

# ***Six Dot Push Button to Speech*** **As an Aid in the Teaching of Braille Letters**

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## **Abstract**

The media of teaching reading and writing of Braille letters are still very limited. Most educational institutions for the blind use pins as the teaching aid. The pins are attached to a board with holes so that a combination of Braille letters are formed. This teaching aid is usually called Pantule ( Braille blackboard). Such an aid still has some weaknesses. It is big in size, and heavy to carry. Furthermore, we may lose the pins easily as they are not permanently attached.

This research is aimed at producin an aid in teaching Braille letters by using 3 X 6 push button switch connected to a personal computer to produce sounds which are according to the Braille letters.

The object of the research is the Braille letters in Indonesian dan the punctuation marks which have been processed into sounds by the personal computer by pressing the combination of push button switch. The data are collected by listening to the result of the sound processing based on the combination of switch representing the letters, numbers, and punctuation marks in Braille.

Keyword : Braille, media, Push Button

## **A. INTRODUCTION**

As the other normal people the blind also need education to develop their potential optimally. Due to their blindnes they need special treatment to rehabilitate their disability . The special treatment include the practice of reading and writing Braille letters, the use of stick, orientation and mobility, as well as the practice of visual/functional sight. Basically the strategy of teaching the blind is the same as that of teaching the normal people. Only in its implementation is modification required in order that the message or the learning material can be understood by them through the other functional senses.

The teaching aids employed to teach the blind children in some special schools are the aids for writing Braille letters (reglet, pen, and Braille typewriter); the aids for reading Braille letters (letter board and optacom); the aid for calculating (cubaritma, abacus, speech calculator), and audio aids, such as tape recorder.

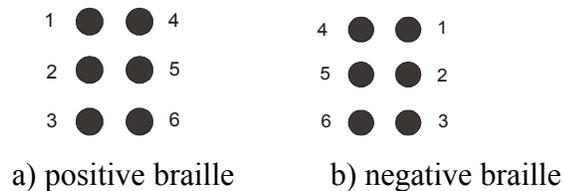
The special aid for reading the Braille letters is a teaching aid for recognizing the Braille letters. This aid is usually called *pantule* standing for papan tulis Braille (Braille blackboard) This aid consists of pins that can be attached to a board to make a combination of Braille letters. It look like a drawer or box, made of a board with holes into which the metal pins are attached. One of its weaknesses is that the pins are easily lost. Besides that, it is relatively big and made of a board so it is quite heavy to carry.

## I. METHOD

This research uses some theories about the writing system of Braille letters in Indonesian, interfacing technique of computer and microcontroller. The following are some theories employed to conduct this research are:

### A. Braille System

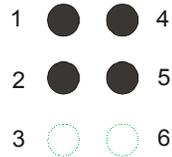
Braille letters consists of six raised embossed dots. The format is 2 columns X 3 rows of dots. Each of the dots are numbered, 1, 2, 3, 4, 5, and 6.



Picture 1 The Format of the Elements of Braille Letters

By numbering the dots, the Braille characters can be stated by mentioning the numbers of the dots. The chosen number of the dot causes protrusion on the printing media (the media can be either plastic or paper), while the number of

dot which is not chosen does not cause a protrusion on the printing media. For example, to make letter “g”, the Braille code is as follows:



Picture 2 the Braille Code for letter 'g'

The numeric sign is formed by adding “numeric sign” # (dots 3-4-5-6) directly in front of letter huruf **a** to **j**(for number 1 to 0).

So, some positive Braille letters can be stated by using the following symbol:

a	b	c	d	e	f	g	h	i	j	k	l	m
⠁	⠃	⠉	⠙	⠑	⠖	⠗	⠚	⠛	⠞	⠝	⠏	⠓
n	o	p	q	r	s	t	u	v	w	x	y	z
⠎	⠕	⠕	⠑	⠗	⠚	⠗	⠚	⠏	⠗	⠗	⠗	⠗
1	2	3	4	5	6	7	8	9	0			
⠼	⠼	⠼	⠼	⠼	⠼	⠼	⠼	⠼	⠼			
,	;	:	.	!	(	)	"	"	'	'	-	—
⠂	⠄	⠆	⠇	⠈	⠊	⠋	⠌	⠍	⠎	⠏	⠑	⠒

Picture 3 The Symbols in the Positive Braille Letters

### **B. Push Button**

Push Button is an electronic/electric component that functions as a switch. The actuation method used is by pressing the finger (push).

In this research the type of push button used is toggle. In this kind of push button, if pushed, the position of the button will move down and be endured. It will return to its initial position if pushed again. The Push Button character will be used to represent the dots in the Braille letters.



Picture 4. The *Push Button* will be arranged in accordance with the rule combination of Braille letter

The *Push Button* will be arranged in accordance with the rule combination of Braille letters, in which 1 character of Braille letter is represented by minimally six combined dots. One dot of Braille character is represented by one Push Button.

### **C. Interfacing**

Interfacing is done by connecting the personal computer to the peripherals outside the computer. This connection is done for the input output process between the computer and the peripherals outside the computer. Interfacing is done through the Parallel Port terminal.

Parallel Port is often used in various interface applications. This port allows the input process up to 8 bits or output up to 12 bits at the same time with only a few simple external series to carry out a certain task.

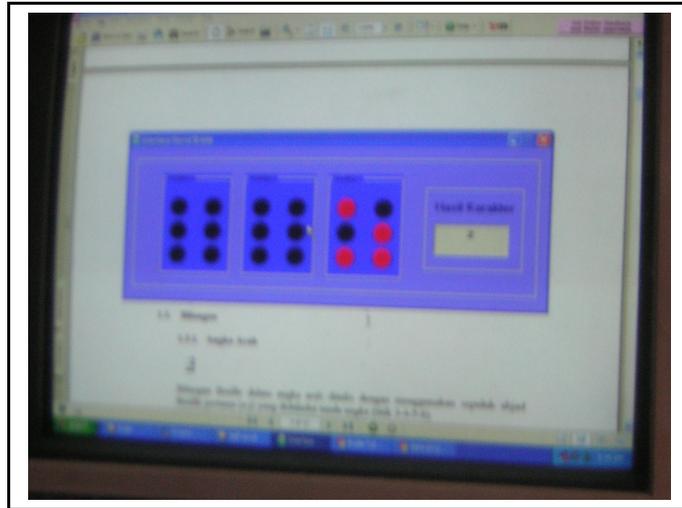
#### **D. Visual Basic Program**

Visual Basic adalah programming language easily used in creating programs based on Microsoft windows. The environment of Microsoft Visual basic Programming contains some tools useful for running and managing a program. This language programmings is also equipped with everything needed to build set the application run in the window systems.

Some features of Visual basic are graphic tools, objects, functions that can be used in programming and other features that are also useful in programming. Besides, this language programming is also equipped with MCI Multimedia, which is an ActiveX control included in the *Microsoft Visual Basic Profesional Edition*. The control of MCI Multimedia plays and records multimedia files in MCI equipment (*Media Control Interface*), for example *audio CD player, VCR and video player*. With those facilities, VB can be used to play the popular multimedia formats like file \*.wav, \*.avi and CD audio. With those facilities above, VB programming can be used to realized this research.

#### **E. RESULT**

The aid of teaching Braille letters can be produced by combining the function of the combined push button according to the format of Braille letters. Then, it is connected to the computer through parallel interfacing. The computer using Visual Basic programming processes the input from the parallel port and compares the data of the combined Braille letters, and then runs the file \*.wav in accordance with the letters, numbers, and punctuation marks based on the combinations of buttons. All sounds in accordance with the input of push button with the Braille format. Letter “a” is sounded as “a”, letter “z” is sounded as “z”, number “1” is sounded as “one”, and so on.



Picture 5 letter “z” is sounded as “z”

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