

AIR CHAT USER GUIDE

Launching the program:

1. Determine the interface the serial port is connected to:

`dmesg | grep tty`

Look for the output with the device named **cp201x converter**

in most cases, it will be **ttyUSB0**

2. Run the Air Chat GUI by typing
`python3 airchat_gui.py /dev/ttyUSB0`

(substitute ttyUSB0 with the mounting point on your machine if it is different)

Once launched, the following GUI will appear, and can be used to send/receive messages:

username (3-16 characters) **Username input**

Gimli

chatroom/talkgroup channel

Channel 0-4

config

8 channels:
00 - 07 are 2FSK
10 - 17 are 00K

Configuration button, used to upload to the radio

AIR CHAT INTERFACE

Received messages

Configuration settings: username - Gimli | channel - CH04
Aragorn: If by my life or death I can protect you, I will. You have my sword!
Legolas: And you have my bow!
Gimli: AND MY AXE!

Message input

TX button

transmit text input (1-192 characters)

send

RF Parameters

- 16 channels broken up into 8 2FSK and 8 OOK
- Each channel is spaced 200 kHz
- CH 00 starts at 913.05 MHz
- For 2FSK, the signal frequency deviation is 25 kHz
- Baud rate is 9600 for FSK and 4800 for OOK
- Power level is approximately 0 dBm at the antenna port

Protocol

The protocol is the same for both 2FSK and OOK. Each packet is variable length up to 192 ASCII characters.

The basic structure is shown in the figure below:

PREAMBLE (8 Bytes) - 0xAA				
Start of Frame (4 Bytes) - 0xD3 0x91 0xD3 0x91		PKT LEN	TYPE	SN LEN
DATA				
DATA				
END 0xFF				

- **Preamble:** 8 bytes long, composed of alternating 1's and 0's (0xAA)
- **Start of frame sequence:** 4 bytes, 0xD3 0x91 repeated
- **Packet length:** 1 byte, integer packet length¹
- **Type:** 1 byte, packet type. RF messages will always be 0x02. Integers 0x00, 0x01, and 0x03 are reserved for internal control data.
- **Screen name length:** 1 byte, integer length of the user chosen screen name
- **Data:** variable length, ASCII message data
- **End of data sequence:** 1 byte, always 0xFF

¹ Packet length starts at the "TYPE" byte

Example TX

Username: "rns"

Message: "test"

0xAA	0xAA	0xAA	0xAA	0xAA	0xAA	0xAA	0xAA
0xD3	0x91	0xD3	0x91	0x0A	0x02	0x03	0x72
0x6E	0x73	0x74	0x65	0x73	0x74	0xFF	

Packet length: 0x0A (decimal 10)

[1 byte type, 1 byte SN length, 3 bytes screen name, 4 bytes data, and 1 byte end of data sequence]

Type: 0x02 (RF message)

SN Length: 0x03 ("r", "n", "s",)

Data: ASCII values ("r", "n", "s", "t", "e", "s", "t")

End: 0xFF

Dependencies

sudo apt-get install python3-serial python3-pyqt5

user must be part of the "dialout" group:

sudo adduser USERNAME dialout

where USERNAME is the user to add to the group