CHAPTER 1

INTRODUCTION

1.1 Background of the project

The FM Radio Telephone Transmitter is a project prepared for final year project, Communication Engineering, UNIMAP. This project is done to be able to amplify a phone call (incoming call) where everybody can hear the message and also can record the message if it's very important for record-keeping purposes. The FM Telephone Transmitter is yet an ingenious device that connects in series with a phone line, real power from the latter, and transmits both sides of a conversation to an FM radio tuned to between 90 and 95 MHz.

There are many legitimate reasons for wanting to broadcast a telephone call to a FM radio as a receiver. When someone calls long distance, he or she doesn't have the time or can't afford to stay on long, but everybody at home still wants to hear his or her voice or maybe we are calling one of those a lot of information or entertainment lines and everybody wants to hear the message.

The electronic FM transmitter circuit attaches in series to telephone lines. When there is a signal on the line (that is, when you pick up the handset) the circuit will transmit the conversation a short distance. In particular it will radiate from the telephone line itself. It is a passive device - there is no battery. It uses the signal on the telephone line for power. No aerial is needed - it feeds back the RF signal into the telephone line, which radiates it in the FM band. The frequency of transmission was adjusted by the trimmer capacitors.

The following block diagram shows that complete operation of the FM Radio Telephone Transmitter

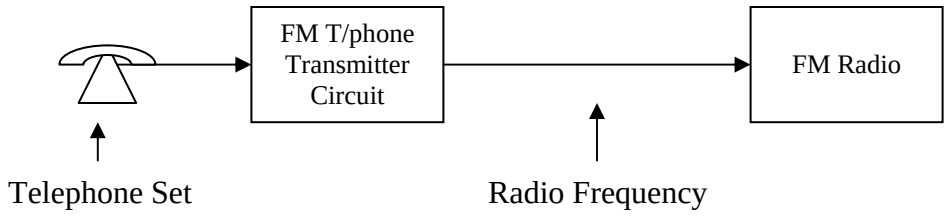

Figure 1.1: Block Diagram of FM Telephone Transmitter

1.2 Objective Of The Project

The objectives of this project are:

i. The objective of this project is to build and examine the workings of a FM Radio telephone transmitter.

ii. To study the circuit and determine how the different parts of the circuit function together to make an FM transmitter

iii. To understand about the concept of FM frequency transmitter.

iv. To be familiar with the use of design and simulation tools in the design process. For this project the design and simulation of the FM Telephone Transmitter circuit is using the OrCAD Capture CIS Software.

v. To be able to construct, analyze and test the complete project of FM Telephone Transmitter designed. In this part of objective the students are required to solve the problem occurred since the circuit does not work as planned earlier. Some alternative and creativity from the student are needed.

1.3 Project Scope

I have identified the scope of this project. The scope can be used as a guideline for me to conduct this project in order to complete this project in a time given and as in a plan from the earlier stage. Basically this project focused on:

i. Identifying the components and materials.

In the process of identifying the components and materials going to use, I have to ensure the components and materials related in this project ready in the stock.

ii. Designing and layout.

In this process I have used the OrCAD Capture CIS software, where it is provide the designing, simulation and layout design for PCB.

iii. Project Circuit Board (PCB)

In the part of Project Circuit Board (PCB) process, I have requested the Engineering Department (Fabrication) to do the process.

iv. Testing and analyzing.

In this process of testing and analyzing, I have performed the job related at TM office (Transmission Department) and at the lab. The testing part have to test using the active phone line and the working FM Radio while the analyzing process have to do at the lab.

v. Interfacing

This project use radio frequency (RF) interface while to broadcast the telephone conversation.

1.4 Significance of the Project

This project is an alternative for people especially for workers in a company to listen or record a telephone conversation while informing all involved parties. There are many legitimate reasons for wanting to broadcast a telephone call to a FM radio that acts as a receiver. This is very important for information or entertainment lines and everybody who wants to hear the message.

During the completion of this project I have apply a lot of knowledge in my communication engineering study from early semester until the end of semester.

1.5 Project Limitation

Each project usually will face several limitations that might occur while running its process of the project. There are several limitations occur along the implementation of this project:

- The electronic components with the recommended value such, as transistor is hard to get due to matching in the circuit of FM Telephone Transmitter.

- The process of mounting the component at Project Circuit Board (PCB) is hard to do since the tracks at the circuit board are very thin.

- The process of tuning to the proper frequency to broadcast at FM radio is hard to get since the problem it's related with the components and the circuit itself.

1.6 Report Overview

This chapter provides an overview of the project by giving description of the problem. Chapter one discusses about the background of the project, problem description, objective, project limitation and overview of the report.

Chapter two discusses about the literature review. This chapter gives the full explanation regarding the project which including with the function of every components related with the circuit, the calculation of the inductance, the definition of frequency modulation (FM) that should be used and the radio frequency itself where it's the interfacing part to broadcast at the FM radio.

Chapter three explained about the methodology that was used. The methodology is based on System Development Life Cycle (SDLC). This project uses the methods, which start with planning, followed by implementing and the last part is analysis the project. All the method is use to determine the way to perform this project in order to achieve the objective of the project. This kind of method will make the progress of the project running smoothly.

In chapter four, I describe about the analysis, which is completed with the results and discuss about the outcomes that have been performed. The part shows the outcomes of the testing in the lab using the power supply and oscilloscope, to perform the transmitter frequency. In the other part of the result, the test result is discussed completely with the actual phone conversation and the parts related with.

In the last chapter (chapter five), a summary of overall progress of project is presented and it will provide the conclusion of the project. The conclusion part concludes all the things related to the project including technical part, creativity and the achievement of this project. It also provides some recommendation that can be made for this project better than the previous job.