**AT779-UV Mic to Radio Serial Protocol**

Mic interface uses an RJ45 Connector. Keypad and PTT button presses are sent from the Mic to the Radio via serial communication using pins 6 and 8 of the RJ45 connector. Data is also sent from the Radio to the Mic and used to control the color of the LED in the Mic.

### Mic Connector Pinout

|  |  |  |
| --- | --- | --- |
| **Pin** | **Function** | **Direction** |
| 1 | Gnd | - |
| 2 | NC |  |
| 3 | Mic Audio | Mic to Radio |
| 4 | Mic Audio Gnd | - |
| 5 | NC |  |
| 6 | Rx Data | Radio to Mic |
| 7 | +5v | Radio to Mic |
| 8 | Tx Data | Mic to Radio |

### Serial Format:

115200 Baud – 8 Data Bits, No Parity, 1 Stop Bit

### Serial Commands

Pressing the various buttons on the mic results in the following byte strings (shown here in Hex representation) to be sent to the radio. Four different cases exist.

1. When the button is initially pressed
2. When the button is held pressed (long press)

For most buttons, the ‘Hold’ byte string is sent only once if the button remains pressed (i.e. for a ‘long press’). The exceptions being the Up and Down buttons where the byte string is repeated as long as the button remains pressed. This allows for continuous up/down changing of channel or frequency.

1. When the button is released
2. PTT is a different case, where there is no ‘Hold’ byte string transmitted.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Key** | **Press Hex** | **Hold Hex** | **Hold Rpt** | **Release Hex** |
|  |  |  |  |  |
| 0 | 41 00 01 00 01 00 00 06 | 41 00 01 01 01 00 00 06 | No | 41 00 00 00 01 00 00 06 |
| 1 | 41 00 01 00 02 00 00 06 | 41 00 01 01 02 00 00 06 | No | 41 00 00 00 02 00 00 06 |
| 2 | 41 00 01 00 03 00 00 06 | 41 00 01 01 03 00 00 06 | No | 41 00 00 00 03 00 00 06 |
| 3 | 41 00 01 00 04 00 00 06 | 41 00 01 01 04 00 00 06 | No | 41 00 00 00 04 00 00 06 |
| 4 | 41 00 01 00 05 00 00 06 | 41 00 01 01 05 00 00 06 | No | 41 00 00 00 05 00 00 06 |
| 5 | 41 00 01 00 07 00 00 06 | 41 00 01 01 06 00 00 06 | No | 41 00 00 00 07 00 00 06 |
| 6 | 41 00 01 00 07 00 00 06 | 41 00 01 01 07 00 00 06 | No | 41 00 00 00 07 00 00 06 |
| 7 | 41 00 01 00 08 00 00 06 | 41 00 01 01 08 00 00 06 | No | 41 00 00 00 08 00 00 06 |
| 8 | 41 00 01 00 09 00 00 06 | 41 00 01 01 09 00 00 06 | No | 41 00 00 00 09 00 00 06 |
| 9 | 41 00 01 00 0a 00 00 06 | 41 00 01 01 0a 00 00 06 | No | 41 00 00 00 0a 00 00 06 |
| A | 41 00 01 00 1a 00 00 06 | 41 00 01 01 1a 00 00 06 | No | 41 00 00 00 1a 00 00 06 |
| B | 41 00 01 00 1b 00 00 06 | 41 00 01 01 1b 00 00 06 | No | 41 00 00 00 1b 00 00 06 |
| C | 41 00 01 00 1c 00 00 06 | 41 00 01 01 1c 00 00 06 | No | 41 00 00 00 1c 00 00 06 |
| D | 41 00 01 00 1d 00 00 06 | 41 00 01 01 1d 00 00 06 | No | 41 00 00 00 1d 00 00 06 |
| Up | 41 00 01 00 10 00 00 06 | 41 00 01 01 10 00 00 06 | Yes | 41 00 00 00 10 00 00 06 |
| Down | 41 00 01 00 11 00 00 06 | 41 00 01 01 11 00 00 06 | Yes | 41 00 00 00 11 00 00 06 |
| PTT | 41 01 00 00 00 00 00 06 | N/A | N/A | 41 00 00 00 00 00 00 06 |

### Keepalive

The hex byte 06 (0x06) is sent by the Mic to the Radio as a ‘keepalive’ approx. every second and appears in the byte string for many of the commands

### Examples of byte strings sent when various buttons are pressed

*Note: Line breaks are used here for readability and are not present in the data sent*

“A” button pressed and immediately released (short press)

41 00 01 00 1a 00 00 06

41 00 00 00 1a 00 00 06

“A” button pressed and held for approx.1 sec (long press)

*41 00 01 00 1a 00 00 06*

06

41 00 01 01 1a 00 00 06

06

41 00 00 01 1a 00 00 06

“A” button pressed and held for approx. 5 sec (longer press)

41 00 01 00 1a 00 00 06

06

41 00 01 01 1a 00 00 06

06

06

06

41 00 00 01 1a 00 00 06

“UP” button pressed and held for approx. 5 sec

41 00 01 00 10 00 00 06

06

41 00 01 01 10 00 00 06

41 00 01 01 10 00 00 06

41 00 01 01 10 00 00 06

41 00 01 01 10 00 00 06

41 00 01 01 10 00 00 06

41 00 01 01 10 00 00 06

41 00 01 01 10 00 00 06

41 00 01 01 10 00 00 06

41 00 01 01 10 00 00 06

41 00 01 01 10 00 00 06

41 00 01 01 10 00 00 06

41 00 01 01 10 00 00 06

41 00 00 01 10 00 00 06

PTT pressed and held for approx. 5 sec

41 01 00 00 00 00 00 06

06

06

06

06

06

41 00 00 00 00 00 00 06

### Responses from Radio

Notes:

1. All responses are sent by Radio with a pause between each byte – a 512 Byte response takes approximately 5 seconds. At a serial link speed of 115200 bps this should take 40 ms
2. There are no ‘keepalives’ sent from the Radio to Mic
3. Mic has three-bar LED display which is Red on Tx and Green when squelch is open. The Red or Green state of the LED is based serial data from the radio (and this was validated using a simple Arduino sketch to control the LED).

When any button on keypad is pressed

Radio returns the two bytes:

aa aa

When the PTT is pressed and held for a couple of seconds

Radio returns:

aa

53 00 00 01 00 00 00 00 00 5c 00 00 00 00 00 06 << PTT Pressed

aa

53 00 00 00 00 00 00 00 00 5c 00 00 00 00 00 06 << PTT Released

53 00 00 00 00 00 00 00 00 5c 00 00 00 00 00 06

53 00 00 00 00 00 00 00 00 5c 00 00 00 00 00 06

53 00 00 00 00 00 00 00 00 5c 00 00 00 00 00 06

53 00 00 00 00 00 00 00 00 5c 00 00 00 00 00 06

53 00 00 00 00 00 00 00 00 5c 00 00 00 00 00 06

53 00 00 00 00 00 00 00 00 5c 00 00 00 00 00 06

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53 00 00 00 00 00 00 00 00 5c 00 00 00 00 00 06

53 00 00 00 00 00 00 00 00 5c 00 00 00 00 00 06

53 00 00 00 00 00 00 00 00 5c 00 00 00 00 00 06

Fourth byte appears to be set to 0x01 when PTT is active – this sets the LED in the Mic to Red

When the Squelch is opened for approx. 2 secs then closed

Radio returns:

53 00 01 00 00 00 00 00 00 5c 00 00 00 00 00 06 << Squelch Opened

53 00 01 00 00 00 00 00 00 5c 00 00 00 00 00 06

53 00 01 00 00 00 00 00 00 5c 00 00 00 00 00 06

53 00 01 00 00 00 00 00 00 5c 00 00 00 00 00 06

53 00 01 00 00 00 00 00 00 5c 00 00 00 00 00 06

53 00 01 00 00 00 00 00 00 5c 00 00 00 00 00 06

53 00 01 00 00 00 00 00 00 5c 00 00 00 00 00 06

53 00 01 00 00 00 00 00 00 5c 00 00 00 00 00 06

53 00 01 00 00 00 00 00 00 5c 00 00 00 00 00 06

53 00 01 00 00 00 00 00 00 5c 00 00 00 00 00 06

53 00 00 00 00 00 00 00 00 5c 00 00 00 00 00 06 << Squelch Closed

53 00 00 00 00 00 00 00 00 5c 00 00 00 00 00 06

53 00 00 00 00 00 00 00 00 5c 00 00 00 00 00 06

53 00 00 00 00 00 00 00 00 5c 00 00 00 00 00 06

53 00 00 00 00 00 00 00 00 5c 00 00 00 00 00 06

53 00 00 00 00 00 00 00 00 5c 00 00 00 00 00 06

53 00 00 00 00 00 00 00 00 5c 00 00 00 00 00 06

53 00 00 00 00 00 00 00 00 5c 00 00 00 00 00 06

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53 00 00 00 00 00 00 00 00 5c 00 00 00 00 00 06

53 00 00 00 00 00 00 00 00 5c 00 00 00 00 00 06

53 00 00 00 00 00 00 00 00 5c 00 00 00 00 00 06

Third byte appears to be set to 0x01 when squelch is open, this sets the LED in the mic to Red. Then 0x00 when it is closed which turns the LED off