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marantz

FILTE

LOW

FM 20

# **Stereo Receivers 2330B,** 2285B & 2265B

Hodel 2265B

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### We sound better.

Steresphonic Receiver

SYRO - TOUCH TUNING

PEAKERS

# The truth about receiver power: It's not only how much, it's how clean.

Granted, power is important. But when you start counting watts, you could be discounting performance. Unless you take a good, hard look at the total harmonic distortion spec too.

Because the simple truth is, you don't need just power, you need *clean* power. Which means you need a receiver that keeps THD to an absolute minimum.

Enter the Marantz 2330B, 2285B and 2265B. Three stereo receivers that outperform the majority of separate components on the market today.

The 2330B delivers a minimum continuous power output of 130 watts per channel, from 20 Hz to 20 kHz, both channels driven into 8 ohms.

Under the same conditions, the 2285B delivers 85 watts per channel, and the 2265B delivers 65 watts per channel.

All three are specified to produce no more than 0.05% total harmonic distortion at rated power. Clean. So clean you can listen for hours on end without a trace of fatigue. As clean, in fact, as the Marantz 510M power amplifier used extensively in professional sound applications.

And that's just part of the story. We've built in many other technological advances that can improve performance quality. Many never used in a receiver until now.

Marantz. We're sounding better all the time.

#### POWER AMPLIFIER SECTION Full Complementary Symmetry Output

Every Marantz receiver features a full complementary symmetry output stage—the same design used exten-





sively in Marantz professional components. It's more costly than the quasicomplementary outputs of many receivers. But it assures significant performance improvements in linearity and harmonic and intermodulation distortion over other types of output stage circuitry.

The Marantz output stage design also produces an exceptionally wide Safe Operating Area—that range where voltage, current and temperature conditions permit reliable output stage operation. The result is an amplifier section so stable, it will drive a load at virtually any frequency or level without breaking down.



Output devices and speakers are guarded by a sophisticated energysensing protection circuit, which eliminates distortion caused by the traditional protection circuitry used in ordinary receivers.

#### **Direct Coupled Power Output**

Provides wide power bandwidth, excellent low frequency transient response and high damping factors.

A number of transistorized amplifiers still use capacitor- or transformer-coupled output stages to ensure reliable operation. However essential this design was in the past, it tended to limit low frequency power response and cause degrading phase shift. Moreover, today's technology has made compromise unnecessary.



Marantz receivers achieve a high degree of stability without the need for coupling transformers and capacitors and the sound inaccuracies they can cause. The benefits are minimal phase error and the best possible low frequency response.

#### Dual Power Supply in Models 2330B and 2285B

A specially designed power transformer with dual secondaries gives you two independent power supplies. Each channel can perform at its best, at all frequencies and levels, without affecting the other channel. In fact, even when one channel is driven by a high level dynamic signal demanding considerable power output, the other



channel can still maintain exceptionally low distortion.

Complementing the power transformer are high-capacity dual section electrolytic capacitors. This combination provides high power reserves, high reliability and low distortion, while keeping heat and weight to a minimum.

Model 2265B incorporates an oversized power transformer and highcapacity electrolytic capacitors in a dual-balanced power supply that symmetrically powers the amplifier stages.

Massive heat sinks on all three models promote reliable long-term operation, even under full power output.

#### TUNER SECTION Steep Quieting Slope

The quieting slope specification measures a tuner's ability to provide good signal-to-noise performance under actual operating conditions. It's a far more reliable indication of quality than the IHF sensitivity often quoted at the prime specification to consider when evaluating an FM tuner.

The IHF figure gives only the number of microvolts necessary for minimum quality reception: a signal with 3% distortion and noise (30 dB quieting) hardly qualifies as high fidelity. A signal-to-noise ratio in excess of 50 dB (the revised 1975 IHF specification) is generally recognized to be necessary for high quality listening. It is most important, then, to examine a receiver's ability to quiet quickly beyond the 30 dB quieting point. Quieting slope sensitivity figures measure the signal-to-noise ratio in the crucial five to 500 microvolt range, where the majority of usable broadcast signals fall. The steeper the slope, the quieter, and therefore the more listenable, the station.

#### Highly Sensitive Dual-Gate MOSFET FM Front End



Dual-gate MOSFET RF amplifier and mixer stages deliver superior linearity for low IM distortion and excellent quieting sensitivity.

A four-gang tuning capacitor contributes improved selectivity and image rejection, and in conjunction with the MOSFET front end, ensures outstanding rejection of spurious signals—specified 100 dB in all three receivers.

#### Phase Locked Loop FM Stereo Demodulator

The phase locked loop (PLL) design was developed by the space industry to provide a state-of-the-art communication system. Today the same tech-



Two tuners with comparable weak signal sensitivities, but significantly different quieting slopes. Tuner A, with an IHF sensitivity of  $2.4\mu$ V, appears to deliver slightly less performance than tuner B, with an IHF sensitivity of  $2.1\mu$ V. However, tuner A's steeper quieting slope (red line) indicates that it gets quieter faster than tuner B—a significant advantage under actual performance conditions. nology is used in all Marantz receivers and tuners to assure low distorion, superior noise rejection and excellent stereo separation.

PLL circuitry locks to the stereo pilot signal broadcast by an FM station. This positive "phase lock" enables the multiplex demodulator to separate the stereo channel information from the FM

multiplex signal with more accuracy and less distortion than multiplex demodulators using other designs.

PLL is dependent on pilot phase and not on pilot amplitude, making it less susceptible to false triggering from various types of noise interference.

#### **Ceramic IF Filters**

The performance of an FM tuner is

determined to a great extent by the performance of its intermediate frequency (IF) amplifier. The ideal IF amplifier should accept the desired band of frequencies with minimum phase distortion, while rejecting all adjacent frequency signals.

Marantz receivers feature IF amplifiers consisting of ceramic filters, whose characteristics produce a 200 kHz passband that's linear in phase. This eliminates a major source of high frequency distortion and loss of stereo separation. Sharp cut-off slopes improve the tuner's rejection and selectivity characteristics, permitting clear reception even when stations are closely spaced.

#### Plug-in Dolby\* FM Capability on Models 2330B, 2285B and 2265B

On the back panel of Models 2330B, 2285B and 2265B is a convenient receptacle that accepts the optional plug-in Marantz DLB-1 Dolby FM Decoder. Inside the receivers is a 25microsecond Dolby FM equalization circuit. In tandem, they can cut the noise from a Dolbyized FM broadcast by as much as 12 dB. That's the equivalent of reducing the noise power of a received FM signal sixteen times below normal.

\*TM Dolby Labs, Inc.



#### **Additional Features**

A multipath/signal strength meter built into the Marantz 2330B and 2285B enables you to read the amount of multipath interference in your receiver-FM antenna system. You can ensure optimum FM reception simply by orienting your antenna so that the distortion level hits its lowest point.

Both models also have a multiplex noise filter that reduces the background noise of weak FM stereo signals, while maintaining full frequency response.

All three feature adjustable FM muting, a pivoting AM antenna and an "F" connector for simple connection of coaxial FM antenna cable.



#### PREAMPLIFIER SECTION Flexible Tone Controls

The more flexible the tone controls, the more accurately you can adjust for non-linearities in frequency response caused by speakers, speaker placement, room acoustics or the program material itself.

The tone control system in Marantz Models 2330B, 2285B and 2265B features a sophisticated five-position tone turnover/mode switch for versatile bass, midrange and treble control. This eliminates a major shortcoming of conventional tone controls—their tendency to affect too wide a band of frequencies. Optional frequency turnover points limit the bass and treble controls to the desired range.

The advantages can be illustrated by a practical example: boosting the low bass (under 100 Hz) to compensate for a deficiency in room acoustics. Most conventional tone controls, even if capable of supplying the boost, will also increase the output in the 300 Hz to 1,000 Hz region.

With the turnover point set at 100 Hz on a Marantz receiver, the bass control can provide the desired bass boost up to the frequency point of 100 Hz and leave the frequency range above the point essentially flat and unaffected.

This flexible, easy-to-set system permits over seven *million* combinations of repeatable settings, enabling you to adjust for the desired tonal balance in virtually any listening environment.

#### **Superior Filter Design**

Marantz Models 2330B and 2285B feature an 18 dB per octave 9kHz Bessel-derived high filter—the most advanced filter design in audio. It reduces high frequency noise—and produces a more natural, less colored sound because it eliminates the overshoot and "ringing" common to other filters. Results are linear phase response and reduced phase and transient distortion.





9 kHz square wave response shows complete absence of overshoot in the Bessel high filter design. Result: greatly reduced audible ringing and coloration. Both models also use an 18 dB per octave 15 Hz sub-sonic Butterworth low filter, which cuts turntable rumble and sub-sonic transients that prevent accurate reproduction of lowfrequency signals.

Never before has such advance filter technology been applied to any audio components, separates or receivers. 18 dB per octave filters provide positive filtering action with little coloration of sound by concentrating their effect only at the specified frequencies. Filters with slower roll-off characteristics, on the other hand, must start acting toward the midpoint of the frequency range in order to perform adequately at the extreme high or low end of the audio spectrum.

#### **High-Performance Phono Preamp**

Low distortion and a wide dynamic range are paramount in the circuit design of a phono section.

The three-stage, 40 dB gain amplifier built into these Marantz receivers utilizes feedback-equalized circuitry to keep distortion at a negligible level.

And we ensure superior overall performance by employing only closetolerance, highly stable components: low-noise carbon-film resistors, Mylar coupling and polystyrene-type equalization capacitors.

As a result, RIAA equalization is precise—within  $\pm 0.5$  dB from 20 Hz to 20 kHz—and under test in the 2330B, the equivalent noise input to the phono section typically measures a low 0.8 microvolts.

#### **Flexible Tape-Copy Functions**



In addition to the standard phono and auxiliary inputs, two sets of tape inputs and outputs are provided to facilitate dubbing between a pair of tape decks. And all three receivers have tape copy facilities that can function independently of program selector and tape monitor circuitry, enabling you to dub from one deck to another while listening to a different source.

Also featured are front-panel dubbing jacks that allow you to add a third tape deck without disturbing any rear panel connections.

Rear panel facilities include connections for two sets of speaker systems, main in/pre out jacks, a Quadradial<sup>®</sup> output jack and two convenience AC outlets.

AMPLIFIER SECTION Rated Power Output, Minimum Continuous	2265B	2285B	2330B
Watts per Channel from 20Hz to 20kHz,			
both Channels driven into 8 Ohms	65	85	130
into 4 Onms	83	110	105
International Distortion at 8 Ohms at 4 Ohms	0.05%	0.05%	0.05%
60Hz & 7kHz mixed 4-to-1 at rated power output)	0.05%	0.05%	0.05%
Damping Factor at 20Hz	55	60	60
PREAMPLIFIER SECTION			
PHONO			
Input Overload at 1kHz Equivalent Input Noise	200mV 1.25µV	200mV 1.0µV	200mV 1.0µV
Dynamic Range (ratio of input overload	10040	10040	10048
Input Sensitivity	TOZUB	TUBUB	ТООЦВ
(Input Impedance, 47k ohms) Signal-to-Noise Batio	1.8mV	1.8mV	1.8mV
(at rated output & 7.75mV input)	78dB	78dB	78dB
(RIAA, 20Hz to 20kHz)	±0.5dB	±0.5dB	±0.5dB
HIGH LEVEL INPUTS (Aux & Tape)			100 11
Input Sensitivity Input Impedance	20k Ohms	20k Ohms	20k Ohms
Signal-to-Noise Ratio	00dB	0048	OEdP
OUTPUT IMPEDANCE	9008	900 8	950 B
Tape out	600 Ohms	600 Ohms	600 Ohms
AM/FM TUNER SECTION	900 Onms	900 Onms	900 Onns
SENSITIVITY			
IHF Usable (Mono)	10.3dBf (1.8μV)	10.3dBf (1.8μV)	10.3dBf (1.8µV)
IHF 50dB Quieting	110101		110100
Mono	(3.0µV)	(3.0µV)	(3.0µV)
Stereo	36dBf (35.0µV)	36dBf (35.0µV)	36dBf (35.0µV)
QUIETING SLOPE (Mono)			
RF Input for 30dB Quieting	8.2dBf (1.4μV)	8.2dBf (1.4μV)	7.5dBf (1.3µV)
Quieting at:	58dB	58dB	58dB
$25dBf(10\mu V)$	63dB	63dB	63dB
40dBf (55µV)	72dB	72dB	72dB
OULETING SLOPE (Stereo)	7608	780B	780B
Quieting at:			
$40dBf(55\mu V)$	430B 53dB	43dB 53dB	43dB 53dB
50dBf (173µV)	60dB	60dB	60dB
$65dBf (1000\mu V) (also S/N ratio)$	70dB	70dB	70dB
100Hz	0.25%	0.25%	0.2%
1,000Hz	0.15%	0.15%	0.1%
6 000 47	(0.3%)	(0.3%)	(0.3%)
0,000Hz	(0.5%)	(0.5%)	(0.5%)
HUM AND NOISE at 65dBf (1,000µV)	-74dB	-75dB	-78dB
FREQUENCY RESPONSE, 30Hz to 15kHz			
Mono	+0.2dB -1.5dB	+0.2dB	+0.2dB
Stereo	±1.5dB	±1.5dB	±1.5dB
CAPTURE RATIO at 65dBf (1,000µV)	1.0dB	1.0dB	1.0dB
ALTERNATE CHANNEL SELECTIVITY	80dB	80dB	80dB
SPURIOUS RESPONSE REJECTION	90dB	90dB	90dB
IF REJECTION (Balanced)	100dB	100dB	100dB
AM SUPPRESSION	55dB	55dB	57dB
STEREO SEPARATION			
100Hz	42dB 50dB	42dB 50dB	42dB 50dB
10,000Hz	42dB	42dB	42dB
SUBCARRIER REJECTION	70dB	70dB	70dB
AM DISTORTION (THD) at 20% Modulation	12μV	12μV	0.4%
SIGNAL-TO-NOISE RATIO	54dB	54dB	54dB
DIMENSIONS	a 71/ ·	1.71/	101/
Width	17¼ in. (440mm)	(440mm)	(491mm)
Height	5% in. (137mm)	5% in. (137mm)	5¾ in. (146mm)
Depth	14% in.	14% in.	15¼ in.
	(365mm) 35.2 lb.	(305mm) 37.4 lb.	(386mm) 49.5 lb
WEIGHT	(16kg)	(17kg)	(22.5kg)

#### SPECIFICATIONS







Graphs show left channel; right channel is equal or better.

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