http://www.vilethings.com/fiber_optic_pnuematic_whips_prop.htm

Fiber Optic / Pneumatic whips

I have seen several air cannons as well as several "air blasters" on the Internet. One idea really caught my eye. I have no idea where it originated, or even where I saw it first, but I will finish this version of it for the Hinton Haunted House, 2002.

I don't know the name of this prop, so for the time being, it will be called the Pneumatic Whips prop. Air enters the female coupling at right and exits through the four brass ferrule fittings inserted into each "tee." I have attached a twelve inch length of vinyl tubing to each fitting. (See photo) The intent here is to use enough air to make the tubing whip around erratically.
I found the page that inspired me. (...give credit where credit is due.) http://www.ghost-ride.com/products/effects/at.html

In the dark, this prop would be great. Visitors to the haunt could hear the air hissing through the hose, and feel the air blowing around ankle level. With soft black rubber tubing (which I plan to add after testing) this prop would be undetectable in a dark hallway.

This is where Brian's creative genius came in. He suggested we find a way to add a light to each hose. The effect would resemble an angry, ankle-biting firefly. The plan is to trigger the air and light to activate with a momentary switch.

How do we put a light at the end of a hose and still maintain the whipping effect? I guess that rules out LED's. The super bright variety would certainly be bright enough, but the wires (whether inside the tubing or out) would interfere with the necessary flexibility.

We would never forget the safety issue either. A piece of hard plastic could possibly do some damage. We want to MIMIC the ankle-biting fireflies. ...So, how about fiber optics?

As of May, 2002, I have only purchased the Fiber Optic Cable. I have not assembled the "lighting" part of this prop. I would, however, gladly recommend the source from which this cable was acquired: The Fiber Optic Store

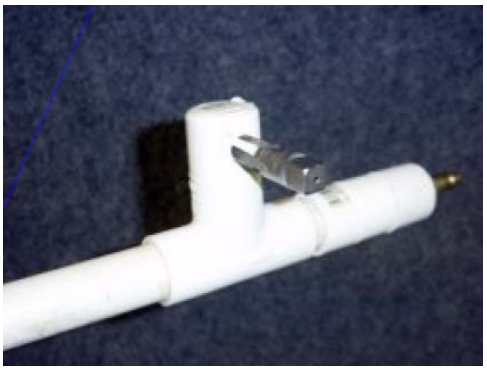
I went to this online store with absolutely no knowledge of Fiber Optics. After reading through their pages for about thirty minutes, I ordered some cable with great confidence. The product arrived quickly, and the company contacted me within a few days just to "check up" on things.

Fiber Optic Pneumatic Whips Part 2 - Pneumatics
This prop, as with most I've built, has been re-engineered. After initial testing, I discovered that the vinyl tubing I attached was rather stiff and did not produce the effect I sought.

At left is a photo of Latex Rubber Tubing 1/8" I.D., 1/4" O.D., 1/16" Wall. And Clear Vinyl Tubing .170" I.D., 1/4" O.D. 1/32" Wall.

I purchased this Latex Rubber Tubing from McMaster-Carr Supply Company. (Part # 5234 K41) This is perfect for this prop. It is supple and resilient, and the dimensions work well with the brass ferrule fittings already installed on the prop.

The fittings I used were purchased at Home Depot. At left is a 1/4" n.p.t. - compression fitting. Center and right are the tubing insert and ferrule compression nut. These two components work together to provide a strong leak-free connection without crushing or otherwise distorting the tubing.



First drill a 7/16" hole through the 3/4" cap and the pipe inside. Then use a 1/4 n.p.t. (pipe thread) tap to create threads in the p.v.c.

Pipe threads are tapered, so don't thread the tap in fully. Doing so will create a joint that is too large. The p.v.c. is soft enough that tapping the hole isn't really necessary, but it does make assembly easier.

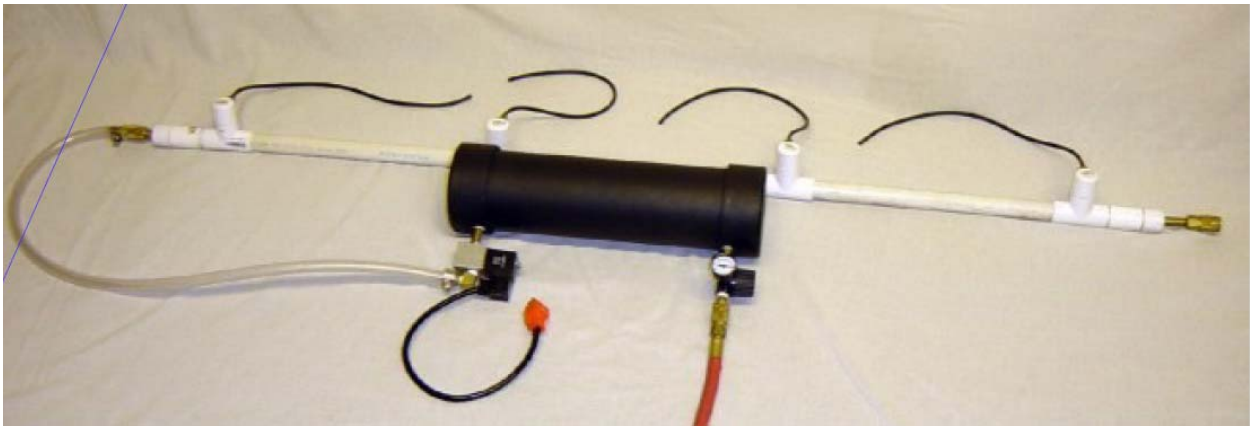
Next slide the compression nut over the tubing, making sure the threads face "out"

With just a short length of tubing exposed, push the insert into the tubing. This is much easier if you moisten the insert first.

Thread the 1/4" n.p.t. - compression fitting into the hole you tapped out earlier, then thread the new tubing assembly onto the compression fitting.

That's about it for the "business end" of this project. The F.O.P.W. I built has four hoses, spaced 14" apart.

At 60 p.s.i., these really whip around nicely. (15 p.s.i. each) but it does consume a considerable amount of air.



Above is a photo of the completed Pneumatic portion of the Whips prop. Air enters the prop through the red hose (bottom right.)

A pressure gauge/regulator allows for precise control and monitoring of reservoir air pressure. (which will be approx. 60 p.s.i.)

A pneumatic reservoir holds a large amount of air. This helps feed this props over-sized appetite.

A solenoid valve (bottom center) will open with a prop controlling device (probably a momentary switch)

I installed a quick connect fitting on each end of the 3/4" p.v.c. main line. I thought I would be able to connect 2 units creating a whipping prop nine feet long. Unfortunately, I doubt my air compressor will be able to supply sufficient air to run this device and the other pneumatic props I'll employ in the 2002 Haunted House. (if you're wondering, it's a 5 h.p., 25 gallon oil-free compressor.)

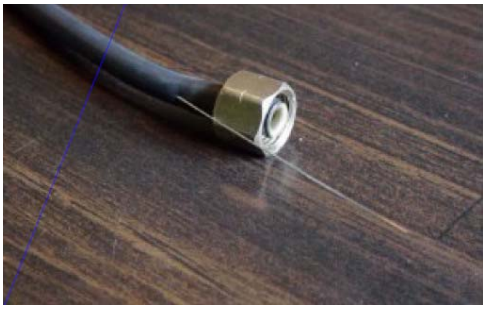
Even though the new tubing's inner diameter is half the size, this device still draws a lot of air. One bit of advice... Make sure the solenoid valve you intend to use will supply enough air pressure/volume.

I first used a skinner valve with 1/8" ports... Big Failure. Now I have an ARO valve with 1/4" ports... Works Great.

Fiber Optic Pneumatic Whips Part 3 – Fiber Optics

So, you want to send light through a cable, ***any*** length, around corners, up or down grade? Well, this is the product for you. The inside wall of fiber optic cable acts like a mirror. Light is reflected along its entire length up to the point where the cable is cut, kinked, or otherwise terminated.

You'll find many options when searching for fiber optic cable. New, surplus, used, and pre-assembled special cables are the most common. I elected to do business with the Fiber Optic Store. This website was quite helpful in deciding which product I would need. I bought single strand cable in a few different diameters. (.25 mm., .5 mm., .75 mm., and 1 mm.) Obviously, the larger diameter cable will appear brighter when lit, but I am also concerned with flexibility. Fiber Optic cable looks and behaves a lot like monofilament fishing line.



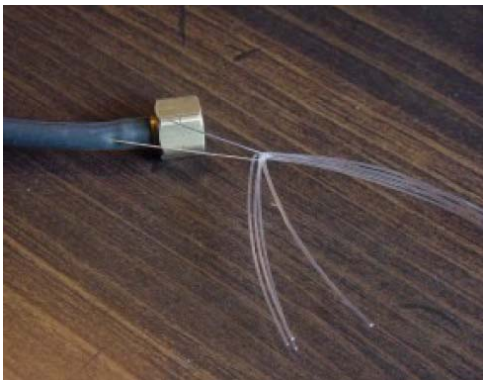
I will be using four strands of .5 mm. cable in each length of tubing. That's right... IN each length...

I considered fastening the fiber optic cable to the outside of each tube with narrow strips of (black) gaffers tape, or possibly painting a little bit of liquid latex over the cables.

I believe running the cables inside the tubing will be better for two reasons.

1. I won't have to worry about the cables separating from the tubing.
2. Fiber optic cable is sort-of delicate. The tubing will protect the cable.

As seen in the photo above, I forced a wire (guitar string) through the tubing.



Bend the wire hard, then insert the fiber optic cable(s) through the bend. Remember to allow a little extra cable for this bend. Once you put a hard crease in fiber optic cable, the light will "stop" there.

On the same topic - be sure to cut the cable "long." because splicing is out of the question. It's easy to cut off any excess.

Completely tape the "loose" end. (If you don't, it could snag during pulling) then tape the cables to themselves.

This is exactly like the "fishing" trick electricians use to feed wires through walls, floors, etc.

Carefully pull the wire through the small hole in the latex tubing.

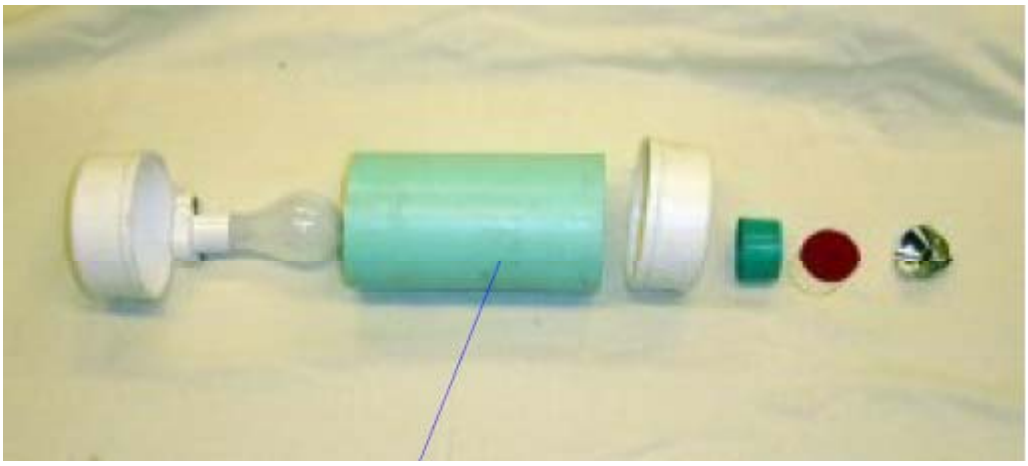
Left to right:

- Single gang metal box.....holds the light socket.
- Light socket from a motion detector light kit.....holds the light bulb.
- Coffee Can.....leak proof light box (except the lid)
- Bright Half of a cheap flashlight (bulb removed)...attach the cable to the light box.

This did the job. It helped me test the different diameter fiber optic cables I bought. I also tried a few colored gel sheets. I quickly built an improved, smaller, and most Importantly - less visibly offensive - light box.

Since this effect will be used with an event control timer, the pneumatic and lighting systems will only run for a short amount of time (about 3-4 seconds.)

This will help conserve air, and I'll be able to startle a few guests in the same group (...cool...)



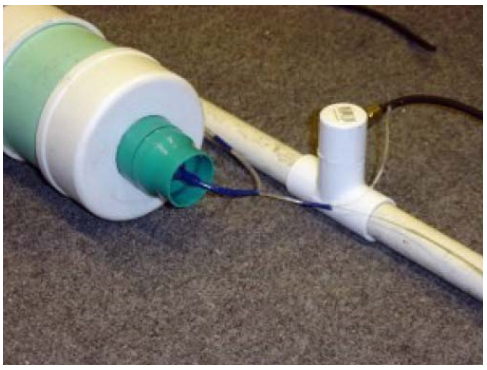
Left to right:

- 4" p.v.c. cap
- light socket (standard incandescent light bulb -screw base)
- 60 watt light bulb
- 4" p.v.c. thin-walled pipe
- 4" p.v.c. cap
- flashlight cap (the part you un-screw to replace the batteries)
- flashlight lens and red gel sheet
- flashlight reflector with light bulb removed.

I will use p.v.c. for this light box because the light bulb will only burn for a few seconds at a time. I would never run a light bulb continuously inside a p.v.c. housing.

You'll need to drill three holes in the (left) 4" p.v.c. cap. (2 for the socket mounting bolts, and one for the wire to power the light.)

In the other (right) 4" p.v.c. cap I drilled a hole large enough to accept the flashlight cap. (snug fit... remember - leak proof.)



In this photo, you see the junction of the fiber optic cables and the light box. I taped the groups of cables together to make them easier to handle.

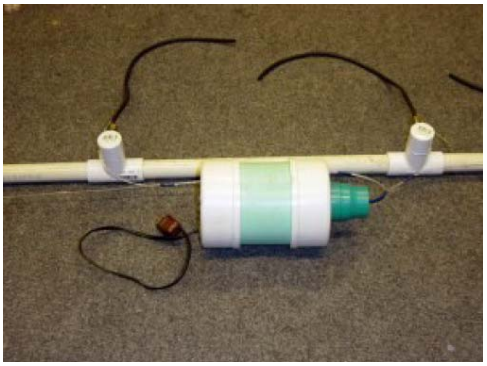
The bundle fit loosely in the hole where the flashlight bulb was removed. Some hot glue or epoxy will work well to fill this gap.

I had to cut the flashlight handle. If not for this short section of handle, the reflector and lens would have to be glued to the cap. (I want easy access to the colored gel sheet.)

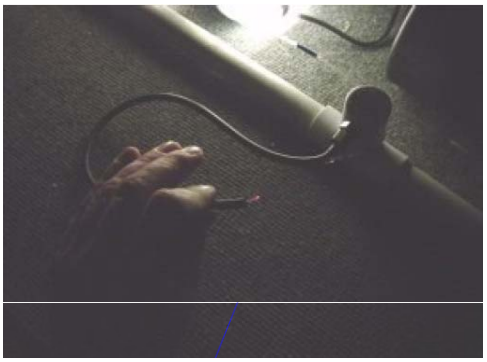
If you don't want to destroy an otherwise perfect two-dollar flashlight, you could certainly drill a small hole in the 4" p.v.c. cap, and attach the fiber optic cables directly.

My plan here is to use the flashlight reflector to compensate for the amount of light lost to the colored gel sheet. I don't know if I was successful, but it made me happy.

The 4" p.v.c. caps are semi-translucent when lit from the inside. A black paint job will fix that problem.



Here is a photo of the finished "fiber optic" part of this project. (almost done.)

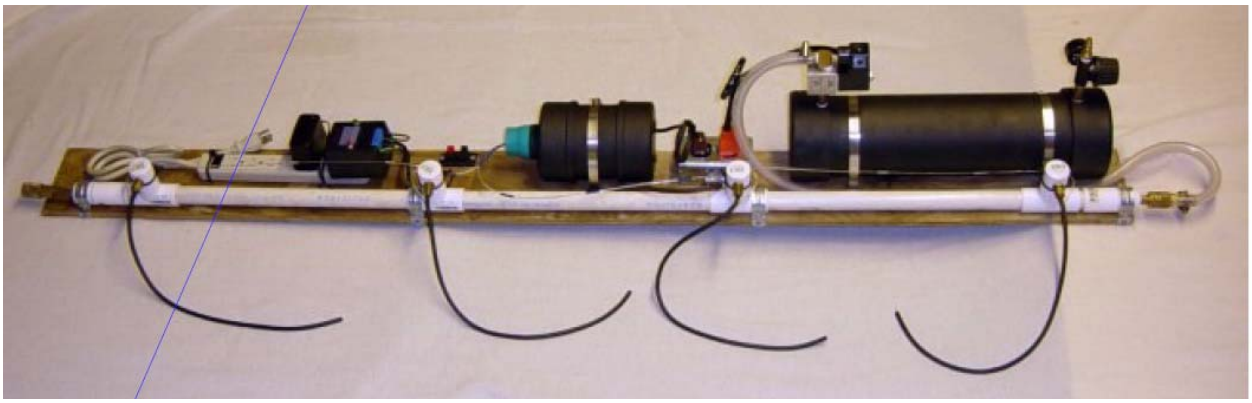


Fiber Optic Pneumatic Whips Part 4 – Assembly

October 6, 2002
It's been interesting, getting to this point.

What seemed like a simple, "fill in" type of startle prop has become a collection of experiments. As with nearly every Halloween prop I build, the completed version you see is the result of many "learning experiences." It's not often that things come together the first time.

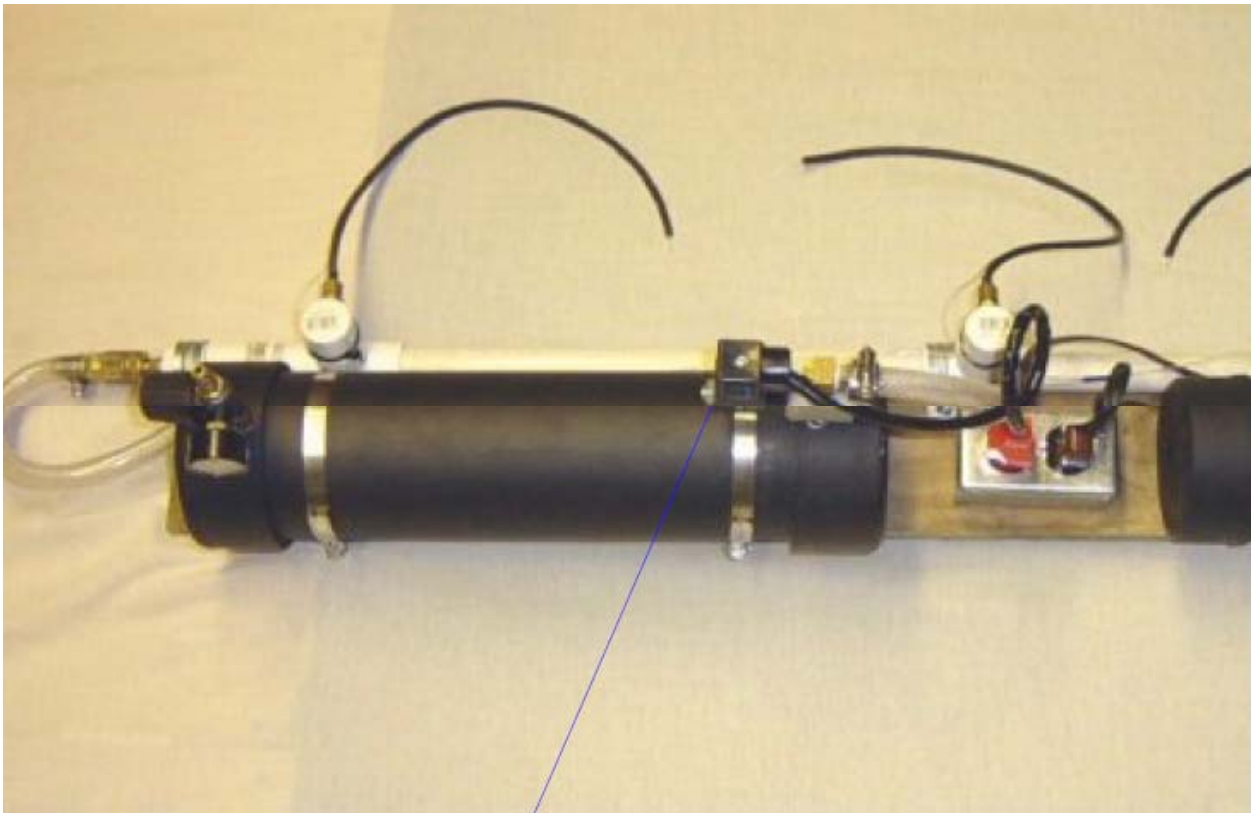
The Fiber Optics Pneumatic Whips prop has been fun, though. I gained some experience in many fields of home haunt prop design and construction.



Here it is... the Vile Things "F.O.P.W." prop

The finished assembly is everything mounted to a piece of 1/2 inch plywood. The only thing missing is the motion detection unit. (more info. below.)

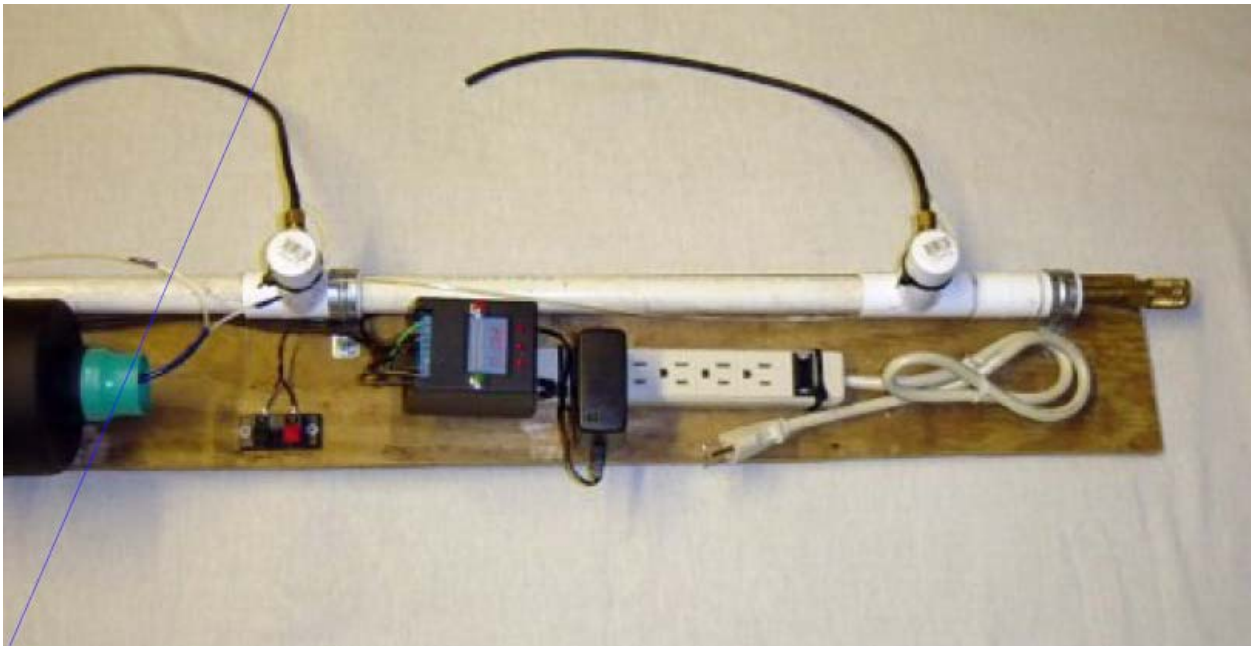
After the fiber optic cables were installed, I found the air pressure (previously 60 p.s.i.) wasn't quite enough. At 70 p.s.i., the effect is good.



Above is a closer view of the pneumatic portion of the finished assembly.

Air will enter the reservoir through the pressure regulator at left. The solenoid valve at right will allow the air to escape.

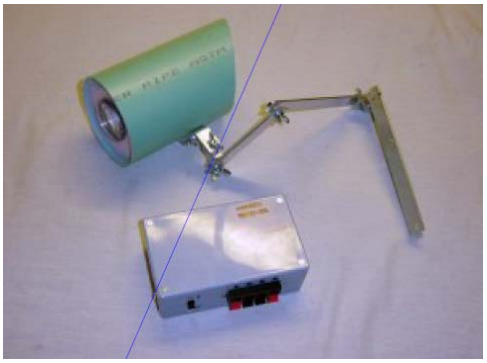
The single gang metal "handi-box" receives power from the effect timer (more info. below.) This box will provide power for the pneumatic and fiber optic portions of this prop simultaneously.



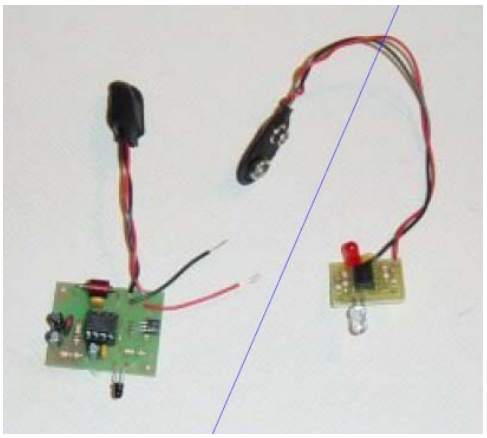
In the photo above you can see the electronic parts and pieces. At left is the light box. Next is a spring-type speaker terminal. This will accept the signal from the motion detecting unit. The last component is a multi -outlet power strip.
This power strip will always be "hot."

I will be using a PET II timing module from Cowlacious Designs. This fantastic "Programmable Effect Timer" will allow for a delayed "on time," a timed "on," and a post-effect "off time."

Since the Fiber Optic Pneumatic Whip prop uses a lot of air, I can now control how often it will fire, in the event someone figures out how to trigger the effect.

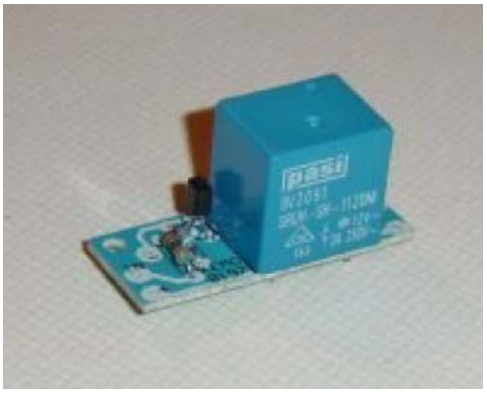


Here is the Motion Detection system that will be used with the F.O.P.W.



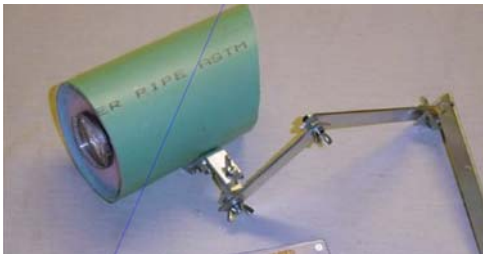
I bought an Infrared Transmitter and Receiver Kit. I decided these kits would most likely live longer if installed in project boxes.

To control things in the "real world," You'll need to add a relay to the output of the transmitter. The transmitter will activate the relay, and the relay will "switch" the voltage, current, etc. that you need.



MCM Electronics sells this handy little kit. 6 amp SPDT Relay Card, item # 28-6344. Requires 12 VDC, 80 mA for operation. Input voltage is 3-12 VDC. 5 mA and up.

This kit was designed for use with other kits.



Here is an ***unfortunately necessary*** modification to the transmitter kit. I had to add a lens (magnifying glass) to the transmitter.

The transmitter kit can be positioned within the housing to focus the beam of Infrared light on the receiver.

The blue housing is a short piece of 4" thin walled p.v.c. pipe. It provides some degree of weather - proofing, and holds things together (like the transmitter kit, the 9 volt battery, and the lens.)

The aluminum linkage will allow me to mount the transmitter to the maze wall, accurately aim the beam of infrared light, then tighten all of the joints. (wing nuts are your friend...)

At left is a photo of the receiver enclosure. With everything mounted inside, all I have to do is plug in the 12 VDC power supply, and attach the relay in/out cable to the spring-type speaker terminals. These terminals are great for no-voltage connections.

The in/out cables run to the PET II on the finished F.O.P.W.

That just about wraps it up. The Prop will be positioned behind a fabric wall.

The latex tubing will pass through this false wall. The receiver will be mounted to the prop, and the transmitter will be mounted on the opposite wall of the hallway.

When someone passes through the ("invisible") beam of infared light, the effect will run for five seconds. The prop cannot be re-triggered for 25 seconds, thanks to Cowlacous Designs PET II.