

getting physical

- lots of physical devices around us
- many work very well
- many do not!

affordance

- Gibson
 - physical shape size suggest actions
 - e.g. size of cup affords holding
 - (some) door handles afford pulling
- Gaver, Norman
 - also cultural interpretations, learning
 - e.g. button affords pushing

physical-logical mapping

- do external physical aspects reflect logical effect?

logical state revealed in physical state?
e.g. on/off buttons

inverse actions inverse effects?
e.g. arrow buttons, twist controls

inverse actions

- yes/no buttons
 - well sort of
- 'joystick'
- also left side control



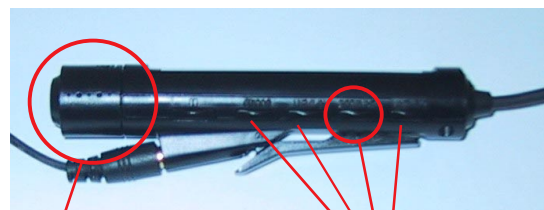
spring back controls

- one-shot buttons
- joystick
- some sliders

good – large selection sets
bad – hidden state



a minidisk controller



twist for track movement
pull and twist for volume
– spring back
– natural inverse for twist

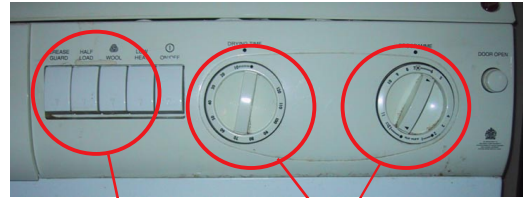
series of spring-back controls
each cycle through some options
–natural inverse back/forward

physical layout

controls:
logical relationship
~ spatial grouping



compliant interaction



state evident in
mechanical buttons

rotary knobs reveal internal
state and can be controlled by
both user and machine