NAD 118

Digital Pre-Amplifier

- **8 inputs: 4 analogue and 4 digital**
- **High resolution 18 bit/48kHz sampling frequency A to D converter for analogue sources**
- **High resolution 20 bit main D to A converter**
- **Automatic sampling rate selection (32, 44.1, 48kHz)**
- **5 User selectable DSP (Digital Signal Processing) modes**
- **Volume, Balance, Polarity, Mono/Stereo all controlled in the Digital domain**
- **Full remote control**
- **Separate Digital outputs for external D to A converter and digital recorder**

The NAD Model 118 represents the latest in State-of-the-Art technology. Unlike any other digital pre-amplifier available the NAD engineers kept the operation of this pre-amplifier simple and intuitive, resisting the temptation to add any little used gimmicks so that its extraordinary features and performance can be used and enjoyed by anybody -without any technical background or experience.

Features & flexibility

Over the past few years more and more digital sources have become available to us (CD, DAT, NICAM, etc.). However, we also rely heavily on analogue sources (Compact Cassette, FM Radio, etc.) and will continue to do so for the foreseeable future. Using Digital technology allows us a level of control which simply is not possible in the Analogue domain (without outrageous cost only or with adverse side effects). Despite it's limitations almost all pre-amplifiers on the market today employ only analogue technology. This either results in mediocre tone controls and other features, or total deletion of ANY useable feature because of the side-effects.

However, thanks to Digital Signal Processing the NAD Model 118 can offer a wide variety of truly useful features:

1. Bass, Mid and Treble controls: Apart from the usual Bass and Treble controls, the Model 118 offers a control with which you can change the Midrange response; bring vocalists forward, give copper sections in an orchestra more presence, etc. Unlike analogue tone controls there is no phase shifting, thus preserving the stereo image. It is possible to substitute the Bass control for a phase-free Infra sonic filter which will effectively remove any unwanted low frequency noises (rumble, etc.).
2. Stereo Width & Spread control: The Width control influences Stereo separation. Reduce separation for traditional "Ping-Pong" stereo recordings, alternatively, for recordings with only a small stereo image the "width" of the sound stage can be enhanced. The Spread control "defocuses" the original stereo sound stage or provides a synthesised stereo function from mono sources, thus avoiding the "keyhole" effect.
3. FM Mode: This control combines the Stereo Width control with the Spread control. As the control is turned clockwise, stereo separation is reduced but at the same time Spread is introduced. This has the effect of reducing the noise level from the FM broadcast but maintaining a realistic sense of "spaciousness".
4. Compressor / Expander: Without any of the side effect of analogue compressors such as pumping and hissing, you can reduce the overall dynamic range of the music, so you can listen at moderate listening levels without the soft passages becoming too soft or the loud passages becoming too loud. It is also possible to reverse the process; expanding the dynamic range of the music, which can be useful, for example, with some classical music radio broadcasts where dynamics are often compressed and potentially reduce the listener's enjoyment of the music .

Any of the DSP functions can be recorded onto tape by selecting "Process to Tape". For instance, by selecting the Compressor mode, this can be used to decrease the dynamics of the music for tapes to be used with in-car systems, where ambient noise can be high and otherwise soft passages are masked by engine and road noise. For analogue tape recording, the Model 118 employees a separate high resolution 18 bit Digital to Analogue converter from the main D to A converter.

To make optimal use of the dynamic range of the A to D converter each analogue input's input sensitivity can be set in four different steps, catering for virtually any line-level source. A non-volatile memory ensures the settings will be retained even if the Model 118 has been disconnected from the mains for some time.

The Model 118 will automatically switch to any of the standard sampling frequencies (32, 44.1 and 48kHz). Each digital input has its own input transformer with accurate 75Ω termination.

Apart from the digital output for use with a digital recorder, the Model 118 also has a digital output for use with external D to A converters or loudspeakers with a D to A converter integrated.

Design

Volume, Balance, Polarity and Mono/Stereo are all controlled in the Digital domain. Many volume controls which work in digital domain (with some CD players, for instance) offer only poor resolution at very low levels. The DSP processor works with 24 bits words, maintaining the music signal's integrity, at even the very lowest of volume settings.

With 20 bit resolution for the Bitstream Digital to Analogue converter and a Bitstream Analogue to Digital converter with 18 bit resolution, sampling at 48kHz, analogue sources will loose nothing of their original quality either.
A large "Holmgren" Toroidal transformer with 10 separate power regulators is used to supply power to the various circuits. This faeture combined with the optimised PCB lay-out (using Surface Mount components) has ensured that all interference between circuits has been eliminated.

Only the highest quality components have been used throughout; metal film resistors, glass fibre PCB boards, Audiophile grade opamps, etc.
With the Model 118 NAD shows that it thinks ahead. Rather than opting for a outboard A to D converter which only has limited use and facilities, the engineers have taken one step further and exploited the benefits of digital technology to the fullest, regardless of whether the source is digital or analogue. The Model 118 despite its very reasonable price deserves to be teamed up with the very best of ancillaries in order to realise its full performance potential.

Anyone considering adding a quality pre-amplifier and/or a D to A converter to their system, should seriously consider the Model 118. Flexible and future-proof, and featuring useful "real world" facilities and ease of use ensure that, once again NAD has leap-frogged their competitors to produce a top performance, world beating product at a modest price.

NAD

Specifications - NAD Model 118

Overall analogue IN, analogue OUT
Max. sensitivity for 1V o/p150mV
Input impedance100k / 450pF
Input attenuator0, -5, -10, -15dB
Frequency response20Hz-20kHz± \s 120.25dBS/N IHF 202 (500mV IN, 500mV OUT)symbol 179 \f "Symbol" \s 1286dB
Max. i/p for 100% FS5.6V
Max. o/p for 100% FS (High Gain)3.2V
THD 1kHzat 100% FS<0.005%
THD + N 20Hz-20kHz Z L=600Ω \s 12 //1nF100% FS<0.03%
Separation 20Hz-20kHz>80dBCrosstalk 20Hz-20kHz>80dBOutput impedance200Ω \s 12
Analogue IN, digital OUT
THDat 100% FS<0.003%S/N ìAî weightedre 100% FS 106dB
Main D/A converter
THD at 100% FS<0.003%S/N ìAî weightedre100% FS108dBLinearity@ -110dB<+2dB
Tape D/A converter
Output for 1V i/p0.667VFrequency response20Hz-20kHz± \s 120.25dBTHD +N<0.01%S/N ìAî weighted100dBDigital inputs and outputsBalanced floating75Ω \s 12
Physical specifications
Dimensions(W x H x D)435 x 90 x 285mmNet weight~6kgShipping weight~7.5kgPower consumptionStand-by
operation~18W
~3W

NOTE: NAD reserves the right to change specifications or design at any time without notice. All specifications are those in effect at time of printing.