Trackpoint: Knee bars and race cars

- Stewart Card / Tom Moran Human Computer Interaction 1983
- Knee bar better than mouse for novices? Mouse takes 1.7 seconds to grab
- Joysticks have always had over-shoot problems people want to drive a Ferrari .. but they crash it
- TrackPoint; 10 years of human factors work ergonomic, ambidextrous device
- Matching human visual and motor abilities
TrackPointIII

- Grippy Top
  - Consistent grippiness

- Drag Buttons
  - Aids to fine pixel manipulation
  - Aid to people with Special needs

- Negative Inertia
  - more precise
  - faster getting to object

Diagram:

- Hard to get moving
- Hard to get stopped

D pressure / D time
Towards a Behavioral Motor Match

- Placement
- Eye Tracking
- Wiggly Fingers
- Going Fast
- Movement Feedback
- Grippiness
- Mouse Lockout
Finger Control Everywhere!

In Keyboard Pointing
Remote Controls
Air Traffic Control
Surgical Instruments
Sightless Pointing
Prosthetics pointing
Steering
Two Handed
Industrial Controllers
Arcade Games
In Mouse Scrolled

TrackPoint
Pointing everywhere
Towards a Behavioral Motor Match

- Placement
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Select and Type

Sensors: 2d 3d, linear, eye motion...
Stable hands point better
Buttons mater too.
Why one?
User System Ergonomic Research
IBM Almaden Research Center
San Jose California

Physical,
Graphical,
&
Cognitive

Human Computer Interface
So many thing
Scrolling....
Does another input help?

[Bar chart showing various input methods and their ratings]

- Mouse
- WheelMouse
- JSMouse
- 2hand

Ratings:
- great 3
- very good 2
- good 1
- OK 0
- poor -1
- very poor -2
- terrible -3
HCI: Who Does What

- We must do enough...
  - technologies and methods
  - meet, know and be thy user
Desktop: was a place to concentrate

- Organize
- Bring Things Together
- Communication is Relationship
Abstractionist Practically Reinvents the Keyboard

By Laurie Hays

Staff Reporter of The Wall Street Journal

Surrounded by an alarming amount of clutter in his research lab, Ted Selker thrives on juggling ideas in his head. When he talks, he jumps from one notion to another, trading concepts and free-associating. After months and even years of this refining and revisiting, he's ready to prove they can come to life.

This is how the 38-year-old inventor, rock climber, bicyclist, sculptor and scientist at International Business Machines Corp.'s research center in San Jose, Calif., came up with a remarkable innovation for the computer keyboard. Dr. Selker created the TrackPoint, a tiny pointing device that looks like a pencil eraser, supplants the computer mouse and became a key selling feature of IBM's ThinkPad line because of its compactness and ease of use.

His invention, a fingertip device in the middle of the keyboard, was inspired after he read that it takes a person almost a full second to move a hand from the keyboard to the mouse, and almost a full second to move it back. He began thinking about dexterity and realized that after the tongue, the forefinger and thumb have the greatest sensory and motor control.

The idea crystallized 10 years later at IBM Research when somebody looking for a project asked if he had any ideas. "After the TrackPoint was done, I realized it was the first change to the keyboard layout in 100 years," Dr. Selker says. "Creativity happens by having this expanding thing head projector. That required slicing off the back of the screen in an experiment, but his bosses balked. So he bought his own ThinkPad and did it himself. A model featuring that unusual one. Tabled, too, is an electrical plug with retractable prongs that can fit into any outlet in any country; only 2% of ThinkPads are taken overseas, he says.

Dr. Selker says it sometimes feels like IBM is telling him something won't work, even when he's showing that it can. But it's his job to contemplate the impossible. That's the only way, he says, to help people regain the control over parts of their lives that technology is starting to take away.

"How do you make the world less confusing?" he asks. The flashing "12:00" on the VCR will be the least of people's worries, he says, unless he makes some progress. "It's really scary if you don't watch out. It's a horrific future if we're surrounded by technology that we don't understand."

So what does he have in mind? "Maybe a keyboard that is malleable, like clay, and you can feel everything you're doing," he says. "Maybe a keyboard that's a mil..."