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### Final Design Proposal

My final design will mimic an infrared (IR) remote receiver such as those used for TV remotes. I will be using the given microcontroller, PIC18F47K40, from the course to process inputs from an IR remote to change the “channels” being displayed on the LCD. This is done by using a photodiode detect incoming IR signals and the capture mode on the microcontroller to read the signal. There will be a I<sup>2</sup>C timer, being able to set the time and an alarm to an LED indicate that a mark showtime is now happening (ex: set alarm time for a 11:30pm show). The time and alarm will be set by a digital input from a switch to change time/alarm mode and button to enable or disable alarm. A potentiometer will be used to alter the voltage value to the microcontroller ADC to select the values. The time, channel, and alarm status will be displayed on the LCD. If the alarm has triggered, a digital output from the microcontroller will be set to turn on an LED. An external DAC using a SPI interface will be used to drive a piezoelectric speaker for a tone relative to which channel is on.

- Microcontroller: Will be using the PIC18F47K40 to decode IR signals to channel values and handle I<sup>2</sup>C, SPI, and I/O.
- ADC: Will implement a potentiometer to alter the voltage value to the microcontroller ADC to select the time values.
- DAC: An external DAC using a SPI interface will be used to drive a piezoelectric speaker for a tone relative to which channel is on.
- Digital Input: A switch to change time/alarm mode and button to enable or disable alarm.
- Digital Output: From the microcontroller to turn on an LED when the alarm is triggered.
- LCD: The time, channel, and alarm status will be on display.
- I<sup>2</sup>C Timer: Being able to set the display time and an alarm to indicate that a mark showtime is now happening.