



7 south blair street • madison, wi 53703
608.255.0511 • 608.255.2750 fax • afa@audioforthearts.com

12 November, 2012

Report on sound pressure levels at 556 State Street apartments, Apt. #12

Jeff, the resident of apartment #12, was given loan of two sound pressure level (SPL) meters for the purpose of measuring sound pressure levels on evening of Friday 11-09-12 and into the morning of Saturday 11-10-12, and also on the evening of Saturday 11-10-12 and into the morning of Sunday 11-11-12.

Meter #1 is a Radio Shack meter with digital readout. It was set for "A" weighting.
Meter #2 is a Tenma 72-860 meter with digital readout. It was set for "C" weighting.

"A" weighting is set for A-curve frequency characteristics. At this setting, the meter responds mainly to frequencies ranging from 500Hz to 10kHz. These are the frequencies most commonly occupied by common sounds such as human speech.

"C" weighting has C-curve (also called "flat") frequency characteristics and causes the meter to respond to frequencies ranging from 32Hz to 10kHz. These are the frequencies used by a wide range of sources, including amplified music.

The comparison points I will use for Jeff's readings come from the report titled "Noise Sources and Their Effects", from Purdue University. It is modified from <http://www.wenet.net/hpb/dblevels.html> on 2/2000. Sources: Temple University Department of Civil/Environmental Engineering (www.temple.edu/departments/CETP/environ10.html), and *Federal Agency Review of Selected Airport Noise Analysis Issues*, Federal Interagency Committee on Noise (August 1992). Source of the information is attributed to *Outdoor Noise and the Metropolitan Environment*, M.C. Branch et al., Department of City Planning, City of Los Angeles, 1970. I will henceforth refer to this document as the Noise Comparisons Chart, or NCC.

For the sake of accuracy and consistency, I will be using only the "C"-weighted readings for this report. "C"-weighting, because of its extended low-frequency readings, is best able to capture the noise levels experienced by the building tenants*. The readings Jeff took at 8:20pm on Friday, when his apartment was quiet, before the music started at Whiskey Jacks, were 35dB ("A" weighted), and 61.3dB ("C" weighted). I would consider these to be normal ambient levels. The NCC compares the 40-50dB range to a library, bird calls or the "lowest limit of urban ambient sound". It compares the 60-70dB range to conversation in a restaurant or at home, or to the sound of large electrical transformers at a distance of 100 feet. In my view, this is a comfortable ambient noise range for a home environment.

From 11:00pm until after 2:00am on both days, the C-weighted readings are consistently in the mid- to high-80's, with one reading of 90.4dB, taken at 1:41am on Sunday, November 11, 2012.

According to the NCC, the 80-90dB range is comparable to the following: Garbage disposal, dishwasher, average factory, freight train (at 15 meters). ...propeller plane flyover at 1000 feet (88dB); diesel truck at 40mph at 50 ft.; diesel train at 45 mph at 100 ft. (83dB). It is roughly twice as loud as 70dB and can cause "possible damage [to hearing] in 8 hours' exposure".

According to the NCC, the 90-100dB range is comparable to a Boeing 737 or DC-9 aircraft at one nautical mile before landing; power mower; motorcycle at 25 ft (90dB); Newspaper press (97dB). In the comment margins, it describes this range as being "4 times as loud as 70dB. Likely damage [to hearing] in 8 hours' exposure". In my view, noise in the 80-90.4dB range would make for an extremely uncomfortable living situation, would likely make sleep impossible, and, with extended periods of exposure, presents potential damage to the resident's hearing.

Copies of the reports are attached.

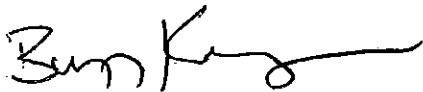
My professional resume: Co-owner of Audio for the Arts, LLC in Madison, WI. Recording engineer, audio consultant and amplified sound engineer since 1974. Former Technical Director of "A Prairie Home Companion" with Garrison Keillor. Recording engineer with recommendations from Maestro John DeMain and cellist Yo-Yo Ma, among others. Forensic audio re-enactment and analysis for attorneys such as William R. Jones; see quote below.

"When our firm needed a quality crime scene sound recreation to present to a jury, the people at Audio for the Arts had the equipment and expertise to make a compelling presentation. I recommend them highly." - William R. Jones, Attorney, Madison

Please feel free to call me to discuss these findings and conclusions.

*Note: Low frequencies are omni-directional and can pass through solid objects much more efficiently than high frequencies. This is why, when a car passes by your home with the stereo turned up, from inside your home you do not hear cymbals, vocals or guitars, but rather the low, booming sound of the bass drum or bass guitar.

Sincerely,



Buzz Kemper

Co-owner, Audio for the Arts, LLC

Noise Sources and Their Effects

Noise Source	Decibel Level	comment
Jet take-off (at 25 meters)	150	Eardrum rupture
Aircraft carrier deck	140	
Military jet aircraft take-off from aircraft carrier with afterburner at 50 ft (130 dB).	130	
Thunderclap, chain saw. Oxygen torch (121 dB).	120	Painful. 32 times as loud as 70 dB.
Steel mill, auto horn at 1 meter. Turbo-fan aircraft at takeoff power at 200 ft (118 dB). Riveting machine (110 dB); live rock music (108 - 114 dB).	110	Average human pain threshold. 16 times as loud as 70 dB.
Jet take-off (at 305 meters), use of outboard motor, power lawn mower, motorcycle, farm tractor; jackhammer, garbage truck. Boeing 707 or DC-8 aircraft at one nautical mile (6080 ft) before landing (106 dB); jet flyover at 1000 feet (103 dB); Bell J-2A helicopter at 100 ft (100 dB).	100	8 times as loud as 70 dB. Serious damage possible in 8 hr exposure
Boeing 737 or DC-9 aircraft at one nautical mile (6080 ft) before landing (97 dB); power mower (96 dB); motorcycle at 25 ft (90 dB). Newspaper press (97 dB).	90	4 times as loud as 70 dB. Likely damage 8 hr exp
Garbage disposal, dishwasher, average factory, freight train (at 15 meters). Car wash at 20 ft (89 dB); propeller plane flyover at 1000 ft (88 dB); diesel truck 40 mph at 50 ft (84 dB); diesel train at 45 mph at 100 ft (83 dB). Food blender (88 dB); milling machine (85 dB); garbage disposal (80 dB).	80	2 times as loud as 70 dB. Possible damage in 8 h exposure.
Passenger car at 65 mph at 25 ft (77 dB); freeway at 50 ft from pavement edge 10 a.m. (76 dB). Living room music (76 dB); radio or TV-audio, vacuum cleaner (70 dB).	70	Arbitrary base of comparison. Upper 70s are annoyingly loud to some people.
Conversation in restaurant, office, background music, Air conditioning unit at 100 ft	60	Half as loud as 70 dB. Fairly quiet
Quiet suburb, conversation at home. Large electrical transformers at 100 ft	50	One-fourth as loud as 70 dB.
Library, bird calls (44 dB); lowest limit of urban ambient sound	40	One-eighth as loud as 70 dB.
Quiet rural area	30	One-sixteenth as loud as 70 dB. Very Quiet
Whisper, rustling leaves	20	
Breathing	10	Barely audible

[modified from <http://www.wenet.net/~hpb/dblevels.html>] on 2/2000. SOURCES: Temple University Department of Civil/Environmental Engineering (www.temple.edu/departments/CETP/environ10.html), and *Federal Agency Review of Selected Airport Noise Analysis/Issues*, Federal Interagency Committee on Noise (August 1992). Source of the information is attributed to *Outdoor Noise and the Metropolitan Environment*, M.C. Branch et al., Department of City Planning, City of Los Angeles, 1970.