Ham 45E – ASL Firmware: Audio Adjust

Dr. Marc & Rosemary © 230201

1. System: AllStarLink beta 2.0, MastersCommunication RL-20/RA-42, Baofeng UV.
2. Once all the hardware is connected, plug in power. Start AllStarLink on another device. Is the node for other device and Raspberry validated in AllStarLink.org.
3. Tx and Rx are the audio out and audio in to the interface, and consequently the node radio.
   a. If the node radio receives Rx, it pulls the COS line active (low) to trigger DB9-3. The audio in (Rx) from DB9-6 passes through pot R9/12 before entering the DSP mic input. The DSP redirects audio data to the computer. Externally, the speaker from node radio is wired to mic/audio in (Rx).
   b. If the computer takes PTT active (low), it triggers DB9-5 to the node radio. The DSP redirects the input data from computer to the audio out (Tx) on DB9-2. Externally, the audio out (Tx) signal is wired to the node radio mic.
4. Options for USB radio set-up depend on carrier-on-switch (COS) source.
   a. SimpleUsb is for interfaces with COS available from the radio / mic. This is preferred.
   b. UsbRadio uses lot of CPU processing to simulate COS and CTCSS decode.
5. The audio levels must be adjusted to match the radio connected.
   a. Each radio design has different impedance particularly on their mic input (interface TX). The levels out of speaker vary with volume setting (interface RX).
   b. The radio circuits respond differently with external loading and discriminator/detector circuits.
6. Adjusting audio levels involves both software and hardware. Simplex is tedious.
   a. Most hams do not have service instruments. Use a separate radio to provide Rx and Tx signals for adjustments. It may not be perfect, but make adjustments to sound good.
   b. Repeaters have a discriminator output, so level is unaffected by volume control.
7. Simplex node radio audio to the interface board Rx depends on the volume level. Three things are interrelated.
   a. Set simplex volume control, so that it is consistent the next time the node radio is turned on. Try to set as low as practical, about 1/8 turn CW.
   b. Set the Rx pot (R9/12) CCW to near cut-off. Rotate slightly a few degrees, again about 1/8 turn CW.
   c. Set the Rx voice level in software to 200 using step 8 below.
   d. Unfortunately, the volume knob will vary each time the radio is turned on, so all the settings are kaput.
   e. If you get reports of your mic being too hot, turn down the simplex node receiver volume knob slightly. If you see COS toggling on and off, but you do not hear a signal, then the Rx settings are also too hot.
8. DTMF tones also arrive through the Rx level from the node receiver to the DSP. If Rx is too high or too low, the tones will not decode properly.
9. To set Rx levels: *PuTTY > Login > ASL Main Menu > 4 – Run simpleusb-tune-menu*.
   a. Select *E) Toggle Echo Mode* to hear audio play back. I heard nada. Toggle off when finished.
   b. Select *2) Set Rx voice level*.
   c. The display has a marker for 3kHz and 5kHz deviation.
   d. Transmit a tone or speak consistently from the separate radio. The node radio will receive and display.
   e. The display should show greater than 3, but less than 5 kHz. On simplex, a level of 200 is about right.
   f. *W) Write, 0) Exit*.
10. To see decode: *ASL Main Menu > 5 – Asterisk CLI*.
    a. CLI displays the status of the Asterisk software. Each tone, hang-up, and command is shown in plain language.
    b. Transmit the tones from the separate radio. They will display. If not, tweak the levels using the above sections.
    c. If you dial the tones too fast, they will not have time to process.
    d. (*exit*) or (*quit*) will leave.
11. To set the Tx levels, go back to: *ASL Main Menu > 4 – Run simpleusb-tune-menu*.
    a. TxA = interface pin 2, left main audio, TxB = interface pin 1, right tone. Tx is the voice sent from the node.
    b. Select *3) Set TxA level*.
    c. Key separate radio mic, press *712, release. Time should play back on separate radio speaker.
    d. Adjust level number. About 55 is pleasing. Below about 50, nothing gets transmitted. Above 70 is distortion.
    e. Select *4) Tx B*. Set level to 0. Stereo is unused.
    f. *W) Write, 0) Exit*.
12. If no transmit, check *simpleusb.conf*. Set *TxmixA = voice*. Set *TxmixB = no*. More *.conf in another article.
13. Life is good. Enjoy!