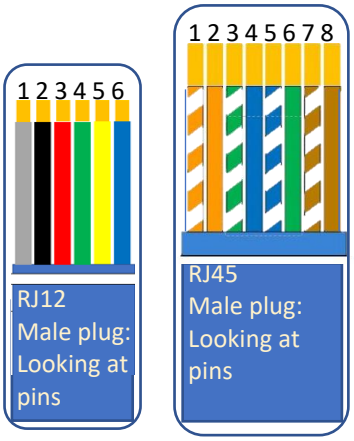
Ham 46D– ASL Radio: Local Node Wireless Solderless

Dr. Marc & Rosemary © 230122

1. Why a local node without a radio? As a maker ham, because you can is adequate reason.
   a. There is another greater purpose. With a local node controller, you can listen to activity across the node.
   b. But more importantly, the local DTMF microphone can do all the control options of a normal radio.
   c. In essence, a complete node for linking, talking, or any other purpose operates without the expense and complexity of two more radios and the nuisance of power supplies. Ultimately, it is just cool.
2. For an interface between the Raspberry Pi and the local controller, use the same board as the SIMPLEX node. USB from the Pi feeds the interface, which in turn has a DB9 female connector for audio connections.
3. Solder a jumper on the board to provide 5V from the board to the DB9-7, which will provide microphone power.
4. The microphone can be your choice as long as it has a DTMF keypad, but its pinout will be different.
   a. The recommended microphone has a modular connector, for ease of wiring.
   b. Create a cable from a RJ45 or RJ12 female socket to the DB9 male plug. Use Standard T568B colors on plug.
   c. Connect the mic PTT line from the audio cable to the interface COS on TB9-3.
   d. When mic PTT is pressed, COS goes active low. In other words audio Rx can come in.
5. Conventional microphones use RJ45 male with an 8Vdc power need. The available power from the board is 5V.
   a. Alinco EMS-57 is preferred. It is 5V, but has 8-pin mic connector. Either cut of end or make adapter.
   b. Although tones work, unfortunately they are not audible.
   c. A TYT TH-9800 mic requires only 5V. It has a RJ12 male, but the numbering is opposite from telco & Japan.
   d. Apparently every site on the web is repeating reverse numbering of TYT. From disassembly, this is the pin out.
   e. The TYT tones have not worked, yet.
   f. Caution: Knock-offs do not use standard colors. Go by pin number to find colors to connect.
6. Audio out (Tx) is on DB9-2. When connecting the audio cable, add a second wire from DB9-2 for a speaker jack.
   a. The audio common is ground. Add a second wire from DB9-8 for the speaker jack sleeve.
   b. A 3.5mm (1/8") female socket with TRS (tip-ring-sleeve) is the preferred socket.
   c. A single speaker from a stereo set may have audio on the ring.
   d. Connecting a powered speaker gives audio output for the node controller.

DB9	RL 20 Function	Speaker	Alinco	Alinco	adapt	TYT	TYT	adapt
1		3.5T red						
2	audio out (Tx) to speak	3.5R wht						
3	COS in from mic PTT		2&7	orange&blk	Blue&yel	1	red	red
4								
5	PTT out							
6	audio in (Rx) from mic		1	yellow	green	2	wh	yellow
7	5VDC solder pad to mic		5	red	red	4	blue	black
8	Ground. bondto gnd lug	3.5S blk	8	grey	black	3	braid	green
9								



7. If a solderless DB9 is used, the project requires no soldering skills.
   a. After trying a variety of adapters, the easiest is a RJ45 /RJ12 female socket with cable to DB9 male.
   b. Connect ground wires at DB9-8. Bond pin 9 to the ground lug by pin 6.
8. The complete link Node consists of a Pi, interface, audio crossover cable, mic, and a powered speaker.
9. Open AllStarLink on a separate device on a different network. i.e. phone on cell. Connect to the node to hear sounds..
10. To set Rx levels from mic: *PuTTY > Login > ASL Main Menu > 4 – Run simpleusb-tune-menu*.
    a. Select 2) Set Rx voice level.
    b. Transmit a tone or speak consistently from mic. The node will display.
    c. The display should show greater than 3, but less than 5 kHz.
    d. W) Write, 0) Exit.
    e. It may be necessary to adjust pot R9 to increase mic gain.
11. Life is good. Enjoy!