STBO Client User Manual

Airspace Technology Demonstration 2 (ATD-2) Team

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Abstract

This document serves as a user manual for the Surface Trajectory-Based Operations (STBO) Client utilized by ATC in the Air Traffic Control Tower. It describes the elements of the STBO Client and provides explanations for how to interact with the interface. STBO Client functionality includes the display of live flight information, management of traffic restrictions, prediction of expected traffic demand/delay. The STBO Client is a component of the NASA Airspace Technology Demonstration 2 (ATD-2) sub-project.

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1 Getting Started: Opening the STBO Client

The thin green bar on the left side of the display provides access to several different system views (Figure 1.1). Any local systems integrated with ATD-2 may be selected for observation.

To access "My Desktop":

> ***Step 1***: Hover mouse over the green bar to display the menu.
>
> ***Step 2***: Select "My Desktop" from the menu.

Figure 1.1. Use the green bar tool to navigate to "My Desktop".

The NASA icon in the lower left of the display provides access to ATD-2 tools, including the STBO Client (Figure 1.2). To get started, first make sure that the correct desktop is displayed.

To open the STBO Client:

Step 1: Ensure that "My Desktop" has been selected.

Step 2: Select the NASA icon in the lower left of the display to open the ATD-2 suite (menu options vary).

Step 3: Select "STBO Client".

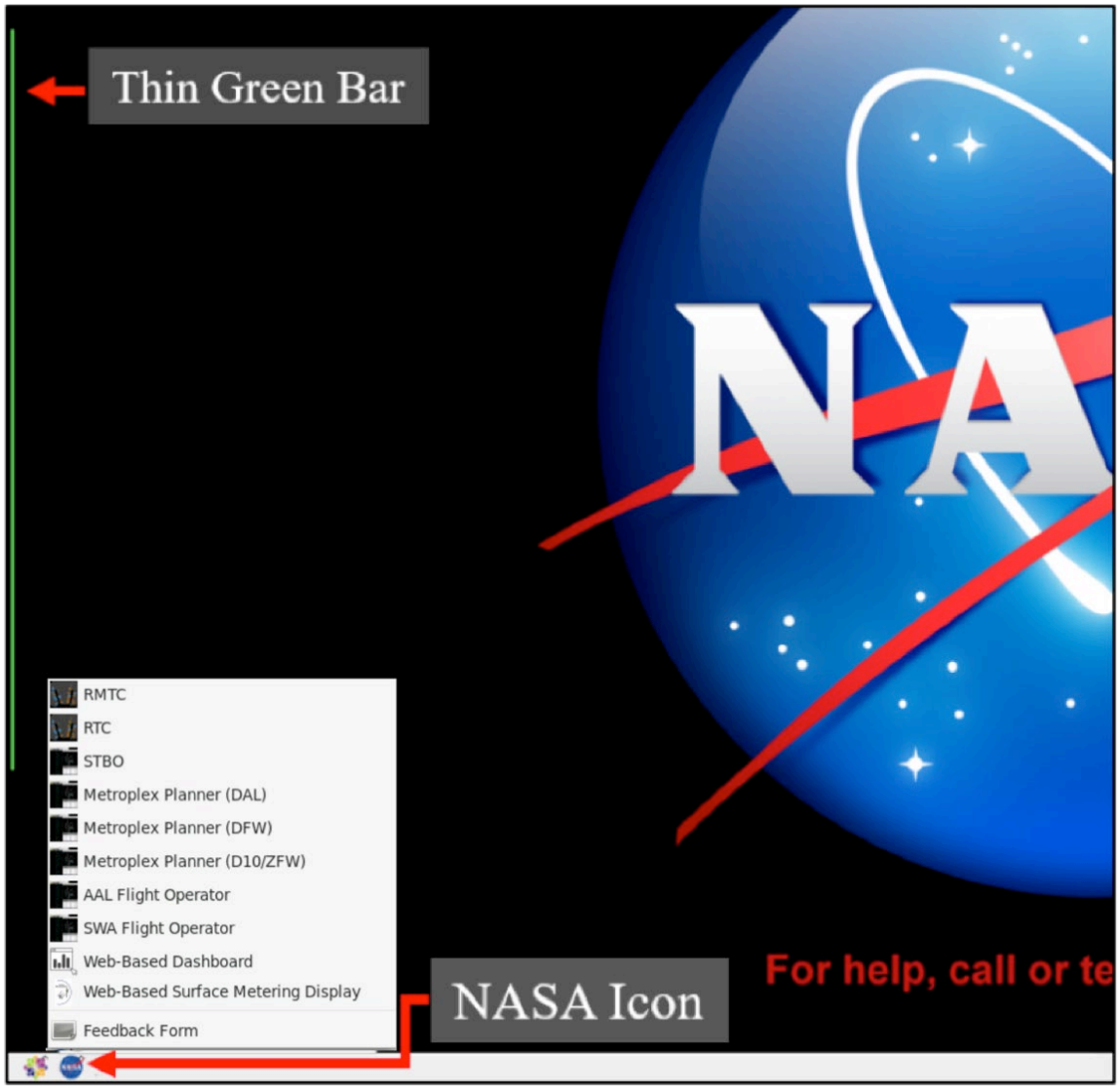


Figure 1.2. NASA Icon: ATD-2 Suite (menu options vary).

2 STBO Client Interface Overview

The STBO Client displays live flight information on the surface and in the terminal area, demand and delay predictions, and allows the user to enter TMI and airport-specific restrictions. The interactive display consists of the following primary elements, each displayed in their own windows: toolbar, maps, tables, and timelines (Figure 2.1).

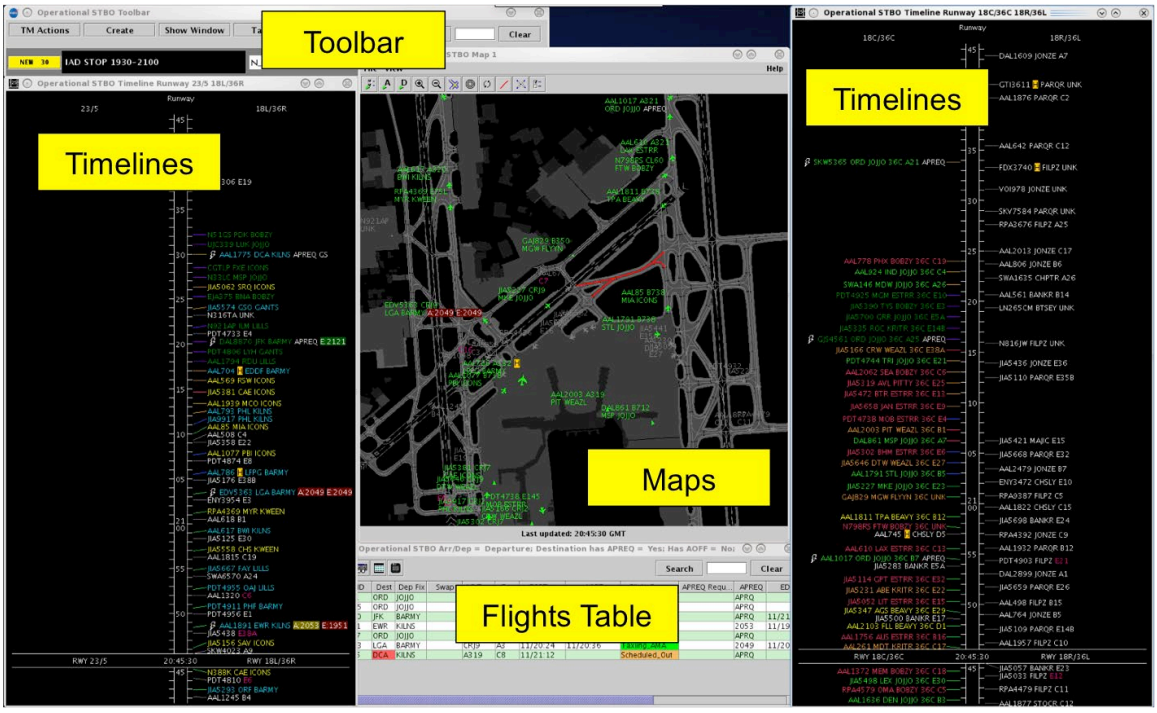


Figure 2.1. STBO Client interactive display.

These elements are described in the following sections:

- Section 3: Toolbar
- Section 4: Maps
- Section 5: Tables
- Section 6: Timelines
- Section 7: Right-Click Menus

Procedures for scheduling an APREQ (Section 8) are also described.

3 STBO Client: Toolbar

The Toolbar provides access to TMI restriction information, and interface controls/settings. Status icons and notifications are also displayed on the Toolbar (Figure 3.1). A complete list of functions and displays on the Toolbar is shown in Table 1.

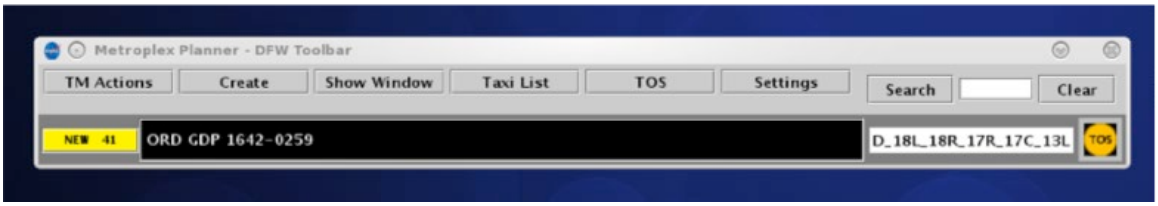


Figure 3.1. Toolbar (not all features available in all versions).

Table 1. Functions and Displays on the Toolbar

Toolbar Feature	Description
TM Actions	View, add, modify, or remove TMI and airport-specific restrictions.
Create	Create maps, tables, and timelines in new windows.
Show Window	View list of open maps, tables, and timelines. Select a window to bring to the front of the display.
Taxi List	View a list of departure flights by runway with delay information.
Settings	Save or load a display configuration.
Search	Search for flight number, a call sign, departure fix, destination airport, or General Aviation flight.
Notification Icon/Banner	Displays new ATC and airport-related notifications.
Runway Utilization	Displays current airport configuration and runway utilization.

3.1 Toolbar: Traffic Manager (TM) Actions

Use the Traffic Manager (TM) Actions menu to view, add, modify, or remove TMI and airport-specific restrictions.

To access the TM Actions Panel from the Toolbar:

Step 1: Click on the "TM Actions" button and select from the dropdown menu (Figure 3.2).

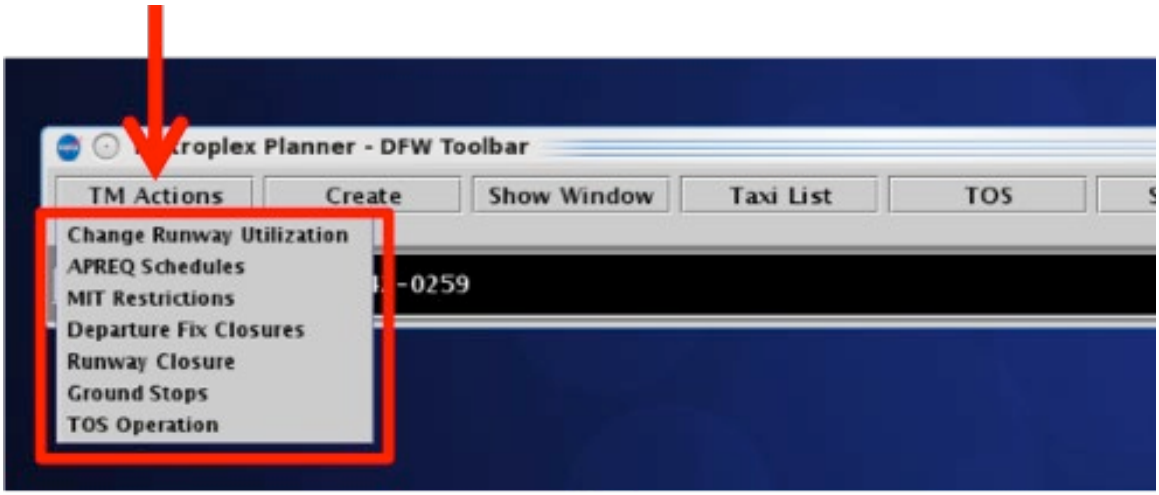


Figure 3.2. TM Actions dropdown menu (menu options vary by version).

3.1.1 TMI Restrictions

Four types of TMI restrictions can be added/modified/removed:

- APREQ Schedules
- Miles-in-Trail (MIT) Restrictions
- Departure Fix Closures
- Ground Stops

There are two sources from which the STBO Client can automatically detect TMI restrictions: the FAA Operational Information System (OIS) and the National Traffic Management Log (NTML). When TMIs are detected by the STBO Client automatically, they can be viewed by accessing the TM Actions panel.

When a TMI restriction is detected incorrectly or when an existing TMI restriction needs to be modified, use the TM Actions menu to add, modify, or remove a TMI restriction.

3.1.1.1 TM Actions Panel: APREQ Schedules Tab

Use the TM Actions panel to apply APREQ restrictions by airport, departure fix, departure gate, or jet route and define start/end times. Existing APREQs can be modified or removed.

To add an APREQ Restriction:

Step 1: Select "APREQ Schedules" tab from the TM Actions menu to open the TM Actions panel on the "APREQ Schedule" tab (Figure 3.3).

Step 2: Select which resource the APREQ restriction will be applied to (e.g., "Airport" in Figure 3.4):

- Airport
- Departure Fix
- Departure Gate
- Jet Route

Step 3: Click on the "Select" button to select one or more Airports, Departure Fixes, or Departure Gates from their respective menus.

Alternatively: In the text field, type:

- 3-digit Airport code, or
- Departure Fix name, or
- Departure Gate name, or
- Jet Route name

Separate multiple entries with a comma, but no space (e.g., "DCA,LGA,PHL" in Figure 3.4).

Step 4: If the restriction begins in the future, uncheck "Start Now" and enter a day/time in the "Start Time" text box in the "*dd/hhmm*" format.

Step 5: If an "End Time" is known, uncheck "No End Time" and enter a day/time in the "End Time" text box in the "*dd/hhmm*" format.

Note: If the time crosses over 0000, the date must be changed. For example, if the current date is the 27th of the month, but the APREQ is not scheduled to end until after midnight, enter "28" for the 28th of the month in the "End Time" field.

Step 6: If necessary, constraints can be added to the APREQ restriction. See Section 3.1.2 for more information on constraints.

Step 7: Select "Add".

Note: APREQ restrictions are displayed in the APREQ Schedule table with start and end times (Figure 3.5).

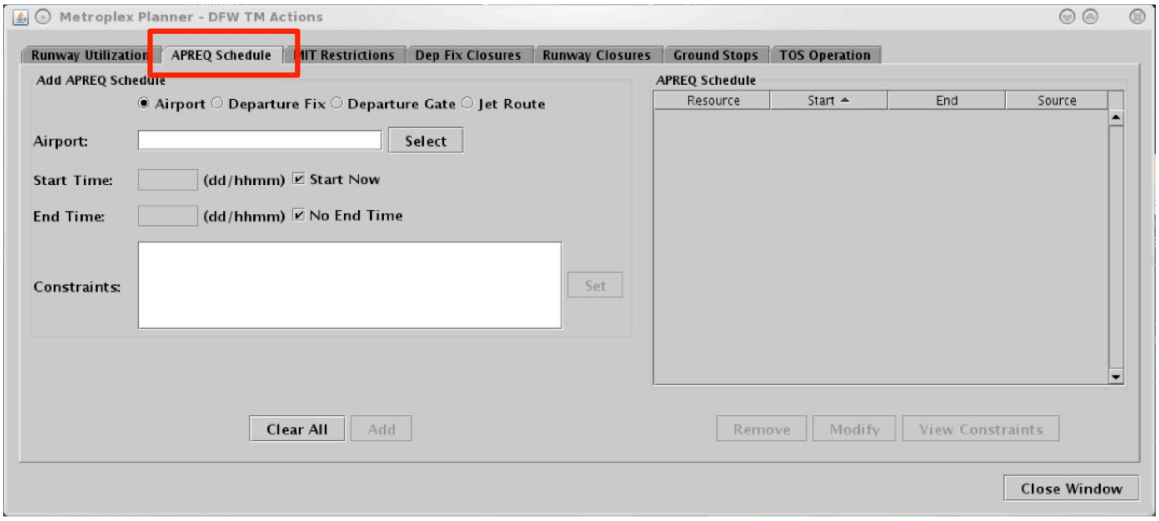


Figure 3.3. TM Actions panel: APREQ Schedule tab.

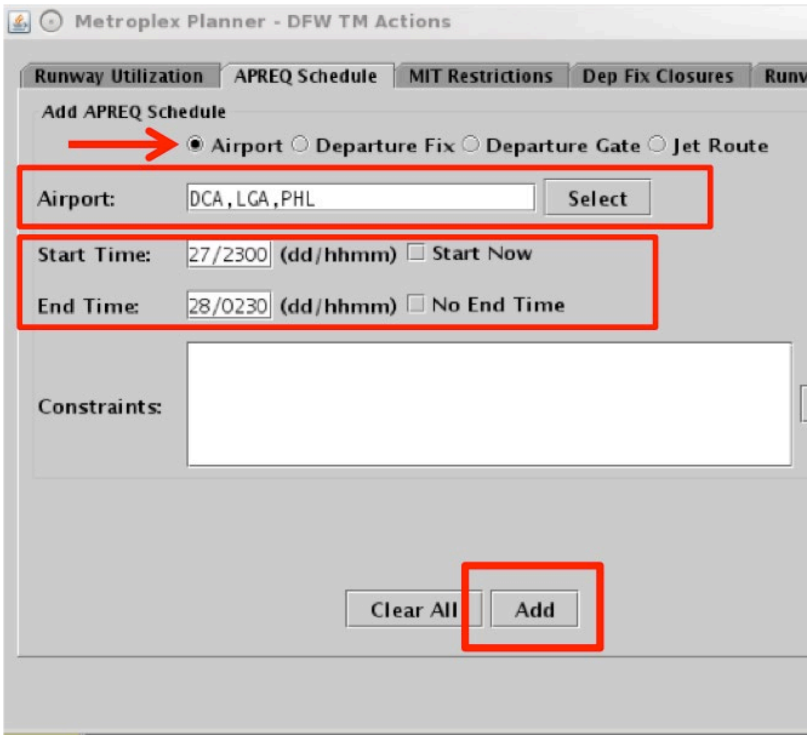


Figure 3.4. APREQ Schedule tab: Resource and Start/End Times.

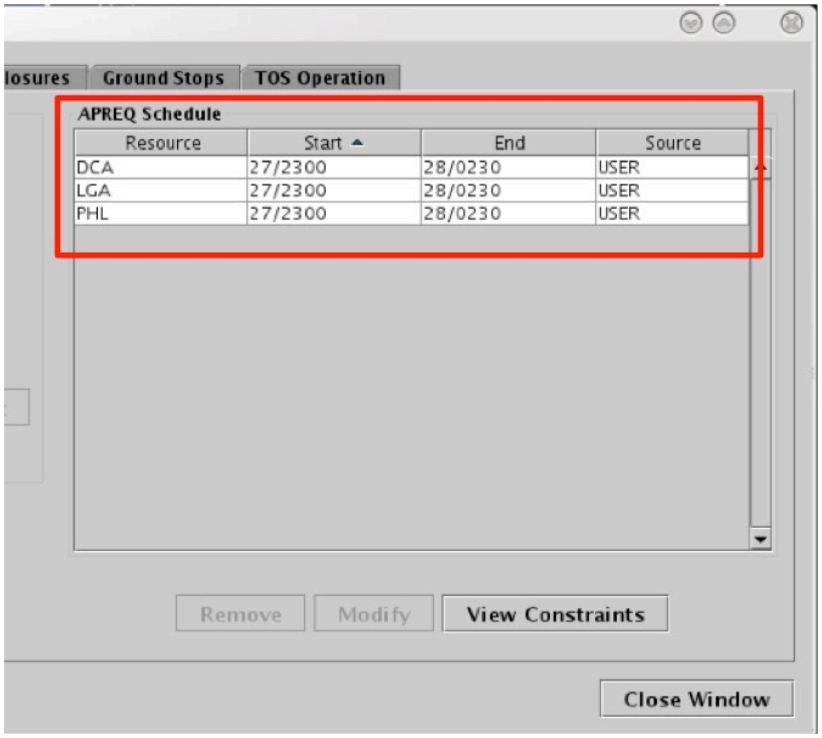


Figure 3.5. APREQ Schedule tab: Scheduled APREQ table.

APREQ restrictions are indicated on maps, tables, timelines, and in notifications. On a map, an APREQ restriction is indicated in the flight's datablock, with color coding for compliance. On a timeline, an APREQ restriction is indicated in the flight's datablock with a "lightning bolt" or "telephone" symbol and color coding for compliance. A new notification will be displayed for each scheduled APREQ restriction. See Section 3 for more details on APREQ procedures.

A future APREQ can have its start time, end time, and constraints modified as long as the source is USER or OIS. A future APREQ restrictions can be manually removed from the schedule.

To modify an APREQ Restriction:

Step 1: Select an APREQ restriction in the APREQ Schedule table (e.g., "LGA" in Figure 3.6).

Step 2: Select "Modify" to change the details of the APREQ restriction (Figure 3.6

Note: If the "Start Time" has already passed, and the APREQ restriction is already in effect, the "Start Time" cannot be modified.

Step 3: When changes are complete, select "Update".

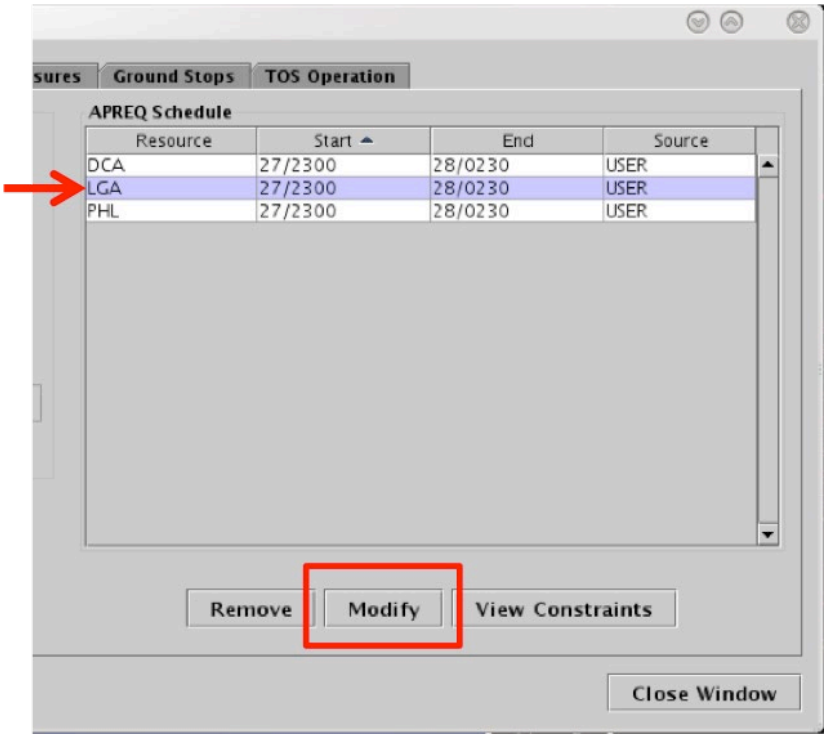


Figure 3.6. APREQ Schedule tab: Modify an APREQ restriction.

To remove an APREQ Restriction:

Step 1: Select an APREQ restriction in the APREQ Schedule table (e.g., "PHL" in Figure 3.7).

Step 2: Select "Remove" (Figure 3.7).

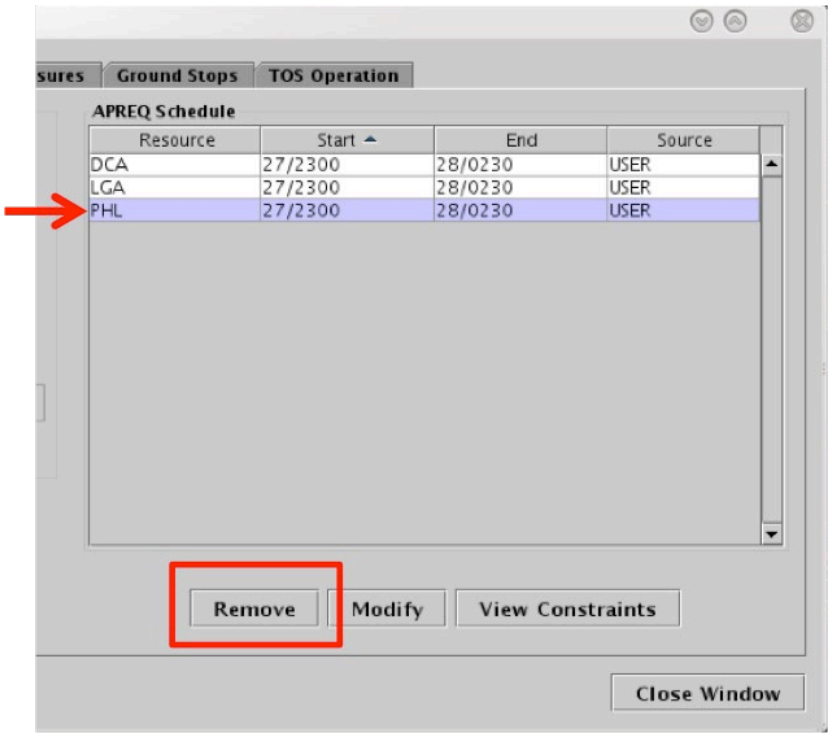


Figure 3.7. APREQ Schedule tab: Remove an APREQ restriction.

When an APREQ restriction is removed, APREQ indicators on the map, table, and timeline are removed automatically. A notification of the cancellation is also displayed.

Once the end time of the scheduled APREQ restriction is reached, the restriction will be removed. If, at that time, the restriction is actually still in effect, it may need to be entered again, unless the updated information is read in from OIS and auto-populates in the STBO Client.

3.1.1.2 TM Actions Panel: MIT Restrictions Tab

Use the TM Actions panel to apply Miles-in-Trail (MIT) restrictions by airport, departure fix, departure gate, or jet route and define start/end times. Existing MIT restrictions can be modified or removed.

To add a MIT Restriction:

Step 1: Select "MIT Restrictions" from the TM Actions menu to open the TM Actions panel on the "MIT Restrictions" tab (Figure 3.8).

Step 2: Select to which resource the MIT restriction will be applied (e.g., "Departure Fix" in Figure 3.9):

- Airport
- Departure Fix
- Departure Gate
- Jet Route

Step 3: Click on the "Select" button to select one or more Airports, Departure Fixes, or Departure Gates from their respective menus.

Alternatively: In the text field, type:

- 3-digit Airport code, or
- Departure Fix name, or
- Departure Gate name, or
- Jet Route name

Separate multiple entries with a comma, but no space (e.g., "AKUNA,GRABE" in Figure 3.9).

Step 4: Select the miles-in-trail (MIT) distance from the dropdown menu (e.g., 15 miles in Figure 3.9):

- 10, 15, 20, 25, 30, or 35 miles

Step 5: If the restriction begins in the future, uncheck "Start Now" and enter a day/time in the "Start Time" text box in the "*dd/hhmm*" format.

Step 6: If an "End Time" is known, uncheck "No End Time" and enter a day/time in the "End Time" text box in the "*dd/hhmm*" format.

Note: If the time crosses over 0000, the date must be changed. For example, if the current date is the 27th of the month, but the MIT restriction is not scheduled to end until after midnight, enter "28" for the 28th of the month in the "End Time" field.

Step 7: If necessary, constraints can be added to the MIT restriction. See Section 3.1.2 for more information on constraints.

Step 8: Select "Add".

Note: MIT restrictions are displayed in the MIT Restrictions table with start and end times (Figure 3.10).

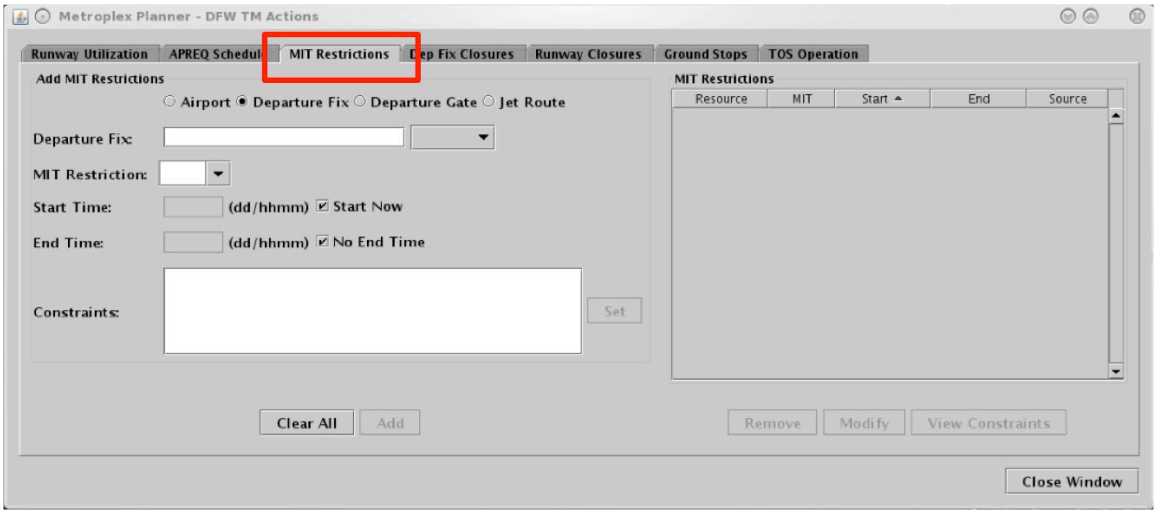


Figure 3.8. TM Actions panel: MIT Restrictions tab.

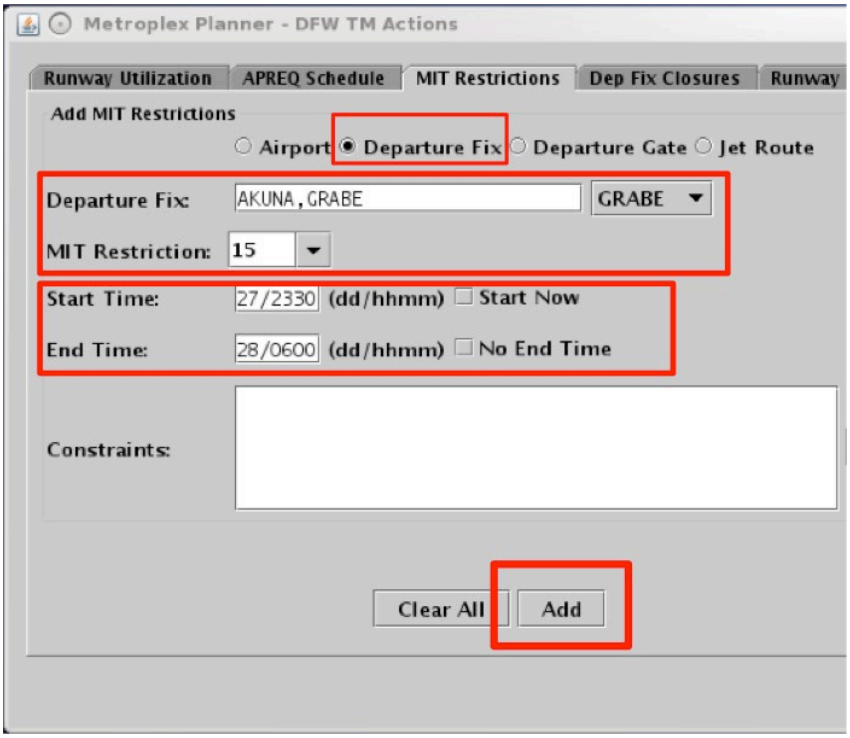


Figure 3.9. MIT Restrictions tab: Resource and Start/End Times.

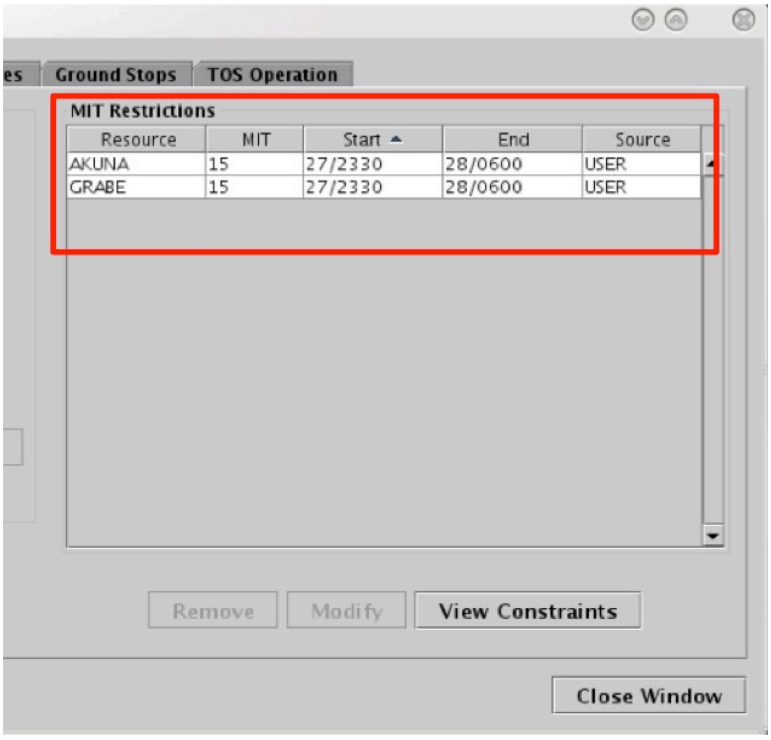


Figure 3.10. MIT Restrictions tab: MIT Restrictions table.

MIT restrictions are indicated on maps, tables, timelines, and in notifications. On maps and timelines, a MIT restriction is indicated in the flight's datablock. A new notification will be displayed for each scheduled MIT restriction.

A future MIT restriction can have its start time, end time, and constraints modified as long as the source is USER or OIS. A future MIT restriction can be manually removed from the schedule.

To modify a MIT restriction:

Step 1: Select a MIT restriction in the MIT Restrictions table (e.g., "AKUNA" in Figure 3.11).

Step 2: Select "Modify" to change the details of the MIT restriction (Figure 3.11).

Note: If the "Start Time" has already passed, and the MIT restriction is already in effect, the "Start Time" cannot be modified.

Step 3: When changes are complete, select "Update".

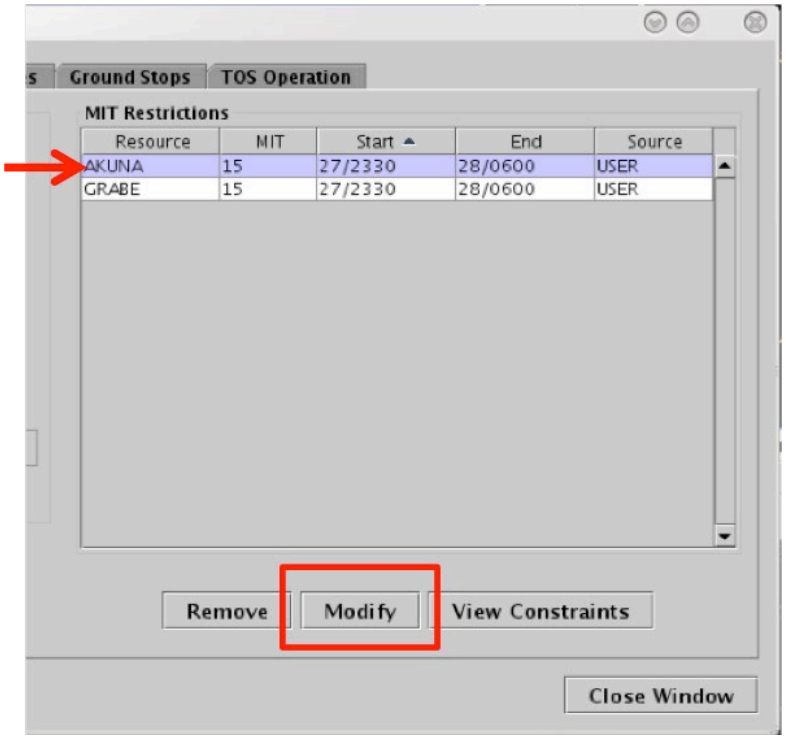


Figure 3.11. MIT Restrictions tab: Modify an APREQ restriction.

To remove a MIT restriction:

Step 1: Select a MIT restriction in the MIT table (e.g., ”GRABE” in Figure 3.12

Step 2: Select “Remove” (Figure 3.12).

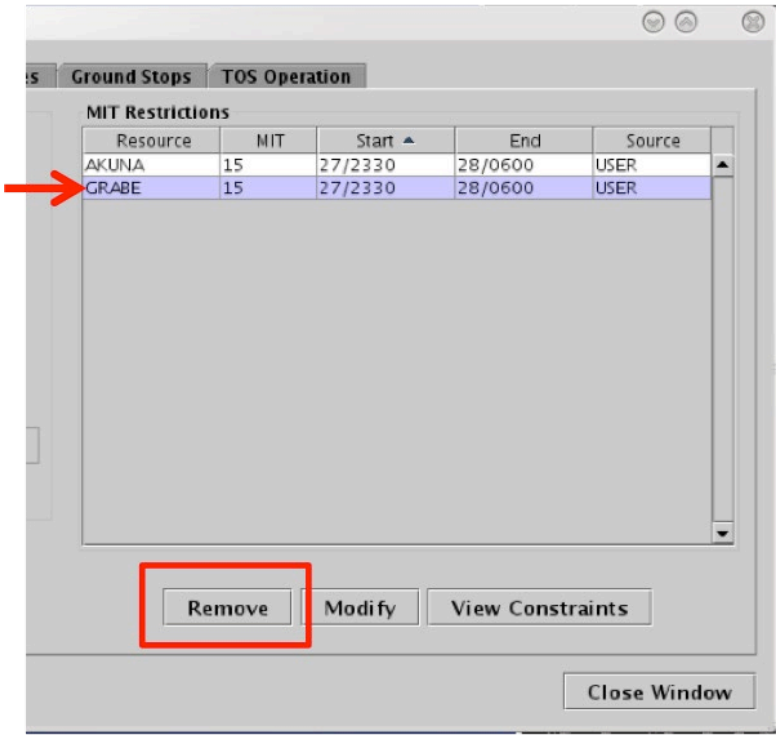


Figure 3.12. MIT Restrictions tab: Remove a MIT restriction.

When a MIT restriction is removed, the MIT indicators on the map, table, and timeline are removed automatically. A notification of the cancellation is also displayed.

Once the end time of the scheduled MIT restriction is reached, the restriction will be removed. If, at that time, the restriction is actually still in effect, it may need to be entered again, unless the updated information is read in from OIS and auto-populates in the STBO Client.

3.1.1.3 TM Actions Panel: Departure Fix Closures Tab

Use the TM Actions panel to apply Departure Fix Closure restrictions by departure fix or departure gate, define an alternate fix, and define start/end times. Existing Departure Fix Closures can be modified or removed.

To add a Departure Fix Closure:

Step 1: Select "Departure Fix Closures" from the TM Actions menu to open the TM Actions panel on the "Dep Fix Closure" tab (Figure 3.13).

Step 2: Select where to apply the closure (e.g., "Departure Fix" in Figure 3.14):

- Departure Fix
- Departure Gate

Note: When a Departure Gate is closed, all of the Departure Fixes associated with that gate are closed.

Step 3: Click on the "Select" button to select one or more Departure Fixes or Departure Gates from their respective menus.

Alternatively: In the text field, type:

- Departure Fix name, or
- Departure Gate name

Separate multiple entries with a comma, but no space (e.g., "PGLET,TYGGR" in Figure 3.14).

Optional: Select an alternate fix to reassign flights to in the "CDR Flights To" field (e.g., "RBBIT" in Figure 3.14).

Step 4: If the restriction begins in the future, uncheck "Start Now" and enter a day/time in the "Start Time" text box in the "*dd/hhmm*" format.

Step 5: If an "End Time" is known, uncheck "No End Time" and enter a day/time in the "End Time" text box in the "*dd/hhmm*" format.

Note: If the time crosses over 0000, the date must be changed. For example, if the current date is the 27th of the month, but the APREQ is not scheduled to end until after midnight, enter "28" for the 28th of the month in the "End Time" field.

Step 6: If necessary, constraints can be added to the Departure Fix Closure. See Section 3.1.2 for more information on constraints.

Step 7: Select "Add".

Note: Departure Fix Closures are displayed in the "Dep Fix Closures" table with start and end time (Figure 3.15).

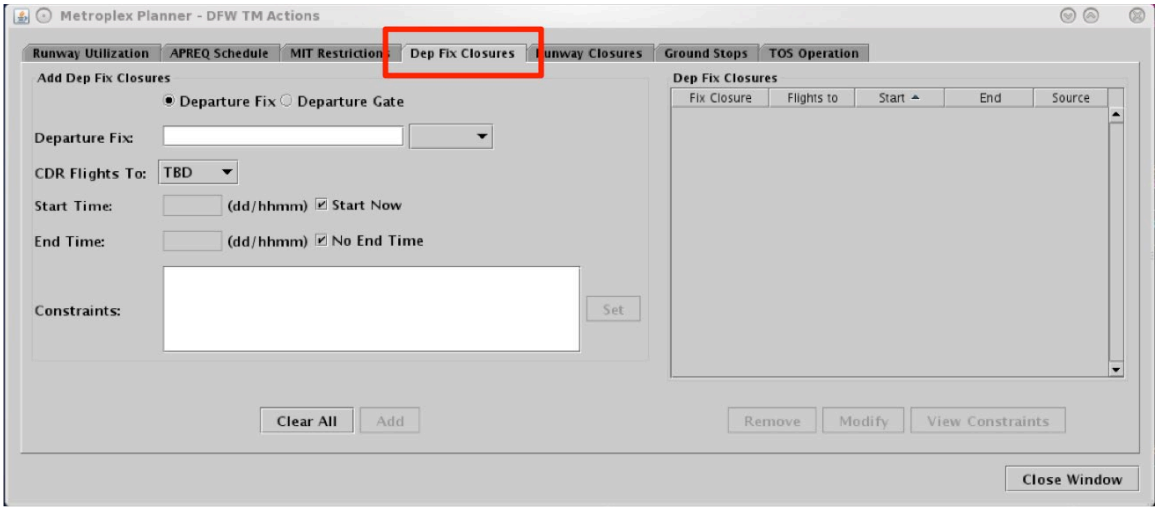


Figure 3.13. TM Actions panel: Dep Fix Closures tab.

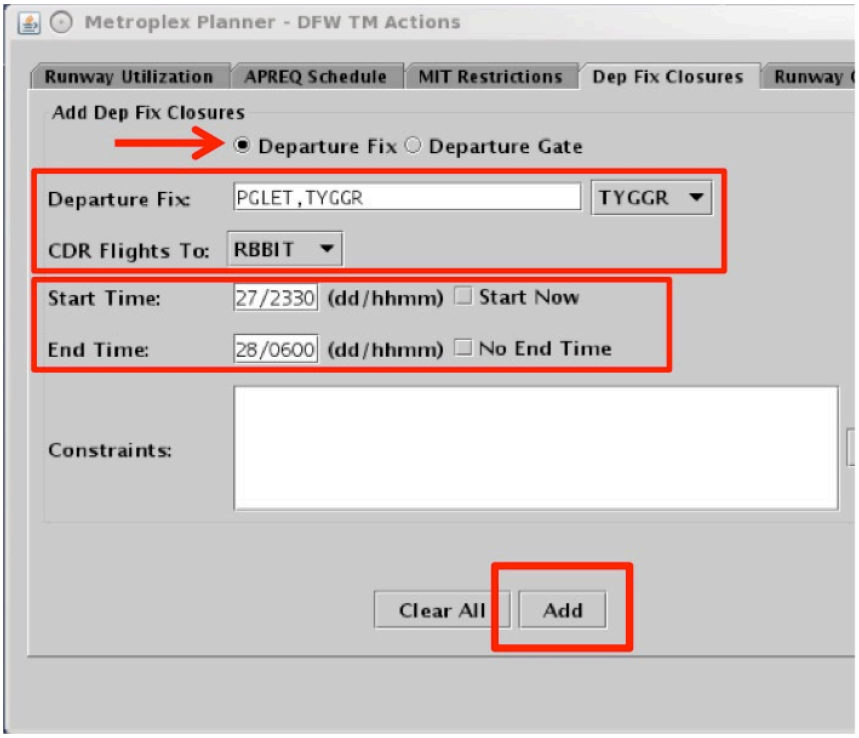


Figure 3.14. Dep Fix Closures tab: Departure fix, alternate CDR fix, and Start/End Times.

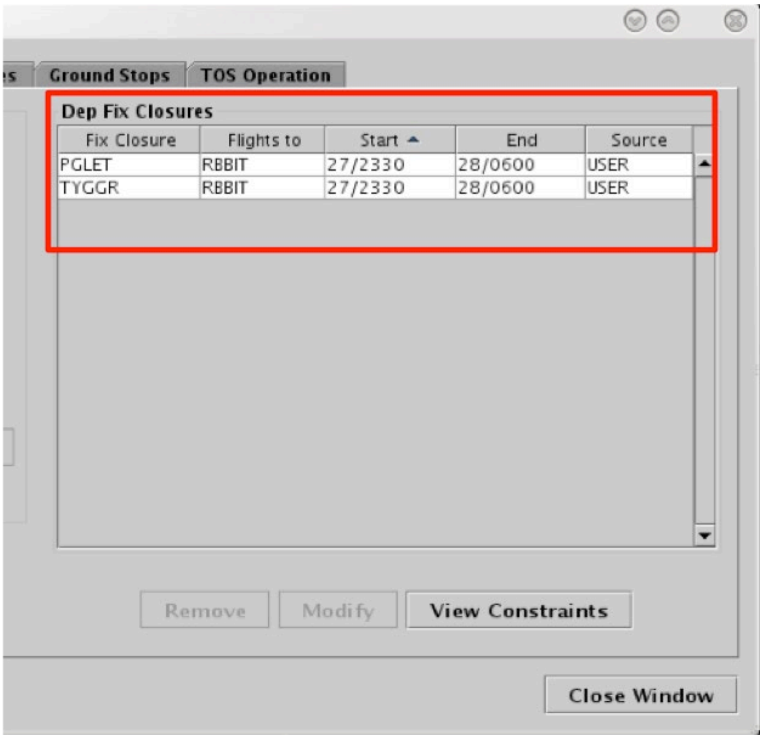


Figure 3.15. Dep Fix Closures tab: Dep Fix Closures table.

Departure Fix Closures are indicated on maps, tables, timelines, and in notifications. If an alternate departure fix is selected in the "CDR Flight To" field, the change will be indicated in the timeline datablock (e.g., "PGLET → RBBIT"). If the "CDR" field was left blank, or "to be determined" (TBD) was selected from the dropdown menu, the new, alternate fix will be indicated in the timeline datablock as "TBD" (e.g., "PGLET → TBD").

On a map, closed Departure Fixes are grayed-out. If an alternate Departure Fix is selected in the "CDR Flight To" field, the names of the closed fixes (e.g., PGLET and TYGGR) will be displayed next to the alternate fix (e.g., RBBIT).

A new notification will be displayed for each Departure Fix Closure; however, the selected "CDR Flight To" fix is only displayed in the Notifications Panel, not the Notifications Banner.

A future Departure Fix Closure restriction can have its start time, end time, and constraints modified as long as the source is USER or OIS. A future Departure fix closure restriction can be manually removed from the schedule.

To modify a Departure Fix Closure:

Step 1: Select a departure fix closure from the Dep Fix Closures table (e.g., ”PGLET” in Figure 3.16).

Step 2: Select “Modify” to change the details of the Departure Fix Closure (Figure 3.16).

Note: If the “Start Time” has already passed, and the departure fix closure is already in effect, the “Start Time” cannot be modified.

Step 3: When changes are complete, select “Update”.

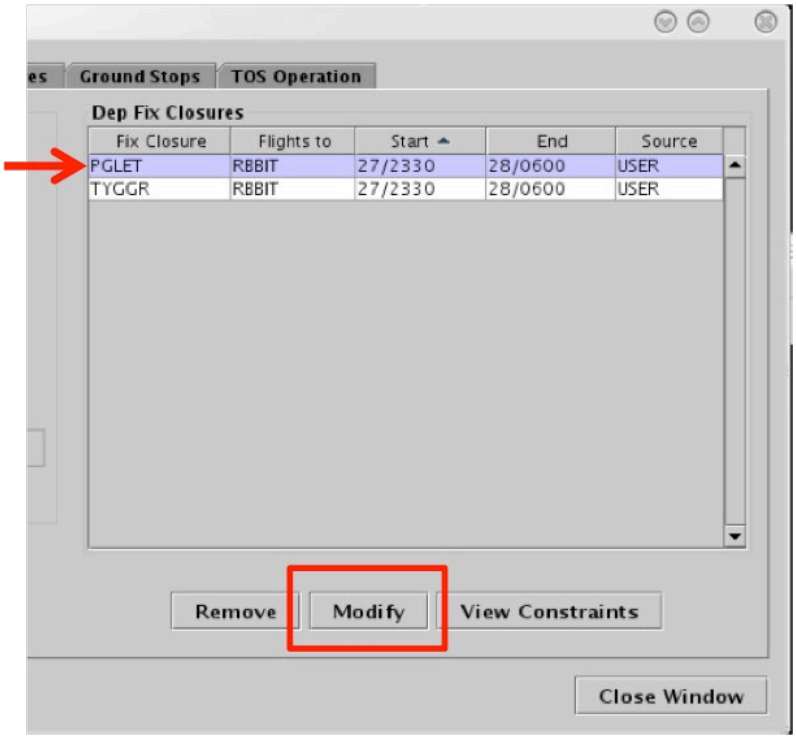


Figure 3.16. Dep Fix Closure table: Modify a departure fix closure.

To remove a Departure Fix Closure:

Step 1: Select a Departure Fix Closure in the “Dep Fix Closures” table (e.g., “TYGGR” in Figure 3.17).

Step 2: Select “Remove” (Figure 3.17).

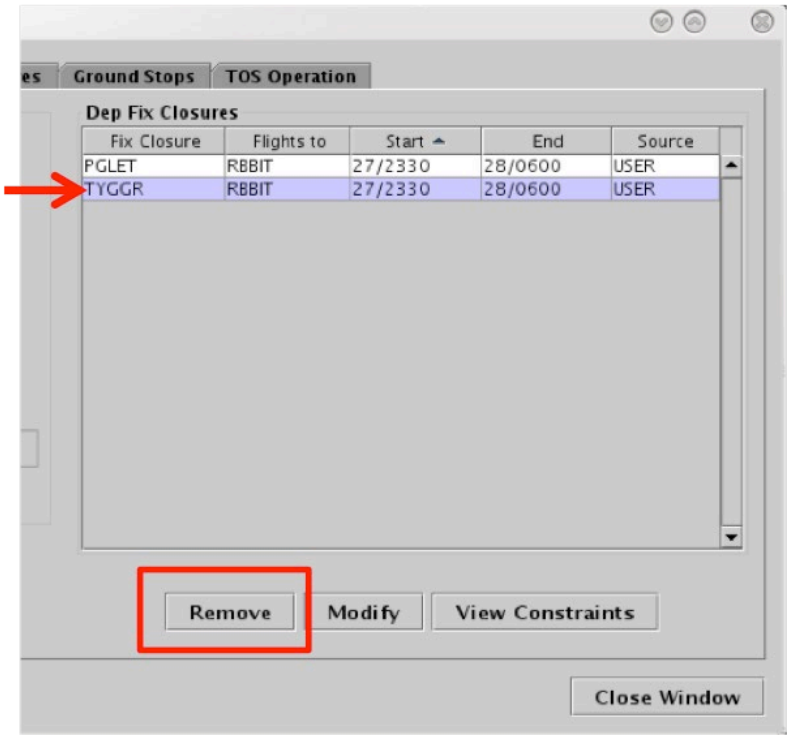


Figure 3.17. Dep Fix Closures table: Remove a departure fix closure.

When a Departure Fix Closure is removed, the Departure Fix Closure indicators on the map, table, and timeline are removed automatically. A notification of the departure fix opening is also displayed.

Once the end time of the scheduled Departure Fix Closure is reached, the restriction will be removed. If, at that time, the closure is actually still in effect, it may need to be entered again, unless the updated information is read in from OIS and auto-populates in the STBO Client.

3.1.1.4 TM Actions Panel: Ground Stops Tab

Use the TM Actions panel to apply Ground Stop restrictions to an airport and define start/end times. Existing Ground Stop restrictions can be modified or removed.

To add a Ground Stop Restriction:

Step 1: Select "Ground Stops" from the TM Actions menu to open the TM Actions panel on the "Ground Stops" tab (Figure 3.18).

Step 2: Click on the "Select" button to select one or more Airports (e.g., IAH in Figure 3.19).

Alternatively: In the text field, type:

- 3-digit Airport code

Separate multiple entries with a comma, but no space.

Step 3: If the restriction begins in the future, uncheck "Start Now" and enter a day/time in the "Start Time" text box in the "*dd/hhmm*" format.

Step 4: If an "End Time" is known, uncheck "No End Time" and enter a day/time in the "End Time" text box in the "*dd/hhmm*" format.

Note: If the time crosses over 0000, the date must be changed. For example, if the current date is the 27th of the month, but the APREQ is not scheduled to end until after midnight, enter "28" for the 28th of the month in the "End Time" field.

Step 5: If necessary, constraints can be added to the Ground Stop restriction. See Section 3.1.2 for more information on constraints.

Step 6: Select "Add".

Note: Ground Stops are displayed in the Ground Stops table with start and end times (Figure 3.20).

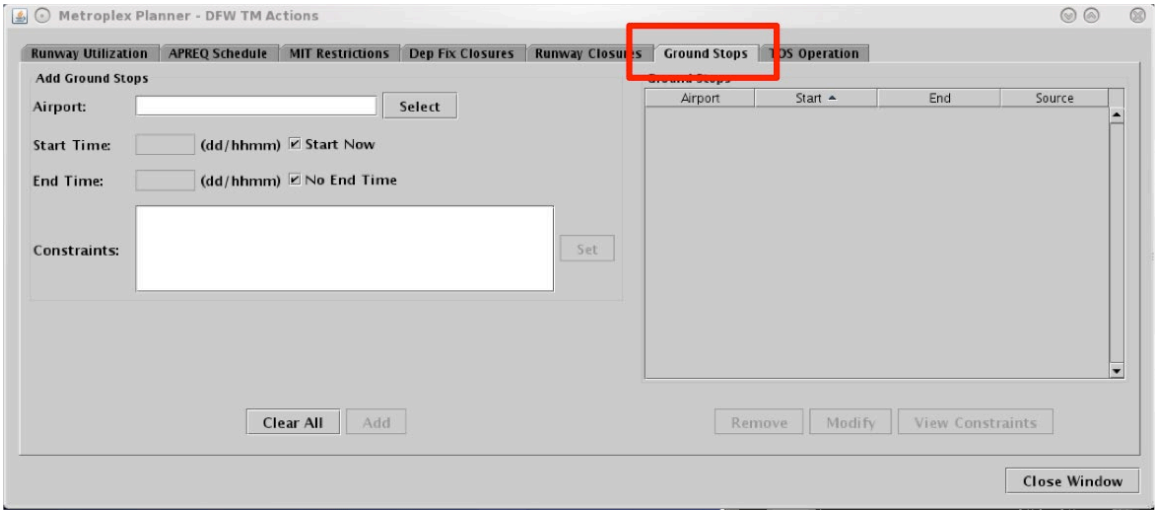


Figure 3.18. TM Actions panel: Ground Stops tab.

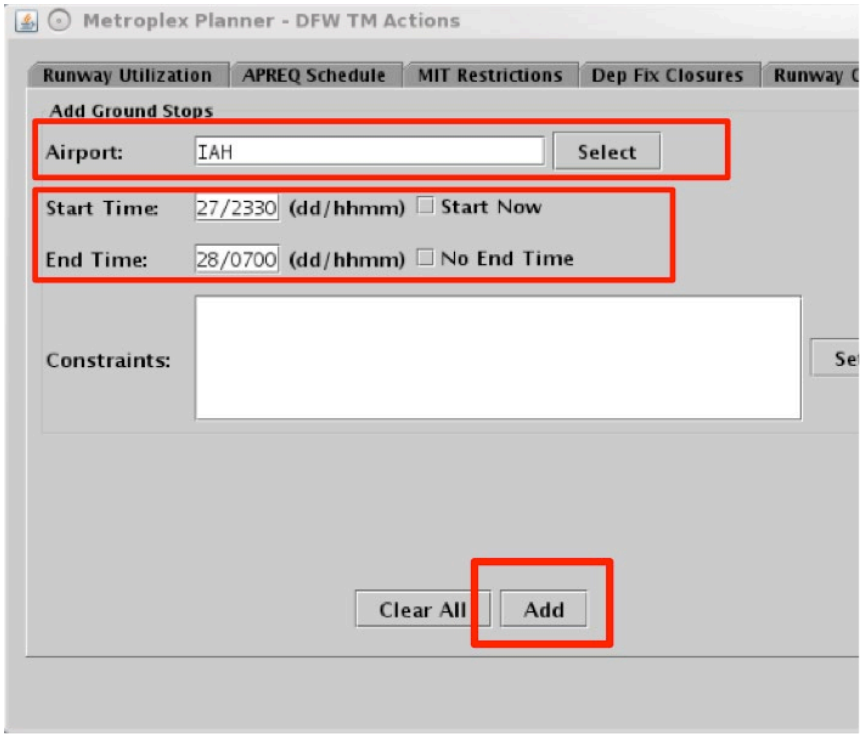


Figure 3.19. Ground Stops tab: Airport and Start/End Times.

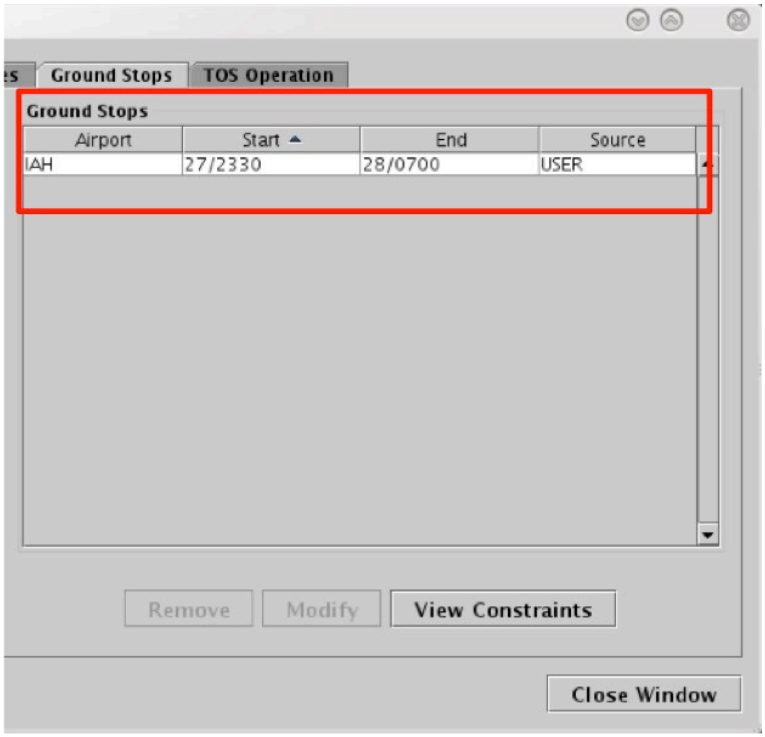


Figure 3.20. Ground Stops tab: Ground Stops table.

Ground Stop restrictions are indicated on maps, tables, timelines, and in notifications. On maps and timelines, a Ground Stop restriction is indicated in the flight's datablock. A new notification will be displayed for each scheduled Ground Stop restriction.

A future Ground Stop can have its start time, end time, and constraints modified as long as the source is USER or OIS. Future Ground Stop restrictions can be manually removed from the schedule.

To modify a Ground Stop restriction:

Step 1: Select a Ground Stop restriction in the "Ground Stops" table (e.g., "IAH" in Figure 3.21).

Step 2: Select "Modify" to change the details of the Ground Stop (Figure 3.21).

Note: If the "Start Time" has already passed, and the Ground Stop is already in effect, the "Start Time" cannot be modified.

Step 3: When changes are complete, select "Update".

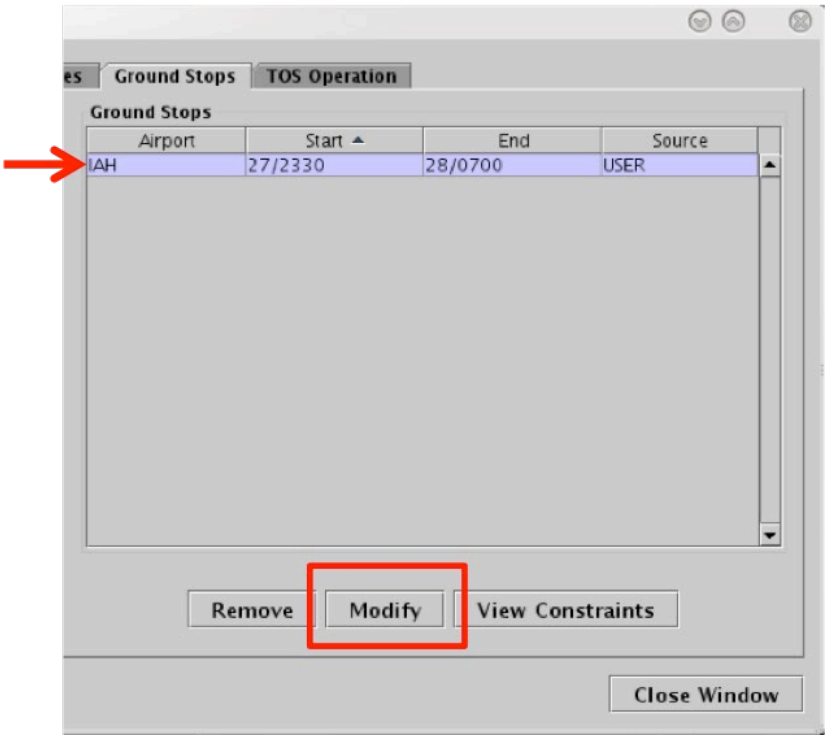


Figure 3.21. Ground Stops tab: Modify a Ground Stop restriction.

To remove a Ground Stop restriction:

Step 1: Select a Ground Stop restriction in the Ground Stop table (e.g., "IAH" in Figure 3.22).

Step 2: Select "Remove" (Figure 3.22).

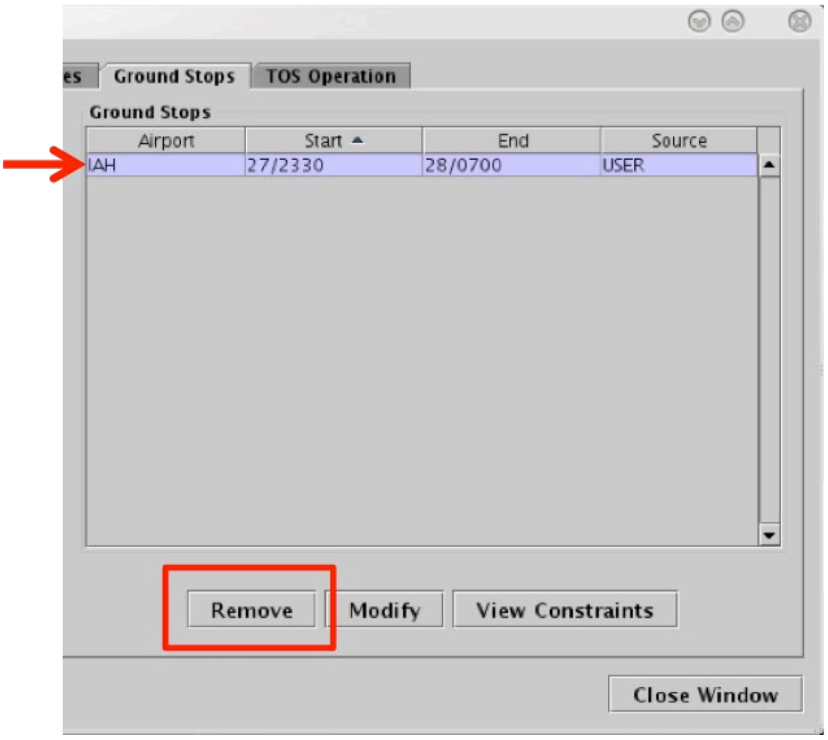


Figure 3.22. Ground Stops tab: Remove a Ground Stop restriction.

When a Ground Stop restriction is removed, Ground Stop indicators on the map, table, and timeline are removed automatically. A notification of the cancellation is also displayed.

3.1.2 TMI Restrictions: Constraints

A TMI restriction may also require additional constraint criteria. For instance, a Miles-in-Trail (MIT) restriction may apply to all flights flying over a departure fix, with the exception of APREQ flights going to the same fix.

In the STBO Client, constraints can be applied to TMI restrictions (i.e., APREQ Schedules, MIT Restrictions, Departure Fix Closures, and Ground Stops) by accessing the TM Actions menu. Table 2 shows the available options for constraining each of the four TMI restrictions (cells marked with an "x" indicate availability of the constraint).

Table 2. TMI Restriction Types

Constraint	**Traffic Management Initiative (TMI) Restriction**			
	APREQ Schedules	**MIT Restrictions**	**Departure Fix Closures**	**Ground Stops**
Engine Type	x	x	x	x
Aircraft Type	x	x	x	x
User Category	x	x	x	x

Center	x	x	x	x
Sector	x	x	x	x
Airway	x	x	x	x
Airline	x	x	x	x
Airport	x	x	x	x
Filed Altitude	x	x	x	x
Weight Class	x	x	x	x
MIT	x		x	x
Departure Fix	x			x
Departure Gate	x			x
APREQ		x	x	x
Destination		x	x	

Constraints can be added and viewed through one of the four TMI-restriction tab windows (i.e., APREQ Schedules, MIT Restrictions, Departure Fix closures, and Ground Stops). These tabs are accessed through the TM Actions panel on the Toolbar.

In the following example, a MIT restriction is constrained by departure Airport, but the same steps can be followed to add/view any constraint.

To add a Constraint to a TMI restriction:

Step 1: In a TMI-restriction window (e.g., "MIT Restrictions" in Figure 3.23), select/enter restriction criteria.

Step 2: Select "Set" (Figure 3.23) next to the "Constraints" field.

Note: "Set" is grayed-out until TMI-restriction criteria has been entered.

Step 3: Available options for constraining the TMI restriction are displayed on individual tabs. Select a constraint by clicking on its tab (e.g., "Airport" in Figure 3.24).

Step 4: Select/enter the criteria with which to constrain the TMI restriction and choose between "Inclusion" or "Exclusion".

Step 5: Select "Apply" to return to the TMI-restriction window, or select a different tab to add more constraints (Figure 3.24).

Note: Upon returning to the TMI-restriction window, the constraints are displayed in the "Constraint" field (Figure 3.25).

Step 6: Select "Add" to finish entering this TMI restriction (Figure 3.25).

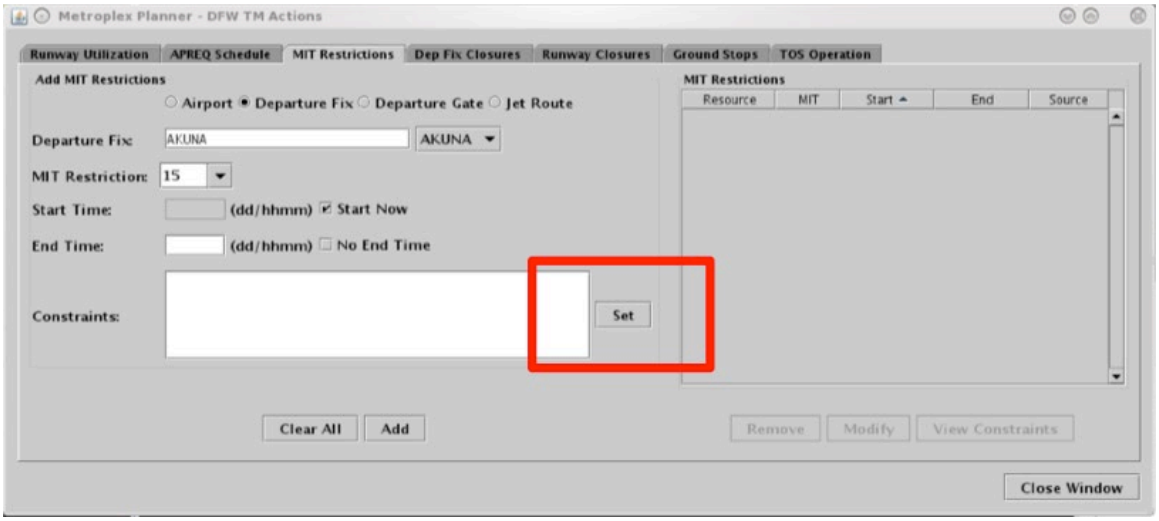


Figure 3.23. Selecting "Set" to add a Constraint.

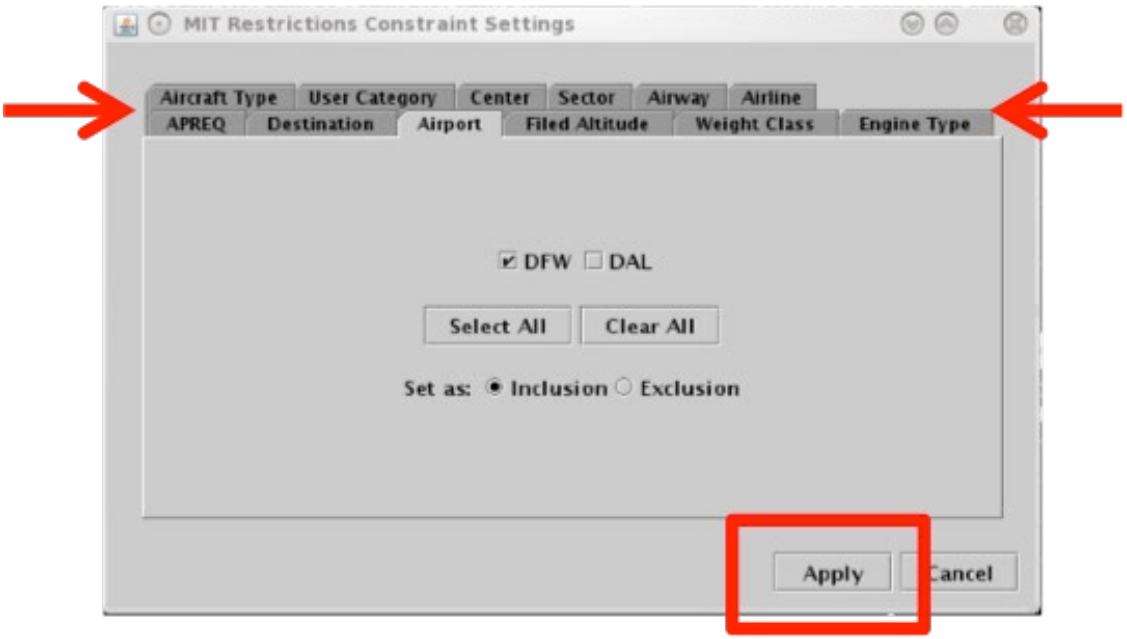


Figure 3.24. Select "Apply" or click on another constraint tab.

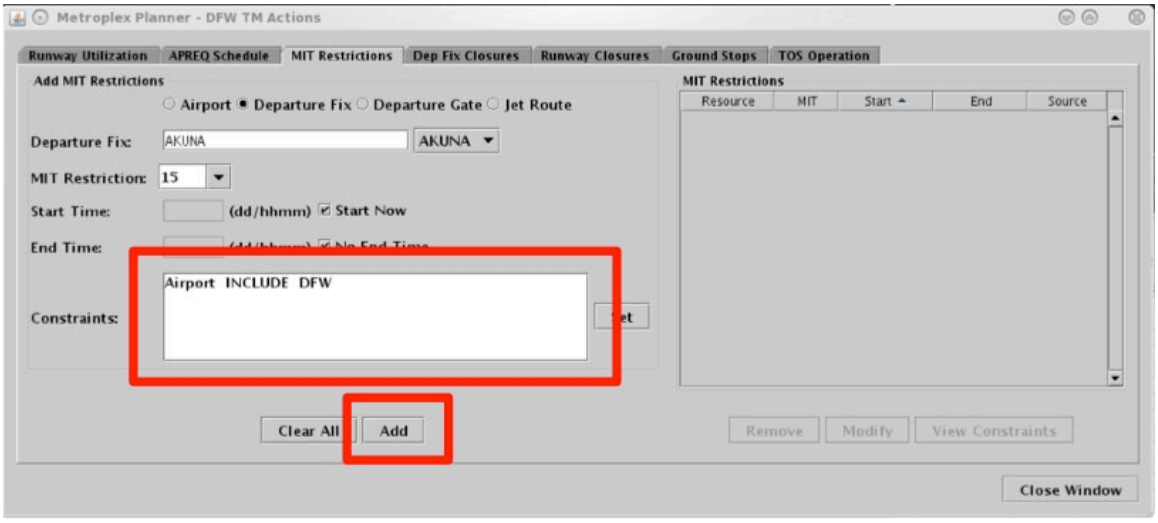


Figure 3.25. View the newly applied constraints in the "Constraints" field. Select "Add" to complete this TMI restriction.

To view Constraints associated with a TMI restriction:

Step 1: Select "View Constraints" (Figure 3.26).

Note: Existing constraints are displayed in a new window (Figure 3.27).

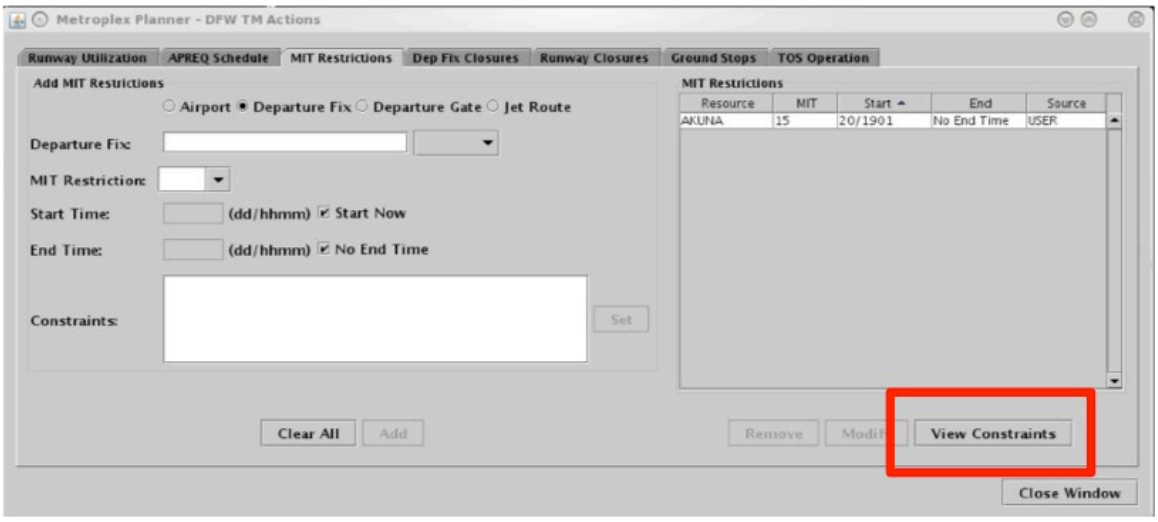


Figure 3.26. Select ""View Constraints"

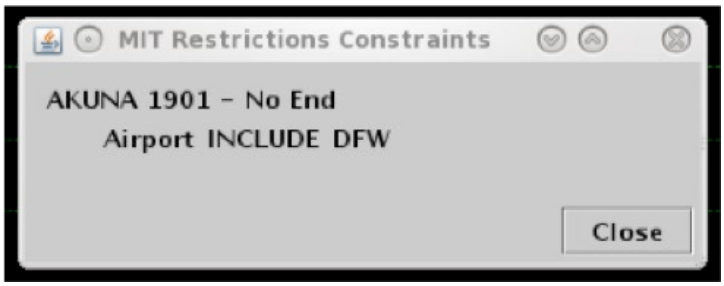


Figure 3.27. View Constraints window.

In addition to being displayed in the "Constraints" field in the TMI-restriction window, constraints associated with a TMI restriction are displayed in the "Details" column in the Notifications Panel (Figure 3.28).

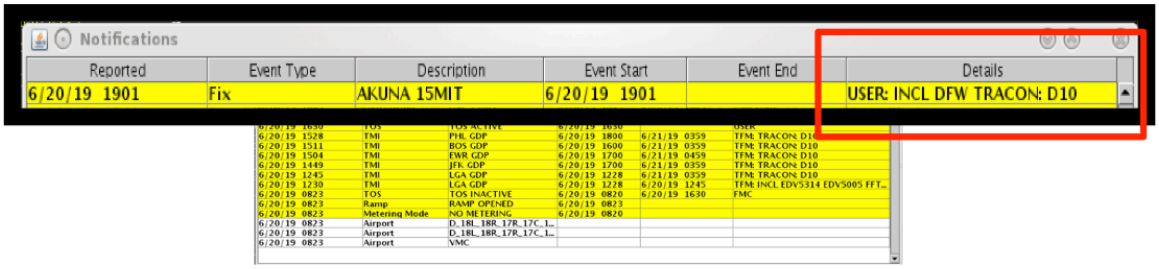


Figure 3.28. Constraints are displayed in the "Details" column of the Notifications Panel.

The following sub-sections describe each constraint tab as well as the right-click method for excluding a flight from a TMI restriction.

3.1.2.1 Constraint: Engine Type

The following types of TMI restrictions can be constrained by aircraft Engine Type.

- APREQ Schedule
- MIT Restriction
- Departure Fix Closure
- Ground Stop

To apply an engine type constraint, select from three aircraft engine types (Figure 3.29):

- "P" for piston
- "T" for turboprop, or
- "J" for jet

More than one type can be selected at a time.

Select “Inclusion” to include flights matching this criteria in the TMI restriction or “Exclusion” to exclude flights from the TMI restriction. Then select “Apply” to return to the TMI-restriction window or select a different tab to add another constraint.

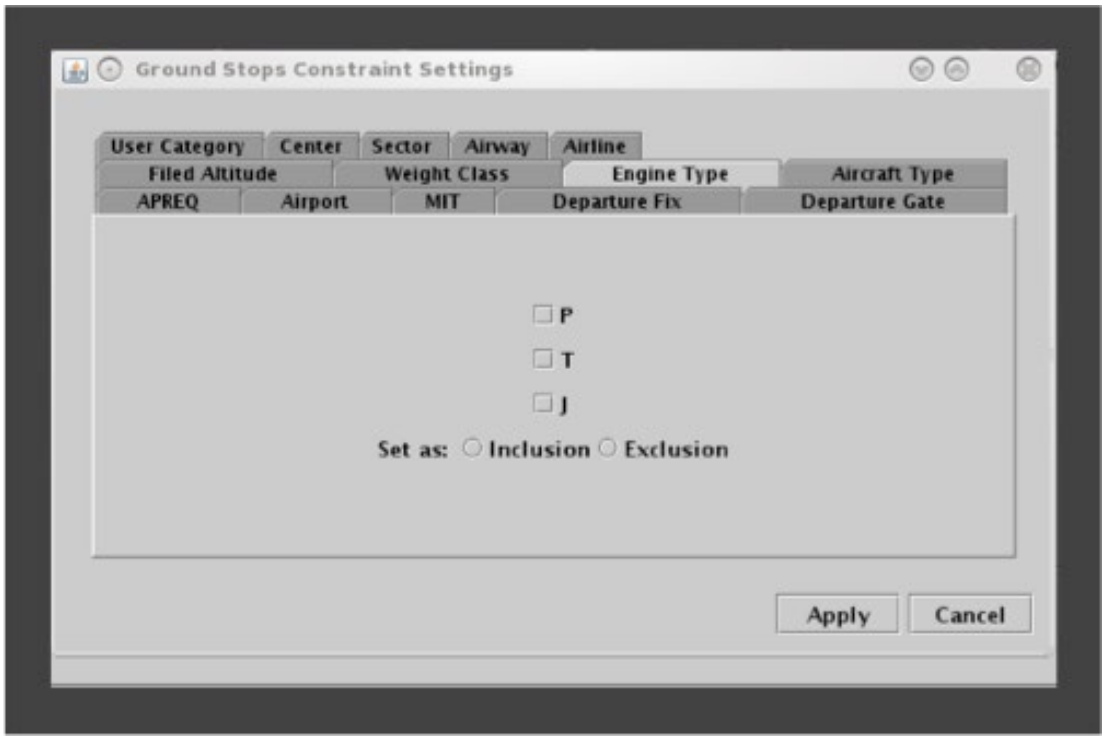


Figure 3.29. Constraint: Engine Type.

To remove an Engine Type constraint, uncheck any checked boxes and select “Apply”.

3.1.2.2 Constraint: Aircraft Type

The following types of TMI restrictions can be constrained by aircraft Engine Type:

- APREQ Schedule
- MIT Restriction
- Departure Fix Closure
- Ground Stop

To apply an Engine Type constraint, enter the 4-character alphanumerical code for an aircraft type (e.g., A320) (Figure 3.30). To enter more than one aircraft type, separate aircraft codes with a comma, but no space (e.g., “A320,A319,E170”).

Select “Inclusion” to include flights matching this criteria in the TMI restriction or “Exclusion” to exclude flights from the TMI restriction. Then select “Apply” to return to the TMI restriction window or select a different tab to add another constraint.

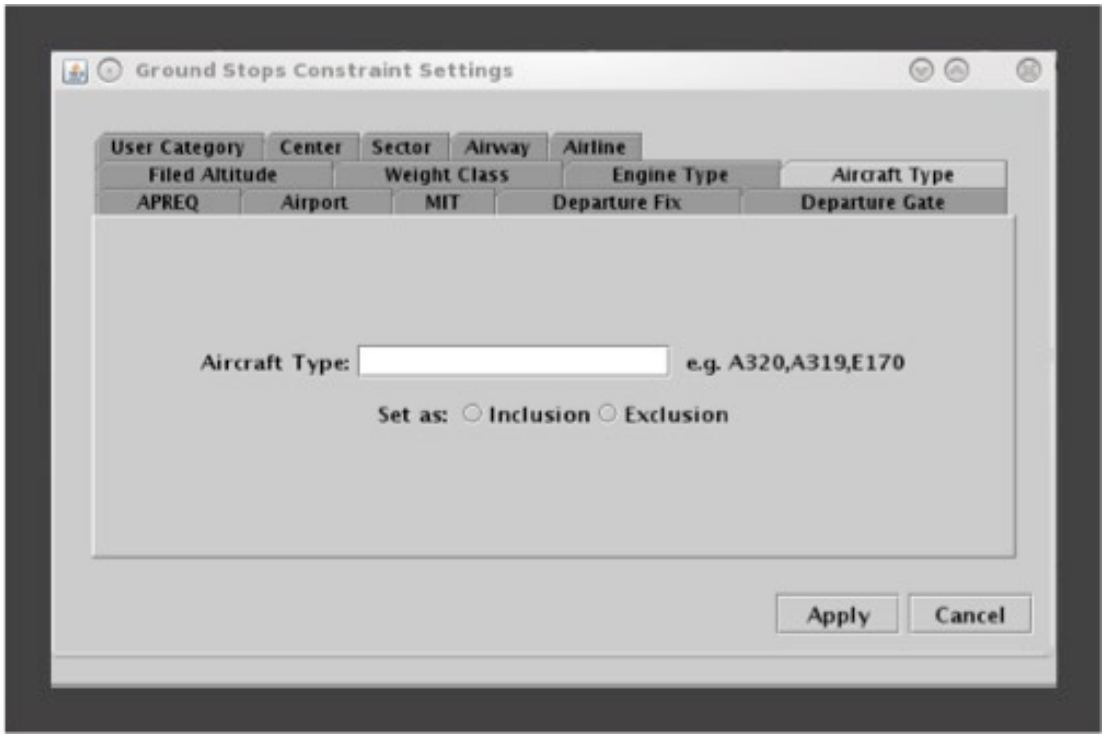


Figure 3.30. Constraint: Aircraft Type.

To remove an Aircraft Type constraint, delete any aircraft codes and select "Apply".

3.1.2.3 Constraint: User Category

The following types of TMI restrictions can be constrained by User Category.

- APREQ Schedule
- MIT Restriction
- Departure Fix Closure
- Ground Stop

To apply a User Category constraint, select from the following User Categories: Air Carrier, Freight Cargo Carrier, General Aviation, Military, Air Taxi, Lifeguard, Other, or Unknown (e.g., "Air Taxi" in Figure 3.31). More than one type can be selected at a time.

Select "Inclusion" to include flights matching this criteria in the TMI restriction or "Exclusion" to exclude flights from the TMI restriction. Then select "Apply" to return to the TMI restriction window or select a different tab to add another constraint.

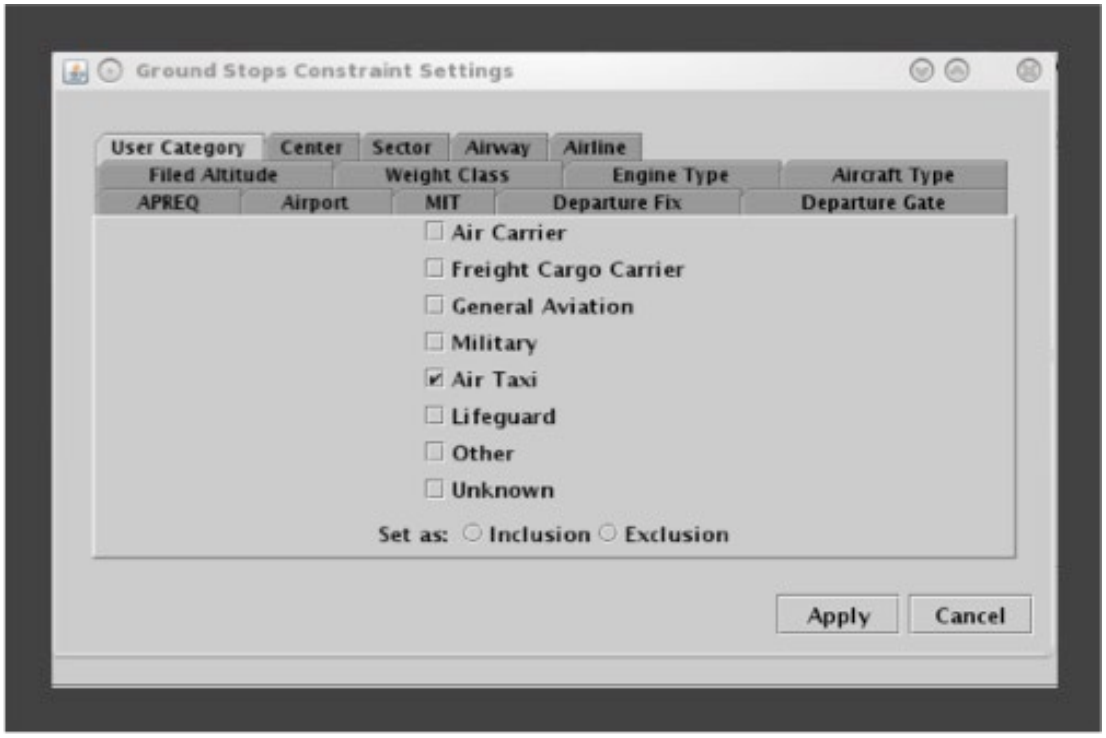


Figure 3.31. Constraint: User Category.

To remove a User Category constraint, uncheck any checked boxes and select “Apply”.

3.1.2.4 Constraint: Center

The following types of TMI restrictions can be constrained by Air Route Traffic Control Center (ARTCC; or Center).

- APREQ Schedule
- MIT Restriction
- Departure Fix Closure
- Ground Stop

To apply a Center constraint, enter the 3-letter code of the Center (e.g., ZDC) (Figure 3.32). To enter more than one Center, separate codes with a comma, but no space (e.g., “ZDC,ZTL”).

Select “Inclusion” to include flights matching this criteria in the TMI restriction or “Exclusion” to exclude flights from the TMI restriction. Then select “Apply” to return to the TMI-restriction window or select a different tab to add another constraint.

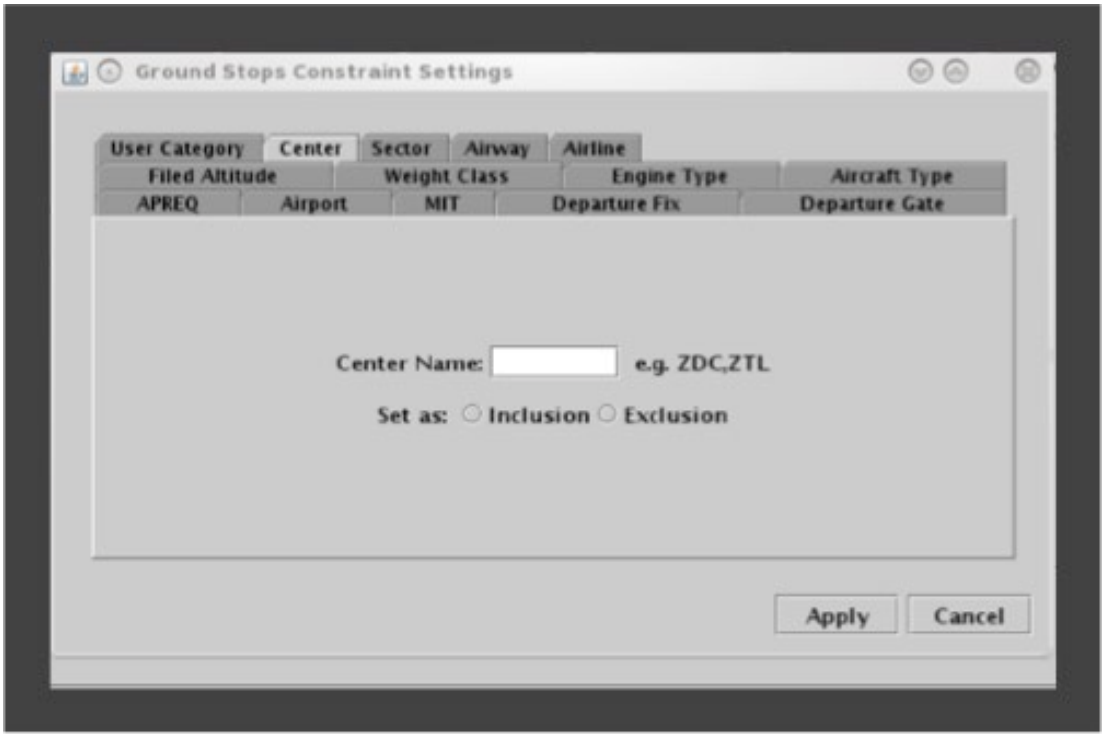


Figure 3.32. Constraint: Center.

To remove a Center constraint, delete any Center codes and select "Apply".

3.1.2.5 Constraint: Sector

The following types of TMI restrictions can be constrained by Sector.

- APREQ Schedule
- MIT Restriction
- Departure Fix Closure
- Ground Stop

To apply a Sector constraint, enter the Sector name in the form of the 3-letter code of the Center, plus the sector number (e.g., "ZTL30" for Sector 30 in Atlanta Center) (Figure 3.33). To enter more than one Sector, separate codes with a comma, but no space (e.g., "ZTL30,ZJX72").

Select "Inclusion" to include flights matching this criteria in the TMI restriction or "Exclusion" to exclude flights from the TMI restriction. Then select "Apply" to return to the TMI-restriction window or select a different tab to add another constraint.

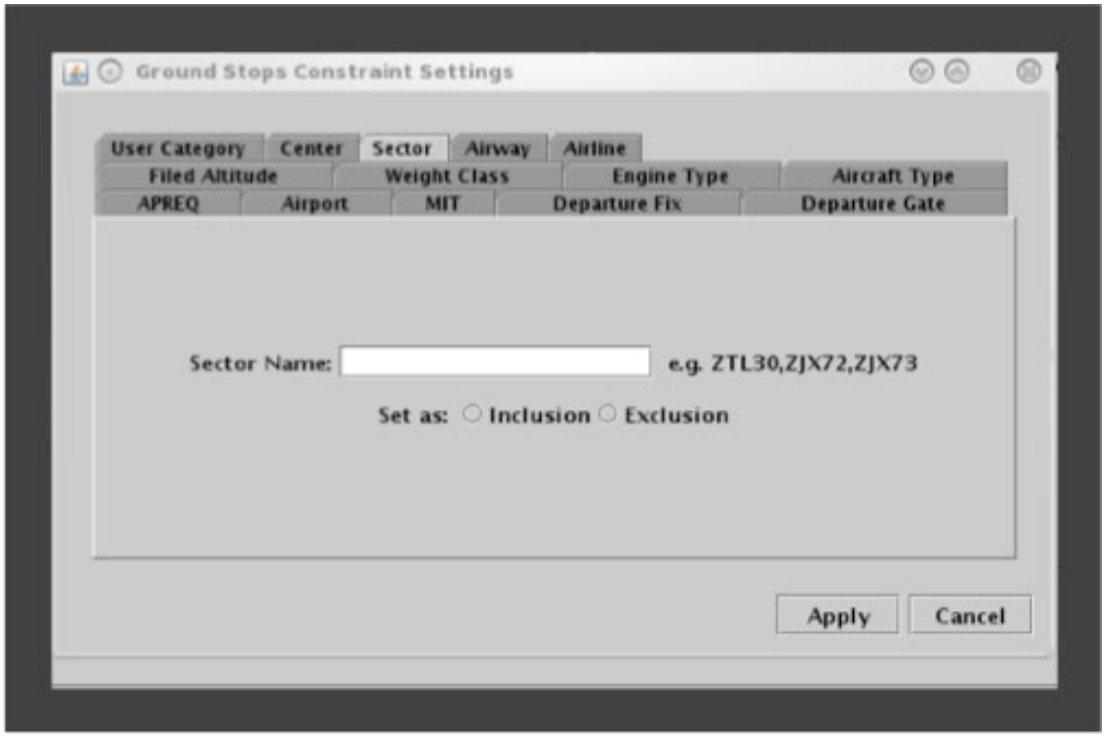


Figure 3.33. Constraint: Sector.

To remove a Sector constraint, delete any Sector codes and select "Apply".

3.1.2.6 Constraint: Airway

The following types of TMI restrictions can be constrained by Airway.

- APREQ Schedule
- MIT Restriction
- Departure Fix Closure
- Ground Stop

To apply an Airway constraint, enter the alphanumerical code of the airway (e.g., "J75) (Figure 3.34). To enter more than one airway, separate codes with a comma, but no space (e.g., "J75,J48").

Select "Inclusion" to include flights matching this criteria in the TMI restriction or "Exclusion" to exclude flights from the TMI restriction. Then select "Apply" to return to the TMI-restriction window or select a different tab to add another constraint.

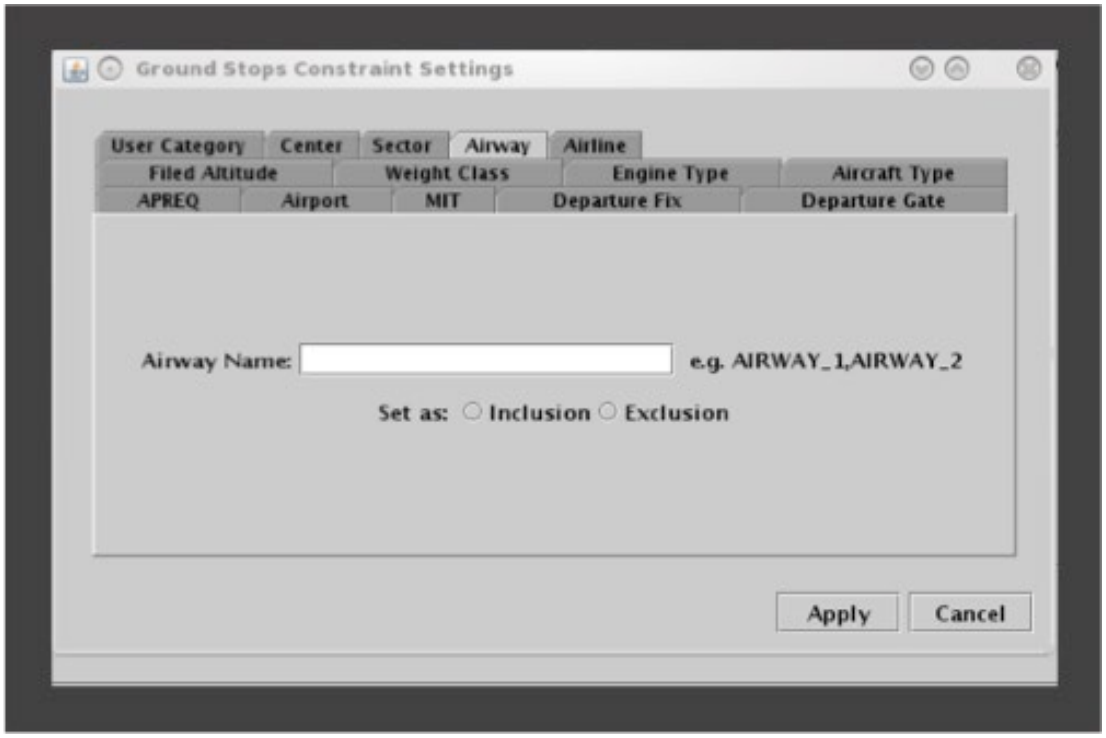


Figure 3.34. Constraint: Airway.

To remove an Airway constraint, delete any Airway codes and select "Apply".

3.1.2.7 Constraint: Airline

The following types of TMI restrictions can be constrained by Airline.

- APREQ Schedule
- MIT Restriction
- Departure Fix Closure
- Ground Stop

To apply an airline constraint, enter the 3-letter airline code (e.g., "AAL") (Figure 3.35). To enter more than one airline, separate codes with a comma, but no space (e.g., "AAL,UAL").

Select "Inclusion" to include flights matching this criteria in the TMI restriction or "Exclusion" to exclude flights from the TMI restriction. Then select "Apply" to return to the TMI-restriction window or select a different tab to add another constraint.

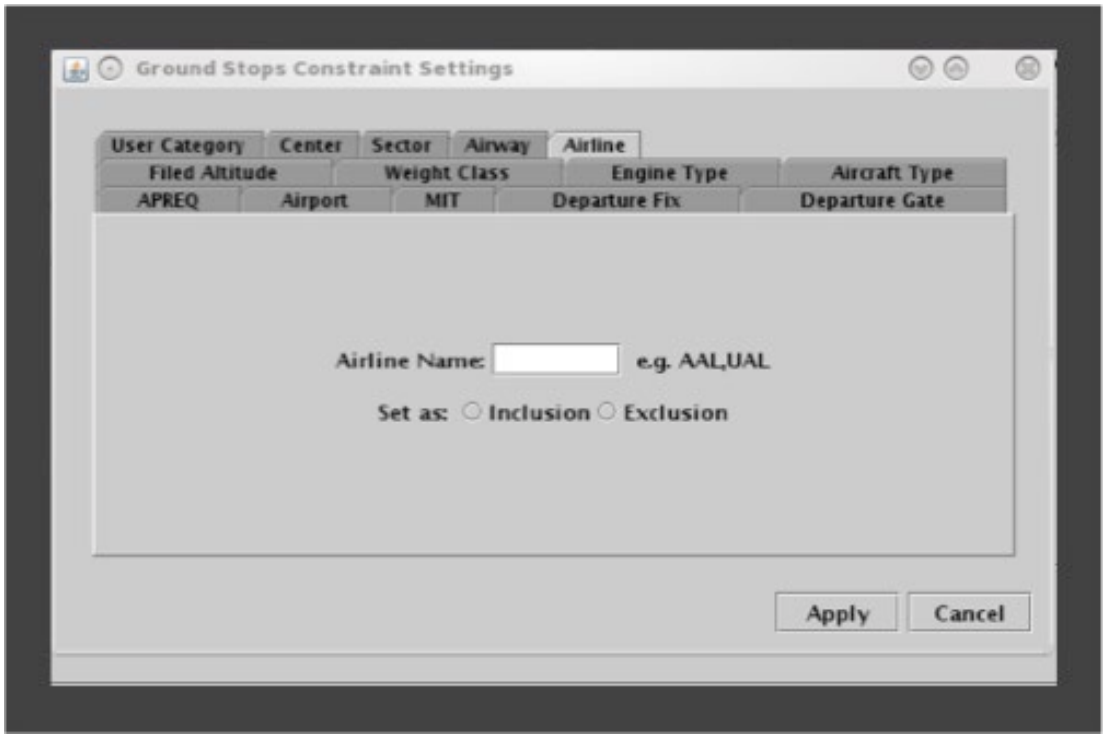


Figure 3.35. Constraint: Airline.

To remove an Airline constraint, delete any Airline codes and select "Apply".

3.1.2.8 Constraint: Airport

The following types of TMI restrictions can be constrained by departure Airport.

- APREQ Schedule
- MIT Restriction
- Departure Fix Closure
- Ground Stop

To apply a departure airport constraint, select from the list of airports (Figure 3.36). More than one airport can be selected at a time. To select all airports in the list, click on the "Select All" button.

Select "Inclusion" to include flights matching this criteria in the TMI restriction or "Exclusion" to exclude flights from the TMI restriction. Then select "Apply" to return to the TMI-restriction window or select a different tab to add another constraint.

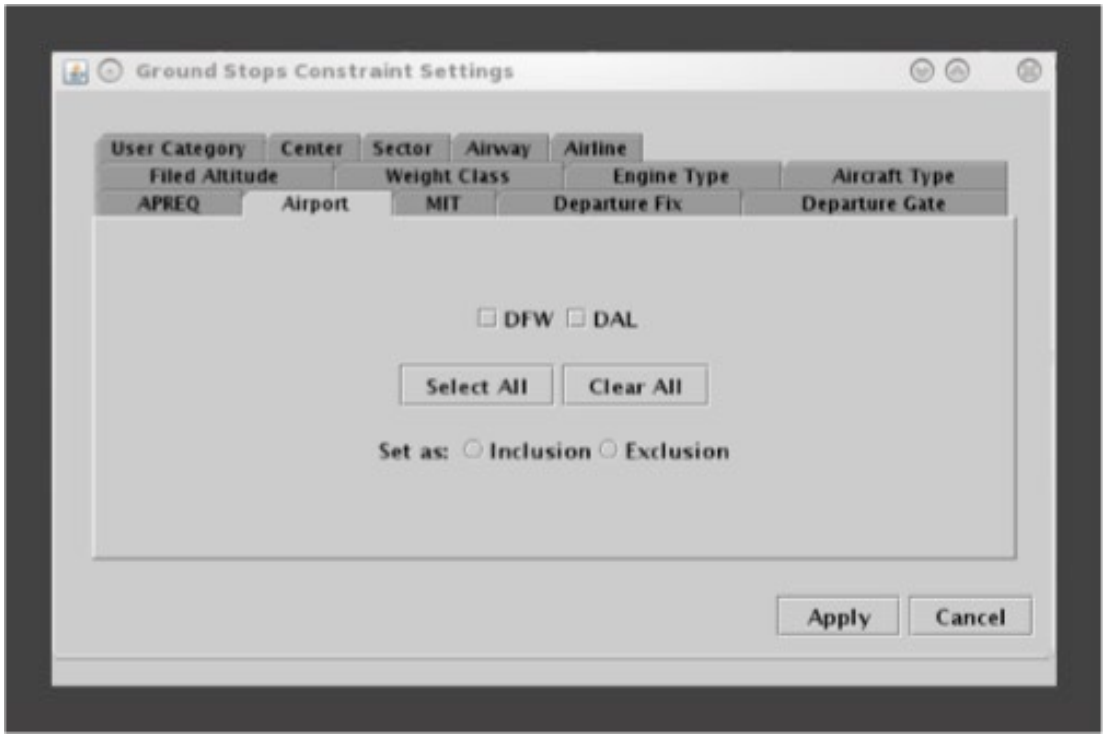


Figure 3.36. Constraint: Airport.

To remove a departure Airport constraint, uncheck any checked boxes and select "Apply".

3.1.2.9 Constraint: Filed Altitude

The following types of TMI restrictions can be constrained by Filed Altitude.

- APREQ Schedule
- MIT Restriction
- Departure Fix Closure
- Ground Stop

To apply a filed altitude constraint, select "At Or Above" or "At Or Below" to specify the range for the altitude constraint (Figure 3.37). Next, enter a 3-digit flight level altitude into the text box. The 3-digit format for altitudes is the abbreviated form of a 5-digit altitude (e.g., "230" is an abbreviation of "23,000 ft").

Select "Inclusion" to include flights matching this criteria in the TMI restriction or "Exclusion" to exclude flights from the TMI restriction. Then select "Apply" to return to the TMI-restriction window or select a different tab to add another constraint.

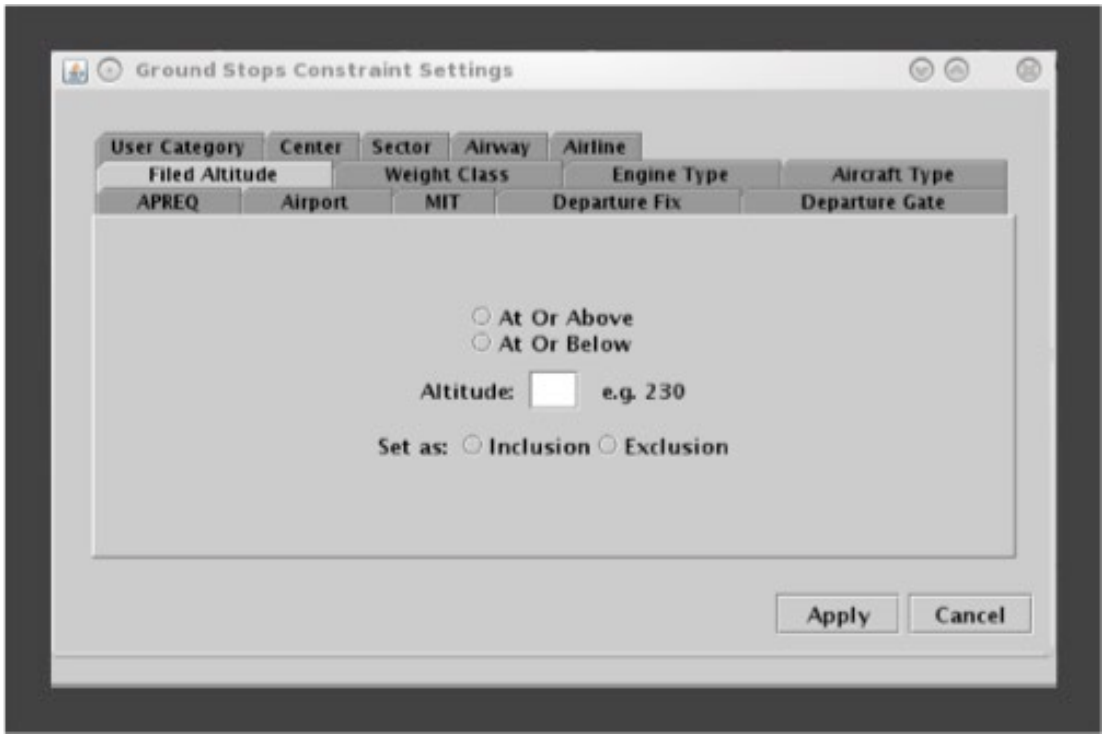


Figure 3.37. Constraint: Filed Altitude.

To remove a Filed Altitude constraint, delete the 3-digit altitude and select "Apply".

3.1.2.10 Constraint: Weight Class

The following types of TMI restrictions can be constrained by aircraft Weight Class.

- APREQ Schedule
- MIT Restriction
- Departure Fix Closure
- Ground Stop

To apply a weight class constraint, select from the following aircraft weight classes: A, B, C, D, E, or F (Figure 3.38). More than one class can be selected at a time.

Select "Inclusion" to include flights matching this criteria in the TMI restriction or "Exclusion" to exclude flights from the TMI restriction. Then select "Apply" to return to the TMI-restriction window or select a different tab to add another constraint.

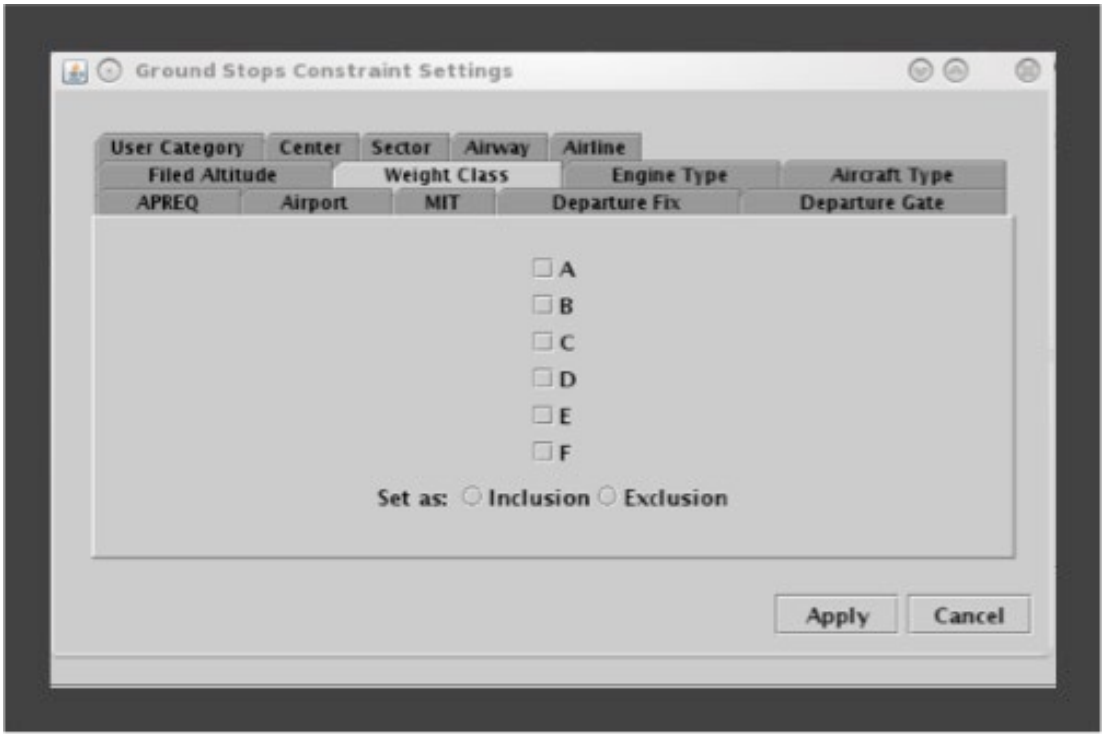


Figure 3.38. Constraint: Weight Class.

To remove an aircraft Weight Class constraint, uncheck any checked boxes and select "Apply".

3.1.2.11 Constraint: Miles-in-Trail (MIT)

The following types of TMI restrictions can be constrained by MIT restrictions.

- APREQ Schedule
- Departure Fix Closure
- Ground Stop

To apply a MIT constraint, select "MIT" (Figure 3.39).

Select "Inclusion" to include flights matching this criteria in the TMI restriction or "Exclusion" to exclude flights from the TMI restriction. Then select "Apply" to return to the TMI-restriction window or select a different tab to add another constraint.

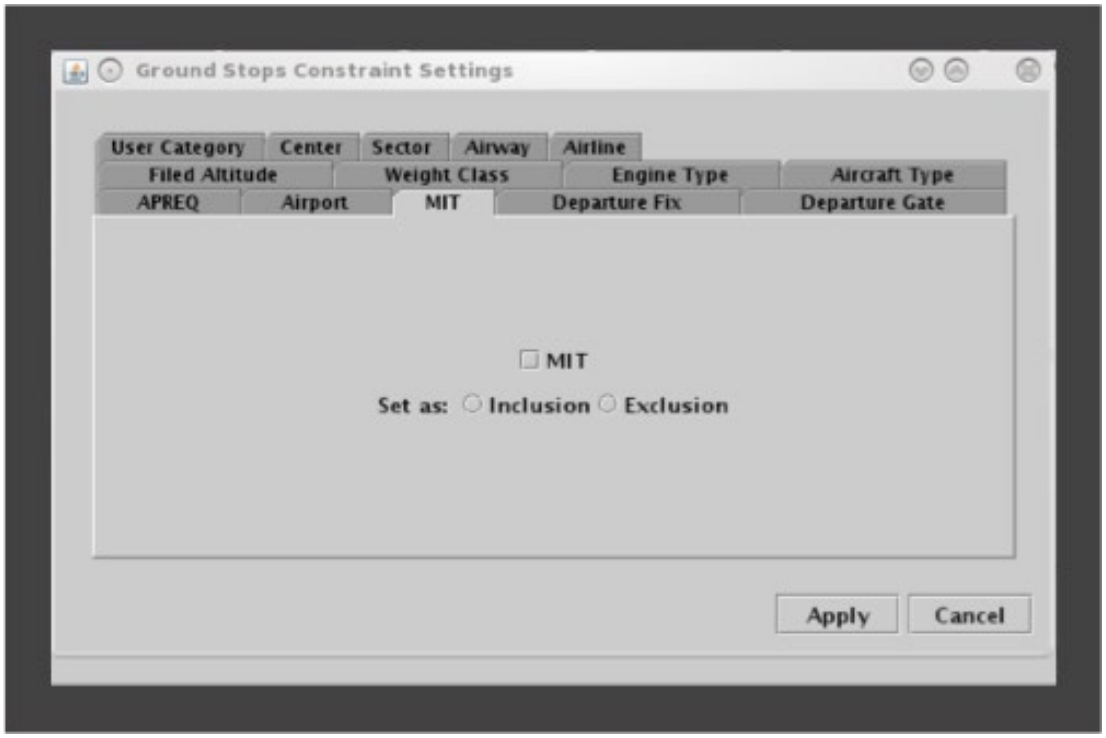


Figure 3.39. Constraint: Miles-in-Trail (MIT).

To remove a MIT constraint, uncheck the box and select "Apply".

3.1.2.12 Constraint: Departure Fix

The following types of TMI restrictions can be constrained by Departure Fix.

- APREQ Schedule
- Ground Stop

To apply a Departure Fix constraint, enter the fix name (Figure 3.40). To enter more than one fix, separate names with a comma, but no space (e.g., JOJJO,ICONS). Alternatively, select from the list of departure fixes. More than one fix can be selected at a time. To select all fixes in the list, click on the "Select All" button.

Select "Inclusion" to include flights matching this criteria in the TMI restriction or "Exclusion" to exclude flights from the TMI restriction. Then select "Apply" to return to the TMI-restriction window or select a different tab to add another constraint.

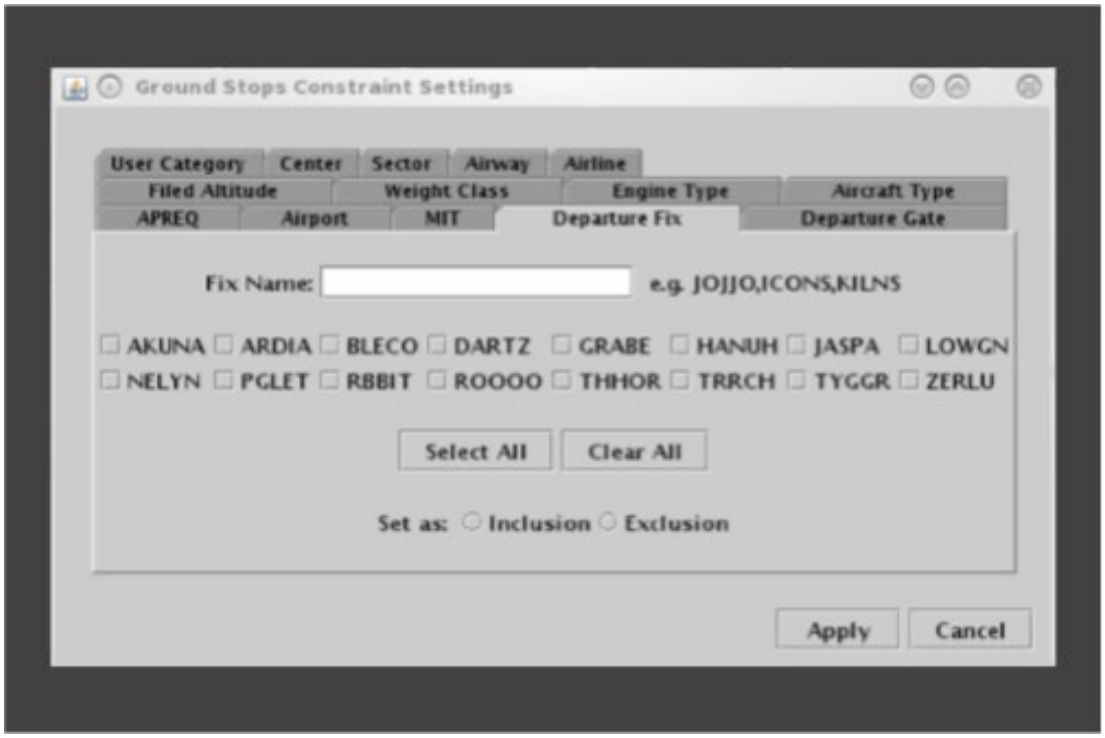


Figure 3.40. Constraint: Departure Fix.

To remove a Departure Fix constraint, delete any Fix names and uncheck any checked boxes and select “Apply”.

3.1.2.13 Constraint: Departure Gate

The following types of TMI restrictions can be constrained by Departure Gate.

- APREQ Schedule
- Ground Stop

To apply a Departure Gate constraint, select from the list of Departure Gates: East, North, South, or West (Figure 3.41). More than one gate can be selected at a time. To select all gates in the list, click on the “Select All” button.

Select “Inclusion” to include flights matching this criteria in the TMI restriction or “Exclusion” to exclude flights from the TMI restriction. Then select “Apply” to return to the TMI-restriction window or select a different tab to add another constraint.

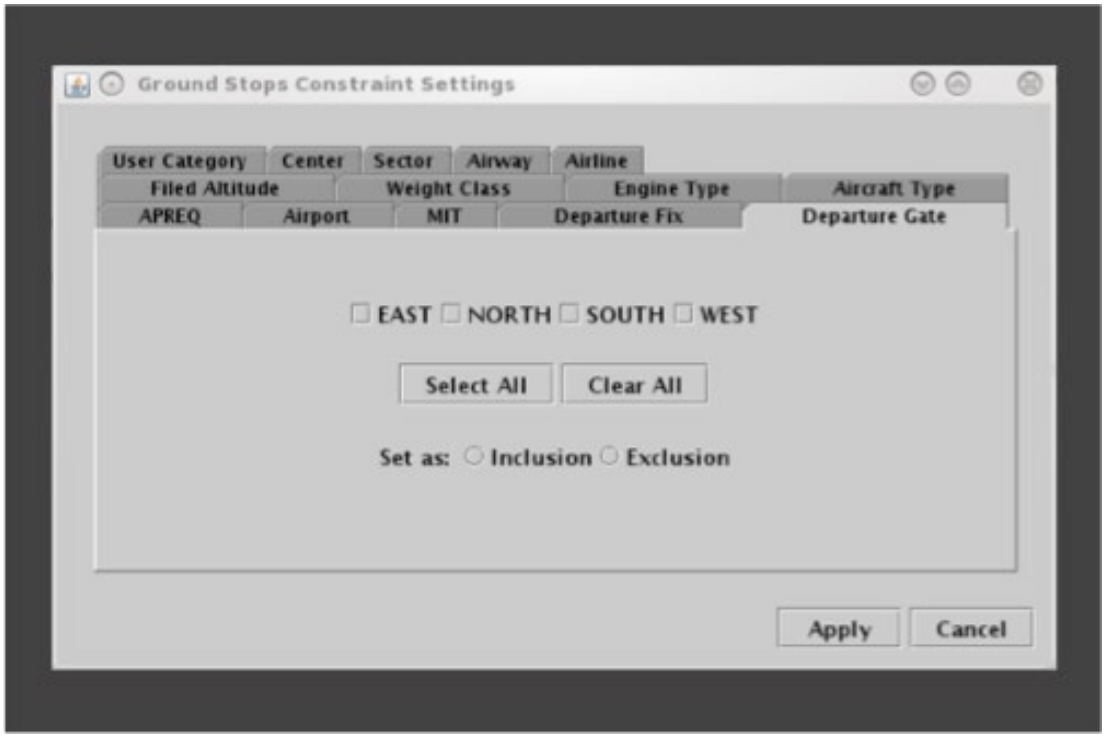


Figure 3.41. Constraint: Departure Gate.

To remove a Departure Gate constraint, uncheck any checked boxes and select "Apply".

3.1.2.14 Constraint: APREQ

The following types of TMI restrictions can be constrained by APREQ.

- MIT Restriction
- Departure Fix Closure
- Ground Stop

To apply an APREQ constraint, select "APREQ" (Figure 3.42).

Select "Inclusion" to include flights matching this criteria in the TMI restriction or "Exclusion" to exclude flights from the TMI restriction. Then select "Apply" to return to the TMI-restriction window or select a different tab to add another constraint.

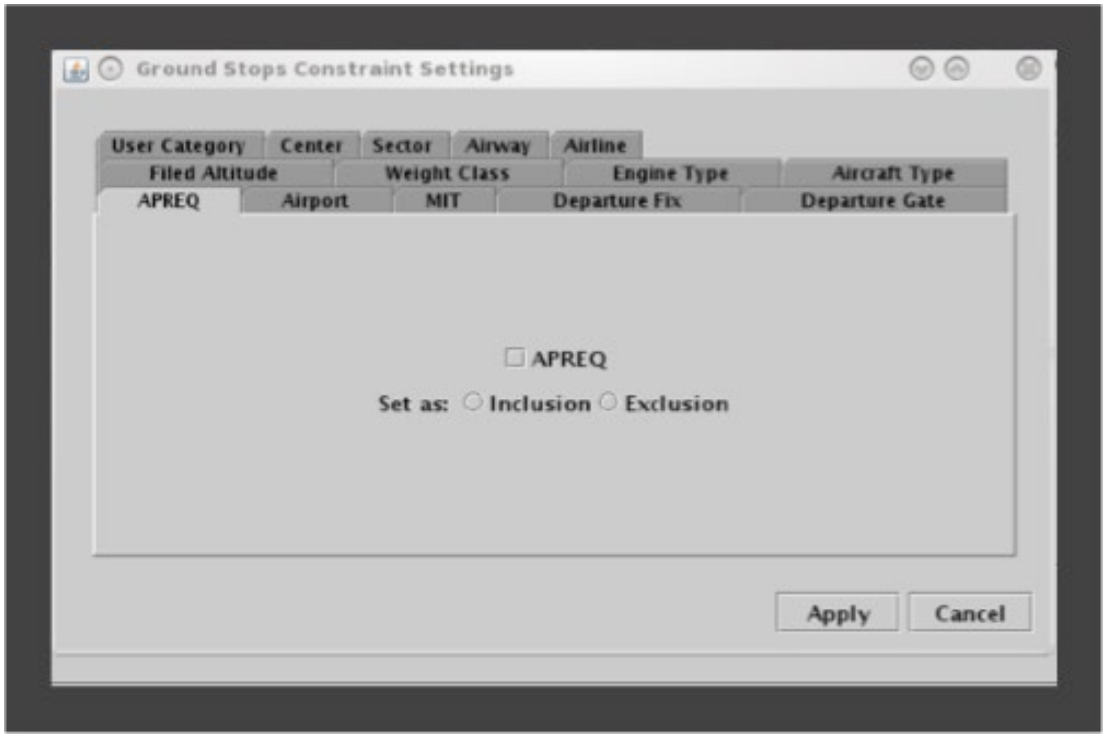


Figure 3.42. Constraint: APREQ.

To remove an APREQ constraint, uncheck the box and select "Apply".

3.1.2.15 Constraint: Destination

The following types of TMI restrictions can be constrained by the Destination airport.

- MIT Restriction
- Departure Fix Closure

To apply a destination airport constraint, enter the 3-letter destination code (Figure 3.43). To enter more than one airport, separate airport codes with a comma, but no space (e.g., "DFW,LGA,BOS" in Figure 3.43). Alternatively, select from the list of destination airports. More than one airport can be selected at a time. To select all airports in the list, click on the "Select All" button.

Select "Inclusion" to include flights matching this criteria in the TMI restriction or "Exclusion" to exclude flights from the TMI restriction. Then select "Apply" to return to the TMI-restriction window or select a different tab to add another constraint.

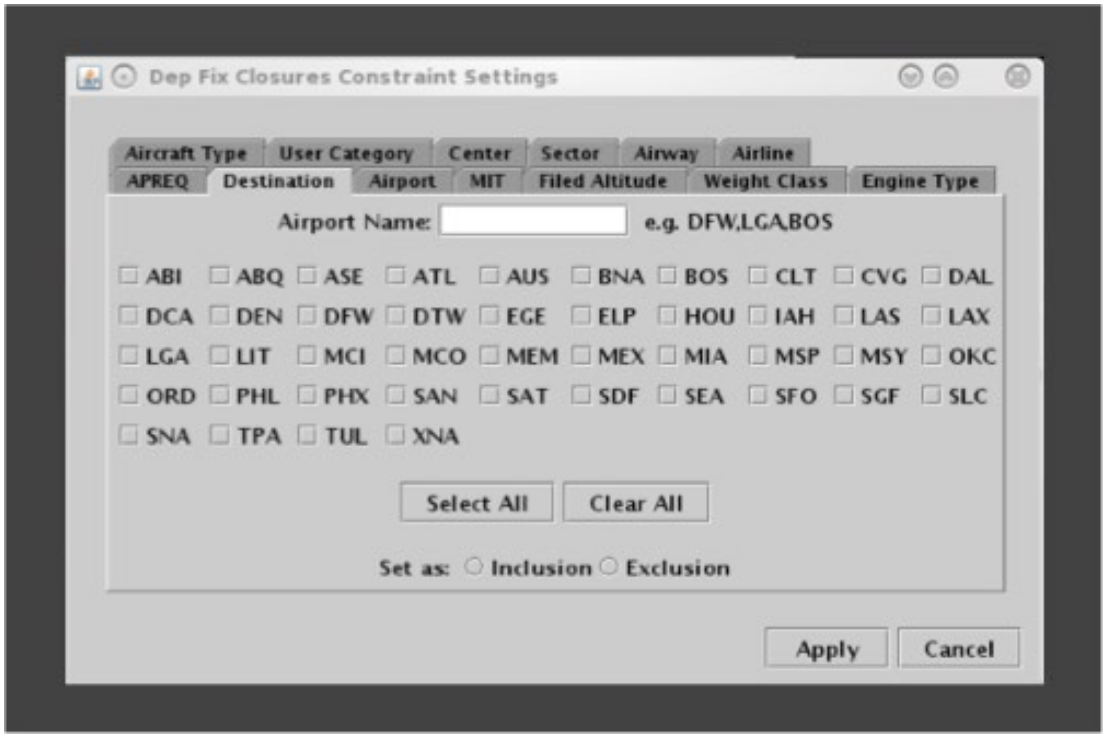


Figure 3.43. Constraint: Destination.

To remove a Destination airport constraint, delete any Airport names and uncheck any checked boxes and select “Apply”.

3.1.3 Airport-Specific Restrictions

Airport-specific restrictions can be entered, modified, or removed using the TM Actions panel.

3.1.3.1 TM Actions Panel: Runway Utilization Tab

Use the TM Actions panel to apply an airport configuration and runway utilization change and define a start time.

To change an Airport Configuration or Runway Utilization:

Step 1: Select "Change Runway Utilization" from the "TM Actions" menu to open the "Runway Utilization" tab (Figure 3.44).

Step 2: Select a meteorological condition: VMC or IMC (e.g., "VMC" in Figure 3.45).

Step 3: Select a configuration from the "Configuration" dropdown menu (Figure 3.45).

Step 4: Select a runway utilization option from the "Runway Utilization" dropdown menu (Figure 3.45).

Step 5: If the change is starting in the future, uncheck "Start Now" and enter a time in the "Start at" text box in the (*dd/hhmm*) format.

Note: If the time crosses over 0000, the date must be changed. For example, if the current date is the 27th of the month, but the APREQ is not scheduled to end until after midnight, enter "28" for the 28th of the month in the "End Time" field.

Step 6: Select the "Add" button.

Note: The Airport Configuration and Runway Utilization are displayed in the Runway Utilization table. The selected Runway Utilization is displayed in the "Scenario" column (Figure 3.46).

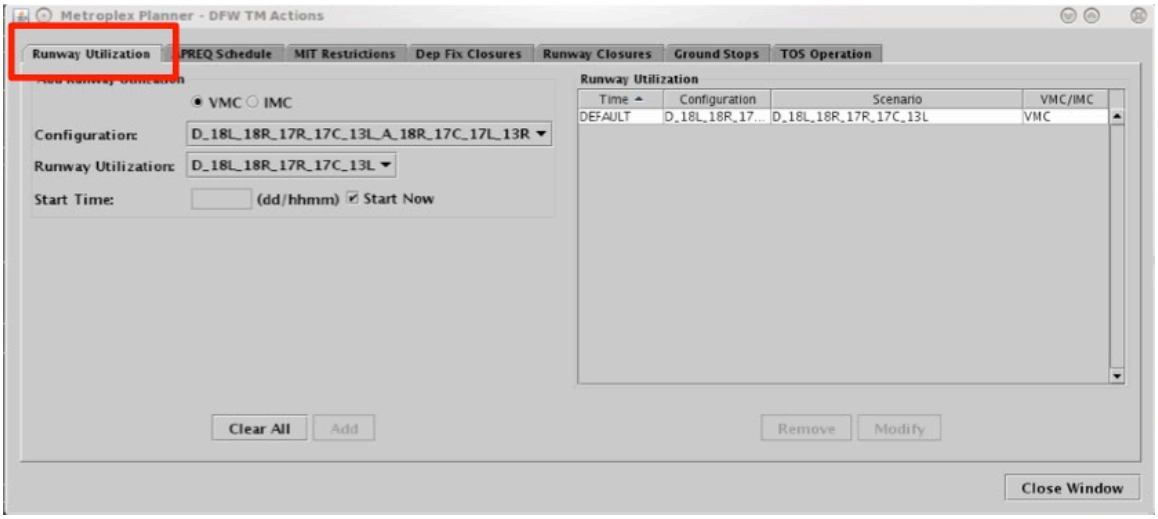


Figure 3.44. TM Actions panel: Runway Utilization tab.

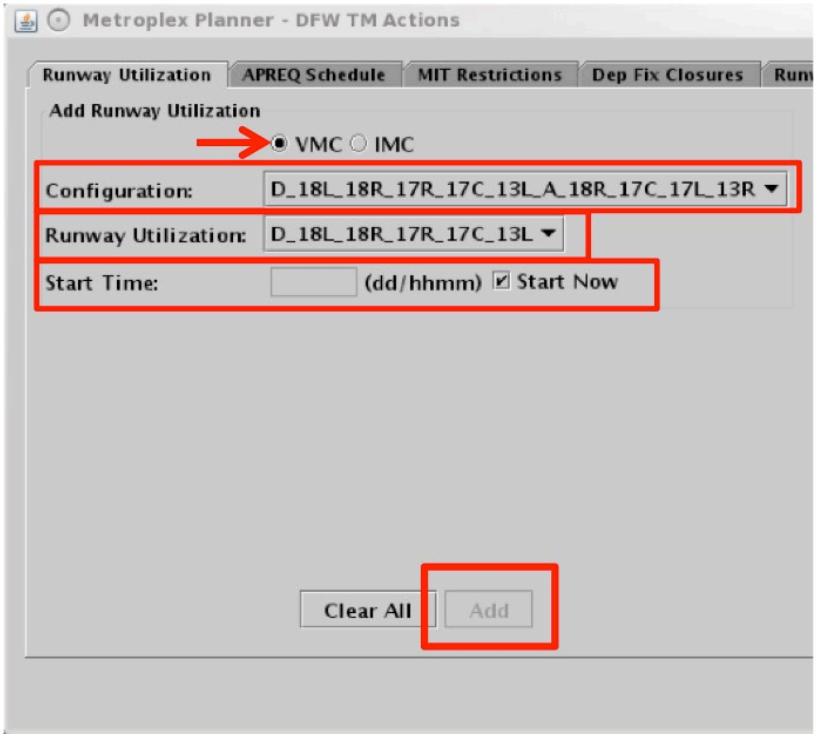


Figure 3.45. Runway Utilization tab: Select a Runway Utilization (options vary by airport).

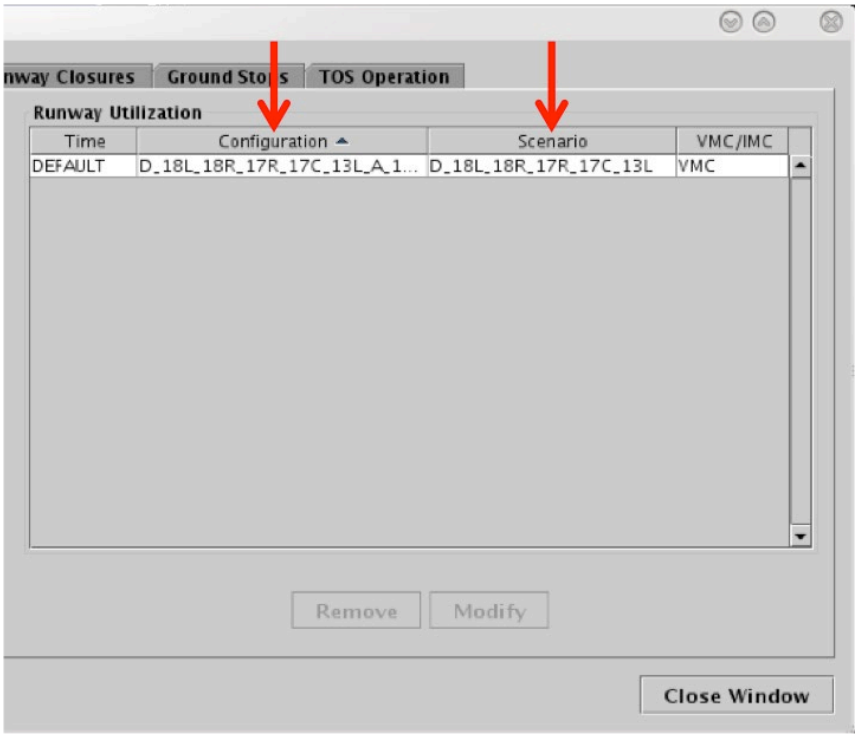


Figure 3.46. Runway Utilization tab: Runway Utilization table. (Note: Runway Utilization is displayed in the "Scenario" column.)

If an airport configuration change is scheduled, "CC" (i.e., Configuration Change) will be displayed on the Timeline at the scheduled start time (i.e., either the "Now" time or a future time). A new notification will be displayed for an airport configuration and runway utilization change.

To replace the Runway Utilization *currently in effect:*

Step 1: Select the Runway Utilization from the Runway Utilization table.

Note: The Runway Utilization currently in effect cannot be modified using the "Modify" button. Replace the current Runway Utilization by creating a new Runway Utilization by following these steps:

Step 2: Select a meteorological condition: VMC or IMC.

Step 3: Select a configuration from the "Configuration" dropdown menu.

Step 4: Select a runway utilization option from the "Runway Utilization" dropdown menu.

Step 5: Check "Start Now".

Step 6: Select "Add" to replace the current Runway Utilization.

To modify a Runway Utilization *scheduled to take effect in the future:*

Step 1: Select the Runway Utilization from the Runway Utilization table (e.g., Figure 3.47).

Step 2: Select "Modify" to change the details of the Runway Utilization (Figure 3.47).

Note: For a Runway Utilization scheduled to take effect in the future, the following can be modified: Meteorological Condition, Runway Utilization, and Start Time.

However, to change the Airport Configuration, the scheduled Runway Utilization must be removed and a new one created.

Step 3: When changes are complete, select "Update".

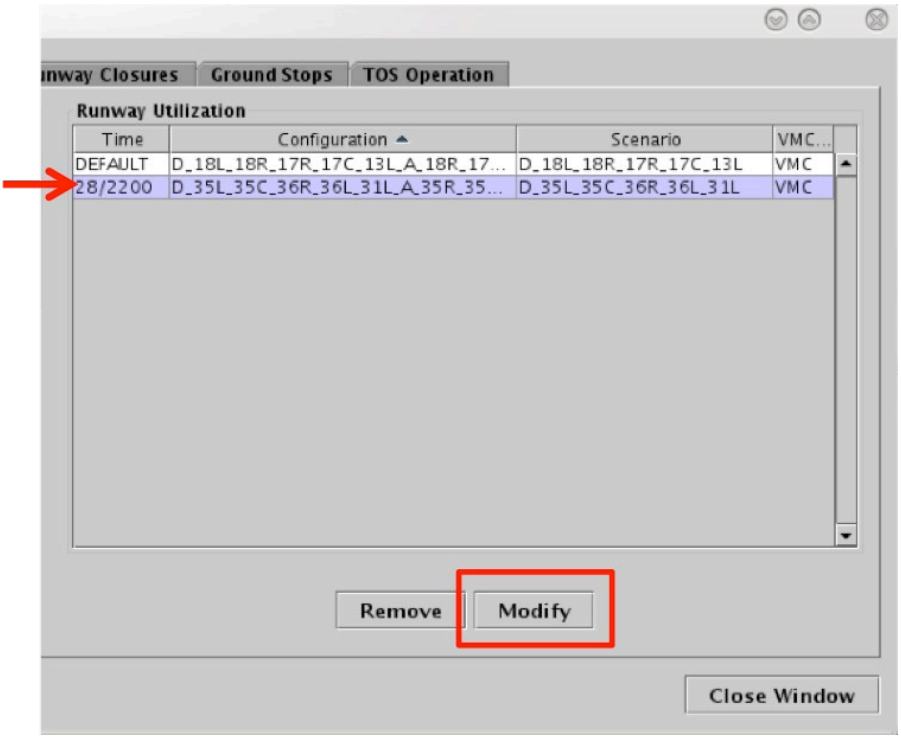


Figure 3.47. Runway Utilization tab: Runway Utilization table.

To remove a Runway Utilization *scheduled to take effect in the future:*

Step 1: Select the Runway Utilization from the Runway Utilization table (e.g., Figure 3.48).

Step 2: Select "Remove" (Figure 3.48).

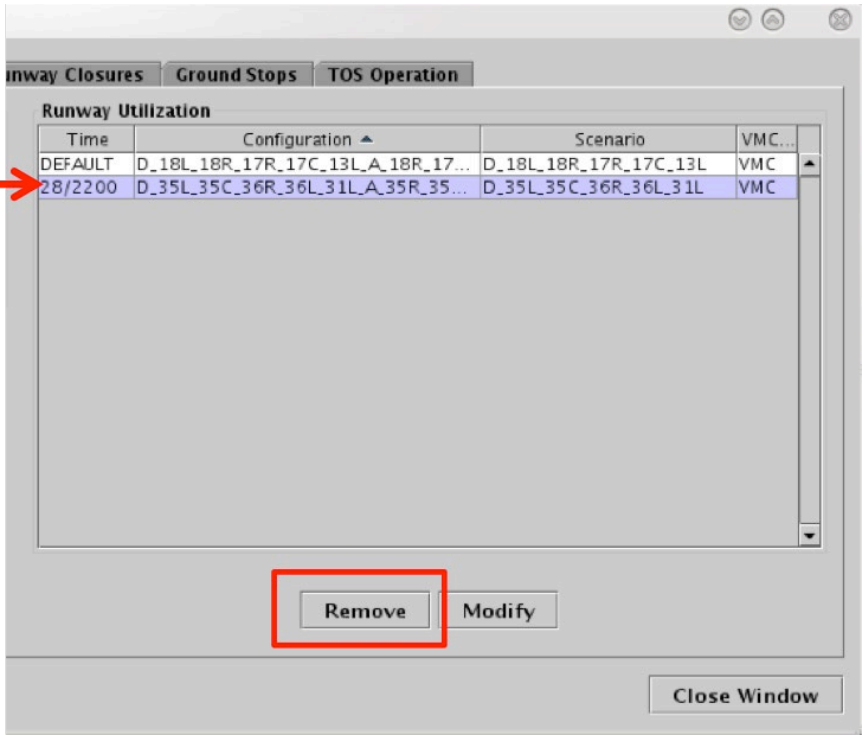


Figure 3.48. "Runway Utilization" tab: Runway Utilization table.

3.1.3.2 TM Actions Panel: Runway Closures Tab

Use the TM Actions panel to apply a Runway Closure at an airport.

To apply a Runway Closure:

Step 1: Select "Runway Closure" from the "TM Actions" menu to open the "Runway Closures" tab (Figure 3.49).

Step 2: Select a Runway from the dropdown menu (e.g., "17R/35L" in Figure 3.50).

Step 3: If the change starts in the future, uncheck "Start Now" and enter a time in the "Start at" text box in the (*dd/hhmm*) format.

Note: If the time crosses over 0000, the date must be changed. For example, if the current date is the 27th of the month, but the APREQ is not scheduled to end until after midnight, enter "28" for the 28th of the month in the "End Time" field.

Step 6: Select the "Add" button to apply the Runway Closure (Figure 3.50, Figure 3.51).

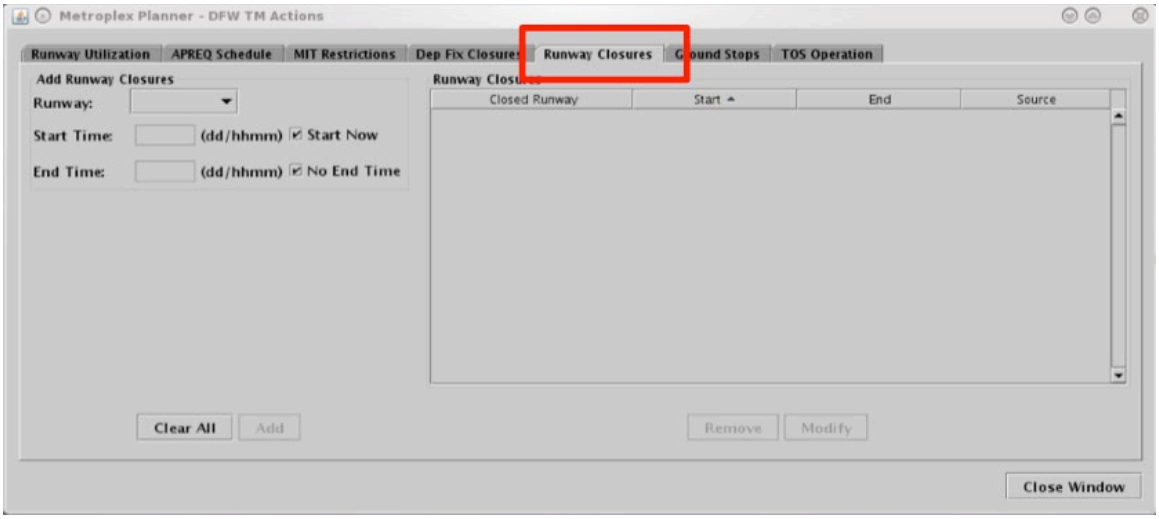


Figure 3.49. TM Actions panel: Runway Closures tab.

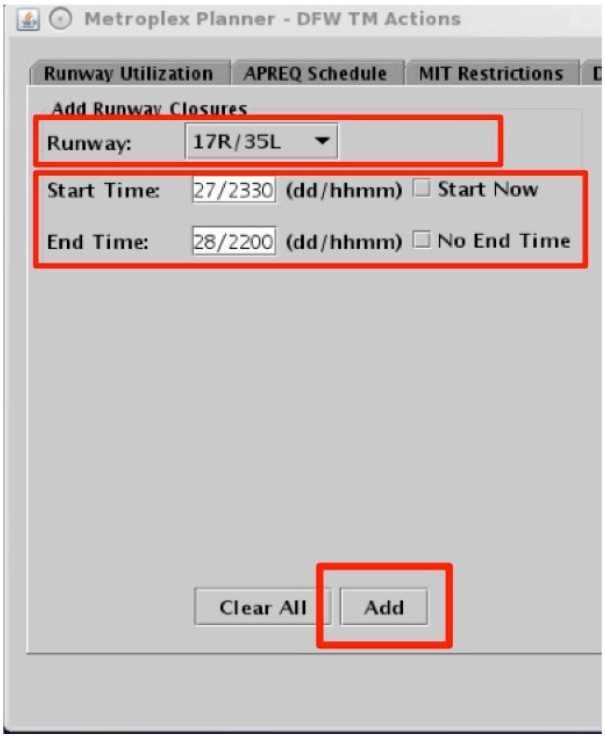


Figure 3.50. Runway Closures tab: Select a runway (options vary by airport).

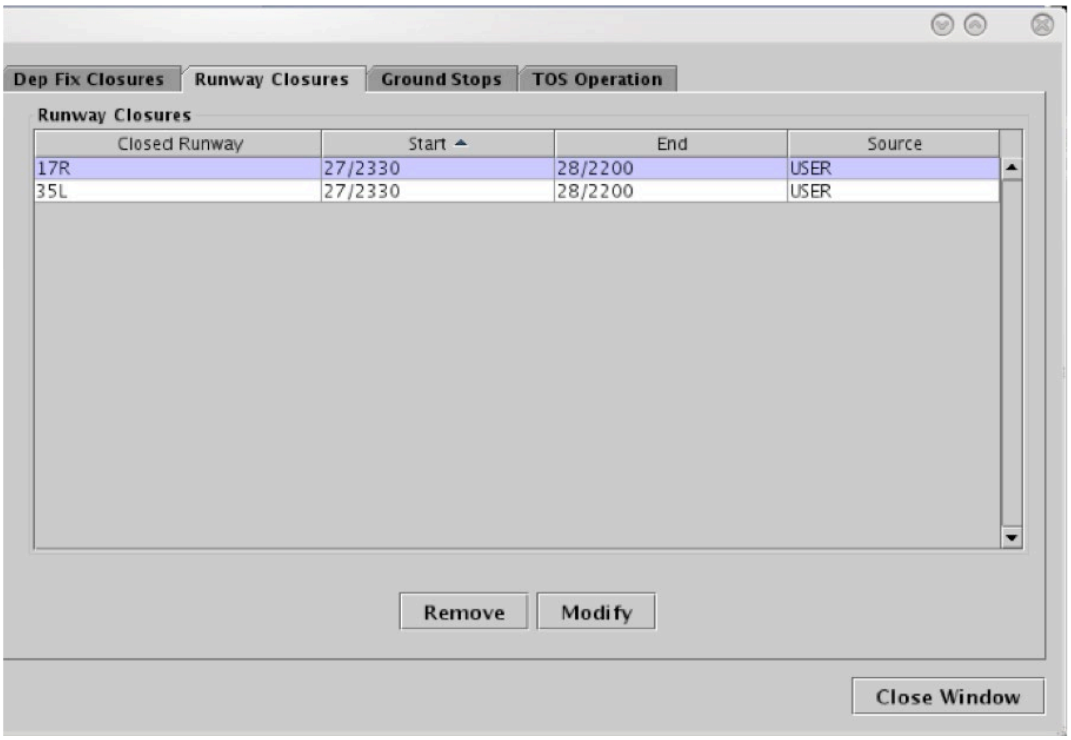


Figure 3.51. Runway Closures tab: Runway Closures table.

Runway closures are indicated on maps, tables, timelines, and in notifications. On a map, the closed runway is displayed in red with a white "X" at each end. Departure flights are reassigned to an available runway departure runway and the change is reflected in their timeline datablocks. Arrival flights are dependent upon TRACON scratchpad entries for runway assignments and will not move to a new runway in the ATD-2 systems until the change is made at the TRACON. A new notification is displayed for each runway direction (i.e., a notification for 17R and another notification for 35L).

To modify a Runway Closure:

Step 1: Select the Runway Closure from the Runway Closures table (e.g., "17R/35L" in Figure 3.52).

Step 2: Select "Modify" to change the details of the Runway Closure (e.g., Figure 3.52).

Note: The Runway selection cannot be modified.

Note: Start Time can only be modified for Runway Closures that are scheduled to take effect in the future.

Step 3: When changes are complete, select "Update".

Note: Changes apply to both directions of a single runway.

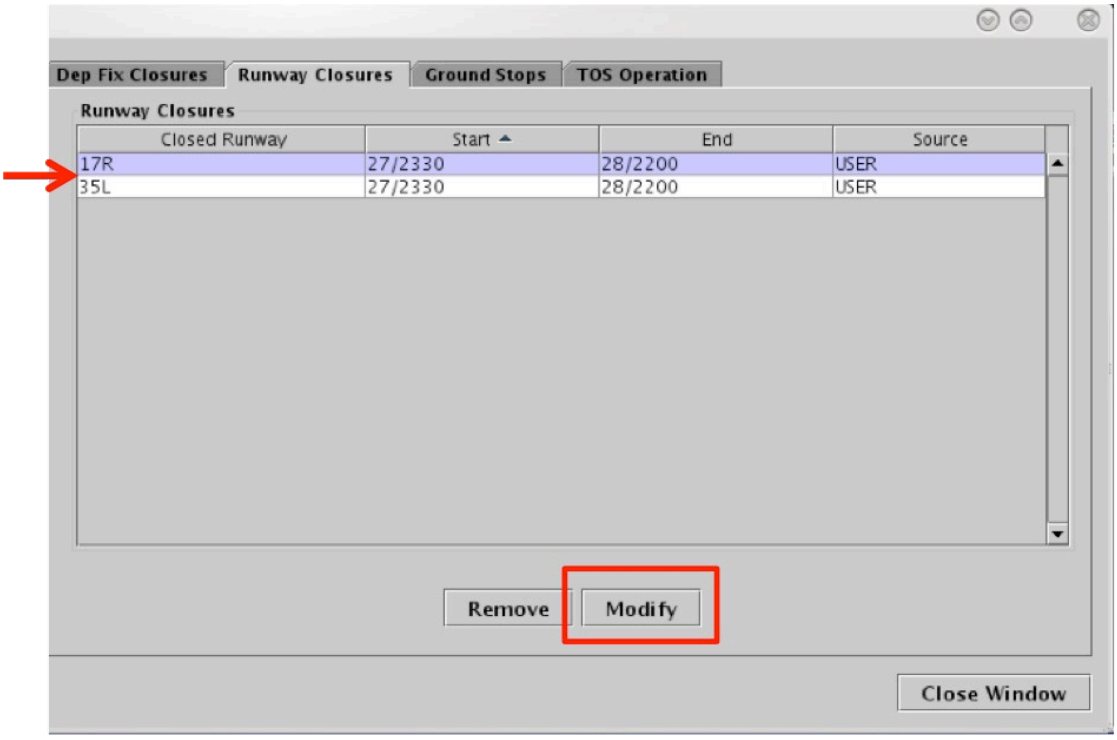


Figure 3.52. Runway Closures tab: Runway Closures table.

To remove a Runway Closure:

Step 1: Select the Runway Closure from the Runway Closures table (e.g., "17R/35L" in Figure 3.53).

Step 2: Select "Remove" (Figure 3.53).

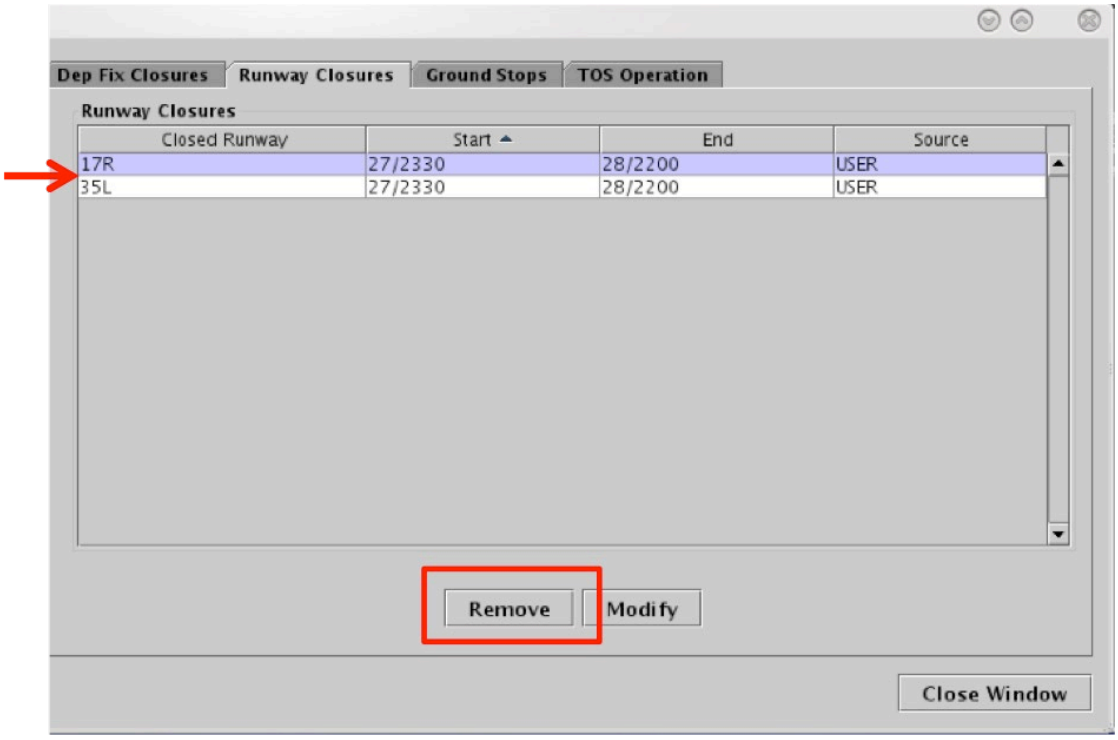


Figure 3.53. Runway Closures tab: Runway Closures table.

3.2 Toolbar: Create

Maps, tables, and timelines can be created using the "Create" function on the Toolbar (Figure 3.54).

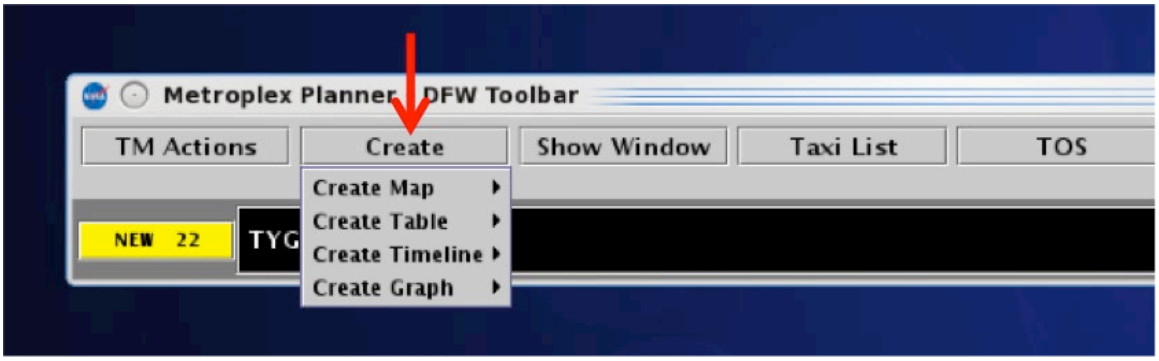


Figure 3.54. Create Menu: Map, Table, and Timeline.

3.2.1 Map

Select "Create Map" to select an airport map. Default settings for newly created maps include:

- Zoom level: Airport Movement Area (AMA) and Ramp area
- Color Scheme: Arrival/Departure
- Datablock Display: ID Only Datablock
- Spacing Between Distance Markers: 10 nmi

Note, the airport map may not display departure/arrival flights on the surface (Figure 3.55).

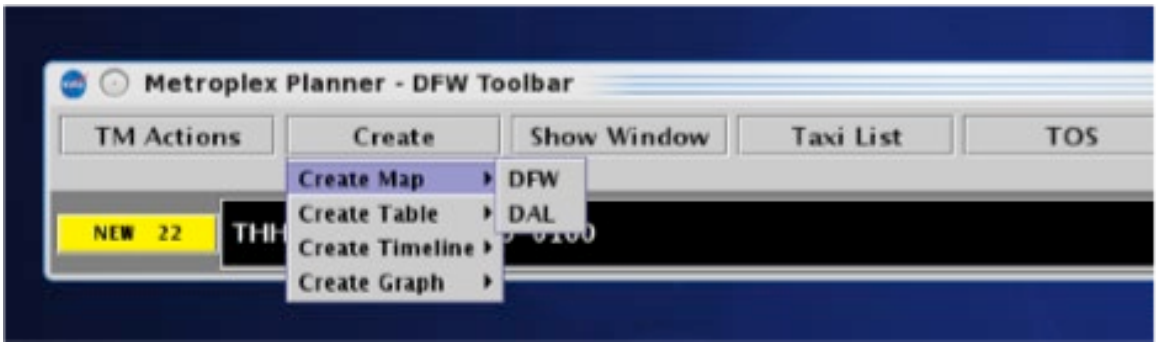


Figure 3.55. Create Map: Select Airport.

3.2.2 Table

Select "Create Table" to choose from Flights Table, Aircraft Table, or Departure Fix Status Table. If a table configuration has been saved for quick-create, the saved configuration is listed in this menu (e.g., "Tower_1" in Figure 3.56).

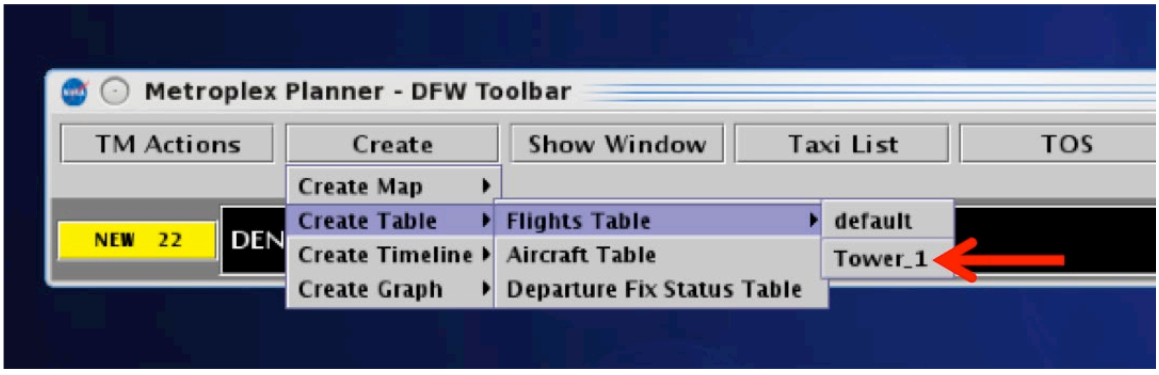


Figure 3.56. Create Table: Saved Flights Table configurations (e.g., "Tower_1").

3.2.3 Timeline

Select "Create Timeline" and select the timeline's reference point: Runway, Arr/Dep Fix, Parking Gate, or Spot. Default settings for a newly created timeline include:

- Filter: arrival flights for left side and departure flights for right side.

- Color Scheme: Arrival/Departure.
- Begin At time: 0 minutes; End At time: 30 minutes.

If a timeline configuration has been saved for quick-create, the saved configuration is listed in this menu (e.g., “Tower_ABC” in Figure 3.57). Saved timeline configurations are listed by their reference point (e.g., “Runway” in Figure 3.57). If a Flight Demand window has been created on another timeline, it will also be displayed on newly created timelines.

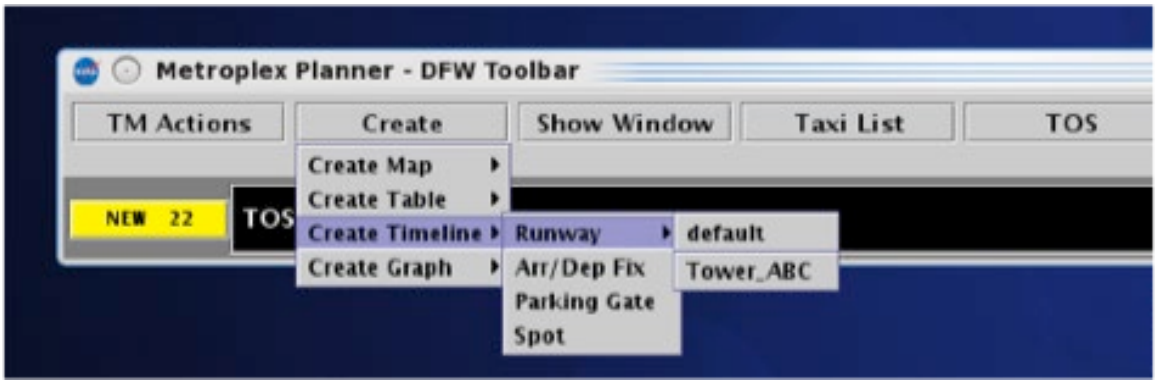


Figure 3.57. Create Timeline: Saved timeline configurations (e.g., “Tower_ABC”).

3.3 Toolbar: Show Window

To bring an open map, table, or timeline window to the front of the display, on top of the other open windows, select “Show Window” (Figure 3.58).

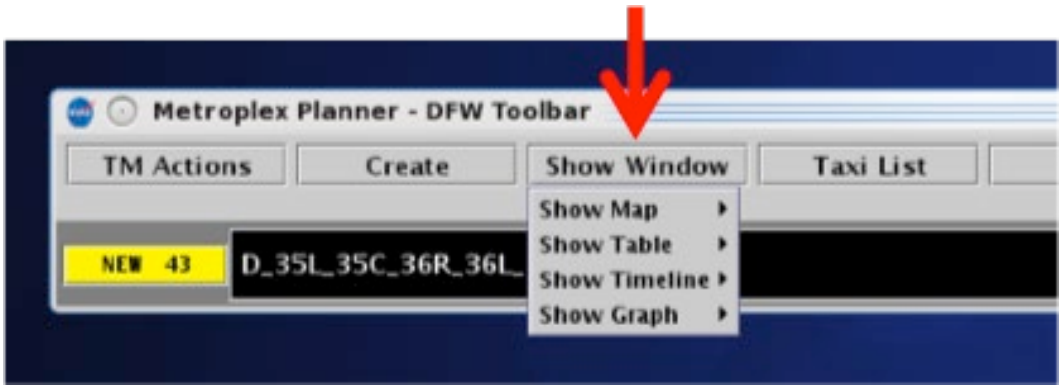


Figure 3.58. Show Window: Map, Table, or Timeline.

3.4 Toolbar: Taxi List

Select “Taxi List” to display a list of departure flights for each selected runway (Figure 3.59).

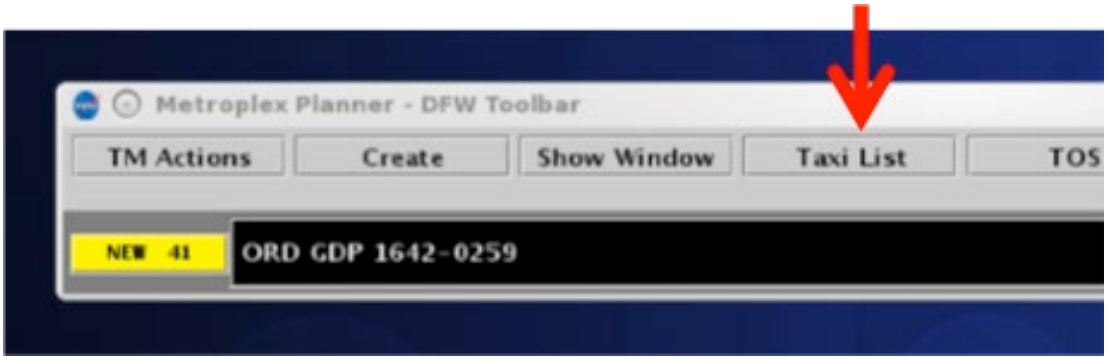


Figure 3.59. Show Window: Map, Table, or Timeline.

Each runway list includes the call sign, AMA time, departure fix, and destination. The "AMA Time" column is color coded to represent minutes of delay currently predicted for that flight (Figure 3.60 and Figure 3.61). A color-coded AMA Time Legend is also displayed.

Figure 3.60. Taxi List with flights color coded for AMA time (delay in minutes).

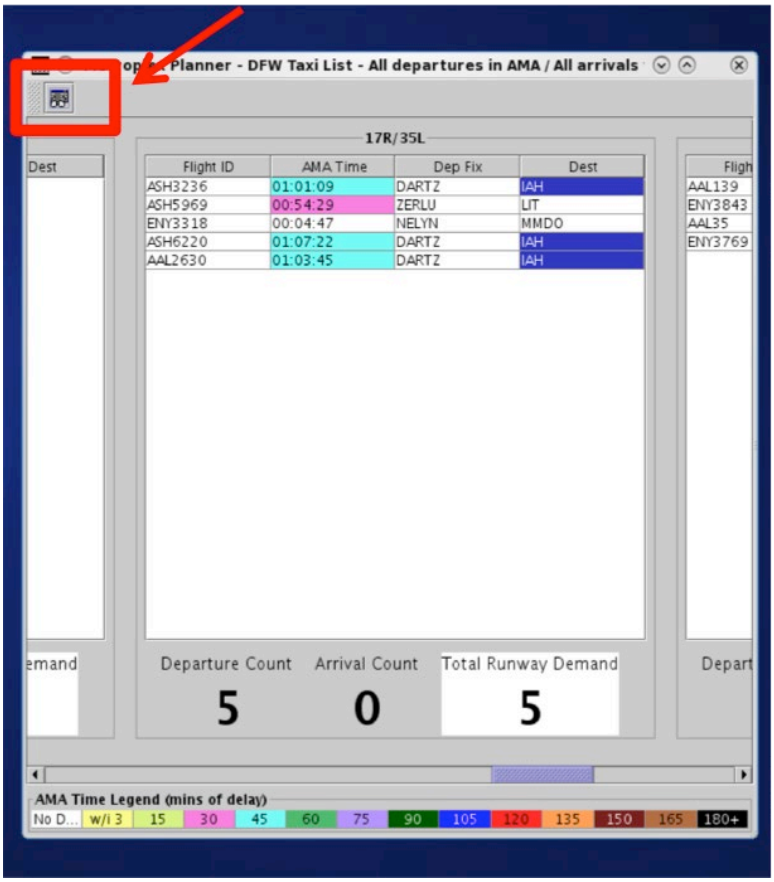


Figure 3.61. Taxi List with flights color coded for AMA time (delay in minutes). Note: The "Destination" column is color-coded to indicate airport Ground Stop (e.g., IAH).

Select the icon in the upper left to open the Taxi List Configuration window (Figure 3.62).

Select a time filter:

- All departures in AMA / All arrivals within the TRACON, or
- All departures / arrivals within a time interval from Current Time: [15, 30, 45, or 60 minutes].

Select runway(s) to include in the taxi list. Three counts are displayed for each runway:

- Departure Count
- Arrival Count, and
- Total Runway Demand

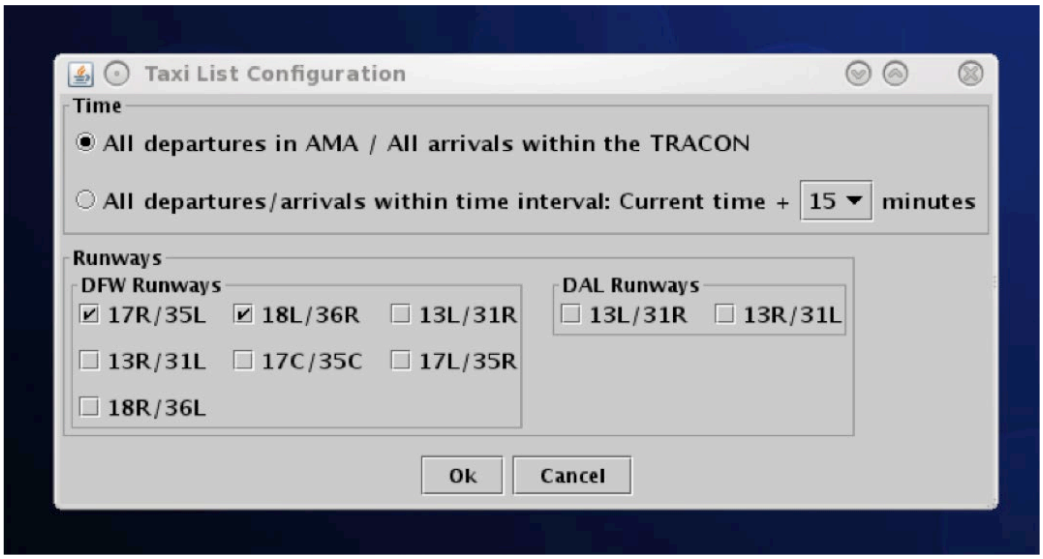


Figure 3.62. Taxi List: Configuration.

3.5 Toolbar: Settings

Select "Settings" on the Toolbar to save the display configuration, adjust the Gate Conflict arrival parameter, and display the clock in the map window (Figure 3.63).

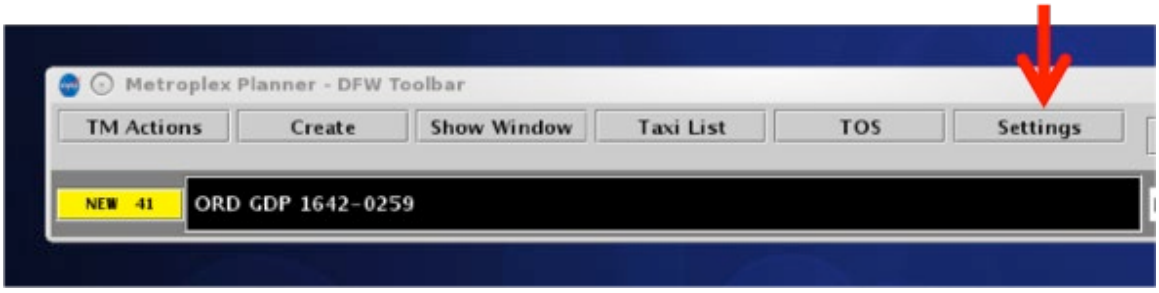


Figure 3.63. Toolbar: Settings.

3.5.1 Load/Save Settings

Select "Load/Save Settings" to save display configurations and load previously-saved display configurations (Figure 3.64).

To Save a display configuration:

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: Select "Close" to exit the Settings window.

To Load a saved display configuration:

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 to load the selected display configuration file.

Step 4: Select "Close" to exit the Load/Save Settings window.

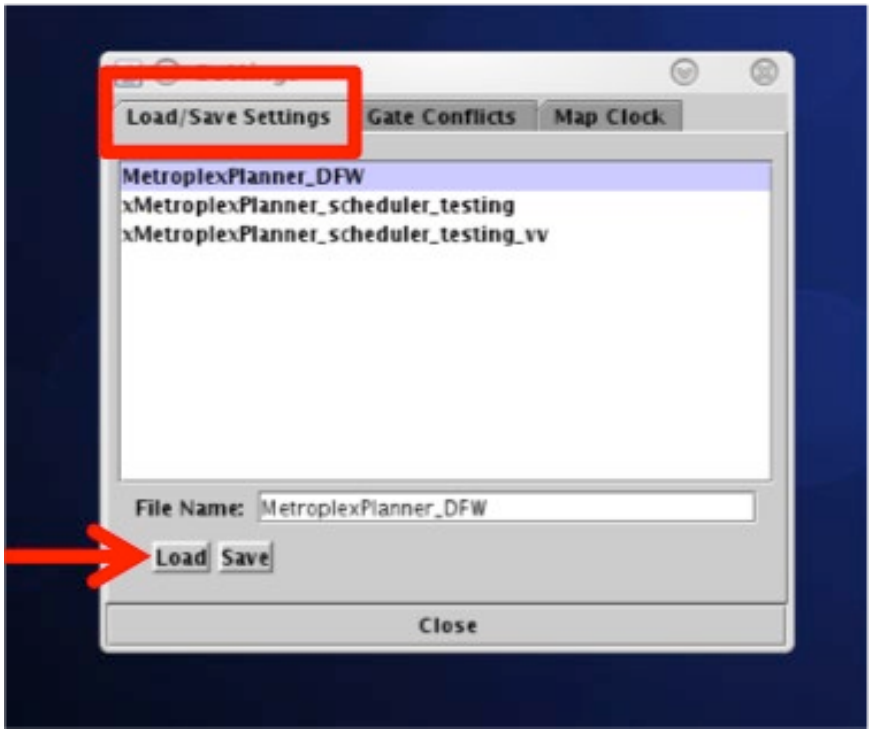


Figure 3.64. Settings: Load/Save Settings tab.

3.5.2 Gate Conflicts

Select the "Gate Conflicts" tab to set the start time for indicating gate conflicts. If the time is set to the default of 10 minutes prior to landing, a gate conflict will not be indicated until the inbound arrival is within 10 minutes of its predicted touchdown time. Specify a different timeframe, or enter zero (0) minutes so that gate conflicts are not shown until the arrival has landed. Gate conflicts are indicated on both the timeline and map by a magenta gate number in the datablock.

Gate conflicts are also shown for gates that are blocked by a flight at an adjacent gate. When there is a 'heavy' aircraft blocking an adjacent gate and there is an inbound arrival for that gate, a gate conflict will be indicated. This only occurs at certain airports where there is limited spacing between gates.

To set the Gate Conflict display value:

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 (Figure 3.65).

Step 2: Click the "Apply" button.

Step 3: Click "Close" to exit the Settings window.

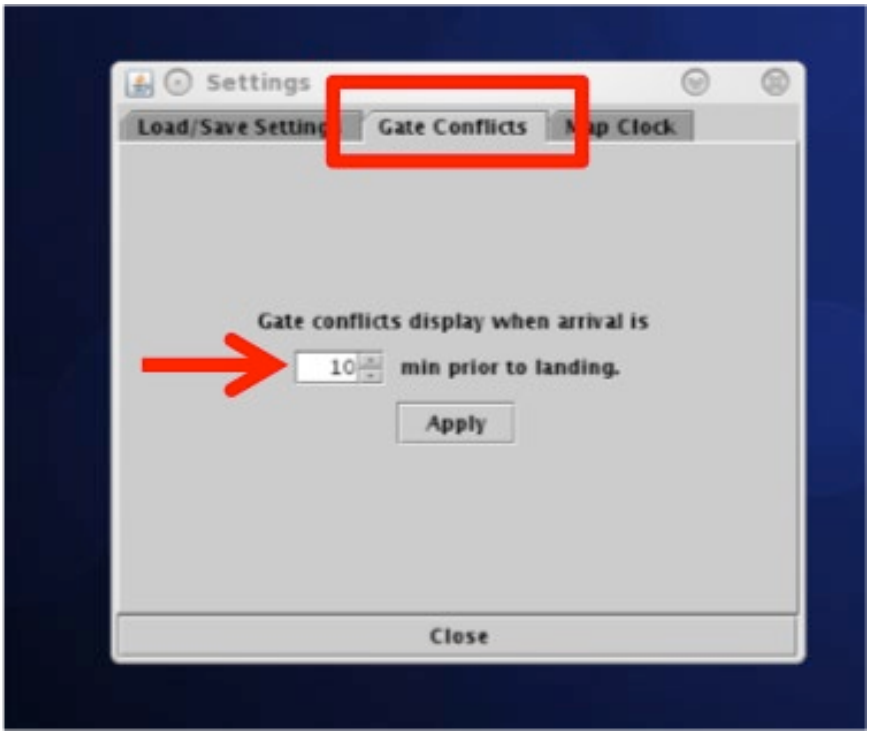


Figure 3.65. Settings: Gate Conflict setting

3.5.3 Map Clock

Select “Map Clock” to display local UTC time on the bottom of the map windows. This is the same time as the “Now” time displayed at the reference point on the timeline.

To show/hide the Map clock:

Step 1: On the “Map Clock” tab, select the “Show Map Clock” checkbox to show the Map clock on the bottom of the map window (Figure 3.66).

Alternatively: Uncheck the “Show Map Clock” checkbox to hide the Map clock.

Step 2: Select “Apply”.

Step 3: Select “Close” to exit the Settings window.

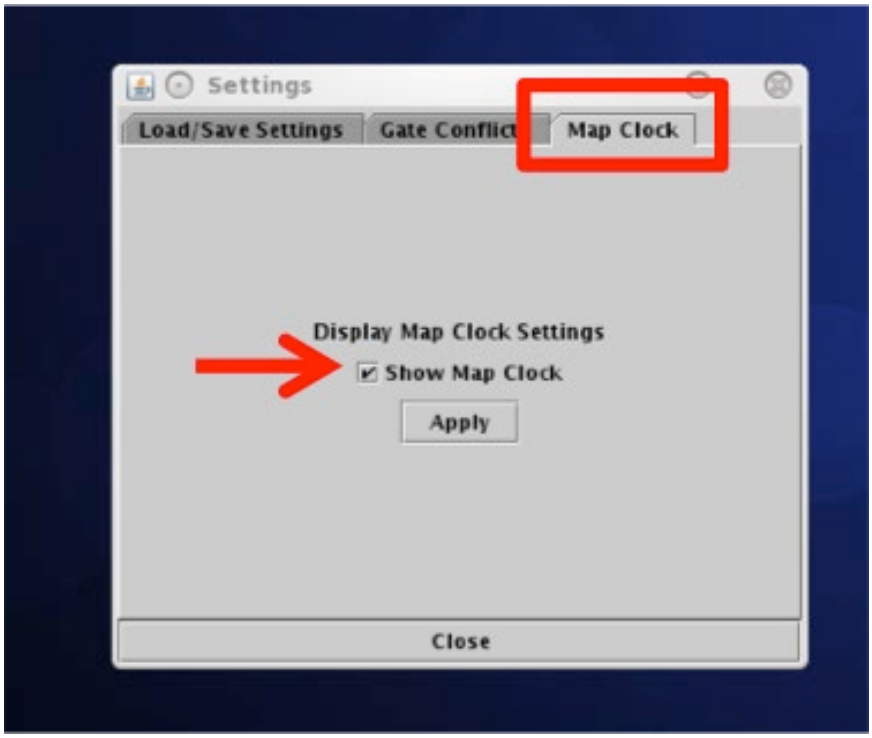


Figure 3.66. Settings: Show/hide map clock.

3.6 Toolbar: Search Feature

Search for a flight number, call sign, destination airport, or departure fix. For example, typing “FDX” will highlight all FedEx flights. Typing “LGA” will highlight all flights to LGA. Typing “53” will highlight all flights whose flight number contains “53”, independent of airline.

Flights matching the search criteria are highlighted on the timeline, map, and in the Flights Table.

To Search for flights:

Step 1: Type in any string of letters or numbers for call signs (e.g., "711" in Figure 3.67).

Or: Type "GA" for General Aviation.

Or: Type a 3-letter airport code for a destination airport.

Or: Type a departure fix name.

Note: As text/digits are entered in the search field, flights matching that criteria (full or partial) will be highlighted on the timeline, map, and in the Flights Table (e.g., "ASH711" in Figure 3.68).

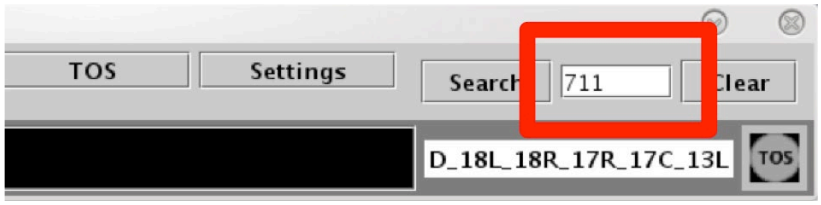


Figure 3.67. Toolbar: Search field (e.g., enter partial call sign, "711").

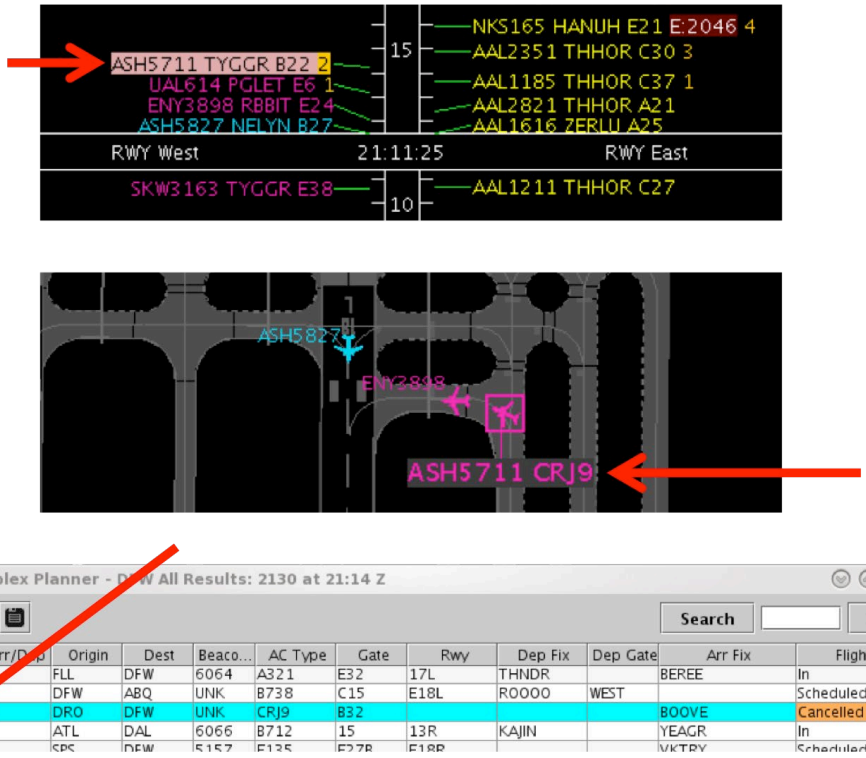


Figure 3.68. Matching search results highlighted in the Timeline, Map, and Flights Table.

3.7 Toolbar: Notifications

Notifications are displayed in the form of a:

- **Notification Icon** to indicate the number of new notifications.
- **Notification Banner** to cycle through unacknowledged notifications.
- **Notification Panel** to display a list of notifications.

Notifications are generated when new information is populated in the system. This new information may originate from ATC or from an outside source, such as the System-Wide Information Management (SWIM), the FAA Operational Information System (OIS), or ATD-2 users. Notifications are always related to events that impact multiple flights or the airport (e.g., TMI and airport-related restrictions) and are never issued for single flights.

When new notifications are received:

- The Notification Icon turns yellow and displays the number of new notifications (e.g., "NEW 41" for 41 new notifications in Figure 3.69).
- The Notification Banner displays the subject of the notification and the time range of the event (e.g., "ORD GDP 1642-0259" in Figure 3.69). The banner cycles through all unacknowledged notifications.

To open/close the Notification Panel:

Step 1: Click once on the Notification Banner (black box) shown in Figure 3.69 to view notifications in the Notification Panel.

Step 2: Click on the "X" in the upper right corner of the Notification Panel to close the Notification Panel.

Alternatively: Click again on the Notification Banner (black box).

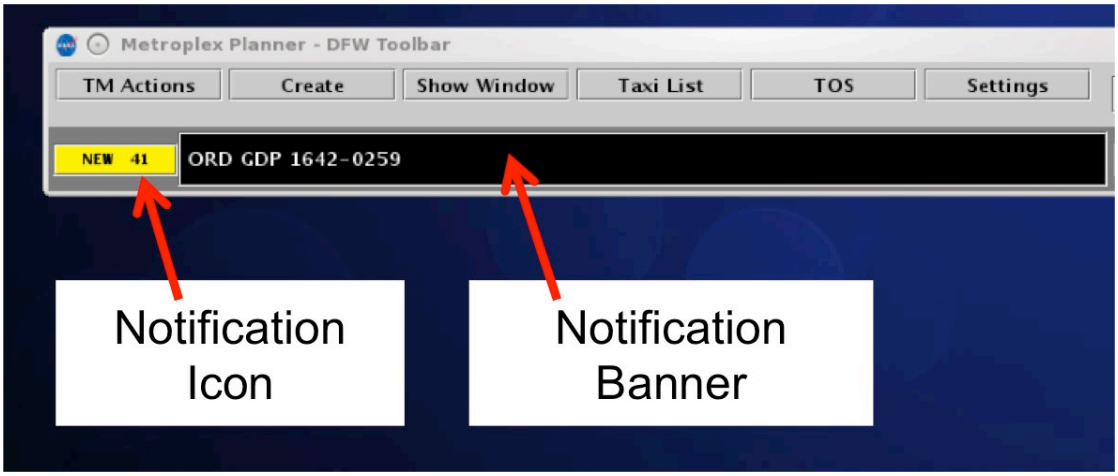


Figure 3.69. Notification Icon (yellow window) and Notification Banner (black window).

The Notification Panel displays all notifications for the past 24 hours, and the list is automatically cleared each day at 0800 UTC. New notifications are highlighted in yellow and newly cancelled notifications are highlighted in blue (Figure 3.70). For example, if a TMI is ended earlier than planned, the notification will be highlighted in cyan. Examples of notifications are shown below.

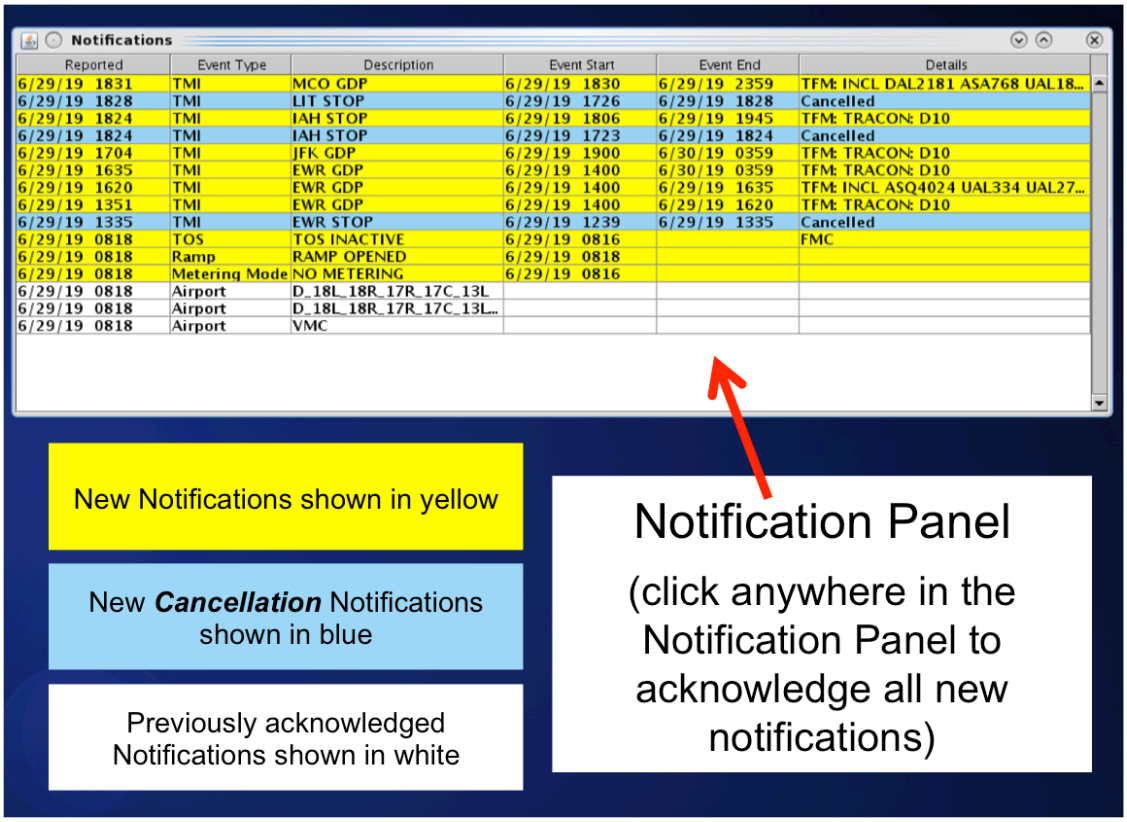


Figure 3.70. Notification Panel: New notifications (yellow), new *cancellation* notifications (blue), and previously acknowledged notifications (white).

Examples of ATC-related Notifications:

- **[EWR] GDP** (Ground Delay Program: *in effect* / *cancelled (CXL)* / *expired*)
- **[TPA] STOP** (Ground Stop: *in effect* / *cancelled (CXL)* / *expired*)
- **APREQ to [JFK]** (APREQ: *in effect* / *cancelled (CXL)* / *expired* / *obsolete*)
- **[JOJJO] CLOSED** (Departure Fix Closure: *in effect* / *cancelled (CXL)* / *expired*)
- **[JOJJO] OPENED** (Departure Fix Opened)
- **[KRITR] 20MIT** (Miles-in-Trail restriction: *in effect / cancelled (CXL) / expired)*

Examples of Airport-related Notifications:

- **VMC** (example meteorological conditions)

- **North** (example of airport configuration)
- **N_Normal** (example of runway utilization)
- **RWY 18L CLOSED** (example of runway closure)

Examples of Ramp-related Notifications:

- **RAMP OPENED** (example of ramp status: *open*)
- **C9 CLOSED** (example of gate status: *closed*)
- **C9 OPEN** (example of gate status: *open*)

Once acknowledged, notifications in the Notification Panel are no longer highlighted in yellow or blue (Figure 3.71) and the Notification Icon changes to gray and displays "NONE" to indicate there are no new notifications (Figure 3.72).

To acknowledge new (yellow and cyan) Notifications in the Notification Panel:

Step 1: Click once anywhere in the Notification Panel to acknowledge all new (yellow and cyan) notifications.

Alternatively: Click once on the Notification Icon (yellow box) (Figure 3.69).

Note: Once new notifications have been acknowledged, the Notification Icon will turn gray and indicate "NONE".

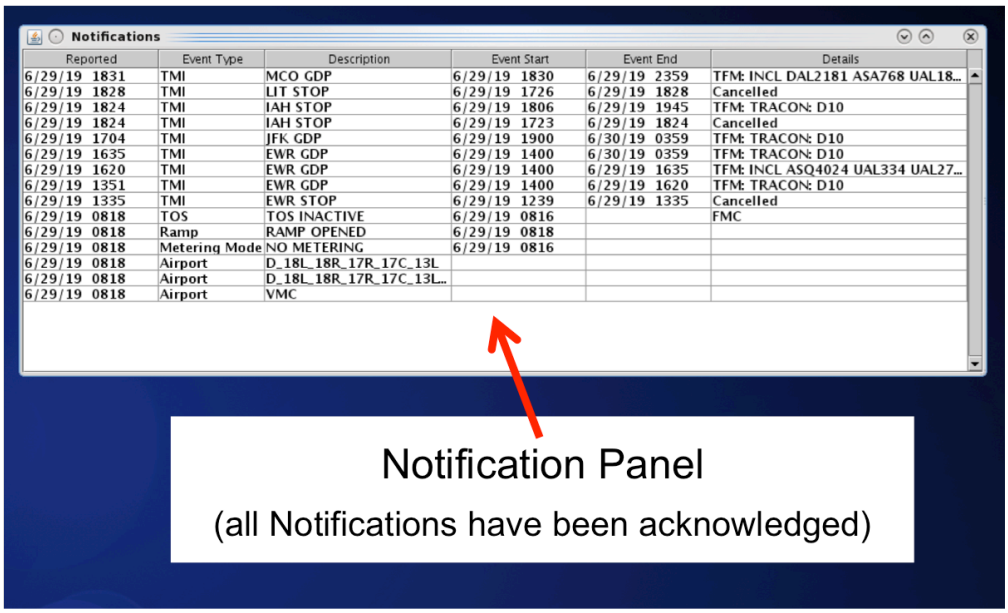


Figure 3.71. Notification Panel: Notifications acknowledged.

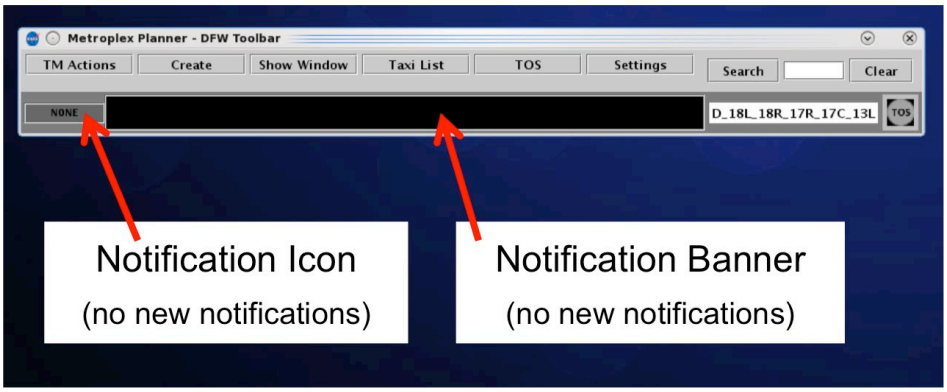


Figure 3.72. Notification Icon and Notification Banner: Notifications acknowledged.

3.8 Toolbar: Runway Utilization

The Runway Utilization icon (Figure 3.73) states the current runway utilization in text format. When the runway utilization and/or configuration information for the airport changes, the text in the Runway Utilization icon updates to reflect this change.

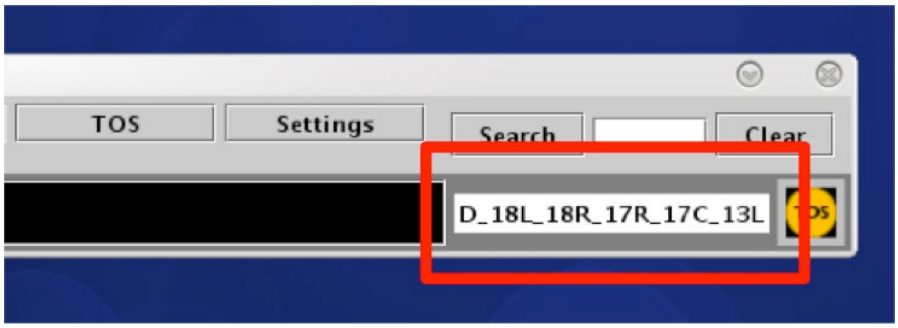


Figure 3.73. Runway Utilization.

3.9 Toolbar: Icons

Icons related to the status of the Surface Metering and Ramp Status are displayed on the Toolbar.

3.9.1 Proposed Surface Metering Program (SMP) Icon

At airports where Surface Time-Based Metering (STBM) is used, information about the status of a proposed Surface Metering Program (SMP) is displayed in the form of an icon. The gear icon changes from black to yellow when a newly proposed SMP is available on the Surface Metering Display (SMD; Figure 3.74).

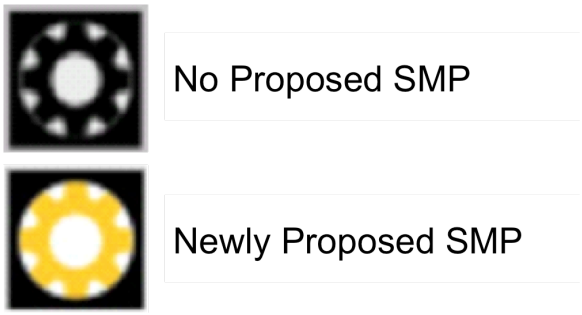


Figure 3.74. Proposed Surface Metering Program (SMP) icon.

3.9.2 Surface Metering Program (SMP) Status Icon

At airports where Surface Time-Based Metering (STBM) is used, information about the status of the Surface Metering Program (SMP), at each departure runway, is displayed in the form of runway metering status icons. The icon changes color from gray with a red slash when metering is *off*, to white when metering is *on (i.e., affirmed/enabled) but not active*, to cyan when metering is *on and active* (Figure 3.75).

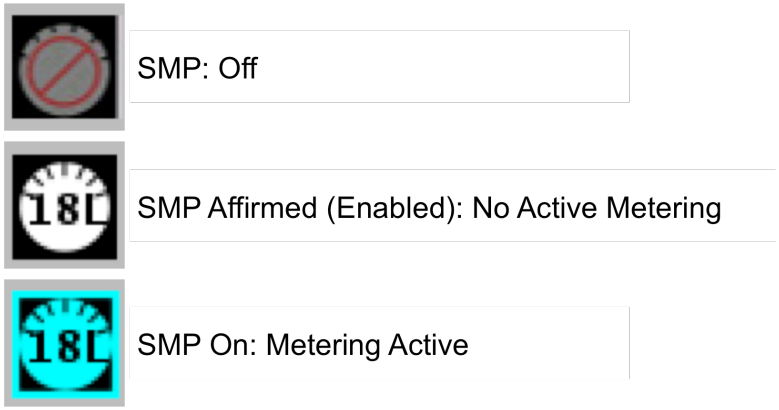


Figure 3.75. Surface Metering Program (SMP) icon.

3.9.3 Ramp Status Icon

The ramp status icon is displayed on the right side of the Toolbar. The ramp status icon indicates the current ramp status: ramp open (green), ramp closure pending (yellow), or ramp closed (red; Figure 3.76). Ramp status is updated by the Ramp Manager.

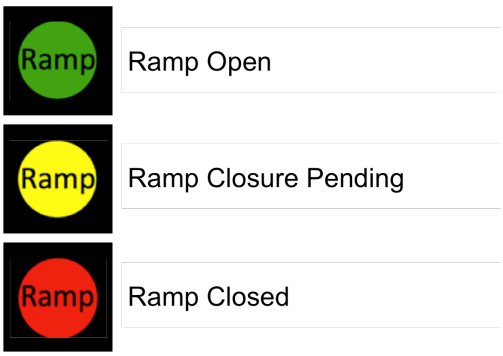


Figure 3.76. Ramp Status icon shown on the Toolbar.

4 STBO Client: Maps

Maps display live positional data to create a visual representation of flights on the surface and in the terminal area. Each flight on the map is accompanied by a datablock which can be configured with flight-specific information.

At lower zoom levels, use the map to view flights on the surface of the airport in the AMA and Ramp areas (Figure 4.1).

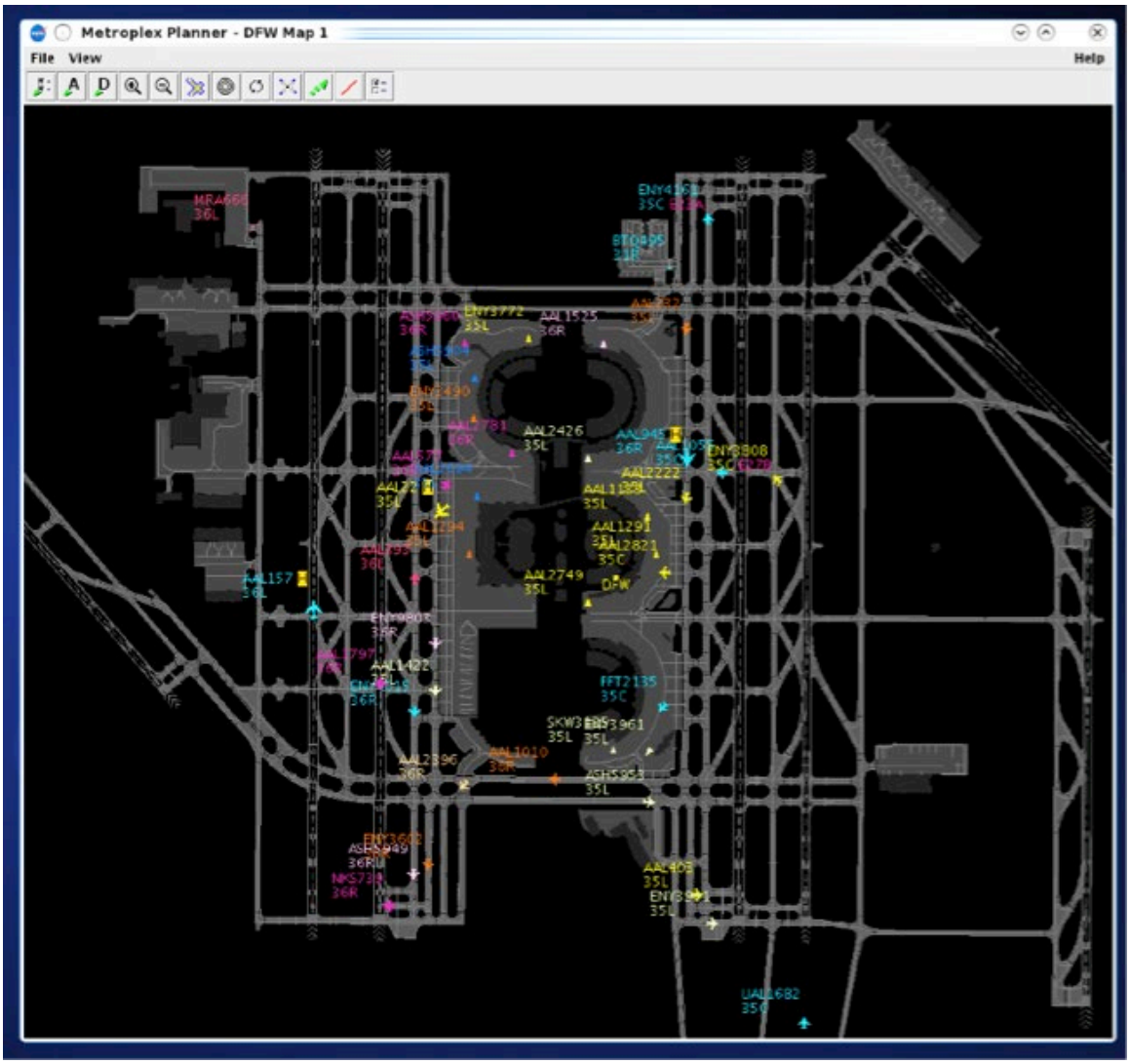


Figure 4.1. Map (AMA/Ramp example).

At higher zoom levels, use the map to view en route flights in the terminal area (Figure 4.2).

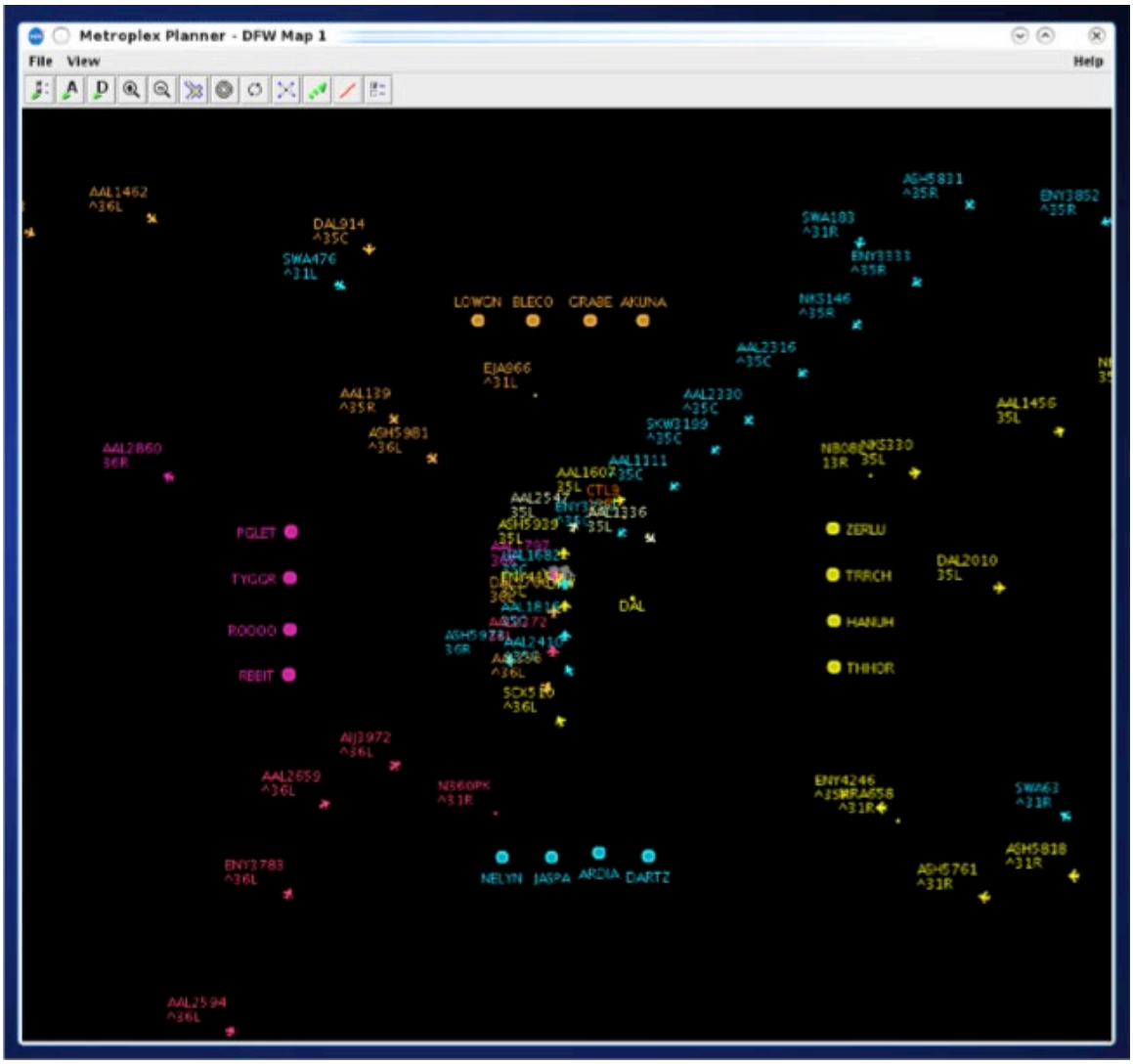


Figure 4.2. Map (terminal area example).

The Menu Bar and Toolbar can be used to configure the map (Figure 4.3). More than one map can be open at the same time and each can be configured independently of the others.

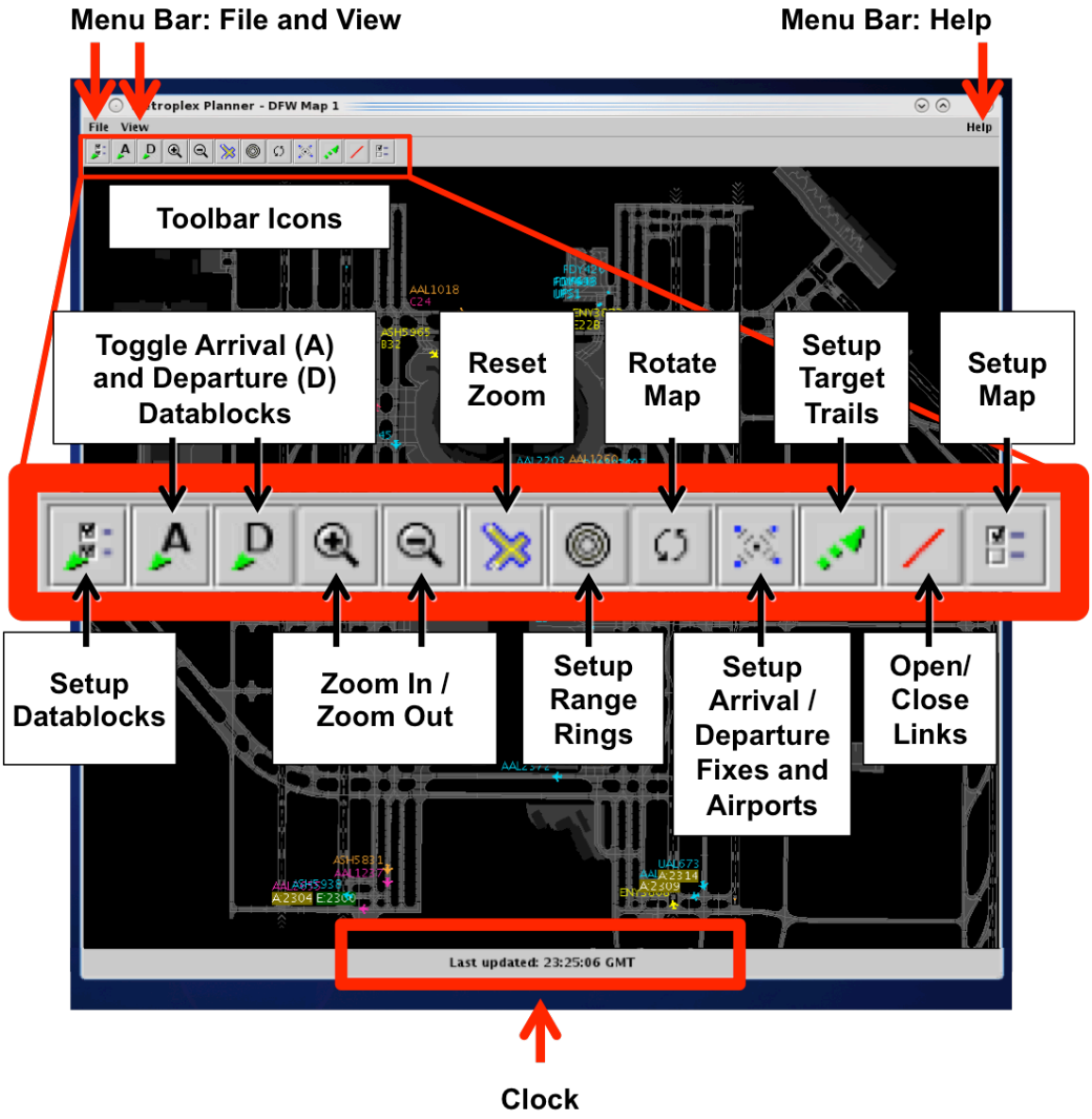


Figure 4.3. Map overview.

4.1 Map: Select a Flight

Select a flight on the map to highlight the flight throughout the STBO Client user interface.

To select a flight on the Map:

Step 1: Left-click on a flight on the map. Once selected, the flight icon's datablock is highlighted and a border is displayed around the flight icon (Figure 4.4).

Note: When a flight is selected on the map, it is highlighted throughout the user interface. That is, it is also highlighted on the timeline and in the Flights Table (if applicable).

Alternatively: Click elsewhere on the map to deselect the flight.

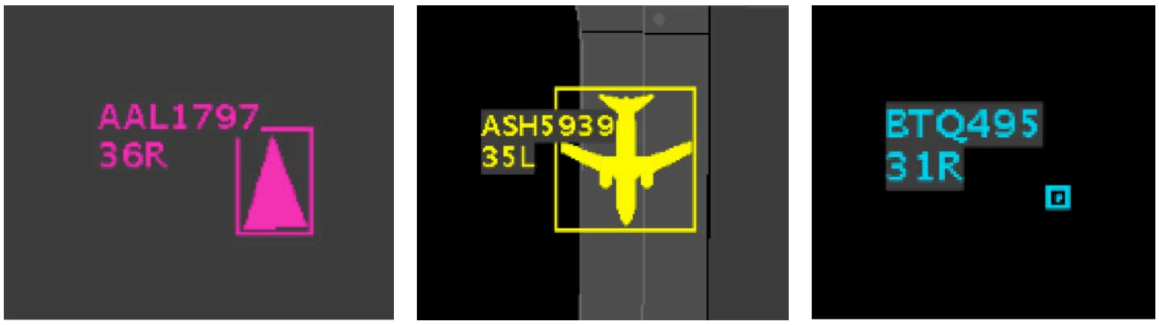


Figure 4.4. Flight icons selected on the map (in the Ramp area, in the AMA, and en route).

More than one flight icon on a map can be selected at the same time.

To select multiple flights on the Map:

Step 1: Select multiple flight icons on the map by holding the "Shift" key on the keyboard while left-clicking on the flights to select them (Figure 4.5).

Alternatively: Click elsewhere on the map to deselect the flights.

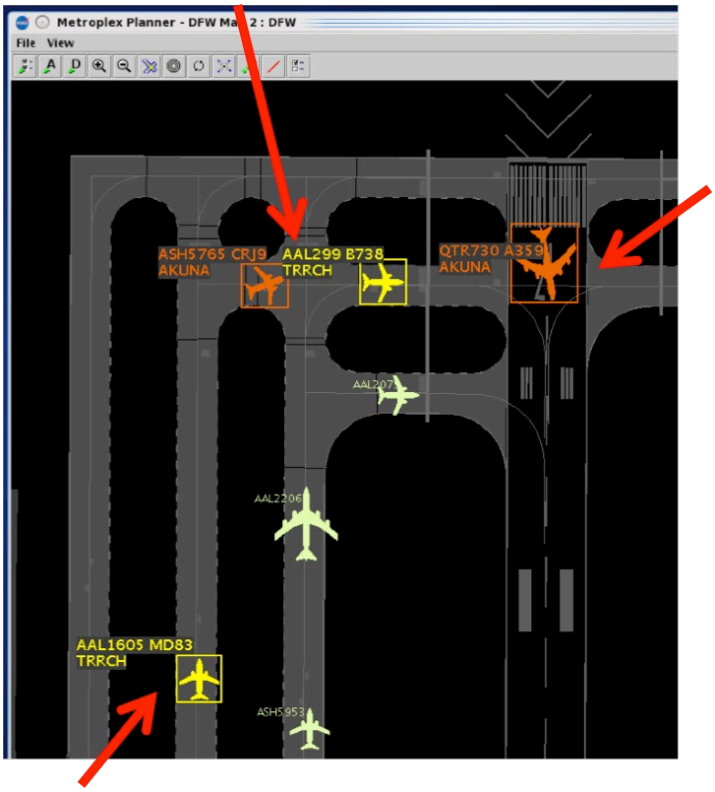


Figure 4.5. Multiple flights selected.

While flight icons themselves cannot be relocated, the attached datablocks can be repositioned.

To reposition a flight icon datablock:

Step 1: Select a flight icon on the map. Once selected, the flight icon's datablock is highlighted and a border is displayed around the flight icon (Figure 4.6).

Step 2: Click and drag the datablock to reposition it.

Alternatively: Click elsewhere on the map to deselect the flights.

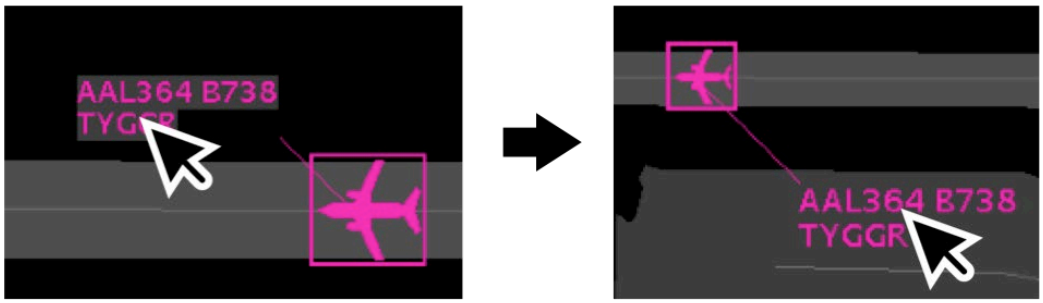


Figure 4.6. Reposition flight datablock.

4.2 Map: Menu Bar

Three options are available on the Menu Bar: File, View, and Help.

4.2.1 File Menu

Use "File" menu to "recycle" flights and shut down the STBO Client (Figure 4.7).

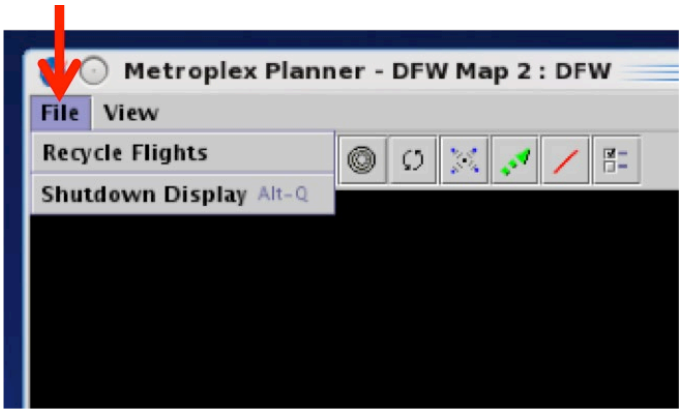


Figure 4.7. Map: File menu.

4.2.1.1 Recycle Flights

When "Recycle" is selected, flight data is reinitialized to refresh flights displayed on the map.

4.2.1.2 Shutdown Display

Select "Shutdown Display" to shut down the STBO Client.

To Shutdown the STBO Client:

Step 1: Select "File" on the Menu Bar.

Step 2: Select "Shutdown Display" from the dropdown menu.

Step 3: Select "Yes" at the prompt to shut down the STBO Client (Figure 4.8).

Alternatively: Select "No" to keep the STBO Client open.

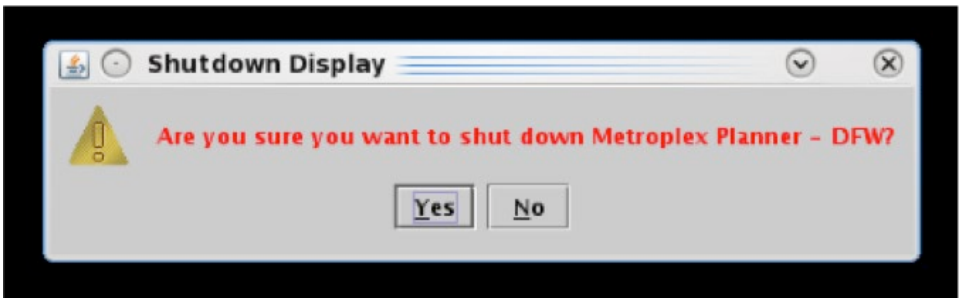


Figure 4.8. Shutdown display confirmation prompt.

4.2.2 View Menu

Use the "View" menu to configure the display (Figure 4.9).

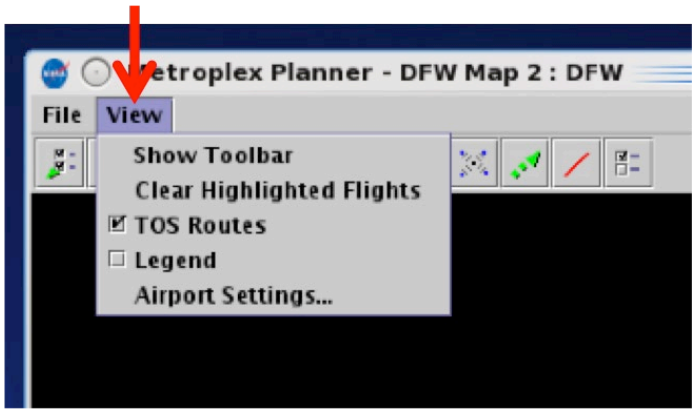


Figure 4.9. Map: View menu.

4.2.2.1 Show Toolbar

If other windows are covering the Toolbar window, use "Show Toolbar" to bring the Toolbar window to the front.

To show the STBO Client Toolbar:

Step 1: Select "View" on the Menu Bar.

Step 2: Select "Show Toolbar" to bring the Toolbar window to the front of other display windows (Figure 4.10).

Note: The Toolbar is displayed in front of other open windows (Figure 4.11).

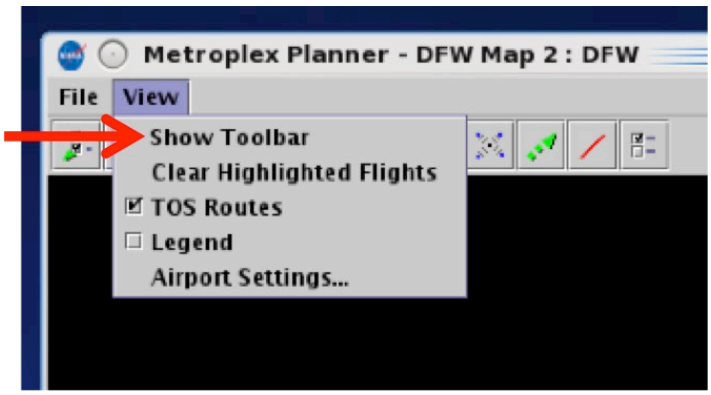


Figure 4.10. View Menu: Show Toolbar

Figure 4.11. Toolbar is displayed on top of other windows.

4.2.2.2 Clear Highlighted off Flights

There are two methods for deselecting highlighted/selected flights on a map. Click anywhere else on the map background or select “Clear Highlighted Flights” from the “View” menu.

To Clear all Highlighted flights on the Map:

Step 1: Select "View" on the Menu Bar.

Step 2: Select "Clear Highlighted Flights" to deselect an individual, or multiple, highlighted flights (Figure 4.12).

Note: Any selected flight is deselected (i.e., no longer highlighted, Figure 4.13).

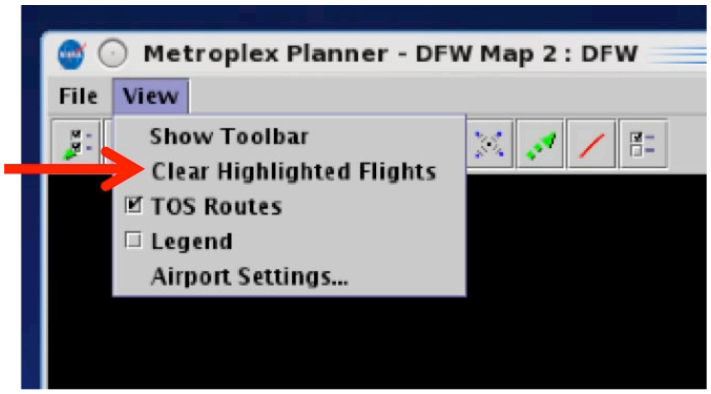


Figure 4.12. View Menu: Clear Highlighted Flights

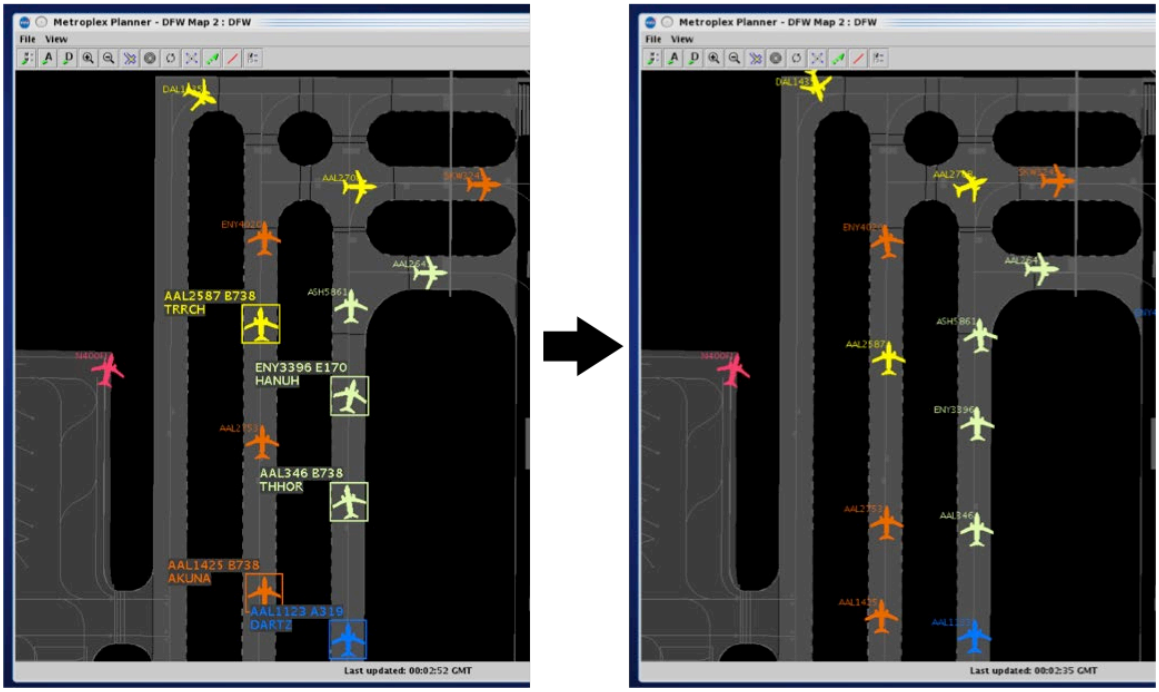


Figure 4.13. Clear Highlighted Flights: Any highlighted flights are deselected.

4.2.2.3 Legend

The map legend displays the color coding for each category in the selected arrival and departure color schemes. Unlike the timeline legend, the map legend is not interactive. That is, categories cannot be deselected for exclusion from the map.

To Show/Hide the Map Legend:

Step 1: Select "View" on the Menu Bar.

Step 2: Check the box next to "Legend" (Figure 4.14). Example legend is shown in Figure 4.15.

Alternatively: Uncheck the box to hide the legend.

Note: Colors displayed in the legend are determined by the selected arrival/departure color schemes. Colors are pre-assigned and cannot be changed.

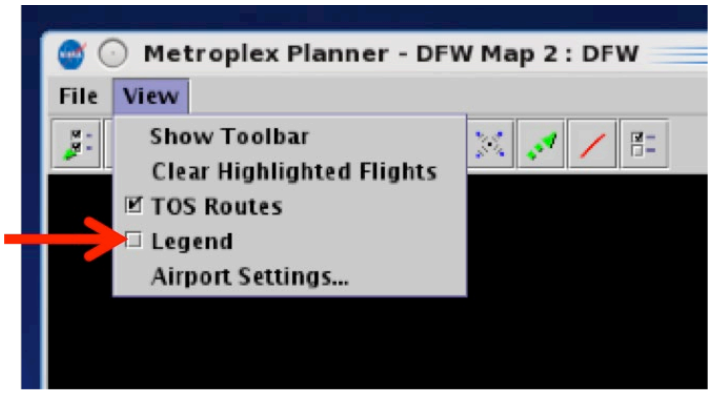


Figure 4.14. View Menu: Legend.

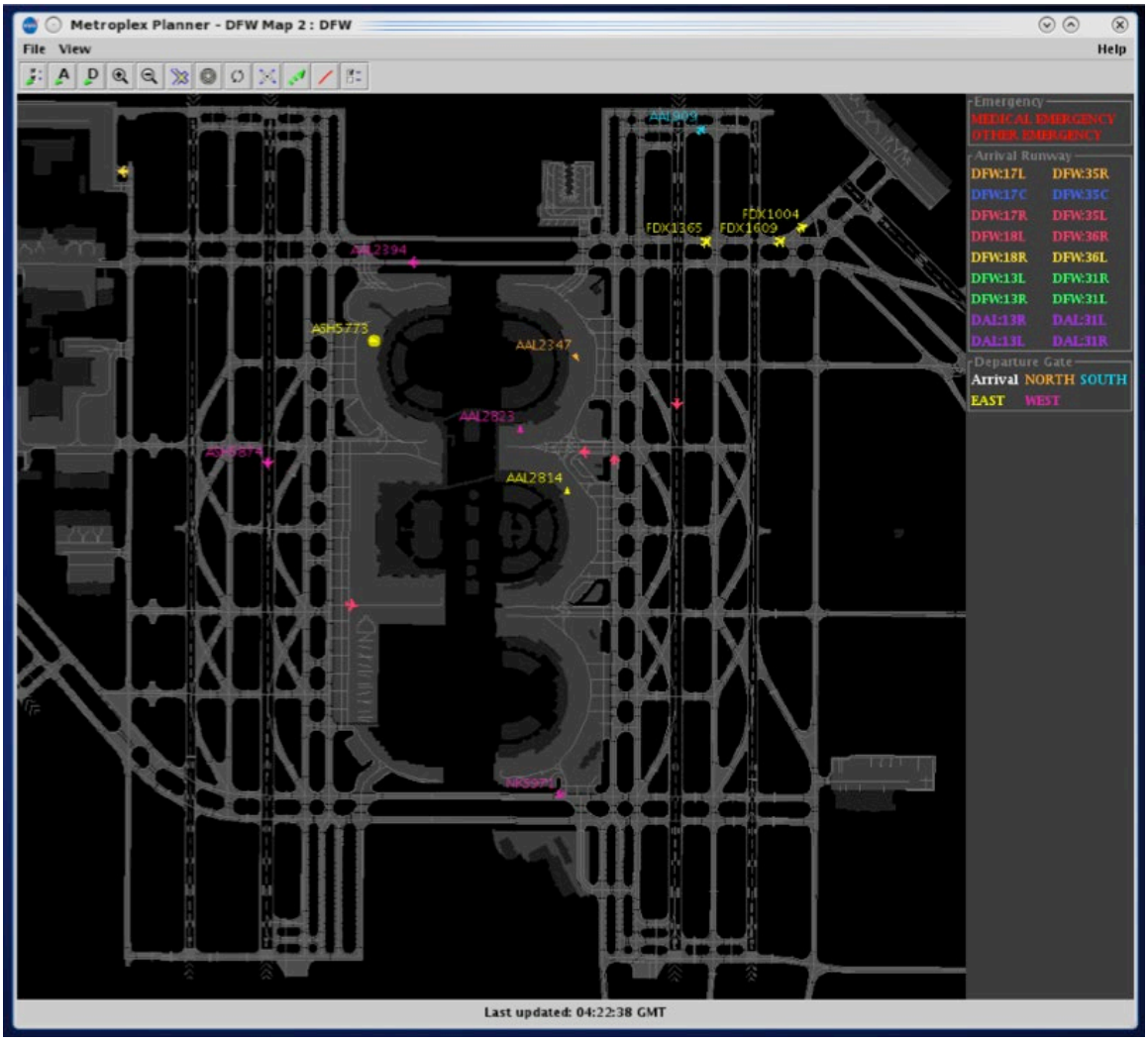


Figure 4.15. Map legend (example).

4.2.2.4 Airport Settings

Configure which flights are displayed on the map using “Airport Settings” in the “View” menu.

To configure map Airport Settings:

Step 1: Select "View" on the Menu Bar.

Step 2: Select "Airport Settings" from the menu (Figure 4.16).

Step 3: Select from six types of flight/aircraft options to view on the map (Figure 4.17).

- Departures
- Arrivals
- Flights at Gates
- Aircraft at Gates
- Flights by Line-of-Flight
- Suspended Flights

Note: These six options are defined below.

Step 4: Select "Apply".

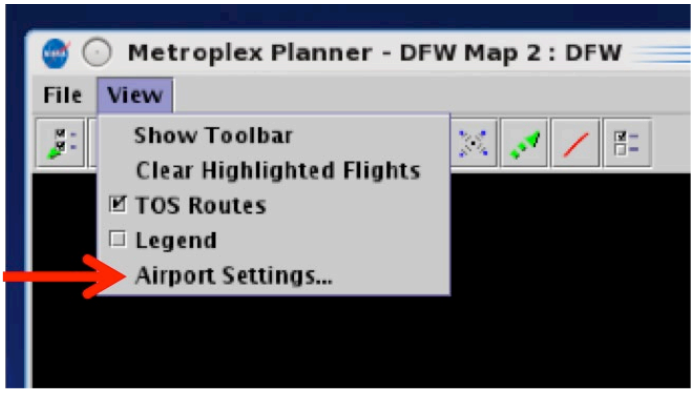


Figure 4.16. View Menu: Airport Settings.

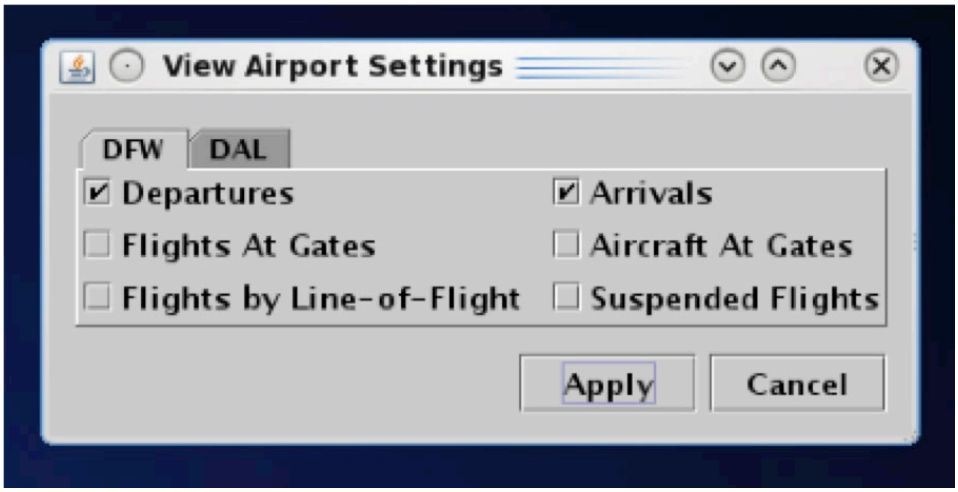


Figure 4.17. View Airport Settings Menu.

- **Departures**: Departure flights on the surface or en route, in the terminal area.
- **Arrivals:** Arrival flights on the surface or en route, in the terminal area.
- **Flights at Gates:**
  - If the "Flights at Gates" option is selected along with "Departures", departure flights at the gate are displayed.
  - If the "Flight at Gates" option is selected along with "Arrivals", arrival flights at the gate are displayed (Figure 4.18).

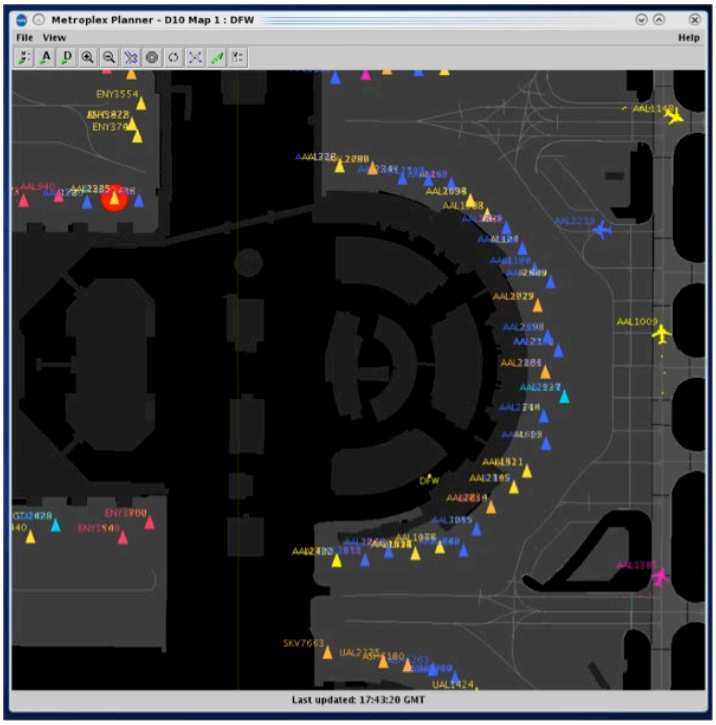


Figure 4.18. Airport Settings: Flights at Gates (example).

- **Aircraft at Gates:** Display tail number and aircraft type at gate (Figure 4.19).

Figure 4.19. Airport Settings: Aircraft at Gates (example).

- **Flights by Line-of-Flight**:

  A particular aircraft may currently be an arrival flight ("Flight A"), but will eventually become a turnaround departure flight later that day ("Flight B").

  - When the "Flights by Line-of-Flight" option is *unselected* (Figure 4.20, left), the current flight *and* future flights that will use the same aircraft are displayed (e.g., "Flight A" and "Flight B").
  - When the "Flights by Line-of-Flight" option is *selected* (Figure 4.20, right), only the current flight (e.g., "Flight A") is displayed.

  Expired Flights. After parking at a gate, flight information associated with an arrival eventually times out, or expires. When "Flights by Line-of-Flight" is *selected,* expired flights are not displayed.

Figure 4.20. Flights by Line-of-Flight: *Unselected* to show current and future flights (left) and *selected* to show only the current flight (right).

- **Suspended Flights**: Display departure flights that have been designated as "suspended" in the ATD-2 system (Figure 4.21). A flight is designated as "suspended" when it is temporarily delayed (e.g., mechanical issue), but not permanently cancelled.

Figure 4.21. Airport Settings: Suspended flight (example).

4.2.3 Help Menu

Use the "Help" menu to view the software version number and help menus for quick keys (Figure 4.22).

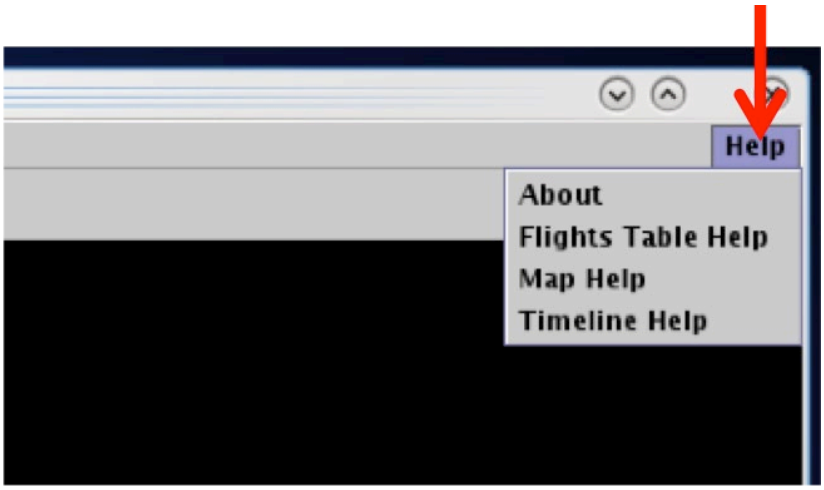


Figure 4.22. Map: Help menu.

4.2.3.1 About

Use the "Help" menu to view the STBO Client version number.

To view software Version number:

Step 1: Select "Help" on the Menu Bar.

Step 2: Select "About" to view the version number (Figure 4.23).

Step 3: Select "OK" to close the window (Figure 4.24).

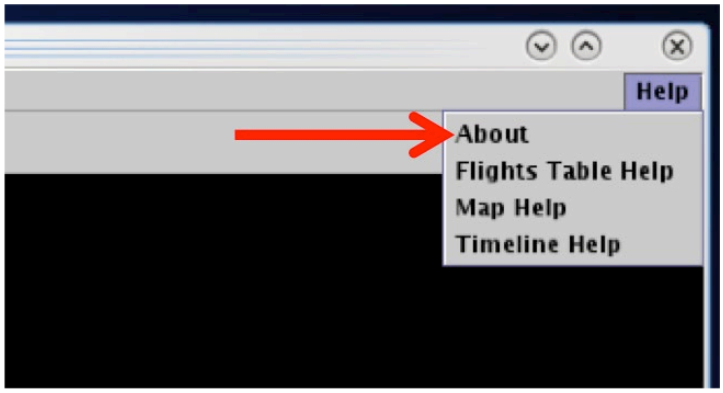


Figure 4.23. Help Menu: About.

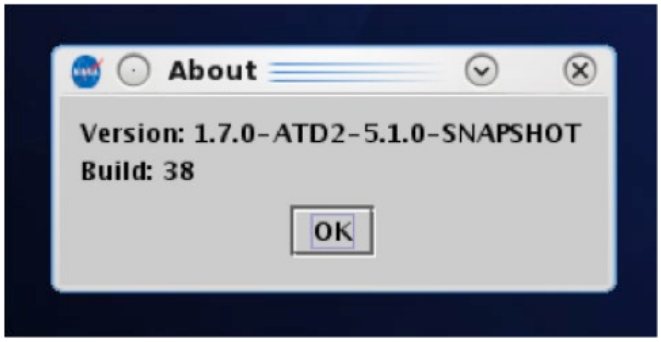


Figure 4.24. About: Version information (example).

4.2.3.2 Flights Table Help

Some users prefer to use "quick key" functions, or keyboard shortcuts, to navigate and interact with the STBO Client. Quick key functions are available for the Flights Table.

To open the list of Quick Keys for the Flights Table:

Step 1: Select "Help" on the Menu Bar.

Step 2: Select "Flights Table Help" to view a list of quick keys (shortcuts) for the Flights Table (Figure 4.25).

Step 3: Select "Close" to close the window (Figure 4.26).

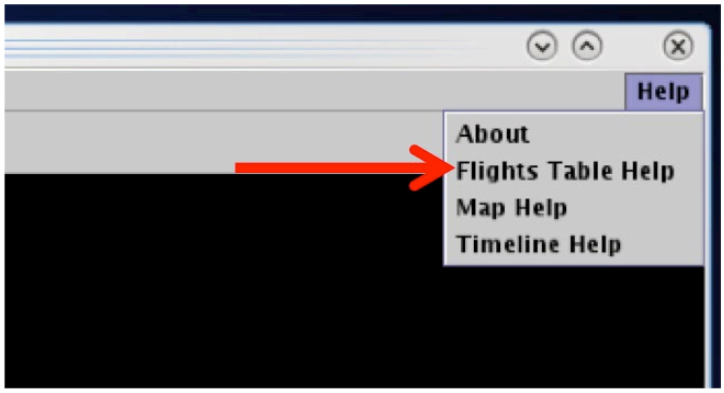


Figure 4.25. Help Menu: Flights Table Help.

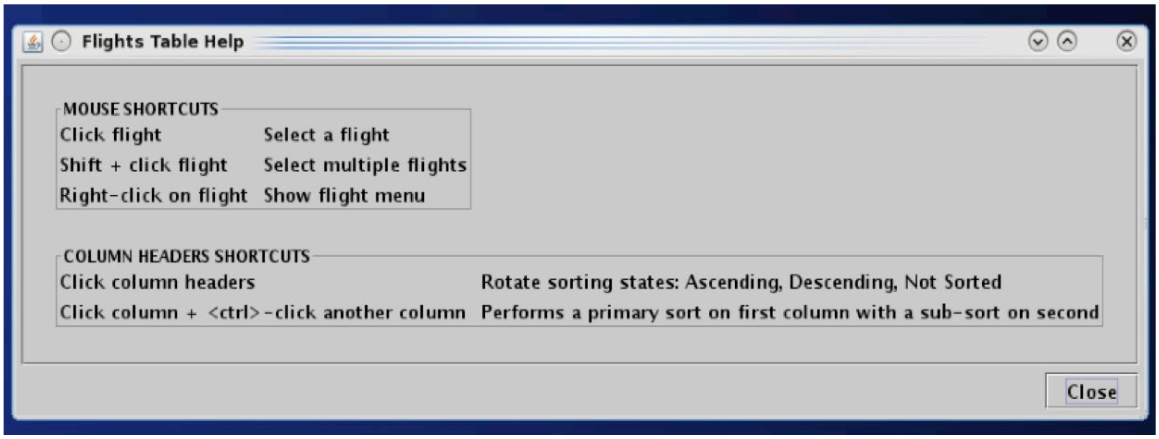


Figure 4.26. Flights Table Help.

4.2.3.3 Map Help

Quick key functions are available for maps.

To open the list of Quick Keys for the Map:

Step 1: Select "Help" on the Menu Bar.

Step 2: Select "Map Help" to view a list of quick keys (shortcuts) for the map (Figure 4.27).

Step 3: Select "Close" to close the window (Figure 4.28).

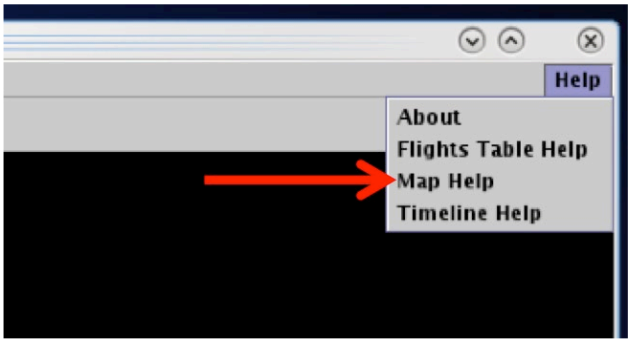


Figure 4.27. Help Menu: Flights Table Help.

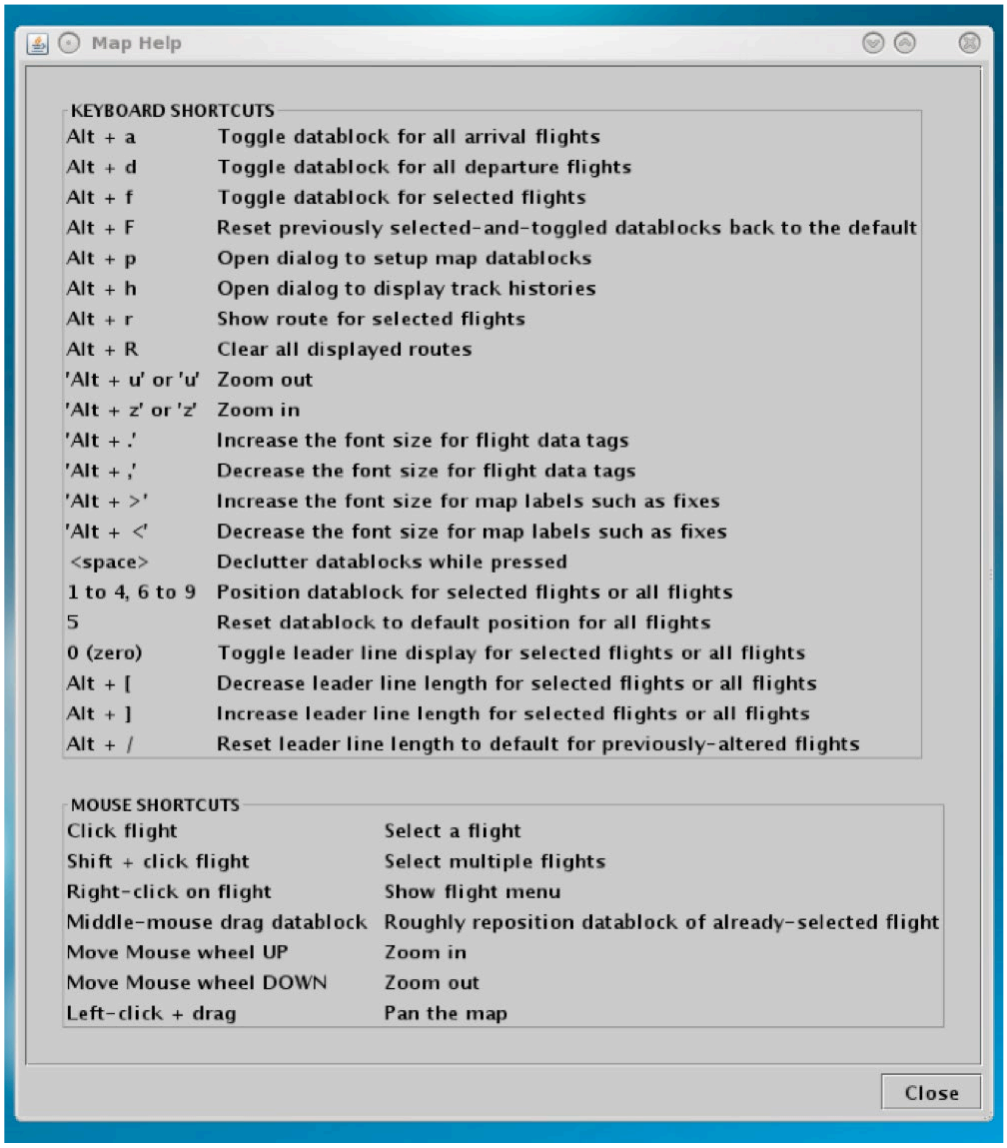


Figure 4.28. Map Help.

4.2.3.4 Timeline Help

Quick key functions are available for timelines.

To open the list of Quick Keys for the Timeline:

Step 1: Select "Help" on the Menu Bar.

Step 2: Select "Timeline Help" to view a list of quick keys (shortcuts) for the timeline (Figure 4.29).

Step 3: Select "Close" to close the window (Figure 4.30).

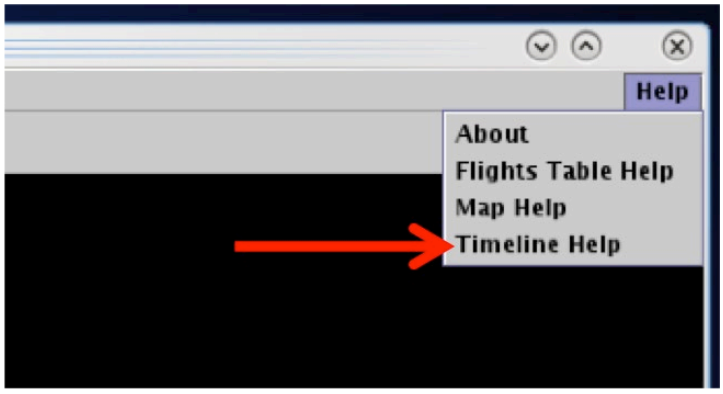


Figure 4.29. Help Menu: Timeline Help.

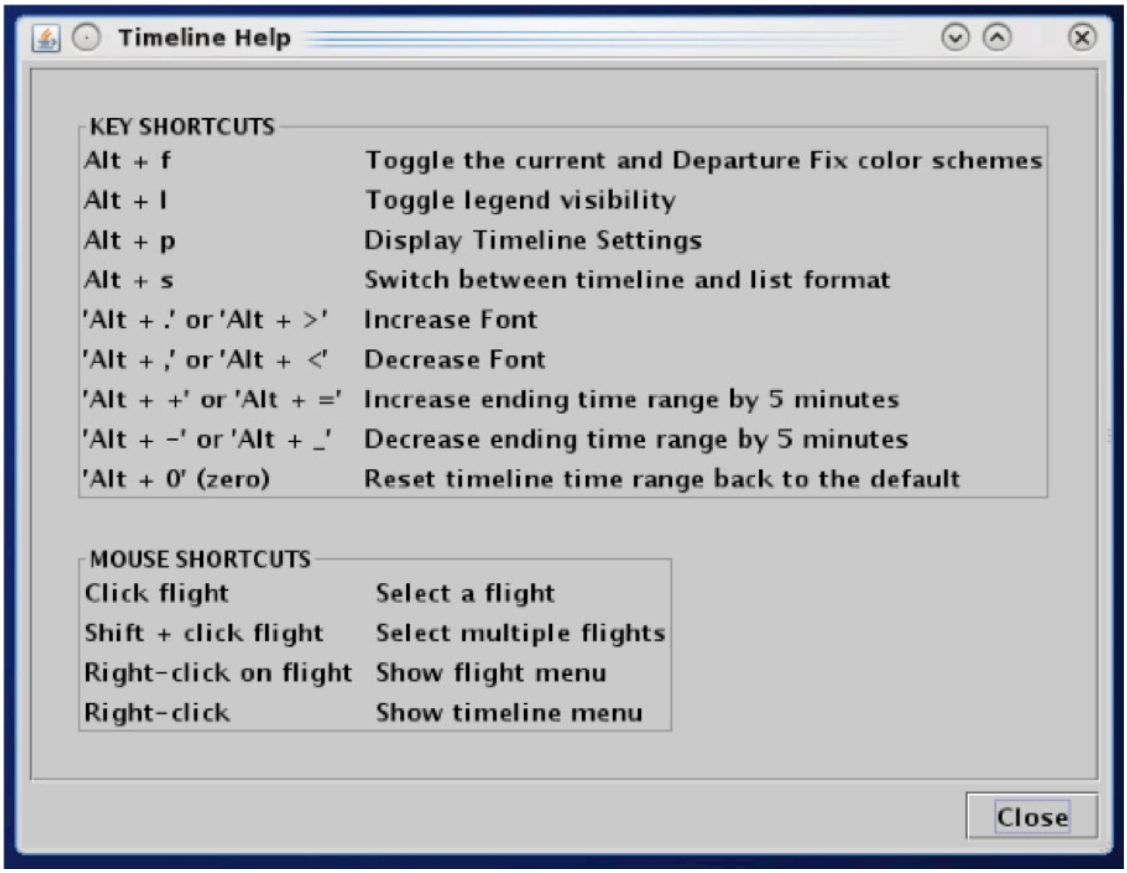


Figure 4.30. Timeline Help.

4.3 Map: Toolbar

Use the Toolbar to configure the appearance of the map and information displayed on the map (Figure 4.31).

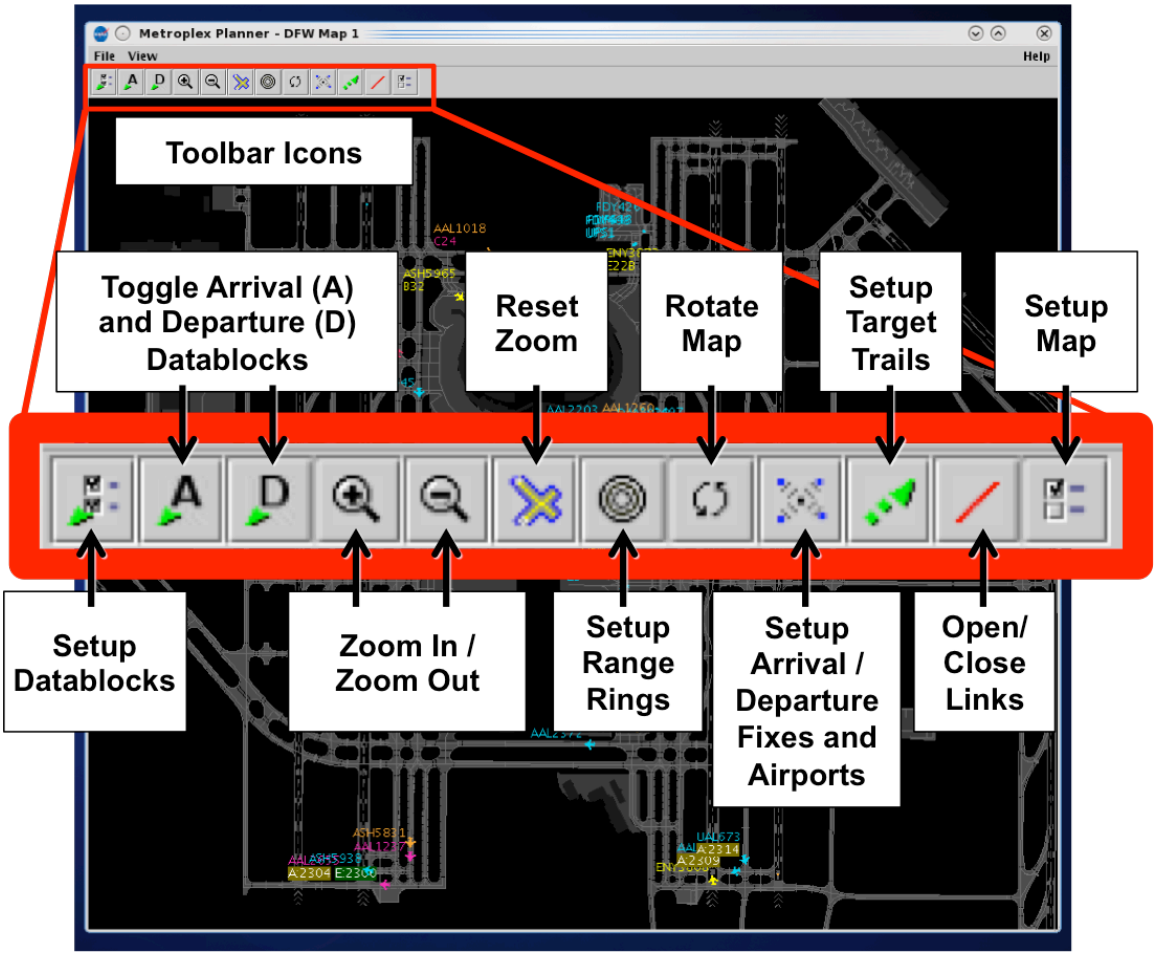


Figure 4.31. Map: Toolbar.

4.3.1 Setup Datablocks

Select the “Setup Datablocks” icon to configure information in the datablock and select color coding for departures and arrivals (Figure 4.32).

Figure 4.32. Map: Setup Datablocks.

4.3.1.1 Flight Datablock Display

Use “Flight Datablock Display” to select how much information is shown in a datablock. Arrivals and departures can be configured differently.

To change the Datablock Display for Arrivals/Departures:

***Step 1*:** Select the "Setup Datablocks" icon from the Map Toolbar.

***Step 2*:** Click on the arrival or departure "Flight Datablock Display" dropdown menus to select a datablock configuration (e.g., "ID Only Datablock" in Figure 4.33):

- No Datablock (e.g., Figure 4.34, left)
- ID Only Datablock (e.g., Figure 4.34, middle)
- Extended Datablock (e.g., Figure 4.34, right)

Note: Arrival and Departure datablocks are configured independently of one another.

***Step 3*:** Select "Ok" to apply the change or "Preview" to preview the change on the map.

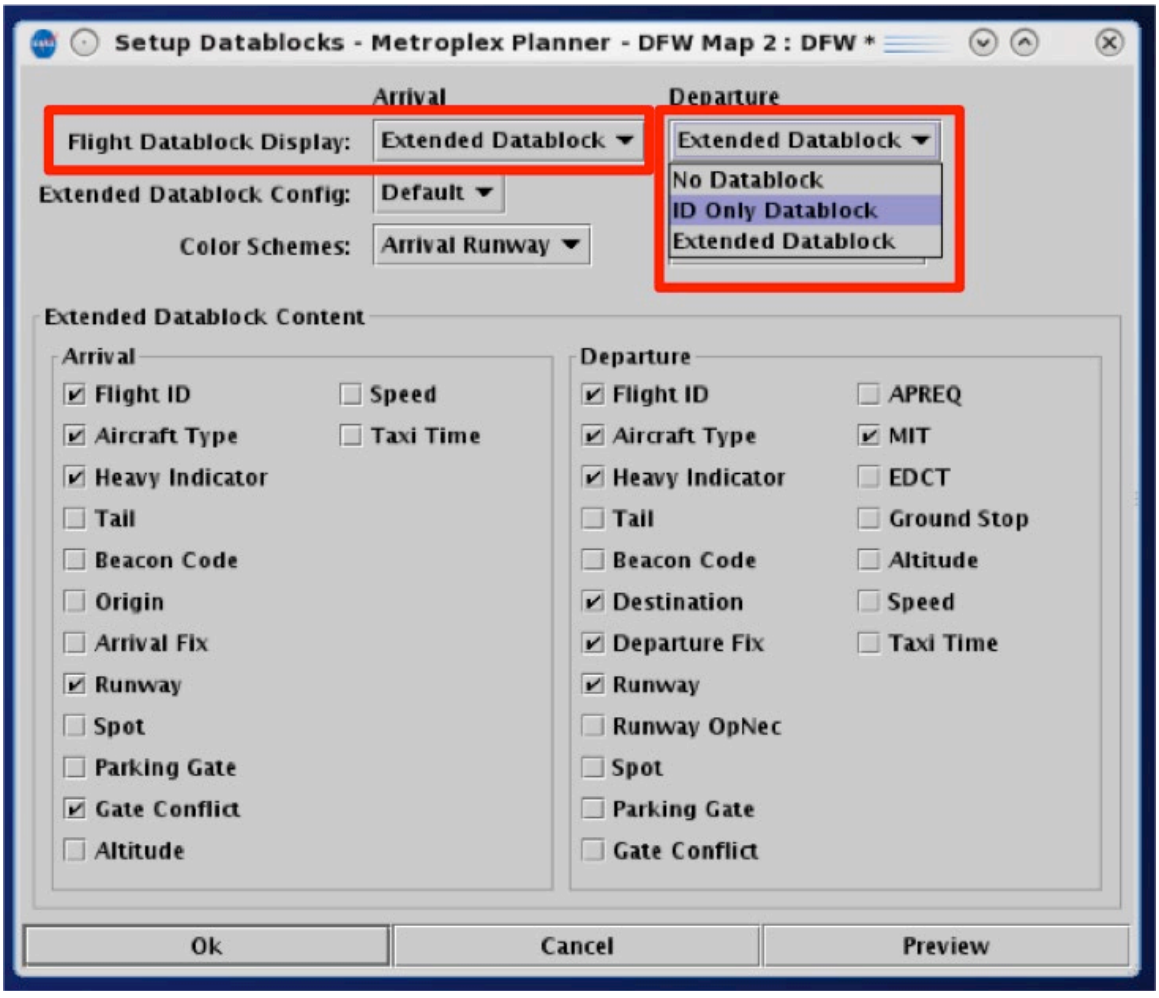


Figure 4.33. Setup Datablocks: Flight Datablock Display.

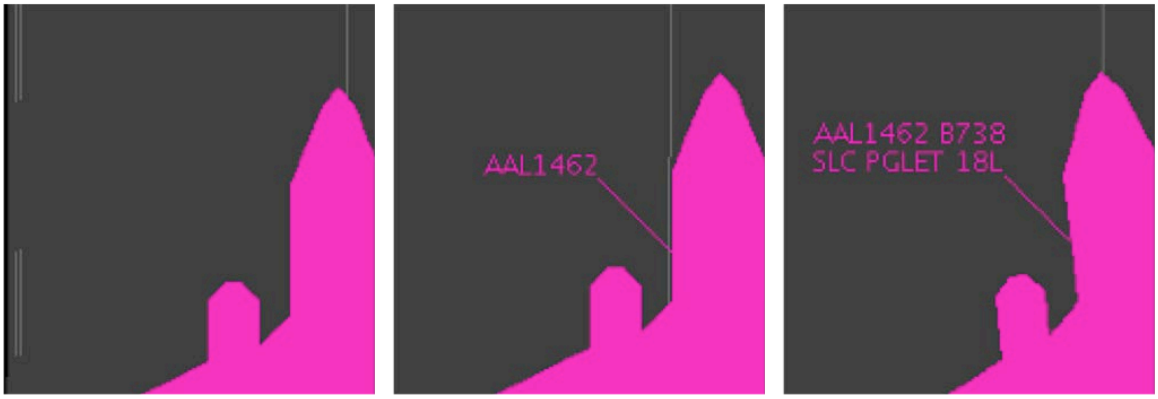


Figure 4.34. Flight Datablock Display: No Datablock, ID Only Datablock, Extended Datablock (content of Extended Datablock is selectable).

4.3.1.2 Extended Datablock Config

Use "Extended Datablock Config" to format extended datablocks. Select from one of two options:

- **Default**: No background color in the datablock.
- **Ramp**: Datablock background is:
  - Blue for flights assigned to the east runway(s)
  - Brown for flights assigned to the west runway(s), and
  - Green for arrivals.

To change the Extended Datablock Config:

***Step 1*:** Select the "Setup Datablocks" icon from the Map Toolbar.

***Step 2*:** Click on the "Extended Datablock Config" dropdown menu to select a datablock format (e.g., "Default" in Figure 4.35):

- Default (see examples in Figure 4.36)
- Ramp (see examples in Figure 4.36)

Note: This formatting applies only to "Extended Datablocks".

***Step 3*:** Select "Ok" to apply the change or "Preview" to preview the changes on the map.

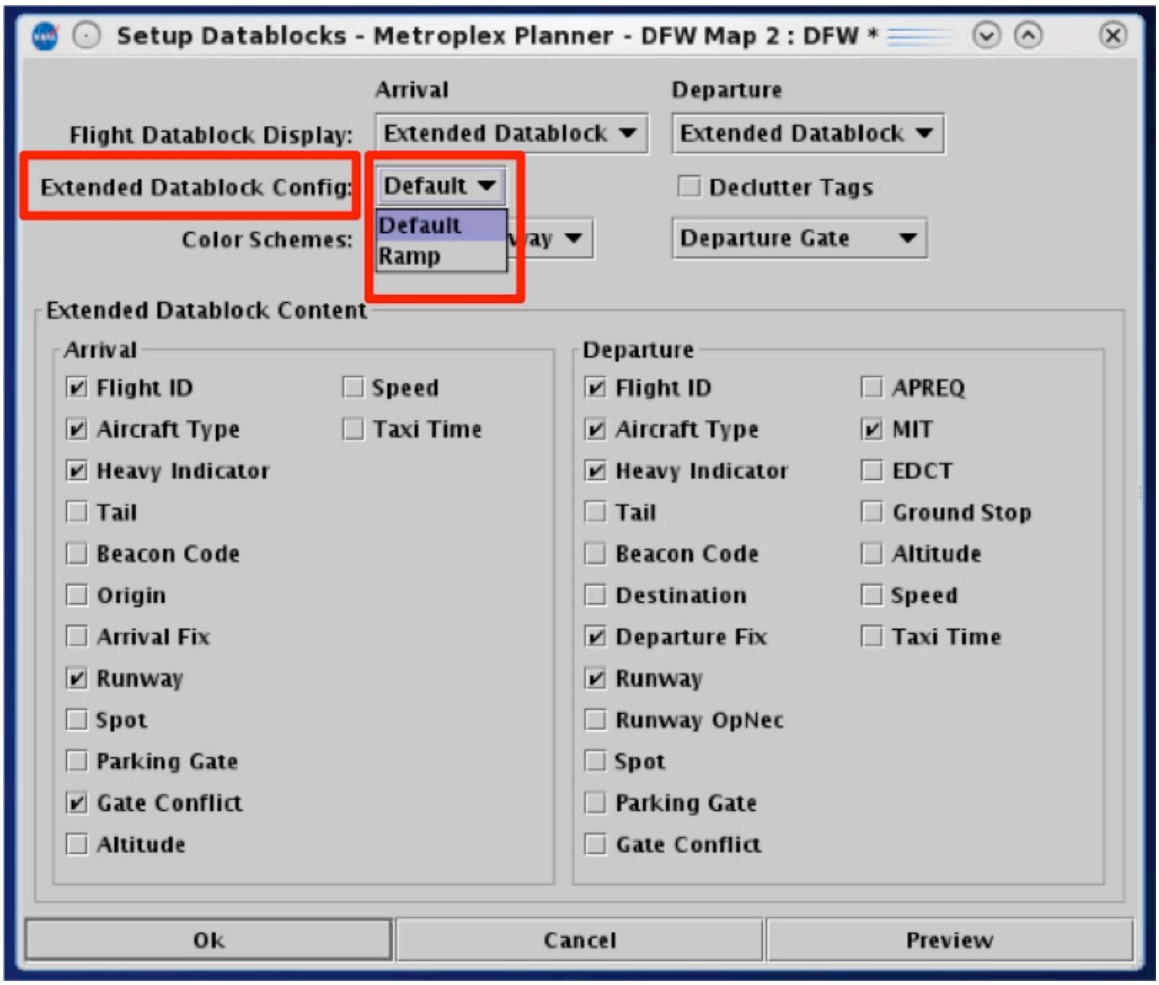


Figure 4.35. Setup Datablocks: Extended Datablock Config.

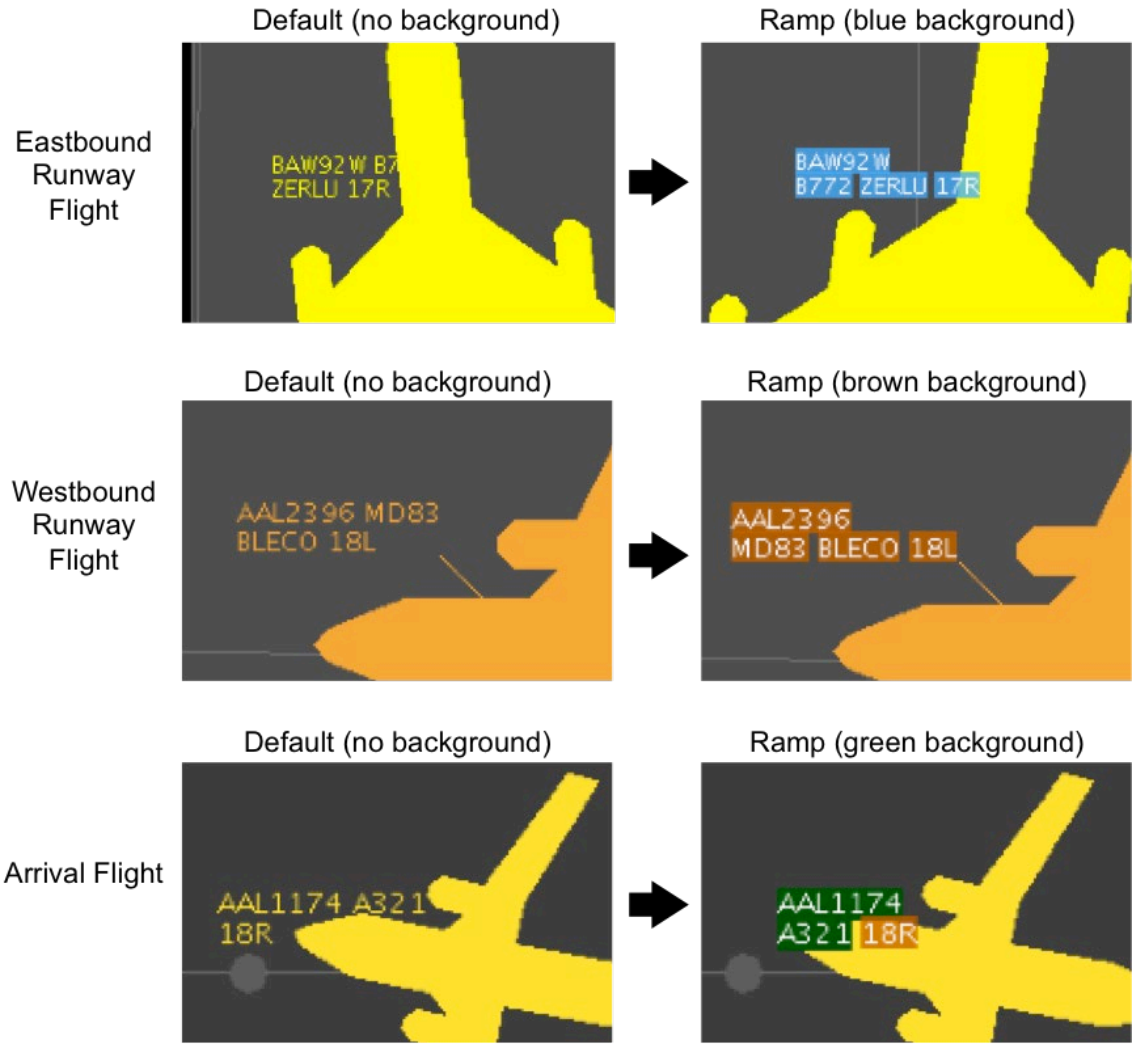


Figure 4.36. Extended Datablock Config: Default (left) and Ramp (right).

4.3.1.3 Color Schemes

Use “Color Schemes” to format flight icons and datablock text. Arrival flights and Departure flight use different color schemes.

To change Arrival/Departure Color Schemes on the Map:

***Step 1*:** Select the "Setup Datablocks" icon from the Map Toolbar.

***Step 2*:** Click on the Departure "Color Scheme" dropdown menu to select a color scheme for departure flights (e.g., "Departure Gate" in Figure 4.37):

- Departure (e.g., Figure 4.39)
- Departure Fix (e.g., Figure 4.38)
- Departure Gate
- Departure Runway
- Weight (Aircraft)

***Step 3*:** Click on the Arrival "Color Scheme" dropdown menu to select a color scheme for arrival flights:

- Arrival (e.g., Figure 4.38)
- Arrival Fix (e.g., Figure 4.39)
- Arrival Runway
- Weight (Aircraft)

Step 4: Select "Ok" to apply the change or "Preview" to preview the changes on the map.

Note: Color schemes are the same as those used in the timeline.

Note: Flights designated as an emergency are always shown in red.

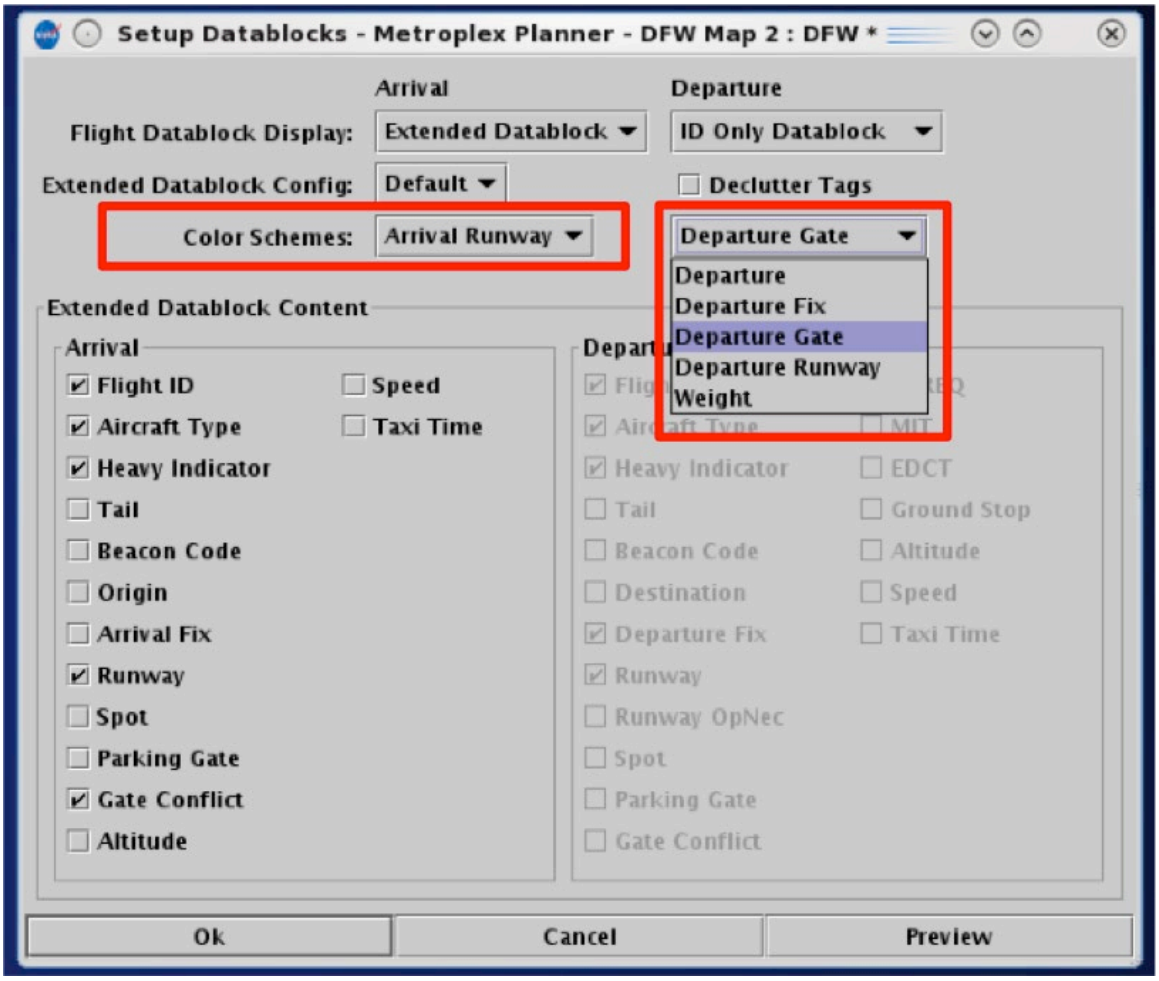


Figure 4.37. Setup Datablocks: Color Schemes.

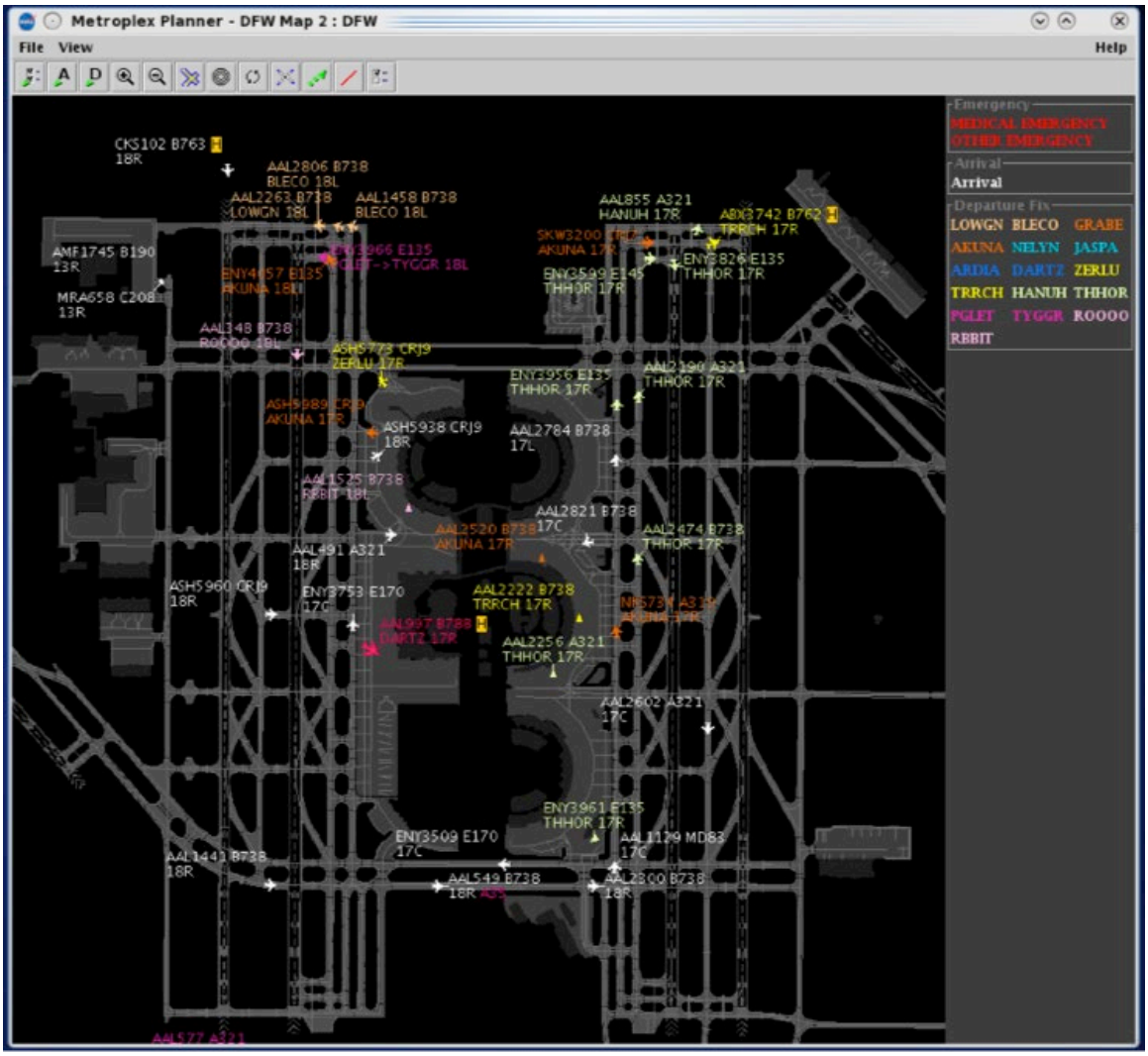


Figure 4.38. Color Scheme (example): “Arrival” and “Departure Fix”.

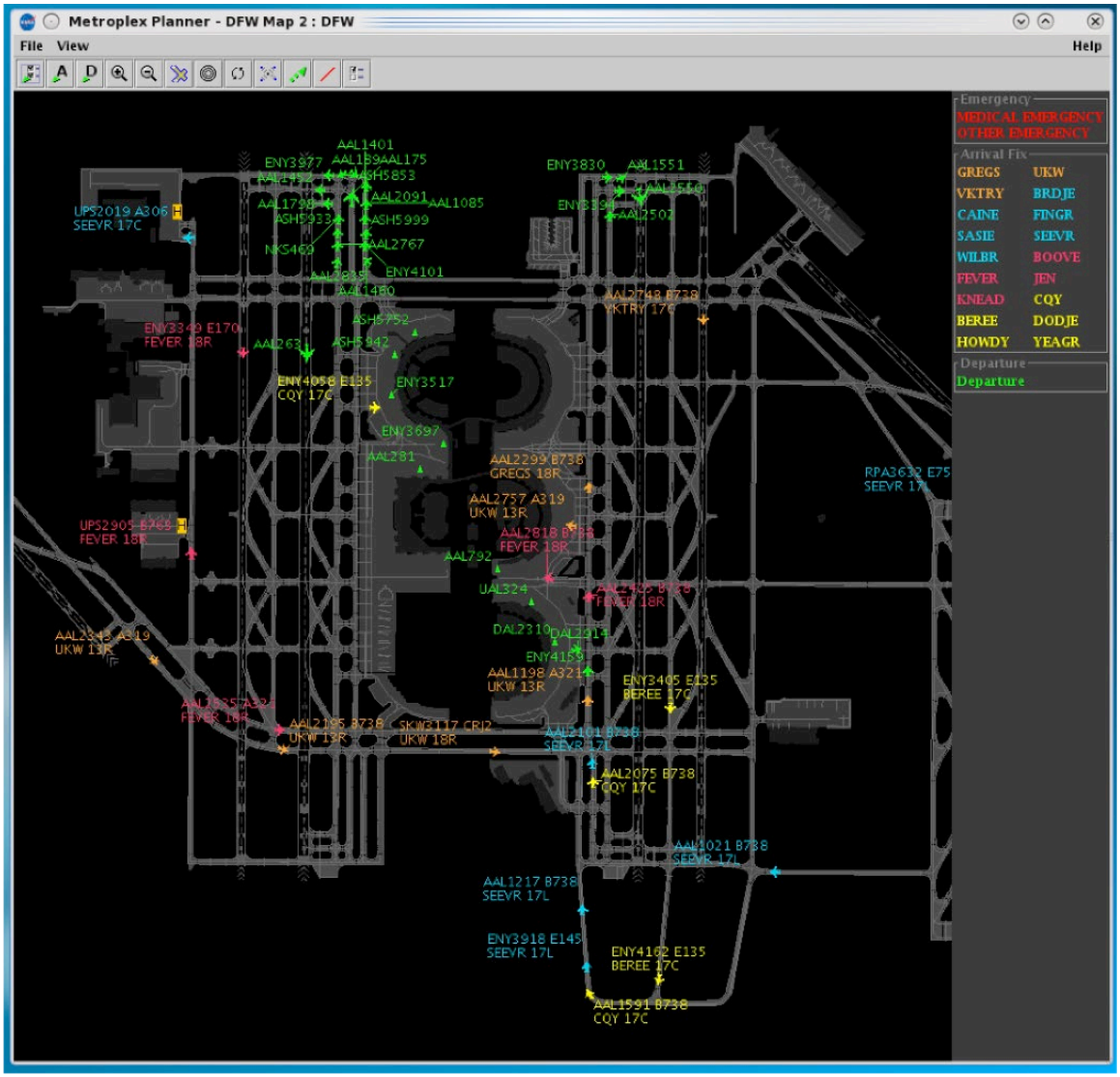


Figure 4.39. Color Scheme (example): “Arrival Fix” and “Departure”.

4.3.1.4 Declutter Tags

By default, the map allows flight datablocks in close proximity to overlap with one another. When "Declutter Tags" is selected, datablocks will be re-positioned so that they do not overlap with one another.

To Declutter datablocks:

***Step 1*:** Select the "Setup Datablocks" icon from the Map Toolbar.

Step 2: Select the "Declutter Tags" checkbox to prevent datablocks from overlapping (Figure 4.40).

Note: When "Declutter Tags" is selected, datablocks are repositioned (Figure 4.41, bottom). Flight icons themselves, however, are not repositioned.

Step 3: Select "Ok" to apply the change or "Preview" to preview the changes on the map.

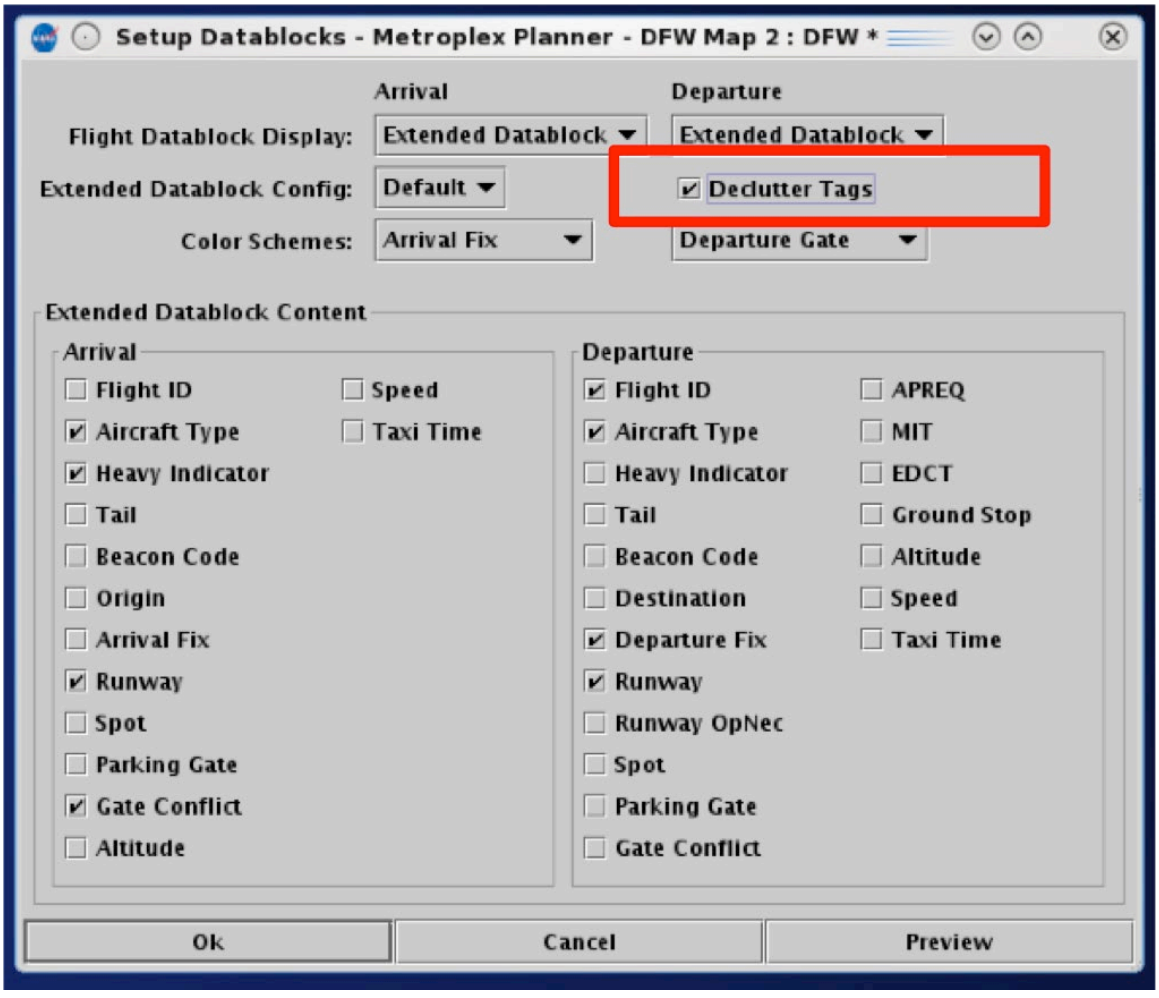


Figure 4.40. Setup Datablocks: Declutter Tags.

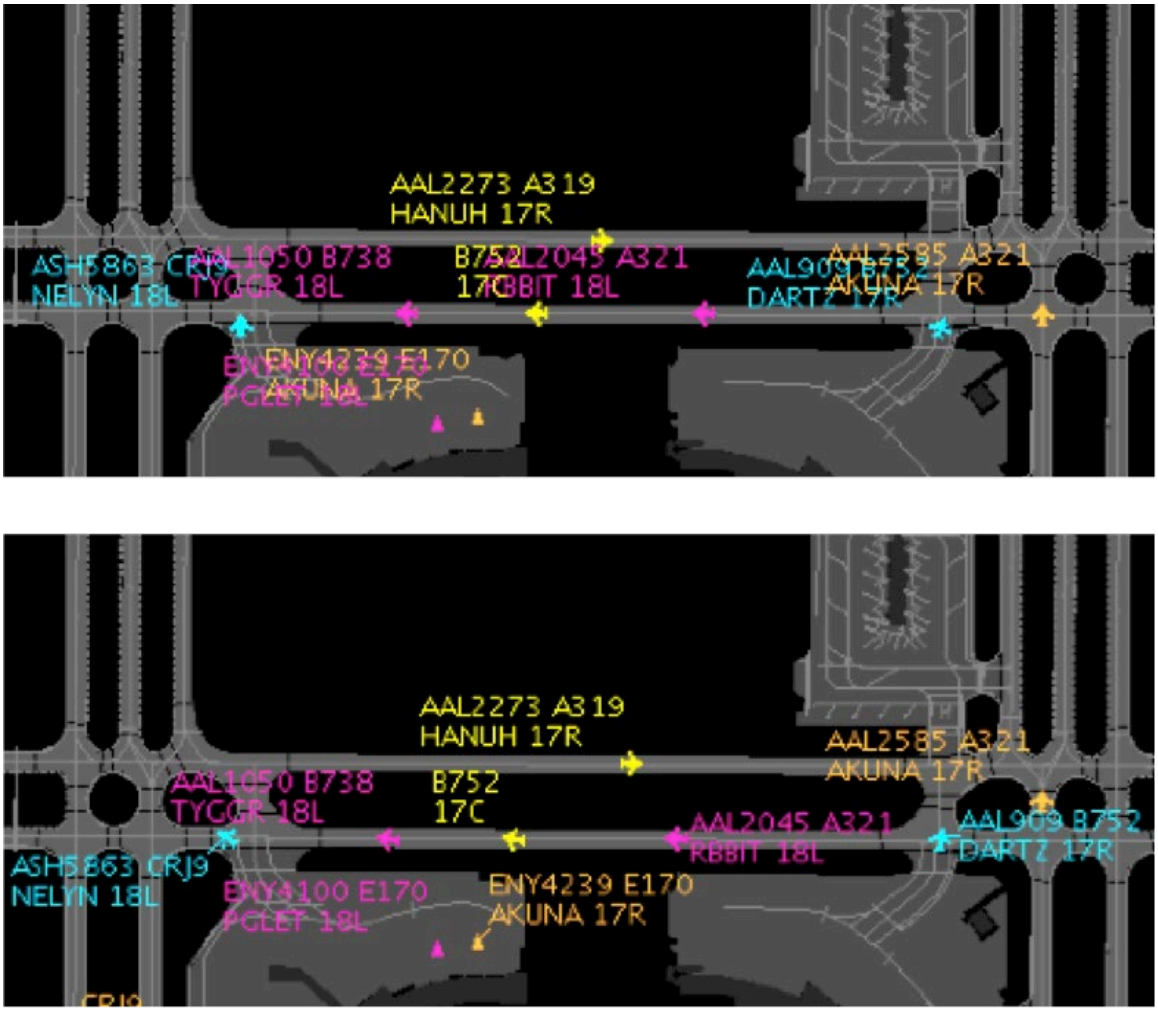


Figure 4.41. Declutter Tags: Unselected (top) and selected (bottom).

4.3.1.5 Map Datablock Content

Content displayed in extended datablocks can be configured for arrival and departure flights.

To change the content of Map Datablocks:

***Step 1*:** Select the "Setup Datablocks" icon from the Map Toolbar.

Step 2: Select items to include in Departure flight datablocks and items to include in Arrival flight datablocks (Figure 4.42).

Alternatively: Deselect items to exclude them from the Departure/Arrival datablocks.

Step 3: Select "Ok" to apply the change or "Preview" to preview the changes.

Note: Selected content is only displayed when "Extended Datablock" is selected.

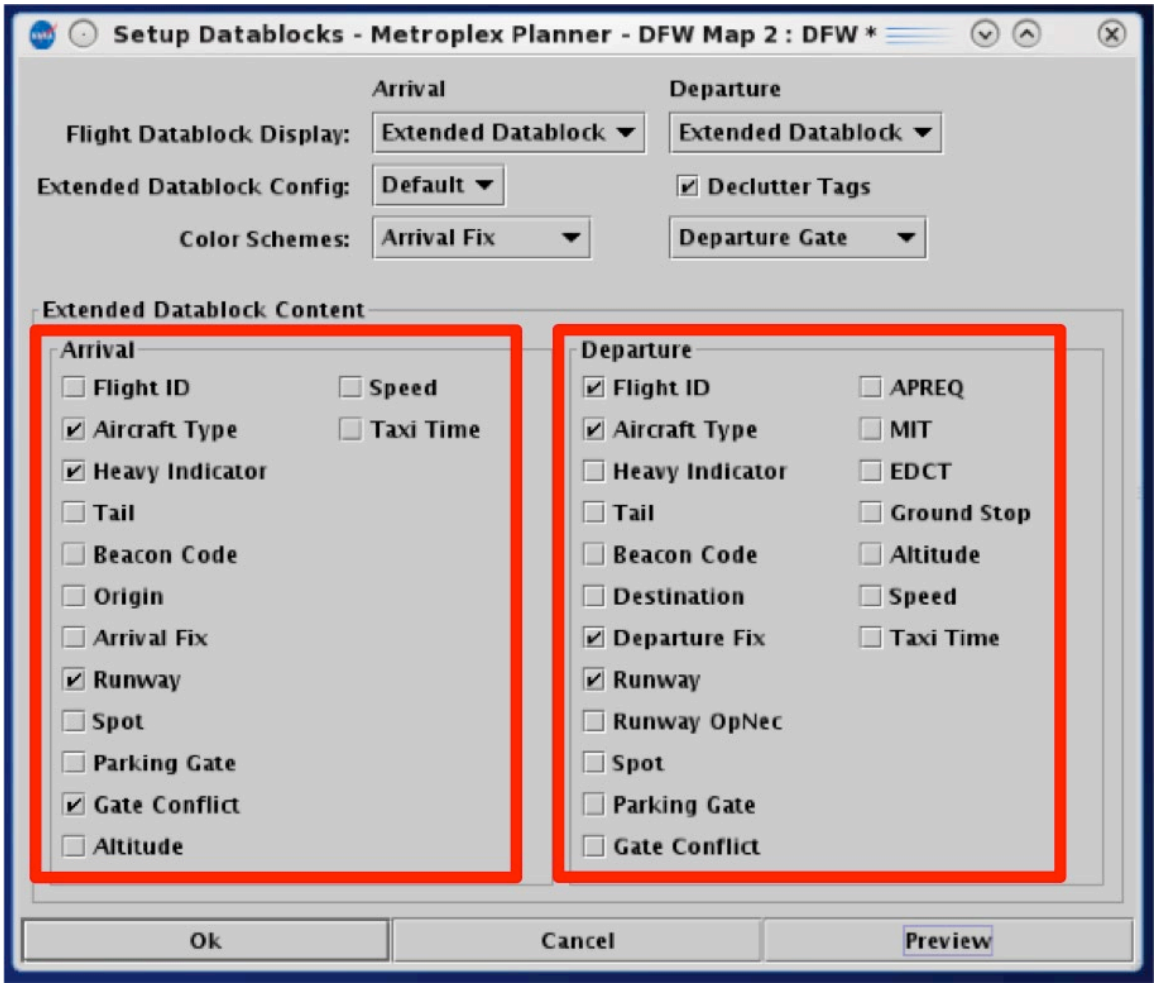


Figure 4.42. Map datablock content for Arrival and Departure flights.

4.3.2 Toggle Arrival / Departure Datablocks

Use “Toggle Arrival Datablocks” and “Toggle Departure Datablocks” to display no datablock, call sign only, or the extended datablock (Figure 4.43).

Figure 4.43. Toggle Datablocks: No Datablock, ID Only Datablock, or Extended Datablock.

4.3.3 Zoom In/Out

Use the “Zoom In” and “Zoom Out” buttons to change the map zoom level. To pan, or move, the move the map, press and hold the left mouse button.

4.3.4 Reset Zoom

Use “Reset Zoom” to reset the map after changing the zoom level or panning the map. Note: The map resets to the saved zoom level and position or the surface of the selected airport.

4.3.5 Setup Range Rings

Use “Setup Range Rings” to display distance markers on the map.

To display and modify Range Rings:

***Step 1*:** Select the "Setup Range Rings" icon in the Map Toolbar to access the Setup Range Rings window (Figure 4.44).

***Step 2*:** Select the "Show Range Rings" checkbox to view range rings on map.

Step 3 (Optional): Select the "Show Range Distance Labels" checkbox to display the value of each range ring (Figure 4.45).

Step 4 (Optional): Click inside the box to select the color of the range rings.

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: Select "Apply".

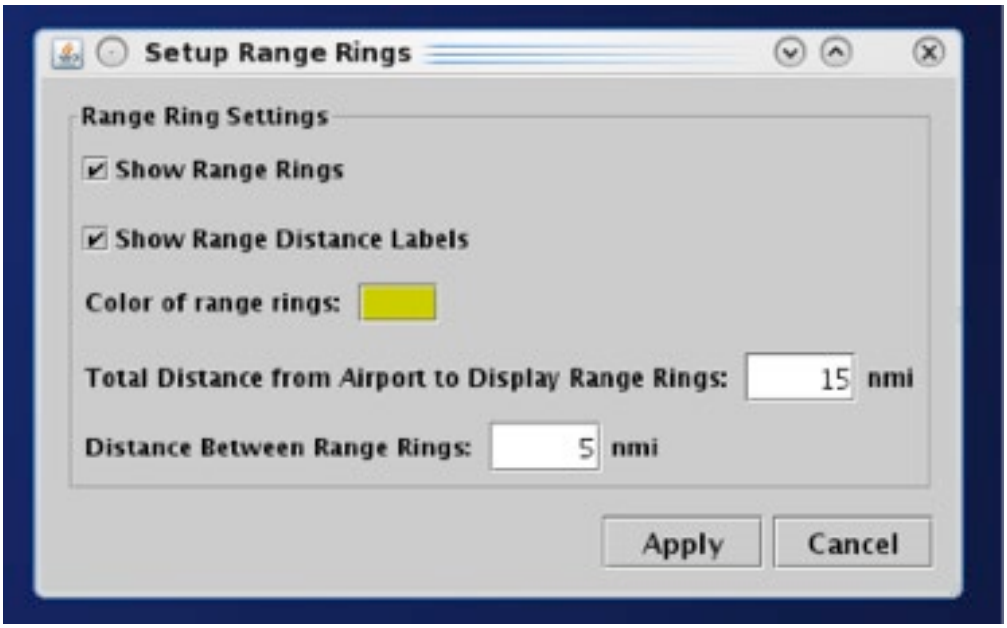


Figure 4.44. Map Toolbar: Setup Range Rings.

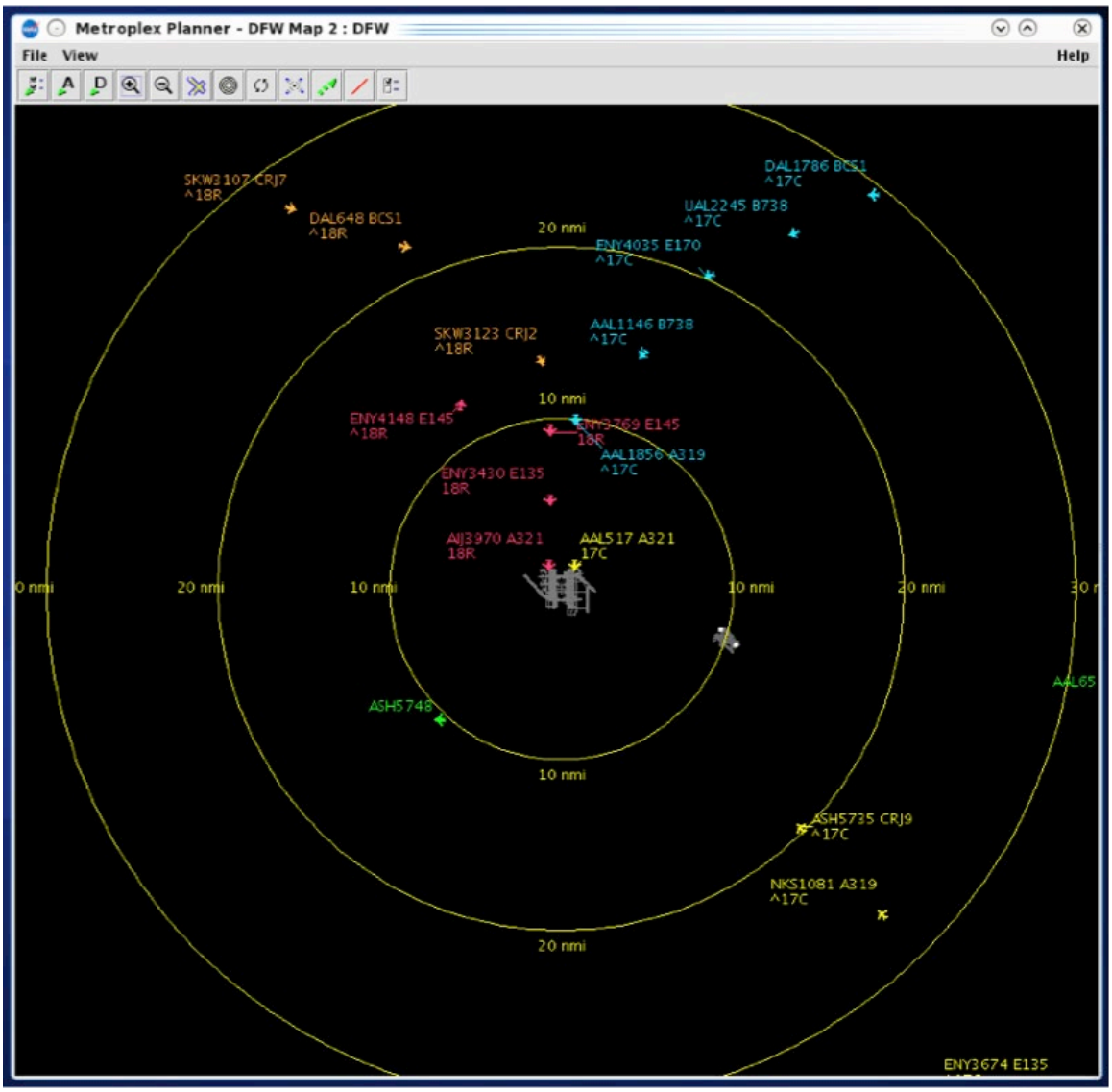


Figure 4.45. Map: Range Rings.

4.3.6 Rotate Map

Use the “Rotate Map” icon to rotate the map clockwise 90, 180, or 270 degrees (Figure 4.46). Select 0 degrees to reset the map to the original position.

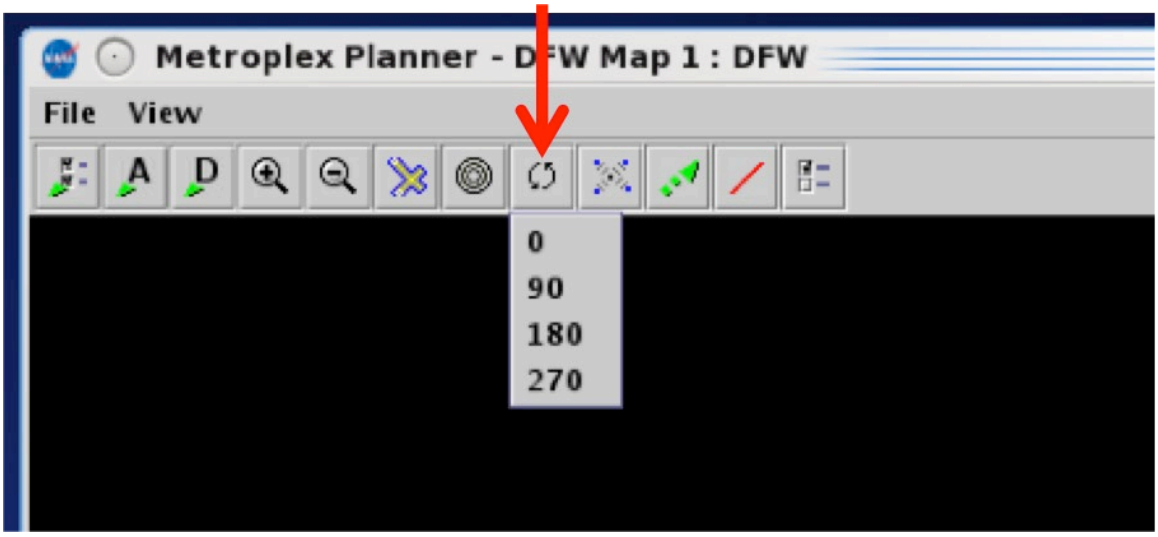


Figure 4.46. Map Toolbar: Rotate Map.

4.3.7 Setup Arrival/Departure Fixes and Airports

Select the "Setup Arrival/Departure Fixes and Airports" icon to display Fixes, TRACON maps, and airport labels on the map.

4.3.7.1 Arrival Fix

On the "Arrival Fix" tab, select "Show Arrival Fix/Procedures" and enter distance parameters (Figure 4.47).

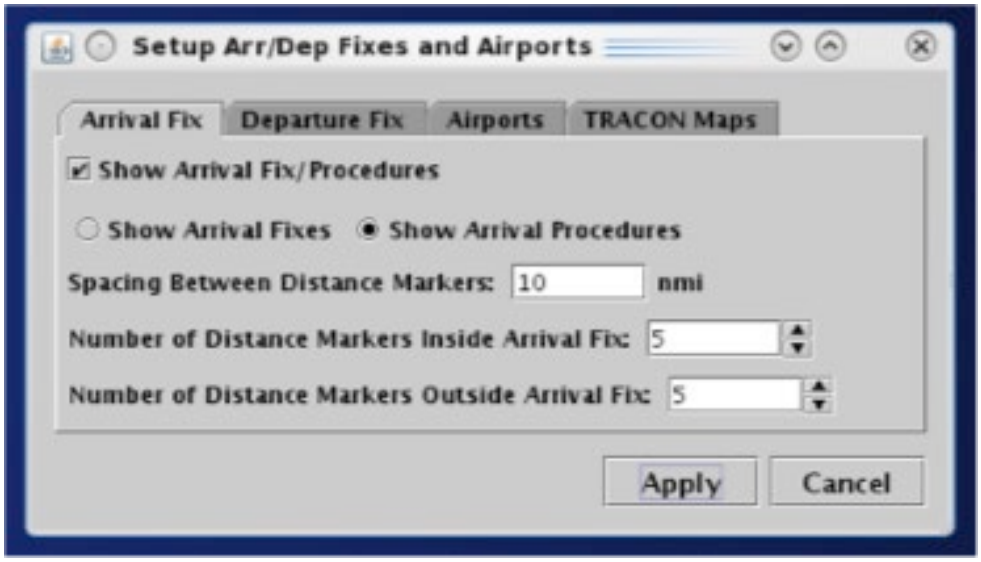


Figure 4.47. Map Setup Arrival/Departure Fixes and Airports: Arrival Fix.

Arrival fix procedures are depicted graphically on the map (Figure 4.48).

Figure 4.48. Map: Arrival Fix.

4.3.7.2 Departure Fix

On the “Departure Fix” tab, select “Show Departure Fixes” and select naming format (i.e., full name or abbreviation) (Figure 4.49). Departure fixes will be shown as illustrated in Figure 4.50.

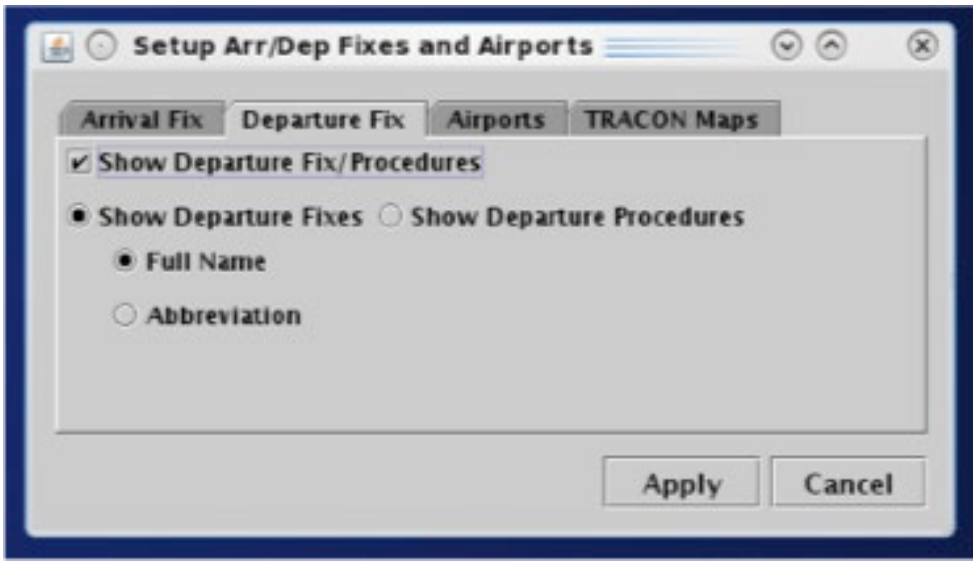


Figure 4.49. Map Setup Arrival/Departure Fixes and Airports: Departure Fix.

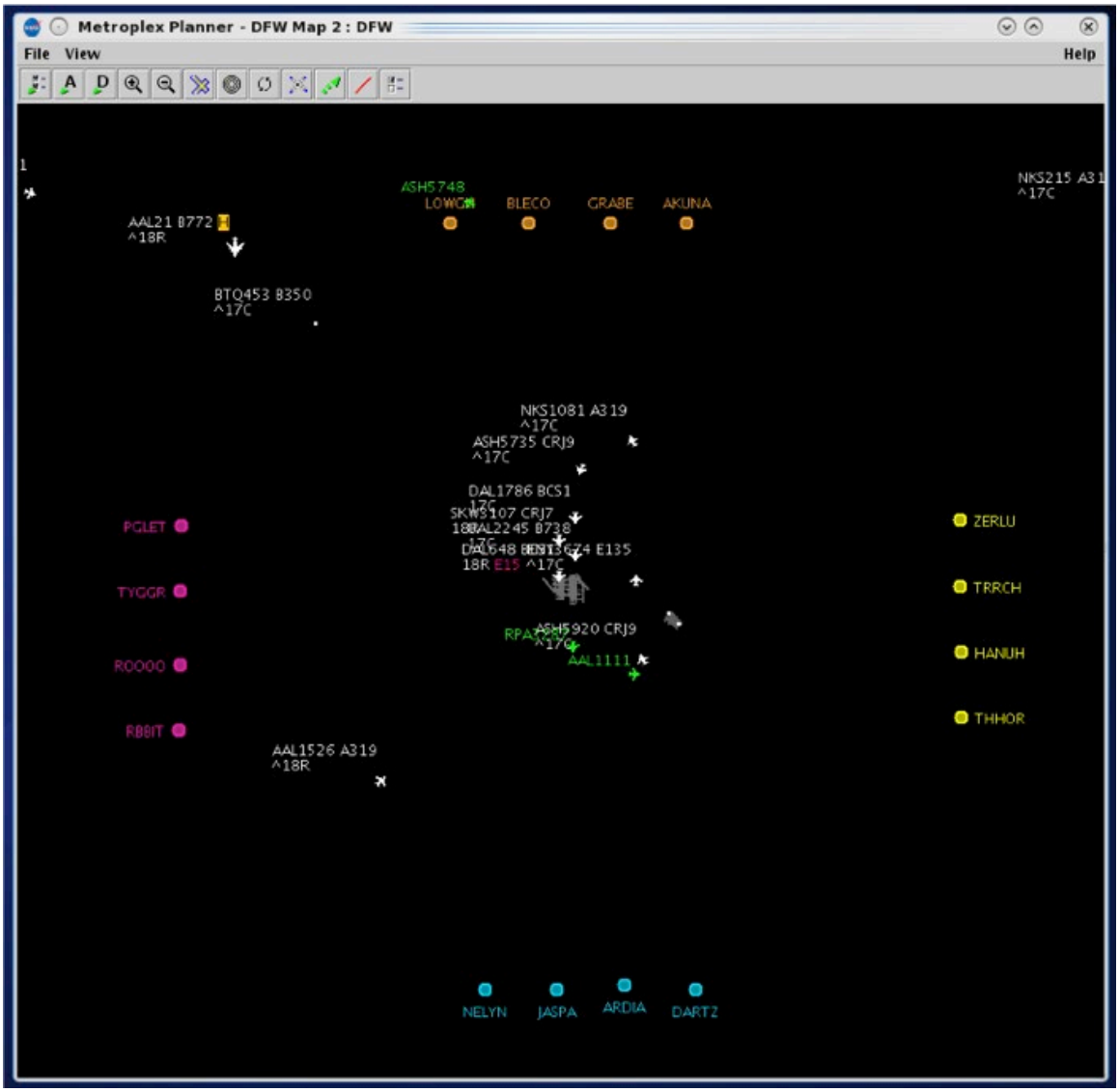


Figure 4.50. Map: Departure Fixes.

4.3.7.3 Airports

On the “Airports” tab, select the “Show Airports” checkbox (Figure 4.51). Select, or enter, airports to label on the map (Figure 4.52).

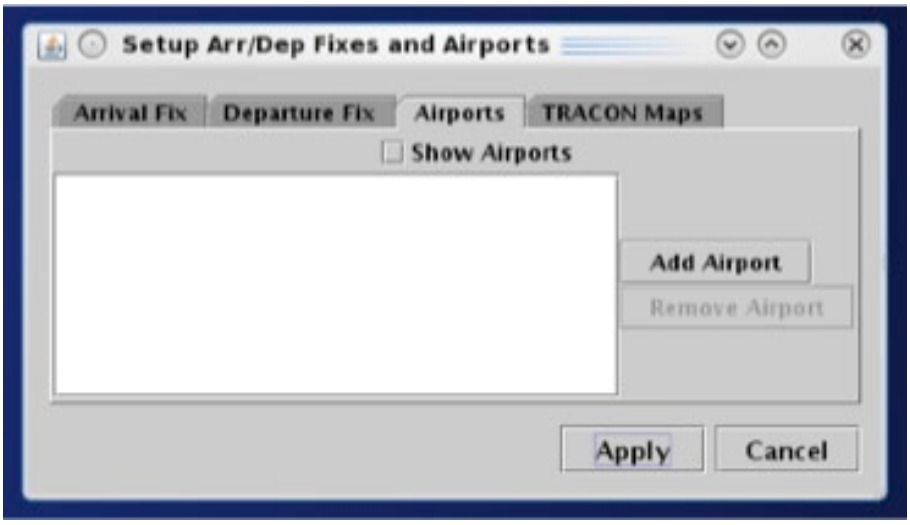


Figure 4.51. Map Setup Arrival/Departure Fixes and Airports: Airports.

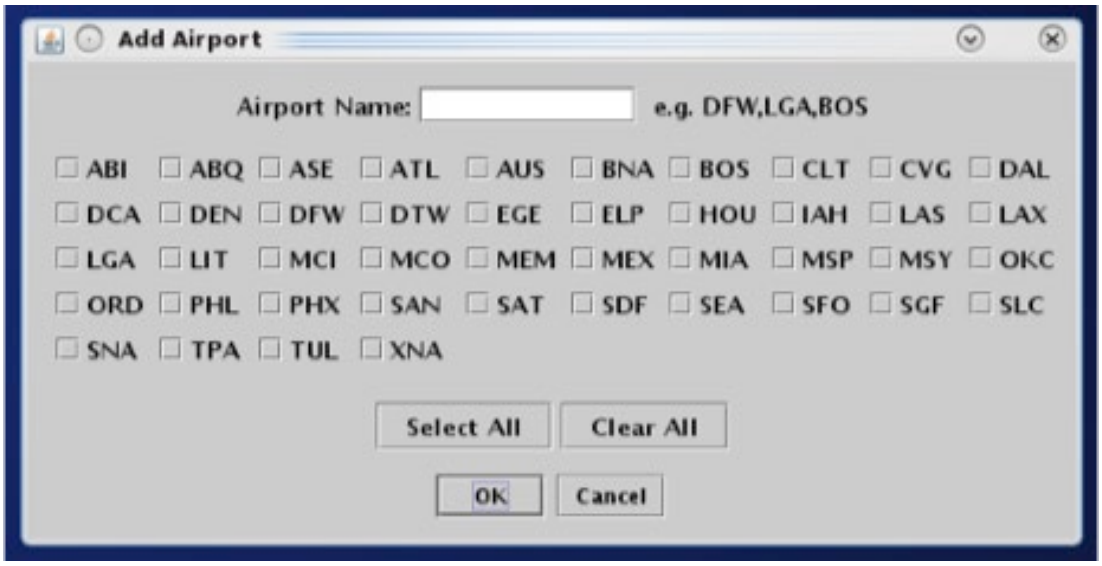


Figure 4.52. Map Setup Arrival/Departure Fixes and Airports: Airports.

Selected airports are displayed on the map (Figure 4.53).

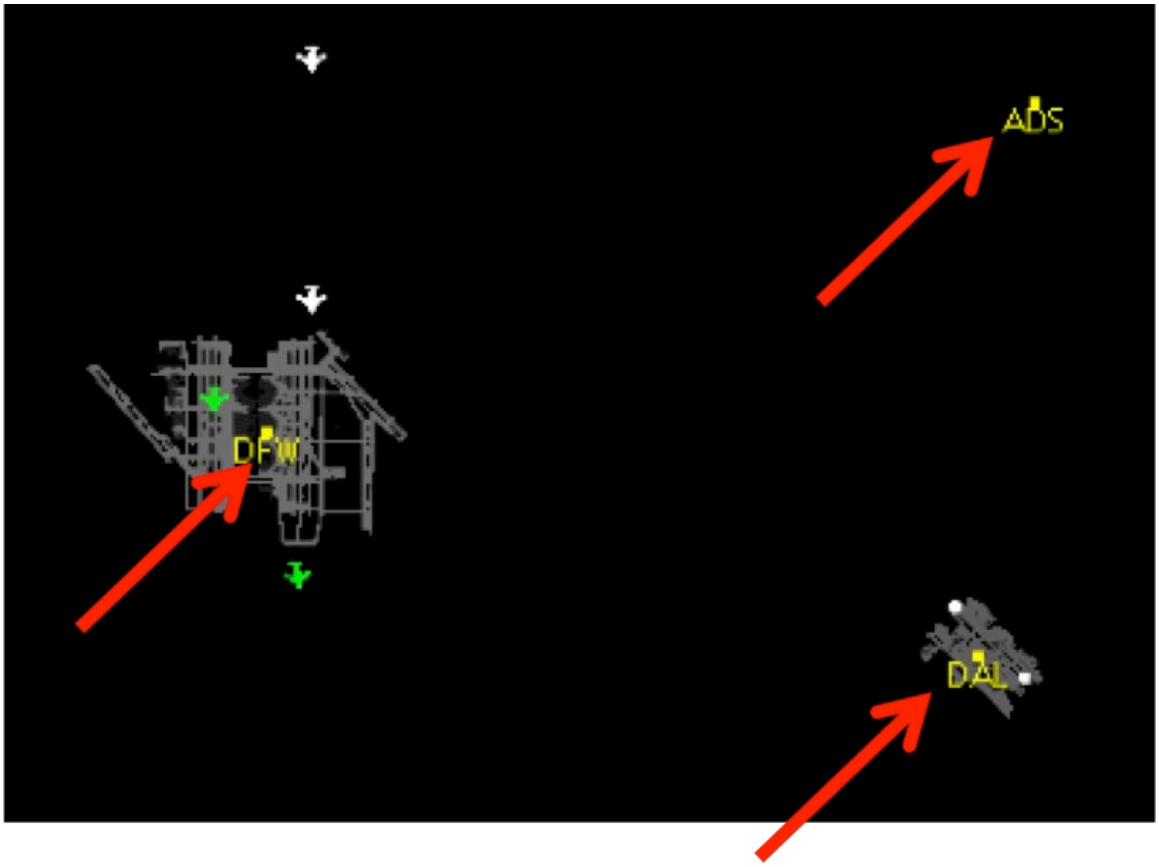


Figure 4.53. Map: Airport lables (example).

4.3.7.4 TRACON Maps

On the "TRACON Maps" tab, select a map from the dropdown menu (Figure 4.54). TRACON maps will be shown as illustrated in Figure 4.55.

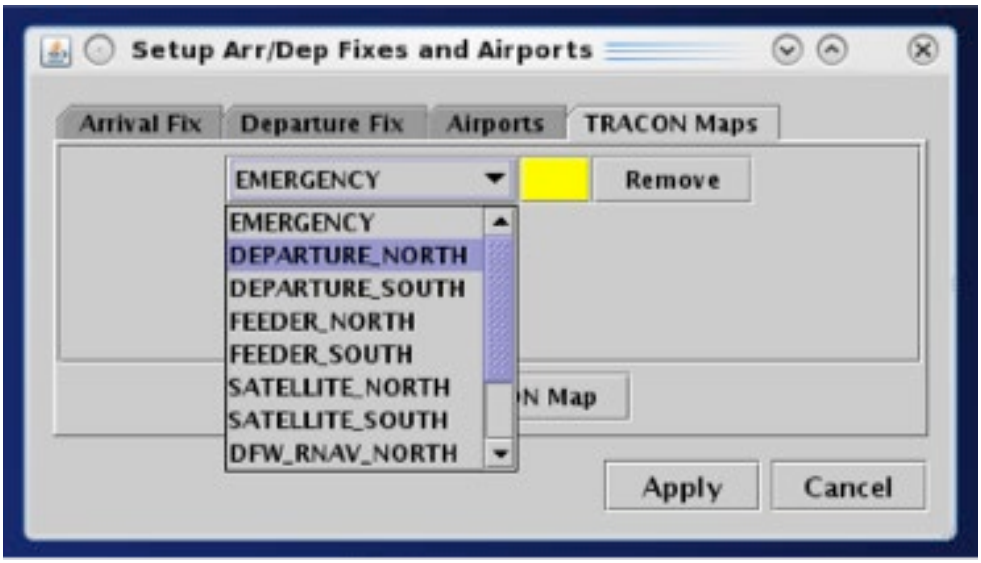


Figure 4.54. Map Setup Arrival/Departure Fixes and Airports: TRACON Maps.

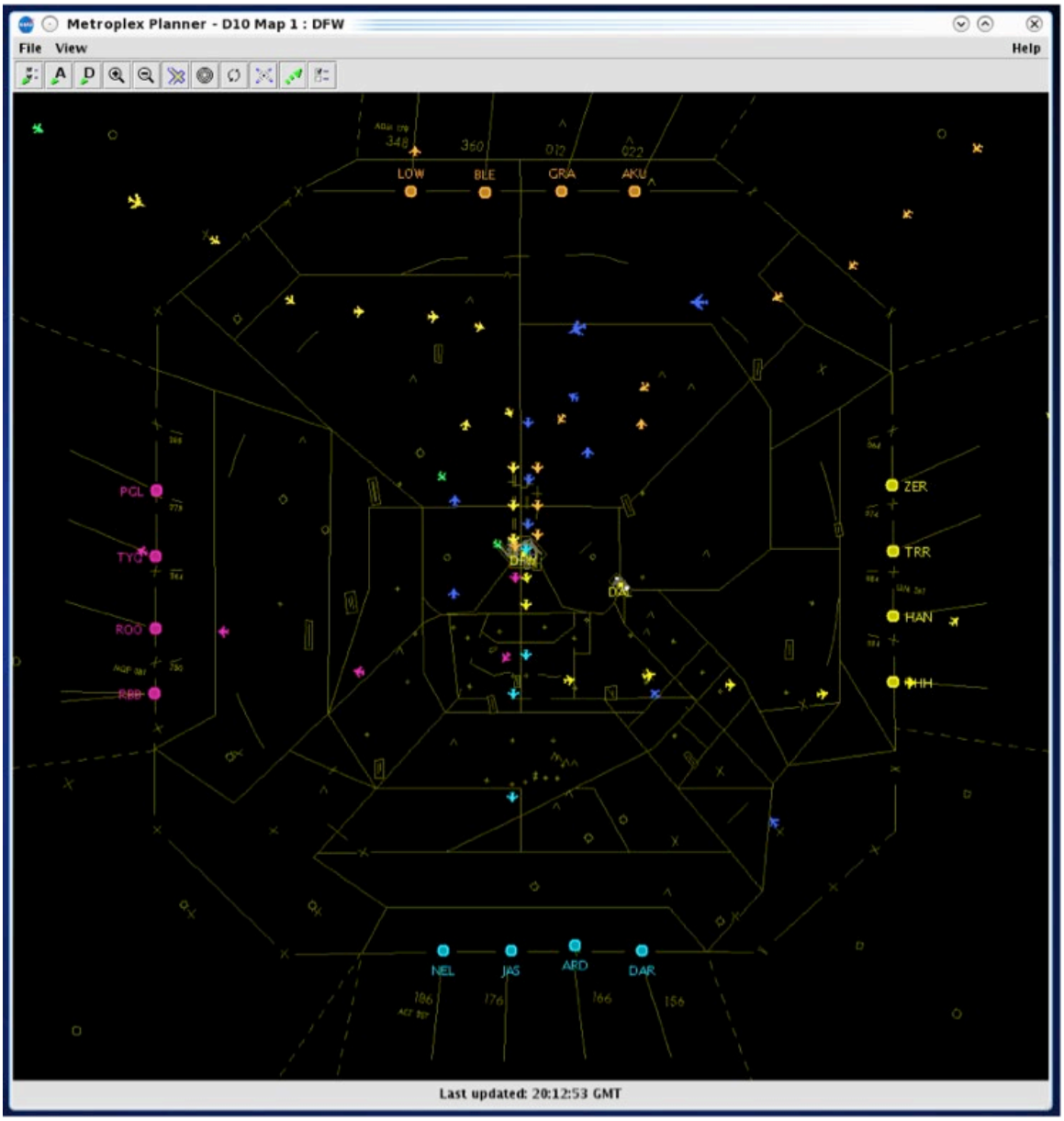


Figure 4.55. Map: TRACON map (example).

4.3.8 Setup Target Trails

Use the "Setup Target Trails" icon to show/hide flight icon target trails (Figure 4.56). Target trails can help indicate the flight's direction of movement on the surface (Figure 4.57) or in the air (Figure 4.58).

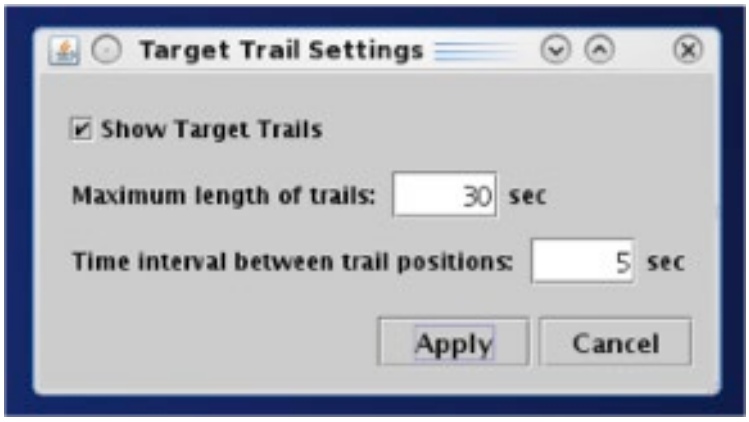


Figure 4.56. Map Toolbar: Setup Target Trails.

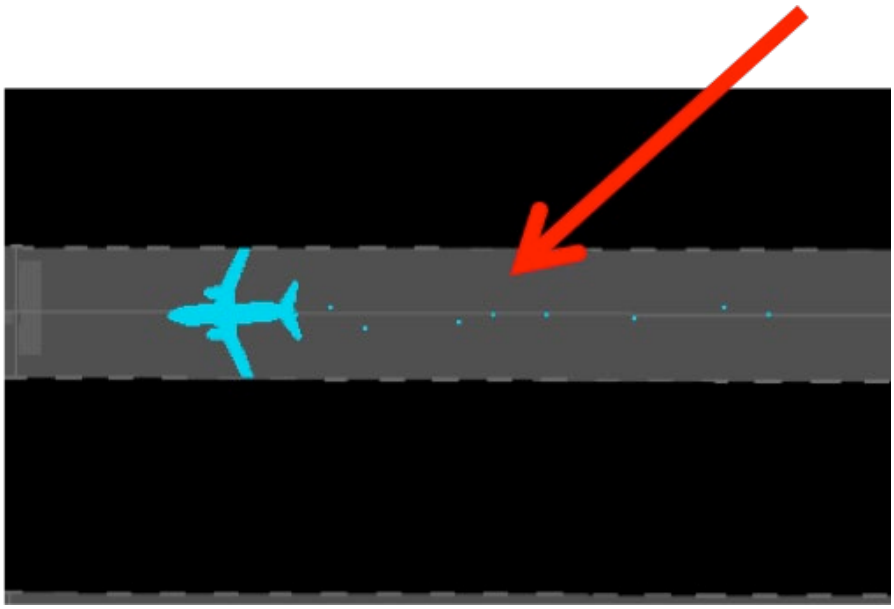


Figure 4.57. Target Trails on the surface.

Figure 4.58. Target Trails in the air.

4.3.9 Open/Close Links

Select the “Open/Close Links” icon to enter taxiway or runway closure information into the ATD-2 systems. After selecting the icon, all taxiway and runway centerlines are shown in magenta (Figure 4.59).

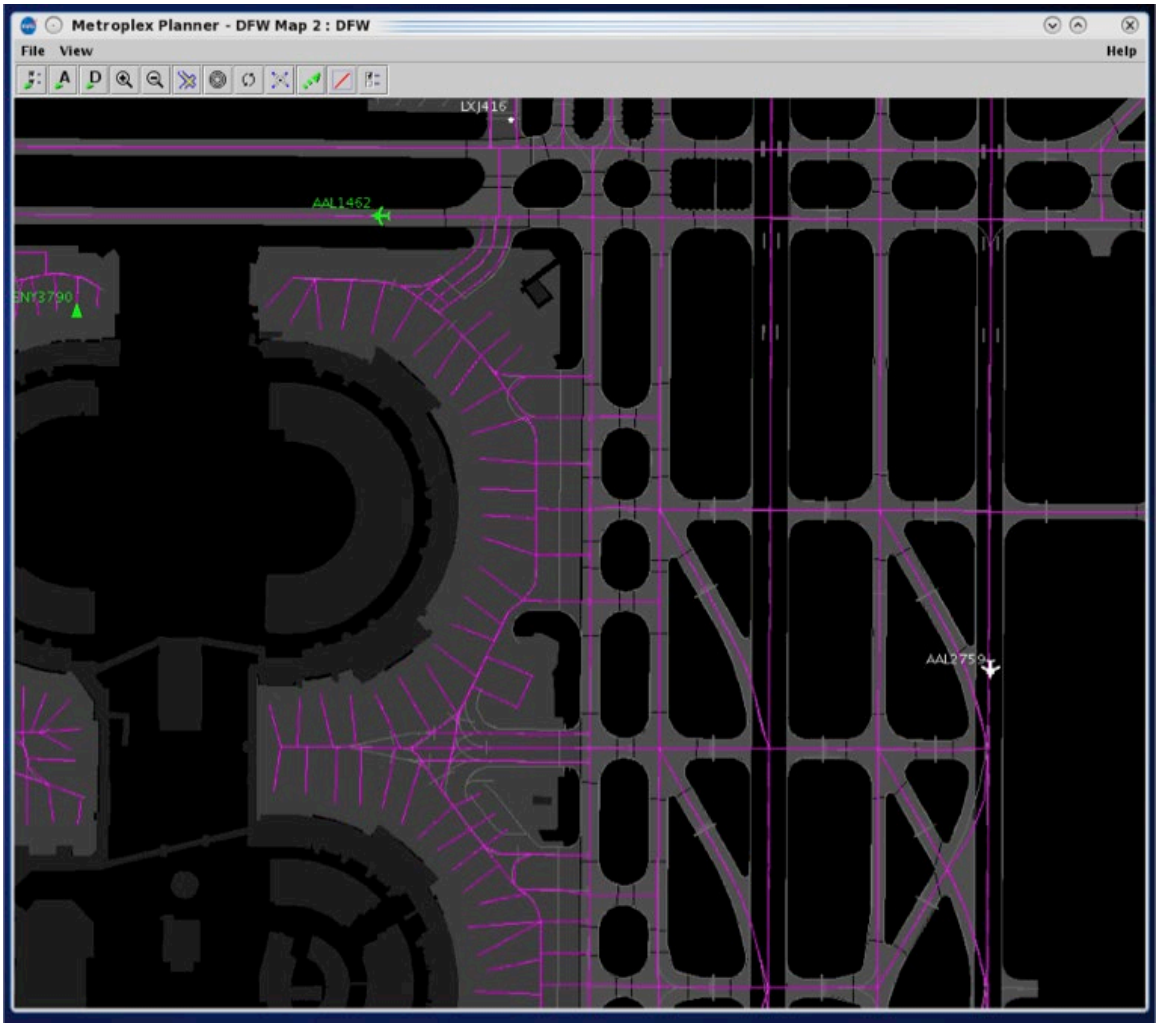


Figure 4.59. Open/Close Links: Select any link shown in magenta.

Click and drag the mouse to select a taxiway or runway (Figure 4.60). Confirm closure at the prompt (Figure 4.61).

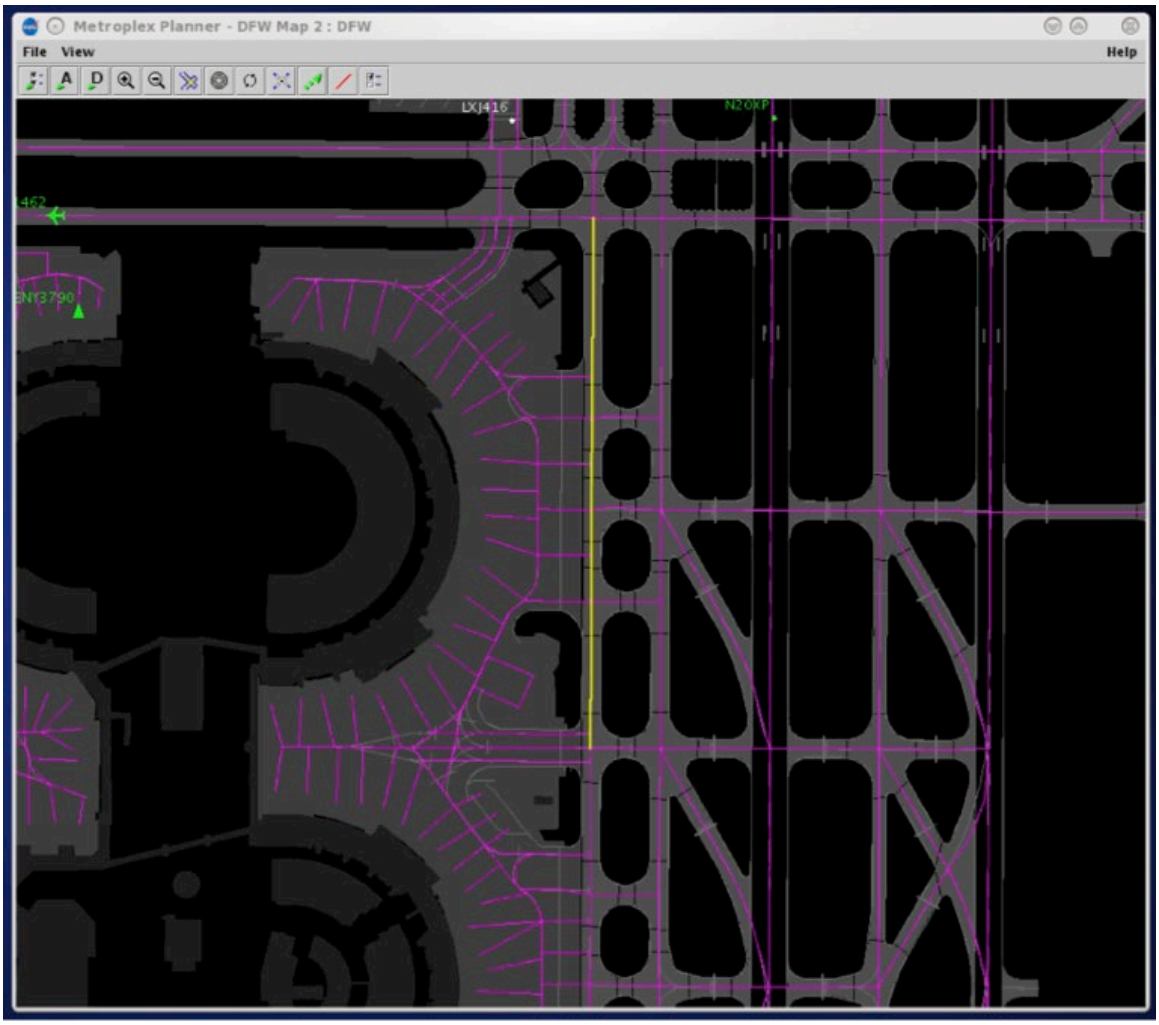


Figure 4.60. Selected taxiways/runways are shown in yellow.

Figure 4.61. Select taxiway and/or runway to close (yellow taxiways).

Once confirmed, closed taxiways are displayed with a red centerline (Figure 4.62) and closed runways are highlighted in red with a white “X” at each end (Figure 4.63).

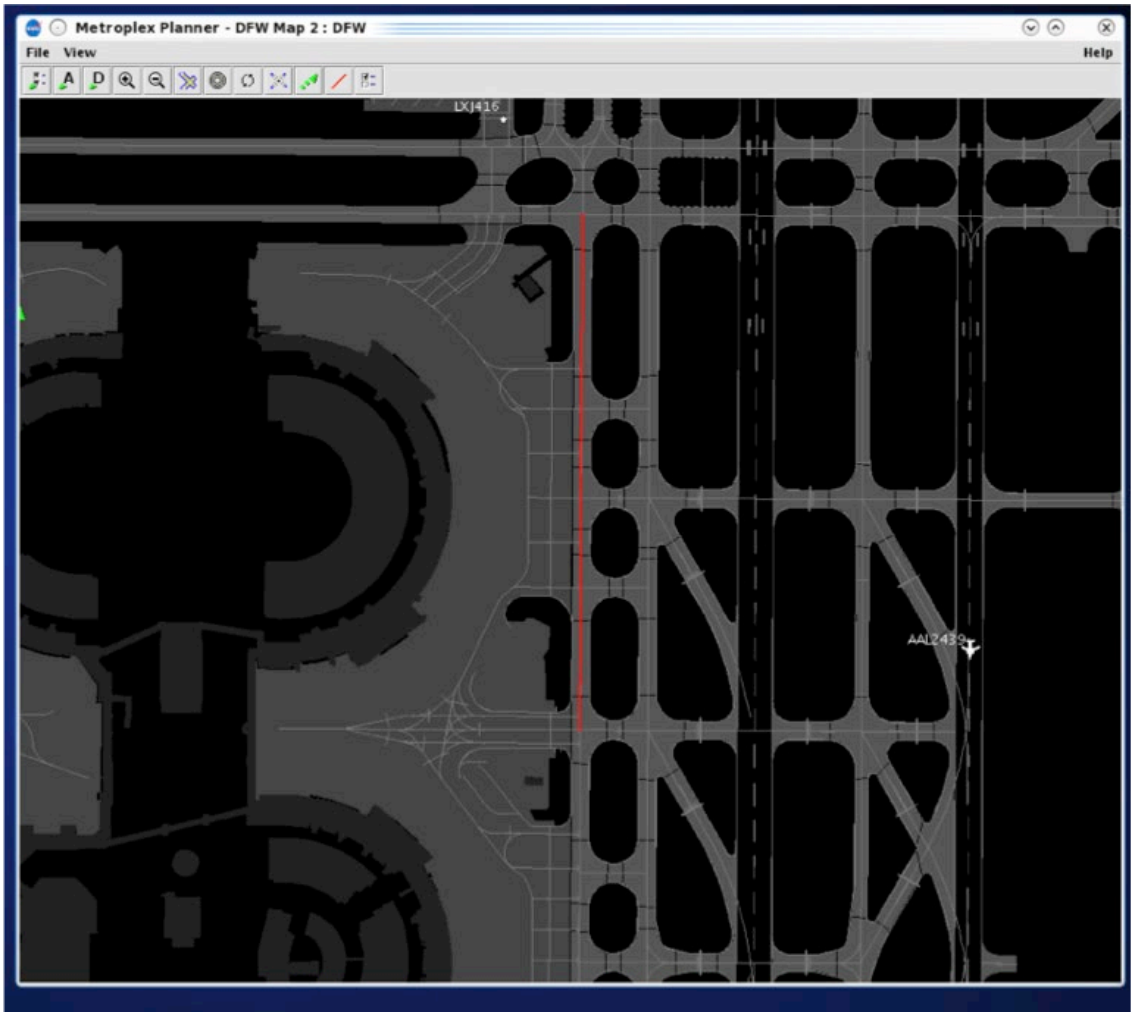


Figure 4.62. Once confirmed, closed taxiways are displayed in red.

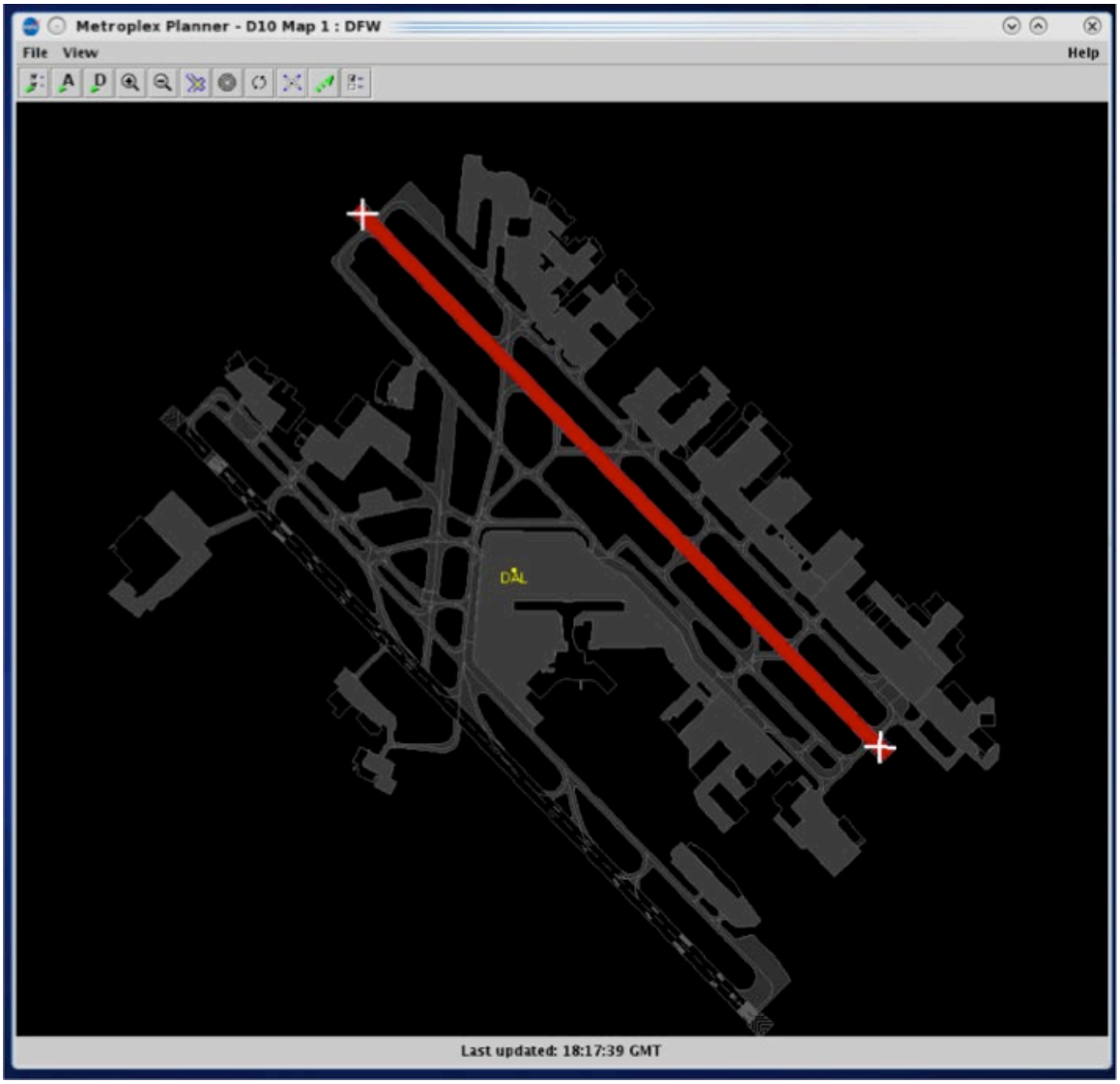


Figure 4.63. Once confirmed, closed runways are displayed in red with a white "X" at each end.

Use the same procedure to re-open the closed taxiways/runways.

4.3.10 Setup Map

Use the "Setup Map" icon to select features to be displayed on the map and assign colors to them (Figure 4.64 and Figure 4.65).

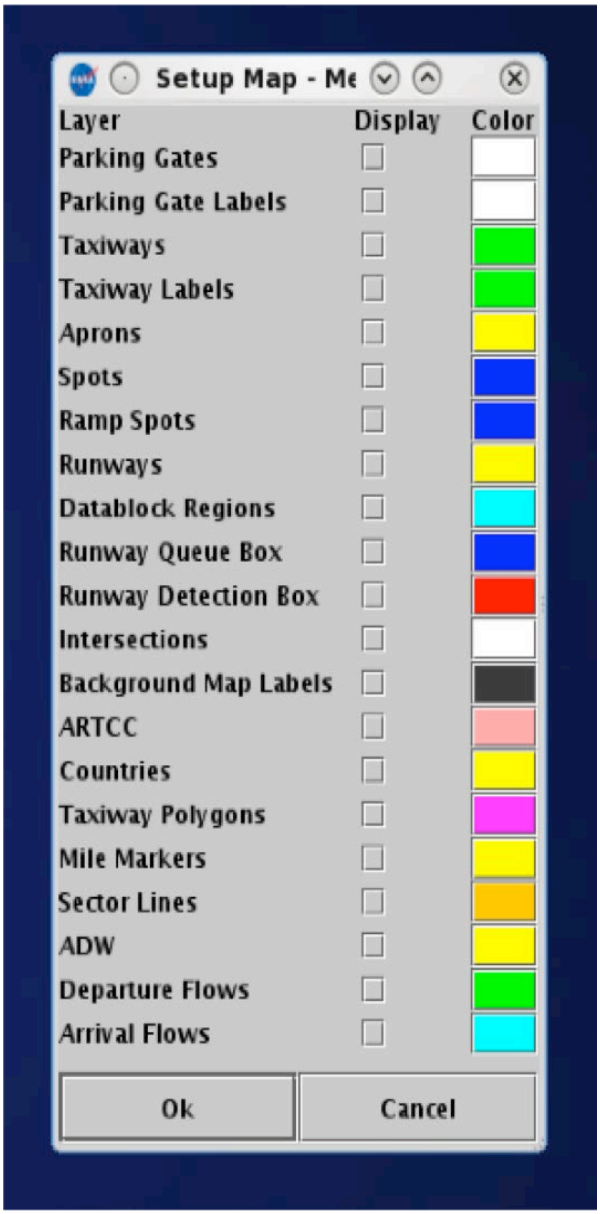


Figure 4.64. Setup Map window.

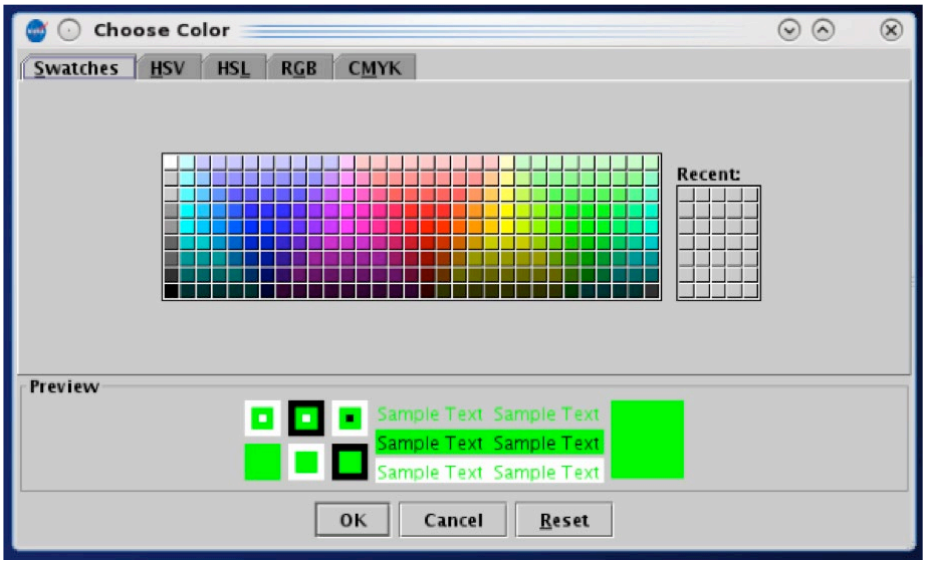


Figure 4.65. Setup Map: Color selection.

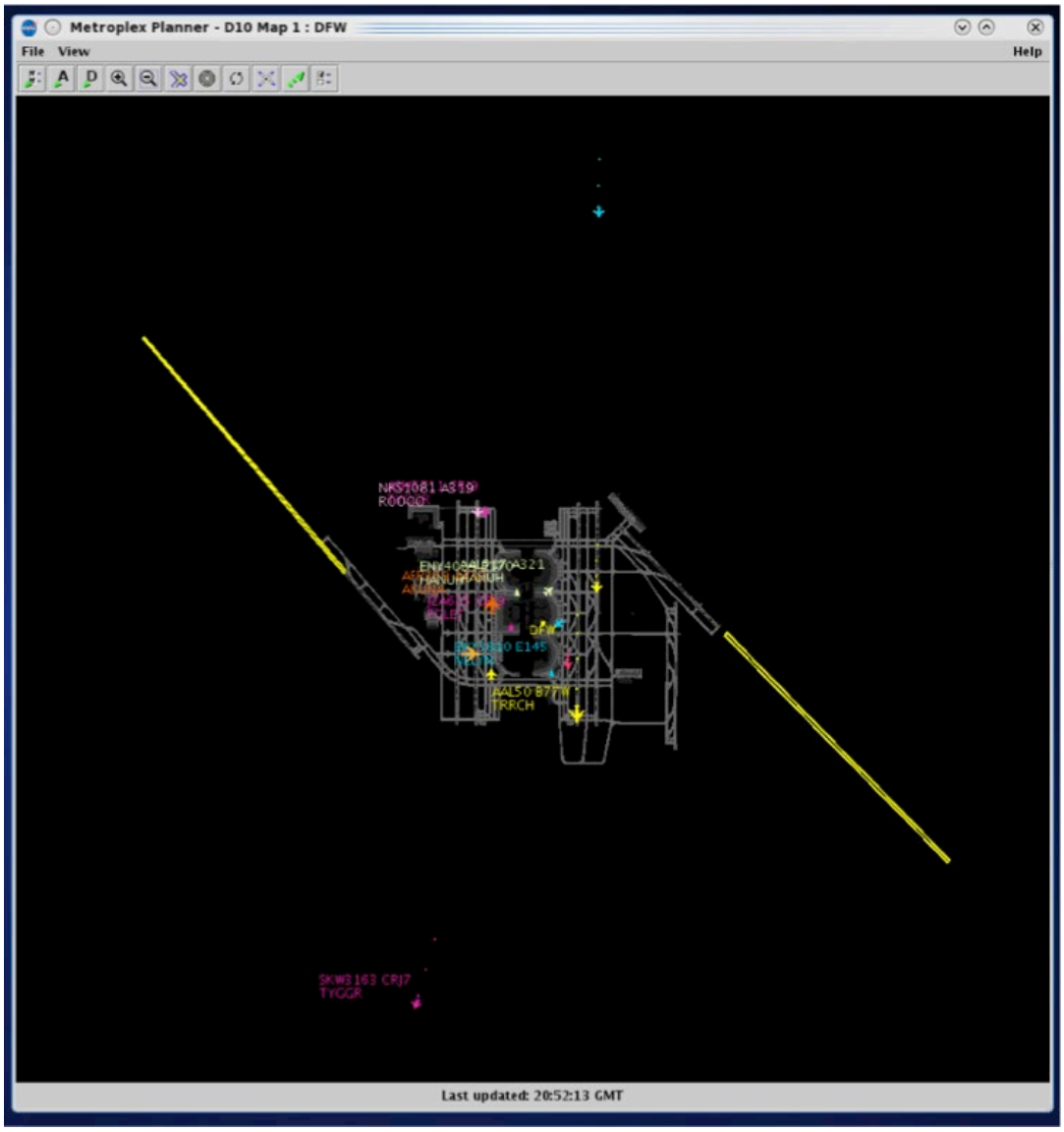


Figure 4.66. Setup Map: Arrival Departure Window (ADW) (example).

4.4 Map: Flight Information

The map also displays other types of flight information.

4.4.1 Tarmac Rule / Long On Board

Tarmac Rule / Long On Board (LOB) information is displayed on the map using a colored disc behind the flight icon.

- For **departures**, the LOB timer starts at pushback and is continuously computed as current time minus the Actual Off-Block Time (AOBT) until the departure takes off.

- For **arrivals**, the LOB timer starts at touchdown and is continuously computed as the current time minus the Actual Landing Time (ALDT) until the arrival is in the gate.

Three different disc colors are used: yellow, orange, and red (Figure 4.67). Note, the color of the flight icon is determined by the selected color scheme and is unrelated to the LOB indicators.

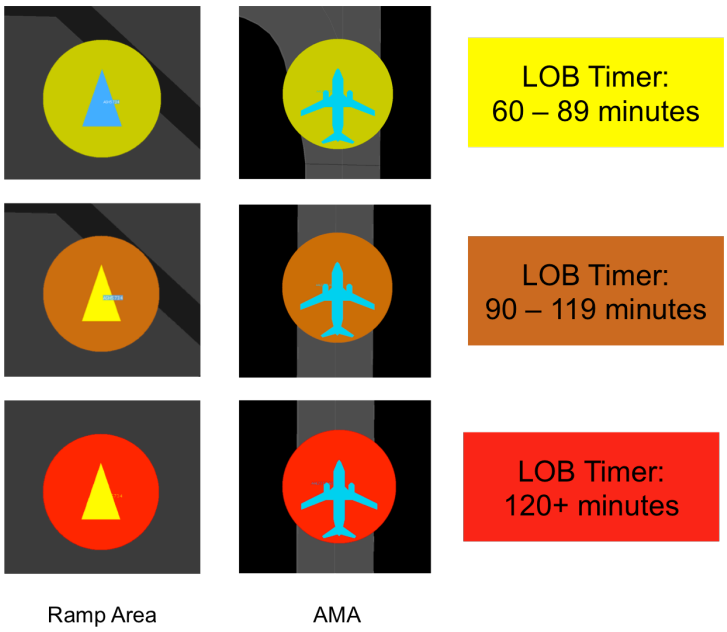


Figure 4.67. Map: Long On Board indicators (yellow, orange, and red discs).

5 STBO Client: Tables

Tables are used to display information about individual flights, aircraft, and departure fixes. Four types of tables are available:

- Flights Table
- Aircraft Table
- Departure Fix Status Table

Tables can be sorted, filtered, and color-coded according to user preference.

5.1 Flights Table

The Flights Table displays all known departures and arrivals within the next 8 hours (Figure 5.1). More than one Flights Table can be open at the same time and each can be configured independently of the others.

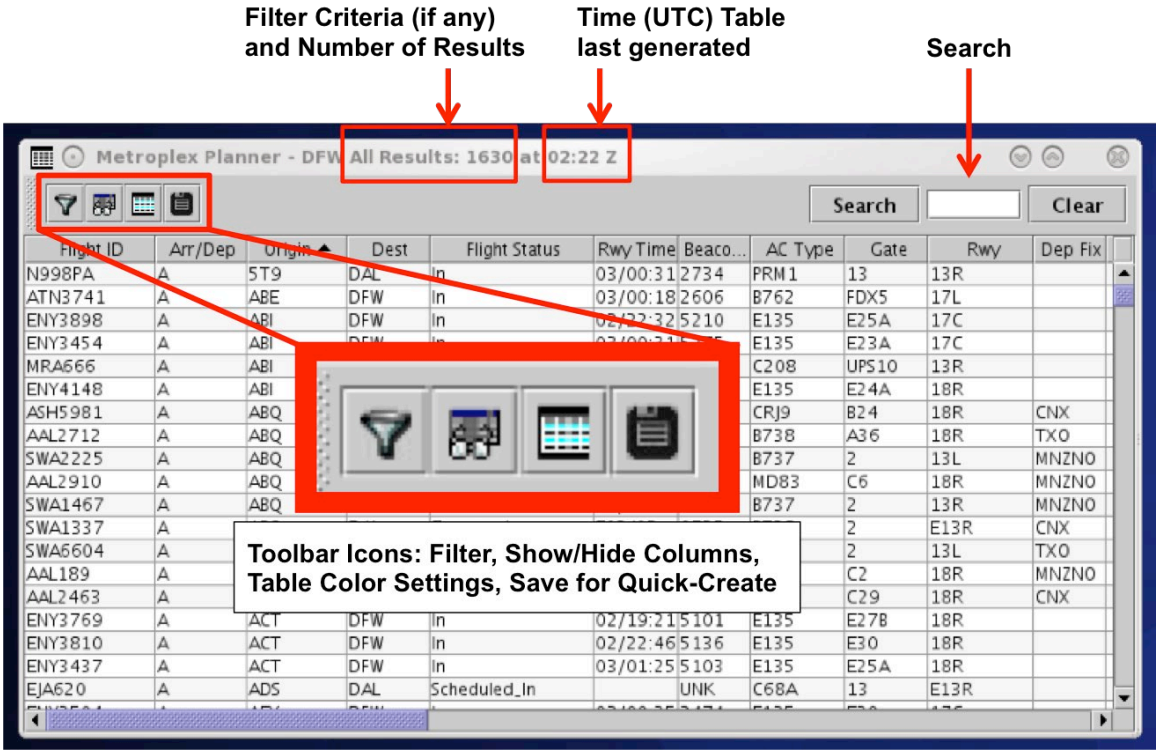


Figure 5.1. Flights Table.

5.1.1 Flights Table: Select a Flight

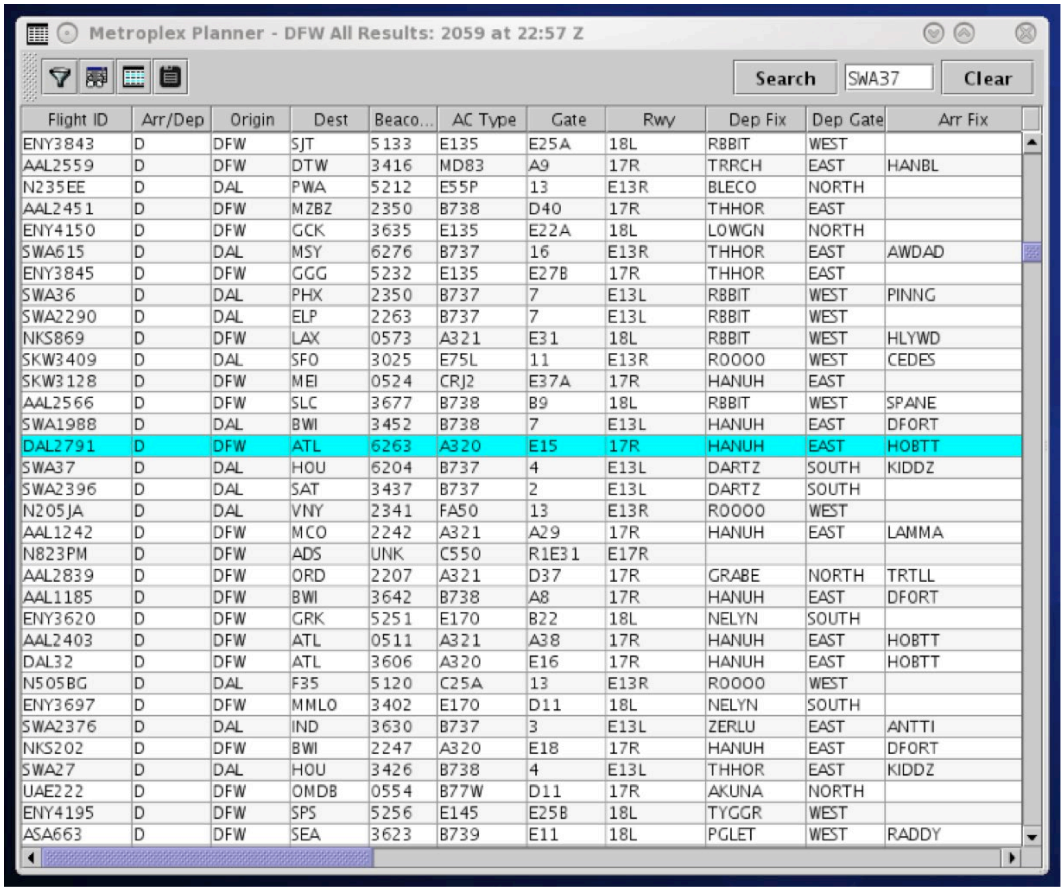
Select a flight in the Flights Table to highlight the flight throughout the STBO Client user interface.

To select a flight in the Flights Table:

Step 1: Select a flight in the Flights Table. Once selected, the row is highlighted in cyan (Figure 5.2).

Note: When a flight is selected in the Flights Table, it is highlighted throughout the user interface. That is, it is also highlighted on the timeline and map.

Alternatively: Click the same row again to deselect the flight.



Flight ID	Arr/Dep	Origin	Dest	Beaco...	AC Type	Gate	Rwy	Dep Fix	Dep Gate	Arr Fix
ENY3843	D	DFW	SJT	5133	E135	E25A	18L	RBBIT	WEST	
AAL2559	D	DFW	DTW	3416	MD83	A9	17R	TRRCH	EAST	HANBL
N235EE	D	DAL	PWA	5212	E55P	13	E13R	BLECO	NORTH	
AAL2451	D	DFW	MZBZ	2350	B738	D40	17R	THHOR	EAST	
ENY4150	D	DFW	GCK	3635	E135	E22A	18L	LOWGN	NORTH	
SWA615	D	DAL	MSY	6276	B737	16	E13R	THHOR	EAST	AWDAD
ENY3845	D	DFW	GGG	5232	E135	E27B	17R	THHOR	EAST	
SWA36	D	DAL	PHX	2350	B737	7	E13L	RBBIT	WEST	PINNG
SWA2290	D	DAL	ELP	2263	B737	7	E13L	RBBIT	WEST	
NKS869	D	DFW	LAX	0573	A321	E31	18L	RBBIT	WEST	HLYWD
SKW3409	D	DAL	SFO	3025	E75L	11	E13R	ROOOO	WEST	CEDES
SKW3128	D	DFW	MEI	0524	CRJ2	E37A	17R	HANUH	EAST	
AAL2566	D	DFW	SLC	3677	B738	B9	18L	RBBIT	WEST	SPANE
SWA1988	D	DAL	BWI	3452	B738	7	E13L	HANUH	EAST	DFORT
DAL2791	D	DFW	ATL	6263	A320	E15	17R	HANUH	EAST	HOBTT
SWA37	D	DAL	HOU	6204	B737	4	E13L	DARTZ	SOUTH	KIDDZ
SWA2396	D	DAL	SAT	3437	B737	2	E13L	DARTZ	SOUTH	
N205JA	D	DAL	VNY	2341	FA50	13	E13R	ROOOO	WEST	
AAL1242	D	DFW	MCO	2242	A321	A29	17R	HANUH	EAST	LAMMA
N823PM	D	DFW	ADS	UNK	C550	R1E31	E17R			
AAL2839	D	DFW	ORD	2207	A321	D37	17R	GRABE	NORTH	TRTLL
AAL1185	D	DFW	BWI	3642	B738	A8	17R	HANUH	EAST	DFORT
ENY3620	D	DFW	GRK	5251	E170	B22	18L	NELYN	SOUTH	
AAL2403	D	DFW	ATL	0511	A321	A38	17R	HANUH	EAST	HOBTT
DAL32	D	DFW	ATL	3606	A320	E16	17R	HANUH	EAST	HOBTT
N505BG	D	DAL	F35	5120	C25A	13	E13R	ROOOO	WEST	
ENY3697	D	DFW	MMLO	3402	E170	D11	18L	NELYN	SOUTH	
SWA2376	D	DAL	IND	3630	B737	3	E13L	ZERLU	EAST	ANTTI
NKS202	D	DFW	BWI	2247	A320	E18	17R	HANUH	EAST	DFORT
SWA27	D	DAL	HOU	3426	B738	4	E13L	THHOR	EAST	KIDDZ
UAE222	D	DFW	OMDB	0554	B77W	D11	17R	AKUNA	NORTH	
ENY4195	D	DFW	SPS	5256	E145	E25B	18L	TYGGR	WEST	
ASA663	D	DFW	SEA	3623	B739	E11	18L	PGLET	WEST	RADDY

Figure 5.2. Flights Table: Selected flight highlighted in cyan.

5.1.2 Flights Table: Sort Data

The data in the Flights Table can be sorted by selecting any column header. For example, select the column labeled “Dest” to sort all flights alphabetically by destination airport. A secondary, multi-column sort may be added using a “control-click” function.

To Sort by a single column:

Step 1: Use the mouse to click on a column header. Data in that column is sorted alphabetically (A to Z) or numerically, in ascending order. An "up" arrow is displayed in the column header.

Step 2 (Optional): Click a *second* time on the same column header to sort the data in the *opposite* order (Z to A) or numerically, in descending order. A "down" arrow is displayed in the column header.

Alternatively: Click a *third* time on the same column header to cancel the sort in that column. No arrow is shown in the column header.

To Sort by multiple columns:

Step 1: Select a column header to sort data in that column (e.g., "Flight Status" in Figure 5.3).

Step 2: Use the "Ctrl" key to add a secondary sort. While holding the "Ctrl" key, use the mouse to click on another column header (e.g., "Rwy Time" in Figure 5.3). A *smaller* arrow is shown in the column header.

Note: In *Error! Reference source not found.****, the Flights Table is now sorted alphabetically by Flight Status (e.g., Departure, Enroute_Arr). Within each of those Flight Status categories, flights are also sorted by Rwy Time (in ascending order).***

Alternatively: Release the "Ctrl" key and click in another column to cancel the multi-column sort.

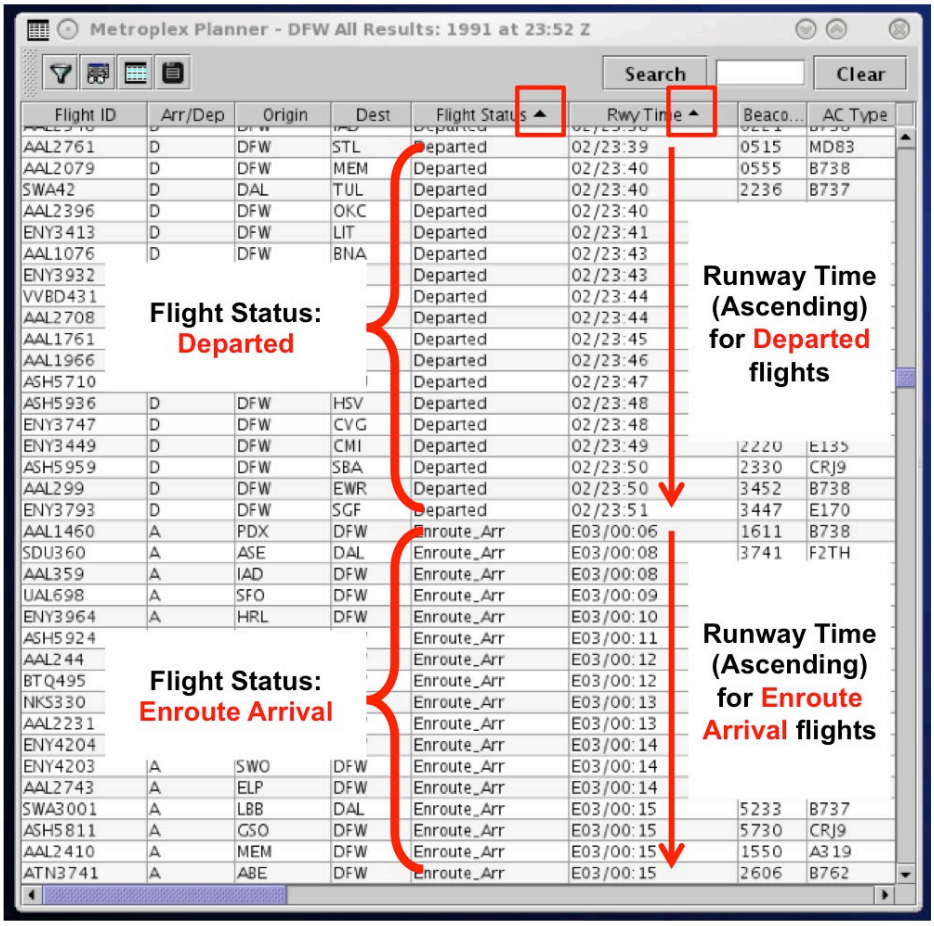


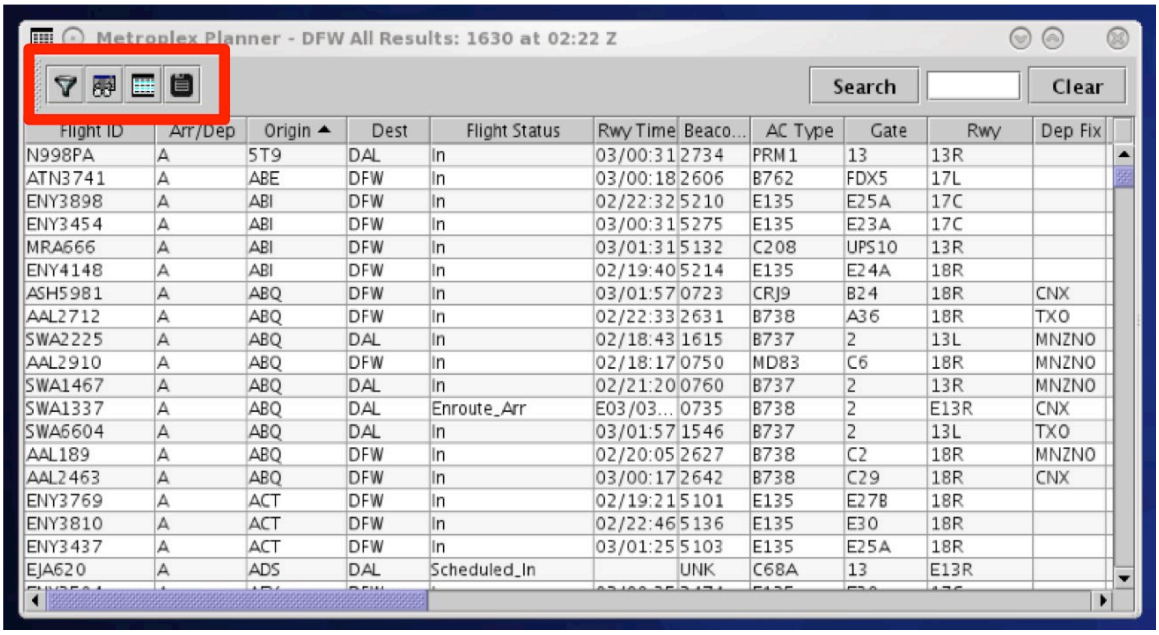
Figure 5.3. Flights Table: Secondary sort with "Flight Status" and "Rwy Time".

5.1.3 Flights Table: Toolbar

The Flights Table toolbar allows the user to filter table results, add, remove, or reorder columns, change color settings, and save their Flights Table configuration. A search feature is also available.

Four icons are displayed on toolbar (Figure 5.4):

- Edit Filters
- Show/Hide Columns
- Table Color Settings
- Save for Quick-Create



Flight ID	Arr/Dep	Origin	Dest	Flight Status	Rwy Time	Beaco...	AC Type	Gate	Rwy	Dep Fix
N998PA	A	5T9	DAL	In	03/00:31	2734	PRM1	13	13R	
ATN3741	A	ABE	DFW	In	03/00:18	2606	B762	FDX5	17L	
ENY3898	A	ABI	DFW	In	02/22:32	5210	E135	E25A	17C	
ENY3454	A	ABI	DFW	In	03/00:31	5275	E135	E23A	17C	
MRA666	A	ABI	DFW	In	03/01:31	5132	C208	UPS10	13R	
ENY4148	A	ABI	DFW	In	02/19:40	5214	E135	E24A	18R	
ASH5981	A	ABQ	DFW	In	03/01:57	0723	CRJ9	B24	18R	CNX
AAL2712	A	ABQ	DFW	In	02/22:33	2631	B738	A36	18R	TXO
SWA2225	A	ABQ	DAL	In	02/18:43	1615	B737	2	13L	MNZNO
AAL2910	A	ABQ	DFW	In	02/18:17	0750	MD83	C6	18R	MNZNO
SWA1467	A	ABQ	DAL	In	02/21:20	0760	B737	2	13R	MNZNO
SWA1337	A	ABQ	DAL	Enroute_Arr	E03/03...	0735	B738	2	E13R	CNX
SWA6604	A	ABQ	DAL	In	03/01:57	1546	B737	2	13L	TXO
AAL189	A	ABQ	DFW	In	02/20:05	2627	B738	C2	18R	MNZNO
AAL2463	A	ABQ	DFW	In	03/00:17	2642	B738	C29	18R	CNX
ENY3769	A	ACT	DFW	In	02/19:21	5101	E135	E27B	18R	
ENY3810	A	ACT	DFW	In	02/22:46	5136	E135	E30	18R	
ENY3437	A	ACT	DFW	In	03/01:25	5103	E135	E25A	18R	
EJA620	A	ADS	DAL	Scheduled_In		UNK	C68A	13	E13R	

Figure 5.4. Flights Table: Toolbar icons.

5.1.3.1 Edit Filters

"Edit Filters" is the first icon on the toolbar (Figure 5.5). Filters are used for configuring which flights are included in the Flights Table. For example, a filter can be applied so that only departures taking off from a particular runway, flights going to selected departure fixes, or flights subject to APREQs are included in the Flights Table.

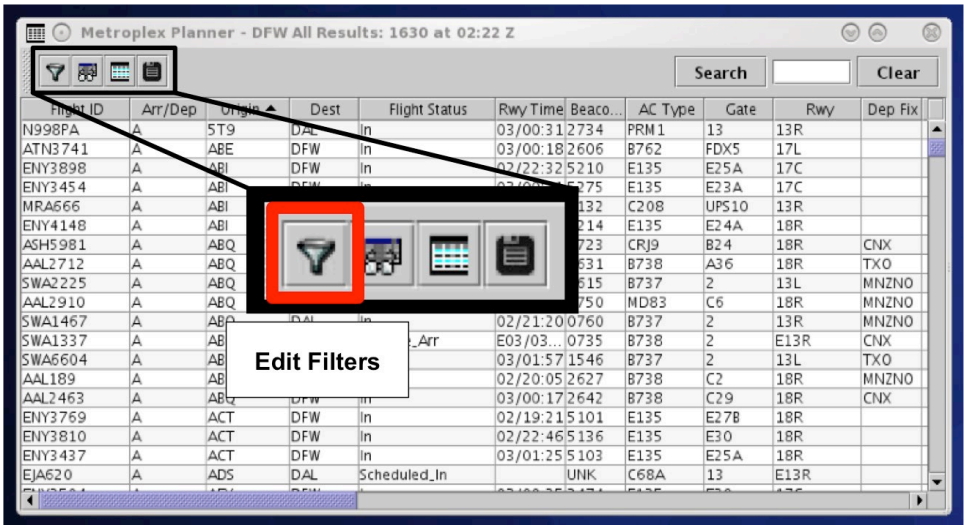


Figure 5.5. Flights Table: Edit Filters icon.

Variables that can be used for applying filters are listed in Table 3. Variables are used in combination with a *modifier*. Depending on the variable, modifier options may include:

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

Multiple variables can be used in combination by selecting "and" or "or" as a *qualifier*.

Table 3. Filter Field Options

Filter Field	Options	
Actual Delay	Actual delay as indicated by data source. [*mm*]	
AIBT	Actual In-Block Time of the aircraft at the gate recorded by the airline or the STBO Client. [*hhmm*] [relative/Zulu]	
ALDT	Actual Landing Time of the aircraft recorded by the airline or the STBO Client . [*hhmm*] [relative/Zulu]	
AOBT	Actual Off-Block Time (AOBT) of the aircraft at the gate. [*hhmm*] [relative/Zulu]	
Airline	[3-digit airline code]	
Arr/Dep	[Arrival/Departure]	
Arr Fix	[dropdown list; varies by TRACON]	
ArrFix Time	Actual or predicted arrival fix crossing time. [*hhmm*] [relative/Zulu]	
Dep Fix	[dropdown list; varies by TRACON]	
DepFix Time	[*hhmm*] [relative/Zulu]	
Dep Gate	[dropdown list; varies by TRACON]	
Dest	[3-digit airport code dropdown list]	
Destination has APREQ	[Yes/No]	
Engine Type	[Prop/Turbo/Jet]	
Flight Status	Scheduled_Out Pushback Out	On_Final On In

	Taxiing_AMA In_Queue Departured Enroute_Arr Term_Area_Arr	Return_to_Gate Suspended Cancelled Unknown In_Ramp
Gate	[dropdown list; varies by Airport]	
Gate Time	The time the flight will pushback according to the scheduler. [*hhmm*] [relative/Zulu]	
Has Acknowledged APREQ	[Yes/No]	
Has AIBT	[Yes/No]	
Has ALDT	[Yes/No]	
Has AOFF	[Yes/No]	
Has AOUT	[Yes/No]	
Has Closed Dep Fix	[Yes/No]	
Had EDCT	[Yes/No]	
Has Ground Stop	[Yes/No]	
Has Entered AMA	[Yes/No]	
Has Entered Ramp	[Yes/No]	
Has Gate Conflict	[Yes/No]	
Has MIT	[Yes/No]	
Has Fix MIT	[Yes/No]	
Has Destination MIT	[Yes/No]	
Has Jet Route MIT	[Yes/No]	
Is Active	[Yes/No]	
Is Hidden	[Yes/No]	
Is Cancelled	[Yes/No]	
Is Suspended	[Yes/No]	
Major Carrier	enter [3-digit airline code]	
Origin	[3-digit airport code dropdown list]	
Runway	[dropdown list; varies by Airport]	

Spot	[dropdown list; varies by Airport]
Spot Time	Time that an arriving flight leaves the AMA entering the non-movement area or when departing flight reaches the spot. [*hhmm*] [relative/Zulu]
SDT-TBFM	Scheduled Departure Time as accepted in TBFM by the Center TMC. This is the scheduled wheels-up time. [*hhmm*] [relative/Zulu]
STA-TBFM	Scheduled Time of Arrival by TBFM. [*hhmm*] [relative/Zulu]
Tail	Aircraft tail number. [Is Set/Not Set]
TIBT	Target In-Block Time. The best prediction of in-block time from the ATD-2 tactical scheduler. [*hhmm*] [relative/Zulu]
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. [*hhmm*] [relative/Zulu]
TLDT	Target Landing Time from the ATD-2 tactical scheduler. The best prediction of landing time. [*hhmm*] [relative/Zulu]
TMAT	Target Movement Area entry Time from the ATD-2 scheduler. The TMAT is the time that a surface-metered departure is expected to enter the AMA. [*hhmm*] [relative/Zulu]
TTOT	Target Takeoff Time. The best prediction of takeoff time by the ATD-2 tactical scheduler. [*hhmm*] [relative/Zulu]
Weight Class	Aircraft weight class. [A, B, C, D, E, F]

To Add a new Filter to the Flights Table:

Step 1: Select the Filter icon in the toolbar to open the Filter window (Figure 5.6).

Step 2: Select a variable from the dropdown menu in the "Field" column (e.g., "Arrival/Departure" in Figure 5.6).

Step 3: Select a modifier from the dropdown list in the "Operator" column (e.g., "=" in Figure 5.6).

Step 4: Select an option from the dropdown list or enter text to populate the "Values" field (e.g., "Departure" in Figure 5.6).

Step 5 (Optional): More variables can be added to the filter by making entries on a new row. Begin new rows by selecting a qualifier (i.e., "and" or "or").

Note: Select "Add Fields" if more rows are needed.

Step 6: When complete, select "OK" to apply the filter(s) and close the Filter window.

Note: An existing filter can be modified by changing the selections in the Field, Operator, or Values columns.

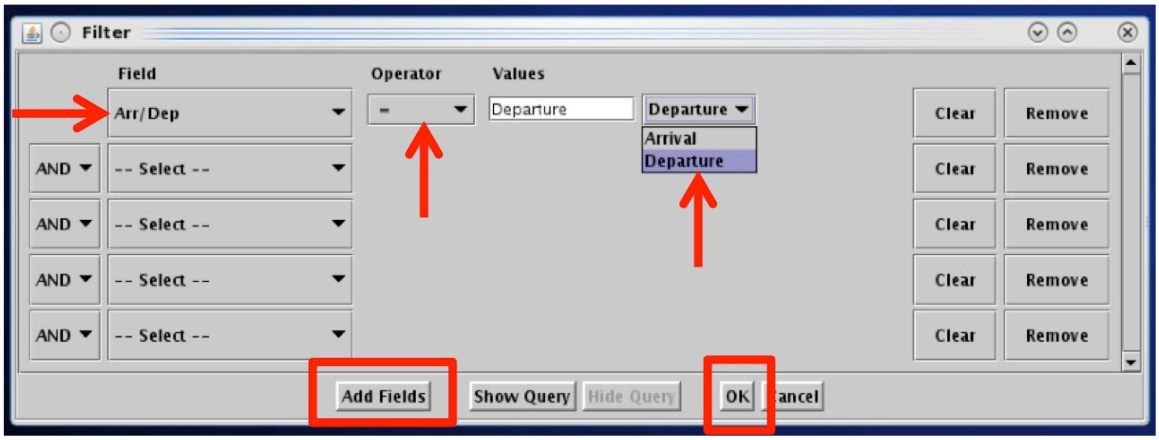


Figure 5.6. Flights Table: Filter.

Filter criteria (e.g., "Dep/Arr = Departure") and number of results (e.g., 740 flights) are displayed in the title bar of the Flights Table window (Figure 5.7).

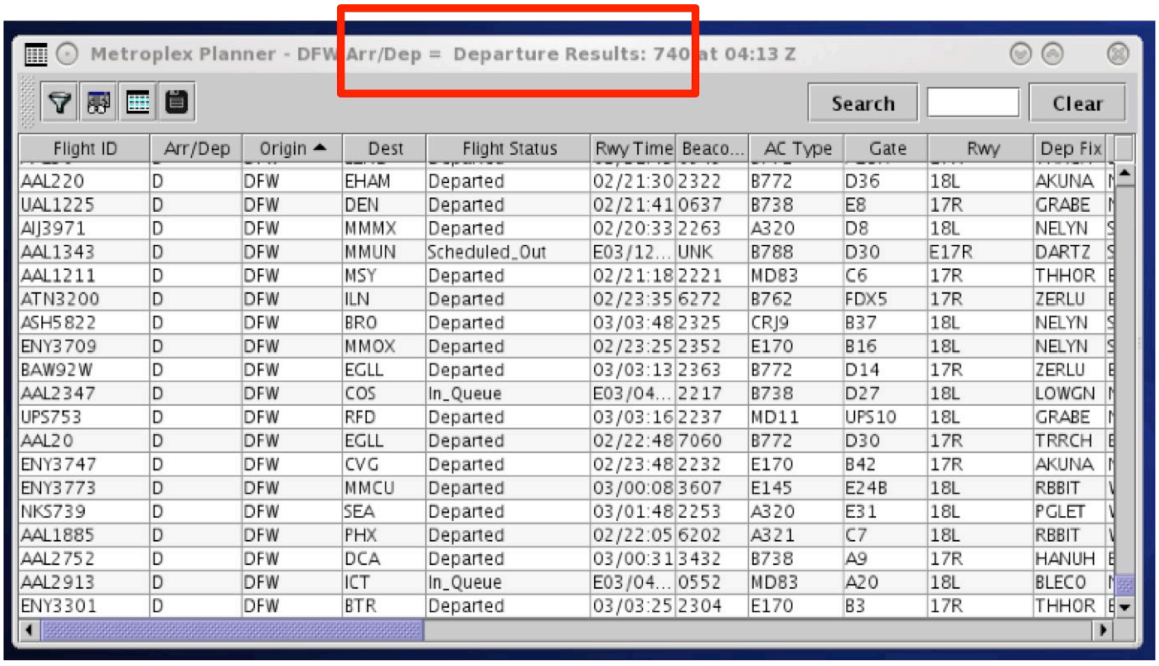


Figure 5.7. Flights Table: Fitler criteria and count of results are shown in window title.

To Remove or Clear a Filter from the Flights Table:

Step 1: Select the Filter icon in the toolbar to open the Filter window.

Step 2: Select "Remove" to delete the entire row.

Alternatively: Select "Clear" to clear the "Value" field in that row.

Step 3: When complete, select "OK" to apply the change(s) and close the Filter window.

5.1.3.2 Show/Hide Columns

"Show/Hide Columns" is the second icon on the toolbar (Figure 5.8). Use Show/Hide Columns to select which columns of information will be included, and the order in which they will be shown, in the Flights Table.

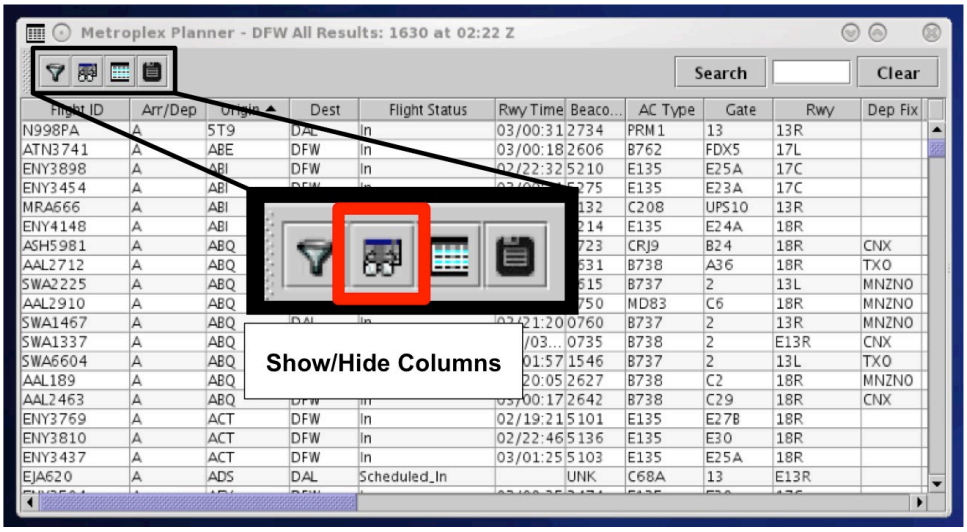


Figure 5.8. Flights Table: Show/Hide Columns icon.

To add an information column to a Flights Table:

Step 1: Select the "Show/Hide Columns" icon in the toolbar to open the Column Settings window (Figure 5.8).

Note: Two lists are shown in the Column Settings window (Figure 5.9). Items already included in the Flights Table are listed on the right under "Shown". Items not included in the Flights Table are listed on the left under "Available".

Step 2: Select an item from the "Available" list on the left (e.g., "Long On Board" in Figure 5.9) and click on the right arrow to move it to the "Shown" list.

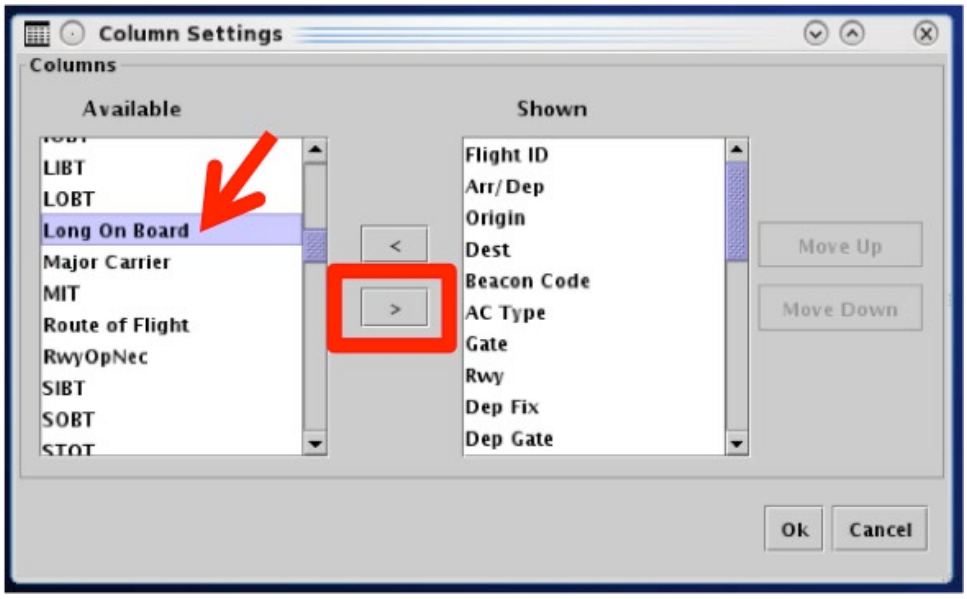


Figure 5.9. Flights Table: Show/Hide Columns. Add an information column.

To remove an information column from a Flights Table:

Step 1: Select the "Show/Hide Columns" icon in the toolbar to open the Column Settings window (Figure 5.8).

Step 2: Select an item from the "Shown" list on the left (e.g., "AMA Taxi Duration" in Figure 5.10) and click on the left arrow to move it to the "Available" list.

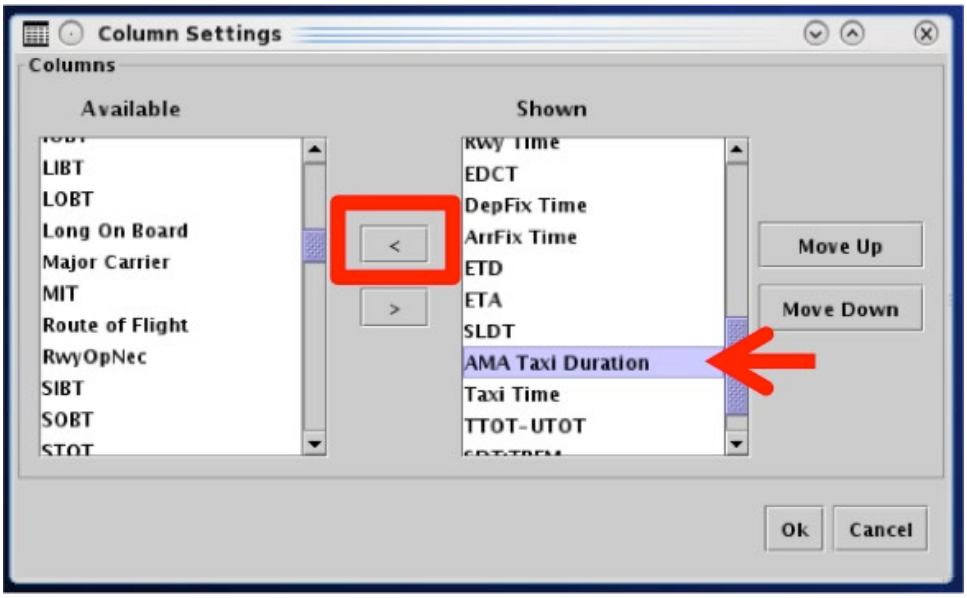


Figure 5.10. Flights Table: Show/Hide Columns. Remove an information column.

To reorder information columns in a Flights Table:

Step 1: Select the Show/Hide Columns icon in the toolbar to open the Column Settings window (Figure 5.8).

Step 2: Select an item from the Shown list on the right (e.g., "Long on Board" in Figure 5.11).

Step 3: Select "Move Up" or "Move Down" to change the position of that column in the list (Figure 5.11).

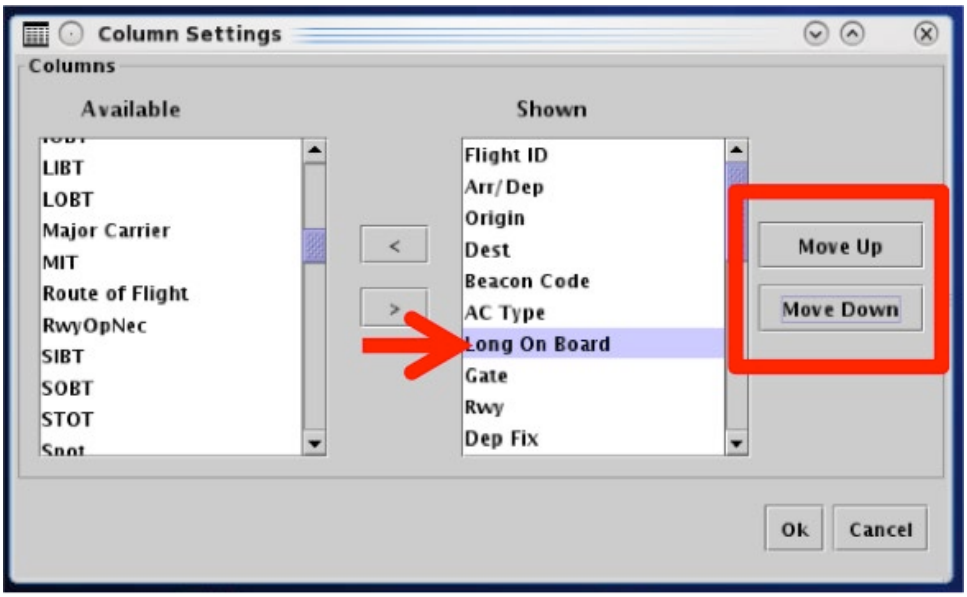


Figure 5.11. Flights Table: Show/Hide Columns. Move up or move down the list.

Information that can be included in a Flights Table is described in Table 4.

Table 4. Flights Table Information

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.
ALDT	Actual Landing Time of the aircraft recorded by the airline or the STBO Client.
Altitude	Altitude in multiple of 100 feet.
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 the STBO Client.
AMAT	Actual Movement Area entry Time (AMAT) when the departure crossed the spot.
AOBT	Actual Off-Block Time (AOBT) of the aircraft at the gate.
APREQ	Indicates APREQ status: • "APRQ" to indicate that the flight needs an APREQ time • "APRQ: REQUESTED" to indicate negotiation is in progress. • "APRQ: REJECTED" to indicate the request time was

	not accepted. A new time may be negotiated. • "FREE RELEASE" to indicate the flight has a floating release time. • 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	"Needs ACK" is displayed 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 PreSchedule	Indicates if an APREQ release time has been prescheduled.
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 Client is predicting the arrival fix based on the most commonly used arrival fix for flights flying between the origin and destination airports. • MODEL – STBO Client 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.
ArrFix Time	Actual or predicted arrival fix crossing time.
ATOT	Actual Takeoff Time of aircraft.
CID	ERAM will generate a new computer ID (CID) for each flight plan. These will be unique and constant for each flight. However, each ARTCC has one ERAM, so a flight may have multiple CIDs when it is located at the borderline of multiple ARTCCs.
Multiple CIDs	A flight may have multiple CIDs when it is located at the borderline of multiple ARTCCs.
Beacon Code	Beacon code of the flight.
Dep Fix	Departure flight's assigned fix.
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 Source	Indicates the data source of the arrival fix: • SOURCE – The departure fix was received from an external source based on the flight plan. • DECISION_TREE – STBO Client is predicting the departure fix based on the most commonly used departure fix for flights flying between the origin and destination airports. • MODEL – STBO Client 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.
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	The flight number of any aircraft. For general aviation flights, tail number is used.
Flight Key	Unique identifier for the flight that contains the call sign, 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 en route 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 not being tracked yet • Scheduled_Out – A departure aircraft has not pushed back 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 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 a decision tree • USER – The gate was assigned by a user
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	Flights that are destined to the affected airport are held at their departure point for the duration of the Ground Stop.
IOBT	Initial Off-Block Time (IOBT) set by TFMS. This time is the first off-block time received for this flight.
Hidden	This value is true if the flight’s right-click option for “Delete Datablock" was used to remove a flight's data tag from the display.
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 (LOBT), "L-time". The estimated pushback time received from an airline either directly or through a CDM message to TFMS.
Long On Board	LOB indicator: • For **arrivals**, the LOB timer starts at touchdown and is continuously computed as the current time minus the Actual Landing Time (ALDT) until the arrival is in the gate. • For **departures**, the LOB timer starts at pushback and is continuously computed as the Actual Off-Block Time (AOBT) minus the current time until the departure takes off.
Longitude	Longitude of the position of the aircraft in decimal degrees
Major Carrier	3-digit airline code.
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. No EOBT, EOBT more than 4 hours in the future, and EOBT more than 13 minutes in the past and did not call ready) • PLANNING – The departure has and EOBT and EOBT is within 4 hours • READY – Flight put on Gate Hold, or EOBT is within the next 5 minutes • 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
MIT	Flight subject to a Miles-in-Trail restriction.
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 surface surveillance data.
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).
Repositioned	This flag will be set by a flight when it is repositioned, which will typically be repositioning the flight away from a gate.

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 the STBO Client • DECISION_TREE – Runway is determined by a 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 Client 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 the STBO Client.
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 Takeoff Time. TFMS estimate of when the flight will take off based on the SOBT.

Swap	New departure fix that the flight will use in place of the original departure fix.
Super Stream Artcc	ARTCC of the scheduling point from TBFM.
Super Stream Point	Scheduling point constraint satisfaction point from TBFM. Scheduling point is the CSP to which the flight can be scheduled by IDAC. This indicates to IDAC where dept. negotiation occurs.
Super Stream Tracon	TRACON of the scheduling point from TBFM.
Super Stream Class Name	Name of the super stream class from TBFM.
Sched Suspended	Displays "SUSPENDED" if a flight has been suspended. A suspended flight is expected to proceed at problem resolution.
Tail	Aircraft tail number.
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.
Taxi Route	The remaining route for taxiing across the AMA.
TIBT	Target In-Block Time (TIBT). 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
TCOT	Terminal Controlled Off-Time (TCOT) for either the Route of Flight or the CDR.
TLDT	Target Landing Time (TLDT) from the ATD-2 tactical scheduler. The best prediction of landing time.
TMAT	Target Movement Area entry Time (TMAT) 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 (TOBT) 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 Takeoff 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 (UIBT). Predicted in-gate time for a single aircraft without consideration of other traffic on the surface.
ULDT	Undelayed Landing Time (ULDT). Predicted landing time for a

	single aircraft without consideration of other traffic on the surface.
UMAT	Undelayed Movement Area entry Time. 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 (UOBT). 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 Takeoff Time (UTOT). Predicted takeoff time for a single aircraft without consideration of other traffic on the surface.

5.1.3.3 Table Color Settings

"Table Color Settings" is the third icon on the toolbar (Figure 5.12). Use Color Settings to manage alternating row colors and color alerts for certain variables.

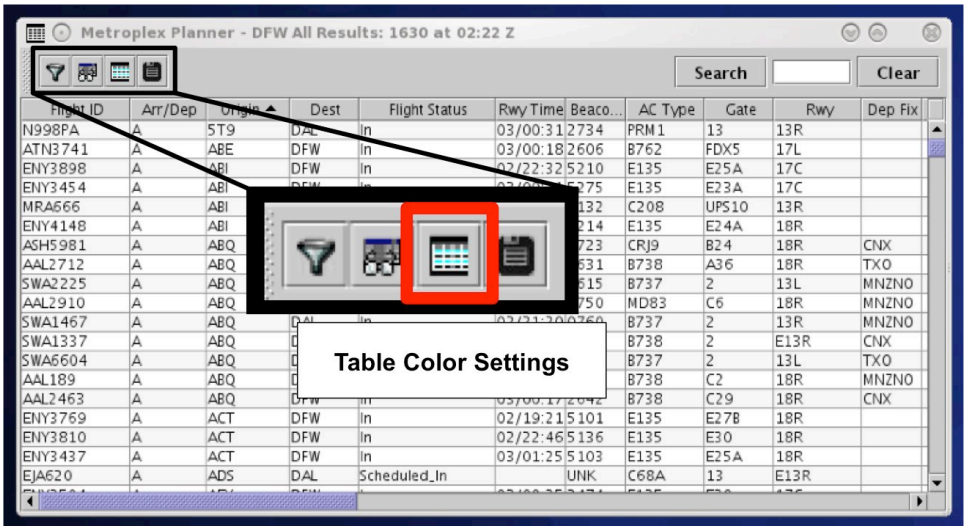


Figure 5.12. Flights Table: Table Color Settings icon.

5.1.3.3.1 Set Row Colors

Use the "Set Row Colors" tab in the Table Color Settings window to select alternate row color.

To change Row Colors:

***Step 1*:** Select the Table Color Setting icon in the toolbar to open the Color Settings window (Figure 5.12).

***Step 2*:** Select the "Set Row Colors" tab.

Note: The default for both odd and even rows in the Flights Table is white.

***Step 3*:** Select either the "Odd Row" or "Even Row" Color box to open the Color Selection window ("Odd Row Color" in Figure 5.13).

Note: Five color palettes are available to select from in the Color Selection window: Swatches, HSV, HSL, RGB, and CMYK.

***Step 4*:** Use the mouse to select a color from one of the five color palette tabs. When a color is selected from the "Swatches" tab, the other tabs can be used to refine that color (Figure 5.14)

Note: The previous color (if applicable) and a preview of the selected color is displayed below the color chart.

***Step 5*:** Select "OK" to view a preview of the selected color (Figure 5.15).

Note: If necessary, follow the same steps to select a second color for the alternating odd/even row.

***Step 6*:** When finished modifying colors, select "OK" to apply the color change(s), close the Color Setting window and return to the Flights Table (Figure 5.16). The selected color(s) are shown in the table.

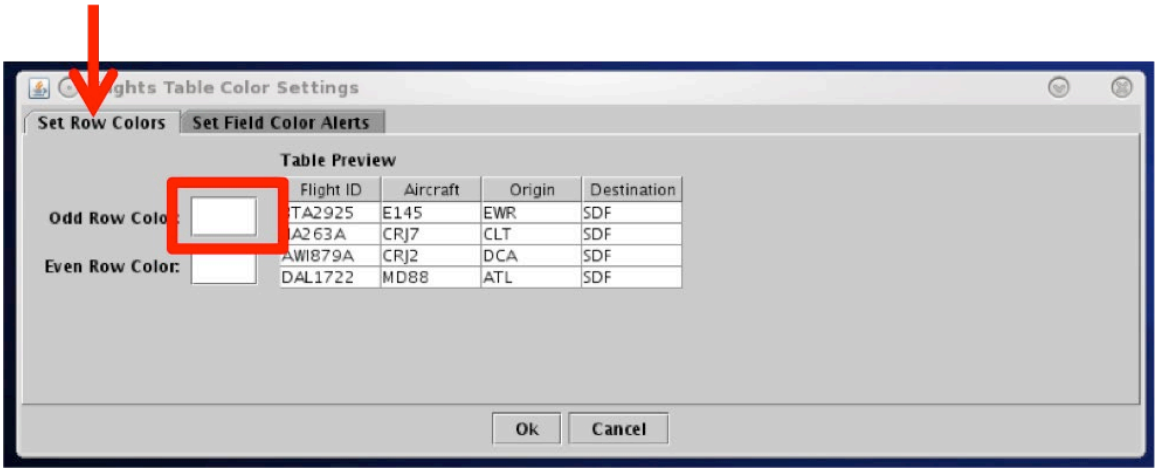


Figure 5.13. Flights Table Color Settings: Set Row Colors tab.

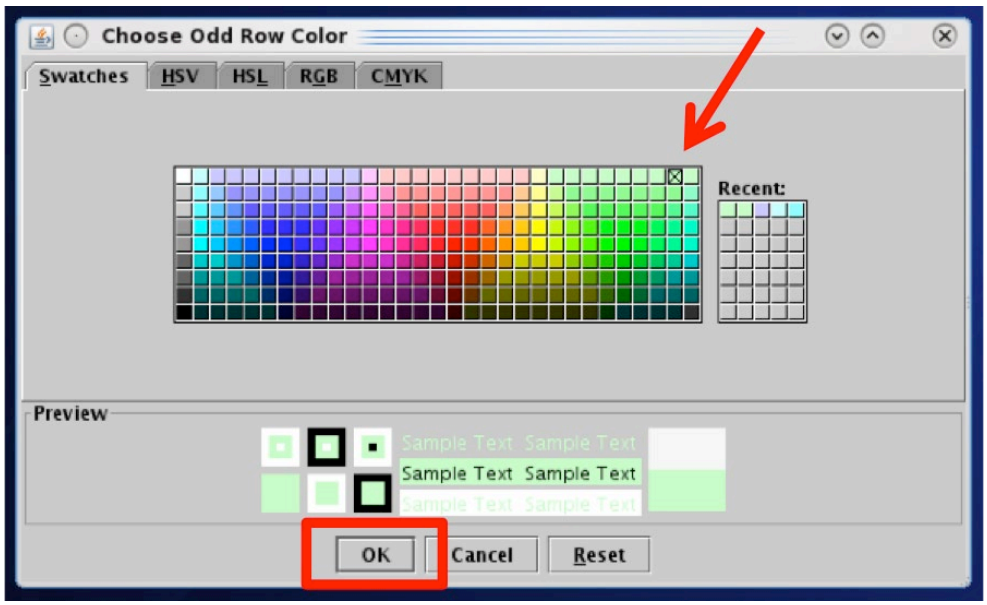


Figure 5.14. Color Selection: Select from Swatches, HSV, HSL, RGB, or CMYK color paletes.

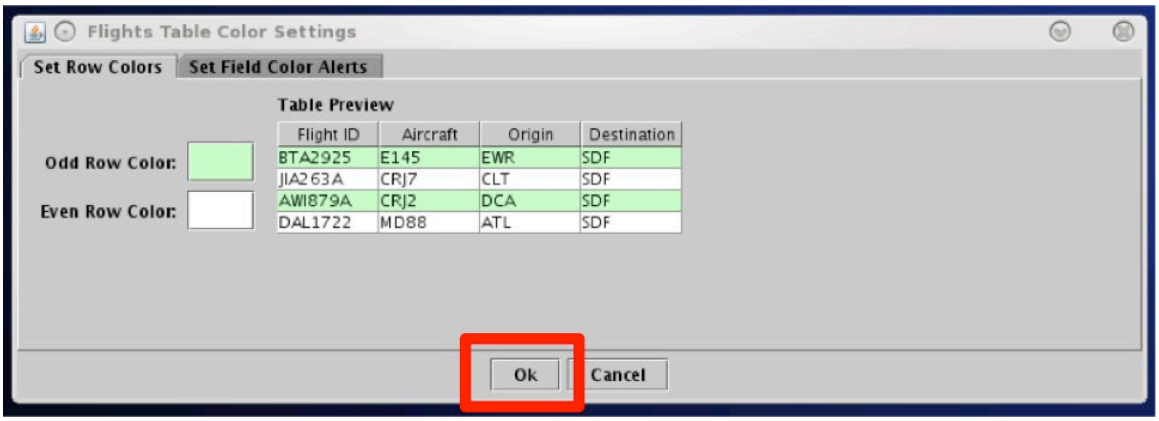


Figure 5.15. Flights Table Color Settings: Set Row Colors Preview.

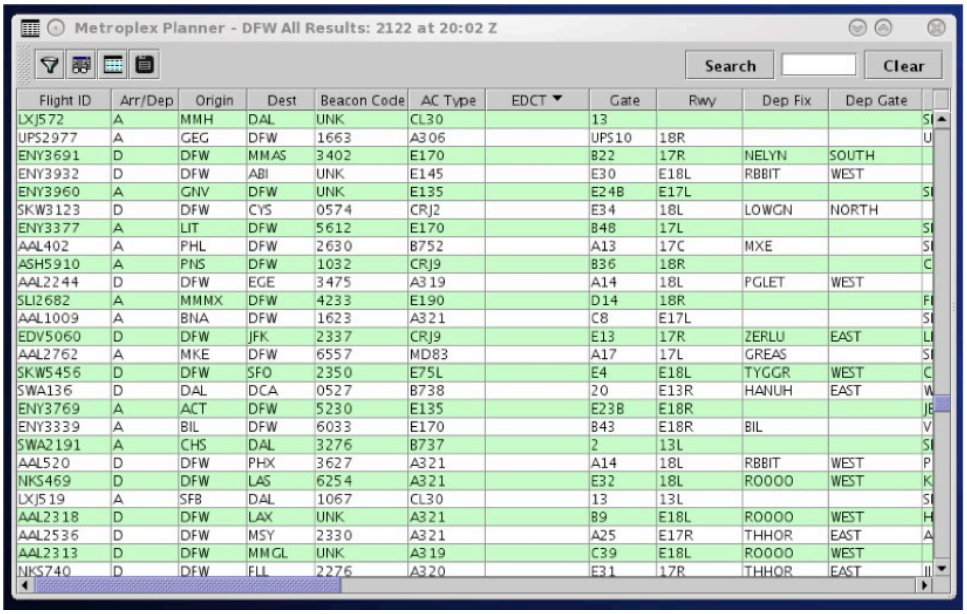


Figure 5.16. Flights Table: Alternating row colors.

5.1.3.3.2 Set Field Color Alerts

Use the "Set Field Color Alerts" tab in the Table Color Settings window to select the cell colors for selected flight variables.

Variables to which alert coloring can be applied, and their corresponding information column in the Flights Table are listed in Table 5.

Table 5. Color Alerts and Information

Field for Color Alerts	Flights Table Column
Flight Status	Flight Status
Has Closed Departure Fix	Dep Fix
Has Gate Conflict	Gate
Has Ground Stop	Dest
Is Hidden	Hidden
Has MIT	Dest or Dep Fix (depending how MIT value is set)
Has Fix MIT	Dest or Dep Fix (depending how MIT value is set)

To Set or Modify Color Alerts:

***Step 1*:** Select the Table Color Setting icon in the toolbar to open the Color Settings window.

***Step 2*:** Select the "Set Field Color Alerts" tab.

Note: Default color selections for several variables are pre-defined, but can be modified.

***Step 3*:** Select a variable from the dropdown list in the "Field" column (e.g., "Has Gate Conflict" in Figure 5.17).

***Step 4*:** Select a modifier from the dropdown list in the "Operator" column (e.g., "=" in Figure 5.17).

Step 5: Select an option from the dropdown list or enter text to populate the "Values" field (e.g., "Yes" in Figure 5.17).

***Step 6*:** Select the color box to open the Color Selection window (Figure 5.18).

Note: Five color palettes are available to select from in the Color Selection window: Swatches, HSV, HSL, RGB, and CMYK.

***Step 7*:** Use the mouse to select a color from one of the five color palette tabs. When a color is selected from the "Swatches" tab, the other tabs can be used to refine that color.

Note: The previous color (if applicable) and a preview of the selected color is displayed below the color chart.

***Step 8*:** Select "OK" (Figure 5.18).

***Step 9*:** When finished adding/modifying colors, select "OK" to apply the color change(s), close the Color Setting window and return to the Flights Table (Figure 5.19). Selected color(s) are displayed in the table when variables match the criteria (e.g., "Has Gate Conflict" in Figure 5.19).

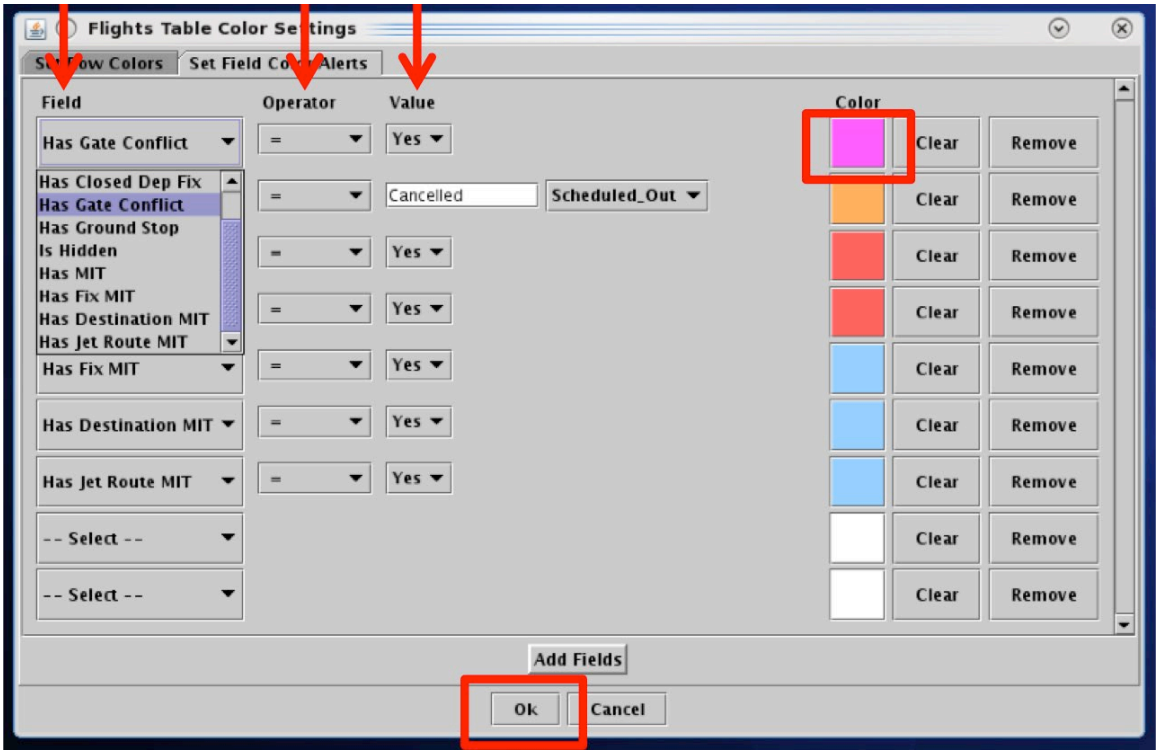


Figure 5.17. Flights Table Color Settings: Set Field Color Alerts.

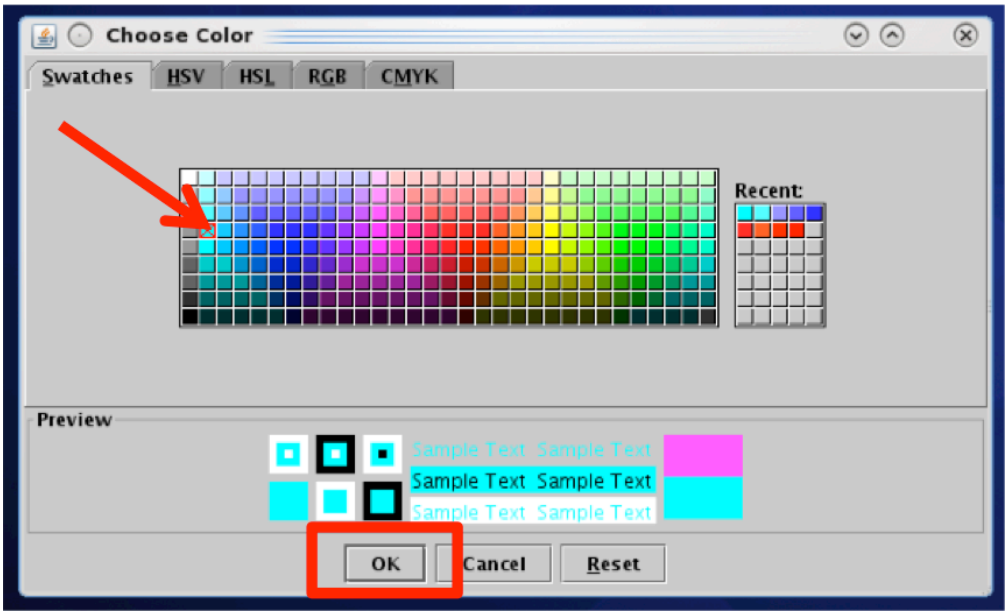
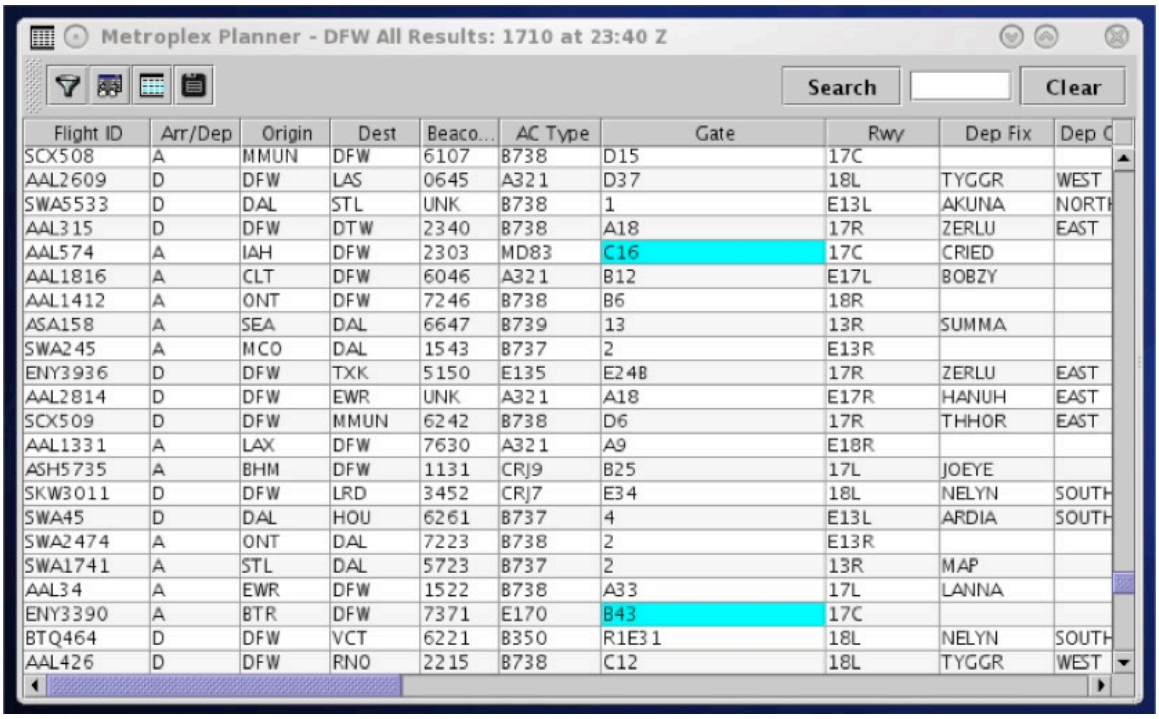


Figure 5.18. Color Selection: Select from Swatches, HSV, HSL, RGB, or CMYK color paletes.

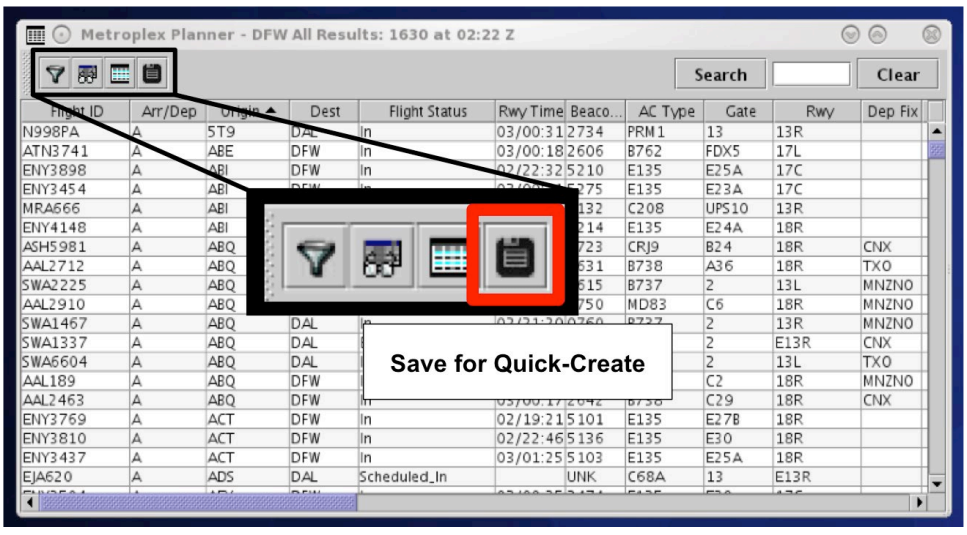


Flight ID	Arr/Dep	Origin	Dest	Beaco...	AC Type	Gate	Rwy	Dep Fix	Dep C
SCX508	A	MMUN	DFW	6107	B738	D15	17C		
AAL2609	D	DFW	LAS	0645	A321	D37	18L	TYGGR	WEST
SWA5533	D	DAL	STL	UNK	B738	1	E13L	AKUNA	NORTH
AAL315	D	DFW	DTW	2340	B738	A18	17R	ZERLU	EAST
AAL574	A	IAH	DFW	2303	MD83	C16	17C	CRIED	
AAL1816	A	CLT	DFW	6046	A321	B12	E17L	BOBZY	
AAL1412	A	ONT	DFW	7246	B738	B6	18R		
ASA158	A	SEA	DAL	6647	B739	13	13R	SUMMA	
SWA245	A	MCO	DAL	1543	B737	2	E13R		
ENY3936	D	DFW	TXK	5150	E135	E24B	17R	ZERLU	EAST
AAL2814	D	DFW	EWR	UNK	A321	A18	E17R	HANUH	EAST
SCX509	D	DFW	MMUN	6242	B738	D6	17R	THHOR	EAST
AAL1331	A	LAX	DFW	7630	A321	A9	E18R		
ASH5735	A	BHM	DFW	1131	CRJ9	B25	17L	JOEYE	
SKW3011	D	DFW	LRD	3452	CRJ7	E34	18L	NELYN	SOUTH
SWA45	D	DAL	HOU	6261	B737	4	E13L	ARDIA	SOUTH
SWA2474	A	ONT	DAL	7223	B738	2	E13R		
SWA1741	A	STL	DAL	5723	B737	2	13R	MAP	
AAL34	A	EWR	DFW	1522	B738	A33	17L	LANNA	
ENY3390	A	BTR	DFW	7371	E170	B43	17C		
BTQ464	D	DFW	VCT	6221	B350	R1E31	18L	NELYN	SOUTH
AAL426	D	DFW	RNO	2215	B738	C12	18L	TYGGR	WEST

Figure 5.19. Flights Table Color Settings: Newly assigned color alert for Gate Conflicts.

5.1.3.4 Save for Quick-Create

"Save for Quick-Create" is the fourth icon on the toolbar and can be used to save Flights Table Settings (Figure 5.20).



Flight ID	Arr/Dep	Origin	Dest	Flight Status	Rwy Time	Beaco...	AC Type	Gate	Rwy	Dep Fix
N998PA	A	5T9	DAL	In	03/00:31	2734	PRM1	13	13R	
ATN3741	A	ABE	DFW	In	03/00:18	2606	B762	FDX5	17L	
ENY3898	A	ABI	DFW	In	02/22:32	5210	E135	E25A	17C	
ENY3454	A	ABI				5275	E135	E23A	17C	
MRA666	A	ABI				132	C208	UPS10	13R	
ENY4148	A	ABI				214	E135	E24A	18R	
ASH5981	A	ABQ				723	CRJ9	B24	18R	CNX
AAL2712	A	ABQ				631	B738	A36	18R	TXO
SWA2225	A	ABQ				615	B737	2	13L	MNZNO
AAL2910	A	ABQ				750	MD83	C6	18R	MNZNO
SWA1467	A	ABQ	DAL					2	13R	MNZNO
SWA1337	A	ABQ	DAL					2	E13R	CNX
SWA6604	A	ABQ	DAL					2	13L	TXO
AAL189	A	ABQ	DFW					C2	18R	MNZNO
AAL2463	A	ABQ	DFW					C29	18R	CNX
ENY3769	A	ACT	DFW	In	02/19:21	5101	E135	E27B	18R	
ENY3810	A	ACT	DFW	In	02/22:46	5136	E135	E30	18R	
ENY3437	A	ACT	DFW	In	03/01:25	5103	E135	E25A	18R	
EJA620	A	ADS	DAL	Scheduled_In		UNK	C68A	13	E13R	

Figure 5.20. Flights Table: Table Color Settings icon.

To save Flights Table settings:

Step 1: Select the "Save for Quick-Create" icon (Figure 5.20).

Step 2: Enter a file name for future access (e.g., "A_Tower1" Figure 5.21).

Step 3: Select "Save".

Note: A Flights Table can be created using a saved configuration (Figure 5.22)

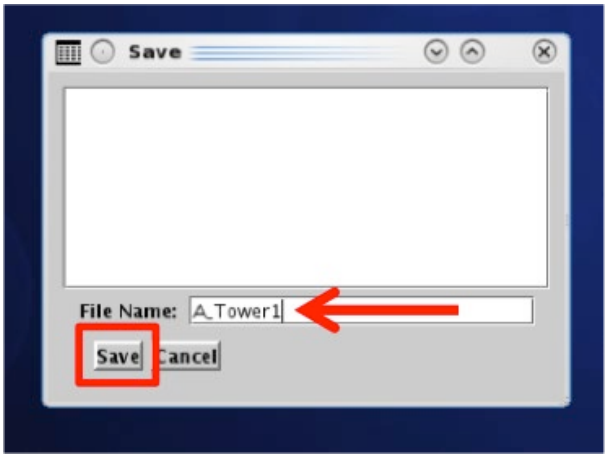


Figure 5.21. Flights Table Save for Quick-Create: Enter file name.

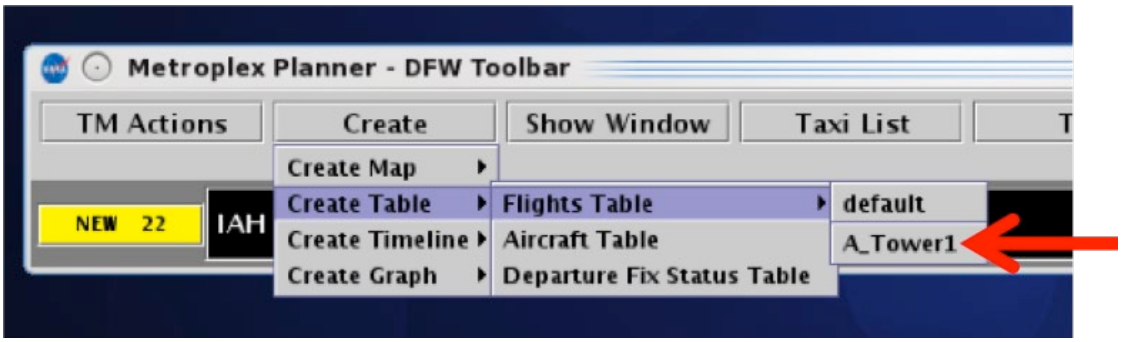


Figure 5.22. Create a Flights Table using a saved configuration (e.g., A_Tower1).

5.1.4 Flights Table: Search Field

Use the "Search" feature to find flights in the Flights Table. A search includes flights currently displayed in the Flights Table and does not include any flights that been filtered out of the table.

There is no need to click on the Search button. As information is typed in, the STBO Client searches for flights that match the query. For example, typing "FDX" will highlight *all* FedEx flights. Typing "LGA" will highlight *all* flights to LGA. Typing

"AKUNA" will highlight *all* flights departing over the AKUNA departure fix (Figure 5.23). Typing "53" will highlight all flights whose flight number contains "53", independent of airline.

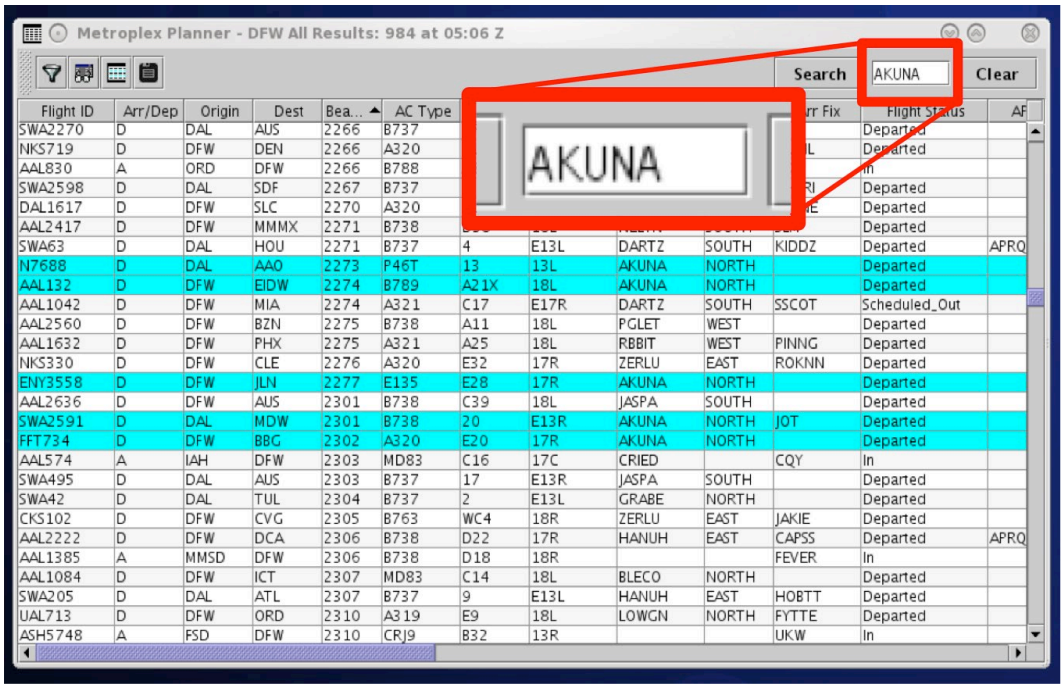
To Search for flights in the Flights Table:

***Step 1*:** Enter one of the searchable fields: Call sign, flight number, tail number, carrier, destination airport, terminal departure gate, departure fix, or "GA" for General Aviation (e.g., "AKUNA" in Figure 5.23).

***Step 2 (Optional)*:** Select the "Search" button.

Note: Flights with full, or partial, matching criteria are highlighted in cyan in the Flights Table (Figure 5.23) and are also highlighted on the timeline and map.

Alternatively: Select "Clear" to remove the search string from the Search field and deselect any highlighted flights in the Flights Tables.



Flight ID	Arr/Dep	Origin	Dest	Bea...	AC Type						Flight Status	AF
SWA2270	D	DAL	AUS	2266	B737						Departed	
NKS719	D	DFW	DEN	2266	A320						Departed	
AAL830	A	ORD	DFW	2266	B788						In	
SWA2598	D	DAL	SDF	2267	B737						Departed	
DAL1617	D	DFW	SLC	2270	A320						Departed	
AAL2417	D	DFW	MMMX	2271	B738						Departed	
SWA63	D	DAL	HOU	2271	B737	4	E13L	DARTZ	SOUTH	KIDDZ	Departed	APRQ
N7688	D	DAL	AAO	2273	P46T	13	13L	AKUNA	NORTH		Departed	
AAL132	D	DFW	EIDW	2274	B789	A21X	18L	AKUNA	NORTH		Departed	
AAL1042	D	DFW	MIA	2274	A321	C17	E17R	DARTZ	SOUTH	SSCOT	Scheduled_Out	
AAL2560	D	DFW	BZN	2275	B738	A11	18L	PGLET	WEST		Departed	
AAL1632	D	DFW	PHX	2275	A321	A25	18L	RBBIT	WEST	PINNG	Departed	
NKS330	D	DFW	CLE	2276	A320	E32	17R	ZERLU	EAST	ROKNN	Departed	
ENY3558	D	DFW	JLN	2277	E135	E28	17R	AKUNA	NORTH		Departed	
AAL2636	D	DFW	AUS	2301	B738	C39	18L	JASPA	SOUTH		Departed	
SWA2591	D	DAL	MDW	2301	B738	20	E13R	AKUNA	NORTH	JOT	Departed	
FFT734	D	DFW	BBG	2302	A320	E20	17R	AKUNA	NORTH		Departed	
AAL574	A	IAH	DFW	2303	MD83	C16	17C	CRIED		CQY	In	
SWA495	D	DAL	AUS	2303	B737	17	E13R	JASPA	SOUTH		Departed	
SWA42	D	DAL	TUL	2304	B737	2	E13L	GRABE	NORTH		Departed	
CKS102	D	DFW	CVG	2305	B763	WC4	18R	ZERLU	EAST	JAKIE	Departed	
AAL2222	D	DFW	DCA	2306	B738	D22	17R	HANUH	EAST	CAPSS	Departed	APRQ
AAL1385	A	MMSD	DFW	2306	B738	D18	18R			FEVER	In	
AAL1084	D	DFW	ICT	2307	MD83	C14	18L	BLECO	NORTH		Departed	
SWA205	D	DAL	ATL	2307	B737	9	E13L	HANUH	EAST	HOBTT	Departed	
UAL713	D	DFW	ORD	2310	A319	E9	18L	LOWGN	NORTH	FYTTE	Departed	
ASH5748	A	FSD	DFW	2310	CRJ9	B32	13R			UKW	In	

Figure 5.23. Flights Table: Search ressults highlighted in cyan (e.g., flights assigned to the "AKUNA" departure fix).

5.2 Aircraft Table

The Aircraft Table displays information about aircrafts, their current status, and current location (Figure 5.24). Unlike the Flights Table, only *one* Aircraft Table can be opened a time.

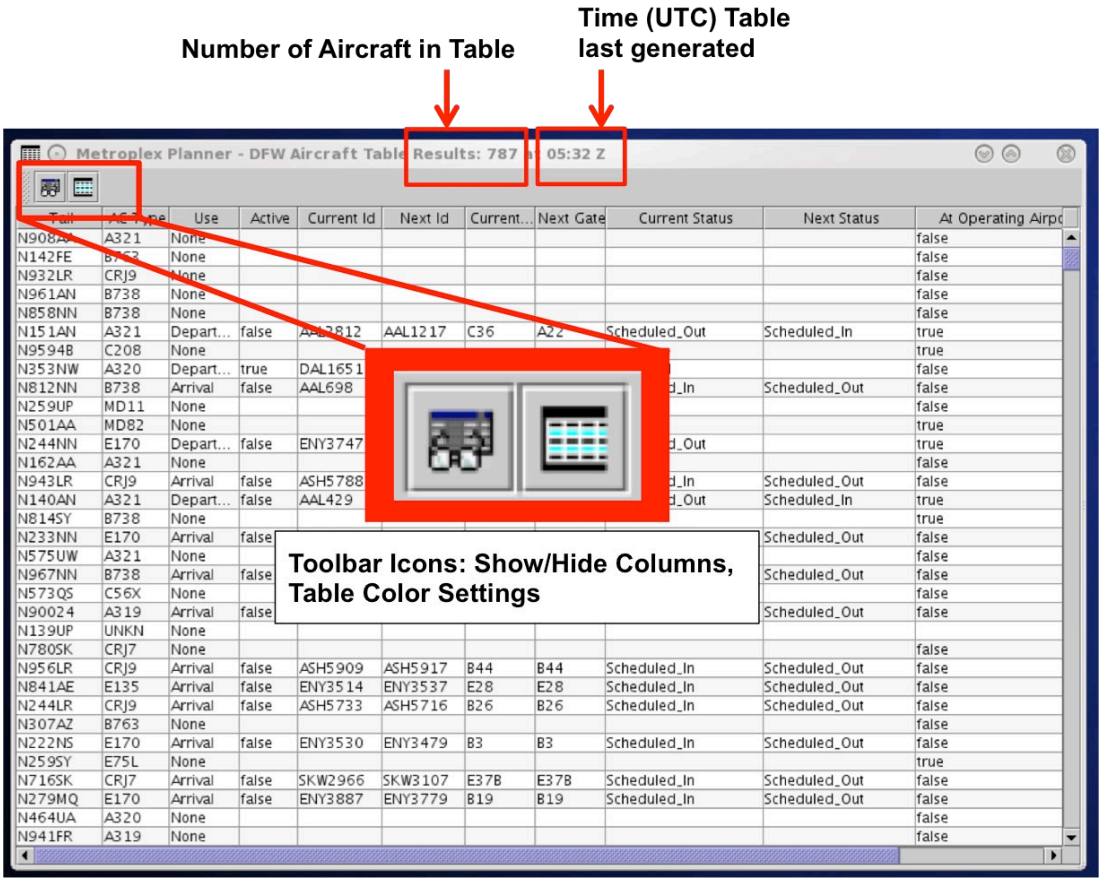


Figure 5.24. Aircraft Table.

5.2.1 Aircraft Table: Select an Aircraft

Select a row in the Aircraft Table to highlight an aircraft in the table, as well as the corresponding flight (if applicable) on the timeline and map.

5.2.2 Aircraft Table: Sort Data

Data in the Aircraft Table can be sorted using the same procedure used in the Flights Table.

5.2.3 Aircraft Table: Toolbar

The Aircraft Table toolbar allows the user to add, remove, or reorder columns and change color settings. Two icons are displayed on toolbar (Figure 5.24):

- Show/Hide Columns
- Table Color Settings

5.2.3.1 Show/Hide Columns

Use “Show/Hide Columns” to select which columns of information will be included, and in what order they will be shown, in the Aircraft Table.

Information that can be included in the Aircraft Table is described in Table 6.

Table 6. Column Header Information

Tail
AC Type
Use
Active
Current Id
Next Id
Current Gate
Next Gate
Current Status
Next Status
At Operating Airport
At Gate
Hide
Last Known State
Last Known Gufi
Repositioned
Last Known Gate
Last Known Lat
Last Known Lon
Previous Id
Reposition Destination
Previous Status
Previous Gate
Current Key
Previous Key
Next Key

Column information can be added, removed, and reordered in the Aircraft Table using the same procedure used in the Flights Table.

5.2.3.2 Table Color Settings

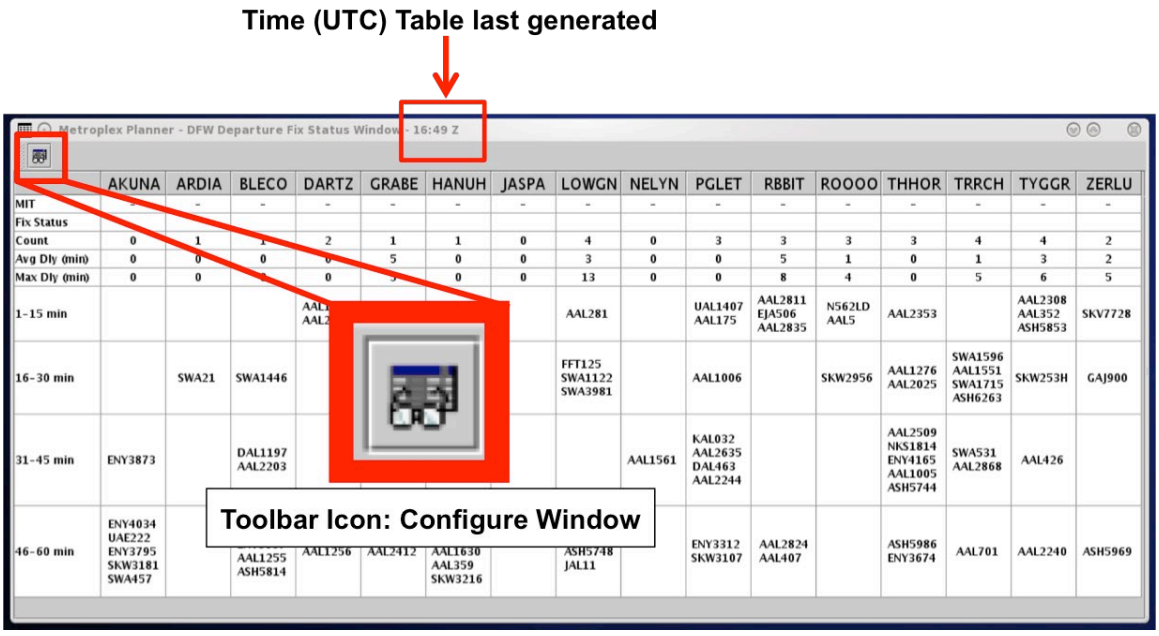
Use “Table Color Settings” to manage alternating row colors.

5.2.3.2.1 Set Row Colors

Row colors can be set by using the same procedure used in the Flights Table.

5.3 Departure Fix Status Table

The Departure Fix Status Table displays information about predicted demand at each Departure Fix in the terminal area. Call signs represent which flights are expected at each Departure Fix, and in what timeframe they are expected to arrive there (Figure 5.25). Only *one* Departure Fix Status Table can be opened a time.



	AKUNA	ARDIA	BLECO	DARTZ	GRABE	HANUH	JASPA	LOWGN	NELYN	PGLET	RBBIT	ROOOO	THHOR	TRRCH	TYGGR	ZERLU
MIT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fix Status																
Count	0	1	1	2	1	1	0	4	0	3	3	3	3	4	4	2
Avg Dly (min)	0	0	0	0	5	0	0	3	0	0	5	1	0	1	3	2
Max Dly (min)	0	0	0	0	5	0	0	13	0	0	8	4	0	5	6	5
1-15 min				AAL1 AAL2				AAL281		UAL1407 AAL175	AAL2811 EJA506 AAL2835	N562LD AAL5	AAL2353		AAL2308 AAL352 ASH5853	SKV7728
16-30 min		SWA21	SWA1446					FFT125 SWA1122 SWA3981		AAL1006		SKW2956	AAL1276 AAL2025	SWA1596 AAL1551 SWA1715 ASH6263	SKW253H	GAJ900
31-45 min	ENY3873		DAL1197 AAL2203						AAL1561	KAL032 AAL2635 DAL463 AAL2244			AAL2509 NKS1814 ENY4165 AAL1005 ASH5744	SWA531 AAL2868	AAL426	
46-60 min	ENY4034 UAE222 ENY3795 SKW3181 SWA457		AAL1255 ASH5814	AAL1256	AAL2412	AAL1630 AAL359 SKW3216		ASH5748 JAL11		ENY3312 SKW3107	AAL2824 AAL407		ASH5986 ENY3674	AAL701	AAL2240	ASH5969

Figure 5.25. Departure Fix Status Table.

TMI restriction information is also indicated in the Departure Fix Status Table (e.g., Miles-in-Trail (MIT), Departure Fix Closures). MIT or fix closure restrictions which are specific to an individual airport (e.g., a MIT constrained to include DFW only will be flagged with “DFW”).

5.3.1 Departure Fix Status Table: Toolbar

The Departure Fix Status Table toolbar provides the user access to table settings through the "Configure Window" icon (Figure 5.25).

5.3.1.1 Configure Window

Use "Configure Window" to select which Departure Fixes to include in the table, which properties (e.g., MIT, Fix Status, Flight Count) to display, and the duration of time to display on the table (up to 120 minutes) (Figure 5.26).

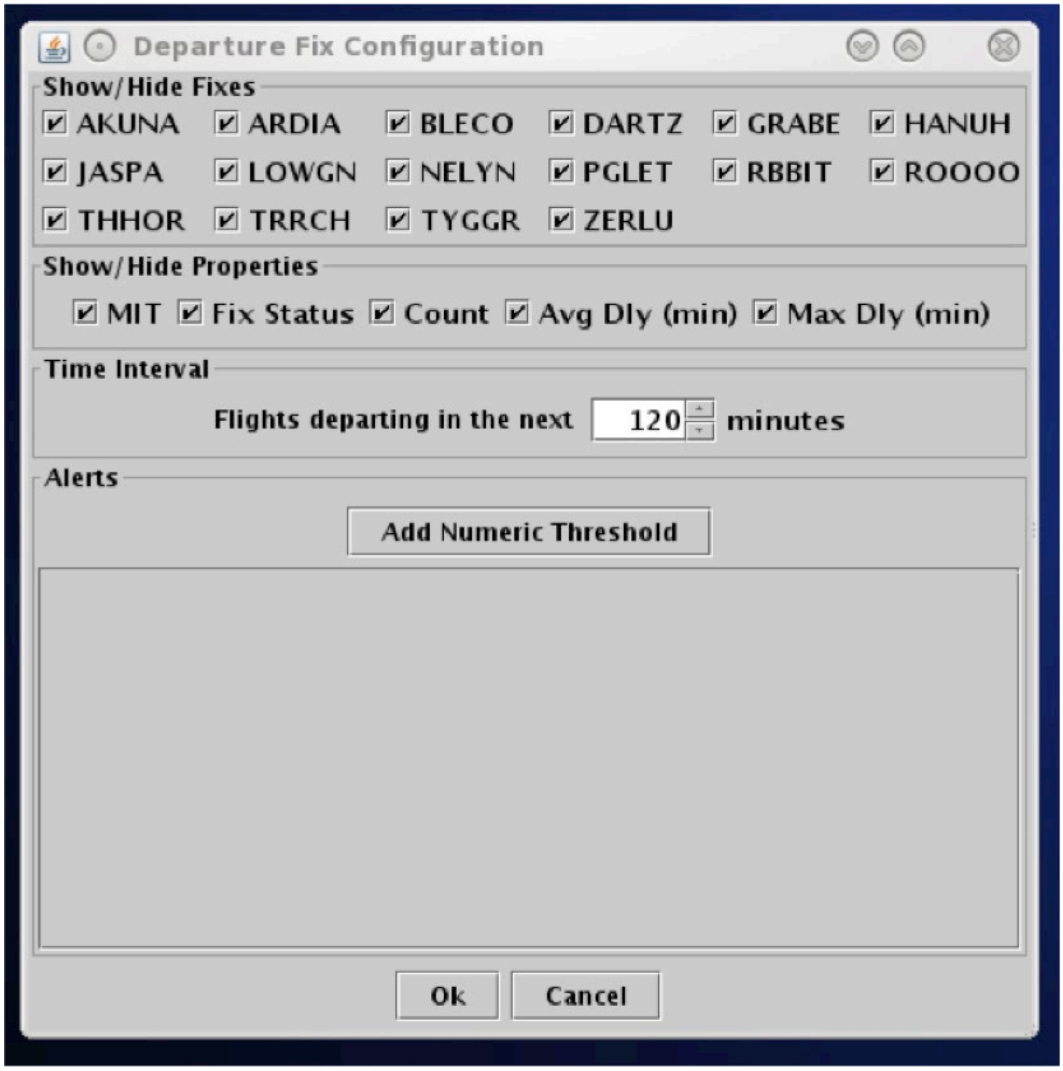


Figure 5.26. Departure Fix Status Table.

6 STBO Client: Timelines

A timeline displays information about individual departure and arrival flights to create a visual representation of traffic demand relative to time. Each flight is represented by a configurable datablock connected to the timeline by a leader line (Figure 6.1). More than one timeline window can be open at the same time and each can be configured independently of the others.

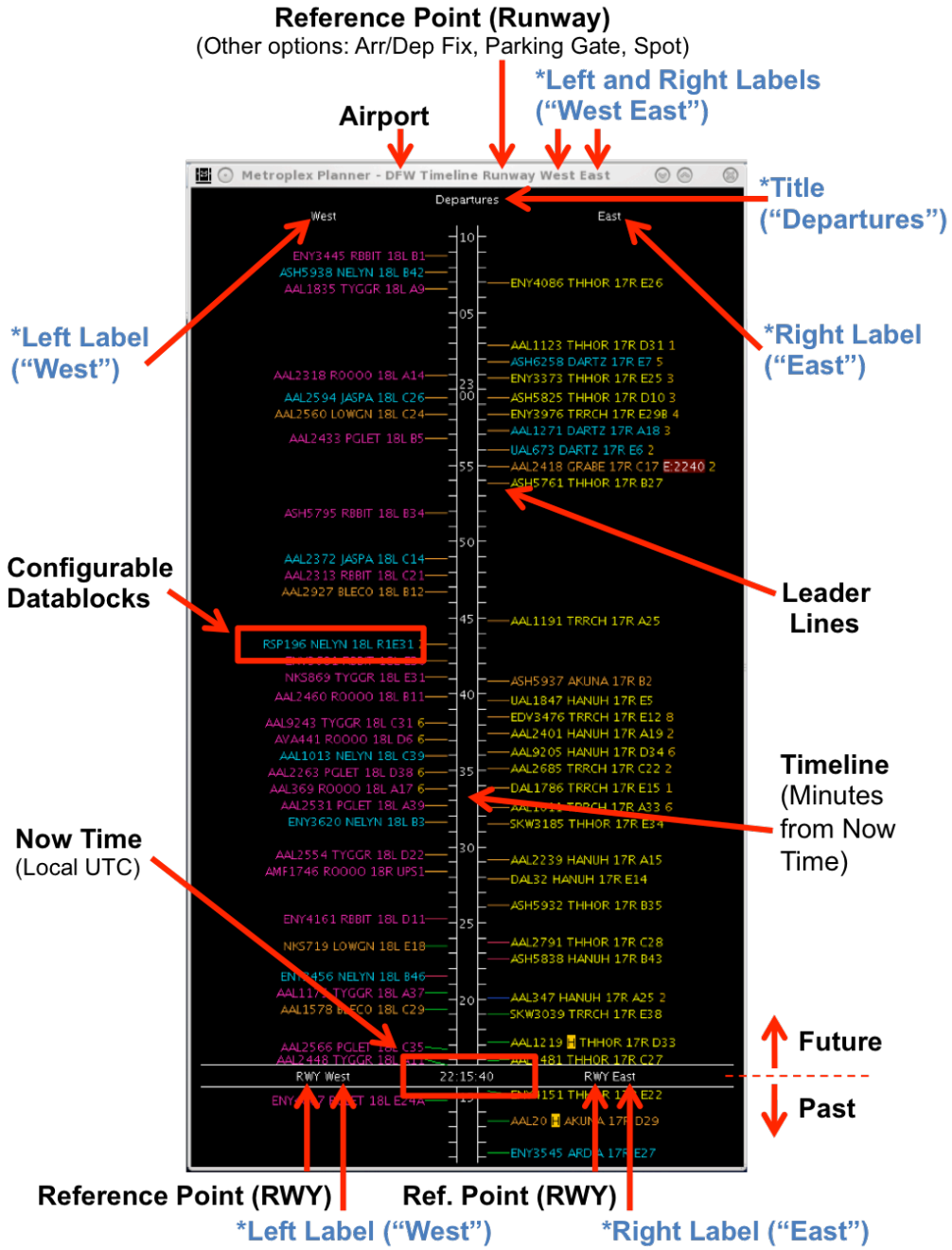


Figure 6.1. Timeline overview. *Fields in blue are labels that can be edited by the user.

6.1 Timeline: Reference Point

The reference point is the point from which flights are scheduled or predicted on the timeline. A timeline can be created using one of four reference points:

- Runway
- Arrival/Departure Fix
- Parking Gate, or
- Spot.

The selected reference point applies to both sides of a timeline and is automatically displayed on the title bar of the timeline window and next to the "Now" time (e.g., "Runway" in Figure 6.2).

"Now" time (i.e., current time) is displayed in local UTC time (e.g., 22:15:40 in Figure 6.2).

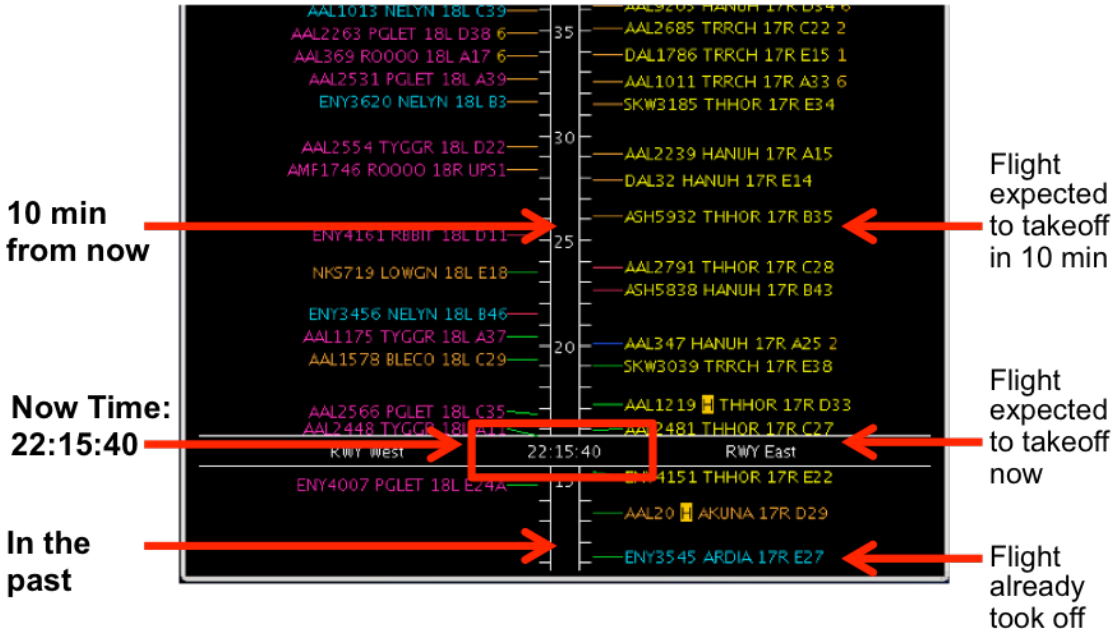


Figure 6.2. Timeline.

A departure (or arrival) flight 10 minutes away from the "Now" time is expected to reach the reference point in 10 minutes. Depending on which reference point is selected, that means:

- **Runway**: The flight is expected to takeoff off (or touchdown) in 10 min.
- **Arrival/Departure Fix**: The flight is expected to cross the fix in 10 min.
- **Parking Gate**: The flight is expected to push back from (or pull into) the parking gate in 10 min.
- **Spot**: The flight is expected to cross the spot to exit the Ramp (or enter AMA) in 10 min.

6.1.1 Runway

When “Runway” is selected as the reference point, the position of flights on the timeline, relative to “Now” time, reflects the surface scheduler's prediction of OFF time for departures and ON time for arrivals. For departure flights, this is either the Target Takeoff Time (TTOT) or Earliest Feasible Takeoff Time (EFTT).

- **TTOT** of aircraft at the gate is a prediction of OFF time based on flight’s pushback ready time and predicted taxi times. For flights with the Controlled Takeoff Time (CTOT), either via Expect Departure Clearance Times (EDCTs) or Approval Requests (APREQs)/Call for Releases (CFRs), the TTOT may equal the Controlled Takeoff Time (CTOT).
- **EFTT** is only provided for APREQs that have yet to be negotiated with Center.

6.1.2 Arrival/Departure Fix

When “Arrival/Departure Fix” is selected as the reference point, the position of flights on the timeline, relative to “Now” time, reflects the prediction of when departure flights will cross their departure fix and when arrival flights will cross their arrival fix.

6.1.3 Parking Gate

When “Parking Gate” is selected as the reference point, the position of flights on the timeline, relative to “Now” time, reflects the surface scheduler’s prediction of “IN” time for arrivals and “OUT” time for departures. “IN” represents the time a flight parks at their gate and “OUT” represents pushback time.

6.1.4 Spot

When “Spot” is selected as the reference point, the position of flights on the timeline, relative to “Now” time, reflects the surface scheduler’s prediction of spot crossing time. That is, leaving the Ramp area and entering the AMA for departures and entering the Ramp area for arrivals.

6.2 Timeline: Leader Lines

Leader lines are useful for determining the status of the flight (Figure 6.3). Leader line colors are pre-defined and not configurable (Table 7).

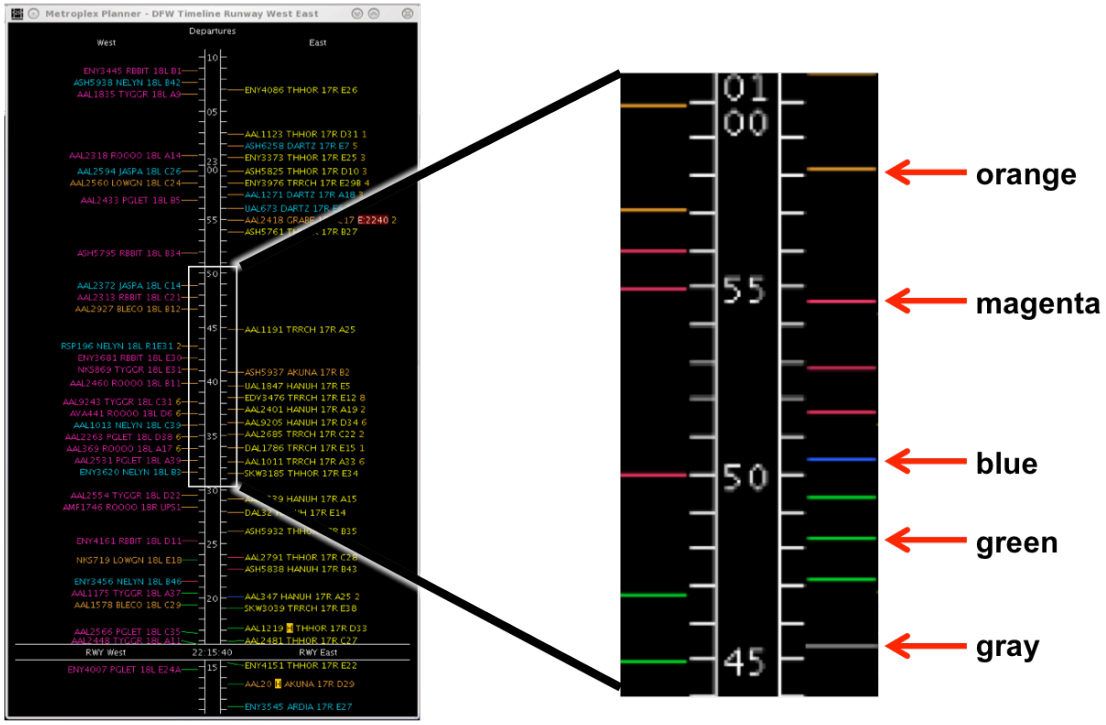


Figure 6.3. Timeline leader lines connecting datablocks to the timeline indicate flight status.

Table 7. Leader Line Color Information.

Leader Line Color	Description
Orange	Departure flight is scheduled but not yet active.
Magenta	Departure flight is in pushback/spool-up state.
Blue	Departure flight is in the Ramp taxi-out state.
Green	Departure flight is in the AMA or has already taken off.
Grey	Arrival flight.

6.3 Timeline: Select a Flight

Select a flight on the timeline to highlight the flight throughout the user interface.

To select a flight on the Timeline:

Step 1: Select a datablock on the timeline. Once selected, the datablock is highlighted (Figure 6.4).

Note: When a flight is selected on the timeline, it is highlighted throughout the user interface. That is, it is also highlighted on the map and in the Flights Table.

Alternatively: Click elsewhere on the timeline background (anywhere not on a flight datablock) to deselect the flight.

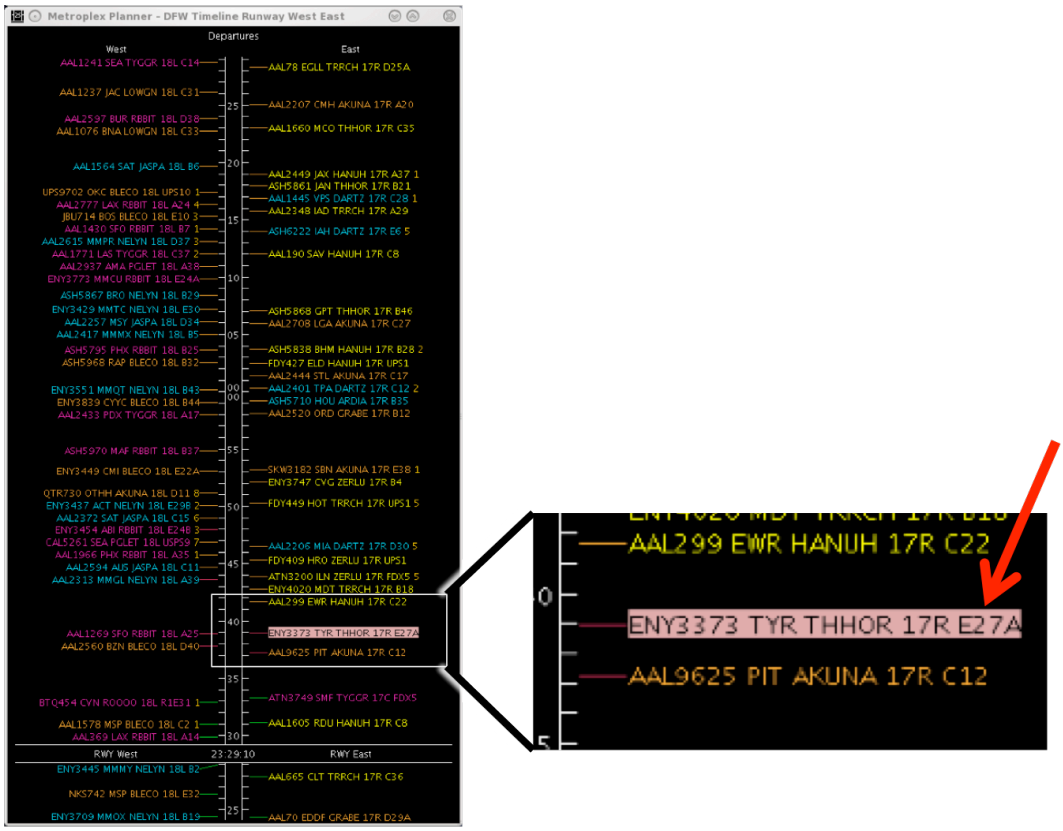


Figure 6.4. Timeline: Selected flight with highlighted datablock.

6.4 Timeline: Move the Timeline

The timeline can be moved, or dragged, forward and backward in time. To move the timeline, click and hold inside the center timeline column and drag the timeline:

- **Down** to view flights in the future, or
- **Up** to view flights farther into the past.

When the timeline is moved, the start and end times at the top and bottom of the visible window will change, but the duration of time in the window remains constant. The size of the visible time window is defined by the “Begin At” and “End At” fields in the Timeline Settings menu. For example, a timeline set to display a 53-minute window (i.e., 3 minutes into the past and 50 minutes into the future), will continue to do so, regardless of how far forward or backward the timeline is shifted.

When the timeline is moved up or down, the “Now” time also moves. If moved far enough, the “Now” time may no longer be visible in the current window (Figure 6.5).

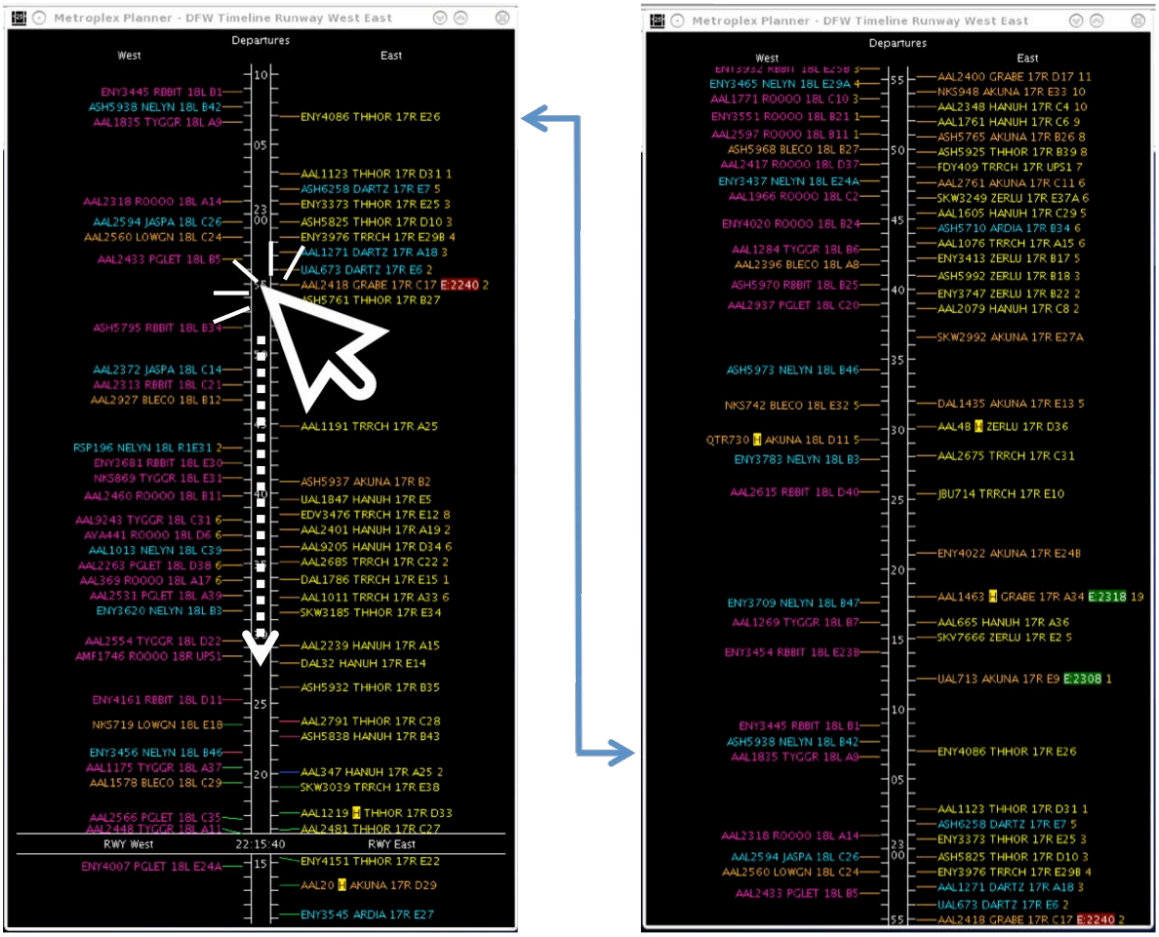


Figure 6.5. Click and drag the timeline to move forward and backward in time.

Once the timeline has been moved in either direction, the option to reset the timeline to the default time interval will be available in the timeline’s right-click menu (Figure 6.6).

To reset the Timeline interval:

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

Step 2: Select "Reset Interval" (Figure 6.6). The timeline resets to the "Begin At" and "End At" window relative to "Now" time as defined in the Settings menu.

Note: The "Reset Interval" option is not available in the right-click menu until after the timeline has been moved up or down.

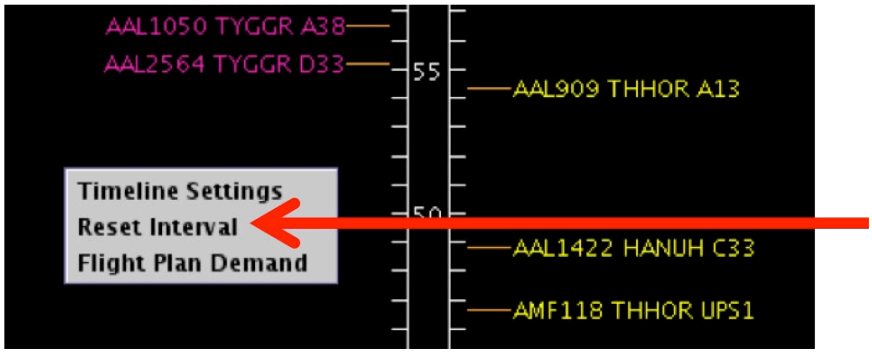


Figure 6.6. Timeline right-click menu: Reset Interval.

6.5 Timeline: Flight Plan Demand

Use the Flight Plan Demand option to draw a graphical indicator around a window time of on the timeline. Create the window by selecting begin and end times.

To create a Flight Plan Demand window:

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

Step 2: Select "Flight Plan Demand" to open the Flight Plan Demand window (Figure 6.7).

Step 3: Check "Show Flight Plan Demand View" (Figure 6.8).

Step 4: Enter a "Begin Time" (*hhmm*) and "End Time" (*hhmm*).

Step 5: Select "Apply" to display the Flight Plan Demand window on the timeline or "Preview" it.

Note: A count of (arrival flights) / (departure flights) remaining in the defined time window is displayed at the bottom of each column. For example 5 arrival flights (left column)) and 13 departure flights (right column) remain in the demand window in Figure 6.9.

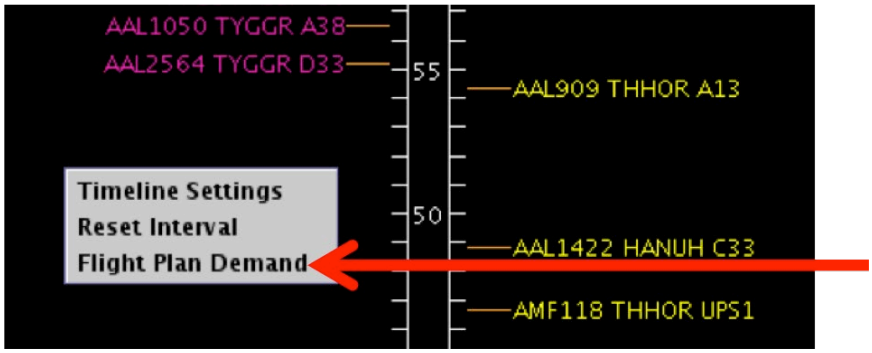


Figure 6.7. Timeline right-click menu: Flight Plan Demand.

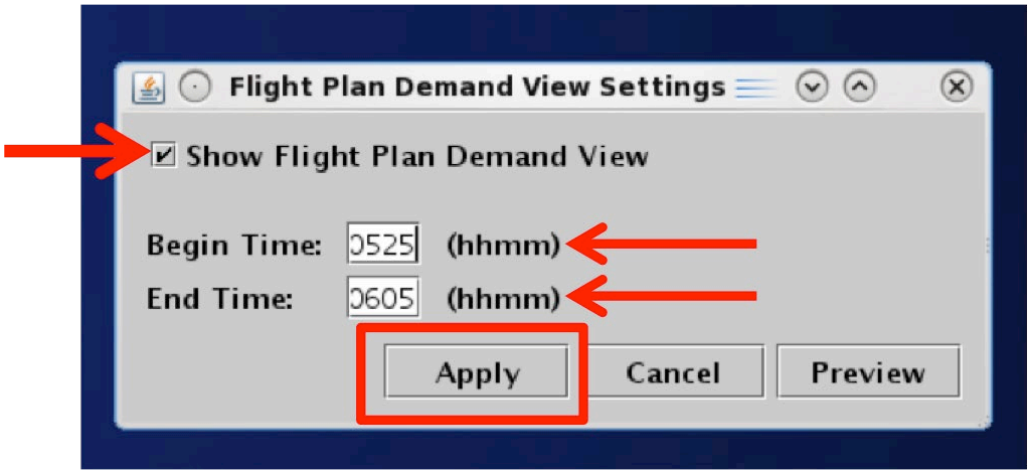


Figure 6.8. Flight Plan Demand View Settings.

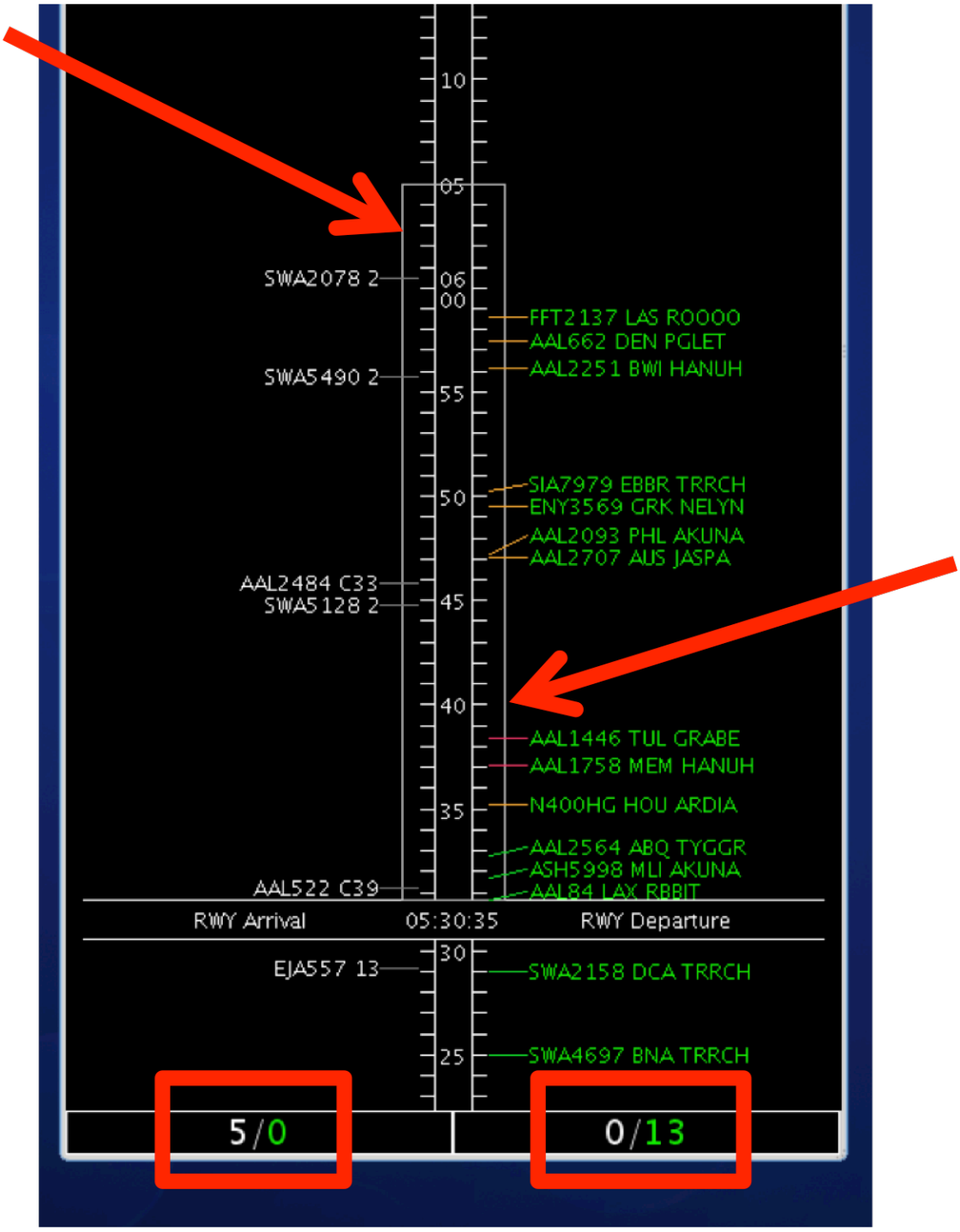


Figure 6.9. Flight Plan Demand depicted by white box around defined time window. Count of arrival flights / demand flights in each column.

6.6 Timeline: Settings

The “Timeline Settings” window can be used to configure timeline parameters, reference point, labels, color schemes, datablock options, and filtering criteria (Figure 6.10).

To open the Timeline Settings window:

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

Step 2: Select “Timeline Settings” to open the Settings window (Figure 6.10) to open the Timeline Settings window (Figure 6.11).

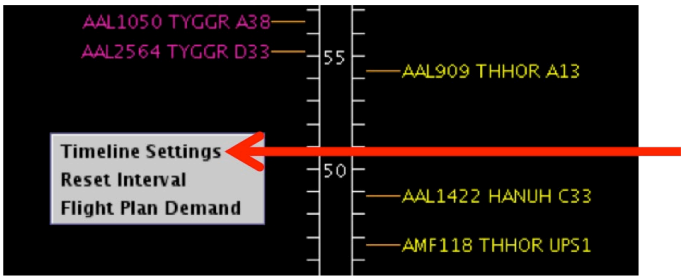


Figure 6.10. Timeline right-click menu: Timeline Settings.

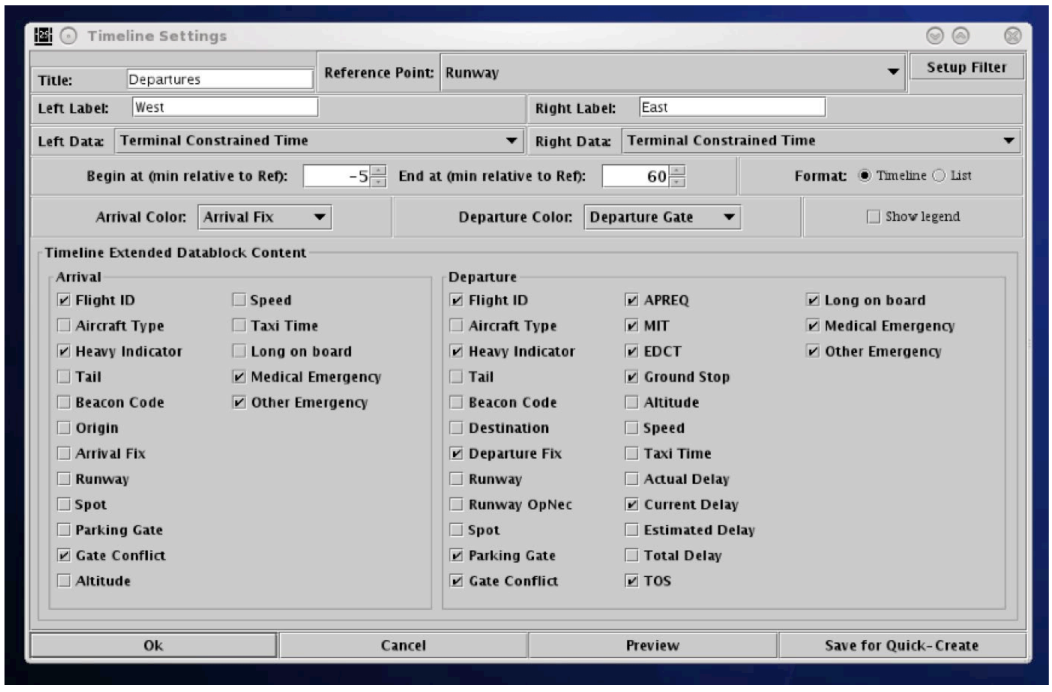


Figure 6.11. Timeline Settings window.

6.6.1 Apply / Preview / Save Timeline Settings

Four buttons are available at the bottom of the Timeline Settings window to apply, cancel, preview, and save timeline settings.

To Preview, Apply, or Cancel changes in Timeline Settings:

Step 1: Make desired changes in the Timeline Settings window.

Step 2: (Optional): Select "Preview" to view the changes without applying them. The Timeline Settings window remains open. If needed, additional changes can be made (Figure 6.12).

Step 3: Select "Ok" to apply the changes and close the Timeline Settings window (Figure 6.12).

Alternatively: Select "Cancel" to discard any changes and close the Timeline Settings window (Figure 6.12).

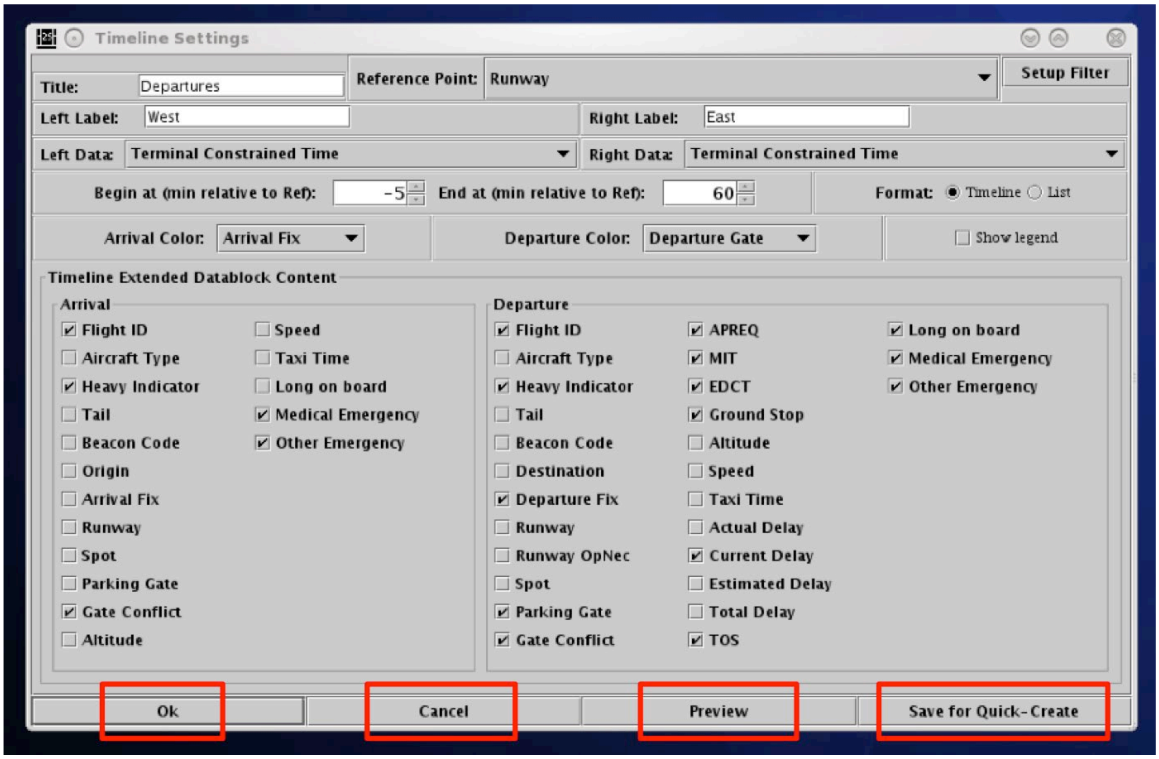


Figure 6.12. Timeline Settings window

To Save Timeline settings:

Step 1: Select "Save for Quick-Create" to save Timeline Settings (Figure 6.12).

Step 2: Enter the preferred file name for future access (e.g., "Tower_2019" in Figure 6.13).

Step 3: Select "Save".

Note: A timeline can be created using a saved configuration (Figure 6.14)

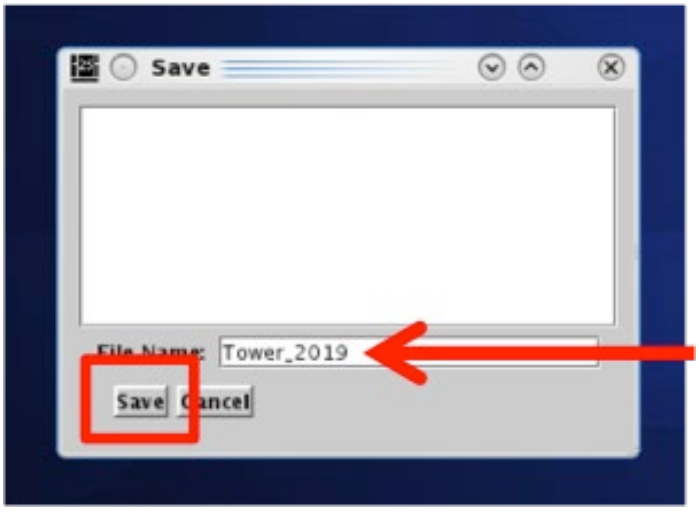


Figure 6.13. Save for Quick-Create in Timeline settings.

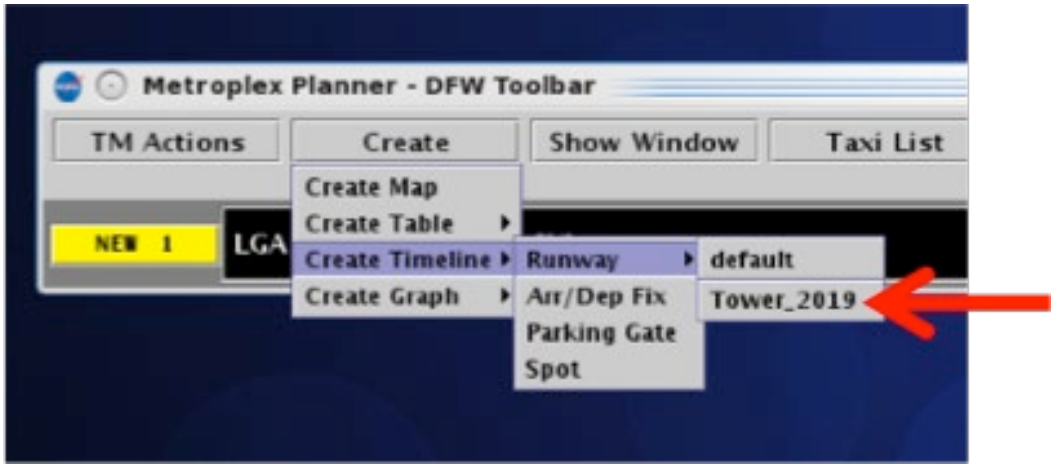


Figure 6.14. Create a Timeline using a saved configuration (e.g., Tower_2019).

6.6.2 Reference Point

The reference point of an existing timeline can modified in the Settings window.

To change the Reference Point of existing Timeline:

Step 1: In the Timeline Settings window, click on the "Reference Point" dropdown menu and select a reference point (e.g., "Arr/Dep Fix" in Figure 6.15):

- Runway
- Arr/Dep Fix
- Parking gate
- Spot

Step 2: Select "Ok" to apply the change or "Preview" to preview the changes on the timeline.

Note: The selected reference point applies to both sides of a timeline and is automatically updated on the title bar of the window (e.g., "Arr/Dep Fix" in Figure 6.16) and on the reference line, next to the "Now "time (e.g., "Fix" in Figure 6.16).

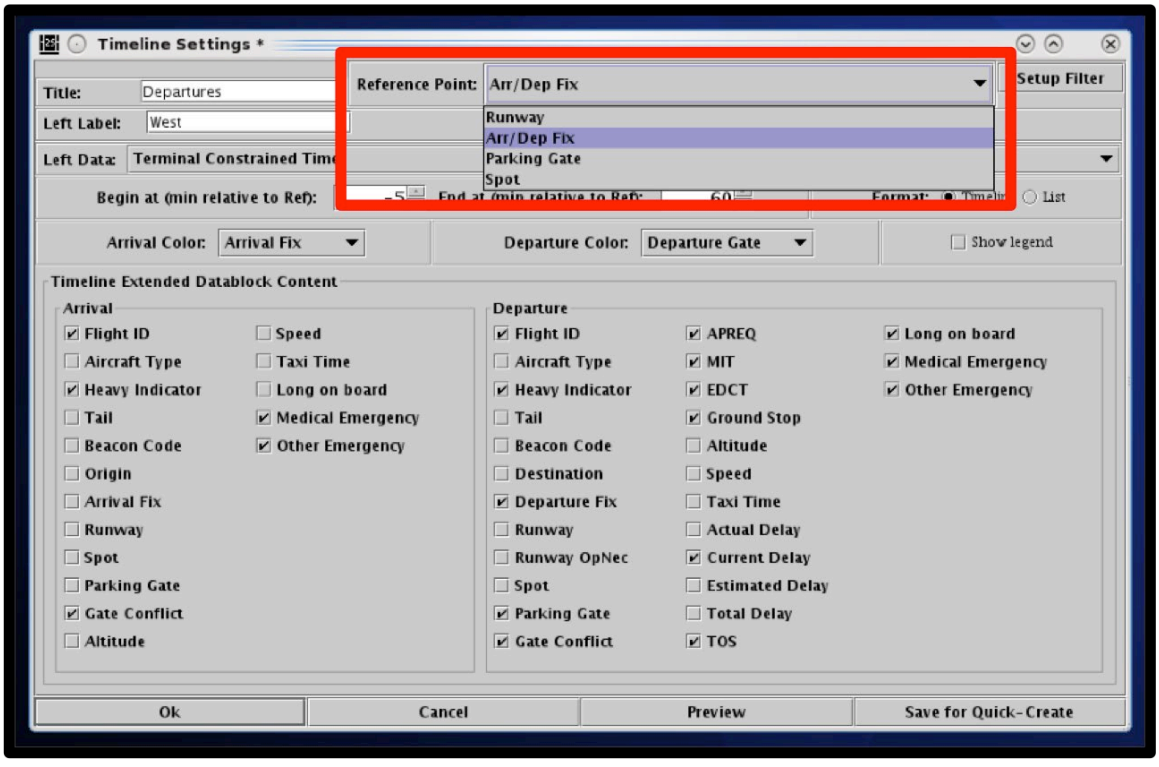


Figure 6.15. Timeline Settings window: Reference Point menu.

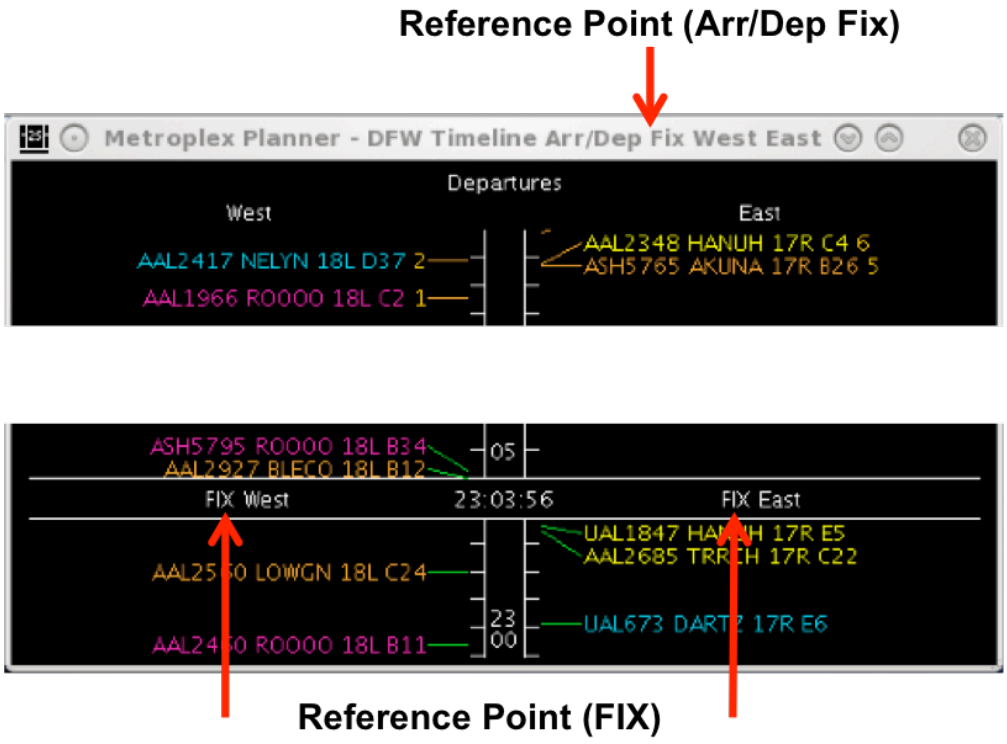


Figure 6.16. Timeline Reference Point (e.g., Arr/Dep Fix).

6.6.3 Labels

The title of the timeline and the left and right column labels can be changed in the Settings window. Note, the title and column labels do not affect the content of the timeline and are independent of any timeline filters.

To change the Timeline title:

Step 1: In the Timeline Settings window, edit the content of the "Title" text box (Figure 6.17).

***Step 2*:** Select “Ok” to apply the change or “Preview” to preview the changes on the timeline.

Note: The timeline Title is automatically updated (e.g., “Departures” in Figure 6.18).

To change the label for the left and/or right sides of the Timeline:

***Step 1*:** In the Timeline Settings window, edit the content of the "Left Label" and “Right Label” text boxes (Figure 6.17).

***Step 2*:** Select “Ok” to apply the change or “Preview” to preview the changes on the timeline.

Note: The timeline’s Left and Right Labels are automatically updated (e.g., “West” and “East” in Figure 6.18).

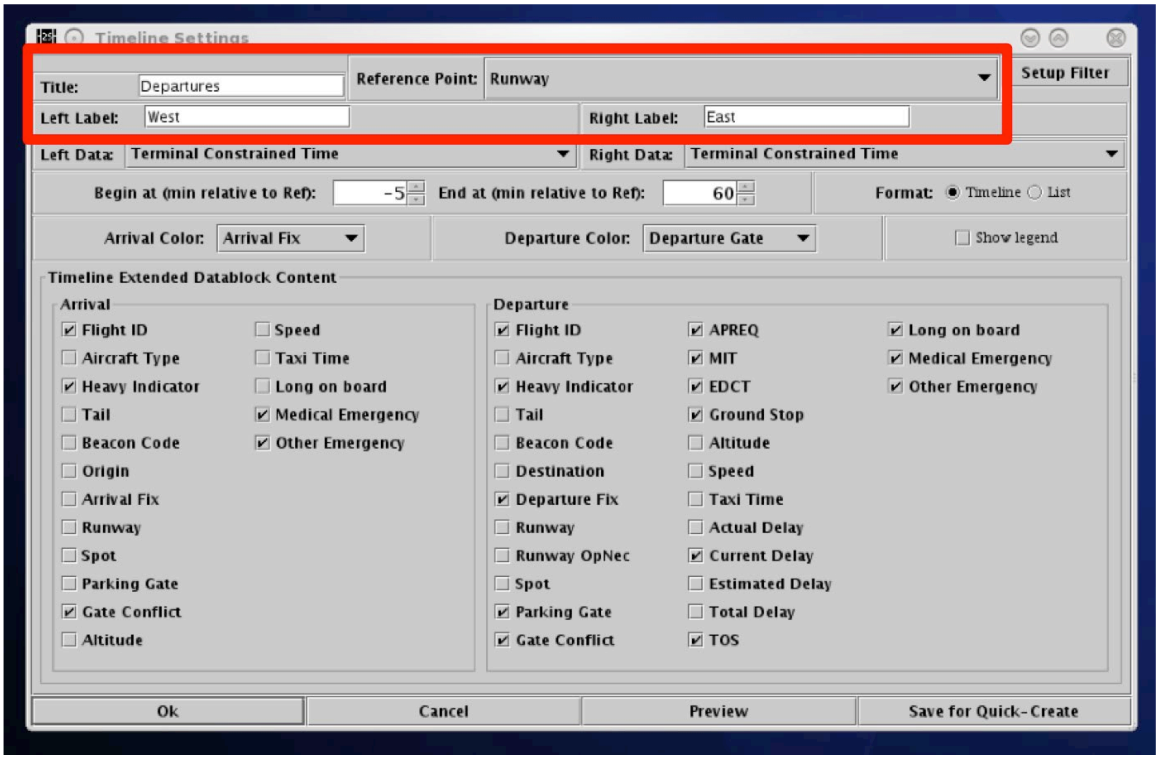


Figure 6.17. Timeline Settings window: Title and Left/Right Label fields.

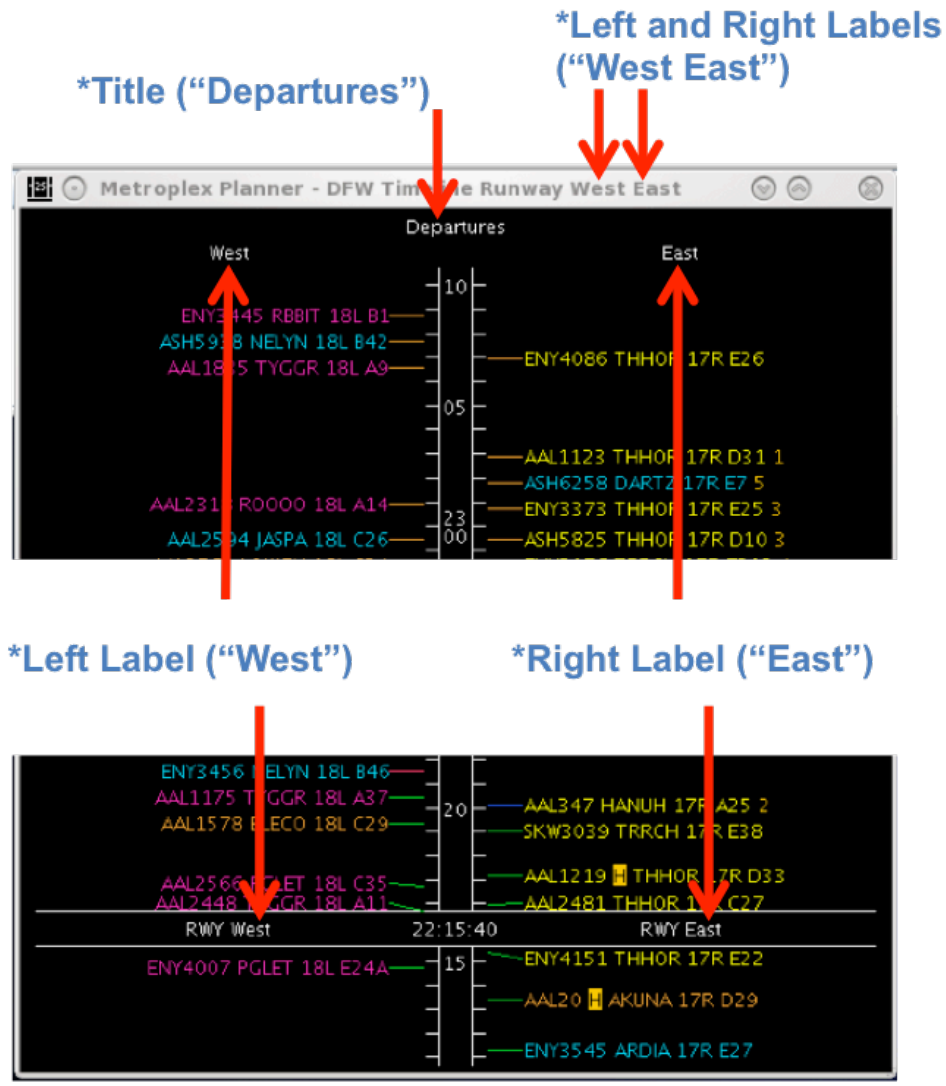


Figure 6.18. Timeline Title (e.g., Departures) and Left/Right Lables (e.g., West / East).

6.6.4 Setup Filter

Filters are used for configuring what information is displayed on a timeline. For example, the filter can be used to display westbound runways on the left side of the timeline and eastbound data on the right side. Filters can also be configured to show flights with only certain TMIs, like APREQs on a timeline.

Variables that can be used for applying filters are listed in Table 8. Variables are used in combination with a *modifier* ("=" equal to or "!" not equal to). Multiple variables can be used in combination by selecting "and" or "or" as a *qualifier*.

Table 8. Filter Field Options

Filter Field	Options
Airline	[enter text]
Arr/Dep	[Arrival/Departure]
Arr Fix	[dropdown list; varies by TRACON]
Dep Fix	[dropdown list; varies by TRACON]
Dep Gate	[dropdown list; varies by TRACON]
Dest	[3-digit airport code dropdown list]
Destination has APREQ	[Yes/No]
Engine Type	[Prop/Turbo/Jet]
Flight Status	• Scheduled_Out • Pushback • Out • Taxiing_AMA • In_Queue • Departed • Enroute_Arr • Term_Area_Arr • On_Final • On • In_Ramp • In • Return_to_Gate • Suspended • Cancelled • Unknown
Gate	[dropdown list; varies by Airport]
Has Acknowledged APREQ	[Yes/No]
Had EDCT	[Yes/No]
Has MIT	[Yes/No]
Has Fix MIT	[Yes/No]
Has Destination MIT	[Yes/No]
Has Jet Route MIT	[Yes/No]
Is Hidden	[Yes/No]
Origin	[3-digit airport code dropdown list]

Runway	[dropdown list; varies by Airport]
Spot	[dropdown list; varies by Airport]
Tail	[Is Set/Not Set]
Weight Class	[A, B, C, D, E, F]

To Add a New Filter to the Timeline:

Step 1: In the Timeline Settings window, select "Setup Filter" (Figure 6.19).

Step 2: Select the "Left" or "Right" tab to filter the left or right side of the timeline (e.g., "Right" in Figure 6.20).

Step 3: Select a variable from the dropdown menu in the "Field" column (e.g., "Runway" in Figure 6.20).

Step 4: Select a modifier from the dropdown list in the "Operator" column (e.g., "=" in Figure 6.20).

Step 5: Select an option from the dropdown list or enter text to populate the "Values" field (e.g., "DFW:35R" in Figure 6.20).

Step 6 (Optional): More variables can be added to the filter by making entries on a new row. Select "Add Fields" if more rows are not visible.

Step 7: Begin new rows by selecting a qualifier (i.e., "and" or "or).

Note: Follow the same steps to apply filters to the other timeline column.

Step 8: When complete, select "Ok" to close the Setup Filter window.

Step 9: Select "Ok" to apply the change or "Preview" to preview the changes on the timeline.

Note: An existing filter can be modified by changing the selections in the Field, Operator, or Values columns.

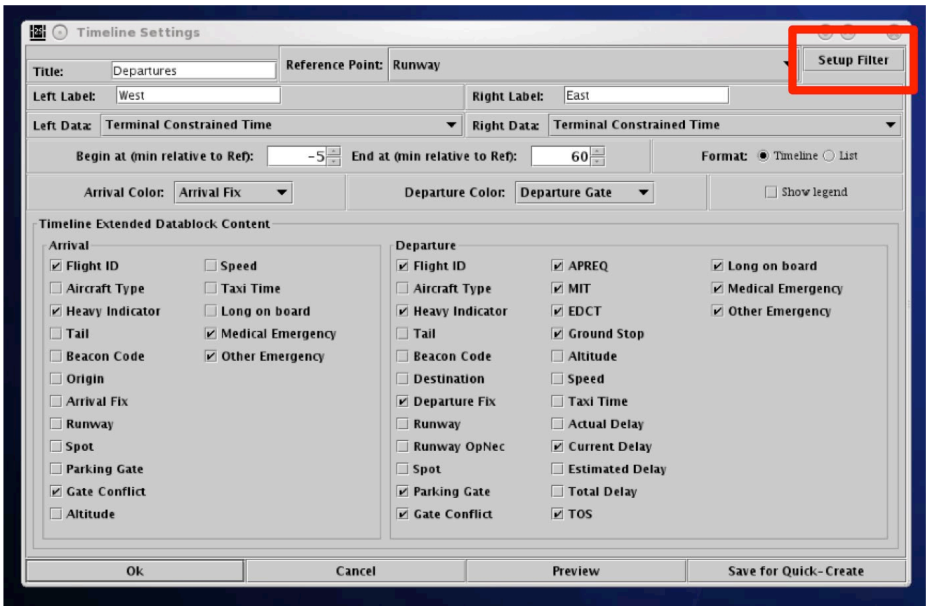


Figure 6.19. Timeline Settings window: Setup Filter.

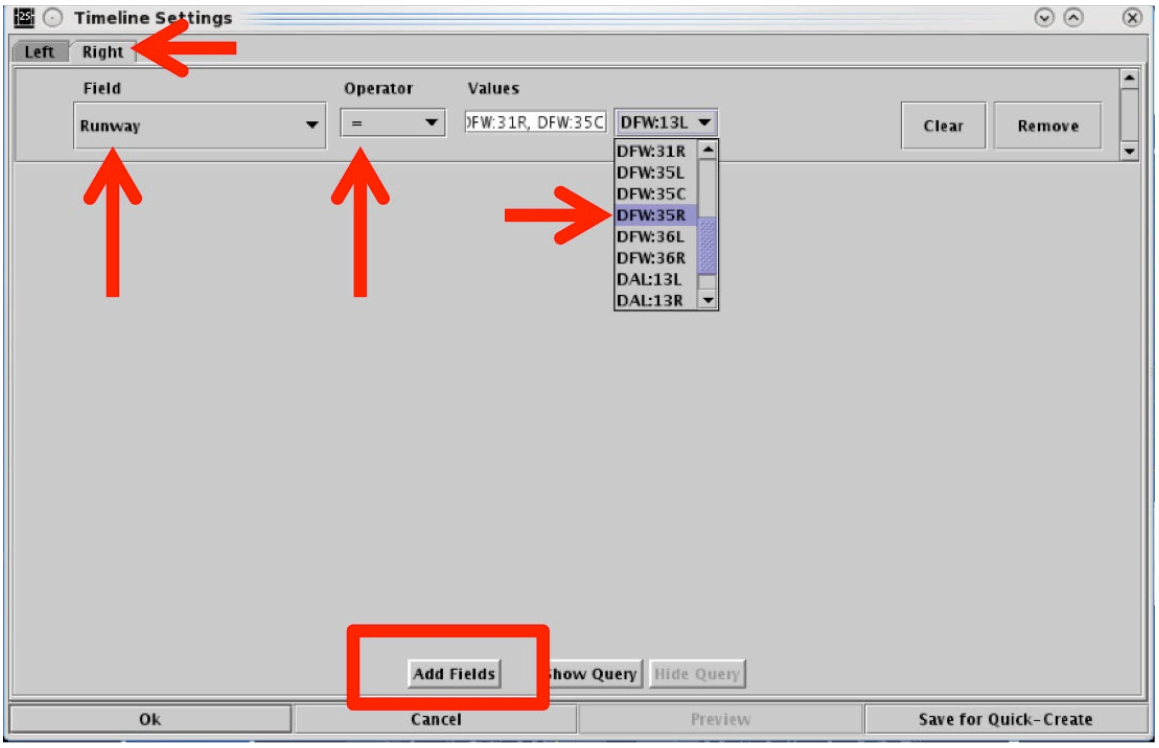


Figure 6.20. Filter Settings: Enter Filter critria.

Note that adding or modifying timeline filters does not change the title or the left/right labels. Labels must be edited manually.

To Remove or Clear a Filter from the Timeline:

Step 1: In the Timeline Settings window, select "Setup Filter" (Figure 6.19).

Step 2: Select "Remove" to delete the entire row.

Alternatively: Select "Clear" to clear the "Value" field in that row.

Step 3: When complete, select "Ok" to close the Setup Filter window.

Step 4: Select "Ok" to apply the change or "Preview" to preview the change on the timeline.

6.6.5 Left Data/Right Data

A flight is positioned on the timeline based on a prediction of when that flight will reach the timeline's reference point. When Runway or Arr/Dep Fix is selected as the reference point, users can select one of three different computation methods: Undelayed Time, Surface Constrained Time, or Terminal Constrained Time to predict at what time a flight is expected to reach the timeline's selected reference point. Surface Constrained Time and Terminal Constrained Time are available only when Runway or Dep/Arr Fix is selected as the reference point.

Each of the three methods predicts the earliest time at which a flight can reach the timeline's reference point, however, each method bases that calculation on different criteria.

- **Undelayed Time** is the earliest time at which a flight can reach the timeline's reference point as predicted by the ATD-2 scheduling systems, based on:
    - a flight's predicted trajectory,
    - a constant taxi speed in the Ramp, and
    - a constant taxi speed in the AMA.

  No other flights (i.e., traffic) are considered in this calculation. This time updates every 10 seconds.
- **Surface Constrained Time** is the earliest time at which a flight can reach the timeline's reference point as predicted by the ATD-2 scheduling systems, based on:
    - *Undelayed Time* + expected separation between flights.

  This time updates every 10 seconds and is available only when Runway or Dep/Arr Fix is selected as the reference point.
- **Terminal Constrained Time** is the earliest time at which a flight can reach the timeline's reference point as predicted by the ATD-2 scheduling systems, based on:

- *Surface Constrained Time* + additional separation between flights based on the demand of multiple airports at departure fixes at the terminal boundary, as well as terminal restrictions applied to the departures.

This time updates every 10 second and is available only when Runway or Dep/Arr Fix is selected as the reference point.

To change Left or Right Timeline data type:

Step 1: In the Timeline Settings window, click on the "Left Data" or "Right Data" dropdown menu to change the data used in the left/right columns of the timeline (e.g., "Left Data" in Figure 6.21).

Step 2: Select a data type from the dropdown menu (e.g., "Terminal Constrained Time" in Figure 6.21):

- Surface Constrained Time
- Terminal Constrained Time
- Undelayed Time

Note: Because each of the three data types base their prediction on different factors, a flight's position on the timeline may change when the data type is changed.

Step 3: Select "Ok" to apply the change or "Preview" to preview the change on the timeline.

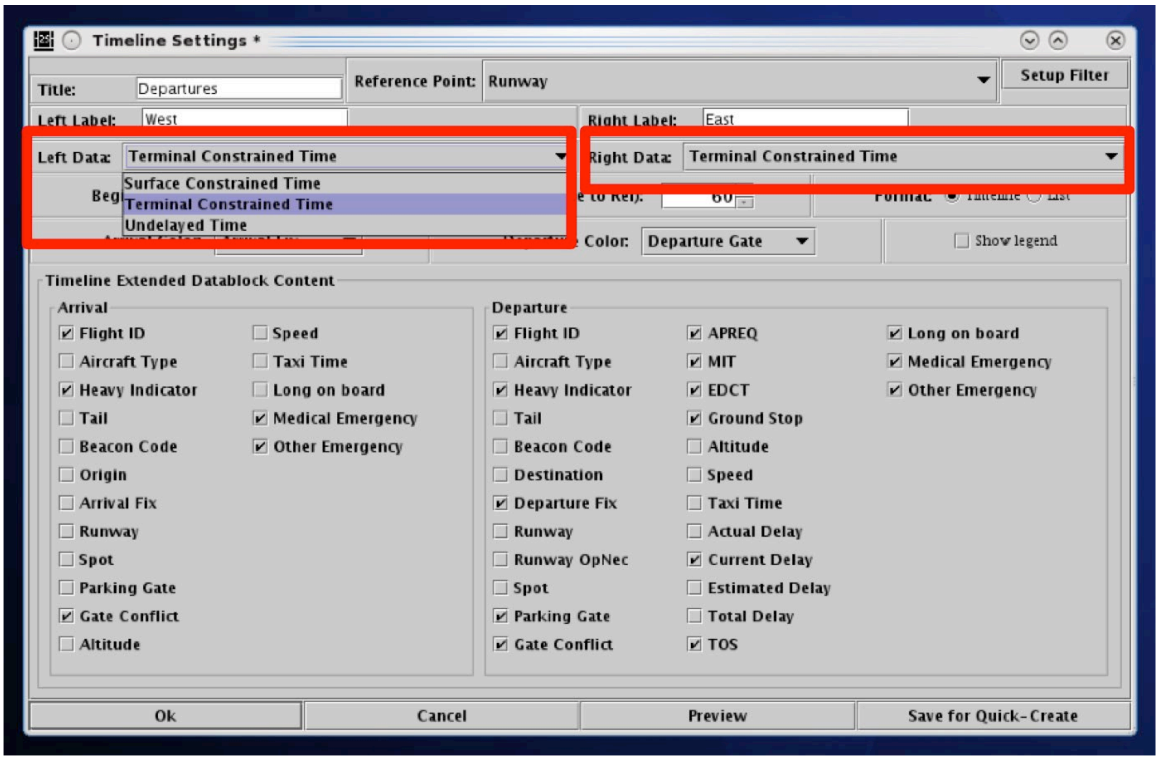


Figure 6.21. Timeline Settings window: Timeline data.

6.6.6 Duration

The duration, or the size of the visible window, of the timeline display can be configured by adjusting the “Begin at” and “End at” times. The “Begin at” time represents where, relative to “Now” time, the timeline display should start. The “End at” time represents where, relative to “Now” time, the timeline display should end. The difference between these two times is the size of the visible timeline window.

Use a negative number to indicate minutes prior to “Now” time (past) and a positive number to indicate minutes prior to “Now” time (future).

For example, if the “Begin at” time is -5 minutes, the timeline display will start 5 minutes prior to “Now” time. If the “End at” time is set at 55 minutes, the timeline display will extend 55 minutes into the future past “Now” time. In this example, the timeline duration (window of time) is a total of 60 minutes.

To change the duration of the Timeline:

Step 1: In the Timeline Settings window, enter the starting point for the timeline in the "Begin at" field (in minutes).

Step2: Enter the end time for the timeline in the "End at" field (in minutes) (Figure 6.22).

Note: Depending on the user's preference, both the Begin At and End At times:

- ***Can be positive (to create a window of time in the future), or***
- ***Can be negative (to create a window of time in the past), or***
- ***The Begin time can be in the past (i.e., negative number), while the End time is in the future (i.e., positive number), creating a window of time that includes "Now" time.***

Step 3: Select "Ok" to apply the change or "Preview" to preview the changes on the timeline.

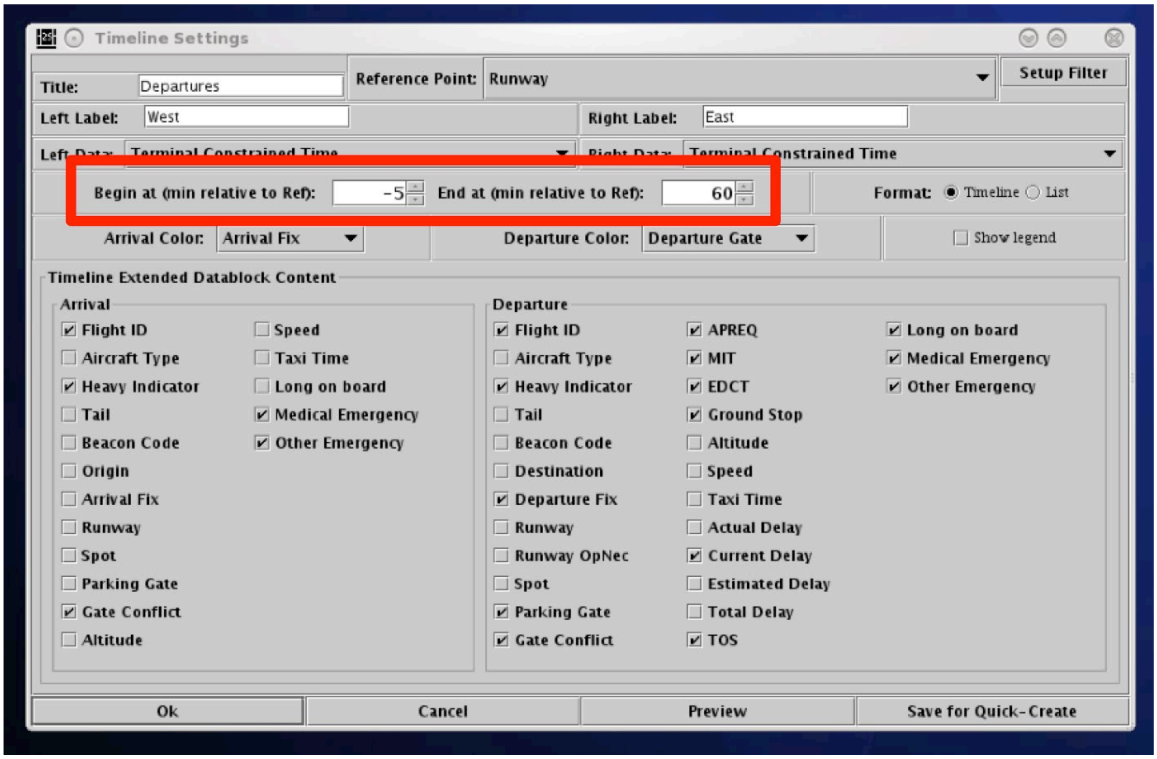


Figure 6.22. Timeline Settings window: Begin at and End at times (in minutes).

6.6.7 Color Scheme

Users can select a color scheme to apply to departure and arrival timeline datablocks.

To change the Color Scheme for Timeline datablocks:

Step 1: In the Timeline Settings window, click on the "Departure Color" dropdown menu to select a departure color scheme (e.g., "Departure Gate" in Figure 6.23):

- Departure
- Departure Fix
- Departure Gate
- Departure Runway
- Weight (Aircraft)

Step 2: In the Timeline Settings window, click on the "Arrival Color" dropdown menu to select an arrival color scheme (e.g., "Arrival Runway" in Figure 6.24):

- Arrival
- Arrival Fix
- Arrival Runway
- Weight (Aircraft)

Step 3: Select "Ok" to apply the change or "Preview" to preview the changes on the timeline.

Note: Color-coding schemes on the timeline apply to datablocks only. The color of leader lines are determined by flight status and do not change by color scheme.

Note: Color schemes are the same as those used in the map.

Note: Flights designated as an emergency are always shown in red.

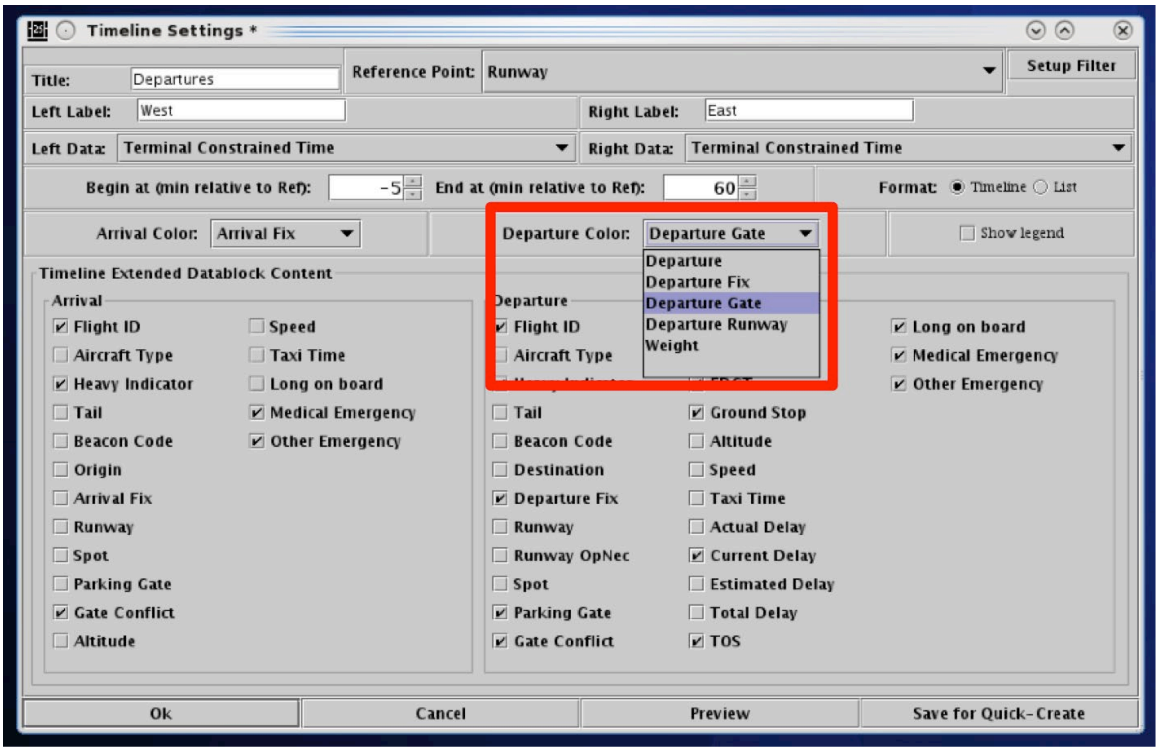


Figure 6.23. Timeline Settings: Departure Color Schemes.

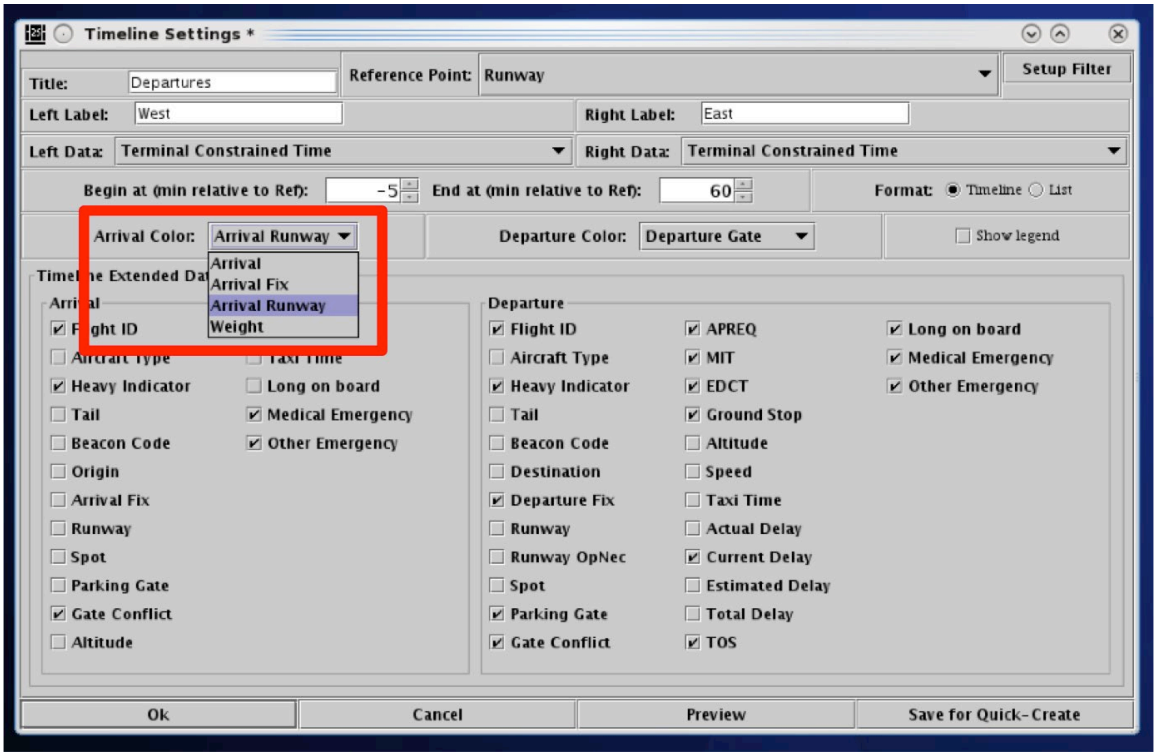


Figure 6.24. Timeline Settings: Arrival Color Schemes.

6.6.8 Legend

The interactive timeline legend displays the color coding for the selected color scheme (e.g., Arrival/Departure, Departure Fix, Departure Gate, Departure Runway, Runway, and Weight) and allows the user to control which categories are displayed on the timeline.

To Show/Hide the Timeline Legend:

Step 1: In the Timeline Settings window, check the box next to "Legend" to display the legend at the bottom of the timeline window (Figure 6.25).

Alternatively: Uncheck the box to hide the legend.

Step 2: Select "Ok" to apply the change or "Preview" to preview the legend on the timeline.

Note: Colors displayed in the legend are determined by the selected arrival/departure color schemes. Colors are pre-assigned and cannot be changed.

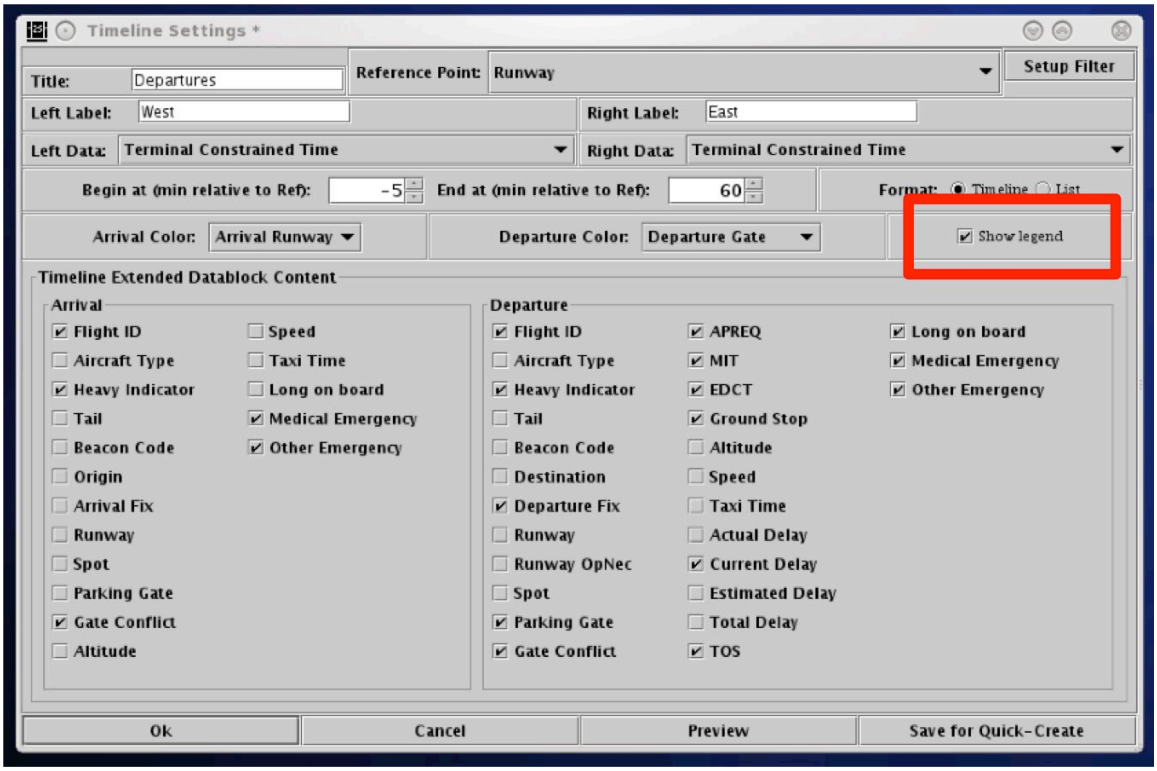


Figure 6.25. Timeline Settings window: Show legend.

To Select/Deselect categories in the Legend:

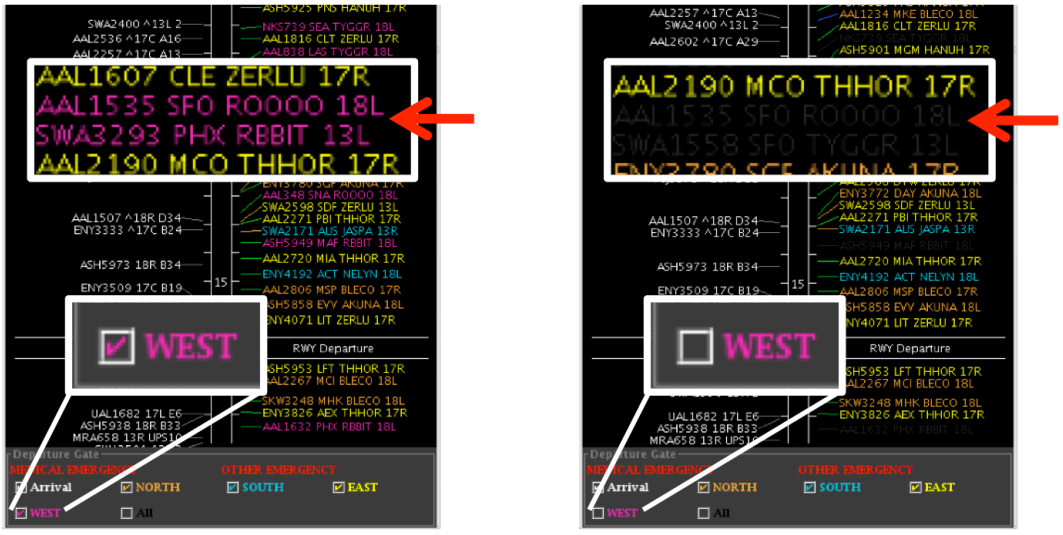
Step 1: In the Timeline legend, uncheck a category (e.g., "West" Departure Gate in Figure 6.26, right) to remove flights in that category from the timeline.

Note: The datablocks of flights in the deselected category appear grayed-out in timeline (e.g., Figure 6.26 right).

Step 2: Recheck the box to show those datablocks in the timeline again.

Alternatively: To re-select all categories in the legend at once, select the "All" checkbox (Figure 6.27).

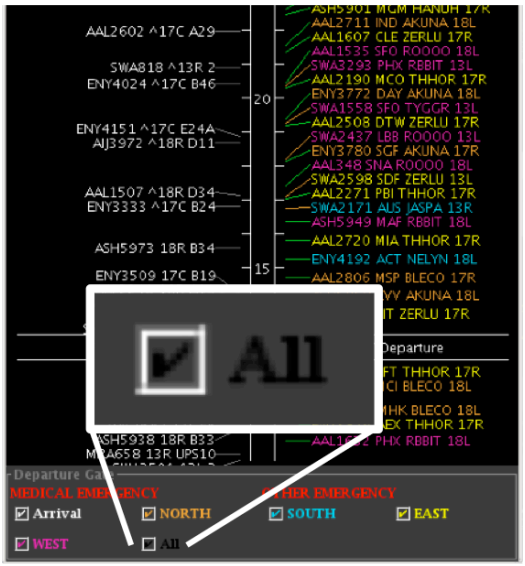
Note: "Emergency" flights cannot be deselected in the Legend.



"West" Departure Gate *Selected*

"West" Departure Gate *Unselected*
(West-Gate flights grayed-out)

Figure 6.26. Timeline Legend (deselect/select a category in the Timeline legend).



"All" *Selected*

Figure 6.27. Timeline Legend (check "All" to re-select all legend categories).

6.6.9 Format

The Timeline can be displayed in either a timeline or list format. In the *timeline* format, datablocks are displayed on a timeline relative to the expected arrival time at the reference point (e.g., expected takeoff time at the Runway, Figure 6.29).

In the *list* format, datablocks are not listed relative to a timeline (Figure 6.29). Instead, flights are displayed in the order in which they are expected to reach the reference point without 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 Timeline/List format:

Step 1: In the Timeline Settings window, select the "Timeline" or "List" option in the "Format" field (Figure 6.28).

Step 2: Select "Ok" to apply the change or "Preview" to preview the changes.

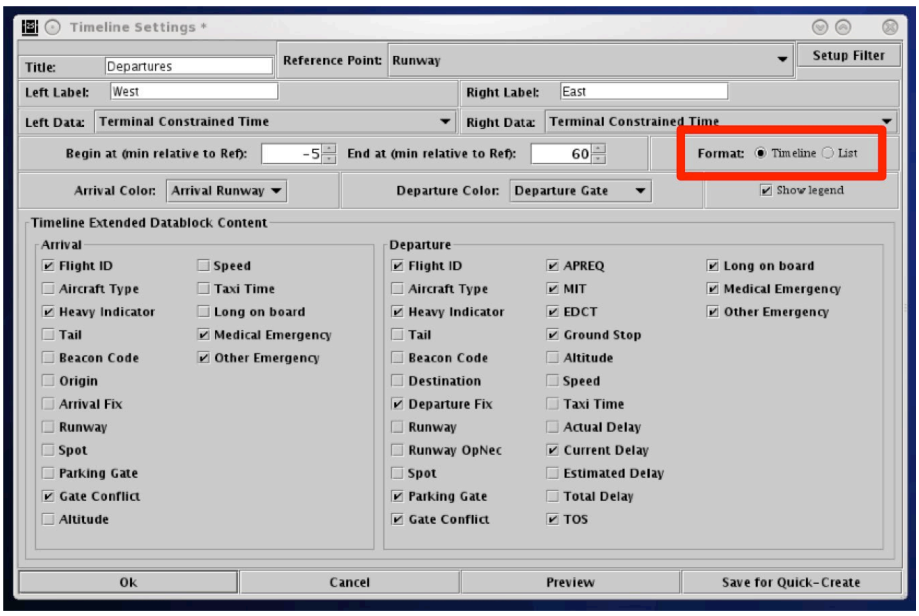


Figure 6.28. Timeline Settings window: Format.

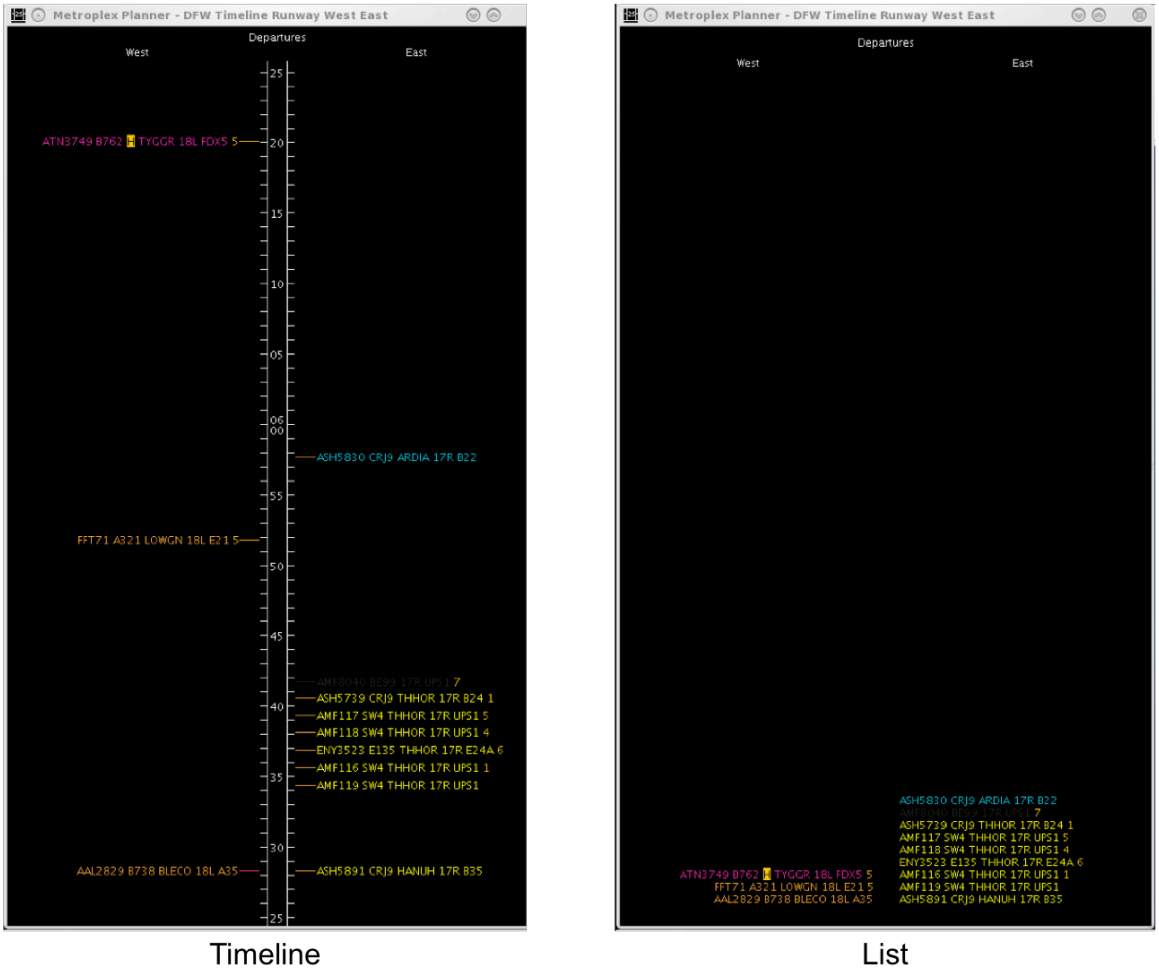


Figure 6.29. Timeline Settings window: Format.

6.6.10 Datablocks

The content of timeline datablocks can be configured by selecting/deselecting options in the Timeline Settings window menu. While departure and arrival datablocks can be configured independently of each another, the configuration for departure datablocks applies to all departure flights in that timeline, while the configuration for arrival datablocks applies to all arrival flights in that timeline. Each data element is described in Table 9.

To change the content of Timeline datablocks:

Step 1: In the Timeline Settings window, in the "Timeline Extended Datablock Content" selection menu, select items to include in Departure flight datablocks and items to include in Arrival flight datablocks (Figure 6.30).

Alternatively: Deselect items to exclude them from the Departure/Arrival datablocks.

Step 2: Select "Ok" to apply the change or "Preview" to preview the changes.

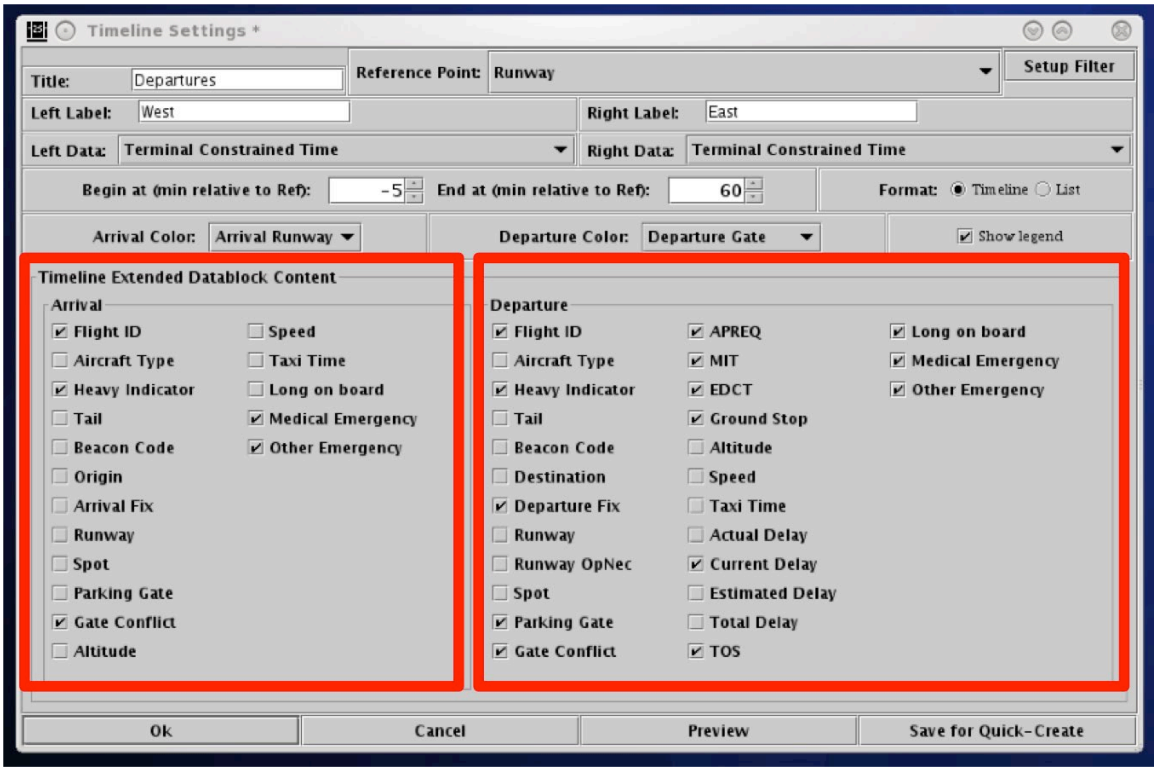
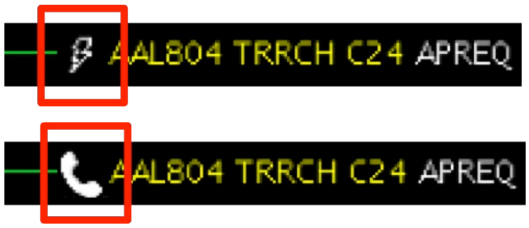


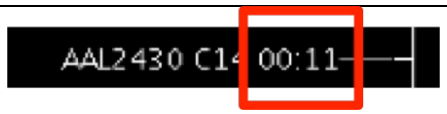
Figure 6.30. Timeline Settings window: Timeline Extended Datablock Content.

Table 9. Datablock Data Element Information

Datablock Data Element	Description of Display	Element Selectable for Arrivals, Departures, or Both
Flight ID	Flight ID/call sign (e.g., AAL123, SWA345)	Both
Aircraft Type	Aircraft type (e.g., A320, E135)	Both
Heavy Indicator	• 'Heavy' aircraft (e.g., B767) indicated by a black "H" highlighted in yellow. • 'Super Heavy' aircraft (e.g., A380) indicated by a black "S" highlighted in white. 	Both
Tail	Aircraft tail number	Both
Beacon Code	Aircraft beacon code	Both
Origin	3-letter origin airport code	Arrival
Destination	3-letter destination airport code	Departure
Arrival Fix	Assigned arrival fix	Arrival
Departure Fix	Assigned departure fix	Departure
Runway	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 Operational Necessity	"OpNec", in light green, when the runway has been changed for Operation Necessity. 	Departure
Spot	Assigned spot to leave (departures) or enter (arrivals) the Ramp area.	Both

Actual Delay	Actual delay for departure flight in the AMA. Actual delay is the amount of time (in minutes) a flight is later than its first computed UTOT (AD:*mm*). 	Departure
Parking Gate	Assigned gate. When the flight's gate is unknown, "UNK" is displayed.	Both
Gate Conflict	The parking gate is displayed in magenta when the flight has a gate conflict. 	Both
APREQ	Flights subject to an APREQ restriction: • Symbol to indicate the availability (or not) of electronic negotiations.  • "APREQ" before flights have a negotiated release time. • A release time once one is negotiated with compliance indicators (green, yellow, red). • Symbology during the negotiation process. 	Departure
MIT (Miles-In-Trail)	Flight is subject to a MIT restriction.	Departure

EDCT	EDCT release time, color coded to indicate predicted compliance. 	Departure
Ground Stop	"GS" displayed when flight is subject to a Ground Stop. 	Departure
Spot Sequence	A departure flight's sequence at a Ramp departure spot. For example, if a flight is currently 3rd in line to exit at a spot, a "3" is displayed. The sequence number will continue to update until the flight enters the AMA. Upon entering the AMA, the Spot Sequence number is removed.	Departure
Altitude	Altitude in units of feet / 100. 	Both
Speed	Flight's speed in nautical miles (*nmi*), after takeoff. 	Both
Taxi Time	**<u>Taxi Time display for Arrivals:</u>** • **Not yet landed:** No Taxi Time value. • **Landed:** Elapsed time from Actual ON to "Now" time (E*hh:mm)*. • **Once at the gate:** Elapsed time from Actual ON to Actual IN (*hh:mm*).	Both

	 **Taxi Time display for Departures:** • **Still in the Ramp:** No Taxi Time value. • **In the AMA:** Elapsed time from Actual SPOT to "now" time (E*hh:mm*). • **Already Wheels-Up (OFF):** Elapsed time from Actual SPOT to Actual OFF (*hh:mm*). 	
Current Delay	 	Departure
Estimated Delay	 	Departure
Total Delay	 	Departure
Long on Board (LOB)	LOB indicator (yellow, orange, or red disc). • For **arrivals**, the LOB timer starts at touchdown and is continuously computed as the current time minus the Actual Landing Time (ALDT) until the arrival is in the gate. • For **departures**, the LOB timer starts at pushback and is continuously computed as the Actual Off-Block Time (AOBT) minus the current time until the departure takes off. 	Both
Medical Emergency	Flight designated as a *medical* emergency is displayed in red with a red "+" symbol highlighted in white.	Both

General (non-medical) Emergency	Flight designated as an emergency is displayed in red with a red "!" symbol highlighted in white.	Both

6.7 Timeline: Expect Departure Clearance Time (EDCT)

EDCT times are indicated in timeline datablocks. Color coding is used to indicate predicted compliance (Table 10).

Table 10. Compliance Indicator Color Information

Compliance Indicator Color	Description
Green	Flight is projected to be released from the runway ***in compliance*** with its +/- 5 minute EDCT window.
Yellow	Flight is projected to be released from the runway ***earlier*** than its +/- 5 minute EDCT window.
Red	Flight is projected to be released from the runway ***later*** than its +/- 5 minute EDCT window.

Select an EDCT flight on the timeline to view the flight's predicted takeoff time relative to the EDCT's +/- 5 minute compliance window outlined in yellow (Figure 6.31).

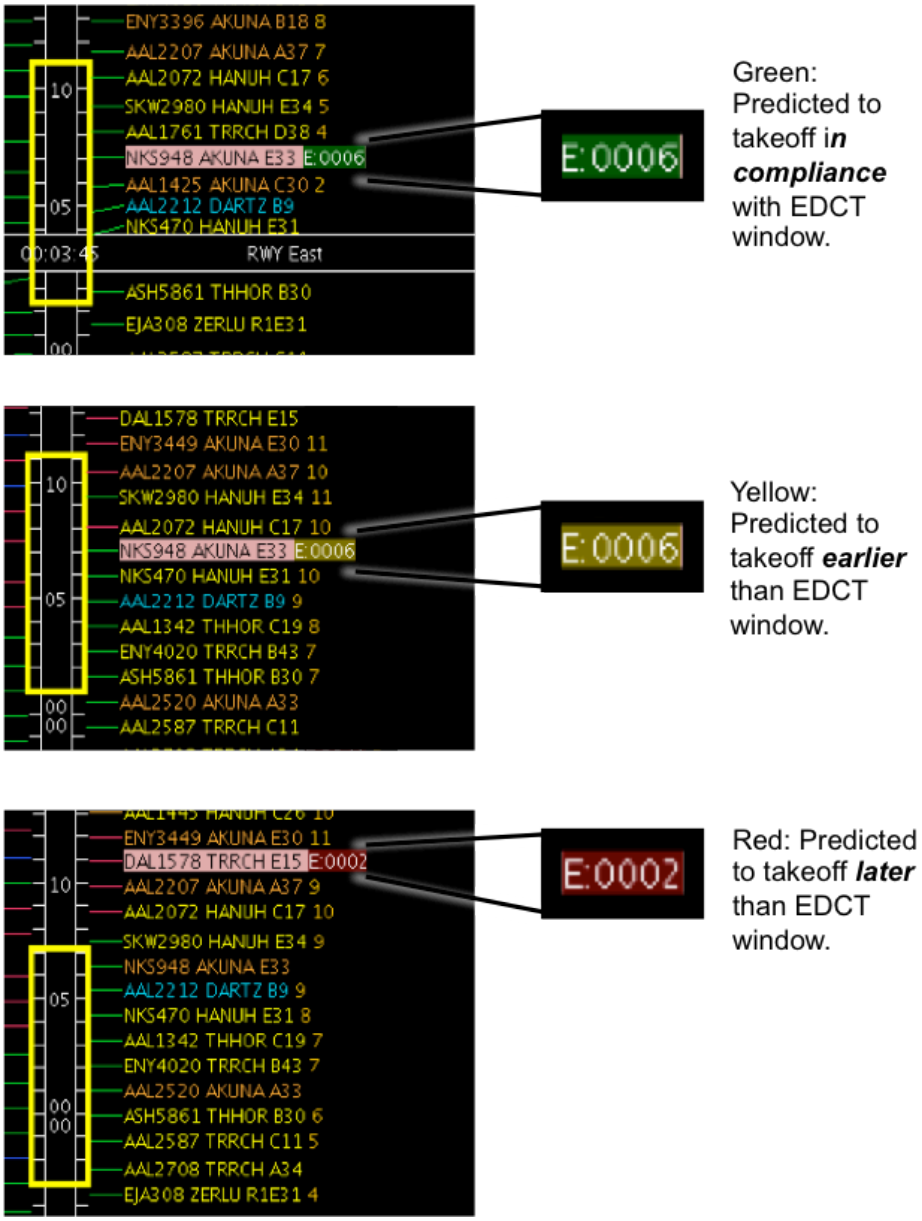


Figure 6.31. Timeline: EDCT compliance indicators (green, yellow, or red). Yellow time window on timeline represents +/- 5 min compliance window around EDCT.

7 STBO Client: Right-Click Menu

As shown in Figure 7.1, a right-click menu is available for flights on the:

- Timeline
- Map
- Flights Table

Options presented on the right-click menu vary by type of flight (arrival vs. departure) and flight status (e.g., at the gate vs. taxiing in the AMA vs. after takeoff).

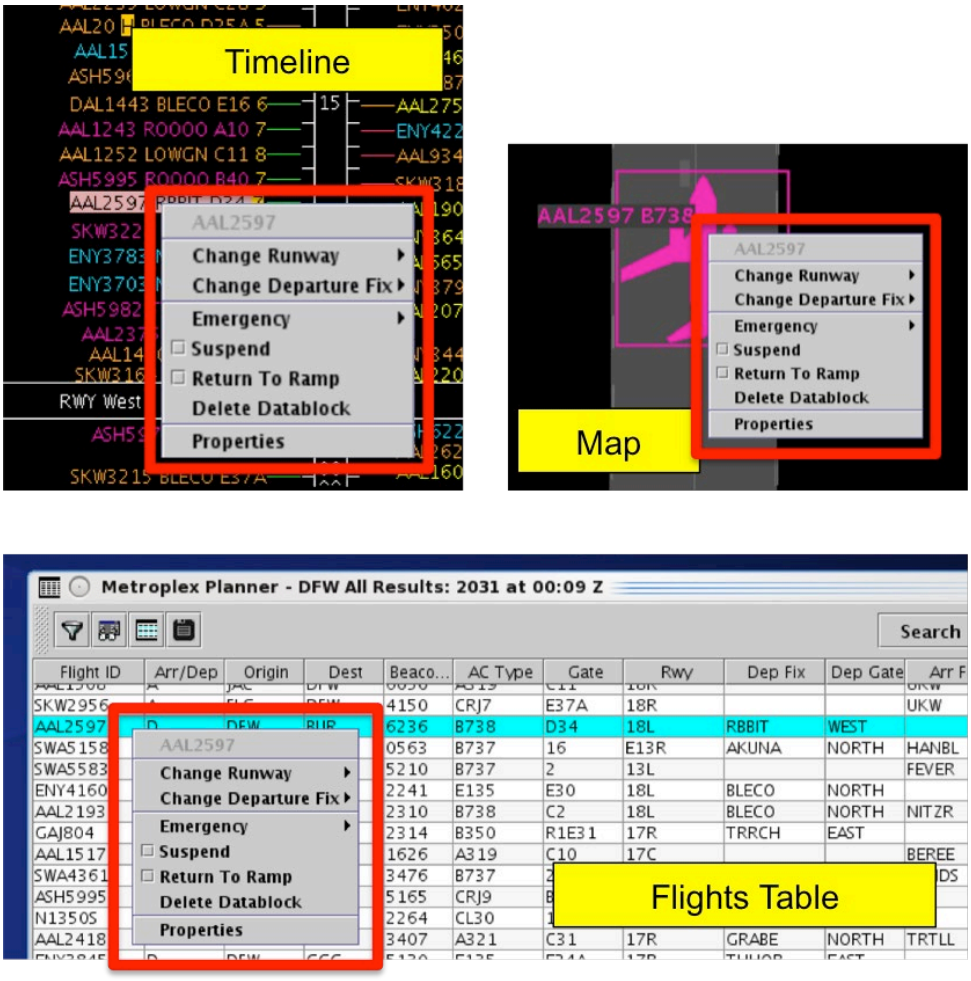


Figure 7.1. Departure flight right-click menu: Timeline, Map, and Flights Table.

7.1 Right-Click Menu: Flight-Specific Actions

A flight's right-click menu provides access to flight-specific information and actions. Some options also can be executed for multiple flights at once.

7.1.1 Runway Change

Use the right-click menu to change the runway for a single flight or a group of flights. The "Change Runway" option is available for departure flights before takeoff and for arrivals before touchdown.

To change the Runway for an individual:

Step 1: Right-click on:

- a flight's timeline datablock
- a flight's icon on the map
- a flight's row in the Flights Table

Step 2: Select "Change Runway".

Step 3: Select a runway from the menu. The current runway is grayed-out (e.g., "17R" in Figure 7.2).

Note: When the new runway is selected, a confirmation message is momentarily displayed in the upper left of the map.

Note: Depending on the timeline setup, the flight's datablock may be moved to a different timeline column to reflect the runway change. The timeline datablock is also updated with the new runway.

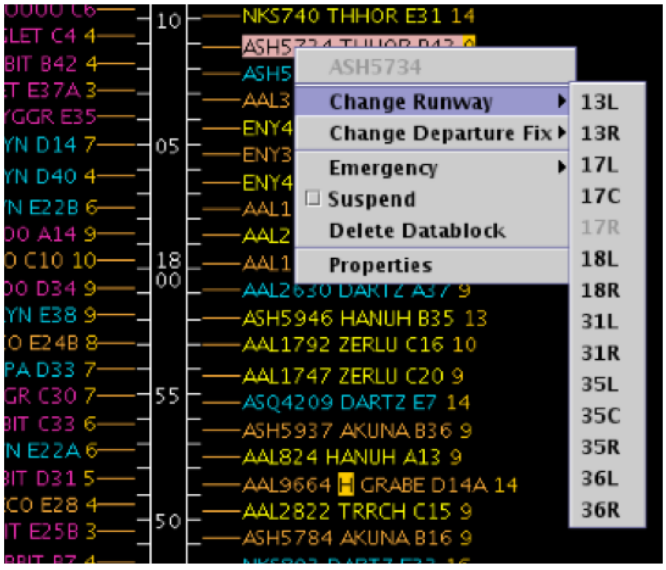


Figure 7.2. Right-click to change the runway assignment for a flight.

Runway changes for multiple flights can be done as a group. While the selected flights may currently be assigned to different runways, they must all be re-assigned to the same runway.

To change the Runway for multiple flights:

Step 1: Right-click on:

- a flight's timeline datablock
- a flight's icon on the map
- a flight's row in the Flights Table

Step 2: Select *multiple* flights by holding the "Shift" key on the keyboard and left-clicking on each target flight in the timeline, map, or Flights Table. Flights with the same, or different runway assignments, may be selected at the same time.

Step 3: Select "Change Runway".

Step 4: Select a new runway assignment from the right-click menu (Figure 7.3).

Note: A "Flight Action Confirmation Panel" is shown to confirm to the selected flights and new runway selection (Figure 7.4).

Step 5: Select "Apply" to confirm the runway change for the selected flights.

Alternatively: Select "Cancel" to keep the original runway assignment(s).

Note: Depending on the timeline setup, the flight's datablock may be moved to a different timeline column to reflect the runway change. The timeline datablock is also updated with the new runway.

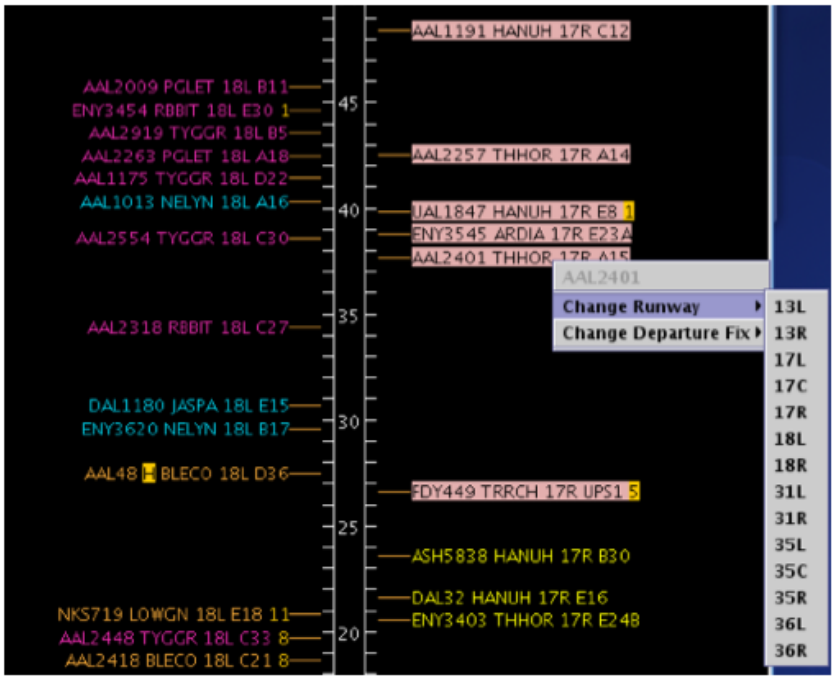
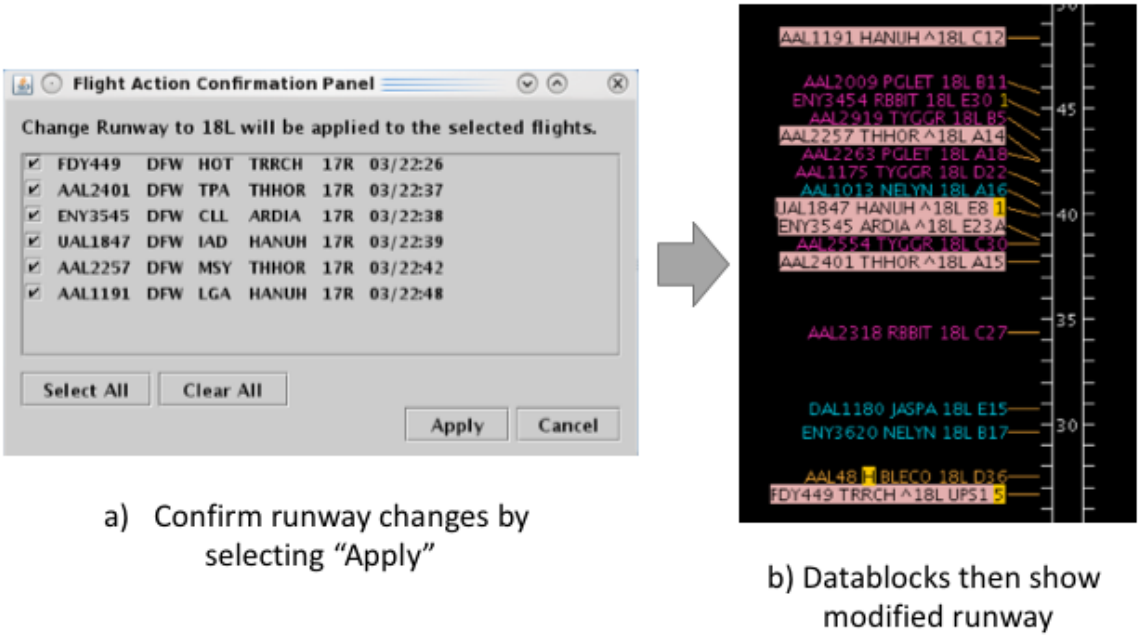


Figure 7.3. Right-Click Menu: Runway change for multiple flights.



a) Confirm runway changes by selecting "Apply"

b) Datablocks then show modified runway

Figure 7.4. Flight Action Confirmation panel for multiple flights. Timeline datablocks updated to reflect runway change.

7.1.2 Departure Fix Change

Use the right-click menu to change the departure fix for a single departure flight or a group of departure flights.

To change the Departure Fix for an individual flight:

Step 1: Right-click on:

- a flight's timeline datablock
- a flight's icon on the map
- a flight's row in the Flights Table

Step 2: Select "Change Departure Fix"

Step 3: Select a departure fix from the menu. The current departure fix is grayed-out (e.g., "DARTZ" in Figure 7.5).

Step 4: The flight's Timeline datablock and Flights Table will automatically update with the new departure fix assignment.

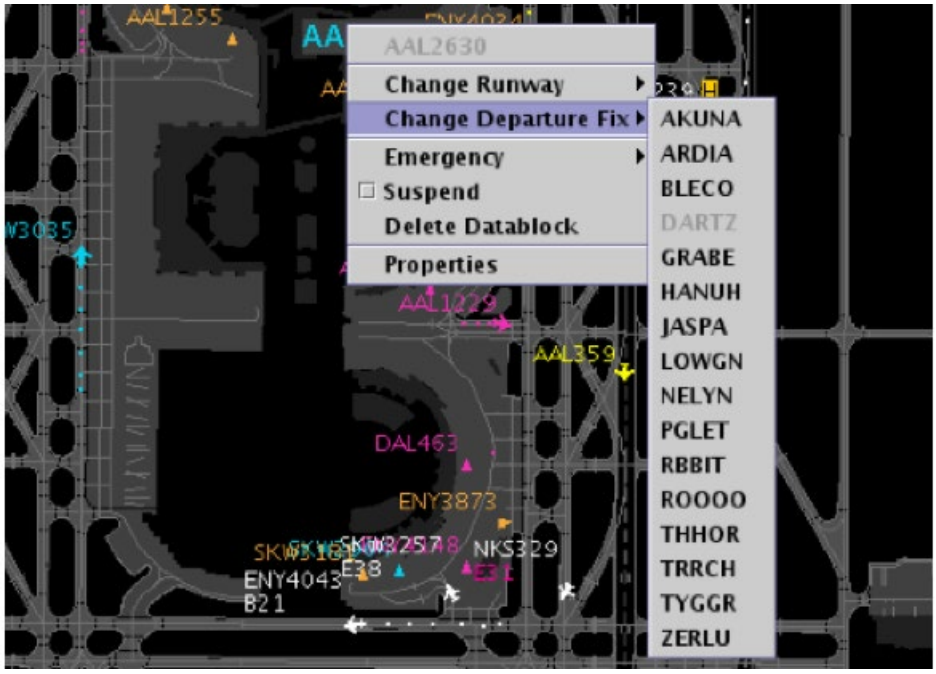


Figure 7.5. Right-Click Menu: Change Departure Fix.

Departure fix changes for multiple flights can be done as a group. While the selected flights may currently be assigned to different departure fixes, they must all be re-assigned to the same departure fix.

To change the Departure Fix for multiple flights:

Step 1: Right-click on:

- a flight's timeline datablock
- a flight's icon on the map
- a flight's row in the Flights Table

Step 2: Select *multiple* flights by holding the "Shift" key on the keyboard and left-clicking on each flight datablock, flight icon, or table row.

Step 3: Select "Change Departure Fix".

Step 4: Select a departure fix from the menu (Figure 7.6).

Note: A "Flight Action Confirmation Panel" is shown to confirm to the selected flights and new Departure Fix selection (Figure 7.7).

Step 5: Select "Apply" to confirm the selected departure fix for all the flights in the panel, or "Cancel" to keep the originally designated fixes.

Note: The flights' timeline datablocks will automatically update with the new departure fix assignment.

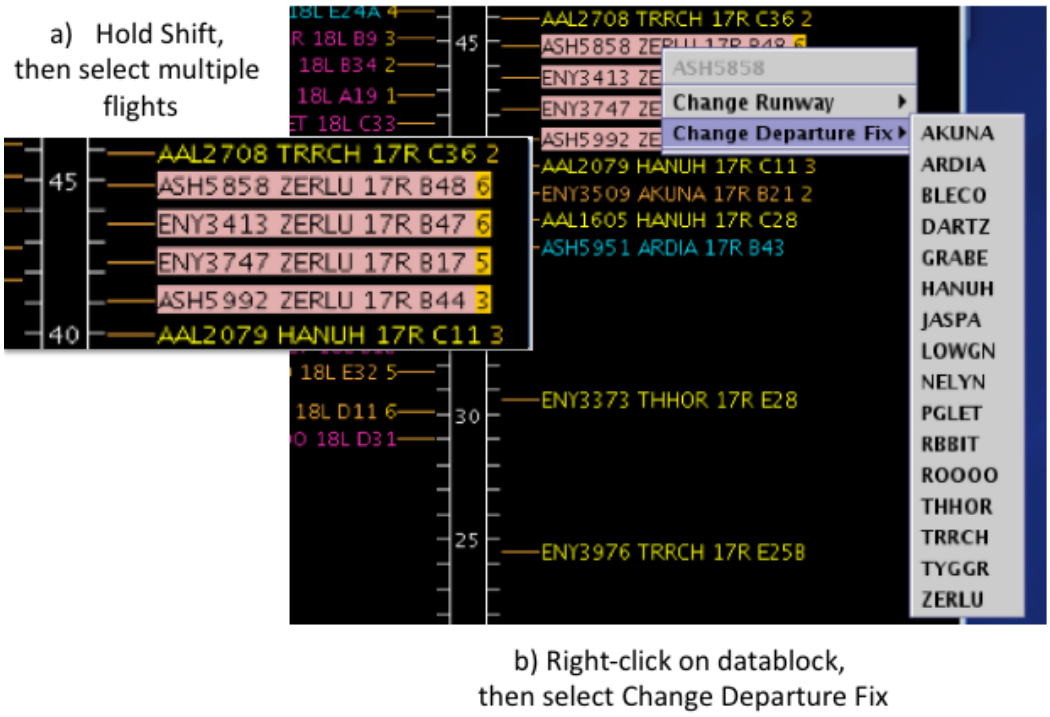


Figure 7.6. Right-Click Menu: Change Departure Fix for multiple flights.

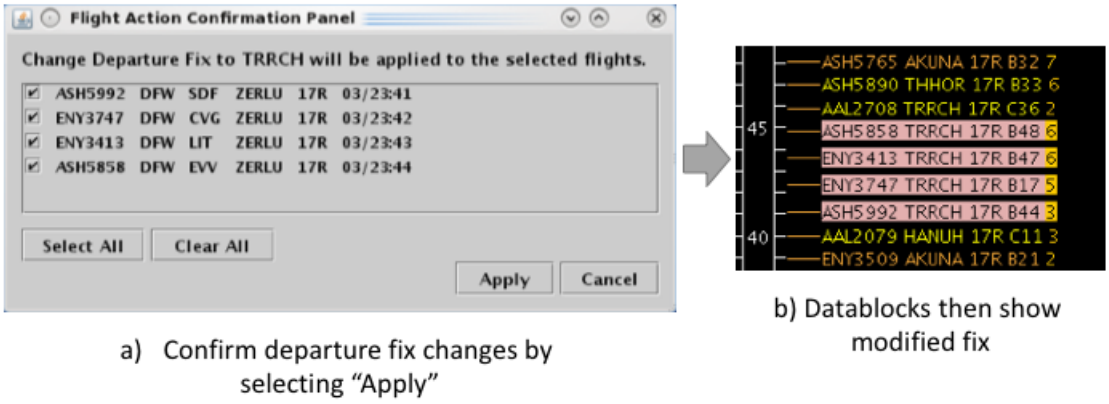


Figure 7.7. Flight Action Confirmation panel for multiple flights. Timeline datablocks updated to reflect Departure Fix change.

7.1.3 Parking Gate Change

Use the right-click menu to change parking gate assignment for arrival flights.

To change the Parking Gate for an Arrival flight:

***Step 1*:** Right-click on:

- a flight's timeline datablock
- a flight's icon on the map
- a flight's row in the Flights Table

***Step 2*:** Select "Change Parking Gate" (Figure 7.8).

***Step 3*:** In the "Change Parking Gate" window, enter the new parking gate.

***Step 4*:** Select "OK" to apply the change.

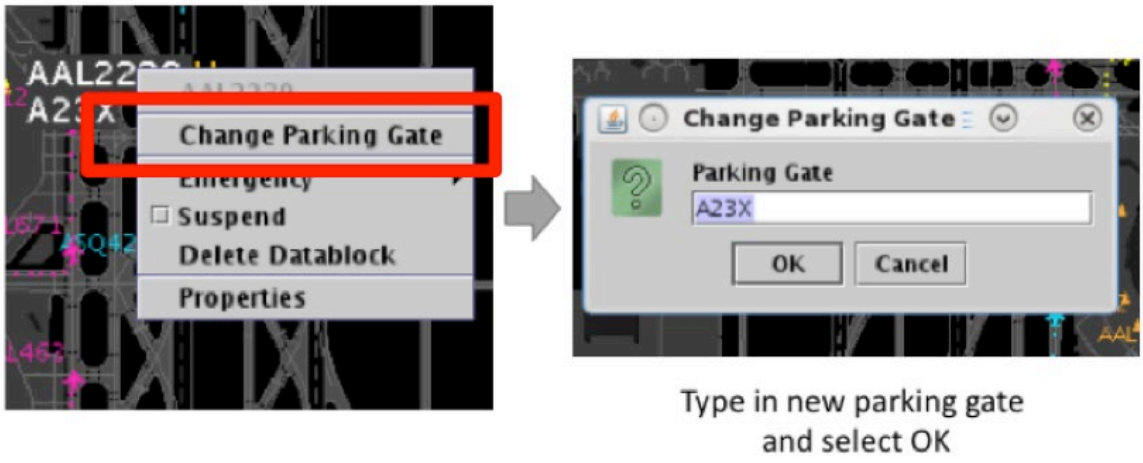


Figure 7.8. Right-Click Menu: Change Parking Gate.

7.1.4 Emergency Status

Use the right-click menu to change *medical* or *general* emergency status for a flight.

To set the emergency status:

***Step 1*:** Right-click on:

- a flight's timeline datablock
- a flight's icon on the map
- a flight's row in the Flights Table

Step 2: Select "Emergency" from the right-click menu (Figure 7.9).

Step 3: Select the type of Emergency:

- For a medical emergency, select: "*Set as Medical*"
- For a general (non-medical) emergency, select: "*Set as Emergency*"

Step 4: At the "Set [call sign] as Emergency?" prompt, select "Yes".

Alternatively: Select "No" to cancel the emergency status.

Note: If "Yes" is selected, the flight's timeline datablock and Flights Table will automatically update with the new emergency setting.

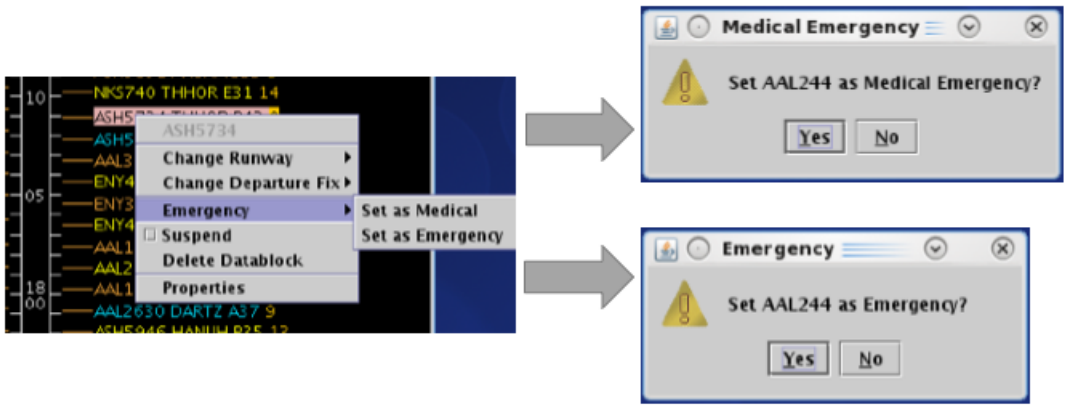


Figure 7.9. Emergency status.

7.1.5 Suspend

Use the right-click menu to "Suspend" a departure flight. The "Suspend Flight" option can be used when a departure flight is temporarily delayed (e.g., mechanical issue), but not permanently cancelled. The purpose of suspending a flight is to provide a visual cue on the map and a reminder of a delay. It is also to inform the ATD-2 scheduling system that the flight should be removed from the scheduling cycle.

To Suspend a flight:

***Step 1*:** Right-click on:

- a flight's timeline datablock
- a flight's icon on the map
- a flight's row in the Flights Table

***Step 2*:** Select the "Suspend" checkbox on the right-click menu (Figure 7.10).

Note: The flight is removed from the timeline, but continues to be depicted on the map with "SUSPENDED" in the datablock (Figure 7.11).

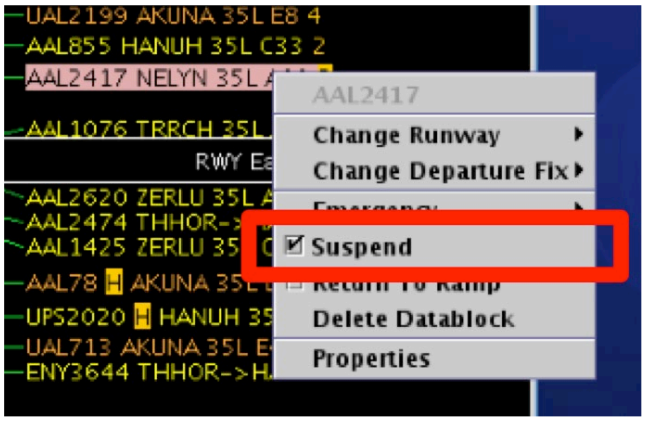


Figure 7.10. Right-Click Menu: Suspend.

Figure 7.11. "Suspended" indicated the flight icon datablock on map.

7.1.6 Return to Ramp

Use the right-click menu to return a departure flight to the ramp. The "Return to Ramp" option can be used when a departure flight needs to return to the ramp area because of a malfunction or some other problem with the flight. Information about the flight's status, predicted schedule, and advisories are cleared from the ATD-2 scheduler.

To return a Flight to the Ramp:

***Step 1*:** Right-click on:

- a flight's timeline datablock
- a flight's icon on the map
- a flight's row in the Flights Table

***Step 2*:** Select the "Return To Ramp" checkbox on the right-click menu (Figure 7.12).

Note: The flight is removed from the timeline, but continues to be depicted on the map.

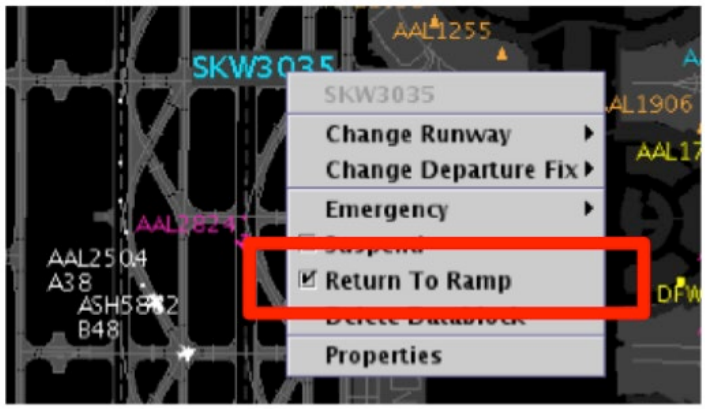


Figure 7.12. Right-Click Menu: Return to Ramp.

7.1.7 Delete a Flight Datablock

Use the right-click menu to delete a flight's timeline datablock and flight icon on the map. In the event that a flight needs to be removed from the ATD-2 system, the flight's timeline datablock and flight icon on the map can be deleted. However, deleting the flight datablock and icon does *not* remove the flight from the ATD-2 system completely. That is, the flight will still be visible on the Flights Table.

To Delete a datablock from the Map and Timeline:

***Step 1*:** Right-click on:

- a flight's timeline datablock
- a flight's icon on the map
- a flight's row in the Flights Table

***Step 2*:** Select "Delete Datablock" from the menu (Figure 7.13).

***Step 3*:** At the confirmation prompt, select "Yes" to complete the deletion of the flight's timeline datablock and flight icon on the map (Figure 7.13).

Alternatively: Select "No" to cancel the deletion.

Note: After the flight datablock is deleted, the flight information will still be available in the Flights Table, however the action to delete the timeline datablock and map icon cannot be undone.

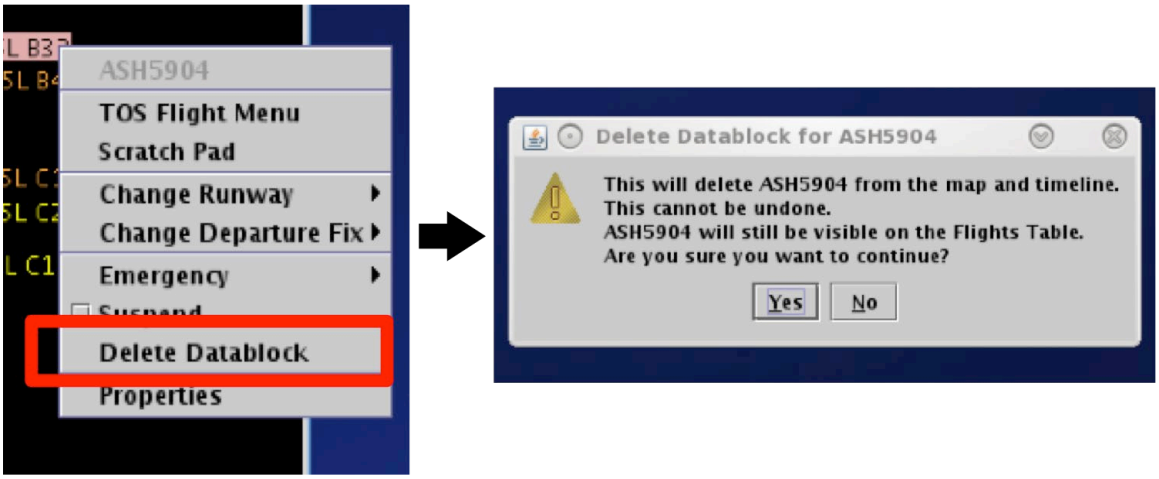


Figure 7.13. Right-click Menu: Delete Datablock confirmation prompt.

7.1.8 Flight Properties

The Flight Properties window can be accessed from the right-click menu. Each piece of information included in the Flight Properties window is described in Table 11.

To view the Flight Properties window:

Step 1: Right-click on:

- a flight's timeline datablock
- a flight's icon on the map
- a flight's row in the Flights Table

Step 2: Select "Properties" to open the Flight Properties window (Figure 7.14).

Step 3: Select "OK" or "Cancel" to close the Flight Properties window.

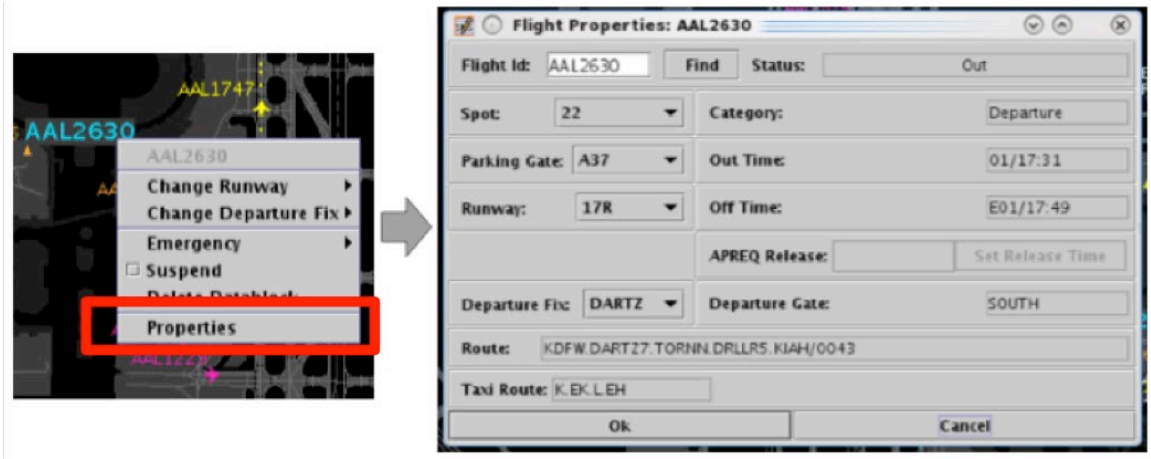


Figure 7.14. Right-Click Menu: Flight Properties window.

Table 11. Flight Property Information

Flight Property	Description
Flight ID	The flight number of any aircraft, For general aviation flights tail number is used.
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 en route 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 • – An arrival aircraft has not been tracked by • **Scheduled_Out** – A departure aircraft has not pushed back • **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
Spot	The spot number expected for transition to/from AMA.
Parking Gate	Assigned/actual gate for the flight.
Runway	Runway assignment.
Category	Arrival or departure.
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.
APREQ Release	For flights with APREQ restriction, the APREQ release time.
Departure Fix	Assigned/actual departure fix for a flight (departures only).
Departure Gate	Assigned/actual departure gate for a flight (departures only).
Route	Filed route reported by FAA system.
Taxi Route	The remaining route for taxiing across the AMA.

The “Find” function in the Flight Properties window can be used to highlight a flight in the timeline, map, and Flights Table.

To find a flight using the Flight Properties window:

***Step 1*:** Right-click on:

- a flight's timeline datablock
- a flight's icon on the map
- a flight's row in the Flights Table

***Step 2*:** Select "Properties" to open the Flight Properties window (Figure 7.14).

Step 3: Select "Find" in the Flight Properties window (Figure 7.15).

Step 4: The flight will be highlighted on the timeline, map, and in the Flights Table (Figure 7.16).

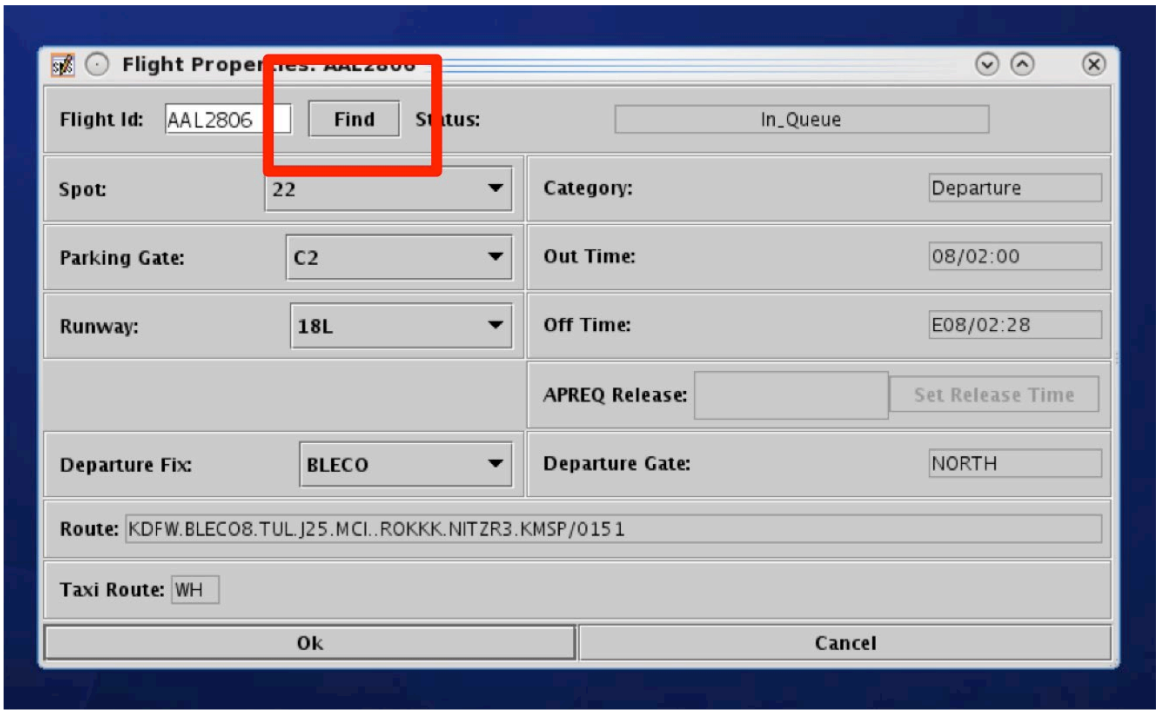


Figure 7.15. Flight Properties: Find flight function.

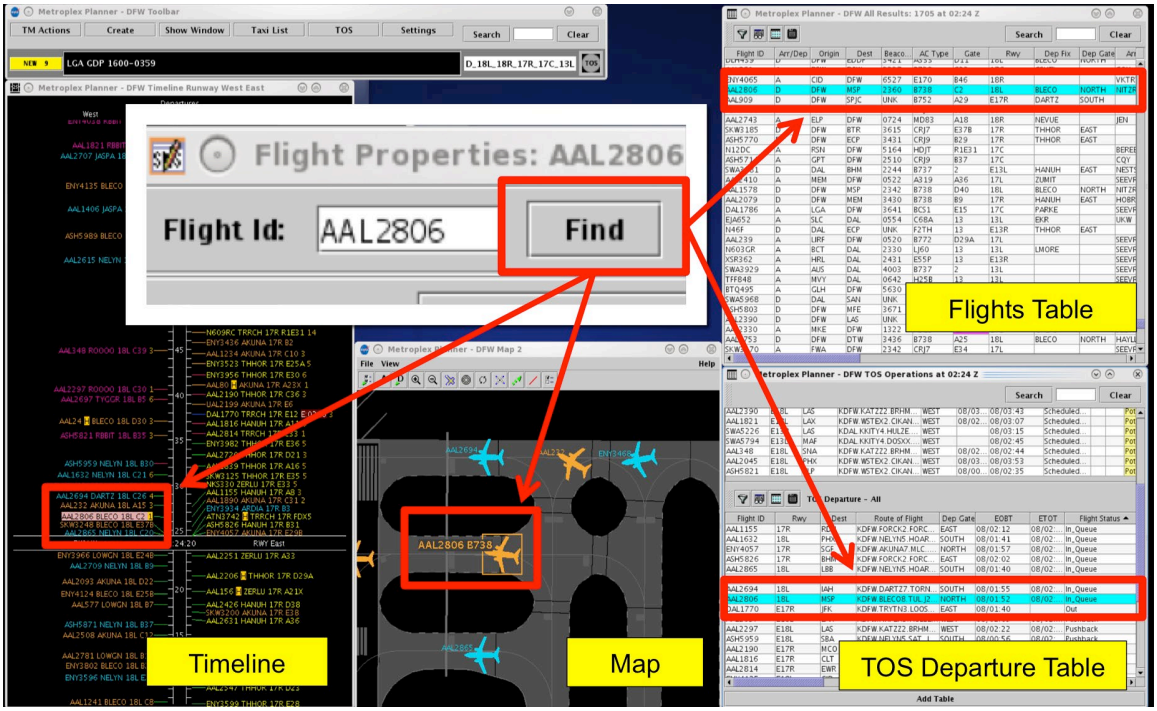


Figure 7.16. Flight Properties: Find function.

The Flight Properties window can also be used to change a flight's:

- Spot
- Parking Gate
- Runway
- Departure Fix

Use the dropdown list in each field to select the new spot, parking gate, runway, or departure fix.

7.1.9 Exclude from Fix Closure

When a flight is subject to a Departure Fix Closure restriction (e.g., Departure Fix "TRRCH" is closed in Figure 7.17), use the right-click menu to *exclude* the flight from the Departure Fix Closure.

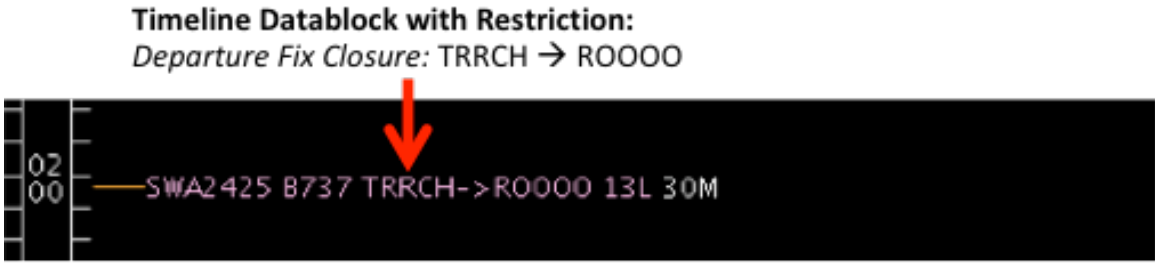


Figure 7.17. Timeline Datablock with Departure Fix Closure.

To exclude a flight from a Departure Fix Closure:

***Step 1*:** On a flight subject to a Departure Fix Closures, right-click on:

- a flight's timeline datablock
- a flight's icon on the map
- a flight's row in the Flights Table

***Step 2*:** Select "Exclude from Fix Closure" from the right-click menu (**Error! Reference source not found.**).

Note: The timeline datablock is updated to reflect the exclusion. That is, the closure is no longer indicated and is replaced with the original Departure Fix (e.g., TRRCH in Figure 7.18).

Note: If the selected color scheme of the timeline or map is fix-dependent, the color of the datablock or flight icon may change accordingly (e.g., yellow in Figure 7.18).

Alternatively: Select "Undo Exclude from Fix Closure" to reapply the Departure Fix Closure restriction.

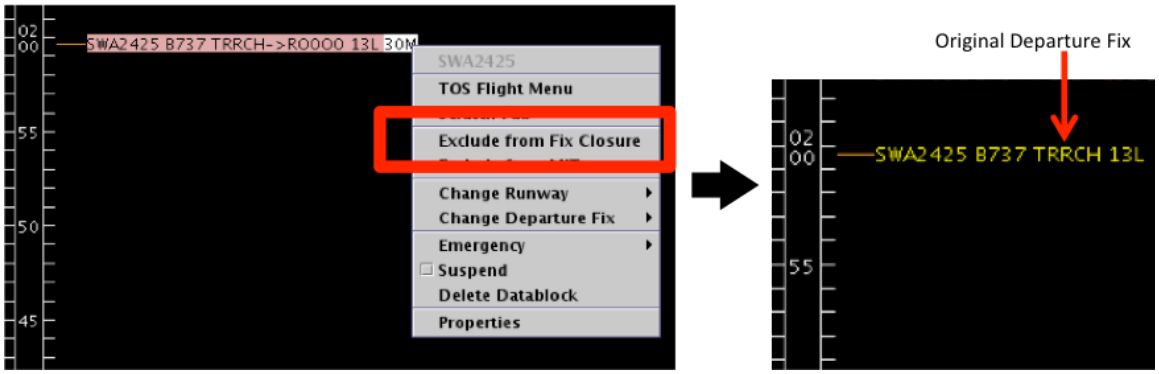


Figure 7.18. Right-Click Menu: Exclude from Fix Closure.

7.1.10 Exclude from MIT

When a flight is subject to a Miles-in-Trail restriction (e.g., Departure Fix "ROOOO" is subject to a 30-mile MIT restriction in Figure 7.19), use the right-click menu to *exclude* the flight from the MIT restriction.

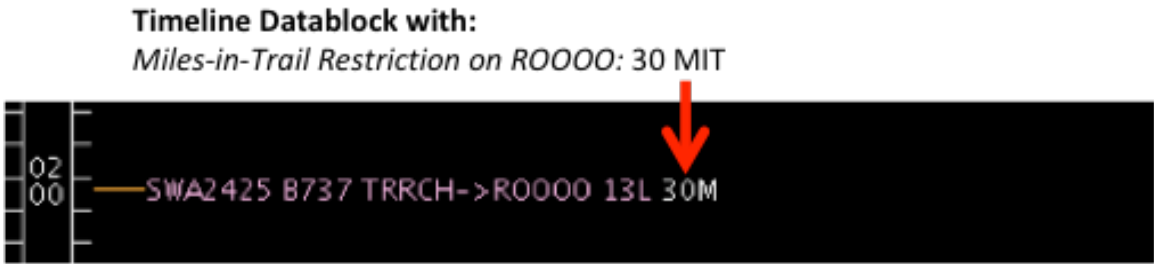


Figure 7.19. Timeline Datablock with Miles-in-Trail (MIT) Restriction.

To exclude a flight from a Miles-in-Trail (MIT) restriction:

***Step 1*:** On a flight subject to a MIT restriction, right-click on:

- a flight's timeline datablock
- a flight's icon on the map
- a flight's row in the Flights Table

***Step 2*:** Select "Exclude from MIT" from the right-click menu (Figure 7.20).

Note: The timeline datablock is updated to reflect the exclusion. That is, the MIT restriction is no longer indicated (e.g., "30M" in Figure 7.20).

Alternatively: Select "Undo Exclude from MIT" to reapply the Miles-in-Trail (MIT) restriction.

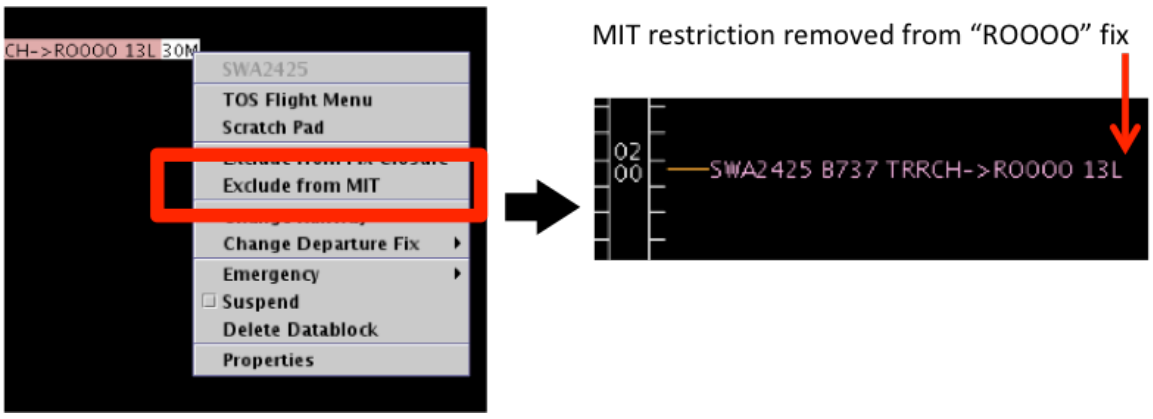


Figure 7.20. Right-Click Menu: Exclude from MIT.

7.2 Right-Click Menu: APREQ

Options for negotiating APREQs are available on a flight's right-click menu.

7.2.1 Schedule Configuration Change

Use the right-click menu to schedule an airport configuration change. Using the right-click menu will pre-populate a "Start at" time for the configuration change based on the flight's current location on the timeline.

To schedule an Airport Configuration change:

Step 1: When a flight is subject to an APREQ, right-click on:

- a flight's timeline datablock
- a flight's icon on the map
- a flight's row in the Flights Table

Step 2: Select "Schedule Config Change" from the right-click menu (Figure 7.21) to open the "Runway Utilization" tab in the TM Actions panel (Figure 7.22).

Step 3: Select an airport configuration from the "Configuration" dropdown menu (Figure 7.23).

Note: Configuration options vary by airport.

Step 4: Select the "Add" button.

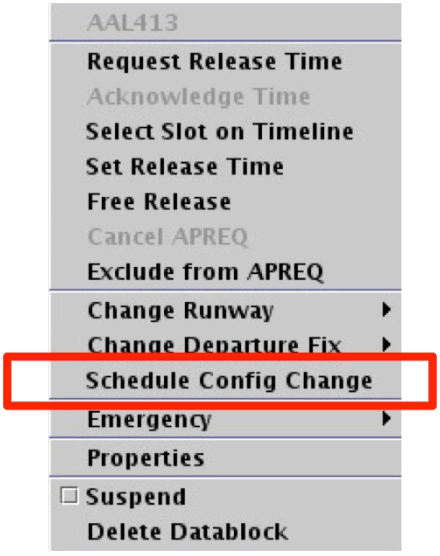


Figure 7.21. Right-Click Menu: Schedule (Airport) Configuration Change.

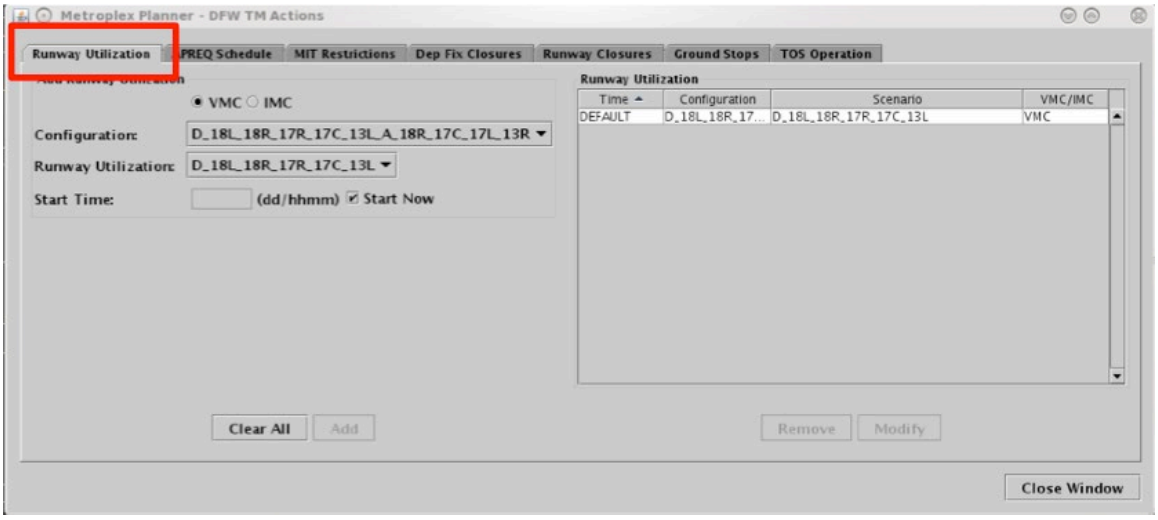


Figure 7.22. TM Actions panel: Runway Utilization tab.

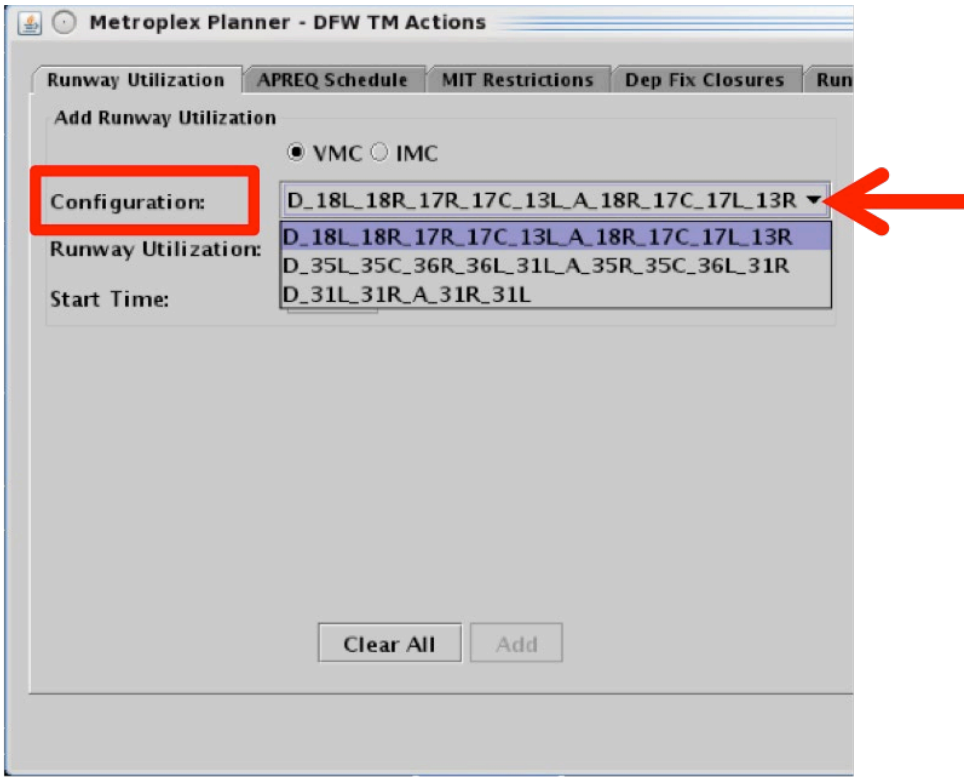


Figure 7.23. Runway Utilization tab: Airport Configuration.

7.2.2 Exclude from APREQ

Use the right-click menu to exclude a flight from an APREQ restriction.

To exclude a single flight from a TMI:

Step 1: When a flight is subject to an APREQ, right-click on:

- a flight's timeline datablock
- a flight's icon on the map
- a flight's row in the Flights Table

Step 2: Select "Exclude from APREQ" (Figure 7.24).

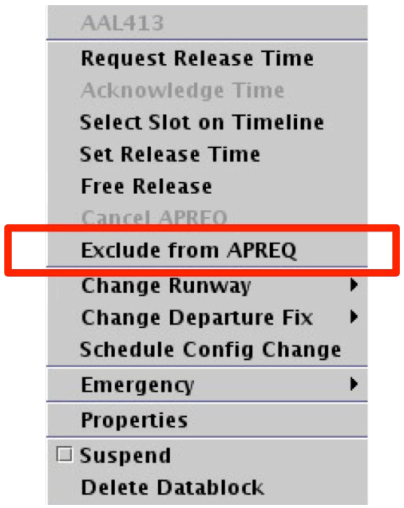


Figure 7.24. Right-Click Menu: Exclude from APREQ.

Once the flight is excluded from the TMI, the flight's timeline datablocks and row in the Flights Table will return to the state of a non-TMI flight.

8 STBO Client: APREQ Procedures

This section describes procedures for APREQs in the STBO Client. It assumes that APREQs have been received through SWIM or manually entered in the TM Actions window. If an APREQ restriction is scheduled, e.g. APREQ for flights to EWR, then 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 8.1). APREQ aircraft will also be identifiable on the Flights Table (Figure 8.2) and the Map (Figure 8.3). All right-click actions for APREQ flights are available on the timelines, tables, and maps.

Figure 8.1. APREQ flight on Timeline.

Flight ID	Dest	Dep Fix	APREQ
ENY3799	CHO	KRITR	
ENY3748	CLT		
AAL838	EWR	KILNS	APREQ
JIA5393	CLT		

Figure 8.2. APREQ flight on Flights Table.

Figure 8.3. APREQ flight on the map.

If an APREQ flight also has an EDCT, the timeline provides situational awareness information about the EDCT compliance window for the flight (Figure 8.4). A yellow

rectangle is drawn on the Timeline that outlines the EDCT compliance window to offer decision support when requesting an APREQ release time. The yellow rectangle is only drawn on the timeline when the flight's datablock is selected.

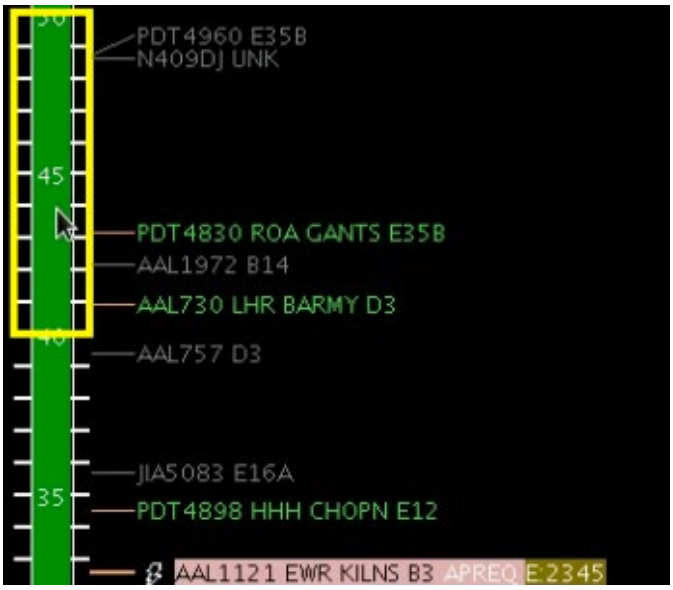


Figure 8.4. EDCT compliance window displayed for an APREQ flight that also has an EDCT.

8.1 Electronic APREQ Coordination

When a "lightning bolt" symbol is shown to the left of the call sign on the timeline datablock (Figure 8.5), electronic coordination of an APREQ release time is available for the flight.

Figure 8.5 APREQ flight capable of electronic coordination of release time.

For APREQ flights that are capable of electronic coordination, the slots in the overhead stream that are available for the flight are displayed on the Timeline (Figure 8.6). Available slots in the overhead stream are shown in green; occupied/unavailable slots are shown in red. The flight's Timeline datablock must be selected in order to display the slots. All available slots displayed are specific to the selected flight. The STBO Client will only read available slots from TBFM for a range of 15 minutes before to 30 minutes after the flight's current position on the Timeline. For example, if a flight's TTOT is 1933, the STBO Client will probe TBFM for slot availability from 1918 to 2003. Any available slots outside of that time range will not be displayed.

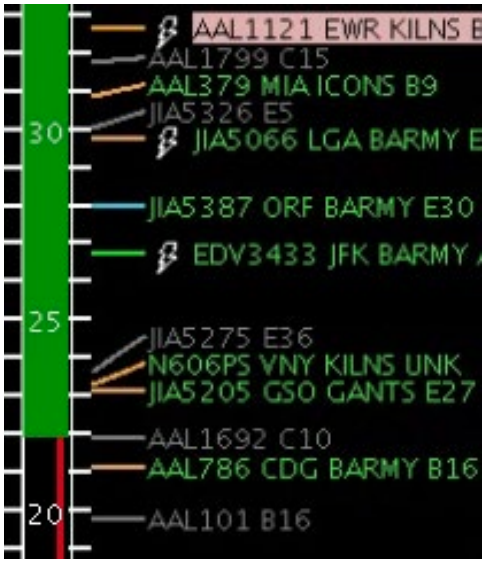


Figure 8.6. Slots in the overhead stream (in green) for a selected flight on the timeline.

There are two methods for requesting APREQ release times electronically: "Request Release Time" and "Select Slot on Timeline." Each of those methods are described in the following sections.

8.1.1 Request Release Time

The "Request Release Time" option is a method of electronically requesting a release time without manually specifying a time to request. The ATD-2 Scheduler automation will choose a release time based on two criteria: 1) the predicted earliest possible departure time for that flight, and 2) on the availability of slots in the overhead stream.

To electronically request a release time using the "Request Release Time" option:

Step 1: Right-click on the APREQ flight's Timeline datablock (Figure 8.7).

Step 2: Choose the "Request Release Time" option. Once the option is selected, a yellow arrow will appear to the right of the Timeline datablock to indicate that the requested release time has been sent to TBFM/IDAC at the Center (Figure 8.8).

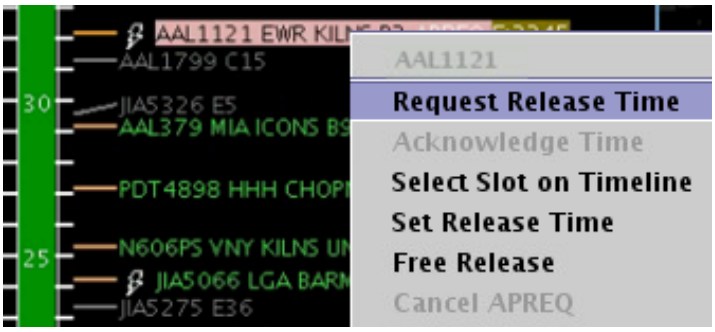


Figure 8.7. Right-click on APREQ flight to "Request Release Time."

Figure 8.8. Request for a release time has been sent to Center.

When Center accepts and returns the release time, the assigned release time is written on the Timeline datablock as "A:####" (e.g., "A:2344" in Figure 8.9). The release time is highlighted with a compliance indicator. The returned release time is accompanied by an audible alert. Once the release time coordination is complete, the release time is published to all ATD-2 users.

Figure 8.9. Release time returned by Center.

8.1.2 Select Slot on Timeline

The "Select Slot on Timeline" option is an alternative way of requesting an APREQ release time that allows the TMC to view available slots and make a manual selection of a release time to request from Center. When viewing slots on the Timeline, green blocks are available slots and slots depicted by the red line are unavailable.

To electronically request a release time using the "Select Slot on Timeline" option:

Step 1: Right-click on the APREQ flight's Timeline datablock (Figure 8.10). When right-clicking on the flight's Timeline datablock, the slots should automatically be drawn on the Timeline.

Step 2: Choose the "Select Slot on Timeline" option.

Step 3: Choose a desired release time for the flight and click on the center column of the Timeline on the desired release time (Figure 8.11). Once the release time is selected, a yellow arrow will appear to the right of the timeline datablock to indicate that the requested release time has been sent to TBFM/IDAC at the Center (Figure 8.12).

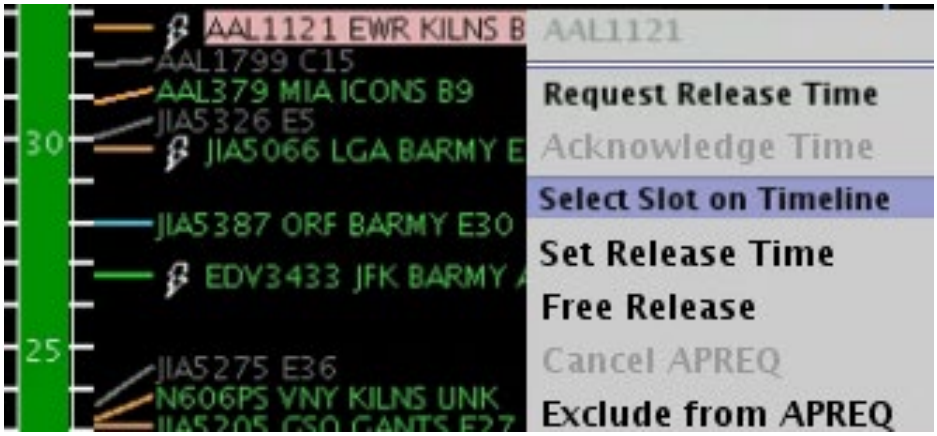


Figure 8.10. Right-click on APREQ flight to "Select Slot on Timeline."

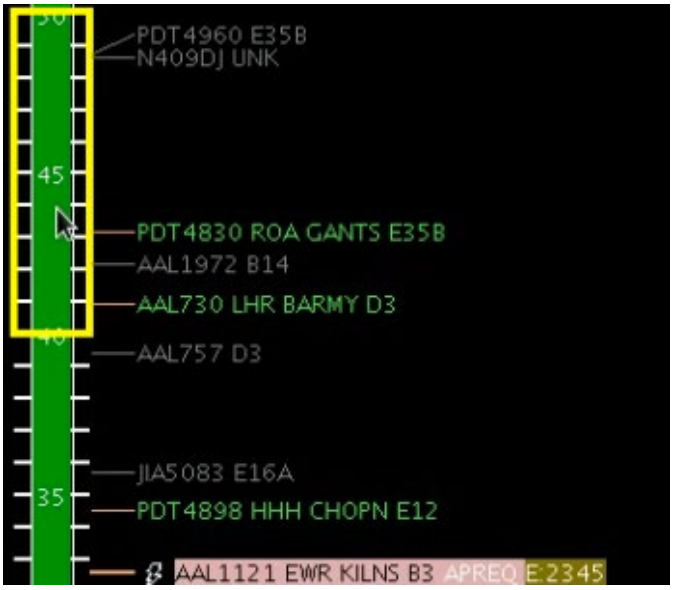


Figure 8.11. Select a slot on the Timeline to request as a release time.

Figure 8.12. Request for a release time has been sent to Center.

When 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 8.13). The release time is also highlighted by a compliance indicator. The returned release time will also be accompanied by an audible ding. Once the release time coordination is complete, the release time will be published to all ATD-2 users.

Figure 8.13. Release time has been returned by Center.

8.1.3 If the Requested Release Time is Not Accepted

8.1.3.1 Center Returns a Different Release Time

If the Center returns a time that differs from the requested release time, a yellow diamond with an exclamation point appears next to the flight's datablock on the Timeline (Figure 8.14). An audible alert (double ding) will also accompany the returned time. To clear out this yellow diamond alert, click on the yellow diamond.

Figure 8.14. Center returns a different release time then the time requested.

If the returned release time is not desired, the APREQ coordination process can be restarted by cancelling the APREQ.

8.1.3.2 Center Cancels the Release Time

If the Center cancels the requested APREQ release time or an APREQ release time that has already been negotiated and confirmed, a double-ding audio alert sounds.

8.2 Manual Entry of APREQ Times

If there is a "telephone" symbol to the left of the call sign on the Timeline datablock (Figure 8.15), it means that electronic coordination of an APREQ release time is not available for the flight. In this case, coordination of the release time be completed via a verbal Call for Release and the release time can be manually entered into the system. If this time is entered into TBFM, this may be read in by ATD-2 automation and entries will not be required. In the event, these entries are not automatically read in, the steps for manual entries are discussed below.

Figure 8.15. APREQ flight is not capable of electronic coordination of release time.

To complete a manual entry of a Call for Release time:

Step 1: Complete the Call for Release for the flight.

Step 2: Right-click on the flight's Timeline datablock and select "Set Release Time (Figure 8.16).

Step 3: Type the verbally coordinated release time into the Set Release Time window (Figure 8.17).

Step 4: Click on "Set Time" to complete the entry of the release time into the STBO Client.

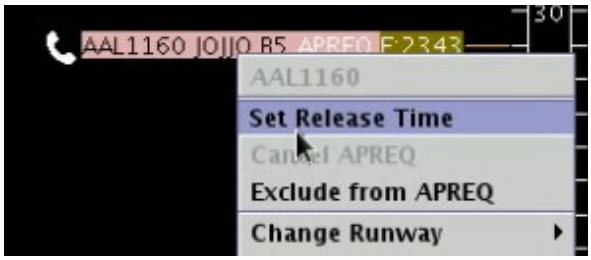


Figure 8.16. Right-click on APREQ flight to "Set Release Time."

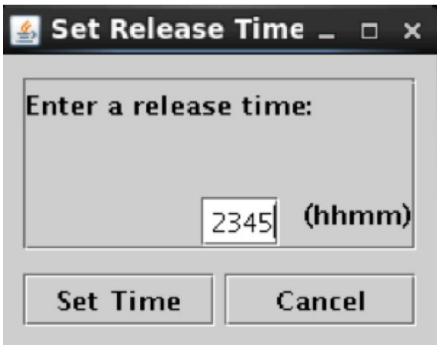


Figure 8.17. Enter the verbally coordinated release time.

The release time now appears on the flight's Timeline datablock as "A:####", or "A:2345" in the example shown (Figure 8.18). The release time is also highlighted by a compliance indicator. Once the release time coordination is complete, the release time is published to all ATD-2 users.

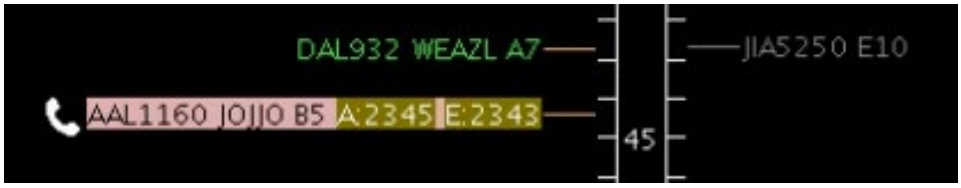


Figure 8.18. Release time is now set in the ATD-2 system.

It should be noted that Center often enters a Call for Release time into TBFM. In this case, SWIM publishes the release time to the STBO Client, and the release time auto-populates without the user having to manually enter the time into the system.

8.3 Free Release

When a flight has a floating release time there is an option to set it for "Free Release" to avoid it being flagged as "non-compliant".

To set a flight with a floating release time:

Step 1: On the Timeline, right click on a flight that currently has a scheduled release time.

Step 2: Select "Free Release" from the menu options (Figure 8.19).

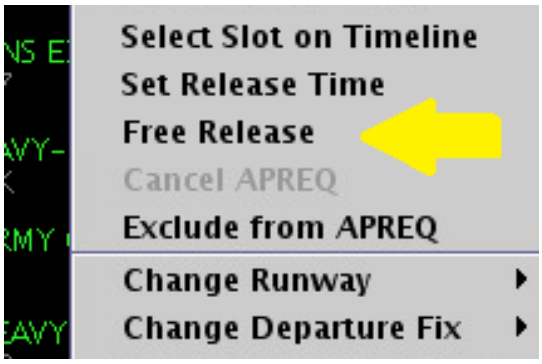


Figure 8.19. Select Free Release for a floating release time.

On the timeline, the flight will now display "A-RLSD" to indicate it has a floating release time (Figure 8.20).

Figure 8.20. Floating Release time for Free Release flights.

8.4 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 8.21).

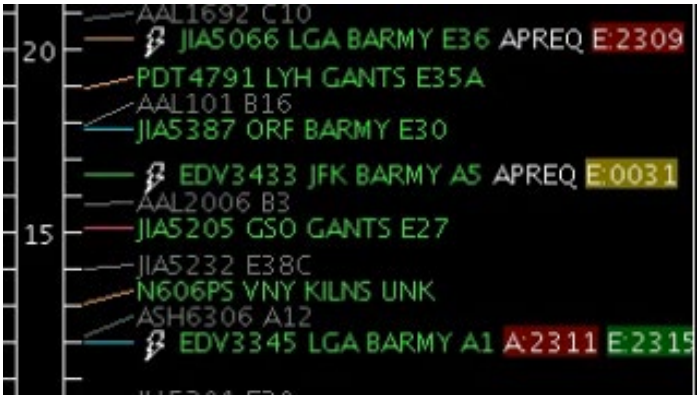


Figure 8.21. Compliance indicators.

Colors-coding used to indicate compliance are described in Table 12.

Table 12. Compliance Indicator Colors Information

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*.

8.5 Cancel an APREQ

Cancelling an APREQ may be done in the event that: (1) Center returns a release time that differs from the originally requested release time and the new release time is not favorable, (2) the flight can no longer make its assigned release time and a new release time must be coordinated, or (3) a new release time has been coordinated and must be manually entered into the STBO Client.

Note that an APREQ release time cannot be edited. An existing APREQ release time must be cancelled before scheduling a new time.

To cancel an APREQ:

Step 1: Right-click on the flight's Timeline datablock.

Step 2: Select "Cancel APREQ" (Figure 8.22).

Step 3: Click "OK" on the confirmation window (Figure 8.23).

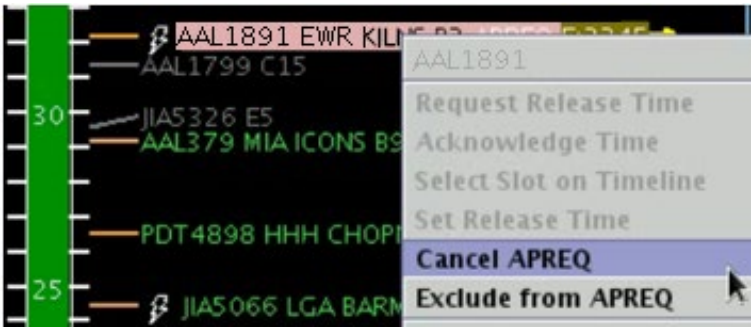


Figure 8.22. Cancel an APREQ.

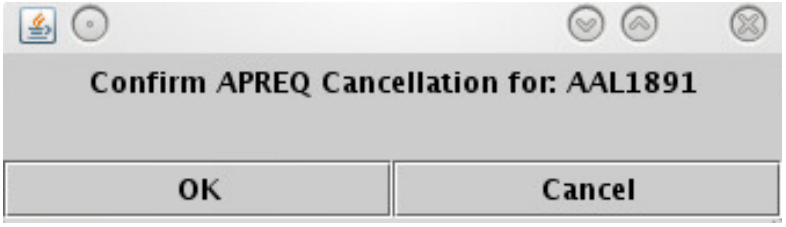


Figure 8.23. Pop-up Confirmation Window.

The flight's datablock on the timeline will return to its original state with no APREQ release time or compliance indicator for the APREQ release time (Figure 8.24). Once the APREQ release time is cancelled, the coordination process for a new release time can begin again.

Figure 8.24. Flight returned to original state after APREQ is cancelled.

Appendix A: Acronyms

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

Acronym	Term
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

Acronym	Term
CTOT	Controlled Takeoff Time
DAL	Delta Air Lines
DAL	Dallas Love Field Airport
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
ETOT	Estimated Takeoff Time
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

Acronym	Term
LOBT	Latest Off-Block Time (provided by the airline)
MIT	Miles-In-Trail
NASA	The National Aeronautics and Space Administration
nmi / *nm*	Nautical miles
OIS	FAA Operational Information System
OPNEC	Operational Necessity
REQ	Request
RMTC	Ramp Manager Traffic Console
RTC	Ramp Traffic Console
RTC	Relative Trajectory Cost
RWY	Runway
SDT	Scheduled Departure Time
SIBT	Scheduled In-Block Time
SID	Standard Instrument Departure
SLDT	Scheduled Landing Time
SMA	Surface Movement Advisor
SMP	Surface Metering Program
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 Takeoff Time
SWIM	System-Wide Information Management
TBD	To Be Determined
TBFM	Time-Based Flow Management System
TCOT	Terminal Controlled Off-Time
TFDM	Terminal Flight Data Manager
TFM	Traffic Flow Management

Acronym	Term
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 Takeoff 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 Takeoff Time