

Mark's Haunted Garage

<http://www.markshauntedgarage.com/halloween/2004/box.php>

Monster in a Box 2004



The monster in the box is the "he" the witch refers to in her speech when she says, "I don't know what *he's* worried about. I'm not cooking *him* until tomorrow night."

The "monster in a box" prop uses a Saturn windshield wiper motor to rotate a cam that causes the lid of the box to go up and down. A PIC16F628 microcontroller controls the motor by way of an optoisolator/MOSFET combination. The optoisolator is needed because the motor and the PIC use different power supplies. The motor's power supply is 12 volts, while the PIC's is 5V. The opto keeps the two power supplies isolated. Since the motor has a fairly low duty cycle in this prop, I used a MOSFET instead of a relay to eliminate the switching noise of the relay.

The PIC also controls a CD player that has the monster's growls on it. There are also a couple super-bright red LEDs that the PIC turns on when it turns the motor on. This gives the interior of the box an eerie red glow.

In order to have some idea where the cam is at any given moment, I put a magnet on the cam. A short distance to the right of the cam is a magnetic switch. The PIC can determine where the cam is based on how long ago the magnetic switch closed and how long the motor has been on. It's not overly precise, but it doesn't need to be.

The box is one I picked up at JoAnn's with a 50%-off coupon. However, the lid that came with it was a bit heavier than I wanted to have to push with the motor, so I made my own lid. I used a

1x2 for the frame and glued a piece of hardboard onto the frame. Since the hardboard was too thin to hold the cam follower directly, I glued a piece of 1x2 in the middle of the lid, then screwed the cam follower to that. As you'll notice in the picture above, I put the first piece of 1x2 too close to the edge of the lid. The result was that the cam hit the front of the box, so I had to put a second piece of 1x2 on so that I could move the cam follower back. I saw no reason to remove the original piece and risk damaging the lid, so I just left it there.



This shows the inside of the box looking straight down. I have labeled some of the parts so that they'll stand out a little better.



This is at an angle so that you can see the cam and the magnetic switch a little better.



You can see the cam follower on the lid of the box. This consists of two angle brackets with a bolt and an aluminum spacer between them.



I added some chains after strengthening the framework holding the motor.

Obtained from
Omarshauntedtrail.com