

**Ramp Traffic Console (RTC)
Ramp Manager Traffic Console (RMTC)
User Manual**

Airspace Technology Demonstration 2 (ATD-2) Team

POC: Lindsay Stevens

Abstract

This document serves as a user manual for the Ramp Traffic Console (RTC) in the Ramp Control Tower. It describes the elements of the RTC interface and provides explanations for how to utilize the RTC to manage ramp traffic. The RTC provides live data for all flights including Earliest Off-Block Times (EOBT) and Traffic Management Initiatives (TMI). The RTC augments management of ramp traffic by providing notifications of runway configurations, and lists flight arrivals, near arrivals, and departures as additional sources of information. If applicable, this document also provides instructions for use of the Ramp Manager Traffic Console (RMTC) for ramp manager functions, such as adjusting the priority flight list and setting the ramp status. The RTC/RMTC ramp tool are components of the NASA Airspace Technology Demonstration 2 (ATD-2) sub-project.

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1 Getting Started

The thin green bar on the left-side of the display (**Error! Reference source not found.**) provides access to several different system views. Any local systems integrated with ATD-2 may be selected for observation.

To access ‘My Desktop’:

Step 1: Hover over the green bar menu.

Step 2: Select the option for ‘My Desktop’.



Figure 1.1. Select My Desktop from Menu.

The NASA icon (**Error! Reference source not found.**) provides access to ATD-2 tools. To get started, first make sure that the correct desktop is displayed.

To open the RTC (Ramp Traffic Console):

Step 1: Click on the NASA icon to open the ATD-2 suite.

Step 2: Select the option for ‘RTC’ (or ‘RMTC’, if applicable).

Step 3: Wait for the RTC to load. This may take a few minutes.

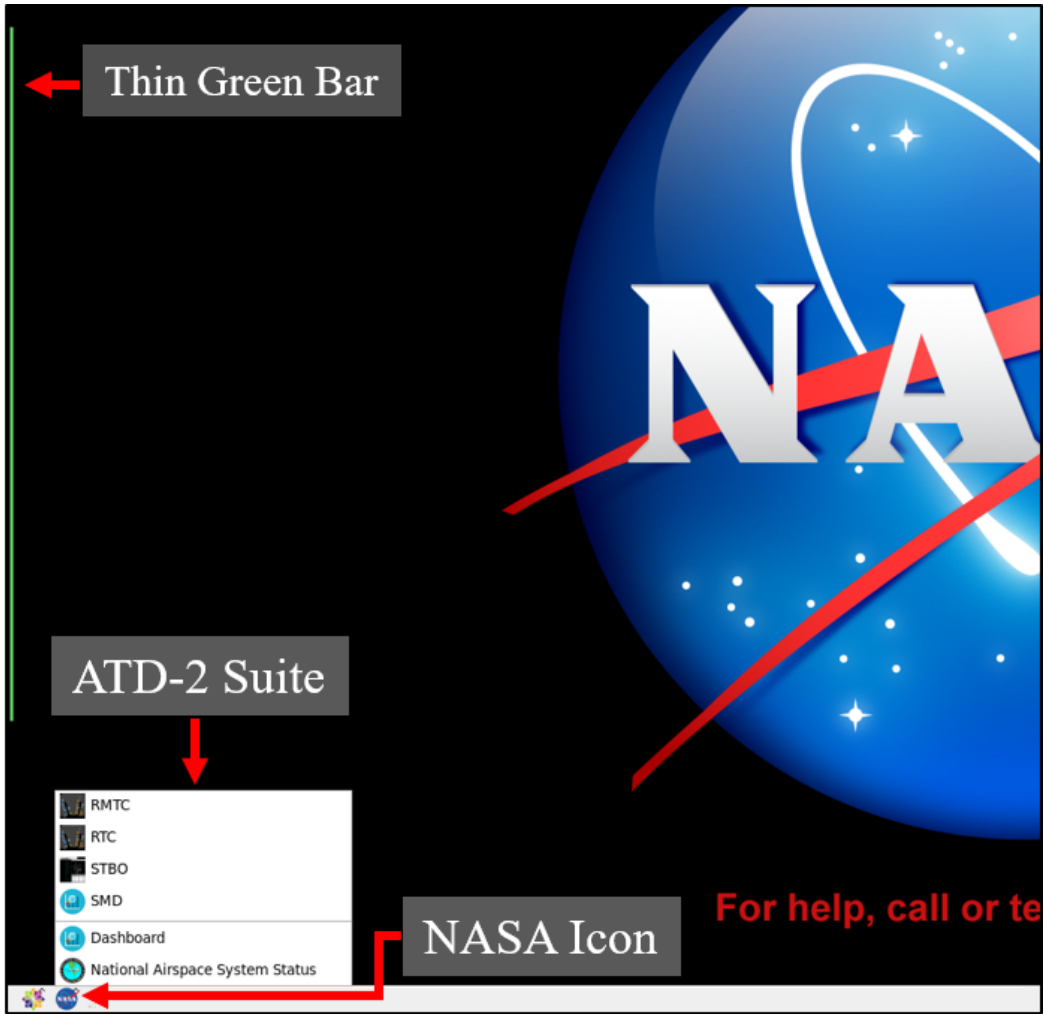


Figure 1.2. Select RTC or RMTC from ATD-2 Suite.

2 General Description of the RTC Interface

The Ramp Traffic Console (**Error! Reference source not found.**), is comprised of an interactive map display and “electronic flight strips” and flight icons that reflect user inputs and flight state information.

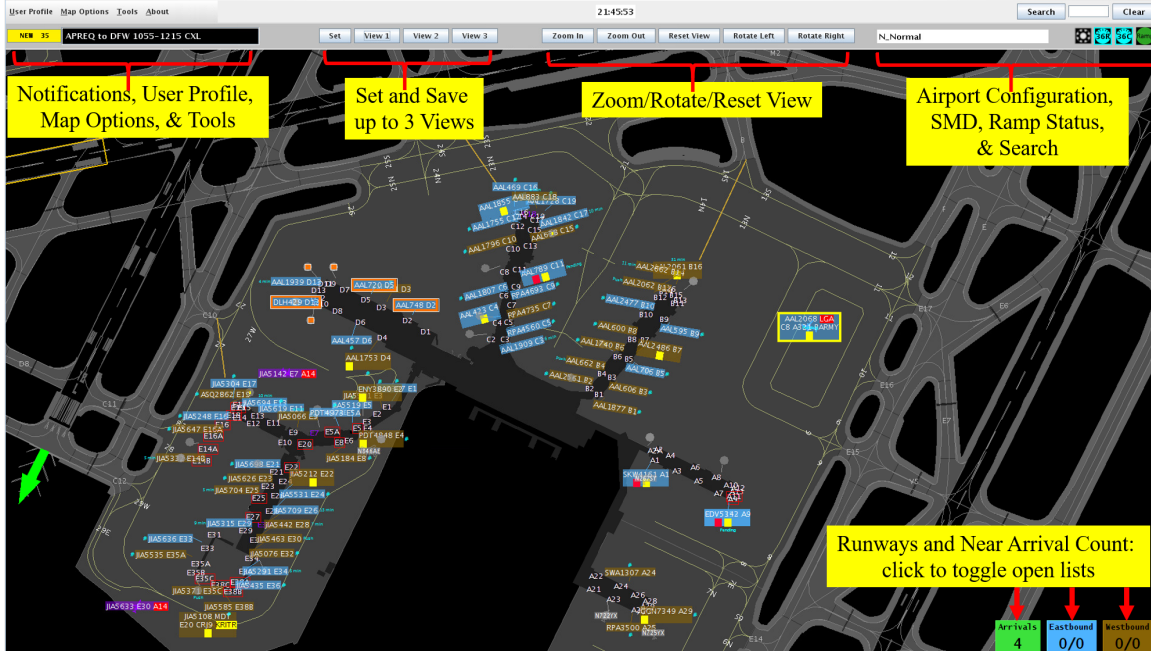


Figure 2.1. RTC Interactive Map Display.

The RTC map displays surveillance data and provides a visual representation of current aircraft positions in the ramp, Airport Movement Area (AMA), and near airspace. Aircraft icons are displayed as a gray diamond with a data tag. When a flight loses surveillance data, the flight becomes a hollow icon.

There are many data exchange elements shared between Ramp (RTC/RMTC) and Surface Trajectory Based Operations Client (STBO Client is used in ATC) including Traffic Management Initiative (TMI) information, notifications, ramp status, airport configuration, and closure information. For example, taxiway links are displayed in red on the RTC/RMTC map if they have been marked as closed in the STBO Client.

For more information about the Surface Metering Display (SMD), please refer to the SMD user manual. The RTC is also able to support metering if it applies to your airport.

The RTC/RMTC times are displayed in Coordinated Universal Time (UTC).

3 RTC Display Overview and Sector Map Settings

The RTC map view is adjustable by using the mouse to click, drag and drop the map objects and using the scroll wheel to adjust the zoom level.

3.1 Set Views, Zoom and Rotate Map

The Set Views buttons (**Error! Reference source not found.**) may be used to save up to three different RTC display views. The Zoom and Rotate buttons allow for incremental adjustment to the zoom and the orientation of the map display. The Set View feature allows display customization by setting and saving up to three different preset views.

To save a display view:

Step 1: Set the zoom, drag and rotate to display the desired view.

Step 2: Click on ‘Set’.

Step 3: Click on either ‘View 1’, ‘View 2’, or ‘View 3’ to save this view.

Step 4: Change the display to another desired view and repeat above steps until all three views are saved.

Step 5: After the views are set, click on ‘View 1’, ‘View 2’, or ‘View 3’ to quickly toggle between saved views.

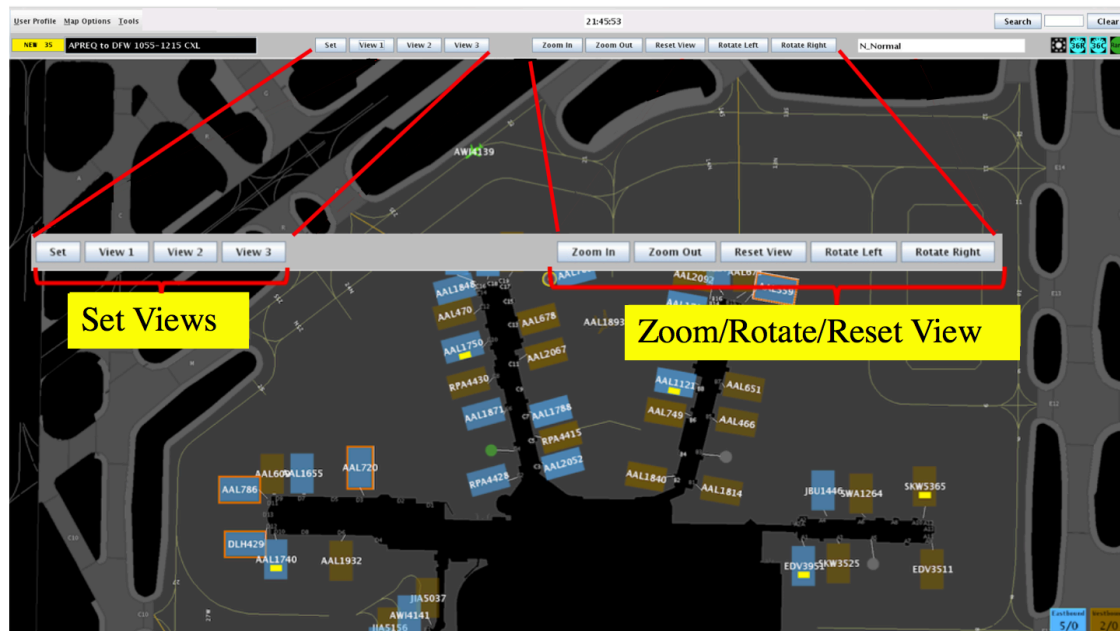


Figure 3.1. Set Views, Zoom, Rotate Map.

The ‘Zoom In’ and ‘Zoom Out’ buttons (**Error! Reference source not found.**) allow incremental increasing or decreasing of the zoom level. The zoom level may also be adjusted using the scroll wheel on the mouse.

To change the zoom setting:

Step 1: Click on 'Zoom In' or 'Zoom Out' to incrementally increase or decrease the zoom level.

Or, Use the scroll wheel on the mouse to adjust the zoom level.

The 'Rotate Left' and 'Rotate Right' buttons allow incremental rotation of the angle of the map display.

To rotate the angle of the map display:

Step 1: Click on 'Rotate Left' and 'Rotate Right' to incrementally rotate the angle of the map display.

The 'Reset View' button in between the Zoom and Rotate buttons will reset the map view to the default view for that RTC sector display.

To reset to the default view:

Step 1: Click on 'Reset View' between the Zoom and Rotate buttons to reset the map view to the default view for that RTC sector display.

3.2 To Load/Save User Profile

When customizing your view preferences or other RTC settings, you may save and/or load user profiles to access your preferred settings. The 'User Profile' menu is located at the top left of the status bar. The 'Load' button will access the list of saved profiles. Default user profiles have been updated to match expected usage at specific locations.

To load a user profile:

Step 1: Click on 'User Profile' (**Error! Reference source not found.**).

Step 2: Choose 'Load' to open menu of available profiles.

Step 3: Select a user profile from the list of options.

Step 4: Click 'Load' in drop-down after selecting file.

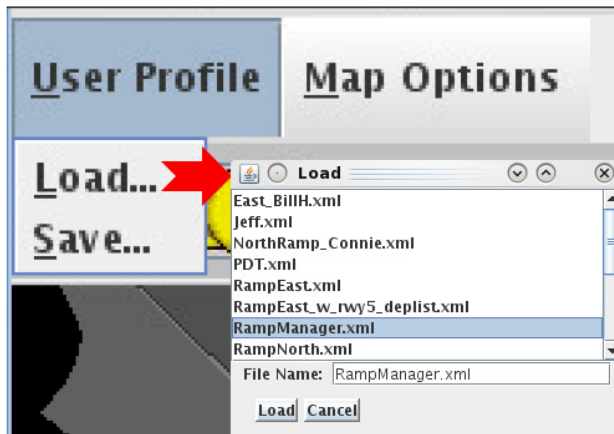


Figure 3.2. Load User Profile.

The 'Save' option lets you save your settings as a unique profile name, for example, "JohnDoe_RampSouth123". The saved user profile will then be available to 'Load' from the User Profile Options.

To save your settings in a User Profile:

- Step 1:** Click on 'User Profile' (Figure 3.3).
- Step 2:** Choose 'Save' to open the Save menu.
- Step 3:** Type in new profile name,
- Or,** Save over an existing profile to update it.
- Step 4:** Click 'Save'.

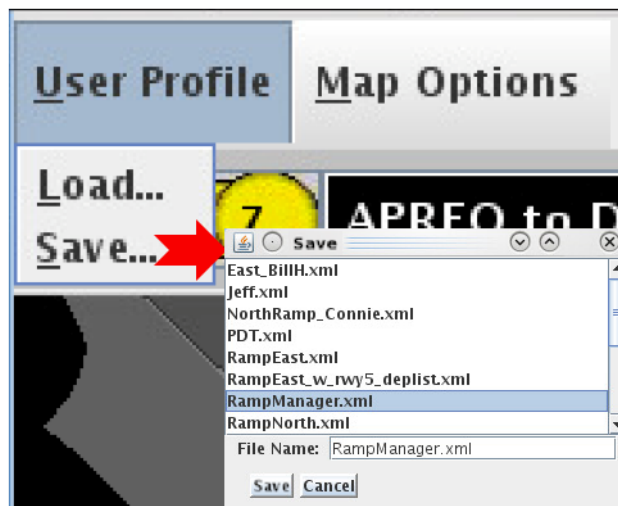


Figure 3.3. Save User Profile.

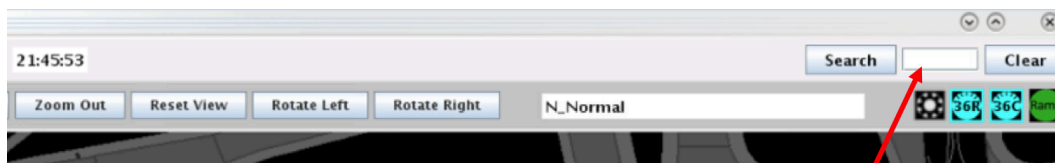
3.3 Search

Find a flight on the RTC map using the Search feature (Figure 3.4), located at the top right of the map display. The search results will be displayed on the map with a yellow circle around each resulting flight on the map display. The search results are narrowed in scope as a more complete call sign is entered into the search field. It may be necessary to zoom out and scan the map to locate the search result, as the map view will not change to include the location of the search result if it is not in the current view. The search feature applies to departures and arrival flights in the ramp, AMA, or near airspace.

To search for a flight:

Step 1: Type in the flight call sign or flight number for a flight, departure fix, or destination airport.

Step 2: If needed, zoom out to see if search results are outside of the current display setting.



Search for call sign, flight number, departure fix, arrival airport

Figure 3.4. Search for a flight.

Search feedback is provided by the system. If an entry in the search field is for a valid flight but the search is not successful, the system will provide a dialog box that explains why flight that match the search criteria are not being displayed. If a callsign or tail number is used to search for a valid arrival flight, the display's viewed area will jump to the location of the searched arrival flight; this will not work for arrivals searched by airline. Once at least three characters have been entered (or "GA" for general aviation flights), if the search entry does not match anything in the system, the search entry will change to red.

3.4 Notifications

The RTC provides notifications in the form of a Notification icon, Notification banner, and a Notifications panel (Figure 3.5 and Figure 3.6). These notifications are generated when new information is populated in the system. This new information may originate from the STBO Client or from an outside source, such as SWIM (System-Wide Information Management), OIS (FAA Operational Information System), or other ATD-2 users. Notifications are always related to events that impact multiple flights or the airport (e.g., TMIs, runway closures, cancellations), and are never issued for single flights. Information on events or restrictions related to an individual flight are available on the flight strip or flight menu.

When new notifications are received, the Notification icon is yellow and displays the number of new notifications (Figure 3.5). The Notification banner will display the subject of the notification and the time range of the event. New notifications are highlighted in yellow in the Notification panel (Figure 3.6). When notifications are acknowledged, the Notification icon changes to grey and displays '0' (zero) to represent no new notifications.

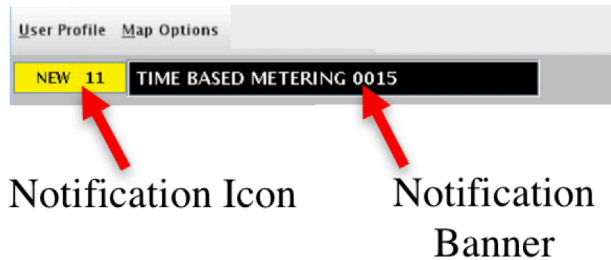


Figure 3.5. New notifications displayed in Notification Icon and Banner.

The Notification banner will cycle through the active notifications; expired or acknowledged events will be displayed in the banner.

To open, view, and acknowledge notifications:

Step 1: Click in notification display field shown in Figure 3.5 to open the notification panel.

Step 2: Click anywhere in the panel or on the yellow notification alert to acknowledge all new (yellow) notifications.

The Notification panel displays all notifications for the past 24 hours, and the list is cleared each day at 0400. The notifications received in this panel pertain to the information exchange that will happen between the ATCT and the AA ramp.

Click here to clear yellow alert



Figure 3.6. Notification Panel.

Entries were added in the notification panel for updates to Surface Metering Programs (SMPs). They include information for the SMP as follows:

Event Type = SMP

Description = <resource> <status>, (e.g., 18R PROPOSED)

Details = <smp statistics> (e.g., Flight Count: 15 Avg Gate Hold: 6 Max Gate Hold: 10)

As the state changes, the current row is updated rather than adding new rows (e.g., there will be one row '18R PROPOSED' that is updated to '18R AFFIRMED', rather than one row for '18R PROPOSED' and a second row for '18R AFFIRMED').

3.4.1 Notifications: Cancellations

Any cancelled notification will have a row highlighted in cyan (Figure 3.7). For example: A TMI was scheduled to be in effect until 1100, but it was manually ended early at 1048.

7/3/18 1111	Airport	VMC	7/3/18 1111		
7/3/18 1109	TMI	APREQ to LGA	7/3/18 1100	7/4/18 0200	OIS: INCL BA
7/3/18 1048	TMI	APREQ to JFK	7/3/18 1000	7/3/18 1048	Cancelled
7/3/18 1008	TMI	APREQ to EWR	7/3/18 1000	7/4/18 0200	OIS: INCL BA
7/3/18 0818	Ramp	RAMP OPENED	7/3/18 0818		

Figure 3.7. Cancellations displayed in blue.

3.5 Map Options

The 'Map Options tab' is used to configure aspects of the RTC map display. The 'Map Options' dropdown includes:

Map Options Item	Description
Pushback Time	Choose which time will be displayed on the departure flight strips as reference for pushback time
Gate Conflict Setting	Set the time for when to display gate conflicts in the RTC display using the amount of time prior to arrivals landing
Bloom Icon Upon Hover	Enables/Disables "bloom" of a strip/icon when hovering the cursor over the strip/icon
Show Sector Frequencies	Toggle display of sector frequencies on the map on and off
Display ADW	Toggle display of the arrival departure window (ADW) on the map on and off
Show Near-Arrival Count	Toggle display of the arrival count box with the list of arrivals that are due in the next 10 minutes on and off
Adjust Strip Font	Reset flight strip font size, increase flight strip font size, decrease flight strip font size

3.5.1 Pushback Time

The 'Display Pushback Time' map option (Figure 3.8) lets you choose which time will be displayed on the departure flight strips. P-TIME (i.e., published time - the airline

scheduled departure time or the Scheduled Off-Block Time) is the default time displayed on the departure flights. Other choices are Earliest Off-Block Time (EOBT) or Target Off Block Time (TOBT) instead of the P-time. EOBT is an updated departure time provided by the airline, and TOBT is calculated by Surface Time Based Metering.

To choose which pushback time is displayed on the flight strips:

Step 1: Click on ‘Map Options’.

Step 2: Click on ‘Display Pushback Time’ to show the options for time to be displayed.

Step 3: Click on ‘P-Time’, ‘EOBT’, or ‘TOBT’.

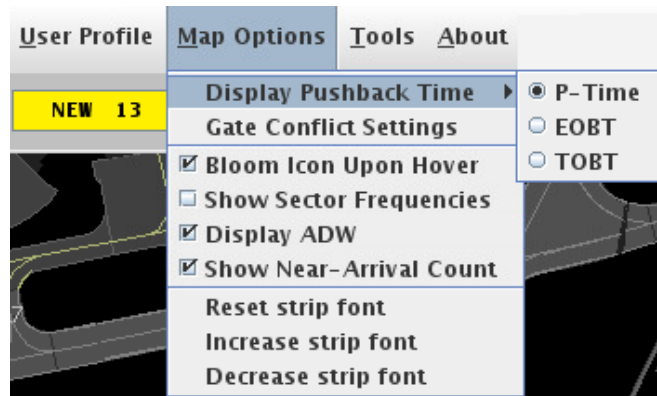


Figure 3.8. Set Time to Display on Strip.

3.5.2 Gate Conflict Settings

The ‘Gate Conflict Settings’ map option (Figure 3.9) sets the time for when to display gate conflicts in the RTC display. The default setting displays the gate conflict at 10 minutes prior to arrival landing if the departure for the gate has not yet been released. The setting can be configured to display the gate conflict at some other number of minutes prior to the arrival landing, or it may be set to 0 so that there is no gate conflict alerting until the inbound flight has landed.

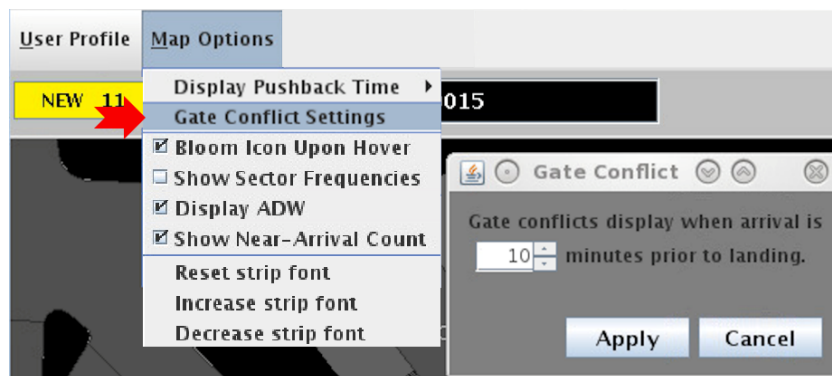


Figure 3.9. Gate Conflict Settings.

To edit the gate conflict alerting settings:

Step 1: Click on 'Map Options'. A drop down menu will appear (Figure 3.9).

Step 2: Click on 'Gate Conflict Settings' to open the Gate Conflict settings window.

Step 3: Use the up/down arrows or type in a value to enter the number of minutes prior to the arrival landing to display a conflict.

Step 4: Select 'Apply'. Any arrivals with gate conflicts that match the set criteria will now display (e.g., Figure 3.10).

The gate number of the gate in a conflict and the associated arrival aircraft icon are highlighted in magenta (Figure 3.10) alerting the controller to the gate conflict. Gate numbers for arrivals that are On (i.e., wheels down) are displayed in yellow. Clicking on either the yellow or magenta gate numbers will draw a tether line from that gate to the arrival icon on the map or in the near airspace. Clicking on any arrival flight will also draw a tether line to its assigned gate.

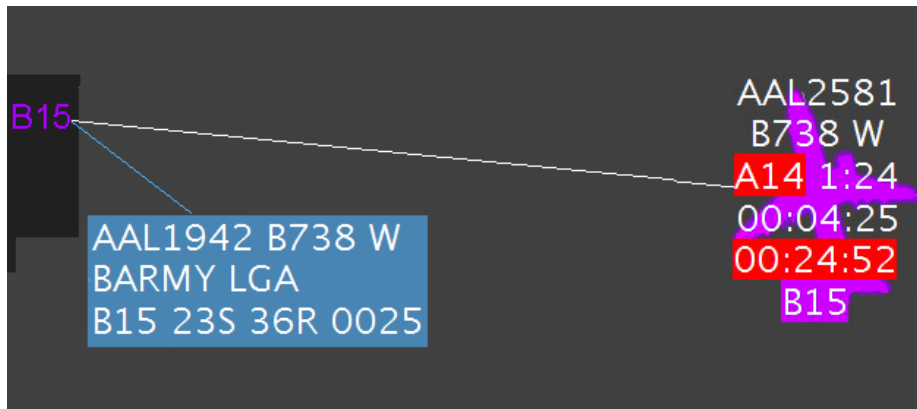


Figure 3.10. Gate Conflict Alerting.

To draw a tether line between a gate and a flight assigned to it:

Step 1: Click on any arrival flight or magenta or yellow gate number to draw a tether line between the flight and the assigned gate.

Step 2: Click on a gate number repeatedly to show multiple flights that are assigned to the same gate, by successively drawing a tether line to each flight assigned to that gate.

Gate conflict tether lines are also shown for gates blocked by an adjacent gate and flight. When there is a heavy aircraft blocking an adjacent gate, and there is an inbound arrival for that gate, the arrival icon and the gate will be displayed in magenta to alert to the conflict.

3.5.3 Bloom Icon Upon Hover-Map Option

The ‘Bloom Icon Upon Hover’ map option enables “bloom” of a strip/icon when hovering (Figure 3.11). Using the mouse to hover over a flight strip or icon on the display will result in that icon or strip blooming to enlarge the strip and font to improve readability and help focus attention. However, this bloom may be distracting or cause interference in some instances and can be turned off. When any flight strip or icon is selected by clicking on the flight strip or icon, it is enlarged or bloomed until it is deselected by clicking anywhere else on the map.

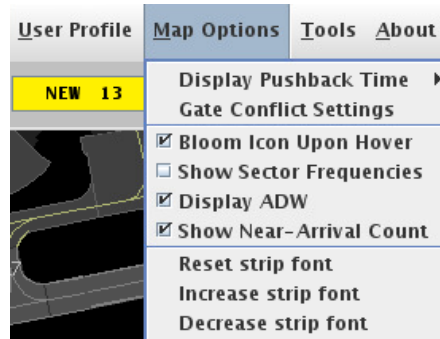


Figure 3.11. Bloom Icon Upon Hover.

To toggle the feature of ‘Bloom Icon Upon Hover’ on and off:

Step 1: Click on ‘Map Options’. A drop down menu will appear (Figure 3.11).

Step 2: Click in the checkbox next to ‘Bloom Icon Upon Hover’ to enable “bloom” of flight strips/icons. This feature is enabled when a checkmark is displayed.

Step 3: Click in the checkbox again to disable bloom of flight strips/icons. This feature is disabled when there is no checkmark.

3.5.4 Show Sector Frequencies

The frequency for each ramp tower is shown on the RTC map labeled over each respective tower ().

To toggle the display of ramp sector frequencies on and off:

Step 1: Click on ‘Map Options’. A drop down menu will appear (Figure 3.11).

Step 2: Click in the checkbox next to ‘Show Sector Frequencies’ to display the ramp sector frequency on the ramp map. This feature is enabled when a checkmark is displayed.

Step 3: Click in the checkbox again to turn off the display of ramp sector frequencies. This feature is disabled when there is no checkmark.

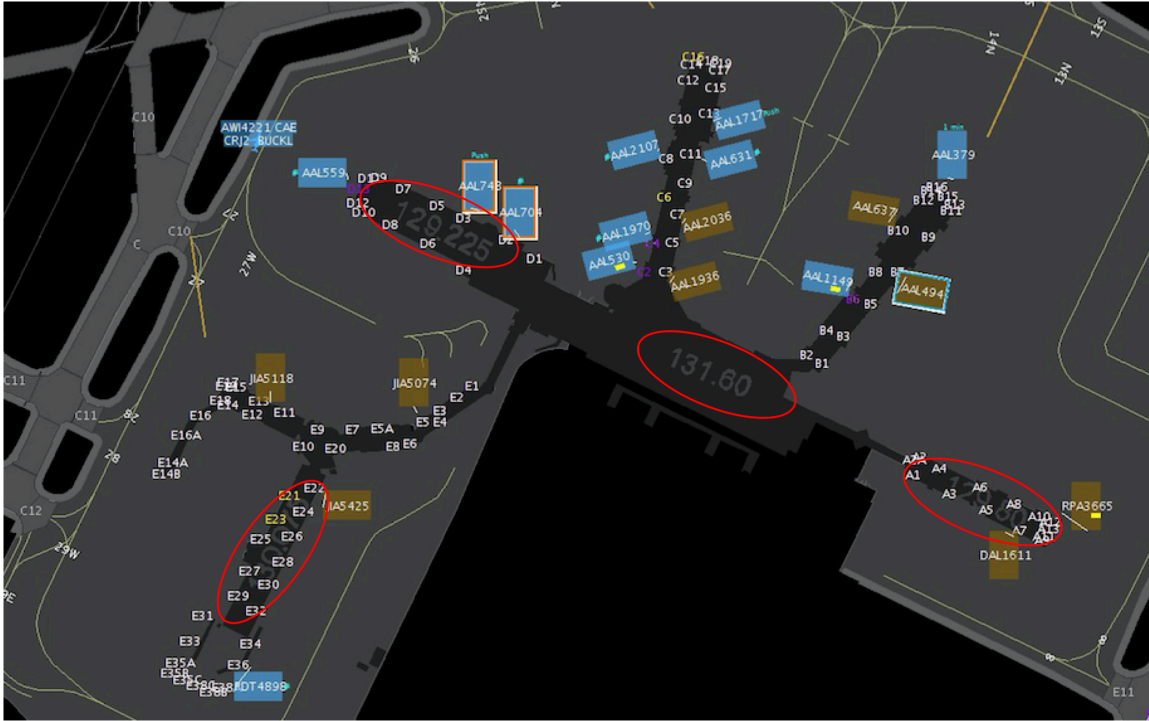


Figure 3.12. Sector Frequencies are shown for each ramp tower.

3.5.5 Display ADW

The checkbox for ‘Display ADW’ under ‘Map Options’ lets the Arrival–Departure Window (ADW) for convergent operations be displayed. A yellow rectangle should be outlined at the affected runways (Figure 3.13). This option may not apply to all airports.

To toggle the display of the ADW on and off:

Step 1: Click on ‘Map Options’. A drop down menu will appear (Figure 3.11).

Step 2: Click in the checkbox next to ‘Display ADW’ to display the ADW for convergent operations. This feature is enabled when a checkmark is displayed.

Step 3: Click in the checkbox again to turn off the display of the ADW. This feature is disabled when there is no checkmark.

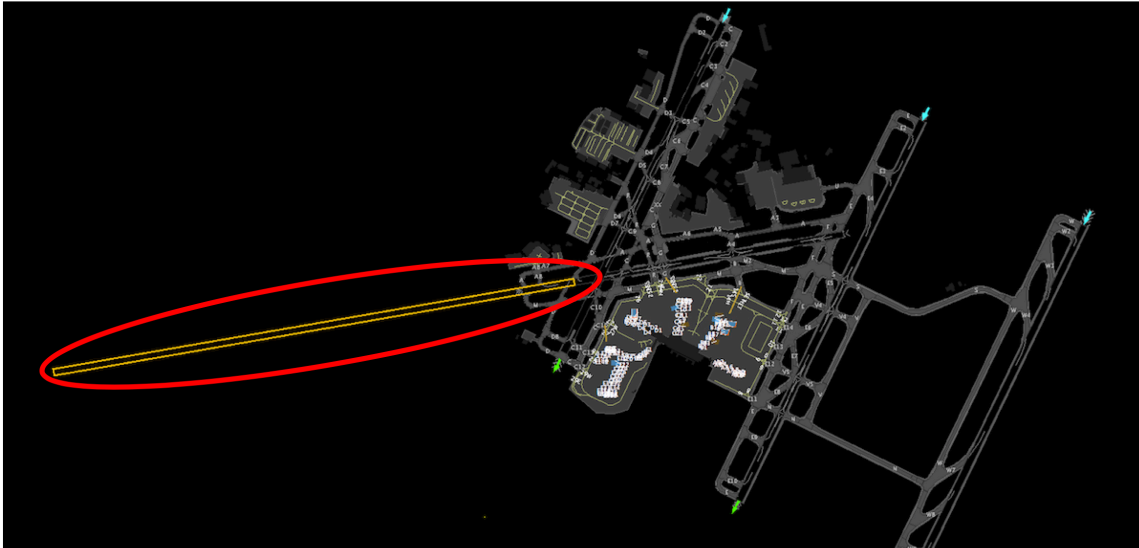


Figure 3.13. Arrival-Departure Window displayed.

3.5.6 Departure and Count Boxes and Lists

The Departure Count boxes are located on the bottom right side of the display. The numerator displays the number of flights that have been released to either the eastbound (blue) or westbound (brown) runway. The denominator reflects the number of eastbound or westbound flights that have been placed on hold.

Eastbound			
Departures (-)			
Seq. #	Callsign	Taxi Time	Dest.
1	JIA5672	4:51	IAD
2	JIA5601	4:39	DAB

Westbound			
Departures (-)			
Seq. #	Callsign	Taxi Time	Dest.
1	JIA5277	3:39	SDF
2	DAL2133	0:35	ATL
3	JIA5498	3:55	LEX
4	JIA5142	47:32	MOB
5	JIA5354	0:52	ATL

Eastbound	
Callsign	Hold Time

Westbound	
Callsign	Hold Time

Eastbound 7/0 Westbound 7/1

Figure 3.14. Departure Count Boxes and Lists.

To toggle open or close any of the three departure lists (Figure 3.14):

Step 1: Click on any departure count box on the bottom right of the display to open the associated departure list.

Step 2: Click on the same departure count box on the bottom right of the map to close the associated departure list.

3.5.7 Show Near-Arrival Count and List

The ‘Show Near-Arrival Count’ provides the list of arrivals that are due in the next 10 minutes (Figure 3.15). A green Near-Arrival count box appears in the bottom right of the display next to the brown westbound and blue eastbound departure count boxes.

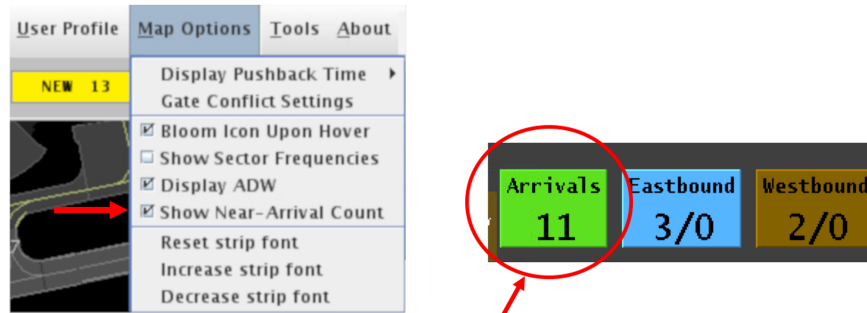


Figure 3.15. Show Near Arrival Count.

To toggle the display of the Near-Arrival Count box in the bottom right corner of the map on and off:

Step 1: Click on ‘Map Options’. A drop down menu will appear (Figure 3.15).

Step 2: Click in the checkbox next to ‘Show Near-Arrival Count’ to display the count of all arrivals expected in the next 10 minutes. This feature is enabled when a checkmark is displayed. A green ‘Arrivals’ count box will display in the lower right corner of the RTC, next to the ‘Eastbound’ and ‘Westbound’ count boxes.

Step 3: Click in the checkbox again to hide the green ‘Arrivals’ box. This feature is disabled when there is no checkmark.

To toggle open or close the arrival lists:

Step 1: Click on the arrival count box on the bottom right of the display to open the associated arrival list (Figure 3.16).

Step 2: Click on the arrival count box again on the bottom right of the map to close the associated arrival list.

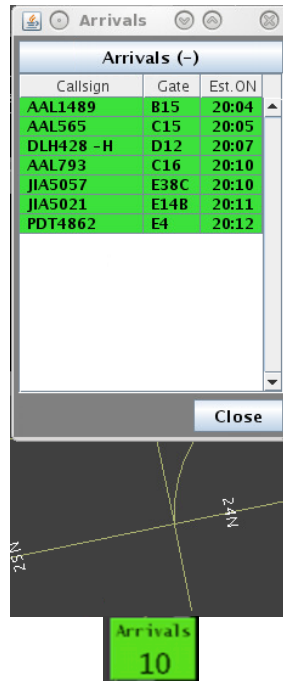


Figure 3.16. Arrival Count Box and List.

3.5.8 Adjusting Flight Strip Font Size

The default value of flight strip font size is set at an optimal size for the display; however, the size of the text can be changed. The ‘Reset strip font’, ‘Increase strip font’, and ‘Decrease strip font’ map options (Figure 3.17) allow for the adjustment of the font size.

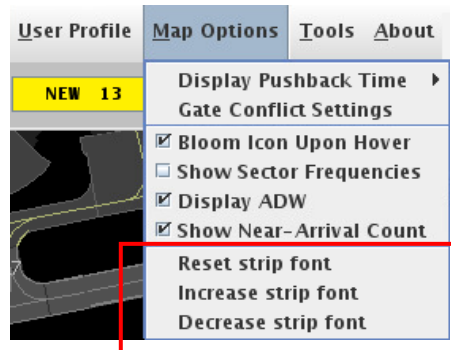


Figure 3.17. Reset, Increase, and Decrease Strip Font.

To change the flight strip font size:

Step 1: Click on 'Map Options'. A drop down menu will appear (Figure 3.17).

Step 2: Click on 'Reset strip font' to reset the size of the font to the default font size.

Step 3: Click on 'Increase strip font' to increase the font size on the flight strips.

Step 4: Click on 'Decrease strip font' to decrease the font size on the flight strips.

3.6 SMD, Runway Utilization, and Ramp Status

There are a set of icons displayed on the right side of the upper status bar (Figure 3.18), which include icons for the Runway Utilization and for the statuses of proposed Surface Metering Programs (SMPs), Runway Metering, and Ramp Status.

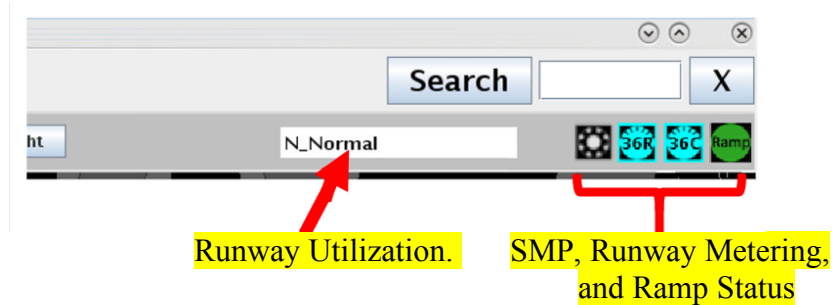


Figure 3.18. Runway Utilization, SMPs, Ramp Status, and Runway Metering.

These icons are displayed on the STBO Client as well as on the RTC, and are designed to display changing conditions in the ramp or AMA. They are informational only.

3.6.1 Runway Utilization

The Runway Utilization icon (Figure 3.18) 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 and a notification is sent out to all systems.

3.6.2 Surface Metering Display (SMD)

A gear icon was added to the toolbar to provide notification when there is a newly proposed SMP. The icon is orange when there is a newly proposed SMP available to view on the SMD and black when no proposed SMP is available (Figure 3.19).

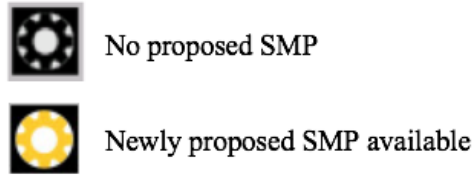


Figure 3.19. SMD icons.

3.6.3 Runway Metering Status Icons

Information about the status of metering on each departure runway is displayed in the form of runway metering status icons. The icons change color from grey when metering is Off to white when metering is On but *not active*, and then again to cyan when metering is On and *active* (Figure 3.20). It is updated by ATCT via the SMD. A change in runway utilization will also be accompanied by a notification in the notification panel.

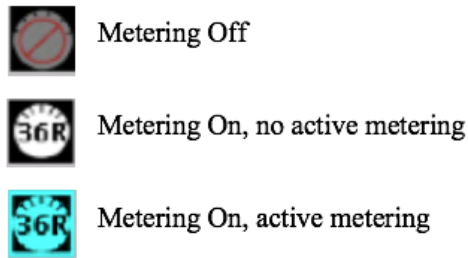


Figure 3.20. Runway Metering Status Icons.

3.6.4 Ramp Status

When the Ramp Manager updates the ramp status, with options of either Open, Pending Closure, or Closed, the icon will be updated to reflect the current status (Figure 3.21). An update to the ramp status will be accompanied by a notification in the notification panel to both the ATCT using the STBO Client and the ramp controller using the RTC.

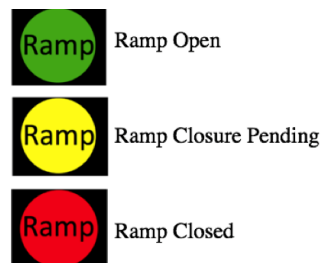


Figure 3.21. Ramp Status Icons.

3.7 Long On Board

The RTC Map also displays Long On Board (LOB) information for flights. LOB is displayed on the Map using a colored disc that surrounds the aircraft icon (Figure 3.22). The LOB timer starts from the flight's pushback from the gate (Actual Off-Block Time; AOBT) for departure flights, or from the moment wheels touch down (Actual Landing

Time; ALDT) for arrival flights. **Error! Reference source not found.** describes the conditions for when each LOB color is displayed.

Disc Color	LOB Timer
Yellow	60-89 minutes
Orange	90-119 minutes
Red	120+ minutes

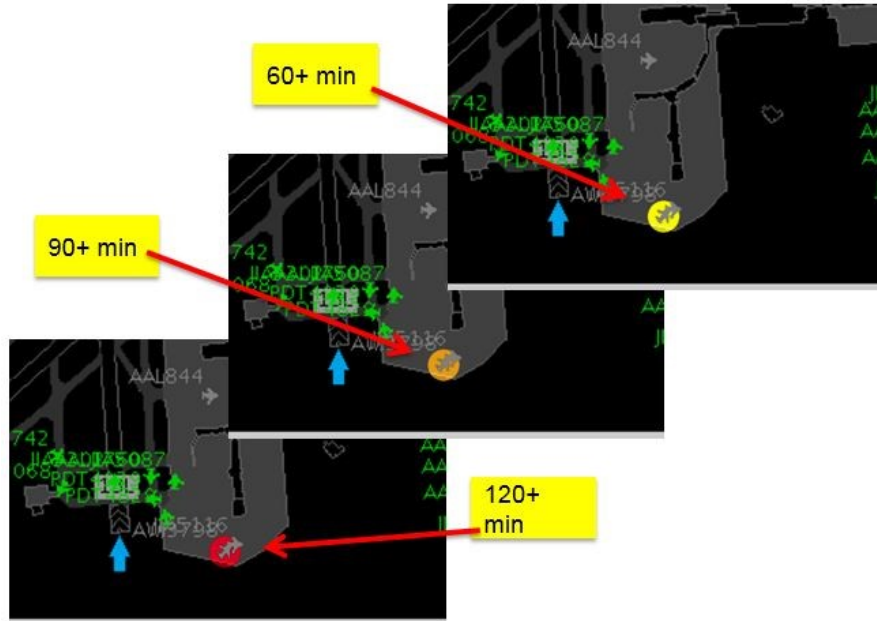


Figure 3.22. Long On Board.

3.8 Map Right Click Context Menu

Flight and aircraft icons can be created on-the-fly using the map's right mouse click context menu option (Figure 3.23).

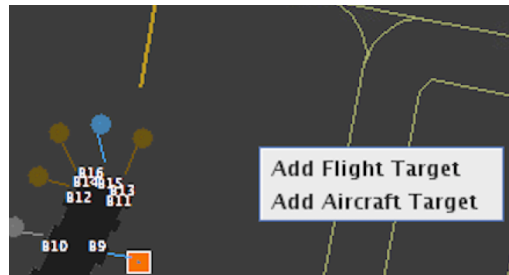


Figure 3.23. Right click on map to open context menu.

3.8.1 Add Flight Target

A flight target can be added to the RTC display using specified search criteria and specified positioning for the target (Figure 3.24). This feature is used to create a target for a known flight or tail number if it is not being displayed. If the search result is found on the current map display, then it will be highlighted on the RTC; otherwise, a hollow grey icon will be displayed with the flight number or tail number that was entered. The Add Aircraft Target option (section 3.8.2) may be used to create a target without a known call sign or tail number.

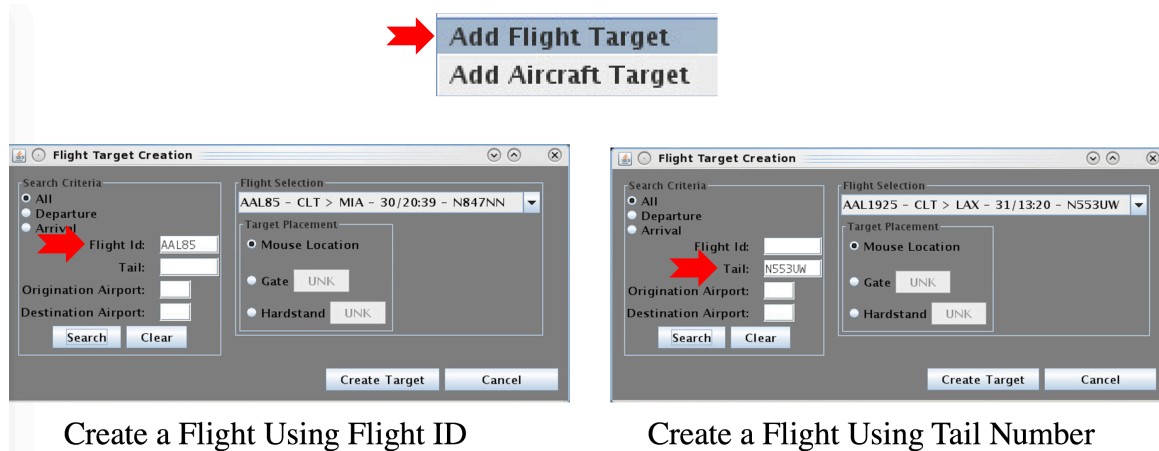


Figure 3.24. Create a Flight.

To create a flight target:

- Step 1:** Right click anywhere on the map. A context menu will appear.
- Step 2:** Click the 'Add Flight Target' option. The Flight Target Creation window will populate (Figure 3.24).
- Step 3:** Select the radio button for the appropriate search criteria: 'All', 'Departure', or 'Arrival'.
- Step 4:** Type in flight ID or tail number as the search criteria for the flight.
- Step 5:** Click the 'Search' button. The flight will appear in the line under the 'Flight Selection' section.
- Step 6:** Select the radio button for the desired target placement: 'Mouse Location', 'Gate', or 'Hardstand'. If either 'Gate' or 'Hardstand' is selected, type in the gate or hardstand identifier.
- Step 7a:** Click the 'Create Target' button. A hollow grey icon will appear at the specified location with the flight information.
- Step 7b:** Alternately, the 'Cancel' button can be clicked to exit the window without creating a flight target.

3.8.2 Add Aircraft Target

An aircraft target can be added when no associated flight information is known about the aircraft (Figure 3.25). Aircraft targets can be added using the tail (required), aircraft type (optional), and positioning location (required) for the aircraft target. The created target will display as a grey diamond shape.

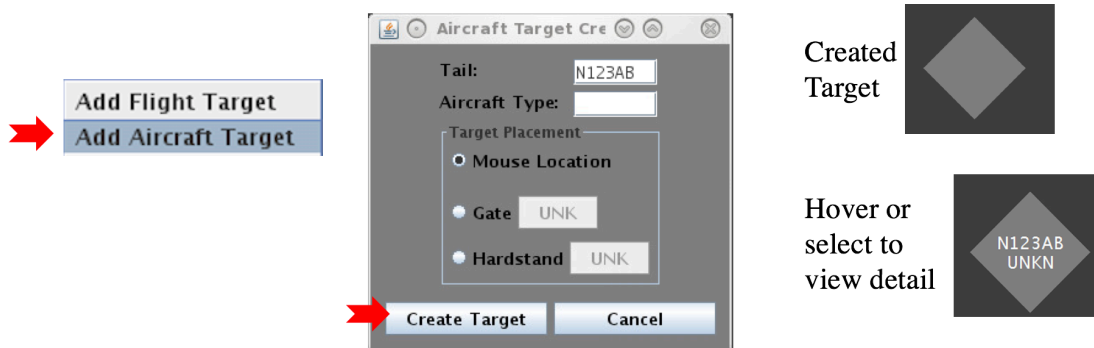


Figure 3.25. Add Aircraft Target.

To create an aircraft target:

Step 1: Right click anywhere on the map. A context menu will appear.

Step 2: Click on 'Add Aircraft Target'. The Aircraft Target Creation window will populate.

Step 3: Type in tail number and, optionally, aircraft type.

Step 4: Select the radio button for the desired target placement: 'Mouse Location', 'Gate', or 'Hardstand'. If either 'Gate' or 'Hardstand' is selected, type in the gate or hardstand identifier.

Step 5a: Click the 'Create Target' button. A hollow grey icon will appear at the specified location. The aircraft information is visible on the target upon target selection or hover.

Step 5b: Alternately, the 'Cancel' button can be clicked to exit the window without creating an aircraft target.

4 Flight Strips and Icons

Flights are displayed as flight strips while at the gate through pushback (Figure 4.1). After pushback, flight strips are displayed with an aircraft engine symbol attached to indicate the spool up state of the flight. After pushback, flights that have track data are displayed as solid icons, which appear as a gray diamond with a data tag consisting of the tail, aircraft type (if known), and gate (if known). Flights that have no track data (e.g., no surveillance data) are shown as hollow icons. An aircraft icon may be relocated by dragging and dropping anywhere on the map. The location of all created and/or repositioned icons is reflected across all connected RTC sector displays.

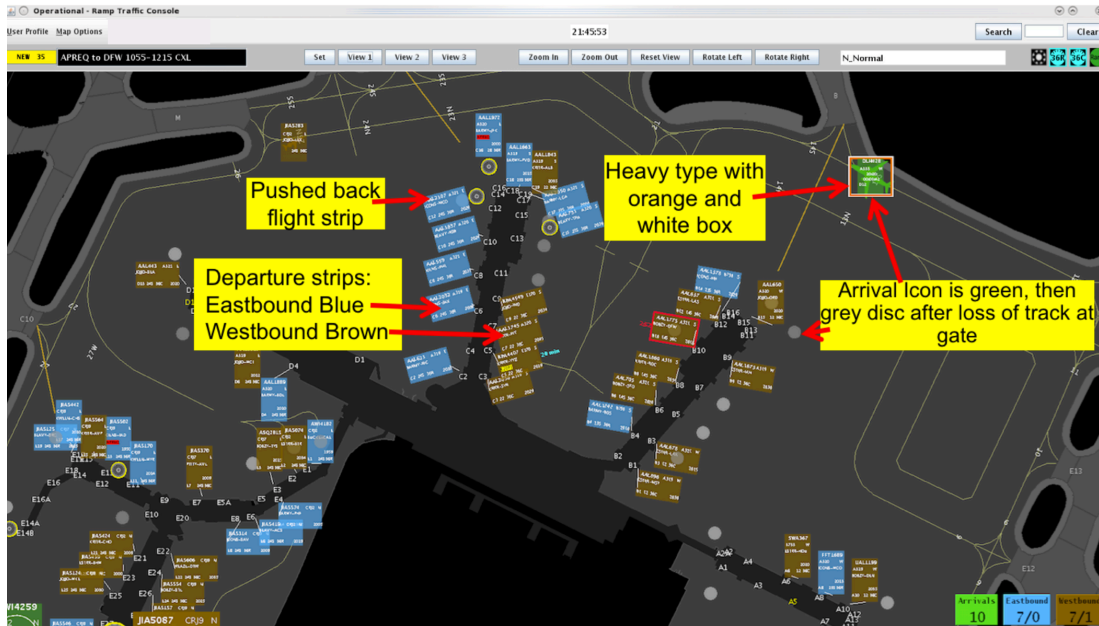


Figure 4.1. Flight Strips and Icons.

To relocate an aircraft target/flight strip:

- Step 1:** Click and hold on aircraft icon/flight strip.
- Step 2:** Drag and drop at new location.
- Step 3:** Deselect by clicking anywhere else on the display.

4.1 Flight Entries and Right Click Menu: Updating flight state

Flight status updates are reflected on the RTC as well as throughout the entire ATD-2 system. Flight status updates aid the situational awareness of controllers as well as update the state of the entire system including STBO. When a flight requests pushback approval and the pushback entry is made for that flight, then the system updates with this data - the flight has called ready and it has been given pushback approval. The entire ATD-2 system reflects the updated state of each flight accordingly. Thus, providing these flight status inputs to the system is important to keep the ATD-2 system and other tools dependent on this information up to date.

To check or change information/status on a flight strip:

Step 1: Click on or hover above a flight strip or icon to enlarge (“bloom”) it (providing that option has been turned on in ‘map options’).

Step 2: While selected, hitting a right click brings up a context menu to modify flight information/status (Figure 4.2).

Step 3: Deselect enlarged flight strip by clicking anywhere else on the display.

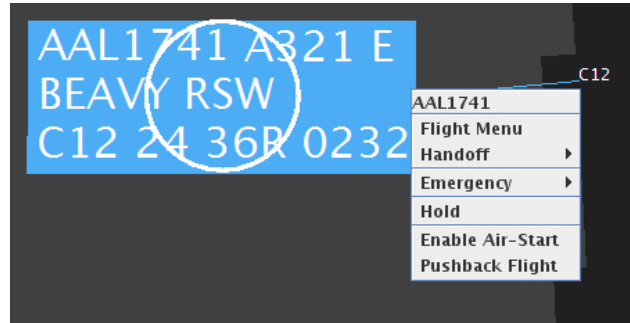


Figure 4.2. Example Right Click Mouse Menu.

4.1.1 After the flight calls ready to pushback

When a pilot calls that a flight is ready to pushback, the flight status will need to be changed. Use the right click menu to change the state of the flight (Figure 4.2).

To change flight status when a flight calls ready to pushback:

Step 1: Click on or hover above a flight strip or icon.

Step 2: Right click to bring up a context menu.

Step 3: Select ‘Pushback Flight’, ‘Enable Air-Start’, or ‘Hold’. Flight state will change to reflect the selection.

Flight states Pushback, Proceed to Spot, Enable Air-Start, Hold, and the Emergency functions have an Undo function to revert the flight back to its previous state. The undo function can be accessed from the flight strip right-click menu (Figure 4.3).

To undo a flight state:

Step 1: Click on or hover above a flight strip or icon.

Step 2: Right click to bring up a context menu.

Step 3: Select the appropriate ‘Undo’ or ‘Disable’ function to revert the flight state.

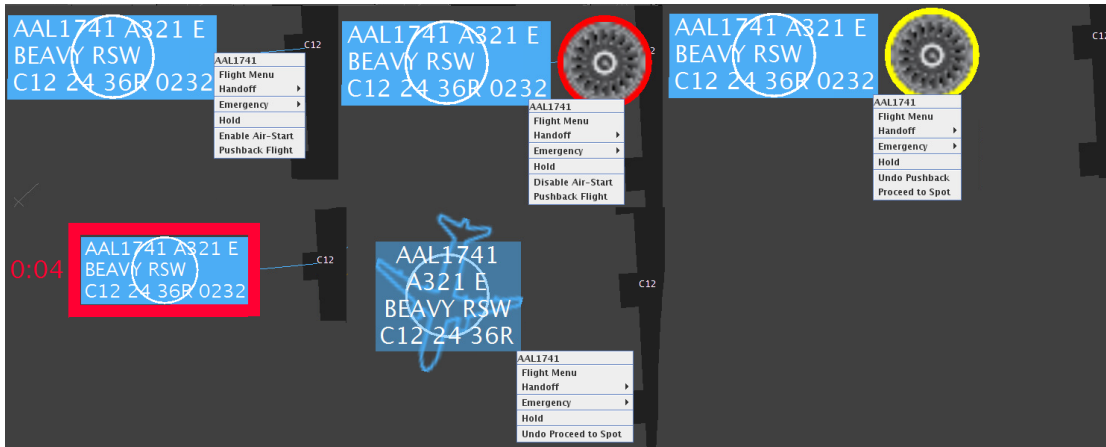


Figure 4.3. Right click mouse menus to access Undo.

4.1.2 During Pushback

The flight strip will indicate a pushback status with an engine icon encased in a yellow circle (Figure 4.4). The right click menu that appears will now have different options to make further changes.

To change flight status when a flight has pushed back:

Step 1: Click on or hover above a flight strip or icon.

Step 2: Right click to bring up a context menu.

Step 3: Select 'Proceed to Spot', 'Undo Pushback', or 'Hold'. Flight state will change to that selected.

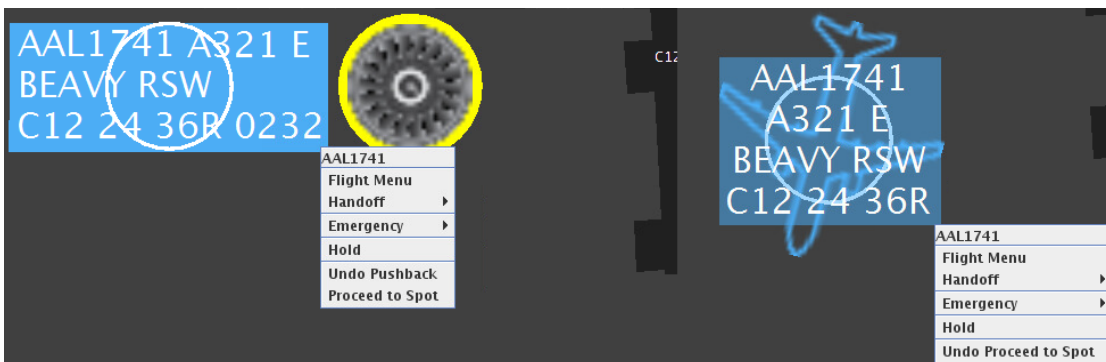


Figure 4.4. Right Click Mouse Menu for the pushback state.

4.1.3 Proceed to Spot

When 'Proceed to Spot' is selected, the flight strip will change to an aircraft icon (Figure 4.4). The right click menu that appears will have different options to make further changes.

To change flight status when a flight has been told to proceed to a spot:

Step 1: Click on or hover above a flight strip or icon.

Step 2: Right click to bring up a context menu.

Step 3: Select 'Undo Proceed to Spot' or 'Hold'. Flight state will change to that selected.

4.1.4 Enable Air-Start

When 'Enable Air-Start' was selected in the right-click menu, the flight strip changes to indicate an air-start status with an engine icon encased in a red circle (Figure 4.5).



Figure 4.5. 'Enable Air Start' Right Click Mouse Menu.

Note: Any flight status in Air-Start may be updated into a Pushback, and a Pushback may also be updated to an Air-Start.

To change flight status when an engine air-start has been enabled:

Step 1: Click on or hover above a flight strip or icon.

Step 2: Right click to bring up a context menu.

Step 3: Select 'Pushback Flight', 'Disable Air-Start', or 'Hold'. Flight state will change to that selected.

4.1.5 Emergency

The Emergency right mouse menu option has been separated into a Medical Emergency and a general (non-medical) Emergency. Flights with a medical or general emergency may be updated to indicate an emergency. Flights flagged as a medical emergency will have a data tag of red text on a white background, plus a '+' icon before and after the first line of the data tag. Flights flagged as a generic emergency will have a similar timeline tag, except the icon is a '!' displayed in black instead of red (Figure 4.6).

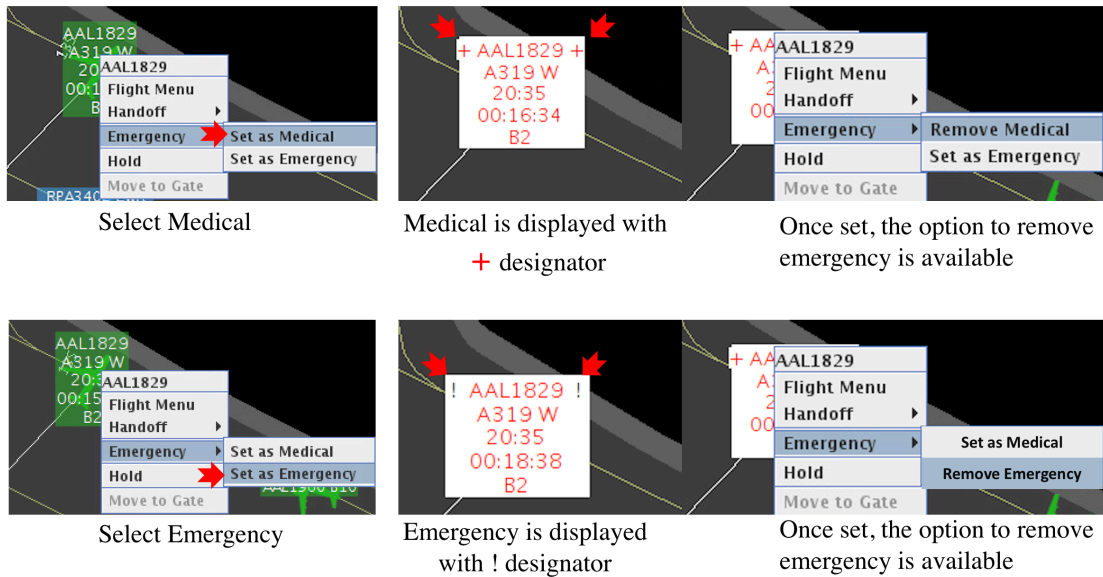


Figure 4.6. Emergency Flight, Medical and General Emergency.

To mark a flight as a medical emergency:

- Step 1:** Click on or hover above a flight strip or icon (Figure 4.6).
- Step 2:** Right click to bring up a context menu.
- Step 3:** Hover over 'Emergency' to bring up the Emergency dropdown menu.
- Step 4:** Select 'Set as Medical' to assign a medical emergency state to the flight. A confirmation dialog box will appear.
- Step 5a:** Accept the confirmation prompt and the flight strip will be displayed in the red on white scheme with a '+' designator.
- Step 5b:** Alternately, click the 'Cancel' button to end the medical emergency settings without applying the change.
- Step 6:** If the emergency status has to be removed, once a flight is marked as a medical emergency, you can repeat steps 1-3 above, then select either 'Remove Medical' to remove the emergency setting or 'Set as Emergency' to change the flight setting to a general emergency.

To mark a flight as a general emergency:

- Step 1:** Click on or hover above a flight strip or icon (Figure 4.6).
- Step 2:** Right click to bring up a context menu.
- Step 3:** Hover over 'Emergency' to bring up the Emergency dropdown menu.
- Step 4:** Select 'Set as Emergency' to assign a general emergency state to the flight. A confirmation dialog box will appear.

Step 5a: Accept the confirmation prompt and the flight strip will be displayed in the red on white scheme with a ‘!’ designator.

Step 5b: Alternately, click the ‘Cancel’ button to end the general emergency settings without applying the change.

Step 6: If the emergency status has to be removed, once a flight is marked as a general emergency, you can repeat steps 1-3 above, then select either ‘Remove Emergency’ to remove the emergency setting or ‘Set as Medical’ to change the flight setting to a medical emergency.

4.1.6 Icon and Symbology Displays and Interactions

The different colors, symbols, and flight state definitions are shown in Figure 4.7.

Flight Icon colors:

Icon Color	Description
Green	Arrival flight
Blue	Eastbound departure
Brown	Westbound departure
Magenta	Gate conflict

Icon Display/Symbology:

Icon Display/Symbol	Description
Grey disc at gate	Aircraft icons are displayed for terminal arrivals after the arrival flight expires.
Yellow engine symbol	Flight is in the pushback/spool up state
Red engine symbol	Flight is labeled for air start
Solid plane icon	Flight has tracked surface surveillance data
Hollow plane icon	Flight has lost /does not have/has not yet received track surface surveillance data

Flight Strip/Icon Border colors:

Border Color	Description
Orange and white	‘Heavy’ flights
Blue and white	‘757 type’ aircraft
White	‘Super’ heavy type aircraft
Green	Priority flights. Flights are designated as priority flights using the ramp manager’s list feature (refer to section 0)

	or by the sector controller by using the Flight Menu (refer to section 0).
Yellow	Hardstand Assignment (see section 5.1 and section 4.1.7.1)

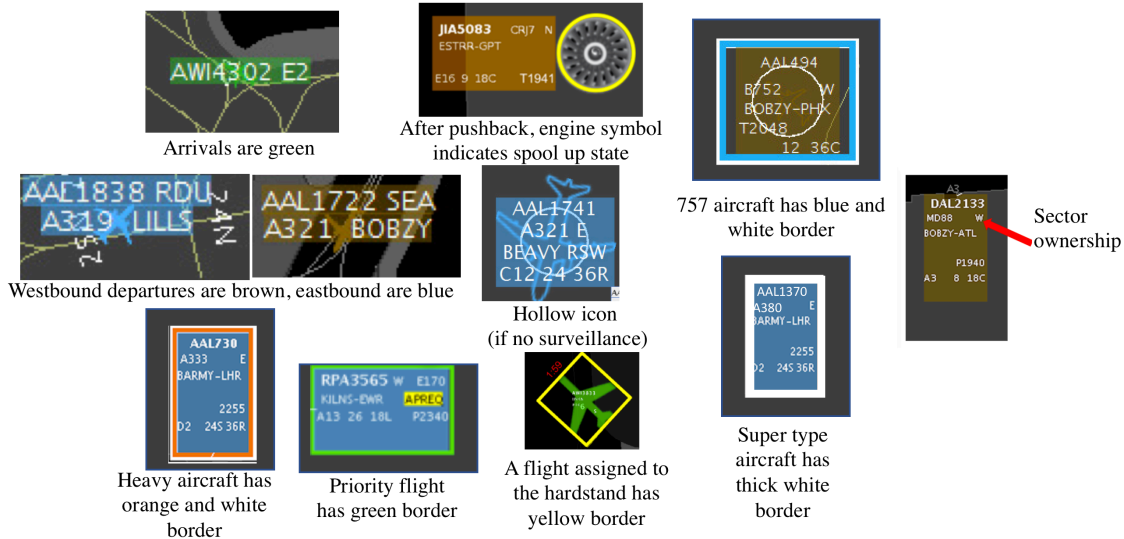


Figure 4.7. Flight States.

To interact with an arrival flight:

Step 1: Click on any arrival flight to draw a tether line to its assigned gate.

Step 2: To assign a flight to a hardstand, open the flight menu by double clicking on the flight, or by selecting ‘flight menu’ from the right click context menu, and use the ‘Flight Menu’ to make the assignment.

To interact with a departure flight:

Step 1: Click on the engine symbol of any departure flight that has pushed back to move that flight to the spot.

Step 2: To assign a flight to a hardstand, open the flight menu by double clicking on the flight, or by selecting ‘flight menu’ from the right click context menu, and use the ‘Flight Menu’ to make the assignment.

A hollow flight icon indicates no track or surveillance data. Once track data is available for a hollow flight, the flight will reappear or snap to the current location as a solid icon.

If a flight has no track data, it may be useful to drag and drop the hollow icon to move it to the “known” location for situational awareness. Placing a hollow flight at the known location may help maintain situational awareness of the flight until tracking data is available. A yellow border, along with the TMAT countdown timer (if appropriate), is added when an untracked/hollow target is dragged into the hardstand. It is not possible to reposition flights that have track (solid icon) or flight strips still at the gate.

To relocate an aircraft target

Step 1: Click on untracked flight icon or active flight strip. A white circle will appear indicating it has been selected (Figure 4.8).

Step 2: To point the aircraft in the desired direction, drag and drop an icon or flight strip from inside the white circle, then select the area of the icon outside the circle to rotate the icon to the desired nose orientation.

Drag and drop at new location.

Step 3: The adjustments of the position and orientation of the hollow untracked icon and pushed back flight strip will be reflected on all of the other ramp sector and ramp manager displays.

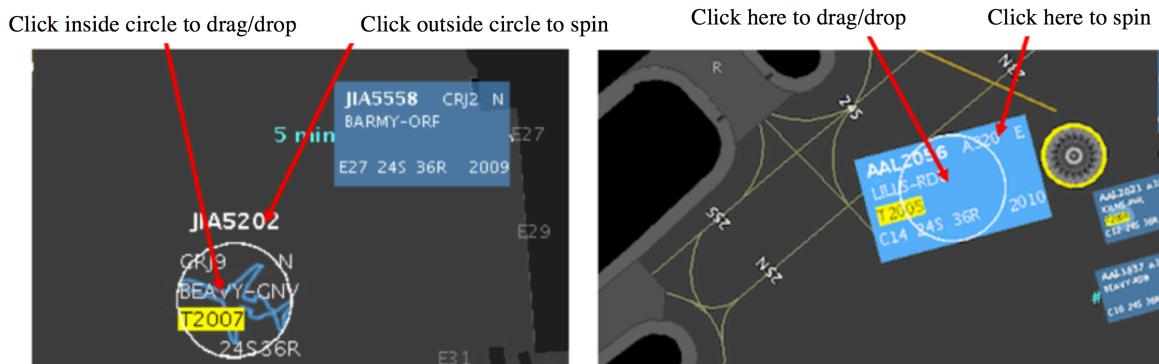


Figure 4.8. Drag and drop/rotate flight strip and icon.

Arrivals are displayed as grey discs at the gate after loss of track data (Figure 4.9). For turnaround flights, the next departure flight strip is displayed up to an hour prior to the airline scheduled departure time, or when the system has acquired data regarding the flight (Figure 4.10).

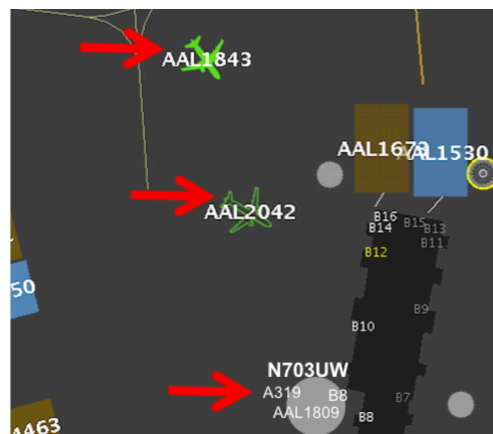


Figure 4.9. Arrivals. Solid green icon for surface surveillance tracked flights, hollow green icon when no longer tracked by surface surveillance, and grey disc when it arrives at the gate.

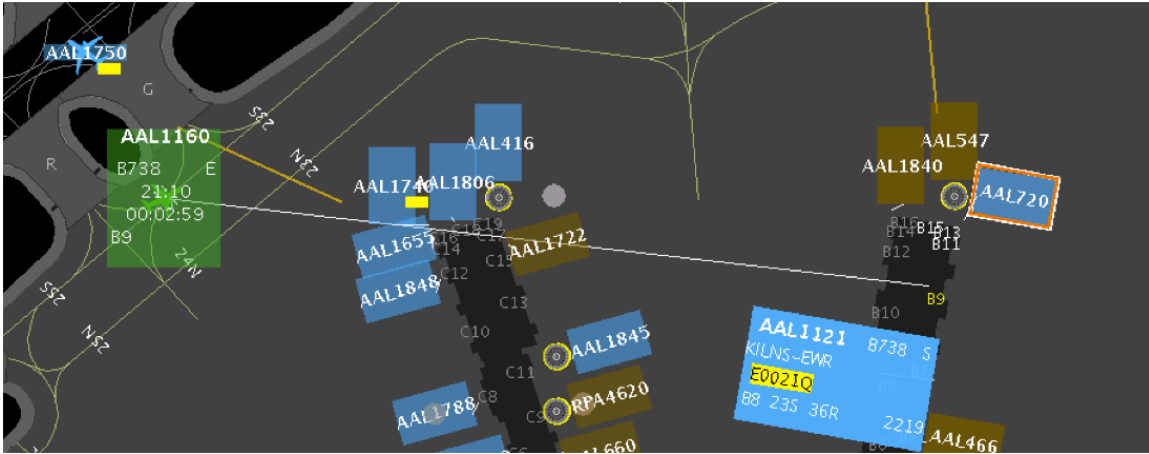


Figure 4.10. Arrivals with timers.

To view arrival flight data:

Step 1: Click on or hover over the grey arrival disc to view arrival flight data, such as flight number, tail number if available, On time, and duration of taxi.

4.1.7 Display of TMIs and Airspace Constraint Information on Flights

If applicable, TMI Information and other constraints are displayed on the flight strip for each flight (Figure 4.11). Alerting is provided for new and/or updated APREQ, EDCT, and MIT with blinking yellow highlighted TMI information on the flight. Alerts are also provided for departure fix closures, ground stops, and destination airport closures by the display of a blinking red highlight of the departure fix, ground stop, or destination airport on the flight.

To acknowledge a blinking alert:

Step 1: Click on the flight to stop the blinking. The information will remain on the flight in a yellow or red highlighted text box.

TMI and airspace constraint information display on flights (Figure 4.11):

TMI type	Display description
APREQ	<p>Yellow highlighting - Flights under APREQs are indicated by showing APREQ in yellow highlighting on the flight strip. This is for flights that need an APREQ/Call For Release (CFR) time, also known as wheels up time or flow time, but have not yet been scheduled by the ATC Tower.</p> <p>Red highlighting - If a flight is pushed back prior to getting a CFR time, then APREQ will be displayed in red highlighting and blink as an alert that this flight still needs to be scheduled. After the APREQ is scheduled, it will be displayed on the flight strip as 'Ahhmm'.</p>

MIT	Displayed on the flight strip as ‘Mnm’ highlighted in yellow highlighting on the flight strip, where nm specifies the distance in nautical mile.
Metering	Flights that are subject to metering will have TMAT displayed after pushback, without the yellow highlighting (see top of Figure 4.12).
EDCT	Display the EDCT time on the flight strip in yellow highlighting, written as ‘Ehhmm’.
Both APREQ and EDCT	<p>Flights with both EDCT and APREQ show ‘EhhmmQ’ while APREQ wheels-up time is not scheduled. On receipt of APREQ wheels-up time by the system, the EDCT is replaced and only ‘Ahhmm’ is shown.</p> <p>Flights with an EDCT or a scheduled APREQ will be shown with TMAT highlighted in yellow after pushback in the format ‘Thhmm’. This will be shown until the flight has reached the designated spot. Once in the Airport Movement Area (AMA) ‘Ahhmm’ is shown (see bottom of Figure 4.12).</p>
Departure Fix Closures	Indicated by highlighting the fix in red.
Departure Fix changes or Coded Departure Routes (CDRs)	<p>Indicated by the highlighting the display of the fix in yellow.</p> <p>Note: If there is an update to the route, then the yellow background will blink to alert to the change. It is expected that the pilot shall obtain the new route prior to pushback.</p>
Ground Stop (GS)	Indicated by highlighting the destination airport in red.

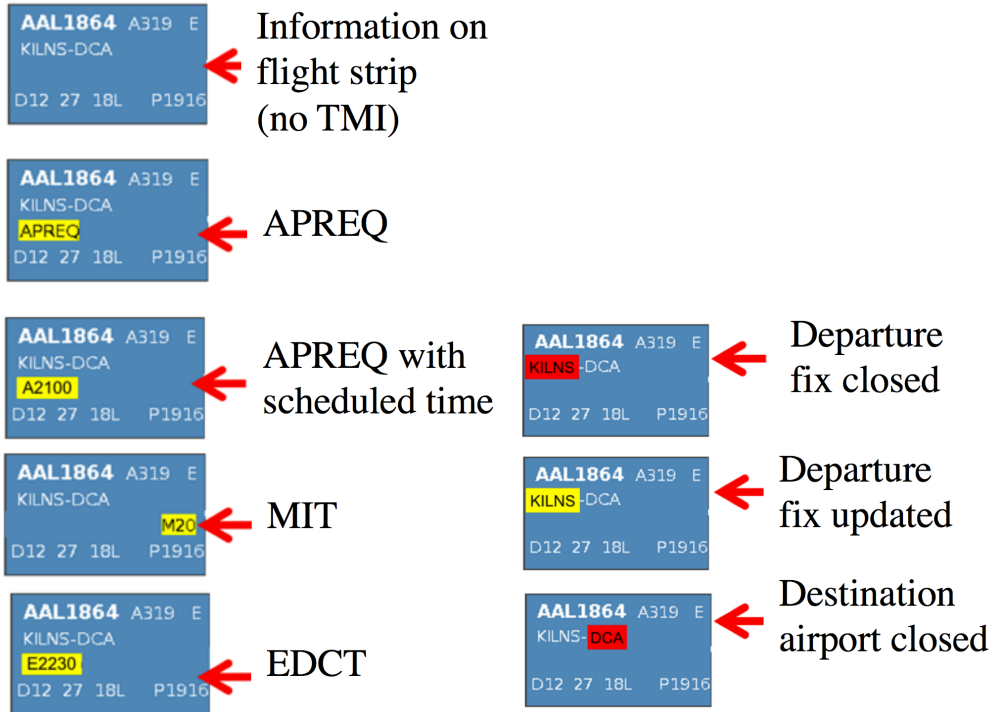


Figure 4.11 Flight Alerts



Figure 4.12. TMAT after pushback (yellow if TMI).

4.1.7.1 APREQ and EDCT flights will have a Release Advisory

APREQ and EDCT flights will always have a recommended hold time (Figure 4.13), based on the release time (i.e., APREQ/CFR release time or EDCT time).

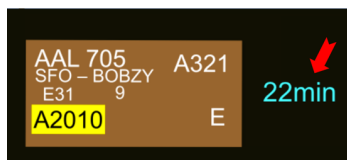


Figure 4.13. APREQ and EDCT Flights: Always Display Hold advisory.

If sent to a hardstand, any flight that has an EDCT or a scheduled APREQ/CFR time will also have a Release Advisory to guide this flight to be released from the hardstand in time to meet the TMAI time which is based on the flight being able to comply with the TMI. The Release Advisory, displayed in cyan blue, will count down to the time the flight should be released to be able to meet the TMAI time (Figure 4.14.). If the flight has not been released from the hardstand prior to the countdown reaching zero, the red Release alert (Figure 4.15) will be displayed for that flight.



Figure 4.14. TMI Flight: Release Advisory.



Figure 4.15. Alert to Release From Hardstand.

5 Flight Menu

The Flight Menu is available for each flight to view and update various flight details for that flight. Using the Aircraft Menu, the user can update the aircraft type, set a scratchpad entry, reposition the icon, set the gate or hardstand, and remove the icon. Note: The L-Time (i.e., LOBT, airline-provided OUT time) has been added to the flight menu. Also note: The hardstand flag must be set/unset using the target creation dialog or the Aircraft Menu; dragging the aircraft icon into/out of the hardstand will not set/unset the hardstand flag because aircraft are not part of the Model update cycle that detects target location.

To open the flight menu for any flight:

Step 1: Double click on a flight strip or icon to open the flight menu for any departure (

) or arrival (Figure 5.2) flight.

or, Use a right click on the flight strip or icon to bring up the right click mouse menu and select 'Flight Menu'.

Step 2: Select the desired menu option(s).

Step 3: Click 'Apply'. Multiple entries may be made on the Flight Menu before selecting 'Apply'.

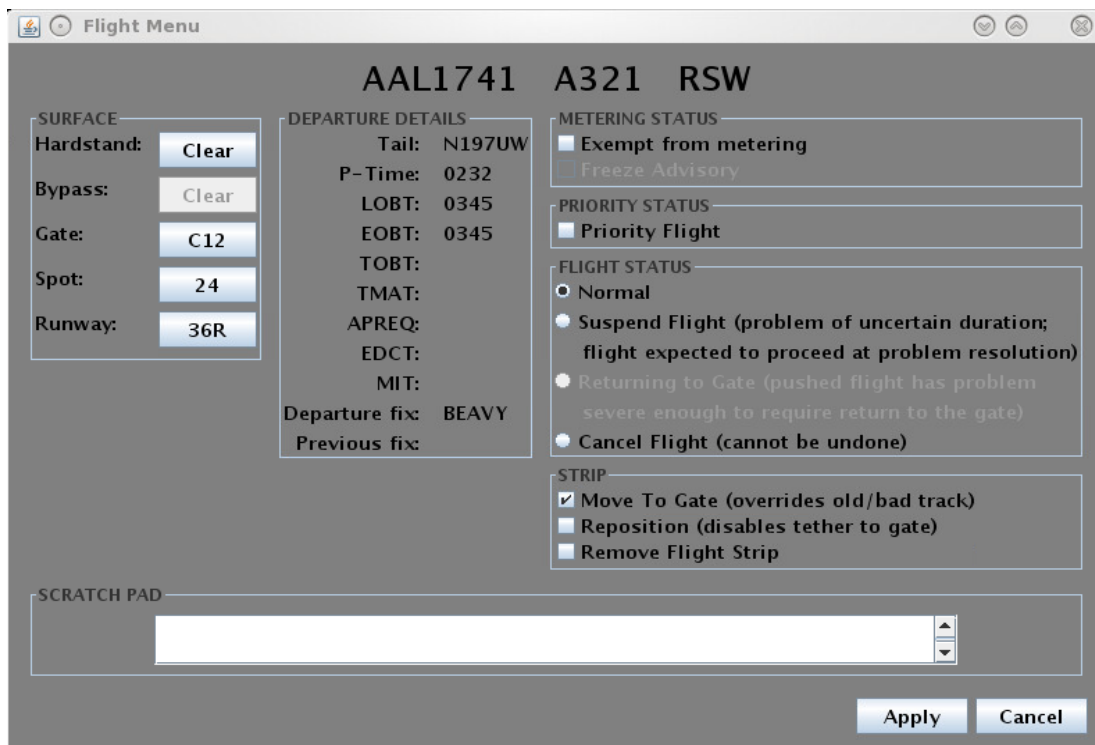


Figure 5.1. Departure Flight Menu.

The flight menu for an arrival flight is slightly different than the flight menu for a departure. The departure flight details do not apply to arrival flights and are therefore greyed out in the arrival Flight Menu. Another example is the 'Move to Gate' option that

is available on the Flight Menu for arrival flights, rather than the ‘Return to Gate’ option for departure flights (Figure 5.2).

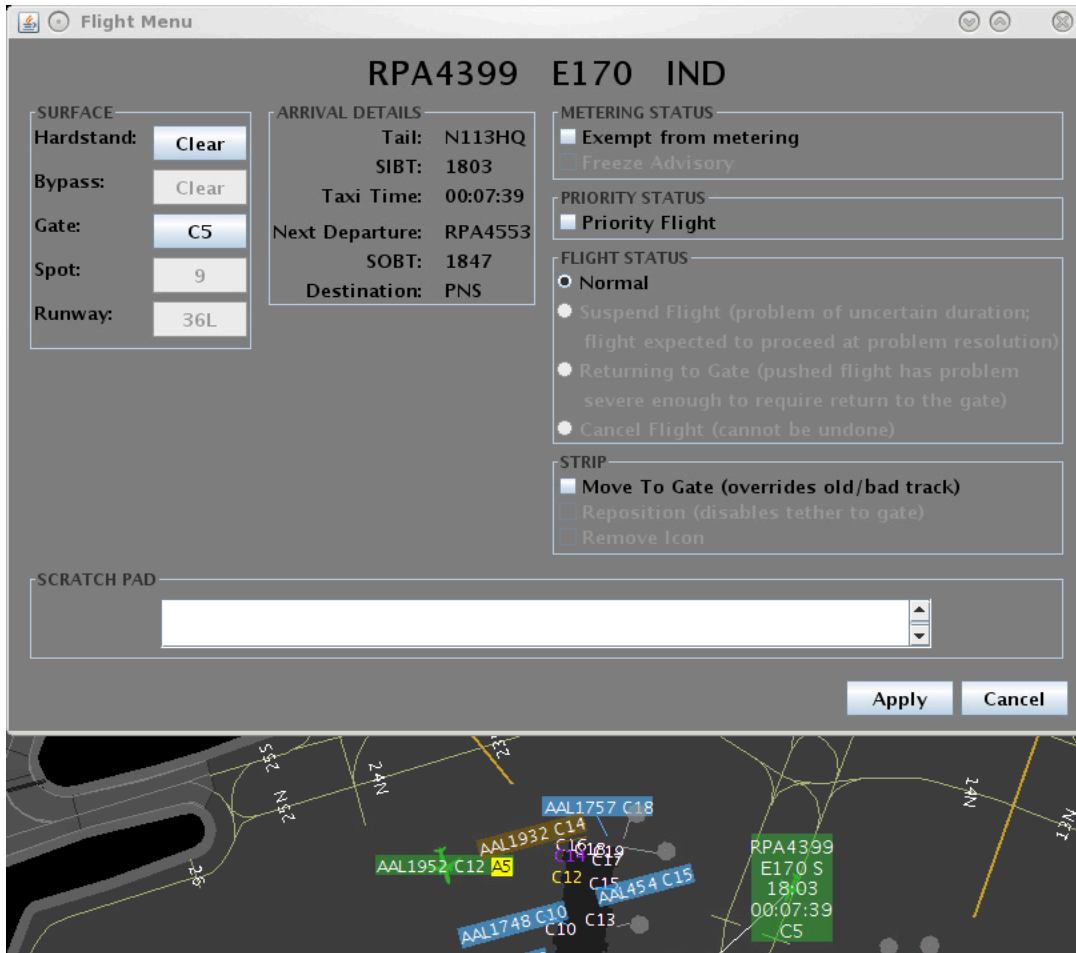


Figure 5.2. Arrival Flight Menu.

Some features on the flight menu may not be available depending on the state of the flight beyond whether it is an arrival or a departure. For example, for arrival flights, it is not possible to change the runway. Also, the ‘Move to Gate’ option for arrivals is not available until the flight is near the gate, and has lost track data. If an arrival has a loss of track data, then the ‘Remove Icon’ option will become available. Departure flights do not have the ‘Return to Gate’ option available to them until after the flight has left the gate.

Any changes made to surface status data elements will be reflected on all system displays including STBO as entered. In the case of an untracked flight (hollow icon), any changes made in RTC using the flight menu are over written once a flight has track data and the data is updated via the system data feed.

5.1 Surface Status Updates

Update a flight’s hardstand, gate, spot, and runway assignment using the Flight Menu Surface data update features (Figure 5.3). Certain updates to a flight (e.g., gate update)

will not be propagated to the rest of the ATD-2 system. Gate updates should still be made in the Gate Manager. Spot updates may impact the scheduler.

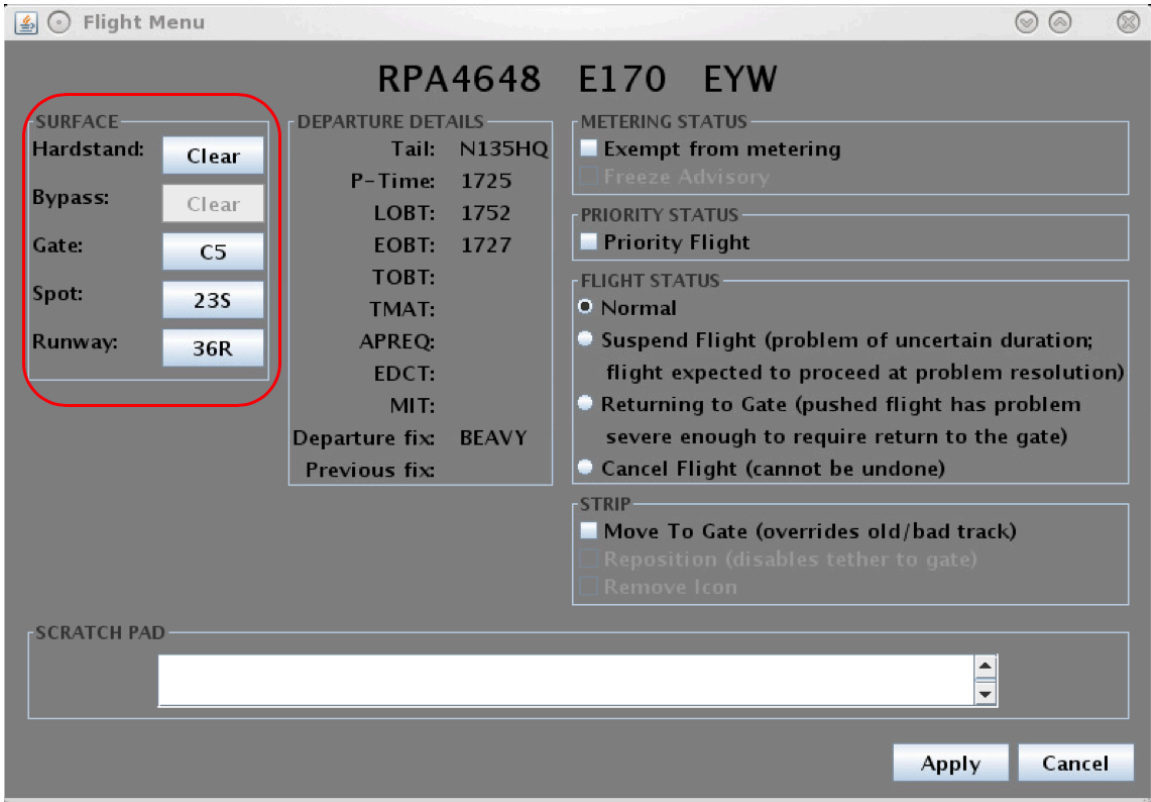


Figure 5.3. Update Surface Flight Data.

To assign a flight to the hardstand (Figure 5.4):

Step 1: Select 'Hardstand' to open the Hardstand menu.

Step 2: Choose 'West' or 'North' hardstand, or choose 'Clear' to remove a hardstand assignment, then select 'Apply' to close the Select Hardstand menu.

Step 3: Select 'Apply' on the Flight Menu to apply the updated hardstand assignment.

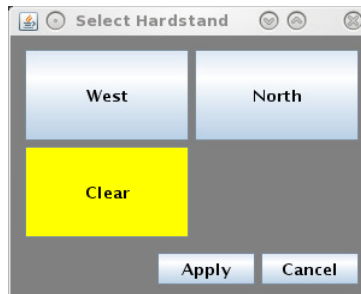


Figure 5.4. Hardstand Assignment.

If a flight is assigned to the hardstand, a yellow box is placed around the flight to mark it as such. If a hardstand assignment is not proactively applied, and the flight is detected in the hardstand, then an automatic hardstand assignment will be placed on the flight. If a hold is placed on any flight in the hardstand, then a red count up timer will display the amount of time the flight has been held, refer to Figure 4.4.

To update the gate assignment (Figure 5.5):

Step 1: Select 'Gate' to open the Select Gate menu.

Step 2: Choose the new gate assignment, then 'Apply'.

Step 3: Select 'Apply' on the Flight Menu to apply the updated gate assignment.

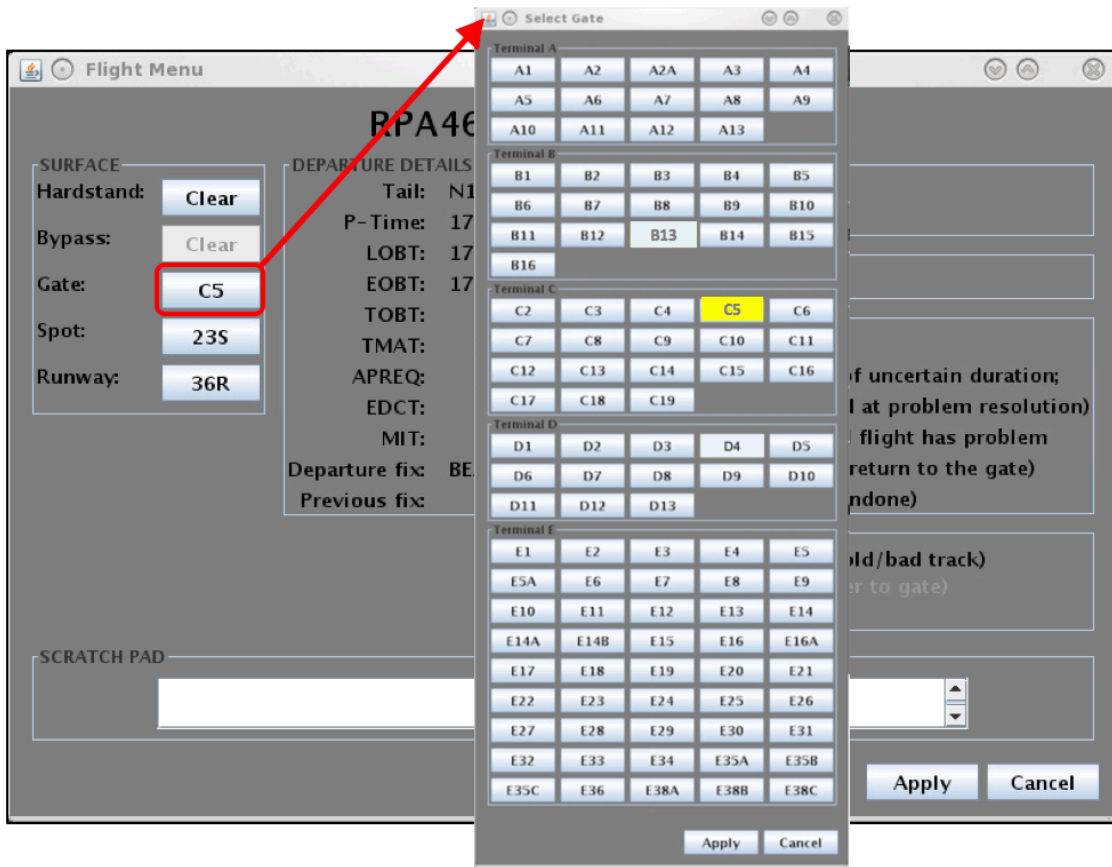


Figure 5.5. Gate assignment.

To update the spot assignment (Figure 5.6):

Step 1: Select 'Spot' to open the Select Spot menu.

Step 2: Choose the new spot, then 'Apply'.

Step 3: Select 'Apply' on the Flight Menu to apply the updated spot assignment.

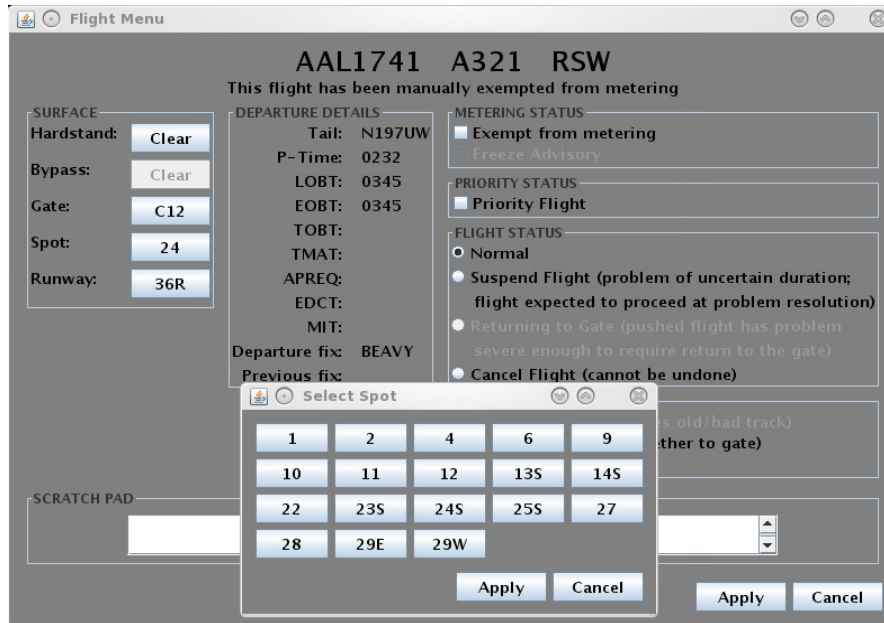


Figure 5.6. Spot assignment.

To update the runway assignment for operational necessity (Figure 5.7):

Step 1: Select 'Runway' to open the Select Runway menu.

Step 2: Select the 'Operational Necessity' checkbox.

Step 3: Select the new runway, then 'Apply'.

Step 4: Select 'Apply' on the flight menu to apply the updated runway information.

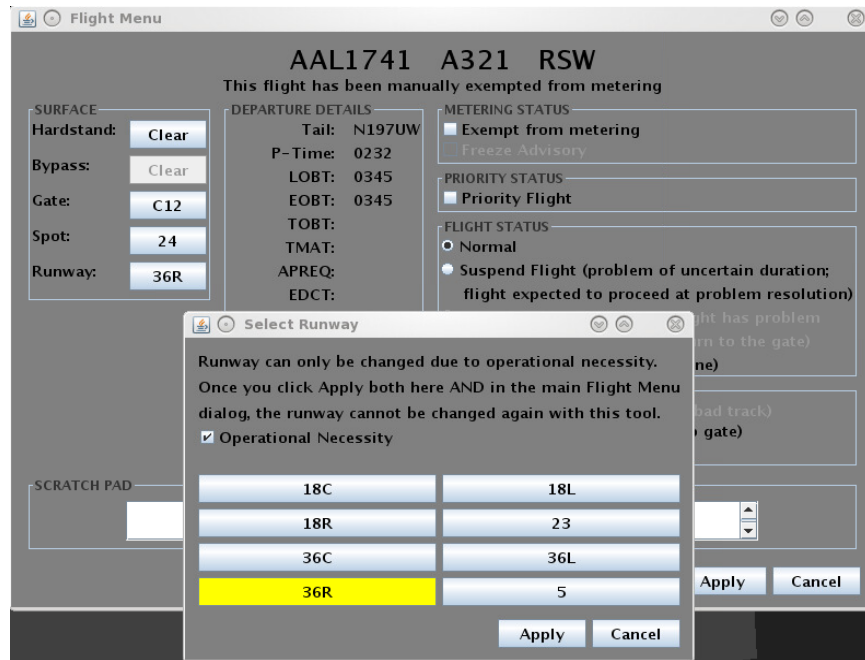


Figure 5.7. Entering a Runway Change for Operational Necessity.

This change may result in a change in the direction of the flight so the flight icon/strip may change from blue to brown, or vice versa, to reflect the updated runway. The runway will be highlighted in green on the flight strip (Figure 5.8). This change will also be reflected on the ATC-T's STBO Client timeline, as the flight will be moved to the new runway timeline. As previously stated, a runway change cannot be made on arrivals.



Figure 5.8. Updated runway assignment for operational necessity highlighted in green.

5.1.1 Departure Details

The 'Departure Details' section of the Flight Menu (Figure 5.9) shows all times associated with the flight and any TMIs pertaining to the flight. The departure fix and any updated departure fix information are also shown here, and described in more detail in the following table.

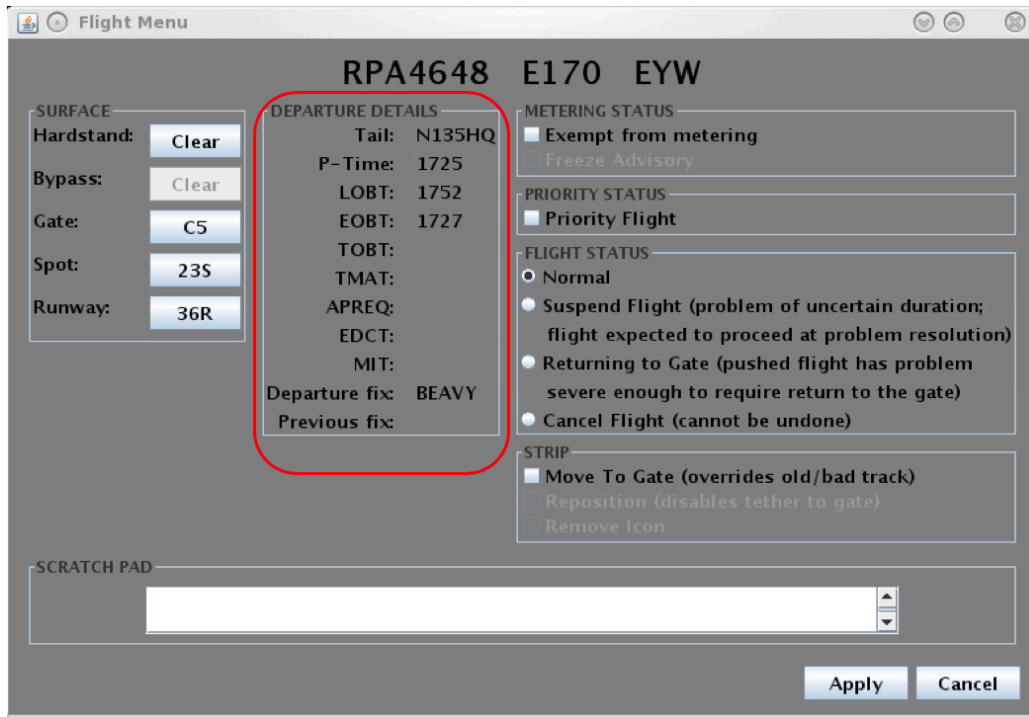


Figure 5.9. Departure Details.

Departure Detail	Description
P-time	the airline scheduled pushback time
EOBT	(Earliest Off Block Time) - the expected pushback time or when the flight will be ready based on airline updates
TOBT	(Target Off Block Time) - the time the tactical scheduler plans for the flight to pushback
TMAT	(Target Movement Area entry Time) - the time the tactical scheduler plans for the flight to be at the spot
APREQ	if the flight is under APREQ/CFR restriction, the release time will be displayed here after the APREQ/CFR is scheduled
EDCT	if the flight is under a Ground Delay Program (GDP), the EDCT will be displayed here
MIT	if there is an MIT restriction for this flight it will be displayed here
Departure Fix	the assigned departure fix for the flight is shown here
Previous Fix	if there was an update to the assigned fix, then the previously assigned fix is listed here

5.1.2 Metering Status, Priority Status, and Flight Status

The status of a flight may be updated using the Flight Menu Metering, Priority, and Flight Status options (Figure 5.10).

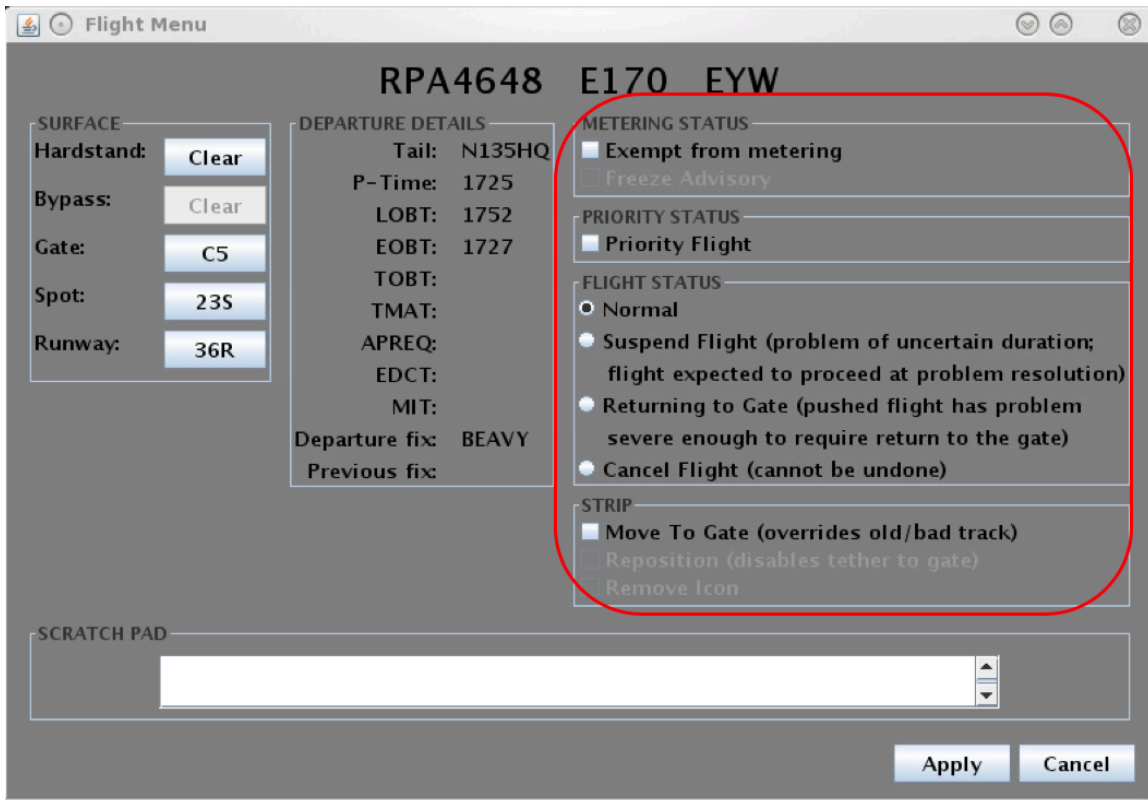


Figure 5.10. Exempting from metering, setting priority, and changing flight status.

A flight may be set to be exempt from Surface Time Based Metering (STBM) by; refer to section 0 for an explanation of Metering Modes. Certain flights may be automatically exempt from metering, such as military or General Aviation flights. International flights are not automatically exempt from metering; they need to be manually marked for exemption.

To set a flight to be exempt from metering (Figure 5.10):

Step 1: Under ‘Metering Status’ in the Flight Menu, select the checkbox in front of ‘Exempt from metering’.

Step 2: Select ‘Apply’ on the flight menu to mark that flight as exempt.

A flight may be designated as a Priority Flight via the ‘Priority Flight’ checkbox. This places the flight on the ramp manager’s Priority Flight List (refer to section 7.2) and places a green border around the flight strip (Figure 5.11).

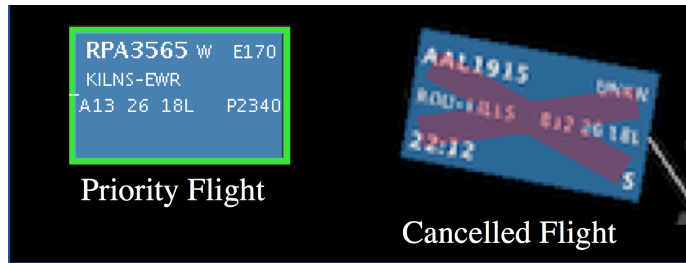


Figure 5.11. Canceled and Priority Flights.

To set a flight as a priority flight (Figure 5.10 and Figure 5.11):

Step 1: Under ‘Priority Status’ in the Flight Menu, select the checkbox in front of ‘Priority Flight’.

Step 2: Select ‘Apply’ on the flight menu to mark that flight as a priority, which adds the green border around the flight strip.

The operational Flight Status for a flight may be updated using the Flight Menu (Figure 5.10). Flight status refers specifically to how the STBM tool considers the flight (refer to section 6). Normal status means the flight is expected to proceed as a normal/ regular flight and is treated accordingly by the STBM. ‘Suspend Flight’ temporarily removes the flight from normal consideration by the STBM tool. This option would be chosen if it is known circumstantially or operationally that there will be a temporary type of delay such as a quickly remedied maintenance issue. ‘Returning to Gate’ is always available for departures that are off the gate. It would be chosen if the flight has a more severe issue that must be addressed or if the departure flight has been mistakenly cleared to proceed. The return to gate option is also available from the right click mouse menu.

To change the flight status (Figure 5.10):

Step 1: Under ‘Flight Status’ in the Flight Menu, select the checkbox in front of either ‘Normal’, ‘Suspend Flight’, or ‘Returning to Gate’.

Step 2: Select ‘Apply’ on the flight menu to change the flight status to the selected option.

If a cancellation status is not received via the data feeds, you may need to cancel the flight. When a flight is cancelled, this action will update the flight status in the ATCT system as cancelled in the flight table. The flight will then time out within a minute and the flight strip will turn grey icon on the display. Once canceled, a flight cannot be recovered unless it is scheduled as a departure flight again. If the flight is again scheduled for departure and the data is received from the data feeds, a flight strip will appear at that gate. The grey icon on the gate can be removed by the Controller using the ‘remove icon’ on the flight menu, or if the underlying flight is deleted automatically by the system, which is currently set to occur 4 hours after it is cancelled.

To cancel a flight (Figure 5.10):

Step 1: Under 'Flight Status' in the Flight Menu, select the checkbox in front of 'Cancel Flight'. This choice cannot be undone once applied.

Step 2: Select 'Apply' on the flight menu to cancel that flight, which places the red X watermark on the flight strip.

5.1.3 Scratch Pad Entry and Strip Changes

The Flight Menu for any flight has a scratchpad feature for adding text to the flight information that is displayed (Figure 5.12).

To add a scratchpad entry:

Step 1: Type text into the 'Scratch Pad' field.

Step 2: Select 'Apply' on the flight menu to add the text to the flight on the RTC display.

The 'Move To Gate' option (Figure 5.12) allows a manual override of old/bad track data.

To move a flight icon to a gate:

Step 1: Under 'Strip' in the Flight Menu, select the checkbox in front of 'Move To Gate'.

Step 2: Select 'Apply' on the flight menu to override the currently displayed track data and move that flight icon to a gate.

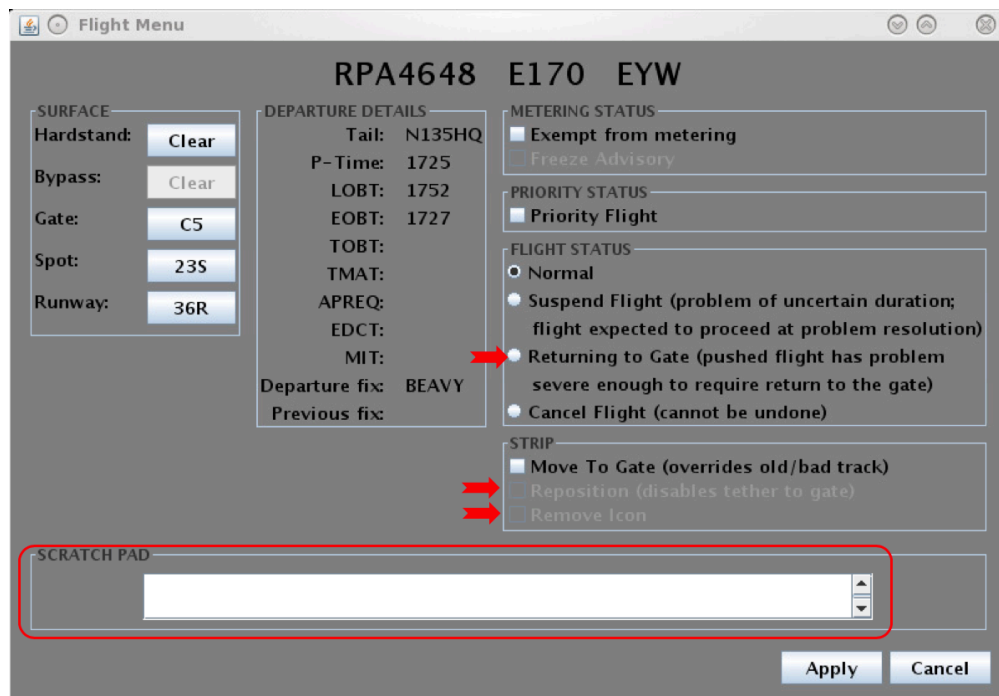


Figure 5.12. Scratch Pad, Return to Gate, and Remove Icon.

The 'Remove Icon' option (Figure 5.12) is greyed out unless a flight has been cancelled or if the flight has landed and has stale position data.

To remove a flight icon:

Step 1: Under 'Strip' in the Flight Menu, select the checkbox in front of 'Remove Icon'.

Step 2: Select 'Apply' on the flight menu to permanently remove the flight from the RTC display.

The 'Reposition' option will remove a flight tethered to the gate, if it is needed to reposition the flight to a hangar or another location on the map (Figure 5.12).

To reposition a flight icon:

Step 1: Under 'Strip' in the Flight Menu, select the checkbox in front of 'Reposition'.

Step 2: Select 'Apply' on the flight menu to disable the tether from the flight to a gate. This places a green Repo identifier on the flight and allows the flight to be moved anywhere on the map.

Step 3: If desired, select a location checkbox (e.g., Hangar, South Cargo, West Hardstand) to automatically move the flight to that location, or simply select a location on the map.

Step 4: To reposition the flight to the assigned gate, uncheck the 'Reposition' check box. This will tether the flight back to the assigned gate and remove the green Repo identifier.

6 Metering

The Surface Time Based Metering (STBM) mode provides tactical gate hold recommendations generated by the scheduler based on multiple inputs, including scheduled departure times, EOBTs, nominal taxi times, and demand at the runway.

6.1 Surface Time Based Metering (STBM)

STBM is ATD-2's surface metering tool to alleviate surface congestion. The tool provides gate hold recommendations for flights that are expected to be treated as advisories for the ramp controller. STBM meters departures at the gate and provides gate hold advisories based on a selected target excess queue time (i.e., excess taxi time) to the runway and meters independently for each departure runway. The excess queue time is the acceptable amount of additional taxi time the departures may spend while they are taxiing on the surface and waiting in the runway queue before taking off. When the demand from the ramp is predicted to exceed the set value, the STBM starts recommending hold times at the gate.

The STBM uses Earliest Off Block Times (EOBTs) and un-delayed taxi time estimations to predict when aircraft will arrive at the runways. Based on these predictions and operational constraints, STBM generates a schedule that calculates Target Takeoff Times (TTOTs) at the runways, Target Movement Area entry Times (TMAT) at the spots, and Target Off Block Times (TOBT) at the gates. The TOBT is used to provide gate hold recommendations.

The metering tool considers the demand and capacity imbalance for every departure runway before recommending gate holds. It may be observed, at times, that there are no gate holds recommended for flights departing from one runway, while at the same time there are gate holds recommended for flights departing from another runway. STBM takes into consideration several variables - APREQs, EDCTs, taxi time estimates both in the ramp and the AMA, gate pushback duration estimates, flight spacing requirements based on the type of runway operations (e.g., converging runway operation, dual use runway operation, runway crossing), and use of EOBT quality to determine level of certainty - to generate a runway schedule for departures and their corresponding gate hold recommendations (described in section 6.2).

The tactical surface scheduler is expected to run all the time in the background. However, metering can be enabled or disabled and can be triggered on and off (i.e., display and use recommended gate hold time advisories; see section 3.6.3 and Figure 3.20) according to the strategy being used to manage the demand/capacity imbalances. RTC displays STBM recommended gate hold times or push advisories in a cyan blue text adjacent to the flight strip (Figure 6.1).

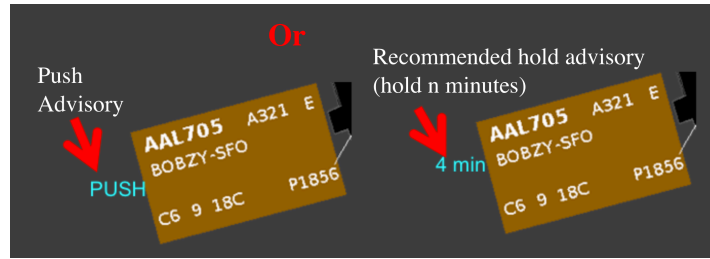


Figure 6.1. STBM Advisories.

6.1.1 Exempt flights

Exempt flights are flights that will not be subject to recommended gate holds. For example, both international and general aviation (GA) flights may be included in this flight category. An exempt flight will not display any guidance or gate holds from the surface metering tool, allowing the ramp controller to push or hold the flight as they deem fit when the pilot calls in ready for departure. Ramp Control can designate a specific flight as an exempt flight on either the RTC or the RMTC by using the Flight Menu (section 5.1.2).

6.1.2 Priority Flights

Priority flights are scheduled ahead of other flights within the same airline during surface metering. Ramp controllers may not see the change in the recommended hold time of a priority flight, until the pilot calls and the flight is in a hold. The Ramp Manager can create a list of priority flights on the RMTC (see section 6.1.3), or the Ramp Controllers can designate a flight as a priority flight using the Flight Menu on the RTC (section 5.1.2).

6.1.3 TMI Flights

TMI flights (e.g., EDCT, APREQ/CFR flights) are *not* subject to surface metering in order to avoid a potential double delay due to both metering and the TMI restriction. However, recommended gate hold or push advisories for TMI flights will *always* be displayed on the RTC (once the wheels-up time has been negotiated) regardless of whether surface metering is turned on or off, in order to assist the ramp controller to release flights so that the flights comply with their wheels-up time (see section 4.1.7.1). Once the flight pushes back, instead of the APREQ or EDCT times, a TMAT will be shown with a yellow background on the flight strip. Note that a large number of TMI flights in the system will impact the overall demand and may increase gate hold times for flights that are subject to metering.

6.1.4 Suspend a Flight

If there is a problem with a flight of uncertain duration, but the flight is expected to proceed after resolution of that problem (i.e., a short term mechanical issue), the flight should be suspended to remove it from the scheduling consideration temporarily. After resolution of the issue, the flight status should be reset to normal for the flight to proceed as usual. **Error! Reference source not found.** This prevents the scheduling computation from holding a place for the flight until it is more certain and predictable when that flight

will be ready. Ramp Control can suspend a specific flight on either the RTC or the RMTC by using the Flight Menu described in section 5.1.2.

6.1.5 EOBTs and Gate Hold Time Advisories

STBM takes Earliest Off Block Times (EOBT) (which can also be described as a flight's estimated ready time) and uses these times to generate gate hold advisories. EOBT is being calculated by the airline based on various factors (e.g., percentage of passengers boarded, baggage loaded, and more). The cyan text beside the flight strip indicates a Push advisory (Figure 6.5). When a flight calls for pushback, if the flight has a Push Advisory, give pushback approval (AAL705, pushback approved, expect 18C"). Slide strip away from the gate or use right click menu to select pushback. The engine symbol appears to indicate spool up state.

To act on a Push advisory:

Step 1: Slide strip away from the gate or use right click context menu and select 'Pushback'. An engine symbol appears to replace the 'PUSH' advisory next to flight strip to indicate spool up.

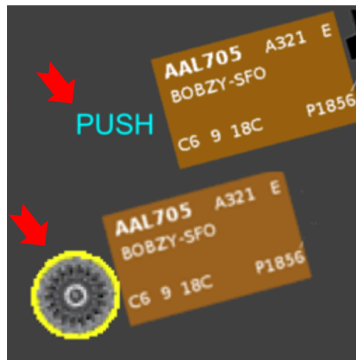


Figure 6.2. The Push advisory for flights prior to pushback. After pushback, the spool up symbol appears next to the flight strip.

If STBM recommends a gate hold, a cyan timer (indicating recommended hold time) will appear next to the flight strip and will proceed to count down (Figure 6.6).

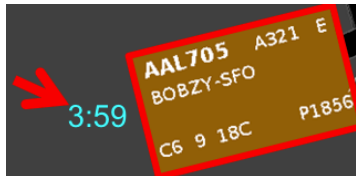


Figure 6.3. Recommended Hold Time.

When the timer expires, pushback is recommended (Figure 6.7). See Step 1 above to act on that Push advisory.



Figure 6.4. Pushback is recommended when timer expires.

If the flight is not pushed back, a red push alert is displayed and red timer begins counting up (Figure 6.8).



Figure 6.5. A red push alert and count up time.

If it is needed, add time to the hold to allow additional time to execute the pushback (Figure 6.9).

To add time to the hold:

Step 2: Use the right click menu and click on ‘Add 2 min Hold’, ‘Add 5 min Hold’, or ‘Add 10 min Hold’.

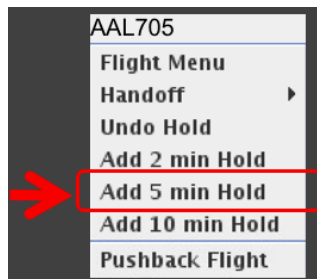


Figure 6.6. Use right click mouse to add time to the hold.

Figure 6.10 shows an additional 5 minutes has been added to the hold time. Adding time to the hold informs the schedule of the intent for the flight.



Figure 6.7. Adding time to the hold increases the time on the timer.

7 RMTC

The Ramp Management Traffic Console (RMTC) is designed to support the ramp manager's role. It provides the same RTC functions as described in the previous sections, plus additional functions that pertain to the ramp manager.

The functions available to the Ramp Manager are listed under the 'Tools' menu in the upper left side of the RMTC (Figure 7.1). This menu gives access to: 1) the operational status of the ramp and 2) the list of priority flights.

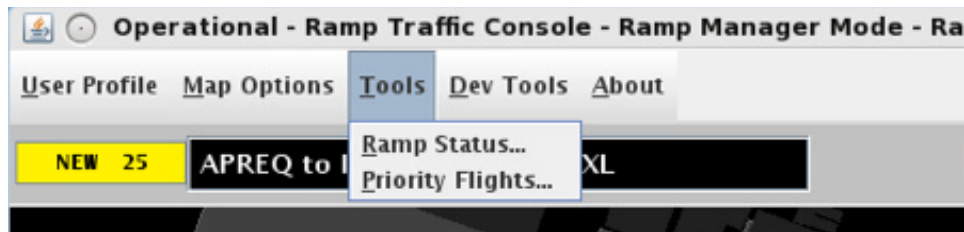


Figure 7.1. Functions under the 'Tools' menu.

7.1 Ramp Status

The default ramp status is 'Open' when the RMTC is launched. As part of the data exchange between the Ramp and the Tower, the ramp manager can use the RMTC to indicate any change in operational status of the ramp. The change in status is then reflected on both the RTC and the STBO Client. One of three ramp status options may be selected: Open, Pending Closure, and Closed. Once one of these is selected, the icon showing ramp status is updated and a notification is issued.

Note that the STBM scheduler will *not* know the impact of the ramp closure, and thus gate hold times may no longer make sense. These gate hold times can be removed by turning off STBM.

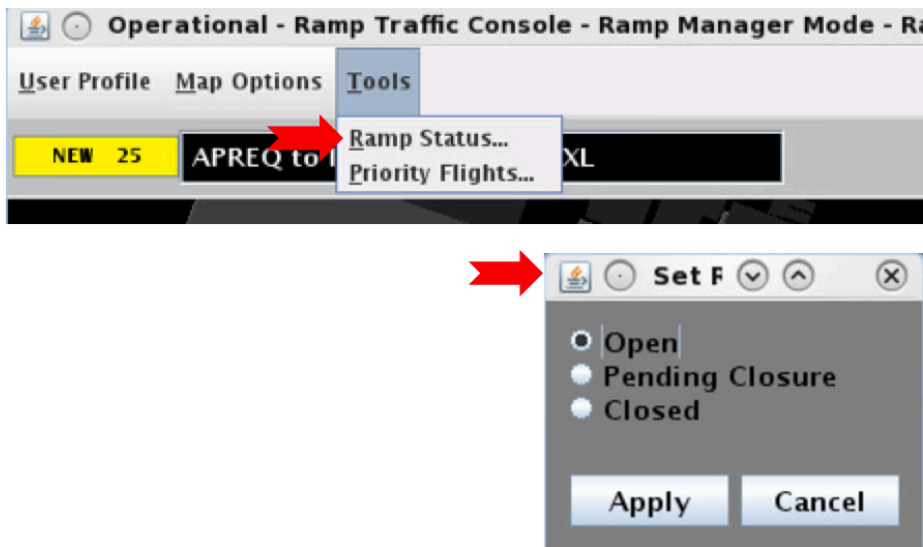


Figure 7.2. Set Ramp Status window.

To change the Ramp Status:

Step 1: Click on ‘Tools’. A drop down menu will open (Figure 7.2).

Step 2: Click on the ‘Ramp Status’ option. The Set Ramp Status window will populate on the display.

Step 3: Select radio button for the desired option:

- When the ramp is expected to close, click on ‘Pending Closure’.
- When the ramp is effectively closed, click on ‘Closed’.
- When the ramp is open, click on ‘Open’.

Step 4: Click on ‘Apply’. The Ramp Status Icon will update to reflect the new ramp status (Figure 7.3). The new ramp status will be displayed in the Notification banner and the Notification Panel (Figure 7.4 and Figure 7.5) on the upper right side of the RTC and RMTC and on the STBO Client.

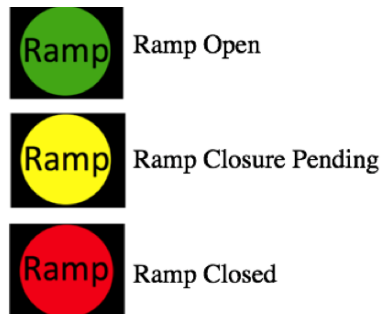


Figure 7.3. Icons indicating the ramp status.

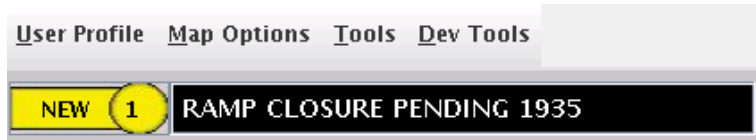


Figure 7.4. Notifications Icon and Banner.

Reported	Event Type	Description	Event Start	Event End
6/9/17 1935	Ramp	RAMP CLOSURE PENDING	6/9/17 1935	
6/9/17 1918	TMI	APREQ to IAH	6/9/17 1910	6/9/17 2015
6/9/17 1838	Airport	VMC	6/9/17 1838	
6/9/17 1838	Airport	S_Normal	6/9/17 1838	
6/9/17 1838	Airport	South_Conv	6/9/17 1838	
6/9/17 1806	Airport	VMC	6/9/17 1010	

Figure 7.5. Notification panel.

7.2 Priority Flights List

The RMTC provides the ability to manage a list of priority flights. Departure flights added to the priority list are given higher priority by the scheduler. For instance, when metering is turned on, the scheduler will give the priority flights the first available slots in the schedule and thus reduce their recommended gate hold times to the minimum values. A note can be added in this window when flagging a priority flight. This note will show up in the scratch pad of the flight's data tag and in its Flight Menu.

The panel provides a drop-down list of all available flights in the system from which you can set a flight as a priority flight (first image, Figure 7.6), as well as a list of flights that have already been added to the priority list (second image, Figure 7.6). Flights are listed by alpha-numerical order, and the list contains both departures and arrivals. Note that even though arrivals are listed here, arrivals are not scheduled by the STBM scheduler.

To add a flight to the priority list:

Step 1: Click on 'Tools' (Figure 7.6). A drop down menu will open.

Step 2: Click on 'Priority Flights'. The Priority Flight List window will populate on the display.

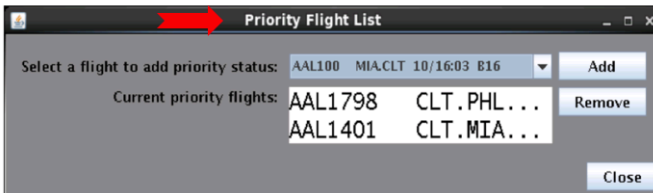
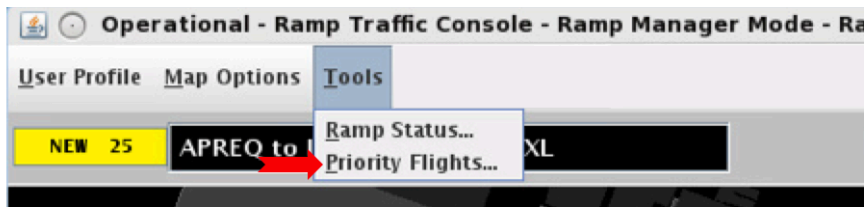


Figure 7.6. Priority Flight List window.

Step 3: Open the list of all flights by clicking on the downward arrow after 'Select a flight to add priority status:' (Figure 7.7).

Step 4: Select the desired flight from the list of all flights. For example, Figure 7.7 shows AAL730 in the list of flights, before it is added to the priority list.

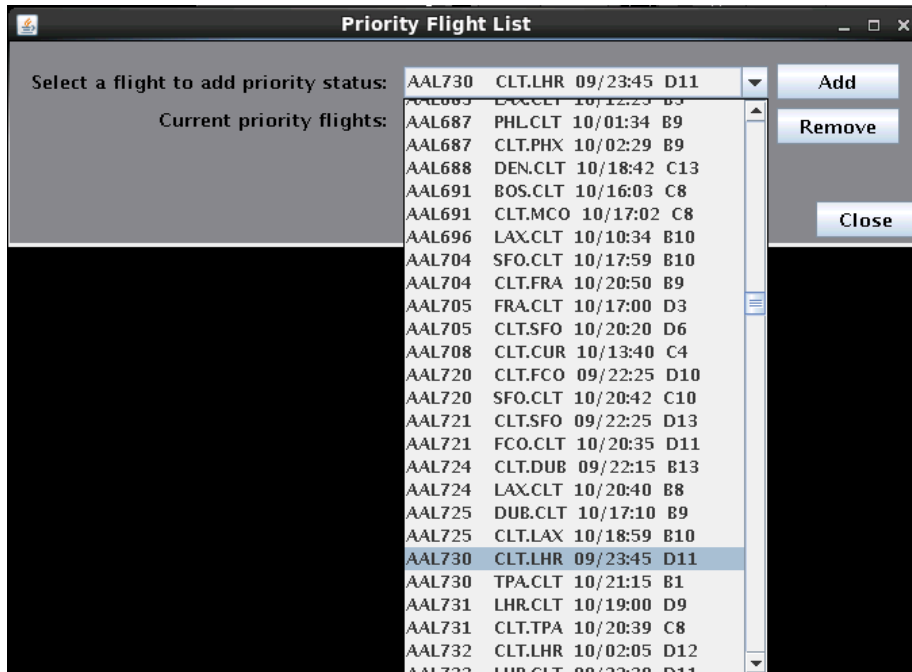


Figure 7.7. List of all flights in the Priority Flight List window.

Step 5: Click on the 'Add' button to add it to the list. Figure 7.8 shows AAL730 listed as a priority flight.

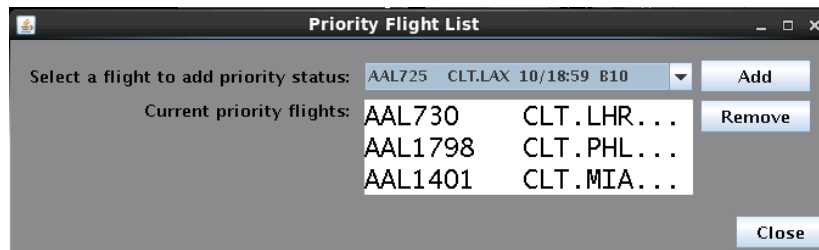


Figure 7.8. Three flights are in the Current priority flights list.

Step 6: Repeat steps, as needed, to add all priority flights to the list. Once flights are on the priority list, a green border appears around the flight strip (Figure 7.9).

Step 7: Click 'Close' to close the 'Priority Flight List' window.

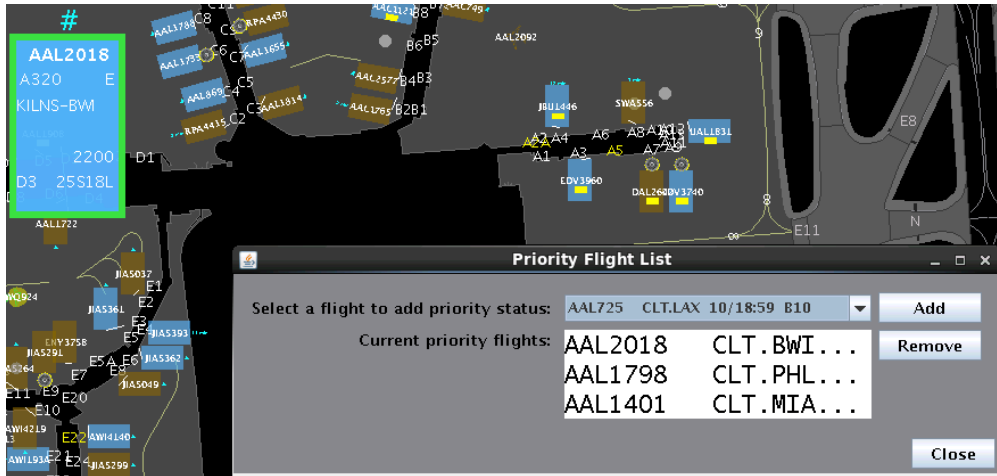


Figure 7.9. Priority Flight List and flight strip with green border on the map.

Tip: To jump to another callsign (e.g., 'DAL'), type the first letter of the callsign in the window (e.g., 'd'). This will bring the list to the Delta Air Lines flights.

To remove a flight from the priority list:

- Step 1:** Click on 'Tools' (Figure 7.6). A drop down menu will open.
- Step 2:** Click on 'Priority Flights'. The Priority Flight List window will populate on the display.
- Step 3:** Select the desired flight on the list of current priority flights (Figure 7.9).
- Step 4:** Click on the 'Remove' button to remove it from the priority list. The flight's callsign will no longer appear in the priority list.
- Step 5:** Repeat steps to remove any other priority flights from the list.
- Step 6:** Click 'Close' to close the 'Priority Flight List' window.

Appendix A: Acronyms

This appendix defines acronyms and terms that are used throughout the ATD-2 RTC RMTC User Manual.

Acronym	Term
AAL	American Airlines
ALDT	Actual Landing Time
AMA	Airport Movement Area
AOBT	Actual Off-Block Time
APREQ / CFR	Approval Request / Call For Release
ATC	Air Traffic Control
ATD-2	Airspace Technology Demonstration-2
CDR	Coded Departure Route
CLT	Charlotte Douglas International Airport
DAL	Delta Air Lines
DASH	Data Analysis and System Health tool
EDCT	Expected Departure Clearance Time
EOBT	Earliest Off-Block Time
GA	General Aviation
GS	Ground Stop
IADS	Integrated Arrival, Departure, Surface
LOB	Long On Board
LOBT, L-Time	Airline-provided OUT time
MIT	Miles-In-Trail
NASA	The National Aeronautics and Space Administration
OIS	FAA Operational Information System
P-time	Airline scheduled pushback time
RMTC	Ramp Manager Traffic Console
RTC	Ramp Traffic Console
STBM	Surface Time-Based Metering
STBO	Surface Trajectory Based Operations
SWIM	System-Wide Information Management
TBFM	Time-Based Flow Management System

TMAT	Target Movement Area entry Time
TMI	Traffic Management Initiative(s)
TOBT	Target Off-Block Times
TTOT	Target Take Off Time