

# Radio World

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## PRODUCT EVALUATION

# Flagship Optimod 8500 Impresses

by Phil Simon

In 2000, I had the privilege of test-driving and reviewing the new Orban Optimod-FM 8400 for Radio World. Every succeeding version of Optimod, starting with the 8000 three decades ago, has delivered a leap in technology and user friendliness.

The Optimod-FM 8500 is no exception. When it seems there is no useful blood left in the audio processing turnip, Bob Orban comes up with a fresh list of improvements and features.

### Code

The all-digital age has turned Bob and his intrepid colleague Greg Ogonowski into code writers instead of circuit designers. Their challenge now is to make any new audio processor sound better than its predecessor in the new world of radical bit-rate reduction and digital radio.

What processing power and coding skill add, lossy compression and the HDC codec taketh away. In the end, these gentlemen

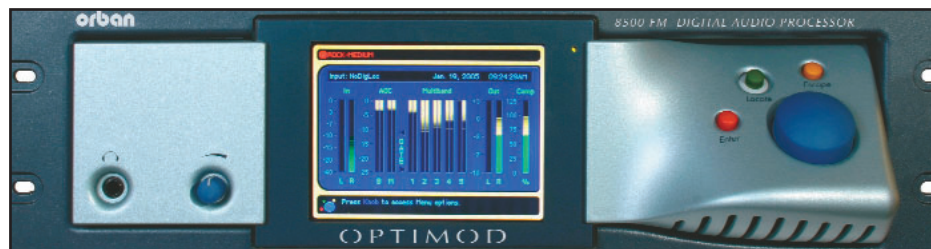
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still rely on their keen senses of hearing and sonic judgment to refine and perfect what consumers will hear out of their speakers.

The 8500 is similar in look and feel to its five-year-old predecessor, although the Fisher-Price colors have been replaced by



The author says the new flagship Optimod is near perfect.

a sleeker metallic blue appearance. The easy-to-use joystick, knob and button navigation system and menu structure with the less/more control scheme have been retained.

A bright, active-matrix color LCD makes it easier to program the 8500 from its front panel. Aging eyesight trapped in bifocals like mine will most certainly appreciate this improvement.

Like the Optimod 8400HD, the 8500 features an integrated and optimized parallel processing chain structure that serves the needs of existing FM analog plus HD digital. The digital output is also well suit-

Orban takes advantage of ever-higher available processing horsepower for the 8500 in the form of a dozen 150 MHz Motorola 24-bit DSP 56367s. This is about double the net DSP processing power of the 8400 and provides a 64 kHz sampling rate for the HD path bandwidth at full 20 kHz response. That is adjustable down to 15 kHz to optimize low-bitrate codec performance where desired. Plenty of resource headroom has been left to handle future additions and enhancements.

### Dual path

The 8500 creates similar sonics for the analog and digital outputs by using a common multi-band compressor/expander section for both, plus parallel tracking look-ahead peak limiter functions. This is especially demanding for any processor, as FM analog uses pre-emphasis limiting while HD Radio remains open and flat. The 8500 achieves a more consistent and natural sounding FM analog high end when compared to HD than any processor I've heard.

Four processing structures using both the classic two-band and the more powerful five-band layout are offered. Forty-two

programming factory presets, including seven low-latency and ultra-low-latency choices, are available. These cover almost every imaginable format sound signature, ranging from "Protection 0 dB" to "Loud+Slam."

The user can pick any of these as a starting point and then modify parameters at three control levels to achieve and save a custom sound signature. I had a favorite preset from my 8400, which imported into the 8500 easily.

After playing with most of the presets for several hours, you may find as I did that twisting parameters around to find something you like that is different and better than the factory's, just so you can put your name on it, is mostly a matter of ego massage and self-gratification. (But Ogonowski apparently knew how important that is, so he's already got three presets in there with his name on them.)

Some may wonder if the 8500's presets in general are better for one type of format or another, like the various "loud" choices for CHR or several of the "urban" presets to get better bass; but I really don't think such generalizations are valid. You can achieve almost any sound you want. The best thing one can say about Optimod is that its consistency song to song is superb.

### Delay

Perhaps the most important 8500 feature for HD broadcasters is a built-in adjustable eight-second analog FM channel delay. This allows the onboard stereo encoder and patented new "half cosine interpolation" composite limiter to be used without the restriction of passing the analog signal through the HD exciter. If that exciter fails or locks up, as they sometimes do, you are still on the air with your analog exciter fed directly by the 8500.

Even if your station has no plans to add HD Radio anytime soon, the improvements provided by the new internal DSP-based stereo encoder and patented composite limiter are worth having. A noticeably cleaner high end and accurate stereo image at higher average loudness is produced for the analog FM signal than with any other processor I've used.

One of the more troublesome side effects of digital processing is the induced time delay, making real-time monitoring difficult if not impossible. Anything greater

than about 7 ms is noticeable by most jocks. Users of the 8400 recall the initial 50 ms delay, which was considerably reduced in later software releases.

The 8500 offers a multitude of processing modes that deliver 37 ms down to an ultra low-latency 3.7 ms mode; 18 ms is the most typical. The front-panel headphone monitor delivers processed audio delay of only 2 ms no matter what processing structure is chosen for the output.

As with the 8400, you won't need any external AGC or flavoring boxes ahead of the 8500. Best results are obtained by feeding it unprocessed audio straight out of the control studio console. If an STL is used, the 8500 really belongs at the transmitter, so Orban suggests engaging an 8200ST or 8100A/ST studio chassis to protect the STL from overshoots. We sneaked in an Aphex Compellor to do this job and it worked just fine.

### Control

Remote control and programming of the 8500 has been simplified by the addition of a 100 Mbps Ethernet jack. No longer do you need to acquire the recommended third-party PCMCIA card to control it via remote PC on a LAN. Two separate serial ports are supplied that can be used for direct or modem connection to a PC.

The 8500 PC remote software supplied with the unit runs under Windows 2000 or XP and allows full control of parameters, including archiving and restoring presets and other system setups. The unit includes an internal tone generator for setup assistance and a real-time clock to support automation and day-part programming.

Orban provides a comprehensive and easy-to-understand operating manual, one of the best you'll encounter for a piece of complex broadcast equipment. Every aspect of the 8500's operation is explained in detail, with excellent supporting screen pix, graphs, charts and schematics. Operation Section No. 3 is especially enlightening on how to achieve the sound you want, with a special section devoted to bass processing. The troubleshooting section is thorough.

This is the most expensive Optimod ever, and the high price is a negative, although only a bit higher than its most direct serious competitor. Obviously large-

## Product Capsule:

### Orban Optimod-FM 8500

**Thumbs Up**

- ✓ Best sounding Optimod ever
- ✓ Built in 8 sec delay for FM analog
- ✓ Superb mechanical engineering
- ✓ Excellent ergonomic design
- ✓ Bright full color LCD display

**Thumbs Down**

- ✓ Pricey

Price: \$13,990

For information contact Orban in California at (510) 351-3500 or visit [www.orban.com](http://www.orban.com).

market stations will be interested in it and better able to afford the processor before medium and smaller stations; but there's nothing new in that. The processor is especially appropriate for stations still running 8200s or other non-Orban processors they are not completely happy with, and for those going HD Radio. It's a perfect product for them.

Pressed to come up with anything to criticize here, I'd have to say it's hard to think of anything unless the cost stops you. Users should consider whether the additional features warrant the higher price over an 8400, or the 8400HD if they are doing HD Radio.

But with the 8400 at five years old and with processing power now doubled, this new box is a welcome addition to the Optimod FM family; it should earn a permanent place in the air chain of every station that gets a test-drive, especially those with HD Radio running or about to deploy. I thought I could get away with only AGC and peak limiting on our new HD station; but after using the 8500, I wouldn't even think of doing HD without this box.

If you're planning for an HD conversion, put this in your equipment budget as a necessity. You'll be amazed and delighted with its performance.

*The author is a frequent contributor to Radio World. His opinions appear here under a pseudonym due to the competitive nature of the market in which he engineers.* 🌐