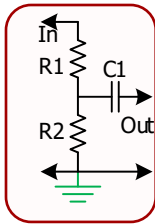


Ham 46A – ASL Radio: Interface
 Dr. Marc & Rosemary © 221211

1. AllStarLink is a system to connect radios, computers, and sound together.
 - a. However, the energy levels between different devices varies.
 - b. Typically, a speaker operates at volts with a power rating in watts and an impedance about 8 Ohms.
 - c. Conversely, an electret microphone (mic) is at millivolts with an impedance of 600 – 800 Ohms.
 - d. Since we are taking a speaker output to connect to a mic input, something has to give.
 - e. A speaker signal has to be attenuated and impedance matched before connecting to a mic.
 - f. The mic signal must be amplified before it can be reasonably heard.
 - g. The mic is DC powered, so a capacitor is required to remove that hum from the speaker AC signal.



2. A typical circuit is shown in the schematic and with calculations.



$$\begin{aligned}
 R_2 &= 8 \\
 R_1 &= 800 - 8 = 792 \\
 V_{in} &= 792 I_{in} \\
 V_{out} &= 8 / 800 V_{in} = 0.01 V_{in} \\
 V_2 &= 8 * I_{out} \\
 V_{in} / V_{out} &= 800 / 8 = 100 \\
 dB &= 20 \log_{10} (100) = 40 \text{ dB}
 \end{aligned}$$

3. A sound card or FOB plus this circuitry must be injected between the Pi and radio.
 - a. In addition, timing circuitry, PTT, and COS must be included.
 - b. For the skill level of many hams, this is past their soldering ability.
 - c. Even those of us with the skill, a custom design is expensive. I spent over \$1000 developing an interface and making prototypes, not including the time. It is good to have an agreeable wife.
 - d. A kludge can be built by modifying a Syba FOB, but that is not an acceptable choice on a heavily used repeater.
4. A better choice is a combination sound card / radio adapter like those by Kevin Custer at www.MastersCommunications.com.
 - a. The site gives myriad options from solder yourself to completely tested.
 - b. He is perhaps the most knowledgeable repeater builder on the web. www.RepeaterBuilder.com
5. The photo at right is the PA-42 with a connector and added COS buffer transistor for a specific radio. That is a clean install.
6. Life is good. Enjoy!

