Project Title: Doorbell Jukebox

Abstract:
These days, everyone wants to personalize their belongings; especially when it comes to cellular phones. There are thousands of different ringtones available for download. It is rare to find any two phones with the same ringtone. Houses on the other hand all tend to have the same sound when someone arrives: the doorbell. So why wouldn’t people want to personalize their doorbell? It would be just like a telephone ringer, only for your house.

Doorbell Jukebox will be a system that does just that: it allows a user to choose an mp3 music file to play whenever their doorbell is pressed. A user will also be able to set up playlists, for those that don’t like hearing the same song over and over again, or if someone wants to have seasonal songs play depending on the time of year.

Project Description:
The Doorbell Jukebox will need to revolve around the reading of flash memory. It is from here that the user will choose what songs they want to play every time the doorbell button is pressed. They will put a song or songs on an SD flash memory card, and then insert the card into an SD card reader in our system. The system will read and decode the mp3’s on the flash card and play the selected song whenever the doorbell button is pressed.

The Doorbell Jukebox will also be able to play a selected list of songs off of the SD card. This will function by playing the first song on the list when the bell sounds, then the next time the bell sounds the second song will be played, and so on. Once all songs have been played the list starts over. To change what songs are played, the user needs only to remove the SD card, plug it into their computer, and modify the songs on the list. They can then return the card to the Doorbell Jukebox and it will operate as described above.

It would be inconvenient to be required to go back and forth between a computer and the Doorbell Jukebox whenever you want to switch between single songs, so part of the user interface will include a way to choose single songs from the list of songs on the SD card. This will allow a user to put as many songs as they can on the SD card, then switch between single doorbell tones at will without having to listen to all of the songs.
See attached sketch and block diagrams for additional information.

Background and Benefits:
Music has always been a very large form of personal expression and it seems to appeal to almost every human being. With the increased availability of cellular phones these days and the relative ease of accessing the internet from nearly all of these devices, custom ringtones are almost a guarantee on any given cell phone; and the demand seems ever increasing. We want to expand the enjoyment that people have in creating music to accompany their lives. Ringtones are an alert to the arrival of a cell phone call, and a doorbell is simply an alert to the arrival of a
person at a home. The stark similarity of the two is what fueled our decision to create the Doorbell Jukebox. With our project, a user will be able to feel the same joy when someone visits his/her home as they do when someone calls them on the phone. As it is right now, just about every doorbell sounds the same or very similar, but with the Doorbell Jukebox every person can have another way to establish their individuality and add a personal touch to their surroundings.

There are many doorbells on the market that provide a number of preset doorbell chimes that a user can choose from, but they only play traditional sounding chimes, and a user is still only limited to what comes with the doorbell. Our design will allow for a range of choice limited only by a user’s mp3 collection.

The most similar available product is the YourBell system designed by BCS Ideas Corporation. Their design incorporates USB and direct sound file downloads from the internet, as well as software that allows for direct ripping from a CD to the doorbell. We are creating our design to be less expensive and allow for users to more simply add and change songs, at the expense of less customization options and a less convenient upload process.

**Societal Impacts:**
This is an innovation that can help raise the spirits of home owners. It is rare to find a person that hears their favorite ringtone or their self-proclaimed theme song and not smile to themselves. This project makes life more fun and hopefully it will put more smiles on more faces.

**Development:**
The project will be developed on a Freescale ColdFire microcontroller with mp3 decoding capabilities. We will use the tools and software provided in the WWU electronics engineering labs for both development and debugging.

To demonstrate the project, we will have the system set up with a pre-loaded SD card with a number of songs on it. Attendees to the demonstration will only have to press the doorbell button and one of the songs will play. We will also allow a user to change between playlist mode and single-song mode, to demonstrate the song changing options.

The hardware and programming tasks will be very integrated with each other and as such the two of us will be collaborating very closely and evenly throughout the development phase.