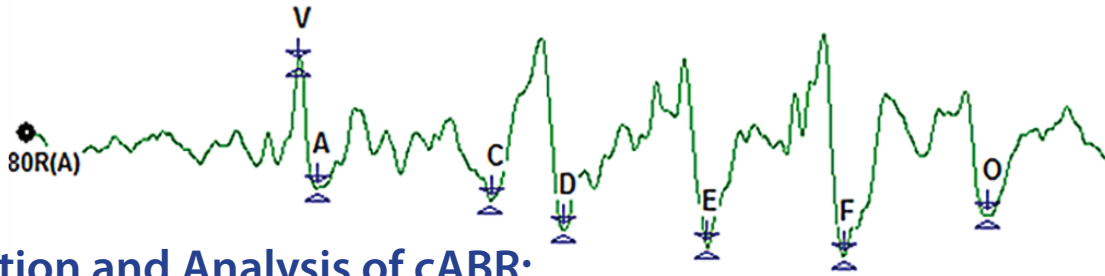
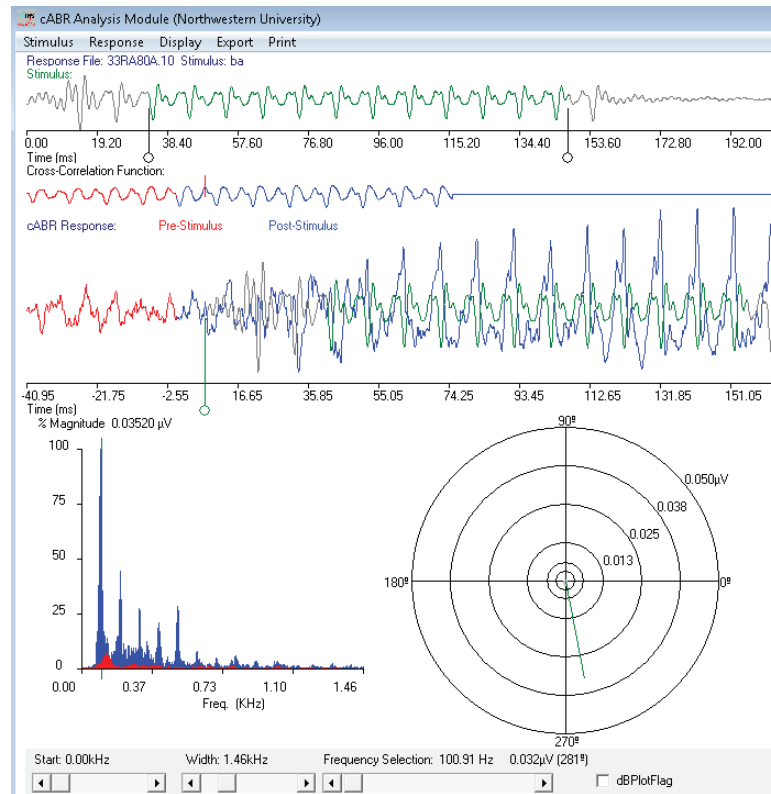


## Complex Auditory Brainstem Response research module for SmartEP



### Acquisition and Analysis of cABR:

- Includes pre-defined settings for complex stimuli, including speech syllables BA, GA, DA, and more.
- Users can create customized settings and stimuli.
- cABR specific label markers.
- Easy comparison of marked recordings.
- Includes cABR analysis, spectrogram, and phaseogram tools.
- Analysis module includes a cross-correlation function, overlapping stimulus and response, and response power spectrum.
- Users can define the response analysis region, high pass, and low pass filters.
- Display of filtered and unfiltered spectrogram.
- Export data, cross correlation information, or power spectrum of recording for additional external analysis.
- Interfaces with MATLAB® modules for further analysis possibilities.



For research use only. Not for use in diagnostic procedures.

The cABR module requires the SmartEP Advanced Auditory Research module and the Universal Smart Box hardware.

Visit the Auditory Neuroscience Lab website ([www.brainvolts.northwestern.edu](http://www.brainvolts.northwestern.edu)) for information about the research supporting this technology and about upcoming scientific talks by the Lab.

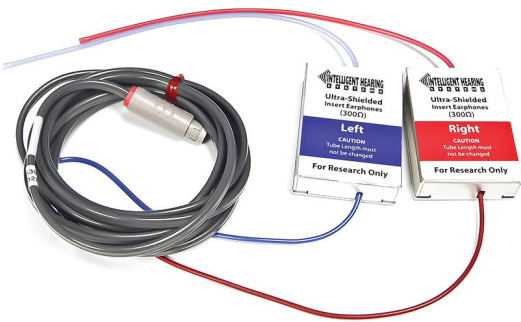


## Advanced Auditory Research Module for SmartEP

### Full control of stimulus and acquisition timeline

The Advanced Auditory Research Module allows users to customize every aspect of acquisition and stimulation using an advanced, yet easy to understand, interface. It permits the mixing of stimuli when the Notch-Noise masking hardware is installed and provides the user access to define times of acquisition by specifying delays and offsets for each stimuli selected.

- Use simple or complex stimuli, including tones, iChirps, speech stimuli, and noise.
- Define custom stimuli using the built-in conversion utility.
- Adjustable stimulus sampling rate: 40kHz, 20kHz or 10kHz.
- Use stimulus files up to 4 seconds in duration.
- Set stimuli to be presented at a specific time, or to be output continuously.
- Combine up to 2 stimuli per ear or present ipsilateral masking.



Optional ultra-shielded ER3 and ER2 insert earphones.

A screenshot of the SmartEP Advanced Auditory Research Module software interface. The window title is 'SmartEP Advanced Auditory Research Module'. The interface features a timeline at the top showing stimulus durations and offsets. Below the timeline are four stimulus channels: 'Right Ear - Channel 1 (Stimulus 1)', 'Right Ear - Channel 2 (Stimulus 2)', 'Left Ear - Channel 1 (Stimulus 3)', and 'Left Ear - Channel 2 (Stimulus 4)'. Each channel has settings for 'ON' status, file name, intensity, time offset, and continuous output. There are also radio buttons for 'Condensation', 'Rarefaction', and 'Alternating'. On the right side, there are settings for 'System Base Sampling Rate' (40 kHz), 'Main' controls, 'Rate' (2.10/s), 'Period' (19048 prnts), 'EP Type' (A-ABR), 'Artifact Rejection (us)', 'Start' (55000), and 'End' (200000). At the bottom, there are 'Load', 'Save', 'Save as Default', and 'OK' buttons. A note at the bottom right states: 'Note: Advanced Settings will also be saved when saving System Settings.'

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Full functionality of the SmartEP Advanced Auditory Research module requires the Universal Smart Box or Duet hardware with Notched Noise Masking Option and the Auxiliary Output Channels.