



# Tools for Asset Repair by PEV

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This is the second in a series of tutorials where I describe the use of the tools I have written to bring assets up to date for TS2009/10 and TS12.

### Introduction

Reiterating the background, Trainz uses a render engine called Auran Jet to display and move objects within the simulator. Auran Jet supports a suite of proprietary file formats that define 3d objects, surfaces, animations, sounds and so on.

Any 3d object or surface can be modelled as a series of triangular facets, on to which surface colouring (textures) are added. All of this information is gathered together in a "mesh". The mesh contains all of the 3d geometrical data needed to define the shape of the object as well as the texture specifications to select surface colouring, and the texture mapping details to correctly place the texture images on to the various portions of the surfaces.

The Auran Jet mesh type is now the "Indexed Mesh" ('IM') which has superseded the "Progressive Mesh" ('PM').

The progressive mesh was the same as the indexed mesh but with the addition of data that could simplify the mesh for distant viewing. (lower the Level Of Detail). Auran later chose to use multiple 'IM' meshes instead of a single 'PM' for their LOD method. The PM method of collapsing the mesh is a bit hit or miss as some of the content on the DLS shows.

PM meshes were obsoleted in TRS2006, though they still work in the game. In TS2009, PM meshes cannot be committed into the game by the Content Manager; so any one doing reskins of assets with PMs will not be able to commit them. So a way of changing PMs to IMs seemed to be important.

I created my first PM to IM converter for TRS2006. That program took the PM mesh and stripped out those portions of it which performed the LOD functions.

PM3IM Converter 2 is an all new version that performs the same functions as well as those such as "strip textures" and "adjust speculars" that were part of the previously released version. This new version makes no changes to the animation base data.

### What Can PM2IM Do?

1. Convert one PM mesh to IM format, from the File Open menu or by double clicking on a PM in windows explorer.
2. Trawl (or search) for PMs and convert any it finds to IM format.
3. Remove unsupported texture types.
4. Change specular lighting to remove an unwanted shine on object surfaces.
5. Remove non-english characters from material and texture names.

### Using PM2IM

#### Installation

If you don't have this program, please download its installer program from my PEVSoft Download page.

<http://www.members.optusnet.com.au/~villamp/pevsoft.htm>

Run the installer and the program will be loaded on to the Program Files area of your C: drive, along with a desktop icon and an entry in the PEVSoft folder of your All Programs menu.

If you have TS2009 or later, you can automatically set up 'OpenWith' macros for Content Manager in each Trainz installation. When PM2IM is run for the very first time it will attempt to install these macros. If you Trainz installations are in the default locations this will happen without any input from you.

As an example, the "OpenWith" macro for TS2009 is located in the following base folder:

'C:\Program Files\Auran\TS2009\bin\CMPData\tools'

In this folder, the PM2IM program will make a new folder named 'OpenWith' (one word). PM2IM then builds the macro (a DOS batch file with the name "PM2IM.bat" or similar) that looks as follows:

```
@echo off
"C:\Program Files\PEVSoft\PM2IM\PM2IM.exe" -trawl %1
```

To use the OpenWith facility select one or more items in Content Manager 2, then right click to bring up the menu. Select Open With, then click on PM2IM.bat.

The selected items will open for edit and the PM to IM conversion will be done as they are opened.

I recommend, also, that you you make PM2IM.exe the program that opens \*.pm files when you double click them in Windows Explorer.

### Opening a File

The program can open .pm files only. (or .im files for texture stripping).

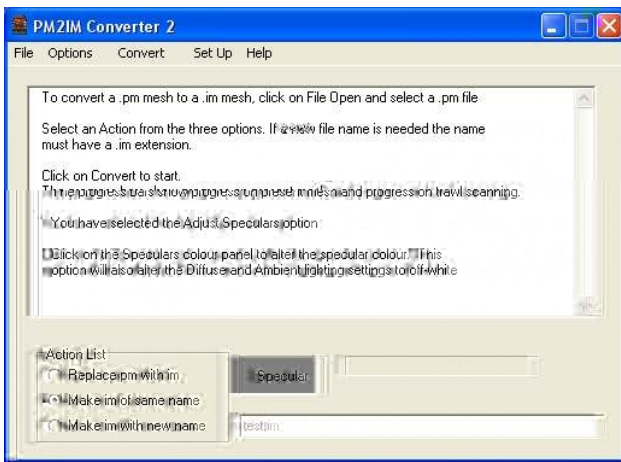


Fig. 1.

To Open a File, start the program and click on the File menu. Click on Open and the open file dialogue box will be displayed. The file extensions are filtered so only the correct type can be opened.

Files can also be opened by double clicking in Windows Explorer. You must add the .pm file extension to the list in Windows explorer and point it to this program before this will work.

The Exit option closes the program.

### Convert to IM

When opened from the Start Menu or the desktop short cut, the program will await a file open instruction from the user. Click on the File menu. Click on Open and the open file dialogue box will be displayed. The file extensions are filtered so only PM will be visible. Select a PM to convert.

There are three options in the action list:

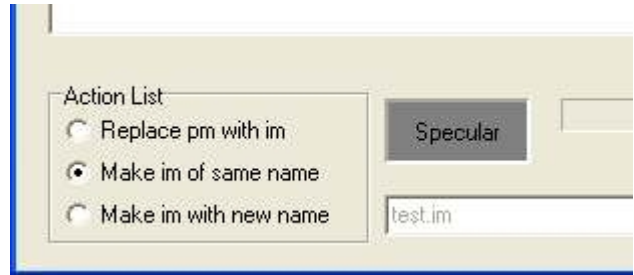


Fig. 2.

**Replace pm with im** makes an im file with the same name as the pm. The original pm file is deleted.

**Make im of same name** makes an file of the same name and retains the original pm file.

**Make im with new name** makes an im file with whatever name you enter into the edit box.

Choose an option and click on the "Convert" item in the Main Menu and the conversion will proceed.

When completed the program will tell you that the IM file has been created.



Fig. 3.

Many PM's have incorrect values (usually 1.00,1.00,1.00) for Specular lighting in the texture settings. With later versions of Trainz these settings cause an unnatural shiny look on object surfaces. To prevent this enable the Adjust Speculars option.



Fig. 4.

You can change the colour of the specular lighting by clicking on the colour patch labelled "Specular" as shown in Fig. 2. A colour picker dialogue will appear allowing you to select a colour. A dark grey (near black) is recommended for starters.

The program also checks for non english characters in material names and texture names. It will automatically replace any non-english characters with an underscore. If this occurs a message is displayed showing the new name. The name of the texture or texture.txt file will need to be altered by the user to match the new name if a texture name is changed.

All messages are included in the log if you are using trawling. The log can be viewed by selecting View Log from the File menu.

The Exit option in the File menu closes the program.

## Trawling.

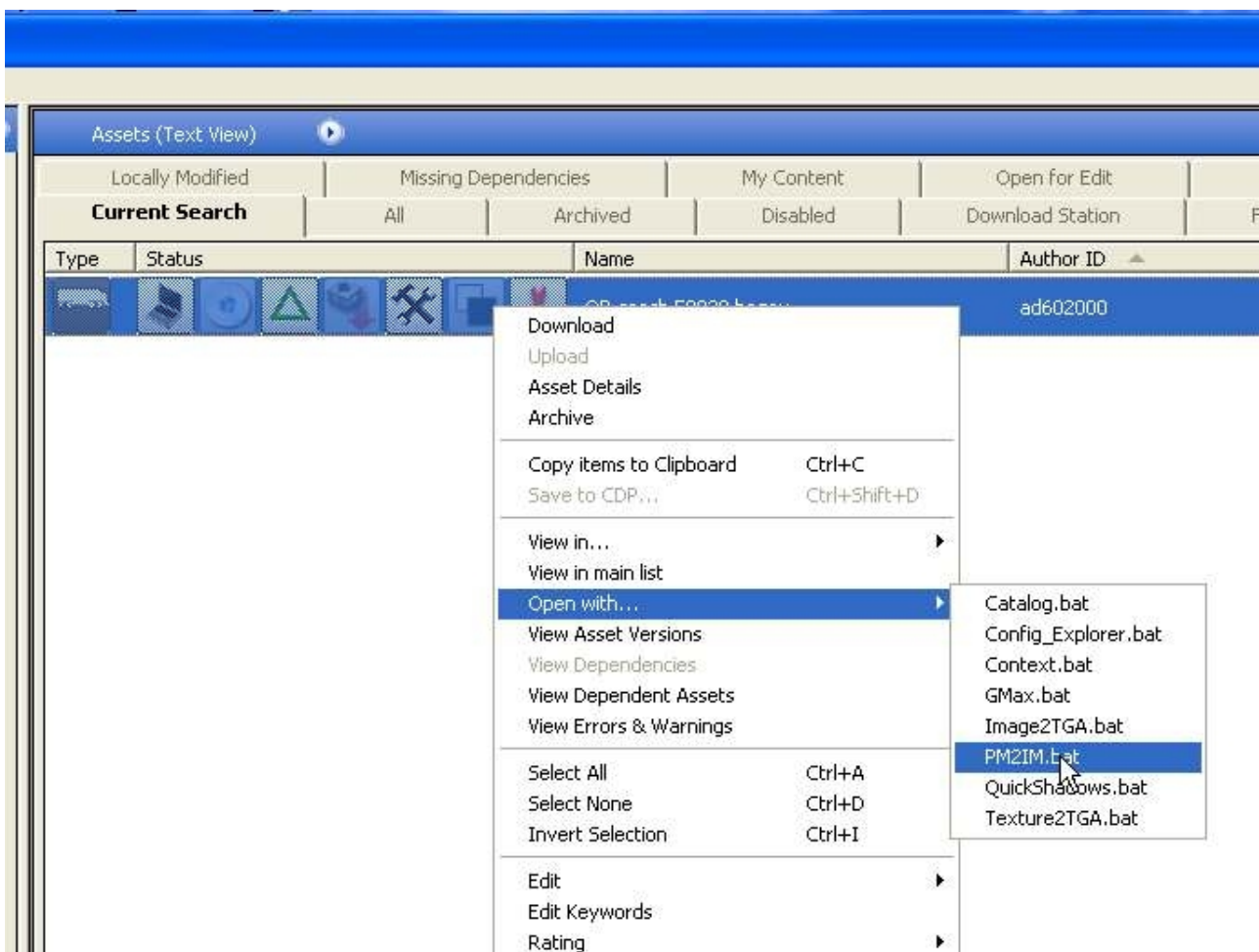
Trawling is the process where the program searches a folder and ALL of its sub folders for Progressive Mesh files to convert to Indexed Meshes. It is similar to the search

function in Windows explorer, except that when it finds a file it processes it without asking any questions. Trawling can save many hours of work by automatically converting PM's to IM's. TS2009 and later do not allow .PM files to be committed into the game without flagging an error.

So if you have faulty content caused by the presence of PM files (as flagged by CM2/3) you can use the CM2 search filter for faulty content and open it all for editing, then apply the trawling process to the editing folder.

To use Trawling you must launch this program from the command line with the -trawl switch, or launch from the Open With menu (right click) in Content Manager 2 or 3.

Here is an example of a faulty bogey in TS2009, caused by the presence of a PM.



If you click on PM2IM.bat as shown the PM2IM program will open in trawl mode and an IM mesh will be made for every PM found in the search. In this case only one IM is made. Please note the the config.txt file will require alteration to get the IM mesh to show up in the game. I do not include any instructions here for config.txt modification because the config.txt changes depend on Trainz version

and the presence or absence of shadow meshes.

If launched in normal window mode (not minimised) you can stop trawling at any time by pressing the Stop button... If you press the Resume button the process will continue.

The files processed are listed in the main text box as the conversions progress.

The program keeps a log (named Trawl\_Log.txt) of files found and shows the actions taken on each file. The log is accessed from the File menu and clicking on View Log. The log file accumulates data every time trawl is started. The Log should be deleted after large trawl conversions. A delete option is included in the File Menu.

### Command Line

The program can be launched from the command line to automatically start trawling for .PM files to make new IMs.

The command line format requires the switch "-trawl" to enable trawling as in the example below

```
PM2IM.exe -trawl " c:\Documents and  
Settings\userPEV\My Documents\PEVContent\Carz"
```

In this case the trawling would start in the ...Carz folder and scan through all its sub folders looking for PM files to convert.

The program keeps a log of files found and shows the action taken on each file. The log is accessed from the File menu and clicking on View Log.

The default for this option is to run minimised showing only an entry on the Windows task bar. The program closes on completion of the trawl.

If you wish to check the log file or view item by item progress, restore the window from the task bar. In this case the program will remain open on completion.

### Remove Unsupported Texture Types

Some content creators made assets using additional texture slots in GMax or 3dsMax. Slots such as "ambient, shine, specular, selfillum" were used in an attempt to enhance the appearance. In TS2009 onwards, the use of these slots causes an error in Content Manager. Unfortunately the error is poorly flagged as "Cannot load texture 'texturename.texture'in 'meshname.IM'" even though the texture is present in the asset folder.

The PM2IM program only reads the "diffuse, bump and reflect" slots, so during conversion it automatically skips the other slots. Hence I was able to add an option to be able to open IM files so that unsupported texture references can be removed from IM meshes as well.

To allow opening of IM files the "Open IM Files" option should be set in the Options menu. You can also over-ride this by manually choosing the file filter in the File Open Dialogue.

Any unsupported texture references are automatically removed from PM meshes when they are converted to IM.

To remove unsupported texture references from an IM mesh, open the IM file from the File menu and the File Open dialogue. The IM mesh option can be found by changing the file filter in the dialogue.

If you are happy to proceed press the Convert to IM button and the unsupported texture types will be stripped from the mesh.

PLEASE NOTE: the original IM file will be lost (over-written) if you chose to remove the unsupported texture types.

If launched from the command line with an IM file as argument the process will proceed without any prompts.

This option to open IM's does not work when launched with the trawl option. Trawling is only for converting PM's to IM's.

### Program Options

The PM2IM program provides the following options:-

#### Adjust Speculars

If converting old PM's it is advisable to set the "Zero Speculars" Option to prevent unwanted shine on converted objects. If you require a shine leave this option un-set and see what sort of result you get.

#### Open IM Files

If you wish to open IM files by default for removal of unsupported textures then set the "Open IM Files" Option. This replaces the old "Strip Textures" option.