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**VIA MAIL & EMAIL** publicworks@marlboro-nj.gov

27 September 2007

Mr. Robert DiMarco
Director, Public Works
Marlboro Township
1979 Township Drive
Marlboro, NJ 07746

cc: Mr. James Priolo, P.E., Township Engineer, jim@birdsall.com

Re: Route 18 Noise Monitoring
Marlboro Township, New Jersey
OAA File 3479A

Dear Mr. DeMarco:

As agreed, we have conducted a noise survey along the Route 18 corridor in Marlboro Township to document traffic noise at the abutting residential properties. I understand from you that the Township wants to document traffic noise levels at residences to submit a case to the New Jersey State Department of Transportation (NJDOT) in order to request that the State fund a Type II highway noise control barrier program along areas of Route 18.

We selected the Monmouth Heights subdivision at which to deploy the monitors in consultation with Township staff. Monmouth Heights is among the oldest subdivisions along Route 18 in Marlboro Township. It lies east of Route 18 between Wyncrest Road and Route 79, South Main Street.

**CRITERIA**

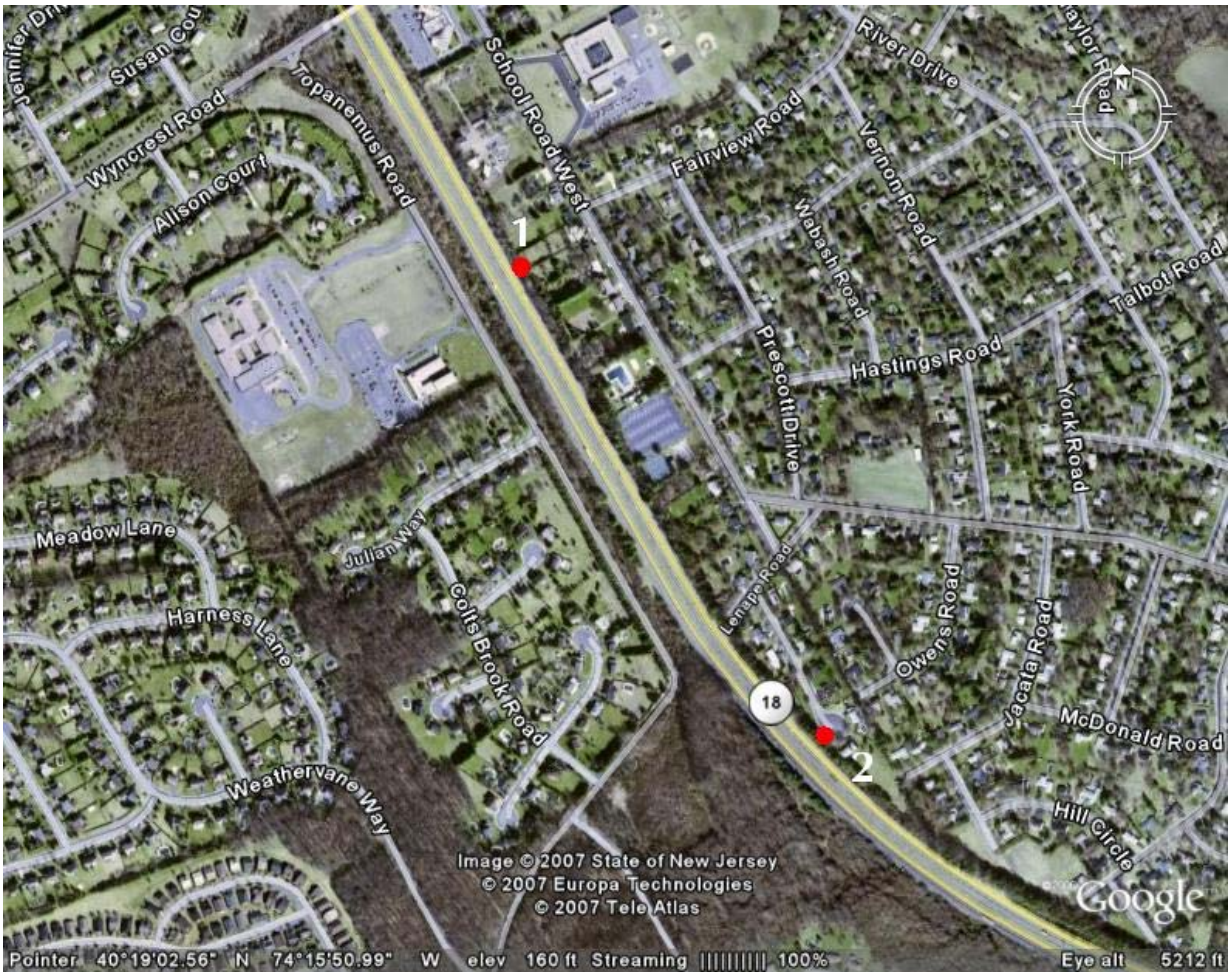
The NJDOT documents its policy on noise control barriers under the Traffic Noise Management Policy and Noise Wall Design Guidelines, 2003, in which the NJDOT follows Code of Federal Regulations 23 CFR 772, "Procedures for Abatement of Highway Traffic Noise and Construction Noise".

Noise abatement criteria in 23 CFR 772 requires that the hourly A-weighted sound level must approach [within 1 dB(A)] or exceed an $L_{eq}$ of 67 dB(A) or an $L_{10}$ of 70 dB(A) for a residential area, in activity category B. Either the $L_{eq}$ or the $L_{10}$ may be used as the criteria, but not both. In addition, to be considered for a Type II mitigation program the houses must have been built on or before 1975.

## NOISE MONITORING

On 21 September 2007, I visited the site to deploy automated sound measuring monitors. The automated sound monitors were deployed at locations shown in Figure 1. These locations were selected along the northbound side of Route 18 to typify house locations along the Monmouth Heights subdivision. The automated monitors, Larson Davis type 720, were programmed to obtain data for forty-eight hours over two weekdays beginning at 0100 hours on 24 September to 0100 hours on 26 September.

**Figure 1 – Route 18 corridor and sound level monitor locations.**




Location 1 is behind 91 School Road West, Block 322 Lot 17, and typifies the northernmost residences found in Monmouth Heights. Location 2 is on Spencer Circle and typifies central and southern Monmouth Heights houses. Both monitors were attached to the fence buffering Route 18 from residences.

The monitors measured the A-weighted sound level 8 times per second on a SLOW time weighting basis and stored the 1-minute average of those samples continuously for the duration of the measurement period. Hourly statistics were calculated and stored by the monitor in addition to the 1-minute average sound levels. Both sound level monitors were calibrated before and after the measurement period using a Bruel & Kjaer Model 4230 calibrator last certified by an outside calibration service in August 2007. The calibration is traceable to the National Institute of Standards and Technology (NIST).

**RESULTS**

The detailed results of the sound survey are provided graphically in Figures 2 through 9. Figures 2 through 5 are plots of the 1-minute time history for each location for the two days. Following the time history plots are Figures 6 through 9 that show the hourly statistics observed at each location during the two days. Statistics include the maximum ($L_{max}$), minimum ($L_{min}$), and average ($L_{eq}$) values, as well as $L_{10}$, $L_{33}$, $L_{50}$, and $L_{90}$, which respectively represent the sound level exceeded 10, 33, 50 and 90% of the time.

The dominate steady noise source for all locations is traffic from Route 18. Sound levels are highest when traffic is greatest between 0500 and 2200 hours, as shown in Figures 2 through 5.

Statistical results from Figures 6 through 9 show that $L_{eq}$ and $L_{10}$ levels exceed the noise abatement criteria of 23 CFR 772, 67 dB(A) and 70 dB(A) respectively, for at least 15 hours, from 0500-to-1900 hours, each day at both locations. The $L_{10}$ exceeds 70 dB(A) for 20 hours each day at Location 2.

❑ ❑ ❑ ❑

I trust the above is useful to you. If you have any questions please let me know.

Sincerely yours,

**OSTERGAARD ACOUSTICAL ASSOCIATES**

Benjamin C. Mueller, P.E.
Senior Engineer

Enclosures

Project: Rt. 18 Corridor Noise Study
Project Number: 3479A

Figure 2 - Measured Sound Levels at Location 1
at Monmouth Heights, Marlboro Twp. N.J.
Starting 24 September 2007

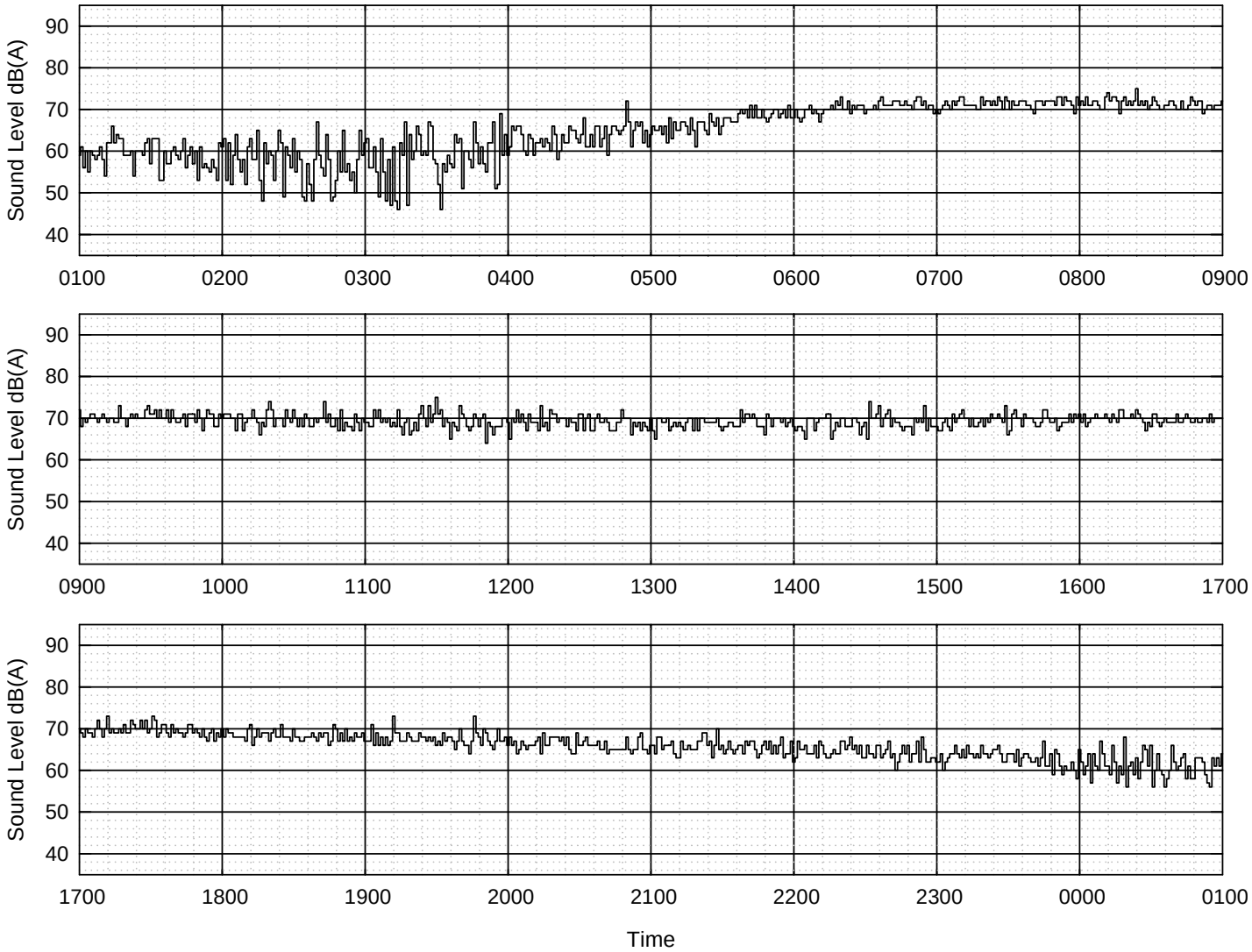


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Figure 3 - Measured Sound Levels at Location 1
at Monmouth Heights, Marlboro Twp. N.J.
Starting 25 September 2007

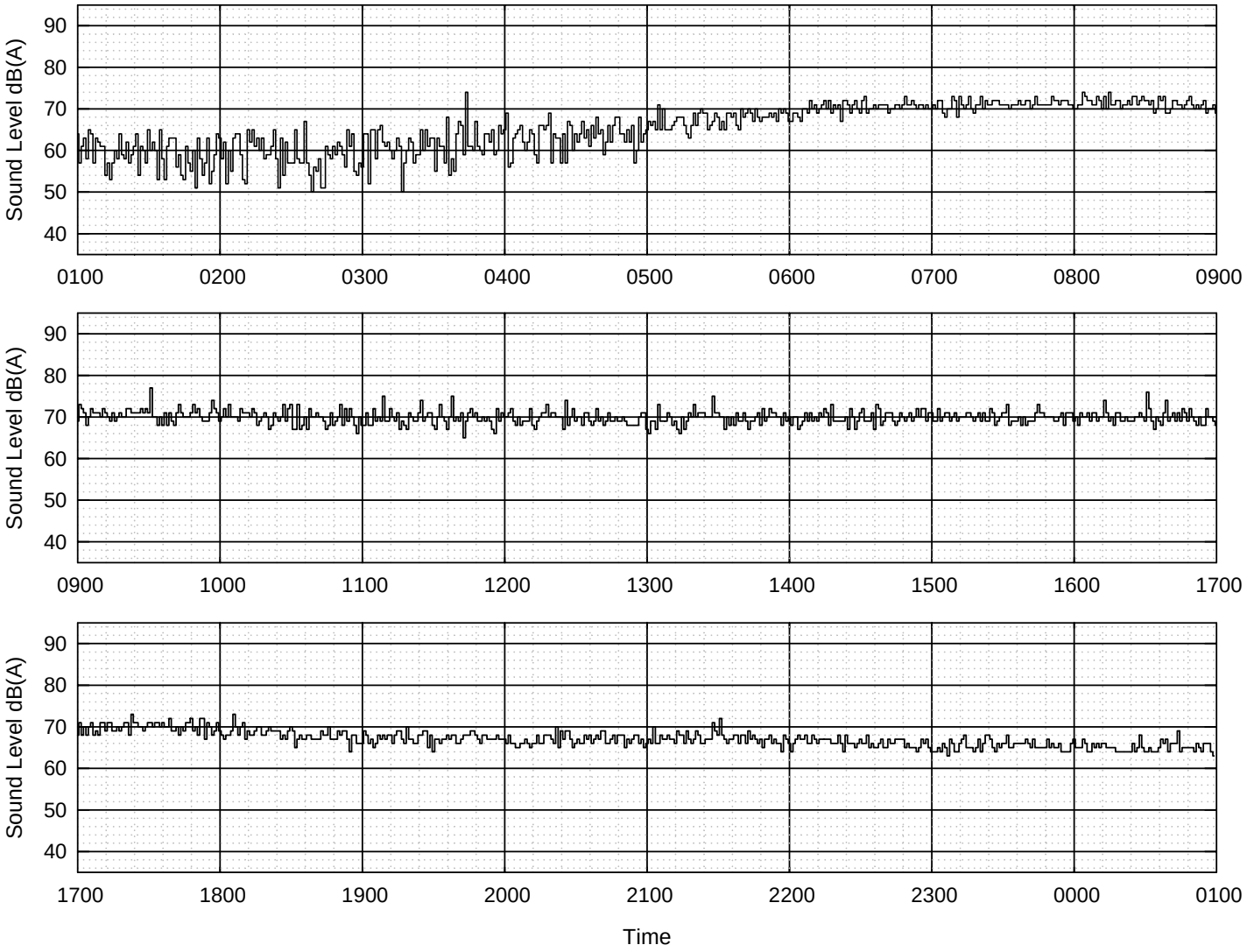

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Figure 4 - Measured Sound Levels at Location 2
at Monmouth Heights, Marlboro Twp. N.J.
Starting 25 September 2007

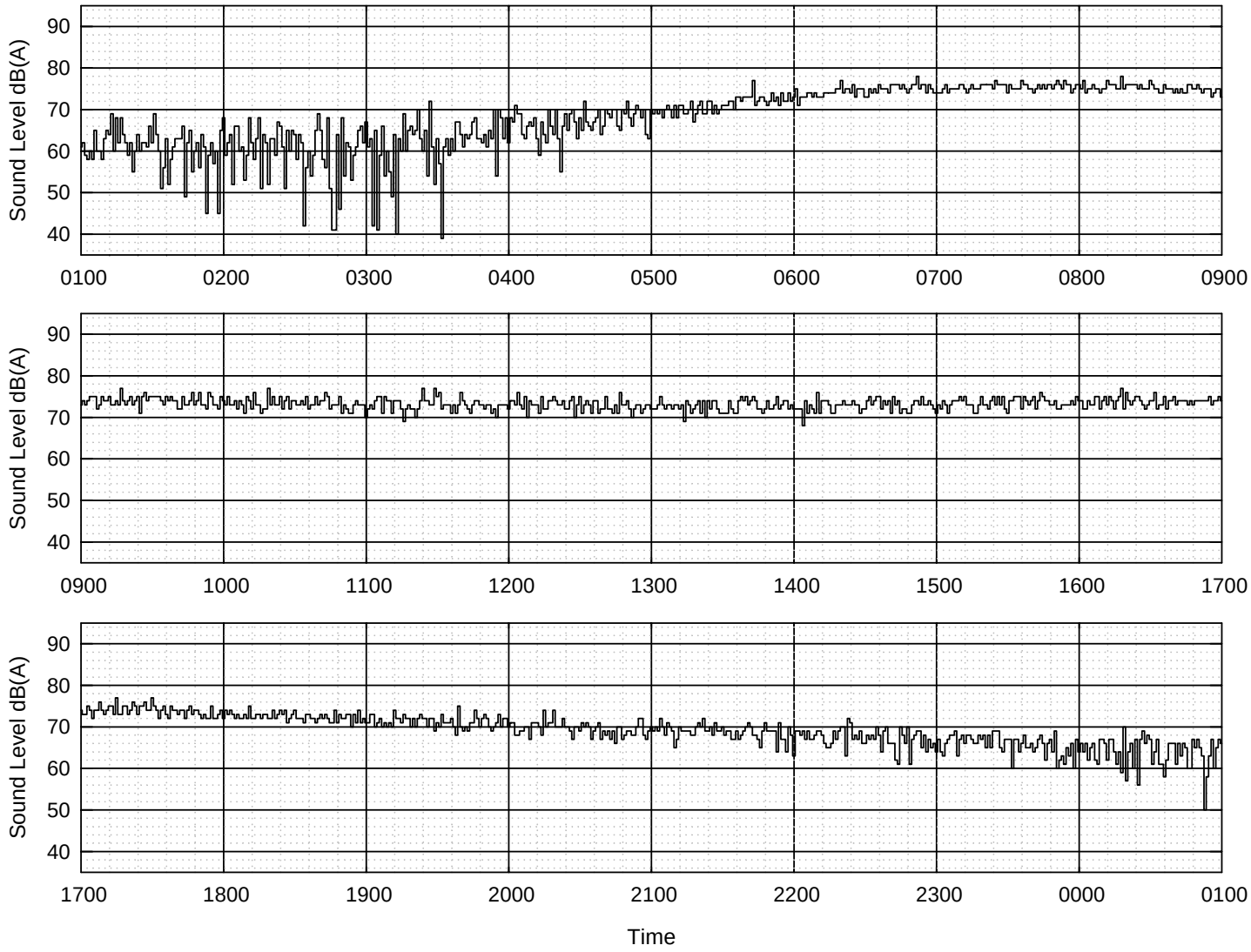

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Figure 5 - Measured Sound Levels at Location 2
at Monmouth Heights, Marlboro Twp. N.J.
Starting 25 September 2007

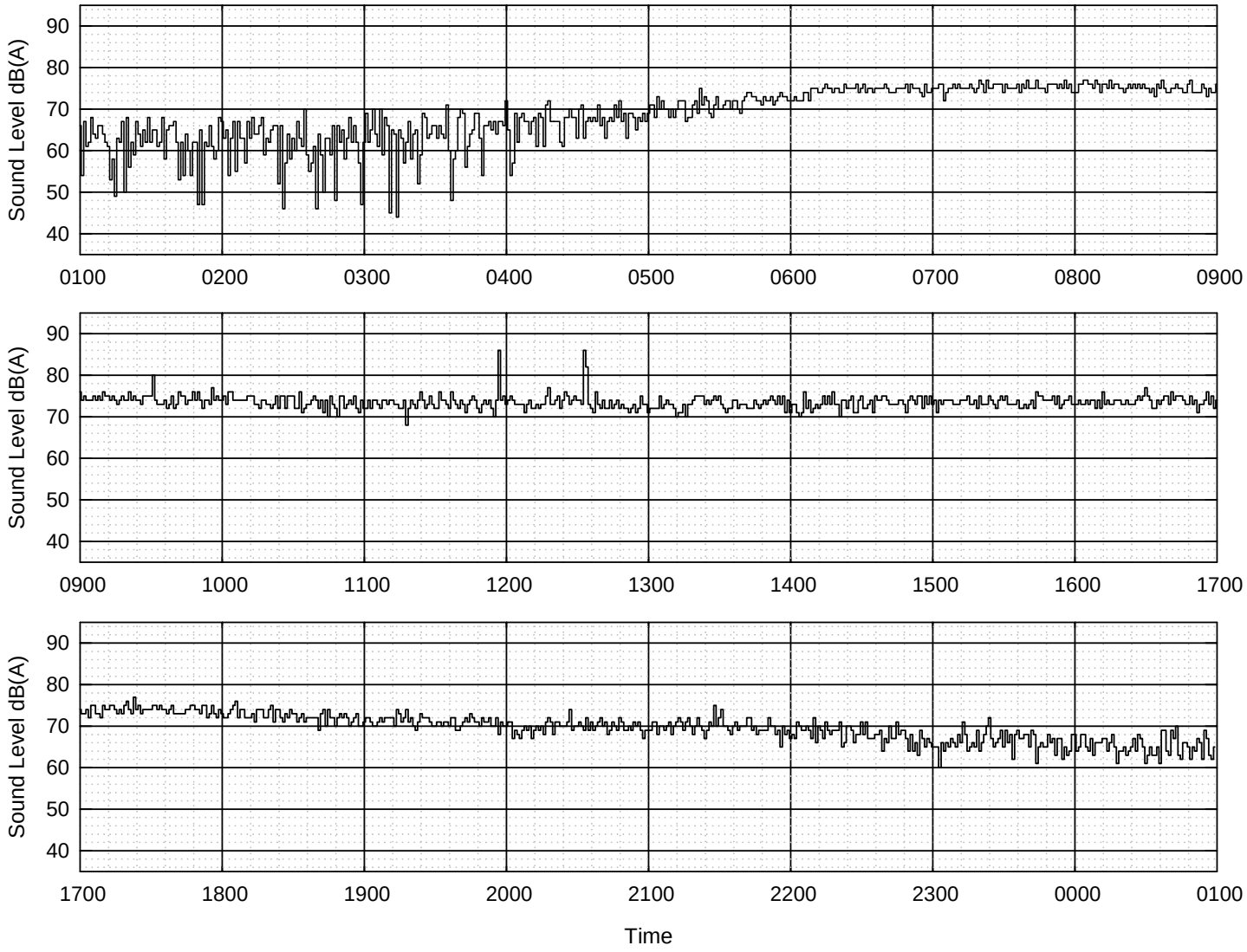

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Figure 6 - Statistical Distribution of Sound Levels at Location 1
at Monmouth Heights, Marlboro Twp. N.J.
Starting 24 September 2007

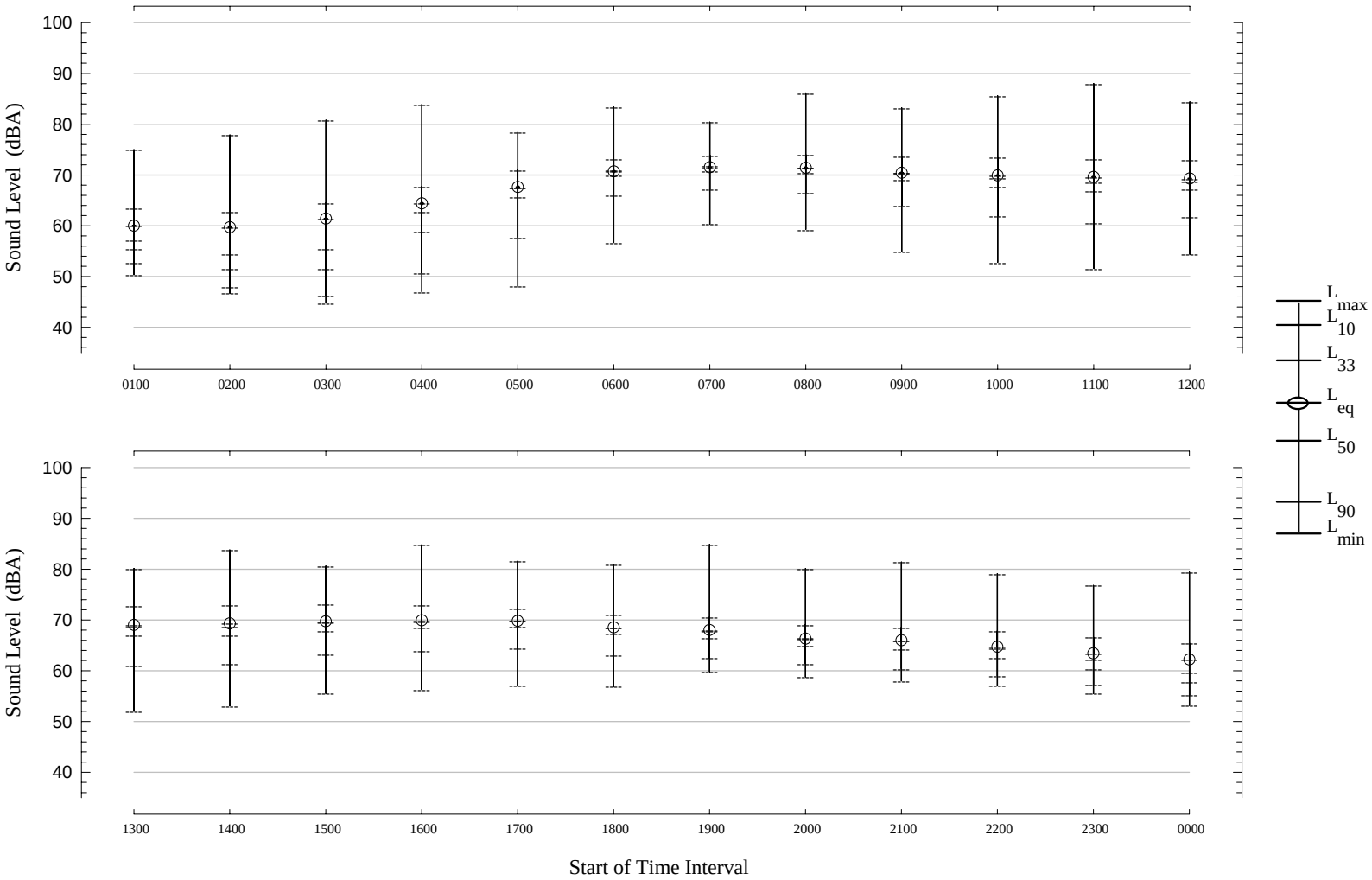

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Figure 7 - Statistical Distribution of Sound Levels at Location 1
at Monmouth Heights, Marlboro Twp. N.J.
Starting 25 September 2007

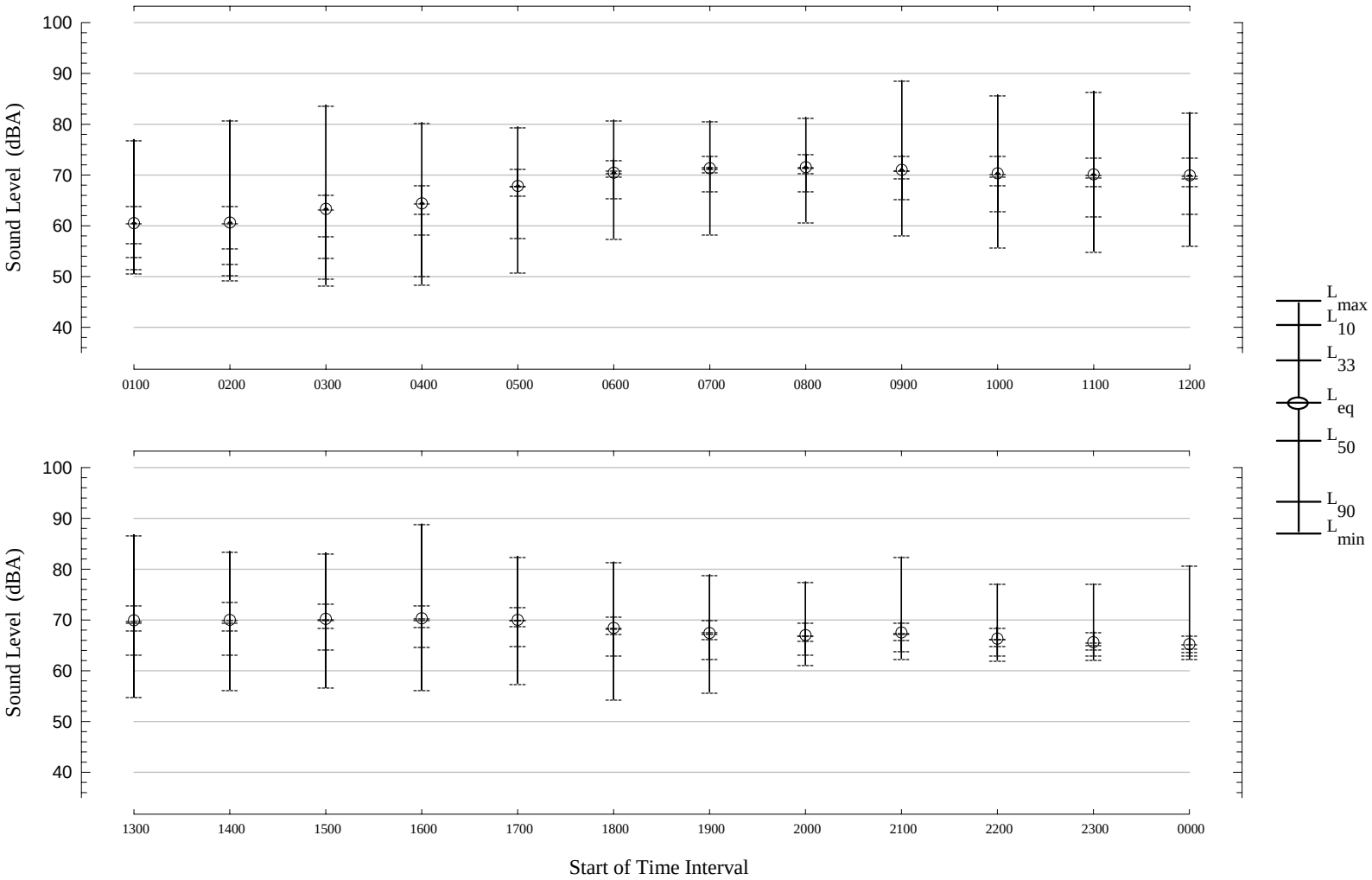

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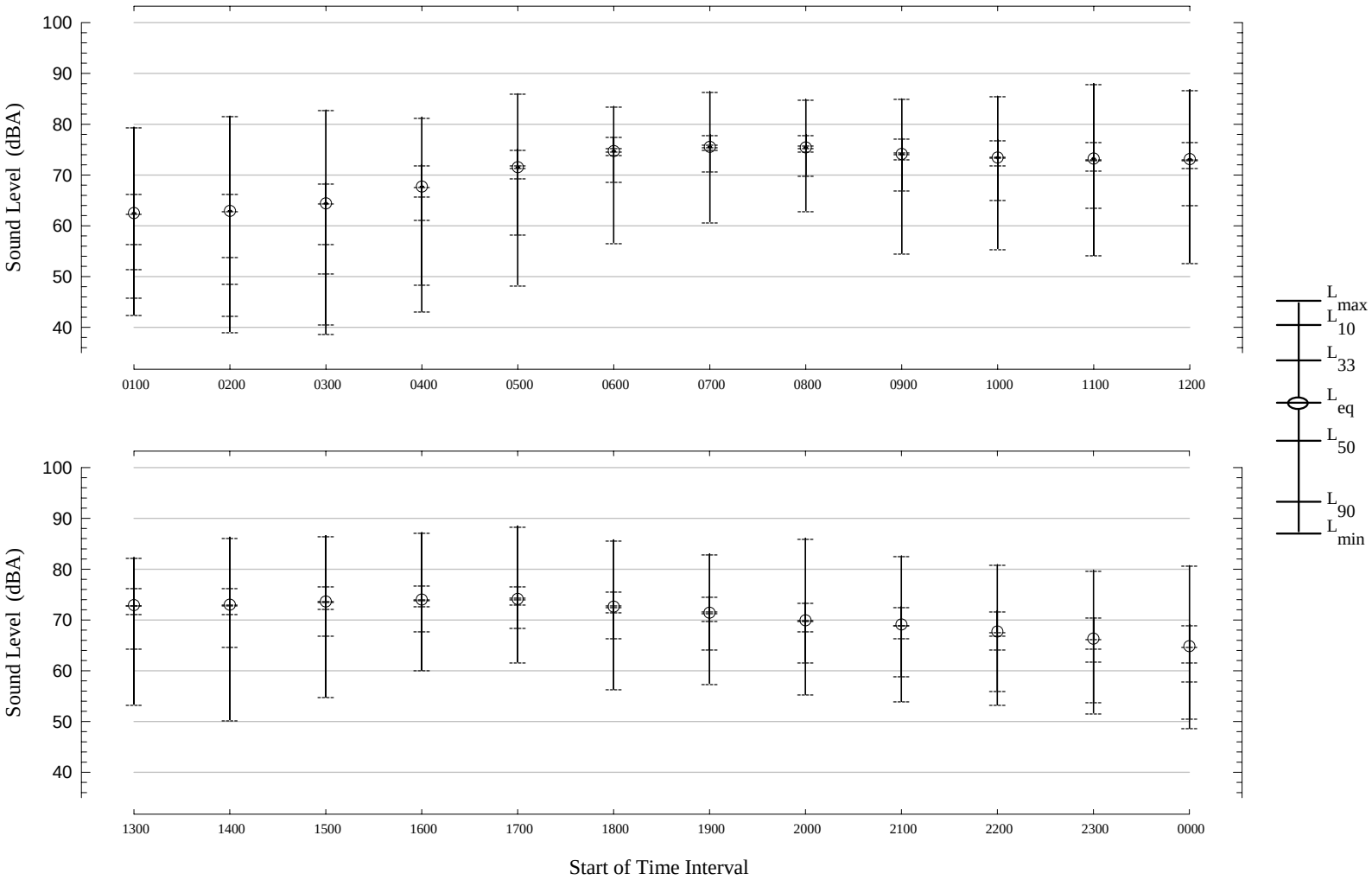
Figure 8 - Statistical Distribution of Sound Levels at Location 2
at Monmouth Heights, Marlboro Twp. N.J.
Starting 24 September 2007



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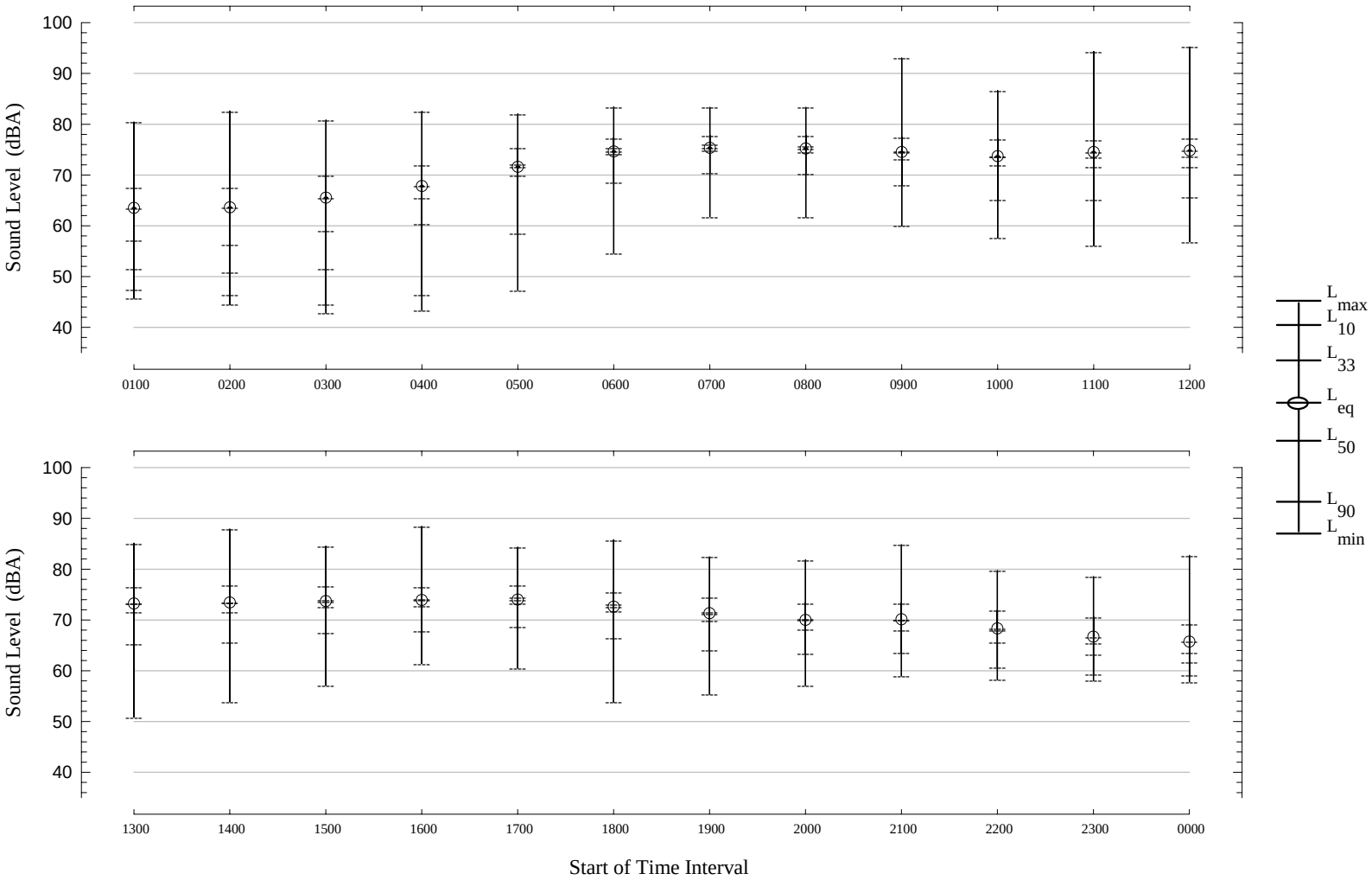
Figure 9 - Statistical Distribution of Sound Levels at Location 2
at Monmouth Heights, Marlboro Twp. N.J.
Starting 25 September 2007