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SERA User Guide

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Advanced Simulation Technology inc.
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SERA User Guide

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ASTi

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Revision history

Date	Revision	Version	Comments
11/15/2015	A	0	(V1.10) Initial baseline version.
12/20/2017	A	1	(V1.11) Spell out EP2 Opcode throughout document; improve **Weight** setting's description in "Set traffic plan departures;"complete other minor edits throughout document.
1/30/2018	A	2	(V1.12) In "Configure a traffic plan for an airport," change **Weight** setting name to **Relative Weight**.

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1.0 Introduction

Simulated Environment for Realistic ATC (SERA) is ASTi's solution for the International Civil Aviation Organization's (ICAO's) recommendation that flight simulators provide a Simulated Air Traffic Control Environment (SATCE) system. SERA is available in a number of service options from Software as a Service (SaaS) running in the cloud to the traditional setup requiring hardware on the customer's local network. The system also integrates with any flight training device, including desktop computers, part-task trainers, flight training devices, and Level D simulators.

SERA provides a comprehensive communications environment, generating artificial intelligence (AI) entities representing air traffic controllers and other pilots who all communicate in the same simulation. Generated entities include the following:

- Other aircraft and pilots
- Ground, tower, clearance, and Terminal Radar Approach Control (TRACON) controllers
- En-route center instruction complete with hand-off between regions

Web-based control pages allow pilot trainees to select and run predefined scenarios. Using advanced speech recognition, trainees can receive and read back customized air traffic control (ATC) instructions from gate to gate amid traffic that would be present in an actual flight. The technology also replicates regional accents and eliminates the need for additional staff role players. For more information about SERA, its capabilities, and pricing, see seraatc.com.

Intended for SERA site administrators, instructors, and students, this user guide explains how to use the SERA web interface, which you can access from your browser. The following sections describe SERA's three user roles (i.e., site-admin, instructor, and student) and the various privileges associated with each role. The guide also identifies and describes tasks that you can complete in the SERA web interface, which include managing user profiles, configuring a traffic plan and scenario settings, selecting a sim, and starting a flight.

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2.0 Site-admin, instructor, and student privileges

Students share limited privileges with site-admin and instructor roles. All three roles can select a sim, start a flight, and view SERA's flight history. The following sections describe how to start a flight and view the flight history.

2.1 Start a flight

To start a new flight in the SERA web interface, follow these steps:

1. From the top navigation bar, click **Flights**.
2. On the **Start a Flight** page, under **Click on a Sim**, click on the desired sim.

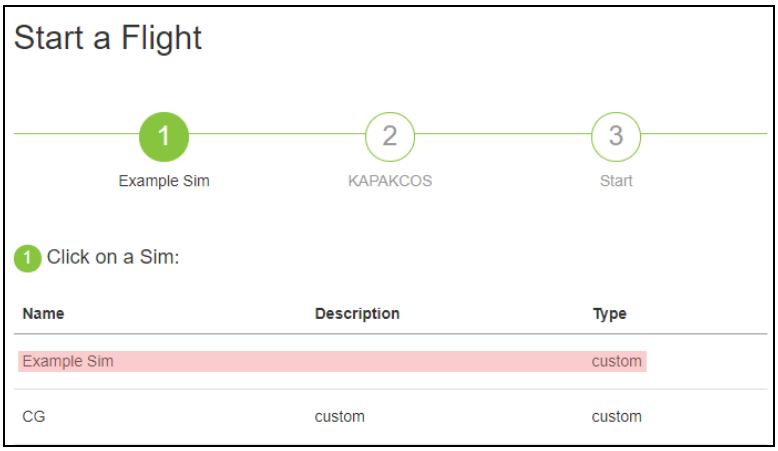

Figure 1: Click on a Sim

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3. Under **Click on a Scenario**, search for a scenario (i.e., flight plan) using the **Search Scenarios** bar, or click on a scenario from the listed options.

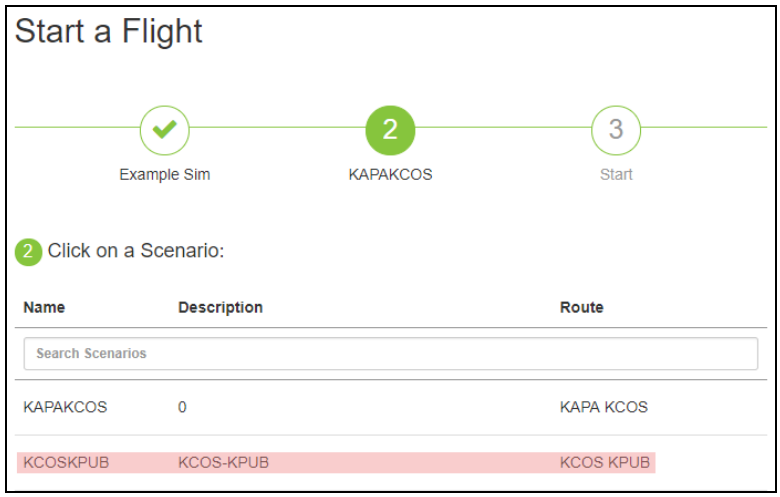

Figure 2: Click on a Scenario

4. Click **Start Flight**.

2.2 View current flights

On the **Flights** page, under **Current Flights**, a list of flights in progress displays. This area shows the sim, scenario, and route of the active flight.

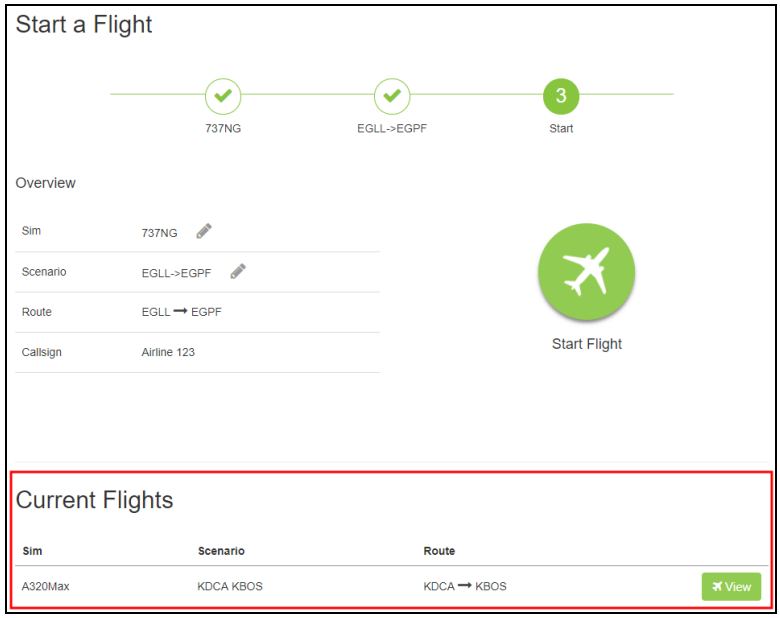

Figure 3: Current Flights

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2.3 View flight history

To view a list of past flights in the SERA web interface, follow these steps:

1. From the top navigation bar, click **History**.
2. A list of past flights displays on the **Flight History** page. To locate a specific flight, search for one of the following:
   - ***Sim***: searches for the flight by sim name.
   - ***Departure***: searches for the flight's departure location by airport identifier (e.g., KSAN for the San Diego International Airport).
   - ***Destination***: searches for the flight's end destination by airport identifier (e.g., KLAX for the Los Angeles International Airport).
   - ***User***: searches for the flight by the user's email address.
   - ***Flightplan***: searches for the flight by flight plan.
   - ***Flight Type***: searches for the flight by type.
   - ***Dataset***: searches for the flight by data set.
   - ***Start Time***: searches for the flight by its start date and time.
   - ***Since***: searches for the flight using a rough estimation of the time passed.
   - ***Duration***: searches for flight by duration time (e.g., 06:01).

   Alternatively, click the First, <, >, or Last buttons to view more options.

   The following figure shows past flights on the **Flight History** page:

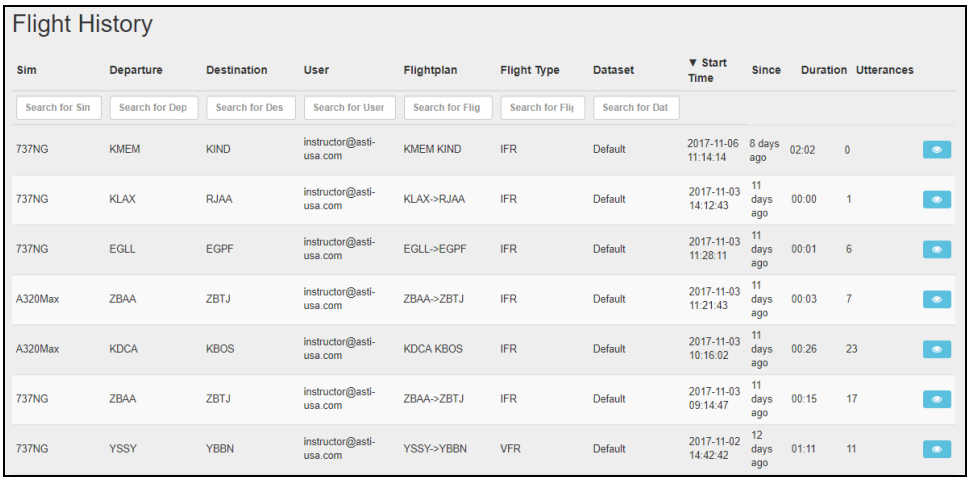

Figure 4: SERA Flight History

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3.0 Site-admin and instructor privileges

Instructors have the second-highest level of access in the SERA web interface. They are responsible for configuring sims, flight plans, and scenario settings. Instructors share some privileges with students, such as starting a flight and viewing the flight history.

The following sections describe how to add and configure a flight plan and additional scenario settings. For more information about sim setup and SERA Client configuration, see "Install and configure SERA Client" in the *SERA Installation Guide*.

3.1 Scenarios

A scenario is a training exercise that includes an International Civil Aviation Organization (ICAO) flight plan and some additional configuration settings. In the SERA web interface, you can customize the flight plan and additional scenario settings, including hold and runway incursions, the type of approach, and traffic settings specific to the scenario. The following sections describe how to configure a flight plan and additional settings for a scenario.

3.1.1 Create a scenario

To add a new scenario, follow these steps:

1. From the top navigation bar, click **Scenarios**.
2. On the **Scenarios** page, click + Add Scenario.
3. In the **Name** box, type a name for the scenario.
4. *(Optional)* In the **Description** box, type a description for the scenario.

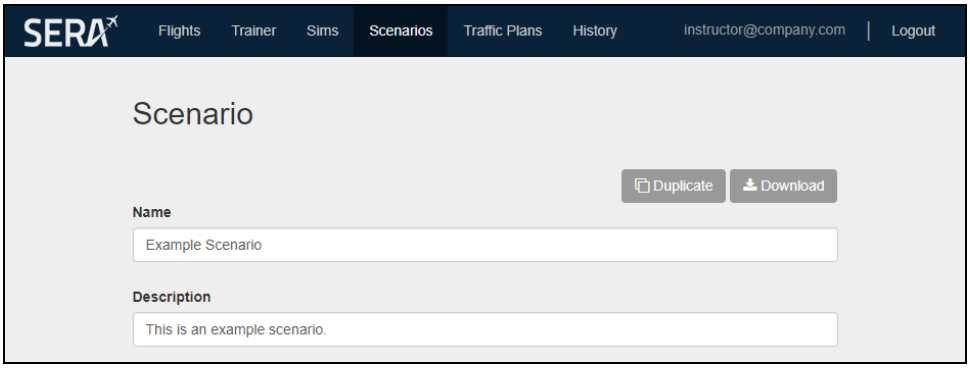

Figure 5: Scenario Name and Description

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3.1.2 Configure a scenario flight plan

To configure the flight plan for a scenario, follow these steps:

1. On the **Scenario** page, click the **Flight Plan** tab.
2. In the **Aircraft Identification** box, type a call sign for the aircraft (e.g., *Airline 123*).
3. Click the **Flight Rules** drop-down box, and then click **IFR** for Instrument Flight Rules or **VFR** for Visual Flight Rules.
4. Click the **Type of Flight** drop-down box, and then click one of the following options:
   - **Scheduled**
   - **Non-Scheduled**
   - **General Aviation**
   - **Military**
   - **Other**

   ***Important**: Make sure **Type of Flight** is compatible with the specified **Aircraft Identification**. Otherwise, air traffic control (ATC) may mispronounce the call sign.*
5. In the **Type of Aircraft** combo box, enter the desired aircraft type.

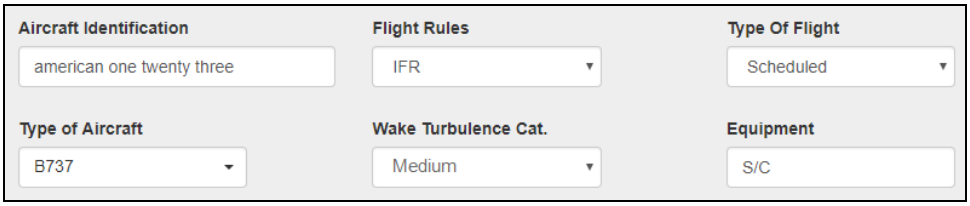

Figure 6: Aircraft and flight settings

6. In the **Departure Aerodrome** box, search for and select the departure airport's four-character International Civil Aviation Organization (ICAO) reference code (e.g., KIAD for the Washington Dulles International Airport).
7. Click the **Departure Runway** drop-down box, and then click the runway from which the plane will depart. Runway options populate based on the selected **Departure Aerodrome** above. If blank, ATC automatically chooses based on weather conditions and aircraft route.
8. Click the **SID** box, and then click the standard instrument departure (SID) route. This setting populates based on the **Departure Runway**. If no runway is selected, all SID routes display. If blank, all options display, and ATC automatically chooses the SID route.

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9. Click the **SID Transition** box, and then click the desired SID transition code (e.g., SLI). If blank, ATC automatically chooses the SID transition.

***Note**: The **SID** and **SID Transition** settings do not apply to some runways.*

10. In the **Cruising Speed** box, type the desired speed for the aircraft measured in knots.
11. In the **Level** box, type the desired flight altitude measured in feet.

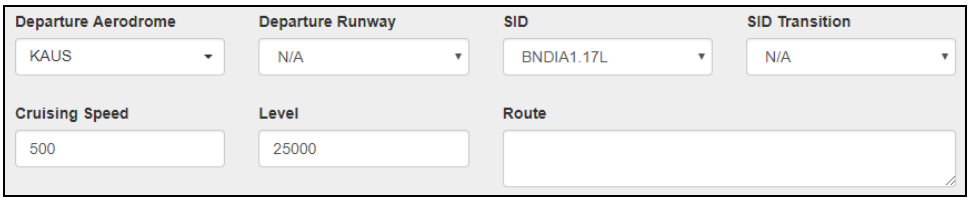

Figure 7: Departure airport settings

12. In the **Destination Aerodrome** box, search for and select the destination airport's four-character International Civil Aviation Organization (ICAO) reference code.
13. Click the **Destination Runway** box, and then click the runway on which the plane will land. Runway options populate based on the selected **Destination Aerodrome** above. If blank, ATC automatically chooses the **Destination Runway** based on weather conditions and aircraft route.
14. Click the **STAR** box, and then click the standard terminal arrival (STAR) route. This setting populates based on the **Destination Runway**. If no runway is selected, all STAR routes display, and ATC automatically chooses the STAR route.
15. Click the **STAR Transition** box, and then click the desired STAR transition code (e.g., ESTWD). If blank, ATC automatically chooses the STAR transition.
16. Click the **Approach** box, and then click the plane's approach type (e.g., WAXIN-ILS). The **Approach** options depends on the **Destination Runway** setting. If blank, ATC automatically chooses the approach.
17. Click the **Approach Transition** box, and then click the desired approach transition code. If blank, ATC automatically chooses the approach transition.
18. Click the **Ramp/Gate** box, and then click the gate where the plane will taxi. If blank, ATC automatically chooses the ramp and gate.
19. In the **Alternate Aerodrome** box, type an alternate airport for the plane to land in case of a non-emergency incident (e.g., inclement weather).

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20. In the **Emergency Aerodrome** box, type an airport for the plane to land in cases of emergency (e.g., engine fire, hydraulic failure, ill passenger). If blank, ATC selects the closest capable airport.

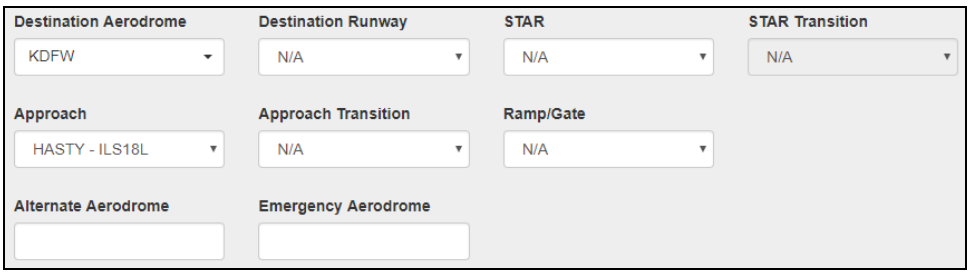

Figure 8: Destination airport settings

21. Click Save Changes.

3.1.3 Configure additional scenario settings

Once you create a flight plan, you can specify additional settings on the **Scenario Configuration** page. These optional configurations are not required to fly with SERA.

To configure scenario settings, follow these steps:

1. On the **Scenario** page, click the **Settings** tab.
2. Under **Scenario Configuration**, in the **Hold Waypoint ID** box, type the desired navigation waypoint ID (e.g., STEPH). If air traffic control (ATC) orders a hold action at a destination airport, then SERA issues this ID to the student pilot.
3. In the **Hold Time** box, type the length of time in minutes that ATC keeps the aircraft at a hold waypoint.

***Note**: To exit the hold early, on the **Actions** page, click **Cancel Hold**.*

4. In the **Hold Distance** box, type the holding leg's length in miles.

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5. To simulate an unauthorized aircraft on the runway on final approach, under **Runway Incursion on Final**, click **Enabled**.

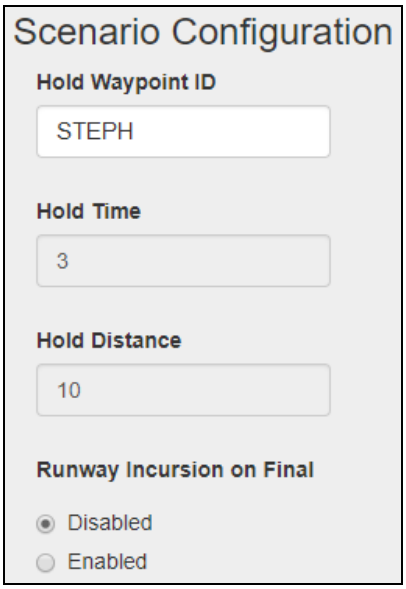

Figure 9: Hold and runway incursion settings

6. To simulate a visual approach on an instrument flight rules (IFR) plan, under **VFR Approach on IFR Flight**, click **Enabled**.

   If this setting is enabled and weather conditions are suitable, SERA asks the pilot to report the airfield on sight. SERA then issues the pilot visual approach instructions. If weather conditions are not suitable, the pilot must land the aircraft via IFR.

7. To enable a structured and guided interaction with ATC, under **Virtual Instructor**, click **Enabled**. During the flight, this setting prompts, guides, and forces trainees to interact with ATC using proper procedures.

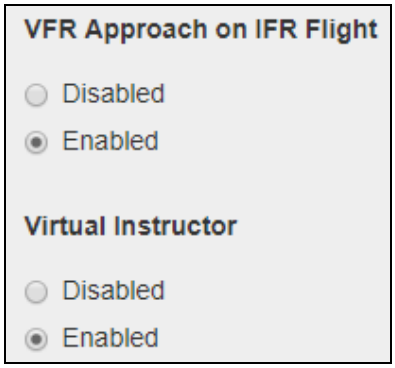

Figure 10: VFR Approach on IFR Flight and Virtual Instructor

8. Under **Pilot Accent**, click **American**, **British**, **Chinese**, or **Spanish**.

9. In the **Max Readbacks** box, type the maximum number of times air traffic control should prompt the pilot on incorrect feedback.

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10. Click the **Trafficplan** drop-down box, and then click the desired traffic plan. These plans are configured on the **Traffic Plans** page. For more information, see Section 4.2, "Traffic Plans" on page 14.

11. To generate random traffic each time the scenario runs, in the **Seed** box, type **0**. To generate identical traffic in each scenario, type **1** or higher. For example, a value of **6** produces the same traffic pattern in each scenario, whereas **0** produces different traffic patterns each time. If you are not satisfied with the traffic composition, adjust the value.

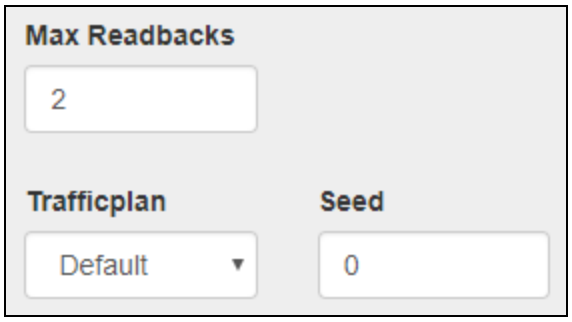

Figure 11: Max Readbacks, Trafficplan, and Seed

12. To determine the percentage of airspace saturation, under **Traffic Density**, adjust the slider on a scale of **0**–**100**.

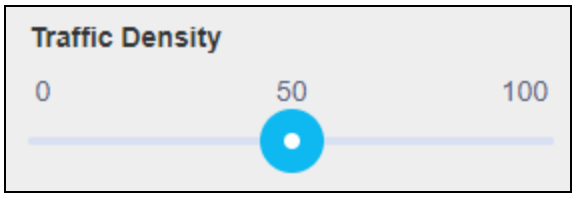

Figure 12: Traffic Density

This setting populates a percentage of the gates defined at an airport. During the flight, it populates a percentage of the maximum airspace density. For example, a value of 50 means SERA populates 50 percent (i.e., 22) of Reagan National Airport's 44 gates and 50 percent of the maximum airspace density.

13. In the **Max Parked Aircraft** box, type the maximum number of parked aircraft at an airport. This setting limits traffic at large airports but allows small airports to appear full. **Max Parked Aircraft** is also useful if the visual system can only display a limited number of aircraft.

    For example, if **Traffic Density** is 100 percent, and **Max Parked Aircraft** is 25, then only 25 aircraft appear at Reagan National Airport. However, if you fly to Lubbock Preston Smith International Airport, then SERA populates all nine gates with aircraft.

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14. Under **Generate Traffic at all airports?**, click **True** or **False**.

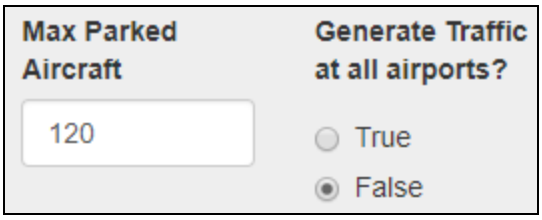

Figure 13: Max Parked Aircraft and Generate Traffic at all airports?

When **False**, SERA only generates AI traffic for your flight and its immediate surroundings. When **True**, SERA generates traffic for all airports in the simulated environment. You might select **True** to populate passing airports with traffic when flying at a low altitude. However, **True** increases the visual system's load, so leave the default setting of **False** for best results.

15. Click Save Changes.

3.1.4 Copy a scenario

To copy an existing scenario, follow these steps:

1. From the top navigation bar, click **Scenarios**.
2. On the **Scenarios** page, click on the scenario you want to duplicate, or click **Edit Scenario**.
3. At the top of the page, click Duplicate.
4. To return to the **Scenarios** page, click the browser's back button.
5. Under **Scenarios**, the duplicate scenario appears under the original with the same name. To edit the duplicate's flight plan or settings, click on the scenario, or click **Edit Scenario**. To configure scenarios, see Section 3.1.1, "Create a scenario" on page 5.

3.1.5 Download a scenario

You may want to download a scenario to transfer it to another SERA server or send it to ASTi for troubleshooting. To download a scenario, follow these steps:

1. From the top navigation bar, click **Scenarios**.
2. On the **Scenarios** page, click the desired scenario, or click **Edit Scenario**.
3. Under **Scenario**, click Download. The scenario downloads as a .flightplan file.
4. Copy the downloaded file to a portable device (e.g., USB drive) for transfer.

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4.0 Site-admin privileges

Site administrators have the highest level of access in the SERA web interface. They are responsible for managing user privileges and assigning site-admin, instructor, or student roles to new users. Site admins can also create and edit traffic plans, facilities, and database operations, which include updating altitudes, aircraft, and Rockwell Collins' EP2 Opcode sub-models. Finally, they are responsible for configuring network settings and backing up and restoring the system.

Site administrators share some privileges with other roles. Instructors and site administrators can set up sims and SERA Clients as well as configure flight plans and scenario settings. All three roles can start a flight and view completed flights in SERA.

The following sections describe how to change user permissions, modify traffic plans, and manage database operations. For more information about sim setup and SERA Client configuration, see "Create a new sim" and "Install and configure SERA Client" in the *SERA Installation Guide*. For more information about network setup, see the *SERA Cold Start Guide*.

4.1 Users

The following sections explain how to change a user's permissions and delete an account from the system.

4.1.1 Change user permissions

To change user permissions, follow these steps:

1. From the top navigation bar, click **Users**.
2. On the **Users** page, locate the desired user account, and click .

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3. Click the **Role** drop-down box, and then click **Site-admin**, **Instructor**, or **Student**.

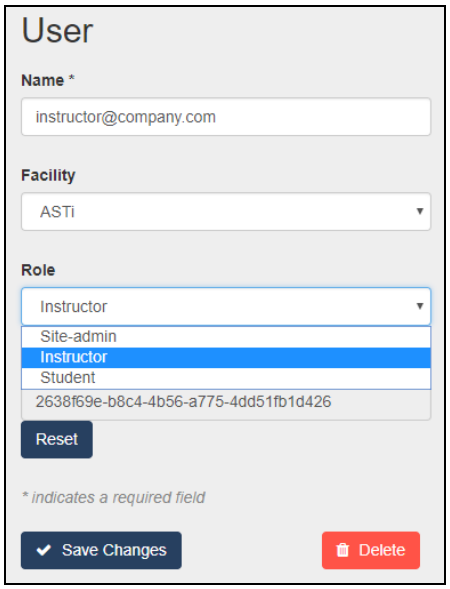

Figure 14: User role selection

4. Click Save Changes.

4.1.2 Delete a user account

To delete a user account, follow these steps:

1. From the top navigation bar, click **Users**.
2. On the **Users** page, locate the account you want to delete, and click .
3. At the bottom of the **User** account, click Delete.
4. When prompted, click Delete.

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4.2 Traffic Plans

A traffic plan is a statistical model that determines the type and number of aircraft circulating at a given airport. SERA's default traffic plan already contains aircraft and airports customized for your organization. However, you can add a new traffic plan or modify an existing plan to fit your specific needs. The following figure shows SERA's predefined default traffic plan:

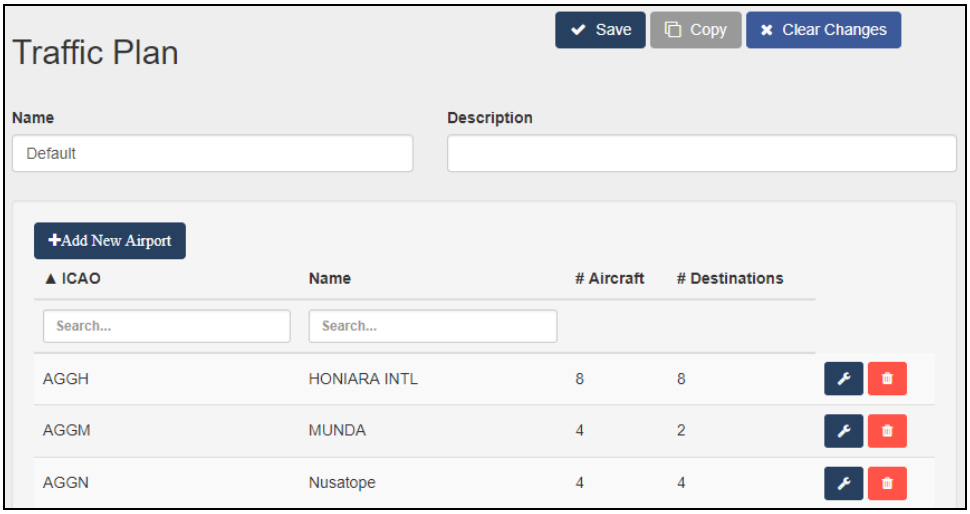

Figure 15: Default traffic plan

4.2.1 Create a traffic plan

To create a new traffic plan, follow these steps:

1. From the top navigation bar, click **Traffic Plans**.
2. On the **Traffic Plans** page, next to the **Default** traffic plan, click **Copy trafficplan** .
3. In the **Name** box, type a name for the traffic plan.
4. *(Optional)* In the **Description** box, type a description of the traffic plan.

Figure 16: Traffic Plan Name and Description

5. Click .

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4.2.2 Configure a traffic plan for an airport

To select an airport for the traffic plan, follow these steps:

1. On the **Traffic Plan** page, click +Add New Airport.
2. An **Add Airport** pop-up window appears. In the **Airport** box, search for and select the desired airport.

Figure 17: Add Airport

3. Search for an existing airport by **Name**, **Airline**, **Weight**, or **Flight Rule**. If the airport doesn't exist in the traffic plan, click Add. The selected airport's International Civil Aviation Organization (ICAO) code displays under the traffic plan's **Name** and **Description**. Each airport contains the following settings:

   - ***Aircraft***: select the airlines and aircraft models that depart from this airport, and define the likelihood of occurrence.
   - ***Departures***: select the departures or destinations of aircraft flying to or from this airport and their likelihood of occurrence.
   - ***Gates***: define the aircraft models that can taxi to and park at specific gates.

   The following figure shows the **Aircraft** settings for the Dallas Love Field (KDAL) airport:

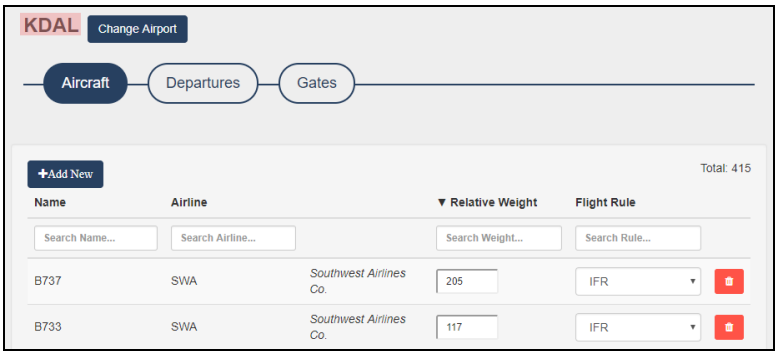

Figure 18: Selected airport for traffic plan

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4.2.3 Set traffic plan departures

To define which airline and aircraft will depart from a given airport, follow these steps:

1. Under the **Aircraft** tab, click +Add New.
2. In the **Type** combo box, enter the aircraft model (e.g., B-737, B-712), or select from the listed options.
3. In the **Airline** combo box, search for and select the associated airline's name (e.g., Southwest Airlines, Delta Air Lines, Inc.), or select from the listed options.
4. **Relative Weight** determines the relative probability of certain airlines and aircraft appearing at an airport. When compared to the airport's total weight and traffic density, this value dictates how often a particular airline and airframe will depart. For example, if 415 aircraft depart from KDAL daily, 205 of those aircraft might be SWA B-737s.

   ***Note**: For best results, adjust the total traffic by changing the traffic density, not weights. To change the traffic density, see Section 3.1.3, "Configure additional scenario settings" on page 8.*

   In the **Relative Weight** box, type a value (e.g., 205) determining how many airframes from a given airline will depart from the airport per day.
5. In the **Flight Rule** drop-down box, click **Any**, **IFR** for Instrument Flight Rules, or **VFR** for Visual Flight Rules.

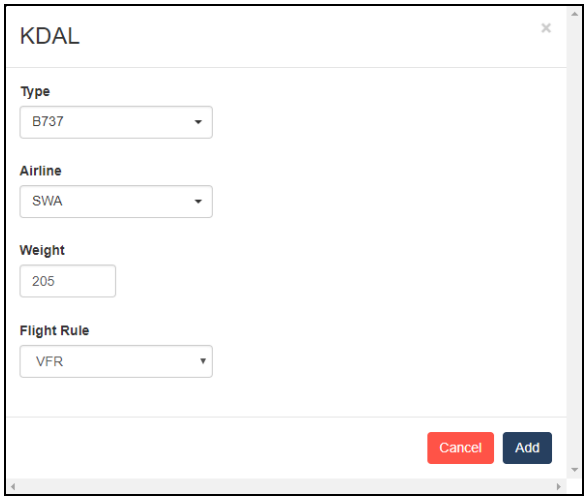

Figure 19: Add aircraft to traffic plan

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6. Click Add, and the new aircraft appears among the listed options. The total weight of aircraft at an airport display in the top-right corner, as shown below:

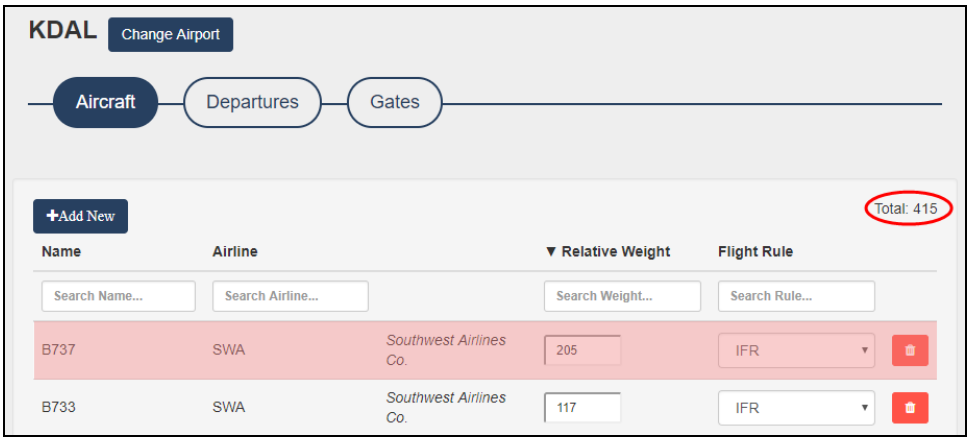

Figure 20: B-737 aircraft at KDAL airport

7. *(Optional)* To delete an aircraft and airline combination, click **Remove Aircraft**.

8. At the top of the page, click Save.

4.2.4 Set traffic plan destinations

To modify or add destinations for an airport, follow these steps:

1. On the **Traffic Plan** page, click the **Departures** tab. This page lists all potential destinations of aircraft departing from this airport.

2. Search for an existing airport by **Name**, **Weight** (i.e., probability), or **Flight Rules**.

3. If a destination doesn't exist for the desired airport, click +Add New. The **Add Airport** window opens.

4. In the **Airport** combo box, search for or select an airport from the listed options.

5. In the **Weight** box, estimate how many aircraft will fly to the destination per day. For example, if 413 flights depart from KDAL daily, 50 of those aircraft might fly to Reagan National Airport (KDCA).

Figure 21: Add destination airport

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6. Click Add, and the new destination appears among the listed options. The total number of destinations appears in the top-right corner.

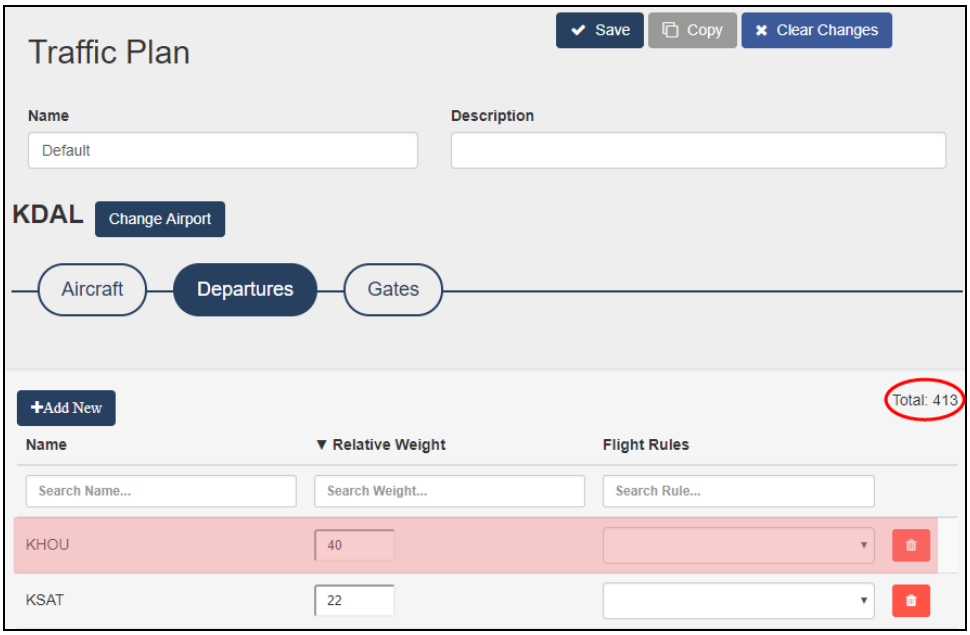

Figure 22: New destination airport

7. Click the associated **Flight Rules** drop-down box, and then click **Any**, **IFR** for Instrument Flight Rules, or **VFR** for Visual Flight Rules.

8. At the top of the page, click Save.

4.2.5 Set traffic plan gate preferences

The **Gates** tab shows all of the predefined gates at the selected airport. This page allows you to define which airlines can taxi to a gate and the parking radius between each gate.

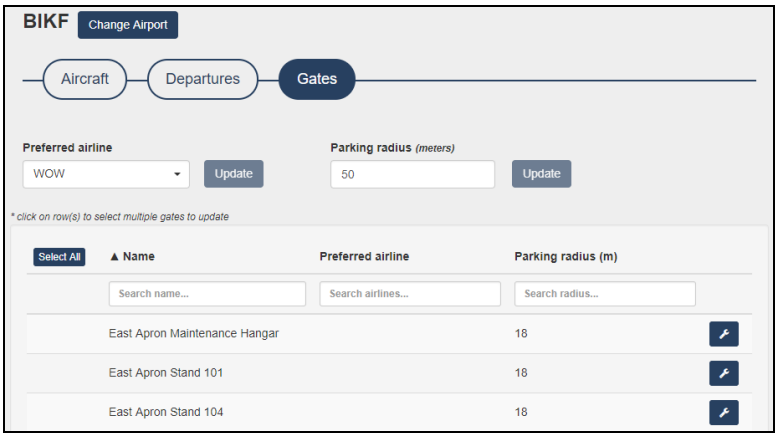

Figure 23: Gates tab

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To set airline preferences for a gate, follow these steps:

1. Search for the gate by **Name**, **Preferred airline**, or **Parking radius (m)**. Alternatively, click the navigation buttons at the bottom of the page to view additional gates.
2. Next to the desired gate, click **Edit Gate** .
3. A pop-up window appears, displaying the gate's name. In the **Preferred Airline** combo box, type the preferred airline's name, or select from the listed options.
4. **Parking radius (m)** prevents larger aircraft from taxiing to gates built for smaller planes. In this box, type a number representing the maximum radius in meters available at this gate. This number equals half the length of the largest aircraft's wingspan. For example, the parking radius for a B-737 is 18 meters, while the parking radius for a Cessna 172 is 6 meters.

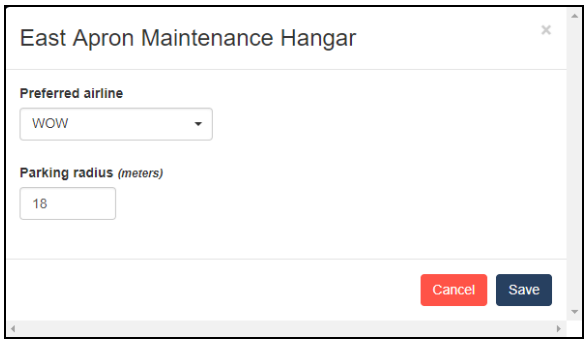

Figure 24: Set gate preferences

5. When finished, click .

To set preferences for multiple gates at the same time, follow these steps:

1. From the listed options, click on each gate you want to modify, or click **Select All**. Selected gates are highlighted blue with check marks.

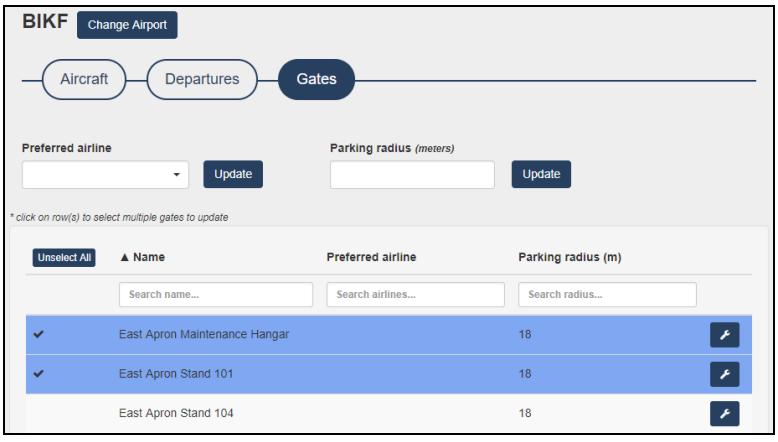

Figure 25: Select multiple gates

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2. In the **Preferred airline** combo box, type or select the desired airline preference, and click Update.
3. In the **Parking radius (m)** box, type the maximum aircraft size in meters, and click Update.
4. At the top of the page, click Save.

4.3 Database Operations

The following sections describe how to manage SERA database operations, including updating SERA's altitudes, editing aircraft, and adding Rockwell Collins' EP2 Opcode submodels.

4.3.1 Update SERA's altitudes

If you are using a custom configuration, you must sync SERA's altitudes for a given airport with data from the host's visual system. If SERA's altitude does not match the host's altitude, the plane may not clamp to the ground during takeoff and landing, causing the visual system to "jump."

This page triggers SERA to send Get Ground Altitude requests to the host. In response, the host sends back Set Ground Altitude messages, which SERA uses to update its internal altitude. For more information about Get Ground Altitude and Set Ground Altitude messages, see "Interface Control Document" in the *SERA Installation Guide*.

***Note**: SERA saves query settings when you back up the system, so you only need to make these configurations once.*

To update SERA's altitude values, follow these steps:

1. From the top navigation bar, click **Database**.
2. Click **Update Altitudes**.
3. On the **Query host for altitudes** page, click the **Sim** drop-down box, and then click the desired sim.

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4. *(Optional)* To control which data sources have priority during a flight, click the **Dataset** drop-down box, and then click **Default** for ASTi's internal data or click on a custom data source (e.g., Jeppesen, DAFIF).

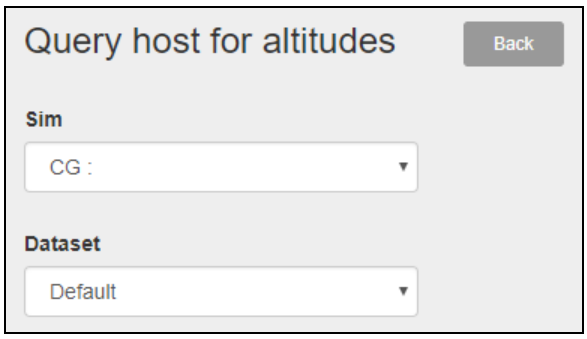

Figure 26: Sim and Dataset

5. In the **Airport** box, search for and select the airport that SERA will query. Before starting the query, make sure the visual system is turned on and has loaded the desired airport.
6. Under **Queries to perform**, select one of the following:
   - ***Taxi Gates***: SERA queries each gate at the airport; this option is ideal for testing because it takes less time to query.
   - ***Taxi Points***: SERA queries every point at the airport; to ensure smooth visuals, ASTi recommends this setting for normal use cases.

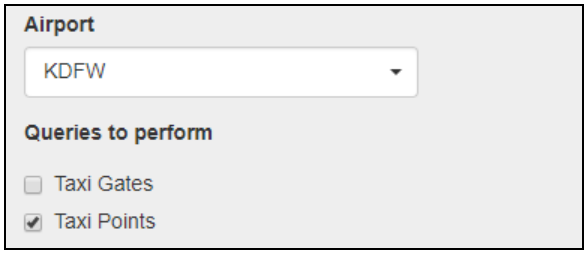

Figure 27: Airport and Queries to perform

7. *(Optional)* In the **Query delay** box, type the number of seconds SERA waits to send a Get Ground Altitude request after receiving a Set Ground Altitude message from the host. To avoid prolonging the query, ASTi recommends leaving the default value at **0**.

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8. If a required setting is blank or the sim is disconnected, a red alert displays under **Query delay**. Before running a query, ensure no alerts are present.

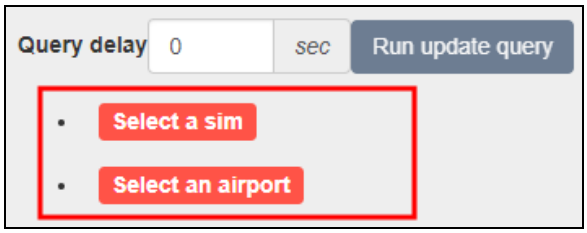

Figure 28: Red query alerts

9. Click Run update query. A green status bar shows the query's completion status.

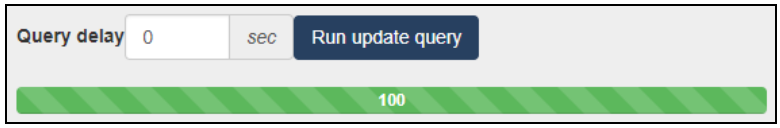

Figure 29: Query status bar

4.3.2 Edit aircraft display settings

ASTi preinstalls available aircraft types in SERA; however, you can customize how various generated aircraft look in the visual system. To edit an aircraft, follow these steps:

1. From the top navigation bar, click **Database**.
2. Click **Edit Aircraft**.
3. On the **Aircraft** page, click on the aircraft you want to edit, or click **Edit aircraft**.
4. Next to **Is Helicopter**, click **True** if the aircraft is a helicopter or **False** if the aircraft is not.
5. Next to **Is Military**, click **True** if the aircraft is military or **False** if the aircraft is commercial.
6. To adjust the aircraft's distance from the ground, in the **Vertical Offset** box, type a value measured in feet. For example, you might use a negative value to lower the aircraft if it is hovering above ground during takeoff or landing.
7. In the **Cruising Speed** box, type a speed for the aircraft measured in knots.

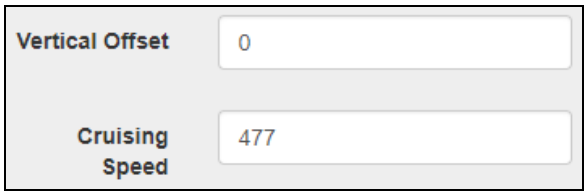

Figure 30: Vertical Offset and Cruising Speed

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8. For **Pitch Max (Deg)**, **Pitch Vel Max (Deg)**, **Pitch Acc Max (Deg)**, **Bank Max (Deg)**, and **Bank Vel Max (Deg)**, leave the default values unless otherwise instructed.
9. If your visual system uses Distributed Interactive Simulation (DIS) protocol, define the following values:
   - ***DIS Kind***: kind of entity; ranges from 0–255.
   - ***DIS Domain***: domain of entity (e.g., air, surface, subsurface, space, etc.); ranges from -1–255.
   - ***DIS Country***: country to which the design of the entity is attributed; ranges from -1–65,535.
   - ***DIS Category***: category of entity; ranges from -1–255.
   - ***DIS SubCategory***: subcategory of entity; ranges from -1–255.
   - ***DIS Specific***: specific information based on subcategory field; ranges from -1–255.
   - ***DIS Extra***: additional DIS specification; ranges from -1–255.

   A -1 value specifies a "wild card," which means that any value is applicable to that box. Once you set a box to -1, subsequent boxes must also be -1, as shown in the figure above. All boxes except for **DIS Kind** accept wild card values.

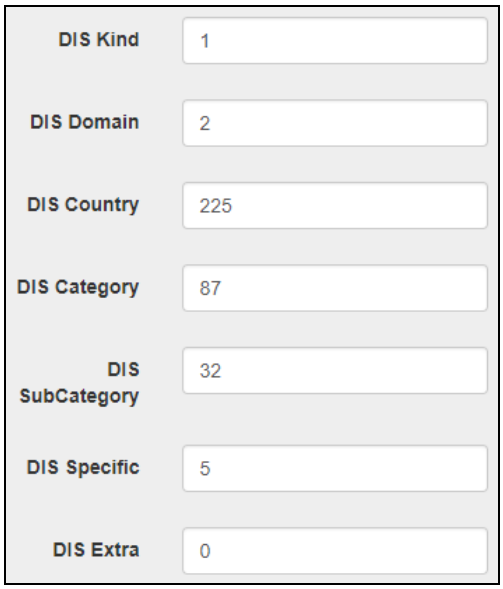

Figure 31: DIS entity settings

For specific DIS protocol values, see the Simulation Interoperability Standards Organization's (SISO's) *References for Enumerations for Simulation Interoperability*.

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10. If your visual system uses Rockwell Collins' EP2 Opcode protocol, define the **RC Type** and **RC Select** values according to Rockwell Collins's Interface Control Document for EP image generators and visual systems.

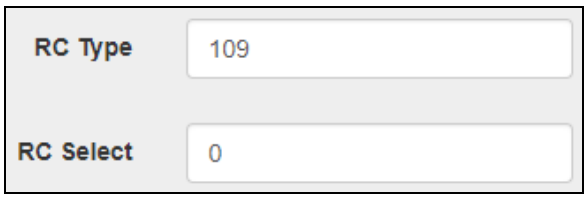

Figure 32: EP2 Opcode settings

11. To save your changes, scroll to the top, and click Save.

4.3.3 Add an EP submodel

EP submodels represent aircraft events that occur during a flight, such as the initiating landing gear or a propeller. To a new EP submodel, follow these steps:

1. From the top navigation bar, click **Database**.
2. Click **Edit EP Submodels**.
3. On the **EP Aircraft Events** page, click +Add New.
4. In the **Add Aircraft Events** window, in the **ID** box, type a value representing the aircraft type (e.g., B-727, ERJ-145). If the ID is blank or contains non-numerical character, "(Invalid Value)" displays, and the box turns red.

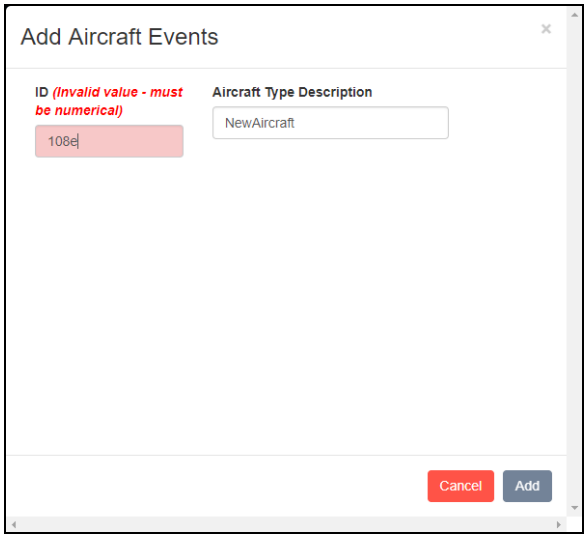

Figure 33: Invalid aircraft ID

5. In the **Aircraft Type Description** box, define the aircraft type (e.g., B-727).

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6. Click Add, and the new event displays among the listed options, as shown below:

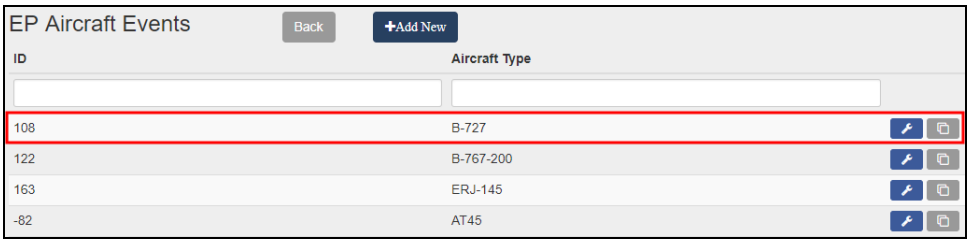

Figure 34: New aircraft event

4.3.3.1 Define and select events during flight phases

Within an EP submodel, you can customize each phase of the flight by adding and selecting new events. For example, you may want to bring the landing gear up during **Takeoff** and down during **Landing**. To define and select an event during a flight phase, follow these steps:

1. On the **EP Aircraft Events** page, click on the desired submodel.
2. Under **Type Description**, click **Init**, **Takeoff**, **Landing**, **Moving**, or **Stopping**.
3. To add a new event, click +Add New.
4. In the **Type** box, enter the event type's predefined value (e.g., 11 for landing gear). In the **Select** box, type **1** to activate the event or **0** to disable the event.
5. In the **Select** box, type **1** to activate the event or **0** to disable the event. The event remains active throughout the flight until you change the selection in a different phase. For example, setting **Type**: **11** and **Select**: **1** during **Takeoff** brings the landing gear up; setting **Type**: **11** and **Select**: **0** during **Landing** brings the landing gear down.

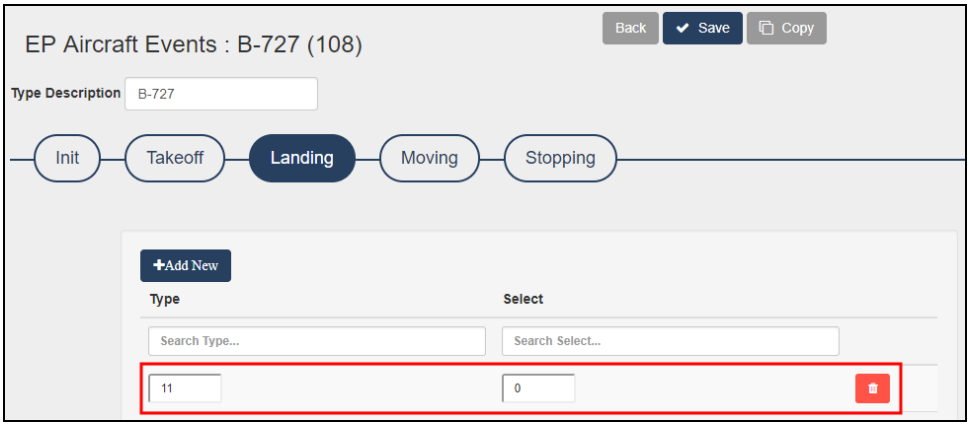

Figure 35: Flight phases and events

6. *(Optional)* To delete an event, click .
7. When finished, click Save.

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