Capstone Design Course

Lecture-10: *Projects*

By

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A Chip Tester

- Design a Tester to verify the functionality of different types of Integrated Circuits, such as 7400, 7402, 7404, 7406, 7408, etc.
- Your tester must be able to verify at least 10 different ICs.
- You should use a 68HC11 Microcontroller, a 4x4 Keypad, an LCD Display, a Socket to hold the chip, etc.
A Small Piano

• Design a small piano using a 68HC11 Microcontroller, a 4x4 keypad, a speaker and an audio amplifier.
• You may use Output Compare Functions to generate sound waves of different frequencies.
A Digital Oscilloscope

• Design an oscilloscope using a 68HC11 Microcontroller, an LCD display.
A Multimeter

- Design a multimeter to measure voltage and current, using a 68HC11 microcontroller, a current sensing transformer and LCD display.

"TRANS,CRNT,10Amax, 1V/1A@50ohm"
"5mH,50TURNS,20-50KHz"

Jameco #154659
Speed Control of a Fan

- Design a system using a 68HC11 microcontroller and two push button switches to control the speed of a fan.
- One push button will be used to increase the speed and the other push button will be used to decrease speed.
- You may generate PWM signals using OC Functions to control the fan speed.

![Images of a switch and a fan with Jameco part numbers.
"SWITCH, PB, SPST, OFF-ON"
"FAN, 5VDC, 4.2CFM, 1.60""SQ x .4"""" BALL, 2"" LEAD"
Jameco #164494
Jameco #142851]
A Home Security System

- Design a home security system using a 68HC11 microcontroller, a smoke detector, a motion detector and an auto-dialer.
A Talking Watch

- Design a talking watch using a 68HC11 microcontroller, a voice chip and an LCD display unit.
A Talking Thermometer

- Design a talking thermometer using a 68HC11 microcontroller, a temperature sensor, a voice chip and an LCD display unit. Resolution must be at least 1 deg. C.
A Traffic Controller

- A 13-state traffic controller has been explained at the website of ECE4600.
- You can do this project provided you add some new features.
A Digital Weighing Scale

- Design a digital weighing scale using a 68HC11 microcontroller, a pressure sensor and an LCD unit.