

FEATURES

- 24 step fully remote discrete volume control for great convenience. Volume control uses the shunt method with only a single Tantalum resistor on signal path to retain best natural sound
- Can be configured as a volume control integrated amplifier or as a direct input power amplifier. Both can accept RCA & XLR inputs
- Push-pull circuit with deep class A bias to get the sonic benefits of class A operation and yet maintain a fairly good power output efficiency
- Special auto bias circuitry without the need for frequent bias adjustment
- Driver stage through excellent low distortion cathode coupled phase-splitter circuit
- Custom designed wideband output transformer for Prelude, with the use of double C core transformer for the Sonata
- German made Mundorf silver oil coupling capacitor for Prelude, ultimate performance Mundorf silver gold oil capacitor for Sonata
- Extra high current power supply transformer with high grade grain oriented silicon steel laminate. Ultra fast rectifier coupling to Mundorf film capacitor and 4-pole electrolytic capacitor to enhancing extension for both low and high frequencies.

SPECIFICATIONS

Liszt Prelude

Output Power	32 W (4, 8 ohms)
Frequency Response	10 Hz-100 kHz (0.5dB, -3dB, 1W)
THD	0.01% (1 kHz, 1W)
Signal/Noise Ratio	-95 dB (32W)
Input Impedance	50 k ohms
Inputs	Line inputs 3 x RCA, 1 x XLR Direct inputs 1 x RCA, 1 x XLR
Vacuum Tubes	4 x 6CA7/EL34, 2 x 12AU7, 1 x 12AX7
Size	17.5"W x 7"H x 16"D
Weight	48 lbs net



Liszt Sonata

Output Power	35 W (4, 8 ohms)
Frequency Response	10 Hz-100 kHz (0.5dB, -3dB, 1W)
THD	0.01% (1 kHz, 1W)
Signal/Noise Ratio	-95 dB (35W)
Input Impedance	50 k ohms
Inputs	Line inputs 3 x RCA, 1 x XLR Direct inputs 1 x RCA, 1 x XLR
Vacuum Tubes	4 x 6CA7/EL34, 2 x 12AU7, 1 x 12AX7
Size	17.5"W x 7"H x 16"D
Weight	52 lbs net



Focus Audio Inc.

43 Riviera Drive Unit 10, Markham, Ontario, Canada, L3R 5J6
 Telephone (905) 415-8773 Facsimile (905) 415-0456 contact@focusaudio.com
www.focusaudio.com

Specifications subject to change without prior notification.



Liszt Prelude and Liszt Sonata amplifiers

Focus Audio Amplifier Design Philosophy

To enable music lovers as you to have ultimate listening experience, we strive to look for the best available amplifier design and components. Let us look at the four key aspects of tube amplifier design listed in their order of importance.

1) POWER SUPPLY

The power supply is the heart and soul of the amplifier. The amplifier circuit modulates the power supply to deliver the necessary power to the speaker in response to the input signal. The power supply must respond in a very linear manner to the demands of the amplifier circuit. If the amplifier demands 400 mA at 20 Hz the power supply must be able to deliver it promptly otherwise there will be dynamic compression and/or clipping. Let us look at the different components in the power supply.

- the power transformer
- the rectifier and the input filter capacitor
- the LC choke and output capacitor filter section

THE POWER TRANSFORMER

The power transformer has a huge influence on the sound as it is the pipeline to supply current to the amplifier circuit. In the premium version of the amplifier the power transformer weights about 17.5 lbs and it is designed to supply about 300% of the required current the amplifier needs. This extra current capability is responsible for the flat 20Hz response at the rated output power to enable you to realize the full potential of your sound system for music source with good low frequency content. The transformer uses the top grade grain oriented silicon steel lamination to ensure cool and stable operation.

THE RECTIFIER AND THE INPUT FILTER CAPACITOR

The traditional design uses an input filter electrolytic capacitor of several hundred microfarads (uF) and some even use more than 1K uF. This large value capacitor presents a very small current charging window to the rectifier i.e. the rectifier has to pump a large amount of current into the input filter capacitor. This will create a large charging

current spike and current spike will contain a lot of high frequency components which will radiate into the surrounding circuitry and intermodulate with the audio signal to create annoying distortion. Also this spike charging current will cause the power transformer to work beyond its designed capacity and saturate.

Our approach is to use a fairly small 30 uF film capacitor from the German manufacturer Mundorf. This small capacitor provides a wide charging window for the rectifier and the current waveform is very close to sinusoidal with no spikes. Hence there is little RF (radio frequency) radiation to cause audio distortion.

One other factor that is rarely discussed is the impedance vs. frequency characteristic of the capacitor. For a several hundred uF electrolytic capacitor its impedance become inductive at 2 to 4kHz region that is it stops behaving like a capacitor and this leaves the critical voice range to undesirable coloration. On the other hand the excellent 30uF film Mundorf capacitor still behaves like a good capacitor around 60 kHz with very linear impedance vs. frequency characteristic up to 30 kHz.

We use high speed rectifier with fast switching recovery time to minimize the rectifier switching noise. This together with the 30 uF Mundorf film input capacitor which has very low impedance at high frequencies (about 0.0095 ohm at 57 kHz) enables us to filter out most of the noise components from the AC line and the rectifier. This allows us to hear the low level signal much better. The low impedance from the 30uF capacitor acts like a short circuit at high frequencies to shunt all the noise components to ground. We found that after we replace the first input electrolytic capacitor with the Mundorf 30 uF film capacitor the background noise drop significantly.

THE LC CHOKE AND THE OUTPUT CAPACITOR FILTER SECTION

The goal here is to have a filter network with a small time constant so that the massive power transformer can transfer the electron charges to the output capacitor quickly to enable it to provide unconstrained current supply to the amplifier. The choke must have a small DC resistance for this to happen. We use a large custom built choke good for 800 mAabout 270% of the rated requirement which has only a DC resistance of 9 ohms. As for the output capacitor we choose the latest high performance 4-pole electrolytic capacitor from Mundorf. This 4-pole capacitor has excellent high frequency characteristics. To keep the time constant small we pick a capacitor with only 220 uF. The smaller value capacitor can be charged much faster.

To summarize, the power supply is the most critical element in the amplifier design. A well designed and massive power transformer is essential for the delivery of unrestrained current supply to the amplifier. The power supply filter network must have a small time constant and minimal DC resistance to enable the power transformer to quickly charge the output capacitor to deliver the necessary current. We feel that this series of Focus amplifier with its optimized design has accomplished these goals.



2) THE OUTPUT TRANSFORMER

The law of physics in output transformer design is such that extended low frequency response and high frequency performance are two opposing requirements. To get good low frequency response you need a lot of inductance and that translates to a lot of turns in the primary winding of the transformer. To get good high frequency performance one has to minimize a parameter called leakage inductance. Leakage inductance is proportional to the square of the number of turns in the primary winding. So you can see from here that if you have a large number of turns in the primary winding for good bass response then the leakage inductance will go up and hence the high frequency response will suffer. The designer has to pick a delicate balance. The Focus engineering team has spent many months building many prototypes before they are happy with the design.

In the premium version of the amplifier we change the core material of the output transformer to double C core. The double C core has excellent magnetic property and that enable us to use less primary turns to achieve the same inductance and hence the leakage inductance is lower. The lower leakage inductance give us a better high frequency performance.

One of the parameter in output transformer design that is rarely discussed is core saturation. The manufacturers always quote you the frequency response at 1W. It looks very good but what is the response at rated power?

To get rated power at 20 Hz you need to have a sufficiently large transformer core so that the output transformer does not saturate at low frequencies. The rule of thumb used by the Focus engineers is that if the rated output power is 35W we will use a core that is rated for 350W. With this kind of design margin we have been able to get an almost flat frequency response from 20 Hz to 20 kHz at the rated power.

Many audiophiles complained tube amplifiers are bass shy. You are invited to audition this new series of amplifiers from Focus. With properly dimensioned output transformers and power supply you will get quick and thunderous bass.

3) THE CIRCUIT TOPOLOGY

The output stage is a low anode voltage and high current design. It is a class AB push pull topology with very deep class A biasing so as to get the sonic benefits of class A operation and yet maintain fairly good power output efficiency. Auto biasing circuitry is employed to give best stable operation condition without the need for frequent bias adjustment.

The driver circuit is a cathode coupled voltage gain and phase-splitter design. It is simple and good sounding. The circuit topology has been implemented in many highly successful tube amplifier designs in the 40s, 50s and 60s by extraordinary audio engineers. Our goal is not to re-invent but to leverage the fruits left by these brilliant designers.

4) PARTS SELECTION

We spare no efforts in picking best sounding components for the Liszt Prelude and Sonata (premium) amplifiers.

- The coupling capacitors in Prelude are Mundorf silver oil type, with ultimate performance Mundorf silver gold oil type for the Sonata.
- Highly regarded audio grade Takman resistors throughout, with best sounding Tantalum resistor for volume control shunt resistor.
- Tantalum resistors in all the signal paths including the shunt resistors in the volume control for Sonata.
- Power supply resistors are the Mills non-inductive type.
- The cathode bypass capacitors for the 6CA7/EL34 output tubes are the ELNA for audio Silmic II type.
- The output transformer is the custom designed high grade grain oriented silicon steel laminated. Double C core output transformer used in Sonata. For the lead out wire of the output transformer we use the ultra fine copper wire custom made by Cardas.
- Specialty polymer amplifier isolation feet by E-A-R aero technologies.

