AUDIOARTS ENGINEERING

AML Radio Console

AZALEA

TECHNICAL MANUAL

January, 2025

Attention!

Federal Communications Commission (FCC) Compliance Notice:
Radio Frequency Notice

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This is a Class A product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take appropriate measures.

This equipment must be installed and wired properly in order to assure compliance with FCC regulations.

Caution! Any modifications not expressly approved in writing by Wheatstone could void the user's authority to operate this equipment.

Attention!

IMPORTANT SAFETY INSTRUCTIONS

THIS PRODUCT IS INTENDED FOR INDOOR USE ONLY

When using an electrical appliance, basic safety precautions should always be followed.

DANGER - To reduce risk of electric shock read all instructions before using this power supply.

A power supply should never be left unattended when plugged in.

Always unplug this power supply from the main socket immediately after using.

WARNING - To reduce risk of burns, fire, electric shock or injury to persons or animals:

1. Use this power supply only for its intended use as described below.
2. Do not use outdoors.
3. Do not allow to be used as a toy. Pay close attention when this power supply is used by, or near to, children.
4. Use only attachments recommended by the manufacturer.
5. Never operate this power supply if it has a damaged cord or plug, if it has been dropped or damaged or if it has fallen into water. In such cases return the power supply to an authorized dealer or service center for examination or repair.
6. Never drop or insert an object into any openings.
7. Do not operate where aerosol (spray) products are being used or where oxygen is being administered.
8. This power supply should be located near a convenient and easily accessible mains socket.

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Introduction to the AML

AZALEA

Installation and Power

Console Overview

The AML AZALEA Radio Console is an eight-channel, self-contained analog radio console. It is meant to be used stand-alone; it does not require Wheatstone Blades in order to function.

The console has the following components:

Fader Channels—There are eight fader channels on the AML AZALEA. Each has two PGM bus assign buttons, ON and OFF buttons and a button to assign the fader channel to the CUE bus. The first two channels are mono microphone inputs. Channels 3 through 6 are “line” inputs, switchable for professional (+4) or consumer (-10) input levels via DIP switches. Channel 7 is a special “Caller” channel designed to interface to a telephone hybrid to allow for recording and airing phone calls. Channel 8 is a USB channel, which is ideal for connecting a computer such as a VoxPro computer, playout system or an internet PC for example.

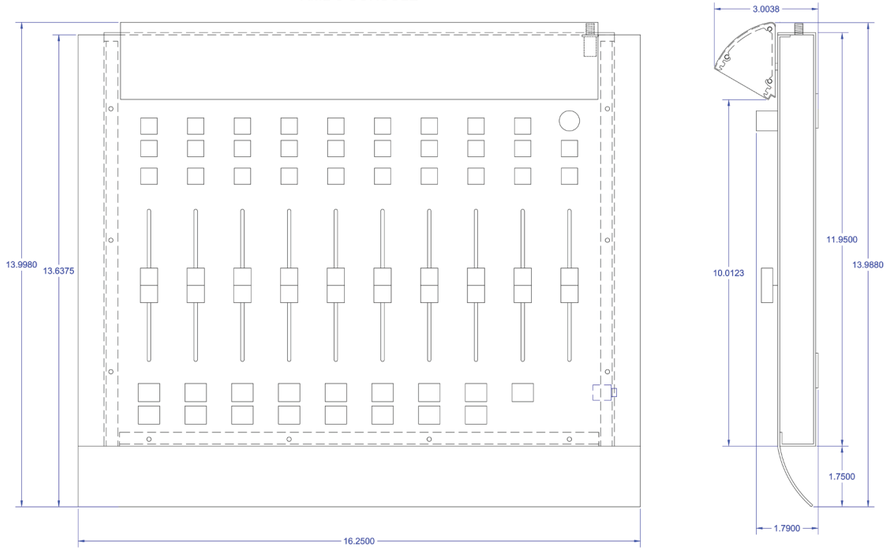
Monitor Controls—The AML AZALEA includes level controls for the Control Room monitor speakers, headphones and Cue; CR Monitor Source selector and Talkback buttons.

Audio Busses—The AML AZALEA has two Program Busses and a mix-minus bus that can be fed to the phone hybrid.

Outputs—The AML AZALEA features outputs for the PGM 1 and 2 busses, control room speakers, a 1/8” stereo jack for headphones, an output for an external cue speaker, logic outputs for an ON-Air light tally signal, and machine start signals for channels 3, 4, 5 and 8. There is also a Guest output for driving a headphone amp to provide headphones for guests.

Meter Bridge—The AML AZALEA’s meter bridge features two stereo LED meters, each displaying audio levels for one of the two PGM busses.

AML-8 CONSOLE



Unpacking and Installing the AML AZALEA

Unpack the console, removing all the packing materials and store these in the box for future use. Inside the box you will find the AML AZALEA console, power supply and power supply cable as well as a Documentation page with a QR code and link. Save this colored sheet of paper as this is where you’ll go to download this manual and any other documentation related to the AML AZALEA console.

Carefully place the console on your countertop. The rubber feet on the bottom keep the console from being too easily moved when placed on the counter.

Avoid proximity to electromagnetic fields such as large power transformers, motors and floures-cent fixtures to avoid interference with the mic input channels.

Console Measurements

The overall length of the AML AZALEA console is 16.25” (41.275 cm). Depth (front to back) is 13.6375” (34.64 cm) including the wrist rest at the front. The meter bridge extends slightly behind the back panel of the console.

Power Supply

The AML AZALEA Console is powered by the Wheat-stone HPS-516 multipurpose power supply. The power supply provides +16 VDC to the AML AZALEA via a supplied cable with two DC power connectors. The HPS-516 is a half-rack-width unit that can be rack-mounted using the RU1-K rack mount kit.

The power supply should be placed near the console and plugged into an outlet that provides “clean” AC power; that is, an AC source that only provides power to control room audio gear. (See next section “Energizing” before connecting the power supply to the outlet.) An outlet on a circuit that also powers lighting, HVAC or other machinery is not acceptable for powering the AML AZALEA. Ensure that the third pin (ground wire) of the AC power connector is tied to the central system ground point of the radio station.

Energizing

Before connecting the power supply to the AC outlet, connect the power supply to the rear panel of the console using the supplied DC power cable. Ensure that the connectors on each end are securely hand-tight-ened. Now plug the power supply into the AC outlet and the console will power up and assume factory-default settings.

Once you have confirmed that the console powers up correctly, remove the power and proceed to begin making your audio and control connections.

IMPORTANT

Never de-energize the console by disconnecting the power connector from the rear panel of the console. Always disconnect from the AC power mains first, then remove the power cable from the console if necessary.

Audio and Control Wiring

All audio I/O connections are made via RJ-45 and USB connectors on the rear panel of the console, and Phoenix connectors on the Mic Preamp section.

Wiring Diagrams

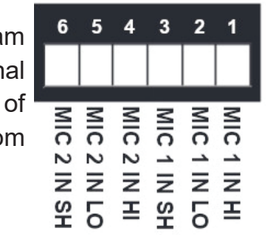
Audio Connections

At right is a wiring diagram for RJ-45 audio connections. These connections use standard RJ-45 connectors and CAT5 or better twisted pair ethernet cable. It’s the tight twist in the cable pairs that rejects noise in this arrangement, which allows the use of this cable for balanced audio. Wiring is shown for both balanced connections (professional, usually +4dBu) and unbalanced (consumer, usually -10 dBu).

STUDIOHUB+ WIRING	
RJ45 PIN (WIRE)	**SIGNAL**
1 (WHT/ORG)	Left/Mono + (balanced) Left + (unbalanced)
2 (ORG)	Left/Mono - (balanced) Ground (unbalanced)
3 (WHT/GRN)	Right + (balanced) Right + (unbalanced)
6 (GRN)	Right - (balanced) Ground (unbalanced)
4,5,7,8	No Connection

Suggested wiring for unbalanced devices is shown, but if possible, we recommend using a matching device when connecting an unbalanced source to the AML AZALEA, or when connecting the AML AZALEA to an unbalanced destination.

The console’s two microphone inputs are wired as shown in the diagram at right. Use shielded microphone cable to connect to the Phoenix terminal block provided with the console. The diagram at right shows the pinout of the connector on the rear of the console. Note the pins are numbered from right to left when viewing the connector on the rear of the console.



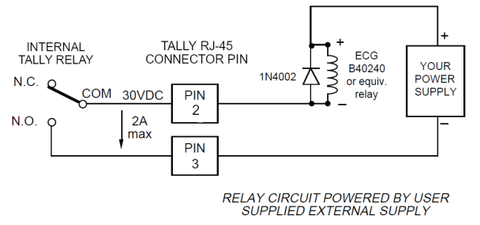
Tally/Logic Connections

Logic connections for the AML AZALEA include the following outputs and are made using CAT5+ or better cable with an RJ-45 connector:

RJ-45 Pin	Signal
1	Ground
2	Tally
3	Tally
4	Line 1 Machine Start Cmd
5	Line 2 Machine Start Cmd
6	Line 3 Machine Start Cmd
7	USB Machine Start Cmd
8	+5VDC

TYPICAL MONITOR ON-AIR TALLY CIRCUIT

USER-SUPPLIED RELAY TRIGGERED BY CONSOLE MONITOR MUTE CIRCUIT



RELAY CIRCUIT POWERED BY USER SUPPLIED EXTERNAL SUPPLY

All machine start outputs are open collector and are active low. The tally signal is an opto-isolated set of “contacts” that can be used to drive a user-supplied low-voltage relay to control one or more on-air lights.The Tally “closure” becomes active when a mic channel is turned ON or placed in CUE. It follows the TALLY LED on the console’s meter bridge. Use this closure to drive an external user-provided relay. Do not bring any on-air light AC connections directly to the console tally output. See typical wiring diagram above.

Output pins 4 through 7 will go low for .5 sec when the ON button for the Line 1, Line 2, Line 3 or USB channels is pressed. These outputs are provided so that a Remote Start function can be implemented for whatever audio device is connected to these inputs. The connected device must support the Remote Start function and must accept a contact closure or active-low signal.

It is expected that a computer will be connected to the USB input, thus some provision must be made to get the Machine Start signal into the computer in a way that can be read by the audio software that you are using on the computer. There are many switchers and logic I/O devices that you can choose from to turn the logic signal output from the AML AZALEA into a start command for your audio playout software or your VoxPro audio editing system.

Getting to Know the AML AZALEA

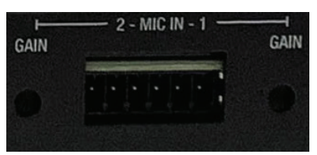
As mentioned, the AML AZALEA Console has eight inputs, all analog except for the USB input. In this section, we will discuss each type of input and output individually. Refer to the photo below or your AML AZALEA for the following discussion.

Console Inputs

Microphone Inputs

The first two inputs are microphone-level inputs. Connections are made via a 6-position Phoenix connector. Use a small straight-blade screwdriver to secure these connections.

The AML AZALEA includes two microphone preamps and the inputs are factory trimmed at approximately -54dBu. There is a gain trim pot for each microphone input next to the mic input connectors. This will allow you to adjust for varying levels of output depending on the microphones you are using.

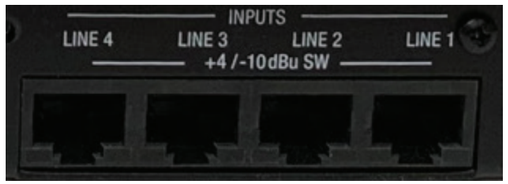


Example: with a microphone input of –60dBm @150 ohm at the port, gain trim can set levels from -22dBu to +16dBu (note maximum preamp gain is +76dB) at the PGM 1 or PGM 2 output.

Line Inputs

Inputs 3 through 6 are stereo analog “line” inputs. These inputs are selectable between a +4 dBu professional input level and a -10 dBu consumer input level. The DIP switches that select the input level are found

on the bottom of the console. Use a small flat-blade screwdriver to select +4 or -10 for each line input as needed. The input connections use the standard StudioHub wiring scheme shown in the Wiring Diagrams section above.



The first three Line inputs include machine start capability to send a .5 second pulsed “Start” logic signal to an external device such as a turntable, CD player or playout system. Remote Start pulses appear on the Tally/Logic RJ-45 connector on the AML AZALEA’s rear panel. See the section “Tally/Logic Connections” on page 4 for details on wiring the remote start logic.

Caller Channel

Input 7, the Caller Channel, is designed to make it easy to interface a telephone hybrid with the AML AZALEA Console. Simply connect the analog output of your telephone hybrid to this channel, and connect the console’s MXM (mix-minus) output back to the analog input of the hybrid and you are ready to air phone calls. Note that the Caller Input and MXM outputs are both mono. See the section called “Working with the Caller Channel” on page 11 for more info on how this channel helps you take callers live to air, record callers and talk to them off the air.

External Input

The External Input is an analog input for monitoring an external source such as off-air radio receiver or Sim Air/Fake Air from an audio processor. It could also be used to monitor audio from a satellite receiver or another control room or production room. Whatever your on-air jock or board-op might need to monitor from time to time can be connected here and can be quickly monitored on the control room speakers.

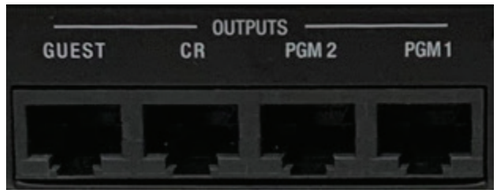
USB Channel

Input 8 is a bidirectional USB channel. You can connect a computer to the USB Type B port on the AML AZALEA and the console will act as a “sound card” for that computer, eliminating the need for an expensive internal or external USB sound card.

The USB input channel features a machine start logic signal. If you are running music playout software or an application such as Wheatstone’s Voxpro editing system, you can start playback remotely from the console’s “ON” button if you connect the remote start output on the Tally/Logic connector to an interface connected to your computer that is recognized by the playout or other audio application. See page 4 for connection details.

Audio playback from the computer will appear on fader 8 without any additional cabling; only the USB A (computer end) to B (console end) cable is required. The computer will receive an audio output from the console’s PGM2 bus. See the section below on Console Outputs for more information.

Console Outputs



Program Bus Outputs

There are two Program Busses designated PGM1 and PGM2. Each fader channel on the AML AZALEA has two Program bus assign buttons near the top of the channel labeled 1 and 2. Pressing these buttons will add the channel to the selected busses and the buttons will light up to indicate that Program bus has been selected for that channel.

The PGM1 bus is expected to be used as the “on air” bus. It is the console’s primary bus and can be fed to the input of your air chain.

The PGM2 bus is similar to PGM1, but it also feeds any connected USB device. While a dedicated mix-minus output is provided for use with a telephone hybrid, the PGM2 bus can be used as a “build-your-own” mix-minus bus if needed. Simply put the channels you wish to include in the mix-minus in the PGM2 bus and remove the channels you don’t want (such as the USB channel if you are recording audio on the connected computer).

The output of each bus is accessed on the rear panel of the AML AZALEA console via an RJ-45 connector, using the Studio Hub wiring standard. The wiring diagram appears in the “Wiring Diagrams” on page 4.

CAT5+ cable is most notable for its use in ethernet connectivity, but its ability to transport audio signals with superior noise rejection (due to the tight twist of the cable pairs) has made it the default choice for many manufacturers of both consumer and professional broadcast equipment for decades. It allows for much higher connector density, thus smaller packages. The AML AZALEA console uses RJ-45 connections for all audio and logic except the microphone inputs, which require a larger gauge wire that can’t be inserted into an RJ-45 connector.

At least one manufacturer produces a single-pair CAT 5e cable that is flexible and easy to work with if you’d like to make your own connecting cables. You’ll just need a bag of connectors and

a quality RJ-45 crimping tool. We recommend using a pass-through type of RJ-45 connector as it is much easier to create audio cables with this type of connetor. It will require a special RJ-45 crimping tool.

There are also numerous sources for adapters that will allow you to use off-the-shelf XLR and 1/4" TRS cables, along with standard ethernet cables, to connect your audio devices to the AML AZALEA. Wheatstone sells a selection of RJ-45-to-XLR and other adapters. See the section "User-Replaceable Parts and Accessories" on page 14 for ordering information.

CR Output

The CR, or Control Room Output is an analog stereo, line level output designed to drive an outboard speaker amplifier or powered speakers. The RJ-45 uses the same Studio Hub wiring scheme as described elsewhere in this manual, with the first pair (pins 1 and 2) being the left channel output and the second pair (pins 3 and 6) carrying the signal for the right channel output. The source feeding the CR Output can be either of the program busses or an external input as decribed in the Console Inputs section. Use the buttons on the monitor section of the console labeled "ASSIGN" to make the selection. Note that you cannot connect regular unpowered speakers to this output.

The CR Output mutes when either of the two microphone channels is turned on or placed into Cue.

Guest Output

The Guest Output is an analog stereo, line level output designed to drive a headphone amp for studio guests. It follows the CR Monitor selector switch. The Guest output has a pre-determined output level and does not mute. There is a talkback button on the control module which allows the board operator to talk directly into the guest headphone feed.

Mix-Minus Output

A Word About Mix-Minus

It might seem to make sense to just select the PGM1 console output to send to the phone hybrid, since that contains everything that's on the air and we probably want the caller to hear all of those things.

However, when the caller is on the air live, we have a bit of a problem with that scenario. The problem is that the caller will hear himself coming back to his ear across the phone line, but with a disconcerting bit of delay due to the nature of both landline and cellular phone systems, which are mostly VOIP and suffer from latency issues.

To solve the problem described above, we have created a dedicated Mix-minus signal, which is a mono signal that includes all the sources selected to PGM1 EXCEPT the caller audio in a post-switch, post-fader arrangement. This special output, called the MXM Output, is the one that should be connected to the telephone hybrid's audio input. When a caller is active on the hybrid, the caller will hear this mix-minus feed. To talk to the caller off-air, the TB button on the Control Room module can be depressed. This will interrupt the MXM feed to the caller and replace it with the Mic 1 audio.

The MXM output is designed specifically for use with a phone hybrid, so if you need another mix-minus (for example to use a computer running Zoom on the air) you will need to use the PGM2 bus to build your own mix-minus. Simply place all channels you wish to be output on this custom mix minus in PGM2, while leaving out the channel that should not be fed back to itself.

Cue Output

The Cue Output is a mono analog, line level output designed to drive an outboard speaker amplifier or powered speaker. The RJ-45 uses the same Studio Hub wiring scheme as described elsewhere in this manual, but as this signal is mono you only need to connect the first pair (pins 1 and 2). Note that you cannot connect an unpowered speaker to this output.

The Cue Output will mute when either of the microphone inputs is turned on or placed in cue.

Working with the Caller Channel

The Caller Channel is designed to help you interface your telephone hybrid to the AML AZALEA Console. You can easily take a caller live to air or talk to the caller off the air. We'll cover both scenarios, as well as recording a caller, in this section.

Hybrid phone systems have an audio output, which connects to the AML AZALEA's Caller Channel and carries audio from the caller to the console. The hybrid's audio input should be fed from the console's MXM output. As discussed above, the MXM output carries post-fader, post-switch audio from everything in PGM1 (except the caller channel's own audio). This allows the caller to hear all the necessary program elements while on the air.

Hybrid phone systems also usually have a Music ON Hold (MoH) audio input. This can be fed with any signal you like, but usually it will be the PGM1 output or a pre-delay simulated air signal so that while on hold, the caller can hear exactly what's happening on the air.

Talking to the Caller Off the Air

The hybrid will receive microphone audio from Mic 1 when the Control Room TB button is pressed. To hear the caller while conversing off-air, the caller channel should be placed onto the Cue bus by pushing the Cue button on the caller channel. The caller's audio will now be audible through a powered speaker connected to the AML AZALEA's cue output or the headphones (if the Split Cue button is activated—see "Split Cue" on page 14.

Putting the Caller On the Air

To put a caller on the air live, press the ON button on the caller channel and adjust the fader appropriately. Assuming the caller channel is in PGM1, the caller will now be on the air, subject to the position of the Input 7 fader. The caller will now hear the Mix-minus created based on the PGM1 bus as described in the section "Mix-Minus Output" on page 10. When the caller speaks, his audio will be added to the PGM1 bus and go on the air. The caller will hear everything that is in the PGM1 bus except his own audio.

While the caller channel is ON, the board-op can still talk to the caller by pressing the Control Room TB button. As mentioned previously, this will interrupt the audio feed to the caller (which at this point is the PGM1 mix-minus) and replace it with the Mic audio.

Recording a Caller

For the purpose of this discussion, we'll assume you have a computer running Wheatstone's Voxpro editing system on Input 8, the console's USB input. The connection is simply a USB A-to-B cable connected from the AML AZALEA's Channel 8 USB connector to a standard USB port on the Voxpro or other computer with audio recording capability.

The first thing we need to cover is the feed from the console to the computer. The AML AZALEA's USB channel provides the PGM2 bus to the connected computer. This feed contains all the audio that you have assigned to the PGM2 bus, assuming those channels are turned on and potted up. When setting up to record, remove channels from PGM1 if they are not intended to also be on the air.

When recording, you will need to ensure that the fader for the computer you're recording on is all the way down, or that the associated channel is turned off or removed from the PGM2 bus.

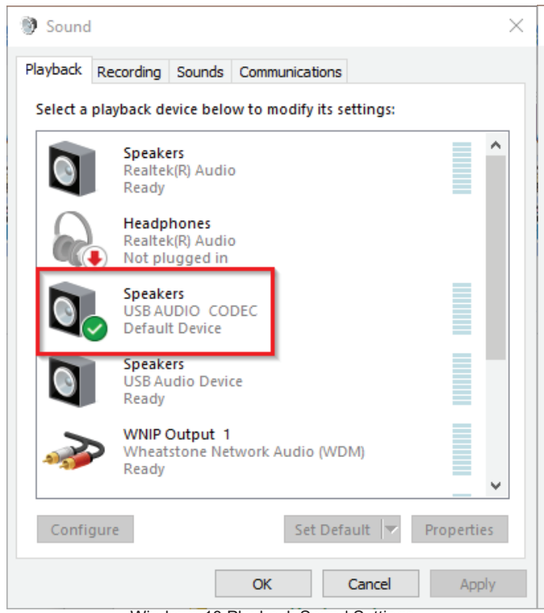
Pot up the mic channel and caller channel, plus any other channels that you want to be included in the recording. If a mic is on, you'll need headphones so that you can hear the caller. You should be able to see the audio levels on the computer recording program's display. Hit the Record button and your recording will begin.

Configuring Windows Sound for AML AZALEA

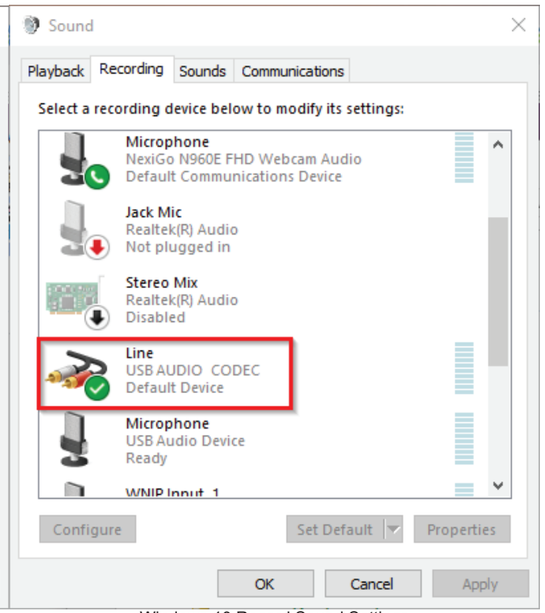
The AML AZALEA, when connected to a computer via USB, will appear in the Windows Sound Control Panel as "USB Audio Codec" both in the Playback and Record tabs. On the Playback tab it will show as "Speakers." ON the Recording tab it will appear as "Line."

Make sure you right click on the USB Audio Device in both tabs and select "Default Device." You'll also need to take a look at the Advanced sound properties and ensure that the sample rate is configured properly. The console operates at 44.1 kHz.

For Windows 10 and 11 systems, you'll also want to search Settings for "Microphone Privacy" and make certain this is set to "Allow access to the microphone on this device."

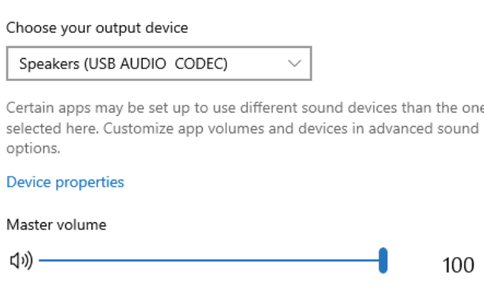


Windows 10 Playback Sound Settings

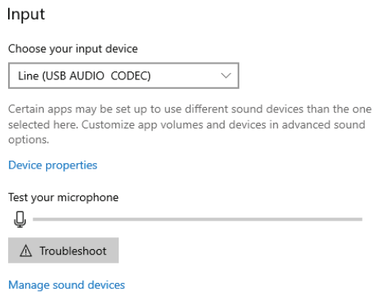


Windows 10 Record Sound Settings

Above graphics show how the console will appear in the “old school” Windows Control Panel. The Windows Control Panel is reportedly being deprecated by Microsoft. If you no longer have Control Panel, you will need to go to **Settings | Sound** in Windows to find the AML’s USB devices. The new settings windows are shown below:



Windows 11 Playback Sound Settings



Windows 11 Record Sound Settings

To edit the recorded call, put the Voxpro computer’s channel (Channel 8) in cue or bring it up in PGM2 on the monitor speakers and start cutting.

Split Cue

This button found near the middle of the far right module, puts a mono sum of the currently-selected Control Room source in the right headphone channel, and the Cue bus in the left channel. (When active, the button’s LED will be lit.) This allows you to monitor a source in cue while still monitoring your on-air bus. The headphone volume control still affects the split cue signal in this mode. To leave Split Cue mode, press the Split Cue button again and its LED will extinguish, putting your headphone audio back to normal.

User-Replaceable Parts and Accessories

Part Name	Part #	Part Name	Part #
HPS-516 Power Supply	007600	**Power Cable**	007507
HPS-516 Dual Rack Face	007609	**Black Fader Knob**	520141
15mm Cue Knob	520162	**20mm HPDN Knob**	520149
Button Cap	530414	**RJ-45 to XLR M Adapter**	920241
RJ-45 to XLR F adapter	920242	**Phoenix Conn. for Mics**	265014

Warranty Information

Limited Warranty by Wheatstone Corporation

1 All equipment sold and shipped to final destinations within the USA and its possessions warranted for one (1) full year from the date of purchase against defects in material and workmanship. All equipment sold and shipped to final destinations outside the U.S.A. and its possessions warranted for one (1) full year from the date of purchase against defects in material and workmanship. All repairs to maintain the unit at original specification will be made at no charge to the original purchaser, except for shipping and insurance costs to be prepaid by the owner to the factory in the event the unit cannot be serviced by an authorized Wheatstone Corporation dealer.

2 This Warranty is subject to the following restrictions and conditions:

a) The owner must have registered the product at Wheatstone's official web site; or at the time of servicing the owner must provide proof of purchase from an authorized Wheatstone Corporation sales engineer, distributor or dealer.

b) This Warranty is valid for the original purchaser on the unit. Parts used for replacement are warranted for the remainder of the original warranty period. Repair or replacement is in the discretion of Wheatstone Corporation and is the exclusive remedy hereunder.

c) This Warranty DOES NOT apply to damage or defects resulting from abuse, careless use, misuse, improper installation, electrical spikes or surges, or alteration, repair, or service of the unit or equipment by anyone other than Wheatstone Corporation or its authorized dealer.

d) This Warranty is void if the serial number has been removed, altered or defaced.

e) This Warranty DOES NOT cover loss or damage, direct or indirect, arising out of the use or inability to use this unit or for shipping or transportation to any dealer.

f) Wheatstone Corporation reserves the right to modify or change any unit in whole or in part at any time prior to return delivery in order to incorporate electronic or mechanical improvements deemed appropriate by the Wheatstone Corporation but without incurring any responsibility for modifications or changes of any unit previously delivered or to supply any new equipment in accordance with any earlier specifications.

g) THERE ARE NO OTHER WARRANTIES, EXPRESSED, IMPLIED, OR STATUTORY, INCLUDING ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IF FOR ANY REASON ANY IMPLIED OR STATUTORY WARRANTY CANNOT BE DISCLAIMED, THEY ARE LIMITED TO THIRTY (30) DAYS FROM THE DATE OF PURCHASE. WHEATSTONE CORPORATION IS NOT RESPONSIBLE FOR ELECTRICAL DAMAGE, LOSS OF USE, INCONVENIENCE, DAMAGE TO OTHER PROPERTY, OR ANY OTHER INCIDENTAL OR CONSEQUENTIAL, WHETHER DIRECT OR INDIRECT, AND WHETHER ARISING IN CONTRACT, TORT, OR OTHERWISE. NO REPRESENTATIVES, DEALERS, OR WHEATSTONE PERSONNEL ARE AUTHORIZED TO MAKE ANY WARRANTIES, REPRESENTATIONS, OR GUARANTIES OTHER THAN THOSE EXPRESSLY STATED HEREIN.