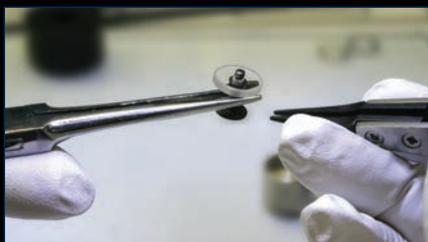




LAB GRADE INSTRUMENTS FOR AUDIO MARKETS



WHY PCB?



Over 50 years of sensor expertise.

PCB PIEZOTRONICS, INC. is a designer, manufacturer, and global supplier of laboratory grade microphones, vibration, force, torque, load, strain, and pressure sensors, as well as the pioneer of ICP® technology.

From design to production, PCB® :

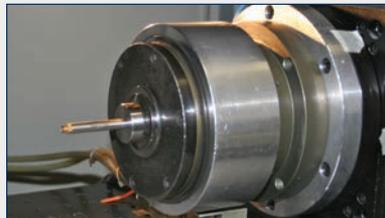
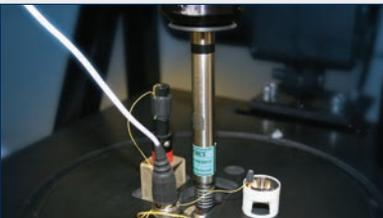
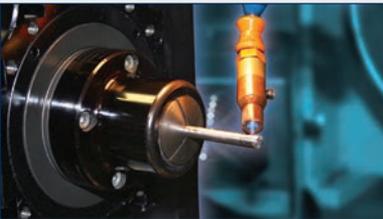
- Controls product quality, delivery, and cost
- Has a vertically integrated state-of-the-art CNC facility
- Has calibration and repair centers to meet strict standards
- Offers 24-hour technical support
- Is committed to **Total Customer Satisfaction**



IN-HOUSE MANUFACTURING

PCB uses only the highest quality material and components for its microphones. While other sensor providers outsource their manufacturing, PCB has invested heavily in on-going training, in addition to a state-of-the-art, in-house CNC machining facility. This allows us to control all factors that affect product quality and delivery. PCB has made significant investments in our people and operations, including:

- High Volume Robotic Machining Cells
- Laser Welding
- Anechoic Chamber
- Clean Rooms
- Environmental Chambers
- Nitrogen Storage Chambers
- Laser Etching
- Calibration
- Inspection



SPEAKER DESIGN & VERIFICATION



"I have been using the PCB Piezotronics phantom powered microphones for test and measurement as well as recording. They are accurate, uncolored, quiet, and dynamic. Their distortion is the lowest of any microphones I've tested, allowing remarkably clean, detailed recording quality. Polar patterns are smooth. The sensitivity is extremely flat for wide frequency ranges, even with changes in temperature and humidity in the recording venue, bringing lab-grade quality to the audio market."

- Stuart Yaniger, Ph.D.
Regular Contributor to AudioXpress
SYclotron Audio Principal



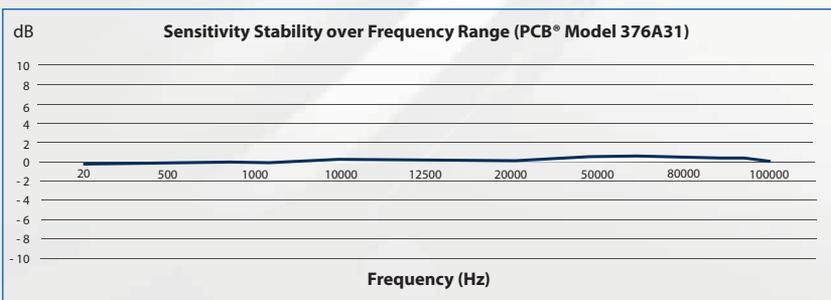
Today, speaker manufacturers are as equally concerned about a speaker's performance as they are about its design aesthetics. High Definition music, and the demand for sound clarity at higher amplitudes, is expected by casual listeners, audiophiles, and live performers alike. This expectation requires manufacturers to design and build products to a higher standard. Manufacturers seeking to produce the highest quality product utilize both acoustic sensors and accelerometers during speaker design and testing, allowing them to effectively identify and isolate issues.

Designed and built to the highest standard, our selection of acoustic microphones, accelerometers, and accessories are ideal for speaker design and testing. We offer acoustic sensors with:

- Extremely low noise floor, down to 5.5 dBA
- High amplitude, up to 182 dB without clipping
- Frequency ranges (0.1 Hz to 100000 Hz) above and below the human hearing range
- Extremely low distortion

Identifying noise and resonance frequencies beyond the audible range is critical for a speaker's sound quality and clarity, as well as the product's longevity.

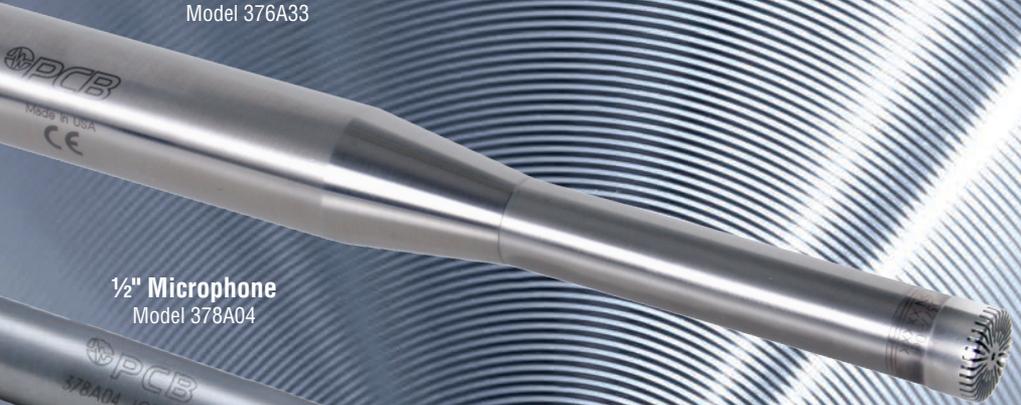
What you can't hear is important.



Truer sound is captured with a flat response. The sensitivity deviation over frequency for lab grade microphones is much more stable than audio microphones. Limiting the inaccuracy of the measuring device, minimizes negative impact on the output. This translates into more consistent levels for all instruments and all notes played.

SPEAKER DESIGN & VERIFICATION

48V Phantom Microphone
Model 376A33



1/2" Microphone
Model 378A04



1/4" Microphone
Model 378C01



Triaxial Accelerometer
Model 356A01



Teardrop Accelerometer
Model 352A91

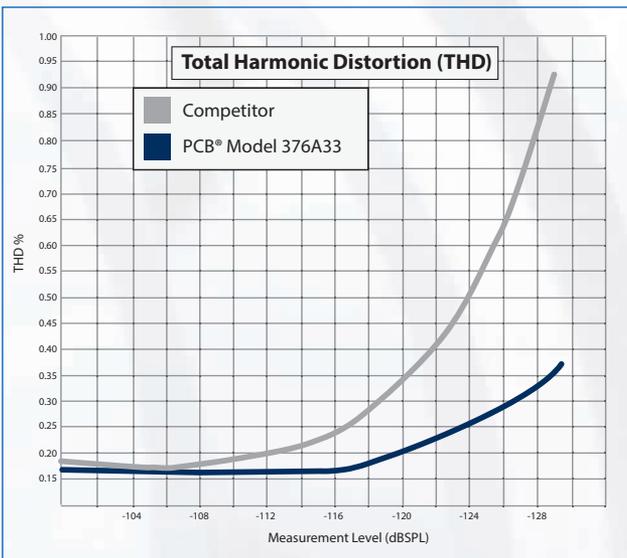




PCB's low distortion Test & Measurement lab grade acoustic and vibration sensors have the necessary performance to capture the full fidelity data required to address common design concerns, including:

- Rub and Buzz resulting from mechanical and structural defects in the speaker
- Air and sound leakage emanating from the cabinet that degrades performance
- Cabinet vibration resulting from a speaker's design, materials, and construction process
- Frequency crossover between woofers and tweeters

When you use the best equipment, you will have a greater level of confidence in your design and manufacturing process.



Low 1% THD provides a more accurate representation of the actual distortion of the speaker, not the added distortion from the measuring device. PCB microphones can reach over 150 dB at 1% distortion, so high amplitude blasts for a soundtrack or kick drums will not overload the mic and the output will remain clear.

HEADPHONE & EARBUD TESTING





Quality sound from headphones is no longer an expectation just reserved for artists in the recording studio or at live performances. Today, video gamers and mobile phone users also demand a high-end listening experience. Consequently, headphone and earbud manufacturers need to move away from the “golden ears” method of product testing and integrate precision instruments into their testing process. The results are accurate and repeatable measurements during R&D and production line testing, such as:

- Frequency response far beyond the audible spectrum
- Total Harmonic Distortion (THD)
- Tracking and verifying both channels (right and left ear)
- Isolation/Attenuation
- Noise Cancellation

Headphone Test Fixture

Model AEC206

Ear Simulator

Model AEC201-A

Acoustic Coupler

Model AEC202

Probe Microphone

Model 377B26

1/2" Preamp

Model 426A13

1/2" Microphone

Model 377B02



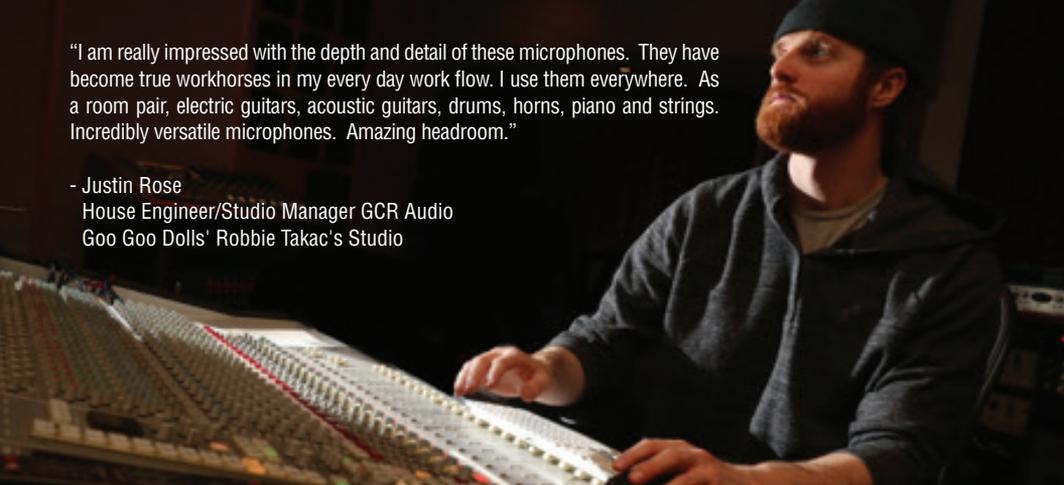


STUDIO RECORDING & SOUND MODELING

The creative process of mixing and colorizing recordings has greatly improved with recent advancements in processing software. Today, engineers can recreate the ambiance of a ribbon microphone, the clarity of a vintage instrument, or the unique sound of a venue. This innovation and creativity necessitates the purest recording as your starting point, requiring full fidelity data. Our precision condenser microphones deliver a true, flat signal across a wide frequency range, accurately capturing the sound waves to which it was exposed. **This condenser signal is the real thing!** We don't want our microphones to have character. We believe that the color should be clear, the tone should be true, and there should be no unique sound added from our microphone.

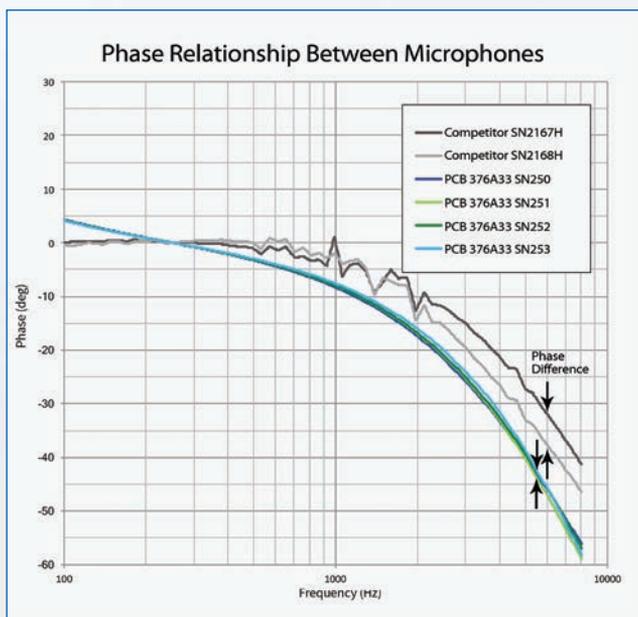
"I am really impressed with the depth and detail of these microphones. They have become true workhorses in my every day work flow. I use them everywhere. As a room pair, electric guitars, acoustic guitars, drums, horns, piano and strings. Incredibly versatile microphones. Amazing headroom."

- Justin Rose
House Engineer/Studio Manager GCR Audio
Goo Goo Dolls' Robbie Takac's Studio



The precision condenser microphone is different from a dynamic microphone. The high frequency sounds of a scorching guitar solo will have remarkable clarity with a PCB microphone, because the very fast impulse response time tracks transients better. We have designed microphones to capture the deep sounds of a kick drum, handling extremely high amplitudes without saturation.

Regardless of expected frequencies or sound pressure levels, we have the right microphone for the job. Our microphones produce a clean signal, and all of the control is in the hands of the audio engineer. **If the produced song is a painter's masterpiece, a PCB microphone delivers clean recording data as a blank canvas, maximizing flexibility for the engineer.** This allows the artist to add the colors or effects of their choice.



Delay differences between multiple microphones receiving sounds and outputting those sounds can make a mix "muddy." Accurate relative phase between microphones will enable crisp reproduction of sound in the time domain and with tighter transients.

ROOM ACOUSTICS & LIVE MUSIC





GRAMMY Award winners, casual listeners, and audiophiles alike demand a high-end listening experience. Technology drives changes in audio every day. Surround sound, active noise cancellation, and wireless communications are found in the studio and at live performances. When you choose a microphone, you accept the limitations of its design. Leading record producers are now selecting modern prepolarized condenser microphones that provide a repeatable and flat response far beyond the audible range. The PCB omnidirectional condenser microphones are clean with no color at all.

Why do many sound recordings fall short of replicating the acoustic experience of a live show? Perhaps the solution is to use test instruments, which accurately measure fast response at the high end (100 kHz+) and sound pressures at the low end (3 Hz), allowing you to enhance the listening experience. **Having a signal which directly correlates to the sound wave allows you to set the stage, and nail the performance.**



“PCB’s 376A33, with the 40 kHz omni element, works really well for all ‘on location’ concert archival and CD projects. This microphone precisely captures the subtleties of the performer and how the music interacts with the concert venue. PCB’s “Lab-Grade” microphones offer an extraordinarily clean and clear sound that captures and preserves ‘the moment’ for orchestras in some of the best acoustic spaces around! Highly recommended for extremely accurate recordings.”

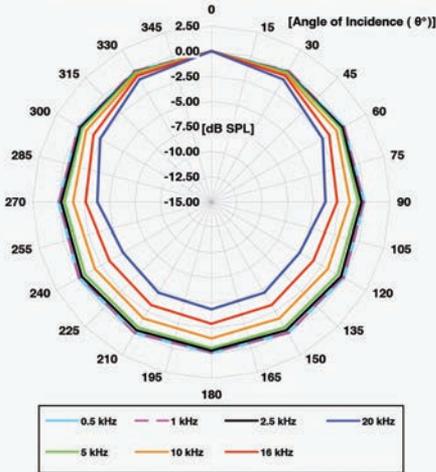
– Ron Meyer
PE Audio Recording Technology Researcher
Planet Venus Audio Technologies LLC

ROOM ACOUSTICS & LIVE MUSIC





Polar Plot Omnidirectional PCB® Model 376A31



Engineers can now process live events with clean signals and appreciate that a microphone is at the front of the signal chain. **Don't let competitors sell you on the "character" of their recording device time domain imprint, which is not a part of the original acoustic sound.** If you want to make it sound dirty, have at it. We'll probably be in the crowd listening and enjoying the show.

Omnidirectional Sound Source

Model BAS001



Sound Level Meter

Model 831



**48V Phantom Power
Microphone
& Preamp**

Model 376A33

Array Microphone

Model 130F20

½" Microphone

Model 377A21



WORLD CLASS QUALITY

Our sensors are used for test and measurement, monitoring, and R&D in automotive, aerospace, audio, industrial, military, educational, commercial, and OEM applications. This instrumentation meets standards found in psychoacoustic research, medical device design and manufacturing, and audiometry.

PCB® builds better products using the latest electronics and manufacturing technologies, as well as six sigma process controls. We have invested in a state-of-the-art vertically integrated CNC machining facility, anechoic chamber, and clean rooms in order to produce the highest level of product integrity. We also believe in investing in our employees and have several Ph.D.'s on staff for applications assistance and acoustic product design.

PCB's Quality Systems adhere to the requirements of multiple international standards. These standards encourage process consistency and provide a means for continuous improvement for the entire product life cycle. In-house calibration of PCB sensors is conducted with full traceability to National and International Institutes of Standards and is provided on PCB's "Scope of Calibration" document(s) with every microphone. The American Association for Laboratory Accreditation (A2LA), with mutual recognition of the International Laboratory Accreditation Cooperation (ILAC), guarantees acceptance on domestic and international levels to governmental and regulatory organizations and ensures that end users will have greater confidence in the product.



3425 Walden Avenue, Depew, NY 14043 USA

pcb.com | info@pcb.com | 800 828 8840 | +1 716 684 0001

© 2021 PCB Piezotronics - all rights reserved. PCB Piezotronics is a wholly-owned subsidiary of Amphenol Corporation. Endevo is an assumed name of PCB Piezotronics of North Carolina, Inc., which is a wholly-owned subsidiary of PCB Piezotronics, Inc. Accumetrics, Inc. and The Modal Shop, Inc. are wholly-owned subsidiaries of PCB Piezotronics, Inc. IMI Sensors and Larson Davis are Divisions of PCB Piezotronics, Inc. Except for any third party marks for which attribution is provided herein, the company names and product names used in this document may be the registered trademarks or unregistered trademarks of PCB Piezotronics, Inc., PCB Piezotronics of North Carolina, Inc. (d/b/a Endevo), The Modal Shop, Inc. or Accumetrics, Inc. Detailed trademark ownership information is available at www.pcb.com/trademarkownership.

TM-AC-ProAudio-0921