

Remote Intercom with Internet Video

By

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A SENIOR THESIS PROPOSAL

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The accompanying Senior Thesis Proposal, "Remote Intercom with Internet Video," is submitted in accordance with the requirements of CEEN 4980, Senior Thesis Proposal. As stated in the proposal, the team members will fund the project.

Respectfully yours,

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I. BACKGROUND

When someone visits your home and you're not there, there is no way of knowing that they were there. At times you may miss important messages. When you're children are home alone, you also don't know if someone shows up at your door. You may not want the person at the door to know that your children are by themselves or even to think that there is no one home. It would be nice if there were a way to know when people are at your house or even to make criminals think that you are home.

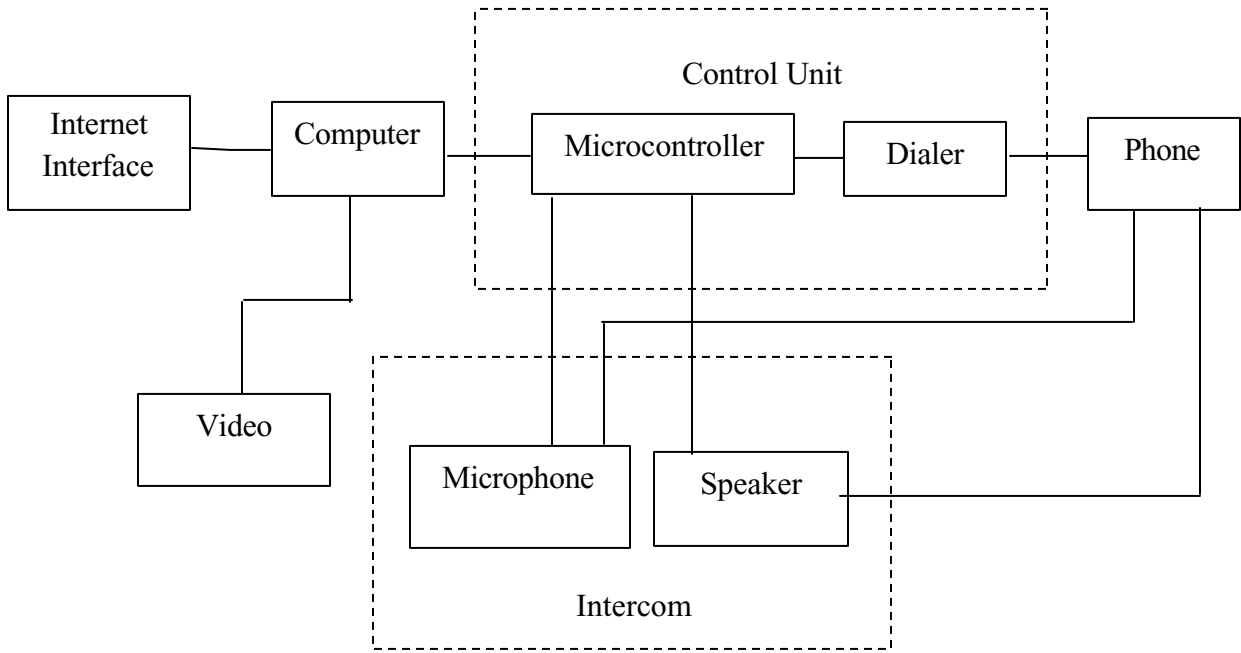
II. THESIS OVERVIEW

This project is designed to provide a way to monitor your door while you are away from home. When the unit is active and the doorbell pressed a pre-programmed number will be dialed. Once a connection is made, an intercom will make it possible to talk to the person at the house through a phone without the person knowing the house is vacant. The number that is dialed will be programmable using a simple entry device. Along with providing voice contact, a camera will take photos from the front and will make them available on the internet with a password. The internet interface will also have the option of making a record of the visitor, in the form of pictures. In this way it will be possible to monitor one's front door while they are away, and keep a small record of visitors.

III. GENERAL DESCRIPTION

In completion of this project several systems will be combined. Following is a list and description of each system to be used in this project. A graphical block diagram of the system is provided in Figure 1.

- **Control Unit** – A microcontroller system, which will control the basic operation of the unit. The number dialed will be programmed using the attached personal computer and an interface program. The dialer is controlled by the microcontroller, and will be used to dial the number preprogrammed into the micro controller. Once a connection has been made the microphone on the intercom will be enabled.
- **Intercom** – The intercom is a simple speaker and microphone combination, which will be enabled by the micro controller. The voice input and output will not be processed at all, digitally to keep the system simple.
- **Computer** – A personal computer will be used to provide the control interface and web interface for the system. This will be used to provide and collect the video if a record is to be made. Video, when requested, will be in the form of pictures taken on a regular interval. These images will be made available to the user through the web interface.
- **Video** – The video system will be a simple camera to collect images to be served on the web. Video will be provided as images taken on a regular interval from a fixed position at the entryway.
- **Internet Interface** – An interface to the video mode will be provided through the internet via an Ethernet adapter. Video will be made available at any time through this interface. Recording of the video imagery will be controlled through this interface.



[Figure 1] Remote Intercom with Internet Video functional block diagram.

IV. COMPONENTS LIST

A listing of the components necessary for completion of the project is included here in Table 1. This list is not complete and may change at any time.

<u>Microcontroller</u>	
8051 Microcontroller	\$5.49
40 pin socket (0.6 width)	\$2.66
5 x 22V10 – 25 GAL	5 x \$3.99
5 x 24 pin socket (0.3 width)	5 x \$1.60
Prototype Board (5 x 6)	\$14.95
<u>Dialer</u>	
ISD2560	\$8.99
<u>Intercom</u>	
Speaker (1.6 x 0.6 Alnico)	\$2.69
Microphone	\$3.69
RJ11 Connector	\$3.59
Push Button Ringer	\$8.99
<u>Video</u>	
USB Camera	\$29.95
<u>Computer</u>	
Personal Computer with Ethernet adapter	\$1000.00
<u>Software</u>	
Web Server	FREE
Dreamweaver Web Development Environment	\$399.00
Miscellaneous	\$100.00
<u>Total</u>	\$1607.95

Table 1

V. TIME SCHEDULE

Below is an estimate of the schedule to be used in the implementation of this project.

Tasks	January				February				March					April				May	
	1st	2nd	3rd	4th	1st	2nd	3rd	4 th	1st	2nd	3rd	4th	5th	1st	2nd	3rd	4th		
I. Research			→																
II. Parts Ordering						→													
III. Hardware Design				→															
IV. Software Design				→															
V. Hardware Construction						→													
VI. Hardware Testing									→										
VII. Software Implementation				→															
VIII. Software Testing																	→		
IX. Final Testing																	→		
X. Documentation			→																

VI. ACCEPTANCE TESTING

5. The system connects to the preprogrammed phone number when the doorbell is rung.
6. The user can change the phone number to be dialed
7. A visual of the front door is available through the website though an Ethernet connection.
8. Communication between the user and visitor is possible after a connection is made through the telecommunications network.

This section will contain a checklist of the items, which will be accomplished, and how you will demonstrate that it works. This should be given in an enumerated fashion. This list will be used during Thesis presentation to verify that all objectives have been met; it will also protect you from being asked to meet specifications not contained in your proposal.

VII. TEAM MEMBERS

Caslyn Covey

Aaron Friesz

VIII. ASSIGNMENT OF EACH MEMBER

Caslyn Covey

- Design and construction of control board, including micro controller, dialer, and Gals for state machine implementation.
- Software for control unit.
- Video control software.
- Web page development.
- Documentation

Aaron Friesz

- Design and construction of intercom.
- State machine design for controlling the intercom and dialer using the micro controller.
- Control software for programming the control unit from the PC.
- Servlets for the web interface.
- Presentation Preparations

IX. SUMMARY

The “Remote Intercom with Internet Video”, when finished, will provide a solution for home visitor management when it is not possible to be at home. It will allow a user to speak to a visitor standing at their door even when the user is not home. The unit will call a preprogrammed number when the doorbell is pushed, allowing the two parties to communicate with the visitor unaware that the user is not home. Video of the entryway will be made available at anytime.