AUDIOMETER CALIBRATION

audiometer performance analysis

“Bio-Betty”

Manual Hearing Test Room Booth & Room Background Tests

Automatic Hearing Test Booth & Room Background Tests

octave band filters

DAILY BIOLOGICAL TESTING

Audiometric Calibration Systems

www.quest-technologies.com
Quest Technologies is one of the most widely recognized and respected manufacturers worldwide for safety and industrial hygiene instrumentation and software. It is through our lifelong commitment to continuous quality improvement, product innovation and a mission to delight our customers that we have achieved this status. Our expertise is the measurement, analysis and reporting of exposures to noise, vibration, heat stress, indoor air quality and toxic/combustible gases. We are unique in providing safety and industrial hygiene professionals with "The ONE & ONLY System Solution" to occupational and environmental exposure monitoring and information management – QuestSuite® for Windows®. QuestSuite is a powerful integrated software solution that brings information from all datalogging Quest instruments together in one place.

Quest Technologies is an ISO 9001 Registered Company and an A2LA ISO/IEC Guide 25 Accredited Calibration Laboratory, which ensures that every Quest brand instrument is designed, built and serviced with quality and a sincere commitment to customer satisfaction. Our full line of instrumentation includes:

- Sound Level Meters
- Personal Noise Dosimeters
- Heat Stress Monitors
- Audiometer Analyzers
- Bio-Acoustic Simulators
- Octave Band Analyzers
- Indoor Air Quality Monitors
- Gas Detection Monitors
- Vibration Monitors
- Outdoor Noise Monitoring Systems

We invite you to review the information contained in this brochure with respect to our highly successful audiometric calibration systems. You may review our entire line of products by visiting us at www.quest-technologies.com. For additional assistance, please contact our customer service representatives at; (800) 245-0779 within the U.S., Canada & Puerto Rico, (262) 567-9157 elsewhere, fax us at (262) 567-4047 or e-mail us at sales@quest-technologies.com.
Audiometric Calibration Systems

Applications:

- Daily Biological Testing
- Audiometer Calibration
- Hearing Test Booth Background Checks
- Manual Hearing Test Booth Background Checks
- Automatic Hearing Test Room Background Checks
- Manual Hearing Test Room Background Checks
- Audiometer Performance Analysis

Hearing tests are necessary as part of the OSHA hearing conservation program. Audiometers must be precisely calibrated to accurately detect hearing loss at an early stage and to protect against needless industrial compensable hearing loss. Quest calibration systems thus meet an important need in hearing conservation programs. The systems perform accurate acoustical calibration of most types of audiometers and ensure that the audiograms taken for record are proper and accurate. All systems are portable and are intended to be used by audiologists, occupational health nurses, CAOHC certified audiometric technicians and qualified clinical personnel.

Quest calibration systems provide a wide range of capabilities, extending from sophisticated calibration and verification of clinical microprocessor-controlled systems to simple systems which perform daily biological testing of the audiometer output without the need to use a “person of known hearing”.
The Quest Model AA-175 Audiometer Analyzer is a microprocessor-controlled module that can be used with all Quest sound level meter-based Audiometer Calibration systems to verify the calibration and performance of audiometers. The versatile analyzer can also be used with other manufacturers’ sound level meter systems.

The AA-175 calculates harmonic distortion, frequency, overshoot, rise/fall times, and pulse width. In conjunction with the sound level meter attenuator, the AA-175 calculates decibel levels and linearity. Each computation result is shown on the large LCD digital display.

For recordkeeping purposes a serial printer can be interfaced to the AA-175 to obtain a hard copy print-out. Because the instrument is automatic, the operator need only select the desired test. There are no filters to tune, no levels to adjust, and no calculations to make. The user can simply operate the audiometer and the AA-175 keyboard to calibrate the audiometer.

**Specifications:**

- **Input Voltage:** From SLM: 0.5 to 2.0Vrms (0.16 to 0.63Vrms with 10dB boost)
- **Input Impedance:** 0.01 µF in series with 100 Kohms
- **Frequency:** Measures from 25 Hz to 12 kHz. Accuracy: 0.01% ± 1 count
- **Linearity:** Accuracy: ±0.1 dB. System accuracy is primarily dependent on the SLM attenuator
- **Distortion:** From 250 Hz to 8000 Hz; Range is 15 to 50 dB down (approximately 18% to 0.3% THD). At 125 Hz: Range is 15 to 33 dB down (approximately 18% to 2.2% THD). Harmonics above 20,000 Hz are suppressed. Accuracy: ±2 dB
- **Rise/Fall Time:** Accuracy: 1 cycle ±1 msec. From 5 msec to 1999 msec
- **Pulse Width:** Accuracy: 2 cycles ±1 msec. From 20 msec to 1999 msec
- **Overshoot:** Accuracy: ±0.1dB
- **Output:** For printer: 2 wire, serial data per RS-232
- **Battery:** 2 NEDA 1604A 9-volt alkaline, approximately 10 hours continuous use
- **External Power:** Model 65 Power Pack (Provides 6.3 VAC @ 500mA)
- **Temperature:**
  - Operating: 15°C to 35°C
  - Storage: -10°C to +50°C
- **Humidity:** 0 to 95%, R.H.
- **Size:** 3.25” x 7” x 6.25” (83 x 175 x 160mm)
- **Weight:** 1.75 lbs (800 g)
Model AM-2019 System (Type 1)

Kit Contains

- 1900 Precision Integrating/Datalogging Sound Level Meter
- OB-100 Octave Band Filter
- 1-inch Pressure Microphone
- A-63B Preamp Adapter for 1-inch Microphone
- EC-9A Earphone Coupler and W-440 Weight
- AS-1550 Calibration Stand
- ICM-10 Microphone Cable
- AA-175 Audiometer Analyzer
- LT-20 Linearity Transformer with 59-746 Input Cable
- QC-20 Sound Calibrator
- Carrying Case & AM Calibration Chart

Model AM-2018 and AM-2017 Systems are identical to the AM-2019 System except that the 1800 and 1700 meters replace the 1900 meter.

Model 1900-30020 AM System (Type 1)

Kit Contains

- 1900 Precision Integrating/Datalogging Sound Level Meter
- OB-300 1/3 - 1/1 Octave Band Filter
- 1-inch Pressure Microphone
- A-63B Preamp Adapter for 1-inch Microphone
- EC-9A Earphone Coupler and W-440 Weight
- AS-1550 Calibration Stand
- ICM-10 Microphone Cable
- QC-20 Sound Calibrator
- Carrying Case & AM Calibration Chart

Model 1800-30020AM and 1700-30020AM Systems are identical to the 1900-30020AM System except that the 1800 and 1700 meters replace the 1900 meter.
**Kit Contains**

- 2900 Precision Integrating/Datalogging Sound Level Meter
- OB-100 Octave Band Filter
- EC-9A Earphone Coupler and W-440 Weight
- AS-1550 Calibration Stand
- ICM-10 Microphone Cable
- AA-175 Audiometer Analyzer
- LT-20 Linearity Transformer with 59-746 Input Cable
- QC-10 Sound Calibrator
- Carrying Case & AM Calibration Chart

Model 2800-30010AM and 2700-30010AM Systems are identical to the 2900-30010AM System except that the 2800 and 2700 meters replace the 2900 meter.

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**Kit Contains**

- 2900 Precision Integrating/Datalogging Sound Level Meter
- OB-300 1/3 - 1/1 Octave Band Filter
- EC-9A Earphone Coupler and W-440 Weight
- AS-1550 Calibration Stand
- ICM-10 Microphone Cable
- QC-10 Sound Calibrator
- Carrying Case & AM Calibration Chart

Model 2800-30010AM and 2700-30010AM Systems are identical to the 2900-30010AM System except that the 2800 and 2700 meters replace the 2900 meter.
The performance of all the BA-202 Models is consistent and dependable. These simulators eliminate the problems and disadvantages inherent with using a human test subject for making the daily biological check of audiometers. Although the simulators don’t eliminate the need to check for clicks, scratches or other extraneous noises, they do provide reliable reading each and every time. These simulators have the capability of checking manual, automatic and microprocessor audiometers. In addition, the BA-202-25 and BA-202-27 measure audiometric room background noise in octave bands.

Key Benefits:

- **Immediate Cost Savings** - The BA-202 will help eliminate the cost and uncertainty of using human subjects for biological checks
- **Flexibility** - Use the BA-202 with manual, automatic and microprocessor audiometers
- **Monitor Background Noise** - Continuously monitor room background noise in octaves (Model BA-202-25 or BA-202-27)
- **No Special Earphone Needed** - The simulators can be used with standard earphones, with or without audiocups
- **Simple Display** - The simulator has two color-coded LED’s that ensure easy operation and comprehension of results
- **Patient Switch Simulation** - Simulate patient switch with normally open or normally closed contacts
- **Power Options** - The unit can be either battery or line-powered
- **Extremely Portable** - The unit is so light-weight and portable that it can even be wall-mounted if needed

Specifications:

**Test Frequencies:** 125 Hz to 8 kHz

**Background Test Levels (BA-202-25):** 40 dB at 0.5 kHz and 1 kHz; 47 dB at 2 kHz; 57 dB at 4 kHz; and 62 dB at 8 kHz (per OSHA, Fed. Reg. March 8, 1983)

**Background Test Levels (BA-202-27):** 35 dB at 125 kHz, 25 dB at 250 Hz, 21 dB at 500 Hz, 26 dB at 1000 Hz, 34 dB at 2000 Hz, 37 dB at 4000 Hz and 8000 Hz

**Calibration:** 60 dB HL +/- 1 dB at 1 kHz continuous tone with TDH-39, 49, or 50 earphone

**Accuracy:** Repeatable to within 2 dB when using an audiometer with a continuously variable HL control. When using automatic audiometers, the BA-202 will be repeatable within the HL step increments of the audiometer (usually 5 dB)

**Transducers:** Two electret elements

**Response Output:** Normally open and normally closed relay contacts (SPDT 3 wire output)

**Hysteresis:** 10 dB +/- 1 dB between ON and OFF indication for the LEFT/RIGHT headphone indicators when used with continuous tone input

**Relay Specifications:** 250 mA current, 30 volts AC or DC. 20 million operations

**Power:** 9-volt alkaline battery (Optional 120-volt or 220-volt power adapter) Low battery indicator when used in battery mode

**Size:** 6.8” x 6.5” x 4.2” (173 x 165 x 107 mm)

**Weight:** 1.63 lbs. (739g); not including the remote microphone

**Approvals:** CE Mark
Technical Services from Quest

At Quest Technologies our commitment to seeing our customers delighted is further demonstrated by the quality technical services we offer in support of our many valued customers. Quest educational seminar information and schedules along with our soon-to-be-released web-based re-certification, repair and rental services can be reviewed at www.quest-technologies.com.

Re-Certification and Repair Services
Annual re-certification of your Quest instruments ensures that your instrument continues to perform for you in accordance with original specifications. From time to time, performance may even improve as a result of product updates incorporated automatically as a part of the re-certification process. All re-certifications include calibration certificates that document traceability to appropriate standards. In the unlikely event that your instrument requires repair, Quest features guaranteed-not-to-exceed pricing for repairs. And in the event both repair and re-certification are needed, specially discounted and guaranteed-not-to-exceed pricing exists.

- Place service orders and obtain return authorizations from our website at www.quest-technologies.com
- Receive automatic 1-year renewal of the original factory warranty with your re-certification
- Enjoy the highest quality re-certification services available with our A2LA ISO/IEC Guide 25 Accredited Calibration Laboratory
- Maintain the integrity and defensibility of your monitoring program with documented traceability to appropriate standards

Rental Services
Who other than the original equipment manufacturer is better qualified to provide you with reliable, high quality instrumentation with the latest updates on a rental basis and backed by strong technical support? Quest is pleased to now support our U.S. customers’ short-term instrumentation requirements with our rental services. Available products include heat stress monitors, noise dosimeters, sound level meters, vibration monitors, octave band analyzers, indoor air quality monitors and toxic/combustible gas monitors. Weekly, monthly and rent-to-own plans are available. With nationwide overnight delivery, our equipment is available when you need it. Check availability, pricing and place rental orders directly from our website at www.quest-technologies.com.

Educational Seminars
Quest Technologies conducts educational seminars throughout the world. Many of our seminars provide Continuing Education Units (CEU’s) or Certification Maintenance Points for maintaining your Certified Industrial Hygienist (CIH) accreditation. Experienced professionals within the respective disciplines teach our seminars. Seminar topics include:

- Heat Stress
- Noise Measurement & Hearing Conservation
- Noise Control Measurements & Techniques
- Community Noise Measurements
- Confined Space Entry & Atmospheric Testing
- Indoor Air Quality Inspections & Testing

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