instructables
The World's Biggest
Show & Tell

Home **Sign Up!** **Explore** **Community** **Submit**

All **Art** **Craft** **Food** **Games** **Green** **Home** **Kids** **Life** **Music** **Offbeat** **Outdoors** **Pets** **Photo** **Ride** **Science** **Tech**

Low-Cost Illuminated Signage for Todays Responsible Citizen

by **Q-Branch** on December 19, 2006

Table of Contents

Intro: Low-Cost Illuminated Signage for Todays Responsible Citizen

Low-cost, illuminated signage for todays responsible citizen courtesy of the GRL and the Eyebeam OpenLab . This tutorial will explain the tools and processes we used to combine LED christmas lights, plexi-glass and rope to make our own low-power signage on the cheap.
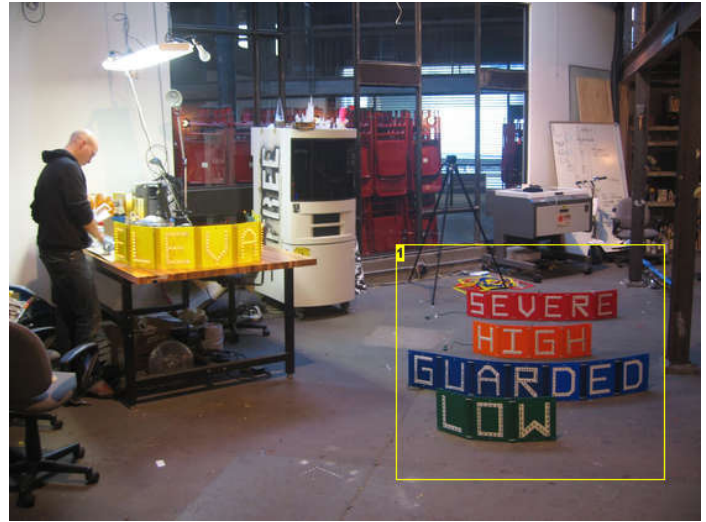
Image Notes
1. fully sprayed and assembled
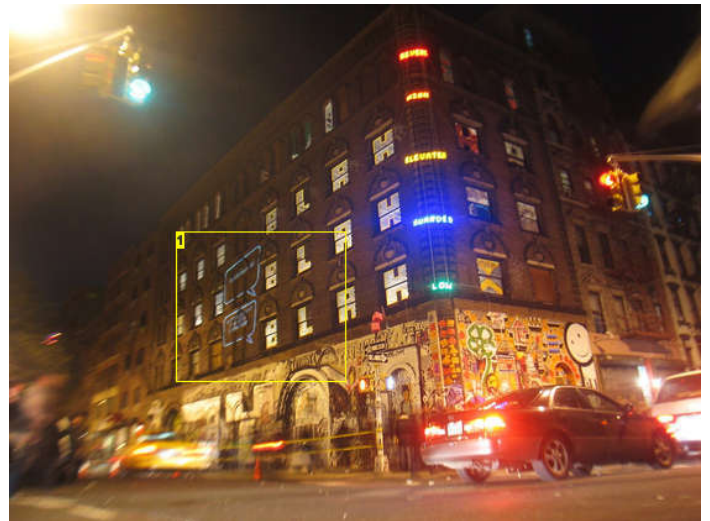

Image Notes
1. http://www.txtualhealing.com/
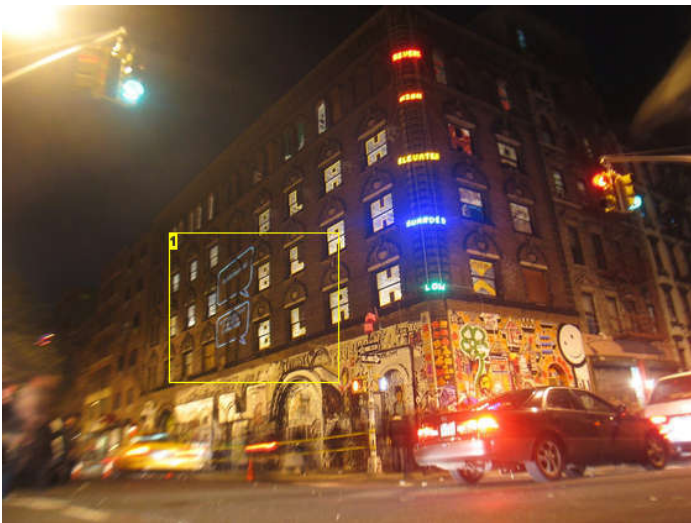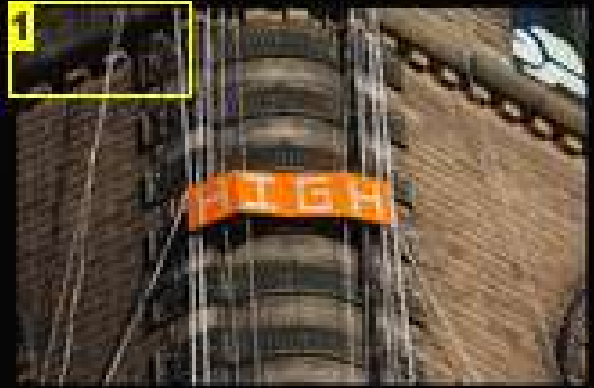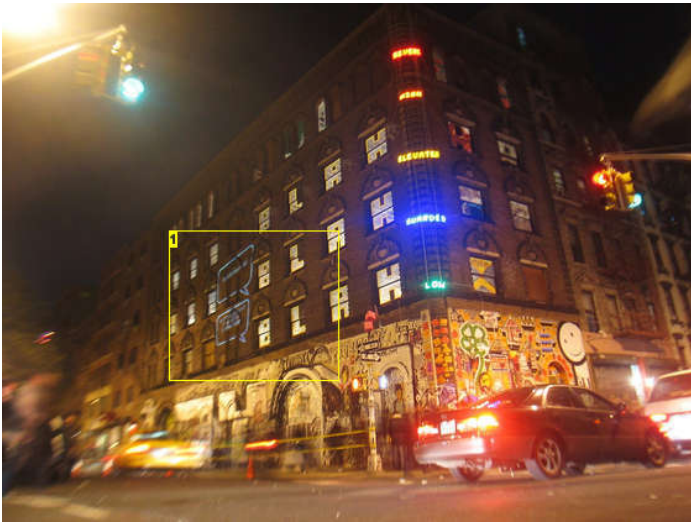
Image Notes
1. http://flickr.com/photos/eugapa/

Check out our video how to for the Homeland Security Advisory Tower at 11 Spring .

Image Notes
1. http://www.txtualhealing.com/

step 2: Tools and Materials

To build your own signs you will need a short list of materials and tools.

Tools:

Hand drill or drill press
Size T or 23/64 plastic drill bit
epoxy designed for plastics
duct tape

Materials:

1/8 acrylic sheet (colors optional)
LED Christmas lights
we used LED christmas lights from Rite-Aid.
Twisted/Braided Nylon or Cotton Rope
Beefy Wire ties

Optional:

Spraypaint
(you should probably use Krylon Fusion or a plastic primer)
Stencils
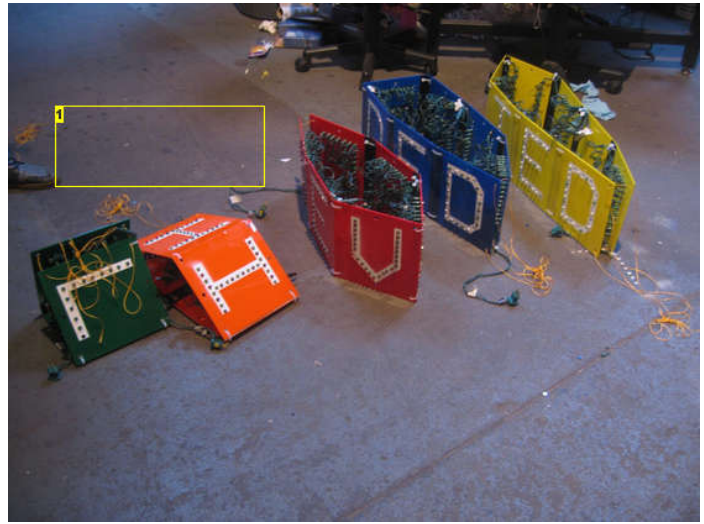Laser cutter
Hammer drill for mounting and hanging

more in LED christmas lights:
http://ledmuseum.home.att.net/xmas1.htm
http://www.holidaycreations.com/led.html

Image Notes
1. wire ties
2. hammer drill
3. can
4. LED christmas lights
5. acrylic 12" x 12" sheets
6. 5 minute epoxy. use the kind made for plastic (not pictured here)
7. duct
8. ladies love cool james

Image Notes
1. foldable, portable

step 3: "So little to say... and so much time"

First you need to decide what you want your sign to say. I'll leave this up to you and yours, but may I suggest you check out this and this for inspiration. And double check your spelling stoners.

We decided to tackle the much needed civic service of telling everyday new yorkers and graffiti tourists that they are currently more at risk than anywhere else in the United States according to the Dept. of Homeland Security. Who knew?

Image Notes
1. unidentified artist

Image Notes
1. dead for nothing

step 4: Colors

For our Homeland Security Advisory Facade we needed to rearrange the multi-color LED christmas lights into individual red, yellow, blue and green LED strands. We had to do some red and yellow color mixing to get orange.

IMPORTANT :

DO NOT remove all the LEDs at once, organize them into little color piles and then re-insert them into their respective single color strings. You'll plug them in. They won't light. You'll have to painfully debug every string one bulb at a time to find which LED isn't fully set into its socket. This may seem obvious but it was a harsh lesson for the lab. In restrospect, I would suggest that if you need a strand of red LEDs, you should just buy that single color. If you are buying out all the christmas lights at rite-aid like us, and your forced to use multi-color strands, just buy extra and slowly bubble sort through each string removing only one LED at a time and replacing it with the right color from the surplus strings. Mark troublesome LEDs with a paint pen so you can look at the likely culprit if your string suddenly goes dark.

Image Notes
1. yellow
2. red
3. 1 red 2 yellows = ~ orange

Image Notes
1. green
2. blue

step 5: Making The Acrylic Frame

Use the attached files or design your own hole patterns in order to trim down and drill the features you will need into the acrylic sign frame. The basic idea is to cut the acrylic sheet into ~10" x ~ 10" squares and drill a number of .36" holes in acrylic in the shape of a letter. Other holes are for connecting letters. In the next step we will show you how to insert the LED bulb and socket into these holes to create letter forms.

Design Rationale:

We decided to make each letter a separate acrylic section in order to allow us to assemble a flexible sign from modular pieces. This design has hole patterns that create letters and hole patterns that are used to connect the squares and secure them to the building. The resulting design allows your signage to bend around corners and fold easily for travel. We will explain how to connect these individual squares in the following steps.

Constructing the Acrylic Squares:

The attached files can be used as a starting point for you to create your own design that can be produced using a 50 W laser cutter or by hand.

1. To cut with a laser cutter you will need to adjust the Corel, Illustrator or EPS file to match the settings and bed size of your laser cutter. These files were made in Corel Draw for a V-460 60 Watt Universal Laser Cutter with a 18" x 24" bed.
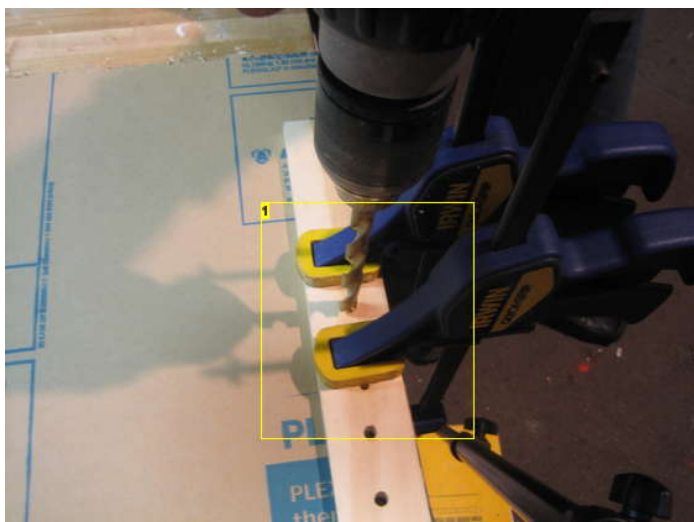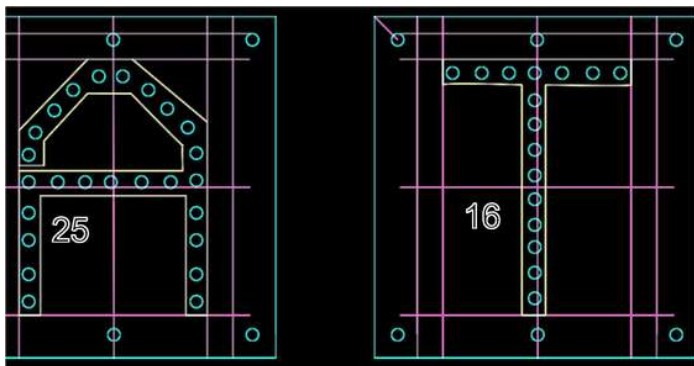
2. Cutting thin acrylic by hand can be difficult. Normal drill bits will grab and lift the acrylic. Use a plastic drill bit and penetrate the material very slowly. If possible use a drill press and anchor your work very securely. If you're cutting by hand, I've found the best way to increase your chances of cutting and not shattering your sign is to sandwich the acrylic using clamps between two pieces of plywood and drill through the wood and acrylic.

After drilling the sign squares, we added a white fill to each letter using spray paint and a stencil.

more info on plastic bits:
http://www.hawkfish.org/snailman/acrdrill.htm http://www.hawkfish.org/snailman/acrdrill.htm
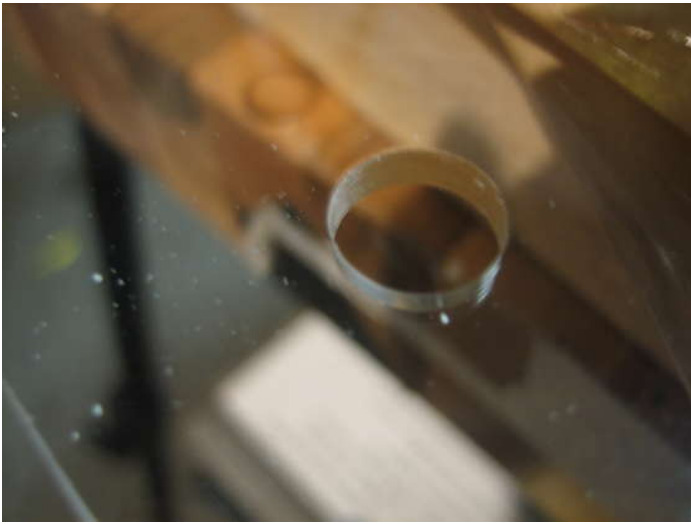http://www.rplastics.com/plasticdrill.html

Image Notes
1. Dirt Style: clamp the acrylic between two pieces of wood. Tight to the hole location. penetrate very slowly. preffered method laser cutter or drill press with plastic bit and proper clamping

File Downloads

GRL_HSAT_Vectors.zip (463 KB)
[NOTE: When saving, if you see .tmp as the file ext, rename it to 'GRL_HSAT_Vectors.zip']

step 6: Put the Pieces Together

How to Assemble the Sign:

Layout the letters you need to create your word. Tightly tape each letter together with a strip of duct tape on the back side of the sign. Lace down wire ties through the attachment holes provided in the design. Finally, loop lengths of > 70 lb. load cotton or nylon rope through the holes provided on the letter squares. You will need two ropes attached to the top of the sign to hang it and two on each side to tension it. We attached an extension cord to one of the tensioning ropes and wire-tied it in place for strain relief.
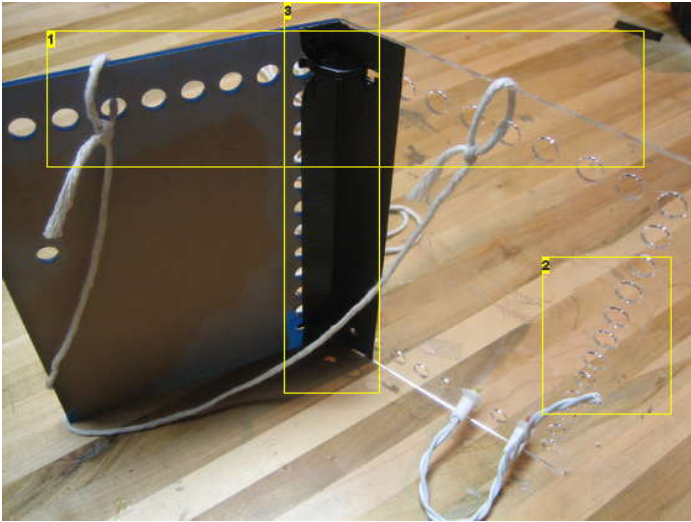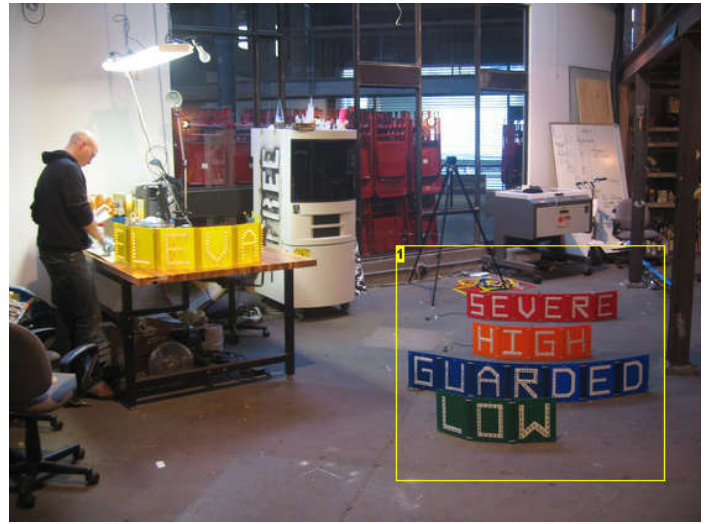

Image Notes
1. to hang the sign from above
2. holes for tension ropes
3. duct tape keeps it in place but flexible
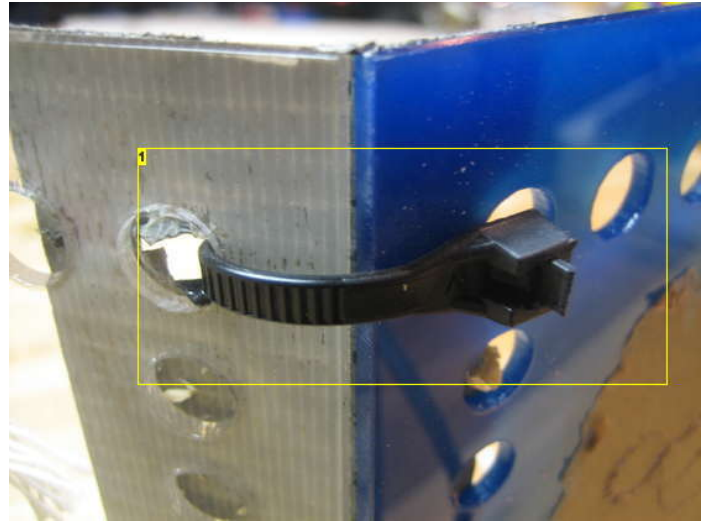
Image Notes
1. wire ties the letter together

Image Notes
1. fully sprayed and assembled

step 7: Pimp my Sign
How to Insert the LED Christmas light bulbs:

Now you can insert the LED bulbs into the letterform hole patterns in the individual sections of acrylic. Mix a batch of two part epoxy and apply it to the LED socket and the back side of the sign. I used the Loctite brand 7-minute plastic epoxy. You may need to skip certain bulbs in order to reach a given letter's holes or to skip between letters. Use duct tape to cover the LEDs in the unused sockets. Keep the string tension free. The LED sockets should press-fit securly in the holes. If you use different size LEDs you may need to change the hole diameter in the file.

Image Notes
1. smoof
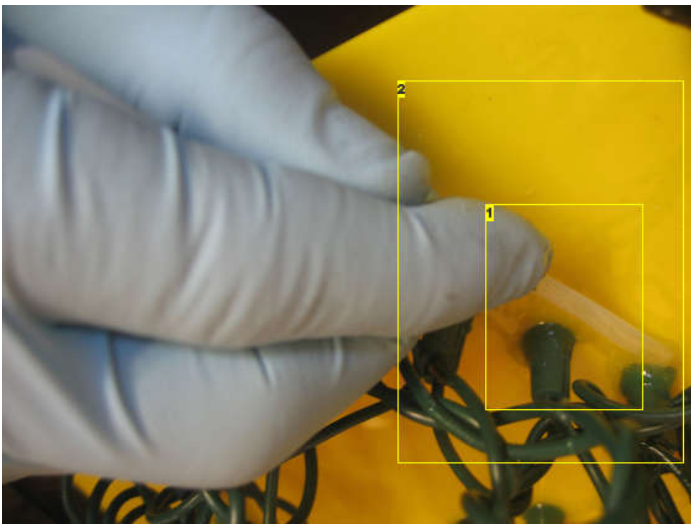
Image Notes
1. generous amounts of epoxy
2. wear gloves so you dont get cancer

How to Hang the Sign:

This will depend on your particular location and architecture. To hang our Homeland Security Advisory Tower signage, we began by getting access to the roof of the Candle Building at 11 Spring. We decided to hang the signs individually so we could more easily vertically space each word. We lowered each letter, starting with the lowest first, over the side of the building. Once the sign was at the right height, we would use a Mr. Longarm telescoping paint pole with a makeshift hook on the end to grab the looped lengths of rope and extension cord on either side of the sign. We pulled the tensioning ropes through the nearest window on the facade of the building and tied them off to brackets we installed on the interior of the building.

BLINKING:

Each sign unit was individually plugged into 120 VAC power outlets using extension cords run along the tensioning ropes. Connections between extension cords and christmas lights were duct taped to protect them from water and wire-tied to relieve mechanical tension. To make the "HIGH" sign blink we used a Winker Lampholder Adapter . You can get these on Canal street in NYC or online here. They will blink about 20 times per minute. The only catch is that they require a load greater than the LED christmas lights provide in order to start blinking. To hack this, we plugged a power strip into the Winker and then plugged in both the christmas lights and a conventional 120 VAC light bulb to the strip. This put the final dynamic touch on the Advisory Tower. Realtime terror awareness had been achieved.
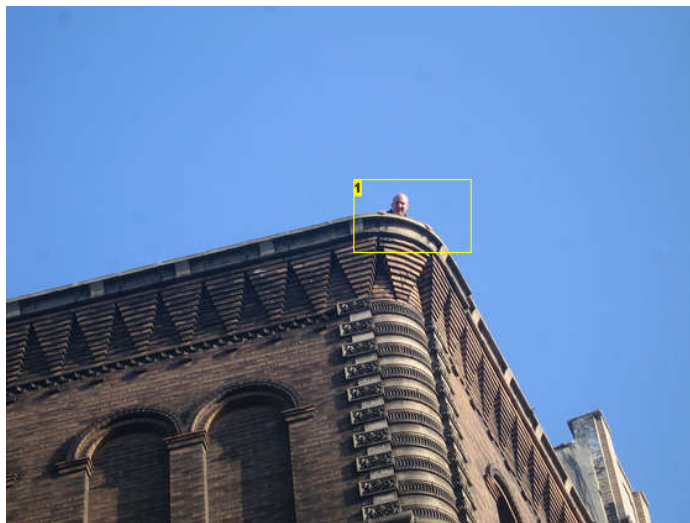
Image Notes
1. the moon
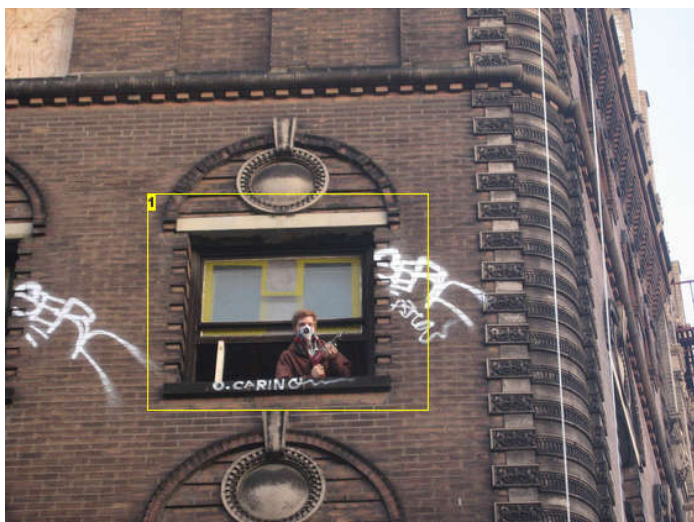
Image Notes
1. by any means neccesary
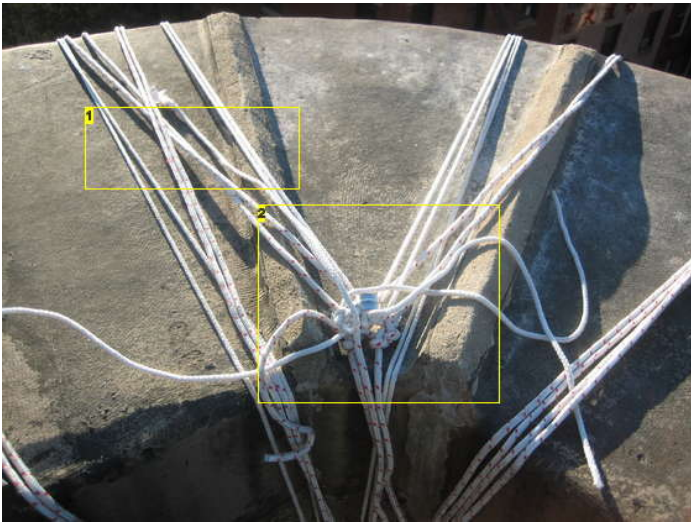
Image Notes
1. ropes going down the building to the sign
2. bracket lag bolted to into the concrete
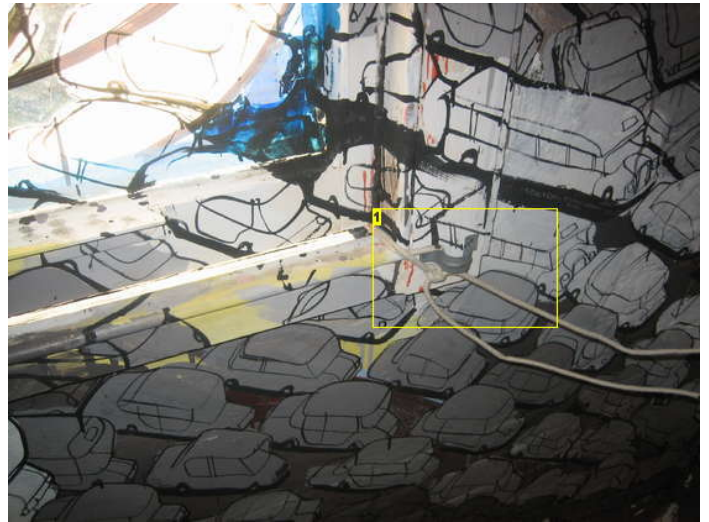
Image Notes
1. brackets inside the windows on each floor for tension ropes
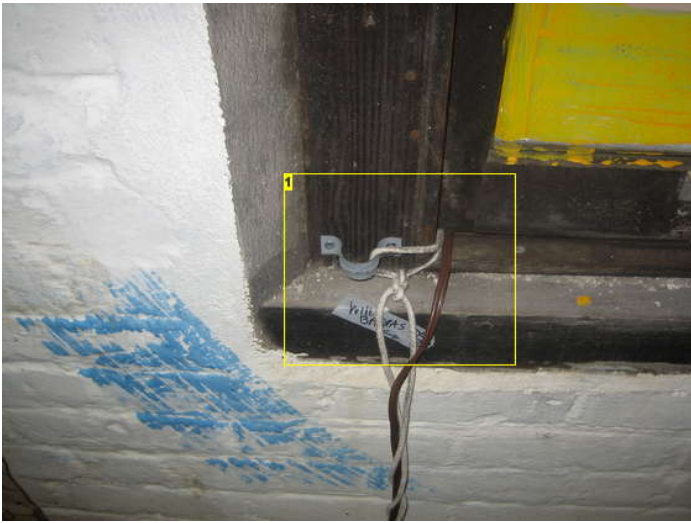
Image Notes
1. brackets, tension ropes and the extension cord

Image Notes
1. dont tell the fire marshall

Image Notes
1. <~~~ this light here
2. this is a hack to make the winker plug think it has load on it
3. christmas lights

Image Notes
1. the winker

4. This power strip is plugged into the "Winker"

Image Notes
1. http://www.codeblooded.net/

Related Instructables

LED Throwie Talkie by pcunning

The EyeWriter by Q-Branch

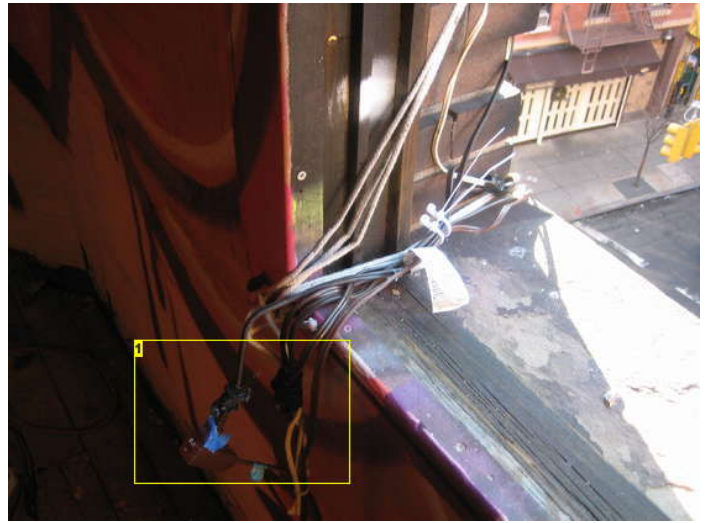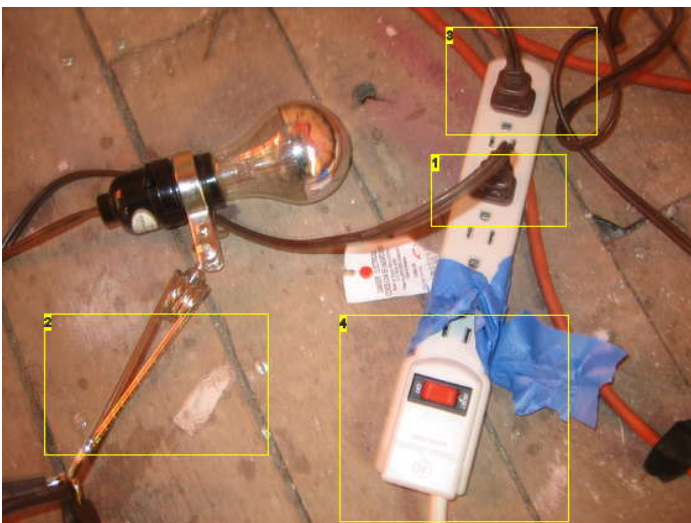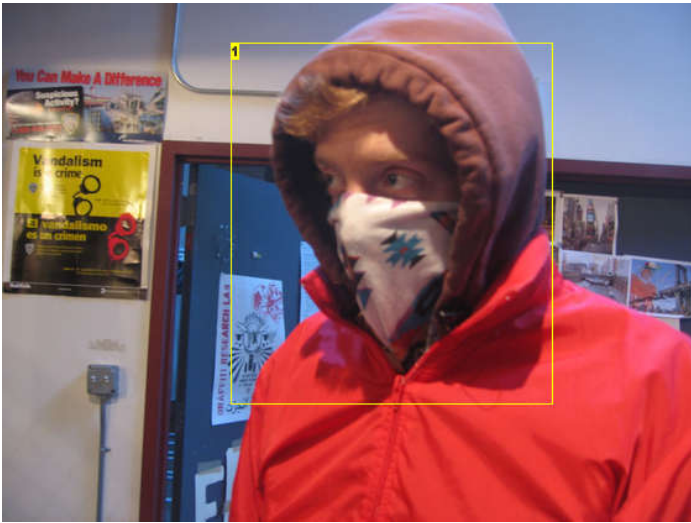**Laser Cut Spray Paint Stencils** by saul

Electro-Graf by Q-Branch

My Keyboard My Hands by noahw

Laser Cut Cake!!! by colin

DIY Efficient Laser Target Sighter by brentgmz

How to Enter the Ghetto Matrix (DIY Bullet Time) by fi5e

Comments

25 comments **Add Comment**

---

kirnex says:
Doh--Cool James...is that what I think it is? And am I the only pervert that noticed that?

Sep 12, 2007. 3:20 PM **REPLY**

---

cerene says:
I noticed too :P

Jun 11, 2009. 10:58 AM **REPLY**

---

kirnex says:
I have to say....I've seen some, but I've never seen *that* one. Plus--honestly, I'm a little disturbed it's apparently kept with the cordless drill and the epoxy. Freaky.

I suppose the duct tape should bother me, too, but surprisingly, it doesn't.

Jun 11, 2009. 1:32 PM **REPLY**

---

nachotronics says:
the rat stencil was made by Banksy

Dec 24, 2006. 10:07 AM **REPLY**

Kay-Oh says:
Looks like an imposter to me. Are you certain?

May 7, 2007. 11:51 AM **REPLY**

---

comp_geek93 says:

I'm sure

It's on his website...
http://www.banksy.co.uk/
You go to outdoors then scroll to the end and click next 5 times. He is last on the one after the fifth click.
:D

Apr 5, 2009. 5:50 AM **REPLY**

NightmarE says:

The rat saying "So little to say and so much time" is by Bansky i believe.

Feb 5, 2009. 5:59 PM **REPLY**

wenpherd says:

your town has a lot of grafitti

Dec 12, 2008. 11:13 AM **REPLY**

Spartan Phalanx says:

IN the video you can see that the rooms windows spell BLAH

Apr 24, 2008. 4:40 PM **REPLY**

www.ledbillboards.co.uk says:

It looks nice. In my country, people still do not know, how powerful and cost-effective it is.
I use the brightest LED to build my ledbillboards - please have a look at: http://www.ledbollboards.co.uk

Dec 7, 2007. 1:06 PM **REPLY**

RedMeanie says:

Awesome Idea.....And I can't believe anyone would complain about your project, it seems to me you are doing a Public Service by letting people know how much "DANGER" they are in.....:-)

Aug 28, 2007. 8:44 AM **REPLY**

valessi says:

where is that located? and what art show is this? If it caused cops to stake it out, it must have been pretty horrorshow.

Jun 17, 2007. 6:45 PM **REPLY**

kentek says:

Well, don't put them up in Boston Mass because they will call the bomb squad.
:-)

Feb 10, 2007. 10:49 AM **REPLY**

StiltGuyJoe says:

HAHAHAHA, don't forget shutting down the highway, and the orange line, and traffic on the river.

Jun 11, 2007. 10:38 AM **REPLY**

curlyfry562 says:

lol "throwies aren't Bombs"

May 15, 2007. 5:21 PM **REPLY**

girrrrrrr2 says:

it wasnt a throwie... it was a mooninite made out of leds... and the largest part on it was the 4d battery holder covered in black duct tape... it is weird that no one over there has ever herd of a mooninite... and i dont get why they didnt look at and think what does this on of switch do... and the last thing i think is weird is that they didnt think that the duct tape fragments couldnt kill a dead person... lol... they arent the smartest over there...

Jun 17, 2007. 5:27 PM **REPLY**

Rectifier says:

I saw this and had to do it! So I did this for a sign on my kegerator - spelled out "COLD" in blue ice-crystal style xmas lights, through holes drilled in a chalkboard. Then wrote Beer on the chalkboard and the names of the beers on tap.

Mine's not exactly social commentary, but I have to say, it looks EXTREMELY nifty, and is so cheap and easy. Everyone should make an LED sign!

May 13, 2007. 3:10 AM **REPLY**

curiousity says:

Nice touch with the blah blah blah windows.
And nice job keeping them even and balanced, that's hard, but really adds a lot to the final statement. Keep it up.

Jan 16, 2007. 10:15 AM **REPLY**

Antiundead says:

Very good, i might give this a go in the future. Oh and by the way, the graffiti with the words "So little to say...and so much time" was done by the british artist Banksy .

Dec 31, 2006. 6:04 PM **REPLY**

joejoerowley says: Dec 22, 2006. 3:42 PM **REPLY**

Hi
This is possibly the coolest thing on Instructables. I love it because even I (13 years old) can do it!!
This is so cool.
Thanks for the inspiration,
JOe

---

ewilhelm says: Dec 20, 2006. 2:50 PM **REPLY**

Acrylic is a bit brittle, which I'm sure you know. Delrin (acetal) is another laser-cutter-able choice, should you want to make larger panels.

What's the back story on the police in the video?

Q-Branch says: Dec 21, 2006. 7:54 AM **REPLY**

thanks for the Delrin tip. I'll try it out. Here's a link to Delrin at USPlastics Corp:

http://tinyurl.com/uhkwy

The police in the video are NYPDs finest. They were al over the street art event at 11 spring. Undercover units were parked outside the building for two weeks leading up to the show. In the video, the gallery had just closed for the last day but there was still a .2 mile line around the block and up the bowery to Houston street. I think they were freaked out that people might have a little mini riot so they sent in some cops to tell everyone that the show was over and they had to leave. Someon hit the cop car with an LED throwie, which you can see in the video if you keep your eyes peeled.

---

bf5man says: Dec 20, 2006. 5:22 PM **REPLY**

Really impressive! Good work and nice intructable.

---

cry_wolf says: Dec 20, 2006. 2:38 PM **REPLY**

Wow! That looks really nice and the lights are so vivid, even when there are strret lights on. Very impressive!

---

mark101 says: Dec 20, 2006. 2:37 AM **REPLY**

Looks good! Did you do this on your first try? I have always wanted to do this but worried about the proper spacing of the lights TO distance viewable ratio, yours looks perfect.the lights are spaced how far appart?