



"...the Phono 1 is compatible with even the lowest-output moving coil cartridges. ...this phono stage will allow you to hear and appreciate your treasured recordings like never before."

Myles B. Astor, December 1997

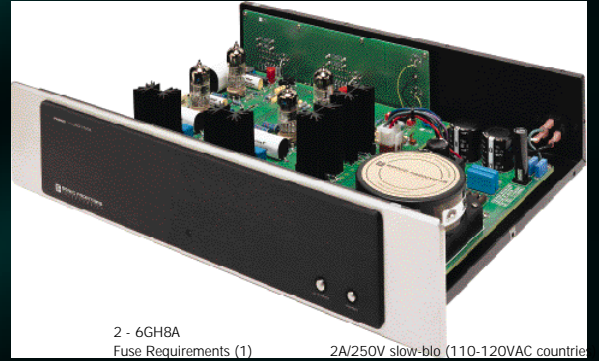
The Phono 1 embodies the newest thinking of Sonic frontiers dedicated and enthusiastic technical design staff. This unit has a factory default setting of 54dB of gain - optimized for all currently available moving coil phono cartridges with an output of 1.7 mV or lower. It is also available from SFI configured at an incredible 62 dB of gain or 44 dB. The 62dB setting is optimized for moving coil phono cartridges with an output of 0.6 mV or lower. The 44 dB setting is for high output moving coil cartridges or moving magnet cartridges with an output level up to 5 mV. The noise floor on the Phono 1 is so low that the only limit to background noise is that set by your phono record, not the phono stage!

Loading: User selectable loading of phono cartridges (resistance and capacitance) is accomplished via DIP switches on the rear of the unit, plus two "internal" positions that allow the technically competent consumer or technician to install special resistors or capacitors, providing complete flexibility for various phono cartridges which may perform better at settings other than the default 47K ohm value (See figure 1a & 1b).

Cue/Mute: Another feature that is new (perhaps to the industry) is the cue/ mute function, adjacent to the power switch. This feature allows the user to "cue up" a track on a LP without potentially damaging the system loudspeakers. This works by reducing the gain by 9 dB when the switch is depressed. This allows records to be "cued up" or changed without completely muting the system. This switch can also be internally configured as a traditional mute switch, if so desired (See figure 2).

Design Details: The high pedigree of parts quality, which has come to be a trademark of SFI, is evident in the Phono 1. To maximize performance, we have chosen to use a potted and encapsulated custom toroidal power transformer, which is magnetically shielded in silicone steel, specially designed for low noise and hum. This transformer is mounted, as well as the unit's raw power supply, on a separate circuit board. To further protect the signal integrity the phono amplifier board is itself is isolated via an elastomer mount suspension, further decoupling it from the main chassis and outside vibration (See figure 3), as used on our top preamplifier, the Line 3.

Sonics: All of these design details culminate to present the listener with a complete musical picture. Precise instrument focus, holographic soundstaging and pinpoint imaging are the hallmarks of this product. Moreover, the very low noise floor of the Phono 1 ensures that the smallest amount of musical detail and ambiance are revealed with astonishing clarity.



2 - 6GH8A Fuse Requirements (1) 2A/250V slow-blo (110-120VAC countries)

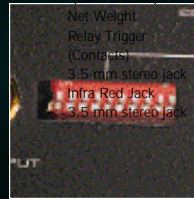


Figure 1a

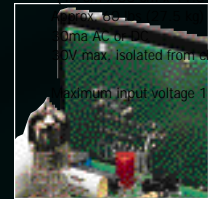


Figure 1b

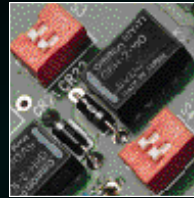


Figure 2

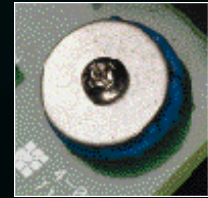


Figure 3

PHONO 1 PHONO PREAMPLIFIER

TECHNICAL SPECIFICATIONS

All Sonic Frontiers products come with a 5 year parts & labour warranty and a 1 year warranty on the tubes and mechanisms.

TRANSPORT 3 TECHNICAL SPECIFICATIONS

Wow and Flutter:	Below measurable levels	Sampling Rate:	352.8 kHz
Jitter:	<2 ps rms, to 40 kHz at the clock. Typically 10ps rms, at the outputs (independently verified with UltraAnalog's latest Jitter Analyzer	Disc Rotation Velocity:	200-500rpm (constant linear velocity)
Digital Outputs (5):	S/PDIF - Coaxial (RCA) - Coaxial (BNC) - ST-Optical (H-P/AT&T) - Toslink-Optical AES/EBU - XLR Balanced I ² S•e - 13W3 style D-subminiature connector	Quantization:	16 bits, linear
Laser Semiconductor:	GaAlAs, 0.5mw, continuous, 790nm	Error Correction:	CIRC principle
		I.R. Jack:	TTL level optically isolated
		Number of channels:	2 channels, stereo
		Power Consumption:	100-120 VAC 50/60Hz 40VA Max. 200-240 VAC 50/60Hz 40VA Max. 19.125" Wide x 16" Deep x 4." High (49 cm x 40 cm x 10 cm)
		Dimensions:	Approx. 31.5 lbs (14.3 kg) - unpacked
		Net Weight:	5 years parts and labor; 1 year on the mechanism
		Warranty:	

PROCESSOR 3 TECHNICAL SPECIFICATIONS

Input Receiver:	UltraAnalog AES21 AES/EBU ultra-low jitter Input Receiver (Note: Not required with I ² S•e interface)	Digital Inputs (6):	S/PDIF - Coaxial (RCA) - Coaxial (BNC) - ST-Optical (H-P/AT&T) - Toslink-Optical AES/EBU - XLR Balanced I ² S•e - 13W3 style D-subminiature connector
HDCD® Digital Filter/Decoder:	Pacific Microsonics PMD -100	Digital Output (1):	S/PDIF - Coaxial RCA
D/A Converters:	2 Dual UltraAnalog custom DAC's (Balanced Configuration) 2 External custom I to V Modules	Analog Outputs:	1pr. Unbalanced RCA 1pr. Balanced XLR 4 - 6922 (E8BCC)
Low Pass Analog Filter:	Proprietary passive filter	Tube Complement:	.75 A slow-blo
Frequency Response:	5Hz - 20kHz ± 0.25dB	Fuse Requirements (1):	60VA
Intrinsic Jitter:	S/PDIF <30ps (picoseconds) I ² S•e enhanced - Below the measurement limits of commercial test instrumentation	Power Requirements:	19" Wide x 14.25" Deep x 4.5" High (48 cm x 36 cm x 11.5 cm)
Jitter Rejection:	S/PDIF 6dB/octave above 1kHz	Dimensions: Main	9" Wide x 13" Deep x 4" High (23cm x 33cm x 10cm)
Unweighted:	20Hz - 20kHz >115dB	Power Supply	Approx. 36 lbs (16.5 kg) - unpacked
S/N Ratio:	>130 dB @ 1kHz, >115 dB @ 16kHz	Net Weight:	5 years parts and labor
Crosstalk:	<0.02%	Warranty:	1 year on the tubes
THD:	Approx. 3.0 Volts Unbalanced		
Maximum Output Level @ Full Scale:	Approx. 6.0 Volts Balanced		
Output Stage:	Fully Balanced (for AC and DC parameters), high speed tube buffer		

LINE SERIES TECHNICAL SPECIFICATIONS

Frequency Response	2 Hz to 250 kHz -0.5 dB; > 500 kHz -3.0 dB at 2V RMS output
Line 3	2 Hz to 250 kHz +/- 0.5 dB
	> 1 MHz -3.0 dB at 2 VRMS output
THD & N	< 0.01% from 20 Hz to 20 kHz Balanced or Unbalanced (single-ended) (Output at 2V RMS)
Gain	18 dB @ 1 kHz (balanced), 12 dB @ 1 kHz (single-ended/unbalanced)
Input Impedance	21k ohms - balanced
Output Impedance	
Line 1	300 ohms balanced output, 150 ohms single-ended (unbalanced)
Line 2	270 ohms balanced output; 135 ohms single-ended (unbalanced)
Line 3	90 ohms balanced output; 45 ohms single-ended
Maximum Input	
Line 1	7.0 VRMS maximum (balanced), 3.5 VRMS (single-ended/unbalanced)
Line 2 & 3	8.0 VRMS maximum (balanced); 4.0 VRMS (single-ended/unbalanced)
Rated Output	2 VRMS (balanced), 1 VRMS (single-ended/unbalanced)
Maximum Output Voltage	56 VRMS at 1% THD (balanced output)
Noise	<50µV unweighted wideband noise* Approx. 25µV IHF A-weighted noise (balanced)
Line 1	-98 dB A-weighted below a 2 VRMS output
Line 2	-99 dB A-weighted below a 2 VRMS output
Line 3	-100 dB A-weighted below a 2 VRMS output
Stereo Separation	>-100 dB @ 1kHz relative to 2V RMS output (Crosstalk)

Tube Complement	
Line 1 & 2	6 - 6922 (6DJ8 types)
Line 3	10 - 6922 (6DJ8 types), 2 - 6GH8A
Fuse Requirements (1)	
Line 1 & 2	1A slow-blo (110-120VAC countries), .5A slow-blo (220-240VAC countries)
Line 3	2A slow-blo (110-120VAC countries), 1A slow-blo (220-240VAC countries)
Power Requirements	
Line 1 & 2	80VA Operate, 40VA Standby
Line 3	135VA Operate, 75VA Standby
Dimensions	19" Wide x 14.25" Deep x 4.5" High (48 cm x 36 cm x 11.5 cm)
Line 2 Power Supply	9" Wide x 14" Deep x 4" High (23cm x 33cm x 10cm)
Line 3 (each chassis)	19" Wide x 14.25" Deep x 4.5" High, (48 cm x 36 cm x 11.5 cm)
Net Weight	
Line 1	Approx. 24 lbs (11 kg) - unpacked
Line 2	Approx. 33 lbs (15 kg) - unpacked
Line 3	Approx. 60 lbs (27.5 kg) - unpacked
Relay Trigger	30mA AC or DC
(Contacts)	30V max. isolated from chassis via 3.5 mm stereo jack
Infra Red Jack	Maximum input voltage 12Vp-p 3.5 mm stereo jack

Note: All measurements performed with an Audio Precision System Two test center.
* Indicates measurement determined within an 80kHz bandwidth.
Due to Sonic Frontiers desire to continually improve its products, specifications are subject to change without notice.

POWER SERIES STEREO AMPLIFIER SPECIFICATIONS

Note: Power ratings based on a nominal power line input (appropriate for the country in which it is used). All specifications are made on the 8 ohm taps, utilizing an 8 ohm load unless otherwise specified.

Power Output:	
Power 1	55 W continuous at 8 - 20 Hz to 20 kHz <1% total harmonic distortion terminated with rated load (typically <0.2% @ 55 watts 1 kHz), both channels driven. Actual power output available at clipping (defined as <1% THD) approximately 60 watts RMS
Power 2	110 W continuous at 8, 4 and 2 from 20 Hz to 20 kHz <1% total harmonic distortion terminated with rated load (typically <0.5% @ 110 W 1 kHz) both channels driven. Actual power output available at clipping (defined as <1% THD) approximately 120 watts RMS
Power 3	220 W continuous at 8, 4 and 2 ohms from 20 Hz to 20 kHz <1% total harmonic distortion terminated with rated load (typically <0.5% @ 220 W 1 kHz) Actual power output available at clipping (defined as <1% THD) approximately 240 watts RMS
SMPT E Intermodulation Distortion:	<1% 20 Hz to 20 kHz
Power Bandwidth:	
Power 1 - 55W output	7 Hz to 25 kHz (-0.5 dB points), 5 Hz to 58 kHz (-3 dB points)
Power 2 - 110W output	15 Hz to 90 kHz (-0.5 dB points), 5 Hz to 110 kHz (-3 dB points)
Power 3 - 220W output	15 Hz to 60 kHz (-0.5 dB points), 5 Hz to 120 kHz (-3 dB points)
Frequency Response:	
Power 1	5 Hz - 30 kHz @ 1W (-0.5 dB points), 3 Hz - 77 kHz @ 1W (-3 dB points)
Power 2	5 Hz - 40 kHz @ 1W (-0.5 dB points), 2 Hz - 120 kHz @ 1W (-3 dB points)
Power 3	5 Hz - 75 kHz @ 1W (-0.5 dB points), 2 Hz - 150 kHz @ 1W (-3 dB points)
Input Sensitivity:	
Power 1 (55 watt output)	0.94V RMS balanced for 55W output; 0.94V RMS single-ended (inverting or non-inverting)
Power 2 (110 watt output)	1.25V RMS balanced for 110W output; 1.25V RMS single-ended (inverting or non-inverting)
Power 3 (220 watt output)	2.2V RMS balanced for 220W output; 2.2V RMS single-ended (inverting or non-inverting)
Input Impedance:	200K ohms balanced, 100K ohms single-ended (inverting or non-inverting)

Voltage Gain:	Power 1 - 26.9dB into 8ohms; Power 2 - 27.5dB into 8ohms; Power 3 - 25.6dB into 8ohms
Damping Factor:	
Power 1	>35 (determined using the IHF method from RS-490)
Power 2 & 3	>50 (determined using the IHF method from RS-490)
Output Impedance:	Power 1 - 0.28 ohms at 1 kHz; Power 2 - 0.30 ohms at 1 kHz; Power 3 - 0.25 ohms at 1 kHz
Negative Voltage Feedback:	Power 1 - 20 dB; Power 2 - 16 dB; Power 3 - 18 dB
Hum and Noise:	
Power 1	approx. 300 microvolts of wideband, unweighted noise @ the 8 ohm taps, input muted; -95 dB below a 55W output
Power 2	approx. 400 microvolts of wideband, unweighted noise @ the 8 ohm taps, input muted; -110 dB below a 110W output
Power 3	approx. 400 microvolts of wideband, unweighted noise @ the 8 ohm taps, input muted; -110 dB below a 220W output
Rise Time:	Power 1 - 5 microseconds; Power 2 - 3.0 microseconds; Power 3 - 2.8 microseconds
Power Requirements:	
Power 1	320VA at rated output, 340VA max. and 200VA with no signal input
Power 2	580VA at rated output, 650VA max. and 375VA with no signal input
Power 3	580VA at rated output, 650VA max. and 375VA with no signal input
Tube Complement:	
Power 1	4 (2 matched pair) x 6550C - power output; 6 x 6922 - input/driver
Power 2	8 (4 matched pair) x 6550C - power output; 6 x 6922 - input/driver; 2 x 5687 - high voltage driver
Power 3	8 (4 matched pair) x 6550C - power output; (per mono amp) 4 x 6922 - input/driver; 2 x 5687 - high voltage driver
Dimensions:	
Power 1	15" (38 cm) W x 20" (51 cm) D x 9" (23 cm) H
Power 2 & 3	18" (46 cm) W x 22" (56 cm) D x 9" (23 cm) H
Weight (approx.):	
Power 1	50 lbs (22 kg) net each (unpacked)
Power 2	110 lbs (50 kg) net each (unpacked)
Power 3	100 lbs (45 kg) net each (unpacked)

Note: All measurements performed with an Audio Precision System Two test center.
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PHONO 1 SPECIFICATIONS

Frequency Response:	+/- .1dB, 20Hz to 20kHz, RIAA equalized
Noise:	0.07µV equivalent input noise, -83 dB below a 2.5mV 1kHz input signal at 54dB setting -83 dB below a 1.0mV 1kHz input signal at 62dB setting -70 dB below a 8.0mV 1kHz input signal at 44dB setting IHF - A-weighted, shorted input.
Distortion:	Less than .01% THD at 1kHz, 1VRMS output. IHF load - 10K ohms, 1000pf (4) 6922/E88CC Dual triodes.
Tube Complement:	
Gain:	Factory Default: 54 dB at 1kHz. (1200X) recommended for cartridges with a maximum of 1.7mV or less output. Optional versions available (from the factory only): • 62dB gain for low output MC cartridges with less than 0.6mV output • 44dB gain for high output MC or MM cartridges with 5.0mV output or less. 100V - 135VAC 50/60 Hz, (200 - 270VAC 50/60Hz). 60 VA maximum. Line fuse .75A SLO BLO (.375A 240V)
Power Requirements:	

Input Impedance:	47K ohms/10pf standard. 10, 100, 1K, 10K ohms resistance and 47, 47, 100, 100pf capacitance available by user selected DIP switches on rear of unit. Two positions available per channel for user selected components via solder posts.
Dimensions:	19" Wide x 14.25" Deep x 4.5" High (48cm x36cm x 11.5cm)
Output Impedance:	175 ohms at 1kHz Recommended minimum load 10K and 1000pf.
Net Weight:	21.5 lbs. (9.75 kg) - unpacked
Maximum Input:	50mV at 1kHz and 280mV at 20kHz
Rated Output:	1.2VRMS 20Hz to 20kHz, 10K ohm load

Specifications subject to change without notice.



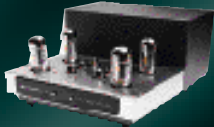
LINE 1
PREAMPLIFIER



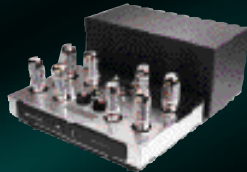
LINE 2
PREAMPLIFIER



LINE 3
PREAMPLIFIER



POWER 1
STEREO AMPLIFIER



POWER 2
STEREO AMPLIFIER



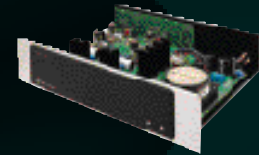
POWER 3
MONO AMPLIFIERS



TRANSPORT 3
CD TURNTABLE



PROCESSOR 3
DIGITAL PROCESSOR



PHONO 1
PHONO STAGE



CD 1 CD Changer



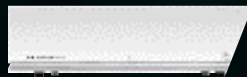
PRE 2L Linstage Preamp



PRE 1P Phono Stage



Integrated 2 Hybrid Integrated Amplifier



AMP 1 Tube Stereo Power Amplifier



AMP 2 Hybrid Stereo Power Amplifier



AVM 1 SSP/Preamp/Tuner



MCA 2 Solid State Stereo Power Amplifier



MCA 3 Solid State Multi-channel Power Amplifier



MCA 5 Solid State Multi-channel Power Amplifier

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