

# MagicKeys: Touch-Sensitive Tooltips for Hardware

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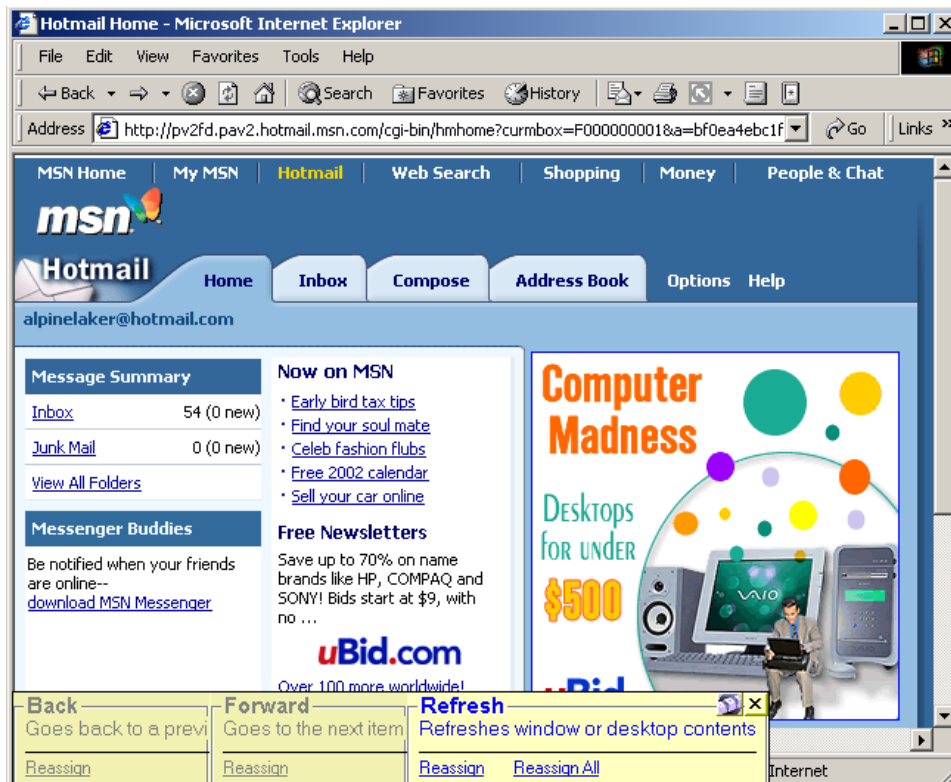
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**Tooltips for hardware, using touch-sensitive keys.** We replaced three of the F-keys (F1, F2, F3) on the MS Office Keyboard with generic task keys (Task A, Task B, Task C). The keys have touch-sensitive key caps that can detect when the user is just touching the key, as opposed to depressing the key to activate it.

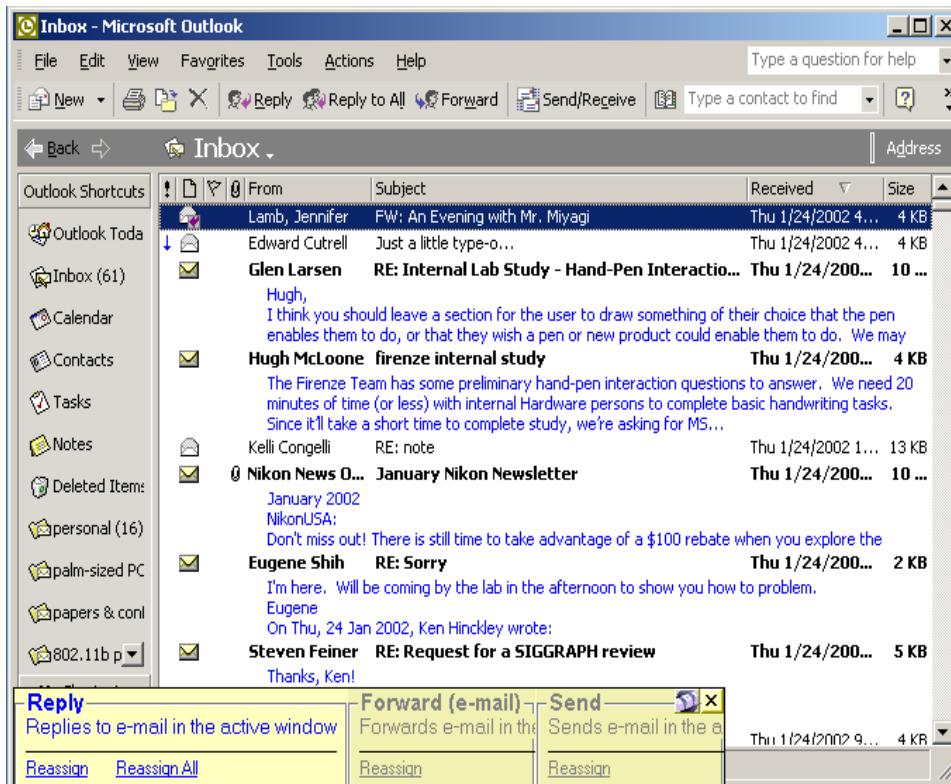
When the user touches a key, a large yellow tooltip showing the current key assignments is displayed at the bottom of the screen. It's a tooltip for hardware, showing the user what the key does. In fact, the tooltips are smart because they only come up after a short delay – so if you already know the key and strike it quickly, the tooltip does not appear – but if you are unsure and you dwell on the key for a fraction of a second, the tooltip is there to help remind you of what the key does.

Furthermore the **key assignments are application-specific**. So in Internet Explorer, the keys can be assigned to Forward, Back, and Refresh, for example, while in Outlook they can be assigned to functions that are useful there such as Reply, Forward (e-mail), and Send. When the user switches applications the key assignments change, and by touching the Magic Keys the user is instantly reminded of the key's function *before* they actually press the key.

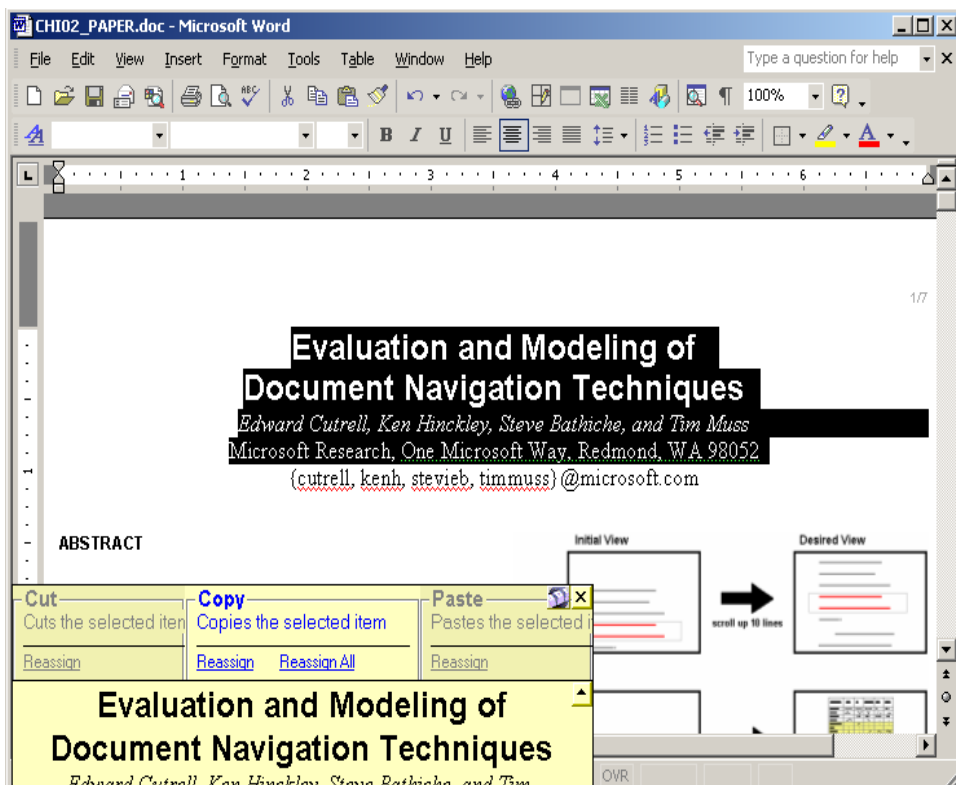


In the screen shot at left, the user is touching the Task C key, which is assigned to Refresh the page contents in Internet Explorer. The Refresh key is highlighted in blue to indicate which key the user is currently touching. The tips for the other two Task keys are also show grayed-out, so the user doesn't have to hunt around to find out what they do.

Here's how it looks when the user switches to Outlook and touches the Task A key:

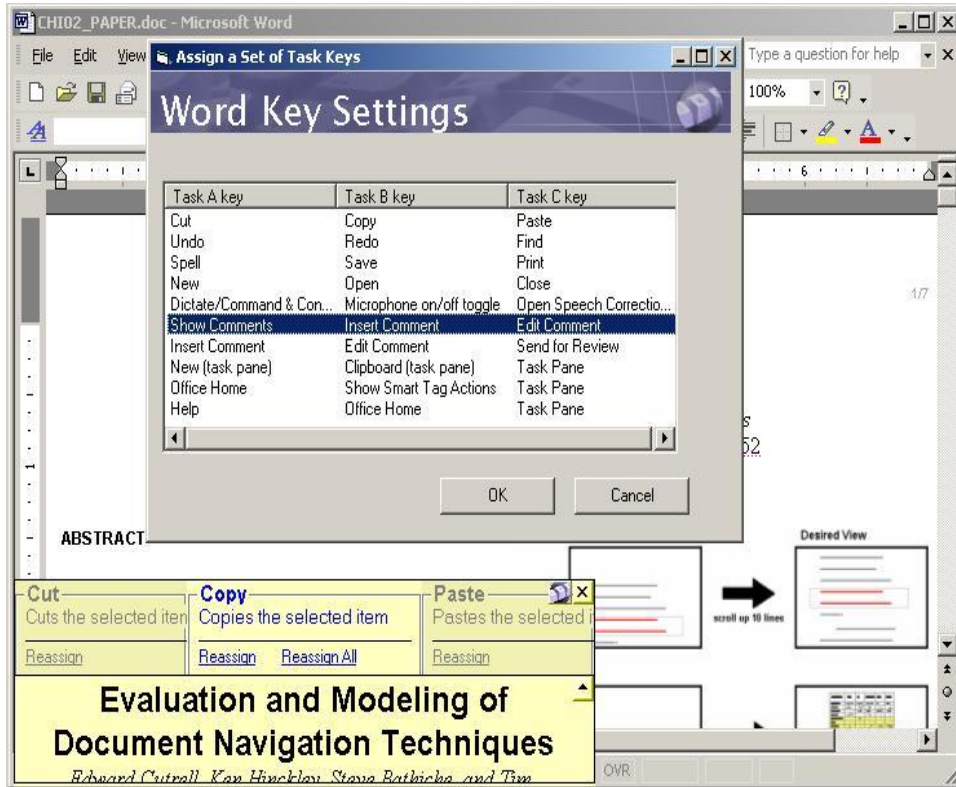


As another example, the following screen shot show Magic Keys for Word assigned to Cut, Copy, and Paste. Since these commands all deal with the clipboard, in this case the tooltip also

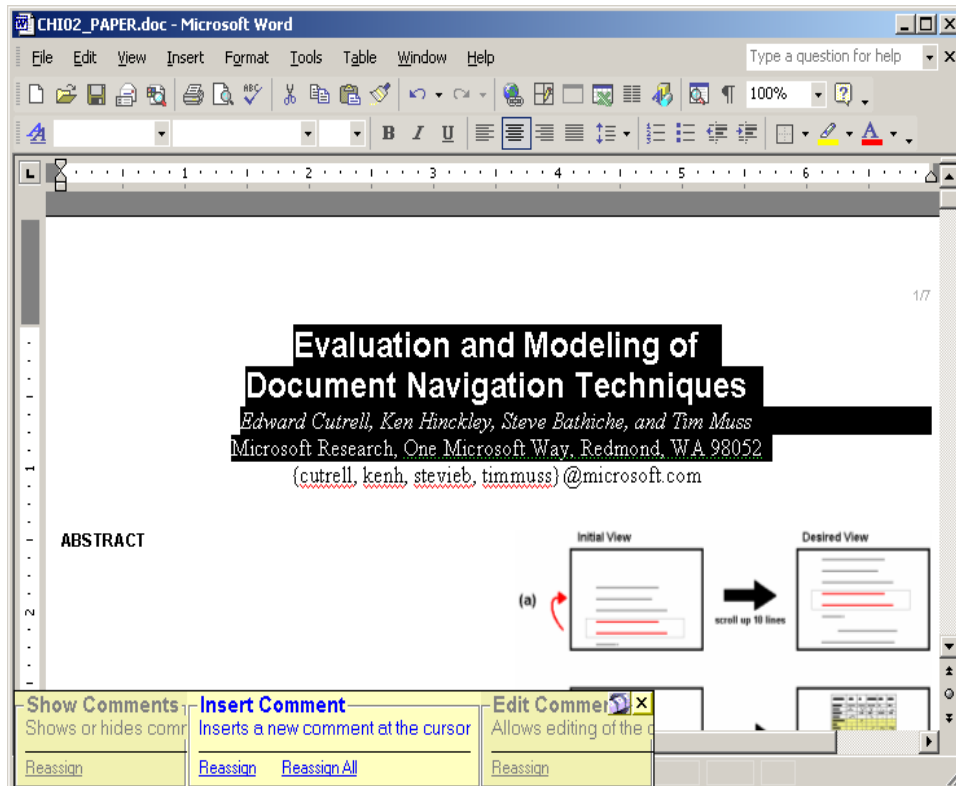


shows the current clipboard contents, so that the user can see what will happen before they press the Paste key.

As a final point, note that **this feature also makes it easy for the user to change the key mappings**. Is it time to insert and edit comments in that Word doc? Well just click on “Reassign All” in the tooltip and choose a



different set of key assignments suited to your current work. The screenshot below shows the dialog box that comes up, letting the user select from several possible sets of key assignments that are useful in Word.



This final screenshot shows the results of reassigning the keys to some Word revision features instead:

## THE MAGICKEYS SOFTWARE

MagicKeys supports application-specific key assignments for:

- Internet Explorer
- Word
- Outlook
- Excel
- PowerPoint
- Windows Media Player

All other applications (“Other”) are given the same default key mappings. It would be useful to allow the end-user to add new applications, but this feature has not been implemented.

### Main (startup) MagicKeys window

When the user starts MagicKeys, a Main window appears with several options to change the look and feel of the UI. These are currently offered advanced options for experimentation, but would be unlikely to be exposed in a commercial realization of this prototype.

- The *ReassignKeys...* button lets you see all of the key assignments, for all supported applications, and change any of them.
- The *OK* button minimizes the main window. This keeps it hidden during normal use of the MagicKey and the associated tooltips that appear.

### Using the MagicKeys tooltips

Touching a key causes tooltips for the key assignments to appear. Pressing a key performs the indicated action. Note that if you touch the keys and use the mouse to switch to different applications, the key assignments will change when the window changes focus.

You can click on [Reassign](#) to change the function of a single key in the current application.

[Reassign Set](#) changes the function of all three keys at once. The software displays a list of useful sets of key assignments for the current application. This makes it extremely easy to assign the keys, even temporarily, to suit the user’s current task.

The tooltips window can be moved just like any other window by dragging on the title bar, or closed by clicking on the **[x]** icon. Touching the keys again will cause it to reappear.

Clicking on the IntelliType icon in the upper right corner of the tooltip brings up the MagicKeys main window. This is a placeholder that would bring up the Keyboard Properties / Key Settings dialog in a commercial realization of this prototype. This is intended as an easy way for people to find and access their keyboard settings without having to look for them in the Start menu.

## IMPLEMENTATION DETAILS

**Mouse Cursor Interaction with the Tooltips.** The Tooltips are activated by touching the keys, but the user can interact with them directly using the mouse. Thus, they are not just informational displays but interactive extensions of the keyboard's functionality. If you move the mouse cursor into the tooltip to click on a function, it is no longer necessary to touch the key caps to keep the tip displayed. The tip remains visible as long as the mouse is active within the tooltip; the tooltip will eventually be dismissed if the mouse leaves the tooltip or if it remains motionless for several seconds.

**Smart Tooltip Delay.** When you touch a key, the MagicKeys tooltips appear after a brief delay of approximately 400 milliseconds. This allows one to rapidly activate a key, if the function is already known, without having to be distracted by the tooltip. But if the user hesitates, the tooltip quickly appears.

**Clipboard Preview:** If Cut, Copy, or Paste is assigned to one of the keys, a preview of the clipboard appears immediately below the tooltips. Click on the blue chevron to hide this clipboard if desired. Click on it again to reinstate the clipboard preview. The clipboard preview works well for most Office applications, but it may not be able to display all content correctly (e.g. HTML or some images).

**Volume / Mute Preview:** If Mute, Volume +, or Volume - is assigned to one of the keys, a preview of the Volume indicator is also shown when the user touches the Magic Keys. The Volume / Mute preview appears at the bottom right of the window.

**Application Launching functions:** For key assignments such as Launch Word, Excel, Mail, etc., the description below the key name indicates what the key will do when the user presses it. For example, if the key is assigned to launch Word and Word is not yet running, the key's function is indicated as "Starts Word (new document)." If Word is already running, its function will be indicated as "Switch to <word document name>."

**Web/Home function:** The key description indicates if a new instance of Internet Explorer will be launched, or if the current Internet Explorer window will navigate to the user's home page.

**Automatic Saving of Key Assignments:** All key assignments are saved to the registry when you exit the MagicKeys application so that they will be available again the next time you use it. If you move it, the new position of the tooltip window is also saved in the registry.

## OTHER INFORMATION

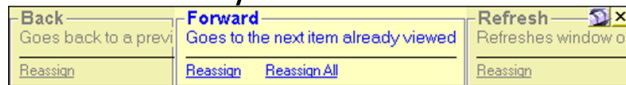
The MagicKeys hardware and software was implemented as a fully functional prototype on top of IntelliType 5.0 so that it could be tried out for actual work. I personally employed the prototype in my own work over a period of about six months.

The following pages show a few slides that I often used to talk about the project.

# Magic Keys

- Users want customizable keys
- BUT, users immediately forget their key assignments
- The problem gets even worse for application-specific key assignments

*In Internet Explorer:*



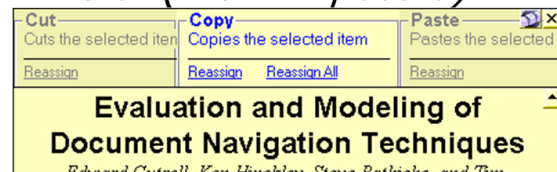
- Solution:
  - **Magic Keys:** ToolTips for hardware!
  - Touch-sensitive key caps +
  - Application-specific key assignments

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# Usage

- Just touch a key to see what it does!
- Smart delay – tips appear after 400ms
- Very easy to reassign key:
  - Touch it, then click [Reassign](#)
  - Click [Reassign Set](#) to choose from useful keys for the current application
- Easy for customers to get at our keyboard sw
- Can show context of command (e.g. clipboard preview)

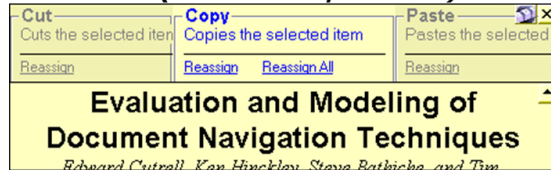
*In Word: (shows clipboard)*



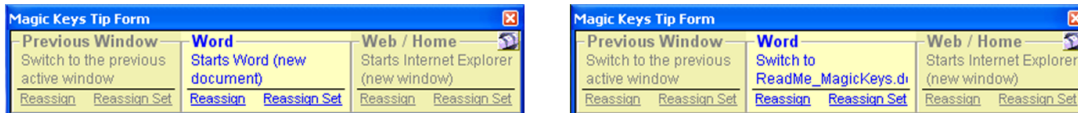
# Preview of exactly what action a key will trigger

- Show context of command BEFORE launching it
- Clipboard preview

*In Word: (shows clipboard)*



- Launch new instance vs. switch to running app



- Volume / mute settings in windows media player

## Volume / mute preview in Windows Media Player

