



Recent Projects List

- **Project Management**
 - Led project team of a loudspeaker manufacturer through major phases of design, prototype, and production
 - Initiated a research project to model the new device behaviour
 - Co-authored 2 conference papers describing this work
- **Acoustical Consulting**
 - Perform modeling and characterization of on-board transducers & signal processing for a transducer-equipped semiconductor product
 - Create performance specification for telecom applications
 - Redesign existing test fixture
 - Perform electroacoustic measurements and provide training
 - Design a test protocol for a noise-canceling headset application
- **Performance Testing**
 - Perform Simulated In-Situ (manikin) Testing and Directional measurements (polar diagrams) on a Completely-In-The-Canal hearing device
 - Perform probe tube in-ear insertion gain tests on test subjects fitted with the device
 - I/O Characterization and compression threshold mapping
- **Technical Marketing**
 - Edit/Co-author journal article for a hearing instrument manufacturer
 - Generate measurements, graphs, and figures as required
 - Research appropriate references
- **Laboratory Measurement System Integration**
 - Consult on room acoustics and sound field verification for clinical experiments for a hearing instrument research facility
 - Oversee calibration and coding of data acquisition and analysis routines
- **Sub-Component Testing**
 - Measure driver impedance data and derive small signal parameters for a headphone company
 - Consult on testing, QC methodology and test system hardware
- **Test Instrument Design**
 - Design and build working prototype sound source for microphone testing
<http://www.cjs-labs.com/sitebuildercontent/sitebuilderfiles/PointSourcePreliminaryDataSheet.pdf>
 - Identify transducer and enclosure vendors
 - Specify protection circuit and outsource prototyping
 - Redesign crossover network
 - Perform electroacoustic measurements to verify performance
- **Product Design**
 - Design and build working prototype battery simulator for hearing aid testing
 - Identify vendors and source components
 - Specify circuit and mechanical designs
 - Create Bill of Materials and Product Data Sheet
<http://www.cjs-labs.com/sitebuildercontent/sitebuilderfiles/BS-01DataSheet.pdf>

NOTE: Client names and the specific details of projects cannot be released as nearly all work is done under NDA.



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- **Comparative Product Testing**
 - Standardized objective testing of headphones for an industry consortium
 - Performed measurements and prepared test report

- **MatLab programming**
 - HRTF plotter and ASCII file conversion
 - Control and data transfer for Listen SoundCheck
 - Frequency Response data reformat and semi-log interpolator
 - 1/3 octave synthesis from FFT data
 - Loudspeaker passive crossover designer/simulator
 - Loudspeaker Impedance LMS data fitting to Equivalent Circuit Models
<http://www.cjs-labs.com/sitebuildercontent/sitebuilderfiles/zfitdatasheet.pdf>
 - Interface and data transfer with a measurement system
 - General purpose GUI and graphics routines
 - ISO 532b Loudness Calculation
 - Calibrated FFT and 1/3 octave band measurements
 - 1/3 octave Multispectrum analysis with Calibration, Time Slice, and Excel Data export

- **Standardization Work**
 - CHAIR: ANSI S3-37 Working Group on Couplers and Ear Simulators
 - ANSI S3.25 – New revision released in 2009
 - ANSI S3.7 (reaffirmation 2008)
 - IEC Liaison: Coordinate US Comment/Vote on IEC Committee Drafts
 - CHAIR: ANSI S3-67 Working Group on Test Manikins
 - ANSI S3.36 - Reaffirm/Revise (in progress)
 - IEC Liaison: Coordinate US Comment/Vote on IEC Committee Drafts
 - IEEE Subcommittee on Telephone Instrument Testing
 - IEEE 1652 (newly issued)
 - IEEE 661 (reaffirmation)
 - IEEE 269 (revision, ballot, and amendments)
 - IEEE 1329 (revision and ballot)
 - IEEE 1027 (ballot and withdrawal)
 - Liaison with ITU-T
 - ANSI S3-48 Working Group on Hearing Aids
 - ANSI S3.22 (revision & FDA approval)
 - ANSI S3.35 (revision)
 - AES SC-04-03 Standards Committee on Loudspeakers
 - AES 2 (revision)

- **Market Research**
 - Background and market research on Audio Codecs for Financial Services & Investment Firms
 - Hearing Instruments for Entrepreneurs & Start-ups
 - Test Instrumentation for test and measurement instrument makers & End Users

- **Simulation/Optimization**
 - Loudspeaker driver specification and system optimization for a novel closed-box design

- **Electroacoustics Training**
 - General Electroacoustics Training for entire scientific staff of an earphone, earplug, and headset manufacturer

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- Recommendations on instrumentation configuration and calibration
- Test set up for high level impulse measurements of hearing protectors

- **System Integration and Testing**
 - Revamp QC/QA test process for a critical component in a hearing screening device
 - Specify, install and program new test system
 - Vendor management and component qualification
 - Redesign critical components for compatibility and serviceability

- **Instrumentation, Measurement, and Test Training**
 - Test system setup and configuration for a loudspeaker subcomponent manufacturer
 - Provide hands-on software training
 - System integration and specification of instrumentation
 - Research vendors for long term power testing

- **Software Re-architecture and Coding**
 - Research existing patents for a hearing/sound processing program
 - Prepare project scope and effort estimation
 - Identify code modules and specify appropriate signal processing and data handling
 - Re-code entire program in MatLab

- **Test Automation**
 - Specify and create test sequences for Hearing Aid QC according to ANSI S3.22 & IEC 60118
 - Architect macro creation into appropriate sub-modules
 - Code and/or review macro routines
 - Create calibration routines – in particular for telecoil tests
 - Perform tests on hearing aids using completed routines to test the software

- **In-House Training Seminar**
 - In-house training presentation on headphone measurements for the research group of a microphone and headphone manufacturer
 - Discussion of test techniques for noise-canceling devices
 - Provide information on time-selective test methods

- **Subcomponent Redesign & Verification**
 - Acoustical testing of prototype subcomponents for audiometry
 - Performed measurements and prepared test report

- **Acoustical Analysis**
 - Room mode calculation and analysis
 - Prepared report and made recommendations for mediating acoustical problems

- **Intellectual Property Evaluation & Expert Witness**
 - Technical analysis and evaluation of patents
 - Design and specify appropriate tests to identify performance as per patent claims
 - Perform measurements on various embodiments and issue test reports
 - Attend meetings with litigants as Subject Matter Expert
 - Draft and edit technology summaries for legal documents

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Recent Projects List

- **Software Consulting**
 - De-bug web-based frequency to musical note conversion program

- **Acoustical Engineering and Design**
 - Specify transducers, data acquisition, signal processing, and performance metrics for a personal recording device
 - Identify subcomponents and qualify vendors
 - Perform electroacoustic measurements on prototypes
 - System design and optimization

- **Prototype Headset Evaluation**
 - Objective testing of USB headsets for telecom and gaming applications
 - Perform measurements and data handling
 - Design and fabricate microphone test fixture as per appropriate standards

- **Comparative Product Testing**
 - Standardized objective testing of the earphone response of various gaming headsets
 - Performed measurements and prepared test report

- **Industrial Design Consulting**
 - Transducer selection for a hand-held PC device
 - Review product requirements, mechanical drawings and candidate transducer specifications
 - System optimization
 - Perform measurements on subcomponents and prototype

- **Seminars in Acoustics, Transducers, and Measurements**
 - Preparation of all PowerPoint materials and demonstrations
 - In house seminars for clients
 - Tutorial sessions at AES, ALMA, and AAA
 - Public seminars on Loudspeaker Testing with Klippel GmbH
 - Self-published book on these topics available from the website:
<http://www.cjs-labs.com/sitebuildercontent/sitebuilderfiles/OrderingCourseNotes.pdf>

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