Speaker Timing System for the Western Protective Relay Conference

ECE 481 Detailed Design Review
September 15, 2006

Team Time’s UP!
Frank Gonzales
Tim Montoya
Jesse Rebeck
Hugh Roberts

Instructor: Joe Law
Advisor: Brian Johnson
Client: Dave Angell
Sponsor: WSU Center for Distance and Professional Education
Presentation Outline

- Background
- Needs Analysis
  - System
  - Unit
- Project Outcomes / Deliverables
- Budget
- Work Schedule
- Summary
Background

The Western Protective Relay Conference in Spokane, Washington is in need of a speaker timing system that will allow a speaker to always know his/her remaining time of the presentation and to be discretely warned when their time is almost up.
Needs Analysis
System

- System suited for dual conference sessions.
- Compact, lightweight, and portable size
- Wireless communication between master and slave stations
- Powered by 120 volts, AC
- Usable for any conference (alternate locations).
Needs Analysis
Units

Master Unit

- Synchronized time-of-day clocks on master stations for moderators.
- Presentation length and warning times programmable at master station.

Slave Unit

- Presentation time and indicator lights on the remote station visible to speaker.
Project Outcomes / Deliverables

- Two portable speaker timing system units, each consisting of a programmable master station and remote station.
- Instruction Manual.
- Technical documentation.
System Components

- Rabbit Microcontroller
- Wireless Receiver/Transmitter
- 20 X 4 Character LCD - Master unit
- 7-Segment Display (5 digits) - Slave unit
- LED Lights (Red, Yellow, Green)
- Radio-Controlled Clock (used with battery) - Master Unit
- Power Supply System to enable units to be plugged in.
- Housing Unit to Enclose Circuitry
Pictures of System

Go to
http://www.webpages.uidaho.edu/~robe2497/pictures.html
Speaker Timing System Design Plan

Master Unit
- Battery
  - WWVB Clock
- 5 Volt Regulator
- Rabbit Microcontroller
  - Wireless Transmitter/Receiver
  - NMOS FETS
    - LED's
  - LCD
  - Encoder
    - Keypad

Slave Unit
- Power Adapter
- 5 Volt Regulator
- Rabbit Microcontroller
  - Wireless Transmitter/Receiver
  - 10 Volt Regulator
    - 7-Segment Driver
    - 7-Segment Display
- NMOS FETS
  - LED's
Work Schedule
What Has Been Accomplished So Far

1) Rabbit Microcontrollers attached to program boards.
2) Power supply designed.
3) LCD interfaced with Rabbit microcontroller
Work Schedule

What Still Needs to be Done

1) Get master and slave units talking to each other.
2) Interface the keypad with board and microcontroller.
3) Interface the 7-Segment Display.
4) Finalize housing design.
5) Put everything together.
6) Test System.
7) System is on schedule to be completed by October 1.
## Budget

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Summary

- Master and Slave with Rabbit Microcontroller
- Intuitive Programmable Master Units
- 900 MHz Wireless link
- Clock with WWVB on Master Units
- Large Display for Speaker to See Remaining Time
- Red, Yellow, and Green Warning Lights
- Powered by 120 Volts, AC
- Speaker Timing System will be completed by October.