

Researching Your Repaint

last update 11th September 2001

This section suggests some simple ways to research your aircraft repaints, to make sure that you get the best possible accuracy.

If you've got any more things to add to this section, please **get in touch!**

Finding reference photographs

Aviation Photo Search Engine

Biggest aviation photo database on the 'Net!

Aircraft:

By manufacturer

- Boeing 737

Airline:

Only largest carriers

Delta Air Lines

Category:

Special selections

All Categories

Keywords:

Search by keywords

Display:

☒ With Pictures

15 / page

☐ No Pictures

60 / page

Sort by:

Show newest additions first

☐ Most popular photos first

If you've got to start somewhere, you might as well start at the largest aviation photo database available...

www.airliners.net has a huge photo archive of material available that's invaluable for getting your aircraft repaints exactly right.

In this screenshot, I'm using the main search engine to simply find Delta Airlines 737's. This is the repaint we're going to work through in the **basic tutorial** (as I've been requested to produce an updated version!).

By doing this particular repaint, we'll come across most of the basic techniques useful for any

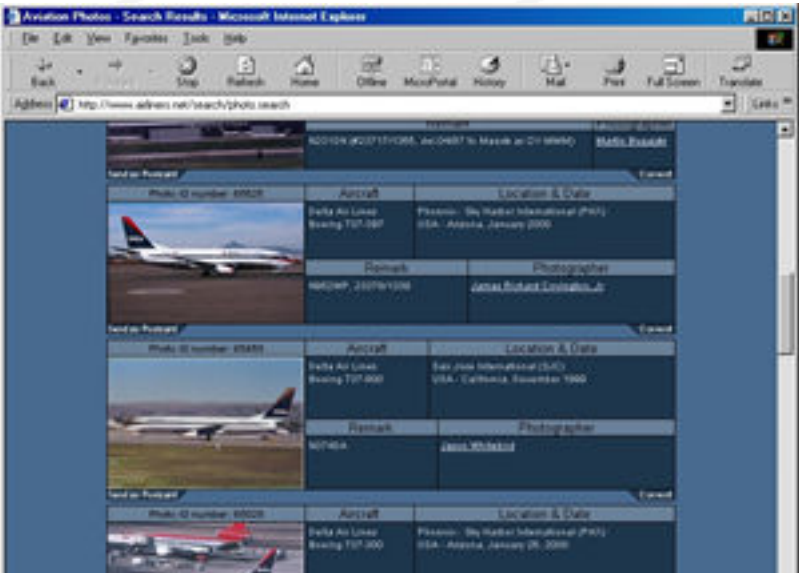
repaint, but we'll avoid sticky areas that may trip you up when it comes to joining textures across many sections. We'll meet that issue when we move on to paint the LearJet 45 (**in the advanced tutorial section**)

For now, we're simply interested in finding a good picture of our desired Delta Airlines jet from various angles, covering all the components we want to paint.

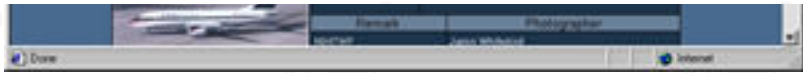
Here we've performed our search and we have a list of images that we can work from.

All the images in **airliners.net** are copyright material, so if you're planning on uploading your finished repaint with an example of the actual photographic material you worked from, you'll need to contact them first.

Images and sections of images I've included here are purely for reference and to show how you might use a photo - I've deliberately not reproduced any of the actual full photos here - you'll have to download them yourself from



airliners.net if you're interested in seeing them.



As well as getting photographs from airliners.net, you should always visit the homepage of the airline you're planning to paint - very often they'll have photographs of their jets, and they may well have their correct logos and other images you can work from. It's useful to visit these sites in order to get the correct colours, too - some photos of jets have very different appearances depending on light level and how they were scanned.

Using your reference material



Now we've found some photographs and we know the correct colour scheme, we've got a good point of reference to start our repaint. You'll need to make sure you have a good image of the airline's logo (as above), and a clear image of where it is. You can see on the first image here that we can place our logo onto our texture by positioning relative to the windows. It's also sometimes possible (if you've got a good enough image) to simply cut and paste the graphic from the photo to the texture. **Only** do this if your graphic really is very clear... otherwise you'll end up with a mess!



You also want to pay close attention to things like doors and hatches, and where the windows are placed relative to these... you need to get an idea of which parts of the aircraft are painted, and which are blank. Sometimes you'll want to use several photos to get a clearer idea of what's going on in this particular paint scheme, and to perhaps get some more interesting angles to see underneath the wings or around the back of the aircraft. There are many aspects of an aircraft's paint scheme that you'll need to address - is the aircraft symmetrical, are the engines painted the same both sides, is this repaint even possible in FS2000?



You can see straight away from this photograph of the aircraft's tail that we've got a problem when it comes to repainting the 737 included with FS2000... The default model mirrors the tail image from one side to the other, so that putting text the right way onto the tail results in mirrored text on the other side. There are a couple of ways to handle this - we can



either put up with it and only ever view the aircraft from one side or we can (oh no!) leave out the text from the tail... This reduces the accuracy, but does mean that our aircraft will look like a real jet, and not some painting accident... It's up to you!

When you've got a good idea of how to lay out your aircraft's paint scheme, you're ready to get down to it and actually do the job you set out to do...

Default Aircraft Tutorial

By Simon Jamie. Edited by Jim Oates

FS2000 Repainting Tutorial

last update 11th September 2001

***** Please note these pages are in a state of update along with the Paint Shop Pro tutorial. I appologise for any problems with links but I am moving all my tutorials from my own site onto AVSIM.com. Please be patient while I complete this task. Many thanks.

Welcome to this tutorial on how to paint FS2000 Aircraft. I will do my best to respond to readers requests and will eventually add an FAQ section if I feel there is enough demand. I cannot promise I will respond directly to emails but I will try and use the information/questions to improve this site for the benefit off all my readers. The greater part of this tutorial is here with the permission of Simon Jamie of Fingermouse Air for which I am most gratefull. I hope to build upon what Simon has already done and keep, you the readers, coming back.

If you need direct assistance please could you try the **Aircraft Design Forum** at **simflight.com**.

There is a new section in progress in which I paint a CRJ200-LR for **Celtic World Airways VA**. We will use layers, bitmaps, paint shop pro files and within a matter of minutes I promise you, you will surprise yourself at how easy this is by using the layers technique provided by most paint programs in use today. I will be switching the main tool of choice from Fireworks to Paint Shop Pro version 6.02. Only reason being is that will give you a chance to see it in use. Simon has used Fireworks for his sections on the default aircraft.

Basic tools

Learn about the basic things you'll need to start repainting an FS2000 aircraft.

Research

For a simple guide to researching your repaint properly - make sure you get things right!

Painting the Default 737 (Basic)

Find out how to prepare your blank texture for painting, set up the initial components and get some artwork onto the aircraft. The 737-400 is one of the easiest FS2000 aircraft to paint, so it makes a good starting point if you're not too experienced.

Painting the Default Learjet 45 (Advanced)

This is a more complicated bitmap and this section of the tutorial covers some of the more advanced

techniques you may need to use when repainting some aircraft.

Painting FS2000 Bitmaps. (Non default Aircraft)

A new section explaining how to paint bitmap textures other than those used on the default aircraft. This section is completely new and shows you how to use layers on texture.bmp files to save a lot of work. It develops on what Simon has already done. I have taken Barry Blaisdells Air Canada CRJ200-ER for FS2000 with night lighting as the work in progress for this section.

File formats and Testing

How to actually get your aircraft texture into FS2000 and how to test your texture.

How do I use my graphics application?

For links to online tutorials about how to use various paint packages. This is not meant to be a tutorial on how to use your paint packages hence the link.

Comments and Suggestions

If you have any comments about this tutorial or material to add, please **Mail Me**. A repainting forum **simflight.aircraft.design** has now been started on simflight.com to cover the subjects covered here.

Basic Painting (Part 3)

last update 11th September 2001

This section continues from part 2 into painting the engines of the aircraft and finishing off the model...

If you've got any more things to add to this section, please **get in touch!**

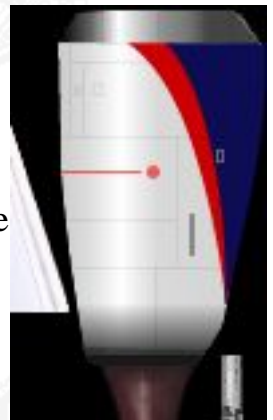
Finishing the job off...Painting the engines



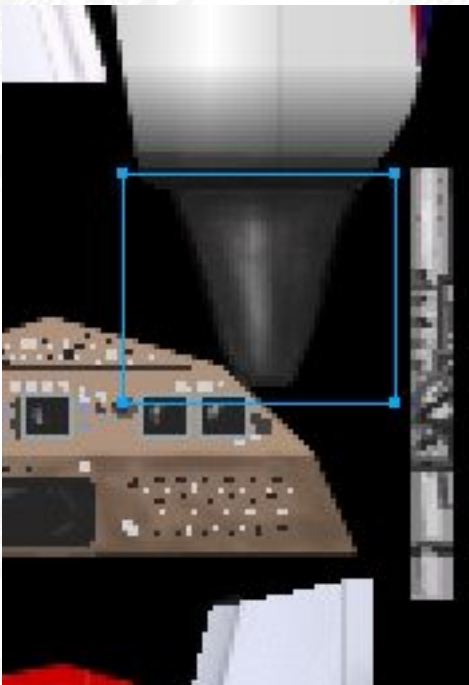
Seeing as we've already painted the nose section of the aircraft, we've done most of the hardest bit of the job...

Taking a quick look at our photographs, we can see that the engines of the Delta Airlines jet look very similar to the nose. In fact, we'll use the textures from the nose on the engines. With the default 737-400 model in FS2000, there's only one engine texture, so naturally it's going to be mirrored on one side of each engine. With the Delta this isn't going to be a problem, but when we have textures using text on engines, we've got to take the same kind of decision we took about the tailplane and the central body section.

Here you can see the finished engine texture - all I've done is to copy the nose textures, rotate them and do any resizing necessary to make them fit. I've also cut off the excess and tweaked the shape where necessary.



You should also notice the red line culminating in the red spot, which is a common feature of the 737's engines, so I actually have this little feature as another file to paste in whenever appropriate. However, it's pretty easy to draw in - if you can draw a line and a filled circle, you've just about got it! The burgundy red colour of the engine near the outlet isn't accurate for all aircraft, and indeed the Delta's we've seen in the photographs don't have this colour.



It's a simple case to fix this, and it's something you can do for any of the basic aircraft components. Here I've selected the red engine exhaust cone from the original background (using a marquee selection tool) and copied it to the clipboard. I've then pasted it to the paintjob layer, and applied a monochrome filter to it. (You can also pull the saturation down to zero in a Hue/Saturation menu). It now covers over the previous image and we can simply delete it if we decide we prefer the red in the end.

Of course, changing the hue or saturation makes no difference to the background black... it's black and contains no colour anyway!

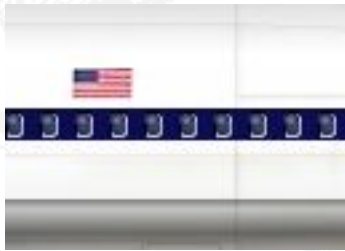
You can, of course, change the colour of other aircraft components, such as the inside of the cockpit in this way, but I'd always recommend copying the image onto another layer before editing the colour - don't edit your original bitmap texture directly, as you'll never know when it might come in useful for something...

I've actually slightly darkened the wings using this method on this texture - it's because the wings don't appear to be painted on the Delta jet, so they ought to be grey rather than white.

Anything else?

By this point, you should have a fairly complete Delta AirLines 737-400 texture. If everything goes smoothly, doing a paintjob like this from scratch shouldn't take more than about half an hour... That's **if** you've got your blank properly done and your layers sorted out in advance... otherwise you're looking at a lot of work!

Now it's time to check over your aircraft and see if there's anything obvious that needs changing. If so - change it! Now's the time when you should make your dirt layer visible if you haven't had it on for a while (you might have noticed i've worked without it being shown - it makes it easier to see what you're doing but is by no means necessary!).



We've also left out the American flag so now's the time to go get it and put it in the right place. I've been lucky here that I've got good enough aircraft photos to work from that I can copy and paste the flag from the photo onto my texture - it's about the right size so I'll just stick it in.

If you can't find a good flag to copy, it's not hard to draw one or pull one off the internet and resize it (there's no shortage on the net!). Don't worry about the flag being mirrored on the other side - even the real jet has the flag backwards on the starboard side...

Some other points to make...

Okay... just some bits and pieces. You can see if you look at the model produced here that I don't have any sharp edges. Each edge is anti-aliased by my graphics program (Fireworks). For lines and most shapes, I've had to select "soft" or "anti-aliased" if the option was available (usually it's the default.) If you've found that all your shapes have hard or jagged edges, try looking to see if it's possible to use softer edges on them.

If you can't use anti-aliased edges on your shapes, a good trick is to select that shape or area and use a blur filter on it... just enough to make some of the pixels smooth out. You need to be careful with this, but a Gaussian Blur filter with radius of 1 pixel is usually pretty good. If you've got a smudge tool, you might also want to use this (carefully!) on some of the edges. Anti-aliasing the edges by whatever means increases the apparent resolution of your paintjob without actually making it any more detailed.

You should also note that not every 737-400 series is identical... If you're going to represent a specific aircraft, you should check the window placements and where the panels fit - you may need to tweak things a little.



Basic Painting (Part 2)

last update 11th September 2001

This section continues from part 1 into painting the body of the aircraft and producing some smooth curves...

If you've got any more things to add to this section, please **get in touch!**

Still painting... Body paint

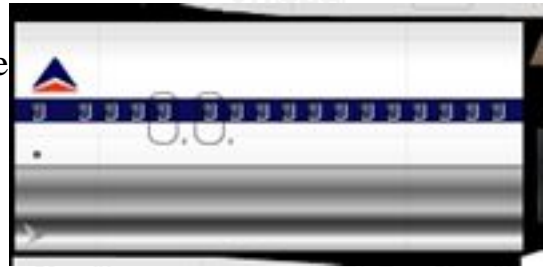


As it's the easiest section, we'll start with painting the stripe along the side of the centre of the aircraft body.

As you can see, this is simply a case of drawing a rectangular box around the windows and colouring it the same blue as the tail. I've moved the Delta logo down a little, because now I've got the blue line in place I can see the location of this symbol was slightly wrong. This is the advantage of working in layers and, in this case,

working with individual image components that can be individually moved. Staying on the central section, we'll add the unpainted metal underside.

Again, we've simply drawn a rectangle, but this time I've applied a gradient from top to bottom. (In Fireworks you have to cheat a little and turn the shape on its side before applying the gradient to get it to go top to bottom...)



We want it to look like metal, so here I've edited the gradient to add a series of black, white and grey stripes, effectively at random.

Grading from one shade to another like this gives an appearance of reflections and makes it look silver.



We've not quite finished the central section yet... the emergency doors are disappearing into the blue line unlike the real aircraft... It's a simple job to add a couple of white lines and solve this. We'll need to do the same for the other doors later. (The white lines will need to go on top of the windows and doors layer for them to appear!)

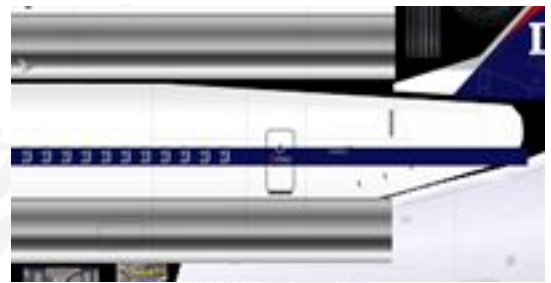
Now we can copy our blue line and metal rectangle onto the other three body panels... This should simply be a case of copy and paste, although depending on your graphics package you may need to

draw them again from scratch.

Of course, these new body paint sections won't fit onto the other sections - just copy them onto one of the front sections and the back section for now, and scale them so that they cover all the area they'll need, and some excess. The next job is to trim back this excess to that it all fits neatly into the correct shape.



Once you've copied your painted sections, you should end up with something like the screenshot on the right... This is a good starting point as you can see that it's a fairly simple job to either use deforming tools (if you're working with vector images here) or the eraser tools to cut the excess sections away. Of course, it doesn't matter if your painted sections cover any of the black background, but where they cross other part of the texture, they'll need to be removed.



area to delete.

After trimming, the rear section should look something like this... You'll notice that I've trimmed the blue line into a smooth curve as on the actual jet. If you're working with bitmaps, you'll need to use the erasing tools carefully here - you can either do it by hand (you'll need to be steady!) or create a curved selection to define the

You should also notice that I've curved the metal surface upwards at the back. You can use all manner of tools to do this, but simple deforming tools or smudging can achieve a similar effect. I've simply moved some control points on the vector rectangle I'm working on. This is another advantage of working with shapes that you can deform without affecting the objects around them.

I've also used the same trick as applied to the emergency doors to make this rear exit door stand out when over the blue line.



The front section is basically the same as the back, except that we're cutting and stretching in the opposite direction here - the blue line is extended downwards and the silver is cut off. Again, I've added the white lines to the door.



Now all we have to do is add the red flash to the nose (using the same red as on the tail)... You can do this any number of ways - if you don't have the ability to draw it directly, or draw a selection (or path) using spline lines, you can create a red rectangle on another layer and simply erase the parts you don't need... This can require a steady hand but is easier than trying to draw a smooth curve from scratch.

Once we have this aircraft section finished, we can copy the red, blue and silver parts onto the other front section so that both parts are absolutely level with one another. Using the same lines for each ensures that they (should) join correctly at the nose.

Just to finish off the middle section, I've decided to try to make this repaint even more accurate... You'll notice from the photos that the area around the wing and



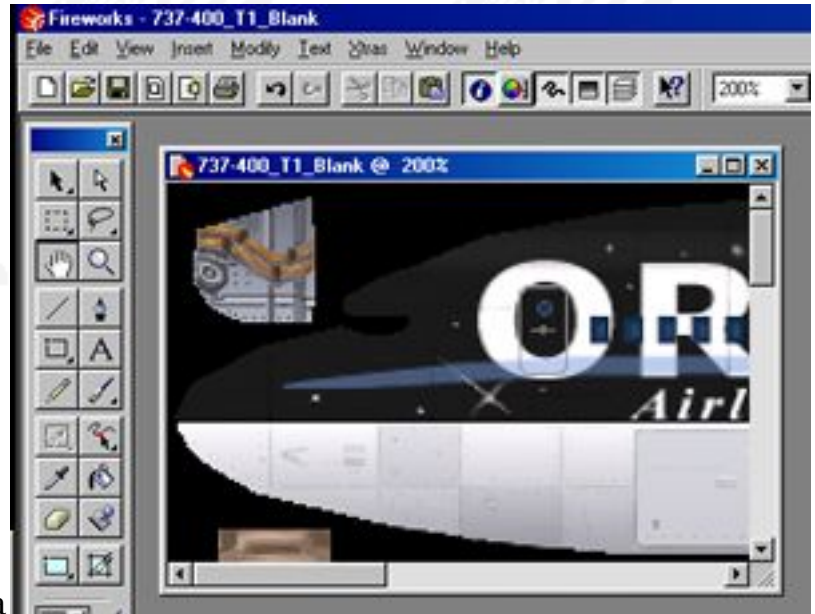


undercarriage is not silver at all, but grey. So I've decided to try and reproduce this by simply adding a patch of grey to the centre. It's just a rounded box and we'll see what it looks like later...

just a bit about mapping across sections...

By doing this particular aircraft, we've actually avoided having any textures having to join across sections... the only join we have is the fairly simple box around the windows, and the metal section. This is one good reason for keeping the original "Orbit" textures... if you make your paint layer (the layer you're painting on!) slightly transparent (reduce the opacity) or just turn off the "Blank Body" layer, you should be able to line up your texture with some of the features on the existing default paintjob.

This can take a bit of practice, but every texture needs a slightly different approach, so it may be a case of "try it and see"...



How do I use my graphics application?

Please note: All these links will open up your browser and connect to the Internet.

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There's no real point going into detail on this site about using individual graphics applications when there are many good guides scattered across the Internet. Here are a few links to some online guides and tutorial information for various packages...

Please feel free to **let me know** about any other good tutorials you know of, or if you have any tips or tricks worth adding to this site.

- [Kenny Freundlich's basic Fireworks page](#)

Tells you a little about the basic features of Fireworks and basically describes just what everything does - all on one page!

- [The official Fireworks 2 support site](#)

Macromedia's support site with hints, tips and answers to frequently asked questions

- [Macromedia Fireworks Forum](#)

Discuss using Fireworks with others!

- [Macromedia Fireworks 2 Manual \(.pdf format\)](#)

The manual for Fireworks 2 (in case you downloaded the application)

- ["Using Macromedia Fireworks 3" download page](#)

The source for getting Fireworks 3 documentation

- [Photoshop Paradise](#)

A site featuring hints and tips for photoshop users

Advanced Repainting Tutorial.....Preparing the Learjet 45 Texture

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This section shows you how to create and use a blank LearJet 45 texture. The LearJet is a more complicated (and confusing!) texture compared to the the 737-400 we looked at earlier, so we'll have to take a couple of extra steps.

As mentioned before, I use Macromedia Fireworks for my repaints (not as strange a choice as you might think...), so all screenshots are specific to that application. However, I've found that most packages have similar features to those that I'll use here, so you should be able to modify this guide for any program. If you've got any more things to add to this section, please **get in touch!**

What files do I use?

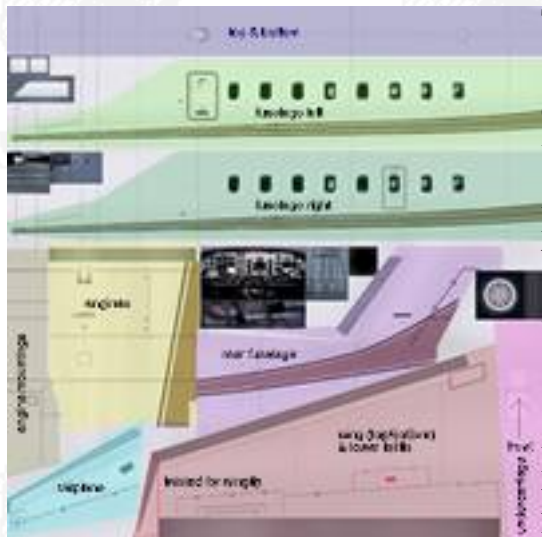
For this tutorial, we'll be working on the default LearJet texture. You'll find this in your Lear45 folder within the "aircraft" directory of your FS2000 installation. The file you need to edit is the LEAR45_T1.BMP file in this aircraft's "Texture" directory. **Back this file up now!**

If you're working with a program using layers, you'll probably be saving this file using a different file format while working on it - save it to a working directory with a new filename now... better safe than sorry! You'll save it as a bitmap (.bmp) file later.

See the **File Formats and Testing** section for information on saving and installing these files for use in FS2000. Check this section also if you're having problems viewing this bitmap in your graphics program (it's not a standard bitmap!).

Making sense of the texture

Before you go any further, it makes sense to build up a series of layers for your repaint. This is described fully in the 737-400 repaint section **right here**.



The first thing you'll notice about the LearJet texture is that it's not so straightforward compared to the 737-400. The sections are not clearly marked out... so we've first of all got to decide what goes where and get an idea of how the aircraft is mapped.

In the screenshot to the left you can see the initial LearJet texture, but I've added another layer. You can see that I've had a "rough guess" as to how the layers might map out (they're labelled in this shot but that's not important!), and I've created some coloured areas (on a separate layer) covering what I think are the main features.

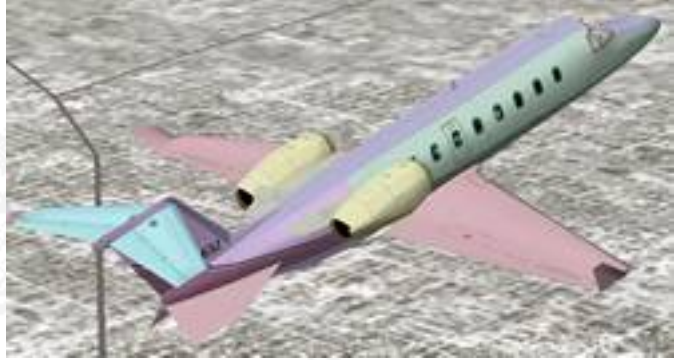
By using different colours like this, when the file is exported into FS2000, I should be able to see clearly what I'm working with.

Because I've made the colour areas slightly transparent, I can see through to the original texture as a guide, and this is what I'm going to work with.

Now I need to export this file into FS2000. If you're not familiar with how to do this, read the **file**

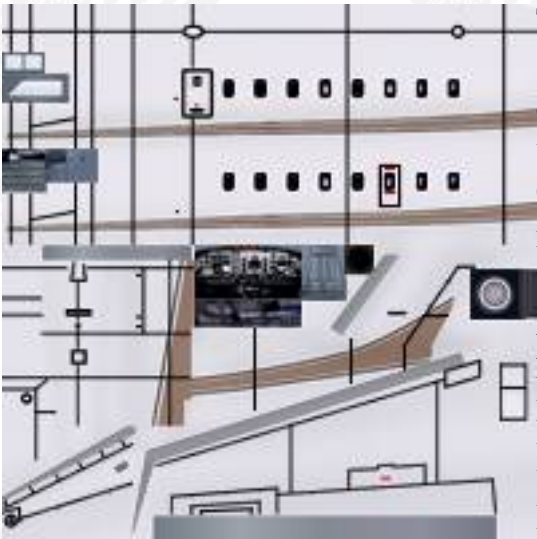
formats and testing section of this site first!

When I load up my aircraft in FS2000, I can straight away see what I'm working with... I've now got a very colourful aircraft, but it's fairly obvious what maps onto what. We can see, for example, that the top section is mirrored onto the bottom, the fins at the bottom of the tail obviously come from the wings (somewhere!) and we know which side of the fuselage is which.



We can also see any areas of the aircraft that haven't been covered by our initial guesswork, and can now use this as a basis for correcting our work so that we know how things go. We need to edit the layer containing our coloured shapes based on what we know from viewing the aircraft in FS2000, and then we'll put that aside for a moment.

Building your blank



The next stage is to create the lines on the fuselage and cut out the standard items. From the initial bitmap, select and copy all the components you're not going to repaint (such as the cockpit, seats, wheel etc...) onto another layer (I'll call this layer "Standard Components", and this will sit **on top** of all the other layers. I won't necessarily have it visible most of the time - except when exporting the file to FS2000).

Now you want to use various tools to draw over all the fuselage lines and other features. Make sure you draw these onto a different layer to the original bitmap. Do the same (very simply) with the windows and doors. In this screenshot, I'm starting with solid black lines and simple outlines for doors and windows so that I can see

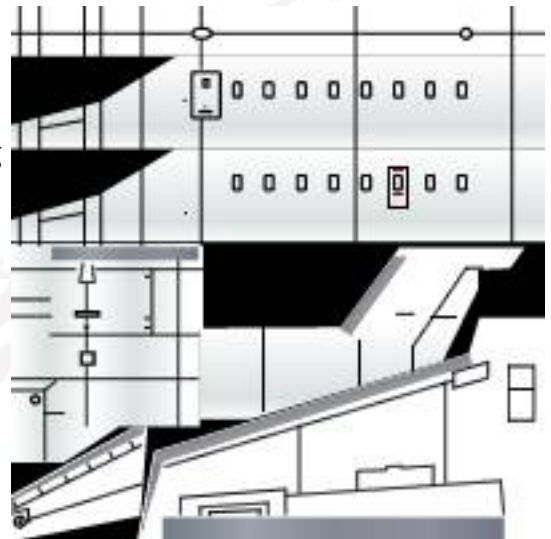
where things go and what I'm working with. I've also created a couple of filled in shapes for the grey areas on the original bitmap.

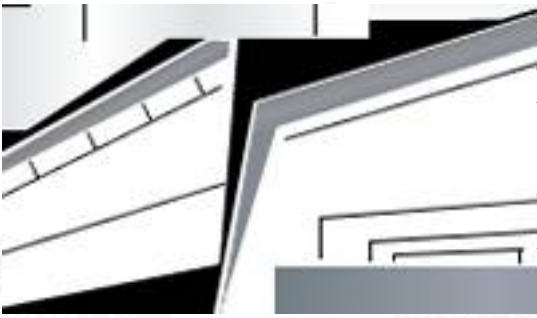
Based upon our layer containing coloured areas, we can now draw some large white shapes to cover each individual area of the aircraft texture. I've also created a black background in my example. This isn't necessary, but it helps me to see what I'm doing and makes the individual sections much clearer.

I've turned off the standard components (wheels, cockpit graphics etc.), so that you can see what I've done clearer. I've added a slight gradient (white to grey and back again) to the main fuselage sections.



This bitmap is now a good starting point for our repaint - none of the original bitmap is





needed now (except for the standard components!), and we've got a clear texture to work with. Of course, we're going to have to draw the windows and doors properly, and sort out those fuselage lines so that they look right. For now, though, we've got to make sure our texture is spot on.

You can see from this screenshot that I've already set up some slight gradients on the grey areas of the aircraft. I've done this largely because we're not actually going to be doing much repainting of these areas (mostly the leading edges to wings) and it pays to have them in place early so we can see what we're working with right away. The gradients along the fuselage may well need to be changed depending on the way that they map onto the aircraft, and whether we decide that they're actually useful in the end!

Exporting this new texture into FS2000, we end up with a plain white aircraft with very obvious fuselage line. This means that we can now see what joins up, what needs moving, and shows up any potential problems with our blank right away. By viewing the aircraft at this point we can correct any small glitches before we commit ourselves to some heavy repainting.



The first thing I've noticed here is that the fuselage lines near the nose don't join, and the lines need to go a couple of pixels forward to connect with the texture that runs along the top and bottom of the aircraft. I could, similarly, move this top texture's line to link up, but it looks better if I move the sides forward. This is actually a problem with the actual default LearJet texture - in the microsoft model they



don't join up correctly (obviously not checked too well - this is why we're working with heavy black lines!). Also we have the problem that the rear of the top and bottom textures don't line up... Can we correct this?



In this case, the answer would be no! If we take a look at the default FS2000 LearJet 45 texture by loading the default aircraft into FS2000, we can see that the actual aircraft suffers this problem and that this is a problem with the texture mapping rather than the texture itself.

In fact, the default texture is full of mapping problems and glitches. We'll have to make sure our texture fixes as many of these problems as possible if it's going to look good.



From the repaint I'm going to do (the Executive Jetways VA new livery), I can see that the texture mapping problems near the back of the aircraft (with sections being repeated from another area of the texture and mapped incorrectly (microsoft's fault!!), are going to cause problems.



This screenshot of the King Air 350 shows an aircraft I repainted earlier for ExecJet VA, and gives an idea of the texture we're going to aim towards with the LearJet. You can see straight away that the blue at the rear of the aircraft may be difficult to get right with the mapping that we've discovered on the LearJet. It's always a good idea to think around a few possible solutions right now at the preparation stage rather than just painting the texture and trying to fix all the problems later. There are a few ways round the problems discussed here, but we may have to be prepared to change our plans to fit in with what we can and can't do.

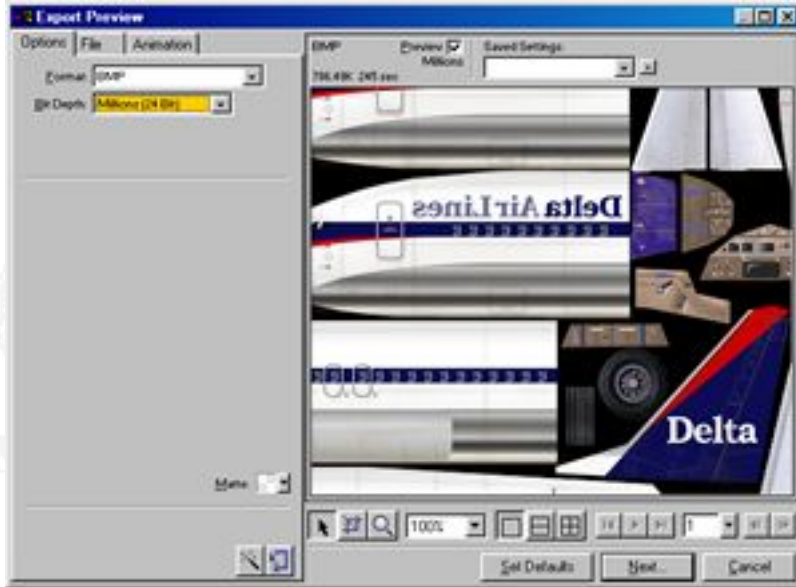
File Formats and Testing

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This section covers exporting or saving your file to a bitmap file, converting it to work in FS2000 and testing your repaint... The details are much the same for both the 737-400 and the LearJet 45, so this section covers both aircraft covered in the tutorial.

If you have any thing to add to this section, please [Mail Me](#)

Creating a Useable Texture File: The Initial Bitmap



Now we've completed at least our first attempt at the texture bitmap, we'll save it **as** a bitmap (.bmp) image.

Here I'm using the export menu of Fireworks to export my 737-400 image as a 24-bit bmp file. This will later get converted to a 16-bit file but you can also use 32-bit files (if you feel the need!).

If your program can save directly as a bitmap image, do that - whatever it takes to save a 512x512 pixel bitmap image in 256 colours or more. If you decide to use 256 colours, you'll lower the quality considerably, but you will find

that you can use this image directly in FS2000 without any conversion to an extended data format. In fact, you should be able to use *some* 16-bit or 32-bit files directly in FS2000, but you'll get better results if you create an extended format bitmap.

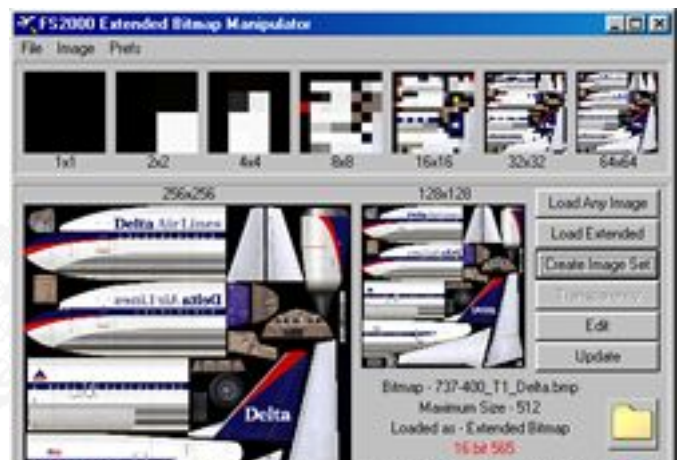
If you want to use your file (or try to use your file!) directly in FS2000, simply make sure that the bitmap is called **737-400_T1.BMP** (for the 737-400) or **Lear45_T1.BMP** (for the LearJet 45) and save it into that aircraft's texture directory. (Or create a new virtual aircraft as described below).

Converting Your Bitmap

This is where Martin Wright's excellent **bmp2000** utility comes in handy. This file is available on flightsim.com and is invaluable for creating image sets and extended format textures.

Using this converter, you can also edit the lower resolution versions of your file so that those with less powerful graphics cards will be able to appreciate your paint job properly!

Simply use the "load extended" button to load your newly



saved bitmap, and then use "save extended format bitmap" to save the file into your aircraft's texture folder.



If the aircraft has more than one texture (such as the case with the King Air 350, Extra 300s etc...) you'll need to make sure you convert all the files - and make sure you save them into the right locations!

Installing the file into FS2000

There are two ways you can install textures... This section works with installing the 737-400, although the technique is virtually identical for the LearJet 45 (except for the folder names and texture names, of course!):

1. Replacing the Default Texture:

- COPY the *.bmp file you've just created into your "...\fs2000\aircraft\B737_400\texture" folder (for the 737-400), overwriting any existing files (back them up first!).

2. Creating a new Virtual Aircraft

- CREATE a new directory called "texture.xxxx" (where xxxx is the name of your new repaint) within your Boeing 737 folder.
- COPY all the *.bmp files from the aircraft's default texture directory into your new texture folder.
- COPY the *.bmp file you've just created into your new texture folder, overwriting any files with the same name.
- ADD this entry to this aircraft's "aircraft.cfg" file:

```
[fltsim.1]
title=Boeing 737-400 (xxxx)
sim=Boeing737-400
model=
panel=
sound=
texture=xxxx
kb_checklists=Boeing737-400_check
kb_reference=Boeing737-400_ref
atc_type=Boeing
atc_id_enable=1
atc_id=N713SJ
atc_id_color=0x00000000
editable=0
```

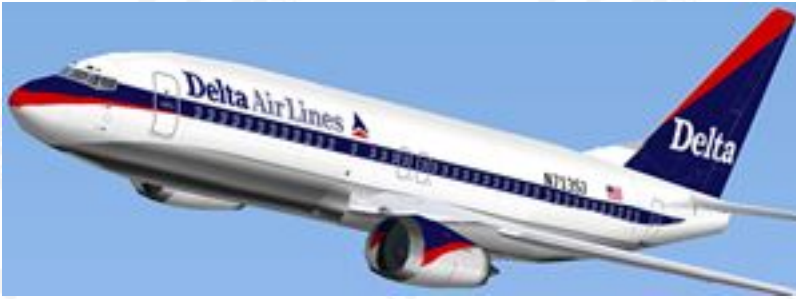
(You can modify this entry to use your own personal atc_id, panels or sounds. If you already have more than one [fltsim.*] entry in your aircraft.cfg file, make sure that this entry uses the next available number (eg. fltsim.2))

Installation

If you are creating a "virtual aircraft" as described above, you find that FS2000 does not display the correct textures if a previous version of the same aircraft (ie. another 737) has been viewed first (even in the aircraft preview window). - To correct this, the aircraft textures may need to first be 'flushed out' of the system memory so that they are reloaded. This can be achieved by viewing all internal views, loading other aircraft or simply flying around.

Testing and Repainting

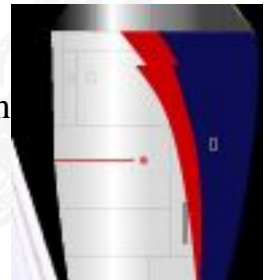
Now comes the hard part - you'll have to view your aircraft texture actually on the aircraft - and you can bet there will be something not quite right... Due to the way that FS2000 maps textures around the default aircraft, there are always some glitches waiting to catch you.



At least usually it's just one pixel here and there needs pulling up or down at the joins between sections. When it's more, you'll have to use trial and error - keep going back to the texture and redoing the bit that's affected until you get it right... a boring job!

Well... what needed redoing to the 737-400 repaint we covered in the basic tutorial section? In testing, the first and most obvious thing was that the lower silver section didn't line up properly. This often occurs because FS2000 doesn't map the textures evenly over their height, so what lines up in one area won't necessarily connect elsewhere. This is easy to correct.

The biggest problem encountered upon testing this repaint was with the engines. The way that FS2000 folds the texture at the front meant that it was necessary to offset the texture of the red line on the texture by a few pixels at a specific point... This results in a strange looking texture on the flat bitmap, but it's fine on the aircraft (except in one place which can't be fixed without throwing out all the rest!).



Another problem involved just having to move the text and the lines on the tail to be slightly closer together. This helped give the impression that the word "Delta" was right in the middle of the tailplane rather than to one side of it.

Of course, "Delta" appears reversed on the other side of the aircraft (no way round that without leaving the text off altogether!).

The resulting aircraft is fairly successful - we've lost some of the accuracy through making a few compromises, but retained a good looking repaint. Of course, as we've got all these textures to hand, it's easy to apply them to a blank 777 (which shouldn't suffer from the same faults!) or another model when one comes along... Just copy and paste!

This section may well be expanded in the future, but that's it for now! Let me know what you think and

get in touch if you've got any suggestions or comments.



Basic Painting (Part 1)

last update 11th September 2001

This section takes you through the job of painting a basic texture (the 737-400 in this case) and suggests some quick ways to get good results...

If this all seems a bit simple to you (or if you've covered it before!), head over to the **advanced tutorial section** where we'll look at repainting the LearJet 45. If you've got any more things to add to this section, please **get in touch!**

Taking the first steps...The tail



Largely through habit, but also because it's one of the most noticeable things about any aircraft (and key to the appearance of your repaint), I tend to start by painting the tail. Here I've taken the basic red and blue scheme of Delta Airlines and applied it to the tail. Basically, I've just created two (slightly distorted) triangles and put them together. Because I'm working (in Fireworks) with vectors, I can easily move these shapes around later.



Notice that the lines on the tail are still visible - I'm painting on the layer below this detail so it's showing above my work. Actually, I've done something to these lines on the tail - I've changed their colour to light grey and increased the opacity a little. This is because black lines on a particularly dark colour aren't easily visible and don't represent how the panels catch the light. On the border between the rudder and the main tailplane, I've used both a black and a white line (the white line offset to the right by one pixel) and reduced their opacities. This gives a three dimensional look to the join, giving the impression of a shadow and a highlight.

You'll notice that the colour I've used here is a little more blue than in the photograph... I'm allowing here for the light quality when the photo was taken and using the colour taken directly from Delta Airline's website (www.deltaairlines.com).



I've decided to put the "Delta" on the tail (despite the fact that it will be mirrored on the other side when mapped onto the 737 model). Luckily, the "Delta Airlines" logo on their website features the text for this in about the right resolution... simply copy it and paste it into your image... However, it's blue on a white background, so I've inverted it and used some filters to change the colours. In many cases, you'll be able to use the actual logo straight on the tail, and here I could actually just adjust the colours a little more and get it about right, but I've decided to create a new bit of text for this tutorial.

First, I've found the closest font to the actual logo (in this case, Bookman Old Style looks fairly close). Then I've adjusted the letters for the right spacing (in the screenshot above you can see I've just moved the "e" across to the left). You'll see that the text isn't *quite* right - so I'll have to edit each letter just a little to make some parts thinner... It's worth the work as in the end I can delete the logo I copied from the website and use my own. If you start out by creating your text big enough, you can then scale it and not worry about losing quality. In the above case, if I'd tried to increase the size of the text from the website, I'd lose a lot of detail.

In the screenshot to the right, you can see the text, after editing, in the right place on the tail. This text has no background, so it blends perfectly with the tail colour. If you're working with bitmaps (as opposed to vector graphics as I'm using here) it's best if you use the eraser tools to rub out the background on your text... even a small colour change between your logo's background and the background you place it against will show up as a box around your text when you use the texture in FS2000.



The body text



As mentioned above, Delta Airlines have a nice logo in about the right resolution on their website... using that I can simply copy and paste it into my new texture. In some cases, this isn't possible and you'll have to take the steps mentioned above to recreate the text. In this case, I've got quite a good graphic as a result of copying and pasting, so I think I'll go with the graphic. Of course, I'll need to remove the tiny "trademark" symbol from the logo and change the spacing a little (based on the photographs).

And as you can see in the photograph, we've now got a little problem... we've scaled the text to the right size and it doesn't fit on the texture section. We could map it across to the next body section, but it'll be reversed on the starboard side... So we've got choices to make - already the tail is going to be mirrored on the starboard side... are we happy with the text on the body looking strange too? Now somewhere, we're going to have to be inaccurate...

There would appear to be three solutions here: First, we could shrink the logo and text to fit it onto the front section. Second, we could simply chop off the last few letters and paste them onto the next section along (causing the starboard side to be reversed). Third, we could move the logo's symbol to the right of the text. As this is symmetrical, it won't matter if it's reversed. And it's on that side of the text on the starboard side anyway.

I'm going to opt for the third of those choices, as reducing the size of the text really doesn't look quite right. Although our aircraft won't now be 100% accurate, it'll look right, and it was never going to be perfect with that tailplane reversing anyway!

Sometimes when you're painting your aircraft, you may end up having to make this kind of compromise... this is the kind of time



when you could really do with some new FS2000 models... The screenshot to the right shows the text in its correct location, with the second fuselage section down having the text mirrored. I've used the original bitmap logos from the website, but used the eraser to take the background out.



Preparing the 737-400 Texture

last update 11th September 2001

This section shows you how to create and use a blank texture, and provides you with an opportunity to download the components of a blank 737-400.

As mentioned in the previous section, I use Macromedia Fireworks for my repaints (not as strange a choice as you might think...), so all screenshots are specific to that application. However, I've found that most packages have similar features to those that I'll use here, so you should be able to modify this guide for any program. If you've got any more things to add to this section, please [get in touch!](#)

What files do I use?

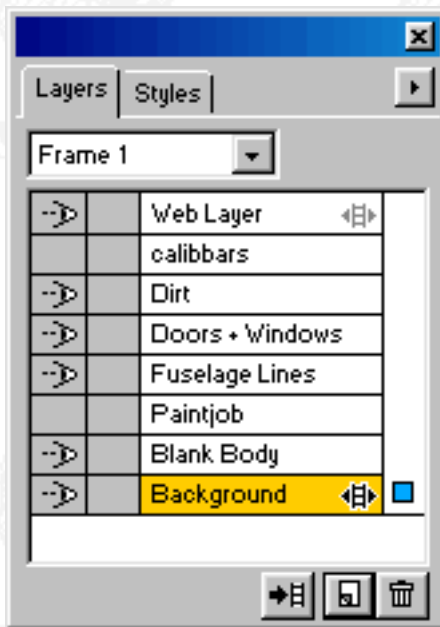
For this tutorial, we'll be working on the default 737-400 texture. You'll find this in your B737-400 folder within the "aircraft" directory of your FS2000 installation. The file you need to edit is the 737-400_T1.BMP file in this aircraft's "Texture" directory. **Back this file up now!**

If you're working with a program using layers, you'll probably be saving this file using a different file format while working on it - save it to a working directory with a new filename now... better safe than sorry! You'll save it as a bitmap (.bmp) file later.

In the case of the other default FS2000 aircraft, you'll always need the "*_T1" texture, although for many aircraft the textures are divided into T1, T2, T3 and T4. You'll need to work on all of these for a complete repaint.

See the **File Formats and Testing** section for information on saving and installing these files for use in FS2000. Check this section also if you're having problems viewing this bitmap in your graphics program (it's not a standard bitmap!).

Setting up your layers



I'm assuming here that you've got a graphics program that can handle layers... if you haven't, there are some workarounds (described at the end of this section) but you'd be better off finding an application that uses them. (See the **tools** section).

The screenshot on the left here shows the layers that I have set up as the starting point for my repaints. Ignore "Web Layer" - a program specific feature...

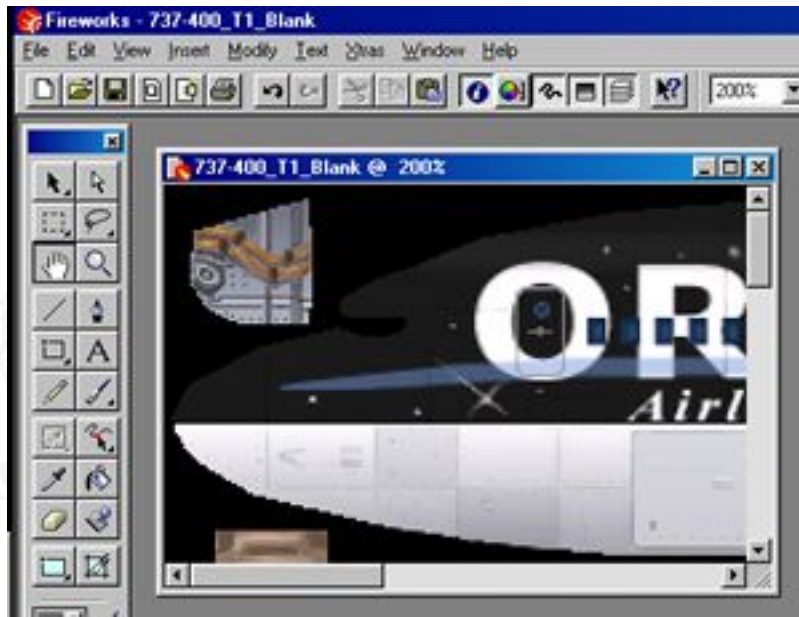
You'll notice that I have the "Blank Body" as the lowest layer, with the "Paintjob" (the actual repaint specific to each airline) on top of this. The "Fuselage Lines" represent the aircraft body panels, and sit on top of the paintwork to give the impression of an aircraft built out of sections (as they are!). The "Doors + Windows" go over this (you don't want fuselage lines through your windows!), and "Dirt" covers everything... I tend to have the "Dirt" layer set to about 40% opacity to just give a hint of grime

rather than covering the aircraft in muck!

You'll notice I also have a "calibbars" layer - this is the layer that I draw lines all over as reference points when aligning textures that cross between sections... the contents of this layer never get exported to the final texture (at least, not deliberately!).

Building your blank

Although you can paint straight on top of the default texture, you'll find it a lot easier (and much more sensible in the long run) to first create a good blank template. Here's how we do it:



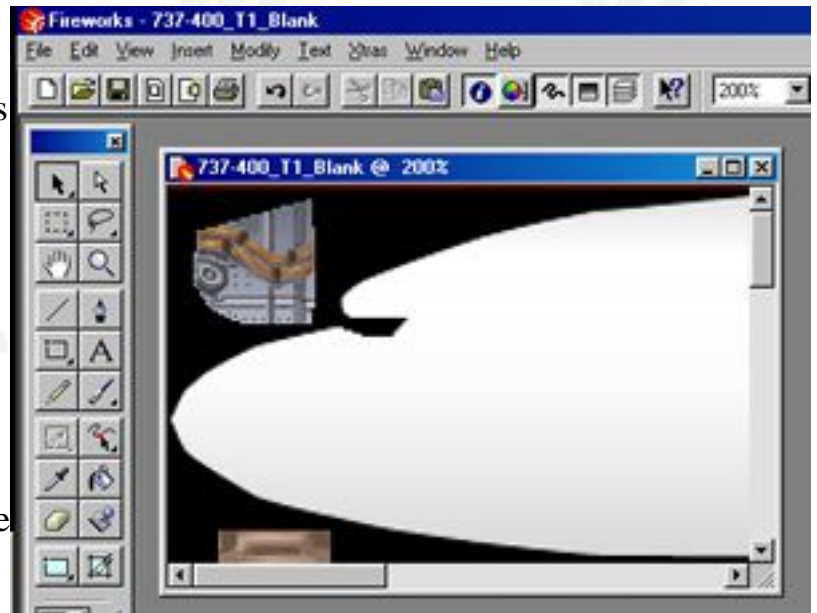
This screenshot shows the nose of the original 737-400_T1.bmp file - you're going to want to set this as your image background. Ideally, you should try to keep this image intact, as you'll need the extra components (such as the undercarriage housing textures seen on this screenshot) and you can use the original textures to give you a better idea of how textures line up between sections.

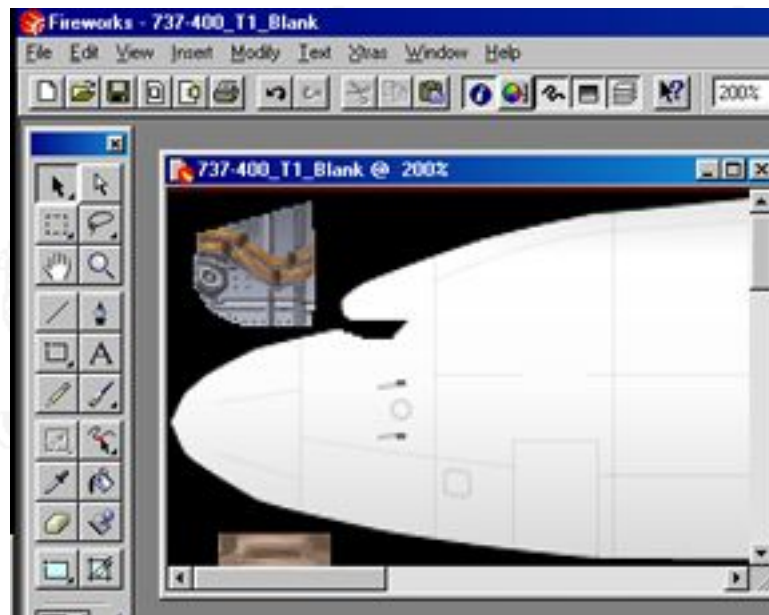
Looking at the default texture here, you'll see (if you've ever been near a real 737-400) that the fuselage lines, hatches and panels are purely a work of fantasy! We'll want to ignore these and work exclusively from the real thing... You can

also ignore the default doors and windows - again, Microsoft seems to be living in fantasy land when it comes to what these look like and where they go...

This next shot shows the "Blank Body" layer over the top. It's fairly simple - I've just painted white over the existing texture... or have I? In this example, you may (just!) be able to tell that there's a very slight gradient of white and grey running down the aircraft, to give a more three dimensional look.

In my graphics application, this is made easier as I've actually created a vector shape for the aircraft body and can edit the fill colour and gradient of this shape at any time. If you don't have this ability, you can simply use a plain white static shape, or paint the thing by hand. I would advise using a slight colour gradient, though (if possible) - it makes the difference between a good repaint (with flat colours) and a great repaint (with more photo-realistic appearance).





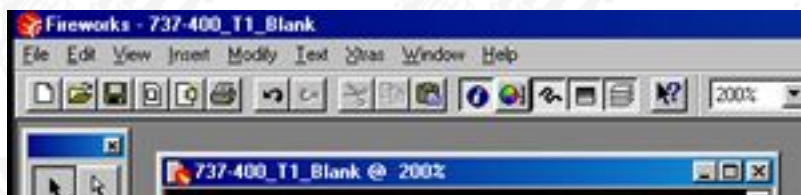
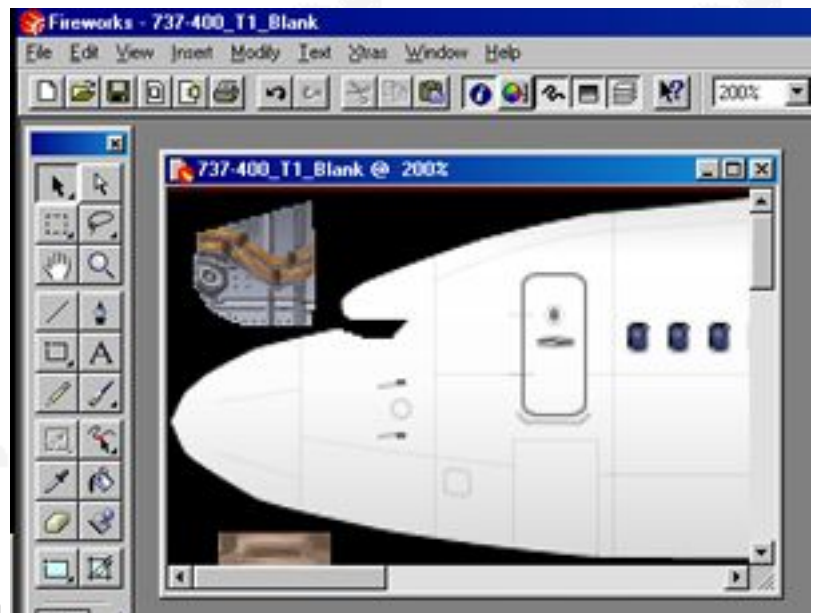
Okay... now we've added our fuselage lines (on another layer). This layer also includes other small components on the aircraft and the whole thing is based on actual photographs (rather than an idea that a 737 is a complicated bundle of random panels!).

In my version of this, each of these lines is a vector and totally editable, but it doesn't matter if it's static in your version - I never edit these lines once produced anyway.

An important thing to note about this layer is that all these lines are actually solid black. I've simply lowered the opacity (opposite of transparency) down to around 10%. This means that if I put textures underneath, they won't be entirely obscured, just "scored" with a slightly darker line. Of course, on top of white, these lines appear grey.

Now we're getting somewhere! I've added the doors and windows to the next layer up. These graphics were created from scratch (simply drawn, but you can take components scanned from a photo of a 737 if it makes life easier), and the windows were copied and pasted multiple times to make sure they are all the same. You might want to make some variations (such as windows with the shutter pulled) to add interest.

You might also consider putting the doors on a separate layer - in this case, the doors use black outlines and are set to around 15% opacity. The windows are solid (100% opacity)- if you can't use multiple different opacities in each layer with your program, just put the doors on one layer and the windows on another.



Finally we've put our "Dirt" layer onto the model. I've simply used an airbrush tool to spray on some brown and black grime at various points. I've used a low opacity for this layer so that the



grime doesn't obscure the entire texture...

Things to remember when adding dirt (if you want to use it at all!) are simple points such as:

- The bottom of the aircraft will get much dirtier (in general) than the top... Dusty runways and general dirt flung up during landing are the chief culprits.

- Dirt will tend to accumulate **behind** aircraft

panel joins - turbulence at these joins tends to deposit dirt right behind them, tapering to be fairly clean further away. The front of most joins tend to be blasted clean by the motion of the aircraft through the air.

- Oil and grease used in lubricating many parts of the aircraft occasionally leak, leaving trails running towards the back of the aircraft. Only add oily streaks where lubrication would be needed, or near engines. (The aircraft control surface and whole tail area can tend to get very dirty because of this).

Workarounds

If you don't have a graphics application that will handle layers, you'll still be able to produce repaints, but changing and editing them will become that much harder.

The best workaround is to never paint directly onto the aircraft body... how? Well, you can select the area of the texture that needs to be a new colour (the underside may need to be blue, for example) and then change the brightness/contrast and hue (colour) of that section using your program's image tools. You'll find that working this way for the basics of your aircraft body keeps all the existing features and just shifts their colour and properties slightly to fit in with that part of the aircraft.

Another option is simply to cut out items like windows and doors, and paste them to a new image or to a blank part of the texture map. When you've completed your painting, you can cut and paste them back into place over the new paintwork. You'll probably need to redraw all your fuselage lines, though... (a lot of work!).

However you're working, if you don't have layers I'd recommend saving your texture very often, and to a different file each time, so that you have previous versions to return to if something goes wrong.

Finally...

Make sure you save your blank aircraft as a separate image, so that you've got it as a template to work from.

If you don't the time (or inclination!) to do all this work, you can download my blank aircraft bodies from www.flightsim.com (b734blnk.zip and b777blnk.zip) as a single image, or get the 737 components right here. To use these graphic components, your graphics application will need to handle **.png** files with **alpha transparency**. This file format is fairly universal (and is becoming more popular) as it can use graded transparency and file sizes are not too large.

Click on each of these files to download them (individual zip files). When you've got them all unzipped, you'll want to create a new image and import first the default 737 bitmap, and then these files into layers as mentioned above...

- **Blank body texture** (plain white graded body and default wings) *** FILES ADDED ***
- **Fuselage lines** (solid black lines - need to be set to lower opacity) *** FILES ADDED ***
- **Windows and doors** (doors need to be set with lower opacity) *** FILES ADDED ***
- **Dirt** (needs to be very faint!) *** FILES ADDED ***

Advanced Repainting Tutorial

last update 11th September 2001

Welcome to the advanced section of the tutorial, covering repainting the LearJet 45 default texture. If you've got any comments about the contents of this section, please **get in touch!**

In this section, we'll take a look at how to set up a more complicated aircraft texture for painting, how to put the textures together effectively and, of course, how to put it all together. We'll also look into file formats and testing your new textures. Choose a heading below to start...

Preparing your LearJet 45 texture

Click here to learn about the setting up your blank aircraft texture in preparation for painting - some tips on how to make your repaint as flexible as possible.

Painting the LearJet 45 texture

Click here to start finding out how to paint your LearJet 45 texture, and how this is different to working on the (much easier!) 737-400. This section contains advice on how to get the paintwork looking right on your bitmap.

File formats and testing

Click here to find out how to actually get your aircraft texture into FS2000 and how to effectively test your texture...

Comments and suggestions

If you've got any comments about this tutorial or material to add, please **get in touch** with me. I may start up a (small) repainting forum on this site if interest is high enough... let me know what you think!

Basic Repainting Tutorial: 737

last update 11th September 2001

Welcome to the basic section of the tutorial, covering repainting the 737-400 default texture. If you have any comments about the contents of this section, please [Mail Me](#)

In this section, we'll take a look at how to set up your aircraft for painting, how to put the textures together effectively and, of course, how to put it all together. We'll also look into file formats and testing your new textures. Choose a heading below to start.

Preparing your 737-400 Texture

Setting up your blank aircraft texture in preparation for painting - some tips on how to make your repaint as flexible as possible.

Painting the 737 Texture

How to paint your 737 texture. This section contains three pages of advice on how to get the paintwork looking right on your bitmap.

LearJet 45 tutorial (Advanced)

Information on repainting the Learjet 45. This is a more complicated bitmap and this section of the tutorial covers some of the more advanced techniques you may need to use when repainting some aircraft.

File Formats and Testing

Find out how to get your aircraft texture into FS2000 and how to test your texture...

Comments and suggestions

If you have any comments about this tutorial or material to add, please [Mail Me](#). I may start up a (small) repainting forum on this site if interest is high enough... let me know what you think!



Advanced Painting

last update 11th September 2001

Okay - this is probably very annoying for everybody but I really haven't had time to get this section completed.

The Learjet in this case did provide me with a number of problems, though. At some point I should be able to get a full series of images to show this, but for now I'll just describe the various stages that I went through in this case.



Most of the issues regarding textures not wanting to align on the default model have been described in the previous page, and at the final painting stage this didn't really cause a problem as my early work had shown me what needed to go where.

One thing that is certainly awkward about the Learjet model (but common to a few of the default aircraft) is that sections of the side texture are used for the undercarriage bays and the nose. This makes it very difficult to paint the aircraft in anything other than a close approximation of the original paintjob. If you get hold of the ExecJet Learjet 45 from www.flightsim.com, you'll discover that I've had to build a couple of panels into the side of the aircraft... This is basically where the side lines go straight through an area used for the undercarriage. There were a number of ways around this, but I decided to add some simple blank hatches (with triangular red warning markers to make them look deliberate!) which almost exactly covered the area over the undercarriage. This meant that, although the side lines were broken up it really did look like it was meant to be like that from the start.

I also tried to map the rear section effectively around in blue from the tail swept down to under the wings. The problem with this was that some of the textures used here are repeated on the top of the aircraft (providing me with a series of unrepeatable words to be said against Microsoft's modellers!). The solution was to rethink the overall plan and redraw the rear of the aircraft so that the only textured area was within the space that I could guarantee wouldn't be mapped elsewhere.



The engines provided few problems but the overall paint job needed tweaking over and over again until I was happy. In the end, although the paintjob looks entirely different to how it was originally planned, I was satisfied that it met the standards I had

hoped for (or something along those lines...)

Okay - I guess all that wasn't incredibly helpful, but when I someday get time to finish this tutorial off, it'll be straight up here in this space!!! Right now, Fingermouse Internet is taking up all my time and I haven't flown for a very long time...