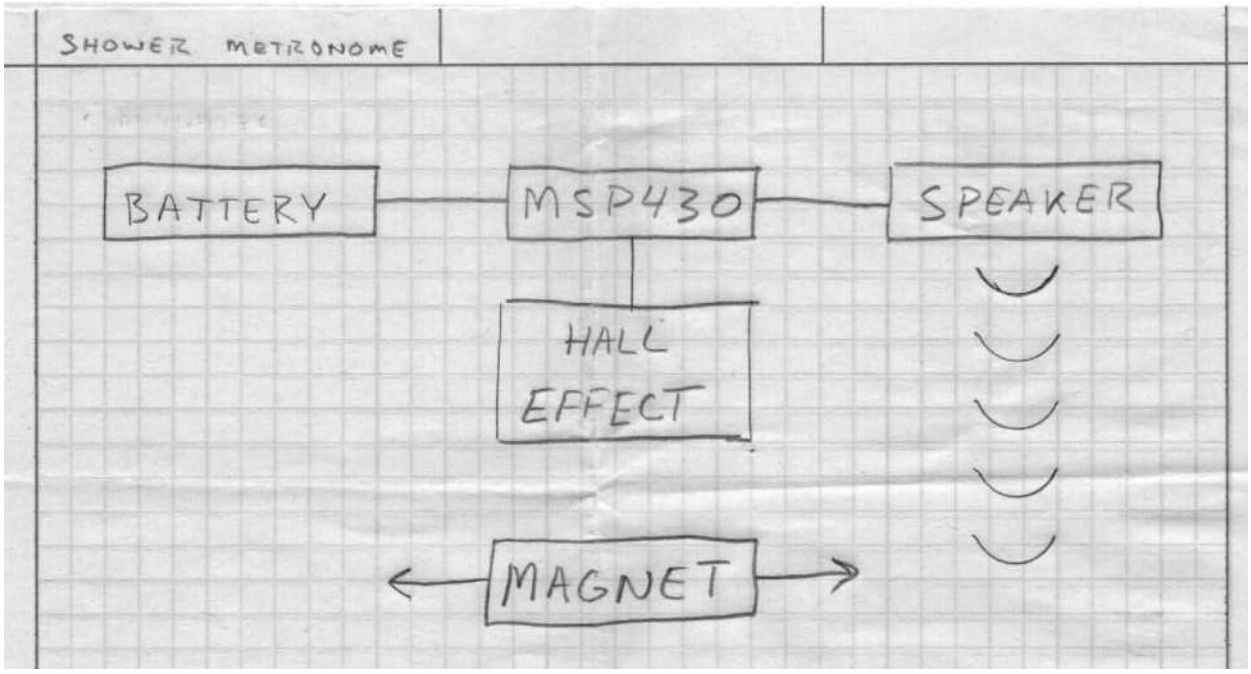
2015 HACKADAY PRIZE

SHOWER METRONOME -SYSTEM DESIGN DOCUMENT



COMPONENTS

Enclosure: Re-purposed generic door/windows security device from dollar store that was in parts bin.

Battery: 3x LR44 coin cell

MSP430: A G2211 or maybe a G2553. G2211 is being used for testing on breadboard. SMD maybe for final design.

Speaker: Generic buzzer being used for testing, speaker from the re-purposed enclosure planned upgrade

Hall Effect: A3314 sensors from prior ebay order being used for testing. They seem to work fine at 3.3V

Magnet: Generic permanent magnets being used for testing. The one from the re-purposed enclosure might not be strong enough. An alternate enclosure will be needed for the shower curtain attachment.

Custom PCB to replace the existing board from the enclosure. Nice long wires from battery contact and speaker, might repurpose on/off switch.

STATUS

Sensors have been tested with microcontroller. Basic code put together to test operation. Beeper tested but going to move to speaker.

TODO

Use MCU PWM output to drive speaker from the current enclosure.

Look into power draw with MCU in low power and interrupt driven off of sensor. Quiescent draw of these sensors might be too high. Maybe a push button to latch operation of unit at start. Would address wife factor if she doesn't like beeping while showering.

Multiple sensors for magnet alignment and direction for shower door or curtain mounting. Provide more flexibility.

Code needs completed, state diagram for operation of the unit.

Low battery feedback led would be nice, or different beep at start to notify user of battery status.

Current enclosure has on/off switch that could be used to conserve battery power. Could have a Start push button here and have MCU keep power on until shower completed.

GOAL

A functional prototype that fits in the housing that wouldn't have been completed otherwise if not for the project entry. This would have remained another incomplete project idea that would have never been completed. Prototype completed by next stage deadline to allow some test showers to be completed to get feedback on the ticking pulses / frequency and operation.