

Pointer Picking

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If there is one thing that has changed computing, it is the “graphical user interface” — Microsoft’s term for the spiffy way computers look and work these days. “GUIs” dictate some kind of pointing device; the Windows point-and-click interface can be run almost entirely from the keyboard, but that is not much fun. And most graphics programs assume some kind of tool for direct manipulation of objects on the screen.

There are options, and picking the right option is often left to someone else — not a wise course for something with which one may become intimately involved, the sort of thing that went out with arranged marriages.... What follows is an overview of the choices and some personal preferences (which latter you should disregard at will).

Mice, of course, are the most ubiquitous of pointers. Choices abound, and the pitfalls are legion. I finally found the worst mouse design, on a recent trip to my local Egghead. This was a cute rodent, modeled to look like a real mouse. The teardrop-shaped body was capped by cute little ears that in actuality were the mouse buttons. This mouse, intended for children, sported a Logitech label, and my current read is, this could turn kids off to computers.

The second-worst mouse (it used to be the worst) is IBM's PS/2 mouse. It's ungainly, and it's slow, and basically, it represents the way things were with mice when the PS/2 line was introduced many moons ago. Since IBM tends to be a “forward” company when it comes to hardware — and the excellent craftsmanship of its PS/2 computers is good evidence of that (the original designs of five years ago are still ahead of a lot of the competition) — the company's adherence to what is, effectively, Microsoft's original mouse design, is disappointing.

Without any question, the current Microsoft mouse defines the standard by which all others need to be judged. The version presently shipping — and attached to one of my test-bench systems — is Microsoft's third generation product. It is elegant and rugged, and Microsoft makes a lot of money on its sales. A glance at this mouse explains why (see picture one).

Notice the size and shape of the box. It is just right for most people to rest their wrists on the table top, hold the mouse lightly between thumb and ring finger/pinky, with the index- and middle-fingers poised over the two buttons. The “top” of the mouse is about where the index finger is — a natural pointing position. Flip the box over. The ball that actuates the pointing action is under the switches-end of the box. With the wrist as a pivot-point, rather small movements of the mouse can traverse even a high-resolution screen easily. This mouse is rated at 400 points-per-inch (ppi) resolution; that's a medium resolution and rather better than most mice deliver.

Another likable thing about the Microsoft mouse is its “feel.” There is something solid about it — a sense of craftsmanship.

The only thing that is not altogether lovely about the Microsoft mouse is its price — list is about \$150, with street-prices about a third less. For between a third and a half of the price, most computer stores can deliver a mouse-

variant. Some offer more buttons (which, however, are only useful for some CAD applications), or a fancier box. Beware: Many of these budget mice are based on older designs; the ball is located further “aft” in the box and that translates into larger hand movements to manipulate the pointer. Many of these less costly rodents deliver only 200 ppi resolution — fine for business users but a pain when it comes time to fine-tune a drawing. And they are shoddy! The plastic is light-weight, among other deficiencies. The fit of the box in the hand is less than perfect. In many cases, though claiming to be Microsoft-mouse compatible, these mice have often proven refractory when it comes time to run them with a Microsoft mouse-driver — the acid test.

That is not to say that there aren't some worthy competitors: At the very high end — commonly supplied with machines like the Sun SPARCstations and other top-line desktop computers — are the entirely-optical mice. Where standard mice use a mechanical device — a ball — to twiddle some wheels which interrupt a light beam, which gets translated to pointer movement, an optical mouse optically senses movement across a grid etched on a special reflective mousepad, and translates that into pointer movement directly. The result is finer movement with no moving parts to get dirty. The downside is that special mousepad, and the higher cost to make the mouse.

As you might guess, I tend to be a Microsoft mouse fan. Recently, however, I've been trying a new Honeywell mouse, a good example of the modestly-priced “worthy competitor.” There's lot's to like about this product. Not least among the features, the suggested retail price of \$79 means that this should end up on deep-discounters' shelves at a price which obviates the need for less-well-made products.

Honeywell has kept the basic design features of the Microsoft mouse; the box is a trifle wider and lighter, and the tracking mechanism is a little further “aft.” But, like the Microsoft mouse, I find this a comfortable box in the hand — no small matter during a long session before the computer.

The big difference is a sealed mechanism, with two little “feet” running on the surface of the desk to act as sensors. If your work area is like mine, that's a nice difference. Where the little rubber ball in a standard mouse can pick up dirt and pass it into the mouse, making for failures down the road, this sealed design keeps the mousy innards clean, thus improving reliability. Honeywell claims you don't need a mousepad with their product but I run mine on a slick-surface “executive” model anyway.

I'm fussy, and I did find some downside aspects: The Honeywell mouse provides a slightly lower resolution. At around 350 ppi resolution, the difference is insignificant. Kicking up the tracking speed (I did not give up my Microsoft driver...) helped a bit. The cord could be about two feet longer. My computer is not on the desktop, but in a tower under the desk; my Microsoft mouse has a long cord and I can drape it affectively to keep it out of the way, while the Honeywell mouse's “tail” has to run across a less convenient part of the desk. Again, this is a trifling matter.

The other problem has to do with selecting the appropriate model. There are three possible ways to connect a mouse to a computer — through a serial port, or a specialized “PS/2” mouseport (essentially, a specialized serial port) or through a buss-mouse connector (which is not the same as a “PS/2” mouseport). Many mouse-makers have followed the lead of Microsoft, and support the serial and “PS/2” connections with a single product.

Firmware in the mouse itself distinguishes the connection point, and the physical difference between the two connectors is handled with a patch cord. Honeywell has discreet products for serial and PS/2 variants. You will need to know how you are connecting your mouse if you choose this product or one like it.

I confess, I am taken with this mouse; after using it for awhile, I find it as neat as my trusty Microsoft mouse — and that is saying a lot. Cordial endorsements for both of them; caveats on mice that aren't as solidly built — that seems to be the message.

A word about “buss mice:” This can be a very good choice for the hardware-alert buyer. Most buss-mouse adapter cards have jumper settings which allow the user to set the IRQ used by the device. Many (not all) serial devices are interrupt-driven, and a collision can result in things not working they way they should. By changing the interrupt setting on a buss-mouse adapter to a less-frequently used interrupt (commonly IRQ5 or IRQ7) both of the interrupts normally used for standard COM ports (IRQ4 and IRQ3) can be kept free for standard serial devices. This is a power-user concern — for the person with a modem and a serial connection to a notebook computer, say — and not something most folks need to worry about.

The usual objection to mice is “real-estate.” A mouse needs a good 10 inches square in which to run around. Smaller territorial limits are possible with a higher-resolution mouse, to be sure, but mice do need desk space.

For folks with a tight working area, a trackball is a very good alternative.

Trackballs come in three basic varieties — small, medium and large, depending on the size of the ball to be twiddled. The mechanism inside is generally like that of a trackball; the ball moves wheels which interrupt a light beam, and so on. The difference, of course, is that the ball is twiddled with the fingers directly.

For most graphics users, trackballs with a generous ball — about two inches in diameter — represent a good desktop choice. The larger ball translates into finer control over the pointer's movement on screen. Most of these desktop-size units wrap the buttons around the ball, housing the whole unit in a more-or-less square, or decidedly rectangular box. (see picture two)

Older trackball designs may still be seen, where the buttons are lined up in a row, either “forward” or “aft” of the ball itself. These older designs involved reaching a finger away from the ball — at least, inconvenient. The wrap-around designs permit the fingers to twiddle the ball, while the thumb hits the main button, and the pinky does second-button duty.

In the square-ish design I sketched, the smaller buttons above the large main buttons are click-locks; hit the button and the first part of a mouse-click is executed, but not the second part. Tap the matching main button to complete the mouse action. In the rectangular design, the small central button above the ball does the same thing, but for both primary and secondary buttons. Click-lock is a nice feature when scrolling through long documents, or working through precise object placement — though Corel Draw's “nudge” command is usually more accurate.

Desktop-size trackballs are favored on some high-end systems because they offer substantial control. A large ball can be moved more — delicately? — than most mice can be moved. Though point-per-inch resolution may be the same as that of a mouse, the finer movement can make movement seem more precise than it actually is. Several vendors produce desktop-size trackballs; the most commonly encountered players are Microspeed and Kensington. I've used both (and others besides); I prefer the ergonomics of the Microspeed PCTrac (upon which design, my rectangularly-boxed sketch is based). The slope of the box makes a fairly comfortable wrist/hand rest; the buttons are positioned perfectly for my hand — for Mrs. Jenner's smaller hand as well. [N. B.: Mrs. J. has always preferred a trackball to a mouse; until we installed a Microspeed PCTrac, her pet was Microspeed's FastTrap 3D trackball. Guess who has the evaluation unit...]

The PCTrac has another advantage: It is handsome. That is not a small matter, if your desk is a place where you spend lots of time, and something that other people see, too. You want the accessories to be easy to look at. The PCTrac is priced to compete with high-end mice, and can commonly be found for about \$90 in the deep-discount stores.

Smaller than standard desktop trackballs, “thumb-ball” type trackballs used a ball about the size of a “shooter” — for those too young to have played marbles, that's a ball about an inch in diameter. This is a hot area, with lots of competitors. The big players are Logitech, with models both for desktop and laptop/notebook applications, and Microsoft, whose Ballpoint was intended for laptop/notebook users, but has found a place on many desktops as well. (Picture three shows sketches of three variant designs.)

The original Logitech Tracman was a rectangular box, with the ball on the left and three mouse-buttons to the right. Twiddle the ball with the thumb; click mouse-buttons with the index finger. These units worked well enough, but always felt a bit cheesy. The new model is housed in an innovative spiral-shaped case, with the buttons ramped up along a rising ramp of the spiral. The effect is dramatic on the eye, and the design feels better under the hand.

The portable Trackman from Logitech is intended to be used with a quick-release clamp on the edge of a notebook or laptop computer. Take the clamp off, and the “D”-shaped box sits on the flat side of the “D.” The thumb-ball and secondary mouse button are on the flat “top” of the box, and the primary button wraps around the curve of the “D.”

Microsoft's Ballpoint looks very much like the portable Trackman, but places two pairs of switches on each side

of the “D” — stacked front to back. Switch assignment is done in software; the Microsoft Ballpoint mouse driver comes with two control panel programs (one for DOS, one for Windows) that do the job painlessly.

The Ballpoint is a bit smaller, and unlike the portable Trackman (which has a deeply curved back), is intended to sit flat on a desktop when that is appropriate. The keyboard/laptop/notebook clamp is a rugged affair with two thumbscrews; unlike the Logitech quick-release clamp, it will not joggle loose. There is a quick-release feature to prevent excess stress on the unit from damaging anything. Like the regular Microsoft mouse, the Ballpoint sports a 400 ppi resolution, double that of the Trackman.

Among the host of small-ball products — including built-in units appearing on many notebooks and almost always inconveniently located (a case where Apple really did have a better idea, in its Powerbook trackball placement) — Microspeed’s MicroTrac stands out. The ball is the size of a marble, rather than a pea, and the switches include a hardware-assignable drag-lock switch. Though it is not a whole lot smaller than the Ballpoint, it folds up into a smaller case, making it an easier fit for use with super-compact notebook computers, such as my Sharp PC6200 (which, modest though it is, sports Win3.1 and some presentation software). The only serious flaw is the mounting bracket; the choice is velcro or a double-faced tape-on metal thing, and neither works well.

These small-size portable devices are of limited interest to graphics users; the pea-size “finger-tip-ball” units from Appoint and now built in to some notebook computers are even less interesting. It’s not that they are not good ideas (though I have a hard time with the pea-size balls, I use a Ballpoint with one portable and a MicroTrac with another, and find merits to both). It’s just that the precision needed for fine drawing control simply isn’t there, in my experience, and this seems to be entirely a matter of the size of the ball. Where thumb-ball pointers do pay off is the presentation made on the road, from a notebook or laptop computer.

Even a crowded portable hard disk usually can carry a standalone slideshow program (such as that in Corel Draw and other, competing products) and a set of images. Plug in an external monitor and use the pointer as a “pickle.” If you have the leave-behind boiler-plate on the same notebook, customize it, and print it out locally. Mice and trackballs are general-purpose pointers. They weren’t intended principally for people making pictures on computers, though they play well enough in that arena. Graphics tablets — sometimes referred to as digitizers — were intended from the first for picture-making — though they are gaining new importance with increasing interest in pen-based desktop-computer environments. The great advantage to tablets comes in the form of absolute addressing: tablet locations match screen locations.

Graphics tablets can be categorized in lots of ways; for convenience, let’s say there are “garden-variety” tablets and “exotic” tablets. Both come in various sizes. The big difference: The “exotic” models can use a pressure-sensitive stylus; combine that with software that knows about such things, and more pressure on the stylus results in different effects — thicker lines, &c.. This is a nice feature for users of paint programs; many paint programs have software accommodations for non-pressure-sensitive “garden variety” tablets that yield the same effect.

By and large, a graphics tablet is an expensive tool — a Cadillac compared to some mousy Chevies. There is one exception: The 5" square AceCat tablet from AceCAD lists for around \$130; add a (disproportionately priced...) \$50 “puck” (looks like a mouse with extra buttons...) and the whole thing is still priced well below the competition.

For all that, it is not a toy. The components appear to be well-made; the standard corded stylus, in particular, was very comfortable in the hand and the cord seemed to avoid tangles. The resolution is acceptable. The Windows driver and control panel, produced by LCS Telegraphics, is excellent; a particularly nice feature for puck-users: one of the puck buttons can be assigned to “double-click” automatically. Neat hack, that. For folks who don’t insist on the one-to-one tracking a tablet offers, the AceCat offers Microsoft-mouse emulation that really works (not always the case). Throw the single user-adjustable switch on the back and use the standard Microsoft mouse driver. According to the company, an updated model is on the drawing boards; it will automatically sense the driver, eliminating the need to set the switch. [Of course, that is moot, since running a tablet in mouse-mode (with merely relative, rather than absolute addressing) is to lose the principle glory of the device. AceCAD recognizes that, and includes a special driver for DOS software which imposes absolute addressing capabilities on refractory non-graphics software.]

The 5" AceCat is an outstanding choice for people who want to move to a tablet without making a major dollar

commitment. Unlike most graphics tablets, the desktop real estate needed is not excessive. Used with the standard stylus, it is very well suited to pen-based applications (a field the company supports strongly; by the time this story runs, the company should be bundling pen-based extensions with the product). The AceCat comes from Taiwan, where drawing characters is a major issue, after all.

As a general purpose drawing tool, this may be the ideal tablet for desktop publishers and photo-editing. It will probably be enough tablet for many paint and drawing users. It proved a favorite on the bench; Mrs. Jenner actually likes it as much as her trackball. There was one downside element: Although the tablet is supposed to work with PS/2-style mouse ports, I did not succeed in making it work on the PS/2 test system mouse port (though it was fine on a standard serial port).

Another "garden variety" tablet for people who have real estate problems comes from Numonics. Though this is a standard 12" square tablet, it is only as thick as a piece of card stock — with a 1.5"x3" box at one corner to handle the electronics. Called the Grid Master, this looks like a nice desk pad. For \$495, you get the tablet and a four-button puck. Add \$75 for a stylus.

For more traditionally-minded tablet users, Numonics has a variant form of the same tablet. The Graphic Master tablet mounts the same thin sheet on a low-profile inclined base, tucking the electronics underneath. The price on this unit is \$595, including both puck and stylus. Though there is a hit on real estate, it isn't so bad, since the tablet is still quite thin and "low-profile" and need not be cleared off except when being used.

Both Grid and Graphic Master tablets use a "soft" setup procedure. Position a template on the tablet surface and switch into setup mode by unplugging the puck or stylus, then re-plugging while holding a control button. Pass the pointer over the various tablet hot-spots, clicking on the appropriate ones, then click on the save-the-changes hot-spot. The most recent versions of Numonics tablets — not tested for this story — add multiple, programmable setups stored in tablet memory. Bring up the system, and select the tablet program for the job at hand. On my — very early model — test units I sometimes experienced some difficulty in switching the tablet into a mouse-compatible mode of operation; since using a tablet in mouse mode seems to me a rather silly endeavor, this falls in the trivial-matter category. Moreover, later firmware may correct the difficulty.

A quick aside on the matter of tablet size: Digitizing tablets have generally been targeted to technical users — engineers, architects and their draftsmen. It's been a small market willing to pay a substantial price for what is not a simple technology. This group often needs to trace drawings, or to work on large, enormously complex drawings. A big tablet is a plus in such cases, as is a puck with a transparent crosshair at the active point. A 12" square tablet is almost a minimum size in such a case.

Outside of that group, the advantages of a large tablet diminish rather quickly. For most of the rest of us users of graphics tablets, 12" square tablets represent an upward limit, and smaller sizes (5"x5", 6"x9" and 9"x12" are common) work very nicely. The smaller tablets cost less, generally — not a small matter in making a choice. I expect small-format tablets will become more common, if not ubiquitous, to the extent that pen-based software becomes popular. If that happens, then prices will fall accordingly, if we may judge from the industry's history.

The leading brand of graphics tablet is that of Summagraphics. This company's command set represents a standard in somewhat the same way that the Hayes command set is a standard for modems. Most tablets offer Summagraphics emulation, in one or more ways.

The basic product in the company's line of tablets, sold both directly and as part of many turnkey graphics systems, is the SummaSketch. The most recent version, the SummaSketch II offers 2000-line resolution and includes either a 4-button puck and stylus or a 16-button puck (the latter mostly for draftsmen, who program the buttons for functions). The 12" square model lists for \$600; the 18"x12" model is \$1,000. The newest Summagraphics product, aimed specifically at graphics artists, is called the SummaDraw. This is Summagraphics's first venture into a cordless-pen-equipped tablet. The company takes special pride in the stylus design; it's intended to feel like a real pen. This is a \$700 tablet; the idea is to think of it as the Montblanc of digitizing devices.

I confess I was a bit surprised to learn that Summa had brought forth a device using a cordless stylus. Company managers had long avoided the move. Their argument: A cordless device is one that gets lost easily. It is a good point; ask yourself how many ballpoint pens have grown legs in your office. But the other side is convenience: Cords get in the way of easy drawing. I blow hot and cold on this question; I have never actually

lost a cordless stylus or puck, but I have mislaid them on a messy desk. And most need batteries.... So there's another aside on something to keep in mind should you go shopping for a tablet.

Competing products from Hitachi and Kurta are not unlike the Summagraphics products in pricing and performance. Each company has its own technological wrinkles, and this shows up in the physical appearance of the unit and other externals. Hitachi units seem more commonly aimed at draftsmen. Kurta's IS1 series of tablets has had wider application in the graphic arts arena. I've used an IS1 for some years at one station or another, and I have always found it a solid unit. Mine is a 12" square model with a solid-feeling corded stylus which is nicely molded to the fingers. It is rather more bulky than I like, and it is a real estate hog — a better product for a pro with substantial studio space.

Actually, Kurta's IS/Penmouse is a particular favorite of mine. This is a small-format tablet — about the size of a sheet of typing paper. It uses a cordless pen or cordless puck. And it is thin — about a quarter-inch thick. It is, therefore, the perfect tablet for use in the field, with a portable computer. Arguably, it is the best portable device for serious graphics applications on the go. Pack it and a juiced-up notebook or laptop computer in a single bag and most of the professional computer graphics studio becomes as portable as a 19th century artist's oils and brushes. There's an added "plus" in this: The tablet is its own rigid work-surface. You can sit on the floor, or in a comfy chair, put the computer in front someplace and the tablet in your lap, and sketch merrily away.

All these tablets are effectively two-dimensional maps of a computer screen. The screen pointer moves across the surface in more or less one-to-one correspondence with the movement of the pointer on the tablet surface. Neat, but tablet makers have been conspiring to give more. The hot new feature is pressure-sensitivity. If I am right, and paint-programs finally come into their own, pressure-sensitive tablets are going to become more interesting. The idea is simple: A line being drawn can be varied by controlling pressure on the stylus.

Two companies enjoy the most substantial reputation for products in this category: Wacom and CalComp. Wacom has the leadership position; they were showing early forms of their pressure-sensitive hardware as much as three years ago (along with the first really light-weight cordless stylus). CalComp is the new kid on the block. Both companies offer tablets running from small-format (6"x9") to large-format. In both cases the products are Cadillac-priced.

I've seen the Wacom tablet and it is good; it has been widely reviewed, and there is little more to add, but that it's a delight to use.

I had not had a chance to test the CalComp offering, dubbed "DrawingPad" and very clearly aimed at graphic artists. This is the company's second effort to move out of the CAD-only orientation. An earlier product, the Wiz, failed to make any lasting impression on the market. The main reason for this, in my view, was a matter of software: It was atrocious. The DOS driver was huge (a cardinal sin in a 640Kb world); the Windows driver simply never worked right. The last version I had of that driver was barely stable in Win3 Standard mode. [And, dear reader, there's another item to check when buying a tablet: Are the drivers stable, and is there a solid, bug-free tablet-setup/control program?]

The small-format DrawingPad looks like its ill-fated predecessor. In fact, the one I tested showed signs that the someone had just manually tooled out the molded "Wiz" lettering from the case, and stuck a DesignerPad logo over it. There are some other artifacts of the old Wiz design, dictated by that reused housing: The least likable is the fact that the cord connecting tablet and computer has to run down a channel under the tablet to a socket near the front; the cord simply won't stay in that channel.

Externals aside, though, the DrawingPad seems to be a whole new product. It is intended to use a cordless pointer — the old plug-in-the-pen location in the Wiz housing was absent a connector. The pen supplied for testing was a delight in the hand. It was a bit heavier than Wacom's and the four small batteries at the upper end gave the counterweight feeling associated with placing a fountain pen's cap on the back of the barrel. For me -- a dedicated fountain pen user -- that was a plus. CalComp also offers two different cordless pucks — the difference is in the button layout — and several different styli (some with pressure-sensitive tips, others using the tip as a switch in the usual tablet fashion). It appears one pointer comes with the device; practicalities dictate having both puck and stylus, a view which I wish would be adopted by more tablet makers.

Unlike the Wiz, the DrawingPad comes with very good Windows software. There is DOS software, too — we can let that slide, here. The installation procedure is run from DOS, and has a number of options; choose DOS, Windows or both. The Windows option copies the requisite driver and control-panel files to a directory, then

calls the Windows setup utility. Make the mods needed there, and the installer then loads Windows to put in the tablet control software. This latter is a very good example of what is wanted in such a program: It controls the manner of mapping tablet to screen, button assignments and macro-recording. These tablet macros can be activated from the tablet by touching a hot-spot. The most useful of the canned macros is a toggle between absolute (one-to-one correspondence) and relative ("mousy") pointer modes; the latter is a bit more useful in general application, while the former is what it's all about for graphics.

In this preliminary testing, I didn't go all out working with every kind of software and so on. I tested with paint and image editing, using a beta of Computer Associates' forthcoming paint program and Micrografx Picture Publisher. Naturally, I also did some work with Corel Draw and other drawing programs. I put it on a production machine for testing in day-to-day use. I was impressed.

The pressure sensitivity aspect was nice, and provided a side-benefit: when used as mouse-button-1, the stylus tip-switch needed but a feather-light touch to activate things. I programmed button-2 (the forward part of the side-mounted rocker switch) as a double-click button; that was a nice way around the usual stylus insensitivity to tip-switch double-clicking. Getting the hang of the settings took a couple hours — no more.

The tablet (I sketched it in picture 4) is just about the same length as my keyboard and WristPerch (a good idea, more on that another time...), and when its little legs are extended, sits at about the same angle. This looks neat, and works out well. At the same time, this is a good use-it-in-the-lap tablet. CalComp is smart enough to supply a long cord (enough so that it could run some five feet under my computer desk in the study, up to desktop level, and still leave plenty of slack to plunk the tablet in my lap and rock back for a drawing session.