The TouchTexter
A human-oriented high-tech product
I. ABSTRACT

I propose to build a Braille texting device, called the TouchTexter, which will be able to send and receive text messages from another device using radio frequency transmission. The user will know when a message has been received through vibration, followed by reception of the message through a single-character solenoid system. Along with receiving messages, the TouchTexter will also be able to send messages through a keypad with the Braille system on the keys. The device will be hand held, so it will be battery powered.

The other device that will be sending and receiving messages as well as have a LCD display of the message received from the TouchTexter. However, this other device will have absolutely no Braille features. The reason for incorporating this extra piece of equipment is to demonstrate to you the real-time functionality of the TouchTexter.

II. DESCRIPTION

The TouchTexter, along with the non-Braille device, will send and receive text messages through RF transmission. When the TouchTexter receives a text message, it will vibrate so that the user may know when he or she has received a text. As soon as the user wishes to “read” the message, he or she will press a button that will activate the Braille solenoid system. The Braille solenoid system will provide the user with the message by a simple touch of the hand. Each individual character of the message will activate the solenoids to that corresponding Braille word or number, while a short pause will be used for spacing between words and numbers. The TouchTexter will also be allowed to send messages through a Braille keypad. To send a message, all that will be needed is to push a button that sets the device for an outgoing message, followed by entering the message through the Braille keypad, and finally pushing the same button just used to send the message.

The non-Braille device that will work with the TouchTexter will be a simple system that will have similar qualities. The non-Braille device will have an alphanumeric keypad to send the messages as well as an LCD to read the received messages. When the user receives a message through the non-Braille device, the device will emit a beeping sound so the he or she knows they
have received a message. By pressing a button, the user will be able to see the message displayed onto the LCD screen. When the user sends a message, he or she will have to push a button that sets the device for an outgoing message, followed by entering the message through the keypad, and finally pushing the same button just used to send the message.

This system is meant to encourage communication between the seeing impaired and the non-seeing impaired. The main application would be to have the TouchTexter developed into a pseudo-mobile phone that would act as globally as any other mobile phone. This of course would need to incorporate the GSM standard or another standard that allows the TouchTexter to send text messages.

III. BENEFITS

The main benefit of the TouchTexter is that it increases global communication among the visually impaired. The device also allows quick, non-verbal communication for visually impaired and is especially helpful for people with both visually and hearing impairments. This type of communication may be common for people with correctable vision, but for other people with alternative lifestyles this device opens a whole new world of communication. The
communication gap between people who normally cannot communicate with one another is decreased with the realization of the TouchTexter.

IV. SIMILAR PRODUCTS

The devices similar to the TouchTexter are not products released on the market. They are prototypes or concepts developed by either mobile phone companies or individuals.

**Touch Messenger by Samsung:**
- Two Braille bump pads
- Fourteen character system
- Won the Gold Award by the Industrial Design Excellence Awards
- Prototype only

**Braille Phone by Spice Telecom:**
- Single Braille keypad
- Transmits and receives calls only
- Enabled by the GSM network
- Estimated price: $14.00
- Concept only

**B-Touch by Zhenwei You:**
- Braille touch screen technology
- Voice recognition
- Scanner that can read text
- Concept only

The TouchTexter will incorporate some of these ideas including a Braille keypad, a bump pad, and affordability. The solenoid system will be a spinoff of the bump pads illustrated by the Touch Messenger prototype. Creating a low cost device is important and can hopefully be achieved by less state-of-the-art features. The most challenging part of this device will be in the development of the human interface.
V. SOCIAL IMPACT

Expanding the use of communications between people from all walks of life is essential. Within the past decade text messaging has become an important form of communication for instant, voiceless messages at the palm of your hand. The implementation of text messaging for people with visual disabilities would further expand our global network. The device can also help people of both visually and hearing impaired. Allowing every human being a chance to join the communication revolution means there will be more of a say in what happens in our world. The more connections we make, the more we learn about each other. By breaking down this communication gap we allow people all over the world become independent and self-reliant. With this device, people who were once concerned with being accompanied by another person now have the choice of becoming more adventurous. The development of high-technology products often leads to people becoming dependent on these products, which in turn has its advantages and disadvantages. The TouchTexter brings on a new and progressive idea of technology dependence by producing immensely high advantages to the world community.

VI. PROJECT DEVELOPMENT

I would like to use the Freescale 9S12 for both the TouchTexter and the non-Braille device because I am already familiar with the functionality of this microcontroller. The TouchTexter will be battery operated while the non-Braille device will be AC operated. The TouchTexter will have solenoids manufactured by Electroswitch, which will be small and long lasting. For the RF transceiver, an OEM solution will be implemented to cut product size and decrease development time. A custom Braille keypad will be made in order for the TouchTexter to operate as desired. The non-Braille device will be a product of the course Engineering Technology 454 because it will incorporate an LCD screen and a standard keypad. The only addition in terms of hardware to the device will be the RF transceiver. Most of the development will take place in room 340 of the Ross Engineering Technology building, while some may occur in the quarters of my own home.

VII. PROJECT DEMONSTRATION

To demonstrate my project, the TouchTexter along with the non-Braille device will be set up in such a way that will illustrate the communication abilities in real-time. I will have the non-Braille device stationary on top of a table while the TouchTexter can be held by the user. Even though the user involved in the demonstration may not know Braille, there will be a Braille index available for decoding at the booth. Exhibiting the effectiveness of sending and receiving messages will be the main aim during the demonstration.