Accessible Radio Update

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Who are we going to service with accessible radio ?

- Deaf and hearing impaired
- Blind and sight impaired
- Sensory loss due to aging, acute illness, dyslexia, severe language disabilities
- Mobility impaired
- People of all ages who want to enjoy radio in quiet environment
- People of all ages who want to use radios in impaired/low-lighting conditions

Consumers with disabilities

- Disabled consumers are not homogeneous.
  - Their impairments, abilities, background, knowledge and motivation to use technology varies widely.
- Consumers with disabilities do not possess “extraordinarily heightened senses” in other areas that can make up for their disability.
- They have, however, learned over time to compensate for poorly designed and inadequate technology. Sometimes they are successful, sometimes they are not. Although they articulate frustration, without fail, they also articulate excitement and enthusiasm for future accessible radio.
- People with impairments do not want to slip further behind the “technology curve”. They are eager to shape the future of technology and are consumers with purchasing power.

Different approaches

- Visually impaired and blind consumers can take full advantage of “output” but need assistance with the process.
- Hearing impaired and deaf consumers can take full advantage of process but need assistance with output.
- Both needs can be taken care of with thoughtful design decisions.

Survey methodology

- Our goal was to compile as many ideas and opinions as possible about future digital radio technology directly from consumers with disabilities.
- In order to start people thinking we developed two questionnaires (i.e., vision and hearing) that included open-ended questions about technologies/features that could be included in future radios.

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Surveys were sent to many places

- American Council of the Blind
- National Federation for the Blind
- American Foundation for the Blind
- International Association for Audio Information Services
- Association of Late-Deafened Adults
- American Association of People with Disabilities
- World Institute on Disability
- Council for Exceptional Children
- National Association for Visually Handicapped
- Hearing Loss Association of America
- National Association of the Deaf
- American Society for Deaf Children
- AGB Assoc. for the Deaf and Hard of Hearing
- AFB Technology and Employment Center
- Gallaudet University's Technology Access Program
- Rochester Institute of Technology
- Boston University deaf Studies Program
- Holy Cross - ASL and Deaf Studies
- Ohlone College
- Louisiana Tech University (Vision Program)
- AARP

Survey respondents

- Surveys were distributed all over the country by these organizations.
- Respondents came from every part of the US, the UK and Canada.
  - 65 female/57 male deaf and hard of hearing
  - 61 female/100 male blind and visually impaired
- Respondents either completed surveys via the web or e-mail, or called in their responses.

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Hearing and Vision questionnaires

What mainstream technologies do you currently use on a regular basis (tv, radio, computer, etc.)?	both
What assistive technologies/software programs do you currently use? Please list and give your opinion of these technologies.	both
How should a radio in the future should look and feel? (for example: size, portability, mobile/at home use, etc.)	both
Any other technologies or features you would like to see included in future radios	both
Do you receive reading services for the blind? If yes, please describe any ways you think these services might be improved.	vision
What technologies/features would you like to see included in future digital radios? Display technology: Size; Look and feel; Controlling scrolling speed or block text rate presentation Speech to text capabilities: Captioning; Avatars; Visual images; Emoticons Bed-shaker alarm support and emergency messages support	hearing
What technologies/features would you like to see included in future digital radios? Voice Command Technology (audible/spoken menu selections) Audible feedback to signal selection activations Design of tactile controls Display features on pad displays, such as size, variable contrast, variable illumination, size of print Sonalert (electronic device that beeps) inclusion for alarm clock functions Pause, rewind and catch-up buffering	vision

Unanimous agreement

- We started out believing that consumers would want radios designed specifically for their needs
- We quickly realized that nothing could be farther from the truth.
- **Both communities are strongly in favor of integrating assistive technology into mainstream products.**
- **Respondents saw tremendous advantage in being able to purchase mainstream products (cost, personal choice, ability to "keep up" with current technology).**

Choice and flexibility matters

- Respondents want choice and flexibility
  - radios as small as iPods with small displays – “enough for 3 lines of text”
  - home radios with large displays - “the bigger the better”
  - USB ports to connect radio to computer.
- Fonts, text color, contrast, and speed of text presentation should be user-adjustable
  - Individually controlled speed
    - Comments range from: “real time” to “fast” to “not so fast!”
    - “Would be nice if this could be individually controlled to meet the individual’s reading speed”

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Hearing Impaired Survey Results Highlights

Captioning

- Captioning should:
  - be accurate
  - be accessible to people who have both hearing & vision problems
  - give listeners understanding of program content, but also emotional content, intention of the talk show hosts, and should identify the hosts
  - include song titles, subtitles and musical lyrics as well as text from talk shows
  - be synchronized with speech

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Radios that support captioning

- Display size matters
  - Many elderly respondents want larger display and are concerned about contrast and font size
  - “Please make it big enough to read without my reading glasses. If I forget them and an alert comes through, I’m cooked.”
  - “Tiny displays and tiny print are out for old, tired eyes”
  - “As I mature I know I need more glare free, larger print captioning”

Contrast matters

- High contrast and dense pixilation.
  - Contrast and brightness for viewing in different lighting conditions
  - Colors should be easy on the eyes for vision impaired and general public

Blue on black ???	Green on black ???

- Synchronization matters
  - “If live captioned, then the delay should be equivalent to real-time captioning of any of tv network news. If pre-recorded news or announcements, the text should be presented in synch or slightly ahead of the voice to allow people to read and hear at the same time”
  - “The flow of talk on radio is so fast that captioning might not be a viable solution. But, if the display were to carry written captioning it could be helpful, if synchronization of the two were good.”

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- Presentation matters
  - Respondents agree that multiple block lines of text (3 or more) are more desirable than scrolling text, with the capability of slowing down/speeding up/backing up text presentation.

What should be captioned?

- Respondents expressed real desire to have song “lyrics” captioned as well as “talk”
  - “Everything from music lyrics to commercial jingles to talk shows”
  - “I would like to see what the songs are saying by having the captions on the radio”
  - “I can’t wait. I love good radio x-mas songs, opera and want captions”
  - “Having text backup for speech is ideal. It would provide a safety net for the words that I don’t hear. And also, if my cochlear implant was not functional for some reason, I would still have access to radio transmissions”.

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Emergency notifications – the top of everyone's list

- Emergency should include weather and natural disasters, but also major traffic jams, road closings and weather/disaster-related closings (i.e., schools)
- Redundant alerting systems would be helpful.
  - "Flash display, use text, have an attachment antenna that flashes strobe"
  - "Remote vibrating alert such as a pen-size device that combines with existing signal system"
- Color coded system on display might be useful (similar to hospital "code" system)

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Visuals / avatars / emoticons

- In general, respondents did not see visuals / avatars / emoticons as primarily important, and some report that if done poorly, extra visuals may even be unhelpful.
  - "Avatars are cute, but ultimately visual clutter when you're trying to read – especially if they're moving – VERY distracting."
- However, respondents report instances where visuals would be useful and desirable to ease the speed of captioning
  - Identifying speakers, simple objects, tone of voice, related information
  - Identifying emergency situations (i.e., yellow circle with a red exclamation mark to identify natural disaster like tornado)

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Visuals continued

- Some respondents felt visuals could be entertaining and pleasurable, showing logos or otherwise identifying what programming one is listening to.
- Emoticons were identified as most useful to “get the tone of what is being said or communicated, especially without visual cues to figure it out”
- However, other respondents felt emoticons could potentially be “childish”, “not necessary and distracting”, and argue that “there is no such thing as a ‘friendly’ voice, or a ‘sad’ voice”.

- User should have capability to select messages from various areas or regions, not just local.
- Focus should be on making radio compatible with alerting systems already in place.
  - "There's already the NOAA Weather Radio with SAME Technology for this. However, I find this technology to be too limited in information. It would be nice if expanded support for emergency messages were included."
- Ability for radio to be turned on remotely to broadcast an emergency message
  - "The text radio should have imbedded message triggers not only for bed shaker activation but emergency notification in a household or while driving."

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Visually impaired Survey Results Highlights

Audible feedback/voice command

- Audible feedback considered the most important feature for the blind user.
  - Combination of beeps and tones may satisfy some feedback needs for verification of menu selections, but would not provide enough information to be useful in all circumstances

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- Voice output to navigate menu selections considered “gold standard”
  - Clear and concise verbal instructions with ability to speed up and slow down spoken speech, control volume and clarity.
  - feedback must include control functions as well as control settings for specific functions
  - Should be able to verbally give current selection on demand
  - Should include audible signals when last or first selection option is reached
- Ability to disable feature important, especially in situations where quiet is needed (i.e., public places)

Voice command

- Respondents were divided on the usefulness of voice command
  - “Voice command technology would be great if it worked consistently and didn’t require a lot of training of the unit”
  - “(Voice command) sounds great, but a lot of times, if a room is noisy, you are on the street, bus, etc., the voice commands do not work properly. The problem isn’t that blind people can’t enter information into devices using their fingers, its that they can’t see what the ‘screen’ on the device reads, and what the buttons on the device say”

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- “I would like it. However, I do have that with my cell phone and I find it is hard to use because often the phone does not recognize the command”
- “Definitely! My current cell phone has voice command options, which have proven to be far more useful than I would have ever imagined”
- “It would be nice to have menu selections spoken to me but not entirely necessary for me to speak to the unit. It would less conspicuous overall if I could enter commands via tactile keypad.”

- Respondents felt voice command would be particularly useful for mobility impaired consumers and aging consumers.
  - “It would be great as long as the directions were easy to understand and follow”

Look and feel

- Mirror currently existing offerings: walkman-style units, tabletop units, stereo component units
- Portable units desired by 99% of respondents
  - The size of an iPod (it should fit into a shirt pocket)
  - good stereo sound or mono speaker with stereo output to headphones, could even just operate via headphones
  - Ability to connect to larger stereo system or computer
  - Durable, robust, resistant to liquids
  - Retractable, durable carrying handle
  - No removable covers for connectors
  - Rechargeable lithium battery so that frequent battery changes are not needed
  - Tamper proof feature so that settings would not change if radio were placed in a purse or suitcase

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- Home units:
  - Quality sound most important (over looks or size)
    - “Either good built-in sound or outputs to drive external speakers or an auxiliary output to wire into a home sound system.”
  - Recording capability/good memory via compact flash
  - Battery and AC power
  - Include storage of content and/or a handy USB slot for external drives
- Affordable
- Simple to operate

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Ergonomic design

- One button, one function!
- Raised/tactile buttons, good-sized and spaced well, easily identified and learned
- Respondents unanimously disliked flat keypads
- Keypads should be laid out in a logical sequence, such as a telephone pad
- Knobs are desirable

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- Respondents were divided on special “tactile” (e.g., raised markers) buttons
  - “I would like to see buttons or surfaces that are raised up from the face of the unit that can be easily discerned by most people tactily”
  - “Braille please”
  - “Having varying tactile markings as in a rough surface for one button and smoother for another is not necessary to me. I remember where buttons are based upon placement and proximity to the other buttons/device casing, not tactile markings. I frankly find tactile surfaces to be more of a distraction as my mind becomes consumed with understanding the texture and not on identifying what the button is in its place on the device”

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Display

- Font size and color, and contrast under user control. Desirable for those with residual functional visual acuity.
- Digital displays with poor definition are useless.
- If fixed, font size must be at least 14-16 pitch
- Screen size should be large enough (six inches) so it does not frustrate users.
  - “Micro everything does not work and has driven to despair and distraction many other wise normal people”
- But, big size and portability don’t necessarily mix well

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Sonalert

- Talking alarm clock with emergency function would be critical
  - Ability of user to select features/settings is important
- Important to make alarm clock functionality equally as accessible as main functions.
  - “ … a lot of off-the-shelf equipment includes alarm clocks as an afterthought. I am very tired of equipment where some portions are accessible and others are totally off-limits for blind users”

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Pause, rewind, catch-up technology

- Although respondents were enthusiastic about these technologies, they were concerned about:
  - Cost
  - Ability to make features accessible
    - "make sure there's feedback as to what buffer you're in, and some indication on how full the buffer is"

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Conclusions of survey

- Remember, everything mentioned in this talk is a result of consumers “wishing” for the future – we all recognize that this will take time to implement!
- Radios that include accessible technologies and features will serve large groups of consumers, with purchasing power.
- Consumers want accessibility features incorporated in mainstream radios, features that are available on demand, and features that can be tailored to individual needs.

Next steps…

- RFI's have been generated to:
  - Radio Manufacturers
  - Chips set providers
  - Technology partners
  - We hope to have lively and productive conversations with interested parties to plan new generation radios here at NAB and over the next few months.
- Designing future radios that best serve all US consumers is an important goal which will only be realized with input from every sector of the industry

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