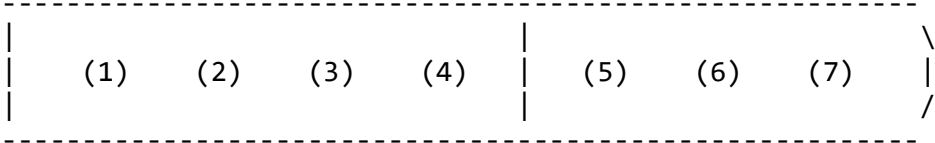


# Super NES Rumble Controller Support

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## 1. SuperNES Controller Port Pinout



- 1 VDD
- 2 Clock
- 3 P/S Out 0
- 4 4017 D0
- 5 4017 D1
- 6 IO Bit
- 7 Ground

## 2. Rumble Data Configuration

←----- Rumble Sentry -----→←----- Rumble Data -----→

0	1	1	1	0	0	1	0	R3	R2	R1	R0	L3	L2	L1	L0
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

### 3. Description of Data Formats

The Rumble Protocol uses two groups of data: 1) the “Rumble Sentry” Group and 2) the “Rumble Data” Group. Each group of data is eight bits wide.

The first group, the “Rumble Sentry” is a predefined bit pattern that is used to identify that the “Rumble Data” group is valid.

The second group, the “Rumble Data” is a sequence of 2 sets of 4 bits which indicate the intensity of rumble operations for the Right motor (low frequency) and Left motor (high frequency)

Each group of 4 Rumble Data bits comprise an intensity value from 0 to 15. Intensity value 0 means NO rumble and intensity value 15 means maximum rumble.

### 4. Theory of Operation

Every display field (1/60 second), the SNES hardware automatically reads the controller bits after Vertical Blank for approximately 215 microseconds.

When the P/S Out line goes high and then low you should clear the 16-bit shift register

After the automatic read of the controller bits has completed, the rumble protocol software will perform a sequence of 16 operations to transmit the rumble information. The 16 operations are comprised of 1 output bit followed by a clock transition to indicate that the hardware should read that bit.

After each strobe of the Clock Line, the hardware should shift the data bit into a 16-bit shift register.

After 16 strobes of the Clock Line, the upper 8 bits of the shift register contain the pattern 01110010 and the lower 8 bits of the shift register contain the rumble intensity values for the Right and Left motors.

If the upper 8 bits do not match 01110010 then nothing is done. Otherwise, the rumble motors are activated according to the intensity specified by the Rumble Data values.