Talking Sponge Bob Clock

Presented By:
Group 7
Please Turn Off
All Cell Phones
&
Pagers
SILENCE IS GOLDEN
Members of Group 7

Edward King

Daniel Wrubel

Jennifer Guiao
Presentation Outline

- Project Objectives
- OSHA/FCC Regulations
- Patents
- Project Features
- Objective Tree
- Parts List
- Cost Analysis
- How the clock works
- Voice Chip
- Software
- Packaging
- Work Distribution
- Problems Encountered
- Conclusion
- Questions
- Prototype Demonstration
Edward King
- Project Objectives
- OSHA/FCC regulations
- Prior Work/Patents
- Parts List/Cost Analysis
Project Objectives

- Design clock for children in mind
- Make talking clock
Objective Tree

Talking Clock

Telling time accurately
Implementing an accurate time program

Display the correct time
Output to the LCD display

Appeal to kids
Large colorful cartoon character
It speaks
Eyes light up

Easy to use
3-button design
Left arm is volume control
OSHA Regulations

- Section 1910.303: GENERAL REQUIREMENTS
- Marking
  - Electrical equipment may not be used unless the manufacturer's name, trademark, or other descriptive marking by which the organization responsible for the product may be identified is placed on the equipment. Other markings shall be provided giving voltage, current, wattage, or other ratings as necessary. The marking shall be of sufficient durability to withstand the environment involved.
OSHA Regulations

- **Section 1926.405(b)(3)(i):**

  OSHA regulation for wiring is that the box the wiring is in has to be completely enclosed.
FCC Regulations

There are no FCC regulations on our project due to the fact that our device is not in anyway going to be used for communication purposes.
A talking clock that consists of a clock face placed in the center of the device. Similar to our device only an LCD display was used instead of a clock face.

Design 1:
Patent Number: D365,764
Date: Dec. 39, 1994

Design 2:
Patent Number: D365,763
Date: Dec. 29, 1994
Another idea was to store our hardware in the clock itself with a hideaway screen such as Francis Yu’s design.

Patent Number: D321,484
Date Filed: April 11, 1989
We decided to use a cartoon character from Nickelodeon network, Sponge Bob Squarepants. This character is trademark of Viacom International, Inc.

- Registration number: 2707262
- Serial number: 78140355
Project Features

- LCD display hidden beneath the tie
- Blue LED eyes
- Left arm volume control
- 2-button clock set up, 1-button to speak
- Spongebob Squarepants outer design
Parts List

1- CME-11E9-EVBU Board
   1-LCD screen
   1-wire set
   1-220 μF Capacitor
   1-22 μF Capacitor
   1-4.7 μF Capacitor
   5-0.1 μF Capacitor
   1-470K Ω Resistor
   1-5.1K Ω Resistor
   1-1KΩ Resistor
   2-10LΩ Resistor
   1-Electret Microphone
   1-100KΩ Resistor
   1-ISD25120 Voice Chip
   1-16Ω Speaker
   1-LM 386 Amp Chip
   1-1/4” buttons
   2-1/2” buttons
   1- 501Ω Potentiometer
## Cost Analysis

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<th>Qty.</th>
<th>Item</th>
<th>Cost</th>
<th>Total</th>
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<td>CME-11E9-EVBU</td>
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<td>1</td>
<td>Wire Set</td>
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<td>Various Resistors</td>
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<tr>
<td>1</td>
<td>16 Ohm Speaker</td>
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<td>1</td>
<td>LM386 Amp Chip</td>
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Daniel Wrubel
• How the clock works

• The voice chip

• Software
How the Clock Works

- Setting
  - There are two switches, red and black
  - When the red switch is held down for two or more seconds the clock goes into setup mode
  - Each portion of the time can then be set by pressing the black button to increment it
  - The user moves onto the next section of the time by pressing the red button once
How the Clock Works (cont.)

- Talking

  - The clock will speak the current time, when the clock is not in the setup mode, and when the user presses the smaller red button on the other side of the user interface.
Voice Chip

- The voice chip accepts addresses
- When the chip is in the playback mode, when the PR bit is high, the chip will begin playback when PD is held low
- When the message is done the EOM marker will go low temporarily letting the user know that the message is done
The address is loaded into PORTD.

From PORTD the address is outputted to the address bits of the voice chip.
PD is then held low
Once the EOM goes low the program then sets PD high
The address of the next word is then loaded into PORTD and the cycle continues
Software
Software

- Hour
- Minutes
- AM/PM
Software (cont.)

Hour

TALKER  BCLR PORTA,X  $08
BSET PORTA,X $10
BCLR PORTA,X $40

LDAA HOUR
STAA PORTD,X
BCLR PORTA,X $10
HERH BRSET PORTE,X $01 HERH
BSET PORTA,X $10
Software (cont.)

- Two minute digits, MINA and MINB
- Loads each separately
Software (cont.)

minute (teens)

LDAA MINA
CMPA#1
BNE TALKM1
LDAA MINB
ADDA #10
STAA PORTD,X
BRA TALKM2
### Minutes (other combinations)

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<td></td>
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Software (cont.)

AM/PM

LDAA AMPM
ADDA #24
STAA PORTD,X

BCLR PORTA,X $10
HEREE
BRSET PORTE,X $01 HERE
BSET PORTA,X $10
RTS
Jennifer Guiao
- Packaging
- Work Distribution
- Problems Encountered
- Conclusion
To design the character Sponge Bob Squarepants following items used:

- Craft Styrofoam sheets
- Plastic bubble
- Sponge
- Foam sheets
- 2x2 Plywood sheet
- 2x2 1/8” Hardwood sheet
- Wooden dowels
- Craft felt
- Acrylic paints
- Hinge
- A lot of hot glue
Packaging (cont.)

- Painted all the parts
- Wood was cut with respect to the size of the board, LCD screen, speaker, and placement of the potentiometer
- Everything placed together to look like Sponge Bob.
## Work Distribution

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<th>Jen</th>
<th>Dan</th>
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## Work Distribution (cont.)

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</table>
Hours Spent

- 30 hours brainstorm/research
- 45 hours programming
- 15 hours shopping for parts/materials
- 15 hours hardware
- 40 hours building Spongebob
- 5 hours for repairs
- 7 hours writing report and presentation

Grand Total of time spent – 157 hours
Problems Encountered

We encountered few problems:

1) **Recording**: Had problems with the circuit that was needed to be hooked up in order to record.

**Solved**: When board was taken to the TA who helped set up the circuit and recording.
2) Programming: Writing the program. The chip not only hard to record but hard to program as well. The datasheets & instruction manual for the voice chip were difficult to understand. To get some concept manual was read over and over. Message cueing mode was initially used to get the desired effect but eventually addressing mode was used to program the chip.
Problems Encountered (cont.)

3) Packaging: We didn’t know what to use for making Spongebob so initially we had used household sponges, which don’t stick on with glue well. But this didn’t give us the desired effect. Had to start from scratch, brainstormed to get the idea to use styrofoam, which worked out well.
Conclusion

- By combining the ideal for a talking clock with our knowledge in assembly, hardware and creativity we were able to create a Sponge Bob Squarepants talking clock that would appeal to many children.
Questions???
Demonstration of Talking Spongebob Clock