

CURRICULUM VITAE



NORM BRONER

Qualifications

B.E. (Hons.), M. Eng. Sci., Monash University, 1977

Ph.D. (Psychoacoustics), University of London, 1979

Certified Technology Specialist, 2005

Affiliations

Fellow Institution of Engineers, Australia

Fellow of Australian Acoustical Society

Member of Acoustical Society of America

Member of Institute of Acoustics London

Member Institution of Noise Control Engineers USA

Member of American Society of Heating Refrigeration and Air-conditioning Engineers

Fields of Special Competence

- Strong problem solving and time management skills
- Team leadership skills and experience
- Extensive experience in management of technical teams and of projects of various scales
- Good working knowledge of QA requirements, NATA accreditation and Occupational Health and Safety regulations
- Management of risk and assessment of uncertainties

Leadership

- President of the Australian Acoustical Society (AAS) 2008 – 2010 and 2012 – 2014
- Vice President of the AAS 2006 – 2008, 2010 – 2012, 2014 – 2016, current
- Chair of the Vic Division of the AAS 2008 – 2012, 2013 – 2016
- President of the Internoise 2014 Congress in Melbourne Australia Nov 2014, Chair of successful international conference WESPAC 2003 held in Melbourne and of the Annual Acoustical Society Conference in Geelong 2009
- Exhibition and Sponsorship Manager for Annual Acoustical Society Conferences 2006 – 2017
- Team Leader Low Frequency Noise ICBEN
- Board Member I-INCE
- Vice President Israel Acoustical Association 2018 - present

Professional Expertise

Norm sits on a number of Australian Standards Committees as an expert:

AV-001 Acoustics/Vibration Terms, Units and Symbols (representing the Institution of Engineers Australia)

AV-003 Acoustics Human Effects (representing the Institution of Engineers Australia)

AV-004 Acoustics Architectural (representing the Australian Acoustical Society)

EV-011 Aircraft Noise (representing the Australian Acoustical Society)

Norm wrote the Chapter on "Effects of Infrasound, Low Frequency Noise and Ultrasound on People" in the "Handbook of Noise and Vibration Control" which was published in September 2007.

Member of the Australian National Health Medical Research Council Wind Farm & Human Health Reference Group which investigated the impact of wind farms on human health. NHMRC Statement released Feb 2015.

International Advisor to the Health Canada research project entitled Community Noise & Health Study which examined the health effects of wind turbine noise on individuals living within close proximity to these installations. Initial summary of findings released in November 2014.

Guest Editor for a special edition of Acoustics Australia dealing with Wind Farm Noise in 2012 (Volume 41 April)

Invited as a guest speaker in May 2015 on LFN and Infrasound at the RIVM in Holland, addressing and meeting with Regulators and other interested Government Departments.

Editor for Environmental Noise for INCE Journal of Noise Control Engineering

Relevant Experience

Broner Consulting Pty Ltd

November 2014 – Present

Managing Director

Consultant in all aspects of acoustic consultancy. Conducted peer review of Rio Tinto Warkworth Extension for NSW DPE, providing all acoustics advice to the State of WA for the Perth Children's Hospital, Impact noise reduction on Multi Purpose Hall in Adass Israel school, vibration damage control for heritage building.

Vibration consultant for Tel Aviv Metro and Jerusalem Light Rail Green Line.

Municipality of Jerusalem

March 2018 – June 2019

Director of Noise

In charge of all noise issues in the City. Responsible for setting guidelines, reviewing and approving building projects with respect to noise and vibration, , measurement and assessment of noise due to complaints, writing of acoustic reports.

Jacobs/Sinclair Knight Merz

December 2005 to October 2014

Practice Leader – Acoustics, Noise and Vibration

Team Leader 2005 – 2012

Responsible for building the acoustics team in Melbourne from scratch and for brand building around Australia and in the UK. Responsible for marketing to new clients (both internal and external) and for budgeting and performance of the Melbourne team.

Developed Low Frequency Noise Criteria for assessment of impact which are used by the NSW Planning Department and other Authorities.

Signature projects include acting as Acoustic Specialist advising the State of Western Australia with respect to the new Perth Children's Hospital, and with respect to the new facilities being built at RAAF Base Williamstown for the introduction of the Joint Strike Fighter. Also involved

in Wind Turbine noise assessment and Power Station environmental noise control, acoustic privacy in Defence facilities and with noise mitigation modelling and design for noise compliance of industrial and power facilities. A further area of expertise is prediction of aircraft noise with respect to land use planning and assessment of impact – this has been utilized around RAAF Bases and at civilian airports. Also, prediction of underwater noise impact on marine mammals due to oil and gas developments.

VIPAC Engineers & Scientists- Operations Manager

1993 to 2005

Responsible for engineering practice of over 50 engineers and support staff in Melbourne Office (Headquarters) involving day-to-day operations, project and personnel scheduling, marketing, engineering review, quality assurance, budgeting, performance to budget, hiring of new staff, contracts.

Required to prepare yearly budget (\$6million +) and to ensure financial targets were achieved. Practice included many engineering areas and manufacturing of specialised hardware. Project management of specific large projects (up to \$0.5 million value) and provision of acoustic technical expertise to other Vipac offices, particularly Vipac Hong Kong and Vipac Singapore. Won international tender for conduct of research for ASHRAE. Presentation of engineering technical papers at international technical seminars and conferences. Lecturing to second and third year Building Science and Architectural students at Melbourne University on fundamentals of Acoustics. Represented Australia at International (ISO) Standards meetings. Responsible for Quality Assurance and liaison with NATA (National Association of Testing Authorities) [equivalent to NVLAP] re accreditation of many tests including calibration of noise and vibration equipment.

Marketing and engineering consulting to various groups in the Far East region. Familiarity with Far East cultural diversity. Good communication skills.

VIPAC Engineers & Scientists

1987 to 1993

Manager, Acoustics/Aerothermal

Responsible for technical and financial management of acoustics and aero-thermal group including acoustics, air diffusion testing, environmental/solar and balanced calorimeter testing. Also responsible for proposal generation and general marketing, development and running of seminars, budget preparation.

1985 to 1987

Manager, Acoustics

Responsible for successful running of Acoustics Division, including direct supervision and control of personnel (3 engineers, technical and draughting personnel), project costing and scheduling, liaison with clients and business development, resource development and provision of expert testimony in court.

1981 to 1984

Manager, South East Asia

Responsible for business development in Jakarta and Singapore. Involved in introducing the Company to various clients and conducting negotiations on contracts. Negotiated \$600,000 contract for Keong Emas Imax Theatre through wife of Secretary of State for the Harapan Kita Foundation (chaired by the First Lady of Indonesia - Mrs. Suharto). Project completed on time and within budget within two years.

1979 to 1981

Senior Consulting Engineer

Involved in design and on-site supervision, liaison with plant personnel and architects. Main projects involved engineering noise control, prediction of noise and effects and architectural acoustic design.

Chelsea College, London**1976 to 1979**

Graduate School Consultant

Involved in research in psycho-acoustics but also responsible for development and construction of test hardware and for development of computer analysis programs. Also conducted various engineering consulting projects as well as teaching of undergraduates.

Australian General Electric**1975 to 1976**

Design Engineer

Involved in production, development and testing of domestic appliances.

Engineering Vacation Work**1969 to 1972**

Williamstown Naval Dockyard, Victorian Railways, Government Aircraft Factory, Aeronautical Research Laboratories

CONTACT DETAILS

Dr Norm Broner **FAAS / Vice President AAS**
Managing Director **Broner Consulting Pty Ltd**
Mob: + 972 586 620477
Email: norm@broner.consulting
Web: www.broner.consulting

Papers and Presentations

- "Low frequency noise in the environment and testing for its effect on human performance". M.Eng.Sci., Monash University, 1976.
- "Low frequency noise and testing for its effects". Proc. of the Vibn. and Noise Control Eng. Conf., Inst. of Engineers, Sydney. October 56-60. (With R.J. Alfredson & T.T. Triggs).
- "Low frequency and infrasonic noise in transportation" Applied Acoustics, 11, 129-146. 1978a.
- "Individual Loudness Functions" Acoustics Letters, 2, 22-25 (With H.G. Leventhall) 1978a.
- "Low frequency annoyance and the dB(A)" Acoustics Letters, 2, 16-21. (With H.G. Leventhall) 1978b.
- "Criteria for the assessment of low frequency noise" Proc. of the Inst. of Acoustics, London, held at Chelsea College. 1979a.
- "Scaling reaction to noise" Noise and Vibration Bulletin (May), 121-124. 1979b.
- "Low frequency noise annoyance" Ph.D. Thesis, Chelsea College, University of London, 1979c.
- "A Criterion for low frequency noise annoyance" Paper C1-4.4, 10th I.C.A. Sydney, July 1980a.
- "A tuned muffler/silencer for low frequency fan noise control" Paper C1-13.4, 10th I.C.A. Sydney, July 1980b.
- "A modified PN dB for assessment of low frequency noise" Journal Sound and Vibration. (with H.G. Leventhall) 73(2), 271-277, 1980c.
- "Noise emission of engine/exhaust brakes on heavy vehicles" Proc. of Aust. Acoustical Soc. Annual Conf., Paper 1A2, Sept. 1981.
- "Some community noise problems and solutions, reviewed relative to E.P.A. criteria" Proc. of Aust. Acoustical Soc. Annual Conf., Paper 1A4, Sept. 1981.
- "Predicting the annoyance response due to high level low frequency noise" Proc. of Physics for Australia's Development, Dec. 1981.
- "Predicting the effect of environmental emissions containing high levels of low frequency noise" Inter-noise 82, San Francisco, May 1982.
- "Setting a plant noise emission limit" Proc. of the 1st Acoustic Conference of the West Pacific Region, Singapore, Sept. 1982, session 2B.
- "A Criterion for Predicting the Annoyance due to Higher Level, Low Frequency Noise", Journal of Sound and Vibration (with H.G. Leventhall), 84(3), 443-448, 1982.
- "Low frequency noise annoyance assessment by low frequency noise rating (LFNR) curves". Journal of Low Frequency Noise & Vibration, 2(1), 20-28, 1983.
- "A criterion for Predicting the Annoyance due to Lower Level Low Frequency Noise" (with H.G. Leventhall). "Journal of Low Frequency Noise and Vibration", 2(4), 160-168, 1983.
- "Annoyance, Loudness and Unacceptability of Higher Level Low Frequency Noise" (with H.G. Leventhall), Journal of Low Frequency Noise and Vibration, 4(1), 1-11, 1985.
- "Environmental Noise Control - A Case Study" Proc Aust. Vibration and Noise Conf., Sept. 1990, 195-199 (I.E. Aust. Natl. Conf. Publication No. 90/9).

- "Room Measurement Considerations for Sound System Design" 3rd Australian Regional Convention, Audio Engineering Society, August 1991.
- "Environmental Noise - is it an issue?" InterNoise 91, Sydney, 907-910.
- "Building Damage Due to Aircraft Noise-Induced Vibration" InterNoise 1992, 687 - 690.
- "Considerations in the Rating and Assessment of Low Frequency Noise" ASHRAE Summer Mtg., Denver, June 1993, Paper DE-93-17-1.
- "Rating Low Frequency Noise Due to HVAC Systems" Audio Engineering Society Inc., 3rd Australian Regional Convention, 20-22 Aug., 1993.
- "Low Frequency Noise Due to HVAC Systems and It's Assessment" Proceedings of the Australian Acoustical Society Annual Conference, 9-10 Nov., 1993, 211-217.
- "Determination of the relationship between low frequency HVAC noise and comfort in occupied spaces - objective phase", ASHRAE 714-RP (Vipac Report 38114, April 1994),
- "Low Frequency Noise Assessment Metrics - What Do We Know" Paper ASHRAE Transactions 100(2), 1994, 380-388.
- "Low Frequency Noise Assessment - What Do We Know?" Noise Con. 94, Ft. Lauderdale, May 1-4, 779-784.
- "Low Frequency Sound Quality and HVAC Systems" InterNoise 94, Yokohama, Japan, August, 1101-1105.
- "A Simple Test for Determining Low Frequency Rumble Sound Quality Due to HVAC Systems" InterNoise 95, NewPort Beach, USA, July, 955-958.
- "Acoustical Comfort - Can We Achieve It?", Presented at ASHRAE Seminar on Comfort is More Than a Thermal Issue - Part 2, ASHRAE Winter Conference, Atlanta, Feb. 1996.
- "Low Frequency Noise Loudness and Annoyance" InterNoise 98, Christchurch, New Zealand
- "Low frequency Noise: Effect of Exposure Time on Loudness vs Annoyance", presented at Noise Effects 98, 7th International Congress on Noise as a Public health Problem, Sydney, 22-26 Nov, 98.
- "Loudness and Annoyance of Steady State and Temporally Varying Noise" with Assoc Prof Rhona Hellman at the ASA/EAA meeting, Berlin, Germany, March 1999, Paper 2pPPa3.
- "Assessment of the Loudness and Annoyance of Low Frequency Noise from a Psychoacoustical Perspective", with Assoc Prof Rhona Hellman, InterNoise 99, Dec 6-8, 1893 -1898
- "Low Frequency Noise Loudness vs Annoyance" with Assoc Prof Rhona Hellman, Acoustics Today, Australian Acoustical Society Annual Meeting, Dec 1999,
- "Low Frequency Noise due to HVAC Systems - How Do We Assess?" Australian Institute of Refrigeration Air Conditioning & Heating (Inc) AIRAH 2000+, Melbourne, Australia, 29- 31 March, 2000
- "Low Frequency Noise Annoyance – Why?" Aust Acoustical Soc Conf, Canberra, 2001
- "Low Frequency Noise - Is Loudness and Annoyance the Same?" Sound Quality Symposium , Dearborn, Michigan, August 2002
- "Rating and Assessment of Noise" AIRAH Acoustics Conference, 2004
- "Low Frequency Noise Assessment – An Update" Aust Acoustical Soc Conf, Gold Coast, 2004

- “What Did We Learn From ASHRAE RP-879?” ASHRAE Symposium, Orlando, Feb 2005
- “The Missing 16 Hz – Can we Live with It? Madrid 19th International Congress on Acoustics, Sept 2007.
- “A Simple Criterion for LFN Noise Emission Assessment” Journal of LFN and Vibration 29(1), 1 – 14, 2010.
- “A Simple Outdoor Criterion for Assessment of LFN” Acoustics Australia April 2011, 123 – 130, 2011
- “Power to the People” LFN 2012 conference, Stratford, UK, May 2012
- “Wind Turbine Sound Power Measurements” – with Keith et al to be published in 2016
- “Wind turbine sound pressure level calculations at dwellings” ” – with Keith et al to be published in 2016
- Wind Turbines – The Perennial Question” Paper at the Clean Energy Council Wind Industry Forum March 2016
- LFN and Vibration Review 2017 – 2021 ICBEN Stockholm 2021