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I am asked quite frequently about connecting Phone Hybrids to audio consoles. Enclosed are some wiring notes on the various Arrakis Systems audio consoles models.

To start with the purpose of the phone hybrid is to bring the phone caller audio into the audio console for broadcasting. The hybrid isolates the phone line from the audio console and provides a separate caller audio signal as well as a send audio signal back to the caller. Some hybrids also provide phone line selection switching as well.

150sc, 500sc, 2000sc and 2100sc Models

Connecting the Phone Hybrid caller output to the consoles line input.

On the SC series audio console, channels 6 and 12 are setup as the phone input channels. You will need to convert the stereo line input to a mono line input by using a wire jumper connect pins 2 and 6 together and by using a second wire jumper connect pins 3 and 5 together Now you have a mono connection for the phone hybrids caller output.

Audio Console Input Ch 6 or 12	Phone Hybrid Caller Output
Pins 3 and 5 - - - - -	XLR pin 2
Pins 2 and 6 - - - - -	XLR pin 3
Pin 4 - - - - -	XLR pin 1

Connect the Phone Hybrids send Input this is used to send studio audio back to the caller.

Audio Console Utility Right Output	Phone Hybrid Send Input
Pin 5 - - - - -	XLR pin 2
Pin 6 - - - - -	XLR pin 3
Pin 4 - - - - -	XLR pin 1

Connecting the consoles remote start logic to the phone hybrid logic.

The consoles remote start logic is set by default as a continuous contact closure, which will provide a contact closure to ground.

Consoles Logic On Off Function	Phone Hybrid Logic External On Off
'A' connector Pin 1 - - - - -	Logic Connector Hybrid On/Off
'A' Connector Pin 4 - - - - -	Logic Connector Common

You can change the SC series logic function from continuous to a momentary closure. On the channel control card cut the wire jumper next to the 10mfd capacitor located at the bottom edge center.

5000sc Model

Connecting the Phone Hybrid caller output to the consoles line input.

On the 5000SC series audio console, you have the option of using two phone hybrids. Select your phone channels for hybrid one and hybrid two. You will need to convert the stereo line input to a mono line input by using a wire jumper connect pins 3 and 12 together and by using a second wire jumper connect pins 2 and 11 together Now you have a mono connection for the phone hybrids caller output.

Audio Console Input Channels	Phone Hybrid Caller Output
Pins 3 and 12 - - - - -	XLR pin 2
Pins 2 and 11 - - - - -	XLR pin 3
Pin 1 - - - - -	XLR pin 1

Before using the PM1 input modules that you have designated as the phone channels, you must set up the PM1 as a phone module. To do this remove the PM1 module and select the DIP switches to the proper positions. The dipswitches are located just underneath the Program select switch.

DIP Switch Orientation

- [4] – Mix Minus 1 (output to the Utility Left located on output pc board)
- [3] – Mix Minus 2 (output to the Utility Right located on output pc board)
- [2] – Monitor Mute
- [1] – Remote Start / Stop Continuous closure

- [4] Mix Minus 1 switch to the left on - right off (turn dipswitch 4 off for phone hybrid one)
- [3] Mix Minus 2 switch to the left on - right off (turn dipswitch 3 off for phone hybrid two)

Please Note if you do not turn off the program or audition mix minus dipswitches the hybrid caller audio will be fed back to the caller and there by causing an audio feedback noise.

Connect the Phone Hybrids send Input this is used to send studio audio back to the caller.

Audio Console Utility Left Output	Phone Hybrid 1 Send Input
Pin 1 - - - - -	XLR pin 2
Pin 2 - - - - -	XLR pin 3
Pin 3 - - - - -	XLR pin 1

Audio Console Utility Right Output	Phone Hybrid 2 Send Input
Pin 5 - - - - -	XLR pin 2
Pin 6 - - - - -	XLR pin 3
Pin 4 - - - - -	XLR pin 1

Logic On Off Function	Phone Hybrid Logic External On Off
CN-2 Pin 9 - - - - -	Logic Connector Hybrid On
CN-2 Pin 5 - - - - -	Logic Connector Hybrid Off
CN-2 Pin 7 - - - - -	Logic Connector Common

The consoles remote start stop logic is set by default as a momentary contact closure.

1200sc Model

Connecting the Phone Hybrid caller output to the consoles line input.
 On the 1200sc series audio console select your phone input channel. You will need to convert the stereo line input to a mono line input by using a wire jumper on the AMP connector connect pins 8 and 9 together and by using a second wire jumper connect pins 3 and 6 together Now you have a mono connection for the phone hybrids caller output.

Audio Console Input Channel	Phone Hybrid Caller Output
Pins 8 and 9 - - - - -	XLR pin 2
Pins 3 and 6 - - - - -	XLR pin 3
Pin 1 - - - - -	XLR pin 1

Logic On Off Function	Phone Hybrid Logic External On Off
CN Pin 2 - - - - -	Logic Connector Hybrid On/Off
CN Pin 7 - - - - -	Logic Connector Common

The consoles remote start stop logic is set by default as a momentary contact closure.

Before using the 1200sc input channel that you have designated as the phone channel you must set up that input channel as a phone input. To do this remove the mix minus jumper which is located on the input PC board just to the left of the silver program and audition reed relays.

Please Note if you do not remove the mix minus jumper the hybrids caller audio will be fed back to the caller and there by causing an audio feedback noise.

Connect the Phone Hybrids send Input this is used to send studio audio back to the caller.

Audio Console Mix Minus Output	Phone Hybrid Send Input
CN-3 Pin 7 - - - - -	XLR pin 2
CN-3 Pin 1 - - - - -	XLR pin 3
CN-3 Pin 1 - - - - -	XLR pin 1

Note the 1200sc mix minus output is unbalanced however the output signal level is at 0db to +4db and the output impedance is at 600 ohm. I would add a series 100 ohm resistor in series between the CN-3 pin 7 connection and the phone hybrid wiring. This will prevent possible oscillations that could destroy the output IC.

12,000sc Model

Connecting the Phone Hybrid caller output to the consoles line input.

On the 12,000sc series audio console, you have the option of using two phone hybrids. Select your phone channels for hybrid one and hybrid two.

Connect your phone hybrids caller output to the consoles stereo line input channel TPM1 module. Connect to the CN-1 connector for the 'A' input or the CN-2 connector for the 'B' input. Our wiring example is for the connector CN-1 'A' console input.

You will need to convert the stereo line input to a mono line input by using a wire jumper.

On the AMP connector CN-1 connect pins 8 and 9 together and by using a second wire jumper connect pins 3 and 6 together Now you have a mono connection for the phone hybrids caller output.

Audio Console Input Channel TPM1	Phone Hybrid Caller Output
CN-1 Pins 8 and 9 - - - - -	XLR pin 2
CN-1 Pins 3 and 6 - - - - -	XLR pin 3
CN-3 Pin 1 - - - - -	XLR pin 1

Logic On Off Function	Phone Hybrid Logic External On Off
CN-1 Pin 7 - - - - -	Logic Connector Hybrid On

CN-1 Pin 5 ----- Logic Connector Hybrid Off
CN-1 Pin 2 ----- Logic Connector Common

The consoles remote start stop logic is set by default as a momentary contact closure.

If you need a continuous contact closure for the hybrid set the modules logic function as follows.

- DIP Switch 4
[1] Switch 1 off
[2] Switch 2 on
[3] Switch 3 on
[4] Switch 4 on

Wiring the phone hybrid for the continuous logic function.

Logic On Off Function	Phone Hybrid Logic External On Off
CN-1 Pin 5 -----	Logic Connector Hybrid On/Off
CN-1 Pin 2 -----	Logic Connector Common

For the second phone hybrids caller output use a different input channel and wire it by using the example above.

Before using the TPM1 input modules that you have designated as the phone channels, you must set up the TPM1 as a phone module. To do this remove the TPM1 module and select the DIP switches to the proper positions. Find dipswitch one it is located just underneath the input trimpots.

- DIP Switch 1
[1] [2] [3] [4]

1. Program Mix Minus switch up on down off (turn dipswitch 1 off for phone hybrid one)
2. Audition Mix Minus switch up on down off (turn dipswitch 2 off for phone hybrid two)

Please Note if you do not turn off the program or audition mix minus dipswitches the hybrid caller audio will be fed back to the caller and there by causing an audio feedback noise.

Connect the Phone Hybrids send Input this is used to send studio audio back to the caller.

TOB-1 Program Mix Minus Output	Phone Hybrid One Send Input
CN-3 Pin 8 -----	XLR pin 2
CN-3 Pin 1 -----	XLR pin 3
CN-3 Pin 1 -----	XLR pin 1

TOB-1 Audition Mix Minus Output	Phone Hybrid Two Send Input
CN-3 Pin 3 -----	XLR pin 2
CN-3 Pin 1 -----	XLR pin 3
CN-3 Pin 1 -----	XLR pin 1

Note the 12,000sc mix minus output is unbalanced however the output signal level is at 0db to +4db and the output impedance is at 600 ohm. I would add a series 100 ohm resistor in series between the CN-3 pin 8 connection and the phone hybrid wiring. Do the same for the Audition mix minus as well. This will prevent possible oscillations that could destroy the output IC.

12,000sc TPH1 Telephone Module Wiring

This module adds additional inputs to your phone hybrids as well as the ability to talk to the caller off air. Plug in your TPH1 module into the 12,000 TMF mainframe usually on the right hand side just to the right of your last TPM1 line input module position. Below is the information to connect the TPH1 to the 12,000 series audio console.

12,000 Console	TPH1 Module	Purpose
Microphone Channel		
CN-3 pin 4	CN-1 pin 9	Prefader announcer microphone audio.
CN-3 pin 1	NC	Shield for the jumper wire only.
TOB-1 Output Module		
CN-2 pin 8	CN-1 pin 5	Program Mix- audio to caller.
CN-2 pin 1	CN-1 pin 2	Program Mix- audio common.
CN-2 pin 3	CN-2 pin 9	Audition Mix- audio to caller.
CN-2 pin 1	CN-1 pin 2	Audition Mix- audio common.
Phone Hybrid Caller Output		
XLR pin 2	CN-1 pin 8	Caller audio output.
XLR pin 1	CN-1 pin 3	Caller audio output common.
XLR pin 3	NC	

Connect the Phone Hybrid Caller output to the TPH1 module as shown above as well as your designated Phone channel TPM1 input. This is a stereo line input so you will need to connect the input wiring in mono. To do this Jumper CN-1 pin 9 to pin 8 this is your (+) input. Jumper CN-1 pin 3 to pin 6 this is your (-) input. You will now feed both the left and right input channels your caller audio.

Phone Hybrid Send Input		
XLR pin 2	CN-3 pin 5	Send audio back to caller.
XLR pin 3	CN-3 pin 2	Send audio back to caller.
XLR pin 1	NC	Audio ground.

Take the phone hybrid audio ground from the XLR pin 1 to the audio ground of the console. This may be connect to the back rail chassis or to the TOB-1 audio ground found on pin 1 of either CN-1, CN-2 or CN-3

The send back audio is selected by the TPH-1 select switch.
Position 1 Red button is the announcer audio sent back to the caller.
Position 2 White button is the Program Mix- from the console.
Position 3 Black button is the Audition Mix- from the console.
Position 4 Gray button is the External audio 1 input.
Position 5 Gray button is the External audio 2 input.

External 1 and 2 inputs are used for custom mix minus sub mixes and may be connected to equipment external to the audio console.

The following models Nova, Xmixer and Revolution are Digital audio consoles.

To use their phone channels, you must set up the consoles by using the setup software. This software was provided with the console and each model has it's own version of this setup software. You will need a PC to connect to the audio consoles Com Port. For more detail on using the setup software, refer to the setup CD or email us at support@arrakis-systems.com.

Nova Digital Model

Connecting the Phone Hybrid caller output to the consoles line input.

On the Nova series audio console, you have the option of using two phone hybrids. Select your phone channels for hybrid one and hybrid two operation.

Connect your phone hybrids caller output to the consoles stereo line input channel RCA jacks. You will need to convert the stereo line input to a mono line input by using a RCA Y adaptor cord.

Audio Console Input Channel	Phone Hybrid Caller Output
Center post of RCA plug - - - - -	XLR pin 2
No connection - - - - -	XLR pin 3
Outside of RCA plug - - - - -	XLR pin 1

Logic On Off Function	Phone Hybrid Logic External On Off
Logic 3 Pin 3 - - - - -	Logic Connector Hybrid On
Logic 3 Pin 2 - - - - -	Logic Connector Hybrid Off
Logic 3 Pin 6 - - - - -	Logic Connector Common

In the example above we are using channel 10 as the phone channel you may assign any channel 2 through 10 as the phone channel. For other logic wiring refer to page 3-12 in the manual.

For the second phone hybrids caller output use a different input channel and wire it by using the example above.

Before using the input channels that you have designated as the phone channels, you must set up the Nova console by using the setup software. This software was provided with the unit. For more detail on using the setup software, refer to the setup CD or email us at support@arrakis-systems.com.

Please Note if you do not select the phone channels with the setup software the phone hybrid will not get any send audio from the console.

For the second phone hybrids caller output use a different input channel and wire it by using the example above.

Connect the Phone Hybrids send Input this is used to send studio audio back to the caller.

Mix Minus 1 Output	Phone Hybrid One Send Input
Center post of RCA plug - - - - -	XLR pin 2
Outside of RCA plug - - - - -	XLR pin 3
Outside of RCA plug - - - - -	XLR pin 1

Mix Minus 2 Output	Phone Hybrid Two Send Input
Center post of RCA plug	----- XLR pin 2
Outside of RCA plug	----- XLR pin 3
Outside of RCA plug	----- XLR pin 1

The output level on the Nova audio console is at -10db to 0db please adjust your phone hybrids send input to the proper input level.

Xmixer Digital Model

Connecting the Phone Hybrid caller output to the consoles line input.
 Connect your phone hybrids caller output to the consoles analog stereo line input channel. Connect to any analog channel 3 through 12. This is a digital audio console so for the phone hybrid audio do not use any of the digital inputs.

You will need to convert the stereo line input to a mono line input by using a wire jumper.
 On the AMP connector connect pins 1 and 3 together and by using a second wire jumper connect pins 2 and 4 together Now you have a mono connection for the phone hybrids caller output.

Audio Console Input Channel	Phone Hybrid Caller Output
(+) Pins 1 and 3	----- XLR pin 2
(-) Pins 2 and 4	----- XLR pin 3
(GND) Pin 5	----- XLR pin 1

Logic On Off Function	Phone Hybrid Logic External On Off
Line Input Pin 7	----- Logic Connector Hybrid On
Line Input Pin 8	----- Logic Connector Hybrid Off
Line Input Pin 5	----- Logic Connector Common

The consoles remote start stop logic is set by default as a momentary contact closure, which will provide a contact closure to ground.

Before using the input channel that you have designated as the phone channel, you must set up the Xmixer console by using the setup software. This software was provided with the unit. For more detail on using the setup software, refer to the setup CD or email us at support@arrakis-systems.com.

Please Note if you do not select the phone channels with the setup software the phone hybrid will not get any send audio from the console.

Connect the Phone Hybrids send Input this is used to send studio audio back to the caller.

Mix Minus Output	Phone Hybrid Send Input
(+) Pin 1	----- XLR pin 2
(-) Pin 2	----- XLR pin 3
(GND) Pin 5	----- XLR pin 1

Revolution Digital Model

Connecting the Phone Hybrid caller output to the consoles line input.

On the Revolution series audio console, you have the option of using two phone hybrids. Select your phone channels for hybrid one and hybrid two operation.

Connect your phone hybrids caller output to the consoles analog stereo line input channel. Connect to any analog channel 3 through 12. This is a digital audio console so for the phone hybrid audio do not use any of the digital inputs.

You will need to convert the stereo line input to a mono line input by using a wire jumper.

On the Molex connector connect pins 1 and 3 together and by using a second wire jumper connect pins 2 and 4 together Now you have a mono connection for the phone hybrids caller output.

Audio Console Input Channel	Phone Hybrid Caller Output
(+) Pins 1 and 3	XLR pin 2
(-) Pins 2 and 4	XLR pin 3
(GND) Pin 9	XLR pin 1

Logic On Off Function	Phone Hybrid Logic External On Off
Line Input Pin 7	Logic Connector Hybrid On
Line Input Pin 8	Logic Connector Hybrid Off
Line Input Pin 9	Logic Connector Common

The consoles remote start stop logic is set by default as a momentary contact closure to ground.

Before using the input channels that you have designated as the phone channels, you must set up the Revolution console by using the setup software. This software was provided with the unit. For more detail on using the setup software, refer to the setup CD or email us at support@arrakis-systems.com.

Please Note if you do not select the phone channels with the setup software the phone hybrid will not get any send audio from the console.

Connect the Phone Hybrids send Input this is used to send studio audio back to the caller.

Mix Minus 1 Output M1	Phone Hybrid One Send Input
(+) Pin 2	XLR pin 2
(-) Pin 1	XLR pin 3
(GND) Pin 3	XLR pin 1

Mix Minus 2 Output M2	Phone Hybrid Two Send Input
(+) Pin 2	XLR pin 2
(-) Pin 1	XLR pin 3
(GND) Pin 3	XLR pin 1

Before using the input channels that you have designated as the phone channels, you must set up the Revolution console by using the setup software. This software was provided with the unit. For more detail on using the setup software, refer to the setup CD or email us at support@arrakis-systems.com.

If you have any questions please give me a call at (970) 461 0730 ext. 316.

Or email at support@arrakis-systems.com

Thank you and I hope this information was helpful for you.