A Proposal for an ARES Standard Headset

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Following on a letter from Douglas McCray K2QWQ in the June 2016 QST here is a proposal for an ARES standard Headset connecctor.

The ARES Powerpole DC connector is now well understood, accepted and deployed.

There are a countable number of RF connectors on the backs of our radios.

But, as Douglas said, what about the microphone?

This is the most complicated connector to standardize so it's not surprising that's it's the last.

But can we do it?

Here is proposal based on work we are doing at San Luis Obispo Emergency Communications Council www.sloecc.org.

First a description of the problem. There are lots of different mic connectors, some easy to get like the RJ series, some much harder. There are a wide range of levels, from about -60 to about -20 dBm. In addition there are several different PTT schemes. Some mic elements need power, some don't. Some mics have lots of extra functions.

What about using MY headset? I really like the way it fits, looks, sounds. I paid a lot of money for it,. I want to use it when I go a served agency to help out. At the present time each person with their own headset needs a "fleet" of adapters.   Some of us use home brew adapters that aren't as professional looking as they might be. When the existing, radio specific, mic is unplugged you lose any special functions available on the mic. When you have you headset plugged in and take a break someone else has to put on YOUR headset to answer that call that came in while you are away. Finally many served agencies are not going to be happy with you unplugging and plugging things in on THEIR radio.

What about an interface that supports both the native mic and an ARES std headset? It could do audio switching based on whether the PTT on the head or the mic was activated. You only have to have one adapter from your headset to the ARES standard. The Served Agency only has to buy one interface.

What are the challenges?

The first is level. Our testing indicates that mic output levels range from -60 to -20dBm. The old Motorola/Aviation/Telephone headset mics are "carbon equivalent" and all three have outputs around -20dBm. If we pick this as the standard we get a couple of advantages. The first is that all the interfaces need only a resistive divider and possibly an audio isolation transformer. No electronics to get damaged or to become suspect in the interface. Any amplification, if needed is done in the adapter that stays with the headset.

The second is that when you want to test your headset you can plug it in (with only a wired adapter) to a plain old telephone replacing the handset. If it works there, it will very likely work when you get where you are going.

What about a connector? The RJ45 computer connection has enough wires as we will see shortly. It's readily available and not very expensive.

Here are the pin assignments we are using/proposing. This assumes telco standard pin count. Hold the connector so the cable is down and the pins face you. Pin 1 is on the left.

1   Current limited 12VDC for amplifier if needed.

2   PTT pull to ground

3   Mic Lo

4   Receiver 1 Hi

5   Receiver Common for both Receivers

6   Mic Hi

7   Gnd

8   Second Receive Audio (for stereo headsets)

The center 6pins (2-7) match commercial telephone headsets with PTT like the Plantronics CA10CD or a PTT handset so those 6 pin cables will plug in directly.

The interface then has a relay to swap the audio from the default mic to the headset. The interface also does any translation of the pull to ground PTT to what the radio requires. Other, special connections to the default mic pass thru. Finally interface provides DC for the carbon equivalent mic.

We have deployed this arrangement on several Motorola Mobiles with great success. The schematic and other supporting information is available at www.sloecc.org/headsets.

Our next step is to build an interface for an Alinco radio that is common in our Emergency Communication Centers and try the headsets there.

In summary, we propose a standard where only one interface is required, and stays connected to the target radio. "Normal" microphone stays connected and available including it's special functions. Interface provides an empty (unless the agency provides headsets) RJ45 socket for the visiting headset. The owner of a headset only needs at most, one additional adapter. If the owner adopts the scheme at their home station then no extra adapter is needed. The standard connector is the ubiquitous RJ45 8-wire connector with the male on the headset and the female on the radio interface.

Have more than one radio that the headset needs to connect to? There are several passive RJ45 switch boxes on the market at reasonable prices. I use two push button 1x4 boxes on my test setup. The boxes are connected common port to common port. One box has 4 different test headsets connected. The other box has my VHF and UHF Motorola radios and my IC-706 radio connected. Two button pushes and I have connected any of 4 headsets to one of the 3 radios. No cable swapping and no level issues.

If you like, don't like, or have improvements to this idea we have setup a survey monkey to get your feedback.

Please visit https://www.surveymonkey.com/r/LLPYVBJ and give us feedback.

Looking forward to feedback on this proposal for an ARES Standard Headset system.

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