

AUDIO ANALOGUE

soundpleasure

HIGH-END AUDIO ELECTRONICS
HANDCRAFTED IN ITALY

FORTISSIMO
INTEGRATED AMPLIFIER

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INTRODUCTION

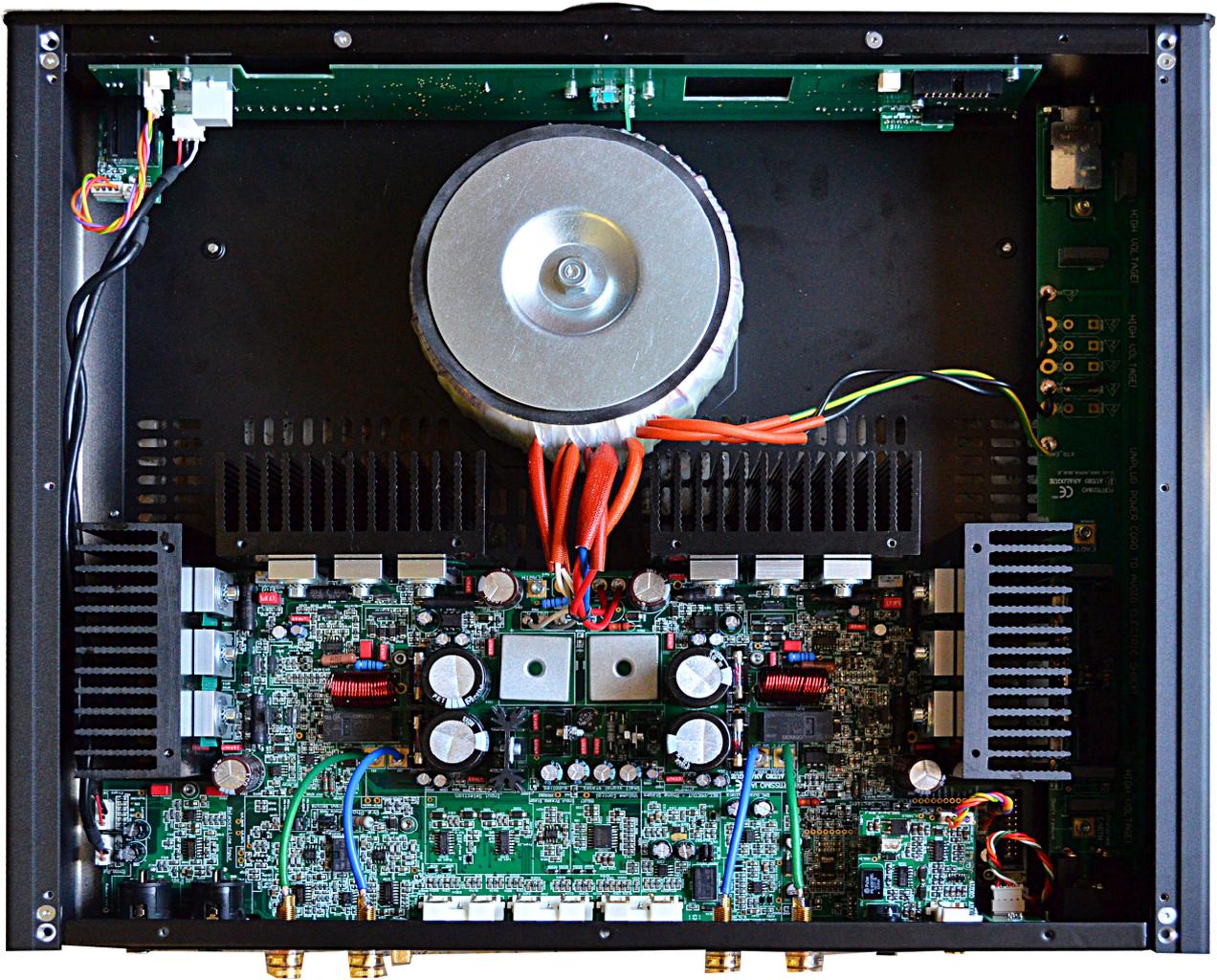
The FORTISSIMO Integrated Amplifier is the last arrived in the AUDIO ANALOGUE ArmoniA line. It shares the ArmoniA line philosophy: maximizing the value for money. But not only! The FORTISSIMO Integrated Amplifier further develops our concept about what an integrated amplifier is. In fact, we believe that the integrated amplifier has to be the interface between the loudspeakers and many different audio systems always guarantying the best audio performances.

Usually the integrated amplifier is asked to: control the volume level, select the audio source and to drive the loudspeakers. In the most of the cases the sources involved are analog ones. Instead we think that the integrated amplifier has to be much more! It has to act as an interface toward the loudspeakers for different entertainment systems that treat audio signals, both analog and digital.

The integrated amplifier should be able to effectively and versatility manage the audio signal coming from the different systems always working with the best of the audio performance.

The goal is to share the loudspeakers and the stereo system with other different audio systems so that such systems are played with a higher audio quality. In fact, the number of the entertainment systems using audio is constantly increasing in the domestic environment. As an example consider: the televisions, the multichannel audio/video systems, the DVB decoders, the DVD/Blue ray player, the multimedia hard disks and the various possibilities due to a connection between the audio system and the PC/MAC.

The FORTISSIMO Integrated Amplifier with its inputs and functions (such as the ByPass mode) has been designed to play the above role of interface between the different audio systems. Obviously a universal integration with all the existing audio systems is not easy and actually impossible. That's because the different systems are characterized by various goals and designed following different electric standards. Anyway we think that must be the road, to supply our customer not just a very high quality sound but also the best versatility toward the more audio systems.



Don't think that this kind of approach has been pursued to the detriment of the traditional analog audio sources! On the contrary!

One of the FORTISSIMO strong points is its pre phono stage with a power supply system conceptually equal to that used in the Maestro Line Pre REVII. The phono stage can manage both MM and MC signals and permits to select the input impedance and the gain in both the modes. An other very interesting function that will like very much to every vinyl LP lovers is that the FORTISSIMO IA, by its USB connection, allows you to record on your PC/MAC the pre-amplified signal. This means that using proper recording softwares (that also in their free revision have "antibump" and cleaning algorithms) the preamplified signal coming from the pre phone stage can be saved on the PC/MAC (Note1). An other peculiarity of the FORTISSIMO IA is its balanced input which has been designed to match the audio high end requirements that are very different from the audio professional ones (Note2).

Audio signal chain

The volume control is performed by the Integrated Circuit: Burr Brown PGA2320, a true reference for this kind of function.

The power stage is completely different from the schemes AUDIO ANALOGUE has used until now. The circuit development has been performed to exalt the even order harmonics reproduction. For such purpose we have used very particular biasing circuits especially in the input stage where matched transistors have been used in specific positions. The power output stage is based on "thermal track" power bipolar transistors (Note3) with the goal of minimizing the distortion due to thermal drift in the power stage. The power for a 8Ohm load is of: 100W@0.025% THD+N while on a 4Ohm load there are: 180W@0.3%. An other goal was the low noise, the noise level of the unit is -110dBV!

For sure what impresses much more as you see the FORTISSIMO inside is its board! We have worked a lot to minimize every signal path. The board is a 4 layers one. The inner layers has permitted to increase the width of the supply tracks and high current ground return improving the efficiency.

Note1: in similar applications the user has saved their LP vinyl on the PC/MAC to burn an audio CD. In such way the songs from the LP are usable to be listen also in different environments such as on the audio car system or on the "second" audio system. Furthermore once the Vinyl information has been saved on the PC/MAC the data can easily be passed on a portable player such as the IPOD. In other cases the users decided to save their LPs and burn the CDs to listen to the LP songs without the risk to damage the vinyl support.

Note2: balanced input schemes designed for professional application are usually directed to maximize the signal immunity to common mode disturbs to the detriment of other parameters such as the noise and the distortion. In fact in a professional application the balanced signals have to work in environments where the common mode disturbs are very high. Unfortunately the same design philosophy is often pursuit also in the high end applications! That approach, in the high end field, is conceptually wrong because in a domestic environment, where the high end equipment will be working, the common mode disturbs and noise are less important than in a professional field. Therefore is not acceptable to maximize the immunity to common mode disturbs to the detriment of general audio quality. Basing on such consideration we have designed a circuit that, compared to the standard applications and those used in the professional field, was more respectful of the signal quality.

Note3: Thermal Track devices are bipolar power transistors having a inner diode that, for its position, works at the same temperature of the power transistor itself. The anode and cathode of the diode are driven out of the package by two dedicated pins. Using the information, usually the voltage across such pins, carried out by those pins very precise bias system can be implemented to avoid the power stage distortion to increase due to temperature.



INPUTS

- 1 optical digital input: accepts SPDIF digital signals with sample frequency of: 44.1KHz, 48KHz, 96KHz...until 192KHz and 16-24bits. Possibility to activate the ByPass mode on the input and to set the ByPass mode gain.
- 1 Coaxial digital Input: accepts SPDIF digital signals with sample frequency of: 44.1KHz, 48KHz, 96KHz...until 192KHz and 16-24bits. Possibility to activate the ByPass mode on the input and to set the ByPass mode gain.
- 1 digital USB input: accepts sample frequency until 48KHz and 16bits data signal.
- 1 FRONT LINE INPUT: the 3.5mm connector placed on the front panel permits to plug a portable player by its audio outputs.
- 1 PHONO INPUT: settable in MC or MM mode; input impedance configurable as 47K or 47K//150pF in MM mode and 100R or 50R in MC mode. Settable gain both in MM and MC mode. When in MM mode, the DC gain is settable in the range of 60dB+/-10dB while in MC mode the DC gain is settable in the range of 80dB+/-10dB. The phono mode and the input impedances are set by jumpers on the board. Such jumpers doesn't carry any audio signal but just set the configuration.
- 3 ANALOG STEREO INPUTS
- 1 ANALOG STEREO INPUT/ByPass: the input is set by default as a standard stereo input but the user can set it to work in bypass mode and set the gain too.
- 1 BALANCED INPUT
- Trigger In: the unit can be switched on and off by a 12VDC voltage furnished by an other unit (such as the Crescendo CD).

OUTPUTS

- DIGITAL SPDIF OUTPUT: on such connector the selected digital input is given.
Note: the SPDIF output can also be set in a particular mode to be used with an external DAC.
- ANALOG STEREO REC OUT or ANALOG STEREO PRE OUT: the output can be set to work as a REC OUT or as a Pre OUT by proper jumpers on the board.
Note: when set as pre out, such output permits to connect an active subwoofer to the FORTISSIMO IA. In fact the active subwoofers usually have inner volume control and an inner circuit to make, from the stereo signal, the mono signal to be sent to the sub loudspeakers.
- USB OUTPUT: the preamplified signal is converted into the digital domain and sent to the PC/MAC by the USB connection. So anything played by the amplifier can be saved on the PC/MAC.
Note: by the volume control and the recording software is possible to set the audio level (by the FORTISSIMO IA volume control) so that during the recording all the available ADC input dynamic is used.
- PHONES OUTPUT

POSSIBLE CONNECTIONS

We list below some possible connections between the FORTISSIMO IA and other audio systems including the most common audio systems.

- a. Connection to a television: the up-to-date television usually have an audio digital optical output. Connecting the FORTISSIMO IA to the television permits you to play the television program audio from the audio stereo system loudspeakers. The television programs can include for instance: films, sport events, concerts...The optical connection is very indicated because reduces the electrical interferences (hum and noise level). In fact there is not connection between the ground of the FORTISSIMO IA and the television one. That divides much more the "dirty" video world from the "clean" audio one.
- b. Connection to a digital video decoder (DVB): such units usually receive a digital high quality audio signal and have a coaxial or optical digital audio output. Therefore they can be directly connected to the proper FORTISSIMO IA digital input. As before the optical connection is preferred for the isolation between the ground of the units. Anyway, being the decoder usually a "ClassII" equipment, the coaxial connection could be good as well and also better because generally permits better performances for the lower jitter. The connection between the Fortissimo IA and the digital video decoder is particularly interesting because permits, not only to play the sound associated with the video programs, but also to listen to the numerous digital radio stations and to their podcast services.
- c. Connection to a DVD/BLUE Ray player: a player such that, even a low quality one, can be connected by its digital output to the FORTISSIMO IA obtaining an increase in the reproduction audio quality.
- d. Connection to entertainment consoles: such equipments are more and more present in our houses. They have a digital audio output that can be coaxial or optical. Such as for the television, the optical is usually preferable. The connection permits to reproduce on the stereo system loudspeakers the sounds played by the consoles.
- e. Connection to a PC,MAC or lap top: such units have a SPDIF output with a settable sample frequency and of course a USB output. When the PC,MAC, lap top is connected to the FORTISSIMO IA any sound played by the equipment is reproduced by the FORTISSIMO IA. This means that any file audio contained on the PC/MAC and for which the codec is available on the PC/MAC, can be played on the FORTISSIMO IA. Therefore many compressed and not compressed file formats can be reproduced (for instance: FLAC, APE, MP3, WMA, AAC...)
- f. Connection to a Multimedia hard Disk: such equipments have the audio digital coaxial output and sometimes also the optical one, therefore they can be directly connected to the FORTISSIMO IA. The Multimedia Hard Disk (medium price around 1000euro) has its remote to select the file to be played while they have to be connected to the PC/MAC to load the files. Connecting the multimedia hard disk to the FORTISSIMO IA you can implement a good performance "media center solution" with little charge.
- g. ByPass Mode: whenever the digital audio from the source has the volume level controlled by the source the bypass mode can be activated on the digital input and the gain level on that input set.

Note: in all the connections listed above the digital source has low quality analog outputs because of its poor digital to analog section. Connecting such digital source to the FORTISSIMO IA the digital to analog conversion is performed by the inner FORTISSIMO IA circuit and the low quality source is used only to furnish the digital signal.

OTHER FUNCTIONS

With the FORTISSIMO IA we have introduced many new control functions further those already present in the last generation AUDIO ANALOGUE products.

For instance:

- Possibility to choose between three different volume scales to match the loudspeakers efficiency.
- Possibility to chose the front leds brightness or to set the Dark mode operation. If the dark mode is set, all the front leds are turned off. When a remote switch is pressed or a command is sent by the front knob, the front leds turn on showing the unit state. Then after about 1 second all the leds are turned off again.
- Balance
- Bypass mode



TECHNICAL SPECIFICATIONS

Parameter	Measurement conditions	Value
Channel number:	-	2
Whole gain. pre + power stage	-	36dB
Input impedance	-	>40KOhm
Power on a 8Ohm load	-	10W @ 0.01% THD + N
		100W @ 0.02% THD + N
Power on a 4 Ohm load	-	180W @ 0.3% THD + N
Noise level	-	-110dBV
Frequency response	Attenuation: 0dB, band at -3dB	120KHz
Signal Noise ratio (SNR)	Attenuation: 0dB A weighted referred to 8 Ohm load nominal power	>100dB
Power consumption:	-	500VA