MUSIC FIRST PEFORMANCE

Great performance is expected at this price level, yet NAD's fanatical attention to every sonic detail is obvious from the very moment the performance begins. Innovative circuit design, proprietary operating and decoding software, and premium quality parts combine with our 30 plus year heritage to produce a component with a musical presence that transcends mere technical specification.

From a 'bypass' for analog stereo and decoded 5.1 signals, to the latest surround formats from Dolby and DTS, the M15 maintains the musical integrity of every signal type and every surround format. THX Ultra 2 post-processing adds the last word in cinematic realism to your movies, and NAD's renowned EARS uses your surround speakers to 'reveal the concert hall' in your favorite stereo recordings without adding artificial artifacts.

The soundtracks of the world's greatest movies are rich with musical content. A component that can convey the 'soul' of a Stradivarius violin will astound you with the realism of the sound effects Hollywood is so proud of. A component that has musical integrity adds another dimension to every performance, be it musical or cinematic. The M15 allows the space, scale, and transparency encoded in the directional sounds of Dolby and DTS surround soundtracks, to push the boundaries of your listening room to nearly infinite dimensions.

SIMPLE CONVENIENCE, OPTIMUM FLEXIBILITY

The surround preamp processor serves as the 'brains' of your surround sound system. It takes the raw, unprocessed digital audio signals, decodes them into multiple (5.1, 6.1, or 7.1) analog channels, and sends them on downstream to your amplifier and speakers. Compatibility is an important issue, as there is a multitude of different audio and video formats that must be catered to, with provision for several different types of signal transmission. Whether it is digital or analog, the M15 has the flexibility to accept all the popular formats, including the latest, HDMI (High Definition Digital Interface).

Once the signal arrives at the M15's input, it must be buffered, identified, decoded, and any 'post processing' routines (like THX) must be applied before the signal is converted from digital to analog and sent to the outputs. There is also a requirement to 'redirect' bass frequencies, depending on the capabilities of the particular speakers used in your system. All this processing is controlled in the M15 by the latest high speed DSP's, loaded with NAD's proprietary software. These DSP's are capable of 100's of millions of operations per second!

Fortunately, we use all this processing power to keep the everyday operation of the M15 as simple and intuitive as possible. Once the system

- THX Ultra 2 Certified
- 6 AV Inputs with Composite and S-Video
- 3 HD Component Video Inputs
- 4 Coax and 4 Optical Digital inputs
- 4 Analog Stereo Inputs
- Tape Monitor
- 7.1 Direct Analog Input
- Dolby Digital EX, ProLogic IIx (movies and music), DTS ES, DTS 96/24, Neo:6, THX EX, THX Cinema, THX Music, EARS, Enhanced Stereo, Stereo Bypass
- Video upconversion; Composite and S-Video inputs available on Component Video output
- HDMI connection – 2 inputs, 1 output
- OSD available on Component Video output
- OSD chip is completely bypassed when not selected
- "Direct" Component Video output without OSD
- Lip sync compensation – (option to 100mS)
- Flexible Bass Management including individual crossover frequencies for Front, Center, and Surround speakers
- Digital domain tone controls with center channel "dialog" control
- RS-232 interface for advanced custom installations
- 12V Triggers for advanced control options, 1 In and 3 Out
- 3.5mm IR Control jacks, 1 In and 2 Out
- Second zone AV output with zone OSD available
- Four dual differential 24 bit, 192 kHz DACs
- Dynamic Headroom Scaling for optimum resolution and S/N ratio for all program and decoding combinations
- Linear Power Supply with custom Toroidal transformer with proprietary shielding to eliminate EMF leakage
- Switched AC Outlet
- Detachable AC cord
- 8 Device HTR M Illuminated Learning Remote control with LCD display
- ZR 2 Second Zone Remote

and user preferences are set, the M15 operates very much like our stereo preamplifiers. Just select the desired source – audio or video – set the volume, and hang onto your hat as the M15 takes you deeply into the essence of the music or movie you are about to experience.

Our User Interface uses a clear front panel display as well as an 'on screen display' that provides setup information directly on your connected TV screen. This is where the M15 can be customized to reflect your specific needs and desires. Surround format preferences, level matching of inputs (so there won't be an annoying jump in volume when you switch sources), and even the renaming of inputs can all be set in these simple two layer menus.

ONE REMOTE

The M15 is supplied with the latest iteration of NAD's renowned remote control, the HTRM (Home Theatre

Remote – Masters Series). This 'smart' remote can learn the commands of any IR remote for any other component. The innovative learning circuit can easily memorize any command (including many that other remotes fail on), and can also memorize a sequence of commands (we call this a macro) to simplify the operation of your entire audio video system.

We use a logical layout of keys that are supplemented by a two-line LCD display to keep you informed of which component you are controlling and which command is being sent. We strongly believe that this combination of keys and display creates the easiest and most satisfying user interface of any remote control. Once familiar, most operations can be completed using the sense of touch alone, allowing you to stay focused on the video picture of your program. In darkened rooms, the HTRM automatically illuminates its keys and display for easy viewing.

The HTR M also includes a PC interface for advanced programming, and easy backup or cloning of your particular HTR M setup. Simply connect via USB cable to a computer running MS Windows and load the supplied program. Commands for various components can be stored, and complex macros can be easily configured and downloaded into the HTR M.

Special attention has been paid to the ergonomics of the HTR M, and you'll find it feels 'right', whether you are right

or left handed, and whether you operate it with one hand or two. Due to the power saving features of the HTRM, the 4 'AA' batteries have a long life and, when necessary, are inexpensive to replace. The display will inform you when the batteries need replacement.

LUXURIOUS DESIGN

The design brief reads: "The industrial design must create a physical presence that is powerful, dynamic, and solid, yet refined and elegant". We wanted a design that will still look fresh and new a decade from now, a design with classic proportions and understated details.

Intelligent use of aluminum extrusions, zinc castings, and heavy gauge steel results in a chassis that is as rugged as it is handsome. Innovative use of specialized coatings and plating results in a product that will retain its good looks for many, many years to come.

COMPATIBLE AND UPGRADABLE

The M15 interfaces perfectly with the majority of consumer audio and video formats including the latest, HDMI. Additionally, the operating and decoding software can be upgraded if and when new features and formats become available.

With rear panel IR remote input and outputs, programmable 12V triggers, and an RS-232 port, the M15 is highly compatible with many of the advanced control systems such as AMX and Crestron.

SECOND ZONE DOUBLES YOUR PLEASURE

A completely independent second audio and video 'zone', with its own remote control, is part of the M15 package. This line level output has independent source and volume selection, and is ready to interface with outboard amplifiers and controllers to send music an pictures to another room in your home.

POWER SUPPLY

The heart of every electronic component is its power supply. Taking the raw current from the wall socket and creating stable, clean DC voltages is crucial to obtain the maximum performance of every circuit in the M15. Based on a custom wound and shielded toroidal transformer, the M15 employs three secondary voltage taps, one for each of the sections of the preamp; audio, video, and digital. These feed into independent rectifiers and multi-stage regulators to obtain pure and stable voltages for each individual circuit. By keeping them completely separate, any possible cross contamination is prevented.

AUDIO PERFORMANCE FEATURES

Tone controls, AV presets, and direct access to sub, center, and surround levels allow unprecedented control of the sound field. Centre channel tone control operates in

the 'presence' region of the human voice to improve the intelligibility of dialog. This is especially effective for many Dolby processed recordings. AV Presets take a 'snapshot' of any combination of speaker selection, level, and crossover frequency, to be recalled with just a couple of button presses of the remote control. You could, for example, have different setups for music and movies, or even settings for different types of music or different surround modes. Direct access to the subwoofer, center, and surround speaker levels, without calling up menus, allow for 'on-the-fly' adjustments without interrupting the video program.

Premium parts from renowned suppliers like Burr Brown, Wolfson and AKM, are used in classic NAD circuit configurations to provide the low distortion and sonic realism NAD is famous for. With full 24 bit 192kHz analog-to-digital and digital-to-analog conversion, the M15 can fully exploit the best source material available today and for the foreseeable future. Unusually, the M15 uses multiple two-channel DACs rather than the 8 channel DACs favored by many of today's surround sound processors. We have found that the sonic performance of the two-channel DACs used in a dual differential mode, is well worth the extra cost of this configuration.

Unprocessed analog inputs, whether stereo or via the 7.1 input, remain in the analog mode, sometimes known as 'bypass' mode. If a digital processing mode is selected, these signals are digitized using a 128x over-sampling Sigma/Delta ADC that employs a linear phase digital anti-aliasing filter to prevent any trace of ripple in the audio band. This superb quality ADC operates at 192MHz and full 24 bit resolution.

Super high-speed (8 MHz band width) low distortion (0.00008% THD) amplifiers are use for analog input and output buffers. These FET OPAmps feature high slew rate and are capable of the high output current required by this application. Low noise and superb dynamics are assured.

VIDEO PERFORMANCE FEATURES

The M15 can easily handle today's high resolution video signals, with support for most analog and digital video formats. Professional quality video buffer amplifiers feature 150MHz open loop bandwidth with super low phase shift and distortion.

HDMI switching is available for two sources. This newly developed high resolution digital audio and video format allows encrypted transmission of high resolution (HDTV) signal formats without passing through analog conversion.

The M15 is also capable of transcoding, or 'upconverting' Composite and S-Video signals to Component Video output. Through the use of the highest quality components and digital comb filters, the video quality of Composite and S-Video is fully preserved.

The on-screen-display (OSD) is simple and effective, and is completely bypassed when not in use to preserve video resolution. It is also available on component and Zone 2 outputs. There is also a 'bypass' Component Video Output that even excludes the OSD switch to provide a reference quality signal.

DIGITAL PERFORMANCE, PERFECTED

The M15 is a clean sheet design, evolved over several years of intense development. Based around two high-speed 24 bit DSPs, the M15's exemplary DSP topology gives better noise and distortion performance than 32 bit floating point designs. New thinking about D/A and A/D conversion processes led to a circuit design that offers a level of technical precision and sonic performance unprecedented at this price level.

DYNAMIC HEADROOM SCALING

Among the many innovative techniques the M15 uses to squeeze the last ounce of nuance from every music and movie audio format, Dynamic Headroom Scaling is at the top of the list. This unique approach maximizes digital resolution.

What is 'digital resolution'? Think of a picture that has really fantastic detail in the dark shadows, with every subtle texture clearly visible; this describes a high resolution picture. It is like the difference between High Definition TV and Standard Definition TV – the HD picture is far more realistic.

Digital audio can also have high or low resolution, depending on the quality of parts in the analog-digital-analog conversion process. With the demands for surround sound processing and post processing, things get more complicated. The spare 'headroom' required to accommodate these complex processes means that the 24 bit signal path may only be working at 12 – 14 bit resolution. This limit is then imposed on all signals, whether the maximum processing power is required, or is not required, the headroom margin is fixed.

While this might be perfectly acceptable performance in a mid-level AV receiver, it is clearly lacking the detail and dynamics required for a realistic Home Theatre experience. This could also limit high resolution audio formats like DVD-A and SACD to merely CD level performance.

The M15 addresses this problem by dynamically adjusting, or 'scaling' the amount of headroom, based on the exact needs of the digital processes running at any given moment. This unique approach maximizes the audio resolution for every type of signal and fully utilizes the premium high performance parts we have included in the M15.
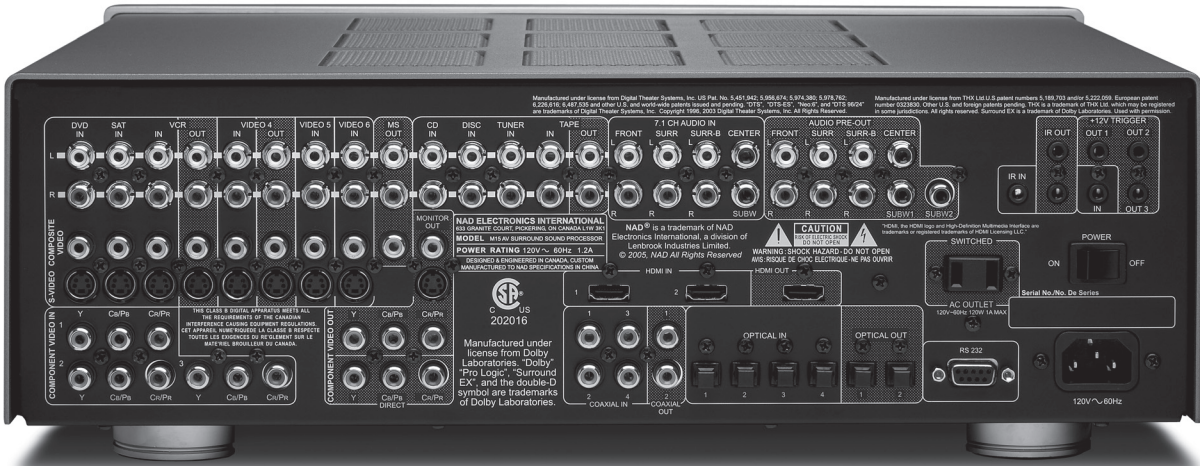
Preliminary Specifications

Analogue performance

Analogue input impedance	56k/180pF
Analogue frequency response	5Hz to 20kHz -/±0.3dB
Maximum input level	4Vrms
THD+N	0.003%
Signal/noise ratio	>102dB
Dynamic Range	100dB
Analogue channel separation	82dB
Crosstalk	82dB
Maximum output level	7Vrms

Output impedance

Main pre-out	470 ohms
Tape out	2K ohms
Multi-room output	470 ohms

Tone Controls

Bass	±10dB
Dialogue	±6dB
Treble	±10dB
Lip Sync Delay (max)	140mS

Digital input performance

THD+N (Bandwidth 10Hz - 20kHz)	0.003%

Video Section

Input and output impedance	75
HDMI	Yes
Component Video Bandwidth	50MHz
Composite and S-Video	≥ 12MHz

Physical Specifications

Dimensions (W x H x D)	17 1/8 x 5 1/3 x 14"
	(435x135x355mm)
Net Weight	29.3 lbs (13.30 kg)
Shipping Weight	43.6 lbs (19.8 kg)

NAD