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Importing & Exporting 3D Objects

World Builder enables you to import 3D models from other programs and into your World Builder scenes. You can take advantage of your favorite modeling tools to construct and apply materials to an object, then import it into World Builder to enhance scene realism.

If you use 3D Studio MAX, you can import 3DS models with their materials into World Builder. You can also import .VUE files for any object, camera, or light animation.

World Builder also includes a MAX Communication Object plugin, which allows you to use World Builder to render the terrain, plants, grass, etc, of your scene. It then lets 3D Studio MAX render mesh objects, such as buildings, and then automatically composites the MAX and AWB images into a single frame or image.

ORTING

World Builder imports 3D Studio 3DS mesh files, 3D Studio VUE files, AutoCad DXF files, VistaPro DEM files and USGS DEM files.

Import from DEM

- VistaPro DEM
- USGS DEM

The one degree DEM file covers, in 1X1 degree blocks, all of the contiguous United States, Hawaii, and limited portions of Alaska. The data are free and available through an FTP site.

Access the EDC on the Internet procedure

1. FTP to edcftp.cr.usgs.gov.
2. Enter "Anonymous" at the Name prompt.
3. Enter your entire E-mail address at the Password prompt.
4. Change directories to "pub/data/250".

5. Set the file transfer mode to binary.

6. Use get and mget commands to download the 00readme and data files.

   The readme file contains information about directory structure and uncompressing data files.

Import a DEM file procedure

1. Select File/Import and either VistaPro DEM or USGS DEM.

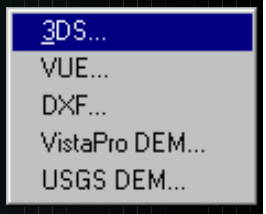
   The Select File to Import Dialog appears.

2. Select the DEM file you want.

   The selected file is opened and appears in the viewports

Import from 3DS

- Mesh Objects import with materials (including Mapping) and smoothing.
- Spotlights with color and Intensity (Multiplier) definitions, as well as Hotspot and Falloff settings (converted to World Builder units), and target. Exclusions and Cast Shadow settings are ignored.
- Omni lights import as Point Lights with color and Intensity (Multiplier) settings.
- Cameras import with FOV settings and targets.



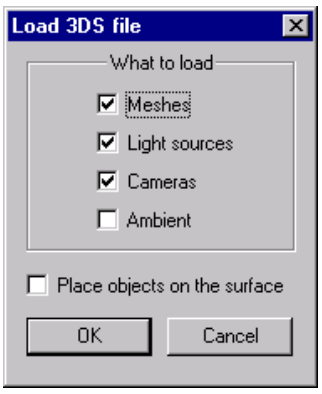
Import a 3DS File procedure

1. Choose File/Import/3DS.

   The Select 3DS File dialog appears.

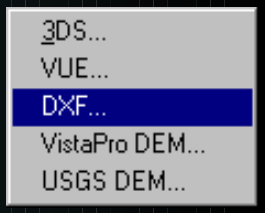
2. Choose the file that you want to import and click Open.

   The 3DS Load File dialog appears asking you what you want to load. You can check the Place objects on surface option to place the imported mesh objects directly on the surface of the Landscape. With this option unchecked the imported objects will maintain their position in world space.



3. Click OK

The objects are imported.



Import from DXF procedure
DXF 3D faces are imported and converted to mesh objects.

1. Choose File/Import/DXF.

The Select File to Import dialog appears.

2. Choose the file that you want to import and click Open.

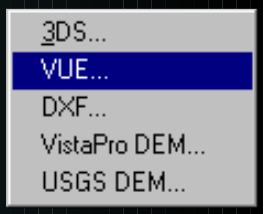
The object is imported and its position in world space is maintained.

Import VUE
VUE files are ASCII text files that contain animation instructions for selected objects for every frame in an animation.VUE animation files are imported and a path is saved along with the scene file. VUE files can be converted to keyframes as desired. The files contain the following instructions for each frame in an animation:

- Mesh Position, Rotation, Scale
- Camera Position, Target, Roll, FOV
- Light Position, Color
- Spotlight Position, Color, Target

TIP: World Builder s increased animation capabilities allow all attributes of a VUE file to be used. If you are exporting a VUE file from 3D Studio MAX, you can export a .3DS file along with it and any VUE

supported animation can then be transferred to World Builder.



Import a VUE file procedure

1. Choose File/Import/VUE.

   The Select VUE File dialog appears.

2. Choose the file that you want to import and click Open.

   The VUE file is imported. The VUE file is also listed in the Movie Parameters dialog in the VUE File Information box. For more information on the Movie Parameters, refer to Chapter 5.

NOTE: If there is more than one camera in the scene, and the VUE file contains camera information, the camera that is topmost in the Object Tree list will be affected by the VUE file. Also, the VUE file animation instructions will replace any keyframe animation that has been applied to candidate objects in the World Builder scene.

EXPORTING

World Builder exports 3D Studio .3DS mesh files, VRML Virtual Reality Modeling Language .WRL files, and AutoCad DXF files.

Export to DXF procedure

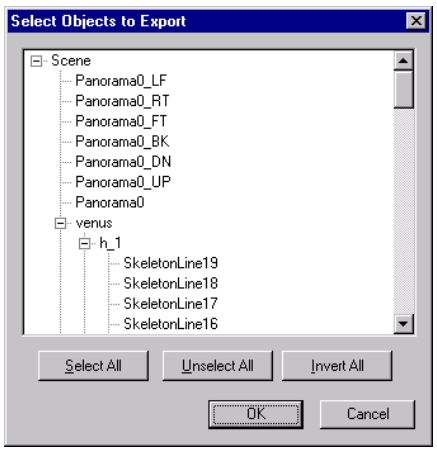
Any objects (except cameras and light sources) can be exported to DXF files and are exported as multiple 3D faces without materials.

1. Choose File/Export/DXF.

   The Select file to Export dialog appears.

2. Choose a path and file name and click Save.

   The Select Objects to Export dialog appears.



3. Tag the objects that you want to export and click OK.

   The objects are exported.

Export to 3DS

- Mesh Objects export with materials.
- Spotlights with color
- Omni lights
- Cameras with FOV settings and targets

Export a 3DS file procedure

1. Choose File/Export/3DS.

   The Select Objects to Export dialog appears.

2. Tag the objects that you want to export and click OK.

   A dialog appears asking if you want to save with materials.

3. Click Yes or No.

   The objects are exported.

Export to VRML procedure

Any objects (except cameras and light sources) can be exported to VRML file with materials as an indexed face set. For Landscape objects a special texture map is created and assigned to the mesh. This special map is the snapshot of the landscape from Top view.

1. Choose File/Export/VRML, then choose a path and file name.

   The Select Objects to Export dialog appears.

2. Select the objects that you want to include in the VRML file and click OK.

   A top view window appears and the view is rendered using Phong shading. After a moment, the window disappears and the objects are exported.

NOTE: If you select more than one Landscape Object to export, then both Landscapes will be rendered from a top view.

STUDIO MAX COMMUNICATION PLUG-IN

The World Builder Max communication plug in enables you to quickly produce a seamlessly composited image which is produced from linked scenes in 3D Studio MAX and World Builder.

The plug-in works by automatically rendering camera views in each program and then compositing the resulting images together using the Z-buffer data from both applications. With both applications running, you can initiate the compositing process from either World Builder or 3DS MAX. Furthermore, the Communication plug-in will even render shadow maps between applications!

You render a Camera view in World Builder, which then tells 3DS MAX to render the Max objects, then imports the Z buffered image, then the World Builder image is rendered and automatically composited with the Max image.

Establish Communication procedure
The first step is to establish communication between World Builder and 3D Studio MAX.

1. Start World Builder and 3D Studio MAX.

NOTE: The order in which World Builder and 3D Studio MAX are started does not matter.

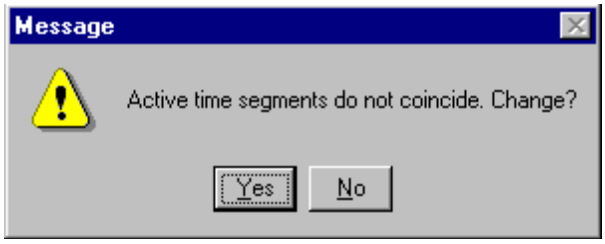
2. In 3DS MAX, click the Utilities Tab and choose AWB Communication Utility from the Utilities pull down list.

   The Communication, Light Export, and Camera Export rollouts appear in the 3DS MAX Command Column.

Connect

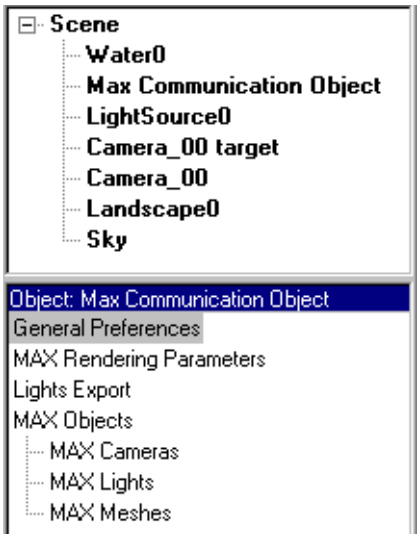
3. Click Connect.

   If the Active Frame Ranges aren t the same in both programs, you will get a Message dialog asking you if you want to change the Active Time Segments. Clicking Yes will make the World Builder scene update to the current active frame range in MAX. If the frames are the same, then you simply won t get a message when the two programs connect.



4. Switch to World Builder and choose Create/MAX Communication Object.

   MAX Communication Object appears in the Object Tree and is selected.



Import Objects to MAX procedure

You can import lights and cameras from the World Builder scene into 3D Studio MAX scene to match the scene lighting, camera settings, and point of view in the MAX scene.

1. In the 3D Studio MAX Utilities panel, expand the Light Export and Camera

Export rollouts

The rollouts appear, each one displaying a list of associated light or camera objects from the World Builder scene, and Update and Export buttons. Update updates the list if you have created an object in World Builder since communication was established. The Export command exports the object from World Builder into the 3D Studio MAX scene.

2. Select the Lightsource that you want to use for the MAX scene and click Import.

   After a moment the selected light appears in the viewports. The name of the imported LightSource disappears from the list.

3. Repeat step 2 for the Camera.

   The camera from World Builder appears in the MAX scene and disappears from the list as well. Both cameras and lights import with their original name and an "AWB_" prefix. Now you can open a viewport for the World Builder camera and frame the MAX scene objects in the camera view.

NOTE: It is not required to import the World Builder camera into 3D Studio MAX to perform the rendering and composition, but it is recommended to ensure that the Max scene objects are properly positioned and framed.

TIP: Use File/Export/3DS in World Builder to export Landscapes from the AWB scene. You can then import the Landscape meshes into MAX to help you align objects with the World Builder scene.

Render from Max procedure

1. Choose Render/Video Post.

   The Video Post dialog appears.

2. Click Add Scene Event.

   The Add Scene Event dialog appears.

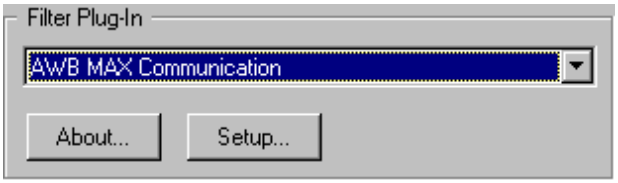
3. In the Add Scene Event dialog, use the drop down list in the View box to choose the World Builder camera view and click OK.

The World Builder camera Scene Event appears in the Video Post Queue.

4. Click Add Image Filter Event.

5. Use the drop down list in the Filter Plug-in box and choose AWB MAX Communication from the list.

   AWB MAX Communication appears as an Image Filter Event in the Video Post Queue.

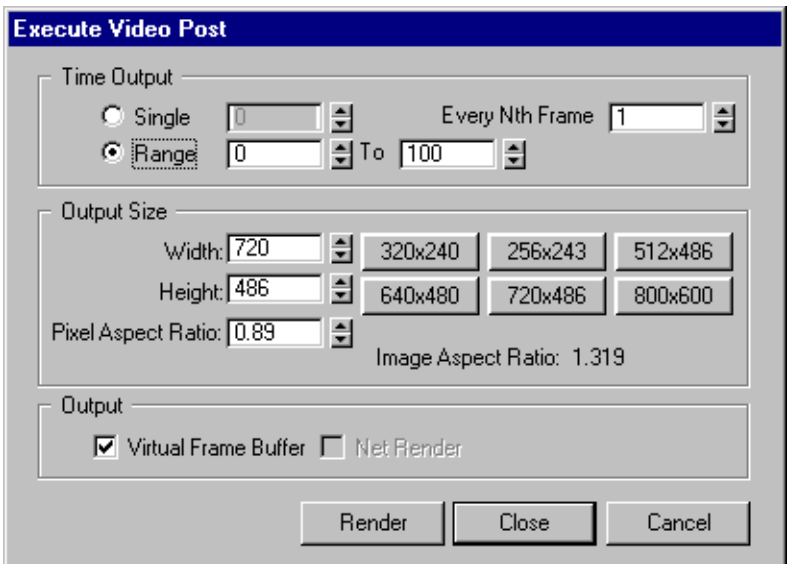


6. Click Execute Sequence.

   The Execute Video Post dialog appears.

7. Select the Time Output, Output Size, and Output options that you want and click Render.

   The Output Size parameters will be transferred to the World Builder renderer temporarily for the purposes of the rendering. Max renders the scene, then calls the World Builder renderer. When the World Builder scene is rendered, the two images are composed in Video Post.



Render from World Builder procedure

1. Select the Camera that you want to render the Max scene and World Builder scene.

2. Open a viewport for the camera and click Phong Render.

   The Status line Reads MAX Render XX% done as Max renders its scene. W orld Builder then renders its scene and Composes the two images.

MAX Communication Object

You use MAX Communication objects to specify link selected The following is a short description of the MAX Communication Object Properties.

General Preferences:

- Mesh Animation Type Sets the import of 3D Studio MAX objects to Bounding Box or Static Mesh if the Max renderer is not being used. Bounding Box will only use the object Bounding Boxes and their anima - tion. Static Mesh will import the Static Mesh and animation information at the first frame of the animation. Mesh transformations such as animated Object Modifiers are not supported.

- Perform Render in MAX Option to call the Max renderer to render its scene. If this box is unchecked, the Max renderer will not be used, and the Mesh Animation Type options will be used.

- Minimum Render Type to Call MAX Sets the minimum shading level

used in World Builder that will invoke the MAX renderer.

- Flat Rendering The Max renderer will be called if you use Flat, Gouraud, or Phong shading to render a view.
- Gouraud Rendering The Max renderer will be called if you use Gouraud or Phong shading to render a view.
- Phong Rendering The Max renderer will be called only if you use Phong shading to render a view.

- MAX Rendering Parameters Displays the rendering options Video Color Check, Force 2 Sides, Render Hidden Objects, Render Atmospheric Effects, Super Black, and Anti-Aliasing for 3D Studio MAX.
- Lights Export Allows you to select lightsources from the World Builder scene to export to 3D Studio MAX. Save to File saves the Shadow Map from the light, and allows you to load the map in MAX in a special options button in the Lights Modifier Panel.
- MAX Objects Update All MAX Objects will update any edits made in MAX to the representative objects in World Builder. You must explicitly update any changes made in either program.
  - MAX Cameras Allows you to select cameras from the MAX scene to import into World Builder.
  - MAX Lights Allows you to select lights from the MAX scene to import into World Builder.
  - MAX Meshes Allows you to select objects from the MAX scene to import into World Builder.

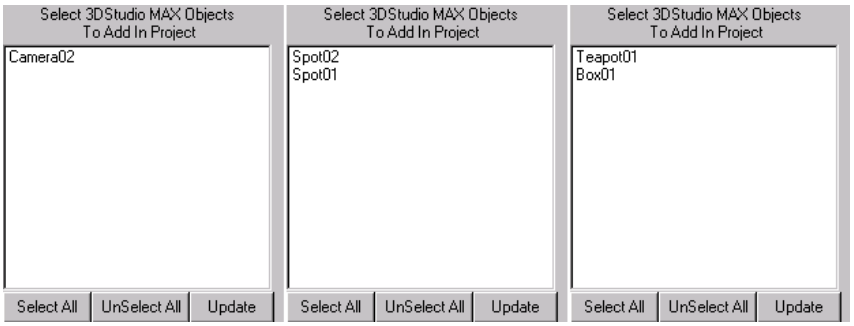
Import Lights, Cameras, and Objects from MAX procedure
You can import lights, cameras and objects from 3D Studio MAX into the current World Builder scene.

1. With both World Builder and 3DS MAX running, select the MAX Communication Object from the Object Tree.
2. Select the MAX Objects Property from the Property Tree

   The Update All MAX Objects button appears in the Property Page.

3. Select either MAX Cameras, MAX Lights, or MAX Meshes.

   The corresponding Property Page appears with an object list and Select All Unselect All, and Update buttons.



4. Click Update to make sure that all objects available from MAX are in the list.

   The list is updated.

5. Select the item or items that you want to import, the click Apply.

   The selected objects are imported from Max and appear as children of the MAX Communication Object.

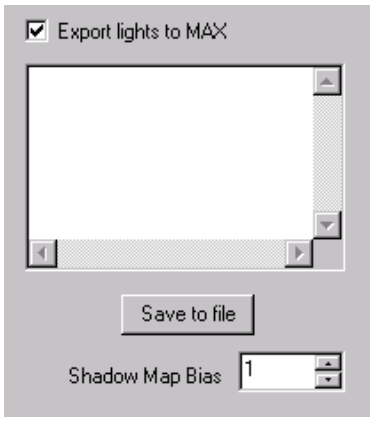
NOTE: It is very important to maintain Object Names once communication has been established. Changing the names of Imported/Exported objects in either program can produce unpredictable results.

Export lights & Shadow Maps to 3D Studio MAX procedure

You can create shadow maps in World Builder and save them to file. You can then choose to export these shadow-mapped lights to MAX, then load the shadow maps into these lights so you can project shadows from World Builder objects onto MAX objects. Alternatively, you can choose to create World Builder Support Lights in MAX and load the shadow maps into these lights.

1. In World Builder, select the MAX Communication Object, then select the Lights Export Property.

   The Lights Export Property Page appears.



2. Click to check Export Lights to MAX.

   The lights in the World Builder scene that appear in the list are automatically exported to Max.

3. Tag the lights in the list that you want to create shadow maps from.

4. Click Save to File.

   The Select Files to Save File dialog appears.

5. Choose a path and file name and click Save.

   The Shadow Map is saved to file. The Map Bias setting mirrors the same setting in Max lights, and offsets the shadow from the object casting the shadow.

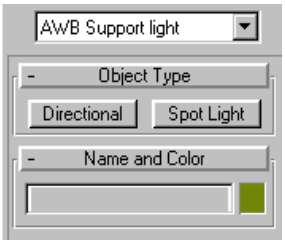
You can cre
Directional or S
AWB Sup
Lights in 3D

Create AWB Support Lights in MAX procedure

1. In 3D Studio MAX, click the Create tab, then choose Lights.

2. In the Lights panel, select AWB Support Light from the drop down list.

   The AWB Support Light Object Type rollout appears.



3. Click either Directional to create a parallel light or Spot light to create a spot.

   The button turns green and sticks.

4. For a Spot Light, click to create the light source, drag to define the distance to target, then release the mouse to create the target. For a Directional light, click once in the desired location.

   The General Parameters and Shadow Parameters rollouts appear. A Spot Light will appear with a yellow cone, and a Directional light will appear as it does in World Builder as a yellow X with a yellow line connecting to the world origin. Also, the Spotlight will have and additional Spot Light rollout with Hotspot and Falloff spinners. The rollouts contain parameters that are common to both AWB and MAX lights, and any unsupported features have been removed.

AWB Support S
and Directio
Lights have sl
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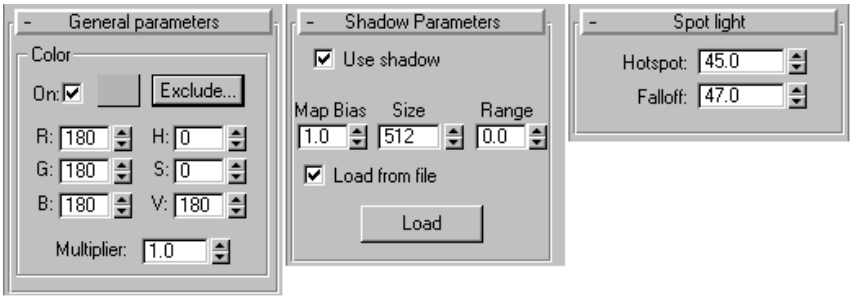
having additio
Hotspot
Falloff contro



5. In the Shadow Parameters rollout, click Use Shadow.

   The Load From File option is now enabled.