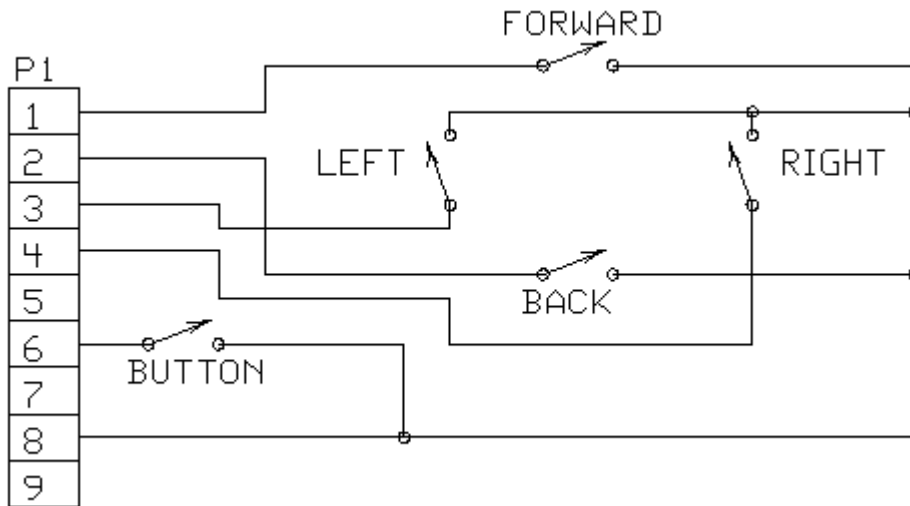


Digital Joysticks

The most common joystick type in home computers have been Atari-style digital joysticks. Those joysticks are called after Atari, because this joystick type was first introduced in Atari 2600 video game at 1977 and then adopted to the home computers introduced on ever since (VIC 20, Commodore 64, Amiga, MSX-computers and even Sinclair Spectrum joystick adapters used this joystick type).

The joystick itself consisted of five switches which are arranged so that four of them told about the joystick direction (UP, DOWN, LEFT, RIGHT) and one was for fire button. The joystick connector is 9 pin D-shell connector. Normally all of those switches are open, but when joystick is turned from the center position, one or two position switches are closed (according to what direction the stick is turned). The fire button worked so that it closes when button is pressed. All of the switches are connected between ground and corresponding signal pin of the joystick connector. On the picture below you can see a schematic of typical ATARI style joystick:



The nicest thing is that those joysticks were standard and there were joysticks available from many manufacturers quite cheaply. Unfortunately most of those joysticks broke down quite quickly because switches and mechanics were made cheaply. Arcade games and some high quality expensive joysticks used microswitches which guaranteed that the joystick switches will last for long time.

Because one button was not enough some video game and home computer manufacturers used the standard ATARI style joystick pinout, but added some extra button function to normally unused pins. Those extra buttons were just proprietary solutions which varied between different computers and game consoles.

Reading normal digital joysticks in typical home computers was very easy. Typically the joystick was connected to one digital input port which is mapped to processor memory or I/O space. Each of the inputs is mapped to one bit which changes state when the joystick switch is closed. This approach was for example used in Sinclair Spectrum and Commodore Amiga.