



PART 23

ANCHORS

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1 Anchors - Access

1-23 ANCHORS

[How do I get this toolbar?](#)

You can also acquire access to these commands from the **Alternate Design** pull-down menu. From the **Design** pull-down menu, pick **Layout Tools and Anchors>** and cascade to their respective command options - see image below, right.

Illustrated to the right is the **Anchors** toolbar but I also show the Layout Tools and Grids toolbars because these are all Objects that Anchors have been designed for.



Anchors pull-down menu

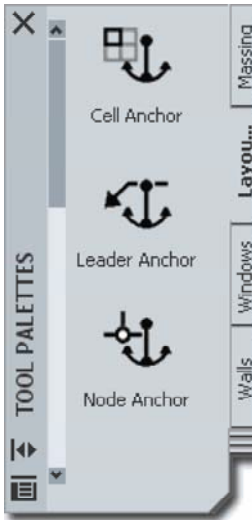
Alt. Menu **Design> Layout Tools and Anchors>**



Keyboard **Anchor** or CurveAnchor, LeaderAnchor, etc.

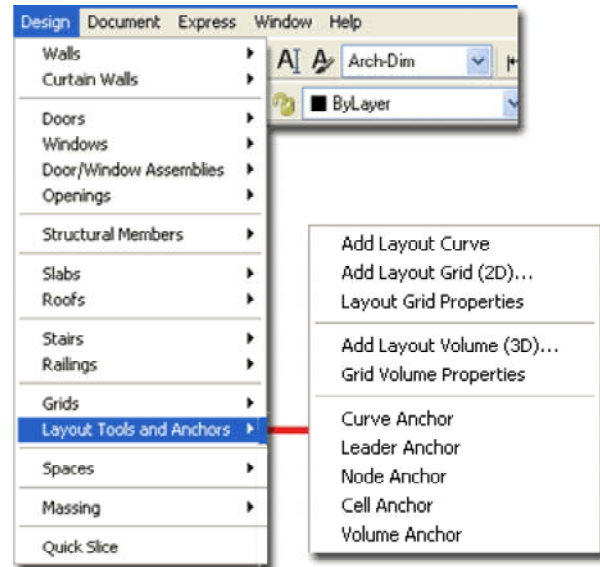
Links [Adjusting to the New Interface for AutoCAD and ADT Users](#) for how to activate the Design pull-down menu

[Content Browser](#) - for how to populate your Tool Palette from the **Stock Tools Catalog** illustrated left.



Anchors or anchoring is something you have probably already worked with whether you were aware of it or not. Many of the Objects in ADT that behave in "intelligent" ways, owe some of their "intelligence" to anchors. The fact that Door and Window Objects automatically "glue" themselves to Walls (and not just Walls but bases of Walls) shows what Anchors can do for you. You can, for example, release the Wall Anchor on a Door or Window Object to have the object as a free form in space (I like to refer to this as free-floating an Object). Most Anchored objects can be released through the Release Anchor option on the Context pop-up menu; i.e., select an object, right-click on your mouse and look for the Anchors > option (see below right).

Though many Objects in ADT use Anchoring as part of their function, those Anchors are not necessarily equivalent to the Anchor Tools and though you know, for example, that a Door has an Anchor, you can't use any of these Anchor tools to work with it.



The Primary purpose for the Anchor Tools is to work with the Layout Tools (including, of course, Column and Ceiling Grids). This means that if you want to utilize the Anchor tools to their greatest potential, you really need to understand how to work with the Layout Tools and I recommend that you focus specifically on the Layout Curve.

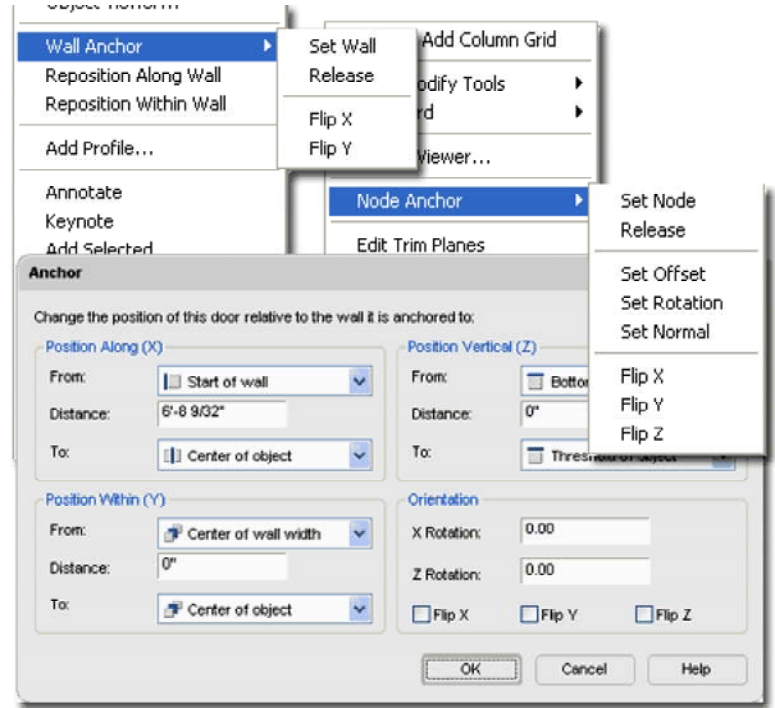
Below is the command line read-out for "**Anchor**":

Command: Anchor
Anchor [Cell/Curve/Leader/Node/Volume/Identify/Release]:

2 Anchors - menus and dialog boxes

Anchors, anchors, anchors everywhere. Illustrated to the right I show three different examples of where you are likely to encounter Anchors. As discussed above, not all Anchors are equal and you should not let me confuse you about the Anchor Tools and Anchors in general but I do want to make you aware that they are virtually ubiquitous in ADT. Having a solid understanding of anchoring whether it is how a Door sits in a Wall or how a Column can be fixed to a Column Grid Node is a big part of mastering Architectural Desktop.

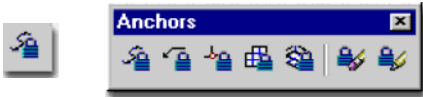
Most users of this program tend to work graphically and often avoid venturing into dialog boxes such as the Anchor dialog illustrated to the right. The problem with this approach and attitude is that some technical problems just can't be solved effectively by working with Grips or other graphical devices. In the case of a Door or Window in a Curved Wall, it can be incredibly difficult to accurately position these Objects along a Curve. Students often get frustrated in my classes as they observe an Object bounce to one side or another but never right to the location they want; even when using OSNAPS. If you Select an Object that is Anchored to something like a Wall, you should find the Anchor dialog on the Properties Palette for the Anchored Object. By working with the various Position settings on the Anchors dialog, you can take extremely accurate control over where Objects reside.



2 Working with the Curve Anchor

Curve Anchors

Alt.Menu **Design> Layout Tools and Anchors> Curve Anchor**



Keyboard **CurveAnchor**

Links [Entity Properties - Layout Tool - Component Layers](#) - for how to turn ON or OFF the Node markers and change their Size
[Layout Curves](#) - for more options using a similar concept.

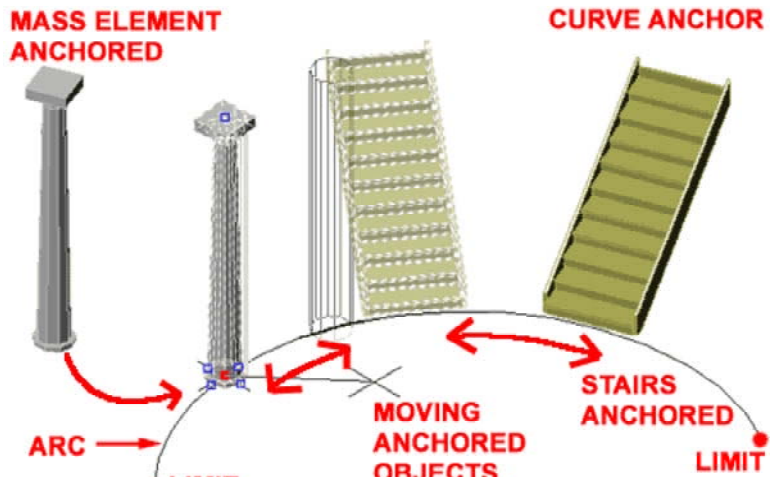
The **Curve Anchor** is arguably the **most powerful** in this suite of Tools because it offers the option to Anchor just about any ADT Object to nearly every other type of Object; from Lines, Arcs, Circles and Splines to Doors, Walls and Grids. I haven't tested all of the various Object Types in ADT but most Style Based Objects can be Anchored with this Tool. Multi-View Blocks can be Anchored but regular AutoCAD-like Blocks cannot. In fact, no AutoCAD-based Object can be Anchored but a clever user might simply convert a Regular AutoCAD Block into a Multi-View Block in order to Anchor it (if needed).

When using this tool, you may find that some Objects get spun around a bit and will require adjustments to their Orientation. This is particularly obvious with Structural Members whose Normals are not the same as that of other Objects. In fact, I cannot recall if I ever figured out how to reorient Structural Members when Anchored with the Curve Anchor - see [Layout Curves](#) for a better option to avoid this problem. For other Objects, reorientation should be a simple matter of working with the X, Y and Z Positions or Rotating. Usually you can access the Anchor dialog via the Properties Palette to make changes after Anchoring.

Note:

Though the prospect of using this tool to Fix the problem with Tags that don't follow their parent Object seems quite plausible, the action destroys the original anchoring and thus dissociates the Property Set Data that is fundamental to using Tags in Schedules. I state this with disappointment because I tried it with Door and Window Tags and was quite pleased to find how the Tags moved with my Objects but then discovered that I had lost my Data.

2-23 ANCHORS



In the illustration above, I show a common AutoCAD Arc used as the subject of working with the **Curve Anchor**.

To Anchor an object to a Curve, pick the **Curve Anchor** button, type **AT** on the command line, **select your object** to be anchored and then **select your Curve** (Line, Pline, Arc, Door, Window, Wall, Stair, Roof Slab and so on).

Command: **_AecCurveAnchor**

Curve anchor [ATtach object/Set curve/X position/Y position/Z position/Rotation/set ANchored end]: **AT**

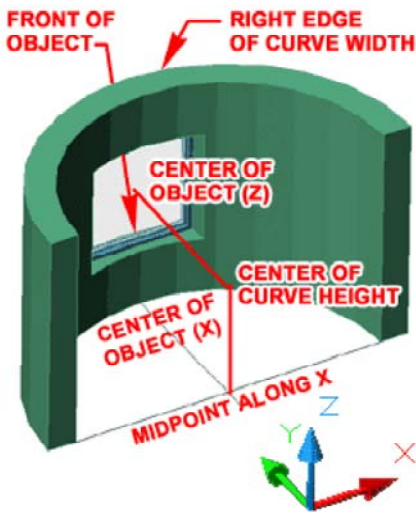
Select object to be anchored: (**pick column** or any other object)

Select curve to anchor to: (**pick on curve**)

Once you have anchored one object to another, they will behave much like a Door or Window in a Wall. In the illustration above, for example, I show that you can **Move** these Anchored objects and they stay glued to the Curve within the Curve's limits. I also illustrate, to the right, that you can use **Grips** (see column), but **be careful** because on many objects, using Grip Stretch actually moves the Anchor relationship. You can use the Grip Move option to be safe.

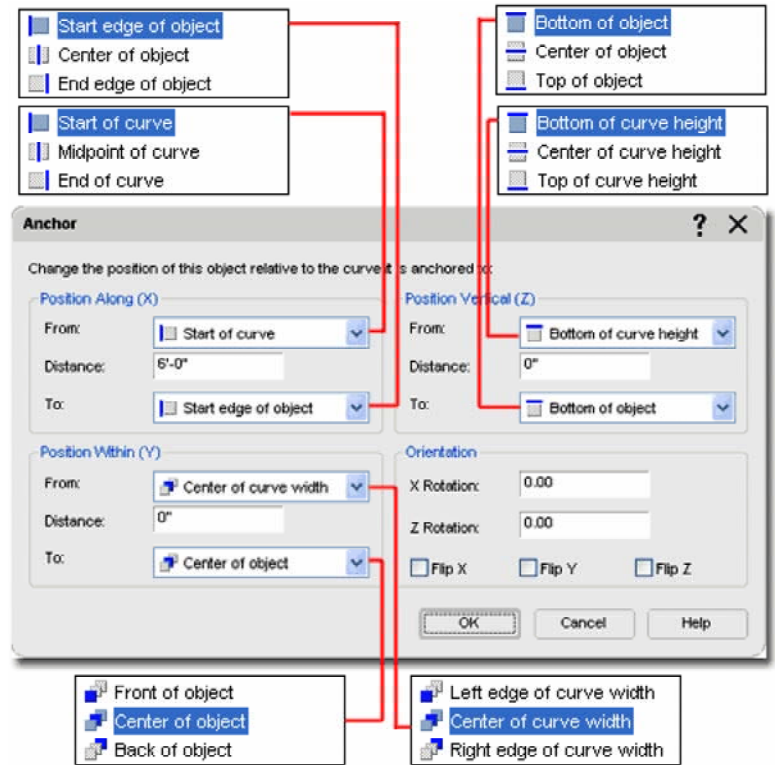
Curve Anchor dialog

Illustrated to the right I show the **Anchor dialog** that you will see when using the Curve Anchor option. Of all the Anchor dialog boxes, this one holds the greatest number of options and settings and is the one that you are most likely to encounter when working with other Objects in ADT; such as Doors, Windows, Walls and so on.



Each of the three **Position** sections offer three similar position controls. The "From" drop-down list relates to the target of the Anchor while the "To" drop-down list relates the Object being Anchored. By working with the Distance value field, you can be very specific about where an Object is positioned relative to itself and the target. As you can see from the illustration to the right, each drop-down list offers three position options that relate to extreme edges or centers of Objects and Anchor Targets.

The Orientation section offers **Rotation** and **Flip** (Mirror) options that can be used to affect the Object relative to the Anchor Target. In some cases when Objects are Anchored, they default into a position and rotation that is different than what you want or expect. This is particularly true of Structural Members.



Notice that you can Rotate Anchored Objects through the **X-axis** and **Z-axis** but not the Y-axis which can prove to be a bit irritating at times and I don't have any work-around solutions for this other than modifying the Object being Anchored but in the case of Windows, for example, that's really not an option. Fortunately Windows are usually parallel to Walls.

3 Working with the Leader Anchor

Leader Anchors

Alt. Menu **Design > Layout Tools and Anchors > Leader Anchor**



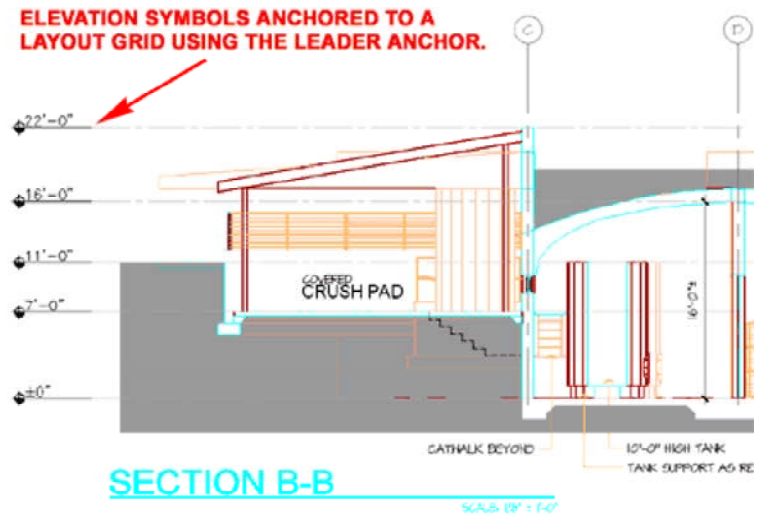
Keyboard **LeaderAnchor**

Links [Entity Properties - Layout Tool - Component Layers](#) - for how to turn ON or OFF the Node markers and change their Size

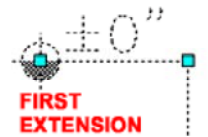
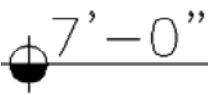
Leader Anchors offer the option to Anchor an Object to a **Node** with a connecting line or "leader". If you combine this feature with the power of the **Layout Curve** which can Add Anchor Nodes to just about any Object, you should be able to come up with some pretty interesting solutions for common drafting problems.

Illustrated to the right I show how I often Anchor my Elevation Datum Points to a **Column or Layout Grid** that I use with 2D Linked Sections and Elevations. The Leader Anchor offers options for controlling the length and position of the leader tail so you can even move it out of direct alignment if space is tight.

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Leader Anchor dialog



Illustrated to the right I show the **Anchor dialog** that you will see when using the **Leader Anchor** option. Unlike any of the other Anchor dialog boxes, this one offers the option to set **First and Second Extension** values for the Leader.

Illustrated to the left I show an example of an Elevation Datum with First and

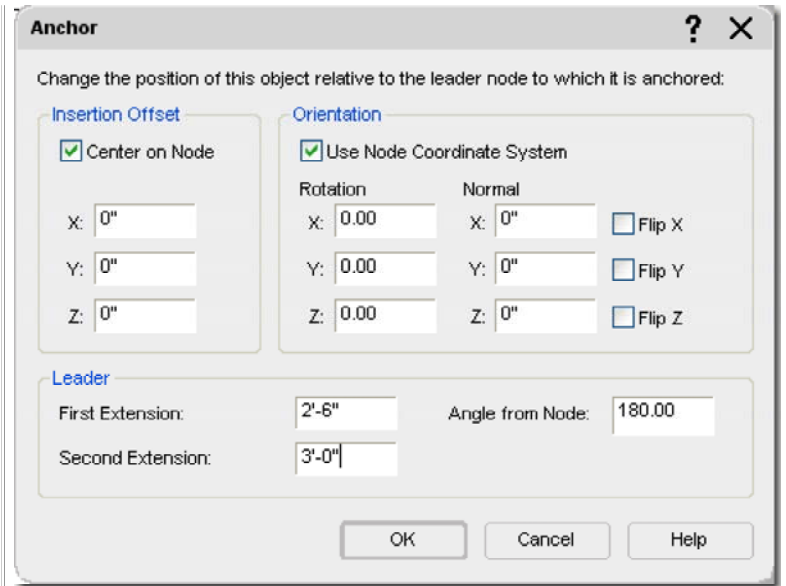
Second Extension Values. A straight leader has no Second Extension value but a bent one has two values as illustrated left and on the dialog, right.

Insertion Offset

Whether or not this checkbox is on, seems to make no difference in this case. Working with the X, Y and Z values will allow you to move the start point of a leader line out and away from a Node.

Orientation

For most Plan (top) work with Grids and Anchored Objects, you probably will not find the need to work with other coordinate systems or unique Normals. Rotation about each of the three axis points provides the option to control the position of the Object being Anchored and should not be confused with the Angle from Node value that controls the Leader.



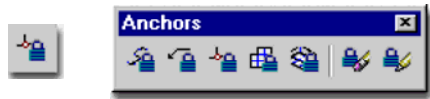
For 3D Volume Grids or Grids that have been Added under non-World UCS icon rotations, you may find the need to uncheck the "Use Node Coordinate System" so the Object being Anchored will align properly with the Grid. Working with Normals (use 1" or -1") offers another method for rotating.

4 Working with the Node Anchor

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Node Anchors

Alt.Menu **Design> Layout Tools and Anchors> Node Anchor**



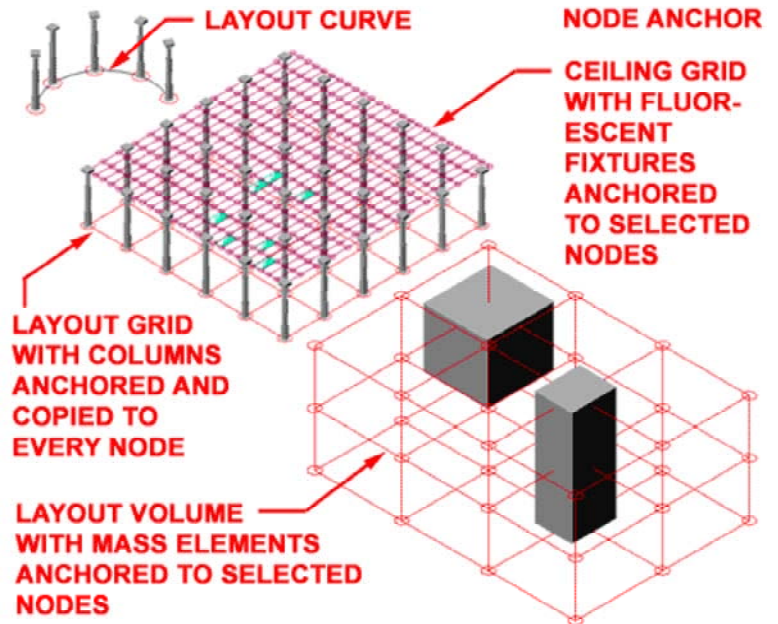
Keyboard **NodeAnchor**

Links [Entity Properties - Layout Tool - Component Layers](#) - for how to turn ON or OFF the Node markers and change their Size

Node Anchors are arguably the easiest Anchor tools to understand because they work on a basic principal of connecting the insertion point of an Object to a Node. If you don't have a Node, this tool will not work. The Column Structural Members uses this form of Anchoring as its default when Added automatically on the Column Grid Properties Palette. Ceiling Fixtures also use this form of Anchoring automatically when you drag them in and Select a point near a Node to Anchor to.

There are three choices for how you can use the Node Anchor to Attach your Object(s): Attach object, Set node and Copy to each node.

Attach object - this one should be easy to understand because it says exactly what it does. You select your object to be Attached and then select the Node on your Layout Tool that you want it Attached to. If you don't have the Node Display Component Visible, you can Select near an intersection.



Set node - use this option to Move or Transfer an Anchored Object from one Layout or Grid tool to another.

Copy to each node - this is just like the Attach Object but with greater impact. As the command states, you will not only Attach a selected object but also copy and attach it to all Nodes on the Layout Tool.

Command: **_AecNodeAnchor**

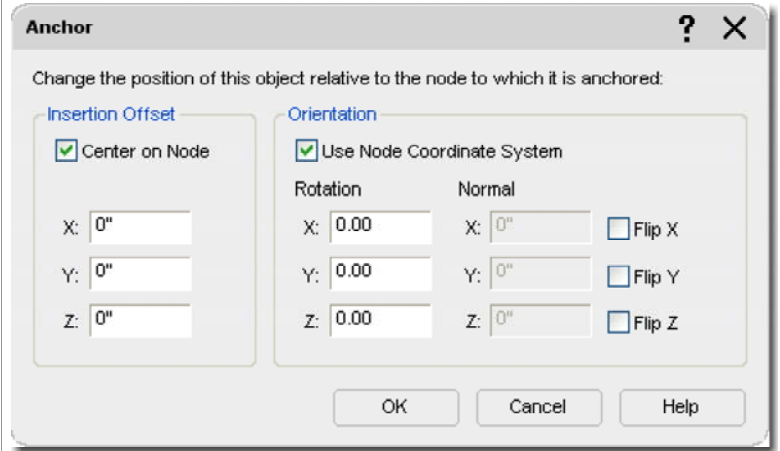
Node anchor [Attach object/Set node/Copy to each node]:

Node Anchor dialog

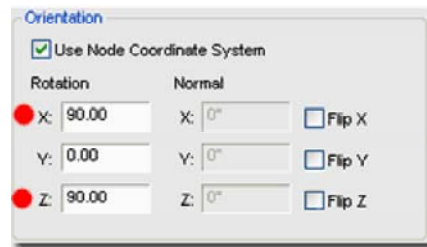
Illustrated to the right I show the **Anchor dialog** that you will see when using the **Node Anchor** option. Since anchoring to Nodes is pretty straight forward, so too are the Anchor options. With this form of Anchoring, you basically have a connection between an Object and a Node. Though this method defaults to the Object's Node or Insertion Point, you can reposition it with the X, Y and Z Insertion Offset value fields.

For Structural Members and Ceiling Fixtures, you may find that you will need to work with the Rotation angles (Z-axis) on a frequent basis since you cannot use the Rotate command to rotate Anchored Objects.

If you need more options for positioning, take a look at the Curve Anchor discussed above.

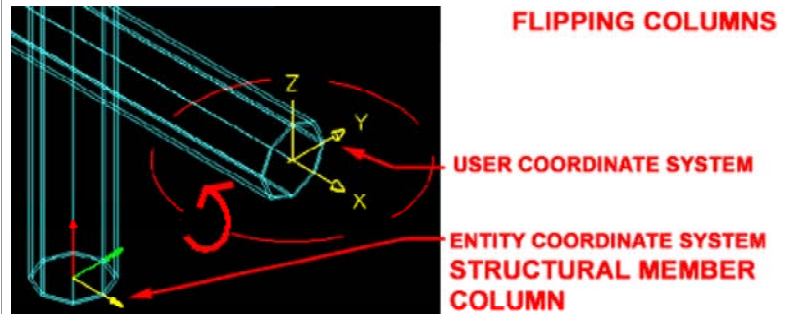


Structural Members and Node Anchors



When using Anchors and Structural Members, you may find that some actions result in reorientation of the Member. This problem has to do with the fact that Structural Members have a different Entity Coordinate System (ECS) than other ADT objects. The result is that the Normals match up and you see the ECS match the UCS.

that the Normals match up and you see the ECS match the UCS.



To fix a flipped Column, for example, you have to change the Rotation values on the Anchor dialog box. You can set X = 90 and Z = 90 or leave X and Z at 0 and set Y = -90 or 270 degrees.

5 Working with the Cell Anchor

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Cell Anchors

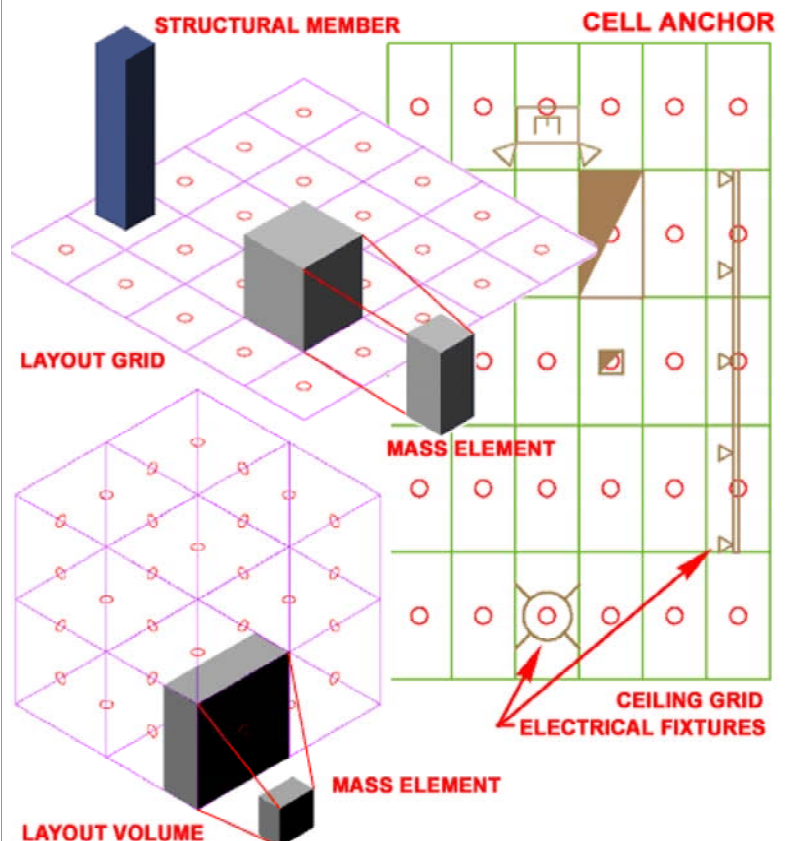
Alt.Menu **Design> Layout Tools and Anchors> Cell Anchor**



Keyboard **CellAnchor**

Links [Entity Properties - Layout Tool - Component Layers](#) - for how to turn ON or OFF the Node markers and change their Size

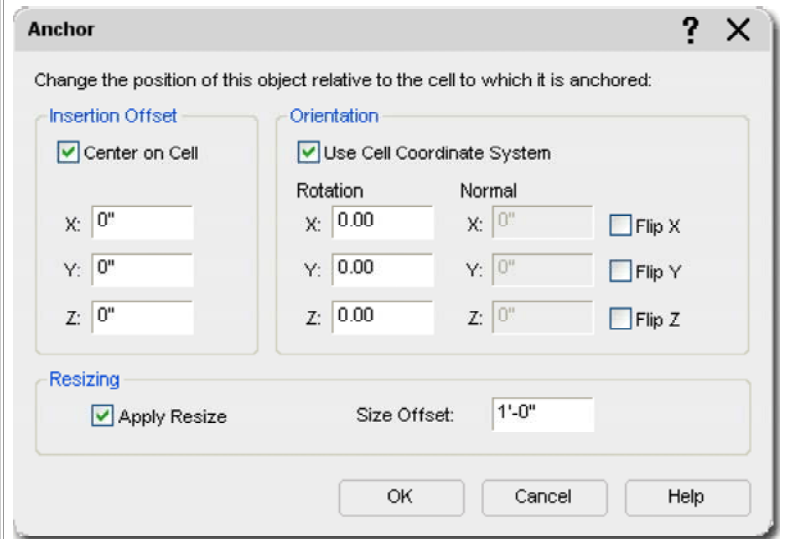
The Cell Anchor will often resize Anchored Objects automatically to match two of the cell dimensions. The scaling effect can be changed by working with the Properties Palette and by unchecking the "Apply Resize" option on the Anchor dialog.



Cell Anchor dialog

Illustrated to the right I show the **Anchor dialog** that you will see when using the **Cell Anchor** option. Under the Resizing section, I show that the Apply Resize checkbox has been set which occurs by default when using the Cell Anchor tool. I also show a "Size Offset" value which can be used to increase the resizing of the Anchored Object by an additional factor. A Mass Element, for example, will be resized to match the length and height of a Cell but with the Size Offset, you can increase that size along the length and height; i.e., it actually grows by twice the Offset amount just as a Rectangle increases with the Offset command.

The Orientation Section is particularly useful when dealing with Structural Members because they always lay flat when you Anchor them to Cells. By setting the X and Z Rotation value to 90 degrees, for example, you can get a column to stand up on end once again.

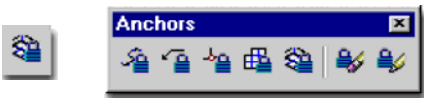


6 Working with the Volume Anchor

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Volume Anchors

Alt.Menu **Design> Layout Tools and Anchors> Volume Anchor**



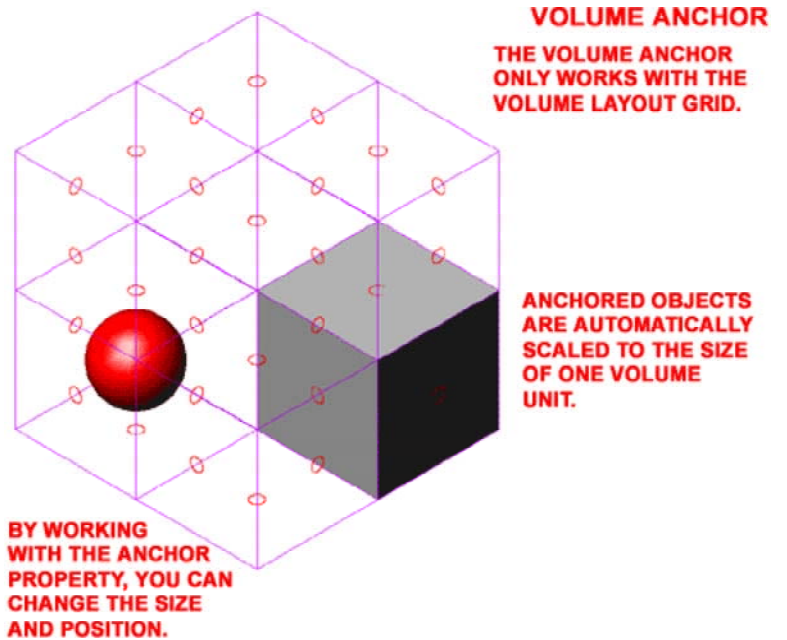
Keyboard **VolumeAnchor**

Links [Entity Properties - Layout Tool - Component Layers](#) - for how to turn ON or OFF the Node markers and change their Size

Volume Anchors are the most specific Anchors in the set of Anchor Tools because they only work with **3D Volume Grids**. To me, the only reason to work with this grid type is for Massing Studies and thus it seems appropriate to use Massing Objects as well.

Objects that are Anchored to a Volume Grid with the Volume Anchor will automatically be "Resized" to match the extents of one Volume Unit (X, Y and Z). Mass Elements, for example, will expand in all directions to match the dimensions of the X, Y and Z proportions. Some Objects, like Structural Members, only expand in the one direction that is free to become longer or shorter.

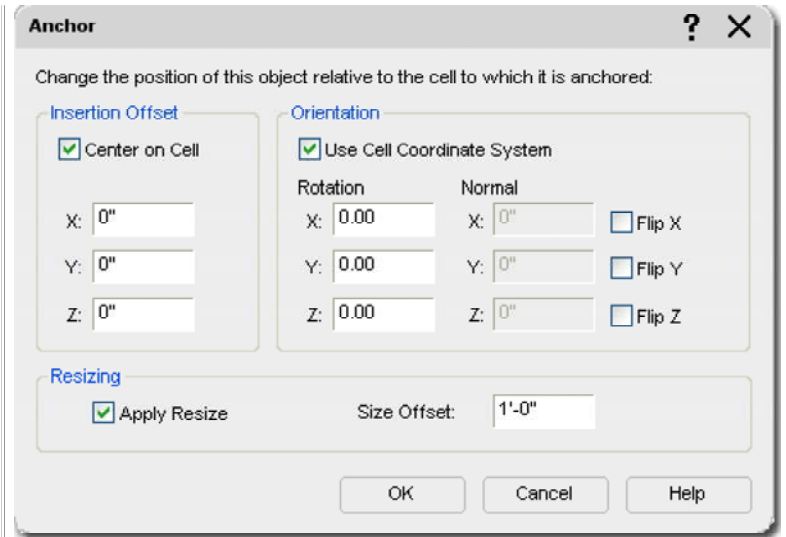
Anchored Objects can be Moved or Copied freely within a single Volume Grid and will automatically Anchor to the next logical Anchor Position.



Volume Anchor dialog

Illustrated to the right I show the **Anchor dialog** that you will see when using the **Volume Anchor** option. This Anchor dialog is identical to that used for Cell Anchors. Keep in mind that though this dialog is the same for the 2D Grid, some settings apply to three dimensions. The Resize and Size Offset options, for example, affect all three dimensions of Mass Elements.

See comments under Cell Anchors for more information.



7 Modifying Anchors

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Releasing Anchored Objects

Menu **N.A.**



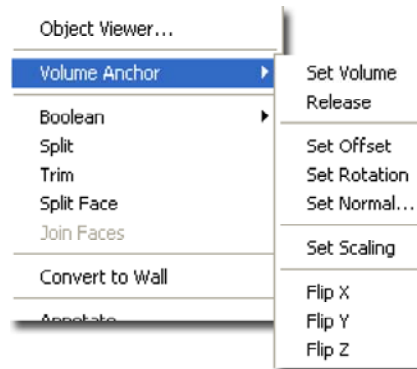
Keyboard **AnchorRelease**

Mouse Select Anchored Object, right-click and look for the Anchor cascading menu.

Links [Anchors via Object-specific pop-up menu](#) - for another way to get this command.

[Anchor Entity Display Component](#) - for a way to turn on a graphical marker that will help to spot Objects that are not Anchored.

The **Release Anchor** option does exactly what it states: releases an anchored Object. In many cases this is a simple operation with little to no consequences but try it on a Door or Window and you lose the opening in the Wall.



Illustrated to the left I show one of the numerous Context menus for an Anchored Object. Depending on the type of Anchor, you should find different options on the cascading menu. Door and Windows, for example, only offer four Anchor options.

Note:

If you want a free Door or Window, simply hit an extra return when you are Adding them and you will be able to place them without any Anchors.

Positioning Anchored Objects

Menu **N.A.**

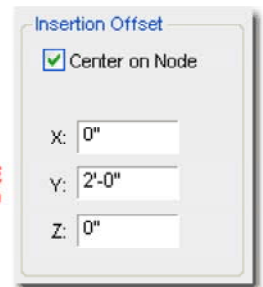
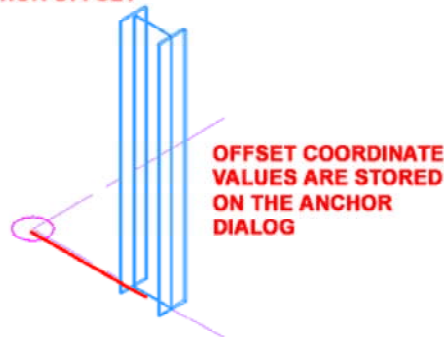


Keyboard **AnchorSetOffset**

Links [Anchors via Object-specific pop-up menu](#) - for another way to get this command.

The **Offset Anchor** option is basically another term for Move. The difference between this option and Moving an Object is that in this case, the original Anchor position is kept.

ANCHOR OFFSET



After choosing this option, you will be queried to specify a second point relative the Object's Anchor source. This second point move the Object relative to the Anchor source. The Offset distance is recorded on the Anchor dialog accessed via the Properties Palette.

8 Anchors - Display Properties

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Anchor Display Representations

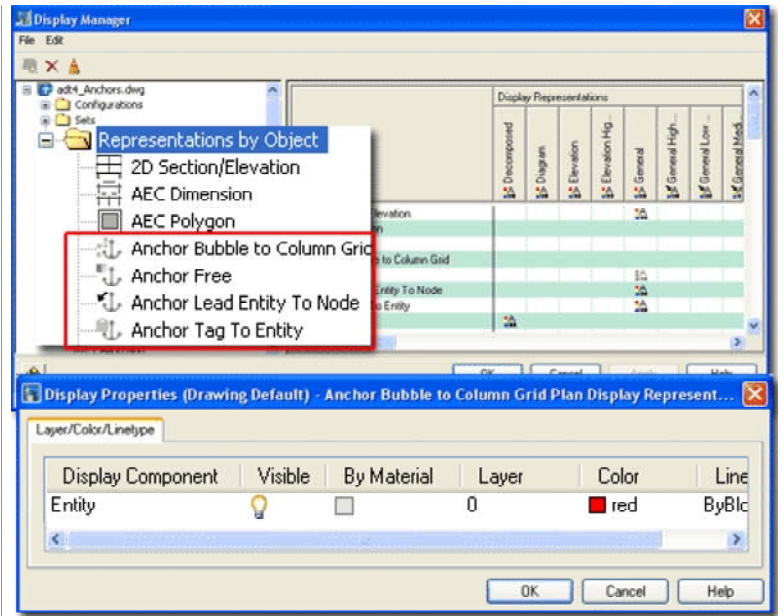
Menu **Format > Display Manager...**



Keyboard **DISPLAYMANAGER**

Though Anchors aren't physical objects that you can manipulate in ADT, they are objects with display characteristics. I do find it interesting that once you display your Anchors, you can actually select an object by picking on its anchor; meaning that Anchors are actually physical objects, we just can't manipulate them.

There are four types of Anchors that you can display: **Bubble**, **Free** (illustrated, left), **Leader** and **Tag**.



Anchor Entity Display Component

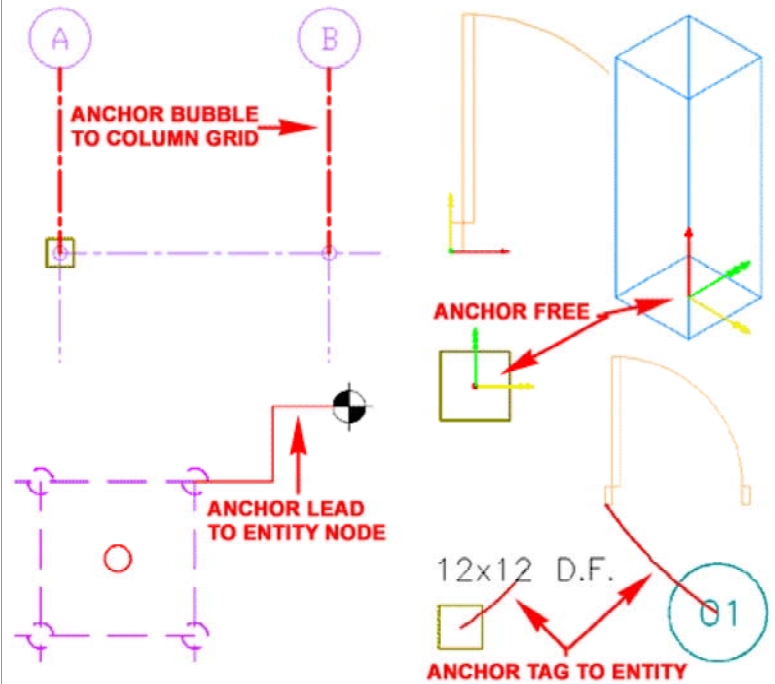
Illustrated to the right I show the four different Anchor Types that have their own Display Representations and some examples of where those Display Representations might be of importance to you.

Generally the one Display Component that each Anchor Object has is set to "ByBlock" so you may never need to venture this deep to work this these settings.

Anchor Bubble to Column Grid - this Display Representation allows you to control the Extension on Column Grid Bubbles as illustrated to the right. You may want to work with different Display Representations, such as Plan and Reflected to control the Lineweight, Plot Style or Color when switching between these two Display Representations.

Anchor Free - this Display Representation is usually turned Off and as you can see from the example image, there is a good reason for that. The one place where you might find this feature rather handy is with Structural Members whose Normals are not the same as that of other Objects. This fixed size icon will display on all ADT Objects that have Anchors and are not Anchored (Free).

Anchor Lead Entity To Node - this Display Representation is similar to the one for the Anchor Bubble Column Grid. It provides the means to control the leader line between Objects that have been Anchored with the Leader Anchor and their target.



Anchor Tag To Entity - this Display Representation is usually turned Off and you would probably find it annoying to have it on. It draws a leader line between any Tag and the target of the Anchor it belongs to.

9 Anchors - Customizing and Tricks

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