

# The Black Swan

## Phono Preamplifier



*I'd like to thank you for purchasing and enjoying the Black Swan. As the designer and builder of the Swan I offer you this piece of my personal art in the form of a sensual sonic experience you'll enjoy every time you listen to your music.*

*Bon Appetite - music, like food, is for the spirit and the body.*

*Barry Thornton*

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# 1. Installation and Setup

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## 1.1. Placement of the Unit

Installation of the Black Swan is very straightforward. All connections are made on the back of the unit and all controls (including cartridge loading) face forward for ease of operation. You'll get the most benefit from the Black Swan if the unit is placed where controls will be easily accessible during audio playback.

As with all low noise hardware it's wise not to place the unit close power transformers, mains, or cords for other products or systems. Magnetic fields from these sources may introduce hum or distortions to the audio signal.

The Black Swan's case is a heatsink for the unit and should remain cool enough to rest your hand on even after hours of continuous use. If your Black Swan is getting hot please make sure there's adequate airflow and space around the unit, at least a few inches on all sides.

## 1.2. Connections



## Connecting a standard Tonearm

Two tonearms with **Moving Magnet** or **Moving Iron** cartridges are accommodated and should be plugged into either Input 1 or 2, marked

as **MM**. The MM inputs accept standard RCA type connectors and are traditional SE (Single Ended) inputs.

A tonearm with a **Moving Coil** cartridge should be connected via standard RCA type connectors to the **MC** input.

Tone arm ground wires can be connected to either available ground post (marked **GND**) on the back of the unit. The posts accept bare wire, banana plugs or spade lugs, and two posts are provided so you can easily connect more than one tone arm.

Cartridge loading will be configured via the front panel.

## Connecting a Balanced Tonearm

The Black Swan uses a differential amplifier as a first stage, meaning you can use a balanced turn-table feed as input and the signal path will remain balanced throughout the amplifier.

It's highly probable that your turntable feed is wired for balanced mode but terminated with RCA connectors. If so, you can run the tonearm in balanced mode if you prefer the sound. Go to our website for a fuller explanation and a method to determine if your feed is balanced.

To operate the amplifier in Fully Balanced mode, connect the tonearm to the **MC** input and switch the "**B-U/B**" switch to "**B**". Running the Swan in balanced mode will provide balanced playback only when a balanced turntable feed is connected via the **MC** input.

**Note ! When running in fully balanced mode a ground wire from the tonearm is REQUIRED for noise and safety reasons. Do not attempt to run the amplifier Balanced mode without the ground connection !**

**Note ! Running the Black Swan in Balanced mode without a known balanced input may provide less than optimal sound.**

## Output Connections

Both SE unbalanced (RCA) or balanced (3-pin XLR) output connectors are provided. Connect an appropriate set of cables from the Black Swan to a set of inputs on your amplifier, pre-amplifier or AVR.

Do NOT connect the Black Swan to the 'Phono' inputs of an amplifier with a built-in phono stage. These inputs usually have a Ground

connector near them and are intended for an un-amplified turn-table connection, not a phono pre-amplifier like the Black Swan. Using these inputs with the Black Swan may produce an extremely loud and unstable musical signal.

An “AAW Link” output is provided as an alternate, balanced 4-pin XLR connection. When the Black Swan pre-amp is used with another Austin Audio Works amplifier this allows for a balanced connection via a single 4-pin XLR cable.

The AAW link can also be used to drive a pair of headphones when wired with an appropriate 4-pin female-to-female XLR connector. Pin wiring can be found in the **Technical Information** section of this document.

## 2. Controls and Operation

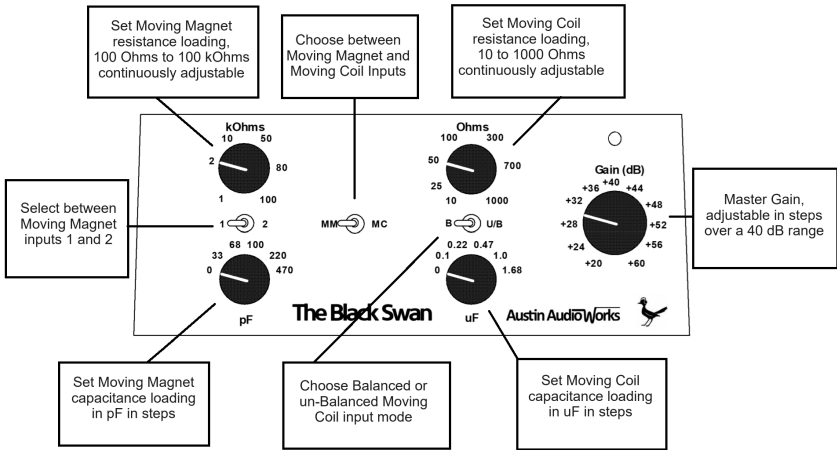
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### 2.1. Switching between Input modes

Use the toggle switches on the front of the unit switch between the appropriate input for your system.

**Note !** Turn your volume control down before switching any of the switch functions !





The **Left Toggle** switches between Moving Magnet (MM) inputs 1 and 2.

The **Center Toggle** switches between the MM and the Moving Coil (MC) inputs.

The **Right Toggle** switches between Balanced mode (B) and Unbalanced mode (U/B). Running the Swan in balanced mode will provide balanced playback only when a balanced turntable feed is connected via the **MC** input. Running the Black Swan in Balanced mode without a known balanced input may provide less than optimal sound.

**Note !** Make sure to turn your volume down and verify your tonearm is properly grounded before switching to the Balanced setting !

## 2.2. Setting the Gain

The rotary switch **Gain (dB)** control sets the system gain to meet the upstream signal level needs. The Gain Control operates in steps of 4 dB from 20 to 60 dB. **A good starting setting for the Gain control is +40 dB for either MM or MC operation.** Then, adjust as suggested below to your own preference.

There's some science to selecting the correct Gain level but basically you put on a record, turn your system level control (usually the preamp

level control) to your “normal comfort” listening setting (11 or 1 o’clock generally), and then set the Black Swan gain to be as loud as desired.

If gain is set too low, you might not be able to increase your amplifier’s volume enough to get the volume you prefer for playback. If gain is set too high, distortion and clipping may occur and background noise will increase. Trying out different gain levels until you find the best sound will not damage your system, just watch your preamp’s volume level !

## 2.3. Cartridge Loading

This section tells you how to operate the loading controls and provides some recommended starting settings for various types of cartridges. Because the concepts involved with cartridge loading can be confusing, we have created a “Properties and Use of Cartridge Loading” document available on the Austin AudioWorks website. Once you have your system up and running with the default settings provided here or by your cartridge’s manufacturer, we *strongly* recommend that review that information and go back to adjust and experiment with the controls.

### The Cartridge Loading Controls

Cartridge loading settings on the Black Swan are controlled via two sets of rotary dials on the face of the unit. Because Moving Magnet and Moving Coil cartridges react differently to loading, separate controls are provided for each type of input. Both controls, **Resistance** and **Capacitance**, should be set for each input.

### Loading for Moving Magnet cartridges

Loading for the Moving Magnet inputs is set via the two left-hand knobs. The top knob adjusts the **Resistance** in kilo-ohms (kOhms) continuously between 100 Ohms and 100 kOhms. The bottom knob adjusts the **Capacitance** in pico-farads (pF) in steps between 0 and 470.

A good starting place for a Moving Magnet or Moving Iron cartridge is to **set Resistance at 47 kOhms, set Capacitance at 100 pF**. If your cartridge manufacturer provides a recommendation for either or both settings, use those recommended settings.

The settings you make here are common to both the MM inputs. If you have tonearms connected to both MM inputs you can adjust the settings while switching between the inputs.

## Loading for Moving Coil cartridges

Loading for the Moving Coil inputs is set via the right-hand set of knobs (next to the Gain knob). The top knob adjusts the **Resistance** in Ohms continuously between 10 and 1000 Ohms. The bottom knob adjusts the **Capacitance** in micro-farads (uF) in steps between 0 and 1.68 uF.

A good starting place for a Moving Coil cartridge is to set **Resistance at 100 Ohms**, set **Capacitance at 0** (zero) uF.

Moving Coil cartridge manufacturers often provide a suggested a range of values for the Resistance setting. If this information is provided we suggest you set Resistance near the lower end of the range and adjust the knob upward as you listen until you find a preferred setting. Take your time and listen before making quick changes!

## A Note about excessive loading

Moving coil cartridges increase their output voltage as the load is raised. For some MC cartridges, when the load is set too high (close to the 1000 Ohms end of the range) their output voltage is increased until it overloads the MC input. This is experienced as a 'mudding' of the sound and occurs most often with high-output cartridges.

If your cartridge sounds 'muddy', 'soft' or 'mushy' when using the MC input, check your Loading and see if it can be reduced while maintaining good sound. If this is occurring with a high-output cartridge, try connecting the cartridge to a MM input and setting the MM loading to the minimum setting of '1'.

## 2.4. Operating the Black Swan

Once you've made your connections, powered on the unit and adjusted to your initial settings, you're ready to listen! A few recommendations:



## *Turn the volume down for your first album!*

When listening to your first album, and until you get used to the Black Swan in your system, be careful not to turn your amplifier volume level up too high before placing the needle in the groove. With the ultra-low noise floor of the Black Swan there will not be characteristic background 'hiss' to key off and you may create an un-pleasantly loud, even possibly destructive opening musical passage !

## Turn the volume down when switching between inputs

Switching between inputs, especially between the MM and MC inputs, may cause gain and volume to shift dramatically. It's suggested you turn down your amplifier volume when switching between inputs or between Balanced and Unbalanced modes.

## Experiment with the Loading Controls !

Placement of granularly adjustable loading controls on the front of the Black Swan was a primary consideration in its design. The goal is to get you beyond settling for the 'generally recommended' manufacturer's setting for your cartridge, and to instead allow you to experiment during playback and truly get the best performance your cartridge/tonearm/cabling combination can provide.

**The reality is that, in the end, adjusting loading is an 'ear-ball' task:** you turn the knobs until you get timbre qualities you like. It's an art you'll learn now that you have a set of controls for it; It's about personal discovery and revelation.

## 2.5. Power

The Black Swan requires a 120 VAC 60 Hz power source. The power supply and the Swan are on all the time that mains power is provided. This does not hurt the Black Swan or your amplifier or pre-amp. The Black Swan draws approximately 1.7 watts of power.

# 3. Technical Information

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## Power

The Power Supply is 16 VRMS, it is low-voltage AC and is isolated from the ground and mains power system by its transformer. This transformer is also a big inductive filter to reject line noise. The Swan's internal power system takes the balanced AC and yields a buffered, isolated and regulated DC voltages to power for the amplifiers contained therein.

## AAW Link

AAW link is about the reduction of wiring. All AAW products have this linkage. Using industry standard 4-pin connectors the wiring is the same as for headphones:

Signal	PIN
L+	1
L-	2
R+	3
R-	4

## Black Swan Headphone adapter

The AAW link output can drive a set of headphones with a 4-pin connector cable. This requires a female-to-female XLR adapter cable. Please contact Austin AudioWorks if you need to obtain an adapter.

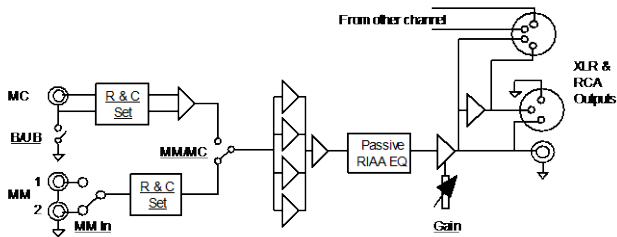
## A Note On 'Right' and 'Left' channels

The Black Swan is two independent amplifiers with passive equalization sharing a common power supply in a common chassis. While the inputs and outputs as labeled 'Right' and 'Left' there is no internal commitment to either a RIGHT or LEFT channel. The source, that is your cartridge, does have a Right and Left preference based on the mechanics of the stylus and the information incorporated in the record groove. The Right

and Left annotations on the preamplifier are offered to facilitate keeping track of this for your convenience.

## Signal Flow

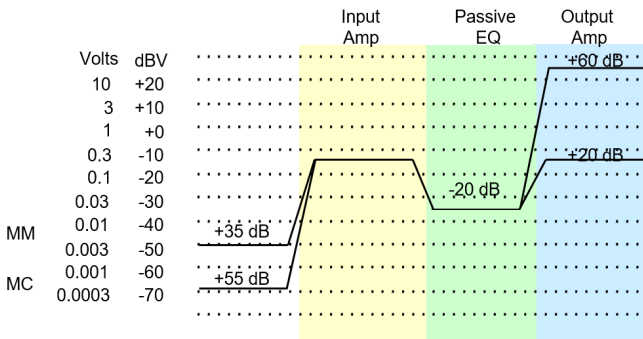
The Black Swan signal flow is represented in the diagram below. This is one of two channels and does not include the power supply system.



**Block Diagram The Black Swan**

Controls are underlined, boxes are passive subsystems, triangles are active subsystems

## Signal Gain per Stage



## RIAA Equalization

The RIAA equalization in the Black Swan is purely passive. Employing active equalization is to invite time-based dynamic distortions such as Slewing Inter-modulation Distortion and Transient Inter-modulation Distortion. Anytime feedback is used to 'perfect' a filter network's amplitude or phase performance, a price is paid in the dynamic

performance of the filter. The choice and use of better components and a bit more design effort offer dramatic sonic improvements that offset any cost savings obtained.

## Performance Characteristics

Output Impedance	5 Ohms
Output Single ended (Left or Right channel) into 10 kOhm	9 Volts RMS
Output Balanced into 10 kOhm	18 Volts RMS
Noise, Moving Magnet, 47 kOhm, 0 pF setting, Gain 45 dB, input reference 5 milliVolts, output 1 VoltRMS into 10 kOhm load	70 dB un-weighted 80 dB "A" weighted
Equalization – Reference RIAA standard	+/- 0.1 dB
Input overload – Moving Magnet	100 mV
Input overload – Moving Coil	6 mv
Distortion (Harmonic) MM at 1 V RMS out Ref 5 mV in @ 1 kHz	0.003% THD + Noise
Distortion (Harmonic) MC at 1 V RMS out Ref 1 mV in @ 1 kHz	0.003% THD + Noise

## Physical Characteristics

**Black Swan**      7.9 Inches (201 mm) wide  
                          4.77 inches (122 mm) deep  
                          3.6 inches (90 mm) height  
                          2 lb, 6 oz (1.08 kg)

**Power Supply**    2.4 inches (60 mm)  
                          1.8 inches (48 mm)  
                          3.14 inches (80 mm)  
                          1.012 lb (480g)

## 4. Troubleshooting and FAQ

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Please see the [AustinAudioWorks.com](https://www.austinaudioworks.com) website for any FAQ updates

When I play an album on my amplifier or receiver the volume is too loud ! I have to turn the volume way down to the bottom of the dial to get a useable signal.

You may have connected the Black Swan to the 'Phono' inputs of your amplifier or receiver. These inputs often connect to a built-in phono pre-amplifier which you should not use along with the Black Swan. If this is the case, switch the Black Swan connections and the amplifier\receiver output to another set of inputs, make sure the volume is reduced and try playback again.

I've connected my tonearm with a **Moving Magnet** or **Moving Iron** cartridge to the MM input and I can't get the volume loud enough, or I have to turn the gain all the way up to get usable sound.

Your cartridge may be a Low Output version. Turn off the unit and turn the Gain control down, then try connecting the tonearm to the MC inputs.

My **Moving Coil** cartridge sounds muddy, soft and mushy when I connect it to the MC input and set the loading to the manufacturer's recommended specifications.

For some MC cartridges, when the load is set too high (close to the 1000 Ohms end of the range) their output voltage is increased until it overloads the MC input. This is experienced as a 'mudding' of the sound and occurs most often with high-output cartridges. Check the loading setting for the MC input and see if its too high. If your cartridge is a high-output MC, try connecting the cartridge to a MM input and setting the MM loading to the minimum setting of '1'.

# 5. Warranty and Returns

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## 5.1. Product Warranty

Austin AudioWorks warrants to the original purchaser that this product shall be free from defects in material and workmanship for three (3) years from the date of purchase. If a defect covered by this warranty occurs during this period, Austin AudioWorks will repair the defective product, free of charge. Date of purchase will be based on customer receipt, otherwise date of manufacturing will be used.

## Warranty Limitations

This warranty shall not apply if a product: (a) is modified or tampered with; (b) is damaged by negligence, accident, unreasonable use, or other causes unrelated to defective materials or workmanship, or (c) has had the serial number altered or removed.

Any implied warranties, including warranties of merchantability and fitness for a particular purpose, are hereby limited in duration to the warranty period of 3 years. In no event shall Austin AudioWorks be liable for consequential or incidental damages resulting from the breach of any implied or expressed warranties. Some states do not allow these limitations, so they may not apply to you. You may also have other rights which vary from state to state or province to province.

## 5.2. Returns

If you need to return your Black Swan for any reason please see the Austin AudioWorks website ( [austinaudioworks.com](http://austinaudioworks.com) ) for details on the return process. Please DO NOT return your unit without first contacting Austin AudioWorks and obtaining a return merchandise authorization number (RMA). We will refuse the shipment of any product sent without an RMA.

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