

CITATION TWELVE

PROFESSIONAL 120 WATT SOLID STATE STEREOPHONIC AMPLIFIER

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CITATION TWELVE

LEFT INPUT

LEFT OUTPUT

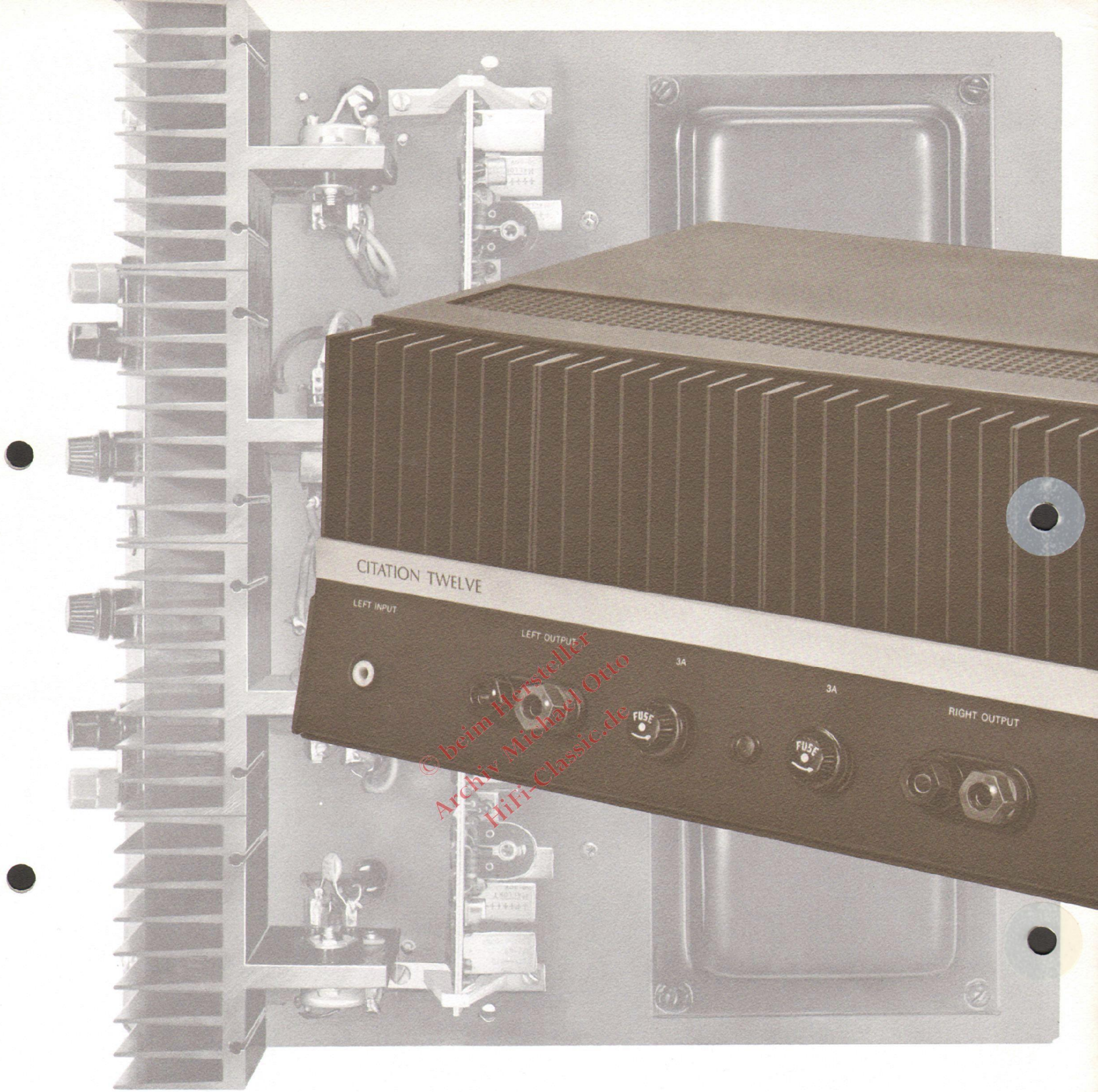
harman kardon

"... FOR THE SAKE OF MUSIC AND OUR DEMANDING LOVE OF IT."

Introduction

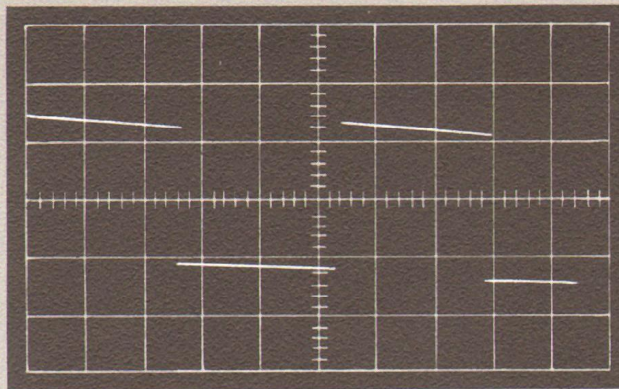
The name Citation has always meant something special to music lovers. When Citation was first introduced a decade ago, it represented a major breakthrough in high fidelity design. "Citation Sound" became the industry's new standard of excellence capturing the imagination of audiophiles throughout the world. HIGH FIDELITY MAGAZINE described Citation as the "classic goal of amplifier design — a straight wire with gain." And Hans Fantel, noted audio authority, stated in a glowing report that "the Citation group bore eloquent witness to the one vital aspect of audio that for so many of us has elevated high fidelity from a casual hobby to a lifelong interest; the earnest attempt to reach an ideal — not for the sake of technical showmanship — but for the sake of music and our demanding love of it."

After three years of research and development, HARMAN-KARDON is reintroducing Citation to the high fidelity field. The first new product in the line is the Citation Twelve — a stereo power amplifier that employs the potential of transistors more creatively than any other amplifier made. It is totally new in concept, design and performance. When you hear this new Citation amplifier, we are confident you will share the experience of its creators — the experience of genuine breakthrough and discovery; the experience of hearing music as you have never heard it before.

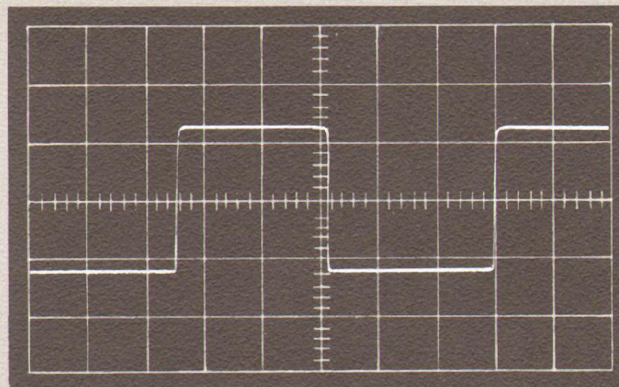


CITATION TWELVE

PROFESSIONAL 120 WATT SOLID STATE STEREO

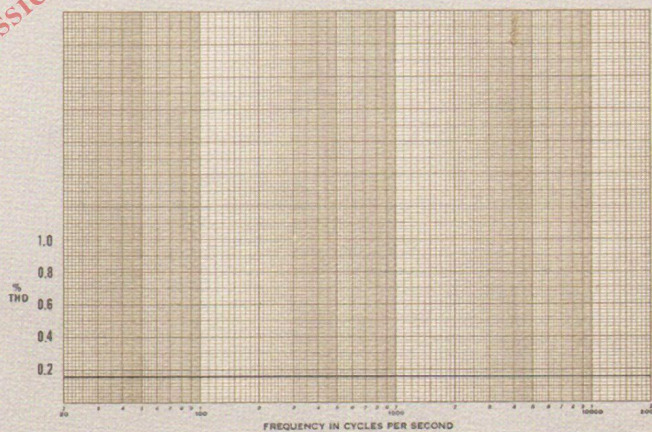


20 Hertz square wave with 8 ohm non-inductive load. The virtually flat top of the waveform indicates that the Citation Twelve extends to below 5 Hertz with negligible phase shift.



20KHz square wave with 8 ohm non-inductive load. Extremely steep slope of leading edge of the waveform indicates that the Citation Twelve extends at least two octaves beyond the normal range of hearing.

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Total harmonic distortion has been measured at full rated output with both channels driven simultaneously into an 8 ohm non-inductive load.

CITATION TWELVE

STEREO PHONIC AMPLIFIER

FOR THE KIT BUILDER

- SIMPLICITY
- BUILT-IN ENGINEERING
- HIGHEST PERFORMANCE

"A Straight Wire With Gain"

The basic design philosophy of the Citation engineering team was to create solid state components which contributed no sound of their own to the program material. To come as close as possible to the design philosophy of a straight wire with gain. Conventional solid state designs were therefore dismissed in favor of new and more advanced techniques.

THE CITATION TWELVE STEREOPHONIC POWER AMPLIFIER

The most important characteristic of a basic power amplifier with inordinately high power capabilities is its ability to perform flawlessly at low power levels. It is for this reason that the Citation Twelve features a newly developed differential comparator input circuit which balances automatically for zero D.C. offset voltage at the speaker terminals. Differential balancing permits the application of negative feedback across the entire frequency spectrum to insure perfectly linear operation for even the most minute signal levels. Notch or crossover distortion has been eliminated completely by carefully controlling the idling current which changes the amplifier mode from Class B to Class AB operation. Class AB guarantees smooth transference of the sine wave power curve which results in extremely articulate sound without a trace of the stridency that is characteristic of most Class B designs.

Years ago, when HARMAN-KARDON engineers first began to design Citation they discovered that the characteristics of an amplifier in the non-audible range strongly influenced the quality of sound in the audible range. This was proven countless times in carefully controlled laboratory listening tests. Wideband designs exhibited greater spaciousness and clarity than amplifiers whose frequency response was restricted to the narrow range of 20-20,000 Hertz.

The Citation Twelve basic amplifier will reproduce frequencies as low as one Hertz with extremely low phase shift. The twenty Hertz square wave is virtually the same as the generator. This results in exceptionally dry and tight bass response.

High frequency response of the Citation Twelve extends beyond 100,000 Hertz without evidence of ringing or instability. Sound quality is totally transparent without harshness or poor instrument differentiation in the higher overtones.

Feedback is an important factor in amplifier design. The higher the degree of feedback, the more apparent the improvement in sound quality and the greater the reduction of listener fatigue. An extremely high degree of feedback has been designed into the Citation power amplifier for lowering distortion without sacrificing stability. Feedback, however, cannot be regarded as a panacea. Distortion

products must be exceedingly low to begin with; then when feedback is applied, distortion is reduced to almost the vanishing point.

The Citation Twelve is "rock" stable with all types of speakers, even the difficult to control electrostatics. To maintain this high order of stability, especially in an amplifier which carries a low frequency cutoff of below one Hertz, the power supply must meet very special requirements in terms of regulation and low source impedance. A dual supply, each with its own power transformer and electrolytics, assures proper operating voltages even under severe stress conditions. The amplifier, therefore, is literally two separate power stages on one chassis. Power measurements can be made with both channels driven simultaneously without deterioration of the power ratings or an increase in distortion. The Citation Twelve is the only power amplifier kit in the world with this important feature.

The power output stage of the Citation amplifier utilizes a quasi-complimentary configuration to insure absolute balance and symmetry at the clipping points. Amplifiers which use output coupling capacitors often clip non-symmetrically which produces raucous breakup in the sound. Elimination of the output coupling capacitors also permits extended low frequency response without phase distortion.

Two thermal cutout circuits, one for each channel, automatically remove power from the output transistors when heat build-up exceeds 80 degrees C. Short circuit protection includes a series-type limiting relay which resets automatically after the short is removed.

When you subject the Citation Twelve to critical examination, you will find its performance consistent with all claims. Citation will glide over the steepest orchestral hurdles without the slightest trace of strain or distortion. The realism of the music will prove to be an emotional experience. Your initial amazement will soon give way to an easy, relaxed enjoyment of the music that can be sustained for hours without a trace of the tension known as "listening fatigue". Here at last is an amplifier which can fulfill the most difficult of all high fidelity requirements; to provide an awareness only of music, and oblivion to technicalities.

The process of designing a kit is far more difficult than producing a complete manufactured product. In the factory, the engineer can control his design from inception until the final packaging. The kit builder has only his tools, his ingenuity and little, if any test equipment. Therefore, the complex process of in-plant production and control which guarantees the fine finished product must somehow be inherent in the kit design. The Citation engineering group has succeeded in doing just this. Even a novice who has never built a kit can complete the Citation Twelve without experiencing difficulty. Keynote in the amplifier's design is its total lack of complexity. Component parts have been kept to a minimum to insure ease of construction and long, trouble-free performance. All parts are of the same high

quality found in computers and military equipment. The engineering built into the Citation Twelve is so marvelously precise that all you require is a reasonable amount of patience to build a stereo power amplifier of unsurpassed quality and performance.

Review the features and specifications and compare them with those of any other professional audio power amplifier. We're confident you'll see how much value and performance Citation offers. And by all means, listen to a demonstration of this phenomenal power amplifier at your high fidelity dealer's showroom. You will be amazed at how much more sound this remarkable component delivers from conventional program material.

PROFESSIONAL FEATURES

- Hermetically sealed silicon output devices capable of handling sustained high power without breakup or overload are used in output stage.
- Exceedingly broad frequency response at full power with low harmonic and intermodulation distortion results in clean and totally transparent sound.
- Phenomenal square wave response throughout entire audio spectrum. Phase shift at 20 Hertz is less than 5 degrees. Rise time at 20K Hertz is better than 2 microseconds.
- Two individual power supplies deliver superb regulation for absolute stability and extended low frequency response. Handling of transients is effortless at any power level.
- Fail-safe operation with all types of speakers including electrostatics. Amplifier can handle high power transients, short circuits, inductive and capacitive loads or unloaded condition without damage to the output stage.
- Computer grade components guarantee long trouble-free life.
- Instrument type speaker binding posts assure positive connections reducing possibility of short circuits.
- Heavy duty heat sinks keep amplifier cool even under stress operating conditions.
- Two thermal cutouts, one per channel, remove power from the output stage when heat build-up exceeds 80 degrees C. Two series-type limiting relays protect amplifier from short circuits. Reset automatically once short is removed.
- High degree of feedback reduces distortion without sacrificing stability.
- 120 volt 50-60 Hertz or 220 volt operation.
- Two year service warranty on parts and labor for factory wired amplifier.

TECHNICAL SPECIFICATIONS

Continuous Power Output:	60 watts per channel, RMS, @ less than 0.2% THD, at any frequency between 20-20,000 Hertz, both channels driven simultaneously into 8 ohms.
Peak Power Output:	120 watts per channel.
Power Bandwidth:	5-35,000 Hertz @ 0.2% THD.
Total Harmonic Distortion:	Unmeasurable at normal listening level. Less than 0.2% at rated output, 20-20,000 Hertz.
Intermodulation Distortion:	Less than 0.15% at all power levels, 60 and 6,000 Hertz.
Hum and Noise:	Better than 100 db below 60 watts.
Damping Factor:	40:1
Input Impedance:	30K ohms
Input Sensitivity:	1.5 volts for 60 watts.
Frequency Response:	1-70KHZ, ± 0.5 db @ normal power level. Less than $\frac{1}{2}$ Hertz - 100KHZ, ± 1 db @ normal power level.
Phase Shift:	Less than 5 degrees at 20 Hertz.
Rise Time:	Better than 2 microseconds @ 20K Hertz.
Inputs:	One RCA type input terminal per channel.
Outputs:	Instrument type binding posts. Accepts speakers from 4 to 16 ohms.
Front Panel:	Two 3 amp. A.C. fuses, two color-coded speaker output terminals, two inputs, neon on/off indicator light.
Construction:	Close point to point wiring with bussbar ground. Printed circuit board. Highest grade components held to tight tolerances.
Power Consumption:	200 watts, both channels driven simultaneously. 30 watts at zero signal.
Dimensions:	5 $\frac{1}{8}$ "H x 12 $\frac{3}{8}$ "W x 12 $\frac{3}{4}$ "D (complete with metal cage).
Weight:	30 pounds.

All Features and Specifications Subject to Change Without Notice.

harman kardon

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Citation Twelve

stereophonic power amplifier



The Citation Twelve is available in both classical and Deluxe models.

Stereo-Endstufe

„Ein Draht, der verstärken kann“

Die „Philosophie“ der Citation-Entwicklung erklärt sich in der Absicht, Komponenten zu schaffen, die dem Signal, das sie übertragen, nichts von sich selbst hinzufügen. Um dieser Vorstellung „eines direkten Drahtes mit verstärkenden Eigenschaften“ so nahe als möglich zu kommen, wurden konventionelle Gestaltungsmöglichkeiten außer acht gelassen, und neue, fortgeschrittene Techniken eingesetzt.

harman/kardon

Das wichtigste Merkmal eines Endverstärkers mit hoher Ausgangsleistung ist seine Fähigkeit, kleine Leistungen frei von Klirr- und Intermodulationsverzerrungen abzugeben. Die Differential-Komparator-Eingangsstufen des Citation Twelve regeln den Gleichstromanteil an den Lautsprecherklemmen automatisch, so daß er von 0 Volt nicht abweicht. Negative Rückkopplung über den gesamten Frequenzbereich — durch den Differentialausgleich ermöglicht — sichert die vollständige Verzerrungsfreiheit auch bei geringsten Signalstärken. Die sorgfältige Kontrolle des Leerlaufstroms verhindert wirksam die sogenannten Cross-over-Verzerrungen und überführt damit die Arbeitsweise dieses Verstärkers von der Kategorie B in die Kategorie AB. Die Kategorie AB garantiert eine gleitende Verschiebung der Sinus-Leistungskurve. Dies äußert sich in einer außergewöhnlich deutlichen Klangdefinition; ohne eine Spur der Härte, die für die meisten Entwürfe der Kategorie B typisch ist. Harman/Kardon's Ingenieure wissen, daß die Eigenschaften eines Verstärkers im unhörbaren Bereich die Tonqualität im Hörbereich stark beeinflussen. Breitbandige Entwürfe überzeugen durch mehr Weite und Klarheit des Klangbildes gegenüber solchen Verstärkern, deren Fre-

quenzgang auf den Bereich von 20—20.000 Hz beschränkt ist.

Die Stereo-Endstufe Citation Twelve ist in der Lage, bei entsprechendem Eingangssignal Frequenzen von weniger als 1 Hz mit extrem niedriger Phasenverschiebung zu reproduzieren! Das 20-Hz-Rechtecksignal ist praktisch mit dem eines Generators identisch. Das Resultat: eine außergewöhnlich trockene und straffe Basswiedergabe.

Nach oben reicht der Frequenzgang des Citation Twelve bis über 100.000 Hz hinaus, wobei Klirren und Instabilität nicht auftreten. Die Tonqualität ist völlig durchsichtig, ohne Rauheit oder unzureichende Differenzierung einzelner Instrumente im hohen Obertonbereich. Der Citation Twelve ist belastungssicher „wie ein Fels“, bei jeder Art von Lautsprechern, selbst den schwer zu kontrollierenden Elektrostaten. Um ein so hohes Maß an Stabilität aufrechtzuerhalten, speziell bei einem Verstärker, dessen Frequenzbereich bis unter 1 Hz reicht, muß das Netzteil ganz besonderen Anforderungen hinsichtlich Spannungs-Stabilisierung und niedrigem Innenwiderstand gerecht werden.

Eine doppelte Spannungsversorgung — jeder Kanal mit einem Transformator und den eigenen, nachfolgenden Bauteilen — garantiert auch bei extremer Belastung die richtigen Betriebsspannungen. Mit anderen Worten, die Stereo-Endstufe besteht aus zwei Leistungsverstärkern in einem Gehäuse. Leistungsmessungen können bei gleichzeitigem Betrieb beider Kanäle durchgeführt werden, ohne daß mit Leistungseinbußen oder dem Anwachsen des Klirrfaktors gerechnet werden muß.

Koppelkondensatoren in der Ausgangsstufe eines Verstärkers führen oft zu Unsymmetrie und Klangverfärbungen. Die quasi-komplementären Leistungsstufen des Citation Twelve sichern die absolute Balance und Symmetrie an den Abgriffspunkten. Der Verzicht auf Koppelkondensatoren ermöglicht außerdem einen nach unten erweiterten Frequenzgang ohne Phasenverschiebung.

Hören Sie den neuen Citation-Verstärker! Wir sind sicher, daß Sie die Erfahrung derer bestätigen werden, die ihn entwickelten: — das Erlebnis eines wirklichen Durchbruchs, einer Entdeckung; ein Hörgenuß, den Sie bisher nicht kannten.

Technische Daten

Ausgangsleistung:	2 x 60 Watt RMS an 8 Ohm, beide Kanäle gleichzeitig betrieben, von 20 Hz bis 20 kHz und einem Klirrfaktor < 0,2 %.
Spitzenleistung:	2 x 120 Watt.
Leistungsbreite:	5 Hz bis 35 kHz, Klirrfaktor < 0,2 %.
Klirrfaktor:	Nicht meßbar bei normalem Lautstärkepegel. < 0,2 % bei Nennleistung, von 20 Hz bis 20 kHz.
Intermodulation:	< 0,15 % bei jeder Ausgangsleistung; 60 Hz und 6 kHz.
Signal-Fremdspannungsabstand:	> 100 dB bei Vollaussteuerung.
Dämpfungsfaktor:	40 : 1.
Eingangsimpedanz:	30 kOhm.
Eingangsempfindlichkeit:	1,5 Volt für 60 Watt an 8 Ohm.
Frequenzgang:	1 Hz bis 70 kHz, \pm 0,5 dB; 0,5 Hz bis 100 kHz, \pm 1 dB, bei normalem Lautstärkepegel.
Phasendrehung:	< 5 Grad bei 20 Hz.
Rechteck-Anstiegszeit:	< 2 μ sec bei 20 kHz.
Eingänge:	RCA-Chinchbuchsen, 1 Stück/Kanal
Ausgänge:	Schraubanschlüsse, für Lautsprecherimpedanzen von 4 bis 16 Ohm.
Leistungsaufnahme:	200 Watt, beide Kanäle gleichzeitig betrieben; 30 Watt bei Ruhebetrieb.
Abmessungen:	31,1 x 14,0 x 31,7 cm (b x h x t).
Gewicht:	13,6 kg.
Ausführungen:	als Deluxe-Modell mit Nußbaumgehäuse lieferbar.



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All specifications and features are subject to change without notice.