



**Amplifiers**

**Rotel RMB-1077 Amplifier**

Thomas J. Norton, May, 2006

When we think of a power amp today, we think of that large, heavy, hot-running, often ugly block of metal we hide away so we don't have to look at it. Or, if it's impressively large or expensive we proudly display it on the floor—an amp that's large, impressive, and expensive enough to show off is too heavy to put anywhere else! There, we willingly subject our ankles and shins to its sharp heat sinks on the sacrificial altar of great sound.



It doesn't have to be that way. Class D amplifiers have been around for a number of years. Early models never gained much of a foothold as full range audiophile amplifiers (though a few high-end models were well received), but they caught on big in car stereos and subwoofers. In both of those applications, their high efficiency, relatively cool operation, and small size counted for more than the ultimate in full range sonic performance.

While the landscape of Class D amps hasn't changed radically, their performance has steadily improved, and the number of serious Class D amps on the market has grown quietly but steadily. And with companies recognized for great sounding electronics climb on board, audiophiles are starting to take notice.

Rotel, a company long known for high quality, high value audio electronics, has taken notice, too. The RMB-1077 (\$2499) is its first multichannel Class D amplifier. It offers seven channels of amplification, rated at 100Wpc into 8Ω. All this comes in a package weighing in at just over 17 lbs. that's compact enough for a 10-year old to carry around without breaking a sweat.

**Looking Around**

A conventional Class D amplifier converts the analog input into a PWM (Pulse Width Modulation) signal, amplifies that signal in a switching power stage, and then low pass filters it to remove the superfluous high frequency noise generated by the switching. Class D amps are sometimes referred to as digital amps, which isn't technically correct in the strictest sense (and also has given them a checkered reputation among anti-digital audiophiles). At least as realized here by Rotel, there are no A/D or D/A conversions involved—at least not in the strictest definition of those terms.

While the RMB-1077 falls broadly under the Class D banner, the technology used here is a relatively recent refinement on Class D design. Known as ICEpower (ICE stands for Intelligent, Compact, Efficient), the rights to the design were acquired by Bang & Olufsen (B&O) several years ago in a co-ownership arrangement with its inventor. ICEpower is now in use in full range, audiophile-grade amplifiers and receivers from BelCanto, PS Audio, and Jeff Rowland Design (plus, of course, Rotel and B&O.) In addition, the technology has found its way into more than a few subwoofers.

ICEpower uses a similar PWM topology, but with the modulation process performed by a more sophisticated modulator than is typical of a conventional PWM amp. Dubbed COM (Controlled Oscillation Module), it isolates the amplifier from imperfections in the power supply. Co-located with the COM is a comparator and correction circuit called the MECC (Multivariable Enhanced Cascade Control) system. The MECC takes feedback signals from two later stages of the amp (the output of the switching power stage and the low pass filter at the output of the amp), compares them to the original source, and modifies them as needed to correct errors in the amplified signal. This lowers distortion and compensates for the output filter's dependence on the load. Together, these processes also allow ICEpower to use a lower switching frequency than earlier PWM designs. The technology claims an overall efficiency of 96%.



The anti-feedback crowd (which is a fair sized slice of the audiophile club) will be the first to choke on their Cheetos at the mention of ICEpower's two stages of feedback (one of which appears to be global.) But reports on the performance of ICEpower amps (both measured and audible) have so far been very positive.

Apart from the RMB-1077's radical departure from conventional design and its Weight Watcher's size, it is externally identical to any other seven-channel amplifier. The front panel sports a single power switch. Around back things are a bit busier, but apart from its seven single-ended inputs, high quality speaker terminals (that provide a reassuringly tight grip on good banana plugs), and detachable power cord, the only feature of note is a switch



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and in/out jacks that allow the user to enable the amp for auto turn-on using an external 12V trigger.

A protection circuit, independent of the audio signal, will shut down the amp if certain limits are exceeded. And if a speaker with unusually low impedance is played at a high enough level, an overcurrent protection circuit shuts down that channel until the current demand is reduced.

#### Setup and Performance

One doesn't usually just "slip" a seven-channel amplifier into a system. Schleppling or even dragging are more appropriate terms. But in the case of the RMB-1077, slip is the right word.

The long, slim profile of the amp demanded a straight-line arrangement of the input jacks and output terminals. Too often, multichannel amps and receivers orient the five or seven sets of jacks and terminals in a way that makes it a nightmare to get at the leads for something like troubleshooting a single faulty channel once everything is connected. While ease of access may be a feature only a reviewer can appreciate, anyone who isn't terminally anti-digital can appreciate the RMB-1077's sweet sound.

I'll begin in a rather backwards fashion by first offering a comparison. I didn't have any other \$2500 amplifiers on hand to compare to the Rotel, so I chose my trusty, long-time reference—the Proceed AMP5. While no longer available, this five-channel amp (which would probably cost more today than its \$5000 price of the late 1990's) remains a superb design, profiting as it did from more than a little trickle-down engineering from its more upscale Mark Levinson siblings (Proceed was at one time the Mark Levinson in-house "budget" brand.) Furthermore—and I'm sure I'll get poison pen letters on this—there haven't been any major breakthroughs in solid state analog amplifier design since the AMP5 engineers scribbled the first draft of their circuit on a coffee-stained napkin.

I did much of my comparative listening to these two amps in two-channel stereo, with some multichannel added later to confirm my impressions. After very careful level matching (a critical step with any audio comparison test) the differences I heard between the two amplifiers were very subtle.

Yes, in my system they favored the Proceed. But the differences I heard were largely at the frequency extremes. I heard a little less air and high frequency detail from the Rotel, and perhaps a shade less depth as well. Both factors are related; airy highs better reproduce a sense of the recording space, which aids in the reproduction of depth.

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