Door Alarm

Steak Electronics

Contents

1 Overview

Client wants a door alarm. Let's do a few transistors, an audio amplifier board, a magnet and magnetic reed switch, along with a light switch.

Functionality req'd:

Makes noise when door opened.

Able to be shut off with light switch.

2 BOM

Any audio amplifier loud enough will work. I'm going to use this one:

IS31AP4088A-QFLS2-EB

I think I have speakers and transistors. I'll need a magnetic reed switch and magnet. They should be black, as the door is black.

MS-324-3-3-0500

let's also try 59140-1-S-03-A,[1] as first co. doesn't make the matched magnets...

and the magnet,
    57140-000
    A speaker, although I have plenty in my junk bin. AS07708PS-2-WR-R

That's a start.

3 Work Log: LM324, LM555, TIP120,125

I spent a bit on this during the evening. I tried first with a LM324, in falstad (sim software) to see if I could make a function gen, out of 3 op amps. I was unable to get the sim to work, although reportedly the circuit works online (ref: https://www.eevblog.com/forum/beginners/simple-analog-function-generator-design/msg1174548/#msg1174548)

I decided instead, to simulate a triple 5 with a LM324, to finally a transistor output, and this worked in sim. I breadboarded the circuit however, the output was not switching correctly. It turned out later, that I had not read my TIP125 close enough - it is a PNP. Oops.

Before realizing this error, I breadboarded two op amps, (ref: https://electronics.stackexchange.com/questions/311648/obtaining-a-triangle-wave-from-a-square-wave-using-a-lm324n-op-amp) and these were able to make the square / triangle wave without issue. Not practical in this situation however, as the freq. is low. I tried adjusting via the R between output 1 and inverting input for op amp 2, but this did not work as expected. I had long leads with a variable resistance box. Most likely, the issue.

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[1] A and F ending letters on this, A is tinned, F untinned leads

Next, I will breadboard the triple 5 with the LM324 (which may be optional) and use that. I will throw in an Arduino to switch the triple 5 on/off via the RST pin. This will allow for some adjustment of tone.[2] Future improvements would be to get some way of removing the Arduino from the project. I would need a solution that will adjust how often the RST pin is switched, for some short period of time while the door magnet switch is active.

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[2]I could just use the tone() function on the Uno, and have a transistor handle the output, but the goal of this project was to lean more towards the analog.