

# AI FLIGHT PLANNER

... a comprehensive, fully integrated AI flight planning tool for FS9 and FSX

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# **1. GENERAL**

AI Flight Planner provides all the facilities necessary to install, create, edit and compile AI traffic flight plans for both FS9 and FSX versions of Microsoft Flight Simulator (MSFS). Either TTools-format *.txt* files (zipped or unzipped) or compiled MSFS traffic *.bgl* files may be used as "source code" – or you may create your flight plans "from scratch".

- 1.1 [AI Flight Planner Release 2](#) - AI Flight Planner Release 2, usually referred to as "AIFP2", adds a flight plan and repaint installation capability to AI Flight Planner

as well as a number of other lesser flight planning functions. The major new functionality is preparatory to the activities normally undertaken with AI Flight Planner Version 1.6) and is controlled by a separate dialog. Therefore it is documented separately in an addendum to this manual entitled AI FLIGHT PLANNER (Version 2) Flight Plan and Repaint Installer. The additional functionality associated with the usual flight plan editing activities is, however, documented in the appropriate sections of this manual.

As well, Version 2 incorporates a number of "behind-the-scenes" improvements to the editor and other tools. So, even though you may not intend to use the installer, you may find some of its functions, particularly the new facilities for managing the Aircraft List useful.

Users may select whether AIFP2 opens with the new dialog or the familiar flight plan editing dialog.

1.2 The AI Flight Planner "System" - In addition to the features expected in any flight planning tool, AI Flight Planner:

- has a leg-oriented flight plan editor that can handle daily and weekly traffic in an identical manner;
- permits entry of arrival and departure times based on any time zone or using local times;
- permits designation of airports with either ICAO or IATA codes;
- displays in airline schedule format all the arrivals and departures for any airport in a flight plan/traffic file;
- allows partitioning of the default traffic file (or, indeed any traffic or flight plan file) and creation of flight plan subsets based on any combination of aircraft types, specific aircraft, country, region, city or airport);
- allows data from either TTools or compiled traffic files to be merged with previously-loaded flight plan and aircraft data;
- includes in the compiled traffic file only the airport and aircraft information used by the included flight plans, reducing system overhead;
- finds FS9 traffic files on your system and converts them for use with FSX.

1.3 What You Need to Know - Successful AI flight planning with AI Flight Planner (and indeed, with any other utility) requires familiarity with not only the use of each flight plan and aircraft data field, but also some knowledge of how that data interacts with the MSFS "AI engine". Without this knowledge, AI flight planning is likely to be a rather tedious and unsatisfying experience. So, it is strongly recommended that "newbies" to AI flight planning download TTools (available from popular download sites) and study its user manual, the most comprehensive source of basic flight planning information available.

## **2. INSTALLING / UNINSTALLING / UPDATING AI FLIGHT PLANNER**

2.1 Installing - AI Flight Planner is installed simply by unzipping or copying the files from the downloaded archive (".zip" file) to the folder into/from which AI Flight Planner is to be installed/run. All the files must reside in the same folder. **Do not attempt to run AI Flight Planner from the zipped archive**, since Windows will

place the executable in a temporary system folder – separated from the rest of the (zipped) files, resulting in an exception being thrown.

The complete set of files includes:

- *AIPF2.exe*
- *AirportList\_Base.dat*
- *Timezone\_Base.dat*
- *ICAO-IATA.dat*
- *FS9Chg\_AIFP.txt*
- *FS9Del\_AIFP.txt*
- *TimeZones.txt*
- and several information files including *AI Flight Planner.pdf* and *AI Flight Planner.htm* (this manual in two formats).

The archive file for some earlier versions of AI Flight Planner contained additional *.dat* and *.exe* files which are no longer required.

AI Flight Planner does not affect the system registry.

AI Flight Planner is a VB NET.Framework 3.5 application. If NET.Framework 3.5 is not already installed on your computer, the “redistributable” can be downloaded from the Microsoft website at no charge.

Vista and Windows 7 users may need full administrative privileges to install AI Flight Planner and use some of the its features, in particular Collect Airports and Convert FS9 Traffic Files for FSX.

- 2.2 Updates - AI Flight Planner checks for updates each time it is started. If an update is available, you are asked if you wish to download it. It will be saved to your AI Flight Planner folder. For security reasons, the new version will not automatically install itself. To install the update, simply close AI Flight Planner (if running) and unzip the new archive to the same folder, overwriting the earlier version.

If your Internet connection is unreliable or intermittent, you may turn off automatic update checking by clicking *Options / No Check for Updates at Startup*. A checkmark beside the menu item indicates whether or not checking for updates is disabled.

When you later click this menu item - re-enabling checking for updates at startup - AI Flight Planner immediately looks for an update. So, if you have disabled the check for updates at startup and wish to continue in that mode, you may check for an update at any time by momentarily turning back on the update checking with that Options menu item and then turning it off again.

You may also check for updates at any time using the Help / Check for Update function.

- 2.3 Uninstalling - To uninstall AI Flight Planner, simply delete the folder in which it is installed.

2.4 Regional Settings - AI Flight Planner has been “internationalized” to the extent reasonably possible. A comma (,) may be used as a decimal separator; time separators may be any non-numeric character, ASCII compares are based on “Invariant Culture”, etc. However there are (at least) two situations which are not addressed.

- Use of a space as a decimal separator – AI Flight Planner may “hang” or otherwise not respond properly when using a Windows regional option that uses a space as a decimal separator (such as Finnish). Since the degrees, minutes and seconds in latitude and longitude entries are separated using spaces, a space cannot reliably be interpreted as a decimal separator.
- With certain regional settings, two or more characters are considered equivalent. Again using the Finnish Regional Option as an example, Vs and Ws are handled as if they were the same character. Hence, in a sorted list, you’d find Vs and Ws intermixed. A case in point is AirportList.dat which, if sorted using the Finnish Regional Option, has Venezuela followed by Western Sahara which in turn is followed by Vietnam. As well, when searching for “CYWG”, for example, Windows will return “CYVG” - “V” being considered as “W”, causing CYWG to be declared as missing – even when using Invariant Culture compares. There seems no way internal to AI Flight Planner around such situations.

So, if you normally use a regional option that causes such errors, you may have to switch to another regional setting (e.g., English, German) for AI Flight Planner to perform certain functions properly.

2.5 Saving Traffic Files - Compiled traffic files (.bgl) are treated by MSFS as a scenery file and, accordingly, may be saved to any location where MSFS expects to find scenery files. Practically, however, this means one of two locations:

- the FS9 or FSX \Scenery\World\Scenery folder, or
- an add-on scenery folder.

Purists will tell you that traffic files must be loaded prior to stock scenery files and, hence, should be saved to the former location. However, I have not experienced any difficulties using a folder in Flightsim's *Addon Scenery* folder enabled in the Scenery Library. Using this latter approach has the added benefit that the traffic can be turned on or off independently, thus reducing system overhead, without deleting or disabling files. Bottom line, it's your choice.

### **3 MAIN AI COMPONENTS**

AI flight planning for MSFS makes use of three types of data:

- airports – the name, geographic position and elevation of the airports between which the AI operates
- aircraft – the identification and cruise speed of the aircraft involved, and
- flight plans – the schedule and other information controlling aircraft movement.

AI Flight Planner provides the “tools” to manage these three data sets and compile them into MSFS traffic files.

- 3.1 Airports – Generally, AI Flight Planner derives the airport information required for the generation of traffic files from a file named *AirportList.dat*.

AI Flight Planner “ships” with a file named *AirportList\_Base.dat* that includes every stock airport in FS9 and FSX and records which of those airports exist in only one or the other MSFS version. Where an airport exists in both FS9 and FSX, the FSX version is used. *AirportList\_Base.dat* is copied and renamed *AirportList.dat* the first time AI Flight Planner is run after initial installation.

To update this data and add airports included in scenery add-ons, AI Flight Planner provides:

- an airport editor,
- a bulk update facility which adds/updates airports from TTools-format airport files, and
- an airport collection facility that extracts airport data from add-on scenery files.

Any changes to airport data you make are saved to a file named *AirportList\_Updates.dat*. Whenever you collect airport data, these changes are re-applied automatically.

*AirportList.dat* includes data for over 25,000 airports. If you have a state-of-the-art computer system, the size of *AirportList.dat* should not present a problem. However, if you use an older system or have limited RAM, you may experience unacceptable delays when accessing airport data. So, AI Flight Planner allows you to specify a subset of the available airports for inclusion in *AirportList.dat*

When AI Flight Planner encounters (in a TTools airport file or a decompiled traffic file) an airport not included in *AirportList.dat*, the data for that airport is saved to a file named *AirportList\_Temp.dat*. Should the airport subsequently be referenced in a flight plan being compiled, its data from that file will be reused. Only the data for the most recently-encountered version of such airports is saved. Airports are easily transferred from this temporary list into *AirportList.dat* under user control.

Using a “tree-view” style window, you can quickly find the ICAO and IATA codes and other details of any airport in *AirportList.dat*.

The airports used by the currently loaded set of flight plans are shown in AI Flight Planner’s Airport List.

- 3.2 Aircraft – AI Flight Planner maintains an aircraft “database” for each set of flight plans. This aircraft information may be derived from:

- TTools-format aircraft *.txt* files,
- compiled traffic *.bgl* files, and/or
- MSFS aircraft folders.

Data from all sources may be combined and used simultaneously.

The aircraft used by the currently loaded set of flight plans are shown in the Aircraft List.

AI-related parameters of any aircraft existing on the user's system, whether or not displayed in the Aircraft List, may be viewed and updated using the Aircraft Editor. A new Aircraft List based on aircraft existing on the user's system may be generated at any time. Individual aircraft in the Aircraft List may be updated using the Aircraft Editor, or the entire Aircraft List may be edited using Notepad or another text editor and saved to a TTools-format text file.

### 3.3 Flight Plans – Flight plans may be:

- created from scratch,
- loaded from TTools-format flight plan files, or
- retrieved from compiled traffic files,

and are displayed in the Flight Plan List. Additional flight plans, whatever their source, may be appended to/ merged with those already in the Flight Plan List.

Individual flight plans may be edited with either:

- the leg-oriented editor, or
- the built-in plain-text editor.

A Find/Replace function is also provided to allow similar changes to be applied to several flight plans at once. After editing of any kind, flight plans are error-checked for a variety of conditions

## **4. OTHER AI CONSIDERATIONS**

There are several common misconceptions and other issues surrounding MSFS AI that it may be helpful to clarify at this point.

### 4.1 Traffic File Compilers –Four different AI flight plan compilers are in widespread use:

- TTools, a compiler/decompiler for FS9 and earlier versions of MSFS,
- AIFPC, a TTools-compatible compiler/decompiler for FS9 and FSX, and
- Traffic Data Base Builder (TDBB), Microsoft's AI traffic generation utility for FS9 and FSX

and AI Flight Planner.

There is a common misconception that flight plans for FS9 must be in TTools format and those for FSX must be developed using TDBB. And, often, you hear "FS9 flight plans can't be used with FSX". But, the reality is, TTools flight plans are compatible with FSX. And TDBB, to the surprise of many, was available in FS9.

The source data formats and concepts used by TDBB are very different from those used AI Flight Planner and are not discussed further.

### 4.2 Compiled-for-FS9 Traffic Files in FSX – FSX accepts and displays AI from traffic files compiled for FS9. However, if you attempt to mix compiled-for-FS9 traffic files with those compiled for FSX, the compiled-for-FS9 traffic is suppressed. This has nothing to do with the different day-of-week encoding schemes (discussed below). Rather, data formats of the two types of traffic files are

different and, apparently, incompatible in the “AI engine”. Surprisingly, FSX gives priority to the compiled-for-FS9 traffic files.

So, each compiled-for-FS9 traffic file on your system that will be “seen” by FSX should be re-compiled for use with FSX – particularly if you wish to see the FSX default AI traffic.

To help you find those files needing to be recompiled, AI Flight Planner provides a capability to locate FS9 traffic files anywhere on your system.

To help you recognize which files have been compiled for FS9 and which for FSX, AI Flight Planner - if you wish - adds a “\_FS9” or “\_FSX” suffix to the compiled traffic file name.

- 4.3 Day-of-Week Encoding – In FS9, the day-of-week encoding scheme for weekly flight plans uses 0 for Sunday, 1 for Monday and so on to 6 for Saturday. In FSX, Microsoft changed the day-encoding to 0 for Monday and 6 for Sunday.

To avoid confusion, AI Flight Planner uses the FS9 scheme irrespective of the target MSFS version, letting the compiler handle any required conversions. In any case, except in the Flight Plan List, day-encoding is transparent; AI Flight Planner’s editor provides checkboxes for entry of day-of-week by name.

Should the day-encoding of a TTools flight plan file have previously been adjusted for FSX, the only consequence should that file be compiled for FS9 is that the AI will operate a day early. To avoid having to correct each flight plan in a file individually, AI Flight Planner provides the *Flight Plans / Adjust Day Encoding* menu item, which advances or retards the day-encoding of all flight plans in the currently-loaded flight plan file by one day.

- 4.4 Some Insight into How the “AI Engine” Works – While the MSFS “AI engine” can handle thousands of flight plans by way of compiled traffic files, only those AI aircraft in the proximity of the user aircraft are actually being processed at any point in time.

For AI purposes, the earth is divided into 256 bands north-south and 384 bands east-west, for a total of nearly 100,000 sectors about 30 nm high and an average (depending on latitude) of about 40 nm wide. Other than for flight plan legs that originate and terminate in the same or adjacent sectors, the compiler determines the entry and exit times of the AI aircraft for every sector lying along the great-circle route between the departure and destination airports and records those times in the sector transition table in the traffic file. The AI engine makes active only those AI aircraft that are scheduled to be in the sector holding the user aircraft and the eight sectors surrounding it at the simulated time. For legs which involve only a single or adjacent sector, the AI is always active.

It is important to note that, with the exception noted below, the aircraft and airport data in the traffic file is used only to determine the time at which each AI aircraft arrives at its entry point into each sector along its route. (Aircraft and airport data is saved in the traffic file primarily to allow de-compilers to reconstruct the flight plans.) The performance of an active AI aircraft is always controlled by the data

in the relevant MSFS aircraft file. The location and other characteristics of airports are always determined from the information in the relevant stock airport or add-on scenery files. It should follow, then, that irrespective of any arrival time specified in the flight plan, the actual arrival time of an AI at a given airport is governed by aircraft performance, weather and other traffic (including the “user” aircraft).

- 4.5 The @ Symbol (User-Specified Arrival Times) – While AI Flight Planner does not use the “@” symbol with arrival times, an understanding of why its use in TTools was problematic is helpful when considering AI Flight Planner’s two compile modes (discussed later).

TTools allowed estimated times of arrival to be specified by prefixing such times with a “@” symbol. Alternately, the arrival time could be left blank, in which case it would be computed by the compiler based on the distance to be travelled and the specified cruise speed of the aircraft used.

TDBB has no equivalent feature; with TDBB, arrival times are always based on distance and aircraft cruise speed. So, not surprisingly, the “@” symbol was not “understood” by the AI engine. Thus, its use in TTools-format flight plan files involved some “trickery”. When arrival time was preceded by the “@” symbol, the TTools compiler subtracted 15 minutes - a nominal amount to allow for approach, landing and taxiing - from the specified arrival time and used that earlier time to recalculate aircraft cruise speed for that leg of the flight plan. Unfortunately (as will be seen in the next section), there is no place to save this revised cruise speed in the traffic file. (Changing the specified cruise speed of the AI aircraft itself would affect all flight plans using that particular aircraft.)

- 4.5 The “37-Minute Problem” when Using @ – The MSFS AI/ATC engine doesn’t “like” tardy AI. If an AI aircraft is delayed on departure due to, for example, runway congestion or a long queue at the hold-short point such that the aircraft has not taken-off within about twenty minutes of the scheduled departure time, it simply disappears from the taxiway. Likewise, if an AI is forced to perform several missed approaches making it very late for landing, it disappears.

There seems to be a similar condition applied to enroute AI. In particular, if an AI is scheduled to be activated more than about twenty minutes later than calculated by the AI/ATC engine using the distance travelled from departure to destination at the cruise speed specified in the traffic file (the exception noted above), that AI will not materialize for landing. Instead, it will spawn in a parking spot at the destination airport some time later in preparation for the next leg.

AI is activated one sector away from the user aircraft at the entry time specified in the sector transition table. Where the entry time is based on the specified cruise speed, AI activation will occur “on-time” (i.e., at the time calculated by the AI/ATC engine) and all is well. But, if the arrival time was specified using “@”, the cruise speed used by the compiler to calculate the sector entry time may have been significantly different from that specified for the AI. When “@” is used to specify a later arrival time (as it usually is), the AI will be activated “late” relative to the time calculated by the AI/ATC engine. If it is more than about 20 minutes late, it is discarded. From extensive testing (by others), it has been

determined that the critical time difference is 22 minutes. Given the 15 minute allowance for approach, landing and taxiing, the 22 minute interval equates to 37 minutes later than a user-specified arrival time. Hence, the name “37-minute problem”.

One might question why this “lateness” check is necessary, given that the activation time is dictated in the sector transition table. First, an enroute AI may be late for other reasons. Secondly, no sector entry/exit times are given in the sector transition table for short-haul (originating and terminating in the same or adjacent sector); they are always active but may, nonetheless, be late. So, the only uniform check that can be applied is distance times cruise speed specified in the traffic file.

The 37-minute problem is most likely to occur when simulating scheduled airline long-haul operations where the user-specified arrival time is often substantially later than the simply-calculated (distance/speed) next-to-final-sector arrival time plus the fifteen minute approach and landing allowance.

Apparently, the AI engine doesn’t “care” about AI activating arriving early. So, to overcome the 37-minute problem, some suppliers of freeware AI flight plan data, such as WoAI, MAIW and, until recently, AIG Alpha-India Group, specify a cruise speed in aircraft text files in the order of 200 kts for all aircraft. This ensures that AI activation time for any AI having a reasonable user-specified arrival will not be “late” - since the cruise speed then specified in the traffic file will be less than the cruise speed calculated by the compiler to accommodate the user-specified arrival time.

AI Flight Planner uses a similar approach. It halves the aircraft cruise speeds before saving them in the traffic file. But, when it decompiles a traffic file that it has previously compiled, it then doubles the saved cruise speeds. Thus, this “evasive action” is invisible to the user – unless he/she happens to notice that a cruise speed originally being an odd number is returned after de-compilation one knot lower. Other than this possible slight changes, there are no known side-effects of this scheme.

Should you decompile an AI Flight Planner-generated traffic file other than with AI Flight Planner, you will find an unusually-named airport as the first entry in the airports.txt file. This airport is a “flag” used by AI Flight Planner to indicate that special measures to address the “37-minute problem” have been taken and that cruise speeds derived from the traffic file should be doubled.

There may be situations where you wish the compiled traffic file to reflect exactly the specified aircraft cruise speeds. In such cases, AI Flight Planner’s “raw” compile mode should be used – but the “37-minute problem” may be experienced if the system-calculated arrival time is overridden.

If you are using any of the many “prepared flight plan” packages available from various download sites, you should confirm that the cruise speeds for the aircraft are realistic (i.e., they have not been reduced to about 200 kts.) If speeds have been adjusted, you should allow AI Flight Planner to restore them to their usual values as described in Section 8.6 of this manual before compiling/re-compiling.

## **5. A GUIDED TOUR OF AI THE FLIGHT PLAN EDITING WINDOW**

AI Flight Planner may be directed to open at startup either the Flight Plan and Repaint Installation panel (sometimes referred to as the "Main Panel") using the *Options / Show Main Panel at Startup* menu item on the Flight Plan Editing dialog, or the familiar Flight Plan Editing dialog (*Options / Open FP Editor at Startup* from the Main Panel). As well you may switch between these two dialogs using the *Flight Plans / Edit Flight Plan List* menu item on the Main Panel and *Options / Show Main Panel* from the FP Editor. Finally, AI Flight Planner will always close when the Main Panel is closed. You may direct that AI Flight Planner close also when the Flight Plan Editing dialog is closed using the *Options / Close AIFP from Editor* menu item from either dialog

AI Flight Planner's flight plan editing window is partitioned as follows.

- The main menu bar is in its traditional position across the top of the window. Used to initiate functions not directly associated with the editing of flight plans, it comprises six sections: Files, Flight Plans, Aircraft, Airports, Options and Help; in this manual, references to menu selections are in the form "menu name / item name".
- The left-hand side of the main window holds the Flight Plan List - a list box displaying all loaded flight plans. Each item in the Flight Plan List is identified with a line number. Only a small portion of each flight plan is normally visible. AIFP2 introduces tooltips, allowing the entire flight plan to be seen by simply hovering the mouse cursor over the flight plan of interest. Any who find this annoying may disable tooltips from the Options menu.
- To the right of the Flight Plan List, towards the bottom of the window, is the Airport List, a list of all the airports referenced by the flight plans in the Flight Plan List and in the editor. Immediately below the Airport List is a checkbox entitled "Display IATA Airport Codes".
- The top-center portion of the window is occupied by the Time Zone Selector. Flight plan times may be displayed and edited in either local time or a selected time zone, subject to certain limitations.
- The upper right-hand corner is devoted to the Aircraft List, which includes all the aircraft used in the flight plans and permits selection of the aircraft to be used in the flight plan currently being edited. The Aircraft List has an associated field for the entry of the aircraft's tail (registration) number.
- The remainder of the screen is consumed by the Flight Plan Editor. Across the top of that area is the Flight Plan Base Data, which displays and allows editing of the flight plan data common to all the legs of a flight plan. Below that is the leg editing area and below that again, the Leg List

Located at the top near mid-screen is a pair of checkboxes labelled Target Version(s): FS9 and FSX. These checkboxes are used by AI Flight Planner to determine from which MSFS installed version to retrieve data (when both FS9 and FSX are installed) as well as when to issue certain error messages. If only one is checked, that version will be given priority. If both or neither are checked, FSX is given priority if it is installed.

Whenever a change is made to the Flight Plan List, the Aircraft List or the Leg List, a red ### indicator appears to the right of the list name to remind you to save the list.

As a general rule, only those menu items, buttons and data entry fields valid for use in the current context of AI Flight Planner are enabled. In particular, all the fields of the editor are disabled unless a flight plan is being edited. All the fields of the Flight Plan Base Data must be completed before the fields and buttons applicable to the Leg List Editor are enabled. All leg fields except Override ETA (which may be left blank) must be completed before the buttons involved in placing the edited leg data (back) into the Leg List are enabled. Buttons pertaining to the insertion of data into or deletion of data from any list are enabled only when an item in the relevant list is selected. And, finally, the buttons for moving a completed flight plan from the editor (back) into the Flight Plan List are enabled only when there has been a change to the leg data.

So, at any time, if a button, menu item or field data-entry field is disabled, it is because that button, menu item or field is not useable in the current context of AI Flight Planner – probably because some required data is missing.

Many buttons and menu items have keyboard shortcuts. If you don't see the shortcuts, it is because Windows is preventing them from being displayed until you press the <Alt> key. You may override this feature of Windows using Control Panel. In Windows XP, the control to do so is found at Display – Appearance – Effects. In other versions of Windows it may be elsewhere.

Finally, many of AI Flight Planner's functions rely on you selecting files, folders or airports from a "treeview" display. The airport tree is organized geographically, i.e., country/region/city. The directory/folder tree is very similar to that displayed by Windows Explorer (not Windows Internet Explorer) with one significant exception. Folders known not to contain files/folders of interest are dimmed and not expandable. Files other than those of interest are also dimmed. For example, if the purpose of the tree is for you to select traffic files, bottom level folders that do not contain traffic files and files other than traffic files are shown dimmed. Similarly, if the tree is for identification of aircraft folders, once you reach an expansion level such that no lower-level folder could be an aircraft folder, no further expansion is permitted. System, hidden and non-accessible files and folders are not displayed in directory/folder trees – irrespective of Windows settings – since they are of no relevance to AI Flight Planner.

## **6.0 FLIGHT PLAN OPERATIONS**

This section describes the main flight plan file-handling operations.

Several of these operations and other lengthy AI Flight Planner tasks display a progress bar which includes an "Abort" button. As the name implies, if the Abort button is used, the operation is immediately terminated. This will result in only partial data being available. Generally, it is not possible to resume an aborted function. After an operation is aborted, you should reload the last-known good data.

AI Flight Planner performs extensive error checks when files are loaded, saved and compiled, and during editing operations. While not every possible error condition is detected, most will be.

In general, any error that prevents a flight plan from being compiled or that, if compiled, would cause difficulty for MSFS, e.g., a missing airport or invalid aircraft number, must

be corrected. While you are permitted to save a file with such errors in text format, it can not be compiled. Numerous other, non-catastrophic errors, e.g., departure time earlier than arrival time, total flight time exceeds repeat period, will also be noted but will not prevent compilation. While the AI traffic generated by MSFS when the traffic file contains such data may not behave as intended, its presence should not create other difficulties. In each instance, however, you will be asked to confirm that the file is to be compiled/saved with errors. At any time, you may suppress the error/warning messages for the latter category of problems using the *Options / Suppress Validation Warnings* menu item. (This menu item is reset when AI Flight Planner is started.) Messages alerting you to potentially catastrophic errors are always output.

When an error message is lengthy, it is output to a separate window so that it may be preserved while you work to correct the errors.

#### 6.1 Loading Flight Plan Data – Flight plan data may be loaded either:

- from TTools-formatted text files (zipped or un-zipped) or compiled traffic files using the *Files / Load File (.txt,.bgl or .zip)* menu item; or
- by reloading the last loaded or saved file – click *Files / Reload Previous File* which discards all changes since the last load or save/compile operation.

Flight plans are loaded into the *Flight Plan List* after the associated aircraft data (if any) has been loaded into the *Aircraft List*. Since AI Flight Planner maintains its own airport database (*AirportList.dat*), companion airport data is not routinely used by AI Flight Planner. However, if a flight plan refers to an airport not in *AirportList.dat* and the data for that airport is contained in companion data, AI Flight Planner saves and uses that data – and will issue an advisory message telling you so.

At the completion of the file loading activity, a summary of any missing airports or aircraft and any other errors is provided. In the case of missing airports, you are asked if you wish to update *AirportList.dat*. If you elect to do so, the Airport Editor opens with all available data shown.

FS9 and FSX flight plans in .txt format are identical save for day-of week encoding. As discussed earlier, in FS9, Sunday is encoded as 0, while FSX uses 0 for Monday. AI Flight Planner always uses the FS9 day-encoding scheme in its displayed data.

When flight plan data is derived from compiled traffic files, AI Flight Planner “knows” which encoding scheme is used. And, when AI Flight Planner saves a flight plan file in text format, it adds a line at the top of the file indicating that the FS9 day-encoding scheme is used. However, there is no way for AI Flight Planner to determine automatically the day-encoding scheme used in text flight plan files not previously saved by it. So, when such flight plan files are loaded, AI Flight Planner will issue a message advising you of the problem.

The *Flight Plans / Adjust Day Encoding* menu item provides a mechanism to adjust the day-encoding in the flight plan after opening a TTools-format flight plan file that has FSX day encoding.

Please be aware that the times in the flight plan information returned by the *Files / Open Traffic .bgl* function may not match exactly the times originally specified by you in the flight plan file. This is because of the way times are stored in the traffic file. The “consolidated” mode of operation of the Leg List may be affected (even though AI Flight Planner treats arrival times within two minutes of each other as being the same). This problem is less of an issue with FSX which uses a more precise traffic file storage format. As well, the solution to the “37-minute problem” may result in aircraft cruise speed returned by the de-compiler being in error by 1 knot.

- 6.2 Appending/Merging Flight Plan/Traffic Data – Previously-loaded flight plan and aircraft data may be supplemented at any time by appending data from or merging it with other files using the *Files / Merge* function. Appended/merged data need not be from the same type of files as the original data, i.e., compiled traffic file data may be append to/merged with data original loaded from text-format file sets, and vice versa. Any number of files may be merged/appended.

If an aircraft reference number in the data being appended or merged is a duplicate of an aircraft reference number already in use, a new, unique reference number will be assigned to the new aircraft and its flight plan references adjusted accordingly. If the title of an aircraft in the new data duplicates a title already in use, you will be asked if you want to consolidate the references to that second aircraft under the reference number of the first. Your response to this question will apply to all subsequent instances of this situation until a new file is loaded. Upon completion of the append/merge, a list of all such changes is displayed.

Before appending/merging a text-format flight plan file, if its day-encoding scheme cannot be determined, AI Flight Planner asks for confirmation that the day-encoding is for FS9. If it's not for FS9, it will be necessary to load the second file by itself, adjust its day-encoding and save before it can be appended/merged.

- 6.3 Saving/Compiling Flight Plan Data – Flight plan data may be saved either:
- in TTools-format plain text (.txt) format – click *Files / Save File Set* (or *Save File Set As . . .* if you wish to specify a new file name), or
  - as a compiled traffic (.bgl) file – click *Files / Compile Traffic File and Save* or *Files / Compile Again*.

In all cases, the full flight plan file is first checked for errors. If errors are found, you are asked if you wish to save/compile anyway. Please note that if you elect to compile with errors, depending on the nature of the error, the compile operation may not succeed, in which case you must either correct the error or save in plain-text format.

For file saves, if there are any unused aircraft in the Aircraft List, you'll be asked if you want to save them. For compiles, the unused airports are simply ignored.

AI Flight Planner has two compile modes:

- “normal”, where the data is pre-processed to avoid the “37-minute” problem discussed earlier, and

- “raw”, where the data is passed to the compiler exactly as entered.

The “raw” mode is selected by checking the *Options / Compile In “Raw” Mode* menu item prior to compiling the files. Unless you have reason to do otherwise, it is recommended you use the “normal” compile mode. Once selected, the “raw” mode remains in effect until deselected.

Following successful error checking, the compile dialog is opened – unless you selected *Compile Again*. In the compile dialog window you may select the filename under which the data is to be saved (which must start with “Traffic”), the MSFS version for which the file is to be compiled and whether or not a file name suffix identifying the target version is to be added to the file name.

To minimize the possibility of parking intended for large aircraft at congested airports being "commandeered" by smaller aircraft, AI Flight Planner, by default, re-sequences the flight plans in the Flight Plan List based on the required parking spot size in descending order. This happens just prior to the files being compiled. Be aware, however, should you later decompile a traffic file that holds re-sequenced data, the order of the flight plans in the Flight Plan list may not match the order prior to compile. If you want to maintain the order (but increase the chances of small aircraft occupying large-aircraft parking), you should uncheck the Sequence Flight Plans for Best AI Performance checkbox.

If you change the target MSFS version and the then-specified traffic file path "points" to a folder in the previous target version, AI Flight Planner will attempt to construct a parallel path to the newly selected target version. However, if the parallel path does not exist or cannot be constructed for some other reason, the default path (the *\Addon Scenery\scenery* for the new target version) will be displayed. You may override the default selection using the Select button.

If you did select *Compile Again*, the data is submitted directly to the compiler using the same parameters as for the previous compile without any opportunity to make changes.

If you have checked the *Options / Identify Non-Stock Airports on Compile* menu item prior to compiling, AI Flight Planner will warn you if any non-stock airports are referenced by the flight plans.

- 6.4 Validating Flight Plans and Traffic Files – The integrity of every flight plan is automatically checked when a flight plan is loaded into AI Flight Planner and prior to the flight plan being saved or compiled. It is also verified whenever an edited flight plan is returned to the Flight Plan List. But, for convenience, AI Flight Planner permits flight plans containing errors to be saved. Consequently, you may wish to validate the flight plans in the Flight Plan List at other times. To do so, simply click *Flight Plans – Validate*

You may also validate one or more traffic files without loading them into AI Flight Planner by clicking the *Files / Validate Traffic Files* menu item. This opens a directory-tree from which you may select any combination of folders and files for validation. If you check the Eliminate unused airports and aircraft checkbox at the bottom of the dialog where you select the traffic files/folders, the traffic file will be re-compiled to its minimum size – which may also speed-up MSFS startup.

In both cases, a summary of all warnings and errors found is generated. You may suppress warnings from the Options menu.

- 6.5 Finding FS9 Traffic Files on a FSX System – When FSX “sees” both compiled-for-FS9 traffic files and compiled-for-FSX traffic files, the FS9 traffic will be displayed normally; however, the FSX traffic is suppressed. This situation will exist until the very last FS9 traffic file has been located and either disabled or converted for FSX operation (see next section).

To locate FS9 traffic files, click on the *Files / Find FS9 Traffic Files* menu item. As in the previous section, this opens a directory-tree from which you may select any combination of folders and files to be searched.

Select the folders of interest and click the Find Files button. You can select entire logical disks, but the search time may be very long.

- 6.6 Converting FS9 Flight Plans for Use with FSX – Conversion of FS9 flight plan and traffic files for use with FSX addresses two main attributes:

- Airports – The ICAO code designator of many FS9 airports changed between FS9 and FSX. AI Flight Planner updates the designators for those airports to their FSX equivalents. If an airport does not exist in FSX and there is no equivalent, an error message is issued.
- Day-Encoding in traffic files – updated to the FSX scheme.

AI Flight Planner uses FS9 day-encoding internally. If text-based flight plan data with FSX day-encoding is loaded, the first thing AI Flight Planner does is convert it to FS9 format. If the day-encoding scheme is not specified in the text file, you are asked whether or not it is for FS9.

The compiler automatically applies FSX day-encoding to traffic files when FSX is designated as the target MSFS version. But, the text files remain in FS9 format and retain FS9 airport ICAO designators for airports that have a different designator in FSX. If you wish to save text-based flight plan data using FSX replacement ICAO designators, you may update the airport ICAOs prior to saving using the *Flight Plans / Convert Airports for FSX*.

The FS9 traffic file conversion function, which is sometimes referred to as “bulk-conversion”, allows you to select any combination of folders and files for conversion using a “tree-view” directory-tree. It is initiated from the *Files / Convert FS9 Traffic Files to FSX* menu item. Selected folders may contain a mix of FSX and FS9 traffic files; only the FS9 files are affected. The names of the converted files are optionally suffixed with “\_FSX” and backed-up if they exist already.

Converted traffic files may be saved to either FSX’s *Scenery\World\Scenery* folder or to any other scenery folder you specify - which must be enabled in the Scenery Library for the traffic to be active. Using the latter method allows the traffic to be turned on and off from the Scenery Library

Following conversion, any missing airports or other problems encountered are noted in a conversion report.

As mentioned in section 4.5, some suppliers of prepared flight plan information, e.g., WoAI, MAIW and, until recently, AIG, in an attempt to avoid the “37 minute” problem, reduce the cruise speed of the aircraft as specified in the flight plan/traffic files to something in the order of 200 kts. Unfortunately, there is no indication in those files that this has been done. (AI Flight Planner does something similar during the compilation of traffic files but records this fact in the traffic file so that it can restore the cruise speeds upon de-compilation.) Thus, when such files are converted by AI Flight Planner, the cruise speed of the aircraft involved is further reduced to an unrealistically-low value.

While it is not known for certain that this situation creates difficulty for the AI engine, there is some evidence that it does. So, should no aircraft cruise speed exceed 250 kts, this situation will be highlighted in the conversion report. If the relevant traffic file involves jet aircraft, it is recommended that you load the converted traffic file back into AI Flight Planner, restore the cruise speeds to their normal values (*Aircraft/Restore Cruise Speed* menu item) and re-compile. Alternately, if you know that all the aircraft in the files being converted have had their cruise speeds reduced, you may direct the system to compile in the “raw” mode – which will avoid the further reduction in cruise speed (but will not restore the cruise speeds to their normal values).

Please note, however, that converting compiled-for-FS9 AI for use with FSX involves more than simply converting the traffic file. In addition:

- the required aircraft must be installed in the *FSX\SimObjects\Airplanes* (or other designated aircraft folder) folder, and
- if propeller aircraft are involved, you may wish to update the propeller textures.

A detailed procedure for converting MAIW FS9 packages for use with FSX can be found at [The Owls Nest](http://www.interkultur.de/gossmann/fsx/maiw.php) (<http://www.interkultur.de/gossmann/fsx/maiw.php>).

- 6.7 Creating Flight Plan Subsets – AI Flight Planner allows the creation of subsets of the flight plans currently in the Flight Plan List based on a selected set of airports or aircraft. Airports may be selected individually or by country in a tree-view structure. Aircraft may be selected individually or by type.

Subsets may be either inclusive or exclusive. An inclusive subset includes each flight plan that references any selected airport or aircraft, as applicable. For aircraft, an exclusive subset includes every flight plan that does not reference any of the selected aircraft, i.e. flight plans referencing any of the selected aircraft are excluded. For flight plans, exclusion is performed on a per-leg basis. That is, individual legs that designate any selected airport as the destination are deleted but the balance of the flight plan remains intact – provided there are at least two legs remaining.

Among other things, sub-setting allows:

- generation of regional flight plans from a flight plan file having broader coverage (airports, inclusive option);
- exclusion of designated airports from the default traffic files (airports, exclusive option); and
- partitioning of the default traffic file into aircraft categories, e.g., airline and GA (aircraft, either option)

To create a flight plan subset:

- click on the *Flight Plans / Subset* menu item; (the sub-setting dialog will be presented)
- click on the Aircraft or Airports radio button; (the contents of the Aircraft List or Airport List, as applicable, will be displayed in the dialog box); you may display the list data in either of two formats;
- select the airports or aircraft of interest;
- click on the Inclusive or Exclusive radio button; and then
- click on the Continue button.

AI Flight Planner will seek confirmation that you wish to generate the specified subset, whether or not you wish aircraft not used in the subset purged from the Aircraft List and whether comments in the Flight Plan list are to be preserved. The resulting flight plan subset will be placed in the Flight Plan List subset and unused airports will be purged from the Airport List. The *Files / Save File Set* menu item will be disabled to prevent an accidental overwrite of the original file with the original file. If you intend to overwrite the original file, use *Save File Set As ...*

To avoid you having to re-select a set of airports or aircraft, you may save the currently selected set of either in a file of your choice by clicking on the Save Selections button. However, if you plan to save your selections, do so before creating the subset since the Subset dialog box closes upon successful subset generation. If you wish to use a previously-created selection file, click on the Use Saved Selection List button and designate the file of interest. The contents of that file will replace the contents of list then in the dialog list box.

With current availability of AI flight plans for most airlines, it is convenient to be able to exclude default airline AI traffic while preserving default GA traffic at airports of interest. For example, suppose you have system-wide AI flight plans for Air Canada but your primary interest is AI only at several Western Canadian airports. As well, you probably don't want Airwave (default) Dash 8s showing up at those airports, but you do want the default GA traffic. AI Flight Planner allows you to do all those things, as follows:

- load the Air Canada system-wide flight plans and aircraft set; make an inclusive subset for the airports of interest; save/compile the sub-setted flight plans to a new file (the new file will still include some other Air Canada AI traffic, but any flight plans not naming any of the selected airports as destinations will have been deleted); this subset is not strictly necessary but, for performance reasons, you'll probably want to exclude Air Canada traffic at airports not of interest;

- load the default traffic file; (it's located in the *Scenery/World/Scenery* folder; for FS9, it's named *traffic030528.bgl* and for FSX, *trafficAircraft.bgl*); make an inclusive subset based on aircraft by selecting GA aircraft (individually or by category), compile and save it back into the *Scenery/World/Scenery* folder under a new name, say *trafficDefault\_GA.bgl*; before creating the subset, save the selected aircraft list;
- reload the default traffic file and the saved aircraft list and, this time, make an exclusive subset; compile and save it back into the *Scenery/World/Scenery* folder under a new name, say *trafficDefault\_Airline.bgl*;
- further subset the Flight Plan List, exclusively, based on the Western Canadian airports; compile and save it back into the *Scenery/World/Scenery* folder under a new name, say *trafficDefault\_Airline\_exWesternCanada.bgl*;
- disable the original default traffic file and *trafficDefault\_Airline.bgl*.

Now, you'll still get default GA AI traffic at all airports, no default airline traffic at the airports of interest and you won't be overloading the system with a bunch of unwanted Air Canada flights.

- 6.8 Displaying Arrival/Departure Information – A detailed listing of arrivals and departures at any airport contained in the Flight Plan List may be obtained by clicking on *Flight Plans / Time Table*. This opens the Arrivals/Departures dialog which lists all the airports referenced by the flight plans – essentially a duplicate of the Airport List. Click on any airport in the list and all the arrivals and departures at that airport are displayed in time sequence.

A hard-copy of the arrivals and departures information can be obtained by clicking on the “dump to Notepad” button and using Notepad's Print function.

Should you wish to modify any arrival or departure, double-click on it. The Arrivals/Departures dialog closes and the corresponding flight plan is moved to the editor.

- 6.9 Adjusting Flight Plans for Summer/Standard Time – Flight plan arrival and departure times are always saved using the UTC equivalents – even if originally specified or edited using local times. Consequently, at airports where daylight savings time is observed, the AI at those airports operates one hour early or late in some seasons.

Rather than requiring re-specification of arrival and departure times to allow for correct operation during the summer season, AI Flight Planner's menu item *Flight Plans / Advance to Summer Time* advances all those times by one hour except in the case of airports where it is known that daylight savings time is not observed. This simple operation followed by a re-compile of the file results in proper summertime operations.

But, of course, such flight plans will then operate one hour late during the winter. *Flight Plans / Retard to Standard Time* to the rescue! It reverses the effect of the *Advance to Summer Time* feature.

- 6.10 Adjusting Activity Levels – The activity level setting in a flight plan determines the traffic level setting in the simulator at or above which the flight plan will operate. The editor allows this level to be set for an individual flight plan. However, large flight plan/traffic files, for example, those covering the complete schedule of a major airline, may overload your system or result in the parking available at certain airports, especially principle hubs, to be exhausted if all flight plans have the same activity level. Sub-setting of the file will, of course, provide a solution. But, sub-setting (which will eliminate legs or entire flight plans) may not be necessary. The *Flight Plans / Adjust Activity Levels* feature allows the activity level of all flight plans to be adjusted at once to achieve a desired traffic distribution.

AI Flight Planner provides three types of traffic-based activity level adjustment. You specify the levels:

- at or below which no traffic, and
- at or above which all traffic

from the file is to operate and select whether, between these two levels, a proportional amount of traffic is to be generated:

- for each airport,
- for each airport but with the most frequently used airports being de-emphasized so traffic is more evenly distributed across the other airports, or
- for each aircraft.

AI Flight Planner will then calculate and apply an appropriate activity level setting for each flight plan in the Flight Plan List, thus allowing you to address the overload situation to a certain extent using the traffic level setting in the simulator.

This feature will be most useful with large, complex flight plan/traffic files. When used with small files or those where the majority of the flight plans are for simple return flights between two airports, you'll likely find the majority of the adjusted activity levels "clumped" near either the low or high end.

- 6.11 Adjust ETAs to Reflect Cruise Speeds - Should you make a change that affects the cruise speed of the aircraft, (e.g., restoring all cruise speeds or adjusting aircraft data), you'll likely want to adjust the ETAs of flight plans that make use of that/those aircraft.

When the cruise speed of the aircraft in the Aircraft List is changed, if the flight plan then in the editor uses that aircraft, ETA field of the leg editor will be updated to reflect the new cruise speed. However, no flight plan data is updated. You may, of course, edit each affected flight plan leg individually to update their ETAs. But, the *Flight Plans / Adjust ETAs to Reflect A/C Cruise Speeds* function allows you to select one or more (or all) flight plans in the Flight Plan List and will update all their ETAs to reflect the cruise speeds then specified in the Aircraft List for the relevant aircraft.

Prior to any changes being made, you will be asked to confirm your intent. You may also specify that any existing ETAs that are later than the newly-calculated value be preserved. This may be helpful, for example, if you are simulating an actual airline schedule.

- 6.12 Adjust Departure Times for Standard "Sit-Time" - Many flight plan packages available from popular download sites schedule departures very close to the previous arrival. *The Flight Plans / Adjust Departure Times for Standard Sit-Time* feature will adjust the departure times of the flight plans selected in the Flight Plan List to follow the previous arrival by not less than the standard sit-time you specify (using the bottom function of Flight Plans menu). If the currently scheduled departure time for a leg is later that it would be based on the standard sit-time, neither the departure time or ETA is affected.

As in the previous function, prior to any changes being made, you will be asked to confirm your intent. You may also specify that any existing ETAs that are later than the newly-calculated value be preserved.

Please recognize that every such adjustment potentially extends the time required for the operation of the flight plan. Consequently, some flight plans may not lend themselves to successful adjusted with this feature.

After all selected flight plans have been processed, a message will be issued that either confirms successful adjustment or identifies the flight plans that were not adjusted and leaves them highlighted.

In the latter situation, there are several options available to you:

- if you elected initially to preserve over-ridden ETAs, try again and let the system calculate all ETAs;
- reduce the standard sit time;
- examine the flight plan(s) looking for excessively-long sit-times that, if shortened, may allow departure time adjustment using standard parameters to be successful.

Then re-run the departure time adjustment function for those flight plans.

It would, of course, have been possible to have AI Flight Planner apply these `fixes` - with or without user direction. But, it was felt that such user-interaction may lead to confusion and that, since such problems are unique, they require unique solutions.

## **7.0 EDITING FLIGHT PLANS**

AI Flight Planner offers three alternatives for editing flight plan data:

- the leg editor, which allows editing on a per-leg basis (double-click on the flight plan in the Flight Plan List)
- the built-in text editor, which allows plain-text editing of a flight plan in TTools-like text format, and
- the Find/Replace function (edits are made to the flight plans *in situ*)

Use of each is described below. But first, some generally-applicable information.

- 7.1 Arrival and Departure Times – Arrival and departure times in all three editors may be specified in either UTC, a time zone selected in the Time Zone combo box or,

provided *AirportList.dat* contains full geographic information for all the airports used in a flight plan, local time - which may be either standard or daylight savings time. However, flight plans are not date-specific, so arrivals and departures specified in local time may be in error by an hour in the transition periods to and from daylight savings time (where applicable).

When using local time, you should appreciate that AI Flight Planner's time zone database reflects real-world time zones – which may not match exactly the time zone calculated by MSFS. MSFS uses a geographic approximation technique to determine the time zone in the area where the user aircraft is located. Hence, there may be disagreement at airports close to the edge of time zones. Since MSFS' calculation of time zones can be affected by add-ons, such discrepancies cannot always be resolved by AI Flight Planner. As well, while significant efforts were expended in making AI Flight Planner's time zone data base complete and accurate, time zone data for smaller airports, especially in developing countries, sometimes is not readily available and, hence, AI Flight Planner's data base may be in error (but, is correctable using the Time Zone Editor – see Section 9.8).

**Please note that both FS9 and, at time of writing, also FSX use an incorrect UTC offset for Hong Kong and much (if not all) of China. This situation may extend to other countries in Asia. So, if you prepare flight plans involving airports in this part of the world and do not use an add-on that corrects this problem (such as FS Real Time), you should revise the UTC offset for those airports as set out in Section 9.9.**

Unlike TTools, AI Flight Planner does not use “@” and “TNG” as prefixes for arrival times. The function performed by the “@” symbol is automatic with AI Flight Planner. (Any arrival time that differs by more than two minutes from the system-calculated arrival time is assumed to have been specified by you. This tolerance is necessary to accommodate “jitter” introduced by de-compilation.) Touch 'n go operation is specified using a checkbox.

Also unlike TTools, all arrival times (not just user-specified ones) reflect nominal arrival at parking. While the actual arrival times will depend on weather, traffic, aircraft performance, etc, the AI Flight Planner compiler makes a 15-minute allowance for approach, landing and taxiing in all cases.

AI Flight Planner determines whether the specified arrival time is for the day (repeat period) of departure or the following day (repeat period) and applies an appropriate suffix where necessary. (Any arrival time in 24 hour format that is earlier than departure time is assumed to refer to the following day (repeat period). The suffix indicating a following day/after midnight arrival is “+1” – a notation used in many airline schedules. Where the flight crosses the International Date Line, the suffix may also be “-1” (eastbound flights leaving Asia just after midnight) or “+2” (westbound flight leaving North America just before midnight). You need not enter these suffixes; AI Flight Planner applies them automatically where appropriate. But, if you do, your entry is used.

When a sub-daily repeat period is selected, the hour value of the arrival and departure time entries must be less than the repeat period. For example, for a repeat period of 4 hours, the maximum acceptable arrival or departure time is

03:59. When the repeat period is changed to a smaller value such that previously-entered arrival and departure times in the editor are invalid, the arrival time and predicted ETA suffixes may become what appears to be nonsensical. Such a situation may not be detected and no error message issued until an attempt is made to save the flight plan.

In weekly consolidate mode, the departure times displayed in the *Leg List* are in “day-time” configuration, i.e., d/HH:MM. This is to maintain proper sequencing of the entries. Departure time entries in the editor are always in HH:MM; AI Flight Planner derives its day-of-week information from the day-of-week checkboxes in the *Base Data* area.

7.2 Airport Designators – There are (at least) two airport designation systems in current use:

- ICAO codes, which apply to every significant airport worldwide, and
- IATA codes, which generally apply only to airports that handle airline traffic.

While MSFS “understands” only ICAO codes, AI Flight Planner allows the use of either. This facilitates the creation/editing of airline AI flight plans.

AI Flight Planner’s main panel contains a checkbox labelled Display IATA Airport Codes. When unchecked, ICAO airport designators are displayed. When checked, airports that have IATA codes use their IATA designator; those that don’t have IATA designators show their ICAO designator prefixed by “\*”.

Lack of IATA codes for smaller airports can be problematic. IATA codes are all three characters long. But, the ICAO code system uses both three- and four-character designators. Fortunately, the ICAO three-digit codes are usually assigned to small airports. So while there is some overlap between the two systems, the practical consequences in AI Flight Planner are relatively minor since most ICAO codes are of the four-character type.

AI Flight Planner allows entry of airport designators using either system. Airport codes entered as four characters are unambiguous and assumed to be ICAO codes. Three-character codes entered when the Display IATA Airport Codes is checked are assumed to be IATA codes. However, if no IATA-match is found but there is an ICAO-match, the ICAO airport will be “returned” (and displayed with a prefixed \*). If the three-character ICAO code is entered with the \* prefix, there will no “indecision”. When Display IATA Airport Codes is unchecked, three-character codes are assumed to be ICAO. But, if no ICAO-match but there is an IATA-match, it will be accepted. With this scheme, Display IATA Airport Codes must be checked in order to obtain an IATA-match on a three-character code used in both systems.

When you enter or edit an airport designator (either IATA or ICAO code), the newly-entered code is validated as soon as you move the cursor to another field. If the code is valid, the airport is entered into the Airport List if it is not already there and the name of the city shown. If invalid, an error message is issued and you are given an opportunity to enter the airport into the system.

If unsure of the ICAO/IATA code for the intended airport, you may enter a “?” optionally preceded by a character string into either the originating or destination airport field. If:

- no character string is entered, i.e., just “?”, the Get Airport Information “airport tree” dialog opened; locate the airport of interest, select (click on) it and close the dialog box;
- the character string contains “>”, a list of ICAO and IATA codes where the city name or airport name contains the entered string pops up; or
- otherwise, a list of ICAO and IATA codes which start with the entered string pops-up.

In the latter two cases, double-click on the airport of interest in the pop-up list. This closes the list and places the selected ICAO or IATA code in the relevant airport field in the editor.

- 7.3 Flight Plan Editor – A flight plan in the Flight Plan File is moved into the Flight Plan Editor by double clicking on it (the flight plan). The Aircraft List combo box highlights the aircraft used by the flight plan (if it is in the Aircraft List), the other base data of the flight plan is displayed in the base data area across the top of the main window, the flight plan legs are inserted into the Leg List and, lastly, the top item in the Leg List is selected, parsed and displayed in the editor. In addition, if the selected aircraft is available on the user’s system and the flight plan does not contain a tail/registration number, the default number for that aircraft will be displayed in the Reg. textbox.

Except when the consolidation option for weekly flight plans is selected (see below), flight plan legs are listed in chronological order, commencing with the leg having the earliest departure based the selected time zone. For easy reference, each leg is numbered, that number appearing at the left-most end of the leg data line.

While flight plans in TTools-format text files also have their legs ordered chronologically, there is no requirement that the first leg be the one with the earliest departure. Indeed, often it is not. This creates a potential problem with error reporting. Flight plan error messages report the sequence number of the faulty leg. But, the sequence number of a leg in the text file may not be the same as that assigned when the flight plan is displayed in the editor. Consequently, a file-leg reference number is shown at the right-hand side of the leg data display when it is applicable. Error reports relating to file data will reference this latter number

Flight plan data editing is straightforward. Nonetheless, a brief summary of each required field follows. For a fuller description, you may wish to download Lee Swordy’s TTools and refer to its user documentation.

A flight plan contains two types of data:

- base data, which governs the overall operation of the flight plan, including:
  - a reference to the aircraft used to perform the flight plan (i.e., the aircraft selected in the Aircraft List),
  - a tail/registration number of up to 7 characters (only required if one or more legs specify ATC Callsign as the registration number (“Reg.”)),

- activity level (1-100%), which determines the MSFS Settings/Display/Traffic activity level slider setting above which the flight plan will operate,
  - a repeat period (being one of 1hr, 2hr, 4hr, 6hr, 8hr, 12hr, 24hr or weekly), and
  - a flight rules selection (either IFR or VFR) which determines how ATC will handle the flight and, in some instances, how the aircraft will be routed for approach; and
- leg data, including:
    - day(s) of the week on which the flight operates (weekly flight plans only)
    - a touch 'n go (TNG) selection which, if checked, causes the aircraft to perform TNGs from the time it initially arrives in the vicinity of the destination airport until its scheduled arrival time
    - a flight number (0-65535)(only required if the ATC Callsign selection for the leg is FN),
    - departure time (in 24 hr format),
    - departure airport (ICAO or IATA code, as discussed above)(only required for the first leg of a new flight plan; automatically updated thereafter),
    - destination airport (ICAO or IATA code, as discussed above),
    - flight level (100s of feet),
    - ATC Callsign selection, and
    - optionally, Override ETA (in 24 hr format), which allows you to override the system-calculated arrival time.

Flight plan legs are displayed in the Leg List time sequenced. For weekly flight plans, a leg which is flown on two or more days may be shown in either of two ways:

- “individual”, i.e., each leg in the flight plan shown individually, or
- “consolidated”, i.e., legs that operate on more than one day of the week but are otherwise identical consolidated into a single list item.

In “individual” mode, the legs are entered/displayed in operational sequence. The destination airport of one leg becomes the departure airport for the next, with the destination airport of the last leg being the departure airport for the first. In “consolidated” mode, the position in the Leg List at which a new leg is entered determines the departure airport for that leg – but only for the purpose of calculating distance, duration and ETA. When the data for a new leg is entered into the Leg List or when edited data is saved, AI Flight Planner automatically positions the edited leg based on departure time and day of week. The Consolidate Weekly FPs checkbox located in the bottom right-hand corner of the main window controls this mode.

An individual leg is moved into the leg editor by double-clicking on it in the Leg List. At that time, AI Flight Planner identifies the departure airport and calculates the distance between it and the destination airport, as well as the expected duration of the flight (based on the cruising speed of the selected aircraft) and anticipated arrival time. Of course, if AI Flight Planner picks the wrong departure

airport in a complex weekly flight plan (see next section), these calculations are of little use. Should that be the case, you should enter the proper departure airport for the leg in the editor. (If this problem occurs at all, it likely will occur every time a leg is moved into the editor until sufficient data has been entered for AI flight Planner to correctly determine the originating airport. Please be tolerant.)

In general, error checking of leg data, where applicable, is performed when you move the cursor away from an edited text box. Error checking of the leg as a whole is performed when the edited data is saved back to the Leg List. If a flight plan is intended to for only one version of MSFS, you can avoid AI Flight Planner generating extraneous error messages by designating the target version using the Target Version checkboxes.

When editing weekly flight plans in the normal (un-consolidated), you will load into the editor the leg for one day only. However, you may direct the editor to apply the change to the same leg that operates on other days of the week by clicking the appropriate day-of-week checkboxes. As you do, the relevant leg(s) in the Leg List will automatically be selected. At the completion of the edit, all selected items will be deleted and new, revised items for the checked days created.

When all intended edits have been applied to the leg, use the Save Edits button to update the item to which the edits apply in the Leg List.

New legs may be inserted into or added to the Leg List as necessary. To insert a new leg, select the leg in the Leg List above which the new leg is to be inserted and click on the Insert Leg button. A blank leg is inserted into the Leg List at that point as a "place-holder". To add a new leg at the bottom of the Leg List, click on the Add Leg button.

Please note, however, the sole reason for selecting a location in the Leg List for the new leg is to identify the departure airport for the purpose of computing the leg distance/duration/ETA (i.e., the destination airport of the leg immediately previous to where you placed the new leg.) When you later save the leg, it will be placed in the Leg List based on its departure time, irrespective of where you initially put it.

When a new leg is added to/inserted in a weekly flight plan, there is no day of the week information available. So initially, AI Flight Planner assumes that the leg originates at the destination of the leg immediately above it in the Leg List. However, once the days of operation are specified, AI Flight Planner attempts to refine its earlier choice by selecting a departure airport from an earlier leg that operates on the same day(s).

When all edits have been made to a flight plan, the edited flight plan may update the original copy of the flight plan in the Flight Plan List or be added to the bottom of, or inserted immediately above the selected flight plan in, the list using the Update FP in List, Insert FP in List or Add FP to List button, as applicable.

When starting a new flight plan, you must enter a departure airport for the first leg, AI Flight Planner continues to report that airport as the departure airport for the first leg until the flight plan is saved. When it comes time to save the flight plan, if the destination of the final leg does not match this airport, AI Flight Planner alerts you. You then have the option to either save the flight plan as it exists, with the destination airport of the last leg becoming the departure airport for the first leg, or to further edit the flight plan.

- 7.4. Departure Airport in Consolidated Leg Mode - When a flight plan leg is moved into the editor, AI Flight Planner must determine the departure airport so as to be able to calculate the distance and flight duration/ETA to the destination. For a daily (or more frequent) flight plan, this is a simple task – as noted above, it is the destination of the leg immediately previous in the *Leg List* to the leg of interest. However, when in the consolidated display mode, the previous leg is not necessarily the one shown in the Leg List.

Consider, for example, the simple case of a flight plan that operates between airports A and B from Monday to Friday but makes an intermediate stop at airport C on Wednesday. Such a situation requires three legs to be specified; A to B on M/T/T/F and A to C and then C to B on Wednesday. In the Leg List, the sequence of the legs is A to B, A to C and then C to B. So, there are two intervening legs between the A to B leg and the ongoing leg from B. In such cases, AI Flight Planner looks back up the Leg List to find an earlier flight plan scheduled for the same day of the week.

Depending on the complexity of the flight plan, AI Flight Planner may not correctly identify the departure airport. (Fortunately, this is of little consequence, since the departure airport is only used to calculate the distance and duration and to predict the ETA of the flight – and you can always override the system-calculated ETA.)

- 7.5 New Flight Plans from “Scratch” – To start a new flight plan “from scratch”, click on the Start New FP button. This clears the Leg List if there is any data in it, places a blank entry in the Leg List and also clears the editor fields. Initially, only the fields for the base data are enabled. Once all the base data for the flight plan has been entered and the aircraft selected, the leg editor fields/controls are enabled. This sequence ensures that all required data is available when needed. In the leg editor, all fields must be completed except for Override ETA, which may be left blank. When the required data for the first leg has been entered, save it to the Leg List using the Save Edits button. Create additional legs as necessary using either the Add Leg or Insert Leg buttons. (In all cases, please note that the Save Edits button is not enabled until all fields except arrival time have been entered.)

Before attempting to enter flight plan leg data, it is recommended to confirm that the associated aircraft exist in the Aircraft List. (The leg editor is not enabled until an aircraft has been selected.)

Once all the legs of the new flight plan have been entered, save the flight plan to the Flight Plan List using the Add to FP List or Insert in FP List buttons as

appropriate. These buttons are not enabled unless there are sufficient legs in the Leg List, i.e., two for all but TNG operation.

- 7.6 Built-In Text Editor – TTools formatting supports embedded comments. AI Flight Planner provides a simple text editor to allow insertion of comments into, and editing of comments already in, the *Flight Plan List*.

To open the text editor, double click on a comment line in the Flight Plan List. The text editor supports both single-line and multi-line comments. Each comment line must commence with either “;” or “//”. Each line in a multi-line comment except for the last must be terminated using the keyboard <Enter> key.

This text editor also supports editing of flight plans in a TTools-like format. For simple changes to flight plans, it may be more convenient to use the text editor rather than the leg-oriented editor. To edit a flight plan in the text editor, select the flight plan in the Flight Plan List and either right click over the Flight Plan List and select Open Text Editor in the menu presented or click on *Flight Plans / Selected FP to Text Editor*. The data is formatted with line numbers to make each leg readily identifiable. However, if you enter a new leg or an entirely new flight plan, you need not enter the line number(s)

New/edited flight plans must comply with TTools formatting “rules”. Users not familiar with TTools formatting rules may wish to download TTools (ttools202.zip - available from popular MSFS download sites) and refer to the “Source Files and Formats” section of its user manual (ReadMe.htm). Multiple flight plan legs may be entered on a single line.

The flight plan, including valid edits, may be re-formatted at any time with the Format button. If re-formatting is not successful (due to incomplete or erroneous edits), the Undo Format button will restore the edit window to its prior state.

In addition to replacing the Flight Plan List item selected when the text editor was opened, the contents of the text editor may be added at the end of the Flight Plan List or inserted immediately above the selected item. Full validation of a flight plan edited in the text editor is performed when an attempt is made to place it (back) into the Flight Plan List.

- 7.7 Find/Replace Functions – The *Flight Plans / Find/Replace* function allows flight plans to be selected based on the contents of one of their fields and to have similar changes applied to those flight plans.

Select the field of interest in the Field combobox and the comparator as: less than (<), less than or equal to (<=), equal to (=), greater than or equal to (=>) or greater than (>). Then, enter the value to be found/replaced in the Find text box. You should always select the Field first since, to ensure a proper match, AI Flight Planner may apply a prefix or suffix based after you enter the “find” or “replace” value – allowing you to make abbreviated entries.

To select the top-most flight plan meeting this criteria, click on the “First” button. Subsequent flight plans may be selected using the “Next” button. To select all flight plans meeting the criteria, click on the “All” button. The “find” functions

operate on the entire Flight Plan List, irrespective of the selected set of flight plans when First or All is clicked.

To change the value in the designated field of the selected flight plans, enter the replacement value in the "Replace with" textbox and click on the Replace In Selected FPs button.

The Replace function may also be used independently of the "find" function by selecting the field of interest, entering the replacement value and manually selecting the flight plan(s) where the replacement is to occur prior to clicking on the "Replace In Selected FPs" button.

7.8 Departure Time Functions - Two menu items affect how departure times are established/managed, namely:

- Flight Plans / Minimum Time Arr->Dep (min.) - sets the minimum time in minutes between arrivals and departures for warning purposes; and
- Flight Plans / ETD Preset Interval (min.) - sets the interval following the ETA of the previous leg used to preset the ETD of a new leg.

Both items are of the checked type. When unchecked, the function is disabled. In the case of the first item, no warnings about departure times close to or earlier than the previous arrival will be issued.

7.9 Global Changes to Leg Data - To make identical changes to two or more legs simultaneously, select the legs of interest. Upon selection of the second leg, the leg data text boxes will be cleared.

Enter the new data in the appropriate fields and click the Update Selected button. The newly entered data will appear in the corresponding fields of each selected leg. Only the fields corresponding to those into which data is entered will be affected. Two or more fields may be edited simultaneously. Bear in mind, however, it is up to you to ensure (or to make further changes as may be necessary to ensure) the validity of the flight plan as a whole.

If, for example, you wish to change the day(s) of the week on which certain legs operate, select the legs in the leg list, check all the days on which you want those legs to operate (not just the additional ones) and then click Update Selected. the legs corresponding to the days on which the legs no longer operate, if any, will disappear from the Leg List and legs for any new days will be added.

## 8.0 MANAGING AIRCRAFT DATA

When a flight plan file-set or a compiled traffic file is loaded into AI Flight Planner, the "companion" aircraft data (if it exists) is also loaded. You may modify, replace or supplement this data with data from other sources.

Please note, whenever you make a modification that affects the cruise speed of the currently-selected aircraft, the ETA data in the leg editor is updated. However, other flight plans/legs that use the selected aircraft are not affected. If you wish to have other

flight plans/legs reflect the new cruise speed, you must either edit them in the normal way or use *Flight Plans / Adjust ETAs to Reflect A/C Cruise Speeds*.

8.1 Loading and Saving Aircraft Data – Loading and saving of aircraft files individually is handled in an identical manner to flight plans. The corresponding items in the Aircraft main menu are:

- Load New Aircraft List (.txt, .bgl or.zip)
- Merge with Aircraft List "
- Save Aircraft List
- Save Aircraft List As ...

Of course, when you Save/Save As a flight plan file, the associated aircraft data is saved as well to its own file.

8.2 Creating a New Aircraft List from Aircraft Folders – The contents of the Aircraft List may be replaced at any time with a list of aircraft based on the aircraft installed on your system. To initiate this action, click on *Aircraft / Clear Aircraft List* (if there are any items in the list to be cleared) and then on *Aircraft / Bulk-Add Aircraft to List*. The Collect Aircraft dialog will be displayed. The list may be based on one of:

- the aircraft available to FS9 (if FS9 is installed),
- the aircraft available to FSX (if FSX is installed), or
- the aircraft contained in a set of aircraft folders you select.

If you choose the latter, you will be presented with a directory tree so you can select the aircraft folders of interest.

Once that choice is made, the Scan button will be enabled. Clicking it causes the applicable set of folders to be scanned for AI aircraft. All the AI aircraft found will be displayed in the large list box. The list is in alphabetical order by title. You then have the opportunity to “massage” that list by deleting items from it and moving items up or down.

You may save the entire list or only the selected items. Click on the applicable “save” button to replace the items in the Aircraft List. Reference numbers will be assigned sequentially, beginning with the number you may have entered in the First Ref. No. field (or 1 if you didn’t enter a starting number).

Since no aircraft data is overwritten until you click one of the “save” buttons, you may also use this feature to explore the aircraft available on your system.

8.3 Aircraft Editor – AI Flight Planner includes a comprehensive aircraft editor that allows you to adjust all the aircraft parameters relevant to AI operation. This includes the model radius for FS9 aircraft.

The Aircraft Editor is opened by clicking on *Aircraft / Open Aircraft Editor*

The Aircraft Editor dialog is divided into three main sections:

- selection of the aircraft folder,
- selection of the particular AI variant of the aircraft and Aircraft List maintenance, and

- display/editing of aircraft AI parameters.

MSFS aircraft have a very specific folder arrangement. The various data for each aircraft is spread among several files and folders collected into a single folder which, for this purpose, is referred to as an “aircraft folder”. Each “aircraft folder” contains only one aircraft but there may be several AI variants of that aircraft.

The first step in using the Aircraft Editor is to select the aircraft folder of interest. This is done using the Aircraft Folder field and the associated Select button.

Once the aircraft folder is selected, the titles of all the AI variants in that folder are listed in the Aircraft Title combobox. If there is more than one variant, you must select the one of interest. Upon selecting the title of interest (or automatically if there is only one variant), if that variant is in the Aircraft List, its reference number and cruise speed (as set out in the Aircraft List) will be displayed in the Aircraft List Data section of the dialog box. Also, if there is thumbnail of the aircraft in the applicable *Texture* folder, it can be displayed

As well, the AI parameters of the selected AI variant are displayed in the bottom section of the dialog box. The data displayed includes:

- default Tail/Registration number.
- a checkbox indicating whether or not the aircraft is regarded as a “heavy”,
- cruise speed used for aircraft flight,
- airline name,
- list of MSFS types of airport parking spots that the aircraft may use,
- list of the parking codes the aircraft may use (these correspond to the parking codes assigned to aircraft parking spots by an airport editor)
- ATC Type and model, which control how ATC refers to the aircraft
- for FS9 aircraft, the model radius (in meters) or for FSX aircraft, the wingspan (in feet), and
- the minimum radius of a parking spot in which this aircraft will park.

The “heavy” indicator, cruise speed, ATC model and type and aircraft size apply to all AI variants of the aircraft; the remainder apply to only the selected variant.

The FS9 and FSX radio buttons will indicate which MSFS version of the aircraft is currently being viewed. If the path to the aircraft folder does not match the path to either FS9 or FSX (assuming they are installed) neither will be indicated. If (under circumstances described below), the FSX version of the aircraft is displayed and it is the FS9 version that is of interest, or vice versa, clicking on the radio button of the other version will bring up the desired data - assuming the other version is installed and the selected AI aircraft variant title is available to it.

All displayed Aircraft Data fields save for the FS9 and FSX radio button status may be edited and the modified data saved back to the aircraft folder by clicking on the Update “aircraft.cfg”/“sim.cfg” File button. No error checking is performed (nor is there much that could be), so be careful.

For adding new AI variants to your AI aircraft “stable”, please refer to the Flight Plan and Repaint Installer manual.

When editing the Parking Types field, a list-box containing the allowable types is displayed. Click on a type and it will be added to the field or enter it directly. Delete from the field directly any unneeded type(s)

The Airport Editor remains open until you close it.

8.4 Adding New Aircraft to the Aircraft List – You may add new aircraft to the current Aircraft List in either of two ways:

- Individually - Click on the *Aircraft / Add Single Aircraft to List* menu item. Then, select and edit as necessary the desired AI aircraft using the Aircraft Editor (as described in the previous section). Finally, click on the Add To/Update Aircraft List button. (The data must represent a valid AI aircraft). If there is more than one AI variant in the selected aircraft folder and you want to add them all, use the Add All to Aircraft List button instead.
- Bulk-Add – Some or all of the AI aircraft contained in a user-selected set of folders may be added by clicking on *Aircraft / Bulk-Add Aircraft to List*. The process is similar to Creating a New Aircraft List from Aircraft Folders (see Section 8.2), except that only those aircraft not already in the Aircraft List are displayed.
- Substitute -You may substitute an installed aircraft for any title in the Aircraft List - installed or not. The Substitute function works as described in the Flight Plan and Installer manual.

8.5 Editing an Aircraft Already in the Aircraft List – To edit the data of an aircraft in the Aircraft List, select the aircraft and click on *Aircraft / Modify Selected Aircraft*. This action opens the Aircraft Editor and displays the aircraft data for the preferred MSFS version (See Section 5). If that’s not the version of interest, you may access the other using the FS9/FSX radio buttons – assuming it exists on your system

Edit the Aircraft Title, A/C Ref No. and/or Cruise Speed fields as necessary, bearing in mind that if either the title or reference number is changed, the new value must be unique in the *Aircraft List*. If the cruise speed from the Aircraft List does not agree with that in the aircraft data, you may use the latter by clicking on Use Cruise Speed from Aircraft Data.

When ready, click on the Add To/Update Aircraft List button. If you have changed the A/C Ref No., AI Flight Planner offers to update all references to the old number.

You may also edit and save the aircraft data. Indeed, if you edit the aircraft title, you will probably want to save the new title back into the aircraft data.

8.6 Checking for Used, Unused or Missing Aircraft and Texture Folders – Since AI Flight Planner may be used to prepare flight plans/traffic files to be run on other systems, it does not automatically check for missing aircraft. However, you may

check for used, unused or missing aircraft and texture folders at any time in several ways:

- *Aircraft / Check for Missing Aircraft and Texture Folders* - missing aircraft or textures required for the currently loaded flight plans;
- *Files / Identify Missing Aircraft in Traffic Files* - missing aircraft required for a set of traffic files you select;
- *Files / Check In which Traffic Files Aircraft Used* - the aircraft (from the set you select) used in each of a set of traffic files; and
- *Files / Check If Aircraft Used In Traffic Files* - the traffic files (in the set you select) that use one or more of the selected aircraft;
- *Files / Identify Aircraft Not Used in Traffic Files* - the aircraft (in the set you select) that are not used in any of the selected traffic files;

Unless the list is very short, the report may be printed.

- 8.7 Restoring Cruise Speeds – As noted in Section 4, if an AI aircraft is scheduled to arrive more than about 37 minutes later than it would based on distance/cruising speed (that specified in the aircraft...txt file), it will not materialize for landing. To address this problem, some suppliers of complete AI add-on packages, specify a cruise speed of about 200 kts for all aircraft.

This artificial cruise speed is problematic when used in conjunction with AI Flight Planner.

- For jet passenger aircraft, the calculated duration of each flight plan leg will be much longer than (2-3 times) the real-world value and, consequently, the calculated ETA will be very late. Hence, you'll have to specify arrival time in all cases.
- As discussed in Section 4, AI Flight Planner has its own solution to the 37-minute problem (i.e., halving the specified cruise speed). This results in a cruise speed in the traffic file being further reduced to only 100kts. Fortunately, with one exception, this does not materially affect AI arrival times – provided you override system-calculated arrival time.

So, when using such prepared flight plan information, you should restore the aircraft cruise speed to the value in the relevant *aircraft.cfg/sim.cfg* file by clicking on *Aircraft / Restore Cruise Speeds for Aircraft In List*. If FSX is selected as a Target Version on the main panel, the aircraft in the FSX aircraft folders will be used as reference. Otherwise, FS9 aircraft will be used.

You may also restore cruise speeds in one or more traffic files without bringing the flight plans into the editor using the *Files / Restore A/C Cruise Speeds in Traffic Files* menu item.

- 8.8 Deleting Aircraft – To delete one or more aircraft from the *Aircraft List*, click on *Aircraft / Delete Multiple Aircraft*, select the aircraft to be deleted and click on the Delete Selected Aircraft button. As an alternative, if only a single aircraft is to be deleted, select the aircraft in the Aircraft List and click on the *Aircraft / Delete Single (Selected) Aircraft*. All aircraft not used by the flight plans in the Flight Plan List may be deleted by clicking on *Aircraft / Delete Unused Aircraft*.

All these actions may also be initiated by right-clicking on the Aircraft List and selecting the applicable menu item.

- 8.9 Finding Duplicate Aircraft – From time to time as you add more AI, you may find that a given flight plan has been duplicated in another traffic file. To find which one, select the aircraft of interest in the Aircraft List and click on *Aircraft / Find Selected Aircraft in Traffic Files*. You'll be presented with a directory tree on which you may select the drives/folders to be searched. Then click on the Find Aircraft button. At the completion of the search, a list of the traffic files that use the selected aircraft will be displayed.
- 8.10 Other Aircraft-Related Functions - The following other functions are available:
- Re-Number Aircraft – After several flight plan or traffic files have been merged, it is often convenient to re-number the aircraft in the Aircraft List. The *Aircraft / Re-Number Aircraft* feature accomplishes this, allowing you to specify the starting aircraft reference number.
  - Check for Missing Aircraft and Textures - AI Flight Planner checks that all aircraft required for the performance of the open flight plans are installed on the user's system and that appropriately-named texture folders exist in the relevant aircraft folders. (However, no check is made for the individual texture files.)
  - Send Aircraft List to Text Editor - the entire aircraft list is transferred to a Notepad window where it may be edited manually and reloaded into the aircraft List

## 9.0 AIRPORT AND RELATED DATA

Whenever possible, AI Flight Planner uses its own internal airport information – generally ignoring the companion airport data for the flight plan file(s) loaded.

For your convenience, AI Flight Planner “ships” with:

- the data for both FS9 and FSX stock airports already collected in a file named *AirportList\_Base.dat*,
- time zone information (UTC offsets) for every country and region where a stock airport exists in a file named *Timezone\_Base.dat*.

For new installations, AI Flight Planner automatically creates *AirportList.dat* and *Timezone.dat* from these files.

- 9.1 Displaying Airport Information – Information on any airport known to the system is but a few mouse-clicks away. Clicking on *Airports / Get Airport Information* displays in tree-view form a list of countries for which airport data exists. “Expanding” a country results in the constituent state/provinces/regions (if any) or a list of cities to appear. Expanding a city shows all its airports, including IACO code, IATA code if it has one, position and UTC offsets.

Double-clicking on an airport in the Airport List will have a similar result, except that the displayed tree will be opened to the airport of interest.

The Airport Editor (see Section 9.4) may be opened for a specific airport by double-clicking on that airport in the “airport tree”.

- 9.2 Finding Airports and Collecting Airport Data - AI Flight Planner includes a function for collecting data for FS9 and or FSX stock airports, as well as identifying and collecting add-on airports for both. The collected airport data is displayed in a standard list box and saved to *AirportList.dat* under user control. This function is initiated using *Airports / Find/Collect Airports*.

The scope of the collection process is controlled by the four checkboxes located beneath the top-level folder path displays. Data may be collected for any combination of FS9 stock airports, FSX stock airports and add-on airports for either version. Where the same stock airport (ICAO code) exists in both FS9 and FSX and the data differs, the FSX data takes precedence.

Unless you will only ever generate AI flight plans for use with FS9, there seems little reason not to use the provided base data which includes stock airports in both FS9 and FSX. Be aware, that, if you collect data on airports for only one MSFS version and you attempt to compile flight plans for the other version, a number of warnings about potentially-missing airports may result. However, subject to the potentially missing airports actually being installed on the end-user's system, the traffic files will generate the specified AI traffic.

For stock airport data, you may specify use of the base data provided with AI Flight Planner, i.e., *AirportList\_Base.dat*, (check Use provided base data checkbox) – which will be much faster – or have AI Flight Planner collect the stock airports from your system. You need only use the latter alternative if you had modified your stock airport data or, for some reason, the file *AirportList\_Base.dat* had been corrupted. Where the same airport (ICAO code) exists in both FS9 and FSX and the data differs, the FSX data takes precedence.

When you check either of the add-on airport checkboxes, a directory-tree is displayed. Check the folders that contain the airports you want AI Flight Planner to collect. If you want to collect only certain airports in a folder, expand that folder in the directory-tree and check the airports you want collected. Only airports checked individually or in the checked folders will be collected – even if additional folders are enabled in the applicable Scenery Library.

If you want the positional data (latitude, longitude and elevation) of your add-on airports to replace that of the corresponding stock airports, also check the Update stock airports with add-on data checkbox.

Please note, only those add-on airports that have at least one runway or helipad are collected. (For a variety of reasons, add-on airport developers often spread their airport definitions across several files, e.g., runways and taxiways in one, taxiway signs in another and boundary fences in yet another. Each such file constitutes an airport. Using the common ICAO code as a guide, MSFS consolidates these individual files back into a single airport. Since all runways, taxiways, heliports and parking spots must be contained in the same file, AI Flight Planner looks for this file and discards any others it encounters with the same ICAO code.) So, if you attempt to control AI routing by using “waypoints” in your flight plans, make sure your waypoint definitions include a helipad.

AI Flight Planner relies on you to differentiate between stock airports and add-on airports. Any airport found in the folders you check for add-on airport collection will be treated as an add-on airport. So, while you could simply tell AI Flight Planner to search your entire FS9 or FSX base folder for add-on airports, all the stock airports would be found and re-designated as add-ons.

Each time stock airport data is collected, any updates you have made previously (saved in the file *AirportList\_Updates.dat* as described below) are re-applied.

Because of the extent of control over the collection process, you may find other uses for this airport data collection feature. For example, if you wish to know which airports are installed in a given add-on folder, the airport collector will answer the question. Data is not copied to *AirportList.dat* until you click on the Save “*AirportList.dat*” button, so you may safely experiment.

- 9.3 Customizing the Airport List – The airport data included with AI Flight Planner includes every stock airport in both FS9 and FSX – which number over 25,000. Thus, the file *AirportList.dat* is huge – over 2mb. For those with state-of-the-art computer systems, this should not present a problem. However, if you have an older computer or limited RAM, you may wish to work with only a subset of the available airports.

To generate a customized airport list, prior to saving the collected airports to *AirportList.dat* in the previous section, click on the Subset button and select the countries/regions/airports of interest. Once the smaller list is generated you may delete entries from it, or you may further subset it

Since this customized list will be named *AirportList.dat*, should you wish to revert to the full set of airports you will have to re-collect all the airports. Alternately, save the full set under a different name and, when you want to use it, rename it to *AirportList.dat* prior to starting AI Flight Planner, renaming the customized list first, if course.

- 9.4 Airport Editor – Once the airport data has been collected (which should be an infrequent necessity), the Airport Editor is the tool for maintaining that data. But, “Why”, you wonder, “does it need maintenance?”

Errors have been noted in MSFS airport data. As well, the original airport data may not match that contained in add-on scenery installed on your system. While small changes are unlikely to have any noticeable effect on AI operation, you may wish to have *AirportList.dat* reflect the corrected data. As well, since AI Flight Planner cannot compile a flight plan file containing an airport for which it does have positional information, any new airport created in add-on scenery must be added to *AirportList.dat* before AI can be programmed for that airport.

Save for the Bulk Update fields and controls (which are described below), use of the Airport Editor is straightforward – except for the Airport Exists for: section which contains two checkboxes and a data field. The two checkboxes are used to indicate for which version(s) of MSFS the airport is available. The data field is used in the case where an airport exists in both FS9 and FXS but uses a different ICAO code in FSX. (There are many instances where the FS9 stock airport data

specifies the wrong ICAO code and this error is corrected in the FSX data. There are a few instances where, between the release of FS9 and of FSX, an old airport was “retired” and a new one opened to serve a particular city.) In those cases, the FSX X-ref data field is used to identify the ICAO code assigned to FSX airport.

An IATA code may be assigned to only one airport – or, stated another way, to be cross-referenced to a single ICAO airport code. There is one situation where this becomes problematic. When a FS9 airport has been re-designated and replaced in FSX, only one or the other may be assigned the IATA code.

Whenever an airport is entered or updated using the Airport Editor, the updated airport data is saved in a file named *AirportList\_Updates.dat*. If *AirportList.dat* ever needs to be regenerated, these updates are re-applied automatically

To allow you to abort a series of updates without affecting *AirportList.dat* and *AirportList – Updates.dat*, any changes you make do not become permanent until you click on the Save to AirportList.dat button. If you wish to exit without saving, simply close the dialog box.

- 9.5 Editing and Adding New Airports – To edit an airport in the Airport List, right-click on the airport and select Open Airport Editor from the menu presented, or double-click on the airport when displayed in an “airport tree”. The editor will be opened with the data for the selected airport displayed. To add a new airport or to otherwise open the Airport Editor, click on *Airports / Edit/Add Airport*. The Airport Editor is also opened if you respond affirmatively to a system enquiry as to whether you wish to enter/update the data for a missing airport.

Proceed as follows:

- if the airport of interest is not already displayed, enter the airport ICAO or IATA code and click the corresponding Open button or click the New button and then enter the ICAO code for a new airport
- enter/update the remaining data as necessary, and
- click the Apply Update button.

Repeat as necessary for additional airports. When finished, click the Save File and Exit button.

- 9.6 Airport Data Bulk Update – Despite the large number of stock airports included in FSX, some small local airports, grass strips, water airports and military fields are missing. Scenery developers often model these missing airports. As an alternative to manual entry or recollecting airports, where an AI flight plan set for such airports is available, AI Flight Planner is able to extract the required data from the corresponding TTools-format airport file.

To update AI Flight Planner’s airport data from a TTools-format airport file:

- click on *Airports / Bulk Update*;
- check the Update Existing checkbox if you wish any airports already in the *AirportList.dat* to be updated based on the data in the TTools file; and

- specify the TTools-format airport file using TTools Airport File for Update field and associated Select button.

The first airport in the file, or the first one not already in *AirportList.dat* (if the Update existing checkbox is not checked), is loaded into the editor. If the airport was previously in *AirportList.dat*, the full record as updated by the TTools-format file data is shown. Make whatever further changes are necessary and then click on the Apply Update button. Scroll forwards or backwards through the airports in the file meeting the Update Existing criteria using the Next Airport and Previous Airport buttons. If you wish all airports to be processed a single step without any manual updates, simply click on All after checking one or both of FS9 and/or FSX (the same selections are used for all airports updated using All). Please note that once you click the All button and the related processing is complete, all airports in the file are then known to the system; hence, the Update Existing checkbox must be checked in order for any airports to be displayed. However, you will still be able to open individual airports.

When finished click on the Save File and Exit button.

- 9.7 Making Temporary Airport Data Permanent – Whenever AI Flight Planner loads a flight plan file that refers to an airport not in *AirportList.dat*, it saves the available data for that airport in *AirportList\_Temp.dat*. To add such data to *AirportList.dat* and make it permanent, click on *Airports / Confirm Temporary Airports* and proceed as described above for bulk updates. Note however, the TTools Airport File for Update field, its Select button and the Update Existing checkbox will be disabled.
- 9.8 Entering/Editing Time Zone Data – The file *Timezone\_Base.dat* in AI Flight Planner's distribution archive file includes time zone information (UTC offsets) for every country and region where a stock airport exists. But reliable time zone data for some of the more remote airports is difficult to obtain. And, even though certain countries notionally lie entirely within a single time zone, there are instances where a certain city in or a small region of such countries use a different time zone. If you develop AI flight plans for such areas using local times, you may find it necessary to update AI Flight Planner's time zone data.

To do so, click on *Airports / Change Local Time Offsets*. This opens the Time Zone Editor. Enter the ICAO or IATA code of the airport of interest into the designated text box and click the Open button. If sufficient information is known about that airport, its location information is displayed.

Enter the standard and daylight savings time offsets from UTC and click the Apply Update button. This action establishes the UTC offsets not only for the designated airport but also for any other airport existing in the same country/region/city combination for which a specific time offset has not previously been specified. Where the city, or city and region, is left blank, the entered time offsets will apply to the whole region or country respectively. As with *AirportList.dat* updates, such changes are not made permanent until you click the Save File and Exit button.

When interpreting time zone data, if AI Flight Planner encounters two or more entries which may apply to a given airport, it uses the most precise. For example, while most of British Columbia, Canada observes Pacific Time, a few towns along its eastern boundary observe Mountain Time. So, the time zone database contains one entry for the whole of British Columbia and several others - one for each of those towns. Where a flight plan refers to one of those towns, the applicable specific entry will be used.

- 9.9 Updates to Base Time Zone Data – From time to time, errors may be discovered in the base time zone data contained in the file *Timezone\_Base.dat*. While such errors will be corrected in the following release of AI Flight Planner, having the corrected data implemented in your system will require some effort on your part.

If you have not made any time zone data changes, simply delete the file *Timezone.dat* from your system prior to installing the release that contains the updated information. AI Flight Planner will regenerate that file the next time you run the newly installed version.

However, if you have changed the time zone data, you must update your *Timezone.dat* file manually. The file *Version History.pdf* for releases containing updated time zone data will identify the countries/regions/cities for which time zone data has been updated. To carry these changes into your system while preserving your earlier changes, open both your *Timezone.dat* and the new *Timezone\_Base.dat* with Notepad or another text editor. Copy the line(s) noted in *Version History.pdf* as having been changed from *Timezone\_Base.dat* into your *Timezone.dat*. Then, save your updated *Timezone.dat*.

In neither case is the timing of your action critical. It can occur either before or any time after installation of the updated version of AI Flight Planner. Of course, the revised data will not take effect until you do one or the other of the above-noted procedures.

## **10 TROUBLE-SHOOTING AI DIFFICULTIES**

Whether you use Microsoft's Traffic Toolbox, which ships as part of both FS9 and FSX, or a TTools compatible utility (e.g., TTools itself, AIFPC or AI Flight Planner), successful AI flight planning requires some knowledge of the "innards" of FS9 and/or FSX, as applicable, and well as an understanding of flight plan data.

For TTools-compatible flight planning, there is no better explanation of flight plan data than the "Source Files and Formats" section of the TTools user manual. However, there is no comprehensive source of information on the inner-workings of FS9 and FSX. While most problems you'll encounter have been discussed, probably numerous times, in various forums, finding that information can be a trying experience.

The purpose of this section, then, is to provide a checklist of things related to FS9 and/or FSX to look for when your flight plans don't work.

- 10.1 Traffic Analyzers - In diagnosing AI difficulties, a tool such as Traffic Toolbox Explorer (part of Traffic Toolbox but useful for all flight plans) or one of the freeware AI traffic utilities (such as Peter van der Veen's Traffic Analyser) can

save you a great deal of time by telling you whether or not an AI flight plan is being processed by MSFS. (If MSFS isn't processing the flight plan or leg of interest, there's no point wasting time "sitting" at an airport waiting for the flight to arrive!) Instructions for the installation of Traffic Toolbox Explorer are contained in the relevant SDK. (For FSX, you must own the deluxe version to have access to the SDK.)

- 10.2 Converting Prepared FS9 Traffic Files for Use with FSX – With the ready availability of prepared flight plans covering airline system-wide schedules, the vast majority of AI difficulties reported with AI Flight Planner are related to conversions. Ensure that all the steps/cautions noted in Section 6.5 have been observed.

Please note that FS9 flight plans in text (TTools) format do not need to be converted.

- 10.3 Don't Mix FS9 and FSX Traffic Files - The most frequent cause of AI difficulties with FSX is the mixing of compiled-for-FS9 and compiled-for-FSX traffic files following conversion. At time of writing, most prepared flight plan data, e.g., WoAI, MAIW, is compiled for FS9. You can load these traffic files directly into FSX and they will (or should) work. But, if you place a compiled-for-FS9 traffic file in the "purview" of FSX, any compiled-for-FSX traffic will disappear. All traffic files in FSX must be compiled for the same target MSFS version. They must be either all FSX traffic files or all FS9 traffic files (in which case, if you want default traffic you must use the FS9 default traffic file or convert the FSX default traffic file for FS9). AI Flight Planner will help you locate compiled-for-FS9 traffic files. But, only you can ensure there's no mixing. Please note that there is no requirement that traffic files be named *traffic ...bgl*. While that naming is customary, it is not a requirement.

- 10.4 Prerequisites for an AI Flight Plan – There are only three ingredients needed for proper AI operation:

- a valid flight plan whose legs are scheduled so as to be achievable with the specified aircraft;
- adequate parking at the destination airports properly connected to the runways – adequate for the number and types of AI aircraft that may exist at the airport at any point in time plus the user aircraft, and
- a compatible aircraft with an *aircraft.cfg/sim.cfg* file that designates the aircraft (title) as an AI aircraft (i.e., the file contains a corresponding "[fltsim.nn]" section).

AI Flight Planner will warn you if, based on the cruise speed of the designated aircraft and assuming normal circumstances, a flight plan leg cannot be completed prior to departure time of the next leg in sequence, and of a host of other flight plan errors. However, weather and traffic delays cannot be foreseen by AI Flight Planner. AI Flight Planner cannot ensure that adequate parking will be available. (Note that FS9 assigns parking based on model radius; for FSX, the wingspan specified in the *aircraft.cfg/sim.cfg* file is used.) Nor will it warn you automatically if a required aircraft does not exist on your system. But, you may check at any time using the *Aircraft / Check for Missing Aircraft and Textures* menu item.

- 10.5 Troubleshooting a Traffic File - If a file compiles or re-compiles without error using AI Flight Planner, it is highly unlikely that the traffic file is invalid. It may not work on your system, but the problem almost certainly lies elsewhere.

When things don't work as planned, "keep it simple" is a good guideline. Recognize that the ETA of a flight plan, unless overridden by the user, is based on a simple computation of distance/cruise speed plus a fixed 15 minutes for approach and taxiing. Once the AI enters the sector of the destination airport or a bounding sector, AI performance is based on the stored flight dynamics for the aircraft and is affected by weather and other traffic. Consequently, depending on circumstances, the 15 minute allowance may be grossly-inadequate. So, make certain there is adequate time for each leg of the flight plan to complete before the next leg is scheduled to depart.

Once you've determined that the included flight plans are reasonable, the first step in troubleshooting a traffic file is to isolate that file. All other traffic files within the purview of the target MSFS version should be disabled to eliminate any unplanned interactions. As well, it may be helpful to disable all add-on scenery except those required to generate the airport(s) of interest. For the default traffic file and any others in the `\Scenery\World\Scenery` folder, this means either changing their file extensions to something other than ".bgl", such as by appending ".xxx" to the file name/extension, or temporarily moving them to another folder outside the purview of the target version of MSFS. If isolating the traffic file solves the problem, you can determine the real source of the problem by re-enabling the other files one-by-one until the problem recurs.

If isolating the traffic file doesn't help, then check the following. (If you're using FSX, it is assumed you've already removed any FS9 files.)

<u>Symptom</u>	<u>Possible Causes</u>
AI do not materialize for departure	<ul style="list-style-type: none"> <li>• No/inadequate parking</li> <li>• No/invalid aircraft</li> <li>• Insufficient time for AI to complete prior leg</li> </ul>
AI do not materialize for landing	<ul style="list-style-type: none"> <li>• No/invalid aircraft</li> <li>• 37- minute problem ("raw" compile mode only) – see Section 4.5</li> </ul>
AI executes missed approaches	<ul style="list-style-type: none"> <li>• User aircraft on runway</li> <li>• No parking available for aircraft</li> </ul>
AI lands but disappears after exiting runway	No taxi path to assigned parking spot
AI does not proceed to runway for takeoff	No taxi path to active runway

Unfortunately, MSFS does not warn you about missing or invalid aircraft. It simply ignores any flight plans for that aircraft. But, you may identify missing aircraft by loading the traffic file or flight plan text file set into AI Flight Planner and run the *Aircraft/Check for Missing Aircraft and Textures* function.

If a missing or invalid aircraft is indicated, ensure that the aircraft title is declared as an AI aircraft in the relevant aircraft folder. If it isn't, update the *aircraft.cfg/sim.cfg* file and try again. If it is, replace the missing/invalid aircraft with a default aircraft or another aircraft you are certain will work. (Not all aircraft you download will perform satisfactorily as AI aircraft, particularly with FSX. Default aircraft are reliable alternatives.) If prepared flight plan data has been used for the faulty traffic file, you should also check whether or not the cruise speed has been altered – even if it's a default aircraft. If it has, try restoring its normal cruise speed.

If inadequate parking or missing/broken taxi paths are suspected, you should analyse the "afcad" for the destination airport using AFCAD 2.21 (FS9 only), ADE or AFX (payware) or another airport editor. They all have fault-finders to help you identify and resolve such problems.

- 10.6 Summary – It's tempting to download the system-wide flight plans for your favourite airline or a package that will populate your local military airfield. But, it's frustrating when you attempt to convert those packages for FSX and they don't work. Hopefully, the foregoing will help you avoid some of those problems or, if you experience them, help you to correct them. Be methodical. Most important, don't get discouraged. Once you find the cause, you'll find the AI generated very satisfying. And you'll probably learn something along the way.

If all else fails, take a tip from *bobbyjack*, a frequent contributor to the AI Flight Planner forum. Set your system-wide flight plan aside and create a simple two leg flight plan to test the aspects of your system that seem not to be working.

## **11 SUPPORT**

AI Flight Planner's support forum is located in the "Tools support" area at <http://www.fsdeveloper.com>. Please direct your problem reports, suggestions for improvement and other comments there. When you report problems, please include relevant details. In particular, the AI Flight Planner version number, the exact error message and a summary of what you were doing at the time are likely to be particularly helpful. If the problem involves a particular traffic or flight plan file, please attach a copy of that file (and the companion airport and aircraft files in the case of flight plan files)

I have also creating a support website at <http://members.shaw.ca/aifp>. Among other things, the site lists all known problems with the latest release. The most recent release of AI Flight Planner is available from that site.

While I can't promise to resolve every issue you report or include every feature addition you propose, I will undertake to support and enhance AI Flight Planner in a manner consistent with it becoming and remaining the AI Flight Planning tool of choice for Microsoft Flight Simulator.

## **12 ACKNOWLEDGEMENTS**

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- Karl Swartz for his Great Circle Mapper website (<http://gc.kls2.com>) which seems to be the most comprehensive source of airport time zone data available at no cost ,
- Arno Gerretson for hosting the AI Flight Planner support forum on FS Developer.com, and
- last but not least, my beta team members, who expended a lot of effort in testing AI Flight Planner and/or advising me.

### **13 END USER LICENSE AGREEMENT**

As used in this end user license agreement, the terms "AI Flight Planner", "AIFP" and "AIFP2" shall be construed as encompassing the full contents of the downloadable archive (.zip) file originally created and posted for distribution on "download sites" by the author, including without limitation: the executable files *AI Flight Planner.exe* and/or *AIFP2.exe*, the associated user manuals and the data files *AirportList\_Base.dat*, *ICAO\_IATA.dat* and *Timezone\_Base.dat*, and any derivatives thereof.

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