

XTREME



Take it to the LIMIT

bernafon[®]
Innovative Hearing Solutions



Extremely POWERFUL

Super Power amplification taken to the limit!

People with severe and profound hearing losses need more than just an ordinary hearing aid. They require a dedicated hearing system capable of the highest performance. Limited dynamic hearing ranges combined with the highest gain and output requirements make Super Power fittings among the most challenging for the Hearing Care Professional.

Pure power is the core requirement. But like an acrobat on a trapeze, the perfect balance of Power and Flexibility is necessary to achieve the outstanding Performance that Super Power users demand.

To meet this challenge, Bernafon proudly presents XTREME: the Super Power hearing system that takes amplification

to the limit! XTREME is one of the most powerful hearing systems on the market. XTREME is also one of the most flexible Super Power instruments available, with 5 channels of advanced digital signal processing and outstanding frequency shaping capabilities.

XTREME offers Telecoil and DAI responses that are fully programmable, independent of the microphone program, to allow optimization of the response for a wide variety of input sources. An attractive, slim design is suitable for listeners of all ages, fitting even the smallest ears. Excellent Feedback Cancellation and Noise Reduction complete the package. Super Power as you've never seen it before!

XTREME: Gain and output taken to the limit!

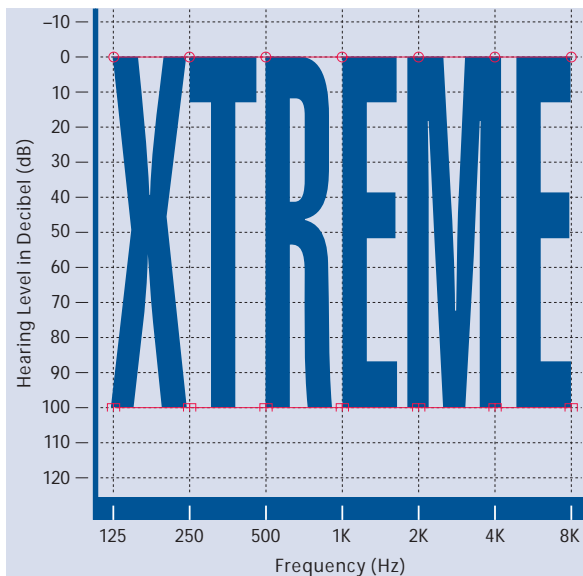
Children and adults with maximum hearing loss need hearing instruments that can accurately transmit critical speech information into their limited residual hearing range. The challenge is to combine exceptionally high gain and output levels with excellent frequency shaping flexibility.

Power is the foundation

Pure power is the first requirement for a Super Power hearing instrument. XTREME is one of the strongest hearing instruments on the market with an incredible peak MPO of 144 dB SPL and peak gain of 85 dB. When power is required, XTREME delivers. Since Super Power users often have a

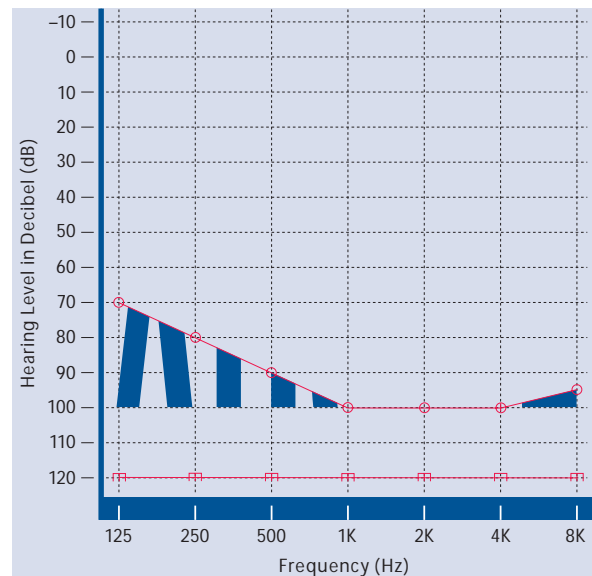
hearing response only in the low frequency regions of the audiogram, XTREME's PowerBoost Technology provides extra low frequency gain to make full use of residual auditory capabilities. XTREME takes amplification to the limit to meet the needs of Super Power users. However, sheer power is not the only requirement.

Normal dynamic range



This is a picture of the normal range of hearing, without amplification.

Severe hearing impairment



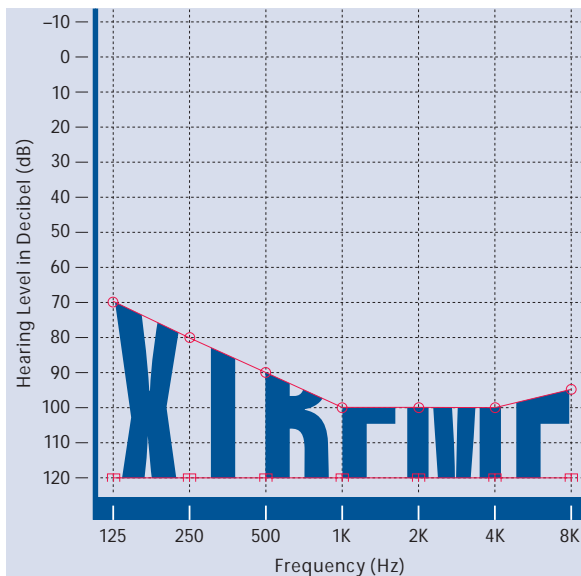
This is a picture of what a person with severe hearing impairment hears without amplification.

Flexibility to fit narrow dynamic ranges

The second requirement for a Super Power instrument is flexibility. XTREME has five channels of advanced digital signal processing that are freely adjustable to provide accurate hearing loss compensation. Gain for soft, medium and loud sounds is combined with the required compression to map sounds precisely to the reduced dynamic range of

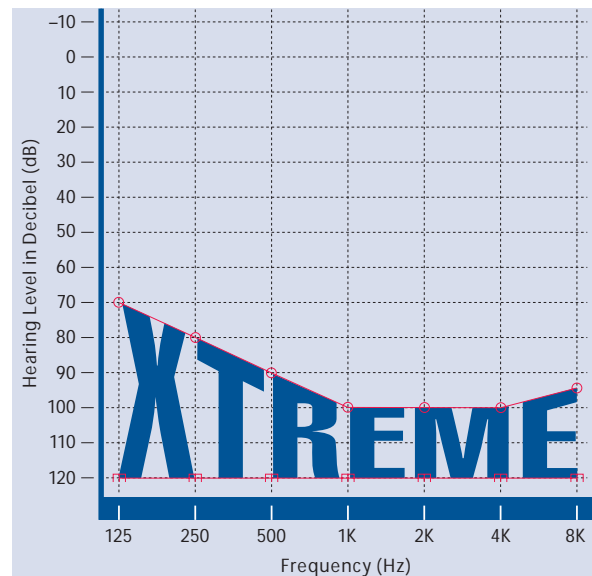
the user. Gain shaping in each channel is independent of MPO shaping, assuring that both gain and output can be precisely mapped to meet individual needs without sacrificing audibility or risking over-amplification. In addition, XTREME has a fine-tuning resolution of 1 dB, allowing the most precise tuning possible when every single decibel is important.

Amplification without flexibility

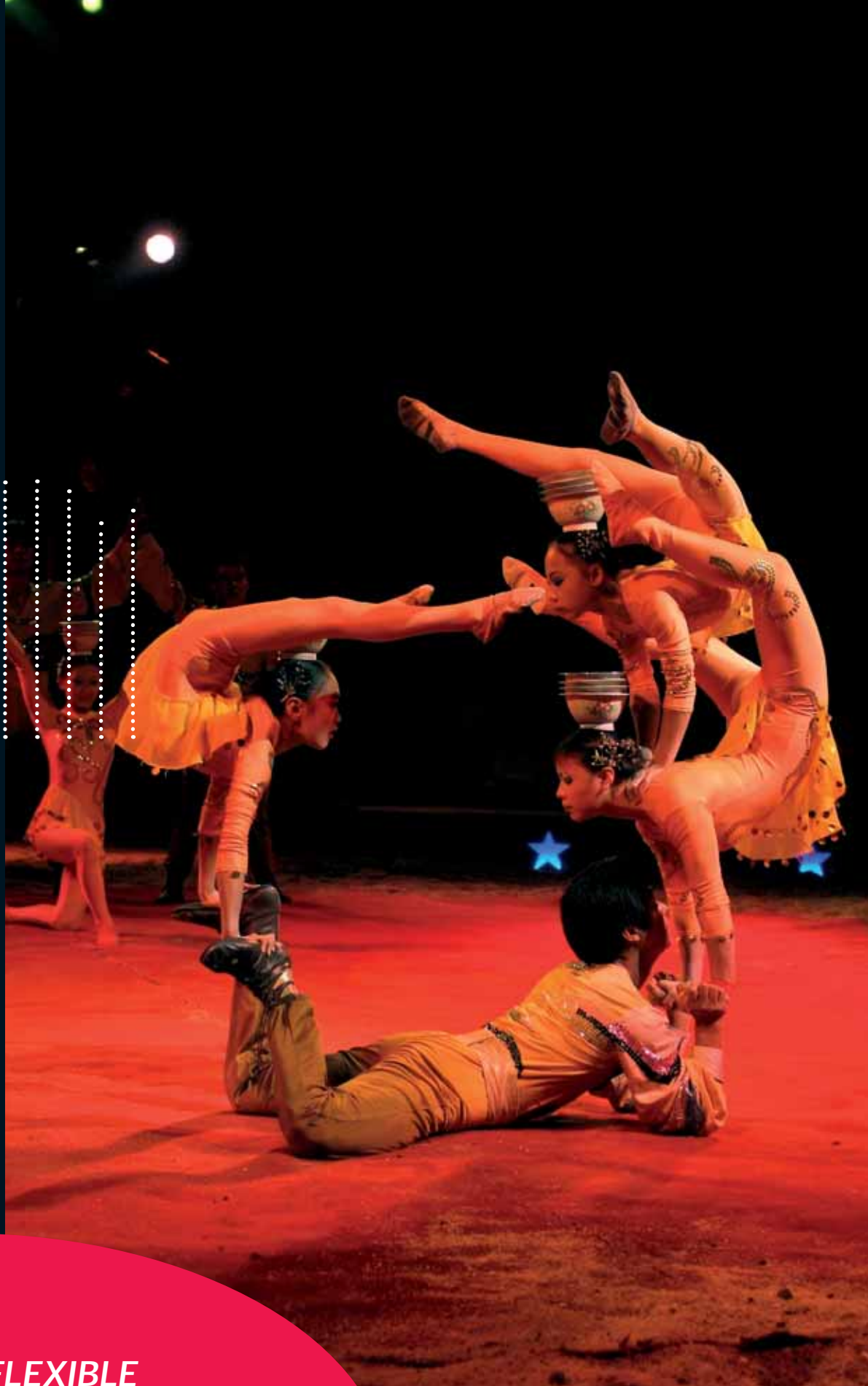


This is what Super Power amplification can do. Now most of the sound is within the range of hearing of the profoundly impaired person. But it is still not clear. Power alone is not enough.

XTREME power and flexibility



Both power and flexibility are needed. Here is the same hearing loss fitted with the solution for your patients.



Extremely FLEXIBLE

Flexibility in a Volume Control

Experienced Super Power users often prefer an analog-style volume control with end stops and clearly defined markings. This style is also easier for parents and caregivers to operate.

Digital volume controls can offer flexible performance but may be difficult for users to manipulate. XTREME's Flexible Volume Control combines the best of both worlds. The analog-style wheel with integrated OFF function, 3 clearly visible level markings and end stops allows users to easily identify their typical volume control setting. It is also possible to lock the VC in the software, to ensure that the volume level always remains the same.

The Hearing Care Professional can also adjust the amount of positive and negative volume control range.



3 different volume control ranges can be configured in the fitting software.

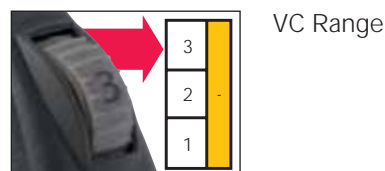
30 dB A 30 dB VC range is recommended for users with a dynamic hearing range of at least 30.

15 dB For users with a narrower dynamic range, a 15 dB VC range should be sufficient.

7,5 dB For those with the narrowest dynamic ranges, 7.5 dB VC range is most appropriate.

If VC position 2 is chosen as the Neutral VC position, (i.e. the position that corresponds to the programmed response saved in the instrument), then approximately one-third of the range will be above position 2 and two-thirds will be below (depending on how much actual positive gain is available). For example, a 30 dB total VC range programmed for position 2 will result in 10 dB positive VC range and 20 dB negative VC range.

When the user needs an easy-to-find VC position, or should never exceed the programmed gain, then VC position 3 can be programmed. In this case, there is only a negative VC range available, regardless of the total VC range chosen.



Effective Feedback Control

Feedback is more likely to occur for Super Power users because of the high amplification levels they require. It is especially problematic because they may not be able to hear the feedback themselves.

Two types of feedback

Stationary feedback occurs due to high gain requirements and earmold fit. Variable feedback occurs in response to sudden changes in the acoustic environment, such as receiving a hug. Both types can cause distortion of the sound signal for the user and annoyance to those around him. Turning down the volume or using notch filtering to eliminate feedback can result in a loss of audibility by reducing needed gain.

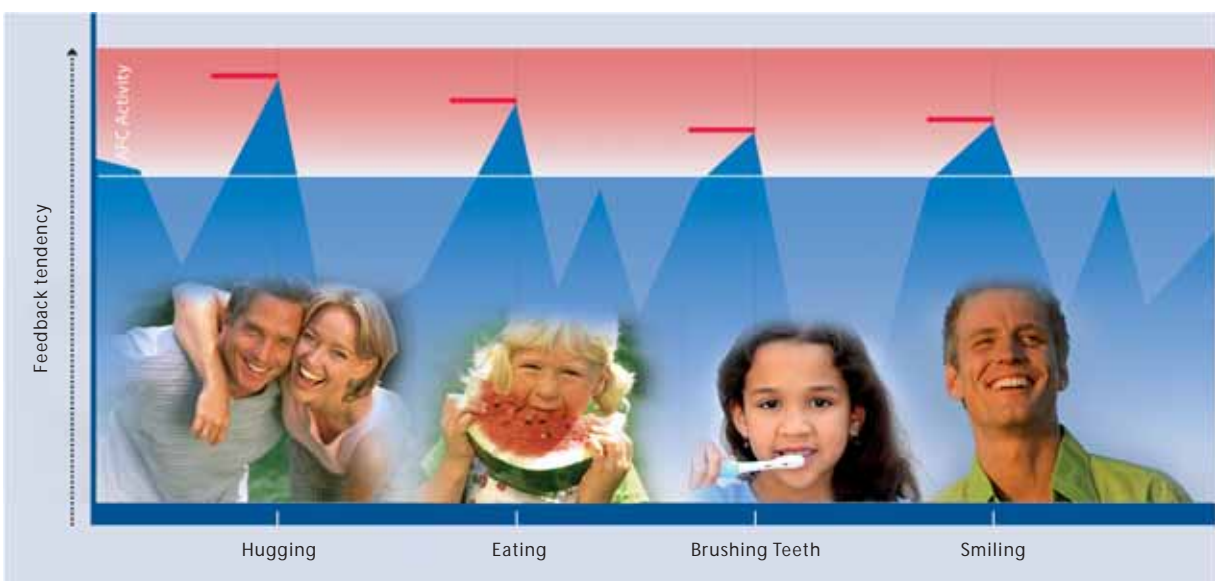
Adaptive Feedback Canceller

XTREME employs a high-performance Adaptive Feedback Canceller. The system constantly monitors the output signal and reacts instantly at the first hint of feedback, producing a counter signal of

the opposite phase to cancel the feedback before it begins. Digital phase cancellation provides efficient feedback control without unnecessary gain reduction, ensuring that audibility is maintained.

Feedback Manager

XTREME has a Feedback Manager in the fitting software to provide all the tools necessary to fight feedback. A predicted threshold of feedback curve is automatically calculated for each fitting, identifying frequency regions where feedback is most likely to occur. The actual feedback curve can also be measured. Programmable safety margins can be selected to balance gain needs against feedback. These tools are available to ensure that XTREME allows maximum gain in every frequency band.



XTREME reacts instantly to any situation where feedback occurs.

Effective Noise Reduction

Background noise is often cited as the number one complaint of hearing instrument users. Noise can affect listening comfort, cause listening fatigue and interfere with speech understanding. To combat the effects of background noise, XTREME offers two advanced systems:

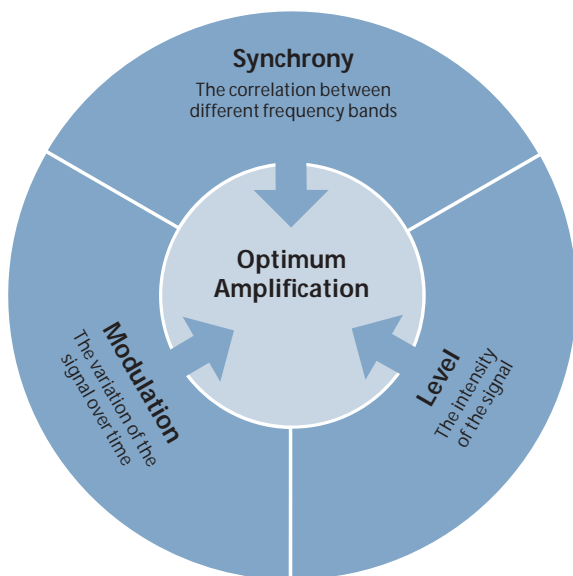
Adaptive Noise Reduction

High levels of background noise can be uncomfortable and can also interfere with speech understanding. XTREME offers Adaptive Noise Reduction to maintain listening comfort in loud noise. XTREME's sophisticated Adaptive Noise Reduction system operates in 8 frequency bands, constantly scanning the sound environment. Synchrony, modulation and signal levels for both speech and background noise are monitored in each frequency band. This smart system then applies the appropriate amount of noise reduction at any given moment, instantly responding to changes in the sound environment.

Soft Noise Management

Low levels of background noise can also be a problem. Digital signal processing allows Super Power users to hear a wider variety of sounds including soft sounds. However, persistent soft noises, such as the sound of a fan whirring, can be annoying and cause listening fatigue. Soft Noise Management is an adaptive digital feature that decreases the level of soft ambient noise. The advanced Soft Noise Management system available in XTREME is designed with a special speech weighting to allow soft speech sounds to come through while preventing the annoyance and listener fatigue caused by unwanted low-level noise.

XTREME's combination of Adaptive Noise Reduction and Soft Noise Management ensures comfortable listening in any situation.



The combination of the 3 environmental detectors allows XTREME to accurately determine the mix of speech and noise at any given moment to deliver optimum amplification.

Designed for the user

Super Power users need instruments that are uncomplicated and user friendly. They also need reliable instruments that can stand up to the high demands of all day wear, every day. XTREME is simple to operate with a sturdy housing that is tough enough for kids aged 0 to 99.

XTREME offers a wide variety of user options to satisfy your customers:



Volume Control

XTREME offers a Flexible Volume Control with analog-style functionality that is easy to operate. Includes OFF-Function.



Program switch

A simple 3-position switch allows the user to change programs quickly and easily.



Status light

The status light (XTREME 120 only) provides visual confirmation of instrument functions including normal operation, program changes, and low battery.

Acoustic indicators

XTREME can be programmed to produce a series of beeps to signal program changes and low battery.

Battery Management System

The Battery Management System in XTREME prevents the battery from draining prematurely when listening to sounds at loud levels. The system controls current consumption to ensure that consistent performance is always maintained – and prolongs battery life.





Connected and ready to go

XTREME can be connected to external sound sources such as MP3 players, computers, television, stereo systems, cell phones with Bluetooth capability and more via a DAI (Direct Audio Input) shoe that attaches easily to the hearing instrument. The dedicated DAI shoe has a sensitivity control and 4 volume levels to optimize performance with a wide variety of inputs. Personal FM systems are also popular for adults with severe-to-profound hearing impairment who require enhanced communication capabilities for business and social purposes. XTREME is compatible with ear-level FM receivers. Your Bernafon Sales Representative will be happy to supply you with further information about FM and DAI connections.



*XTREME 120
with DAI shoe*



Extremely PRECISE

Precision Fitting

Super Power fittings are challenging because there is often a fine line between audibility and over-amplification. That's why precision is so important in all aspects of the fitting.

What you see is what you get

For those with severe and profound hearing loss, every decibel counts to maximize audibility. The margin for error is much smaller for hearing instrument users in this group because of the extremely limited range of residual hearing. This means that the accuracy of the software simulations and targets is critical for both children and adults.

XTREME has the most sophisticated and accurate acoustic model available on the market. Estimations of sound levels at the eardrum are more precise and based on the most recent age-related norms. This accuracy is further enhanced when the hearing care professional enters individually measured RECD (Real Ear to Coupler Difference) values into OASIS plus to replace the age-specific average values.

The right fitting targets

Because accuracy is so important, Bernafon offers research-based fitting rationales for XTREME. Experienced adult users may prefer a more linear instrument response. NAL-RP provides linear fitting targets that have been validated for severe and profound hearing loss.

For children, DSL i/o has long been recognized as the benchmark fitting rationale. XTREME is one of the first instruments to offer the new DSL mi/o, which has been updated to provide more accurate fitting targets for both children and adults.

Last but not least, XTREME offers the popular NAL-NL1 rationale for non-linear amplification targets that have been validated on both adults and children.

Timing is everything

Auditory resolution and residual auditory capabilities vary widely among Super Power users. Unfortunately, there is currently no clinical test to evaluate these capabilities but it is clear that slower signal processing may be better for some, while faster signal processing may be beneficial to others. For this reason, XTREME offers a choice of 3 different time constant sets that the Hearing Care Professional can configure in the software.

Independent Tuning of Telecoil and DAI

In most hearing systems, the Microphone response determines the configuration of the Telecoil and DAI responses. XTREME allows more precision in fitting Telecoil and DAI (Direct Audio Input) responses by allowing these to be tuned individually, independent of the Microphone program. This ensures that XTREME can deliver the optimum hearing response for every input source.

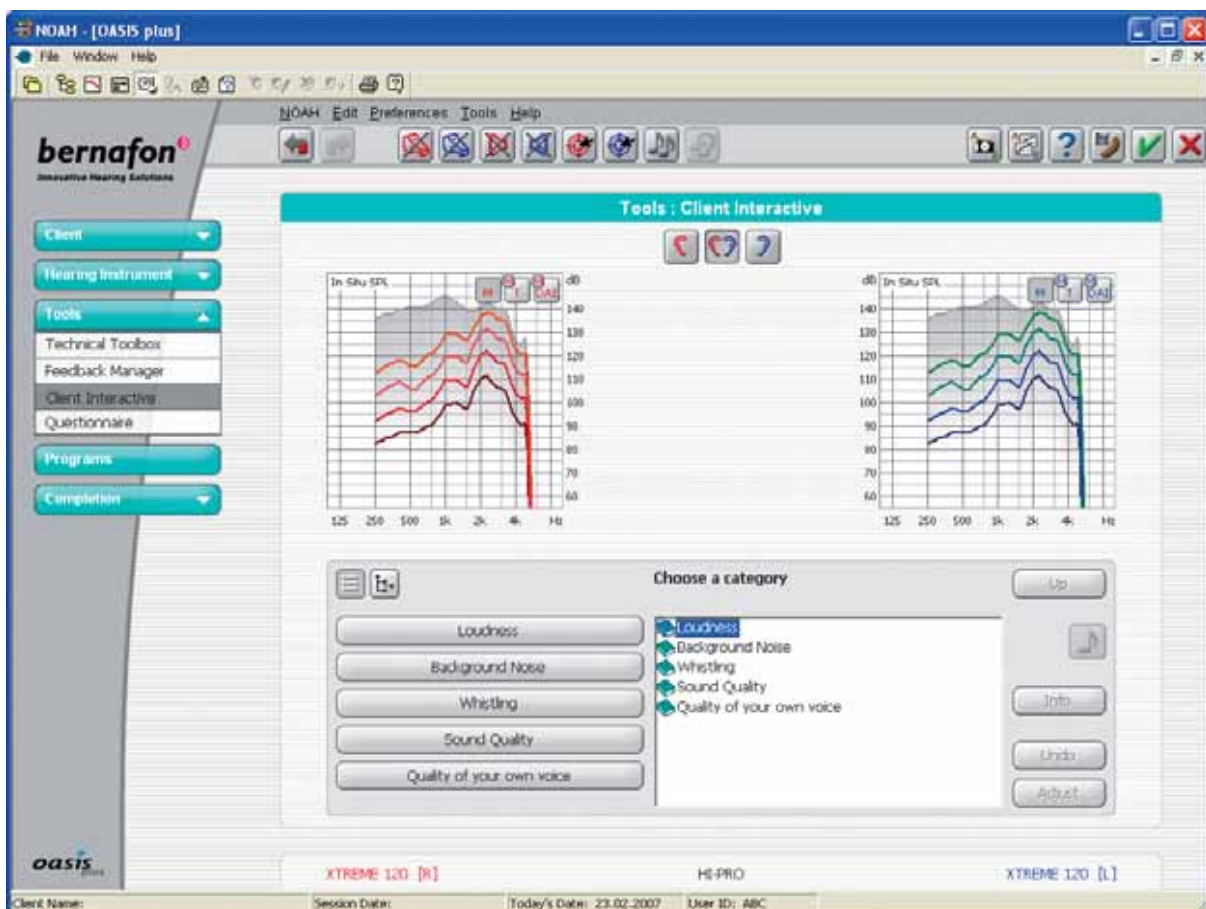
Software – the Performance behind the Fitting

The greatest performances require the right support behind the scenes. OASIS plus is Bernafon's outstanding fitting software, designed to incorporate every tool you need to fit any Bernafon product.

Simple, yet sophisticated

OASIS plus provides a logical and intuitive fitting flow that makes navigation easy, while at the same time offering the sophisticated tools you need for precise fittings. The Client module contains all the information that is specific to the patient. The Lifestyle Profile helps to identify the individual's most important listening goals and provide a basis for measuring the outcome of the fitting.

The Technical Toolbox contains basic controls for adjusting the instrument response. If you prefer a directed approach, the Client Interactive tool contains structured questions about the sound of the instruments. As you work with the client to answer the questions, OASIS plus makes adjustment proposals that can be applied, as desired.



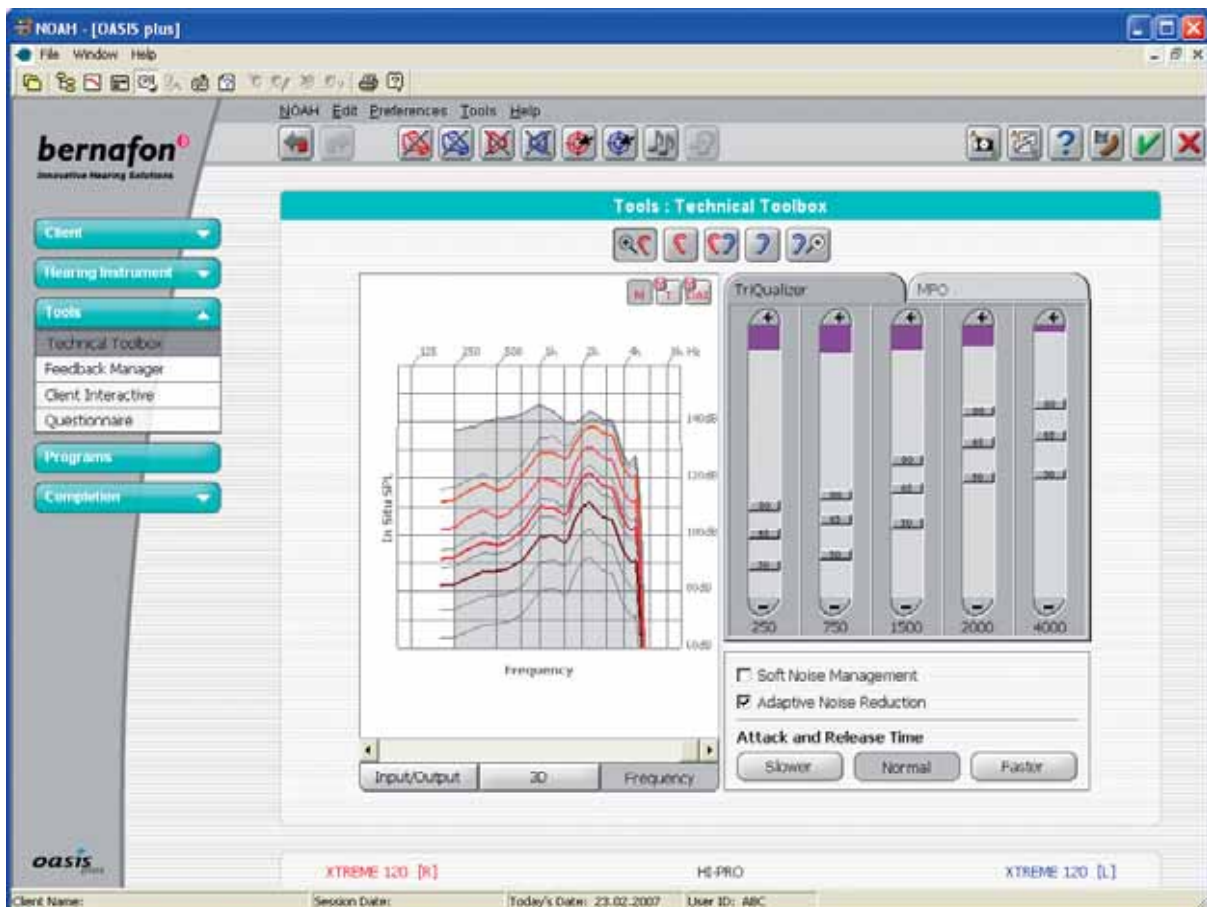
The Client Interactive tool in OASIS plus

Fine resolution tuning

For access to all the parameters of the hearing instrument, the Zoom View provides the tools for the finest resolution tuning. Here you can use the TriQualizer to make, and simultaneously view, very precise changes to the gain for soft, medium and loud input levels in all five channels, in 1 dB steps!

A separate tab opens the controls to adjust MPO in each channel. Controls for Noise Reduction, Soft Noise Management and Time Constants are also available (XTREME 120 only).

Additional screens allow easy access to feedback management, indicator and volume control configuration and more. No matter what your fitting style, OASIS plus gives you everything you need!



The Technical Toolbox Zoom View in OASIS plus



Extremely SMALL

XTREME for Kids

Children are not just small adults. They represent a special group of hearing instrument users. Even though they wear the same hearing instrument models as adults, special attention and care are necessary in the hearing instrument fitting.

Size matters

Since children have smaller ear canal volumes, they receive higher amplification levels than adults when using the same instrument. This changes over time as the child grows. In addition, research has shown that children require different amplification targets than adults to achieve the best audibility and speech recognition, because they are acquiring language.

Hearing Care Professionals can be confident that amplification and output levels in OASIS plus are carefully adjusted to age-appropriate levels to ensure that important sounds (especially speech) are amplified correctly and comfortably. OASIS plus automatically compensates for the child's smaller ears. Individually measured RECD values can be entered directly into OASIS plus to ensure even greater accuracy. Together with the most accurate simulation model available today, and the most current fitting rationales, XTREME instruments can be fit very precisely to take full advantage of the residual auditory capabilities of each child.

XTREME's excellent fitting flexibility and frequency shaping also make it an ideal instrument for children with cochlear implants who need additional acoustic amplification.

Bigger isn't always better

Super Power hearing instruments have traditionally been big and bulky. XTREME is one of the smallest Super Power instruments in the world, yet one of the most powerful. This is wonderful news for both adult and pediatric Super Power users. It's true that good things come in small packages!

Built for extreme situations

Children experience life through action. That means they require hearing instruments that can stand up to a lot of wear and tear. XTREME instruments have a robust design with a solid housing to ensure reliable performance all day, every day. XTREME is built to take a beating!



Visual confirmation with the Status Light

XTREME 120 hearing instruments have a small status light on the back of the housing. The light can be programmed to remain steady while the instrument is operating or to blink only when programs are changed. This visual confirmation makes it very easy for parents and teachers to monitor the operation of the instrument at a quick glance.

It's the little things that count

Child-sized earhooks are available to help the instruments fit properly on small ears. The volume control can be locked via software to prevent little fingers from accidentally increasing the volume too much. A tamper proof battery door also prevents little ones from removing batteries that could be accidentally swallowed.



Performance in the Classroom

FM technology broadcasts the teacher's voice directly to the child's hearing instrument to ensure maximum audibility with minimal impact from background noise, reverberation and distance. XTREME instruments are compatible with all popular wireless FM systems used in school classrooms. A special FM shoe is available that securely attaches to the hearing instrument. The shoe has a standard 3-pin Europlug that accepts most brands of FM receivers. For further information about using XTREME with FM systems, please contact your Bernafon Sales Representative.

Kid style

Kids have their own sense of fashion, sometimes to the dismay of their parents! That's why we offer XTREME in two child-friendly colors: Blue and Lilac. Of course, standard skin and hair colors are also available. In addition, colorful easy-to-remove stickers are supplied in the YoungStar kit, allowing kids to decorate their instruments to their own desires.



Lilac



Blue

Smart Accessories for Children

YoungStar is Bernafon's pediatric package including compatible instruments and accessories necessary to support hearing instrument use for children.

Although YoungStar is available for the first time with XTREME instruments, it may be used with any instrument in the Bernafon portfolio. A YoungStar kit is available to assist children, parents and teachers in the daily use and care of the hearing

instruments. The Kit includes listening tubes for monitoring the sound output of the instruments, a Dry-Aid kit to protect against moisture build-up, a squeeze bulb for drying earmolds and tubing after cleaning, a battery tester, and much more.

young  **star**





The Swiss St. Bernard dog is famous around the world. The legend of the St. Bernard dog developed around a particular dog that lived in the Swiss alps in the early 1800s. He was the hero of a mountain rescue team that searched for people lost in the snow. During his twelve years of service, he saved more than 40 lives. In keeping with Swiss tradition, Bernie the rescue dog is a special feature

of the YoungStar Kit. Children are delighted with the cuddly Bernie dog and by the story book, which shows how Bernie helps a little girl interact with her friends by bringing her new hearing instruments.

Feature Summary



XTREME 120 Features

- 5 Channel Digital Signal Processing
- MPO: 144 dB SPL / Peak Gain: 85 dB (Earsim.)
- Adaptive Feedback Canceller
- Adaptive Noise Reduction
- Soft Noise Management
- Independent MPO shaping – 1 dB steps
- Variable Time Constants
- Fully programmable Telecoil
- Fully programmable DAI
- Flexible Volume Control with rotary operation and OFF-function
- Status Light
- 3 Program switch
- Compatible with external inputs (FM, DAI, etc.)



XTREME 121 Features

- 5 Channel Digital Signal Processing
- MPO: 144 dB SPL / Peak Gain: 85 dB (Earsim.)
- Adaptive Feedback Canceller
- Independent MPO shaping – 1 dB steps
- Fully programmable Telecoil
- Fully programmable DAI
- Flexible Volume Control with rotary operation and OFF-function
- 3 Program switch
- Compatible with external inputs (FM, DAI, etc.)



Beige



Dark brown



Dark grey



White

Innovative Hearing Solutions from Bernafon

Bernafon's mission is to help people hear and communicate better. For over sixty years, Bernafon has been a pioneer in the hearing instrument industry, constantly improving technology to develop Innovative Hearing Solutions. In addition to the research and development headquarters in Bern, Switzerland, the

Bernafon Group operates a world-wide network of sales companies and independent distributors in over 50 countries.

Bernafon employees are dedicated to the delivery of excellent products and services to help hearing impaired people around the globe.



Bernafon provides a wide range of digital hearing systems that cover all of your client's needs. All hearing instruments are fit with OASIS plus – the single, intelligent fitting software for all Bernafon instruments.

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