

bel canto

Tosca

Balanced Single-ended Control Preamplifier

**User's Guide and
Operating Information**

Tosca

Balanced Single-ended Control Preamplifier

The **Tosca** is a fully balanced, line level control preamplifier using Bel Canto Design's unique Balanced Single-Ended circuit architecture. All components are selected for high sound quality, precision and overall material quality. Circuit design and component quality will provide superb performance with years of listening satisfaction.

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Bel Canto grew from the quest to achieve the ultimate musical satisfaction from an audio system. This goal began with the discovery of the inherent sonic qualities and musical performance potential of a nearly forgotten technology, the single-ended triode amplifier. The ability of this type of amplifier to recreate the musical experience and evoke a powerful emotional response in the listener, much like the live event, inspired the development of the Orfeo line of amplifiers through the ultimate expression of this technology. The Orfeo amplifier was developed to be used as both a cornerstone for a modern audio system and as a reference tool to explore the reasons behind the single-ended triode amplifier's uniquely musical attributes.

For the better part of a decade this quest continued and has resulted in the birth of a line of fine audio components in Bel Canto's series of solid state, balanced single-ended, amplifiers and matching components. These components share the inherent musical qualities of the reference amplifier. They are conceived from a marriage of some of the oldest audio technologies developed by Bell Labs and Western Electric in the early part of the century and the latest technologies, including materials technologies in the active and passive components, digital audio technologies and active device technologies bring inherently musical performance to a wider audience than the single-ended triode could alone.

*The **Tosca's** audio component presented in the following pages is designed to present very high value in its range and retain this value for many years, both because of the quality of design and manufacturing and also the timelessness of each component's musical performance.*

Bel Canto Design

Design Features

The gain stage is a zero loop-feedback, balanced single-ended design. It uses a JFET differential gain stage with power MOS devices in a class A source follower buffer configuration. This circuit prevents the audio signal from modulating and from being modulated by the power supplies and ground. The audio signal information is effectively isolated from these sources of signal loss and degradation.

The power supplies use a current source driven shunt regulator for the gain stage. A separate power supply buffer is used for the output driver stage. This supply architecture provides the stability and isolation of battery power without the inconvenience and expense.

The power transformer is a custom design, it provides lower mechanical and electrical radiated noise than toroidal transformers with better isolation from noise on the power lines, mechanical isolation is provided through special elastomeric grommets. This allows the transformer to share the chassis with the audio circuitry without compromising performance. Extensive mechanical damping is used in the rigid chassis to minimize microphonic effects from coloring the signal outputs.

There is over 25,000 *mF* of capacitance filtering the raw DC. The first stage of filtering drives eight (8) individual regulators providing power to the analog circuits, where audio grade

electrolytic and film bypass capacitors complement the active regulation stages. The volume control is a precision laser-trimmed potentiometer used in a unique circuit to provide balanced level control without compromising the performance of the balanced input stage. Over 80 dB of common mode rejection is maintained over most of the level control range, this contrasts sharply with the limit of 40 dB obtained by other balanced level control methods.

The input controls allow two (2) true balanced input connections and three (3) RCA jack connections. The 'Balanced in 2' input bypasses the tape loop and provides a minimum signal-path for your primary music source. The tape output is a RCA output with an active audio-grade buffer preamplifier to convert and isolate the internal balanced signal bus from the tape output.

The elegant simplicity of the balanced single-ended signal path and gain stage allows the **Tosca** to preserve all of the audio signal.

Warm Up

The **Tosca's** sonic performance will start to stabilize after approximately forty (40) hours of continuous power up, and will continue to improve over several hundred hours of use.

Unpacking

The box containing your **Tosca** contains the following parts:

- 1 - **Tosca** User's Guide
- 1 - Power Cable for connection to utility power [1.85m, 6' long]
- 1 - **Tosca** audio power preamplifier
- 1 - Bel Canto Owner's Warranty & Registration Card

Carefully unpack each piece and check for shipping damage. If there is any damage, or if

any piece is missing, please contact your dealer or Bel Canto Design, Ltd. **Save all packing materials** as the packing is specially designed to protect the preamplifier for shipping or transporting it. If you lose or damage the packing materials and carton, please contact your dealer or distributor before attempting to transport the preamplifier.

The Tosca's power supply is preset for the proper national voltages before your receive it. The power cable will have the correct plug for your local power system. If you believe this is not true, please contact your dealer immediately.

Warning

Do not connect power to this amplifier yet!

This amplifier, like any electrical component, can be dangerous and cause injury unless correct handling procedures are observed and used. Before powering this amplifier it is necessary to read and follow proper procedures concerning its setup and use.

Do not open up your Celio (do not remove the chassis covers). There are no user serviceable parts inside. Any tampering of internal parts will immediately void your warranty.

Complete and mail the Owner's Registration Card immediately in order to activate your warranty.

Front Panel Controls

The **Tosca** provides input switching for five (5) signal sources. The control layout and logic is optimized for controlling two balanced and 3 unbalanced inputs. These sources are switched through two 3-position rotary controls.

- **Main Selector**

This is the left-most switch and selects either the **Bal 1** (balanced input 1) or the RCA inputs **Turner** and **Aux**. The input selected by this switch is then routed to the Tape Output and the second rotary switch which selects between the **Main Selector**, the **Tape Monitor** input, and the direct **Bal 2** (balanced input 2) input.

- **Tape Monitor and Bal 2 Selector**

This switch selects the between the **Main Selector** and the **Tape Monitor** or the **Bal 2** inputs. This second balanced input bypasses the first switch and provides the

shortest signal path for your primary music source. This input can not be routed to the **Tape Out** jacks. If you wish to record this input you will need to connect this source through the Bal 1 inputs. The center position of the Tape Monitor switch can serve as a system mute if no tape source is being played.

This switching arrangement provides useful functionality with minimum signal degradation and cost-effective, true-balanced switching. The central LED indicates that power is applied to the preamplifier. There is no on-off switch since the preamp is designed to remain on to insure optimum performance without a warm-up period.

- **Gain Level**

The **Level** control functions as a standard volume control, adjusting the output level with logarithmic-law.

Rear Panel Connections

The rear panel provides RCA and XLR jacks for five (5) inputs, Tape Out and Main Outputs. Beginning from the left side of the rear panel the connections are as follows:

- ***XLR and RCA Main Output Jacks for Left and Right Channels***

These outputs go to your power preamplifier or active crossover. Either the balanced XLR or Single-ended RCA jacks can be used as required for your preamplifier. Optimum performance will be obtained using the XLR outputs, although no added circuitry is in the RCA output path. These use the standard Male XLR pinout pattern of:

- 1 - Gnd
- 2 - Plus Signal
- 3 - Minus Signal

- ***Balanced XLR Inputs for Bal 2 and Bal 1 Inputs***

These inputs come from your primary signal sources. A non-balanced source can be connected to these inputs using a specially constructed cable with an RCA plug on one end and an XLR Male connector on the other end. Contact your retailer, cable supplier or Bel Canto Design for details on

this. The **Bal 2** input is a direct input and bypasses the Main selector and Tape Loop. These female XLR inputs use the standard pinout pattern of:

- 1 - Gnd
- 2 - Plus Signal
- 3 - Minus Signal

- ***Tape Output Jacks***

The tape output jacks are a buffered signal version of the input selected on the Main Selector. This output uses an audio grade amplifier stage to convert the internal balanced signal bus and to drive the tape output. This is not designed to be used as the primary output but as a buffered tape output only.

- ***Tape Monitor, Auxiliary and Tuner Inputs***

These inputs use standard RCA jacks to allow hookup to most equipment. If you encounter problems with hum or clicks when switching to these inputs it may be because their chassis are not grounded. This may require a ground connection to the house ground or to the chassis of the preamplifier. Consult your retailer or Bel Canto Design if such problems are encountered.

Placement of the Tosca Within Your System

The **Tosca** may be situated within your system in any convenient manner desired. The most typical arrangement places the **Tosca** on a rack or shelf unit, toward the top for easy access. It is recommended to use a high quality type stand capable of dissipating or isolating vibration and resonance into or from the floor area.

We do not recommend placing weights or other objects directly on the **Tosca**. This may mar or scratch the chassis finish.

Service

Do not attempt internal service of your **Tosca**. This will immediately void your warranty. If service is ever needed, contact your dealer or Bel Canto Design directly.

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Specifications

Class of operation • Class A Balanced Single-ended FET

Input overload • 10 Volts rms

Bandwidth Into >20K Ohms • 2 Hz-100 kHz

Input Overload • 10 Volts rms

Signal to Noise Ratio re 1 watt out • >95 dB A weighted

Distortion at 3 Volts rms Balanced Out • <0.01% low order harmonic

Input configuration and impedance • Single-ended/balanced 50K ohm

Output Options • 2-XLR Balanced; 2-RCA; 1-buffered RCA Tape Out

Output Impedance • 100 ohms

Maximum Output Level • 10 volts rms

Gain Single-ended • 10 dB

Gain Balanced • 16 dB

Power Requirements • 100-120 VAC 50-60 Hz or 230-240 VAC 50-60 Hz 15VA

Size • 17"W x 12"D x 2.5"H (432 mm x 305 mm x 64 mm) Weight • 14 lbs (6.3 kg)

Warranty Information

Please take a moment to fill out your warranty registration card. Returning this registration validates your warranty and allows us to send you information on product updates and new product development. Completion of this card is requested within 15 days of purchase to ensure immediate warranty coverage.

Bel Canto Design offers a 5 year limited warranty on internal parts and workmanship that will replace any defective parts directly. This warranty is void if damage is due to abuse, neglect or unauthorized modification.

Bel Canto Design products are uniquely identified with a serial number on the back panel or the bottom plate of each unit. This number is required to validate your warranty, please reference if service is required. If you have any questions, comments or if we can be of service, please contact us Monday through Friday 9:00 a.m. - 5:00 p.m. central time.

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