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**FINAL REPORT:
LETTER DETECTOR OF MAILBOX BY USING SOLAR CELL TECHNOLOGY**

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ABSTRACT

This project is mainly to investigate more on solar panel. Solar panel is a photovoltaic cell that converts light energy from the sun to electrical energy. Solar panel has been used widely in the world and the applications of it have been increasing day by day. Nowadays, people invest more on solar panel technology as it is more practical and environmental friendly.

Therefore, solar panel is added to this letter detector of mailbox project to investigate if it is compatible to basic home appliance. This project is tested on terrace house that the mailbox will be put outside within range of 500ft open space. Two main objectives of this project are to develop the innovation of smart mailbox and to implement the usage of solar panel as energy harvesting.

It will be one of the modern technologies that help mankind to have a better life. Mailbox is a conventional way to send a letter while nowadays, everything is done via email. Therefore, upgrading a mailbox into a smart mailbox with some environmental friendly is a good start.

This smart mailbox can help to notify the users when there is a load. Infrared sensor works when an obstacle comes and interfering the transmitting signal and green LED will lights up. Thus, radio frequency transmitter, (RF tx), will send signal wirelessly to the receiver that is to be put in the house. Receiver will then activate the red LED and buzzer will sound. This will be off after the load has been taken.

CHAPTER 1

INTRODUCTION

1.1 Background of Study

The mailbox is powered by solar cell as a backup. The reason solar panel is attached to the mailbox is because it can reduce the usage of electricity and lower monthly expenses than before. Every location on earth receives sunlight for at least part of the year. The amount of solar radiation that reaches any one places on the earth's surface varies according to five factors; geographic location, time of the day, time of year, local landscape and local weather.

Solar cell technology is widely used and the usage of solar energy in humans' daily needs is spreading. The sensor in the mailbox will detect the presence of a letter or more and the LED will lights up. The signal of the radio frequency will transmit to the receiver inside the house thus the buzzer will make a sound.

The mailbox will use infrared and radio frequency signal concepts. The IR is used to detect mails in the mailbox while RF concept is used to make it easier to handle. Wires have higher chances to break and imagine when the wire breaks, the current will flow and hit people passing by it. This is dangerous and we want to maintain a safe environment for people and especially children.