

AXIOMETRIX SOLUTIONS

# Aircrew Hearing & Performance

Axiometrix Solutions

**APPLICATION NOTE** // By Lars Winberg



## Advanced Solutions for Aircrew Hearing & Performance

In aviation, protecting aircrew from harmful noise exposure, ensuring effective communication, and mitigating noise-induced fatigue are critical for safety and performance. GRAS Sound & Vibration provides world-class acoustic measurement solutions for assessing hearing protection effectiveness, monitoring noise-induced fatigue, and verifying communication intelligibility in cockpit environments. With decades of expertise, GRAS empowers aviation organizations to optimize aircrew performance and safeguard their hearing health.

## Specialized Acoustic Measurement Solutions

GRAS offers industry-leading tools designed specifically to address the challenges of aircrew hearing protection and performance in high-noise environments:

- **Head-and-Torso Simulators (KEMAR):** Realistic human head-and-torso simulators for evaluating hearing protection devices under real-world cockpit noise conditions.
- **High-Precision Measurement Microphones:** Capture detailed acoustic data to assess noise levels and ensure compliance with hearing protection standards.
- **Communication Intelligibility Testing Tools:** Evaluate and verify the clarity of communication systems in cockpit environments to ensure effective crew coordination.
- **Fatigue and Noise Exposure Monitoring:** Advanced solutions for measuring cumulative noise exposure and assessing its impact on aircrew fatigue and performance.
- **Impulse Noise Measurement:** Specialized tools to measure sudden, high-intensity noise events that can impact hearing and communication in flight operations.

## Applications in Aircrew Hearing & Performance

GRAS solutions are trusted by aviation organizations, defense contractors, and research institutions worldwide to address critical challenges in aircrew hearing and performance:

- **Hearing Protection Effectiveness:** Evaluate the performance of hearing protection devices, such as active noise-cancelling headsets, in high-noise cockpit environments.
- **Noise-Induced Fatigue Assessment:** Measure and analyse the effects of prolonged noise exposure on aircrew cognitive performance and fatigue levels.
- **Cockpit Communication Intelligibility:** Verify the clarity of pilot-to-co-pilot and pilot-to-ground communication systems to ensure operational safety and efficiency.
- **Compliance with Aviation Standards:** Support testing in accordance with international aviation noise and hearing protection standards to ensure regulatory compliance.



GRAS 45BC-10



APx517

## Why Choose GRAS for Aircrew Hearing & Performance?

- **Unmatched Precision:** GRAS microphones and simulators deliver industry-leading accuracy for reliable and repeatable measurements.
- Proven Expertise: With decades of experience, GRAS is a trusted partner for aviation organizations and defense contractors worldwide.
- **Tailored Solutions:** We provide customized configurations to meet the unique requirements of cockpit noise environments and aircrew performance testing.
- **Robust and Reliable:** GRAS equipment is built to withstand the demanding conditions of aviation testing, ensuring consistent performance over time.
- **Global Standards Compliance:** Our solutions support testing in compliance with aviation-specific standards, ensuring your products meet stringent safety and performance requirements.

## Advancing Aircrew Safety and Performance

GRAS Sound & Vibration is committed to enhancing aircrew safety, communication, and performance in aviation. Our advanced acoustic measurement solutions empower you to develop and validate technologies that protect hearing, reduce fatigue, and ensure effective communication in the most challenging environments.

## Recommended Solution Configuration

Based on the application requirements and environmental conditions, Axiometrix recommends a tailored measurement solution combining high-precision microphones, signal conditioning, and analysis systems to ensure reliable, repeatable, and standards-compliant results in demanding defense environments.

**Typical recommended solutions may include:**

- **GRAS 45BC-10** KEMAR with Mouth Simulator and Anthropometric Pinnae for Headset Test, 2-Ch CCP
- **APx517**

For more information or application-specific recommendations, please contact our team of specialists.

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**About Axiometrix Solutions**

Axiometrix Solutions is a global leader in advanced test and measurement solutions, supporting customers across aerospace, automotive, defense, audio, and electronics industries. With a strong focus on precision, reliability, and innovation, Axiometrix delivers technologies that enable accurate measurement and analysis in even the most demanding environments.

Axiometrix Solutions brings together three world-class brands:

- **GRAS Acoustics** – Specialists in high-precision measurement microphones and acoustic solutions, trusted for their accuracy, durability, and repeatability.
- **imc Test & Measurement** – Experts in intelligent data acquisition systems and real-time analysis for mechanical and mechatronic testing.
- **Audio Precision** – The industry standard in audio analyzers and electroacoustic test solutions.

Together, these brands provide a comprehensive portfolio of solutions that empower engineers and researchers worldwide to measure, analyze, and improve performance across a wide range of applications. Axiometrix Solutions operates globally through subsidiaries and distributors in more than 40 countries. Learn more at www.axiometrixsolutions.com