
MicroTouch®

Mac 'n Touch Software

User's Guide

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INTRODUCTION: Mac 'n Touch

INTRODUCTION

Mac 'n Touch is the most intuitive pointing device available for the Apple Macintosh series of computers and monitors. Mac 'n Touch is compatible with HyperCard and all Macintosh software, making it ideal for

- Point-of-Sale Promotion
- Training Systems
- Factory Automation and Process Control
- Information Kiosks
- Executive Workstations
- Laboratory and Medical Instrumentation
- Interactive Selling Demonstrations
- Educational Programs

This manual contains the following instructions:

- Installing the Mac 'n Touch Software Driver
- Calibrating the Touch Screen (and Controller)
- Setting the Touch Button Mode
- Setting the Usage of the Control Key
- Setting the Tap Speed and Distance Tolerances
- Using Multiple Touch Screens with One Macintosh Computer

Included with this package are the following:

"Mac 'n Touch" software driver, including the Control Panel

"Touch Me (Hyp 1.2x)," an MTS Folder with a HyperCard 1.2x demo of Touch Screen applications

"Touch Me (Hyp 2.x)," an MTS Folder with a HyperCard 2.x demo of Touch Screen applications for newer systems

"The HyperCard Toolkit," a HyperCard stack containing tips and techniques for developing touch screen applications

INTRODUCTION: Important Notes

IMPORTANT NOTES

Before you begin to install your Touch Screen software driver in your Macintosh computer, please be aware of the following conditions:

Your Mac 'n Touch driver is shipped as a *locked file* so that you may test its functions without saving the data to the controller. This enables you to become familiar with the touch modes and calibration without losing the factory hard calibration or causing a reset of the controller modes.

After you have installed the driver as shown in the instructions herein and tested the actions of the Control Panel with the locked driver file, then you can unlock the file for saving default touch modes or performing a real calibration. (See the paragraph on this page describing how to unlock the file).

Do not try "CALIBRATION" until you are sure that your monitor's installation requires a controller reset. Touch screens and controllers are tested and set at the factory for average conditions of use and average screen sizes. For normal purposes, they should not need to be recalibrated. Please read "Calibration of the Touch Screen" before starting this activity. Calibration erases current settings!

To unlock the file, highlight the "Mac 'n Touch" Icon or name in the desktop window. Then pull down the "File" Menu and highlight "Get Info." An information window will open, showing the creation dates and file size of the driver, and there will be a small box located in the window that says "Locked" beside it. It will have a black "X" through it, indicating a locked file. Just click on the box to remove the "X" and the file will become unlocked. After this action, any subsequent Control Panel changes will be saved, including the hard calibration data.

Once you have calibrated the controller to perform the way you prefer, you may relock the driver file if you do not want anyone else to change it. Even with a locked file, the touch modes can be switched at any time to work with different programs while the computer is running. But, once the power is shut down, the touch mode at the next startup will be the one in the locked file setup. This can be used as a way to guarantee that your choice of mode will be available for the desktop upon startup.

CHAPTER ONE: Installing the Driver

INSTALLING THE DRIVER

- 1) Complete the installation of the touch screen cable hookups according to the directions in the "Mac 'n Touch Hardware Installation Guide." This can be done for benchtop testing or final installation.
- 2) Insert the **MicroTouch** software diskette with the label *Mac 'n Touch (Hyp 1.2x)* into the floppy disk drive of your Macintosh.

Using the mouse, copy the touch screen icon named *Mac 'n Touch* into the **System Folder** of your hard disk. If the driver is to be used with System 7, the icon should be placed normally in the "Control Panels" folder, which is what System 7 will indicate when you load the driver. (If you later experience difficulties with the Control Panel function, see "APPENDIX A: Compatible Software and Hardware." Alternative setups are presented).

Please refer also to "APPENDIX A" for use of Mac 'n Touch with Desk Accessories, initialization files, and other Control Panel Devices.

- 3) In order for the Macintosh to detect the touch screen (or any new Apple Desktop Bus device), you must restart the machine. Pull down the "Special" menu and select "Restart." You will see a white touch screen icon appear briefly in the lower-left corner of the screen. The touch screen and software driver are now active. If you see a *black* touch screen icon with an "X" across it, the touch screen is not functioning because it is not fully hooked up—usually the ADB cable is not installed in the desktop port.

See the "Troubleshooting Tips" Chapter for more information on the black icon at startup.

- 4) To verify installation, touch the screen and check the cursor's location under your finger and see that it follows as you move across the screen. Move out to each corner and edge of the image screen and see if the cursor follows. Check the center of the screen and note the cursor position. Try accessing the Mac 'n Touch Control Panel. Pull down the **Apple** icon at the far left of the menubar and select "Control Panels." Highlight the **Mac 'n Touch** icon which appears. The Mac 'n Touch Control Panel will open up (See Figure 1). For System 7, the Control Panel can be accessed as above, under the Apple, or you can select the Mac 'n Touch item in the "Control Panels" folder in an open "System Folder" Window (see Figure 2).

CHAPTER ONE: Installing the Driver

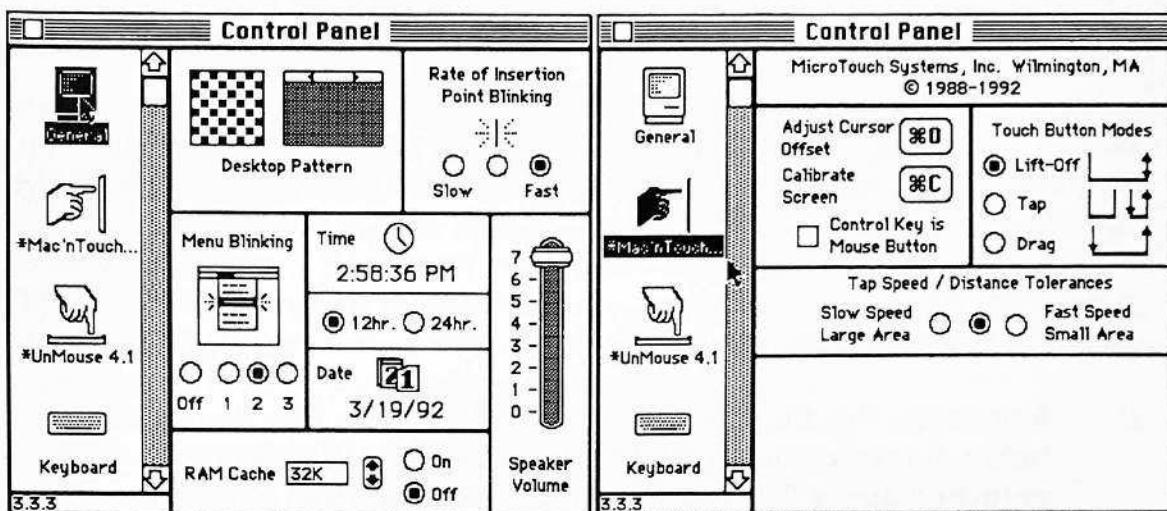


Figure 1: Mac 'n Touch Control Panel for System 6.0x

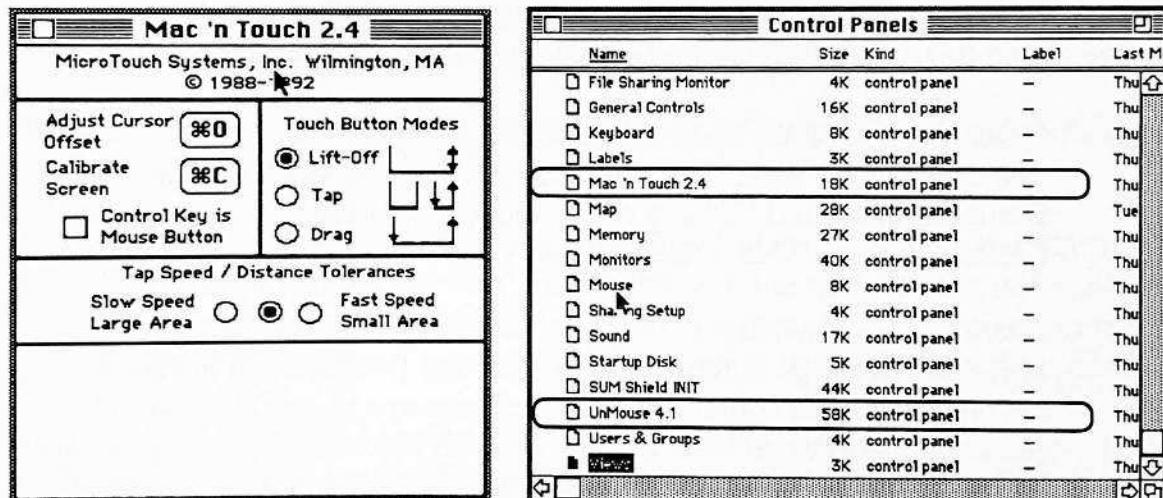


Figure 2: Mac 'n Touch Control Panel for System 7

IMPORTANT

If you are updating the software driver from a previous version, it is necessary to "rebuild the desktop" in order for the software icon to be updated. When you reboot your system, you should simultaneously hold down the Option and Command keys. A message dialog box will appear asking "Do you want to rebuild the desktop?" Choose "OK" and the icon will be updated. *Do not leave any older Mac 'n Touch drivers in your System Folder as this could cause a malfunction of the touch screen controller.*

CHAPTER TWO: Calibrating the Touch Screen

CHECKING AND CALIBRATING THE SCREEN

If this is the first time the touch screen is being used, you need to check the size and dimensions of the active area of the screen. If the screen is improperly calibrated, the active area of the touch screen may be out of alignment with the Macintosh screen, or unnecessarily small in size. Calibration allows the controller to adjust itself to the edges of the screen image and to locate the center of the touch screen. When you touch the center of the screen image, the cursor should be in the same position as your touch without any cursor offset.

- 1) Remember that the Control Panel is a *locked* file. Test the following instructions first before performing an actual calibration with an *unlocked* driver. The calibration steps will function but the data will not be saved, so there will be no change in the cursor's locations.
- 2) To calibrate the touch screen, access the Mac 'n Touch Control Panel by following the directions in Step 4 of INSTALLING THE DRIVER.
- 3) Touch or click on the **Calibrate Screen** button with the letter "C" in it. The Calibration screen will now appear. Alternatively, press the Command Key and "C" key simultaneously in order to bring up the Calibrate screen. This is useful when you do not have a mouse available.
- 4) There is a diagonal line in the lower-left corner. **Touch the corner** of the *screen image* at the outermost point of this line. Do not go beyond the image corner into the black non-image area, as that will result in distortion of the edges. (The touch point registered represents the pixel at the center area of your finger where it touches the screen).
- 5) Wait several seconds until a similar line appears at the top right. **Touch the upper-right corner** of the screen image at the outermost point of this line. After this touch, the Control Panel will reappear. When you are familiar with this process, *unlock the file* and proceed with the real calibration. *This will change the settings in the controller.* Calibration data, as well as all other settings made in the Mac 'n Touch Control Panel, are saved (with the unlocked file) and are used as defaults when the system is rebooted. Do not use a stylus other than your finger to calibrate the screen. Metal objects are able to generate touch points when held to the screen, but they do not make the necessary "capacitive contact" for accurately calibrating the screen.

CHAPTER TWO: Calibrating the Touch Screen

CALIBRATING THE SCREEN (continued)

If you find after calibration that the cursor does not travel with your touch right out to the edges of your screen image on all sides, try calibrating again, making sure to touch the corners carefully. If the cursor is far removed from your finger, it is likely that one of your touches did not register properly, or you accidentally touched the screen in the wrong place during calibration. Try recalibrating. If that does not restore the cursor to the correct center location, turn off the monitor/computer for a minute; the controller will revert to default values set in the factory if a “bad” calibration takes place.

SETTING THE CURSOR OFFSET

After calibration, the cursor will be located directly underneath your finger when you touch the center of the screen. Many people prefer to have the cursor located slightly above or to one side of their finger width. This makes the cursor easier to see and to locate in selecting items, or to “zero-in” on small check boxes.

- 1) To offset the cursor, access the Mac ‘n Touch Control Panel by following the directions in Step 4 of INSTALLING THE DRIVER.
- 2) Touch or click on the **Adjust Cursor Offset** button with the letter “O” on it. A screen will appear with a large arrow in the middle of it. Alternatively, press the Command key and “O” key simultaneously in order to bring up this screen. This is useful when you do not have a mouse available.
- 3) The tip of the arrow indicates where the cursor will appear relative to your finger. To set the desired cursor offset above your finger, **touch a point below the tip of the arrow and lift off**. The distance between your fingertip’s liftoff position and the tip of the arrow will be the offset distance. Thereafter, the cursor will be positioned above your finger by a distance equal to the offset distance. After completing this setting, the screen automatically reverts to the Mac ‘n Touch Control Panel.

The offset distance is designed to compress at the top and bottom of the screen. This enables you to touch items at the extreme top and bottom. Sometimes, though, the offset may be too great for the cursor to reach an edge. It is possible to recalibrate the screen so that when you do point in the perimeter areas, the cursor will stay offset beyond your fingertip and still touch the screen edges. This procedure is described on the next page.

CHAPTER TWO: Calibrating the Screen (cont'd)

SETTING THE CURSOR OFFSET (cont'd)

Follow the directions in Step 2, 3, and 4 in CALIBRATING THE SCREEN. However, instead of touching the outermost point of the guidelines, touch the lines somewhat inside the corner of the screen. After calibrating in this manner, the active area of the screen is defined as slightly smaller than the image, and the cursor will always move beyond your finger when you touch any of the four corners of the screen. The drawback of this approach is that the cursor offset will be somewhat variable from the middle to the edges of the screen, which is inappropriate in certain applications.

.....

CHAPTER THREE: Selecting a Touch Button Mode

The Mac 'n Touch screen can perform mouse "clicks" through one of three Touch Button Modes which are selected from the Mac 'n Touch Control Panel. Note that the Control Panel itself is programmed to operate in "LIFTOFF" mode (see below for description). This is most often set as the "normal" mode because it is the most intuitive for the majority of applications. However, for drawing and painting programs, "TAP" mode is usually necessary to activate the tools properly. ("DRAG" mode is used for various situations, but chosen more rarely). Even novice computer users require little or no explanation to use the touch screen to perform all of the actions of a mouse.

The three Touch Button Modes are as follows:

LIFTOFF MODE:

To position the cursor anywhere, touch the screen at the desired point.

.... To "single click," simply lift your finger off the screen. The software emulates the mouse button moving down and up immediately upon liftoff.

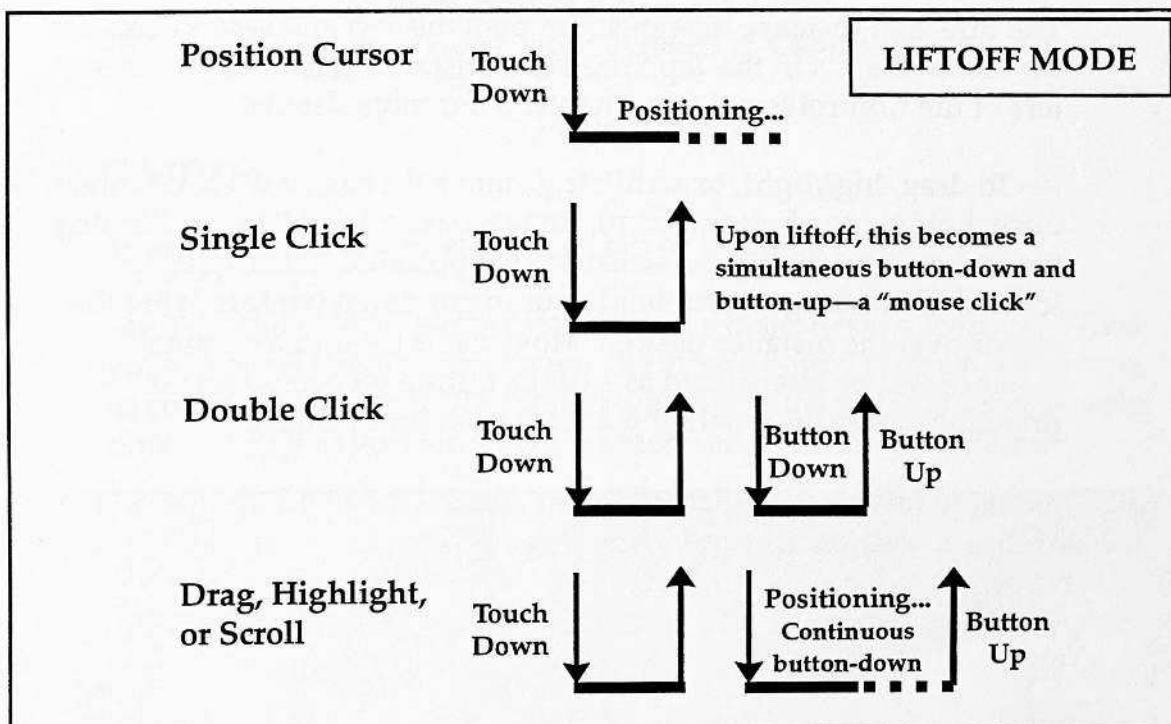
Note that a mouse "single click" will be triggered as soon as you lift your finger off the screen, so do not position the cursor over a button or icon that you do not wish to activate.

CHAPTER THREE: Selecting a Touch Button Mode

.... To "double click," first register a "click" by lifting off and then quickly touch down and liftoff again to register the second "click." The second touch down and liftoff must occur within a reasonably short distance and timeframe relative to the initial liftoff. These time and distance tolerances are used in the Tap Speed and Distance Tolerances set in the Control Panel (see Chap. 5).

.... To drag, highlight, or scroll (e.g., to move the cursor while continuously holding the "mouse button" down), quickly touch the screen again after the initial liftoff and hold your finger down while moving over the desired distance. Movements beyond a minimal distance will be interpreted as a drag. Lifting off completes the dragging action by generating a mouse button-up signal. You may find it convenient to associate this mode with the icons below in Figure 3. For example, to move an icon to a new position:

- touch down and locate the cursor on the icon
- liftoff (which highlights the icon)
- touch back down again at approximately the same spot
- drag the icon to the desired location
- liftoff to complete the action



**Figure 3: Diagram of Liftoff Mode
(Single click radio button appears in Control Panel)**

CHAPTER THREE: Selecting a Touch Button Mode

TAP MODE

To position the cursor anywhere, touch the screen at the desired point.

..... To “single click,” simply lift off your finger and tap the screen again in the same location. The software emulates the mouse button moving down and up immediately upon the touchdown and liftoff of the tap. Note that the second touchdown (a slight flick against the screen) *will only register as a tap if it is very close to the initial liftoff position, and it is made quickly after the initial liftoff*. Otherwise, the software recognizes the second tap as a new touch sequence and moves the cursor to the new position.

..... To “double click,” first register a “click” by positioning the cursor and tapping the screen in that position. Then quickly tap again to register the second “click.” Again, the second tap must occur within a reasonably short distance and timeframe--relative to the initial tap--in order to be registered as the second click.

The time and distance tolerances for both the first and second taps are the same ones set in the Tap Speed and Distance Tolerance parameters of the Control Panel (see Chapter 5 for more details).

..... To drag, highlight, or scroll, (e.g., move the cursor while continuously holding the button down), first register a “click” by positioning the cursor and tapping the screen in that position. Then, quickly touch the screen again and hold your finger down while moving the cursor over the distance desired. Movements beyond a minimal distance will be interpreted as a drag. Lifting off completes the dragging action by generating a mouse button-up signal.

You may find it convenient to associate this mode with the icons in Figure 4, on the next page.

CHAPTER THREE: Selecting a Touch Button Mode

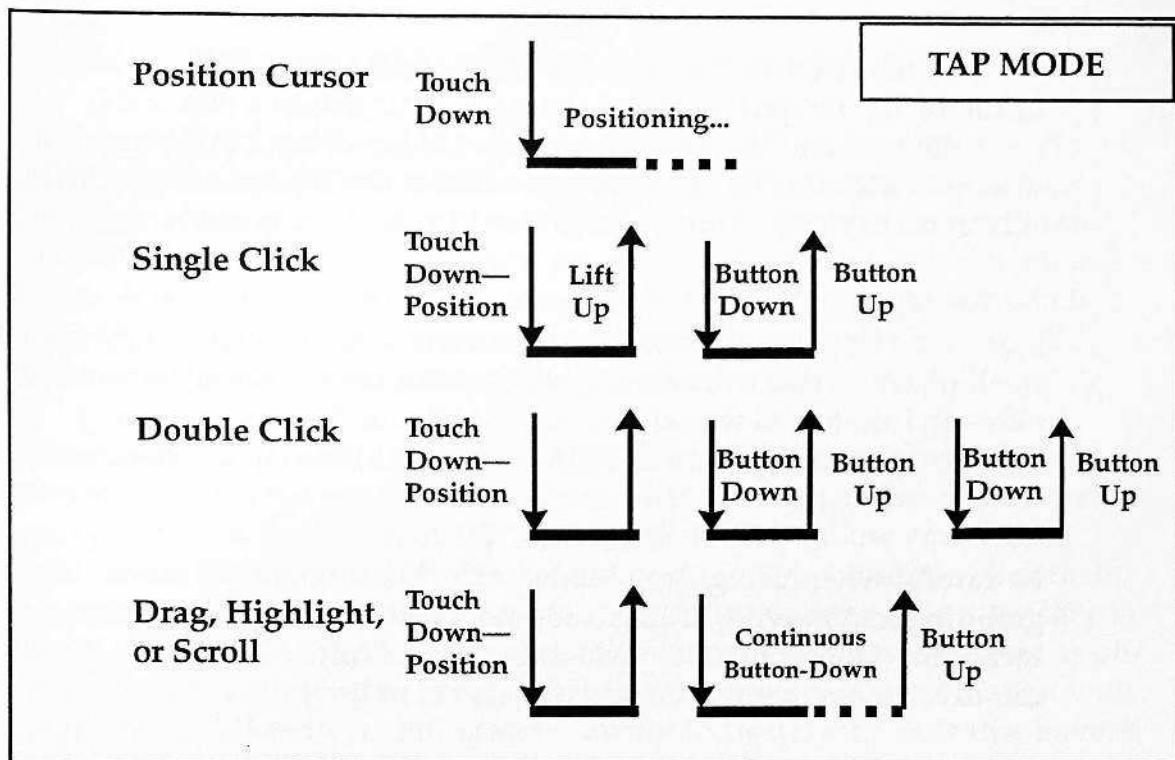


Figure 4: Diagram of Tap Mode
(Single click radio button appears in Control Panel)

DRAG MODE

To position the cursor anywhere, tap or touch the screen.

.... To “single click,” simply tap the screen in the desired location. When your finger is touching the screen, the mouse button is down, for as long as you touch the screen. The software emulates the mouse button moving down and up as you tap (quickly touch and liftoff from) the screen.

You must be careful to accurately hit your target. You must touch a blank area of the screen unless you want to trigger the corresponding action of the object, scroll bar, click box, etc. Touching the screen will immediately trigger a single click or button-down, and the button remains down as long as your finger remains in contact with the screen.

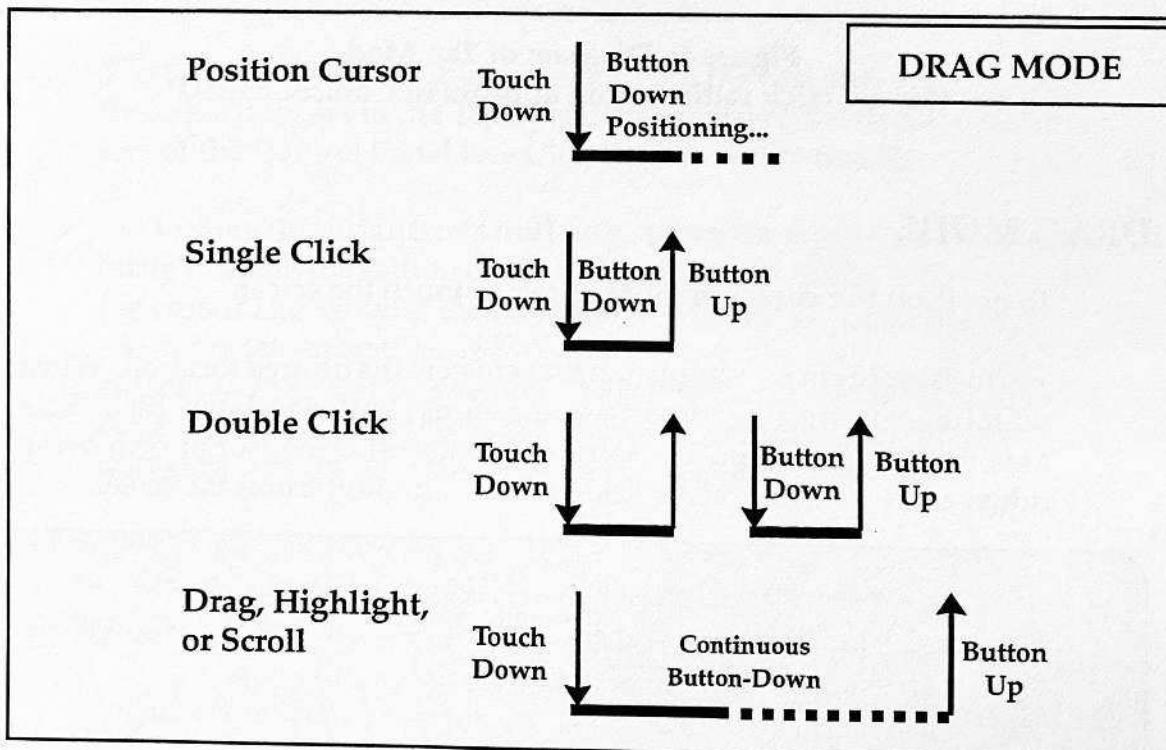
CHAPTER THREE: Selecting a Touch Button Mode

.... To "double click," tap the screen twice in the same position. As in Liftoff or Tap mode, the second tap must occur within a reasonably short distance and timeframe relative to the initial tap. These time and distance tolerances are the same ones used in the Tap Speed and Distance Tolerances set in the Control Panel (see Chapter 5 for more details).

.... To drag, highlight, or scroll (continuously hold the button down), touch your finger to the screen and hold it down. If you then move a small distance, this will be interpreted as a drag. For example, you can move an icon to a new position. Lifting off completes the dragging action by generating a mouse button-up signal. (See Figure 5 below).

IMPORTANT

Be careful when using Drag Mode on the Desktop. It can cause grabbing and moving of files and folders away from their usual locations. Do not use Drag when the System folder is open, as it can cause movement of Control Panels out of the folder!



**Figure 5: Diagram of Drag Mode
(Drag radio button appears in Control Panel)**

CHAPTER FOUR: Tips for the Touch Button Mode

TIPS ON SETTING THE TOUCH BUTTON MODE

The Mac 'n Touch software driver, like Apple's driver for the mouse, is technically complex, but the end result is an extremely intuitive and easy-to-use interface. Users quickly learn how to click, double click, and drag without completely understanding the subtle process of converting touches to mouse clicks. Moreover, for most touch screen applications, such as those written using HyperCard, the user merely has to learn how to single click because input consists entirely of selecting simple buttons.

MicroTouch recommends the use of LIFTOFF mode for normal applications of the touch screen, but specialized programs may need experimenting to find your preference. For example, LIFTOFF mode does not allow you to drag (continuous button down) objects that disappear when you single-click them. In applications which contain this type of specialized button, it is necessary to use TAP mode. TAP mode is also preferable in many business software applications which use dragging and highlighting extensively in combination with single clicks. Likewise, painting and drawing software with tools that have to be selected and then activated often require TAP or DRAG mode. Publication and layout programs are another of the TAP applications.

| MODE | USAGE | EXAMPLES |
|---------|---|---|
| Liftoff | Single-click intensive applications, using average to large-sized buttons | HyperCard pre-programmed stacks and slide shows Public access kiosks |
| Tap | Applications requiring fine control and double-clicking | Microsoft Word Excel Paint & Layout programs |
| Drag | Dragging intensive applications; on-screen numeric keypads | Paint programs Process control screens Education workstations |

Figure 6. Use of Touch Modes

CHAPTER FIVE: Setting the Tap Speed Tolerances

SETTING THE TAP SPEED AND DISTANCE TOLERANCES

The Tap Speed and Distance Tolerances' settings control the relative time and distance between touches necessary to register mouse button activity. For example, in TAP mode, it is necessary to touch the screen again after lifting off in order for the second touch to be considered the beginning of a click, double-click, or drag action. If the distance or time is too great, the touch screen interprets the second touch as a repositioning of the cursor.

Selecting the "Slow Speed/Wide Area" option makes it extremely easy for a novice to generate a mouse click, even if a relatively long time elapses between re-touching the screen or if the finger touch moves slightly.

On the opposite end of the spectrum, the "Fast Speed/Small Area" option is for the expert user who wants to speed up interactions with the computer or require pixel-by-pixel precision. Separate, closely spaced touch sequences can be generated more easily, without these being misinterpreted by the software as a single sequence such as a double-click or drag.

The "Medium/Average" setting falls in between the Slow and Fast setting.

.....

CHAPTER SIX: Setting the Usage of the Control Key

LETTING THE CONTROL KEY ACT AS MOUSE BUTTON

In normal use, set the **Control Key** to **OFF**.

In certain applications, it is convenient to separate the action of positioning the cursor from that of clicking the mouse button. For example, in a paint program it may be difficult to liftoff or tap the screen after having accurately positioned the cursor. In this situation, the user should set the **Control Key** to **ON**. With this setting, depressing the **Control Key** serves to activate the mouse button. Depressing the key is equivalent to holding the mouse button-down, and releasing it generates a mouse button-up. This feature allows for fast-action work with two hands, where one does the precision touching and the other activates the mouse button.

CHAPTER SEVEN: Using Multiple Touch Screens

MULTIPLE TOUCH SCREENS WITH ONE MACINTOSH

Equipment Required:

- Macintosh Computer with appropriate video cards/ports for monitors.
- Apple Monitors (or other brand that works with the video cards in use).
- *MicroTouch®* Touch Screens (and Kits with cables, hardware, etc.)
- *MicroTouch®* ADB ASIC Controller Assembly with Rev. 3 Firmware chip.
- *MicroTouch®* Mac 'n Touch Software Driver Version 2.0 or later.
- *UnMouse®* Rev. 3 & Rev. 4.1 Software (for use with Touch Screen)—optional
- ADB Port Splitter (for Macintosh computers with only one ADB Port).
- Video Cable for Monitors in Use (some monitors require special cables)

Installation of the Equipment and Cables:

Connect the monitors and video cables to the Macintosh computer and test all monitor video operations before installing Touch Screens to the CRT's.

Open the **Mac 'n Touch 2.x** software disk and drag the Touch Screen driver into the System Folder of your Macintosh (or into the Control Panel Folder for System 7). Drag the **UnMouse 4.x** driver also, if it is to be used with the Touch Screen. Deactivate any other Touch Screen and UnMouse drivers on your System by removing them from the System Folder. The multiple screen driver will not work if the previous drivers are still being loaded at startup.

Install the Touch Screens to the monitors as described within the chapters of the Installation Guide. Test *each Touch Screen/Monitor separately with the computer* for function of the Touch Screen. This requires connecting only one monitor, video cable and ADB cable at a time and re-booting the computer to look for the Touch Screen icon and Control Panel. If calibration or cursor offset changes for cursor location are needed for any of the Touch Screens, do so at this point—while only *one screen and controller* are connected with the Control Panel. These settings can be done properly when only one Touch Screen at a time is connected to the computer. When each Touch Screen is calibrated and working properly as a single, then all the monitors can be connected at the same time with the computer shut down. See the more detailed description of the setup on the next page.

CHAPTER SEVEN: Using Multiple Touch Screens

Installation of the Equipment and Cables (continued):

Internal Controller:

Make sure that the Touch Screen(s) and UnMouse are plugged in to the ADB desktop ports of the computer (the UnMouse can operate usually from the keyboard ADB port as well). If you are using a one-port model of Macintosh, an ADB Port Splitter will be needed. Connect one Touch Screen to the Port Splitter, and the other to the Keyboard. The Keyboard cable connects to the other port of the Splitter, and then to the computer ADB. If using an UnMouse, keep in mind that it derives its power from the ADB port, so do not daisy-chain heavy power users to the same ADB port. (The ADB ASIC touch screens do not take power from the ADB).

Restart your computer and watch for the *white* Touch Screen/UnMouse icon(s) during bootup. These icons appear in the lower left corner before the Desktop Menu comes up.

External Controller:

Make sure that the Touch Screen(s) are plugged in by serial cable to the 9-pin input on the ASIC ADB Controller boxes. The ADB desktop cables connect from the external Controller to the ADB ports of the computer. Make sure that the Wall Mount Power Supplies are plugged in to the external Controller boxes. Follow the directions above for daisy-chaining ADB cables with an ADB Port Splitter for one-port computers.

Restart your computer and watch for the *white* Touch Screen/UnMouse icon(s) during bootup. These icons appear in the lower left corner before the Desktop Menu comes up.

IF YOU SEE A BLACK TOUCH SCREEN ICON:

If an icon is dark with an "X" through it, then the Macintosh ADB manager is not talking to the device. The black icon means the driver is loaded, but the Touch Screen controller is not responding. Check the ADB cables and controller power connections for power-on. Change the cable arrangement if using a keyboard daisy-chain. Be sure the 9-pin touch screen serial cables are connected to both the monitors and the external Controller boxes.

CHAPTER SEVEN: Using Multiple Touch Screens

When the bootup shows a white icon but the cursor does not move properly, the touch screen software is functioning but you may be experiencing one of the following conditions:

- If the cursor does not move at all, one of the touch screen ADB cables may be unplugged; the ADB cable may be defective; the daisy-chain with other devices may be drawing too much power (in the case of the UnMouse).
- The software driver may be an earlier version than Rev. 2.x—only one touch screen at a time will operate with older Mac 'n Touch Rev. 1.2, leaving the other screen unseen. Or, your driver may not be in the *active* System Folder; sometimes there are several “system” files on the computer.
- If the cursor wiggles along the edge or moves only over part of a touch screen, the touch screen Controller may need to be recalibrated. The ADB Controllers have been calibrated for the touch screens before leaving the factory, but if this setting has been disturbed, it will be necessary to run through the recalibration process. (See the next page for **Control Panel** instructions). If the cursor cannot be positioned over the Calibration button, use a mouse or keyboard to aid in clicking on Calibration. When calibration is completed and the cursor still misses a part of the screen, try recalibrating several times. **Be sure to turn off all other touch screen monitors or unplug their ADB cables so that the controller you are calibrating is the one being seen by the Control Panel.** If the cursor is still not covering the entire image area, the wiring harness of the Touch Screen needs to be checked.
- If you are not satisfied with the cursor’s location at screen image edges, this can be reset by Calibration in the Control Panel. The image size is set by the width of your finger on the image corners during Calibration. The Cursor Offset can be adjusted also. (See next page for **Control Panel** instructions).

Remember that when there is more than one touch screen, the Control Panel only calibrates the touch screen where the actual calibration screen diagonal lines occur. It is possible to touch one screen and calibrate a different monitor's controller by incorrect assignment of buttons in the Control Panel! Please read the next section "Control Panel for Multiple Screens" on the next page before trying to recalibrate one of the screens.

CHAPTER SEVEN: Using Multiple Touch Screens

THE CONTROL PANEL FOR MULTIPLE TOUCH SCREENS

When using an UnMouse and Touch Screens together, each will function as an input device, and each can be set up with the **Control Panel** for your preferences. The UnMouse instructions are the same as in the general information manual. The Touch Screen Control Panel settings are used as described in CHAPTER TWO for calibration, touch settings, sensitivity, etc. and for multiple touch screen setup and operation. See Figure 7 for a picture of the Control Panel.

For multiple Touch Screens on Mac II series computers, the Control Panel has at the bottom a set of "chooser buttons" for matching up touch screens and controllers with monitors. Normally, the Desktop Menu will come up on the monitor that should be designated as #1 button with Touch Screen #1. This monitor will be the "home" screen holding the menus and program controls. Other monitors can be given #2, #3, etc., and these will carry screen or window images scrolled over from the home screen or defined by a software program. It is important that the monitor, Touch Screen attached to it, and controller be matched; especially that the Touch Screen/Controller pair be connected properly for external controllers.

If you define the Touch Screens in the Control Panel to be on different monitors than they actually are attached to, then a touch on one monitor will show a cursor on another. You can see how the Macintosh numbers the monitors by looking at the "Monitors" file in the Control Panels. Watch the I.D. numbers that appear in the center of each monitor. This delineates the video devices that are connected to the computer. Then select the #2 monitor to have Touch Screen #2 and so on.

If you see only one button in the Control Panel when you have more than one Touch Screen, then one of the Controllers is not powered or connected properly, or one of the controllers has Rev. 2 firmware, not Rev. 3. If there are no buttons at the bottom of the Control Panel, you are using an earlier software file.

If you get into trouble by moving the Control Panel off the "home" screen and you are not able to get the cursor back to it, just turn off the power to your computer and monitors, wait a few minutes, and start up again. The Controllers will reset when the power is turned off for a while. It then will call the "home screen" #1 on bootup. This is a safety device to sort out confusion with monitors and controllers.

CHAPTER SEVEN: Using Multiple Touch Screens

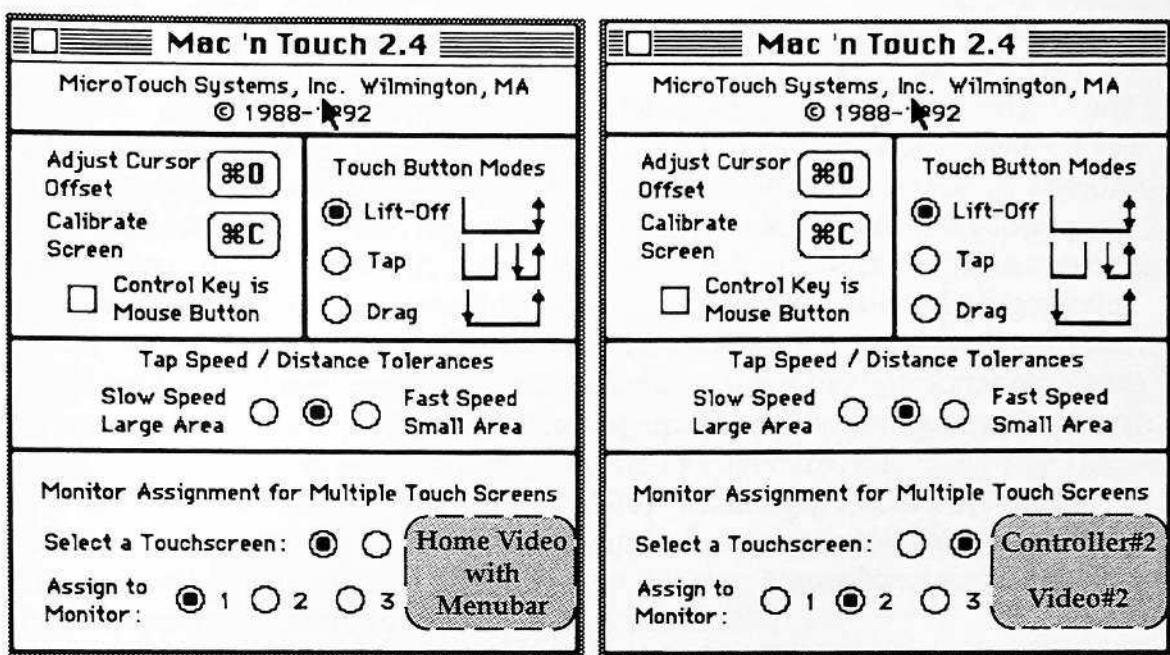


Figure 7: Control Panels for Multiple Touch Screens

OPERATING PROGRAMS WITH MULTIPLE TOUCH SCREENS

When operating multiple touch screens with standard software, such as MacPaint, usually only the "home" screen will show the program menus. A window or workspace can be scrolled off the main screen onto a secondary touch screen. It is possible to move tools and style sheet menus on to the second screen for use there. Items can be copied, cut, pasted, and manipulated between the screens, but the program menu cannot be moved over to other screens. In the case of System 7, more than one program can be working simultaneously on the different screens, besides the layered or tiled arrangements of windows. Custom-written software can be made to use touchpads on all the screens. Customized programs using HyperCard stacks are capable of great effectiveness with the multiple screens.

When an UnMouse is used, and two or more Touch Screens are also connected, the UnMouse will cover both screens, dividing the UnMouse pad into two halves. The Power Keypad feature can be used with the UnMouse to invoke menu commands on the secondary screen(s)—such as Cut, Paste, Open, Save, etc. so that one does not have to return to the "home" screen for menu commands.

CHAPTER EIGHT: Troubleshooting Tips

1. I can't get the cursor out to the edges of the screen image.

The touch screen controller needs to be recalibrated or the cursor offset changed. See the instructions in "CHAPTER TWO: Calibrating the Screen" for details on this procedure. Be sure to *unlock* the Mac 'n Touch driver file in the System Folder (see page 5). Be careful not to touch the CRT screen all the way out at the bezel corner during calibration—the correct touch is at the corner of the *screen image*. Touching farther out will cause the controller to expect a larger screen size, and your finger will have to touch the bezel for the cursor to reach the edge. To get almost exact placement of the cursor under your finger, experiment with touching the diagonal line *inside the image corner* somewhat.

2. With System 7, I get a message *The Control Panel "Mac 'n Touch 2.4" cannot be used with this Macintosh*. And there is a black icon at startup. What is wrong with my software?

There is nothing wrong with the Mac 'n Touch 2.4 software. The driver is properly loaded in the System Folder and is being accessed during startup by the ADB manager. What is causing this message is that the Touch Screen controller is not plugged in to the ADB port, and the ADB manager cannot talk to it. The black icon indicates that the touch screen ADB cable is not connected or is hooked up in a daisy chain with a conflict (or the external controller Wall Mount Power Supply is not on). To remedy this problem, shut your Mac computer down and reinstall the Touch Screen ADB cable directly to an ADB Desktop port for verification of operation. Restart and look for a white icon at startup. This will signal that the ADB manager is able to find the touch screen. Now when you open the Mac 'n Touch Control Panel icon, the proper operation should result.

If you have a one-ADB-port computer, you will need to use an ADB port splitter for hooking up the touch screen with other devices, such as an UnMouse or tablet. See the discussion in #4 on ADB port hookups.

3. When I try to use the Mac 'n Touch 1.2 driver after upgrading to System 7, the cursor does not move, but I do get a white touch screen icon on startup.

Previous Mac 'n Touch software was written before System 7 and does not interface properly. You must load Rev. 2.2 (or above) to work with System 7. When 1.2 is used, a white startup icon appears, but there is no cursor movement on the touch screen. If you use a mouse to open the Control Panel, it will open, but when buttons are touched, the screen beeps and flashes and nothing happens.

CHAPTER EIGHT: Troubleshooting Tips

- 4. I have a new Mac computer which has only one ADB Desktop port. I have connected my touch screen to the keyboard ADB port. What happens if I change keyboards? How can I avoid an ADB conflict?**

If you are using the standard Mac keyboard that comes with your computer, it is OK to connect the touch screen to the keyboard port, since the new touch screens with ASIC controllers receive power either from the power supply in the monitor or externally from an outlet transformer—not from the ADB port. Earlier touch screens with non-ASIC controllers derive 5V from the ADB port. This works fine with Apple keyboards, but a touch screen could be competing for power with a 3rd party manufacturer's keyboard. If you find that a previously working touch screen fails to function with a different brand of keyboard, it is likely that there is not enough power reaching the controller. (1) Try using an ADB port splitter cable (see below); (2) replace the earlier touch screen controller with an ADB ASIC controller (call our Technical Hot-Line for details); or (3) use a Wall Mount Power Supply for power to the touch screen controller.

For running several ADB devices at the same time using the new ADB ASIC controller, it would be wise to have a **MicroTouch ADB Port Splitter Cable** which plugs in to the one available ADB port. This has two y-splitter cables coming from the input. With this cable, you could have a keyboard, touch screen, and mouse all working together. Other devices will work together in one ADB port daisy-chains as long as the devices do not draw more than 5V, 500mA collectively, and they do not occupy the same ADB memory addresses.

- 5. When I start up my Mac, two white touch screen icons show up on the screen and the Control Panel "Calibration" feature hangs up.**

You have two Mac 'n Touch drivers in your System Folder—possibly one is called *Mac 'n Touch* and another one says *Touch Screen* or a name you may have changed it to, such as **Mac 'n Touch* (for moving to the top of the folder). These drivers are **both being loaded** as touch screen ADB files. You must remove all but one of them—the latest version—from the System Folder (or Control Panels Folder). The calibration is being confused by the two drivers.

If you are not sure which driver is the newest, highlight each in turn and pull down the "File" menu and click on "Get Info" which opens an information window. The date of creation and the Version # is listed there in the middle area. Do not consider the date "Modified" as that changes every time the touch screen Control Panel is used when the file is unlocked.

CHAPTER EIGHT: Troubleshooting Tips

6. I have a previously installed touch screen monitor with an external controller and Mac 'n Touch 1.2. I would like to run two touch screen monitors at the same time on the Macintosh computer. How do I accomplish this?

First, in order to run two or more touch screens on the same Mac, it is necessary that all monitors have an **ADB ASIC controller with Rev. 3 firmware** installed, and the Mac 'n Touch must be **Rev. 2.2** or later. These three components work together. Install two video cards in the Mac and follow the directions in "CHAPTER SEVEN: Using Multiple Touch Screens with One Macintosh Computer." Replace the controller that you have with the ADB ASIC and install the second touch screen monitor as described in Chapter 7. Remove the older Rev. 1.2 driver, as it will be mismatched with the ADB ASIC, and replace it with Rev. 2.2.

7. I would like to run both a MicroTouch UnMouse and a Touch Screen on my Mac for various educational training purposes. What is required?

See the answer above for multiple touch screens—the UnMouse is another type of touch screen. The UnMouse must have a **Rev. 3.0** or later firmware and **Rev. 4.1** or later software. Connect the UnMouse directly to an ADB port if possible because it needs to draw its power from there. Connect the touch screen to the keyboard ADB port. Place both drivers in the System or Control Panels Folder. If both drivers are loaded and you get one white icon and one black icon at startup, it means that one device does not have either the correct firmware or cabling.

8. My "Touch Me" HyperCard demo does not run with HyperCard 2. It says "There are too many Exit Repeats." Am I loading it wrong?

There are several versions of HyperCard available at this writing—the latest are Version 2.0, and 2.1 for System 7. We have included two HyperCard demo stacks with this Mac 'n Touch package; one works with 1.2x versions and the other with HyperCard 2.x versions. The message you mentioned above is because you loaded "Touch Me (Hyp 1.2x)" in your Mac that is running HyperCard 2.x. You should select Diskette #2 of the Mac 'n Touch package, "Touch Me (Hyp 2.x)," which is the correct one for HyperCard 2. Drag the "**MTS**" **Folder** over to your hard drive, but do not place it inside any other folders with HyperCard stacks. Open the MTS folder and click on the "Touch Me" stack icon to start the demo, or on the Home stack. The Home stack with "Touch Me" is made for running the demo and should not be in the same folder with Apple's "HyperCard Home" stack. You can alter the "Touch Me" Home stack if you prefer to run the demo with other stacks or to add cards and buttons of your own.

CHAPTER EIGHT: Troubleshooting Tips

- 9. I have System 6.0.7 and I get the message “*The file ‘Mac ‘n Touch 2.2’ could not be opened/printed (the application is busy or missing)*” which happens if I click on the icon in the System Folder. Why does this happen?**

This is normal for System Folder Control Panel files in systems prior to System 7. For example, in v6.0.7 this message occurs because the Control Panel files are not opened by clicking on them in the System Folder. You must go to the Apple symbol on the menubar line and pull down the menu to highlight the Control Panel item. The Control Panel will open with the Control Files indicated as icons down the left side—which is where you will see the Mac ‘n Touch and UnMouse icons. By highlighting the touch screen icon, it will open the windows shown in CHAPTER TWO. Now you can perform changes to the Touch Modes, etc.

- 10. I don’t understand what the “Control Key Click” is all about.**

If you use the touch screen just for pointing at items on the screen image—for example, for running a prepared HyperCard program and activating buttons on the screen—you would not be interested in using the Control Key. This is a special feature for users of Painting/Drawing programs and similar applications. A tool is selected first from a toolbox palette; next, the cursor with that tool function (*i.e.*, a pencil) is positioned on a “canvas”; and then a mouseclick-and-drag operation causes the drawing to develop. Some users want very precise positioning for this drawing activity. Depressing the “Control Key” (as a mouse button) allows the user to start the “mouseclick” at the perfectly positioned spot without moving the finger off the screen to make a tapclick. This also allows people who like to work fast to activate icons and tools by a combination of both finger-touches and keyclicks, using both hands. *If your setup does not give users a keyboard, make sure this choice is turned off!*

If you are using a drawing program and find that you cannot draw on the canvas because the tool disappears when you touch down, this is happening because you have selected the “Control Key Click” to be ON. Just turn it off if you do not intend to use the keyclick function.

- 11. I know I loaded the Mac ‘n Touch driver but no icon shows up on startup.**

You probably have more than one **System Folder** on your hard drive. Do a Find File for “System” and locate the *active* folder. You should remove the extra one, being careful not to consolidate files from two different system versions.

CHAPTER NINE: Customer Support

Customer Support

If a problem arises, first try the following:

1. Review the section on "Troubleshooting Tips."
2. Review the section on "Installing the Touch Screen Driver."
3. Review the section on "Calibrating the Touch Screen."

If the Touch Screen and Control Panel are still not functioning properly, and you are sure that you have *unlocked the driver file* to make resetting of the controller possible, then call our Technical "Hot-Line" to see if the problem can be resolved over the telephone. The representatives will advise you if the driver needs to be replaced or the touch screen needs to be returned for service. If an item needs to be returned, they will give you a Service Return (SR) number which will be used to keep track of your unit.

*You must have an SR to return an item to MicroTouch,
and it must be prominently displayed on the outside of
the carton that is shipped to us.*

You can reach the MicroTouch Technical "Hot-Line" directly at

(508) 694 9973 Telephone
(508) 694 9980 FAX

Our mailing address is:

MicroTouch Systems, Inc.
55 Jonspin Road
Wilmington, MA 01887
Phone 508 694-9900

APPENDIX A: Compatible Software and Hardware

Compatible Software and Hardware

The Mac 'n Touch software driver is a Control Panel (CDEV) device. It has been tested to work with many popular third-party Desk Accessories, initialization files, and Control Panel devices that may reside in your System Folder. It also has been tested with System 7.

If you experience difficulty in using your Mac after installing the Mac 'n Touch software driver, first review the section on "Troubleshooting Tips." Then review your "*Mac 'n Touch Hardware Installation and User's Guide*" for the instructions on proper cable hookups and controller operation checks for the touch screen. Often the problem is not in the software at all. If you still cannot get the software to function properly, and the driver is loaded correctly in the System Folder, then the next step is to try the following.

Prepare a Floppy Disk with only the necessary startup files from the System you are using. These files are located on the "Utilities" disk that comes with the System. (See other information about System 7 below). Add the Mac 'n Touch driver to this floppy disk System Folder, and reboot the computer from this disk. Without the additional System files and third party software in the folder, the System should boot up with the Touch Screen Control Panel fully operational. Check the performance of the touch screen to verify that the installation is working properly. Review the "Troubleshooting Tips" if there is still a problem. Check your computer memory to be sure that there is enough available for all System files to be loaded.

Once your Control Panel is satisfactory, you will need to reorganize your Hard Disk System Folder to find out which file is conflicting with the Touch Screen Control Panel. First, look for an ADB Desktop device that is part of a daisy-chain setup and unplug it. Remove its file from the System Folder and reboot, testing the Touch Screen Control Panel. If this missing device makes the difference, it was probably sharing the same ADB memory address as the Touch Screen. If the problem persists, temporarily remove other third-party software Control Panel files from the System Folder. Restore the files one by one to the System Folder to isolate the problem. If your System folder is full of additional Control Panels, MicroTouch recommends the purchase of a commercially available Init Manager Program in order to guarantee trouble-free operation.

See the next page for System 7 System Folder information.

APPENDIX A: Compatible Software and Hardware

MAC 'N TOUCH WITH SYSTEM 7

If there is a problem starting System 7 and Mac 'n Touch—because System 7 uses so much memory to operate—it is necessary to try to isolate the Control Panel files that can be contributing to the problem. Look for the following as possibilities, and remove them from the System for testing:

- Screen Savers
- ADB Desktop devices daisy-chained to the Touch Screen port
- Other devices that could share the same ADB memory address
- Non-Control Panel files that do not belong in the System Folder

Check the RAM and Virtual Memory to see if memory is too low to allow all System files to load properly. A minimum of 4 Megabytes is usually required.

The actual placement of the Touch Screen driver in the System Folder and its loading sequence is also of great significance in getting proper operation.

It is recommended that the Touch Screen driver be placed in the System folder *outside of the Control Panels Folder* if there is a conflict. Locate it at the end of the System operational files by adding a "Tilde" symbol (~) at the beginning of the Mac 'n Touch name: ~Mac 'n Touch

(The driver also can be placed in the Control Panels folder at the **TOP** of the list by using an asterisk in front of the name—*Mac 'n Touch).

The purpose of this placement is to force the driver to load before the other Control Panel files so that memory address conflicts can be avoided. You can also force other ADB device Control Panels to load later on by adding a tilde or a "z" in front of their names in the Control Panels Folder.

If the problem continues, review all the "Troubleshooting Tips," check your Apple computer manuals, or call your Apple dealer for additional information about System 7 Control Panels. Also, call the MicroTouch Customer Support Technical "Hot-Line" for further assistance.

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Mac 'n Touch™

*Mac SE/Mac II/Classic
Hardware Installation Guide*

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To Mac 'n Touch® Users:

The software package included with your *Mac 'n Touch®* Touch Screen is the latest version of the *Mac 'n Touch®* driver which works with Macintosh System 7 and with HyperCard 2.0 and above. It will allow you to use more than one Touch Screen connected to the same computer in a multiple touch screen installation.

A Touch Screen demonstration program called "Touch Me" is included with this software package, and it comes in two versions on your disks. One version is made for HyperCard 1.2x and one is for HyperCard 2.0 and above. Depending on the HyperCard that you are using, load the proper "Touch Me" demo:

- "Touch Me (Hyp 1.2x)" is for HyperCard 1.2x and
- "Touch Me (Hyp 2.x)" is for HyperCard 2.0 and above.

Diskette One has the *Mac 'n Touch 2.4 driver* (for the System Folder) and the complete HyperCard 1.2x demo. Diskette Two contains the complete HyperCard 2.x demo.

To load the demo, copy the complete MTS folder onto your hard disk drive, with the 3 HyperCard stacks included. All 3 stacks are necessary for the demo to run, including the MTS version of the "Home" stack. These stacks are linked together in the scripts. Touchclick on the icon, "Touch Me," to start the demo, or on the "Home" stack. To exit from the demo, there is an icon on the MTS address card to go to Home, or you can press the Apple key+Spacebar which shows the HyperCard Menubar, where you can select "Quit."

Part of the demo includes the "HyperCard Toolkit," which is a separate stack describing the Touch Screen Controls that are available in the Control Panel. It shows sample scripts which you can adapt to modify your operation of the Touch Screen from within a HyperCard stack. Follow directions in your current HyperCard program for scripting and commands if you wish to change touch screen functions in this manner.

The "Home" stack with the demo is set up for displays where "Touch Me" can be started with the touch button—you can alter this stack (after unlocking the file) to include your own special cards and buttons or to start up other stacks as well. The demo will recycle and run continuously if left idle for a while in a display.

Thank you for using *MicroTouch Systems* products!