ARC-talk-Blue Radio Console

ARC-talk-Blue 🖇		-20 -4	Left 15-10-5 -38 0 12	Pro- 3 gram -2018	Right 5 -10-5-3 -1 0 12	s		Arrak	is Systems
Talk 1			Line	Cue	Cue	Cue		External	Blue 1 Blue 2
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				*	*				
1 2		4	5		7	8	¥	Monitor	Headphone
Mic 1 Mic 2	Mic 3	Mic 4	Mic 5-Line	Blue Ch 1	Blue Ch 2	PC USB			

Technical Manual

February 15, 2017





Thank you from Arrakis Systems inc.

Thank you for purchasing this product by Arrakis Systems inc. Our company has provided professional audio equipment to the broadcast, commercial audio, and consumer audio markets for more than 30 years. Our products are sold worldwide and are well known for leading edge technology, quality, and reliability.

Telephone Support for the 'Free' Arrakis software

Free Arrakis live on air software may be available for your ARC console. It does not include the cost of telephone support. The software is specifically designed to be easy to use for people with average PC computer and radio industry experience. Support is limited to the product manual and the on screen help system in the software itself. Refer to the Arrakis website at www.arrakis-systems.com for updated training materials. In a case where telephone support is a necessity, Arrakis has per minute and per incident support available that can be paid for by valid credit card. For comprehensive support and advanced automation features, the 'Solutions' program may be purchased. Refer to the website or contact the factory for details.

How to contact Arrakis Systems

Arrakis Systems inc. is located at

Arrakis Systems inc 6604 Powell Street Loveland, Colorado 80538

Business Hours:

Contact:

Fax: email: web:

Voice:

8:00am - 4:30pm mountain time

970-461-0730 970-663-1010 support®arrakis-systems.com arrakis-systems.com

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



Safety Instructions

 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.

 Follow All Instructions. All operating and product usage instructions must be followed.
 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.

 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.
 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. **Dverloading**. Do not overload AC wall outlets, extension cords, or integral convenience outlets as this can result in a fire or electric shock hazard.
14. **Dbject 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.







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.



Software End User License Agreement

This product contains software licensed from Arrakis Systems inc. and possibly from other software companies. Ownership of this product constitutes acceptance of this agreement.

1- This product contains intellectual property (i.e. software programs) that are licensed for use by the end user customer (hereinafter "End user").

2- This is not a sale of such intellectual property

3- The End user shall not copy, disassemble, or reverse compile software programs

4- The software programs are provided to the End user "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, and fitness for particular purpose. The entire risk of the quality and performance of the software program is borne by the End user.

5- Arrakis and its suppliers shall not be held to any liability for any damages suffered or incurred by the end user (including, but not limited to, general, special, consequential, or incidental damages including damages for loss of business profits, business interruption, loss of business information and the like), arising from or in connection with the delivery, use or performance of the software program.



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PRODUCT Description

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PRODUCT DESCRIPTION

Product Description ARC-talk-Blue

Advanced Radio Console



Dual Bluetooth Cell phone & Audio Streaming interfaces

ARC-talk-Blue * Lett Program Regist Arrakis Systems				
	Image: Construction Image: Construction Imag	External But 1 But 2 Image: Constraint of the second sec		

- 9 Source inputs total
 - 4 mic, 1 mic/stereo line, 2 Bluetooth, 1 PC USB
- 8 input channels
 - 4 high quality Mic channels (with optional phantom power)
- 1 mic/stereo line input channel (with balanced inputs)
- 2 Bluetooth input channels (for wireless streaming or cell phone pairing)
- Channel 8 is a PC USB sound card input
- Stereo Program Mixing bus (with both balanced and unbalanced outputs)
- PC USB output of the Program bus for recording in digital direct to your PC
- Monitor, Headphone, and Cue system with External input for off air monitoring
- Cue system autocues (with Program dimming) into the Monitor & Headphone systems
- Fixed level Headphone output for use with external headphone amps for the 5 mics
- Conductive plastic slide faders & LED switch lamps for long life

Powerful, compact, portable, and not needing a land line to take incoming calls, the 'ARC-talk-Blue' is ideal for talk studios or remotes that require a mic mixer with telephone caller interface. The revolutionary console features 5 high quality mic channels plus phantom power. Channels 7 & 8 on the console can be paired to any Bluetooth enabled audio device such as your Cell phone, MP3 player, MP3 recorder-editor, and more. Each 'Blue' channel features a button you push to connect an incoming caller and push again to disconnect from the caller. The channel One mic features 'Talk' buttons to talk to each Blue caller off line. No external hybrids are needed. OR... you can pair any Bluetooth enabled audio device such as an lpad, Tablet device, or MP3 player and stream full bandwidth, high quality stereo (A2DP) audio into the console. The 'ARC-talk-Blue' also features a built in USB PC sound card on channel 8 so that you can play audio from your PC while recording the console Program output with your favorite software.



USB play & record

Operational Description



On Startup: Long Press – Turns on Bluetooth & puts into Pair mode.

Will blink when ready to pair. Solid lit when connected to device. Talk 1 & Talk 2 switchs **VII Meters** When connected: Long Press - Ends bluetooth pair, and puts into oush to talk offline to the Ch & & 7 **IFD VII meters** Pair mode. When receiving call: Short Press – Accepts Call. Long Bluetooth callers. The caller will hear for the main Press - Rejects Call. Will blink when call is coming in. the mic only and the caller will be Prooram bus Solid lit when with caller. During call: Short Press – Ends Call. heard in the headphones. The mic channel need not be on. Mic/line Cue switches Monitor Input Selector ARC-talk-Blue Arrakis Systems selects an External audio input (such as off air) as the source for the Monitor & Headohone systems Monitor & Headohone Level Controls slide faders for conł Monitor leadphone trol of monitorina Mic 3 Mic 5-Line Blue Ch 1 Blue Ch 2 PC USB Mic Mic 2 Mic 4 level Channel On-off switches

Four Mic channels

For normal on air talent or a Host and Guest talk format.

Channel one features 7 'Talk' buttons to talk to the Channel 6 and 7 Bluetooth channels

Mic/steren line ch

For a mic or stereo line source Push the hutton above the fader to access the steren line source.

Note: there is no que button for the stereo line source input.

Bluetooth Channels 6 8 7

Channels 6 & 7 can be paired to any Bluetooth audio device for (1) wireless audio streaming or (2) interface to a cellphone/landline as a wireless headset.

Turn the Channel switch On to place the Bluetooth audio on to the Prooram bus. Cue the Bluetooth audio off line with the cue switch

PC channel

This channel is an internal PC USB sound card for playing directly in digital from a Windows PC

Auto-cue into the Monitor and Headphone systems

The console features a cue system that plays through the monitor and headphone systems. To cue a channel, depress the cue switch. The Program audio in the Monitor speakers will dim and the Cue audio from the cue'd channel will play through the monitor speakers and through the headphones.

Back panel Diagram



Specifications

<u>Electronic</u>

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 IKHz
	-75dB typ 20kHz
On Air Light Logic:	reed relay closure, 50mA max
Source Start Logic:	none
Mic Turret Logic:	none

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

Physical Specifications

Dimensions:

Depth - 11 1/2" Height - 2" Width- 18"

OPERATING INSTRUCTIONS

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Quick Start



On Startup: Long Press – Turns on Bluetooth & puts into Pair mode. Talk 1 & Talk 2 switchs Will blink when ready to pair. Solid lit when connected to device. VII Meters push to talk offline to the Ch & 87 When connected: Long Press - Ends bluetooth pair, and puts into **IFD VII meters** Bluetooth callers. The caller will hear Pair mode. When receiving call: Short Press – Accepts Call. Long for the main the mic only and the caller will be Press – Rejects Call. Will blink when call is coming in. Program bus heard in the headphones. The mic Solid lit when with caller. During call: Short Press - Ends Call. channel need not be on. Mic/line Cue switches Monitor Input Selector ARC-talk-Blue Arrakis Systems selects an External off air) as the tor & Headohone Ŧ systems Monitor & Ŧ Headphone Level Controls slide faders for con- $\mathbf{1}$ Monitor trol of monitoring Mic 3 Mic 5-Line Blue Ch 1 Blue Ch 2 PC USB Mic Mic 2 Mic 4 level Channel On-off switches

Four Mic channels

For normal on air talent or a Host and Guest talk format.

Channel one features 7 'Talk' buttons to talk to the Channel 6 and 7 Bluetooth channels

Mic/steren line ch

For a mic or stereo line source. Push the button above the fader to access the stereo line source.

Note: there is no cue button for the stereo line source input.

Bluetooth Channels 6 & 7

Channels 6 & 7 can be paired to any Bluetooth audio device for (1) wireless audio streaming or (2) interface to a cellphone/landline as a wireless headset.

Turn the Channel switch On to place the Bluetooth audio on to the Program bus. Cue the Bluetooth audio off line with the cue switch.

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PC channel

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Auto-cue into the Monitor and Headphone systems

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3.1

Mono mic level Input Channels (channels 1 - 4)

Channels one through four are dedicated mono microphone channels.

CHANNEL ON AND DFF

To turn a channel on, simply push the red ON switch at the bottom of the fader. When the channel is on, the LED indicator above the switch will light. To turn the channel off, simply push the red ON button again.

CHANNEL ON AND OFF LOGIC

The console does not have remote channel on and off logic.

TALK BUTTONS ON CHANNEL ONE

These buttons activate a bi-directional off air talkback between Mic one and the channel 6 or 7 Bluetooth channels. The mic feeds the caller while the caller feeds the console cue system. The caller is heard on the monitor speakers and in the headphones. The switch is a push-push interlocking type. Push once for on, push again for off.



Stereo Line Level Input (Channel 5B)

The console has a single stereo line level input selectable between Mic and Line on Channel 5.

CHANNEL ON AND DFF

To turn a channel on, simply push the red DN switch at the bottom of the fader. When the channel is on, the LED indicator above the switch will light. To turn the channel off, simply push the red DN button again.

CHANNEL ON AND OFF LOGIC

The console does not have channel logic to start or stop audio source.

MIC / LINE SELECTOR

To select the stereo Line input, click on the LINE button above the fader. To return to the Mic click on the button again.



The Bluetooth Input Channels (channels 6 and 7)

The console features dual conferencing phone system capability through the two Bluetooth channels (6 and 7).

CHANNEL ON AND OFF

To turn a channel on, simply push the red ON switch at the bottom of the fader. When the channel is on, an LED indicator above the switch will be lighted. To turn the channel off, simply push the red ON button again.

CHANNEL ON AND OFF LOGIC

The console does not have channell on off logic.

CELL PHONE AUDIO FEED

The output to Bluetooth channel 6 will be a mix of channels 1-5, channel 7, and channel 8. The output to the phone hybrid will NOT include the channel six phone callers voice so that there will NOT be feedback. The Bluetooth channel 7 audio also includes all channels minus its own channel to eliminate 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 ear-phone systems (Program audio dimmed below the caller's voice).



Turn the channel on to place the caller onto the console Program bus for on-air or production.



The Bluetooth Input Channels (continued)

BUTTONS AND STATUS LEDS

On the far right side of the console above the Headphone Level Control are two buttons and status LEDs that control channels 6 and 7's Bluetooth functionality. There is one multipurpose button with status LED for each Bluetooth channel. Operation is very similar to standard Bluetooth cell phone headset operation.

<u>Names</u>: 'ATB (1.0) Call 1' 'ATB (1.0) Call 2'

On Startup:

Long Press – Turns on Bluetooth & puts into Pair mode. Will blink when ready to pair. Solid lit when connected to device.

When connected:

Long Press - Ends bluetooth pair, and puts into Pair mode.

When receiving call:

Short Press – Accepts Call Long Press – Rejects Call

Will blink when call is coming in. Solid lit when with caller.

During call:

Short Press – Ends Call



The 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 (channels 1 through 5A), the monitor system will mute (audio 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. Push the switch down (LED will light) to select an external input to the monitor speakers. This is usually an off-air source so that the final output of the station can be monitored. When the switch is up (unlighted) the Program bus output of the console is being monitored.

MONITOR VOLUME FADER

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



MONITOR SELECTOR SWITCH

The Headphone system

The Headphone (earphone) system in the console is provided so that audio can be listened to while the microphone is active and the monitor speakers are muted. The Headphone system receives the same audio feed as the Monitor system but does not mute when the microphone channel is turned on. The Headphone system has a 1/8" headphone jack on the rear of the console. The headphone amplifier connected to the headphone jack is designed to work with high impedance (not 8 ohm) headphones.

FIXED LEVEL HEADPHONE OUTPUT

A connector with a fixed volume level headphone output is located next to the standard Headphone connector. This output is provided to be used with an external audio amplifier to provide headphones to all five mics.

<u>CUE</u>

The console features Autocue. Whenever a channel is placed into cue, the Program audio in the Headphone system will dim and the Cue audio will play over the Program signal.

MUTING

The headphone system is not muted. When the 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. The headphone system can not have audio feedback so muting is not required.

MONITOR SELECTOR SWITCH

This switch selects the audio source for the Monitor/Headphone system. Push the switch down (LED will light) to select an external input to the monitor speakers and headphones. This is usually an off-air source so that the final output of the station can be monitored. When the switch is up (unlighted) the Program bus output of the console is being monitored.

HEADPHONE VOLUME FADER

Sets the headphone level to the internal headphone amplifier.



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 a CD to be certain it is the correct song, etc. The cue system features 'Auto-cue,' where cue is heard in the Monitor speakers and separate Cue speakers are not required.

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-DFF status has no effect on the cue signal.

<u>CUE AUDIO</u>

Cue audio will be heard in the Monitor speakers and the Headphones. In the Monitor and Headphone system, Autocue will dim the Program in the headphones and play the cue audio over top of program audio.

The VU meters

The console features a single set of fixed LED VU meters that monitor the stereo Program output of the console. The meters feature standard 'VU' ballistics.



INSTALLATION INSTRUCTIONS

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Unpacking

a) PACKING SLIPS- do you have everything?

Check the Packing Slips that come with the shipment to be certain that all packages have been received.

b<u>) CHECK FOR DAMAGE</u>

Check all packages and equipment for damage IMMEDIATELY upon receipt.

If damage is found, contact Arrakis Systems immediately to report the damage. (refer to inside cover of this manual for contact information)

c) <u>CAREFULLY GO THROUGH EACH BOX</u>

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 the 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.





SAVE ALL PACKING MATERIAL

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) AREA IN FRONT OF THE CONSOLE

It is normal to have 8-10" between the front of the console and the front of the table so that a piece of paper may be laid on the table in front of the console.

c) SCRIPT OR COPY BOARD

Are you going to use a copy bridge that spans the top of the console for paper or other objects? A copy bridge can allow the console to be placed close to the front of the table in tight rooms.

d) ADEQUATE VENTILATION

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

e<u>) 110V - 220VAC OPERATION</u>

The console comes with a 110VAC-220VAC autosensing external power supply as standard equipment.

f<u>) Static</u>

Static discharge to electronic devices can cause damage, reduce performance, or cause noise in the system. Proper choice of carpet is an important consideration when building a studio.

g) THE 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

Getting started... a MUST Read !

a) <u>CONSUMER SOURCE EQUIPMENT</u>

The console is designed to be used with balanced professional & unbalanced consumer type audio source equipment such as CD players, MDs, DAT machines, cassette machines, etc. Unbalanced consumer equipment is designed to perform well in compact studios where audio cables are short. Balanced audio is required when connecting multiple studios or with long audio cable runs (> 10 feet). When choosing consumer audio equipment, choose equipment that has 2 prong AC power plugs (not the 3 prong plugs).

b) <u>AC POWER CONSIDERATIONS</u>

Plug all of the equipment in your studio into a single AC power strip!

Unbalanced consumer source equipment is not designed to reject AC power line hum. This makes it important to put ALL of the equipment in the studio on the same branch of the AC power and preferably on a single AC power 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.

Because many buildings have as many as 8-12 duplex wall outlets on a single 1500-2000 watt branch, you must have NO other equipment on any of those 8-12 other outlets. Make sure the branch your outlet is on does not also power the lights or any other building equipment.

c) SOME THOUGHTS ABOUT GO CYCLE HUM (or some ideas about what to do if you get it)

The RCA audio cables used in consumer audio equipment connect the chassis ground and signal ground of all of the equipment in the studio together through the cable shield. All shield ground connections should be as tight and low impedance as possible. Use only high quality RCA (IHF) audio cables.

Most consumer audio equipment will have a 2 prong AC power plug. Some equipment has a 3 prong AC power plug. The third prong 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. With stubborn hum, replace the equipment with 3 prong AC power plugs with equipment with 2 prong AC power plugs. This is often less expensive that making a custom audio cable with audio transformer isolation.

If there is 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 (such as from another studio) 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 the 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.

d) CONNECTING MULTIPLE STUDIOS

When connecting multiple studios, long audio cables are sometimes necessary. These long cables can introduce AC hum into your audio. Long audio cables should always be balanced. If it is not possible to use a balanced output from the console, 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.

e) STEP BY STEP INSTALLATION PROCEDURE

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 Instructions

IMPORTANT- 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 A MICROPHONE

Connect a Microphone to the Channel One Mic input XLR connector on the back of the console.

Turn the channel one Mic on by pushing the red on button (the red on LED should now be on), and bring the slide fader on that channel to the in hand setting (D).

TEST- The VU meters on the console should move as you speak into the Microphone.

STEP 3- LISTEN TO THE MIC AUDIO ON THE HEADPHONES

Plug the headphones into the headphone jack on the back right side of the console as illustrated. The console supports only high impedance (>20 ohm) headphones. On the console, the Monitor Selector switch should be off (assigned to the Program bus) and set the Headphone Volume control to 1/2. Talk into the mic on channel one. Adjust the headphone level control on the console to a comfortable audio level.

TEST- You should hear your voice clearly. There should be no audible hum or noise. If you hear no audio or there is hum or noise, then repeat Steps 1,2,63.



Monitor amp & Speakers

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, the Monitor Selector switch should be off (assigned to the Program bus) 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 levels controls at maximum. Too much audio level through your speakers can damage the speakers.

To hear Monitor audio you must stream audio through one of the two Bluetooth channels or the PC USB channel. 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 all mic channels are 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.

RCA AUDIO CABLE



More Microphones

STEP 5- CONNECT MORE MICS TO THE CONSOLE

Using a mic to XLR cable, connect mics to the Mic 2-Mic5 inputs on the console.

Turn Mic channels on (the red LED should be on) and set the channel 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.



Program Output

STEP 6- CONSOLE PROGRAM 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.

STEP 6- connect the console Program output to the station's Signal Chain

Unbalanced Pgm out (-10dBu)	
Balanced Pgm out (+4dBu)	
ARC-talk-Blue HP HP Mute Monte Est Pgm Pgm Pgm Image: Arc talk and	$ \begin{array}{ c c c c c }\hline & & & & & & \\ \hline & & & & & \\ \hline & & & & $

Record Output

STEP 7- CONSOLE RECORD OUTPUT

The console may be connected to an audio recorder as well as the main audio on air signal chain. The availability of BOTH unbalanced and balanced program outputs makes it easy to connect the console output to on air and a recorder.

CONNECTING TO AN AUDIO RECORDER

Most audio recorders will directly connect to consumer type unbalanced sources. Connect to the recorder with the analog cable supplied with the recorder.

<u>test</u>

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.



External Monitor Input

STEP 8- 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.

INSTALLATION

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

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

<u>Calibration</u>

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

<u>test</u>

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

RCA AUDIO CABLE

The White connector is left and the Red connector is right



STEP 10- OFF AIR MONITORING



The On Air Light

STEP 9- CONNECT AN 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.

MUTING LOGIC

Sustained, dry reed relay closure. Maximum of 50 milliamps.

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.

<u>test</u>

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



1/8" TRS phone connector with On Air light (Muting) logic	
ARC-talk-Blue HP HP HP HP Hute L Nun L Ext L Pgm Pgm Right I Ch 8 I Ch 5 +I2V Main Du Du Fixed Logic Du In Du Du Du In	$ \begin{array}{ c c c c } \hline & & & & & & & & & & & & & & & & & & $

Channel 5b Balanced Input

STEP 10- CONNECT A BALANCED PROFESSIONAL AUDIO SOURCE DEVICE

The console has a balanced, +4dBu audio input on channel 5B. It uses an RJ45 connector.

Factory Cables

A prebuilt cable can be purchased from the factory with an RJ45 on the console end and your choice of XLR, RCA, or TRS phone connectors on the other end. Or, you can build a custom cable as described below.

<u>Custom Cable</u>

The cable used with the RJ45 connector is CAT5. This cable has 4 twisted pairs of wires. The twisted pairs are identified by color (ie: orange, orange... green,green... etc). Arrakis ARC consoles use 2 pairs for left and right audio [the two pairs used by ethernet as the transmit (green) and receive pairs (orange)]. Left is the orange (ethernet transmit pair). Right is the green (ethernet receive) pair.

Arrakis supplies a CATS cable with RJ45 connectors on each end with the console. Cut the cable in half (or to the length that you need). Then attach the desired connector to the unterminated end of the cable (XLR, TRS phone, RCA, etc)

The balanced inputs are >10,000 ohm input impedance and levels are set for +4dBu signals.





Channel 8 PC Setup

STEP 11- CONNECTING A WINDOWS PC

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

<u>CONNECTIONS</u>

The PC is connected to the console by a standard USB cable (USB 1 or USB 2).



WINDOWS SOUND PLAYBACK AND RECORD DEVICES

Basic Calibration

The console has been calibrated at the factory to normal -10dBu and +4dBu levels and should not require field calibration. Because the console has BOTH -10dBu consumer AND +4dBu professional outputs level adjustment is usually not required. Also, it is better to adjust the level out of the source device than to adjust the console levels. In this way, a source device can be moved from one studio to another without requiring recalibration.

MIC GAIN ADJUSTMENT

The only user level adjustments are on the 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 screw-driver until the desired level is reached.



SERVICE & MAINTENANCE INSTRUCTIONS

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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. Most ICs are plug in, and a physical board layout is provided with descriptions of the functions of each IC. ICs can be individually replaced to test for functionality. A small amount of disassembly is required. Diagrams on the following pages explain the required disassembly.

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.

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

(1) 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.

(2) 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.

(3) 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.

(4) 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. Four screws must be removed from the side panels (2 on each side) to have access to the console electronics for test and IC replacement. Be careful to not scratch the console when turning the console over.

<u>Removing the motherboard</u>

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 #1: 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 but one IC in the console is 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.

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

Motherboard Parts Layout

______ ___ ___ ___ ___ | Dual Bluetooth | Daughter Card



Factory Service

Technical Questions

Arrakis Systems maintains a staff of friendly broadcast engineers, design engineers, and technicians who have many years of in depth field experience in broadcasting. All of our technical resources are available to you to answer installation questions, solve problems, and repair equipment. If you have a question or problem, please feel free to call us. We can not solve every problem, but our people are here to try.

Our customer support department is open from: 8AM - 4:30PM, Monday -Friday (except for Holidays)

Voice:	970-461-0730
Fax:	970-663-1010
email:	support@arrakis-systems.com

IMPORTANT:

Collect calls will not be accepted

Warranty Service Procedure for the ARC console hardware

Arrakis Systems assumes that its customers have on staff (or access to) competent technical personnel and adequate test equipment.

If a product fails, Arrakis will first seek to ascertain the problem over the phone and solve it at the modular replacement level where we find the specific part(s) that have failed and repair or replace them. This is the least expensive and time consuming solution for you. Depending on the circumstances and at our discretion, Arrakis will replace the specific PC board suspected to be at fault. If replacing PC boards does not resolve the problem, then the console is to be returned to the factory where it will we repaired and returned to you. Repair time at the factory is normally two week days.

Shipping- The customer is responsible for payment for shipping to the factory. Parts returned to the factory freight collect will be refused. Return shipping over and above the cost of UPS ground will be born by the customer. In the case of international shipments, all cost of shipping and duties are born by the customer, both to and from the factory.

Under no circumstances will Arrakis replace a defective console with a replacement console.

IMPORTANT- Under no circumstances does Arrakis take any responsibility for non-factory technical expenses.

Factory Service (continued)

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 Departent" 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.

<u>Spare Parts</u>

Arrakis does not provide a spare parts kit with this console. Contact the factory if a part needs to be replaced.

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.

Parts may be purchased by:

- 1) C.O.D. shipping
- 2) Valid and approved Credit Card (below our current credit limit)
- 3) Prepaid by company check (shipment after check clears the bank)
- 4) Wire transfer of funds
- 5) Through an Arrakis authorized dealer

Arrakis does not sell items on open account.

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