twiddler™

USER'S GUIDE

FCC WARNING

NOTE: This equipment has been tested and found to comply with the limits for Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference in radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and the receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio/TV technician for help.

CAUTION:
Changes or modifications not expressly approved by the party responsible for compliance with FCC rules could void the user's authority to operate the equipment.

FCC ID: I62-HKT   Patents Applied For

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES.
Operation is subject to the following two conditions (1) This device may not cause harmful interference, and (2) This device must accept any interferences received, including interference that may cause undesired operation.

Twiddler   Model HKT-35   MADE IN USA
Handykey Corporation

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Twiddler User's Guide

GETTING STARTED

Overview

The Twiddler is designed to perform the computer input functions of both mouse pointer and a full computer keyboard. To control these functions, the Twiddler has 12 keys on the front and 6 keys on the top, as well as an internal sensor. The keys on the front are pressed by the four fingers, the top keys are for the thumb, and the internal sensor controls the mouse pointer. The Twiddler is designed to be used by one hand. The hand not holding the Twiddler is free for other tasks (holding a telephone or a cup, keeping your place when typing a list, jotting a note on paper, etc.)

The Strap

There is a soft fabric strap that extends from a slot in the side and attaches to the bottom. This strap goes around the back of the hand and holds the Twiddler in position for typing or pointing. When you receive your Twiddler, the strap will be set up for right-hand use, but it may be easily readjusted for left-hand use.

Changing to Left-Hand Use

To adjust the Twiddler for left-hand use, first remove the strap from its Velcro fastener on the bottom. Next, grasp the strap close to the slot and slide the end of the strap out of the slot. It is designed to be a snug fit. Then, slide the same fitted end of the strap into the matching slot on the left side of the Twiddler. Be sure to insert it all the way into the slot.

Left or Right?

Which hand should you use for the Twiddler? The obvious answer is to use it in your dominant hand. But, you may wish to put off this decision and try the Twiddler with each hand and think about how you will be using it before you decide.

Here are a few things to consider:

- What do you want to be able to do with the hand not holding the Twiddler? If you want to take pencil-and-paper notes, you may wish to try the Twiddler in your non-writing hand.

- Does your normal computer work involve fine control of the pointing device (such as CAD or drawing programs)? If so, you may want to use the Twiddler in the hand that has the best drawing control.

In any case, you may wish to experiment with each hand to see which suits you best. It is always easy to change the strap to the other side. Note that the Twiddler key layout is designed to be equally accessible for either left- or right-hand use. Neither hand is put to a disadvantage.

How to hold the Twiddler

How you hold the Twiddler is a matter of personal taste. It is designed to accommodate a wide range of hand sizes and shapes. The following guidelines may aid in your trying different styles.

In general, the strap goes around the back part of the hand,

between the knuckles and the wrist, and attaches to the Velcro fastener on the bottom. (Check the photo on the back cover for strap placement.) Do not make the strap too tight. You should adjust the strap so your fingers fall naturally and easily over the center column (the column with the small guide-bumps on the keys). You will notice that the thumb is resting on the top inside corner of the Twiddler.

Rotating the Twiddler toward or away from your palm adjusts the angle of operation to accommodate longer or shorter fingers; and the angle of the strap on the bottom of the Twiddler can also be adjusted for your comfort. In fact, the most comfortable position may be found by removing the strap from the bottom, setting the Twiddler's angle, and then re-attaching the strap to the bottom. The fastener on the bottom helps to hold the desired angle of the Twiddler.

By adjusting the strap and position so your fingers fall naturally over the center column, the left and right columns are an equally short reach for the fingers. By having the strap too tight, the closest column may cramp the fingers. If the strap is too loose, the column farther away may be less easy to reach.

You can comfortably rest your thumb on the inside corner of the Twiddler, in a relaxed position, as shown in the photograph on the back cover. You don't need to grip the Twiddler. By resting the thumb as shown, the Twiddler will be steady.

THE KEYBOARD

The Twiddler keyboard is designed to perform all the functions of a full, 101-key keyboard. With only 18 keys, the

Twiddler accomplishes this by "chording." On a musical instrument, you can play a single note to produce one sound, or several notes simultaneously to make a chord. The Twiddler works in a similiar way. Some characters are produced by pressing a single key, and other characters are made by pressing more than one of Twiddler's keys at the same time. Various key combinations will emulate all of the 101 keys found on a standard keyboard.

With the Twiddler, there are actually over four thousand different accessible combinations (chords). Since most of these combinations are not pre-assigned, you can make your own assignments to these chords. In fact, even pre-assigned chords may be re-assigned by the user. Custom chording is explained in the section on Macros.

TYPING ON THE TWIDDLER

Single Keys

There are 12 keys on the front of the Twiddler, in 3 vertical columns and 4 horizontal rows. When looking at it from the front, the center column has tiny bumps in the center of its keys. These bumps aid in touch-typing by letting you know immediately, by feel, where your fingers are. Each of your fingers is assigned to a horizontal row of three keys across. Your index finger presses the keys marked "A", "E", and "SP" (space); use your middle finger to press "B", "F", and "DEL" (delete); your third finger is for "C", "G", and "BS" (backspace), and your little finger is in position for "D", "H", and "ENT" (enter). Pressing each of these single keys will produce a corresponding character or command.

Chords

The Twiddler registers a keystroke upon release of a key or keys. For example, if you press the "A" key on the Twiddler and hold it down, nothing happens. But when you release the "A" key, the letter "A" (actually "a") appears on the screen. For key chords, where more than one key is pressed, the character does not appear on the screen (or the command is not initiated) until you release one or more of the chord keys. By registering the characters on release rather than by simply pressing, you do not have to press each of the chord keys at exactly the same time. With Twiddler, you can press and release all keys at once, or press and hold one or more and then press and release another key. The entry is not registered until at least one of the chord keys is released.

Repeating Keys

On a standard keyboard, repeating keys (the "typematic" action) are activated by pressing and holding down a given key. To repeat characters in the same way on the Twiddler, press and release the key or keys and then quickly press the same key or keys again and hold them down. When you do this, the letter or symbol will repeat as long as the key or keys are held down.

Key Notation

For learning purposes, the notation that we use to indicate what keys to press with the four fingers are given from the viewpoint of looking at the Twiddler from the front. When viewing the Twiddler from the front, the three vertical

FINGER KEYS are indicated by a group of four symbols: 0, L, M, and R.

These symbols represent key presses in ROWS 1, 2, 3, and 4 (top to bottom). 0 means no button pressed, L means the Left button is pressed, M indicates the Middle button, and R means that the Right button is pressed.

Example:

L00R means the LEFT button in ROW 1 and the RIGHT BUTTON in ROW 4 are pressed. Since no buttons are pressed in ROW 2 or ROW 3, the two middle symbols are 0.

This example shows the keys pressed on the Twiddler to type the letter "k".

Finger Key Notation

columns are designated "L", "M", and "R", for left , middle, and right columns respectively. The four horizontal rows are specified by a four-symbol sequence, from top to bottom. (See the box: Finger Key Notation, above.)

To indicate which keys to press to get the letter "a", for example, the notation would be "R000". This means that in the top row (assigned to the index finger), the key in the right-most of the three columns is pressed and released; and, in the second, third, and fourth rows no keys are pressed and released. As another example, the letter "k" would be typed

by pressing the left key in the top row and the right key in the bottom row, and then releasing them. This would be designated by the notation "L00R".

bels

For the most frequently occurring symbols and commands, the keys are labelled by color to show the keys involved. The letters on the keys in black color show the symbol or command which is entered when that key is pressed and released all alone. For example, the keys "A", "B", "C", "D", "E", "F", "G", "H" are in black, indicating that these letters are accessed (in lower case, of course) by simply pressing and releasing a single key. Similarly, the keys labelled "SP" (space), "DEL" (delete), "BS" (backspace), and "ENT" (enter or newline) perform that command by pressing and releasing the single key with the corresponding label.

Above the three keys in the top row there are three colored dots: Red over the left key, blue over the middle, and green above the right-most key. To the right of the keys in rows 2, 3, and 4, there are letters and symbols in different colors. The colors indicate the combination of keys to be pressed and released to access a desired entry. A key in the top row picks the desired color and the key in the other rows with the corresponding color will access the symbol with that color.

For example, by pressing the left key in the top row (under the red dot), and the right key in the second row, the letter "I" is accessed (in the above notation, "LR00"). Note that the letter "I" is in red, indicating that the left key in the top row must also be pressed and released to get that letter. Similarly, by pressing and releasing the key in the top row under the green dot and the left key in the third row (R0L0), we get "!". Note that in either case one key may be pressed and held and

the other pressed and released, or both keys may be pressed and released at the same time (the latter is obviously faster). A full list of the pre-assigned letters, symbols, and commands is provided in the **Key Assignment** Section, later on in this booklet.

Speed Tip

As a tip to speed up typing a sequence of letters of the same "color", note that the finger in the top row need not be released in between a sequence of letters with the same color. For example, in typing the word "pin": First press L0L0 ("p"), then release the left-hand key in the third row; still holding down the left key in the top row, press and release the right-hand key in the second row ("i") ; and, finally, press the middle key in the bottom row ("n") and then release both keys. This procedure saves a few extra finger movements.

Another Speed Tip

Since there are so many easily-accessible key combinations (actually, over four thousand), we have built in a number of short-cuts for some of the most frequently used English words or letter sequences: *the, of, to, ed, and, in, ion,* and *ing.* The keys used for these can be found in the **Key Assignment** section.

Thumb Keys

There are six keys on the top rear of the Twiddler case. These keys operate in conjunction with the front keys to modify the meaning of key presses and also to engage and control the mouse pointer.

The "NUM" key, at the far left, accesses the numbers "1, 2, 3, ... 0": Holding the NUM key and pressing and releasing the front key R000 (marked "A"), produces the symbol "1". Likewise, NUM 0R00 accesses "2"; NUM 00R0 accesses "3", etc.

In clockwise direction from the NUM key, the ALT key functions in the same way as the Alt key on the standard keyboard: the command "Alt x" would be keyed by ALT ML00, holding down the ALT key while pressing and releasing the front keys in the combination for "x".

While holding down the FN key with the thumb, the front keys become Function 1 (FN R000) through Function 12 (FN 000L). The CTRL key functions as the Control "Ctrl" key; and the Shift key accesses upper case letters in the same way as the standard keyboard.

THE MOUSE POINTER

The mouse pointer is engaged when the "Mouse" key is pressed with the thumb. When the mouse key is not pressed, no pointer movement is produced on the screen. Releasing the mouse button on the Twiddler serves the same function as lifting a desk-bound mouse up off the surface of the desk or mouse pad. And, putting the mouse down on the surface is like pressing the Mouse button on the Twiddler. Pointer action only occurs when the Mouse button is pressed;

otherwise no motion is produced.

To get a feeling for how the pointing function works, make a fist with your hand with the thumb on top. Now, extend your index finger and rock your hand back and forth and side to side. (Tip your hand from side to side with the bottom not moving.) If you were pressing the Mouse button on the Twiddler and pointing with your index finger at the screen, the cursor would follow where your index finger was pointing. This illustrates conceptually how pointer movement is accomplished with the Twiddler. (Note that you don't really have to point at the screen.)

Mouse Click Buttons

The Twiddler emulates the Microsoft Mouse (with some extras). While the Mouse button is being pressed with the thumb, the front key R000 ("A") acts as the "Left" mouse button; and the front key L000 ("SP") acts as the "Right" mouse button; and M000 the "Middle" button. Note that the Mouse key must be held down when engaging mouse click buttons. As a convenience for many applications, holding the Mouse button and pressing the front key 0R00, acts as a "double-click left".

Mouse Navigation

Since the Twiddler is a pointing device based on relative motion (like a desk-bound mouse), the Twiddler's mouse movement is always relative to where the pointer starts on the screen. On an ordinary mouse, sometimes you run out of desk space and pick up the mouse to reposition it in a different place to get the motion you need. Although the Twiddler needs no desk space, the same concept applies. When you