



Audiometer Calibration

Certification and Electro-acoustic Test Systems

Applications

- Audiometer certification
- Audiometer testing
- Earphones and hearing aid testing
- Electro-acoustic testing

Typically used in:

- Clinics and Hospitals
- Universities and Research Programs
- Workplace Hearing Conservation Programs

Features

- Full line of artificial ear couplers and accessories including new AEC201-A, IEC 60318-1:2009 Ear Simulator and AMC493B Artificial Mastoid
- Verify audiometers quickly and accurately using ANSI S3.6-2004 Specification for Audiometers
- Test virtually every type of transducer such as supra-aural, extended range circumaural, bone vibrator, hearing aid, insert earphone, and speaker
- Automatically correct the RETSPLs for microphone, coupler, and all other response adjustments using AUDit™ software
- Perform level and frequency adjustments during audiometer tests
- Qualify audiometric booth ambient noise with real time 1/3 octave analysis and fast pass/fail results (MPANL)
- Store and recall tests in databases; query databases by audiometer, technician, date, etc.
- Print custom reports and certificates for your clients or your archives



Portable, Rugged and Accurate

Larson Davis audiometer calibration systems combine the power and versatility of the System 824 real time analyzer with AUDit™ software to create a complete, portable audiometer test and calibration solution. Standard audiometer tests can be performed manually on the sound level meter or automatically with AUDit™ software which controls the sound level meter to run a full battery of audiometer performance and accuracy tests. For interfacing with the wide variety of audiometer transducers used, Larson Davis offers NBS 9-A, IEC 60318 and other couplers as well as an extremely practical artificial mastoid. The combination of AUDit™ and the 824 is a field ready solution for fast, comprehensive audiometer calibration.

System 824: Electro-acoustic analyzer and precision SLM

Level, frequency, FM, and pulse measurements are only some of the capabilities of the System 824 real time analyzer when fitted with 824-AUD firmware.

Narrow-band FFT and real time 1/3 octave analysis make measurements such as THD and ambient noise easy and accurate.

AUDit™ PC Software automates the test process, walking you through the complete calibration process.

After the test procedure you can easily print pass/fail reports and calibration certificates. Data can also be exported to Microsoft® Excel.





An integration of SLM/OBA analyzer, software and couplers for fast, comprehensive in-clinic testing or field calibration of Audiometers



824-AUD Firmware

additional features such as FM and pulse, plus a powerful 400-line FFT for narrow-band analysis and total harmonic distortion.

Real time analysis for HL, frequency & THD

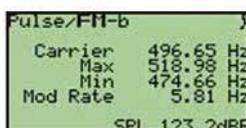
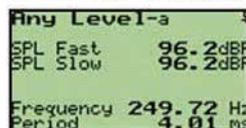
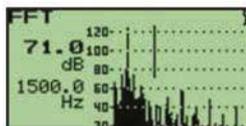
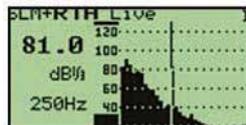
Hearing level measurements are simple using the real time 1/3 octaves of the System 824. The 400-line FFT mode displays frequency bands to locate and measure harmonics for THD measurements. A precision counter accurately samples the period of a tone and displays it along with frequency.

All pulse measurements on a single screen

When pulsed stimulus capability must be tested, simply present the tone and read all measured values on a single screen of the System 824. Rise, Fall, ON and OFF times are measured with millisecond accuracy. Plateau duration and overshoot level are also averaged and displayed on the same screen.

Test frequency modulated stimuli

The characteristics of the FM presentation can be viewed just as easily. The System 824 measures minimum and maximum frequencies, calculates the carrier frequency and also measures the modulation rate.



Audit™ PC Software

AUDit™ Software offers test management, audiometer database, and reporting

Audiometer calibration used to be time consuming and error prone, requiring a great deal of note-taking and calculation. AUDit™ software has been designed to simplify those steps and streamline testing.

Complete test definition and information

Measurement system: tracking of all test equipment is easy because AUDit maintains a database of your calibrators, microphones, couplers, mastoid, and 824 SLM with model, serial number and calibration date information. It can also import individual device sensitivity or response information directly from a supplied file (.csv format).

Audiometer description: enter a complete description of the tested audiometer, its capabilities (such as type and frequencies), and its transducers. Future tests can recall this configuration.

Level corrections: done automatically from entered or imported microphone and coupler data.

Perform exhaustive calibrations of the Audiometer Setup and Test Location

Ambient (booth) noise level test: the ambient noise present during an audiometric test must not affect the test subject. LD has integrated this test into AUDit™. Simply calibrate the microphone, then start the test. Failed frequencies are reported with a large red X.

Speaker tests, visual inspection: these are only two of the many tests that are available. Previous audiometer tests can be recalled and re-tested with ease and saved as a new measurement.

Perform all, or select only desired tests: the main measurement screen displays a selection of tests, as well as their current status. Once a test is selected, simple prompts indicate what stimulus is required. Adjustments can be made immediately if applicable.

Generate results, reports and certificates

Results: each test displays immediate results on screen, with measured data and standards-defined limits. It is possible to retest any failed frequency, level or function individually.

Custom reports and certificates: any stored calibration may be printed in whole or part. A certificate can also be printed, with your customized, client-ready certification text.

Export from database: should you desire even more flexibility, test results can be exported as .csv files.



Test Accessories

AEC100 NBS 9-A 6-cc Coupler for 1 in. Microphone
A rugged artificial ear for testing supra-aural earphones



The AEC100 Coupler is a precision acoustic coupler designed primarily for the calibration and test of supra-aural earphones used in audiometry. It allows accurate and repeatable measurements within its frequency response (up to 8 kHz). It may also be used for production testing where correlation between the coupler and real ear response is not a requisite.

AEC201-A IEC 60318-1 Ear Simulator
A new Ear Simulator for testing a variety of earphones using the latest standards



AEC201-A is a new ear simulator designed to be used with both supra-aural and circumaural earphone at frequencies up to 16000 Hz. Its design meets the requirements of IEC 60318-1:2009 Edition 2 and ANSI S3.7 section 5.4 which make it compatible with earphones like TDH 39, TDH 49, TDH 50, HDA200 and Koss HV/1A. The AEC201-A is supplied with the 377B13 microphone and a Type 1 adapter plate. The optional AEC201-2 is a Type 2 adapter plate for testing earphones such as Koss HV/1A. Weights, accessories and the AEC201-A are all packaged in a durable weather-tight case.

AMC493B Artificial Mastoid
Use this innovative transducer for bone vibrator testing



The AMC493B artificial mastoid is a precision mechanical coupler used to calibrate bone conduction hearing aids and audiometer bone vibrators.

The AMC493B is cost effective and simple to use. Its patented design converts the vibrator force output to an acoustic signal measured with the system's sound level meter. It is used with the AEC100 coupler or AEC201-A Ear Simulator to perform bone vibrator tests.

Optional Couplers for Insert Type Hearing Aids and Earphones



Model AEC203
 IEC60126
 IEC60318-5
 ANSI S3.7 2cc
 (For 1 in. Microphone)



Model AEC202
 IEC60126
 IEC60318-5
 ANSI S3.7
 (For 1/2 in. Microphone)

Occluded-Ear Simulator



Model AEC304
 IEC60318-4
 IEC60711:1981
 (includes 1/2 in. 12.5mV/Pa
 matched microphone)
 For the measurement of earphones
 coupled to the ear by ear inserts

Coupler Selection Guide

Earphone	Examples	Coupler
Supra-Aural	TDH 39, 49, 50, HDA 280, DT-48, Holmberg 8103	AEC100
Supra-Aural	TDH 39, 49, 50	AEC201-A
Insert Earphone	ER-3A, 3A (EAR)	AEC202/-203
Insert Earphone (occluded)	ER-3A, 3A (EAR)	AEC304
Circumaural	HV/1A, HDA 200	AEC201-A



Ready to use systems or custom configurations: Larson Davis has a solution for your audiometer or electro-acoustic test

The following systems are configured for exhaustive audiometer testing. The SYS008, SYS010 and SYS012 are for certification of audiometers with circumaural or supra-aural earphones. If you calibrate audiometers that include bone vibrators, the SYS009, SYS011 and SYS013 include the AMC493B artificial mastoid. Call Larson Davis to configure a system for your exact needs.

Item	Description	SYS008	SYS009	SYS010	SYS011	SYS012	SYS013
SLM	Precision Sound Level Meter	824	824	824	824	831	831
Firmware	Audiometer calibration firmware	824-AUD	824-AUD	824-AUD	824-AUD	831-OB3	831-OB3
AUDit	PC software for audiometer calibration	✓	✓	✓	✓		
Calibrator	Class 1 acoustic calibrator	CAL250	CAL250	CAL250	CAL250	CAL200	CAL200
Cable	10 ft (3 m) extension cable	EXA010	EXA010	EXA010	EXA010	EXC010	EXC010
Case	Custom carrying case	CCS007	CCS007	CCS007	CCS007	CCS042	CCS042
Cable	PC to SLM data cable	CBL006	CBL006	CBL006	CBL006	CBL138	CBL138
DVX011	Serial to USB Adapter for CBL006	✓	✓	✓	✓		
ADP010	For electrical and ambient noise	✓	✓	✓	✓	✓	✓
AEC100	NBS 9-A Coupler for 1 in microphone	✓	✓				
377A15	1 inch pre-polarized pressure microphone	✓	✓				
AEC201-A	IEC 60318-1:2009 Ear Simulator with 377B13 microphone			✓	✓	✓	✓
AEC201-2	Type 2 Adapter plate			Optional	Optional	Optional	Optional
AMC493B	Artificial mastoid for bone vibrator test		✓		✓		✓

System Components

System 824 with 824-AUD	Integrating Precision SLM (Type 1) with A, C, Flat Weighting, >80/105 dyn. Range, Low Noise Preamplifier (PRM902), NiMH Battery 1/1 Octave Band: 16-16kHz, 1/3 Octave: 12.5-20kHz, 400-line FFT: 1, 2, 5, 10, 20 kHz
CAL250	Class 1 Acoustic Calibrator, 114dB, 250 Hz, 1 in. Opening, 1/2 in. Adaptor (ADP019)
CAL200	Class 1 Acoustic Calibrator, 94 or 114dB, 1000 Hz, 1/2 in. Opening
AEC100	Artificial Ear Coupler (6cc) for 1 in. Microphone (NBS 9A) with Adaptor, Weight, Pillow
AEC201-A	Ear Simulator with 377B13 Microphone, Adaptor, Weight, Pillow
AEC202	Artificial Ear Coupler (2cc) for 1/2 in. Microphone
AEC203	Artificial Ear Coupler (2cc) for 1 in. Microphone
AEC304	IEC 60711:1981 Ear Simulator Including 1/2 in. Microphone
AMC493B	Artificial Mastoid Including Storage Humidor

Standards

System 824	ANSI S1.4 Type 1, ANSI S1.11 Type 1D, IEC 60651 and 60804 Class 1, IEC 61260 Class 1, IEC 61672-3
AUDit Software	ANSI S3.6-2004 Specifications for Audiometers, ANSI S3.7-1995(R2007) Methods for Coupler Calibration of Earphones, ANSI S3.1-1991(R2008) Maximum Permissible Ambient Noise Level for Audiometer Test Rooms.
AEC100	ANSI S3.7-1995, IEC 60318-3:1998
AEC201	ANSI S3.7 Section 5.4, IEC 60318-1: 2009, Directive 2004/108/EC
AEC202	IEC 60318-5:2006
AEC203	IEC 60318-5:2006
AEC304	IEC 60318-4:2010
AMC493B	ANSI S3.13-1981(R2007), IEC 60318-6: 2007, Note: Patented Low Thermal Mass Design Varies From Design Features in Standard.

Physical

SYS0xx	Weight: 22 lbs (10 kg), CCS007 and CCS042 Dimensions: 20 1/2 x 16 3/4 x 8 1/2 in (520 x 425 x 216 mm)
AEC201-A	Weight: 3.2 lbs (1.4 kg)
AMC493B	Weight: 0.2 lbs (0.05kg)



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LD-AUDit-0716

Printed in U.S.A.

For environmental noise monitoring and building acoustics, **Larson Davis** offers a full line of instruments, accessories and software. For personal noise and vibration exposure monitoring, Larson Davis complements this with sound level meters, personal noise dosimeters, human vibration meters, audiometric calibration systems and hearing conservation programs.

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