1. One of the secrets of a successful AllStarLink node is the construction of the crossover audio cable.
   a. Our objective is to make the construction simple for anyone with a wire stripper.
   b. Cable construction can be a frustration for even the most skilled maker.
   c. It does not have to be. It no longer is. Solder not required.

2. A little out of the box thinking and using the wide array of available products makes construction straightforward. Tools needed are simple.
   a. A wire stripper for AWG 26 or smaller wire plus an insulation cutter.
   b. A small screwdriver usually comes with the connector. That is it.

3. Parts start with DB9 (D-sub) male non-solder breakout connector. Cost ~ $7.
   a. Acquire a pre-manufactured cable having one end that fits the device.
   b. From the pre-manufactured cable, cut off the unneeded end.
   c. Strip wires. Tinning (solder coating) is beneficial, but not necessary.
   d. Place under the terminals of the DB9 and tighten. You are now a maker. Congratulations.

Screwdriver   Stripper   DB9 Breakout
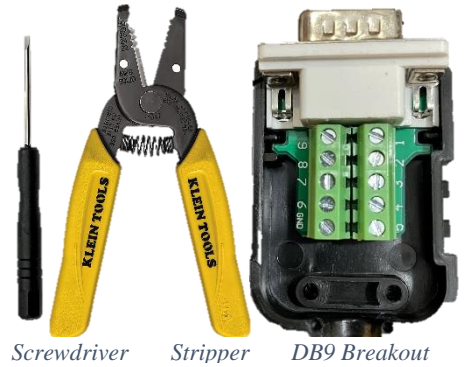
4. Conventional microphones use RJ45 male with an 8Vdc power need. But, the available power from the board is 5V.
   a. An Alinco EMS-57 mic requires only 5V with a shielded cable & 8-pin round mic connector.
   b. A TYT 7800 is also 5V with a RJ12 modular connector. We still have issues with making its tones work.

DTMF mic   RJ45 female   3.5mm stereo socket   Powered speaker

| DB9	RL 20 Function	Speaker	Alinco		knockoff
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
4					
5	PTT out				
6	audio in (Rx) from mic		1	yellow	green
7	5VDC solder pad to mic		5	red	red
8	Ground. Bond to gnd lug	3.5S blk	8	grey	black
9					
gn	Gnd lug		8	shield	

5. *Local / Link* digital radio node uses a powered speaker and a mic, 5V DTMF with shield preferred.
   a. If mic is not Alinco style 8-pin round, acquire an Ethernet extension cable with RJ45 or phone extension with RJ12 female.
   b. Get an audio repair cable with 3.5mm (1/8") female TRS (tip-ring-sleeve) stereo socket.
   c. A DB9 solderless connector is the only other item.
   d. Cut off the opposite end of the Alinco or extension. Look at pin numbers to decipher colors.
   e. Strip wires, feed through strain relief of DB9. Screw down to pins.
   f. Alinco pin 7, mic E, connects to cable shield. Jumper to 3. If noisy move to 8.
   g. Be sure to bond from pin 8-Ground to the gnd lug by pin 6.
   h. Find an Elmer to solder one thing, a jumper on the board from 5VDC to terminal 7 pad.
   i. Adjust mic volume: First the screw, then the software according to the Elmer card.

Baofeng   K-head plug

6. *Simplex / Link* node uses a radio which has a COS (carrier-on-switch) signal available.
   a. Baofeng UV are common radios with the capability.
   b. These radios have a K-head (K-1) connector.
   c. Acquire an inexpensive Baofeng mic with the proper plugs. Uncoiled is easier. Cost ~ $8.
   d. Obtain a 2N7000 FET and a 4.7K resistor to make a COS switch and buffer. Cost ~ $1.
   e. A DB9 solderless connector is the next item.
   f. Remove the cable from the mic. Dispose of the mic.
   g. Strip wires, feed through strain relief of DB9. Screw down.
   h. Add the FET – resistor combination under the same DB9 screws with the wires.
   i. Cover bare wires with heat-shrink or tape to prevent touching.
   j. The radio duty cycle is 100%. Lower power setting by half to reduce heating.

DB9	RL 20 Function	Radio	FET
1	stereo not used		
2	audio out (Tx) to mic	3.5-r	
3	COS in from FET		Drain - D
4			
5	PTT out	3.5-s	
6	audio in (Rx) from speak	2.5-t	4.7K to gate
7	5VDC solder pad		
8	Ground. Bond to gnd lug	3.5-s	Source - S
9			

2N 7000 031

S G D

note flat side

NM0D

6
4.7K
G
3 — COS
D S
8 — Gnd
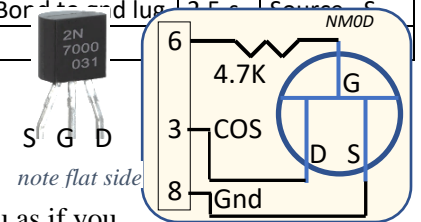
7. If you live where the local repeater is not dependable or you just want to operate on a node someplace else, a simplex or local digital link will connect you as if you are in the same room. Your node is a digital extension of the repeater.

8. Life is good. Enjoy!