RESUME:

Cameron D. Jones; 1567 Sky Terrace SE; Salem, Oregon 97306; (503)-363-1586; cam_jones@msn.com

AUDIO PRODUCT DESIGN SPECIALIST:

Professional Electrical Design Engineer with a 30+ year career developing professional audio products and obtaining safety certification for worldwide product sales.

Safety Compliance • Switching Power Supply Design
Class-D & Linear Amplifier Design • PCB Design
Technical Writing

PROFESSIONAL EXPERIENCE

Cranium Audio Designs, LLC Salem, OR 1 Year
(Note: Total time consulting & **Audio Clients** has been combined with work done as **High Fidelity Concepts/Cranium.**)

- 16 years Product Safely Compliance Submissions under UL/EN 60065 (USA, Canada & CB certifications).
- 12 years Switching Power Supply Design (multiple topologies).
- 22 years of High Power / High performance Class-D, Class-AB, G & H amplifier design.
- 30 years of PCB Designer experience.
- Technical Writing
  Audio Clients: JBL Professional, Mackie Designs, P.A.S. (Professional Audio Systems), Keen Ocean Industrial

Loud Technologies, Inc. (Formerly Mackie Designs, Inc.) Woodinville, WA 1996 to 2014

- Senior Safety Compliance Engineer.
- Senior Electrical Design Engineer, Project Engineer.
- Designer of Power Amplifiers, Power Supplies, Analog Mixers.
- Mentoring of JR Engineering Staff (I very much enjoyed this).
- Product Definition / Specification Development, Circuit Design & Debug, Performance Standards & Product Qualification, PCB Design.

High Fidelity Concepts (Owner) Salem, OR 1985 - 1997

- Electrical Engineering Consultant.
- Small Scale Manufacturer of Professional Audio Electronic Equipment.

Westronix (High End Audio and Video Repair) Salem, OR 1980 - 1988

- Electronic Technician.
- Responsibilities: Repair Of High-End Stereo, Consumer Video & Industrial Electronic Equipment, Parts Purchasing, Employee Training, Used Equipment Sales.

AREAS OF SPECIALIZATION (See "ADDENDUM / PRODUCTS DEVELOPED TO DATE" below for further details)

Safety Compliance
solely responsible for obtaining safety agency approval at Mackie (Loud) for 50+ products (UL, C-UL, CSA, CB-Certification) under UL60065, CSA C22.2 #60065, IEC60065 & UL813. Familiar with many of the normative standards related: EN61000-3.2 (AC Line Harmonics), EN61000-3.3 (AC line Flicker), IEC61032 (Probes), EN55103-1 (EMC Emissions), EN55103-2 (EMC Immunity), UL94 (Flammability), UL1411 (Transformers), UL1449 (MOV's), UL101 (leakage Current).

Power Supply Design
Design of CCM (Continuous Conduction Mode) single stage PFC (Power Factor Corrected) pre-regulators at 1000W & 1400W of output power (2 designs). Design of several line operated 100 KHz Q-Resonant LLC open-loop designs from 500W to 2000W. Design of several line operated 100 KHz Q-Resonant LLC closed-loop designs up to 1000W. Design of line operated PFC plus regulated LLC supply at 1000W of output power. Design of several line operated multi-output Flyback designs from 20W – 300W (I've lost count of how many!). Single design of 300W power factor corrected multi-output forward converter power supply (Product line cancelled, never prototyped). Experience in Non-Isolated Buck & Boost converter designs. Extensive experience in linear (60Hz) regulated and unregulated designs from 10W – 7000W. Extensive magnetics design experience (Line frequency transformer design, high frequency magnetics design, some experience in audio output transformer design).

Power Amplifier Design
Class-D design experience with several designs up to 1000W. Extensive design experience in high performance Class-AB, Class-G & Class-H linear amplifiers from 50W – 4000W.

Small Signal Analog Design
Extensive and varied analog circuits as a result of doing this for 30 plus years: Grounding, overall system design & circuit design for audio mixers; LRC & active filter designs of low and high order for graphic equalizers, parametric equalizers, crossovers, brick wall filters, powered speaker equalization filters, tone controls, etc.; VCA designs, VCF designs, RMS detector and Log converter designs; circuits related to manipulation, distribution, and amplification of NTSC video and sync signals; various logic circuits to control and protect the designs noted above.

Digital Design
Hardware designer: 6502 based controller (Audio Crossover); Z80 based controller (Exercise computer); 64180 based controller (EPROM emulator); 4000 series discrete logic design (2 Second Audio digital delay line / effects processor); Various PAL programs & state machines.

CAD & Computer
Pads-Logic (VX1.2), Pads-Layout (VX1.2), LT-Spice, Linear-X Leap & LMS, Audio Precision AP-Win, Microsoft products (Excel, Word, Access, Outlook), Agile, PDXpert, Projectlibre

EDUCATION

Oregon State University — Corvallis, OR — 1983
- Pre-Engineering

Chemeketa Community College — Salem, OR — 1980-1982
- Electronics, Calculus, LDC Transfer Courses

REFERENCES:
- Can be provided upon request

ADDENDUM:

PRODUCTS DEVELOPED TO DATE

Keen Ocean Industrial LTD:

These products were developed during 2015. Cam acted as Project Manager, Project Lead, Principle Electronic Design Engineer, Safety Compliance Engineer, Schematic and PCB capture, performed all non-DSP product debugging and did a tremendous amount of technical writing (Engineering design specs, Application notes, Brochure add copy, Etc.) and a bit of mechanical design on the following products:

- TKO-1000W-AMP2 — 500W/500W Class-D amplifier module
- TKO-1000W-AMP1 — 500W Class-D amplifier module
- TKO-500W-AMP2 — 250W/250W Class-D amplifier module
- TKO-500W-AMP1 — 250W Class-D amplifier module
- TKO-1000W-PSU — 1000W Fast-Transient LLC regulated power supply module
- TKO-500W-PSU — 500W Fast-Transient LLC regulated power supply module
- TKO-STUDIO-MONITOR-DSP [1] — 2-channel DSP module with programming software interface
- TKO-1000W-AMP2+PSU+DSP — Single panel solution incorporating all of the above modules
- TKO-500W-AMP2+PSU+DSP — Single panel solution incorporating all of the above modules

[1] Acted as a project manager only. The DSP and software was developed for Keen by another company.

Loud Technologies / Mackie Designs, Inc.

Project Lead, Principle Electronic Design Engineer, Safety Compliance Engineer, Schematic and PCB capture, Product debug on the following products:

- AM-5000 [1,4] — DSP Based PA Mixer, Industrial / Install Market
- AM-5080 [1,4] — DSP Based PA Powered Mixer, Class-AB 80W At 100V – 70V – 25V
- AM-5160 [1,4] — DSP Based PA Powered Mixer, Class-G 160W At 100V – 70V – 25V
- M-800 — 400W / 400W Class-AB Two Channel power-amplifier
- M-1000 [2] — 500W / 500W Class-AB Two Channel power-amplifier
- M-1200 — 600W / 600W Class-AB Two Channel power-amplifier
- M-1400 — 700W / 700W Class-AB Two Channel power-amplifier
- M-1400i — 700W / 700W Class-AB Two Channel power-amplifier
- M-2000 — 1000W / 1000W Class-H2, Two Channel power-amplifier
- M-2600 — 1300W / 1300W Class-AB Two Channel power-amplifier
- M-3000 — 1500W / 1500W Class-H3, Two Channel power-amplifier
- M-4000 — 2000W / 2000W Class-H3, Two Channel power-amplifier

Electronic Design Engineer, Safety Compliance Engineer, Schematic and PCB capture, Product debug on the following products:

- 40-8 Supply — 3-Rack Space Power Supply for 40-8 / 56-8 mixer family
- DLM-Family[6] — 1400W PFC+LLC supply & 500W (X2) Class-D amplifier assembly for DLM8, DLM12, DLM12S powered speakers.
- HDA-1501 [5] — 15” sound reinforcement powered subwoofer
- HDA-1801 [5] — 18” sound reinforcement powered subwoofer
- HR-624THX — 6” Powered 2-Way Studio Monitor With THX-PM3 Approval
- HR-626THX — Dual 6” Powered 2-Way Studio Monitor With THX-PM3 Approval
- HR-824THX — Re-Design of HR-824 Product, 8” Powered 2-Way Studio Monitor With THX-PM3 Approval
- HR-120THX — 12” Powered (500W) Studio Subwoofer With THX-PM3 Approval
- HR-150THX — 15” Powered (1000W) Studio Subwoofer With THX-PM3 Approval
- Onyx Supply — Universal input switching supply. Used in Bel-Air Quad Compressor, Bel-Air EQ, Digital Snake, MX-8800, Onyx 800R, Onyx 1200F, Onyx 1220, Onyx 1620, Onyx 1640, and Scratchy-D2 products.
- Onyx 1620i — 16 Channel mixer, with 16X2 Firewire converter section and universal switching power supply.
- Onyx-i Small Supply — Universal input switching supply, Used in Onyx 820i, 1220i, and 1620i mixers, Used in Onyx Blackbird, UL Recognized Component.
- Onyx-i Large Supply — Universal input switching supply, Used in Onyx 1640i mixers, 2404 VLZ3. 3204 VLZ3, UL Recognized Component.
- Rufus Supply [4] — 2-Rack Space Supply For Rufus Series Mixers, 40-8 / 56-8, and 8-Bus Family of Mixers (Compliance not applied for.)
- SRM Companion [4] — Portable Powered Mixer with attached speakers. Designer of Power Section: 300W Multi-output switching power supply, 100W (X2) Class-D power amplifier section.

Power Amplifier Design and Debug, Safety Compliance Engineer, Schematic and PCB Capture, on the following products:

- PM•808M — 400W / 400W (Class-H2) 8 channel Powered Mixer (Mono)
- PM•808S — 400W / 400W (Class-H2) 8 channel Powered Mixer (Stereo)

Safety Compliance Engineer On The Following Additional Mackie Products:

- Mixers — 1642VLZ Pro, CFX•12, CFX•16, CFX•20, Onyx 1220, Onyx 1620, Onyx 1640, Onyx 820i, Onyx 1220i, Onyx 1620i, Onyx 1640i, Big-Knob, 2404 VLZ3, 3204 VLZ3
- Powered Mixers — PM•406M, PM•408M, PM•408S
- Rack Products — Onyx 800R, Onyx Blackbird
- Powered Speakers — SRM-150, HDA1501, HDA1801, Thump12, Thump15, Thump18S, SRM350v3, SRM450v3, DLM8, DLM12, DLM12S
- Instrument Amp — Ampeg PF800

1 The AM-5000 was not put into production after sales quantities were revised downward.
2 The M-1000 was not put into production due to insufficient profit for model.
3 DSP, Firewire, and acoustic aspects of these products designed by other colleagues.
4 Product has not been put into production at this time.
5 Design of input / EQ board and Safety compliance only.
6 This design was not used in production due to slight additional cost over unregulated LLC supply design.

Professional Audio Systems (1996)

Project Manager, Principle Electronic & Mechanical Design Engineer, Schematic and PCB capture, Product debug on the following products:

- P.A.S. L-2 — Large Touring System Processor/Crossover
- P.A.S. R-2 — Large Touring System Processor/Crossover
- P.A.S. S-2 — Large Touring System Processor/Crossover

JBL Professional (1993 to 1995)

Principle Electronic Design Engineer, Schematic and PCB capture, Product debug on the following products:

- EON Power-10 — Powered 2-Way, EON family of Portable PA Systems
- EON Power-Sub — Powered Subwoofer, EON family of Portable PA Systems

Electronic Design Engineer, Schematic and PCB capture, Product Debug on the Following Products:

- MI-Series — Four Models (from 350W/ch to 1400W/ch), Two Channel High Power amplifies for use by Musicians
- SC-Series — Four Models (from 350W/ch to 1400W/ch), Two Channel High Power amplifies for use by Sound Contractors

I was co-author of a part numbering system for JBL Professional. I was responsible for the ordering, tracking and warehousing of parts for prototype and first quarter production (approximately 2,000 copies of 13 different products) on both the EON and MI/SC power amplifier programs.

High Fidelity Concepts

Project Manager, Principle Electronic & Mechanical Design Engineer, Schematic and PCB capture, Product debug on the following products:

- SP-4300 — Full Range Loudspeaker Processor/Crossover
- PA-1400 — 1600W Powered Subwoofer, Sound Reinforcement
- NC-4200 — Four Channel Compressor/Noise Gate
- DX-4000 — Four way Digital Electronic Crossover (6502 CPU)
- RT-3100/3110 — 31 Band (1/3 Octave) Real Time Audio Spectrum Analyzers
- DM-1 — Digital Sound Pressure Level Meter

ShowTime Video Ventures

Principle Electronic Design Engineer:

- Audio Effects Creator (Mixer, Audio-for-video effects box)

Electronic Design Engineer, Schematic Capture, Product Debug on the Following Products:

- Camera Color Processor (Video Product)
- Audio/Video Distribution Amp
- Video Special Effects Generator (Video Product)

Involvement with various companies in various aspects of product development

- RF Transmitter/Receivers For Model Electric Trains (Keithco)
- Hand-held Exercise Computer (Z80 CPU) (Leap)
- Live Video Capture System (34010 & 34020 CPU) (Autostudio)
- EPROM Emulator (64180 CPU) (Plano Technics)