LARSON DAVIS
A PCB PIEZOTRONICS DIV.

MODEL **AUDCAL**

AUDIOMETER CALIBRATION SYSTEM

TYPICAL APPLICATIONS

- Audiometer calibration
- Booth qualification for ambient noise
- Speaker testing

PORTABLE, APP-CONTROLLED CALIBRATION

The 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. 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.

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.

larsondavis.com/aud-cal

SIMPLIFYING YOUR TESTING

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.

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.

MULTI-FUNCTIONAL SYSTEM

- **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

USER FRIENDLY SOFTWARE

- **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)
- **Store and Recall Tests –** System offers comprehensive search capabilities of previous tests
- **Reports are Easy –** print, email, share, or store reports and certificates for your client or your archives

ACCESSIBLE APP

- **Mobile Connectivity –** setup, control, and run your tests using the AudCal app
- **iOS and Android –** download the latest version of the app and connect your device to 831C WiFi to take control
- **Control the Test Environment -** See live data, add/edit customers, progress through the full test suite, and generate reports/certificates

ACOUSTIC COUPLERS & EAR SIMULATORS

SUPRA-AURAL EARPHONES

NBS 9 A 6CC COUPLER MODEL AEC100

- Designed for 1–inch microphones (not included) and the calibration testing of supra-aural earphones
- 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

INSERT HEARING AIDS AND EARPHONES

COUPLER MODELS AEC202 & AEC203

- Use AEC202 for ½ inch microphones
- 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

BONE VIBRATOR TESTS

ARTIFICIAL MASTOID MODEL AMC439B

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.

SUPRA-AURAL & CIRCUMAURAL EARPHONES

EAR SIMULATOR MODEL AEC201-A

- Used 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

INSERT EARPHONES

OCCLUDED EAR SIMULATOR MODEL AEC304

- Designed to test insert earphones
- Includes ½ inch 12.5 mV/Pa matched microphone
- Meets IEC 60318-4 and IEC 60711:1981 requirements
- Often referred to as a Series 711 Coupler

WHICH COUPLER SHOULD I USE FOR CALIBRATING AUDIOMETERS?

Head phone	AEC100	AEC201-A	AEC202	AEC203	AEC304	RETSPL	Notes
Ear Tone ER-3A/5A			✓ ✓	✓ ✓	✓ (Occluded)	ISO 389-2 ANSI S3.6	
Koss HV/1A		✓ ✓				ISO 389-5 ANSI S3.6	Use 9-10 N weight and optional AEC201-2
Telephonics TDH-39 3	✓ ✓	✓ ✓				ISO 389-1 ANSI S3.6	Use 4-5 N weight
Telephonics TDH-49	✓	✓ ✓				ISO 389-1 ANSI S3.6	Use 4-5 N weight
Telephonics TDH-50	✓	✓ ✓				ISO 389-1 ANSI S3.6	Use 4-5 N weight
Sennheiser HDA200		✓ ✓ ✓				ISO 389-5 ISO 389-8 ANSI S3.6	Use 9-10 N weight and type 1 adapter plate
Sennheiser HDA280	✓	✓ ✓				ISO 389-1 ANSI S3.6 Sennheiser	Use 4-5 N weight
Sennheiser HDA300	✓	✓				Sennheiser	Use 4-5 N weight
Beyer DT-48	✓	✓ ✓				ISO 389-1 ANSI S3.6	Use 4-5 N weight
Interacoustics DD45	✓	✓				Interacoustics	Use 4-5 N weight
Radio Ear B-71	✓ ✓	✓ ✓				ISO 389-3 ANSI S3.6	Use 4-5 N weight and optional AMC493B weighting mass

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 humidor
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

MODEL NUMBER	DESCRIPTION
Standards (Continued)	
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)

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 in microphone onto PRM831 preamplifier	✓	✓	✓	✓	✓
AEC201-A	IEC 60318-1:2009 ear simulator with 377C13 ½ in microphone			✓	✓	
AMC493B	Artificial mastoid for bone vibrator test		✓		✓	

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Larson Davis offers a full line of noise and vibration measurement instrumentation such as Class 1 and 2 sound level meters, outdoor noise monitoring systems, personal noise dosimeters, human vibration meters, audiometric calibration systems, microphones and preamplifiers, and data analysis software. Instrumentation is used in community and environmental noise monitoring, measurement of building acoustics, managing worker exposure to noise and vibration, and various automotive, aerospace, and industrial applications. Larson Davis is a division of PCB Piezotronics, Inc., a wholly owned subsidiary of MTS Systems Corporations.

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MTS SENSORS

MTS Sensors, a division of MTS Systems Corporation (NASDAQ: MTSC), vastly expanded its range of products and solutions after MTS acquired PCB Piezotronics, Inc. in July, 2016. PCB Piezotronics, Inc. is a wholly owned subsidiary of MTS Systems Corp.; IMI Sensors and Larson Davis are divisions of PCB Piezotronics, Inc.; Accumetrics, Inc. and The Modal Shop, Inc. are subsidiaries of PCB Piezotronics, Inc.

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