

SYBEX Bonus Material

Microsoft[®] Flight Simulator 2002: Sybex Official Strategies & Secrets[™]

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Bonus Material: Modifying Microsoft Flight Simulator 2002: Professional Edition by Craig Wessel

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MODIFYING MICROSOFT FLIGHT SIMULATOR 2002: PROFESSIONAL EDITION

By Craig Wessel

Have you ever had the urge to build your own aircraft and fly it in *Microsoft Flight Simulator 2002: Professional Edition*? Have you always wanted to create scenery of your home town and fly over it in the simulation? If you're an experienced *FS2002* pilot, or if you enjoy creating modifications of your own, *Flight Simulator 2002 Pro* ships with some tools that can be used to edit existing aircraft, create aircraft, and modify or create scenery. This is good news for the *FS2002* community, as it ensures a long life for the product long after you've flown everything that comes with the simulation.

However, the bad news is that there is no single tool you can use to do all these things—some of them are on the *FS2002 Pro* CD, but some of them have to be installed manually, as well as configured to work with the program. You'll also need some external tools.

What I've done here is compile the basic procedures you need to follow in order to get your own aircraft into the air, edit an existing aircraft, or work with scenery. What I have *not* done is give you every detail of every step along the way. The tools we'll be discussing have tutorials that cover the nuts-and-bolts of what we're doing—you don't need me to re-hash that material. What I'm focused on here is getting what you've created to work in the simulation. We'll discuss:

- Editing existing aircraft
- Creating and importing aircraft
- Editing textures and scenery

Getting Started

You'll need to use at least one, and sometimes more than one, external program to do any editing and creating. The tools you'll need are:

- gmax (it's on the *FS2002* CD, but not fully installed)
- Aircraft editor (already installed in your *FS2002 Pro* program group)
- Image Tool (already in your *FS2002* gmax directory)
- Bitmap editor (Paint Shop Pro, Photoshop, or another graphics editor. You can use Paint, but it won't do layers, making your task very difficult.)

First, we need to get things installed so they will work properly.


Installing and Setting Up Your Tools

I'm assuming that you've already installed *Flight Simulator 2002*. If not, do so now. Once installed, you'll find the tools we need in the sub directories of the installation directory (C:/Program File/Microsoft Games/FS2002 by default).

gmax

gmax, published by Discreet, is the little brother of one of the most powerful 3D editors around, 3D Studio Max. It can be used to create models for many games, animate models, apply textures, assign behavior to models, and create architecture (game maps or objects). In short, just about everything you'd want to do can be done. But we're only concerned with using gmax for aircraft-related editing.


gmax includes a very detailed tutorial on creating an aircraft model. Once you have created the model, you can then import it into *FS2002*. We'll go into more detail on how this is done later. For now, let's get gmax set up to work properly.

 For our purposes here, an aircraft *model* is the structure of the aircraft itself. Think of it as the exterior of the aircraft, and that will be close enough for now.

Setting up gmax

gmax can be found in the gmax sub-directory of the main *FS2002* directory (C:/program files/microsoft games/Fs2002/gmax by default). Using Windows' File Manager, open this directory to start setting up gmax, then follow these steps:


1. Click on gmax setup.exe to run set up.
2. Select an installation directory (we use C:/gmax).

 Be sure to install the Flash 5 controller when asked—gmax won't work without it!

3. Now, go to the directory you installed gmax *from* (not *to*) and open the FLIGHTSIM folder (C:/program files/microsoft games/Fs2002/gmax/Flightsim)
4. Copy the contents of both the “Gamepacks” and “plugins” directories into the same directories in your new gmax installation directory (C:/gmax/gamepacks and C:/gmax/plugins).
5. Now, navigate back to the directory from which you installed gmax (C:/program files/microsoft games/Fs2002/gmax) and go into the “Help Install” directory. Click on “gmax_help.exe” and place the contents in your new gmax help directory (C:/gmax/help). Do the same with the “gmax_tutorials.exe” file, but place it in a tutorials directory (C:/gmax/tutorials). The current tutorials directory in your new gmax folder is empty.
6. Once you have the *FS2002* gamepack and plugins placed in your new gmax directory's “Gamepacks” and “plugins” sub-directories, and the help and tutorial files in place, you're ready to use gmax with *FS2002*..

The Aircraft Editor

Now that we've got gmax squared away, let's make sure that the Aircraft Editor is correctly installed. The Aircraft Editor is what we will use to edit the actual panel design, sounds, textures, and flight dynamics of our aircraft. Every detail about the various aircraft that came with *FS2002* can be found using the Aircraft Editor.

 *Flight Dynamics* refer to the way the aircraft will behave in the air. Using the Aircraft Editor, you can change all

aspects of an aircraft's behavior—but not always with good results!

This program is better integrated with *FS2002* than gmax. In fact, it should already appear in your Windows Task Bar Start menu. Open the Start menu and find “Programs ->Microsoft Games ->FlightSimulator 2002”. The Aircraft Editor should be the first program inside this menu.

If it isn't, you can install it from the CD at any time. Simply insert Disc 1, and when prompted, agree to install the Aircraft Editor. That's it—you're ready to go.

Image Tool

This program also already exists in your *FS2002* directory. Look under *FS2002/gmax/Flightsim/gamepacks/Flightsim*. You'll use this program when we begin working with textures.

Bitmap Editor

The last we'll talk about is a bitmap, or graphics, editor. There is no one tool that's best for this—it's really a matter of personal preference, and how much work you plan to do in creating your own graphics (scenery, textures, and other items).

An editor like Corel Draw (www.corel.com) or Adobe Photoshop (www.adobe.com/products/photoshop/main.html) will work, as will Paint Shop Pro (www.jascsoftware.com/products/psp/). The important thing is to choose a graphics editor that you are comfortable with, and allows working with layers.

Any of the programs mentioned above will be able to export various file formats with ease. Add some basic artistic ability, and you'll be able to create your own textures and other artwork at will. We won't be talking about graphic editing much (see the Resources section for links to some good tutorials and the like), but a bitmap editor is a must-have tool if you want to do this kind of work.

Now that we've got the tools we need, we can begin talking about the fun stuff. We're going to start with editing existing aircraft, and then we'll move on to creating our own aircraft, textures, and scenery.

Editing Existing Aircraft


The Aircraft Editor is the tool you will use to edit existing aircraft, the aircraft that came with *FS2002 Pro*. If you include the different paint styles, there are 46 aircraft that shipped with the simulation. Since you are reading this, I assume you're ready to tweak some things and see what you can come up with.

Aircraft Editor Overview

Let's take a quick look at the Aircraft Editor itself before we begin editing anything. From the Start menu, open the Microsoft Games->FS 2002 menu and select Aircraft Editor.

When the editor is open, you'll see a split display. The left pane of the display shows the directories and elements that you can manipulate—it works like Windows File Manger—and the right pane shows the detail. The best way to learn the Aircraft Editor is to use it, so let's take a look at an aircraft and get familiar with how to get around.

From the text menu at the top of the Aircraft Editor, click on File and then select Open.... You should see a pop-up box entitled "Open Aircraft for Editing" that contains all the aircraft currently in your *FS2002* directory.

 If you don't see any aircraft listed, make sure that the Aircraft Directory is set properly. It should be set to the main *FS2002* directory on your hard drive.

Select the first aircraft, "Boeing 737-400" and click OK. Now, you should see your Boeing 737 listed in the left panel of the Aircraft Editor. Click on the "+" next to it to access all of the aircraft's detail.

Let's take a look at each editable element:

Panel

This is where *FS2002* looks for the graphic to display on the instrument panel. If you click on "Panel" in the left panel of the editor, you'll see several different views of a Boeing 737's instrument panel.

Sound


All sounds associated with the aircraft are found here. If you click on “Sound”, the list of available sounds for the aircraft will appear in the right panel of the editor. Double-click on a sound in the right panel to hear it.

Texture

Textures are the bitmap images, or graphic files, that *FS2002* needs to use when displaying the aircraft in the simulator.

Flight Dynamics

This is the meat of the editor. When you click on “Flight Dynamics” in the left panel of the editor, you’ll see several tabs in the right panel of the editor: Configuration, Controls, Flaps, Weight and Balance, Jet Engine, Fuel, Gear, and Tuning.

 When you open an aircraft that comes with *FS2002* in the Aircraft Editor, it is in “Read-only” mode. You cannot edit it, and in fact the General Information and Flight Dynamics detail are grayed out. This keeps someone from accidentally ruining a perfectly good aircraft by changing settings that should be left alone!

Editing an Existing Aircraft

The first thing you need to do in order to edit one of the aircraft that shipped with the simulation is to make a copy of it. As mentioned above, you cannot change settings for an existing aircraft—they will all open in “Read-only” mode in your editor.


To create a copy of our 737 so you can edit it, highlight the aircraft in the editor, then select File > Save Copy As from the editor’s text menu. A dialog box will appear, and you can type in a name for your new aircraft, or accept the one the editor suggests.

Once you’ve completed this step, you’ll see the new aircraft appear in the left panel of the Aircraft Editor. You’ll notice that the General Information and Flight Dynamics are no longer grayed out; you can now freely edit this aircraft without damaging the original.

Changing General and ATC Information

When you highlight your new aircraft in the left panel of the Aircraft Editor, the right panel contains some general information about the aircraft. You'll see two sections, Aircraft Info and ATC (Air Traffic Control) Information. You can change the Aircraft Info if you like; it's only general information about the aircraft. The ATC information is important, since this is the data that the in-flight Air Traffic Control will use to identify you—in general, you can leave this alone.

The Description field is a good place to jot notes to yourself about what you've done (or plan to do) that differs from the original. Aside from that, you can rename the aircraft from this screen, and choose different ATC information if you choose. ATC information is how the control tower will refer to you.

 You can edit the drop-down lists in the ATC section, adding your own information, but if you choose an airline, manufacturer, or aircraft type that isn't included in *FS2002*, ATC will not be able to use it to identify you.

Editing the Panel

It might appear to be a simple thing, but editing the panel graphics and panel behavior of any aircraft can be quite complicated (particularly a 737 or other commercial aircraft). It's one thing to export the panel graphics and make slight cosmetic changes, and quite another to alter the panel layout and have it function properly in *FS2002*.

Take a look at the panel of your aircraft by clicking on Panel in the left pane of the editor, then selecting Main Panel. You'll see the graphic appear in the upper right panel, but there's more than just graphics going on here. Click on different areas of the panel display, and you'll see a blue outline around them. You'll also notice that there are individual dials and gauges in the lower-right panel display. Click on them, and you'll see that they have names, such as "spitfire_mki!Vertical_Speed". As you click around the upper-right display, you'll also see that there are a set of numbers displayed at the bottom of the editor screen that change depending on where you click.:

Left=
Top=
Width=
Height=

So what do we have here? The visual portion of the instrument panel is only part of what's embedded in each aircraft's panel.

Making Cosmetic Changes

It's a given that the entire instrument panel (and all sub-panels) must fit within the aircraft you've chosen to edit. It's a fairly simple thing to export the graphics shell—the gray border around all the dials and gauges—for the Main Panel and change them cosmetically. Go into your aircraft's directory from Window's File Manager—make sure you choose your aircraft, and not the original you copied!

☛ Always back up any files you plan to edit. Copy them into another directory **BEFORE** you make any changes to them.

Open the Panel directory, and you'll see several bitmap files (those with a ".bmp" extension). Open these in a graphics editor and you can easily make cosmetic changes—make the background orange or put a corporate logo on the panel. Be sure that you don't change the image size or resolution because this would alter the way it looks in *FS2002*. Save the altered files back to your aircraft's Panel directory with the same names they had, and they will work just fine.


Making Other Changes

If painting the panel orange isn't what you're after, then you're probably interested in re-arranging it, or editing the graphics of the actual dials and gauges.

You can drag and drop different dials and gauges into the current panel. In the upper-right panel of the editor, click on the object you want to delete from the panel. Once it's highlighted in blue, hit your Delete key and it will disappear. Now drag a gauge or dial from the bottom-right panel of the editor, and drop it in the black space where the old one was. If you need to resize it, click on it again and drag the sides or corners until it fits.

☛ Do not attempt to re-arrange an aircraft's panel or instrumentation unless you are fairly capable at both graphics manipulation and overall editing.

To get a look at what's behind your aircraft's panel, enter your aircraft's directory from Windows Explorer, and open the "panel" folder. Inside, you'll find a file named, "panel.cfg." Back up this file before you continue—make a copy and name it, "panel.old" or something else recognizable.

 Note that your aircraft's panel.cfg file is copyrighted by Microsoft Corporation. What this means is, if you edit it and then sell it to someone else, you could get sued. So, just remember, kids, this is all for fun and your own personal enjoyment.

Understanding how this file works is the key to truly editing your instrument panel. In general, this file tells *FS2002* which gauge functions belong where, and how they appear in the panel. The easiest way to understand this is to take a look at one of the gauges in the panel.cfg file.

Within the panel.cfg file, there are several sub-sections, each corresponding to a Window title. Window titles are the sub-panels that appear in the Aircraft Editor under the Panel section:

```
[Window Titles]
window00=Main Panel
window01=Radio Stack
window02=GPS
window03=Throttle Quadrant
window04=Overhead Panel
window05=Compass
```

Let's look at the first sub-section for Window00, the Main Panel:

```
[Window00]
file=Main_640.bmp
file_1024=Main_1024.bmp
size_mm=640
position=7
visible=1
ident=MAIN_PANEL

gauge00=737-400!Airspeed, 0, 64
gauge01=737-400!Flaps, 586, 64
```


The first area of this sub-section tells *FS2002* which .bmp file to display as the main panel shell. If you look in the Panel directory under your new aircraft, you'll find the files main_640.bmp and main_1024.bmp. It also gives the size and position of the file, and it tells *FS2002* how to display the Main Panel shell in the simulator.

The next section details each of the gauges that appear in the Main Panel shell, as well as their position. Take a look at this line:

```
gauge00=737-400!Airspeed, 0, 64
```

This tells *FS2002* that the first gauge in the list, gauge00, is the 737-400's Airspeed gauge, and that it is positioned at 0,64 (0 horizontally, 64 pixels vertically) in the Main Panel shell graphic. You've already seen the graphics for the gauges, but how does *FS2002* know how the Airspeed gauge for a 737 acts?

There is a "Gauges" sub-directory in your main *FS2002* directory. Within this directory, you can see that for each aircraft type, there is a file with a ".gau" extension. These files are the actual code that tells *FS2002* how each gauge behaves in the simulation. It is this file that the `panel.cfg` file is referencing to fill the Main Panel shell with the proper, working gauges.

 Do not edit the .gau files in the Gauges sub-directory. If you feel you must mess with them, back them up first!

You can change the gauge shown in any of the aircraft's panels by simply changing one of the lines in the `panel.cfg` file and placing its associated gauge in the panel view. Bear in mind that unless the gauge is exactly the same size as the one it's replacing, you'll have to resize it after dropping it in so that it fits.

You can also find hundreds of other gauge configurations online. Check the Resources section of this guide for more detail.

Working with Sounds

The sound section of the Aircraft Editor is fairly straightforward. Assuming you've still got our 737-400 open in the editor, click on the Sound icon. A list of all the sounds the aircraft uses will appear in the right pane of the editor.

You can double-click on any sound to play the associated .wav file. You shouldn't have a need to, but you can replace any of these files with another one by right-clicking on a sound, and choosing, "Change sound." As always, be sure to back up the old sound file so you can restore it if there's a problem. (Backing up isn't entirely necessary as you're just changing the association rather than deleting files—but you know how it is. Once you don't back something up, you'll wish you had!)

If we take a look at the `sound.cfg` file that exists in our aircraft's Sound directory, you'll notice something interesting. To keep the size of

the .wav files used to create sound in the simulation smaller, the files are linked together. For instance, under the heading [STARTERA], we have:

```
[STARTERA]
filename=ban1strt
viewpoint=1
link=starterA.1

[STARTERA.1]
filename=xban1strt
viewpoint=2
```

Note that the sound played when STARTERA is called (ban1strt) has a link value that points to the next section, STARTERA.1. This allows *FS2002* to use sounds without having them become too large, or taking too long to load. That's useful to keep in mind when using your own sounds—link them for better results, rather than creating one huge sound file.

Working with Textures

Textures are used for things such as decals, and other surfaces in *FS2002*. You can right-click on any texture, and select Edit to work on it in your system's graphics editor. However, avoid editing in this way. We'll cover a better way in more detail later. For now, just don't resize it or change its resolution..

The Flight Dynamics Editor

The most important, and therefore the most complex part of the Aircraft Editor, is the Flight Dynamics Editor. With your copy of the 737-400 aircraft open, select Flight Dynamics from the editor's left pane. Since this is a copy, and not the original, all the Flight Dynamics info can be edited.

💡 Be very careful when editing flight dynamics and keep notes of the changes you make. A good rule of thumb is, unless you know something should be changed, and what the change will do, leave it alone.

We're not going to cover every setting here as you will find basic descriptions of each tab and their settings in the FSHELP file that can be accessed from the Aircraft Editor's text menu.

The tabs available across the top of the editor will vary depending on the type of aircraft. As a general rule, all aircraft will have the following tabs:

- **Configuration:** This tab defines the geometry of the aircraft, so it has settings that deal with aerodynamics.
- **Controls:** This tab defines the controls (elevator, aileron, rudder, and spoiler) of the aircraft.
- **Flaps:** As you would expect, this is where you define the number and types of flaps on the aircraft.
- **Weight and Balance:** This tab defines the weight of the aircraft for various load outs.
- **Fuel:** This tab defines the number, position, and capacity of the aircraft's fuel tanks.
- **Gear:** This tab defines the gear and scrape point types of the aircraft.
- **Tuning:** Leave this tab alone unless you know what you are doing. It allows you to fine tune various settings.


There are other tabs that are specific to engine type (Jet, Piston, Turbo Prop), and propellers. They will not appear unless you change the aircraft type.

Creating and Importing Aircraft

We've gone over the Aircraft Editor in some detail, which will give you a good foundation to use for this section.

gmax provides an excellent tutorial for creating new aircraft models that will get you moving in the right direction, so we won't cover that here. We will touch on the process, but what we will focus on here is getting those models to work with FS2002.

It's worth pointing out that you should make sure that the aircraft type you plan to create is already supported by *FS2002*, or that you can find the data you'll need to flesh out the Flight Dynamics of the aircraft. If you wanted to, you could build a model that's a boring cube, import it into FS2002, and give it whatever flight characteristics you wanted. But then, where's the fun in that?

 Unless you can accurately fill in the flight dynamics of an imported aircraft model, it won't fly anything like its real-


world counterpart. This is why it's best to stick to aircraft for which you already have the necessary data.

Using gmax to Create an Aircraft Model

Without rehashing material that's already discussed in the gmax aircraft model tutorial, this section will go over the basic creation process so that you can see what is involved.

- 1. Find or create a picture of the aircraft you want to model.** The picture needs to be in .jpg format to work with gmax. For best results, find same-scale pictures that show top, side, and front views. A picture created from scratch will work, too, but it's much easier to use a picture as a guide than to try to "freehand" one in gmax. An Internet search for "aircraft diagrams" or "aircraft schematics" should produce what you need.
- 2. Convert the picture's scale to real-world measurements.** It won't do you any good to create a model if it's not to scale. gmax contains the tools to set the aircraft up so it's to scale. More importantly, it helps you set up the different views of the aircraft so they are all in sync.
- 3. Use the picture as the basis of your model.** Models are created from solid polygons that you move and stretch. Add and stretch them in gmax to fit the contours of your picture, then delete the picture.
- 4. Fine-tune the model.** Make sure the model is as accurate as you need it to be.
- 5. Animate the model.** If your model has elements that need to be animated (propellers, turbines, etc.), you can animate them in gmax.
- 6. Texture your model.** Create and apply graphics to your model.
- 7. Export your model in .mdl format.** Use gmax to export the model in .mdl format, and place it in the *FS2002* aircraft directory under a name of your choosing.

Now you have a model that can be imported into *FS2002*. Unfortunately, you're only halfway home. You now need to create the detail that *FS2002* needs to make your creation fly.

 If the “Export” option is not available in gmax, copy all the folders from the *FS2002* gmax directory (where you installed gmax *from*) into the root gmax directory (where you installed gmax *to*) on your hard drive.

Importing an Aircraft Model into *FS2002*

In order to accurately import your creation into *FS2002*, you need data, and lots of it. You can guess at it, but the more accurately you can input data into the *FS2002* Aircraft Editor, the more realistically your aircraft will perform. Hopefully, since you’ve seen the data the Aircraft Editor requires, you did some homework before you built your model to be sure that you could get your hands on accurate data.

You are much better off if your creation conforms closely to one of the aircraft already in *FS2002*. If you’ve just created a single engine plane that resembles a similar Cessna, then you can use that aircraft’s data to flesh it out, and then adjust it as you go. Performing a simple Internet search for “aircraft schematics” or “aircraft specifications” should get you the detail you need.

Components of Imported Aircraft

Take a look in your *FS2002* “Aircraft” directory. You’ll see that each aircraft in the simulator has its own folder. Within this folder, you’ll find directories for model, panel, sound, and texture (sometimes more than one of these). For your new model, you’ll need to provide the files to fill these in, but you can do most of that work from inside the Aircraft Editor.

Inside the model directory, there are two files—an .mdl file (the actual model for the aircraft) and a file named model.cfg. If you’ve created your model in gmax and exported it, you should have the .mdl file you need. The model.cfg file is mostly empty, and likely only contains a line like this:

```
[models]
normal=aircraftname
```


You don’t need to do anything with this information just yet; we’ll come back here once we get things rolling.

Importing the Model

There are templates in *FS2002* that you can use as the basis of any imported aircraft. To begin importing your creation, let's start by looking at these.

Choose an Aircraft Template

From the Aircraft Editor, select File>New. A pop-up window will appear with a list of the available templates. Choose the one that most closely resembles your aircraft, click "OK", and name it whatever you want. Take note of the directory where the "For Your Information..." dialog tells you it is placing your new aircraft.

 Selecting a template that is similar to your model is important; it will save you time and headaches later!

Panel and Sound Files

You may receive some error messages as the editor sets up your new aircraft. One of these may refer to missing Panel components, and another may refer to Sound files that you'll be unable to edit directly. If you've created your own panel and sound graphics, all you need to do is place them where they belong (in the panel and sound folders of your aircraft's directory) using Window's File Manager. If you plan on using the ones from the template, you'll have to copy them into your aircraft's directories before you can use them.

To do this, go to your aircraft's directory under FS2002/aircraft. Don't remember your aircraft's directory name? No problem—it's usually in a folder in your FS2002/aircraft directory with the same name as the template you created it from.

Inside this directory, you'll see an *aircraft.cfg* file. Open it up and you'll see two lines like this:

```
Panel_alias=aircrafttemplatename  
Sound_alias=aircrafttemplatename
```

Where "aircrafttemplatename" is the name of the aircraft the template is based on. To make the panel and sounds editable in the Aircraft Editor, simply find the directory for the aircraft the template is based on, then copy the contents of the source aircraft's panel and sound directories into your aircraft's corresponding directories. Re-open your aircraft in the editor and

you should no longer get the error messages, and you'll now be able to edit/manipulate the panel and sounds.

Fill out the General Information and Flight Dynamics

You've got a brand new aircraft here, so you must tell *FS2002* what it is, and what its specs are. We've already discussed filling in General Information and Flight Dynamics. If you created an aircraft that is very similar to your template, congratulations. If not, you'll need to find as much data as possible in order to fill in the Flight Dynamics.

One of the more difficult things to do is placing the engines in their proper positions. If you look at the Engine tab of the Aircraft Editor, you'll see a Properties section, as well as an Engine Position section. You should be able to find the Properties of your engines in an online search, but the positioning is something you'll have to experiment with. If you don't place them properly, your aircraft's performance will likely suffer. Use the defaults for now, and you can tweak them once you've flight tested your model.

☛ Remember, don't change Flight Dynamics settings if you're unsure what they do, or if you don't have the proper information to do so. See the Aircraft Editor Help file for more detail.

Flight Testing your Model

Once you've got everything where it needs to be, you're ready to fire up *FS2002* and see how your model looks in the simulation.

Save your work, then select, "Fly this Plane!" from the File menu of the Aircraft Editor. Once you're in the simulation, you'll be sitting in the cockpit of your new plane, ready for take off.

Check the panel, and all exterior views to see if your creation looks the way it should. If not, take notes of what needs to be changed. Once in flight, make sure it performs as you expected. If you've created an aircraft that you're familiar with, and want it to be exactly as it is in real life, then you'll probably need to spend a lot of time tweaking everything. Unless it's an issue with your model, for which you'd need to go back to gmax, you can make most changes in the Aircraft Editor.

Textures and Scenery

Working with textures in *FS2002 Pro* can seem confusing at first. However, there are some shortcuts to getting the job done. There are tools you can use that were included on your *FS2002 Pro* CD, and you can also get some help from gmax if necessary. There are so many good sources for this information online, I'm just going to hit the highlights here. Check the Resources section of this guide to find the best sites to get more detailed information.

Working with Textures

In *FS2002 Pro*, textures affect the way your aircraft appears. If you want a new paint job on your aircraft, or if you want to redesign the look of your panel shell, then you'll need to edit (or create) those textures.

You may have noticed that if you opened one of the texture files for any aircraft using an outside editor, they appeared fuzzy or blurred. Never fear—Microsoft has included a utility that will help you work with textures. But you'll have to find it first.

The utility is called Image Tool, and it's located in the following directory assuming a default installation:

```
C:\Program File\Microsoft Games\FS2002\gmax\Flightsim\gamepacks\FlightSim.
```


Once you've found it, create a shortcut for it on your Windows Desktop so you don't have to hunt it down again. Check the Resources section of this guide for some links to other optional tools that you can use.

Now, take a look at the texture directory of one of the aircraft that came with *FS2002 Pro*. In this directory, you'll find several files. In fact, you might even see several texture folders listed as "texture, texture.1, texture.2." This is how *FS2002* keeps track of different texture sets for the same aircraft.

Inside each of these folders, you will see .bmp files with `_L`, `_T`, and possibly even `_C` in their names. What does this mean? `_L` is the texture set for light effects on the textures (night); `_T` is the basic texture with reflections, and `_C` is the crash damage display set. You can create texture set for all these instances, or just use one. However, if you only create one set, your aircraft won't show up at night, and if you crash it, it will look pristine, rather than damaged.


Editing Existing Textures

Open one of the texture files with Image Tool and take a look. This jumble of images is what is being used to texture, or paint, your aircraft.

 It's important to keep the images within the texture file in their same positions, as this is the file that's used to texture your model. As you edit, take care not to overlap other images within the file.

Editing an existing texture is fairly straightforward. It's still a complex process, but since the steps are the same for any image, once you learn it, you'll become more comfortable with it each time you try.

1. **Format the image for editing.** Open the texture you want to edit (use one of the `_T` textures for now) in Image Tool. It will look odd because Image Tool shows you how the texture will look at various resolutions—don't worry about this. Select `Image>Format to 24-Bit`. Save the file in another directory with the same name as the original (use a "new textures" folder to hold images you edit). For best results, use the `.tga` format.

 Note that the original image was in DXT3 format. This is important, as this is the format the final, edited image must be in for it to work in *FS2002 Pro*.

2. **Open the new file in your graphics editor.** We used Paint Shop Pro to edit the file. Open the file, and you'll be in business.
3. **Use Layers.** Every good graphics editor lets you work in layers. Instead of editing the base image (the one you just opened), you should always add layers. That way you can easily undo a layer, instead of having to re-work the entire image.
4. **Edit the image.** Make the modifications you want to make to the image, remembering to create new layers for each major change (text, shading, etc.).
5. **Save the image.** Be sure to save it in a format that supports layers, such as Paint Shop Pro's `.psp` format, or you'll flatten the image and lose all your layers. Now save it as a bitmap (`.bmp`), and open it up in Image Tool.
6. **Re-format the image for *FS2002*.** Once you have the image open in Image Tool, select `Image`, then `Format to DXT3`. Now, save

the image to a texture directory within your aircraft's main directory (ie Texture, Texture.1, Texture.2).

7. **Edit aircraft.cfg.** In your edited aircraft's directory, be sure that you set it up so that the proper textures appear based upon your airline selection. This is done by changing the line: `texture=` to 1, 2, or whatever matches your new texture's directory. You can also change the `ui_variation=` line to match a new airline name if you've given it one.
8. **Repeat this process for each type of texture.** If you want your texture to appear properly in full light, darkness, and when you crash the plane, go the extra mile and create all three types of textures. Just be sure you place them in the proper directory—see any existing aircraft's texture directory to be sure you get it right.
8. **Fly the aircraft and check out your handiwork!**

That's it. You're basically set, although there are more details to each step in the process. Check the Resources section of this guide for more help. The important thing to remember is to save your work in stages, so you can easily undo something that turns out badly.

Creating New Textures

To create new textures, you need to be able to generate a texture file that will wrap the model you've created properly. The best way to do this is to create your textures within gmax and then export them with the .mdl file.

Just as we did when discussing model creation, I'm not going to go into the specifics of doing this in gmax because that program contains a help file (select Help from the main menu) that outlines the process in great detail. What I will do here is give you the general procedure.

1. **Open the gmax material editor.** This is where all the work on materials (as gmax calls textures) is done. Click "New" and name your new material.
2. **Enter settings for the material components.** gmax will walk you through the settings you need to use to make your material look right on the model (diffuse color, shininess, opacity, lights and shading, and more).
3. **Assign texture maps to the material.** Texture maps give your material a level of complexity above what you can do with basic tools. They provide images, patterns, color adjustments, and more.

4. **Apply the material to the object.** Once you have your material completed, apply it to your aircraft model. Repeat this for other sections of the model until you are finished, then save your work. Each new material becomes a separate image in the final file. That's not the exact terminology or process, but it's close enough for our purposes.
5. **Export the .mdl.** Your model will now contain the texture data you need for *FS2002*, and you can edit it as mentioned previously.

Working with Scenery

Before you jump into doing anything with scenery in *FS2002 Pro*, you need to know that there are literally hundreds, if not thousands, of good scenery packs available online. Perform an online search for “FS2002 Scenery” and browse around a bit. You'll be pleasantly surprised at what you'll find.

Now, that only applies if you're looking to edit or create scenery for a place others have likely seen. If you want to make sure your small hometown is accurately represented in *FS2002*, then you'll most likely need to do the work yourself.

In order to make your life easier, look for an *FS2002* scenery creation tool on the Internet. My personal favorite is Derek Leung's FS Scenery Creator (<http://www.geocities.com/deleung8/fssc>) because it will allow you to do just about everything you need, and it provides some great tutorials to get you there.

You can create just about anything you like and import it into *FS2002 Pro* as scenery. FS Scenery Creator lets you do everything—create runways, taxiways, buildings, radio beacons, and locate your scenery geographically. If there were not a tool as comprehensive as this, I'd walk you through the process. However, there's little point in going through it all here when you can download the file and work through the provided tutorials.

As with anything, you can get as detailed as you want. Find an overhead shot of the area you're re-creating, and work from that. If you're really a glutton for punishment, you could use gmax to create models for each and every building, but don't—there's no point.

Resources

We've come across literally hundreds of online resources that will help you in your quest to modify *FS2002*. Here are some of the best links, but as always, it pays to do a current search when you're looking for something specific.

Tools

gmax homepage (www.discreet.com/products/gmax/). You'll find general info about gmax here.

gmax support, including forums and tutorials (www.gmaxsupport.com). We can't stress the importance of checking the forums for answers to your questions, as well as using the provided tutorials.

FS Panel Studio (www.fspanelstudio.com). If you don't mind paying for it (\$24.99 USD), this is a slick program that will do the work for you. This nifty program will allow you to modify panels on the fly without working with the panel.cfg file.

DXTBmp (<http://fly.to/mwgfx/>). MWGFX software's freeware image editing utility.

FS Scenery Creator (www.geocities.com/dleung8/fssc). A great scenery creator.

General Information

Notes on FS Aircraft Files (www.maltbyd.fsnet.co.uk/html/notes_on_fs_aircraft_files.htm). A handy overview.

FlightSim.com (www.flightsim.com). You *must* go here if you're looking for anything related to *FS2002*.

FlightSim Network (www.flightsimnetwork.com). Another good overall site with plenty of links and info. The forums are very useful, as is the rest of the site. You'll find how-to's on just about every subject as well as tons of other resources. Searching the *FS2002* forum will get you links to most of the answers you're looking for

Tutorials

gmax Tutorials (<http://takeoff.to/landing>). Chris File's excellent gmax aircraft editing site.

Image editing (www.avsim.com/hangar/flight/tutorials/tutorials.html). Some good tutorials on image editing.

Re-painting, texture editing (www.supadetail.co.uk/lesson2.asp). Good tutorial on re-painting aircraft.