

## 4.8 Audio Interfaces

Starting with the Personal IRIS, IRIS systems started to include audio in and out capabilities as part of, or an option to, the basic system. Actually, in fact, there was hardware for audio output as early as the IP4 processor, but there was never software support for this hardware.

The basic complement of audio input/output for a system is: stereo line in, stereo line out, stereo microphone input, stereo headphone output, and AES Stereo Digital Audio input/output. Most of the systems use stereo mini-jacks for these connections, but RCA, BNC and even ADAT optical connections are now used for some audio connections. Some systems have augmented the basic capability by adding the ability to input or output four channels of audio at one time.

Table 4-51 shows the chassis that have analog audio capabilities and Table 4-52 shows the chassis with digital audio capabilities. Shaded boxes indicate that audio capability is not available. Numbers indicate the number of input or output channels that are available. Unless noted otherwise, all connections on the table are via stereo mini-jacks.

**Table 4-51** Analog Audio Inputs and Outputs on SGI Systems

Chassis	Model	Inputs		Outputs	
		Line In	Microphone	Line Out	Headphone
Twin Tower	All				
Diehard	All				
Predator	All				
Diehard2	All				
Eveready	All <sup>1</sup>	2	2	2	2
Terminator	All <sup>1</sup>	2	2	2	2
Personal IRIS	4D/20, 25 <sup>2</sup>	1	1	1	
	4D/30, 35 <sup>3</sup>	2	2	2	2
Indigo	All	2	2	2	2
Indigo <sup>2</sup>	All	4	2	4	2
Indy	All	4	2	4	2
O2	All	2 (RCA)	2	4 (2 RCA, 1 stereo mini-jack)	2
OCTANE	All	2 (RCA)	2	2 (RCA)	2
Onyx2	AI	2 (RCA)	2	2 (RCA)	2

1. With the addition of the Audio/Serial Option card, or Vigra audio card
2. Audio on the 4D/20, 25 was 8 bit  $\mu$ -law, all others are 16 bit linear.
3. Audio capability could be added to a 4D/30 or 4D/35 with an optional add-in audio card.

Terminator and Eveready systems may add audio capability by using an add-in card co-engineered by SGI and Vigna or by purchasing the Audio/Serial Option (ASO) card from Silicon Graphics.

**Table 4-52** Digital Audio Inputs and Outputs on SGI Systems

Chassis	Model	I/O		Speaker Power
		AES Digital	Optical Digital	
Twin Tower	All			
Diehard	All			
Predator	All			
Diehard2	All			
Eveready	All <sup>1</sup>	2		
Terminator	All <sup>1</sup>	2		
Personal IRIS	4D/20, 25 <sup>2</sup>			
	4D/30, 35 <sup>3</sup>	2		
Indigo	All	2		
Indigo <sup>2</sup>	All	2		
Indy	All	2		
O2	All			
OCTANE	All	2 (RCA)	2 (ADAT)	1
Onyx2	AI	2 (BNC)	2 (ADAT)	1

## 4.8.1 Connector Notation

Many of the connectors used for audio are one of only a two types, the two most commonly used connectors will be shown here rather than repeated for each connection type. In addition, since the notations “tip”, “ring” and “sleeve” come from the names given an audio plug, a drawing of a typical stereo audio plug will be shown for reference. Each interface will make references to these notations.

### 4.8.1.1 Stereo Audio Jack and Plug Drawing

Unless otherwise noted these jacks are 1/8" (3.5mm) jacks and plugs.

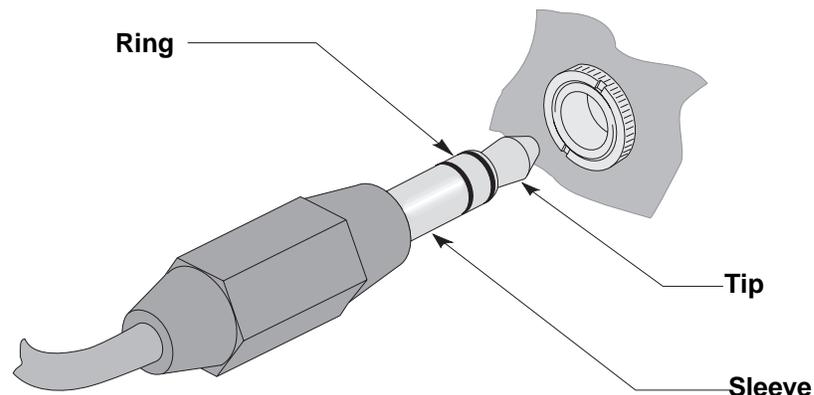


Figure 4-53 Audio Jack & Plug

### 4.8.1.2 RCA “Phono” Jack Drawing

The RCA style “phono” jack is the same as found in many consumer products. The center lead is the signal lead while the outside lead is the shield. The colored insert designates the use for the connector - audio right channel, audio left channel, or video

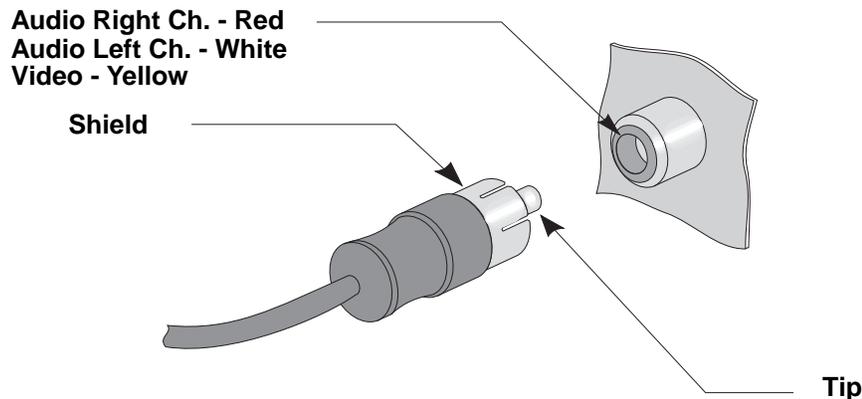


Figure 4-54 RCA “Phono” Jack

## 4.8.2 Audio Line In and Line Out Connections

Characteristics for the Line In and Line Out connections are shown in the table below.

**Table 4-53** Audio Line Input and Output Characteristics

Model	Line Inputs		Line Outputs	
	Impedance	Full Scale Amplitude	Impedance	Full Scale Amplitude
Personal IRIS 4D/20/25	5k $\Omega$	1 Vpp to 10 Vpp	600 $\Omega$	6 Vpp
Personal IRIS 4D/30, 35	5k $\Omega$	1 Vpp to 10 Vpp	600 $\Omega$	6 Vpp
Indigo	5k $\Omega$	1 Vpp to 10 Vpp	600 $\Omega$	6 Vpp
Indigo <sup>2</sup>	20k $\Omega$	0.63 Vpp to 8.4 Vpp	600 $\Omega$	4.7 Vpp
Indy	10k $\Omega$	0.63 Vpp to 8.4 Vpp	600 $\Omega$	4.7 Vpp

### 4.8.2.1 Pinout

**Table 4-54** Line In and Line Out Connection Pinout

Pin	Signal Name	Description
Tip	L	Left Channel Input or Output
Ring	R	Right Channel Input or Output
Sleeve	GND	Ground

### 4.8.3 Microphone Input and Headphone Output

Characteristics for the Microphone inputs and Headphone outputs are shown in the table below.

**Table 4-55** Microphone Input and Headphone Output Characteristics

Model	Microphone Inputs		Headphone Outputs	
	Impedance	Full Scale Amplitude	Impedance	Level
Personal IRIS 4D/20/25	600Ω		8Ω	
Personal IRIS 4D/30, 35	2kΩ	0.25 Vpp to 2.5 Vpp	16Ω	200 mW into 32Ω load
Indigo	2kΩ	0.25 Vpp to 2.5 Vpp	16Ω	200 mW into 32Ω load
Indigo <sup>2</sup>	1.5kΩ	0.063 Vpp to 0.84 Vpp	10Ω	57 mW into 32Ω load
Indy	2kΩ	0.063 Vpp to 0.84 Vpp	10Ω	57 mW into 32Ω load

#### 4.8.3.1 Microphone Pinout

**Table 4-56** Microphone Connection Pinout

Pin	Signal Name	Description
Tip	L	Left Channel Microphone Input
Ring	R	Right Channel Microphone Input
Sleeve	GND	Ground

#### 4.8.3.2 Headphone Pinout

**Table 4-57** Headphone Connection Pinout

Pin	Signal Name	Description
Tip	L	Left Channel Headphone Output
Ring	R	Right Channel Headphone Output
Sleeve	GND	Ground

#### 4.8.4 AES Stereo Digital Audio Input/Output

This connection provides a stream of digital audio data that complies with the AES3/AES11/SPDIF digital audio specification.

The connector used for this signal is either a stereo audio jack (as shown in Figure 4-53), an RCA jack, or a BNC connector. If the connector is a stereo audio jack, the pinout is as specified in Table 4-59. If the connector is an RCA or BNC, the center conductor is the signal and outside conductor is ground. In this case one connector is used for input and another is used for output.

**Table 4-58** AES Stereo Digital Audio Input/Output Characteristics

Model	Input		Output	
	Impedance	Full Scale Amplitude	Impedance	Level
Personal IRIS 4D/20/25	Not Available			
Personal IRIS 4D/30, 35	Not Available			
Indigo, Indigo <sup>2</sup> , Indy, OCTANE, Onyx2	75Ω (transformer coupled)	0.5 Vpp nominal	75Ω (transformer coupled)	0.5 Vpp into 75Ω load

##### 4.8.4.1 Pinout

**Table 4-59** AES Stereo Digital Audio Connection Pinout

Pin	Signal Name	Description
Tip	Out	AES Stereo Digital Output
Ring	In	AES Stereo Digital Input
Sleeve	GND	Ground

## 4.8.5 ADAT Optical Digital Audio Input/Output

This audio connection is made via a fiber-optic cable and connector. One connector is used for input and a separate one used for output. The format of the data complies with the AES3/IEC958 stereo 24-bit digital, optical 24-bit stereo SPDIF, or 24-bit 8-channel ADAT. The connector type is a 12.8 Mb/sec EIA RCZ-6901

### 4.8.5.1 Connector Drawing

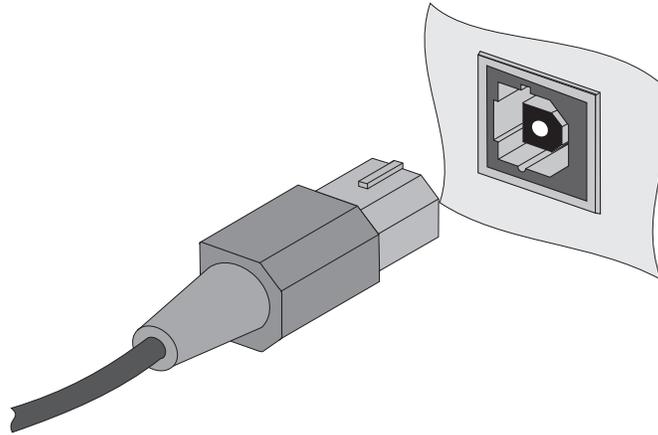


Figure 4-55 Optical Digital Audio Connector

## 4.8.6 Speaker Power Connection

The Onyx2 and OCTANE systems incorporate a Speaker Power output for use with external speakers. The voltage available at the connector is 10 Volts and can supply a maximum current of 0.5 Amps. The connector used for this is a 3.5mm mini-jack with two contacts (tip and shield only, no ring). The tip contact is connected to +10 Volts, the shield is connected to ground.