

# **STATIC AIRCRAFT .mdl MAKER ("SAMM")**

## **Please Remember**

In most countries, a static scenery model converted with this program from a flyable or AI aircraft model is considered a derivative work of the original aircraft model author and is subject to the end-user license agreement (EULA) or other terms under which that author released the aircraft. Hence, your use and distribution of the static scenery model may be restricted.

Please observe those terms and, if you include these models in scenery you distribute, please give credit to the original aircraft author(s).

Tired of having to program AI (and suffer the overhead) just to have some "eye candy" sitting around your airport. No More! Static Aircraft .mdl Maker ("SAMM") will convert just about any FS8 or FS9 flyable or AI aircraft into a FS9 scenery model. Just "point" SAMM to the aircraft you wish to convert, decide where to save the scenery file and, presto, "eye candy".

## **INSTALLING, EXECUTING and UNINSTALLING SAMM**

Installation - To install SAMM, simply copy all the files from the downloaded archive. SAMM does not affect the system registry.

SAMM is a Microsoft NET.Framework 3.5 application. If NET.Framework 3.5 or later is not already installed on your computer, the "redistributable" can be downloaded from the Microsoft website at no charge.

Execution - To execute SAMM, double-click on SAMM.exe.

Vista and Windows 7 users must have and, depending on circumstances, others may require, administrator privileges when running SAMM. If you need but do not have administrator privileges, you will not be able to access certain data. To run SAMM with administrator privileges, right-click *SAMM.exe*, select "Run As ..." and then "administrator".

Windows 7 users may wish to run SAMM in the XP compatibility mode. Running it otherwise results in a "this program may not have installed correctly" message when SAMM is shut-down. Despite the error message, there is no known problem - other than the annoyance factor.

The first time you run SAMM, three new folders will be created in your SAMM folder, namely Models, Libraries and Listings. The latter is for internal use. Use of the other two is described throughout this manual.

You should not change the names of any files or folders in SAMMs *Models* folder.

Initialization - When you shut-down SAMM for the first time, an additional file, *SAMM.ini*, will be created and saved to the SAMM folder. SAMM "remembers" key settings from one session to the next. Those key settings, which include the last folder to which a static and scenery file is saved and your preferences for positional data entry, are saved in *SAMM.ini*. The next time SAMM is run, those settings are re-loaded from this file.

Automatic Updates - Whenever SAMM is started, it checks the support server to determine if a more recent release is available. If so, it will download that release with your consent. The updated release must be manually installed in the normal manner.

If you decline an update, you will be asked if you wish to be advised of future updates. If you decline, the "No Automatic Updates" item in the *SAMM.ini* file will be set to "True". To reinstate automatic update checking, manually edit *SAMM.ini* to set this item to "False".

Un-Installation - To uninstall SAMM, just delete the SAMM folder and all its contents

Terminology -To avoid misunderstanding, when the following terms are used in this manual their meaning is as follows:

- "aircraft" - a FlightSim aircraft folder or a file or sub-folder in such folder
- "aircraft title" - the title assigned to a specific "Fltsim.x" variant of an aircraft
- "static model" - a static model generated or to be generated by SAMM
- "base model name" - the user-specified name for the subfolder (to be created) in SAMMs *Models* folder to/in which a static model and its related textures are saved
- "static version name" - a user-specified character string (applied as a suffix to the base model name) to differentiate between individual static models in a base model folder.

## CREATING THE STATIC MODEL

(SAMM will not convert aircraft models developed specifically for FSX or for FS2000 or earlier.

Aircraft to be converted must be in standard FlightSim aircraft folder format and include model and texture folders and an *aircraft.cfg* file.)

On starting SAMM, a dialog box similar to that on the following page appears.

To create a static model:

- specify the set of aircraft folders containing the model of interest (FS9, FSX or Other);
- click the Select button associated with the Aircraft Folder textbox and navigate to the aircraft of interest; and
- if more than one version of that aircraft exists, select the desired aircraft title in the Select Aircraft Title combobox.

If there are no error messages:

- the checkboxes reflecting the animations available for the aircraft are enabled;
- if the aircraft model has LODs (levels of detail), the Has LODs radio button will be checked;
- the base model name (displayed in the STATIC MODEL Name textbox) will be the aircraft title and the STATIC MODEL Version textbox will be blank; and
- the name of the texture folder to be used is displayed.

Please note, if the aircraft title contains characters not valid in a file name, like " or /, SAMM will replace/discard those characters before using that title as the base model name.

At this point, the static model (wheels down, engines quiet, shadow enabled and no crash-code) has been created and is ready to save.

If you want something other than the default configuration, select:

- the desired pose (animation) options, and
- Other Options as necessary:
  - Suppress Shadow (if you want to minimize the FPS impact), and
  - Enable Decal (to display a registration number).

*Static Aircraft .mdl Maker Main Panel*

In default configuration, SAMM includes only those animation most likely to affect the landing gear and major control surfaces. About 80% of models successfully convert using SAMM's default setting for animations. For the remainder you may have to enable all animations or selectively enable or suppress particular animation using the Animations: Custom mode. In a few cases, you may also have to adjust one or more of the parameters that control the animation. For further information, please see ANIMATIONS, MISSING PARTS AND OTHER ISSUES below. (If you are going to make a library anyway, you may find it convenient to create two models, one with Animations: Auto, the other with Animations: All, which you can then compare after placement.)

If you wish to save the model under a base model name other than the aircraft title, edit the STATIC MODEL Name textbox. (The model name may be any character string that is legal as a file name under Windows. But for reasons explained later, you should keep it short.) If you intend to create more than one version of static model, you may also - but need not - enter a version name in the STATIC MODEL Version textbox. (As for the Name, you may enter any character string that is legal as a Windows file name but, again, keep it short). The texture folder name will be updated as you edit. (While this name isn't of much use to you at the moment, it may be later.)

Finally, click Save .mdl File. The static model and associated texture folder will be saved to SAMM's *Models* folder in a sub-folder named as the base model name. Both the .mdl file and the texture folder are named as the base model name and static version name separated by a semi-colon (";").

As well, you will be advised if any textures referred to in the static model are missing from the aircraft texture folder. SAMM has no way of knowing whether or not such textures are actually used or, if they are, whether or not their absence will have a material effect on the rendered model. Simply, the original aircraft .mdl file specified the need for the particular texture(s) under circumstances you chose to include in the static model. If the missing textures don't adversely affect the aircraft in its AI or User Aircraft role, they're unlikely to affect the static model. But, you will need to assess that for yourself.

Prior to generating the static model, SAMM applies the offsets for *static\_cg\_height* and *static\_pitch* specified in the aircraft's *aircraft.cfg* file. (These are the values that FlightSim uses to render the aircraft when it is "at rest".) Depending on how diligent was the designer and due to the slight differences in the way aircraft and scenery models are rendered, these values may require adjustment when you place the static model in order for the model to sit "perfectly". You won't know whether or not this is necessary, however, until you first compile and view static scenery model as generated by SAMM. Please note, if you apply a negative bias to the AGL elevation when placing the model, FS9 will suppress the display of the shadow. To avoid this, where models are off the ground, you'll have to fine-tune the *static\_cg\_height* parameter in the *aircraft.cfg* file.

SAMM generates static models using the FS9 compiler. FSX will display FS9 scenery models up-close satisfactorily with two possible exceptions:

- transparency, and
- illumination.

The latter should not be a problem so long as you don't check Show Night Textures - and may not be a problem if you do. The former shouldn't be an issue either with aircraft models intended for AI operation. But, with flyable models with transparent windows/canopies, those parts may not appear when a SAMM-generated model is used with FSX. As well, some aircraft designers make a habit of using DXT-3 or 32-bit textures routinely - even when transparency is not required. Parts that use such textures may be totally transparent when rendered by FSX. This is easily fixed by converting the texture to DXT-1 (no alpha). If either of these issues cannot otherwise be resolved, Arno Gerretsen's ModelConverterX (MCX) - available from [fsdeveloper.com](http://fsdeveloper.com) - will further convert the static model for use with FSX - which should correct such problem(s). (Arno has offered to implement a special interface in MCX to allow conversion of static models for use with FSX directly from SAMM's main panel. A new version of SAMM will be released when this capability becomes available.)

If you have converted FS9 model textures to .dds format for use with FSX, SAMM will treat these as substitutes for their .bmp counterparts.

There is one other issue FSX-related issue you should be aware of. When FSX displays FS9 aircraft models at very long distances, it does not texture them. Instead, they are displayed using the a solid color - the color depending on one of the design parameters. SAMM can't do anything about this conversion to a solid color. What it can do, and does, is make the solid color medium-gray so that the transition should not be very obvious.

I may upgrade SAMM at some point to also use the FSX compiler but, it's a big job and, at the moment, I'm not sure worth the effort since Arno's MCX seems to offer an alternative solution.

## **MAKING ADDITIONAL VERSIONS OF AND RE-SAVING A STATIC MODEL**

Once you have saved the first static model, you may save additional poses simply by checking the applicable pose options, specifying a new static version name and clicking Save .mdl File. If the static version name you enter has already been used (for that static model), you'll be asked to confirm that it is the folder of interest.

Perhaps you want to have several static versions of a particular aircraft in different liveries. To make a static model in a different livery:

- select the aircraft/aircraft title for the desired livery as before,
- specify the base model name (in the STATIC MODEL Name textbox) of the static model for which this is an additional livery,
- enter a version name in the Version textbox, and
- click Save .mdl File.

There is no need to place all liveries in the same base model folder. But, doing so gives you the opportunity for texture storage savings as noted in the next section.

Should you wish to make additional poses of a previously-saved static model:

- load the static model by entering its file path in the Static Model File textbox or using the associated Select button (the STATIC MODEL Name textbox will be disabled),
- enter a new static version name in the STATIC MODEL Version textbox,
- select the desired new pose options, and
- click Save .mdl File.

If this is the second time the static model is saved (or the second pose), you will be reminded that the model currently being saved will use the textures for the last-saved version.

Should you need to re-save a static model (as you may be directed later), you need only:

- load the static model by entering its file path in the Static Model File textbox or using the associated Select button (the STATIC MODEL Name textbox will be disabled), and
- click Save .mdl File.

Alternately, of course, you may re-create the static model from the aircraft

## **TEXTURE CONSIDERATIONS**

Aircraft textures tend to require a lot of storage space. You'll probably want to minimize the storage requirements.

SAMM operates in either of two modes:

- default - the full set of textures is saved for each "pose" of a static model; and

- texture conservation - multiple poses of the same aircraft/title use the same textures.

A checkbox near the bottom of SAMM's main panel controls which mode is used. If you plan to create static model libraries, the latter mode requires some organization on your part to ensure the proper textures are copied to the scenery folders.

Normally, the textures for a SAMM-generated static model are saved to a dedicated sub-folder in the `\texture` folder associated with the `\scenery` folder to which the model is saved. This sometimes causes difficulty, particularly with certain object placement tools. So, optionally, SAMM will save the textures individually in the `\texture` folder - the texture file names being prefaced with the Static Model Name followed by "%". In either case, SAMM copies only those textures that are actually used by the static model to the scenery `\texture` folder.

The remainder of this discussion deals with texture storage in the SAMM folders.

In the texture conservation mode, SAMM only saves the aircraft textures for the first static model converted after selecting a particular aircraft/title. Any additional static models (poses) created for that aircraft/title use the texture files saved for the first model. While in the texture conservation mode, if you want a set of textures dedicated to a particular version/pose of a static model, re-select the aircraft/title first.

If you have several static models of the same aircraft in different liveries, there are probably several texture sheets that are common to all versions e.g., *prop.bmp*. To avoid saving multiple copies of such textures, you may at any time manually create a folder named "*model\_name;All*" (e.g., "CAF-AI CC-130E Hercules; All" - with or without the space between ";" and "All", case independent) in the base model texture folder and copy into it the common texture files. When SAMM creates a new static model or recompiles an existing one, it will change the references in the *.mdl* file to those textures to "point" to the "*model\_name;All*" folder instead, and delete the files from the dedicated texture folder. Any existing static models that make use of the dedicated texture folder must be opened and re-saved. Of course, the "*model\_name; All*" folder must also be copied to the scenery texture folder. (SAMM will do that for you when you use SAMM to place your models or create an object library.)

If you are still concerned about the amount of storage required for textures, take heart. Some of the textures supplied with an aircraft, particularly if its flyable, are not needed for the static model. Virtual cockpit textures are just wasting space with a static model. Textures related to the underbody, cockpit or interior of the aircraft can often be omitted without materially affecting the rendering of the static scenery model for the intended purpose. If you delete them from the aircraft folder prior to creating the static model and they are required by the static model, SAMM will report them as missing, but will shade all affected parts a medium grey. As well, you can save considerable space by compressing textures, both by converting 32-bit textures to DXT3 for FS9 or DXT5 for FSX (or DXT1 if there are no transparent parts on it) with, for example, Imagetool or DXTBmp, or by reducing the size of large texture sheets from, say, 1024x1024 to 512x512 with Photoshop or other such tool.

Texture sheets may be compressed and replaced at any time. However, because of the way FlightSim locates textures, you are not able simply to remove textures for static models as you can for normal scenery or in aircraft folders. If you remove textures after a static model is generated because, for example, they don't contribute to the rendering of the model, you must regenerate or re-save the static model. Otherwise, FlightSim will issue a "missing texture folder" message when it attempts to load the static model. This applies to all static models that use the affected texture sub-folders i.e., all poses of the static model, not just the static model for which the texture folder was initially created.

When converting older models, you may encounter a situation whereby Flight Simulator "complains" about a reference to a non-existent texture folder (no further details), yet all textures required by the model are available in the texture folder. The cause may be a texture format that is valid in aircraft files but not in FS9 scenery files. (In the case that prompted this note, the size of a texture was 768x768 - apparently OK for aircraft but certainly not for scenery.) If this happens to you, you'll have to identify the errant texture (probably by process of elimination) and re-format it.

Aircraft and scenery *.mdl* files limit texture filenames to 64 characters - including any folder names and the file extension. So, the total length of the base model name and static version name may not exceed 63 minus the number of characters in the longest texture file name. SAMM will warn you if these names are too long.

Finally, if you check Enable Decal, you must provide a small texture file containing the registration number to be displayed. It should be named *Decal\_User\_Decal.bmp* and should be of the same aspect ratio - but not necessarily the same size - as the original *Decal\_NNumber.bmp* it is to replace.) If there is a registration number "painted" on the "\_t" texture, you should not use this feature.

## CREATING THE SCENERY FILES

You may place your static models using hand-prepared XML files, with the facility provided in SAMM or using one of the available object placement tools (see next section).

The screenshot shows the 'SAMM - Place Static Model' dialog box. The 'Positioning Data' section includes input fields for Latitude (48.0\*), Longitude (-123.0\*), and Altitude (0.00). There are radio buttons for coordinate formats: DD.dddd (selected), DD MM.mm, and DD MM SS.ss. Below the altitude field, there are radio buttons for units: Ft. and M. (selected). A checkbox labeled 'Alt is AGL' is checked. The 'Pitch' field is 0, 'Bank' is 0, and 'Heading' is 0. The 'Complexity' dropdown is set to 'NORMAL'. A 'Set Default Posn' button is located to the right of the complexity dropdown. At the bottom, there is a checked checkbox for 'Save textures to main texture folder' and a 'Compile Scenery Model' button.

*Place Static Model Dialog*

To place your model with SAMM, click the Save .bgl File button. (This button will not be enabled until you have saved the *.mdl* file.) After you navigate to the destination folder and click

OK, a dialog box for entry of the positioning parameters pops up. The destination folder may be any folder. If it is not a subfolder named `\scenery`, a `\scenery` subfolder will be created in it and the `.bgl` file will be saved there. Similarly, if there is no companion `\texture` subfolder, one will be created and the textures saved in it.

If this is your first attempt to create a static scenery model for this aircraft, then default positioning data will be used. If you have previously placed a static model as scenery, the data displayed will reflect the previous placement.

Enter/edit the latitude, longitude and heading at which you want the static scenery model placed and update the other parameters as necessary. (You may use the most recently entered latitude, longitude and heading as the default position for future placements by clicking the Set Default Posn button.) Check the Save textures to main texture folder checkbox as necessary.

Finally, click the Compile Scenery Model button. The `.mdl` file is compiled (with the FS9 compiler included with SAMM). If all is well, you will see a short confirmation message.

To see your static scenery aircraft, you need only create (if necessary) and enable a Scenery Library entry for the scenery folder holding the static aircraft and start FS9 or FSX as applicable. Your aircraft should be where you placed it (and you don't have to reserve parking).

## CREATING LIBRARIES OF STATIC AIRCRAFT

The procedure for placement of static models from a library will depend on the placement tool(s) used. However, SAMM will create the object library for you.

To create an object library of previously-saved static models, click Make Library on the main panel. The Make Object Library Dialog similar to that shown above will come into view.

Select the base folders you wish to include and specify a name for the library. (If the name you enter for the library has already been used, you'll be notified.) Check the Save textures to main texture folder checkbox as necessary. If you wish SAMM to place the library `.bgl` file and associated texture folders in a FlightSim scenery folder, check "Save library to an Add-On Scenery folder."

Some library managers and object placement tools do not "understand" SAMM's two-tier texture folder scheme. If you are using one of those utilities, check "Save textures to main texture folder" if that's what you want SAMM to do.

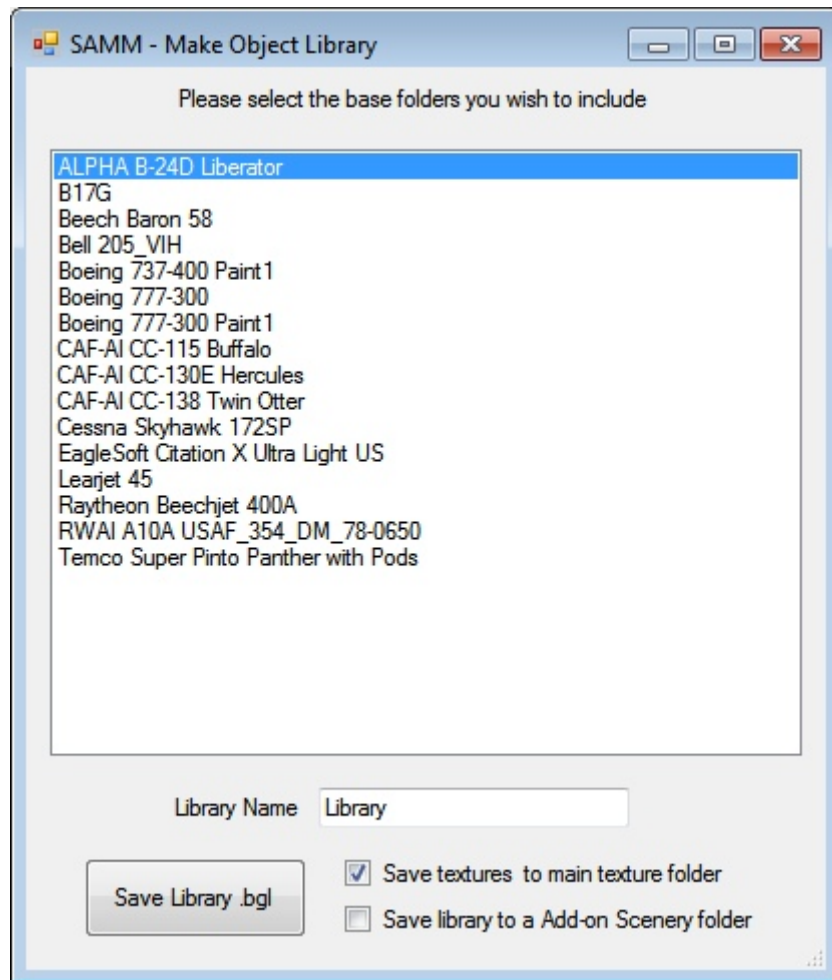
Then, click Save Library `.bgl`. If there is a folder in SAMM's *Libraries* folder named as the library, its contents will be deleted (so don't put anything in it you want to save). If there is no such folder, one will be created. The `.xml` file from which the library `.bgl` is compiled and a text file containing a list of required texture folder are saved in that sub-folder. (These may be helpful if your library doesn't turn out as expected.) As well:

- if you checked Save Library to a Scenery Folder, you'll be asked to navigate to the folder you wish to use (it may be any folder; if it is not a subfolder named `\scenery`, a `\scenery` subfolder will be created in it).
- if you did not check Save Library to a Scenery Folder, a `\scenery` sub-folder will be created in the relevant *Libraries* subfolder.

The library `.bgl` will be saved to the `\scenery` sub-folder and the textures to a companion `\texture` sub-folder - which will be created if it doesn't exist. If all is well, you will see a short



confirmation message. A library description .txt file named as the library will be saved with the object library.



*Make Object Library Dialog*

(During testing, I noticed that if the sub-folder or interest in SAMM's \Libraries folder was open on the desktop when an attempt was made to delete its contents, Windows issued a "directory not empty" error - but emptied the folder anyway.)

As noted in the previous section, minor adjustments may be necessary when you later place the static models to fine-tune static pitch and elevation.

## **ANIMATIONS, MISSING PARTS AND OTHER ISSUES**

Aircraft designers have a great deal more flexibility (and complexity) in creating their models than do scenery designers. While SAMM copes with most of it, you may find the odd aircraft that won't convert properly just by adjusting the range of animations incorporated in the static model. Usually, these situations manifest themselves as missing or misplaced parts. However, during testing we encountered one aircraft for which the static model compiled without error but FlightSim (both FS9 and FSX) "hung" when we tried to use the static model. Such situations do no harm, other than the inconvenience of having to re-start FlightSim. But, you should be aware of the possibility should SAMM encounter unusual circumstances.

Most of the appendages on an aircraft model are displayed via animation. Wheels down or wheels up (and all points in between), for example, is accomplished that way. These animations are expensive in terms of processing resources. Therefore, in the interests of FPS efficiency, SAMM eliminates any animations that, generally, are unlikely to contribute to the final appearance of the static scenery model - particularly those for cockpit controls.

Microsoft provides a set of standard animation names (or keys). SAMM uses these keys to decide which animations to keep and which to discard. However, aircraft designers often "tie" their animations directly to cockpit controls rather than to standard animation keys. To make matters worse (for SAMM), FS9 aircraft designers are free to create custom animation keys. So, for example, you select wheels down (default) - and SAMM will set the appropriate animation key value - but the wheels may not appear if the wheels animation in the model is dependent also upon on the position of the cockpit gear lever. There's no way for SAMM to "know" this. So, to get the model to render with wheels down, you may have to adjust the parameter that represents the position of the gear lever using the parameter adjustment tool described in the next section.

In Animations: Auto mode, SAMM retains any animations that use "standard" keys and those for selected cockpit controls for helicopters. This seems to be adequate for most "run of the mill" models. However, it may result in missing parts when the static scenery model of a sophisticated aircraft model is rendered. Should this be the case, try checking the Animations: All radio-button on SAMM's main panel to include all animations in the model. This will reduce the efficiency of the static model (it will still be more efficient than the aircraft), but all the parts should be in place (in their "0" position). Unfortunately, these additional animations sometimes create other difficulties - which is why there's an Animations: Custom mode. In the custom mode, you decide which particular animation are used in the rendering of the static model. Click that radio button and a list of available animations is shown. Those currently included in the static model are highlighted. Adjust the complement of animations and click Continue. If you exit that dialog without clicking Continue, the current selections are unchanged. Together with the Individual Parameter Adjustment feature described in the following section, you should be able to make just about any FS8 or FS9 model display correctly - with one possible exception ...

You may encounter situations where parts are missing from the rendered static model no matter what animations you enable/preset. The likely cause is that the aircraft designer used FlightSim's internal variables or other custom parameters to control display of the part. If the problem is due to the use of a custom parameter, then the individual parameter adjustment facility available from the Listings and Tool dialog may help. If it's an internal variable, that's unfortunate. Many of the internal variables used in aircraft models are not available to scenery models. If the part is intended to display when the inaccessible controlling variable is set to 0, then you may see it. Otherwise, it will remain missing. Hopefully, the part is not of such visual significance that the static model can't be used.

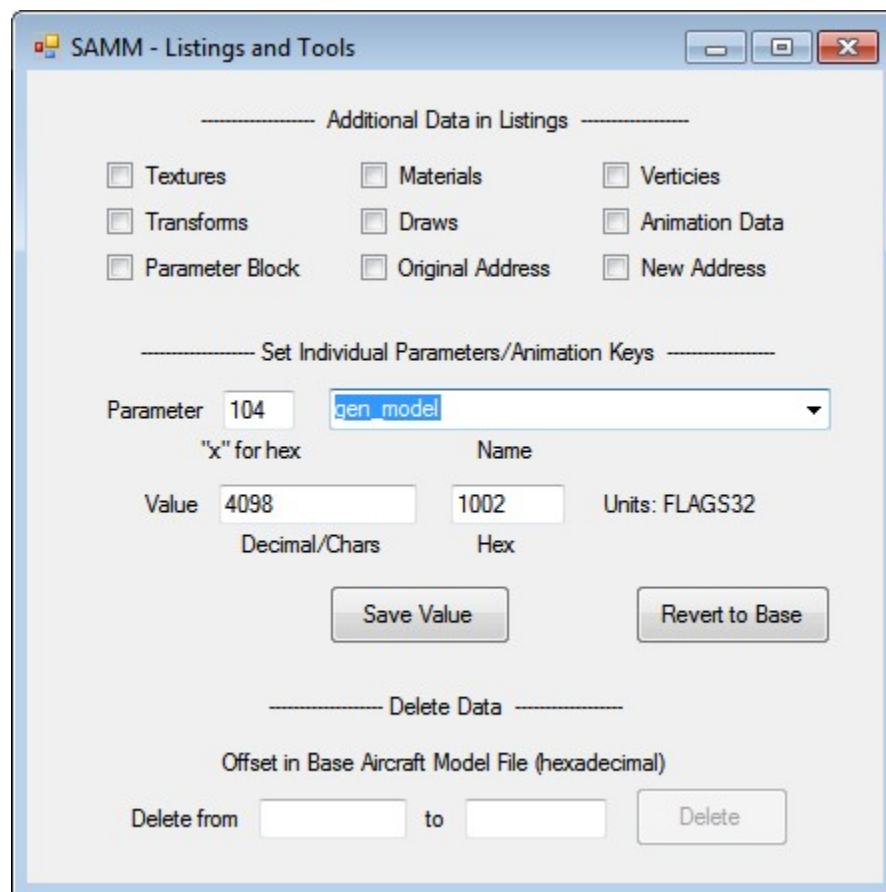
## **LISTINGS and TOOLS**

Some of you will want your static models to adopt non-standard poses - or you may simply want to examine the code "behind" them. To do either, check the Listings and Tools checkbox. The dialog shown below pops-up.

Listing Content Control - The upper portion of the dialog contains a number of checkboxes to control the display of various categories of information in the listings (not all categories are available for every aircraft, Transforms applied only to trace listings). If you decide to display the individual vertices or draw code, please be patient. For a typical aircraft, generating the listing when either of these categories is selected may require a noticeable amount of time.

Two features you may find particularly useful when troubleshooting missing parts are Original Address and New Address - particularly the latter. The first displays for each line in the static model listing the original address in the aircraft model listing. The other displays for each line in the aircraft model listing that is used in the static model the corresponding address in the static model listing. Where a part is missing from the static model with Animations: All enabled, the associated code in the aircraft model listing is often easily spotted as a large block of code without new addresses.

Trace Listings - When a static model is generated, listings that traces the execution path through the original aircraft .mdl file and the newly-created static model file are generated. These listings can be found in SAMM's Listings folder. Except for inclusion or exclusion of the current transform (Transforms checkbox), their content is fixed, but you may find them useful for troubleshooting problematic models.



*Listings and Tools Dialog*

Individual Parameter Adjustment - In the central portion of this dialog are the controls for adjusting the parameters used by the model. These controls allow you to preset the value of any parameter used in the aircraft model and have the animations react accordingly. (Available parameters and their current values are displayed near the top of the listings when Parameter Block is checked.) For example you could have one engine running with the others on a multi-engine aircraft off, or the nose-wheel up (on models where the gear retracts) while the others remain down. You are unlikely to want to do either of these, but they are illustrations of what you can do with these controls. Something you may wish to do, however is have only one door open while the other(s) remain closed. As well, some designers tie the presence of ground

support equipment to a custom parameter, often one that refers to the rotation of the nose wheel. But, you'll have to examine the listing to know that.

(To SAMM, a model is just a bunch of unlabelled vertices that are displayed or not based on the setting of some parameter. There is no way for SAMM to "know" which vertices represent which parts. By default, SAMM displays vertices based on the default value of the relevant parameter. For standard animation keys/parameters, SAMM sets the appropriate default value. Otherwise, the default value is 0. Hence, where the display of a part is dependent upon a parameter value other than the default, it's up to you to determine and set the appropriate value.)

To preset a parameter value/animation key, refer to the listing of the parameters and enter either the parameter number (in decimal or in hex preceded by "x") or select the parameter of interest from the Parameter Name combobox. You may also key the parameter name into the combobox (the entered name must match exactly the parameter name). If you enter a parameter number, the corresponding name will be displayed in the combobox. If you select/enter a parameter name, the number will appear in the text box. In either case, the current value of that parameter will be displayed in decimal form and, for integer-based parameters, also in hexadecimal form. The internal data format for the parameter is also shown. Edit the value as desired.

For example, the parameter name on most aircraft for the left gear is "l\_gear" and the animation key range is 0-200, with 0 being gear fully retracted, 100 being fully extended and values over 100 for various compression levels. (150 is gear-down and compressed for normal aircraft weight). Settings in between 0 and 100 will yield partial retraction. Similarly, there are four engine parameters, named "engine0", "engine1" and so on. When set to 0, the engine is stopped and the prop is shown still. If set to x7fff0000, the "whirling-prop" texture is displayed.

"Standard" aircraft animation key/parameters are a topic of the MakeMDL SDK. You should review that document prior to making use of this feature. In addition, aircraft modelers have the ability to create custom animation keys/parameters. I have not found any documentation of the topic of custom keys. (Nonetheless, SAMM copes with them.)

Generally, the range of values for the parameter in any animation can be discerned for the aircraft of interest by listing the animation data and examining that data in the Aircraft listing. (The static aircraft listing animation data contains only the selected value for each animated parameter.) You may enter any reasonable value. SAMM will interpolate for the correct animation key when the parameter is within the normal range. If outside the normal range, SAMM will pick the applicable end-value. What the model does with that key depends on the modeler.

Then, click Save Value button. The static model will be re-computed based on the new entry (but not saved) and the listings will be regenerated. As well, if the entry interferes with a standard animation control on the main panel (for example, you start one engine), that standard animation control (in this example, the Engine checkbox) will be disabled.

You may revert to the standard animations at any time by clicking Revert to Base. Doing so will remove all your entered presets.

When you save the model, all your parameter changes are saved with it. When you reload the static model, it is initialized with those changes. Hence, you need not make all your parameter value presets in a single session.

Deleting Code - Some of you will want to perfect your static models to make them even more efficient. To do so, you may edit the aircraft model data. The lowest portion of the Listings and Tools dialog allow you to do this. (In this release, editing is limited to deleting sections of code)

The delete function doesn't actually delete anything. Rather it overwrites the data in the aircraft file between the boundaries (inclusive) you specify with no-ops - to preserve absolute addressing. When the static model is next saved, the *.mdl* file will be re-created without the section of code previously overwritten. Since edited the aircraft *.mdl* file is re-saved with the static model, your changes will be preserved.

## UNSUPPORTED OPCODES AND OTHER ISSUES

SAMM has been successfully tested on a wide variety of flyable and AI aircraft models. Most convert with no difficulty using SAMMs default settings. Of the others few need more than an additional animation enabled.

However, should the author of an aircraft have done something unusual, the solution may be less obvious. If the issue is an unrecognized BGL opcode, you will receive a message to that effect and have the option to continue or not. (The opcode might not even apply to the converted static model.) If you choose not to continue, SAMM will close.

If it's not an opcode problem and you really want that static aircraft "fixed", you've got some work to do. Should an aircraft not convert properly and the problem is not an unrecognized opcode, the first thing you should do is confirm that the aircraft model is rendered properly by MS Flight Simulator when used as the User Aircraft or in an AI role. If that's OK, then you should review the ANIMATIONS, MISSING PARTS AND OTHER ISSUES section of this manual for suggestions of a possible cause. After that, turn to the listings.

Should you experience difficulty with an otherwise "good" aircraft that can't be fixed using the animation options/adjustment tools provided, I would like to know about it - after you make an honest effort to fix it yourself. Please note the address at which a faulty opcode occurs (if applicable) or the specific other issue, and e-mail that information together with the relevant aircraft folder (i.e., model file, texture folders and *aircraft.cfg* file) to me at the address below.

While I do want to know about problem aircraft, please do not ask me for help adjusting/ presetting animation parameters or otherwise troubleshooting individual aircraft. Satisfying (and successful) use of SAMMs advanced features will depend largely on your experience, your interest in learning something new and the extent to which you have studied and understand the model listings. There seem to be few hard-and-fast rules in aircraft design, so don't be surprised if something that worked for one model doesn't work for another. What I can tell you is that if you preset the right parameter to the right value and select the right set of animations, you should get good results. Figuring-out which is the right parameter/value and deciding which animations to use is up to you.

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- Bill (ngix) for his advice on aircraft development techniques when things didn't work for me as expected.

## **SUPPORT**

Thanks to Arno, SAMM has a dedicated support forum in the Tools section at fsdeveloper.com, <http://www.fsdeveloper.com/forum/forumdisplay.php?f=114> . Please direct your queries and suggestions there.

Known issues and updates are posted at <http://stuff4fs.com/SAMM>.

Don Grovestine  
stuff4fs.com

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