

# One-Button Game

## Designing within tight constraints

### Brief

Your challenge is to make a game whose interface is limited to a single button.

A button has two states: pressed and released. How can you design a core game mechanic solely using the changes between these states? These actions could control movement (running, jumping, flying), an action (attacking, transforming), or a change in the environment (gravity, weather, friction). For multiplayer games, your system may use one button per player. You are encouraged to think beyond making a “runner” game—the most common one-button game mechanic, in which the player’s avatar jumps over pits and obstacles.

### Learning Objectives

- Design and realize a game within tight design constraints
- Discuss, differentiate, and appraise the range of game mechanics possible with a single binary input
- Develop an aesthetic or narrative treatment that supports the play experience

### Variations

- Keyboard emulators like the Makey-Makey allow the rapid construction of whimsical button controllers from household materials like bananas and Play-Doh. Using a keyboard emulator, construct a custom game controller that is part of a piece of clothing, furniture, or architecture.

- Convert a classic arcade game into a one-button game by “automating” (eliminating) interactions that are customarily under control of the player. For example, *Space Invaders* uses two sets of controls: one to move the player’s laser cannon back and forth, and another to fire at descending aliens. It can be changed into a one-button game by making the cannon move back and forth on an automatic schedule.
- Modify the problem scope so that your game uses continuously valued data from a single sensor, such as a slider, knob, photoresistor, or microphone.

### Making It Meaningful

The one-button game belongs to a classic category of games wherein user interaction is limited to a single binary input. As the popularity of *Tiny Wings* and *Flappy Bird* make evident, this category remains more relevant than ever, particularly in the context of small mobile devices. Yet today’s bountiful computational resources tend to encourage a focus on sumptuous audiovisuals, making it easy to overlook how strict design constraints can counterintuitively produce engrossing experiences. As Andy Nealen, Adam Saltsman, and Eddy Boxerman have observed, much can be done with simple inputs, narrow decision spaces, and minimal graphics, as they help focus a designer on “the most relevant rules, mechanics and representations of a system, while still providing for an intractably large possibility space.”<sup>1</sup>

Despite its minimal affordances, a single button can allow a surprisingly wide range of expressive interactions—and therefore, game design strategies—through the manipulation of timing. The duration of a button press, for example, can be used to regulate the amount of “energy” applied to a virtual game object (such as charging a battery or stretching a slingshot). A game mechanic may operate by counting how often a player presses the button within a unit of time (i.e., taps per second); measuring the precision of the player’s rhythmic sensibility (i.e., how accurately they can achieve a pulse of periodic taps); or quantifying the player’s feel for timing (whether their button taps are early or late, relative to another game event). Sequences of long and short button presses can even be used to communicate text through Morse code.

The provocative potential of the one-button game is unleashed when the controller is placed deliberately in the world and interpreted in new physical forms. As designers like Kaho Abe, Kurt Bieg, and Ramsey Nasser show, when attached to different parts of the body, novel multiplayer interactions can be choreographed and agilities tested. Taken together, these strategies outline ways in which a designer can savor tight constraints to make compelling and novel game play.



71	72	75
	73	76
	74	

### Captions

71. The popular mobile game *Flappy Bird* was released by Dong Nguyen in 2013. Tapping the screen boosts the flight of a small bird, keeping it aloft and helping it avoid obstacles as they scroll by.

72. Artist Rafaël Rozendaal, co-creator of *Finger Battle* (2011), writes: "The game is very simple: two players, tap as fast as you can, the fastest tapper wins." Each player is restricted to tapping in their own zone (blue or red). If a player taps faster than their opponent, their zone grows in size—making it easier to tap the screen, and accelerating the game to its conclusion.

73. In Major Bueno's *Moon Waltz* (2016), a single-button side-scroller, the player does not directly control the main character. Instead, the game's button performs a narrative function in a chain of cause and effect: pressing the button parts the clouds, which reveals the moon, which causes the main character to transform into a werewolf, enabling new modes of attack.

74. Jonathan Rubock's *One Button Nipple Golf* (2016) employs a tap-and-hold interaction and partial automation to control both the orientation and strength of the player's putt. Before the putt, a rotating indicator continually orbits around the tee; the player determines the orientation of their putt from this indicator by deciding when to press the button. The strength of the player's putt is then regulated by how long they hold the button down. The golf course is a landscape of human torsos, in which nipples are the golf holes.

75. Kaho Abe's *Hit Me!* (2011) is a physical, screenless game in which each player wears a button on their head. The objective is to tap your opponent's button before they tap yours.

76. Moving the button to a different location on the body, Kurt Bieg and Ramsey Nasser extend Abe's core game mechanic with richly suggestive play. In *Sword Fight* (2012), each player sports an Atari-style joystick strapped to their groin, with which they attempt to strike their opponent's action button. Awkward hilarity ensues.

### Additional Projects

Kaho Abe and Ramsey Nasser, *Shake it Up!*, 2013, two-player physical game.

Atari, *Steeplechase*, 1975, arcade game.

Stéphane Bura, *War and Peace*, 2010, online game.

Peter Calver (Supersoft), *Blitz*, 1979, video game for Commodore.

Bill Gates and Neil Kenzen, *DONKEY.BAS*, 1981, video game distributed with the original IBM PC.

Andreas Illiger, *Tiny Wings*, 2011, mobile game.

Kokoromi Collective, *Gamma IV Showcase: One Button Games*, 2009, one-button game competition website.

Konami, *Badlands*, 1984, laserdisc cowboy-themed shooter game.

Paolo Pedercini (Molleindustria), *Flabby Physics*, 2010, online game.

Adam Saltsman (Atomic), *Canabalt*, 2009, video game.

SMG Studio, *One More Line*, 2015, online and mobile game.

Phillipp Stollenmayer, *Zip-Zap*, 2016, mobile game.

### Readings

Barrie Ellis, "Physical Barriers in Video Games," *OneSwitch.org.uk*, accessed April 14, 2020.

Berbank Green, "One Button Games," *Gamasutra.com*, June 2, 2005.

Paolo Pedercini, syllabi for Experimental Game Design (CMU School of Art, Fall 2010–2020).

Paolo Pedercini, "Two Hundred Fifty Things a Game Designer Should Know," *Molleindustria.org*, accessed July 20, 2020.

George S. Greene, "Boys Can Have a Carnival of Fun with This Simply Built High Striker," *Popular Science* (September 1933): 59–60.

Katie Salen and Eric Zimmerman, *Rules of Play: Game Design Fundamentals* (Cambridge, MA: MIT Press, 2005).

### Notes

i. Andy Nealen, Adam Saltsman, and Eddy Boxerman, "Towards Minimalist Game Design," in *Proceedings of the 6th International Conference on Foundations of Digital Games* (ACM Digital Library, 2011), 38–45.