Expanded Vocabulary Easy Button

by **instain** on January 19, 2009

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Intro: Expanded Vocabulary Easy Button

The Easy Button is available from Staples for $5 and it simply says "that was easy" every time you smack it. The easy button is well constructed for the price, but requires a little work and about $10 worth of parts to make it recordable.

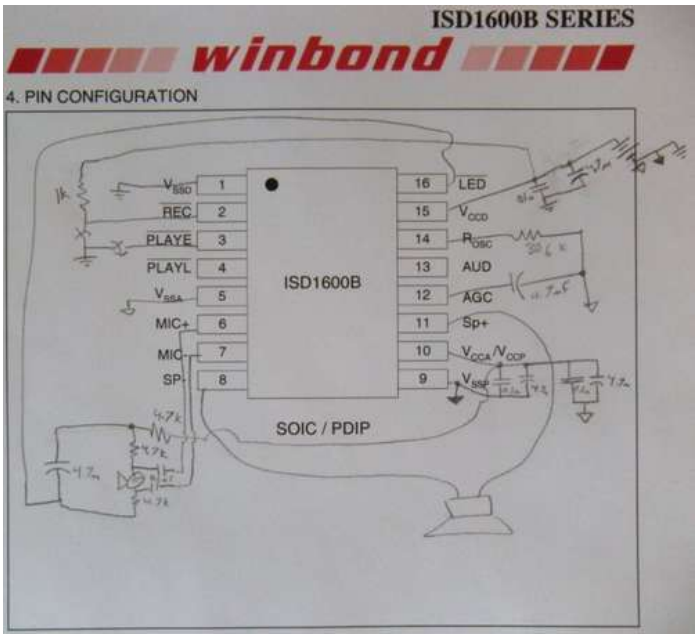
step 1: Get your parts

I chose to use the ISD1600B voice recorder chip and essentially build the reference circuit for it. I made sure to get a microphone that had good low frequency response since the speaker in this thing is so big and can reproduce low frequency voices well.

You will need [digikey part numbers in brackets]:
(1) Easy Button
(1) ISD1610 Voice recorder [ISD1610BSY-ND]
(1) Electret microphone [P9925-ND]
(1) Pushbutton [EG1826-ND]
(1) 1k Resistor [1.00KdXBK-ND]
(1) 80.6k Resistor [80.6KXBK-ND]
(3) 4.75k Resistor [4.75KXBK-ND]
(5) 0.1uF Ceramic capacitor [BC1101CT-ND]
(5) 4.7uF Caramic capacitor [445-2854-ND]

You will also need these supplies:
Wire (I used 24 AWG stranded and 30 AWG solid)
Glue (I used 5 minute epoxy)
Solder

And these tools:
Soldering iron
Wire cutter/stripper
Tweezers



step 2: Disassemble

Remove the four rubber feet on the bottom of the easy button, revealing the screws that hold it together. Remove the four screws. Lift the top off.

Remove the two screws holding the circuit board down, remove the circuit board and the spring steel below it.

Finally, remove the last four screws and the bracket they hold down so we can see the speaker and bottom plate.

This might sound complicated, but just take everything apart.

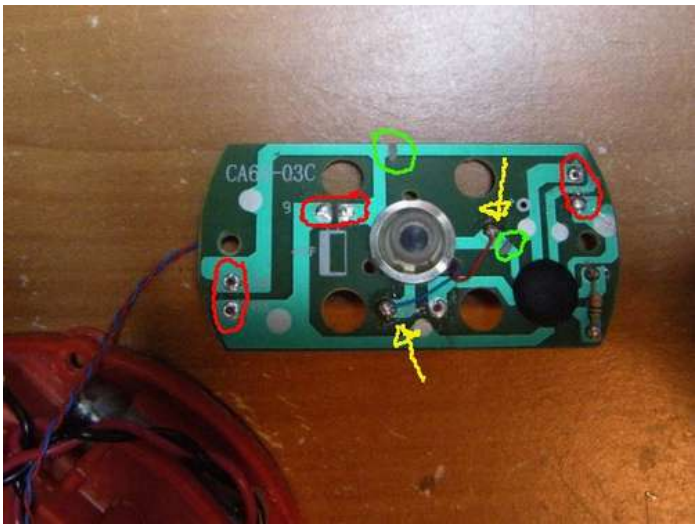
step 3: Rework the pushbutton

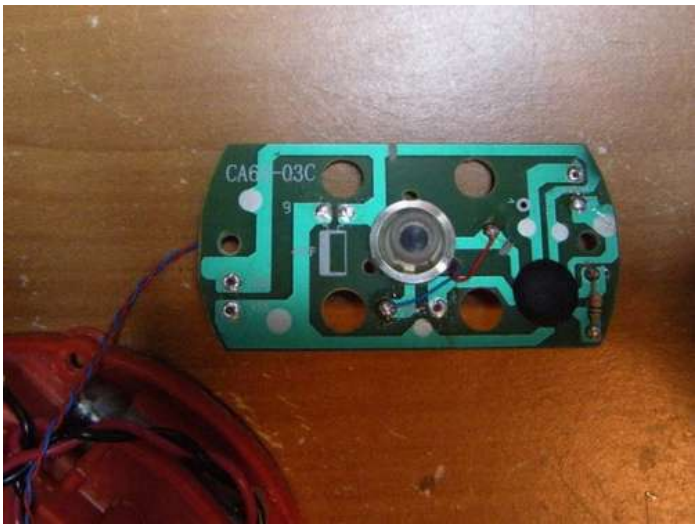
First we will have to disable the original circuitry and claim the main pushbutton for our own use.

In the picture below, remove the items circled in red: the power wires, an electrolytic capacitor, and a resistor.

Next, make small, complete cuts through the traces where shown circled in green.

Finally, attach wires to the pushbutton at the test points where the yellow arrows show. Feed the wires down through one of the holes next to the button.





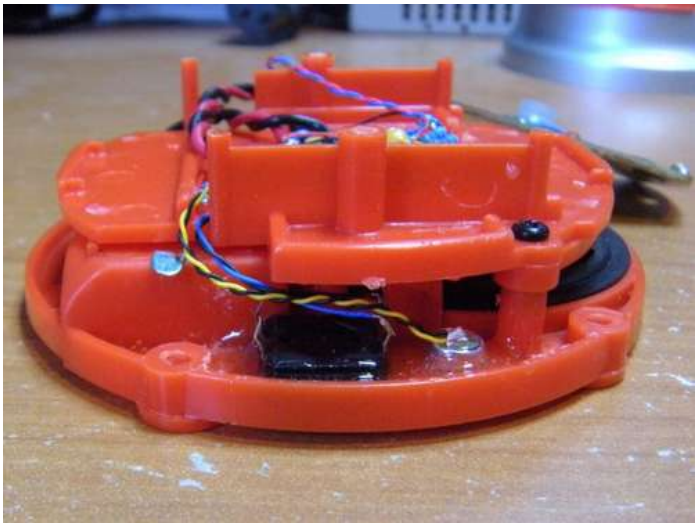
step 4: Adding the microphone

Now we need add our microphone and record switch. I put these on the bottom so they can't be seen during normal use. Also, that's about the only place available to mount them.

Looking at the bottom you will see two metal rods that are glued on either side of the speaker. Pry one of them out so we can put our hardware there. You will also have to hack out the vertical brace that the rod was glued to.

Next, drill two holes, as shown in the picture below. One should be just smaller than the microphone and one should be just bigger than the switch's actuator. Carefully glue the microphone and switch in place as shown. This is also a good time to add some pieces of wire to them.

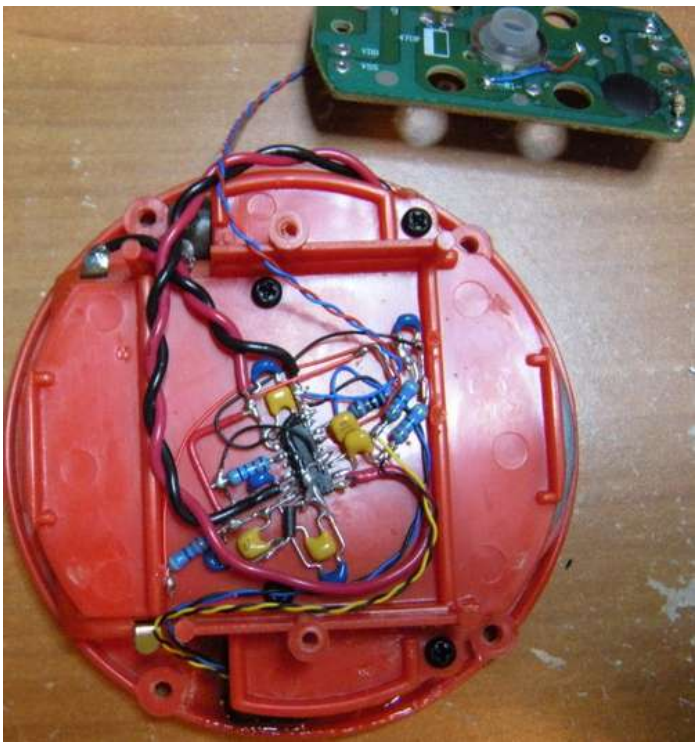
Put the big plastic bracket back in place over the speaker and fasten it down with the four screws removed earlier.



step 5: Building the circuit

This is the most difficult step, but it basically comes down to patience and origami skills. I chose to put the circuitry on the plastic shelf underneath the spring steel since this seems to be the largest available space. The downside is that there isn't much clearance above the parts so you have to keep things as flat as possible.

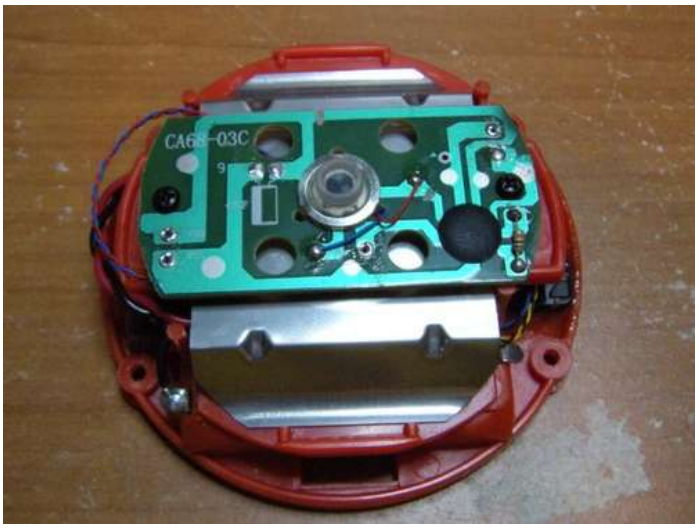
Following the schematic, add all the parts, I like to start with the big wires first, in this case the power and ground and the two speaker wires. Then add all the capacitors, then connect power and ground to each Vcc and Vss with short pieces of wire, then add the resistors. Finally, connect the microphone and two switches.



step 6: Assemble

Carefully route the wires so they don't stick out anywhere and get pinched. Set the spring steel down over the circuit and make sure it won't touch any parts when depressed. Set the original circuit board down on top and screw it into place. Finally reassemble the main parts, put the four screws back in the bottom and put the rubber feet back in.

To record a message, hold down the pushbutton on the bottom and speak into the microphone. It is reasonably sensitive and has automatic gain control so you don't have to yell into it. Now press the big button on top to play back your message. It is similar in volume to the original, but a lot more fun.



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Comments

8 comments **Add Comment**

degroof says: Feb 25, 2009. 7:09 PM **REPLY**

I tried using the SOIC chip but it was a bit too small for me solder, even with a magnifier. I ended up cramming an ISD1620 demo board (DigiKey I16-COB20-ND) in instead. Wasn't enough room for both it and the spring, though. Still works pretty well.

cmrc says: Jun 23, 2009. 11:33 AM **REPLY**

I used the demo board and fashioned a new spring out of the spiral wire off the back of an old notebook. It worked well. All it took was removing some of the plastic that was getting in the way, and mounting the spring in such a way that it did not interfere with pushing the button down.

akatsuki666 says: Feb 13, 2009. 4:27 AM **REPLY**

umm can ur little chip download stuff off the computer? if not pls tell me one that can ty

instain says: Feb 13, 2009. 5:15 AM **REPLY**

No, it cannot. Not directly anyway. You can hold the microphone up to your speakers and it records pretty well.

cyrozap says: Jan 21, 2009. 10:34 AM **REPLY**

a video of it would be cool.

cflowers says: Jan 21, 2009. 10:07 AM **REPLY**

Awesome hack! I featured it on The Daily Hack . Keep hacking, modding and building! :)

Charlie Flowers
twitter.com/charlie

inventorjack says: Jan 19, 2009. 11:33 AM **REPLY**

Awesome little project. I just happen to have one of those ISD chips laying around, and one of my coworkers has an Easy button at work. When he comes back next week, it will have a new vocabulary :)

jeff-o says: Jan 19, 2009. 9:32 AM **REPLY**

Now that is some crazy "squished bug" soldering!
