

Wireless Joypad for Sony PlayStation

Theory of Operation

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1. Joypad Side Radio Transmitter

Joypad side radio is a radio transmitter operates in the frequency range of 908.058 – 922.803 MHz. It is divided into 8 RF channels. It has a radio transmitter and a baseband processor. The baseband processor takes data from game controller, packetizes the data, and transmits them. When powered on, the baseband processor scans keystrokes on the joypad, packetizes the keystroke data, and transmits the command with the keystroke data to the Station Side Radio receiver at the data rate of 76.8 kbps. The transmitter has 8 dedicated channels which can be selected manually by the user via rotary switch. The joypad radio transmitter is powered by 4-AA size batteries and down regulated to 3.3V. The total average power consumption of the radio transmitter is about 12.7 mA at 3.3V.

2. Station Side Radio Receiver

The radio receiver is mainly composed of two parts: radio receiver, and baseband microprocessor. The radio receiver is interfaced with Sony PlayStation via a 9-pin connector via a baseband processor. The receiver receives keystroke data from radio transmitter described in Section 1, depacketizes the data, and sends the data to Sony PlayStation every 16 milliseconds. The radio receiver is a FSK receiver running at 76.8 kbps. Frequency is controlled by a frequency synthesizer which adjusts a voltage-controlled RF oscillator dynamically for accurate frequency management. Channel is set by selecting an 8-position slide switch. A total of 8 channels can be selected covering the frequency range of 908.058 – 922.803 MHz. The antenna is an embedded PCB antenna matching is done by using lumped inductors and capacitors. The radio is powered by a 3.3V power source provided by Sony PlayStation.