Definitions.

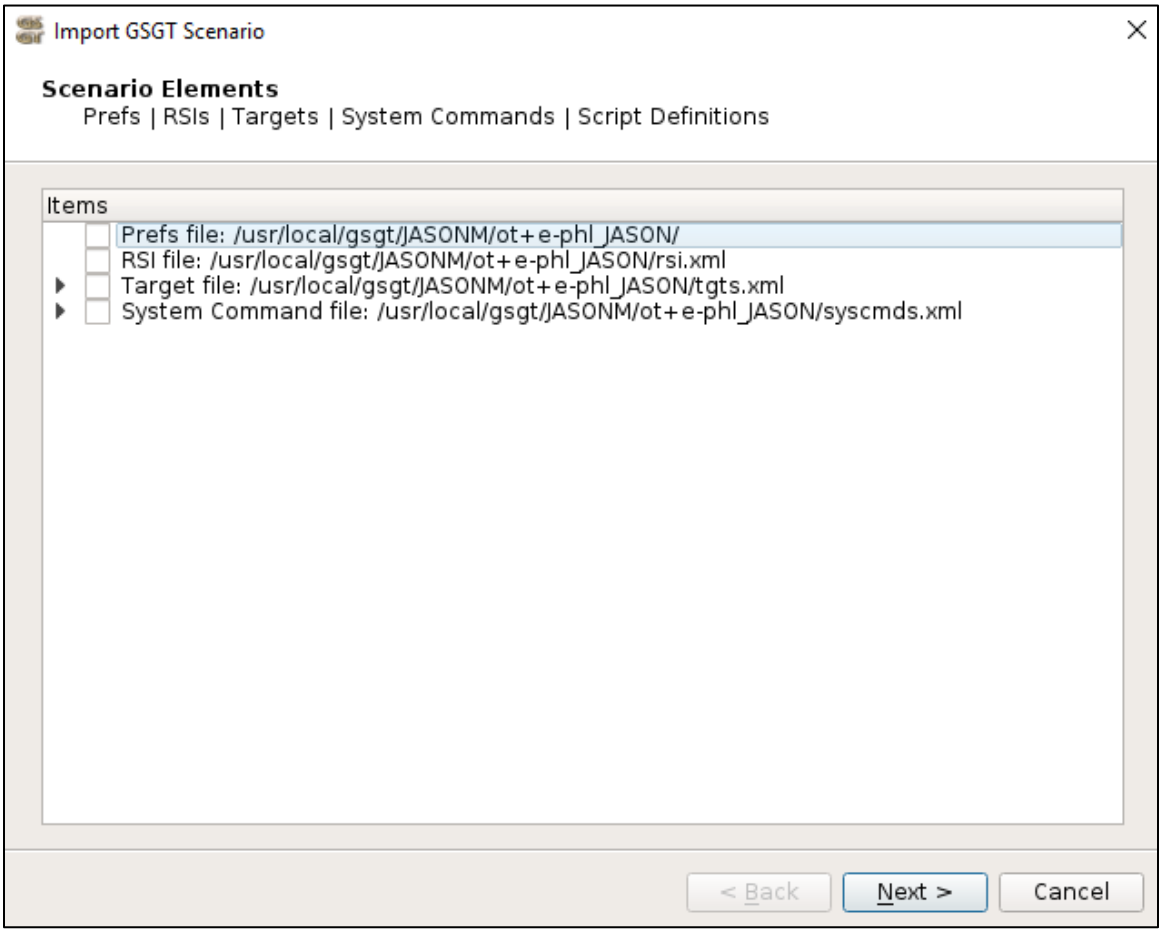


Figure 127. Select Scenario Elements

Back

Returns to previous page of the import dialog.

Next

Advances to the next page of the import dialog.

Cancel

Closes the scenario import dialog.

The second page allows the selection of user defined custom maps (if the selected scenario includes any).

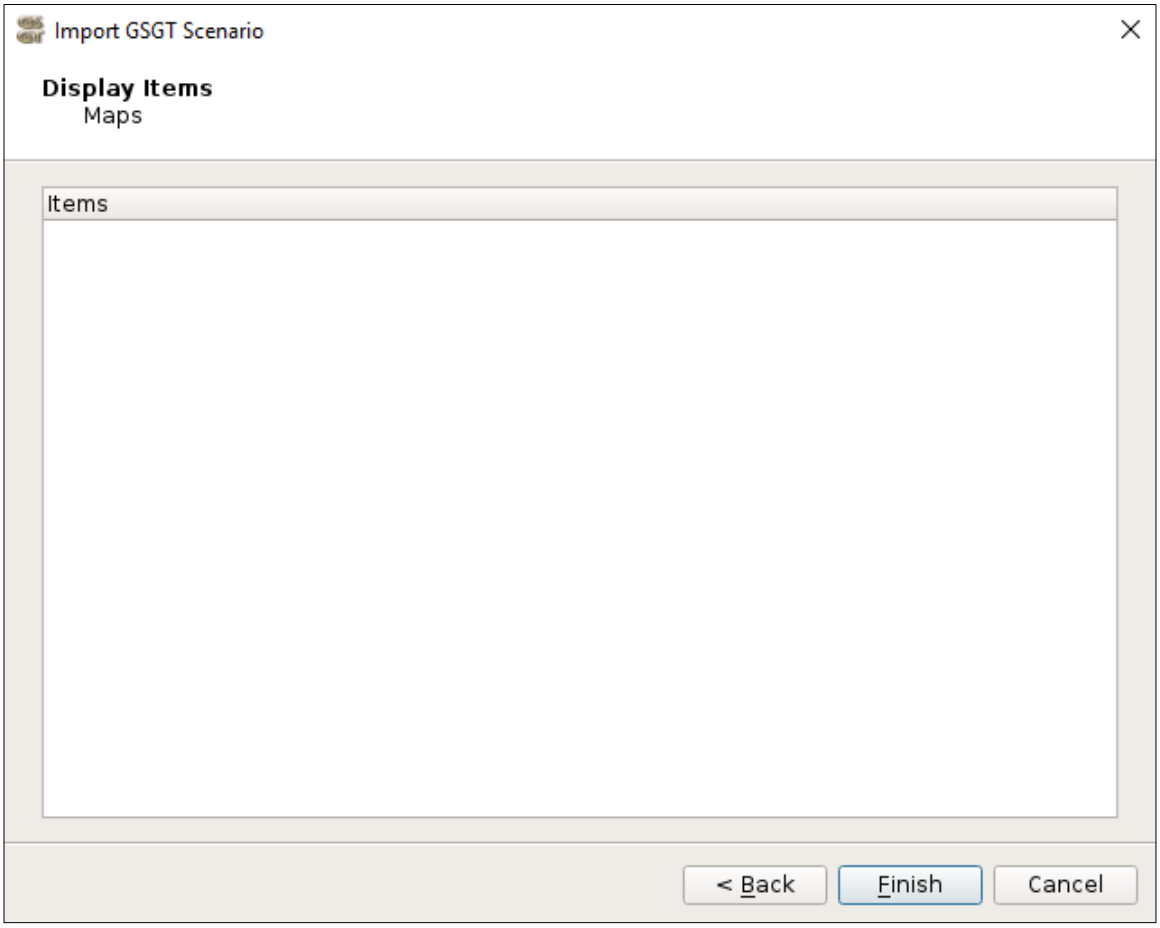


Figure 128. Select Display Items

Back

Returns to previous page of the import dialog.

Finish

Imports the selected items into the current scenario.

Cancel

Closes the scenario import dialog.

After import is complete, a message box is presented to review status of import and errors during parsing or opening of the selected scenario.

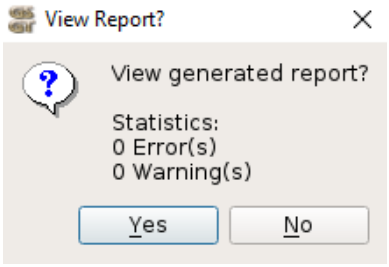


Figure 129. Import Errors and Warnings

7.1.1. Import NASQuest Site

To import data directly from the NASQuest server, start the process by selecting **Import**->**Nasquest Site** from the GSGT Main Window.

Figure 130. NASQuest Site Import

7.1.2. Import NASQuest CSV

To import data from a NASQuest CSV file, start the process by selecting **Import**->**Nasquest CSV** from the GSGT Main Window.

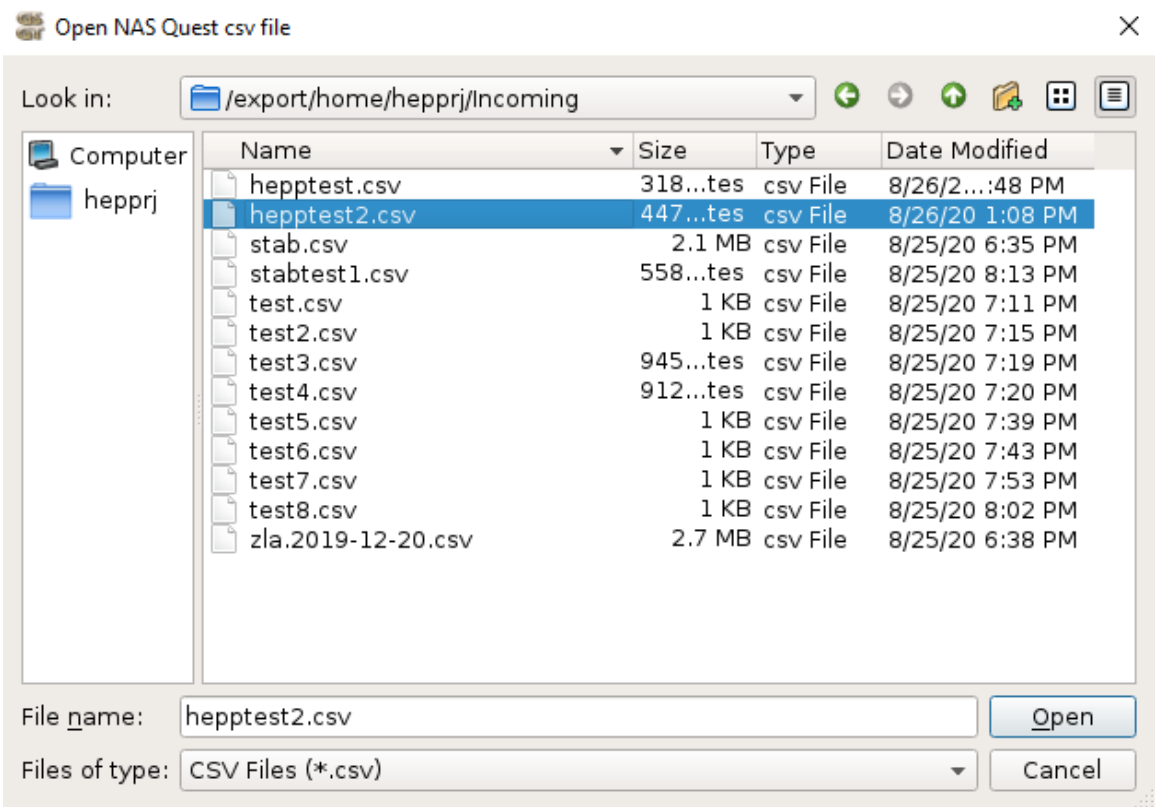


Figure 131. Import CSV File

Users have the option to filter the CSV file based on airports of interest.

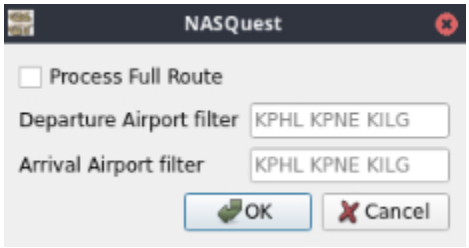


Figure 132. Import CSV Options

The Finished CSV Import dialogue box will inform how many targets from the CSV file were imported. Click 'OK' when finished.

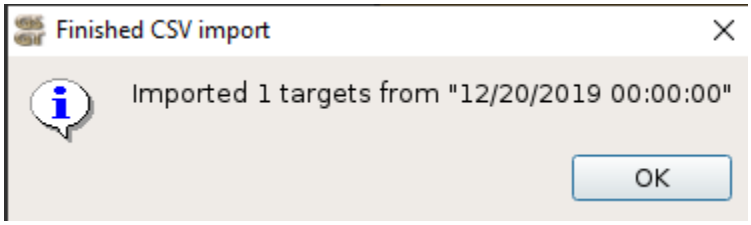


Figure 133. CSV Import Status

7.1.3. Import STARS CDR

The STARS CDR import function allows the user to import a CDR file that will generate Time Based Targets into the scenario. This function can be used to update older CDR radar data against today's latest adaptation, including true north.

Time Based Targets can be used in SimDriver for playback. In SimDriver, users can take control and dynamically pilot the targets. Please reference the Dysim Manual for more information.

To start the import process, select **Import**->**Stars CDR** from the GSGT Main Window.

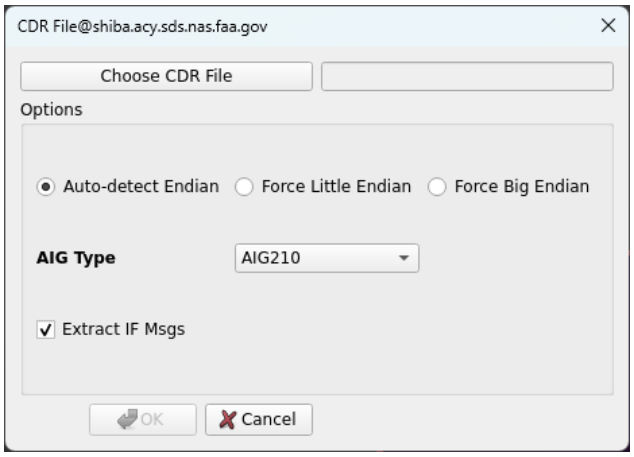


Figure 134. STARS CDR Options

The CDR File window allows the user to choose a CDR file for import. GSGT attempts to automatically detect the correct Endian type, but the user can override this if desired. Most CDR is created with the AIG type as 210, but users can switch to 200 for non-standard cases, such as, ATCoach data.

Select a CDR file that ends with the file type (*.cdr).

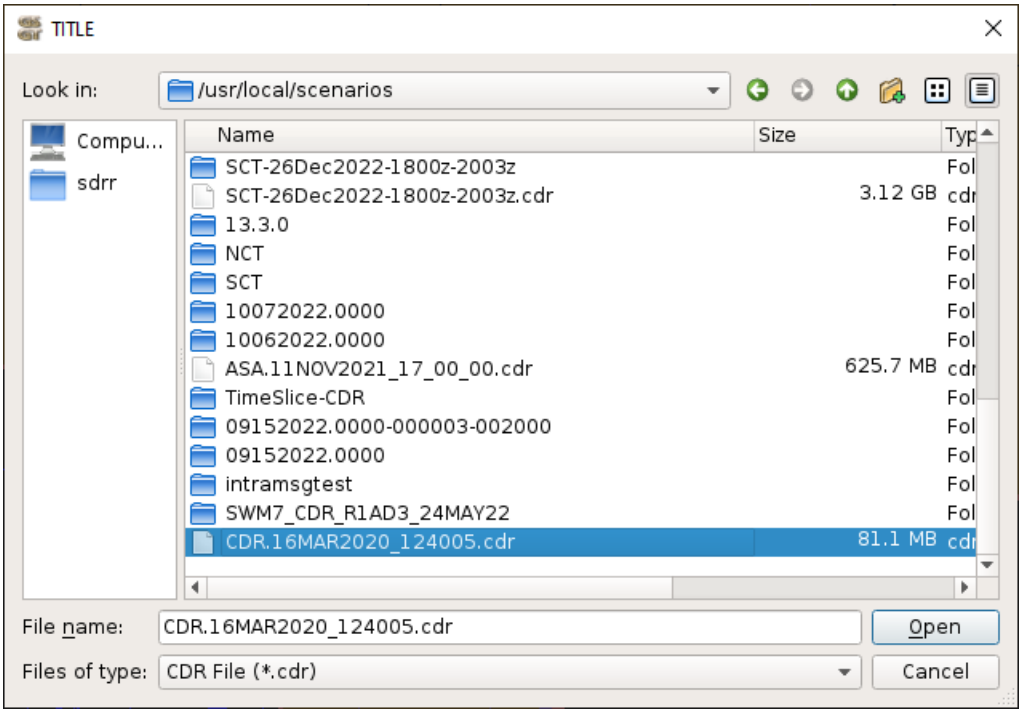


Figure 135. Import CDR File

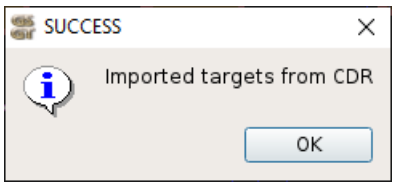


Figure 136. CDR Import Status

Time Based Targets are imported into the scenario.

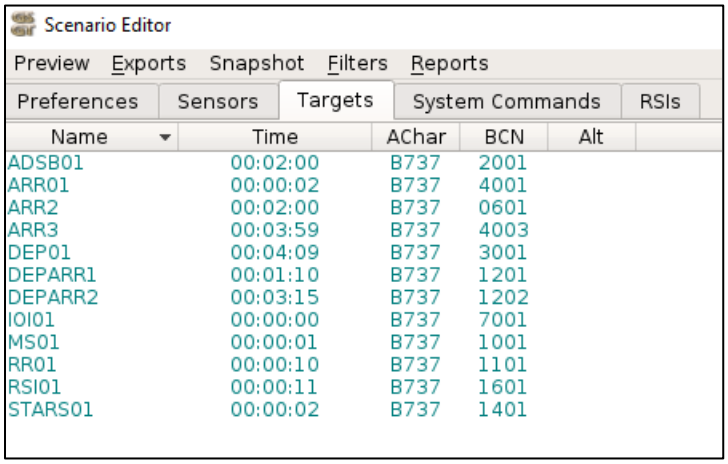


Figure 137. Time Based Targets

Time Based Targets are point based with latitude and longitude fixes. These fixes cannot be modified under the Dynamics tab; however, they can be dynamically controlled while using Dysim/simDriver.

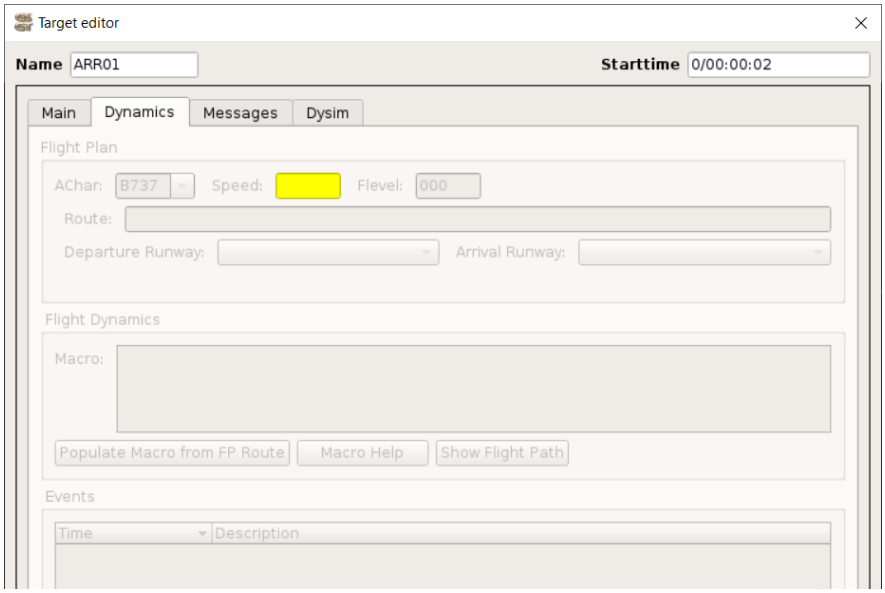


Figure 138. Time Based Targets - Dynamics

8. Export Functions

GSGT provides two export functions, Export SDRR and Export GSGT, from the Scenario Editor window.

8.1. Export SDRR

The Export SDRR function converts the GSGT scenario into a static scenario for SDRR injection and playback. The exported scenario includes surveillance data and non-surveillance messages. Once the scenario is exported, it should be transferred to an SDRR processor for static scenario execution.

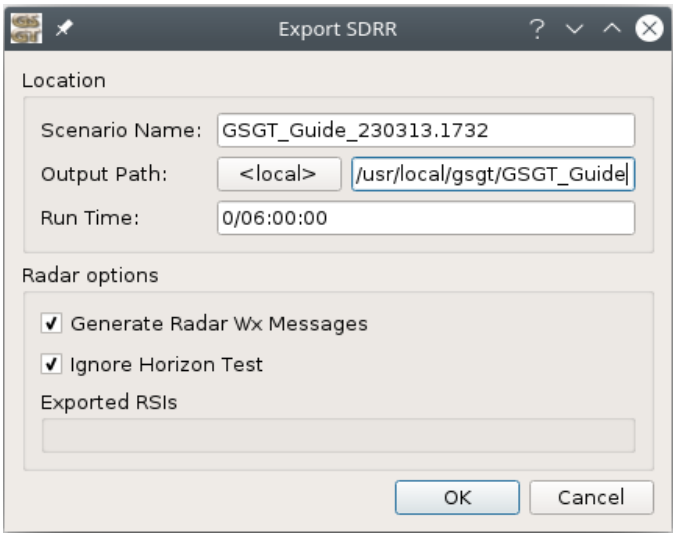


Figure 139. Export SDRR

8.2. Export GSGT

The Export GSGT function is essentially the opposite of the Import GSGT function. Export GSGT allows the user to create new GSGT scenarios from the currently opened scenario. For example, the user can filter the current scenario and then export the filtered version to new scenario name.

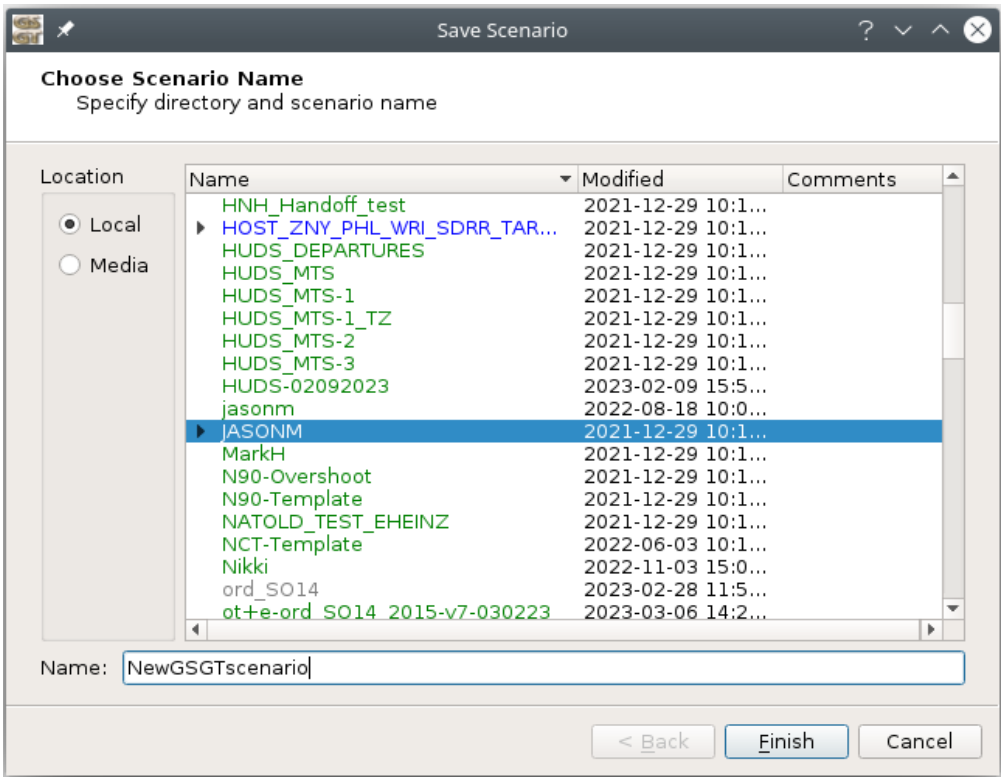


Figure 140. Export GSGT

9. Reports and Tools

GSGT includes the ability to generate various reports such as Traversal reports. All reports (as well as import and export logs) are written to files that can be viewed by any HTML browser outside of the GSGT application.

After selection of the report and its options (if applicable), a dialog is displayed to choose a file name where the report will be saved. If the file name already exists, a prompt will be displayed to confirm that the old file will be overwritten. While the report is being created, a window is displayed indicating that the report is being generated. Once the report is complete, a dialog is displayed asking to preview the report. The report is always saved to a specified file, and it may be viewed at a later time by any HTML browser.

The following reports are located on the main GSGT menu: GSGT Session Log, Simulated Target Position, FAV Traversal Report, and Simulated Radar Target Count.

Two additional reports are located in the scenario editor under reports: Sorted Scenario Listing and Message Injection Report.

Table 9. List of Reports

Report Name
GSGT Session Log
Sorted Scenario Listing
Message Injection Report
Simulated Target Position
FAV Traversal Report
Simulated Radar Target Count

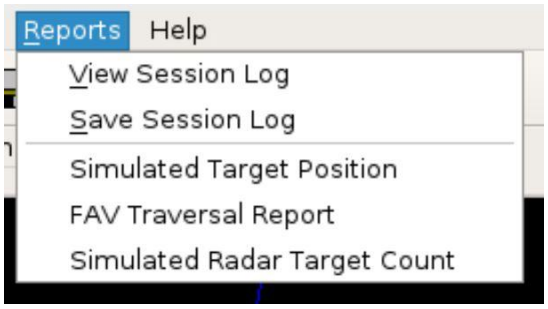


Figure 141. Main Reports Menu

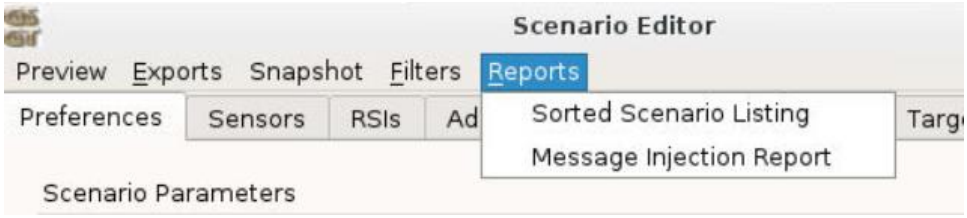


Figure 142. Scenario Editor Reports Menu

9.1. GSGT Session Log

The Session Log displays messages that were generated during the current session while performing certain tasks. Messages are logged for start and end of GSGT session, loading of a scenario, and import and export functions.

To generate the report, select Reports->View/Save Session Log from the GSGT Main Window.

Status and completion messages are shown in GREEN. Warnings are shown in YELLOW and error messages are shown in RED.

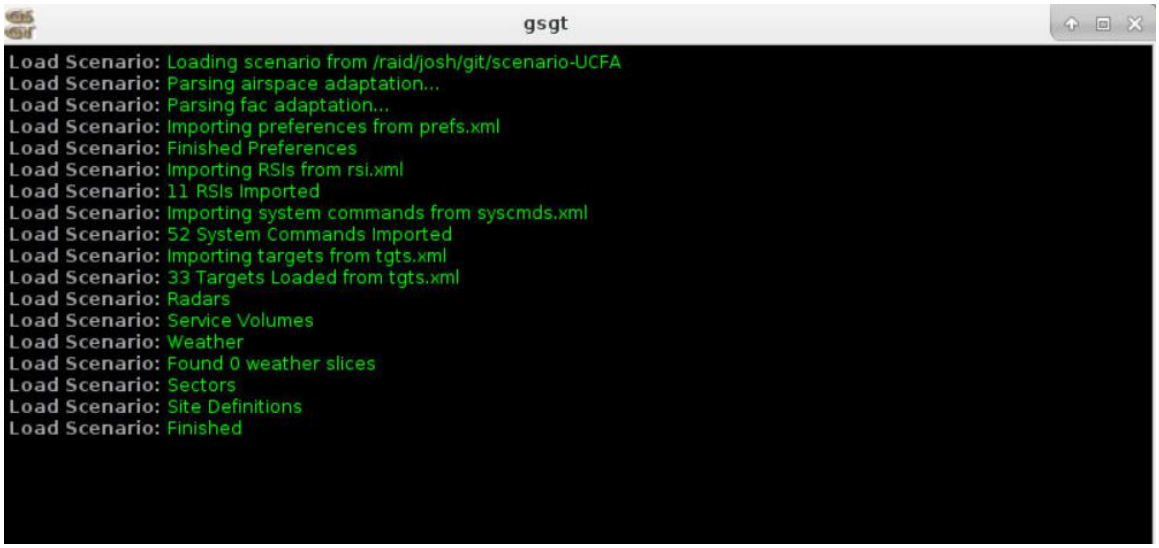


Figure 143. GSGT Session Log

9.2. Sorted Scenario Listing

The Sorted Scenario Listing displays the injected messages for each target.

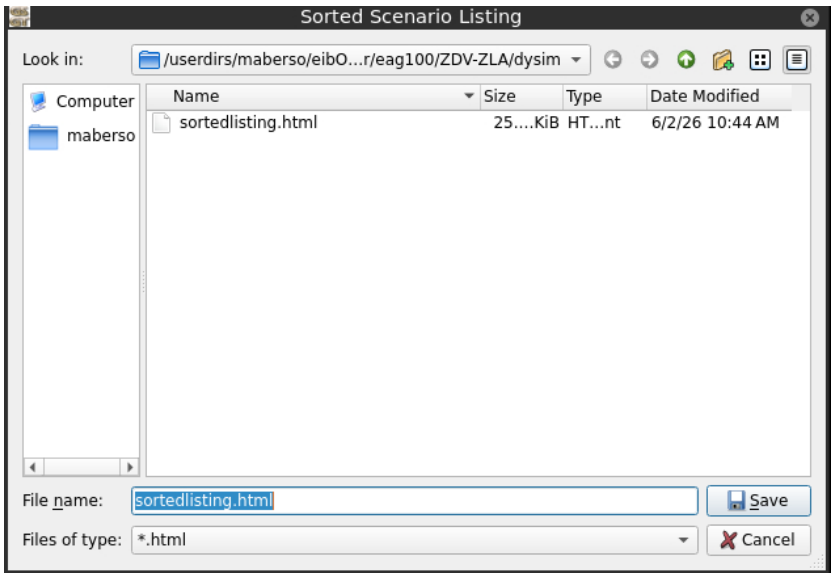
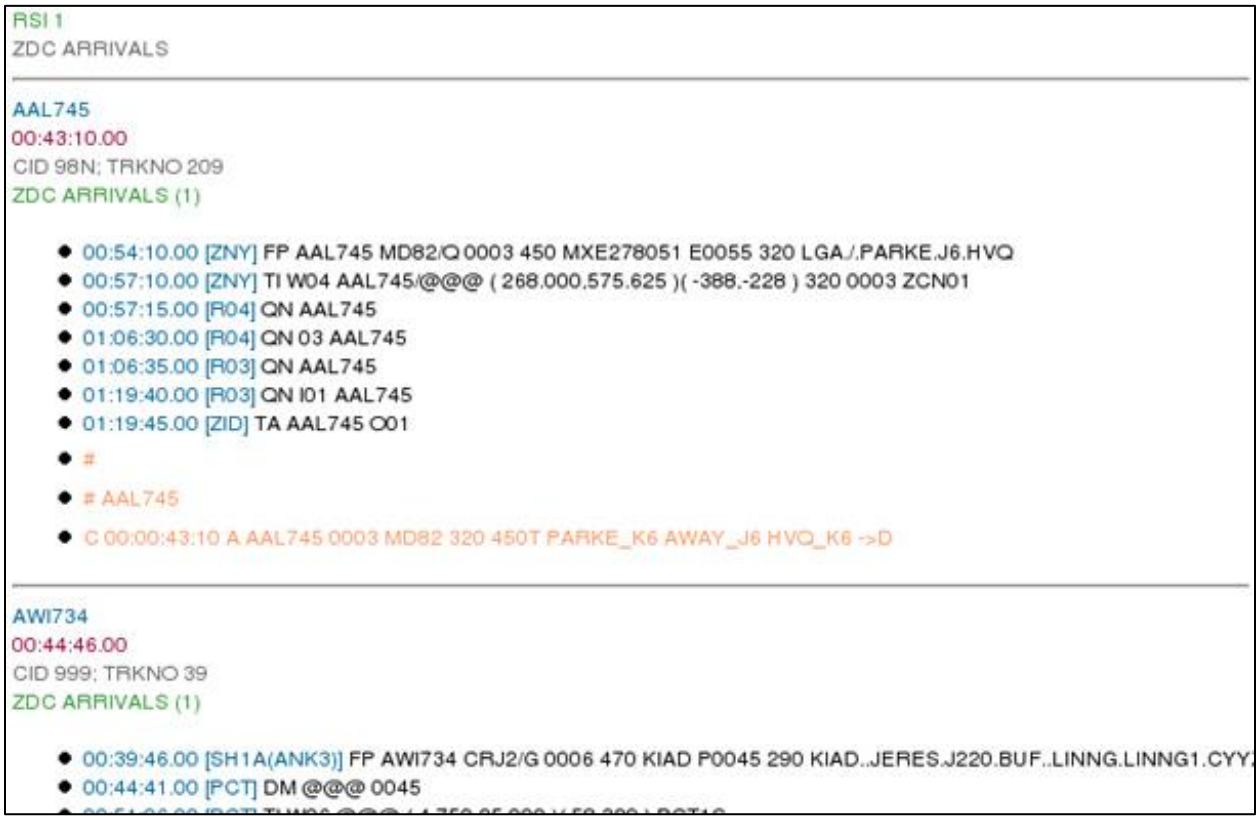


Figure 144. Sorted Scenario List Options

To generate the report, select Reports->Sorted Scenario Listing from the Scenario Editor. A file manger is displayed allowing the user to select a name and location where to save the Sorted Scenario Listing as an html file. Once the file is saved, users may view the html file from a browser.


RSI 1
ZDC ARRIVALS

AAL745
00:43:10.00
CID 98N; TRKNO 209
ZDC ARRIVALS (1)

- 00:54:10.00 [ZNY] FP AAL745 MD82/Q 0003 450 MXE278051 E0055 320 LGA./.PARKE.J6.HVQ
- 00:57:10.00 [ZNY] TI W04 AAL745/@@@ (268.000,575.625)(-388,-228) 320 0003 ZCN01
- 00:57:15.00 [R04] QN AAL745
- 01:06:30.00 [R04] QN 03 AAL745
- 01:06:35.00 [R03] QN AAL745
- 01:19:40.00 [R03] QN I01 AAL745
- 01:19:45.00 [ZID] TA AAL745 O01
- #
- # AAL745
- C 00:00:43:10 A AAL745 0003 MD82 320 450T PARKE_K6 AWAY_J6 HVQ_K6 ->D

AWI734
00:44:46.00
CID 999; TRKNO 39
ZDC ARRIVALS (1)

- 00:39:46.00 [SH1A(ANK3)] FP AWI734 CRJ2/G 0006 470 KIAD P0045 290 KIAD..JERES.J220.BUF..LINNG.LINNG1.CYY
- 00:44:41.00 [PCT] DM @@@ 0045

Figure 145. Sorted Scenario List Report

9.3. Message Injection Report

The Message Injection Report lists all scenario messages in chronological order based on injection time.

To generate the report, select Reports->Message Injection Report from the Scenario Editor. The report opens into a new window.

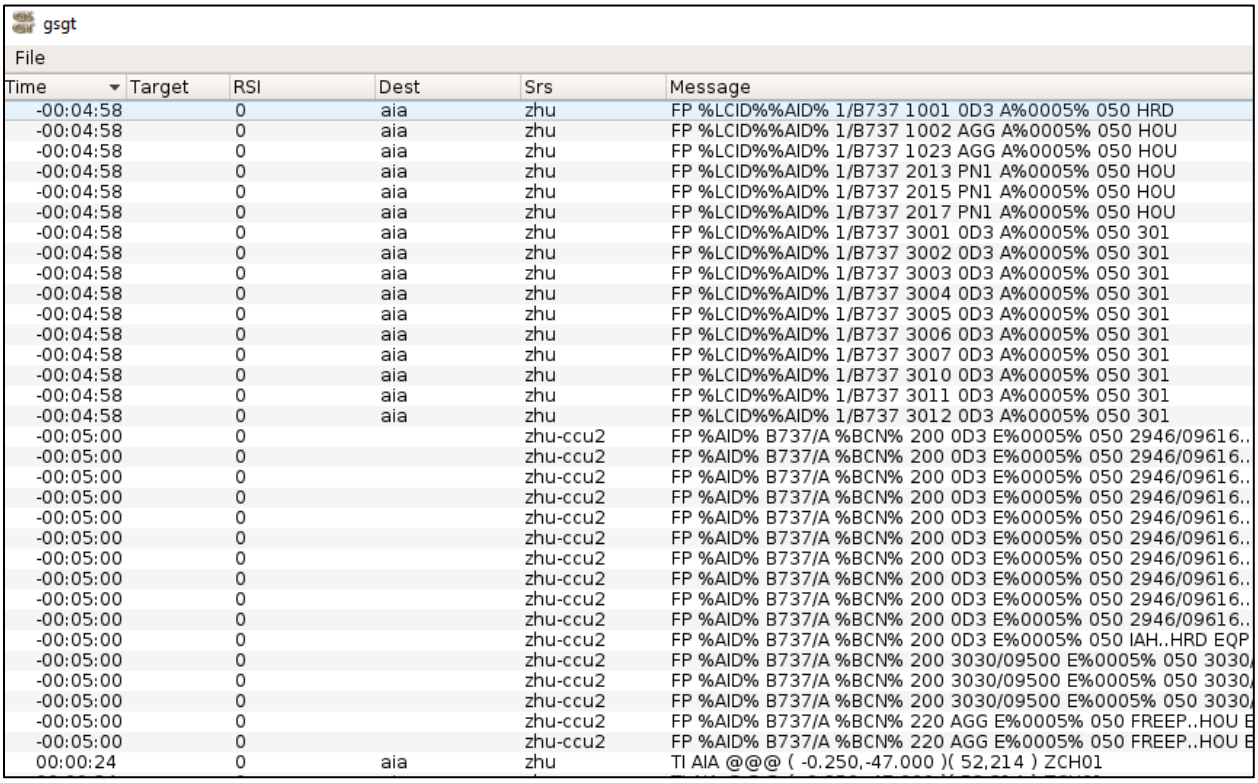


Figure 146. Message Injection Report

9.4. Simulated Target Position

The GSGT Simulated Target Position report provides information on selected target positions at a specified time interval.

NOTE: *This is not available in Terminal/ERAMSim Mode.*

To generate the report, select Reports->Simulated Target Position from the GSGT Main Window.

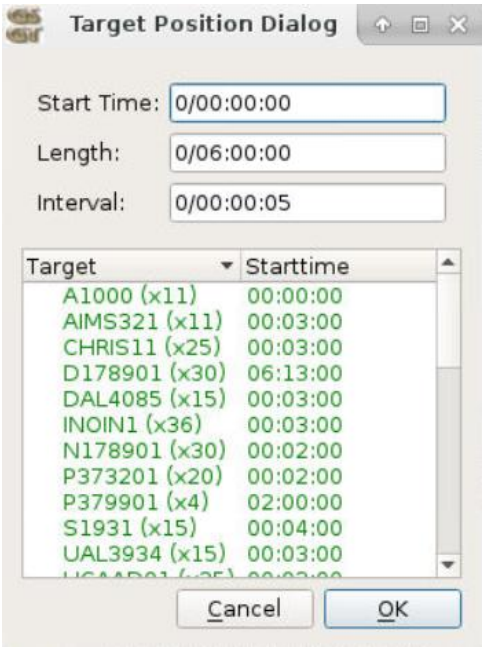


Figure 147. Target Position Report Options

Start Time

Start time of the report.

Length

The length of time the report will cover.

Interval

The time interval of each target report.

Targets

The targets listed in the report. Hold down CTRL to select multiple targets. Clicking on Target ID or Start time will sort the targets appropriately.

OK

Generates the report using the specified criteria.

Cancel

Closes the dialog and cancels the report.

The first file displayed is a summary containing links to the report for each selected target. Clicking on a link will display the individual target report.

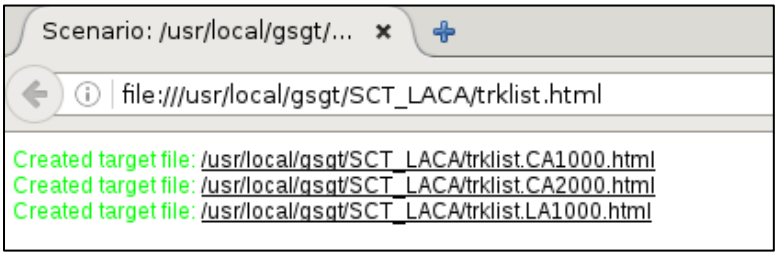
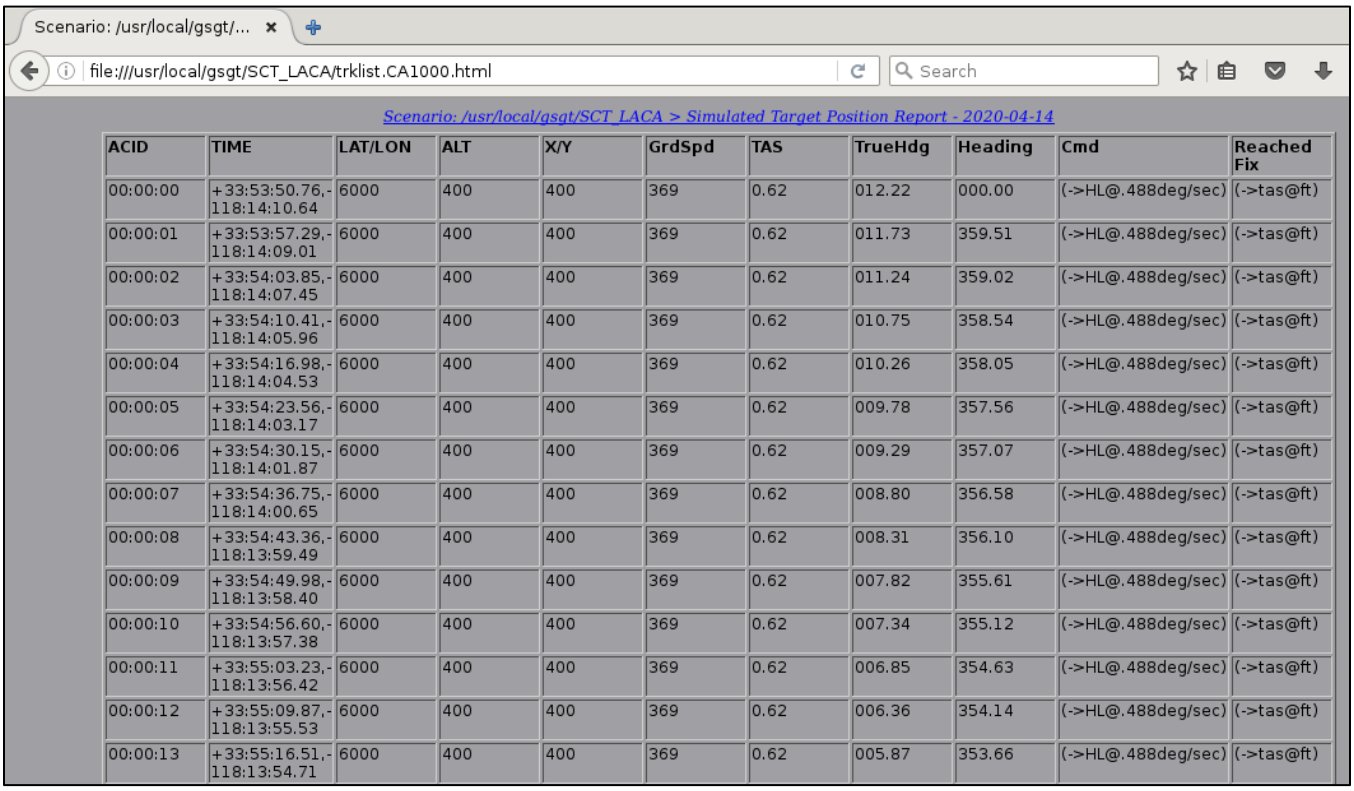


Figure 148. Target Position Report File List



ACID	TIME	LAT/LON	ALT	X/Y	GrdSpd	TAS	TrueHdg	Heading	Cmd	Reached Fix
00:00:00	+33:53:50.76,-118:14:10.64	6000	400	400	369	0.62	012.22	000.00	(->HL@.488deg/sec)	(->tas@ft)
00:00:01	+33:53:57.29,-118:14:09.01	6000	400	400	369	0.62	011.73	359.51	(->HL@.488deg/sec)	(->tas@ft)
00:00:02	+33:54:03.85,-118:14:07.45	6000	400	400	369	0.62	011.24	359.02	(->HL@.488deg/sec)	(->tas@ft)
00:00:03	+33:54:10.41,-118:14:05.96	6000	400	400	369	0.62	010.75	358.54	(->HL@.488deg/sec)	(->tas@ft)
00:00:04	+33:54:16.98,-118:14:04.53	6000	400	400	369	0.62	010.26	358.05	(->HL@.488deg/sec)	(->tas@ft)
00:00:05	+33:54:23.56,-118:14:03.17	6000	400	400	369	0.62	009.78	357.56	(->HL@.488deg/sec)	(->tas@ft)
00:00:06	+33:54:30.15,-118:14:01.87	6000	400	400	369	0.62	009.29	357.07	(->HL@.488deg/sec)	(->tas@ft)
00:00:07	+33:54:36.75,-118:14:00.65	6000	400	400	369	0.62	008.80	356.58	(->HL@.488deg/sec)	(->tas@ft)
00:00:08	+33:54:43.36,-118:13:59.49	6000	400	400	369	0.62	008.31	356.10	(->HL@.488deg/sec)	(->tas@ft)
00:00:09	+33:54:49.98,-118:13:58.40	6000	400	400	369	0.62	007.82	355.61	(->HL@.488deg/sec)	(->tas@ft)
00:00:10	+33:54:56.60,-118:13:57.38	6000	400	400	369	0.62	007.34	355.12	(->HL@.488deg/sec)	(->tas@ft)
00:00:11	+33:55:03.23,-118:13:56.42	6000	400	400	369	0.62	006.85	354.63	(->HL@.488deg/sec)	(->tas@ft)
00:00:12	+33:55:09.87,-118:13:55.53	6000	400	400	369	0.62	006.36	354.14	(->HL@.488deg/sec)	(->tas@ft)
00:00:13	+33:55:16.51,-118:13:54.71	6000	400	400	369	0.62	005.87	353.66	(->HL@.488deg/sec)	(->tas@ft)

Figure 149. Target Position Report

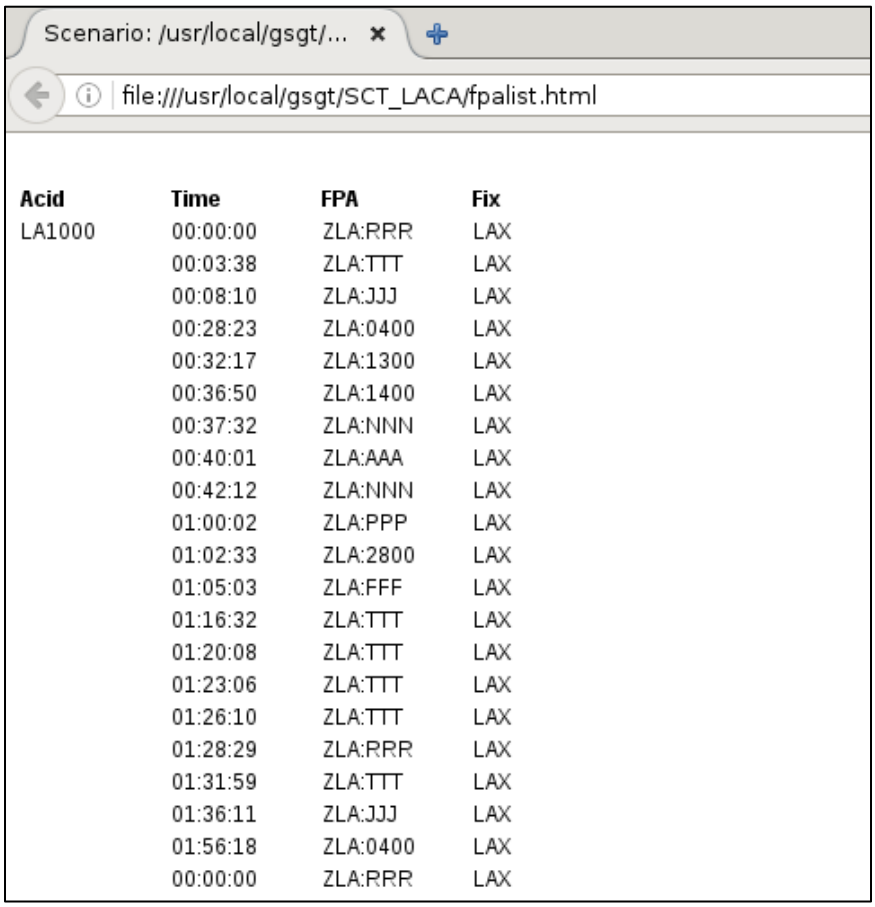
9.5. FAV Traversal Report

The FAV Traversal Report displays the FAV crossing times for the selected targets.

To generate the report, select Reports->FAV Traversal Report from the GSGT Main Window.

The dialog with report options is the same as in Simulated Target Position report.

The FAV Listing displays each aircraft ID and the time it enters each FAV.



Acid	Time	FPA	Fix
LA1000	00:00:00	ZLA:RRR	LAX
	00:03:38	ZLA:TTT	LAX
	00:08:10	ZLA:JJJ	LAX
	00:28:23	ZLA:0400	LAX
	00:32:17	ZLA:1300	LAX
	00:36:50	ZLA:1400	LAX
	00:37:32	ZLA:NNN	LAX
	00:40:01	ZLA:AAA	LAX
	00:42:12	ZLA:NNN	LAX
	01:00:02	ZLA:PPP	LAX
	01:02:33	ZLA:2800	LAX
	01:05:03	ZLA:FFF	LAX
	01:16:32	ZLA:TTT	LAX
	01:20:08	ZLA:TTT	LAX
	01:23:06	ZLA:TTT	LAX
	01:26:10	ZLA:TTT	LAX
	01:28:29	ZLA:RRR	LAX
	01:31:59	ZLA:TTT	LAX
	01:36:11	ZLA:JJJ	LAX
	01:56:18	ZLA:0400	LAX
	00:00:00	ZLA:RRR	LAX

Figure 150. FAV Traversal Report

9.6. Simulated Radar Target Count

The GSGT Simulated Radar Target Count.

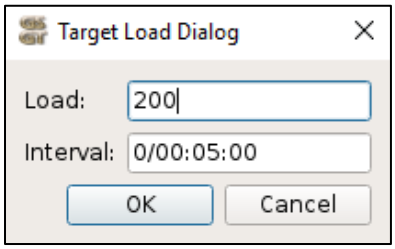


Figure 151. Target Count Report Options

To generate the report, select Reports->Simulated Radar Target Count from the GSGT Main Window.

Load

The aircraft load to report.

Interval

The time interval used in the report.

OK

Generates the report using the specified criteria.

Cancel

Closes the dialog and cancels the report.

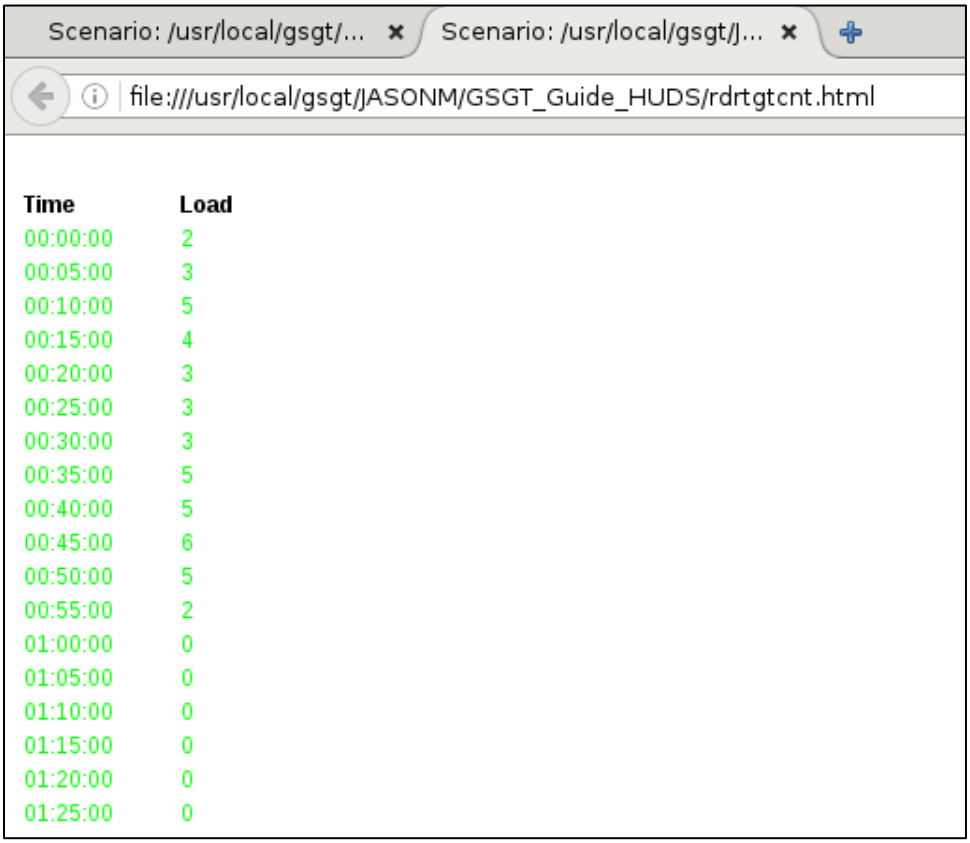


Figure 152. Target Count Report

10. Weather Editor

Weather scenarios can be included in GSGT scenarios to provide more realistic simulation. They are created using the GSGT Weather Editor. The Weather Editor closely resembles the Scenario Editor; however, it is only designed to create and edit weather scenarios. Weather scenarios and regular scenarios are saved in different paths, so they may have the same names. However, it is recommended to use different names to be able to distinguish them easily.

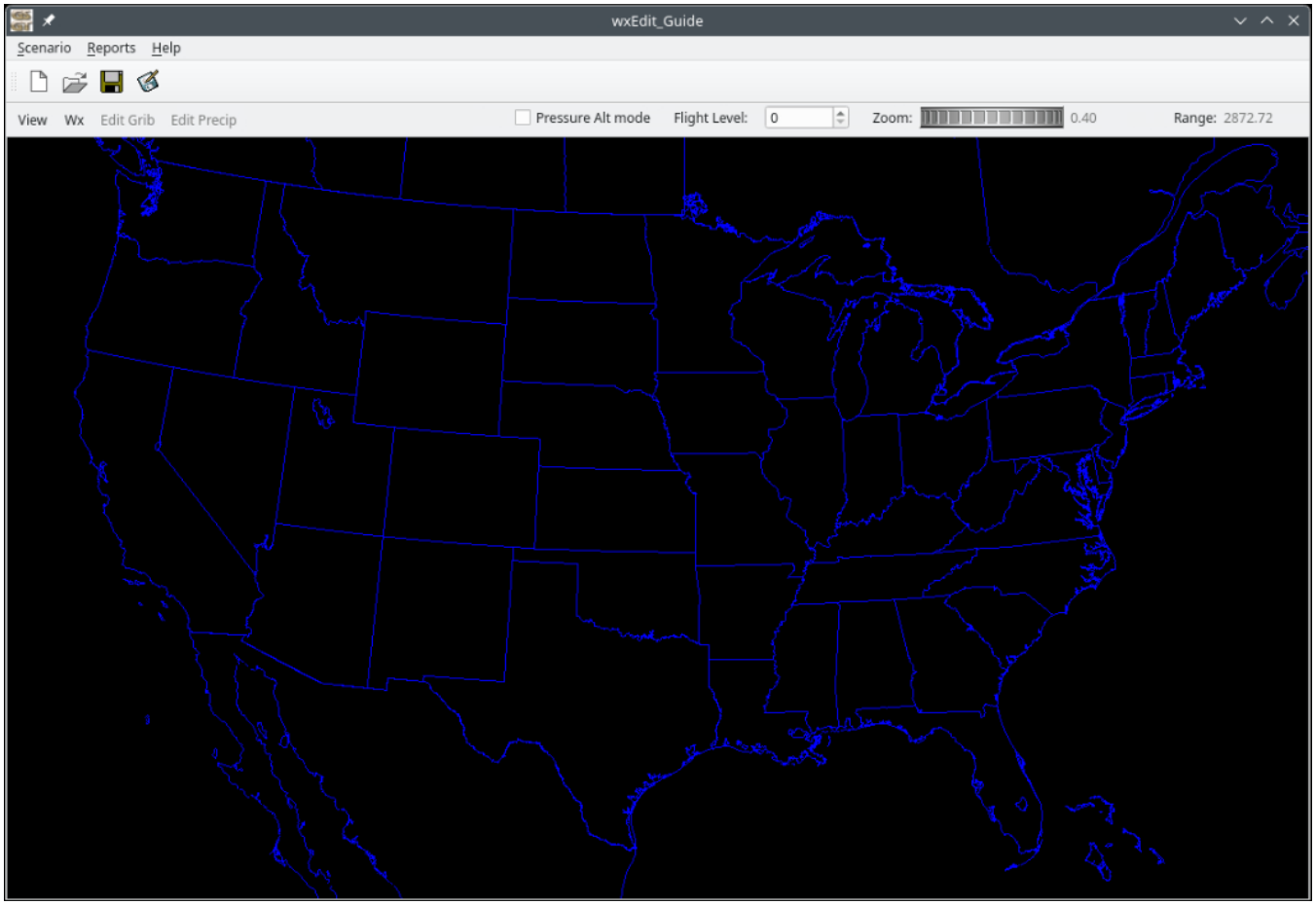


Figure 153. Weather Editor

Since weather scenarios can be associated with multiple GSGT scenarios, they are included as read-only and can't be modified from within a regular scenario. Any change in the weather scenario will affect all GSGT scenarios that are associated with that weather scenario.

10.1. Starting the Weather Editor

The GSGT Weather Editor is executed using the executable wxEdit.

To start the Weather Editor from the command line, enter:

```
> wxEdit
```

To launch a version of the Weather Editor that is not the default version, enter:

```
> /usr/local/jvn.x.x.x/bin/wxEdit
```

NOTE: *Starting the Weather Editor from a command line while inside a weather scenario directory will automatically open that scenario.*

10.1.1. Command Line Options

The Weather Editor can be started with options which control its operation.

Table 10. Parameters for the Weather Editor

Parameter	Description
`--tbfmFormat`	TBFM mode for generating GRIB2 formatted weather.
`--version`	Display the Weather Editor version.
`--precipOpacity=x.xx (0.0 to 1.0)`	Changes the opacity of the precipitation data.
`--rucOpacity=x.xx (0.0 to 1.0)`	Changes the opacity of the RUC/RAP data.
`--nofullscreen`	Not full screen mode; the Weather Editor will be stared in a window roughly half the size of the screen.
`--help`	Display application parameters.

For example, to start the Weather Editor in TBFM Mode, enter:

```
> wxEdit --tbfmFormat
```

10.2. Creating a New Weather Scenario

The New Weather Scenario Wizard allows users to select a name and location for the weather scenario, to download RAP data (requires internet connection), and to define the number of weather forecast hours. Without downloaded RAP data, a newly created weather scenario includes uniform standard temperature and pressure, zero wind, and no precipitation.

To create a new scenario, select **Scenario->New** from the Weather Editor Main Window.

The wizard includes navigation buttons allowing users to return to previous screens to modify options before pressing the **Finish** button.

Back
Goes to the previous screen.

Next
Goes to the next screen.

Finish
Completes scenario wizard and creates a new scenario according to selected options.

Cancel
Quits the scenario wizard without creating a new scenario.

10.2.1. Location and Name

The selection of a name and location for a new weather scenario is similar to a new GSGT scenario with the exception that weather scenarios are saved in a different location. The location of weather scenarios is controlled by `$WX_PATH` environment variable.

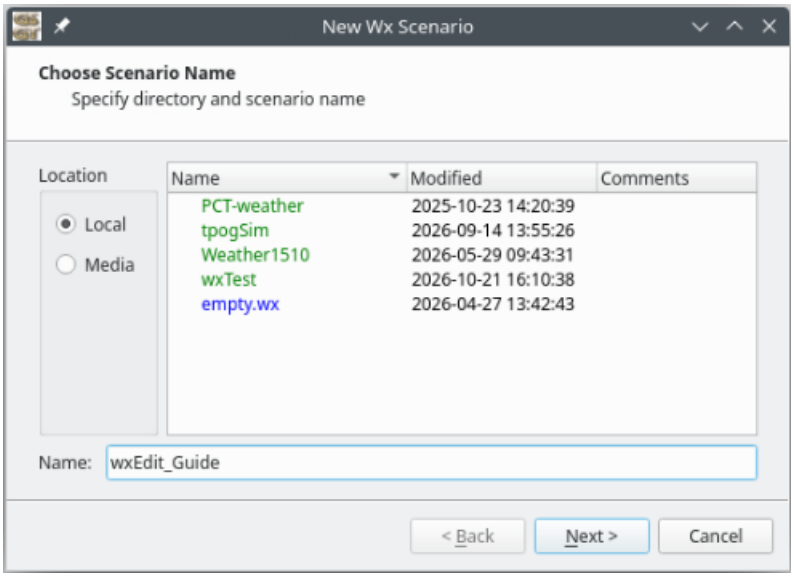


Figure 154. Weather Scenario Name and Location

10.2.2. New Weather Scenario Options

After selecting a name and location and clicking the Next button, users with an internet connection have the option to download RAP data. Users can choose Nomads or NCEI data source for a particular date, hour, and grid size. All users can add additional forecast hours by clicking the arrow or typing a number.

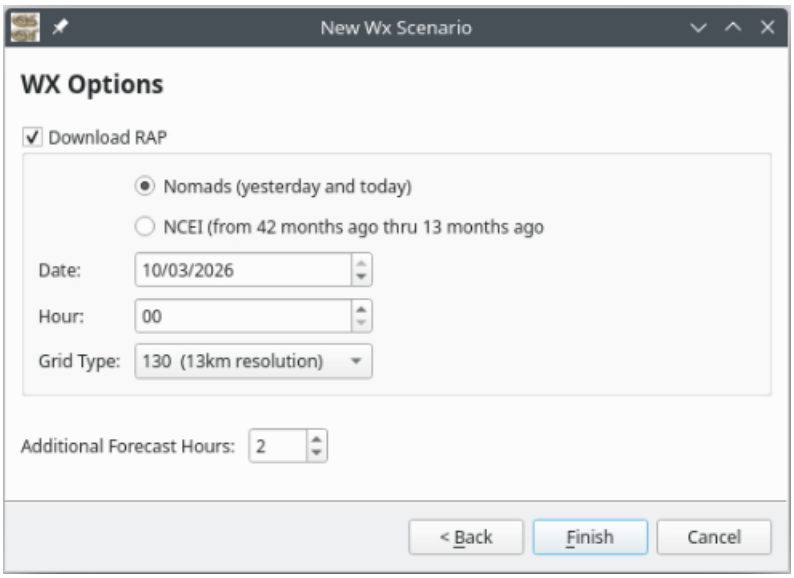


Figure 155. New Weather Scenario Options

The number of forecast hours should be sufficient to span the length of the GSGT scenario. RAP data will be downloaded for each forecast hour. When RAP data is not downloaded, each forecast hour will have standard temperature and pressure and no wind or precipitation uniformly across the entire airspace. Once the weather scenario is created, additional forecast hours cannot be added through the weather editor.

10.3. Open an Existing Weather Scenario

Weather scenarios are opened in a similar manner as regular GSGT scenarios. To open an existing weather scenario, select **Scenario->Open** from the wxEdit Main Window.

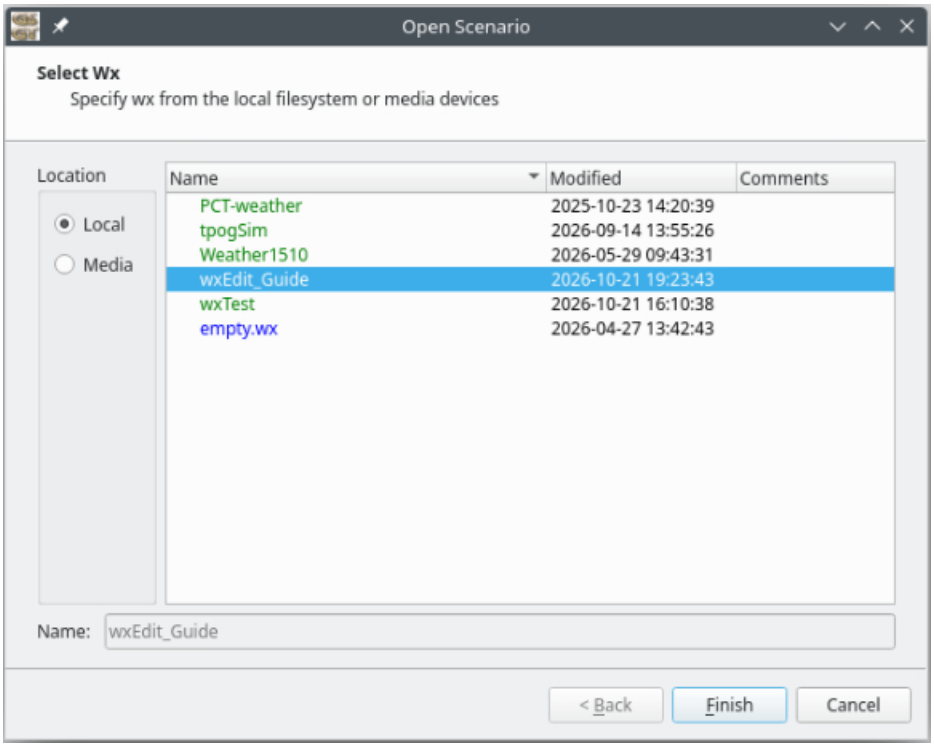


Figure 156. Select Existing Weather Scenario

10.4. Weather Editor GUI

The weather editor consists of main menu options, toolbar, and a map display.

10.4.1. Menu Options

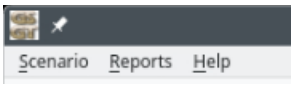


Figure 157. Menu Options

Menu Options include:

Scenario

Provides options to create a New weather scenario, Open an existing weather scenario, Save the current weather scenario, Save As the current weather scenario with a different name, Load Adaptation, or Exit the wxEdit GUI.

Reports

The Reports menu provides the option to open the GSGT Session Log for the current wxEdit session.

Help

The Help menu provides an option for **About** to display the About GSGT dialog.

Figure 158. About GSGT

10.4.2. Toolbar

The weather scenario toolbar includes icons to create a New weather scenario, Open an existing weather scenario, Save the current weather scenario, and Save As to select a different name.

Figure 159. Toolbar

10.4.3. Map Display

The map display has menu options, tools, and a status bar (when invoked).

10.4.3.1. View Menu

View

The View menu is used to select or deselect political maps of the US, Canada, and Mexico and adaptation elements, if ERAM adaptation has been loaded.

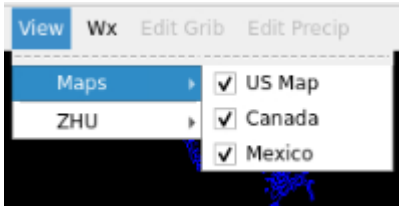


Figure 160. Map Selection

Maps

US Map (BLUE)
Canada (BLUE)
Mexico (BLUE)

ARTCC Name

En Route center adaptation loaded for display has its own submenu with options to display local adaptation data.

Figure 161. ARTCC Options

10.4.3.2. Weather Menu

The Wx menu is used to select a forecast hour and the weather data elements to be added to the map display. Weather scenarios can consist of multiple forecast hours, defined during initial creation of a weather scenario. Upon initial load or creation of a weather scenario, the map display only shows a background map. Weather data for a particular forecast hour can be selected from the menu bar Wx option. Only one forecast hour can be displayed at a time.

Wx

Selecting Wx opens the Wx Maps dialog with options for selecting the forecast hour, scalars for temperature and pressure (with or without contours), wind, and precipitation. Selecting the empty space at the top of the forecast hour dropdown removes all weather data from the map display.

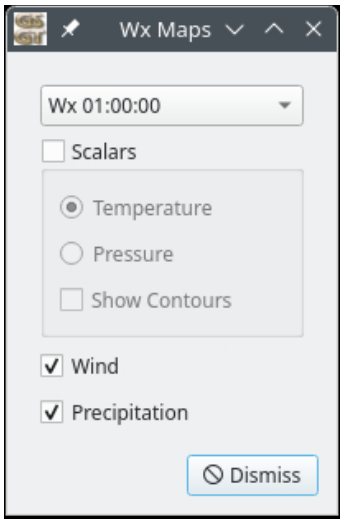


Figure 162. Weather Data Selections

Temperature is depicted on the map display by gamma colors (blue being cold, red being hot). Contour lines at 10 degree increments can also be displayed. Temperatures vary with altitude. When no RAP data is downloaded, the default temperature at 1000mb is 57.7F and at 100mb it is -69.70F.

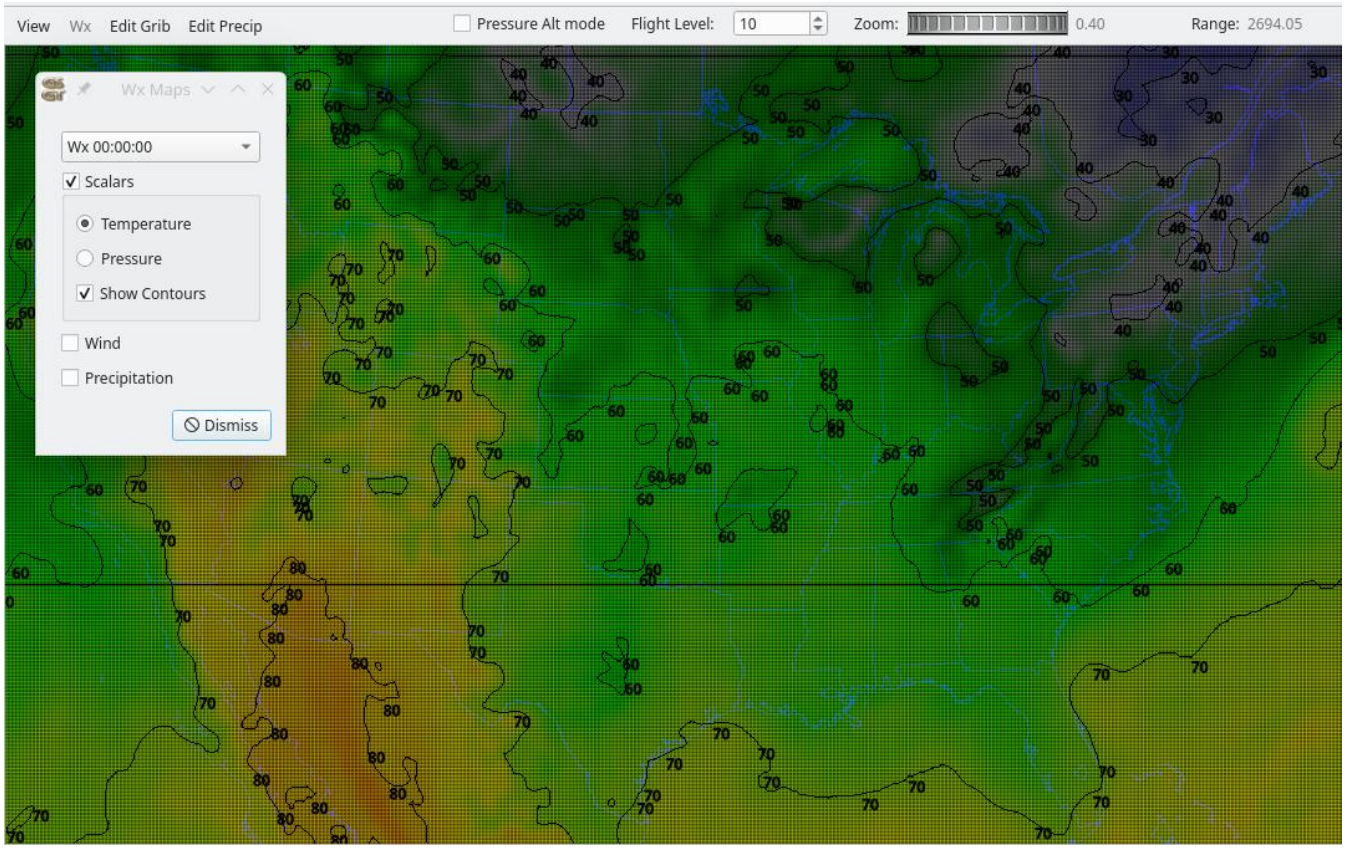


Figure 163. Temperature with Contours

Pressure is depicted on the map display by red and blue intensity colors, where red is high pressure and blue is low pressure. When no RAP data is downloaded, the default pressure is 1013.25mb.

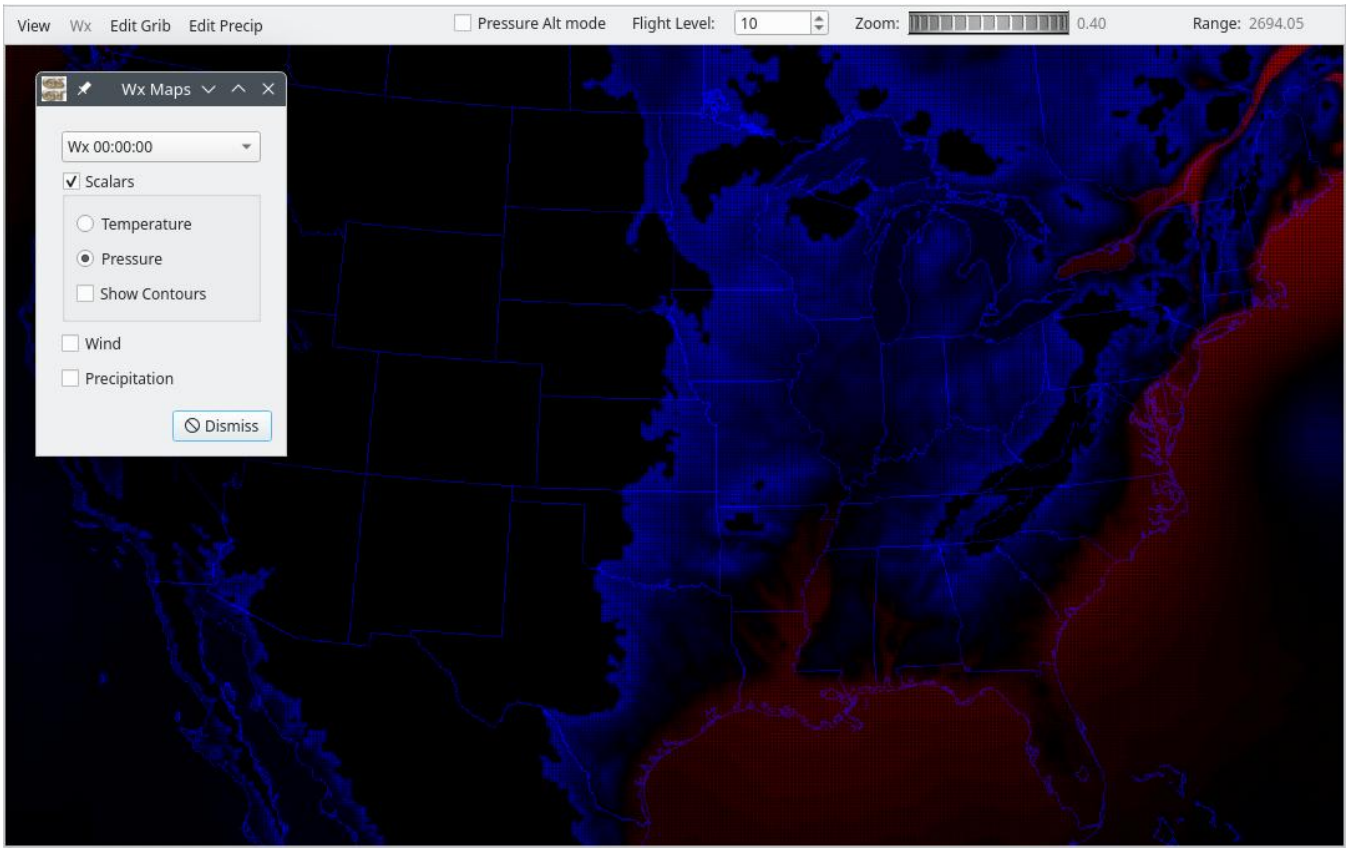


Figure 164. Pressure Display

Wind is depicted on the map display by WHITE vectors indicating heading, and length indicating wind speed. When no RAP data is downloaded, the default speed and heading is 0.

When winds are defined at the 1000mb layer, they affect precipitation areas, causing them to drift. Adding wind values to specific layers also affects aircraft performance for targets flying at the same altitude, causing them to slow down in a head wind and speed up with a tail wind.

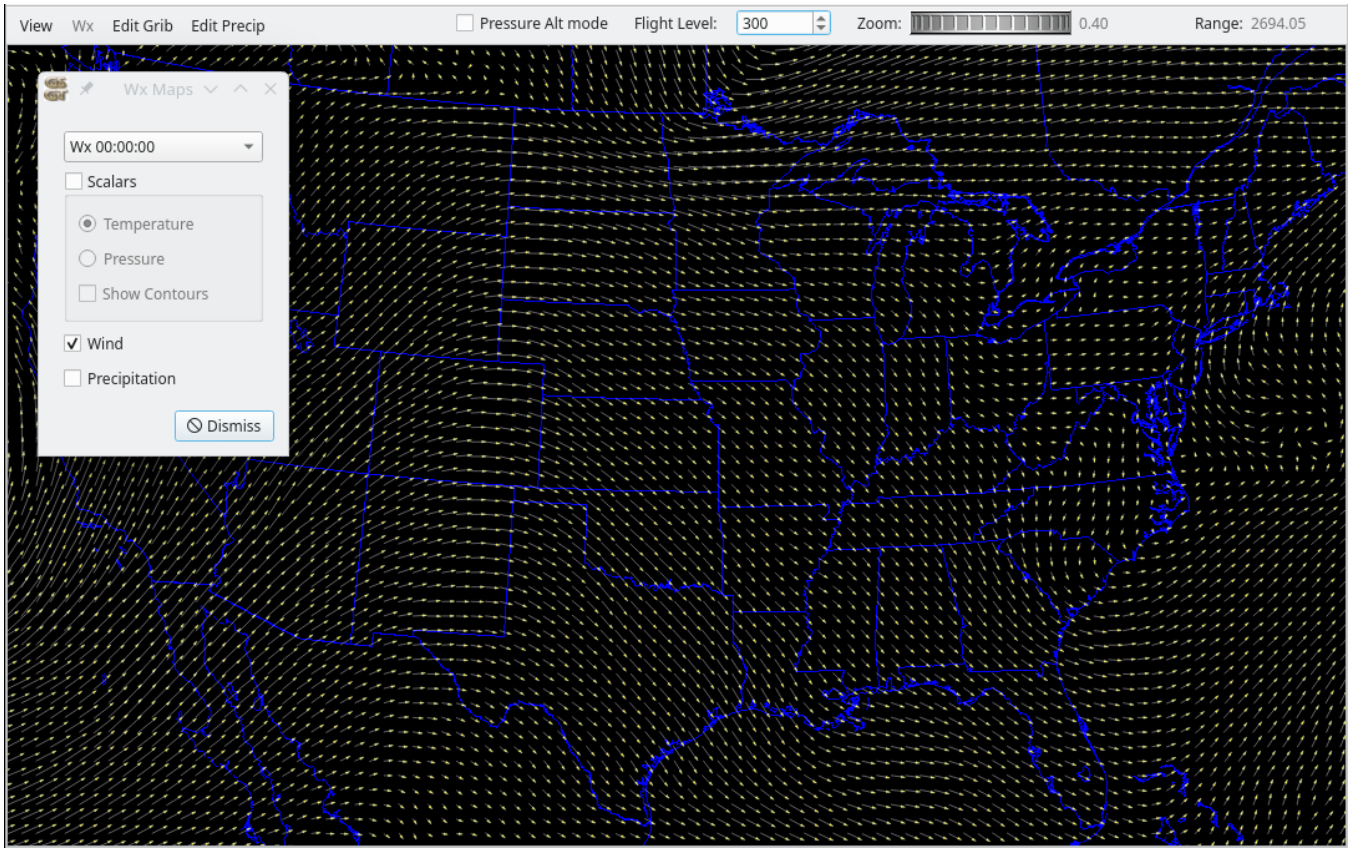


Figure 165. Wind Vectors

Precipitation is depicted on the map display by intensity in various colors ranging from light to severe precipitation.

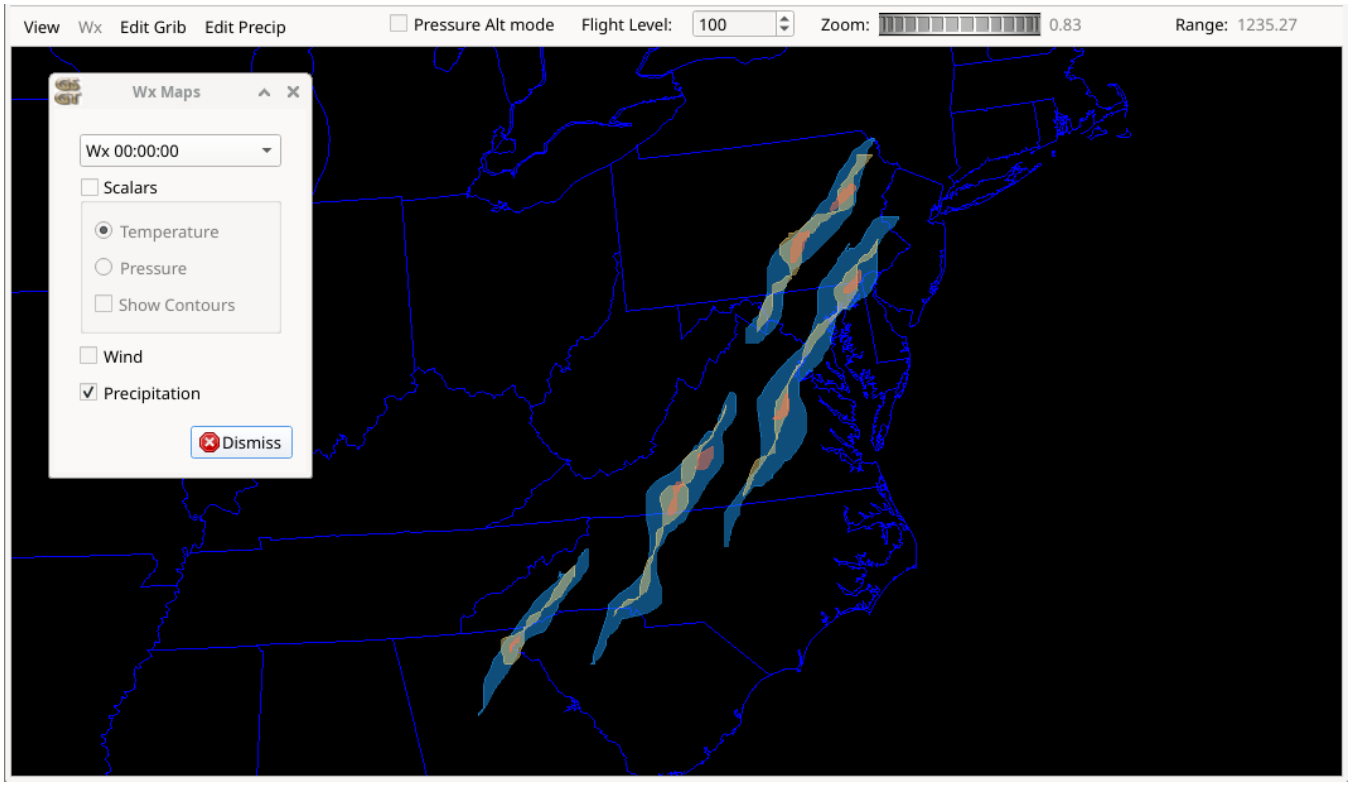


Figure 166. Precipitation Display

10.4.3.3. GRIB Edit Menu

The Edit Grib menu allows users to modify RUC/RAP weather data values for temperature, pressure, and wind. Weather data values can be changed for one pressure altitude or for a range of altitude layers.

Edit Grib

Selecting Edit Grib opens the GRIB Edit dialog for the currently displayed forecast hour.

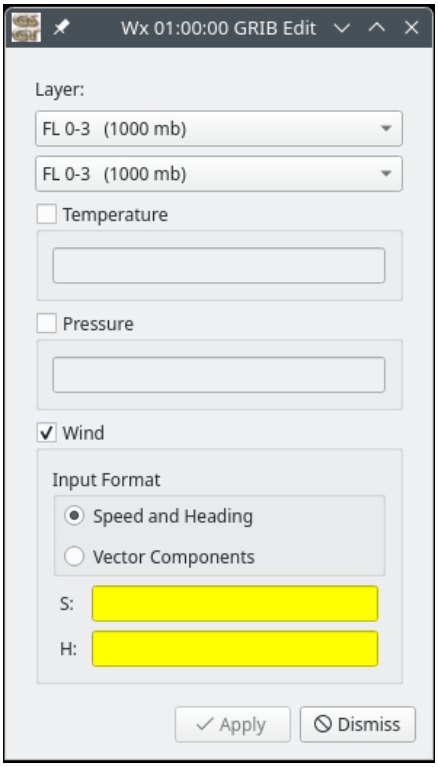


Figure 167. GRIB Editor

Layer

Select one altitude layer or a range of altitude layers (in 25mb increments) to modify.

Temperature

Temperature values are Fahrenheit unless otherwise specified by "C" for Celsius or "K" for Kelvin. Different temperature values can be applied to different altitude layers.

Pressure

Pressure values are specified in millibars. Standard sea level pressure is 1013.25 mb. The range of pressure values is 100mb - 1100mb. Only one pressure value can be specified for all altitude layers.

Wind

Wind values can be specified as speed and heading or as U and V wind speed components, aligned to the RUC/RAP grid. Wind speed values are in knots and heading is in degrees. The U component is the East – West component of wind speed in knots. The V component is the North – South component of wind speed in knots. Different wind values can be applied to different altitude layers.

To change temperature or pressure, check the selection box and enter a value, click to draw the affected area on the map display, then select Apply. To modify wind, select either Speed and Heading or Vector Components, enter appropriate values, click to draw the affected area on the map display, then select Apply.

NOTE: *To create multiple areas with the same values, hold the Ctrl key while drawing on the map display. A right mouse click clears previous selections and selects a single cell. A left mouse click clears all selections.*

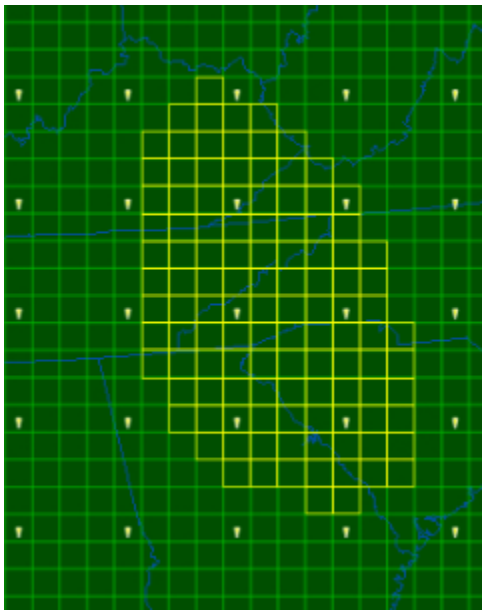


Figure 168. Selecting Weather Cells

10.4.3.4. Precipitation Edit Menu

The Edit Precip menu allows users to add precipitation data to the weather scenario. The user can choose the flight levels, intensity, and optionally velocity for moving precipitation.

Edit Precip

Selecting Edit Precip opens the Precip Edit dialog for the currently displayed forecast hour. To add precipitation, select the flight level range, enter or select the intensity, hold the Shift key and click to draw the affected area on the map display, then select Apply. For moving precipitation, additionally check Velocity, select either Speed and Heading or Vector Components, enter appropriate values, hold the Shift key and click to draw the affected area on the map display, then select Apply.

NOTE: *To create multiple areas with the same values, hold both the Shift and Ctrl keys while drawing on the map display.*

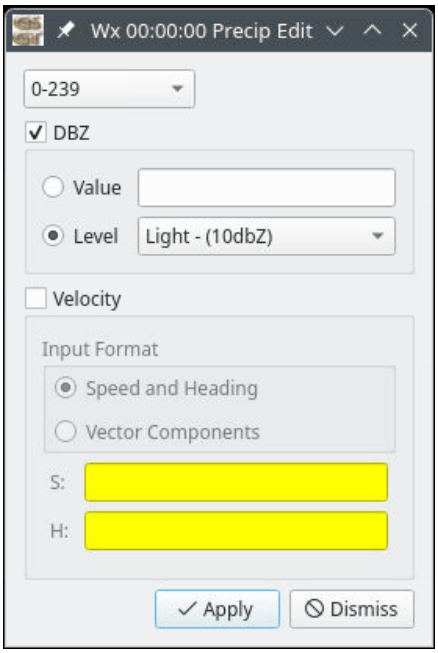


Figure 169. Precipitation Editor

Flight Levels

Drop down selection box with flight level ranges: 0 – FL239, FL240 – FL329, FL330 – FL600, or 0 – FL600.

DBZ

Intensity of the precipitation can be entered as a decibel value or selected from the intensity level drop down: light, moderate, or heavy.

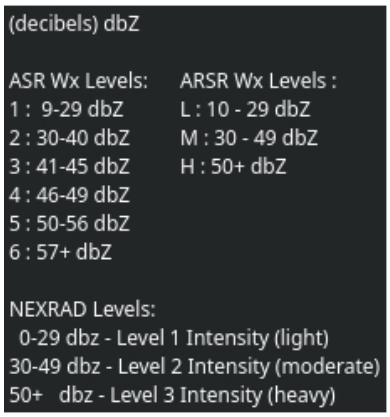


Figure 170. Precipitation Intensity

Table 11. ASR Precipitation Levels

dbZ Level	Description
9 – 29	level 1
30 – 40	level 2
41 - 45	level 3
46 - 49	level 4
50 - 56	level 5
57 +	level 6

Table 12. ARSR Precipitation Levels

dbZ Level	Description
10 – 29	Light precipitation
30 – 49	Moderate precipitation
50 +	Heavy precipitation

Table 13. NEXRAD Precipitation Levels

dbZ Level	Description
0 – 29	Level 1 - Light
30 – 49	Level 2 – Moderate
50 +	Level 3 - Heavy

Velocity

The speed and direction of moving precipitation. Velocity values can be specified as speed and heading or as U and V wind speed components, aligned to the RUC/RAP grid. Speed values are in knots and heading is in degrees. The U component is the East – West component of speed in knots. The V component is the North – South component of speed in knots. The values applied here take precedence over RUC/RAP wind values for defining moving precipitation.

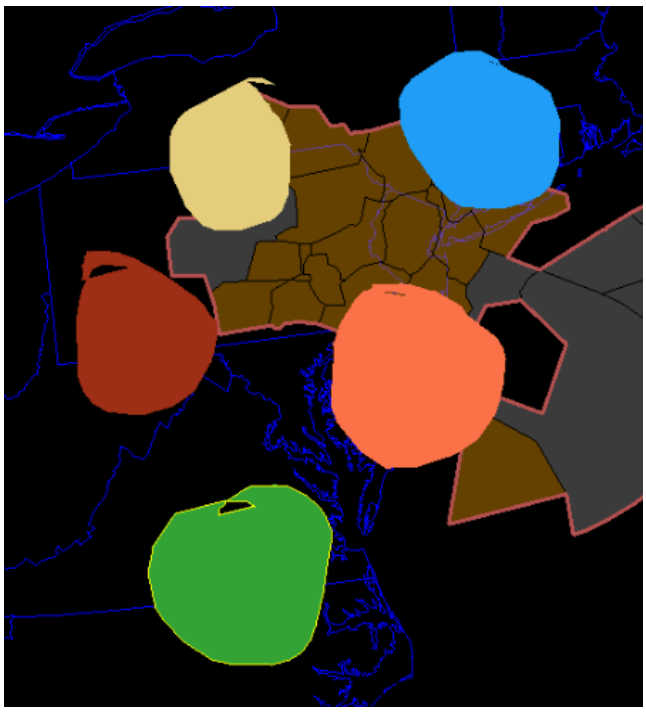


Figure 171. Defining Precipitation

10.4.3.5. Display Options

The map display behaves similarly to the GSGT scenario editor.

10.4.3.5.1. Basic Functions

Moving Map

Left mouse button click and drag to move the map display.

Centering Map

Left mouse button click while holding **CTRL** key. This will reposition display so that the point on the map where mouse click occurred will be positioned in the center of display.

Rubberband Zoom

Left mouse button click and drag while holding **CTRL** and **SHIFT** keys. This will draw a rectangular area representing the zoom detail after the mouse button is released.

Adaptation Info

If ERAM adaptation is loaded in the map display, hold the Shift key and right mouse click within the FAV to display adaptation information. This works in the same fashion as in the GSGT Editor.

Weather Cell Info

Hover mouse over a particular point on the weather grid to display UV components of wind speed.

Measurement Tool

Hold the Shift key and click to get location data for a point or click and drag to get distance and heading displayed in the measurement bar at the bottom of the map display.

10.4.3.5.2. Toolbar

Pressure Alt Mode

When Pressure Alt mode is checked, altitude is displayed in millibars of pressure. Each pressure level corresponds directly to one of 37 RUC layers. (1000 mb is sea level, lower values indicate higher elevations)

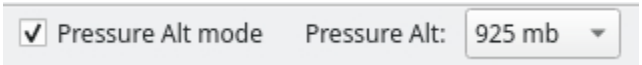


Figure 172. Pressure Altitude Options

Flight Level

When Pressure Alt mode is unchecked, the altitude is displayed in hundreds of feet. Altitude values can be typed into the box or changed by clicking the up and down arrows. Changing the altitude also changes the weather data values that are displayed.

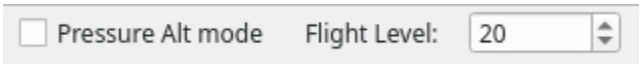


Figure 173. Flight Level

Zoom

The **Zoom** tool allows the range of the display to be adjusted. The slider bar can be dragged to set the zoom level. Clicking on the slider bar and pressing the Page Down and Page Up keys zooms the view in and out. Users may also use the scroll wheel of a mouse.

Figure 174. Zoom

Range

The **Range** tool displays the horizontal size (in nm) of the airspace shown in the map display.

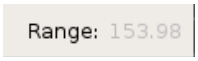


Figure 175. Range

10.4.4. Loading Adaptation

The weather editor, by default, does not display any adaptation information because it is not adaptation specific, meaning it does not require an adaptation for creating or editing weather patterns. However, loading adaptation gives the user a better visual reference. The loaded adaptation does not affect the scenario and is not saved as part of the scenario.

To load adaptation, select **Scenario->Load adaptation** from the Weather Editor Main Menu.

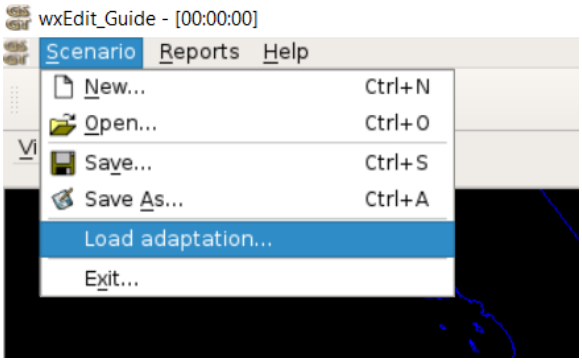


Figure 176. Loading Adaptation

The adaptation selection is performed in same manner as when selecting adaptation for regular scenario. Multiple adaptations can be selected to better aid creation of weather patterns. Once adaptation is loaded, it may not be changed to a different adaptation during the same session. To change adaptation, close the editor and restart to select different adaptation.

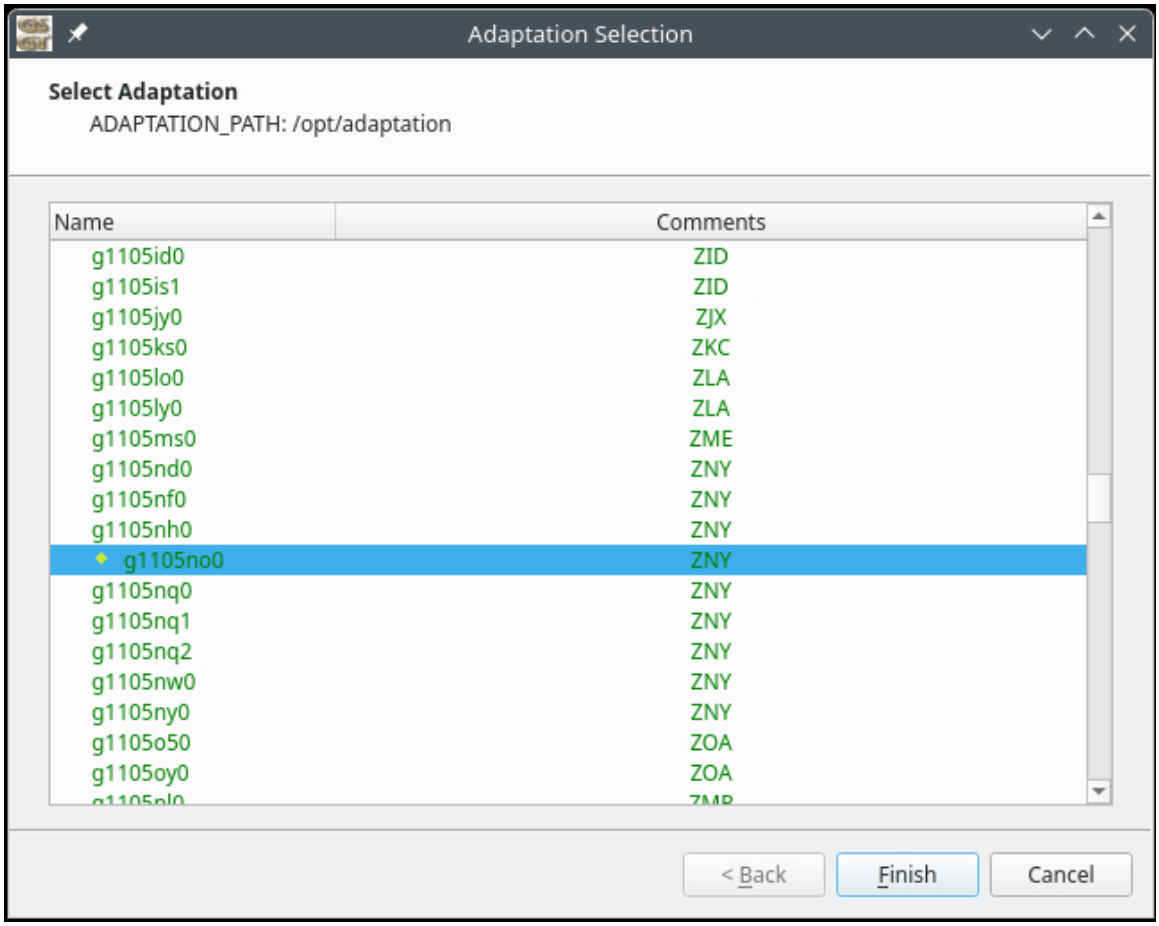


Figure 177. Selecting an Adaptation

NOTE: *The weather scenario is defined on a national grid. In other words, weather patterns are defined on a national scope. A single weather scenario can be used by many site specific scenarios that in turn will use only a specific sub grid of the national weather.*

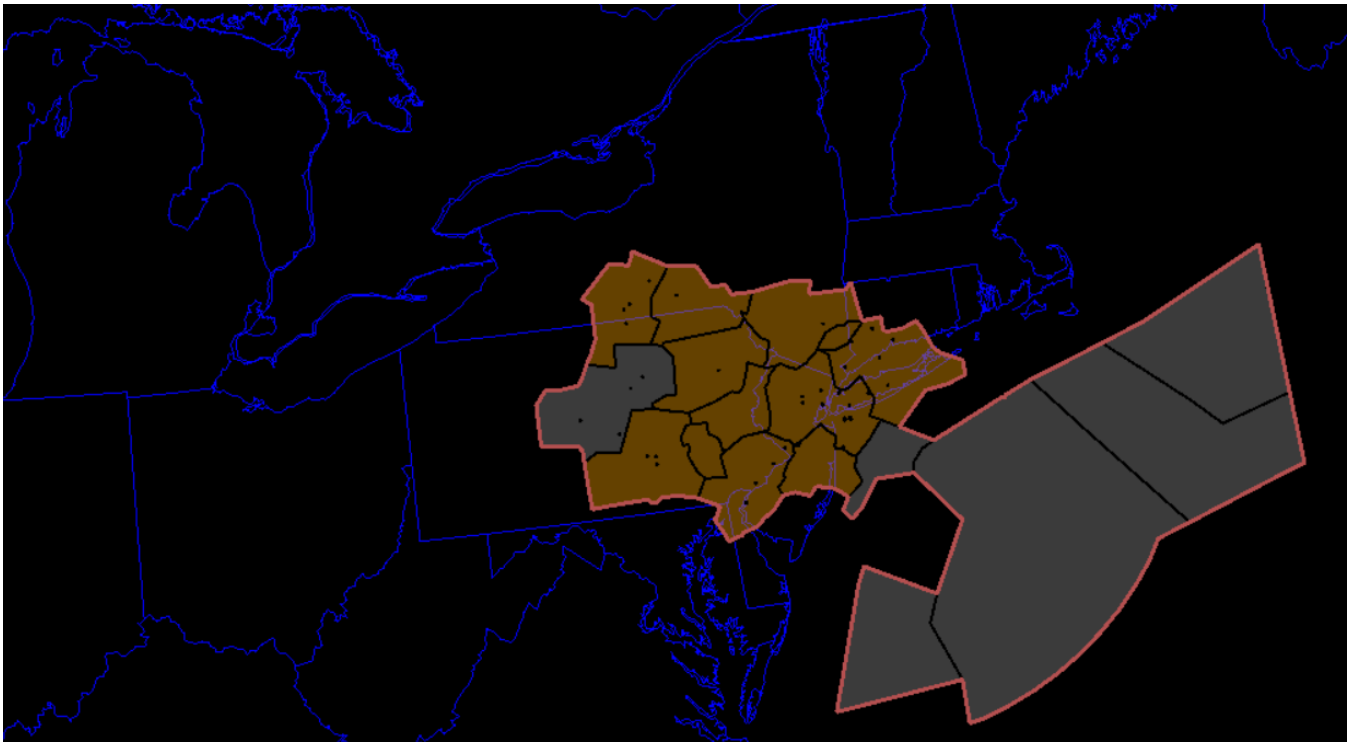


Figure 178. Adaptation Display

11.Source Scenario Files

When a scenario is created, a directory is made with the name of the scenario in the location that is specified. All aspects of the scenario are written to a set of files within the scenario directory.

11.1. Scenario Components

The scenario.xml file defines the components of the scenario. All adaptation and customization that was selected when the scenario was created is listed in this file, including ERAM (eadp), STARS (dms), TBFM, and MEARTS. The scenario.xml file lists each of the files that contain scenario targets, system commands, preferences, record select indicators, script definitions, active runways, restrictions, pilot controls, and device controls. This file also lists the name of the weather scenario if one was selected when the scenario was created.

NOTE: *The MEARTS entry in the Facility portion of scenario.xml does not contain airspace but defines MEARTS radars.*

```
<scenario version="13.4.19">
  <airspace>
    <eadp dir="ERAM/ZNY_f20e3no0">
      <override product="STAR.xml.75">./STAR.xml</override>
      <tbfm dir="TBFM/ZNY_T4.8.3_2.0"/>
    </eadp>
  </airspace>
  <facility>
    <eadp dir="ERAM/ZNY_f20e3no0">
      <override product="STAR.xml.75">./STAR.xml</override>
      <dms file="STARS/phl/phl_s6r8a01_y7_08a_Y708A.bl_j3011092022.rpt" name="PPP"/>
      <mearts file="./mearts.txt" name="ppp"/>
      <tbfm dir="TBFM/ZNY_T4.8.3_2.0"/>
    </eadp>
    <eadp dir="ERAM/ZBW_f20e3bo0"/>
  </facility>
  <targets>tgts.xml</targets>
  <syscmds>syscmds.xml</syscmds>
  <prefs>prefs.xml</prefs>
  <rsi>rsi.xml</rsi>
  <scriptDefinitions>scriptDefinitions.xml</scriptDefinitions>
  <activeRunways>activeRunways.xml</activeRunways>
  <restrictions>restrictions.xml</restrictions>
  <pilotControls>pilotControls.xml</pilotControls>
```

```
  <devctl>devctl.xml</devctl>
  <wx dir="./wx-weather-scenario"/>
</scenario>
```

11.2. Targets

The tgts.xml file contains all of the targets that have been created or imported into the scenario. It includes all of the attributes of each target, such as name, start time, aircraft type, equipage, route, dynamics, timed events, and any target specific messages that have been scripted or frozen.

Example tgts.xml generated with a DMS Report File:

```
<tgtlist>
   <target autogen="1" bcn="3001" name="DEP01" time="00:04:00"
transponderType="modes,1090es,cpdlc">
      <scriptAssignments/>
      <dynamics achar="B737" flevel="100" speed="100tas">
         <route>KPHL..FJC</route>
         <macro>KPHL{arpt} -&gt;100tas@10000ft FJC -&gt;drop</macro>
      </dynamics>
      <replication timeDelta="12000">3</replication>
   </target>
   <target autogen="1" bcn="4001" name="ARR01" time="00:00:00"
transponderType="modes,1090es,cpdlc">
      <scriptAssignments/>
      <dynamics achar="B737" flevel="100" speed="100tas">
         <route>QWEST..KPHL</route>
         <macro>-&gt;86cas@10000ft QWEST KPHL{arpt} -&gt;drop</macro>
      </dynamics>
      <events>
         <macro appendActiveCmd="1" delta="00:00:00">-
&gt;hold{turnDir:L}{duration:500sec}{legs:100sec}</macro>
      </events>
   </target>
   <target autogen="1" bcn="1701" name="INJEC01" time="00:00:00"
transponderType="modes,1090es,cpdlc">
      <scriptAssignments/>
      <dynamics achar="B737" flevel="100" speed="100tas">
         <route>QWEST..KPHL</route>
         <macro>-&gt;86cas@10000ft QWEST KPHL{arpt} -&gt;drop</macro>
      </dynamics>
      <msgList>
```

```
         <tcwMsg fac="PPP" position="*" time="00:00:00">[MULTI_FUNC]C[DELTA]ALL[ENTER]
</tcwMsg>
      </msgList>
   </target>
```

Example tgts.xml generated with a STARS Site File:

```
<tgtlist>
   <target autogen="0" bcn="0353" icaoAddress="0x111111" name="CA03" nasEquip="A"
time="00:22:04" transponderType="modes">
      <dynamics achar="B737" flevel="080" speed="200tas">
         <route>ACY..PHL</route>
         <macro>-&gt;200tas@8000ft +39:35:27.73,-074:17:41.88 PHL -&gt;drop</macro>
      </dynamics>
      <events>
         <macro delta="00:00:00">-&gt;hold{turnDir:R}{legs:1}</macro>
      </events>
   </target>
   <target autogen="0" bcn="0354" icaoAddress="0x111112" name="CA04" nasEquip="A"
time="00:22:04" transponderType="modes">
      <dynamics achar="B737" flevel="080" speed="200tas">
         <route>ACY..PHL</route>
         <macro>-&gt;200tas@8000ft +39:34:16.99,-074:13:36.38 +39:34:14.31,-074:13:26.67 -
&gt;drop</macro>
      </dynamics>
      <events>
         <macro delta="00:00:00">-&gt;hold{turnDir:L}{legs:1}</macro>
      </events>
   </target>
   <target autogen="0" bcn="0357" icaoAddress="0x111113" name="CA07" nasEquip="A"
time="00:23:01" transponderType="modes">
      <dynamics achar="B737" flevel="080" speed="200tas">
         <route>ACY..PHL</route>
         <macro>-&gt;200tas@8000ft +40:05:03.34,-075:02:53.22 -&gt;090 +40:05:03.44,-
075:02:53.22 -&gt;drop</macro>
      </dynamics>
      <events>
         <macro delta="00:00:00">-&gt;hold{turnDir:R}{legs:1}</macro>
         <ssrBlipScanChange delta="00:03:49" value="0"/>
         <psrBlipScanChange delta="00:03:49" value="0"/>
         <psrBlipScanChange delta="00:06:58" value="1"/>
         <ssrBlipScanChange delta="00:06:58" value="1"/>
      </events>
```

```
   </target>
</tgtlist>
```

Example tgts.xml file with script assignments, timed events, and capability overrides:

```
<tgtlist>
   <target autogen="1" bcn="0145" isDCL="1" name="ABRR200" nasEquip="L" pilotPosition="500"
rsi="500" tailNumber="ABR200" time="00:00:00" transponderType="modes,1090es,cpdlc">
      <scriptAssignments>
         <script delta="-00:15:00">ABRR-2</script>
      </scriptAssignments>
      <dynamics achar="B738" flevel="430" speed="229tas">
         <route>KSFO./.4928/11305..YXE..5500N/09900W..5800N/09000W..DUGNO..TEFFO..KAGLY..
EMBOK..6400N/05000W..6400N/04000W..6300N/03000W..6200N/02000W..BALIX</route>
      </dynamics>
      <field918Overrides>
         <DAT>1FANSE2PDC</DAT>
         <EQP>SDE1E2E3FGHIJ2J3J4J5M1RXYZW</EQP>
         <NAV>RNVA1D1E2</NAV>
         <PBN>A1B1C1D1L1O1S2</PBN>
      </field918Overrides>
      <events>
         <macro delta="00:00:00">-&gt;set:cpdlcResponseDelay=15</macro>
      </events>
      <replication icaoAddrDelta="0" targetIDDelta="0" timeDelta="24000">9</replication>
   </target>
   <target autogen="1" bcn="0355" isDCL="1" name="ABRR300" nasEquip="L" pilotPosition="500"
rsi="500" tailNumber="ABR300" time="00:00:00" transponderType="modes,1090es,cpdlc">
      <scriptAssignments>
         <script delta="-00:27:00">ABRR-3</script>
      </scriptAssignments>
      <dynamics achar="B738" flevel="430" speed="420tas">
         <route>KSLC./.3622/11410..LAKRR..ZZYZX..HAKMN..SHTNR..SMASH..SALYY..GLESN..ANJLL..
CAANN..BOYEL..CRCUS..KLAX</route>
      </dynamics>
      <field918Overrides>
         <DAT>1FANSE2PDC</DAT>
         <EQP>SDE1E2E3FGHIJ2J3J4J5M1RXYZW</EQP>
         <NAV>RNVA1D1E2</NAV>
         <PBN>A1B1C1D1L1O1S2</PBN>
      </field918Overrides>
      <events>
         <macro delta="00:00:00">-&gt;set:cpdlcResponseDelay=15</macro>
      </events>
      <replication icaoAddrDelta="0" targetIDDelta="0" timeDelta="24000">9</replication>
   </target>
```

11.3. System Commands

The syscmds.xml file contains messages not related to a particular target. Messages such as combine sector, switch activity, change parameter, map request, etc. can be scripted as general set-up messages.

```
<syscmdlist>
  <ssrvmsg device="E1" injectorName="zlc" rsi="100" sysSetup="1" time="00:00:00.00">CP DCST
FACS/ON</ssrvmsg>
  <ssrvmsg device="E1" injectorName="zlc" rsi="100" sysSetup="1" time="00:00:04.00">CP DCST
IC/ON</ssrvmsg>
  <ssrvmsg device="E1" injectorName="zlc" rsi="100" sysSetup="1" time="00:01:01.00">PF 02
132.25</ssrvmsg>
  <ssrvmsg device="R02" injectorName="zlc" rsi="100" sysSetup="1" time="00:01:04.00">MR 02
ZLCMAP</ssrvmsg>
  <ssrvmsg device="R10" injectorName="zlc" rsi="100" sysSetup="1" time="00:01:23.00">MR 10
ZLCMAP</ssrvmsg>
  <ssrvmsg device="R01" injectorName="zlc" rsi="100" sysSetup="1" time="00:01:24.00">MR 01
ZLCMAP</ssrvmsg>
</syscmdlist>
```

11.4. Preferences

The prefs.xml file lists global scenario preferences such as scenario run time, system setup time, and flight plan lead time.

```
<Prefs>
  <comments>Default prefs</comments>
  <syssetuptime>00:02:00</syssetuptime>
  <tgtintermsgtime>00:00:03</tgtintermsgtime>
  <defaultFpLeadTime>00:15:00</defaultFpLeadTime>
  <termFpLeadTime>00:02:00</termFpLeadTime>
  <trackStartOffset>00:00:24</trackStartOffset>
  <qnleadtime>00:00:20</qnleadtime>
  <tileadtime>00:02:00</tileadtime>
  <hoacceptdelta>00:00:30</hoacceptdelta>
  <deriveFPLsSource>BGTLYWYX</deriveFPLsSource>
  <allTargetsCpdlc>1</allTargetsCpdlc>
  <externalFacRouteDistance>50</externalFacRouteDistance>
</Prefs>
```

11.5. Record Select Indicators

The rsi.xml file lists all of the record select indicators including the number and description of each RSI.

```
<rsilist>
  <rsi description="RADAR ONLY FLIGHTS">200</rsi>
  <rsi description="ADSB ONLY FLIGHTS">300</rsi>
  <rsi description="ZKC SYSCMDS">100</rsi>
  <rsi description="Background Flights">500</rsi>
  <rsi description="WMSCR MSGS">101</rsi>
</rsilist>
```

11.6. Script Definitions

The scriptDefinitions.xml file is the place where scenario developers can create sets of messages such as DataComm logon scripts or TTP flight updates. The DataComm logon scripts can be edited using the Script Definitions tab of the Scenario Editor. However, the XML formatted TTP messages must be manually edited with a text editor such as **vi**.

```
<scripts>
   <scriptDefinition name="ACID-mismatch">
      <triggerable processor="avionics" trigger="U163">
         <afnmsg delay="00:02:30.00"
injectorName="avionics">FMHTEST01,@{paddedTailNo},@{address},%TS%/FPO@{arptSpos},1/FCOADS,0
1/FCOATC,01</afnmsg>
      </triggerable>
      <afnmsg injectorName="avionics"
time="00:00:00.00">FMH@{aid},@{paddedTailNo},@{address},%TS%/FPO@{arptSpos},1/FCOADS,01/FCO
ATC,01</afnmsg>
   </scriptDefinition>
   <scriptDefinition name="ACID-mismatch_after_session">
      <afnmsg injectorName="avionics"
time="00:00:00.00">FMH@{aid},@{paddedTailNo},@{address},%TS%/FPO@{arptSpos},1/FCOADS,01/FCO
ATC,01</afnmsg>
      <afnmsg injectorName="avionics"
time="00:15:30.00">FMHTEST02,@{paddedTailNo},@{address},%TS%/FPO@{arptSpos},1/FCOADS,01/FCO
ATC,01</afnmsg>
   </scriptDefinition>
</scripts>
```

11.7. Active Runways

The activeRunways.xml file is where scenario developers can define the default runway for each airport that is listed. This file must be manually edited with a text editor such as **vi**.

```
<activeRunways>
  <activeRunway>
    <airport name="KLAX"/>
    <departureRunway name="RW24L"/>
    <arrivalRunway name="06R"/>
  </activeRunway>
</activeRunways>
```

11.8. Restrictions

The restrictions.xml file is where restrictions can be defined for each fix and airport pair that is listed. This file must be manually edited with a text editor such as **vi**.

```
<restrictions>
  <restriction>
    <key>ESSO</key>
    <restriction>&lt;250cas@&lt;10000ft</restriction>
    <arpt>KPHL</arpt>
    <arpt>KPNE</arpt>
    <arpt>KTTN</arpt>
  </restriction>
</restrictions>
```

11.9. Pilot Controls

The pilotControls.xml file is where sector positions can be mapped to simulation pilot positions. When a handoff is accepted by a sector position controller in a dynamic simulation, the scenario target will be handed off to the simulation pilot mapped to that sector. This file must be manually edited with a text editor such as **vi**.

```
<pilotControls>
   <pilotControl controller="ZNY:PPP/1F" pilot="10" />
   <pilotControl controller="ZNY:PPP/1S" pilot="20" />
   <pilotControl controller="ZNY:PPP/1N" pilot="30" />
   <pilotControl controller="ZNY:PPP/1W" pilot="40" />
   <pilotControl controller="ZNY:PPP/1Y" pilot="50" />
</pilotControls>
```

11.10. Device Control

The devctl.xml file allows scenario developers to create events that modify the behavior of a simulated device. This file must be manually edited with a text editor such as **vi**.

When running a scenario with a simulated Terminal Flight Data Manager (TFDM) interface, devctl lines can inject events for their TFDM Consumers. An example line would be as follows with the facility being the TFDM Consumer initiating the event and the time being relative to the scenario start time:

```
<devctl devType="rtcs" facility="klax" time="00:01:30">
  <hbPeriod>7</hbPeriod>
</devctl>
```

Table 14. Parameters for Simulated TFDM Device Control

Parameter	Description
<hbPeriod/>	The time (seconds) that the consumer injects heartbeat messages.
<disableHBs/>	The number of iterations that a heartbeat will not be sent. If a value < 0 or a value of 'true' is set, heartbeats will be disabled.
<retransmitTimeout/>	The time (seconds) that the consumer will wait before re-injecting an RTCS message, that requires a response.
<maxRetries/>	The number of times that a consumer will resend an RTCS message that requires a response.
<delayReceiptAck/>	The time (seconds) that the consumer will wait before sending a receipt acknowledgement message.
<disableReceiptAck/>	Boolean, if a value of 'true' is set consumer will not send receipt acknowledgement messages.
<unsolicitedReconWaitTime/>	The time (seconds) that the consumer will wait for a solicited recon from the producer before issuing a recon request.
<reconRequest/>	Sends a recon request message to the producer.

Appendix A. Acronyms

AAR	Adapted Arrival Routes
AAV	Aircraft Alert Volumes
ACID	Aircraft Identification
ADAR	Adapted Departure/Arrival Routes
ADR	Adapted Departure Routes
ADS-B	Automatic Dependent Surveillance – Broadcast
AIG	Application Interface Gateway
AOI	Area of Interest
API	Application Program Interface
ARSR	Air Route Surveillance Radar
ARTCC	Air Route Traffic Control Center
ARTS	Automated Radar Terminal System
ASDI	Aircraft Situation Display to Industry
ASR	Airport Surveillance Radar
ASR-9	Airport Surveillance Radar Model-9
ASTERIX	All Purpose Structured Eurocontrol Radar Information Exchange
ATC	Air Traffic Control
AViD	Airspace Visualization Display
BRTQC	Beacon Real Time Quality Control
CAS	Commercially Available Software
CD	Common Digitizer
CDR	Continuous Data Recording
CMS	Common Message Set
DASI	Digital Altimeter Setting Indication System
DASR	Digital Airport Surveillance Radar
DataComm	Data Communications

DME	Distance Measuring Equipment
DP	Departure Procedure
DYSIM	Dynamic Simulation
ECG	External Communications Gateway
ECGP	External Communications Gateway Protocol
EDDS	En Route Data Distribution System
ERAM	En Route Automation Modernization
ETMS	Enhanced Traffic Management System
FAA	Federal Aviation Administration
FAV	Fixed Airspace Volumes
FDIO	Flight Data Input/Output
GIM-S	Groundbased Interval Management-Spacing
GRIB	Gridded Binary
GSGT	Graphic Simulation Generation Tool
GUI	Graphical User Interface
IFDT	Interfacility Flight Data Transfer
JMS	JAVA Messaging Service
JRE	Java Runtime Environment
MIS	Metering Information Service
Mode 3/A	Identification Reporting Mode of Secondary Radar
Mode C	Altitude Reporting Mode of Secondary Radar
Mode S	Mode Select Beacon System
MLAT	Multilateration
NAS	National Air Space
NDB	Non-directional (radio) Beacon
NEMS	NAS Enterprise Messaging System
RAP	Rapid Refresh
RAPPI	Random Access Plan Position Indicator
RF	Radius-to-fix

RSI	Record Select Indicator
RTCS	Release Time Coordination Service
RTQC	Real Time Quality Control
RUC	Rapid Update Cycle
SAA	Special Activities Airspace
SAC	System Area Code
SDRR	Simulation Driver Radar Recorder
SIC	System Identity Code
SIRS	STARS Interfacility and Radar Simulator
SMIF	Simulation Interface Support
SSRV	Simulation Services
STAR	Standard Terminal Arrival Route
STARS	Standard Terminal Automation Replacement System
SWIM	System-Wide Information Management
TACAN	Tactical Air Navigation System
TARP	Time-based Archive Recording Player
TAV	Terrain Alert Volume
TBFM	Time Based Flow Management
TFDM	Terminal Flight Data Manager
TFMS	Traffic Flow Management System
TRACON	Terminal Radar Approach Control
TSIM	TBFM Simulation
TTP	TFDM Terminal Publication
VOR	Very High Frequency (VHF) Omni-Directional Range
WAM	Wide Area Multilateration
WJHTC	William J. Hughes Technical Center