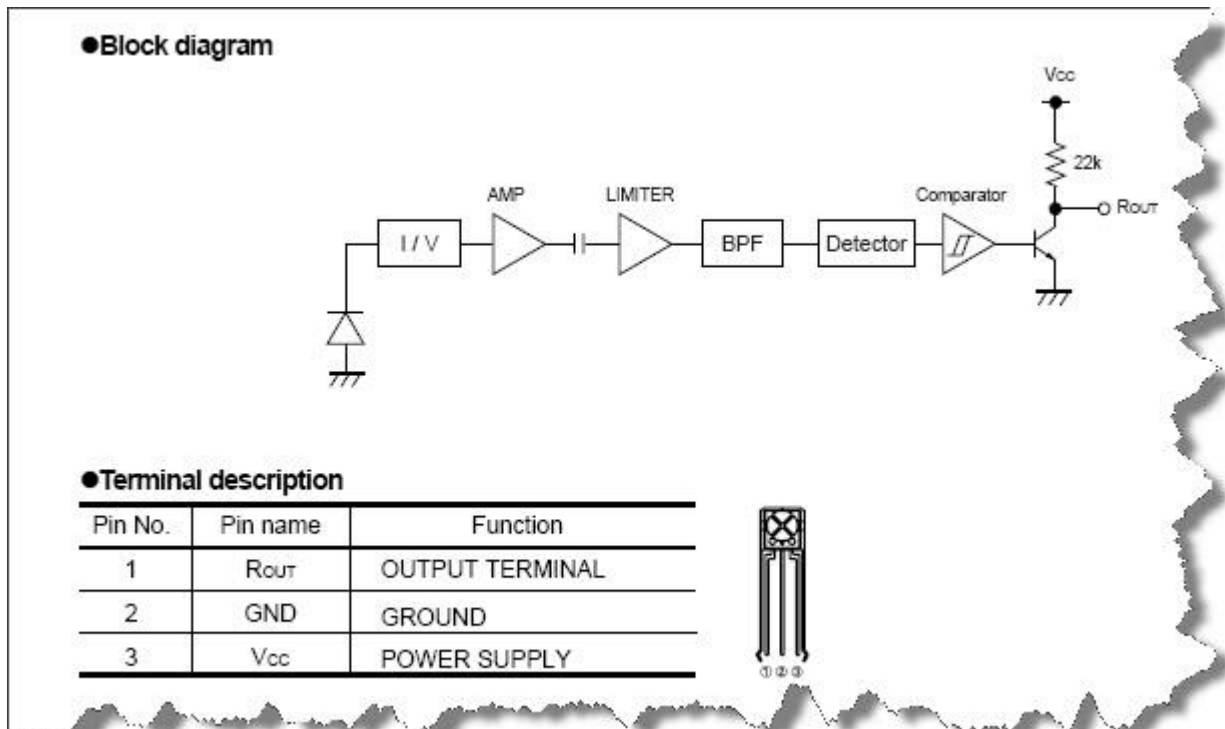


## SONY SIRC Protocol.

Infra-red remote control has been around for a very long time now. Each manufacturer uses different sets of protocols. For example, RC80 is used by Panasonic, RC5 is used by Philips, and SIRC is used by SONY, which is one of the simplest to decode.

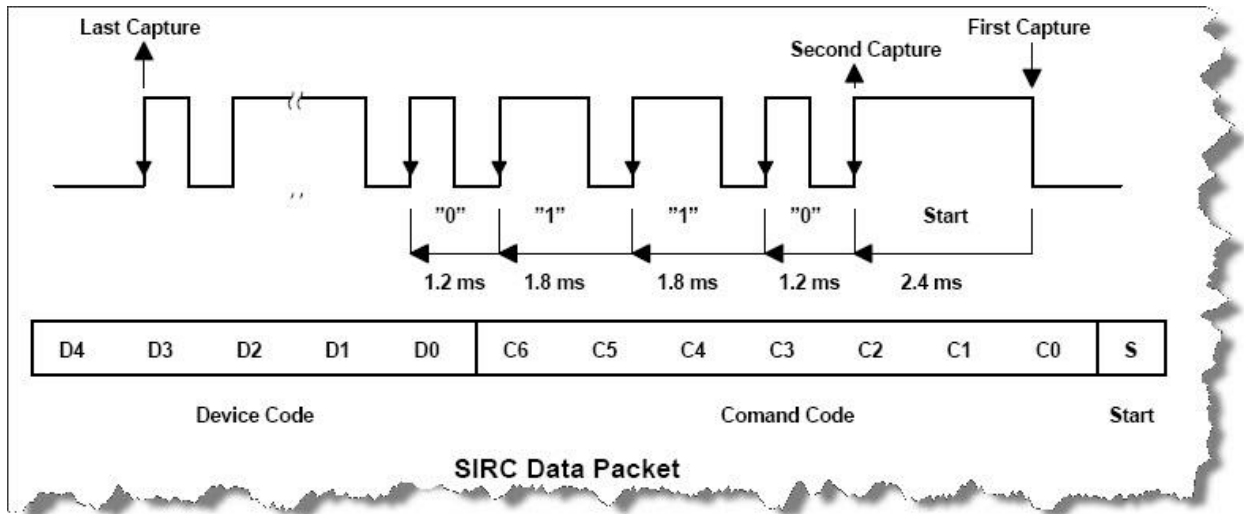
In order to eliminate ambient light sources from interfering with the data stream transmitted modulated light is used. This modulation is centered around different frequencies depending on the manufacturer and varies from 32KHz to 56KHz. In the case of SONY, the modulation center is 40KHz, which means we need an IR-receiver that can receive the modulated infra-red light and convert it to a TTL signal for a PIC. There are a number of IR-receivers available, each having a specific center frequency that they are more sensitive to. In this example, I use the RPM7140, which has a 40KHz center frequency. The figure shown below is the internal block diagram of the RPM7140.



Output (Rout) is normally high as you can see from the block diagram, it has a pull-up resistor that keeps logic high when no signal is present. When an infra-red signal is detected, the output is low.

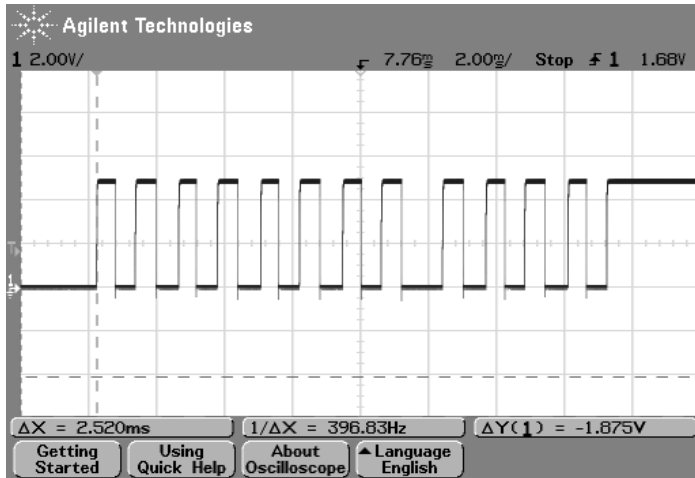
SONY protocol, SIRC (Serial Infra-Red Control) protocol is an infra-red light remote control communication that uses a form of pulse width modulation (PWM) to build a serial interface. The most common protocol is a 12-bit interface, but 15-bit and 20-bit versions are also available. The figure shown below is a series of pulses that build up a 12-bit packet.

The header is 2.4ms in length, logic 1 is 1.8ms (1.2ms high + 0.6ms low), logic 0 is 1.2ms (0.6ms high + 0.6ms low). The packet consists of a header, a command code (7-bit) which presents the actual button pressed on the remote control, and a device code (5-bit) which presents a TV, VCR, CD player, and etc. Those signals are inverted to Rout of the RPM7140. When the data is sent, there is a 45ms delay time before the next packet is sent and it is repeated for as long as the key is pressed. Table shown below is some list of key command codes for TV (Device code = 1).

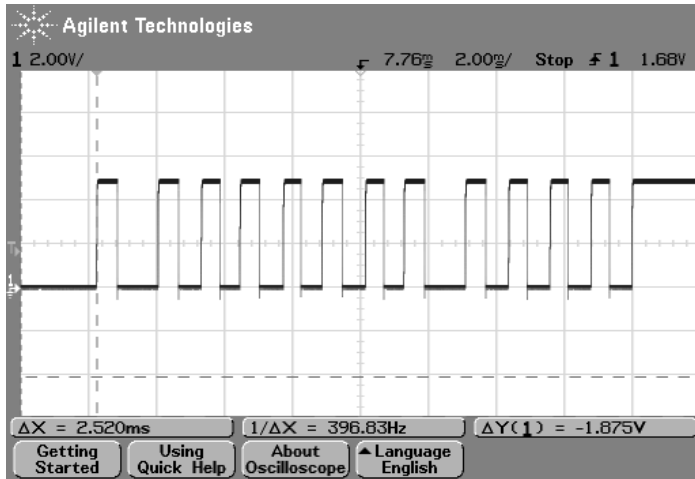


Command Code (Hex)	Function
0	Key 1
1	Key 2
2	Key 3
3	Key 4
4	Key 5
5	Key 6
6	Key 7
7	Key 8
8	Key 9
9	Key 0
0x10	Channel +
0x11	Channel -
0x12	Volume +
0x13	Volume -
0x14	Mute
0x15	Power
0x0B	Enter
0x25	Input
0x74	UP
0x75	DOWN
0x33	RIGHT
0x34	LEFT

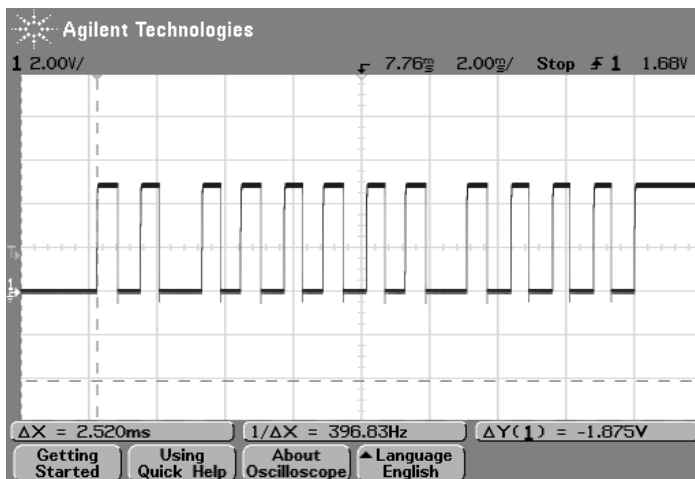
Sony '1'



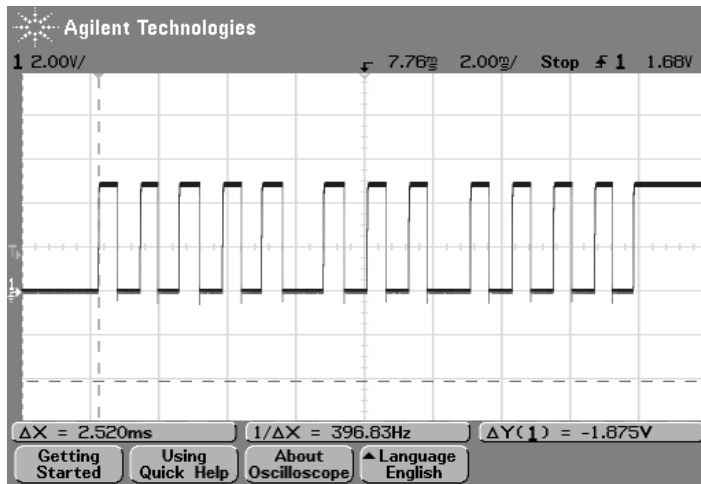
Sony '2'



Sony '3'



Sony 'Chan. UP'



Sony 'Chan. DWN'

