

RICH RAREY

rich@rareworks.net

Working with companies to design hardware, software, and methodologies that solve unique challenges.

PROFESSIONAL EXPERIENCE

General Manager Rareworks LLC

Kensington, MD | August 2014-Present



Clients include:

Tome, Inc. Royal Oak, MI:

- Integrated Tome's proprietary communications technology into a drone command-and-control iOS app with remote navigation display, telemetry, and real-time camera video stream (Swift) for Search and Rescue.
- Project engineering and implementation of small unmanned aircraft systems protocols, policy, licensing, registration, and software for Search and Rescue, including Tome's flight operations at NASA's Langley Research Center.
- Project engineering on high-resolution, in-car audio solutions for the Ford Motor Company. Designed and built hardware to power and control the Tome's in-car audio module and display its status (C, BASH) .

Odhner Holographics, Inc. Amherst, NH:

Designed and implemented hardware and software solution to read and manage holographic data.

SoundHound, Inc. Santa Clara, CA:

Developed a unique embedded interface (C/C++ and hardware) to a consumer appliance that implements HOUND Speech-to-Meaning™ technology on a Raspberry Pi. The result is an appliance that responds to voice commands and can follow the context of a user's spoken questions and answer the user in spoken word.

Jump2Go, Inc. Seattle, WA: Development and implementation of a national alert dissemination system from AMBER and FEMA sources to broadcast and Internet outlets.

- Wrote the server ingest and database management of the FEMA and AMBER messages (Java, MySQL), and a RESTful presentation of the messages to downstream clients (Java, JSON, Tomcat).

NewBay Media Alexandria, VA: Technical Editor, *Radio World Engineering Extra* magazine. Authored a continuing column and edited contributing authors' work for each publication. Approved publication layout, graphic selections, author development and future content.

Texas Public Radio San Antonio, TX: Facilities assessment and author of a disaster recovery plan for a five-station radio group. The assessment included a ground-up analysis of fail points, existing transmitters, audio streams and data links, studio fail points and practical actions to minimize down time. The report analyzed the existing technical infrastructure and made recommendations for successfully achieving the group management's aggressive expansion goals.

Georgia Tech Atlanta, GA; Accessibility consultant under a Department of Homeland Security contract for Wireless Emergency Alerting to at-risk populations. Assisted administration of the human trials, analyzed the raw data gained during the trials and wrote narrative sections for the final report based on that raw data.

iBiquity Digital Corporation (now DTS), Columbia, MD; Assessment of public radio HD Radio Technology for brand expansion. Developed an extensive on line survey, generated a large contact list, encouraged station participation and analyzed the results with narrative and statistical breakdowns for the final report.

MacBe, bv Eersel, the Netherlands; Software development for the Android platform and technical consultant on wireless projects (Java, Android).

RICH RAREY

rich@rareworks.net

PAGE 2

Director/Manager

NPR Labs, (NPR)

Washington, DC | December 2009-August 2014



2014 CES Innovations Design and Engineering Awards Honoree for the unique NPR Labs-designed accessible alerting receiver.

- Architect and Project lead - *Accessible CAP RDS Demonstration Project for U.S. Gulf Coast States*, funded by U.S. Department of Homeland Security, Science and Technology Directorate (DHS S&T). Designed a national alerting infrastructure and unique, accessible alerting receivers for deaf/hard-of-hearing consumers.

Authored the FEMA-alert ingest software and developed the alerting receiver's display and control software (Java/Android).

- Lead Consultant - Real-time captioning and rapid transcription.

Created novel, cost-saving software and methods that produce real-time, high-accuracy captioned streams and transcriptions for audio and video programs (C#).

Patent Application No.: 14/046634 covering these techniques and methods.

- Co-Principal Investigator and Architect - Personalized Audio Information Services (PAIS) project for NIDRR (Department of Education).

Designed and implemented a unique broadcast tagging infrastructure and custom hardware to capture broadcast programming for blind/low-vision radio listeners (embedded C, VB.net).

Designed and built the world's first PAIS-enabled HD Radio Receiver (embedded C).

The PAIS final report, schema, and project details are publicly available at <http://www.nprlabs.org/pais>

Master Control Supervisor

December 2000-December 2009

- Administered NPR mission-critical audio ingest, routing, automation, recording, playback and transmission systems running on Windows, Linux, QNX, and Mac OS X.

- Administrator of the national Emergency Alerting System (EAS) system at NPR, on behalf of the U.S. Department of Homeland Security.

- Administrator of NPR's eight NPR-originated, audio streams for broadcast and cable, worldwide.

- Administrator for automated capture and playback systems for national NPR programs.

- Shared management of 34 union technical staff.

Technical Director

Prior to December 2000

- Responsible for the audio quality and work flow of multiple NPR News programs heard around the world.

- Highly proficient studio, on-air, and on-deadline audio mixing and skilled in mono and stereo field recording.

- Panelist in subjective listening tests at CRC, Canada to determine HD Radio digital coding quality.

- Co-engineered multi-channel recordings for the first national Dolby® Surround Sound™ broadcast, as heard on NPR.

PUBLICATIONS

NAB Engineering Handbook, 11th Edition (2017), National Association of Broadcasters, Washington, DC; *In-Studio Audio Recording* (chapter).

Radio World magazine, NewBay Media, Alexandria, VA

- 2014 - Author, 21-page eBook *Radio Station Streaming 2015*

http://www.nxtbook.com/nxtbooks/newbay/rw_streaming2015/

- 2013 - Author, 12-page eBook *Audio over IP* <http://nbmedia.wufoo.com/forms/audio-over-ip-2013/>

- 2012 - Author, 15-page supplement *IP4: The Evolution of Audio and Data Transport*

www.nxtbook.com/nxtbooks/newbay/rw_20120328/#/72

- Long time contributor to NewBay Media publications on broadcast technical topics.

EDUCATION, PROFESSIONAL REGISTRATION, PATENTS

B.S., Communications, *cum laude* - Ohio University, Athens, Ohio

Certified Engineer, Audio - Society of Broadcast Engineers

Certified Broadcast Network Technician - Society of Broadcast Engineers

Private Pilot License, Single Engine, Land - Federal Aviation Administration

Remote Pilot Certificate with small UAS rating - Federal Aviation Administration

Patent - TECHNIQUES FOR LIVE-WRITING AND EDITING CLOSED CAPTIONS

United States US 2015/0098018, published April 9, 2015