http://www.vilethings.com/simple_pop_up_introduction.htm1

Simple Pop-Ups

The photo (left) shows my version of "the basics." This is an angle iron frame with two pieces of flat stock used as braces.

After Halloween, I'll loosen the wing nuts and fold the legs up. (I'm sure everyone knows about off - season prop storage.)

I plan to add a prop head, some hands, and a loose robe. When fully extended, this prop should stand just under six - feet - tall.

Update as of June 4, 2002 :
Well, I had an idea. As much as I like the SIMPLE aspect of this prop, I have decided to go one step ahead. I will use the force of the cylinder to lift the prop body AND move the arms.

Update June 28, 2003
Okay, so this update is a little out of order ...First, I'd like to thank everyone for the fantastic response the Vile Things version of a "Simple Pop-Up" prop.

I've met a lot of good people since putting this website together, and most of them because of this prop!

Our 2002 Simple Pop-Up prop was removed from service immediately following the 2002 haunt.

The photo at left shows the 3/4" p.v.c. coupling I use to make this cylinder work.

I cut a groove in each end of the coupling. I insert a rubber o-ring into each groove. The coupling fits inside a 1 1/4" schedule 40 p.v.c. pipe with about 1/16" clearance.

These o-rings will fill this gap nicely, and accommodate any imperfections in the 1 1/4" pvc.

The grooves keep the o-rings from sliding out.

Thsi photo shows the order of things.

From left to right:

1. 3/4" schedule 40 p.v.c. pipe (Cylinder Ram, length depends on application)
2. 3/4" p.v.c. coupling
3. 3/4" p.v.c. cap
   You'll need to glue a short piece of pipe between the coupling and cap
4. 1 1/4" schedule 40 p.v.c. pipe (Outer wall of Cylinder, length variable)
5. 1 1/4" p.v.c. cap

Here you see the cylinder ready to be assembled.

I don't glue this joint, just in case the o-rings need to be replaced. I do, however, use three short sheet metal screws to secure the joint.

Here it is, ready to go.

At the far left (at the end of the cylinder ram) I attached a 3/4" threaded male fitting.

I attach a 3/4" threaded female fitting to my prop. The prop is attached to the cylinder by screwing the fittings together. This makes a strong, non-permanent joint.

At right (bottom of the cylinder assembly) I thread a male quick connect fitting through the 1 1/4" p.v.c. end cap and the pipe glued inside. The wall thickness here is almost 3/8" thick.

The following information is a very basic description of some of the products I have used . This is not a Pneumatics How -To.

This photo shows some products I choose to install on each pneumatic prop.

At left is a pressure gauge.

In the center is a pressure regulator.

At right is a combination regulator and gauge.

This is my product of choice. I purchased several of these from Harbor Freight Tools for about six dollars a piece. These are not required to make a pneumatic cylinder work, but they will provide more control. Adjustments can be made to each cylinder individually.

This is a collection of solenoid valves. Solenoid valves are not required to make pneumatic cylinders work.

These are used to automate the operation of pneumatic devices.

Simply put, these solenoid valves use electricity to open or close an air valve. There are many different types of solenoid valves. Most of these pictured above are one - way valves, meaning they only perform one operation (example: open when electric current is applied)

I use solenoid valves rated for standard household current (120 vac) Valves are available with different voltage requirements, so be careful when making a purchase.

Now that I have a cylinder, regulator, and solenoid valve, I will need to connect everything.

At left are some fittings and hoses.

This tubing has a high pressure rating. (at least 150 p.s.i.)

The white tubing at left is less expensive, but the clear tubing at right is more flexible.

Both are available at most hardware stores.

These brass fittings are designed for use with compressed air.

Left to right:

- Female quick connect fitting .....(male quick connect below)
- Female quick connect fitting with male barb .....(nice feature- easy hook up)
- 1/4" male n.p.t. to male barb.....(barb is inserted inside air hose)
- Threaded nipple.....(Used to connect two female threaded parts)
- Teflon pipe threading tape.....(recommended, but not required)
- Hose clamps .....(secures joint between barb fitting and air hose)

This is the bare -bones kit. Special fittings, reducing bushings, etc. will most likely be necessary, depending upon your particular application. These fittings are usually available in most hardware stores.

Here are a few examples of possible pneumatic system connections.

The photo above shows a simple connection. At left is a male barbed fitting secured inside a length of tubing with a hose clamp.

The barbed fitting is threaded into an air filter. A male quick connect is threaded into the opposite side. The quick connect -type fittings make life a little easier. They provide a secure, non-permanent connection.

Here is another example.

Left to right:

- Male barbed fitting secured inside tubing with a hose clamp.
  (This male barbed fitting is threaded into a Female quick connect fitting.)

- Male quick connect fitting (silver) threaded into flow control / pressure gauge.

- Female threaded coupling.

- Male barbed fitting secured inside tubing with a hose clamp.

The photo at left shows the pneumatic system for Vile Things new Pop-Up.

Top to bottom:

- Male quick connect threaded into regulator / gauge.
- 2" long brass nipple.
- solenoid valve.
- Male barbed fitting secured inside tubing with hose clamp.
- 10" air line.
- Male barbed fitting secured inside tubing with hose clamp.
- Male barbed fitting threaded into air cylinder.

More important than any of the parts and pieces listed above is RESPECT for compressed air.

While compressed air is a fantastic method for prop moving, it can be extremely dangerous when installed, used , or maintained improperly.

If you have any doubts, put the tools down and hire a professional. (Better Safe Than Sorry.) For more information on the use of compressed air please visit Phantasmechanics.com.....(Haunting with compressed air.)

Pop Up Part 1
Pop - Up Mechanism

Here it is... at least the start of it.

This is a front view of the simple pop-up stand, my version of a home-made PVC air cylinder, and the upper - body frame for this prop.

This is the "shoulder" part of the prop.
It is nothing more than a 3/4" PVC "cross" with two 6" sections of 3/4" PVC .

I glued a 3/4" dowel inside the whole length. PVC cement works fine here, but I could have used 2 part epoxy, or Polyurethane Glue.
(It foams and expands slightly as it cures.)

This is the Four Bar Linkage that will Move the arm. The 4" "Ell bracket" in the upper right hand corner acts as the shoulder blade. The vertical bar on the left will be the forearm. I used 1/8" x 1" aluminum flat stock for the forearm and "biceps."

Since the lower bar will be doing all the work, I used 1/8" x 1" steel flat stock. After building it, I think it was kind - of over-kill.

I assembled each joint with a 1/4" x 3/4" hex bolt. I inserted a 1/4" x 1" fender washer between each moving part. I used a 1/4" washer and locking nut.

This makes the joint stay together, but remain loose enough to move freely.

All of the extra holes in the "forearm?" By using a different hole here, you can adjust how far the arm stretches out, instead of simply shooting up. I know there is a mathematical solution for all of this, but:

1. Math was not my strong point in school.
2. I like the idea of "adjustable."
3. Four more holes... no big deal.

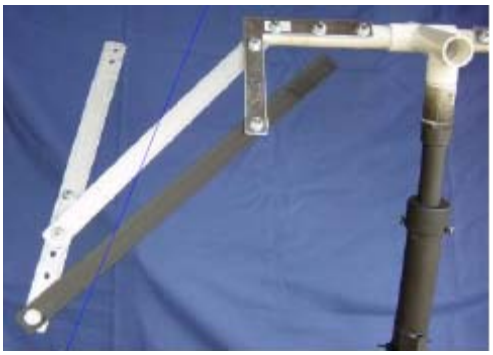
Here is the shoulder with both arms attached.

When the prop is at rest, both arms will be in the lower position.

When air is applied to the cylinder, A bungee cord will pull the steel arms down, thus raising the arms.

It's hard to see here, but the arms are attached to the shoulder so that they will extend at about 45 degrees, not straight up.

If you look at the 3/4" PVC "cross," you can see that the head will attach at a right angle to the cylinder. By doing this, I hope to build the shoulders up, similar to the "hunchback look."



In this photo, it is easier to see the angle I mentioned earlier. This is the back side of the prop. (left arm.)

I can still pull straight down on the arms and cause them to extend. The 45 degree angle doesn't interfere.

I suppose I could have used a pulley on each shoulder, and had each arm stretch straight out, but I think this will look better as the prop jumps .

I applied expanding foam to the inside of a latex mask, thin layers at a time.

About mid-way I inserted a 3/4" PVC "tee" with a short piece of pipe sticking out the back. I inserted this into the front part of the 3/4" PVC "cross." I didn't glue it, and I probably won't. I will, however, drive a screw through the joint. (I can change heads next year.)

There is one more thing I should point out...

Directly above the "elbow," I added an extra bolt and 4 washers.

This acts as a limiter to how far the "elbow" folds. Putting the bolt here ensures that it will not interfere with the movement of any joints.

I hooked everything up and tried it out.
The prop lifted SLOWLY at 10 p.s.i. At 25 p.s.i., this prop reaches full height in about 1/2 second. I'm sure the weight of the body will slow things down a bit.

I used two 60" bungee cords, one on each arm. They act as anti- spin devices, otherwise, the prop may turn itself around pop-up mechanism after a few firings. Also, by using two different cords, I can adjust the amount of pull applied to each arm independently. (more adjustment.)

Finally, using two separate cords, I was able to form a tripod- like support system at the base. At full extension, the arms reach over 6 feet, so it may become unbalanced with only the cylinder holding it up. The bungee cords will do a fine job of keeping everything in line.

Pop up part 2
Building A Monster

I finished building his chicken wire exo-skeleton.

I left large areas around each arm open.
The linkage needs a little over four inches of room for travel. I added two short pieces of 1 1/2" sch. 40 PVC to the lower portion of the

torso. These act as guides for the bungee cords. They keep everything straight and protect the cords from getting snagged on the wire.

Here is a better picture of the finished wire body.

I made short "tubes" of chicken wire and attached them to each part of the arm, making sure nothing would interfere with the arm movement.

The gaps at the shoulders and elbows won't be visible once the prop is dressed.

So far everything has progressed nicely. The only real problem I've encountered at this point is forming the chicken wire torso in a way that it will not make contact with the stationary portion of the cylinder.

I solved this problem by cutting away the center, bottom area of wire that would be considered the "abdomen".

This is the prop so far.

I started with a simple pop –up frame, consisting of an air cylinder mounted to a metal frame.

I used a home - made PVC air cylinder with this prop. This prop was decomissioned after it's 2002 debut.

Even though it performed properly, the use of home-made pneumatic cylinders (p.v.c. or otherwise) is a practice that has been completely abandoned by us at Vile Things.

This is the control set up I'll use with this prop. (I apologize for the poor quality of this image.)

This is an ARO solenoid valve, purchased from Grainger for entirely too much money.

I added a pressure regulator before the inlet. I purchased this regulator from Harbor Freight Tools for about $6.00.

This model includes a gauge. I decided to add a regulator to each of my pneumatic props.

The price is right, and this an easy way to fine tune the performance of each prop.

I can charge the main air line with a higher amount of pressure, and adjust each prop individually.

This will certainly save MANY footsteps while the Haunt is up and running.

This shows the prop at full extension.

The top of his head is now about 5 1/2 feet from the floor.

The arms extend slightly out and slightly forward.

They reach up about 16 inches. After I add the hands, this prop should reach a very proud 7 feet tall.

I decided to make the robe for this prop out of landscape fabric.

This is a "non-woven" weed barrier. besides making a fine looking robe, I suppose it could be used around your azaleas....

considering the arms move, I wanted the sleeves of this robe to be Very loose - fitting. I have no spare "Dead Guy" robes lying around the house, so I broke out the scissors, needle, and thread. Other than the fact that I don't know how to sew, the only problem I encountered here was the fabric I chose to use, (it's semi - stiff, as if it was starched)

This problem was solved by washing it. (easiest "fix" to date...)

This is not a nice fabric to work with. It's rough textured, and tends to cling to itself somewhat, however, it's already black, it costs 6 cents/square foot, and it looks like "Dead Guy" attire.

Here he is with the rest of his robe.

I pretty much cut out a huge bib. I cut a slit to wrap around his "neck" and let the pieces drape over his shoulders and down his back.

I cut two more slits for the arms. This material, being four feet wide, wrapped completely around the torso (loose at the "feet").

I added the forth piece around the head... looks like a hood.

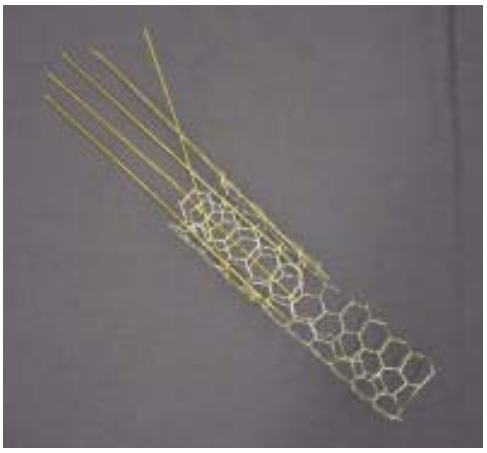
This is the prop fully dressed, and fully extended.

He is starting to look like a prop. (finally)

In my next update I'll include pictures of the hand - making process.

I know hands are available for purchase, but they're easy to make, and you can make them in ANY shape, size, etc.

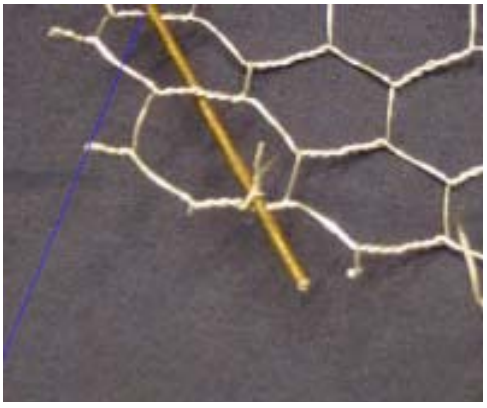
Pop Up Part 3
Making Monster Hands



I have been making the hands for my new Pop up prop.

I am using a combination of techniques I "borrowed" (stole) from some great sites on the Internet. The basic frame for my hands is made of coat hangers.

I also need to make forearms because my prop's forearms will be visible when the arms are extended. I used a "cylinder" of chicken wire to build the base for my forearms.



At left is a close up of the method I used to attach the coat hanger "fingers" to the chicken wire "forearm".

I tied each finger in two places with light gauge wire.

This made the whole arm strong. It's easy to bend each finger into the desired position.

I lined the forearm (inside and out) with duct tape. I also used this for the palm of the hand.

This will give me somewhere to attach the "skin".

The photo at left shows the manner in which a cotton ball is "opened up" for use in the "skin" making process that follows. First the cotton ball is unrolled, then it is gently pulled. I stole this idea from Britt Griffith via the Monster List (decayed arm how - to).

Cotton makes a great "decayed skin" texture.

I first apply cotton to the fingers. At this point, the fingers are only bare pieces of wire. I pull a cotton ball from the tip of the finger to the base, then wrap the finger with thread.

This will form the basic shape of the finger.

I also begin building up the palm area.

Here I simply use a hot glue gun to attach whole cotton balls.

In the photo at left you see the "knuckles" being formed, as well as "tendons" on the back of the hand.

At this point, the hand should be formed into the desired position, and cotton should be added where necessary to fill everything in.

In the photo at right you see the same hand with one coat of latex applied. I use Monster Makers mask latex, because that's what I have.

Last year I built hands similar to this, but coated the cotton with white glue. That process worked fine, but latex dries a little faster, and remains flexible. Latex also "builds" faster, requiring fewer coats.

This photo shows the second layer of cotton applied to the hand and arm, followed by a second coat of latex applied with a brush. As the latex dries, it turns a darker shade of yellow. This prop hand is starting to look pretty good.

Add layers if needed, just be patient while the latex dries between layers. (I've heard a heat gun will speed the drying process.)

I recommend buying several inexpensive paint brushes. I used "acid brushes" because they cost about ten cents. The first time I applied latex with a paint brush I learned it won't wash out with soap and water. My favorite camel hair brush with all of the tooth - marks on the handle was gone for good...

Fellow Haunter, Dave (Lothars Lair) sent along some advice: The brush is pre-treated with a soap and water solution. This should keep the liquid latex from adhering to the bristles. Any partially dried latex can be scraped off with a putty knife.

Thanks Dave.

I'd also like to point out that I have about three hours of construction time in this project at this point. (building two hands) The cost is almost nothing, since I had some latex left over from a previous project.

Metal coat hangers are just about everywhere, and no home haunter should ever be without chicken wire, duct tape, or light gauge wire.

A few finished (long fingered) hands.

They look creepy enough, but they sure do take a long time to make. In light of this, I plan to tackle the molding and casting arts soon. Is there such a thing as small scale mass production?

Pop- Up Part 4 - Assembly

At left is a photo of the motion Detecting unit that will be used with the Vile Things Simple Pop- Up.

The PIR sensor head is from a "Regent" outdoor lighting kit. It detects rapid changes in temperature, and activates a relay upon detection. This model has a 4 second test mode, as well as "1 minute" and "5 minute" run modes.

I opened the sensing head and disconnected the relay from the AC contact voltage.

The PIR sensor still requires standard household voltage for operation, but the relay now switches what ever I put into it, which, in this case is 12 volts DC - the output voltage of my home-made event control timer unit.

The metal "handi-box" at right will always be "hot." This will supply power to the PIR motion Sensor head and the timing unit.

Upon detection, the timer unit will delay for 10 seconds, then run for ten seconds. The 3 prong receptacle on the timer unit is wired to be "hot" only when the unit is in the"on" mode. By setting the PIR sensor head to the "1 minute" time, I will have approx. 40 seconds of "off time," during which time the prop cannot be re-triggered.

I mounted the PIR sensor head to an adjustable linkage. This will allow me to position the viewing lens wherever it will be the most effective (and least visible.)

He looked kind-of lonely, so I built him a couple of pals. (actually it's part of the set design.)

These guys don't do anything, they just provide moral support. The building process was identical to that of the 2002 Pop-Up, without any mechanical, pneumatic, or electronic parts.

These are very similar to "Monster Mud" props, without the mud. They each weigh less than twenty pounds.

In order to guarantee no haunt visitors will come close to the Pop-up prop, I built a section of p.v.c. fence. At a finished height of 37 inches, it would be difficult to simply walk over.

The bars are spaced 6 inches apart, so even little folks can't accidentally walk through.

Here's a sneak peek at the pop-up room during daylight hours.

Before... ...

and after.

Night time photos are NOT my thing, but you get the idea.

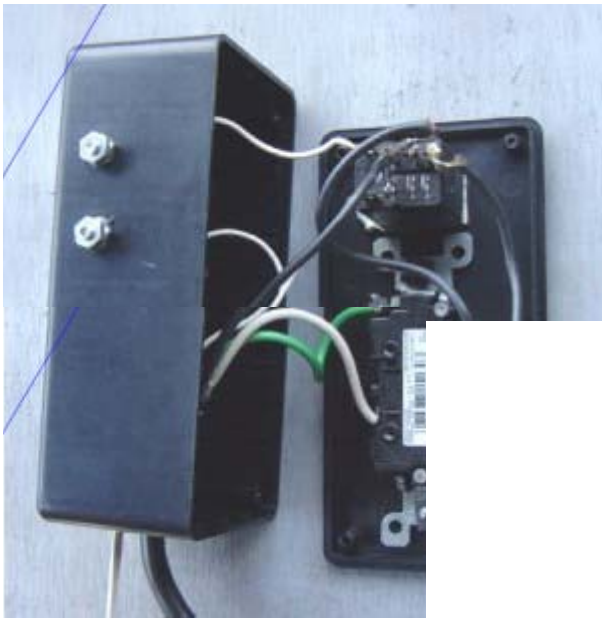
Switches

In the Hinton Haunted House, 2001, I needed a way to switch some lights and sound effects for the Scrim Box effect.

I listed my options as:
1. Manually switch the sound and lights.
2. Use a motion detector - type switch.
3. Use 12 volt current to switch 120 volt supply.

I like the idea of manually switching effects, the timing is nearly perfect. However, I couldn't be with the prop constantly. I needed something automatic.

Motion Detectors are great, but the sensitivity adjustments aren't very precise. Also, the "run time" is limited to whatever the Motion detector offers, typically 5 seconds or 1 minute. (Not a lot of options here...)

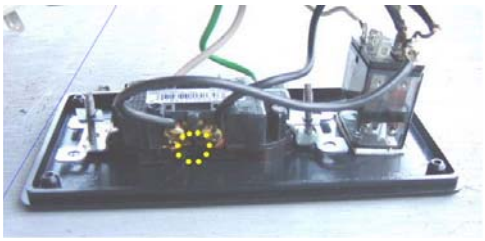


12 volt electromechanical relay. This low - tech approach to prop control worked fairly well for me.

The picture at left shows my 2001 switching device.

This is nothing more than a wall receptacle, a twelve volt Electro Mechanical Relay, a twelve volt power supply ("wall wart"), a 120 volt power source (extension cord), Two #10 - 32 machine screws (Switch contacts), and a project box.

Using 12 volts DC is a safer method of switching AC current.



This photo below, although a bit over - exposed, shows how I was able to use each side of the receptacle independently.

The connecting tab on the "hot" side (copper - colored side) was broken off, leaving me with two separate outlets.

One side is wired to the "Normally Closed" circuit of the relay. I used this for the room lights. The second outlet is wired to the "Normally Open" circuit of the relay. This is used for the effects (sound and lights).

Wiring the switch this way guaranteed that the Scrim effect would work, since that effect is a lighting - based illusion.

One outlet is always hot, typically wired as the "Normally Closed" side. The second outlet only activates when the switch is "pressed," and in this case, it is a momentary switch - if you were to jump up and down on the (mat) switch, the lights would switch back and fourth.

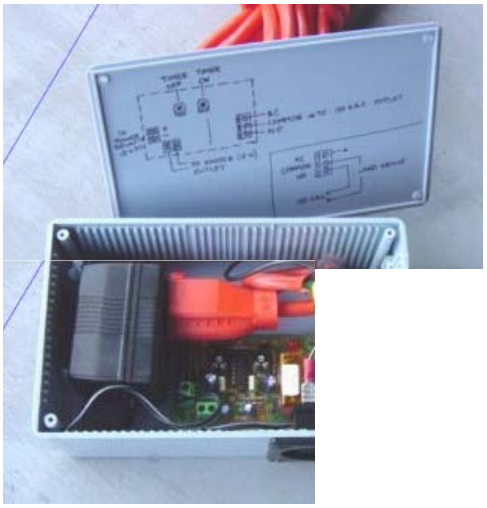
That was my biggest complaint. I had no control over how long the effect cycle would run.

I have seen several "Event Control Timers" at different Haunted House Supply sites on the Internet. At around $50.00, the price is good, especially considering some of the flexible features. I built two different Event Control Timers for the 2002 Haunt.

The design is very similar to our 2001 timer.

This unit has only one cord exiting the box. The switch is wired to the spring – type speaker terminal cup on the side.

A timer module was added to the circuit, and this gives us the control we were lacking in 2001.

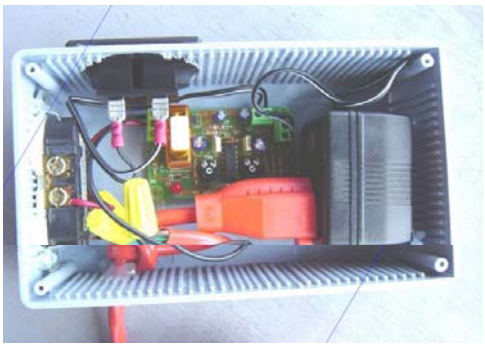


I cut the extension cord close to the female end. I used the female end to power the 12 volt "wall wart" that powers the timer module.

The speaker terminal cup replaces the switch that activates the timer module.

The wall receptacle is wired to the module's output relay. This timer has two "pots," The first adjusts the amount of delay. (when the effect is initially triggered, there will be a delay before the output relay is energized.)

The second pot adjusts the length of time the effect runs. I sketched a wiring diagram on the inside cover of the project box. I'm not very good at electronics, and this diagram may come in handy should I ever need to adjust or replace anything in the future.



This is a better view of the inside of my "delay timer."

My 2001 relay switch was built from parts purchased at Radio Shack and Home Depot.

The hardest part of the construction was cutting the shape of the wall receptacle with a Dremel tool. I estimate the total cost of the 2001 Relay Switch to be about $25.00 . I'm sure it could have been built for MUCH less shopping elsewhere, but I was in a hurry...

The 2002 Event Control Timers were built from parts purchased from MCM Electronics (with the exception of the extension cords and wall receptacle).

Following is a list of parts (including part numbers)

# 28-4750	On Delay Timer Module (1 - 180 sec.)	$19.95
# 50-010	Spring Terminal Cup	$.89
# 28-3075	12 volt DC adapter (500 mA)	$3.99
# 28-6465	Fuse Block (1/4" x 1 1/4")	$.99 (X 2)
# 313.600	6/10 amp slo blo fuse pkg	$3.89 / 5pcs
# 313005	5 amp slo blo fuse pkg	$2.89 / 5pcs.
# 28-975	Project Box (4 5/16" x 7 1/16" x 2 3/8")	$4.39
# 108-300	Female crimp terminal (16-14 ga. /1/4")	$6.74 / 50pcs
	Wire Nuts (10 / 18 ga. yellow)	$4.00 /25pcs
	25 foot 14/3 extension cord	$4.00
	Wall Receptacle	$.89

MCM Electronics also sells different (Cebek brand) timer modules:

- Sequential Relay Module (4 or 8 relays in sequence)
- Flip - Flop Relay Module
- Single Event Timer Module
- Sequential Dual Timer Module
- Repeat Cycle Timer Module

Most of these modules are also available in different timed lengths (1-180 sec., 2-45 min., 20-150 min.) As I mentioned earlier, I'm not well versed in electronics, but I was able to incorporate these timer modules into my boxes

--- IMPORTANT ---

Vile Things and its members will assume no responsibility for any damage or loss that may occur before, during, or after the construction of anything presented on these pages.

This information is presented as reference material ONLY. We do not suggest or support the use of home made pneumatic cylinders. Without any guarantee of safe operation, please seriously reconsider the use of any home made pneumatic actuator.