PC MAGAZINE

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PORTABLE MICE FOR PORTABLE PCs

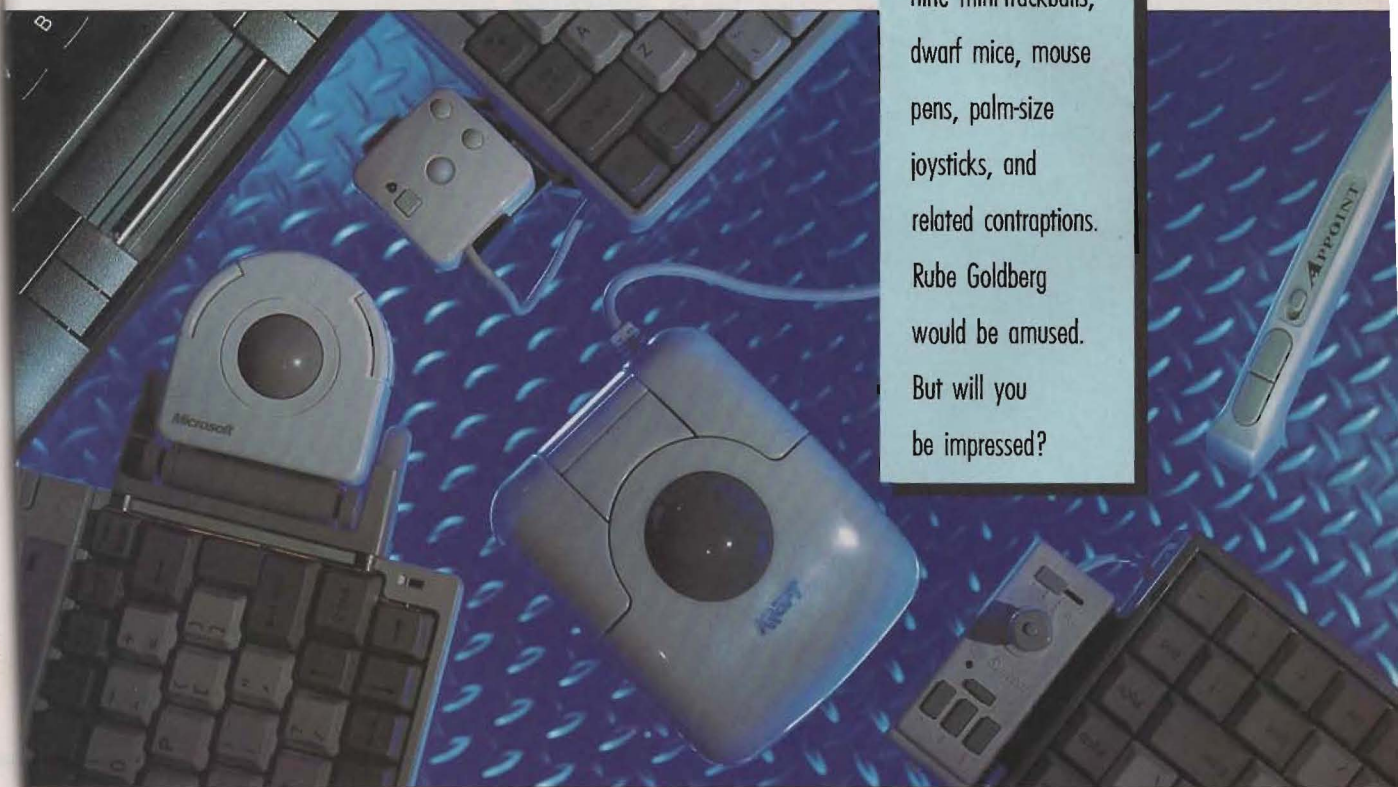**DIFFERENT? Yes! BETTER? Maybe.**

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Different, Yes. Better, Maybe.

Laptop-toting road warriors want something smaller than desktop mice, with shorter cords. Enter the portable pointing device. PC Labs tests nine mini-trackballs, dwarf mice, mouse pens, palm-size joysticks, and related contraptions. Rube Goldberg would be amused. But will you be impressed?

Who says the computer industry doesn't have a sense of humor? Just take a gander at some of the mouse alternatives that have become available for users of laptop and notebook computers. They're—well, different. Quirky.

The category known as *portable pointing devices* evolved because of low-level dissatisfaction with mainstream desktop devices such as the Microsoft and Logitech mice. Some laptop users find them

BY BILL HOWARD

bulkier than necessary and the cords far too long. When you fly coach and your laptop covers the entire tray table, there's also the issue of where to roll the mouse.

Over the past year, more than a half-dozen companies have developed alternatives to the mouse that are highly individualistic, to put it mildly. In this article, we test nine such devices. Four are trackballs ranging from tiny (Appoint's Thumbelina) to portable-size (Logitech's TrackMan Portable and Microsoft Corp.'s BallPoint Mouse) to too big (Kraft Systems' TopTrak). One is a combination trackball/mouse (IBM Corp.'s IBM PS/2 Trackpoint), one is a mouse in the shape of a pen (Appoint's MousePen Professional), one is a downsized joystick (Suncom Technologies' ICONtroller), one is a smallish traditional mouse (Mouse Systems Corp.'s The Little Mouse/PC), and one is a built-in device (GRiD Systems Corp.'s GRiD IsoPoint).

The five trackballs and two other devices (GRiD IsoPoint, ICONtroller) are stationary; you do not have to clear space so that you can roll or drag them on a tabletop. Six of the nine can be attached to your PC (Thumbelina, TopTrak, TrackMan Portable, BallPoint Mouse, ICONtroller) or are built in (GRiD IsoPoint). All except the TopTrak have cords shorter than the typical Microsoft or Logitech desktop mouse. And all except the TopTrak, the IBM PS/2 Trackpoint, and The Little Mouse/PC are smaller than a desktop mouse.

Microsoft's and Logitech's offerings are likely to be the standards against which portable pointing devices are measured, because the companies dominate the world of desktop mice and because of the similarity of their laptop products: mini-trackballs that clip onto the side of your laptop.

TOO UNUSUAL?

The majority of the designs are unusual, especially if your familiarity with pointing devices starts and ends with the traditional desktop mouse. Appoint offers products more thoughtfully designed than other unconventional devices: MousePen Professional and Thumbelina, a trackball just 1.6 inches square. Thumbelina is small enough that it could be built into a laptop computer. But other devices are so unusual that you may have trouble taking them seriously as portable pointers:

■ The Kraft TopTrak is a desktop trackball (read: bulky) with an 8-foot cord. Kraft pitches TopTrak for portable use because of its low-current design, but that's of little importance, since most pointing devices work well with both desktop and laptop PCs and have minimal current drain.

■ The Little Mouse/PC, from Mouse Systems, is indeed significantly smaller than a Microsoft or Logitech mouse, but it's an optical design, which means you have to lug around (and not lose) a 7- by 8-inch mirrored pad. A minimouse remains a great idea, perhaps an obvious idea waiting to be implemented, but not if it's optical.

■ The IBM PS/2 Trackpoint is so wobbly as a mouse that most users will find it functional only as a trackball.

OTHER PRODUCTS

To be included in this review, the pointing device had to be designed for on-the-go use with a portable computer and available by early summer 1991. For earlier reviews of 58 desktop mice, trackballs, and light pens, see "Mice and Trackballs: Choices for the New Generation of Applications" (*PC Magazine*, August 1990).

Additional portable pointing devices should be available now or by year's end. GEC Plessey Semiconductors (516-293-8636, formerly Marconi Circuit Technology) plans a sub-$150 Microsoft Mouse–compatible ballistic trackball called LT that can be held by hand or clipped to a laptop; the ball functions as a mouse button when you tap or click it. If you need a portable tablet for CAD, consider GridMaster ($449 to $469) from Numonics Corp. (800-247-4517 or 215-362-2766), a roll-up 17- by 15-inch tablet with a stylus pen or four-button cursor (mouse). It's intended to be readily portable but is probably too bulky to use while in transit.

Veridata Research (818-303-0613) sells

EDITORS' CHOICE

■ **Four maybes, no winners**

The portable pointing device market is evolving; most products would benefit from further development. Of the nine devices we tested, you're likely to find that one of these four suits your needs: Appoint's MousePen Professional, Appoint's Thumbelina, Logitech's TrackMan Portable, and Microsoft's BallPoint Mouse. Given the personal nature of the devices and the rough edges, none of them earn Editors' Choice this time around. For now, they are all honorable mentions.

MousePen Professional, $99, comes closest to duplicating the feel of a mouse in the shape of a pen. This is the best choice if you want a mouse but don't want the bulk of a mouse—until some company wakes up and builds a half-size mouse for portable use. Thumbelina, a $99 trackball, only 1.6 inches square and with barely any height at all, would be excellent for running presentations where you click the left and right buttons to control slide shows.

The Microsoft and Logitech trackballs are more similar than different. They are relatively expensive ($175 and $169, respectively). Their installation and removal could be smoother. TrackMan Portable works only at a fixed angle; BallPoint Mouse will not let you close the cover of your laptop. But once you adjust to how a trackball works (particularly when dragging an object), you'll have no problems with either one.

Of the remaining products, Kraft Systems' TopTrak trackball is too big, Mouse Systems' The Little Mouse/PC requires a bulky optical mouse pad, and the IBM PS/2 TrackPoint reversible trackball/mouse is bulky and somewhat hard to use as a mouse. Joysticks have not caught on, except for games, but if you like them, you'll like Suncom Technologies' midget ICONtroller. The GRiD IsoPoint, the built-in rolling, sliding pointer, is an acquired taste.

the ExecuLite 386 notebook with an optional slide-in 2- by 2-inch touch pad. The pad works with a tiny stylus that looks like a guitar pick. In a pinch, you can use your finger. Commax Technologies (408-435-5000) sells a variant called the UltraThin 386SX. Olivetti (908-526-8200) also has a line of five notebook and laptop computers with touchpad technology.

Other pointing device technology that may find its way into laptops includes MicroTouch Systems' UnMouse, a pressure-sensitive 3- by 4-inch glass plate with a stylus; Home Row's Push-n-Point, a flexible J key that functions as a miniature joystick; and Key Tronic Corp.'s KeyMouse, also a built-in joystick workalike. The KeyMouse is located to the right of the space bar; sensors determine direction and velocity. The F and D keys on the keyboard act as primary and secondary mouse buttons, respectively, and Ctrl-Space controls cursor speed. We tested a demonstration version of KeyMouse; our first impression was that it is awkward to aim and control. We found it especially difficult to hold the mouse pointer in position while double-clicking. A Key Tronic spokesman said the G key will be used for double-click functions on future models.

BUYING CONSIDERATIONS
Because the choice of a laptop pointing device is so highly subjective, you should use our reviews as a starting point; what's comfortable for one user may be awkward for another. Other issues may factor into your buying decision: Not all clip-on devices will clip on to every laptop, and some that do may block the floppy disk drive or the display controls. Trackballs should have a drag-lock feature that toggles the button on and off because holding down the primary button while you move the ball is awkward. You'll want a short cable (3 feet or less); anything longer gets in the way. Most cables have DB-9 serial connectors. The two Appoint products and IBM have round PS/2 mouse connectors; most products also have DB-9-to-PS/2 or PS/2-to-DB-9 adapters. If you have to use the adapter, expect the connector to stick out 2 inches from the back of your laptop.

200-point-per-inch resolution allows greater precision in selecting objects; 400 ppi requires less motion to move the mouse across the screen. The majority can use the ubiquitous Microsoft Mouse driver, although they may also have a proprietary

driver for variable sensitivity (resolution) and ballistic tracking.

Prices range from $89 (TopTrak) to $169 (TrackMan Portable) and $175 (BallPoint Mouse), although the two most expensive products will also be the most widely available and probably the most heavily discounted.

FIXING WINDOWS
Portable pointing devices are a necessity if you're running *Microsoft Windows* 3.0 on your laptop, but you're likely to have trouble seeing the small mouse cursor on-screen. AT&T wisely modified the version of *Windows* included with its Safari notebook computer to enlarge the cursor and the I-beam (which marks your current position in a file). Microsoft says that an upgraded BallPoint driver (which also works with the Microsoft Mouse) due by summer's end will include an enlarged-cursor option. You may want to consider one of several *Windows* cursor-enhancement utilities. *Magic Cursor!* ($79.95, Fanfare Software, 818-886-8787) is robust but expensive. Cheaper alternatives are available on bulletin boards and on PC MagNet. On MagNet, go to the Utilities Forum, Library 10 (Windows), and browse for the keyword CURSOR. You will find NEW-CSR (free), BCURSOR (free), and CHGCUR (shareware).

Additional research and reporting by Eric Berlin and Robin B. Bornstein.
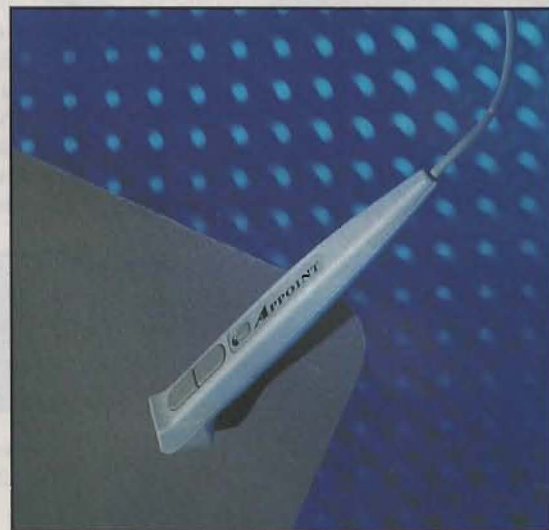

MousePen Professional
Thumbelina
by Robin B. Bornstein

Appoint offers two of the more unusual and useful portable pointing devices in this roundup. The MousePen Professional is a thick plastic mouse pen with a pearl-size roller-ball tracking mechanism in the tip and two buttons set into the barrel. Thumbelina is a dwarf trackball with the same tiny roller set into a housing the size and shape of a small pill box.

Both are $99, both are Microsoft

Mouse–compatible, both provide ballistic tracking variable from 150 to 1,000 ppi (points per inch), and both come in portable (45-inch cord) and desktop PC or Macintosh (8-foot cord) versions. Both use the round serial connectors used by IBM on its PS/2s and adopted by a small but increasing number of laptop makers.

Appoint's MousePen Professional, $99, looks like a pen and works like a mouse.

Both also have PS/2-to-DB-9 (and PS/2-to-DB-25) adapters for connections to the more common 9-pin serial ports.

MOUSEPEN PROFESSIONAL
The MousePen Professional functions exactly as you would expect a device that's a cross between a writing pen and a mouse to function. It's especially good for design and drawing operations, but freehand drawing (especially signing your name) can be awkward compared with a real pen. MousePen Professional lends itself to click-and-drag functions, with the primary button (the left button on a mouse) located near the base, where your index finger rests. Above that is the second (right) button, and above that a switch that lets you choose fixed or variable (ballistic) resolution.

The MousePen Professional needs a working space 3 inches square; in a pinch that can be your leg. You may find a few smooth surfaces where the unit doesn't track well. (To improve the tracking, one *PC Magazine* editor replaced the Delrin plastic ball with a steel ball bearing.) While typing, you may be able to hold the MousePen Professional between your thumb and finger. The cord sticking out of

the top is a slight impediment to free movement of the pen, but you'll get used to it. All in all, this is a well-designed portable pointing device.

Appoint's Thumbelina, $99, is a tiny trackball (1.6 inches square).

THUMBELINA

At 1.6 inches square and little more than half an inch high, Thumbelina is an excellent choice for users partial to trackballs and for those who need a pointing device that does not take up much storage or desktop space. You can hold it in your hand as you would a stopwatch, attach it to your computer with Velcro, or attach it with a Z-shaped bracket (supplied). Don't let Thumbelina's 0.4-inch-diameter Delrin trackball fool you: A small spin moves the on-screen pointer a good distance. A filtering system eliminates "mouse jitter"—unwanted cursor movements sometimes caused by hand twitches or even a bumpy train, plane, or bus. In addition to the roller ball and left and right buttons, Thumbelina includes a drag-lock button. The cord attaches at the front of Thumbelina; it should attach at the rear. (If you turn Thumbelina so the cord sticks out the back, the screen pointer moves up when you move down, and vice versa.) Thumbelina would be an especially good choice

for laptop
control on
Philips
bundles N

PORTABLE POINTING DEVICES: SUMMARY OF FEATURES

Products listed in alphabetical order by company name

	Appoint MousePen Professional	Appoint Thumbelina	GRiD Systems Corp. GRiD IsoPoint	IBM Corp. IBM PS/2 Trackpoint	Kraft Systems Inc. TopTrak
List price	$99.00	$99.00	$5,095.00 (as part of GRiDCase)	$159.00	$89.95
HARDWARE FEATURES					
Type of device	Optomechanical mouse	Optomechanical mouse	Mechanical mouse	Optomechanical trackball/mouse	Optomechanical trackball
Connector	PS/2	PS/2	None	PS/2	DB-9 serial
Additional connector (adapter)	DB-9 serial	DB-9 serial	N/A	None	DB-25 serial
IRQs supported	3, 4	3, 4	3–5	None	3, 4
Base hardware resolution (points per inch)	150	150	450	200	200
Composition of ball	Delrin	Delrin	N/A	Phenolic	Phenolic
Ball removable for cleaning	■	❑	N/A	❑	■
Method of attaching device to laptop	N/A	Z-bracket	Built-in	N/A	N/A
BUTTONS					
Unduplicated	2	2	2	2	2
Total	2	2	4	4	2
Drag-lock	None	1	None	2	1
Other switches	Fixed/ballistic	None	None	None	Simultaneous left/right
PHYSICAL SPECIFICATIONS					
Length of interface cable (inches)	56	45	N/A	44	95
Weight (ounces)	2	2	N/A	5	11
Ball diameter (inches)	0.4	0.3	N/A	1.3	1.5
OTHER FEATURES					
Size of CONFIG.SYS device driver	15K	15K	14K	N/A	10K
Size of command line driver	15K	15K	14K	14K	10K
Disk format of supplied drivers	5.25-inch, 3.5-inch	5.25-inch, 3.5-inch	3.5-inch	3.5-inch	5.25-inch, 3.5-inch
Version number of tested driver	2.00	7.04	7.4	7.04	6.24
Driver can be disabled from DOS	■	■	■	■	■
Driver supports ballistic tracking	■	■	■	■	■
AutoCAD driver	❑	❑	❑	❑	■
Resolutions supported (points per inch)	150–1,000	150–1,000	100–1,000	N/A	10–1,150
Other mouse emulations included	None	None	None	Microsoft	Microsoft
Software bundled	None	None	None	None	LCS's *Telepaint*

■—Yes   ❑—No

N/A—Not applicable: The product does not have this feature.

Thumbelina is a good choice for laptop users who want a mouse to control a presentation.

for laptop users who want a mouse to control on-screen presentations.

Philips Consumer Electronics Co. bundles MousePen Professional with its

286-based Magnavox laptops sold in the United States.

MousePen Professional
Thumbelina
Appoint, 1332 Vendels Circle, Paso Robles, CA 93446; 800-448-1184, 805-239-8976. **List Price:** $99. **In Short:** The MousePen Professional is a mouse in the shape of a pen. Thumbelina is a pea-size trackball in a 1.6-inch square case. Both are Microsoft Mouse–compatible and have ballistic tracking. Despite the MousePen Professional's shape, mouse users find they use the

same gestures and motions as they do with a mouse. Thumbelina is the most compact portable pointing device yet. It has a bit of a learning curve unless you've used trackballs before. Laptop users should specify the portable versions with 3.5-foot (instead of 9-foot) cables.
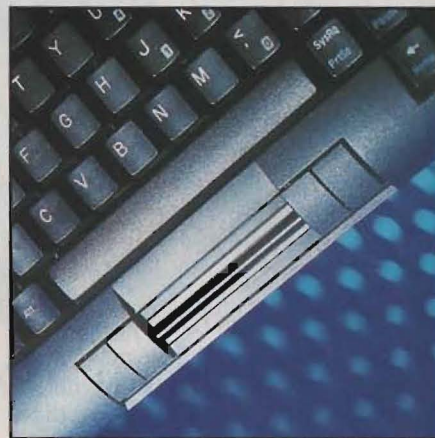
CIRCLE **544** ON READER SERVICE CARD

GRiD IsoPoint
by John R. Quain

Much-publicized for years but never actually built into a laptop until late 1990, the GRiD IsoPoint is very much an acquired taste. Users may love or hate IsoPoint, a solid straw-shaped shaft set into the very front of a portable computer, parallel to the Spacebar. You roll the shaft front-to-back and slide it left and right to move the mouse cursor around the screen.

The only real design restrictions are that IsoPoint must be built in, not added on, and that the keyboard must be set back

The GRiD IsoPoint, a straw-shaped, rolling, sliding shaft, is built into the keyboard of the GRiDCase 1550SX.

about an inch from the front edge of the laptop case. The IsoPoint's rolling shaft is less than a quarter-inch in diameter and about 2.8 inches long. Two buttons flank each side of the shaft. The inner buttons act as the main (left) mouse buttons, the outer buttons as the secondary (right) mouse buttons. You can also click on the bar itself, although doing so without simultaneously moving the cursor is difficult. Using your thumb, you roll the bar to move the cursor vertically, and slide the bar from side to side for horizontal con-

	Logitech Inc. **TrackMan** **Portable**	Microsoft Corp. **BallPoint Mouse**	Mouse Systems **The Little** **Mouse/PC**	Suncom Technologies **ICONtroller**
	$169.00	$175.00	$134.95	$99.95
	Optomechanical trackball	Mechanical trackball	Optical mouse	Mini-joystick
	DB-9 serial	DB-9 serial	DB-9 serial	DB-9 serial
	DB-25 serial	PS/2	DB-25 serial, PS/2	DB-25 serial
	3, 4	All (0–15)	2–15	3, 4
	200	400	300	(approximately) 200
	Polycarbonate	Compression- molded plastic	N/A	N/A
	■	■	N/A	N/A
	Detachable clip	Detachable clip	N/A	Duo-Lock
	3	2	2	3
	3	4	2	4
	2	None	None	1
	None	❑	❑	Resolution, compatibility, joystick button
	26	52 (coiled)	70	36 (coiled)
	4	6	5	3
	1	1.1	N/A	N/A
	16K	N/A	13K	13.5K
	34K	16K	12K	13K
	3.5-inch	3.5-inch	5.25-inch, 3.5-inch	5.25-inch, 3.5-inch
	6.0	1.00	7.01	1.00
	■	■	■	■
	■	■	■	❑
	❑	❑	❑	❑
	50–10,000	0.75–22,400	300–30,000	N/A
	Microsoft	None	Microsoft, PS/2	Microsoft
	Windows hotkeys	Mouse menus	Pop-up menus, utilities	Testing and tutor programs

Left column

trol. There is just enough leeway in the bar's physical sideways motion to move the arrow from one side of the screen to the other.

Once you grow accustomed to its interface, you can use the IsoPoint to move the cursor without lifting your fingers from the keyboard. The tricky part is using drawing and paint packages. In its default mode (450 ppi), the IsoPoint zips the cursor around a little too quickly for some tastes, but its sensitivity and acceleration (or ballistic tracking) can be adjusted from the DOS command line or with a TSR control panel. If you choose to use a standalone pointing device, you can disable the driver from DOS. The IsoPoint uses standard Microsoft Mouse drivers.

The IsoPoint's mechanical rolling-bar-and-button system was invented by GRiD Systems' Craig Culver. Currently, if you want the IsoPoint, you are limited to one computer: the GRiDCase 1550SX, $5,095 with a 60MB hard disk and internal modem. (You can also buy the computer with a CD-ROM drive as the 1550CD.) At 12.7 pounds and 2.5 by 11.5 by 15 inches (HWD), the GRiDCase is not on the cutting edge of packaging. But little of the the unit's bulk (other than an inch of the depth) is related to the IsoPoint. Zenith Data Systems (708-808-4800) expects to ship its new SupersPort 486 and 486SX portable with the IsoPoint before year's end, but these machines will also be heavy: more than 14 pounds.

GRiD IsoPoint
GRiD Systems Corp., 47211 Lakeview Blvd., Fremont, CA 94537; 800-222-4743.
List Price: $5,095 for the GRiDCase 1550SX laptop with the IsoPoint installed. **In Short:** A rotating, sliding, straw-shaped shaft built into a laptop in front of the Spacebar, the IsoPoint adds about an inch to the depth of a portable PC. Its desirability is much a factor of personal preference. Currently available in the 13-pound GRiDCase 1550SX, it is planned for inclusion later in the year in a pair of equally bulky Zenith portables.
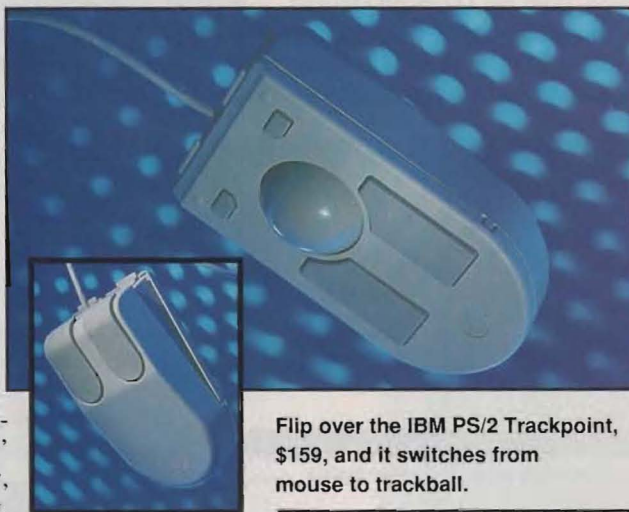CIRCLE 545 ON READER SERVICE CARD

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Middle column

IBM CORP.
IBM PS/2 Trackpoint
by John R. Quain

Of all the portable pointers in this roundup, the $159 IBM PS/2 Trackpoint is the only device that's both a trackball and a mouse. Conceptually, that's admirable. The 6-

Flip over the IBM PS/2 Trackpoint, $159, and it switches from mouse to trackball.

ounce device can be used as a trackball when you're limited to an airplane tray table; it converts to a mouse when you have a desktop to work on. But as with many two-in-one solutions, it's less capable than single-purpose mice or trackballs. Of the two implementations, the trackball mode is more workable.

Introduced in March with IBM's PS/2 L40 SX laptop, the clam-like Trackpoint is a 200-ppi optomechanical system with a round PS/2 connector. The Trackpoint bears a rough family resemblance to IBM's four-and-a-half-year-old PS/2 mouse. At 4.5 inches long by 2.5 inches wide, it's a bit bulkier than a standard mouse. As a trackball, the Trackpoint has four buttons situated around the 1.2-inch-diameter ball: two small drag-lock buttons above the ball, two large click buttons below it. Depress two plastic braces, pull up on the hinged top so less of the ball sticks out, flip it over, and you've got a mouse. The two rubber-like feet that keep it steady as a trackball become the left and right mouse buttons. Unfortunately, enough of the ball still protrudes so that the mouse remains a bit wobbly, making for sloppy cursor con-

Right column

trol. The design also means that the ball cannot be removed for cleaning.

The Trackpoint's software driver proved to be one the smoothest trackball operators in *Windows'* Paintbrush, providing steady and consistent control. Users can set vertical and horizontal sensitivity using command line switches, as well as selecting four levels of acceleration: slow, medium, fast, or none. On the downside, the package has no auto-install program or CONFIG.SYS driver, and the command line driver uses 32K of memory, more than twice as much as most other drivers.

IBM PS/2 Trackpoint
IBM Corp., 1133 Westchester Ave., White Plains, NY 10604; 800-426-9292.
List Price: $159. **In Short:** The PS/2 Trackpoint is a bulky, boxy mouse that becomes a trackball when flipped upside down. The trackball mode is the more successful of the two; the mouse is unsteady and a bit hard to maneuver. It's a great idea, imperfectly executed.
CIRCLE 546 ON READER SERVICE CARD

KRAFT SYSTEMS INC.
TopTrak
by Eric Berlin

Kraft Systems says that its $89.95 TopTrak trackball merits consideration as a portable pointing device because of its low current requirements. You certainly wouldn't choose TopTrak because of its size. At 2 by 3.8 by 4.5 inches (HWD), it's roughly four

Kraft Systems' TopTrak, an $89.95 trackball, is too big for serious use with a laptop, even without the optional $10 foot pedal that duplicates the left button.

times as bulky as a Microsoft Mouse. The cord stretches 8 feet, twice as long as necessary. The optional steel foot pedal ($10) that serves as an alternative left mouse button has another 8-foot cable and adds an extra pound of weight.

TopTrak's left and right buttons dominate the upper left and right corners. Sandwiched between them are a textured drag-lock button and a simultaneous left/right button. Driver installation is easy. You also get AMENU.COM, a series of mouse menus for programs such as *Lotus 1-2-3* and *WordPerfect*. The foot-pedal option includes LCS/Telegraphics' *Telepaint*, a low-end paint program.

TopTrak may be an adequate pointing device for the desktop, but it's too bulky to be seriously considered for portable computers. And the low-current claim isn't much of a distinction: Almost every popular pointing device works fine with a laptop.

TopTrak
Kraft Systems Inc., 450 W. California Ave., Vista, CA 92083; 619-724-7146. **List Price:** $89.95; $99.95 with foot pedal and *Telepaint*. **In Short:** The TopTrak works with portable computers, but that doesn't make it a portable pointer. A trackball too bulky for portable use, with an optional foot pedal that duplicates the left mouse button, it's far too big for serious consideration.

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LOGITECH INC.
TrackMan Portable
by Robert W. Kane

Logitech believes that the trackball is the tool of choice for portable pointing devices. The world's largest manufacturer of mice and the winner of an Editors' Choice award for its desktop trackball (*PC Magazine*, August 1990), Logitech brings considerable design expertise to the $169 TrackMan Portable trackball. It's roughly similar in function to Microsoft's BallPoint Mouse, although there are enough subtle differences to make the two far from interchangeable.

The 2- by 2.8- by 3-inch dimensions (excluding the attaching clip) may make the TrackMan Portable easier to use than the BallPoint for those with large hands. Its three-button design carries over from other Logitech input devices (even though most software uses only one or two of the

buttons). With a single button on the side and the other two buttons on the top, your index finger is always positioned on the primary (left mouse) button. For left-handed users, the position of the primary button can be flipped 180 degrees to allow the unit to be mounted on the left side of the keyboard.

Logitech's TrackMan Portable, $169, can attach to the side of a laptop or be used as a freestanding trackball.

Mounting the TrackMan on your laptop is both a blessing and a curse. It attaches with a sliding, spring-loaded U-channel clip that grabs the side of the portable's case, as long as the attaching point is no wider than 5/16 of an inch. The mounting angle is fixed at 45 degrees (the BallPoint's is variable). Annoyingly, you must attach the TrackMan in two pieces and remove the mounting clip in order to remove the ball. You can, however, close the lid of your laptop with the unit attached, unlike the BallPoint. The compromises are less bothersome if you use TrackMan as Logitech suggests: freestanding on the desk or held in your hand. With six nonskid feet on the bottom, the TrackMan Portable sits at a 5-degree angle and can be readily cradled in your hand.

The removable, cerulean 1-inch trackball spins on optomechanical wheels with a base hardware resolution of 200 ppi (the BallPoint's is 400 ppi). The cord is 26 inches long and has a DB-9 serial connector (but no round PS/2 adapter) and a 6-foot extension for desktop users. While the standard DOS driver has ballistic tracking capabilities, the *Windows* driver does not. This may be acceptable with a VGA screen, but 200 ppi on an 800-by-600 or 1,024-by-768 desktop display will wear your thumb out in no time at all.

The compromises inherent in both the

Microsoft and Logitech trackballs are dissatisfying. Of the two, Logitech appears to be the slightly better choice.

TrackMan Portable
Logitech Inc., 6505 Kaiser Dr., Fremont, CA 94555; 800-231-7717, 415-795-8500. **List Price:** With cable and 6-foot extension cable, $169. **In Short:** This versatile, ergonomically designed hand-held 200-ppi trackball can be clipped to the side of your laptop (at one fixed angle only) or used freestanding on your desk. Users with large hands may find the TrackMan Portable more comfortable than Microsoft's BallPoint Mouse. It has annoying procedures for attaching and detaching but, unlike the BallPoint, lets you close your laptop with the device attached. It was the second-most-expensive product we tested.

CIRCLE **548** ON READER SERVICE CARD

MICROSOFT CORP.
BallPoint Mouse
by John R. Quain

Like Logitech's TrackMan Portable, Microsoft's $175 BallPoint Mouse is a small trackball-type device that clips to the side of your laptop or rests alongside on your desk. The simple D-shaped form attaches easily to most laptops.

Technically, the BallPoint Mouse is neither a mouse nor a trackball; it's a thumb-rolling device. You operate it with your forefinger resting on the curved click buttons and your thumb resting on the ball. There are four buttons: two along the top edge and two along the bottom edge. Either pair can be selected as the primary

Microsoft's BallPoint Mouse, $175, is a portable trackball-shaped device. It attaches easily to most laptops but must be removed to close the laptop cover.

and secondary (left and right) buttons.

The BallPoint attaches to a laptop (or a desktop PC keyboard) with a quick-release bracket and a pair of thumbscrew clamping arms. Microsoft provides three sizes of arms. The BallPoint juts out about 3.5 inches from the side of the laptop, has a coiled 4-foot cord with a DB-9 serial connector (plus a PS/2 adapter), and adds 6 ounces to your laptop.

Software installation is easy. The driver takes about 16K of memory. The driver, Version 8.0, works with both the Ball-Point and the Microsoft Mouse. You cannot, however, use earlier versions of the Microsoft Mouse driver with the Ball-Point.

How do the BallPoint and the Track-Man Portable compare? Either can attach to the side of a laptop or stand on its side on a desk. The BallPoint uses a slightly larger, textured 1.1-inch ball; you may find it feels more comfortable and gives you better control over the cursor. The TrackMan uses a lighter and smoother ball that tends to spin more freely. The BallPoint's hinged clamp is adjustable; the TrackMan attaches at a fixed angle.

The BallPoint uses a mechanical system of rollers resting next to the ball to drive the encoder disks and move the cursor directly (the TrackMan uses opto-mechanical technology). In testing, it did not appear quite as precise as the Micro-soft Mouse, but the BallPoint's base resolution of 400 ppi is fine-grained enough for any of today's notebook screens. Additionally, the ballistic tracking (or sensitivity, as Microsoft calls it) can be set from 0.75 ppi to 22,400 ppi.

You cannot close your laptop with the BallPoint installed. It also will not fit on every portable (the IBM PS/2 L40 SX is difficult, for example). On some note-book PCs, the BallPoint blocks the floppy disk drive bay or the brightness and contrast controls. But Microsoft offers a "fit guarantee": If the BallPoint does not fit on your computer, you may return it within 30 days of purchase.

At press time, Microsoft planned to release an updated *Windows* mouse driver for the BallPoint (and the Microsoft Mouse) by late summer. It will increase the size of the arrowhead when the cursor is in motion, making the arrowhead easier to see on laptop displays. Owners can get the driver by calling Microsoft technical support or by downloading it from an on-line service such as Microsoft's forum on CompuServe. Microsoft has also planned

laptop-specific accessories to allow users to close their PCs without having to remove the clamp.

BallPoint Mouse

Microsoft Corp., 1 Microsoft Way, Redmond, WA 98052-6399; 206-882-8080. **List Price:** $175. **In Short:** A small trackball that clips to the side of a laptop or keyboard or sits on the desk, the BallPoint Mouse is a good compromise for laptop owners who need a pointing device. The mounting clip has to be removed before you close the cover. It's a matter of personal preference whether Microsoft's or Logitech's implementation of the mini-trackball is more comfortable to use. Unlike the TrackMan Portable, the BallPoint can be adjusted to more than one angle. It was the most expensive product we tested.

CIRCLE **549** ON READER SERVICE CARD

MOUSE SYSTEMS CORP.
The Little Mouse/PC
by John R. Quain

As a compact portable pointing device, Mouse Systems Corp.'s downsized $134.95 Little Mouse/PC suffers from an enormous drawback: It's an *optical* mouse. That means you have to carry a special reflective mouse pad. Leave the pad on the plane or in your hotel room, and your mouse is a paperweight until you can get to a computer store and find a spare optical mouse pad.

If you can get past that drawback, you'll probably like The Little Mouse/PC. In

Mouse Systems Corp.'s Little Mouse/PC, $134.95, is small but requires an optical pad, an inconvenience for laptop users.

side-by-side hands-on comparisons with all other portable pointing devices (and with the industry-standard Microsoft Mouse), we found that The Little Mouse/PC provided the most accurate cursor control of all. The optical technology (a single LED and a photo detector) is not affected by the occasional crumbs of dirt that can make a mechanical or opto-mechanical mouse skip a beat.

The two-button optical mouse has no internal moving parts and operates just like the standard mouse—no unfamiliar hand-crimping or arcane thumb-rolling techniques to master. But for laptop users, the issue is not The Little Mouse/PC's performance but portability. The pad is 7 by 8 inches and cannot be rolled up or folded in half. The mouse itself is 1.8 by 4 inches, noticeably smaller than the 2.2- by 4-inch Microsoft Mouse.

The Little Mouse/PC can be adjusted via ballistic tracking (300 ppi to 30,000 ppi) to use an area of only 3 by 5 inches. In addition to the automatic installation software, Mouse Systems Corp. supplies several pop-up mouse utilities for a variety of best-selling applications, including current versions of *Lotus 1-2-3*. Mouse Systems provides free driver upgrades for the first year, although there is no toll-free technical-support hotline at the moment. The Little Mouse/PC comes with a 6-foot cord (a bit long for portable users), a DB-9 serial connector, and a serial-to-PS/2 adapter.

The Little Mouse/PC

Mouse Systems Corp., 47505 Seabridge Dr., Fremont, CA 94538; 415-656-1117. **List Price:** With reflective mouse pad, cord, and extension cord, $134.95. **In Short:** The Little Mouse/PC is a compact and highly accurate device. But it's an optical mouse, which means you have to carry (and try not to lose) a 7- by 8-inch reflective pad. For this reason, it is not really suited for portable computing.

CIRCLE **550** ON READER SERVICE CARD

SUNCOM TECHNOLOGIES
ICONtroller
by Oliver Rist

Suncom Technologies' $99.95 ICON-troller represents the mini-joystick segment of the portable-pointing-device genre. Your taste may be for either a joystick or a mouse. With a joystick, the on-

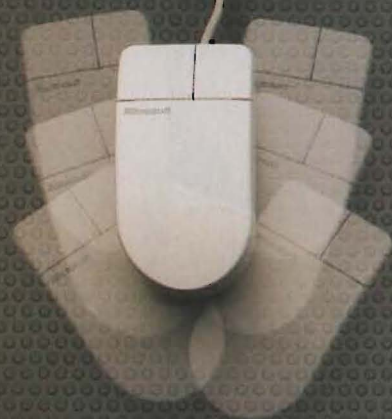Suncom Technologies' ICONtroller, $99.95, is a miniature joystick that can be attached to the laptop with Velcro.

ICONtroller

Suncom Technologies, 6400 W. Gross Point Rd., Niles, IL 60648; 708-647-4040. **List Price:** $99.95. **In Short:** This miniature device has one mouse button at the tip of the 1-inch joystick. It must be attached to the side of your laptop or you'll need both hands to control it.

CIRCLE **601** ON READER SERVICE CARD

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screen cursor continues to move as long as the stick is off-center; the cursor stops moving when you return the joystick to neutral. With a mouse or trackball, you need continuous motion to keep the on-screen cursor moving. For most laptop applications, you should find it easy to get used to the ICONtroller and its inch-long joystick.

The ICONtroller is small, 2 by 1.3 by 3 inches (including the controller stick), and bristles with buttons and switches. It has three buttons on the base (left, right, both), a user-selectable button on the joystick tip that usually duplicates the left mouse button, and switches that control cursor speed and driver type (either Microsoft or Suncom).

With a competitive price, easy software installation, fast learning curve, and well-thought-out design, the only drawback to this little joystick is its method of attachment. On some laptops, it may obstruct access to a disk drive or screen controls. The ICONtroller attaches to the side of your laptop with an industrial-strength Velcro-like hook-and-loop tape made by 3Com. If you do not attach the ICONtroller, you will need two hands to operate it. (An extremely dexterous user might find it possible to cup the joystick in one hand and manipulate it with a thumb or index finger.) Suncom says that it is developing an alternative mounting solution that should be ready by this year's Fall Comdex.

The ICONtroller comes with installation and testing software (in 5.25-inch and 3.5-inch formats) and a DB-9 serial connector. Installation is easy: Simply load the disk and follow either the electronic or printed instructions. You may run the driver either from the command line or from your CONFIG.SYS file. ∎