

## **Audio Messaging System for Handicapped Persons**

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### **INTRODUCTION**

The audio messaging system was designed to assist people who cannot talk. This device is a handheld box that plays prerecorded messages. These messages can be stored on the device at a time. Any message can be played by pressing the button corresponding to the prerecorded message. This device aids persons who are in situations where other communication options are not available. This device differs from the products currently available in the number of messages available in a portable unit. This project was designed using a commercially available voice chip controlled by a Complex Programmable Logic Device (CPLD).



Figure 1. Audio Messaging System

### **SUMMARY OF IMPACT**

This device was designed to be lightweight enough for a small child to operate and easily carried. It also needed to be inconspicuous and easy to operate. This allows the person using the device to have it with them. This device is designed to help the user communicate easier and more efficiently. This allows increased self-sufficiency.

### **TECHNICAL DESCRIPTION**

This design was implemented using an ISD 2560 voice chip. This voice chip was chosen because it has a storage capacity of 120 seconds, and it was designed specifically to record and play voice messages. This chip has a sample rate of 4.0 kHz and a filter pass band of 1.7 kHz. It has the potential for high quality voice playback. The ISD 2560 is also fully addressable and can be controllable by a CPLD.

The 120-second message storage capacity is divided up into sixteen segments. Each message on the chip corresponds to a button on the external casing of the design. The duration of each message is approximately 7.5 seconds. A membrane keypad was selected because of its lightweight and low profile.

The membrane keypad used in the design also has a removable legend. The legend beneath the keypad can be changed to reflect changes in the contents of the messages. The microphone used in the design was the WM-62PC electret microphone manufactured by Panasonic. This microphone is omni-directional and has a passband that extends from 20-16,000Hz.

The amplifier used in this design is the LM 386-N. This amplifier can be used at various voltage levels including 5VDC. This voltage requirement allowed it to be connected to the same voltage source as the voice chip and the XILINX chip. The amplifier is connected differentially to help reduce popping when

the messages start and stop. The amplifier is connected to the volume control for the system. A  $100k\Omega$  logarithmic-taper stereo volume controls the playback volume. The circuit diagram for the design is shown in figure two.

The cost of parts was approximately \$80.00

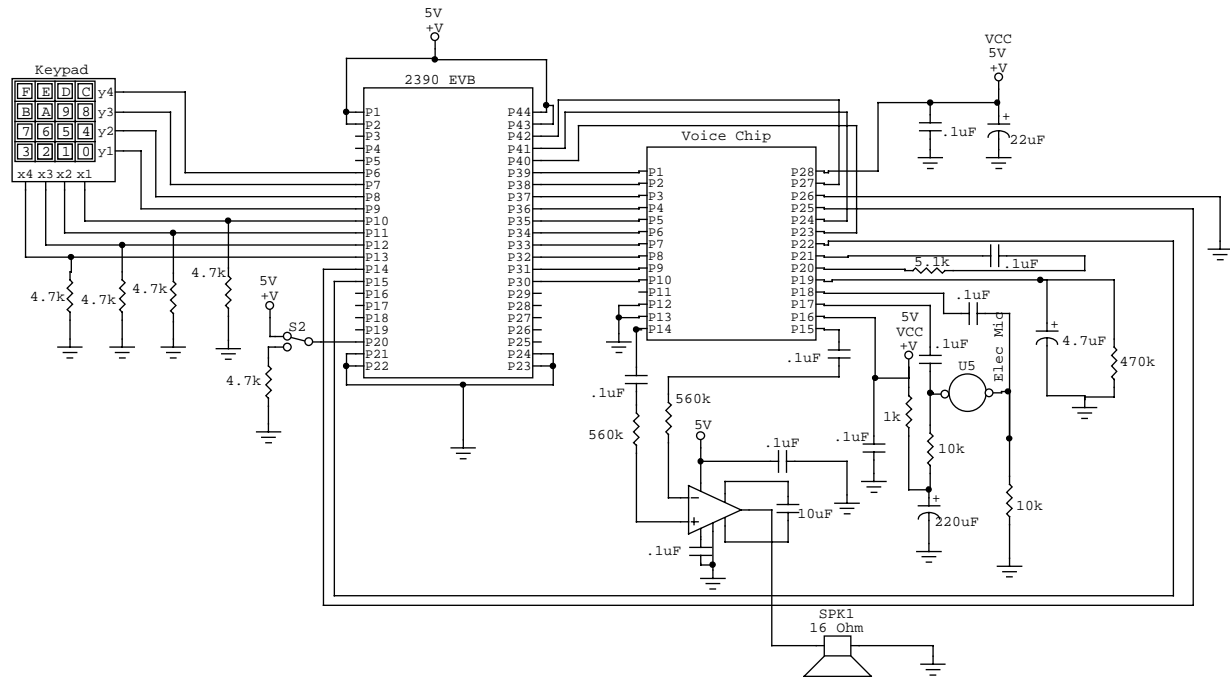


Figure 2 – Circuit Diagram