H10

H10-Lite



Technical Manual

October 24, 2024

HSeries Controller

Bluetooth Enabled

(Not available with H10-Lite)

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Introduction

Thank you for purchasing this product by Arrakis Systems. Our company has provided professional audio equipment to the broadcast, commercial audio, and consumer audio markets for more than 40 years. Our products are sold worldwide and are well known for leading edge technology, quality, and reliability.

How to contact Arrakis Systems

Arrakis Systems inc. is located at:

Arrakis Systems inc
6604 Powell Street
Loveland, Colorado
80538

Business Hours: 8:00am - 4:30pm mountain time

Voice: 970-461-0730 x316

Fax: 970-663-1010

Email: consolesupport@arrakis-systems.com

Having difficulty contacting Arrakis?
Refer to the website (www.arrakis-systems.com) for current contact information

Safety Instructions

1. Read All Instructions. All safety and operating instructions must be read before operating the product.
2. Retain All Instructions. All safety and operating instructions must be retained for future reference.
3. Heed All Warnings. All warnings on the product and those listed in the operating instructions must be adhered to.
4. Follow All Instructions. All operating and product usage instructions must be followed.
5. Heat. This product must be situated away from any heat sources such as radiators, heat registers, stoves, or other products (including power amplifiers) that produce heat.
6. Ventilation. Slots and openings in the product are provided for ventilation. They ensure reliable operation of the product, keeping it from overheating. These openings must not be blocked nor covered during operation. This product should not be placed into a rack unless proper ventilation is provided through following the manufacturer's recommended installation procedures.
7. Water and Moisture. Do not use this product near water—for example; near a bath tub, wash bowl, kitchen sink or laundry tub; in a wet basement; or near a swimming pool or the like.
8. Attachments. Do not use any attachments not recommended by the product manufacturer as they may cause hazards.
9. Power Sources. This product must be operated from the type of power source indicated on the marking label and in the installation instructions. If you are not sure of the type of power supplied to your facility, consult your local power company.
10. Grounding and Polarization. This product is equipped with a polarized AC plug with integral safety ground pin. Do not defeat the safety ground in any manner.
11. Power Cord Protection. Power supply cords must be routed so that they are not likely to be walked on nor pinched by items placed upon or against them. Pay particular attention to the cords at AC wall plugs and convenience receptacles, and at the point where the cord plugs into the product.
12. Lightning. For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the AC wall outlet. This will prevent damage to the product due to lightning and power line surges.
13. Overloading. Do not overload AC wall outlets, extension cords, or integral convenience outlets as this can result in a fire or electric shock hazard.
14. Object and Liquid Entry. Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.
15. Accessories. Do not place this product on an unstable cart, stand, tripod, bracket, or table. The product may fall, causing serious damage to a child or adult, and serious damage to the product. Any mounting of the product needs to follow manufacturer's installation instructions.
16. A Product and Cart Combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the product and the cart combination to overturn.
17. Servicing. Refer all servicing to qualified servicing personnel.
18. Damage Requiring Service. Unplug this product from the wall AC outlet and refer servicing to qualified service personnel under the following conditions: a. When the AC cord or plug is damaged. b. If liquid has been spilled or objects have fallen into the product. c. If the product has been exposed to rain or water. d. If the product does not operate normally (following operating instructions). e. If the product has been dropped or damaged in any way. f. When the product exhibits a distinct change in performance. This indicates a need for service.
19. Replacement Parts. When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or that have the same characteristics as the original parts. Unauthorized substitutions may result in fire, electric shock, or other hazards.
20. Safety Check. Upon completion of any repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.
21. Cleaning. Do not use liquid cleaners or aerosol cleaners. Use only a damp cloth for cleaning.

Hazard / Warning Label Identification

WARNING: SHOCK HAZARD - DO NOT OPEN
AVIS: RISQUE DE CHOC ELECTRIQUE - NE PAS OUVRIR

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK DO NOT REMOVE ANY COVER OR PANEL. NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THE CONSOLE TO RAIN OR MOISTURE.



The Exclamation Point symbol, within an equilateral triangle, alerts the user to the presence of important operating and maintenance (servicing) instructions in product literature and instruction manuals.

The Lightning Flash With Arrowhead symbol, within an equilateral triangle, alerts the user to the presence of uninsulated dangerous voltage within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock.

WARNING— This equipment generates, uses and can radiate radio frequency energy. If not installed and used in accordance with the instructions in this manual it may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device (pursuant to Subpart J of Part 15 FCC Rules), which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

Warranty

This console carries a manufacturer‘s warranty subject to the following guidelines and limitations:
A) Except as expressly excluded herein, Arrakis Systems inc. (“Seller”) warrants equipment of its own manufacture against faulty workmanship or the use of defective materials for a period of one (1) year from date of shipment to Buyer. The liability of the Seller under this Warranty is limited to replacing, repairing or issuing credit (at the Seller’s discretion) for any equipment, provided that Seller is promptly notified in writing within five (5) days upon discovery of such defects by Buyer, and Seller‘s examination of such equipment shall disclose to its satisfaction that such defects existed at the time shipment was originally made by Seller, and Buyer returns the defective equipment to Seller’s place of business in Loveland, Colorado, packaging and transportation prepaid, with return packaging and transport guaranteed.

B) Equipment furnished by Seller, but manufactured by another, shall be warranted only to the extent provided by the other manufacturer.

C) Thermal filament devices (such as lamps and fuses) are expressly excluded from this warranty.

D) The warranty period on equipment or parts repaired or replaced under warranty shall expire upon the expiration date of the original warranty.

E) This Warranty is void for equipment which has been subject to abuse, improper installation, improper operation, improper or omitted maintenance, alteration, accident, negligence (in use, storage, transportation or handling), operation not in accordance with Seller‘s operation and service instructions, or operation outside of the environmental conditions specified by Seller.

F) This Warranty is the only warranty made by Seller, and is in lieu of all other warranties, including merchantability and fitness for a particular purpose, whether expressed or implied, except as to title and to the expressed specifications contained in this manual. Seller’s sole liability for any equipment failure or any breach of this Warranty is as set forth in subparagraph (A) above; Seller shall not be liable or responsible for any business loss or interruption, or other consequential damages of any nature whatsoever, resulting from any equipment failure or breach of this warranty.

For the latest warranty information, please visit our website.

Product Description



H-10 Analog Broadcast Console

- 10 Channels
- Inputs – 2 Built in Mic (gain 2 more mic inputs by purchasing the ARC-MIC-PRE), 7 Stereo Line, 1 USB , 1 Mix-Minus, 1 Bluetooth.
- Outputs – 2 Stereo Mixing buses (PGM & AUD).
- 2 high quality mic channels (with optional 48VDC phantom power).
- 7 stereo line inputs.
- USB input/output. Record or playback.
- Mix minus telephone output for interfacing with an external phone hybrid.
- Conductive plastic slide faders & LED switch lamps for long life.
- Works with H-Series Controller for remote control and other added features.
  (Not available with H10-Lite. Check website for information on how to upgrade to the full version of the H10.)

Technical Description

Mechanical

Switch type:	Electronic. Multi-Million operation.
Switch illumination:	LED, for long life.
Linear Fader type:	Conductive plastic for highest possible resolution and life. 30,000 cycles.
PC Boards:	Single motherboard.
IC sockets:	All IC's, except for two, are socketed for ease of service.
VU Meters:	Long life Analog or LED meters.

Electronic

Stereo Line Input
- Freq Response- +(-).5dB 20-20kHz
- S/N- -82dB typ, +8dBu in, +8 dBu out
- THD- .01% typ, +8dBu in, +8 dBu out
- CMRR- -75dB typ 1kHz
- Max Input- +23dBu, balanced

Mono Mic Input
- Freq Response- +(-).5dB 20-20kHz
- EIN- -115dBu typ, -50dBu in, +8 dBu out
- THD- .05% typ , -50dBu in, +8 dBu out
- CMRR- -60dB typ 1kHz

Impedances
- Mic Input- > 2000 ohms
- Line Input- > 10000 ohms
- Outputs- < 100 ohms

System
- Max Output- +23dBu balanced
- Stereo Separation- -75dB typ 1KHz
- Cue to Pgm XTalk- -90dB typ 1KHz-75dB typ 20kHz

Power Supply
- 110vac - 220 VAC, 50-60 hz, autosensing
- Certified: UL, CE, CS, CB
- External inline module: 3"W x 5 3/4"L x 1 3/4"D

Logic

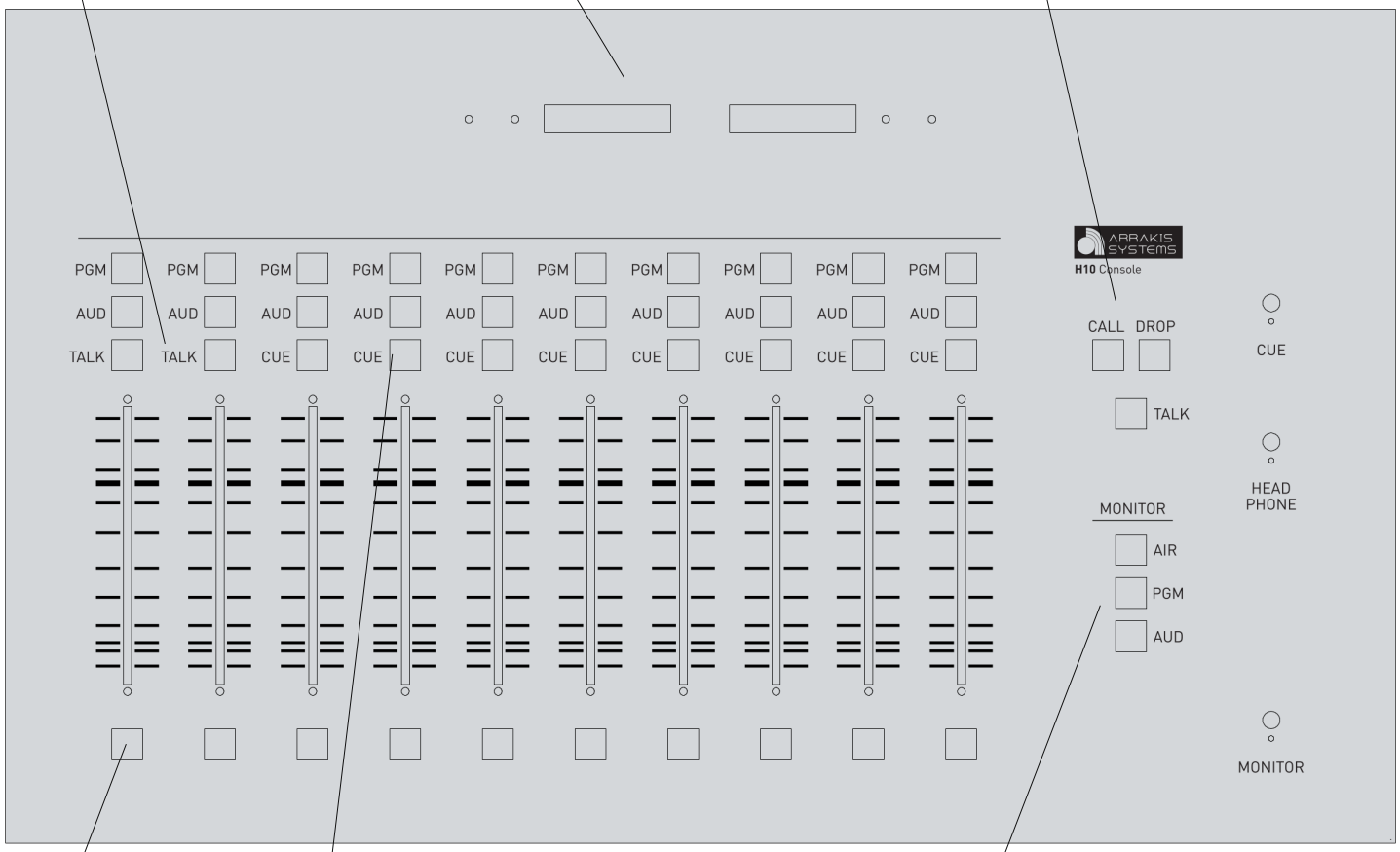
On Air Light Logic: reed relay closure, 500mA max
Mic Turret Logic: none

Operating Instructions

Talk Button
Push to talk to other Studio.

VU Meters
ballistics. Program bus. (Optional)

Bluetooth
DROP drops calls.



On / Off
Select to turn a channel On or Off.

PGM | AUD | CUE
Select to turn Program, Audition or Cue channels on or off.

Monitoring
Select to choose which audio will feed your headphones & monitor output. This also toggles the VU/LED meter display.

Mono Mic Level
Input Channels 1 & 2

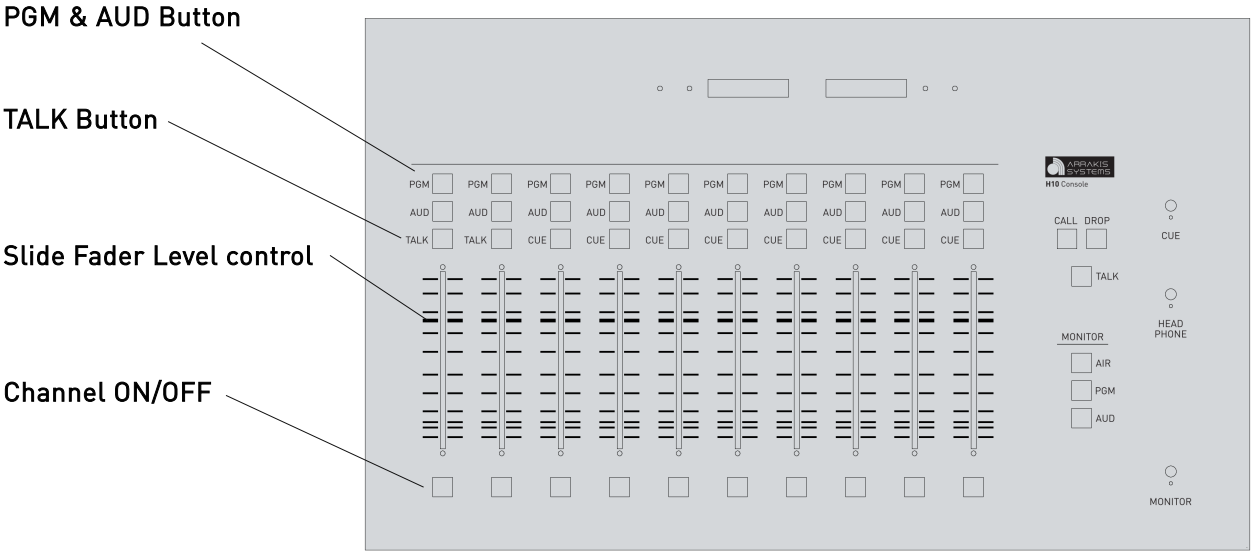
Channels 1 & 2 are both designated as mic channels. These are mic-preamps, ready to be connected to dynamic microphones. If you are using condensor microphones, then you will need the ARC-48V Phantom Power supply, which can be purchased on our website.

Channel On & Off
To turn the channel on, simply push the red on button at the bottom of the fader. When the channel is on, the LED will be lighted. To turn the channel off, simply push the red on button again.

Channel On & Off Mute Monitor
Mic channels are programmed to mute the Monitor speakers when activated (Monitor output). This prevents audio feedback through the mic channel. Audio may still be heard through the headphone output.

TALK
Talkback is a simple 2 way intercom system to communicate with another studio such as an Announce booth, Interview room, News room, or Production studio. The H-10 has an audio output from the control room microphone that can be connected into a console in another studio. The H-10 has an audio input into the cue system for the other studio to talk to the H-10 console. Either or both Mic channels One & Two can feed the talkback output. To activate talkback, simply click on the red 'Talk' switch. To exit the talkback mode, click on the 'Talk' button again

PGM / AUD
Push the PGM (Program) or AUD (Audition) button to assign the particular channel to the output bus.



Stereo Line Level
Input Channels 3 - 8

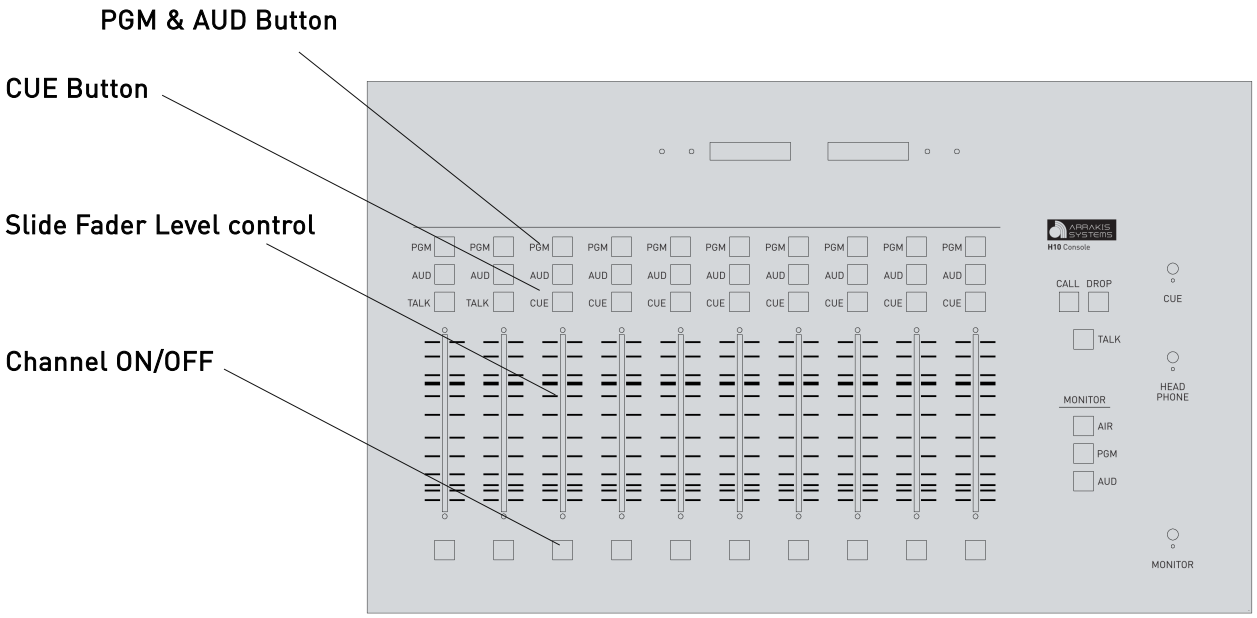
Channel 3 through 8 are stereo line level input channels. Channel 3 through 8 have both balanced RJ45 & unbalanced RCA inputs. Channel 10 can be used with an external phone hybrid. Channel 10 is balanced RJ45 only.

Channel On & Off
To turn the channel on, simply push the red on button at the bottom of the fader. When the channel is on, the switch will be lighted. To turn the channel off, simply push the red on button again.

CUE
To activate cue, click on the CUE button above the fader. To exit the cue mode, click on the CUE button again.

Cue audio will be heard on the Monitor & Head Phone outputs. Cue audio levels are prefader.

PGM / AUD
Push the PGM (Program) or AUD (Audition) button to assign the particular channel to the output bus.



USB
Input/Output Channel 9

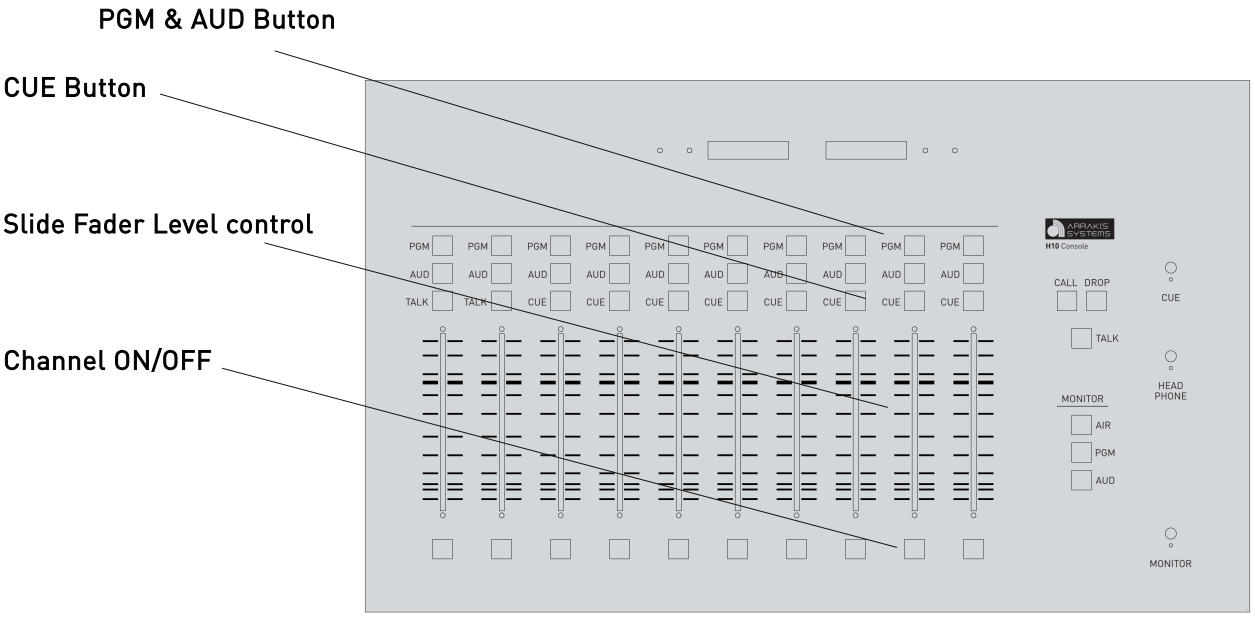
The H-10 console features a built in sound card on Channel 9 of the console. This enables the console to play & record audio directly from a Windows or Mac PC. Because the electronics is USB HID compliant, it will be recognized as a soundcard by the Windows or MAC operating system and can be used with any Windows or Mac compliant audio software (such as Adobe Audition). The PC will recognize the USB sound card as **USB Audio Codec**. Simply point your recording or playback software to the USB Audio Codec.

Channel On & Off
To turn the channel on, simply push the red on button at the bottom of the fader. When the channel is on, the switch will be lighted. To turn the channel off, simply push the red on button again.

CUE
To activate cue, click on the CUE button above the fader. To exit the cue mode, click on the CUE button again.

Cue audio will be heard on the Monitor & Head Phone outputs. Cue audio levels are prefader.

PGM / AUD
Push the PGM (Program) or AUD (Audition) button to assign the particular channel to the output bus.



Telephone
Input Channel 10

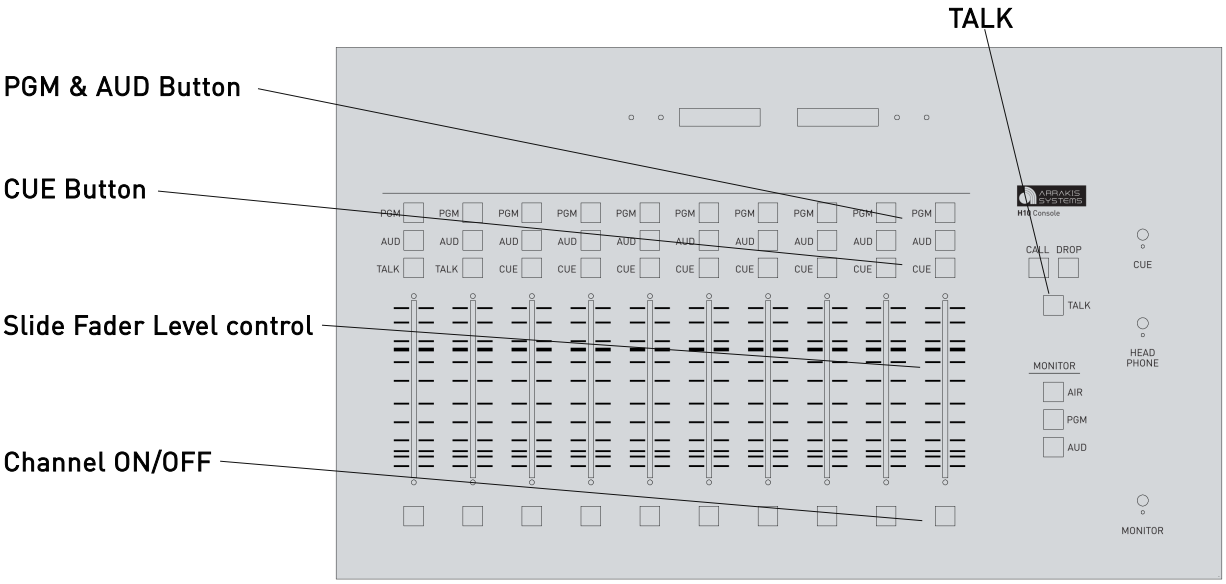
The H-10 console supports a single phone caller for live on-air or off-line applications on channel 10.

Channel On & Off
To turn the channel on, simply push the red on switch at the bottom of the fader. When the channel is on, the switch will be lighted. To turn the channel off, simply push the red on button again.

Channel On & Off Logic (Hybrid control)
The H-10 has the ability to externally control the phone hybrid. The **CH10 Hybrid** connection on the H-10 allows you to connect to your phone hybrid to accept and drop the call via the on/off button of Channel 10. The hybrid may also be activated manually from the front panel of the hybrid.

Hybrid Audio Feed
The output to the phone hybrid that the caller will hear is determined by channel ten's output bus assignments: PGM only, AUD only, or a mix of PGM & AUD. The output to the phone hybrid will not include the phone callers voice which eliminates feedback.

Talking to the Caller (off line)
Push the 'TALK' button on the channel one mic to feed the control room mic to the caller. When the button is down, the program audio fed to the caller is muted and only the control room mic audio is heard by the caller. The caller will be heard in the monitor and earphone systems (Program audio dimmed below the caller's voice).



Control Room Monitor System

The Control Room Monitor system is the main audio monitoring system for the studio. It features an input selector switch and a volume level control. The output of the monitor system is connected to an external audio power amplifier and speakers. The level control on the external amplifier should be set for the maximum sound level desired in the studio.

Monitor Muting

When a control room microphone is turned on, the monitor system will mute (audio is turned off) so that there will not be feedback from the speakers to the microphone.

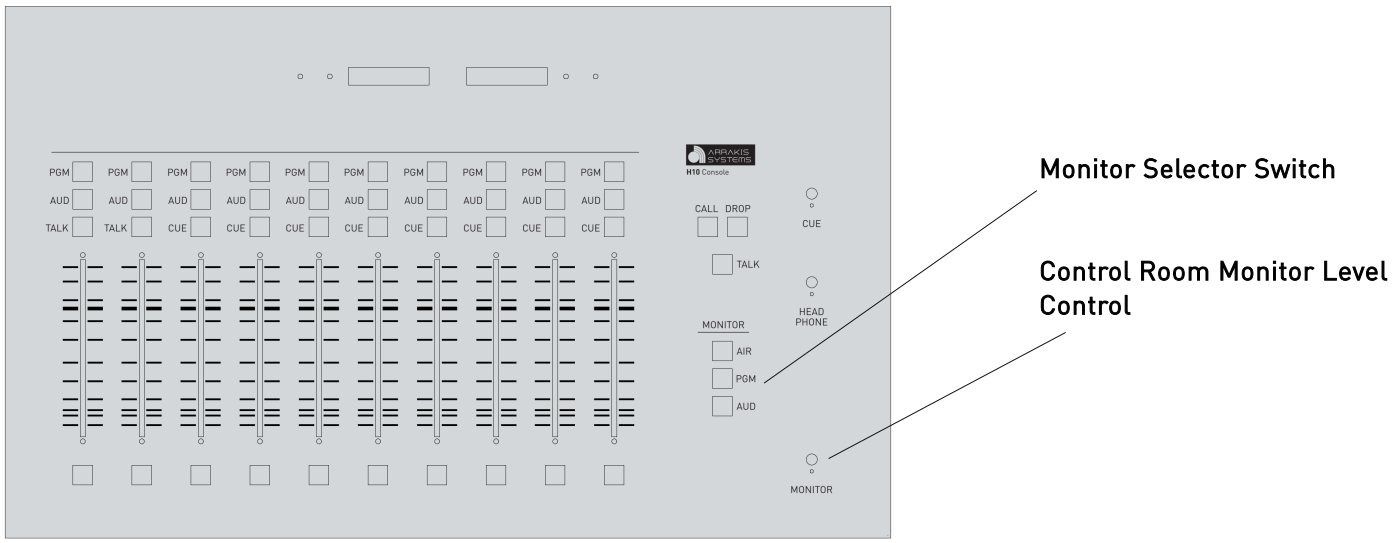
Monitor Selector Switch

This switch selects the audio source for the Monitor system. It also switches which feed the VU meters will follow.

1) AIR- this is usually an off air audio feed to monitor the actual transmitted signal
2) PGM- the main Program output bus from the console
3) AUD- a secondary Program bus that can be used for several purposes such as Recording

Monitor Volume Level Control

Sets the monitor level into the external audio amplifier and speaker.



The Cue System

The cue system is designed for monitoring an audio source without placing it on air. This feature is useful for listening to a network feed before bringing it to air, listening to an audio file to be certain it is the correct song, etc.

Activating Cue

To activate cue, click on the CUE button on an input source channel. To exit the cue mode, click on the CUE button again. The cue signal is PRE-fader and therefore the fader level and the channel ON-OFF status has no effect on the cue signal.

Cue Audio

Cue audio will be heard in the built in Cue speaker and the Headphones. In the Headphone system, Autocue will mute the Program in the headphones and play the cue audio over top of program audio.

Cue Fader

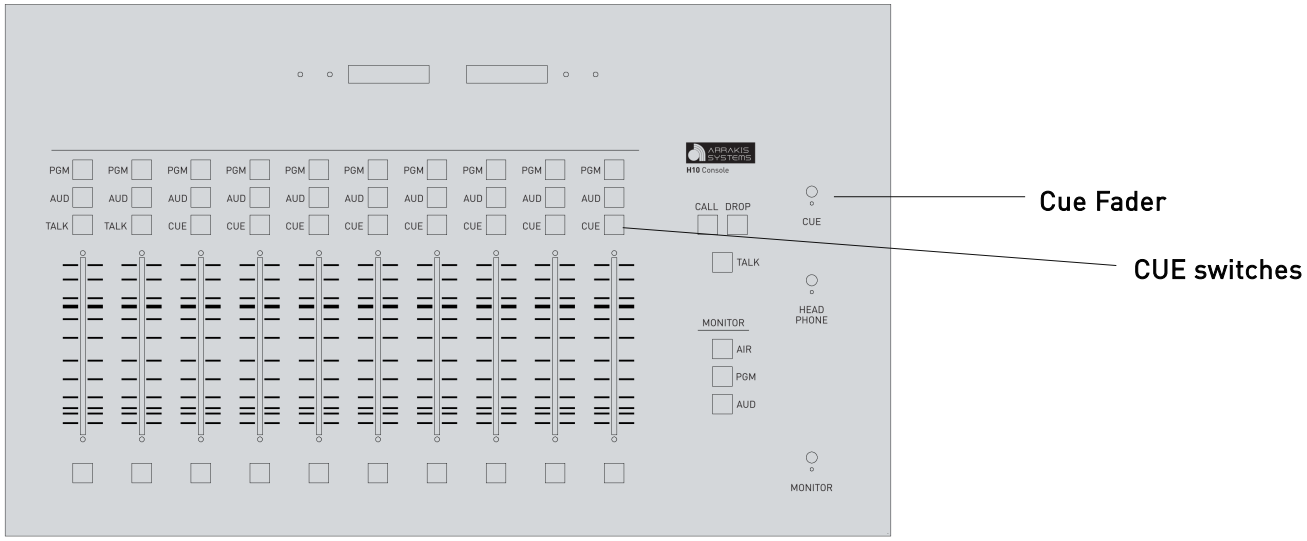
The cue fader adjusts the level in the internal cue speakers. It does not adjust the level of the cue in the headphones.

External Cue Input

The console has an unbalanced (-10dBu) input to the cue system on a RCA stereo jack on the rear panel of the console. The cue input sums into the cue bus and appears on the Cue speaker and Headphones.

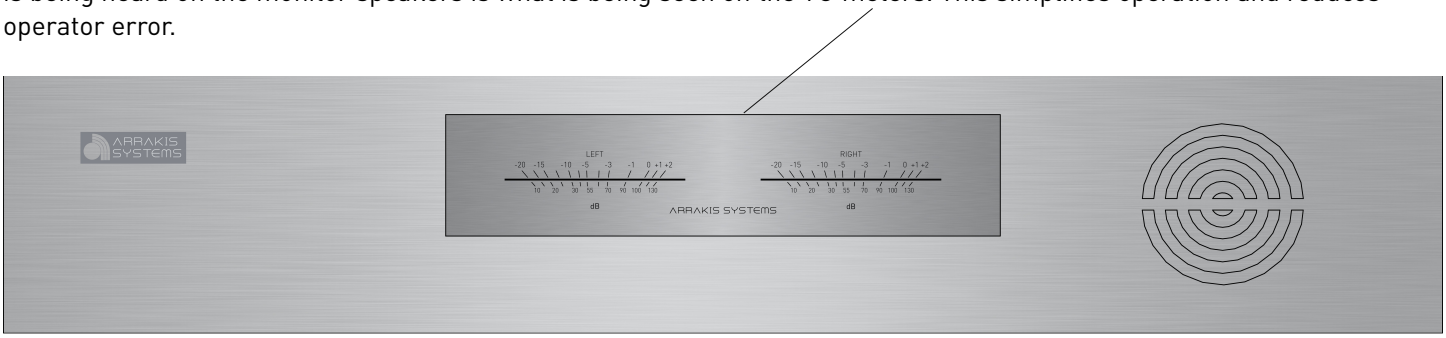
Muting

The cue speaker audio will be muted to stop feedback whenever Mic channels One or Two are turned on by their respective On-off switches.



VU Meters

The H-10 console features a single set of fixed VU meters. These meters switch to follow the MONITOR SELECTOR SWITCH. Therefore the VU meters can be selected to the Program bus, Audition bus, and even the external AIR input. What is being heard on the monitor speakers is what is being seen on the VU meters. This simplifies operation and reduces operator error.

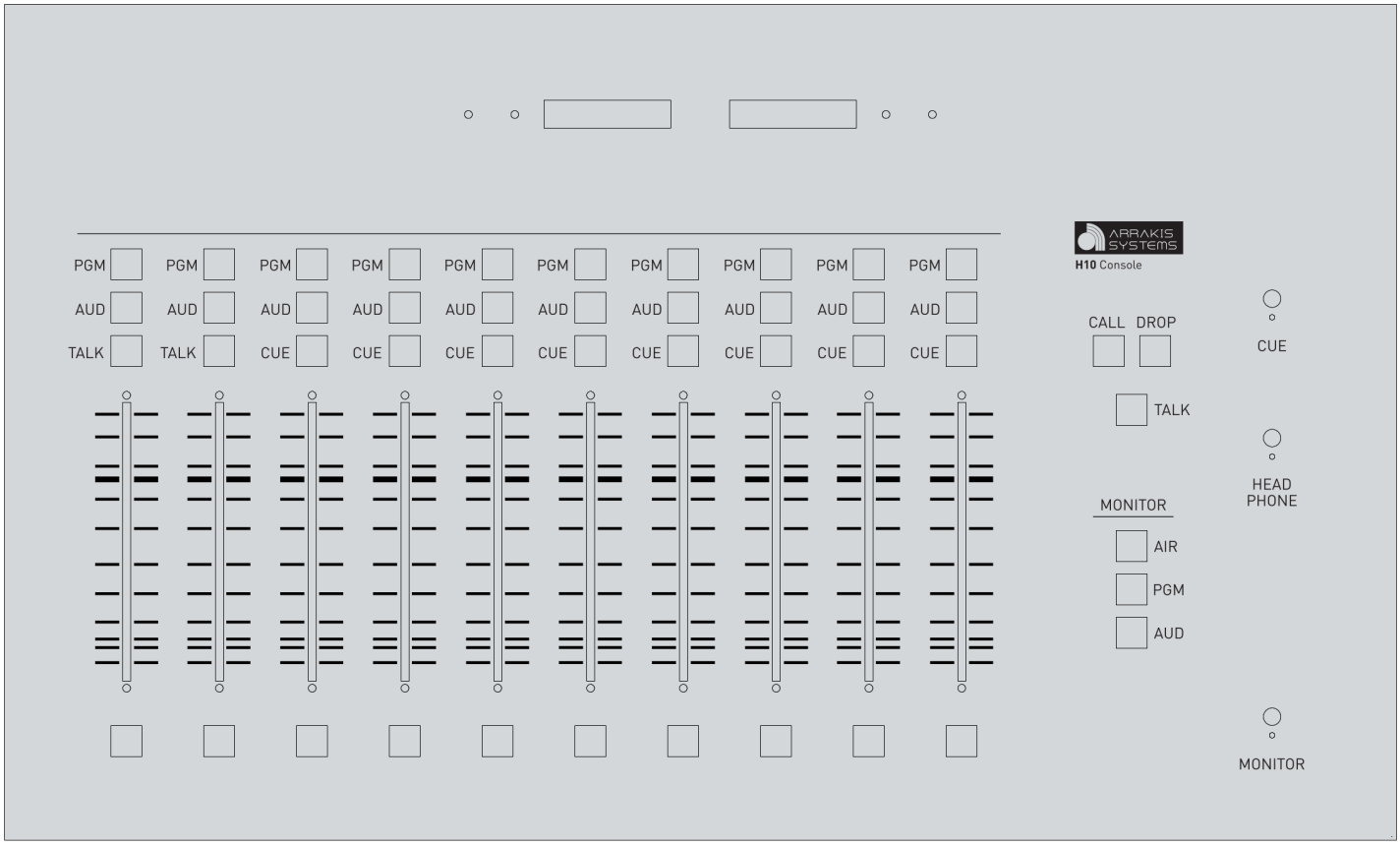


Depending on the model of H-10 purchased, it is optional to have LED meters instead of analog meters. These LED meters feature standard 'VU' ballistics.

Bluetooth

The Bluetooth feature comes standard with the H-10 console. The Bluetooth channel is located on channel 10 of the board, which is summed with the phone mix minus.

Controls for the Bluetooth feature can be found on the right side of the board, with the **CALL** and **DROP** buttons.



TO PAIR YOUR BLUETOOTH DEVICE

STEP 1 - Power up your H Series Console.
STEP 2 - Press and hold the **CALL** button on the H Series console for 2 seconds and then release. The console will now be in pairing mode for 2.5 minutes.
STEP 3 – On your bluetooth enabled device, search for the name **ARC-Blue**. Select the device to now pair.

INCOMING CALL

While a call is incoming on the Bluetooth enabled device, the **CALL** LED will blink. Press the **CALL** button to accept, and the **DROP** button to reject the call.

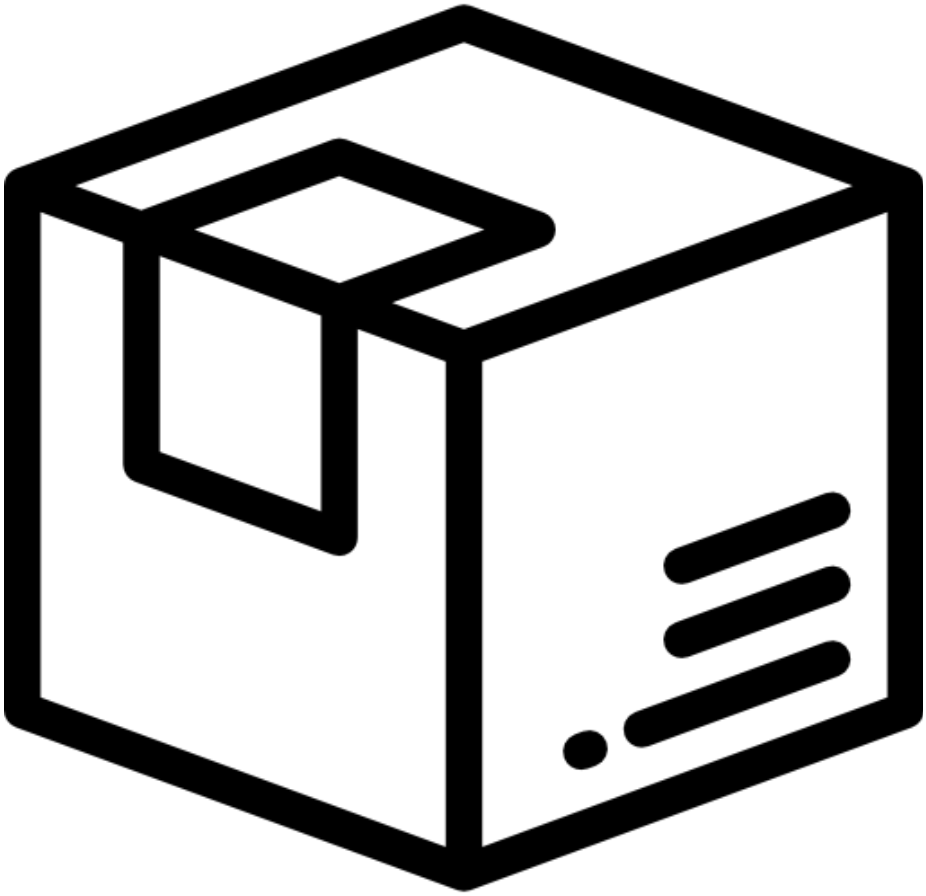
DURING CALL

While the call is active on your device, the console **CALL** LED will be constant lit, and the **DROP** LED will blink. To end the call, press the **DROP** button.

Installation Instructions

Unpacking

A) Packing slips – Check the packing slips that come with the shipment, to be certain that all packages have been received.



B) Check for damage – Check all packages and equipment for damage immediately upon receipt. If damage is found, contact Arrakis Systems immediately to report the damage. Refer to the website for the latest contact information.

C) Carefully go through each box – Arrakis inspects every shipment for accuracy. You will receive all of the appropriate documentation, install kit, spare parts kit, and equipment. Be very careful to not throw away anything if you decide to throw out shipping materials.

D) Keep all packing materials – Arrakis consoles are shipped in custom shipping containers. Keep all containers at least until the installation is complete. This is in case some piece of equipment may need to be returned to the factory for service.

It is a good idea to keep the shipping materials for the life of the product. Arrakis is not responsible for shipping damage to products not shipped to the factory in the original packing materials.

Before you start

A) Physical space – It is important to install the console with sufficient space around it to operate and service the console easily.

B) Adequate ventilation – It is important to provide adequate ventilation to electronic equipment. High temperatures can reduce the life of the equipment.

C) 110V – 220VAC Operation – The console comes with a 110VAC – 220VAC auto-sensing external power supply as standard equipment.

D) Static – Static discharge to electronic devices can cause damage, reduce performance, or cause noise in the system. Proper choice of carpet is important consideration when building a studio. There are ways to reduce static in rooms, and should be researched and implemented prior to installation. You may also ground the chassis if necessary.

E) Console power supply – The console is powered by an external, regulated power supply. The supply simply plugs into the back of the console. There are no high voltages within the console.

F) AC Power considerations – If possible, plug all of the equipment in your studio into a single AC Power strip. A good policy would be to have each room on the same AC outlet. A single power outlet will have a 1500-2000 watt capacity. That is plenty of power for most studios. Simply plug a multi-outlet AC power strip into the single wall outlet and then all of your equipment into the power strip. If possible, the power strip should be the kind that has internal surge protection, and battery backup.

G) 60 Cycle Hum & Audio interference – Most consumer audio equipment will have a 2 prong AC power plug. Some equipment has a 3 prong AC power plug. The third plug on a 3 prong plug is a "Safety Ground" which grounds the chassis to reduce shock hazard. The 3rd prong must never be removed even though it creates a 2nd ground path along with the audio cable shield ground. Two ground paths creates a Ground Loop antenna, which picks up 60 cycle AC hum. If possible, use only equipment that has 2 prong AC power plugs. This is often less expensive than making custom audio cable with audio transformer isolation.

If there are no other ground connected to the studio, a single piece of equipment with a 3 prong AC plug does not create a ground loop. However, if there is another ground, or a 2nd piece of equipment with a 3 prong AC power plug, then a ground loop is completed. If you can not change to two prong equipment, it may be necessary to use an audio isolation transformer on the audio cable to break the audio ground path. Contact a technician or factory on how to build a transformer isolated audio cable.

In some stubborn cases of hum (or RF interference), the best solution is to make the ground resistance between ALL of the equipment as low as possible. To do this, connect all of the equipment chassis' together with #12 stranded, insulated wire. Each piece of equipment is to have its own wire that returns in a star configuration to a single point in the studio. That single point should return by a single ground wire back to the main station ground. A 2"-4" copper ground strap to station ground is best.

IMPORTANT NOTE: Audio cables should be kept well away from AC power cables. A magnetic field is created by an electric current. The larger the current, the larger the magnetic field. AC ground and power wires have large currents and create significant AC magnetic fields. If an audio cable is physically close to an AC ground or power cable, then a 60 cycle AC noise voltage can be magnetically coupled into the audio signal cable.

H) Connecting multiple studios - When connecting multiple studios, long audio cables are sometimes necessary. These long cables can introduce AC hum into your audio. In these cases, it may be necessary to use distribution amplifiers with balanced inputs and outputs (or audio isolation transformers) to break the ground path and to cancel the AC hum.

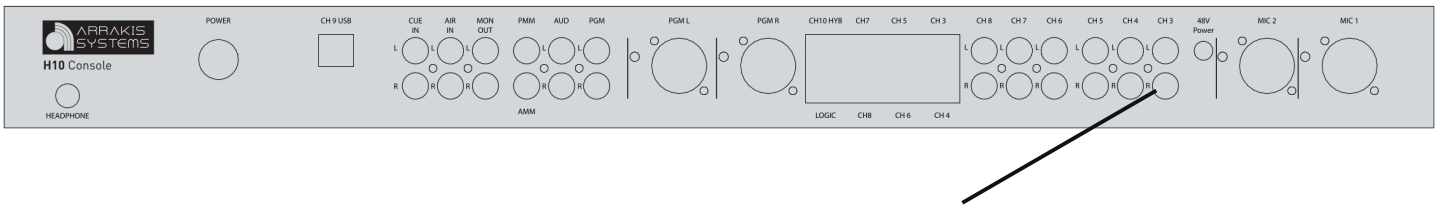
I) Setup your studio, one piece at a time - When building a studio, it is important to be able to isolate problems that may be causing noise, hum, or even not passing audio. To do this properly, the studio should be assembled and tested one piece of equipment at a time. Each problem is detected and eliminated as it occurs. This manual provides a basic step by step process to assemble and test your studio.

Step by Step
Installation Instructions

IMPORTANT NOTE: Follow this step by step procedure. Each step has specific tests to determine if the console installation has been performed correctly to that point.

STEP 1 - Power Supply Installation. The console power supply should be plugged into a surge protected outlet. First plug the power supply into the back of the console and then plug the power supply into the AC outlet.

TEST- The console should now be on. To test for power, simply push one of the console On/Off switches to see that the Channel On LED lights.



STEP 2 – Connect an audio source. Connect an audio source to the Channel 3 on the rear of the board. A simple connection would be to connect an MP3 player 1/8" headphone jack to Channel 3 of the H-10 console on its RCA jacks.

On Channel 3, turn the channel on by pushing the red button(the red on LED should now be on), and bring the slide fader on that channel to the in hand setting (0).

Press play on your MP3 player.

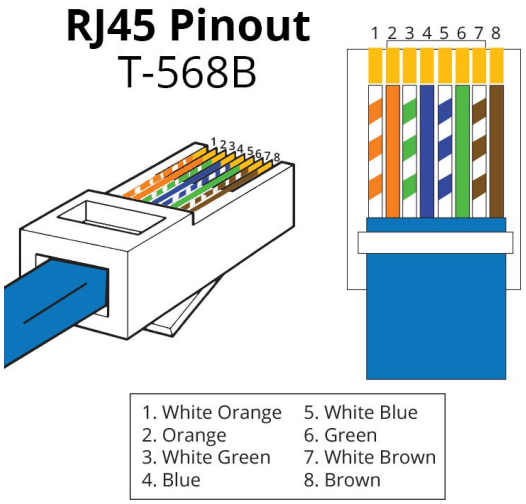
TEST- The VU meters on the console should move as the MP3 player plays a song.



Balanced CH 3 input. Channel 3 also includes a balanced RJ45 input, that is set to a +4dBu gain.

Pinout

Pin 1 – Left (+)
Pin 2 – Left (-)
Pin 3 – Right (+)
Pin 4 – Ground
Pin 5 – NC
Pin 6 – Right (-)
Pin 7 – NC
Pin 8 – NC



STEP 3 – Listen to audio on the headphones. Plug headphones into the headphone jack on the back (**HEADPHONE**) right side of the console. The console supports both low (8 ohm) and high impedance (>20 ohm) headphones. On the console, the Monitor Selector switch should be set to the PGM bus and set the Headphone Volume control to 1/2. Play audio on your MP3 player as in Step 2. Adjust the headphone level control on the console to a comfortable audio level.

TEST- You should hear the song on the MP3 player clearly. There should be no audible hum or noise. If you hear no audio or there is hum or noise, then repeat Steps 1,2,&3. You may review the Before you start section of this manual, as this will help with any noise issues.

Pinout

Tip – Left
Ring – Right
Sleeve - Ground



STEP 4 – Monitor Speaker Connection. The console has a low level monitor audio output that is designed to connect to an external audio power amplifier. The console output will not directly drive speakers. Connect the audio amplifier input to the console Monitor Output on the back panel of the console.

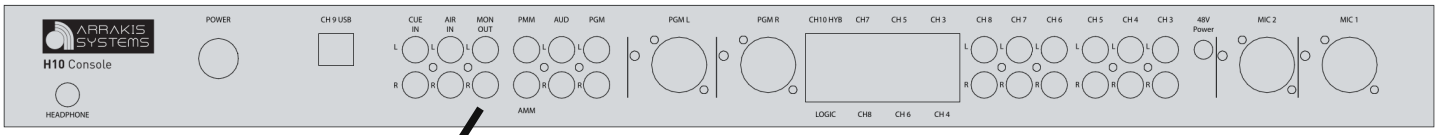
The monitor output of the console is unbalanced, consumer level and will use an RCA cable (usually supplied with the amplifier). Follow the amplifier's instructions and connect speakers to the amplifier.

Turn the console power on and the amplifier power on. On the console, select PGM on the Monitor Selector switch and set the Monitor Volume control to 1/2. Set the audio power amplifier level and front panel switches per the amplifier instruction manual.

WARNING- do not have all level controls at maximum. Too much audio level through your speakers can damage the speakers.

There should be an audio source (such as MP3 player) connected to the console as described in Steps 1,2, & 3. Turn the console source channel on and play a song. The VU meters should move with the audio and audio should be present at the headphone jack at the back of the console. Be certain that any mic channel is turned off because it will mute the audio out of the speakers so that there is no feedback. Audio should now be audible through the monitor speakers.

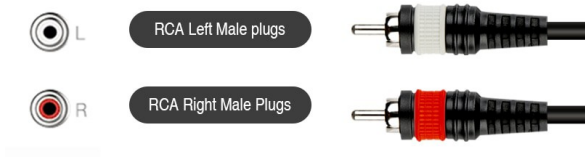
TEST- The audio through the monitor speakers should be clear and without significant noise or hum.





Audio Power Amp

Speakers

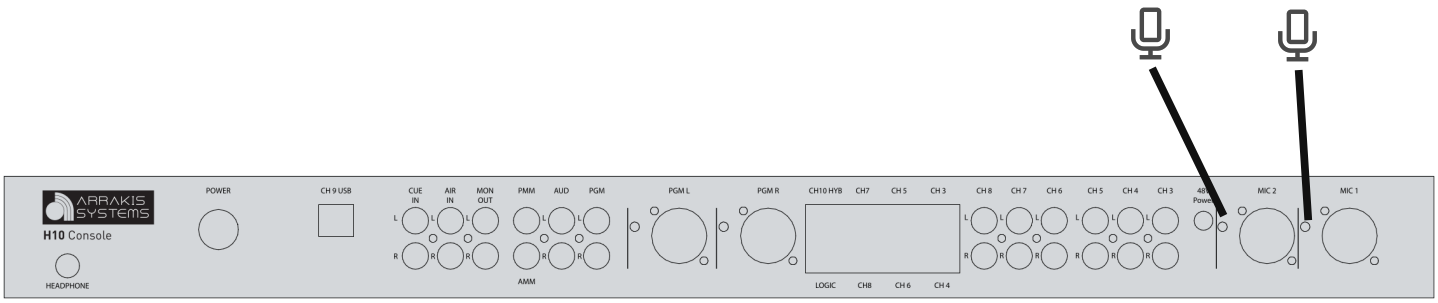


Monitor Left & Right outputs are also included on the **LOGIC** connector pins 3 (Left) & 6 (Right).

STEP 5 – Connect a Dynamic mic to the console. Using a mic to XLR cable, connect a dynamic mic to the Mic 1 input on the console. Turn Channel One on (the red LED should be on) and set the channel one fader to the in hand position (middle). If the mic itself has an on/off switch, then turn it on.

TEST- Speak into the microphone and the console VU meters should follow your voice. There should be no audio out of the monitor speakers (they are muted to eliminate feedback) but there should be audio in the Headphones.

If mic level is low, use a small screwdriver to adjust the 25 turn trimpot on the back of the console located next to the mic XLR connector.

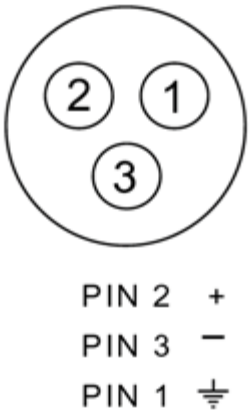


IMPORTANT NOTE: If you are using a condenser microphone, you will need the ARC-48V phantom power supply. This may be purchased on our website.

Connecting a Condenser mic to the console (optional). With the console main power & 48V power supplies unplugged, connect the condenser microphone. Then connect the main console power, along with the 48V power supply.

IMPORTANT NOTE: If you are using a condenser microphone and have the ARC-48V phantom power supply, be sure NOT to unplug or plug in microphones while the 48V supply is connected to the board. Doing so may damage the mic preamp IC.

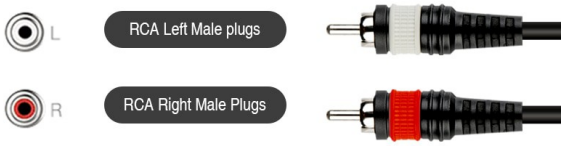
Pinout



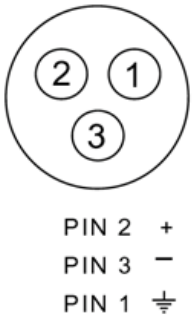
Additional microphones. The H-10 comes with 2 mic preamps. This gives you two mic inputs by default. You may however choose to buy the ARC-MIC-PRE, which will give you 2 additional mic inputs.

STEP 6 – Connect the Program (PGM) output. The console has both balanced and unbalanced Program bus outputs.

UNBALANCED PROGRAM OUTPUT - The console program output (PGM) is located on the console back panel. It is an unbalanced (-10dBu) audio output on RCA connectors.

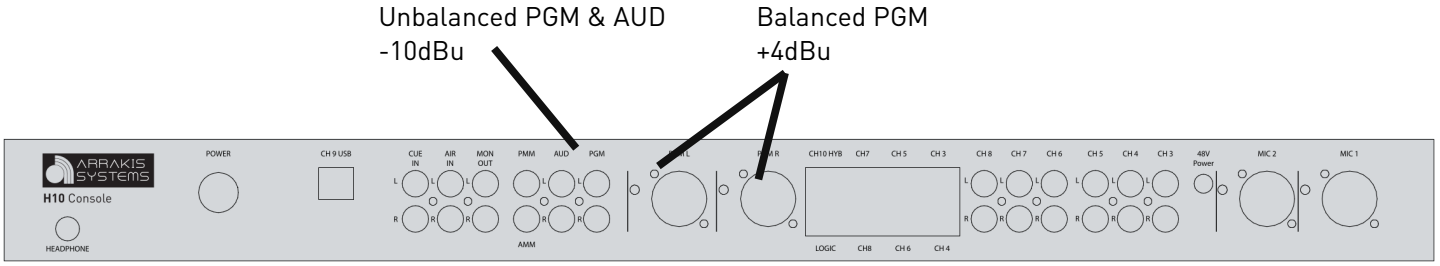


BALANCED PROGRAM OUTPUT - The console program output (PGM) is located on the console back panel. It is a balanced (+4dBu) audio output on XLR connectors.



CONNECTING THE PROGRAM OUTPUT TO THE SIGNAL CHAIN - The console Program output is both unbalanced analog (-10dBu level) and balanced (+4dBu). The equipment that the Program output drives must accept one of these input types and levels. You must refer to the product manual for that product. In some cases, it may be useful to connect the Program output of the console to an audio distribution amplifier which is designed to connect analog audio products that are of different types and levels.

TEST- The Program output of the console is connected to additional equipment (processor, distribution amp, etc) to form a signal chain. Check for presence and quality of audio at each point along the signal chain.



Connecting recording equipment (optional). With a Balanced & Unbalanced output, it is simple to connect a separate recording device. Simply connect the recorder to either the balanced or unbalanced PGM output.

Console Record Output

The console AUDITION output (AUD) is usually the bus that is used for recording. By using the Audition bus for recording, a recording can be occurring at the same time as the Program bus is used On Air. If you want to record the On Air signal on the Program bus, simply assign all of the channels in PGM also to AUD.

The Audition output connectors are located on the console back panel. It is an unbalanced (-10dBu) audio output.

CONNECTING TO AN AUDIO RECORDER
Most audio recorders will directly connect to consumer type unbalanced sources such as the Audition (Record) output of the console. Connect to the recorder with the analog cable supplied with the recorder.

TEST - Once connected, send audio from the console output to the recorder and view the input signal on the recorder. Refer to the recorder manual for more information.

STEP 7 – Connect a telephone hybrid.

CONSOLE PHONE INPUT- A telephone hybrid has an audio input and an audio output. The hybrid audio output is the callers voice and is connected to the source input channel 10 on pins 7 & 8 of the RJ45 connector **CH10 HYB** of the console.

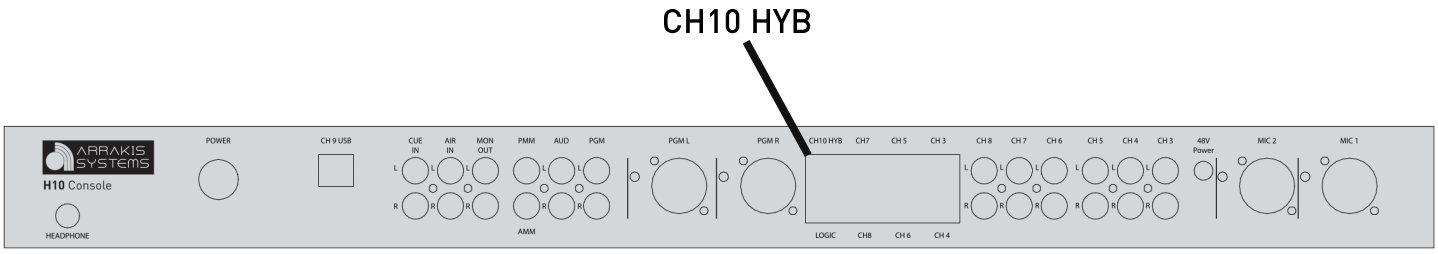
CONSOLE MIX MINUS OUTPUT- The input to the hybrid is from pins 4 & 5 on the console **CH10 HYB** connector on the back. A mix minus bus is a special audio mixing bus that contains all audio on the console program bus MINUS the callers voice. In this way the caller hears everything except himself. If he was not "minused" from the mix, then the caller would feed back to himself. The mix minus output is balanced (+4dBu) located on **CH10 HYB** connector.

CONTROL LOGIC- The hybrid has two ways to "answer" the caller and pick up the telephone line: front panel manual control of the hybrid itself and remote control. For manual control, an On and Off button will be located on the front panel of the hybrid. For remote control, the **CH10 HYB** back panel connector (RJ45) must have a custom cable connecting it to the console source start/stop logic. The logic is dry reed relay closures for both Start and Stop.

You may also choose to go with one of our USB relay kits to control the phone hybrid. Visit our website for more details.

Pre-built cables can also be purchased, for quickly connecting to your phone hybrid. Contact our sales team for more information.

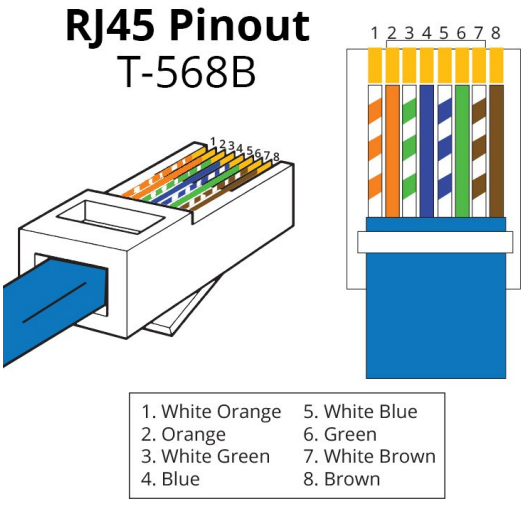
LEVELS- The console PHONE IN and PHONE OUT connectors are set for +4dBu levels.



CH10 HYB

Pinout

Pin 1 – Phone Logic Stop
Pin 2 – Phone Logic Start
Pin 3 – Phone Logic Stop 100 ohm
Pin 4 – Mix (-)
Pin 5 – Mix (+)
Pin 6 – Phone Logic Start 100 ohm
Pin 7 – Phone Audio In (+)
Pin 8 – Phone Audio In (-)



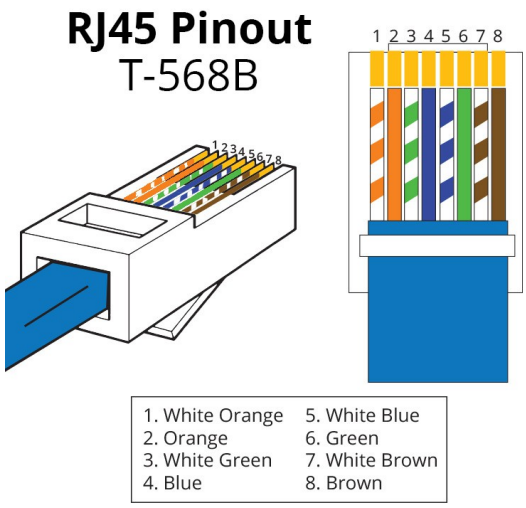
Talkback to another Studio. The Talkback feature is designed so that a console can easily communicate with another studio. In the H-10 studio, the operator pushes the TALK button on mic channels One or Two and speaks through his control room mic into the Monitor/Cue system of the other studio. The second studio responds back to the H-10 studio and the audio is heard through the CUE system.

INSTALLATION - The H-10 has a talkback audio output to be sent to the remote studio and an audio input to the Cue system to receive audio from the remote studio. All connections are made to the **LOGIC** connector on the rear of the console. On site installation requires the building of a custom cable to link the console to the studio at the other end.

LOGIC

Pinout

Pin 1 – On-Air Light
Pin 2 – On-Air Light 2
Pin 3 – Monitor Out Left
Pin 4 – GND
Pin 5 – Mic 1 & 2 Talk Studio Out
Pin 6 – Monitor Out Right
Pin 7 – Talkback audio Input to Cue
Pin 8 – +12VDC



OTHER CONSOLES - Talkback can be accomplished between non H-10 series consoles and studios. Care should be taken to assure compatibility between logic voltages.

GROUND LOOPS AND HUM - Because of long cable lengths between studios, it is possible for the talkback system to introduce hum into one or both studios. Isolation transformers may be required on the analog inputs and outputs.

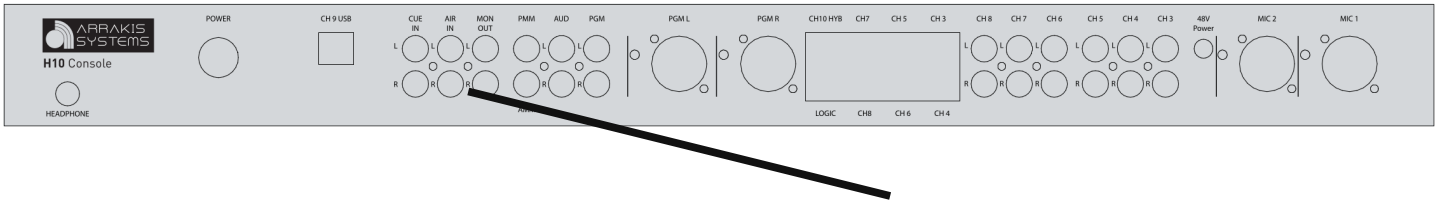
FACTORY CABLE - Arrakis has optional cables available in various lengths from the factory.

TEST - Test talkback between the two studios. It is important to also listen for hum or noise in the Program output on the control room monitor speakers.

STEP 8 – External monitor input.

OFF AIR MONITORING - The Monitor Selector Switch (EXT) is usually used to monitor the actual radio station on air signal from a radio tuner.

NOTE: it is important to monitor the actual signal from the radio station and not just the output of the console. This is so as to monitor the entire radio chain from the console to the transmitter.

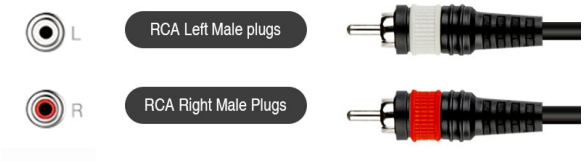


Connect the output of a radio tuner or professional on air monitor to the AIR IN connector on the back of the console.

IMPORTANT: if using a consumer tuner, use a line level output and not the speaker output.

CALIBRATION. The EXTERNAL IN is calibrated to -10dBu input level.

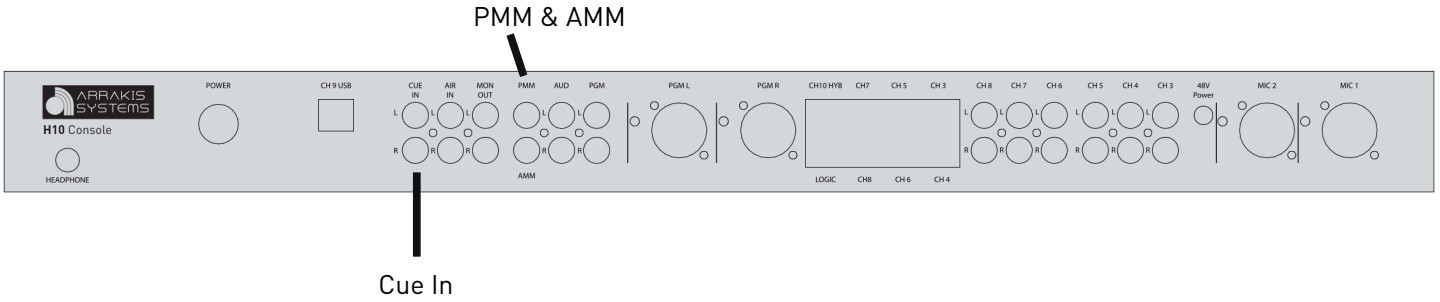
TEST - Set up the tuner or monitor to your station's frequency and switch the console control room monitor to the AIR position. You should hear the audio output of the tuner. Audio quality should be high and there should be no objectionable audio hum.



STEP 9 – PMM out, AMM out & CUE IN

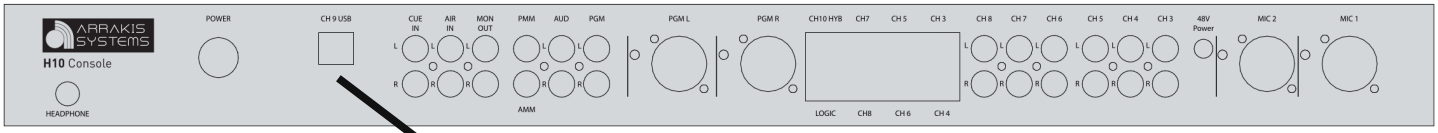
PMM - The H-10 comes with a mono mixdown of the Program and Audition outputs. This gives you a mono signal that you can use for AM playback, recording, or other needs.

CUE IN – The console has an unbalanced (-10dBu) input to the cue system on a stereo RCA jack on the rear panel of the console. The cue input sums into the cue bus and appears on the Monitor output and Headphones.



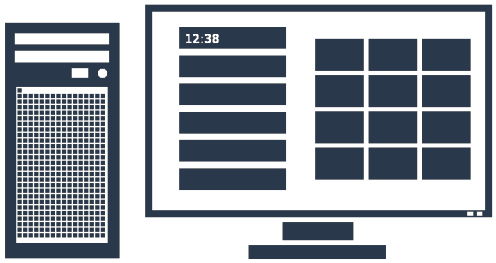
STEP 10 – USB Channel

The H-10 console features a built in sound card on Channel 9 of the console. This enables the console to play & record audio directly from a Windows or Mac PC. Because the electronics is USB HID compliant, it will be recognized as a soundcard by the Windows or Mac operating system and can be used with any Windows or Mac compliant audio software (such as Adobe Audition).



Drivers should automatically install. It may be necessary to connect the PC to the internet for driver installation.

The sound card will be recognized as **USB Audio Codec** on the PC.



IMPORTANT - It is important to have the PC and the H-10 console on the same power outlet. Doing so will protect you from added noise.

Logic Output

The H-10 comes with a logic output for an On-Air light.

ON-AIR LIGHT

The console has a logic output for triggering an external On Air Light. This installation procedure requires a professional technician to select an interface for driving the On Air light that you have chosen. Some lights require low voltages (such as 24VDC) and others require 110VAC. Some have built in drivers, but most do not. To simplify the setup process, plug & play on-air light kits may be purchased from our website.

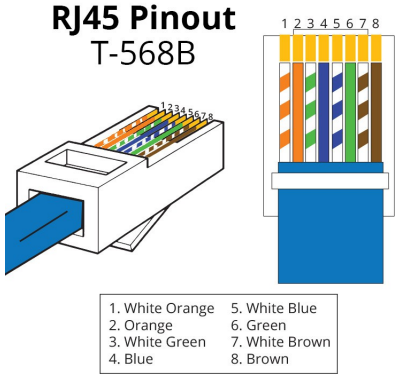
MUTING LOGIC Sustained, dry reed relay closure. Maximum of 500 milliamps. The relay closure is between Pin 1 & 2 on the RJ45 Logic connector.

IMPORTANT- The logic output will not directly drive an AC light bulb and will be destroyed if AC is applied to any console logic pin.

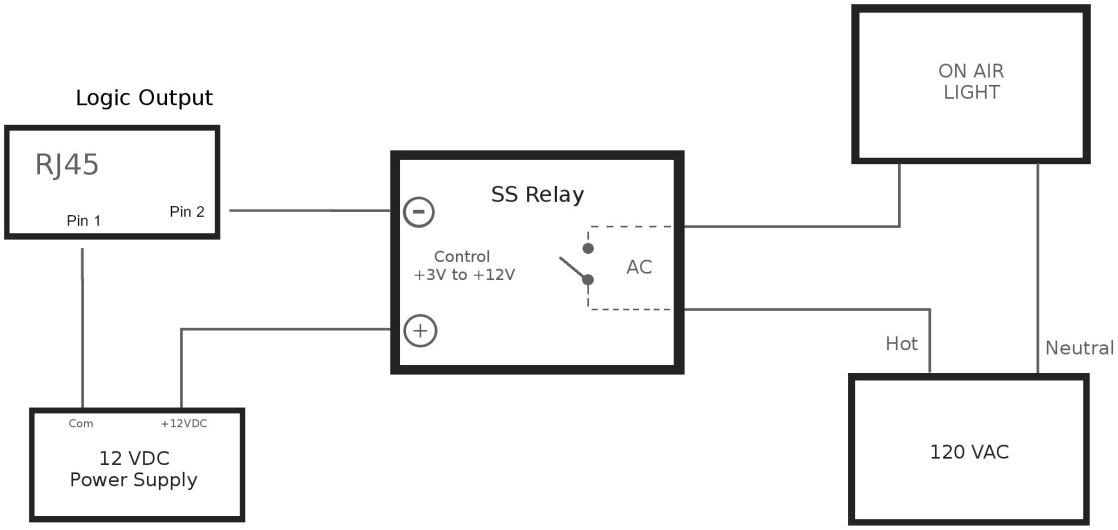
LOGIC
Pinout

Pin 1 – On-Air Light
Pin 2 – On-Air Light 2
Pin 3 – Monitor Out Left
Pin 4 – GND
Pin 5 – Mic 1 & 2 Talk Studio Out
Pin 6 – Monitor Out Right
Pin 7 – Talkback audio Input to Cue
Pin 8 – +12VDC

RJ45 Pinout
T-568B



The diagram on the right shows a basic circuit for connecting an external relay, that could then turn power on/off for an external on-air light. On-Air light kit wiring/relays can be purchased from the Arrakis Systems website.



TEST - Activating the On Air Light should not produce an audio pop in the console audio.

Audio Calibration

The console has been calibrated at the factory to normal -10dBu and +4dBu levels and should not require field calibration. Usually, it is better to adjust the level out of the source device than to adjust the console trim levels. Field calibration should only be done with proper test equipment and by a qualified audio technician.

VU METER ADJUSTMENT

The VU meters are factory set for +4dBu at 0VU. These levels should not be changed from factory settings unless directed by factory service technicians.

MIC GAIN ADJUSTMENT

The only user level adjustments are on the two mic channels. These trim pots are set at the factory for typical microphone gain levels. These trim pots can be adjusted if different mic gains are required. To adjust, the simplest method is to speak into the mic and adjust the trim pot with a small straight edge screwdriver until the desired level is reached.

UNBALANCED SOURCE CHANNEL GAIN ADJUSTMENT

No gain adjust is required for unbalanced -10dBu source devices

BALANCED SOURCE CHANNEL GAIN ADJUSTMENT (Channels 3-8 only)

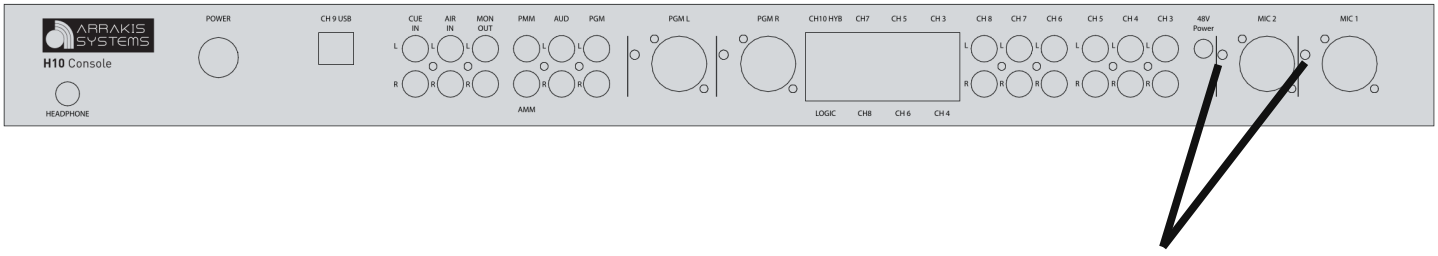
These channels are set at the factory for +4dBu levels. If the levels must be adjusted, trim pots are available on the bottom of the motherboard. This requires the bottom panel of the console to be removed. Care must be taken when adjusting the trimpots to not short any electronics.

PHONE CHANNEL TEN LEVEL ADJUST

The phone in and out audio connectors are balanced +4dBu outputs. If the levels must be adjusted, trim pots are available on the bottom of the motherboard. This requires the bottom panel of the console to be removed. Care must be taken when adjusting the trimpots to not short any electronics.

PROGRAM & AUDITION OUTPUT LEVEL ADJUST

The Program balanced output has a trim pot level adjust on the rear panel beside the XLR. The Audition output is unbalanced -10dBu consumer level and does not require trimming.



Mic gain trim pots.

Service & Maintenance

General Repair Considerations

WARNING

The console should be repaired by qualified, professional, & experienced, audio technicians ONLY. Before beginning any type of repair or opening the console CALL Arrakis customer support for recommendations.

DESIGNED FOR MODULAR PART REPLACEMENT

The ARC series console is designed for modular replacement rather than repair. The power supply is external and plug in. The rotary faders are plug in. All ICs are plug in. ICs can be individually replaced to test for functionality. A small amount of disassembly is required.

PC BOARD COMPONENT LEVEL REPAIR

If possible, PC board component level repair requiring soldering should be performed at the factory. In particular, replacement of slide faders and switches should be performed at the factory. If the repair must be made in the field, then extreme care must be taken to not damage the PC board or other components. Arrakis can not warranty non-factory service.

POWER SUPPLY

The power supply is a sealed module that must be replaced in whole if there is a problem. Using the incorrect power supply, not supplied by Arrakis, will void the warranty.

REPEATED EQUIPMENT FAILURES

If a specific part of the console is failing regularly, it is likely that it is being subject to unusual stresses. Examples are;
(1) Switch or fader failure- rough physical treatment.
(2) Mic channel IC failure- static discharge to mic.
(3) Input op amp failure- lightning, power surge, or other transient on this cable.
(4) Output op amp failure- lightning, power surge, or other transient on this cable.
(5) Power Supply failure- lightening, power surge, or other transient on the AC power line.

Suggested Repair Procedures

NO AUDIO OUT OF ONE INPUT CHANNEL- (Swap Cables) Be certain that the problem is in the console itself. If mic channel two doesn't function but mic channel one functions properly, then plug the cable from the good mic into the channel that you suspect to be bad. If the channel that you suspect to be bad now functions, then the problem is external to the console and is in the source or the wiring. This is a very fast and easy way to test your system.

VU METERS MOVE BUT NO AUDIO OUT OF THE CONSOLE- The VU meters measure the actual output of the console itself. If the meters move but no audio is present, the problem is after the console output and is in the following signal chain. Plug a set of headphones into the output of the console and listen to the Program output to confirm this.

LOUD LOW FREQUENCY HUM IN AUDIO- Many years ago this would mean a power supply failure. In today's electronics, this is an installation problem such as a ground loop. To confirm the problem is not in the console, remove ALL wiring from the console and connect a pair of headphones to the output you are testing. The hum should be absent. All wiring must be removed and headphones only used. A very common problem is for an audio power amp and speakers to create the ground loop with the console.

NO AUDIO OUT OF THE MONITORS- Be certain that the monitor system is not muted due to a mic channel being on or talkback being activated.

Opening the Console

WARNING

The console should be repaired by qualified, professional, & experienced, audio technicians ONLY. Before beginning any type of repair or opening the console CALL Arrakis customer support for recommendations.

ACCESSING THE MOTHERBOARD

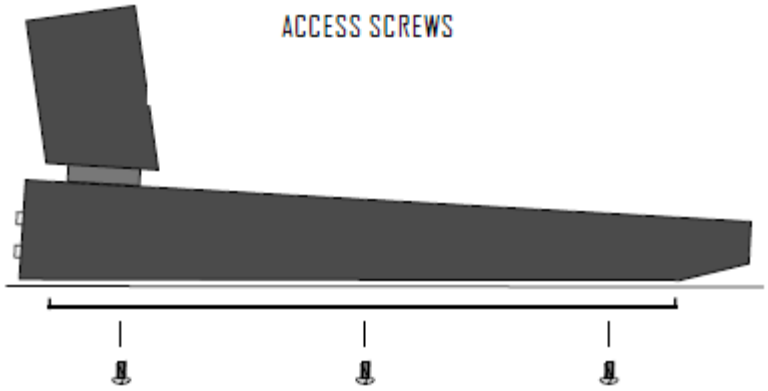
The motherboard is accessed from the bottom of the console. Six screws must be removed from the bottom panel to have access to the console electronics for test and IC replacement. Be careful to not scratch the console when turning the console over.

REMOVING THE MOTHERBOARD

The motherboard is attached on the top of the front panel (slide fader screws) and with screws on the bottom of the motherboard, requiring access to the inside of the console. When replacing the motherboard, be certain to replace all of the screws so that switches and faders will operate properly.

ACCESSING THE INTERIOR OF THE VU METER PANEL

The VU meter panel is opened by removing the screw at the left and right rear of the panel.



REMOVING THE MOTHERBOARD

The motherboard is attached to the front panel with screws on the bottom of the motherboard. This requires access to the inside of the console. When replacing the motherboard, be certain to replace all of the screws so that switches and faders will operate properly.

Replacing Slide Faders, Switches, and other parts

Slide faders and switches are soldered onto the PC board and should be replaced at the factory if at all possible. The procedure requires proper tools, and it can be difficult to remove the parts without damaging traces or pads on the PC board. Also, the switches are very sensitive to temperature and duration during the soldering process and can be electronically damaged or destroyed when being soldered. If a slide fader, switch, or other part must be replaced in the field, then extreme care must be taken.

Tools required:
1) Hand held solder sucker (stranded solder wick is not suggested)
2) Temperature controlled soldering iron with pencil tip (soldering guns should not be used)

Procedure:
1) Suck the solder from all holes until the damaged component is entirely free from the PC board. Remove the damaged part.
2) Place the new part onto the PC board. Slide faders and switches (and some other parts) ARE oriented and MUST be replaced in the correct orientation.
3) Carefully solder the new part to the PC board.
    a) Clean the tip of the soldering iron on a wet sponge.
    b) Tin the tip of the soldering iron (cover the tip of the soldering iron with a small amount of solder).
    c) Set the soldering iron to 734 degrees Fahrenheit (390 degrees Celsius).
    d) Touch the tip of the 'soldering iron' to the junction of the PC board pad AND the component lead.
    e) Immediately touch the 'solder' to the junction of the soldering iron and the PC board pad.
    f) Flow only enough solder to fill the hole. Immediately remove the soldering iron from the part.
    g) Do not keep the soldering iron on the part for more than 2 seconds.
    h) Clean the solder rosin from the PC board if required. (See Note #1 below)

Note: Arrakis uses aqueous core (water soluble) solder that requires the solder joint to be cleaned by water after soldering. Aqueous core solder is acidic and must be cleaned so as to not damage the PC board over time. Rosin core solder is not water soluble and requires a flux remover if it is to be cleaned. The rosin residue however does not have to be removed for rosin core solder.

Warranty: Arrakis can only warranty service performed at the factory. All field service is performed at the customer's risk.

Replacing ICs

ICs must be replaced with care. All ICs in the console are socketed so that they can be replaced.

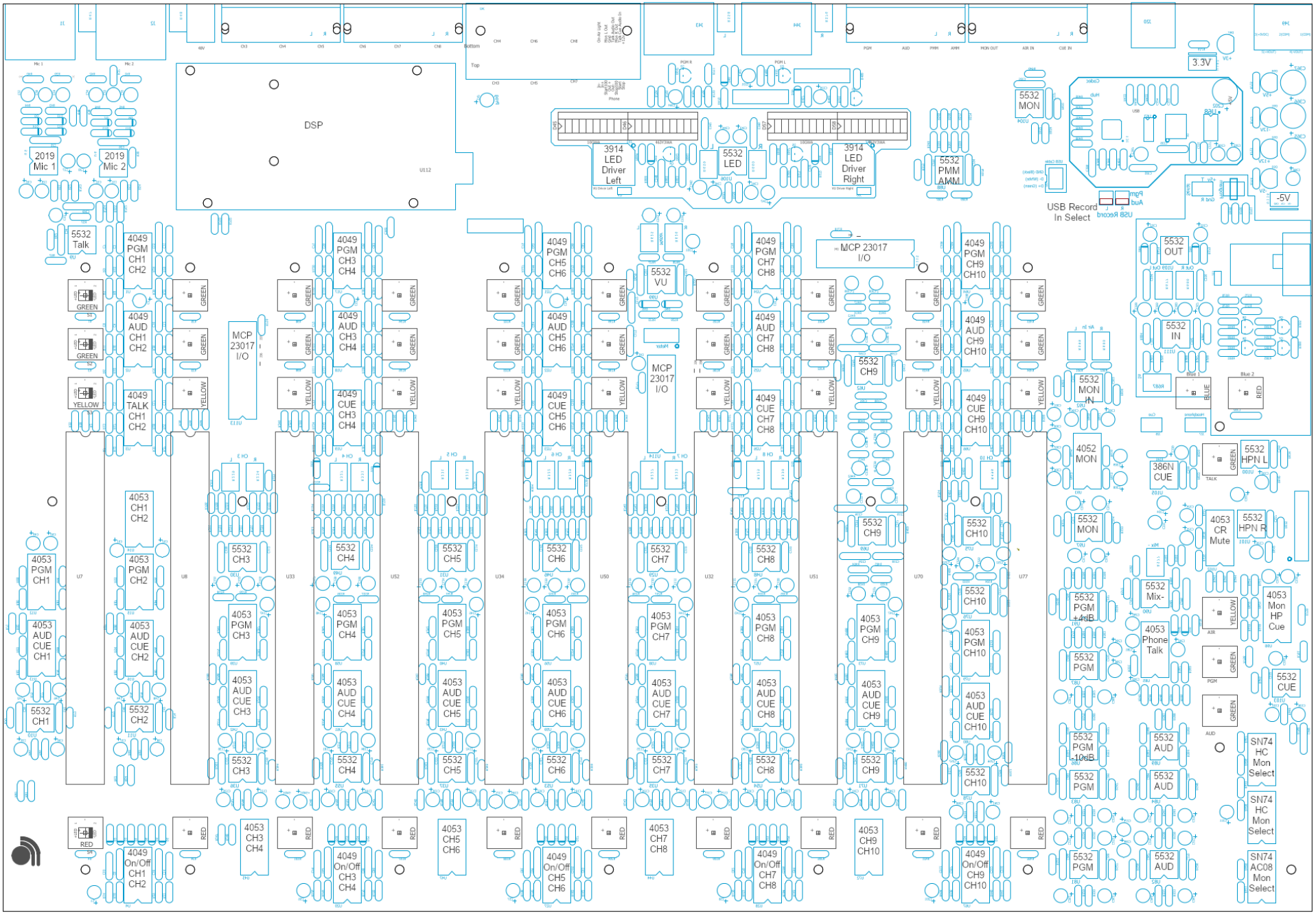
When replacing an IC, be careful to not bend legs under the IC or outside the socket. Be extremely careful to not shock an IC or the motherboard with a static discharge. In some cases, you must use a grounded arm or anklet if there is a possibility of a static discharge. Make sure the IC is being placed in the proper orientation.

In all cases, retain the old IC because it may be found to not be damaged.



IMPORTANT NOTE: Disconnect power to the console before opening the console & while swapping IC's. IC's should never be swapped while the board is still connected to power.

Motherboard Parts Layout



Warranty Replacement of Parts

To have a part replaced under warranty, you must:
1) Provide a valid product serial number that is within the warranty period

2) Contact the Arrakis customer service department and describe what parts need replacement and the circumstances of the failure. (The customer service department may require on site test by your technician to confirm the part replacement is appropriate for your problem.)

3) A Return Merchandise Authorization Number (RMA #) will be issued when a part s to be returned to the factory.

4) Return ALL defective parts to the factory (shipping prepaid) to the attention of the "Customer Service Department" with a letter including your name, address, call letters, serial number, date, and valid RMA #.

5) Parts replaced under warranty will be shipped at Arrakis expense by UPS ground. Any expense over and above UPS ground will be born by the customer.

IMPORTANT- If the defective parts are not returned to the factory within 30 days, you will be invoiced for them and it will be assumed that they do not fall under warranty. Further customer service will be denied until the defective parts are returned of paid for.

Purchased Parts

An Arrakis customer may purchase spare or replacement parts from the factory. The cost of the parts will include a service charge, the cost for the parts, and the cost of the shipping.

Details for purchasing parts may be found on our website.

IMPORTANT- Non payment or late payment for parts will result in refusal of further customer service until the problem is resolved.