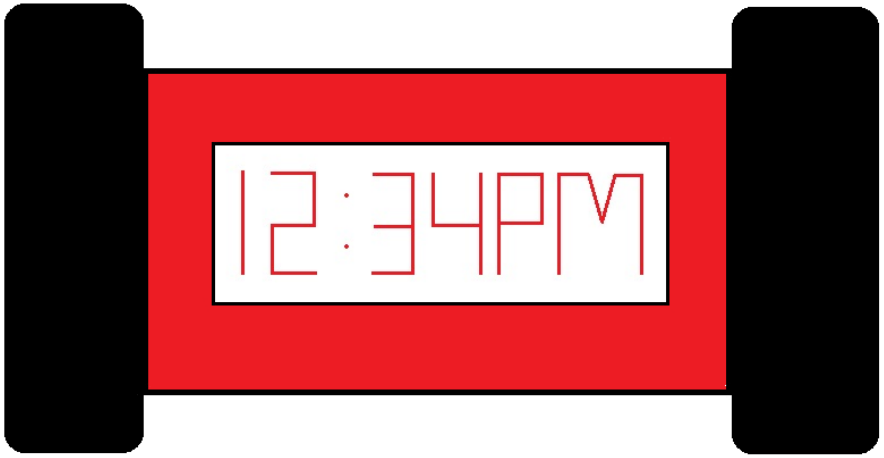
EEL 4924 – Senior Design

Run-Away Alarm Clock



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Summary of Talk

- Our project consists of an alarm clock that forces its to owner get out of bed by driving itself around the room until the alarm is disabled.

- Wide range of challenges:
  - Processing
  - Analog
  - Mechanical

Summary of Talk

- Goals:
  - Full alarm functionality
  - Smooth, responsive driving operation
  - Durability
- Approach
  - Design & build hardware and software in parallel
  - Modular design
  - Custom built housing to meet needs

Summary of Talk

- Results:
  - Full alarm functionality
  - RC and simplified Autonomous driving
  - Meets minimum durability needs
- Future plans:
  - Reduce board size, hardware footprints
  - More intelligent Autonomous algorithm
  - Lighten and increase durability

Project Overview

- Our project expands and improves upon the commercial product Clocky™

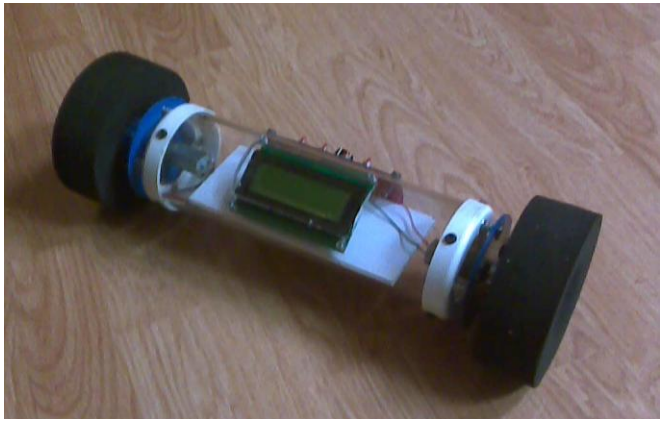
Project Overview

- Our system uses an LCD to report:
  - Time (12 or 24 hour format)
  - Date (MM/DD/YY)
  - Indoor temperature (C/F)

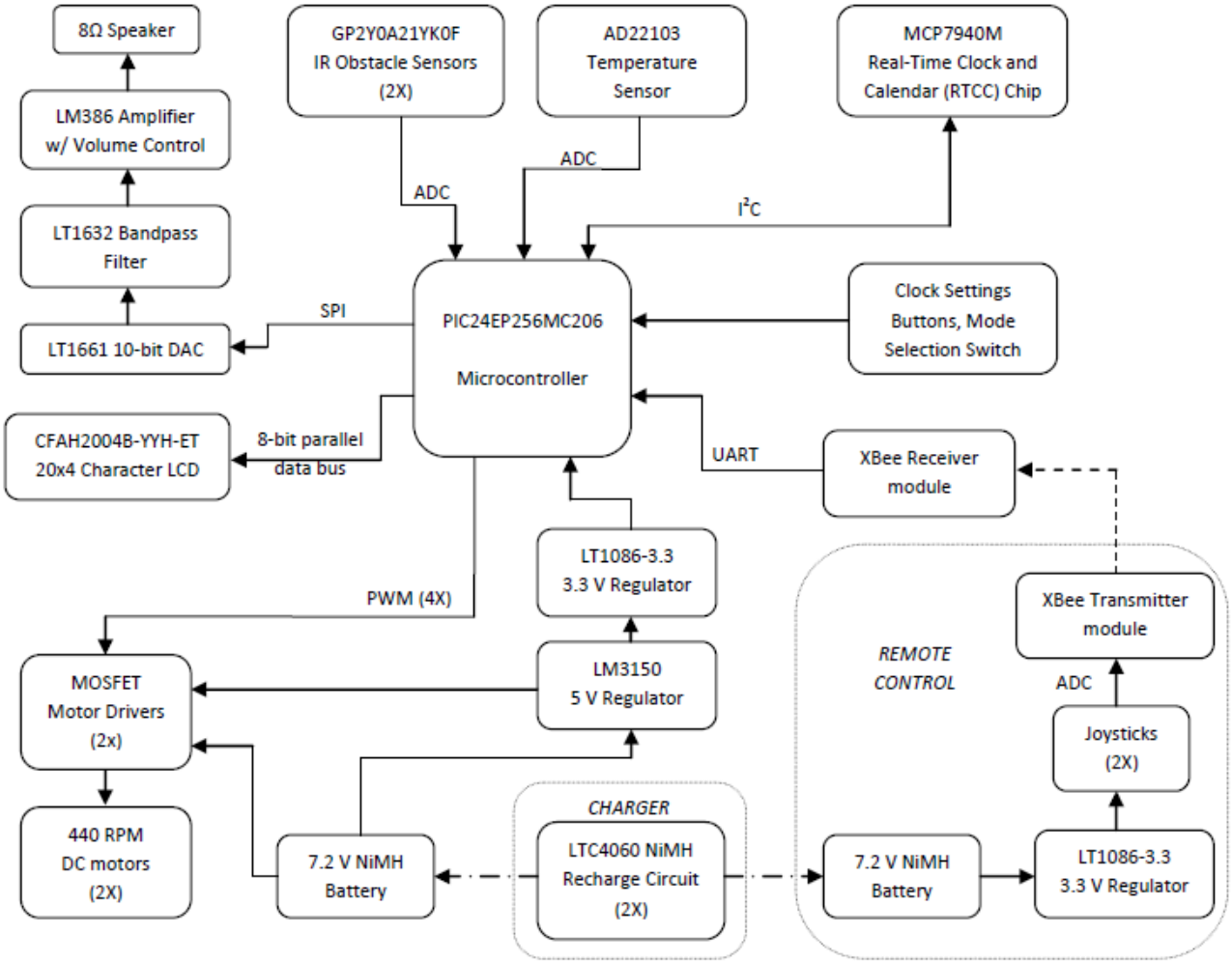
- Programmable alarm tone has adjustable volume

Project Overview

- The clock can operate in one of three modes:
  - Autonomous mode (Alarm on)
  - Remote control mode (Alarm off)
  - Wheels off mode (Alarm on)



Project Overview (cont.)

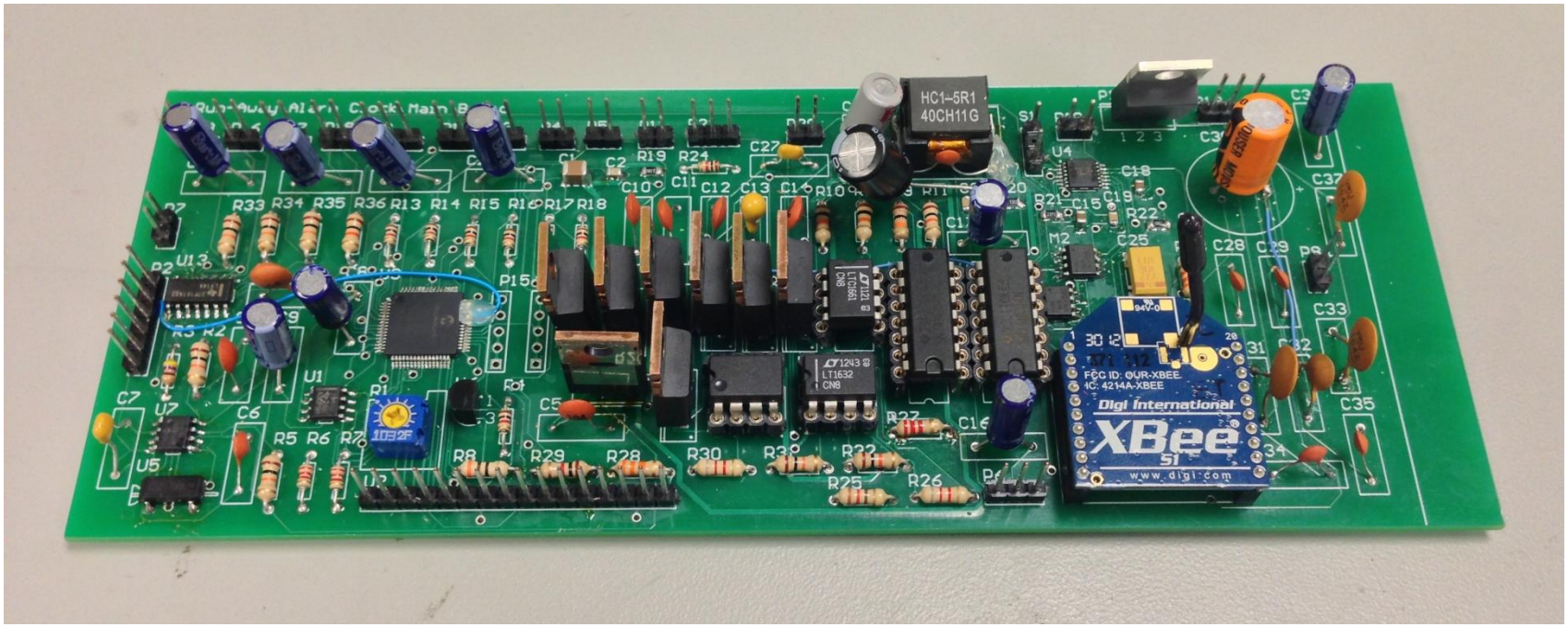


Technical Objectives

- Read and report time and date information from RTCC chip.
- Use PWM on microcontroller to interface to H-Bridges and control motors.
- Interface with an XBee device for remote control usage.
- Use IR sensors to determine alarm clock's distance from wall or objects.
- Determine indoor temperature from analog temperature sensor.
- Provide recharge circuit for battery for long-term usage.

Results

- Software, hardware, and function integration



Results

Future Work

- Minor routing corrections
- Reduce board size, overall size
- Improve component locations on board
  - Buttons and switches as well
- Addition of radio and selectable alarm tones
- Improve shock resistance