CONTOUR™

Digital Loudspeaker Processor

MESA™ Quad EQ

Digital Loudspeaker Equalizer

The world's most powerful audio processors.

Contour™ and Mesa™ give you total control over every element of your sound by combining the responsiveness of an analog system with the pinpoint accuracy of Lake® 40-bit floating point, 96kHz digital signal processing technology.

Wireless graphical control gives you the freedom to walk the floor of a venue and adjust any individual or set of speakers in real time.

The result? Maximum performance from your system and a smoother, more natural sound for every seat in the house.

Proven performance.
## From the Athens Olympics to the Hollywood Bowl to seven out of ten major Fall 2004 U.S. tours*.

Control everything from anywhere in the venue.

Walking the floor to hear what a system sounds like and then returning to the board or backstage to make changes is painful. Trying to tell someone exactly what you want via a walkie talkie can be even harder.

With Lake Contour and Mesa's full wireless control, you can make all the changes you need in real time from wherever you're standing — and hear the effect instantly. Even during a show and in the middle of the audience.

Since both Mesa and Controller have been specifically designed for use with touch screen and tablet computers, you can forget tiny digital read outs and push-button adjusters in racks under the stage — we've brought back the feel of analog meters, faders and controls to make the Contour incredibly easy to use.

Performing A-B comparisons, or changing EQ and crossover settings is just like drawing on a whiteboard. You can literally see and change the shape of your sound in real-time.
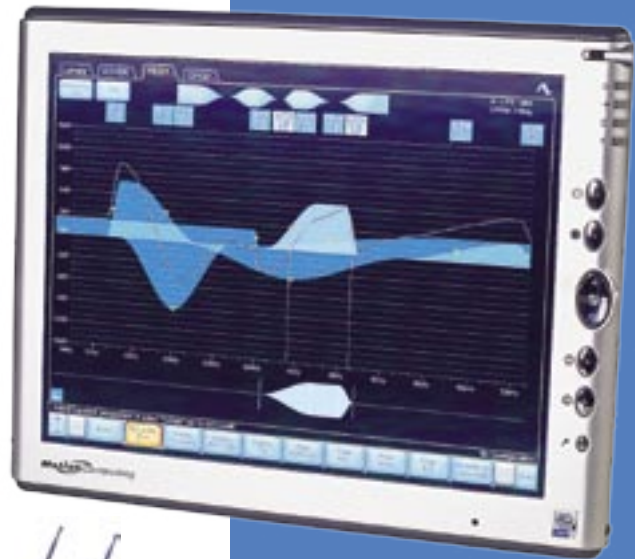
Controller Touch Screen

Wireless Network Access Point
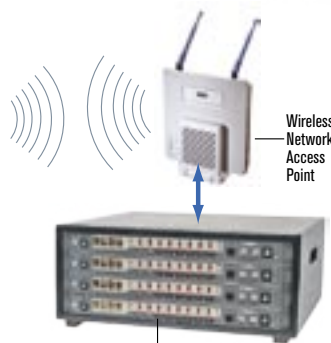
Ethernet-linked Contours and/or Mesas

*Based on tours reported as of October 1st in Pro Sound News Centerstage Top Ten Tours of the Month.

Below: Scott Willsallen, sound designer with Lake Controller, a rack full of Contours and his unique measurement microphone headgear at the Athens Olympic stadium. Photo courtesty of Jack Morton Productions.

Contour users sound off: critical acclaim from world class touring companies and venues…

Clair Brothers *"It's the perfect marriage between digital speaker processing and our new curved line array. The system was so easy to tune and get results quickly."* Gene Pelland

Hollywood Bowl *"The Lake system is nice because the information you need is all right in front of you, and you're able to make quick changes anywhere in the house and hear them as you're doing it."* Fred Vogler

Norwest Productions *"There is no doubt that the Lake Contour is breakthrough technology for the live sound industry. We're converts!"* Chris Kennedy

Lake® Contour™

All-in-one with EQ, crossovers, limiters and measurement tools – Contour™ sounds better, costs less and is simpler to use than separate devices.

Wireless touch screen remote does everything you want from any-

Contour Properties Screen

Contour Linear Phase Crossover

where in a venue using our innovative user interface.

Full networked control across all processors – one or one hundred processors act in harmony, all from a single wireless touchscreen.

Exclusive Lake Mesa EQ™ filters give you unparalleled shaping ability, perfect for speaker response optimization.

Ideal Graphic EQ™ response means what you see is precisely what you get.

Ideal Crossovers with Zero Phase Shift are linear phase with greater than 180 dB per octave transitions!

Full integration with SIA Smaart Live™ on your touch screen lets you measure spectrum, spectrograph or transfer functions and adjust EQ at the same time.

40-bit extended floating point precision delivers amazing dynamic range, no loss of signal quality and no degradation.
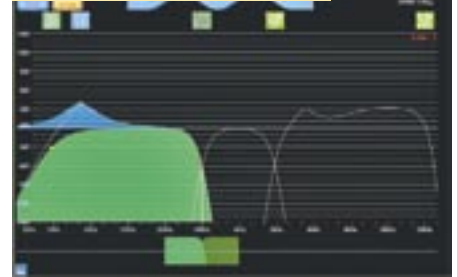
24-bit, galvanically-isolated, 96 kHz analog converters and digital I/O gives you the ultimate in sonic transparency for both live and studio processing.

Precise, responsive remote metering lets you see everything as you hear it.

Even without its innovative touch screen interface, the Lake Contour™ has completely re-defined the all-in-one speaker processor category. With sonic quality so good that several mastering engineers have started using it, Contour's roster of high-profile live sound users is growing daily.

Lake Contour provides a wealth of innovative features, including new methods of equalization, linear phase brick wall crossovers, and true RMS and Soft Clamp limiting on all outputs.

And now, in response to many user requests, we're offering Contour's digital equalization functions in a separate 4-in/4-out version: The new *Mesa Quad EQ*.
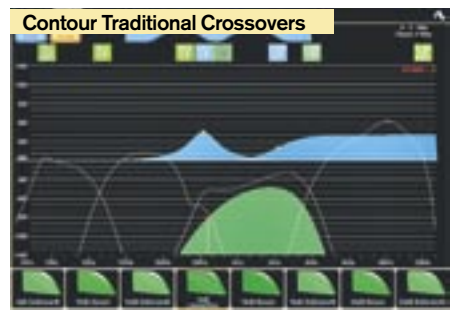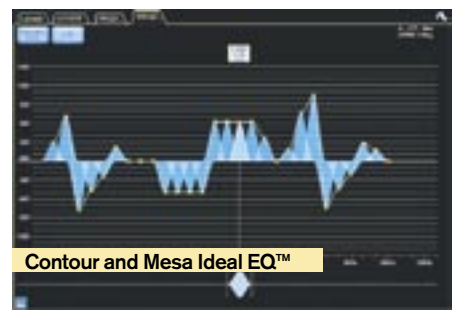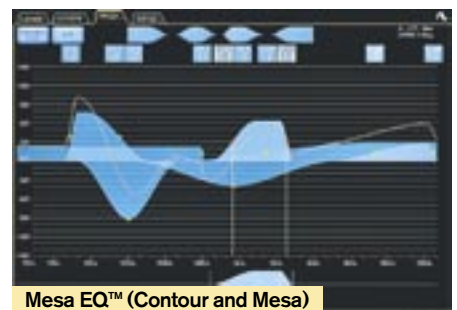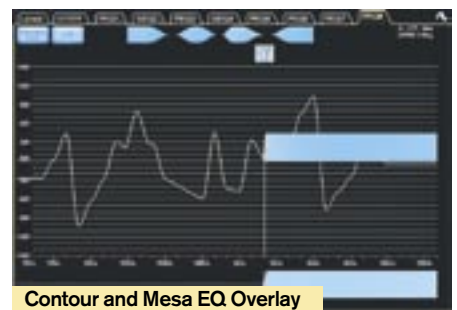
The wireless and Ethernet connectivity of both units gives you centralized control of an unlimited number of processors. Instant adjustments can be made to any parameter of any processor (or group of processors) on the network.

Ultra-accurate EQ control.

How much time have you spent fiddling with graphics and parametrics trying to get the right EQ curve? It's a time consuming and frustrating exercise, and one that you will never do again with the Lake Contour or Mesa.

Instead of individually adjusting settings on separate EQs, you can create a virtually unlimited number of filters and apply them to entire systems with a few strokes of a pen. And with the proprietary Mesa filter you can quickly correct for common asymmetrical speaker responses with a single filter.

Both units remove the problem of filter interaction too. Our *Raised Cosine Filters* are ultra smooth yet give you pin-point accuracy: when you cut 3 kHz, you're not cutting 2 kHz and 4 kHz at the same time.

Contour and Mesa EQ Overlay

Mesa EQ™ (Contour and Mesa)

Contour and Mesa Ideal EQ™

Contour Traditional Crossovers

EQ Overlays. The Lake Contour and Mesa Quad EQ Overlay interface provides a logical separation of equalization functions within each processing module, and also enables the ability to group processing modules. Each Overlay can either be an Ideal *Graphic* EQ™ Overlay, or a Lake Mesa EQ™ *Parametric* Overlay. Each Overlay provides a different set of tools for rapid use of the virtually unlimited number of EQ filters.

Unique Mesa Filter. The Lake proprietary Mesa Filter is a significant advance in EQ technology. Where other processors provide standard symmetrical boost and cut functions, the Mesa Filter offers asymmetric filtering, with the ability to separate the sides of a parametric section, change center frequencies and adjust slopes independently. This places a faster, more effective optimization tool in the your hands — one that can truly match the asymmetrical responses of loudspeakers.

Ideal Graphic EQ™. The Ideal Graphic EQ is the next generation graphic equalizer. It is not implemented in the traditional sense, rather it uses Raised Cosine Filters that provide better selectivity than conventional filters. Ideal Graphic EQ filters sum to flat, thus providing a true response equalizer. This results in controls that provide exactly what is expected by the end user.

Linear Phase Brick Wall Crossovers.

The Lake Contour introduces linear phase brick wall crossovers, with transition slopes in excess of 180 dB per octave. The benefits are dramatic when applied to loudspeaker arrays.

Off-axis lobing and cancellation between loudspeakers are dramatically reduced.

Linear phase response enables different speaker cabinet types to be easily mixed and matched.

Impulse response of a loudspeaker is significantly improved, providing a time-coherent wavefront.

Improvements of up to 3 dB or more in acoustic output power may be expected in some frequency ranges.

True RMS and Soft Clamp Limiters.

Lake Contour and Mesa offer True RMS limiting on each output channel. By calculating the true RMS value of every sample, the system produces acoustically transparent results even under extreme limiting conditions. The Soft Clamp limiter removes the possibility of clipping by gently removing audio peaks, thus restricting the signal output's swing that would otherwise drive an amplifier into distortion.

Flexible control at all levels.

Tuning large systems can be very time consuming. One minute you want to make a sweeping change that affects the entire system; next minute you need to fine-tune just one array, or just a side fill. With a conventional setup you would be running around changing settings, listening, then making more adjustments.

All Contour and Mesa processors can be networked and managed as a single system on the Lake Controller wireless touch screen.

With our powerful speaker grouping system, you can zero in on and adjust your system at any level, from individual speakers and arrays, to the entire system without ever leaving your chair. That means you can do in seconds what used to take hours.

Listen, measure and optimize with built-in SmaartLive®.

The Contour is the first speaker processor to fully integrate with SmaartLive® analysis tools from SIA™. Now you don't have to rely solely on your ears, because the Contour presents Smaart measurements *directly on your wireless touch screen*, and gives you the tools you need to optimize even the toughest setups.

Once you've measured the system response with SmaartLive, our unique Mesa Filters give you the ideal way to fix the problems you find. By creating your own asymmetrical Mesa EQ functions, you can — with the stroke of a pen— dramatically improve the sound of almost any venue.
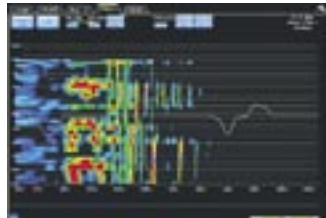
And now for the first time, you can toggle between spectrum, spectrograph and transfer functions, viewing the results of your EQ changes as you hear them.
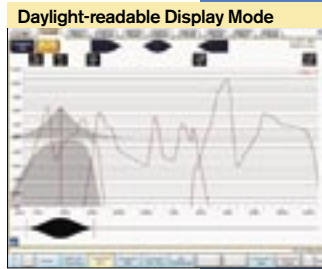

SmaartLive® Transfer Function

Contour and Mesa Levels Display

Contour and Mesa Spectrograph

Contour and Mesa Spectrum Display

Lake® Mesa™ Quad EQ

Contour's extraordinary EQ capabilities in a 4-in / 4-out configuration.

Wireless touch screen remote

Full networked control across all processors

Exclusive Lake Mesa EQ™ filters

Ideal Graphic EQ™

Full integration with Smaart Live™

Field-proven, bullet-proof reliability.

Mesa and Contour are built to perform. Night after night, or continuously in permanent installations. And we have a multi-year track record as proof.

Less than three seconds from switching them on, you'll hear sound passing through — just as you left it the last time. As *Mix* magazine put it, *"Parameters are stored in nonvolatile memory, so if the Contour loses power during operation…it returns to its exact pre-power loss state. If a network communications problem occurs, then the sound out from Contour's processors continues without interruption."*

We've also made sure that Contour and Mesa can't be tampered with by giving you two distinct operating modes. In the password protected "designer" mode you can change every setting. When you're finished, set access privileges and switch to "user" mode. All of your critical settings will be safely out of reach, while providing operators with the interface they need. Save all your settings for a show and recall them on the night, or months later when you (or an act) returns to the venue.

Studio-quality sound — on the road or in the studio.

On tour or in a professional installation, you shouldn't be spending time dealing with poor connections, hisses, pops or hums from cheap hardware. That's why we engineered Contour and Mesa with…

The highest quality, best-sounding converters you'll find in any loudspeaker processor. Each converter has its own clean, isolated power source and runs at full 24-bit, 96 kHz resolution. And there's also an optional stereo AES/EBU digital input on Contour to make it even cleaner.

40-bit Floating-Point Extended Precision. Lake Contour and Mesa provide the ultimate in processing resolution through the entire signal path. Every aud-io calculation uses 40-bit precision, resulting in amazing dynamic range, no loss or degradation of signal quality.
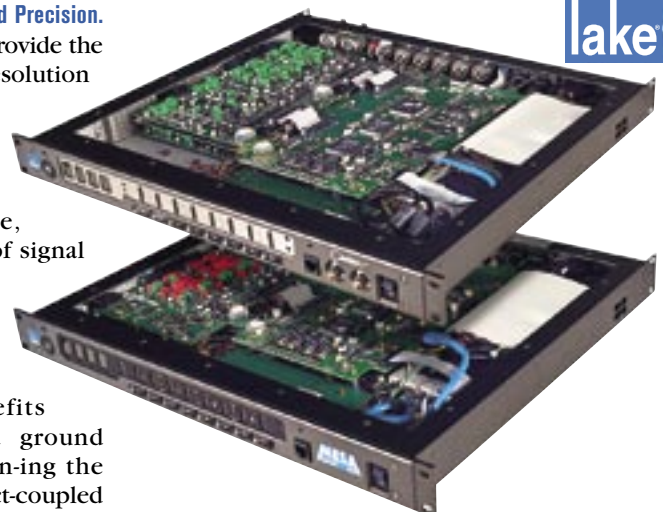
Iso-Float™ Ground Isolation. Lake Iso-Float technology incorporates the benefits of transformer-coupled ground isolation while maintain-ing the advantages of clean, direct-coupled inputs and outputs. The audio converters are galvanically isolated, and not connected to the main ground. This tech-nique uses high-speed trans-formers and opto-isolators to create a barrier between the device and any grounding aberrations from the outside electrical environment.
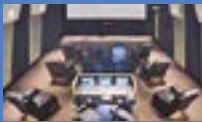

Experience Contour and Mesa at www.proaudio.lake.com.

Test drive Lake Controller software on your computer. Download manuals, specifications and white papers. View our video tour of the Lake Contour System.

The more you learn, the more you'll agree that we've created the world most powerful speaker processors. Then join the touring companies and recording studios who rely on Lake Technology.

Daylight-readable Display Mode

Lake® Contour™

Lake® Mesa™ Quad EQ

PC and Uplink Ethernet ports • Analog outputs • Iso-Float ground lift • Analog inputs • Stereo digital input and output

Digital I/O • Iso-Float ground lift

Audio Performance

Conversion Resolution	24-bit
Internal Sampling Frequency	96 kHz
Internal Data Path	40-bit floating-point
System Propagation Delay	2 msec, input to output
Maximum Available Delay	2 sec, input to output
Iso-Float 3-position switch	1) I/O grounded to device 2) Inputs floating 3) I/O floating

Digital-to-Analog Audio Outputs

Frequency Response	+0/–0.1 dB, 3 Hz to 20 kHz
THD + Noise (unweighted)	0.0005% typical at 1 kHz 0.0007% typical, 20 Hz to 20 kHz
Dynamic Range (unweighted)	111 dB typical, 20 Hz to 20 kHz
Output Impedance	50 Ohms
Maximum Output Level	+21 dBu
Crosstalk between Outputs	Better than -100 dB, 2Hz to 40 kHz

Analog-to-Digital Audio Outputs

Frequency Response	+0/–0.1 dB, 2 Hz to 20 kHz
THD + Noise (unweighted)	0.0005% typical at 1 kHz 0.0006% typical, 20 Hz to 20 kHz
Dynamic Range (unweighted)	113 dB typical, 20 Hz to 20 kHz
Input Impedance	20 kOhm balanced, 10 kOhm unbalanced
Maximum Input Level	+ 24 dBu
Input Sensitivity Trim Range	+12 dBu to +24 dBu, adjustable in 1 dB steps
Input Common Mode Rejection Ratio	Better than 65 dB, 20 Hz to 20 kHz 75 dB typical at 1 kHz 70 dB typical at 20 kHz
Crosstalk between Inputs	Better than –100 dB, 2 Hz to 40 kHz

Combined A/D and D/A

THD + Noise (unweighted)	0.0007% typical at 1 kHz 0.0009% typical, 20 Hz to 20 kHz
Dynamic Range (unweighted)	109 dB typical, 20 Hz to 20 kHz

Lake® Contour™ and Mesa™ Quad EQ Specifications

AES/EBU Digital Input/Output

Supported Resolutions	up to 24-bit
Supported Sample Rates	44.1 kHz, 48 kHz, 88.1 kHz, 96 kHz

Audio Equalization

EQ Overlays	8 per Module, 4 per Group PEQ or GEQ modes
Mesa Filters	Asymmetric filtering, two frequency and slope controls per filter. Available on PEQ Overlays
Ideal Graphic Equalizers	Raised-Cosine filter bank, EQ controls precisely match response. Available on GEQ Overlays
Conventional Filters	Low Shelf, High Shelf & Parametric Raised Cosine Filters available on PEQ Overlays

Crossovers (Lake Contour Only)

Linear Phase Crossovers	Transition slopes exceeding 180 dB per octave
	Choice of 24 dB and 48 dB per octave slopes
	Adjustable Alignment delay
Classical Crossovers	Bessel, Butterworth, Linkwitz-Riley up to 48 dB per octave
Output EQ filters	Traditional High shelf, Low shelf and Parametric filters assignable to each output

Connections – Lake Contour

Analog Inputs/Outputs	2 female XLR, 6 male XLR
Stereo Digital Input/Output	5-pin XLR, supplied with fanout
Ethernet	3 10BaseT: RJ-45 (2 PC, 1 Uplink)
	2 10Base2: BNC Thin Coax
Power In	3-pin IEC

Connections – Lake Mesa Quad EQ

Analog Inputs/Outputs	4 female XLR, 4 male XLR
Digital Input/Output	DB-25 for use with standard

	XLR fanout (not included)
Ethernet	3 10BaseT: RJ-45 (2 PC, 1 Uplink)
Power In	3-pin IEC

Physical

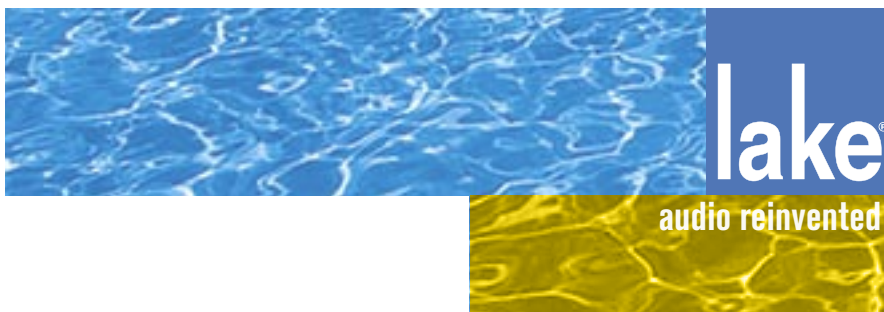|	
Chassis Height	1.72 in (4.37 cm)
Width	19.00 in (48.26 cm)
Depth	15.75 in (40.00 cm)
Net Weight	14 lb (6.35 kg)

Electrical

Power	100 to 240 VAC (±10%)
Consumption	60 Watts maximum
CE, CSA and FCC Compliance Safety	UL6500, EN 60065, CB scheme, EMC FCC part 15 Class A, EN 55022, EN 55024

Platform Requirements

Operating System	Windows® 2000, XP
PC Requirements	600 MHz Pentium® III, 128 MB RAM
	Windows® 2000 SP2 or later
	DirectX 8.1 or higher
	8MB VRAM
Ethernet Interface	10BaseT wired and/or 802.11 WiFi

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lake®

audio reinvented