AIFlPln user manual

Summary

1   Introduction

"AIFlPln" is simple manual edition tool of Flight Plans for Flight Simulator AI Traffic, according to AI Traffic standard conventions defined by the reference TTools of Lee Swordy for FS 2002 and FS 2004. The main objective of its design was simplicity and comfort of a user who wishes to create and edit manually AI Traffic Flight Plans.

The originality of AIFlPln is mainly based upon the graphic representation of the edited Flight Plans on a planning board, providing by this way a visual understanding of the flight plan of one or several aircraft on a day or a week. Classical flightplan edition features such as scheduling in local time, day light saving, edition of the aircraft file content, etc, are also provided. AIFlPln can be translated into any language based on the standard Roman alphabet.

AIFlPln doesn't include any "compiler-decompiler" function. Its output is limited to the creation and/or the modification of the 3 files (Aircraft, Airports and Flightplans files) defined by Lee Swordy as the input files necessary to his well known compiler-Decompiler TTools (see References hereafter). Producing the AI Traffic .bgl file for FS9 or FSX goes through the use a compiler tool compatible with the reference standard input files format and conventions as defined by TTools.

It has to be noted that using AIFlPln is at the own risk of its user!

2   References

Many "user-friendly", freeware programs have been created to manage AI flight plans and traffic and can be found on the web, each of them providing their own set of interesting and useful functions; some of them are mentioned hereafter:

- **TTools** by Lee Swordy: The Reference in the world of AI Traffic ; anybody interested in but not familiar with AI Traffic for FS has to read TTools manuals first. Furthermore, TTools is a "Compiler – De-Compiler" of AI traffic files for FS2002 and FS2004 ("FS9") and can be used to compile the files edited with AIFlPln into a .bgl traffic files which can be read by FS9.

- **AITM** by Thomas Molitor : Includes several tools to manipulate the AI Traffic in many ways like rearrange, move, export, analyze, edition of flight plans and many others.

- **AI Flight PLanner** by Don Grovestine : A multi-function tool for AI Traffic providing also a Compiler – Decompiler tool not only compatible with FS9 but also with FSX. Can use files formatted as per TTools Input files standard and thus should be adequate to compile AIFlPln output files into FSX compatible traffic files.
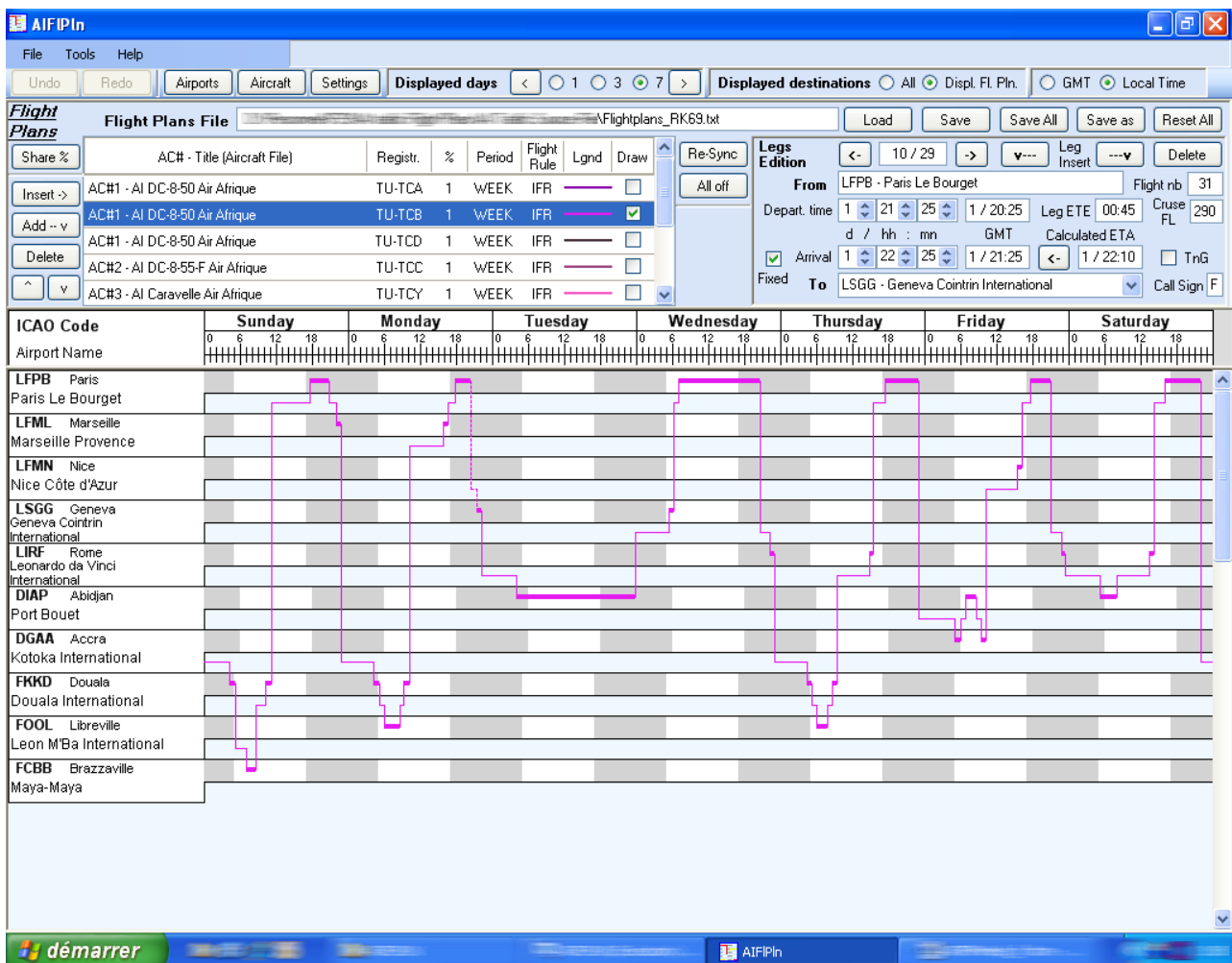
3   AIFlPln overview

Preliminary reminder about the basic concepts of AI traffic for Flight Simulator (FS9 / FS10) and the associated vocabulary :

An Aircraft of the AI Traffic is created as soon as a planning defining its operational flights and meeting certain rules is defined in an input file according to an adequate format for FS. This operational planning, called a **Flightplan**, is periodic (the repeat period being of 1 or several hours, up to 24 hours, or 1 week) and is made of successive flights called **Legs** joining the different stopovers of a closed loop trip. Each leg follows the great circle of the earth joining its departure stopover to its arrival stopover (nevertheless, the standard approach trajectories of FS are followed in principle)

Edition of flight plans with AIFlPln goes through 3 different groups of commands or parameters, each of them being associated to a dedicated window :

- The main window is dedicated to the edition of the planning by itself, which consists in defining the characteristics of the base of the edited flights on one hand, and the characteristics of each leg of those flights on the other hand. Any flight can be drawn on the planning board offering a visual representation of its different legs. Scheduling of each leg (defining the departure time and the arrival time) can be done either via numeric up/down edition boxes, either directly by a drag and drop sequence on the planning board (a final adjustment via one of the numeric up/down edition boxes can be necessary to accurately set up the scheduled time).

- A second window is dedicated to the selection of the stopover airports to be used as destinations of the flight legs; those airports constitute the Airports file of the TTools convention.

- A third window is dedicated to the selection of the aircraft models upon which are based the aircraft the flights of which are planned. They constitute the Aircraft file of the TTools convention.

- A fourth window is dedicated to the settings of AIFlPln.

Any set of Aircraft, Airports and Flightplans files formatted as defined by TTools convention can be read as input data. The output of AIFlPln is also consisting in those three files, also formatted as per TTools rules.

Several files are associated with the executable file AIFlPln.exe and must be located in the same folder:

- AIFlPln.ini keeps the settings parameters from the previous AIFlPln session.

- The airports database associated with AIFlPln, consisting in four different editable files linked the one to the others: AIFlPlnDB.txt, AIFLPLNCitiesList.txt, ICAO Countries Code.txt and ICAO Wide Regions Code.txt. All four files must be present to allow AIFlPln to run. The airports selection can be done among the list of airports contained within this database which contains approximately 6800 airports ; they represent almost the totality of the airports recognized by the ICAO (International Civil Aeronautical Organization). It has to be noted that the Airports data-base of FS9 (and FSX) contains approximately 14000 airports; so the airports data-base of AIFlPln is at the time being half of that size. Nevertheless this should not be a real problem in most of the cases. Should one or two airports be missing for the planning of a fleet of aircraft, it remains the possibility to add them by manual edition of both AIFlPlnDB.txt and AIFLPLNCitiesList.txt files.

- A set of customization files, AiFlPlnCustom_xx.txt, AiFlPlnMsg_xx.txt and AIFlPlnHelp_xx.htm. They permit to customize the menus and the command buttons of AIFlPln for the first one, the information or warning messages for the second one and the current help file for the third. English (at least an approximation) and French versions (respectively _en and _fr suffixes) are provided at the time being.

4   Installation

To install AIFlPln, unzip all the files contained into the compressed .zip distribution file into one folder of your choice (all the unziped files must be located into the same folder.) AIFlPln.exe can be run without any Windows program installation.

It may be requested to install some components of the Microsoft .NET Framework (version 2.0 or later). Nevertheless, tests performed on different computers and Windows XP (SP3) on which such components of the Microsoft .NET Framework had never been explicitly installed did not exhibit this requirement.

Compatibility mode with Windows XP (32 bits) programs may be requested if used with later version of Windows, especially Windows Vista - 64 bits or Windows 7 - 64 bits.

5   AIFlPln Settings window

From the Flight Plans editing window, click on the "Settings" button or select the Settings option of the Tool Menu. The following window appears:

- Setting parameters :

  - Language (the default language is English) ; French is the unique alternative at the time being. Other languages should be available later.

  - Scheduled time resolution of 5 mn (checkbox) : If checked, the departure and arrival times are adjusted by steps of 5 mn, at the exception of the calculated arrival times (ETA) which keep a resolution of 1 minute. Checked by default.

  - Minimum stop time (minutes) : the lower limit of the duration of a stopover. A value of 45 mn or higher is recommended; however, in certain cases a lower value may be necessary but with the risk that aircraft don't land due to late arrival or not enough time available before departure time as scheduled. So the default value of the lower limit is set at 45 mn.

  - Standard stop time (minutes) : the stopover duration selected by default when a new leg is inserted in a flight planning. Default value set at 55 mn.

  - Minimum flight time (minutes) : the lower limit allowed for the duration of a leg. It is also the initial value for the duration of a new leg before its arrival airport is defined (initially, the arrival airport of a leg is identical to its departure airport). This parameter should not be set below the default value of 15 mn.

  - Daylight Savings Time (DST) activation (checkbox)

  - Daylight savings period (season from northern hemisphere) to be considered for DST, summer or winter

6 Airports Selection window

This window allows to create and/or to modify the list of Airports which are used as destinations of the edited flightplans (the content of the Airports File).

From the Flight Plans editing window, click on the "Airports" button or select the Airport Selection option of the Tool Menu. The following window appears:

6.1 Filtering panel

The filtering panel contains 3 filtering lists permitting to significantly facilitate the selection of airports by filtering the content of the drop-down list of the combo-box "ICAO Code – Airport Name" used for that selection.

- World Region: Each country belongs to one "World Region" (continental scale) according to its geographical location on the earth (with some exceptions, linked to the ICAO codification). One World Region being selected, the list of countries displayed within the country list-box is filtered or not according to the status checked or unchecked of the World Region checkbox. By the same way, the list of cities displayed within the City list-box is filtered or not, according to the status of both World Region and Country checkbox. Finally, the list of Airports displayed within the Airports selection combo-box (see Selection of Destination Airports) is filtered according to the same principle.

- Country: As above; each city belongs to a country.

- City: The same, for each airport.

- Command buttons:

  ➢ ^ (up) :   to change the position of the selected region in the list (one line, up)

  ➢ v (down) : idem, down

> Sort : sort the list (alphabetic order)

6.2 Selection of Destination Airports panel

- ICAO Code – Airport Name: This combo-box permits to select airports to add or insert into the list of destinations airports.

- List of Destination Airports: The list of Airports which can be used within the edited flight plans. This list is the one contained within the airports file.

- Command buttons :

  > Insert -->: to insert the selected airport from the combo-box "ICAO Code – Airport" at the position of the one selected in the Destinations list (or in first position if no item is selected)

  > Add ---v : to add an airport at the bottom of the list

  > Remove : to remove an airports from the list

  > ^ (up) : to change the position of the selected item in the list (one position, up)

  > v (down) : idem, down

  > Sort : reorder the list of airports according to the rank of each airport World Region within the World Regions list, as a first sorting key; the alphabetic order of the ICAO code is the second sorting key. The interest of this sorting command is to group the Airports of a same World Region in a same area within the flights planning board; it has to be combined with the reordering functions dedicated to the World Regions list (see above).

  > Used : reduce the list to the airports used at least one time as a stopover within one of the edited flight plans. It has to be noted that using the complete set of available airports of the data base is not useful and slow down any scrolling of the planning board so much that it may become unacceptable for the user (airports file some time contains the totality of the Airports data base of FS : in such case, activating this "Used" function is highly recommended as soon as the Airport file is loaded).

  > OK : ends the destination airports selection and go back to the planning.

6.3 AI Traffic Airports File sub-panel

- Textbox : displays and permit to modify the current airports file associated to the Destinations Airports list

- Command buttons :

  > Add: add the content of the specified file (in the above text box) to the Destinations list. If one airport in the file is already within the list, it is ignored

  > Save: save the list of destination airports in the above specified file. If no file is specified, a save file dialog box asks for a file specification.

  > Save as: save the list of destination airports in a file specified by the user through a save file dialog box.

6.4   Missing Airports list

- List-box : Displays the list of airport ICAO codes called by flight plans from the last loaded Flightplans file which have not been found neither in the destinations list, neither in the airports data base.

7   Aircraft selection window

This window allows to create and/or to modify the list of Aircraft models on which are based the edited flight plans (the content of the Aircraft File).

From the Flight Plans editing window, click on the "Aircraft" button or select the Aircraft Selection option of the Tool Menu. The following window appears:

7.1   Flight Simulator Aircraft Database panel

The Flight Simulator Aircraft panel permits to define the location of the Aircraft folder of Flight Simulator, to get the complete tree of the aircraft models variations available within this folder and to select aircraft models variation directly from that database. Any directory containing the same kind of files as the Aircraft directory of Flight Simulator (especially one subdirectory per aircraft model, containing each one "Aircraft.cfg" files) is suitable.

- Aircraft Directory textbox : Indicates which folder is selected

- Change button: Click on it to get a folder selection dialog box by which a new Flight Simulator Aircraft folder can be selected. The FS Aircraft Tree is then updated accordingly

- FS Aircraft Tree: Presents the complete aircraft models and variations available in the specified Aircraft folder. The aircraft tree is arranged according to 3 levels :

  - Level 1 : Aircraft Manufacturer level (ex : AI Douglas) – corresponds to the "UI_Manufacturer" parameter of the aircraft.cfg file

  - Level 2 : Aircraft Type level (ex : DC-8-50) – corresponds to the "UI_Type" parameter of the aircraft.cfg file

➢ Level 3 : Aircraft Variation level (ex : Air Afrique) – corresponds to the "UI_Variation" parameter of the aircraft.cfg file

Only selected items from Level 3 (aircraft variation) can be directly added or inserted in the list of Flight Plans aircraft models.

7.2 Flight Plan Aircraft Models panel

The Flight Plan Aircraft Models panel permits to edit the content of the Aircraft file.

- AI Traffic Aircraft File textbox : Indicates which Aircraft file is edited

- Aircraft models edition table :

  ➢ AC# : The Aircraft number of the Aircraft file. Can be manually edited. Assigning to an aircraft a number already assigned to another aircraft is not allowed.

  ➢ Cruse Ground Speed : 200 kts is given by default when a new aircraft is inserted or added and has to be manually adjusted to the correct value. Edited value must be within the range of 50 to 1500 kts.

  ➢ Title (Aircraft File) : Corresponds to the "Title" parameter of the Aircraft.cfg file.

- Command buttons :

  ➢ Load: load an existing aircraft file. This action is possible only if no flight plan is currently defined (see Flight Planning main window)

  ➢ Save: save the list of aircraft models in the above specified file. If no file is specified, a save file dialog box asks for a file specification.

  ➢ Save as: save the list of destination airports in a file specified by the user through a save file dialog box.
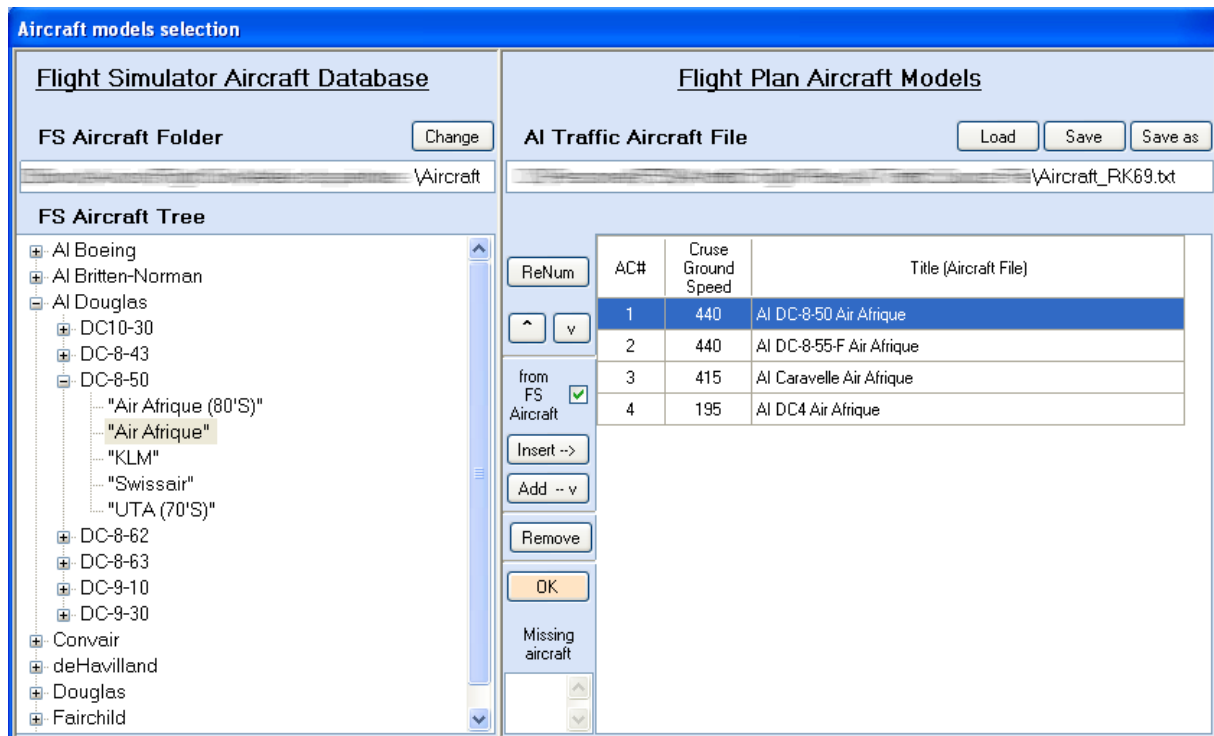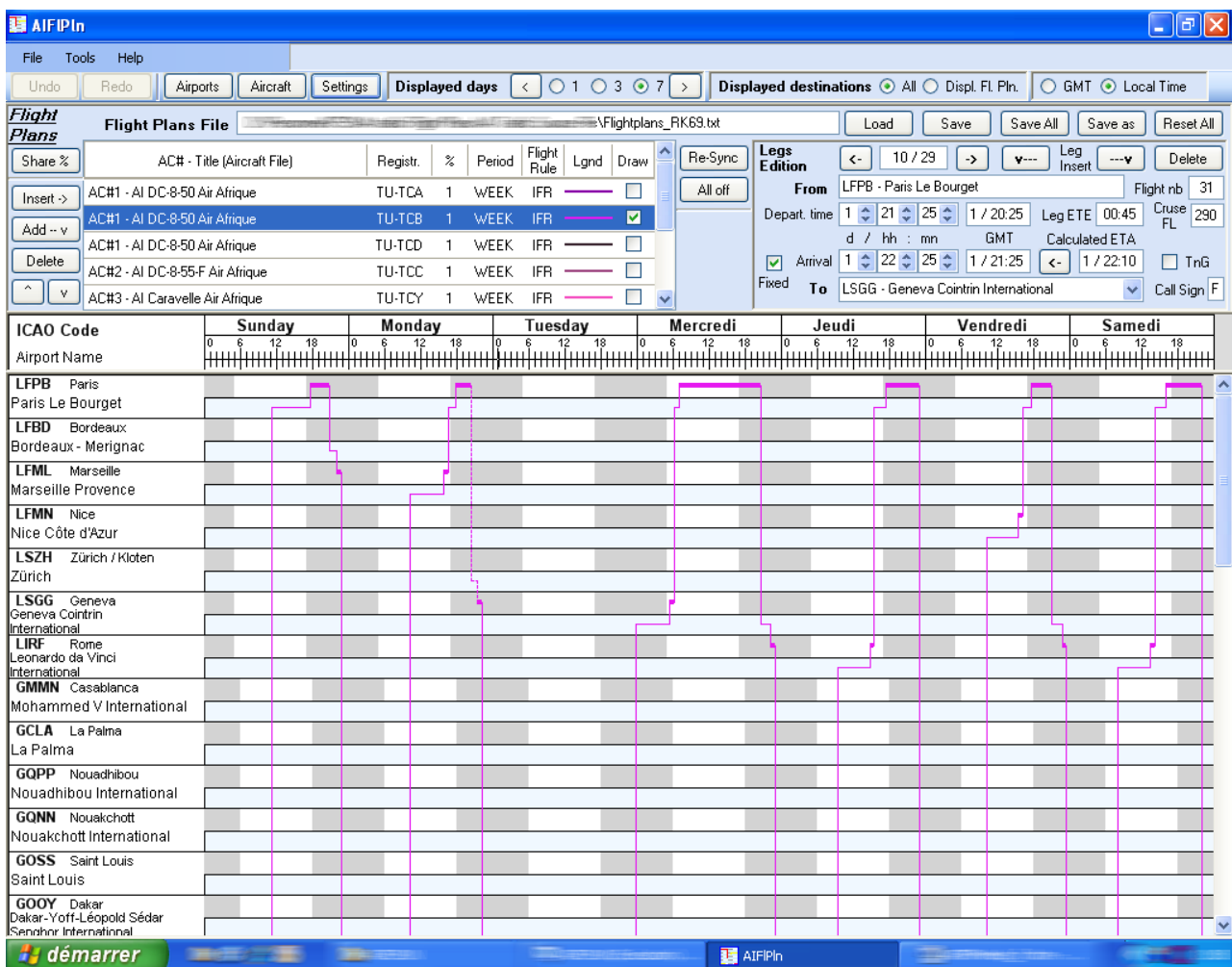
  ➢ ReNum: Renumber the aircraft within the range of selected lines in the editing table, into a sequence starting at the number defined for the aircraft of the first selected line ; the step of the series is 1. If one aircraft number within the series is already affected to an aircraft outside the selected range, then the number is incremented until a "free" number is found (this is just to avoid to get several aircraft with a same number. This function is useful in particular for renumbering aircraft coming from FS2002 aircraft file or after modification of the order of the aircraft list

  ➢ ^ (Up):   to change the position of the selected item in the list (one position, up)

  ➢ v (Down): idem, down

  ➢ from FS Aircraft: When checked, the selected items of the FS Aircraft Tree (Level 3 - aircraft variation only) is directly added or inserted in the list of aircraft models when clicking on the Insert or the Add button ; the aircraft title is that defined in the Aircraft.cfg file for the selected variation. If unchecked, a tbd (to be defined) aircraft is inserted (or added) with the default ground speed of 200 kts. Then the Aircraft title has to be defined manually, as the ground speed.

  ➢ Insert-->: Insert an aircraft just above the one selected in the editing table (or in first position if no item is selected). The number associated to the Aircraft is the smaller "free" (not already affected) integer starting from 1. A ground speed of 200 kts is given by default and has to be set to the correct value manually.

  ➢ Add --v :   The same as Insert but the new item is added at the bottom of the list

- ➢ Remove: To remove an aircraft from the list. An aircraft for which at least one flight plan has been defined cannot be removed

- ➢ OK : Ends the aircraft models selection sequence and go back to the planning.

- Missing Aircraft: list of aircraft (AC# numbers) which have not been found in the Aircraft file associated to the last loaded Flightplans file. Those aircraft have to be inserted in the Aircraft file before reloading the Flightplan file. This list is empty in a normal situation.

8 Flight Planning – The main window

The main window of AIFlPln is dedicated to the edition of the flight plans and is divided into 5 areas:

- The main menu strip

- The general and display commands strip

- The Flight Plans edition panel

- The Legs Edition sub-panel

- The Fight Planning board

8.1 Main menu strip

- File menu

  ➢ New planning (Reset) : The same as the "Reset All" button of the Flight Plans edition panel. Erase all the current data, i.e. the airports list, the aircraft list and the flight plans in order to start a new planning from scratch.

  ➢ Load a Flightplans file : The same as the "Load" button of the Flight Plans edition panel. Re-initialize the planning by loading the specified Flightplans file. If the associated Airports file and Aircraft file exist, they are loaded as well.

13

- Load (add) an Airports file : The same as the "Add" button of the AI Traffic Airports File sub-panel. Add the content of the specified Airports file to the Destinations list. If one airport in the file is already within the list, it is ignored.

- Load an Aircraft file : The same as the "Load" button of the Flight Plan Aircraft Models panel. Load an existing aircraft file. This action is possible only if no flight plan is currently defined (see Flight Planning main window)

- Save all three files : The same as the "Save all" button of the Flight Plans edition panel. Save the three AI traffic files, i.e. Airports, Aircraft and Flightplans files. If no Flightplans file has been previously specified, a save file dialog box asks for a Flightplans file specification.

- Save the Flightplans file : The same as the "Save" button of the Flight plans edition panel. Save the edited flight plans in the previously specified Flightplans file. If no file has been previously specified, a save file dialog box asks for a Flightplans file specification. If the airports list and/or the aircraft list have been modified since they have been loaded from or saved to their corresponding files, the user is prompted to know if these lists have to be saved or not.

- Save the Airports file : The same as the "Save" button of the AI Traffic Airports File sub-panel. Save the list of destination airports in the previously specified Airports file. If no file has been previously specified, a save file dialog box asks for a file specification.

- Save the Aircraft file : The same as the "Save" button of the Flight Plan Aircraft Models panel. Save the list of aircraft models in the previously specified Aircraft file. If no file has been previously specified, a save file dialog box asks for a file specification.

- Save the Flightplans file as … : The same as the "Save as" button of the Flight plans edition panel. Save the edited flight plans in a file specified by the user through a save file dialog box. Then, if the airports list and/or the aircraft list have been modified since they have been loaded from or saved to their corresponding files, the user is prompted to know if these lists have to be saved or not.

- Save the Airports file as … : The same as the "Save as" button of the AI Traffic Airports File sub-panel. Ssave the list of destination airports in a file specified by the user through a save file dialog box.

- Save the Aircraft file as … : The same as the "Save as" button of the Flight Plan Aircraft Models panel. Save the list of destination aircraft models in a file specified by the user through a save file dialog box.

- Exit : to exit from AIFlPln

- Tools menu

  - Select Aircraft : The same as the "Aircraft" button of the general and display commands strip : call for the Aircraft Selection window.

  - Select Destination airports : The same as the "Airports" button of the general and display commands strip : call for the Airports Selection window.

  - Re-synchronize Legs numbering : The same as the "Re-Sync" button of the Flight Plans edition panel. Re-number the legs so that the legs number sequence is synchronized with the repeat period of the flight plan ; i.e. the leg from which the departure time is the first within the repeat period becomes the first leg of the flight plan.

  - Share traffic activation (%) thresholds : The same as the "Share %" button of the Flight Plans edition panel. Randomly shares activation thresholds (%) values between the flight plans associated to each of the aircraft models. For a given aircraft model, the activation threshold values are determined according to the number of flight plans associated to that aircraft model, so that for this aircraft, the number of activated flight plans is consistent with the AI traffic density selected in FS. At least one flight plan associated with an

aircraft model is activated, getting an activation threshold of 1%. Example : let's assume that we have defined 3 flight plans for a given aircraft model (we have planed the flights of a fleet of 3 aircraft of the same type) ; we wish that if the traffic density in FS is set below 33%, only 1 of the flight plans is activated ; if it is set between 33% and 66%, then we expect to see 2 of the flight plans activated ; if it is set over 66%, then the 3 flight plans have to be activated. Then, for that aircraft model, the activation threshold values will be 1%, 33% (the real value is in fact rounded to 34%) and 66% ; those 3 values are randomly distributed to the 3 flight plans.
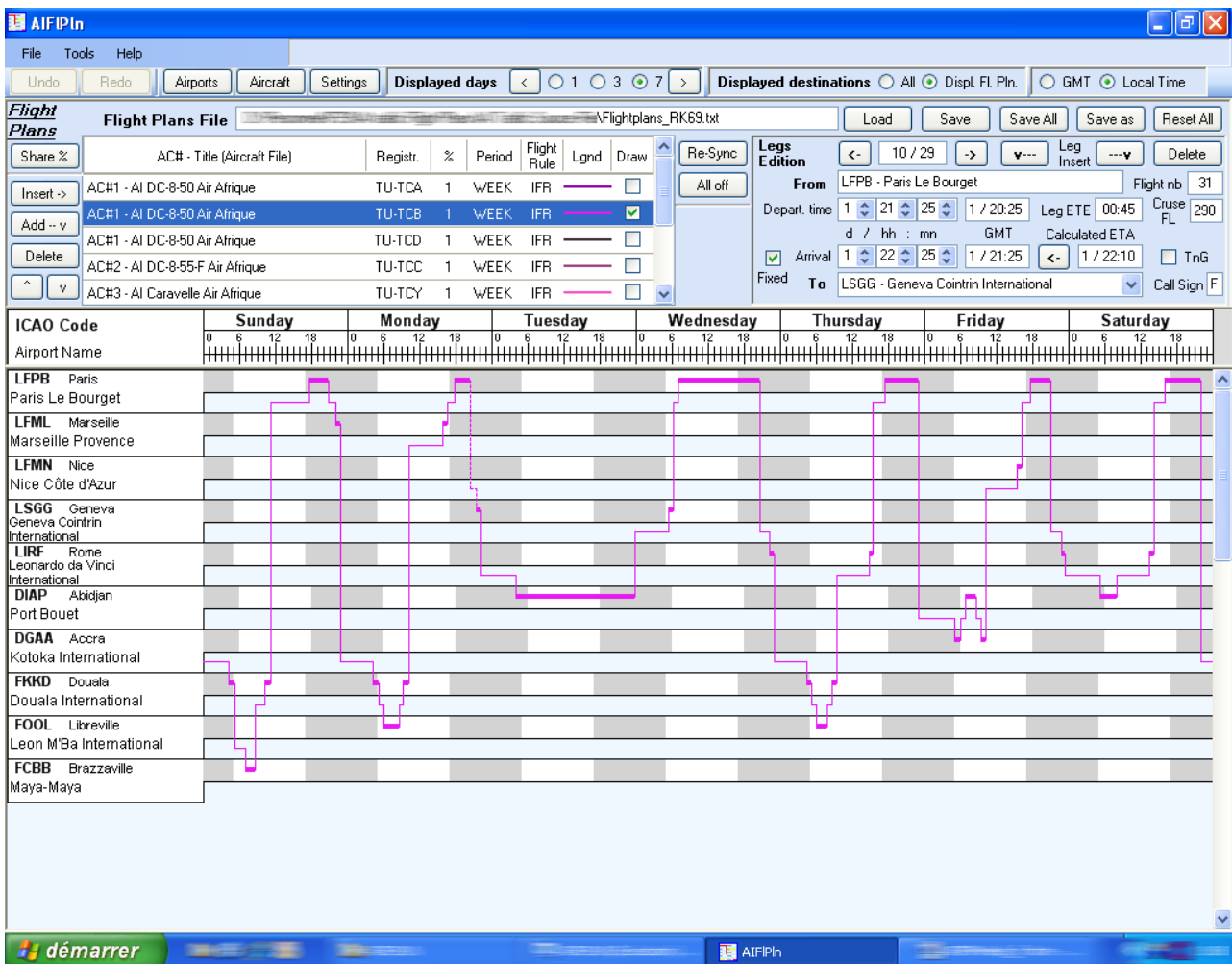
- ➢ Settings : The same as the "Settings" button of the general and display commands strip : call for the AIFlPln Settings window.

- • Help menu : Call this help file

8.2 General and display commands strip

- • General command buttons

  - ➢ Undo : Cancels the previous action applied on flight plans or on aircraft models. No limitation.

  - ➢ Redo : Redo the previously canceled actions

  - ➢ Airports : The same as the "Select Destination airports" item of the Tools menu : call for the Airports Selection window.

  - ➢ Aircraft : The same as the "Select Aircraft" item of the Tools menu : call for the Aircraft Selection window.

  - ➢ Settings : The same as the "Settings" item of the Tools menu : call for the AIFlPln Settings window.

- • Displayed days commands

  - ➢ < (left) and > (right) buttons : Shift the first displayed day of the week on the planning by one day left (the day before) or one day right (the day after). By default the first displayed day of the planning is Sunday (day 0).

  - ➢ "1", "3" or "7" radio buttons : Select the number of days displayed on the planning.

- • Displayed destinations

  - ➢ "All" and "Displ. Fl. Pln." Radio buttons : Select to display either all the airports contained within the complete list of destination airports or only the set of airports defined as stopovers of the currently displayed flight plans. This last mode permits in most of the cases to get all the stopovers of an edited flight plan visible on the screen without scrolling it, as illustrated below

    A click on one of these buttons, even if they are already selected, permits to reset the scrolling of the board so that the first stopover of the currently edited flight becomes the first stopover to be displayed on the board.

- Time editing mode

    ➢ GMT or Local Time radio buttons : select the mode of edition to schedule the time of departure and arrival of the currently edited leg within the leg edition sub-panel. It has to be noted that the time graduation displayed in the strip just above the planning always refers to GMT.

8.3 Planning board description and legs representation

The planning board is consisting in :

- The Time strip which contains a graduated time axis. 3 different time scales can be selected (see Displayed days commands) : 7 days, 3 days and 1 day.

- The column containing the displayed stopovers on the left side of the board; the stopovers are identified by their ICAO Code, the city where they sit and the name of the Airport.

- One line of the board is dedicated to each of the displayed airports (each one presenting series of 6 pm to 6 am (local sun time) shadowed area alternated with 6 am to 6 pm (idem) white area to help to visually differentiate day sun time from night sun time on the board at the considered airport). Those airport lines are separated by white lines on which are drawn the "flight segments" of the flight legs.

- Each leg of a flight plan is represented by 4 segments :

    ➢ 1 – The departure segment, vertical and in a position aligned on the board consistently with the scheduled departure time

    ➢ 2 – The flight segment, horizontal, representing the duration of the flight

16

➢ 3 – The arrival segment, vertical and joining the flight segment to the second horizontal segment which represents the ground phase of the leg, i.e. the stopover at the gate of the leg destination airport.

➢ 4 – The ground segment, drawn in the line of the board dedicated to the destination airport of the leg.

8.4   Flight Plans panel

• Flight Plans File (Textbox and buttons)

➢ Flight Plans File textbox : Indicates which Flightplans file is currently edited

➢ Load : Re-initialize the planning by loading the specified Flightplans file. If the associated Airports file and Aircraft file exist, they are loaded as well.

➢ Save : Save the edited flight plans in the Flightplans file specified in the Flight Plans File textbox. If no file has been previously specified, a save file dialog box asks for a Flightplans file specification. If the airports list and/or the aircraft list have been modified since they have been loaded from or saved to their corresponding files, the user is prompted to know if these lists have to be saved or not.

➢ Save All : Save the three AI traffic files, i.e. Airports, Aircraft and Flightplans files. If no Flightplans file has been previously specified, a save file dialog box asks for a Flightplans file specification.

➢ Save as : Save the edited flight plans in a file specified by the user through a save file dialog box. Then, if the airports list and/or the aircraft list have been modified since they have been loaded from or saved to their corresponding files, the user is prompted to know if these lists have to be saved or not.

➢ Erase all the current data, i.e. the airports list, the aircraft list and the flight plans in order to start a new planning from scratch. The corresponding files (from which the current data have been loaded) are not affected by this operation. If the airports list and/or the aircraft list and/or the flight plans have been modified since they have been loaded from or saved to their corresponding files, the user is prompted to confirm the reset action without saving the modified data.

• Flight plan base edition table (description per Columns)

➢ AC# - Title : Defines the Aircraft model on which each flight plan is based. A dropdown list permits to select an aircraft model within the previously defined list of aircraft

➢ Registr : Registration of the planed aircraft (any characters string, compatible with FS9 / FSX ATC convention for call signs if used)

➢ % Column : Activation threshold of the flight plan ; must be within the range 1 to 99. A flight plan is activated if the FS9 (/ FSX to be confirmed) traffic density set for AI traffic is over this parameter. The default value is 1%.

➢ Period: Repeat period of the flight. To be selected within values proposed by a dropdown list (Week, 24h, 12h, 8h, 4h, 2h, 1h)

➢ Flight Rule : IFR or VFR (to be selected in a dropdown list)

➢ Lgnd : Legend. The color of the Line representing the flight on the board. Not editable.

➢ Draw (Check box) : If checked, the corresponding flight plan is displayed on the planning board.

Important note : Several or even all flight plans can be drawn at the same time on the planning board ; but only one of them can be edited at a given time, the one which is

selected (highlighted in blue) in the base edition table ; it is designed as the "currently edited flight plan" in this help document.

- Flight plan base command buttons

  - ➢ Share % : The same as the option "Share traffic activation (%) thresholds" of the Tools menu. Randomly shares activation thresholds (%) values between the flight plans associated to each of the aircraft models. For a given aircraft model, the activation threshold values are determined according to the number of flight plans associated to that aircraft model, so that for this aircraft, the number of activated flight plans is consistent with the AI traffic density selected in FS. At least one flight plan associated with an aircraft model is activated, getting an activation threshold of 1%. Example : let's assume that we have defined 3 flight plans for a given aircraft model (we have planed the flights of a fleet of 3 aircraft of the same type) ; we wish that if the traffic density in FS is set below 33%, only 1 of the flight plans is activated ; if it is set between 33% and 66%, then we expect to see 2 of the flight plans activated ; if it is set over 66%, then the 3 flight plans have to be activated. Then, for that aircraft model, the activation threshold values will be 1%, 33% (the real value is in fact rounded to 34%) and 66% ; those 3 values are randomly distributed to the 3 flight plans.

  - ➢ Insert --> : Inserts a new flight plan between the currently selected flight plan and the previous one in the flight plans edition table. The inserted flight plan inherits from its previous flight plan its aircraft model (AC#), its activation threshold (%), its repeat period and its flight rule. If the inserted flight plan is in first position within the edition table, these parameters take their default values : the aircraft model is the first of the defined aircraft models list, the activation threshold is 1%, the repeat period is 24 Hr and the flight rule is IFR. When a new flight plan is inserted, it contains two closed loop legs. Their departure and arrival airport is the first airport of the defined airports list. their departure time is set depending upon the initial repeat period, as follows :

    - Week : 1st leg departure set at day 0 (Sunday), 6:00 GMT and 2nd leg departure set at Day 6 (Saturday), 21:00 GMT.

    - 24 Hr : 1st leg departure set at 6:00 GMT and 2nd leg departure set at 21:00 GMT.

    - 12 Hr, 8 Hr, 4Hr and 2 Hr : 1st leg departure set at 0:00 GMT and 2nd leg departure set 60 mn before the end of the repeat period.

    - 1 Hr : 1st leg departure set at 0:00 GMT and 2nd leg departure set at 0:30 GMT. The choice of 1 Hr repeat period induces the probable necessity to reduce significantly the minimum stop time (cf Setting Parameters) and thus to take the risk of malfunction of the so planned Aircraft.

    And their leg duration is the minimum flight duration; the flight level is set at FL 50.

    Note : to be compiled into a FS9 traffic file, all the flight plans defined by a flightplans file (as output of AiFlPln) must include at least **2** legs ; furthermore, each of the data fields (such as registration code of the aircraft, etc) must be completed.

  - ➢ Add --v : Add a new flight plan to the list of flight plans in last position within the flight plans edition table. The same rules as above are applied to define the initial parameters of the added flight plan.

  - ➢ Delete : Deletes the selected flight plan.

  - ➢ **^** & **v** : Changes the position of the selected flight plan within the edition table, by one rank up or down.

  - ➢ Re-Sync : Re-Synchronize the series legs of the selected flight plan with its repeat period, via a simple circular permutation, so that the first leg of the series is also the first one within the defined repeat period. This function is very useful at the end of the edition of a

complete flight plan, to be sure that the series of legs is correctly ordered with regard to the repeat period; it permits also to forget this requirement when inserting the legs in the flight plan during edition.

➢ **All off** : Uncheck the Draw checkbox of all flight plans of the edition table excepted that of the selected flight plan, so that only this flight plan remains drawn on the planning board.

8.5 Legs edition subpanel

This subpanel is dedicated to the edition of each leg of the currently edited flight plan. It permits to define all the parameters which characterize the legs, according to the rules of TTools (and finally FS9/FSX) for AI traffic flight legs description.

From top to bottom and left to right, we find :

• Selection of the leg to edit (<- button, -> button and selected leg text box)

➢ Previous (<-) and following (->) leg selection buttons : to select the leg to edit among the different legs of the flight, by increment of one leg backward or forward. The leg selected for edition can be identified by its number displayed in the dedicated text box (see next item). On the planning board, the segments representing that selected leg (at the exception of the ground segment) are drawn with dotted lines. As a flight plan is periodic, the leg following the last leg of a flight plan is the first leg of that flight plan ; and the leg preceding the first one is the last one.

➢ Leg number textbox : displays the rank of the leg selected for edition and the total number of legs defined in the edited flight plan.

• Insertion of a new leg (**v--** button and **--v** button), deletion of a leg

➢ **v--** button : To insert a leg **just before** the selected leg. The new leg is inserted in the ground phase (A/C at the gate) of the previous leg, i.e. between the previous landing of the A/C and the departure of the selected leg ; it is just a closed loop flight landing at the same airport as its departure airport. The duration of that flight is equal to the minimum flight duration (standard value of 15 mn). The real destination of the new leg has to be adjusted as a second step via the "To" dropdown list (see hereafter). The departure time of the inserted leg is scheduled after the previous landing time plus a stop time either equals to the "standard stop time " parameter if enough time is available, either equals to the "minimum stop time" parameter. If the stop time where the new leg should be inserted is not long enough to meet the minimum stop time requirement (before and after the new leg flight phase), then the insertion is denied.

➢ **--v** button : To insert a new leg in the ground phase of the edited leg. The same principles as above are applied. The departure time of the closed loop leg which is inserted is scheduled after the arrival time of the selected leg plus a stop time either equals to the standard stop time parameter or equals to the minimum stop time parameter according to the available time before the departure of the following leg. If the stop time where the new leg should be inserted is not long enough to meet the minimum stop time requirement (before and after the new leg flight phase), then the insertion is denied. It has also to be reminded that in a flight plan defined with a repeat period of less than 24 hrs, a leg cannot end after the end of the repeat period ; this rule is not

applicable to flight plans with a repeat period of 1 week or 24 hrs ; in these cases, a leg starting before the end of the repeat period may end the day after.

> Delete button : To delete a leg. This action is equivalent to skip a stopover and directly join the departure airport of the deleted leg to arrival airport of the following one. The departure time remains that of the deleted leg. The arrival time is estimated according to the geographic situation of both the departure airport and the arrival airport. If the leg following the deleted one is a fly back to the departure airport of that deleted leg, then a closed loop leg is created and has to be deleted by a second click on the delete button. The last leg of a flight plan cannot be deleted.

- From and to Airports

  > From Airport textbox: Read only information of the departure Airport of the selected leg

  > To Airport textbox & combined dropdown list : Permits to change the destination of a leg by selection of an airport in the associated dropdown list. This list of selectable airport is the one defined in the Airports Selection window. The modification of the destination of the selected leg also impacts the following leg since that airport is also its departure airport. Before the requested change is accepted, checking that enough time is available for both modified legs is performed ; if this condition is not fulfilled, the modification is denied (and an information message displayed). If the modification is accepted, a new arrival time at the new destination is calculated.

- Time display and scheduling

  > Departure and arrival time adjustment (day, hour and minute up-down numeric edition boxes) : To adjust the departure and the arrival time of the selected leg, only by click on the up or down arrows. The box dedicated to day selection is active only when the repeat period of the edited Flight is "WEEK" (cf Flight plan base edition table). The time displayed (and adjusted) is either GMT or Local Time according to the selected mode for time edition (cf Time editing mode in General and display commands strip). The resolution of the minute adjustment box is either 5 mn or 1 mn according to the status of the parameter "Scheduled time resolution of 5 mn" , checked or unchecked (Cf AIFlPln Settings window).

    Note : the arrival time adjusted in the corresponding up-down numeric boxes is active only if the status of the "fixed" arrival time checkbox is checked ; if not checked, the active arrival time is the calculated ETA (see below).

  > Local Time or GMT display boxes, departure and arrival: display the scheduled departure time and arrival time in the mode (Local time or GMT) opposite to the one selected for edition.

  > Leg ETE display textbox : Displays the calculated duration of the flight phase of the selected leg (ETE : "Estimated Time En route").

  > Calculated ETA (textbox and **<-** button) : Displays the time of arrival (ETA : "Estimated Time of Arrival") calculated as suggested by Lee Swordy (cf References) in his TTools manual; the flight phase duration is the sum of a fix 15 mn period covering taxiing and waiting time on ground plus the time necessary to fly over the portion of a great circle joining the departure to the arrival airports at the cruse ground speed of the aircraft defined in the aircraft models edition table (cf Fligh Plan Aircraf Models panel). The **<-** button permits to directly enter the calculated arrival time into the arrival time edition boxes. The time displayed in this textbox is either GMT or local time consistently with the time displayed in the arrival time edition boxes.

  > Fixed arrival time checkbox : Select for the edited leg which arrival time has to be considered : either the calculated one (checkbox unchecked) or the edited one in the edition boxes (checkbox checked). If the calculated arrival time mode is selected, the arrival time edition boxes can still be used, but without any check of the consistency of the edited time ; since no consistency check is performed when switching the arrival time
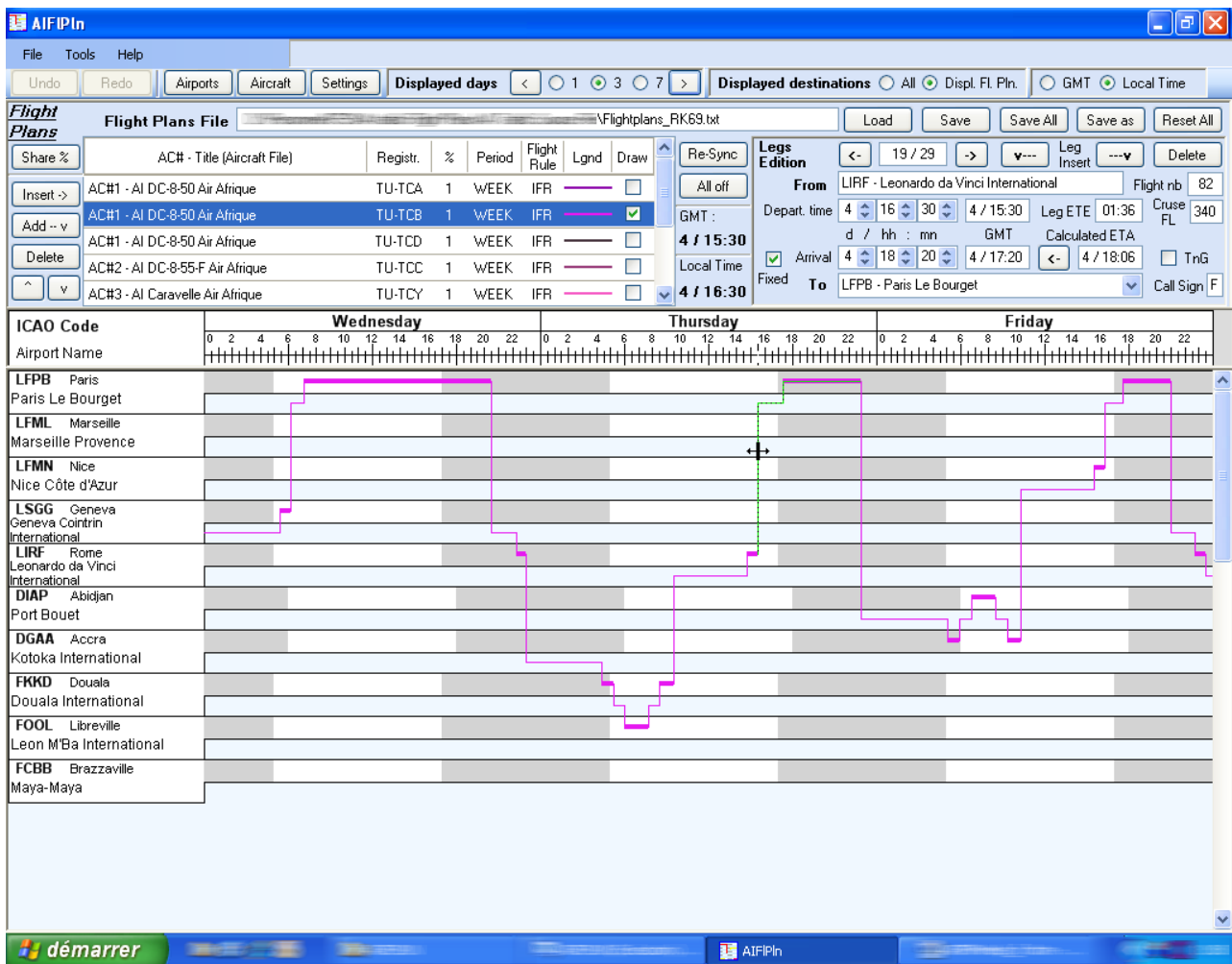
mode from calculated to fixed, it is possible by this way to bypass all the checks which are normally performed and to select an inconsistent arrival time such as arrival before departure or after departure of the following leg or outside the repeat period etc. As it can be anticipated, in such a case, the resulting flight plan drawn on the planning board is not consistent and the probability to get an AI Traffic aircraft following its flight plan in FS9/FSX is very poor. But in certain circumstances, this way may permit to recover abnormal situation that normal consistency checks do not permit to supersede.

➢ Touch and Go (TnG) checkbox : The role of this checkbox is comparable to that of the fixed arrival time one, but when checked, indicates that the A/C should perform touch and go when arriving at the destination airport of the leg until the edited arrival time is reached. Fixed and TnG checkboxes are exclusives the one with the other.

- Flight number, cruse flight level and call sign

➢ Flight number textbox : must be filled by a string of numeric characters; initiated to 0 for the first leg of a flight and then to flight number of the previous leg for the following ones.

➢ Cruse FL textbox : To define the Flight Level of the cruse phase of the selected leg. Initiated per default at a value depending upon :

1 - the heading of the leg so that the standard FL attribution rule is respected at the best.

2 - The cruse ground speed defined for the A/C model, according to the following principle :

-> FL50 to FL100 for A/C ground speed less than 220 kts

-> FL110 to FL280 for A/C ground speed in the range 220kts to 250 kts

-> FL270 to FL360 for A/C ground speed in the range 250 to 400 kts

-> FL310 to FL380 for A/C ground speed over 400 kts

-> The initial FL of a new leg is proposed randomly within those ranges unless the calculated leg duration is not sufficient to reach that level according to the hypothesis that the climb and descent rates of an A/C with a ground speed less than 250 kts is 1200 ft/mn and those of an A/C with a ground speed over 250 kts is 2000 ft/mn ; in such a case, the proposed level is deduced from the calculated leg duration and the vertical speeds mentioned above.

➢ Call Sign text box : Defines the ATC call sign mode ; must be either F (as flight number) or R (as registration). The default value is F.

8.6 Leg selection and scheduling by direct action of the cursor on the planning board

Selection and scheduling of a leg can be directly performed on the planning board via the mouse cursor.

- Leg selection : Put the cursor on one of the 3 flight segments of the leg to select and click on it (the cursor becomes black when it is positioned on one of the 3 flight segments of a leg which is still not selected). If the segment on which the cursor is set is the departure segment or the arrival segment (one of the two vertical segments of the leg representation), then the cursor takes the form of vertical bar and two horizontal arrows for horizontal adjustment (see figure below).

- Departure or arrival time adjustment : Click continuously on the departure or arrival segment to adjust and drag it up to the desired time. The time (in both system GMT and local time) corresponding to the cursor current position is displayed in the central square just at the left of the leg edition sub-panel. A final adjustment to the exact desired time may be necessary via the time edition boxes. If the arrival time mode selected for the edited leg is the calculated one, both departure and arrival are moved simultaneously since the leg duration is constant. Consistency checks are continuously performed during the drag operation so that the dragged segment stops to move when the limit of a scheduling rule (most of the time the minimum stop time rule) is reached.

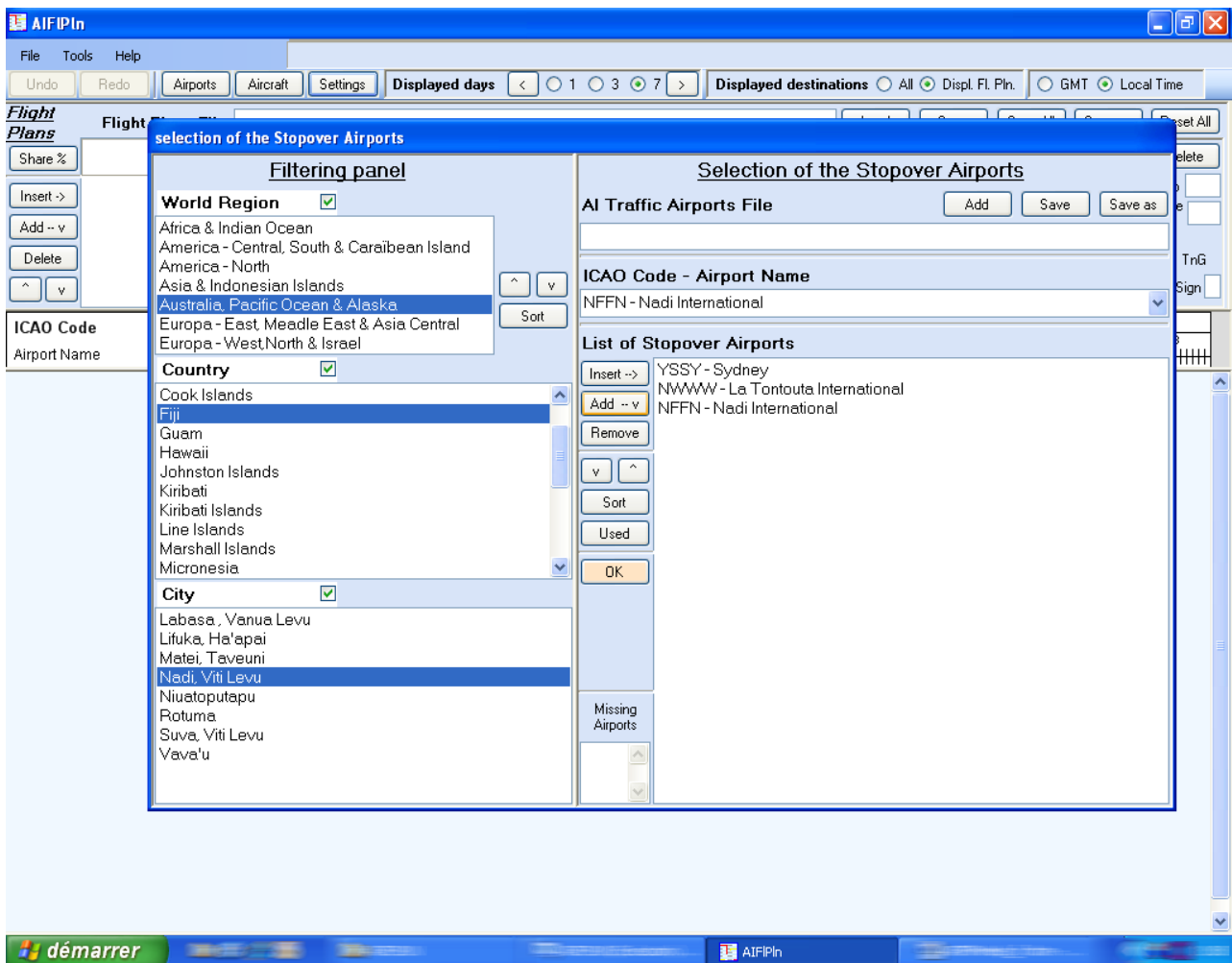# 9   Tutorial : Starting from scratch to create of a new flight plan

9.1   The flight plan to create

To illustrate the way to proceed to create a new flight plan from scratch with AIFlPln, let's choose to define the flight planning of the Caravelle F-BNRA from UTA in the middle of year 1968 ; she was flying in the Pacific area, joining Noumea (La Tontouta - NWWW) to Sydney (YSSY) twice a week and Noumea to Nandi (Fidji) (NFFN) once a week. UTA timetables from that period gives us the following time schedule :

- Tuesday (day2)

  - departure from Noumea to Sydney at 9:30 local time (GMT+11), flight ut2501, arrival at 11:50 local time (GMT+10)

  - departure from Sydney to Noumea at 13:10 local time (GMT+10), flight ut2502, arrival at 17:15 local time (GMT+11)

- Friday (day 5)

  - departure from Noumea to Nandi at 9:30 local time (GMT+11), flight ut2508, arrival at 12:35 local time (GMT+12)

  - departure from Nandi at 13:50 local time (GMT+12), flight ut2509, arrival at 15:00 local time (GMT+11)

- Saturday (day 6)

  - departure from Noumea to Sydney at 9:30 local time (GMT+11), flight ut2505, arrival at 11:50 local time (GMT+10)

  - departure from Sydney to Noumea at 13:10 local time (GMT+10), flight ut2506, arrival at 17:15 local time (GMT+11)
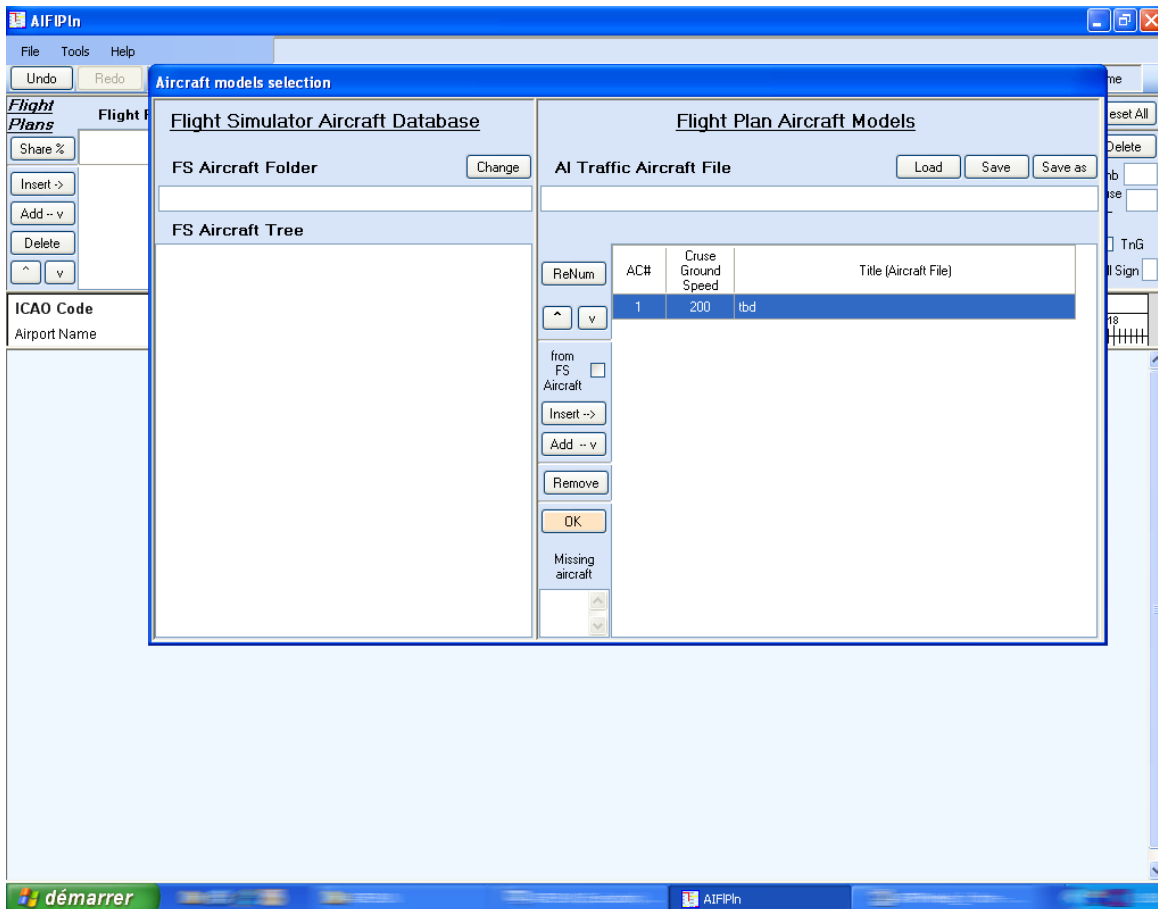
9.2 The preparation of the planning

- The Airports list

  ➢ After activation of AIFlPln, click on the Airports button to get the Airports selection window.

  ➢ Then selection the world region Australia, Pacific Ocean & Alaska, and check on the World Region checkbox.

  ➢ Selection of the Australia country, check on the Country check box, then selection of the city Sydney or directly the airport by its ICAO code YSSY if it is known, then click on the Add or the Insert button to insert that airport in the airport list.

  ➢ Let's repeat the same process for La Tontouta (Noumea in New Caledonia - NWWW) and Nadi International (Nandi or Nadi in Fiji – NFFN), keeping this order. We should get something close to the following screenshot :
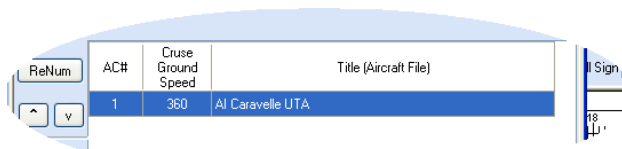

  ➢ Saving the Airports file (choose Airports_Tuto.txt as the file name) in the appropriate directory could be a good idea before quitting the session of airports selection by a click on the OK button.

- The Aircraft models list

  ➢ The second thing to do before starting the planning is to define the list of aircraft models to be used. In our case, this list will be limited to one model. Let's click on the Aircraft button to get the Aircraft selection window.

- Let's assume that the model of our Caravelle UTA is still not defined anywhere in our PC; so it is not useful to load any FS Aircraft tree. As a consequence also, we have to uncheck the "from FS Aircraft" checkbox to be allowed to directly define a new aircraft model in the list.

- Let's click on the insert button : we should get something like the following screen shot, with a aircraft named "tbd" (as "to be defined") and a default ground speed of 200 kts.
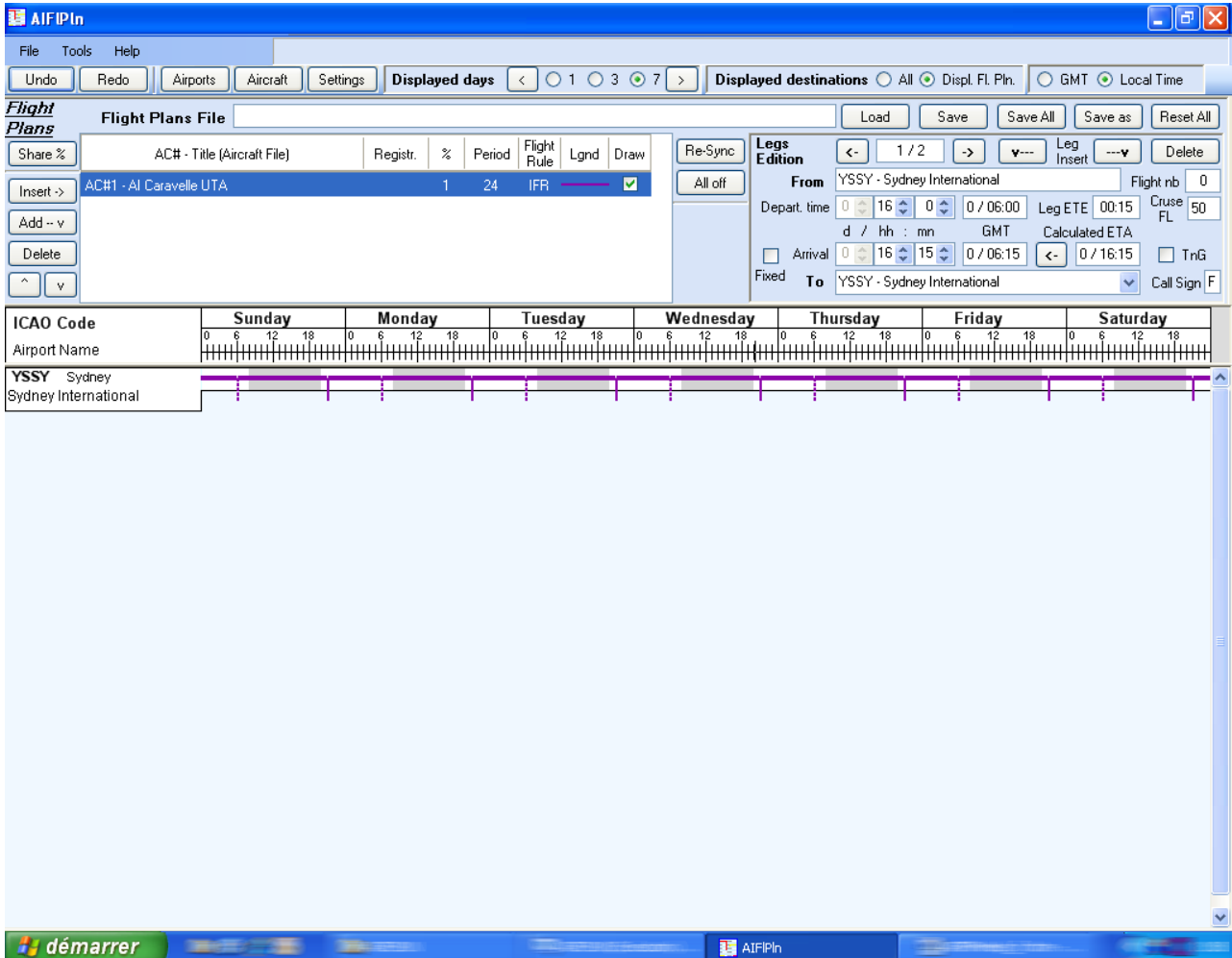

- We have now to give a title to our (future) model and to correct its ground speed value; let's call it "AI Caravelle UTA" and give it a cruse ground speed of 360 kts as illustrated hereafter

- It remains now to save the list as Aircraft_Tuto.txt (to be consistent with the file name given to the Airports file) and to go back to the main window by clicking on the OK button.
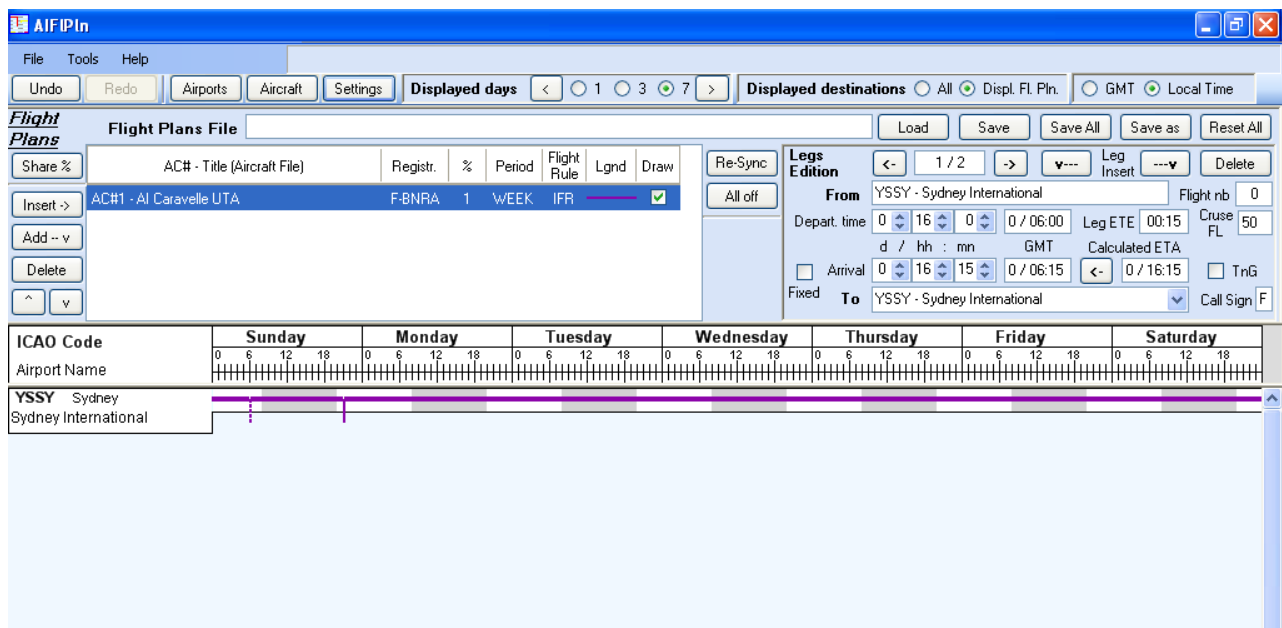
9.3 The Flight Plan

- Initialization of the flight plan

  ➢ We can now **create the flight plan** of our Caravelle by a click on the Insert or the Add button at the left of the flight plan base edition table. What we got should be like the following screen shot.
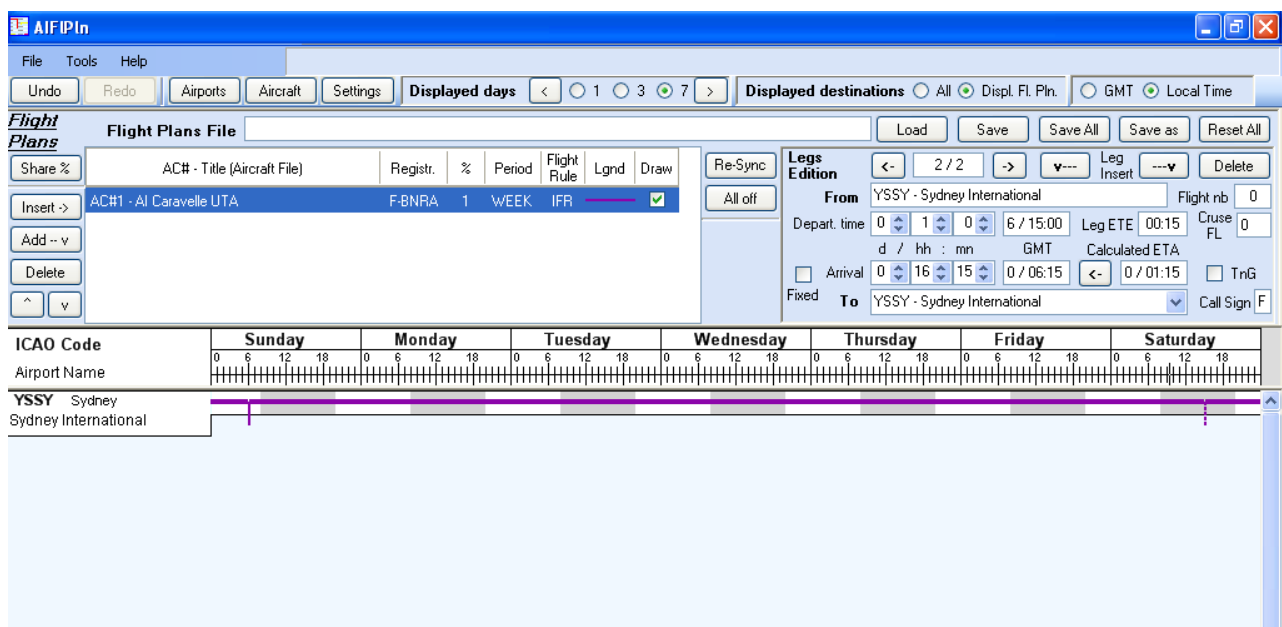

  ➢ We have then **to fill up or to correct the parameters of the base of the flight plan** in the edition table:

    - As there is only one model in the aircraft list, we got directly the right one in the first column "AC# -Title (Aircraft File)"

    - The registration of the aircraft is F-BNRA

    - We can keep the 1% activation threshold or change it to any value between 1% and 99%

    - The repeat period is the Week (to be selected in the associated drop-down list)
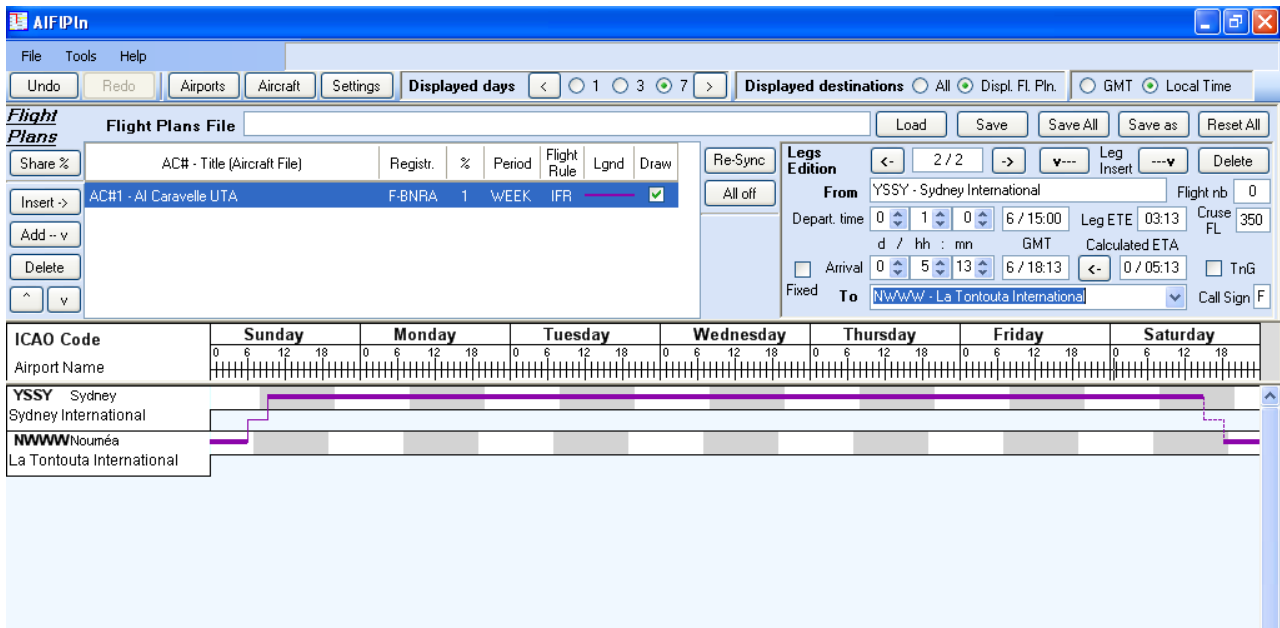
    - We keep the IFR flight rule

- The draw checkbox has to be checked to see the flight plan on the planning : it should consist in 2 closed loop legs of 15 mn each starting on Sunday from the first airport of our airports list, Sydney, the first one at 06:00 GMT and the second one at 21:00 GMT. Our screen should be now like the following one :

➢ We **shift the second leg up to the end of the repeat period** in order to be free to adjust the first leg where we want or to add all the new legs that we need. To do this we can select directly the second leg with the cursor (click left on one of the vertical segments of the second leg) and shift it to the right (like any drag and drop sequence). We get something close to the following screen shot :

➢ Since the first leg of the repeat period departs from an airport different from the first one in the airports list, we shall **fly the aircraft to the location where its first leg departs from by changing the destination of the second leg**, using the " **to** " combo-box of the legs edition subpanel. We should then get the following screen :

- Scheduling the Flight Plan

Scheduling the flight plan is now the easiest task ; we shall proceed as follows :

➢ Selection, then shift of the first leg up to its scheduled departure time; final adjustment of the departure time with the numeric edition boxe shall probably be necessary.

➢ The first leg destination is already the right one and don't need to be changed ; if it was not the case, we should modify the leg destination at that step.

➢ The arrival time has to be fixed at the scheduled one : We first enter the calculated ETA (should be day 2, 11:43 local time) into the arrival time edition boxes by using the "<-" button, then we do the adjustment to the scheduled time (day 2, 11:50 local time) ; it may be useful to check that the time shifts between local time and GMT are correct since there may be errors in the airports database (in several places in the world, the official time shift has been modified and the airport database may not reflect exactly the situation that we want to reproduce with our flight plan ; also, the daylight saving time may not be correctly set); finally we check on the fixed arrival time check-box.

➢ The flight number has to be set (2501).

➢ The flight level proposed is checked and may be corrected if not as we want. That's all for this leg.

➢ Insertion of the following leg by a click on the " --v " button ; a new leg (closed loop, 15 mn duration) is inserted departing 55 mn after the arrival of the first leg.

➢ Modification of the destination airport (flight back to Noumea).

➢ Adjustment of the departure time (day 2, 13:10 local time). Note : these 2 last steps could be done in the inverse order.

➢ Shift of the ETA into the fixed arrival time edition boxes ("<-" button) (note : if the 2 previous steps have been done in the inverse order as suggested, this is already done), then adjustment to the scheduled time (17:15) ; then we check on the fixed arrival time check-box

- ➢ Set up the flight number (2502) ; check the flight level.

- ➢ Repeat the same process for the next 3 legs (ut 2508, ut 2509 and ut 2505).

- ➢ We now have just to adjust the departure time and the arrival time of the last leg, to check on the fixed arrival time check-box and to set up the flight number (2506). That's all for our flight plan :

- ➢ The last thing to do is to save our work in Flightplans_Tuto.txt (Save or Save as).

17:10 local time, a Saturday evening, mid of august 1968; F-BNRA is landing at Noumea – La Tontouta, coming back from Sydney.

10 AIFlPln language translation

AIFlPln can be translated into any language based on the standard Roman alphabet. There is no particular difficulty, but just a little work to do so :

➢ First choose a language code in 2 letters (similar to "en" for English or "fr" for French) ; this code will be used as a suffix to the names of the customizable files corresponding to the new language

➢ Then copy the files AIFlPlnCustom_en.txt, AIFlPlnMsg_en.txt into the same folder (where AIFlPln.exe is located), renaming them with the new suffix chosen just above, but keeping the root of their name as it is.

➢ Edit each of these new files with a simple text editor and perform the translation, line per line, of the text located on the right of each equal sign ("="). Don't alter the left part of any line, it would cancel the translation of the corresponding item or would suppress the corresponding message.

➢ Create a new help file in .pdf format and give it the name AIFlPlnHelp_xx.pdf (where xx is your language code). Hopefully, this step is optional and can be done later ; in such a case, the original English version (this file) would remain the active help file.

➢ Edit AIFlPln.ini with a simple text editor and complete the line starting by "LanguagesCodes =" (it should be the first effective line not starting with a comment mark "//") with a character string indicating first the new language, then the language code, respecting the syntax used to specify the language codes already defined.

➢ Check your work and perform the unavoidable adjustments which are necessary to get exactly what you want.

11   Legal aspects

11.1 Using AIFlPln

AIFlPln has been created by Bruno Thoraval in the context of a personal hobby, without any kind of professionalism especially in matter of software development. It is reminded that **using AIFlPln or any part of it is at the own risk of its user !**

11.2 Proposing AIFlPln

AIFlPln is freeware and can be proposed to the members of the flight simmers community who may find some interest in using it as far it is proposed to them for **free** and exclusively in a form containing **exactly** the content of a distribution package prepared by its author for that purpose; redistributing such a distribution package with any file added, removed or modified is prohibited. The inclusion of any individual file from such a distribution package in another distribution archive without the prior permission of the AIFlPln's author is prohibited. **Commercial usage of AIFlPln in part or in totality is also prohibited** except express written permission of AIFlPln's author.

11.3 Copyright information

Microsoft, Microsoft Windows and Microsoft Flight Simulator are trademarks of Microsoft Corp.

12   Acknowledgements

Many thanks to :

Lee Swordy for his fundamental tool 'TTools" and the associated manual which permits to discover the bases of the AI Traffic world.

Thomas Molitor for his tool "AITM" and the powerful functions that it proposes to manipulate AI Traffic data.

Don Grovestine for his AI Flight Planner and his analyses of the AI Traffic behavior.