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Acoustic Engineering Report

US Rack Distributors – Acoustiquiet 42U



by Peter Jackson
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Holliston, Mass

Acoustic Engineering Report

Date: Aug 8th, 2010

Originator: Peter Jackson

Project N°: 100628

Subject: Measurement of the Noise Reduction Potential of AcoustiQuiet Rack Enclosure

Objective:

To measure and report the acoustic performance of a AcoustiQuiet 42U Rack Cabinet using AAP/AP 2010 procedure

Foreword:

The enclosure to be tested was placed in a typical office room with the back of the enclosure at a normal distance from the wall. The background noise levels inside the enclosure and in the office room were measured in one-third octave bands. A special calibrated 2U rack box with rear facing miniature speakers was installed in the middle of the rack with the remaining spaces covered with blanking plates. Sound pressure Levels and the articulation index were then calculated for a calibrated test noise with all cooling fans running. The average noise in each one-third octave band was then calculated with a weighting for the measurement made at the front of the enclosure. The source signal is then changed to white noise and the level recorded with the source inside the enclosure compared to the level without an enclosure and the resultant level difference is the Insertion Loss of the Rack Enclosure.

The interpretation is that dB(A) (A weighted levels) give a measure of the overall energy levels as perceived by the listener, whereas AI (Articulation Index) is more closely related to comfort as it is a measure of how loud one has to speak in order to be understood by the listener. That is to say below 10% AI, speech is considered unintelligible; above 100% AI intelligibility is perfect.

In practical construction terms dB(A) tends to be controlled by the low frequency booms and cooling fan noise whereas (AI) is a function of mid to high frequency noise.

Results: (see graphs attached)

This test was conducted in accordance with test method AAP/AP 2010

The test enclosure was a US Rack Distributors Acoustiquiet 42U with 6 thermostatically controllable cooling fans lined with the 2011 upgraded acoustical material.

Sound Pressure Level	58.3dB(A)
Articulation Index	113%
NIC	15.4dB

Details of the test method, test location and test instrumentation are available on request.

Prepared by:

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Reviewed by:

Circulation:

Acoustic Performance of AcoustiQuiet 42U
NIC calculated from Insertion Loss using ASTM E413
Noise Level simulated with 74dB Calibrated Noise Source in Rack

