

PATHS TO CHAOS

<open with some variety of Twisted 3D Orbiter running>

Welcome to the 4th Harmony Tutorial: Paths to Chaos.

In this tutorial we will be customizing the properties that make Animators GO!

We've seen a 3D orbiter, like this one, in action... but how do we customize the action?

Let's start with the basics and build a unique orbiter. We will be putting our hands on the levers and dials of (and wrapping our heads around) what drives Animators.

As we delve deeper into Animator creation, we will often want to manually set the movement to synchronize with the music.

Harmony includes a nifty tool that you may find you use frequently. It is the Beat Finder.

With my music imported, I click play <play>, then open the Beatfinder.

<clicking Edit, Beatfinder>...

You find it here, under Edit, at the bottom of the dropdown list, and it is very easy to use.

I simply tap the down arrow on my keyboard in time with the music. <tapping> The longer I tap, the more accurate the number on the Beatfinder. You can see that my music clip is registering 120 beats per minute. That is the average based on my taps.

The Beatfinder creates a nice list for us. The leftmost column labels the beat count, based on the beats per measure... the center column is the the number of beats per minute for those beat counts and the rightmost column shows the amount of time it takes for that number of beats to go by in seconds.

The default beats per *measure* is 4, if you know your music has a different number of beats per measure, just change it here <click on BPMmeasure box and change> and hit enter, the list will update to reflect the changes.

<double-click in the quarter note box, highlight the number and cntrl-C>

You can copy any of the numbers in the lists by selecting the one you want, and using the copy command, Control-C. Paste it into any other location in Harmony with Control-V.

As long as you are working within the same session of Harmony, you can close the Beatfinder and re-open it, with your numbers still available.

<Fade> <Delete the orbiter and Drop in a plain 3D Orbiter, set shape to Box>

<Play>

You can think of Animators as the hidden “puppet masters” in Harmony. The “puppet strings” are “PATHS”, and a path is a series of numbers that tell something (a shape, a color, or even a size) where to be, over time.

Paths are where the math meets the road... but all we need is enough understanding to adjust the details to make our chaotic puppet strings dance the way want them to.

Here, I'm starting with a plain 3D Orbiter with the shape set to "box". Obviously, a Bouncer, Flier or a Spinner will work similarly, but with different results. You can play with them on your own!

<mouse over properties>

Over her in Properties, we find the various "Paths", the puppet strings, that we can tweak and pull to make the animator dance.

<mouse over Orbit Axis, and Orbit Sizes>

One of the most basic changes we can make is to the axis it is orbiting around, and to the size of the orbit.

For those who decided to block all memory of geometry and coordinates... picture the X axis running left to right, the Y axis running up and down, and the Z axis running toward and away from you.

<changing axis to X, then Z>

If we change the Orbit Axis to X, it rotates like this. And if it is set to Z, like this.

<changing axis back to Y>

I'll set it back to Y.

<set Orbit Size A=100, B=500>

Orbit sizes A & B, adjust... the size of the orbit path in two directions. How that looks depends on which axis you have it rotating around. Here I've set A to 100 and B to 500, you can see the path has become oblong, instead of the original perfect circle.

<Fade>

<Set Shape color to Rainbow Cycle & color BPM to 1>

Moving on... I've reset the orbit to a circular path, and added color.

<clicking on Animator Center Point>

Let's look at the Animator Center Point.

By default the path is "Constant". If you adjust the values, you change where the orbiter is on the screen.

<mousing over boxes>

The boxes map to the X, Y and Z axes, respectively.

If I change the Z (or third) box value to 1000...

<set Z to 1000>

You see that it moves the animator into the distance, along the Z axis.

The center point can be set to other paths. The dropdown menu gives you the choices.

<dropdown, choose Circle>

If I choose a Circle path... nothing changes!

This brings up a great point: Notice that the Scale is set to ONE. [<mouse over Scale box>](#) Scale is multiplied by the other size values to determine how big to draw a shape. “One” is the default or “natural” size. To make things bigger, enter a scale number larger than one, to make them smaller, enter a scale number of less than one.

A value of one can be small enough, depending on what path you are playing with, that it will not show any change in your animator.

If you expected something to move or change, and it didn't – you probably need to input a larger number.

[<set Scale to 2000>](#)

On the other hand... (here I set the Scale to 2000)...If your animator disappears, or keeps wandering off the screen and you don't want it to – you almost always need to input a smaller number.

[<set Scale to 1>](#) I'll reset the scale to one.

Changing the size settings alters the movement.

I click in the size box [<click size box>](#) to access the controls. I can set the size itself to change according to another path shape, but I'm sticking with the default “constant” to show you how the setting affect things.

[<set X & Y to 300>](#)

By setting X & Y to 300, I am telling the orbiter to have it's center-point follow a circle with a height and width of 300.

If I add in a Z value of 300, and close this menu...

[<set Z to 300 and close menu>](#)

... and increase the cycles per minute... to 30, here...

[<set cycles per minute to 30>](#)

... The center of my orbiter is now traveling in a circular loop in all 3 dimensions.

You have the basic orbit – at 15 revolutions every minute... once every 4 seconds.

AND the center point looping 30 times every minute... once every 2 seconds!

It's not going to take much to have a LOT of motion here.

[<dropdown menu, choose spirograph, set scale to 30, BPM to 30>](#)

And...there are other path shapes! Here's a Spirograph.

Again, increasing the scale and playing with the beats per minute makes it more interesting.

[<playing with path options>](#)

There are several other options, and the best way to get a feel for them is to go get your hands dirty and play play play!

To find out what else paths can make dance... check out the next tutorial: The Long and Winding... Path!