KENWOOD

DC STEREO INTEGRATED AMPLIFIER

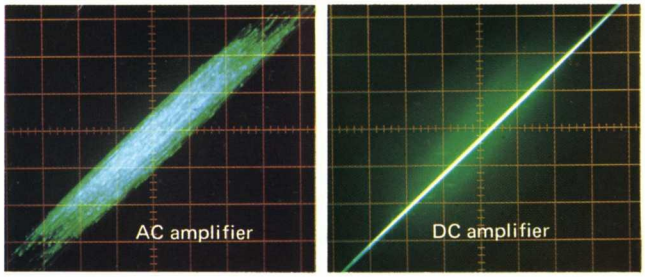
KA-8100

Dual Power Supply

A DC amplifier that provides amplification down to zero frequency without any phase shift, independent power supplies for low transient crosstalk distortion, and outstanding signal to noise ratio of 85dB for 2.5mV input should make the KA-8100 the best performing integrated amplifier available today at any standard.

The DC power amplifier, first to be incorporated in an integrated amplifier by Kenwood engineers, has now been accepted as the ultimate in amplification of the audio signal. This amplifier provides gain to zero frequency as well as signal amplification down to zero frequency without any phase shift. Independent power supplies are incorporated to eliminate Dynamic Crosstalk distortion, a phenomenon first exposed by Kenwood engineers. In addition, there is a further separate power supply to the preamplifier stage which maintains the high level of sound quality. Output power is rated at a minimum of 75 watts per channel RMS, driven into 8 ohms through 20Hz to 20,000Hz. Total harmonic distortion over the whole range is held to a very low 0.03%. Another indication of Kenwood's superior audio technology is the extremely high signal to noise ratio of 85dB (91dB 5mV, 97dB 10mV)— a reminder that the KA-8100 is designed with the ultimate criterion of reproducing sound with the least possible noise or distortion. Other key design elements include an attenuator type Volume control, a Gain control and a specially contoured loudness control, all carefully designed to provide you with high tonal quality and flexibility.

The DC Amplifier. Faithfully reproducing the input waveform

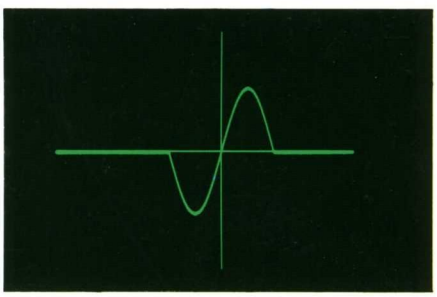


Phase characteristic of bass drum

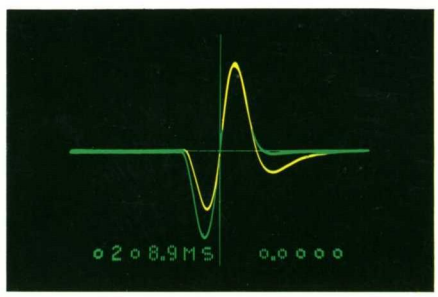
A synchroscope comparison showing the waveform of a bass drum as it appears through a conventional AC amplifier and a DC amplifier. The DC amp. displays no phase shift and appears as a clean straight line.

In the search for improvement in tonal quality, the advantages of the DC amplifier over the conventional AC type are evident. Originally a Kenwood development, the DC integrated amplifier provides linear frequency response from DC right up to 100kHz. Throughout this range, and particularly in the low frequencies, distortion is kept very low, while both phase and transient response are excellent. What this means to you is that the response in conditions of actual musical reproduction is unusually clear and natural—so natural, in fact, that the input signal seems to go 'straight through' the amplifier, with nothing added to it or subtracted from it. The resulting sound quality, with every musical instrument clearly defined, has a refreshing 'wholeness' throughout the whole dynamic range, even at very high or very low volume levels. But Kenwood's DC technology goes deeper. For embodied in our DC power theory lies the whole concept of the role of the amplifier, which we see as extending beyond the amplifier's output terminals to the speaker system itself. One important area Kenwood engineers have been working on is the relationship between the speakers and the amplifier. In actual operation, a dynamic speaker feeds back electromotive force as well as free vibrations, to the amplifier, and these disturb its proper operation. Apart from driving the speakers, the amplifier must suppress this counter-electromotive force as well as control the cone movements (typically, when the cone continues to vibrate after the signal is cut abruptly). Conventionally, the damping factor, as one indication of an amplifier's performance, is actually a static measurement made without speakers connected. So with dummy loads, static tests show AC and DC amplifier damping factors to be relatively the same. Yet when our engineers made a number of complex comparison tests in dynamic conditions (with speakers connected), AC amplifier damping was poor. The DC amplifier on the other hand showed no adverse effects from the speaker counter-electromotive force. Simply put, it means that Kenwood's discovery of the Dynamic Damping Factor is a critical element in assessing tonal quality in the DC amplifier. Contributing to the KA-8100's tonal quality is the power circuitry, consisting of a direct-coupled, 3-stage differential circuit with FETs used in the first stage, and a pure complementary symmetry design provides signal amplification with low distortion over a wide range. Massive, solid-cast aluminum heat sinks provide efficient dissipation of the heat from the power transistors, while our full limiter and relay circuit protects all circuitry as well as speakers from overload.

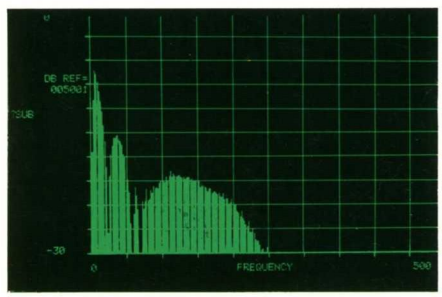
The Kenwood Dynamic Damping Factor proves the superiority of the DC amplifier.



Original toneburst input signal.



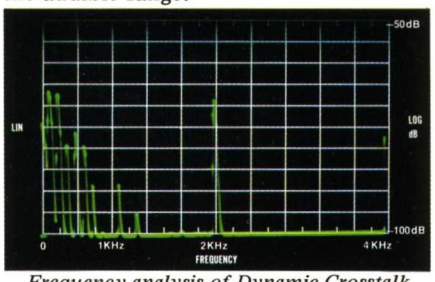
The same signal through a conventional AC amplifier and the Kenwood DC amplifier. The yellow line shows the AC amplifier's poor dynamic damping ability.



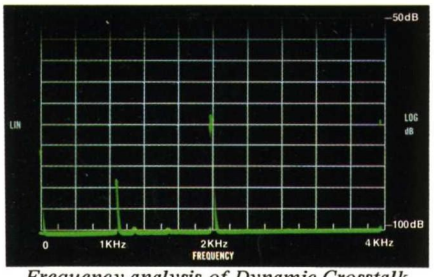
Difference in frequency component between AC and DC amplifiers analysed by computer.

Independent Dual Power Supplies Plus Separate Preamplifier Power Supply Eliminate Dynamic Crosstalk

Complete channel separation is vital to sound quality, because any undesirable transfer of signal between channels may create reproduction with muddy sound, especially at low frequencies. This is a common problem with conventional single power supplies. Kenwood's discovery of Dynamic Crosstalk distortion has led to the development of separate, independent power supplies (DPS), which successfully overcomes this problem by providing precise stereo imaging right down to the lowest frequencies. Each power supply employs a large power transformer, with two 10,000μF electrolytic capacitors in each filter circuit, assuring ample and stable power supply. In yet another separate power supply to the preamplifier stage, there is a full-scale transistorized voltage regulator which prevents any interaction between front and rear stages. With the elimination of Dynamic Crosstalk distortion, transient response is excellent. Each musical instrument is correctly localized and at its natural level, and response is crisp and clear throughout the audible range.

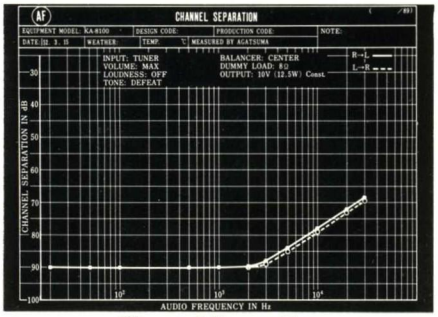


Frequency analysis of Dynamic Crosstalk (Single power supply amplifier)



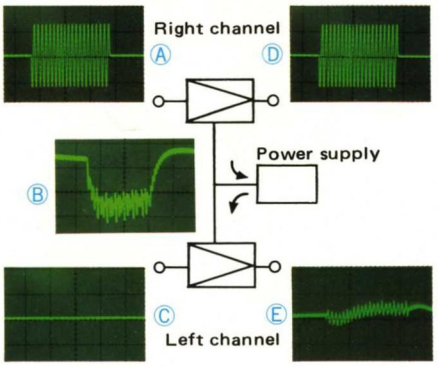
Frequency analysis of Dynamic Crosstalk (Model KA-8100)

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



Channel Separation

Generation of Dynamic Crosstalk
(Single power supply system)



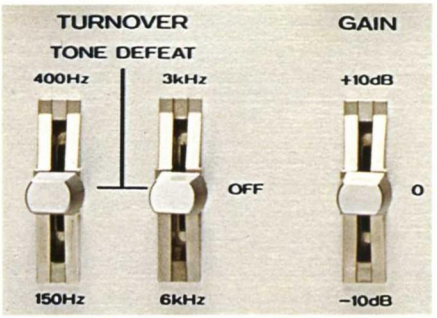
The disadvantage of a single power supply. A) A transient input signal is applied to the right channel. B) This signal affects the normally stable power voltage. C) The left channel has no input signal. D) The original input signal is amplified. E) When the same power supply (B) is used for both channels, 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.

High 85 dB (91 dB 5 mV, 97 dB 10 mV) S/N Ratio Is Achieved By Direct-Coupled FET Phono Equalizer

85 dB (IHF-A Curve) signal-to-noise ratio is an exceptionally high value unrivalled in this class of amplifier. To achieve it, an elaborate 3-stage ICL differential amplifier uses an FET in the first stage, with current mirror load. The second stage is a Darlington circuit with current mirror load. The final stage is a pure complementary single-ended push-pull circuit using specially selected, paired PNP-NPN transistors. All this circuitry means that the preamplifier stage is similar in quality to the power amplifier stage. The extremely wide dynamic range and high stability achieved in the phono amplifier is due to the large common mode rejection ratio (CMRR) — the ability of the amplifier to separate noise from signal. While full output can be attained with an input of only 2.5 millivolts, the use of the front panel Gain control at its +10 dB position further increases input sensitivity of the phono input to accommodate moving coil cartridges having an output of 0.8 millivolts.

Sophisticated Tone Controls Have Defeat Switch For Flat Frequency Response

To match the acoustic characteristics of your listening room, speakers or cartridge, etc. you will probably want to 'tailor' the sound individually. For this purpose, the KA-8100 is provided with highly stable, low-noise Baxandall type bass and treble tone controls. Adjustment is in 1.5 dB steps, with a maximum range of ±7.5 dB. Turnover frequencies operate at 150 Hz and 400 Hz for bass, and 3 kHz and 6 kHz for treble. Although the tone controls can be highly useful, there may be times when they are not needed, and some purists actually prefer not to use them at all. In these cases, the KA-8100 tone controls are provided with a defeat switch position which allows the signal to bypass them, thus eliminating potential distortion which could lead to poor sound quality.

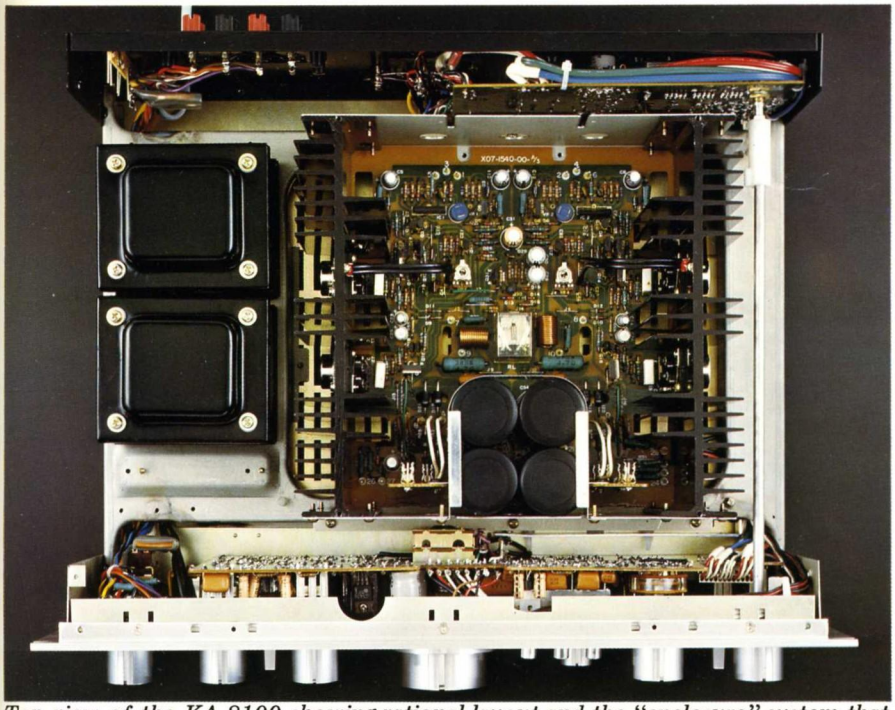


High, Low And Subsonic Filters

The High filter cuts off at 8 kHz to eliminate record scratch or other high frequency noises. The Low filter cuts off at 40 Hz. Both filters roll off at the rate of 12 dB/oct. In addition, there is a Subsonic filter which slopes at 6 dB/oct, cutting off at 18 Hz. This allows all subsonic influences such as those generated by record warp (which could affect your speakers) or turntable rumble to be eliminated without disturbing the lowest audible frequencies. Like the tone circuits, the filter circuits can be switched out of the signal path when not needed.

New Loudness Control Is An Aid To Tonal Quality

The versatile loudness control provides a variety of compensation functions using a total of six contours, controlled by two knobs. As well as compensating for poor human audio perception at low frequencies, it provides extra boost at low frequencies when needed. It also provides compensation for poor low frequency response in some speaker systems. The circuit permits a three-level boost in the volume level at −30 dB volume level at either 100 Hz or 50 Hz. Boost is made in increments of 3 dB. Few other manufacturers provide such a comprehensive aid to tonal quality.



Top view of the KA-8100 showing rational layout and the "enclosure" system that separates large from small current circuitry.

Flexible Tape Circuit With Tape-Through Facility

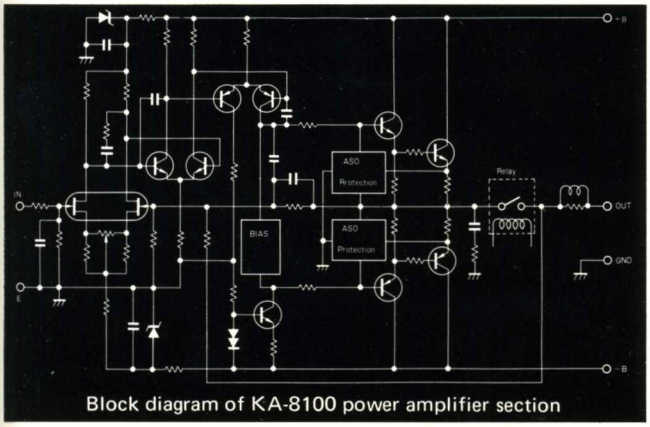
With inputs permitting two tape decks to be connected, the KA-8100 features a variety of editing functions such as source or tape monitoring on A or B, inter-deck dubbing, and there's a unique tape-through circuit that permits dubbing while simultaneously listening to a different source.

Professional Logarithmic Attenuator Type Volume Control And Gain Control

Because the human ear is non-linear, and usually poor in low-frequency perception, the KA-8100's full-scale attenuator type volume control provides logarithmic attenuation for naturally balanced sound even at low volume levels. In addition, the Gain control (selectable at −10 dB, 0, +10 dB) allows more precise volume adjustment when used in combination with the Volume control. The Gain control can also be used as a muting switch.

The Simpler The Circuitry The Better The Sound

It's axiomatic at Kenwood that the more we reduce or eliminate long distortion-causing wiring, the greater the gain in overall tonal quality. We also believe that individual improvements in performance, however remarkable, are not so meaningful unless they relate to the total sound quality. This is why we have concentrated on simplifying circuitry in order to reduce potential distortion. Apart from the input capacitorless circuitry used in both the crucial equalizer and tone control sections, the whole internal layout has been redesigned. The new chassis design effectively separates large and small current circuits, so that there is no interaction between them. In fact, the large current block is isolated by heat sinks on either side and by a special shielding plate. The small current circuits are outside this enclosure. This construction significantly contributes to the high S/N ratio of the KA-8100. In addition, the input selector is mechanically extended to the rear panel, and the phono inputs are directly connected to their equalizers on the preamplifier circuit board — two important examples among our many wiring eliminations. In this way, the tonal quality of the KA-8100 can be realized to full advantage.



Block diagram of KA-8100 power amplifier section

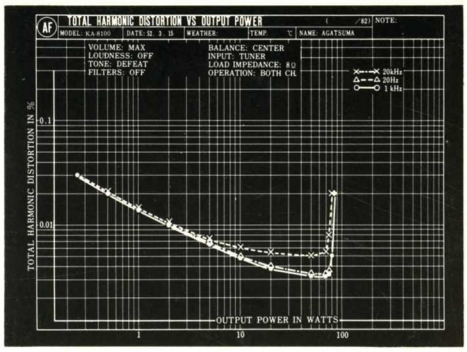
The Kenwood Professional Touch

The KA-8100 has a professional look and feel, with every knob and control thoughtfully designed for maximum ease of use. Inside, too, the circuitry is innovative and often well in advance of prevailing standards. As a pace-setting specialist audio manufacturer, Kenwood believes that audio components have one overriding purpose — to provide you with reproduced sound quality that mirrors the original signal. Whatever kind of music you enjoy, the KA-8100 will faithfully reproduce it, with the minimum of distortion, over the whole dynamic range. After all, this is what hi-fi is all about.

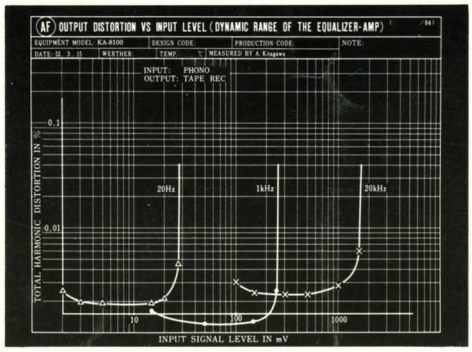
Optional carrying handles (D-7) are available.

Attractive walnut-finished, laminated wood side panels (B-8) are also available as an optional extra.

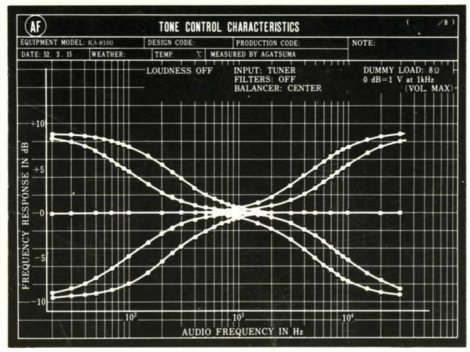
KA-8100



Total Harmonic Distortion vs Output Power



Output Distortion vs Input Level (Dynamic Range of the Preamplifier)



Tone Control Characteristics

SPECIFICATIONS

POWER AMPLIFIER SECTION

Power Output

75 watts per channel minimum RMS, at 8 ohms from 20Hz to 20,000Hz with no more than 0.03% total harmonic distortion.

Both Channels Driven	75 + 75 watts 8 ohms at 1,000 Hz 90 + 90 watts 4 ohms at 1,000 Hz
Dynamic Power Output	330 watts 4 ohms
Total Harmonic Distortion	0.03% at rated power into 8 ohms 0.01% at 1 watt into 8 ohms
Intermodulation Distortion (60 Hz : 7 kHz = 4 : 1)	0.03% at rated power into 8 ohms 0.01% at 1 watt into 8 ohms
Power Bandwidth	5 Hz to 50,000 Hz
Frequency Response	DC to 100,000 Hz +0 dB, −1.5 dB
Signal to Noise Ratio	115 dB (short circuited)
Damping Factor	50 at 8 ohms
Input Sensitivity/Impedance	1.0 V/50 k ohms
Speaker Impedance	Accept 4 ohms to 16 ohms

PREAMPLIFIER SECTION

Input Sensitivity/Impedance	
Phono 1 & 2	2.5 mV/50 k ohms
Tuner	150 mV/50 k ohms
AUX	150 mV/50 k ohms
Tape A, B	150 mV/50 k ohms
Signal to Noise Ratio (IHF.A)	
Phono 1 & 2	85 dB for 2.5 mV input 91 dB for 5.0 mV input 97 dB for 10 mV input
Tuner	110 dB for 150 mV input
AUX	110 dB for 150 mV input
Tape A, B	110 dB for 150 mV input
Maximum Input Level for	
Phono 1	250 mV (RMS), T.H.D. 0.02% at 1,000 Hz
Output Level/Impdeance	
Tape REC (PIN)	150 mV/220 ohms
(DIN)	30 mV/ 80 k ohms
PRE OUT	1 V/470 ohms
Frequency Response	
Phono	RIAA standard curve +0.2 dB, −0.2 dB
AUX & Tape	7 Hz to 50,000 Hz +0 dB, −1 dB
Tone Control	
Bass	
(Turnover at 150 Hz)	±7.5 dB at 50 Hz
(Turnover at 400 Hz)	±7.5 dB at 100 Hz
Treble	
(Turnover at 3 kHz)	±7.5 dB at 10,000 Hz
(Turnover at 6 kHz)	±7.5 dB at 20,000 Hz
Loudness Control (at −30 dB Volume Level)	1 at 50 Hz 1)+3 dB, 2)+6 dB, 3)+9 dB 2 at 100 Hz 1)+3 dB, 2)+6 dB, 3)+9 dB
GAIN Control	+10 dB, 0 dB, −10 dB
Subsonic Filter	18 Hz, 6 dB/oct
Low Filter	40 Hz, 12 dB/oct
High Filter	8 kHz, 12 dB/oct

GENERAL

Power Requirements	60 Hz 120V
Power Consumption	600 watts at full power
A.C. Outlet	Switched 2, Unswitched 1
Dimensions	W 16-15/16" (430mm) H 5-7/8" (149mm) D 15-1/8" (384mm)
Weight (Net)	32.0 lbs (14.5 kg)
(Gross)	32.6 lbs (16 kg)

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

KENWOOD

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