User Guide

Carmen Crew Tracking

Preliminary version 1

JEPPESEN®

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Table of Contents

About this manual

This manual provides information on a basic level about the planning process with Carmen Crew Tracking. Beginners are the intended readers.

Overview

This manual contains the following sections:

- *About this manual*
- *How to use Carmen Help*
- *Introduction to Crew Tracking*
- *Working procedures*
- *Alert Monitor commands*
- *Studio commands*
- *About Carmen documents*
- *Glossary*

How to use Carmen Help

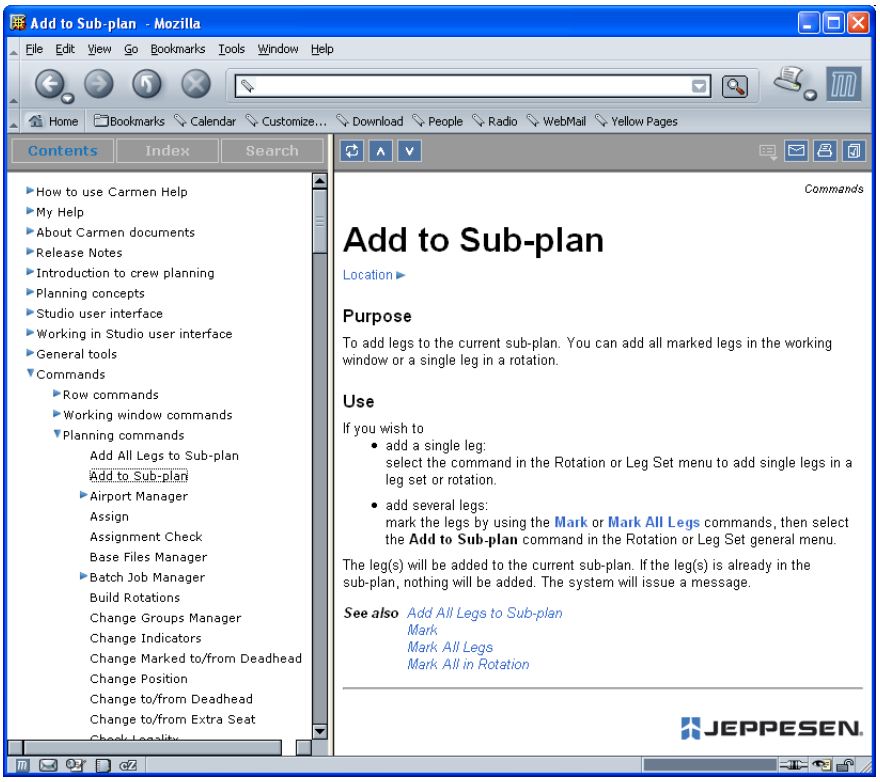
Carmen Help is the first place you should turn to for assistance when working in a Carmen product. It quickly provides information about the product. This section describes how to use Carmen Help.

Starting Carmen Help

To start Carmen Help, do one of the following:

- Click  . The start page for Carmen Help is displayed.
- Select the command **Help >Carmen Help**. The start page for Carmen Help is displayed.
- Open a form and press F1. Carmen Help displays information about the form.
- Mark a command and press F1. Carmen Help is launched showing information about the command.

Carmen Help is launched in a browser.



Example Select **File** in the menu bar, mark the command **Exit** and press F1. Carmen Help is launched showing information about the **Exit** command.

If pressing the F1 key does not start Carmen Help, the reason may be that the key is mapped to some other function. Ask your system administrator. If your keyboard has a specific Help key, try pressing that one instead.

If the browser does not start or if you have any other problems with the Carmen Help, please contact your service manager.

See also *System Configuration Reference Manual, Carmen Help system*

My Help

You can connect your own documents to Carmen Help.

Note The system has to be configured before you can use My Help. See *System Configuration Reference Manual, My Help* for instructions.

Finding help topics

To find a particular help topic, you can:

- select the **Contents** tab to browse through topics by category
- select the **Index** tab to see a list of index entries
- select the **Search** tab and do a full-text search.

Note The entries in the table of contents that start with **Link to** contain links to other sources of information. This information is displayed in separate windows and is not included in the search function.

Contents

1. Click the **Contents** tab. A list of topics is displayed.
2. Select a topic or a subtopic.

Index

1. Click the **Index** tab.
2. Type one or several letters in the empty field. Topics are displayed in the field below.
3. Select a topic.

Search

1. Click the **Search** tab.
2. Type one or several words in the field and click **Search**. One topic or a list of topics is displayed. The topics that are most likely to contain the information you want are at the top of the list.
3. Select a topic.

Search tips

- You can limit the search by selecting a book from the pick-list.
- To search in a page: press Ctrl+F. The Find form is displayed. Type the word you are looking for and click **Find/Find Next**.

Toolbar buttons


Click the **Show in Contents** button to locate the currently displayed topic in the Contents tab


Click the **Previous** button to display the topic that precedes the currently displayed topic.


Click the **Next** button to display the topic that follows the currently displayed topic

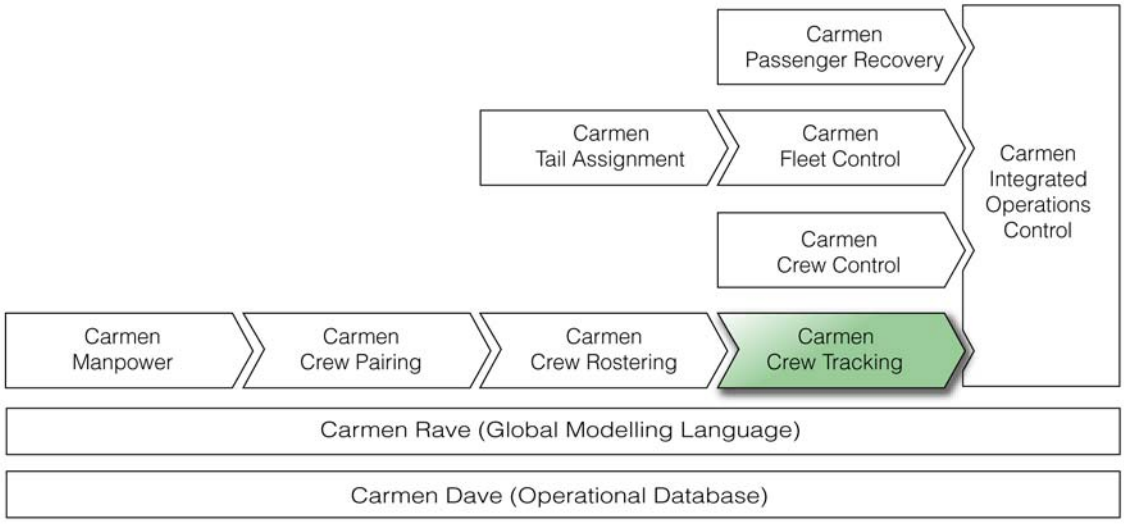

Click the **E-mail** button to open a new message to the Carmen Service Centre.


Click the **Print** button to print the currently displayed topic.


Click the **Bookmark** button to add the currently displayed topic to your favourites.

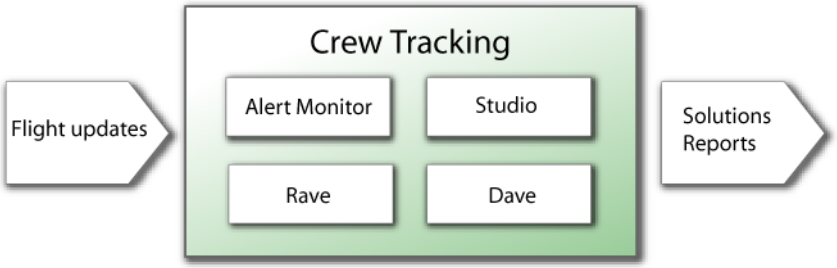
Introduction to Crew Tracking

Carmen Crew Tracking is a software solution to track and recover disrupted crew rosters. This help provides information on a basic level about the planning process with Carmen Crew Tracking. Beginners are the intended readers.



Basic components

A simplified image of the components in Carmen Crew Tracking.



Input

Input can be automatic changes or manual changes in the flights.

Alert Monitor

The Alert Monitor is used to visualize all alerts. Alert Monitor consists of three parts: Alert and task list, Alert Overview and Alert Selection Details. From the Alert Monitor it is possible to launch Studio for more detailed analysis or for solving problems.

See also *Alert Monitor interface on page 16*

Studio

Studio provides a graphical user interface in which you do disruption repair and advanced what-if analysis. Studio is started from Alert Monitor or from the launcher.

Studio contain a lot of functionality that you will use on a daily basis, such as on-line legality controls, swapping flights, changing crew position, finding deadhead candidates, finding replacement reserve crew, etc.

See also *Studio user interface on page 21*

Rave

Rave is the modelling language, specially designed to manage all legality and cost requirements within the crew, aircraft and passenger area. The ability to quickly adjust a rule or a cost definition makes Rave very suitable for simulating agreement changes as well as new operational strategies. In addition to legality and cost modelling, Rave can be used to customize the behaviour of a wide set of functions in the system.

See also *Carmen Rave Reference Manual*

Dave

Dave is the database component for Carmen software. Changes made in Studio and Alert Monitor are committed back to the database. When a new data object is introduced in Dave the data object automatically becomes available in Rave to allow new rules or more comprehensive cost definitions.

Output

The reports are generated by Rave publisher.

See also *Reports on page 78*
Carmen Rave Publisher

Basic working procedures

This section will give you an overall picture of how you, as a crew tracker work with the Carmen Crew Tracking system.

View alerts in Alert Monitor

The Alert Monitor gives you a quick and easy overview of the active alerts. See *Alert Monitor interface on page 16*.

Get an overview and prioritize

The first thing you do when starting a shift is to zoom in around the actual time and check if there are any urgent alerts that needs to be solved right away. If not, then spend a couple of minutes to get an overview of the alerts.

If taking over from a colleague, you should have a briefing to help you get an overview of the active alerts in the alert monitor. The hand over should also cover snoozed and ignored alerts.

Prioritize which alerts to solve first.

Alerts changing

The view in the alert monitor will change constantly due to new alerts popping up and alerts disappearing (the violation has disappeared by itself or has been solved). View the alert monitor frequently and decide if you need to reprioritize.

The alerts are as informative as possible, for example different icons for different rules. When necessary you can select the alert to view a more detailed description. See *Alert Selection Details on page 19*.

Ignore and snooze alerts

There might be some alerts that you know you can not solve, ignore these alerts. You should also snooze alerts whenever relevant. The ignored and snoozed alerts are removed from all crew trackers' Alert Monitors.

If necessary it is possible to get a view of snoozed and ignored alerts.

Assigned alerts

The alerts assigned to a crew tracker are not locked, only dimmed out in the Alert Monitor.

If only a part of an aggregated alert is assigned to someone the aggregated icon is not dimmed out – thus showing that no one is fixing the full problem. If you start working on such a problem, you are informed that a number of violations is already assigned to another crew tracker. Discuss with your colleague if one of you should start working on the full problem. See *Aggregated alerts on page 19*.

Create a task

When you start solving one or more alerts the system will automatically create a task. The task is opened in Studio, the tool where you do the editing. You can have several Studio sessions running with different tasks.

You do not have to think about the task or maintain it. You can rename a task, this is useful when you are working on a problem which will take some time and you assume that you will be interrupted. This way you can find the relevant Studio very fast just by clicking on the task.

Edit in Studio

There are several working windows in Studio, but for Tracking most of the work is done in the roster window. The only exceptions are editing a trip for a whole crew at one time or rebuilding a trip in open time.

Edit a whole crew

If you need to edit a whole crew, this is done one by one in the roster window. You can also de-assigned the trip, edit it in the trip window and reassigned to the involved crew.

Rebuild a trip

You can rebuild a trip in open time in the trip window. In the trip window you can easily remove legs from a trip, move legs from one trip to another and add deadheads. The results are the same as when done in the roster window, for example when searching for deadheads you get the same deadhead suggestions.

Rule exceptions

The solutions for some problems could be to ask the involved crew member or the union to accept violations of certain rules. If that is accepted the crew tracker will create a rule exception which will affect this crew member and this instance of the rule violation only.

Overview and details

It is easy to zoom in and out in Studio, this give a good combination of the big picture and detailed information. It is also possible to view rosters, trips and aircraft rotations based on the same leg.

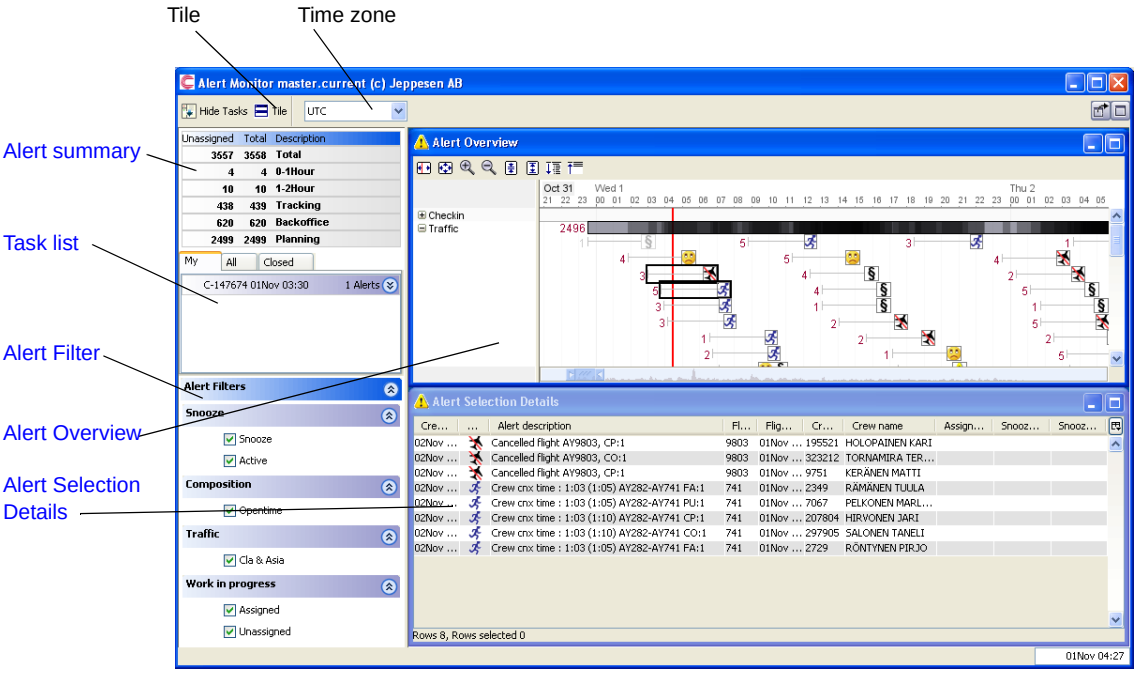
There are toolbar buttons for actions done frequently and short cuts in the selection menus for selections done frequently.

User Interface

This chapter describes the user interface of the Alert Monitor and Studio.

Alert Monitor interface

Alert Monitor consists of following parts:



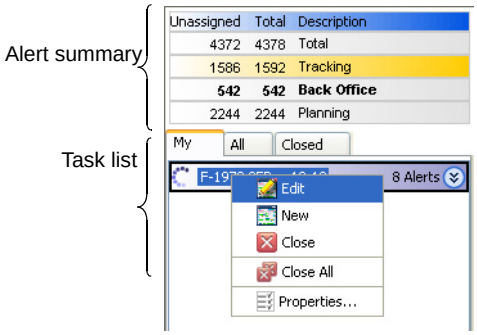
Alert Monitor overview

Tile	Tiles the Alert Overview and Alert Selection Details.
Time zone	When you select a time zone from the pick-list, the new time is shown in the Alert Overview and in the Alert selection details. Default is set to UTC time.
	Disconnects the selected window, which enables you to move it to another screen. To dock a floating window, close it and select **Tile**.
	The selected window is made into a tab. To undo this, click this button again.

See also *Working in the Alert Monitor on page 32*
Alert Monitor commands on page 43

Alert summary

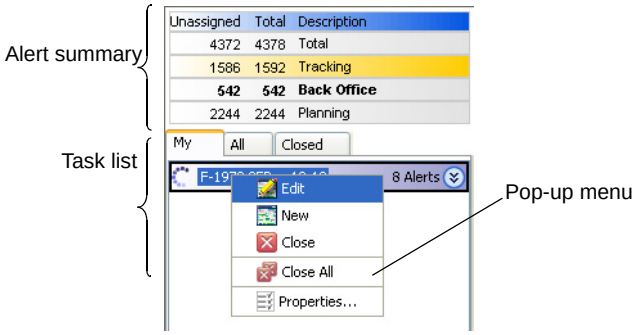
The Alert summary is configurable. The buttons are configured to show different time intervals. When you click a button in the Alert summary, the corresponding alerts are shown in both the Alert Overview and in the Alert Selection Detail.



Alert summary and task list

Task list

A task is one or several alerts that the crew trackers are working with or needs to work with.



My	Displays tasks that are assigned to the current tracker. Right click to display the pop-up menu. See also *Task commands on page 50*.
All	Displays all tasks, grouped by user.
Closed	Displays all closed tasks. Right click to display a pop-up menu. See also *Task commands on page 50*.

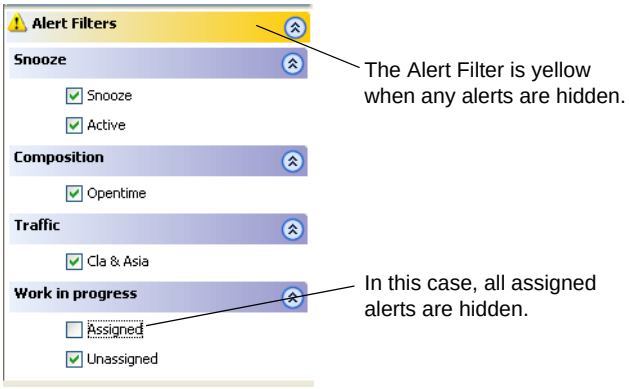
Rename task

Click on a task in the Task list, change the name and press enter. This is useful when you are working on a problem which will take some time and you assume that you will be interrupted. This way you can find the relevant Studio very fast just by clicking on the task.

You can use the same name for several tasks.

Alert filter

With Alert Filter you can control which alerts to show in the Alert Overview and Alert Selection Details. The alert filters are configured for each customer. Example:



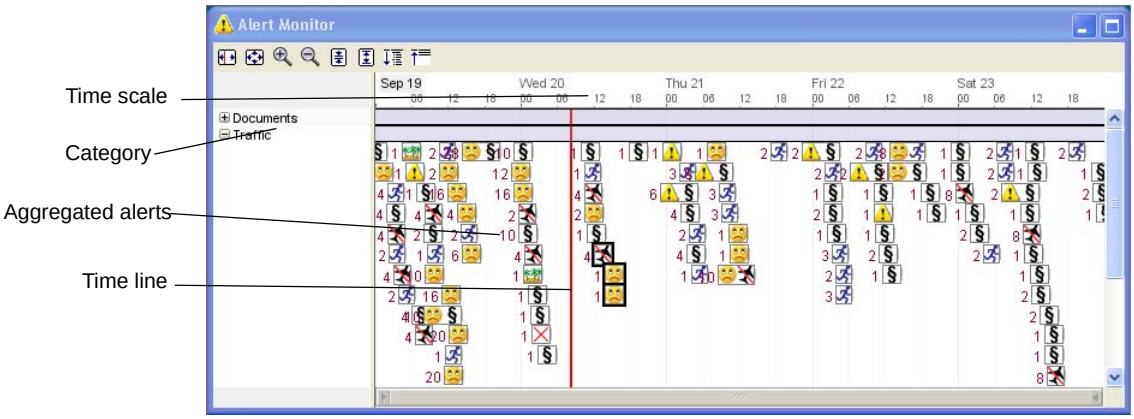
Uncheck a checkbox to hide the corresponding alerts.

Snooze

If you hide a snoozed alert, it becomes visible again when the snoozed time is up. See also *Snooze on page 48*.

Alert Overview

In the Alert Overview the alerts are displayed in a Gantt chart.



Alert Overview

Time scale

Click in the time scale at the start and end time of the desired period. When you place the pointer on the time scale, the exact time is shown.

Time line

Marks the present time.

Aggregated alerts

The alert are displayed in an aggregated mode. If there are several alerts affecting the same flight, these alerts will be displayed as one icon with a number next to it indicating the number of alerts.

When you click an icon with four alerts aggregated, the Alert Selection Detail will show information regarding all four alerts.

Toolbar buttons

Decrease row height. This way you can display more rows if needed.

Increase row height. This way the information is easier to read.

Show alert icons.

Hide alert icons.

Zoom

Click in the time scale at the start and end time of the desired period. You can also use the toolbar buttons:

Zoom to now. As default the period is set to one day prior and four days after the timeline.

Zoom all alerts. To see all alerts.

Zoom in.

Zoom out.

Alert Selection Details

Details regarding all selected alerts are shown in the Alert Selection Details. Here you can for example see when the alert was created, which alert group it belongs to and to which crew tracker it is assigned.

Alert Selection Details

Columns

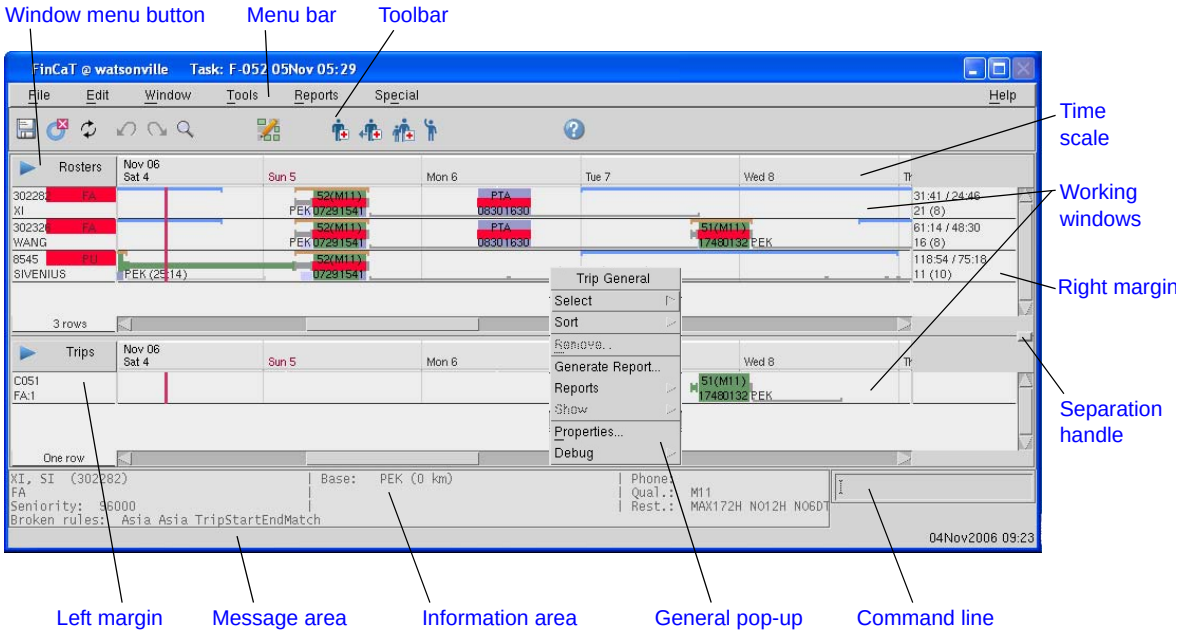
Created	Time when alert was created.
Group	Which group the alert belongs to. All alerts in a group has the same symbol.
Alert description	Descriptive text regarding the violated rules
Flight	Number of flight.
Flight dep	Departure time of flight
Assigned to	Which crew tracker the alert is assigned to.
Snoozed by	Which crew tracker that snoozed the alert.
Snoozed until	Time when alert is activated again.

Display columns

Click  and select from the list which columns to display in the Alert Selection Details.

Studio user interface

You can have up to four working windows in the working screen. This is useful when you work with a lot of data at the same time. By using several windows you can make a new selection in another window and still keep the current selections.



Studio

Context-sensitive menus and toolbar items

With context sensitive menus and toolbar items, unavailable commands appear dimmed.

See also *Studio commands on page 53*
Working in Studio user interface on page 35.

Menus

Menu bar

The menu bar contains menus with general commands that influence the Carmen system globally.

Window menu button

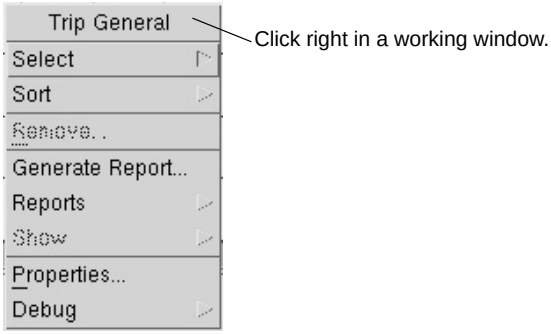
At the upper left corner of each working window there is a menu button labelled with a number (1 to 4). Click this button, to display a menu with

commands controlling what to display in the working window and how to present it, for example Show Rosters and Redraw.

General pop-up

The general pop-up menu is displayed when you click right anywhere in a working window or place the pointer in the working window and press 2.

Each working window has a general menu, for example the rotation window will display the Rotation General menu and the roster window will display the Assignment General menu etc.



Object pop-up

This menu is displayed when you click right on an object in a working window or place the pointer on an object and press 1. An object can for example be a leg, a duty or a trip. The object pop-up menu contains commands that affect only the indicated object.

The object pop-up menu contains commands that affect one or several objects in the working window. If not otherwise stated by the command name, these commands apply to the selected objects in the working window.

Each working window has an object menu, for example the rotation window will display the Rotation Object menu and the roster window will display the Assignment Object menu etc.

Toolbar

The toolbar contains the following items.

 Save

 Close task

 Refresh

 Undo

 Redo


Zoom See also *Scrolling and zooming on page 38*.


Show edits. Click to display the rosters in which changes has been made since you saved last.

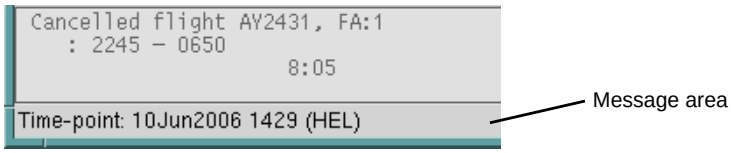

Start Carmen help

Tooltip

A tooltip is a short text describing the command, displayed when you place the pointer on the item. In addition, a more descriptive text about the item is displayed in the message area.

Message area

The line at the bottom of the working screen is the message area. It displays information, guidance and error messages.When you move the pointer inside a time scale, the message area shows the exact position.



Information and Message area

Working windows

A working window displays a set of planning objects, such as rosters. Up to four working windows can be displayed at the same time. For more information on how to add or remove working windows, see *Working window commands on page 99*.

Some commands may display the result in another window. For example, the **Get Next** command may, when applied to a leg in one window, display all possible next legs in the window below.

As an alternative, the **Get Next** command may instead place the selected object in the current window's top row with the possible legal objects on the

rows below. You then pick your choice by clicking with the cross until you are finished.

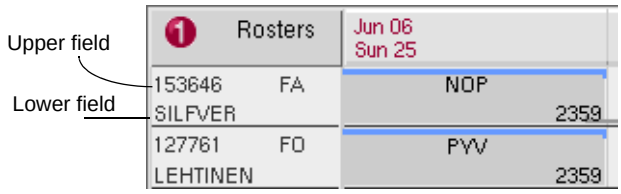
You can control the height of the working windows by dragging the separation handle, located to the right between the scroll bars. This will cause the windows to be redrawn. If you have specified the number of rows to be displayed, the height of the rows will vary and there will be a zoom in—zoom out effect.

If you have set the height of each row, the number of rows displayed will vary when you drag the separation handle.

See also You can set the height and the number of rows, see *Properties on page 99*.

Left margin

The left margin shows information about rows and crew resources depending on what is displayed in the working window. Settings can be installation dependent. Please ask your system administrator.



Left margin in a roster window.

Right margin

In the roster and trip window, a right margin can be enabled and configured the same way as the left margin. It is enabled by adding the resource `gpc.config.ConfigWindow`, see *System Configuration Reference Manual, Appendix: Carmen resources.*

Texts and colours for left and right margins (called headers and trailers in Rave) are configured using map variables. See *Rave Manual, Map variables*

Time scale

At the top of each working window there is a time scale, with which you manipulate the time intervals for the window. If you click in a time scale, you

will get further guidance in the message area. When you move the pointer inside the time scale, the message area shows the exact position.

The time scale can adapt to the local time for any chosen airport. You set this with the **Preferences** command. Normally, with **Scale Time Presentation** set to UTC the date scale displays UTC dates and times for the chosen period. With **Scale Time Presentation** set to **Reference**, the time scale will be adjusted to reflect the local time (daylight savings time included) at the reference airport.

See also *Scrolling and zooming on page 38*
Preferences on page 70

Bank holidays

You can mark the bank holidays by setting the resource `gpc.window.specialDayEtabName`. They will get the same colour as Sundays (normally red). If the resource or the external table it refers to has been changed, Studio must be restarted for the changes to take effect.

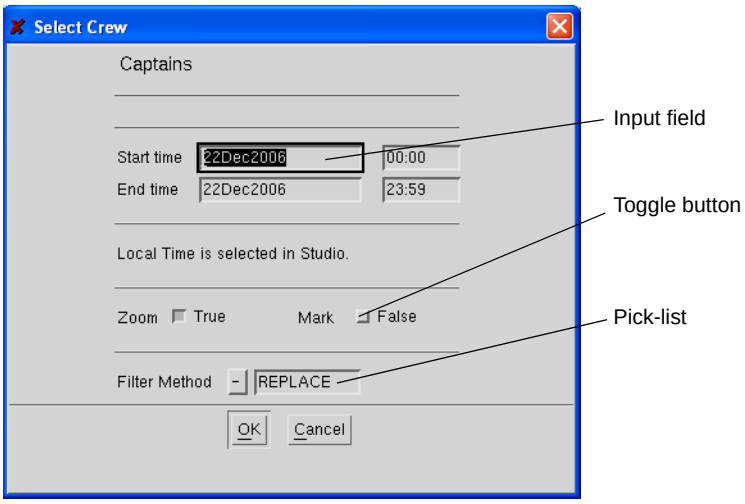
Example

```
2
SComment, "Comment",
ADate, "National Day Date",
"Sweden", 06JUN2007,
"USA", 04JUL2007,
"Vietnam", 02SEP2007,
```

See also *System Configuration Reference Manual, Appendix: Carmen resources*

Forms

A form has the following general layout:



Input field

The input fields can be read-write or read-only. In insert mode the cursor is a vertical bar and in replace mode it is a box.You toggle between these modes using the insert key on the keyboard.

Pick-list

If there are pre-defined values connected to an input field, you will find a menu button next to the input field. When you click on the menu button, a pick-list is displayed. The pick-list holds some or all alternatives for the current field. You may also type the value of the field manually.

A plus sign means that the displayed pick-list is long and that you have to select **Cancel** to close it.

A line under the minus or plus indicates that the input field is active (has focus).

Toggle button

A toggle button has only two permitted values.

Buttons

Available buttons vary depending on which command that initiated the form.

OK Executes the command using the parameter values currently shown in the form. Depending on the command, the values can be used for selections, database updates etc.

Cancel Closes the form without any action.

Close	Closes the form.
Reset	Resets all parameters to the values they had when the form was first displayed.
Print	Sends a hard copy of the contents of the form to the default printer.
Default	Restores all parameters to their default values.

Different pointer shapes

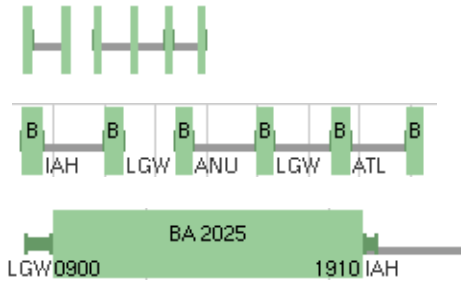
As you move the pointer on the screen, it changes shape over different areas. Usage of pointers can be installation dependent. Ask your system administrator if you have different pointer shapes.

	Pointer	This is the normal shape.
	Pointer	This is the shape when you navigate in a menu.
	Hour-glass	Carmen is working and you are locked out.
	Cross	Appears when the system asks you to point out a position.
	Cursor	Shows where you should enter text.
	No Entry	The system expects you to insert in another window.

Legs

Depending on the current time scale and number of rows in the working window there is not always room enough for all the information in a leg symbol, but the system tries to show the most valuable information.

The code for the departure airport is placed to the left of the rectangle and the code for the arrival airport to the right.



Close-up on the first leg.

The same leg in different time scales

The times shown in a leg depend on the **Leg Time Presentation** chosen in the Preferences form.

Note The layout of the working windows and the data displayed can be customized using map variables. See *Rave Manual, Map variables*. The following sections describe the standard working windows.

The colour of the leg gives you information about what type of leg it represents and in what state the leg is, regarding for example booked crew complement.

Rudobs

A rudob (Rule Defined Object) is a graphical planning object defined in Rave.

Rudobs can have different shapes, and they can even overlap each other. A rudob is used to define activities to flight legs and depot duty legs, e.g. debriefing time.

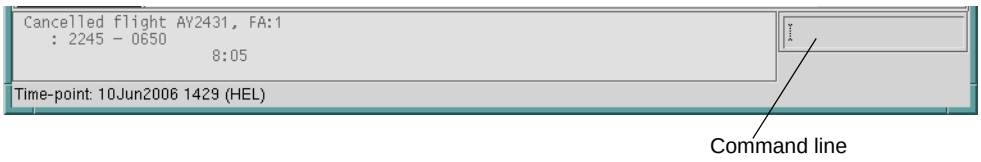
Information area

When you pass the mouse pointer over some objects, information on that object is displayed in the information area.

4.

Command line

The command line is a field in Studio where you can enter a limited set of commands. The command line interface is not a replacement for existing menu options, but is a complement in order to assist you executing the most frequently used commands faster.



Example of commands:

- select crew using a quick search tool
- display all crew members assigned on a particular flight on a given date
- select crew which are marked as volunteers on a given date
- select crew which have sickness on a given date.

Command line functions

Command mode

To enter command mode either click on the command line, or press the dash (“-”) key on the keyboard. Deactivate by pressing the escape (“Esc”) key.

Command execution & auto completion

The command line has an auto completion feature. Enter the first specific characters in a command and press tab, the command line will complete the command.

Press enter to execute the command.

History & reset

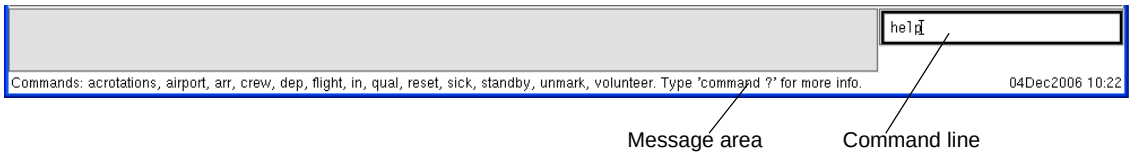
The command line has a history function which will remember the previously used commands. The historic commands can be accessed using the arrow-up key.

The command line history can be reset by executing the “reset” command in the command line.

Help

Write the command name followed by a question mark (“?”) to display a short help text for each command.

Write the command “help”, and the system will show all available commands in the message line.



Example:

`crew ?`	Short description of the show crew command shown.
`help`	All available commands shown in the prompt.

Working procedures

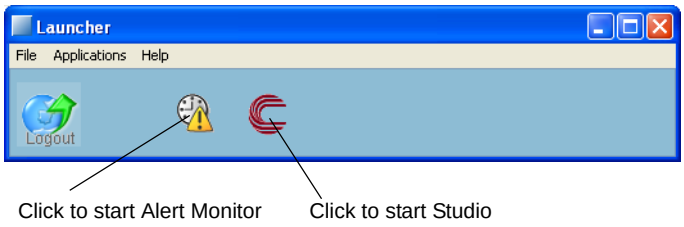
This section describes some of the general working procedures in Alert Monitor and in Studio.

Working in the Alert Monitor

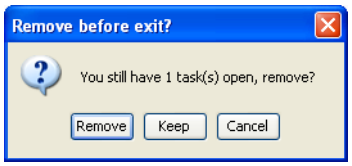
This section describes some general working procedures in Alert Monitor. To see the overview, see *Alert Monitor interface on page 16*. All commands are listed in the section *Alert Monitor commands on page 43*.

How to start and quit

Click on the desktop. The launcher is displayed.



When you close the Alert Monitor and have tasks open a message is displayed.



Buttons

Remove	Removes all tasks under the tabs My and Closed.
Keep	The tasks are kept.

Alerts

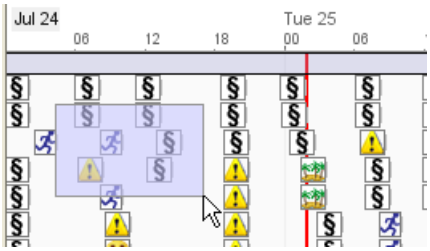
Alerts are shown in the Alert Overview and in the Alert Selection Details. Tasks are shown in the task list.

When you select the command **Solve**, the alerts becomes a task. The task is added to your task list.

Mark alerts

- Click an alert to mark it.
- Using Ctrl+click to mark several alerts.

- Using rubberband. All alerts that are touched or surrounded by the rectangle are marked. You can make several selections like this by using Ctrl+drag the "rubberband".



Rubberbanding

Details regarding the marked alerts are displayed in the Alert Selection Details. See *Alert Selection Details on page 19*.

To deselect, click where there are no alerts.

Keyboard shortcuts in Alert Monitor

Regardless of keyboard focus

To	Press
Tile	Ctrl+T
Show/Hide task panel	Ctrl+H
Switch between tabbed and desktop mode	Ctrl+M
Undock selected frame or tab in the dockable workspace	Ctrl+U
Show Help	F1

Objects with keyboard focus

To	Press
Perform single click action on object	Space
Perform double click action on object	Enter

Focus in Alert Overview

The icon panel must be focused, all navigation is performed on visible objects.

To	Press
Next alert on same row	Arrow right
Previous alert on same row	Arrow left
Closest alert on next row	Arrow down

To	Press
Closest alert on previous row	Arrow up
Closest alert on 10 rows down	Page down
Closest alert on 10 rows up	Page up
Last alert on row	End
First alert on row	Home
First alert on top row	Ctrl + Home
First alert on bottom row	Ctrl + End
Expand all categories	Ctrl + X
Collapse all categories	Ctrl + C
Expand category	Arrow right
Collapse category	Arrow left
Select highlighted alert	Space
Create task of selected alerts	Enter

See also *Alert Overview on page 18*

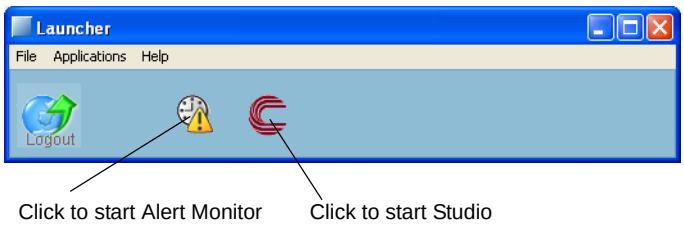
Working in Studio user interface

This section describes some general working procedures in Studio. To see the overview, see *Studio user interface on page 21*. All commands are listed in the section *Studio commands on page 53*.

How to start and quit

Start

Studio is started from the launcher or from Alert Monitor. You can have up to three Studio sessions started from the Alert Monitor.



There are two ways to start from Alert Monitor:

- Select the **My** tab in the task list and click right. Select the command **New**. A new task is created and Studio will start.
- Select an alert in the Alert Overview or Alert Selection Details and click right. Select the command **Solve**. Studio will start and display the corresponding alerts.

Quit

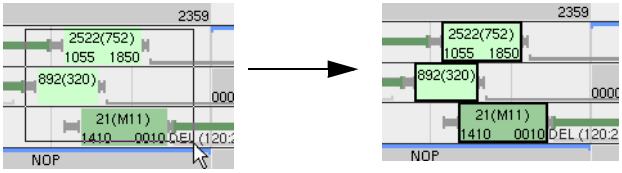
There are two ways to close Studio:

- To save and close a task, click . When you close Studio this way, next time you open Studio it will re-use the previous session and therefore start quicker.
- To close a task without saving, select **File >Exit** or press Ctrl+Q.

Mark

- To mark one leg, click it.
- To mark a whole trip, double click.
- To mark several consecutive legs in a roster: click the first leg and click the last leg while pressing shift. The first leg selected does not have to be earlier in time than the second leg selected.
- To mark several legs that do not have to be consecutive: Click several legs while pressing Ctrl.

- To mark legs in several rosters in the same time-frame: Click where there are no legs, hold down the mouse button and drag the rubberband. All legs that are touched or surrounded by the rectangle are marked. You can make several selections like this by using Ctrl+drag the rubberband.



Mark by using rubberband

Note It is possible to have objects marked in several working windows, or in the left margin and a working window. Note that commands are carried out only on the marked objects in the working window where the pointer is placed.

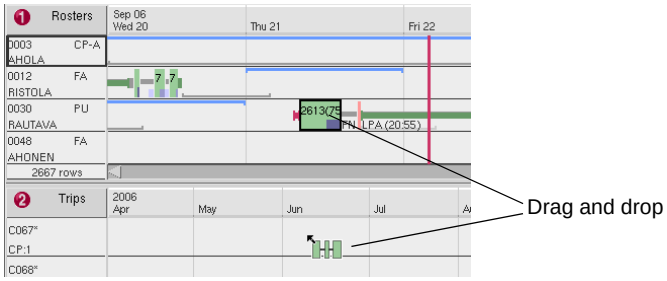
Unmark

- To unmark all legs, click where there are no legs.
- To unmark just a few legs in a selection, use Ctrl+click.

Drag and drop

Moving objects is easy with the drag and drop feature. Select the object you want to move and drag it while pressing the left mouse button.

If you want to drag several objects, select them before dragging. Only legs from one roster at a time are dragged.



See also *Mark on page 35*
Cut, copy and paste on page 39

Roster to trip window

Use this to deassign legs from a roster.

1. Drag the legs to the trip window.
2. The legs are deassigned. Note that only legs from one roster at a time are deassigned. If you want to deassign legs from several rosters, use the keyboard button delete.

See also *Deassign on page 96*
Delete button on page 37

Roster to roster window

Use this to assign legs to a roster.

1. Drag the legs to another roster.
2. The legs are assigned to the new roster. If there are any legs that would overlap, the old legs will be deassigned from the roster. Stand-by-duties are cut to fit the new legs.

Trip to roster window

Use this to assign trips to a roster.

1. Drag the trips to the roster window.
2. The trips are assigned to the new roster. You can select one or several legs in a trip and assign them. If there are any legs that would overlap, the old legs will be deassigned from the roster.

Trip to trip window

Use this to join trips.

1. Drag a trip from one row and put it beside a trip on another row.
2. These trips are joined to one. You can not drag single legs in the trip window.

Crew margin

1. Drag a crew from the crew margin to an empty window.
2. The crew roster is displayed in the target window. You can drag several crew rosters, one at a time or at the same time.

Drag and drop using right button

You can also drag and drop using the right mouse button. Doing this, a pop-up menu is displayed when dropping the object. Here you choose what to with the object.

Move	Moves the object.
Swap	See *Swap on page 95*.
Cancel	Cancel the command

You can also press Esc to cancel the command.

Delete button

You can select several objects and press Delete, this will move the deleted objects to the trip window. From the trip window you can select the command **Assign**.

Roster window
When you delete objects from the roster window, the deleted legs are put in open time.

Trip window
When you delete objects from the trip window, the selected legs will be removed and deassigned from the trip.

Scrolling and zooming

Scrolling up and down

You can scroll up and down in the working window.

To	Action
Scroll up and down	Roll the mouse wheel
Scroll left and right	Press Shift + roll the mouse wheel
Scroll step-by-step	Arrow keys

See also *Working windows on page 23*

Zooming

You can zoom in the working window.

To	Action
Zoom	Click in one of the time scales at the start and end time of the desired period.
Rezoom	Click right in the time scale.
Zoom As Is	Click middle in the time scale to use same settings as other working window.
Zoom horizontally	press Ctrl + use the mouse wheel
Zoom vertically	press Alt + use the mouse wheel

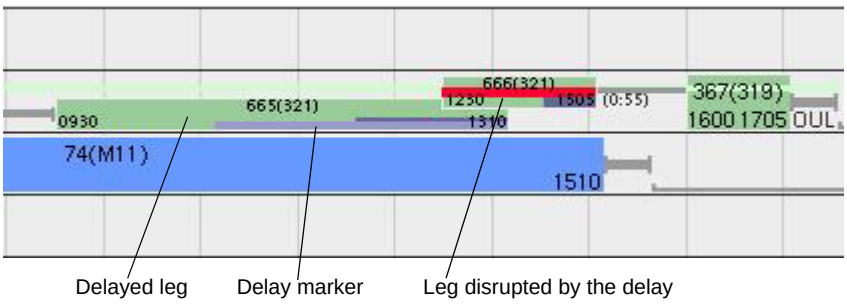
You can also zoom by clicking the toolbar button 

See also *Time scale on page 24*

Overlapping activities

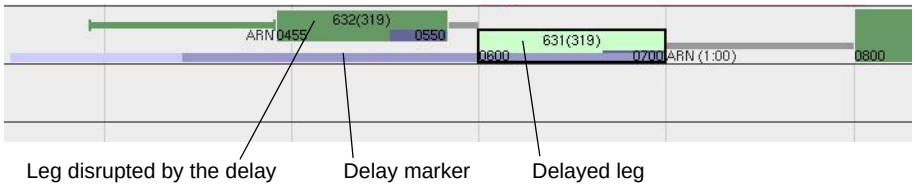
An overlapping activity can be caused by a delayed flight or by two crew trackers saving edits that will cause a conflict. See *Rule violations on page 40*.

When a delay is reported into the system, it is presented in Studio with a marker. If it is a long delay that will overlap with the next leg, this is also presented in Studio, see figure below.



The delayed leg is placed under the next and the disrupted leg is pushed upwards in the row. By pushing the leg upward, the information on the delayed leg is still visible. Information such as the delay marker and departure and arrival time.

A long delay can cause a leg to start after the next leg. In Studio these legs will not overlap as in the figure above, but the disrupted leg will be pushed upward anyway to show the disturbance.



You can set the amount of overlap by setting the parameter `gpc.config.overlapFraction`.

See also *System Configuration Reference Manual, Appendix: Carmen resources*

Several overlaps

When there are several overlaps, the problem that need to be solved first is placed on top. If you mark a leg that is overlapped by another, the marked leg is temporarily placed on top.

An easy way to navigate the overlapping legs is to use the arrow keys.

Cut, copy and paste

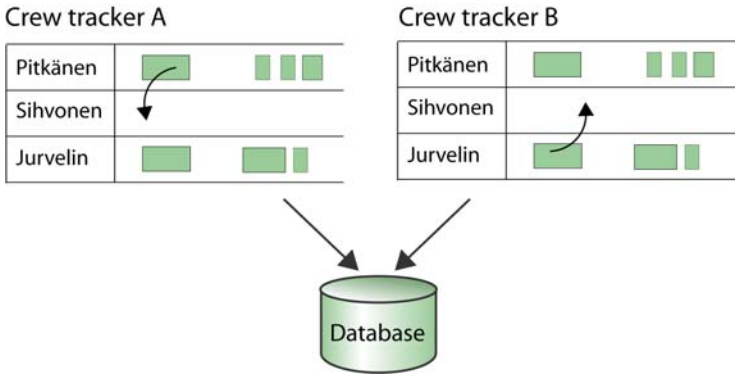
To	
Cut	Ctrl+X or **Edit >Cut**
Paste	Ctrl+V or **Edit >Paste**
Copy	Ctrl+C

The cut object is dimmed out until pasted somewhere else. Cut objects are placed in open time.

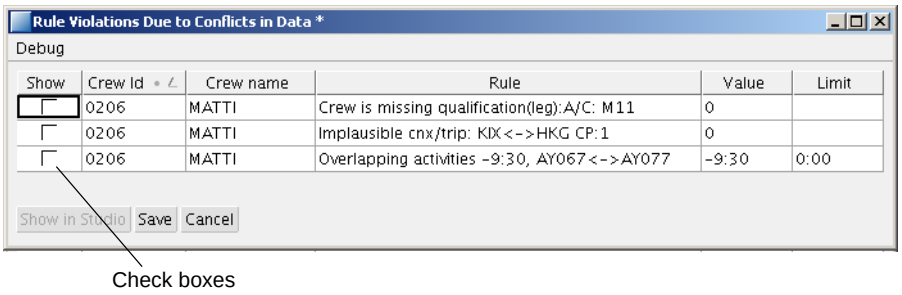
Note You can only cut from one row at a time. If you have several objects selected on different rows when you use the command, only the object over which the pointer is placed will be cut.

Rule violations

If two crew trackers saving edits that will cause a conflict they are notified of this.



In the figure above, crew tracker A makes a change in the roster and saves the changes to the database. You do a different kind of change and save the changes to the database. If you were the last to save, you will be informed about the conflict by the Rule Violations Due to Conflict in Data form.



In the form you see the crew Id, crew name and which rules are being violated. For more information regarding rules, see *Rave Manual*.

Buttons

Save	Save the changes although there is an illegality.
Show in Studio	Select one or several crew by checking the boxes. Click **Show in Studio** and the corresponding rosters will be displayed in another window.
Cancel	Close the form without saving changes.

Note It is not possible to do **Undo** on your changes which caused the conflict. A work around is to exit the Studio session without saving your edits.

Alert Monitor commands

This section describes the commands you will find in the Alert Monitor.

See also *Alert Monitor interface on page 16*
Working in the Alert Monitor on page 32

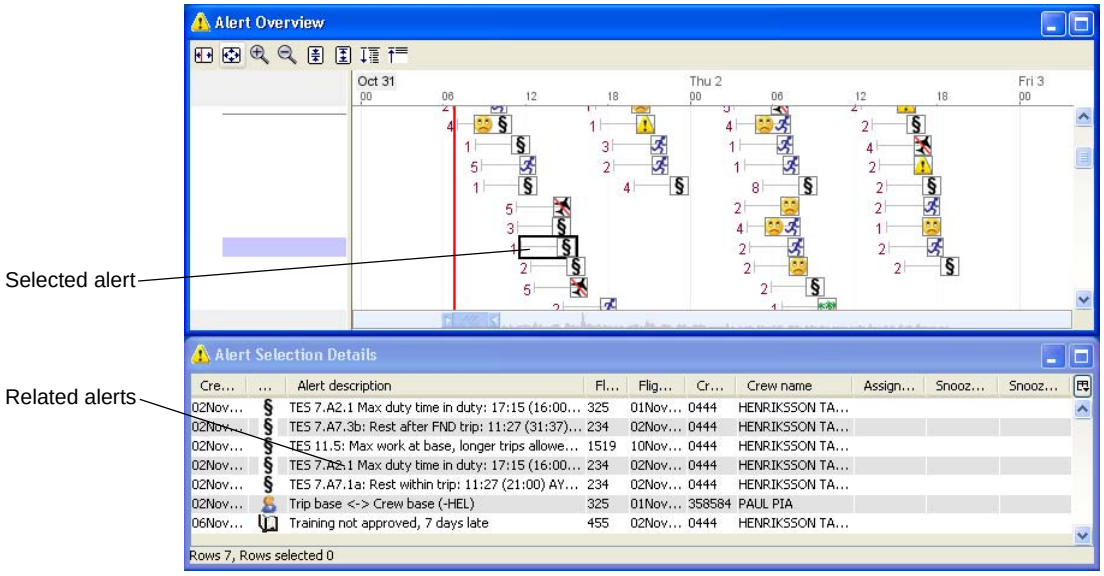
Find Related

Menu location Alert Overview, pop-up menu

Purpose To display all alerts related to both the flight and crew of the selected alert

Use Click right on an alert in Alert overview and select **Find Related**.

The related alerts are displayed in the Alert Selection Details.



The related alerts have either the flight or crew member in common with the selected alert. Not necessarily both.

See also *Find Alerts on Flight on page 45*
Find Alerts for Crew on page 46

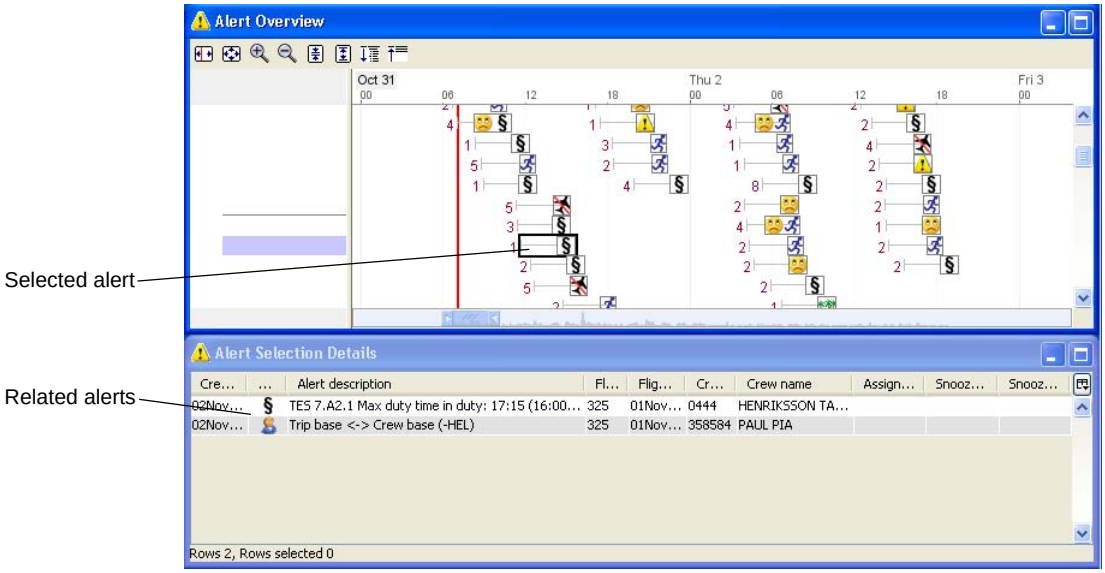
Find Alerts on Flight

Menu location Alert Overview, pop-up menu

Purpose To display all alerts related to the flight of the selected alert

Use Click right on the alert in Alert overview and select **Find Alerts on Flight**.

The related alerts are displayed in the Alert Selection Details.



The related alerts have the flight id in common with the selected alert.

See also *Find Related on page 44*
Find Alerts for Crew on page 46

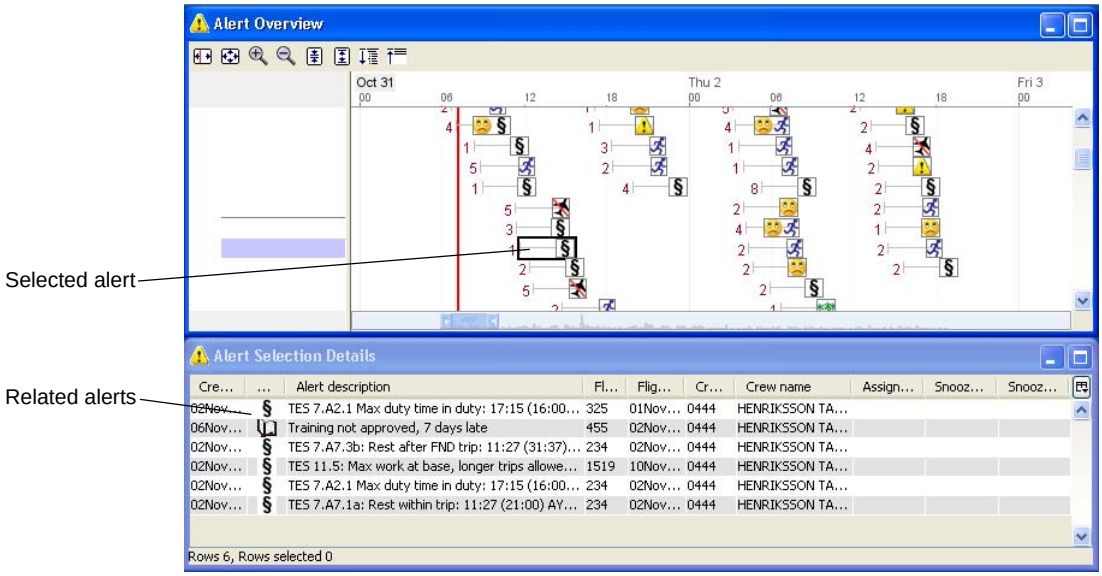
Find Alerts for Crew

Menu location Alert Overview, pop-up menu

Purpose To display all alerts related to the selected crew.

Use Click right on the alert in Alert overview and select **Find Alerts on Crew**.

The related alerts are displayed in the Alert Selection Details.



The related alerts have the crew in common with the selected alert.

See also *Find Related on page 44*
Find Alerts on Flight on page 45

Solve

Menu location Alert Overview, pop-up menu
Alert Selection Details, pop-up menu

Purpose To start a Studio session for solving a task.

Use Select one or several alerts and select the command. Studio will start and display the corresponding alerts. The alerts now becomes a task and added to your task list.

Each task can consist of one or several alerts. In the task list you can choose to display all, closed or your own tasks.

See also *Mark on page 35*

Snooze

Menu location Alert Overview: Pop-up menu

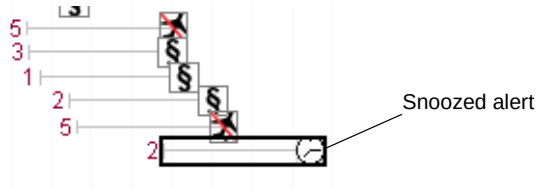
Purpose To snooze selected alerts for a fixed amount of time.

There can be many reasons for snoozing an alert, for example when a crew member has not checked in, but called and said she is on her way.

Use Mark one or several alerts and select the command. You can:

- Select from the list of predefined times.
- Select **Set time** to set an exact time.
- Use the command **Activate** to reactivate a snoozed alert.

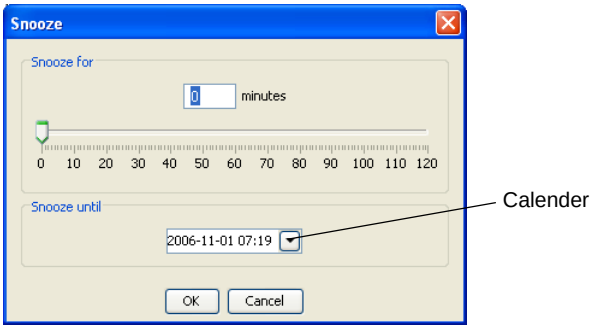
The snoozed alert is marked with a clock. The alert is snoozed for all crew trackers. In Alert Selection Details you can see who snoozed the alert and until when.



See also *Mark on page 35*
Alert filter on page 18

Set time

When you select Set time, the Snooze form is displayed.



You can enter a number of minutes to snooze, or use the calender to snooze for a longer period of time.

Activate

Menu location Alert Overview: Pop-up menu >Snooze

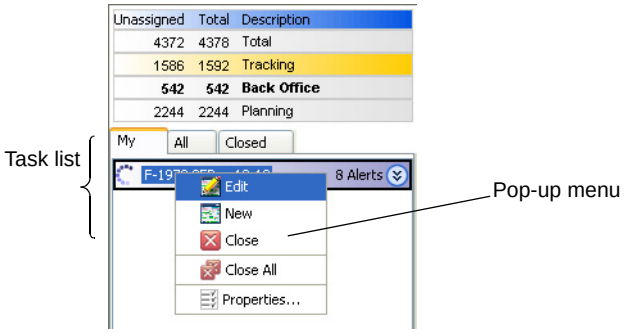
Purpose To reactivate a snoozed alert. Snoozed alerts are marked with a clock.

Use Select one or several snoozed alerts and select this command. The selected alerts become active again.

See also *Mark on page 35*

Task commands

The following commands affect tasks. You find them in Task list, pop-up menu. See also *Task list on page 17*.



Close

Menu location Task list: My tab >Pop-up menu

Purpose To close a task.

Use Click right and select **Close**. The task disappears from the task list and is moved to the Closed tab.

Close All

Menu location Task list: My tab >Pop-up menu

Purpose To close all task.

Use Click right and select **Close All**.

Edit

Menu location Task list: My tab >Pop-up menu

Purpose To edit the task.

Click right in the Task list and select **Edit**. Studio will start and display the corresponding alerts.

New

Menu location Task list: My tab >Pop-up menu

Purpose To create a new task.

Use Click right in the task list and select **New**. Studio will open.

Properties

Menu location Task list: My tab >Pop-up menu

Purpose To display the properties of the alerts in the task.

Use Click right on a task and select **Properties**, a form is displayed. This is the same information as in Alert Selection Details. With the Properties command, you can open several properties for comparison.

See also *Alert Selection Details on page 19*

Remove

Menu location Task list: Closed tab >Pop-up menu

Purpose To remove a closed task.

Use Click right on a closed task and select **Remove**.

Remove all

Menu location Task list: Closed tab >Pop-up menu

Purpose To remove all closed task.

Use Click right and select **Remove all**. All your tasks are removed.

Reopen

Menu location Task list: Closed tab >Pop-up menu

Purpose To reopen a closed task.

Use Click right on a closed task and select **Reopen**. The task is moved to the tab **My**.

Studio commands

This section describes the commands you will find in Studio.

Working window commands on page 99 describes the commands affecting the working windows in Studio.

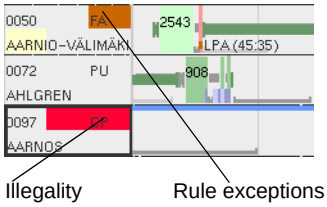
Check Legality

Menu location Crew Object (left margin in roster window)

Purpose To check a crew member's roster against the rules in the current rule set. Also used to edit rule exceptions.

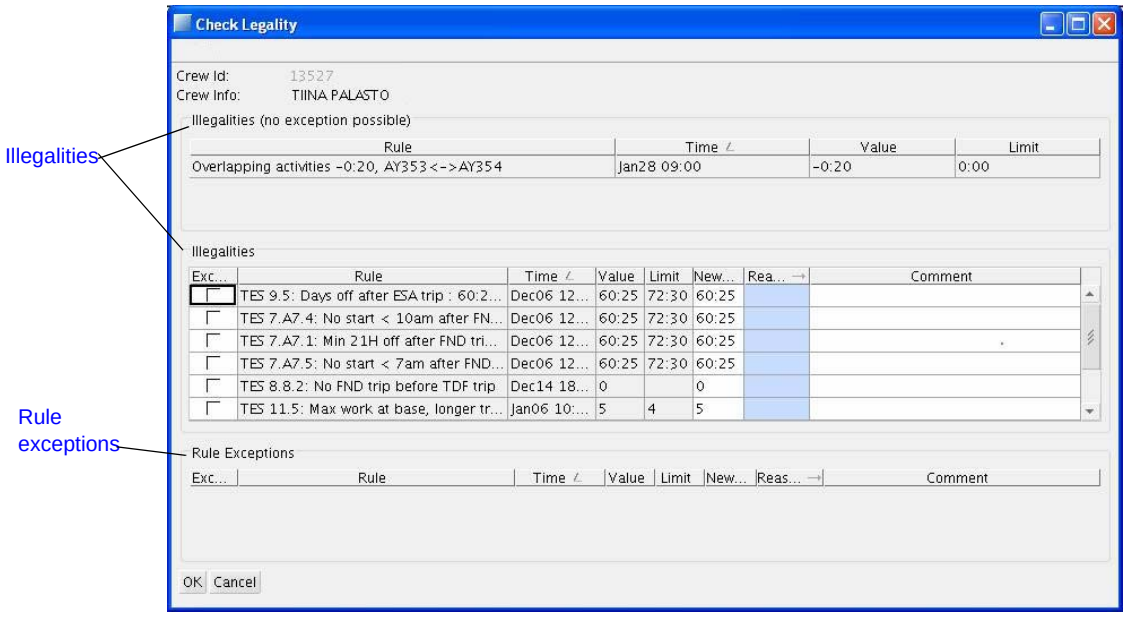
Use Illegalities and rule exceptions are displayed in the left margin with different markers.

An example:



When you place the pointer on a marker, information is shown in information area, see *Information area on page 28, Crew.*

Click in the left margin and select the command. The Check Legality form is displayed:



Parameter description

Exception	Check this box if you like to make a rule exception. See *Illegalities and rule exceptions on page 55*.
Rule	Which rule that is being violated.
Time	Departure time for leg.
Value	Value for the rule violated
Limit	Limit for the rule.
New	New value for the rule.
Reason	Select from predefined codes.
Comment	Further comments regarding the rule exception.

Illegalities and rule exceptions

There are two kinds of illegalities, illegalities where no exceptions are possible and illegalities where exceptions are possible.

Illegalities (no exceptions possible)

These illegalities are displayed in read only mode.

Illegalities

Rule exceptions are possible.

1. Check the box if you wish to make a rule exception.
2. Click OK. The rule exception is displayed with a marker in the left margin and on the affected leg.

Rule exceptions

The rule exceptions that has been made are displayed here. To remove a rule exception, simply uncheck the box and click OK.

See also *Rave Manual, Rules*

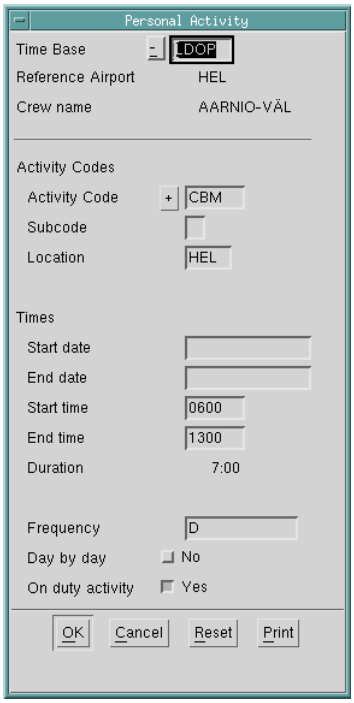
Create Activity

Menu location Crew Object (left margin in roster window)
Assignment General >Create

Purpose To create a personal activity and assign it to the selected crew member. You can use the command to create individual tasks such as vacation.

Use When you select the command the Personal Activity form is displayed.

The **Time Base** and **Times** values will be overwritten by the **Main Code** if the selected main code has predefined values.



Parameter description

Subcode Each leg can have an individual **Sub Code** which is a subset of the **Activity Code**. It can be used to specify the type of activity performed in the **Activity Code** activity.

The **SubCode** should be one of the predefined crew movement codes.

Location Specifies the location where the ground duty will take place.

Times Specifies the various date, time and duration values for the ground duty.

The terms **time base** and **frequency** are described in *Glossary*.

You can change the properties of an activity, see *Leg properties on page 73*.

Deadhead commands

The commands in this section all applies to deadheads.

A deadhead is a passive transport of crew between airports. The transport can be a flight with the crew's carrier, with another carrier or a ground transport. The Crew Tracking system distinguishes between this fleet deadheads and other fleet deadheads.

Change to/from Deadhead

Menu location Assignment Object >Leg
Trip Object >Leg

Purpose To switch legs between deadhead and on-duty.

Use Click the leg you want to change and select the command. If the leg was on-duty it will be changed to a deadhead and vice versa.

You will get a warning if a deadhead leg which does not exist as an on-duty leg is selected. You can choose whether or not the change should take place. If the change is done, the leg becomes one of the legs which should be covered.

It is impossible to change a deadhead leg to an on-duty leg if the leg is an OAG flight.

See also *Replace with deadhead on page 59*

Get Next Deadhead

Menu location Assignment Object >Deadhead
Trip Object >Get Next

Purpose To find the next legal deadhead.

Use When you select the command, the following deadheads are displayed in another window. The pointer changes into a cross.

1. Select one of the presented alternatives to become next in the chain by clicking on it. The selected deadhead will be moved into the chain, and the system will present its followers in the same way as above.
2. Repeat as long as needed or until no followers are found.
   Another way to select the following deadhead is to click middle on it. This will cause the deadhead to move into the chain and the command to end.
3. When you are satisfied with the chain of deadheads or just want to quit the command, you end by clicking right.

Get Previous Deadhead

Menu location Assignment Object >Deadhead
Trip Object >Get Next

Purpose To find the previous legal deadhead.

Use When you select the command, the previous deadheads are displayed in another window. The pointer changes into a cross.

1. Select one of the presented alternatives to become previous in the chain by clicking on it. The selected deadhead will be moved into the chain and its preceders are presented in the same way as above.
2. Repeat as long as needed or until no preceders are found.
   Another way to select the previous deadhead is to click middle on it. This will cause the deadhead to move into the chain and the command to end.
3. When you are satisfied with the chain of deadheads or just want to quit the command, you end by clicking right.

See also *Get Next Deadhead on page 58*

Replace with deadhead

Menu location Assignment Object >Deadhead

Purpose To find legal deadheads to replace legs with. Similar as **Change to/from Deadhead**, but here you get alternatives to choose from.

Use When you select the command, all legal deadheads are displayed in another window. The pointer changes into a cross.

1. Select one of the presented alternatives to become next in the chain by clicking on it. The selected deadhead will be moved into the chain, and the system will present its followers in the same way as above.
2. Repeat as long as needed or until no followers are found.
   Another way to select the following deadhead is to click middle on it. This will cause the deadhead to move into the chain and the command to end.
3. When you are satisfied with the chain of deadheads or just want to quit the command, you end by clicking right.

See also *Change to/from Deadhead on page 58*

Edit commands

This section describes the commands you use to edit objects in the working windows.

See also *Cut, copy and paste on page 39*
Mark on page 35
Drag and drop on page 36
Undo on page 98

Copy

Menu location Menu bar >Edit
Keyboard shortcut: Ctrl+C

Purpose To copy one or several objects.

Use Select one or several objects and select the command.

Cut

Menu location Menu bar >Edit
Keyboard shortcut: Ctrl+X

Purpose To cut one or several objects.

Use Select one or several objects and select the command. This command is useful when you need to scroll down to find the target row.

Paste

Menu location Menu bar >Edit

Keyboard shortcut: Ctrl+V

Purpose To paste a cut out object.

Use When you select the command the cut objects are pasted on the current row. You can also use the drag and drop feature to move objects in the working window.

Exit

Menu location Menu bar >File

Purpose To exit Studio.

Use If you have not saved, the system will inform you if you have unsaved edits and provide you with an opportunity to save, close or cancel **Exit**.

You can also use the toolbar button  . This will save the task and close Studio.

See also *Save Plan on page 79*

Get Next

Menu location Trip Object

Purpose To build a chain of consecutive legal objects.

Use Starting with the selected object, the **Get Next** command searches for the next legal object of chosen type. The system presents the possible legal candidates out of which you can make your choice.

For ground transport see *Get Next >Ground Transport on page 63*

The **Get Next** command works differently for different objects:

Deadhead	Gets the next legal deadhead legs.
Leg	Gets the next legal free legs. Not deadhead legs. All presented legs have passed the same crew complement filter as the legs in the leg window.
Duty	Gets the next legal duties with the same crew complement.
Trip	Gets the next legal trips with the same crew complement.
from Rotation	Gets the next legs in any rotation. You use the command to build chains that are similar to the rotations.

To use the command:

1. Click the object that you want to start with.
2. Select the **Get Next** command.
3. Select object type from the submenu.
   The system will find and present the objects according to search criteria set with **Options >Command Parameters**.
   Depending on your personal settings, see *Preferences on page 70*, the system will behave in one of two ways:
   - display the selected object in the current window's top row with the following possible legal objects on the rows below
   - display all the following legal following objects in another window.

   The pointer changes into a cross.
4. Select one of the presented alternatives to become next in the chain by clicking on it.
   The selected object will be moved into the chain, and the system will present its followers in the same way as above.
5. Repeat as long as needed or until no followers are found.
   Another way to select the following object is to click middle on it. This will cause the object to move into the chain and the command to end.
6. When you are satisfied with the chain of objects or just want to quit the command, you end by clicking right.

Note Also illegal candidates will be displayed if **Show even illegal** is set to `Yes` (in the **Command Parameters** command).

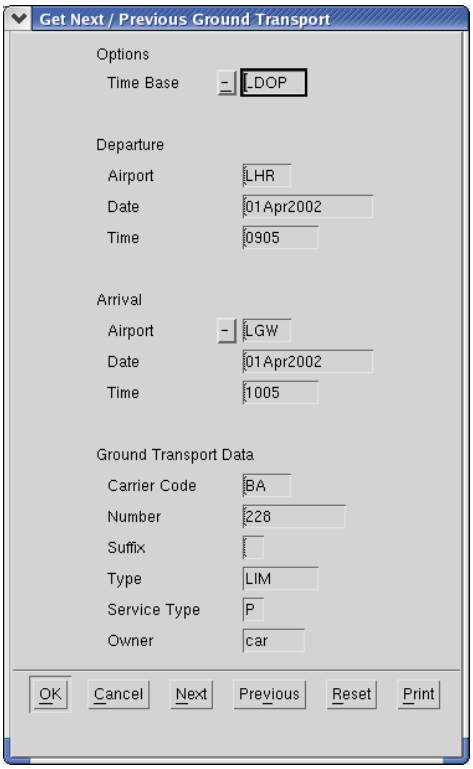
See also *Get Previous on page 65*

Get Next >Ground Transport

Menu location Trip Object

Purpose To find a ground transport leg, such as a bus connection.

Use When you select the command the Get Next/Previous Ground Transport form is displayed.



Parameter description

In the Get Next/Previous Ground Transport form you specify your search criteria.

Time Base
See the glossary for information about time base.

Departure
Specifies the departure airport, date or time for the next or previous search. **Time** is shown as UTC or local time according to your **Preferences**.

Arrival
Specifies the arrival airport, date or time for the next or previous search. **Time** is shown as UTC or local time according to your **Preferences**.

Ground Transport Data

Specifies characteristics of the ground transport to search for.

Buttons

OK	Creates a ground transport leg and inserts it in the chain. Note that if you have entered data in the form manually, you have to click **Previous** or **Next** before you click **OK**.
Next	Finds the next ground transport between the airports according to the search values in the form.
Previous	Finds the previous ground transport between the airports according to the search values in the form.

Get Previous

Menu location Trip Object

Purpose To build a chain of consecutive legal objects.

Use This command works in the same way as the command **Get Next**. The difference is that this command selects objects that can be placed before the selected object.

For ground transport *Get Next >Ground Transport on page 63*

See also *Get Next on page 62*

Help

Menu location Menu bar >Help

Purpose To quickly provide help when you need information about a command or a procedure.

Use To start Carmen Help, do one of the following:

- Select the command **Help >Carmen Help**.
- Click the toolbar button 

Carmen Help is launched in a browser. To find a particular help topic, you can:

- select the **Contents** tab to browse through topics by category
- select the **Index** tab to see a list of index entries
- select the **Search** tab to do a full-text search.

See also *How to use Carmen Help on page 7*

Carmen Help Settings

Carmen Help can be installed locally on your computer, made available to multiple users on a network share, published on CD-ROM or hosted on an Internet or intranet Web server.

Two Carmen resources are used to configure the help system within Studio:

- `default.config.OnlineHelpPath` specifies the path to the directory where the start page (`wwhelp.htm`) of the help system is located.
- `gpc.config.externalBrowser` specifies the name of the web browser to use.

Leg commands

The commands described in this section all applies to legs. A leg is the smallest planning unit, defined by place and time for departure and arrival. There are a number of different leg types. See *Glossary*.

See also *Get Previous on page 65*
Change to/from Deadhead on page 58

Switch Legs

Menu location Trip Object >Leg

Purpose To exchange two legs with one another.

Use To use this command:

1. Click the first leg and select the **Switch Legs** command.
   The pointer changes into a cross and the selected leg will get a temporary marker. If you want to cancel the command, click right.
2. Click the second leg in a working window (it may be a leg, duty or trip window).
   If the switch is allowed, the two legs will change place.

A number of checks are carried out:

- that the legs have the same arrival and departure airports. You may override this check.
- that the legs fit in their new positions.
- that the switch does not cause any illegalities. A warning is displayed.

The booked crew complement will be justified accordingly if legs are switched from or to trips.

See also *Swap on page 95*

Move

Menu location Trip Object >Leg

Purpose To move a leg to another row in the working window.

Use When you select **Move**, the pointer turns into a cross. Click the row to which you want to move the leg. To end the command, click right.

See also *Drag and drop using right button on page 37*

Replace NOP Leg

Menu location Trip Object >Leg

Purpose To replace not operating legs with legal legs. The system presents the possible legal legs, out of which you make your choice.

Use To use this command

1. Click the not operating leg that you want to start with.
2. Select the **Replace NOP Legs** command.
   The system clears the other working window presents all legal possible legs from the local plan. The pointer changes into a cross.
3. You can now pick one of the displayed alternatives to replace the not operating leg by clicking on that leg. The selected leg will be moved to the chain in the first working window.
4. When you are satisfied or just want to quit the command, click right.

Move

Menu location Trip Object

Purpose To move a trip to another row in the working window.

Use To use this command

1. Click the object that you want to move and select **Move**.
   The pointer changes into a cross and the selected object is marked with a black bar.
2. Click the target row or click right to cancel the command.
   The system performs plausibility check and a legality check for the target row including the moved object. If errors are detected, you will get a message and a chance to change your mind.
   The legality checks will only be made if a rule set is loaded.

If several working windows contain the same view, a move activity in one of the windows will also update the others. This can be useful if you need to work with different pages of the objects.

See also *Drag and drop on page 36*

Preferences

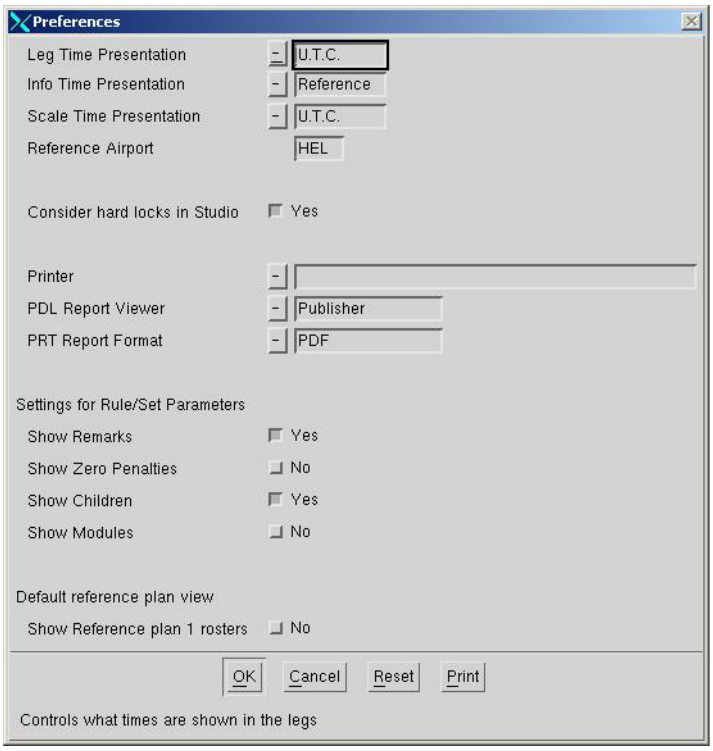
Menu location Menu bar >Tools

Purpose To set your personal preferences for the working windows and other planning attributes.

Use When you select this command the Preferences form is displayed.

If you change any values and select **OK**, they will be stored in a personal file that will be used the next time you start the system.

The default values are stored in the file `$CARMSYS/data/config/default_preferences`. When you close the form, the values are stored in `$CARMUSR/preferences/$USER`.



Parameter description

The Preferences form has the following fields.

Leg Time Presentation
Decides if UTC local time or reference airport time is shown in the legs.

Info Time Presentation
Decides if UTC or reference airport time is shown in the information area.

Scale Time Presentation
Decides if UTC or reference airport time is used in the time scale.

Reference Airport
This value is used when showing times in the legs, information area and the time scale. The reference airport is also used when matching legs belonging to different daylight savings time periods. Before matching a leg, the time of it may be temporary changed. The change is done to keep the local time at the DST airport. It means that if there is a change in difference between local time and UTC at the given airport for the two dates of the legs to match, that change is temporary added to the time of one of the legs.

Consider hard locks in Studio
Decides whether hard locks should be considered.

Printer
Decides which printer to use for all printouts. There is a menu with all selectable printers. If none is selected the computer system default printer is used. The script `$CARMSYS/bin/find_printers` is used to determine currently available printers. If you find this time consuming you can specify the available printers with the resource `default.config.PrinterList`, see *System Configuration Reference Manual, Appendix: Carmen resources*.

PDL Report Viewer
`Publisher`: use Rave Publisher to view your reports.

`Acrobat`: use Adobe Reader (PDF format) to view your reports.

You can view your reports with the Rave Publisher viewer and save it in PDF format.

PRT Report Format
Use HTML. PRT is short for Python Report Toolkit.

Show Remarks
`Yes` means that the remark of the variable, as defined in the rule source code, will be printed as label.
`No` means that the name of the variable will be used.

Show Zero Penalties
This switch only affects rules: `Yes` means that the penalty fields will always be presented for rules which have a penalty definition.
`No` means that the penalty fields will be hidden for rules where both min. and max. penalty are equal to zero.

Show Children
This switch only affects the rules in the ALL RULES group. `Yes` means that the parameters which are children to a rule, one level below, will be presented together with the rule switch. `No` means that the rules will be presented without children.

Show Modules
If set to yes, all modules will be displayed in the Rule parameters form.

Default reference plan view

If set to `Yes`, the reference plan will automatically be displayed. If set to `No`, select **Crew General >Reference plan> Show reference plan** to display the reference plan.

Properties

Menu location Assignment Object
Crew Object (left margin in roster window)
Trip General
Trip Object

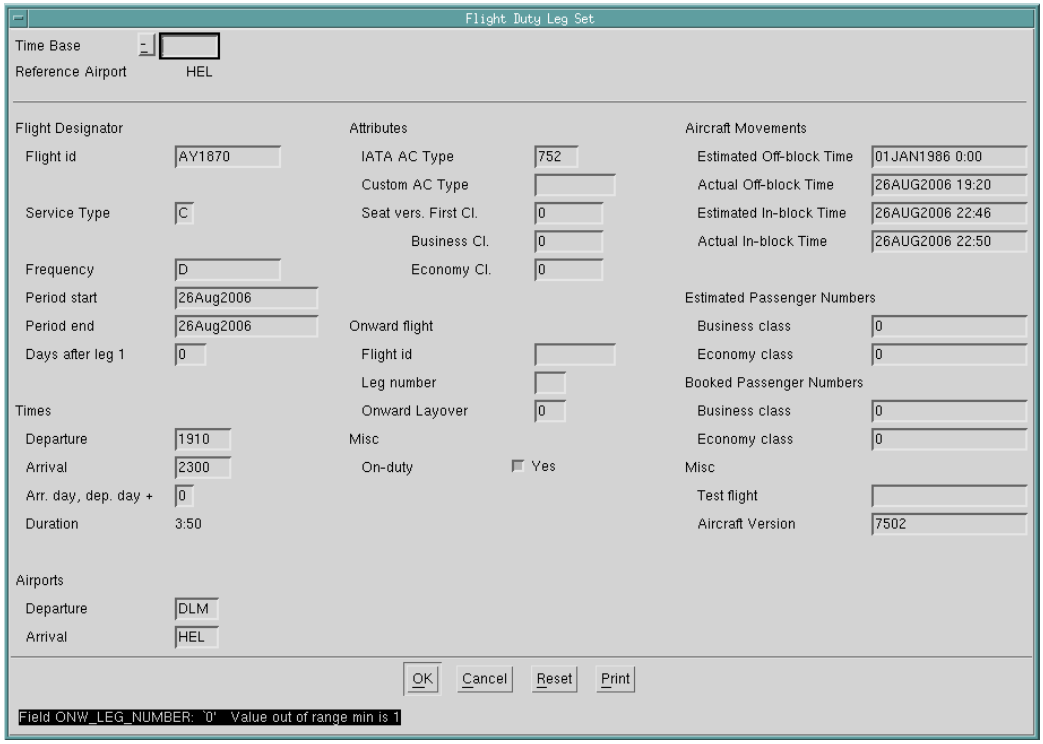
Purpose To display and edit the selected object's properties.

Leg properties

Menu location Assignment Object >Properties
Trip Object >Properties
Rotation Object

Purpose To display and edit leg properties.

Use When you select the command, the Flight Duty Leg Set form is displayed.

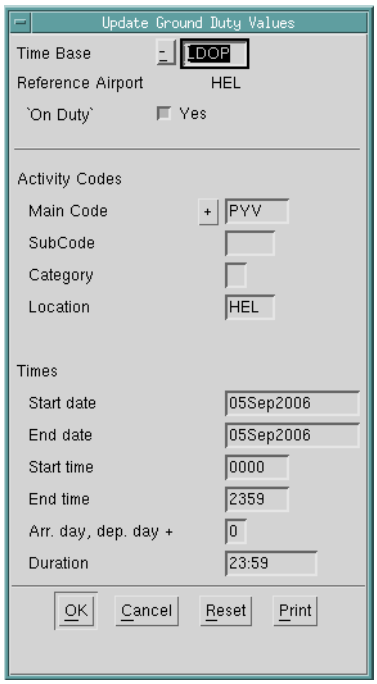


Personal activity properties

Menu location Assignment Object >Properties

Purpose To display and edit properties for personal activities.

Use When you select **Properties** in the roster window for a personal activity, the Update Ground Duty Values form is displayed.



Parameter description

Main Code — Specifies an activity common to all instances of this ground duty. For example, a simulator session `SIM1`.

Sub Code — Each leg can have an individual **Sub Code** which is a subset of the **Main Code**. It can be used to specify the type of activity performed in the **Main Code** activity, e.g. `VT1`.

The **SubCode** should be one of the predefined crew movement codes.

Category — Used in the same way as flight suffix of a regular flight. See flight ID.

Location — Specifies the location where the ground duty will take place.

Times — Specifies the various date, time and duration values for the ground duty.

The **Time Base** and **Times** values will be overwritten by the **Main Code** if the selected main code has predefined values.

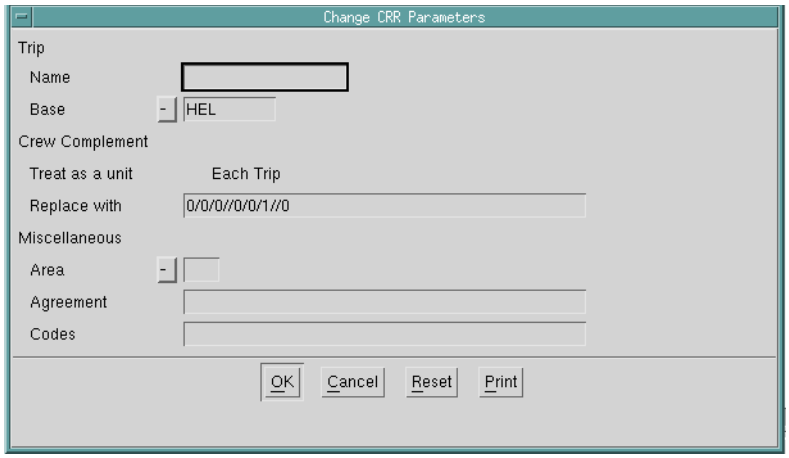
See also *Create Activity on page 56*

Trip properties

Menu location Assignment Object
Trip Object
Trip General

Purpose To display and edit trip properties.

Use When you select the Properties command from the Roster or Trip Object, the Change Trip Parameters form is displayed. When you select the command from the Trip General the Change all trip parameters form is displayed.



Parameter description

The Change Trip Parameters form has the following fields.

Name You can give the trip a name.

Base Specifies the trip's home base.

A trip cannot have more than one variant with the same home base, this means that you cannot change home base to one that is already the home base of an optional trip variant.

Treat as a unit `Each Trip` means that the crew complement stated in **Replace with** will be set on the selected trip.

`Trips with same leg sequence` means that all trips (including assigned trips) that have identical leg sequences will be treated as a unit, i.e. if you sum up their respective crew complement you will get the entered value.

Replace with Specifies the crew complement for the selected trip.

Area Defines to which area a trip belongs to.

Agreement Used to explain why for example certain legs are locked to each other.

Codes Used to extend the trip name. Keywords: `crr_code_**`

Note When you change the trip's crew complement, the booked crew complement for each included leg will be changed accordingly. If one or more legs become overbooked, they will be shown in a special colour (medium blue).

Refresh

Menu location Menu bar >File
Toolbar button 

Purpose To reload data and redraw the working windows.

Use When you select the command it reloads data from the storage sources (external tables, database) and redraws the working windows. This can be useful when, for example, source data has changed.

See also *Redraw on page 100*

Reload

Reload External Tables

Menu location Menu bar: File >Load

Purpose To reload external tables.

Use When you select the command it reloads the external tables. Only external tables that have been changed are affected. The system automatically loads external table files when need arises, for example in a rule evaluation.

Reload Rule Set

Menu location Menu bar: File >Load

Purpose To reload an already loaded rule set keeping the parameters currently set.

Use This command is a fast way to reload a current rule set.

Note A quick way to find a crew member is to use the command line, see *Command line on page 28*.

3. Find the crew member either via the command line or *Select Crew on page 80*.
4. Find the crew member either via the command line or *Select Crew on page 80*.
5. Find the crew member either via the command line or *Select Crew on page 80*.

Reports

Menu location Menu bar: Reports
Assignment General
Assignment Object
Trip General

Purpose To generate a report from Rave Publisher (using PRT).

Use The input data for the reports is always taken from the data that is currently loaded.

Depending on where you issue this command, different scopes of input data is used:

- from the menu bar: the complete plan is used.
- from a general pop-up menu, you can select items in the working window and sort them before running the command. This way you can get a report for a sorted subset of the plan.
- from an object pop-up menu, the generated report is only for the selected object (for example, one trip).

Save Plan

Menu location Menu bar >File
Toolbar button 

Purpose To save to the database.

Use When you select the command, all edits you have made are saved to the database. If you want to save the task and close Studio, you can use the toolbar button  .

See also *Exit on page 61*

Select commands

Menu location Trip General
Rotation General
Assignment General

Purpose To select and display a subset of trips, rotations, crew or flights.

Use The alternative **by Selection Mask** displays the selection form, see *Select by selection mask on page 84*.

See also *Sort on page 93*

Select Crew

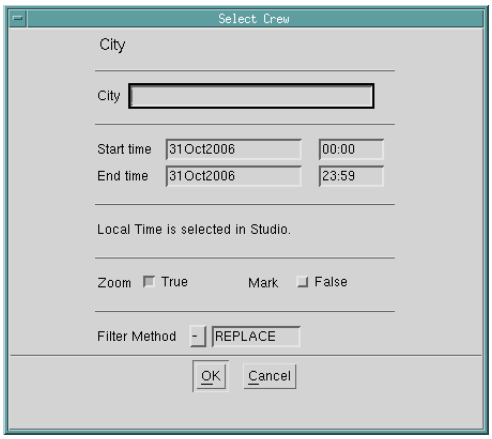
Menu location Assignment General

Purpose To select and display a subset of crew members.

Use The alternative **by Selection Mask** displays the selection form, see *Select by selection mask on page 84*.

Select one of the predefined selection alternatives from the submenu.

When you choose among predefined selection alternatives from the submenu, the Select crew form is displayed.



Parameter description

Zoom Set to true to zoom to the selected period.

Mark Set to true to mark the selected objects.

Filter Method

`ADD`
The chains found in the sub-plan will be added to the chains in the working window. No duplicates will be added. The added chains will be sorted and placed after the already visible ones.

`SUBSELECT`
The selection is only made from the chains already visible in the working window.

`REPLACE`
Replaces the chains in the working window with the chains found in the sub-plan. Default.

See also *Select by selection mask on page 84*
Sort Crew on page 93

Select Flights

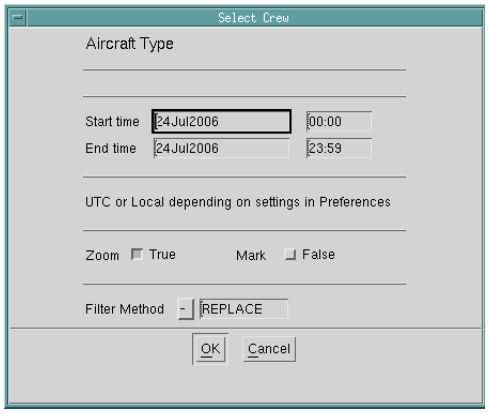
Menu location Assignment General

Purpose To select and display a subset of flights.

Use The alternative **by Selection Mask** displays the selection form, see *Select by selection mask on page 84*.

Select one of the predefined selection alternatives from the submenu.

When you choose among predefined selection alternatives from the submenu, a form is displayed.



Parameter description

Zoom Set to true to zoom to the selected period.

Mark Set to true to mark the selected objects.

Filter Method

`ADD`
The chains found in the sub-plan will be added to the chains in the working window. No duplicates will be added. The added chains will be sorted and placed after the already visible ones.

`SUBSELECT`
The selection is only made from the chains already visible in the working window.

`REPLACE`
Replaces the chains in the working window with the chains found in the sub-plan. Default.

Select Rotations

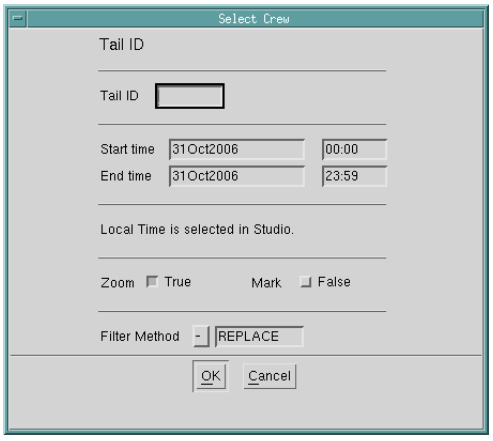
Menu location Rotation General

Purpose To select and display a subset of rotations.

Use The alternative **by Selection Mask** displays the selection form, see *Select by selection mask on page 84*.

Select one of the predefined selection alternatives from the submenu.

In some cases when you choose among predefined selection alternatives from the submenu, a form is displayed.



Parameter description

Zoom Set to true to zoom to the selected period.

Mark Set to true to mark the selected objects.

Filter Method

`ADD`
The chains found in the sub-plan will be added to the chains in the working window. No duplicates will be added. The added chains will be sorted and placed after the already visible ones.

`SUBSELECT`
The selection is only made from the chains already visible in the working window.

`REPLACE`
Replaces the chains in the working window with the chains found in the sub-plan. Default.

See also *Sort Rotations on page 94*

Select Trips

Menu location Trip General

Purpose To select and display a subset of trips.

Use The alternative **by Selection Mask** displays the selection form, see *Select by selection mask on page 84*.

Select one of the predefined selection alternatives from the submenu.

In some cases when you choose among predefined selection alternatives from the submenu, a form is displayed.

Parameter description

Zoom Set to true to zoom to the selected period.

Mark Set to true to mark the selected objects.

Filter Method

`ADD`
The chains found in the sub-plan will be added to the chains in the working window. No duplicates will be added. The added chains will be sorted and placed after the already visible ones.

`SUBSELECT`
The selection is only made from the chains already visible in the working window.

`REPLACE`
Replaces the chains in the working window with the chains found in the sub-plan. Default.

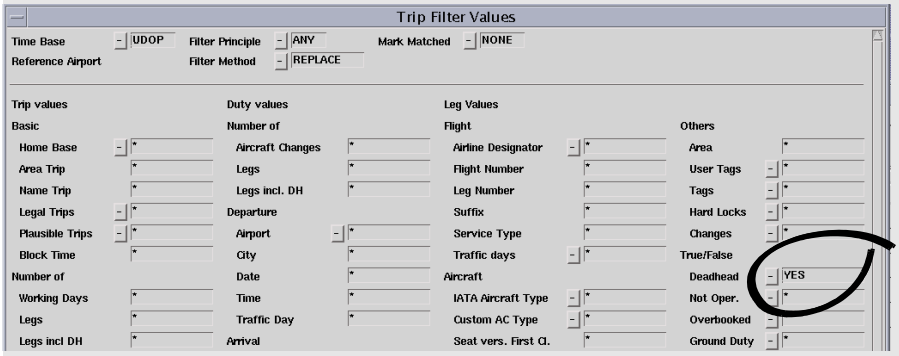
Select by selection mask

Use the selection mask when you wish to enter your own selection criteria.

1. In a working window, click and select **by Selection Mask**.
2. The appropriate filter values form is displayed.
3. Enter the selection criteria and click **OK**.
   Only the objects that match the entered selection criteria are displayed in the working window.

Example Show only trips with deadhead legs.

1. Show all trips by using the command **Show Trips** in the window menu.
2. In Trip General, select **Select >Select by selection mask**.
   The Trip Filter Values form is displayed.



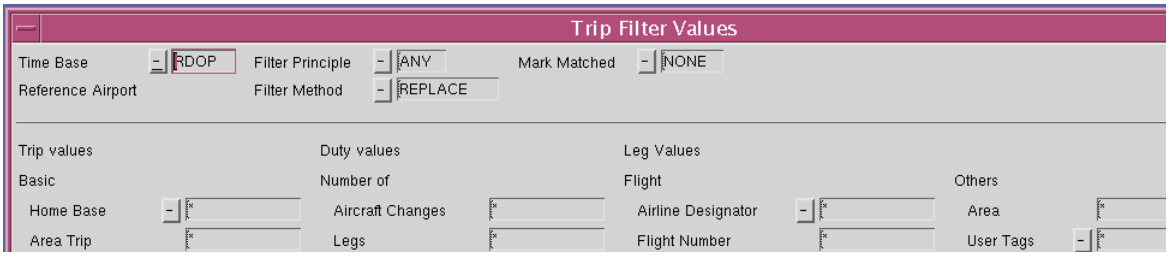
3. In the **Deadhead** field under **Leg Values**, **True/False** select `YES`.
4. Click **OK**.

Only trips containing deadhead legs will now be shown in the working window.

For information on how to define your own predefined selections.

Selection form

When you issue the **Select by Selection Mask** command the Filter Values form is displayed.



There are a number of settings to control the filtering:

- *Time base*
- *Filter principle*
- *Filter method*
- *Mark matched.*

For the selection values you can use two types of selection languages:

- *Regular expressions*
- *Select expressions*.

You can also use *Rule values* in the selection.

Time base

There are different types of time bases:

`UDOR`	UTC Day of ORigin (default value)
`UDOP`	UTC Day of OPeration
`LDOP`	Local Day of OPeration
`RDOP`	Reference airport Day of OPeration

Filter principle

The select expressions may be a bit tricky to use. For example, setting departure airport `FRA` will display all chains having at least one leg that departs from Frankfurt. Setting departure airport `!FRA` will select all chains with at least one leg that does not depart from Frankfurt, but the chain may still contain legs which actually depart from Frankfurt.

To meet the different requirements that exist on a versatile selection function, there are two selection modes:

`ANY`	It is enough for one leg in a chain to fulfil the selection criteria. This is the case illustrated earlier. Default.
`ALL`	All legs must fulfil the selection criteria. Thus, if departure airport `=!FRA` and the `ALL` selection principle is chosen, only chains where no legs depart from Frankfurt will be displayed.

Filter method

There are three methods of applying the selected items:

`ADD` The chains found in the sub-plan will be added to the chains in the working window. No duplicates will be added. The added chains will be sorted and placed after the already visible ones.

`SUBSELECT` The selection is only made from the chains already visible in the working window.

`REPLACE` Replaces the chains in the working window with the chains found in the sub-plan. Default.

Mark matched

This option instructs the system to mark the objects that match the filter criteria in a selection.

`NONE` Marking nothing. Default.

`LEG` Mark individual legs that matches the selection criteria.

`Duty` Mark all legs in a duty that matches the selection criteria.

`Trip` Mark all legs in a trip that matches the selection criteria.

`ROSTER` Mark all legs in a roster that matches the selection criteria.

Markers are only put on legs in those chains that are actually selected. When combined with filter method `ADD`, markers will only be set on chains that are added to the selection. Previously selected chains will not be touched.

Default values for parameters in selection commands

Time Base `UDOR/DOR`

Select Principle `ANY`

Select Method `REPLACE`

Mark Matched `NONE`

All the other parameters in the form will have the default value */ which means that no selection will be done.

Regular expressions

Regular expressions is a powerful way of defining sets of strings. Here are some of the most useful constructions:

Description	Regular expression example	Examples of matching strings
Matches part of string	`arrival`	`arrival` `local_arrival_time`

Many strings (matches either before or after |)	`arrival|departure`	`arrival`
		`local_arrival_time`
		`departure`
		`local_departure_time`

Description	Regular expression example	Examples of matching strings
Beginning of string (^)	`^arrival`	`arrival` `arrival_airport_name`
End of string ($)	`name$`	`arrival_airport_name` `departure_airport_name`
Matches string exactly	`^arrival$`	`arrival`
A period matches any character	`crew_position_1.`	`planning_crew_position_11` `planning_crew_position_12`
Matches any sequence inside string	`is_.*_leg`	`is_first_leg` `is_last_leg`

To use any of the special characters, e.g. ^, as a regular character, you have to precede it with a \ (backslash).

Select expressions

When you use a form to make a selection, a number of special characters are available to specify your selection.

Symbol	Description
*	Don't care This setting will have no selective effect at all and is valid on all types of items. The * must be alone in the text field except for string items see `xxx*` below.
!	Not Example: `!200` All values except 200 will be selected.
/	Interval Example: `100/199` All values from 100 to 199 will be selected.
<	Less than Example: `<100` All values less than 100 will be selected.
>	Greater than Example: `>100`
<=	Less than or equal Example: `<=100` All values less than or equal to100 will be selected.
>=	Greater than or equal Example: `>=100` All values greater than or equal to 100 will be selected.

Symbol	Description
`xxx*`	Any string Example: `air*` All string values starting with air will be selected. This * can only be used on string items. Only one * per field is permitted.
`?`	Any single character Example: `Car?en` All string values beginning with `Car`, ending with `en` and with one character between will be selected. The `?` can only be used on string items.
`,`	Separator Example: `100,200,250` The values 100, 200 and 250 will be selected. The separator can be used in connection with all of the above described characters.

The item selection is always evaluated from left to right, one sub-expression (separated by comma) at a time.

If a sub-expression is true, the evaluation for the field stops and gives `TRUE` except when `!` precedes the sub-expression, which will result in `FALSE`.

Some examples:

`100/200,!150`	Selects all values between 100 and 200.
`!150,100/200`	Selects all values from 100 to 200 except 150.

When doing a selection, all of the selected items of the form must result in `TRUE` to get a match.

Rule values

Each **Rule Values** selection field consists of two parts. In the left field you write the rule variable or keyword. In the right field you write the selection value.

There is usually a pick-list to select rule variable or keyword from, but any variable or keyword that is included in the rule set is possible. To distinguish between rule variable and keyword, you use the module as a prefix or encompass the variable name with %. See the example below.

Example

Rule variable or keyword	The selection will be made for
`homebase`	a keyword `hombase`. If no such keyword is found, the system will search for a variable `hombase` in the `_topmodule`.
`%homebase%`	a variable `homebase` in the `topmodule`.
`crew.homebase`	a variable `homebase` in the `crew` module.
`crew.%homebase%`	a variable `homebase` in the `crew` module.

Whether void values (the value doesn't exist for the object) should be considered as a match or not depends on the **Filter Principle** field. If this field is ALL, the void values match but if it is ANY, the void values never match.

Show roster commands

Menu location Window menu
Assignment Object >Leg >Show
Trip Object >Leg >Show

Purpose To display all or a subset of rosters in the current sub-plan.

Show Rosters

Menu location Window menu

Purpose To display the rosters in the current sub-plan.

Use When you select this command the rosters from the sub-plan will be displayed and the working window set to roster mode.

Each row in the working window will normally contain the assignments for one crew member. However, depending on the scale and display mode assignments may stretch over several rows.

The rosters will be sorted according to the last used sort order. The default order is by departure time.

See also *Sort Crew on page 93*

Show >Rosters (for leg)

Menu location Assignment Object >Show
Trip Object >Show
Rotation Object >Show

Purpose To show the rosters in which the leg is included.

Use To use the command:

1. Mark one or several legs and select the **Leg >Show >Roster**.
2. The rosters in which the leg(s) exists are displayed in another working window.

See also *Mark on page 35*

Show rotation commands

Menu location Assignment Object >Show
Trip Object >Show

Purpose To show all rotations or the rotations included in the selected legs.

Show Rotations

Menu location Window menu

Purpose To display all legal rotations in the current local plan.

Use All legal rotations in the local plan will be displayed and the working window is set to rotation mode. Whether an rotation is legal is decided by the current rule set.

If no rule set is loaded the command will not be able to execute. The system will display a message in a Message form.

Each row in the working window will normally contain an rotation but depending on the display scale and display mode an rotation can stretch over several rows.

If a leg included in the rotation is overbooked or not operating or other fleet on-duty, that leg will be displayed in a specific colour.

See also *Sort Rotations on page 94*

Show >Rotations (for leg)

Menu location Assignment Object >Show
Trip Object >Show
Rotation Object >Show

Purpose To show the rotations in which the leg is included.

Use To use the command:

1. Mark one or several legs and select the **Leg >Show >Rotation**.
2. The rotations in which the leg(s) exists are displayed in another working window.

See also *Mark on page 35*

Show trips commands

Menu location Window menu
Assignment Object >Leg >Show
Trip Object >Leg >Show

Purpose To display all trips or a subset of trips in the current sub-plan.

Show Trips

Menu location Window menu

Purpose To display all trips in the current sub-plan.

Use When you select this command, all trips from the sub-plan will be displayed and the working window is set to trip mode.

Each row in the working window will normally contain a trip but depending on the display scale and display mode a trip can stretch over several rows.

The trips will be sorted according to the last used sort order for trips. The default order is by departure time.

If a leg included in the trip is overbooked or not operating or other fleet on-duty, that leg will be displayed in a specific colour.

See also *Sort on page 93*

Show >Trips (for leg)

Menu location Assignment Object >Show
Trip Object >Show
Rotation Object >Show

Purpose To show the trips in which the leg is included.

Use To use the command:

1. Mark one or several legs and select the **Leg >Show >Trips**.
2. The trips in which the leg(s) exists are displayed in another working window.

See also *Mark on page 35*

Sort

Menu location Assignment General
Rotation General

Purpose To sort the contents of the working window by a specified sort order.

Use When you select this command you also select one of the sort orders presented in the submenu:

- Departure time
- Arrival Time
- Departure Airport
- Arrival Airport
- Rule Values
- Crew Complement
- Trip Name
- Crew Alias
- Flight Designator

The system sorts the contents and redraws the working window in question. All empty rows are removed from the working window.

If the working window contains chains of flights, e.g. trips, it is the first and last legs of the chains that are targets for the sort. Excepted is the sort by Crew Complement which uses the largest common crew complement.

The system stores the current sort order and uses it when showing the same type of data (for example Show Trips) the next time during that session. If you use the same sort order often you can add that sort order as a direct menu entry.

Sort Crew

Menu location Assignment General

Purpose To sort the contents of the working window by a specified sort order.

Use Select one of the sort orders presented in the submenu:

- **Crew Function**
  Sort crew according to crew main function.
- **Crew ID**
  Sort crew according to crew ID.
- **Departure**
  Sort crew according to next departure.
- **Duty Time**
  Sort crew according to month duty time.
- **First name**
  Sort crew according to crew first name.
- **Home base**
  Sort crew according to crew home base.

- **Points**
  Sort crew according to month points (Cockpit only).
- **Seniority**
  Sort crew according to crew seniority.
- **Soon Check In**
  Sort crew according to scheduled check in time.
- **Surname**
  Sort crew according to crew surname.

See also *Select Crew on page 80*

Sort Rotations

Menu location Rotation General

Purpose To sort the contents of the working window by a specified sort order.

Use Select one of the sort orders presented in the submenu:

- **Arrival**
  Sort rotations according to next arrival.
- **Departure**
  Sort rotations according to next departure.
- **Tail**
  Sort rotations according to tail ID.
- **Type**
  Sort rotations according to aircraft type.

See also *Select Rotations on page 82*

Swap

Menu location Assignment Object
Keyboard shortcut: Ctrl+W

Purpose To swap roster objects.

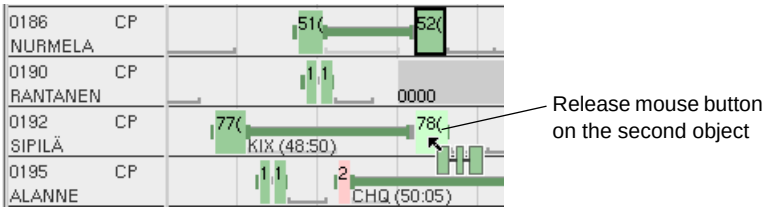
Use You can swap using the command from the object pop-up or by using drag and drop. To view only a subset of crew, use **Select Crew**.

Swap using object pop-up

1. Click left and select **Swap**. The pointer turns into a cross.
2. Click where you want the swap to take place. To end the command, click right.

Swap using drag and drop

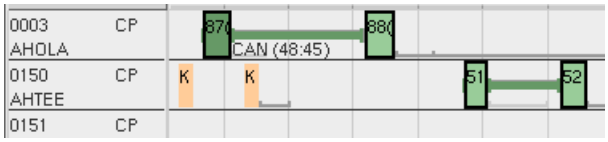
Select the object you want to swap and drag it while pressing the right mouse button. Release the button on the second object and select **Swap** from the pop-up menu.



Swap using drag and drop

Overlap in time

When the objects do not overlap in time, you have to select both objects involved in the swap before the actual swap. Otherwise you will only a move will be performed, not a swap.



No overlap, mark before swap

See also *Select Crew on page 80*

Trip commands

Assign

Menu location Trip Object

Purpose To assign a trip to a crew member.

Use To use this command

1. Show the crew member in the roster window and the unassigned trip in the trip window.
2. Mark the objects you want to assign and select the command. The pointer changes into a cross.
   You can cancel the operation by clicking right.
3. Click the crew member in the roster window.
   The trip will now be assigned to the crew member and moved into the crew member's roster in the roster window.

Note The trip must have a crew complement greater than zero for the crew position corresponding to the crew member's main position.

If the unassigned trip has a crew complement that is larger than 1, the original trip is retained and its crew complement is decremented for the position corresponding to the crew member's position.

See also *Mark on page 35*

Deassign

Menu location Assignment Object

Purpose To deassign trips from a roster.

Use Mark the objects you want to deassign and select the command. The deassigned object will be moved to the trip window.

This can also be done by selecting the objects and press the keyboard button delete.

See also *Mark on page 35*

Reassign

Menu location Trip Object

Purpose To reassign a trip to a crew member.

Use A trip can become deassigned by the command **Deassign**. If you assign a trip to a roster and it causes an overlap, the original trip will be deassigned.

When you select the command, the trip is reassigned to its original roster.

Remove

Menu location Trip Object

Purpose To remove all marked trips in the working window or a single trip.

Use Mark the trips you want to remove and select the command.

See also *Mark on page 35*

Split

Menu location Trip Object

Purpose To divide a trip into separate parts. The split parts will be placed in new rows in the working window.

Use Click a trip and select **Split**.

The trip is split after the selected leg. The parts of the split trip will form new trips placed in new rows in the working window.

The first part of the split trip keeps all its attributes. The cut off part gets the same attributes as the first part, except for the name which is set to the default value. For some customers the index is also set to a default value.

Undo

Menu location Menu bar >Edit
Keyboard shortcut Ctrl+Z
Toolbar button 

Purpose To undo, redo or repeat your last command or action. If you make a mistake, **Undo** will bring you back to where you were. You don't have to save your plan every time before performing massive planning operations.

The functions are:

Undo 
Reverts to the previous state, which means the state of the program before you executed the last command. The state is defined by the current values of all planning objects in the loaded local plan and sub-plan and the current settings for the working window.

Redo 
Redoes your last undone action. This is the opposite to undo and reverts to the state of the system before the last **Undo** command.

Repeat Executes the command again. This is the same as if you issued the command again from the menu.

Example The difference between **Redo** and **Repeat**.
Suppose that you have selected the command **Mark Trips >One by One** and marked a number of trips. Then you reverted to the previous state by using **Undo**. At this stage you can choose to redo or to repeat the command:

- **Redo** The command executes with the same trips marked again.
- **Repeat** The pointer changes into a cross, and you can mark the trips of your choice.

You can issue the commands from the menu or from the toolbar. The commands in the **Undo** menu is continuously updated and will display your current options for undo, redo and repeat.

Not all commands and actions are meaningful or possible to undo, redo or repeat. For example, it doesn't make sense to undo the command **Redraw**. And there is no way to undo the effect of saving or deleting a plan.

The functionality will not work for changing parameters or modifying external tables.

Working window commands

This section describes the commands affecting the working windows in Studio.

See also *Studio user interface on page 21*

Clear

Menu location Window menu

Purpose To clear the working window.

Use Click the window menu button and select **Clear**. When you select the command, the working window is cleared.

New

Menu location Menu bar >Window
Keyboard shortcut: Ctrl+N

Purpose To open a new working window.

Use Select the **New** command. A new working window is opened below the already opened window(s). You can have up to four working windows open at the same time. Use the **Remove** command to close the windows.

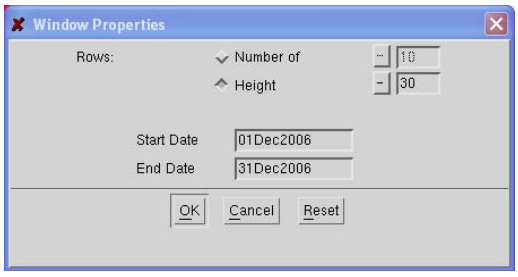
Properties

Menu location Window menu

Purpose To set the number of rows or the height of the rows displayed in the window and the time period to be displayed.

Use Click the window menu button and select **Properties**. The Window Properties form is displayed.

1. Specify the number of rows or the height of the rows displayed in the window and the time period to be displayed.



2. Click **OK**. The working window will be redrawn.

Redraw

Menu location Window menu

Purpose To redraw a working window.

Use Click the window menu button and select **Redraw**. When you select the command, the working window with all its objects will be redrawn.

The command is useful when the working window has become hard to read and when rules have been changed, influencing objects on the screen.

Remove

Menu location Window menu

Purpose To remove a working window.

Use Click the window menu button and select **Remove**. The working window is removed.

Studio commands for administrators

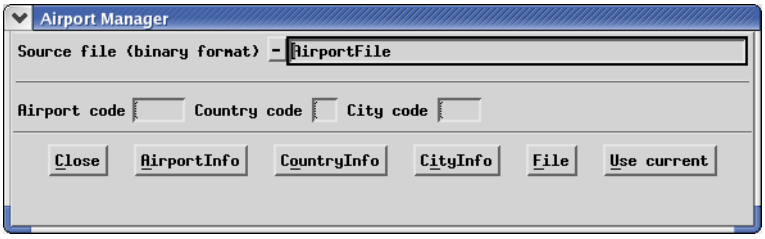
The commands in this section you will only have access to if you are logged in as an administrator.

Airport Manager

Menu location Menu bar: Admin Tools

Purpose To get information on airports and to handle the files with airport data.

Use When you select this command, the Airport Manager form is displayed.



Parameter description

The Airport Manager form has the following fields.

Source file Select a file name from the pick-list. This file will be used when you click **Airport**, **Country** or **City**. Default is the current published file.

Airport Code Enter the IATA airport code and click **Airport**. A report with the corresponding name, city, country, longitude, latitude and time variation will be displayed.

Country Code Enter the country code and click **Country**. A report with information on all the airports located in this country will be displayed.

City Code Enter the city code and click **City**. A report with information on the airports connected to the city will be displayed.

Buttons

The Airport Manager form has the following buttons.

AirportInfo Executes an airport query. Enter the IATA airport code to display the corresponding name, city, country, longitude, latitude and time variation. Dates and times refer to UTC indicating shift from/to daylight saving time.

CountryInfo Executes a country query. Enter the country code to display information on all the airports located in this country. For each airport you will get the airport name and the corresponding city code, city name, state code and state name for some of the airports.

CityInfo	Executes a city query. Enter the city code to display information on all the airports connected to this city. For each airport you will get the airport name and the corresponding state code, state name, country code and country name for some of the airports.
File	Functions for managing airport files. See *Airport Manager (File) form on page 103*.
Use Current	Change source file to current published file.

Airport Manager (File) form

When you click **File** in the Airport Manager, the Airport Manager (File) form is displayed. In this form you start functions to handle airport files.

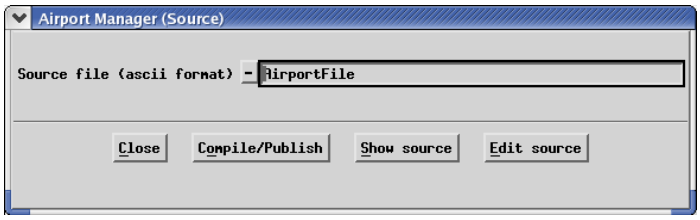
Buttons

The Airport Manager (File) form has the following buttons.

Source	Functions for handling the source files. See *Airport Manager (Source) form on page 104*.
Compare	Compare two airport manager information files.
Publish	Commit the airport manager information file to the Carmen system. This is done by pointing out the new compiled airport file.

Airport Manager (Source) form

When you click **Source** in the Airport Manager (File) form, the Airport Manager (Source) form is displayed.



Parameter description

The Airport Manager (Source) form has the following fields.

Source file Select the file name from the pick-list. This file will be used when you click **Compile/Publish** or **Show Source**. Default is the current published file.

Buttons

The Airport Manager (Source) form has the following buttons.

Compile/Publish Compiles the file by using the `apcomp` function. The `apcomp` function checks the file format and gives statistics as an output. If an error occurs you will get information on the type of error and to which record the error is connected. If everything is OK you will get statistics from the compilation. The compiled file will have the same name as the source file.

Show source Shows the source file.

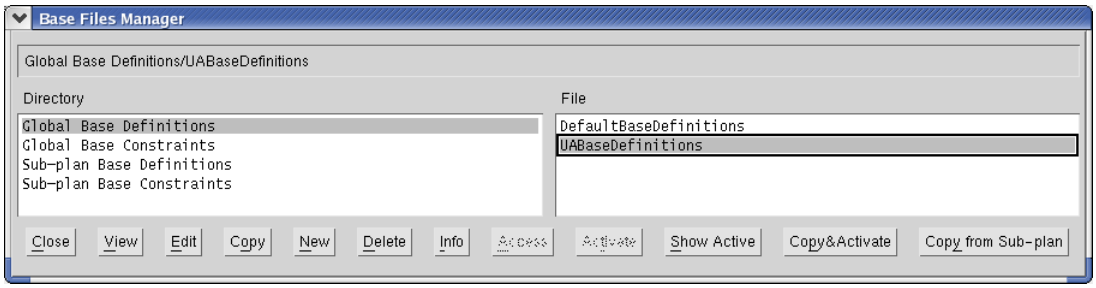
Edit source Starts an editor on the source file.

Base Files Manager

Menu location Menu bar: Admin Tools >File Management

Purpose To handle external tables containing base information.

Use When you select this command the Base Files Manager form is displayed.



Directories

`Global Base Definitions`
`Global Base Constraints`

These two directories contain files with base information valid for global use. The main purpose of these directories is to store files, which may be used in several sub-plans. The files to use with a sub-plan have to be copied to the Sub-plan Base directories before use.

`Sub-plan Base Definitions`
`Sub-plan Base Constraints`

These two directories contain files with base information valid only for the current sub-plan. Only these files can be activated for use.The Sub-plan Base directories are only available if the current sub-plan exists on file.

Buttons

The Base Files Manager is a CFM form. For a description of standard buttons see *Carmen File Manager*. Additional buttons or buttons with different behaviour.

Edit Starts Tabletool with the selected file loaded. This is the same as the commands **Carmen Help,Edit Base Definitions** and **Edit Base Constraints** but you can't edit active files this way.

Activate This button is only enabled when you select a file in a sub-plan directory. The selected file will be activated for use, and the bases currently used by the system will be updated.

Show Active A message form is displayed with information on which base files are currently active.

Copy & Active This button is only enabled when you select a file in a Global Base directory. The selected file will be copied to the corresponding Base Sub-plan directory, and then activated. This button combines the **Copy** and **Activate** buttons.

Copy from Sub-plan You can select a sub-plan and a file to copy from that sub-plan. The file is automatically activated.

When you create a sub-plan (using the **Select Legs** command) it gets its initial base information from two files in the `Global` directories. When you save the sub-plan for the first time, it gets its own copies of the base files (in the directories `Sub-plan Base Definitions` and `Sub-plan Base Constraints`). All sub-plans will have one active base definition file and one active base constraint file.

The base constraints files are stored in different directories,
the global version (default files): `$CARMUSR/etable/.BaseConstraints/`
the sub-plan specific version: `$CARMUSR/LOCAL_PLAN/...subplan_name/etable/SpLocal/.BaseConstraints/.`
The keyword `base_constraint_file` points to the file actually being used by the optimizer.

See also *Edit Base Constraints on page 119*
Carmen Help,Edit Base Definitions on page 121

Batch Job Manager

Menu location Menu bar: Admin Tools >Jobs

Purpose To monitor and manipulate the optimization jobs in their various states of execution, queuing, finished etc.

Use Since the optimization jobs may take some time, they are executed independently of the user's activity. This command provides you with information on the status of queuing and executing batch jobs.

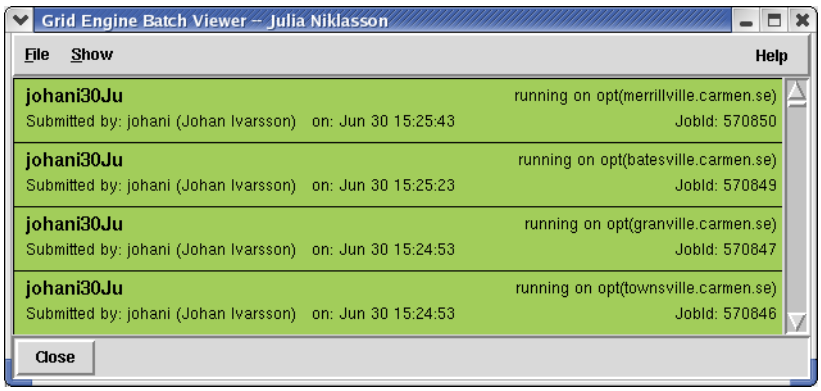
When you select the command, the **Batch Job Manager** displays a window with information about the jobs.

Your system is configured to run one of these batch systems

- *Sun Grid Engine* (SGE) an open source project.
- *Carmen Batch system*
- *LSF Batch system*, provided by Platform Inc.

Sun Grid Engine

If your system is configured to run the Sun Grid Engine (SGE), the Grid Engine Batch Viewer is displayed.



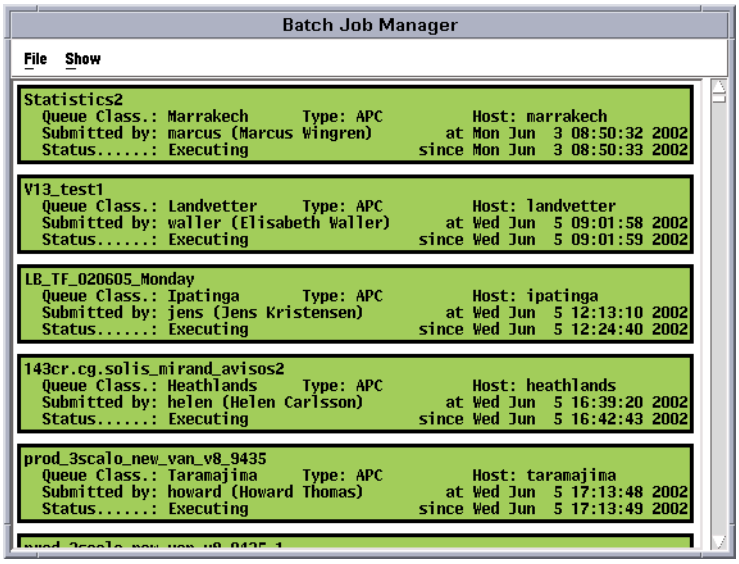
The Batch Viewer displays a list of batch jobs. Each job is displayed with information about

- job name
- job status (queuing, running, finished, suspended and exited)
- queue
- the user that submitted the job, and when it was submitted
- job Id.

To find more information click **Help** in the toolbar in the Sun Grid Batch Viewer.

Carmen Batch system

If your system is configured to run the Carmen Batch system, the Batch Job Manager is displayed.



The information displayed for each job is:

`Job name`	The name of the job.
`Queue class`	Queue where the job runs.
`Submitted by`	The person who started the job and when it was submitted.
`Status`	`Queuing`, `Executing` or `Finished` and when it got that status.
`Type`	The type of job, e.g. APC.
`Host`	The host on which the job is run.

The information is automatically refreshed periodically.

If you want to see more detailed information for a specific job, click and select **Status** from the pop-up menu, see *Pop-up commands on page 111*.

Note If you want to be notified when the job is finished, you have to have the **Batch Job Manager** open.

File and Show menus

The Batch Job Manager menu bar has the two menus: **File** and **Show**.

In the **File** menu you will find the following commands:

Update	Updates the displayed status of the jobs. The information in the window is updated automatically. The **Update** command forces an update.
Remove My Jobs	Removes your finished jobs.
Server Configuration	Information about how the server is configured

Server Statistics	Information about the number of jobs, in what queue they are and on which machine they are running.
Close	Closes the Batch Job Manager window.

In the **Show** menu you will find commands that control which jobs to display.

Submitter	A submenu with the sub-selections **Myself** and **Everybody**. Default is **Everybody**.
Queue Class	A submenu with the sub-selections **All** and one option for each available queue class. The number of queue classes depends on the server configuration. Default is **All**.
Class Type	A submenu with the sub-selections **All**, **Report** and **APC**. Default is **All**.
Machine	A submenu with the sub-selection **All** and one option for each available machine. The number of machines is dependent of the server configuration. Default is **All**.
Job Status	A submenu with the sub-selections **All**, **Finished**, **Executing** and **Queuing**. Default is **All**.

Pop-up menus

If you click on one of the jobs in the job list, a pop-up menu is displayed with the following options:

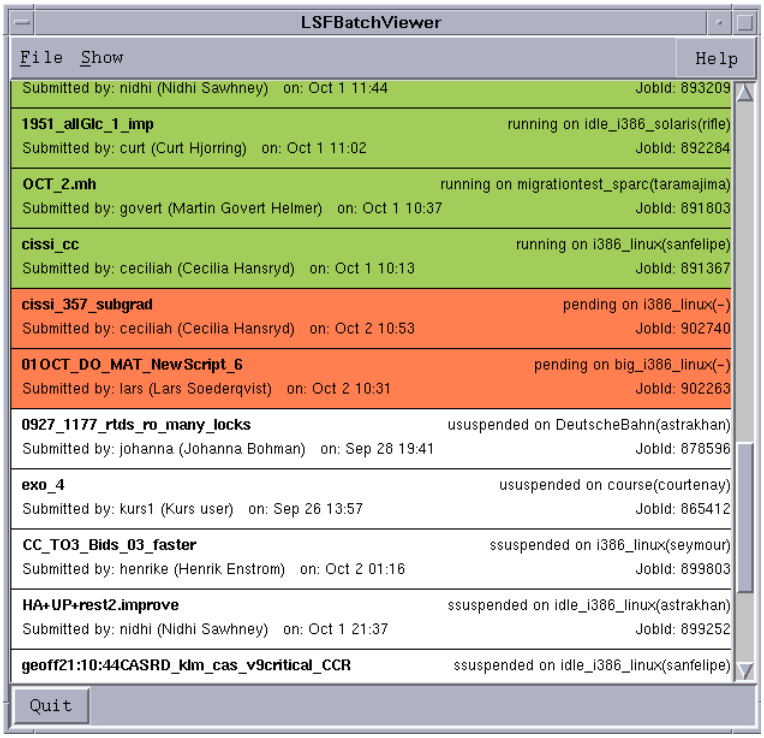
Status	Displays a Batch Job Status window with additional status information about the job. Only one job at a time can be monitored. If you activate the status display for another job, the status window is simply redrawn and starts monitoring the new job.
Cancel	Cancels the job, i.e. it is removed from the batch queue. This applies only to queuing or executing jobs.
Remove	Removes the job. Applies only to finished jobs.

See also *System Administration Reference Manual, Carmen batch*

LSF Batch system

Optional

If your system is configured to run the LSF Batch system, the LSF Batch-Viewer is displayed.



The LSF BatchViewer displays a list of LSF Batch jobs. Each job is displayed with information about

- job name
- job status (queuing, running, finished, suspended and exited)
- queue
- the user that submitted the job, and when it was submitted
- job ID.

If you want to see more detailed information for a specific job, click on the job and select **Status** from the pop-up menu, or double click on the job.

When you start the LSFBatchViewer a pop-up message will inform you of all your jobs that have finished since you last ran the viewer.

When a job is finished, you are notified with a pop-up message and/or an e-mail.

File and Show menus commands

The LSFBatchViewer menu bar contains the following commands.

File >

Refresh	Updates the information displayed on the screen. An automatic refresh is done every 60 seconds.
Remove My Jobs	Removes your jobs that are not running.

Quit	Quits the LSFBatchViewer.
Show >	
My Jobs	Lists all your jobs.
All Jobs	Lists all jobs.
Reset Viewer	Resets the screen to show all the jobs and updates the jobs' status, active users, available hosts and queues.
Advanced Selection	Displays a selection form where you can specify your selection. The advanced selection form offers a number of selection possibilities: **Users** - A list of users that currently have jobs in LSF. **Hosts** - A list of the available hosts. **Status** - A list of possible job status. **Queues** - A list of the available queues. **History** - A list of users whose finished jobs you want to be displayed in the list.

You can select the **all** check box or one of or a combination of the other options.

By using the **Save Selection** button you can save your favourite selections to be used as default. The next time you start the LSFBatchViewer this selection will be used.

Load Selection displays the saved selection while **Reset** displays the original default (the **all** boxes checked for all except **History** which has the **myself** box checked).

Pop-up commands

If you click right on a selected job in the job list, a pop-up menu is displayed which contains

Status	Displays the Status Viewer showing the APC runtime status report. The Status Viewer is updated every 15 seconds. You can also double click on the job.
Cancel	Cancels the job. You can only cancel your own jobs.
Remove	Removes the job from the list. You can only remove your own jobs.
Suspend	Puts the job on hold. `ssuspend` in the job list means that the job is suspended by the system. `ususpend` means that the job is suspended by a user.
Resume	Resumes the execution of a suspended job.
Switch to	Switches the job to another batch queue.

Job History Displays the Job History Viewer showing the history of the selected job.

See also *System Administration Reference Manual, Platform LSF*
LSF Batch User's Guide (external)
LSF Administrator's Guide (external)

Colour Manager

Menu location Menu bar: Admin Tools

Purpose To set up your own colour set.

Use You can set a colour for most of the objects shown in the working windows. It is also possible to set colours for other objects such as predefined leg, duty and trip type.

All objects with associated text can have the texts coloured as well. Texts on top of the object `Xyz` is indicated with the parameter `Xyz_on`, for example `Free_leg_on`. Texts written immediately before and after the object `Xyz` is indicated with the parameter `Xyz_off`, for example `Free_leg_off`.

The colours used in the working windows are defined by a combination of XResources, Carmen resources and Rave definitions. See *System Configuration Reference Manual, Colours*.

When you select the command the Colour Manager form is displayed.

The form contains a list of objects that can be coloured and the colour palette to choose colours from.

How to set your own colours

1. Search for the object type you want to change and select it. **Current Colour** shows the current colour for the selected object type.
2. Select a new colour from the colour palette. **Current Colour** changes to the selected colour.

3. Click **Current Colour** to update colours on objects in the working windows. The active colour field and all matching objects in the working windows will get the selected colour.
4. Click **Save Colours** if you want to keep the changes to another planning session or click **Close** to leave the form.

Parameter description

The Colour Manager form has the following fields.

Background	Background for the working windows.
Grid	The vertical lines separating the working windows into rows and columns.
Chain_border_line	The lines between two chains.
Wrap_line	The lines between two rows in a chain.
Weekday	The colour for the week days (except Saturday and Sunday) in the major scale.
Saturday	The colour for Saturday text in the major scale.
Sunday	The colour for Sunday text in the major scale.
Selected_day	Background for the part of the major scale that contains the selected period.
Trip_connector	The colour of line connecting legs in assigned trips.
Connection_lock	The hard lock marker colour.
Locked_trip_connector	The colour of line connecting legs in locked assigned trips.
Temporary_Marked	The colour of the marker that shows that a leg is selected for any kind of manipulation.
Change_Indicator	The colour of the change indicator. It indicates that the leg has at least one change in common with the current change group.
Leg_in_duty Leg_in_duty_on Leg_in_duty_off	The colour of a flight leg in a crew chain when it is covered by a duty or a trip.
Crew_inexperience	The colouring of the crew margin.
Crew_unknown	The colouring of the crew margin.
Crew_marked	The colour of the marked crew.
Crew_temporarily_marked	The colour of the temporarily marked crew.
Crew_text	The colour of the crew text.

Due_Date_Alert_1(close) Due_Date_Alert_2(soon) Due_Date_Alert_3(way off)	In combination with rules you can get a graphical indication (red, yellow, green) on how soon a qualification will run out.Text view data
Variant_line	The colour of the checked pattern around a chain from a reference plan.
Text_view_header_text	Text view mode
Text_view_data_text	The colour of the header where the time scale normally is.
Text_view_data_background	The colour of the text in the main working window. The colour of the background in the main working window.
Marked Marked_on Marked_off	The colour of marked legs.
Not_operating_leg Not_operating_on Not_operating_off	The colour of a leg which is no longer operating (does not exist in the local plan).
Free_leg Free_leg_on Free_leg_off	The colour of a free flight leg in a leg, leg set or rotation view.
Deadhead_leg Deadhead_on Deadhead_off	The colour of a deadhead leg.
Deadhead_other_fleet Deadhead_other_fleet_on Deadhead_other_fleet_off	Other fleet deadhead colour.
Not_in_sub-plan Not_in_sub-plan_on Not_in_sub-plan_off	The colour of legs in a rotation or leg set, not selected into the sub-plan.
Other_airline_deadhead_leg Other_airline_deadhead_leg_on Other_airline_deadhead_leg_off	The colour of a deadhead leg on a flight with another airline company.
Caught_by_Crew_Filter Caught_by_Crew_Filter_on Caught_by_Crew_Filter_off	The colour of a leg that is saturated (caught by the crew filter) in leg, leg set or rotation window.
Over_crewed_leg Over_crewed_on Over_crewed_off	The colour of a leg with more crew than required.

Varying_crew_complement Varying_crew_complement_on Varying_crew_complement_off	The colour that indicates that the crew complement for a leg is not the same for all times in the interval covered by the leg.
Other_Fleet_Onduty Other_Fleet_Onduty_on Other_Fleet_Onduty_off	The colour of on-duty legs not selected as on duties into the local plan (after **Move to New Version** or **Roll Out to Dated**). Used for deadhead candidates in leg set view.
Pact Pact_on Pact_off	The colour of a personal activity; only appears in crew schedule.
Task Task_on Task_off	The colour of a ground task.
Ground_Transport Ground_Transport_on Ground_Transport_off	The colour of a ground transport.
Extra_seat_leg Extra_seat_on Extra_seat_off	The colour of a leg on a flight that has extra seat for crew.
Extra_seat_overbooked_leg Extra_seat_overbooked_on Extra_seat_overbooked_off	The colour of a leg on a flight that has extra seat for crew which is overbooked.
Rule_Colour_1 .... Rule_Colour_32	32 colours for rule defined objects and markers.

Command Parameters

Menu location Menu bar: Admin Tools

Purpose To set selection parameters for the **Get Next/Get Previous** commands and to see the create optional trip variant parameters.

Use When you select this command the **Command Parameters** form is displayed showing the current parameter values.

Parameter description

Legality

Show even illegal

If set to `Yes` even illegal candidates are presented. All illegal chains will be marked with temporary markers.

Consider Crew Complement

If set to `Yes`: only duties/trips with the same crew complement will be shown, respectively only free legs.

Leg Parameters

Airport

The arrival/departure airport of the next/previous legs.
Example: If **Airport** is `FRA` and **Get Previous** is invoked, only legs departing from FRA are selected.

City

The arrival/departure city of the next/previous legs. Example: If City is `NYC` and **Get Next** is invoked, only legs that arrive at JFK, LGA or EWR are selected.

Connection Time

The time gap between the chosen leg and the selected legs.
Example: If the time interval is set to `<24:00` and **Get Next** is invoked, only legs that departs within 24 hours are selected.

Back to Base

Get Next: Only legs that arrive at the crew base on the trip.
Get Previous: Only legs that depart from the crew base on the trip.

Back to Original Airport

Get Next: Only legs that arrive at the departure airport of the first leg in the chain.
Get Previous: Only legs that depart from arrival airport of the first leg in the chain.

Returning Flight

Only flights which return to where the selected leg departed or arrived.
Example: If **Get Next** is invoked from a chain ARN-GOT, only legs between GOT and ARN are presented.

Deadhead Parameters

Airport
City
Connection Time
Back to Base
Back to Original Airport
Returning Flight

See the corresponding **Leg Parameters** above.

IATA Aircraft Type

The IATA aircraft type of the next/previous leg.

Service Type

The service type of the next/previous leg.

Duty/Trip Parameters

Airport

The arrival/departure airport of the first/last leg in the duty/trip. Example: If **Airport** is `CPH` and **Get Next Trip** is invoked, only trips which last leg arrives at CPH are selected.

City

The arrival/departure city of the first/last leg in the duty/trip.

Connection Time

The time gap between the chosen duty/trip and the selected duties/trips.

Parameters for Creating Optional Trip Variants (Rave definitions)

Read-only information.

Your default base variant settings are displayed here. To change them use the command *Rule Parameters on page 258*. To be available they must be set as map variables in Rave, see *Rave Manual, Map variables*.

Maximum number of deadheads before trip
Maximum number of deadheads after trip
Total maximum number of deadheads before/after trip

You can use these parameters to reduce time for deadhead search. E.g. if you want the system to be able to find a variant that starts with 3 deadheads you may set **Max...before trip** to 3. However, a large number may considerably increase search time.

Maximum prolongation before trip, hours and minutes
Maximum prolongation after trip, hours and minutes

You can use these parameters to reduce search time. E.g. if you want the system to search for deadheads up to 2 days before the trip kernel you may set **Maximum prolongation before**... to 48:00.

Replace existing optional trip variants

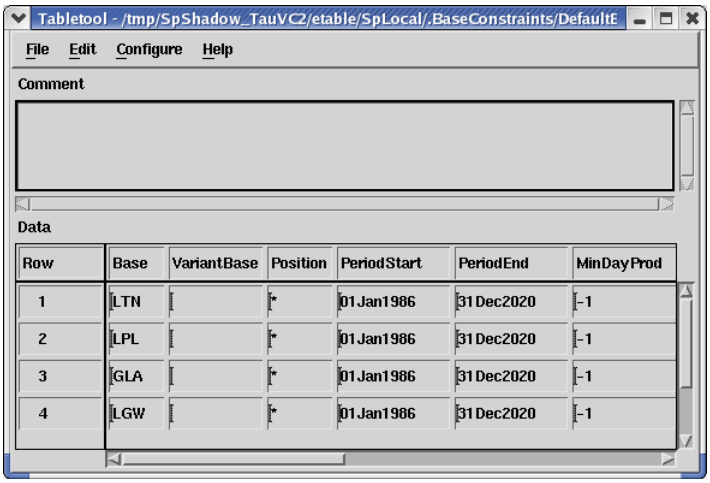
`Yes`, existing variants are removed and replaced with new ones.
`No`, existing variants remain and the new ones are added.

Edit Base Constraints

Menu location Menu bar: Admin Tools >Sub-plan >Bases

Purpose To specify constraints for different periods in an optimization job. You can specify the minimum and the maximum number of working days for a number of specified periods.

Use When you select the command, the Tabletool form shows the external table with the base constraints.



Parameter description

The bases will be updated when the **Exit** command is invoked in the Tabletool, but not when the table is saved without invoking **Exit**.

Base	The base has to be defined in the base definition table.
PeriodStart **PeriodEnd**	A base may have several constraint periods. If the period is larger than the plan period APC sets the constraints period to that of the plan. Setting a very long period is the same as setting no period at all.
MinDayProd **MaxDayProd** **MinTotProd** **MaxTotProd**	A value of -1 in the production columns indicates that there is no max/min limit

Example Using base variants

In the table below, rows 1 and 3 contain regular constraint specifications. In these rows, the **VariantBase** column must be left empty. The second and fourth rows contain base variant specifications.

Periods of base variants must equal the period of the corresponding base constraint (inconsistencies are silently ignored.) In the base constraints table, variant rows (one row per variant base) has to follow immediately after the base constraint entry for the main base. If a base has several constraint periods then variant rows should follow right after the entry of the base constraint with the same period.

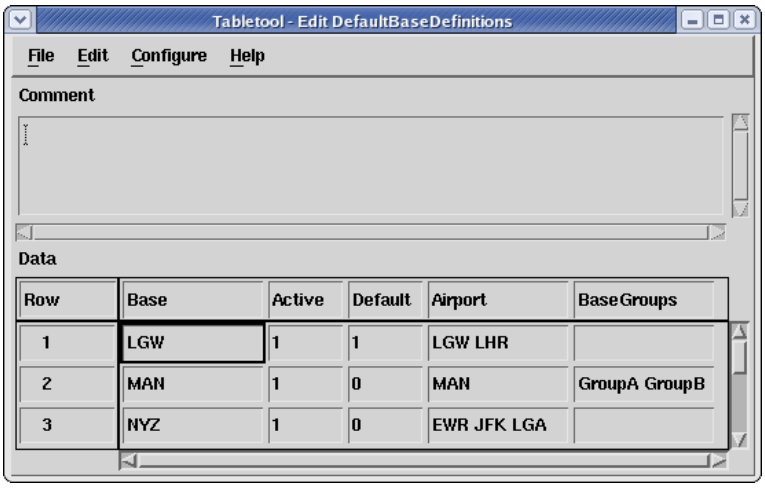
Base	VariantBase	PeriodStart	PeriodEnd	MinDay	MaxDay	MinTotP	MaxTotP
MUC		05JAN2003	14JAN2003	10	15	135	160
MUC	FRA	05JAN2004	14JAN2004	5	-1	10	20
MUC		15JAN2004	31JAN2004	12	18	180	265
MUC	FRA	15JAN2004	31JAN2004	6	10	25	70

Carmen Help, Edit Base Definitions

Menu location Menu bar: Admin Tools >Sub-plan >Bases

Purpose To maintain the base definitions.

Use When you select this command, the Tabletool form shows the external table with the base definitions.



See *Tabletool on page 80* for information on how to navigate and edit in the Tabletool form.

The definition of a base is a three letter string of the format [A-Z 0-9]. It may be a valid airport or city code, although it doesn't have to be.

A base can only be defined once in the table.

Any number of bases can be marked as active. Bases are taken into consideration when the optimizer creates trips or when legality is checked in Studio.

Only one base can be set as the default one. When creating a trip which does not start or end at any of the active bases, the default base will be used as home base.

Multiple airports and base groups are separated by space. The first group of the base groups is used as default base group.

The bases will be updated when you exit Tabletool (**File >Exit** command in the Tabletool).

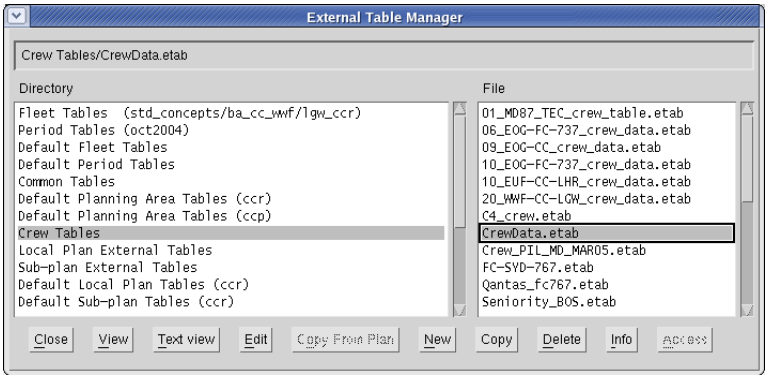
See also *Base Files Manager on page 105*

External Table Manager

Menu location Menu bar: Admin Tools >Table Management

Purpose To maintain external tables.

Use When you select the command the External Table Manager is displayed.



A number of directories are displayed, three are general directories and the rest are directories for customer specific files.

`External Tables`
: General external tables available for all plans.

`Local Plan External Tables`
: External tables available only for the current local plan and its sub-plans. This directory appears in the form, only when a local plan is loaded.

`Sub-plan External Tables`
: External tables available only for the current sub-plan. This directory appears in the form only when a sub-plan is loaded.

`Local Plan Fall-back`
: If Rave doesn't find a file in `Local Plan External Tables` it looks in this directory.

`Sub-plan Fall-back`
: If Rave does not find a file in `Sub-plan External Tables` it looks in this directory.

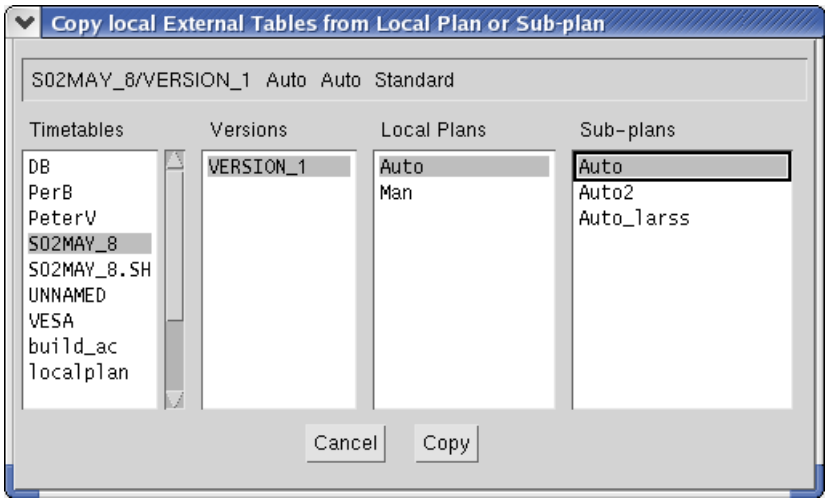
Buttons

The External Table Manager is a CFM form. For a description of standard buttons see *Carmen File Manager*. Additional buttons or buttons with different behaviour:

Copy from plan To copy local external tables from other plans. See *Copy from plan on page 123*.

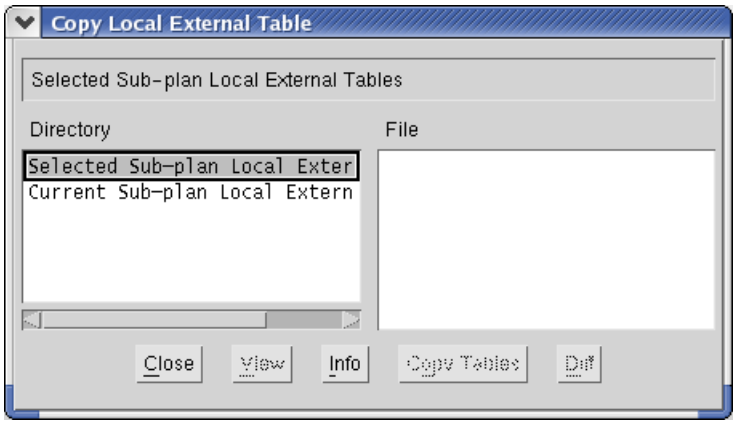
Copy from plan

When you click **Copy from Plan** button in the **External Table Manager** the Copy Local External Tables from Local plan or Sub-plan form is displayed.



1. Select the local plan or sub-plan to copy the external table from.
2. Click **Copy**.

   The Copy Local External Table form is displayed showing the selected plan's external tables.



   The form displays a number of directories and files.

   `Selected...`
   Shows the files that are the local external tables for the selected plan.

   `Current ...`
   Shows the files that are the local external tables for the currently loaded plan.

3. Select the external tables to be copied into the current local plan or sub-plan.
4. Click **Diff** if you want to see the differences between the selected local external table and the current local external table with the same name (if it

exists). If you have selected many files it only compares the first one with the current one.

5. Click **Copy Tables** to activate the copy of all the selected files to the current plan.

If the command tries to override an external table with the same name, you will get a warning message.

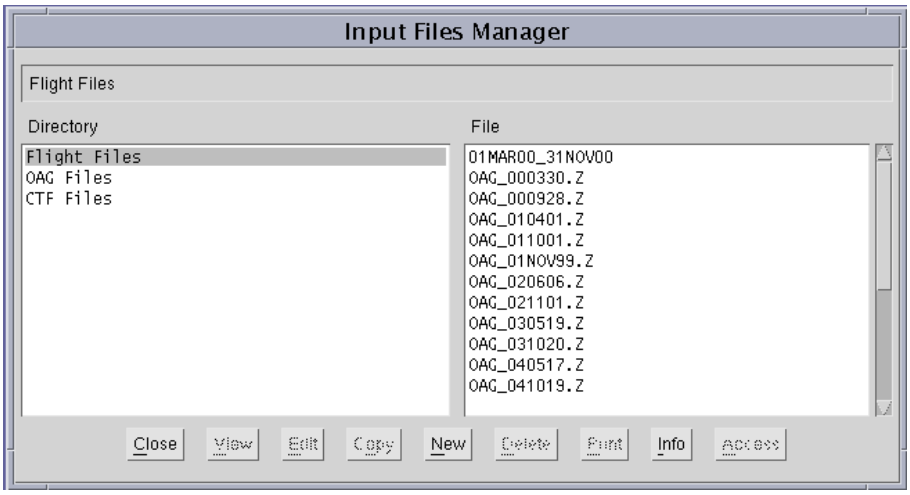
Note An external table can be specific to a plan only when the plan has been saved to file.

Input Files Manager

Menu location Menu bar: Admin Tools >File Management

Purpose To examine input files.

Use When you select this command the Input Files Manager form is displayed.



The Input Files Manager is a CFM form, see *Carmen File Manager*.

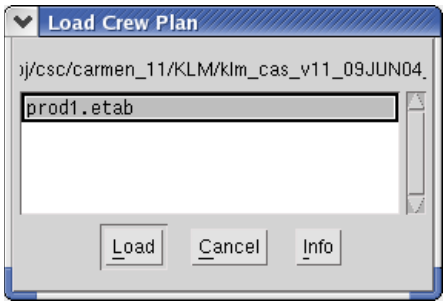
Since this is a CFM form it may be configured for customer specific needs. Read about this in the *System Configuration Reference Manual, Carmen File Manager (CFM)*.

Load Crew Plan

Location Menu bar: File >Load

Purpose To load a crew plan.

Use The Load Crew Plan form is displayed, showing the available crew plans.



When you click **Load**, the selected plan is loaded and the form closes.

See also *Crew Plan Manager on page 71*

Load OAG Plan

Location Menu bar: File >Load

Purpose To load an OAG flight plan.

Use When you select the command the Load OAG plan form is displayed.

Select an OAG plan and click **Load** to load the selected plan.

Load Parameters

Location Menu bar: File >Load

Purpose To load Rave parameter settings from parameter files or from saved sub-plans.

Use When you select the command a submenu with two options is displayed:

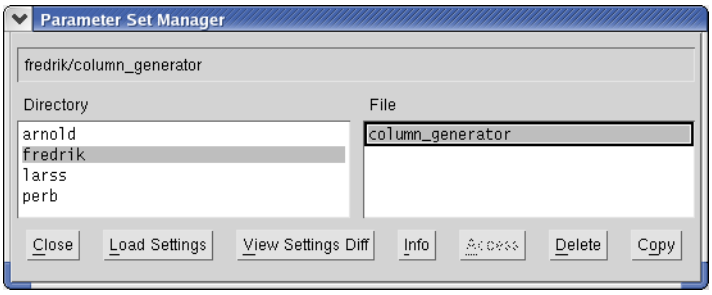
- **from File**
- **from Sub-plan**

You can generate a report on how the parameters settings will be affected by the load operation, see *View Settings Diff on page 129*.

from File

One way of storing parameter settings is in parameter files. These files are stored in a separate directory structure, accessed through CFM.

When you select this command the Parameter Set Manager form is displayed.



You load a settings file by selecting a directory and the desired settings file, and click **Load Settings**.

Buttons

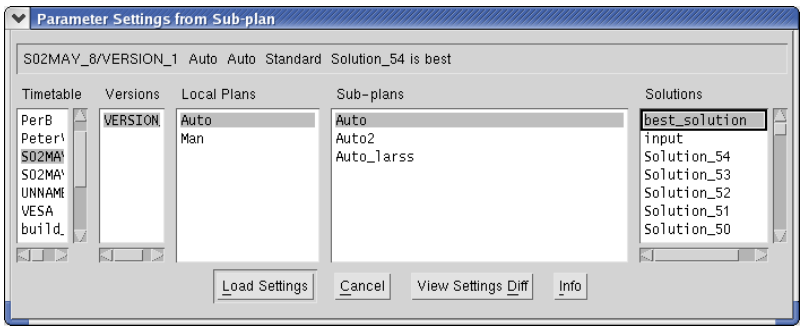
The Parameter Set Manager is a CFM form. For a description of the standard buttons see *Carmen File Manager*. Additional buttons or buttons with different behaviour:

Load Settings Initiates the load.

View Settings Diff Generates a report on what will change in the parameter settings when the selected setting file is loaded.

from Sub-plan

The system stores parameter settings in the sub-plan. When you select this command the Parameter Settings from Sub-plan form is displayed.



Buttons

Load Settings Initiates the load.

View Settings Diff Generates a report on what will change in the parameter settings when the selected sub-plan's parameters are loaded.

View Settings Diff

Before you load Rave parameter settings into the loaded rule set it is a good idea to view the consequences of such a setting. To do this, click **View Settings Diff** and a **Parameter Settings Diff Report** is displayed.

This report may also be displayed automatically after an actual loading of settings. You switch this automatic report on or off by using the **Options >Preferences** command, field **Show Read Report**.

A Parameter Settings Diff Report consists of the following major parts:

- A header part with information on the currently loaded rule set, the settings with which the current settings are compared, and a brief summary of changes that would take place if the settings were to be loaded.
- `ITEMS THAT WILL BE CHANGED`
  A detailed report on the actual changes, all affected items are reported with the present value and the new value. Items are divided into rules, parameters and parameterized sets.
- `ITEMS FOUND IN THE PARAMETER SET BUT NOT IN THE RULE SET.`
  A report regarding new rules, parameters or parameterized sets.
- `ITEMS NOT FOUND IN THE PARAMETER SET, LEFT UNCHANGED.`
  A section with items in the currently loaded rule set which were not found in the settings with their present value.
- `UNCHANGED ITEMS`
  All the items which are not changed, are reported with the present value.

See also *Preferences on page 70*
Rule Parameters on page 258

Load Rule Set

Location Menu bar: File >Load

Purpose To load a rule set and its parameters.

Use When you select this command a submenu with all the production rule sets currently available is displayed. Click the rule set to be loaded.

This command is a fast way to load a compiled rule set. To get more information about the rule sets, use the command **Rule Set Manager**.

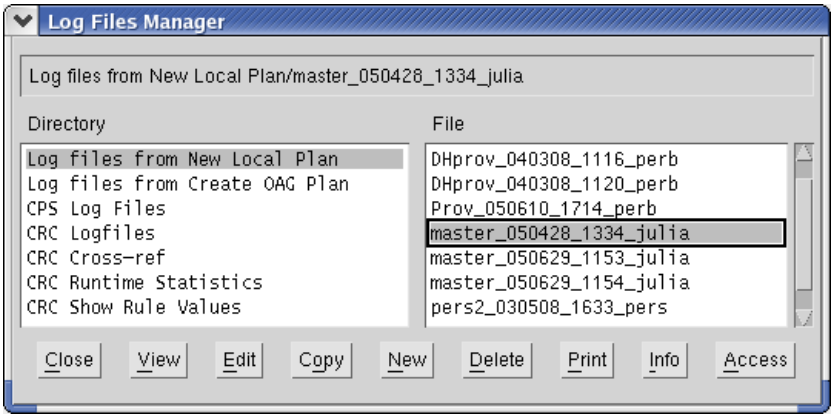
See also *Rule Parameters on page 258*
Rule Source Manager on page 261

Log Files Manager

Menu location Menu bar: Admin Tools >File Management

Purpose To examine and manage the log files.

Use When you select the command the Log Files Manager is displayed.



The Log Files Manager is a CFM form, see *Carmen File Manager*.

Since this is a CFM form it may be configured for customer specific needs. Read about this in the *System Configuration Reference Manual, Carmen File Manager (CFM)*.

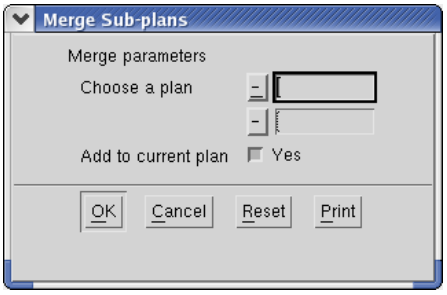
See also *System Configuration Reference Manual, Log files*

Merge (sub-plans)

Menu location Menu bar: Admin Tools >Sub-plan

Purpose To merge a set of sub-plans.

Use To use this command you must have a local plan loaded. When you select the command the Merge Sub-plans form is displayed.



Parameter description

Choose a plan

Specifies the sub-plans to be merged. The pick-list contains all the available sub-plans.

Add to current plan

`Yes`: The merged plans will be added to the current sub-plan.
`No`: The plans will be merged into a new sub-plan that will replace the current one. A Sub-plan Properties form is displayed where you can enter the new sub-plan's properties. All parameters, except sub-plan name, are taken from the sub-plan defined on the topmost row.

If there is a current sub-plan and you have decided to keep it (**Add to current plan** = `Yes`) no new rule set or Rave parameters are loaded. In other cases rule set and Rave parameters are loaded from the sub-plan defined on the topmost row in the form.

All trips and duties are read from the specified sub-plans and are added to the current one. On-duty legs in free leg chains are only added if they do not already exist in the current sub-plan.

When the merge command is finished, the Log from Merge Sub-plans window is displayed. It contains the number of chains read from each sub-plan and warnings if something went wrong.

Crew Rostering

For Crew Rostering the process is a little different. For each new sub-plan the system tries to assign all trips already assigned to a crew member to the same crew member in the current plan. If this is not possible due to time overlap, a warning is written to the log, deassign indicators are set to the legs and the trip is added as a free trip instead.

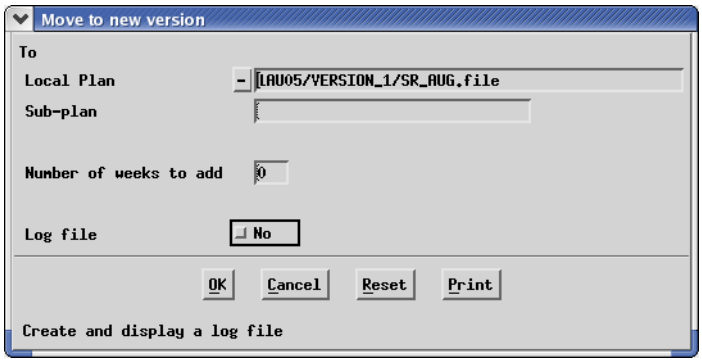
Move to New Version

Location Menu bar: Planning Tools >Sub-plan

Purpose To copy a sub-plan to another local plan. The local plan may contain flights from a new version of the flight plan or cover another period.

Use Before the command can be used, the sub-plan to be copied must be opened. The type of the source and target plan must be the same: it is not possible to move a daily sub-plan to a weekly local plan or a standard plan to a dated.

When you select the command the Move to New Version form is displayed where the attributes for the move are defined.



Parameter description

Local Plan

The local plan to move to the sub-plan. All available local plans are found in the pick-list. Default is the current local plan.

Sub-plan

The name of the resulting sub-plan.

Number of weeks to add

The number of weeks to add to the dates of the legs. Could be negative. This field only exists in dated mode and when there are no assignments in the sub-plan. Default is 0.

Log file

If `Yes`, a log file is created with information about changed attributes, created not operating flights, deassigned chains and split chains. Default is `Yes`.

When the move is finished, the displayed chains in the windows are updated. If a log file is requested (**Log file** = `Yes`), it will be displayed.

Use the **Save** command to save the resulting sub-plan.

Leg matching

The system reads the local plan to which you want to move your current sub-plan and tries to find matching legs for all the legs in the sub-plan. Change indicators are set for changed leg attributes. If no matching leg is found a not

operating is created. If time overlap appears, the chain is split into two chains and the change indicator `OVERLAP_INDICATOR` is set to the legs. If the overlap appears in an assignment, the chain is deassigned before the split and change indicators of the type `DEASSIGN_INDICATOR` are set to all legs in the chain.

When rolling out over a period in which there is a daylight saving change, the leg matching can be made to preserve either the local time unchanged or the UTC time. This is controlled by the resource `gpc.config.MatchLegPreserveLocalTime`

It can be set to either `TRUE` or `FALSE`.

True - Match all legs by preserving local time unchanged. Locality is the departure airport.

False - Match all legs except Ground Duties by preserving UTC time unchanged. Ground Duty legs are matched by preserving local time unchanged. Locality is the departure airport.

If the resource is not defined, the default behaviour is as if the resource was set to `TRUE`.

See also *Change Groups Manager on page 32*

Open Plan

Menu location Menu bar >File

Purpose To open a plan.

Use When you select the command, the plans and solutions are displayed in the Open Plan form. When you click **Open**, the selected plan is opened and the window is closed.

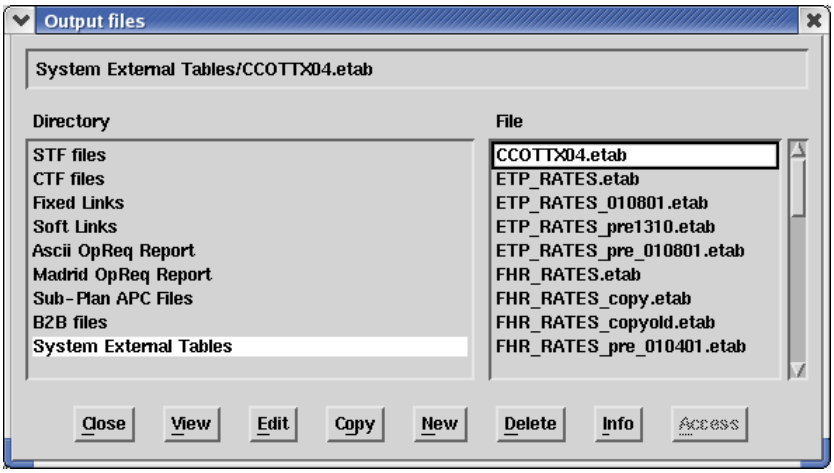
If you already have an open plan that you have modified but not saved, a Saving Plans form is displayed. For more information on how to save the plan see *Save Plan*.

Output Files Manager

Menu location Menu bar: Admin Tools >File Management

Purpose To examine output files.

Use When you select the command the Output Files Manager form is displayed.



This is a CFM form, see *Carmen File Manager on page 78*.

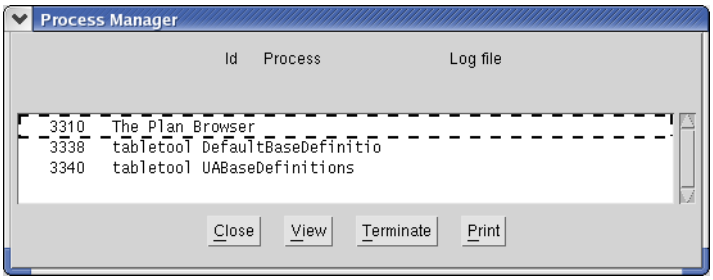
Note Since this is a CFM form it may be configured for customer specific needs. Read about this in *System Configuration Reference Manual, Carmen File Manager (CFM)*.

Process Manager

Menu location Menu bar: Admin Tools >Jobs

Purpose To show a list of the CPS child processes that currently are running.

Use When you select the command, the Process Manager window is displayed.



The child processes are listed with the name of the process and the name of the log file, if the process has a log file.

Columns

Id The identity of the process.

Process The name of the process, consisting of the name of the program and the main argument given to the program.

Log file If this column is empty, the process does not send output to a log file, otherwise the name of the log file is displayed here.

Buttons

View Views the contents of the log file of the selected process, while the process is running (only if the process has a log file).

Terminate Kills the selected process. The process will be terminated directly.

Print Prints the list of process. An update is made before the print-out.

Rave IDE

Menu location Menu bar: Admin Tools >Rave Tools

Purpose Rave Integrated Development Environment (Rave IDE) provides a set of tools for displaying and working with Rave projects, including a text editor and the possibility to search for definitions and their dependencies.

Use Select the command to start Rave IDE. Rave IDE will be started in the jEdit editor, a free of charge third-party product.

See also *Rave Manual, Rave IDE*

Reload External Tables

Location Menu bar: File >Load

Purpose To reload external tables.

Use When you select the command it reloads the external tables. Only external tables that have been changed are affected.

The system automatically loads external table files when need arises, for example in a rule evaluation. You can change the values of the external table in the **External Table Manager**.

See also *External Table Manager on page 83*

Reload Rule Set

Location Menu bar: File >Load

Purpose To reload an already loaded rule set keeping the parameters currently set.

Use This command is a fast way to reload a current rule set. To get more information about rule sets, see the command *Rule Parameters on page 151*.

Remove All NOP Legs

Location Menu bar: Admin Tools Sub-plan >Remove from Plan

Purpose To remove all not operating legs from the sub-plan and local plan.

Use When you select the command a form is displayed, requesting confirmation of the removal. The not operating legs are removed from all chains. Then the crew chain can become not plausible.

Remove All Other Fleet On-duty

Location Menu bar: Admin Tools >Sub-plan >Remove from Plan

Purpose To remove from the sub-plan all on-duty legs which are not marked as on-duty legs in the local plan.

Use When you select the command a form is displayed with information on the number of legs that will be removed and the number of hard locks that will be broken.

Click **Yes** to continue. All other fleet on-duty legs will now be removed from the sub-plan.

Other fleet on-duty legs may appear after using the command **Move to New Version** or one of the **Roll Out**, **Fetch** or **Copy** commands.

Remove Change Indicators

Location Menu bar: Admin Tools >Sub-plan >Remove from Plan

Purpose To remove the change indicators of the current group from all the legs in the whole sub-plan.

When you select the command a form is displayed where you are to confirm the removal. Only the change indicators of the current group will be removed: if the legs have any other change indicators (not in the current group) they will not be removed from the legs.

In the message area you will get information on how many legs from which change indicators were removed.

Current group is set with the **Change Groups Manager** command.

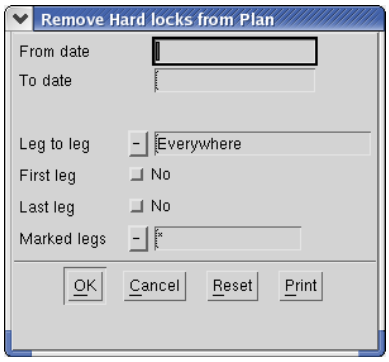
See also *Change Groups Manager on page 32*
Change Indicators on page 34
Switch Change Group on page 316

Remove Hard Locks

Location Menu bar: Admin Tools >Sub-plan > Remove from Plan

Purpose To remove the hard locks from the sub-plan.

Use When you select the command the Remove Hard Locks from Plan form is displayed. Here you can enter restrictions for the removal.



Parameter description

From date No hard locks from connections before this date are removed.

To date No hard locks from connections after this date are removed.

Leg to leg

`Everywhere`
All hard locks between legs are removed.

`Inside duties`
Hard locks are only removed from connections inside duties.

`Between duties`
Hard locks are only removed from connections between duties.

`Nowhere`
Hard locks are not removed from connections between legs.

First leg Decides if the hard lock should be removed from the beginning of the chain.

Last leg Decides if the hard lock should be removed from the end of the chain.

Marked legs

`*` Remove all hard locks ignoring if they are marked or not.

`Only` Remove hard locks on marked legs only.

`No` Do not remove hard locks on marked legs.

Hard locks will be removed from the legs when you click the **OK** button.

If you don't enter anything in the form, hard locks will be removed from all connections in the plan except from the start and the end of the rotations.

See also *Hard Locks >Remove on page 116*

Replace NOP OAG Legs

Location Menu bar: Admin Tools >Sub-plan >Replace in Plan

Purpose To match OAG NOPs with OAG flights in an OAG flight plan.

Use This command goes through all existing OAG NOPs in the local plan and tries to match them against a real flight from the OAG flight plan.

It is intended to be a backup when the normal matching fails if, for instance, the OAG flight plan accidentally has been removed, all OAG flights will become NOPs. After a load of a new OAG flight plan, this command rematches the previously created NOPs.

See also *New OAG Plan on page 179*
Get Next on page 105
Get Previous on page 110
OAG Plan Manager on page 183

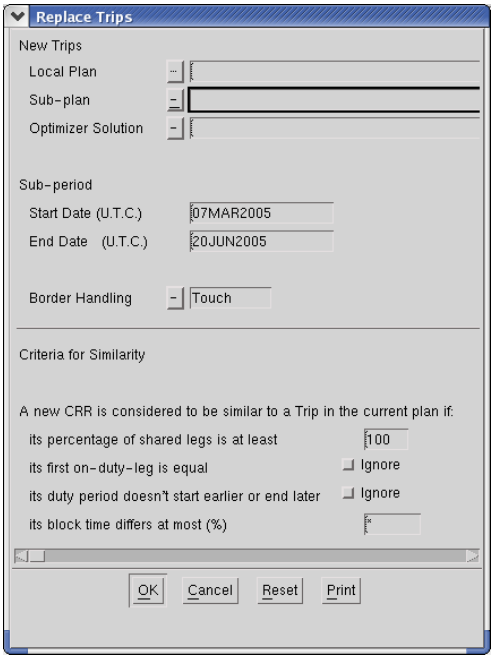
Replace Trips

Location Menu bar: Admin Tools >Sub-plan >Replace in Plan

Purpose To replace trips in a crew rostering solution with trips from another trip solution. This can, for example, be useful when there is a new trip solution, created during or after the rostering phase. The result of the replace will be displayed in a report on the screen, see *Replace Information report on page 148*.

The current sub-plan and the sub-plan with the new trip solution have to belong to the same local plan.

Use You set the criteria for the system to decide when the trips are similar enough to be replaced. The result of the command is a new rostering solution with as much as possible preserved from the old solution. When you select the command the Replace Trips form is displayed.



Parameter description

The Replace Trips form has the following fields.

Local Plan
Shows the current local plan.

Sub-plan
The sub-plan with the new trip solution. It has to be based on the current local plan.

Optimizer Solution
Used if you are selecting the trips directly from an optimizer solution.

Sub-period
Only trips in the specified sub-period will be considered. The assigned trips outside the sub-period will be unaffected. Regarding the treatment of trips on the sub-period's border, see **Border Handling** below.

Start Date (UTC)
Start of the sub-period.

End Date (UTC)
End of the sub-period.

Border Handling
Defines how to handle trips starting or ending outside the sub-period.

`Touch`
The starting point of at least one of the objects (legs, duties) has to be inside the period.

`Start Inside`
The starting point of at least one of the objects (legs, duties) has to be inside the period. No object may start before the period.

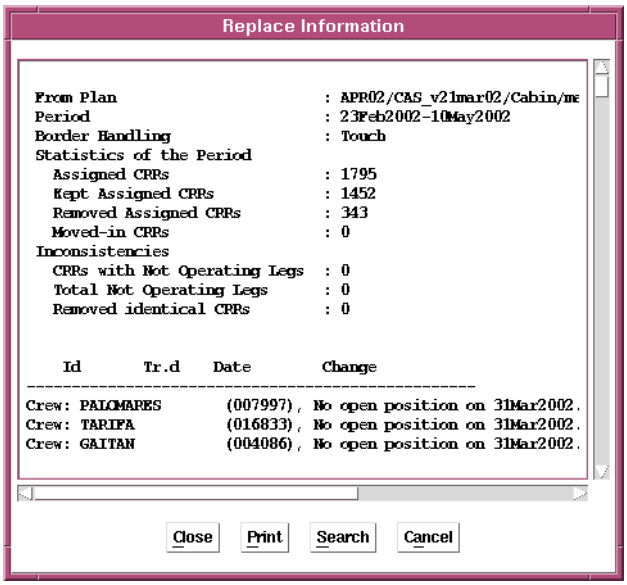
`Trips Inside`
The starting point of every trip must be inside the period.

Criteria for Similarity
Defines how the system should match the trips between the current and the new sub-plans. When there is a match between two trips, i.e. when they are similar enough, the system will replace the trip in the current sub-plan with the one from the new sub-plan.

Buttons

OK	Starts the replacing of trips. The Replace Information report will be displayed.

Replace Information report



`Assigned trips`
: The number of assigned trips in the current sub-plan before the replace is done.

`Kept Assigned Trips`
: The number of assigned trips in the current sub-plan that will be unaffected by the replace.

`Removed Assigned Trips`
: The number of assigned trips that will be removed from the current sub-plan if the replace is carried out.

`Moved-in Trips`
: The number of trips within the specified sub-period in the new sub-plan.

`Trips with Not Operating Legs`
: The number of trips that will contain not operating legs after the replace.

`Total Not Operating Legs`
: The total number of not operating legs in trips.

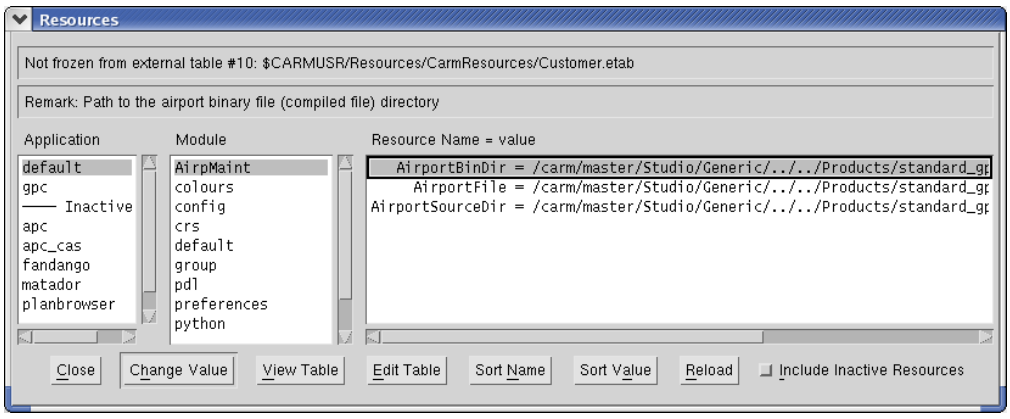
`Removed identical trips`
: The number of trips that are identical and therefore removed.

Resources

Menu location Menu bar: Admin Tools

Purpose To navigate among the loaded resources. If you have administrator access rights you can change and edit the resources.

Use When you select the command the Resources form is displayed.



When you select an application by clicking on it, its modules will be listed under **Modules**. When you click on a module, the names and values of its resources are displayed.

When you click a resource name, additional information is displayed in the two text fields at the top of the window.

Buttons

View Table
Starts the tabletool for viewing the table that defines the selected resource.

Sort Name
Sorts the resources in the window by name.

Sort Value
Sorts the resources in the window by value (the values are sorted lexicographically).

If you have administrator access rights the buttons below are also available.

Edit Table
Starts the tabletool for editing the table that defines the selected resource.
Note that there is no input data checks in the form.

Change Value
Activates a form where you can type a new value and comment. You can also activate the Change Value form by double clicking on the resource.
Note: There is no validity check of a value in the form.

Reload

Reloads resources. This may be necessary if you have modified the source tables outside the control of CRS.

Include Inactive Resources

Setting this toggle button causes the form to display all resources that can be found in the loaded sources. This makes it possible to view resources defined for other applications that are found in the same source files.

See also *System Configuration Reference Manual, Carmen Resource system*

Rule Parameters

Menu location Menu bar: Admin Tools >Rave Tools

Purpose To set parameter values and turn specific rules on or off in the current rule set.

Use A rule set with at least one rule or one parameter must be loaded before calling this function. When you select the command, the Rule Parameters form is displayed.

You can switch between parameter categories by using the tabs at the top of the window. The values of the parameters can be changed by typing new values in the input fields.

The parameters are of different kinds and must have specific values. If you do not know the values, ask your Rave programmer.

Buttons

The Rule Parameter form has the following buttons.

OK
The form is closed. Changed rule values will be used until a new rule set is loaded, or the values are changed due to new settings read from file or sub-plan.

Cancel
The form is closed. All values are reset to the state which they had when the form was opened.

Load from File
Reads a previously saved file with rule/parameter values (for the entire rule set). A Parameter Set Manager window is displayed in which you choose the file.

Load from Sub-plan
Reads the settings from a saved sub- plan. A Parameter Settings from Sub-plan form is displayed where you select the sub-plan.

Save to File
Opens the Save Parameter Settings form where you can save rule and parameter settings to specified file. See *Saving parameters to a file on page 152*.

Reset
All values are reset to the state which they had when the form was opened. The form remains open.

Print
The contents of the form is sent to the printer for printout.

Default diff
Shows a list of rules and parameters that have a different setting (value) than the default value stated in the rule set.

Search

Gives the possibility to search on labels, values and descriptions.

Online parameter help

You can display detailed information about a single parameter. Select the parameter by activating the corresponding input field and press F1. The displayed information originates from the parameter definition in the rule set and is updated each time the rule set is compiled.

The online help for the form, usually displayed by pressing F1, is displayed by clicking **Help**.

Configuration of the form

There are different configuration possibilities affecting the layout and the contents of the form and also some behaviour of functionality related to the parameter settings.

In the **Preferences** form, when **Show Children** is set to `Yes`, the rules are presented in different sub-groups starting with the actual rule switch followed by the child parameters and ending with a separator. If you change the configuration, you have to close the form and re-open it to make the changes take effect.

Advanced The `groupdefs` file defines the layout of the Rule Parameters form. A complete description of the syntax and semantics of the `$CARMUSR/crc/groupdefs` file and couplings between Rave source code and the Rule Parameters form behaviour and layout is found in the *System Configuration Reference Manual, Appendix: Customization of the Rule Parameters form*.

The file could be defined by a map variable in Rave, `map_group_defs_file`, which makes it possible to use different layout files for different rule sets.

Saving parameters to a file

You can save parameters and rule settings to a file in the Save Parameter Settings form (displayed when you click **Save To File**).

It is possible to save a selected subset of settings by using a regular expression filter in the form. Examples:

Expression	Meaning
`*` (or empty)	save all parameters
`^map`	save all parameters with names starting with `map`
`^_topmodule\.`	save all parameters in the `_topmodule` module

The three toggle buttons are used to select sections to be included in the subset:

- rules (rule on/off settings)
- parameters (parameter values)
- sets (Rave set definitions)

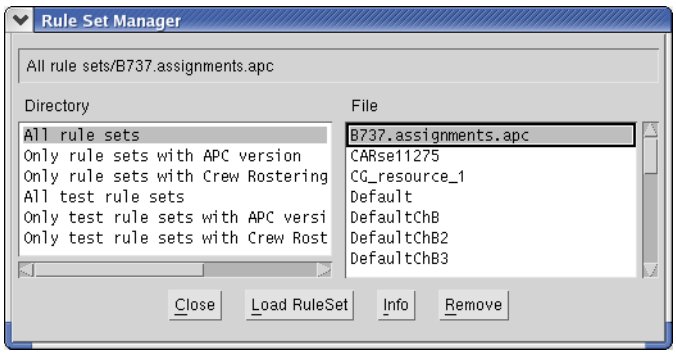
Click **Preview File** in the form to display a preview of the contents of the resulting file.

Rule Set Manager

Menu location Menu bar: Admin Tools >Rave Tools

Purpose To load, remove or get information on rule sets.

Use The Rule Set Manager form is displayed showing the available rule sets, i.e. compiled rule code ready to be loaded.



Directories

`All rule sets`
: All available production rule sets.

`Only rule sets with APC version`
: Production rule sets which can be used both for Studio and APC.

`Only rule sets with Crew Rostering Optimizer version`
: Production rule sets which can be used both for Studio and Crew Rostering Optimizer.

`All test rule sets`
: All available test rule sets.

`Only test rule sets with Crew Rostering Optimizer version`
: Test rule sets which can be used both for Studio and Crew Rostering Optimizer.

Buttons

The Rule Source Manager is a CFM form. For a description of the standard buttons see *Carmen File Manager*. Additional buttons or buttons with different behaviour:

Load Rule Set	Loads the selected rule set and its parameters.
Remove	Removes the selected rule set.

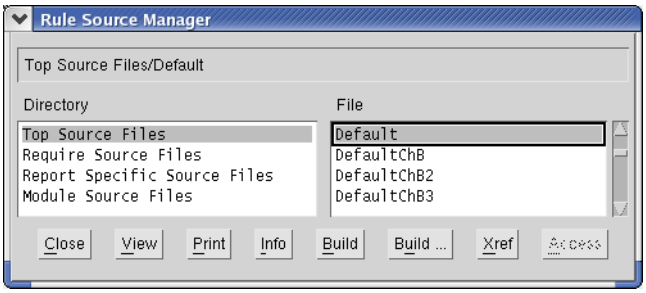
See also *Rule Source Manager on page 154*

Rule Source Manager

Menu location Menu bar: Admin Tools >Rave Tools

Purpose To inspect rule source code and to generate rule sets from the source.

Use The Rule Source Manager form is displayed showing the rule source code available.



Directories

`Top Source Files`

Basis for rule sets.When one of the top source files is selected, it is also possible to generate a rule set from that source code.

`Require Source Files`

For production. (Studio and optimizer)
The require source files are used for standard rule sets while the report specific source files are used for reports

`Report Specific Source Files`

For production. (Studio)
These files are used as bases for the top source files. They mostly contain general definitions which are used in several rule sets.

`Module Source Files`

Where all modules are stored.

Buttons

The Rule Source Manager is a CFM form. For a description of the standard buttons see *Carmen File Manager*. Additional buttons or buttons with different behaviour:

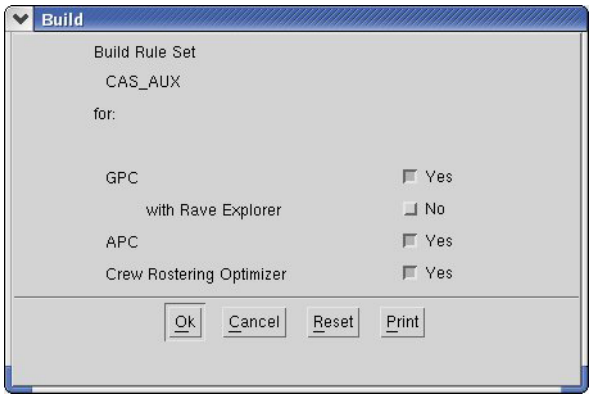
Build Builds rule sets for both Studio and optimization.

Build... With **Build...** you get the possibility to specify how to build the rule set. See *Build... on page 155*.

Xref Generates a cross-reference list of the selected rule source files. This can be very useful when developing rules. The list contains information on how the variables and functions depend on each other. When you click **Xref** the CRC Cross Reference form is displayed. See *CRC Cross Reference form on page 155*.

Build...

When you click **Build...** in the Rule Source Manager form, the Build form is displayed.



Parameter description

Studio

`Yes` to build a rule set for Studio, i.e. rule sets that are not going to be used by the optimizer.

with Rave Explorer

`Yes` if the Rave Explorer is to be used.

APC

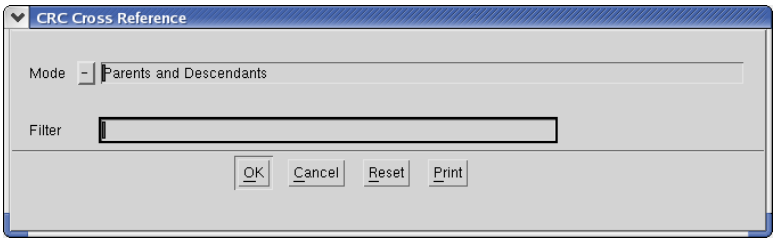
`Yes` to build a rule set for APC.

OK

Builds the rule set as specified.

CRC Cross Reference form

When you click **Xref** in the Rule Source Manager form the CRC Cross Reference Form is displayed.



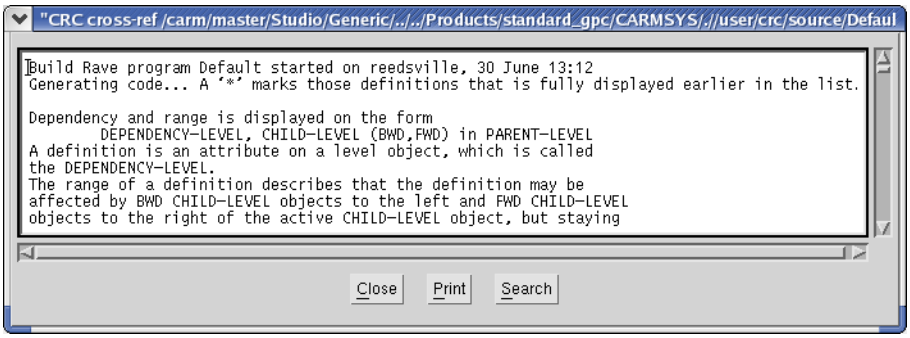
Parameter description

Mode Defines how much information you want for each definition entry in the cross-reference list. There are five levels:

```
Descendants
Parents and Descendants
Parents and All descendants (level and range)
Parents and All descendants (file name)
Parents and All descendants(file name,level and range)
```

Filter The filter is a regular expression of the definitions that should be viewed. If you enter a filter, only the definitions matching the filter will be listed. See *Selecting and filtering on page 31*

OK starts the `Xref` program. The Carmen Program Starter is used. The cross-reference function will fail if the selected rule files contain syntax errors. On successful execution a log file with the cross-reference list is displayed.



The definitions (rules, tables, dictionary variables etc.) are listed. Inside the square brackets the name of the (require) file is displayed with line number and also the dependency level of the definition.

Below the dashed line the parents and the descendants of the definition are listed. Parents are indicated by `Used by` and descendants by `Uses`.

The log file can also be found using the command **Input Files Manager**.

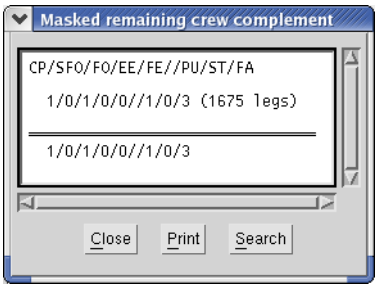
See also *Rule Parameters on page 151*

Show Crew Complement

Location Menu bar: Admin Tools >Sub-plan

Purpose To show all current combinations of remaining crew complement for the free legs in the sub-plan.

Use When you select this command a report is displayed showing the current crew complement combinations.



The last line in the form shows the largest crew complement that all current legs have in common. Legs with no remaining need are not taken into consideration during this calculation.

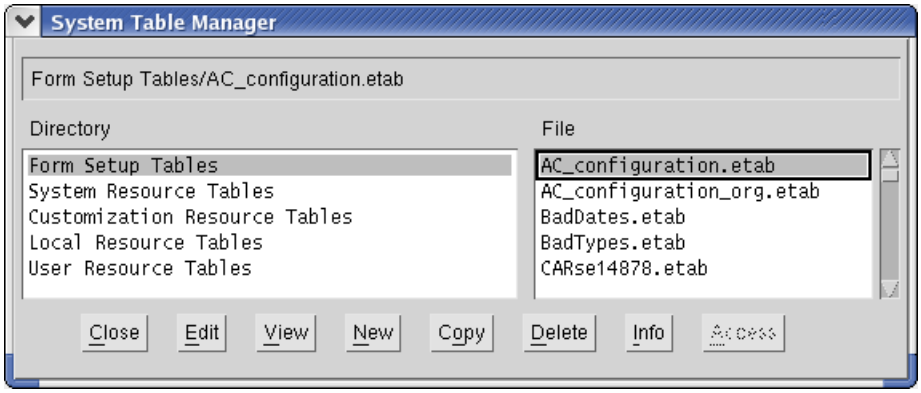
The combinations shown are the crew complements with the mask value excepted. The mask values are set by the command **Properties**.

System Table Manager

Menu location Menu bar: Admin Tools >Table Management

Purpose To maintain external tables that are not used in the rules.

Use When you select the command the System Table Manager form is displayed.



The System Table Manager is a CFM form, see Carmen File Manager.

Directories

`Form Setup Tables`
: These tables contain menus for various forms, groups of aircraft type to be treated as families etc.

`System Resource Tables`
: These tables contain data loaded by the Carmen resource system. See *Resources on page 244*. All the tables are delivered and maintained by Jeppesen AB.

`Customization Resource Tables`
: These tables contain data loaded by the Carmen resource system. All the tables are delivered and maintained by Jeppesen AB.

`Local Resource Tables`
: These tables contain data loaded by the Carmen resource system. The tables contain customer specific data.

`User Resource Tables`
: These tables contain data loaded by the Carmen resource system. The tables contain the personal preferences and colour choices for each user. A table is automatically created the first time the user runs the application.

Table Editor

Menu location Menu bar: Admin Tools >Table Management

Unload

Location Menu bar: File

Purpose To set the system into the initial state.

Use From the submenu select one of the options.

Unload

You will get a question for verification. If you answer `Yes`, current plans, rule sets and parameters are removed from the memory.

Unload Plans

Removes the current plans from memory.

Unload Reference Plan

Select the reference plan to be unloaded from the submenu.

Unload Rule Set

Removes the current rule sets from the memory.

Unload OAG Plan

Removes the current OAG plan from memory.

About Carmen documents

The standard documentation for Carmen Crew Tracking is delivered as online help, pdfs and printed manuals.

Carmen Help

The Carmen Help for Crew Tracking contains the following parts:

Sections	Contents
How to use Carmen Help	Tips and tricks on how to use Carmen Help.
Crew Tracking User Guide	Includes Introduction to Crew Tracking, user interface, working procedures and a list of the commands.
Python Manual	The Python scripting language in the Carmen system.
Rave Manual	The modelling language Rave.
Rave Publisher Manual	The report tool Rave Publisher. Rave Publisher includes two tools for report generation: • Publisher Definition Language (PDL). The reports are written using constructs described in Introduction to Publisher Definition Language. • Python Report Toolkit (PRT). The reports are written in Python, using the PRT API described in Introduction to Python Report Toolkit.
API documentation	
CSL pdf	
About Carmen documents	This section describes the Carmen documentation.
Glossary	The terms used in the Carmen systems.

Printed manuals

The following manuals are delivered as printed books.

Manuals	Target Groups
Rave Reference Manual	Modelling engineer*
Rave Publisher Reference Manual	
System Configuration Reference Manual	
Carmen PythonReference Manual	
System Administration Reference Manual	System administrator

* Modelling engineer includes Rave programmer and report writer.

Documents delivered as PDF files

The documents below are delivered as PDFs.

PDFs	Target Groups
System Requirements	System administrator
Release Notes	Planner Modelling engineer*
Migration Instructions	Modelling engineer

* Modelling engineer includes Rave programmer and report writer.

Conventions

The Carmen documentation uses the following conventions.

Tags

The Carmen documentation uses the following conventions for tags.

Advanced Information for customizing the forms.

Note Matters of specific importance.

Rave Information for the Rave programmer.

Report Information for the report writer.

See also Cross-references.

Example Paragraphs with examples. The examples are numbered within a section. The example texts are distinguished from the surrounding text by a coloured background.

A drop-down provide a quick way for you to get information without having to do a lot of scrolling. When you click on a drop-down, additional text or an image is revealed. To close the text or image, click the drop-down again.

Screen shot ▶

A graphic representation of a form, working window etc.

Optional

This function is optional and not included in the basic product offer, but can be purchased as add-in software. For information, contact your account executive.

Type styles

The Carmen documentation uses the following conventions for type styles.

Example	Description
Rave Reference Manual	A cross-reference.
Print	Carmen components, such as names of buttons, boxes, field names. menus and commands.
`airport`	Data and choice entered such as file names, values and parameters.
Plan Manager	Names of Carmen forms and services use initial capitals.
Hard Locks >Set in Window	A '**>**' indicates a menu choice. The example means that **Hard Locks** should be selected from the main menu, and then **Set in Window** from the submenu.

Mouse actions

The Carmen documentation uses click and click right when referring to mouse actions.

Glossary

This is a glossary of terms used in the Carmen system and documentation. Obsolete terms may still occur in the system, for example as parameter or file names. Such terms are noted as obsolete in this glossary.

AC
Short for aircraft.

add-in
Add-in software are software packages added to the standard Carmen system. They are installed separately from the standard Carmen system installation.

aircraft group
Customer specific groups of IATA aircraft types.

aircraft type
In Carmen there are different aircraft type concepts:

IATA aircraft type
a 3-character IATA code. Example: `D94` for McDonnell Douglas DC-9-40

Custom aircraft type
optional customer specific aircraft type.

airline designator
The IATA carrier code.
Examples: AF for Air France and KL for KLM.

airport
A place where crew start or finish a leg.

airport code
The IATA airport code.
Examples: LHR for London Heathrow, CDG for Charles De Gaulle.

APC
The tool for automatic trip generation in the Crew Pairing system. APC contains a generation and an optimization mechanism.

APC tags
See *tags*.

assign value
Crew Pairing: When trips (and duties) are generated, they get their crew complement from the sub-plan's assign value: all legs included in the trip or duty are booked with the assign value.

Crew Rostering: The assign value defines for which crew positions the optimizer should assign trips. A non-zero value in a position means that it should be assigned while a zero value means that this crew position should be ignored by the optimizer.

The assign value is represented by the crew vector.

assigned crew
The number of crew that are assigned to a leg.

assignment An assigned trip: a trip that has at least one crew member allocated.

base Area from which crew members are available for assignment. All used bases must be defined in the external table for base definitions. A base often comprises more than one airport.

Examples: PAR for Paris (airports: CDG, LBG and ORY) and NYC for New York City (airports: EWR, JFK, LGA).

See also *co-terminal*.

base constraint A base constraint restricts the optimizer to produce a solution with no more than a fixed number of working days or credit hours at each base. Base constraints are a type of global constraint.

base production The total number of working days or credit hours at each base.

batch queue Computer jobs can be put on a batch queue to wait for free computer resources. A single computer can have several batch queues assigned or one queue can serve a whole network of computers.

base variant Used for multi-base problems by allowing trips to be assigned to crew from different bases.

bid By placing bids crew members may specify their wishes for the next planning period. For example, a bid can be made for preferred trips or preferred days off. Carmen InterBids may be used to place the bids.

See also *bid group*, *strictly ordered bid* and *weighted bid*.

bid group In a bid group, multiple bids are grouped together. For a bid group to be awarded, all bids in the bid group must be fulfilled. Each crew member can create multiple bid groups, and give them an order of priority.

block time Duration of an activity, for example a leg.

booked crew The number of crew that a leg is booked for: the sum of the crew complement (in each crew position) for all trips containing the leg.

For example, a leg with crew need 0/1/4 is included in two trips. The trips have crew complement 0/1/1 and 0/0/2. The leg's booked value is then 0/1/3. See also *crew complement*.

briefing time Time to prepare for an activity, such as check-in time before a working day.

buddy When a crew member places a bid to work with a specific crew member then they are buddies. The bid is called a buddy bid.

carrier An airline company. See also *airline designator*.

carry-in An activity that starts in previous planning period and extends into current planning period.

Obsolete term: tail

carry-out An activity that starts in current planning period and extends into next planning period.

CFH Short for Carmen Form Handler. CFH is used to define forms.

CFM	Short for Carmen File Manager. CFM is used to maintain and select files from within the Carmen system. CFM implements a form-like interface to the part of the Unix file system containing Carmen related files. One example of this is **Rule Source Manager**. You can define and maintain your own CFM forms.
chain	A set of legs ordered in time and connected to one another, for example a duty or a trip.
chain user tags	See also *tags*.
change indicators	After certain operations, such as **Move to New Version** command, the components in a plan may have changed. In the working window, such changes are visualized by small coloured squares in positions where the changes took place. These coloured squares are called change indicators.
connection	The link between two legs, one arriving before the next departs.
connection matrix	See *connection table*.
connection table	Optimization term. Also called connection matrix. The connection table keeps information about which legs or trips can follow each other legally.
connection time	Time between two legs, one arriving at and one departing from the same airport or co-terminal.
constraints	There are rule constraints and global constraints. Rules constrain individual chains or rosters, whereas global constraints are requirements on the solution as a whole. Base constraint is one kind of global constraint. See also *rule*, *global constraint* and *base constraint*.
co-terminal	Pairs of airports that are so close to each other that they should be regarded as one airport when creating trips or rotations. Co-terminals are connected without having to specify a leg between them.
CPS	Short for Carmen Program Starter. CPS makes it possible to start Unix programs from within the Carmen system.
crew	Personnel based at a station. In the Carmen system a crew member must be defined in the crew plan external table.
crew alias	The name (both names or only surname) and serial number (if any), unique in a sub-plan. An example is JENSEN 01. Crew alias for each roster is displayed in the left margin in roster window.
crew augmentation	Used for long-haul problems where extra crew is needed. Extra crew provides relief for main crew.
crew category	You can divide crew into two main categories, for example cockpit crew and cabin crew.
crew chain	Generic term for duty and trip.

crew complement Amount of crew on each leg, duty or trip. Carmen uses several crew complement terms: crew need, booked crew and assigned value. The different values relate to a certain activity (leg, duty or trip).

The crew vector is used to represent the crew complement values, see *crew vector*. See also *assign value*.

crew filter Used to control the contents displayed in a leg, rotation or trip window.

Crew filter may be on or off:
off, display all legs, rotations or trips in current sub-plan.
on, display only legs that can take the amount of crew defined by the assign value without getting overbooked.

crew need The remaining amount of different crew positions needed for a leg. The system displays it in the **Need** value in the information area. See also *crew complement*.

crew position Defines the task a crew member performs, for example captain, first officer and flight attendant. There are a number of crew positions to on each leg. Carmen uses the crew vector to define these crew positions and to calculate the crew need, see *crew vector*.

crew rank Defines the grade that a crew member has, for example captain, first officer and flight attendant. A crew member that is assigned to a crew position for which the crew member is over qualified is said to fly below rank.

Crew Rostering Optimizer The tool for automatic roster generation in the Crew Rostering system. Crew Rostering Optimizer contains a generation and an optimization mechanism.

crew rotation Obsolete term. See *trip*.

crew user tags See *tags*.

crew vector An array of values where each position corresponds to a crew position. Each value defines the amount of crew at that position. The crew vector is divided into two sections separated by //, the first for cockpit the second for cabin crew.

For example, 1/0/0//1/0/0 could mean one pilot and one purser.

CRG Obsolete term. See *Rave Publisher*.

CRR Obsolete term. See *trip*.

CRS Short for Carmen Resource System. CRS handles user preferences and several system configuration settings.

CSL Short for Carmen Script Language. CSL is one of two script languages used to automate manual planning tasks. The other script language used is Python, see *Python*.

CTF Short for Carmen Transfer Format. CTF is a general format for leg, duty, trip and roster data. See the *Carmen Transfer Format Reference Manual*.

CTM Short for Carmen Timetable Manager. A Carmen tool for handling files containing timetable information.

daily plan Same as standard daily plan. A plan that applies to a standard day, which means that all flights are daily. See also *standard plan*.

dated plan A plan that applies to a certain time interval.

Plans can be dated or standard. A standard plan is applied to a standard day or week, see also *standard plan*.

In the planning process you typically start with creating trips for a standard week in a standard plan. After that, you roll out your standard week to a certain time interval (often two or four calendar weeks) and thereby create a dated plan with dated trips.

deadhead A passive transport of crew between airports. This transport can be a flight with the crew's carrier, with another carrier or a ground transport. The Carmen system distinguishes between this fleet deadhead and other fleet deadhead.

debriefing time Time needed after an activity as specified in crew rules, for example check-out time after a working day.

depot duty leg Activity (e.g. parking or locking) involving a stationary vehicle (e.g. locomotive, wagon, aircraft).

DFS Optimization term. Short for Depth First Search, the main algorithm used by Crew Rostering Optimizer for roster generation. This algorithm generates rosters by incrementally assigning trips within a time window as long as it is possible (depth search). In the next stage these are incrementally replaced by other assignments (width search).

DH Short for deadhead.

dictionary variable See *rule parameters*.

DOP Short for day of operation, the day on which a leg starts.

DOR Short for day of origin. Origin refers to start time of the flight to which a certain leg belongs. For flights consisting of just one single leg, DOR and DOP are by definition the same date.

dynamic report A Rave Publisher report that the system updates automatically. For example, dynamic reports are used to display data in the information and status areas of the working screen. See also *reports*.

duty A duty is a part of a trip delimited by daily rest as defined by working time regulations.

Obsolete terms: RTD, rotation day.

duty type Defines the different tasks performed in a crew position during a rotation or trip. A captain can for example fly as an instructor for parts of a trip. The duty types are defined in an external table.

environment plan A plan that contains pre-assignments that must not be changed.

etab See *external table*.

external table External tables are files, external to the Carmen system, with a specific table-like format. They contain information that is important for solving a planning problem, such as co-terminals or crew data.

extra seat leg
An extra seat leg is used to add extra crew members to the working crew. The Carmen system regards extra crew members as on-duty because they are part of the working crew. A leg does not become overbooked when extra crew members are added to it, i.e. the booked crew value does not increase.

fixed report
Fixed reports are produced by Jeppesen and cannot be customized, as opposed to Rave Publisher reports which are designed by the report writer.

Examples of fixed report are the results from the commands **Check Legality** and **Compare Sub-plans**.

See also *reports*.

fleet
A group of aircraft of a carrier. All aircraft in a fleet are of the same type. For example, a 747 fleet consists of only Boeing 747 aircraft.

flight
A journey made by flying in a aeroplane. A flight may correspond to one or several legs. A flight consisting of several legs is called a multi-leg flight.

flight designator
An IATA SSIM term defining a flight or a series of similar flights operated by a carrier. The flight designator consists of carrier designator followed by a flight ID.

flight ID
Consists of carrier code followed by flight number and suffix. The suffix (a letter) is used to differentiate legs when both carrier code and flight number are identical.

flight number
See *flight ID*.

flight plan
See *timetable*.

form
A structured window with pre-defined areas for entering or changing information. Typical examples of forms in Carmen are the windows displayed by the **Select** commands. You can customize and define your own forms, see *CFH*.

free crew position
Crew Rostering: A crew position in which any number of crew members can be assigned.

free leg
Legs that are not fully booked.

A leg is regarded as free as long as there are crew positions that remain to be booked: a free leg can receive the amount of crew determined by the assign value without getting overbooked.

A leg is a free leg if: booked + assign value <= need

frequency
Specifies to which days a leg will apply.
`1-7` denotes the days this leg operates, `1` for Monday, `2` for Tuesday etc.
`D` denotes daily.
`DX` denotes daily with exception. For example, `DX7` means all days except Sundays.

Gantt chart
A bar chart that shows individual parts of a plan as horizontal bars against a horizontal time scale.

GLC
Short for global constraint.

global constraint	Limitations on a set of chains as opposed to rules which are constraining single chains. Example: base constraint. You can define global constraints both in absolute numbers and in per cent (relative global constraints).
GPC	Obsolete term. See *Studio*
ground duty	An activity which does not involve crew moving between airports, but has to be planned as a duty for crew. Examples are reserve duty, office duty, simulator training and medical check-up.
ground transport	A type of leg that operates between two airports. It is always a deadhead and may be used to move crew between airports that are close but not linked by flights, for example LHR/LGW or CLG/ORY.
hard lock	Crew Pairing. A hard lock means that a duty or trip may under no conditions be broken, even if it is illegal. See also *soft lock*.
helper process	Crew Rostering. When running in parallel mode, Crew Rostering Optimizer divides a problem into one master process and a number of helper processes.
home base	The home base of a trip is the base where the crew for that trip resides. Each trip has one or several home bases. See also *base variant*.
IATA	Short for International Air Transport Association.
IATA code	An international coding system for objects related to the airline industry, for example airports and aircraft types.
IATA aircraft type	See *aircraft type*.
imitate	Try to get as close as possible to a reference solution.
IP-solver	A specialized optimizer that is used for a particular part of the optimization problem. Examples of IP-solvers used in a Carmen system are paqs and Xpress.
jumper	Part of the varying crew problem. Jumper is used in Crew Pairing APC when you need to have more than one active reference to one leg. See also *varying crew problem*.
keyword	A predefined attribute in Rave, used on a planning object. You use keywords to access information about a planning object, such as a leg.
layover	A long stop during which crew members get their rest, for example night sleep. To be regarded as a layover it must be longer than a certain time defined by a rule. See also *night-stop*.
LDOP	Short for local day of operation. See also *DOP*.
LDOR	Short for local day of origin. See also *DOR*.

leg — The smallest planning unit, defined by place and time for departure and arrival. IATA definition: the operation between a departure airport and the next arrival airport. There are a number of different leg types:
deadhead
extra seat leg
free leg
not operating leg
OAG leg
on-duty leg
onward leg
other fleet deadhead
other fleet on-duty
overbooked leg.

leg number — Used with multi-leg flights, where the first leg is number 1, the second is number 2 etc.

leg set — A set of legs that are equal in all aspects except for operation date.

local external table — External table stored with a local plan or sub-plan. See also *external table*.

local plan — The Carmen schedule containing leg sets, rotations and OAG data. All data in the local plan are prerequisites for solving the planning problem and not a part of the solution.

A local plan can be standard or dated. See also *standard plan* and *dated plan*.

lock — Short for locked connection. You lock chains or parts of chains to prevent the optimizer from breaking them. There are hard locks and soft locks.

LSF — Short for Load Sharing Facility. See also *batch queue*.

Macro Recorder — A tool in Studio that records and stores a sequence of events (such as Studio commands) in a macro which may be replayed later.

main crew — When you have a varying crew problem, you plan for the main crew first and then for the supplementary crew.

main crew category — See *crew category*.

manual pages — Also called man pages. A standard format for documentation of functions in a Unix system. The Carmen system contains a number of Carmen specific manual pages. You access manual pages via **Help >API documentation** or from a Unix command window.

map variables — Constitute the communication interface between the optimizers and Rave. A map variable is defined in a Rave program and used by Studio and the optimizers. For example, there are map variables for the cost of a trip (`map_cost_of_crr`) and for the cost of replacing an active leg with a deadhead (`map_cost_of_deadhead`). The content of a map variable (how it is calculated) is defined by the construction of rules, i.e. by the Rave programmer.

night-stop — A stop between two duties within a trip. A night stop does not necessarily include a night's sleep. See also *layover*.

NOP	Short for not operating leg.
not operating leg	A plan is valid for a certain timetable. If the timetable is changed, the plan may contain legs that have booked crew but that do not exist in the timetable. In Carmen such legs are called not operating (NOP) legs, meaning that they exist in a sub-plan, but not in the corresponding local plan. See also *leg*.
OAG	Short for Official Airline Guide. OAG is a report with detailed information about airline flight schedules.
OAG file	A file that contains information about flights from other airlines. It can be used for search of possible deadhead legs.
OAG flight	A deadhead flight with another airline.
OAG leg	Deadhead leg with another airline. See also *OAG flight*.
offset handling	Includes a set of decision rules for handling the placement of objects (e.g. legs) on the screen with an offset of one week (or day in daily mode) relative to the position wanted. Used when handling objects in a standard plan.
on-duty leg	A leg where crew is on-duty on a flight as opposed to a deadhead leg.
onward leg	An attribute on a leg that can be used to indicate the continuation, i.e. the next leg that the aircraft of a certain leg will do.
open time	Trips that are not assigned to any crew member.
original airport	The original airport always relates to a rotation and means the airport where a rotation starts. See also *airport*.
other fleet on-duty	Leg that is on-duty in the sub-plan but not in the local plan. Such legs occur usually after a fleet change in the time table.
other fleet deadhead	Deadhead leg with another fleet. Such legs only exist as deadhead candidates in local plan.
overbooked leg	A leg that has more booked crew than needed in any crew position. A leg is overbooked if booked > need
PACT	Short for personal activity.
pairing	See *trip*.
passive transport	See *deadhead*.
PBS	Short for Preferential bidding.
PDL	Short for Page Description Language. It is used to define the different kinds of reports that Rave Publisher generates. See also *Rave Publisher*.
personal activity	Activities which should not be rescheduled and must be taken into consideration when solving rostering problems. Examples are vacation and training.
plausible chain	Duty or trip that fulfils the following criteria: for each connection the airport of the arrival leg must be identical to, or a co-terminal of, the airport of the departure leg. In a trip the first and the last airport must belong to the same base.

po file A file used for translation of the Carmen system into a language other than English.

pre-assignment Pre-assignments may be assignments made before the start of the planning period (carry-ins) or assignments in the planning period that must not be changed, for example a medical check-up.

Preferential bidding The preferential bidding system (PBS) is an option in Crew Rostering. It makes it possible to take crew preferences into account when creating rosters. Crew preferences can be input via the internet bid entry system, Carmen InterBids.

PRT Short for Python Report Toolkit, a toolkit for writing reports in Python. See also *Rave Publisher*.

Python Python is a scripting language used in Carmen to automate tasks. Using Python you can create advanced functions interacting with Studio, the optimizers and Unix scripts.

Rave Short for Rule And Value Evaluator. Rave handles interpretation of rules. Rave provides a language with which to define your rules. You may also define certain dictionary values used by the optimizers, Studio or in reports.

Rave Booster A tool that analyses Rave code and parameter values to increase the performance of long optimizer jobs.

Rave Explorer A function that enables examination of an evaluation tree, for example a rule evaluation or a cost function. It is used for Rave code development and quick tracing of logical errors.

Rave IDE The Rave Integrated Development Environment. Provides a fast and flexible way to edit Rave code, search for definitions, examine dependencies and analyse and compile rule sets.

Rave parameters See *rule parameters*.

Rave Publisher Rave Publisher enables different kinds of formatted output to be printed or sent to other systems. With Rave Publisher, you may define your own reports. There are also predefined reports which you can customize. Rave Publisher provides two tools for report generation: PRT and PDL.

See also *dynamic report*.

reference plan A reference plan is a sub-plan used for comparison with the main (currently loaded) plan. You can have up to two reference plans.

regularity add-in An add-in software package, used with the Carmen Crew Pairing system. It makes it possible to a preserve the pattern from another sub-plan in the current sub-plan. This ensures some degree of regularity without using the roll-out function.

Also called TOR.

relative global constraints Global constraints defined as percentage values. See also *global constraint*.

remaining crew The amount of crew that remains to be booked: need minus booked crew.

reports — You can generate a number of reports, such as crew utilization, hotel booking, deadhead use or tight connections. There are fixed report and Rave Publisher reports.

resources — Items of information that set user preferences and system configuration settings. See also *CRS*.

roll out — A standard plan can be rolled out.

A daily plan can be rolled out over a week, meaning that all days in a week look the same as the standard day.

A weekly plan can be rolled out to become a dated plan, meaning that the plan applies to a certain time interval.

roster — Assigned activities (trips, PACTs etc.) for a particular crew member.

rotation — the chain associated with an aircraft or vehicle.

Obsolete term: aircraft rotation.

RRL — A data format used by the Carmen system to store local plans and sub-plans in a file.

RTD — See *duty*.

rudob — Short for rule defined object. A rudob is an object defined in Rave for visualization in Studio. For example, debriefing time may be visualized with a rudob.

rule — Limitations on single chains as opposed to constraints which are limitations on a set of chains. Rules set limits for certain measures, for example the length of a trip or a working day. Rules are used to check the legality of created trips and assignments. In Carmen rules are defined with the Rave language. You can express working regulations as well as policy rules and expressions defining quality measures for trips and assignments.

rule parameters — With rule parameters you can tune certain values in a rule set. You do this via the Rule Parameters form while the Carmen system is running. Also called Rave parameters.

rule set — The same as Rave program. Denotes a set of rules prepared to be loaded into Studio. The preparation consists mainly of a compilation of the rule source. Only one rule set can be loaded (and used in planning) at a time, but several rule sets can be prepared for loading, allowing quick exchange of rules.

saturated leg — A leg that cannot take on the total assign value without becoming overbooked. Such a leg is not necessarily fully booked, it depends on how big the current assign value is. These legs can be said to be about to become overbooked.

A leg is saturated leg if
booked + assign value > need or
booked = need when assign value = 0

Saturated legs can be displayed when the crew filter is turned off. See also *crew filter*.

seat version

Aircraft capacity for different passenger classes. Seat version is displayed in the information area of the working screen.

Example: First/Business/Economy - 20/30/40. The corresponding IATA concept is Aircraft Configuration/Version.

selection form

A selection form is a form where you can describe the criteria for a selection of trips, legs etc.

service type

The service type of a flight denotes the type of the flight. The legal types are defined by IATA. For example, J for scheduled normal service passenger flight, M for a mail only flight and C for a cargo flight.

SGE

Short for Sun Grid Engine. See also *batch queue*.

soft lock

Used in Crew Pairing. Soft locks are similar to hard locks, but the optimizer will accept them only if they contribute to legal chains. This means that the optimizer interprets soft locks as strong suggestions rather than as requirements. See also *hard lock*.

SSIM

Short for Standard Schedules Information Manual. A manual describing an international standard for the exchange of flight information, produced and maintained by IATA. In particular, file formats and terms are defined. An SSIM file conforms to the format specified in the Standard Schedules Information Manual.

SSIM is one of two time schedule formats supported by the Carmen system. The other is TPTS.

stacking

Also called open time distribution. A situation typically happening in a strict seniority environment where open time is concentrated on a single day or a couple of days. Classic example is a December month where there are no trips in the open time for most of the month but many trips stacked in the open time on Christmas Eve and Christmas Day.

standard plan

A plan that applies to a standard day or week: daily plan or weekly plan. Plans can be standard or dated. A dated plan relates to a certain time interval, see *dated plan*.

A daily plan can be rolled out to a weekly plan or to a dated plan.

A weekly plan can be rolled out to a dated plan.

In the planning process you typically start with creating trips for a standard week in a standard plan. After that, you roll out your standard week to a certain time interval (often two or four calendar weeks) and thereby create a dated plan with dated trips.

station

See *airport*.

strict seniority

Assuring that no crew member holds a bid that could be awarded to a more senior crew, while all the overall solution constraints are still satisfied.

strictly ordered bid

Bids without any explicit weights attached to them where each single bid is infinitely more important than any other bids that come after it.

Studio The planner's graphical interface in the Carmen system. It is composed of the working window editor (Gantt chart editor) and a number of Studio programs, such as Tabletool, Airport Manager, Plan Browser and Macro Recorder.

Obsolete term: GPC

sub-plan Defines a part of a planning problem which is small enough to be solved automatically by the optimizer or by manual planning in Studio. The result is stored in a sub-plan. To get a solution to the complete problem, you can join several sub-plans.

Sun Grid Engine A a third-party product for computer resource management. Abbreviated SGE. See also *batch queue*.

super user tags See *tags*.

supplementary crew Part of the varying crew problem. When you have a solution with differing crew need on legs you may want to supplement the main crew with extra crew. See also *varying crew problem*.

Tabletool A Studio program used to view and change the contents of external tables.

tags Tags are markers on legs, rotations, duties, trips, rosters or crew. APC tags are markers set by APC on legs that were involved in an APC job. This allows you to easily find out what the optimizer has changed.

User tags are markers set by the user: crew user tags for crew and chain user tags for legs or chains.

Super user tags are used to freeze the names of user tags. Super user tags cannot be changed by an ordinary user.

tail Tail Assignment term. The tail term refers to a specific aircraft.

time base Defines how a time or date entered in a form will be interpreted by the Carmen system. There are different types: UDOR, UDOP, LDOR and LDOP.

time scale Above each working window there are two scales showing the time for which a plan operates. You can use these time scales to zoom in and out.

timetable Contains a number of flights over a certain period. A timetable is the most important input to the Carmen system.

TOR See *regularity add-in*.

TPTS TPTS is one of two time schedule formats supported by the Carmen system. The other format is SSIM.

traffic days The days of the week when a generic flight is in operation.

trailing leg Refers to the ending of a trip or duty, used for the last part of a split trip or duty.

trip

A trip is a sequence of legs which normally starts and ends at the same base. A trip always has a crew complement showing the amount of crew supposed to service that trip. The main result of a pairing planning process is a set of trips covering the crew requirement of all legs in a timetable. A trip usually carries some administrative data, used when being transferred to other systems.

A trip with a crew member allocated is called an assignment.

See also *trip kernel*.

Obsolete term: pairing, crew rotation, CRR.

trip connector

The line drawn between legs in an assigned trip in the roster window.

trip kernel

All legs within a trip except for deadheads at the beginning and end of the trip. Used in the base variant concept.

trip variant

When base variant are added to an original trip, you get trip variants.

Main trip variant
The trip that you see in the trip window. Since you may switch the main trip variant with an optional trip variant, the main trip variant is not necessarily the original trip.

Optional trip variant
Added variants are called optional trip variants.

UDOP

Short for UTC day of operation. See also *DOP*.

UDOR

Short for UTC day of origin. See also *DOR*.

user tags

See *tags*.

UTC

Short for Universal Time Coordinated, the international time standard. It is the current term for what was commonly referred to as Greenwich Mean Time (GMT).

varying crew problem

A problem where the crew need is different for different legs in a subplan. It usually depends on several factors, such as flight time and estimated number of passengers.

There is normally a common subset of crew members: the main crew. In addition, some legs require supplementary crew, for which separate trips must be built. See also *supplementary crew* and *jumper*.

weekly plan

A plan that applies to a standard week. See also *standard plan*.

weighted bid

In a bid model based on weighted bids, crew members assign bid points to each bid.

wop

Short for working period, period of work between days off.

XResource

Resources that control the visual characteristics of the system.