

LOW-COST TV LISTENING DEVICE FOR HEARING IMPAIRED PERSONS

Thesis presented in partial fulfillment for the award of the
Advanced Diploma in Electrical Engineering of
INSTITUT TEKNOLOGI MARA



FAIZAL BIN MANSOR
Department of Electrical Engineering
INSTITUT TEKNOLOGI MARA
40450 Shah Alam, Malaysia
NOVEMBER 1995

ABSTRACT

The design of a low-cost practical wireless receiver with volume-control and transmitter for hearing impaired person to hear TV sound are presented in this thesis [1]. A trade-off design approach is introduced to solve the problem of minimizing the size of the receiver and at the same time maximize its performance. The main activity of the system is the development of appropriate technology for flexibility, durability and portability of the receiver and transmitter. It has been designed for a single supply voltage of approximately 6V for the receiver and 9V for the transmitter which reduces its power consumption. It is also designed to suit the objective function in terms of overall cost of the device. Experimental results using intergrated circuits shows that the receiver can detect each valid frequency from the transmitter within the nominal value of 700kHz.

ACKNOWLEDGMENTS

THESES JUST DON'T HAPPEN OVERNIGHT. ALWAYS THERE, assisting in the effort to complete this thesis, were my following lecturers : Mr. Niranjana Debnath and Ir. Dr. Syed Abdul Kader Aljunid, who supplied their technical expertise and support.

And to those who have filled my life with LOVE

My wife, Basariah Naina; my children, Nur Aflyn Fatimah and Nur Fazryn

Faizal Bin Hj. Mansor

LOW-COST TV LISTENING DEVICE FOR HEARING IMPAIRED PERSONS

<u>CONTENTS</u>	<u>Page No</u>
Abstract	i
Acknowledgment	ii
Contents	iii-iv
Chapter 1	
1.0 Introduction	1
1.1 Types of Hearing Aids	2
1.2 Problems Associated with Presently Available Hearing Aids	4
1.3 Possible Application of Hearing Aids	5
1.4 Organisation of the Thesis	7
Chapter 2	
2.0 Design of Low-Cost TV Listening Device For Hearing Impaired	8
2.1 The Requirements of A Hearing Aid	8

CHAPTER 1

1.0 INTRODUCTION

The ears are exposed to potentially damaging environment irritants, and infective agents that sometimes caused hearing loss (Figure. A1 in Appendix A) that would substantially effect the persons suffering it emotionally and psychologically.

People with hearing impairment often experience difficulty in listening to sound including, sound from television set. Increasing the volume of the television set may irritate other people watching TV in the same room, and sitting very close to the television set may damage the eyes. Researchers have found that the comfortable zone to watch television without any hazards to the eyes is approximately 1.3 meters (approx. 4 feet) away from the front panel of the television set. Use of personal hearing aid, while sitting close to a television may give satisfactory results provided the room is not reverberant and there are not too many interfering sounds. Satisfactory results can be achieved by the use of assistive devices [2].

Hearing aid devices are used to compensate the hearing loss of a person by amplifying some parts of the audio spectrum. There are different types of hearing aids available, and based on their size and placement, they are known as “behind-the-ear”, “in-the-ear”, and “in-the-canal” aids. Hearing aids can also be classified