

WELCOME TO THE WORLD OF SUMO!!!

This being our first composite brochure, it is intended to be a departure from the normal methods of producing spec sheets. Our products are different and so shall be our method of presentation.

In the last few years it has become obvious to the avid hi-fi enthusiast that a spec sheet just doesn't present an accurate picture of the performance to be expected from the product in actual use. Products generally perform excellently on the test bench, but more often than not, do not perform quite so admirably under conditions of actual use.

With the foregoing in mind, we will present a technical description of the specifications of our products for those people who feel they can find meaning and understanding relative to test bench measurements. For those of you who are primarily concerned with the sonic performance (that is not to say that technically oriented individuals do not care about sonic performance) we will explain in understandable language what you may expect from our products acoustically.

There are also certain items that will be missing from our presentation that have been accepted normal practice in the past. The main thing that we will not have is glossy photographs. We feel that the costs involved do not add anything to our products except a raised price. We will instead use line drawing renderings. In this day and age of exasperating prices and price increases, we intend to market products that are still affordable with no frills, yet with as much use of sophisticated technology as is currently available.*

The driving force behind our efforts is James Bongiorno, clearly one of the leading innovators in the audio industry. For the last several years from his Dynaco days, through his stay at S. A. E. culminating with his founding of the Great American Sound Company Inc., his designs have been consistently in the forefront of technology and have been the most copied designs in the industry. His leadership and creative marketing, aside from scientific achievements, made G. A. S. the fastest growing and most successful company in the entire industry in recent years.

We at Sumo are fortunate to have his leadership and creative inspiration which is so familiar to most audiophiles. Our new products reflect Mr. Bongiorno's continuing efforts in the direction of achieving sonic perfection at an affordable price.

In recent years, a great many technical advances have been made that may benefit the audiophile. A few of these innovations are power FET technology, vast improvements in integrated circuits, and a general overall lowering of some component costs. However, just because these things exist doesn't necessarily mean that they can or will be used immediately. These new innovations and improvements are used on a continuing research and development basis and when, and only when, they provide improved performance at or below present costs, will they be implemented into our products.

The most promising new devices are the complementary MOS power fets. They are free from second breakdown problems and are immensely rugged. However, at the present moment, the price of these devices is astronomical. So, for the time being, we will pass on these devices but are hoping for price reductions in the future.

The statements in the preceding paragraph are not intended to signify the death of the transistor, quite the contrary. Recent advances in semi-conductor technology have yielded improvements in power transistors that were only a dream just a few years ago. We now have devices which are substantially more rugged and much more linear than ever before. Also, much wider bandwidths have been achieved with no increase in costs.

As a matter of fact, these new devices as used in our new class A amplifiers have yielded a performance that has never before been obtainable. To give you an indication of what we are talking about, our new class A amplifiers achieve a distortion factor of a mere .05% at all powers and at all frequencies in the audio band WITH ABSOLUTELY NO FEEDBACK OF ANY KIND AROUND THE OUTPUT STAGE. Of course, we do not manufacture the product like that as feedback has many benefits. Therefore we use just enough to lock down the parameters that we desire and no more. What this boils down to is the fact that we now have an output stage which is inherently linear, without feedback.

For those of you who are technically minded, here are a few more tidbits. Our amplifiers do not exhibit any T. I. M. distortion and therefore do not slew or vice versa. We therefore do not quote a slew rate per se. Instead we quote the FULL POWER RISE TIME in microseconds which is 100% exponential at any power level. What does this mean to you? Very simply put, it means that there is absolutely NO frequency overload in our amplifiers under ANY circumstances. Our amplifiers roll-off at an absolute controlled rate of 6DB per octave which represents a first order network (a simple R-C network) which cannot be overloaded in the frequency domain.

Please be informed however, that we are not trying to gild our own lily. There are many other fine amplifiers that approach this performance, although none that we have seen meet it 100%. This is only one parameter out of many that are important.

We feel that the most significant advantage in our new amplifiers is their totally balanced operation. This is not to be confused with the term "bridging". A "bridged" amplifier does not give you as much improved performance but rather almost (theoretically) four times more power into an equivalent load. In most cases, this significant increase in power will make a difference, but only in quantity and much less in quality.

The next question you may ask is: Why is it necessary to have balanced operation? The easiest way for you to understand this concept is to consider that everything happening in the audio chain (meaning from cartridge to loudspeaker) is functioning on a two port basis. The cartridge for example has two leads per channel which are opposite ends of a coil. That we use one end as ground is only a reference, as it isn't necessary. The identically same signal is available at either end of the coil (of opposite phase of course). This means that the cartridge doesn't know the difference between which end we take the signal from and it doesn't care. Since the cartridge is a generator instead of a reproducer, the following electronics have no bearing on the cartridge performance.

Not so with the loudspeaker however, even though it too is a two port network just like the cartridge. Here we have an absolutely critical situation in which two components are heavily dependent upon each other: the amplifier and the speaker. They influence and affect each other and if the partnership is not right, then less than spectacular results are often the case.

The loudspeaker is a motor, pure and simple. As such, it has a multitude of its own idiosyncrosies which can and do cause improper performance from the amplifier. Since the speaker is only a two port system it doesn't care which end is which, only the phase is affected. The amplifier however, very much cares what's happening in the loudspeaker. The loudspeaker is a mechanical device and as such has moving and static mass, which means, inertia. Inertia must be overcome by some greater force; in the speaker this is the motor assembly which can be of several forms and varieties. Usually, there is a voice coil of some kind, and as such, stores energy. Of course, loudspeaker engineers try very hard to optimize parameters in order to minimize these idiosyncrosies, but there is only so much that can be done. As long as there is mass there will be these problems.

The job of the amplifier is manifold. It must supply power to the loudspeaker to move it. It must also supply a reverse E. M. F. called damping, to stop or break the motion of the loudspeaker when necessary. However, in doing so the amplifier must be capable of absorbing tremendous reverse energy from the loudspeaker. This is because even though the amplifier tries to stop the motion of the loudspeaker, it (the loudspeaker) doesn't want to stop, but rather tries to keep going. Since the loudspeaker's coil is not necessarily in phase with the cone motion, the stored energy at this point must go somewhere. Since it is out of phase with the amplifier we have a dilemma. Since our amplifiers are feedback amplifiers, which means that effectively the internal impedance is only a fraction of the loudspeaker impedance, the amplifier output voltage (at whatever static point it happens to be at that moment) will not alter or change. Under these foregoing circumstances the only thing left that can happen is that the amplifier will and must accept and absorb all of this dynamic energy from the loudspeaker.

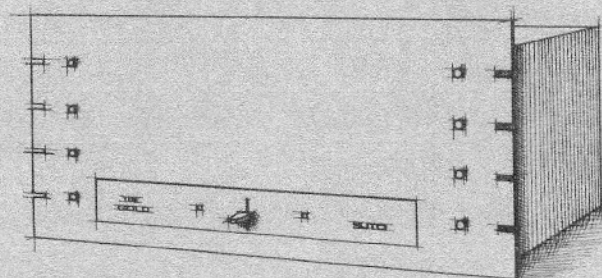
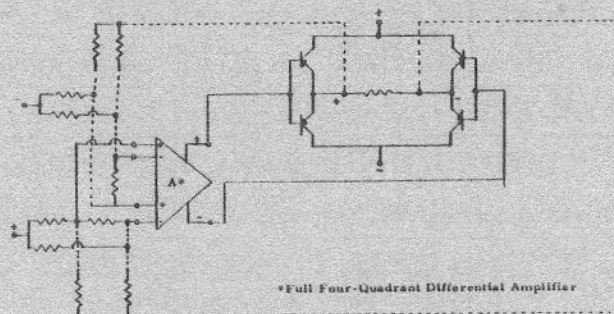
* Patents are pending for all of our circuitry.

Of course it is obvious to all of you that this is greatest at the low frequencies. Since we have a collapsing energy source, we will not have an instantaneous release of this energy but rather, a small delay. This can be evidenced by thinking of the ringing that takes place when loudspeakers are subjected to tone bursts. Also these effects are never equal in both directions. Nothing that is mechanical, whether it be the instrument that produced the sound, or the speaker that reproduced the sound, can start and stop instantaneously. There is always a build-up and decay of every sound in nature, regardless.

What this means of course, is that the positive and negative alternating cycles are never the same, or alike, or symmetrical, with the exception of steady state tones. It is very easy to understand therefore, that although the alternate (positive and negative) half cycles of the signal are almost never alike, it would seem that in order to have perfect control from the amplifier, it is mandatory that the push-pull amplification be exactly and perfectly symmetrical. This is what full complementary amplification is all about, and why it was invented (or conceived if you wish). Even though Mr. Bongiorno is the creator of this concept, it was decided

to go one better. Just because the two halves of the amplifier (positive and negative or push-pull) are complementary, does not guarantee that they are exactly equal and alike. There are still differences and inequalities due to the fact that the devices are not and cannot be exactly, perfectly alike and complementary. We tried hard but could only get so close and that's that. Due to these differences the feedback loop still has to change gears as it controls the alternate positive and negative half cycles of the signal. The most offensive problem that we have is ASYMMETRICAL distortion. It is not too difficult to see that this can possibly be one of the foundational reasons of why amplifiers sound different, although for the most part they perform identically on the test bench. Most engineers are not aware, nor do they know how to measure asymmetrical distortion, nor have they yet recognized the existence of it.

To make a long story short, our new amplifiers have solved this problem forever. Since all of our new amplifiers are 100% perfectly balanced from inputs to outputs, each side of the loudspeaker is driven by an identical half of a perfectly balanced differential power amplifier. The simplified drawing below illustrates the principle.



We at Sumo feel that our new amplifiers will be a significant step forward in the advancement towards the ultimate

goal of true holographic reproduction. For those of you who need specifications to relate to, we present the following:

The POWER (Standard Version) All specifications into 8 Ohms unless noted.

- 400 Watts per channel, both channels driven 20Hz to 20KHz at less than .05% total distortion of any kind.
- Power Bandwidth--measured by the risetime method-- .1Hz to 175KHz -3dB.
- Frequency Response--measured by the risetime method-- -3dB-- .1Hz to 175KHz at 1 Watt R. M. S. .
- Risetime--2 μ seconds, constant at any power level up to clipping.
- Signal-to-noise ratio--greater than -100dB below full power, wideband, no filter.
- Stability--absolutely unconditional into any load. Resistive or reactive.
- T. I. M. distortion and/or slewing effects: non-existent under any circumstances.

Mechanical Specifications

- Size 10 1/2" (H) X 19" (W) X 12 1/2" (D)
- Weight approximately 80 lbs.
- Whisper Fans 2
- All monocoque construction.
- All plug-in circuit board construction.
- Recessed Banana terminals--Dual Banana plugs must be used for output connections (supplied).

Additional Electrical Specifications

- | | |
|---|---------------------------------------|
| Input sensitivity for full output-----1.35 volts R. M. S. . | Thermal overload protection. |
| Total electronic protection without limiters of any kind. | Turn-on surge relay protection. |
| Peak overload L. E. D. 's indicate clipping. | 120,000 μ f of B1 FILTERING |
| A. C. , B1, B- fuses. | Unique quadrature feedback operation. |
| Both balanced (600 Ohm) + unbalanced (Hi-Z) inputs. | |
| 6 regulated supplies, independent for each channel. | |
| Massive 4000 Watt transformer weighs 42 lbs. . | |

THE POWER (Gold Version) All specifications into 8 Ohms unless noted.

125 Watts per channel, pure Class A, both channels driven 20Hz to 20KHz at less than .05% total distortion of any kind.

Power Bandwidth--Same as the Standard Version.

Frequency Response--Same as the Standard Version.

Risetime--Same as the Standard Version.

Signal-to-Noise Ratio--Same as the Standard Version.

Stability--Same as the Standard Version.

T. I. M. distortion and/or slewing effects: non-existent.

Mechanical Specifications--Same as the Standard Version.

Additional Electrical Specifications

Peak overload L. E. D. 's indicate clipping.

A. C., B+ fuses.

Both balanced (600 Ohm) and unbalanced (Hi-Z) inputs.

6 Regulated supplies.

Massive 4000 Watt transformer weighs 42 lbs..

Mono version available for center channel and sub-woofer use. (Identical Specs.)

Thermal overload protection.

Turn-on surge relay protection.

120,000 μ f of B+ FILTERING.

Unique quadrature feedback operation.

36--200 Watt output devices.

The HALF POWER All specifications identical to the POWER except for the following:

200 Watts per channel, both channels driven.

Mechanical Specifications

Size 7" (H) X 19" (W) X 12 1/2" (D).

Weight approximately 45 lbs..

Whisper Fans 1

All monocoque construction.

All plug-in circuit board construction.

Recessed dual banana terminals.

Additional Electrical Specifications

Input sensitivity-----,95 volts R. M. S. .

No limiters of any kind.

Thermal overload protection.

Peak overload L. E. D. 's.

A. C., B+, B- fuses.

Turn-on surge relay protection.

60,000 μ f. of B+ FILTERING.

Both balanced (600 Ohm) and unbalanced (Hi-Z) inputs.

Unique quadrature feedback operation.

Mono version available for center channel and subwoofer use. Identical specs.

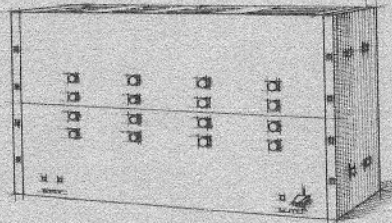
The NINE Our proudest contribution to the state-of-the-art.

All specifications identical to the POWER (GOLD) except for the following:

70 Watts per channel pure Class A, both channels driven.

Mono version available.

Additional mechanical and electrical specs identical to the HALF POWER.



BITSY and BABY Our most inexpensive amplifiers.

SPECIFICATIONS

Power output (8 Ohms) both channels
Driven at less than .05% distortion
Input sensitivity (8 Ohms)
Power Bandwidth
Frequency Response
Risetime
Signal-to-noise ratio
Stability
T. I. M. Distortion (Slewing effects)
Filtering B+

BITSY

100 Watts
.67 volts R. M. S.
-3dB .1Hz-175KHz
-3dB .1Hz-175KHz
2 μ seconds CONSTANT
-100dB
Absolute
Non-existent
40,000 μ f

BABY

35 Watts
Pure Class A
.4 volts R. M. S.
Same
Same
Same
Same
Same
Same
Same

A few words about our Class A circuits. They are unlike any previous circuit designs. Our Class A circuits are 100% PURE. Unlike some other manufacturers who would lead you to believe that their super class B amps are Class A, ours are real--theirs are not. True Class A only comes one way; either it is or it isn't.

Unlike all previous attempts at Class A designs, our amplifiers have no bias networks of any kind, no adjustments for idle current, no sensing networks of any kind, no thermal tracking networks of any kind. All are totally unnecessary in our designs (patents applied for). Therefore, there is nothing to run away thermally. Our Class A current stability is inherent in the design.

With the offering of both Class AB and pure Class A designs, we at Sumo feel that we are offering the customer a

choice. The best of both worlds is now available. We at Sumo recognize the need for both products. One mode of operation is not necessarily optimum in all cases. Although we claim total stability for all of our amplifiers into any load, resistive or reactive, there are certain kinds of loudspeakers that perform better with Class A than with Class AB and vice-versa. We feel that massless and near-massless loud-speakers must be driven from Class A amplifiers. These include Magnephanars (all models), all electrostatic, and finally ribbon types such as the Pyramid and the Decca. All cone loudspeakers on the other hand and especially woofers, must be driven by higher power Class AB amplifiers.

We hope you will evaluate your needs carefully in order to make the right choice.

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WHERE TO BUY SUMO PRODUCTS WORLD-WIDE:

NORTH EAST

OLD GREENWICH, CONN. 06870: Audioloom Inc.
177 Sound Beach Avenue..... (203) 637-3621
NEW BRUNSWICK, NJ. 08901: HI-Fi Haven
28 Easton Rd..... (201) 249-5130
BUFFALO, N.Y. 14217: The Stereo Emporium
3407 Delaware Avenue..... (716) 874-3372
MANHASSET, N.Y. 11030: Audio Breakthroughs
1534 Northern Blvd..... (516) 627-7333
ROCHESTER, N.Y. 14608: Paul Heath Audio
354 State Street..... (716) 232-2828
WAPPINGERS FALLS, N.Y. 12590: Sound Odyssey Inc.
Route 9..... (914) 297-6922
BETHLEHEM, PA. 18018: Canlen Audio Inc.
612 West Broad Street..... (215) 866-0728
PROVIDENCE, RI. 02906: Ashley Hi-Fi
189 Angell St..... (401) 421-5636
MORGANTOWN, W. VA. 26505: Sound Investments
465 High St. [Pittsburgh: (412) 884-4040].... (304) 292-3292

SOUTH EAST

CORAL GABLES, FL. 33134: Sound Components Inc.
2710 Ponce de Leon Blvd..... (305) 446-1659
CHAPEL HILLS, N.C. 27514: Vicker's Audio
210 West Franklin Street..... (919) 929-4554

NORTH CENTRAL

DAVENPORT, IOWA 52807: Audio Odyssey
730 East Kimberly Rd..... (319) 391-2244
ANN ARBOR, MICH. 48104: Absolute Sound
312 South State Street..... (313) 662-2026
DETROIT, MICH. 48224: Absolute Sound
12400 Morang Avenue..... (313) 527-2244
ROYAL OAK, MICH. 48072: Absolute Sound
4354 No. Woodward Avenue..... (313) 549-7550
SAGINAW, MICH. 48603: Creative Audio
4572 Wintergreen Dr. North..... (517) 799-6013
MINNEAPOLIS, MINN. [Bloomington] 55420: Audio Perfection
8714 Second Avenue South..... (612) 888-3224
ST. ANN, MO. 63074: Continental Sound
9847 St. Charles Rock Rd..... (314) 429-5460
AKRON, OHIO 44313: Golden Gramophone
2858 West Market Street..... (216) 864-4411
MIDDLETON, WIS. 53562: Audiophile's Sound Studio
7459 Elmwood Ave. [Cincinnati, O. (513) 994-0954].. (608) 836-3807
MILWAUKEE, WIS. 53223: Audio Emporium
6914 A. W. Brown Deer Road..... (414) 354-5082

SOUTH CENTRAL

LOUISVILLE, KY. 40202: Specialized Sounds
734 S. First St..... (502) 582-1935
OKLAHOMA CITY, OK. 73102: Maguire High Fidelity Inc.
9329 N. Penn Place..... (405) 840-1531

NORTH WEST

FORT COLLINS, COLO. 80524: Audio Alternative
1124 East Elizabeth..... (303) 221-1496
PROVO, UTAH 84601: Winterton's Audio Center
83 North University Street..... (801) 374-0179
SALT LAKE CITY, UTAH 84106: Winterton's Audio Center
2166 Highland Drive..... (801) 486-7362

SOUTH WEST

ALBANY, CA. 94706: Pad's Stereo
1394 Solano Avenue..... (415) 658-7837
BEVERLY HILLS, CA. 90210: The Sound Center
319 North Beverly Drive..... (213) 274-6951
LOS ANGELES, CA. 90025: The Ear Drum
11710 Santa Monica Blvd..... (213) 820-5697
SANTA ANA, CA. 92706: Absolute Audio
305 East 17th Street..... (714) 547-4497
SAN DIEGO, CA. 92123: Audio Directions
8898 Claremont Mesa Blvd..... (714) 278-3310
VISALIA, CA. 93277: California Audio Systems
1018 South Mooney Blvd..... (209) 625-0677
WOODLAND HILLS, CA. 91364: The Sound Center
20044 Ventura Blvd..... (213) 883-2811

WORLD WIDE

AUSTRALIA, Audio Supply
13-15 Wentworth Ave. Sydney, N.W.S. 2000..... (02) 61-96-11
GERMANY, Audio International
Gonzenhelmerstr. 2b, 6 Frankfurt 56..... 50-47-33
HONG KONG, Exact Hi-Fi Co.
Central Bldg. Peddar St..... 5-23-25-19
JAPAN, B. L. C. Corp.
2-16-15 Hirakawa A-Cho Chiyoda-ku, Tokyo..... 03-230-3625
SCANDINAVIA, Ingenjorsfirma Sven Eriksson
Box 834
S-12108 Johanneshov, Sweden..... (08) 19-90-50
SOUTH AFRICA, The Soundlab
Shop 7 & 8 Kine Centre, Market St.
P. O. Box 1379, 2000 Johannesburg..... 21-8612
THAILAND, Asia Audio
289-291 Chareonkrung Rd. S. A. B. Square
Bangkok, Thailand..... 222-6379
FRANCE, Beta-Tronic
22 rue de Billancourt, 92100 Boulogne..... 604-77-66