



SYSTEMS FOR AUDIOMETRIC CALIBRATION



AUDIOMETER CALIBRATION

Certification and Electro-acoustic Test Systems



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 **LARSON DAVIS**
A PCB PIEZOTRONICS DIV.



Audiometric Calibration

When you need to test and measure an audiometer's performance to ensure accurate test results, Larson Davis is ready to support you with a fully inclusive Audiometer Calibration System. AudCal Systems deliver a complete package of hardware, firmware, and software designed to streamline your testing. At the heart of the system is the Larson Davis SoundAdvisor™ Model 831C Sound Level Meter, trusted by acoustic professionals around the globe to make precise measurements.

Packaged in a rugged case as a turnkey solution, AudCal Systems eliminate setup time by allowing audiometer tests to be performed quickly and easily right in the box. Whether you are performing a typical audiometric test, a booth qualification for ambient noise, or a speaker test, Larson Davis is here to simplify your measurement challenges.

Test for These Functions

- Signal distortion
- Frequency
- Hearing level
- Linearity
- Pulsed signals
- Speech signals
- Frequency modulation (FM)
- Narrowband noise level
- Broadband noise level
- Sound booth noise levels
- Cross-talk and on/off ratio

PORTABLE AUDIOMETER CALIBRATION SYSTEM

AudCal

The new SoundAdvisor Audiometer Calibration System AudCal is a field-ready solution for fast, comprehensive audiometer calibration. The system combines the power and versatility of the SoundAdvisor Model 831C sound level meter with the accessibility and functionality of the LD G4 Utility Software. AudCal works seamlessly with a tablet for both testing and data collection—no PC is required. Artificial ear couplers and mastoids are available to simplify the challenge of interfacing with a wide variety of audiometer transducers.

AudCal creates a complete, portable audiometer test and calibration solution. Access the meter on a PC or through the app on your mobile device to setup and run the full suite of tests with ease. Measurement capabilities include frequency, hearing level, FM, and pulse. Narrowband FFT and real time 1/3 octave analysis make measurements such as total harmonic distortion (THD) and ambient noise easy and accurate.

After completing the test suite, generate a test report and certificate that details the pass/fail, and parameters of each test. Test reports can be exported as a PDF that can be printed, shared, and saved.

- **For All Your Transducers** – test virtually every device including supra-aural & circumaural headsets, bone vibrators, insert earphones, speakers, and sound booths
- **Couplers to Simplify** – artificial ear couplers and accessories including AEC201-A “318” ear simulator, AEC100 “NBS 9/A” coupler, AMC493B artificial mastoid, and AEC304 occluded ear simulator
- **Qualify Booths** – audiometric booth ambient noise with real-time 1/3 octave analysis and fast pass/fail results
- **Store and Recall Tests** – the AudCal system offers comprehensive search capabilities of previous tests

Simplify your testing while collecting, analyzing, and reporting your data via the AudCal software and/or the app on your tablet or PC:

- **Intuitive Software** – AudCal Software leads you through each step with automatic detection of signals using four different standards including ANSI S3.6 (2010) and IEC 60645 (2017)
- **Mobile Connectivity** – setup, control, and run your test from a mobile device using the AudCal app available for both iOS and Android
- **Automatic Corrections** – the AudCal Software corrects for reference equivalent threshold for sound pressure levels (RETSPL) for microphones and couplers as well as other response adjustments
- **Real-time Adjustments** – perform level and frequency adjustments during audiometer tests
- **Reports are Easy** – print, email, share, or store reports and certificates for your client or your archives



FIRMWARE, SOFTWARE & APPS

Bringing You an Audiometric Analyzer

With real-time fractional octave filters, FM and pulse capabilities, plus powerful FFT and narrowband analysis and total harmonic distortion, 831C-AUD creates a fully functional audiometer measurement system.

User Friendly AudCal Software

AudCal software allows you to set up customers and their equipment, run a suite of tests, and generate reports. The software is smart – when you start a new test at an existing location, the software will configure your setup to match what you've done before.

Each test displays real-time results on screen, with measured data and standards-defined limits. Retest any failed frequency, level, or function individually during testing. Results are used to generate reports that can be customized with company logo and technician signatures.

Generate a report with all the data as it appears on the test. You can upload a company logo that populates on the test, and for certificates, create a signature that will electronically appear on the signature line of the certificate, making it so digital sharing can be done immediately.

Accessible AudCal App

Download the latest iOS and Android versions of the Larson Davis AudCal app easily online. Connect your device to the 831C WiFi, open the app, then take control of the test environment. See live data, add/edit customers, and progress through the entire test suite. Through your app you can generate reports/certificates, sign them with the touch-screen, and save to your phone or email the PDF.



ACOUSTIC COUPLERS & EAR SIMULATORS

NBS 9 A 6cc Acoustic Coupler for Supra-Aural Earphone Testing

Model AEC100



Model AEC100 is designed for 1 inch microphones (not included) and the calibration testing of supra-aural earphones used in audiometry

- Delivers accurate and repeatable measurements up to 8 kHz
- Used for production testing where correlation between the coupler and real ear response is not a requisite

Ear Simulator for Supra-Aural & Circumaural Earphone Testing

Model AEC201-A



Model AEC201-A can be used with both supra-aural and circumaural earphone at frequencies up to 16000 Hz

- Meets IEC 60318-1:2009 Edition 2 and ANSI S3.7 section 5.4 requirements
- Compatible with earphones like TDH 39, TDH 49, TDH 50, HDA200 and Koss HV/1A
- Supplied with 377B13 microphone and Type 1 adapter plate (Type 2 available)
- Packaged with weights and accessories in a weather-tight case

Artificial Mastoid for Bone Vibrator Tests

Model AMC493B



Model AMC493B is used to calibrate audiometer bone vibrators

- Pairs with Model AEC100 or AEC201-A to perform bone vibrator tests
- Converts vibrator force output to an acoustic signal measured by the system
- Cost effective and simple to use

Couplers for Insert Type Hearing Aids and Earphones

Models AEC202 & AEC203



- Model AEC202 is used for ½ inch microphones
- Model AEC203 is used for 1 inch microphones
- Both units meet IEC 60126 and IEC 60318-5 requirements
- AEC202 meets ANSI S3.7 2cc and AEC203 meets ANSI S3.7

Occluded Ear Simulator for Insert Type Earphones

Model AEC304



Model AEC304, often referred to as a Series 711 Coupler, is designed to test earphones inserted in the ear

- Includes ½ inch 12.5 mV/Pa matched microphone
- Meets IEC 60318-4 and IEC 60711:1981 requirements

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

AUDCAL SYSTEM CONFIGURATIONS						
Item	Description	SYS014	SYS015	SYS016	SYS017	SYS-UPG
SLM	Precision sound level meter	831C	831C	831C	831C	831C
Firmware	Audiometer calibration firmware	831C-AUD	831C-AUD	831C-AUD	831C-AUD	831C-AUD
Calibrator	Class 1 acoustic calibrator	CAL250	CAL250	CAL250	CAL250	
Cable	6 ft (2 m) extension cable	EXC006	EXC006	EXC006	EXC006	EXC006
Case	Custom carrying case	CCS055	CCS055	CCS055	CCS055	CCS055
DVX014	WiFi adapter for 831C	✓	✓	✓	✓	✓
ADP010	For measuring electrical and ambient noise	✓	✓	✓	✓	
AEC100	NBS 9-A coupler for 1 in microphone	✓	✓			
377A15	1 in pre-polarized pressure microphone	✓	✓	✓	✓	✓
ADP008A	Adapter to mount 1 inch microphone onto PRM831 preamplifier	✓	✓	✓	✓	✓
AEC201-A	IEC 60318-1:2009 ear simulator with 377C13 ½ inch microphone			✓	✓	
AMC493B	Artificial mastoid for bone vibrator test		✓		✓	

MODEL NUMBER	DESCRIPTION
System Components	
SoundAdvisor 831C with 831C-AUD	Integrating Precision SLM (Type 1) with Low Noise Preamplifier (PRM831), NiMH Battery, Firmware for Testing Linearity, Frequency Response, FM, Pulse, Booth Noise, etc.
CAL250	Class 1 acoustic calibrator, 114 dB, 250 Hz, 1 in opening, ½ in adapter (ADP019)
AEC100	Artificial ear coupler (6cc) for 1 in microphone (NBS 9A) with adapter, weight, pillow
AEC201-A	Ear simulator with 377C13 microphone, adapter, weight, pillow
AEC202	Artificial ear coupler (2cc) for ½ in microphone
AEC203	Artificial ear coupler (2cc) for 1 in microphone
AEC304	IEC 60711:1981 ear simulator including ½ in microphone
AMC493B	Artificial mastoid including storage humidior
Standards	
SoundAdvisor 831C	ANSI S1.4, IEC 61672-1, IEC 60651 and 60804 Class 1, ANSI S1.11 and IEC 61260 Class 1
831C-AUD	Measures requirements from ANSI S3.6 and IEC 60645 specifications for audiometers, ANSI S3.7 methods for coupler calibration of earphones, ANSI S3.1 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 lb (10 kg), CCS055 dimensions: 20 ½ x 16 ¾ x 8 ½ in (520 x 425 x 216 mm)
AEC201-A	Weight: 3.2 lb (1.4 kg)
AMC493B	Weight: 0.2 lb (0.05kg)



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ISO 9001 CERTIFIED

Preliminary

Larson Davis provides complete solutions for noise and vibration measurement and analysis. From stand-alone, simple-to-use instruments to complete systems including sensors, data acquisition, and software, Larson Davis has what you need.

As a part of MTS Systems Corporation, Larson Davis guarantees **Total Customer Satisfaction** through our outstanding limited warranty; no-charge, 24-hour, toll-free technical support; global distribution; and worldwide customer service.

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