THE INFRARED TOUCH-PAD

ENG 421 MANUAL

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Submitted to Professor Norman Harris

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TABLE OF CONTENTS

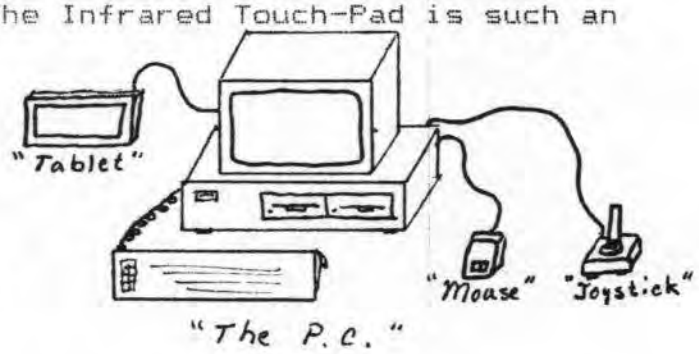
THE INFRARED TOUCH-PAD

FIGURE LIST

FIGURE PAGE

INTRODUCTION

Since the introduction of the personal computer in the late 1970's, there has been a growing need for different types of input devices. Devices such as the joystick, the mouse, and the graphics tablet have made great advances in recent years. Within just the past year, however, came the introduction of several types of touch-sensitive pads. The Infrared Touch-Pad is such an input device.



This manual is designed to guide the user in the setup and operation of the Infrared Touch-Pad. It contains step-by-step instructions which will allow the user to interface the touch-pad to virtually any computer.

First of all, this manual will provide you with some background in the theory of operation. Secondly, it will guide you through the electrical connections required to interface the touch-pad to a computer. Thirdly, it will describe the software needed for normal operation, and give examples and suggestions for use. Finally, it will provide a guide for troubleshooting, in the event that the system should fail.

THEORY OF OPERATION

The touch-pad uses several infrared light beams to detect an obstruction on the pad. These beams are transmitted from one side of the pad to the other, where they are then detected by infrared receivers. Therefore, if you place an object such as a finger on the pad, a beam is broken and the computer can detect that the pad is being touched.

The pad has 16 rows and 16 columns of transmitter-receiver pairs (see figure 1 on the next page). This creates a 16 by 16 grid giving you 256 seperate locations which you can monitor with the computer.

With software you will write, you will output a six bit word which selects a light beam from one of the 16 rows or 16 columns. Then, you can look at the return line from the pad to see if that selected light beam is being broken. Later in this manual, you will see how this process can be implemented into a software loop which will continuously repeat a check of all 256 locations on the touch-pad.

Once this software loop is complete and functioning, you can define it as a ***scan subroutine***. Now, any time you wish to see if the pad is being touched, one call to the subroutine will return to you the location of the touch (if there is one). For example, if you wanted to write your own computer game, you could use the touch-pad for an input device. Imagine a game where you control a helicopter by moving your hand around on the surface of the touch-pad! The possibilities are limited only by your imagination.

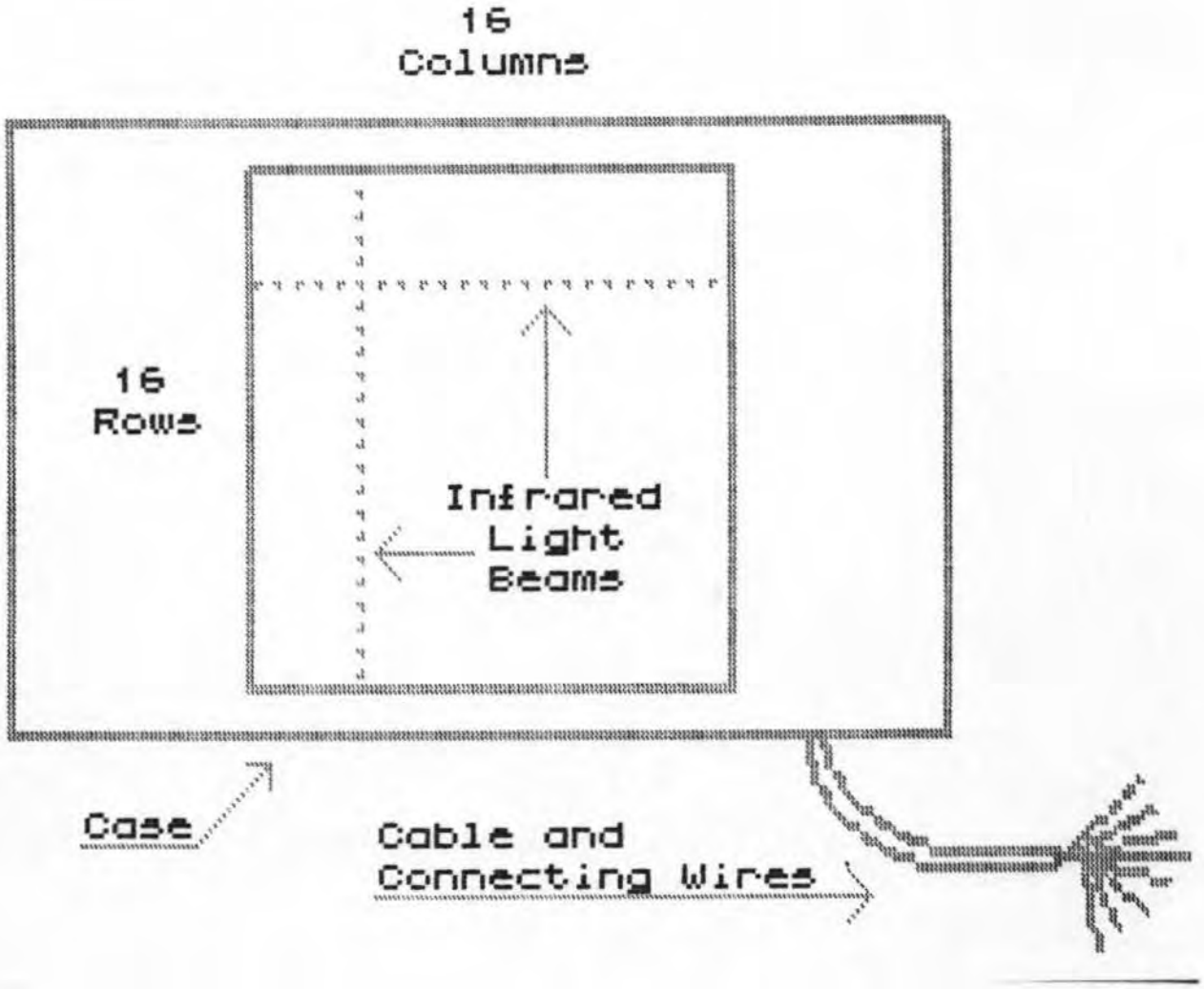


Figure 1: The Infrared Touch-Pad

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