World Editor 1.0

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USER'S GUIDE

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INTRODUCTION

Welcome to World Editor, the scenery creation and editing tool for the X-Plane Flight Simulator. World Editor is a radical departure from the previous X-Plane scenery editor, World-Maker. With a major shift in the structure of X-Plane scenery from Version 7 to Version 8, A new tool was necessary to create and edit scenery in a graphical manner comfortable for average users. At the moment, World Editor's capabilities are limited to editing airports only and all those entities contained in the apt.dat 8.50 specification (see reference section). World Editor is currently NOT used for placing objects or editing terrain or terrain textures like ortho photos or photo based scenery. These features will be added at some time in the future.

CHAPTER 1: High Level Concepts

World Editor was designed to take a graphical CAD-like approach to creating airports. Airports are made up of a collection of entities. Each entity is of a specific type, i.e. runway, taxiway, taxi sign, windsock, etc and each entity has a set of attributes. A runway has length, width, surface type, lighting and a taxisign has text and a direction it faces, etc. The toolset of World Editor (called WED from now on) is organized to create and edit each of these entites on an individual basis. For instance, when you add an entity, you then can edit it's attributes and move onto the next entity, or in the case of editing existing entities, you select an entity and then edit it's attributes. Most of these operations are done in an intuitive "drawing" type of methodology. The graphics in the map view will update accordingly as entities are created and edited. Eventually, all your entities together will make up an airport.

WED file vs. apt.dat

X-Plane draws airports by reading a special file called 'apt.dat'. In the past, World-Maker was the tool used for creating airports and editing the apt.dat file directly. WED does NOT use apt.dat files in any way other than importing and exporting them. WED uses a dedicated text file with the extension *.wed to hold all the information about scenery during the editing process. This file is generically referred to as the 'WED' file. When existing airport data files (apt.dat) either Version 7 or 8, are imported into WED, that information is translated into the *.wed file for WED to use. Now since X-Plane only reads the airport data file called 'apt.dat', WED will export to the apt.dat format. The data format for airports changed considerably with the introduction of X-Plane 8.50 and WED will only export apt.dat files in the 8.50 or greater format. Apt.dat files before version 8.50 can be imported into WED for editing, they'll just be converted to the latest format during export.

CHAPTER 2. USER INTERFACE

Figure 1. below shows the interface of WED. The total interface is comprised of 3 primary windows, a status / options bar, a toolbar and the menu commands. Each window is resizable by grabbing the bar separating the windows and dragging them. The MAP WINDOW is the primary window and is were a good majority of graphical editing takes place. The HEIRARCHY window contains a running list of all objects in the WED file, be it runways, taxiways, helipads, taxisigns, or anything else the airport data format supports. The ATTRIBUTES WINDOW is where the attributes of selected objects are displayed and edited.

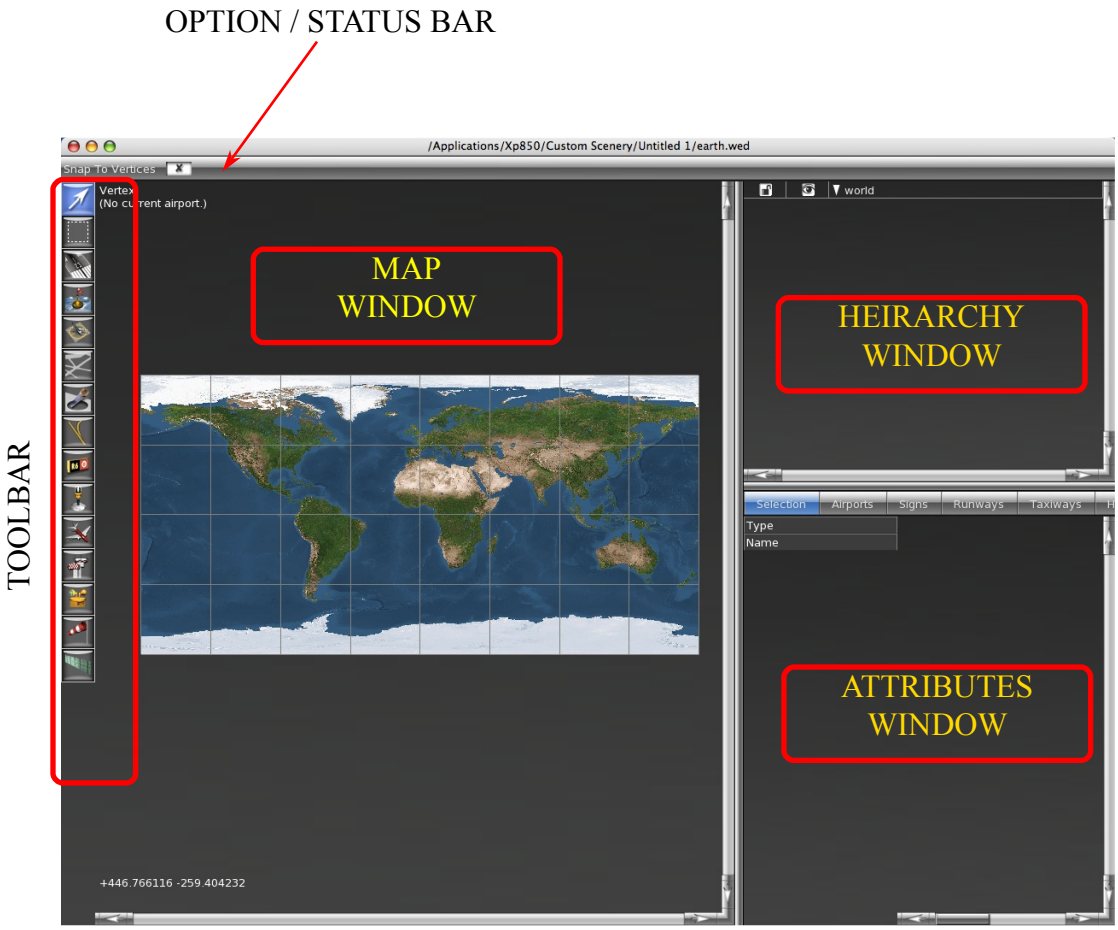
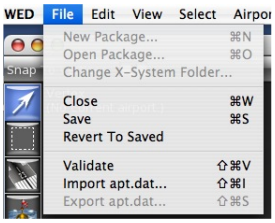


Figure 1. World Editor User Interface

MENU SUMMARY

FILE MENU

. New Package - Creates a new Folder and *.wed file in the custom scenery folder.
. Open Package - Opens an existing *.wed file inside the custom scenery folder.
. Change X-System Folder - Used to select your x-plane root folder.
. Close - Closes the *.wed file
. Save - Saves the *.wed file
. Revert to Saved - Reverts back to the last saved state of the wed file.
. Validate - Checks the WED file for
. Import apt.dat - Imports any version of apt.dat file
. Export apt.dat - Exports data in *.wed file to apt.dat 8.50 format

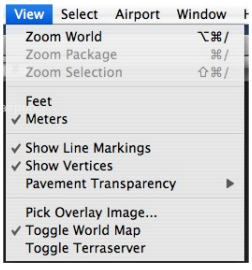


EDIT MENU

. Undo - Undoes last action. NOTE: Some actions cannot be undone.
. Redo - Opposite of "undo"
. Cut - Deletes selected items. Used for text
. Copy - Copies selected items to memory. Used for text
. Paste - Pastes text from the clipboard.
. Clear - Clears an item from the heirarchy. 'Think CUT'
. Duplicate - Duplicates entities in the heirarchy. 'Think CUT and PASTE'
. Group - Groups entities together for moving / rotating, etc.
. Ungroup - Ungroups entities.
. Split - Splits a segment (Adds a bezier point between two selected bezier points)
. Reverse - Reverses the direction of a curve or shape.
. Crop Unselected - Deletes anything that is not selected.
. Move First - Moves selected item to the "top" of the heirarchy
. Move UP - Moves selected item "UP" one level in the heirarchy
. Move Down - Moves selected item "DOWN" one level in the heirarchy
. Move Last - Moves selected item to the "bottom" of the heirarchy

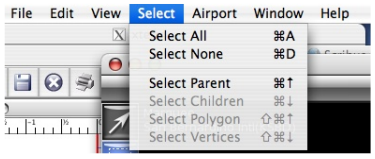
VIEW MENU

. Zoom World - Zooms the graphic window to encompass the whole world
. Zoom Package - Zooms the graphic window to encompass all "entites" in the *.wed file..or "package"
. Zoom Selected - Zooms the graphic window to encompass the selected item
. Feet - Sets the units to be in feet.
. Meters - Sets the units to be in meters.
. Show Line Markings - Toggles the actual markings of a linear feature on/off as opposed to only showing a line
. Pavement Transparency - Sets the transparency of the pavement so you can see the boundaries of overlapping entities
. Pick Overlay Image - Allows you to select a bitmap file to be used as an overlay
. Toggle World Map - Toggles the World Map bitmap on/off
. Toggle TerraServer - Toggles the terraserver image on/off. Images are downloaded automatically with this on.



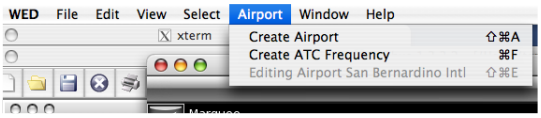
SELECT MENU

. Select All - Selects all entites in the *.wed file
. Select None - Deselects all selected objects
. Select Parent - Selects an objects "parent" based on the heirarchy menu (one level up)
. Select Children - Selects an object's "children" based on the heirarchy in the object window (one level down)
. Select Polygon - Selects the parent polygon of a selected verticie.
. Select Verticies - Selects individual verticies of a selected parent polygon.



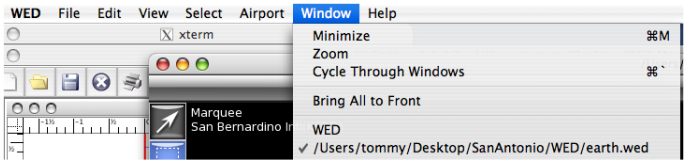
AIRPORT MENU

. Create Airport - Creates a new airport in which to add object to
. Create ATC Frequency - Creates the primary frequency for an airport
. Edit Airport - Used to set the "Current Airport" to be edited.



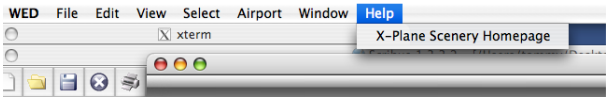
WINDOW MENU

. Minimize - C'Mon now
. Zoom - C'Mon Now
. Cycle Through Windows - C'Mon Now
. Bring All to Front - C'Mon Now



HELP MENU

. X-Plane Scenery Homepage - You should be slapped if you don't know this



TOOL SUMMARY

VERTICIE TOOL - Used to select and manipulate vertices or any type of "point"

MARQUEE TOOL - Used to drag a rectangle to select object OR click on an object to select it. Result is a bounding box

RUNWAY TOOL - Used to graphically add runways, blastpads and displaced thresholds

SEALANES TOOL - Used to graphically create sealanes with buoys

HELIPAD TOOL - Used to graphically create Helipads

TAXIWAYS TOOL - Used to graphically create/edit taxiways via closed Bezier Paths

HOLE TOOL - Used to create/edit "holes" in bezier taxiways

TAXLINE TOOL - Used to graphically create / edit taxiline paths

TAXISIGN TOOL - Used to graphically place/edit taxisigns

LIGHT FIXTURE TOOL - Used to place light fixures such as PAPI/VASI or wig-wags

RAMP START TOOL - Used to locate/place starting points for aircraft

TOWER VIEWPOINT TOOL - Used to locate / place Control Tower "viewpoints"

AIRPORT BEACON TOOL - Used to locate/place Rotating Airport Beacons

WINDSOCK TOOL - Used to graphically add windsock locations

BOUNDARY TOOL - Used to graphically add "fencing" via bezier polygon

3. USING WED

When you launch WED for the first time, you'll see a splash screen similar to the one shown in Figure 2 at right; however, there will be no custom scenery packages listed. You must select "choose x-system folder" and navigate to your root level x-plane folder. WED will then look in your custom scenery folder and list all the custom scenery packages that you have available. This is a one-time step unless you move your x-plane folder, in which case you'll have to relocate it.

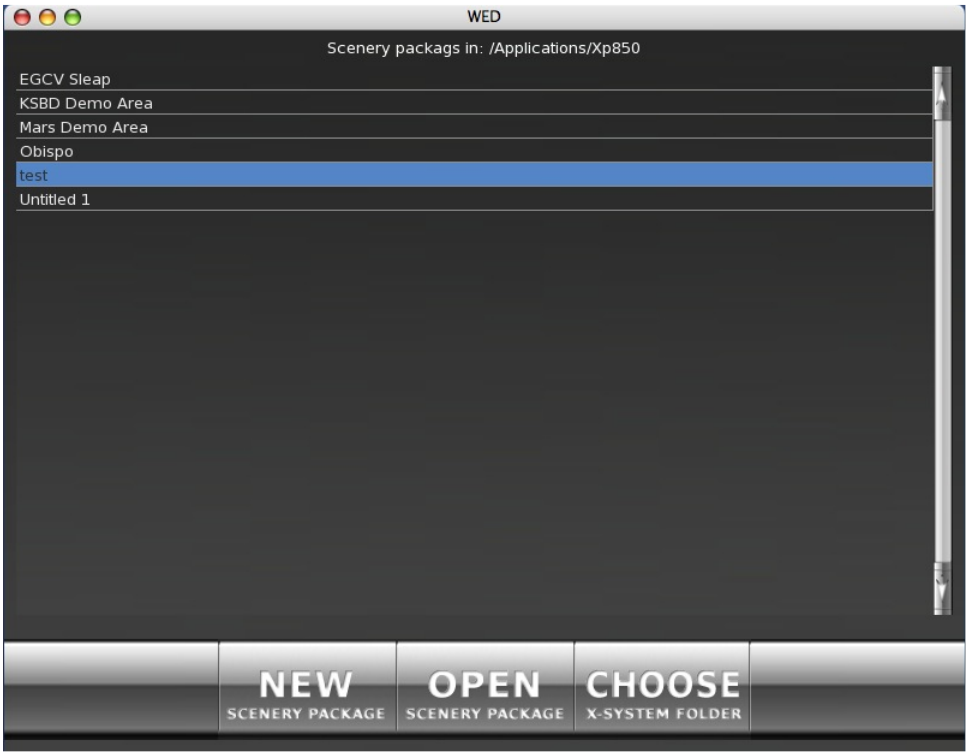


Figure 2. Opening Splash Screen

With the root folder located, You'll now have the option to either select and open an existing scenery package or create a new one. If you opt to select an existing scenery package and open it, WED will create a *.wed file inside that scenery package if one doesn't exist and immediately open it for editing. If you opt to create a new scenery package, then you will assign a name to the scenery package and WED will create that scenery folder for you and then add it to the list of scenery packages. You then select that new package and select "open scenery package" at which point WED creates a empty *.wed file and opens it for editing. Remeber that for now, WED only edits airport data, so even though you a new wed file in your custom scenery, there won't be anything in it until you create something or import something. (More on that later).

CURRENT AIRPORT CONCEPT

Whenever WED creates a scenery package for the first time, there will be no airports in the *.wed file. You can confirm this by looking in the heirarchy window and seeing no entities in this list (See Figure 1.). As such, none of the entity creation tools will work until an airport is created as WED must associate every newly created entity with an airport. Airports are created in WED by two methods. 1.) Creating a new airport from scratch using the "Create Airport" menu command or 2.) Importing an existing apt.dat file. Keep in mind that an apt.dat file can also contain multiple airports, so that if you import such a file, multiple airports will be created in the *.wed file. WARNING: If you attempt to import X-Planes default apt.dat file, you will be attempting to open thousands and thousands of airports Once an airport exists in the world, the airport tools can be used. An important concept in WED is that of the "current airport". Any new entities created will be added to the current airport, so if you import multiple airports into the *.wed file for editing, you want to ensure that the airport you're adding new entities to is the current airport. It is the heirarchy; however, (see below), that ultimately establishes what entity belongs to what airport...so if you happen to create an entity in the wrong airport, you can drag that entity to the proper airport in the heirarchy window.

If you're creating an airport from scratch, the act of executing the "Create Airport" menu command will cause that newly created airport to become the current airport. It will be called "unnamed entity" and you should select it in the heirarchy window and rename it. When you import an existing apt.dat file into an empty *.wed file, it will automatically be set as the current airport. If you import an apt.dat file with multiple airports in it, the first airport in the apt.dat file will be the current airport. The current airport is clearly identified in the upper left hand corner of the map window. To set an airport to be the current airport, you select the airport in the heirarchy window and execute the menu command "edit airport" (CTRL+SHIFT+E). The name of the airport will then appear in the upper lefthand corner of the map window. As a short cut, you can also click on the "airport" tab of the attributes window to quickly display all the airports in the file.

HEIRARCHY

The heirarchy window contains a comprehensive list of every entity within the *.wed file and every entity belongs to a given airport. In figure 3. below, note that the only airport in the wed file is "San Antonio Intl". All the entities listed underneath this belong to San Antonio Intl. Regarding the order of items in the heirarchy, WED will always export in a specific type order at a minimum to keep things working right, i.e. the runway type will be exported first, ATC frequency type last, etc; however, within each type, the order things are listed in the heirarchy will be the order of the export. For example, within the runway type, if you have multiple runways, you can set the order of the runways such that one runway will be on top of another. This also pays dividends when you need for one taxiway to be on top of another. You can grab an item in the heirarchy window and drag it to a new position or you can select an item in the map window and execute the menu commands to move entities up or down. When you use the menu commands to move items up/down, this will be reflected in the heirarchy window. The easiest method though is to drag items in the heirarchy window. You can also drag an entity from one airport to another in the heirarchy window...which is very helpful if you accidentally create an entity at the wrong airport. You may select any entity by clicking on it's name in the heirarcy window.

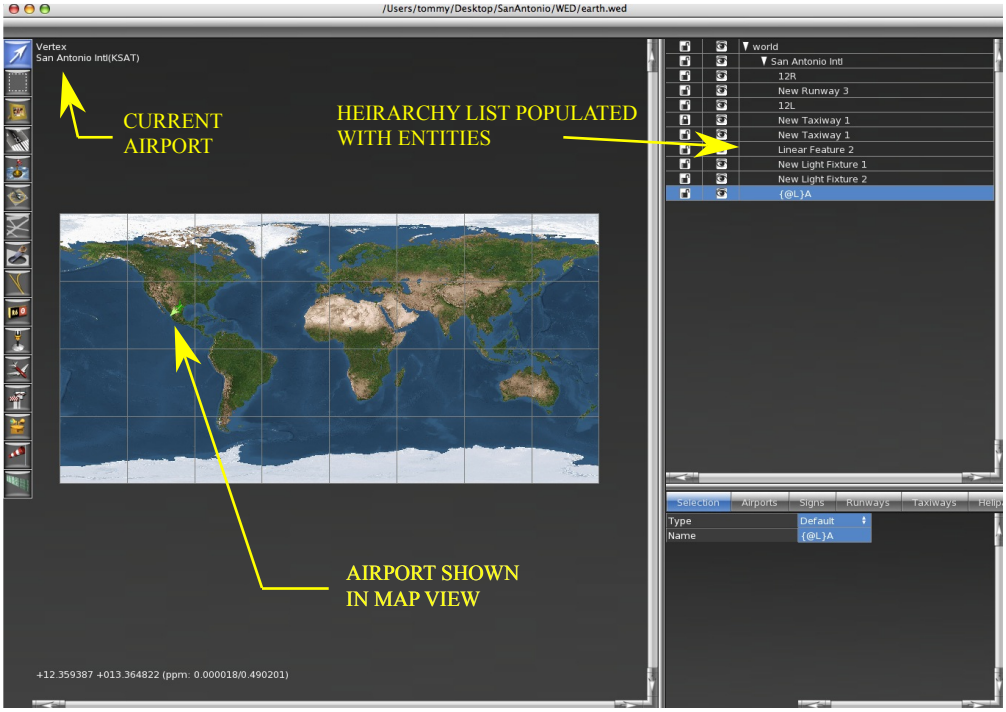
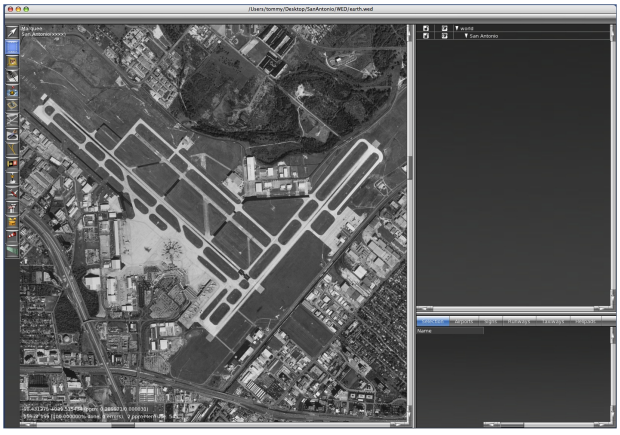


Figure 3. WED after importing existing apt.dat file

USING TERRASERVER (U.S.A. Only)



Using Terraserver images for reference couldn't be easier. Just execute the menu command " Toggle Terraserver" and the images will be automatically downloaded and displayed in the background a la Google Earth. You need to be reasonably zoomed in to display the images, so don't zoom out to encompass the whole USA and expect to see the terraserver images. As you zoom in though, they'll load and display automatically. If you have a slow internet connection or stone age computer, you'll have to be patient.

4. TOOL USE

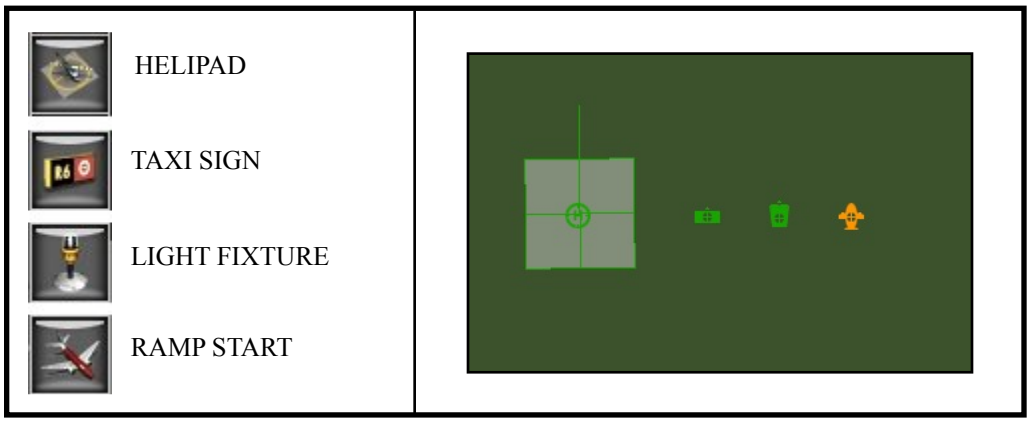
Because the WED tools can be classified as one of three types as outlined below, this section presents tool use based on type rather than giving a tool by tool explanation. The methodology used by one type of tool can also be applied to other tools of the same type. The three types of tools are:

1.) POINT TOOLS
2.) LINEAR TOOLS
3.) BEZIER PATH TOOLS

Before we begin, some consistent terminology needs to be clarified:

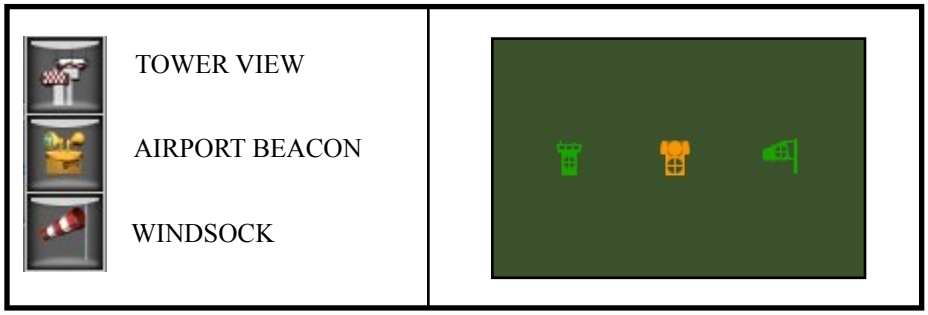
Single Click - A single click in the map view, the mouse does not move during the click
Click-Drag - Pushing the left mouse button down and then moving the mouse while the left button is held down.
Double Click - C'mon now!

POINT TOOLS - DIRECTIONAL

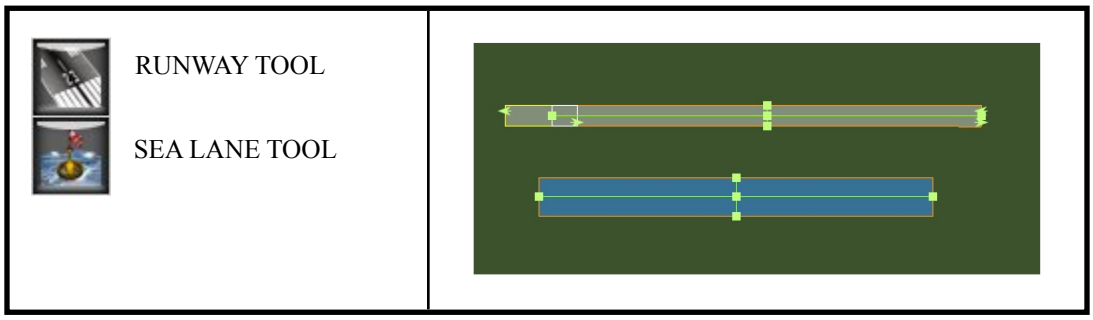


A directional point tool, when used, will allow you to place an entity and set it's direction by click-dragging when placing the entity. Directional point entities are characterized by a heading indictor on the symbol in the map view, except in the case of the ramp start tool...which is a little icon of an airplane. If a single click with no dragging is used to place a directional entity, the entitiy will be placed with a heading of 0.00 degrees. The heading can be changed by either 1.) Selecting the entity and typing a numerical heading in the attributes window or 2.) Using the vertex tool to select and graphically rotate the entity by grabbing and moving it's heading arrow. Non directional entites are simply placed by clicking in the map window where you want the entity to be. Each type of entity has it's own set of unique attributes viewable and editable in the attributes window. NOTE: The orange entities shown indicates that the entity is currently selected and can be edited in the ATTRIBUTES window.

POINT TOOLS - NON DIRECTIONAL



LINEAR TOOLS



2.) LINEAR TOOLS

A linear tool is defined by two points. The two linear tools are runways and sealanes. Placement of linear entites can be accomplished with either 1.) two single mouse clicks, one for each end of the entity, or 2.) a single mouse click to establish one end and then click-dragging the second end graphically. If you click-drag for the first point of a linear entitiy, a little cross hair cursor will appear which can then move around for exact placement of the first point. Releasing the mouse button will then allow you to click for the second point or click-drag with a rubberband line.

RUNWAY: While all runway attributes can be set numerically in the attributes window, there's a graphical method to set the blastpad length and/or a displaced threshold. When the runway is selected AND the verticie tool is selected, there will be two small triangles at the end of each runway. (See screenshot above) Simply click-drag these triangles to set the length of the blastpad/displaced threshold attributes. Since the blastpad and displaced threshold distances are usually very specific numbers, it would probably be better to type the value into the proper field in the ATTRIBUTES window.

BEZIER TOOLS


TAXIWAY TOOL


HOLE TOOL


TAXILINE TOOL


BOUNDARY TOOL

The bezier toolset of WED are used to create freeform shapes. These shapes are commonly called bezier curves or bezier paths, but all the names are acceptable and refer to the same thing. Drawing bezier shapes for the unitiated may seem a bit foreign, but you'll get the hang of it with some practice. There are some important concepts to know in order to successfully work with bezier shapes. The first is that a bezier shape may be opened or closed. Figure XX below shows an example of open and closed bezier paths. In WED, the closed bezier path is used for the taxiway tool and the hole tool. The open bezier path is used for the taxilines and airport boundaries. A closed bezier path is also called a "ring". This term will make more sense when you use the TAXIWAY tool for the first time. Another important concept is that a closed bezier path may not cross over on itself. Figure XX shows two closed bezier paths. You'll notice that the path that crosses over itself has no fill (is not solid), so make sure your bezier paths do not cross over themselves. Now in order to learn and work with bezier paths, you need to know the pieces that make a bezier path. Figure XX shows the primary parts of a bezier path. The most fundamental part of the path is the NODE. In WED, these are represented by the round 'dots'. Attached to these nodes are CONTROL HANDLES. A node can have 0, 1, or 2 control handles. The control handles have triangles on the end of them. The path between the nodes are called SEGMENTS. The location of the control handles determines the shape of the segment between the nodes. For example, two nodes with no control handles would have a straight segment between them. All the segments together make up the bezier path.

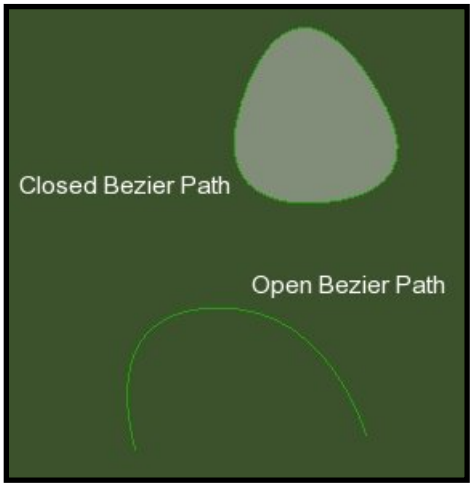


Figure 1. Open & Closed Bezier Paths

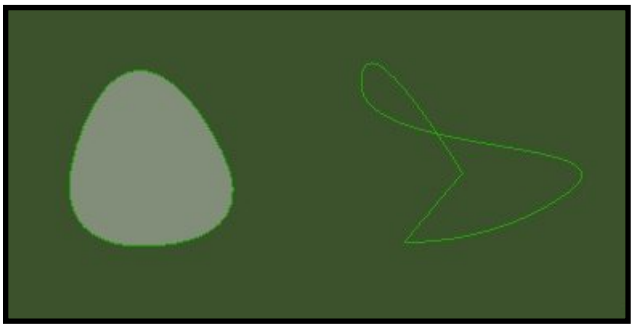


Figure 1. Open & Closed Bezier Paths

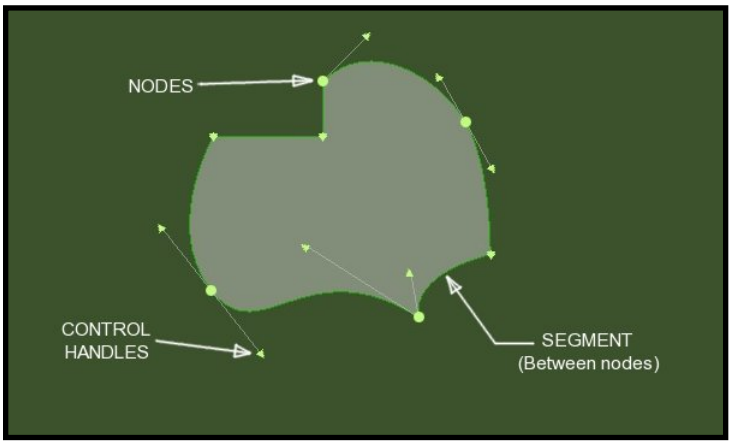


Figure 1. Parts of a Bezier Path

A NODE can have four possible configurations with regards to control handles. Figure XX below shows the possible configurations.

PLAIN NODE:

A plain node has no control handes and is primarily used for sharp corners. It is represented by an upside down triangle.

SINGLE HANDLE NODE:

BEZIER TOOLS

A single handle node has a control handle on only one side of a node. It is generally used at a node where the segment on one side of the node is straight and the segment on the other side is curved.

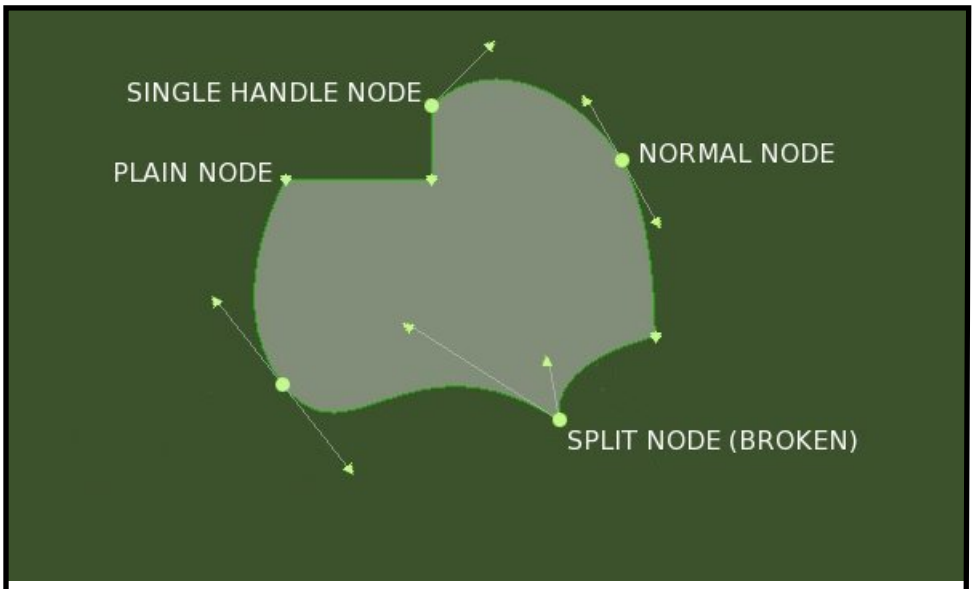


Figure 1. Parts of a Bezier Path

NORMAL NODE:

A normal node has two control handles which are exactly opposite one another. Moving one control handle causes the other to move also. The lengths of the control handles will always be the same length also. This is a common node to use in the middle of a curve.

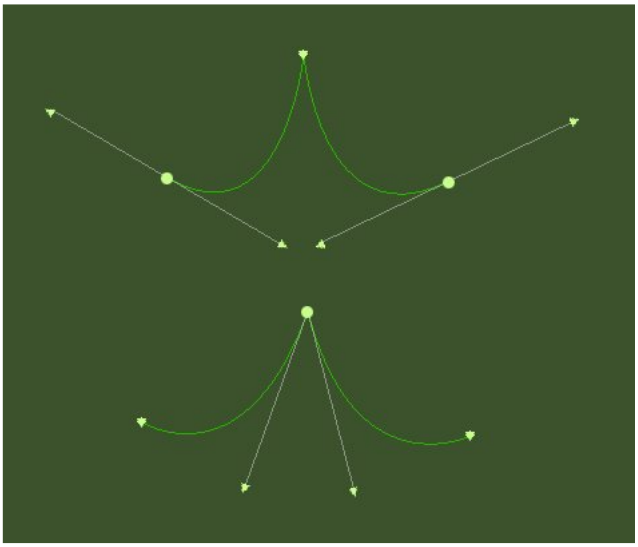
SPLIT NODE:

A split node is also called a "broken" node. A split node has two control handles but each handle can be moved independently of the other. Moving one handles does not cause the other to move. The control handles may also be different lengths. If you have a situation where you need the control handles to be exactly opposite of one another but you need one handle to be longer than the other, then a split node is the solution.

CREATING SHAPES:

With the knowledge of the four node types, the next step is then to string together those nodes and control handles in such a way as to create the shapes you want. A bezier path is created by selecting a bezier tool, either the taxiway or taxiline and adding a node for each click or click-drag operation. A bezier path may have as many nodes as needed to create the shape. There are two ways to "complete" or finish the shape. 1.) Double click to create the very last node or 2). Change to another tool, in which case the last node you added will be the last point. Once the shape has been completed, you can edit it with the verticie tool.

It is very common when drawing with bezier paths to work with all the node types. There is no one particular way to draw a path. Figure XX below shows two similar shapes drawn with different combinations of nodes. With a little practice, you'll soon get the feel for how you want to create your shapes.



IMPORTANT: When drawing curves, it is extremely common to convert between node types while in the middle of drawing a path. When in the process of drawing a path, you may only create plain nodes (by single clicking) or normal nodes (by click-dragging). You must place either of these two types of nodes first and then you may CONVERT them to plain or split nodes and then continue on drawing the path. Note that you cannot convert a node to a single handle node while in the act of creating a path. Once a path has been completed, you can convert between all the types. You convert from one type of node to another by using the modifier keys, that is the SHIFT, CTRL and ALT keys in combination with single clicks or click-drags. The table below shows the keystroke combinations to

BEZIER TOOLS

convert between the various node types. It just takes a bit of practice to get comfortable with the process.

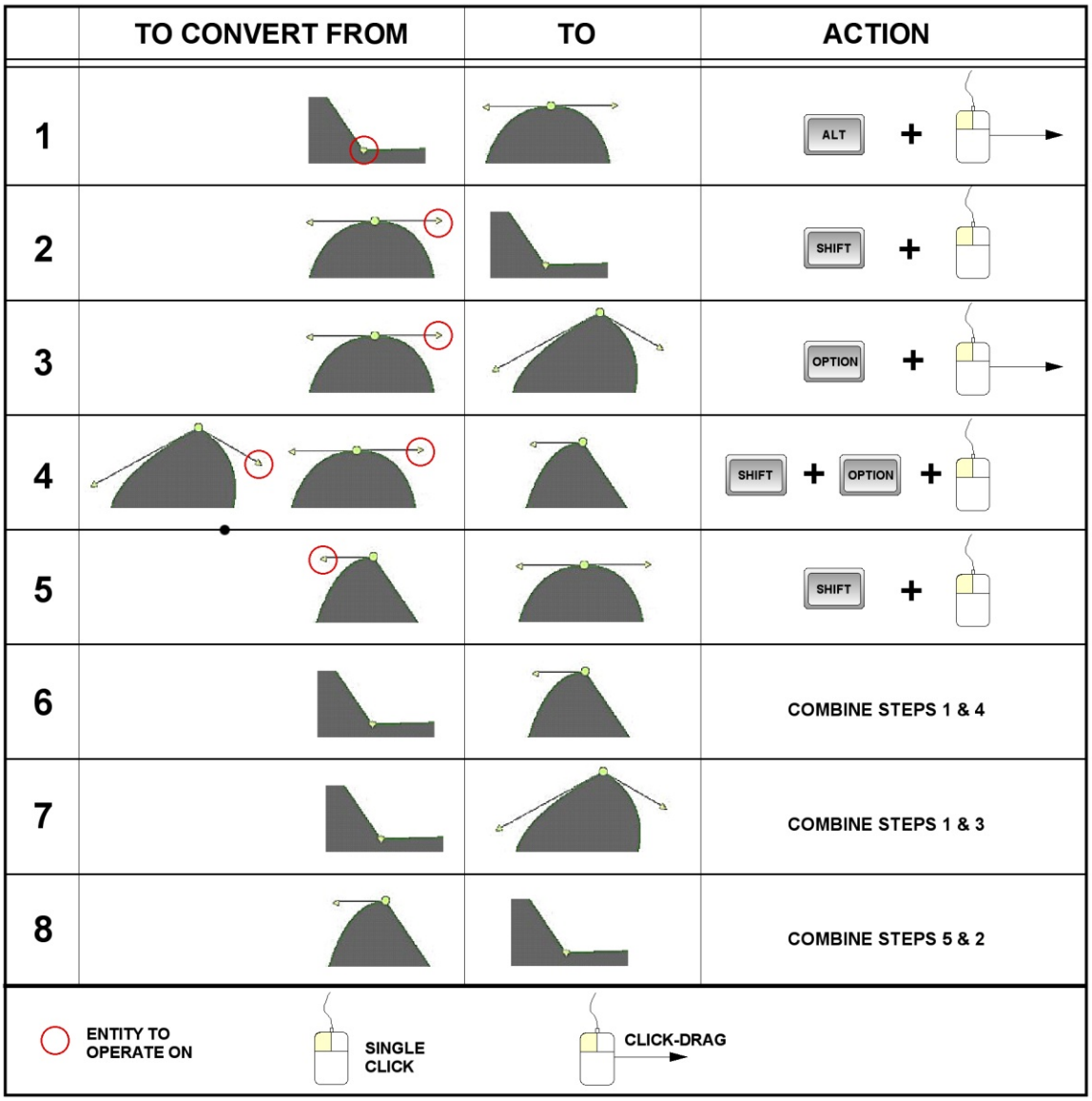


TABLE 1. Keystrokes and Mouse Actions for Converting between Node Types

5. MARKINGS & LIGHTING

Once you have your shapes created for taxiways, taxilines, hold shorts and the like, you'll need to add markings to them. Markings come in two varieties. 1.) Perimeter markings around the outline of taxiways and 2.) Overlay markings, like taxilines, ILS and hold short markings. Note that whenever you select a tool that supports markings i.e. the taxiway and taxiline tools, you'll notice some options appear at the top of the MAP window. One of these options are markings. When you select a marking in this pull-down menu, that marking will be applied to that tool until you change it. So if you were going to draw taxilines, you'd select the taxiline tool, then set the Markings to Double Solid Yellow (Black) and begin drawing the shape. You can; however, draw the shape first and add the markings later. This is easily accomplished by selecting the entity, with either the verticie tool OR the marquee tool, then going to the ATTRIBUTES window and setting the line attributes or light attributes or both. When you do this, the markings will be applied to the entire shape. This is generally not what is desired though and you'll need to remove the markings from some of the segments.

In the previous section we stated that a segment is a line or curve between two nodes and that a path is composed of as little as one segment or as many as you care to add. Markings and lighting in WED are applied to the shapes and curves on a "per segment" basis. When you apply markings to a whole shape as described above, WED is actually applying the markings to all the individual segments at once. So if a taxiway shape is made of 50 segments, then the markings are applied to all 50 segments in order to have a continuous marking around the shape. The implication of this is that you can select individual segments and remove the markings from those segments, or converesely, add new or different markings. Since you cannot select a segment directly but only select verticies, a basic understanding of segments is needed to create exactly what you want.

When a bezier shape is created, WED keeps track of the order the nodes are added and each node is given a number. Figure 4 below shows the nodes and their corresponding number. NOTE: WED does NOT display the numbers of the nodes in the map view, you must select a node to see it's ID number in the attributes window. The white numbers were placed on the drawing for illustration only.

To apply/remove a marking to/from a segment, you select the node at the beginning of the sement. For example, if you want to have a solid yellow line (or any marking) on the segment between nodes 2 and 3, you would select the beginning node, node 2. Once the node is selected, it will appear in the attributes palette and you can apply a marking or lights using the pull-down menu in the "ATTRIBUTES" row and that marking will be applied to that segment. Figure 05 on the following page shows the pull down menu of markings and you can also find a graphic guide to markings in the reference section. Note that you can not only

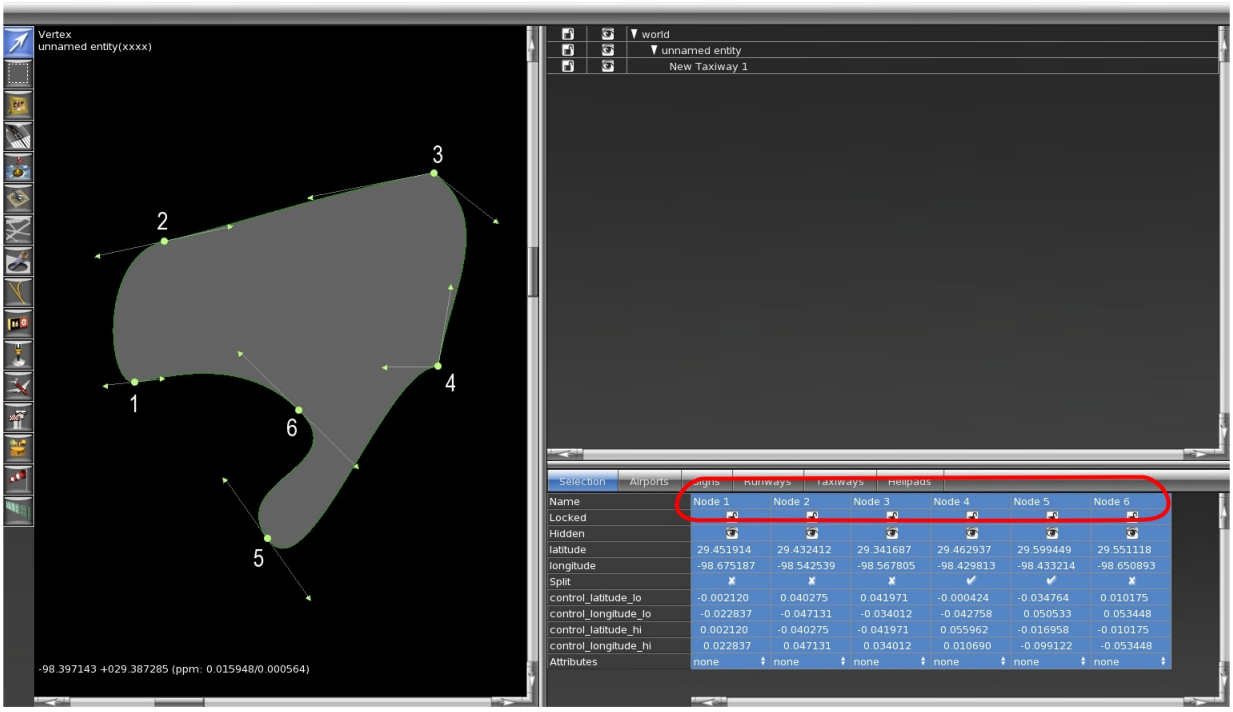
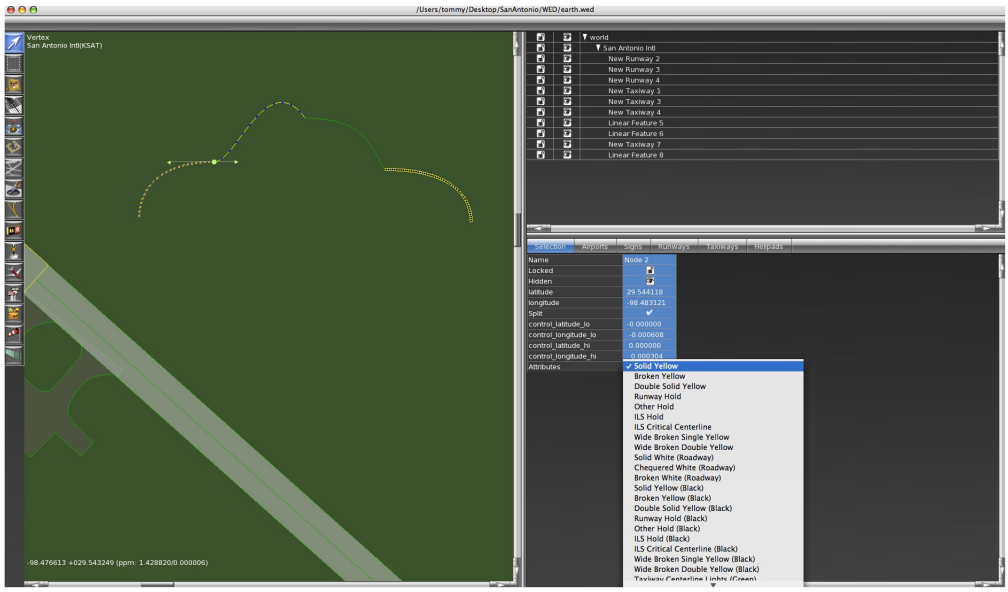
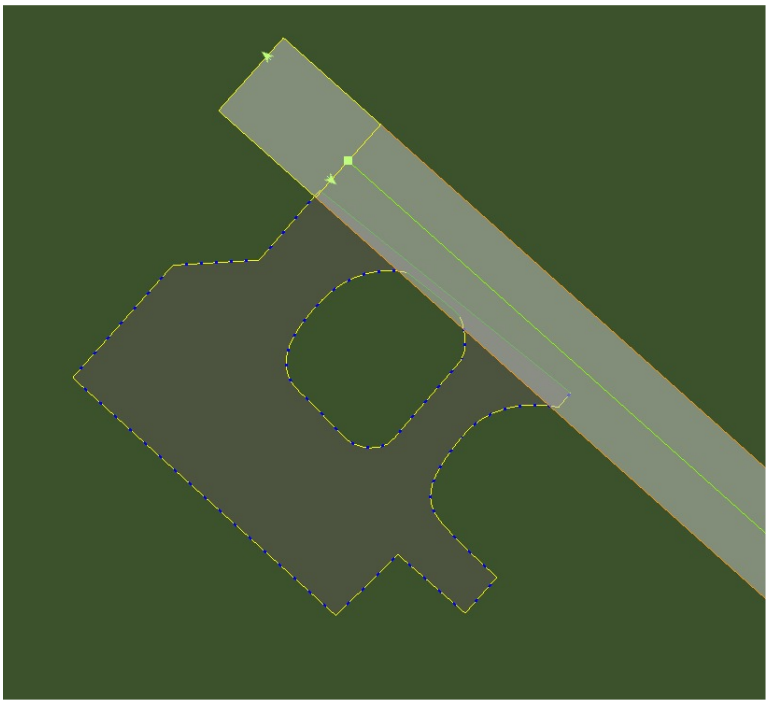


FIGURE XX. Node ID Numbers

apply a different marking to every segment, but that you can put markings on top of one another. When you use the pull-down menu of markings, you'll see check marks that indicate which markings are applied to that segment. This is a toggle setting so you select an item to apply a marking and then you select it again, to remove it. There are several tips and tricks to be used when setting markings. See the tips and tricks section.



In the path shown above, Node #2 was selected and then the "SOLID YELLOW" marking was applied. Also applied was the blue taxiline lights (not visible in the pull down menu). The other segments had various markings applied to them also.



In the figure at left, The "SOLID YELLOW" marking was applied to all the segment as was the "BLUE TAXILIGHTS". Then the segments underneath the runway had the markings andl lighting removed so they would not show on top of the runway. It is helpful to place nodes at locations where markings and lighting will end. The particular taxiway shown here is a drawn sloppy and would show markings and lighting partially on the runway. The nodes should just be against the edge of the runway..or very slightly overlap to avoid "cracks" in X-Plane.

TAXI SIGNS

As stated earlier, a taxisign is simply a directional point entity. Place the sign, rotate it to which way you want it facing. The only attributes that you will probably set are the sign size and the name of the sign, which controls the content. The contents of the sign are set in the ATTRIBUTES window in the "NAME" field. The specification for setting sign content comes from the FLIGHTGEAR open source project and a copy of that specification and instructions can be found in the REFERENCE Section.

6. TIPS, TRICKS, MISC INFO.

PARENT-CHILD:

Entities as a whole are called parent entities, for example...a runway, a taxiway, or a taxiline. The components that make up those parent entites are called "children". The nodes and control handles are the children of the parent shape. This is relevant for 2 reasons...1.) Because you can select either parents or children depending on what you want to do and 2). The ATTRIBUTES window displays different information based on whether the parent or it's children are selected. When a parent is selected, it will be oulined in orange and the ATTRIBUTES window will only show one column of information. When the children are selected, the object will be outlined in green.

The reason this is important is that let's say you want to add markings to all the nodes of a 50 node taxiway. If you select the taxiway in the heirarchy window with the verticie tool selected, you will see all the nodes and control handles highlighted, but the outline will be in orange. So if you go to the ATTRIBUTES window looking for the markings pull-down menu, it wont be there. You must select the children (or verticies) in order to have the ATTRIBUTES window update and show information for every node in the curve. There's two ways to do this. 1.) use the menu command "Select Verticies" with the parent entity selected or 2.) Use the keystrokes, SHIFT + COMMAND + Down Arrow with the parent entity selected. When you do this, the outline of the shape will turn to green. Seleccted objects in the heirarchy window will ALWAYS select the entity at the "parent" level. This parent/child relation holds for runways, sealanes, Taxiways, taxilines, holes, and boundaries. You should experiment with the parent/child relation for each of these entities and note the changes in the MAP and ATTRIBUTES window.

SELECTIONS:

All the talk about parent-children...what's the deal? Well if you do your selecting of entities graphically in the MAP window, you'll have to pay attention to what you're selecting. For instance, if you single click on an entity with the verticie OR Marquee tool, you'll select the parent..and see the orange outline, BUT, if you click-drag a rectangle around that same entity with the verticie tool, you'll select the entity at the "children" level and see the green outline; however, If you click-drag a rectangle around an entity with the Marquee tool, you'll select the parent. You can, of course, go between the two levels as outlined above.

The marquee tool, when used to select entites, will result in a bounding box, which you can then move and scale. To move an entity with a bounding box around it, click-drag the dot in the middle of the bounding box. You can click-drag on any of the other dots of the bounding box to scale the entity.

SETTING ATTRIBUTES AT THE SAME TIME

The reason we went over parent/child and selection issues is that they both need to be understood in order to achieve our real goal of setting attributes in bulk. If we have a taxiline made up of 50 nodes that needs markings, we want to apply the Yellow and black taxi markings to the whole path at once. But if you select the parent entity (orange outline), you have no opportunity to set the markings. Select the children as outlined above so that you see all the nodes in the ATTRIBUTES window. You then apply the markings using the attributes pull-down for ANY node WHILE holding down the ALT key. When you do this...every node in the entity will be set to that attribute and the entire shape will have that marking. You can then

remove markings for the segments you don't want as outlined in the MARKINGS chapter.

SNAPPING TO POINTS

WED does not currently snap to points; however, using the method in the previous paragraph, we can workaround the issue to make sure points are exactly on top of one another. Let's say you want to snap node 1 to node 2, that is node 2 doesn't move. Select node 1 and 2 with the verticie tool. You'll see these two nodes in the attributes pallette. Click on the latitude of node 2 like you're going to change the value, the field will highlight white with a blinking cursor. Then hold down the ALT key and hit ENTER. When you do, the latitude of node 1 will be set to the value of node 2. You then do the same thing with the longitude and the two points will share exactly the same value. That is what the ALT key does when changing (or entering) attributes, it sets all nodes selected to that value. This can be handy for any PROPERTY in the ATTRIBUTE window.

MISC INFORMATION

. WED has 20 levels of UNDO
. Selection is undoable, that is whenever you select anything, it's like putting up a brick wall on anything you did before the selection.
. There is no undo for text editing, so type accurate or type it again.
. The DELETE key will "back up" while creating a bezier shape...so if you place a bad node, hit the delete key to erase that last point.
. SAVING the file does not purge undos, you may save and still undo; however, quitting the program certainly does :-)