

# Leaping Arches

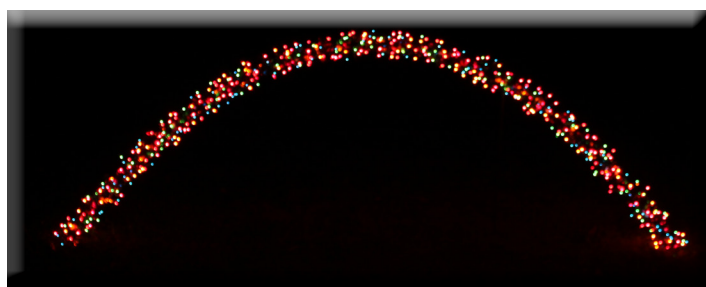
Cool effect, even for newbies!

By James Toliver

**O**n Monday Chuck stood at my desk and “suggested” the magazine needed a how-to article on building leaping arches of lights. My immediate response was “What’s a leaping arch?” Have you ever experienced the dreaded “dolt” look? I now have. Chuck said “Go to YouTube.com and search for Christmas Leaping Arches.” I did and went wow! Leaping arches look like streams of water jumping around in the yard and are a really cool effect. Even better, they looked like a simple project to build.

I started checking various websites on how to build leaping arches. Yikes! There are certainly a lot of different techniques. I was soon overwhelmed with way-too-many details about plastic pipe thickness, potato peeler motors, using seven, eight or nine electrical circuits to power the leaping arch sections and how much one should bend a straight piece of pipe to create the perfect arch.

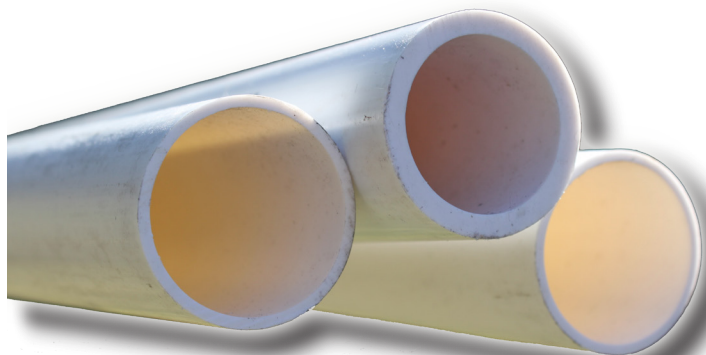
I went to the home center and bought a bunch of components, took everything to the house and started playing around with different techniques. On Wednesday I went back to Chuck and pleaded “Please help me focus. There are just too many possibilities building these things.” According to others on the staff I’m the first to get the dreaded “dolt” look twice in the same week. Chuck reminded me we’re here to teach the fundamentals. PlanetChristmas readers are smart and quite



gifted at improving a design once they understand the basics. Create a small arch for the typical front yard that’s easy to build, light, program and store during the off-season.” Since I had no desire to ever get another “dolt” look, that’s all I needed to move forward.

This article is a guide to building a simple ten foot leaping arch. Use it to create something special for your display knowing you can easily customize it for your unique venue.

Let’s start with the basic pipe that makes up the arch. Think 10 foot, white, rigid water pipe. 1” diameter pipe will work fine. You’ll find two thicknesses at the home center. Since our arch



*Schedule 40 is the thicker pipe in the center*

## *I kept thinking of Chuck saying to focus on the fundamentals*

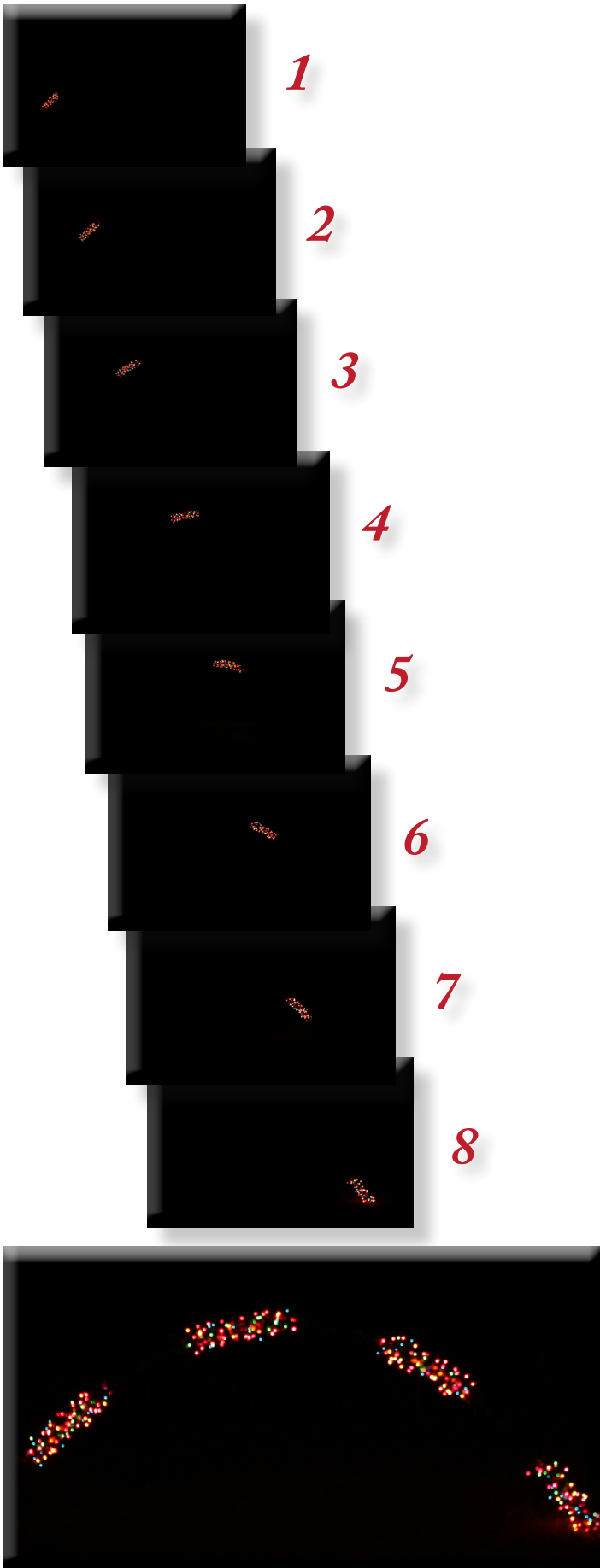
is only 10 feet long, the thinner pipe is fine because it bends easier. If you are thinking 20', 30' or 40' arch, go with the thicker pipe (called schedule 40 PVC) and a larger diameter. Your home center should have the 10' pipe for less than \$3.

I watched enough leaping arch videos to know the “leaping” is accomplished by lighting small sections of the pipe in a sequence. Each lit section is a dedicated electrical channel of an animation controller. Purists think of the arches as streams of water so they make a splash at the end. Since a leaping arch should be able to sequence the lights in either direction, you need a “splash” of water at each end and means two more dedicated electrical channels. I kept thinking of Chuck saying to focus on the fundamentals and then watched about an hour of display videos with leaping arches. The “splashes” were nice but it took me awhile to even notice them. Why worry about the splashes? No one said you had to. In the beginning, don't worry about them. In other words: no splash is required. We're keeping this really simple.

How many electrical sections of lights do you need for this 10' piece of pipe? That's easy. Animation controllers tend to come in eight and 16 channel configurations. Divide your pipe into eight sections.

Here come the important hints I've gleaned from now building a dozen of these ten foot arches.

Divide each pipe into eight sections, 15 inches apart ( $15 \times 8 = 120$ " or exactly 10'.) Every 15 inches use electrical tape to mark the pipe by wrapping a stripe all the way around. Why such a bold line? When you're wrapping the pipe it's much easier to know where to stop working on a section.



*Light channels 2-4-6-8 turned on*

Use standard 18 gauge lamp cord (SPT-1 or SPT-2) to power each section of pipe and run all the male plugs to the same end of the pipe. There's a temptation to tape the lamp cord to each section to the outside of the pipe because it's easier. I found out the hard way when you arch the pipe in the wrong direction there won't be enough slack in the wires if they're taped so forget about bending anything. For the pipe to easily arch in any direction, you need to run the power to each section inside the pipe.

*Stand at one end of your pipe and notice the manufacturers writing running the full length. Use that as a straight line down the pipe.*

Stand at one end of your pipe and notice the manufacturers writing running the full length. Use that as a straight line down the pipe. Drill a 1/2" hole in the center of each 15 inch section along the manufacturer's writing, use a Sharpie or other permanent marker to number each section (1-8) and snake your electrical wires inside the pipe. The lamp cord and vampire plugs work fine. If you don't have a fish tape, 12 gauge rigid copper wire will do the trick. Be sure to label your plugs (1-8) as you go. Running the wires inside the pipe is the most tedious part of the build. It's all downhill from here.



Finally it's time to wrap lights around each section. Use any type of lights you want but let me suggest using the same lights for all of your leaping arches. Chuck gave me a bunch of incandescent 100 count mini-lights he bought at Home Depot the week after Christmas for \$0.62 each. Ends up each pipe section needs one string of 100 lights. Connect the light string to the vampire plug, wrap the section of pipe uniformly and use an 8" tie wrap to secure the end of the light string around the pipe. Keep repeating until all eight sections are covered with lights.

*Everything became so much easier, at least until the third pipe when I noticed smoke pouring from the motor.*

I'll admit in the beginning to wrapping the pipe by hand but that became incredibly boring. I had seen the video where a potato peeler motor was used to spin the pipe to make wrapping the lights much easier. My wife didn't have a motorized potato peeler so I went looking for a solution at my local big box store. While walking the kitchen aisle I saw an electric hand mixer for less than \$7. It had multiple speeds and one of the mixing paddles looked like it would easily connect to the end of my 10' pipe. Mine! At home I hooked up a little foot switch to the mixer and started wrapping pipe. Everything became so much easier, at least until I saw some really dark looking smoke



pouring from the motor. Seems mixers are designed to mix cake batter and not turn 10' water pipes. I ended up trashing the mixer and using a standard battery operated drill by attaching it to the mixing paddle already inserted in the plastic pipe. Wrapping a pipe by hand takes a little over an hour. Wrapping a pipe spun by a motor can be done in about 20 minutes. It's worth the effort to motorize.

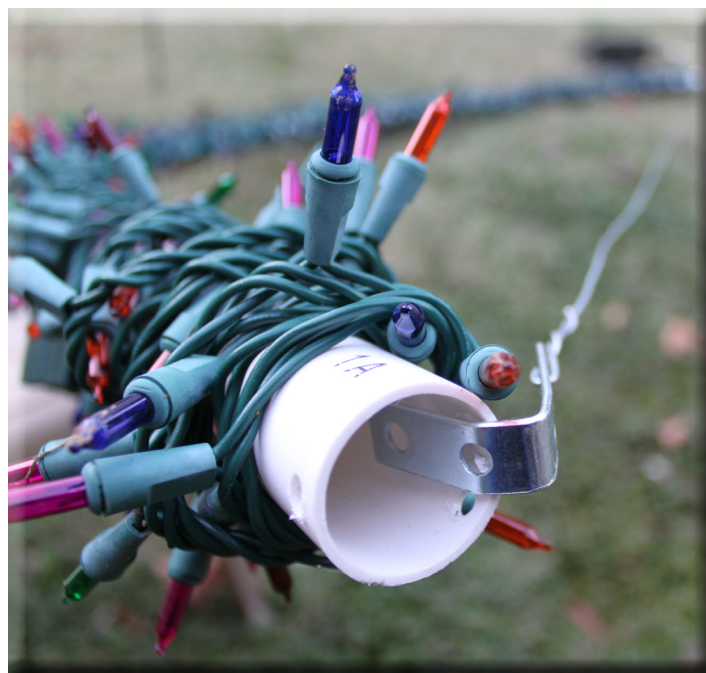
Now you have a straight 10' piece of pipe wrapped in lights. It should be easy to bend it into an arch. I wish! I tried all kinds of ways anchoring each end in the ground to create the arch. Let's just say that thin water pipe prefers to be straight and constantly fights being bent. At one point I bent the pipe a little too much and crimped it. Word to the wise: don't bend the pipe too much.

In the perfect world the top of the leaping arch is 32 inches off the ground. You can shoot for 36 inches but you'll probably suffer "crimped pipe syndrome." I used a couple of right angle brackets and electric fence wire to make up a cheater wire exactly 96 inches long. I insert one end of a right angle bracket into each end of the pipe (flexing it a bit of course) and you end up with a perfectly curved leaping arch you can actually carry around. When done, flex the pipe a bit, remove the cheater wire, the pipe becomes straight and you can easily store it.

How do you mount the leaping arches in your display? I use a 4' piece of rebar, pound it in the ground and lean the arch against it. Use a big tie wrap to secure everything together and you're good to go.

The leaping arch is built but what about the animation part? It's beyond the scope of this article to teach the sequencing but it's easy. You have eight circuits that simply chase one after the other. Light-O-Rama sees the potential and even includes leaping arches in their Master Controller Layout concept at <http://lightorاما.com/SequencesStandards.html>

How much does a leaping arch cost? \$3 for the pipe. \$10 for lamp cord. \$16 for plugs. \$25 for lights. Grand total for parts: \$54. You can



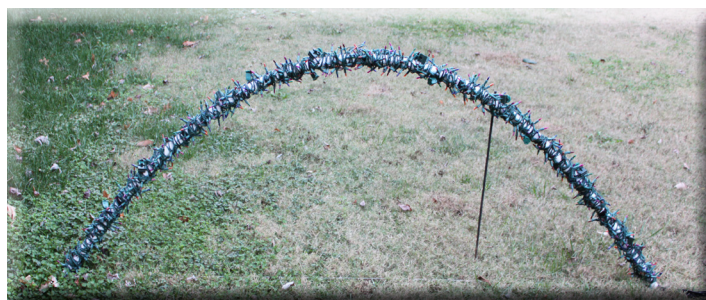
*Cheater wire in place to arch the pipe*

probably beat the pricing with minimal effort. It took me about two hours to build an arch so value your time accordingly.

Are there leaping arch alternatives? Winterland (<http://winterlandinc.com/PC>) has metal arch frames (instead of plastic pipe) and will even put the lights on for you. Wow Lights ([www.wowlights.com](http://www.wowlights.com)) has complete packages of larger arches. Check around and you might get lucky.

Already tired of leaping arches? There's a new trend of using "leapers" in displays. Instead of bending the water pipe into an arch, the straight pipe is mounted vertically so lights shoot up and down. Put a strobe light at the top to add a real pop. Cooooooooo! Now that's a versatile design piece for any display.

Can you build your own leaping arch? Sure! ❄️



*An ugly duckling during the day but this finished leaping arch adds drama to your display!*

