

4.37U4 How to ADD A New PBR Skin by @Tomcattwo 9/7/2024

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Initially, it was felt that new skins developed using Physically Based Rendering (PBR) for aircraft models in BMS 4.37U4 and above could only be used by replacing an existing skinset. Pity we couldn't just ADD new skin art to the models...

But thanks to some tips provided by @MaxWaldorf and @Warmoor, and additional info by @Gizemkar, I was able to find a way to ADD a new skin instead of replacing an existing skin. This method has been tested in BMS 4.37U4.1 and works correctly in the Loadout in 2D and in 3D. Basically, it entails editing the Materials.mtl file, all of the Model_#.mti files in the folder and also the Parent.dat file in the main Model folder and doing the same in the parent "Wings" Model folder, then adding the new albedos and ARMW files with correct numbering. This procedure should work in any Theater using 4.37U4 or above and PBR rendered aircraft models.

Here is a table containing the model #s for the F-16 CM40/42/50/52 models and their parent wing model folders (Index and CT Index are useful for BMS Editor):

Aircraft	Index #	CT Index	Model #	Wing Model #
F-16 CM40	59	173	1982	1765
F-16 CM42	384	2454	1980	1770
F-16 CM50	397	2467	1052	1196
F-16 CM52	394	2464	1909	1771

For our example, I will use the new 4th TFS skin I made for the F-16 CM40. The model # is 1982, and the parent Wing Model # is 1765. Below is the workflow and code changes to do this.

1. **MOST IMPORTANT!! Make sure you save your original files in a safe place!!!** If you mess this up, BMS will crash, and you will want to get it back working again by reinstalling the baseline files. Navigate to your ...**TerrData\Objects\Models\1982** folder. **Copy** all the files in that folder (yes all of them) **and save them** in a safe place.

2. Take a close look at the files. The F-16 CM40 has 6 different skinsets that BMS Pilots can choose from (other aircraft models may have more or fewer). Inside model folder # 1982, you will see 12 albedo files in .dds format, and 12 ARMW files also in .dds format. We are going to add our new skins as “F-16CM40_Albedo13.dds” (fuselage/wings) and “F-16CM40_Albedo14.dds” (Tails), with corresponding ARMW files “F-16CM40_ARMW13.dds” and “F-16CM40_ARMW14.dds”.
3. Using your favorite Text Editor (I use TextPad), open the “Model_0.mti” file and let’s have a look. This is a straight text file that lists the models used for each skin that the F-16 CM40 can use. They are listed here with the main model of the skin (F-16CM_40_1 through F-16CM_40_6) followed by the specific additional models needed to produce that skin.

```
1. F-16CM_40_1
2. Glass_CM40
3. Serial_CM40_1
4. Lights_CM40_2
5. Lights_CM40_3
6. Lights_CM40
```

Note that all six skinsets use the same Glass_CM40 model, and Lights models, but each skinset has a different **Serial** model, and of course a different **main** model. What we need to do then is to **add a new main model: F-16CM_40_7, and define what additional models are needed to produce it**. So, we are going to **add the following code to the end of each of the five Model_#.mti files** (Model_0.mti through Model_4.mti):

```
1. F-16CM_40_7
2. Glass_CM40
3. Serial_CM40_7
4. Lights_CM40_2
5. Lights_CM40_3
6. Lights_CM40
```

And then **save each Model_# file** (Model_0.mti through Model_4.mti)

4. Now we have to define all of the various parameters and texture files our new F-16CM_40_7 model needs to render the new skinset. We will do this in the “Materials.mtl” file. This is a big long file xml-flavored text file. Essentially, we are going copy one of the already existing skinset definitions, and paste it near the end of the script so that our new model will be defined properly along with all the other models needed to render the new skinset. It will really help if your text editor has a “**Show Line Numbers**” feature...
 - a. **Open the Materials.mtl** file now in your Text Editor.
 - b. **Look at the File Structure:** Each new model definition starts with a section called Flags:

```
1. { "Flags": {
```

You can see the name in the next section: "Name": "Lights_CM40",

- c. Let's scroll down (or better yet, use your Text Editor's search feature) until you find the model named "F-16CM_40_2" (line 472). We are going to **copy this entire main model and all its sections** to make our new F-16CM_40_7 model definitions. **Start copying** at and including line 465 (a single {), and copy all the way through to and including line 732 (a single },) a total of 268 lines copied.
 - d. Scroll all the way to three lines from the end of the file to line number 1878. That line is a single }. **Place your cursor at the end of that line, type a single comma (,) after the bracket**, then paste in your 268 copied lines on the next line.
 - e. If you pasted it properly, your new model will start on line 1879 (a single {). Scroll down to line 1886, and **change** "Name": "F-16CM_40_2", to "Name": "F-16CM_40_7",
 - f. Scroll down to line 1901 ("Textures"). In line 1903, **change** "File": "F-16CM40_Albedo3.dds", to "File": "F-16CM40_Albedo13.dds", and in line 1907 **change** "File": "F-16CM40_ARMW3.dds", to "File": "F-16CM40_ARMW13.dds",
 - g. Scroll down to line 1923. **Change** "Name": "Serial_CM40_2", to "Name": "Serial_CM40_7",
 - h. Scroll down to line 1938 ("Textures"). In line 1940, **change** "File": "F-16CM40_Albedo4.dds", to "File": "F-16CM40_Albedo14.dds", and in line 1948 **change** "File": "F-16CM40_ARMW4.dds", to "File": "F-16CM40_ARMW14.dds",
 - i. Scroll all the way down to three lines from the end, to line 2146 (a single },). **Delete the comma** from the end of this line.
 - j. **Save** the Materials.mtl file.
5. Open the Parent.dat file in your Text Editor. In line 2, TextureSets = **change** the 6 to a 7 then **save** the Parent.dat file.

Now let's change the Wing Models to include our new artwork as well, so our artwork will show "out the window" from inside the cockpit. We will do essentially the same thing we just did above in the Main Model folder to the files in the Wing Model folder.

1. **MOST IMPORTANT!! Make sure you save your original files in a safe place!!!** If you mess this up, BMS will crash, and you will want to get it back working again by reinstalling the baseline files. Navigate to your ...**TerrData\Objects\Models\1765** folder. **Copy** all the files in that folder (yes all of them) **and save them** in a safe place.

2. Take a close look at the files. This folder only has 4 files:

1. **Materials**.mtl
2. **Model_0**.bml
3. **Model_0**.mti
4. **Parent**.dat

3. Using your favorite Text Editor (I use TextPad), open the “Model_0.mti” file and let’s have a look. This is a straight text file that lists the models used for each skin that the F-16 CM40 can use for this “Wings” view. They are listed here with the main model of the skin (F-16CM_40_1 through F-16CM_40_6) followed by the specific additional models needed to produce that skin.

1. F-16CM_40_1
2. **Glass_CM40**
3. **Serial_CM40_1**
4. **Lights_CM40_2**

Note that all six skinsets use the same **Glass_CM40** model, and **Lights** models, but each skinset has a different **Serial** model, and of course a different **main** model. What we need to do then is to **add a new main model: F-16CM_40_7, and define what additional models are needed to produce it**. So, we are going to **add the following code to the end of the Model_0.mti file**:

1. **F-16CM_40_7**
2. **Glass_CM40**
3. **Serial_CM40_7**
4. **Lights_CM40_2**

And then **save the Model_0.mti file**.

4. Now we have to define all of the various parameters and texture files our new F-16CM_40_7 model needs to render the new skinset. We will do this in the “Materials.mtl” file. This is a big long file xml-flavored text file. Essentially, we are going copy one of the already existing skinset definitions, and paste it near the end of the script so that our new model will be defined properly along with all the other models needed to render the new skinset. It will really help if your text editor has a “**Show Line Numbers**” feature...

- a. **Open the Materials.mtl** file now in your Text Editor.
- b. Let’s scroll down (or better yet, use your Text Editor’s search feature) until you find the model named “F-16CM_40_2” (line 268). We are going to **copy this entire main model and all its sections** to make our new F-16CM_40_7 model

definitions. **Start copying** at and including line 261 (a single {), and copy all the way through to and including line 426 (a single },) a total of 166 lines copied.

- c. Scroll all the way to three lines from the end of the file to line number 998. That line is a single }. **Place your cursor at the end of that line, type a single comma (,) after the bracket**, then paste in your 166 copied lines on the next line.
 - d. If you pasted it properly, your new model will start on line 999 (a single {). Scroll down to line 1006, and **change** "Name": "F-16CM_40_2", to "Name": "F-16CM_40_7",
 - e. Scroll down to line 1021 ("Textures"). In line 1023, **change** "File": "F-16CM40_Albedo3.dds", to "File": "F-16CM40_Albedo13.dds", and in line 1027 **change** "File": "F-16CM40_ARMW3.dds", to "File": "F-16CM40_ARMW13.dds",
 - f. Scroll down to line 1043. **Change** "Name": "Serial_CM40_2", to "Name": "Serial_CM40_7",
 - g. Scroll down to line 1058 ("Textures"). In line 1060, **change** "File": "F-16CM40_Albedo4.dds", to "File": "F-16CM40_Albedo14.dds", and in line 1068 **change** "File": "F-16CM40_ARMW4.dds", to "File": "F-16CM40_ARMW14.dds",
 - h. Scroll all the way down to three lines from the end, to line 1164 (a single },). **Delete the comma** from the end of this line.
 - i. **Save** the Materials.mtl file.
5. Open the Parent.dat file in your Text Editor. In line 2, TextureSets = **change** the 6 to a 7 then **save** the Parent.dat file.

Lastly we need to add your new skinfiles to the 1852 folder:

1. F-16CM40_Albedo13.dds
2. F-16CM40_ARMW13.dds
3. F-16CM40_Albedo14.dds
4. F-16CM40_ARMW14.dds

6. Run BMS and open a TE with a F-16 CM40 aircraft, and check the Loadout screen. Change Skin until you see your new skin (or BMS crashes if you made a mistake somewhere).

That's it! You can use this basic method to ADD a new skin to any PBR model. Please leave any comments or questions in the BMS Forum Thread.

Regards,

Tomcattwo