Introduction

This manual is written to help you configure and use FSCaptain – an Air Transport Pilot simulation for use with Microsoft’s Flight Simulator 2004, Microsoft’s Flight Simulator X, Dovetail Games’ Flight Simulator X – Steam Edition, and Lockheed-Martin’s Prepar3D (versions 2 & 3). This manual explains everything about the Administrator program in detail, omitting those parts involving using the FCDU communications device while you are flying.

FSCaptain is easy to configure and use. This manual is divided into seven main sections:

Getting Started -- is as easy as 1 – 2 – 3. This section will help you understand how to install the FCDU device into your aircraft so you can use them with FSCaptain, and how to start your career flying for one of the airlines provided with the system.

Your Career -- will explain how to track your career, and what all the data means. This section contains advice on how to make the most of your time to get the highest scores.

Flight Dispatch -- documents how to select and plan a flight and have that flight be committed into your log.

Options for All Airlines -- contains an explanation of the FSCaptain options that apply to your entire installation and not to a specific airline. This also explains how to configure FSCaptain for dual operations – sharing the same career in FS2004, FSX, and P3D.

Configuring Aircraft -- will tell you how to create and maintain the aircraft overrides that help FSCaptain calculate the flight profiles for the different airplanes you fly.

Load Maps -- explains what load maps are and why they are necessary to solve certain loading problems with the FSCaptain automatic loading process.

Creating and Managing an Airline -- explains how to create a new airline, including all the details about all the options and policies. Also, it reveals how to create and change airline schedules.

These sections are followed by several Appendices which go into detail about different ways to configure your FSCaptain to suit your style.
Engine icing can cause engine flameout (HP) ............................................. 76
Runways can be contaminated by precipitation and degrade braking action (HP) .......... 77
Improper wheel brake use can incur damage (HP) ........................................ 78
Enhanced buffeting with possible engine/systems failures inside thunderstorm cells (HP) 78
Enhanced Structural Ground Ice Simulation (HP) ......................................... 79

The Standard Icing Simulation ...................................................................... 79
Ground Structural Icing .............................................................................. 80
Enhanced In-Flight Structural Icing ............................................................. 80
Ground Deicing and Anti-Icing Procedures ................................................ 81
In-Flight Structural Anti-icing Systems ....................................................... 84
Collisions with SimObjects are tracked (HP) .............................................. 85

Section 5: Configuring Aircraft ................................................................. 87
Section 6: Load Maps .................................................................................. 100
Creating a Load Map for your Aircraft ...................................................... 108
Configuration-based Load Maps ................................................................. 110

Section 7: Creating and Managing an Airline ........................................... 112
Airline Definitions ..................................................................................... 112
Creating or Modifying the Flight Schedule ............................................... 122
Generating a Hub Schedule ........................................................................ 126
Importing an AI Schedule ......................................................................... 129
Replicating Real Airlines .......................................................................... 132
Editing Flight Schedules as Text Files ....................................................... 133

Appendix 1: Score Computation .................................................................. 135
Appendix 2: Items.cfg and the Manifest Generator .................................. 140
Appendix 3: Aircraft Interfaces to FSCaptain .......................................... 146
Appendix 4: Mechanical Fault Codes ......................................................... 153
Appendix 5: Special Options and Features ................................................. 155
The airport_surface Override.txt File ..................................................... 156
The closed_user.txt File ........................................................................... 157
The customs_user.txt File ........................................................................ 158
The Exceptions.cfg File ........................................................................................................ 160
The ignored_airports.cfg File ............................................................................................. 161
The new-id_user.txt File ..................................................................................................... 162
The Options.cfg File .......................................................................................................... 163
The private_user.txt File .................................................................................................... 168
The Profile.cfg File ............................................................................................................ 169
Appendix 6: Transitions.cfg (and Transitions_18.cfg).......................................................... 170
Appendix 7: Minimum Safe Distances ............................................................................... 171
Appendix 8: The Speed Table in the Aircraft Characteristics File ..................................... 173
Appendix 9: Manually Adding an FCDU Gauge to an Aircraft's Panel.cfg File .................. 175
Appendix 10: Manually Removing an FCDU Gauge from an Aircraft’s panel.cfg file .......... 177
Appendix 11: Backing Up and Restoring Company Log Data ........................................... 178
Appendix 12: Your Airline’s Nodes file .............................................................................. 179
Section 1: Getting Started

It's easy to get started using FSCaptain and to start your career as an Air Transport Pilot (ATP). It requires just three steps: 1) Installing the program on your computer, 2) Setting up your FCDU device, and 3) Signing up for employment by an airline.

What is the FCDU device? It’s how you communicate with your crew and company. In two forms, it's either a standalone EXE, or a gauge called the FCDU which is installed as a separate window into any airplane you will be flying with the FSCaptain system. It's an innocuous gauge – the FCDU is only used with FSCaptain; you can fly the airplane normally just like before without even looking at the FCDU.

Step 1: Installing FSCaptain
(Note: most users will have already done this step before reading this manual. But the manual can be downloaded from the website and read before installation, so we'll cover the installation steps here. If you've already installed FSCaptain, skip to step 2 below.)

Installation is very easy. FSCaptain is distributed as a Zip archive with two files inside it: a README.txt file and the FSCaptain.exe executable. You should read the README file (which will also contain installation instructions – if they differ from what's said here, follow what's in the README) and then execute the FSCaptain.exe file.
Clicking on “Next” will take you to the next window:

This is the root folder of your Flight Simulator installation. (The example above is where I put my FS2004. What you see here is where yours is installed, and by default it’s something long like “C:\Program Files\Microsoft Games\Microsoft Flight Simulator 2004”.)

By default, the installer searches for an FSX installation, as FSX has the largest base of users.

If you do not have FSX installed, the above entry will be blank and you will have to use the “… ” button to find your simulator folder.

FSCaptain can be installed into FS2004 or FSX or P3D and it will run well in either. If you are installing into FS2004, just click on the “… ” button above and browse to your FS2004 root folder. Once this is pointing to the place where you want to install FSCaptain, click the ‘Next” button.

The rest of the installation is straightforward. The next screen will ask you to confirm the folder to install into and you’ll do that by pressing “Start”. The files will be installed, and then the FCDU gauge installation window will appear – see Section 2 on how to get started using FSCaptain.
A word of reassurance about the installation of FSCaptain: All of us have had the experience of installing FS add-ons or other programs that have caused problems with our FS installation or even the rest of the computer. For this reason, we are justifiably cautious about putting a new one on our computer, especially from an automatic installation program that doesn't let us see exactly what it’s doing.

FSCaptain is designed to be very safe to install. If you are very cautious and choose to install to a temporary folder called “Check it Out” to see what it does, this is what you'll see:

![Image]

You can see that it creates a new folder inside your FS root folder called FSCaptain, and inside that there are several sub-folders containing the FSCaptain databases and programs. Also, there are several gauges and a small sub-folder placed in the 'Gauges' folder of your FS folder. These gauges are the FSCaptain FCDU, some xml interfaces for complex aircraft, and some smaller warning gauges that you can optionally install on your airplanes.

FSCaptain will also install Pete Dowson’s MakeRunways program into the root folder of your Flight Sim installation if you do not have it already, or if your installed version is older than the one we would be supplying. MakeRunways is a great program that can leaf through your enabled scenery folders and dig out lots of pertinent information about your airports. We’ll look at this utility and the FSCaptain Scenery Scanner later.

That's all. Nothing else inside your FS installation is modified, and the Windows registry is not touched in any way, shape or form. You’ll also notice that there's an “Uninstall FSCaptain.exe” program placed in your FS root folder. Simply execute this to remove the program completely. (Or just delete the \FSCaptain\ folder from your simulator along with the gauges listed above.)

The only thing the un-install program does not do is it will not remove any FCDU gauges installed into your aircraft with the FCDU installer. You should do this with the FCDU Installer (see step 2 below) before you uninstall FSCaptain itself. Also, it will not delete any logs that you have record-
ed in the \FSCaptain\Data folder. This will preserve your career in case you change your mind, but you can easily delete this too if you want by removing the FSCaptain folder with Windows Explorer.

**Steps 2 & 3: Installing an FCDU gauge and signing up**

After you have clicked “Exit” on the FSCaptain Installer program, the Administrator will run for the first time. It will know that you aren’t working for any airlines yet, and will give you a welcome dialog:

![Welcome dialog](image)

This gives you a basic guide to getting started. First, there are two buttons. The first will let you run the FCDU installer program for the first time. This program is the one that will install the FCDU gauge into the aircraft that you select, or remove it from any aircraft you where it was previously installed.
This is the dialog of the FCDU Installer program:

Here you see each panel in each airplane in your Flight Simulator installation. At the top is the folder where the airplanes are found. This folder is the one located in the same root FS folder that the Installer was executed from, which in the case of a new installation will be the FS version you are installing FSCaptain into. But this is an important point if you have more than one Flight Simulator folder. The Installer and Administrator programs only work on the databases inside the flight simulator folder that they were executed from.

You can simply change the folder the program is looking in, by typing a new folder name in the window and pressing the “Change” button. But normally you wouldn’t need to do this.
Each line shows all the panels in each of your aircraft. The aircraft manufacturer and name from the aircraft.cfg are shown along with the word ‘in’ and the folder name where the airplane was found in brackets. After this, if the FCDU is already installed in that panel the phrase “FCDU Installed” will appear in parenthesis. If there is no FCDU you won’t see this, obviously.

To install the FCDU in an airplane, just click on a line to select it. The button “Install” will be enabled, and to install the FCDU just click on this button. A dialog will appear showing you all the windows currently installed in the panel plus some other information to help compute the proper style and resolution of the new window:

At the top, you get a choice of which style of FCDU (Flight Communications Display Unit) to install in this airplane. By default, the FCDU is a grey color and if you open the FCDU panel in a darkened cockpit, it will be dark itself. You can choose to install a “Bright” FCDU that will never be darkened, and you can choose to install a bronze-colored FCDU if your cockpit would suit.
You can choose either of the options or none at all. If later you want to change the appearance of
the FCDU in this aircraft, you can use this Installer program to remove the previous version and
install the other one.

You will also need to input is the width in pixels of your monitor’s screen resolution you’ll be run-
ing when flying airplanes with this gauge installed. The reason for requiring this is so that the
size of the gauge window can be adjusted for wide-screen or square-screen monitors.

The window below that is the list of windows defined in the panel for this airplane.

Since there is no icon on a panel to click on to access the FCDU (though it is possible to install such
an icon manually) we can choose a location that allows us to use a SHIFT-key combination. This
means you need to choose between the 01 and 08 numbered windows. For example, let’s decide
above to install the FCDU after the “07 Compass” window:

In our example above we see that the “07 Compass” line is highlighted, and a message appears be-
low the list of windows saying “You can access the FCDU in this aircraft by pressing SHIFT-9”.
This is because we chose to install it after the 7th line, which would place it as the 8th window.
(The way FS works is that the first window (Window 00) is accessed by the shortcut key combina-
tion SHIFT-1, and so forth. This is slightly complicated, which is why the Installer just tells you
how to access the FCDU. If you try and install it past the 8th window it will explain to you that you
won’t be able to access it except with the standard shift-control-6 key combination, which always
works.)

This also prevents you from installing the FCDU into Window00, which could affect your simula-
tors performance.

If the Installer detects one or more of the existing panel windows uses a “zorder” value, the install-
er will ask if you wish to apply a zorder value to the FCDU panel.

Zorder is the value given to the simulator to instruct the drawing order of panels… to make one
panel appear “on top” of others. A panel zorder value of 2 will have that panel drawn “on top” of
panels with a zorder value of 1 (or none). Zorder values range from 0 to 100.

If you answer “Yes” then the FCDU’s panel will be given a zorder value that is higher than all other
panel windows (or ‘100’ if there is another panel already with a zorder of ‘100’.)

The FCDU panel can also be installed such that the panel will not automatically close if you change
your simulator’s “view.” You will be asked before installation if you wish this to occur.

Once you press the “Install” button the FCDU will be installed in the panel automatically. It's that
simple.
You can also remove the gauge by a very similar process – if you click on a line that already says “FCDU Installed” you will see the “Remove” button is highlighted. Click on it to remove the gauge from the airplane. Windows shifted down will be shifted back up. Any changes you have made to the panel since installing the FCDU will be retained.

What is the FCDU?

The FCDU is a device that allows you as the Captain (Pilot in Command) to communicate with your Dispatch Office and members of your crew using the ACME system – the ACARS and Crew Messaging Environment. The FCDU appears in the style of an FMC/CDU in a modern airliner, specifically the types used by Boeing in the 737/747 (grey / bronze). Options are selected using line-select keys, and there’s an alphanumeric keyboard with special shortcut keys, and a scratchpad area into which you can key in data and up-select using the line select keys.

Among the FCDU’s capabilities is the ability to create a flight, to revise the details of a flight during the preflight phase, to communicate with the apron crew (for pushback and deicing) and exchange messages with your dispatcher and your flight crew during the flight. It also monitors critical aircraft systems and can be used to alert you to a system failure!

This is the entire premise of ACME – combining the ACARS system together with a Crew Messaging Environment for a unified solution!

Geeky Details: What does the Installer do? It alters the panel.cfg text file for the airplane by placing a new window in it for the FCDU device, and it places an invisible gauge on the main window and the main VC window (if there is one). This invisible gauge is the FDR, the Flight Data Recorder that silently records each flight for scoring an analysis. Before it changes your panel.cfg, it makes a backup for safety named “panel.cfg_before_fsc.cfg”. If things get really messed up in your panel, you can always delete the altered panel.cfg and rename the backup to restore things to the way they were. This should only be necessary in an emergency as the Installer has been carefully tested.

Once you are done with installing the gauge you can close the Installer window and go back to the 'Welcome to FSCaptain!' dialog. You don’t need to install the FCDU right now if you want to wait; it’s easy to run the Installer anytime from the desktop icon, or the start menu, or from a button in the Administrator.

However: The need for installing an FCDU gauge has been lessened with the introduction of the standalone FCDU.EXE. If you are happy to use the FCDU, all you need to do is to run FCDU.EXE once you have launched your simulator. You can even run the FCDU.EXE from a remote PC – one that is networked with your simulator’s PC, that has a properly configured SimConnect profile, and
with sufficient Microsoft networking rights to run programs on other PCs. We won’t get into details of how to do all of that now, because we need to get you signed up with an airline!

The last button on the welcome dialog isn’t optional if you want to be a captain for an FSCaptain airline! This is where you sign up for employment:

In FSCaptain, you are choosing a career as an Air Transport Pilot (also known as an Airline Transport Pilot in some countries). An ATP is the highest classification of pilot license that all countries issue. You will be the Pilot in Command (PIC) of aircraft which will contain cargo or passengers – or both. You will be employed by an Airline who will Dispatch you on Flights in order to arrive safely, and on-time, all the while hoping to generate revenue. (But don’t worry about that – FSCaptain is not itself a business simulation. Your job is to fly aircraft to the best of your ability. The bean counters back at the home office will always find a way to keep the doors open. That’s what they’re paid to do.)
Some of the airlines are based on liveries that are provided by default out of the box in both FS2004 and FSX. If you choose a default airplane that belongs to one of these airlines not only will you look right flying for it, but the FS ATC will call you by the right airline name. Under FSX, FSCaptain will even ensure that ATC will call you by the correct flight number. There are even dozens of real world airlines for you to choose from – from (nearly) every continent! (*Sorry Antarctica, you don’t have native airlines!*)

There is even a fictional airline – Acme Air Service – which if truth be told, is the founding spirit for FSCaptain itself. (If Acme Air Service had a logo on its aircraft, it would be an image of a falling anvil….)

But let’s focus on the simulator airlines to start with. Which airline should you choose? They are all different. Here’s a quick guide:

**Easy Airlines:** *Landmark* and *Emerald Harbor* are the easiest in that they have less restrictive policies and so it’s less frustrating for a new pilot to fly for these two. They do not require you to commit to a flight during the selection process and the flight won't be logged until you land. If you crash, the crash won’t be counted against you. There are fewer requirements and so fewer ways to screw up. We suggest your first few test flights should be for one of these until you get the hang of using the FCDU to deal with the Dispatcher’s office.

**Medium Airlines:** *World Travel* and *Global Freightways* are two airlines that have a medium level of difficulty. Once you start your flights you are committed to finishing them – even if you have to start over (due to an FS crash). If you crash your airplane it will count against your career. There are some policies that you’ll need to watch out for, such as needing to turn your landing lights on before you take off, and off anytime you fly above 10,000 feet. Global is the only “cargo-primary” airline provided out of the box. If you are interested in cargo flights over passenger flights, you might want to sign up with Global. (You can also easily change one of the others to “cargo-primary” or create your own, see the section “Creating an Airline” later in this manual.)

**Hard Airlines:** *Acme* and *Pacifica* have the hardest rule-set. Once you *select* a flight you are committed to finishing it. These companies not only have all the policies that the medium ones do, but they require accurate position reporting during flight. These are closest to the reality of a professional pilot’s challenges.

Once you’ve chosen the airline you want to work for, you need to fill out some information on your employee application form. You should enter your name, indicate your gender, and enter your birth date. Following those three obvious fields are some that could use a little explanation:

**You are certified in:** These check boxes let you tell the airline the categories of aircraft you are competent to fly. This will not limit your choices in FSCaptain...but it will allow you to avoid check rides in new aircraft for airlines that have chosen a policy to make check rides optional.
**Between Passenger and Cargo you prefer**: This is the type of flights you’d rather be making. You can choose between passenger, cargo or both. This will have a major effect on the type of flights you will see offered to you by the airline. Here's how it works: If you are in an airplane that is configured as a passenger aircraft, you will see passenger flights. If it’s configured for cargo, then naturally you’ll see cargo flights. But many aircraft are designated “convertible”. If you select “either” here, then the airline’s primary role (passenger or cargo) will determine the type of flights. But if you indicate a preference here, then those are the type flights you will be offered most often.

**Between Scheduled and Charter you prefer**: This also affects the kind of flights you are offered. If you choose either you’ll see both scheduled and charter flights. If you chose a specific type, you’ll only see that type presented to you – unless there are none of that type available, in which case you will see flights of the “other” type.

After clicking “Apply Now” you are ready to make your first flight in your career as an FSCaptain!

But before you click “Apply Now” you should understand that this is an easy task you seek. As an ATP, you will be required to follow all pertinent regulations, to exercise your complete understanding of aviation knowledge, to follow all operational procedures of your airline, to understand your aircraft’s performance capabilities under all circumstances, to be fully aware of the meteorological conditions that you may encounter, to account for the human performance and limitations of your team(s), and most of all to dress sharply and neat always while in public.

There will be tests….
Multiple Installations of FSCaptain

You may wish to install FSCaptain in more than one Flight Simulator folder. For example, you may have a copy of FS2004, one of FSX, and of Prepar3D and want to have a career in all versions. To accomplish this, you need to execute the installer in all three folders so that each one has its own copy of FSCaptain and the FSCaptain databases.

You then need to decide if you want to have the same career in all versions, or not. If you do, an explanation of how to configure this situation is in section 3 of this manual, “Options for All Airlines” under the subheading of “Log File Folders.”

You may install FSCaptain in any number of Flight Simulator folders on your PC or on multiple PCs. In some cases, you may have two or more installations of a simulator with different environments, such as FSX Boxed or FSX Steam Edition. FSCaptain can be installed in all of these locations, with the same technique used above to point all databases to the same master location.

When the Administrator or the FCDU Installer program is executed it determines the location and version of the simulator under which it is installed. Each copy of the Administrator and Installer only work with the databases inside its own installation where it is located. Therefore, if you have two copies of FS2004 you must be sure to run the right copy of the Administrator program to access the databases in the copy you want. Note that the installation process will overwrite the desktop and start menu links with each new install. You must create your own links to different copies of the Administrator and Installer if you have them installed in separate places.

I have two versions of FS2004, a “modern” and a “retro” one. The modern one is in a folder called FS9 and the “retro” one is in Retro_FS9. I installed FSCaptain in both locations. I created two desktop icons for the Administrator program, one called “Admin FS9” and the other “Admin Retro FS9”. To create the retro one, for example, I right-click on the Windows desktop, select “New” from the pop-up menu, and then select “Shortcut”. I browse to the C:\Retro_FS9\FSCaptain\bin folder and click on “Admin.exe” to select it. On the next panel, I type in “Admin Retro FS9” for the name. I do the same for the other version. Thus, I have two administrators for my two separate versions on my desktop.

The Administrator and the FCDU Installer will indicate in its window title what folder it is accessing.
“FSCaptain Can't Find My Simulator”

It is possible that when you first start the Administrator, that it cannot find certain simulator files which it needs to access. In this case, you will be prompted to choose the simulator which you want to use the Administrator against.

The series of [ Yes | No ] message boxes you see to the right represent the order by which the Administrator tries to gain knowledge of your simulator.

Just click “Yes” when you get to your simulator type.
**Understanding the Administrator**

There are several programs you will use as an FSCaptain pilot. The primary one is the FCDU communications device.

The other program is documented here, the Administrator. This program lets you configure and control the entire FSCaptain system. You can do everything from change the airline you work for, to creating a whole new airline with its own elaborate schedules and much else.

The Administrator is organized as a property sheet rather than a standard Windows application. This means there are tabs across the top to allow you to select the various sections. It also means that you can change anything in any tab but you should only click on the “OK” button when you are done with the Administrator and want to save your changes and exit. Do not click on “OK” every time you make a change. If you want to save your changes immediately use “Apply”, which will leave the Administrator running. “OK” means you are done with working with the program.

It's important to understand how these two programs relate to one another. You can access the Administrator program either from your desktop icon, from the Start menu, or from the FSCaptain menu item while you are in Flight Simulator. The program is the same however you access it.

If you use the Administrator while Flight Simulator is active and the FCDU is in use, any change you make to the databases or the configuration of FSCaptain will not be effective inside the FCDU until it is reset and you login again. This is to protect the integrity of the system – unpredictable results could easily happen if you change things “on the fly”.

If you access the Administrator from inside Flight Simulator, the “Erase Last Entry” button on the Detailed Log tab is disabled. You are not allowed to change the log while Flight Simulator is active. If you need to do this, you'll need to execute the standalone Administrator from the desktop icon or the Start menu. On the Flight Dispatch page the “Commit” button will be disabled any time the power is turned on to the FCDU device. Thus, you can accept a flight assignment from the Administrator while in the cockpit, but you must have the FCDU turned off.

Other than those exceptions, no matter how or when you access the Administrator it will function per the documentation in this manual.

To manage your airport sceneries, you’ll also use the FSCaptain Scenery Scanner which combines data from many various data files, including output from Make Runways. Scenery Scanner can be launched from the Administrator by selecting the Rebuild Airport Database function.
The FSCaptain Menu

The Administrator program can run inside FS or outside FS. When it runs inside FS, it knows this, and puts a menu on the FS menu bar. Under FS2004 (FS9) this will be a separate menu item named “FSCaptain”. Under FSX, it will appear as a sub-menu named “FSCaptain” under the “Add-ons” menu heading. In either version, even though they may look different, the menu functions are the same.

Use Administrator: Clicking on this option invokes the Administrator program as documented in this manual.

Toggle FCDU Window (Ctrl-Shift-6): Clicking on this option (or using the keyboard shortcut) will make the FCDU window appear if it is hidden, and hide when it is in view.

View Dispatch Release: If a dispatch release has been prepared and is ready, then you may view it using this option. Normally this document is not ready until the loading process is complete. However preliminary versions are generated ahead of time. You should review the contents of the release carefully as they are the legal document allowing the flight to proceed. In the real world, this must be signed by the pilot in command and the dispatcher for a flight to be legally released.

Toggle Belt Switch (Ctrl-\): Clicking on this (or using the shortcut) will toggle the seat belt sign on or off. Under FSX, this toggles the actual Cabin Alert function. Under FS2004 (FS9), it toggles the FSCaptain Interface variable (ACMEBELTS), which can be used by aircraft to interface to the FSCaptain system. Even if your airplane doesn’t interface to FSCaptain, toggling this switch will be accepted by the FCDU as the seat belt switch. Warning: Most aircraft in FS2004 do not have a seat belt cabin alert switch and are configured as not having one in the Aircraft Characteristics. This means that the entire Belts function of FSCaptain is ignored. If you use this option to toggle the belt switch at any time during an FSCaptain flight, this will be detected by the FCDU and it will assume an interface is present, so you are then responsible for the operation of the seatbelt sign – it is no longer ignored.

Toggle No Smoking Switch (Ctrl-\): Clicking on this (or using the shortcut) will toggle the no smoking sign on or off. Under FSX, this toggles the actual Cabin Alert function. Under FS2004 (FS9), it toggles the FSCaptain Interface variable (ACMESMOKE), which can be used by aircraft to interface to the FSCaptain system. Even if your airplane doesn’t interface to FSCaptain, toggling this switch will be accepted by the FCDU as the no smoking switch. You may use this keystroke to alert the Flight Attendants prior to takeoff or landing by turning it off, waiting for a half second or so, then turning in on again. This will work in either version.
Alert Flight Attendant: This option will alert the lead flight attendant of an impending takeoff (if on the ground) or that you are about to land (if in flight.) These two notifications are very important for the safety of the flight attendants and you should never forget to do them at the appropriate times. There are multiple ways to do this, one of which is to select this option from the menu. You can also use a button from the Communications page of the FCDU device, but the most realistic and easiest way is to flip the “No Smoking” cabin alert switch off for about a half second and then on again. This flicking of the switch will cause an audible ding in most airplanes and is the signal to the flight attendants. However, some aircraft don’t have this switch implemented so you can use the FCDU or this menu option instead.

Say Again Please: This will cause the last verbal message from your crew to be spoken aloud again. If both the First Officer and the lead Flight Attendant have both spoken, the First Officer’s statement will be repeated first. If you invoke this function a second time, the Flight Attendant will repeat their last statement. If you invoke it a third time, the First Officer statement will be repeated yet again. And so on.

About FSCaptain: This displays the current version of the system you have installed, and shows the credits for the program.
Understanding Weather in FSCaptain

Because weather is such an important part of aviation it’s important to understand how FSCaptain obtains weather information and how it uses it – and the potential for misunderstanding.

FSCaptain obtains weather information from three sources: published information from sites on the Internet, internally from the weather that is set inside Flight Simulator during and FSCaptain flight, and optionally from a database that is a part of a third-party weather generator program. FSCaptain never changes any weather inside Flight Simulator; it merely obtains, uses, and/or reports it.

FSCaptain uses weather information in these ways:

- It uses METAR and TAF data to adjust Block Time and fuel requirements during the dispatch planning process. This METAR and TAF data are obtained from real-world weather as reported on the several Internet sources, or from the database of an external weather generator program.
- It uses METAR information obtained from the weather settings at weather stations inside Flight Simulator to determine minimum safe weather conditions for dispatch of flights and landing at destinations. Dispatch will not authorize landing at an airport below company minimums (as defined for each airline).
- It obtains current weather information from inside Flight Simulator, or from an external weather generator, to display weather reports at pilot request on the FCDU during flight.
- It uses the current external weather outside the airplane to implement the special “hazard package” that optionally intensifies the effects of icing and thunderstorms on the aircraft. The Ground Deicing feature even tracks conditions that would result in frost and/or freezing fog, even though they may not be mentioned in a METAR report.

Most simulator pilots using FSCaptain fly using real-world real-time weather. For this reason, using Internet METAR and TAF data from the Internet is reasonable. But you must be aware of the potential difference between the weather as set and depicted inside Flight Simulator and any data obtained from real-world sources. When planning and dispatching your flight using the Administrator the program will obtain the latest METAR and TAF information available at that point in time. If, however, substantial time passes between the times the flight is dispatched and when it is flown things will have changed. The data obtained by the Administrator from Internet sources is not necessarily the same used by the FS “Real World” weather option, nor is it necessarily the same source as used by third-party weather generators. While all these programs obtain “real world” METAR data, because of timing they may not match up as exactly as you might expect.

Within Flight Simulator all weather is depicted based on weather parameters set at each Weather Station within the program as you are flying. There are several ways these weather stations have their data set and it’s important to understand these sources. Remember, regardless of real-world METAR data, the weather you are flying in is determined only by what is set at these FS weather stations.
stations. The Flight Simulator world is full of weather stations. (Not all are set always – some simply do not have any weather data in them.)

These are the weather sources:

- You may define your own weather manually or select Weather Themes from the weather options. Obviously, if you set up your own weather it won't match the real-world data. You can choose to define only certain named stations, or define all of them as having the same weather.
- You can elect to use the “Real World Weather” option of Flight Simulator. This will download METAR data for all the weather stations inside the program, all over the world, and will set each to match its own METAR.
- You can use a third-party weather generator. Since these programs are specialized they generally do a better job of setting the weather at weather stations – but that is all they do (although some also modify some FS graphics to make clouds and such look more realistic but this is cosmetic and has no effect on flight.)

We’ll assume here you don’t set your own weather and either use “Real World” weather or a third-party weather program.

Either way, real-world METAR data is downloaded and weather stations inside FS are set to match it. In the case of the internal Real World weather, all reporting stations are set. In the case of third party generators (and this is critically important to understand) only a select set of stations within a given radius of the user’s aircraft position are set. The only exception is that for many third-party generators if you load a flight plan into the weather software any stations within a given radius of the destination and any way points of the flight plan are also set.

It’s important to realize that if you are using a third-party generator, most of the weather stations in the world will not have their weather set. Therefore, requests to the FCDU to report on weather at distant stations will likely report “Weather Station not set in FS” if you are using Flight Simulator itself as your weather data source. If you’re using an external program this warning doesn’t apply – all the weather information for all stations should be available in its database.

Weather data at a weather station contains more detail than is reported in real-world METAR data. For instance, many cloud layers can be defined and attributes such as turbulence and icing can be defined in different intensities in any cloud layer. Real-world METAR data does not contain turbulence and icing data. (Although FS METARs do report such.) Therefore, both the “real world” and third-party weather programs make educated guesses and combined with random factors will assign turbulence and icing to cloud layers. The FCDU reads and reports these extra attributes as Pilot Reports (PIREPS) when your data source is your simulator. (If you have an external program configured you can still see what FS has in a weather station by using an option on the weather display page. You can flip back and forth between the two sources. In fact, it’s interesting to compare in this way to see how FS has altered a station from an external METAR.)
All weather you see depicted in FS comes from these weather station settings. Third party weather generators can set the parameters and attributes more accurately, but they cannot change the depiction inside Flight Simulator except to change the graphics.

Many weather “problems” of FS occur because two different weather stations are reporting dramatically different weather. You may be flying near a station that is reporting clear skies and suddenly pass into the zone of one that’s reporting overcast – suddenly, once you pass that invisible zone line, clouds appear everywhere! Major differences in wind direction and velocity as well as visibility also lead to these unrealistic transitions. Many third-party weather programs try to deal with these effects but they can only do so much because they are external to FS and dependent to a large degree on the basic FS weather depiction programming.

The very useful utility FSUIPC can change some weather depictions and it is highly recommended that if you don’t already have a registered copy of this program you should consider doing so, whether you are using FS2004 or FSX or Lockheed Martin’s Prepare3D. The most important thing FSUIPC can do is smooth wind transitions which can be brutally unrealistic (flying at 300 knots from a weather station that has winds reported at 270 degrees 80 knots into the next one that is reporting 90 degrees at 60 knots to use an extreme example.) It can also smooth visibility transitions and fix a host of other small and large FS bugs and glitches.

(FSUIPC is not just a weather utility - it has a host of non-weather-related functions. It can offer customized hardware interface items such as axis, button and key controls, recover lost VAS, launch other add-ons, and even help to block some simulator crashes!)

FS weather does not remain static, but changes over time per weather change rules programmed into FS. Flight Simulator has an option to determine the rate of weather changes, and one of the settings is “none”, but field research tends to confirm that indeed Flight Simulator starts to change the loaded weather station settings almost at once, albeit at a slower rate. But none of the Flight Simulator family ever leaves the weather completely alone after it is set but is constantly changing it in small and large ways.
Understanding Gates and Parking

Checking the option on the “Options for All Airlines” tab of the Administrator Require an FS Parking Location to Unload will make FSCaptain aware of gates (or parking spots) in the Flight Simulator world. It's important that if you choose this option you understand how parking is defined and works in Flight Simulator and how FSCaptain uses those definitions.

All the large and medium size airports, and most of the smaller ones, have parking spots defined on them. These parking spots serve one purpose for Flight Simulator: they are the starting and ending points for flights. The user aircraft starts in a parking spot (or on a runway, unrealistically) and if under control of the default ATC will be assigned a parking spot on arrival at an airport if any parking exists there. AI aircraft always start a flight in a parking spot (if an airport has no parking it will not have AI airplanes landing or taking off there) and will always be assigned to one and taxi there when they land.

Each parking spot has four attributes that are important to us: it has a name, number, a type and a radius. Names are generally of three classes: Ramp, Gate, and Dock. Each gate is unique at an airport by its name and its number. You may have a Ramp 1 and a Gate 1 but you shouldn’t have two Ramp 1s. Gates can be further defined by a letter; you can have Gate A1 and Gate B1 and so on down to Z. Ramps cannot be so split. The name “Gate” or “Ramp” implies a larger or smaller spot but this is only an implication it has no real effect. There are eleven types of parking spots: RAMP_GA, RAMP_GA_SMALL, RAMP_GA_MEDIUM, RAMP_GA_LARGE, RAMP_CARGO, RAMP_MIL_CARGO, RAMP_MIL_COMBAT, GATE_SMALL, GATE_MEDIUM, GATE_HEAVY, and DOCK_GA. Again, these tend to imply size but in fact this too has no effect. The only attribute that define size is “Radius” which is a value in meters. Version 1.7.0 of FSCaptain begins the support of “helipads” at airports. While helipads initially won’t be seen as a valid parking area for helicopters, their presence will be noted for the Captain’s consideration.

Size is very important to a parking spot. It determines gate assignment in Flight Simulator. FS will always try to assign a parking spot to the user aircraft, or to an AI airplane, based on how closely it matches the radius of a parking spot, regardless of the parking type. Each aircraft has in its aircraft.cfg an attribute called “wing_span”. This, converted to meters and matched to the radius of the parking spots, will determine what’s assigned when you (or an AI plane) lands. The closer the match, the more certain the assignment.

Parking spots have another attribute which is not used in the default FS airport definitions but which is partly honored by the program and used by most add-on designers. Spots can optionally be assigned “airline codes” which are 1-4 letter designators. Many airlines can even be assigned to a single parking spot. For example, a gate at an airport can be given a code “DAL” for Delta Airlines, and then two gates away, the codes are for “DAL, DALX, FFT, HAL.” (In sequence, they are: Delta, Delta Express, Frontier, and Hawaiian Airlines.)

Aircraft can be assigned airline codes in their aircraft.cfg. When a code in the aircraft definition matches a code in a parking spot, AI aircraft will tend to be assigned to those spots. Thus, any AI
airplanes with a code “DAL” will wind up in “DAL” parking spots if they are defined at an airport. Disappointingly, this system only works for AI airplanes. Now while the default ATC will only guide AI aircraft to these spots, ATC will ignore the codes for the user airplane, who is only assigned a spot by the internal Flight Simulator ATC based on radius versus wingspan.

That’s where the FSCaptain dispatch system comes into play. If your airline has parking codes for a spot that can fit your aircraft – and which is appropriate to your type of flight – then chances are you will be assigned to one of your airline’s locations.

**Parking in FSCaptain**

FSCaptain uses gates / ramps on two levels: 1) The requirement that you park in a parking spot to unload (triggered by the Require an FS Parking Location to Unload option) and 2) Dispatch can assign gates to you and you must be in your assigned gate to unload (the Assign Gates option on an airline definition.)

What this means is you can enforce the requirement that you unload in any valid parking location of your choosing, and you can even add the requirement that you must use the spot that’s been pre-selected by either you or by Dispatch.

**Important:** for FSCaptain to use parking spots, it must know where they are. For this to happen you must use the option Rebuild Airport Databases the first time you turn on the options to use parking spots, and any time you add, delete or change any add on airports you may have. This option runs Pete Dowson’s MakeRwys.exe – a nifty little program that scans your sceneries and identifies airports and their facilities, and then runs the FSCaptain Scenery Scanner which combines data from MakeRunways with many other data sources to build your airport database.

**Tip for FS Nerds:** Recently it’s become *de rigueur* (that’s French for “fashionable”) to disable scenery areas in your scenery.cfg file when you will not need them for a flight. (After all, if you’re flying from Chicago to Detroit, why enable scenery areas in Africa, South America, Europe, Texas, etc. It just uses valuable virtual memory.) However, when you add new airport scenery packages to your installation, you should enable all airport-containing scenery areas before you run the Rebuild Airport Database option in FSCaptain… as well as other similar options for other MSFS add-ons. (After you’ve updated your add-ons, you can revert to your “only what I need for this flight” scenery areas for scenery.cfg.)

When you are required to park at a parking spot, but not assigned to one, it means you can unload at any open spot at the airport. The trick is to get into one. FSCaptain uses the “radius” attribute to determine whether you are there or not. It doubles the radius figure of a parking spot and if you are that many meters away (or closer) regardless of the direction you are pointing, you are considered “in” the spot and allowed to unload. When you are not yet in a spot, the FCDU Flight Status page will offer guidance to the nearest gate, depicted as “Nearest (123/456M)” where ‘123’ is the heading to the gate and ‘456’ is the number of meters distant you are from its center point.
As you move about the airport the “nearest spot” will change. You are not required to park at the nearest spot. If MS ATC has assigned you a spot, taxi to it and FSCaptain will allow you to unload once you are in it.

If you are not using MS ATC finding your spot may be challenging (this can be true in the real world.) There are some external programs that can help. A free version of the FollowMe package for FSX is available on the FSCaptain Website (see the “File Exchange” section.) A fine payware solution for FSX installations is GSX from FSDreamTeam, which adds much more than a follow me car. Another great add-on that works with FS9 and FSX is AES from Aerosoft. It also adds more to your airports than a follow me car.

If you have been assigned to a gate it will only be because your airline definition has selected this option, and your challenge is higher. You will know you have been assigned a gate by four indicators: 1) It will be written in the remarks section of the Dispatch Release document, 2) You can see it on the Information page accessible from the Progress page of the FCDU, 3) When Dispatch clears you for approach via the clearance FCDU message they will tell you what your assignment is, and 4) on the FCDU Flight Status page you will see the text “Assigned (123/456M) after you land at your destination. The 123 is the heading to your assigned gate and 456 is the distance in meters to its center point. When you have arrived in the gate the heading and distance will disappear.

When parking destinations are assigned during dispatch it’s assumed they will be open. When you arrive however this may not be the case. AI aircraft may be parked in your destination parking spot. If this happens, dispatch will assign you to another open spot and send you a message that your gate assignment has been changed. If before you arrive there another AI aircraft occupies that spot, you can be assigned to yet another open gate.

It is possible that an airport does not have parking spots large enough for your aircraft and it is also possible that it does but after you land all are occupied by AI airplanes. In the first case, you won’t be assigned a gate and you are authorized to park at any gate – as if the gate assignment process was not in use. If after you land there are no parking spots available for you, Dispatch will send a message stating “NO PARKING AVAILABLE, PARK AS CLOSE AS POSSIBLE.” In effect, this means all gate rules are suspended for this flight and you can unload anywhere at the airport.

However, if you have SimConnect (or the fully licensed version of FSUIPC), the FCDU can be configured to “clear” AI aircraft from your assigned parking spot. It’s a process that does not need to be triggered by the user, and by default will remove rogue parked AI 70% of the time. (The level at which this is triggered can be adjusted in the OPTIONS.CFG – see Appendix 4: Special Options and Features.)

FSCaptain assigns parking spots based on different rules than standard FS. No parking space is considered for assignment unless its radius is equal or greater than the wingspan of your airplane.
The wingspan of your aircraft is not taken from the aircraft.cfg but is based on the “volume class” as follows:  
Tiny: 5 meters, Small: 10 meters, Medium: 15 meters, Large: 24 meters, Heavy: 24 meters.  These may seem less than real life, but based on research into the radius of average parking spots as defined in the default Flight Simulator these numbers were picked so that a “Large” aircraft would fit into most “Small” gates, and “Heavy” would fit into most “cargo” and “heavy” gates.

For all matching parking locations, FSCaptain first tries to find a match for your flight type (PAX or Cargo) to the type of parking area, favoring a “Gate” for PAX, and “Ramp” or “Dock” for cargo. It also tries to match any airline codes to the “Designator” code on the airline definition if codes are on the parking spots and a designator is defined. If the airline code match fails, it tries on flight type. If the flight type fails, it goes for any spot that will fit. Thus, it is possible that your passenger flight could be assigned to a cargo parking spot, if, for example, that was the only spot available at the airport large enough for your aircraft. There is a certain randomness built in: when multiple spots match the criteria, the spot is selected randomly from the candidates.

One other criteria that FSCaptain honors is that if you’re flying a small GA type aircraft, FSCaptain will try to select a non-gate parking spot. It’s normally not usual to have a Beechcraft or Cessna turboprop parking among jumbo jets, and using a jetway for passengers!

Another quirk is that some airport scenery developers choose “military” type designations for their ostensibly “commercial” parking spots. (They have their reasons, one of which is to suppress commercial vehicles & pushback tugs in the area.)

FSCaptain will always favor a non-military parking area, but if the only open spot that would fit your aircraft has a military type, that spot will be assigned for your use.

If you’re using the Administrator to plan your flight, you’ll see the Destination Parking selector populated with all possible parking spots, listing their Types, Names and Numbers along with their parking radius (in meters) and any special flags to help you select a spot. These flags include “A” for Airline Code Match, “C” for Cargo parking, “M” for Military Cargo parking, and “O” for Military Combat parking.

Here’s an example for a PAX flight to LSZH (where they have wonderful coffee shops!) showing that we’ve been offered to park our airliner at Gate E 56, where our airline has a lease. If we were flying with another airline that did not have a lease, as long as our aircraft had its own staircase, we could consider one of the “Terminal F” gates which are marked as Cargo, and could then arrange for a small bus to transport our passengers to the terminal.
FSCaptain Integration with FSDreamTeam’s GSX

FSDreamTeam produces an add-on for the same Microsoft/Lockheed Martin flight simulation environment the FSCaptain runs under that adds an extra layer of realism and authenticity to ground operations at airports. It works for any aircraft and any airport and most if not all the FSCaptain development team routinely use it to enhance their flights.

FSCaptain is aware of GSX so that during ground operations before a flight starts and goes “on the clock” all GSX procedures can be detected and woven into the flow of preparation that our Captains are accustomed to. This integration is completely optional. Unless you invoke GSX services during the FSCaptain load process, nothing will change. But if you do, you can expect FSCaptain to see and react to them in logical ways that enhance the realism of the simulation. All GSX services are detected and reacted to in the following ways:

**Deboarding**

If you are in the midst of a multi-leg passenger flight, once you go IN at your parking spot, you can call GSX to deboard your passengers and their baggage. If your aircraft is configured for “exit mapping” and if you have allowed your crew to handle all doors, they will open your passenger and baggage for you.

If the GSX process is underway after the ACME process completes and if you are ready to start your next leg… if you are using the option HONOR_OTHER_GROUND_SERVICES=1 you will not be 'Cleared to Load' nor ‘Commit’ on the FCDU until all GSX deboarding procedures have completed.

**Fueling**

After a flight is resumed or created on the FCDU and PROCEED has been selected from the Flight Review and before loading begins (typically this would be on the “READY TO LOAD” page) if you invoke the GSX fuel truck by using the standard GSX menus then when the fuel truck arrives FSCaptain will load the flight’s requested fuel into the fuel tanks and send an FCDU message to the pilot to that effect.

If you are using the option HONOR_OTHER_GROUND_SERVICES=1 you will not be 'Cleared to Load' nor ‘Commit’ on the FCDU until all GSX fueling procedures have completed once started.

We recommend that if you choose to do this that the option on the GSX ‘aircraft customization’ to bring up the FSX/P3D 'Payload and Fuel Box' be unchecked. This is because FSCaptain will do the loading for you seamlessly, you don’t need to use the menu item dialog box. If you choose the GSX option for “progressive fueling” they will simulate taking time to fuel your aircraft once they arrive.
**Catering**

Any time before the flight begins (even before you turn on the FCDU) you can request catering services from GSX using the standard menus. When catering services are completed, if the FCDU is powered up, an FCDU message will be sent informing you that catering is completed.

If you are using the option HONOR_OTHER_GROUND_SERVICES=1 you will not be 'Cleared to Load' nor 'Commit' on the FCDU until all GSX catering procedures have completed once started.

**Boarding**

Once any fueling and catering services are completed, you may request boarding from GSX using their standard menus. If you do this, then you will not be 'Cleared for Departure' on the FCDU until all GSX boarding procedures are completed.

*Technical Note:* all GSX passenger ambient sounds are in the fsdreamteam/couatl/gsx/sounds folder and are named beginning with the words “Airplane_Boarding” or “Airplane_DeBoarding”.

**Pushback/Departure**

Once you are 'Cleared for Departure' (page 22) on the FCDU you are free to use the GSX pushback procedures from their standard menus, or the FSCaptain pushback system, or any other that will get you out of the gate. If you are on FCDU page 22 (CLEARED FOR DEPARTURE) you can start the GSX pushback immediately, or you can select the PUSHBACK option and start the GSX pushback from the FCDU pushback page (70). If you start it from the FCDU page 70, it will monitor the progress of the pushback and integrate some of the FSCaptain pushback dialog with the GSX dialog.

**GSX Deicing**

If certain criteria are met (the common ones are a temperature of 4C degrees or colder and an aircraft wingspan of 22 meters or more) the GSX Pushback procedure will offer you the option of performing a deicing procedure before the pushback begins.

Whether you started the GSX pushback from the FCDU page 22 'Cleared for Departure' or the FCDU page 56 'Pushback', if you choose the GSX deicing option you will automatically be switched to the FCDU page 70 'Deicing' which will then monitor the progress of the GSX procedure while interleaving ACME voice dialog with the GSX dialog. When the procedure is complete you can press PROCEED or RETURN to get back to the Pushback page where the pushback will resume when you select the direction from the GSX menu which appears once deicing is complete.

You may also start GSX deicing from the FSCaptain Deicing page (70) directly simply by selecting the GSX menu option for pushback, then selecting 'yes' when asked about deicing. If all you want
to do is deice and push back later, you can cancel the 'pushback direction' menu GSX will eventually present to you by pressing the GSX menu key (usually, CTRL-F12).

**A Typical Procedure for using GSX with FSCaptain**

1. Power up the aircraft and turn on the FCDU.
2. If you want, you can call for GSX catering now to get it started early. Do not call for boarding or departure yet. You may call for fueling after calling for catering.
3. Either resume, select, or create your flight using the FCDU.
4. For your first flight of your session, when you select MANUAL or NORMAL LOAD on the 'Flight Review' page (that’s lucky page 13), your aircraft’s fuel will immediately drop to the “pre-set level” as noted on your Aircraft Configuration data. (This will allow GSX to take time to simulate adding fuel.) If GSX catering or fueling has been called or is otherwise is underway, you will not be able to process if you are using the FSCaptain option HON-OR_OTHER_GROUND_SERVICES=1.
5. When the GSX fueling truck arrives, if you are still on the Flight Review page you will not be given the chance to select MANUAL or NORMAL LOAD. Once the GSX fuel truck connects, you will be allowed to start your load, which will begin the ACME fueling process (if your FSCaptain options allow).
6. Carry on with other cockpit duties until you get FCDU messages that fueling and catering are complete. You are then ‘Clear to Load’ assuming all other conditions have been met.
7. As soon as you are 'Clear to Load' you can call the GSX boarding function if you want to. GSX does not broadcast how long they will take in this process so attempting to synchronize ACME loading with GSX loading is a matter of trial and error.
8. Proceed with the ACME loading and boarding until it is complete.
9. Once all GSX and ACME pre-loading and loading operations are completed you are CLEARED FOR DEPARTURE.
10. If deicing is required, select DEICING from the ACME 'Clear for Departure' page (22).
11. From the deicing page (70) you may continue with the ACME procedure, or simply use the GSX menu to call for Pushback then select deicing 'yes'. If GSX deicing is not offered, cancel the Pushback (with your GSX key combination or your custom GSX menu key) and use the ACME procedure.
12. Once deicing is complete, if you used the GSX procedure you can continue with the pushback by selecting a direction from the GSX menu, or you can cancel with your GSX menu key operation, return to the FCDU, then later select the PUSHBACK page and start the GSX pushback again from there, declining any deicing option since you've already done it. GSX does not broadcast which anti-ice types were used, so the ACME system will give you a generous Holdover Time – although not one that matches the published HOT for the weather and the deicing process used.
13. Once all pushback and deicing procedures are complete the FCDU will automatically switch onto the 'Flight Status' page and you are 'on the clock'. Have a great flight!
Saving and Restoring your Flights

Introduction
While you are flying and the FSCaptain FCDU is monitoring your flight, you can save the state of the FSCaptain data and later restore it. This can restore you to a saved point before a crash. Saving is very easy to do and restoring is only slightly less complex. So long as you save your data you don’t have to fear losing the flight and having to start over. You can resume at the last point your data was saved as long as you follow some easy to remember guidelines....

If you are flying under FSX & P3D versions 2 & 3, FSCaptain will automatically monitor the simulator looking for save flight operations. If a save occurs FSCaptain will detect it and will save the FSCaptain data also. Later you can restore that flight using the simulator’s restore facility (“Load Flight”) and then once your cockpit is accessible you can use the FCDU to restore the FSCaptain data and resume the flight. This save flight detection works anytime a flight is saved, including when using the FSUIPC AutoSave facility. If you are a registered user of this utility and have your flights being saved at regular intervals, your FSCaptain data is automatically saved too.

The other way of saving is a manual process using the FCDU – just click the Menu key, and then select SAVE>. If you haven’t saved your simulator flight data recently, this may not allow you to synchronize the two save files. Remember, you need to save both simulator and FSCaptain data!

However your data is saved, it's important to understand the relationship between MS Flight Simulator standard data, special data that may be present in a complex add-on, and the FSCaptain data set. Whenever you use the 'Save Flight' action in FS a copy of your flight will be saved under a name you choose in your 'Flight Simulator Files' folder. If you are flying an add-on aircraft, it too may detect this save and save its own special data where it chooses to do so. And thirdly, FSCaptain will detect the save and write out a copy of its current state in a file in the folder \FSCaptain\Data\Saves. The file will be named by the airline and the aircraft type, for example, Acme_MD80.sav is a file saved of the last Acme flight in the MD80. This is important to realize because only one save is kept per aircraft per airline. If you were to save an Acme flight in the MD80, then start another Acme flight in an MD80 and save that flight, the data from the first flight would be overwritten and you wouldn't be able to restore it. However, as of FSCaptain 1.7.2, a backup of that file is made which you can use to refresh the targeted “save file” if that’s needed.

The other factor that’s important to keep in mind is that the pair of save files (the one the simulator saves and the one FSCaptain saves) should be thought of as a matching set. When you go to restore the flight to resume it, you must first restore the flight inside the simulator, and then restore the data from the FCDU. When FSCaptain restores a flight it checks to be sure the data being restored matches the current situation. Obviously the airline and aircraft must match, but also the aircraft must be positioned at approximately the same point in space that the FSCaptain data was saved at. To use an extreme example you may have crashed just after takeoff but you don’t know where, so place your airplane on the departure runway to restore it. The location of your airplane must be within 15 nautical miles and 5,000 feet of altitude to successfully restore an FSCaptain save.
Saving a Flight
Under FSX or P3D, simply save your flight using the FSX menu 'Save Flight...' at any time, or use the FSUIPC AutoSave facility, or press the semicolon key. This insures the best chance that your simulator save file and your FSCaptain save file data will match up. Be sure you know which save file matches to this FSCaptain data.

To manually save a flight (FSCaptain data only!) from the FCDU, simply press the MENU key at any point and then click on the line select key next to SAVE. There is no reason to do a manual save in FSX, since it's done for you, and you should always do an FSX save when you do an FSCaptain save. But under FS9 you need to do this manual save, using this method, and then immediately do an FS save using the 'Save Flight' menu or the semicolon key. If you wait until you've flown more than 15 miles away from the point where your FSCaptain data was saved then the two files won't match up and you won't be able to restore the situation.

Auto saving your Simulator Flight Data
Everyone here at ACME Industries (Our motto: “Our motto changes daily!”) is a registered user of FSUIPC which has a wonderfully easy to use function that allows its users to automatically save FSX/P3D.

However not every Captain has a registered copy of FSUIPC. So we have added the optional ability for FSCaptain to request the simulator to perform a save at a frequency each Captain can specify. These four options – also noted in Appendix 5 – control how this feature is controlled.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIM_AUTOSAVE_CLEANUP=1</td>
<td>1 = Removes all simulator save files generated during the flight after going IN and updating your company log. Default is 0.</td>
</tr>
<tr>
<td>SIM_AUTOSAVE_FILES=0</td>
<td>The number (0-16) of autosaved simulator files to generate per flight. 0 = Disables simulator autosave.</td>
</tr>
<tr>
<td>SIM_AUTOSAVE_ON_GROUND=0</td>
<td>Sets autosaving of simulator files while on the ground. 1 = Before takeoff. 2 After landing. 3 = In air and both ground phases. 4 = Only while on ground. 0 (Default) = Simulator autosave will only occur in air.</td>
</tr>
<tr>
<td>SIM_AUTOSAVE_SECONDS=180</td>
<td>The number of simulator seconds between simulator autosaves. Range is 30 to 1800, default of 180.</td>
</tr>
</tbody>
</table>

Of these options, SIM_AUTOSAVE_FILES is the one that can enable/disable auto-saving. Set it to zero to disable FSCaptain Sim Autosaving, or set it to a value of how many save files you wish to keep. (With a max of 16 files.) SIM_AUTOSAVE_ON_GROUND allows you to save while on the ground (useful when you run out of VAS just as you’re parking!), and SIM_AUTOSAVE_SECONDS sets the duration between saves. (It’s not an exact count, but very close.) Finally, enabling the option SIM_AUTOSAVE_CLEANUP will remove all the auto-save files after you’ve gone IN and logged your flight. Some Captains might want to archive such files, so this can be disabled if preferred.

Captains who use other utilities which auto-save only while in the air can use the SIM_AUTOSAVE_ON_GROUND=4 option to have FSCaptain auto-save while on the ground.
Restoring a Flight

Restoring is where you save your bacon by getting back to where you were before the sim crashed without having to start over. It's not complex or dangerous to restore but it can be slightly tricky because of the need to match up FSCaptain’s saved data with your current flight situation, and also potentially because it can be a bit of trouble to get some airplanes to restore their systems properly in the simulator. **You need to be sure the flight situation is restored and stable before doing the FSCaptain restore** or you could incur penalties from FSCaptain detecting undesirable settings of the systems or abrupt flight maneuvers as the situation stabilizes.

The procedure for restoring is the same in FS9, FSX and P3D, are almost the same. Follow this procedure:

1. Start Flight Simulator and select "Load Flight" then click on the saved situation you want to resume. Be sure that the one you pick is the one that has your airplane in roughly the same point in space that it was in when you saved the FSCaptain data.
2. Once your flight loads, let it run for 10-15 seconds in order to have all switches and controls to restore their saved values. Then press the P key to pause the simulator.
3. Once you are in the cockpit again be sure the airplane is in the state you want it to be in. Some complex airplanes don't restore all their settings after an FS situation load so be careful that lights and other vital controls are correct before proceeding - or you could get a penalty. You may need to un-pause to flip some switches. Just be sure you don't fly over 15 miles while getting this set up before you do the next steps.
4. Bring up your FCDU – either the gauge window or the FCDU.EXE.
5. Power up the FCDU (it will power up while the simulator is paused).
6. On the FCDU click on MENU, then click on RESTORE
7. Once you have restored your flight, the page you were viewing at the same the state was saved will appear.
8. Un-pause the simulator. You are now where you were at the point where your flight and your FSCaptain state were saved.

Problems in Restoring

You can receive several error messages when you attempt to restore. Here they are and how you can avoid them.

**LAT/LONG MISMATCH** or **ALTITUDE MISMATCH** – if you see either of these it means your aircraft isn’t currently located near the same point as it was when your FSCaptain data was saved. This probably means you've picked the wrong Flight Simulator situation file to restore. If you are using the FSUIPC AutoSave facility but are saving multiple files always pick the most recent save. This is the one that will match up with the FSCaptain save. (Comparing the files’ timestamps can help.) Repeat the restore procedure with the correct situation.

**NO SAVE FILE FOUND** – this probably means you are in the wrong airplane, or with the wrong airline, since that’s how the save files are named.
WRONG VERSION – each version of the save file format is marked. Versions change from one release of FSCaptain to another as more data items are added with new features. Simply put, you can't restore a flight saved by a different version of FSCaptain.

INCORRECT SAVE FMT – the restore data did not go where it was expected to go. This could be an FSCaptain bug, it could be that you are trying to restore to the FCDU.EXE from a gauge-saved file, or it could be another variation of the WRONG VERSION problem.

Recovering an Overwritten Save
If you regularly save your flights and you’re are in the latter legs of a long transcontinental flight and run out of VAS – no worries! You know that all you need to do is to just restore the last simulator saved flight and when you stabilize your aircraft and go to restore your FSCaptain save, all should be in sync.

But what if something occurred that would disrupt your FSCaptain save file? For instance, what if your VA needed you to make another flight in the meantime using the same type of aircraft?

Starting with FSCaptain 1.7.2, each of your FSCaptain save files will generate a copy using your flight number and the year/month/day/hour/minute/second when your flight starts. So taking our earlier example, your backup file would be named Acme_MD80_9435_20160502_195741-backup.sav. Just make a copy of it using the filename that would be loaded into the FCDU – Acme_MD80.sav.

Final Observations

We would recommend that you try out the save and restore procedures before you need them. That way you’ll be more familiar with the concepts. Start up a short flight, save it midway through, shut down Flight Simulator, and go through the restore procedure.

It can be tricky to restore a situation, and this has little or nothing to do with FSCaptain. For example, the PMDG 737NGX under FSX does an excellent job of saving its internal data and restoring it. But the airplane has a built-in 15 second pause where it is initializing its systems and this won’t happen if you pause the simulator. So even though you probably saved a situation with the autopilot flying LNAV and VNAV for you, for 15 seconds of flight you won’t have an autopilot after you restore. At the end of those 15 seconds the autopilot will kick in suddenly and the airplane may make an abrupt movement to get back on course. If you have restored your FSCaptain data before this happens your newly awakened PAX will probably be upset and you risk a “rough flying” penalty. To avoid this carefully hand-fly the NGX until the autopilot resumes its control.
Other aircraft, even default ones, sometimes do not restore the settings of even simple things like brakes, NAV lights, or landing lights. Be sure everything is how you need it before restoring FSCaptain – allow 15 to 30 seconds to elapse and double check all necessary aircraft systems again!

Finally, if you are about to upgrade FSCaptain to a new version, your previously saved flights cannot be reloaded. We’re constantly making changes and since it’s possible that the save/restore file format may have changed, we had to add a version number match!
Section 2: Your Career

When you fly using the FCDU device to sign up for a flight with your airline, every detail of that flight is recorded in the FSCaptain log files. That information is used to evaluate your career with your airline. Here’s how a career in FSCaptain works.

Pay Grades
Each airline has up to 10 pay grades (it may have fewer although all the default ones have 10). The names of the pay grades and the pay rates may vary by airline, but the requirements to advance from one grade to the next are the same across all airlines. This is so that players are all climbing the same ladder. For example, the Angel airline defines these pay grades:

This means that as a “qualifier” you will earn 25 dollars per hour (currency does not have to be in dollars, it's configurable, see the section “Creating an Airline” below). The next step up is “Probationary” at 40 at hour, and so on all the way up to “Angel Ace” which is your goal – at 200 an hour you are being rewarded for being the expert professional you're proved yourself to be by getting that far. It isn't easy, but it’s doable – there are many FSCaptains out there who have made it to Level 10.
What are the requirements for advancing to each level?

Advancing to a higher level (except for 1, the starter level) requires three conditions:

- A number of flights flown at the previous level,
- A total number of hours flown in your career so far
- A minimum average score in the previous level:

<table>
<thead>
<tr>
<th>Level</th>
<th>Flights at previous level required</th>
<th>Total hours required</th>
<th>Average score required</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>10</td>
<td>75</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>50</td>
<td>80</td>
</tr>
<tr>
<td>4</td>
<td>15</td>
<td>100</td>
<td>80</td>
</tr>
<tr>
<td>5</td>
<td>20</td>
<td>200</td>
<td>82</td>
</tr>
<tr>
<td>6</td>
<td>25</td>
<td>250</td>
<td>85</td>
</tr>
<tr>
<td>7</td>
<td>35</td>
<td>350</td>
<td>88</td>
</tr>
<tr>
<td>8</td>
<td>50</td>
<td>500</td>
<td>90</td>
</tr>
<tr>
<td>9</td>
<td>75</td>
<td>750</td>
<td>92</td>
</tr>
<tr>
<td>10</td>
<td>95</td>
<td>1000</td>
<td>94</td>
</tr>
</tbody>
</table>

For an example, to advance from level 1 to level 2, you must have flown at least three flights at level 1, for a total of ten hours, and have an average score of at least 75. To advance to level 3, you must have a minimum of five flights in level 2 (the flights you made in level 1 don’t count towards the level 2 advancement), you must have flown at least 50 total hours (in all levels), and you must have a minimum score of 80 in level 2. It’s important to realize that your average score is reset at the beginning of every level.

(The details on how scores are computed are explained in Appendix 1 “Score Computation”.)
Career Evaluation

In addition to climbing the pay ladder, your performance is constantly being evaluated by the Chief Pilot's office by looking at overall trends in how you are doing your job. The result of this is the “Quality Point Average”, which is a number which can be positive (good) or negative (bad) based on points awarded to you based on performance.

This evaluation starts with the “Career Summary and Achievements”:

![Achievements Tab](image)

This tab will list all the positive things you're done overall in your career. You get a commendation for each pay level you gain, and each time you score over 100 on a flight. In addition, you can receive many awards for special achievements such as landing with broken equipment, arriving on-time often (and even arriving on-time always!), or simply by landing smoothly, as well as many others.
The second tab is the negative one, “Areas of Concern”:

Here you see those things you aren’t doing so well. The explanations should be self-explanatory. It’s important to note that these are recent trends – it’s possible to “grow your way out” of trouble here by cleaning up your act and correcting these areas of concern. If you stop committing the sins that led to these rebukes, they will drop off here eventually.

The above two tabs of information and evaluation are based on the detailed flight log recorded for your every flight. You can access this log with the tab “Flight Log”:
Flight Log

You see your name and your employer. Below that, every single flight you've made for that airline is listed. Every column here should be obvious, up to the one to the right of the PAX. 'Grd' is the score for that flight (Appendix 1 details how scores are computed.) After that you'll see the total money you were paid for the flight and the pay level. Following that is the Level Score ("LS"), which is a running average score for that level. This is the score that's used when it's time for your promotion. After that is the Level Hours ("LH"), the number of hours (rounded down) after the flight was completed. Then it’s your Average Score ("AV"), your current ranking with your airline. And finally the “comment code” which is dashes (“--”) for a normal flight. If the flight didn't end normally, this code gives the reason, and the possible reasons are listed on the tab at the bottom.

Below the table and on the right is a button called “Erase Entry”. We all know sometimes Flight Simulator can unfairly cause crashes or create other bugs that are unrealistic for us, and that sometimes these problems can result in an unfair score. This will solve that problem. If something hap-
pens that just isn't right and you wind up, say, crashing on a tiny invisible blip on a runway – you can come here and erase that flight. Click on the flight number you want to erase first.

Note: the “Erase Entry” button is disabled (grayed out) when you are using the Administrator from inside Flight Simulator, to prevent conflicts.

On the far left side is a button marked “View Details”. To see more information on a flight, including the detailed computation of the score, click on the flight number (the actual flight number, not just the line the flight is on) and press View Details. You'll see this:

![Log Entry Details](image)

This shows you how your score was computed and much more details of any flight.
If your aircraft or cargo suffered any damage during the flight, special damage codes will be listed:

- **g** = Exceeded minimum G Force.
- **G** = Exceeded maximum G Force.
- **L** = Landed too hard.
- **H** = Hypoxia. (You strayed too long above 11000 feet in an unpressurized aircraft.)
- **C** = Crashed.

And yes, there could be multiple reasons for damage... and they all add up.

Note that on the Details dialog there are two special buttons. You can assign a flight ID that’s different from the FSCaptain one if you belong to a VA and need to do this. And on the right, a button is available for you to appeal any or all of the penalties shown on the dialog above, and potentially erase them.

**Appealing Penalties**

A penalty accessed against you can be appealed and removed. Each penalty has a price to remove it in points, with the number of points each costs related to the severity of the penalty (worse penalties cost more to erase, of course.)

The points available to you are based on your “Quality Points” computed by the system and shown at the top of the “Areas of Concern” page. Basically, you receive positive quality points for doing good things, and negative ones for doing bad things. The grand total indicates how you are doing in your career, and they can be used to remove penalties.

Once points are used to erase a penalty, they are gone from your pool. A penalty erasure is permanent; you cannot restore the penalty once you have accepted the removal. The total pool available at any point in time is your total quality points minus all the points you have previously used to remove penalties. It’s possible this total could be zero or negative, if for example you used up all your points and then had an “area of concern” pop up that reduces your quality point total. If the pool goes negative that doesn’t restore any previously removed penalty, it just means you can’t remove any more until you build up your quality point total.

As of version 1.7.2, two options are available which allows each Captain to adjust the cost of Quality Points to remove a Penalty Point (the standard cost is 10 QPs) and to set the minimum amount of Quality Points necessary to lodge an appeal. You can find these options in Appendix 5.

These options could be used to make an appeal much costlier, or to effectively make appeals “free of cost.” This can be useful for those Captains who fly aircraft that have design decisions such that they bounce so hard while in taxi that they “take flight” and land with enough force to render a “rough flying” penalty. (Yes, there are such!) Use your best judgement in these matters. Remember, FSCaptain is not a competition, so you alone are accountable for your flights.
The Appeal button will not be enabled if there are no penalties assessed for this flight, or you don't have enough points to appeal. If you click on the button, you'll arrive at the Appeals dialog:

![Appeal Penalties dialog](image)

In this example there are three penalties assessed against the flight. Below you can see that this pilot has only 35 points still available. Therefore, Penalty number 1 cannot be erased as it cost 50 points to do that. A choice between 2 and 3 is possible. Once either of these is removed, there will only be 5 points left.

Remove a penalty by clicking on (and therefore highlighting) the item number, then click on “Remove Penalty”. You'll be asked to confirm, and once you do the penalty is *permanently* erased from your record, and all scoring is updated. This can have an immediate effect on your career. For example, erasing a penalty could bring a flight score from a C+ up to a B. Imagine you have enough hours to get up to the next level but are held back because it requires a B average, and this change raised your average in your current level to a B. Presto! You are the next grade up, and this will be immediately shown on the Flight Log page.
**Reviewing your Dispatch Releases**

Beside the View Details button is a button that will allow you to review the Dispatch Release for your flight. A Dispatch Release is a formal binding establishment of a flight under *domestic*, *flag* (international), *commuter*, or even *supplemental* and *on-demand* operations. It’s an agreement signed by the Pilot in Command and a Company Dispatcher which lays out the details of the flight.

The ACME Dispatch Release combines elements of real-world dispatches releases (aircraft info, crew info, required fuel, flight plan data, etc.) with elements of “load manifests,” NOTAMs, current weather information, and any “Risk Factors” attached to the flight. We’ll go into details about Dispatch Planning shortly.

This image shows your basic flight information, fuel and weight data, and some weather information. A very detailed view of a Dispatch Release can be found in the accompanying *A Guide to FSCaptain Dispatch Releases* in the \FSCaptain\Documentation\ folder.
**Exporting your Flights to your Virtual Airline**

The Detail Log page has the facility to export your flight details to a virtual airline over the Internet directly. To use this feature, the virtual airline must be using scripts that are compatible with the venerable FSPassengers system for reporting flights, and they must have provided you with a small set of standard configuration information such as a user name and password.

Each entry in the FSCaptain log has a status attached to it – this is the second column right after the flight number. This status can be “Open”, which means the flight is either currently in progress or is on hold awaiting a pilot (you) to show up at the departure airport in the appropriate aircraft. Or, it can be “Closed” which means the flight is complete. There is a third status: “Sent”. This means the flight has been exported to your virtual airline through this reporting system.

When a flight is marked “Sent” it will not be sent again. You can control the status of a flight by “marking” it. To mark a flight, click on the flight number (not the line, the actual number) then click on **Mark Exported** or **Mark Unexported** as appropriate. You could use this marking ability to mark a flight that has not been sent, if you don’t want to send it. Or to mark an already sent flight as not exported if you need to re-send it for some reason.

The other button on this dialog is **Export**. This is where you actually do the export operation. When you click on this button you will see something that would look like this:

![Virtual Airline Export Dialog]

At the top you see that it tells you that you have one flight ready for export to “FSCaptain Default VA Configuration”. In most cases what will be displayed here in the name of your virtual airline as you set it up in the configuration. If you see you have no flights ready for export that means that there are no flights in your log with a status of “Closed”.

Page 47
There are four options:

**Mark All Flights Exported:** This will change the mark on all flights in your log with a status of “closed” to “Sent”.

**Unmark All Flights:** This will change the mark on all flights in your log with a status of “Sent” to a status of “closed”.

**Configure:** This is where you can configure your connection to your virtual airline. When you click this the following dialog appears:

![Configure Virtual Airline dialog](image)

You must properly fill in each of these boxes with the correct information to hope to have this connection work. Alternatively, if you have received an FSPassengers “VaFsPassengers.cfg” file (normally found in the FSPassengers\config_va folder) from your virtual airline you can use Windows explorer to drag that file to the \FSCaptain\Config folder and rename it to “VADefault.cfg” and this will set your configuration to what is in that file. You can modify that here in the Administrator in this dialog if you need to but normally you shouldn’t need to.

**Name:** This is the name of your virtual airline. It's displayed at the top of the Export dialog (see below) but otherwise it’s used for matched to anything.

**Site URL:** This is the Web site of the Virtual Airline. This must, obviously, be spelled correctly for a connection to be made.

**Export:** This is the location and name of the script your VA uses to accept flight data. Your VA will provide this.

**Username:** Your user name as provided by your VA.
**Password:** Your password as provided by your VA.

**Convert to FSPassengers Result Style:** This option lets you control how the export process sends the “Flight Result” text. The default behavior is to send this as the FSCaptain letter grade score and numeric score – for example “B+ (91)”. However if you check this option the Administrator will translate the FSCaptain result into the words “Perfect” for any A grade, “Good” for any B grade, “Average” for any C grade, “Poor” for a D+, “Very Poor” for a D, “Bad” for a D-, and “Horrible” for any grade of F.

**“Export Now”:** This means to export all the available flights now. If you click this the blank text box will have status information displayed in it:

![Virtual Airline Export](image)

In the normal, successful case you will see something like the display above. If there were problems, you will see error messages. In the example above “*** Well it appears to work ***” is the welcome message from the virtual airline which is likely to be something along the lines of “Welcome to ABC Virtual Airlines” but this depends entirely on how the system is configured for each airline. The last line will say “A total of X were exported”, or “No flights were exported.”
It is possible to receive several error messages during this process:

**Windows TCP/IP Socket Init Failed**: There is a serious problem with your internet connectivity. It's likely you can't get on the internet at all and you must resolve this problem before you can export any flights.

**Unable to connect to host**: Probably the “Site URL” option in the configuration is not typed in properly, or the VA's website is temporarily down.

**Connection Timed Out...Disconnected**: The “Site URL” is properly typed in, but when trying to connect to the VA's website the connection could not be made. Probably, the website is down. You should try again to see if you connect.

**Invalid or Unknown Answer from Host...Disconnected**: A connection was made but the response data from the web site could not be interpreted. This is an issue you'll have to work out with your VA.

**Invalid Username or Password...Disconnected**: The user name /password pair was not accepted by the website processing script.

**Unable to send...disconnected**: After getting a valid acceptance from the VA, attempts to send the flight data were not able to be completed. This could be a temporary Internet condition and you may want to try again, if the problem persists you must contact your VA.

**Send timed out...disconnected**: This could be a temporary condition, but if it persists you must contact your VA to resolve the issue.

**Flight X Already Exists in Database**: The flight you sent appears to already exist in the VA's database (at least that's what they told us when we sent it.) This happens when a flight is sent with the same Flight ID and the same departure, destination and local departure time as an existing flight.

**Flight X was NOT exported**: If any error occurred on a flight export you will see this message. If you do not see any error message, each flight was exported successfully.
Section 3 - Flight Dispatch

This tab allows you to browse for available flights using a set of criteria, select one that you want to fly; then using an existing MSFS flight plan along with weather information (from an external source) you can determine an accurate Block Time and Fuel burn, and finally you can book the flight so that it is a committed flight that the FCDU will recognize when you appear in Flight Simulator at the scheduled airport in the scheduled aircraft type.

![Flight Dispatch Interface](image-url)
The process of creating a flight on this tab proceeds in three phases:

**Phase 1 – Selecting a Flight**
You are required to enter a date (today’s date will be provided as a default date.) You may optionally enter an airport ICAO if you wish to fly from that airport – the last airport you landed at on an FSCaptain flight will be preset as your departure airport, although you are free to change that. You’ll also need to choose the type of flight: passenger, cargo, and ferry. (If you select “ferry” as the flight type you’ll be required to enter a destination in the flight details dialog.) Optionally, you can enter a time constraint (in minutes, with the default coming from the airline definition.) Below the time constraint is a button “Specify Flight Details.  This allows you to precisely define a specific flight to be made. See **Specify Flight Details** below for details on how to use this feature.

*Important note:* all aircraft in your flight simulator aircraft folder are scanned for inclusion, but only those that have their types defined with an aircraft characteristics file will be shown in the selection list. See the section “aircraft characteristics” in this manual for more details. Another important criterion is the presence of an atc_id. To be included on this list and aircraft type must have at least one of its liveries [fltsim.x] assigned with a non-blank atc_id. Also, to eliminate AI type airplanes any aircraft with a blank ‘atc_model’ in their aircraft.cfg files will not be selected.

If you are flying with the optional ‘Economic Mode’ enabled, then you are further restricted to choosing aircraft types which your airline has listed in its [airline-name].Aircraft.cfg file.

If you use airport sceneries which have parking spots customized to include airline parking codes, you can configure FS Captain to attempt to assign you those parking spots upon landing. However, some airlines operate on the principle of “codesharing” whereby the aircraft owned by one airline is making a flight under the “code” of another airline… or under the code of several airlines. (So a Landmark Airlines-liveried aircraft could be making a flight for Pacifica Airlines.)

You can change the “airline code” under which your flight will be conducted on this dialog, before you select a flight. So, if you’re a Landmark Captain, and you’re making a Pacifica flight, your data will be recorded into the Landmark Airlines log, but you will receive Pacifica parking at your destination. (These parking assignments will persist for each leg of the current flight.)

Once you have entered the above information you will have a choice of two buttons.

**List Flights:** If any flights are found matching your criteria they will appear in the list box below. You can scroll through this list, and if you see the flight you want click on the flight number (the actual number not the line) and then click on the “Select” button to proceed to Phase 2. If you don’t like the list that’s presented, you can press the “Reject” button and make another selection using different criteria. (In the case of charter flights simply pressing “Reject” and selecting “List Flights” again may present a new selection of charter flights.)
The selection list you see here is equivalent to the flights presented in the FCDU when you use the “Select Mission” option from Page ID 10 Preflight Menu and the same rules that apply there apply here concerning charter flights and time constraint. There is one significant difference: all scheduled flights from this airport for your current airline that qualify for the date and aircraft type you gave in the search criteria will be displayed regardless of the time of day the flight departs (unless you chose the special time constraint option described above.) The other difference is when you enter a specific destination you will see only one flight presented -- a charter flight to there.

**Get Assignment:** All available flights are scanned and one is picked as your assignment. The initial set of flights considered is the same one that would have been listed if you had clicked on **List Flights** but instead of being listed they are evaluated for eligibility as your next assignment. Any flight with a projected duration longer than your Time Constraint will be rejected. The current date and time (on your PC while you are doing this) is considered: if you are searching for an assignment for today no flights earlier than 1 hour past the present time will be considered. If you are searching for a date in the future departure time is not filtered. Once a subset of eligible flights has been filtered, one will be selected randomly as your assignment.

You also must specify a departure airport and cannot specify a destination airport.

**Specify Flight Details**
When you use the “Specify Flight Details” button this dialog will appear:
Any information you insert here will be used to define a charter flight, and any that's omitted will be filled in by the system... except for the destination airport. If you fill in any of the optional information, you must supply a destination airport ICAO. That is the only field that must be filled out on this page. (If you are flying a ferry flight, you must use this to supply a destination.)

The other fields are optional. If you don’t supply a flight number one will be generated for you. The same with specifying an alternate airport; you can choose your own, or allow the system to pick one.

You can specify how many passengers for either a cargo or a passenger flight. This cannot exceed the seating capacity of the airplane you have chosen. (Cargo aircraft typically have a small number of seats for ride-along passengers.) It is typical for no passengers to ride on a cargo flight. If you leave this blank, the system will assign the number of passengers for the flight. A reasonable load will be generated for passenger revenue flights, and your airline’s Load Factor will be considered to calculate how much payload you will carry.

You can specify a cargo payload weight for either type flight. For a cargo flight this will be the total weight carried as payload, including passengers. For a passenger type flight, this is extra cargo above and beyond the weight of the passengers and their baggage. The total payload in that case will be the weight of the PAX, plus their baggage (actual weight per PAX is defined in the FSCaptain 'Items.cfg' file on the first line and baggage is randomly between 20 and 60 pounds per PAX) plus the weight you specify here for other cargo.

You can include an optional local departure and arrival time. If you only specify a departure but not an arrival, this is a suggestion but the system won’t enforce you starting at that time. If you specify both, then FSCaptain arrival time rules (defined on the airline configuration page) apply and you’ll need to start within the standard times or your gate will not be ready for departure. See the section **Creating an Airline** in this manual for details on the departure time rules.) If your company has checked the option “Score Actual Arrival Time” on their configuration, you will be scored on whether you arrive on time or not (there is a 15-minute window in which you will not be considered late, after that penalties start and build based on how late you are.)

You can include a service code for the flight if it is a passenger flight. This will determine what services are available to your passengers during the flight:

- A code of -1 (minus one) means no service will be provided on the flight.
- A code of 0 (zero) is the default, and it means that optional service is available. Optional means you won’t have a penalty accessed against you if you don’t provide the service. (You will, however, risk a penalty if the service is started but not completed.) If your flight is long enough to possibly account for a snack and a meal, then you will be able to offer a snack, followed by a meal. If your flight isn’t long enough for that, then you will be able to offer a snack service. In either event, please judge your time enroute to ensure that you’ll have enough time to complete your service(s).
• A code of 1 means a snack service is required. You will get a “poor service” penalty if you don’t complete at least one snack service. A snack service is shorter than a meal, and takes on average about 30 seconds per passenger plus a start-up time interval.

• A code of 2 means “Required Meal Service”. This is the same as a snack service except to serve a meal takes longer time in preparation so therefore longer to complete it. Usually, you can figure on a meal service taking about 50 percent longer than a snack service.

Do realize that the initial service on a Meal flight will be a snack, or possibly a “drinks” service – to get your passenger’s appetites ready! This snack will be followed by the meal. If there’s time after the meal, the next services will be snacks again.

After you have completed filling in this dialog and pressed “OK”, you will not see the flight appear automatically. You’ll need to click on “List Flights” for it to appear. You will see it at the top of (potentially) a list of other flights you could choose. Often, it will be the only flight available. (You cannot specify a destination if you would rather use the “Get Assignment” method.)

You’ll then proceed to click on the flight number and proceed to Dispatch Planning, described next.

**Easter Egg**: If you enter 1 or 2 in the “Service Code” for a Cargo flight, your Dispatch will try to assign you a “special flight” with some combination of Priority, Live and Fragile cargo. These flights will give you bonus points if you complete the flight according to the criteria, but if you fail to meet the criteria, you’ll lose extra points!!

**Phase 2 – Dispatch Planning**

Dispatch planning is different from flight planning. It is concerned with getting three things right: an alternate airport, the estimated Block Time enroute, and the estimated fuel burn. In addition, weather factors are analyzed to both to ensure that the time and fuel burns are accurate and to assure that weather conditions are above minimums for safe flight. The route chosen is a function of flight planning which you do with an external tool (or the FS built-in flight planner) and doesn’t concern Dispatch Planning – except that it influences the estimated Block Time for the flight.

*What is “Block Time?”* Simply speaking, Block time is the amount of time that an aircraft takes between going OUT and going IN. (It approximates what you may think of as “gate-to-gate time,” but is more accurately thought of as the time an aircraft is under its own power.) This time is logged for each aircraft to show how much wear and tear its systems has experienced.

It’s also what most passengers expect as the duration of their flight, so making your flight closely track the expected Block Time can influence how happy your passengers will be on arrival.
Once you have selected your flight from the list the buttons and controls on the top part of the tab will be disabled (grayed out) and the ones in the planning section will be enabled. The default flight plan is GPS Direct with no wind flown at the standard altitude defined in the aircraft characteristics file. This usually doesn't match reality and the dispatch planning process is a method of reconciling the ideal with the real.

Your next step should be to select a flight plan (if you have one) by using the “Select” button to the right of the flight plan edit box. You will see a list of MSFS flight plans you have stored in your “Flight Simulator Files” or “Flight Simulator X Files” folder. Having the Dispatch office aware of your actual planned route will increase the accuracy of the estimates but it is not officially required. You as Captain assume the risk of not making the flight on time if you don’t select a plan and use a direct route here but your actual route differs significantly.

If you are dispatching a flight to a new destination you should plan the flight with your favorite flight planner before using this dispatch planning tool; or alternatively you can plan the flight while this dialog is up, just be sure to save or export your plan into the standard FS9 or FSX folder before selecting it here. Once the plan is loaded the information in the “Flight Plan” edit box will change to the title as defined in the flight plan and the “Altitude” will change from this aircraft’s standard cruise to that defined in the plan. If you press the “Recalculate” button the Block Time and fuel burn will be updated to reflect the impact of the flight plan, both in revised distance and possibly a different altitude than the standard. Usually, the Block Time and burn will go up, but in some cases, it can go down if a short flight is planned at a lower altitude than the standard.

The second step is usually to retrieve weather information and apply it to the planning. Use the “Get Weather” button above to obtain the latest weather data from your installed weather add-on program (such as Active Sky, FSGRW, Opus, REX, or others) if you’ve configured the weather options (a button on the “Options for All Airlines tab”) or if you haven’t configured an external program the Administrator will download weather information from the Internet. METAR and TAF data can usually be obtained from the external program or from the Internet. Winds aloft is more uncertain. Active Sky and FSGRW products include winds aloft data; the original REX did not, but newer versions do. Often the winds aloft data on the Internet are unavailable. If valid winds aloft data could be found for your flight route a table of winds aloft data will be built from the available data, if not this table can be provided manually. Pressing the 'Enroute Winds' button will display a dialog where you will have access to this winds data.

When winds data is obtained from an external source the program uses your flight plan to determine a set of “wind points” along your route. Not every waypoint will be a “wind point”. The selection rules are simple: any planned way point that is an airport, or that is 50 or more miles away from any previously selected wind point will be included. (The 50-mile limit is configurable by including a statement in the options.cfg file – see the Appendix for details.)

Each line will be populated with the wind direction, speed, and temperature that is current for the altitude band the aircraft is calculated to be in at each point in the vertical flight path. You can
change these figures, or the calculated altitude, or add winds data for a planned way point not au-
tomatically selected. If you add a wind point it must be for a way point in your flight plan.

If no winds aloft data can be found, this table will be blank. In that case, you may enter winds
aloft data manually. To help with this you may press the “Waypoints” button on the Enroute
Winds dialog and all the likely wind points and altitudes for your plan will be placed in the table
with directions, speeds and temperatures preset to zero.

Here is an example of the Enroute Winds dialog box:

![Enroute Winds dialog box]

Clicking on OK will update the internal winds data used for calculation; pressing Cancel will ig-
nore any changed or added data in this dialog.
Once this data entered (whether you modified enroute winds or not) you can press “Recalculate” to have your Block Time and Fuel recomputed using the current flight plan with the current weather and altitude factored in. It's important to realize the effect that altitude can have on Block Time and Fuel. To calculate this, the program assumes that the standard cruise speed defined in the aircraft characteristics is the no-wind TAS of the aircraft at its defined standard cruise altitude (since there is no wind this is the same as the ground speed.) Using this as a base, the TAS will be adjusted lower for lower than standard altitudes and upwards for higher. This will be shown in the “Speed” data item and obviously this affects Block Time and thus Fuel burn. Often the selection of the right altitude for a flight is a tradeoff between higher TAS at higher altitudes versus potential headwinds at those altitudes. If you didn’t load a flight plan and the program is assuming a direct route you can change the altitude and recalculate to see the effect on Block Time and Fuel burn.

If you wish to see the effect altitude and winds are having on your timing you may use the 'View Release' button to display a working copy of the dispatch release document. On there, your flight plan will be displayed with each way point and the speed adjustments made at each point by the recalculation process.

If you do not select a flight plan a direct plan will be generated for you. If you do not click on Get Weather and don't enter any winds data manually then the winds along your route will be assumed to be nonexistent and the temperature standard for each altitude band.

“I have another flight planner….”
Many Captains use external flight planning software that calculates Block Time and Fuel Burn values to a very high precision. If you choose, you can override the values that the Administrator generates by entering the values you prefer into the Block Time and Fuel textboxes, holding down either SHIFT key on your keyboard, and clicking “Recalculate”. If you change your mind and choose to go with the Administrator-generated values, simply press “Recalculate” without pressing a SHIFT key.

ACME Fuel Planning
Fuel planning using the ACME system is much more involved than trying to calculate how much fuel you need to get from takeoff to landing. FSCaptain is an ATP simulator and its rules are modeled upon US FAA domestic operation rules in order to give you safe flights:

1. Enough fuel to fly to your destination. (Noted on your Release with the Destination ID.)
2. Plus, the fuel to fly from there to the alternate airport. (Noted with the Alternate ID.)
3. Plus, the fuel for 45 minutes at cruise speed. (Noted as “RSV”.)
4. Plus, the fuel for 15 minutes of ATC holding. (Noted as “HOLD”.)
5. Plus, the fuel for normal taxi operations at both airports. (Noted as “TAXI”.)

The total fuel amount to be loaded is always subject to any adjustment which the Pilot In Command orders, but Dispatch is bound to offer the amount of fuel which they feel is safe.
Multi Leg Flights
If the flight you are planning has continuations to other airports, you can plan those extra legs exactly like you plan the first leg. In the top left of the planning section there are two buttons “<<” and “>>”. On a multi-leg flight, you must use these buttons to go forward or back among the legs of the flight – if you don’t confirm each leg, the Administrator will not allow you to commit to this flight. The current leg number is shown between the buttons. On a single leg flight both buttons are inactive. Each leg is initially assumed to be planned as a great-circle direct plan with no way points and no winds until you supply flight plan, weather and cruise altitude information and press the Recalculate button to determine an adjusted Block Time and fuel burn.

You must plan each leg of a flight because you may be asked to make all of them.

Phase 3 – Committing the Flight
After loading the flight plan, weather, and recalculating the Block Time and Fuel for each leg you are about ready to log the flight. You can, if you choose, manually change the Block Time and Fuel, the assigned parking, your alternate airport, or even your altitude level. No matter what you enter here, those figures will be the official dispatch figures for the flight when you start up the FCDU in your airplane – so choose carefully.

You can always press the “Reject” button to return to the flight selection process before you choose “Commit” and nothing will be logged.

Before you press the “Commit” button you probably want to review your flight using the “View Release” button on the left. This will show you a preliminary version of the dispatch release document. Here you can see the details of the fuel calculations, the weather information, and your flight plan with timing and fuel calculations.

Once you are satisfied with the flight, you can press the “Commit” button. You’ll be asked to confirm, and once you do your flight will be entered into the airline’s log in “Open” status, assigned to an airport and an aircraft type but not to a specific aircraft registration number. A manifest will be generated at this time, and a more finalized copy of the dispatch release.

Once in the log, the flight will be treated as if you had set it up using the FCDU but not taken off. That is, it is subject to be dropped or canceled and reassigned depending on the rules of your airline (see the “Flight Commitment” option on the airline definition tab.) The date and time of the flight commitment is the windows system date and time when you pressed the “Commit” button.

If the flight had multiple legs only the first leg will be committed in the log but the preflight information, manifests, and a preliminary copy of the release document will be written to the Manifests folder. When you later fly these extra legs, this information will be picked up by the FCDU on each leg.
To fly the flight, you must be certain you are in the assigned aircraft type at the departure airport at the correct time (if scheduled). Even if you picked a scheduled flight, you do not have to arrive within a certain time window to fly it – when you log in to the FCDU and an open flight matches the current aircraft type and airport the FCDU will start up that flight and not allow you to select any other until that flight is closed or removed.

In general, whenever possible, you should not allow much time to elapse between scheduling and dispatching a flight from this tab and getting into the cockpit and flying it. You can plan the flight using the Administrator available from the drop-down menu in Flight Simulator if you like, then immediately power up the FCDU and start the flight. However, you are not permitted to select a flight (the button won’t be enabled) if you are in flight simulator and the FCDU is powered up.

**Multiple Commitments and Updating a Flight**

You are not permitted to make more than one commitment of a flight for a given aircraft type from a given airport. If you attempt to select any flight from the same airport and for the same type as an existing commitment, you’ll get a message asking if you want to update that commitment. If you don’t, you’ll be returned to the selection process. If you do, you’ll be placed in the planning stage where you can change whatever you’d like. When you press the “Commit” button the existing logged committed flight will be updated to reflect any changed alternate, Block time, fuel, PLN, and weather.

You are also not permitted to book a flight under a unique flight number if another flight has been booked but not yet closed under that same flight number.

**How Dispatch Uses Weather**

When the 'Get Weather' button is pressed the Administrator program attempts to retrieve three types of weather information from the best sources available at the time it is being used. Currently, those sources are the 1) Any external weather add-on you have configured in the Weather Options tab of the Options for All Airlines, or 2) from the simulator itself if it is running and Administrator can establish communications with it, or 3) various Internet sites including the US government NOAA site.

The three types of weather are METAR, TAF, and Weather Aloft. METAR information is retrieved for the departure, destination, and alternate airports. First, if you have configured an ex-
ternal weather program the Administrator will look at the database you configured and extract the weather data from there. You will be warned if the data is out of date (you define “out of date” on the Weather Options.) If no weather is available then METAR, TAF, and Weather Aloft data for the airports will be retrieved from the Internet. The Weather Aloft data is a part of the weather data retrieved from the simulator if there is a connection, but if necessary the Administrator will attempt download the latest winds aloft from the Internet.

The METAR and TAF information is used as part of the dispatch preflight analysis, and is printed on the dispatch release document for the pilot's information. The Weather Aloft data is used to compute a more accurate Block Time and fuel burn. If no data can be downloaded for your plan, you can obtain the current information from external sources and easily enter the data into the dialog box.

You must press “Recalculate” anytime you change anything and want an updated calculation of Block Time and fuel burn. When weather is successfully retrieved the 'Get Weather' button is disabled. Pressing the “Recalculate” button re-enables the weather button. Occasionally, the Internet site is down or some of the information doesn't get successfully downloaded. You can view the dispatch release document to see the results of the weather retrieval at any time. Sometimes getting weather again will correct a 'not available' notation for a METAR or TAF.

For those not familiar with it, the coded weather information looks like a meaningless jumble of letters and numbers. But it is in fact a compact and unambiguous way of displaying all the weather data a pilot needs to know. There are many sources on the Internet to help you decode it all; simply search for METAR, TAF, or Winds Aloft using your favorite search engine.
Section 4: Options for All Airlines

The Administrator contains a tab to control the options that apply to all airlines:

**Current Airline:** Select from the drop-down list the current airline you are working for. This is an alternative to the “Change Airline and/or Pilot” button of the first tab. They accomplish the same thing. You can only work for one airline at a time. You may have several pilot profiles but only one can be active at any one time.

**Current Pilot:** Use this drop-down list to select the current pilot profile.
Failure Percentages

There are five separate areas. 'Mechanical Failure' applies to all failures potentially triggered by FSCaptain that pertain to a specific instrument, engine, or system of the user aircraft. 'Bird Strike' applies to the potential to hit a bird or birds. 'Blown Tire' applies to the potential for a tire to blow out on landing, takeoff, or taxi. 'Cargo shift' is the likelihood that the weights in your payload stations could change in-flight due to inadequately secured cargo containers. And, 'Cabin Emergency' is the percentage chance that an emergency could develop in the cabin during a passenger flight only. Examples of cabin emergencies include a serious medical condition or the presence of smoke in the cabin indicating a potential cabin fire.

The percentages are down to the decimal point. Writing 2 in this field means there is a two percent chance of failure. .5 in this field is ½ of one percent chance of failure. Etc. A two percent chance means it's likely (but not certain) that of 50 flights, one will have a failure of some kind. In the case of a mechanical failure this may be as major as an engine fire or as minor as the magnetic compass sticking. A .5 percent chance means out of 200 flights one might have a failure. You might not even notice the failure if it's minor enough.

Mechanical failures are assigned three-digit numeric 'fault codes'. Fault codes below 200 are considered MEL items – you can fly with them failing. Anything above 200 is a major failure and may require the declaration of an emergency. You can see the fault code in the log (use 'View Details' in Administrator or 'Justify' in the FCDU) after a flight has ended. If you check the option “Display Fault Codes on FCDU” then when a fault occurs, the FCDU will display the fault code in red numbers underneath the page title on each page during the flight. (See Appendix 3 in this manual for a list of the codes.)

External failures. Everything said above only applies to failures created by the FSCaptain system. Some add-on aircraft or other programs outside the scope of FSCaptain have their own failure generator. In many cases FSCaptain cannot detect these externally generated failures and therefore you could be in a situation where a major aircraft system has failed in your add-on but FSCaptain doesn't detect it. Exceptions: So long as the add-on failure generator uses the standard FS9/FSX failure signals FSCaptain will detect and honor the failure as a valid reason to declare an emergency. This is most common on engine failures (you can test this by triggering an engine failure using the FS menu items.) In all simulator versions FSCaptain will detect most of the official systems failure modes except for hydraulic failure (because of a bug in FS that falsely reports hydraulic failure, the detection of this has been disabled.) With a properly configured interface in FSX and P3D, FSCaptain can detect and honor externally triggered engine fires.

Note that you can always declare an emergency from the FCDU using the EMER button or the EMERGENCY selection from the Flight Status page, and dispatch will accept your declaration. However, should you be successful in making a safe landing, the bonus points awarded will be linked to the type of failure. If FSCaptain hasn't detected any failure (yet one did happen due to an external trigger from an add-on aircraft) you will be awarded an average of 10 bonus points.
**Pilot Options:** In this area you can add a new pilot profile, change an existing pilot's profile, or delete a pilot. When you add a new pilot you can select the employee ID. This can be important because if you run both FS2004 and FSX and want to share a career between the two, the pilot defined in one must match the employee number of the other in order for their careers to match.

**Weather Options:** This pushbutton will allow access to a dialog (described below) that can be used to specify the location of a database used by an external weather generator program.

**Require an FS Parking Location to Unload:** By default, you can unload your passengers and cargo at any point at your destination airport. (Some early users of FSCaptain would even unload on the runway to avoid a late penalty!) Checking this option will change that rule and require you to unload your PAX or cargo only within the limits of a defined Flight Simulator parking location. You will not receive an “Unload” option on the FCDU, even when you set your parking brakes and shutdown engines (if required) unless you are within the radius of a parking spot.

Checking this option also enables the airline option “Assign Parking”, which will have the airline assign you to a specific gate when your flight is accepted – see “Airline Definitions” in this manual for more information.)

Checking this option increases the realism of your FSCaptain experience, but the potential downside is that finding a parking spot (or an assigned gate or ramp) can be quite difficult because parking spots are not often well marked at Flight Simulator airports, and the actual name of the gate or ramp is never shown at a stock airport and seldom at an add-on airport. The FCDU does provide guidance to gates in the form of a heading and distance. Read the section “Understanding Gates” for more information on how FSCaptain handles this.

**Cargo Preload Percents:** Usually, when a cargo pilot gets to the aircraft most of the cargo has already been loaded into it. This option determines what quantity 'already loaded' really represents. Each aircraft volume class can have a separate percentage to have been loaded when you get to it. Usually, the smallest airplanes will have the lowest percentages. The point of all this is so you don't have to sit and wait for long periods while the cargo is loaded at a realistic pace. Tiny airplanes are smaller and have less cargo space so it doesn't take long to load most of it.

**PAX Load Timing:** This section contains a series of five entries that allow you to control how fast or slow passengers board any aircraft during the FSCaptain boarding process. The interval of delay between passengers is measured in “ticks”, where each tick is 1/18 of a second. So to specify a one second delay would be 18 ticks, two seconds would be 36, and so on. Each interval controls the boarding of a pair of PAX ... within that interval the two may board together or separated by a random number of ticks, but each pair will take up no more and no less than the number of ticks you specify in the interval.

There is room for five interval levels, with each level distinguished by a number of passengers. The first row consists of the number of PAX and the interval in ticks. Read this as meaning “if the flight has this number of total passengers or higher the interval for each pair will be this number of
ticks.” The reason for the levels is so that you can board larger aircraft faster if you wish. The de-
fault numbers do this: The first level is 0 PAX 80 ticks. This means for any number of PAX from 
zero to the next level (25) it will take 80 ticks to board each pair (or 40 ticks per person, slightly 
father than 2 seconds each). The next default level is 25 PAX 60 ticks, so if a flight has between 25 
and 49 passengers the number of ticks per pair will be 60 (about 1.5 seconds each). For some peo-
ple this is much too fast, for others, it is right. This option is so you can adjust these rates to suit 
yourself.

**Log File Folders**

Normally FSCaptain stores the logs of your flights in a file named for each airline in a folder called 'Data'. Before each flight, the program also makes a copy of the affected log file in a backup folder, in case something awful happens to your log (log data represents lots of time and effort on your part and we make every effort to keep it safe.) The default locations for these files are listed in this option, for example, “\FSCaptain\Data\” means the Data folder within the FSCaptain folder in the 
FS root folder directory (the dot means current directory which is the Flight Simulator root direc-
tory.)

You may have FSCaptain installed in both FS2004 and FSX. You may wish to have the same career 
in both simulator versions. FSCaptain handles this by letting you change the location of your log 
and backup files.

There are two basic schemes you can use. The simplest is to think of one version as your “master” 
version. The other simulator version (which maybe you play less often) will have its log file loca-
tions changed to point to the log file locations of the “master” version. For a simple example, let's 
say you use FS2004 most of the time, and have it installed in C:FS2004. But you also have an FSX 
installation on the same drive in C:FSX. You would install FSCaptain into both versions. (Alt-
least the Administrator is the same program in all versions it will recognize the specific folder it 
beings to and access the data files for that particular installation of FSCaptain.) In the one for FSX, 
in the log files put this:

<table>
<thead>
<tr>
<th>Log File Folders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logs: C:\FS2004\FSCaptain\Data\</td>
</tr>
<tr>
<td>Backups: C:\FS2004\FSCaptain\Backup\</td>
</tr>
</tbody>
</table>

Notice that we replaced the dot with the explicit location of the FS2004 folder. Now, when the 
FSX version of FSCaptain goes to read the log files it will access the FS2004 logs. The two formats 
are compatible; FSCaptain will not know the difference.

A second option is to place a log folder in a separate location (perhaps a network drive) and have 
both versions point to it. There is no need to have it be called “Data”, you can name it anything, 
and as long as it's referenced here and is findable from your computer FSCaptain will access it.
Note that to share a career not only must you point the logs to the same data folder, but you must also have the same pilot ID flying for the same airline name.

**Utility Functions**

**FCDU Installer:** Pressing this button will run the FCDU Installer program as if you selected it from the menu. Use this if you prefer the “panel gauge” version of the FCDU.

**Rebuild Airports Database:** FSCaptain keeps its own data file of the location and attributes of airports in your Flight Simulator. The database which is distributed with FSCaptain is built from the default airports in Prepar3D.

In the \FSCaptain\Config\ folder there are some data files derived from some “Aviation Authorities”. These data files contain lists of airports that are only available for Private Use, airports which have closed since your simulator was built, airports with defined Customs operations, or airports which may have had their ID change since your simulator was originally built.

These files come in pairs:

- closed_fsc.txt and closed_user.txt
- customs_fsc.txt and customs_user.txt
- new-id_fsc.txt and new-id_user.txt
- private_fsc.txt and private_user.txt

Things change constantly, and if you know of new data, you can add it to the “_user” files – they’re there for you to customize your setup. If you wish, you can advise us of any additions that you’ve made. If we agree that your changes are valid, we could publish them in a future version.

The “_fsc” files have been loaded with data that we at FSCaptain have obtained. They’re read-only to prevent accidental editing, but if you wish to dispute an entry that we’ve made please email us with your information and we’ll update our lists as needed.

The format of these files will be described in Appendix 5: Special Options and Features.

**Run Makerwys as part of Rebuild:** This option is pre-selected each time you run the FSCaptain Administrator. If it is selected when you click “Rebuild Airports Database” then the MAKERWYS.EXE utility from Peter Dowson will run against your active scenery.cfg entries, and create a new set of output files which the SceneryScanner will use to build the FSCaptain airport database.

Running Makerwys.exe against a large set of scenery entries can take time, so if all you are doing is updating some FSCaptain airport data configuration files (such as “private_user.txt”) then you can safely unselect this option before clicking “Rebuild Airports Database”.

Page 66
However if you are adding a new airport scenery, then you should leave this option selected so that Makerwys.exe runs before the SceneryScanner. (Also if you intend to use the option to require you to park at a gate or ramp you must use this function if you change your Flight Simulator scenery entries.) Essentially, if you have any modified or added airports in your installation, FSCaptain may not see them or may not see them correctly. Keeping this checked will rebuild the FSCaptain airport database from the data currently active for Flight Simulator.

SceneryScanner will also output extra files that aren't currently used for FSCaptain, but which may be of interest to Captains with large scenery collections. These files are:

- Sceneries-With-Airports – a listing of all scenery layers with their airports listed per layer.
- Sceneries-Sans-Airports – a listing of all scenery layers without airports.
- My_Sceneries.kml – a KML file containing airport facility data which can be viewed in Google Earth or any other KML client.
- AirportSceneries.csv – the same data as airports.cfg, but with scenery information included, and renamed for easier loading into Excel or any other CSV file viewer.

We’ve found that disabling scenery layers that are not needed for a particular flight can help in managing a reasonable VAS usage in our simulators. The Sceneries-With-Airports file can be very helpful in finding the addon scenery areas that would be needed for a particular flight.

The Sceneries-Sans-Airports file can be used to disable scenery layers to avoid having Makerwys.exe scan a layer without any airports (texture-only layers or mesh-only layers, etc.)

SceneryScanner.exe requires the Microsoft .Net 3.5 Framework to be installed on your PC. That has been part of the Microsoft OSes since around 2006, so if you are running Vista 32 or 64, Windows 7, or Windows 8, you should have that already installed on your PC. If you’re running Win-

My_Sceneries.kml is a file that can be viewed in Google Earth or any other KML viewer and which shows “FAA VFR” icons at each of your airports.
In short, the icons can be understood as such:

- Magenta colored icons are for untowered airports, blue colored icons are for towered airports.
- The circle Xs (2CL2 – upper left in the image) are abandoned fields and the circle Rs are "restricted / private" fields.
- The circled anchor (E20 – center left in the image) is used for water-only airfields.
- The empty circles (L36 – center right in the image) are tiny airfields while the circles with the four "legs" (KMCC – just to the right) are civil airports.
- KBAB (upper right in the image) shows a circle within a circle, indicating it’s a military field.
- Finally, KSUU (lower left in the image) is Travis Air Force Base. This icon has the military double circles with the civil four legs indicating it’s a military field with civil use.
- If an airport has had its ID changed since circa 2006, you’ll see its new ID along with the “Formerly…” quantifier.
- If you click on one of the icons a pop-up appears with some pertinent data about the facility, as indicated for KSMF, Sacramento International.

In Google Earth, all airports are divided into "scenery areas" and by default if there's more than a few dozen airports in the scenery, it loads as un-displayed and you can tick a checkbox to display them. This keeps your initial viewing of your sceneries as uncluttered as possible.

**Auto-Loader and Crew Options**

This set of options exists so that if desired you can turn off certain portions of the FSCaptain system so that other add-on programs can fulfill these roles without “fighting” with FSCaptain for control. The primary use of these options is to accommodate special-purpose automatic loaders and add-ons or aircraft that provide their own crew. Any options checked here will apply to all airplanes used with FSCaptain. If you want to make special exceptions for individual airplanes, see the similar set of options on the Load Maps tab in this manual. Note: If you use one of these “Suppress” options you cannot “un-suppress” it for individual aircraft. These are “system-wide” switches.

**Suppress Auto-Payload:** If this option is checked, FSCaptain will not generate payloads for flights or automatically load any payload aboard the aircraft during the loading process. Instead, FSCaptain assumes that the payload weight that's already on board the aircraft at the time a flight is reviewed or selected is the correct payload weight, and FSCaptain will generate a valid manifest that matches that total weight. The payload weight referred to is the payload actually loaded aboard the aircraft's load stations (all of them). It does not matter to FSCaptain how that payload weight got there – it could have been loaded via the FS menus, or from another loading program. But the correct payload weight you want to use for the flight must be loaded and ready, or whatever is there will be used.
**Simulate Load:** This option is only effective if the option above “Suppress Auto-Payload” is checked. If you choose to not automatically load a payload, checking this will simulate the boarding process for passenger flights only, showing the count of passengers boarding the aircraft just as if they were being loaded by FSCaptain – but they are not. If you check the “Suppress Auto-Payload” option and leave this option unchecked, the loading process will be nearly instantaneous since fuel is loaded immediately.

**Suppress Auto Fuel Load:** If this option is checked, FSCaptain will not load fuel on board the aircraft during the loading process. You are responsible for having the correct amount, as FSCaptain will not after it. Your fuel can be loaded from an external loader program, or manually, it does not matter but you must have at least minimum fuel in the tanks to be cleared for departure.

**Suppress First Officer:** Even if an aircraft has a first officer designated as part of the crew, the FSCaptain first officer will not speak nor provide any other function (such as managing the seat belt sign). It will be as if he or she isn’t there at all. This option is most likely to be used if you have another add-on that provides its own co-pilot that you would rather use in all aircraft.

**Suppress Flight Attendant:** Even if an aircraft has a flight attendant designated as part of the crew, the FSCaptain flight attendants will not speak nor provide any other function (such as cabin service to passengers). It will be as if he or she isn’t there at all. This option is most likely to be used if you have another add-on that provides its own flight attendant that you would rather use in all aircraft.

**Prompt for PAX Count:** This option is only effective if you have checked the “Suppress Auto-Payload” option above. The intent of that option is to accept an already-loaded payload weight as having been produced by another add-on program. Often, such a loader program has loaded a certain number of passengers for a passenger flight, but FSCaptain has no way of knowing exactly how much of the payload weight is passengers. But since FSCaptain records the number of passengers in its logs, you may wish to be sure that the passenger count in FSCaptain matches that of the external program that did the initial loading. Checking this option will cause a special page (Page ID 57 PAX Count) to appear whenever FSCaptain accepts an already loaded payload. On this page you can specify, using the number keys on the FCDU, the number of passengers on the flight. You will only see the PAX Count page if you create a flight using the Destination option from the Dispatch Online page (ID 10), or you have resumed a flight and the payload weight does not match the original payload weight. You will not see this page appear if you accept a flight generated by the FSCaptain system, that is, when you are using the Select Flight option from Dispatch Online. Those flights are generated internally and although their payloads will match the already loaded weight the number of PAX generated cannot be altered.
**Example of using the Auto-Loader and Crew Options:** If you use the FSPassengers program and want to use FSCaptain along with it, your problem is that both provide a first officer, flight attendants, and automatic loading of passengers and payload. The solution is to turn off those parts of FSCaptain that FSPassengers provides (since it is not possible to do the reverse.) A good combination of options to check for FSPassengers compatibility is:

- Suppress Auto-Payload ON
- Suppress Auto Fuel Load OFF
- Simulate Load OFF
- Suppress First Officer ON
- Suppress Flight Attendant ON
- Prompt for PAX count ON

When using FSCaptain with FSPassengers, you may log in to Dispatch at any point before the passengers have all boarded, but you should not use the Destination option to start the FCDU process until all the payload is loaded from the FSPassengers boarding process. Once you use the FCDU to enter your destination to match the FSPassengers destination you will see Page ID 57 PAX Count. Enter the number of passengers for this flight. Once you accept the correct number you will proceed to the normal Flight Review page. After making any adjustments necessary once you ask for a Normal Load you will go to the Load in Progress page where FSCaptain will load your fuel. Since you had the “Suppress Auto-Payload” option checked and the “Simulate Load” option not checked, the three rows should show green READY messages within a second or two. You can then proceed to start the flight normally with a pushback or whatever suits your needs. Operate the FCDU normally from this point on.

Another example comes from Multi Crew Experience, a voice control solution. MCE has the ability to add a virtual First Officer to any FS9 or FSX aircraft – one who will reply to your cockpit commands, and while one of the standard MCE FOs sounds awfully like one of the standard FSCaptain FOs, it’s possible that users might want to suppress the FSCaptain FO in lieu of the MCE FO in all of their aircraft.

**FCDU Configuration**
These options apply to how the FCDU functions during flight.

**Font Name:** You may enter the name of a Windows font here and that font will be used to display the alphanumeric characters on the FCDU. However, many cautions apply and we recommend you leave this blank and let the FCDU choose its own font. The first important caution is that if you enter a font name here you must spell it precisely. The second caution is that if you don't use a mono-spaced font the display data on the FCDU will not line up properly. There are only three mono-spaced fonts typically distributed with standard Windows: “Courier”, “Courier New”, and “Fixedsys”. Of these three only “Courier New” is TrueType font that will adapt to any size you make the FCDU. Both “Courier” and “Fixedsys” will remain the same size. For all these reasons
we strongly recommend leaving this option blank unless you *know what you are doing* and want to experiment with changing the look of the FCDU.

**Enable GPWS:** The FCDU has an optional Ground Proximity Warning System built-in to it. By default, this is turned off, as many aircraft have their own GPWS system and you don't want to have two systems making double altitude call-outs for you. However, you can enable it here by checking this box. If you do, then altitude call-outs will be made in any airplane except those that have had their characteristics set to “Equipped with GPWS”. In this case, the default FCDU GPWS will not be enabled for that aircraft. This setting can be changed on the Aircraft Characteristics tab for an aircraft type, or on the Load Mapping chart for a specific airplane.

**No Reset Warning:** When using the Administrator program inside Flight Simulator, whenever you make changes while the FCDU is powered up and logged in, a warning message box is displayed reminding you that any changes you make in the Administrator will only apply to the FCDU device once it is reset and you log in again. This warning could get annoying once you know this fact well, so here you can stop it from happening by checking this box.

**Display Measurements:** This set of options controls how certain measurements are displayed on the FCDU. There are five types of measurements that you can control:

**Weight:** Weights can be displayed in imperial Pounds (LB) or Kilograms (KG).

**Speed:** Speeds can be displayed in Knots (nautical miles per hour) (KT) or Kilometers Per hour (KMH, or KH as displayed on the FCDU.)

**Distance:** Distance measurements can be displayed three ways: Nautical Miles (NM), Statute Miles (SM), or Kilometers (KM).

**Altitude:** You can choose to display altitudes in Feet (FT) or in Meters (M).

**Liquids:** When liquid measurements must be displayed (for example fuel or oil quantities) you can choose to display them in pounds (LB), Gallons (GAL or GL as displayed on the FCDU), Kilograms (KG), or Liters (LT). Note that internally, the FSCaptain system keeps all measurements in the standard defaults (pounds, knots, nautical miles, and feet). Standard formulas are used to convert these quantities to the other measurements for display on the FCDU. Every measurement display will always be followed by its standard two-letter designator; for example 145KT or 16325KG.
**Media Control**
From this dialog, you can adjust the voice levels of your FO and FA and your aircraft music library.

You can also customize your MP3 playlist – tagging your tunes to play during BOARD, TAXI, UNBOARD, or ANY ground phase of passenger flights.

![Media Control dialog box](image)

**Background:** During boarding and deplaning of passengers, the FSCaptain system will play background ambiance sounds to enhance the feeling of “being there”. You can choose to not play these sounds by leaving this box unchecked. This does not affect the playing of most passenger boarding sounds – just the background noise.

**Monitor PA:** This option will allow you to listen to your Flight Attendants’ public announcements to the passengers. It is checked by default to preserve the functionality of previous versions where this wasn’t an option. If you uncheck this you will still hear all FA communications with the cockpit over the intercom, but not the announcements (except, possibly, faintly through the door.)
Many users of FSCaptain also own one or more external weather generator programs to supplement the weather options in Flight Simulator. These programs operate outside the simulator to download weather information from real world sources and set the weather inside the simulator to match.
Normally, if no external weather data source is described in this dialog, FSCaptain will use an available interface program (FSUIPC or SimConnect) to query the weather settings at the FS weather stations and report that to the pilot on the FCDU. The advantage of this is that the weather report you see displayed comes directly from the data that’s used to simulate weather. The drawback comes in that often third party external programs do not set weather at all stations but only for those within a defined range of the user's aircraft. Thus, FCDU weather queries for weather stations far away (say, the destination airfield) have no weather to report.

FSCaptain has the capability to search the text databases that certain external weather engines have downloaded to display the weather that they are using, or will use, to set the simulated weather inside Flight Simulator. This dialog configures the setup.

**Configure Defaults:** Select one of the four options above and press this button, and the data items below will be populated with the location and type of the databases, assuming the third-party program was installed in its default configuration. If you installed it somewhere else, you will need to modify the location but this will provide a good starting point. Note: choosing "Other Weather Program" means you will need to do the entire configuration yourself. If you have a version of ActiveSky other than 6.5 or Evolution, chose Active Sky Next FSX or Active Sky P3D as the best starting point.

**METAR / TAF / Winds Data Source:** The path and name of a text file that contains a list of weather stations followed by METAR information; or, in the case of the ActiveSky series, a list of ICAO codes followed optionally by METAR, TAF, and Winds Aloft information. FSCaptain will automatically recognize the ActiveSky & REX format. If the file is not in ActiveSky format, it must contain the ICAO of each weather station as the first item on each line, followed immediately by METAR information. Extra information (such as a time or a blank line) is acceptable between METAR lines.

**This Location is:** Here you select which type of path the Data Source above is. For ActiveSky, Opus, FSGRW, REX Essentials, or other products that have a METAR text file, select **A text file listing METARs and optionally TAF and Winds Aloft Data.** For users of the original REX, select **A Folder with Text Files containing METARS inside them.**

The "**Configure Defaults**" button will place the default location, name, and type of the data source. You must modify this if your source folder is not in its default location.

**The Name of This Data Source is:** Enter a short (up to 8 characters) name of the data source, which will be displayed on the FCDU whenever data from this source needs to be identified. This text will only be used for display purposes.

**Test the Data Source:** This button will trigger a retrieve and interpret function. If the function fails to find and identify the data source as a list of METAR information, you will be told this. If it succeeds you have properly configured your data source.
**Initial FCDU Data Source:** When you first query weather in the FCDU, this is the source it will use, and the source that will be used to make decisions for the Dispatcher. You can, on the weather display page, easily change this source. This is only the initial presentation.

**Initial Format of Weather Data:** Allows weather data to be “descriptive” or METAR format in the earlier FCOM devices. This function is currently under review.

**Hazard Pack Enhancements:** FSCaptain can "enhance" (make more severe) the effects of certain detectable weather and other conditions you may encounter in Flight Simulator. Currently the weather areas which receive our focus are thunderstorms and icing conditions. Both these are significant hazards in real world aviation but their effects have been so muted in the Flight Simulator environment that they pose no real threat to pilots. Checking these Hazard Pack (HP) options will add the threat to your flights!

**Engine icing can cause engine flameout (HP)**

Engine icing is simulated in both FS9 and FSX/P3D. In piston aircraft, this manifests as "carburetor icing" and will significantly degrade engine performance if not countered with "carburetor heat." For turbine-powered aircraft, engine icing is simulated in the simulator and engine anti-ice switch functions are available… but field research indicates that no matter how long engine icing can accumulate with the anti-ice switches left off there is no adverse effect on the engine performance. FSCaptain restores this hazard by computing a simulated level of engine icing on all aircraft, and when this level reaches an extreme point the engines can fail. Use of the engine anti-ice switches will prevent ice from accumulating, or will clear ice already accumulated. Note: FSCaptain will never fail all engines on an aircraft unless you adjust an options.cfg value to fail the engine on a single-engine aircraft.

Engine ice will build whenever precipitation (rain or snow) is visible to you as the pilot and the external temperature is around the freezing point. The longer you fly (or taxi) in these conditions without turning on your engine anti-ice the higher your possibility of a flameout. If you have not disabled the FSCaptain co-pilot they will warn you verbally when in icing conditions and the engine anti-ice is not enabled.

Note that some aircraft may not have working anti-ice switches. To work correctly a switch must turn on the internal simulator anti-ice signal (or be recognized by an FSCaptain aircraft interface… more on this later). You can test this in the FCDU – in offline mode select the Information page, then the Systems page, then Systems Screen 4. You'll see the current state of your engines and their anti-icing signals. If an engine is running, its number will appear – if not, the space will be blank. The same applies for each engine's anti-ice system. A number indicates the engine's anti-ice is on, lack of a number signifies that engine is not protected from ice.
Here we have a four-engine aircraft, but only engine 1 has its anti-ice systems operational. That could be a problem for our Captain if it's not noticed in time.

Flip your switches and verify if the signals change. If your switches don't work you can use the "Engine Anti-ice INOP" option on the Aircraft Characteristics tab to turn off this hazard enhancement when flying this aircraft. (You can also send this to the attention of the FSCaptain support staff, and we could consider providing an interface to your aircraft.)

Runways can be contaminated by precipitation and degrade braking action (HP)

Although FSX shows wet runways there is no effect on braking. FSCaptain can enhance this effect for both simulator versions by degrading your braking action when runways or taxiways are considered "contaminated." None of the simulators have any internal indication of this contamination so FSCaptain computes this as described here:

Surface contamination is determined by the type and severity of the precipitation reported to the FCDU by the current weather source. If you have configured an external weather program and use that as your FCDU data source, then the METAR data for the airport you are at (or are flying towards once you become airborne) is used to compute the contamination level. If you don't have an external program configured, then the weather data as reported by the simulator is used.

The type of precipitation is either rain or snow. The severity can be trace, light, moderate, heavy or extreme. At the first look at the conditions at an airport FSCaptain sets a level of contamination as a braking condition based on these factors plus some randomness: dry, good, fair, poor, or nil. A dry or good runway has no effect on FS braking action. A fair condition will degrade braking somewhat, a poor condition will degrade braking significantly, and NIL will render braking mostly ineffective. Braking only applies to wheel brakes: the action of spoilers and reverse thrust will not be affected by FSCaptain at all.

When braking is reported as fair you should allow as much as 25 percent greater length for stopping. If poor, you should allow at least 50 percent more room assuming you are using spoilers and full reverse thrust. More if these are not available. You should never attempt to land on runways reported NIL except in an extreme emergency. Dispatch will consider reported poor or nil condition as valid grounds to divert to an alternate airport. As Captain, it's your choice to divert or attempt to land. However, you will be expected to land at your destination when runways are reported good or fair and the other weather conditions are above minimums. Factor this into your flight planning if you are assigned an airport with short runways in bad weather.

Braking action applies to taxiways as well as runways. Be very cautious and taxi slowly when conditions are reported less than "good". Bad taxiway conditions are never considered a reason to cancel a flight by Dispatch.
Runway and taxiway conditions will change over time as airports attempt to clear the runways. You may ask Dispatch for a runway conditions report using the Dispatch Requests page from the Communications page. The amount of time to upgrade conditions will vary by airport size and the type and severity of the reported precipitation. Random factors are always thrown into the conditions and they could degrade rather than upgrade. You must keep updated with the reported braking action reports and roll with the punches.

Improper wheel brake use can incur damage (HP)

Currently, aircraft brakes are highly simplified in our simulators. Pressing a button, or depressing a pedal, engages the simulator’s aircraft wheel brake systems. Aircraft gears, tires, wheels and wheel brakes undergo a tremendous amount of physical force during taxi, takeoff and especially landing.

Checking this option will have FSCaptain monitor your wheel brake use (both pedal brakes and “parking brakes”) and possibly damage your wheels & gear if you’ve abused them. If you would like to test this feature, try landing with your parking brakes already engaged. 😊

Enhanced buffeting with possible engine/systems failures inside thunderstorm cells (HP)

There are thunderstorms in our simulators and they will toss you around a bit but they are perfectly safe to fly into with any type airplane. This is not true in real life! Therefore, FSCaptain can make thunderstorms much more dangerous. Being "inside" a thunderstorm is detected not by weather data (as in the runway contamination simulation) but by a combination of external conditions around the airplane: 1) you are inside a cloud, 2) there is precipitation outside, 3) the sea level barometric pressure is below 993 millibars, and 4) at least one extreme vertical wind gust has been detected. If any of the first three conditions are not present you are not in a thunderstorm. If all are present, then the enhanced effects are not enabled until the first vertical wind gust is detected. Once any of the first three are no longer present you are not considered inside the cell and the detection of the wind gusts is reset.

When FSCaptain detects you are in storm conditions as defined above (regardless of the reported weather) the following things can happen to you: 1) Engines can fail whether piston or turbo (FSCaptain will never fail all engines on a multi-engine aircraft however.). 2) Aircraft systems can fail randomly, particularly the electrical system, and 3) Turbulence effects can be made more severe by uncommanded deflections of the rudders, elevators, and ailerons. The longer you are in the cell the higher the likelihood of failures happening. Getting out of the storm cell resets all conditions and counters.

An option introduced in version 1.7.3 (ENABLE ENGINE FAILURE IN CAT) can cause turbine-powered aircraft to lose an engine in Clear Air Turbulence (CAT) if the aircraft’s “continuous ignition” is not enabled.
Enhanced Structural Ground Ice Simulation (HP)

This is a complex topic that requires its own section. If you choose to turn on the enhanced weather hazard option Enhanced structural icing with ground deicing procedures (it is off by default) you are choosing to add a realistic, very sophisticated and potentially deadly layer of realism to your cold-weather flying past anything you have experienced in Flight Simulator. This enhanced option extends both the occurrence and the consequences of icing dramatically beyond what is built into the standard sim. Complex and authentic deicing procedures are a part of this package because when you turn on this option they suddenly become necessary for safe flight in any aircraft from two-seated GA airplanes to the largest airliner. Ice can and will kill you – just like in the real world. It must be taken very seriously.

The Standard Icing Simulation

Many of us that fly in a simulator don’t believe there is any icing simulation beyond those we often encounter which is pitot tube freezing (countered with pitot heat) and carburetor icing (countered with carb heat in piston aircraft.) The FSCaptain weather hazard engine icing can cause turbojet and turboprop flameout extends this engine icing hazard to turbine-powered aircraft.

In fact, the last two MSFS versions (2004 and FSX) and the current Prepar3D simulate both structural icing and propeller icing. Cloud layers in the simulator have an attribute named “icing” which can be set any level of severity from “trace” to “severe.” If the ambient temperature outside the aircraft is zero Celsius or below, and the icing severity is greater than “none,” invisible ice will form on propeller blades and on the aircraft’s structure. The simulator itself does not provide any visual model, but the accumulation of ice will slowly degrade the airplane's performance, and increase stall speed, such that prolonged time spent in severe icing without clearing the ice can result in loss of control and a crash. Leaving an icing layer either by seeking warmer air, or a layer without the icing attribute turned on, will result in the ice melting. The ice can also be removed from propellers (and prevented from forming on them) by the “Propeller anti-icing switch,” and structural icing can be prevented or removed with the “structural anti-icing switch” (sometimes called “wing ice” if those are present in the aircraft.

So many ask why they have never seen these effects even when they fly in winter conditions. There are two reasons. First, the icing attribute seems to be rarely set either by the internal weather engine or by external ones, and very rarely is extreme icing set. Secondly, the ice accumulates so slowly that in any setting other than extreme the buildup will be so slow that only a very long flight in constant icing will show the effects in a way that gets the pilot’s attention. Couple that with the relative rarity of the icing even being turned on and in practice you're safe from icing in all but the rarest cases.

In the real-world icing is a deadly enemy that every cold-weather pilot fears. In the simulator, it’s a paper tiger than can be safely ignored. This option of FSCaptain changes all that.
**Ground Structural Icing**

In the simulator, you almost never have airframe icing on the ground because it can only be set in cloud layers and these layers don't often extend to the ground. FSCaptain adds ground icing completely outside the simulator. You can accumulate ice while on the ground, and quite often in winter conditions your airplane will have already accumulated a layer of ice by the time you climb in the cockpit. IFR regulations around the world clearly state that you may not take off with ice accumulation on your wings or other surfaces. This ice must be removed. FSCaptain provides highly realistic deicing and anti-icing services at many airports, for you to accomplish this.

**Enhanced In-Flight Structural Icing**

Once airborne, FSCaptain retains the level of any non-cleared ground ice and can impose restrictions on flight controls and aerodynamics accordingly. FSCaptain also monitors the accumulation of structural ice from the simulator (originating from the presence of the icing attribute in cloud layers and the temperature below zero), and will enhance the effects of this ice so that it realistically accumulates much faster and the effect on flight is much more dramatic.

How do I know I have ice on my airplane?

MSFS does not model visible ice, and without extensive modifications to the aircraft’s model and textures no add-on can show icing on wings and surfaces; therefore, FSCaptain can't show visible ice due to simulator restrictions. If we could we surely would. Therefore, we have a number of warning systems in place for you on any FSCaptain flight. If you have a first officer, they will warn you about the presence of ice with statements to that effect. Your dispatcher is also looking out for your safety and when icing is a hazard you’ll receive messages to that effect. In addition, you can perform a contamination check yourself from the Request menu if you are on the ground, or on the Information page either on the ground or in the air. On the information page, on the left-hand side, there is an item named Xtra Weight. If this is non-zero you may have ice on your airplane and this is the weight of it. If you watch it, you will probably see it increase or decrease.

While you are on the ground, the Request page gives you the option to request deicing services. This will offer a detailed report on the outside conditions and ice on your surfaces and the trend, as well as recommendations on what to do about it.

Weather-wise, FSCaptain considers many factors, from active frost and freezing fog, to ordinary rain and snow in applying ice to your aircraft. Outside Air Temperature, relative humidity, and wind speed also play their parts. Even if the air itself isn’t freezing if you land at an airport after flying hours “at altitude” you may have what pilots call “Cold Soaked Wings” where the icy cold fuel in your wing tanks can cause condensation to form… or they could be subjected to non-freezing rain… but in either case begin to collect ice.
Dispatch will place a **Weather Hold** on your flight if you have any ice on your aircraft surfaces and you will not be cleared for departure until it is removed, or you specifically request a release. Attempting takeoff with ice on your wings is very dangerous and can result in a crash. *Don't do it.*

**How do I get the ice off my airplane?**

If you are on the ground most aircrafts’ internal anti-icing systems (if they have them) won't work or are simply not recommended for use on the ground. You will need to request the deicing crew at your airport to remove the ice, and if conditions are ripe for further accumulation, put anti-icing fluid on your surfaces to keep them clear. The subject of deicing is complex and covered in detail below in the section "Deicing Procedures" but if you don't want to study all these options you can simply accept the defaults provided you by the deicing crew – they know what they are doing.

If you are in the air, you must rely on the anti-icing equipment on your airplane. Not every FS airplane has a structural icing removal system, and even fewer have one that actually works. There are arcane rules and requirements for anti-icing and these are covered below in the section "Structural Anti-icing Systems." We strongly encourage you to test the anti-icing abilities of any airplane you use to make FSCaptain flights when you have this hazard enhancement turned on, and if your airplane does not have working systems, avoid or quickly remove yourself from any icing conditions – just like real world pilots do. You can test anti-icing systems by using the 'customized' weather option in Flight Simulator to create a cloud layer with temperatures below freezing and the icing attribute set to 'Severe'. Fly in this layer and observe the 'Xtra Weight' on the Information Page (this can also be accessed from the Offline menu; you don't have to book and fly an official flight.) Flip on your structural anti-icing switch and see if the ice weight returns to zero. If not, your structural anti-icing system is failing. This can be fixed – see the section below, "Structural Anti-Icing Systems."

**Ground Deicing and Anti-Icing Procedures**

With FSCaptain, nearly every airport in the world has some form of deicing and anti-icing services. This may not be true in the real world, but in this simulator, we are making it so. ACME Industries is a very aggressive conglomerate of course!

There are two phases to deicing: the removal of accumulated ice (*deicing*) and the application of anti-icing fluids to prevent the ice from re-forming while you are taxiing (*anti-icing*). Each phase is separate and can be requested and controlled separately. (You will need to deice before applying anti-ice, obviously.)

Deicing (and anti-icing) services fall into two broad categories: **manual**, and **fluid**. You should think of the manual services as a crew of rampies with brooms and scrapers or heated forced-air blowers who can remove the ice with their individual human labor. This is the service that is present by default at every airport. Larger airports (those with a control tower, usually) have fluid services available. This is usually a truck with a spraying device that can spray heated deicing or anti-icing fluid on your airplane. In addition, medium sized airports (those with an ILS but with-
out a control tower) often have a combination of manual and fluid services – deicing may be done manually, but an anti-icing fluid can be applied by smaller hand sprayers.

At smaller airports, you will have only manual procedures available. These usually take longer to perform than fluid sprayers but they work just as well. The airport deicing crew may can spray you with simpler (and less effective) anti-ice fluids also.

You request and control all ground deicing services from the Deicing page (ID 70). You reach this page in two ways. If you are placed in a Weather Hold because of structural icing (or even the threat of such), you will be given the option to proceed to the deicing page. We suggest that you receive any weather release before undergoing deicing as your Holdover Time will start when the deicing has completed. Otherwise at any time on the ground, once the flight has started, you may navigate to the Request page (from the Communications page).

You’ll initially see the status of the icing situation – the ambient conditions, whether and how much ice you have on the airplane, the trend (accumulating or melting… and how fast), along with a set of two recommendations, one for deicing and the other for anti-icing. Under different conditions either service may not be needed, may be suggested, or may be required. If required, you will see the recommendation in red and with all caps. This is to get your attention! If either service (de- or anti-icing) is needed you will see a PROCEED option.

The next step is to select the options for both services. The options available will vary based on the airport you are in, and the type of aircraft you are flying. In every case, what you will see is a set of recommendations which you can accept by clicking on PROCEED again. If you wish to modify the options, click on the LSK next to each one to cycle through the possibilities. The result of de-icing is that icing is removed from your surfaces. Anti-icing may be available, and if requested a fluid can be applied that will prevent icing for a while. How long is dependent on the fluid and the ambient conditions. This time is referred to as the "Holdover Time" or HOT. This is how much time you have to get to the active runway and take off before your chemically-enhanced immunity to icing wears off, and a lot of factors come into play in its calculation.

**Holdover Time:** When viewing and deciding on options, you’re showed a "projected HOT" in hours and minutes. You can see this change if you switch options. Usually, the default suggestions will result in the longest HOT. What you want to be sure of is, if possible, you get a HOT that allows you time to take off with time to spare. Available anti-ice fluids vary by aircraft type and airport, and their longevity is largely determined by the mixture. (FSCaptain is proud to use ACME brand fluids.)

Holdover time is **critical to flight safety.** Once you have been issued a holdover time, keep very aware of it. The deicing status page will tell you how much is remaining, and your co-pilot (if you have one) will warn you if it’s getting low. Once the holdover time has elapsed, ice will start accumulating on your surfaces again. Ice accumulation can and will negatively impact the performance of your aircraft. If you can’t take off before your HOT expires, you may need to return to a parking space to remove the accumulated ice and re-apply anti-icing fluid if available.
**Fluids**: Type I fluids are considered "deicing" fluids - they remove ice from surfaces. They're often mixed with heated water, and then applied to the surfaces of aircraft. They are “thin” and so generally they run off, onto the ground. They have negligible “anti-icing” effects.

Type II, III and IV fluids are "anti-icing" fluids. They’re thick and thus slightly adhesive when sprayed. These fluids are designed to capture and hold onto water & ice as the aircraft taxis, and then to slide off the surface during takeoff. Ergo, they must be applied to “clean surfaces”

Of these three types, Type II and IV fluids are mostly meant to be used on jet airliners. These types offer the best anti-icing protection because they are thick, but because of that they should not be applied to aircraft who cannot achieve 100kts on takeoff. In contrast, Type III fluids are anti-ice fluids designed for aircraft with rotational speeds less than 100kts. Think of them as being slightly thinner than II and IV.

Type III fluids could be used on “fast” aircraft, but Type II and IV fluids should not be used on aircraft that can’t reach 100kts for takeoff. These types need the force of rapid air movement to clear the aircraft’s surfaces before the aircraft reaches VR speed.

All types of fluids have a value known as the Lowest Operational Use Temperature (LOUT) - that’s simply the lowest temperature at which a fluid can safely be used. ACME Brand fluids conform to standard SAE guidelines (hence ACME's Fluid Dynamic Division's new slogan, "We're Standard!") for aluminum airframes and have a LOUT of:

- Type I = -35°C degrees at a 75%/25% mixture with heated water.
- Type II = -27°C degrees at 100%.
- Type III = -14°C degrees at 100%.
- Type IV = -27°C degrees at 100%.

Your ramp agent and ice crew are aware of these items and will suggest what they feel you should apply given current conditions. However, as Captain of your flight, you may override their opinion. Just remember though, as Captain you are the one who will bear the ultimate responsibility.

There is another type of fluid mixture that’s known as "Alcohol mix" – it’s sometimes available at medium airports, or smaller airports in very northern latitudes. Mixtures are always available in 50, 75, or 100 percent levels. Generally, the higher the level the more effective and long-lasting the fluid will be. For Captains who fly in Economy Mode, it will also be more expensive....

**Conditions for Ground Deicing treatment**: Certain basic conditions must be met for the granting of deicing and anti-icing services at the airport. If you don't meet these conditions your services won't start (or will be suspended if they have started.) You must:

- Set your parking brake and otherwise not move. (Unless parking brakes are INOP.)
- Close all doors/exits. (Unless exit checking is INOP.)
• For on-stand deicing, all engines must be shut off. The ramp workers’ union is very adam-

• If you are undergoing fluid deicing, you need to extend your aircraft’s flaps in order that
every nook and cranny of your aircraft’s surface is treated with deicing fluids. (Unless flaps
are INOP.)
• In FSCaptain 1.8 you may define certain airports to enforce a requirement to have all de-
icing performed at a “Designated Deicing Facility (DDF)” otherwise you may have ground
deicing performed at your parking position. Check the document *Designated Deicing Fac-
ilities in FSCaptain (when published)* for details.

**In-Flight Structural Anti-icing Systems**

As previously mentioned, MSFS simulates structural (wing) icing, and simulates anti-icing. It al-
ways simulates icing (given the conditions of the temperature below freezing and the icing attrib-
ute set above “none” in a cloud layer) but MSFS only simulates ice removal under certain parame-
ters. Many MSFS simulated aircraft (default and add-ons) fail to meet these parameters.

First, the airplane must have a structural anti -icing switch available to the pilot. If such a switch
is in your cockpit, it may be labeled various things, like "Wing Anti-ice" or "Boots". The intent is
that turning this on will clear the ice weight on the airplane and remove the effects on the flight
envelope. If the aircraft’s anti-icing system works it will do this, although the effect may be star-
tling when it does ... the sudden removal of a significant amount of ice can cause pitch-
ups and other unexpected effects. It’s nothing you can’t handle if you are prepared for it, so just be ready.

You can test your anti-icing switch by using the facilities of FSCaptain. From the **Information** page
(accessible from the Offline menu, or from the **Progress** page during a flight) you can select **Inter-
face**, and from there **Interface Page 2**. Look for the line **ANTI-ICE** and if you see a plus sign “+”
your aircraft’s structural anti-icing is working… a minus sign “-” indicates that structural anti-icing
is not active. Flip your cockpit switch and see if the status on the FCDU changes. If not, your
switch is a dummy switch. (Only rely on the data presented on the SYSTEMS page – not the SIG-
NALS page.)

The next question is, if the switch works by toggling the signal, does it remove the ice weight?
Aircraft that do not have a properly coded AIR file will not remove the ice even if the signal is
turned on. Many simulated aircraft do not have this properly coded. If ice weight is not removed
by the signal, then your structural anti-icing switch (whatever it is called) might as well be a
dummy switch, it is useless.

The only way to test this is to get ice weight on your airplane, and see if the switch clears it. You
can do this without flying. At the airport of your choice, get into the airplane, and use the 'cus-
tomized weather' options of Flight Simulator to define a cloud layer that extends to the surface
(that is, below the little airplane on the visual display) and set the 'Icing attribute' to Severe. And be sure your defined temperature is several degrees below freezing (that's 0C or 32F) I also recommend turning the 'rate of change' in your General options of Flight Simulator to 'none' because if you don't FS may take away your icing layer before you can test it – it seems to like removing icing whenever it can!

Once you are in the icing cloud layer, go into the Offline Menu on your FCDU and then go to the Information page. On the left-hand side, there is a value for 'Ice Weight'. If you have successfully gotten yourself into an active icing layer, you'll see this number increasing. The larger the airplane, the faster it will be building. Now once you see that, flip your cockpit's anti-icing switch. Does the ice weight go back to zero instantly and stay that way? If so, you have a working structural anti-icing system on the airplane.

**But it didn't work, now what?** It is possible this can be fixed but it involves modifications to the airplane's ".air" file, and the nitty-gritty details of doing this is beyond the scope of this manual. As a general guide, search for the "AirEd" program and install it. This will allow you access to the details inside the .air file in a fairly accessible manner.

What you need to look at and possibly modify are the 1513, 1518, and 1519 records. The 1513 record contains two numbers. I do not know what these numbers represent but I know that if this record is missing or the numbers are zero, anti-icing won't work on the airplane. On the default FS9/X airplanes that have the 1513 record, for jets the first value seems to be 1 and for all others it is .15; but it doesn't seem to make a difference that I notice. I always use 1. The second number always seems to be 18. So, if your airplane doesn't have a 1513 record, place one with values of 1 and 18 in the two numbers.

The 1518 and 1519 records are very simple. The 1518 record is a switch with a value of 0 or 1, which enables prop anti-icing. This is a value that is overridden by the setting in the aircraft.cfg. Obviously, set this to 1. The 1519 record controls wing anti-icing. There are three possible values: 0, 1 or 2. Zero means no wing anti-icing is available. I suspect that 1 or 2 selects between the two common anti-icing systems (heaters or boots), however, in actual practice I can't see any difference in the results. So, let's just say that a non-zero value here enables wing anti-icing.

Collisions with SimObjects are tracked (HP)

This is an exciting feature for only FSX and P3D Captains, as it requires SimConnect to be active. It also requires its own section for explanations.…. 

The simulator-based “Collision Detection” feature is very precise in determining if you have collided with something, but has one significant drawback which renders it nearly useless for FSCaptains: should the simulator ever detect a collision, your flight is immediately over and the simulator prepares to close down / reset.

Page 85
That puts a damper on any open FSCaptain flight, as some items that can be “collided with” are invisible scenery objects, as well as meandering ground traffic vehicles that could strike your aircraft even before you start your engine! These things are beyond the control of any simulator pilot, which is why we strongly suggest that all FSCaptains fly with the simulator’s Collision Detection switched off!

But doing that gives you the ability to taxi through other aircraft and ground traffic. While that may seem unprofessional, there are many instances where the ATC that’s guiding ground traffic can set you on a collision course with other aircraft or with ground vehicles! Since they’re now harmless, most Captains tend to ignore them if they find themselves in a tight situation.

So, you can now take advantage of the ACME Collision Detection & Consequences (ACDC) feature, what does ACDU allow? Simply put, it can check all surrounding SimObjects and determine if you have collided with them, and then optionally apply various levels of consequences.

It doesn’t care about ‘scenery objects’ so if there’s a building crowding onto your taxiway, it won’t check to see if your wing had sliced through the ground floor. For our initial rollout, it won’t consider ground traffic, although we plan to offer an option to do so for a future release. Ground traffic can be highly hazardous!!

And ACDC does have a few “escape clauses” built in so it can be not as flight-threatening as the simulator’s collision detectors are.

First, you are in control of how the collision reports are manifested. At a minimum, a red COLLISION notice will appear on your FCDU, and a “bang” audio will play. That’s to let you know that FSCaptain feels that there was a collision with a moving object.

Optionally ACDC could generate a series of system failures (engine failures, hydraulic failure, depressurization, etc.). Finally, it could also generate flight control failures (locking control surfaces so they can’t move). (You can find these options on the Weather and Hazard Pack dialog.)

Second, for a collision to be recorded both you and the other SimObject must be moving. Why so?? Well, consider that you might find yourself on a taxiway with no outlet when some traffic turns and begins heading your way. The AI driver might stop, or it might not. But what they won’t do is move aside, nor retreat. You’re both in a deadlock situation!

Whether the AI stops or not, they want to be where you were and you want to be where they were – both behind one another. So, if they don’t stop you can, and then they can drive through you with no penalty. Contra, if they were to stop (either by orders from their AI driver or by your FSCaptain Freeze Ray) you could safely drive through them with no collision recorded!
Section 5: Configuring Aircraft

Because FSCaptain simulates an airline dispatch office with its flight planning and monitoring functions, it needs more information about a given aircraft than that provided within the Flight Simulator program. Having an accurate set of characteristics is vital to the realistic performance of the dispatch office and the proper monitoring and operation of your aircraft systems during flight. Examples of characteristics are normal cruise altitude, cruise speed, fuel burn in pounds per minute at climb, cruise, and descent. The characteristics also contain a chart for loading fuel and payload into your aircraft, and this chart must match the aircraft’s fuel tanks and payload stations for it to be used.

(There is a separate document in your \FSCaptain\Documentation\ folder – “FSCaptain Airplane Configuration How-To”. It is a detailed walk-through of how to take a new aircraft and build the configuration & interface files for FSCaptain.)

The characteristics files are separated into three categories. First, the “generic” characteristics for an aircraft type are created and maintained in the \FSCaptain\Aircraft\ folder where you access them from this tab. These are keyed by the aircraft model type code (for example, B734 or C172.) Secondly, there is an “Overrides” folder inside the Aircraft folder where characteristics files can be keyed by the name of the folder where they are defined inside Flight Simulator. This is rarely used but can solve the problem where two different designers of two different airplanes use the same model type code for their airplanes, creating a conflict. The “exception” is placed in the “Overrides” folder. Thirdly, there is a “Maps” folder inside the FSCaptain Aircraft folder where load maps can be defined for specific simulations of the generic model types. Normally this does not have to be used but some aircraft have special payload and fuel requirements. See Section 5 “Load Maps” in this manual for more information on this feature.

This is how the characteristics system works. When you log in to the dispatch office using the FCDU in an airplane, the type and registration number are used to find the characteristics file in the FSCaptain database like this:

The model (from atc_model in the aircraft.cfg file) and the registration number are combined and the FCDU looks for that file in the \FSCaptain\Aircraft\ folder. Example: a Boeing 737 registration number N737AC might have an atc_model of ‘B734’. So, the FCDU would look for a file named ‘B734_N737AC.cfg’ in the \FSCaptain\Aircraft\ folder. If the “atc_model” item is blank, then the “atc_type” will be used in its place. If both items are blank or not present in the aircraft.cfg, then the aircraft cannot be used with FSCaptain until this is corrected.

If this file isn't there, then the FCDU will next look for a file in the 'Overrides' folder that is named the same as the folder the aircraft is defined in (where the aircraft.cfg is) but with the extension .cfg and if this file is found it will be used as the characteristics file.
If this file is not found (and normally it is not as this is just for exceptional circumstances) then the generic type 'B734.cfg' is looked for in the \FSCaptain\Aircraft folder. If this is not found either there is no record of this aircraft in the database and the FCDU will then create a characteristics file by a special set of default rules and name it the generic type. In our example, it will create a file named 'B734.cfg' in the \FSCaptain\Aircraft folder. It will also issue a warning screen saying that it did this, what the file is called, and suggest that you review the file in the Administrator – which is what this section is all about. (These default rules are in the text explaining each data item on this tab, look for the phrase 'by default' in each paragraph.)

If the FCDU finds a characteristics file in any of these locations, it will then look for a Load Chart file inside in the \FSCaptain\Aircraft\Maps folder that matches exactly the name of the folder the aircraft.cfg file is located in. If this is found the FCDU will use the specifications in that file to override the fuel and payload charts in the generic configuration.

This system is elaborate but it is necessary to solve the problem of the many different ways that aircraft are designed and packaged in Flight Simulator without requiring the FSCaptain user to tweak their FS data files. The 'Maps' folder inside \FSCaptain\Aircraft allows the database to contain one generic Boeing 737, but many different simulations of it with different payload stations and even different fuel tanks. The 'Overrides' folder solves the problem of two different designers using the same atc_model code in their aircraft.cfg files to represent two different aircraft.

It's important that you have accurate characteristics files available to use with FSCaptain, otherwise, you may find the program not behaving realistically. With bad fuel numbers, dispatch may give you too much fuel – or too little. Without accurate speed numbers, dispatch may expect you to arrive at your destination unrealistically fast – or slow. Without accurate fuel and payload maps the payload and fuel may not be loaded correctly, particularly in complex or deeply realistically simulated airplanes.
Here's the “Aircraft Characteristics” tab with an aircraft already loaded:

When you first access this tab, it will be mostly blank. Above, you would see a text box that says “(No aircraft file loaded)” and three buttons: Select Airplane, New Airplane, and Delete Airplane.
We can see the database and modify an airplane by clicking on “Select Airplane”:

Here we see all the generic types. B703 is a Boeing 707-320. C208 is a Cessna 208B. How do we know what type is what? The type code for an aircraft is defined inside the 'aircraft.cfg' file by the airplane's designers and is seen in FSCaptain on the “Dispatch Online” page on the FCDU (ID 10). In addition, there is a standard set of four-letter codes for aircraft types in use in aviation today. These may or may not match those codes, but often they come close. Each type is a file here, with a .cfg extension. (They are in the \\FSCaptain\\Aircraft folder.) Most should be obvious to you. Select a file by clicking on it and selecting “open”, as usual.

You may notice files that have an underscore and a registration number. Those are examples of specific overrides: targeted to a specific airplane with that registration number only.

Once you have selected a file the airplane's data will be populated on the tab. Here we give details on what each data item means to FSCaptain:

**Type:** This is the official type code and it should match the type in the filename. By default, this comes from the 'atc-model' in the aircraft.cfg file, or if this is blank from the first 10 letters of the 'atc-type'.

**Name:** The spelled-out name of the aircraft type, so you can verify it's what you really want to modify. By default, this is the 'title' from the aircraft.cfg file.

**Reg:** This is an optional item and should only be used if you are intending to apply this config file to a single aircraft with a specific tail number.
**Volume Class:** Different airplane types are obviously different sizes. This is usually signified by gross weight. But what particularly concerns us in our cargo simulation is: how big a container will fit inside this aircraft? For reference, FSCaptain divides the sizes into five broad categories:

- **Tiny.** These are your 2, 4 and 6-seater single engine airplanes or small helicopters. Most are small General Aviation airplanes such as a Cessna 172. Only a few relatively small boxes can fit as cargo.
- **Small.** This is a larger space but still a small airplane. It could be a single-engine or a twin. A larger box or container, perhaps the size of a casket, could fit in one of these. A Cessna 208 would be a good example of a small airplane.
- **Medium.** These sizes are the larger GA airplanes or smaller commercial aircraft. An example would be a small to medium regional jet, or a DC-3, or a Convair CV-580. Quite a sizable container of cargo can fit, but not a large one.
- **Large.** These are large aircraft designed to carry a heavy load of passengers or cargo. All but the largest size cargo items can fit. A Boeing 737, Airbus A320, DC-6, 7, or 9. A Boeing 707 or DC-8 might be the top end of this class. Any standard cargo container can fit in these but not the largest items, such as a truck or tank.
- **Heavy.** These are the big specialist airplanes, such as the 747 or A380. Almost nothing transportable is too big to fit in these, including trucks or tanks.

This “volume class” is also used in scheduled operations (whether passenger or cargo) to designate what size aircraft is required to fly a specific route. See the next section “Creating an Airline” for details. By default, the volume class is estimated from the aircraft's empty weight. It is ‘tiny’ up to 5,000 pounds, 'small' to 30,000, 'medium' to 90,000, 'large' to 180,000, and 'heavy' if over that.

**Passenger Seats / Cargo Jumpseats:** A type can be configured for passengers, cargo, or both. *The aircraft configuration determines whether a flight will be passenger or cargo.* By default, most aircraft are configured with both checked, which means it's “convertible”. This means when you fly in this type for a passenger-primary airline (or if your pilot profile preference is for “passenger”) you'll make a passenger flight. For a cargo-primary airline, the same type will be flown on a cargo flight. But if the airplane is configured only one way, then that's the type flight it will make regardless of the primary role of the airline. By default, both are checked – the aircraft is convertible.

For passenger aircraft, you can enter number of seats for passengers (of all classes) in the aircraft. This, plus cabin crew and flight crew, are the maximum number of “souls on board” for a passenger flight. For a cargo-only aircraft, this should be zero. By default, this is the empty weight divided by 1,000, but never less than two.

Cargo-configured airplanes often have a small set of seats for ride-along (non-revenue) passengers. It's quite possible you'll be having company employees riding along with you on cargo flights. This is the maximum number. By default, this is the empty weight divided by 5,000.
**Engine Type:** This designates the type of engine(s) which the aircraft type uses. Select one of the four commercial MSFS engine types from the list provided. (FSCaptain currently does not model gliders, or Part 460 craft for commercial purposes, so *none* and *rockets* aren’t supported.)

**Undercarriage:** This is the type of landing gear which the aircraft type uses. By far most aircraft use a type of Wheel, but there are Amphibious (land and water capable) aircraft, aircraft with Floats (water only) and skis. (Currently FSCaptain does not support ski-equipped aircraft, but will do so soon.)

**Weights:**

**Max Takeoff Weight / Max Landing Weight:** Amazingly, these numbers are not stored in the aircraft configuration within Flight Simulator. You must calculate it for each airplane and store it here. For some smaller aircraft, they’re the same as the maximum gross weight but for many larger planes it is less. This can usually be found in the aircraft's documentation or on the Internet. FSCaptain needs this number for accurate fuel and runway allowance calculations. By default, these are assumed to be the maximum gross weight of the aircraft.

**Maximum Payload:** Normally an aircraft's maximum payload is determined by how much weight is available after factoring in the required fuel for the trip. However, you may specify a figure here and this figure will become a maximum amount of payload that can be loaded into this aircraft regardless of all other factors. A zero or any figure less than zero means this option will be ignored.

**Minimum Runway:** These are the minimum runway lengths in feet that the airplane requires to takeoff or land. The simulator refers to this as an “ATC suggested runway” but it is often not precise.

**Takeoff:** The takeoff value will be used to caution you via the Dispatch Release if the longest appropriate runway at your departure airport is too close in length (110%). If no runway at your departure airport is long enough to handle your chosen aircraft, it’s possible you may be allowed to depart at considerably reduced weight. If you have entered a value for the aircraft’s Max Takeoff Weight, your Dispatch office will be able to adjust the takeoff roll length to account for the airport’s altitude and temperature. Airports at high altitude (where the air is thinner), with high temperatures, or with wet runways will require longer takeoff runs. Always be aware of your aircraft’s performance!!

**Landing:** The landing value will primarily be used to determine destinations for charter flights: those airports with a runway less than the minimum will not be offered, nor selected as an alternate. Airports with runways within 110% of an aircraft’s Landing Runway Length will also be
noted in the Dispatch Release. By default, you can specify a flight to an airport without runways of this length, but you will be cautioned on the Dispatch Release. (There is an option that would deny such requests, if you prefer not to take such risks.)

**Performance:** Data in this group is used by your Dispatch Office to calculate the suggested Block Time for all flights in the given aircraft. If you find that you are always ahead of schedule (or late!) these are the numbers you would begin adjusting.

**Cruise Altitude:** This is the *average* altitude that the airplane *normally* cruises at. It is *not* the maximum altitude or ceiling. For an unpressurized airplane, this might be 8,000. For low-range pressurized propeller aircraft, it might be 16,000 to 18,000. For higher flying pressurized propeller aircraft, 20,000 to 23,000. For lower flying jets, 25,000 to 29,000 feet. For the big passenger jets, 30,000 to 35,000 feet. Rarely anything above that, even though a specific flight might be higher. Dispatch uses this for accurate Block Time calculations; they must determine how much of a flight’s distance is climb, how much cruise, and how much descent. To derive a default, these are the rules: unpressurized aircraft: 8,000 feet. For pressurized aircraft: for piston-powered airplanes it is 20,000 feet; for jets and turboprops it is based on their normal cruise speed: 200 to 300 knots, 25,000 feet; 300 to 450 knots, 30,000 feet; over 450 knots, 35,000 feet.

**Max. Headwind:** This is the *maximum* headwind *likely* to be encountered by this aircraft at its normal cruise altitude. Dispatch needs this to establish boundaries for flight durations. Since Dispatch will know the normal cruise speed and cruise distance for a flight, it will make a worst-case limit based the maximum headwind, and a best-case limit based on the same velocity tailwind. These are the parameters which determine the minimum and maximum Block Time that you can specify for a flight in this aircraft. I usually assign 40 for an unpressurized airplane, 50 for the ones that fly in the teens (12,000 to 19,000 feet), 60 for low cruising jets (20,000 to 29,000), and 80 for the high fliers. By default, this is 50 unless the average cruise speed is above 300 knots, then it is 80.

**Climb Speed:** Dispatch needs to know the speed of the aircraft while climbing, during cruise, and while descending. This is the climb speed. By default, this is the cruise speed divided by 2, although it should be the average climb speed from takeoff to cruise altitude.

**Cruise Speed:** Dispatch needs to know the speed of the aircraft while climbing, during cruise, and while descending. The proper rule for calculating this data item is: this is the True Airspeed the aircraft normally cruises at the altitude defined above as the “Cruise Altitude”, assuming no wind and standard temperature and pressure. Thus, with no wind, this is also the ground speed. This is a crucial item to get right if you expect dispatch to calculate accurate Block Time information. When a flight is planned at other than the standard cruise altitude, dispatch will assume that this is the TAS at the cruise altitude and adjust the TAS for lower or higher altitudes as appropriate.

By default, this data is obtained from the “cruise_speed” parameter written by the designer in the aircraft.cfg, unless there are 5 or more flights in the log by this aircraft. If so, the average speed of
those flights will be substituted for the speed coming from the simulator. Sometimes these speeds provided by the designers are accurate, other times they are way off. Since this parameter doesn't seem to adversely affect the performance in Flight Simulator, its accuracy is a matter of some casu-
alness for designers. Much of the assumptions we make about defaults are based on this speed, however.

**Descent Speed:** Dispatch needs to know the speed of the aircraft while climbing, during cruise, and while descending. This is the descent speed. By default, this is 75 percent of the cruise speed, although it should be the average speed while in descent.

**Climb FPM:** Dispatch needs to know how fast the airplane climbs and descends on average, in feet per minute. By default, this is 700 for unpressurized piston-powered aircraft, 1000 for pressurized pistons, 1200 for turboprops, and 1800 for jets. It should be the average speed for the aircraft from takeoff to cruise altitude.

**Reliability:** This is a percentage factor that potentially will override the “mechanical failure percentage” on the Options for All Airlines tab. It is how reliable this particular airplane is, and it's the opposite of the failure percentage: this is the percentage of flights that will not have a problem. FSCaptain will take the worst of these two factors to determine the likelihood of failure. That is, if the general failure percentage is 1 percent but this airplane has a reliability of 98 percent, there will be a two percent chance of failure. If on the other hand this plane has a reliability of 99 percent but the general option says 2 percent failure, the 2 percent rules. By default, this is 100.0 minus the current default failure percentage.

**Systems & Abilities:** These are some of the items and abilities that each Airline Captain must decide for their fleet of aircraft. Each of our simulators can model hydraulic systems or retractable gear, but some aircraft designers will use their own process outside of the simulator. Likewise, some light aircraft cannot taxi on soft surfaces, while other heavier aircraft can. This is where you tell FSCaptain what your aircraft can do.

**Can Taxi on Grass:** Check this if your airplane is authorized to taxi off the hard-surfaced taxiways and runways. Normally, jets are never authorized. Propeller aircraft often are, except for the very heavy ones. By default, this is assumed 'no' for all jets and turboprops, or any aircraft at or over 100,000 pounds.

**Has Hydraulic Systems:** Check this if the airplane has any hydraulically operated flight systems. By default, this is assumed 'yes' for all turboprops and turbojets, or any aircraft with a maximum gross weight of 20,000 pounds or above.

**Has Own GPWS:** If this aircraft has its own GPWS altitude call-outs, then checking this box will disable the optional FCDU call-outs so you don't get repeats. However, caution: If you are modifying aircraft characteristics in the \FSCaptain\Aircraft folder (which is the normal mode) if you click this option then all implementations of this aircraft are considered to have a working GPWS. For example, you may have bought an add-on Boeing 737-800 that has a nice GPWS system and you
don't want to hear the FCDU call-outs when you fly it. But if you check this box on the “B738” type aircraft, you are saying any B738 has a GPWS call-out – which the FSX default 737-800 does not have. If this doesn’t matter to you (if you don’t fly the default FSX 737-800) then check this. But be aware of this problem. You can enable this option on a specific implementation of an airplane by using the Load Maps feature which has its own override option “Do not play GPWS call outs” -- and the load maps apply to a specific aircraft in a specific folder. See the “Load Maps” section of this manual for more details.

Has Retractable Gear: Check this if your aircraft has these. By default, this is derived from the simulation variable “IS GEAR RETRACTABLE” and if not available, it is assumed 'yes' for all jets and turboprops, or if any aircraft is 20,000 pounds or over.

Has Seat Belt Switch (FS9): Does this airplane have a seat belt and smoking sign that has been modified to interface to FSCaptain? (See Appendix 3 in this manual for instructions on how to code this interface.) If so, check this, and FSCaptain assumes that you (or your FO) are in control of the belt sign when flying in FS9. If not, leave this unchecked and you won't be penalized for improper seat belt control. By default, this is assumed 'no' unless the presence of the FSCaptain interface is detected.

Has Seat Belt Sign (FSX/P3D): Does this airplane have a working seat belt switch under FSX or P3D, that is, does it manipulate the variables that indicate whether the seat belt and no smoking alert signs are on or off. If this is checked, then FSCaptain assumes that you (or your FO) can control the sign when flying under FSX. By default, this is 'yes' for any volume class over 'small'.

Is Helicopter: If this is a helicopter, check this box. Do know that you will have to select an Engine Type of either “Piston” or “HeliTurbine.”

Is Pressurized: Check this box if the airplane has a pressure-controlled cabin. FS2004 does not consider pressurization, so FSCaptain simulates this for you. FSX & P3D does factor in pressurization, and airplanes can be configured to include it. If you check pressurized here, and your FSX/P3D aircraft is not configured to properly report the correct cabin pressure altitude, FSCaptain will assume the pressurization system is malfunctioning. (You can correct this by checking the INOP – Pressurization option discussed later. By default, this is assumed 'yes' for all jets and turboprops, or if the aircraft is 100,000 pounds or over.

Entertainment System: Choose the in-flight entertainment system the aircraft has, if any. Any aircraft that has a movie or digital system is also assumed to have music. Movies and digital are exclusive to one another: 'digital' represents individual IFE devices, whereas 'movie' represents a movie screen shown to groups of passengers. By default, this selects 'none' for any aircraft under 20,000 pounds, 'music' for any above that; 'movies' for any jet aircraft at or above 100,000 pounds, and 'digital' for any jet aircraft at 200,000 pounds or over.
Load Maps: See Section 6 ("Load Maps") for a full description of this exacting feature, but for here
know that this type of load map is meant to be applied to each aircraft of the specified aircraft
type… not to "type variants."

Fuel System: The data in this grouping is used by your Dispatch Office to calculate the initial Fuel
Loads for each flight in this aircraft. If you find that you are landing heavy… or having to make
time-costly refueling stops… these are the numbers that you should look to adjust.

Fuel Type: Check whether this airplane uses Avgas or jet fuel. By default, is comes from the
'fuel_type' variable in the aircraft.cfg file.

Fuel Capacity: This is the total usable fuel in all tanks, in pounds. By default, this is the sum of all
the capacity of all the fuel tanks in the aircraft.cfg.

Minimum Fuel: This is an amount in pounds to be added to the normal fuel calculation in order to
reserve fuel that should not be used. (Some aircraft need to maintain a small amount in their
tanks.) Normally this is zero. This should **not** be used to reserve fuel for holding or for regular
Flight Reserve needs – your Dispatch office will handle those amounts for you.

Fuel Flow CLB (PPH): Fuel flow, in pounds per hour, when this aircraft is climbing. By default,
this is 'Fuel Flow CRZ' times two, but it should be the average fuel flow during climbout.

Fuel Flow CRZ (PPH): Fuel flow, in pounds per hour, when this aircraft is cruising. By default,
this is derived from the “ESTIMATED FUEL FLOW' variable provided by Flight Simulator.

Fuel Flow DES (PPH): Fuel flow, in pounds per hour, when this aircraft is descending. Together,
these three fuel flow factors, plus the climb and descent rate, plus the cruise altitude and speeds of
climb, cruise and descent will determine the estimated Block Time and fuel burn for a flight. By
default, this is 'Fuel Flow CRZ' divided by 2 however it should be the average fuel flow rate during
descent.

Preload Min Fuel: When you initially load your aircraft in the simulator, it will contain a preset
amount of fuel - often what's entered in the aircraft.cfg file - which could be more fuel than you
would need to fulfill your flight.

Setting this value to a low percentage will drain your tanks when you first log into Dispatch using
your FCDU, giving your ACME fueler (or other Ground Service fueling system) ample time to add
fuel to your aircraft when its time. The range of values here runs from 7.5% to 45%. This simu-
lates arriving at an aircraft which has flown in to your airport – the tanks certainly wouldn't be
empty, and likely they would not be over half full either.

This setting does not apply if you have disabled auto-fuel loading globally or for a specific aircraft
via its load map. (More on that later.)
**Crew & Duties**  While you can Captain a flight by yourself – with no others on board for a ferry or cargo flight… or just you and a group of passengers… you have the ability to call upon a First Officer who will handle certain flight items, and a crew of Flight Attendants who will keep an eye on any passengers, while possibly supplying them with food and beverages.

**Has a First Officer:**  Check this box if you will have a First Officer riding with you on this type of airplane.  By default, volume classes 'tiny' and 'small' do not have First Officers, all others do.

**Disable Takeoff Callouts:**  Some detailed aircraft (or other add-ons) can have their FO make V1/V2/VR calls, as well as calls to set flaps, and calls of “eighty knots” on takeoff.  Checking this box will disable an active FSCaptain FO from making these calls.

**Disable Climbout Callouts:**  Some detailed aircraft (or other add-ons) can have their FO make “gear up” calls, as well as calls to check / raise flaps on climbout.  Checking this box will disable an active FSCaptain FO from making these calls.

**Disable Landing Callouts:**  Some detailed aircraft (or other add-ons) can have their FO make calls of “eighty knots” and “sixty knots / sixty knots, reversers off” on rollout after landing.  Checking this box will disable an active FSCaptain FO from making these calls.

**Cabin Crew:**  The standard number of flight attendants serving passengers on this airplane.  By default, this is the number of passenger seats divided by 50, plus one, except for volume classes “tiny” and “small” which by default are zero.

**Disable Preflight Announcements:**  There are some announcements which the Chief FA makes which can be suppressed (PAX welcome, safety briefing, “prepare for takeoff”) and with this checked, the ACME FA will not speak them.  However some emergency-related announcements (“The Captain has aborted the takeoff!”) will be made.

**Disable Inflight Announcements:**  There are some announcements which the Chief FA make that can be suppressed () and with this checked, the ACME FA will not speak them.  However some emergency-related announcements (asking for a Doctor, etc.) will be made!

**Disable Postflight Announcements:**  There are some announcements which the Chief FA makes which can be suppressed ( “we have arrived at our destination”) and with this checked, the ACME FA will not speak them.  However some emergency-related announcements (“Evacuate the aircraft!”) will be made.

**Cabin Service Alt:**  This is the altitude, *above ground level*, below which no cabin service will be performed.  In practice this altitude has several effects:

- Flight Attendants will not automatically start cabin service until you are above this height, and will (politely) refuse any orders to do so below it.
• If cabin service is in progress and you descend below this height, the service will be terminated (not suspended, but terminated and often provoking passenger complaints.)

• When climbing above this height, your lead Flight Attendant will announce to any PAX that “we are now climbing towards our cruise altitude.” (A separate announcement, only on turbojet aircraft, “you are now allowed to use your portable electronic devices” is triggered when the aircraft ascends over 10,000 feet pressure altitude.)

• If your First Officer is in charge of the passenger signs they will insure that the Seat Belts sign is turned on below this height.

• When descending below this height your lead Flight Attendant will make an announcement “we are now descending towards our destination, please insure your seat belts are securely fastened.”

**INOP Systems:** Some aircraft developers don’t model certain aircraft systems in a manner that can be read by FSCaptain. Here is where you can disable our monitoring of such systems on an aircraft-type basis.

**Landing Lights:** If your airplane doesn’t properly set the FS Landing Lights signal then you can check this option to suspend detection of its landing lights signal. This is useful if you are getting penalties. You can test this using the FS signal testing functions of the FCDU – in offline mode select the Information page, then the Systems page, and to the third page therein. You’ll see the current state of your Landing Lights signal. Flip your switch and verify if the signal changes.

**Nav Lights:** The same as for Landing Lights, except for Navigation / Position Lights.

**Beacon Lights:** The same, except for the aircraft’s Beacon Lights.

**Flaps:** This is primarily used to silence First Officer callouts that you have not extended your flaps for takeoff, as well as to remove the requirement for fixed wing aircraft to extend their flaps when undergoing fluid-based Ground Deicing.

**Engine Anti-ice:** If your airplane doesn’t properly turn on the “Engine anti-ice” signals inside FS, but you have the Weather Hazard Enhancement to detect engine icing turned on, then you can check this option to suspend the effects of engine icing for this airplane. You can test this using the FS signal testing functions of the FCDU – in offline mode select the Information page, then the second Systems screen. You’ll see the current state of your engines’ anti-icing signals. Flip your switches and verify if the signal changes.

**Structural Anti-Ice:** The same as for Engine Anti-ice, except for Structural / Pitot systems.

**Pressurization:** It’s come to our attention that some aircraft – while pressurized in real-life – have not been modeled as such in our simulators. If you experience “hypoxia penalties” in an aircraft which should be pressurized, check this box.
Baro Altimeter: Some aircraft don’t follow the standard simulator signal for the altimeter’s barometric setting. If you experience “transition altitude penalties” in an aircraft where you have followed the practice to set standard pressure, check this box.

Battery: Some aircraft don’t follow the standard simulator signal for the aircraft’s main electrical power system. If you’re being told to “Power up your aircraft” before loading passengers, check this box.

Exits: If you’re being told to “Open aircraft exits” before being able to load passengers or cargo, it’s likely that your aircraft isn’t using the standard simulator signals that indicate if your main exit is open. If that’s the case, tick this box and the normal “exit checks” won’t occur.

Ignition: If you use the option “ENABLE_DEFAULT_IGNITION” (see Appendix 5) for turbine-powered aircraft and a particular turboprop / turbojet aircraft doesn’t seem to

Parking Brake: Another standard requirement is to have your aircraft’s parking brakes set before and during loading and unloading. If the FCDU is telling you to “Set your parking brake” while your aircraft has its parking brakes engaged, check this box.

Autopilot & Strobe Lights: These systems will be monitored in future versions of FSCaptain for some extra “interesting” options. ☺
Section 6: Load Maps

Aircraft characteristics files provide the basic information that FSCaptain needs for its dispatcher functions to accurately construct a flight profile. Another function of the program that needs extra information beyond what Flight Simulator provides is the automatic loading process.

Default load rules are simple and every airplane has enough information to use them without a special load map. For fuel, every tank defined on the aircraft (in the [fuel] section of the aircraft.cfg) is filled evenly until the required amount of fuel is loaded. For payload, every payload station is filled evenly until the total payload is loaded. Simple enough. But sometimes, this results in a poor distribution – often on the more sophisticated simulations that go for maximum realism over simplicity.

A fuel example: A real Lockheed Constellation L1049G aircraft has nine fuel tanks – four main tanks (one for each engine), a center tank in the fuselage, two auxiliary tanks, and two tip tanks. The fuel protocol for loading the real Connie calls for the four main tanks to be filled equally, then the two auxiliary tanks equally, then the center tank, and then finally the two tip tanks. Filling all nine tanks evenly with the total fuel load using the default loading rules simply won't work for an accurately simulated Connie.

A payload example: Some designers of simulations allocate detailed payload stations containing things like pilot, co-pilot, cabin crew, and even oil and other consumables. Normally fixed weights are provided in the aircraft.cfg for these stations which are not intended to hold actual payload. But the default rules would clear these payload stations and fill them evenly. In the case of the DC-3 for example, filling the very up-front “pilot” and “co-pilot” stations with an even distribution of the revenue payload would not just be unrealistic but would heavily front-load the airplane -- dangerously so in a DC-3 which is prone to tipping over.

These reasons and more are why we have load maps for payload. Not every aircraft simulation needs a load map but some do and all but the very simplest would benefit from having a load map defined.

An FSCaptain load map allows for three levels of load control: simple, medium, and very precise. It also allows for some special options to override some features of an airplane that are defined in its standard configuration.

If you are not flying passenger aircraft with the Economic Mode activated, if you don’t want to use exit mapping, and if you plan to manually load your aircraft yourself, then you don’t need a load map for your aircraft.
This is a view of the Load Map tab:

There are five buttons which allow you to control the current load map:

**Clear**: All data on this dialog is cleared.

**Load**: A file selection dialog will appear allowing you to select an existing load map and fetch it into these data items to be potentially changed and saved.

**Save**: Saves the currently displayed load map data into the file named in the “File name” data item, with the “.cfg” extension added, in the \FSCaptain\Aircraft\Maps” folder.

**Save As…**: This allows you to save the currently displayed load map data into the Pax, Cargo or Combi sub-folder.
**Import:** Calls up a dialog allowing you to import default load maps from airplanes defined inside your flight simulator installation, which you can then modify and save as a load map. The proper filename will be placed for you based on the folder name where your aircraft is defined. The import function makes this a fairly easy process, and is described later on in this document.

These are the data items on the dialog and how they are used to make a load map:

- **Filename:** This is the name of the load map file. In order to be seen by the FCDU, it must match exactly the folder name of the aircraft it is intended to apply to. The Save function will automatically add the extension “.cfg” when the file is saved, and the Load function will remove that extension when a load map file is loaded using the Load button.

Load maps are stored in the special “Maps” folder inside the regular `\FSCaptain\Aircraft` folder where the normal characteristics files are stored. It is crucial that they be named correctly, because their name is how the system finds them when it looks. They are named for the folder where the specific simulated aircraft they apply to is defined (that is, where the aircraft.cfg is placed.) For example, the MAAM-SIM DC-3 requires a load map to be acceptably loaded automatically by FSCaptain. There are several variations of the MAAM-SIM DC-3 loaded into Flight Simulator when you install the product from the CD (eight in the version I have.) One goes in a folder named “MAAM-SIM C-47A – Cargo”, another in one called “MAAM-SIM DC-3 Passenger” and so on. In order to have these simulations of the DC-3 load properly, we need to have a load map for each folder, named for that folder but with the extension .cfg. Thus, for these two folders we would have a “MAAM-SIM C-47A – Cargo.cfg” load map and a “MAAM-SIM DC-3 Passenger.cfg” load map. And six others, one for each of the eight folders the MAAM-SIM variations are distributed in. The import option on the Load Maps dialog makes will place the correct name in this field for you.

- **Type:** This is the generic type of aircraft this load map is normally attached to. When the FCDU locates a load map that matches the aircraft’s folder name, this type code must also match the model type code used to retrieve the airplane’s generic characteristics file.

- **Reg:** This is an optional item which would apply this load map to a single aircraft by its “atc_id” designation – its “tail number.” This would be only used for a highly particular situation where one of your aircraft’s liveries has a different set of layout, system or fuel requirements.

- **Name:** An optional text name for this load map. You would normally use this to specify which specific simulation this load map applies to. Often, this is similar to the “File name”, but it doesn’t have to be. For example, the “File name” for the FS2004 default 737 is “B737_400” but the name here would be more informative written as “FS2004 Default Boeing 737-400”.

- **Payload Stations:** This is a table of all the payload stations FSCaptain will automatically load arranged in six columns:
Stn: This is the number which must correspond to the station number defined in the aircraft.cfg file. It's critically important that a load map match up to the stations in the airplane. Do not attempt to define stations here that aren't defined for the aircraft. FSCaptain will not create load stations for you. They must exist in the aircraft.cfg file. You will get an error message if you try to auto-load an airplane when its FSCaptain load map doesn't match its station configuration.

Active: Every payload station defined for the aircraft needs to have its active box checked – even if you don't want to load anything into it. Stations are numbered sequentially starting with zero and on up to a maximum number for each aircraft. This version of FSCaptain will support up to station number 340. If the aircraft.cfg skips some station numbers you must ignore that and assign the stations in sequential order here from zero to the highest without any gaps. The simulator also does this and assigns stations sequentially without skipping any regardless of the value of X on the station.X line and FSCaptain must match to the internal FS load station line-up.

Priority: Priority numbers range from 1 (highest) to 9 (lowest). All priority one stations will be filled before any priority 2 stations are loaded, and so on. Default rules state that all stations are priority one. You can change this to set up a priority system, but you must use limits to do this. See the next data item. If you don't want a station to be loaded at all, place a priority of zero on it.

Limit: If you use a priority scheme with more than one priority, you must place limits on all the stations that have any priority other than the lowest. This is because payload stations are not defined with any limit inside FS. For example, in order to load any priority 2 stations, you must set limits on all the priority 1 stations or they will never fill up, leaving nothing for the other stations.

Description: This is an optional text description of what this station contains.

Name: This is the name of the unit that fills this station. For PAX type stations this will be “Seat” and that is the default for PAX types if left off. For crew it may be “Seat” or some other name, for example a simulated airplane that defines an oil quantity in a payload station would be type C but “Seat” would not be appropriate for that station. For cargo this should be the name of the standard container. “Pallet” or “Box” are both common, as is “Crate”. But we encourage you to use standard modern freight container types where appropriate, for example “LD1” or “LD3” depending on the size and configuration of the station. An internet search for “Air freight container types” will give you good guidance.

The next three fields are used to precisely control the loading of your payload stations. By placing data in any of these for any station you are choosing to exercise precise control. This means you must define every station using precise control. You can’t mix the two levels. Precise control overrides the standard loading mechanism of FSCaptain with a different model that is more complex and has realistic restrictions. The limit and priority still apply but the fields here will place restrictions on the contents of the station by type. If precise control is defined for an aircraft the dispatch release will compute and print a “Load Plan” for the stations and the auto-loader will follow this plan (or you can follow it yourself with an external loader.)
**Type:** There are three broad types of weight: static weight that is present in a fixed quantity on every flight, passenger weight, and cargo weight. The code in this field defines the type:

- **C** – Crew (or Constant): this weight is specified here in the units multiplied by the size, and this fixed weight will be included as “CREW” in any manifest using the aircraft this load map is attached to.
- **F** – First class passengers only in this station.
- **J** – Business class passengers only in this station.
- **W** – “Comfort Economy” passengers only in this station.
- **Y** – Economy (coach) class passengers only (the default for PAX type stations.)
- **G** – General Cargo only. This will include baggage (if any) and any PAX weight that is included on the flight but which enough PAX capacity is not built in (this is most likely with ride-along passengers on cargo-configured airplanes.)

**Units:** The number of units this station holds. For types F, J, W and Y this is the number of passenger seats. For type C this is typically the number of crew seats (but it could be defined differently in special cases for other fixed weights.) For type G it is the number of cargo containers that will fit in the station.

**Size:** This is the maximum weight, in pounds, of each of the units at this station. For PAX (types F, J, W and Y) this should be a standard usually between 170 and 180. If you plan (or need to) use a loading system outside the FSCaptain auto-loader it’s very important that this number match up to the standard number used by your auto-loader or you will find it difficult to reconcile the weights actually loaded versus what is planned. For example the PMDG 737NGX loader uses a standard PAX weight of 175 pounds whereas the PMDG MD-11 and 747-400 use 180.

For type C or G stations the important factor is the maximum weight that is defined by the number of units times the size. For type C stations that number will be placed in the station by the FSCaptain auto-loader and nothing will be added to it. For type G stations that number is the maximum capacity of the station. In computing random payloads for flights the total capacities of all type G stations will be the maximum cargo capacity of the airplane regardless of any other factors. You will not be able to specify a cargo load greater than this total.

**Value:** This is a read-only data item that will have unique numbers when a default load map is imported from the aircraft data inside flight simulator, being the weight value programmed into the station by the designer. Often, these are default weights which are intended to be overridden. But in some cases they are never meant to be altered – as in the example of the MAAM-SIM DC-3, which expects the weight of the first three payload stations to not change (it actually reduces station 3, oil, as you fly!) Seeing this number will help you compute the “Static Payload” number, below. When loading a pre-existing load map, the static weight of the station is used.

At the bottom of the payload station table are two read-only data items and three buttons:
Next & Previous: These buttons advances and retreats twenty stations per dialog, From Station 0 to Station 339.

Compute - - >: This button recalculates the next two items – the aircraft’s non-revenue static payload, and the aircraft’s maximum payload.

Static Load: This is normally the weight defined in stations that should not be changed by the auto-loading process (that is, the stations with a priority of zero). You can add up this field by pressing the “Compute” button in front of it. This will simply add up the station's values that are currently coded with a priority of zero. This number will be used by dispatch in accurately calculating payloads for your flights by subtracting this number from the payload weight available for loading.

Max Payload: This is the sum total of all active load stations. Dispatch will not generate flights for this aircraft which exceed this value.

Fuel Tanks: This is a table of the eleven possible fuel tanks defined in Flight Simulator. Most airplanes don’t use all of these, in fact most use only two or three of them. There is no requirement that a particular simulation of a real aircraft match its simulated fuel tanks to the real ones on the airplane. By default, flight simulator draws fuel from all defined tanks equally until all tanks are dry. This allows the pilot of the typical airplane to not worry about fuel at all as long as he or she has enough to get to their destination. Often, designers will simplify the fuel tank situation on an airliner. When this is done, the default rules usually work well and no fuel load map is necessary.

But other times, a complex fuel system is simulated accurately and therefore the loading of the fuel tanks must be done realistically. This involves filling the tanks in a defined order.

Tank: The eleven possible MSFS fuel tanks are listed, each with its flight simulator name and a check box next to it. You must be sure that all tanks that are defined in the [fuel] section of the aircraft.cfg for this airplane simulation are checked, and none are checked that aren’t defined there. If the mapping here doesn’t match the tanks in the simulated airplane’s aircraft.cfg this load map will be rejected by the FCDU and default mapping used instead. Important note: These fuel tank names may or may not correspond to the names of the tanks in the real airplane. Don’t be thrown by this. Often to construct a proper priority sequence you must understand which simulator tanks are representing which real tanks. This can only be done by studying the documentation that came with the simulated aircraft.

Priority: This is the priority load order, from 1 (highest) to potentially 9 (lowest). All priority 1 tanks will be filled before any priority 2 tanks, and so on.

Optional Overrides: This is a set of fields which, if specified, will override the corresponding data items on any aircraft characteristics for this airplane. This allows you to change some of the characteristics based on the different simulations. If you leave these data items blank the corresponding data items on the generic characteristics will not be altered.
**Passenger or Cargo:** Check one or both of these to specify a configuration for this simulation that will override the configuration specified in the generic characteristics. You should save Passenger-only load maps in the \PAX\ subfolder, Cargo-only load maps in the \Cargo\ subfolder, and “Combination” load maps in the \Combi\ subfolder.

**Passenger Seats:** Change the number of passenger seats (of all classes) from the number specified on the generic characteristics.

**Cabin Crew:** Change the number of flight attendants from the number specified on the generic characteristics.

**Jump seats:** Change the number of jump-seats in the cargo configuration from the number specified on the generic characteristics.

**Do not play GPWS Callouts:** If this particular implementation has a set of GPWS altitude call-outs, check this to mute the FSCaptain altitude callouts when you fly in this airplane.

**Suppress Auto-Payload:** If this option is checked, FSCaptain will not generate payloads for flights or automatically load any payload aboard the aircraft during the loading process. Instead, FSCaptain assumes that the payload weight that's already on board the aircraft at the time a flight is reviewed or selected is the correct payload weight, and FSCaptain will generate a valid manifest that matches that total weight. To help remind you if you have this option checked, the FCDU will display the prompt message “Insure Payload (and fuel) are Correct” in white letters at the last point where you could set the payload before it is processed into the FSCaptain system and a manifest is generated to match it. The payload weight referred to is the payload actually loaded aboard the aircraft’s load stations (all of them). It does not matter to FSCaptain how that payload weight got there – it could have been loaded via the FS menus, or from another loading program. But the correct payload weight you want to use for the flight must be loaded and ready, or whatever is there will be used.

**Simulate Load:** This option is only effective if the option above “Suppress Auto-Payload” is checked. If you choose to not automatically load a payload, checking this will simulated the boarding process for passenger flights only, showing the count of passengers boarding the aircraft just as if they were being loaded by FSCaptain – but they are not. If you check the “Suppress Auto-Payload” option and leave this option unchecked, the loading process will be nearly instantaneous since fuel is loaded immediately.

**Suppress Auto Fuel Load:** If this option is checked, FSCaptain will not load fuel on board the aircraft during the loading process. You are responsible for having the correct amount, as FSCaptain will not after it. In addition, you will not be required to meet your minimum fuel in order to be allowed to dispatch your flight. Your fuel can be loaded from an external loader program, or manually, it does not matter.
**Suppress First Officer:** Even if an aircraft has a first officer designated as part of the crew, the FSCaptain first officer will not speak nor provide any other function (such as managing the seat belt sign). It will be as if he or she isn't there at all. This option is most likely to be used if you have another add-on (or a special airplane) that provides its own co-pilot.

**Suppress Flight Attendant:** Even if an aircraft has a flight attendant designated as part of the crew, the FSCaptain flight attendants will not speak nor provide any other function (such as cabin service to passengers). It will be as if he or she isn't there at all. This option is most likely to be used if you have another add-on (or a special airplane) that provides its own flight attendant.

**No Slick Runways:** Check this if you are using the Hazard Pack’s “Runways can be contaminated by precipitation and degrade braking action” but have poor or limited braking control for this aircraft. While FSCaptain strives to bring added levels of realism to our simulations, sometimes allowances have to be made for aircraft that are deficient in one area or another.

Examples of using the above options to suppress parts of FSCaptain include an aircraft that has its own loader to handle payload, fuel, or both. Or, some users may use an add-on such as FS2Crew with a particular aircraft and may wish to suppress the FSCaptain crew in this case.

For example, CaptainSim has their ACE tool which can load the payload for an aircraft, but not the fuel. For that, check the “Suppress Auto-Payload” and “Simulate Load” options, but leave the others unchecked. For an aircraft like the iFly 747-400 which can load both fuel and payload you could check both “Suppress Auto-Payload” and “Suppress Auto Fuel Load”. The Aerosoft Airbus has a fuel loader, and both a FO and a team of attendants. You may adjust each aircraft’s loading abilities as you wish.

If you suppress the automatic loading of payload, and do not check “Simulate Load” there will be no period where the passengers begin to board the aircraft.

**Exit Mapping:** This is a set of fields which, if specified, will group exit numbers into “types” for this airplane. This can be used to manipulate more than one exit at a time for those Captains who wish to supervise loading and unloading from outside their aircraft.

Microsoft / ACES defined four exit indices for an aircraft along with several exit “types.” The four exit indices correspond to the SHIFT-E, SHIFT-E #2, SHIFT-E #3, SHIFT-E #4 key commands we’re all accustomed to. The “types” imply what each exit is used for – in ACME terms, Passengers, Cargo and all Other items (emergency exits, service exits, crew exits, and even APU panels). What Exit Mapping allows is for you to define the type of exit for each exit.

Looking at the example image above, the venerable default FSX Cessna 208B uses SHIFT-E #3 to open/close the Passenger exit/steps. It uses SHIFT-E #4 for the cargo door. It uses SHIFT-E for the Captain’s door, and SHIFT-E #2 for the front right door (used in an ATP situation for the First Officer.) So we enter “3” for the PAX exit, “4” for the Cargo exit, and “1” and “2” for all Other exits.
The Speed value is the amount of seconds that it takes to open/close an exit. If FSCaptain is told to open an exit and the simulator does not report that the exit is open in this duration, you will receive a message on the FCDU asking you to check the exit’s status.

If you’re having trouble customizing an exit map for your aircraft, you can click the “Reset Exit Mapping” button and it will rest these values so that SHIFT-E will open/close both Passenger and Cargo exits.

But what if you don’t want your crew to manage a particular exit? For example you may have one aircraft that has its own Ground Support package which handles the PAX doors on its own while ignoring Cargo and Other exits. In this case, you would enter the PAX exit number as a negative – so in our example above you would enter “-3” for your PAX exit. FSCaptain will wait until you or your Ground Support package handle Exit 3.

Creating a Load Map for your Aircraft
After all that formal definition, a load map may seem too complex to bother with. But by using the Import feature as a starting point it’s actually quite easy and straightforward to build an accurate load map and it’s usually well worth the effort.

When you click on the “Import” button, you will see a listing of all the aircraft you have defined in this copy of Flight Simulator:
Simply find and select the airplane whose load map you want to import. The plane's configuration will be accessed and converted to FSCaptain format and presented in the data fields. You can then edit and save it. Most usefully, the exact folder name is placed in the “Filename” data item.

After you've done the import you have a picture of how FSCaptain will load your aircraft by default. This means it has found all the load stations and made them active with the same priority and with no weight limits, and it has found all the fuel tanks and made them fill up with the same priority. This means when the auto-loader does its thing the whole fuel load will be spread evenly through all the active tanks, and the whole payload will be spread evenly across all the load stations. If this is okay with you then unless you need to check one of the special options in the lower right you don't need a load map for this airplane simulation.

Almost every add-on aircraft needs more control than this. When I import the first thing I look at is the fuel situation. The way Flight Simulator works by default all tanks will feed all engines. But most add-ons are more realistic. For a simple example, on a Boeing 737 the center tank will be drained first, feeding both engines, then the wind tanks, each feeding its own engine. If all three are filled equally this will work out okay, but this is not how it's usually done in the real world. The wing tanks are filled first and then if more is needed the center tank takes the extra. To make this happen with FSCaptain define the two wing tanks here with a priority of 1 and the center with 2. You can have up to nine levels of priority to make the fuel load match the way the real world expects it to go.

Next check the override section below the fuel configuration. This allows you to make this particular variant different from the standard defined for this type. As you know FSCaptain defines an aircraft based on its type code which comes from the “atc_type” defined in the aircraft.cfg file. But this doesn’t account for the many simulated variations in these basic types.

For example you may have 737 type aircraft from three different developers: The Captain Sim 737-100 and -200, the iFly 737NG airplanes, the MilViz 737-200, plus the set of PMDG 737NGX planes. (All of these in addition to the FSX default 737-800!) Several of these probably have the same type code of “B737”, particularly the default and the 737-700 variants.

But there can be a separate load map for each one. On that we get to use the overrides to customize the variant. For the default 737-800 we want to use the auto-loader to load the airplane and we want FSCaptain to provide GPWS altitude calls because the default doesn’t. But for the PMDG 737-800s we might want to use the PMDG loader built into the MCDU and suppress the FSCaptain GPWS calls because the PMDG has its own. And if we are using FS2Crew we probably want the FSCaptain crew to stay silent in favor of the FS2Crew. Note: these are examples. FSCaptain comes provided with load maps defined for most popular add-ons including all the ones mentioned here. But you can change them to suit yourself if you like.
And last, but not least, the biggest and most complex task, the station configuration.

The most important decision is: how precise a control do we want to use? It's tempting to go for broke and use the most precise in every case, but this is often not necessary and brings on more work and problems that it solves. In making this decision there are a number of factors.

Do you plan on using the FSCaptain auto-loader for this airplane or a loader built specially for it? (Some add-ons don't give you a choice; the PMDG MD-11 will not allow any but its own loader to be used. Others strongly recommend only using their loader in scary terms.) If you are using a non-FSCaptain loader but want to be able to use it to match the FSCaptain generated payloads precisely you will probably need to use the type-coded precise controls, in fact this is largely why they are there.

If you are using the FSCaptain loading system then an even spread (or one with simple limitations) will often work surprisingly well. If the station layout in the aircraft.cfg defines a set of stations fairly evenly spread along the length of the airplane then probably an even spread will be okay, but watch for traps. Some simulations define a spot for the crew up front. You don't want to put payload up there or you'll place the CG too far forward. You can still use the simple method by making these stations have a priority of zero. That will keep the FSCaptain loader from filling them. It may be tempting to put a type C in the type field for Crew. But this is an all-or-nothing thing: if you put any type in to any station you have to define precise controls for every station!

Putting in type codes, units and sizes will route the different types of payload into the appropriate stations. Passengers are allocated by unit and will be spread evenly across their stations with a slight bias towards the front of the airplane. Cargo is allocated by weight and an even distribution across all type G stations will be attempted, but maximums for each station will not be exceeded. Type C stations will always contain the weight you define here as the units times the size. The name field is only documentation and is not used in the computations.

It's important to realize that retaining the simple method of allocation gives you greater flexibility. An aircraft without precision controls can easily swing between passenger and cargo roles but one with a fixed definition by type will never be able to carry more cargo that is defined in its type G stations even with most passenger seats empty.

**Configuration-based Load Maps**

There are three special folders underneath the “Load Maps” folder in the data structure that can contain load maps that will be used based on the flight type being flown at a particular time. What this allows you to do is have the same airplane have a detailed load map for an all-passenger configuration, an all-cargo configuration, and a combination passenger-cargo configuration.
The three special folders are named:

- **Cargo**: contains a load map used when a cargo-type flight is being flown without any passengers.
- **PAX**: contains a load map to be used when a passenger-type flight is being flown.
- **Combi**: contains a load map used when a nominal cargo-type flight is flown with “ride-along” passengers.

These special load maps have exactly the same format and are used in exactly the same way as standard load maps in the “Load Maps” folder, and they are completely optional. When the system looks to see if a load map is to be used for a flight, it determines which of the three categories the flight belongs to, and then looks in this folder to see if there is a load map matching the aircraft folder name. If one is found, that’s the one used. If nothing is found, the system looks in the main Maps folder like it always has.

The reason these exist is to support the “detail load” option where types, units, and numbers are assigned to a load map. This way, you can reserve seats (type F, J, W or Y) for cargo flights with passengers, but mark the same station as type G for pure cargo flights.

The best way to create these special maps is to use Windows Explorer to copy and paste the base map from the Load Maps folder into one of these special folders, then use the Administrator to select it and edit it with the “Load Maps” tab as described above. When a load map has been loaded from one of these special folders the “Save” button will automatically know to save it in the spot it was loaded from.
Section 7: Creating and Managing an Airline

Airline Definitions
This section will explain how to create an airline from scratch, or how to modify one. Each data item will be explained in detail. Airlines are defined from the *Airline Definitions* tab in the Administrator:

![Airline Definitions Dialog Box](image)

At the top of this dialog, you see an area where an airline name can be typed. Next to that are the buttons to Select, Create, or Delete an airline. Your current airline should be presented when you first visit this section, but to look at an existing airline, and perhaps to modify it, click on the “Select Airline” button:
You will see all the airline definition files in the database. Click on the one to load and then click “Open”, as usual.

To create a new airline, click on the “Create Airline” button. You'll be asked if you want to base this new airline on an existing one. This isn't required but it’s very helpful – it will save you some typing. Whether you do or not, the name entry field will change to “(newname)” and the items will either be filled with blanks, or be filled with the same data from the base airline you chose.

You should type the name of your new airline's file on top of the “(newname)”, then change or fill in the data below. Here's an explanation of each data item:

**Official Name:** The name of the airline, officially. It’s what’s used on tax and other governmental forms and papers.

**Short Name:** A shorter version of the name, for display in restricted places on the FCDU. You must limit this name to eight characters or less.

**Code:** This is an optional one to four character code to identify flights when they are exported to a virtual airline. For example, if you are configuring an airline for Delta Virtual Airlines, you might want to put “DAL” in this code. Then flights exported to your virtual airline will be recorded as “DAL5256” rather than just “5256”. This is also used to determine an arrival gate when the option to assign gates has been checked (see below). This code is matched against the airline code that can be placed on every parking spot. Your Airline will try to assign you to a gate with a matching code, so long as the gate is large enough to hold your aircraft. If no airline-specific parking spots are found at an airport you will be assigned another spot.
Set ID to Code: This is an option to internally set the aircraft ID to this code plus the flight number for the FSCaptain flight. Thus, if your aircraft is normally called “N3535P” for an FSCaptain flight it might be temporarily renamed “DAL5256” when the code above and the current flight number are combined. This renaming is temporary for the current flight only and is not recorded in any files. It will not be effective in having the FS ATC call you by this name if you also have an airline name in the aircraft configuration – FS ATC will always prefer to call an aircraft by the airline name and flight number.

Display Name (on FCDU): This is what the airline calls the FCDU device. Some airlines like to customize this, for example, Acme calls it the “Acme Communicator”.

ATC calls this name: This is the name of the airline as far as the MSFS ATC system is concerned. This should match a pre-programmed name if you want ATC to call your airline properly. For example, “Acme Aero” is an airline built into the MSFS in both versions. All of the MS default airlines and most of the real-world ones have a name to use there.

Must Match: Check this box if the aircraft’s airline designation (in the parameter 'atc_airline' in the aircraft.cfg file) must match the above data item (ATC calls this name) for the airplane to be flown for this airline. For example if you are flying for Landmark and you have “Landmark” in (ATC calls this name) then you could only fly aircraft that have “Landmark” as the 'atc_airline' value in their aircraft.cfg file.

Primary Role: The primary role of the airline, whether passenger, cargo or medical. This will determine what kinds of flights are flown in “convertible” type aircraft. Cargo-configured airplanes will always fly cargo flights; the same with passenger configured ones, regardless of this setting. There is a specialty setting here: “Medical”. A medical airline is a cargo-oriented airline that specializes in medical flights. All flights for this specialty will be “priority”, and all flights will contain medical type cargo, often including fragile cargo and even human patients.

Checkrides are: A “checkride” in FSCaptain is a set of standard maneuvers which the FCDU can monitor to see if the pilot performs them properly. They are: a steep turn, a stall recovery, an emergency landing, and six regular landings. This is a simplified version of the real-world checkrides that real professionals have to perform. Options are:

- **Not Used.** A check-ride is never necessary for this airline.
- **Optional.** A check-ride page is presented on the FCDU anytime the pilot goes to select a flight with a new aircraft type. However, the check-ride can be easily skipped on the page. If in your pilot profile you are certified for this aircraft type the check-ride page is skipped.
- **Required.** A check-ride must be performed on every new type of aircraft flown by the pilot before he or she will be allowed to fly revenue flights in that type for the company. If you have specified you are certified for this type aircraft on your pilot profile, you will have the option to waive the check-ride.
**Maintenance:** This option indicates the effectiveness of the airline's maintenance operation. “Excellent” means no adjustments are made to the base mechanical failure rates supplied by either the “options for all airlines” tab and/or the aircraft's “reliability” rating. “Good” means these failure rates are made worse by 50 percent. “Marginal” means if the government were to inspect the maintenance operation they might well have their certificate pulled or at least be on probation. This will *double* the failure rates over the base rates.

**Flight Commitment:** This largely determines how difficult the airline can be to fly for, and it has several effects. The options are:

- **Committed and Logged at End (easy):** You simply fly, and at the end of your flight the log entry is recorded. If you crash, the crash is not recorded in the log.
- **Committed After Load, Dropped if Elapsed (medium):** Your flight is committed (that is, you must complete it) after the load is complete. If you fail to complete the flight, it will be held for you for a period (defined in the next option) but if you don't resume it, it will be silently re-assigned to another pilot without penalty to you. If you crash, your crash will be recorded in the log with a zero score.
- **Committed After Select, Canceled if Elapsed (hard):** Your flight is committed (that is, you must complete it) as soon as you select it from the dispatch selection list. If you fail to complete the flight, it will be held for you for a period (defined in the next option) but if you don't resume it, it will be re-assigned to another pilot and recorded in your log with a low score. If you crash, your crash will be recorded in the log with a zero score.

**Hours to hold flight after commitment:** If you select the medium or hard options above, this factor is the number of hours FSCaptain will hold the flight open for you. The hours elapsed is calculated by comparing the current simulator time to the simulator time originally recorded in the log. Thus, you can make a flight open to you anytime by manipulating the simulator time.

**Policies:** These values define the rules which all Captains for the airline must follow. Essentially, they set a series of penalties which Captains can have applied to each flight. Unchecking all policy choices makes for very easy flying, just nowhere near as rewarding as working under strict conditions.

**Fuel Management?** If this is checked the airline expects its pilots to not fly with excess fuel. The proper fuel burn, plus a reserve, is always calculated by Dispatch. You can request more fuel, and you have the option to request overrides if Dispatch complains about how much fuel you are loading. But, if this is checked, then Dispatch will monitor the amount of fuel left after the flight, and if that amount is greater or equal to the total amount required for the flight then your score will be docked for excess fuel on landing.

**Allow to Taxi on Grass?** Does this airline allow its airplanes to taxi off the runway and taxiways? Check this if yes, otherwise you risk a penalty if you don't stay on the tarmac.
Landing Lights on below _____ft?
Landing Lights off above? These items correspond to policies in the real world where some airlines require pilots to leave landing lights on when below a certain altitude - 10,000 feet for instance. You may select any altitude from 6000ft to 21000ft to be your airline's default Policy Altitude.

This applies mostly to turbojet aircraft in the modern world, but if this option is checked it will apply to all aircraft flying for this FSCaptain airline. To avoid penalties, you should turn your landing lights on when you enter the runway, and leave them on while below that altitude. (There's a 500 foot “cushion” either way.) On descent, make certain your landing lights are on before reaching this altitude.

There is another option that your airline may require, and that is to turn off your Landing Lights when above the same altitude. This option does not apply if your airline does not require Landing Lights to be on while below the Policy Altitude.

There are exceptions for very high altitude airports. If your flight’s Departure, Destination or Alternate airport is at an elevation less than 4000 feet from your airline’s Policy Altitude, then the elevation of the airport with the highest elevation will be added to the Policy Altitude (with a cap of 21000ft).

Example: Your airline has a default Policy Altitude of 10000ft and you have a flight from KDEN (elevation 5324) to KJAC (elevation 6449). The difference between KJAC and the Policy Altitude is less than 4000 feet, so the height of KJAC (rounded up to the next thousand, so 7000ft) will be added to the current flight’s effective Policy Altitude – requiring you to keep your Landing Lights on while below 17000ft.

Example: Your airline has a default Policy Altitude of 12000ft and you have a flight from SPRF (elevation 14962) to SPHO (elevation 8805). SPRF has the higher elevation, and the difference between SPRF and the Policy Altitude is less than 4000 feet, so 15000 feet (rounded up from 14962) is added for a value of 27000ft, which is then capped to 21000ft, becoming the effective Policy Altitude for this flight.

The Policy Altitude for each flight is noted on your Dispatch Release, along with a reminder of your airline’s policy when climbing through the Policy Altitude.

If your First Officer is enabled to give advice, they should also remind you when it’s time to check your landing lights.

Note: non-optional policies: A hard-coded restriction at the 10,000 level should be mentioned here. It is not optional and is the restriction to stay under 250 knots under 10,000 feet. Again there are “cushions” around these limits, you actually need to be 256 knots or above while less than 9,500 feet or so to trigger the penalty. The other hard policy is to set the altimeter to standard pressure (29.92 or 1013 millibars) above the transition altitude. The cushion there is about 1000 feet.
**Assigned Parking?** Checking this box means that your airline will assign you a parking spot at your destination which you must be inside before the FCDU will allow unloading of your cargo or passengers. Leaving this unchecked means you can taxi to and unload at any spot. This option will be ignored unless the option “Require an FS Parking Location to Unload” is also checked on the Options for All Airlines Tab.

Even with this option turned on, it may not be possible for an airline to assign a parking spot at every airport. There may be none available. In that case, you will be told that you can unload anywhere at the airport.

If you are assigned a specific spot, you will see this mentioned on the final Dispatch Release document given to you after you are clear to depart. You can also see this on the Information page accessible from the Enroute Progress page of the FCDU. The spot that is assigned to you may be changed by your dispatch office at any time until you arrive there. If it is changed you will receive a message from Dispatch to that effect on the FCDU. For more information on parking spots, read the section “Understanding Gates and Parking” earlier in this manual.

**Score Actual Arrival Times?** If the airline has a schedule and that schedule has local arrival times on it, you can choose to have the airline include your performance against the scheduled arrival time in your score for each flight. The scoring is as follows: Up to 15 minutes after the scheduled arrival time is considered “on-time” and no penalty will result. After 15 minutes late, you will be assessed a two point penalty, plus one additional point for each 10 minutes late after that.

**Position Reports Interval?** Air Transport Pilots are usually required to give position reports to ATC or their company dispatch at regular intervals. Entering a zero here will disable this requirement; otherwise a value from 10 to 70 minutes will specify the interval at which reports should be made. Unless you use your aircraft’s performance data to estimate when the initial TOC (Top Of Climb) report is to be made (see the list of Options in the Appendix), your airline will require your TOC to be made within two times this duration. (So, if you have a 15 minute Position Report Interval, TOC needs to be made within 30 minutes, etc.)

**Load Factor:** This is the base percentage used to calculate how “full” Dispatch will attempt to load your aircraft. It’s a rough target, and if you want to always be surprised, you can enter “0” to have random loads always assigned.

**Max Flights Presented:** How many flights, both scheduled and charter, will be presented on the FCDU when browsing for available flights.

**Default Flight Length:** The FCDU has a “time constraint” and it will not present flights to you that exceed this constraint, unless they are scheduled flights. You can adjust this constraint from the FCDU, but this is the default length used before you adjust it.
Deny Block Revision this close: You as pilot in command are responsible for estimating your Block Time before the flight takes off. If, however, unexpected events occur during flight that will materially affect the Block Time and thus the scheduled arrival time, you should send an Block Time revision to Dispatch while in-flight. However, Dispatch will not accept any Block Time revision when the aircraft is this number of nautical miles or closer to the destination.

MAX Flight No.: By default, FSCaptain will automatically number flights up to and including “9999.” Some Virtual Airlines have rules which do not allow flights to have flight numbers that high. A value entered here that is below 9999 will be the new “cap” for this airline’s flight numbers.

Cargo Exceptions: These options control how certain aspects of cargo flights take place.

Jumpseat %: This is the percentage of cargo flights in which ride-along company employees will be on the flight. If you are defining a medical specialty airline, this will help determine the percentage of flights that carry patients, as a patient requires attendants and will not be included on any flight that does not have any PAX.

Special %: This is the percentage of cargo flights that will have at least one of the special flags: priority, fragile, or live. The Priority flag doubles both penalties and rewards for on-time performance (or lack thereof), the Fragile flag reduces the G force and landing speed limits for cargo damage, and the Live flag means you are carrying live animals which are usually fragile and cannot be flown above 12,000 feet for long in an unpressurized airplane.

Ramp Optional? On normal FSCaptain flights, you are required to unload cargo at a ramp or gate or dock at your destination. Checking this means this restriction is lifted for cargo flights only (not passenger flights.) For a cargo flight, you may unload at any point on the airport.

Scheduled Flights: These are three data items that determine the parameters for picking up scheduled flights. “Pilots must arrive no earlier than [X] and no later than [Y] minutes before scheduled departure.” This means that to see a scheduled flight on your FCDU, you must be within X and Y minutes early before the flight is scheduled to leave. Assume X is 45 and Y is 10. If a flight is supposed to leave at 0800 (8 o’clock in the morning) to see it as an available flight on the FCDU you must be at the airport and in the appropriate volume class aircraft between 0715 and 0750. If you are not within these times, you will not see the scheduled flight because you are either too early, or too late, to fly it.

The last factor, “Passengers will begin boarding [Z] minutes before scheduled departure” means exactly what it says. Therefore, if Z is 10, then if you arrive 30 minutes early, you will have a 20-minute wait before the boarding process starts.

Schedule: This button will take you to a section where you can modify your schedule. See the section “Creating and Modifying the Flight Schedule” later in this manual for details.
Weather Minimums: Your Dispatch Office will follow these preset values to allow unfettered access from and to airports. If the reported weather is “worse” than what is noted here, you will receive either a “Weather Hold” to prevent departure or “Authorization to Divert” to an alternate.

Minimum Ceiling: The ceiling at the departure airport must be at least this high (in feet) for you to take off. It must also be this high at the destination (or the alternate) for your landing to be approved by Dispatch. If the ceiling is below minimums before departure, you will be placed on “weather hold”, but you can request that the hold be lifted. If the ceiling is below minimums at the destination airport, you would be authorized to divert to your alternate. When you divert, you will be assigned another alternate. This process can be repeated.

Minimum Visibility: The visibility at the departure airport must be at least this high (in feet) for you to take off. It must also be this high at the destination (or the alternate) for your landing to be approved by Dispatch. If the visibility is below minimums before departure, you will be placed on “weather hold”, but you can request that the hold be lifted. If visibility is below minimums at the destination airport, you are authorized to divert to your alternate. When you divert, you will be assigned another alternate. This process can be repeated.

Maximum Surface Wind: This is the maximum allowed surface wind reported at an airport, above which you are not authorized to take off. If the winds are this high or higher at your destination an approach or landing will not be approved by Dispatch. If the winds are above maximums before departure, you will be placed on “weather hold”, but you can request that the hold be lifted and you can attempt the flight. If the winds are above maximums at the destination airport, you will be authorized to divert to your alternate and assigned another alternate. This process can be repeated.

Charter Flights: These are the options that guide selection of charter (random) flights.

Percent of time Charters Offered: How often will the pilot see charter flights offered on the FCDU? This is a percentage, where 100 represents you will always see charters (unless there are no airports available from where you are located given your airplane type and other restrictions.)

Maximum Charters Offered: This is the maximum number of charter flights that will be offered on a given session with the FCDU.

Military Airfields: This influences whether charters will be offered to military airfields. As of FSCaptain 1.6.0, this option influences generated airline schedules. As of FSCaptain 1.7.0 specific military airfields can be designated as “Civil-Military” and be permitted commercial traffic. As of FSCaptain 1.7.3, flights can be denied to, or allowed to, or preferred to military airports.

Allow to Numeric Airfields? Smaller and sometimes private airports in the USA often have numbers in their airport codes. Check this to allow charter flights to these small airports.
As of FSCaptain 1.7.0, private airfields are handled differently than “Numeric Airfields”. Private airfields are defined in a separate configuration file that lists their ICAO ID.

If this option is enabled in your options.cfg file (see Appendix 4: Special Options and Features), flights to private airfields are permitted only if departing from a private airfield.

**ILS Required for Fixed-Wing Aircraft?** If this is checked, charter flights will not be offered to any airport without an ILS if you’re planning to fly a fixed-wing aircraft. (Helicopter Captains do practice and use ILS glideslopes, but they’re more critical for fixed-wing aircraft approaches.)

**Control Tower Required For:** Select if no flights, all flights, or only turbojet flights will be offered only to airports with a control tower.

**Cabin Service:** These are options that affect how your team of attendants deals with passengers:

**Minutes for Auto Start:** Your flight attendants will manage the cabin service for you – you don’t have to micromanage them. This is the number of minutes before the first cabin service will start. Often, in practice, it takes quite a bit longer than this. This factor also determines the “cabin service interval” which will determine how long between services. At least 30 minutes will be added to the interval after the first service. Service intervals are extended during late night flights to allow passengers to sleep, and during periods of dangerous turbulence.

**FO:** Here is where you select your preferred First Officer for flights on this airline. You may have a selection of First Officers available to you, loaded into FSCaptain. The program is distributed with some default ones and more are planned for optional download from the FSCaptain website. This selection doesn’t affect what the FO does, only the voice that speaks to you.

**FO does belt sign:** The First Officer can manage the seat belts for you. If this option is checked, they will do this by default when the flight first starts (you can take over the belts anytime from an option on the FCDU.) If this is not checked, then when the flight starts you are in charge of the belts. You can give control to the FO anytime from the FCDU.

**Crew do Exits:** With this checked, the FA will close and open the passenger exits as you are going OUT and IN, and the FO will handle the exits on any cargo flight (and on a PAX flight if there is no FA onboard). There is a global option which could disable this for all airlines should you use another add-on which itself handles door/exit operations. (See Appendix 5 – options.cfg - for that.)

**FA:** Here is where you select your lead Flight Attendant for flights on this airline. You may have a selection of FA’s available to you, loaded into FSCaptain. The program is distributed with some default ones and more are planned for optional download from the FSCaptain website. This selection doesn’t affect what the FA does, only the voice that speaks to you and the passengers.
**Music:** Aircraft may be equipped with a sound system to play background music to soothe the passengers. You can choose to have the FA's switch on this music system when passengers are entering or leaving the airplane, when the airplane is taxiing, or never play any music at all.

Music is only played on PAX flights despite any calmative effects it could have on any live animals you may be transporting.

**Pay Levels** As described in section 2 *Your Career* an airline can have up to 10 pay levels. Here you can specify the hourly rate to pay at each level, and the name of the level. (The name must be 19 characters or less.) If you want to have fewer than 10 levels, leave the pay rate zero and the pay level name blank on a level you don't use.
Creating or Modifying the Flight Schedule

Flight schedules for all airlines can be easily modified from the Administrator, and new schedules can be imported from external databases or fantasy schedules generated according to a set of specifications.

To access the schedules for an airline, click on the 'Schedule' button on the Airline Definition tab. Each flight is shown on a single line. The first five columns are sortable – you can click on the header to re-arrange the listing by that item. Clicking twice will reverse the order of the sort.
The columns are:

**Flight:** The flight number. By default, the list is ascending by flight. Each flight number must be unique in the complete schedule for this airline.

**From:** The departure airport's ICAO code.

**To:** The destination (or first leg if multi-leg) airport's ICAO code.

**Min A/C:** The minimum aircraft volume class required for this flight. The options are “None” (any aircraft can fly the flight), “Small”, “Medium”, “Large”, or “Heavy”. Volume classes are defined in more detail on the Aircraft Characteristics tab, explained in this manual.

**Time:** The scheduled departure time in local 24-hour format. This is local time, not GMT.

**Weekdays:** A set of up to 7 numbers, each representing a day of the week. 0=All days of the week, 1=Monday, 2=Tuesday, 3=Wednesday, 4=Thursday 5=Friday 6=Saturday and 7=Sunday.

**Leg 2 ... Leg 6:** Up to five optional additional destinations, allowing a single flight to have six total legs. There must not be gaps in the legs if you use them – Leg #2 must be filled in before you can place something in Leg #3. When you fly a multi-leg scheduled flight, the FCDU will automatically set up the next leg each time you land until the final destination is reached. Each leg is logged as a separate flight in the flight log. If you start a leg for an early-commit airline and FS crashes for some reason, then your status is preserved as usual and the remainder of the flight will sequence the remaining legs correctly.

At the bottom of the schedule display are a set of buttons you can use to manage your airline's schedule:

**Save:** Click on this button to write your schedule data out to the database. This will not be enabled until you have made some changes.

**Cancel:** Abandons any changes and returns to the Airline definitions tab. If you have made any changes you'll be asked to confirm.

**Clear:** Remove all schedule entries, after confirmation.

**Generate Hub:** A dialog (explained below in “Generating a Hub Schedule”) will appear, allowing you to enter parameters to specify how to generate the hub schedule.

**Import:** A dialog will appear (explained below in “Importing a Schedule”) allowing you to specify the location of an external database from which to build your airline's schedule.
**Remove Hub:** You will be asked for an airport ICAO, and an option to delete only flights that have a return following them. All schedule entries from or to the airport you enter will then be removed from the schedule.

**Print:** Print the complete schedule on a printer of your choice.

**Add Flight:** This will allow you to add a new flight to the schedule. A dialog will appear where you can enter the flight data. It is the same format as the 'Change Flight' dialog below.

**Change Flight:** This brings up the Flight dialog where you can change the information on a line.

**Delete Flight:** This button will delete a flight from the list.

*Important:* In order to change or delete a flight, you must first select the flight by clicking on the flight line in the list.

This is the dialog used for adding and changing flights:
The data items in this dialog correspond to some of the data items on each line of the schedule display. The flight number will be grayed out when changing, and enabled when adding.

Those not displayed on the schedule display but that are here are optional, but their use will trigger certain features when you fly a flight where they are present:

**Arrival Time:** The local time when the flight is expected to arrive. Note that this is a local time, which if the departure is in another time zone to the west of the arrival airport, it could be earlier than the departure time. This is a local time. If not specified (left blank) there is no arrival time. Specifying an arrival time will trigger different options on the FCDU during a flight. On the “CLEARED FOR DEPARTURE” page you will see the scheduled departure and arrival times, and whether and what type of cabin service is required (see below). On arrival, you will see a display on the unload page that will tell you how you did versus the schedule. If your airline has chosen the option, your score may be affected if you are more than 15 minutes after the scheduled arrival time.

**Service:** This specifies the nature of the cabin service required on this flight, if any. There are four possible values:

-1 No cabin service is required or allowed on this flight.
0 Cabin service is optional at the Pilot's discretion. It will be a Meal service on longer flights, and Snack service on shorter ones.
1 Snack service is required on this flight. Snack service is relatively short.
2 Meal service is required. Meal service takes much longer than snack service. Plus if you have enabled “economic mode,” know that *meals cost more than snacks.*

**A/C Specific Type:** If left blank, any aircraft that meets the Min A/C requirement (see above) may be flown. But if a type is specified here, only that type of aircraft can be used for this flight. The type code is the same code as used to designate the aircraft type to FSCaptain (the one you see on the post-Login page of the FCDU, and the one used to access and change aircraft characteristics in this Administrator.)

Note: Arrival Times and Service Codes (the same as described above) can optionally be included on any leg of a multi-leg flight.
Generating a Hub Schedule

You may create a schedule for a typical airline hub. The program will generate flights to randomly selected destinations and return flights from those destinations to the hub. The flights may be a mixture of non-stop and multi-leg flights. Any hub schedule you generate is added to the schedule entries you already have – so you can generate multiple hubs, or add your own fantasy hub to an existing schedule.

To generate a hub schedule, first specify the ICAO of your hub, and a starting flight number. Remember, flight numbers have to be unique. You must enter a number that isn't already used in the schedule. All flights generated for this hub will start with this number and then increment the number by one for each flight. To follow standard airline practice, you should make this an even number, so that all outbound flights will be even numbers and inbound will be odd.

If you are generating a hub schedule to add to an existing airline schedule, you should try and choose a starting flight number that will allow all the flights you generate to have numbers assigned that do not conflict with existing flight numbers. The generator will not allow duplicates – it will keep incrementing its newly generated numbers until there is no conflict. But this would disrupt the even/odd numbering suggested in the paragraph above.
There are five rows, corresponding to the five aircraft volume classes in FSCaptain. The first row will generate flights that have no volume class restriction (any FS airplane can fly them). The second row will generate flights that require at least a small volume class aircraft (a “tiny” won’t qualify.) And so on, up to “heavy” which can only be flown by large wide-bodies. You do not have to generate flights for all rows – put a zero “Flights per day” item for a row and no flights will be generated for that minimum volume class.

Each row has these data items that control the flights generated for that minimum volume class:

**Flights per Day:** This is the number of outbound flights generated from this hub each day for this minimum volume class aircraft. Each outbound flight will have a corresponding return flight generated for it with a flight number one higher than the outbound flight (unless a duplicate prevents this in which case it will be the first unique flight number higher than the outbound flight number).

**Start Time:**

**End Time:** These are two 24-hour local time limits that define the “day” the flights are generated over. Normally the Start time is early and the End time is late in the day. The number of flights per day defined above will be spread evenly over the day from the start time to the end time. For a simple example, an eight hour day defined as starting at 0900 and ending at 1700 with 16 flights per day would have a flight leaving every 30 minutes.

**Minimum Distance:**

**Maximum Distance:** These define the shortest and the longest flights that will be generated for this minimum volume class. This affects the airports eligible for inclusion: any airport closer than the minimum distance from this hub, or further than the maximum, will not have flights generated to it.

**Runway Required:** To be eligible for a flight from this hub, an airport must have this length runway. This can be used to limit flights to only larger airports. This is obvious for the larger aircraft, but even for a hub schedule generated for the lowest class (no restrictions) you can use this to ensure that your flights are only to major airports.

**Percent Nonstop:** This is the percentage of direct flights generated. Anything less than 100 will include some multi-leg flights. For example a 50 here would generate roughly half the flights as non-stop and half as having one or two stops. The generator doesn’t generate a flight with more than two stops in this version.

**Standard Speed:** This is used to determine the departure time for the return flight. The time to make the flight at this speed, plus one hour, will be the return departure time.

The following buttons are available:
**Generate:** This starts the hub schedule generation. This could take some time, depending on the number of flights generated.

**Remove Hub:** This allows you to undo the last generation, removing all new entries from the existing schedule.

**Cancel:** Leaves the dialog without generating anything.
**Importing an AI Schedule**

It is possible to convert AI schedules from Flight Simulator itself into FSCaptain schedules.

A third-party program called “Traffic Tools” is commonly used to import and export AI (Artificial Intelligence) schedules into and out of Flight Simulator. This program has a set of well-defined text file databases that it uses, and a “de-compiler” function that will extract the flight schedules from Flight Simulator and place them in this format. FSCaptain can read these Traffic Tools data files and convert them into the FSCaptain schedule format. This gives you the capability to take any AI schedule developed for Flight Simulator and turn it into your airline’s schedule.
The import process is a little bit involved and requires you to have a basic understanding of how Traffic Tools organizes its text files. Here’s how it works in a nutshell: There are three text files that Traffic Tools uses: a list of airports, a list of airplanes, and a list of flight plans. FSCaptain does not use the airports – we have our own database of those. The concept of conversion means that we (us, the human) must locate those airplanes in the Traffic Tools aircraft list that belong to the airline we want to build a schedule for. FSCaptain can then scan the flight plans, selecting only those that apply to the aircraft on our “fleet list”, and convert those plans to FSCaptain format.

The illustration above shows how to build a schedule for Landmark Airlines from the default schedules provided with FS2004. The default traffic file for FS2004 is called “Traffic030528.bgl”. When the Traffic Tools de-compiler is run, it will create three files from this: Airports030528.txt, Aircraft030528.txt, and FlightPlans030528.txt.

Importing is a three-step process. The first step is to enter (or browse for) the Traffic Tools aircraft file (in this case, “Aircraft030528.txt”). Once this file is located, the import dialog will open it and list all the aircraft in the file in the list box on the left-hand side.

The second stop is to identify the aircraft that belong to the airline we want to import (this cannot be done automatically). Although it is not obvious from the names, four default aircraft are painted in the Landmark scheme in out-of-the-box FS2004, and you see those four listed in our example on the right-hand list box. What I did is find those four in the left-hand list box, select each one and click the button marked “--->” to move the airplane from the left to the right. The airplanes listed in the right-hand box are our “fleet”.

Note that once you build a fleet like this, you can use the “Save Fleet” button to save it, and the “Load Fleet” button to restore it – you don’t have to go through this laborious process again.

Also note that unlike the Microsoft defaults, most third-party AI schedules and airplanes are clearly identified as to which airline they are painted for. Thus it should be obvious from the names in the list on the left which you want to select.

The third step is to locate the Traffic Tools flight plans text file, which in our case is the aforementioned “Flightplans030528.txt”. Once this is done, the “Import” button will be enabled, and you can press it to actually import the schedule. Once the import is done, the entries will instantly appear in the schedule.
It's important to realize that the formats, concepts and goals behind the Flight Simulator AI are not the same as FSCaptain. Thus, an AI schedule may not perfectly import into FSCaptain. The significant differences are:

- Flight Simulator does not have the concept of 'aircraft volume class'. A specific airplane is assigned to each flight, and we can't know what the volume class of that airplane is without guessing. Thus, all flights imported into FSCaptain are designated with no volume class restriction.
- Each leg of an AI flight plan can have a different flight number. FSCaptain uses the concept of a multi-leg flight with the same flight number. When different flight numbers are encountered in the same flight plan, the import process will create separate FSCaptain flight entries for each such leg.
- AI flights support an unlimited number of legs. FSCaptain supports only six. If the import function sees more than six legs of a flight plan with the same flight number, the extra legs are not imported.
- FSCaptain allows any combination of days of the week for a flight. The AI only allows one day to be specified per flight. In practice, this means that when “realistic” flight schedules are put into Flight Simulator multiple-day flights have separate flight entries with the same flight number but different weekdays. The import process will merge these into a single FSCaptain flight.
- The AI flight plan has the concept of “repeating” flights, that is, a single plan can repeat on a weekly or at an hourly interval each day. The import process ignores these repeats and generates a single FSCaptain flight for each AI unique flight number it finds. FSCaptain flights always “repeat” on a weekly basis.
- The AI allows a weekly repeating pattern with no weekday specified. If the import process sees this condition, the flight is imported as “all days”.
- The AI flight plans always loop from a starting point through a series of one or more destinations and back to the starting point. The import process does not generate the return flight from the final destination back to the starting point, as this is not realistic in many cases.
- FSCaptain requires each flight to have a unique flight number. This restriction is not present in the AI flight plans. The import process always tries to merge flights with the same flight number according to these rules: 1) if the duplicate flight has a weekly repeating pattern with a different day of the week than the existing flight, the new day of the week is added to the existing flight; 2) If the days are the same, but the destination of the AI flight plan leg is not on the existing flight, it is added to the next available leg. If there is no available leg, the flight is ignored. If neither 1 nor 2 are true, the flight leg is not imported.
**Replicating Real Airlines**

Here’s how to use the FSCaptain airline maintenance functions along with the schedule import facility to create a real-world airline for you to fly for.

Go to the World of AI website: http://www.world-of-ai.com/ and download the package for any airline you’re interested in along with the installer package if you haven’t already got it. Put both in some new folder all by themselves.

Execute the installer and select the airline package(s) you downloaded. Now **this is really important**. Unless you want to install that package as an AI airline in your FS, you need to extract it to a folder rather than install it into FS9/X. So be sure to check the **extract files for manual installation** box, and then the **decompile flightplans** box. Choose your target simulator (FS9 or FSX) and your target folder which will contain the output. After you click on extract and agree and then install that target folder will have a new folder named for the airline with everything you need to import the schedule into FSCaptain.

Now go into the Administrator and create an airline configuration that matches the airline you’re creating. I’d base it off an existing one. Change the names and any policies you want to modify. Put in a new name in place of the (newname) and click on Apply. Then when you click on the Schedule button down at the bottom you'll see a blank slate. We’re going to import the WOAI schedule into FSCaptain. Click on the Import button.

In step 1, aircraft, click on Browse and navigate to the folder created after you did the WOAI extract (it will be named for the airline you extracted by the WOAI installer.) You'll see a file starting with Aircraft_000 - that’s your aircraft list. Select it.

In step 2 you'll see the list of airplanes on the left and blanks on the right. Normally we’d want ALL the airplanes but if you only want flights for particular types just move them. If you're moving them all you don't have to select each one, just click on the --> button until all the planes have moved from the left side to the right side.

Almost done…. Now in step 3 use the browse button to navigate to the same folder you found the Aircraft_000 file inside and click on the file that starts with **Flightplans**. Pick a GMT time adjustment and then click on Import below.
**Editing Flight Schedules as Text Files**

Flight schedules are stored as text files in the `\FSCaptain\Airlines` folder. They are named by adding the word “_schedule” to the airline's file name. For example, the schedule for Pacifica Airlines would be named `pacifica_schedule.txt`. The case does not matter. Note that the extension is `.txt` and not `.cfg`. You can edit the schedule in a text editor such as Notepad. Use Windows Explorer to navigate to the `\FSCaptain\Airlines` folder underneath your FS root folder. Double-clicking on a schedule file should bring it up in Notepad or Wordpad (either will do but you **must** save your changes in plain text format. Do not use word-wrap in Notepad for this editing.

Here's an example of an airline's schedule file:

![Example Schedule File](image)

The first three lines are comments because they start with a semicolon. The next line is an “official” comment telling FSCaptain what section of the schedule this belongs to. These table directives are optional.
Each flight has a line of its own. It begins with the word “Flight=” (not case sensitive) and then some comma-separated fields. The first field is the flight number which must be unique in the schedule for an airline (don’t make two different flights with the same number.)

Next follows the departure airport and the destination airport. The next field is the minimum volume class of aircraft required for this flight. See the section Configuring Aircraft in this manual for more details about the volume class code, but briefly the classes are: 0=Tiny (C172), 1=Small (C208), 2=Medium (CRJ-700), 3=Large (B737), and 4=Very large (B747). Since this is a minimum, coding a zero in this field allows any larger aircraft to fly it, effectively making zero mean “no volume class restrictions”.

Following the minimum volume class is the departure time, in 24-hour local clock time. This time is local to the departure airport.

Following the departure time is a set of codes indicating which day of week the flight will operate. Zero means “all days”. Other than that, any combination of these codes is allowed: 1=Monday 2=Tuesday 3=Wednesday 4=Thursday 5=Friday 6=Saturday 7=Sunday. For example, a flight scheduled to depart Monday, Wednesday, and Friday would be 135 in this field.

Following the days of the week are up to 5 optional extra leg destination airports.

**How to fly a scheduled flight:**

Flying a scheduled flight means showing up for work at the right airport, at the right time, and in the right sized airplane. If you do this, then the FCDU will show you the scheduled flights that will be departing within the time window defined for the airline (see creating an airline, scheduled flight parameters for more information on this time window.

Basically, it’s simple. Check the schedule for the flight you want to fly. Set the simulator time for about 15 minutes before the scheduled departure time for that flight. Be sure you are in an airplane that’s the right volume class for the flight (don’t park a DC-3 at a gate expecting to see a flight that’s marked class 3 for 737-sized airplanes.) Note that this is volume class, not type. A propeller driven DC-6B is a class 3 airplane and will substitute on this flight as well as an A320 or 737 or DC-9. If you aren't sure, use the Administrator Aircraft Characteristics tab to look up the volume class for an airplane.
Appendix 1: Score Computation

Each flight is scored by starting with a base score of at least 85 points, then adding points for each thing above average that you did right, or subtracting points for each thing that you did wrong.

If you perform well in certain aspects, you will receive bonus points. If you perform poorly or violate airline regulations, you will lose points. Scores can go above 100, but never below zero. (If you crash your score is zero for that flight, period.)

Beyond that, your score starts at your base level and can have points adjusted for these reasons:

<table>
<thead>
<tr>
<th>Early Arrival (details below)</th>
<th>-5 points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Late Arrival (details below)</td>
<td>-5 points each increment</td>
</tr>
<tr>
<td>Early Arrival – priority flight</td>
<td>-10 points</td>
</tr>
<tr>
<td>Late Arrival – priority flight</td>
<td>-10 points each increment</td>
</tr>
<tr>
<td>Priority flight on-time</td>
<td>+10</td>
</tr>
<tr>
<td>On-time with no Block Time revisions in-flight</td>
<td>+5</td>
</tr>
<tr>
<td>Not on-time even with Block Time revisions in-flight</td>
<td>-5</td>
</tr>
<tr>
<td>Block Time revisions filed in-flight</td>
<td>-2 for each revision above 2</td>
</tr>
<tr>
<td>Completed with a serious mechanical fault</td>
<td>+15</td>
</tr>
<tr>
<td>Landed with Medical Emergency</td>
<td>+10</td>
</tr>
<tr>
<td>Cargo or aircraft damage assessment (details below)</td>
<td>-10 each level of damage</td>
</tr>
<tr>
<td>Fragile or live cargo delivered undamaged</td>
<td>+5</td>
</tr>
<tr>
<td>Correct position reporting during flight</td>
<td>+2</td>
</tr>
<tr>
<td>Hard landing reported by PAX</td>
<td>-5</td>
</tr>
<tr>
<td>“Rough flying” reported by PAX</td>
<td>-5</td>
</tr>
<tr>
<td>Breathing difficulties reported by PAX (due to high altitude)</td>
<td>-5</td>
</tr>
<tr>
<td>PAX complaints about late arrival</td>
<td>-3</td>
</tr>
<tr>
<td>PAX complaints about seatbelt signs that should have been on</td>
<td>-2</td>
</tr>
<tr>
<td>PAX complaints about seatbelt signs that should have been off</td>
<td>-2</td>
</tr>
<tr>
<td>Excessive ear pressure or pain reported by PAX</td>
<td>-2</td>
</tr>
<tr>
<td>An unbelted PAX injured when belt signs should have been on</td>
<td>-10</td>
</tr>
<tr>
<td>PAX complaints about interrupted cabin service</td>
<td>-5</td>
</tr>
<tr>
<td>PAX alarmed because you taxi too fast (over 30 knots)</td>
<td>-5</td>
</tr>
<tr>
<td>Cabin crew reports no alert from cockpit before takeoff</td>
<td>-3</td>
</tr>
<tr>
<td>Event</td>
<td>Score</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Cabin crew reports no alert from cockpit before landing</td>
<td>-3</td>
</tr>
<tr>
<td>PAX compliments you on a smooth flight</td>
<td>+2 (+5 if passenger flight)</td>
</tr>
<tr>
<td>PAX compliments you on a gentle landing</td>
<td>+2 (+5 if passenger flight)</td>
</tr>
<tr>
<td>PAX comments that this was a very professional flight</td>
<td>+3 (+5 if passenger flight)</td>
</tr>
<tr>
<td>Failed to declare an emergency when called for</td>
<td>-25</td>
</tr>
<tr>
<td>False emergency declaration</td>
<td>-25</td>
</tr>
<tr>
<td>Successful emergency landing</td>
<td>Varies according to system.</td>
</tr>
<tr>
<td>Unauthorized cancellation due to weather</td>
<td>-25</td>
</tr>
<tr>
<td>Unauthorized cancellation due to mechanical fault</td>
<td>-25</td>
</tr>
<tr>
<td>Flight cancellation due to pilot error</td>
<td>-25</td>
</tr>
<tr>
<td>Flight reassignment due to pilot not completing commitment</td>
<td>-25</td>
</tr>
<tr>
<td>Unjustified delay due to weather report</td>
<td>-20</td>
</tr>
<tr>
<td>Unjustified delay due to reported mechanical fault</td>
<td>-20</td>
</tr>
<tr>
<td>Delayed arrival due to pilot error</td>
<td>-15</td>
</tr>
<tr>
<td>Unjustified diversion to alternate due to weather</td>
<td>-25</td>
</tr>
<tr>
<td>Unjustified diversion to alternate due to reported mechanical fault</td>
<td>-25</td>
</tr>
<tr>
<td>Failure to make required position reports</td>
<td>-3</td>
</tr>
<tr>
<td>Lights not set per company policy (NAV lights off, or if landing</td>
<td>-5</td>
</tr>
<tr>
<td>lights are off below 9500 feet, or on above 10500 feet)</td>
<td></td>
</tr>
<tr>
<td>Altimeter not set to standard over transition altitude</td>
<td>-5</td>
</tr>
<tr>
<td>Gear damaged by over speed</td>
<td>-20</td>
</tr>
<tr>
<td>Gear speed exceeded with no damage found</td>
<td>-5</td>
</tr>
<tr>
<td>Flaps damaged by over speed</td>
<td>-20</td>
</tr>
<tr>
<td>Flaps speed exceeded with no damage found</td>
<td>-5</td>
</tr>
<tr>
<td>Exceeded 250 knots under 10,000 feet</td>
<td>-5</td>
</tr>
<tr>
<td>Fuel Quantity increased while in flight (cheater)</td>
<td>-30</td>
</tr>
<tr>
<td>Payload changed while in flight (cheater)</td>
<td>-30</td>
</tr>
<tr>
<td>Excess fuel on landing (fuel left after flight is equal or greater</td>
<td>-5</td>
</tr>
<tr>
<td>than the dispatcher's estimate for the whole flight.)</td>
<td></td>
</tr>
<tr>
<td>Departed runway or taxiway</td>
<td>-5</td>
</tr>
<tr>
<td>Aircraft maximum red-line speed exceeded in flight</td>
<td>-10</td>
</tr>
<tr>
<td>Failed to promptly unload after landing</td>
<td>-10</td>
</tr>
</tbody>
</table>
Stalled aircraft while in flight  -10
Runway overrun on landing or takeoff  -20
Gear-up landing with no emergency  -20
No response to cabin emergency  -15

‘If you are forced to endure a holding while on Ground, a holding in flight... or even to commit a go-around, you will receive an extra “free” Block Time Revision

Detailed definitions:

**Late Arrival:** You are always allowed to arrive up to 5 minutes after your scheduled arrival time based on the Block Time supplied by you to Dispatch before the flight (and possibly revised in-flight).

If your flight is more than 50 minutes in duration, you are allowed to be late by 10 percent of the total minutes. For a two-hour flight (120 minutes) you would be allowed to be 12 minutes late. (The percentage calculation is done from the actual time not the estimated time.) This number of minutes is called the “increment”. Points are deducted by increment. For a 60 minute flight the increment is 5. If you are 16 minutes late, that is three whole increments, thus you would be charged 5 times 3 or 15 points for being very late.

**Early Arrival:** You are always allowed to arrive 10 minutes before your scheduled arrival time based on the Block Time supplied by you to Dispatch before the flight (and possibly revised in-flight).

If your flight is more than 60 minutes in duration, you can be early by 15 percent of the total minutes. For a two-hour flight (120 minutes) you would be allowed to be 18 minutes early. (The percentage calculation is done from the actual time not the estimated time.) This number of minutes is called the “increment”. Points are deducted by increment. For a 60 minute flight the increment is 10. If you are 21 minutes late, that is two whole increments, thus you would be charged 5 times 2 or 10 points for being too early. Note: you can't get around this by sitting on the tarmac outside the gate and waiting for the arrival time window to open. Dispatch times your arrival and won't allow you to do this – you'll be penalized if you do. They will send you a message if you are waiting an excessive amount of time to warn you before penalties start.

If you are flying Priority cargo (or special VIP or Groups of passengers) your Early Arrival window will be voided – you can arrive as early as you can safely manage. Be aware though that if you are allowed such, your penalty for a Late Arrival will be doubled!

**Damage Assessment:** General damage to cargo or aircraft is assessed based on excessive G forces encountered in-flight or excessive landing speeds. There are 10 condition levels assigned, from 10
(undamaged) to zero (destroyed). There is never a penalty for a 10/10 condition. For each level below 10 extra points are deducted.

**Emergency Landing Bonuses:** Making a safe and successful landing while under the stress of an emergency will give you a bonus according to this list:

- Mag Compass - 0
- NAV1/NAV2 - 15
- COM1/COM2 - 15
- ADF - 10
- RMI - 10
- Transponder - 10
- VSI - 5
- Turn Coordinator - 5
- Fuel Gauge - 10
- Pitot Static Line - 15
- Altimeter gauge - 15
- Attitude gauge - 20
- Airspeed gauge - 20
- All Avionics - 20
- Hydraulics - 20
- Vacuum - 20
- Electrics - 20
- Pitot - 20
- Brakes - 20
- Pressure - 15
- Flaps - 15
- Gear - 20
- Flight Controls - 25
- Fuel Leak - 20
- Oil Leak - 20
- Hydraulic Leak - 20
- Engine Failure - 10
- Engine Fire - 20
- Cabin (Medical) - 25
- Cabin (Fire) - 35
Grades: You will see “letter grades” attached to the scores. This is a grading system familiar to most people who’ve been graded in American schools. An “A” is excellent. “B” is above average. “C” is average. “D” is below average. And “F” mnemonically stands for failing.

Here is the grading scale used by FSCaptain:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>95-100+</td>
</tr>
<tr>
<td>A</td>
<td>93-94</td>
</tr>
<tr>
<td>A-</td>
<td>90-92</td>
</tr>
<tr>
<td>B+</td>
<td>87-89</td>
</tr>
<tr>
<td>B</td>
<td>84-86</td>
</tr>
<tr>
<td>B-</td>
<td>81-83</td>
</tr>
<tr>
<td>C+</td>
<td>78-80</td>
</tr>
<tr>
<td>C</td>
<td>75-77</td>
</tr>
<tr>
<td>C-</td>
<td>72-74</td>
</tr>
<tr>
<td>D+</td>
<td>69-71</td>
</tr>
<tr>
<td>D</td>
<td>65-68</td>
</tr>
<tr>
<td>D-</td>
<td>60-64</td>
</tr>
<tr>
<td>F</td>
<td>Below 60</td>
</tr>
</tbody>
</table>
Appendix 2: Items.cfg and the Manifest Generator

All items loaded into an FSCaptain flight will be generated out of the Manifest Generator function, including passengers and baggage. You can customize the manifest generator to include many cargo items in addition to those provided by default. This appendix describes the format of the 'Items.cfg' file that controls the generation of cargo-type items.

There is a text file, located in the \FSCaptain\Config folder, called 'Items.cfg'. The entries in that file determine what can be loaded into an airplane. Each line specifies a different possible item. The file is a comma-delimited file which means it can be imported into a spreadsheet. There can potentially be 18 fields on each line although only 14 are currently in use.

You are limited to 1024 different individual items....

Field 1 – Weight Range. This is the minimum and maximum weight of each item or package, separated by a dash. The actual item will be randomly generated within this range. You can code a fixed figure here, not a range, by leaving off the dash. But generally, you should make ranges whenever possible – the generator will appreciate the flexibility this gives it to match cargo to the payload stations in an airplane.

Field 2 – Item Rarity. This is a percentage rarity factor, ranging from 100.0 percent (1000, the last digit is an implied decimal point) to 0.1 percent (1). This will determine how often this item will be generated on a given flight. Any number here above 400 will make this a commonly included item. Any number above 100 will make it quite frequently included. Any number below 30 is rare, and any number 10 or below is quite rare.

Field 3 – Volume Class. This is a range of aircraft volume classes that this item can be included with. This is a critical field! Do not code a Sherman tank with a volume class of 2 – it may be included in a flight on a regional jet, which is absurd. This is the main reason for the volume class on the aircraft. Only small boxes or items should be on classes 0 or 1. Medium sized items can be included for volume class 2. Larger items can be included on volume class 3. For example, a lion or tiger could be shipped on a 737 (class 3) but do not code elephants on any smaller than a class 4 (747 sized A/C). See the section Configuring Aircraft in this manual for more details about the volume class code, but briefly the classes are: 0=Tiny (C172), 1=Small (C208), 2=Medium (CRJ-700), 3=Large (A320), and 4=Very large (B747).

Field 4 – Special Flag. Write a “1” in this field if this is a Fragile item. Write a “2” in this field if this is a Live item (e.g. a human kidney.). Write a “4” in this field if this item is a Priority item. Write an “8” if this item needs to be accompanied by a passenger. Leave it a zero if it is none of these.

These flags can be combined. For instance, to have an item that is both Priority and Fragile, you would enter a “5” here. Live animals generally aren’t “buckled in” so they would need a Fragile
and Live code… a “3”. A “7” would indicate a Fragile, Live, Priority item. Remember than an item cannot be selected if its special flag doesn’t match the special conditions of a flight, and that your Items.cfg file must have at least one of each of these flags or the conditions of a given flight might not be able to be met. You can add 8 to whatever number you code here to require the item to only be included if passengers are on the flight. The 8 can also be alone with no other number. An example of using this feature would be a human patient being transported which could be coded 15 – 1 for Fragile, 2 for Live, 4 for Priority, and 8 for Requires PAX (that is, the nurses or paramedics flying along with the patient).

**Field 5 – Container Name (singular):** The name of the container that contains the item(s). For example: Box or Crate or Pallet.

**Field 6 – Pluralization:** The suffix to append to the container to make it read as “more than one.” For example, 'es' appended to 'Box' makes 'Boxes'.

**Field 7 – Description:** What the item is called. Examples are: “Electronics,” “Television,” “Wine,” “Industrial Robot”, etc.

**Field 8 – Minimum Runway:** This determines how large the airport must be before this item will be loaded at it. This is mainly to prevent huge items from being loaded at tiny airports.

*The following fields are optional and can be omitted. However, if you require a field beyond Field 9, you must enter a 0 or leave the field blank in all intervening fields.*

**Field 9 – Special Status:** This is a set of flags which for Cargo items indicate an item’s “special transport status” that might draw the attention of Customs or other airport security officials. For “celebrity PAX” this will be the type of celebrity they are.

We have started the definitions for this field and have made initial entries. Details will be published when all values are locked down.

A 0 or a blank field here indicates that the item is of little special interest to anyone other than the shipper, or is an “everyday” passenger.

**Field 10 – Specialist Airline:** This field is used to specify an item that requires a “specialist airline” type for transport. Currently a value of 0 indicates an item can be carried by a standard Air Transport airline. A 1 will designate items which can only be carried by a Medical airline. (Such an airline would carry only these items.) As of FSCaptain 1.7.0 there are only Medical specialist airlines. Other specialist airlines are planned for future versions….

**Field 11 – Season:** The date must be within this season or seasons for the item to be included. This is a mask. These are the season numbers: 1=spring, 2=summer, 4=autumn and 8=winter. Add the season numbers together and place the sum in this field. A value of 0 or 15 means all seasons.
Field 12 – Climate Zone: The departure airport must be within this climate zone or zones to be included. These are the zone numbers: 1=tropical, 2=temperate, 4=arctic. Add the zone numbers together and place the sum in this field. A value of 0 or 7 means all zones. As an example, bananas would not usually be shipped from any but a tropical zone.

Field 13 – Airport Affinity: The departure airport must be within a range (next field) of this airport to be included. Use the airport’s ICAO ID as supplied in Flight Simulator. This can be used to load special items only available in certain areas. For example, “Alaskan Salmon” could be loaded only within a specified radius of the PANC airport (Anchorage, Alaska). If multiple airport ICAO IDs are required, separate them with a space.

Here is a sample entry (with elements color-coded) followed by a color-coded explanation:

50=100, [50, 1-2, 1, Box, es, Live Dungeness Crabs, 2800, 18, 0, 2800, PAYA PAEL PAPG CZMT CBBC CAL9 KCLM, 98

... will allow a 50% chance for Live Dungeness Crabs to be loaded in small or medium sized aircraft in autumn or winter at any airport with at least a 2800ft runway within 98 nautical miles of PAYA PAEL PAPG CZMT CBBC CAL9 or KCLM. This cargo is Fragile, Live, and requires Priority handling.

Field 14 – Affinity Distance: The distance, in nautical miles, for the airport option in field 12. A positive integer needs to be entered for the “affinity” to exist.

Field 15 – Field 18: Reserved for future use – currently blank.

Special Requirements in the Items.cfg file: The first two items must describe passengers and their baggage like this:

170,0,0,4,2,PAX,,Passengers,0,1000
0-9999,999,0,4,0,Lot,,Baggage,0,1000

Do not alter these two items!

Examples of other items:

10-300,500,0-1,0,Box,es,Misc. Items,0,1000
100-400,500,1-1,0,Box,es,Misc. Items,0,1000
500-2000,500,2-2,0,Pallet,s,Misc. Items,0,3000
1000-2000,500,3-3,0,Pallet,s,Misc. Items,0,5000
2000-4000,500,4-4,0,Pallet,s,Misc. Cargo,0,5000
500-1000,10,2-4,0,Box,es,Air Conditioner,0,3000
200-500,10,1-3,0,Box,es,Automobile Parts,0,3000
500-2000,10,2-3,0,Box,es,Automobile Tires,0,5000
500-1000,10,2-3,0,Box,es,Aircraft Parts,0,5000
50-200,10,1-2,0,Crate,s,Flowers,1,3000,0,3,2

Explanation: The first item here is a small box that can be between 10 and 300 pounds which can be loaded on a “tiny” or “small”-sized aircraft. It is called “Misc. Items”. The next four lines define
increasingly larger kinds of “Miscellaneous Items” for loading into each volume class. “Miscellaneous” is a very common cargo description in the real world, since often all kinds of things are placed on cargo pallets for shipment. These boxes and pallets have a rarity of 500 (50%) which means they’ll be on just about every cargo flight.

From line 6 onward, we have some specific items. An air conditioner (an industrial sized one) weighing in at 500 to 1000 pounds, that can be loaded anything from size 2 up. It requires at least a 3,000-foot runway at departure to be seen in a manifest (such an item wouldn’t be loaded from a tiny dirt airstrip.) That’s followed by more parts and tires. Finally, Flowers have more detail – we see they need a runway at least 3000ft in length, do not need a special airline for transport (0), and would be transported in spring and summer (3) from a temperate zone (2).

Here are some regional items:

<table>
<thead>
<tr>
<th>Size</th>
<th>Quantity</th>
<th>Rarity</th>
<th>Type</th>
<th>Description</th>
<th>Weight</th>
<th>Length</th>
<th>Airports</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-500</td>
<td>100</td>
<td>1-4</td>
<td>Crate</td>
<td>California Wine</td>
<td>4,0000</td>
<td>0,0</td>
<td>KCCR,110</td>
</tr>
<tr>
<td>100-500</td>
<td>100</td>
<td>1-4</td>
<td>Crate</td>
<td>Bourbon</td>
<td>8,0000</td>
<td>0,0</td>
<td>KLEX,100</td>
</tr>
<tr>
<td>50-200</td>
<td>50</td>
<td>0-2</td>
<td>Box</td>
<td>Ski Equipment</td>
<td>0,3000</td>
<td>0,8</td>
<td>KDEN,100</td>
</tr>
</tbody>
</table>

Here you have wine from Northern California, bourbon from Kentucky, and ski equipment from Denver – all items that are awaiting transport. Note the use of the airport radius – any departure airport of the correct size within the radius of the airport coded here can have these items included on the manifest.

Other regional items include Cognac & Escargot from France, Poutine from Quebec, Oranges from Florida, Porto from the Douro Valley of Portugal, and fresh Stilton cheese from the Counties of Derbyshire, Leicestershire and Nottinghamshire in England!

Here are some animals:

<table>
<thead>
<tr>
<th>Size</th>
<th>Quantity</th>
<th>Rarity</th>
<th>Type</th>
<th>Description</th>
<th>Weight</th>
<th>Length</th>
<th>Airports</th>
</tr>
</thead>
<tbody>
<tr>
<td>50-100</td>
<td>10</td>
<td>0-2</td>
<td>Crate</td>
<td>Snakes</td>
<td>16,3000</td>
<td>0,0</td>
<td>3</td>
</tr>
<tr>
<td>100-300</td>
<td>30</td>
<td>1-3</td>
<td>Crate</td>
<td>Ferrets</td>
<td>16,3000</td>
<td>0,0</td>
<td>3</td>
</tr>
<tr>
<td>100-300</td>
<td>50</td>
<td>1-3</td>
<td>Crate</td>
<td>Chickens</td>
<td>16,3000</td>
<td>0,0</td>
<td>3</td>
</tr>
<tr>
<td>100-300</td>
<td>30</td>
<td>1-3</td>
<td>Crate</td>
<td>Swans</td>
<td>16,3000</td>
<td>0,0</td>
<td>3</td>
</tr>
<tr>
<td>200-1000</td>
<td>50</td>
<td>2-3</td>
<td>Pen</td>
<td>Goats</td>
<td>16,3000</td>
<td>0,0</td>
<td>3</td>
</tr>
<tr>
<td>500-2000</td>
<td>30</td>
<td>3-4</td>
<td>Stall</td>
<td>Cattle</td>
<td>16,5000</td>
<td>0,0</td>
<td>3</td>
</tr>
<tr>
<td>500-2000</td>
<td>30</td>
<td>3-4</td>
<td>Stall</td>
<td>Horses</td>
<td>16,5000</td>
<td>0,0</td>
<td>3</td>
</tr>
<tr>
<td>100-300</td>
<td>20</td>
<td>1-3</td>
<td>Tank</td>
<td>Live Fish</td>
<td>16,5000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-50</td>
<td>100</td>
<td>0-2</td>
<td>Pen</td>
<td>Kittens</td>
<td>16,3000</td>
<td>0,0</td>
<td>3</td>
</tr>
<tr>
<td>15-50</td>
<td>100</td>
<td>0-2</td>
<td>Pen</td>
<td>Puppies</td>
<td>16,3000</td>
<td>0,0</td>
<td>3</td>
</tr>
</tbody>
</table>

All of these can come from either temperate or tropical zones (zone = 3).

This is a patient – one of the masks in its type (15) indicates the patient can only travel with an accompanying passenger (usually a nurse or paramedic, or some attendant). These patients need to
be transported aboard “air ambulances” and not in the economy section of a discount air carrier. So the “Specialist Airline” flag is set to (1) so only a medical airline can transport.

And here are some really rare items:

300-400,1,3-4,2,Tiger,s,Bengal Tiger,512,5000,0,0,1
1900,1,4-4,0,Car,s,1967 Mustang,0,6000
2500,1,3-4,0,Unit,s,Gas Turbine,0,7000
2000,2,3-4,0,Unit,s,Industrial Robot,0,6000

Note that the Bengal tiger must be loaded from a tropical zone (1).

New since Version 1.7.0 is the concept of transporting celebrities, whether they are individual VIPs or GROUPs of celebrities. Now you can have the chance to have your favorite sports team, singer, politician (?), athlete, band, media celebrity (?), tycoon, or actress to be aboard one of your flights!

While we cannot publish the names or trademarks of real individuals or groups as data, we have given enough examples to allow you to customize your own lists:

1700-3400,10,1-2,0,GROUP,,Famous Band,4000,1,0,0,3
61200-70000,10,4,0,GROUP,,Famous Choir,7000,9,0,0,3,KSXC,150
6800-17000,10,2-3,0,GROUP,,San Francisco Baseball Team,6000,2,0,7,3,KSFO,65
3400-5100,10,2-3,0,GROUP,,Zurich FC,6000,2,0,0,3,LSZH,50
170,10,0-4,0,VIP,,Famous Actor,4000,1,0,0,3,EGFF,100
170,10,0-4,0,VIP,,Famous Golfer,4000,2,0,0,3,EGPF,150
170,10,0-4,0,VIP,,Famous Mountie,4000,4,0,0,0,CYXE,1670
170,10,0-4,0,VIP,,Famous Newscaster,4000,16,0,0,0,KCIN,1265
170,10,0-4,0,VIP,,Famous Politician,4000,4,0,0,3,CYVO,330
170,10,0-4,0,VIP,,Member of Parliament,4000,4,0,0,3,EGSF,132
170,10,0-4,0,VIP,,Nashville Singer,4000,1,0,0,3,KBNA,150

The “container type” must be specified as VIP or GROUP. Their weights should be standard, they should be limited to the size of aircraft and airport that would be appropriate, and it’s easily possible to limit their appearance to be seasonal, or limited to climate zones, or limited to airports! (After all, an American baseball team would only fly in Spring, Summer and (hopefully) Autumn.)

GROUPs only appear on a charter PAX flight. VIPs appear on scheduled or charter PAX flights.

While the chances to have any of these celebrities on a flight are very low – there is a one percent chance to even have one aboard, plus each VIP or GROUP has an additional one percent chance of being included – it is possible with a large enough aircraft to have a flight with more than one VIP!

We are happy to credit fellow Captain “philtum” for bringing this concept to us - a concept which is being expanded in current versions of FSCaptain to keep it interesting.

Currently, VIP flights are considered a Priority flight, which means you can arrive early without penalty, but will be penalized moreso than a regular flight if you are late.

Page 144
It’s just another reason to check your Dispatch Release. *Who knows what or whom might be listed??*

**Two files – NewItems.cfg and new Items.cfg**
Sometimes when you are upgrading your FSCaptain from an earlier version, there will be a file in the `\FSCaptain\Config` folder, called ‘NewItems.cfg’. This file has updated items over the original ‘Items.cfg’ which you can copy and paste into your existing ‘Items.cfg’.

In some instances however (such as with 1.7.1), we will publish an ‘Items.cfg’ file directly – these are times when we have to modify the layout of the file, or the logic behind it.

If you have made modifications to your existing Items.cfg file, you will need to copy over your changes, taking into consideration any modifications we’ve made to the structure of the Items.cfg file. If you are not certain, you may email your existing Items.cfg to us, including notes on any changes you’ve made, and we will update them as we have time.

If you are doing a full install of FSCaptain, all “new items” are included in the ‘Items.cfg’ file.
Appendix 3: Aircraft Interfaces to FSCaptain

**Canned Interfaces:** There are several interfaces that have already been written and tested for many popular add-on aircraft. More are being added all the time; after any new FSCaptain Fixpack you may see more interfaces appear, perhaps one for an airplane you love to fly. To look for and install these canned interfaces, look inside the FCOMPNL folder that’s been installed into your FS Gauges folder. Inside there will be a file named README_Interfaces.txt. That will contain all the information you need to find and install any XML interface we have pre-written for you.

Some airplanes have support built-in to the FSCaptain system and do not require an interface. As of version 1.7.3 the following aircraft have support built-in:

- **Aerosoft:** Airbuses 318, 319, 320, 321, and Twin Otter Extended
- **Captain Sim:** 707, 727, 737, 757 / 767, 777, L1011
- **Carenado:** B1900, B200, C208EX, C406, Citation, PC-12, Phenom 300
- **CLS:** BAe-146, DC10
- **CoolSky:** DC-9
- **David Maltby:** BAC One Eleven series
- **Digital Aviation:** Fokker
- **FeelThere:** EMB, ERJ, Phenom 100
- **FlightOne:** ATR-72
- **Flysim:** Cessna 441 Conquest, Lear 35
- **FSDS:** Hawker Siddeley 748 (in the FSCaptain Airplane Configuration How-To document)
- **FS Labs:** A320
- **iFly:** 737 NGX, 747 V2
- **Leonardo:** Maddog MD-80
- **Lionheart:** Quest Kodiak
- **Majestic:** Dash 8 Q400
- **MilViz:** 737-200
- **PMDG:** 737 NGX, 747, 777, JS-4100, MD-11
- **Qualitywings:** 757, BA46
- **Razbam:** Metroliner
- **RealAir:** Duke Turbine
- **TFDi Design:** B717
- **Virtualcol:** ATR Series, Embraer 17x and 195 packages, SAAB Regional Pack

Check the “FSCaptain aircraft interface matrix” document for the current list of aircraft and their interfaced systems.

The rest of this appendix applies to the situation where no existing interface exists and one needs to be written. To implement an interface on your own, you can use a pre-written one as your starting point but you'll need to be at least somewhat conversant with FS9/FSX/P3D XML programming. You'll also need a tool to detect and read any XML variables that the add-on aircraft may be using.
or exporting its data to. The tool we use for this is called the LINDA Tracer, which can detect and display the settings of any XML user variables while an aircraft is flying. The LINDA package is available on the Internet as shareware and has its own documentation.

There is a separate document – “Introduction to FSCaptain Interfaces” that you can find in the FSCaptain\Documentation folder which gives an overview of how to use LINDA to capture the data needed to make an interface for an aircraft that we at FSCaptain Central Command don’t own.

If you can contribute data so that we can write an interface – we will credit you with your work. If you can write your own interface, we ask that you please share it with the rest of the FSCaptain community via our forums so that others can benefit from your work.

**Interface basics:** FSCaptain looks for, and can set, several special XML variables that allow it to communicate with an aircraft that has gauge code written or modified to check and manipulate those variables. This interface is never required --- any FS airplane will work with FSCaptain. However, the realism of the experience is enhanced when an airplane communicates with FSCaptain.

**Seat Belt and No Smoking Signs**
In the real world, airliners have these two switches and they have important communications functions. The seat belt switch is used to communicate to passengers and cabin crew when conditions require the use of their seat belts. The no smoking switch can be used to communicate to cabin crew when certain key events are about to take place: in FSCaptain, when cleared for takeoff and cleared for landing.

FS2004 does not implement these switches at all. Many third-party airliners for FS2004 may have them, but they are no more than dummy switches which may sound a chime. FSX & P3D allow the implementation of these two functions in XML code, but many airplanes converted from FS2004 do not use them properly – although most of the default newer airliners do.

FSCaptain has an aircraft characteristic that lets you tell the program which condition is true: the belts do not work in this airplane at all, or they work in FS2004 but not in FSX/P3D, or they work in FSX/P3D but not FS2004, or they work in all versions. If the switches are designated as not working in the version you are flying, FSCaptain ignores them (and any score penalties are ignored). If they are designated as working, FSCaptain expects you to use them properly and may reduce your score if passengers or cabin crew complain.
Implementing the switch interface in FS2004.
FSCaptain looks for two XML variables called ACMEBELTS and ACMESMOKE. If these variables are not found (that is, they contain the value zero), then FSCaptain assumes that under FS2004 the airplane being flown does not have working belts and smoking switches. If however a non-zero value is found, FSC knows that the aircraft code set that value and so has a working FSCaptain interface. The values are simple: 1 for switch off, 2 for switch on.

It is important that your code set these variables as soon as possible so that FSCaptain can detect them. It is also important that your code check the values of these variables, because the FSCaptain First Officer may manipulate them during flight.
Here is an example of XML code for a seat belt switch:

Notice two things: first, the mouse clicks and visual display track a separate variable 
"{(L:Seatbelt sign,bool). This is so that this code will work any time not just with
FSCaptain. Second, notice there is a separate <Element> section which monitors for changes in the
interface variable made by FSCaptain and changes the internal variable appropriately.

This exact same code will work for the ACMESMOKE 'no smoking' variable too.

**Implementing the switch interface in FSX/P3D:**

The system used for FS2004 is not necessary in FSX/P3D, simply set on and off the two FSX XML variables:

(A:CABIN NO SMOKING ALERT SWITCH, bool)
(A:CABIN SEATBELTS ALERT SWITCH, bool)

However if the aircraft uses the ACMEBELTS and ACMESMOKE variables FSCaptain will see and
use them, just as in FS2004.

**Installing the Switches in an Aircraft**

(The following is an example of how to construct the switch code yourself. Several ready-made
belts and smoking switches are available in the \FSCaptain\Panel folder for you to use.)

First create a folder in your airplanes 'panel' folder called 'FSCaptain'. Then copy the XML code I
have provided in the appendix into Notepad and save it as 'Beltswitch.xml' in the 'FSCaptain' folder
you just created. Also copy that code, change the ACMEBELTS variable in it to ACMESMOKE, and
save it as Smokeswitch.xml in the same folder.

Then make (or find) two pictures of the switch you want to show on the panel called
switch_on.bmp and switch_off.bmp. Put these in the FSCaptain folder you
created.

Now in your panel.cfg file, place these lines in the [Window00] section at end of the list of gauges:

gauge60=FSCaptain!Beltswitch, 100,200,20,20
gauge61=FSCaptain!Smokeswitch, 130,200,20,20

The numbers in these two examples will have to be adjusted for your panel. the 'gauge60' and
'gauge61' will have to have the 60 and 61 changed to unique numbers on your particular panel.
The numbers after the name, in the belts example, are the location and size where the image goes on the panel. The 100,200 means the top left hand pixel of your "switch_on.bmp" picture will be placed on the 100th pixel to the right on the panel, and the 200th pixel down; and the size of your picture will be scaled to be 20 pixels high and 20 pixels wide. You'll have to experiment to get it exactly where you want it.

**Cabin Comfort Variables**

An aircraft can transmit to FSCaptain several XML variables that specify the cabin altitude, rate of climb, and temperature. From these, FSCaptain will measure passenger comfort and failure of the pilot to effectively manage these variables can result in passenger complaints against him. If these variables are not present (that is, zero, not transmitted) no such evaluation is done by FSCaptain.

(L:ACMECABINALT, feet)

This variable is zero if not present, or it represents the cabin altitude in feet plus 1000. The reason for the additional thousand is that zero represents no data available, so an aircraft at an altitude of zero feet MSL would have 1000 in this variable.

(L:ACMECABINROC, fpm)

This variable is zero if not present, or represents the cabin's rate of climb or descent in feet per second, plus 10,000. Numbers above 10,000 represent climb, below represent descent.

(L:ACMECABINTEMP, celsius)

This variable is zero if not present, or represents the cabin temperature in degrees Celsius plus 100.
**General Status Variables**

(L:ACMEHEAT,enum)

This variable represents whether the window heat is turned on or not. Zero means no switches are present, 1 means heat is not turned on, 2 means it's turned on. On the case of multiple switches this will only be a 2 if all switches are turned on. The effect of window heat being on is to decrease the odds of a depressurization event in the case of a bird strike.

(L:ACMEIGNITION,enum)

This variable represents whether the turbine ignition switch is turned on or not. 1 means ignition is not turned on, 2 means it's turned on. On the case of multiple switches this will only be a 2 if all switches are turned on. This will not be present unless the airplane is a jet or turbo prop type, it does not apply to piston driven engines. FSCaptain monitors the status of this signal for jets and turboprops, and when it is not on during takeoff and landing, or during visible precipitation, the odds of a flameout are increased.

(L:ACMECABINCALC,enum)

This variable is zero if not present, or 2 if the Cabin Call button has been pressed. It is not presently monitored in FSCaptain but may be in the future.

(L:ACMEPOWER,enum)

This variable is zero if not present, or 1 if the Galley Power is turned off in the aircraft, or 2 if the Galley Power is on. The pilot will be notified by the cabin crew if cabin service is necessary on the flight but the galley power isn't turned on.

(L:ACMEBRAKE,celsius)

This variable is zero if not present, or represents the brake temperature plus 1000. This is monitored by FSCaptain and the pilot will be informed by the first officer if the brake temperatures exceed 399 degrees.

(L:ACMELGTNAV,celsius)

This variable is zero if not present, or is set to 1 if the NAV lights are off, and 2 if the NAV lights are turned on. This can be used in those airplanes that do not manipulate the standard FS signals. It is not necessary in those that do.

(L:ACMELGTL, celsius)

This variable is zero if not present, or is set to 1 if the landing lights are off, and 2 if they are turned on. This can be used in those airplanes that do not manipulate the standard FS signals. It is not necessary in those that do.

(L:ACMEV1,number)
(L:ACMEVR,number)
(L:ACMEV2,number)

These variables can be used to transmit the settings of speed bugs to the interface. If these numbers are not zero, and the flight has a co-pilot, the co-pilot will verbally make these speed calls on takeoff when the aircraft’s speed matches the numbers in these variables.
The Mechanical Failure Interface:

(L:ACMEPRESSFAIL,bool)

This variable is set by FSCaptain and not by the interface. When set to 1 it means that FSCaptain has control of the cabin pressure variables ACMECABINROC and ACMECABINALT. It will set those and the interface should attempt, if possible, to read them at their standard values and set the airplane’s variables accordingly. This means reversing whatever logic is used to translate the airplane’s cabin rate of climb and altitude. Also, when this variable is set to 1 the interface should stop trying to transmit the airplane’s values in the variables ACMECABINROC and ACMECABINALT. In other words, this switch reverses the flow of those two variables from the normal airplane-to-FSCaptain into FSCaptain-to-airplane.

(L:ACMEFLAG,bool)

The XML variable ACMEFLAG can be used by the interface to suppress all mechanical faults coming from FSCaptain regardless of the settings in the Administrator. Set the variable to 1 to accomplish this. This does not affect non-mechanical failures and problems such as bird strikes, blown tires, cargo shifts, or others. Use this if your airplane will generate all failures by itself.

(L:ACMEFAULT,bool)

This variable can be used by the aircraft interface code to alert FSCaptain to a mechanical fault triggered by that code. As long as this variable stays zero, there is no fault indicated. If non-zero, FSCaptain will see a fault according to the following list:
Appendix 4: Mechanical Fault Codes

There are many systems onboard our aircraft which can fail and FSCaptain can detect many such failures which would occur if the aircraft designers deem a failure should occur, which might be triggered by another add-on, or by FSCaptain itself using the ACME Failure Generator. (Rule 1 of the ACME Failure Generator is, “the ACME Failure Generator cannot itself fail.”)

If you have the option “Display Failure Codes on FCDU” set, then your FCDU will display a code of the failed system, along with the failure type.

There are six types (or causes) of system failures:

0 – External (either another add-on, or the aircraft itself)
1 – Mechanical – the percentage is set from the Options for All Airlines tab in the Administrator
2 – Bird strike – the percentage is set from the Options for All Airlines tab in the Administrator
3 – Weather – ice or another type of Chilled Precipitation (snow, rain, even clouds if enabled!)
4 – Blown Tire – the percentage is set from the Options for All Airlines tab in the Administrator
5 – Chilled Precipitation Intake / Other WX Causes

Here are the codes for the sixty-plus systems which can fail. Note that all codes below 200 are considered not to be part of the ACME Systems’ Minimum Equipment List and do not warrant an emergency declaration or a cancellation of the flight if detected before airborne.

100 – Mag Compass
101 – NAV1
102 – NAV2
103 – COM1
104 – COM2
105 – ADF
106 – RMI
107 – Transponder
108 – VSI
109 – Turn Coordinator
110 – Fuel gauge
111 – Autopilot
112 – Ammeter
113 – Prop Deice
114 – Hydraulic Pump 1
115 – Hydraulic Pump 2
116 – Generator 1
117 – Generator 2
118 – Carb Air Temp Gauge
119 – Cylinder Temp Gauge
120 – DME
121 – Fuel Pressure Gauge
122 – Oil Pressure Gauge
123 – Oil Temp Gauge
124 – OAT gauge
125 – RPM gauge
126 – MAN Pressure Gauge
127 – Gyro
150 – Magneto 1L
151 – Magneto 1R
152 – Magneto 2L
153 – Magneto 2R
154 – Magneto 3L
155 – Magneto 3R
156 – Magneto 4L
157 – Magneto 4R
180 – Alcohol Leak
200 – Pitot
201 – Altimeter
202 – Attitude Indicator
203 – Avionics total
204 – ASI
301 – Hydraulics
302 – Vacuum
303 – Electrics
304 – Pitot Blockage
305 – Brake all
306 – Brake left
307 – Brake right
308 – Cabin Pressurization
310 – Flaps
311 – Spoilers
312 – Gear
32X – Prop Governor X
33X – Prop Feather X
40X – Fuel Leak Tank X
50X – Oil Leak
60X – Hydraulic Leak
70X – Engine Failure
80X – Engine Fire
90X – Thrust Reversers
910 – Elevator Cables
911 – Aileron Cables

In the above, “X” represents the engine affected by the failure, 1 through 4.
Appendix 5: Special Options and Features

There are certain options in the FSCaptain system that can only be accessed by a text editor in this release. Future releases may provide access to some of these special options and features from the Administrator. None of these files are essential to the operation of the FSCaptain system and only exist to solve certain rare problems to provide very special features.

All FSCaptain configuration files are text files which can be edited by Notepad or any other text file editor. However, for most of these files, this is dangerous as the Administrator edits the content of these files to prevent bugs and crashes in the FCDU during flight. Editing a configuration file outside the Administrator is strongly discouraged for this reason.

The files which can be edited by hand are:

- airport_surface_override.txt
- closed_user.txt
- customs_user.txt
- Exceptions.cfg
- ignored_airports.cfg
- Items.cfg
- new-id_user.txt
- Options.cfg
- private_user.txt
- Profile.cfg

Items.cfg has been discussed in Appendix 2. What follows are the guidelines for the remainder of these files.

The file “Profile.cfg” normally does not need to be edited by hand – it should only be done so under the guidance from the FSCaptain Support Team.

The files which include the filename pattern “_user.txt” are optional data that can be enabled by editing the Options.cfg file as noted in each file's guideline notes.
The airport_surface_override.txt File

FSCaptain gets its information about airport surface types (which can be Hard or Soft Ground, Water, Ice, and Snow from the Makerwys and SceneryScanner utilities. They read the active scenery files and list many different types of data from airport BGL files and convert them into a format for FSCaptain to use.

Some scenery designers have chosen to not include the correct runway surface type in their BGL files, instead only providing visually appealing textures, which unfortunately cannot be turned into recognizable data.

This file is to be edited by individual Captains to override the general runway types normally collected by Makerwys and SceneryScanner. It is not a detailed replacement for differently constructed sceneries, but it will allow Captains to make quick on-the-fly adjustments until they (or another scenery owner) can make adjustments to the scenery directly.

The format of this file is simple. On separate lines are the ICAO code of the airports in question, followed by an equal sign, and then by a single character code denoting the primary runway types at that airport. The primary runway codes are:

- H -- Hard surface (asphalt, concrete, etc.)
- S -- Soft surface (grass, dirt, etc.)
- W -- Water surface
- I -- Ice surface
- N -- Snow-bound surface

As an example, if your KJAX scenery is constructed with beautiful looking grooved concrete runways, yet the BGL file containing the simulator-visible information has them as grass surfaces, Dispatch will not permit flights in aircraft which cannot taxi on grass!

So you would need to add the following line to this file:

KJAX=H

Then you would run SceneryScanner, and Dispatch will trust your declaration that KJAX has hard-surfaced runways.

All overrides which are listed here of the hard-surface type will automatically be included in the "airport exceptions" list. (\FSCaptain\Config\exceptions.cfg) and do not need to be listed there. (However there will be no harm if they are.)
**The closed_user.txt File**

This file supplements the official closed_fsc.txt file, allowing each Captain to customize their data.

These files are used only when the option RESPECT_CLOSED_AIRFIELDS=1 is added to a Captain’s options.cfg file. (Detailed several pages from here.)

These files contain a simple listing of ICAO, FAA, TC codes for airports which have closed operations since FS9 / FSX were first published and which would not be used by commercial aircraft under any circumstances.

Taking the first four listings – in alphabetical order – from the (original) closed_fsc.txt, they are:

00CL
0Q6
25OR
2CL2

Each of these is an airport in the United States which is no longer listed in the FAA database.

We only have several dozen such airports listed – most in Northern California. However if you know of an airfield near you which is no longer in use and is not listed in closed_fsc.txt, you can add its code to your closed_user.txt file and run SceneryScanner… your FSCaptain airport database will be updated.

If an airport is listed in closed_fsc.txt and you need to be able to make flights to or from the airport in question – for example, if your VA considers 2CL2 to be one of their airports – then add 2CL2 to your private_user.txt and run SceneryScanner and 2CL2 will be considered an operational airport!
The customs_user.txt File

This file supplements the official customs_fsc.txt file, allowing each Captain to customize their data.

These files are used only when the option RESPECT_CUSTOMS=1 is added to a Captain’s options.cfg file. (This is detailed in another appendix.)

These files contain a complex listing of ICAO, FAA, TC codes for airports with known Customs services (including the lack thereof), as well as a bit/flag value of the airport’s services. The airports contained in customs_fsc.txt have been compiled from various official and unofficial sources.

The purposes of these files are to establish which airports can and cannot participate in a flight between nations. It’s not always possible to discern such from an airport’s name. For example, KBIL – Billings Logan International Airport – despite its name it does not have Customs Services.

There are certain exceptions that prevent this from being a simple on/off arrangement. Some airports are understaffed and therefore limit Customs operations to a small number of crew and passengers. For example, CYZF – Yellowknife (the main base of Buffalo Airways) is designated as AOE/15 – Airport of Entry / 15… Customs there can only process 15 souls per flight. So while the 7400ft runway at CYZF can handle a 737… you’d only be able to take 15 PAX and crew combined from any other country.

What follows is a detailed description of how these values are stored. This data is included in the header of each file – if there are any differences between what follows and either of the files in question, the header data should be considered as most current.
For airports of the Americas, Greenland, Ireland, Northern Africa, Oceania, the current and prospective Schengen Agreement countries, and the United Kingdom: if there is no listing here, it is ASSUMED that no Customs Services are available.

For all other countries, if an airport is not listed here it is ASSUMED that all Customs Services are always available.

This is a character-based bitwise flag system, employed using the following values/services:

1. SERVICES
   - bit 0  = Full Passenger Service (if bit 15 is clear)
   - bit 1  = Full Cargo Service (if bit 15 is clear)
   - bit 2  = Special (Live) Cargo Service (if bit 15 is clear)
   - bit 3  = Either Passenger and Crew Count -or- assumed on (if bit 15 is clear)
   - bit 4  = Passenger and Crew Count (if bit 15 is set)
   - bit 5  = Passenger and Crew Count (if bit 15 is set)
   - bit 6  = Passenger and Crew Count (if bit 15 is set)
   - bit 7  = Passenger and Crew Count (if bit 15 is set)
   - bit 8  = Passenger and Crew Count (if bit 15 is set)
   - bit 9  = Passenger and Crew Count (if bit 15 is set)
   - bit 10 = No Unscheduled Service - Only scheduled flights are allowed
   - bit 11 = No Scheduled Service - Only charter flights are allowed
   - bit 12 = Alternate Use Permitted regardless of other restrictions.
   - bit 13 = Future Use - Commercial Cargo Service
   - bit 14 = Future Use - Export Control Service
   - bit 15 = Limited Passengers and Crew with Cargo - Valid for Passenger flights only, and limits the number of Souls On Board to the value of bits 0 to 9. (Max souls of 1023.)
     E.g., a value of 32783 (bits 0, 1, 2, 3 and 15) would allow flights of 15 or fewer crew and passengers with related cargo - but not "cargo only" flights.

2. COMPREHENSIVE COUNTRIES LIST
The token "CCL:" is used to denote a list of "country names" used in MSFS default and add-on airport sceneries where "comprehensive" data has been obtained. If you were to add 100 sceneries for the country "Freedonia" where XX99 is a full Customs enabled airport and all others not, you could represent such by adding "CCL:FREEDONIA" and "XX99=15". Any other airport with a matching country name would be presumed to not have Customs Services.

There’s a lot of detail that can be applied here, but to make things simple, any airport with a value of “15” is considered capable of all standard Customs services, and an airport with a value of “8” is considered to not have any standard Customs services.

If you wish to update the data – to add a new airport whose status doesn’t appear correct, or to enable international flights to or from the airport in question (for example, if your VA considers KBIL to be an airport capable of flights to or from another country) then add KBIL=15 to your customs_user.txt and run SceneryScanner and then KBIL will be considered a Customs-enabled airport!
The Exceptions.cfg File

The Exceptions file provides a way to fix certain problems with airport configurations. This is the default as packaged in this release:

```
; A file to record exceptions for airports.
; List airport ICAO and exception code.
; the only code supported in this release is:
; 1 = Suppress all off runway penalties
:
KTEB,1
```

You may list any airport ICAO identifiers in this file, one per line, and follow that with the numeral 1 (one). This indicates that when operating at that airport as a departure or a destination, any penalties for leaving the taxiway or runway will be suppressed. This includes a runway overrun situation.

This will handle the problem of poorly constructed airports where it appears the taxiways and runways are in place but in fact they are not and you can get penalties for what appears to be perfect taxiing.

If you declare an airport to have Hard surfaces using the airport_surface_OVERRIDE.txt file (mentioned earlier in this Appendix) then you would not have to also include the airport code here - adding it to that file would automatically turn off surface checking at the same airport.
The ignored_airports.cfg File

This file is another configuration file which can help to correct problems with airport which are too close to one another.

This file contains the ICAO identifiers of airports which you wish to be utterly ignored by FSCaptain. These airports will not be listed in the airports.cfg file, nor any other file created by SceneryScanner.

Looking at the Google Earth image above, you can see the Airport Reference Points (ARPs) for the major New York City airport hub LaGuardia – KLGA – along with a private seaplane base 4NY2, and a small civil airfield in Flushing, NY (FLU).

It is easily possible to log in to your Company Dispatch at the start of runway 22 or 31 and find yourself “closer” to 4NY2 or FLU than KLGA. (Some sceneries move the ARPs to different locations, allowing the distance differential to encompass some of the KLGA terminal gates.)

If you launch at certain airports and see on your FCDU that you’re at another airport in the vicinity, you can add that airport to this file, and then run SceneryScanner to make a new FSCaptain airport database which has no knowledge of the other airport.

You may list any airport IACO identifiers in this file, one per line. By default, this file is empty – only using what airport sceneries which are problematic for you.
The new-id_user.txt File

This file is currently not used – expect it to be enabled for the next point version of FSCaptain.
The Options.cfg File

This file contains over 120 custom options, and is currently not editable from the Administrator.

If you are upgrading your copy of FSCaptain, newer options (with the default values) will automatically be added to your options.cfg file once you run the FCDU or Administrator. Options which have been added since the second previous public release (1.7.2) are noted here in red text.

One option that has been in use for several years – BACKUPAFTER – is being depreciated and the FCDU will henceforth perform both Before and After backups to maintain each Captain’s career at the finest level.

Here are the contents of this file using the default values – the values FSCaptain would use if you did not have this file:

; This file is written by the FSCaptain Administrator and should only be hand-edited
; by those Captains with nerves of steel, and who have first made a backup of the original.
; Learn more at http://fscaptain.net
;
; This file can be edited to disable certain penalties and options.
;
DONT_DISPLAY_OPTIONS=0 ; 1 = Do not log option values (this file).
DONT_DISPLAY_AIRCRAFT=0 ; 1 = Do not log aircraft values.
DONT_DISPLAY_AIRLINE=0 ; 1 = Do not log airline values.
ALLOW_INSULTS=0 ; 1 = Allows your airline to drop insults if you have a habit of
; doing improper things - e.g., crashing your aircraft.
BACKGROUND_AIR=1 ; 1 = Enables background sound effects.
BACKUPAFTER=0 ; 0 = Backup company log before updating the log.
; 1 = Backup company log after updating.
; 2 = Backup company log before and after updating.
COLLISIONS_NEED_INSPECTION=0 ; 0 = No inspection needed.  1 = Inspections needed only if
; a collision damaged a system or control.  2 = Inspections needed
; even if a collision is only noted on the FCDU.  Default=0.
CREW_OPERATES_DOORS=1 ; 1 = Your FO and FA will operate the main external door.
; 0 = Crew are not responsible for external doors.
DEFAULT_CAN_BE_OPEN=0 ; 1 = The most recent Open flight's departure airport will
; become the default departure airport in the Administrator's
; Flight tab.
DISABLE_FA_AMBIENT=0 ; 1 = Disable ambient FA and PAX noises if FA is disabled for
; a particular phase.
DISABLE_FA_INFLIGHT=0 ; 1 = Disable common FA PAX announcements during in-flight phases
; for all aircraft. Does not affect crew interaction.
DISABLE_FA_POSTFLIGHT=0 ; 1 = Disable common FA PAX announcements during post-ON phases
; for all aircraft. Does not affect crew interaction.
DISABLE_FA_PREFLIGHT=0 ; 1 = Disable common FA PAX announcements during pre-OFF phases
; for all aircraft. Does not affect crew interaction.
DISABLE_FO_ROLLOUT=0 ; 1 = Disable FO speed callouts during rollout for all aircraft.
DISABLE_FO_TAKEOFF=0 ; 1 = Disable FO speed callouts during takeoff for all aircraft.
DISABLE_LOG_AC_VARIANTS=0 ; 1 = Disables logging of all aircraft variants via Administrator.
DISABLE_LOG_AUDIO=0 ; 1 = Disables logging of audio data.
DISABLE_LOG_FUELCALC=0 ; 1 = Disables logging of Fuel Calculation events.
DISABLE_LOG_GROUND_SERVICES=0 ; 1 = Disables logging of ground service events.
DISABLE_LOG_LOADING=0 ; 1 = Disables logging of aircraft loading events.
DISABLE_LOG_PAX_SERVICE=0 ; 1 = Disables logging of passenger service events.
DISABLE_LOG_PUSHBACK=0 ; 1 = Disables logging of pushback stages.
DISABLE_LOG_SAVEFILE=0 ; 1 = Disables logging of SaveFile events.
DISABLE_LOG_SEARCH=0 ; 1 = Disables logging of Administrator Flight Search events.
DISABLE_LOG_STAGE=0 ; 1 = Disables logging of Flight Stage Change events.
DISABLE_LOG_WX=0 ; 1 = Disables logging of WX data.
DISABLE_SURFACE_CHECKS=0 ; 1 = Disables checks of runway surface types. Use with caution.
DISABLE_TOTAL_SYSTEM.Failures=0 ; 1 = Disables failures of 'complete systems' such as electrical
; and hydraulic.
PERCENTNODE=70 ; Percent of charters to use airline's 'node list'.

PERCENTZAP=70 ; Percent chance to remove an AI aircraft parked
; in your assigned destination parking spot.

POSITIVE_CROSSWIND=0 ; 1 = Crosswinds from the right will be noted with a '+'.
; 0 = Crosswinds from the right will be noted with a '-'.
POSITIVE_HEADWIND=0 ; 1 = Headwinds will be noted with a '+'.
; 0 = Headwinds will be noted with a '-'.

PROTECTIONANGLE=45 ; Angle in degrees (0 to 90) to consider AI ground
; traffic to be facing your aircraft.

PROTECTION_HEIGHT=0 ; AGL height in feet (0 to 200) to check AI ground traffic if you
; are in a rotorcraft. (0 = default.)

PROTECTIONZONE=100 ; Distance in meters to freeze AI ground traffic
; facing your aircraft.

PUSHBACK_ANGLE_DIFF=2 ; The difference (in degrees) for the pushback to
; conclude a complete turn has occurred.
; Default is 2 degrees.

QP_MINIMUM_TO_APPEAL=0 ; The minimum amount of Quality Points necessary to lodge an appeal.
; Default is 0; range is -10000 to 1000.

QP_PER_PENALTY_POINT=10 ; The amount of Quality Points needed to remove a penalty point.
; Default is 10; range is 0 to 20.

RANGE_FACTOR_SANS_ALTERNATE=10 ; 0-85 percent range of reserve fuel if no
; alternate is selected.

REQUIRE_GLIDESLOPE_FOR_ILS=0 ; 1 = 'ILS Required For Fixed Wing Aircraft' must include
; a glideslope in addition to a localizer.

REQUIRE_TYPE_FOR_MAP=1 ; 1 = The TYPE value in load maps must match the atc_model
; value from the aircraft.cfg file.

RESERVE_FUEL_IN_MINUTES_HELI=30 ; Minutes of reserve helicopter fuel for your flight.
; Max of 40. (Should not be - but could be -
; less than 20 minutes).

RESERVE_FUEL_IN_MINUTES=45 ; Minutes of reserve aircraft fuel for your flight.
; Max of 60. (Should not be - but could be -
; less than 30 minutes).

RESPECT_CLOSED_AIRFIELDS=0 ; 1 = Airfields marked as closed can not be used.

RESPECT_CUSTOMS=0 ; 1 = Airfields known not to have local Customs services
; cannot be the destination of an international flight.

RESPECT_PRIVATE_AIRFIELDS=0 ; 1 = Airfields marked as 'private-use' may only be
; flown to from another private-use field.

RUNWAY_DETECT=2 ; Half-seconds between 'OnRunway()' detections.
; (0 = disable.)

RUNWAY_FACTOR_FOR_SCHEDULE=95 ; Percentage of aircraft's minimum runway length to consider
; for scheduled flights. Range of 85 to 100. Default is 95.

SERVICE_MAX_BANK_ANGLE=25 ; The maximum bank angle (5 to 45) the aircraft can maintain before
; cabin service is interrupted. Default is 25.

SERVICE_MAX_TURBULENCE=2 ; The maximum turbulence level (0 to 4) the aircraft can endure before
; cabin service is interrupted. Default is 2.

SEVERE_MLW_MULTIPLIER=1000 ; Percentage overweight at landing to declare a 'severe landing'.
; Range is 0 to 5000 (50 percent). Default is 1000 (10 percent).

SHOWENVIRONMENT=1 ; 1 = Receive cautionary messages via FCDU about
; the environment.

SHOW_ICEMAN_TIMES=0 ; 1 = Display seconds remaining in each interactive phase with Iceman.
; (Default is 0.)

; ATTENTION - The following SIM_AUTOSAVE options should be set to their default
; values if you use any other program's autosaving function!
;
SIM_AUTOSAVE_CLEANUP=0 ; 1 = Removes all simulator save files generated during the
; flight after going IN and updating your company log. Default is 0.

SIM_AUTOSAVE_FILES=0 ; The number (0-16) of autosaved simulator files to generate per
; flight. 0 = Disables simulator autosave.

SIM_AUTOSAVE_ON_GROUND=0 ; Sets autosaving of simulator files while on the ground.
; 1 = Before takeoff. 2 After landing. 3 = In air and both ground
; phases. 4 = Only while on ground. 0 (Default) = Simulator autosave
; will only occur in air.

SIM_AUTOSAVE_SECONDS=180 ; The number of simulator seconds between simulator autosaves.
; Range is 30 to 1800, default of 180. (That’s three minutes.)

SINGLE_ENGINE_PRECIP_FAIL=0 ; 1 = Allows engine failure of single engine turboprop
; and jet aircraft due to precipitation intake.

STRICHT_DEICE_PROCS=0 ; 1 = Enables STRICT Ground Deicing procedures
; *overriding HAZARDDEICE=0 in profile.cfg*.

TAKEOFF_FAILURE_ENHANCEMENT=0 ; Percentage chance (0 to 100 - default 0) that an expected
; engine failure (or an otherwise early-flight failure) will
You can change the values of each option to disable (or enable) the documented penalty or function. Likewise, for the “distance” or “percent” options, you can use reasonable integer values in the distance type specified.

The options with the names that begin with “DISABLE_LOG_” have been included to reduce the size of your ADMIN, FSCAPTAIN and FCDU log files. These files record (in plain text) various events occurring in each flight you make, and can help the FSCaptain support staff to diagnose problems that you might encounter in any of your flights. Ideally you would leave all of these values as “0” so that all actions are recorded…but you do have the option to disable certain items from being logged if you find them tedious to read.

For example, this line...

FCDU.GAU:: 10:24:48 Ground hold declared due to icing - Ice: 87 / 10

… indicates that soon after startup, your company dispatch issued a ground hold because of surface ice buildup. Then later…

FCDU.GAU:: 10:37:43 Ground ice hold released due to successful deicing procedure. HOT: 20
… indicates that the ground hold was released after the deicing crew completed its tasks, and you were granted a holdover time of 20 minutes.

**Key Assignments**

You can override the key assignments for the FSCaptain menu shortcut keys if necessary. But be aware that the menu titles will not change to reflect your changes.

These options can be included:

```plaintext
KEY_BELTS=28 ;Ctrl-\, Hex 1C
KEY_SMOKING=29 ;Ctrl-], Hex 1D
KEY_FCDU=30 ;Ctrl-Shift-6, Hex 1E
```

The numbers are the ASCII values of keys that can be assigned to the different functions, in decimal. You will need to look up the values of the keys you want to use in place of these defaults and put them in these options.

For example, to make the seat belts sign use SHIFT-S (a capital S letter), code this:

```plaintext
KEY_BELTS=83 ;"S", Hex 53
```
**The private_user.txt File**

This file supplements the official private_fsc.txt file, allowing each Captain to customize their data.

These files are used only when the option RESPECT_PRIVATE_AIRFIELDS=1 is added to a Captain’s options.cfg file.

These files contain a simple listing of ICAO, FAA, TC codes for airports which are “private use” and which would only be used by commercial aircraft in certain circumstances.

A “private use” airport is different that a “privately owned” airport. Several publicly used airports are privately owned – nearly 1000 such in the United States.

Taking the first four listings – in alphabetical order from (the original) private_fsc.txt, they are:

- 00AK
- 00AL
- 00CA
- 00CO

Each of these is a private use field in (respectively) Alaska, Alabama, California, and Colorado.

We’ve collected over 14000 such airfields from FAA and other official data sources. However, if you know of an airfield near you which is no longer public use and is not listed in private_fsc.txt, you can add its code to your Private_user.txt file and run SceneryScanner… your FSCaptain airport database will be updated.

If an airport is deemed private use, you can’t fly to it directly from a public use airport. You can’t even have one of these airports designated as an alternate for a flight.

However, you can charter flights from these airports to any public or private use airport that you wish. For the most part, private use airports generally do not have Customs services however, so you would likely be limited to flights within the same country / Customs area.

If an airport is listed in private_fsc.txt and you need to be able to make flights from public use airports to the airport in question – for example, if your VA considers 00CA to be one of their airports – then add 00CA to your private_user.txt and run SceneryScanner and 00CA will be considered a public use airport!
**The Profile.cfg File**

If you are a registered customer of FSCaptain, please understand that this file contains your license key information. Under no reason should you ever share this file with anyone other than those on the FSCaptain Support Team (Dutch, Peter and Travis).

This file contains basic information for FSCaptain to operate in a mode customized for your use. It contains items such as:

- All your possible airline choices, including the currently active one.
- All your Captain “personas” including birthdays.
- All “common” options such as Dispatchers, Display Units (feet / meters, kilometers / nautical miles), Hazard Pack options, PAX Timing, and WX Engine information.
- Your license key.

These items are normally edited via the Administrator. Manual editing is strongly discouraged, unless advised by the FSCaptain Support Team.
Appendix 6: Transitions.cfg (and Transitions_18.cfg)

It is required for all ATPs to maintain proper altimeter settings in regards to “local pressure” (the pressure reading for the controlling airfield in question) and “standard pressure” – the “ISA standard” which is 29.92 inches of mercury and 1013.25 millibars of pressure.

This change occurs on ascent at what’s known as the Transition Altitude (TA) – the altitude above sea level where a Captain changes from “altitude” to “flight levels” – from local to standard pressure.

In the real world, each country establishes its own standard for what the TA should be – either the same across the country’s airspace, or individually per-airfield. (Some countries join other countries in aeronautical consortiums in establishing joint standards, but all to the same end.)

(There is an opposite change – from standard to local pressure – which occurs at an airfield’s Transition Level which is the lowest flight level above TA, but except for countries which strictly define Transition Levels as a fixed altitude *such as Australia*, this value is very complex to determine.)

Taking a step backwards, in the Flight Simulator series, the default ATC has always operated under FAA rules of a global (get it?) standard of a Transition Altitude at 18000ft.

If you’ve ever made a flight using default ATC with a cruise altitude below 18000ft, you’ve needed to maintain current local pressure, or ATC would complain that you’ve level busted and over 300ft off of your assigned altitude. Then they would likely send you off chasing vectors into nowhere and transfer you to another controller….

But circa 2010, we (in conjunction with AivlaSoft’s Electronic Flight Bag) created a very accurate global database of real-world Transition Altitude values. Navigraph and Aerosoft quickly followed up to provide AivlaSoft with Navdata updates on each AIRAC cycle, and soon several ATC replacement engines and other FS add-ons followed suit, and it’s currently possible to run several FS add-ons that work off similar real-world data – FSCaptain being one of them!

With all that said, the key to the database is the \FSCaptain\Config\Transitions.cfg file. It’s a condensed list of global airports and a recent set of published TA values. This file is regularly updated, and should not be hand-edited without express instruction from the FSCaptain Support Team.

Should you prefer to use default ATC, you can delete the Transitions.cfg file and rename the file \FSCaptain\Config\Transitions_18.cfg to replace it. Rebuild your airport database with SceneryScanner, and all airports worldwide will have a Transition Altitude of 18000ft.

In upcoming versions of FSCaptain we’ll begin to use Navdata in our own fashion, towards supporting our Captains. At that point, if you have a subscription to a Navdata service you can then expect updated Transition Altitude values on each AIRAC.
Appendix 7: Minimum Safe Distances

Commercial aircraft need to operate in a manner that is highly safe both for the crew, the passengers, and the general public as well. One safety function is a requirement for aircraft to maintain a minimum safe distance from objects on the ground. While it is fun to skim the water beneath a bridge such as the Golden Gate, if such were done in real life, there would doubtless be numerous complaints, jangled nerves, and possibly some arrests.

As of version 1.7.0, Captains flying fixed wing aircraft will be under the optional requirement of maintaining a Minimum Safe Distance from ground objects, risking the wrath of complaining passengers and severely ticked off aviation authorities.

Now as FSCaptain can't detect individual buildings & obstacles with our sensors, we've decided that if you are beyond 4 nm from your departure or destination airport (9nm if it is in a mountainous area – see later), you must keep a minimum AGL level based on the surface type you're over.

The levels are:

- 500 feet for uncongested areas (water, sand, snow, ice)
- 900 feet for populated areas (forests & grassy areas)
- 1400 feet for congested areas (urban areas)

... with an additional 1000 feet added if you are departing or approaching in "mountainous" areas – with a corresponding distance increase to 9nm from the Airport’s Reference Point. A mountainous area is defined as the airport's elevation being over 550ft – using the departure airport before the Descent stage, and the Arrival airport after. So if you are flying from the heights of Lake Tahoe to the flats of Fresno, you would be departing a “mountainous” area to a “non-mountainous” one.

These values are based on the real world requirements from the FAA for both 14 CFR 91.119 (VFR) and 14 CFR 91.177 (IFR) flights... with some allowances made for our simulators.

Your Dispatch Release will contain the expected levels for your Departure, Arrival and Alternate airports based on their type and size – private airports are thought to be in uncongested areas, very large public airports are pegged to be in congested areas, and all other airports are deemed to be in populated areas.

If you do dip beneath the MSD level, you will start accumulating "violation points" (think of them as "eyeball views per second") and after a while you’ll hear your FO caution you, and at that point you risk a 5 point penalty from a frightened passenger. Carry on a bit longer, and you’ll definitely get a PAXCOM, and if you dawdle too long too low, you’ll get a message on the FCDU from the airline telling you to stop it. By that time, you've lost 20 more points!
The FCDU will display MSD violation points at the top of each screen and page while they are being accumulated. Cyan indicators signal “no problem yet.” Yellow indicators mean you’re pushing your luck. And red indicators… are a sign that you’re going to be written up on this flight.

MSD “violation points” will accumulate at a lower rate at night… owing to the simple fact that it’s more difficult to visually gauge an aircraft’s exact altitude in the dark….
Appendix 8: The Speed Table in the Aircraft Characteristics File

In addition to all the options maintainable from the Administrator, you may also include a table of "speed calls" in the file for an aircraft type. An example of this feature would be the definition for the default Boeing 737-400 in FS2004. In the folder \FSCaptain\Aircraft you will find a configuration file for each aircraft type. One such is B734.cfg, a configuration for the Boeing 737-400 aircraft. If you open that file with Notepad or another plain text editor you'll see about half of the entries correspond to the options maintained visually by the Administrator. But the bottom half of the file consists of a number of entries with the keyword 'Speedcall':

```
Type=B734
Name=Boeing 737-400
Config=Convertible
VolumClass=Large
IFE=1
MinRunway=6000
 PaxSeats=140
Crew seats=8
Attendants=3
SeatBeltSwitch=FSX
Pressurized=Yes
GrassTaxis=No
Hydraulics=Yes
RetractGears=Yes
MaxLandingWeight=121000
ServiceAGL=3
EmptyPayload=0
MaxHeadWind=110
CruiseAlt=33000
CruiseSpeed=370
DescentSpeed=250
ClimbPERM=1800
Reliability=99.9
FuelType=Jet
FuelCapacity=35580
FuelReserve=1600
CruiseEPP=6780
ClimbEPP=8100
DescentEPP=4800
Speedcall=5,82000,102,120,113
Speedcall=5,90000,108,125,118
Speedcall=5,98000,113,130,123
Speedcall=5,106000,119,120,124,127
Speedcall=5,115000,125,128,131
Speedcall=5,123000,131,132,142,135
Speedcall=5,131000,136,136,146,139
Speedcall=5,139000,141,141,150,146
```

The presence of these speedcall entries in an aircraft configuration file will trigger two special features of the FCDU: 1) the speeds will be displayed on Page ID 23 “Flight Status” underneath the status line when appropriate (before takeoff and during approach). And, if the aircraft has a first officer aboard, he or she will verbally announce the speed calls during takeoff: “eighty knots”, “V1”, “rotate” at the appropriate points in the takeoff roll.

Each entry has six fields. The fields, in order left to right, are:
Flap setting: This is one of the standard flap settings of the aircraft and it plus the next item determine when the four speeds on the rest of the line are appropriate.

Gross Weight: This, combined with the flap setting above, determines when the four speed settings that follow are appropriate. If the aircraft is at least this weight, but not over the next higher weight entry for this flap setting, then the speeds on this line will be used.

V1 Speed: This is V1 for this flap setting and weight range.

VR Speed: This is the “rotate” speed for this flap setting and weight range.

V2 Speed: This is the V2 speed for this flap setting and weight range.

Vref Speed: This is the Vref speed (final approach speed) for this flap setting and weight range.

Items 5 and 6 and not currently said by the First Officer, but they are displayed for reference on the FCDU. Speed reference tables for many aircraft can be found on the Internet, and always in the aircraft’s flight manual if you have access to it. We are aware that there are more factors involved in the accurate computation of V speeds than flap setting and aircraft weight, but these are the two factors most often used in printed V speed tables in flight manuals.

If you are not certain what your aircraft’s flap setting values are, you can load the FCDU and navigate to the 2nd Systems Screen and you will see the current flap setting values there.
Appendix 9: Manually Adding an FCDU Gauge to an Aircraft’s Panel.cfg File

Although an automatic installer exists to automatically install the FCDU gauge and the FDR gauge into an aircraft’s panel.cfg file, here are instructions for doing it manually if you have the need to do so, or if you are just curious as to exactly what is done where.

There are eight or nine steps to installing the FCDU and FDR in an aircraft. Whether the ninth step needs to be done depends on whether the aircraft has a virtual cockpit or not.

There are several versions of the FCDU, one called FCDU.gau and the other called FCDU9.gau. The first is for FSX & P3D and the second for FS9. You will need to be sure you use the appropriate one in each aircraft or the system will not function properly.

A bronze faceplace version of the FCDU is available as an option. To use it, substitute “FCDU2” for “FCDU” in the instructions below.

Follow this procedure:

Find the panel.cfg file for the airplane (follow any aliases if necessary.) Then copy that panel.cfg file and name the backup something else, like panel_backup.cfg.

Open the panel.cfg with Notepad or another plain text editor (do not use a word processor) and observe the first section, titled [Window Titles]. Decide which window you want to make the FCDU appear in. Remember than Window00 is reserved for the main panel and you can’t use that. Also recall that Window01 is accessed with the SHIFT-1 combination, and so on, so if you want to access the FCDU with SHIFT-6, place it as Window06 after the existing Window05.

If for example you decide the make the FCDU live in window 06, insert the following line after the one that reads Window05 :  Window06=FCDU Then you must increment the numbers on all following windows by one. The old Window06 becomes Window 07 and so on.

Now, find the actual [Window06] section in the file. Increment the 06 to 07.

Insert the following code block before this Window07 line you just changed. Be sure to insert only one of the two FCDU lines, depending on the sim version you are using:
(1) Find all subsequent sections that define windows and increment their window numbers, so that the window following the new FCDU window becomes Window07 and so on.

(2) Now it's time to install the FDR gauge. Find the first window, entitled Window00. This is the main window on the 2D panel. (If there is no 2D panel you can skip this step.) Scroll down the gauges until you find the highest numbered ones. For (as an example) the default Cessna 208 it reads:

\[\text{gauge39}=\text{n\_number\_plaque!n\_number\_plaque},320,500,67,19\]

Then insert one of these two lines after that line:

\[\text{gauge40}=\text{FCDU!FDR,1,1,1,1} \quad (\text{<---- for FSX/P3D})\]
\[\text{gauge40}=\text{FCDU9!FDR,1,1,1,1} \quad (\text{<---- for FS9})\]

The number 40 in the above example will probably need to be changed to be appropriate for the panel you are modifying, one higher than the highest gauge number already there.

(3) Now to insert the FDR into the virtual cockpit. (You can skip this step of the aircraft doesn't have a VC.) The FDR has to be inserted in both places because otherwise it will not be executed when you are viewing that style cockpit in FS2004. In FSX this is not strictly true but it does no harm (to frames or otherwise) to insert it in both so we do it for safety. Find the section marked [Vcockpit01]. Scroll down the gauges until you find the highest numbered ones. For (as an example) the default Cessna 208 it reads:

\[\text{gauge23}=\text{Cessna208B/XML!fd\_ap\_buttons},265,214,29,34\]

Then insert one of these two lines after that line, again making sure the gauge number is one higher than the highest gauge number already in the window:

\[\text{gauge24}=\text{FCDU!FDR,1,1,1,1} \quad (\text{<---- for FSX/P3D})\]
\[\text{gauge24}=\text{FCDU9!FDR,1,1,1,1} \quad (\text{<---- for FS9})\]

(You will almost certainly have the change the 24 above to match your situation.)

Save your panel.cfg file and try to bring up the FCDU in the airplane. If you did all these steps exactly correct it should work. If it doesn't work, carefully review each step until you find the problem.
Appendix 10: Manually Removing an FCDU Gauge from an Aircraft’s panel.cfg file

Follow this procedure:

1. Find the panel.cfg file for the airplane (follow any aliases if necessary.)
2. Then copy that panel.cfg file and name the backup something else, like panel_backup.cfg, just in case you need to restore it if things go wrong.
3. Open the panel.cfg with Notepad or another plain text editor (do not use a word processor) and observe the first section, titled [Window Titles]. Find the line that says WindowNN=FCOM or WindowNN=FCDU (NN will be some number). Delete that line. Re-number all subsequent lines so that their window numbers are one less. For instance if you deleted Window06=FCOM, then the next line should be Window07. Change that 07 to 06 and so on for all remaining windows. Remember which window number you deleted (let’s call it NN).
4. Now search for the text [WindowNN] where NN is the number of the window you deleted. Now, delete all lines up to the next window definition [WindowMM]. Change the number on that line from MM to NN. Find all subsequent lines that start with [Window and change their numbers to one less. These lines must match the window numbers you changed in step 3.
5. Search for the text FCOM or FCDU in the file. (The FCOM was the original ACARS device, and is being phased out.) You should see lines that have the text FCOM together with !FDR, as well as FCDU together with !ACARS. Delete any line you find with those items on it.
6. Save your file, you are done.
Appendix 11: Backing Up and Restoring Company Log Data

All FSCaptain log data is kept in the folder `\FSCaptain\Data`. If you copy this folder you are backing up your log data. Alternatively (and this is what we do) you can back up the entire FSCaptain folder.

There is another folder called `\FSCaptain\Backups`. In this folder are copies of the log for each airline, with the state preserved either just before a flight is started or just after (or even both!). The naming convention is `<airline>_flt_<number>_[START|END].log`. If your active log is messed up or destroyed, or you simply want to restore the state of your career to the point where it was right before you started a particular flight, you can follow this procedure:

1) Shut down any instance of FSCaptain – including your simulator. This prevents FSCaptain from overwriting the changes you are about to make!
2) Find the main log file for your airline in `\FSCaptain\Data`. For example if your airline is Emerald Harbor Air, the file name will be `Emerald.log`. (The filename is the airline's short name as defined in the airline definitions tab in the Administrator.)
3) Rename that file to something else, for example `Emerald_Testing.log`
4) Copy the saved log file you want to revert to. For example, let's say we want to reset our career to the point right after flight 231 was flown. Copy the file `Emerald_Flt_231_END.log` from `\FSCaptain\Backups` to `Emerald.log` in `\FSCaptain\Data`.

After doing the restore you should bring up the Administrator and check the status of your active log.
Appendix 12: Your Airline’s Nodes file

It’s possible to restrict (or to heavily influence) the choice of your airline’s flights to certain airports by implementing an airline “nodes” file and setting the option PERCENTNODE to a value of 0 to 100 percent. By doing this, you can influence the choice of destinations for both your Hub’s scheduled flights, as well as your Charter flights from anywhere.

Take the airline SurfAir into account. It supports one aircraft type (PC12), and twelve nodes in California (and Las Vegas). If you were to set PERCENTNODE to 100 and tried to get a flight from Montreal or Atlanta, the Flight List will likely be empty – in our simulator, a PC12 can’t fly (unrefueled) from CYUL or KATL to the closest SurfAir node (KLAS).