



APOGEE POWER AMPLIFIERS
A Breakthrough in Sonic Purity, Management and Control



Welcome to Apogee Sound



*Ken DeLoria
President, Apogee Sound*

Apogee amplifiers have changed the way the world looks at professional power amplification. In just a few years, they've earned an enviable position in the marketplace through innovation, quality and reliability.

Suddenly, Apogee amplifiers are everywhere. They can be found in touring systems, industrials, opera houses, Broadway theaters, churches, theme parks and television sound stages. It's impossible for an audio professional not to notice.

Why has Apogee had such an impact?

- No other amplifier offers Apogee's sonic purity.
- No competing brand offers our digital control and front panel information displays.
- No other amplifier was designed from inception to be networked. Our AmpNet™ software system offers bi-directional control and monitoring capabilities while utilizing the highly mature and robust LONWORKS™ network technology for exceptional reliability and ease of use.

The industry caught on right away. In 1994, the Apogee DA Series amplifiers were nominated for a TEC Award, and won the TCI Product of the Year Award. In 1996, Live Sound magazine nominated Apogee for their Amplifier of the Year award.

Read on. You owe it to yourself to discover what Apogee amplification can do for you.

Piet Meekel, who runs FocusShowequipment, one of the largest rental houses in Europe, explains why his company owns hundreds of Apogee amplifiers:

"In a word, experience," Piet says. "Apogee amplifiers sound terrific, and they are by far the most reliable.

We've used Apogee amps for everything from opera to theater to a Rolling Stones concert feed for 80,000 people in Amsterdam's Museum Square. Our customers and sound technicians are always satisfied.

I've been in the business for 30 years, and Apogee amplifiers are the best in the world."



Apogee's new headquarters near San Francisco

The success of Apogee amplifiers has played a key role in our expansion and decision to construct our new company headquarters in the greater San Francisco Bay Area.

Amplifier production alone has increased to over ten times the size of our previous location, while most other manufacturing areas have doubled and tripled in size. Our new building also includes seminar, training and conference rooms to accommodate visits from sound designers, consultants and business associates from all over the world, plus a specially designed testing and demo environment.

Founded in 1985, Apogee Sound has brought a commitment to business integrity and engineering excellence, reflected in its products, service and vision, to audio professionals around the world.



*Piet Meekel, owner of
FocusShowequipment, Amsterdam*

At Apogee, sonic purity comes first

Most power amplifiers are built pretty much the same, regardless of the marketing hype and brand name on the front panel. But at Apogee, we don't believe "pretty much the same" is good enough, so we decided to break the rules.

We designed a new form of high current connectivity that vastly improves the sound quality while avoiding the troubles of corroding connectors that have plagued competing brands.

Specially designed 100 amp bus bars carry the supply rail currents to the output transistors, instead of flimsy PC traces. Another 100 amp bus bar provides an ultra low impedance path for the speaker level output to the rear binding posts. Wiring, where it is used, is heavy gauge and terminated with crimp connectors — the same kind utilized in aircraft.

We select the finest, proven components available, like Wima capacitors and Toshiba semiconductors. Our power supply is a study in harnessing physics to improve the art of sonic excellence.

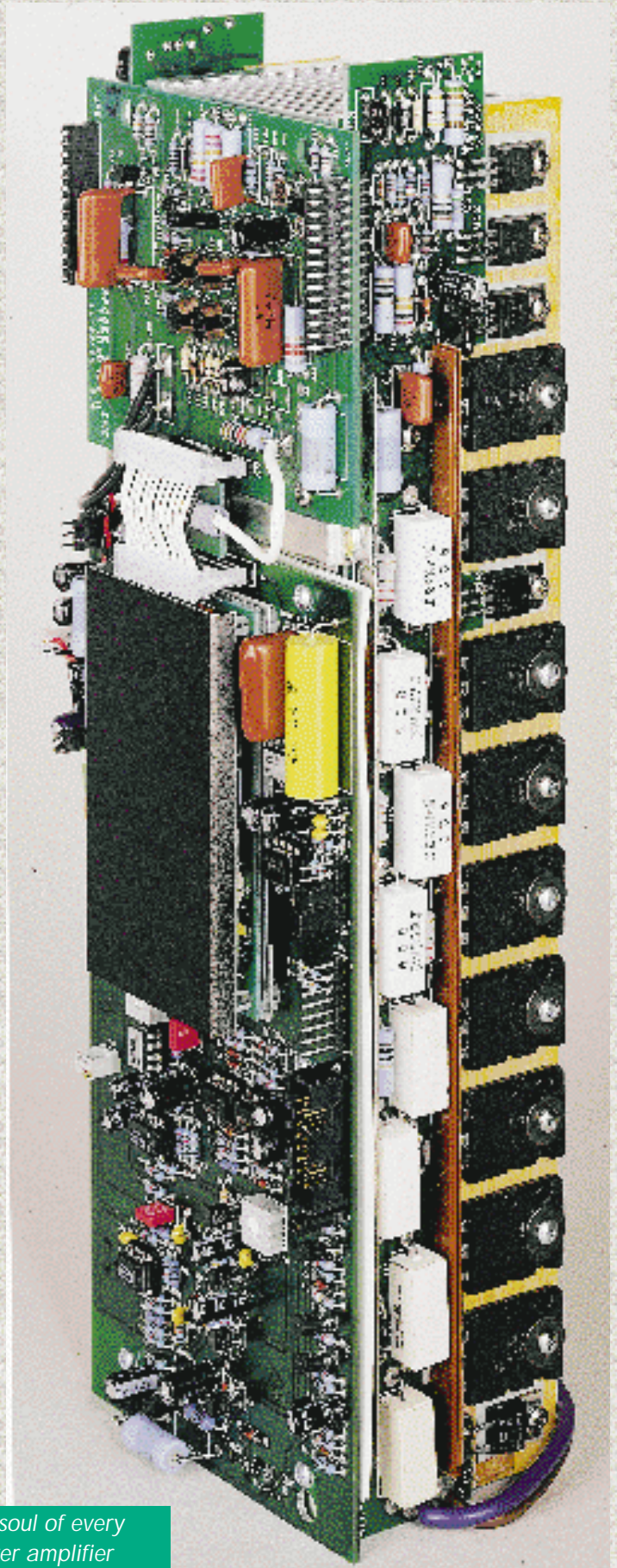
Custom, high voltage, low ESR (Equivalent Series Resistance) Philips capacitors allow our amps to produce more power in a smaller size. Our massive toroidal transformers feature highly precise and uniform windings, which reduce heat and EMI (Electro Magnetic Interference) while increasing power transfer. This means better transient response, lower distortion and more headroom. Apogee amplifiers deliver a clearer sound with tighter bass than you've ever heard before — the sonic purity that you've been missing.

The elegant power module shown here is built around a bonded-fin heat sink that offers more surface area than typical extruded designs for better thermal management. Each sub-assembly receives its own metal and mu-metal shields, resulting in the lowest noise and distortion figures in the industry.

All of this adds up to unprecedented fidelity and reliability.

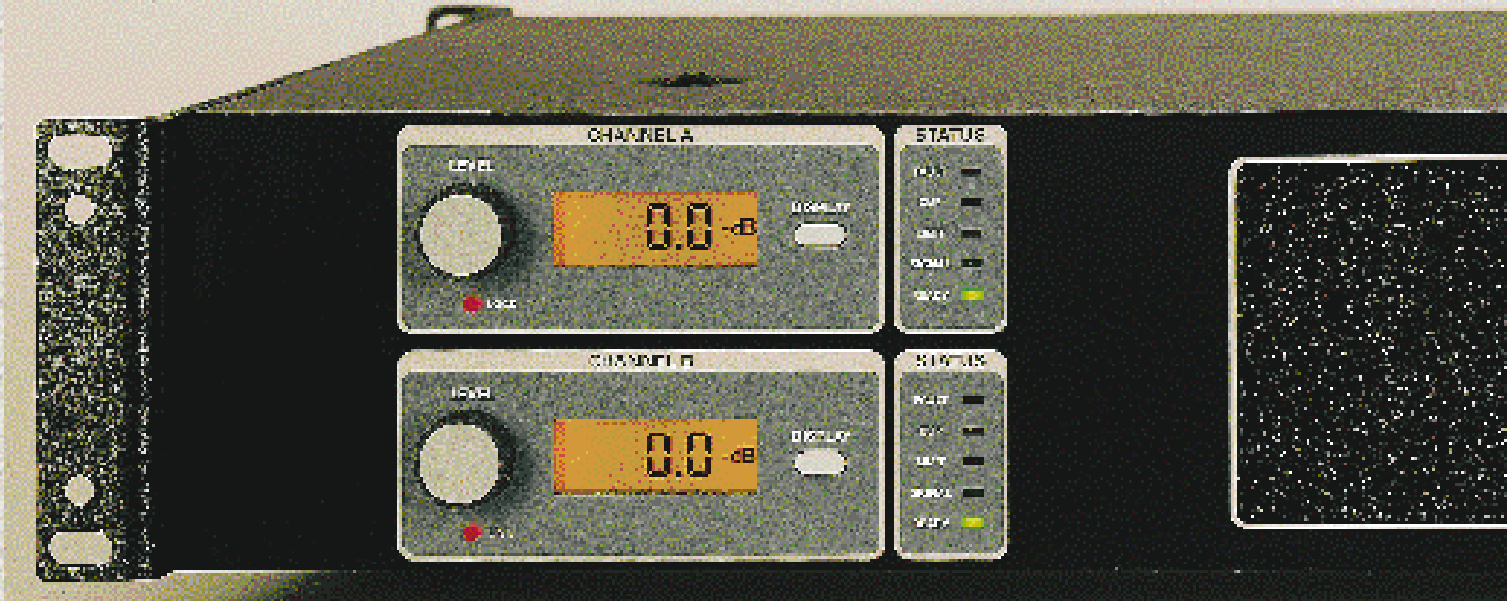
We've married the best sonic engine in the business with an intelligent control system that is simply not available from anyone but Apogee.

And this is just the beginning.



*The heart and soul of every
Apogee power amplifier*

All other amplifiers keep you in the dark, but Apogee DA Series amps have a lot to tell you.



Other brands of amplifiers have one thing in common. They keep you in the dark.

But Apogee DA Series amps keep you informed.

An on board microprocessor continually monitors all critical internal functions, and sends status reports to the front panel information displays. No other amplifier does this for you.

You simply touch the white DISPLAY button provided for each channel to toggle through the displays shown on the facing page. The vital information that the computer provides, such as driver impedance and line voltage, can greatly aid the professional in quickly troubleshooting or verifying proper system performance. And best of all, nothing needs to be added — these capabilities are built-in and require no external computer.

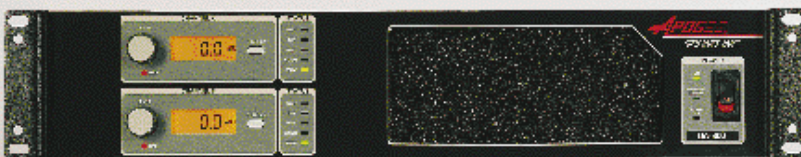
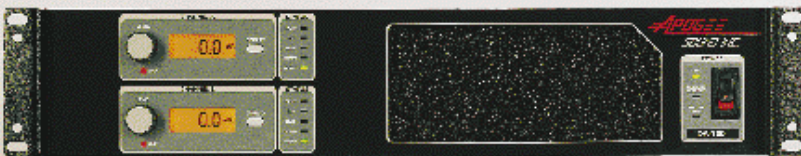
Available displays are: Channel On/Off (Mute State), Phase State, Output Voltage, Output Wattage, Load Impedance, AC Mains Voltage, Temperature, and Attenuation Levels (in 0.5db increments), with complete independence of the channels.

Diagnostics, such as monitoring of the load, can be performed in real time using any signal source, even the program material itself! Unlike other amplifiers, the Apogee DA Series provides this information even if the DA amplifier is not connected to a network, and no external hardware is required for impedance measurements.

Gain adjustment is managed with shaft-encoder technology, thereby completely eliminating the conflicts of earlier amplifier control systems. When you make a change in gain at the computer, the display is instantly updated on the amplifier's LCD display. Conversely, if you change the amplifier's control panel, the computer screen is updated. Try to find this elsewhere. You can't.

The gain controls may be digitally linked with 0.0 to 31.5dB of offset, allowing precision tracking during adjustment of overall levels. The controls may also be disabled to resist tampering.

All of this performance is available without an external computer control system! And when you use your DA amplifiers with our AmpNet computer networking system, many important additional features become available.



Same sound, different power: the DA-700 and DA-600

ou in the dark,
ot to say for themselves



The DA-800 produces over 1200 watts per channel (when both channels are not driven fully, such as in a bi-amp application) and over 900 watts per channel into 4 ohms with both channels fully driven. The DA-700 and DA-600 produce 775 and 600 watts per channel (into 4 ohms) respectively. All three models are based on third generation bi-polar transistor technology for the utmost in confidence and freedom from long term degradation of sound quality. They offer superb thermal stability, ultra-low distortion and unprecedented reliability. All feature an industry-first electronic circuit breaker which may be remotely reset through network control.

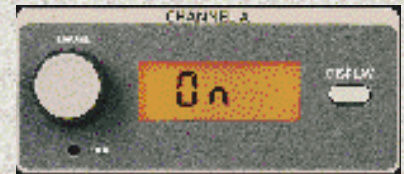
The DA Series offers many additional practical features, such as a front panel removable air filter for ease in cleaning, and adjustable rear rack ears.

DA amps are also available with built-in loudspeaker processors for all single amp and bi-amped Apogee loudspeaker models. Consult the factory for loudspeaker processors for other brands of loudspeakers.

The DA Series Power Amplifiers are the product of the future, available from Apogee today.



The back panel of DA Series amplifiers features adjustable rear rack ears for easy mounting in road cases



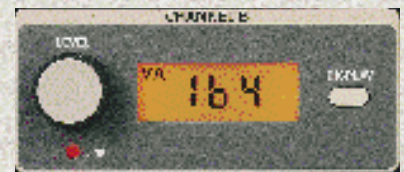
Channel On/Off



Phase State



Output Voltage



Output Wattage



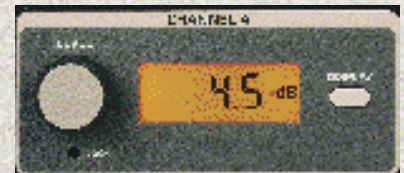
Load Impedance



AC Mains Voltage

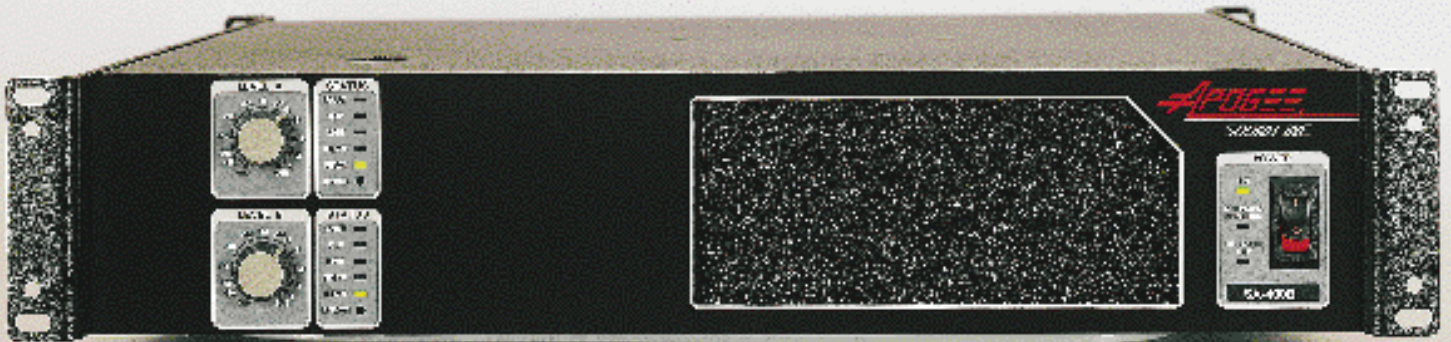


Temperature (in percentage)



Attenuation Levels

Apogee's SA and CA Series: Sonically pure and cost-effective



SA SERIES: You want the sonic purity of an Apogee DA amp. But your application doesn't require the DA's on-board computer, front panel displays or network capability on demand. Where do you turn? The new SA Series II.

Like the DA Series, SA amplifiers are made in the U.S.A., at Apogee's modern factory. The SA Series provides affordable high power amplification for concerts, theaters, clubs, touring and fixed installations. And SA Series power amplifiers utilize the same engine as the DA Series. So the sound remains the same.

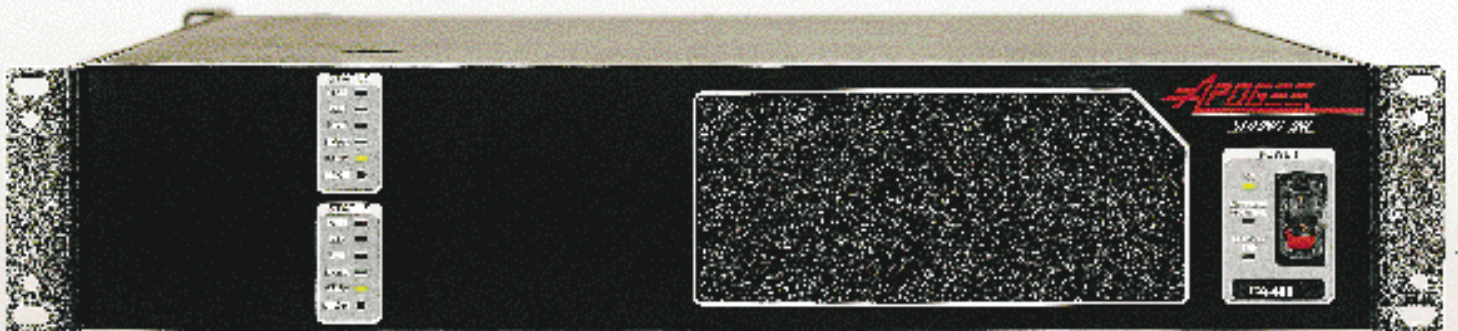
SA Series amplifiers may be upgraded to full computer control. By adding an internal microprocessor control board, along with the same external network interface adapter that DA amps use, SA amplifiers can

readily be controlled from the same software as the DA Series. In fact, they can easily co-exist on the same network with DA amps.

Models are available in three power levels: The SA-400B produces 480 watts per channel, the SA-600B produces 600 watts per channel and the SA-700B produces 775 watts per channel (into 4 ohms).



Like all Apogee amps, the SA Series II provides adjustable rear rack ears for easy road case mounting



CA SERIES: Sleek, elegant and effective. Apogee's new CA Series amps are the smart choice for contractors when gain settings must remain fixed.

CA Series amps have the same engine as the DA Series. And the same controls as the SA series.

We simply located the gain controls on the CA amplifier's rear panel instead of the front.

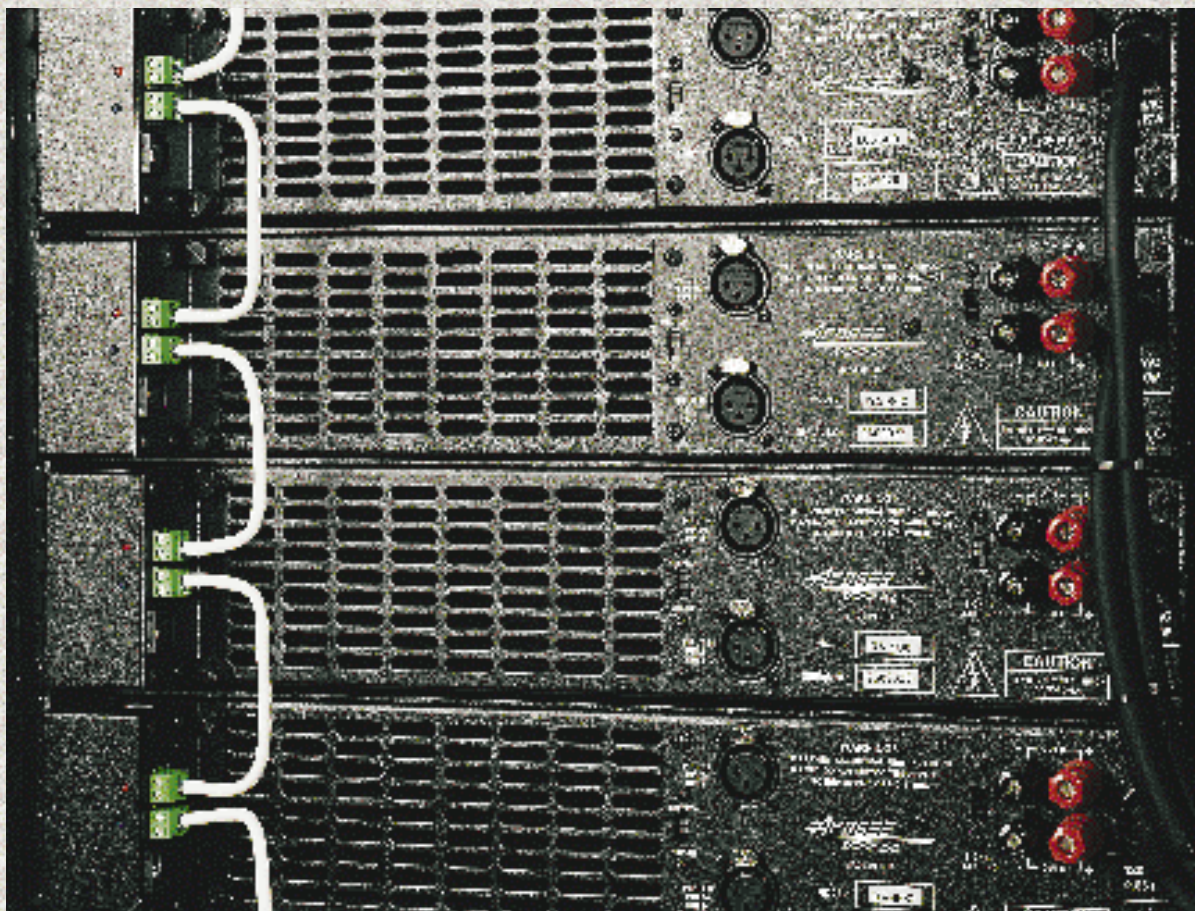
This is a must for contractors and installers who don't want to make service calls because "turning the knob" was just too hard to resist.

Models are available in three power levels: The CA-400 produces 480 watts per channel, the CA-600 produces 600 watts per channel and the CA-700 produces 775 watts per channel (into 4 ohms).



Apogee CA Series amplifiers have the gain controls on the back panel to prevent tampering in fixed installations

For larger systems or remote operation, AmpNet™ gives you total control



Apogee amplifiers networked for use with AmpNet software

Apogee's new AmpNet™ control software allows DA Series amplifiers to be networked right out of the box with Apogee's NIA (Network Interface Adapter), which can be connected and disconnected from the amplifier without disturbing the set-up. SA and CA Series amps can be upgraded for full computer control as well.

Of course, a networked amplifier system doesn't mean much if it doesn't actually help you, the operator. Earlier industry designs were plagued by slow response time, erratic operation and difficulty in set-up.

But Apogee's AmpNet utilizes proven technology and a protocol that has made its mark in high reliability industrial environments and critical aerospace applications around the world.

AmpNet uses the Echelon Company's LONTALK™ protocol, of which more than three million nodes are installed at the time of this writing. Companies like Raytheon have developed LONWORKS peripherals for aircraft control systems — so rest assured that AmpNet and LONWORKS is not an experiment. It's ready for the audio market now!

AmpNet's sophisticated network traffic management always gives priority to the devices you are viewing. This means that the real-time displays for output voltage and wattage *really are* in real time.

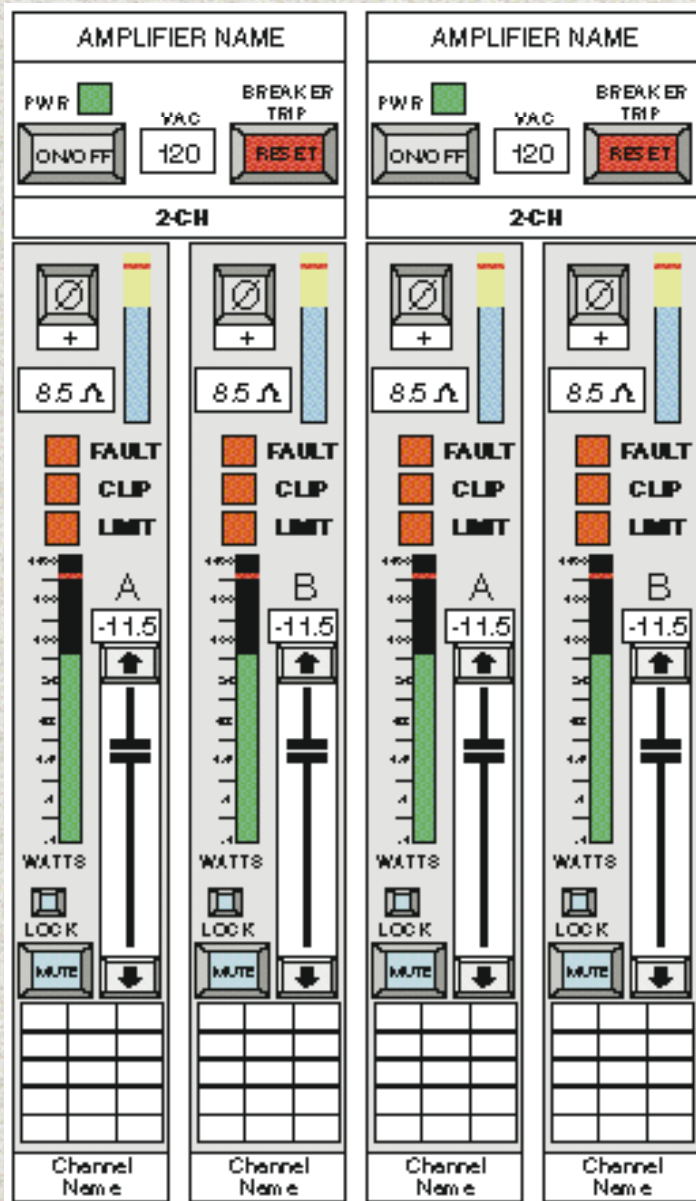
AmpNet lets you link a virtually limitless number of amplifiers with simple twisted-pair cable or fiber optics. You can even transmit and receive over modulated power lines and of course, modems. You can monitor and control your amplifiers from anywhere on the planet.

And only Apogee gives you a practical and usable bi-directional system. Any changes you make with your computer are instantly reflected on the amplifiers' LCD displays, and conversely, changes made on the amplifiers' control panel are immediately updated to the computer.

Best of all, AmpNet couldn't be easier to use.

AmpNet runs under Windows and, as you'll see on the next two pages, is configured much like a mixing desk, making it very easy for a sound engineer to learn in almost no time at all.

Now that you've been introduced to AmpNet



Your computer's mouse is all you need:
AmpNet displays every amplifier and amplifier channel
on your computer monitor to give you comprehensive
monitoring and complete control from any location

CONTROL PANELS: As you can see in the illustration on your left, AmpNet provides a mixing-desk type view of every channel of every amplifier on your network. You're looking at two Amp Panels as they would appear on your computer monitor. The 15 buttons at the bottom allow for group control.

Each Amp Panel contains all of the controls and displays needed to operate and monitor a single amplifier.

Popout Panels, as shown on the right, display additional operational data. They are accessed by clicking on the appropriate meters or display boxes on any amp panel. Popout Panels allow the user to view "Hold Flag" data (a display of a particular readout's highest or lowest data value since the last reset) and to set Warning Thresholds for individual amplifiers or channels.

GROUPS: AmpNet's Groups feature allows full monitoring and *complete control* over a user-defined group of amps or amp channels. Groups can be easily created, edited or deleted. A Group View is produced automatically when you create a group of amplifiers.

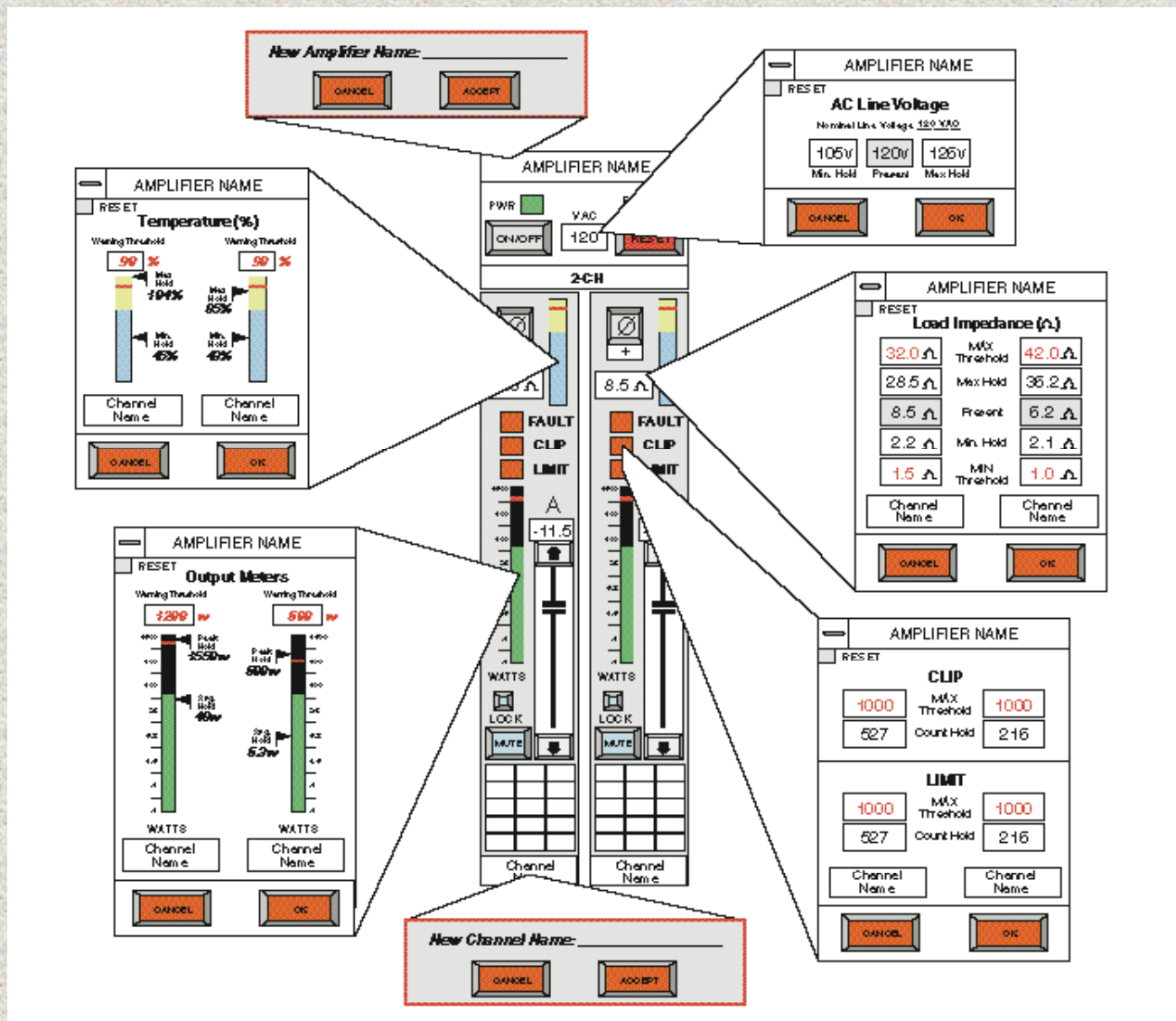
CUSTOM VIEWS: Want to view an odd assortment of amps or channels, but you don't need Group control? No problem. Any number of Custom Views can be created, so you see only the channels you want, when you want.

WARNINGS and THRESHOLDS: The user may set thresholds for various parameters such as max temperature and max voltage, and enable a variety of responses such as on-screen warnings.

REPORTS: AmpNet can provide four types of reports. These reports can be printed, or sent anywhere by modem or fax.

- Configuration: This report tells you how all of your system parameters (amp controls) are set at the moment you run the report.
- Events: Any breach of your thresholds can be reported as an Event. When a threshold is exceeded, or a fault (such as a tripped circuit breaker) is detected, the event will be noted in AmpNet's Log File.
- Log File: A file containing a record of each logged event. Each record contains information regarding the type of threshold breached or fault experienced, along with data on the amp or channel involved. A new log file is created each time the program is started.

Net™, here's a closer look at its features



AmpNet's Popout Panels display additional and editable operational data

- **Statistical:** AmpNet can count frequently occurring events and report them as a single event. For example, AmpNet can tell you that an operator allowed an amp to go into clipping 47 times during last night's show, and report the 47 clips as one event.
- **Warnings:** A "Warnings Management" dialog box allows the user to enable or disable a variety of responses, such as a flashing screen, to alert the operator to a threshold breach or fault.

SNAPSHOTS: This feature allows AmpNet to "take a picture" of all settings. If those settings are modified, AmpNet can recall the snapshot settings instantly.

PASSWORDS: AmpNet's password protection empowers the administrator to allow or disallow user access to each specific control function. For example, one user may be allowed to control only the entire system gain, another user may be allowed to control entire system gain plus the front, right and left clusters, and so forth.

PRINTING: Anything you see on your computer monitor can be sent to a computer's printer.

Apogee AmpNet™ is the most advanced control system in the world — the perfect complement to the best amplifiers in the world.

Remember: It's not just that Apogee are It's also the

Now that you know what Apogee power amplifiers do, take a look at how we do it.

Even the finest sounding amplifier means little to the working professional unless it's reliable. That's why Apogee amps are engineered to be as reliable as the landing gear on an aircraft.

Every model provides an arsenal of protection schemes, including DC sensing, temperature sensing, turn-on signal ramp-up to protect drivers and relay contacts, and a high-speed, low distortion gain reduction circuit to soften the effects of power clipping.

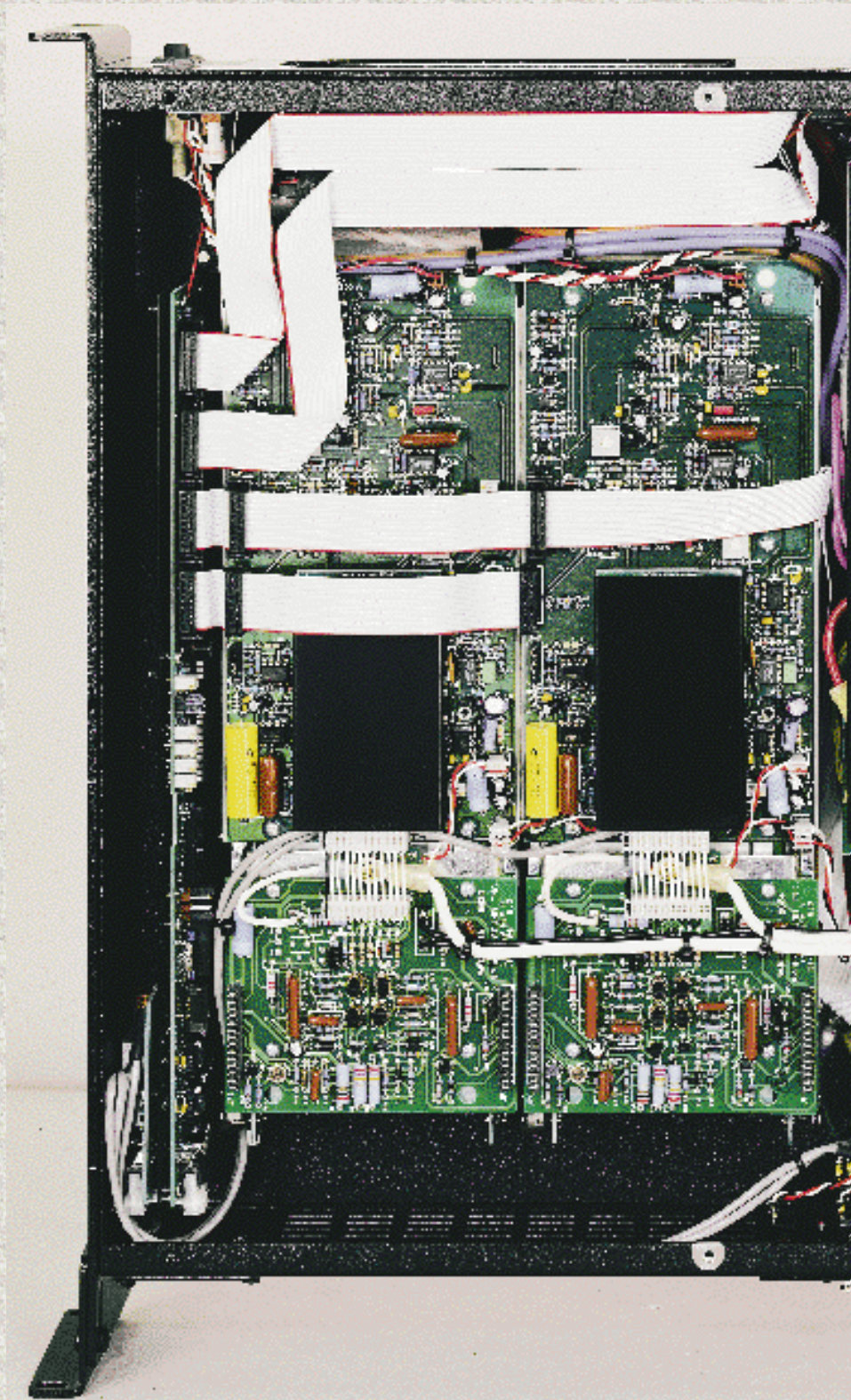
In addition, Apogee has insured that any disturbance to the microprocessor will not result in inadvertent shutdown. In fact, the microprocessor can be removed during operation and the result is, at most, a level change.

Engineered to allow operation in very high ambient temperature, Apogee amplifiers come equipped with a pair of variable speed DC fans, a front-to-rear air tunnel with oversized inlet and exhaust ports and a low restriction air filter located on the front panel for easy cleaning.

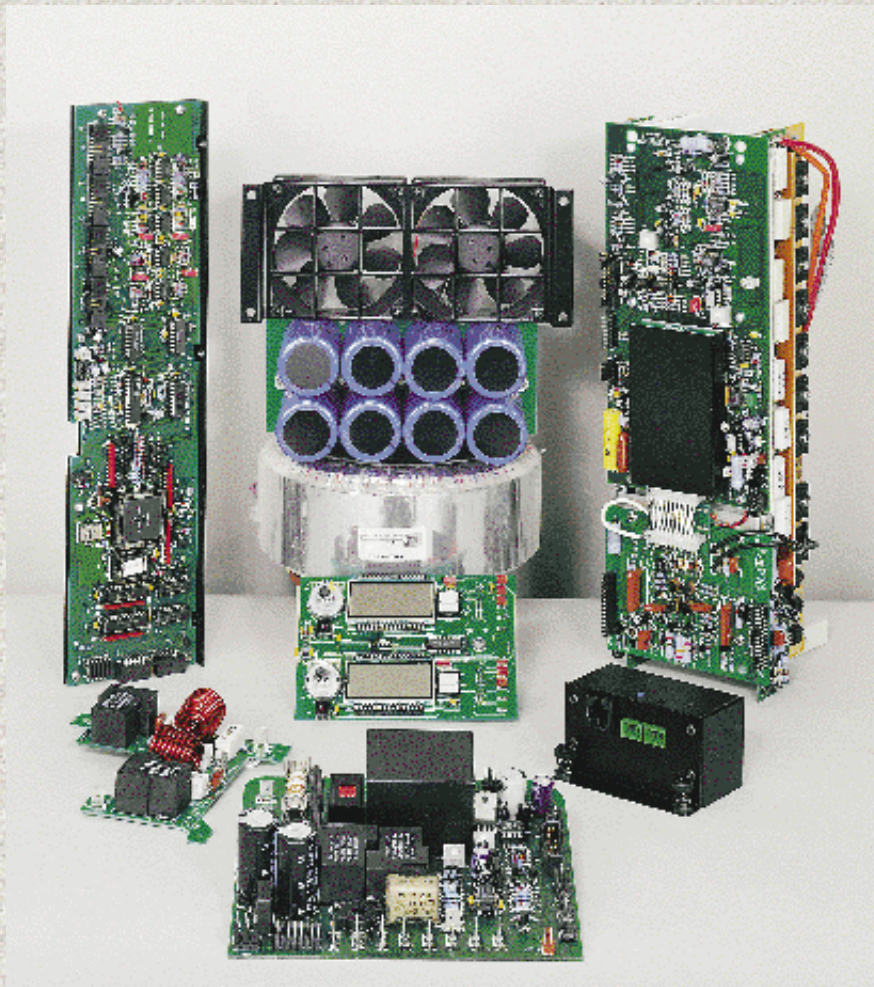
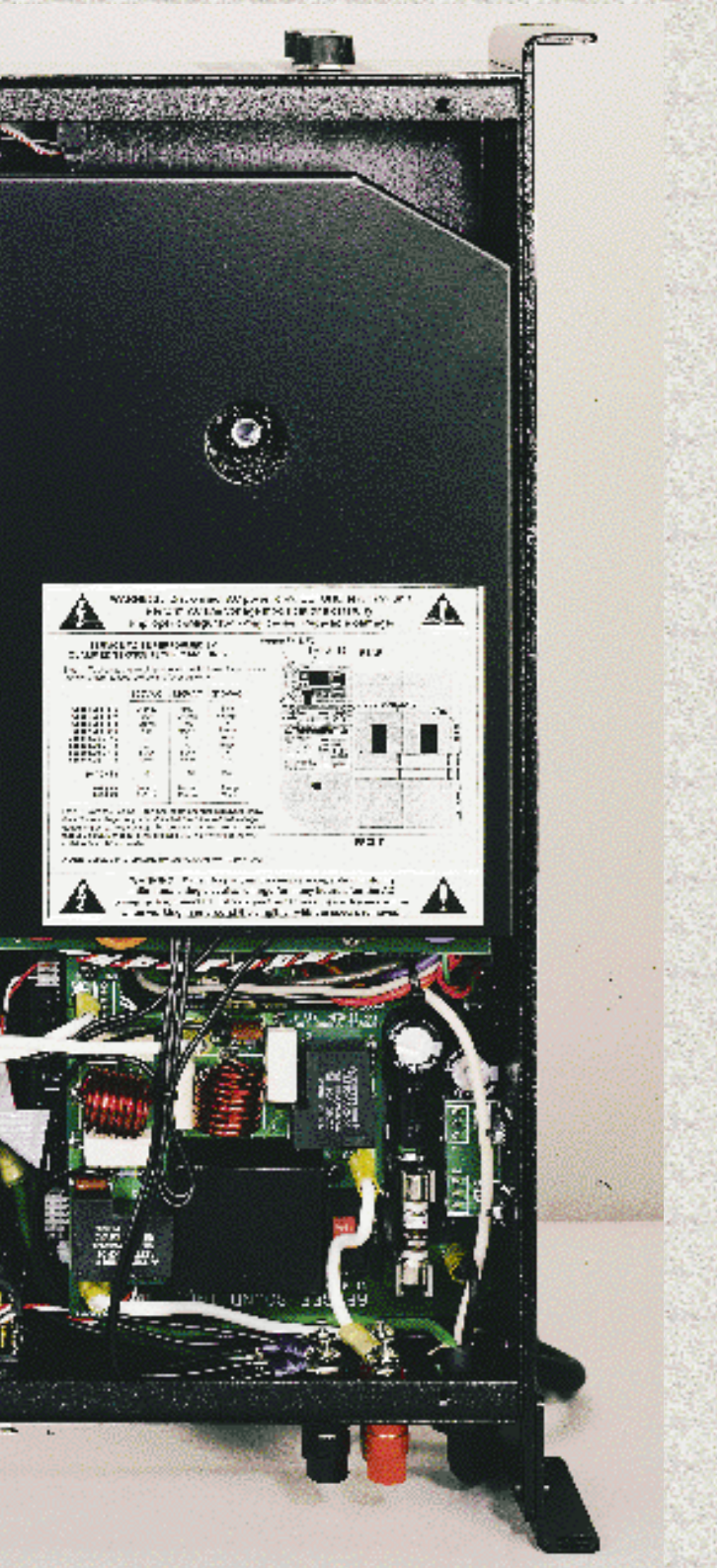
With Apogee amplification, you get unsurpassed reliability.

Which means your great sounding system can keep sounding great, show after show, year after year.

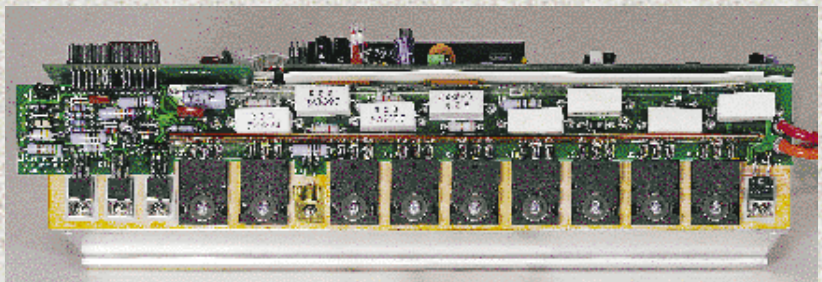
A look inside reveals the quality design and construction of every Apogee power amplifier



Apogee amplifiers do more than all the others...
the way we do it



When it comes to performance and reliability, sometimes it's what you can't see that makes all the difference



No flimsy PC traces here — All Apogee amps utilize specially designed high current bus bars

Apogee Amplifier Specifications

POWER OUTPUT (FTC, both channels driven)

DA-800	8Ω - 660 watts 4Ω - 975 watts 2Ω - 910 watts	BRIDGE MONO 8Ω - 1880 watts 4Ω - 1820 watts
DA-700	8Ω - 545 watts 4Ω - 775 watts 2Ω - 700 watts	BRIDGE MONO 8Ω - 1600 watts 4Ω - 1640 watts
DA-600	8Ω - 500 watts 4Ω - 600 watts 2Ω - 600 watts	BRIDGE MONO 8Ω - 1200 watts 4Ω - 1200 watts
SA-800B	8Ω - 660 watts 4Ω - 975 watts 2Ω - 910 watts	BRIDGE MONO 8Ω - 1880 watts 4Ω - 1820 watts
SA-700B	8Ω - 545 watts 4Ω - 775 watts 2Ω - 700 watts	BRIDGE MONO 8Ω - 1600 watts 4Ω - 1640 watts
SA-600B	8Ω - 500 watts 4Ω - 600 watts 2Ω - 600 watts	BRIDGE MONO 8Ω - 1200 watts 4Ω - 1200 watts
SA-400B	8Ω - 300 watts 4Ω - 480 watts 2Ω - 400 watts	BRIDGE MONO 8Ω - 960 watts 4Ω - 800 watts
CA-800	8Ω - 660 watts 4Ω - 975 watts 2Ω - 910 watts	BRIDGE MONO 8Ω - 1880 watts 4Ω - 1820 watts
CA-700	8Ω - 545 watts 4Ω - 775 watts 2Ω - 700 watts	BRIDGE MONO 8Ω - 1600 watts 4Ω - 1640 watts
CA-600	8Ω - 500 watts 4Ω - 600 watts 2Ω - 600 watts	BRIDGE MONO 8Ω - 1200 watts 4Ω - 1200 watts
CA-400	8Ω - 300 watts 4Ω - 480 watts 2Ω - 400 watts	BRIDGE MONO 8Ω - 960 watts 4Ω - 800 watts

FREQUENCY RESPONSE:

20 Hz to 20 kHz, +0, -0.3dB, At All Power Levels

THD:

< 0.07% (4 ohms, 1kHz, 400W)

SMPTÉ INTERMODULATION DISTORTION (IMD):

< 0.01%, 60 Hz & 7 kHz, Rated Power @ 8Ω

SLEW RATE: 35V/microsecond, Input Filter Bypassed

DAMPING FACTOR: 400:1, 1 kHz @ 8Ω

INPUT COMMON MODE REJECTION (CMR):

Greater than 90dB

VOLTAGE GAIN: 40 X (32dB)

INPUT SENSITIVITY: For Rated Power @ 4Ω.

DA-800: 1.53V	SA-700B: 1.36V	CA-700: 1.36V
DA-700: 1.36V	SA-600B: 1.2V	CA-600: 1.2V
DA-600: 1.2V	SA-400B: 1.1V	CA-400: 1.1V

INPUT IMPEDANCE: 13k ohms, Balanced

HUM and NOISE: Better than -117dBa

CROSSTALK: Better than -80dBa

CONNECTORS: Input - XLR Balanced, Output - 5-way Binding Posts

COOLING: Front-to-Rear Tunnel, Dual Variable Speed DC Fans

CONTROLS:

DA Series: Two front panel detented shaft encoder LEVEL controls, channel LINK switch, level control LOCK switch, DISPLAY toggle switch, STEREO / BRIDGE switch, GROUND LIFT switch.

SA Series II and CA Series: Two detented LEVEL controls, STEREO / BRIDGE switch, GROUND LIFT switch.

CHANNEL INDICATORS:

DA Series: Large backlit Liquid Crystal Display for each channel showing: Channel On/Off (Mute State), Phase State, Output Voltage, Output Wattage, Load Impedance, AC Mains Voltage, Temperature, and Attenuation Levels (in 0.5db increments). Each channel also has a Clip LED, Limit LED, Signal LED, Fault LED and Ready LED.

SA Series II and CA Series: Each channel has a Clip LED, Limit LED, Signal LED, Fault LED and Ready LED.

MASTER INDICATORS: LEDs indicating Power On/Off status, Network Control status (DA only) and Breaker Trip warning.

PROTECTION: Electronic Circuit Breaker (may be remotely reset), High Temperature, DC, turn-on delay with power ramp-up, ultrasonic, short circuit.

LINE VOLTAGE: 100/120/220-240 VAC internally user configurable, electronic circuit breaker

CONSTRUCTION: 16 gauge welded steel chassis, 10 gauge continuous front-to-rear side rails with front and rear rack ears.

DIMENSIONS: 19" (483mm) wide by 3.5" (89mm) high (2 EIU rack spaces) by 18.5" (470mm) deep.

WEIGHT: 60 LBS. (27.2 KG)

PRODUCT DEVELOPMENT IS ONGOING, THEREFORE SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE



AMPLIFIER QUICK CHART	Power Output FTC			Bridged Mono FTC		THD (4 ohms, 1kHz, 400W)	Weight lbs (kilos)
	8Ω	4Ω	2Ω	8Ω	4Ω		
DA-800	660	975	910	1880	1820	<.007%	60 (27.2)
DA-700	545	775	700	1600	1640	<.007%	60 (27.2)
DA-600	500	600	600	1200	1200	<.007%	60 (27.2)
SA-800	660	975	910	1880	1820	<.007%	60 (27.2)
SA-700	545	775	700	1600	1640	<.007%	60 (27.2)
SA-600	500	600	600	1200	1200	<.007%	60 (27.2)
SA-400	300	480	400	960	800	<.007%	60 (27.2)
CA-800	660	975	910	1880	1820	<.007%	60 (27.2)
CA-700	545	775	700	1600	1640	<.007%	60 (27.2)
CA-600	500	600	600	1200	1200	<.007%	60 (27.2)
CA-400	300	480	400	960	800	<.007%	60 (27.2)

Continuous power per channel; Federal Trade Commission testing is understood to be a minimum of five minutes operation. Harmonic distortion is measured as the RMS sum total as a percentage of the fundamental output voltage. This distortion specification applies for all wattages greater than 0.25 watts.

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