Surface Trajectory Based Operations (STBO) Client Observer Mode User Manual

Airspace Technology Demonstration 2 (ATD-2) Team

POC: Lindsay Stevens

lindsay.stevens@nasa.gov

Abstract

This document serves as a user manual for the STBO Client in observer mode. It describes elements of the interface and provides explanations for how to interact with the interface.

Table of Contents

1 Getting Started

The 1 pixel wide green bar (Figure 1) provides access to a number of different system views. To get started, first make sure that the correct desktop is displayed (Figure 1).

To access the correct display:

> ***Step 1***: Hover over the green bar to populate the menu.
>
> ***Step 2***: Select "My Desktop" from the top of the menu to access the correct display.

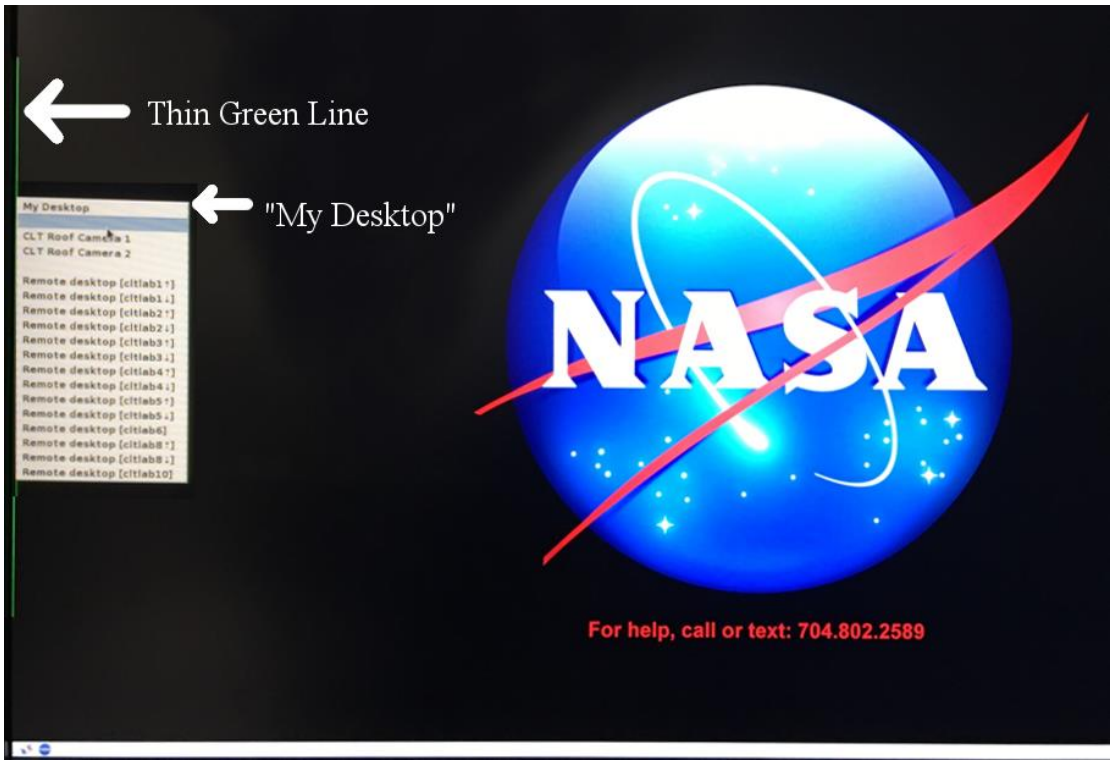


Figure 1. Use the green bar tool to navigate to "My Desktop".

To launch the Surface Trajectory Based Operations (STBO) Client:

> ***Step 1***: Click on the NASA icon on the bottom left corner to launch the menu on the toolbar (Figure 2).
>
> ***Step 2***: Select the option for the STBO Client.
>
> ***Step 3***: Wait for the STBO Client to load. This may take a few minutes.

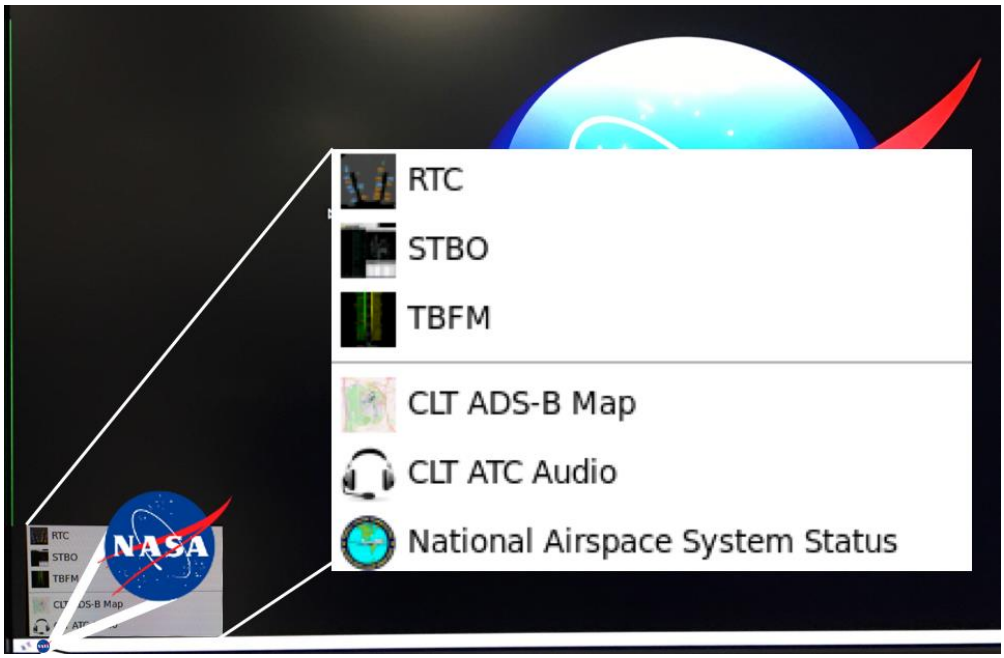


Figure 2. Loading STBO Client.

2 STBO Client Interface

This section describes the elements of the STBO Client main interface (Figure 3) and ways to interact with them.

Figure 3. The elements of the STBO Client interface.

The full interface of the STBO Client is composed of multiple display windows that serve different purposes and can be arranged in any desired configuration.

The Toolbar allows the user to interact with the system by adding new display windows, managing current display windows, saving and loading user configuration preferences, searching for flights, and displaying new notifications to the user.

The Timelines provide information about the predicted OFF times for departures, predicted ON times for arrivals, gate conflicts, and aircraft that are subject to TMIs. Datablocks on the Timelines can be configured to show flight-specific information.

The Map displays surface surveillance data and provides a visual representation of aircraft current positions. The Map also displays runway closures. Datablocks on the Map can be configured to display flight-specific information.

The Flights Table is a list of all known arrivals and departures within the next 6 hours for the airport. The list can be sorted and filtered according to the user's preference, and information columns can be moved, added, and removed.

2.1 Timeline

The Timeline (Figure 4) is set up to display flight location, reference labels (e.g., "18C/36C") at the top and bottom of the display, the reference point (e.g., "RWY" at the bottom), the title at the top of the Timeline, and the Now time. The Timeline also provides information about arrivals, departures, TMIs, runway assignments and changes for operational necessity, gate conflicts, and pushback and taxi status.

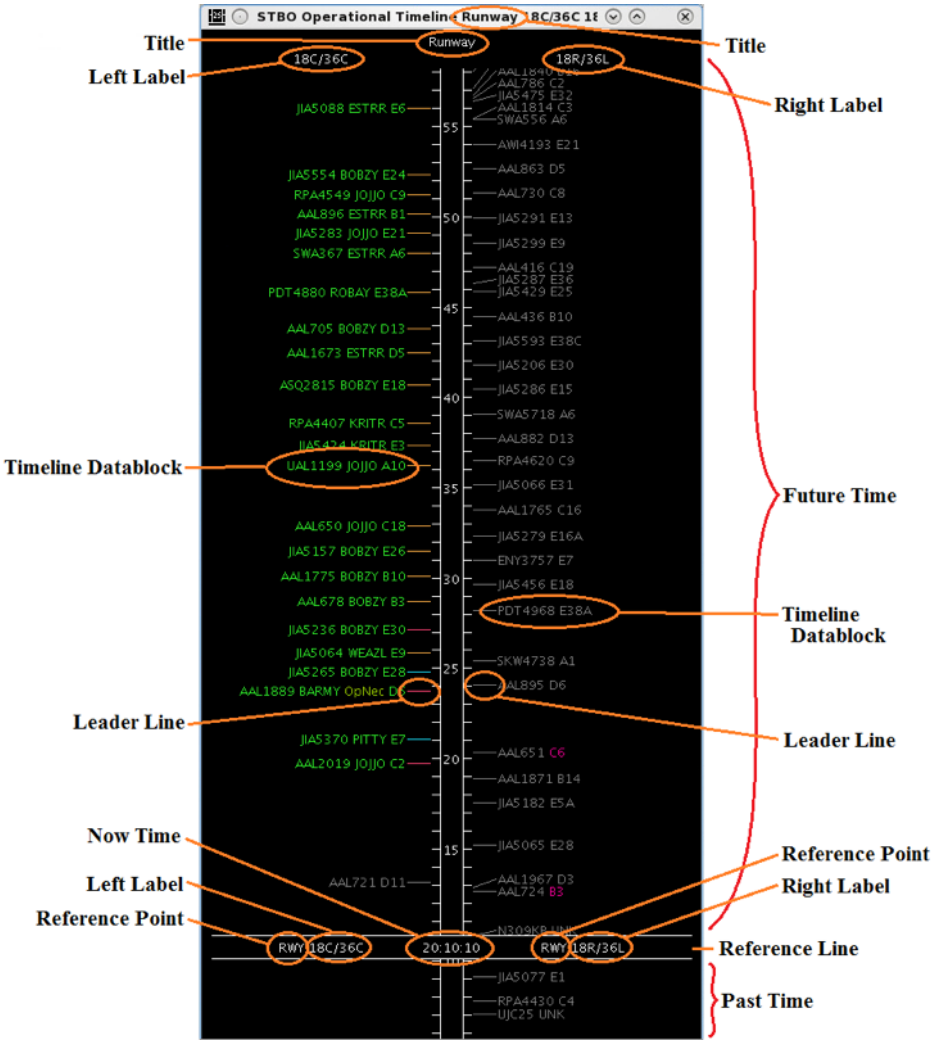


Figure 4. The STBO Client Timeline.

The location on the Timeline reflects the Surface Time Based Metering (STBM) algorithm prediction of OFF time for departures and ON time for arrivals. For departures, this is either the Target TakeOff Time (TTOT) or Earliest Feasible Takeoff Time (EFTT).

- EFTT is only provided for APREQs that have yet to be negotiated with Center.
- TTOT is a prediction of OFF based on Target Off-Block Time (TOBT) and predicted taxi times. For flights with Expect Departure Clearance Times (EDCTs) or Approval Requests (APREQs) / Call for Releases (CFRs), the TTOT may equal the Controlled TakeOff Time (CTOT).

When flight datablocks cross below the reference line with the Now time, arrivals have landed and departures have taken off.

To create additional Timelines:

> ***Step 1***: Click on "Create" on the STBO Client Toolbar.
>
> ***Step 2***: Select "Create Timeline".

The new Timeline will appear with default Timeline datablocks. The overall layout of Timelines, Maps, and Flights Table can be saved via the Settings menu on the STBO Client Toolbar (see section 0).

2.1.1 Timeline Elements

When the Timeline is configured by arrivals and departures, arrival flights are displayed in grey (Figure 5), and departure flights are displayed in green.

Figure 5. Various elements of the Timeline.

All TMI information is displayed in white text. For APREQ/CFR flights, the word "APREQ" is initially displayed in white text. When the APREQ flight receives a release time in the system, APREQ/CFR times are displayed on the Timeline in white text (e.g., "A:2250"). APREQ/CFR flights have additional symbology (e.g., the telephone icon in Figure 5) that is described in section **Error! Reference source not found.**.

When parking gates are displayed on the Timeline, any unknown parking gate assignments are displayed as "UNK." When gate conflicts are displayed on the Timeline, the parking gate number is colored magenta for flights with gate conflicts.

When Ramp inputs a requested change of runway assignment for operational necessity (see *RTC_User_Manual.pdf*), the flight datablock moves to the portion of the Timeline dedicated to the new runway assignment and "OpNec" (operational necessity) is written in light green text on the right side of the Timeline datablock (AAL1810 in Figure 5).

Additional flight information can be configured to display on the Timeline datablocks (see section 2.1.2).

2.1.1.1 Leader Lines

Leader lines (Figure 6) are useful for determining the status/position of the flight on the surface.

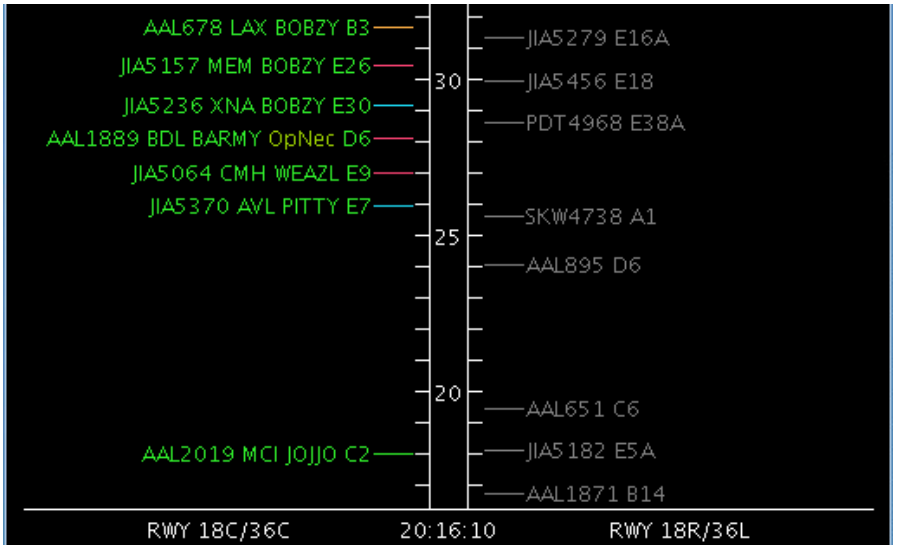


Figure 6. Timeline leader lines.

Leader Line Color	Description
Orange	Show untracked departure flights that are scheduled but have not yet pushed off the gate (no OUT time)
Dark Pink	Show untracked departure flights that have pushed back from the gate (have an OUT time)
Blue	Show tracked departure flights that are still in the Ramp area
Green	Show tracked departure flights that are in the Airport Movement Area (AMA)
Grey	For arrival flights (see right side of the Timeline in Figure 6)

2.1.2 Timeline Settings

Timeline display windows are not limited to showing information about arrivals and departures to the runway. Timelines can be configured for other reference points, to input

different data, to have color coding beyond that of arrivals and departures, be filtered to display select information, and can be shown in list format rather than as a Timeline. Timelines can also be configured to show a variety of information in the datablocks about arrival and departure flights.

To open the Timelines configuration window:

Step 1: Right-click anywhere on the Timeline background (anywhere not on a flight datablock) (Figure 7).

Step 2: Select “Timeline Settings”.

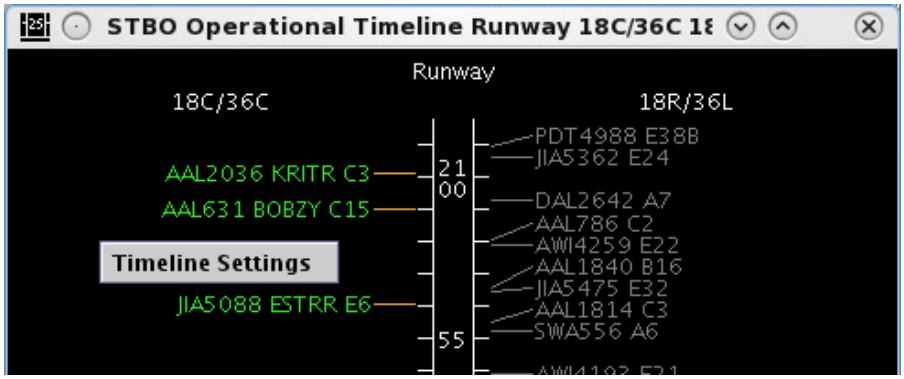


Figure 7. Right-click on the background of the Timeline to open the Timeline Settings window.

The “Timeline Settings” options will open the Timeline Settings window (Figure 7). Use this window to alter the Timeline. Once the desired changes are input into the Timeline Settings window, click the “Ok” button at the bottom of the window to apply the changes and close the Timeline Settings window. To exit the window without applying changes, click the "Cancel" button at the bottom of the window, or click the window close "X" button in the upper right corner; this must be done *without* clicking “Ok” in order to prevent changes to the current Timeline configuration.

2.1.2.1 Labels

Within the Timeline Settings window, the title of the Timeline window and the reference labels for the left and the right side of the Timeline can be changed.

To change the title:

Step 1: Edit the content of the "Title:" text box (Figure 8).

Step 2: Then click the “Ok” button. When the change is applied, the title on the top of the window will change (Figure 4).

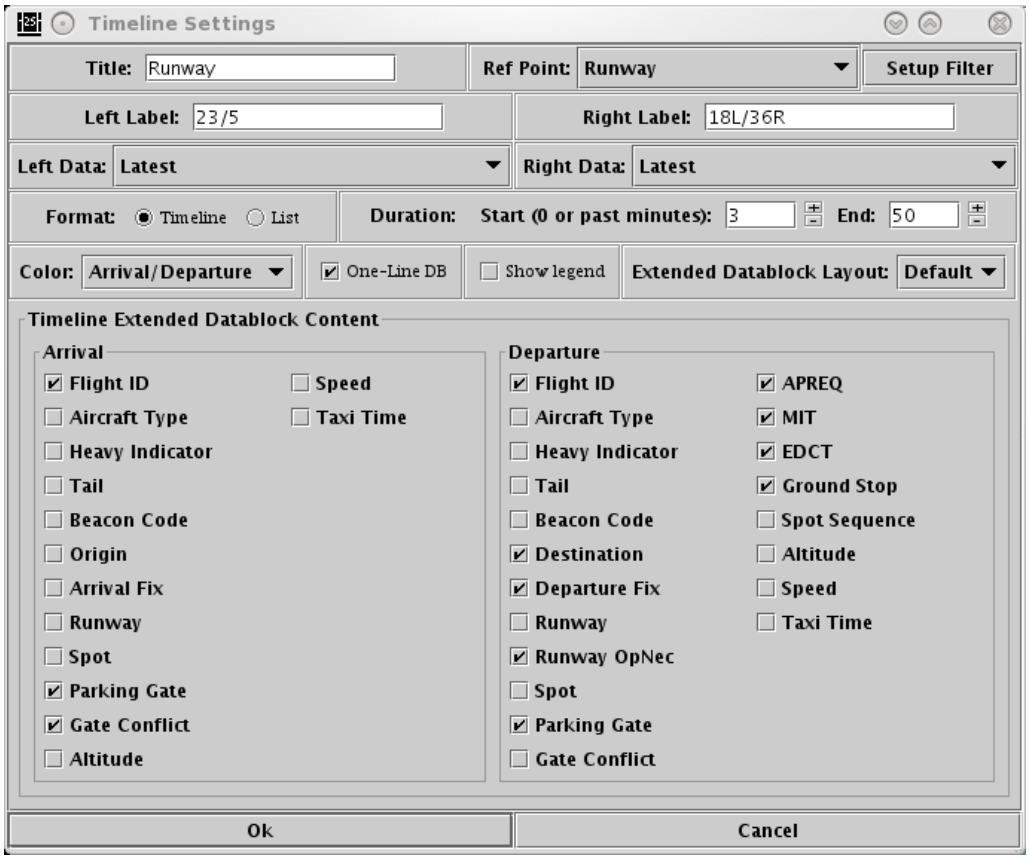


Figure 8. Timeline Settings window for the STBO Client Timeline.

To change the label for the left side of Timeline:

> ***Step 1***: Edit the content of the "Left Label:" text box (Figure 8).
>
> ***Step 2***: Then click the “Ok” button. When the change is applied, the left labels at the top of the Timeline (Figure 7) and at the bottom on the reference line will have changed.

To change the label for the right side of Timeline:

> ***Step 1***: Edit the content of the "Right Label:" text box (Figure 8).
>
> ***Step 2***: Then click the “Ok” button. When the change is applied, the right labels at the top of the Timeline (Figure 4) and at the bottom on the reference line will have changed.

2.1.2.2 Reference Point

The reference point is the point from which flights are scheduled or predicted on the Timeline. For example, if a flight is 10 minutes away from the Now time on the Timeline (Figure 2), then the flight is 10 minutes away from reaching the reference point. If the reference point is a runway, the flight is 10 minutes away from taking off on the runway; if the reference point is the spot, the flight is 10 minutes away from reaching the spot.

Changing the reference point in the Timeline Settings window changes the reference point for both sides of the Timeline.

To change the reference point:

Step 1: Click on the "Ref Point:" drop-down list arrow (Figure 9).

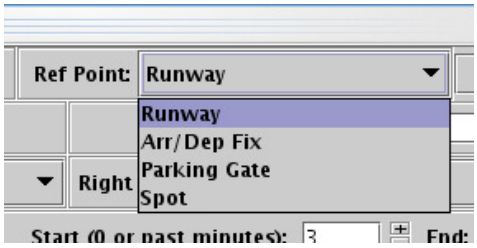


Figure 9. Timeline reference point.

Step 2: Select a new reference point from the drop-down list.

Step 3: Click the "Ok" button. When the change is applied, the reference point indicators on the bottom of the Timeline on the reference line will change (Figure 10). If no other title is specified, the title on the top of the Timeline will also change. Timeline datablocks will also have shifted up or down on the Timeline depending on where the new reference point is physically located relative to the old reference point.

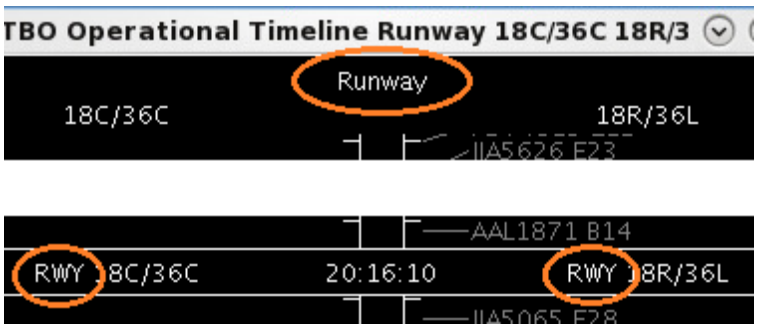


Figure 10. Timeline reference point and title labels.

2.1.2.3 Setup Filter

Adjusting filters for the Timeline can help to refine the information displayed on the Timeline. The filters are how to set specific resource to display on each side of the Timeline. For example, the filter can be used to display runway 5/23 data on the left side of the Timeline and runway 18L/36R data on the right side of the Timeline. Filters can also be used to set up Timelines to show flights with only certain TMIs, like APREQs.

To change the Timeline filters:

Step 1: To add filters to the Timeline, click on the "Setup Filter" button (Figure 8). The Filters window will open (Figure 11).

Step 2: The window will allow for applying filters to the left and right side of the Timeline separately. Choose either the "Left" or "Right" tab to set filters for the left or right side of the Timeline respectively.

Step 3: Select a resource from the "Field" drop-down list (e.g., "Runway").

Step 4: On the same row, select a modifier from the “Operator” drop-down list (e.g., "=").

Step 5: On the same row, select a more specific resource (e.g., "18L"). Multiple specific resources can be selected for a single resource category and modifier.

Step 6: If more resources need to be included in the filter, make entries on a new row. Begin these entries by selecting a qualifier from the qualifier drop-down list (e.g., "AND"). Complete the entries in the new row in the same manner as described in steps 3-5.

Step 7: Once all desired entries are complete, click the "OK" button at the bottom of the Filters window.

Step 8: Click the "Ok" button on the Timeline Settings window (Figure 8). The Timeline will now only display flights that match the filter.

Note that changing the filters does not automatically update the labels. To update labels to reflect the resource (e.g., “18L/36R”), see section 2.1.2.1.

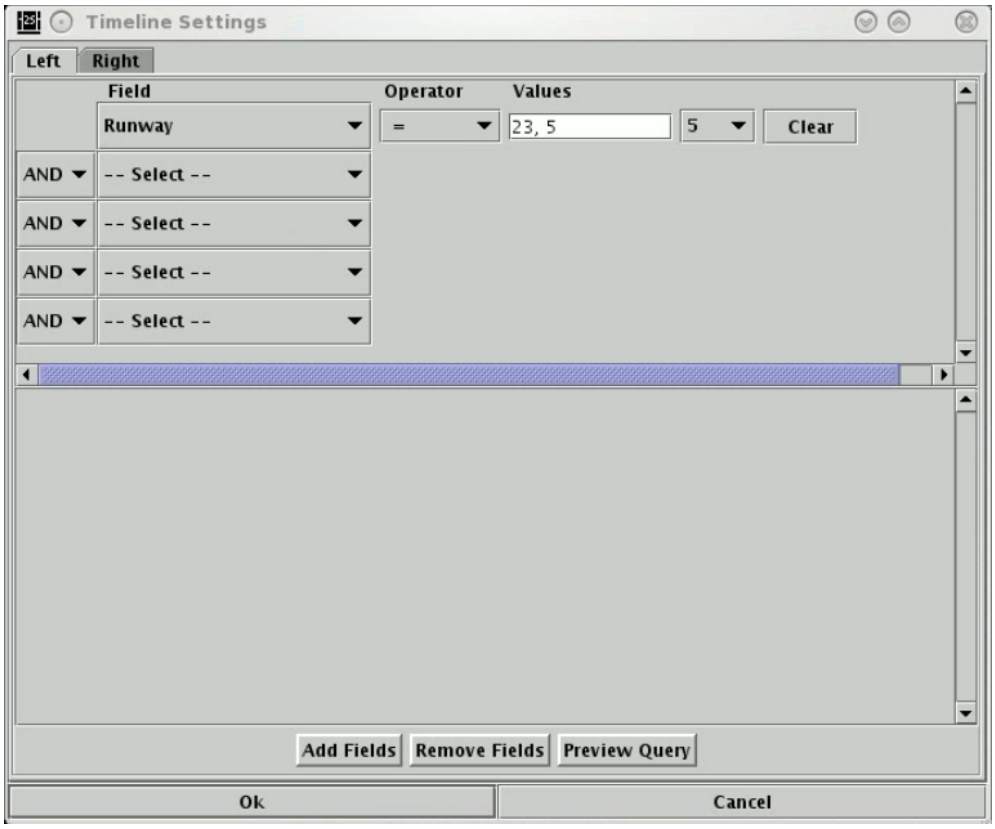


Figure 11. Timeline Filter.

2.1.2.4 Left and Right Data

Two types of data can be populated on the Timeline. Changing the type of data will result in different positions of Timeline data blocks (Figure 12).

- "Undelayed" data is the earliest time that the flight can reach the Timeline's reference point as computed by STBO based on predicted trajectory, a constant rate of speed in the Ramp, and a constant rate of speed in the AMA. No other flights are considered in this calculation. This time updates every 10 seconds.
- "Latest" data populates Timeline datablocks based on the most up to date information for a flight.
    - If the actual event (e.g., landing, pushing back, etc.) has occurred, this is the time the event occurred. The data source is from Airline, Terminal Flight Data Manager (TFDM), Traffic Flow Management (TFM), or computed by the Model.
    - If the actual event (e.g., landing, pushing back, etc.) has not occurred, this is the target time from the scheduler.

To change the data that's used to populate the Timeline (using “Right Data” as the example):

Step 1: Click on the "Right Data:" drop-down list arrow (Figure 12).

Step 2: Select an item from the drop-down list for what type of data to display on the right side of the Timeline.

Step 3: Click the “Ok” button.

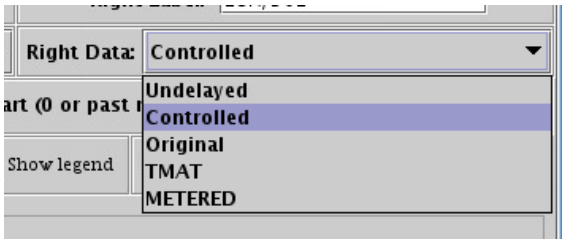


Figure 12. Timeline data.

2.1.2.5 Format

The Timeline can be setup to display as either a Timeline or as a list. The Timeline places the Timeline datablocks for flights at the point on the Timeline where each flight is expected to reach the reference point. The list format does not space the Timeline datablocks; it instead lists all of the flights in the order in which they are expected to reach the reference point without what considering the specific time they are expected to reach the reference point. The ordering of the list is bottom-up, with the flights that will reach the reference point the soonest on the bottom of the list.

To change the format:

Step 1: Choose either the "Timeline" or the "List" radio button on the left side of the Timeline Settings window (Figure 13).

Step 2: Click the “Ok” button.

Figure 13. Timeline format.

2.1.2.6 Duration

By default, the duration of the Timeline is set to display from 3 minutes into the past to 50 minutes into the future for a total of 53 minutes. However, the duration of the Timeline display can be configured to any interval of the user’s choice.

To change the duration of the Timeline:

Step 1: Choose the starting point for the Timeline. Use either the + and – buttons next to the "Start (0 or past minutes):" text box or manually enter a number of minutes into the text box (Figure 14).

Step 2: Choose the ending point for the Timeline. Use either the + and – buttons next to the "End:" text box or manually enter a number of minutes into the text box.

Step 3: Click the "Ok" button. The amount of time displayed on the Timeline will change from the default duration to whatever duration matches the new entry. Additional adjustments can be made to the viewed Timeline duration (see section 2.1.3).

Figure 14. Timeline duration.

2.1.2.7 Color Scheme

Timeline datablock colors can be coded by six categories: arrivals/departures, departure fix, departure gate, departure runway, runway, and weight.

To change the Timeline datablock color scheme:

Step 1: Click on the "Color:" drop-down list arrow (Figure 15).

Step 2: Select an item from the drop-down list on which to base the Timeline color coding.

Step 3: Click the "Ok" button.

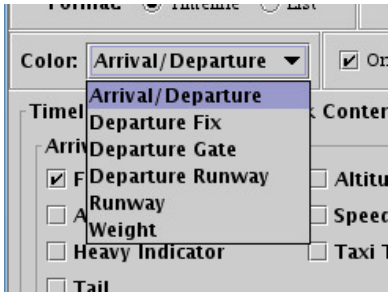


Figure 15. Timeline color scheme.

2.1.2.8 Legend

The Timeline legend allows for control of which types of aircraft are displayed on the Timeline. The legend on the Timeline is interactive. The legend is based on the Timeline's organization of flights by the selected color scheme (see section 2.1.2.7). When the legend is displayed, the title of the legend on the Timeline is the option

selected for the color scheme. For the purpose of the following sections, “Departure Fix” is selected for the Timeline color scheme.

2.1.2.8.1 Show/Hide the Legend

To show/hide the legend:

> ***Step 1***: Select the "Show Legend" checkbox to show the legend (Figure 16) or deselect the “Show Legend” checkbox to hide the legend.

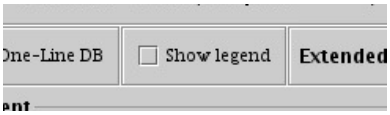


Figure 16. Show/hide the Timeline legend.

> ***Step 2***: Click the “Ok” button. The legend will display at the bottom of the Timeline (Figure 17).

Figure 17. Deselcting items on the Timeline legend.

2.1.2.8.2 Interacting with the Legend

The items in the legend will be displayed in the same color scheme as they are displayed on the Timeline (Figure 17). For example, the “KRITR” label is displayed in orange, like the KRITR Timeline datablocks, while the “JOJJO” label is displayed in white, like JOJJO Timeline datablocks.

Deselecting checkboxes in the legend will turn the item deselected a dark grey color on the Timeline. Selecting checkboxes in the legend will return the selected item to its original coloring, as determined by the coloring selected in the Timeline Settings window (see section 2.1.2.7).

The “All” item at the end of the legend list is deselected whenever any other item in the legend is deselected. If the “All” checkbox is clicked on as the method to deselect the “All” item, no other legend items are impacted. When the “All” checkbox is selected, all other items in the legend are also selected.

2.1.2.9 Timeline Datablocks

In the Timeline Settings window, changes can be made to the configuration of the Timeline datablocks as well as to the content of the Timeline datablocks. These Timeline datablock settings options are described in the following sections.

2.1.2.9.1 Timeline Datablock Configuration

Changes to the Timeline datablock configuration can be made to restrict the content of a single datablock to one line on the Timeline vs. allowing the content of a single datablock to be written across two lines on the Timeline.

To change the configuration of Timeline datablocks:

Step 1: Select the "One-Line DB" (datablock) checkbox to restrict the content of each datablock to one line (Figure 18) or deselect the “One-Line DB” checkbox allow the content of each datablock to be written on two lines (Figure 18).

Step 2: Click the “Ok” button.

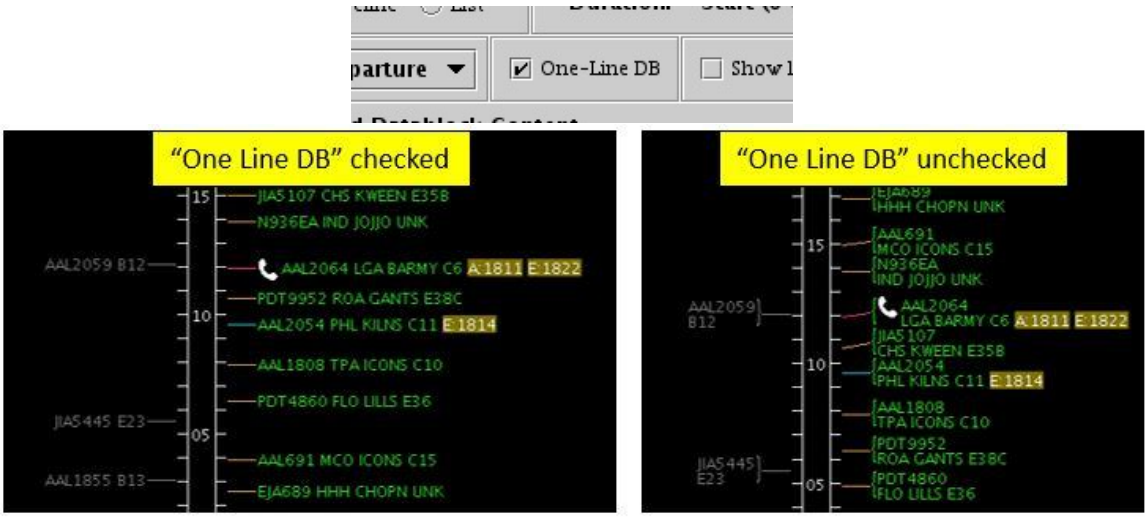


Figure 18. Timeline datablock configuration.

Note that currently the only available option for the "Extended Datablock Layout:" feature in the Timeline Settings window is "Default".

2.1.2.9.2 Timeline Datablock Content

Content of Timeline datablocks can be adjusted for arrival and departure datablocks independently.

To change the content of Timeline datablocks:

Step 1: Select the items to be displayed in the Timeline datablocks (Figure 19) and deselect items to be removed from the Timeline datablocks. Make changes separately for arrivals and departures.

Step 2: Click the "Ok" button.

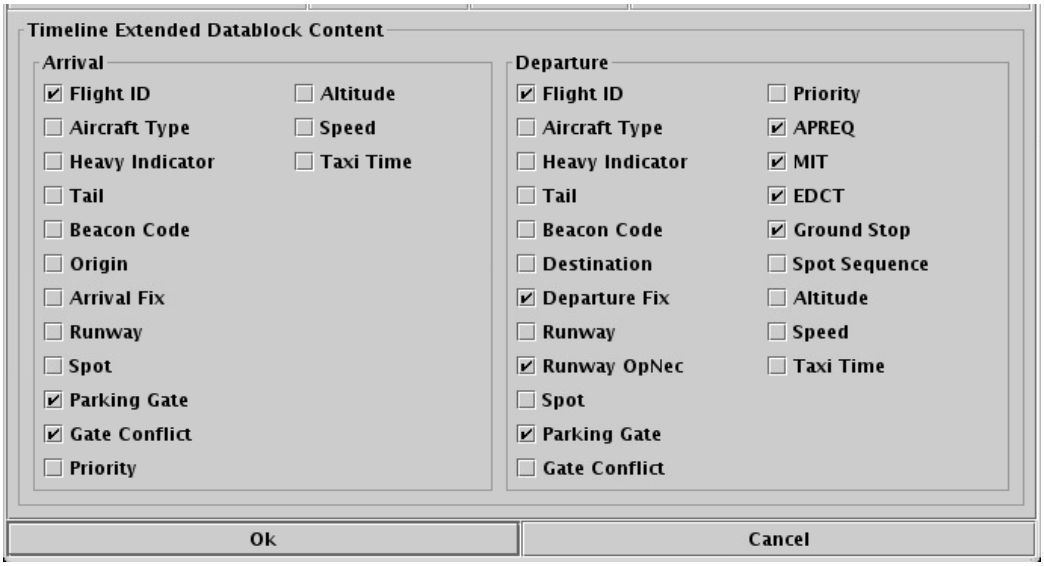


Figure 19. Timeline datablock content.

Datablock Content Item	**Description**	**Content available for arrivals, departures, or both**
Flight ID	Displays the flight ID/callsign.	Both
Aircraft Type	Displays the aircraft type.	Both
Heavy Indicator	Displays an orange H on the datablock to indicate that the aircraft is a heavy type.	Both
Tail	Displays the tail number of the aircraft.	Both
Beacon Code	Displays the flight's beacon code.	Both
Origin	Displays the arrival flight's origin airport.	Arrival
Destination	Displays the departure flight's destination airport.	Departure
Arrival Fix	Displays the assigned arrival fix for the arrival flight.	Arrival
Departure Fix	Displays the assigned departure fix for the departure flight.	Departure
Runway	Displays the flight's assigned runway. For arrivals, a "^" symbol will appear in front of the runway when the runway assignment is populated from the Terminal RADAR Approach Control (TRACON) scratchpad entries.	Both

Runway OpNec	Displays a light green “OpNec” when the departure flight has been assigned to a runway for operational necessity.	Departure
Spot	Displays the assigned spot for the flight to enter or leave the Ramp.	Both
Parking Gate	Displays the assigned gate for the flight. When the flight’s gate is unknown, “UNK” is displayed.	Both
Gate Conflict	When the flight has a gate conflict, the parking gate will display as magenta.	Both
APREQ	Displays information for flights that have APREQ restrictions, including: • symbol to indicate the availability of electronic negotiations • “APREQ” before flights have a negotiated release time • a release time once one is negotiated • symbology during the negotiation process (see section 3).	Departure
MIT (Miles-In-Trail)	Displays an MIT restriction for a flight.	Departure
EDCT	Displays the EDCT release time for flights with an EDCT restriction.	Departure
Ground Stop	Displays “GS” for flights with a ground stop.	Departure
Spot Sequence	For departures exiting the Ramp at a certain spot, the fight’s sequence number to the spot is displayed. So if the flight is currently 3rd in line to exit at the spot, a “3” will be displayed. This will update as aircraft cross into the AMA. Once an aircraft enters the AMA, it will no longer be assigned or display a spot sequence number.	Departure
Altitude	Displays the aircraft’s altitude in units of feet / 100.	Both
Speed	Displays the aircraft’s speed in nautical miles (*nmi*).	Both
Taxi Time	For arrivals, taxi time displays once the arrival lands and has an Actual ON time. Taxi time displays for arrivals as follows: • Arrival not yet landed: no value • Arrival landed but not in the gate: elapsed time from Actual ON to "now"	Both

	• Arrival in the gate: elapsed time from Actual ON to Actual IN For departures, taxi time displays as follows: • Departure still in the Ramp: no value • Departure in the AMA: elapsed time from Actual SPOT to "now" Departure taken off: elapsed time from Actual SPOT to Actual IN	

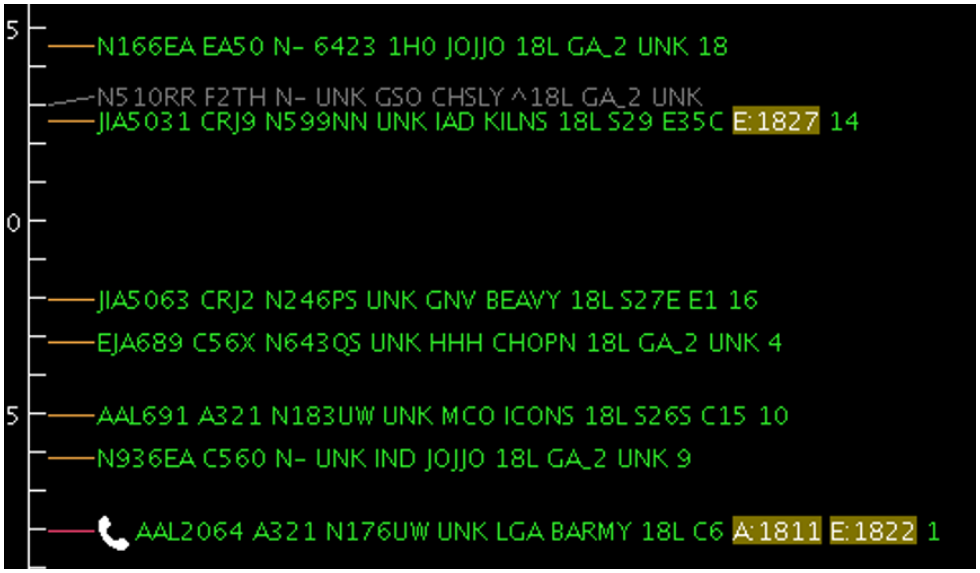


Figure 20. Timeline datablocks with all of the Timeline datablock options selected.

2.1.3 Dragging the Timeline Up or Down

The Timeline can also be dragged up and down by left or right-clicking in the center column of the Timeline and dragging the mouse up or down (Figure 21). The mouse's scroll wheel can also be used as a button to click and drag the Timeline. When the Timeline is dragged, the duration remains constant, but the start and end times will differ. For example, if the Timeline is displaying 53 minutes of time from 3 minutes in the past to 50 minutes into the future, by clicking and dragging the Timeline up 20 minutes, the Timeline will keep displaying the 53-minute duration, but the start and end time for the Timeline display will now be from 23 minutes into the past to 30 minutes into the future.

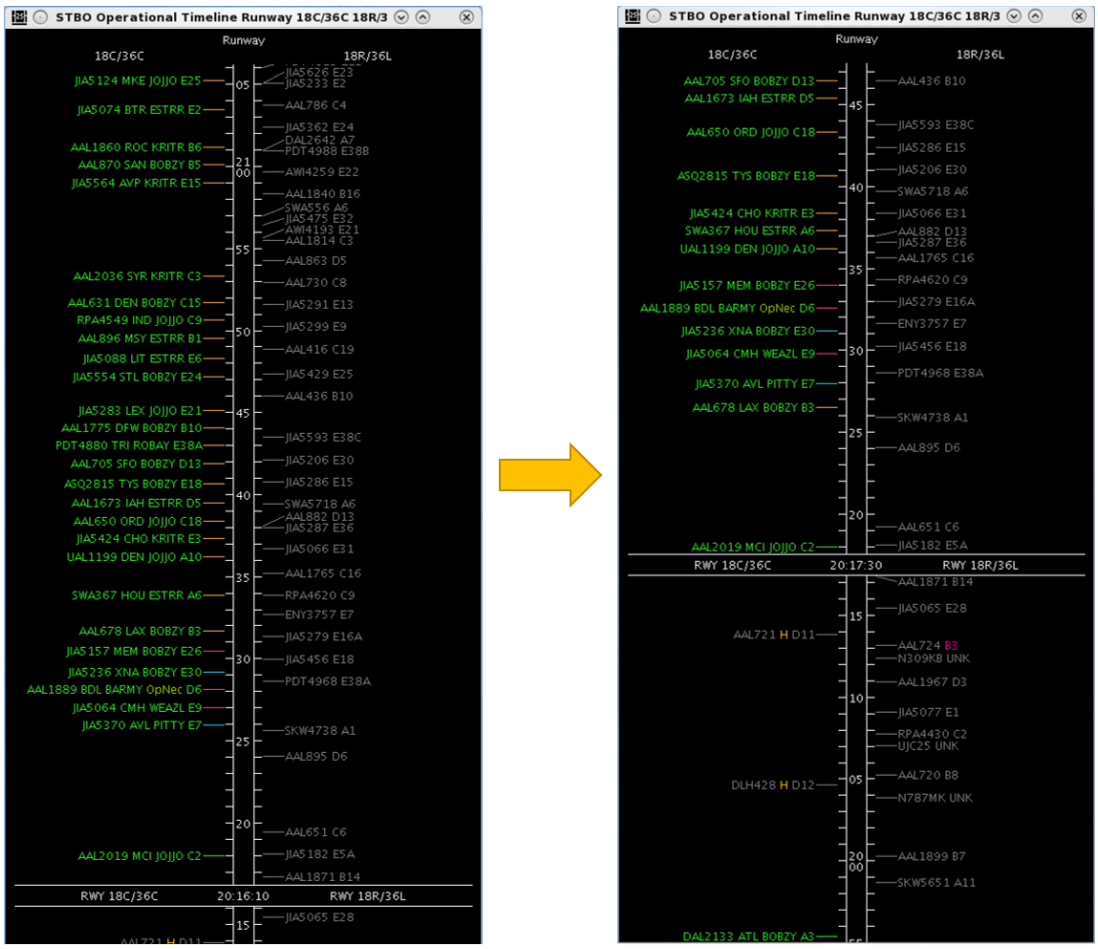


Figure 21. Dragging the Timeline up and down.

Once the Timeline has been dragged, the option to reset the Timeline to the default time interval will appear in the Timeline's right-click menu. The default time interval is the "Duration" in the Timeline Settings panel (see section 2.1.2.6). For example, once the Timeline has been dragged to display from 23 minutes into the past to 30 minutes into the future, the Timeline can be reset to display from 3 minutes into the past to 50 minutes into the future.

To reset the Timeline interval:

Step 1: Right-click on the background of the Timeline.

Step 2: Select "Reset interval" (Figure 22). The Timeline now displays the default time interval.

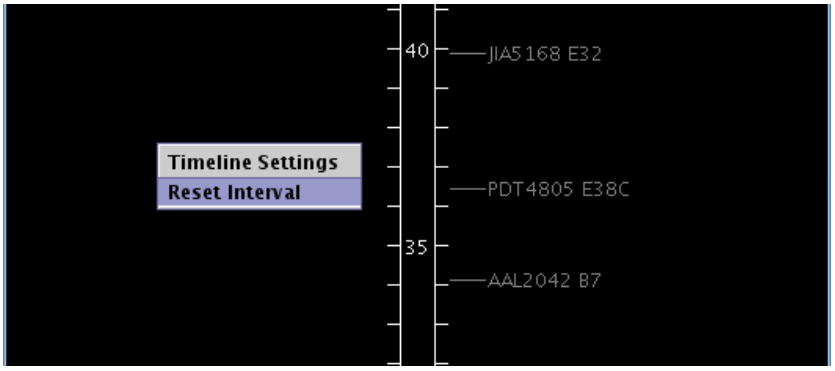


Figure 22. Right-click on the background of the Timeline to reset the Timeline interval.

2.2 Map

The STBO Client Map (Figure 23) is set up to display the layout of the AMA and Ramp of the airport, as well as flight positions and datablocks. The Map window consists of an aerial view of the airport surface, flight positions on the surface, drop-down menus (File, View, Help), and Map configuration toolbar. Flight positions are collected from surface surveillance.

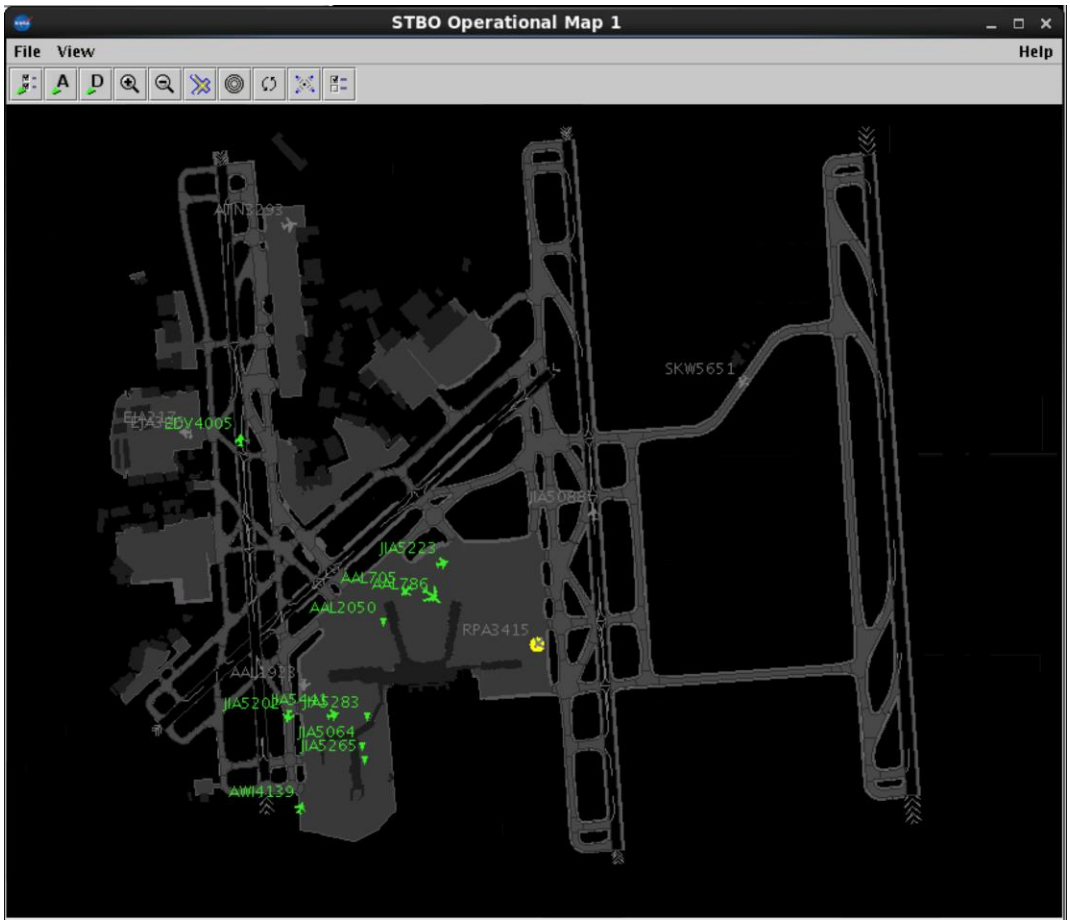


Figure 23. STBO Client Map.

Like on the Timeline, the default color scheme display for departure flights is green and for arrival flights is light grey (see section 2.2.4.1.1 and 2.2.4.1.2 for alternative datablock and color scheme options). Gate conflicts appear as magenta parking gates when extended datablocks are displayed on the Map.

To create additional Maps:

Step 1: Click on "Create" on the STBO Client Toolbar.

Step 2: Select "Create Map".

The new Map will appear with default departure and arrival datablocks, zoom level, and location.

2.2.1 Map Aerial View

The aerial view is pre-set to show the layout of the airport, south facing up. Departure flights are displayed in green and arrival flights in grey. Gate conflicts appear as magenta parking gates. Flights with long on board are marked on the Map. Flight datablocks also provide additional information, such as TMI information.

The position of the flights comes from radar data.

2.2.1.1 Tarmac Rule / Long On Board

The Map also displays Tarmac Rule / Long On Board (LOB) information for flights. LOB is displayed on the Map using a colored disc that surrounds the aircraft icon (Figure 24). LOB timer starts from the flight's pushback from the gate (Actual Off-Block Time; AOBT) for departure flights or from the moment wheels touch down (Actual Landing Time; ALDT) for arrival flights. The following table describes the parameters for when each LOB disc color is displayed.

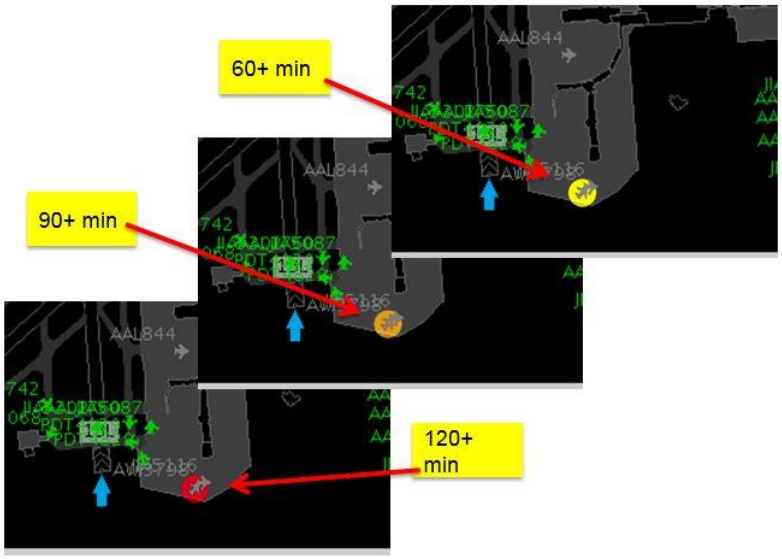


Figure 24. Map Long On Board.

Disc Color	LOB Timer

Yellow	60-89 minutes
Orange	90-119 minutes
Red	120+ minutes

2.2.2 Menus

Two menus are available on the top left of the Map: File and View.

The "File" menu (Figure 25) provides the ability to shut down the STBO Client. To shut down the STBO Client:

Step 1: Click on the "File" menu in the Map window.

Step 2: Click on "Shutdown STBO."

Step 3: Confirm STBO Shutdown. Clicking "Yes" will shut down the whole STBO Client program.

Figure 25. Map "File" drop-down menu.

The "View" menu (Figure 26) provides visual options: to show, or hide, the Map toolbar (section 2.2.2.1), aircraft at the gates (section 2.2.2.2), flights by line of flight (section 2.2.2.3), or clear highlighted flights (section 2.2.2.4).

Figure 26. Map "View" drop-down menu.

2.2.2.1 Toolbar

To show the STBO Client Toolbar (see section 2.4):

Step 1: Click on the "View" menu in the Map window.

Step 2: Select on "Show Toolbar." This will bring the STBO Client Toolbar to the forefront of the STBO Client windows.

2.2.2.2 Aircraft at Gates

The "Aircraft at Gates" function impacts all open Maps on the STBO Client interface. If this function is enabled on one Map, it's automatically enabled on all Maps. When this function is enabled, it shows the physical aircraft at the gates with their tail numbers.

To show/hide aircraft at the gates:

Step 1: Click on the "View" menu in the Map window.

Step 2: Select the "Aircraft at Gates" checkbox to display all untracked aircraft parked at the gates and their tail numbers or deselect the "Aircraft at Gates" checkbox to hide all untracked aircraft parked at the gates and their tail numbers.

2.2.2.3 Flights by Line of Flight

The STBO Client displays information for all flights in the system for the day, even if multiple flights are using the same physical aircraft. "Line of Flight" refers to which flight is using a physical aircraft. For example, flight A (an arrival) and flight B (the turnaround departure for the arrival) can share a physical aircraft. If the "Flights by Line of Flight" checkbox is checked, only the current flight is displayed. If the "Flights by Line of Flight" checkbox is unchecked, both flight A and flight B are displayed, even though they occupy the same physical aircraft.

This checkbox also affects "expired" flights. The STBO Client has a timeout parameter; an arrival will display for *N* minutes after it arrives at the gate and receives an IN time. Values for *N* are listed in the table below. Once the timeout value is reached (*N* minutes after the IN time), the flight becomes "expired." Expired flights are not displayed when the "Flights by Line of Flight" checkbox is checked. If the "Flights by Line of Flight" checkbox is unchecked, the flight continues to be displayed until it is deleted from the system. This *N* value is not configurable.

***N* value for "Flights by Line of Flight"**	**Description of when to use each *N* value**
10 minutes	Used for any arrival flights that will turnaround as departures.
30 minutes	Used for domestic arrival flights with no turnaround departures.
75 minutes	Used for international arrival flights with no turnaround departures.

To show/hide flights by line of flight:

Step 1: Click on the "View" menu in the Map window.

Step 2: Select the "Flights by Line of Flight" checkbox to hide expired flights or deselect the "Flights by Line of Flight" checkbox to show expired flights.

2.2.2.4 Clear Highlighting of Flights on the Map

There are two methods for clearing out the highlighting/selecting of flights on the STBO Client Map. The first is to click anywhere else on the Map background, and the second is to use the "View" menu in the Map window.

To clear all highlighted flights on the Map:

Step 1: Click on the "View" menu in the Map window.

Step 2: Click on "Clear Highlighted Flights." This will unselect all flights that are highlighted.

2.2.3 Help Menu and Quick Keys

On the top right of the Map is the help menu (Figure 27). This menu provides access to the software version (About), or the quick keys for the Flights Table (Flights Table Help), Map (Map Help), or Timeline (Timeline Help).

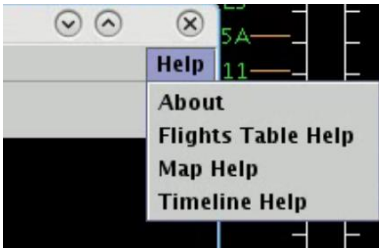


Figure 27. Map "Help" drop-down menu.

To find out about the software version currently in use:

Step 1: Click on the "Help" menu in the Map window.

Step 2: Click on "About." A window appears with the version number and the build (Figure 28).

Step 3: Click on "OK" to close the window.

Figure 28. STBO Client version information.

Some users prefer to use quick key functions to navigate through the interface and interact with it. Quick key functions exist in the system today for the Flights Table, Map and Timeline. The Map "Help" menu can be used to view lists of these quick key functions.

To open the list of quick keys for the Flights Table:

Step 1: Click on the "Help" menu in the Map window.

Step 2: Click on "Flights Table Help." A window appears with a list of keyboard and mouse shortcuts for various Map functions (Figure 29).

Step 3: Click on "Close" to close the window.

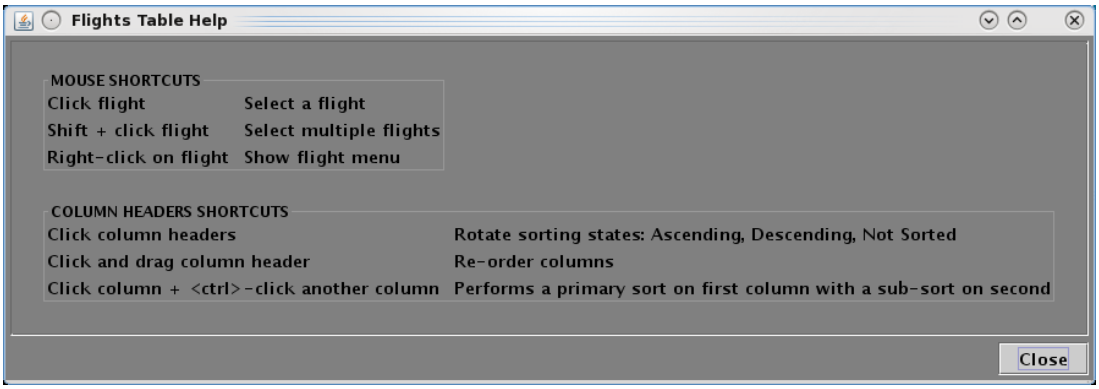


Figure 29. Flights Table Help window.

To open the list of quick keys for the Map:

Step 1: Click on the "Help" menu in the Map window.

Step 2: Click on "Map Help." A window appears with a list of keyboard and mouse shortcuts for various Map functions (Figure 30).

Step 3: Click on "Close" to close the window.

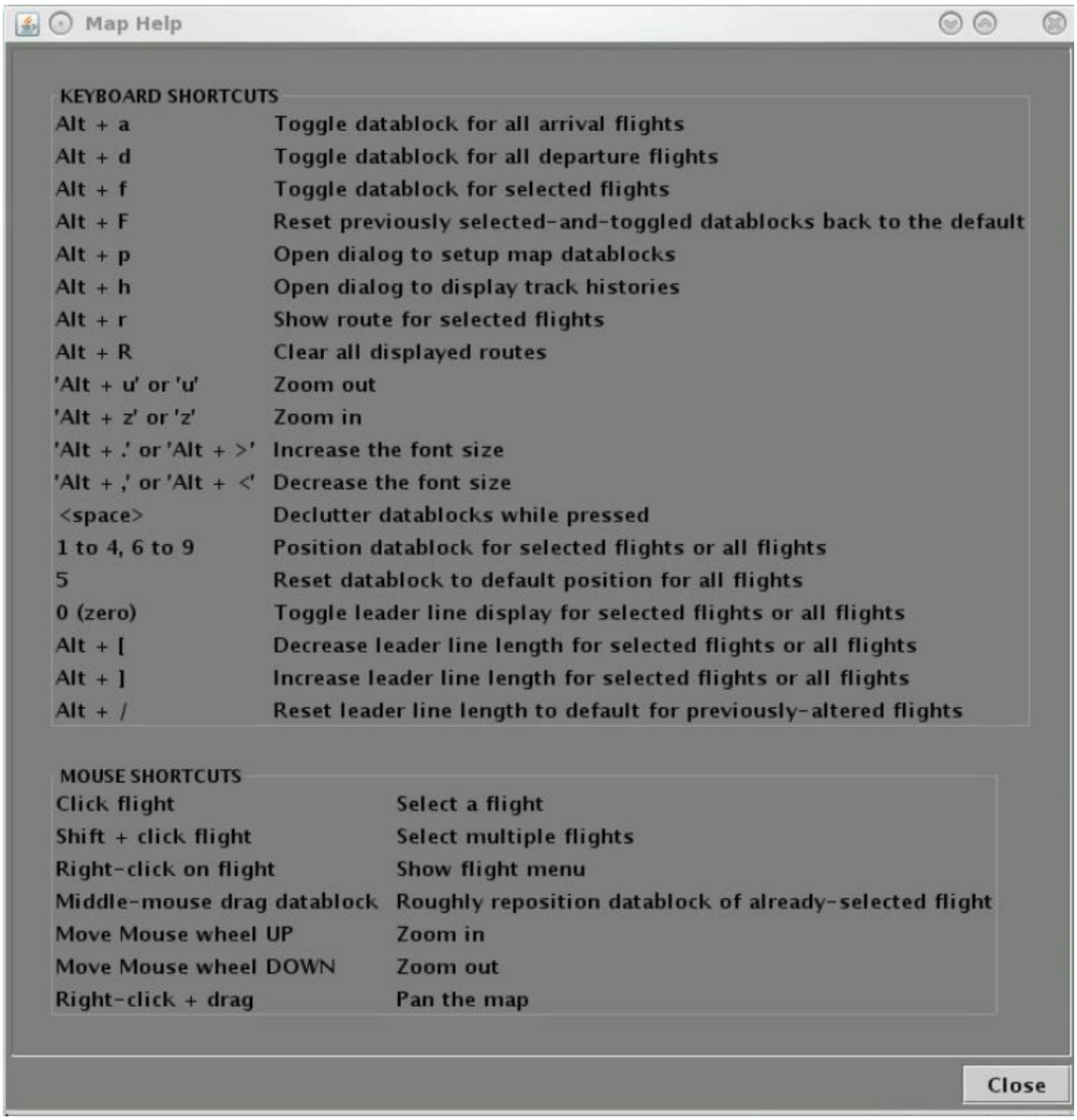


Figure 30. Map Help window.

To open the list of quick keys for the Timeline:

Step 1: Click on the "Help" menu in the Map window.

Step 2: Click on "Timeline Help." A window appears with a list of keyboard and mouse shortcuts for various Map functions (Figure 31).

Step 3: Click on "Close" to close the window.

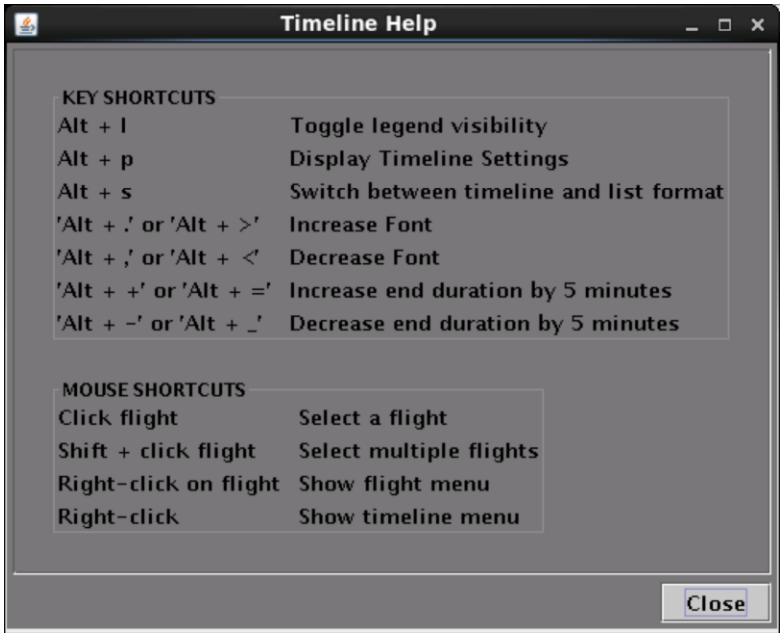


Figure 31. Timeline Help window.

2.2.4 Map Toolbar

There are several functions available to the user on the Map toolbar (Figure 32). The Map Toolbar has a tooltip feature (Figure 33) that displays the labels for button functions when hovering over each button. The tooltip displays for 5 seconds.

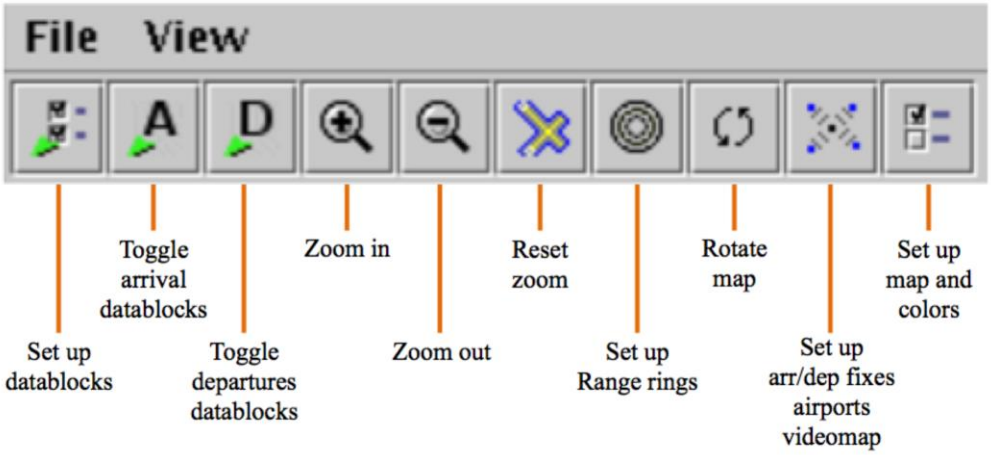


Figure 32. Map toolbar.

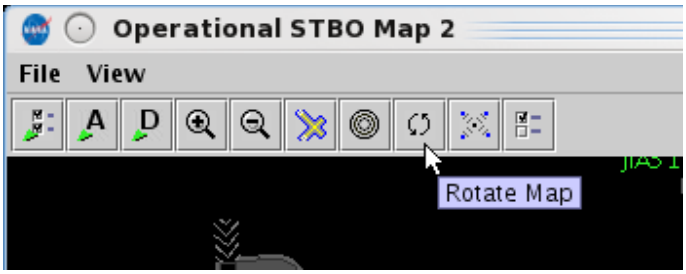


Figure 33. Tooltips on the Map toolbar.

The following table provides a description of the Map toolbar buttons from left to right. For those Map toolbar buttons that open windows to provide additional functionality, a more in-depth description of the windows is provided in sections 0-4.

Map Toolbar Button	Description
Setup Datablocks	Opens a settings window for making adjustments to how all Map datablocks are displayed
Toggle Arrival Datablocks	Toggle between "No DB", "ACID (Aircraft ID/callsign) only DB", and "Extended DB" for arrival flights
Toggle Departure Datablocks	Toggle between "No DB", "ACID only DB", and "Extended DB" for departure flights
Zoom In	Zoom in on the Map
Zoom Out	Zoom out on the Map
Reset Zoom	Return to the default Map zoom level
Setup Range Rings	Opens settings window to set interval for range ring spacing, show range rings, show distance labels for each range ring, and set the max distance to show range rings
Rotate Map	Select one of four orientations for the Map (0°, 90°, 180°, 270°). Note: Choosing the orientation the Map is currently on will result in no rotation.
Setup Arrival/Departure Fixes and Airports	Add specific fixes and airports to the display, overlay TRACON map onto airport map
Setup Map	Opens a window to change settings for showing or hiding labels, shapes, and other items on the Map

2.2.4.1 Setup Datablocks

The Setup Datablocks button on the Map toolbar opens the Setup Datablocks window (Figure 34), which enables changing the Map datablock configurations, color schemes,

displaying the legend, showing (untracked) flights at the gate, editing Map datablock content, and other display filters. These Map datablock setting features are described in the following sections.

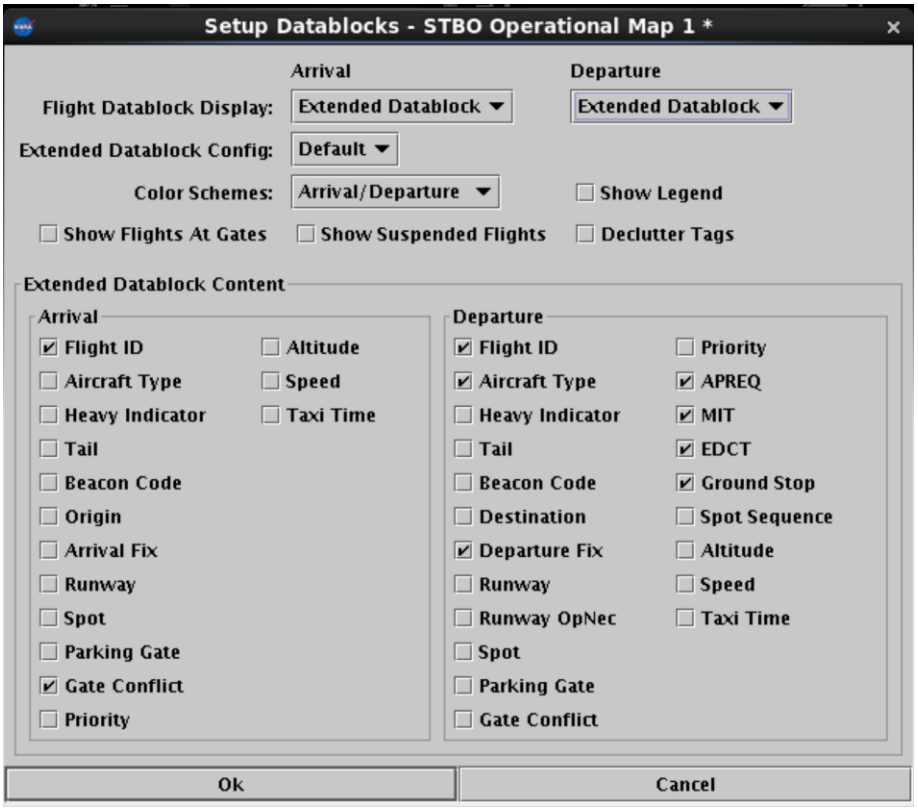


Figure 34. Setup Datablocks window for the STBO Client Map.

2.2.4.1.1 Map Datablock Configuration

Map datablocks can be configured separately for arrivals and departures. Datablocks can be configured to display as no datablocks, ID (aircraft callsign) only datablocks, or extended datablocks (Figure 35). The following example will use the arrival datablocks to demonstrate the steps for changing the datablock displays.

To change the flight datablock display using the Setup Datablock window:

Step 1: Click on the "Arrival" drop-down menu next to “Flight Datablock Display:” (Figure 35).

Step 2: Select the desired option for displaying the flight datablock.

Step 3: Click the “Ok” button.

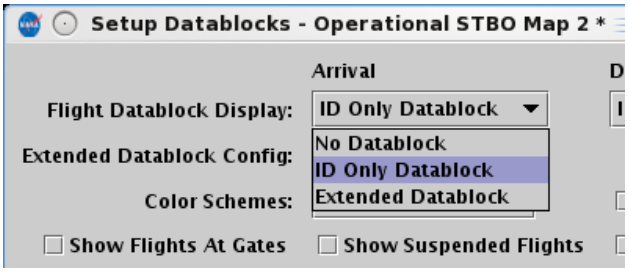


Figure 35. Flight Datablock Display.

The "Extended Datablock Config:" feature enables the changing of the standard color for the Map datablock backgrounds between "Default" and "ramp". This feature is only applicable when using extended datablocks and does not impact the aircraft icon on the Map, only the flight's datablock backround. Aircraft icons will match the Map datablock color scheme, described in section 2.2.4.1.2. The following table describes the differences for these two options:

Extended Datablock Config: Options	**Descrition of Datablock Background Changes**
Default	All: No background color Datablock text: matches the color scheme selected as described in section 2.2.4.1.2
ramp	Arrivals: green Departures: blue for eastbound flights, brown for westbound flights All datablock text: white

2.2.4.1.2 Color Scheme

Map datablock colors can be organized by six categories: arrivals/departures, departure fix, departure gate, departure runway, runway, and weight. The color of the Map aircraft icons matches datablocks for the color scheme as well.

To change the Map datablock color scheme:

Step 1: Click on the "Color:" drop-down list arrow (Figure 36).

Step 2: Select an item from the drop-down list on which to base the Timeline color coding.

Step 3: Click the "Ok" button.

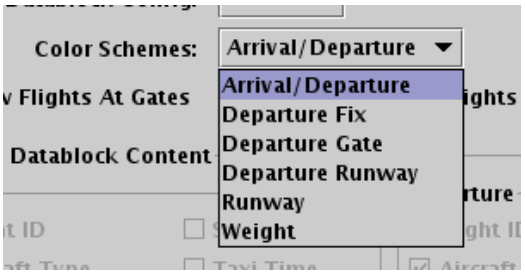


Figure 36. Map color scheme.

2.2.4.1.3 Legend

The Map legend provides information about categories of aircraft that are displayed on the Map. The legend on the Map is not interactive. The legend is based on the Map's organization of flights by the selected color scheme (see section 2.1.2.7). When the legend is displayed, the title of the legend is displayed as the option selected as the color scheme. For the purpose of this section, "Departure Fix" is selected for the Map color scheme.

To show/hide the legend:

Step 1: Select the "Show Legend" checkbox to show the legend or deselect the "Show Legend" checkbox to hide the legend (Figure 37).

Step 2: Click the "Ok" button. The legend will display on the right side of the Map (Figure 38).

Figure 37. Show/hide the Map legend.

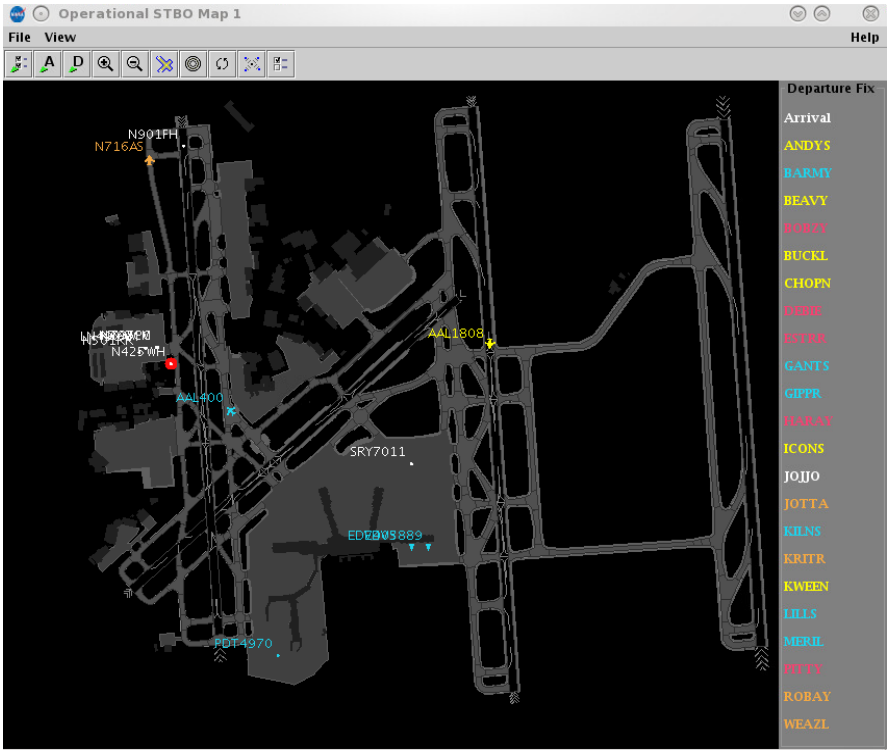


Figure 38. Map legend.

Unlike the Timeline legend, the Map legend is not interactive; there are no check boxes to select or unselect items from the legend.

2.2.4.1.4 Flights at Gates

The "Flights at Gates" function only applies to the current selected Map. When this function is enabled, it shows the flights at the gates with their callsigns / flight numbers.

To show/hide flights at gates:

> ***Step 1***: Select the "Show Flights at Gates" checkbox to display all untracked flights parked at the gates and their flight numbers or deselect the "Show Flights at Gates" checkbox to hide all untracked flights parked at the gates and their flight numbers.
>
> ***Step 2***: Click the "Ok" button.

2.2.4.1.5 Suspended Flights

To show/hide suspended flights:

> ***Step 1***: Select the "Show Suspended Flights" checkbox to display all suspended flights or deselect the "Show Suspended Flights" checkbox to hide all suspended flights.
>
> ***Step 2***: Click the "Ok" button.

2.2.4.1.6 Declutter Tags

By default, the "Declutter Tags" function is not enabled. The Map normally allows flight datablocks to overlap as the aircraft traverse the surface of the airport. When the "Declutter Tags" function is turned on, flight datablocks on the Map will move around the flights so that the flight datablocks do not overlap.

To show/hide flights at gates:

> ***Step 1***: Select the "Show Flights at Gates" checkbox to display all untracked flights parked at the gates or deselect the "Show Flights at Gates" checkbox to hide all untracked flights parked at the gates (Figure 37).
>
> ***Step 2***: Click the "Ok" button.

Flight datablocks can also be repositioned on the Map by clicking and dragging the datablock to a new position directly on the Map.

2.2.4.1.7 Map Datablock Content

Content of Map datablocks can be adjusted for arrival and departure datablocks independently. These controls are only available if "Extended DB" has been selected (see section 2.2.4.1.1).

To change the content of Map datablocks:

> ***Step 1***: Select the items to be displayed in the Map datablocks (Figure 39) and deselect items to be removed from the Map datablocks. Make changes separately for arrivals and departures.
>
> ***Step 2***: Click the "Ok" button.

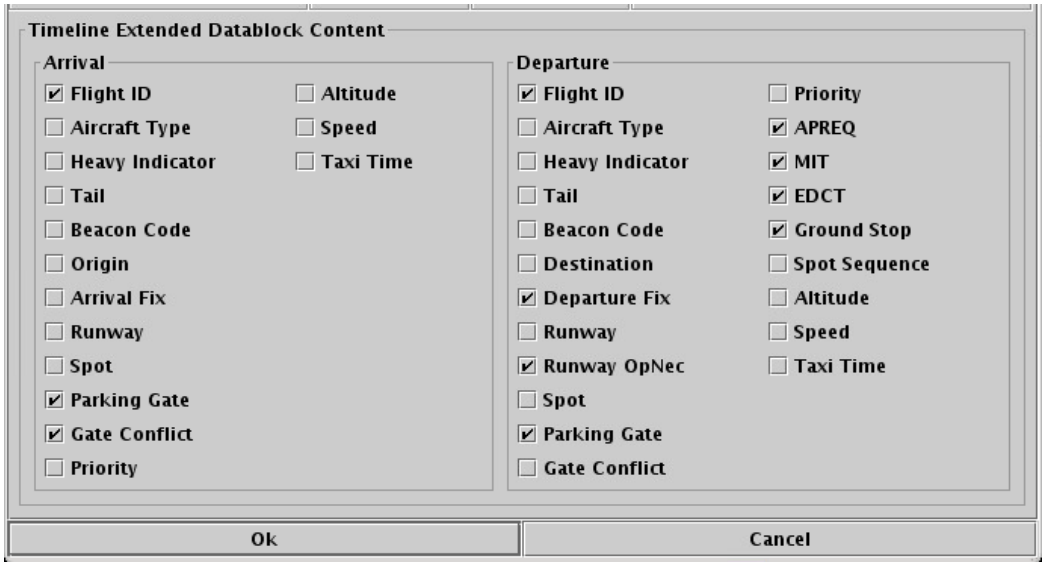


Figure 39. Map datablock content.

2.2.4.2 Setup Range Rings

Range rings are a valuable tool in helping to judge distance on the STBO Client Map. The Setup Range Rings window provides a means to make changes to the way range rings are displayed.

To setup Range Rings (Figure 40):

Step 1: Click on the Range Ring button to set interval for range ring spacing.

Step 2: Select the "Show Range Rings" checkbox to show range rings.

Step 3 (optional): Select the "Show Range Distance Labels" checkbox to display the value of each range ring.

Step 4 (optional): Click on the colored box to select the color of the range rings. This will open the Choose Color window. For more information on how to interact with the Choose Color window, see section 2.2.4.4.

Step 5: Enter the value of the maximum distance in *nmi* to show range rings in the box next to "Total Distance from Airport to Display Range Rings:"

Step 6: Enter the value of the distance between the range ring in *nmi* in the box next to "Distance Between Range Rings:".

Step 7: Click on the "OK" button.

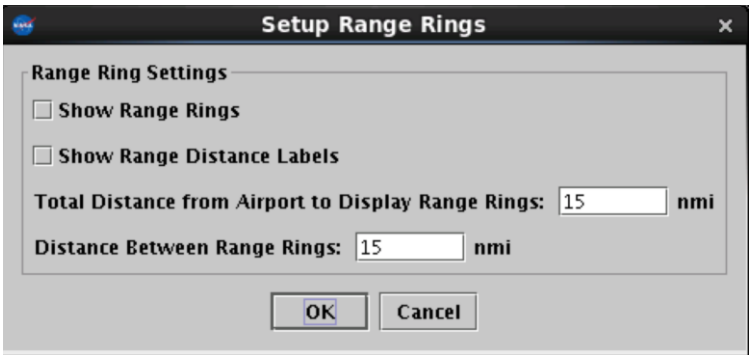


Figure 40. Setup Range Rings window.

2.2.4.3 Setup Arrival and Departure Fixes, and Airport and Airspace Elements

The Setup Arr/Dep Fixes and Airports window provides the ability to display arrival and departure fixes, as well as other airports and video-maps of the TRACON (Figure 41). The following sections describe how to use the Setup Arr/Dep Fixes and Airports window.

2.2.4.3.1 Arrival Fixes

When the Setup Arr/Dep Fixes and Airports window is opened, the default tab is the "Arrival Fix" tab.

To configure the arrival fix displays on the Map (Figure 41):

Step 1: Select the "Show Arrival Fixes" checkbox to display the arrival fixes.

Step 2 (optional): Enter a value for the spacing between the distance markers for the arrival procedures in *nmi*.

Step 3 (optional): Enter the total number of distance markers to display inside the arrival fix (or rather, between the arrival fix and your airport). Note: enter "0" (zero) if no spacing markers are desired.

Step 4 (optional): Enter the total number of distance markers to display outside the arrival fix, away from your airport. Note: enter "0" (zero) if no spacing markers are desired.

Step 5: Click on the "OK" button. The arrival fixes and procedures will now display in blue on the Map.

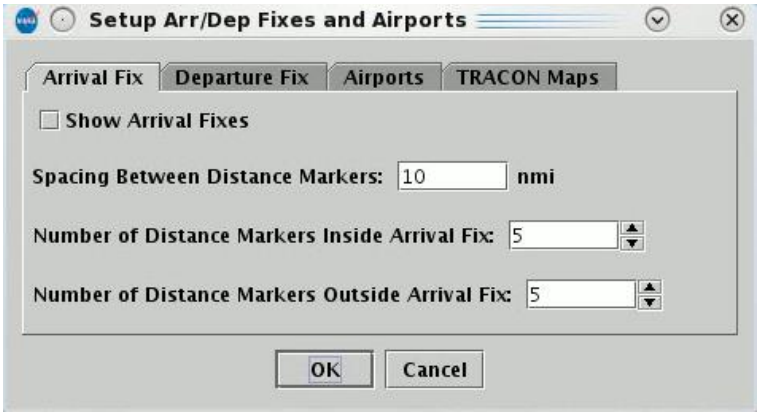


Figure 41. Setup Arrival Fixes.

2.2.4.3.2 Departure Fixes

To configure the departure fix displays on the Map (Figure 42):

Step 1: Click on the "Departure Fix" tab.

Step 2: Select the "Show Departure Fixes" checkbox to display the departure fixes.

Step 3: Click on the "OK" button. The departure fixes will now display in cyan on the Map.

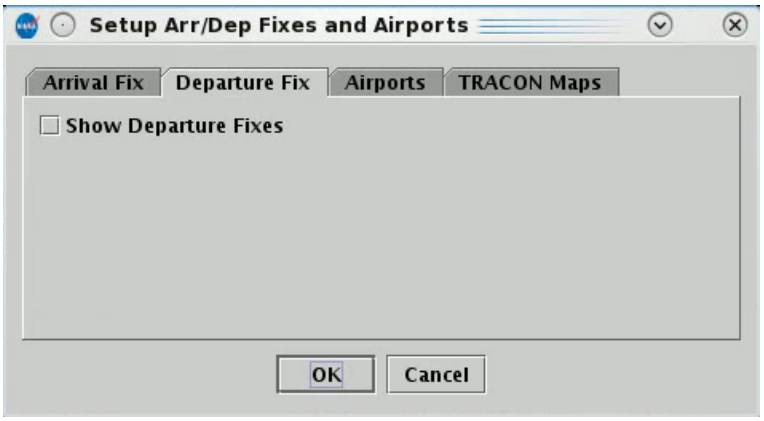


Figure 42. Setup Departure Fixes.

2.2.4.3.3 Airports

To configure the airport displays on the Map (Figure 43):

Step 1: Click on the "Airports" tab.

Step 2: Select the "Show Airports" checkbox.

Step 3: Click on the "Add Airport" button on the right side of the window. This will open the "Airport Input" window.

Step 4: Select the checkbox next to the desired airports or type the 3-letter airport code into the text box (e.g., "RDU").

Step 5: Click on the "OK" button. If the airport code was typed incorrectly, an error message will appear. If the airport code was entered correctly, the airport now appears in the list on the "Airports" tab.

Step 6: Click on the "OK" button. The listed airports will now display in yellow text on the Map.

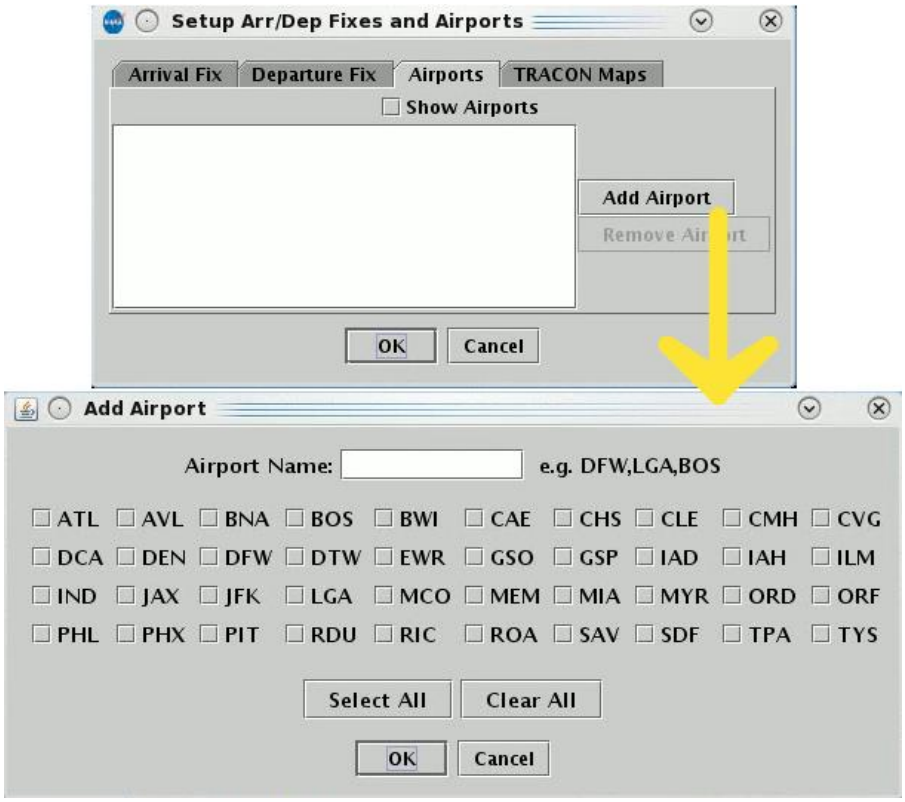


Figure 43. Airports window.

2.2.4.3.4 TRACON Maps

To configure the airport displays on the Map (Figure 44):

Step 1: Click on the "TRACON Maps" tab.

Step 2: Select the "Show Selected TRACON Map" checkbox.

Step 3: Click on the drop-down menu.

Step 4: Select a TRACON map to overlay onto the Map window. Only one map can be selected.

Step 5 (optional): Click on the "Choose Map Color (applies to all maps)" button. This opens the Choose TRACON Map Color window

Step 6 (optional): Select a color from one of the tabs. This color will be applied to any map selected from the TRACON map drop-down list. (For more information on how to interact with the Choose Color window, see section 2.2.4.4.)

Step 7: Click on the "OK" button. The TRACON map will now display in the selected color on the Map.

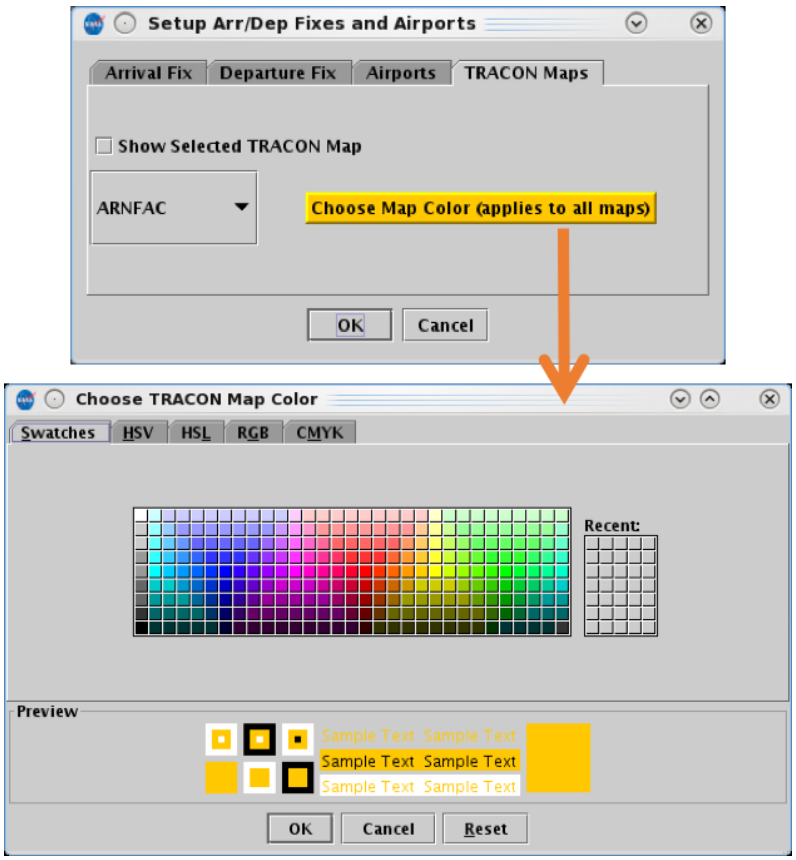


Figure 44. TRACON Maps.

2.2.4.4 Set up Map and Colors

The "Setup Map" button on the Map toolbar opens the Setup Map window, which enables changing the labels, shapes, and other items on the Map (e.g., selecting the "ADW" checkbox displays the physical boundary for the Arrival/Departure Window (ADW) on the Map; Figure 45). The left column on the window ("Layer") lists the different layer items that can be displayed on the Map. Selection of checkboxes from the middle column ("Display") will populate the layer item on the Map. The right column ("Color") allows for the selection of what color the Map uses to display each of the layer items.

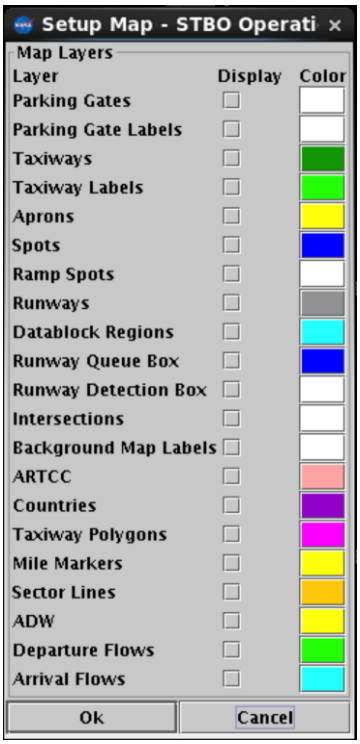


Figure 45. Setup Map window.

To choose items to display on the Map and select colors for displaying each item:

Step 1: Locate the item to be displayed from the "Layer". Select the corresponding checkbox for that item under the "Display" column.

Step 2 (optional): Click on the colored square for that item under the "Color" column to change the color for displaying the layer item. A single click will open the Choose Color window.

Step 3: On the "Swatches" tab, click on the desired colored squared. The color is now displayed at the bottom of the tab in the "Preview" section. Note that once a color is selected, the other tabs will provide information for that color and allow for refining the color selection (additional description on these other tabs is provided below).

Step 4: Click the "OK" button to close the Choose Color window. The colored square in the "Color" column has now changed to the selected color.

Step 5: Click the "Ok" button to apply the change and close the Color settings window. The layer item now appears on the Map.

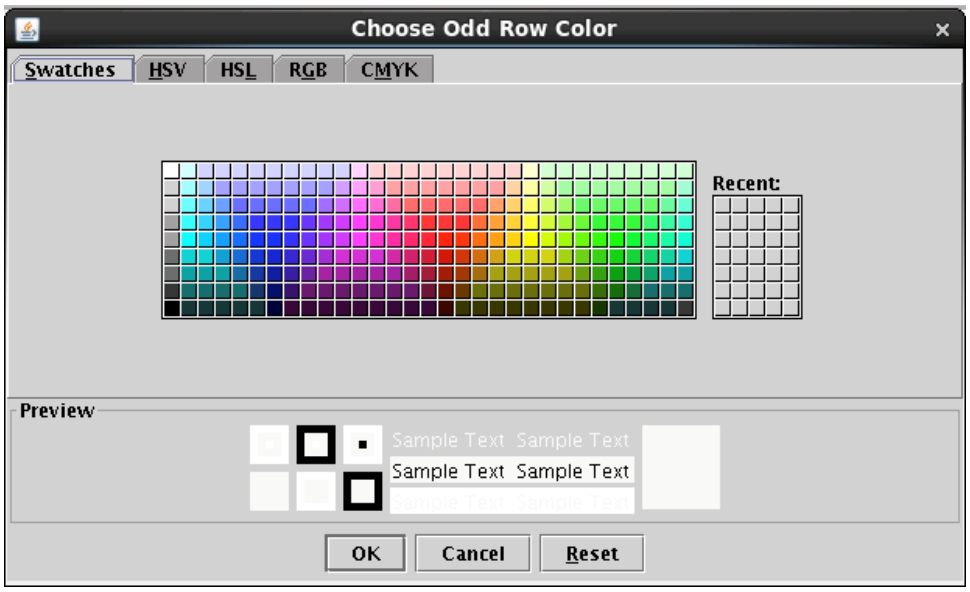


Figure 46. Flights Table Color Settings – choose a color.

The other tabs on the Choose Color window are: Hue-Saturation-Value (HSV), Hue-Saturation-Lightness (HSL), Red-Green-Blue (RGB), and Cyan-Magenta-Yellow-Key (CMYK; "Key" is black). An example of the RGB tab is shown in Figure 47. In these windows, a color can be changed by dragging the various parameters, such as hue, saturation, lightness, or any of the main colors (blue, green, red, cyan, magenta, and yellow). A color can also be changed by clicking on a desired color inside the vertical gradient of colors and inside the axial gradient square.

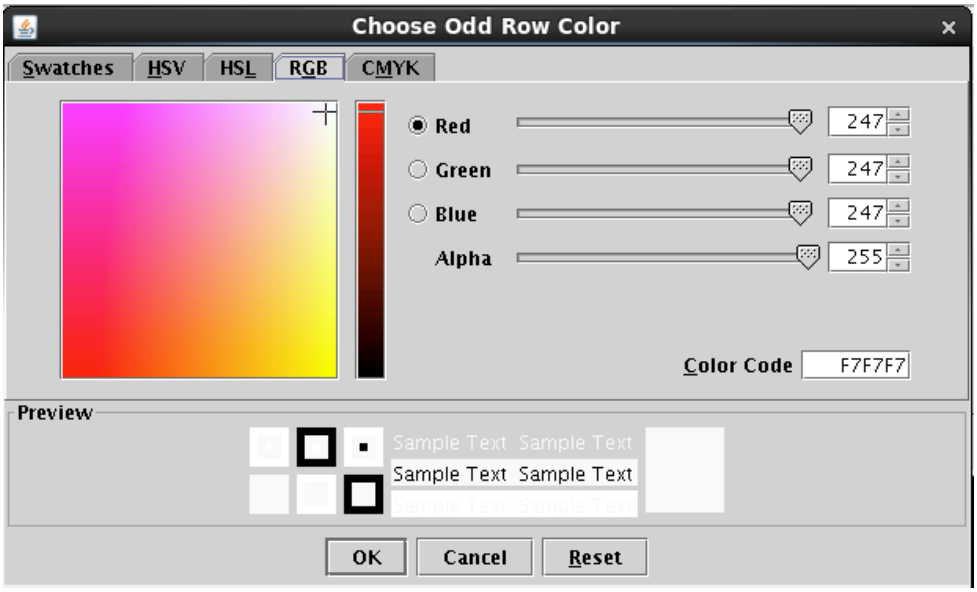
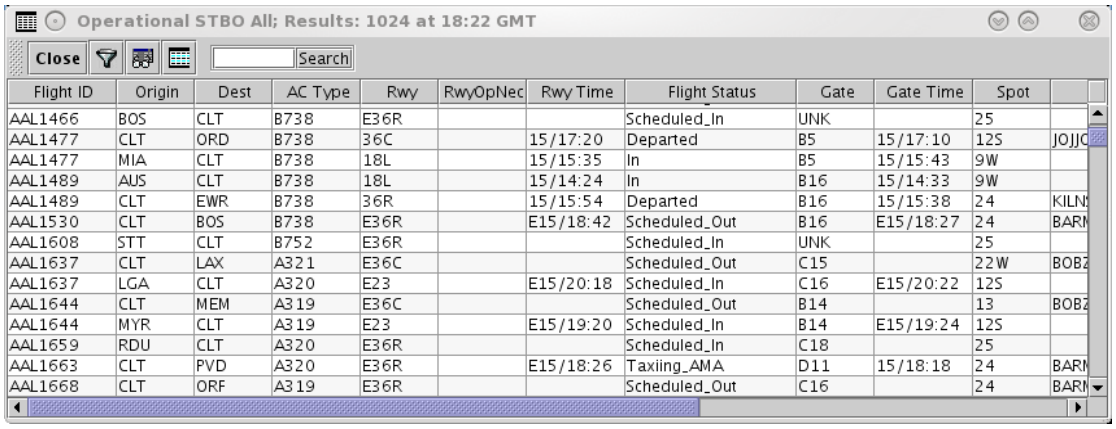


Figure 47. Flights Table Color Settings – choose an RGB value.

2.3 Flights Table

The Flights Table (Figure 48) provides a list of flights for the airport. Each flight selected in the table is highlighted in the Flights Table, on the Map, and on the Timeline.



Flight ID	Origin	Dest	AC Type	Rwy	RwyOpNec	Rwy Time	Flight Status	Gate	Gate Time	Spot	
AAL1466	BOS	CLT	B738	E36R			Scheduled_In	UNK		25	
AAL1477	CLT	ORD	B738	36C		15/17:20	Departed	B5	15/17:10	12S	JOJJC
AAL1477	MIA	CLT	B738	18L		15/15:35	In	B5	15/15:43	9W	
AAL1489	AUS	CLT	B738	18L		15/14:24	In	B16	15/14:33	9W	
AAL1489	CLT	EWR	B738	36R		15/15:54	Departed	B16	15/15:38	24	KILN
AAL1530	CLT	BOS	B738	E36R		E15/18:42	Scheduled_Out	B16	E15/18:27	24	BARN
AAL1608	STT	CLT	B752	E36R			Scheduled_In	UNK		25	
AAL1637	CLT	LAX	A321	E36C			Scheduled_Out	C15		22W	BOBZ
AAL1637	LGA	CLT	A320	E23		E15/20:18	Scheduled_In	C16	E15/20:22	12S	
AAL1644	CLT	MEM	A319	E36C			Scheduled_Out	B14		13	BOBZ
AAL1644	MYR	CLT	A319	E23		E15/19:20	Scheduled_In	B14	E15/19:24	12S	
AAL1659	RDU	CLT	A320	E36R			Scheduled_In	C18		25	
AAL1663	CLT	PVD	A320	E36R		E15/18:26	Taxiing_AMA	D11	15/18:18	24	BARN
AAL1668	CLT	ORF	A319	E36R			Scheduled_Out	C16		24	BARN

Figure 48. STBO Client Flights Table.

2.3.1 Creating a New Flights Table

There are a few different types of tables that can be created in the STBO Client: Flights Table, Aircraft Table, and Departure Fix Status Table. Multiple Flights Tables can be created at one time to display and help organize different data. Only one Aircraft Table and one Departure Fix Status Table can be created at a time.

To create a new table:

Step 1: Click on "Create" on the STBO Client Toolbar.

Step 2: Click on "Create Table."

Step 3: Select "Flights Table" A new generic Flights Table will appear (Figure 49).

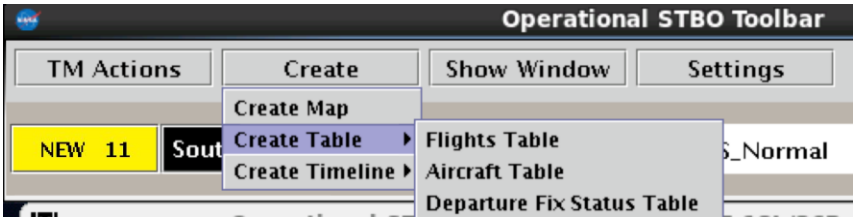


Figure 49. Create a new Flights Table.

To add or remove fields in the new table, see the Set Column function described below in the Flights Table Toolbar section 2.3.3.

2.3.2 Sorting Data

The data in the Flights Table can be sorted by selecting any header. For instance, selecting "Dest" will sort all flights alphabetically by destination airport.

To sort the data:

Step 1: Click on any header. This will list the flights from the lowest to the highest value.

Step 2: Click on the same header. This will list the flights from the highest value to the lowest value.

Step 3: Click on the same header to cancel the sorting feature.

2.3.3 Flights Table Toolbar

The Flights Table toolbar is located on the top left of the Flights Table. This toolbar provides the following functions for altering and interacting with the Flights Table (Figure 50):

- Close the Flights Table
- Filter data
- Set columns (data fields)
- Set colors in the Flights Table
- Search

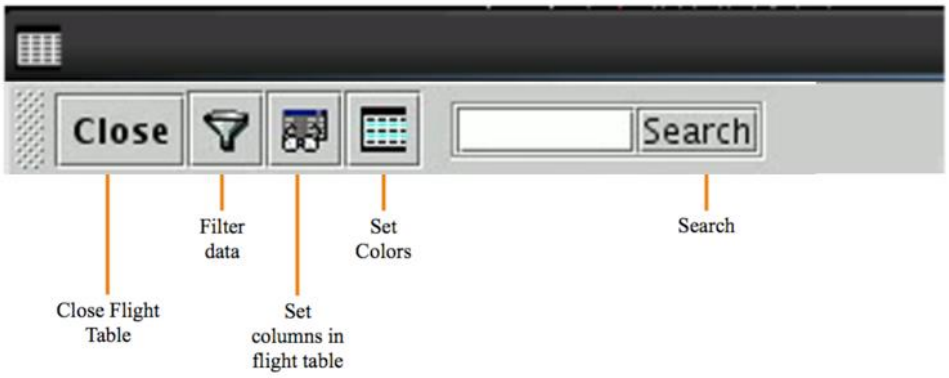


Figure 50. Flights Table toolbar elements.

The following sub-sections describe the various Flights Table toolbar features and how to use them.

2.3.3.1 Filter Function

The filter function down selects the data displayed to specified criteria.

To filter data:

Step 1: Click on the funnel icon. A Search window appears with selectable fields (Figure 51).

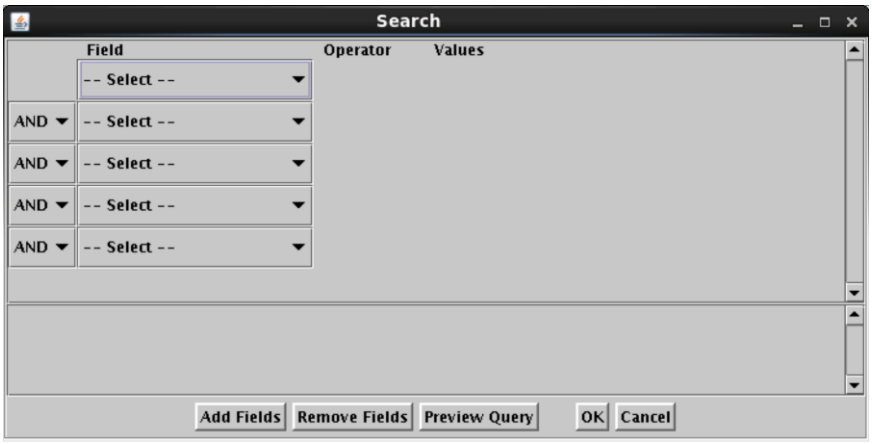


Figure 51. Filter window for the Flights Table.

Step 2: Select the desired data field by clicking on the "- - Select - -" drop-down button (Figure 52).

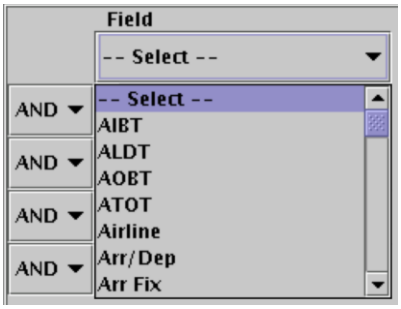


Figure 52. Select a field to filter by.

Step 3: Once the field is selected, select the operator by clicking on the "=" drop-down button. Up to 5 options for the operator are possible for a single "Field", depending on the "Field" selected (7 total possible operators; Figure 53):

- equal "="
- not equal "!="
- less than "<"
- less than or equal to "<="
- greater than ">"
- greater than or equal to ">="
- or "BETWEEN"

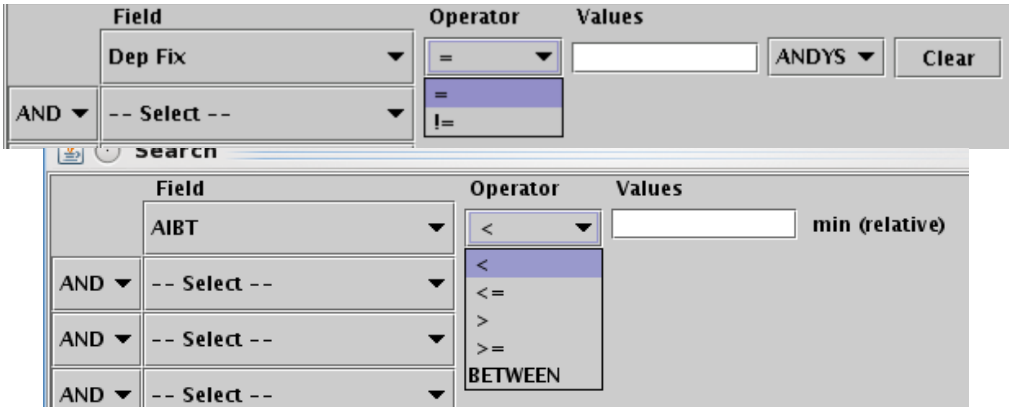


Figure 53. Select an operator to filter by.

Step 4: Next to the Operator, type in or select a value from the drop-down list (Figure 54). The Figure shows a drop-down list of all departure fixes for Charlotte Douglas International Airport (CLT).

Note that multiple items can be selected and/or added to the list in the "Value" text box. When desiring to add multiple values for the same "Field" under the same condition ("AND" vs. "OR"), enter all values in the same "Value" text box. STBO Client cannot process multiple lines of the same condition and the same field.

For example, "Dep Fix = BARMY,KILNS" and "Dep Fix = BARMY OR Dep Fix = KILNS" are okay, but "Dep Fix = BARMY AND Dep Fix = KILNS" will not work.

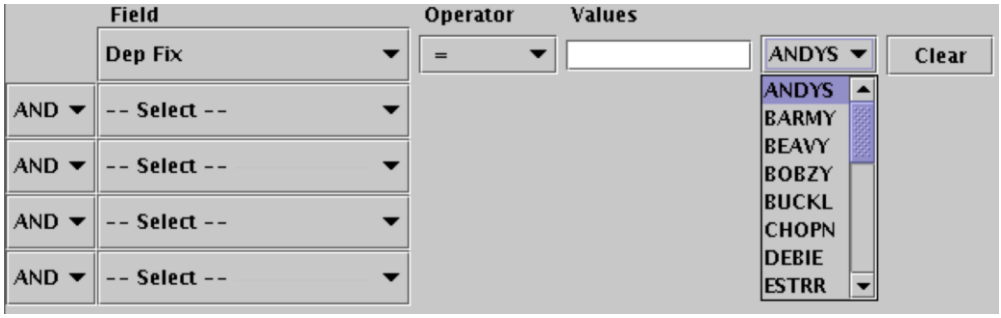


Figure 54. Select a value to filter by.

Step 5: If another criterion is needed, repeat Step 2 by clicking on the Field drop-down list in the next row. The logical argument to the left of the Field drop-down list can be changed to "OR" via its drop-down list, if desired.

In the example in Figure 55, the destination field was added to filter flights to BARMY departure fix and to LaGuardia International Airport (LGA).

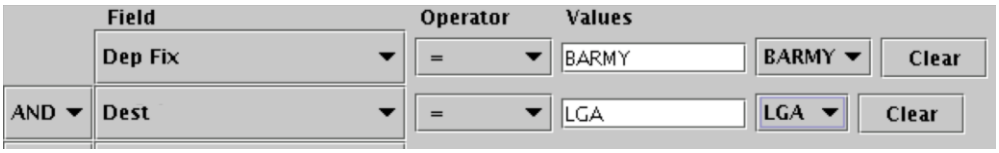


Figure 55. Enter values to filter by.

Step 6: Click "OK" to close the window. The Flights Table now only displays the flights that match the selected criteria.

In the example, the Flights Table only shows flights that are going to LGA via the BARMY departure.

To remove the filter:

Step 1: Click on the button with the funnel image.

Step 2: Click on "Clear" on the far right, next to each field argument.

Step 3: Click on "OK".

Step 4: Confirm that the search field has no value (Figure 56).

Step 5: Click "OK" to close the window.

Figure 56. Cleared the filters from the Flights Table.

2.3.3.2 Setup of Columns in Flights Table

The fields, and their order can be swapped out and moved around in the Column Settings window.

To access the Column setting:

Step 1: Click on the Set Columns in Flights Table button (the third button).

The window displays two lists (Figure 57). The one on the left shows fields that are available, but not displayed on the Flights Table. The one on the right are the fields that are currently displayed in the Flights Table.

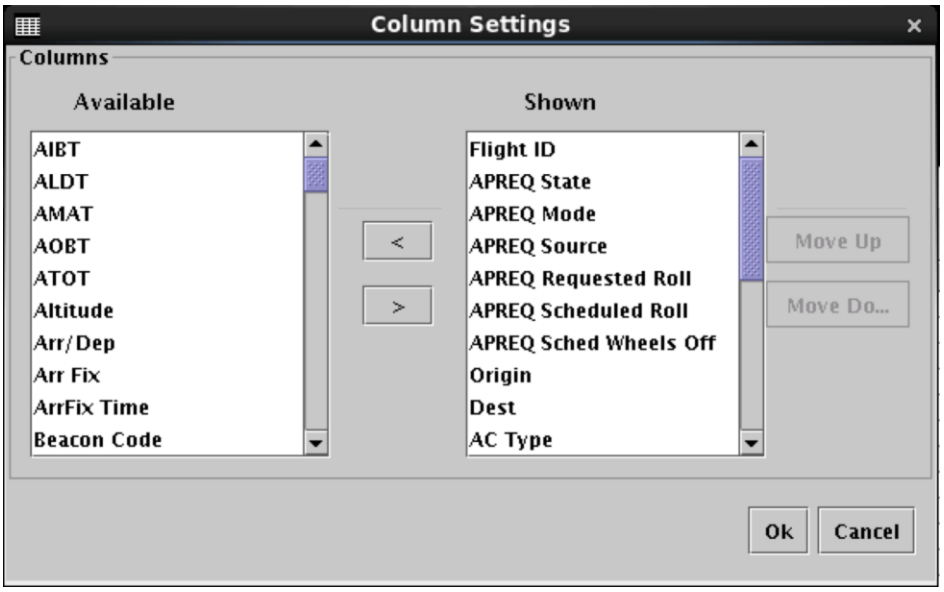


Figure 57. Column Settings window for Flights Table.

To move a field up or down on the list and reorder the way fields are displayed in the Flights Table:

Step 1: Inside of the Column Settings window, select the field in the right "Shown" list.

Step 2: Click on either "Move Up" or "Move Down" (Figure 58). A higher position in the "Shown" list results in moving that field to the left in the Flights Table.

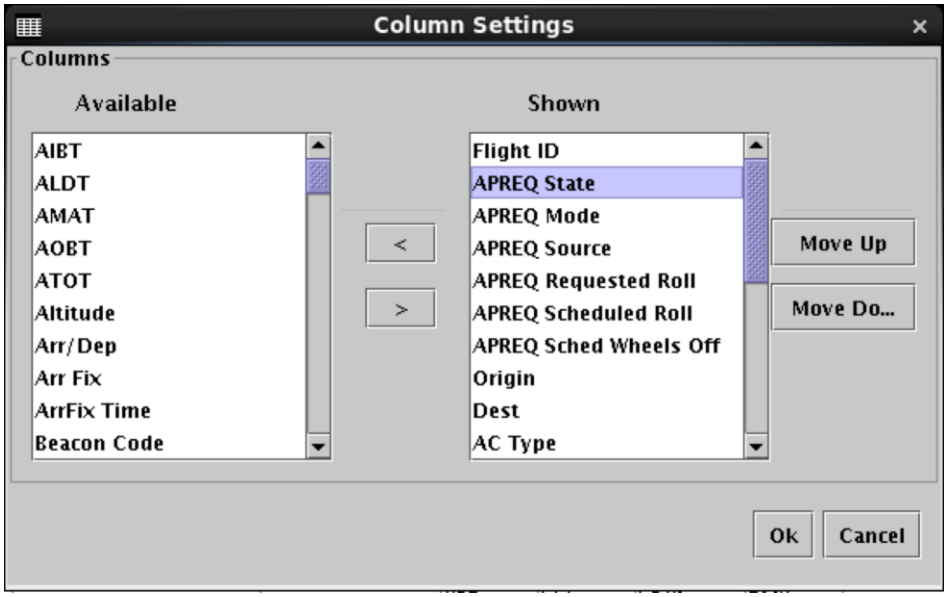


Figure 58. Moving column positions in the Column Settings window.

To add a field to the Flights Table:

Step 1: Select the field in the "Available" list to be added to the "Shown" list (list of items displayed in the Flights Table).

Step 2: Select the field on the "Shown" list where the added field should be inserted (Figure 59).

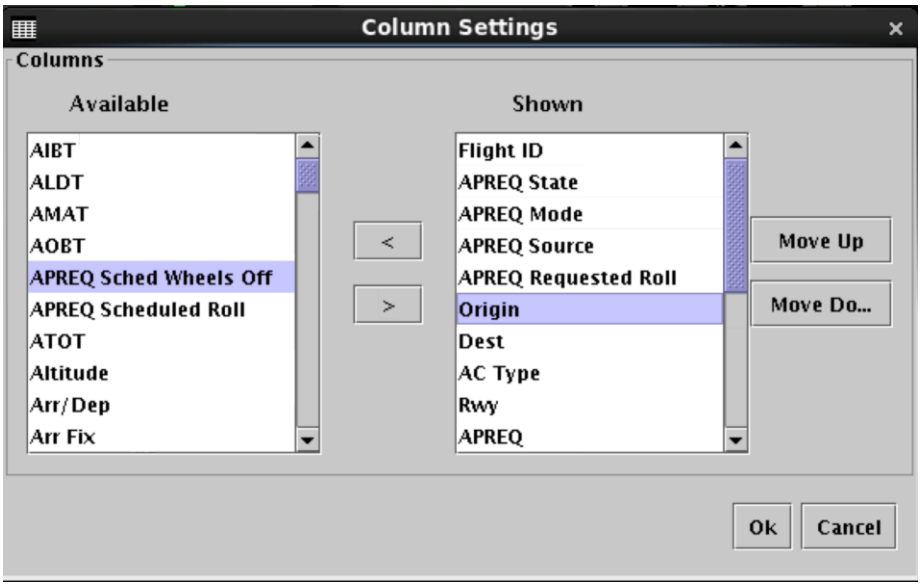


Figure 59. Add a column to the Flights Table – select a field.

Step 3: Click on the right arrow ">" in the middle of the lists. The new field should now be inserted above the selected field in the "Shown" list (Figure 60).

Step 4: Click "Ok" to close the window.

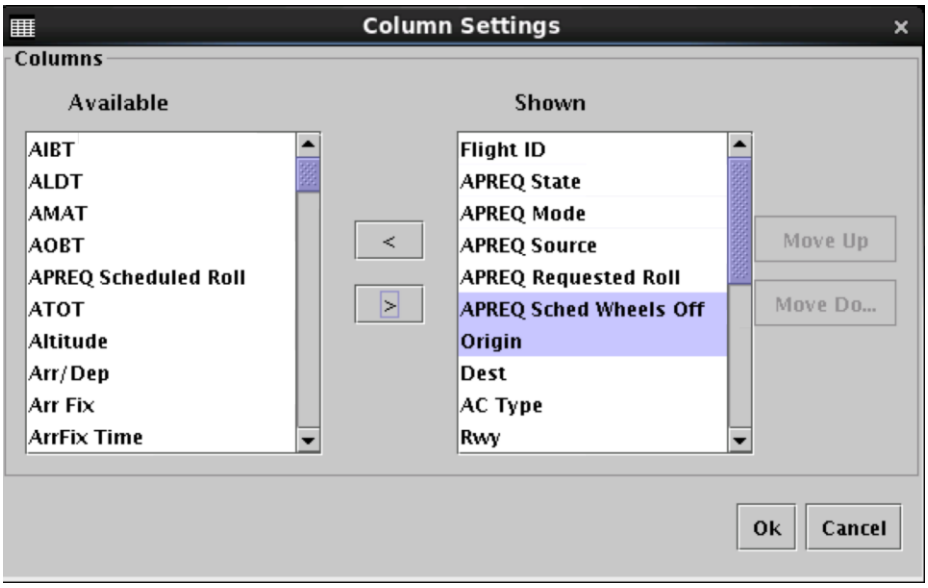


Figure 60. Add a column to the Flights Table – field added.

To remove a field from the Flights Table:

Step 1: Select the field in the "Shown" list to be removed.

Step 2: Click on the left arrow "<" in the middle of the lists. The field should move to the "Available" list on the left.

Step 3: Click "Ok" to close the window.

2.3.3.3 Color Settings

The color setting provides additional enhancements to the Flights Table for readability. Some fields are already preset with colors to alert the user of specific events.

To access the color settings:

Step 1: Click on the symbol to the left of the search field (Figure 50) to open the Flights Table Color Setting window (see Figure 61).

2.3.3.3.1 Set Row Colors

The "Set Row Colors" tab gives options to set different colors for the rows of the Flights Table. The row colors can be set to alternate for even and odd rows.

To change the colors of the rows:

Step 1: On the "Set Row Colors" tab (Figure 61), click on the colored square next to either the "Even Row Color" or "Odd Row Color" option to change the color for that set of rows. A single click will open the Choose Row Color window.

Step 2: On the "Swatches" tab (Figure 62), click on the desired colored squared. The color is now displayed at the bottom of the tab in the "Preview" section. Note that once a color is selected, the other tabs will provide information for that color and allow for refining the color selection (additional description on these other tabs is provided below).

Step 3: Click the "OK" button to close the Choose Row Color window. The colored square on the "Set Row Colors" tab has now changed to the selected color.

Step 4: Click the "Ok" button to apply the changes and close the Flights Table Color Settings window.

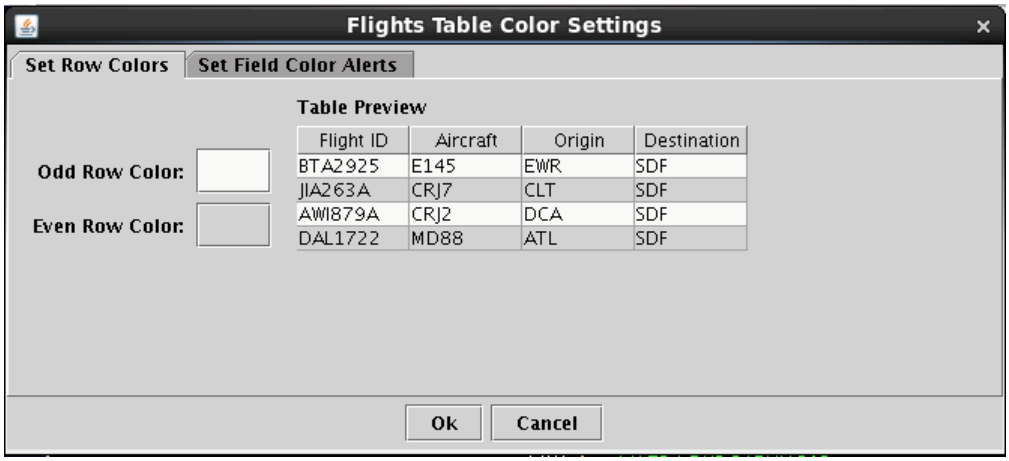


Figure 61. Flights Table Color Settings window – Set Row Colors.

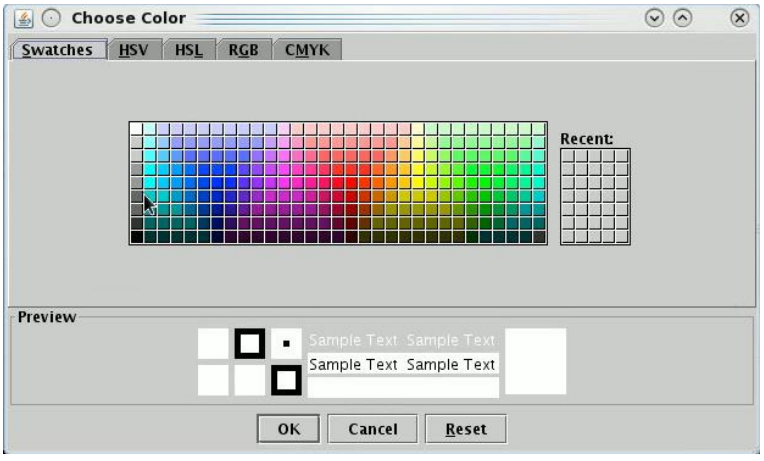


Figure 62. Flights Table Color Settings – Swatches.

2.3.3.3.2 Set Field Color Alerts

The "Set Field Color Alerts" tab provides options to highlight particular events in the Flights Table (Figure 63).

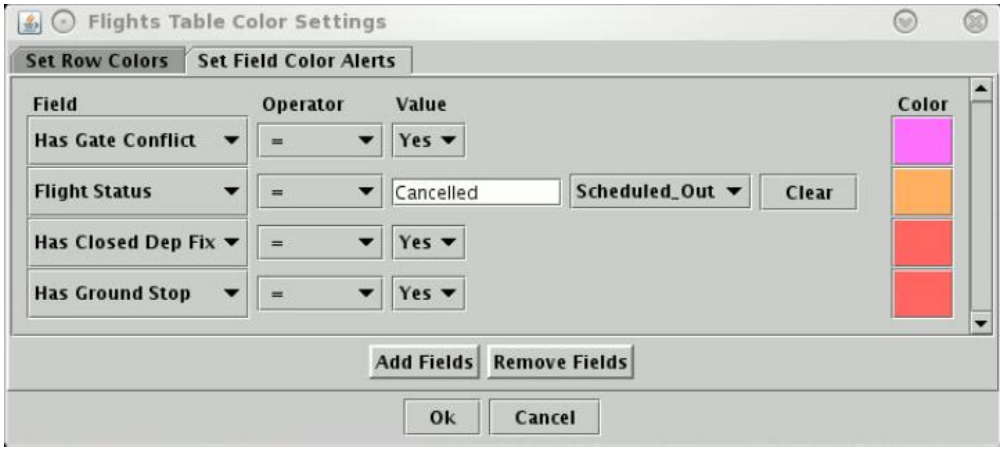


Figure 63. Flights Table Color Settings – set color alerts.

Flight ID events are already pre-set with colors. Those are flights with gate conflict, flights that are cancelled, flights with a closed departure fix, and flights with a Ground Stop. Each color can be changed by clicking on the color sample rectangle. Each instance of the value specified in the "Set Field Color Alerts" tab will be displayed with the given color in the Flights Table. The table below lists where each type of color alert is displayed. Figure 64 provides an example of displaying flight statuses for flights taxiing in the AMA in a green color.

Field for Color Alerts	**Column Where the Color Alert is Displayed**
Has Gate Conflict	Gate
Flight Status	Flight Status
Has Closed Departure Fix	Dep Fix
Has Ground Stop	Dest
Is Hidden	Flight ID

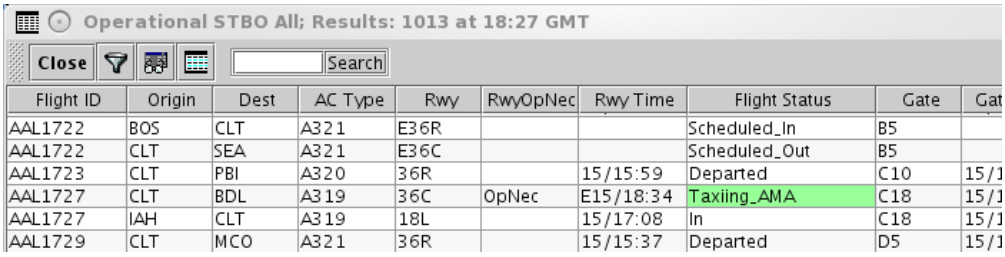
To change the colors of the Flights Table alerts:

Step 1: On the "Set Field Color Alerts" tab, click on the colored square that corresponds the desired "Field". A single click will open the Choose Color window.

Step 2: On the "Swatches" tab, click on the desired colored squared. The color is now displayed at the bottom of the tab in the "Preview" section. Note that once a color is selected, the other tabs will provide information for that color and allow for refining the color selection (additional description on these other tabs is provided below).

Step 3: Click the "OK" button to close the Choose Color window. The colored square on the "Set Field Colors Alerts" tab has now changed to the selected color.

Step 4: Click the "Ok" button to apply the changes and close the Flights Table Color Settings window.



Flight ID	Origin	Dest	AC Type	Rwy	RwyOpNec	Rwy Time	Flight Status	Gate	Gat
AAL1722	BOS	CLT	A321	E36R			Scheduled_In	B5	
AAL1722	CLT	SEA	A321	E36C			Scheduled_Out	B5	
AAL1723	CLT	PBI	A320	36R		15/15:59	Departed	C10	15/1
AAL1727	CLT	BDL	A319	36C	OpNec	E15/18:34	Taxiing_AMA	C18	15/1
AAL1727	IAH	CLT	A319	18L		15/17:08	In	C18	15/1
AAL1729	CLT	MCO	A321	36R		15/15:37	Departed	D5	15/1

Figure 64. Color alerts on Flights Table.

2.3.3.4 Search Field

The search field provides the ability to search for flight numbers, callsigns, destination airports, or departure fixes in the Flights Table. The matching flights will be highlighted in the Flights Table, and also on the Timeline and on the Map.

To search for information in the Flights Table:

Step 1: Type in any string of letter or number for callsigns.

or

Step 1: Type a 3 letter airport code for a *destination* airport.

or

Step 1: Type in a departure fix name in full letters.

There is no need to click on the Search button. As information is typed in, STBO Client searches for any flights that matches the query. For example, typing "FDX" will highlight all FedEx flights. Typing "LGA" will highlight all flights to LGA (Figure 65). Typing "53" will highlight all flights whose flight number contains "53", independent of airline.

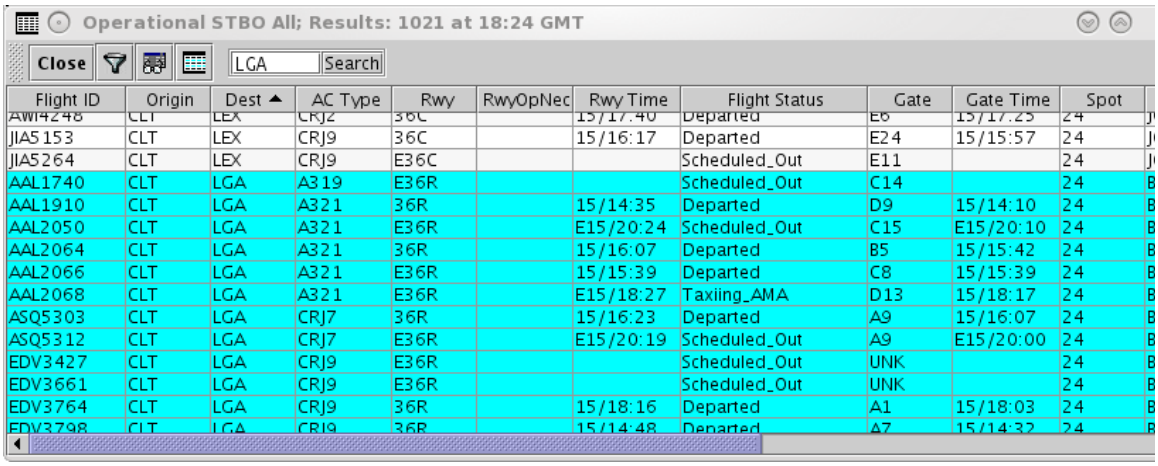


Figure 65. Search for LGA flights in the Flights Table.

2.3.4 Data in the Flights Table

The data displayed in the Flights Table is described in the table below. The "Available" columns are listed in (mostly) alphabetical order by commonly used items, then in (mostly) alphabetical order by less commonly used items

Column Header	Description
AC Type	International Civil Aviation Organization (ICAO) type of aircraft, i.e. B738: Boeing model 737-800
Actual Time In Queue	Actual TakeOff Time (ATOT) – Undelayed TakeOff Time (UTOT). This field only displays once the flight takes off.
AIBT	Actual In Block Time of the aircraft at the gate recorded by the airline or STBO
ALDT	Actual Landing Time of the aircraft recorded by the airline or STBO
Altitude	Last recorded altitude in units of feet / 100
AMA Taxi Duration	Duration of time on the AMA • Departures: OFF time – spot time • Arrivals: spot time – ON time OFF time, ON time, and spot time are the actual time of the flight when it uses the runway or crossed the spot; otherwise these times are predicted by STBO.
AMAT	Actual Movement Area entry Time when the departure crossed the spot
AOBT	Actual Off Block Time of the aircraft at the gate recorded by the airline or STBO
APREQ	Lists either • "APRQ" to indicate that the flight needs an APREQ time • "APRQ: REQ" to indicate negotiation is in progress • The assigned APREQ roll time, e.g. "2330"

APREQ Forced	Indicates whether or not the APREQ time was set using the Integrated Departure Arrival Capability (IDAC) negotiation process through the STBO Client. • FALSE if the APREQ time was negotiated through IDAC • TRUE if the APREQ time was manually set by a user or was received through System Wide Information Management (SWIM) apart from IDAC
APREQ Mode	Lists the modes of handling the APREQ requests in TBFM by the Center Traffic Management Coordinator (TMC): • UNDETERMINED – Mode has not been set • MANUAL - Requests from the Tower needs to be made over the phone • SEMI - Requests are made via IDAC, but still require electronic approval by the Air Route Traffic Control Center (ARTCC) TMC • AUTO - Requests are made via IDAC and are automatically approved by TBFM • OFF - TBFM is not being used to schedule APREQ release times. Requests must be made by telephone.
APREQ Change Ack Status	Displays “Needs ACK” when the requested APREQ release time sent by the Air Traffic Control Tower (ATCT) through the STBO Client is not equal to the scheduled APREQ release time received back from the ARTCC TBFM. Equality is determined in minutes.
APREQ Release Req Allowed	Indicates whether an APREQ release request can be made through the STBO Client. Currently, release requests are always allowed through the STBO Client for IDAC flights.
APREQ Requested Roll	Requested APREQ release time, minus 38 seconds to adjust to the start of the takeoff roll
APREQ Scheduled Roll	Scheduled APREQ release time, minus 38 seconds to adjust to the start of the takeoff roll
APREQ Scheduled Wheels Off	Scheduled APREQ release time at wheels-up (corresponds to the scheduled release time set in TBFM)
APREQ Source	Data source from which the APREQ release time originates

APREQ State	Indicates the status of the APREQ negotiation: • UNSCHEDULED - The APREQ release time has not been requested yet • PENDING_SCHEDULE – The APREQ release time has been requested by ATCT but not accepted yet by ARTCC • SCHEDULED – The APREQ release time as scheduled by the ARTCC and sent to the ATCT • PENDING_ACCEPT – ATCT start of negotiation for accepting the ARTCC scheduled release time • ACCEPTED - The APREQ request time has been accepted by ATCT • PENDING_CANCEL – The ATCT has issued a request to cancel APREQ negotiation • CANCELLED – The APREQ negotiation has been cancelled by the ATCT or ARTCC
Arr Fix	Predicted (if aircraft has not yet crossed the fix) or actual (if aircraft has crossed the fix) arrival fix / Standard Terminal Arrival Route (STAR) the aircraft has or flown or will fly. If the originally-assigned fix is closed and an alternate has been specified, this will display "<origFix> -> <altFix>".
Arr/Dep	Lists either: • "A" for arrival • "D" for departure
ArrFix Source	Indicates the data source to determine the arrival fix: • SOURCE – The arrival fix was received from an external source based on the flight plan • DECISION_TREE – STBO is predicting the arrival fix based on the most commonly used arrival fix for flights flying between the origin and destination airports • MODEL – STBO is predicting the arrival fix to be the one closest to straight line between the origin and departure airport; or the arrival fix is based on a fix closure and a set of alternate fixes • SURFACE – The arrival fix was detected based on track data • UNKNOWN – The arrival fix is unknown. This option should only occur for CLT departures.
ArrFix Time	Predicted (if the aircraft has not yet crossed the fix) or actual (if the aircraft has crossed the fix) crossing of aircraft at the arrival fix
ATOT	Actual TakeOff Time of aircraft recorded by the airline or STBO
Beacon Code	Beacon code of the flight
Dep Fix	Departure fix that aircraft is planned to fly to, or has flown to

Dep Gate	Departure Gate that aircraft is planned to fly to, or has flown to. If departure fix is not mapped to a departure gate, then this column contains the departure fix.
DepFix AwaitCDR	Displays "Awaiting CDR" (Coded Departure Route) if the originally-assigned fix for a departure flight is closed and an alternate has not yet been specified
DepFix Source	Indicates the data source to determine the arrival fix: • SOURCE – The departure fix was received from an external source based on the flight plan • DECISION_TREE – STBO is predicting the departure fix based on the most commonly used departure fix for flights flying between the origin and destination airports • MODEL – STBO is predicting the departure fix based on a fix closure and a set of alternate fixes • SURFACE: the departure fix was detected based on track data • UNKNOWN – the departure fix is unknown. This option should only occur for CLT arrivals
DepFix Time	For departures, the actual (if aircraft has crossed the fix) or predicted (if aircraft has not yet crossed the fix) time the aircraft crossed or flew by the departure fix
Dest	Destination airport of the flight
EDCT	Expect Departure Clearance Time assigned to the flight as part of a Ground Delay Program (GDP), Airspace Flow Program (AFP) or Collaborative Trajectory Options Program (CTOP)
EOBT	Earliest Off-Block Time provided by the airline. A new surface data element providing the best prediction of when a flight will be ready to push back.
EstIBT	Estimated In-Block Time provided by an external source other than the airline
EstOBT	Estimated Off-Block Time provided by an external source other than the airline
ETA	Estimated Time of Arrival provided by TBFM, TFMS, the airline, or other external sources
ETD	Estimated Time of Departure at wheels-up provided by TBFM, Traffic Flow Management System (TFMS), the airline, or other external sources
Flight ID	Callsign of the flight
Flight Key	Unique identifier for the flight that contains the callsign, the origin, destination, flight creation time, and flight creation source, e.g., Airline, TFM, Traffic Management Advisor (TMA; TBFM)

Flight Status	Lists the aircraft state and location: • Cancelled – The flight has been cancelled by the airline • Departed – A departure aircraft is airborne • Enroute_Arr – An arrival aircraft is in the enroute airspace • In – An arrival aircraft is parked at the gate • In_Queue – A departure aircraft is inside the queue detection box of the assigned runway • In_Ramp – An arrival is taxiing in the Ramp • On – An arrival aircraft has landed • On_Final – An arrival aircraft is on final approach • Out – A departure has pushed back and/or released brakes and is taxiing in the Ramp • Pushback – A departure aircraft is pushing back • Return_to_Gate – A departure is returning to the gate • Scheduled_In – An arrival aircraft has not been tracked by STBO yet • Scheduled_Out – A departure aircraft has not pushed back out yet • Suspended – The flight should have already departed and no flight updates have been received • Taxiing_AMA – A departure aircraft is taxiing on the airport movement area • Term_Area_Arr – An arrival aircraft is inside the terminal airspace
Gate	Gate number assigned to the aircraft by the airline or user
Gate Conflict	Gate and duration of a gate conflict. The values are: • Gate • Start time • Duration in minutes
Gate Conflicting Key	Unique identifier of the other aircraft that is in conflict with the given aircraft
Gate Source	Data source for gate information: • AIRLINE – Data comes from the airline • DECISION_TREE – The default gate assignment from STBO's decision tree • USER – The gate was assigned from an STBO user interface
Gate Time	For arrivals, the TIBT prior to reaching the gate and the AIBT once the flight arrives at the gate. For departures, this is the TOBT prior to a flight pushing back from the gate and the AOBT after pushback. Prior to the actual time (AIBT or AOBT) the time is prefixed with "E" to represent that the time is estimated.
Ground Stop	Displays "Ground Stop" when a flight is subject to a ground stop

IOBT	Initial Off Block Time set by TFMS. This time is the first off-block time received for this flight.
Is Hidden	This value is true if the flight's right-click option for "Delete
Latitude	Latitude of the position of the aircraft in decimal degrees
LIBT	Latest IN Block Time. The estimated time the flight will arrive at the gate, sent by the airline either directly or through a Collaborative Decision Making (CDM) message to TFMS.
LOBT	Latest Off Block Time. The estimated pushback time received from an airline either directly or through a CDM message to TFMS.
Long On Board	Elapsed time that an aircraft has been on the airport surface but not at a gate. For arrivals, the timer starts when the flight lands (ALDT) and stops once the flight arrives at the gate (AIBT). For departures, the timer starts when the flight pushes back from the gate (AOBT) and ends when the flight takes off (ATOT) or returns to the gate.
Longitude	Longitude of the position of the aircraft in decimal degrees
Metering Group	Tactical scheduler group assigned to the departure aircraft based on its EOBT and flight state: • UNCERTAIN - The data for the departure is less certain (i.e. the flight does not have an EOBT, the EOBT is more than 10 minutes from current time, or the flight has not yet called ready, but was expected to have already called ready) • PLANNING – The departure has an EOBT and the EOBT is within 10 minutes of current time • READY – The departure has called ready for pushback • OUT – The departure has started pushback but has not yet begun taxiing • TAXI – The departure is taxiing in the Ramp area or AMA • QUEUE – The flight is in the queue • OFF – The departure has taken off • ARRIVAL – The group for all arrival flights
ModeS	International Civil Aviation Organization (ICAO) transponder code for Mode-S equipped aircraft
Origin	Airport of origin for departure or arrival aircraft
Position Source	The source of the position data • TZ – The track data was received from TFMS • SMA – The track data was received from TMA • FUSION – The track data was received from ASDE-X or AAL's surface surveillance at CLT
Prev Tail	If a flight's tail number changes, this is the previous tail number assigned to the flight.

Ramp Area	Indicates the planned or actual general area in the Ramp where the aircraft is or will be parked, i.e., B_EAST (B for concourse B and EAST for the East side of the concourse)
Route of Flight	Filed route reported by Federal Aviation Administration (FAA) system
Rwy	Estimated (e.g., "E18L") or actual runway (e.g., "18L") based on flight plan, departure fix, actual location of aircraft, or user input
Rwy Source	Lists the data source that determines the runway: • MODEL – The runway is determined by STBO • DECISION_TREE – Runway is determined by the STBO decision tree • STARS – The runway is determined by scratch pad entries made in the Standard Terminal Automation Replacement System (STARS) • UNKNOWN – The source of the runway determination is unknown
Rwy Time	The STBO predicted runway time or actual runway time for a flight. For arrivals, this is landing time. For departures, this is takeoff time.
RwyOpNec	Displays "OpNec" when the runway is changed for operational necessity
SDT:TBFM	Scheduled Departure Time as accepted in TBFM by the Center TMC. This is the scheduled wheels-up time.
Sector List	List of all sectors that a flight has or will travel through from the data available to STBO
SIBT	Scheduled In-Block Time. The time the flight is scheduled by the airline to arrive at the gate.
SLDT	Scheduled Landing Time. TFMS estimate of when the flight is scheduled to land based on the SIBT and future SOBT.
SOBT	Scheduled Off Block Time. The time the flight is scheduled by the airline to leave the departure gate.
Spot	Actual or predicted spot for a flight. E.g. For 11W: • 11 = spot number • W = direction indicator
Spot Source	Indicates the source of data to determine the spot: • SURFACE – The spot is determined by the actual spot the aircraft used based on surface surveillance • DECISION_TREE – The spot is predicted based on flight's gate and runway
Spot Time	The predicted or actual time an arrival or departure will cross the spot. For departures, departure metering is assumed to always be on when the spot prediction is made. If this column contains the prediction, then the time is prefixed with "E" to represent that the time is estimated.

STA:TBFM	Scheduled Time of Arrival by TBFM
STOT	Scheduled Take Off Time. TFMS estimate of when the flight will take off based on the SOBT.
Tail	Tail number of aircraft
Taxi Time	The predicted or actual amount of time spent taxiing on the airport surface. For arrivals, this is the amount of time between landing and arriving at the gate. For departures, this is the amount of time from pushback to takeoff. If predicted, the time will be prefixed with an "E" to represent that the time is estimated.
TIBT	Target In Block Time. The best prediction of in-block time from the ATD-2 tactical scheduler.
Time in Queue	Amount of time that an aircraft has spent in the runway queue detection box
TLDT	Target Landing Time from the ATD-2 tactical scheduler. The best prediction of landing time.
TMAT	Target Movement Area entry Time from the ATD-2 tactical scheduler. The TMAT is the time that a surface-metered departure is expected to enter the AMA.
TOBT	Target Off-Block Time from the ATD-2 tactical scheduler. The TOBT is the time that a surface-metered flight should push back from the gate. Currently, the TOBT is populated for all flights whether or not metering is turned on.
TTOT	Target Take Off Time. The best prediction of takeoff time by the ATD-2 tactical scheduler.
TTOT-UTOT	Displays the value of TTOT-UTOT
UIBT	Undelayed In-Block Time. STBO's predicted in-gate time for a single aircraft without consideration of other traffic on the surface.
ULDT	Undelayed Landing Time. STBO's predicted landing time for a single aircraft without consideration of other traffic on the surface.
UMAT	Undelayed Movement Area entry Time. STBO's predicted spot time for a single aircraft without consideration of other traffic on the surface.
Undlyd Off At Queue Entry	UTOT from when the flight enters the queue on the taxiway
UOBT	Undelayed Off-Block Time. STBO's best estimate of when the flight would be ready to push back in the absence of all external constraints, e.g., surface departure metering, EDCTs, Ground Stops, APREQ release times. UOBT is based on EOBT, LOBT, SOBT, entries in the RTC, and other data elements.

UTOT	Undelayed Take-Off Time. STBO's predicted takeoff time for a single aircraft without consideration of other traffic on the surface.

2.4 Toolbar

There are several functions available to the user on the Toolbar (Figure 66). The following table describes the various Toolbar features from left to right. Toolbar features that need additional description are (unless otherwise noted) described in sections 0-2.4.4.

Toolbar Feature	**Description**
TM (Traffic Manager) Actions	Drop-down menu that allows user to schedule/make changes to TMIs and runway utilization (see section 0 for details)
Create	Drop-down menu used to add new windows to the interface (i.e., Timelines, Tables, and Maps).
Show Window	Drop-down menu used to locate a window that is open but hidden from view beneath other windows. The Show Window menu will list all of the currently open windows, organized by window type (i.e., Timelines, Tables, and Maps). The desired window can be selected from these lists and will bring the selected window to the forefront of the STBO Client display.
Settings	This button opens a window for saving the current display configuration for the whole STBO Client or to load a previously saved configuration.
Search Feature	Search for flight number, a flight's callsign, departure fix, or destination airport
New Notification Icon/Number	Provides situational awareness about new notifications
Notification Banner	This banner cycles through the new notifications in the notification table. Once notifications are cleared/acknowledged, the banner is blank. Only new notifications are displayed. Clicking on the banner populates the notification window.
Runway Utilization Icon	Provides situational awareness for the airport runway configurations and runway utilization
Ramp Status Icon	Provides situational awareness information about Ramp status: • Green = Ramp is open • Yellow = Ramp closure pending • Red = Ramp is closed
Metering Mode Icon	Provides situational awareness information about what metering mode the Ramp is using

Figure 66. STBO Client Toolbar.

2.4.1 Settings

The "Settings" button on the STBO Client Toolbar can be used to save display configurations, load previously saved display configurations, adjust settings for displaying gate conflicts, and enable the clock (Now time) to be displayed on the Map. The following sections describe each of these settings features.

2.4.1.1 Save/Load Display

To save a user's display configuration (Figure 67):

Step 1: In the "Load/Save Settings" tab, type a name for the display configuration in the "File Name:" text box.

Step 2: Click the "Save" button. This will populate a "Save Settings" confirmation window.

Step 3: Click "OK" to acknowledge that the display configuration has been saved. The display configuration file name will now appear in the list of "Available Configurations".

Step 4: Click "Close" to exit the Settings window.

To load a saved display configuration (Figure 67):

Step 1: In the "Load/Save Settings" tab, find the file name under the "Available Configurations" list for the desired display configuration. If necessary, the list may be scrolled.

Step 2: Select the desired display configuration file name.

Step 3: Click the "Load" button. The STBO Client will reload the interface to match the selected display configuration file.

Step 4: Click "Close" to exit the Settings window.

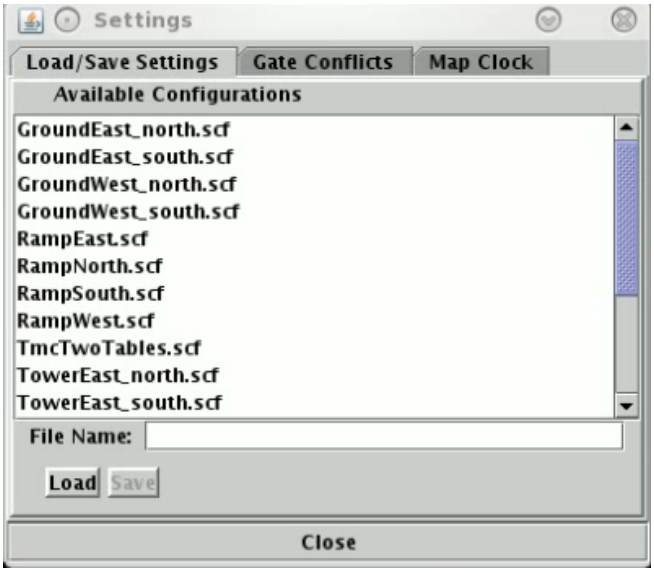


Figure 67. Toolbar Settings – Save/Load Display.

2.4.1.2 Gate Conflicts

In the "Gate Conflicts" tab of the Settings panel, a value can be set for the number of minutes prior to landing to display gate conflicts for arrival flights.

To set the gate conflict display value (Figure 68):

Step 1: In the "Gate Conflicts" tab, type a value into the text box or use the up and down arrows to select a value for the number of minutes prior to landing that the system will display a gate conflict for an arrival flight.

Step 2: Click the "Apply" button.

Step 4: Click "Close" to exit the Settings window.

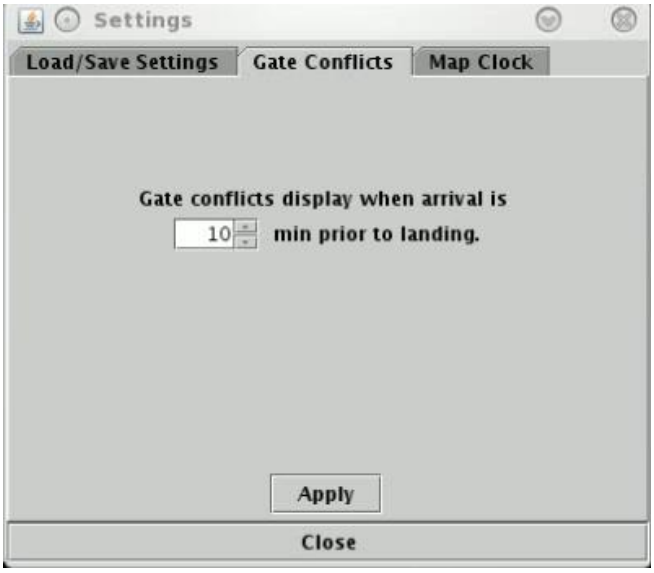


Figure 68. Toolbar Settings – Gate Conflicts.

2.4.1.3 Map Clock

The Map clock shows the Map's update time, which is the Now time. It is the only clock that can be hidden.

To show/hide the Map clock (Figure 69):

Step 1: In the "Map Clock" tab, select the "Show Map Clock" checkbox to show the Map clock or deselect the "Show Map Clock" checkbox to hide the Map clock.

Step 2: Click the "Apply" button.

Step 4: Click "Close" to exit the Settings window.

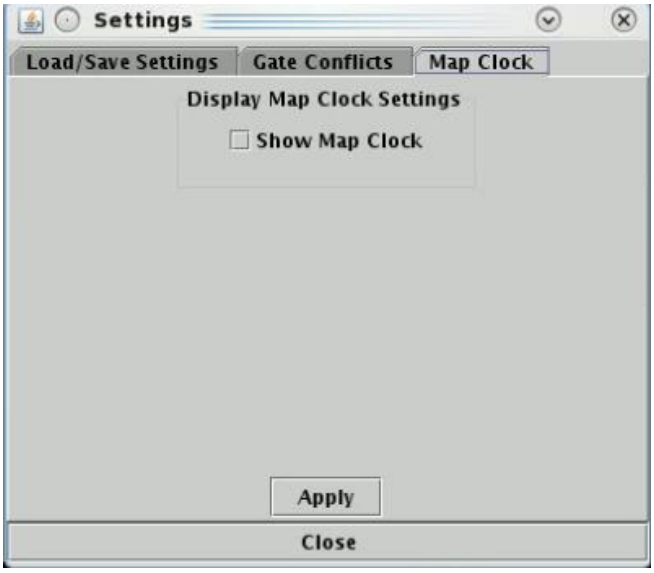


Figure 69. Toolbar Settings – Map Clock.

2.4.2 Search Feature

The search feature provides the ability to search for flight numbers, callsigns, destination airports, or departure fixes across the STBO Client interface. The matching flights will be highlighted on the Timeline, the Map, and in the Flights Table.

To search for information:

Step 1: Type in any string of letter or number for callsigns.

or

Step 1: Type a 3 letter airport code for a *destination* airport.

or

Step 1: Type in a departure fix name in full letters.

There is no need to click on the Search button. As information is typed in, STBO Client searches for any flights that matches the query. For example, typing "FDX" will highlight all FedEx flights. Typing "LGA" will highlight all flights to LGA (Figure 70). Typing "53" will highlight all flights whose flight number contains "53", independent of airline.

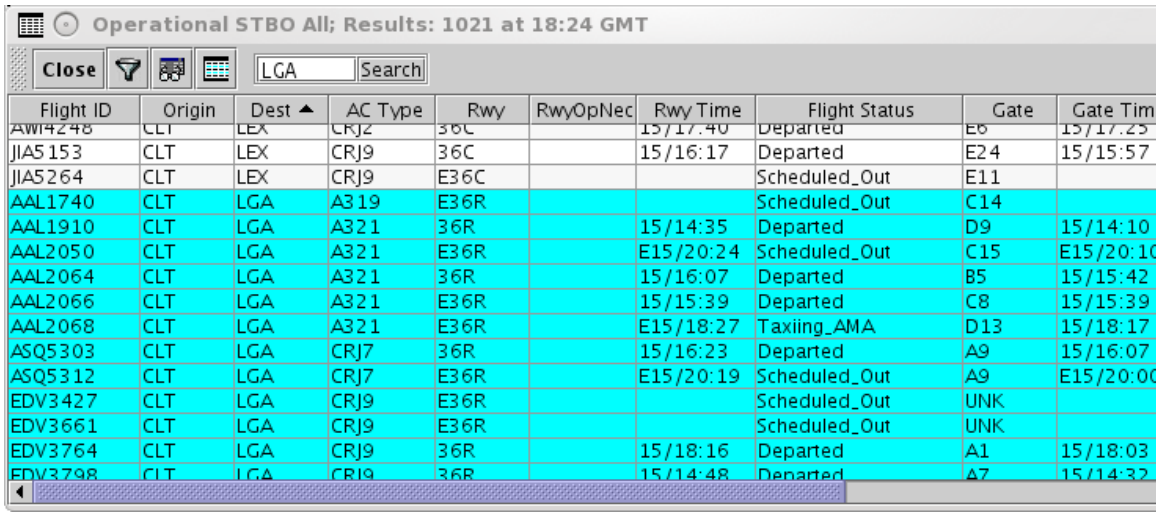


Figure 70. Search for LGA flights in the Flights Table.

2.4.3 Notifications

The STBO Client provides notifications in the form of a Notification icon, Notification banner, and a Notification window (Figure 71). These notifications are generated when new information is populated in the system. This new information may originate from the STBO Client or from an outside source, such as SWIM, the FAA's Operational Information System (OIS), or other ATD-2 users. Notifications are always related to events that impact multiple flights or the airport (e.g., Ground Stops, runway closures, metering events), and are never issued for single flights. For events or restrictions related to a single flight, the flight's datablock, properties, and/or entry in the Flights Table are modified in some way that's more salient then the standard display of information (without events or restrictions).

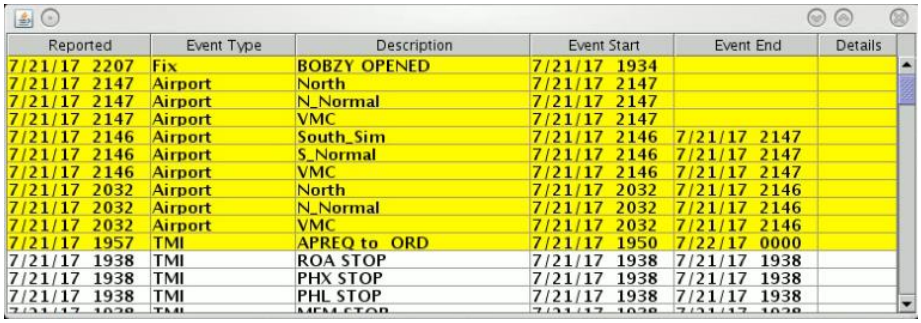


Figure 71. Notification Window.

A list of all notifications for the day can be found in the Notification window. The notifications list is cleared out each day at 0400.

To access the Notification window:

> ***Step 1***: Click on the Notification banner. The Notification window is now populated.

When new notifications are received, the Notification icon is yellow and displays the number of new notifications (Figure 72). The Notification banner will display the subject of the notification and the time range of the event. When there are multiple new notifications, the Notification banner will cycle through the unacknowledged notifications. New notifications are highlighted in yellow in the Notification window.

When notifications are acknowledged, the Notification icon changes to grey and displays "0" (zero) to represent no new notifications. The Notification window will also remove all yellow highlighting (Figure 73). The Notification banner not display anything until new notifications are entered into the system again.

Figure 72. New Notifications.

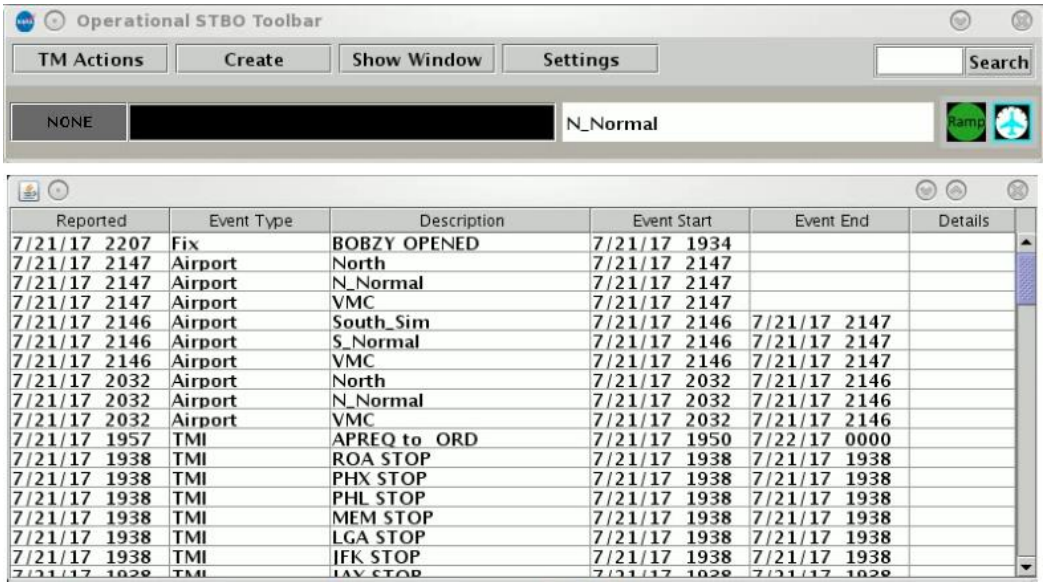


Figure 73. No New Notifications.

To clear new notifications via the Notification icon:

Step 1: Click on the Notification icon. All new notifications will clear and the icon will change to grey and display "0".

To clear new notifications via the Notification window:

Step 1: Click on the Notification banner to populate the Notification window.

Step 2: Click anywhere inside the window to clear the new notifications. The yellow highlighting will disappear.

2.4.4 Icons

Three additional icons appear on the Toolbar in addition to the Notifications icon: The Runway Utilization icon, the Ramp Status icon, and the Metering Mode icon. These icons provide a quick visual representation of important information for situational awareness.

The Runway Utilization icon (Figure 74) states the current runway utilization in text format. When the runway utilization and/or configuration information for the airport change, the text in the Runway Utilization icon updates to reflect this change.

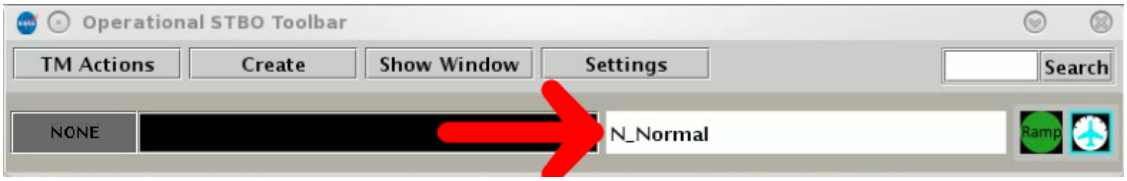


Figure 74. Runway Utilization.

The Ramp Status icon (Figure 75) is color coded to provide information about the Ramp status. When the icon is green, the Ramp is open and operational. When the icon is yellow, the Ramp is pending closure and is using limited operations. When the icon is red, the Ramp is closed for operations.

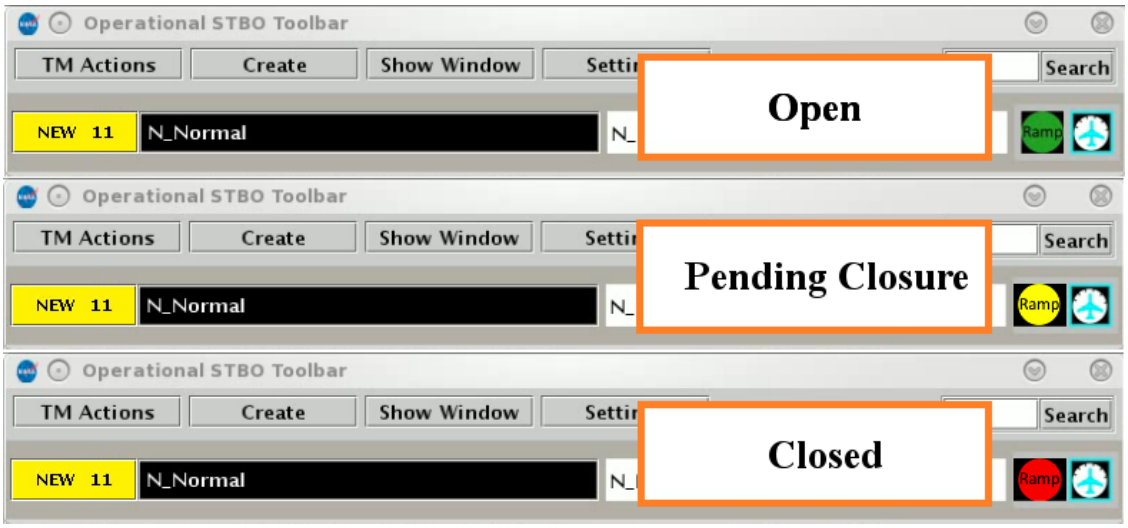


Figure 75. Ramp Status.

The Metering Mode icon (Figure 76) changes to different images to provide information about which metering mode the Ramp is currently using to aid in issuing pushback advisories for flights. In part A of Figure 76, the Ramp is using metering. In part B, the Ramp is using Departure Sequence Metering. The value inside the icon represents the total number of flights that can be pushed back and anywhere on the airport surface before the Ramp Controllers will begin holding flights at the gate. In part C, the Ramp is using Time-Based Metering. Time-Based Metering uses the ATD-2 automation's algorithm for metering at the flights in the Ramp.

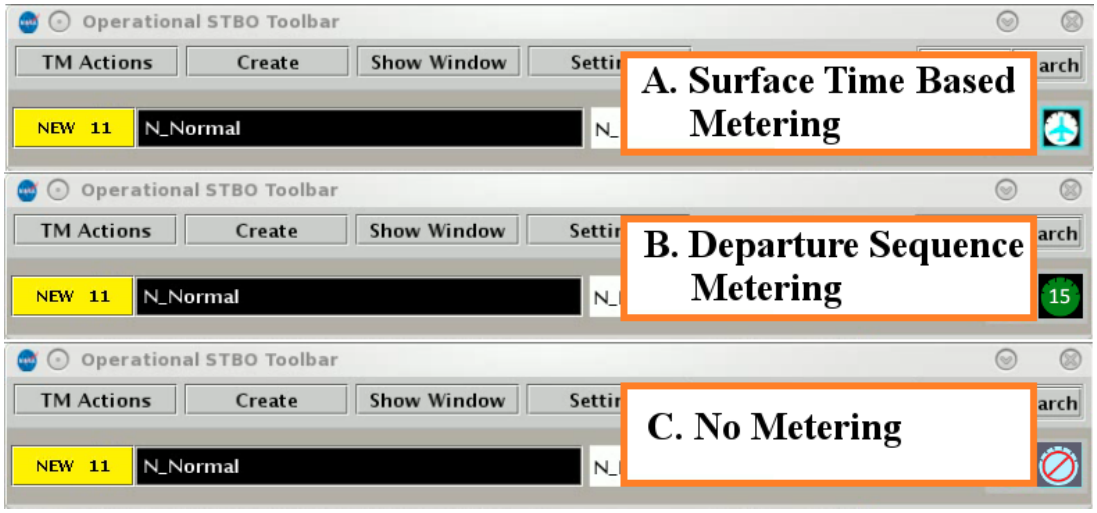


Figure 76. Metering Modes.

2.5 Flight Properties

The Flight Properties window can be accessed using the flight's right-click menu from the Flights Table, Map, and Timeline ("Properties" option in Figure 77). This window displays flight-specific information for individual flights. Once open, the Flight Properties window lists the flight's callsign in the window's title bar. The following table describes each of the items in the Flight Properties window.

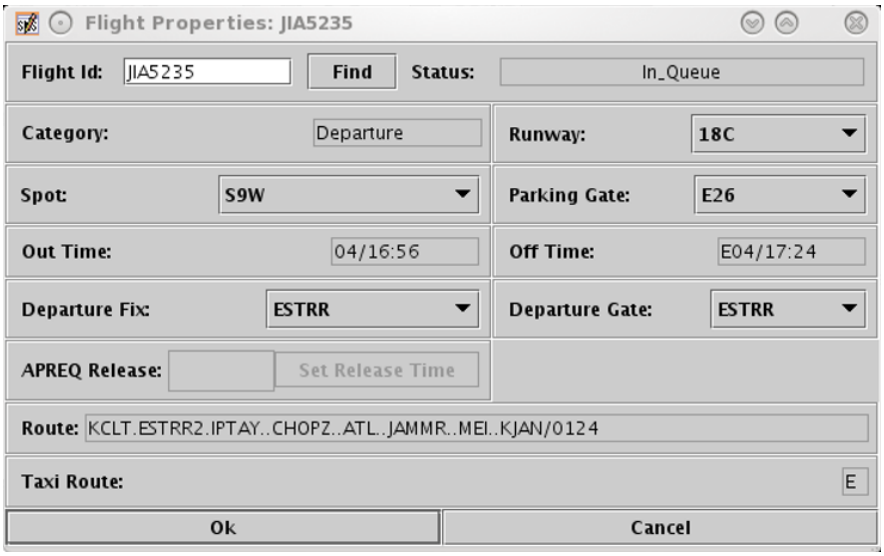


Figure 77. Flight Properties.

Flight Properties Item	Description
Flight ID	Callsign of the flight

Status	Lists the aircraft state and location: • Cancelled – The flight has been cancelled by the airline • Departed – A departure aircraft is airborne • Enroute_Arr – An arrival aircraft is in the enroute airspace • In – An arrival aircraft is parked at the gate • In_Queue – A departure aircraft is inside the queue detection box of the assigned runway • In_Ramp – An arrival is taxiing in the Ramp • On – An arrival aircraft has landed • On_Final – An arrival aircraft is on final approach • Out – A departure has pushed back and/or released brakes and is taxiing in the Ramp • Pushback – A departure aircraft is pushing back • Return_to_Gate – A departure is returning to the gate • Scheduled_In – An arrival aircraft has not been tracked by STBO yet • Scheduled_Out – A departure aircraft has not pushed back out yet • Suspended – The flight should have already departed and no flight updates have been received • Taxiing_AMA – A departure aircraft is taxiing on the airport movement area • Term_Area_Arr – An arrival aircraft is inside the terminal airspace
Category	Arrival or departure
Runway	Runway assignment
Spot	Spot assignment
Parking Gate	Assigned/actual gate for the flight
Out Time	Time a departure flight will/did push off the gate
Off Time	Time a departure flight will/did takeoff from the runway
On Time	Time an arrival flight will/did land on the runway
In Time	Time an arrival flight will/did park at the gate
Departure Fix	Assigned/actual departure fix for a flight (departures only)
Departure Gate	Assigned/actual departure gate for a flight (departures only)
APREQ Release	For flights with APREQ restriction, the APREQ release time
Route	Filed route reported by FAA system
Taxi Route	The remaining route for taxiing across the AMA

The “Find” button is a way to locate the flight across the whole STBO Client interface. When the “Find” button is clicked, the flight’s datablock will highlight on the Timeline, the Map, and on the Flights Table (Figure 78).

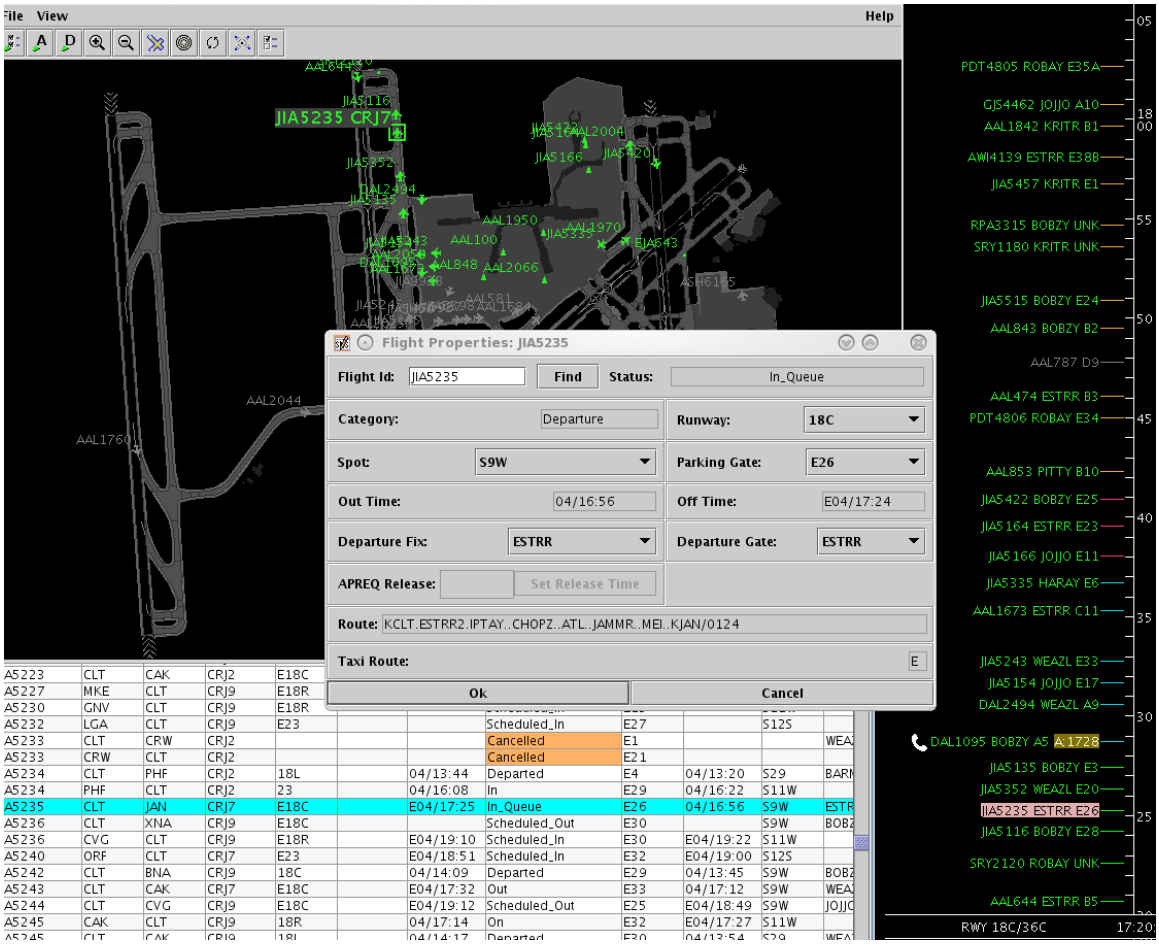


Figure 78. Find function in the Flight Properties window.

3 Flights with APREQ/CFR restrictions

This section describes information about APREQs in the STBO Client that is available in the observer mode. Note that users of the STBO Client in observer mode cannot participate in the negotiation process for an APREQ release time using STBO Client.

This section assumes that APREQ restrictions have been entered or read into STBO previously, either read in through SWIM or manually entered in by a user of the STBO Client in operational mode. If an APREQ restriction is scheduled, e.g. APREQ for flights to LGA, then a notification about the APREQ has already been published to all ATD-2 users, and the Timeline will have been updated to show "APREQ" on the Timeline datablocks for all flights with the APREQ restriction (Figure 79). APREQ aircraft will also be identifiable on the Flights Table (Figure 80) and the Map (Figure 81).

Figure 79. APREQ flight on STBO Client Timeline.

JIA5486	CLT			E08/23:27
JIA5212	EWR	KILNS	APRQ	E08/23:28
JIA5285	CLT			E08/23:28
AAL1889	LGA	BARMY	APRQ: RE...	E08/23:29
AAL650	CLT			E08/23:29

Figure 80. APREQ flight on STBO Client Flights Table.

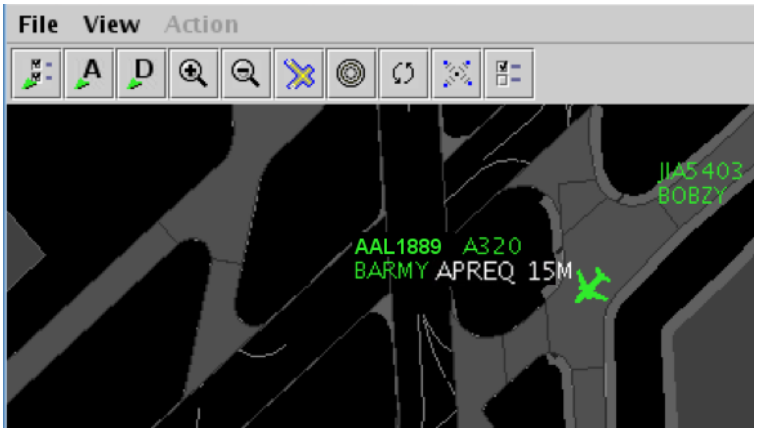


Figure 81. APREQ flight on STBO Client Map.

3.1 APREQ Symbols on the Timeline

If there is a "lightning bolt" symbol to the left of the call sign on the Timeline datablock (Figure 82), it means that electronic coordination of an APREQ release time is available for the flight. The user of the STBO Client in operational mode can engage in this electronic APREQ coordination.

Figure 82. APREQ flight capable of electronic coordination of release time.

Once the request for release time has been sent to TBFM/IDAC at the Center, a yellow arrow will appear to the right of the Timeline datablock (Figure 83).

Figure 83. Request for a release time has been sent to Center.

Once the Center accepts and returns the release time, the assigned release time is written on the Timeline datablock as "A:####" (e.g., "A:2344"; see Figure 84). The release time is also highlighted by a compliance indicator (see section 3.2 for more information on compliance indicators).

Figure 84. Release time has been returned by Center.

If the Center returns a time that differs from the operational STBO Client user's requested release time, a yellow diamond with an exclamation point appears next to the flight's datablock on the Timeline (Figure 85).

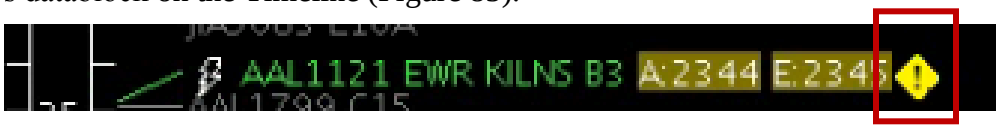


Figure 85. Center returns a different release time then the time requested.

If there is a "telephone" symbol to the left of the call sign on the Timeline datablock (Figure 86), it means that electronic coordination of an APREQ release time is not available for the flight.

Figure 86. APREQ flight is not capable of electronic coordination of release time.

When the APREQ request or time is cancelled, the APREQ flight's Timeline datablock will return to its original state with no APREQ release time or compliance indicator for the APREQ release time (Figure 87).

Figure 87. APREQ flight returned to original state after APREQ is Cancelled.

3.2 Compliance Indicators

Compliance indicators are used to show the status of a flight's compliance with its release time. Flights can be assigned both APREQ and EDCT release times, and therefore each release time has its own compliance indicator (Figure 88).

Figure 88. Compliance indicators.

The following table outlines the different colors of the compliance indicators:

Compliance Indicator Color	**Description**
Green	The flight is projected to be released from the runway in compliance with its release time window.
Yellow	The flight is projected to *not* be released from the runway in compliance with its release time window and to be released *early*.
Red	The flight is projected to *not* be released from the runway in compliance with its release time window and to be released *late*.

Appendix A: Acronyms

This appendix defines acronyms and terms that are used repeatedly throughout the ATD-2 STBO Client User Manual.

Acronym	Term
!=	Does not equal or not equal to
AAL	American Airlines
AC	Aircraft
ACID	Aircraft Identifier
ACK	Acknowledge
ADW	Arrival / Departure Window
AFP	Airspace Flow Program
AIBT	Actual In Block Time
ALDT	Actual Landing Time
AMA	Airport Movement Area
AMAT	Actual Movement Area entry Time
AOBT	Actual Off Block Time
APREQ / CFR	Approval Request / Call For Release
ARR / DEP	Arrival / Departure
ARRFIX	Arrival Fix
ARTCC	Air Route Traffic Control Center
ASDE-X	Airport Surface Detection Equipment - Model X
ATC	Air Traffic Control
ATCT	Air Traffic Control Tower
ATD-2	Airspace Technology Demonstration 2
ATOT	Actual TakeOff Time
BOS	Boston Logan International Airport
CC	Configuration Change (Runway)
CDM	Collaborative Decision Making
CDR	Coded Departure Route
CLT	Charlotte Douglas International Airport

CSV	Comma-Separated Values (file type)
CTOP	Collaborative Trajectory Options Program
CTOT	Controlled TakeOff Time
DAL	Delta Air Lines
DB	DataBlock
DEPFIX	Departure Fix
DEST	Destination
DFW	Dallas / Fort Worth International Airport
EDCT	Expected Departure Clearance Time
EFTT	Earliest Feasible Takeoff Time
EOBT	Earliest Off-Block Time
ESTIBT	Estimated In-Block Time
ESTOBT	Estimated Off-Block Time
ETA	Estimated Time of Arrival
ETD	Estimated Time of Departure
FAA	Federal Aviation Administration
FDX	FedEx
FUSION	Consolidates all available airport surveillance to simulate a single-sensor radar display system
GDP	Ground Delay Program
GS	Ground Stop
HSV; HSL; RGB; CMYK	COLOR MODELS: Hue, Saturation, Value; Hue, Saturation, Lightness; Red, Green, Blue; Cyan, Magenta, Yellow, Key (Black)
ICAO	International Civil Aviation Organization
ID	Identification
IDAC	Integrated Departure Arrival Capability
IOBT	Initial Off-Block Time
LGA	LaGuardia International Airport
LIBT	Airline In Block Time
LOB	Long On Board

LOBT	Airline Off Block Time
MIT	Miles-In-Trail
NASA	The National Aeronautics and Space Administration
nmi	Nautical miles
OIS	FAA Operational Information System
OPNEC	Operational Necessity
REQ	Request
RMTC	Ramp Manager Traffic Console
RTC	Ramp Traffic Console
RWY	Runway
SDT	Scheduled Departure Time
SIBT	Scheduled In Block Time
SID	Standard Instrument Departure
SLDT	Scheduled Landing Time
SMA	Surface Movement Advisor
SOBT	Scheduled Off-Block Time
STA	Scheduled Time of Arrival
STAR	Standard Terminal Arrival Route
STARS	Standard Automation Replacement System
STBM	Surface Time-Based Metering
STBO	Surface Trajectory Based Operations
STOT	Scheduled Take Off Time
SWIM	System-Wide Information Management
TBD	To Be Determined
TBFM	Time-Based Flow Management System
TFDM	Terminal Flight Data Manager
TFM	Traffic Flow Management
TFMS	Traffic Flow Management System
TIBT	Target In Block Time
TLDT	Target Landing Time
TM	Traffic Management

TMA	Traffic Management Advisor
TMAT	Target Movement Area entry Time
TMI	Traffic Management Initiative(s)
TOBT	Target Off-Block Time
TRACON	Terminal RADAR Approach Control
TTOT	Target Take Off Time
TZ	Track data from TFMS
UAL	United Airlines
UIBT	Undelayed In Block Time
ULDT	Undelayed Landing Time
UMAT	Undelayed Movement Area entry Time
UNK	Unknown
UOBT	Undelayed Off-Block Time
UTOT	Undelayed Take Off Time