

## The Mark Levinson N° 31.5 Reference Digital Transport



When the [Mark Levinson N° 31](#) was introduced in 1992, it was immediately hailed as a breakthrough in digital transport design. Adopted as the reference for myriad reviewers, manufacturers and music lovers around the world, it became the standard against which everything else was measured. In large part, the N° 31 owes its success to its massive, no-compromise approach to mechanical isolation of the transport mechanism from external influences, combined with innovative digital output circuitry that minimized electrical sources of [jitter](#).

After years of continued research and development, the Madrigal design team is proud to introduce the next Reference CD Transport: the N° 31.5. Building on the solid foundation of its predecessor, the N° 31.5 extends the already remarkable measures taken to eliminate vibration-induced distortions of the digital signal. The N° 31.5 isolates its critical master clock on a separate circuit board. This small board enjoys its own, dedicated power supply and employs a special suspension designed to reduce mechanical vibrations. As a result, the custom-made, five part-per-million crystal oscillator benefits from unprecedented electro-mechanical isolation, enabling it to provide unmatched stability.

But the N° 31.5 goes much further than conventional electrical and mechanical isolation. Using a highly refined version of Madrigal's proprietary Closed-Loop Jitter-Reduction™ (CLJR™) system, the N° 31.5 actually improves the qua of the digital signal before passing it along to the digital processor. The CLJR system uses a small memory buffer in conjunction with the reference clock discussed above. Operating at 256x the sampling rate, this precision clock controls precisely when each successive bit of information is allowed to leave the N° 31.5 on its way to the digital processor and ultimate conversion to analog. To ensure that the next bit of information ready to go at its appointed time, the transport mechanism is slaved to the needs of a "perfect" output (as defined by the reference clock). A 2x industrial CD-ROM mechanism is used to read the data on the disc, due to its greater ability to respond quickly to the needs of the output.

In readying the next Reference CD transport, every detail was reviewed and evaluated. Even the massive lid was investigated for possible improvements, resulting in a new lid assembly. The new lid features a special constrained damping construction, new ball/race bearings and full software control for quieter, more responsive operation. A mere touch of the open lid will close it and cause the N° 31.5 to read the disc's table of contents.

### Technical Highlights

- Closed-Loop Jitter-Reduction™ circuitry reduces jitter to unprecedented levels for proved accuracy and musicality.
- Fully optimized AES/EBU, S/PDIF, ST and EIAJ outputs for compatibility with a wide range of digital processors.
- New lid assembly with constrained damping, quieter operation and improved control.
- Existing N° 31 Reference CD Transports may be upgraded.

### CLJR™ Circuitry



First introduced in the [Mark Levinson N° 37 CD Transport](#), the Closed-Loop Jitter-Reduction circuitry in the N° 31.5 incorporates several refinements appropriate to its position as a Reference product. The critical reference clock is the same custom-made part used in the original N° 31, but it now enjoys its own, dedicated and double-regulated power supply and a separate, vibration-absorbing suspension. This exceptionally stable reference clock controls the rate at which musical information is released from a small memory buffer in the digital output stage (which has its own, separately-regulated power supply). The result is virtually total freedom from internally-generated jitter, and unmatched timing accuracy in the output.

### Output Versatility

The N° 31.5 supports the four most common digital interfaces, each of which has been carefully optimized to deliver the finest performance its standard allows. As a direct result, the N° 31.5 performs optimally with any digital processor without having to resort to techniques which would limit its compatibility to other Mark Levinson products.

The N° 31.5 supports both AES/EBU and S/PDIF electrical interfaces. A new complementary driver for the balanced AES/EBU electrical output delivers outstanding performance to the high quality XLR connector. Single-ended S/PDIF electrical output is provided via a custom-made Madrigal RCA connector. Both the ST and the EIAJ (sometimes called "Toslink®") outputs use special, high-bandwidth parts for optimal performance.

### Improved Lid Assembly

A three-layer constrained damping system minimizes vibration in the already substantial lid assembly to further isolate the transport mechanism from external influences that would otherwise degrade sound quality. A new counterbalance system, combined with a 66:1 gear reduction motor and ball/race bearings make lid operation almost silent.

### Upgrade Options

Owners of existing N° 31 transports have several upgrade options available to them. For more information, contact your local, authorized Mark Levinson dealer.