Reverse Engineered Notes

# Transmitter Serial Port

There is a ⅛” (3.5 mm)  stereo input jack on the remote transmitter.  The three inputs are +9Vdc, Data In, and Ground.  It appears that this will allow the device to be powered externally, and a signal injected into the transmitter circuit from an external source.  This should allow the transmitter to be hooked up to an external data and power source.  It has been reported that the jack disconnects the signal from the transmitter’s controller board, as well as bypasses the power down “Sleep” mode so the transmitter will stay active while on external power.

# Interfacing to the Receiver Port

The receiver module is connected to the main board by a 3 pin connector with 0.100” (2.54mm) spacing for the pin.  The connector is a locking connector, but a JST connector will work for the female end without modification.  The male end may need to have the locking tab removed from the JST connector.  
  
The Pins are VSW (+5VDC), Data Out, and GRD.  The output of the receiver is 5 Volt logic level and it goes directly into the CPU without external buffering.

# Command Format

Commands are sent via On-Off Keying the transmitted signal at specific intervals.  While the button is pressed, it transmits the same packet continuously every 29 milliseconds.  When the button is released, the packet is altered in a specific place to denote the termination of the signal.  
  
The Power/Stop button is an exception.  It repeats the same code every 21 milliseconds until it is released.  There is no difference between the Repeat and Terminate packets.  
  
The format is not currently decoded, so we will represent the outgoing signal as a binary code where each bit represents approximately 1.55 milliseconds and 1 is the presence of a transmitted signal, and 0 is the absence with the bits being read out from left to right.

# Transmitter Tokens

There are 25 buttons on the remote.  24 of them are in a 4 x 6 matrixed keyboard.  The last button, Power/Stop, is tied directly to the interrupt input, and will wake the remote after it has gone to sleep.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Row | Column | Repeat | Terminate |
| 0 | 1 | 1 | 0b10101000101 | 0b11010000101 |
| 1 | 1 | 2 | 0b10101000110 | 0b11010000110 |
| 2 | 1 | 3 | 0b11001000111 | 0b11110000111 |
| 3 | 1 | 4 | 0b10101001000 | 0b11010001000 |
| 4 | 2 | 1 | 0b11001001001 | 0b11110001001 |
| 5 | 2 | 2 | 0b11001001010 | 0b11110001010 |
| 6 | 2 | 3 | 0b11101001011 | 0b10010001011 |
| 7 | 2 | 4 | 0b10101010100 | 0b11010010100 |
| 8 | 3 | 1 | 0b11001010101 | 0b11110010101 |
| 9 | 3 | 2 | 0b11001010110 | 0b11110010110 |
| LAMP | 3 | 3 | 0b11101010111 | 0b10010010111 |
| HOME | 3 | 4 | 0b11001011000 | 0b11110011000 |
| NOTE REST | 4 | 1 | 0b11101011001 | 0b10010011001 |
| SHIFT OCTAVE | 4 | 2 | 0b11101011010 | 0b10010011010 |
| CLEAR | 4 | 3 | 0b10001011011 | 0b10110011011 |
| ENTER | 4 | 4 | 0b10101100100 | 0b11010100100 |
| NOTES | 5 | 1 | 0b11001100101 | 0b11110100101 |
| STATUS | 5 | 2 | 0b11001100110 | 0b11110100110 |
| SPEECH | 5 | 3 | 0b11101100111 | 0b10010100111 |
| MOTION | 5 | 4 | 0b11001101000 | 0b11110101000 |
| GAME | 6 | 1 | 0b11101101001 | 0b10010101001 |
| PROGRAM | 6 | 2 | 0b11101101010 | 0b10010101010 |
| LEARN | 6 | 3 | 0b10001101011 | 0b10110101011 |
| EXECUTE | 6 | 4 | 0b11001110100 | 0b11110110100 |
| Power/Stop | N/A | N/A | 0b1110111010100 | N/A |