

# Project Proposal

## Possessed Beaker Head

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#### Project Abstract

This is a novelty project of a possessed Beaker head. Beaker was an unfortunate lab assistant on The Muppet Show, who was always subject to scientific experiments which ended poorly. This project strives to recreate the head of Beaker, but also make him appear possessed. The “possession” will manifest itself by use of angry sounds and angry lights. The head shall use tri-state LEDs that will be used to simulate a multi-color “evil” effect. A speaker will be used to play back insults (e.g. the sorts of things a possessed muppet might say.) An ultrasonic sensor will be used to determine proximity of nearby people—as long as you don’t get too close to Beaker, he will be his usual timid self. But as soon as someone gets too close his possession will take over.

#### Strategy

Description of the overall design: Above

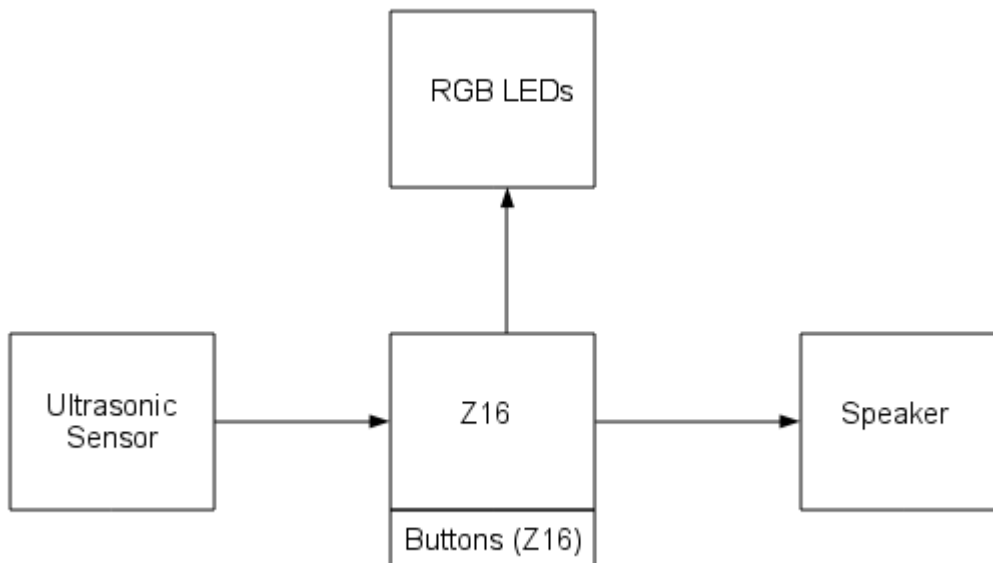
What platform: based on the Zilog Z16 contest kit.

What capabilities: GPIO, timers, interrupts

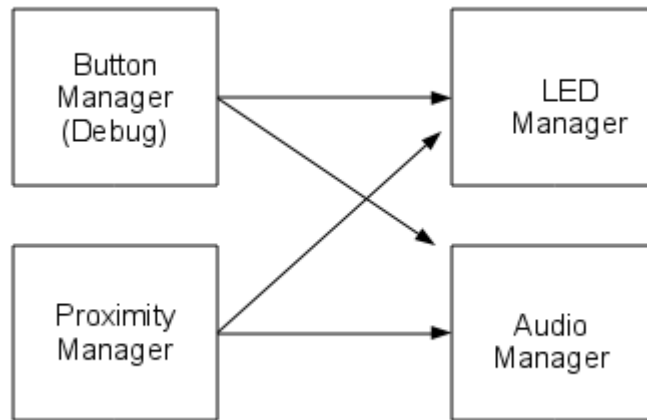
What external: tri-state LEDs, ultrasonic sensors, speaker

What sort of evaluations: input from ultrasonic sensors

What software modules: LED manager, proximity manager, audio manager, button manager (for debug interface)



Preliminary Hardware Block Diagram



Preliminary Software Block Diagram

### **Unknowns**

There are many. I do not know anything about controlling tri-state LEDs. Modulating the signal has been suggested, but I will have to learn how to do that. I would prefer the audio to be in WAV format, but it appears there are ready made modules for handling MP3s, so this may be the most expedient format to use. I am also not certain about the best way to get audio into the system—may need some kind of memory card for example. Need to investigate that further as I learn more about what the Z16 can do.

### **Implementation Plan**

- Acquire tri-state LEDs, ultrasonic sensors, and some sort of audio component (whether MP3 or WAV).
- Determine parts needed to sculpt Beaker head and order any parts/tools needed.
- Determine how to get audio into system.
- Record audio (beeps for normal Beaker, messages for possessed Beaker.)
- Experiment with and learn how to use tri-state LEDs.
- Experiment with and learn how to use ultrasonic sensor.
- Experiment with and learn how to use audio component.
- Develop debug interface with buttons.
- Get speaker and audio working with debug interface.
- Add LEDs to debug interface.
- Add ultrasonic sensor to drive LEDs and speaker.
- Determine how to combine Beaker head with Z16 and additional hardware.
- Build Beaker head (plastic??).