



Graphic Simulation Generation Tool (GSGT)

User Reference Guide

March 8, 2024

JVN Tool Suite v13.4.19 Volume 2

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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 injection. When launched in dynamic simulation 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 click the “Login” button or press **Enter** on the keyboard.

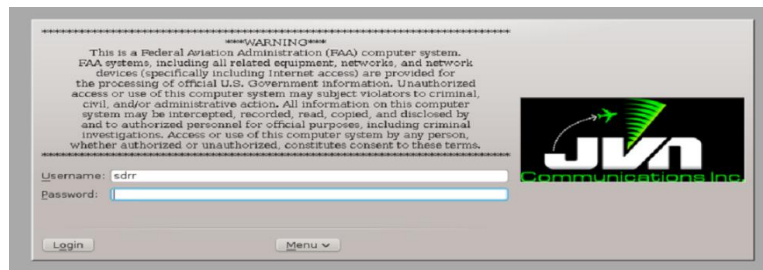


Figure 1. GSGT Processor Login

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.

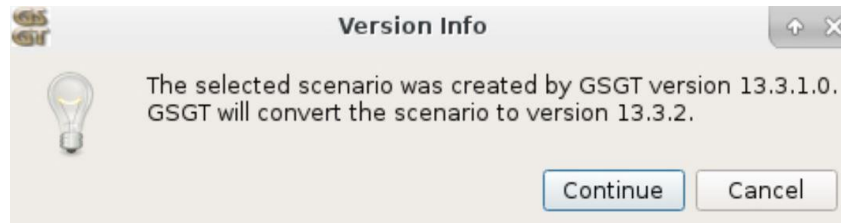


Figure 3. Version Warning

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. |
| --proxy=server/port | Opens GSGT with specific server/port for mapTiles. |
| --open | Opens the GSGT Open Scenario window. |
| --new | Opens the GSGT New Scenario window. |
| --version | Display GSGT version. |
| --nofullscreen | Not full screen mode; GSGT will be started 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 dynamic execution without an ERAM system. |

3.3. Graphical User Interface

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

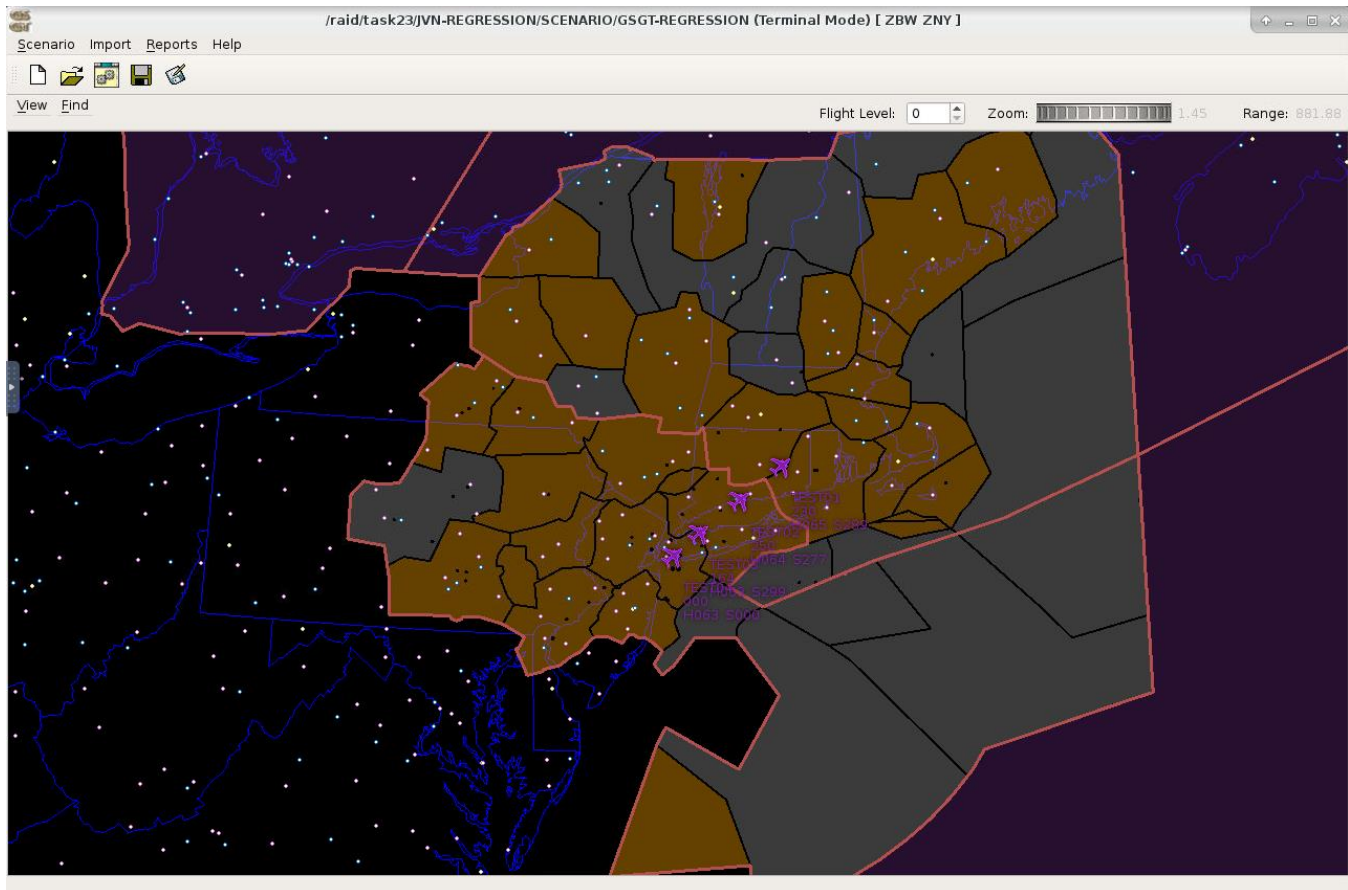


Figure 4. GSGT GUI

3.3.1. Menu Bar

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

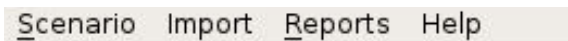


Figure 5. Menu Bar

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

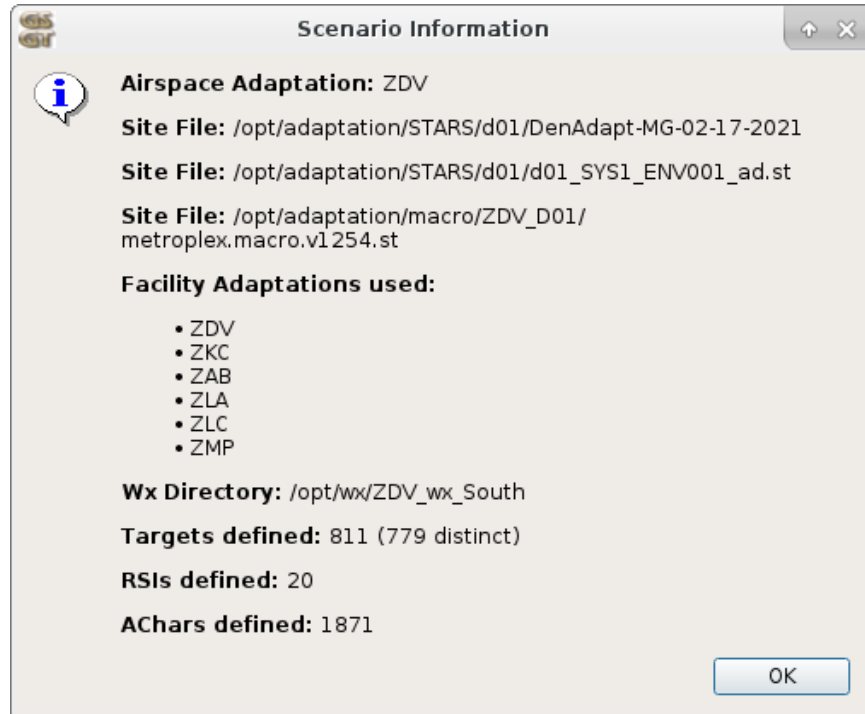


Figure 7. Scenario Information

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.

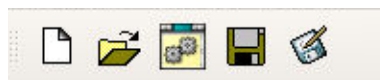


Figure 8. Toolbar

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**.

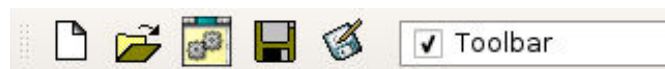


Figure 9. Toolbar Display Control

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 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.

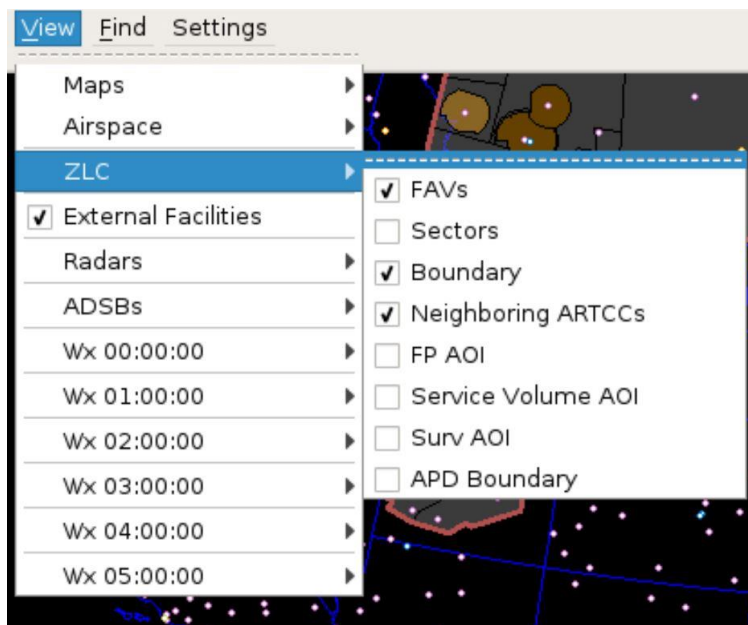


Figure 11. Menu Tear-off

Adaptation elements available for display are:

Maps

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

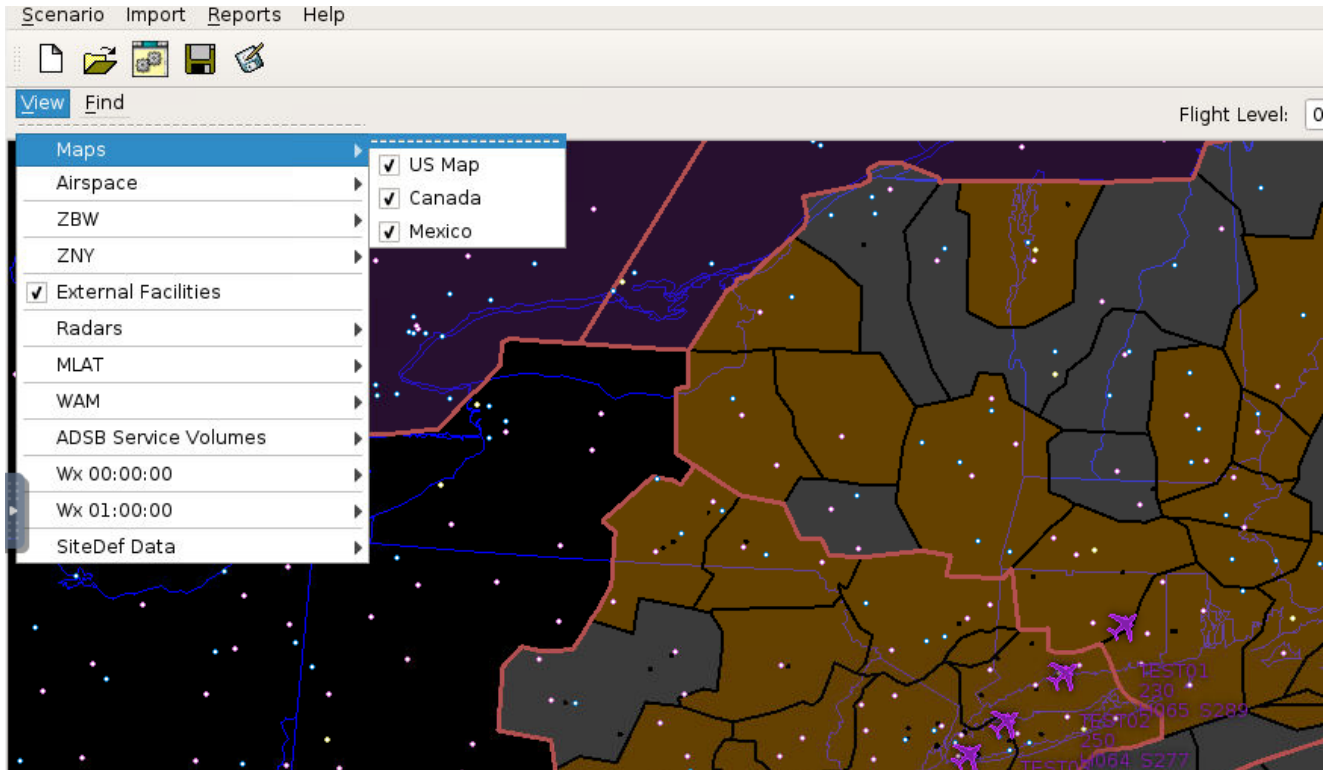


Figure 12. Map Selection

Background maps are available if an internet connection is established and include Virtual Earth, Open Street Map, Google Satellite, Google Street, Google Terrain, Stamen, and ThunderForest. STARS maps are also 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 'phi' are available. The default is No Background Map.

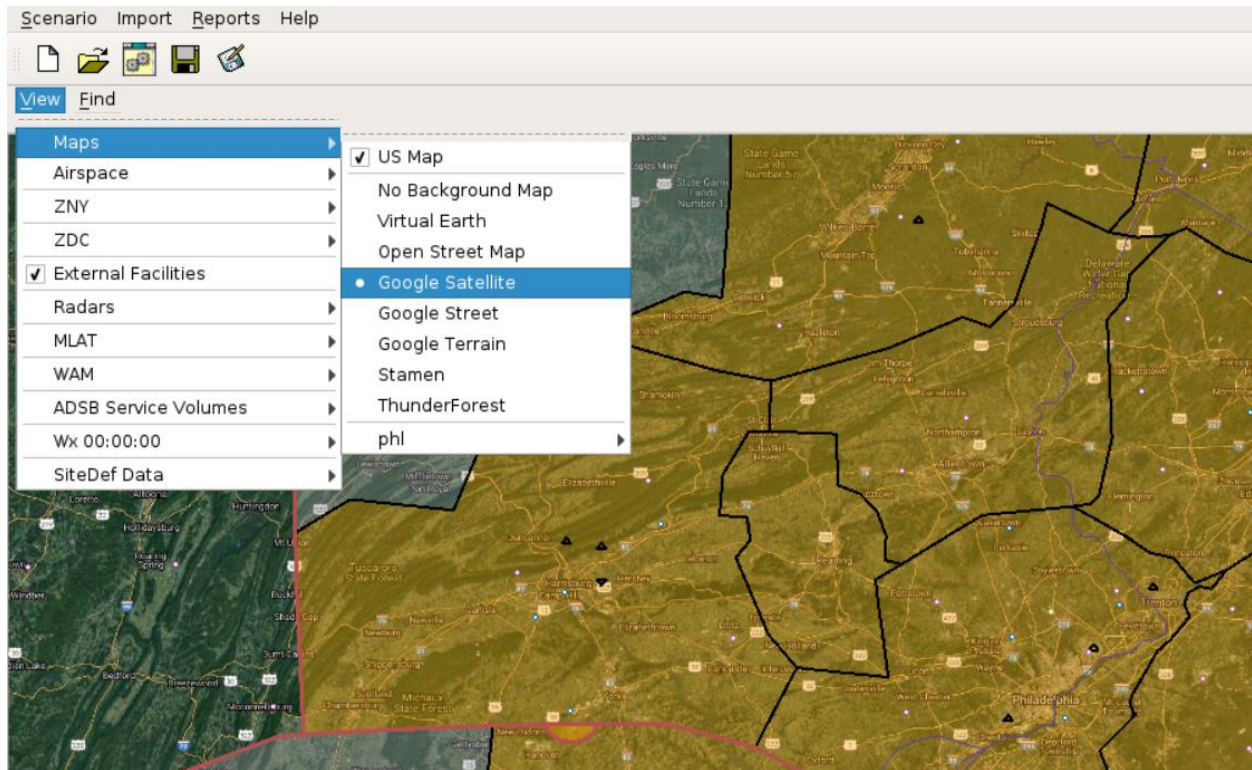


Figure 13. Background Maps

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 need to be 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>
```

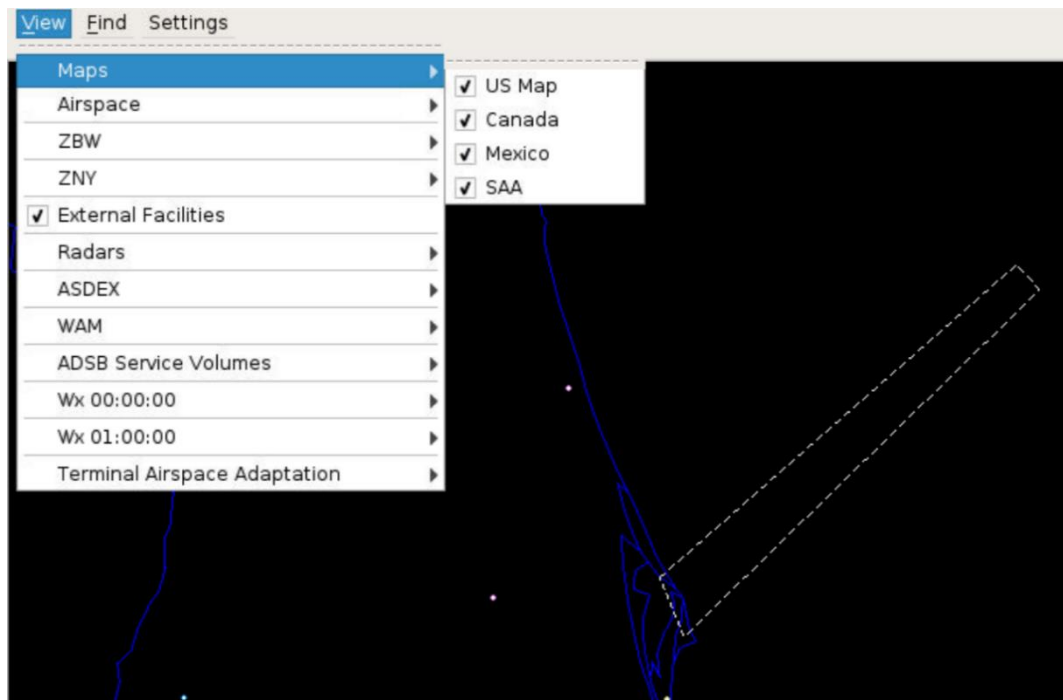


Figure 14. Customized “SAA” map overlay added to Maps

Airspace

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

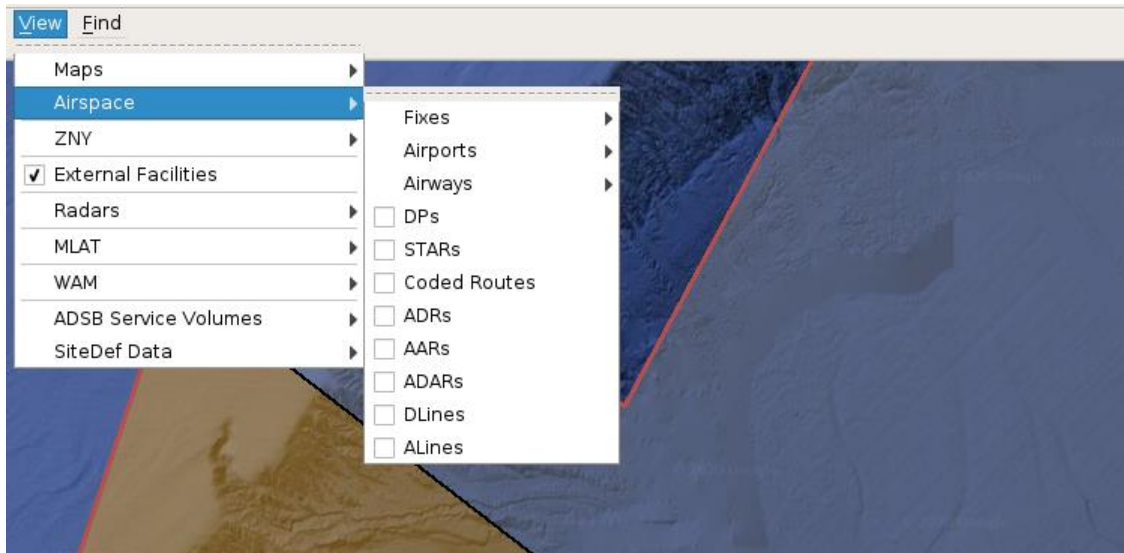


Figure 15. Airspace Options

Fixes

Contains a submenu with the following:

- VORs (white and purple dots)
- VOR Labels (purple letters)
- DMEs (white and olive dots)
- DMEs Labels (olive 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)
- Fix Aliases (white and turquoise dots)
- Fix Alias Labels (gray letters)

Airports

Contains a submenu with the following:

- Airports (green and white triangles)
- Airport Labels (green letters)
- Airport Aliases (green and white triangles)
- Airport Alias 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)

DPs

Departure Procedure (turquoise lines and points)

STARs

Standard Terminal Arrival Route (turquoise lines and points)

Coded Routes

adapted routes (heavy tan lines and turquoise points)

ADRs

Adapted Departure Routes (teal lines, gray points, and turquoise points and airports)

AARs

Adapted Arrival Routes (teal lines, gray points, and turquoise points and airports)

ADARs

Adapted Departure/Arrival Routes (teal lines, gray points, and turquoise points and airports)

DLines

lines in the airspace if crossed, the flight is forced onto a ADR (green lines and gray points)

ALines

lines in the airspace if crossed, the flight is forced onto a AAR (green lines and gray points)

ARTCC Name

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

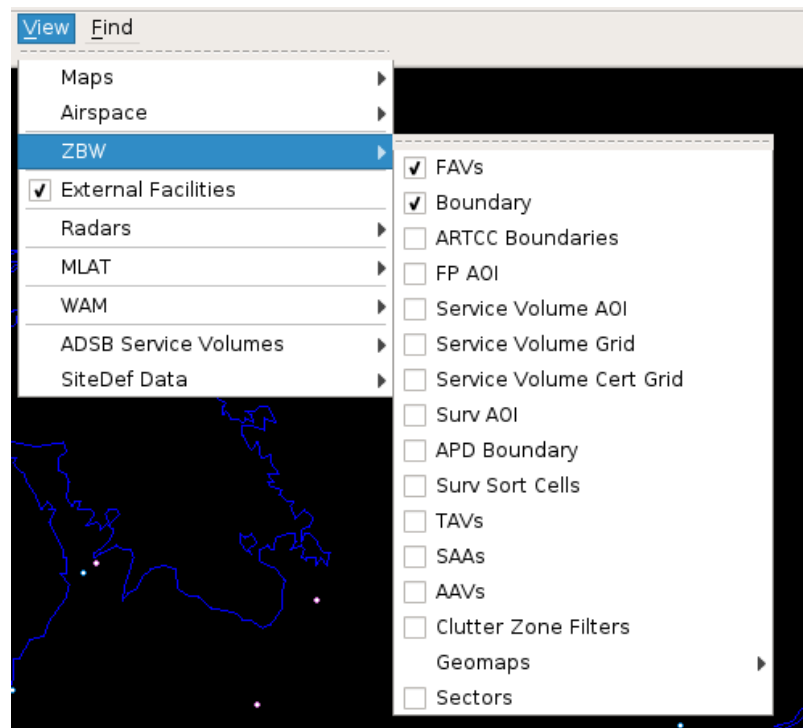


Figure 16. ARTCC Options

FAVs

Fixed Airspace Volumes (gray for ARTCC and orange for Terminal airspace)

Boundary

Area of responsibility (AOR) boundary (red line)

ARTCC Boundaries

Boundaries of all ARTCCs (dark red)

FP AOI

Flight Plan (FP) 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)

Surv Sort Cells

Radar Surveillance Sort Cell Grid (green)

TAVs

Terrain Alert Volumes (yellow cross-hatching with red outline)

SAA

Special Activities Airspace (solid orange lines, with dotted-line buffer area)

AAVs

Aircraft Alert Volumes (purple)

Clutter Zone Filters

(gray)

Geomaps

Contains a submenu with the names of the adapted Geomaps (white)

Sectors

Contains a submenu with the adapted sector plans (green)

External Facilities

When checked, this option displays adapted non-US airspace shaded in purple.

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.

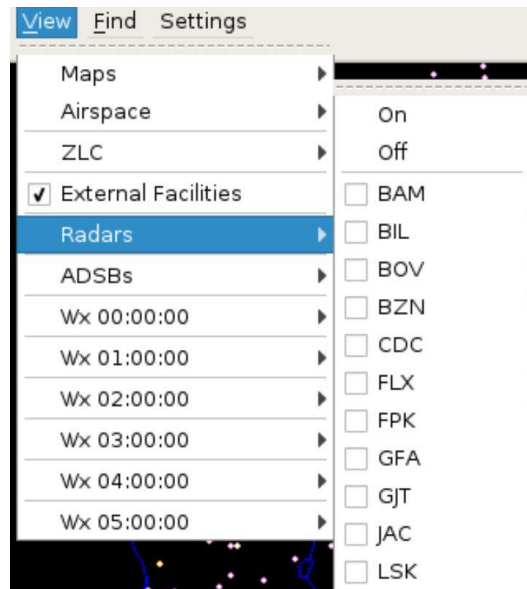


Figure 17. Radar Options

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.

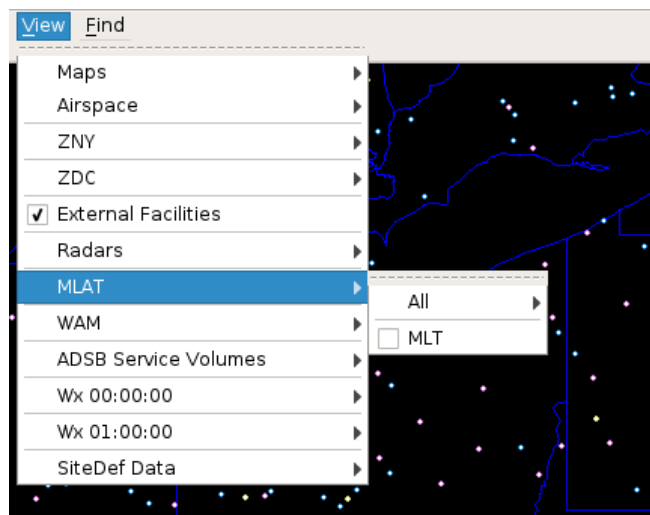


Figure 18. ASDEX Options

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.

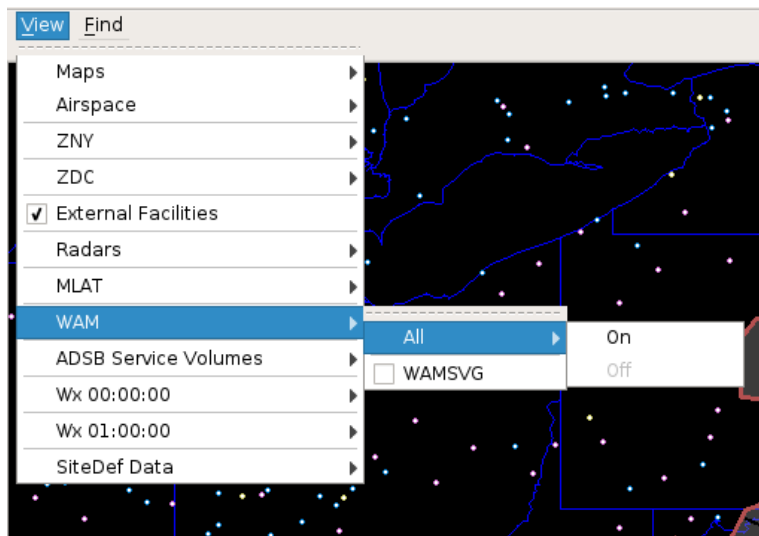


Figure 19. WAM Options

ADS-B Service Volumes

The ADS-B Service Volumes 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 20. ADS-B Options

WX hh:mm:ss

If the target scenario includes a weather scenario, a WX submenu is available for each weather forecast hour and displays Temperature (various colors), Pressure (gray contour lines), Wind, (white arrow vectors) and Precipitation (various colors).

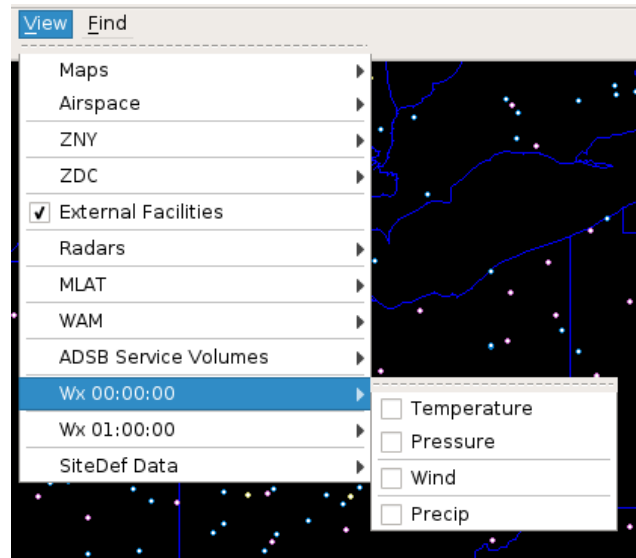


Figure 21. Weather Options

Terminal Airspace Adaptation

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

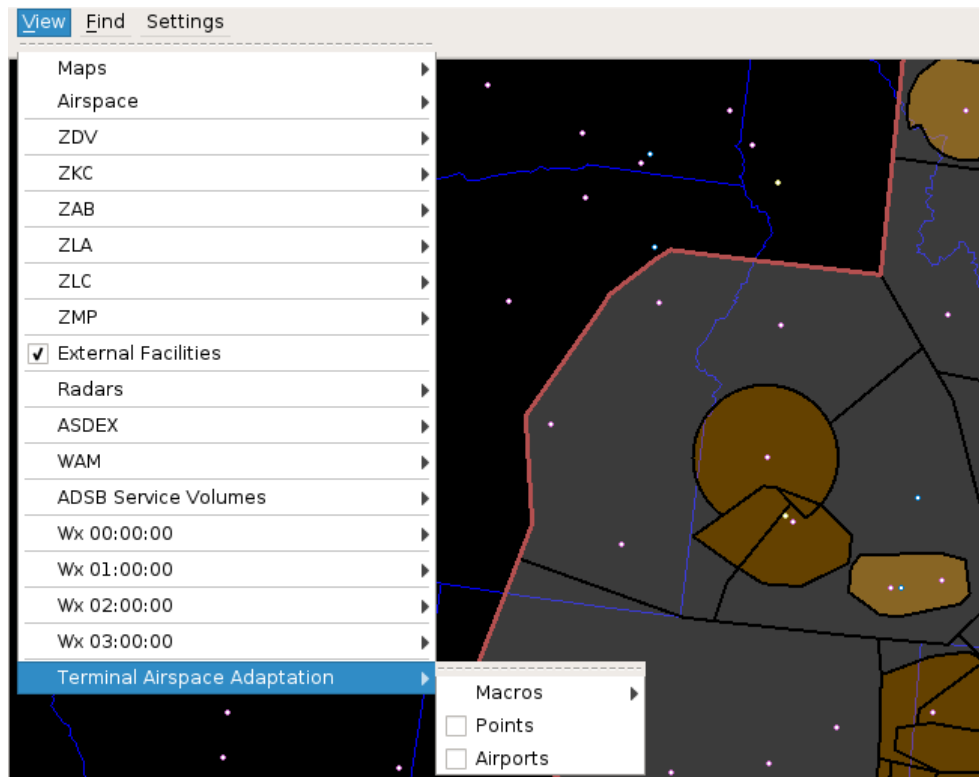


Figure 22. Site Definition Data

Macros

User defined route macros.

Points

(yellow dots)

Airports

(purple triangles)

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.

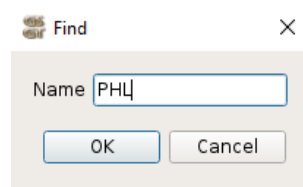


Figure 23. Find Menu

Settings

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

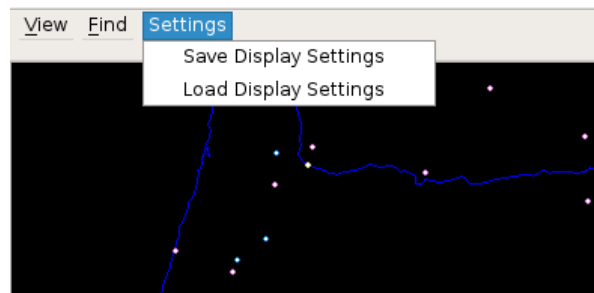


Figure 24. Settings Options

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.

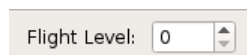


Figure 25. Flight Level

Zoom

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



Figure 26. Zoom

Range

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

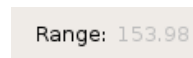


Figure 27. Range

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 in any particular location on the map. Holding down the **SHIFT** key and left-click dragging the mouse will display spherical distance in nmi, heading, both true and magnetic, and delta X/Y system coordinates.

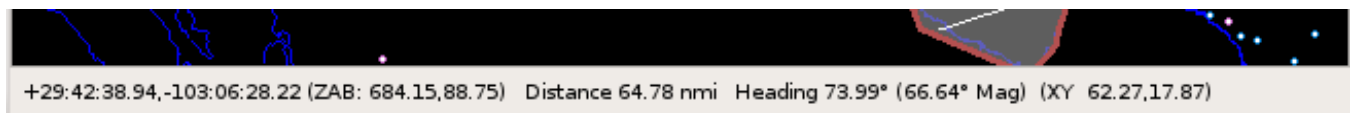


Figure 28. Status Bar

3.3.5. Context Boxes

Shift+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.

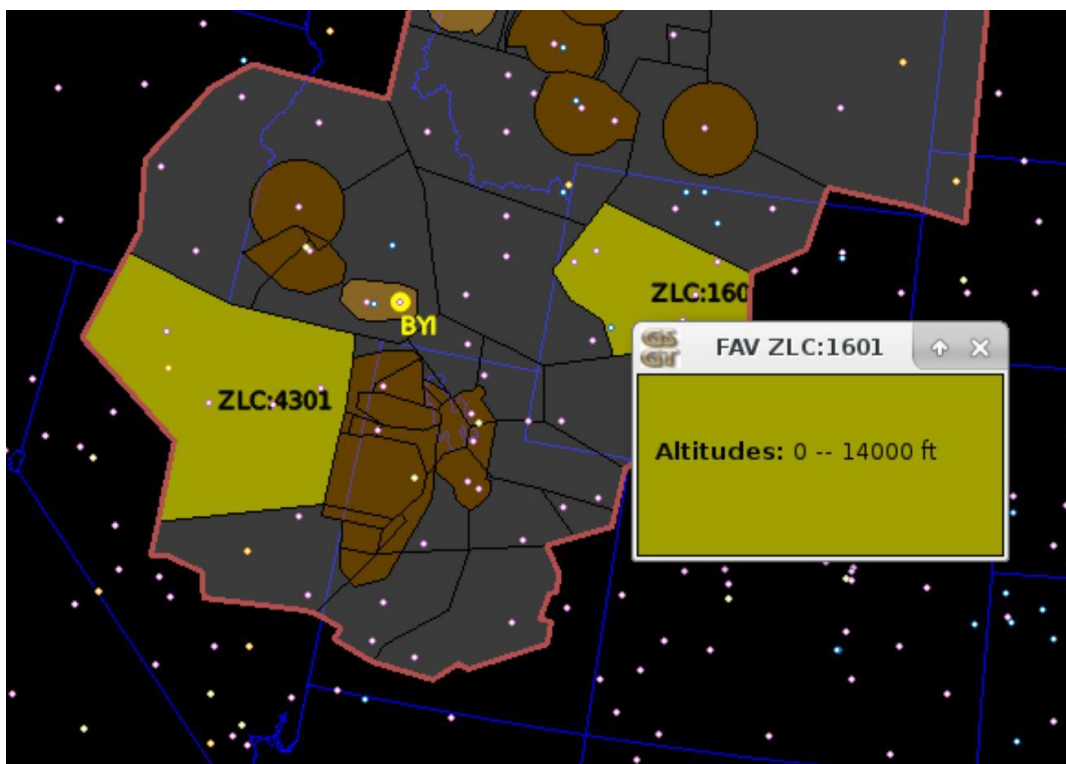


Figure 29. Context Boxes

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 adaptation 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.

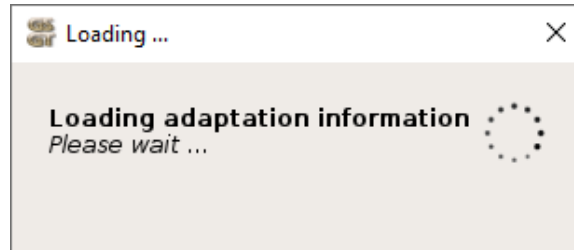


Figure 30. Loading Adaptation List

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.

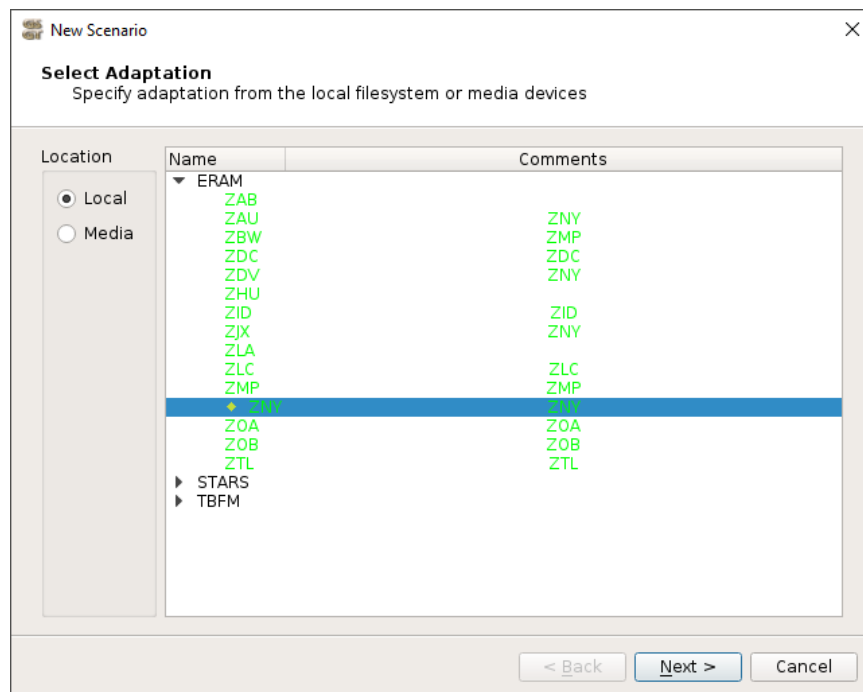


Figure 31. Selecting an ERAM Adaptation

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).

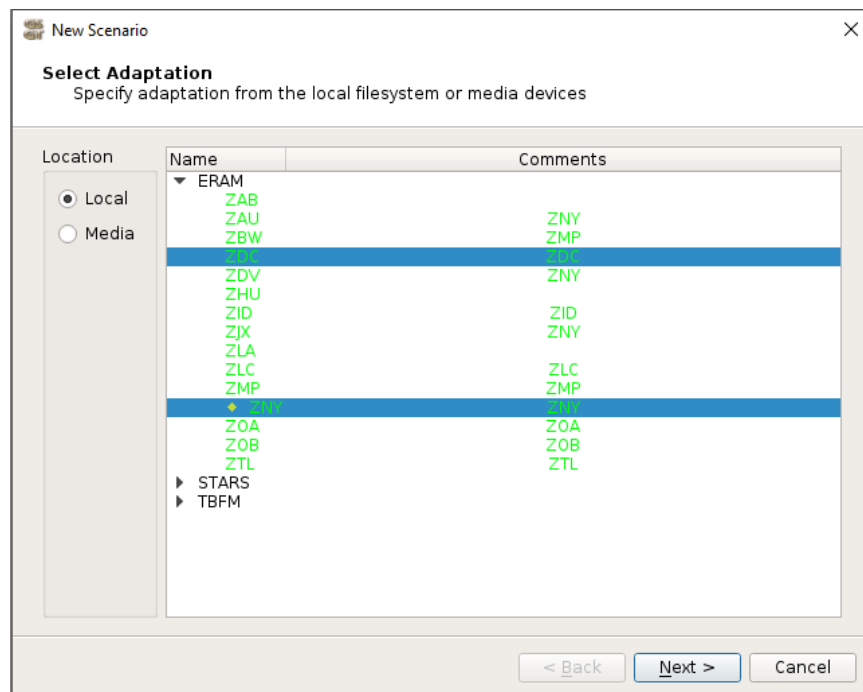


Figure 32. Selecting Multiple ERAM Adaptations

4.1.1.3. Adding Child Adaptation or Customization File

To add child adaptation (Terminal, 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.

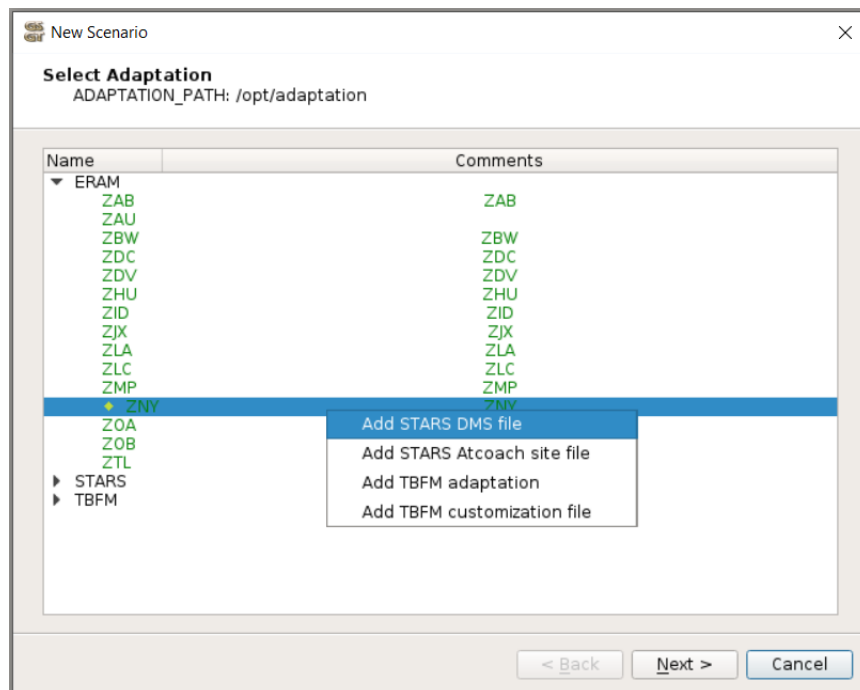


Figure 33. Adding STARS DMS File

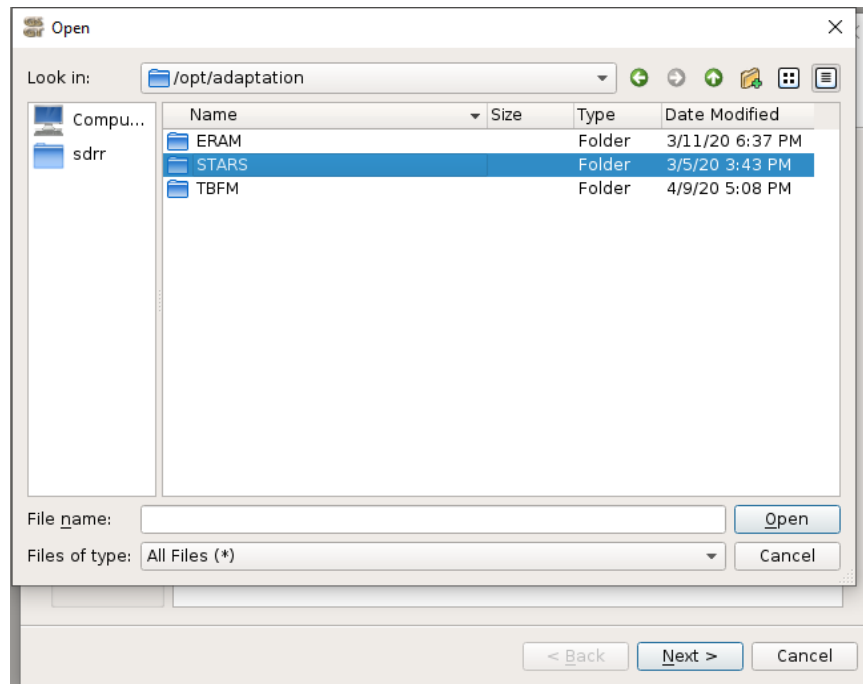


Figure 34. Selecting the DMS File Location

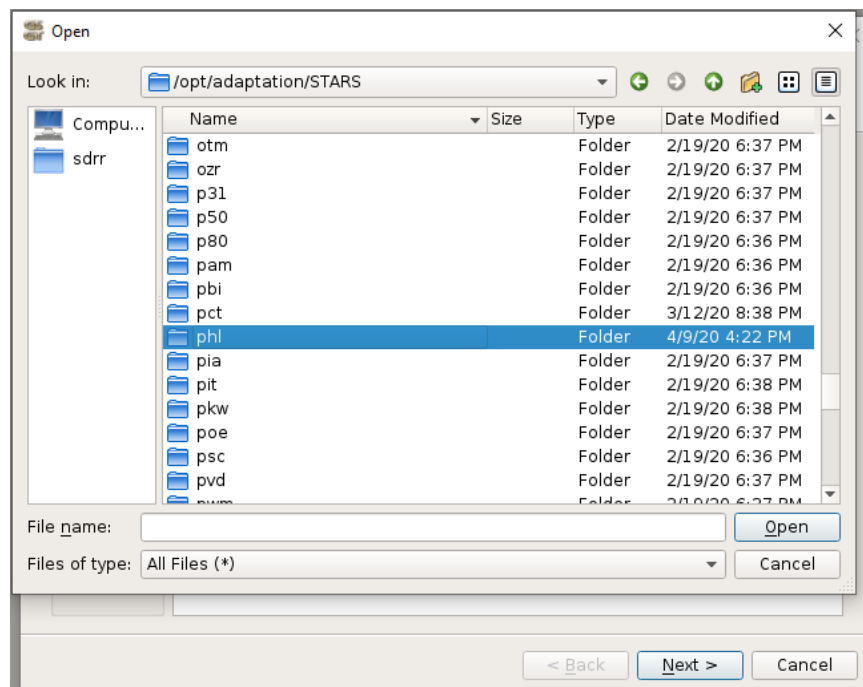


Figure 35. Selecting the TRACON Folder

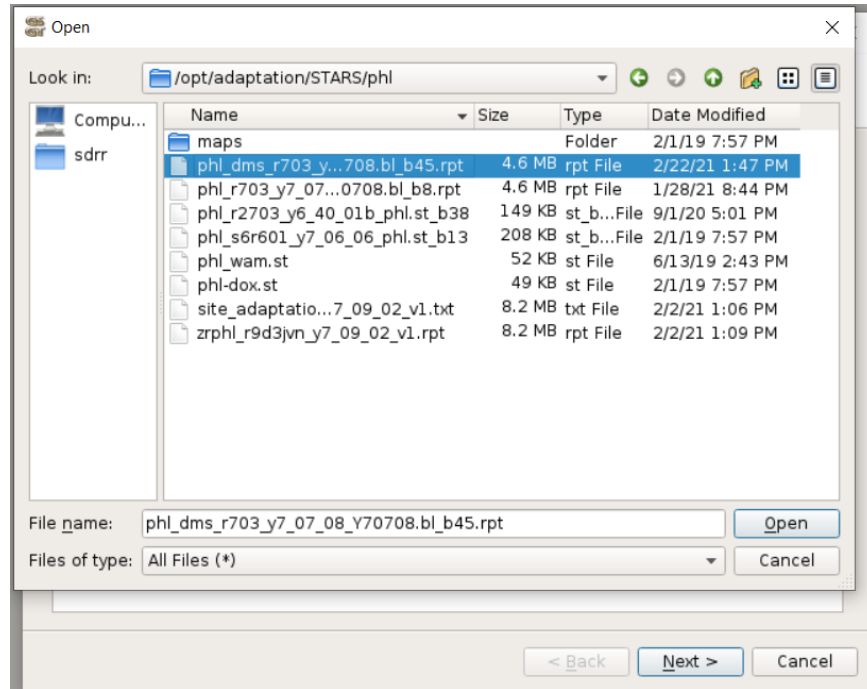


Figure 36. Selecting a DMS Report File

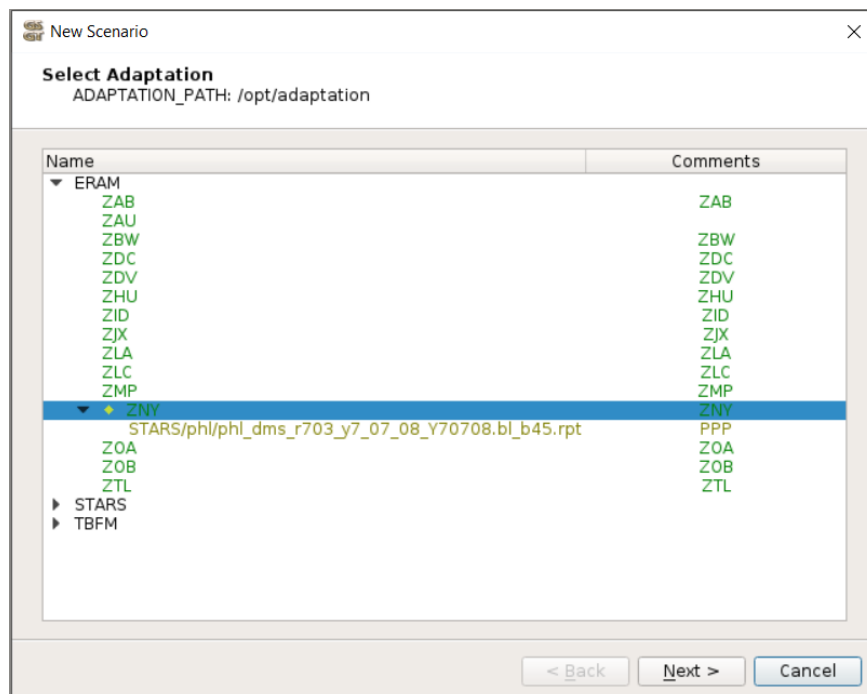


Figure 37. STARS DMS Report File Added

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.

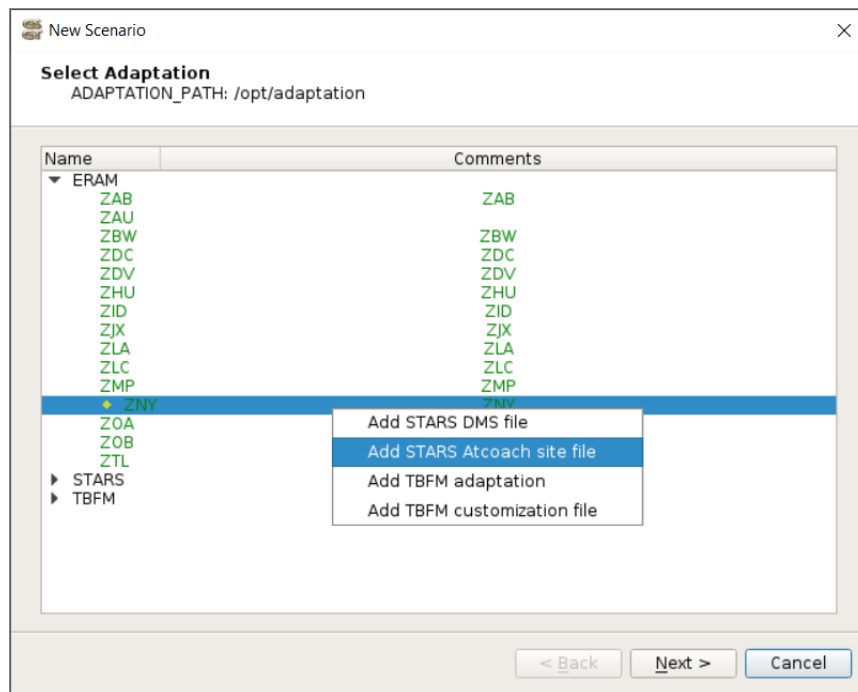


Figure 38. Adding STARS Adaptation

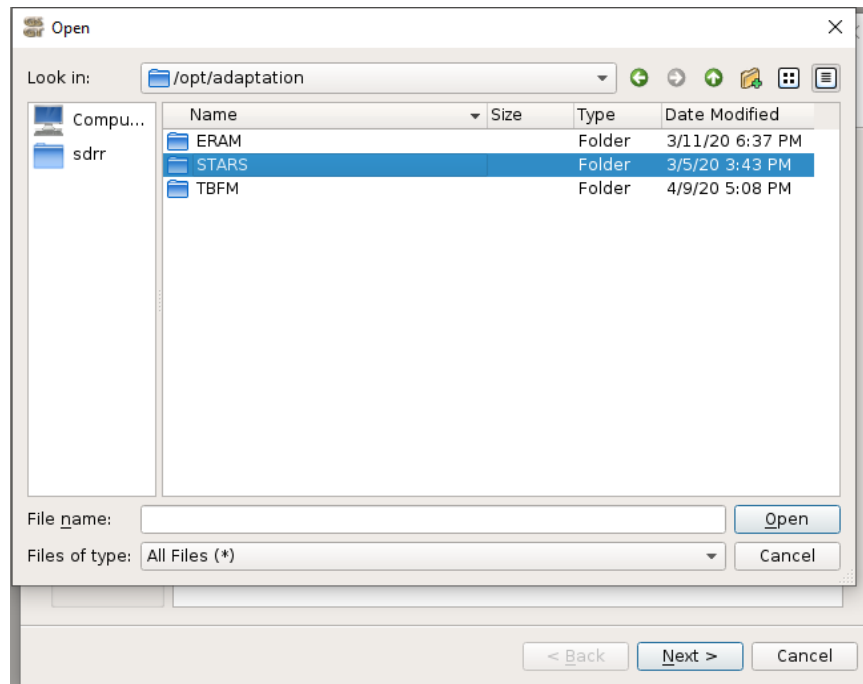


Figure 39. Selecting the STARS Adaptation Location

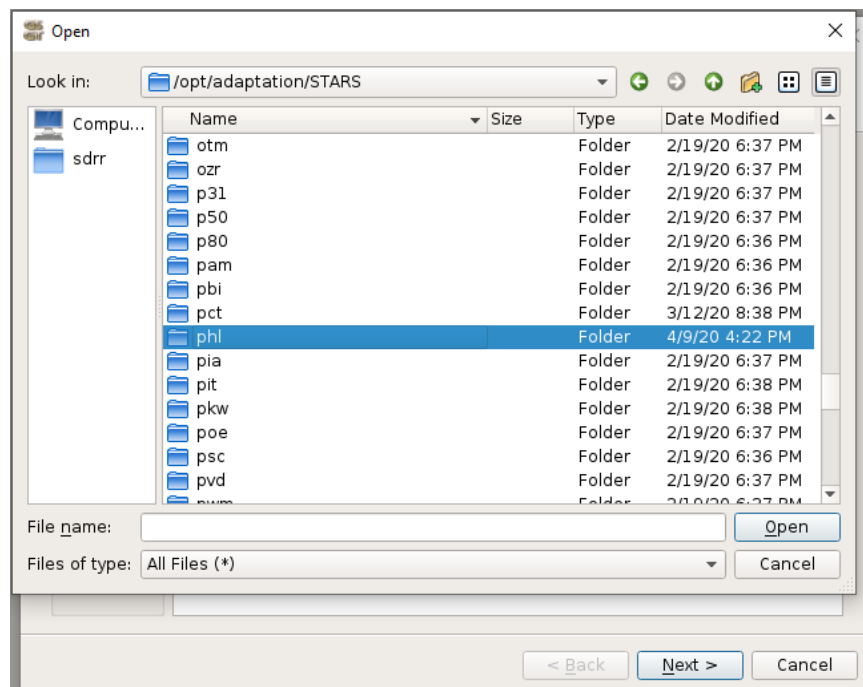


Figure 40. Selecting the TRACON Folder

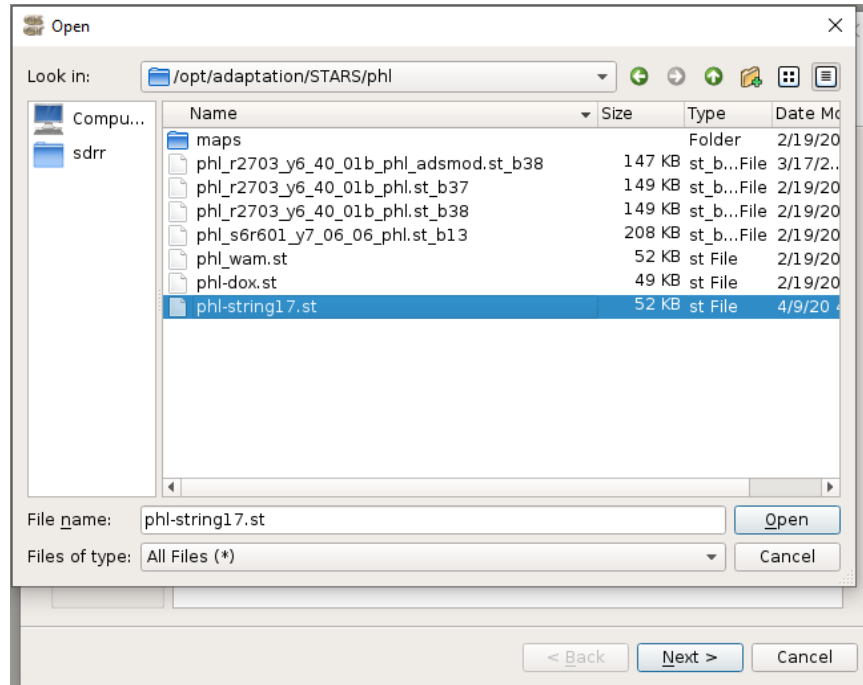


Figure 41. Selecting a Site File

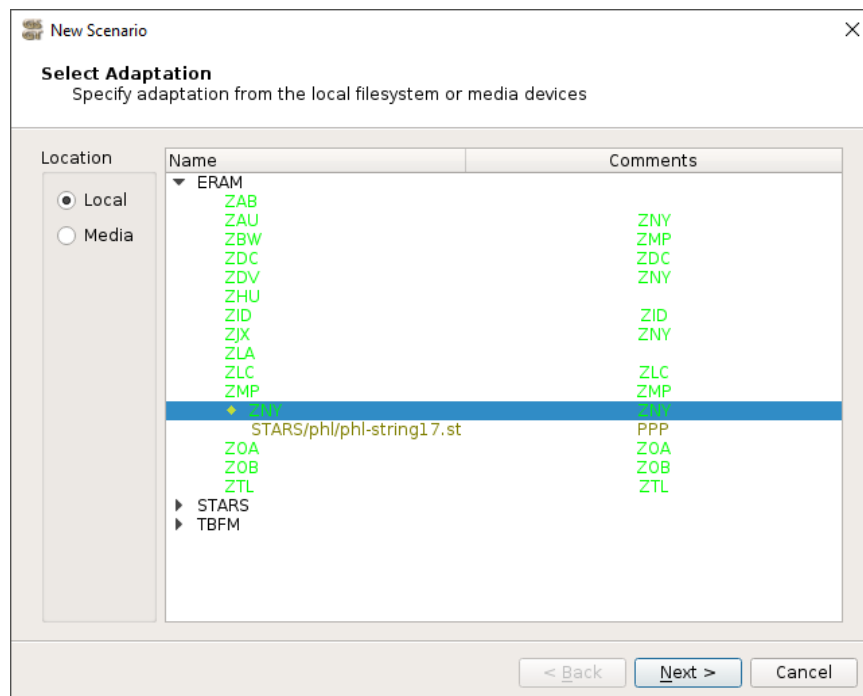


Figure 42. STARS Adaptation Added

4.1.1.3.3. 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.

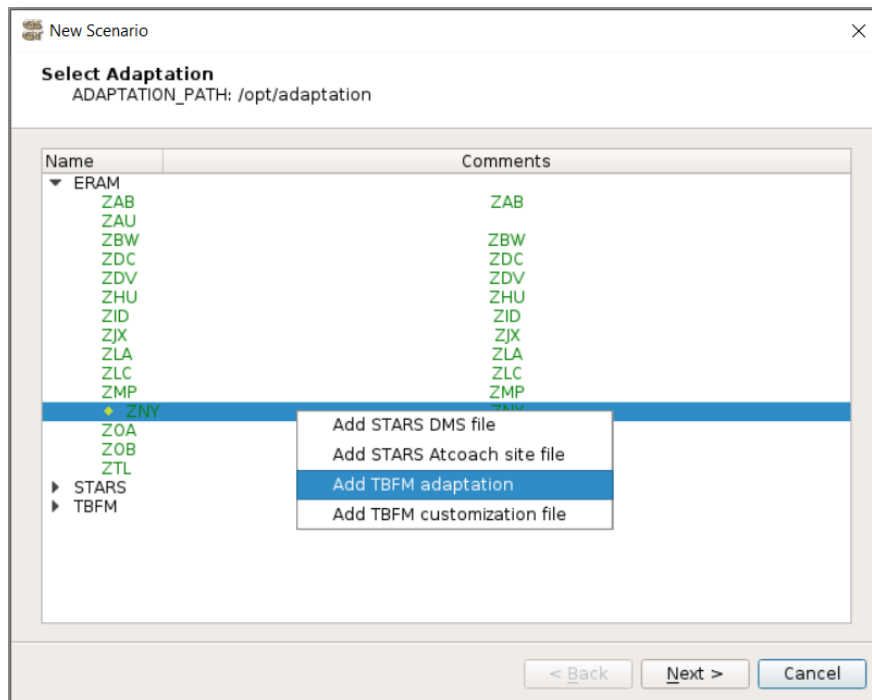


Figure 43. Adding TBFM Adaptation

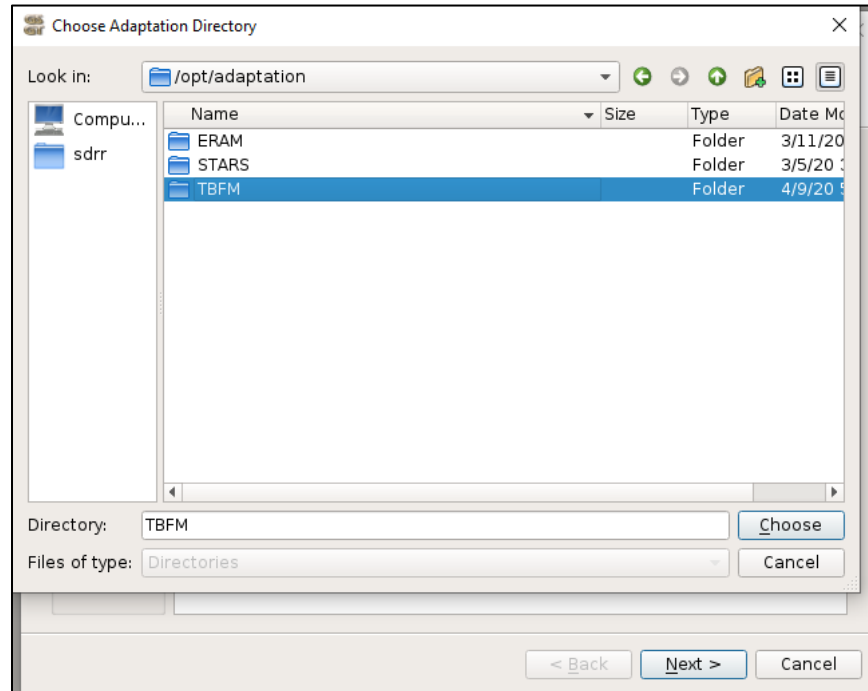


Figure 44. Selecting TBFM Location

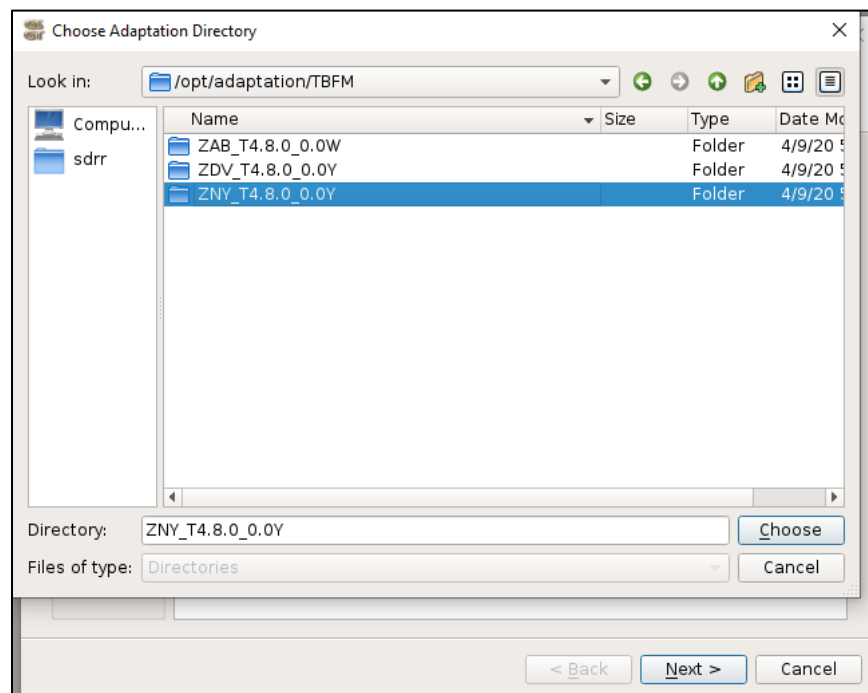


Figure 45. Selecting TBFM Adaptation

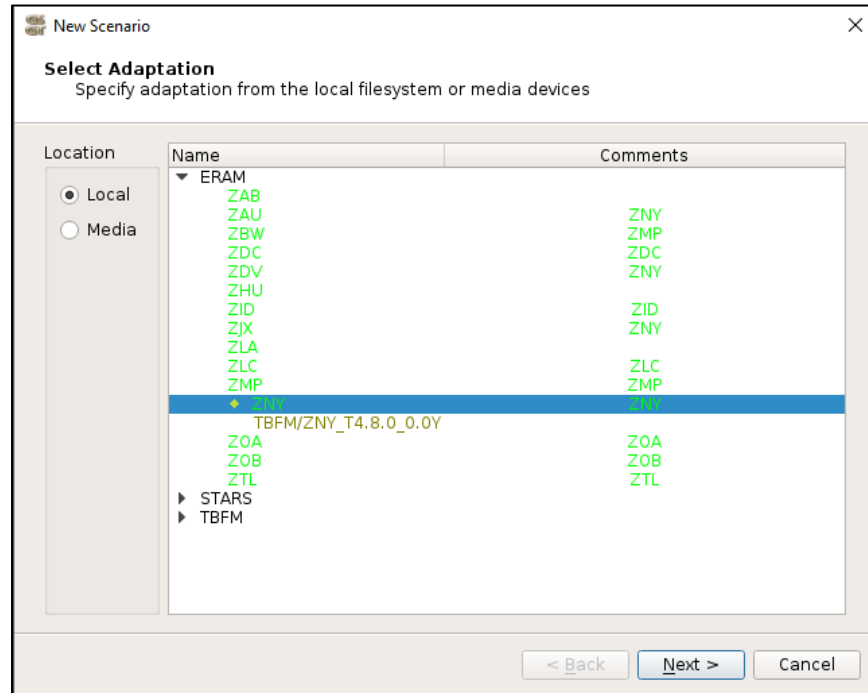


Figure 46. TBFM Adaptation Added

4.1.1.3.4. 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.

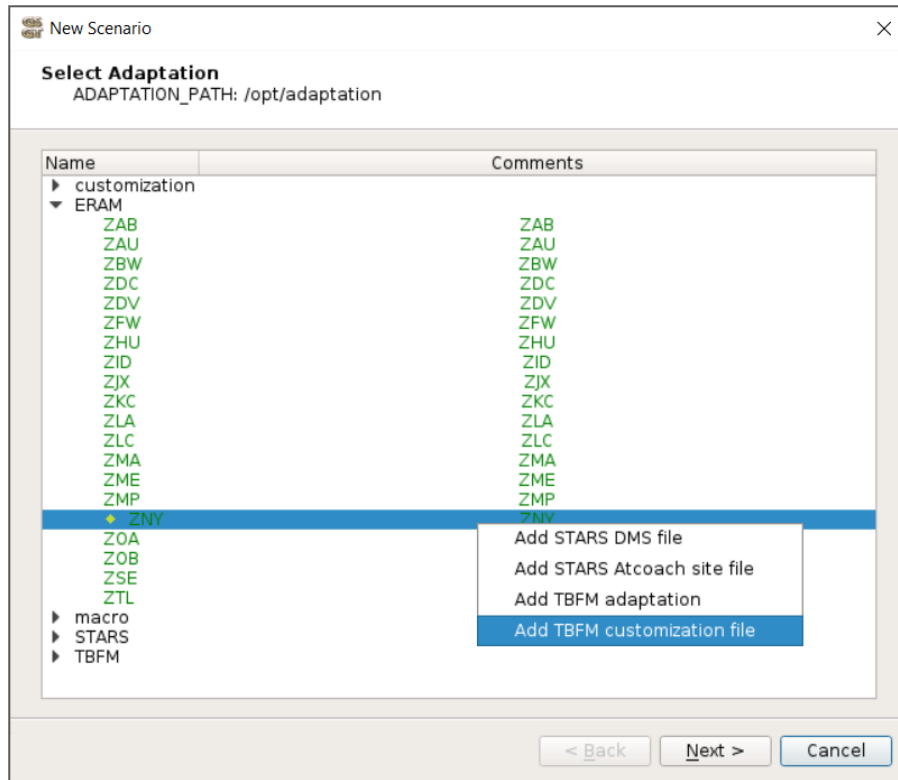


Figure 47. Adding a TBFM Customization File

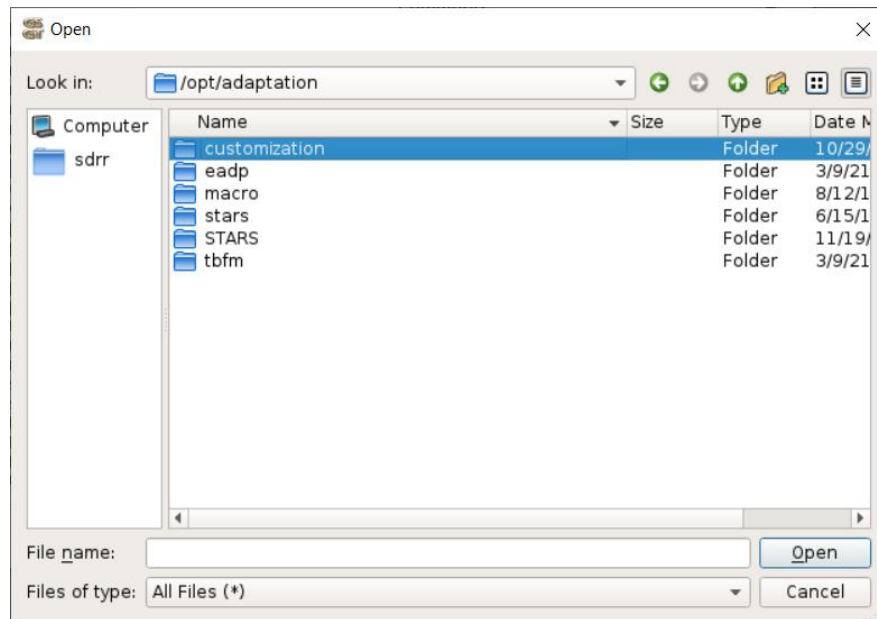


Figure 48. Selecting TBFM Customization File Location

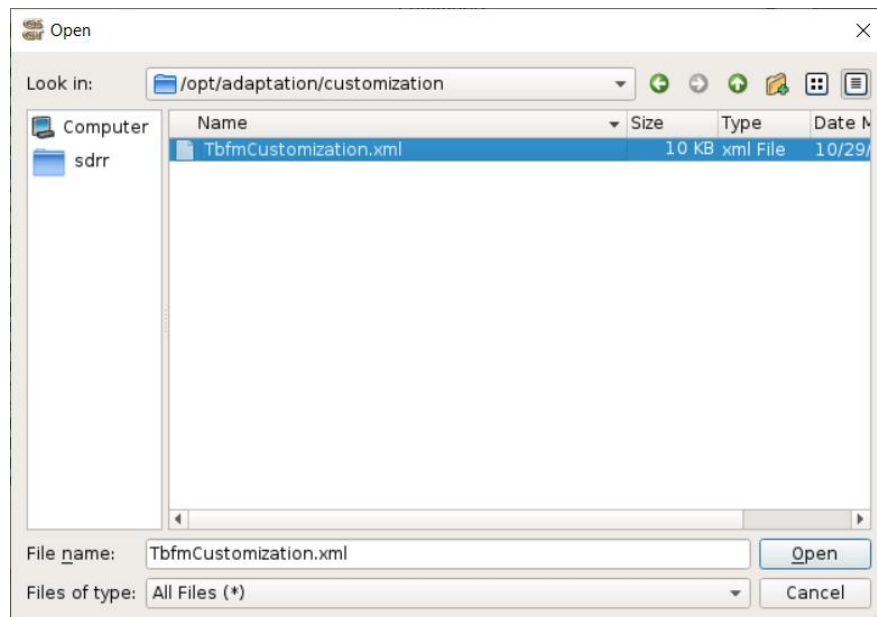


Figure 49. Selecting TBFM Customization File

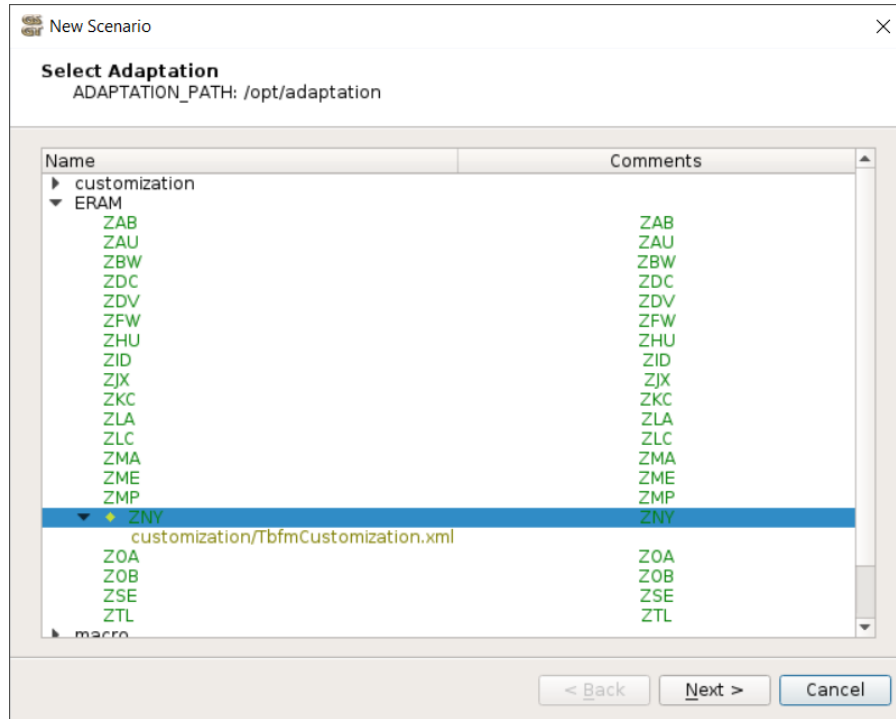


Figure 50. TBFM Customization File Added

4.1.1.4. Removing Child Adaptation

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

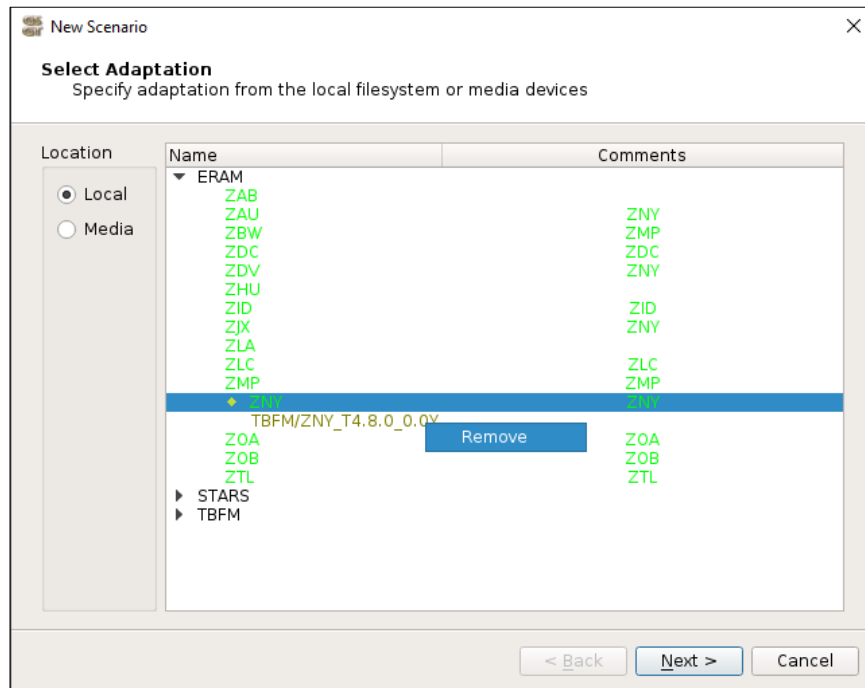


Figure 51. Removing a Child Adaptation

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/ph1/ph1_s6r8a01_y7_08a_Y708A.b1_j3011092022.rpt" name="PPP"/>
      <tbfm dir="TBFM/ZNY_T4.8.3_2.0"/>
    </eadp>
  </airspace>
  ...

```

4.1.2. Scenario Location and Name

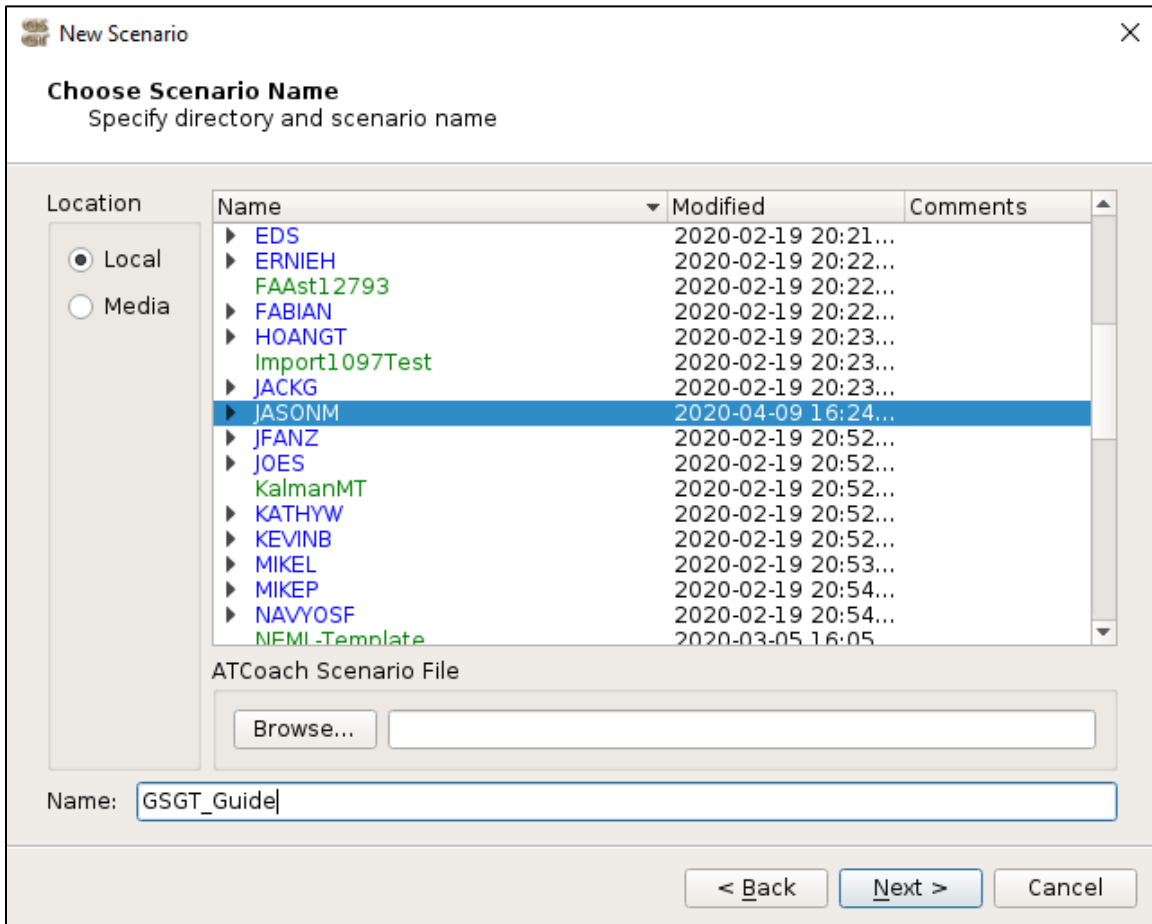


Figure 52. Selecting a Scenario Location and Name

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.

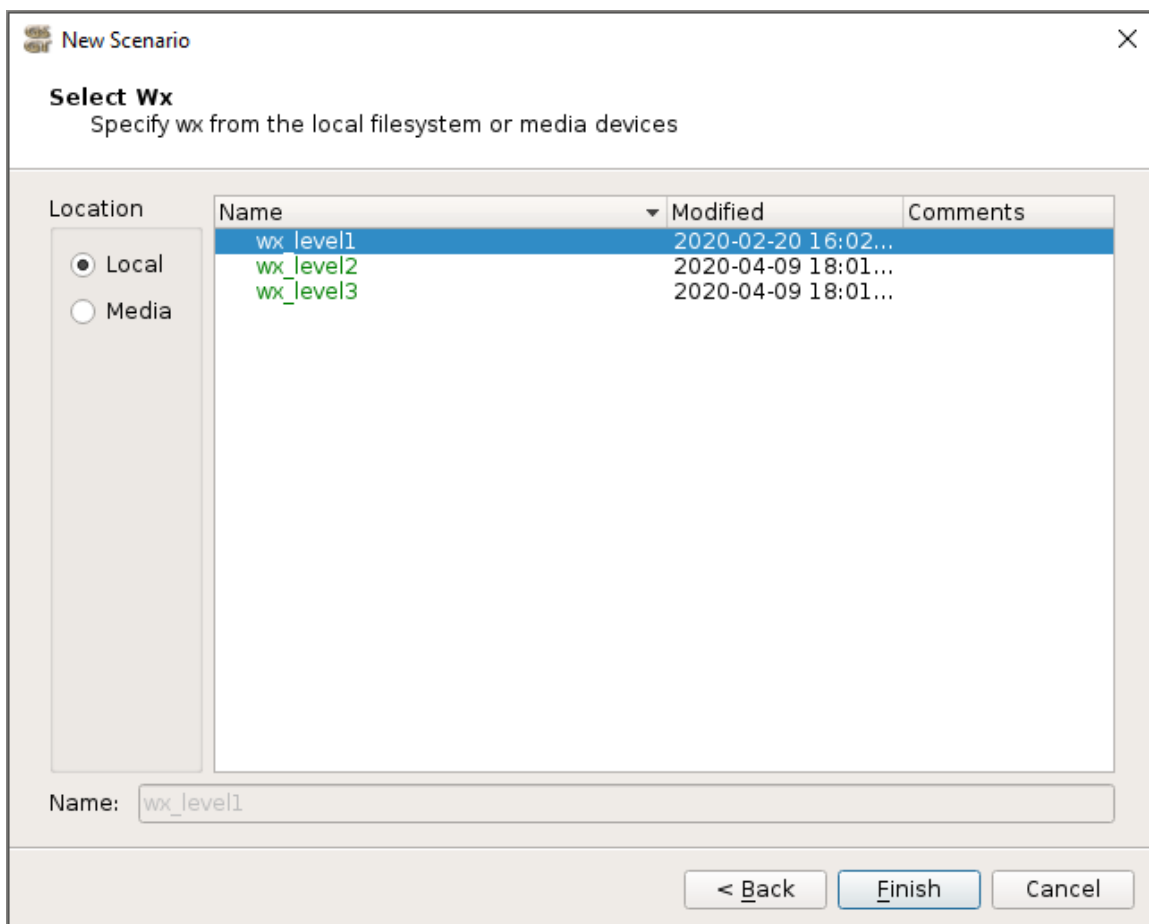


Figure 53. Selecting a Weather Scenario

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.

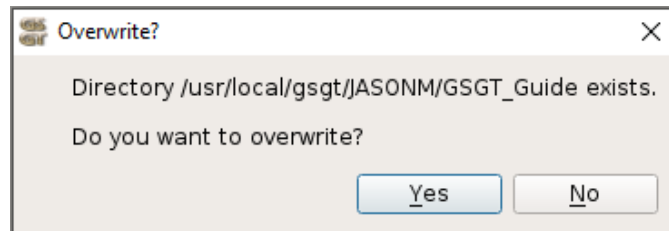


Figure 54. Scenario Overwrite Warning

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.

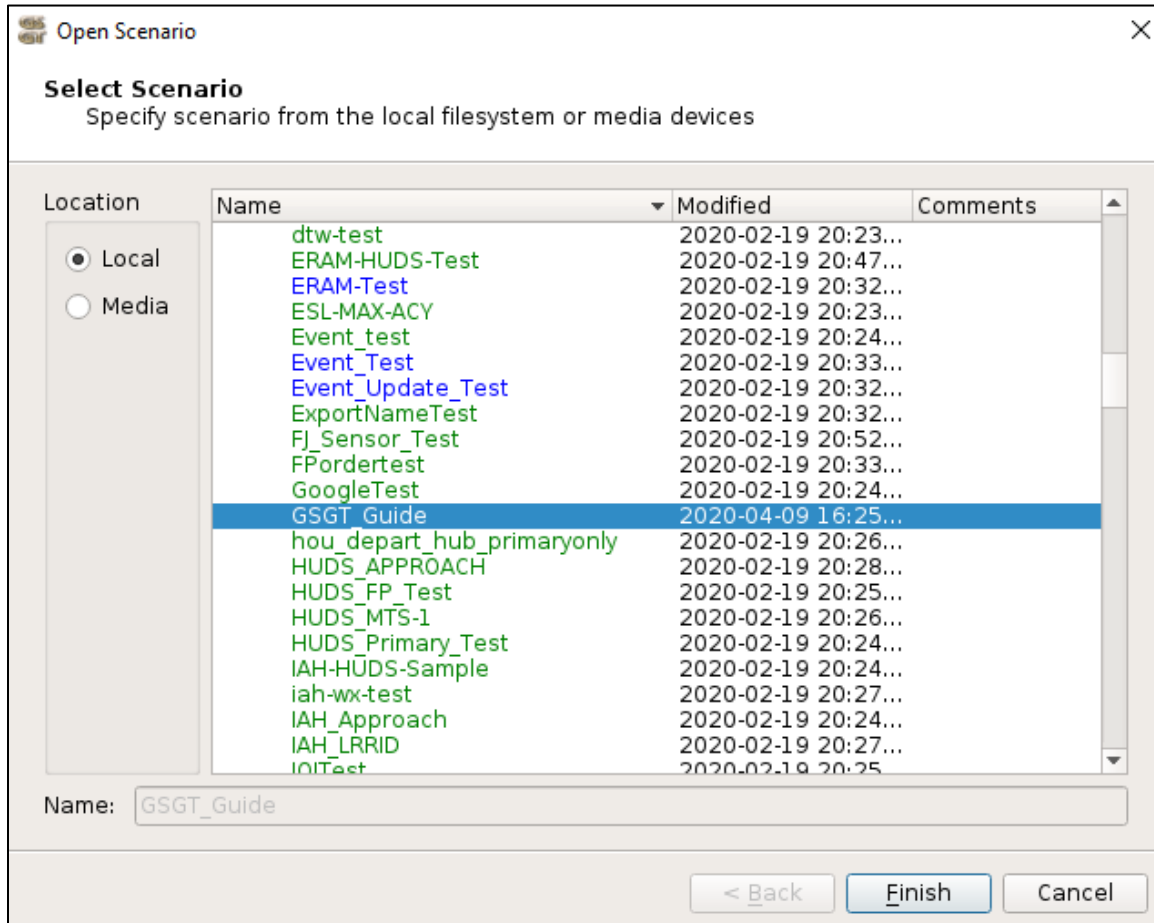


Figure 55. Opening an Existing Scenario

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 56. 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.

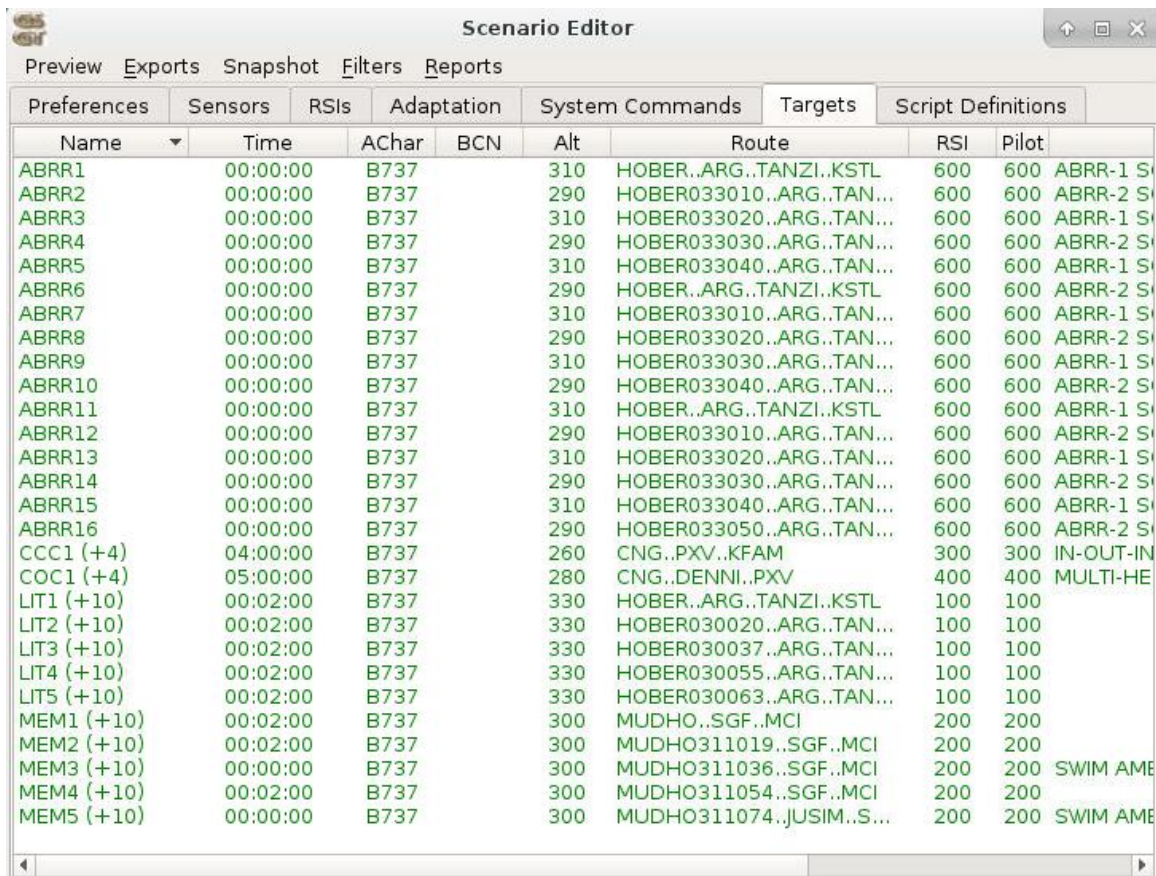


Figure 57. Loading Errors

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.



| Name | Time | AChar | BCN | Alt | Route | RSI | Pilot |
|------------|----------|-------|-----|-----|--------------------------|-----|---------------|
| ABRR1 | 00:00:00 | B737 | | 310 | HOBER..ARG..TANZI..KSTL | 600 | 600 ABRR-1 S |
| ABRR2 | 00:00:00 | B737 | | 290 | HOBER033010..ARG..TAN... | 600 | 600 ABRR-2 S |
| ABRR3 | 00:00:00 | B737 | | 310 | HOBER033020..ARG..TAN... | 600 | 600 ABRR-1 S |
| ABRR4 | 00:00:00 | B737 | | 290 | HOBER033030..ARG..TAN... | 600 | 600 ABRR-2 S |
| ABRR5 | 00:00:00 | B737 | | 310 | HOBER033040..ARG..TAN... | 600 | 600 ABRR-1 S |
| ABRR6 | 00:00:00 | B737 | | 290 | HOBER..ARG..TANZI..KSTL | 600 | 600 ABRR-2 S |
| ABRR7 | 00:00:00 | B737 | | 310 | HOBER033010..ARG..TAN... | 600 | 600 ABRR-1 S |
| ABRR8 | 00:00:00 | B737 | | 290 | HOBER033020..ARG..TAN... | 600 | 600 ABRR-2 S |
| ABRR9 | 00:00:00 | B737 | | 310 | HOBER033030..ARG..TAN... | 600 | 600 ABRR-1 S |
| ABRR10 | 00:00:00 | B737 | | 290 | HOBER033040..ARG..TAN... | 600 | 600 ABRR-2 S |
| ABRR11 | 00:00:00 | B737 | | 310 | HOBER..ARG..TANZI..KSTL | 600 | 600 ABRR-1 S |
| ABRR12 | 00:00:00 | B737 | | 290 | HOBER033010..ARG..TAN... | 600 | 600 ABRR-2 S |
| ABRR13 | 00:00:00 | B737 | | 310 | HOBER033020..ARG..TAN... | 600 | 600 ABRR-1 S |
| ABRR14 | 00:00:00 | B737 | | 290 | HOBER033030..ARG..TAN... | 600 | 600 ABRR-2 S |
| ABRR15 | 00:00:00 | B737 | | 310 | HOBER033040..ARG..TAN... | 600 | 600 ABRR-1 S |
| ABRR16 | 00:00:00 | B737 | | 290 | HOBER033050..ARG..TAN... | 600 | 600 ABRR-2 S |
| CCC1 (+4) | 04:00:00 | B737 | | 260 | CNG..PXV..KFAM | 300 | 300 IN-OUT-IN |
| COC1 (+4) | 05:00:00 | B737 | | 280 | CNG..DENNI..PXV | 400 | 400 MULTI-HE |
| LIT1 (+10) | 00:02:00 | B737 | | 330 | HOBER..ARG..TANZI..KSTL | 100 | 100 |
| LIT2 (+10) | 00:02:00 | B737 | | 330 | HOBER030020..ARG..TAN... | 100 | 100 |
| LIT3 (+10) | 00:02:00 | B737 | | 330 | HOBER030037..ARG..TAN... | 100 | 100 |
| LIT4 (+10) | 00:02:00 | B737 | | 330 | HOBER030055..ARG..TAN... | 100 | 100 |
| LIT5 (+10) | 00:02:00 | B737 | | 330 | HOBER030063..ARG..TAN... | 100 | 100 |
| MEM1 (+10) | 00:02:00 | B737 | | 300 | MUDHO..SGF..MCI | 200 | 200 |
| MEM2 (+10) | 00:02:00 | B737 | | 300 | MUDHO311019..SGF..MCI | 200 | 200 |
| MEM3 (+10) | 00:00:00 | B737 | | 300 | MUDHO311036..SGF..MCI | 200 | 200 SWIM AME |
| MEM4 (+10) | 00:02:00 | B737 | | 300 | MUDHO311054..SGF..MCI | 200 | 200 |
| MEM5 (+10) | 00:00:00 | B737 | | 300 | MUDHO311074..JUSIM..S... | 200 | 200 SWIM AME |

Figure 58. 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.

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.

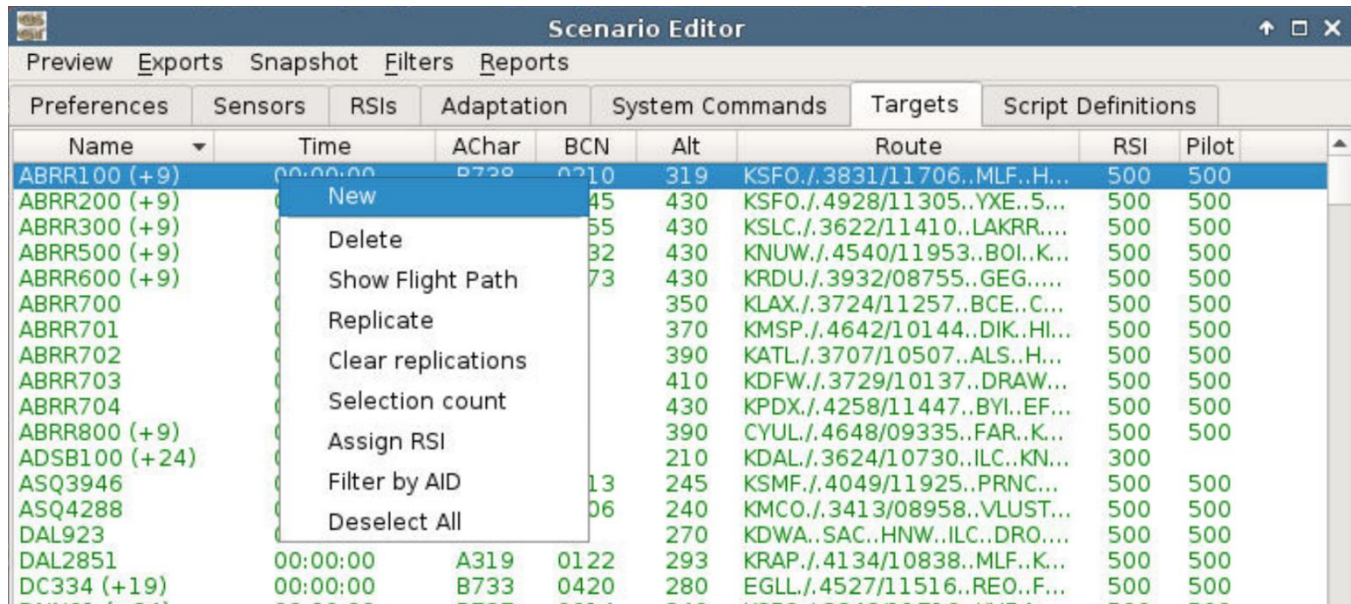


Figure 59. Creating a New Object

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).

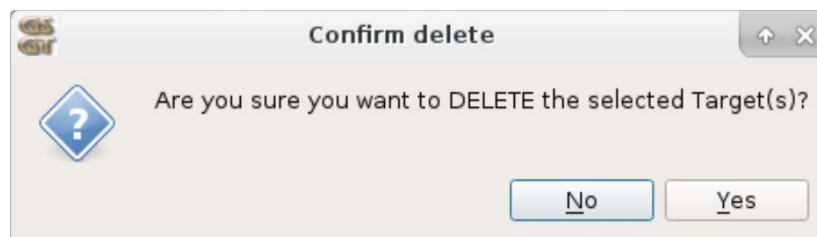
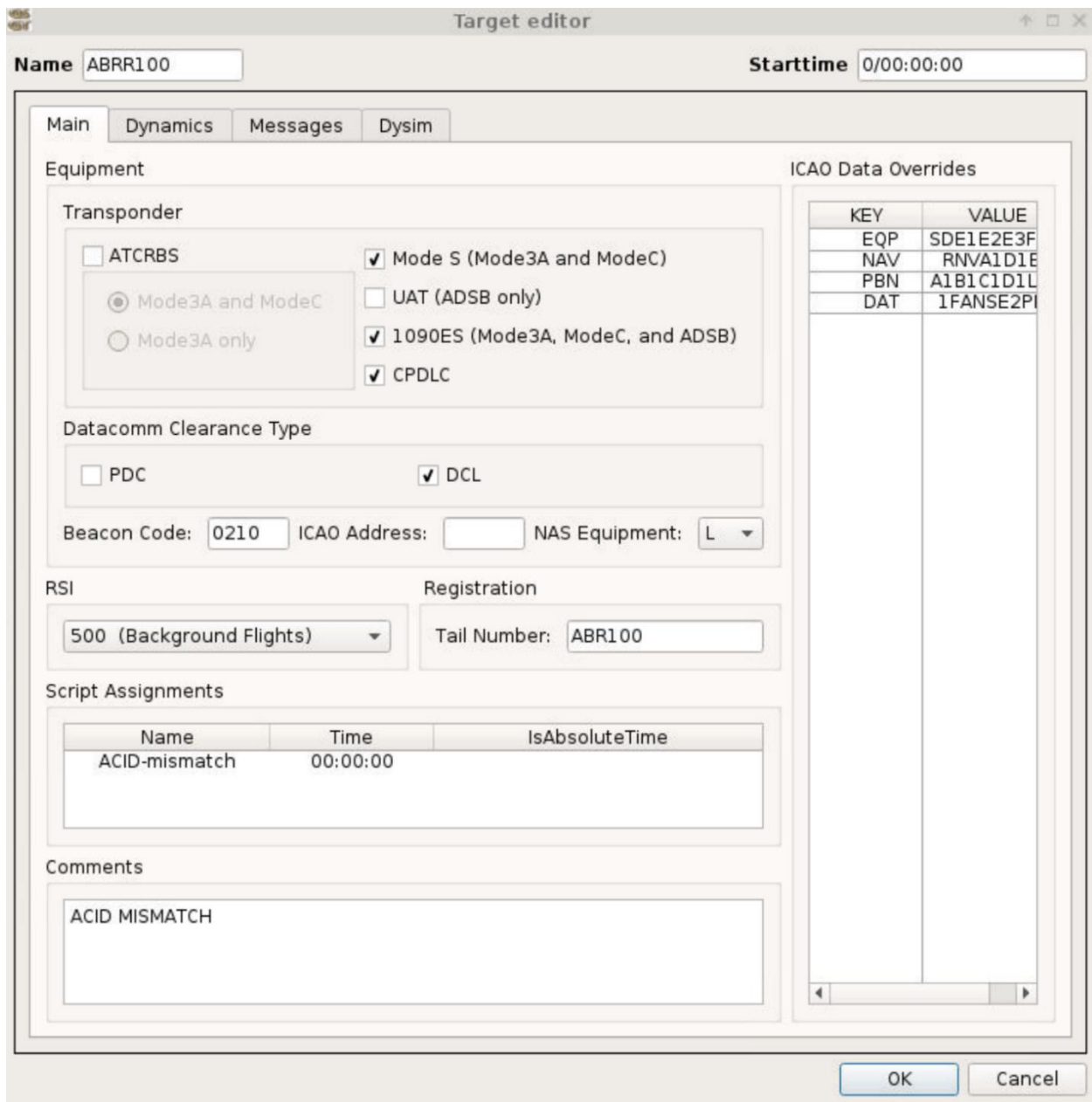


Figure 60. Object Delete Confirmation

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.



Name ABRR100 **Starttime** 0/00:00:00

ATCRBS Mode S (Mode3A and ModeC)
 Mode3A and ModeC UAT (ADSB only)
 Mode3A only 1090ES (Mode3A, ModeC, and ADSB)
 CPDLC

Datacomm Clearance Type
 PDC DCL

Beacon Code: 0210 ICAO Address: NAS Equipment: L

RSI 500 (Background Flights) **Registration** Tail Number: ABR100

| Name | Time | IsAbsoluteTime |
|---------------|----------|----------------|
| ACID-mismatch | 00:00:00 | |

Comments
 ACID MISMATCH

| KEY | VALUE |
|-----|-----------|
| EQP | SDE1E2E3F |
| NAV | RNV1D1E |
| PBN | A1B1C1D1L |
| DAT | 1FANSE2PI |

OK Cancel

Figure 61. 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.

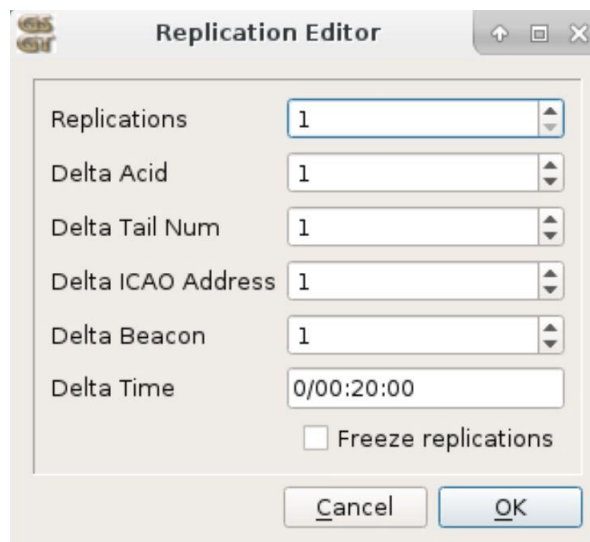


Figure 62. Replication Editor

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.

Scenario Editor

Preview Exports Snapshot Filters Reports

Preferences Sensors RSIs Adaptation System Commands Targets Script Definitions

| Name | Time | AChar | BCN | Alt | Route | RSI | Pilot | Comments |
|------------|----------|-------|-----|-----|--------------------------|-----|-------|--|
| ABRR1 | 00:00:00 | B737 | | 310 | HOBER..ARG..TANZI..KSTL | 600 | 600 | ABRR-1 SCRIPT GROUP 1 |
| ABRR2 | 00:00:00 | B737 | | 290 | HOBER033010..ARG..TAN... | 600 | 600 | ABRR-2 SCRIPT GROUP 1 |
| ABRR3 | 00:00:00 | B737 | | 310 | HOBER033020..ARG..TAN... | 600 | 600 | ABRR-1 SCRIPT GROUP 1 |
| ABRR4 | 00:00:00 | B737 | | 290 | HOBER033030..ARG..TAN... | 600 | 600 | ABRR-2 SCRIPT GROUP 1 |
| ABRR5 (+4) | 00:00:00 | B737 | | 310 | HOBER033040..ARG..TAN... | 600 | 600 | ABRR-1 SCRIPT GROUP 2 |
| ABRR6 | 00:00:00 | B737 | | 290 | HOBER..ARG..TANZI..KSTL | 600 | 600 | ABRR-2 SCRIPT GROUP 2 |
| ABRR7 | 00:00:00 | B737 | | 310 | | | | Replicated Target: x4 time delta = 00:20:00 acid delta = 1 bcn delta 1 |
| ABRR8 | 00:00:00 | B737 | | 290 | HOBER033020..ARG..TAN... | 600 | 600 | ABRR-2 SCRIPT GROUP 2 |
| ABRR9 | 00:00:00 | B737 | | 310 | HOBER033030..ARG..TAN... | 600 | 600 | ABRR-1 SCRIPT GROUP 3 |
| ABRR10 | 00:00:00 | B737 | | 290 | HOBER033040..ARG..TAN... | 600 | 600 | ABRR-2 SCRIPT GROUP 3 |
| ABRR11 | 00:00:00 | B737 | | 310 | HOBER..ARG..TANZI..KSTL | 600 | 600 | ABRR-1 SCRIPT GROUP 3 |
| ABRR12 | 00:00:00 | B737 | | 290 | HOBER033010..ARG..TAN... | 600 | 600 | ABRR-2 SCRIPT GROUP 3 |

Figure 63. 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.

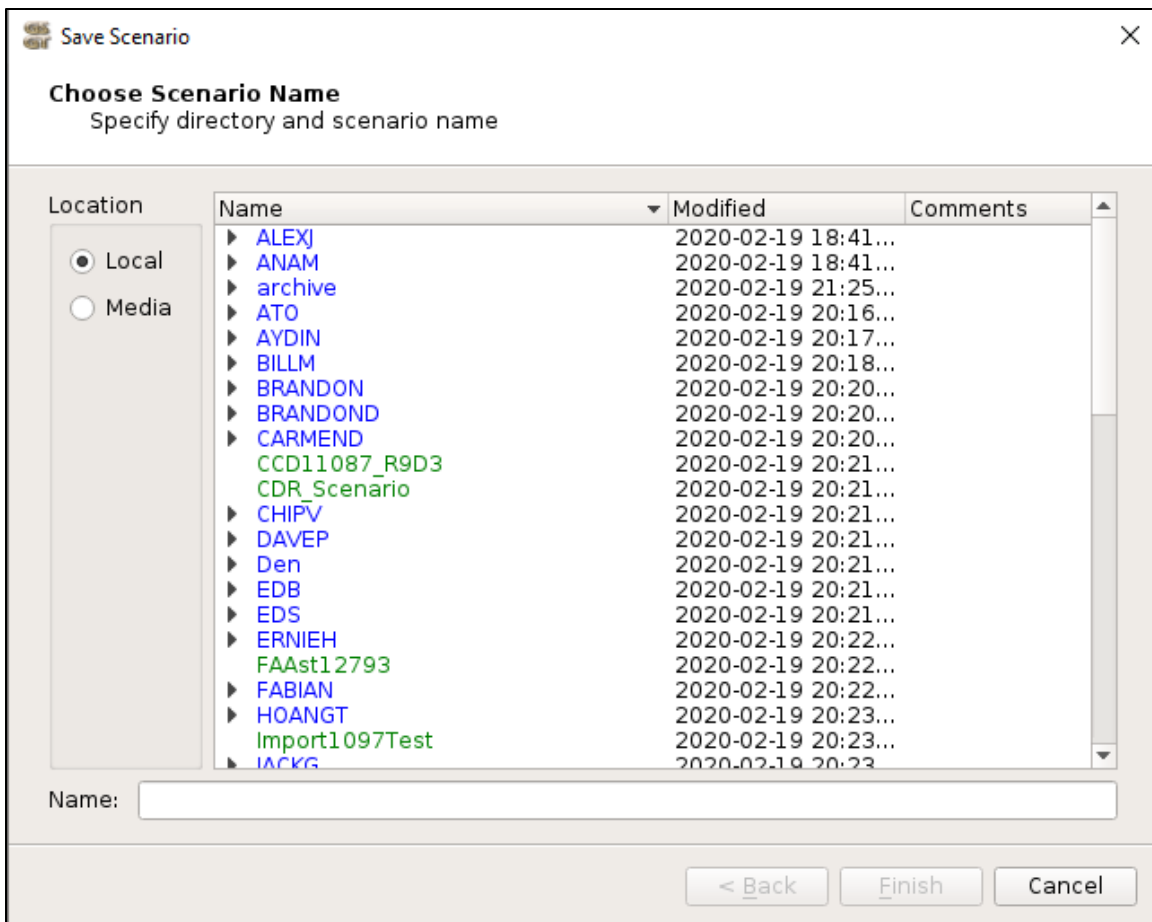


Figure 64. Save Scenario

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.

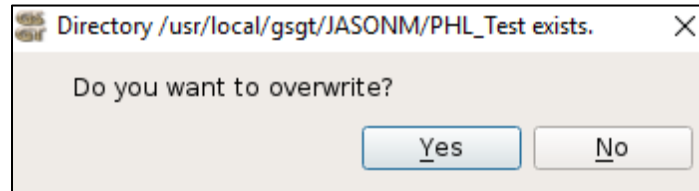


Figure 65. Scenario Overwrite Warning

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.

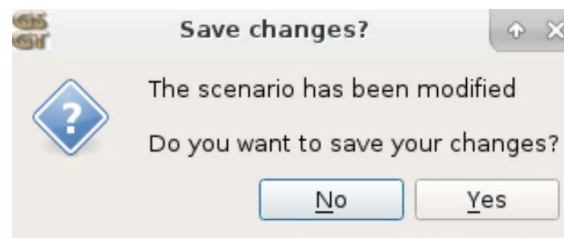


Figure 66. Save Before Exit

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 67. Terminal and ERAM Sim Mode Tabs

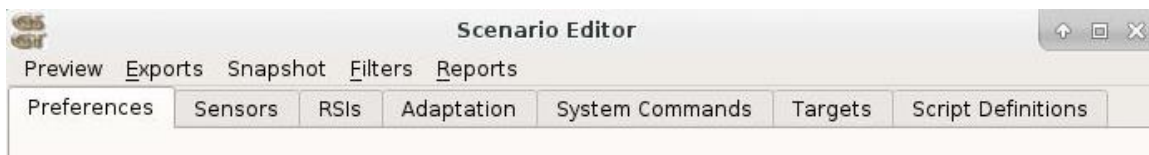


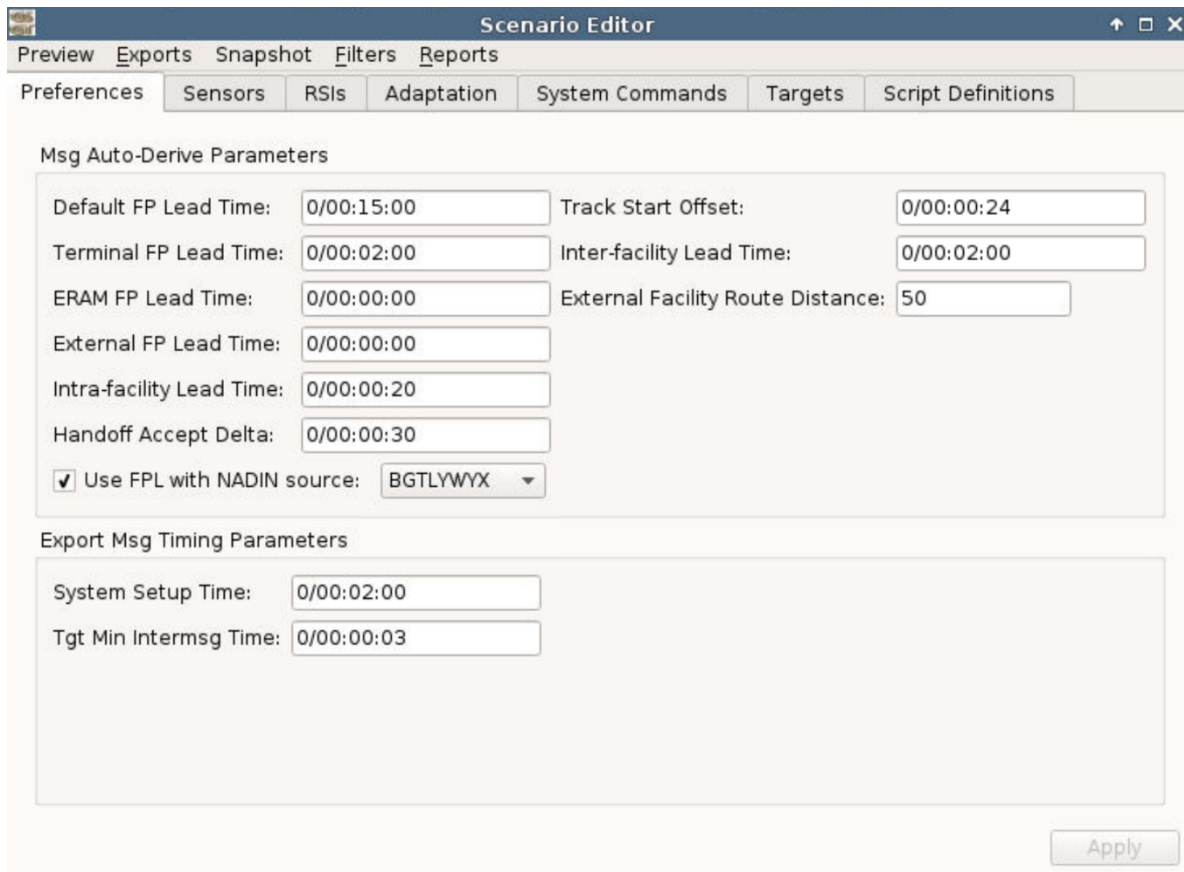
Figure 68. Normal and Dysim Modes Tabs

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.



The screenshot shows the 'Scenario Editor' window with the 'Sensors' tab selected. The 'Msg Auto-Derive Parameters' section includes the following fields:

- Default FP Lead Time: 0/00:15:00
- Terminal FP Lead Time: 0/00:02:00
- ERAM FP Lead Time: 0/00:00:00
- External FP Lead Time: 0/00:00:00
- Intra-facility Lead Time: 0/00:00:20
- Handoff Accept Delta: 0/00:00:30
- Track Start Offset: 0/00:00:24
- Inter-facility Lead Time: 0/00:02:00
- External Facility Route Distance: 50
- Use FPL with NADIN source: BGTLWYX

The 'Export Msg Timing Parameters' section includes the following fields:

- System Setup Time: 0/00:02:00
- Tgt Min Intermmsg Time: 0/00:00:03

An 'Apply' button is located at the bottom right of the window.

Figure 69. 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 Intermmsg 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 flight 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.

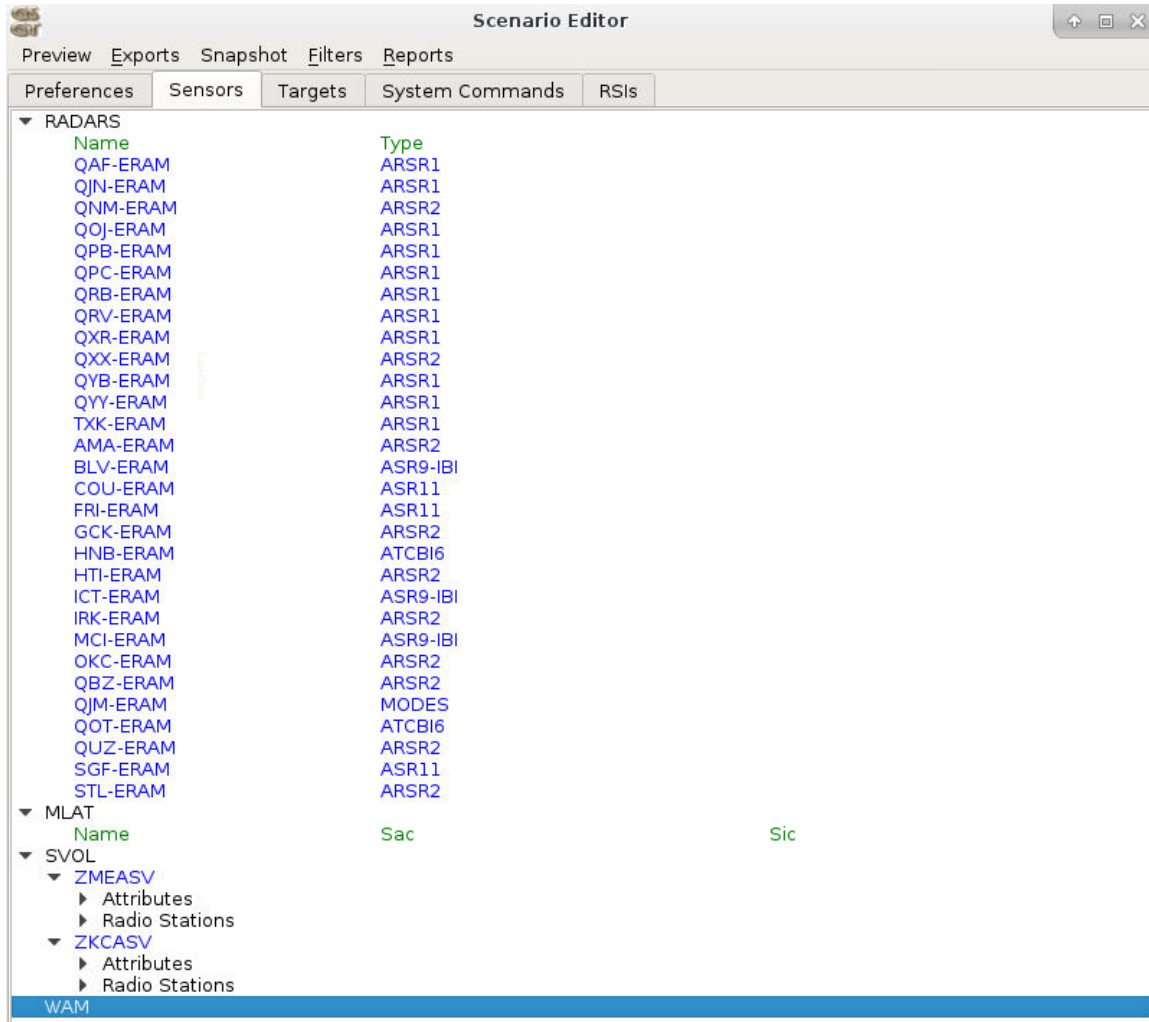


Figure 70. Sensors Tab

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.

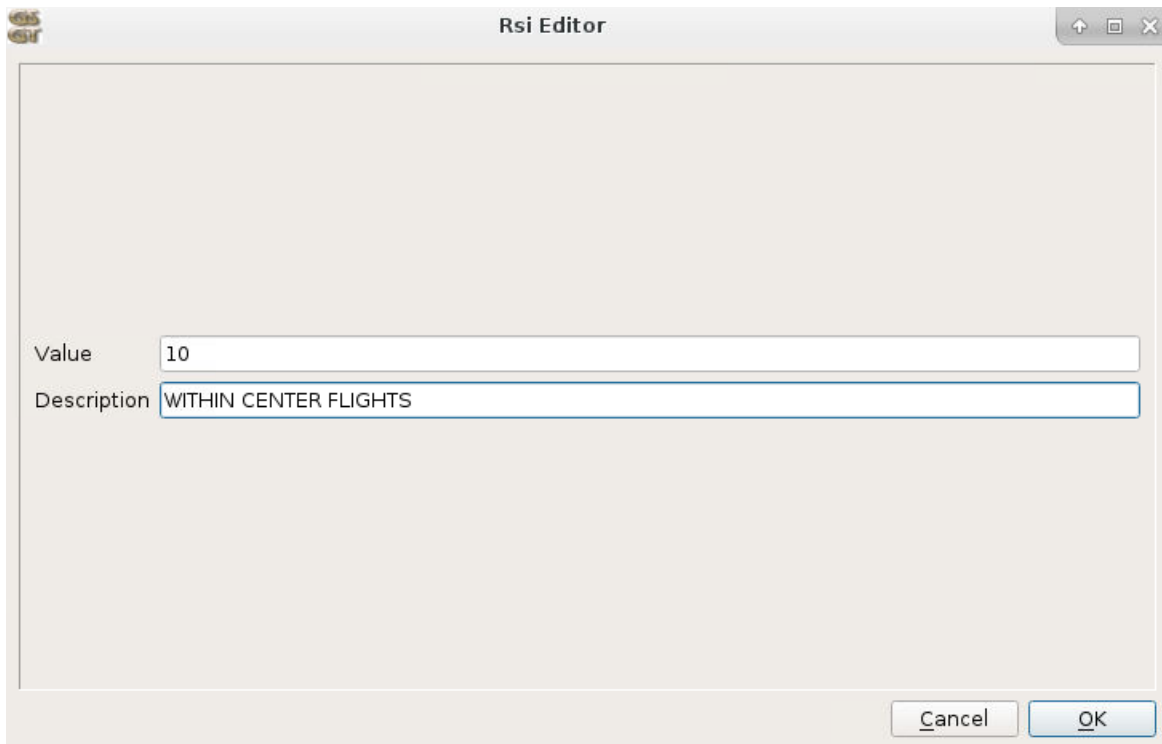


Figure 71. RSI Editor

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 72. 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 RSI(s) to filter the editor by.

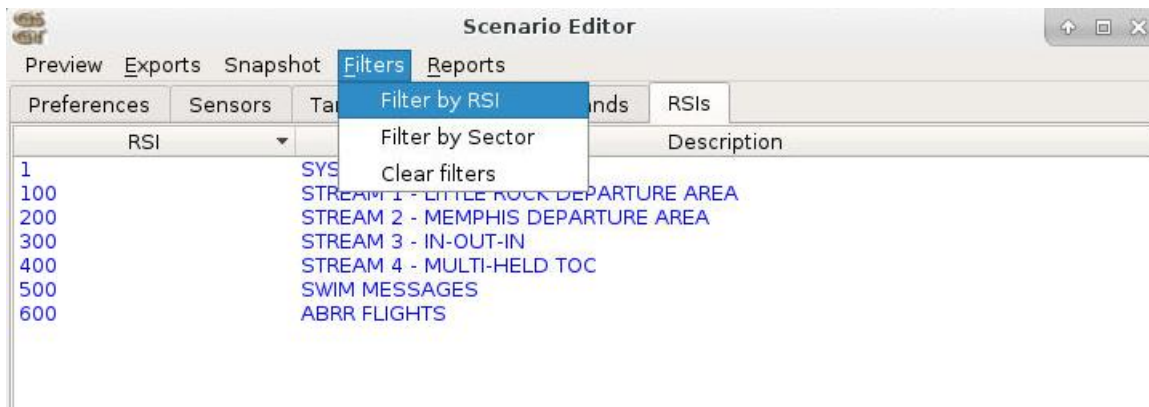


Figure 73. Filtering the Editor

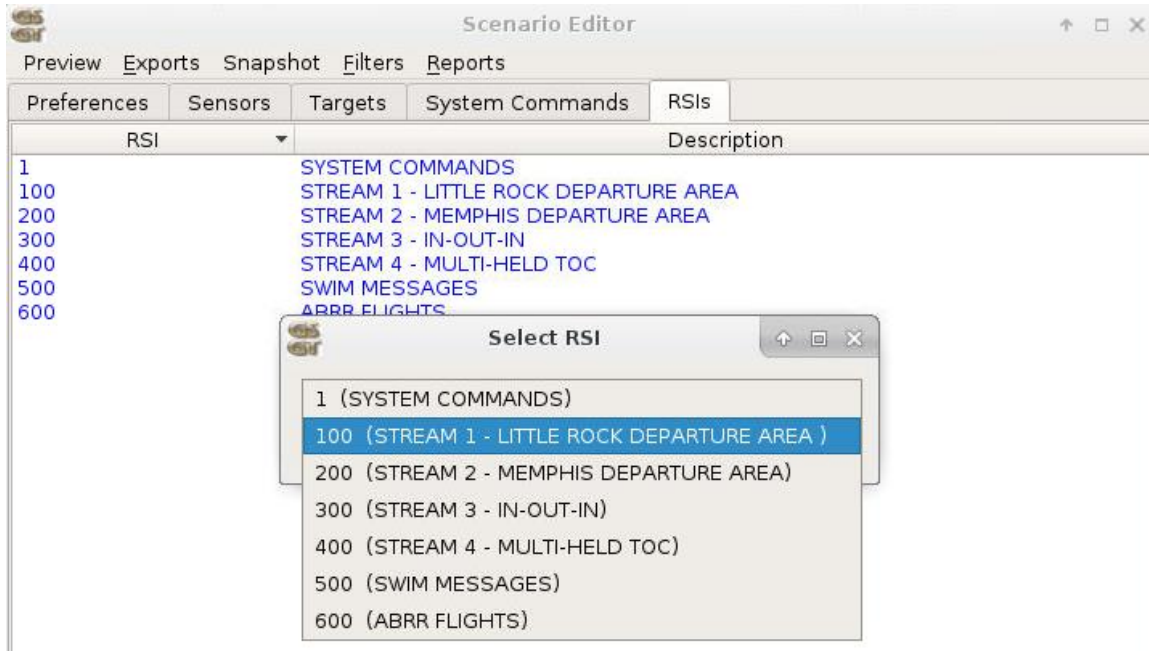


Figure 74. RSI Filter Selection

This filters the scenario editor by the RSI(s) selected.

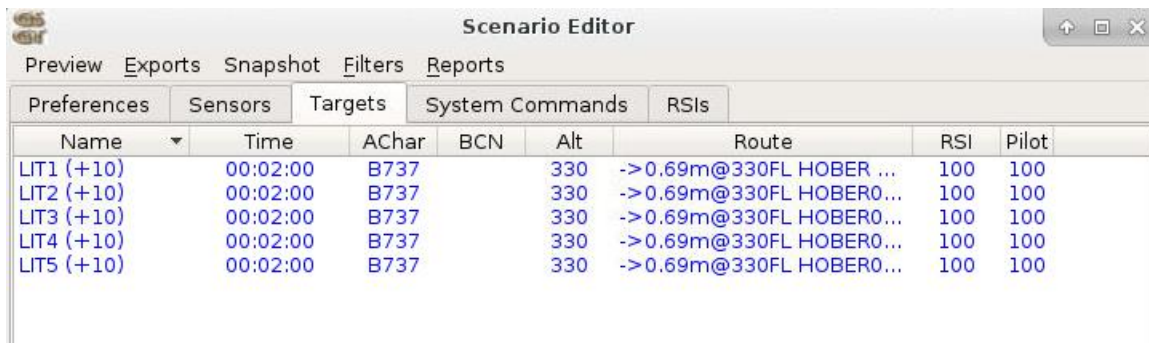


Figure 75. Objects Filtered by RSI

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, GUF1, etc. If target token substitution is needed, the flight data message must be scripted within the Target editor; see section 5.6.1.3.5.

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, so for instance ether \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.

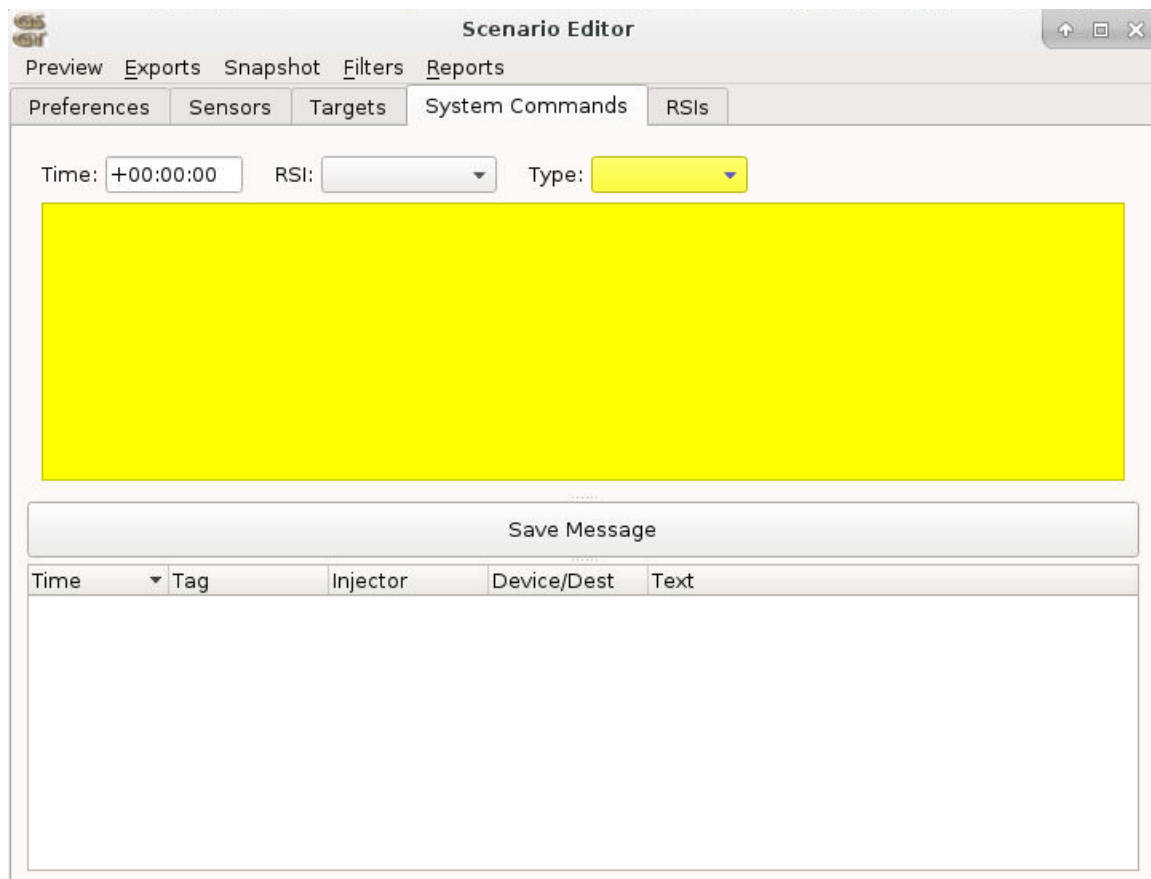


Figure 76. Message Editor

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 asterisk (*) 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.

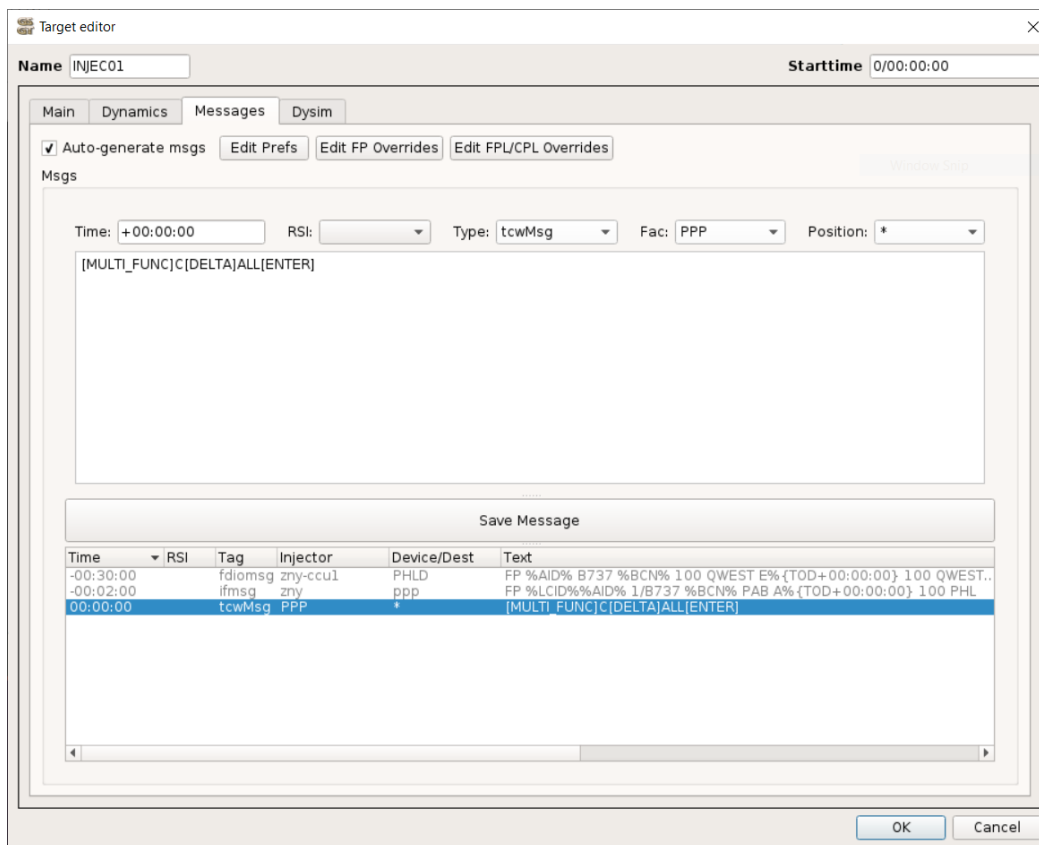


Figure 77. TCW Message

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:

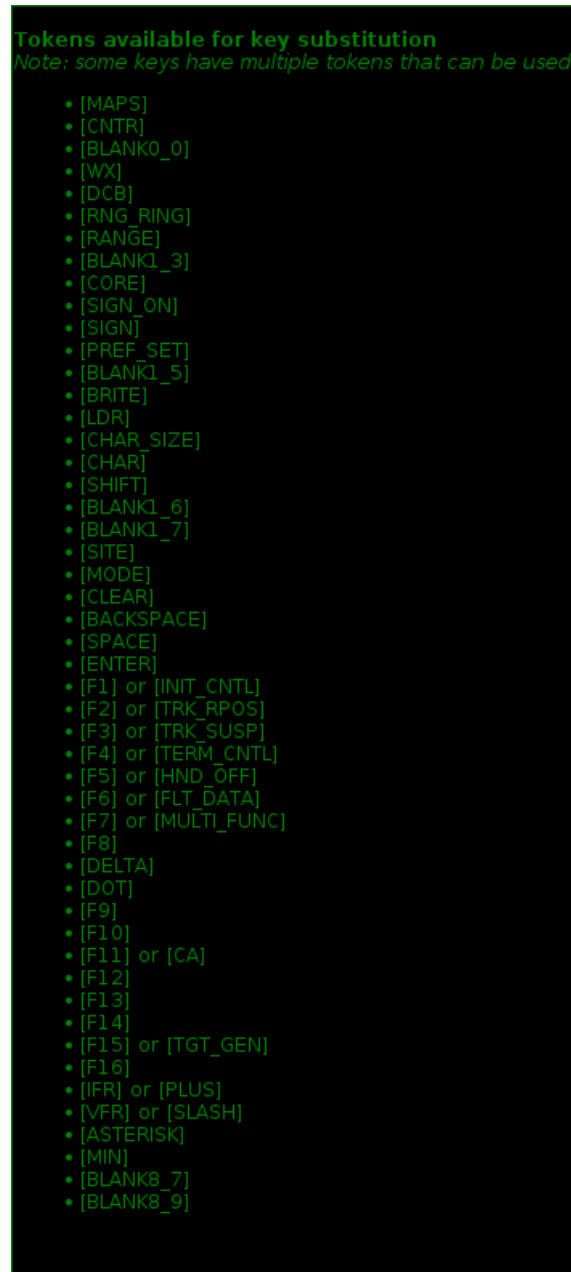
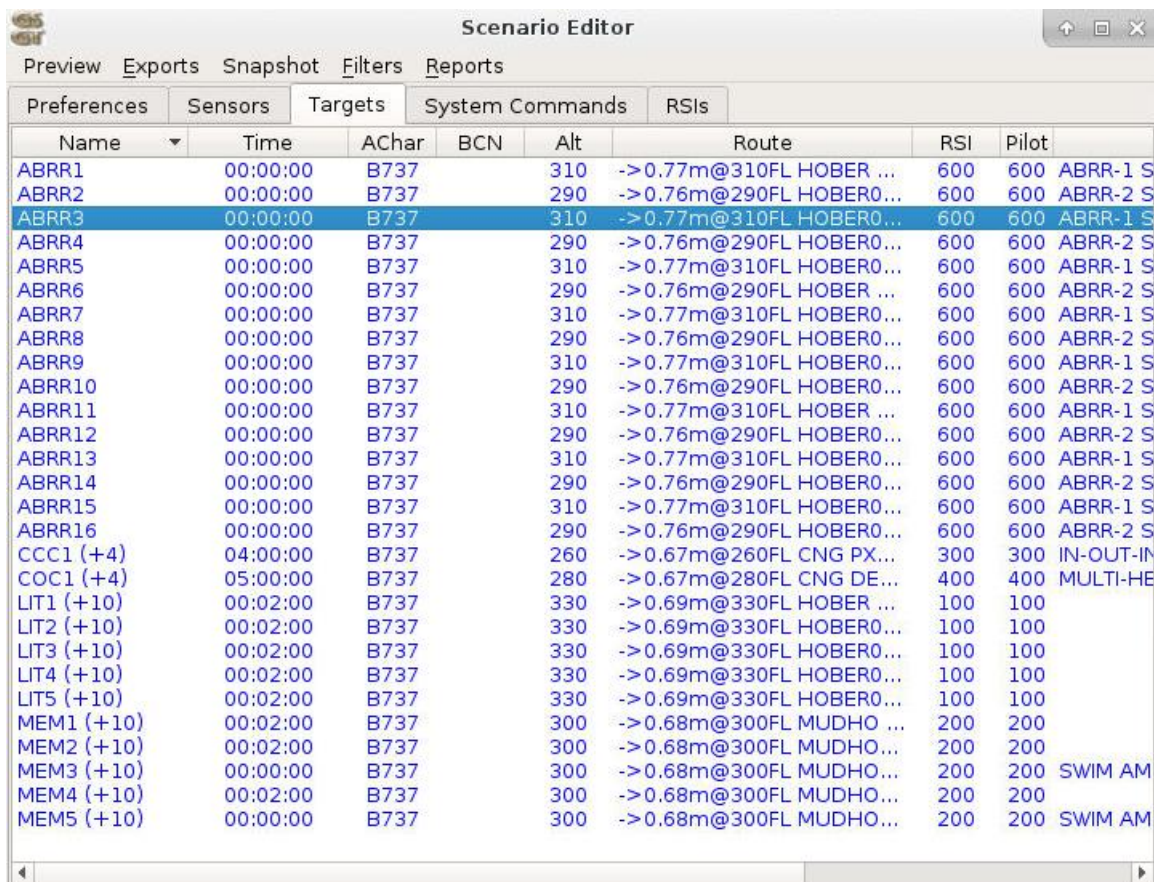


Figure 78. TCW Message Tokens

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 |

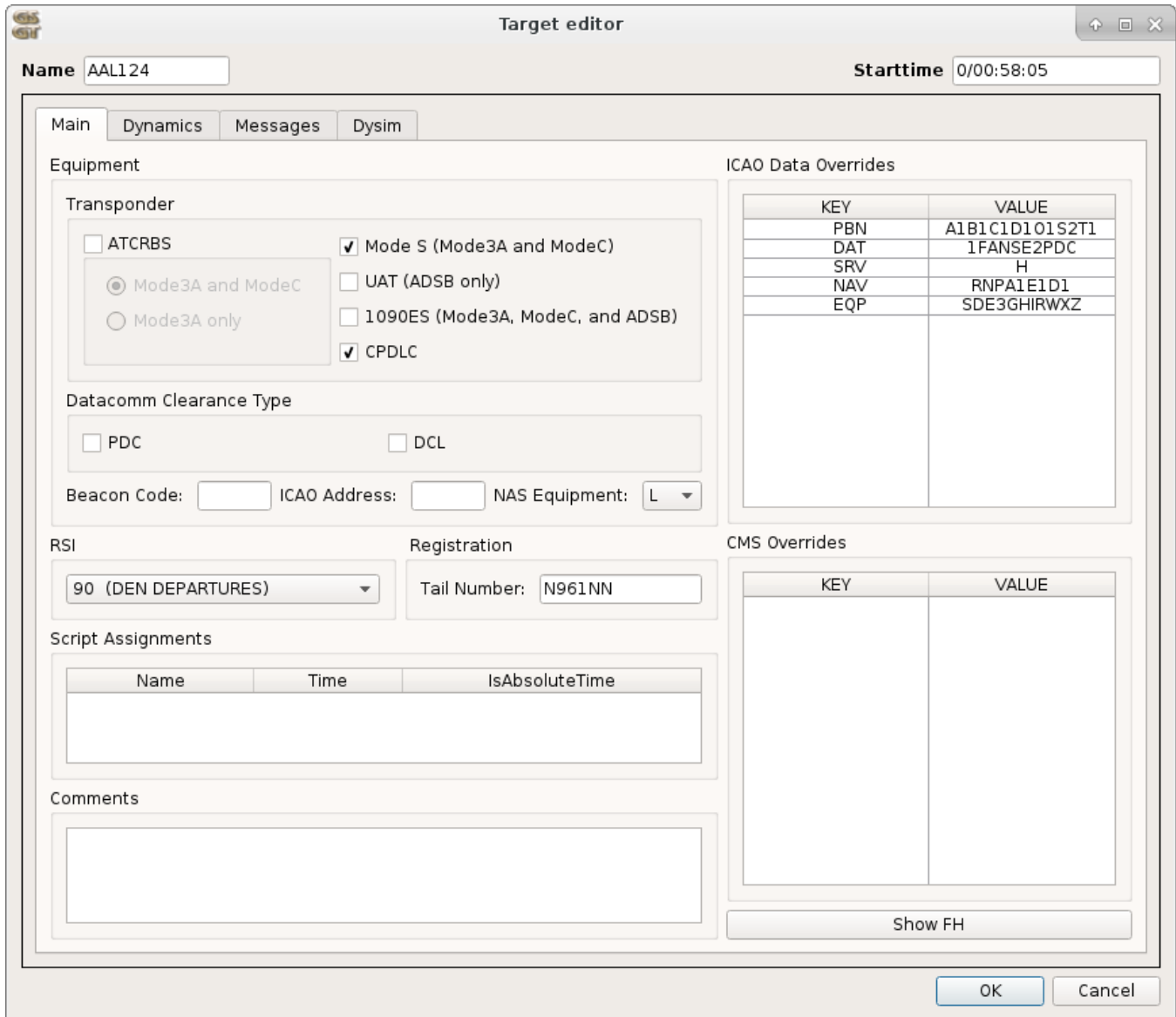
Figure 79. Targets Tab

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 general target attributes are located on the Main tab of the Target editor. The attributes describe the target's characteristics such as on-board navigation equipment and transponder types.



The screenshot shows the 'Target editor' window with the 'Main' tab selected. The 'Name' field contains 'AAL124' and the 'Starttime' field contains '0/00:58:05'. The interface is divided into several sections:

- Equipment:**
 - Transponder:**
 - ATCRBS
 - Mode3A and ModeC
 - Mode3A only
 - Mode S (Mode3A and ModeC)
 - UAT (ADSB only)
 - 1090ES (Mode3A, ModeC, and ADSB)
 - CPDLC
 - Datacomm Clearance Type:**
 - PDC
 - DCL
 - Beacon Code: ICAO Address: NAS Equipment:
- ICAO Data Overrides:**

| KEY | VALUE |
|-----|----------------|
| PBN | A1B1C1D1O1S2T1 |
| DAT | 1FANSE2PDC |
| SRV | H |
| NAV | RNPA1E1D1 |
| EQP | SDE3GHIRWXZ |
- RSI:** **Registration:** Tail Number:
- Script Assignments:**

| Name | Time | IsAbsoluteTime |
|------|------|----------------|
| | | |
- Comments:**
- CMS Overrides:**

| KEY | VALUE |
|-----|-------|
| | |

Buttons at the bottom include 'Show FH', 'OK', and 'Cancel'.

Figure 80. 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.

Equipment

Transponder

ATCRBS

Mode 3A and Mode C

Mode 3A only

Mode S

Mode3A and ModeC

UAT

ADSB only

1090ES

Mode3A, ModeC, and ADSB

CPDLC

Datacomm Clearance Type

PDC

DCL

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.

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.

NAS Equipment

The single-letter equipment id. It is appended to aircraft type in the FP message.

RSI

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

Registration

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).

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.

ICAO Data Overrides

ICAO Data overrides used for generating flight plan messages. New elements can be added by right mouse click, selecting **New Element** and entering the element key name. New Values can be added to an element by double clicking the **Value** field for the element. After creating at least one element right clicking again will give the option to **Delete** the highlighted element.

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. Neither the element key nor the value is validated for correctness. It is up to the scenario developer to script the appropriate overrides. However, only valid keys will be incorporated into the generated flight plan message.

The user can dwell the cursor over the ICAO Data Overrides input area to see a tool tip listing the valid key names. 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.

Name - ICAO - CMS - Example

- EQP - 10a - 910C - include 'R' if PBN approved
- SRV - 10b - 910D
- FLR - 8a - 908A
- FLT - 8b - 908B
- WAK - 9c - 909C
- EET - 18 - 918B - EET/KZOB1253 KZID1273
- RIF - 18 - 918C
- REG - 18 - 918D
- SEL - 18 - 918E
- OPR - 18 - 918F
- STS - 18 - 918G
- TYP - 18 - 918H
- PER - 18 - 918I
- COM - 18 - 918J
- DAT - 18 - 918K
- NAV - 18 - 918L - NAV/GBAS RNVA0.7D1.3 RNPA1E5
- NAV/RNVAd(d)(.d(d)) - 18 - e.g. RNVA1 generates 0100 for 925A
- NAV/RNPAd(d)(.d(d)) - 18 - e.g. RNPA1 generates 0100 for 925G
- DEP - 18 - 918M
- DEST - 18 - 918N
- ALTN - 18 - 918O
- RALT - 18 - 918P
- CODE - 18 - 918Q
- RACE - 18 - 918R
- SUR - 18 - 918S
- DLE - 18 - 918T
- TALT - 18 - 918U
- DOF - 18 - 918V
- ORGN - 18 - 918W
- PBN - 18 - 918X - Up to 8 capability fields of the form Ld; e.g. PBN/O1

Figure 81. ICAO Data Override Keys

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.

CMS Overrides

CMS overrides used for generating FH messages in eramSimMode. New elements can be added by right mouse click, selecting **New Element** and entering the element key name. New Values can be added to an element by double clicking the **Value** field for the element. After creating at least one element right clicking again will give the option to **Delete** the highlighted element.

Some CMS data is automatically generated in the FH message based on other inputs, such as registration and navigation and surveillance equipage as well as the ICAO Data Overrides. (For example, the RNAV accuracy specified in the ICAO Data NAV field is used to automatically generate the CMS field 925 elements.) Entries in the CMS Overrides will override the automatically generated

values. Neither the element key nor the value is validated for correctness. It is up to the scenario developer to script the appropriate overrides. However, only valid keys will be incorporated into the generated messages.

Show FH

The **Show FH** button opens a pop up window that shows what the current generated FH message would be for the target if it was launched in simDriver configured for eramSimMode.

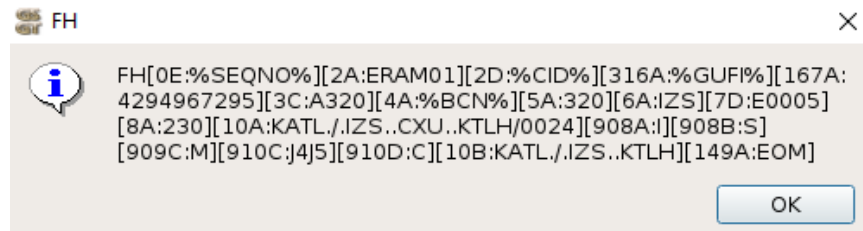


Figure 82. FH Message Preview

5.6.1.2. Target - Dynamics

The Dynamics tab of the Target Editor defines the type of aircraft, its speed and altitude, and the path the target is flying in an airspace. A target's aircraft trajectory can be specified as a route with defined points, such as fixes and airports.

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 particular runways on the airport. The runways must be predefined using Runways site definition in order to be available for inclusion.

Based on the target's route definition, GSGT generates radar and derives appropriate messages such as flight plans and handoffs.

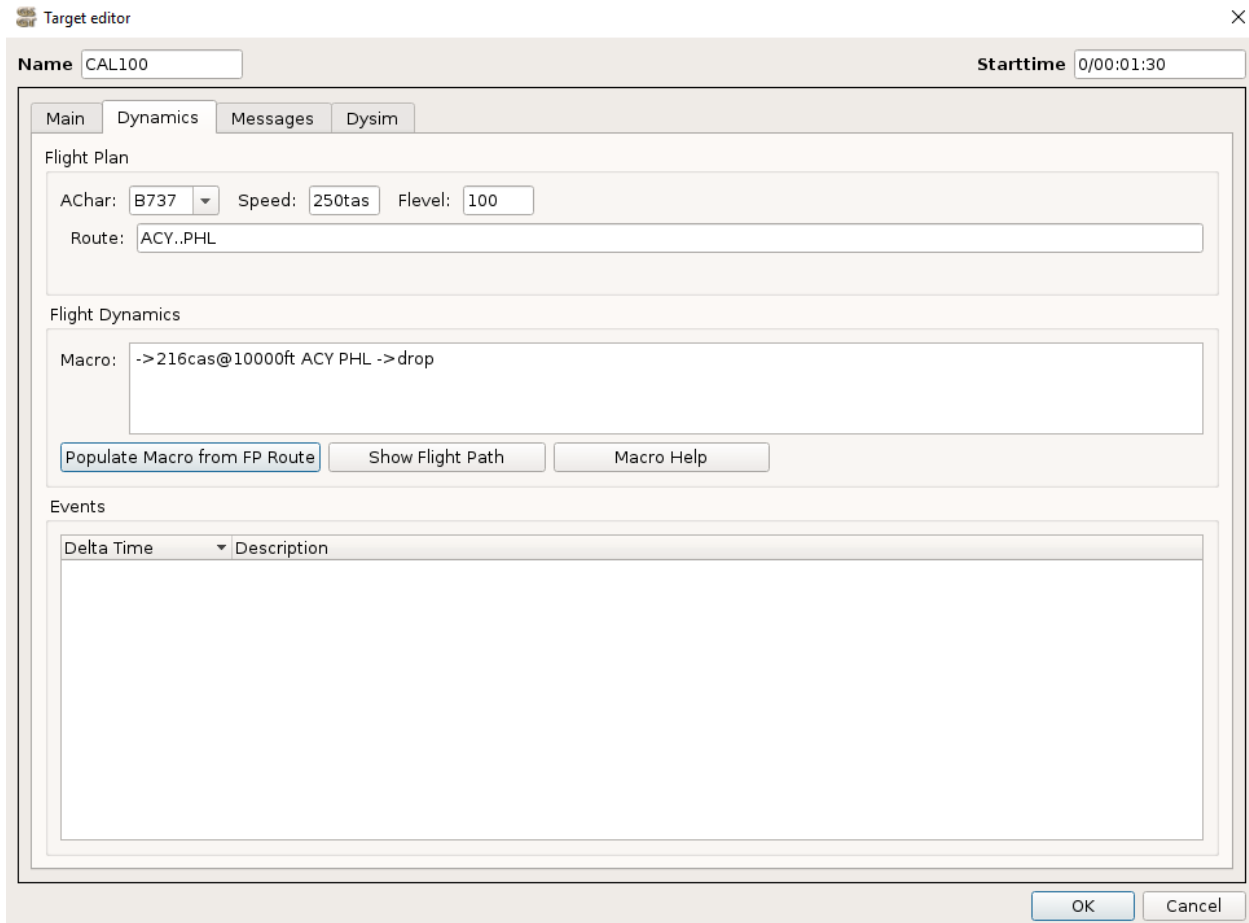


Figure 83. Target Editor Dynamics Tab

Flight Plan

AChar

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

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.

Flevel

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

Route

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

Flight Dynamics

Macro

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

Populate Macro from FP Route

Upon clicking this will populate the **Macro** text field with commands derived from the **Route**. If any changes are made to the macro, the target will fly as what is written in the macro, versus its 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.

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 in the dialog box. 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 dialog box. As elements are added to the flight plan, fixes and airports are highlighted in BLUE, the flight route is outlined in RED between fixes, and segments along airways are outlined in GREEN.

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 "..") that you want to insert additional elements.

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

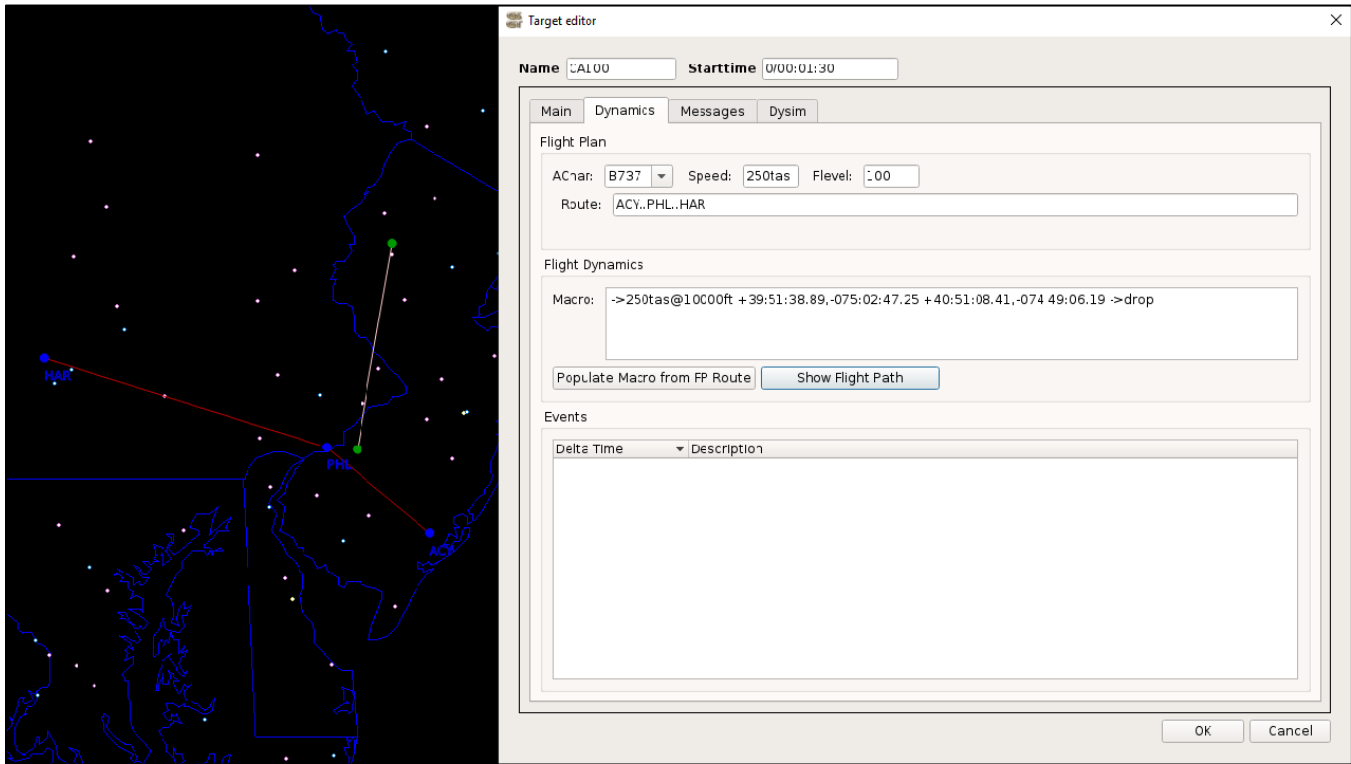


Figure 84. Show Flight Path

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 mouse 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).

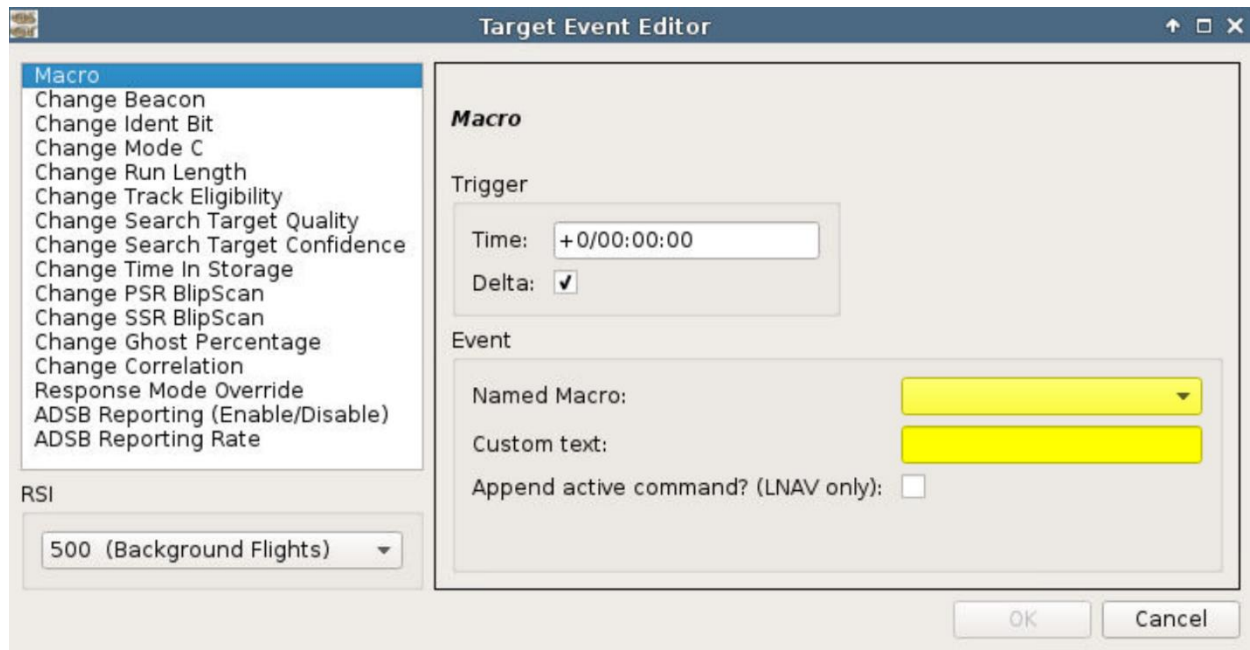


Figure 85. Target Event Editor

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. 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 |
| 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. |
| ->dddtdas | Change the true air speed of the target to the value specified. |
| ->dddtdas~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 ->dddtdas@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). |
| ->(+\-)ddddft | Change the altitude of the target by the specified amount. |
| LNAV Commands | |
| FIXNAME | Proceed to the fix. |

| | |
|--|---|
| <p>FIXNAME{attributes}</p> <p>Attributes:</p> <p>{arpt}</p> <p>{rw:dd} or {rw:ddA}</p> <p>{ils:dd} or {ils:ddA}</p> <p>{ddddft}</p> <p>{<ddddft}</p> <p>{>ddddft}</p> <p>{ddddftBddddft}</p> <p>{dddcas}, {dddtas}, or {.ddm}</p> <p>{<dddcas}, {<dddtas}, or {<.ddm}</p> <p>{>dddcas}, {>dddtas}, or {>.ddm}</p> <p>{rf}{dddmag}{turnDir:A}</p> | <p>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.</p> <p>On the first fix, auto-apply departure logic; on the last fix, auto-apply top of descent (TOD) restriction. Not valid on other fixes.</p> <p>In conjunction with {arpt} on departures, use a defined departure procedure for the specified runway.</p> <p>In conjunction with {arpt} on arrivals, perform an ILS approach to the specified runway. This disables TOD processing.</p> <p>Cross the fix at the specified restriction altitude.</p> <p>Cross the fix at or below the specified restriction altitude.</p> <p>Cross the fix at or above the specified restriction altitude.</p> <p>Cross the fix between the specified restriction altitudes. Order is of the restriction altitudes is irrelevant.</p> <p>Cross the fix at the specified restriction speed.</p> <p>Cross the fix at or below the specified restriction speed.</p> <p>Cross the fix at or above the specified restriction speed.</p> <p>Perform a radius to fix turn (in the specified turn direction), exiting the fix at the specified heading.</p> |
| <p>->dddmag</p> <p>->dddmag~ddddeg/sec</p> <p>->dddtrue</p> <p>->dddtrue~ddddeg/sec</p> <p>->(+ -)ddddeg</p> | <p>Change the heading of the target to the value specified in degrees from magnetic North.</p> <p>Change the heading of the target to the value specified in degrees from magnetic North at a given rate of change.</p> <p>Change the heading of the target to the value specified in degrees from true North.</p> <p>Change the heading of the target to the value specified in degrees from true North at a given rate of change.</p> <p>Change the heading of the target by the specified amount.</p> |

| | |
|-----------------------------------|---|
| ->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 | Enable radar detection. |
| ->RADARD | Disable radar detection. |
| ->ADSBE | Enable ADSB detection. |
| ->ADSBD | 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.

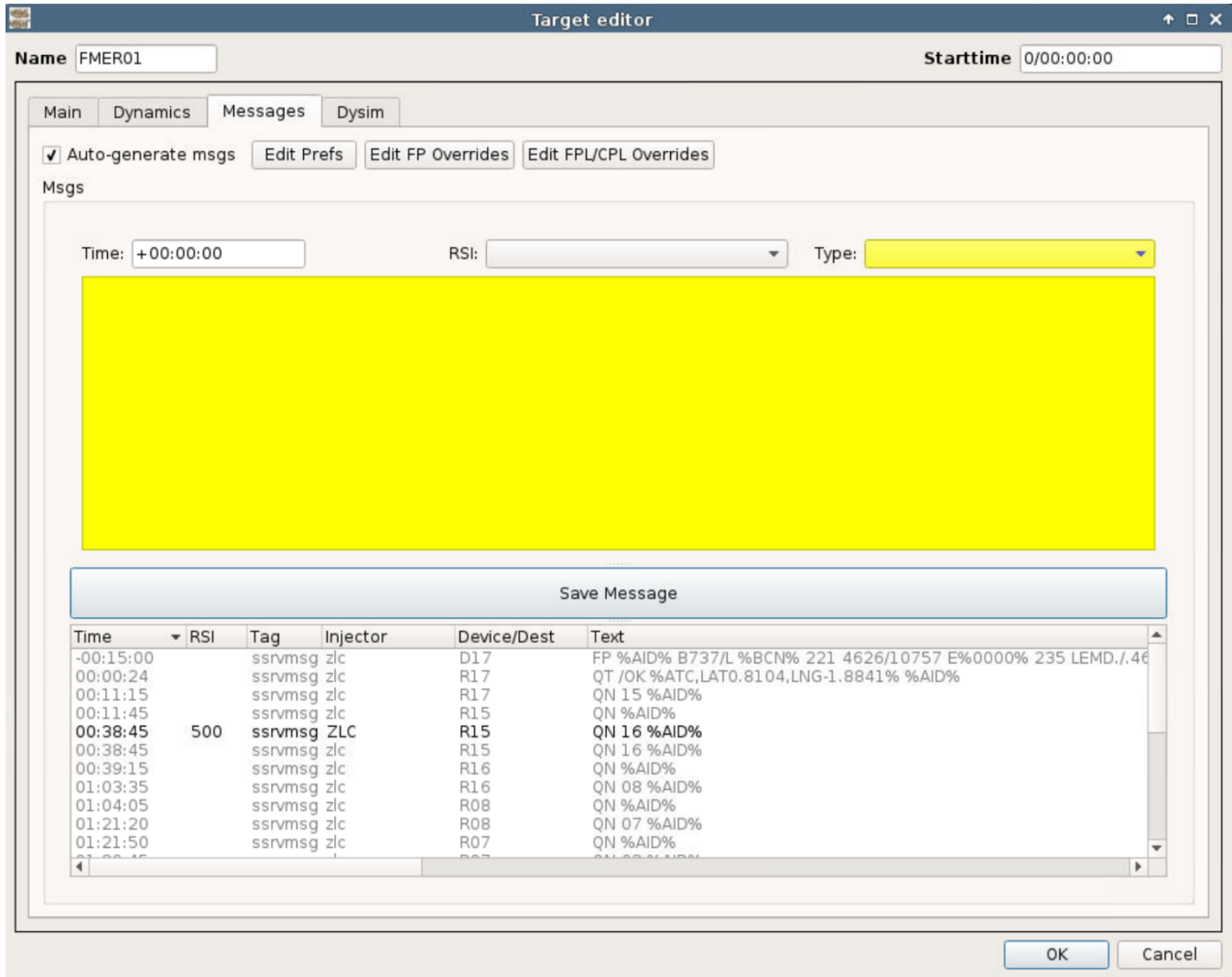


Figure 86. Target Editor Messages Tab

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 FPL/CPL 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.

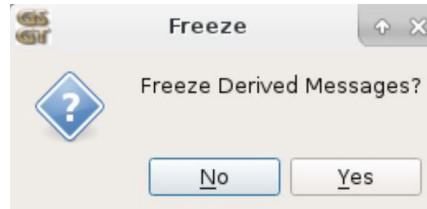


Figure 87. Freeze Derived Messages

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.

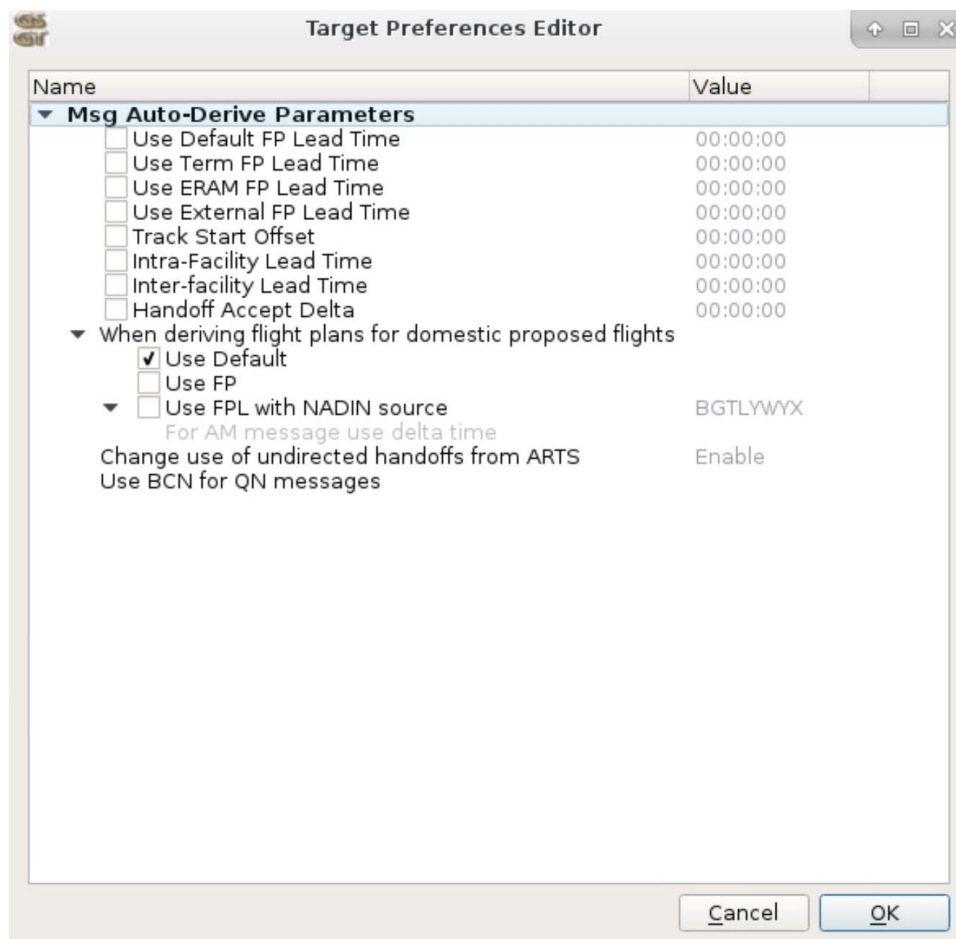


Figure 88. Target Specific Preferences

Parameters in the Target Preferences behave exactly 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.

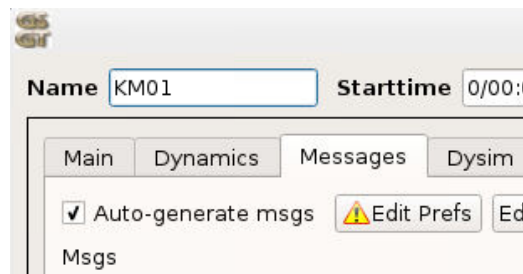


Figure 89. Edit Prefs Attention Icon

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.

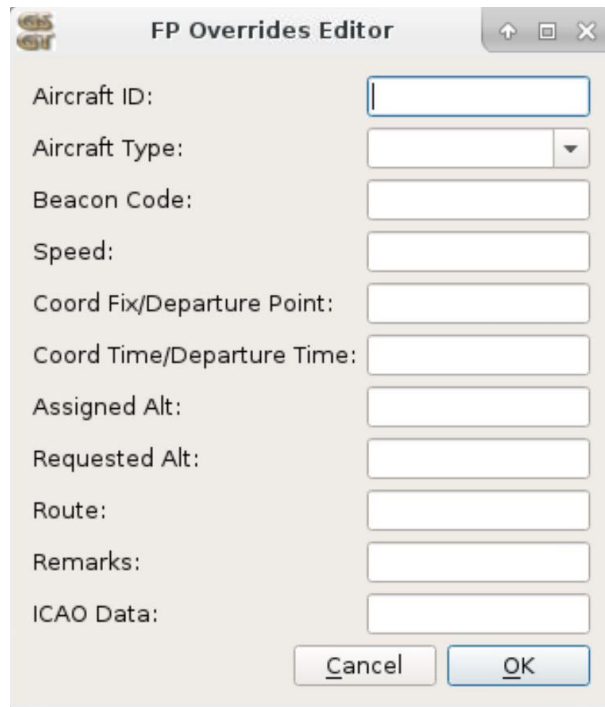


Figure 90. Flight Plan Override Editor

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.

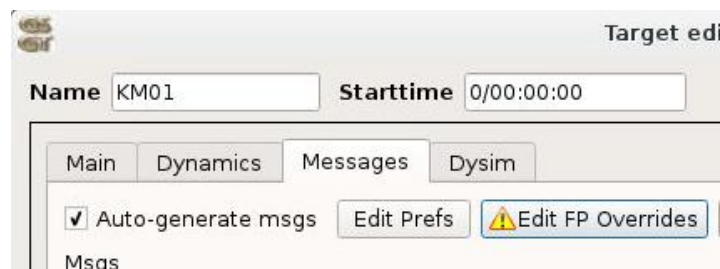


Figure 91. Edit FP Overrides Attention Icon

5.6.1.3.4.FPL/CPL Overrides

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

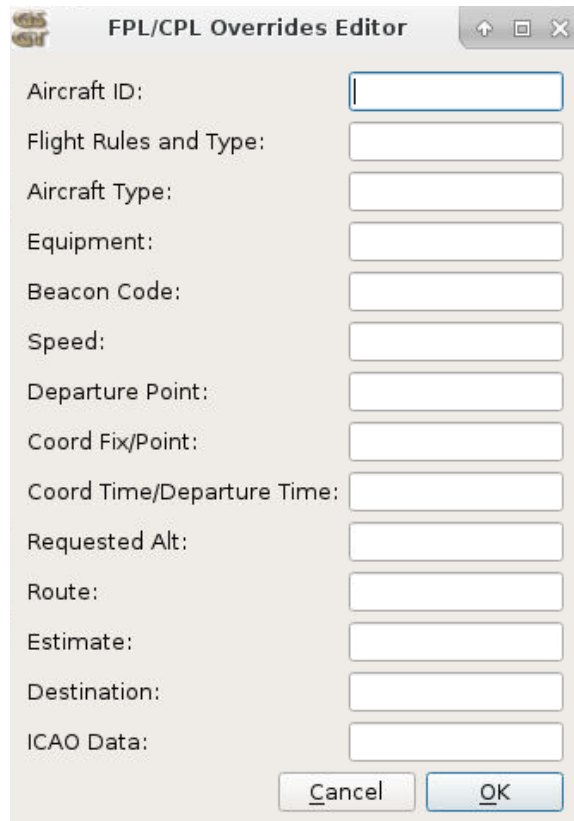


Figure 92. ICAO Flight Plan Overrides Editor

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

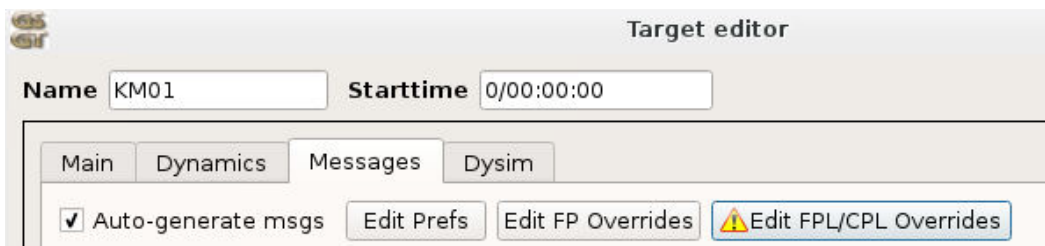


Figure 93. Attention Icon

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, GUFU, 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>

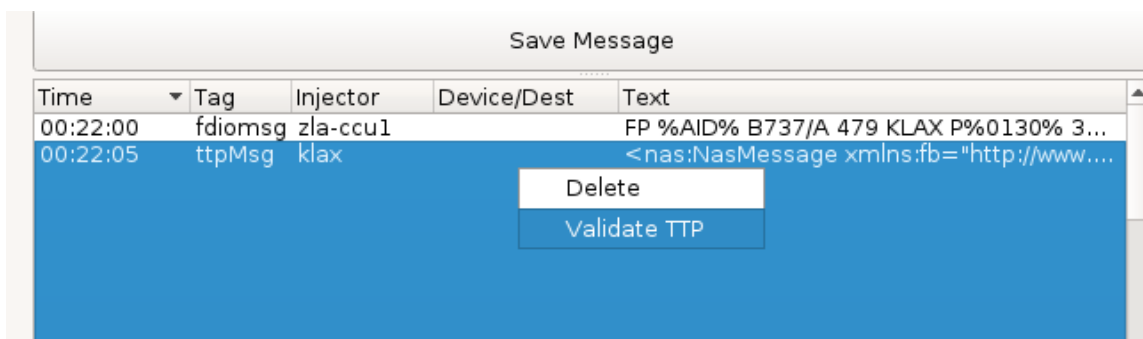


Figure 94. RTCS and TTP Message Validation

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

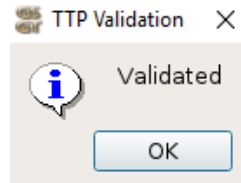


Figure 95. Validation Successful

5.6.1.4. Target Dysim Definitions

The Dysim tab of the Target editor provides ability to change engine specific options and define Pre-Programmed Events and Pilot Prompts. This tab is labeled Dysim when running with JVN simulation engine.

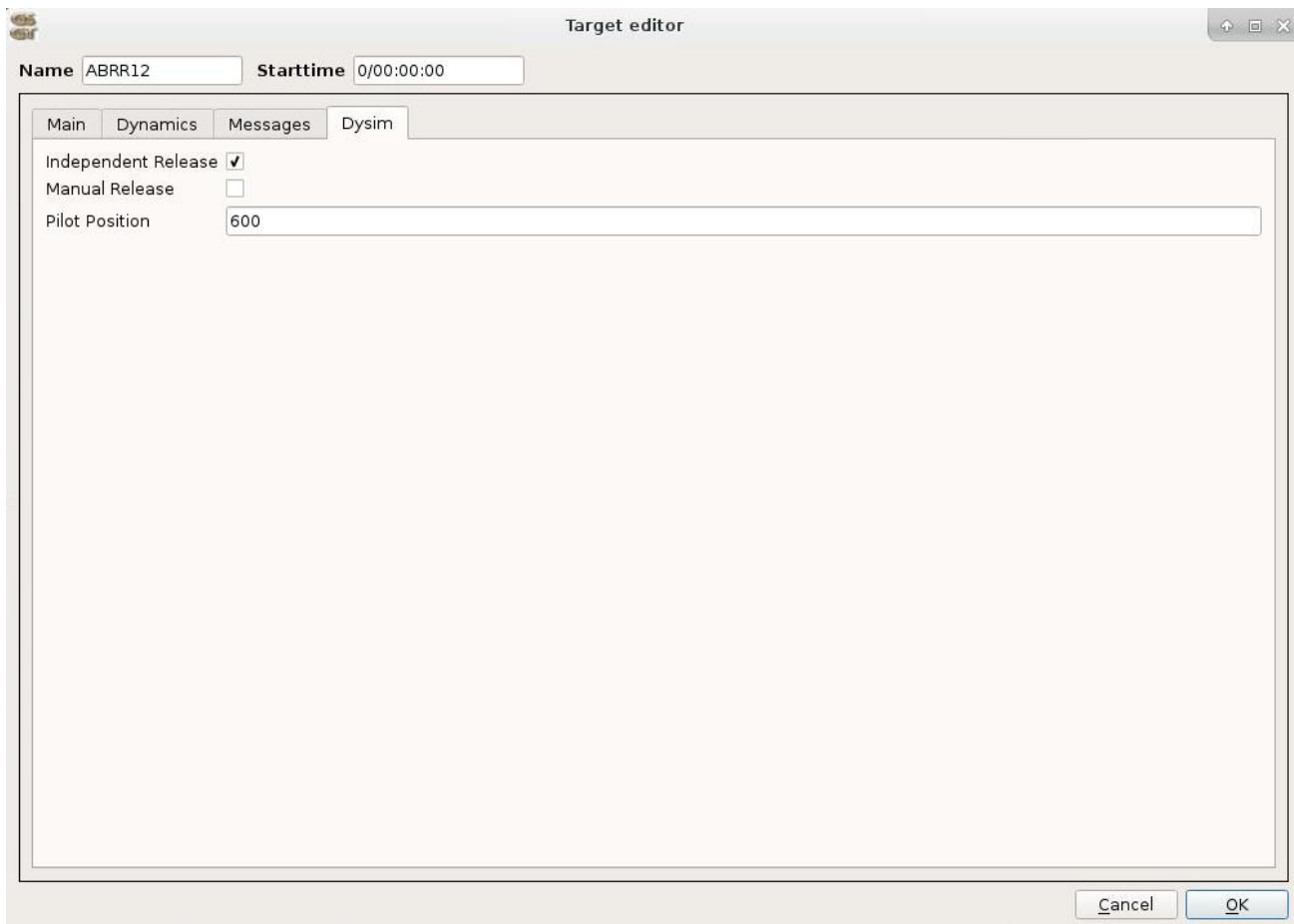


Figure 96. Target Editor Dysim Tab

Independent Release

Engine will not generate the target at the start time. It needs to be released from pilot position. The flight will be in the scenario but no flight data messages will inject nor will the target start until the user manually injects them.

Manual Release

Engine will generate the target's flight data messages but will not release the target at the start time.

Pilot Position

Pseudo Pilot assigned to the target (optional) (ERAM version only).

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.

| | | | | | | |
|---------------|----------|------|-----|-------------------------------|-----|-----|
| ABRR700 | 00:00:00 | B737 | 350 | KLAX./,3724/11257..BCE..C... | 500 | 500 |
| ABRR701 | 00:00:00 | B737 | 370 | KMSP./,4642/10144..DIK..Hi... | 500 | 500 |
| ABRR702 | 00:00:00 | B737 | 390 | KATL./,3707/10507..ALS..H... | 500 | 500 |
| ABRR703 | 00:00:00 | B737 | 410 | KDFW./,3729/10137..DRAW... | 500 | 500 |
| ABRR704 | 00:00:00 | B737 | 430 | KPDX./,4258/11447..BYI..EF... | 500 | 500 |
| ABRR800 (+9) | 00:00:00 | B737 | 300 | CYUL./,4648/09335..FAR..K... | 500 | 500 |
| ADSB100 (+24) | 00:00:00 | | | KDAL./,3624/10730..ILC..KN... | 300 | |
| ASQ3946 | 00:00:00 | | | KSMF./,4049/11925..PRNC... | 500 | 500 |
| ASQ4288 | 00:00:00 | | | KMCO./,3413/08958..VLUST... | 500 | 500 |
| DAL923 | 07:13:00 | | | KDWA..SAC..HNW..ILC..DRO.... | 500 | 500 |
| DAL2851 | 00:00:00 | | | KRAP./,4134/10838..MLF..K... | 500 | 500 |
| DC334 (+19) | 00:00:00 | | | EGLL./,4527/11516..REO..F... | 500 | 500 |
| DNN01 (+24) | 00:00:00 | | | KSFO./,3842/11710..KU54... | 500 | 500 |
| EDV3910 | 00:05:00 | | | KNUW./,NUW126016..ELN..... | 500 | 500 |
| ENY3482 | 00:00:00 | | | KDEN./,4328/11020..DBS..... | 500 | 500 |
| ENY3616 | 02:11:00 | | | KAFW./,FTI102046..FTI1020... | 500 | 500 |
| FARK500 (+30) | 00:00:00 | | | KSNA./,3757/11329..MLF..B... | 500 | 500 |
| FAVP1 | 00:00:00 | | | KOAK./,3830/11629..MLF..H... | 500 | 500 |
| FDX860 | 00:51:00 | | | KSMF.RVRCT3.MACUS.Q124... | 500 | 500 |
| FMER01 (+80) | 00:00:00 | | | LEMD./,4626/10757..BIL..K... | 500 | 500 |
| FMT01 (+80) | 00:00:00 | | | KAD./,4502/00445..BPT..K... | 500 | 500 |

- New
- Delete
- Show Flight Path
- Replicate
- Clear replications
- Selection count
- Assign RSI
- Filter by AID
- Deselect All

Figure 97. Target List Context Menu

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.

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 Conflict Message

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

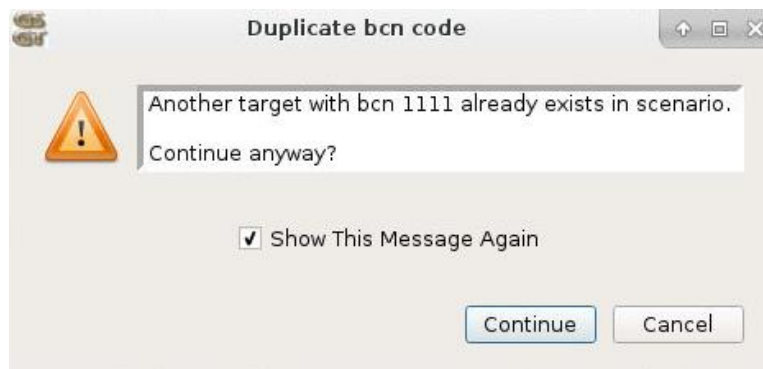


Figure 98. Target Conflict Warning

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.

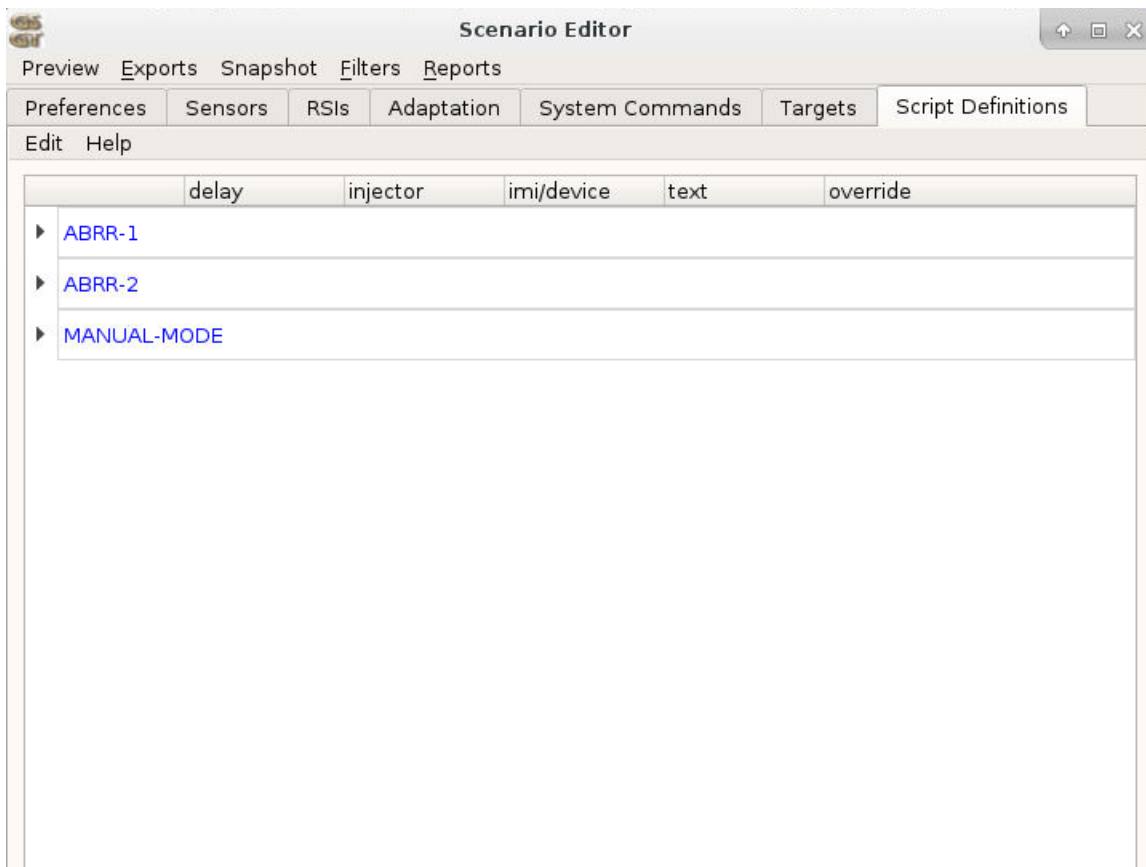


Figure 99. Script Definitions Tab

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. There are several types of preview functions in GSGT tailored for specific needs. Preview, which simulates the entire scenario, and Show Flight Path, that allows to preview targets for fine tuning its parameters while in edit mode.

When Preview is invoked, a dialog is presented to select options for the preview, such as the time to start the preview. This is helpful particularly when scenario is several hours long but user wants to preview the last hour of the scenario. Instead of running through the entire scenario from the start, preview can start at any specific time between the start and end of the scenario.

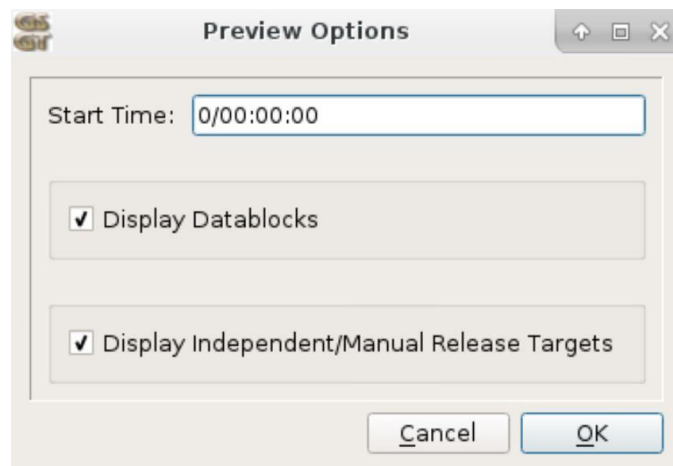


Figure 100. Preview Options

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 Release Targets

If selected the targets tagged for Independent Release will inject at their assigned starttime.

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 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'.

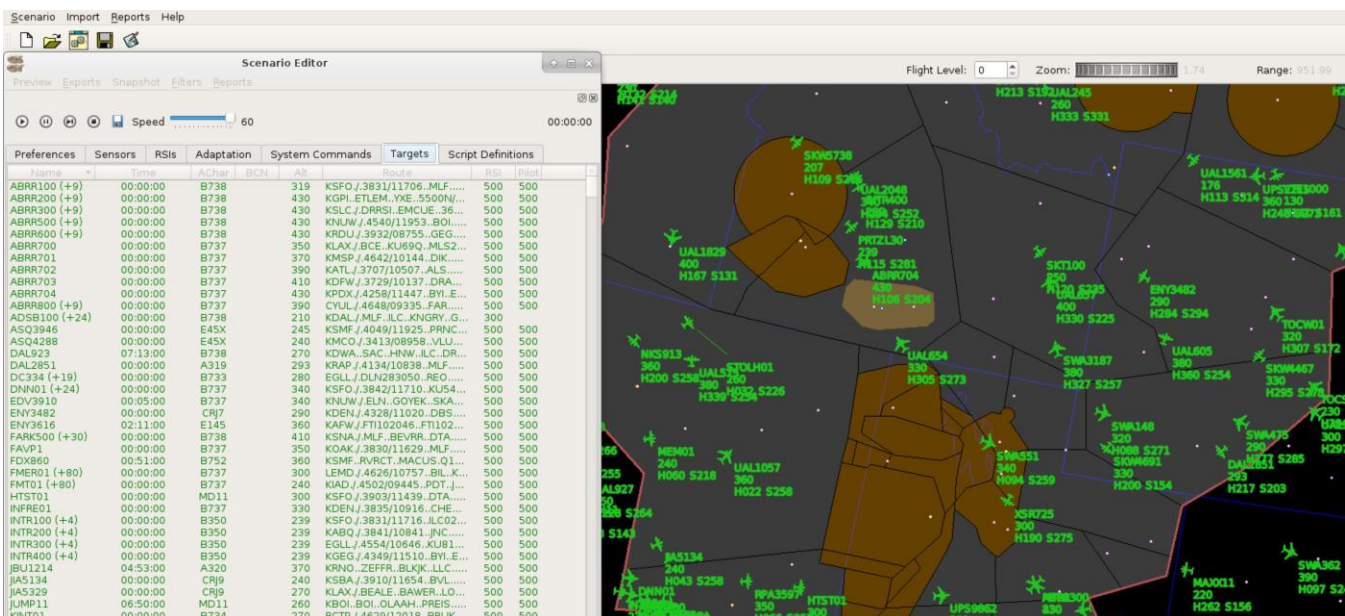


Figure 101. Scenario Preview

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).

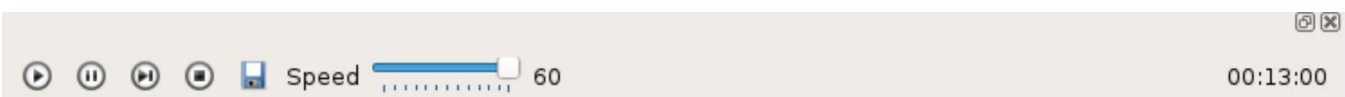


Figure 102. Preview Controls

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.

Speed

Specifies the preview rate relative to the time in seconds. Valid range is 1-20 (1-60 in the HCS version) 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.

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.

| Scenario Editor | | | | | | | | |
|--|----------|---------|------|------------|-------------------------------|---------|--------------------|-------|
| Preview Exports Snapshot Filters Reports | | | | | | | | |
| Preferences | | Sensors | RSIs | Adaptation | System Commands | Targets | Script Definitions | |
| Name | Time | AChar | BCN | Alt | Route | | RSI | Pilot |
| ABRR100 (+9) | 00:00:00 | B738 | 0210 | 319 | KSFO./,3831/11706..MLF..H... | | 500 | 500 |
| ABRR200 (+9) | 00:00:00 | B738 | 0145 | 430 | KSFO./,4928/11305..YXE..5... | | 500 | 500 |
| ABRR300 (+9) | 00:00:00 | B738 | 0355 | 430 | KSLC./,3622/11410..LAKRR... | | 500 | 500 |
| ABRR500 (+9) | 00:00:00 | B738 | 0232 | 430 | KNUW./,4540/11953..BOI..K... | | 500 | 500 |
| ABRR600 (+9) | 00:00:00 | B738 | 0273 | 430 | KRDU./,3932/08755..GEG..... | | 500 | 500 |
| ABRR700 | 00:00:00 | B737 | | 350 | KLAX./,3724/11257..BCE..C... | | 500 | 500 |
| ABRR701 | 00:00:00 | B737 | | 370 | KMSP./,4642/10144..DIK..HI... | | 500 | 500 |
| ABRR702 | 00:00:00 | B737 | | 390 | KATL./,3707/10507..ALS..H... | | 500 | 500 |
| ABRR703 | 00:00:00 | | | | KDFW./,3729/10137..DRAW... | | 500 | 500 |
| ABRR704 | 00:00:00 | | | | KPDJ./,4258/11447..BYI..EF... | | 500 | 500 |
| ABRR800 (+9) | 00:00:00 | | | | CYUL./,4648/09335..FAR..K... | | 500 | 500 |
| ADSB100 (+24) | 00:00:00 | | | | KDAL./,3624/10730..ILC..KN... | | 300 | |
| ASQ3946 | 00:00:00 | | | | KSMF./,4049/11925..PRNC... | | 500 | 500 |
| ASQ4288 | 00:00:00 | | | | KMCO./,3413/08958..VLUST... | | 500 | 500 |
| DAL923 | 07:13:00 | | | | KDWA..SAC..HNW..ILC..DRO... | | 500 | 500 |
| DAL2851 | 00:00:00 | | | | KRAP./,4134/10838..MLF..K... | | 500 | 500 |
| DC334 (+19) | 00:00:00 | | | | EGLL./,4527/11516..REO..F... | | 500 | 500 |
| DNN01 (+24) | 00:00:00 | | | | KSFO./,3842/11710..KU54... | | 500 | 500 |
| EDV3910 | 00:05:00 | | | | KNUW./,NUW126016..ELN..... | | 500 | 500 |
| ENY3482 | 00:00:00 | | | | KDEN./,4328/11020..DBS..... | | 500 | 500 |
| ENY3616 | 02:11:00 | | | | KAFW./,FTI102046..FTI1020... | | 500 | 500 |
| FARK500 (+30) | 00:00:00 | | | | KSNA./,3757/11329..MLF..B... | | 500 | 500 |

Figure 103. 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 position 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.

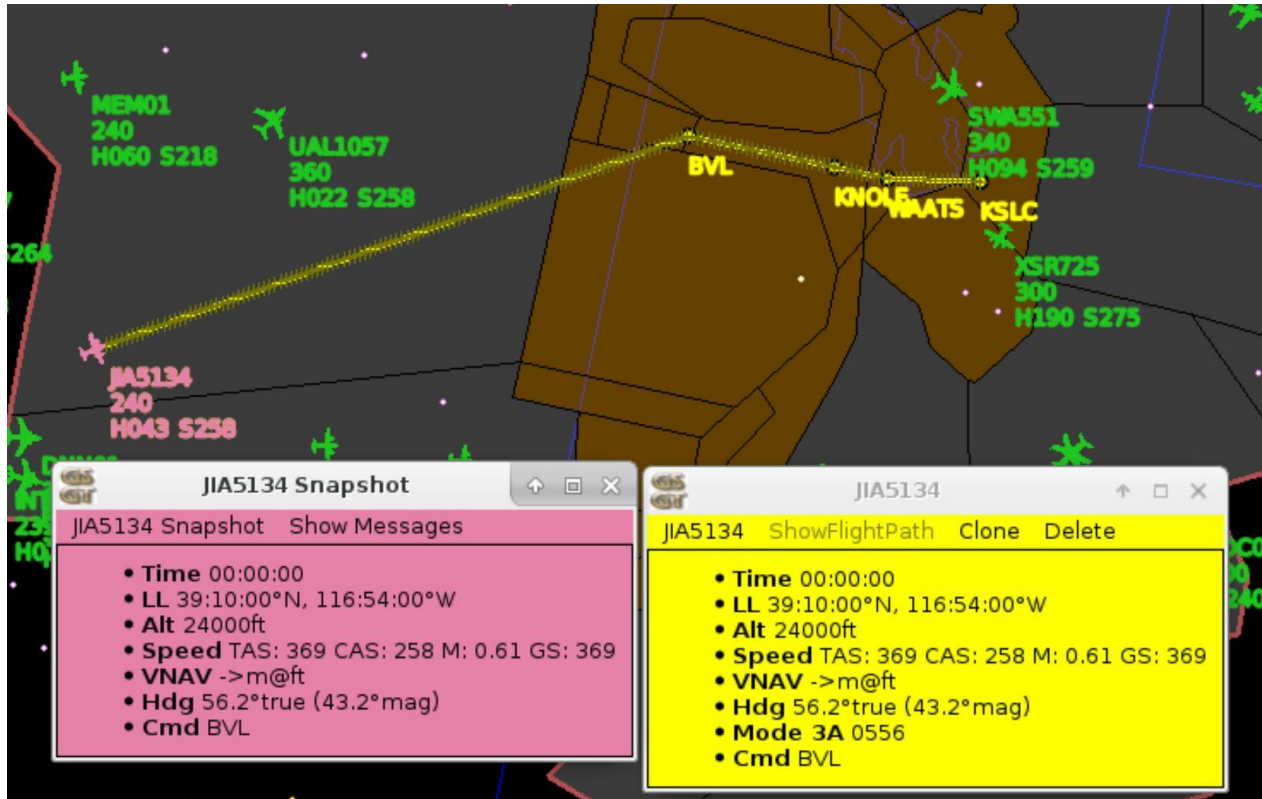


Figure 104. Target Flight Path

6.3. Clone a Flight

To clone a flight in GSGT, start preview mode from the Scenario Editor. Make sure to have the flight that will be cloned already created in the scenario. Then right click the flight on the map, and click ShowFlightPath. This will enable the clone option for that flight to be selected.

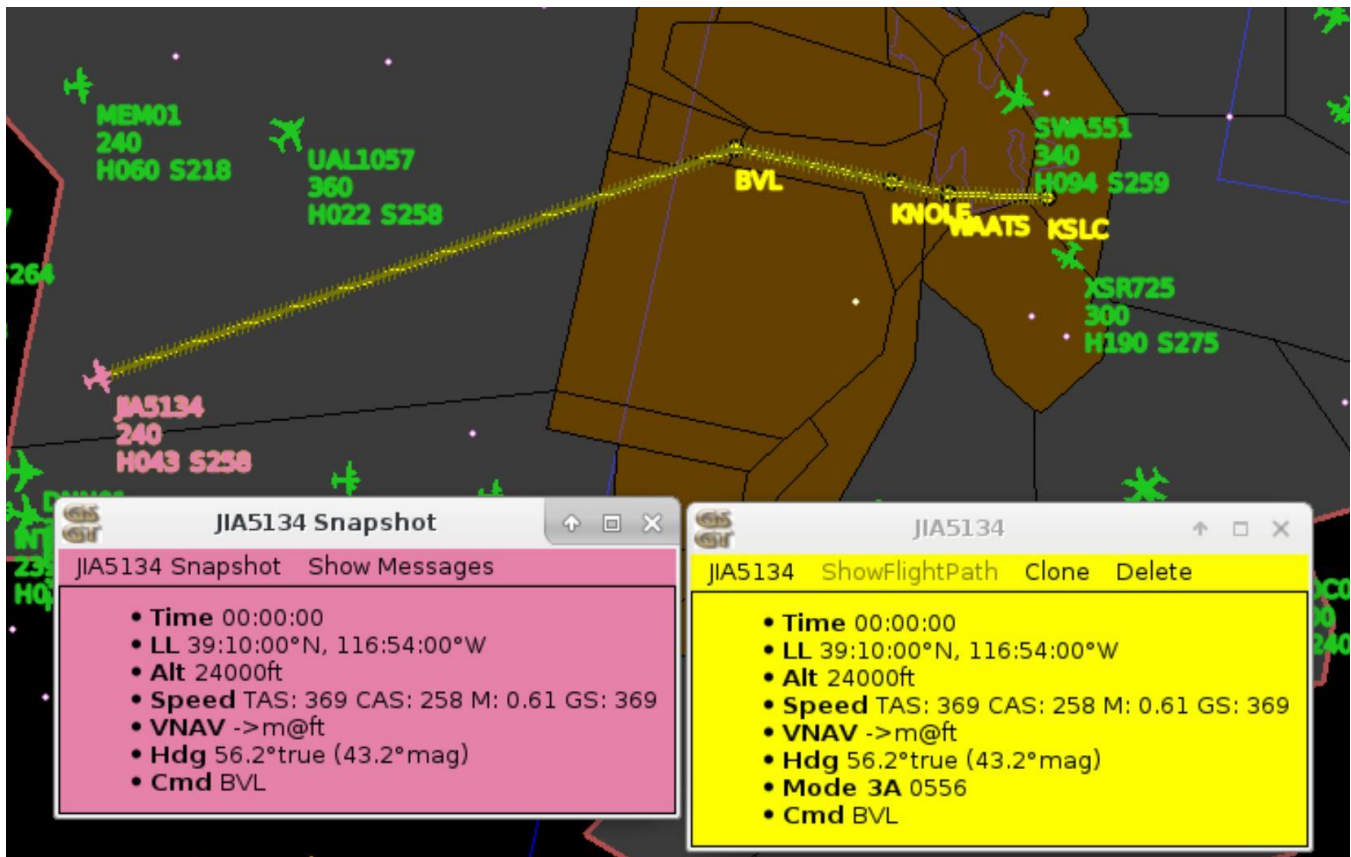


Figure 105. Cloning a Flight in Preview

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.

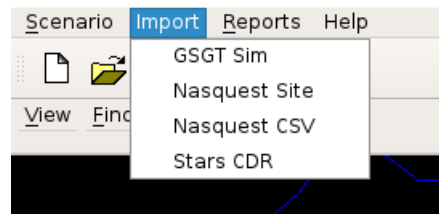


Figure 106. Import Scenario

Select the GSGT scenario to import into current scenario.

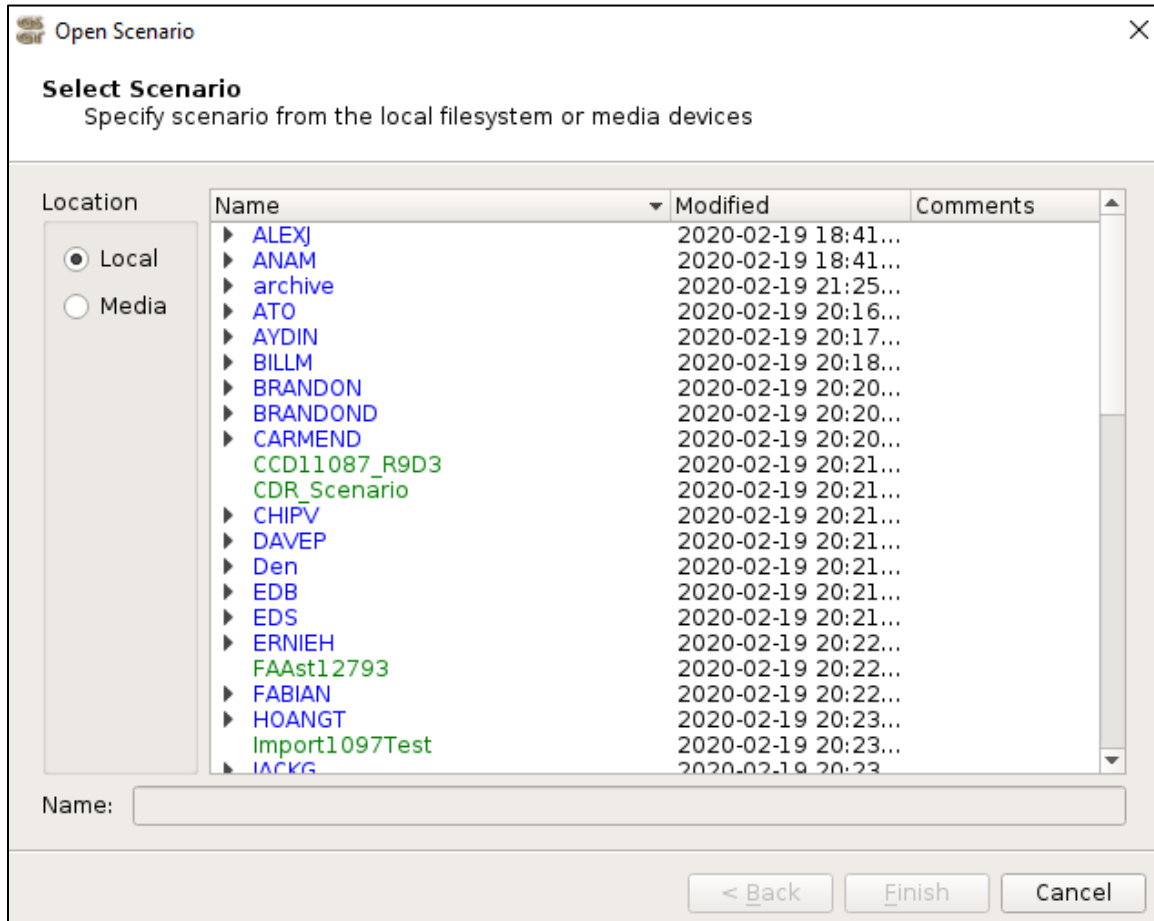


Figure 107. Scenario Selection

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.

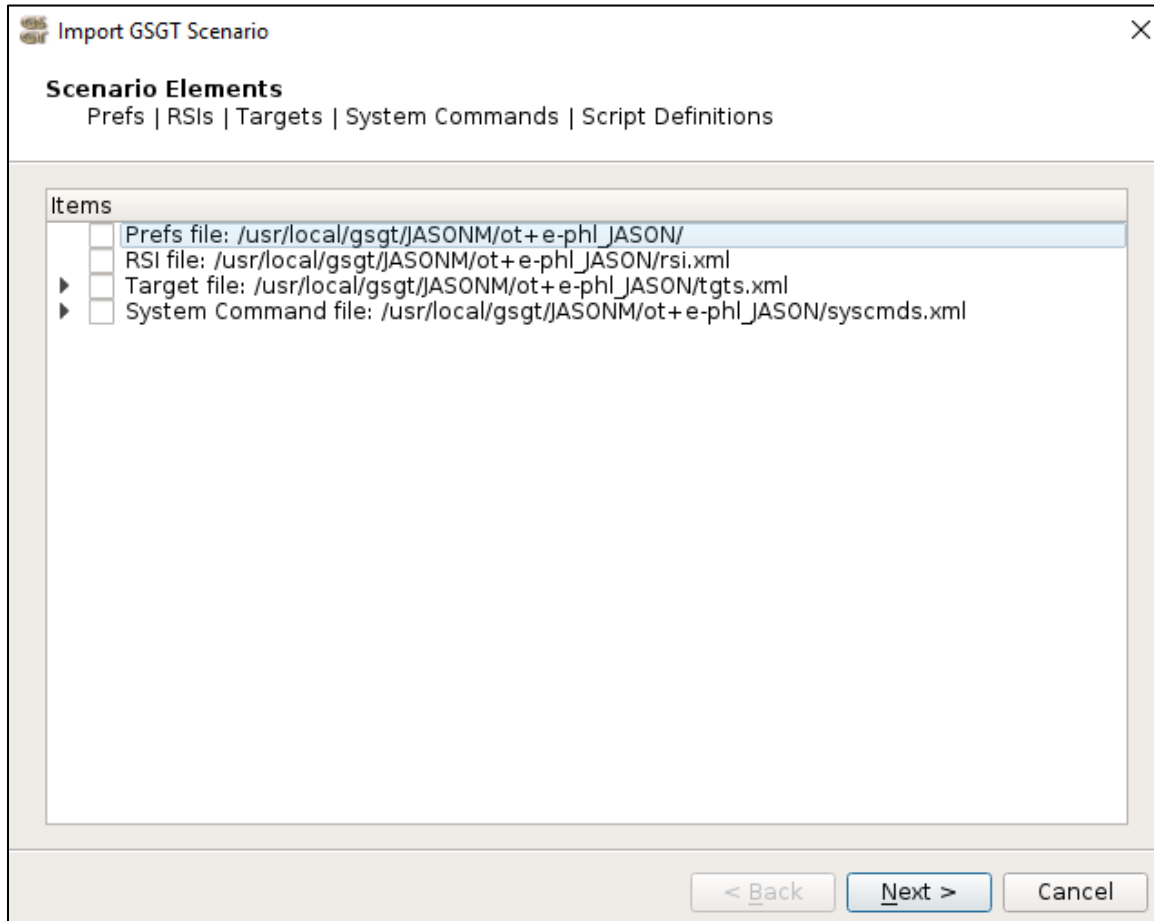


Figure 108. Select Scenario Elements

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).

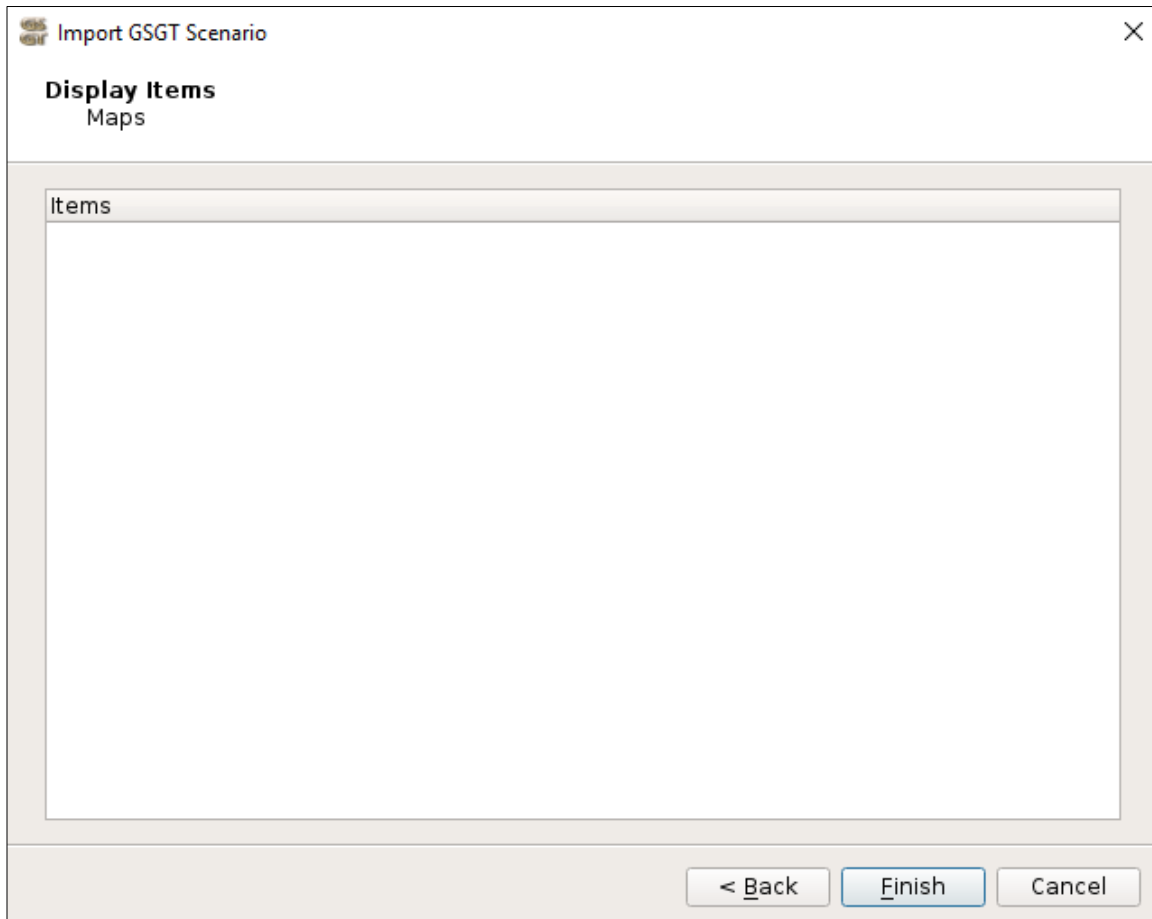


Figure 109. Select Display Items

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 110. 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 111. 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.

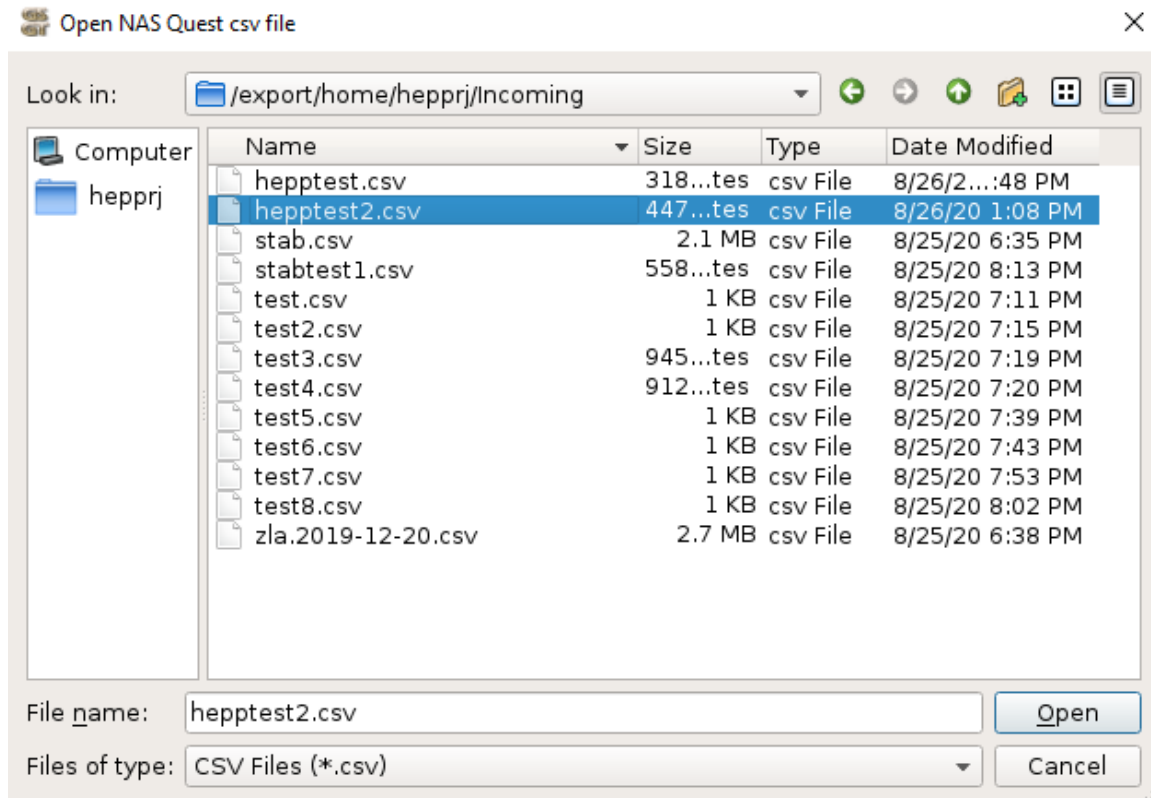


Figure 112. Import CSV File

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

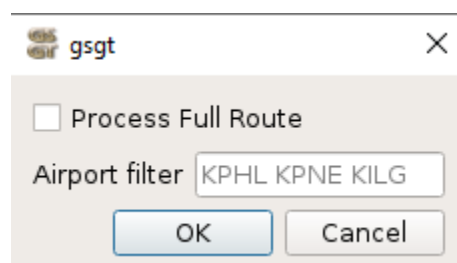


Figure 113. Import CSV Options

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

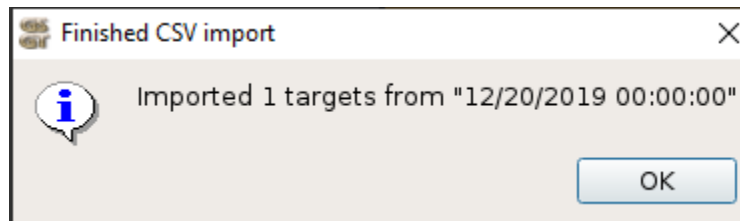


Figure 114. CSV Import Status

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.

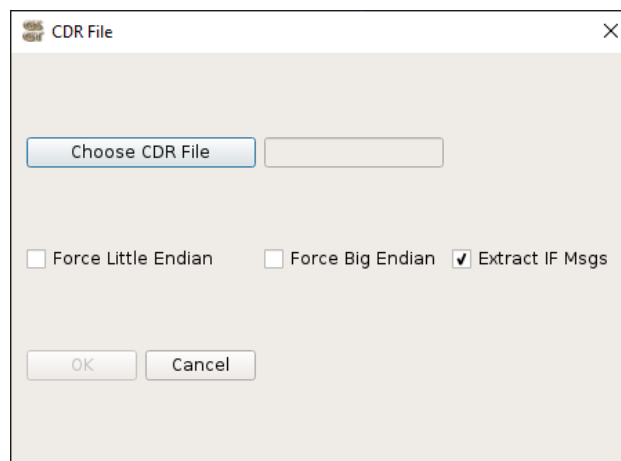


Figure 115. STARS CDR Options

Users have the option to Force Little Endian, Force Big Endian, or Extract IF Msgs. By default, GSGT will automatically detect the correct Endian type.

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

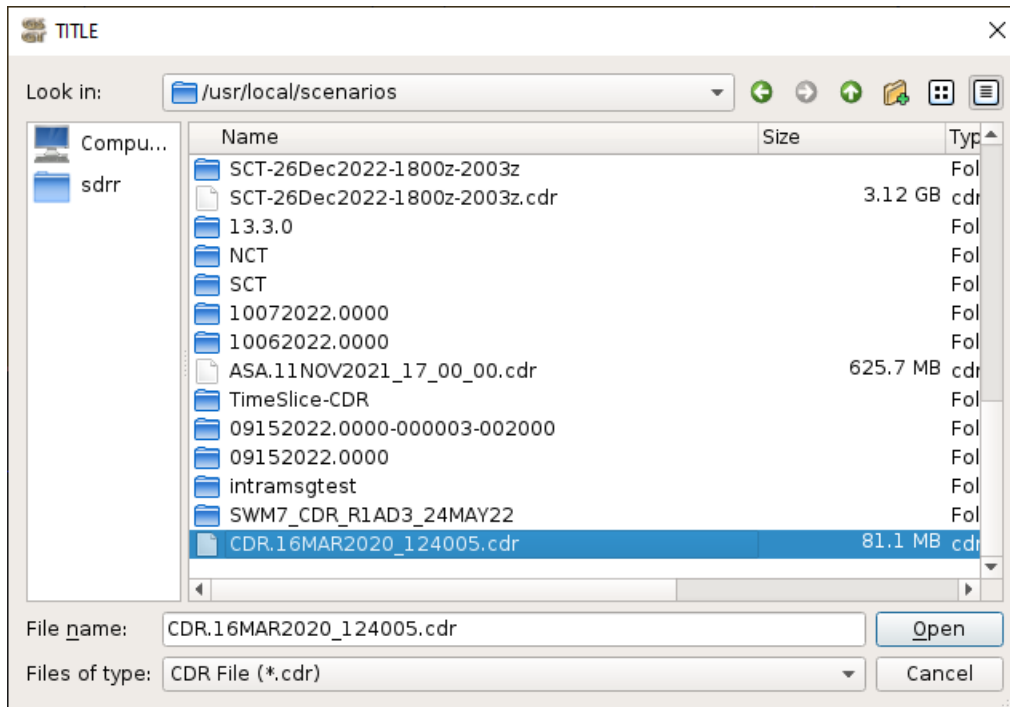


Figure 116. Import CDR File

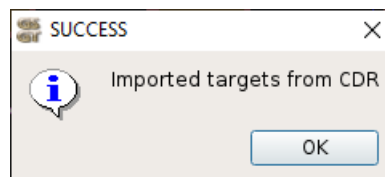


Figure 117. CDR Import Status

Time Based Targets are imported into the scenario.

Scenario Editor

Preview Exports Snapshot Filters Reports

Preferences Sensors Targets System Commands RSIs

| Name | Time | AChar | BCN | Alt |
|---------|----------|-------|------|-----|
| ADSB01 | 00:02:00 | B737 | 2001 | |
| ARR01 | 00:00:02 | B737 | 4001 | |
| ARR2 | 00:02:00 | B737 | 0601 | |
| ARR3 | 00:03:59 | B737 | 4003 | |
| DEP01 | 00:04:09 | B737 | 3001 | |
| DEPARR1 | 00:01:10 | B737 | 1201 | |
| DEPARR2 | 00:03:15 | B737 | 1202 | |
| IOI01 | 00:00:00 | B737 | 7001 | |
| MS01 | 00:00:01 | B737 | 1001 | |
| RR01 | 00:00:10 | B737 | 1101 | |
| RSI01 | 00:00:11 | B737 | 1601 | |
| STARS01 | 00:00:02 | B737 | 1401 | |

Figure 118. 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.

Target editor

Name: ARR01 Starttime: 0/00:00:02

Main Dynamics Messages Dysim

Flight Plan

AChar: B737 Speed: Flevel: 000

Route:

Departure Runway: Arrival Runway:

Flight Dynamics

Macro:

Populate Macro from FP Route Macro Help Show Flight Path

Events

| Time | Description |
|------|-------------|
| | |

Figure 119. 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.

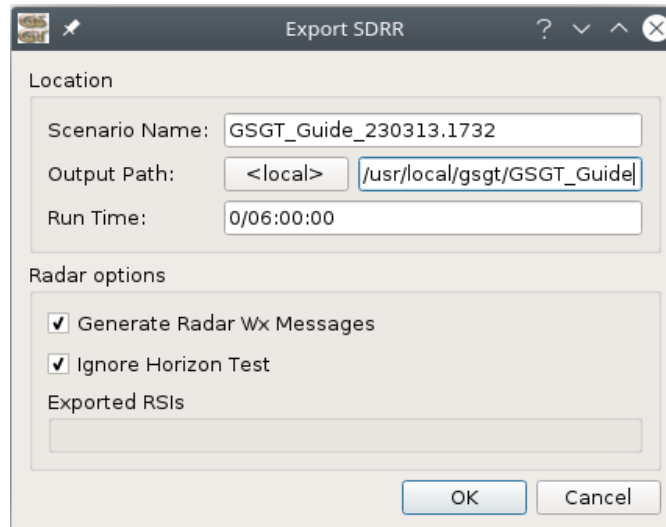


Figure 120. Export SDRR

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.

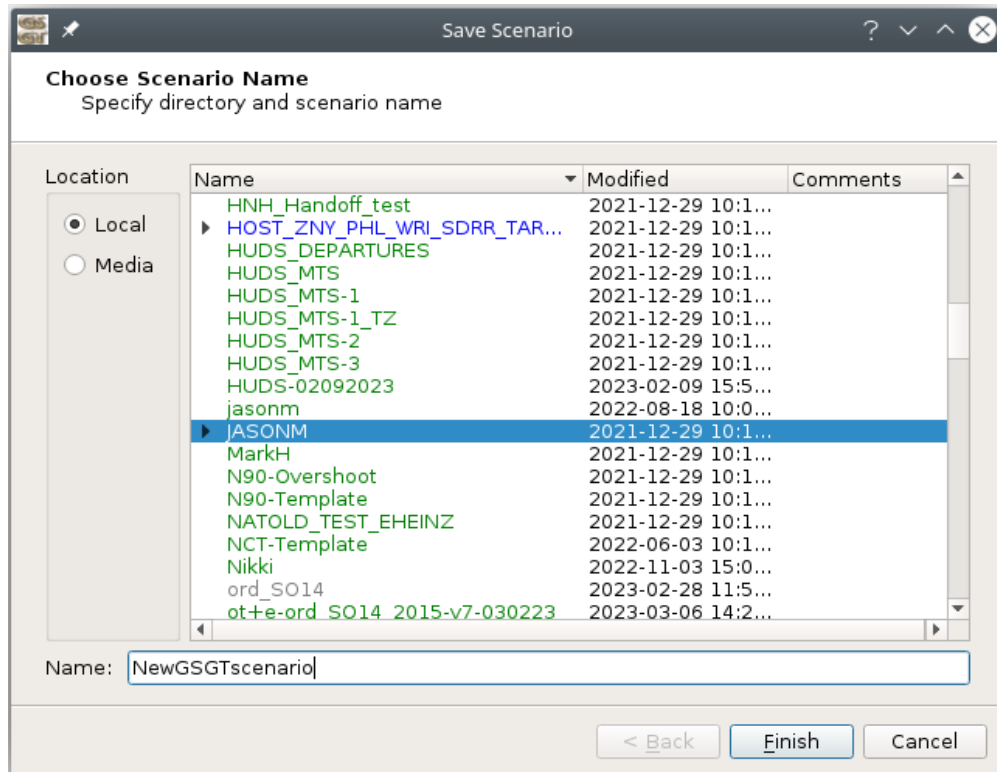


Figure 121. Export GSGT

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.

The rest of the 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 |

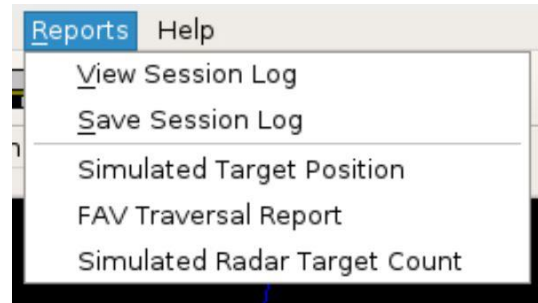


Figure 122. Main Reports Menu

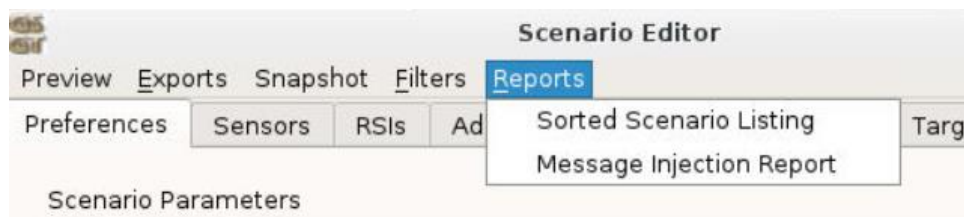


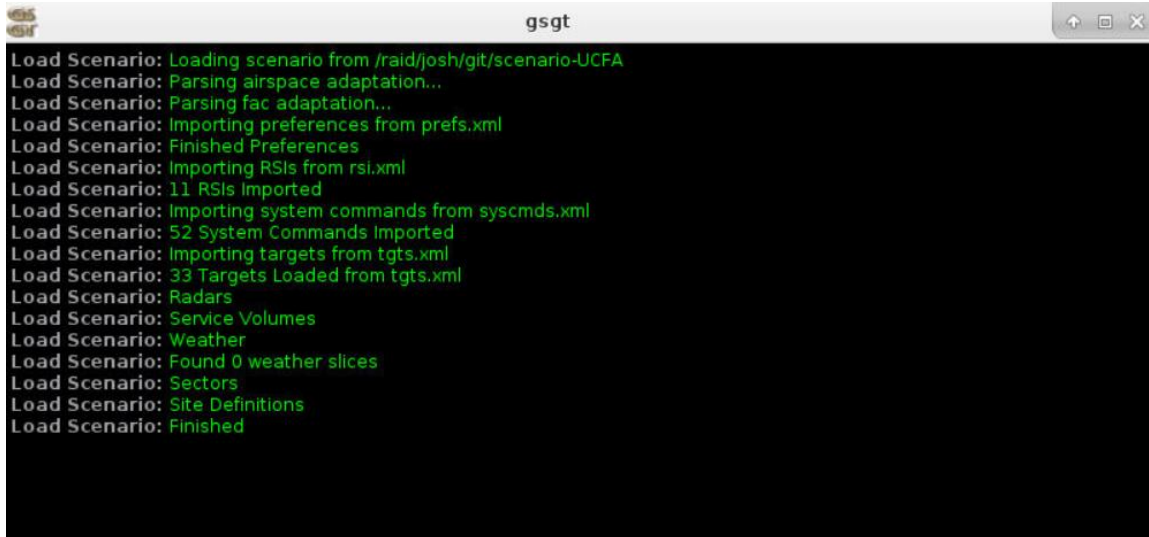
Figure 123. Scenario Editor Reports Menu

9.1. GSGT Session Log

The Session Log displays messages that were generated during the current session while performing certain task. 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.

The task that generated the message is shown in GRAY. Status and completion messages are shown in GREEN. Warnings are shown in YELLOW and error messages are shown in RED.



```

Load Scenario: Loading scenario from /raid/josh/git/scenario-UCFA
Load Scenario: Parsing airspace adaptation...
Load Scenario: Parsing fac adaptation...
Load Scenario: Importing preferences from prefs.xml
Load Scenario: Finished Preferences
Load Scenario: Importing RSIs from rsi.xml
Load Scenario: 11 RSIs Imported
Load Scenario: Importing system commands from syscmds.xml
Load Scenario: 52 System Commands Imported
Load Scenario: Importing targets from tgts.xml
Load Scenario: 33 Targets Loaded from tgts.xml
Load Scenario: Radars
Load Scenario: Service Volumes
Load Scenario: Weather
Load Scenario: Found 0 weather slices
Load Scenario: Sectors
Load Scenario: Site Definitions
Load Scenario: Finished
  
```

Figure 124. GSGT Session Log

9.2. Sorted Scenario Listing

The Sorted Scenario Listing displays the injected messages for each target. The targets can be sorted by name and RSI.

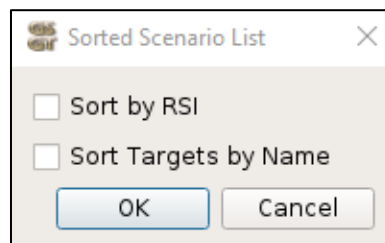


Figure 125. Sorted Scenario List Options

To generate the report, select Reports->Sorted Scenario Listing from the GSGT Main Window.

Sort by RSI

Group and sort the output by RSI.

Sort Targets by Name

Group and sort the output by the targets name.

OK

Generates the report using the specified criteria.

Cancel

Closes the dialog and cancels the report.

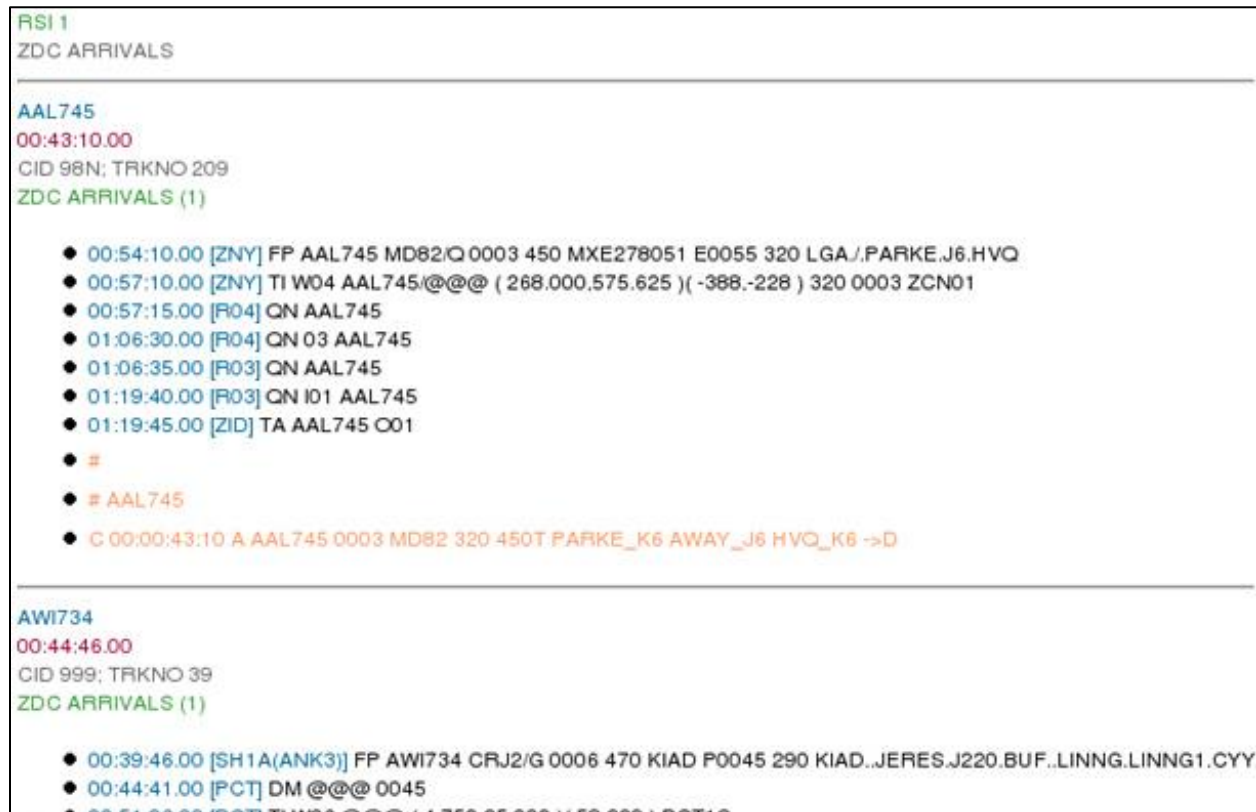


Figure 126. Sorted Scenario List Report

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 GSGT Main Window.

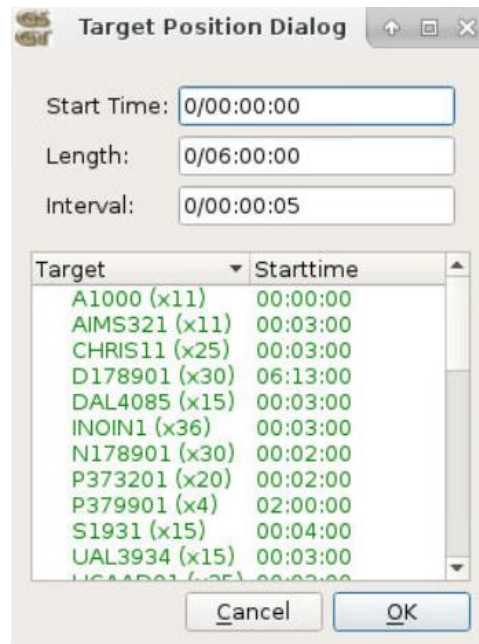


Figure 128. Target Position Report Options

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 Starttime 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.

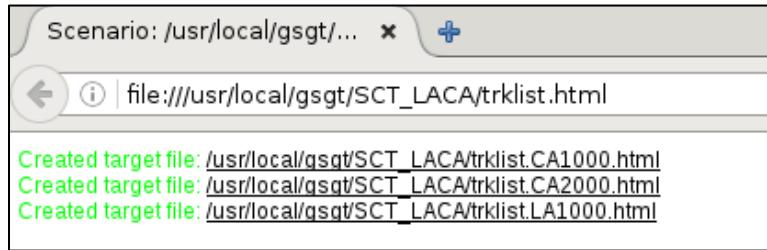
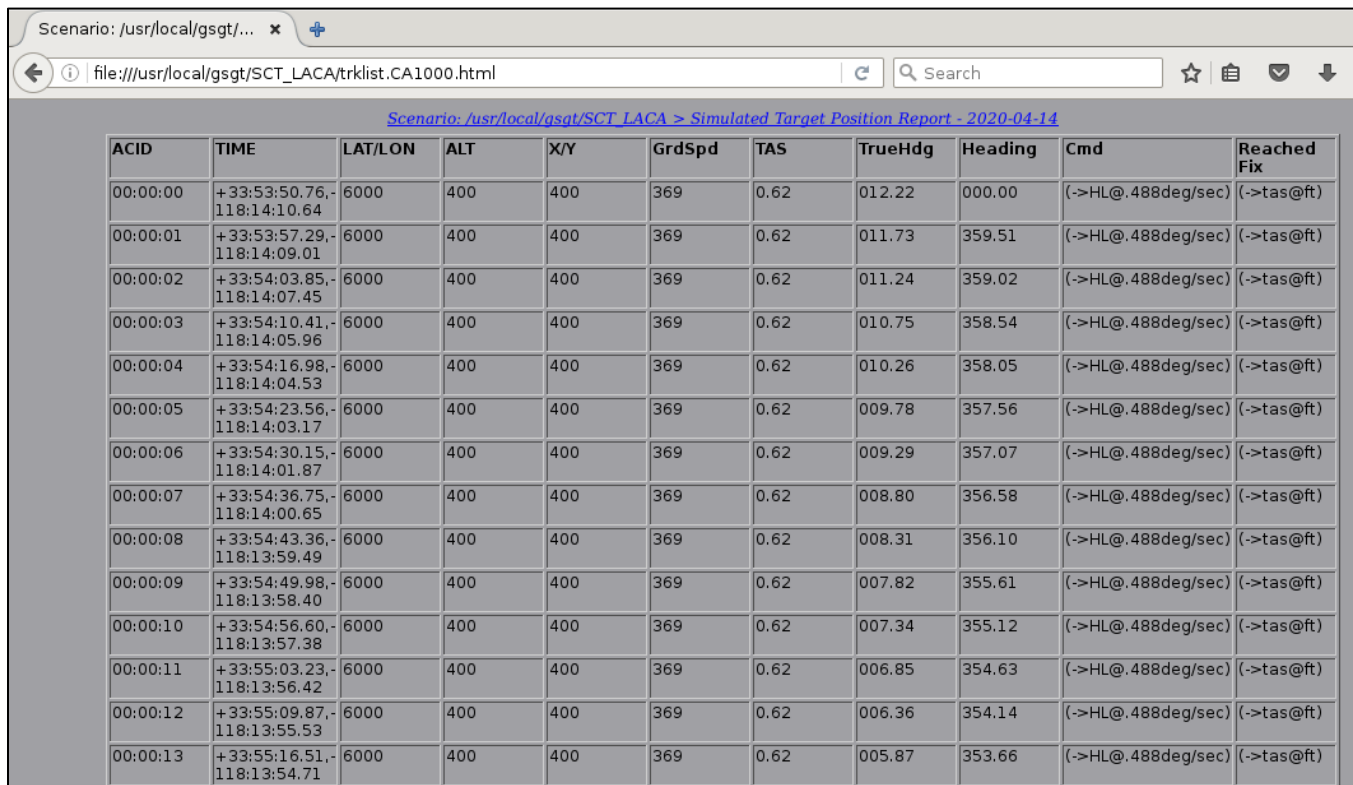


Figure 129. Target Position Report File List



Scenario: /usr/local/gsgt/... x +

file:///usr/local/gsgt/SCT_LACA/trklist.CA1000.html

Scenario: /usr/local/gsgt/SCT_LACA > Simulated Target Position Report - 2020-04-14

| 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 130. Target Position Report

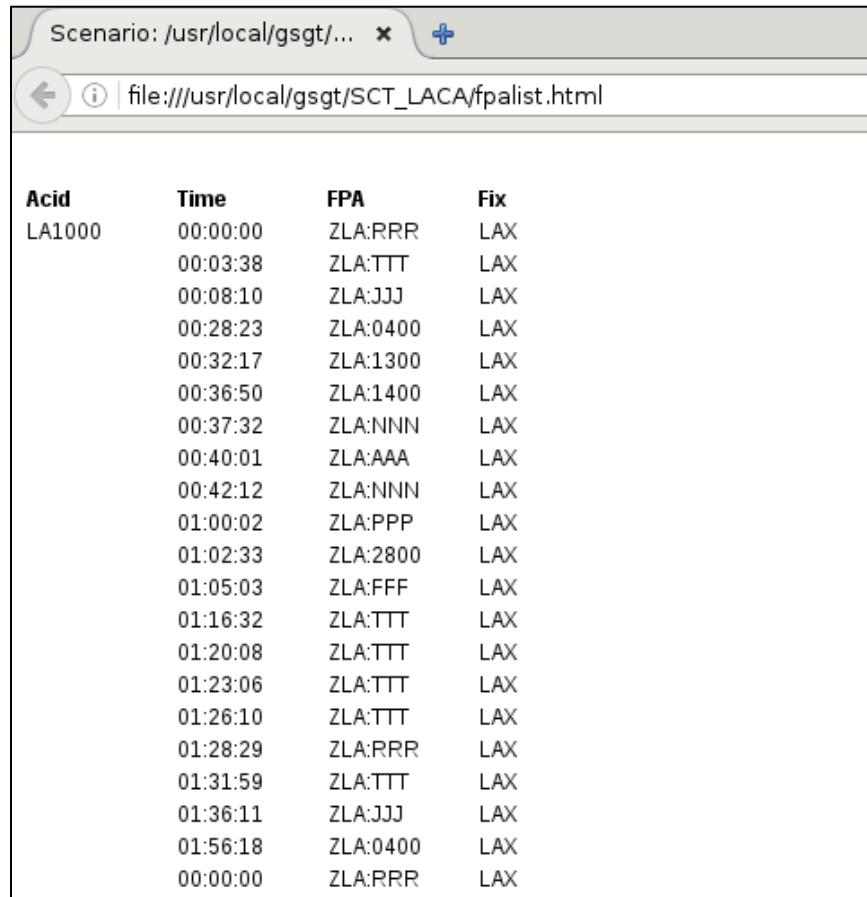
9.5. FAV Traversal Report

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 131. FAV Traversal Report

9.6. Simulated Radar Target Count

The GSGT Simulated Radar Target Count.

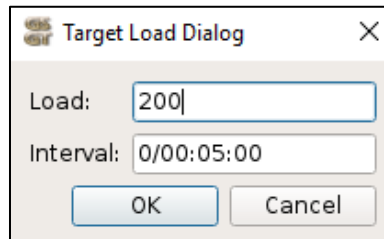


Figure 132. Target Count Report Options

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

Load

The aircraft load to report.

Interval

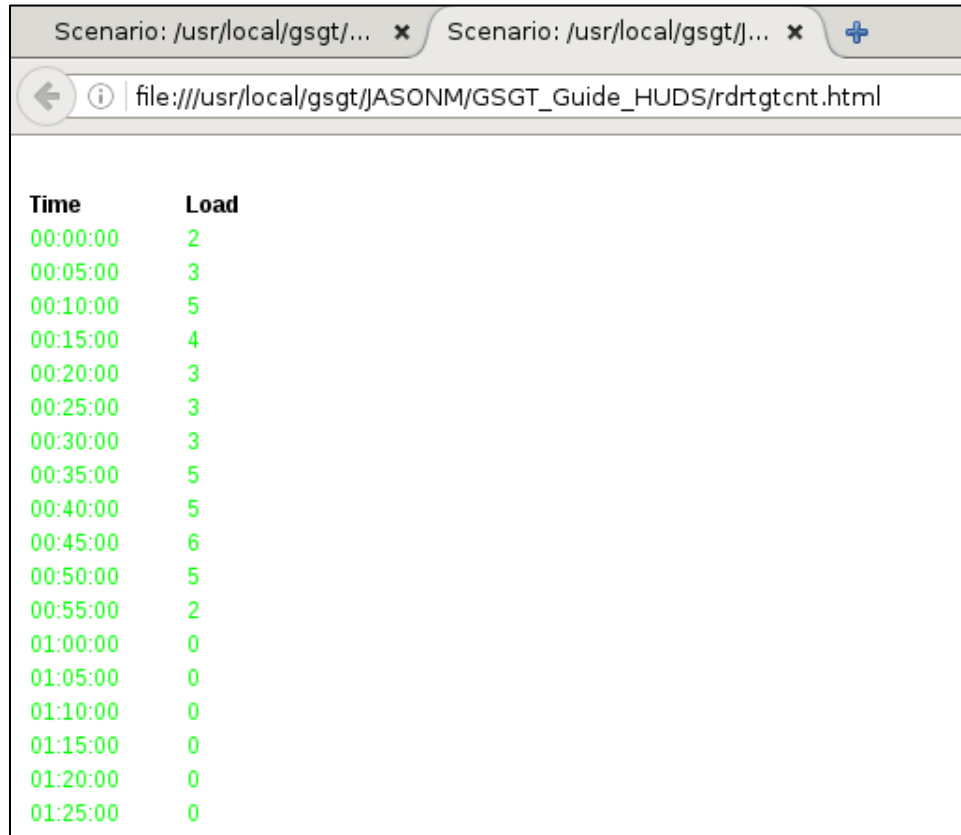
The time interval used in the report.

OK

Generates the report using the specified criteria.

Cancel

Closes the dialog and cancels the report.



The screenshot shows a web browser window with two tabs. The active tab is titled "Scenario: /usr/local/gsgt/..." and the address bar shows the file path "file:///usr/local/gsgt/JASONM/GSGT_Guide_HUDS/rdrtgtcnt.html". The main content area displays a table with two columns: "Time" and "Load". The "Time" column contains timestamps from 00:00:00 to 01:25:00 in 5-minute increments. The "Load" column contains numerical values ranging from 0 to 6. The table data is as follows:

| Time | Load |
|----------|------|
| 00:00:00 | 2 |
| 00:05:00 | 3 |
| 00:10:00 | 5 |
| 00:15:00 | 4 |
| 00:20:00 | 3 |
| 00:25:00 | 3 |
| 00:30:00 | 3 |
| 00:35:00 | 5 |
| 00:40:00 | 5 |
| 00:45:00 | 6 |
| 00:50:00 | 5 |
| 00:55:00 | 2 |
| 01:00:00 | 0 |
| 01:05:00 | 0 |
| 01:10:00 | 0 |
| 01:15:00 | 0 |
| 01:20:00 | 0 |
| 01:25:00 | 0 |

Figure 133. Target Count Report

10. Weather Editor

The weather scenarios can be included in GSGT scenarios to provide more realistic simulation. They are created using GSGT Weather Editor, which is a part of GSGT distribution. 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 exactly the same names. However, it is recommended to use different names to be able to distinguish them easily.

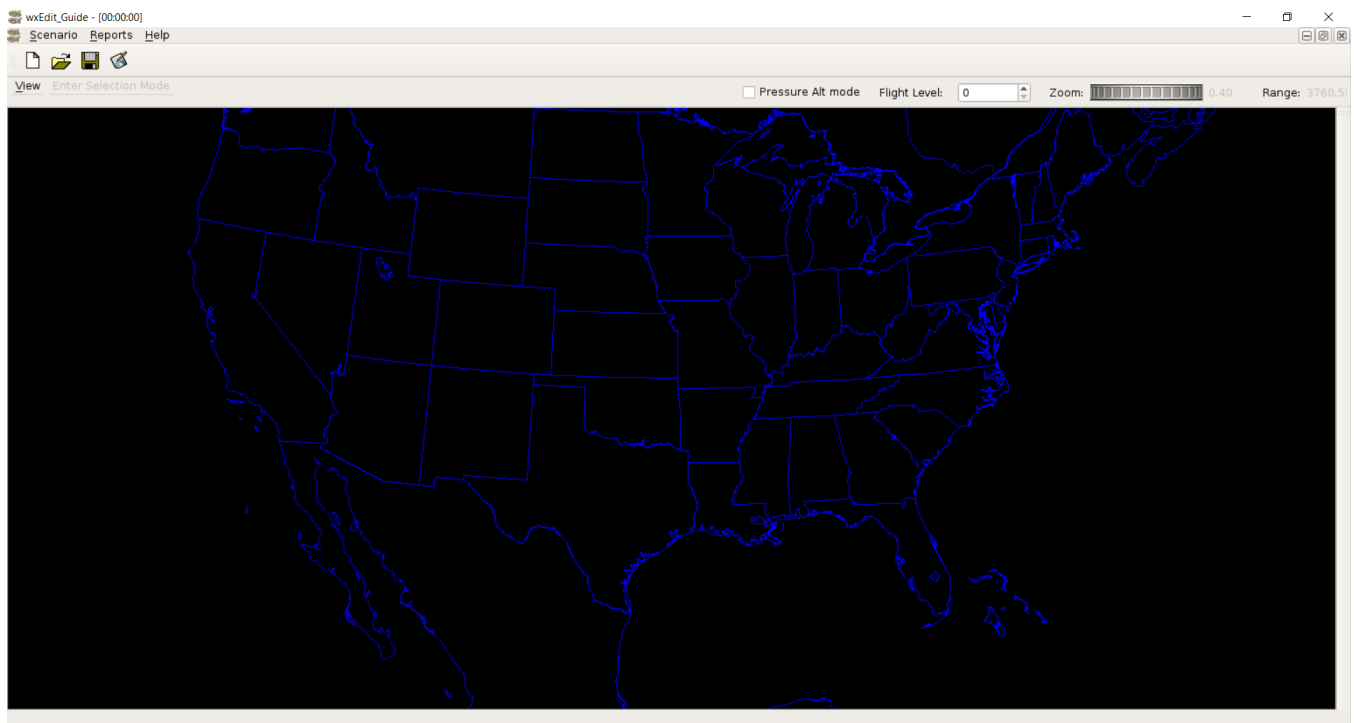


Figure 134. Weather Editor

Since weather scenarios can be included into multiple GSGT scenarios they are included as read-only and can't be modified from within a regular scenario. Also since they are shared, any change in the weather scenario will affect all scenarios that use that particular 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. |
| --native | Default mode. Same as no parameter. Native mode provides the ability to export the scenario to SDRR for execution with the ERAM system. |
| --proxy=server/port | Opens wxEdit with specific server/port |
| --version | Display the Weather Editor version. |
| --nofullscreen | Not full screen mode; the Weather Editor will be started 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
```

10.1.2. Loading Adaptation

The weather editor, by default, does not display any adaptation information because it's not adaptation specific, meaning it does not require an adaptation for creating or editing weather patterns. However, it allows the user to load adaptation for a better visual reference but the adaptation is not saved with scenario.

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

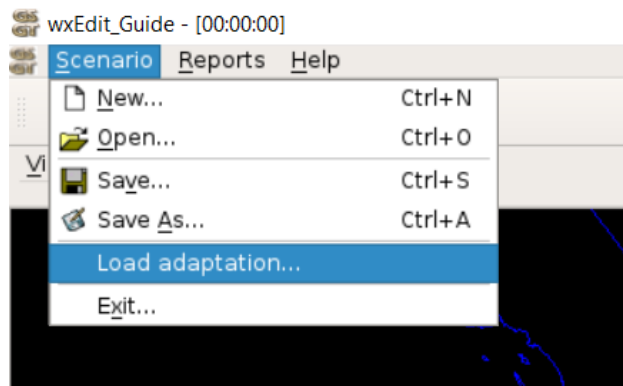


Figure 135. Loading Adaptation

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 the 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 a different adaptation.

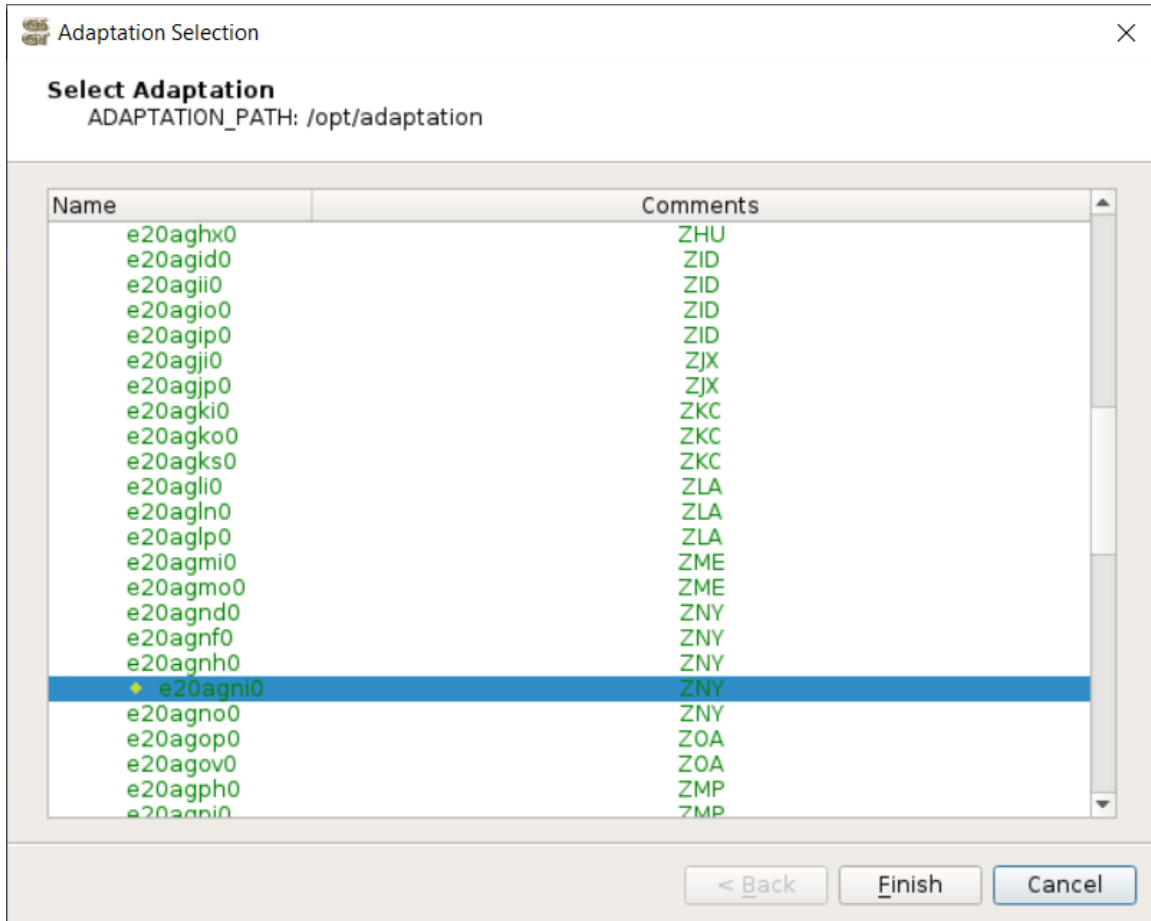


Figure 136. Selecting an Adaptation

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.

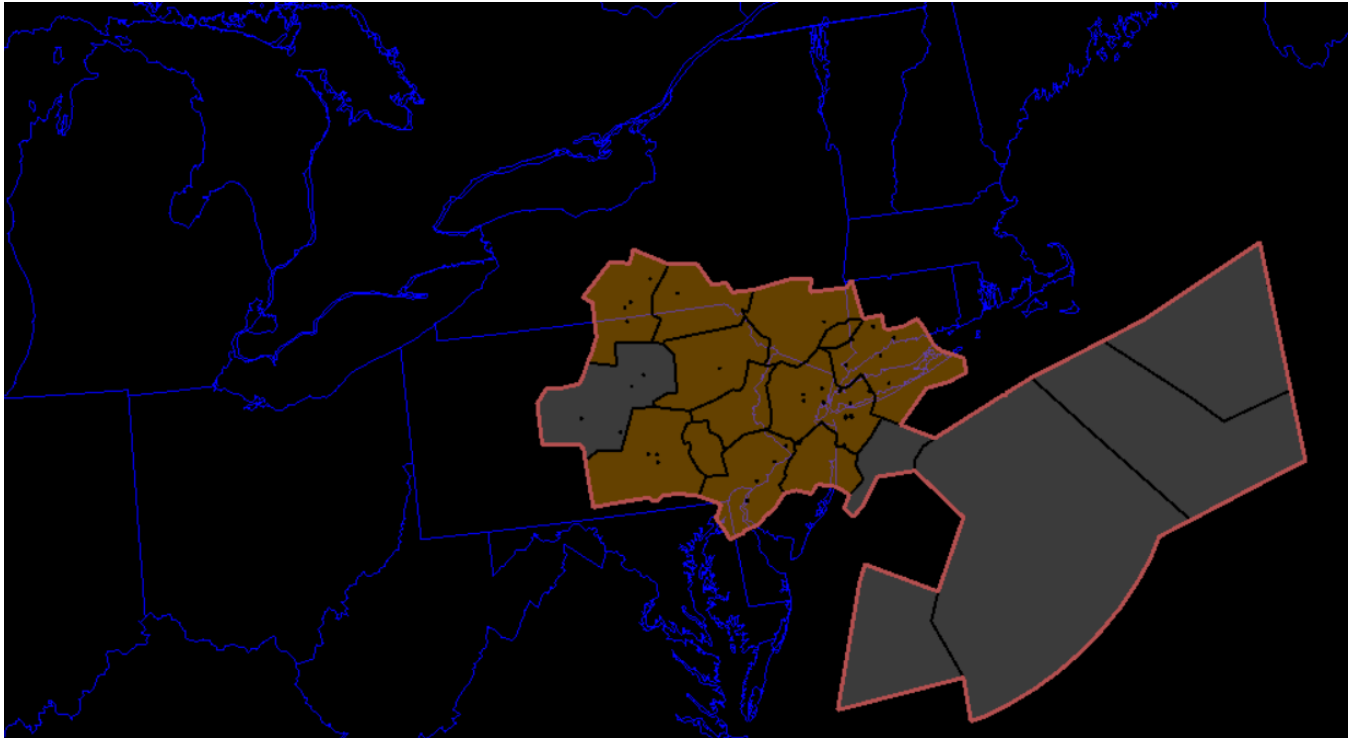


Figure 137. Adaptation Display

10.2. Weather Editor GUI

10.2.1. Weather Time Slice Windows

Weather scenarios can consist of multiple time slices. Time slices can only be defined during initial creation of a weather scenario. The beginning time of the time slice is displayed in the title bar of the window or in the main title bar if the window is maximized.

Every time slice in the weather scenario is contained in its own editor window. Each of these windows can be separately adjusted to view maps and different types of weather. Additionally, changing the stratum allows the user to view the different wind and temperature values for a particular level. Stratum can be specified in pressure altitude (millibars or mb) or by flight level (FL). Changing stratum does not affect the preview of pressure or precipitation. Only wind and temperature may have different values at different stratum levels.

Table 11. Weather Types

| Event | Description |
|-------------|--|
| Wind | It's depicted by WHITE vectors indicating heading, and length indicating speed. Default speed and heading is 0 |
| Temperature | It's depicted by gamma colors (blue being cold, red being hot) outlined every 10 degrees. Default temperatures vary by stratum. For example default temperature at 1000mb is 57.7 F and at 100mb it is -69.70 F. |
| Pressure | It's depicted by red and blue intensity colors, where red is high and blue is low pressure. The default pressure is 1013.25mb. |
| Precip | It's depicted by intensity in colors (blue, green, yellow, red, purple and white) ranging from light to most severe precipitation. |

10.2.2. Weather Editor Menus

To preview weather, from the wxEdit window menu select **View->Wx**. This opens a list of weather views (Wind, Temperature, Pressure, and Precip). Select desired weather types to be viewed by repeating this step as necessary. To remove wx data from the display select **View->Wx** and deselect the appropriate weather types.

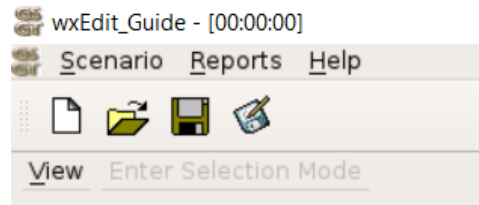


Figure 138. Menu Bar

View

The pull-down menu is used to select weather data and map data for background display. The background functions may be displayed individually or in combination.

Maps

US Map (BLUE)

Canada (BLUE)

Mexico (BLUE)

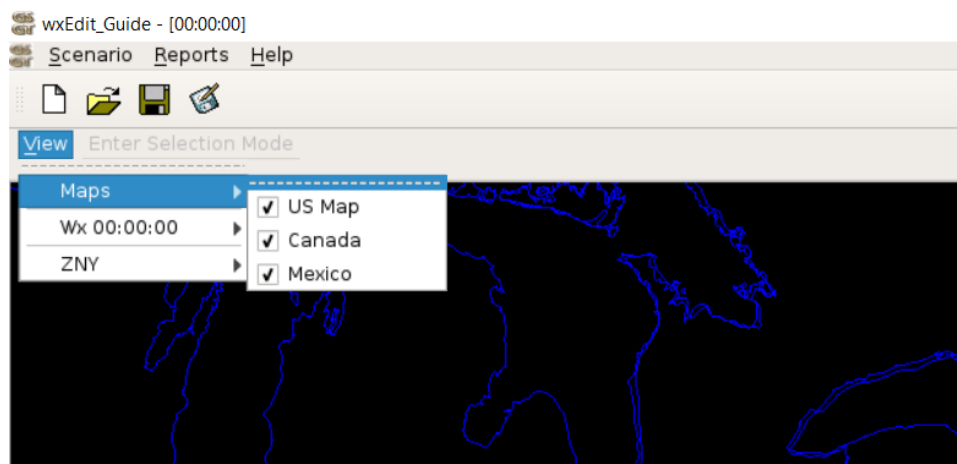


Figure 139. Map Selection

Wx

Temperature – Display the temperature.

Pressure – Display the air pressure.

Wind – Display the wind.

Precip – Display the precipitation.

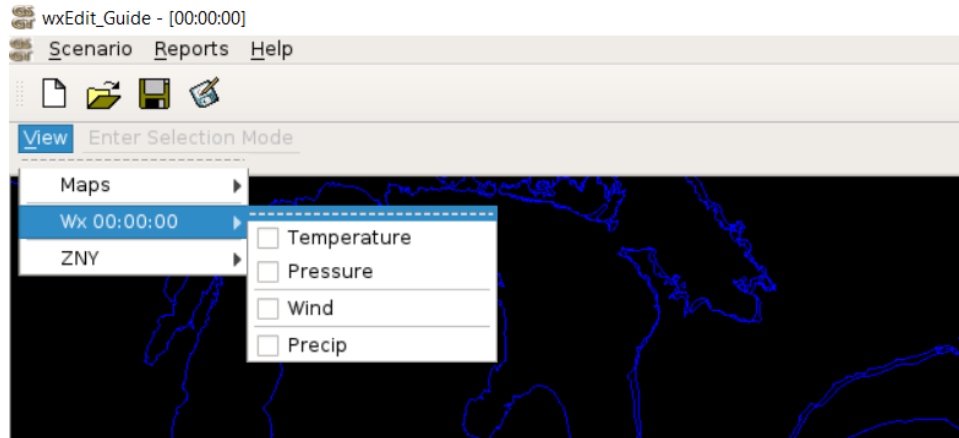


Figure 140. Weather Data Selections

ARTCC

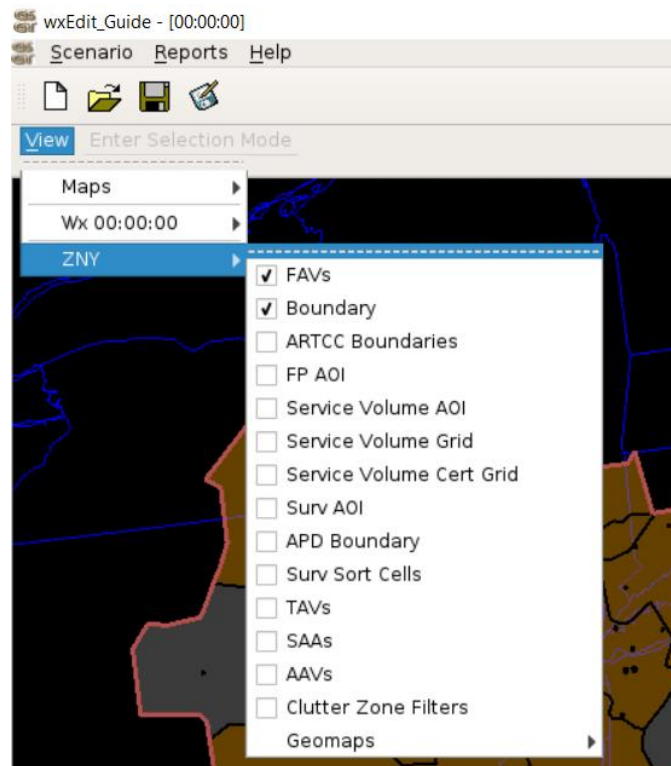


Figure 141. ARTCC Options

Enter Pointer Mode

Enter Pointer Mode – Default mode that enables selecting and editing weather values. Disables adding weather.



View Enter Pointer Mode

Figure 142. Enter Pointer Mode Menu Button

Tool used for activities such as repositioning/centering map display, rubber band zoom, weather cell info.

Moving map - Use left mouse button click and drag to move the map display

Centering map - Use 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.

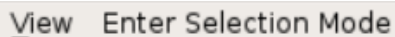
Rubber band zoom - Use left mouse button click and drag while holding **Ctrl** and **Shift** keys. This will draw a rectangular area representing the zoom detail after the mouse button is released.

Weather cell info - Use right mouse click to display weather pattern information, such as temperature, pressure and winds in and particular point on the weather grid. The information is displayed in the status bar on the bottom of the display view.

Adaptation info - If the adaptation is loaded in the view, use right mouse click within the FAV to display adaptation specific information such as FAV. This works in same fashion as in general GSGT Editor.

Enter Selection Mode

Enter Selection Mode – Enables modifying and adding weather.



View Enter Selection Mode

Figure 143. Enter Selection Mode Menu Button

Pressure Alt Mode

Pressure Altitude mode - Altitude 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)

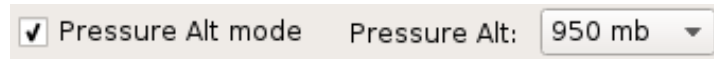


Figure 144. Pressure Altitude Options

Flight Level

Altitude in hundreds of feet.

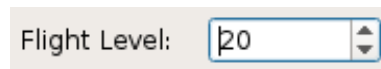


Figure 145. Flight Level

Zoom

Provides a zoom function for the GSGT Adaptation Window. The zoom function is controlled three ways. The slide bar on the top right area of the window can be moved to set the zoom level. Clicking on the slide bar and then pressing the Page Down and Page Up keys will zoom the view in and out, respectively. The user may also use the scroll wheel on their mouse if applicable.



Figure 146. Zoom

Range

Provides range of the current view in nm. The measurement of the range is taken horizontally across the middle of the viewer.

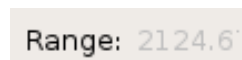


Figure 147. Range

10.2.3. Weather Information

Information for the existing RUC weather (Temperature, Pressure and Wind) is displayed in the status bar using a right mouse click on any specific point on the map. The information for each cell includes temperature, pressure, and wind speed and direction.

Cell: 66,39 Temperature: 57.70F Pressure: 1013.25mb Wind: 0.00,0.00 (U/V) 0.00,0.00 (X/Y) S0.00 H90.00 (true north) S0.00 H90.00 (RUC grid)

Figure 148. Weather Information Bar

10.2.4. Viewer Configuration

Weather scenarios are created with predetermined size of the viewer that covers continental US. To adjust zoom (Scale), location (Reference) and size (Width and Height) of the viewer select **Scenario -> Edit Viewer Config** from the Weather Editor Main Window.

NOTE: *The change is applied to all time slices and viewer is restarted. Make sure to save scenario changes before editing viewer configuration.*

Width

Width of the working size of the viewer in nautical miles centered at Reference point.

Height

Height of the working size of the viewer in nautical miles centered at Reference point.

Scale

Scale determines the maximum zoom-out of the display viewer. Working size of the viewer (Width/Height) is not affected. Increasing the Scale, zooms-in and decreasing Scale zooms-out the maximum view.

Reference

Reference point is the center of display viewer.

10.3. Creating a New Weather Scenario

A New Weather Scenario Wizard allows selection of scenario name and weather time slices to be defined in the new scenario. Newly created weather scenario includes 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 allows a back and forth navigation through pages of the wizard allowing the user to return to previous screen to modify any options before pressing **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.

10.3.1. Location and Name

The selection of a name and location for new a weather scenario is identical as in the new GSGT scenario with the difference that weather scenarios are saved in a different location. The location of weather scenarios is controlled by \$WX_PATH environment variable.

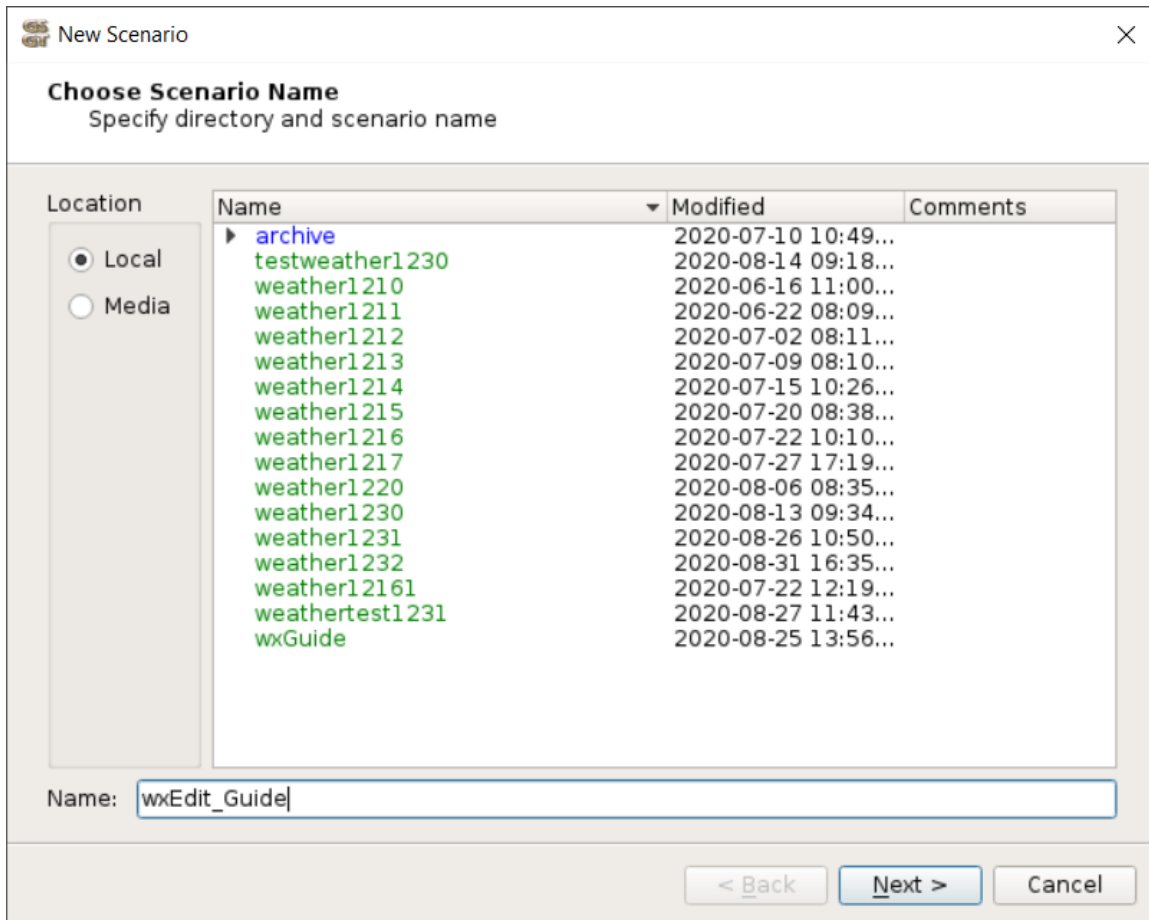


Figure 149. Weather Scenario Name and Location

10.3.2. Weather Time Slices

To add a time slice to a weather scenario, use the up/down arrows to select time slice hour, then click **Add Time**. Weather scenario may include multiple time slices. Add desired number of time slices for every hour before pressing **Finish** button. Time slices cannot be easily added after weather scenario is created.

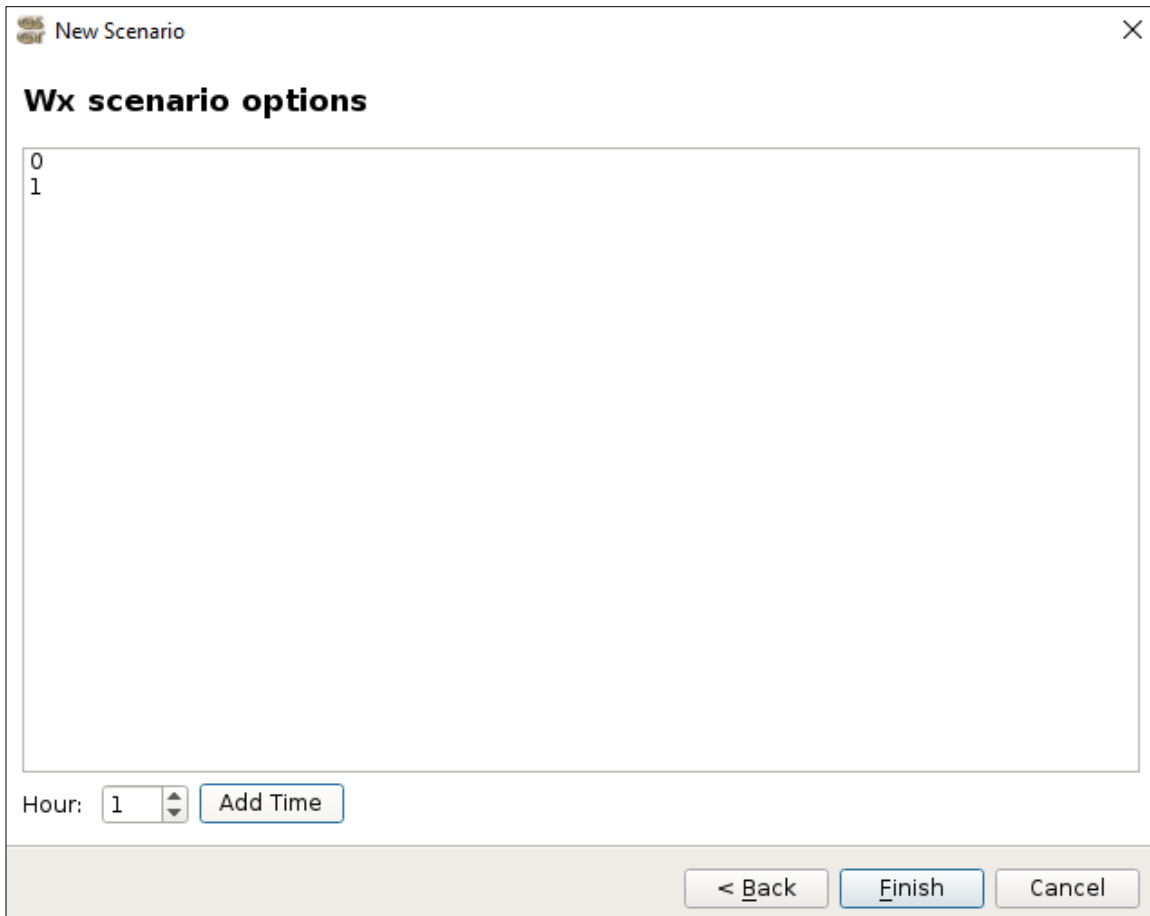


Figure 150. WeatherTime Slices

Hour

List of hourly time slices to include in the scenario.

Add Time

Adds desired time slice (as selected in Hour field) at which weather should be injected into the scenario by setting time using up/down arrows. The only allowable time slices are in 1 hour

increments. Defined time slices are displayed in the list. To delete unwanted time slice, right click on that particular time in the list and select **Delete**.

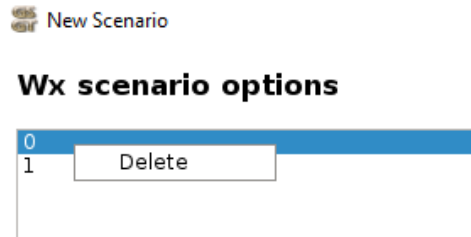


Figure 151. Deleting a Time Slice

Repeat this as many times as needed to create all time slices at which the weather should be injected, selecting a single time slice or multiple time slices for injection. Rethink how long weather scenario needs to be and include a time slice for each hour. Once the weather scenario is created, the additional time slice is difficult to add as it requires a manual edit of the scenario files.

10.4. Open an Existing Weather Scenario

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

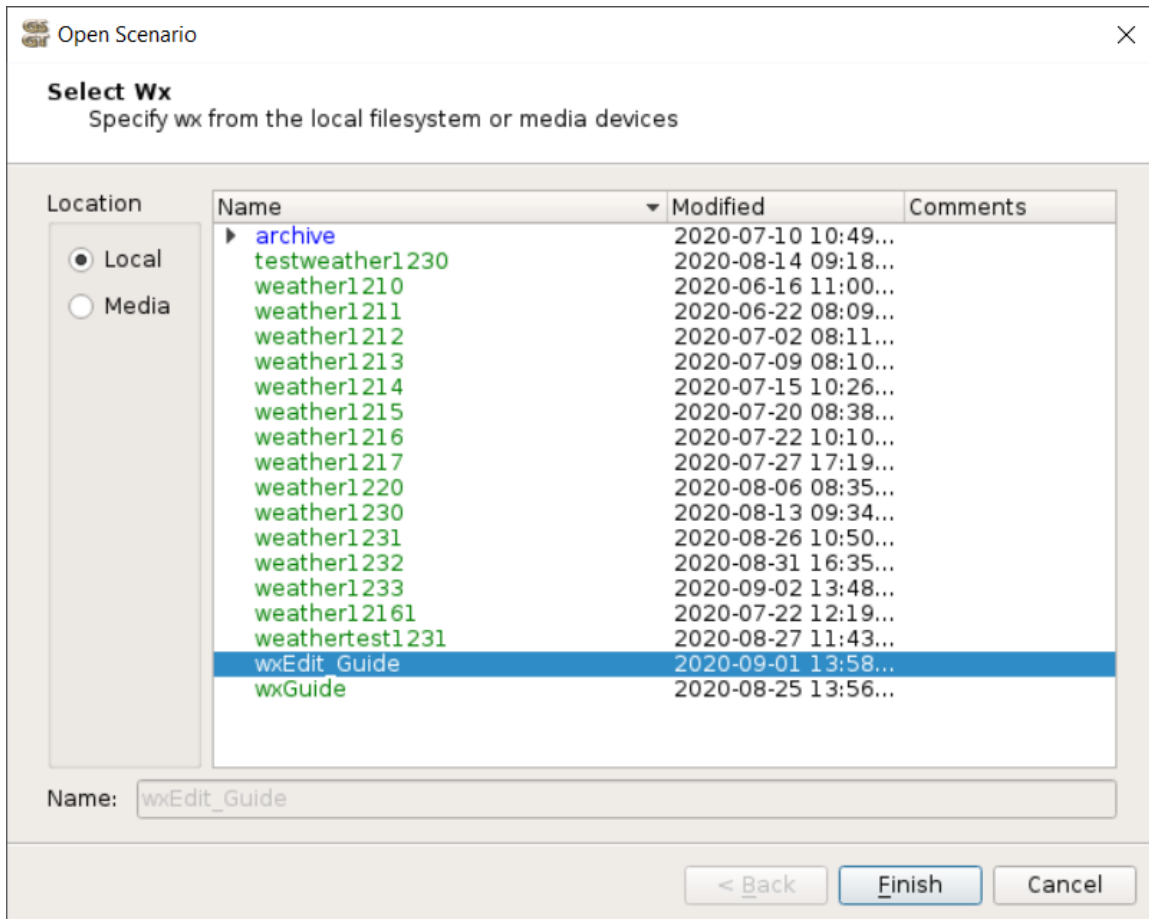


Figure 152. Select Existing Weather Scenario

10.5. Edit weather scenario

To edit weather attributes, preview the desired weather type from the **View** menu to aid selection and view changes. Also select desired Flight Level (or pressure altitude) from the menu bar, as temperature and wind may be different at different altitudes.

To make changes to any of the weather patterns, select the weather attribute and click **Enter Select Mode**. Temperature, pressure and wind are modified using RUC editor, while precipitation is modified using Precipitation Editor.

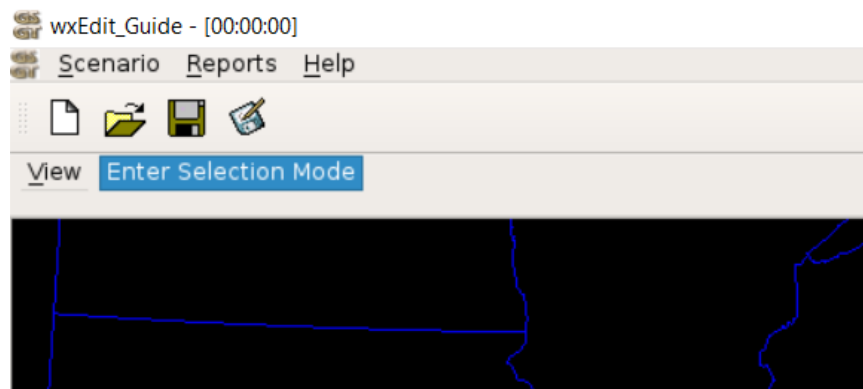
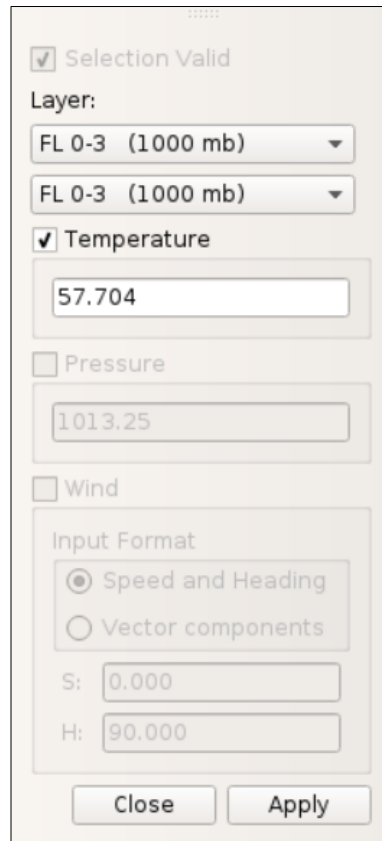


Figure 153. Enter Selection Mode

10.5.1. RUC Editor

To start editing RUC select one of the following weather attributes: Temperature, Pressure and Wind. The editor opens docked on the right side of the screen and may be repositioned on the screen if needed by grabbing its selection bar. To exit edit mode, use **Close** button on the editor dialog.



The RUC Editor dialog box contains the following elements:

- Selection Valid
- Layer:
 - FL 0-3 (1000 mb) [dropdown]
 - FL 0-3 (1000 mb) [dropdown]
- Temperature
 - 57.704 [text input]
- Pressure
 - 1013.25 [text input]
- Wind
 - Input Format
 - Speed and Heading
 - Vector components
 - S: 0.000 [text input]
 - H: 90.000 [text input]
- Buttons: Close, Apply

Figure 154. RUC Editor

Layer

The Strata layers that the new Temperature and Wind values will be applied to in hundreds of feet.

Temperature and Wind have separate values for each RUC layer. The list displays 37 layers with corresponding range of altitudes. A single or multiple layers can be selected at once to apply a specific value.

Weather Types

The values for each of the weather types can be applied individually or in combination by enabling or disabling individual weather types.

Add Weather

While in Enter Selection Mode, hold the **Shift** or **Ctrl** button and use left mouse click and drag to draw a loop around the desired area to edit the weather values. Additional cells may be selected by holding **Ctrl** button and selecting additional area using left mouse click and drag or by right

mouse click on desired cell. A right mouse click on a cell clears previous selection and selects a single cell. Also a left mouse click clears current selection.

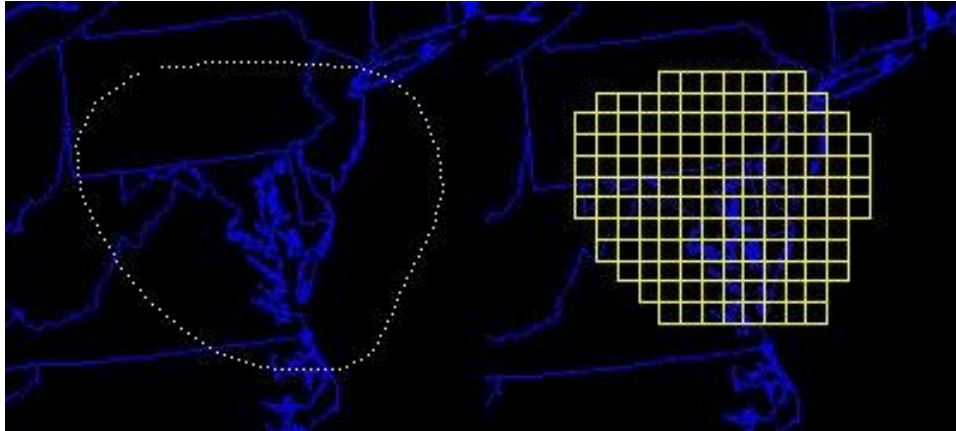


Figure 155. Selecting Weather Cells

One of the tools in RUC editor is ability to flood fill a contiguous area of the weather with the same value based on a single cell selection. To apply flood fill, select a single cell and fill in desired value for temperature or pressure, and press appropriate icon on the **Tools toolbar**, for either temperature or pressure. To aid selection and preview, enable appropriate weather type in the view.

10.5.1.1. Temperature

Temperature values can be specified in several temperature scales, such as Fahrenheit, Celsius or Kelvin. The default is Fahrenheit, to specify Celsius append C or for Kelvin append K after temperature value. Also different temperature values can be specified at a different stratum layers.

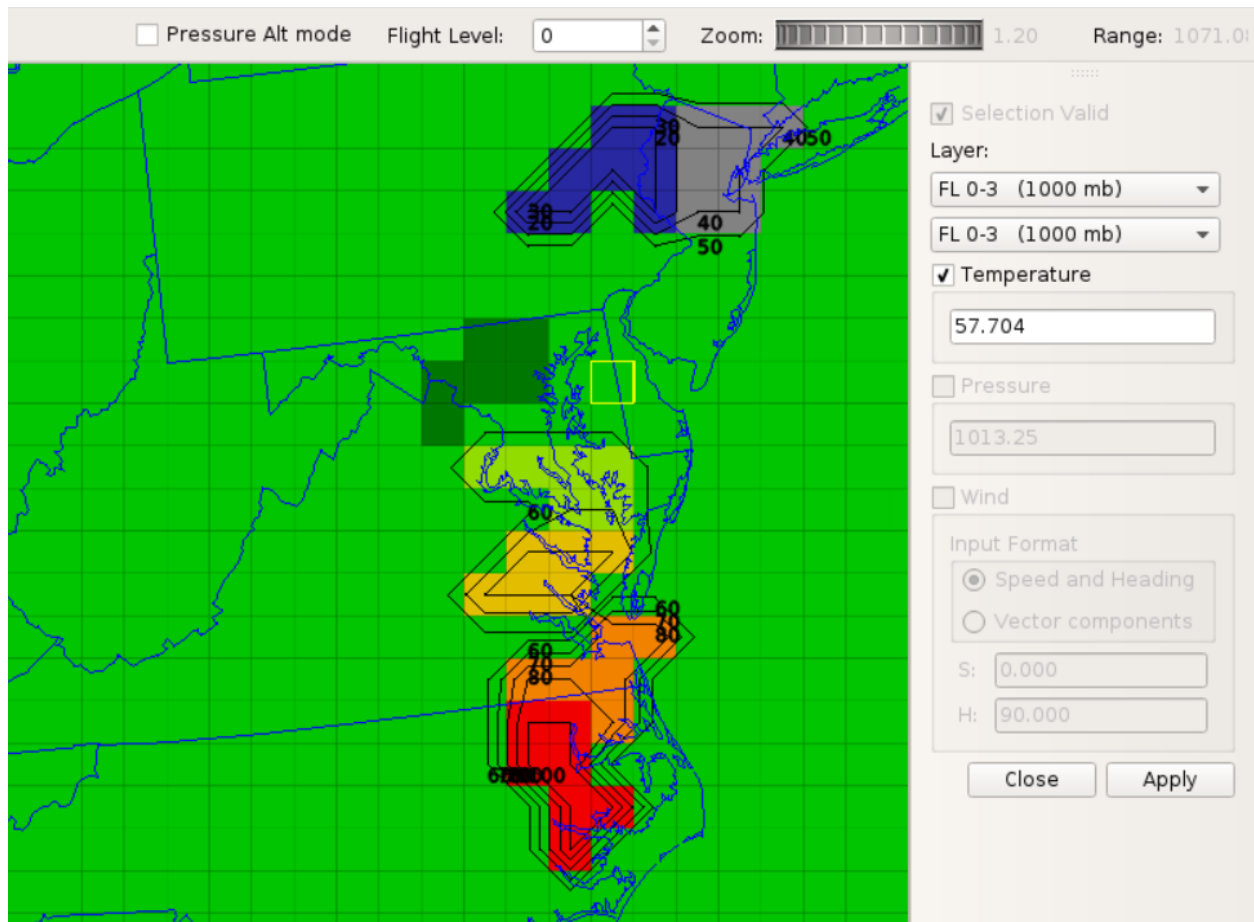


Figure 156. Defining Temperature

10.5.1.2. Pressure

Pressure values are specified in millibars (mb) units of pressure. The "standard" sea level pressure is 1013.25 mb. The range of pressure is 100 mb - 1100 mb. Only a single pressure value can be specified for all stratum levels.

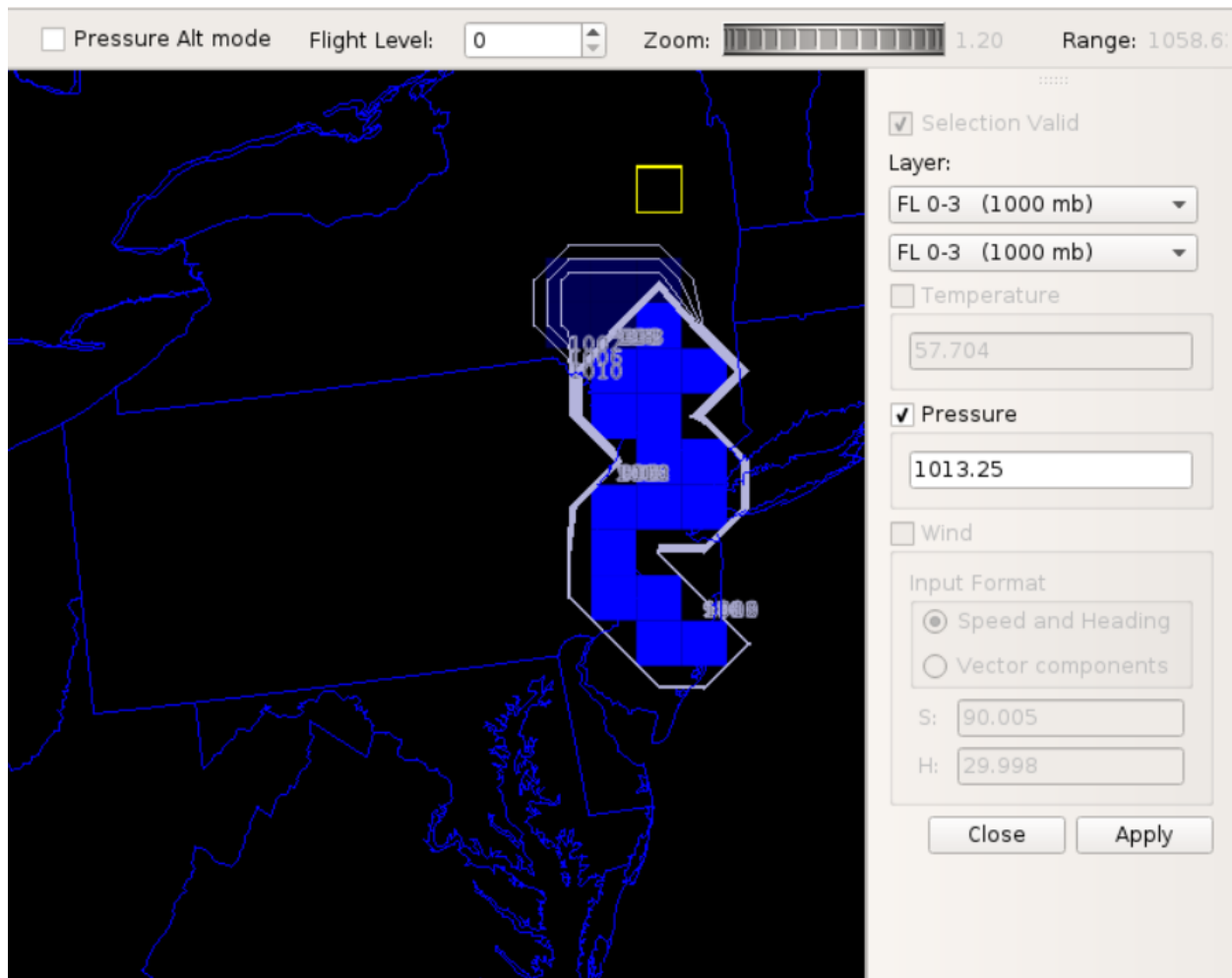


Figure 157. Defining Pressure

10.5.1.3. Wind

Wind values can be specified in several ways, such as speed and heading, U and V components, or X and Y components depending on type of the input format selected. Also different wind values can be specified at a different stratum levels.

The Speed and Heading input format defines wind speed in knots and heading in degrees. Depending on selected option **Use X/Y coords**, the wind values are aligned to true north (when turned on) or to RUC grid (when turned off).

The Vector component input format defines wind using X/Y or U/V vectors in meters/sec. Depending on selected option **Use X/Y coords**, the wind values are aligned to true north (when turned on) or to RUC

grid (when turned off). The X/Y vectors are aligned to the true north, where X is E/W component and Y is N/S component. The U/V components are aligned to RUC grid, where U corresponds x axis of the grid plane and V corresponds the y axis of the grid plane.

NOTE: When option **Use X/Y coords** is not set, the relative orientation of the axis does not correspond to true north orientation (North-South / East/West) due to the fact that RUC #236 grid is represented using lambert conformal projection with offset focal point. That is the projection focal point is not on an axis passing through the two geographic poles and grid plane axes do not follow constant latitude and longitude lines.

When option **Use X/Y coords** is set, the orientation values are converted from True North to RUC grid orientation specific to location on the grid. RUC #236 grid data is always represented using lambert conformal projection regardless of input orientation.

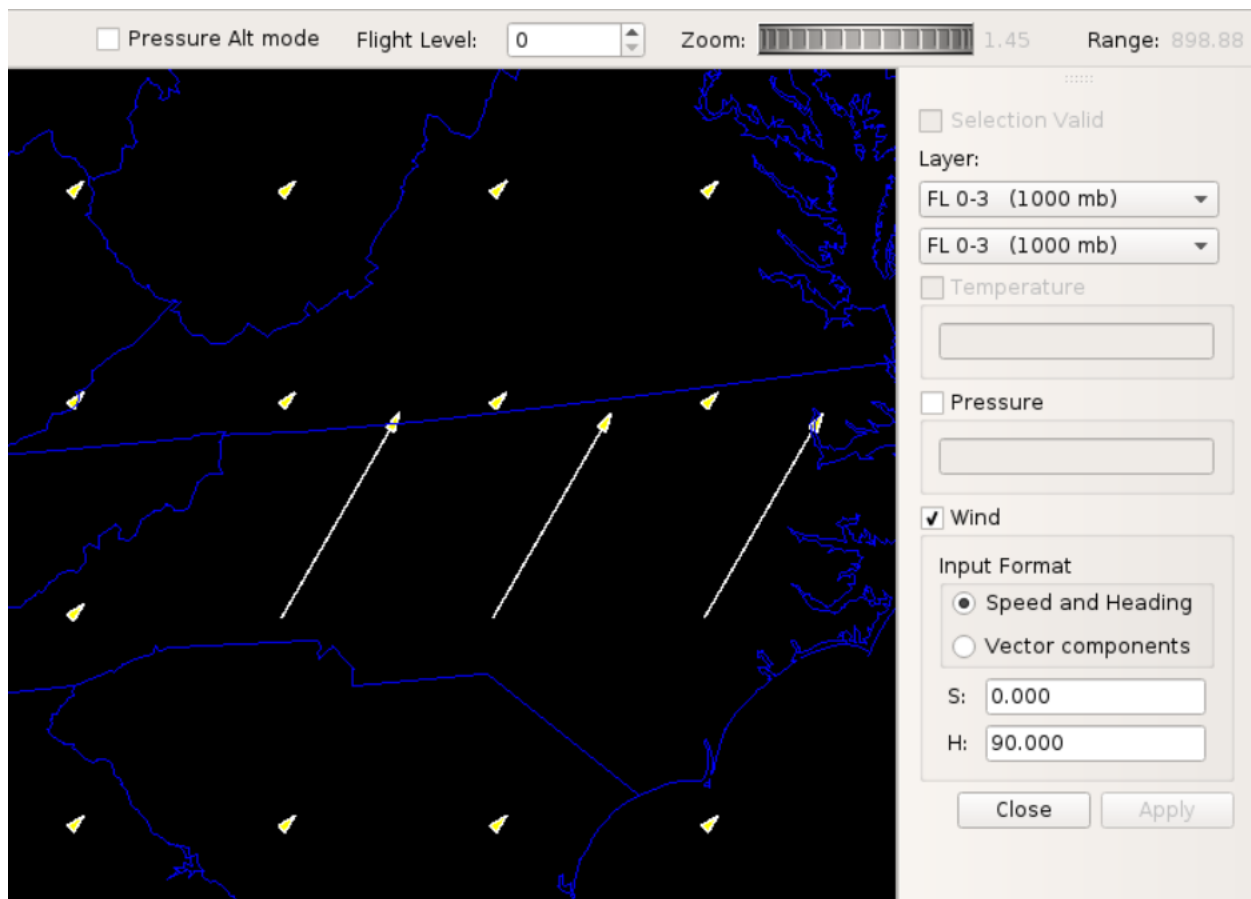


Figure 158. Defining Wind

Vector lines on the map represent wind direction and speed: longer lines representing higher wind speeds, shorter lines representing lower wind speeds.

Wind affects precipitation areas, causing them to drift and morph much as real weather is affected by winds aloft. Precipitation is only affected when winds are defined at the 1000mb layer. Adding wind values to specific layers also affect aircraft performance for targets at a particular level causing them to slow down in a head wind and speed up with a tail wind.

10.5.2. Precipitation Editor

To start editing precipitation select the Precip weather attribute. The editor opens docked on the right side of the screen and may be repositioned on the screen if needed by grabbing its selection bar. To exit edit mode, use **Close** button on the editor dialog.

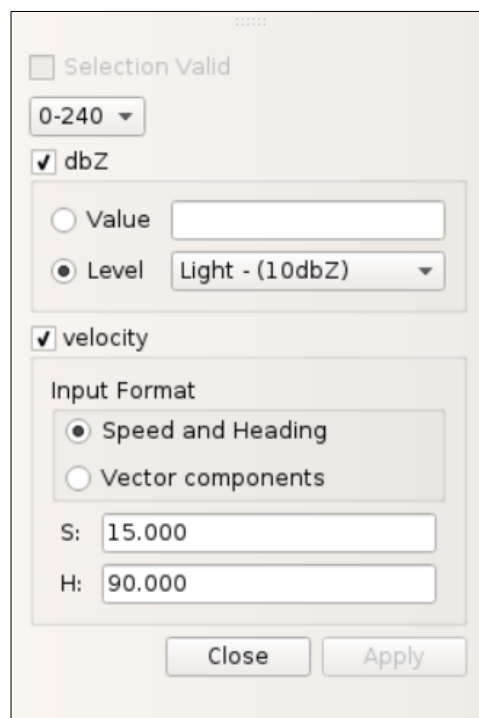


Figure 159. Precipitation Editor

Strata / Interval

The Strata / Interval levels are in 5 increments (0-240, 240-600, 330-600, 600-0), that the new precipitation values can be applied to.

dbZ

The value of intensity of precipitation. A specific weather level value can be entered in the Value dialog or select Level and choose between Light, Moderate or Heavy.

velocity

The speed and direction of moving precipitation. The values can be input in several formats as well as relative to true north or precip grid. The orientation precip direction is based on the same projection as winds. The values applied here take precedence over RUC wind values for defining moving precipitation.

While in Enter Selection Mode, hold the **Shift** button and use left mouse click and drag to draw a loop around the desired area to edit the weather values. Additional cells may be selected by holding **Ctrl** button and selecting additional area using left mouse click and drag or by right mouse click on desired cell. A right mouse click on a cell clears previous selection and selects a single cell. Also, a left mouse click clears current selection.

10.5.2.1. Precipitation

Precipitation value is specified in decibels (dbZ) units of precipitation and range from 0-99. This determines the intensity of the precipitation cell that was selected. The "default" precipitation in new scenario is 0 - no precipitation. Additionally, precipitation can be specified with a velocity using the same input format as Wind in RUC editor.

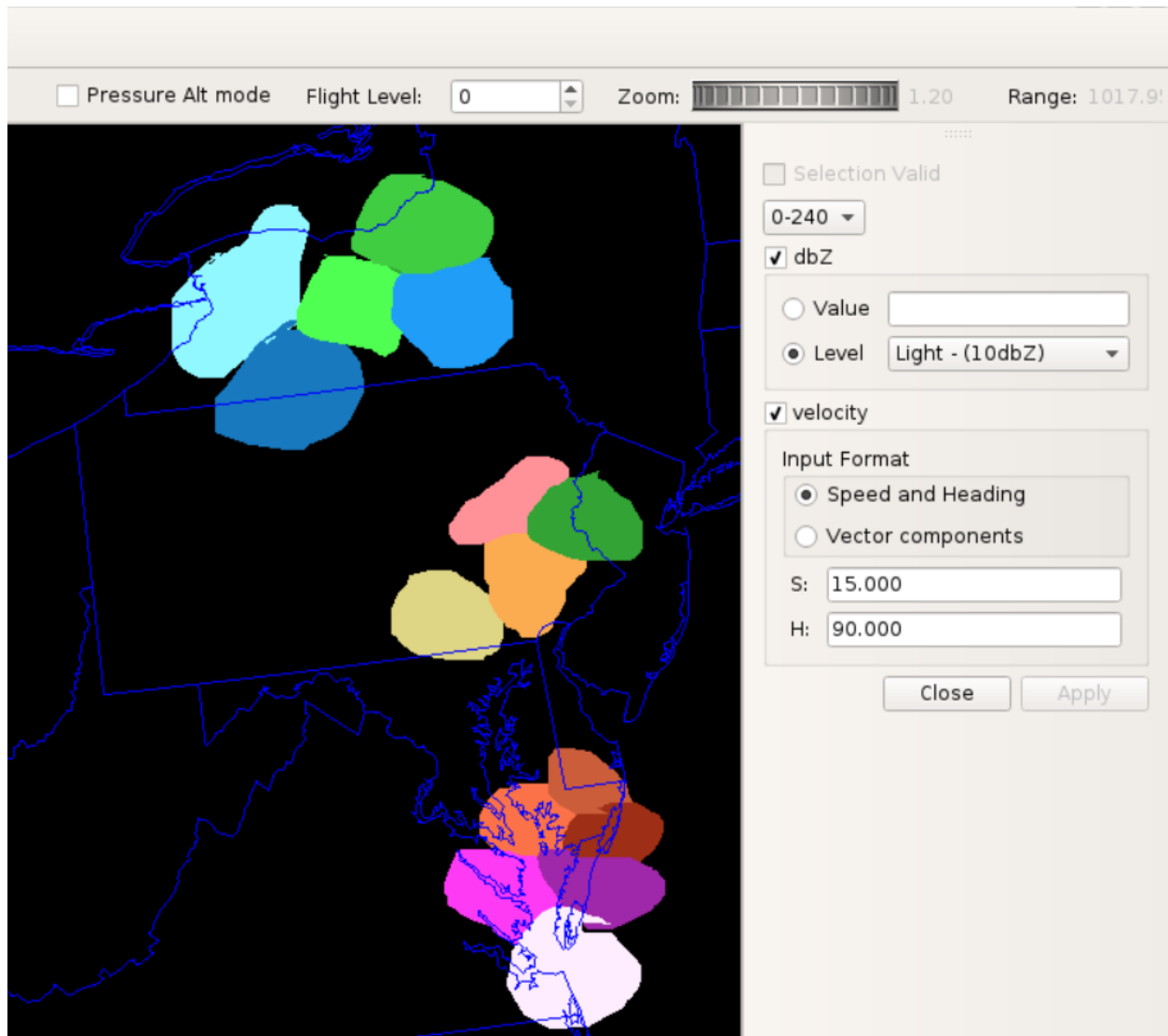


Figure 160. Defining Precipitation

Precipitation level can also be specified by one of the preset levels Low, Moderate or High. For additional reference below tables can be used to specify precipitation intensity for specific radar type.

Table 12. ASR Precipitation Levels

| 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 13. ARSR Precipitation Levels

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

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/ph1/ph1_s6r8a01_y7_08a_Y708A.bl_j3011092022.rpt" name="PPP"/>
      <mearths file="./mearths.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="1200">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>
    <field9180overrides>
      <DAT>1FANSE2PDC</DAT>
      <EQP>SDE1E2E3FGHIJ2J3J4J5M1RXYZW</EQP>
      <NAV>RNVA1D1E2</NAV>
      <PBN>A1B1C1D1L101S2</PBN>
    </field9180overrides>
    <events>
      <macro delta="00:00:00">-&gt;set:cpdlcResponseDelay=15</macro>
    </events>
    <replication icaoAddrDelta="0" targetIDDelta="0" timeDelta="2400">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>
    <field9180overrides>
      <DAT>1FANSE2PDC</DAT>
      <EQP>SDE1E2E3FGHIJ2J3J4J5M1RXYZW</EQP>
      <NAV>RNVA1D1E2</NAV>
      <PBN>A1B1C1D1L101S2</PBN>
    </field9180overrides>
    <events>
      <macro delta="00:00:00">-&gt;set:cpdlcResponseDelay=15</macro>
    </events>
    <replication icaoAddrDelta="0" targetIDDelta="0" timeDelta="2400">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>BGTYLYWX</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>ESS0</key>
    <restriction><250cas@<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 TFDN 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 |
| 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 |
| RAPPI | Random Access Plan Position Indicator |
| RF | Radius-to-fix |
| RSI | Record Select Indicator |
| RTCS | Release Time Coordination Service |

| | |
|--------|--|
| RTQC | Real Time Quality Control |
| 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 |