KENWOOD

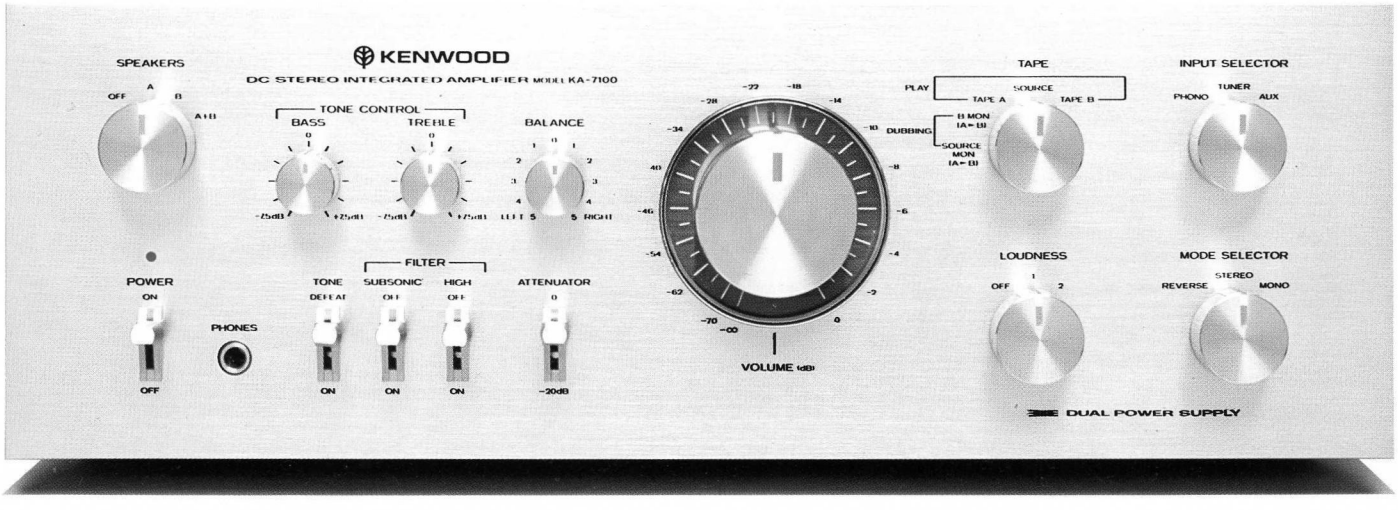
DC STEREO INTEGRATED AMPLIFIER

# KA-7100

Dual Power Supply

# Kenwood's superior tonal quality is again demonstrated by the low distortion characteristic of the new KA-7100. With its professional features, such as our exclusive DC power amplifier and independent dual power supplies and many circuitry innovations, the KA-7100 is a truly outstanding amplifier with amazing value.

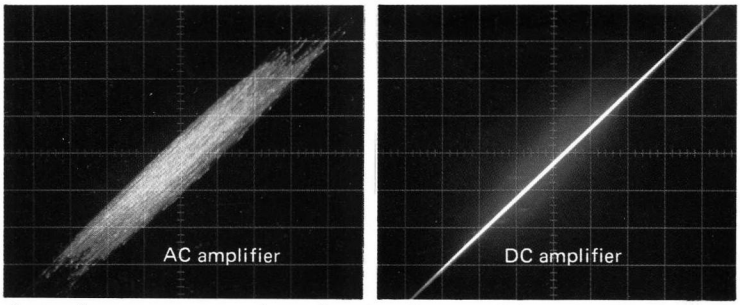
Kenwood's exclusively developed DC power amplifier has very low distortion and excellent transient response. Separate power supplies for each channel reduce Dynamic Crosstalk distortion to negligible levels, providing purer sound quality. Total Harmonic Distortion is a very low 0.02% over the 20—20,000Hz audio range. Signal-to-noise ratio measures a high 80dB (IHF A) at the phono inputs. And there's a superior tone control system, attenuator-type volume control and two-step loudness control to let you contour the sound to match your room characteristics and individual needs.



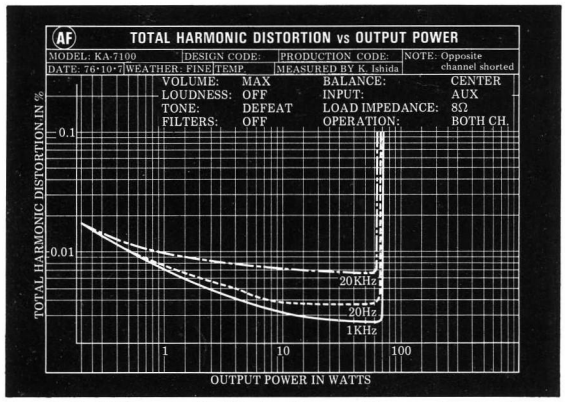
# New DC Power Amplifier

The development of the DC power amplifier can be counted as one of our most significant engineering successes, because it provides an almost perfect linear frequency response that starts virtually from 0Hz. What this means is that the signal amplified has effectively the same waveform as that at the input terminals. The amplifier maintains extremely low distortion right down to the ultra-low frequency range. With excellent phase and transient characteristics—the response in actual conditions of musical reproduction—the sound that you hear is perfectly natural. The direct-coupled amplifier consists of a three-stage differential circuit (with a dual-gate FET in the first stage) and our power amplifier circuitry, assuring ample, highly stable, effective power output. To safeguard all circuits, and your precious speakers, there's a built-in limiter protection circuit and protection relays. With phase and transient distortion both at negligible levels, the KA-7100 provides a refreshing clarity and "roundness" of sound even at high volume levels.

Phase characteristic of bass drum

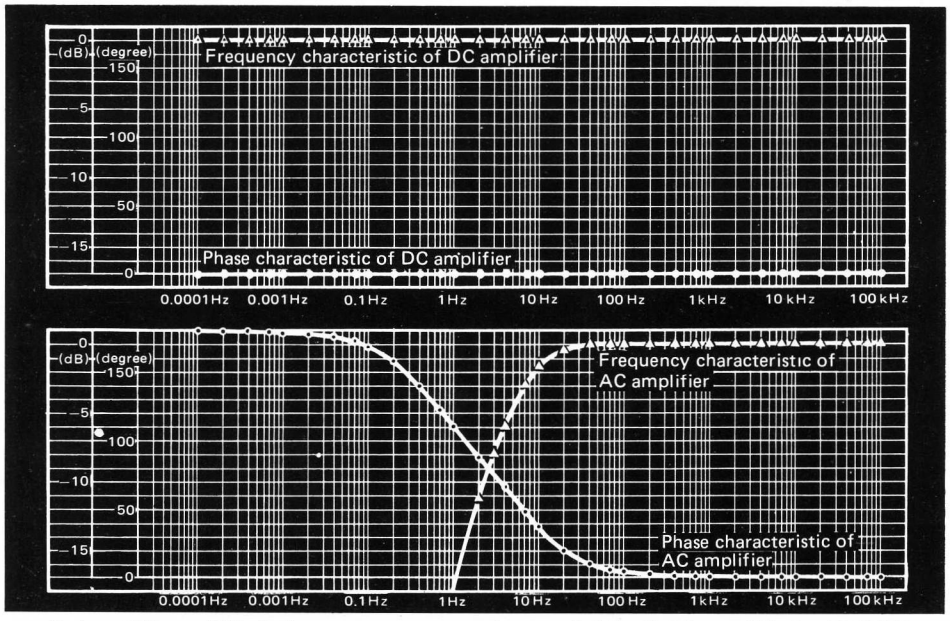



*A synchroscope comparison showing the waveform of a bass drum as it appears through a conventional AC amplifier and a DC amplifier. The DC amp. displays no phase shift and appears as a clean straight line.*

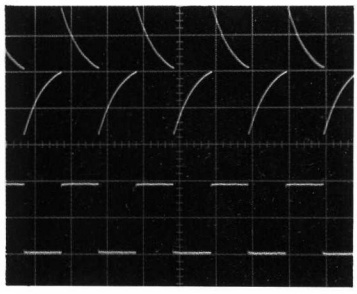



*Total Harmonic Distortion vs Power Output*

Comparison of frequency and phase characteristics of AC amplifier and DC amplifier



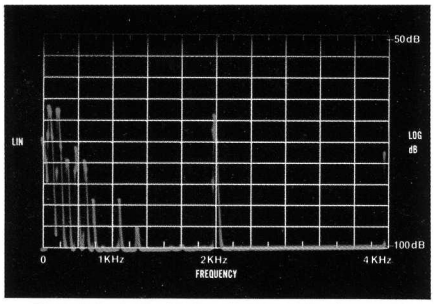

*Only a DC amplifier's frequency response is completely flat from 0Hz to 100kHz.*



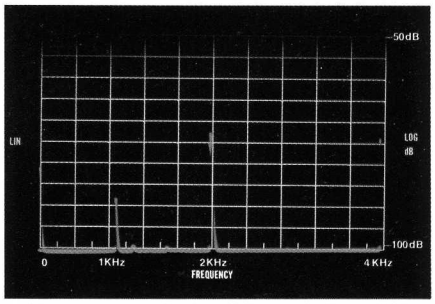
*A 10Hz square wave oscilloscope comparison of AC (top) and DC (below) amplifier output signals. The DC amplifier shows no waveform deformantion.*

## Independent Dual Power Supplies For Right And Left Channels

Obviously, no stereo imaging can be true unless there is complete channel separation. One of the drawbacks of conventional amplifiers is that a single power supply creates Dynamic Crosstalk distortion — a form of distortion discovered by Kenwood engineers. Dynamic Crosstalk has been largely overlooked in normal laboratory measuring methods which do not reveal the dynamic distortion in an amplifier appearing in conditions of actual musical reproduction. This is the kind of distortion caused by a particularly dynamic crescendo involving brass and percussion instruments, to give one example. Following this important discovery, Kenwood's engineers completely redesigned the power supply into two separate supply systems. The power transformer has a large EI core and two separate windings, and there are four 6,000$\mu$F electrolytic capacitors. As well as this, a full-scale voltage regulator using transistors is employed in the pre-amplifier stage to prevent any interference between amplifier stages. By significantly reducing Dynamic Crosstalk distortion, there is a great improvement in transient response and damping. This allows each musical instrument to be heard in its correct location in the stereo sound field, and at its natural level. Reproduced sound, right down to the 1st octave, is wonderfully crisp and clear.



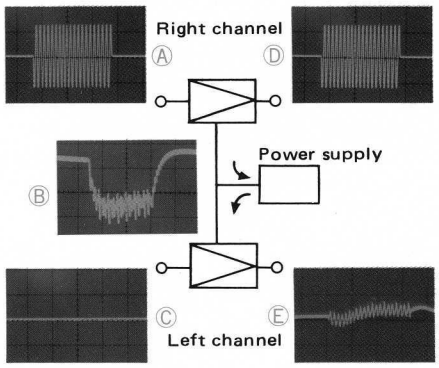

*Frequency analysis of Dynamic Crosstalk (Single power supply amplifier)*




*Frequency analysis of Dynamic Crosstalk (Model KA-7100)*

*A spectral analysis graph comparison revealing a concentration of Dynamic Crosstalk in the low frequencies in a single power supply system.*

Generation of Dynamic Crosstalk
(Single power supply system)




*The disadvantage of a single power supply. A) A transient input signal is applied to the right channel. B) This signal affects the normally stable power voltage. C) The left channel has no input signal. D) The original input signal is amplified. E) When the same power supply (B) is used for both channels, a spurious 'ghost' signal appears in the left channel as an output signal. This is Dynamic Crosstalk Distortion. A dual power supply system successfully avoids this interference.*

## Direct-Coupled, FET Equalizer Section

The high signal-to-noise ratio of 80 dB at the phono inputs is the result of a carefully designed three-stage ICL (input capacitorless) circuit, using FETs in the first stage. This provides good phase and transient response. The class A amplifier with constant current output provides low distortion signal reproduction throughout the audible range. Tracking of the RIAA curve is so accurate, in fact, that deviation from it is never more than ±0.2 dB. The maximum phono input level, by the way, is an unusually high 200mV, so there's no danger of overloading when you're playing passages of exceptional dynamic range.

## Sophisticated Tone Controls Make You Master Of Your Sound

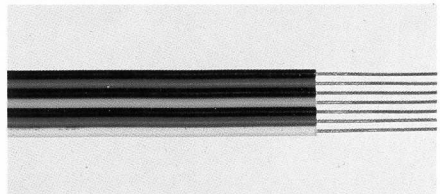
Tonal purity gets top priority at Kenwood, and many of our design innovations and improvements have been made in order to achieve the most transparent, distortion-free sound possible. The tone control system of the KA-7100 has been devised to enable you to match the acoustic characteristics of your room and of the music you play, so that you can, in effect, 'tailor' the sound. Baxandall-type low-distortion negative feedback tone circuits are employed to give both precision and stability. Attenuation is made in 1.5 dB click-stop steps over a maximum range of ±7.5 dB. An important feature is that the tone defeat completely bypasses the control section in order to maintain excellent tonal quality.

## Unique Tape-Through Circuitry

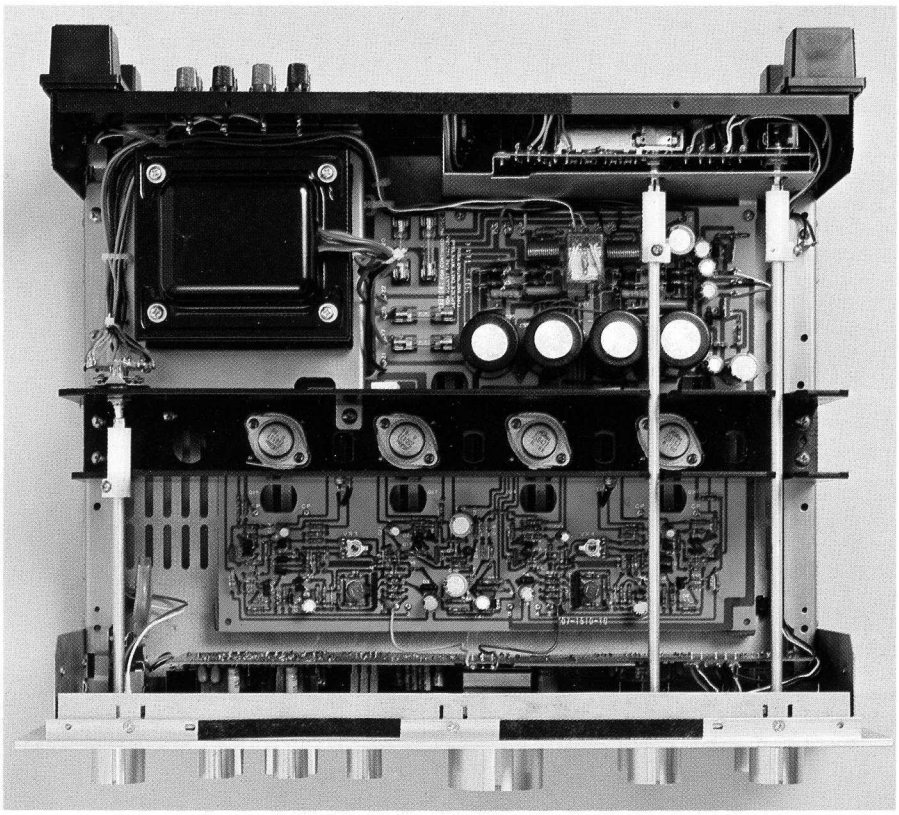
Kenwood's now familiar tape-through circuit allows you to listen to a completely different source while recording or dubbing. You can record simultaneously on one or two tape decks, and monitor both tape inputs, and you can dub from A to B.

## The Simpler The Circuitry, The Better The Sound

Many circuitry design improvements have been made solely to enhance tonal quality. Some of these are major developments such as our DC power amplifier and dual power supply system. ICL circuitry is used in both the crucial equalizer and the tone control sections. In all circuits there are no shielded cables used at all, and inputs are directly connected to the unit without having to pass through input capacitors which produce distortion. In a further move to protect vital tonal quality, the KA-7100's unusual heat sink consists of a divider running through the center of the chassis. This not merely makes the chassis much more rigid. It actually screens the small signal circuitry from the large current circuitry, and prevents any influence from the power transformer. What is more, the interior of the KA-7100 is remarkably 'clean'. This is not just cosmetic treatment. There are clear-cut audio advantages in reducing wiring, and by making direct connections to circuit boards. Long wiring and shielded cables common on other amplifiers inevitably generate fields of distortion. As one example, the speaker selector is now next to the speaker terminals, and instead of wires leading to the back panel picking up noise on the way, there's a long mechanical shaft. All this contributes towards the refinement of the special tonal quality that is Kenwood's.



*Shielded cables in amplifiers are a major source of distortion, resulting in poorer sound quality. So, in crucial areas we have used 7-lead, parallel molded, flat cables with a ground wire on each side.*



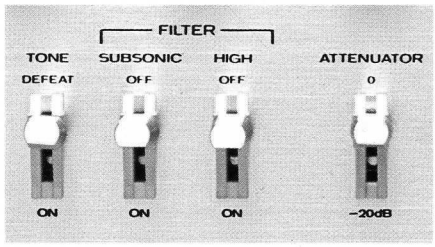
*Top view of the KA-7100, showing the dual power supply system and greatly simplified circuitry, and "wire-less" connections. The speaker selector shaft is on the left.*

## Two-Stage Loudness Control

The loudness control boosts the lower frequencies which would otherwise roll off when the volume is turned down very low. Position 1 boosts by 3 dB (at 100 Hz) and Position 2 boosts by 6 dB (at 100 Hz) at −30 dB volume level. This gives a more natural, balanced sound when you are listening at low level.

## High Frequency And Subsonic Filters

High frequency noises, record scratch etc, can be cut by a high filter which cuts off at 8 kHz. Similarly, record warp (there are more warped records than you think) or other subsonic influences, which could affect your speakers, can be eliminated by a subsonic filter which has a cut-off point of 20 Hz. Both have characteristic slopes of 6 dB/oct.



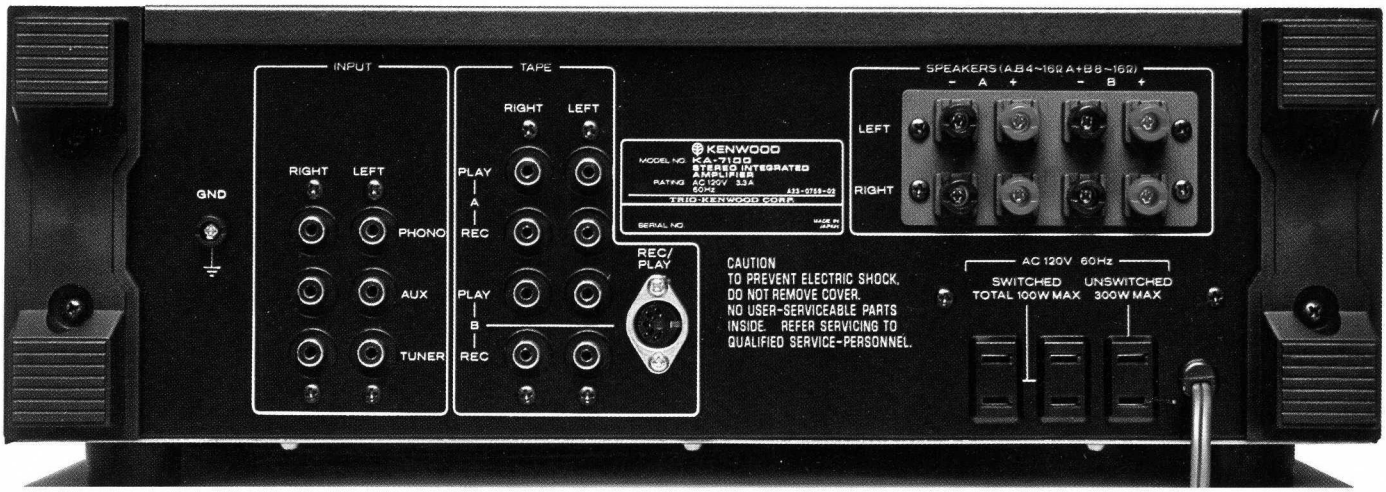

## Full-Scale Attenuation-Type Volume Control

The combination of the professional 32-step click-stop attenuator-type volume control and the −20 dB attenuator (or muting) provides a precise read-out of the volume level in decibels. With conventional volume controls there is a certain amount of deviation between channels when the volume level changes — especially below the '9 o'clock' level. This results in an unequal sound level, termed 'gang-error'. The attenuator-type control increases or reduces the sound level logarithmically, so that there's no error at all, and a natural balance is maintained at all levels.

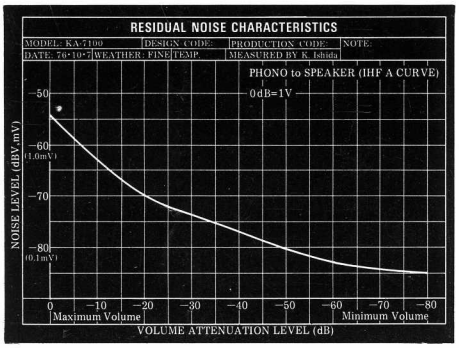
Incidentally, an important specification connected with the use of the volume control is that of residual noise. This type of noise normally increases as the volume level is increased. But, as you can see from the graph on the back page of this catalog, the KA-7100 with its volume attenuation maintains a consistently low level of residual noise throughout the attenuation range. Just how low this level is can become clear if you compare with other amplifiers of this class. This is just one more indication of the technical superiority of the KA-7100 — a superiority displayed in its purer tonal quality.

## The Kenwood Professional Touch

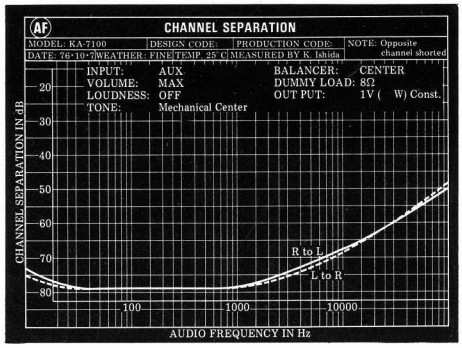
With its professional look and circuitry, the KA-7100 is in tune with current high audio standards. And, as you'll discover for yourself, the feel of the controls is equally professional. All the controls, knobs and switches, as well as their layout, have been thoughtfully designed through human engineering techniques, for ease of use and long, hard wear.



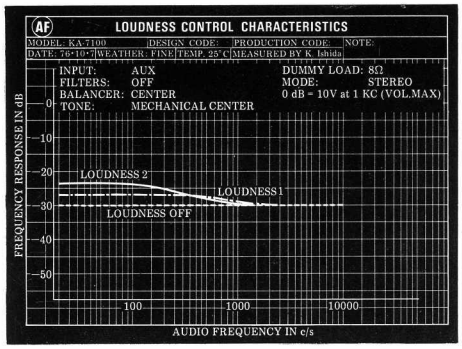
# KA-7100




*Residual Noise Characteristics*




*Channel Separation*




*Loudness Control Characteristics*

## SPECIFICATIONS

### POWER AMPLIFIER SECTION

Power Output

**60 watts per channel minimum RMS, at 8 ohms from 20Hz to 20,000Hz with no more than 0.02% total harmonic distortion.**

| | |
|---|---|
| Both Channels Driven | 60 + 60 watts 8 ohms at 1,000 Hz<br>80 + 80 watts 4 ohms at 1,000 Hz |
| Dynamic Power Output | 250 watts 4 ohms |
| Total Harmonic Distortion | 0.02% at rated power into 8 ohms<br>0.02% at 1 watt into 8 ohms |
| Intermodulation Distortion (60 Hz : 7 kHz = 4 : 1) | 0.01% at rated power into 8 ohms<br>0.01% at 1 watt into 8 ohms |
| Power Bandwidth | 5 Hz to 45,000 Hz |
| Frequency Response | D.C to 100,000 Hz +0 dB, −1.5 dB |
| Signal to Noise Ratio | 120 dB (short circuited) |
| Damping Factor | 50 at 8 ohms |
| Speaker Impedance | Accept 4 ohms to 16 ohms |

### PREAMPLIFIER SECTION

| | |
|---|---|
| Input Sensitivity/Impedance | |
| Phono | 2.5 mV/50 k ohms |
| Tuner | 150 mV/50 k ohms |
| AUX | 150 mV/50 k ohms |
| Tape | 150 mV/50 k ohms |
| Signal to Noise Ratio (IHF.A) | |
| Phono | 80 dB for 2.5 mV input<br>86 dB for 5.0 mV input<br>92 dB for 10 mV input |
| Tuner | 110 dB for 150 mV input |
| AUX | 110 dB for 150 mV input |
| Tape | 110 dB for 150 mV input |
| Maximum Input Level for Phono 1 | 200 mV (RMS), T.H.D. 0.02% at 1,000 Hz |
| Output Level/Impedance | |
| Tape REC (Pin) | 150 mV/450 ohms |
| (DIN) | 30 mV/80k ohms |
| Frequency Response | |
| Phono | RIAA standard curve +0.2 dB, −0.2 dB |
| AUX & Tape | 10 Hz to 100,000 Hz +0 dB, −1.8 dB |
| Tone Control | |
| Bass | ±7.5 dB at 100 Hz |
| Treble | ±7.5 dB at 10,000 Hz |
| Loudness Control (−30 dB) | at 100 Hz (1)+3 dB, (2)+6 dB |
| Subsonic Filter | 20 Hz, 6 dB/oct |
| High Filter | 8 kHz, 6 dB/oct |

### GENERAL

| | |
|---|---|
| Power Requirements | 60 Hz 120V |
| Power Consumption | 460 watts at full power |
| A.C. Outlet | Switched 2, Unswitched 1 |
| Dimensions | W 16-15/16" (430mm)<br>H 5-7/8" (149mm)<br>D 15-1/8" (384mm) |
| Weight (Net) | 25.4 lbs (11.5 kg) |

Kenwood follows a policy of continuous advancements in development. For this reason specifications may be changed without notice.


As an optional extra there are tough professional-type carrying handles available (D-7).

KENWOOD

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In Canada: Magnasonic Canada, Ltd.

C-256-K 770730SA Printed in Japan