

Putting "brains"
into hearing instruments

Audible Notes

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Audible Difference was founded in 1991 to combine state-of-the-art hearing assessment with the best technology available for each individual.

As an independent audiologist, Veronica H. Heide, M. S., CCC-A takes time with each client to discuss concerns and the range of possible solutions.

"I want to make a difference people can hear... an Audible Difference!"

For a personal consultation, call: (608) 273-3036

First Digital Hearing Aid - A Madison Story

Over 13 years have passed since the inception of Project Phoenix in 1984. Under the leadership of Kurt Hecox, MD, Ph.D., Nicolet Instrument Corporation launched Project Phoenix. This joint venture between the University of Wisconsin and the Wisconsin Alumni Research Foundation was chartered to develop a wearable digital hearing aid.

As a research audiologist with Project Phoenix, I had the pleasure of working with many Madison folks who participated in the clinical trials of many phases of development of the digital hearing aid — the *Nicolet Phoenix*.

The *Nicolet Phoenix*, was brought to market in 1989. The first version was a pocket computer attached with a cord to a behind-the-ear hearing aid. The initial algorithms (signal processing recipes) were

(Continued on page 2)

Digital Signal Processing Providing Smart Solutions for Hearing Needs

Have you ever wished that your hearing aid could think, adjust, and react for you? New digital computer chip technology has made it possible for hearing instruments to sense when things are changing and to make automatic adjustments.

That's why Widex, a leading hearing instrument manufacturer, decided to call their new digital hearing instrument *Senso*, because it senses changes in the sound environment and adjusts to those changes quickly.

The *Senso* performs 40 million arithmetic calculations every second.

Just think if you had to make 40 million calculations a second on a slide rule! Impossible compared to clicking one button on a computer.

Speed, accuracy, precision, and data manipulation are compelling reasons to use digital technology in hearing instruments.

The *Senso* is programmed for each individual's hearing loss in three separate frequency bands: low, mid, and high.

This results in a more precise fitting for soft,

comfortable, and loud sounds than single-band or dual-band programmable hearing instruments allow.

The Widex *Senso* senses when the hearing



**Widex Senso
Canal Model CX6**

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"You can do things in digital hearing instruments that are otherwise

Nicolet Phoenix, contd.

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designed for frequency shaping, loudness control, and noise reduction. Over two hundred units were sold nation-wide.

A completely behind-the-ear version of the Nicolet Phoenix was developed and actually worn by a Madison businessman for three years.

Unfortunately, the business climate of the late 80's caught up with the project. With over \$20 million invested in research and development, and few dollars being returned on that investment, Nicolet decided to terminate the project. This was

a very sad day for all involved.

Although the Nicolet Phoenix may never rise from the ashes, it laid the foundation for other companies to continue to develop digital hearing aids. It served as a model for product



Digital Hearing Instruments, contd.

(Continued from page 1)

instrument is starting to feedback (whistle), and suppresses the feedback, so that Senso users can hold the telephone up to their ear without turning down the volume.

Digital signal processing means turning sound into numbers and back again. The Widex Senso has no analog amplifiers inside. The computer chip *is* the amplifier, tone control, loudness limiter, etc.

By using numbers to manipulate sound, digital hearing instruments can do things that conventional and programmable hearing instruments cannot do. For example, the Widex

Senso analyzes the incoming sound and automatically adapts the amplification to maximize speech and listening comfort. The Senso also monitors the microphone noise (a major source of background hiss in conventional hearing instruments) and automatically reduces it below the user's hearing threshold.

The Senso is used not only to process sound, but to create sound. During the fitting, the Senso generates test tones to allow for compensation of the individual's ear canal acoustics and the fit of the earpiece. This improves the accuracy of

the fitting for each individual.

What about battery life? Widex engineers in Denmark again went back to the drawing board to make sure there were no compromises in battery life with improved performance. They found a way to send the digital code directly to the receiver (loudspeaker) of the Senso. This conserves battery power in the conversion of the digital signal back into sound.

Oticon, another Danish hearing instrument manufacturer, has also released a digital hearing instrument which is currently available in a behind-the-ear model. An

Widex

Widex was established in 1956 by Christian Topholm and Erik Westerman.

"In 1989 we became aware of the fact that, to make hearing aids even more advanced and to make it possible to include complex audiological solutions, we had to change technology... We set the following aims:

- 1 No compromises
- 2 No technical disadvantages
- 3 No bigger than current hearing aids
- 4 It had to solve some of the most essential problems relative to the hearing impaired, which cannot be solved with analog hearing aids."

Telephone Vouchers make phone access affordable for those with hearing loss.

Audible

Difference provides a variety of telephone equipment including:

- Walker Clarity
- WilliamSound Teletalker
- Amplified handsets
- Custom and non-custom telephone headsets
- Induction loops and direct audio input connectors to connect your hearing aids directly to the phone
- Counseling about options to help with the phone
- Guidance to other facilities and resources
- 30-day money back trial on phone equipment

Call today for your free consultation.

Telephone Assistance Program

"I can't hear on the telephone!"

Audible Difference provides many solutions for telephone problems, including amplified handsets, ringers, alerting devices, and text telephones (TTY). If you have always wanted to upgrade your telephone, but have found the increased cost for these devices to be a disincentive, now is the time to consider purchasing the right telephone for your needs.

The Public Service Commission of Wisconsin's Universal Service Fund created a Telecommunications

Equipment Purchase Program (TEPP). Under this program you apply for a TEPP voucher for a particular product. Once you receive the voucher, you take it to the business from whom you are buying the phone and pay the first \$100. The balance is billed to the TEPP program. You may purchase one phone (i.e. amplified phone, TTY plus accessories).

Here is a partial list of equipment authorized for TEPP voucher purchases:

- Amplified Handsets
- Walker Clarity Phone
- Teletalker Phone

- Text Telephone
- TTY modem with software
- Tone Ringer
- Visual Alerting device
- Wrist Alerting device

Equipment **NOT** covered by TEPP vouchers:

- Pagers
- TV Decoders
- Hearing Aids
- Personal Computers
- Batteries, Paper
- Alarms-Doorbell, Smoke, Baby Cry

This program is governed by Wisconsin Administrative Codes s.160.07 and 160.071.

Access Continues to Improve

The Americans With Disabilities Act (ADA) requires all public buildings to provide reasonable accommodation to those with hearing loss. Many of you have benefited from the use of wireless headphones at the Civic Center and Point Theaters in Madison and have shared your success with friends.

When you are planning to go to the theater, call

ahead to inquire about wireless headphones or interpreter services. Obtaining wireless headphones are usually as simple as asking your usher.

While many of you may find that you don't need amplification for a performance of the Madison Symphony, you may find them helpful for a play with soft, rapid dialogue, especially if the

actors have any kind of accent.

If the headphones alone are not strong enough, talk with Audible Difference about ways to connect your hearing aids directly to the sound system. If you go to the theater frequently, you may want to purchase your own wireless headphones.

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Audible Notes

"Your seminars are truly professional and educational. I learned so much that I brought two friends along . Thank you!" EC

Friday, May 9

5:30 p.m.

or

Saturday, May

10

10:00 a.m.

Shearaton Inn

John Nolan Drive

Room _-Vilas Room

You are invited...

Spring Seminar - May 9 or May 10

It's time to dust off your spring wardrobe and get ready to attend Audible Difference's annual Spring Seminar.

This year there is an evening seminar on Friday, May 9 at 5:30 p. m. or a morning seminar Saturday, May 10th. Come to learn the latest information about the ear and how we hear. Find

out about new technologies in hearing instruments including tiny Completely-In-The-Canal instruments and Digital Hearing Instruments.

This year's event promises to be filled with fun, learning, and door prizes galore. There are only a certain number of seats, so call today to reserve your place.