

1. HHI Contesting Console, User's Guide

Thank you for purchasing the Halibut Electronics **HHI Contesting Console**!



Note: Images in this version of the User Guide are from pre-production hardware. Where the image silkscreen differs from the documentation, the **documentation is correct**. This is most notable in the labels of the volume knobs. As of 2023-11-08, I'm still working on getting updated images of production-run hardware and will update the User Guide when those are available.

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3. Introduction

The **HHI Contesting Console** is a device that connects two users to one radio. For example: a logger and an operator in a contest (hence the name.) Or an Elmer and a student, etc.

The users have an intercom between them so they can hear each other without taking their headsets off. They can both hear the radio, and whichever user presses their PTT, their microphone audio is sent to the radio. See [Section 5](#) for a full list of HHI Contesting Console's features.

This User Guide will:

- Provide an overview of the HHI Contesting Console.
- Explain how HHI Contesting Console fits into a larger OHIS ecosystem.
- Help you troubleshoot any problems you might experience.

Note: The HHI Contesting Console, like all HHI products, works with OHIS compliant User devices (like headsets) and Radio devices (like ... radios). If your headsets and radios are not already OHIS compliant, they will require adapters, such as the [HHI Radio Pro](#) and [HHI User Pro](#) (any OHIS compliant adapters will work), to make them OHIS compliant. See [Section 5.2](#) for more details on the OHIS compliant ecosystem.

4. Document History

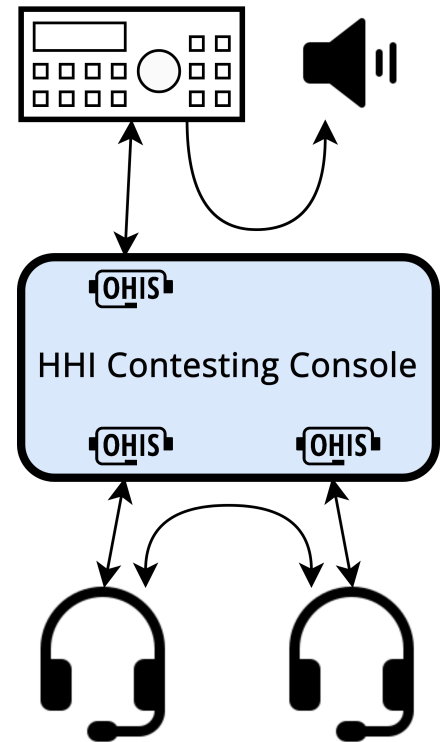
- 2023-11-07, v0.1: Initial draft.
- 2023-11-08, v1.0: First release, for v1.3a devices.

5. About the HHI Contesting Console

The **HHI Contesting Console** is a device that connects two OHIS compliant User devices (such as headsets) to one OHIS compliant Radio device (such as ... a radio).

The features of HHI Contesting Console are:

- **Intercom:** The users have an intercom between them, so they can talk without having to take their headsets off.
- **Radio Receive:** Both users can hear the radio's receive audio.
- **Radio Transmit:** When either user presses their PTT, their microphone audio is sent to the radio. So either user can operate the radio.
- **Independent Controls:** Each user has their own four channel mixer to set the volumes in their own headset, independent of the settings of the other user. The four channels are:
 1. Radio: The radio's receive audio
 2. Intercom: The other user's mic
 3. Your Mic: For optional side-tone
 4. Ambient: A built-in microphone to listen to the immediate environment
- **Observers:** If an observer (not one of the two users) wants to listen to the radio, Contesting Console has a powered "Radio Speaker" port to connect an external speaker (not included).



5.1. Why use the HHI Contesting Console?

I designed the HHI Contesting Console for my local club to use at ARRL Field Day. We often have two users: an Operator, and a Logger. The Operator is the one talking on the radio, working the pile-up. The Logger listens along, logging the received call sign, section, and class.

Note: Since both user ports are the same and either user can transmit, we refer to both users as "operators."

The primary feature of the Contesting Console is the intercom between the two operators. Often times, the Logger and Operator have to confer with each other



to make sure they both heard the remote station correctly, or discuss plans for hunt-and-pounce, changing bands, etc.

The Radio Speaker port allows observers walking by to listen to radio receiver, as well as the operators, so they can hear the entire exchange. Or, they can turn down the volume on the Radio Speaker port to minimize noise.

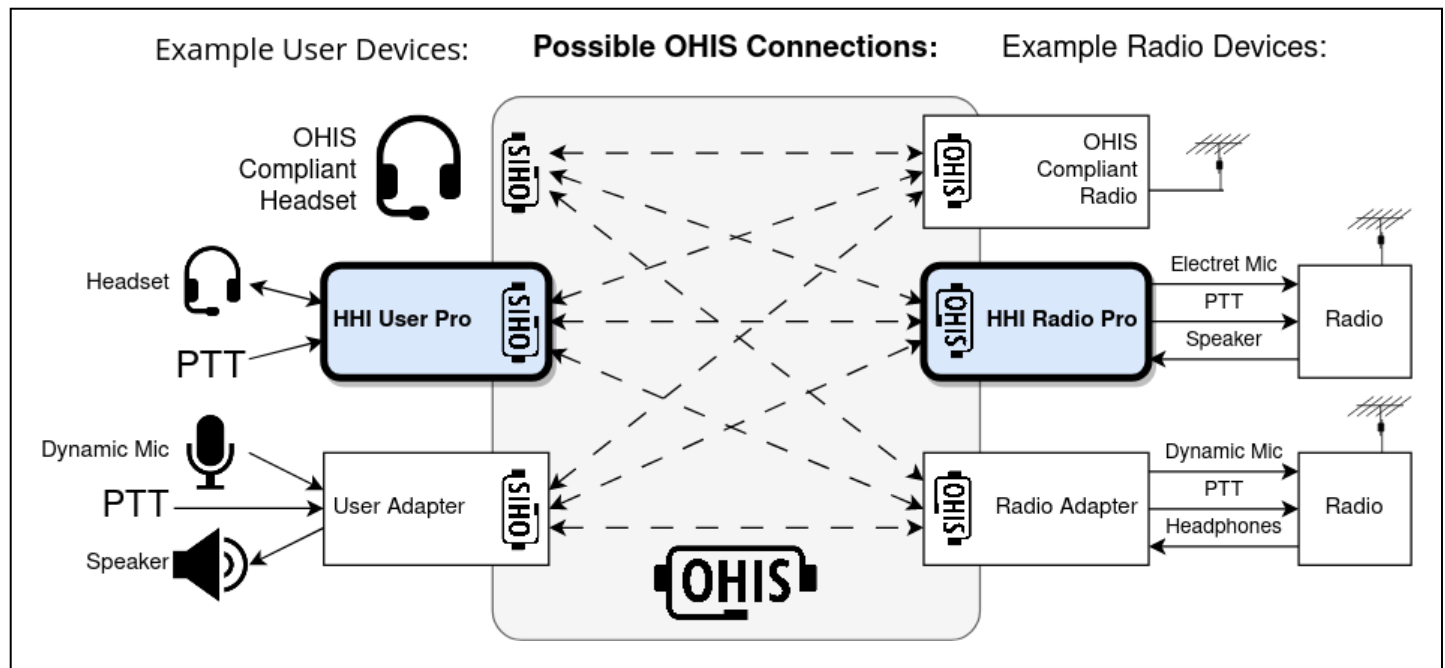
The Ambient Microphone allows the operators to mix in some of the sound going on around them so they're not entirely cut-off from the real world. Or they can turn down the ambient microphone if they *want to* cut-off the distractions around them.

5.2. About OHIS and HHI

What are OHIS and HHI? How are they different? How are they the same?

5.2.1. Open Headset Interconnect Standard

The **Open Headset Interconnect Standard** (OHIS) is an open standard ("Free Like Speech") that defines the physical and electrical connections between a radio and headset. It does *not* specify the design or function of the devices themselves (such as the HHI Contesting Console), only the connections.



By working with OHIS-compliant radios and headsets (or radios and headsets connected to OHIS-compliant adapters), you can easily connect devices and immediately start operating without needing to build or buy an adapter that's specific to the pairing of those two devices.

This makes it simpler to design products that go between the user and the radio, such as the HHI Contesting Console. Now that device need not worry about what type of microphone the user is using, or whether the radio outputs a speaker level or headphone level, etc. All of that is standardized by OHIS.

For more details on OHIS, see <https://ohis.org/>.

5.2.2. Halibut Headset Interconnect

The **Halibut Headset Interconnect** (HHI) product line are devices made and sold by Halibut Electronics that use the OHIS standard.

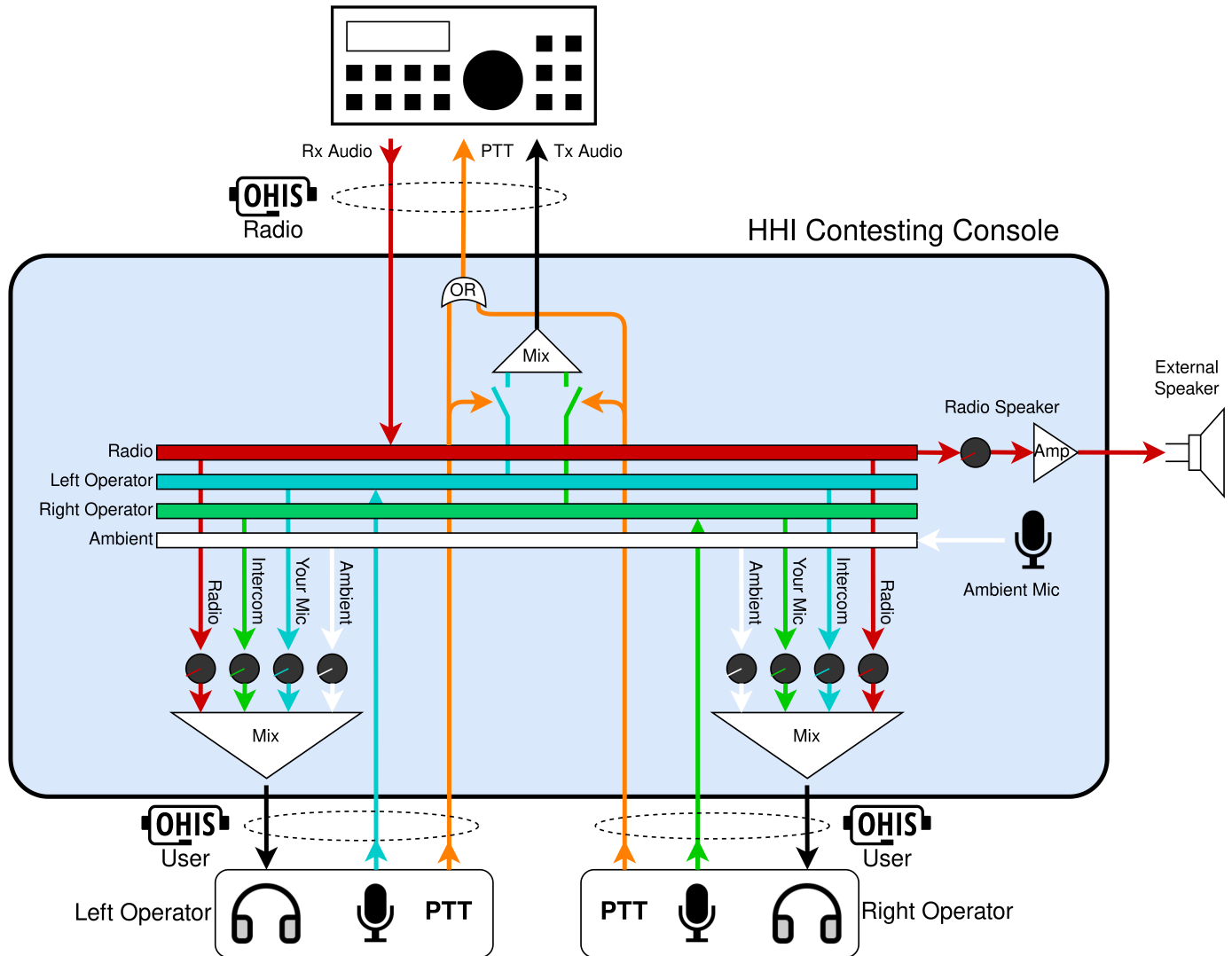
The HHI Contesting Console uses OHIS standard ports to connect two users to one radio. Using OHIS greatly simplifies the Contesting Console since there is only one type of audio interface the radio and headsets have. The Contesting Console doesn't have to be configured or modified in any way for the specific radio or headsets.

6. Using HHI Contesting Console

HHI Contesting Console is very simple to connect and use. There is no Configuration required, other than each user setting their own preferred volumes.

6.1. What does this thing actually do?

This is a detail diagram of where all the signals come from, where they go, and how they're used.



It can be considered in the following parts:

1. Each user has their own four channel mixer that feeds their headphones, so they can select what they want to hear, irrespective of what the other user is hearing.
2. The four inputs to the mixer are: (Locations assume the console is placed between the two users, and each user connects their headset to the OHIS User port closest to them.)
 1. **Radio**: The red knob closest to the user sets the volume of the radio's receiver in their headphones.

2. **Intercom:** The second knob is always "the other operator." The color represents which user: Blue for the Left Operator, and Green for the Right Operator.
 3. **Your Mic:** The third knob is always the mic audio of the immediate user. Again, the color represents which user: Blue for the Left Operator, and Green for the Right Operator. This adds some side-tone in their headphones, to prevent them from yelling.
 4. **Ambient:** The white knob furthest from the user, closest to the center, sets the volume of the built-in Ambient microphone.
3. Which user's mic audio sent to the radio is selected by which user's PTT is being pressed.
 4. The Radio Speaker has its own volume knob that feeds an audio power amplifier to drive an external speaker (user provided). It does not mix any other audio, it ONLY plays the radio receive audio.

6.2. Connecting All The Things

6.2.1. Power

HHI Contesting Console can get power from two different sources.

6.2.1.1. Preferred: Anderson Powerpoles

HHI Contesting Console is normally powered by an external 13.8vDC +/- 15% power source, and draws at most 500mA (including down-stream OHIS User device current draw). It will actually support anything from 11vDC to 20vDC.

There are two Anderson Powerpole connectors on HHI Contesting Console. They are both connected in parallel with each other, and through a fuse to Contesting Console. The idea being that you can "pass through" power in one Powerpole and out the other, so HHI Contesting Console doesn't consume a port on your distribution panel.

TODO: Measure actual power handling of power passthrough. Theory says 20A to 25A should be safe (10C rise at 25C ambient: trace is .325" wide, .325" long, all layers 1oz/.5oz/.5oz/1oz four layer board), but verify.

6.2.1.2. OHIS Radio Port Vcc

Alternatively, HHI Contesting Console will also work when powered by the OHIS Radio Port. However, the audio performance may be degraded, and the Radio Speaker power amplifier is disabled when only powered by OHIS Radio Port.

If you experience audio problems when powered only by the OHIS Radio port, connect the HHI Contesting Console to 13.8vDC power through the Anderson Powerpole port.

6.2.2. OHIS Connections

OHIS cables are shielded twisted pair cables, with 8p8c Modular (aka RJ-45) connectors. Halibut Electronics resells "[OHIS Cables](#)", but any common off-the-shelf "shielded Ethernet cables" works.

The category of the cable is not important; Cat5, Cat5e, Cat6, Cat7, etc... They'll all work. OHIS is all low frequency audio, not high frequency RF, so even telecom grade Cat3 cables would work, as long as they're shielded. Shielded Cat3 isn't common though; shielded Cat5 is usually the "lowest grade" cable you can find that will work.

6.2.2.1. Radio

Connect the "OHIS Radio" port to an OHIS compliant Radio device, such as the [HHI Radio Pro](#). (Any OHIS compliant Radio device will work.)

6.2.2.2. Operators

Connect the Left and Right Operator "OHIS User" ports to OHIS compliant User devices, such as [HHI User Pro](#). (Any OHIS compliant User device will work.)

6.2.3. Radio Speaker (Optional)

Optionally, connect an external unpowered speaker to the Radio Speaker 3.5mm port, tip and sleeve. The speaker should be between 4 and 16 ohms, and must be rated for at least 2W.

Warning: The speaker is *NOT* ground referenced. Both tip and sleeve are driven. I don't recommend you connect this speaker output to any device other than a speaker. If you do, make sure you use an isolation transformer or some other balanced input that can handle a positive DC bias voltage from ground.

6.3. Operation

Using the HHI Contesting Console is simple.

6.3.1. Users

Each user has their own volume control for each of four audio sources: the radio, the other user's mic, their own mic, and the "ambient" mic. Each user adjusts their volumes however they prefer.

The intercom does not require PTT. Both users can hear each other all the time (assuming the volume is turned up.)

When either user presses their PTT, their microphone audio is sent to the radio and the radio is keyed up. Assuming only one user presses their PTT at a time, the other user's microphone is NOT sent to the radio. If both users press the PTT at the same time, both user's mics will be mixed and sent to the radio.

6.3.2. Radio Speaker Volume

There is a separate volume knob for the Radio Speaker. When an external speaker is connected to the Radio Speaker port, that knob will control the volume of the radio's receive audio in that speaker. No other audio can be sent to the Radio Speaker output.

7. Troubleshooting

7.1. Audio feedback in headphones

Situation:

- Contesting Console is being powered by the OHIS Radio connection, and is NOT connected to the Anderson Powerpole power source.
- When a user turns up their own microphone, it starts to feedback and hum very loudly. Turning down the microphone makes the hum go away.

Solution:

- Power the Contesting Console from 13.8vDC on the Anderson Powerpoles.
- If you have the same problem when powered by 13.8vDC, please contact Halibut Electronics Support at <https://electronics.halibut.com/contact/> and provide details of your situation.

7.2. External Radio Speaker isn't playing any audio

Situation:

- Contesting Console is being powered by the OHIS Radio connection, and is NOT connected to the Anderson Powerpole power source.
- An external speaker is connected to the Radio Speaker port.
- When an observer turns up the Radio Speaker volume, no audio is heard from the external speaker.

Solution:

- The Radio Speaker amplifier is only powered by the 13.8vDC coming in the Anderson Powerpoles, not by the OHIS Radio port (which doesn't supply sufficient current.)
- Power the Contesting Console from 13.8vDC on the Anderson Powerpoles.

8. FAQ

Please send your questions to <https://electronics.halibut.com/contact/> and we'll add them here.