Speech Studio

Speech Studio is Laryngograph’s voice analysis system. The integrated software and hardware are specifically designed for the exacting requirements of voice measurement. The Laryngograph microProcessor provides a Laryngograph and acoustic waveform. These input to the host PC via a highly specified USB interface to give precise analyses of sustained vowels and, uniquely, connected speech.

**Features**

Laryngograph Processor provides a Laryngograph (EGG) and Speech input.

- 4 channel high quality recording and playback.
- Realtime narrowband or broadband spectrogram and formant display.
- Continuous display of closed quotient (Qx) and fundamental frequency (Fx).
- Jitter, shimmer and HNR measurements for continuous vowels.
- Extensive library of quantitative analyses for connected speech. These work on different kinds of speech pattern including fundamental frequency, speech amplitude, vocal fold contact quotient, nasality and friction.
- Optional Nasality Processor for temporal nasalance measures.
- USB 2.0 interface allows use with desktop or laptop PC.
- Advanced methods of voice analysis are linked to diagnosis and stroboscopy.

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Specifications

**Laryngograph Processor**

- **Microphone**: Pressure sensitive electret, +/- 0.1dB 1Hz to 20kHz
- **Laryngograph**: Gold plated electrodes in small, medium and large sizes
- **Bandwidth**: +/- 0.5dB, 1Hz to 7kHz
- **Gain**: 0-22.5dB, software adjustable

**USB Interface**

- **Analog inputs**: 4 channel, +/- 5V, 13.6kΩ input impedance, 16-bit A to D, 90dB dynamic range
- **Sampling rate**: 16 kHz
- **Analog outputs**: Speech and Lx waveforms, 16 bit D to A, speaker or headphone compatible
- **PC Interface**: USB 2.0

**Speech Studio Software**

- record speech and laryngograph and optionally up to two more waveforms to hard disk at 12000 or 16000Hz
- real time display of waveforms, fundamental frequency (Fx), amplitude (Ax), frication, contact quotient (Qx), spectrogram and LPC spectrum.
- high quality playback
- display of fundamental frequency (Fx) and/or closed quotient (Qx)
- pattern display combining Fx, amplitude (Ax), frication and optionally nasality
- realtime acoustic spectrogram with narrowband (40Hz) or broadband (200Hz) resolution
- realtime display of formants via LPC spectrum
- Sustained vowel analysis
  - Minimum, maximum, average and SD for Fx and Qx
  - Jitter (%)
  - Shimmer (% and dB)
  - HNR (harmonic to noise ratio)
  - NNE (normalised noise equivalent)
  - RAP (relative amplitude perturbation)
- Connected speech analysis (QA)
  - First and second order frequency distribution (DFx1 and 2)
  - Pitch crossplot (CFx) with irregularity score (%)
  - First and second order closed quotient distribution (DQx1 and 2)
  - Closed quotient crossplot (CQx) with irregularity score (%)
  - First and second order amplitude quotient distribution (DAx1 and 2)
  - Amplitude crossplot (CAx) with irregularity score (%)
  - Speech pattern elements – time spent in voice, non voice, friction and nasalance (with optional Nasality Processor) (%)
  - Dynamic phonetogram – Ax vs Fx, first and second order
  - Qx vs Fx, first and second order
  - Statistics

**Minimum PC specification**

P4 processor, 512 MB RAM, 80GB IDE HDD, CD-RW, USB 2.0 interface, Windows XP Professional.