

**Hand-Talk Assistive Kit for the Dumb**

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ABSTRACT-Dumb people have complexity in communicating with others who don't understand sign speech. The Hand Talk glove is made of regular, cloth driving glove fixed with flex sensors along the length of each finger and the thumb. The flex sensors output a flow of data that varies with point of bend. The output from the sensor is analog signal it is converted to digital and processed by using microcontroller and then it will be transmitted through wireless communication (RF), it will be received in the receiver part and processed using responds in the voice using speaker. In this project Flex Sensor Plays the key role, Flex sensors are sensors that change in resistance depending on the amount of bend on the sensor. They convert the change in bend into electrical resistance - the more the bend, the more the resistance value.

They are usually in the form of a thin strip from 1"-5" long that vary in resistance from approximately 10 to 50 kilo ohms. They are often used in gloves to sense finger movement. Inside the flex sensors are carbon resistive elements within a thin flexible substrate. More carbon means less resistance. When the substrate is bent the sensor produces a resistance output relative to the bend radius. With a typical flex sensor, a flex of 0 degrees will give 10K resistance with a flex of 90degrees will give 30-40 K ohms. The Bend Sensor lists resistance of 30-250 K ohms .In this system we use Radio Frequency Signal to transmit the signal from transmitters to Receptors

Keywords: Hand Talk glove, flex sensors, dumb people, degree of bend

I INTRODUCTION

In general, dumb people have difficulty in communicating with others who don't understand sign language. The Hand Talk glove is a normal, cloth driving glove fitted with flex sensors along the length of each finger and the thumb. The sensors output a stream of data that varies with degree of bend. The output from the sensor is analog values it is converted to digital and processed by using microcontroller and then it will be transmitted through wireless communication (RF), then it will be received in the Receiver section and processed using responds in the voice using speaker. In this project Flex Sensor Plays the major role, Flex sensors are sensors that change in resistance depending on the amount of bend on the sensor. They convert the change in bend to electrical resistance - the more the bend, the more the resistance value.

They are usually in the form of a thin strip from 1"-5" long that vary in resistance from approximately 10 to 50 kilo ohms. They are often used in gloves to sense finger movement. Flex sensors are analog resistors. They work as variable analog voltage dividers. Inside the flex sensors are carbon resistive elements within a thin flexible substrate. More carbon means less resistance. When the substrate is bent the sensor produces a resistance output relative to the bend radius. With a typical flex sensor, a flex of 0 degrees will give 10K resistance with a flex of 90degrees will give 30-40 K ohms. The Bend Sensor lists resistance of 30-250 K ohms .In this system we use Radio Frequency Signal to transmit the signal from transmitters to Receptors, in this project we have used microcontroller, a speech IC and also a speaker to produce the output.

II IMPLEMENTATION

Technology has always been of great help to the disabled and given them a helping hand to allow them to live a normal and healthy life like others. We have come up with a novel idea of a glove named Hand talk that will convert hand movements into text and allow the deaf to express themselves better. The Hand talk glove needs to be worn on the hand by the deaf or mute person and depending on the variation of movement, the device will convert it intelligently into voice for the other person to comprehend it easily.

III BLOCK DIAGRAM EXPLANATION

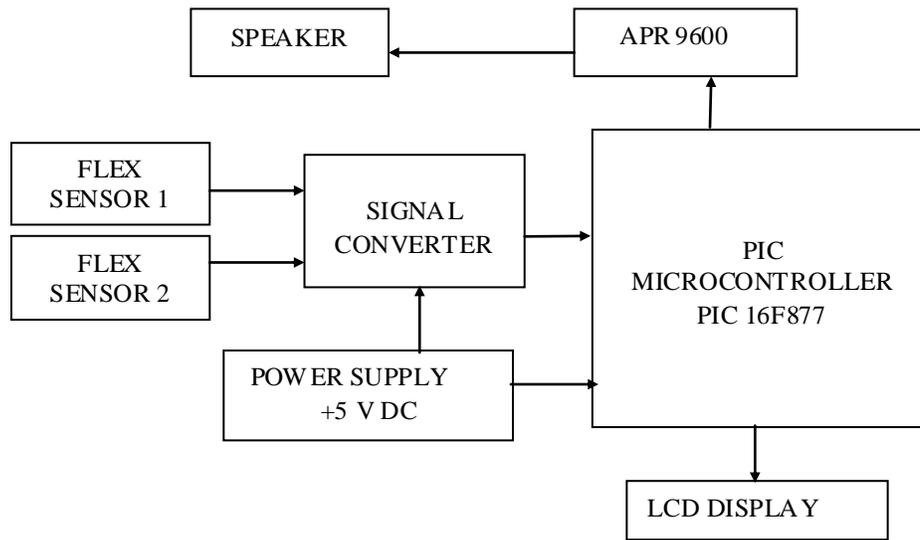


Fig 1 Block Diagram

3.1 Microcontrollers

The contrast between a microprocessor and microcontroller is best exemplified by the fact that most microprocessors have many op codes for moving data from external memories to CPU; microcontroller has one or two. Microprocessor may have one or two types of bit handling instruction; microcontrollers have many. Microprocessors are concerned with rapid movement of code and data from external address to the chip. Microprocessor must have many additional parts to be optional. Microcontrollers can function as a computer with addition of no external digital parts.

3.2 Hand Talk Glove

The Gestures can be converted to voice by using an APR 9600 Voice storage and retrieval chip. Prerecorded voices are stored into APR Memory and when corresponding gestures are received, the appropriate voices are reproduced by the APR through the speaker.



Fig 2 Hand Talk Glove

3.2.1 Flexible Bend Sensors

The Flex Sensor is a unique component that changes resistance when bent. A unflexed sensor has a nominal resistance of 10,000 ohms (10 K). As the flex sensor is bent the resistance gradually increases. When the sensor is bent at 90 degrees its resistance will range between 30-40 K ohms.

The flex sensor may be bent greater than 360 degrees depending upon the radius of the curve. Operating temperature is -45F to 125F.



Fig 3 Flex Sensors

The sensor measures 1/4 inch wide, 4 1/2 inches long and only .019 inches thick!

3.2.2 Applications of Flex Sensors

Flex sensors are used in gaming gloves, auto controls, fitness products, measuring devices, assistive technology, musical instruments, joysticks, and more. The Flex point bend sensor was first developed for automotive airbags and now is also used in car horns, toys that detect different degrees of pressure or bending, robots, machine control, medical devices and assistive technology. The Flex point Bend Sensor is somewhat different from the simple flex sensors. It has a much bigger range of resistance - see the chart below.

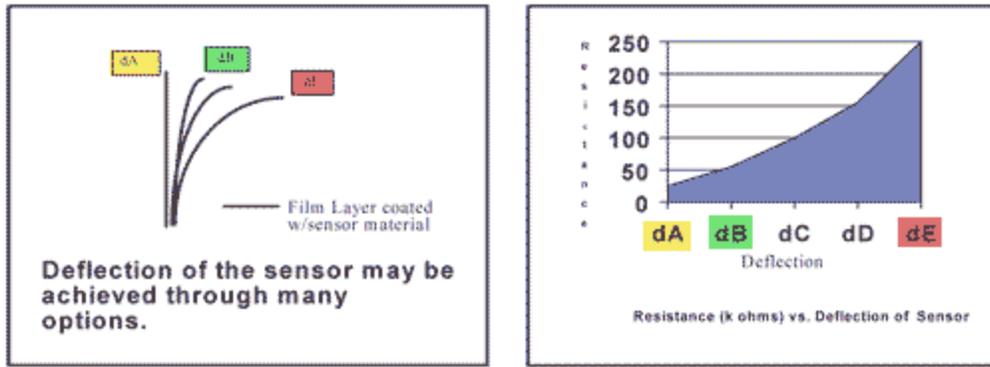


Fig 4 Resistance Graph

It might be useful to note that these companies will do custom jobs, including screen-printing these special carbon-based inks on various materials.

3.3 Power supply unit:

As we all know any invention of latest technology cannot be activated without the source of power. So in this fast moving world we deliberately need a proper power source which will be apt for a particular requirement. All the electronic components starting from diode to Intel IC's only work with a DC supply ranging from +5v to +12v. We are utilizing for the same, the cheapest and commonly available energy source of 230v-50Hz and stepping down, rectifying, filtering and regulating the voltage.

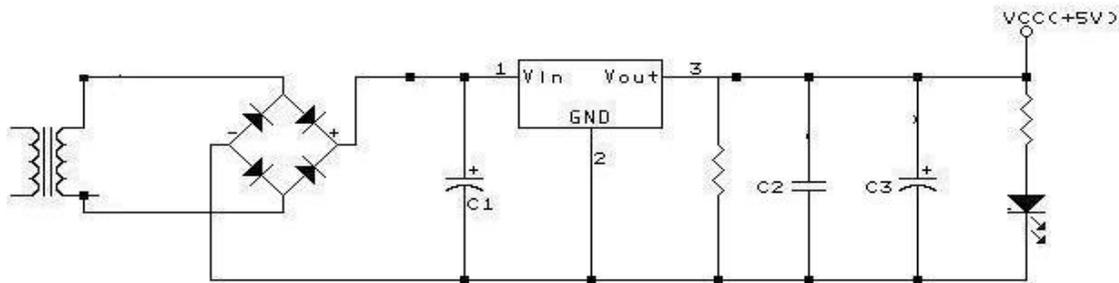


Fig 5 Block Diagram of Power Supply

3.4 Voltage Regulators

The voltage regulators play an important role in any power supply unit. The primary purpose of a regulator is to aid the rectifier and filter circuit in providing a constant DC voltage to the device. Power supplies without regulators have an inherent problem of changing DC voltage values due to variations in the load or due to fluctuations in the AC line voltage. With a regulator connected to the DC output, the voltage can be maintained within a close tolerant region of the desired output. IC7812 and 7912 is used in this project for providing +12v and -12v DC supply.

3.5 Flex Sensors

Flex sensors are sensors that change in resistance depending on the amount of bend on the sensor. They convert the change in bend to electrical resistance - the more the bend, the more the resistance value. They are usually in the form of a thin strip from 1"-5" long that vary in resistance from approximately 10 to 50 kilohms. They are often used in gloves to sense finger movement.

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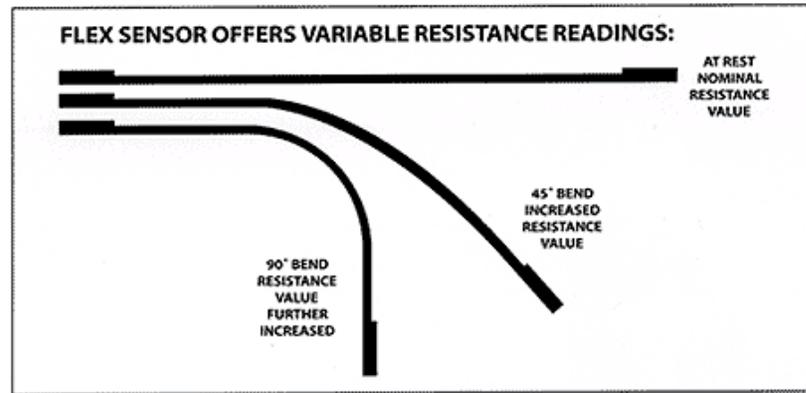


Fig 6 Flex sensor resistance

IV CONCLUSION

This assistive technology helps the dumb people in better communication with the people who find sign language difficult to understand. This method uses a Hand Glove fitted with Flex sensors. The Hand Talk glove is a normal, cloth driving glove fitted with flex sensors along the length of each finger and the thumb. The sensors output a stream of data that varies with degree of bend. This data is then converted into digital signals. The resistance values accordingly generated the output through the sound chip with sounds recorded.

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