Operating Manual

Mark Levinson®
№30
Reference Digital
Processor

Madrigal Audio Laboratories, Inc.

Important safety instructions

Please read all instructions and precautions carefully and completely before operating your Nº30 Reference Digital Processor.

1. **ALWAYS** disconnect your entire system from the AC mains before connecting or disconnecting any cables, or when cleaning any component.

2. This product is equipped with a three-conductor AC mains power cord which includes an earth ground connection. To prevent shock hazard, all three connections must **ALWAYS** be used. If your electrical outlets will not accept this type of plug, an adapter may be purchased. If an adapter is necessary, be sure it is an approved type and is used properly, supplying an earth ground. If you are not sure of the integrity of your home electrical system, contact a licensed electrician for assistance.

3. AC extension cords are not recommended for use with this product. If an extension cord must be used, be sure it is an approved type and has sufficient current-carrying capacity to power this product.

4. **NEVER** use flammable or combustible chemicals for cleaning audio components.

5. **NEVER** operate this product with any covers removed.

6. **NEVER** wet the inside of this product with any liquid.

7. **NEVER** pour or spill liquids directly onto this unit.

8. **NEVER** block air flow through ventilation slots or heatsinks.

9. **NEVER** bypass any fuse.

10. **NEVER** replace any fuse with a value or type other than those specified.

11. **NEVER** attempt to repair this product. If a problem occurs, contact your Mark Levinson dealer.

12. **NEVER** expose this product to extremely high or low temperatures.

13. **NEVER** operate this product in an explosive atmosphere.

14. **ALWAYS** keep electrical equipment out of the reach of children.

From all of us at Madrigal Audio Laboratories, thank you for choosing the Mark Levinson® №30 Reference Digital Processor.

A great deal of effort went into the design and construction of this precision device. Used properly, it will give you many years of enjoyment.

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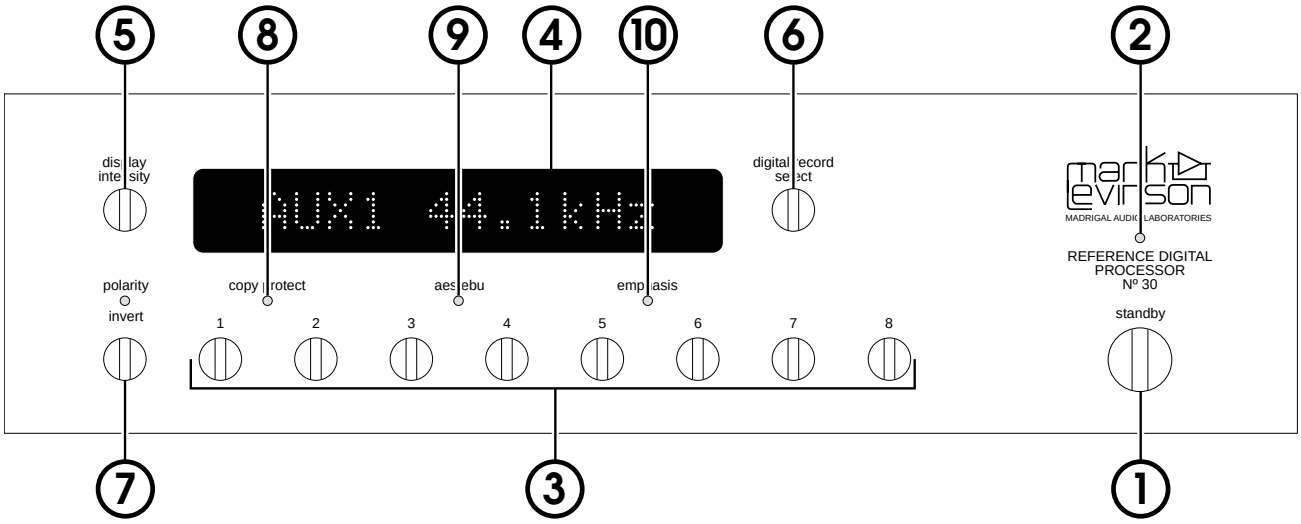


Front panel, Nº30

1 standby
Provided the Nº30 is connected to AC power (via the PLS-330), pressing this button takes the Nº30 out of "standby" mode, turns the Display on, and enables the front-panel controls.

Pressing **standby** again places the Nº30 into standby mode, turns the Display off, and disables the front-panel controls.

2 standby LED
While the Nº30 is in standby mode, this LED flashes every five seconds. When the Nº30 is ready to operate (that is, when it's not in standby mode), this LED remains lighted.

3 Source selection buttons
Pressing these buttons selects the digital source, according to the input connections on the rear panel (see "Rear panel, Nº30"). Only one source at a time may be selected.

PRECAUTION

When changing source material with a digital source (like a DAT) that selects among different sampling frequencies, the Nº30 can generate a transient "click" as it locks onto the new sampling frequency. To prevent this click from coming through your loudspeakers, adjust your system's volume control to its lowest level before changing source material.

When power is first applied to the Nº30 (or when power is restored after an interruption), source **1** is automatically selected.

When the Nº30 is taken out of standby mode, the source last selected before going into standby will be automatically selected.

4 Display
See "Display, Nº30."

5 display intensity
Pressing this button varies the brightness of the Display. Four brightness levels are available.

When power is first applied to the Nº30 (or when power is restored after an interruption), the Display is automatically set to its brightest level.

Pressing the **display intensity** button once dims the Display one level; pressing it again dims it further; pressing it again turns the Display off. Pressing **display intensity** once more returns the Display to its brightest level.

6 digital record select
Pressing this button allows you to select the digital source you want to record.

It's possible to record a different digital source than the one selected for listening.

To record a digital source, press **digital record select**. The Nº30's Display will show **RECORD** followed by the source currently selected. For example:

If you want to record a different source than the one currently selected, press the corresponding source selection button; the Display will then show the input number of that source (for example, **RECORD DBS2**).

After a few seconds, the Display will return to normal.

PRECAUTION

When using a digital recorder (like a DAT) that also allows recording of analog signals, a specific combination of interconnections and settings on the digital recorder, the N°30, and an associated preamplifier may create a "feedback loop" that may damage your system's loudspeakers. For guidance in avoiding such a feedback loop, consult your Mark Levinson dealer.

7 polarity invert
Pressing this button inverts the polarity of the digital signal, to compensate for differences in phase during the recording process. Some recordings may simply "sound better" when this function is active.

While **polarity invert** is selected, the LED above the button will light.

Note: polarity invert doesn't affect the **digital outputs**, and isn't available for inverting the polarity of digital signals to be recorded.

Note: polarity invert may be operated by infrared remote control, but only when the Nº30 is connected to certain compatible Mark Levinson components. Complete instructions are included in those components' operating manuals.

8 copy protect LED
This LED lights when the Nº30 detects encoded copy protection in the digital program being processed.

9 aes/ebu LED
This LED lights when the Nº30 detects that the digital program being processed conforms to the AES/EBU professional standard.

Note: The **aes/ebu** LED lights only when AES/EBU professional-standard recording information is present in the data stream.

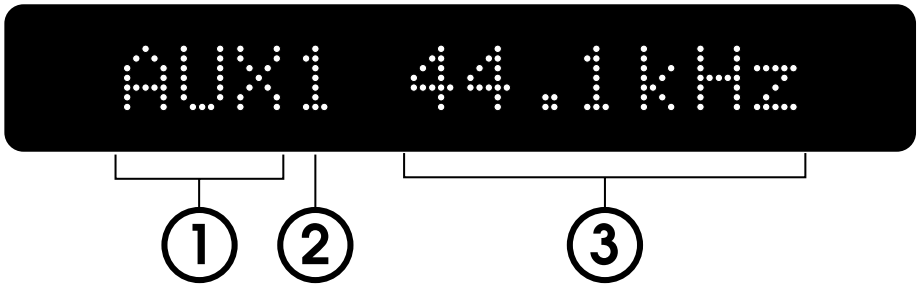
Using AES/EBU-standard interconnections doesn't activate this LED ***unless*** AES/EBU data is present in the source material. Playback of non-AES/EBU CDs or DATs won't activate the **aes/ebu** LED, even if the associated transport is connected according to the AES/EBU standard.

10 emphasis LED
This LED lights when the Nº30 detects recording pre-emphasis in the digital program being processed, and subsequently employs its de-emphasis circuitry (see "Specifications").

Note: The de-emphasis circuitry of the Nº30 is designed to be compatible with all known digital standards. Under certain conditions, however, the emphasis LED will light in error (that is, when the digital program doesn't contain recording pre-emphasis).

This isn't a malfunction of the Nº30. Rather, it's the result of incorrect signals generated by the program source's transport. Depending on your transport and how you operate it, you may never see this condition. Even when the condition exists, it has no effect on sonic quality.

Display, Nº30



1 Input alias
This part of the Nº30's Display shows the type of input selected, according to the settings of the internal DIP switches (see "Assigning input aliases" in the "Installation" section of this manual).

The input aliases available are: **CD** (Compact Disc), **LD** (Laser Disc), **DBS** (Digital Broadcast), **DAT** (Digital Audio Tape), **VCR** (Video Cassette), and **AUX** (other digital sources).

2 Input number
This part of the Nº30's Display shows the input number of the selected digital source, according to the connections on the rear panel (see "Rear panel, Nº30").

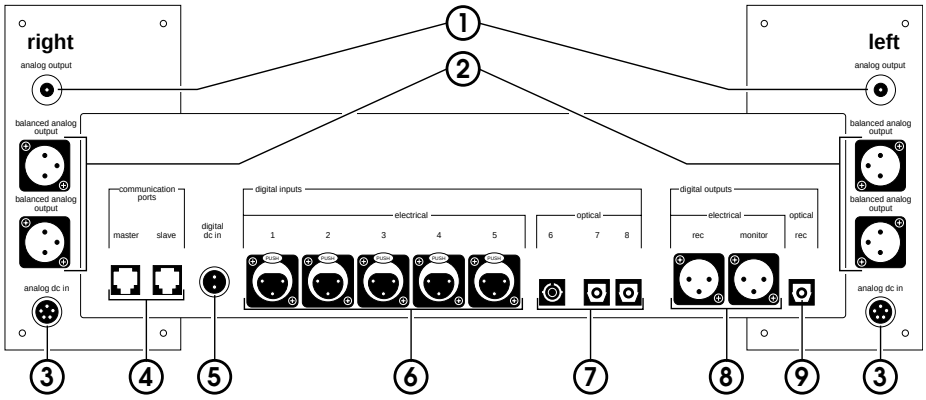
3 Sampling frequency
This part of the Nº30's Display shows the sampling frequency of the digital input being processed, expressed in kilohertz (kHz). One of three sampling frequencies will be shown: **32kHz**, **44.1kHz**, or **48kHz**.

After you press one of the source selection buttons, the Nº30 will reduce the volume and this part of the Display will show:

While the Nº30 is attempting to lock onto a digital signal, this part of the Display will show:

If no digital signal is present (if the source is turned off, is improperly connected, or is disconnected), this part of the Display will show:

Rear panel, Nº30



PRECAUTION

Disconnect all associated equipment from the AC mains BEFORE making any signal connections and applying power to the N°30/PLS-330.

1 analog out

These outputs provide single-ended line-level analog audio (via cables equipped with RCA-type connectors) to a preamplifier, integrated amplifier, or receiver.

PRECAUTION

When using a digital recorder (like a DAT) that also allows recording of analog signals, a specific combination of interconnections and settings on the digital recorder, the N°30, and an associated preamplifier may create a "feedback loop" that may damage your system's loudspeakers. For guidance in avoiding such a feedback loop, consult your Mark Levinson dealer.

2 balanced analog outputs

These outputs provide balanced line-level analog audio (via cables equipped with XLR-type connectors) to a preamplifier, integrated amplifier, or receiver equipped with balanced inputs (see "Set-up and installation").

Male XLR output connector (analog)

Pin 1: Signal ground
Pin 2: Signal **+** (non-inverting)
Pin 3: Signal **–** (inverting)
Connector ground lug: chassis ground

3 analog dc in

These inputs, one for each channel, accept DC power from the PLS-330 (via the supplied cables equipped with five-pin connectors).

Connect the left channel's **audio dc in** on the rear panel of the Nº30 to the **left audio dc out** on the rear panel of the PLS-330; likewise, connect the right channel's **audio dc in** on the rear panel of the Nº30 to the **right audio dc out** on the rear panel of the PLS-330.

4 communication ports
These ports are reserved for connection to certain compatible Mark Levinson components. Complete instructions are included in those components' operating manuals.

5 digital dc in
This input accepts DC power from the PLS-330 (via the supplied cable equipped with two-pin connectors).

Connect **dc in (digital)** on the rear panel of the Nº30 to the **dc out (digital)** on the rear panel of the PLS-330.

6 digital inputs, electrical (1 – 5)
These inputs accept digital audio (DAS, via cables equipped with XLR-type connectors) from digital sources such as a compact disc transport, laser disc transport, digital audio tape transport, digital broadcast receiver, or video cassette recorder.

Female XLR input connector (digital)

Pin 1: chassis ground
Pin 2: Signal **+** (non-inverting)
Pin 3: Signal **–** (inverting)
Connector ground lug: chassis ground

Note: To connect digital sources which provide digital output only via RCA-type connectors, see "Accommodating digital sources with only RCA digital output."

PRECAUTION

When using a digital recorder (like a DAT) that also allows recording of analog signals, a specific combination of interconnections and settings on the digital recorder, the N°30, and an associated preamplifier may create a "feedback loop" that may damage your system's loudspeakers. For guidance in avoiding such a feedback loop, consult your Mark Levinson dealer.

7 digital inputs, optical (6 – 8)
These inputs accept digital audio (DAS, via cables equipped with optical connectors) from digital sources such as a compact disc transport, laser disc transport, digital audio tape transport, digital broadcast receiver, or video cassette recorder.

Input 6 is an ST-type optical connector; inputs 7 and 8 are EIAJ-type optical connectors.

PRECAUTION

When using a digital recorder (like a DAT) that also allows recording of analog signals, a specific combination of interconnections and settings on the digital recorder, the N°30, and an associated preamplifier may create a "feedback loop" that may damage your system's loudspeakers. For guidance in avoiding such a feedback loop, consult your Mark Levinson dealer.

8 digital outputs, electrical
These outputs provide digital audio (DAS, via cables equipped with XLR-type connectors) to a digital processor, digital audio tape recorder, preamplifier, integrated amplifier, or receiver equipped with XLR-type digital inputs.

Male XLR output connector (digital)

Pin 1: Chassis ground
Pin 2: DAS **+** (non-inverting)
Pin 3: DAS **–** (inverting)
Connector ground lug: chassis ground

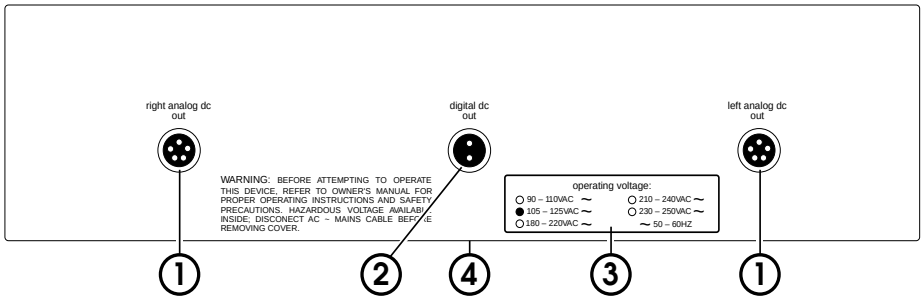
The **monitor digital output** is controlled by the source selection buttons on the front panel.

The **rec digital output** is controlled by the **digital record select** button, and is unaffected by the source selection buttons.

9 digital output, optical
This output provides digital audio (DAS, via a cable equipped with EIAJ-type optical connectors) to a digital processor, digital audio tape recorder, preamplifier, integrated amplifier, or receiver equipped with optical digital inputs.

This **rec digital output** is controlled by the **digital record select** button, and is unaffected by the source selection buttons.

Rear panel, PLS-330



PRECAUTION

Disconnect all associated equipment from the AC mains BEFORE making any signal connections and applying power to the N°30/PLS-330.

1 right analog dc out, left analog dc out
These outputs, one for each channel, provide DC power to the Nº30 (via the supplied cables equipped with five-pin connectors).

Connect the left channel's **analog dc in** on the rear panel of the Nº30 to the **left audio dc out** on the rear panel of the PLS-330; likewise, connect the right channel's **analog dc in** on the rear panel of the Nº30 to the **right audio dc out** on the rear panel of the PLS-330.

2 digital dc out
This output provides DC power to the Nº30 (via the supplied cable equipped with two-pin connectors).

Connect **digital dc in** on the rear panel of the Nº30 to the **digital dc out** on the rear panel of the PLS-330.

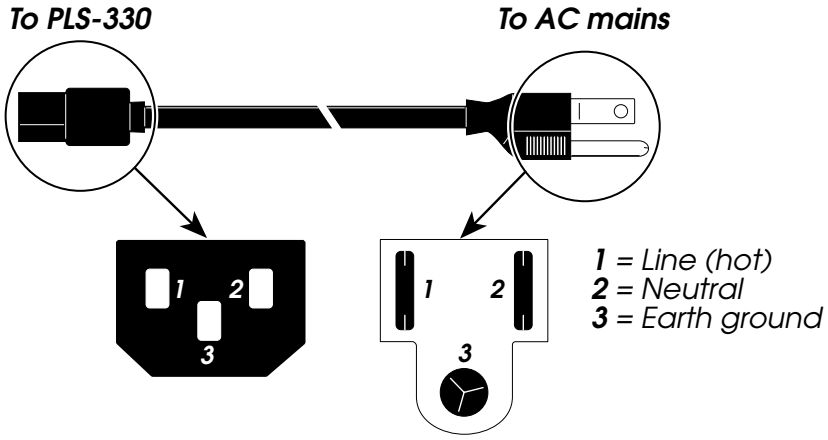
3 Operating voltage label
As indicated on this label, the PLS-330 is set internally for 100V, 120V, 200V, 220V, or 240V AC mains operation @ 50 or 60Hz.

Make sure that this label indicates the correct AC operating voltage for your location. If the voltage indicated is incorrect, or if you wish to change the operating voltage, see your Mark Levinson dealer.

4 AC power connector (on bottom)
This input accepts AC power from the AC mains (via the supplied AC cable).

Connect the female end of this cable to the PLS-330. Connect the male end of this cable to wall outlet or to an "unswitched" convenience outlet like those found on many audio components.

AC power cord polarity



Unpacking and placement

Unpacking

Unpack your Nº30 Reference Digital Processor/PLS-330 Power Supply and remove all accessories from the cartons. Keep all packing materials for future transport.

Carefully inspect your Nº30. If you find any damage or flaws, see your Mark Levinson dealer immediately.

Placement

The Nº30 should be placed as close as possible to your digital source equipment, thus keeping interconnect cabling as short as possible. It may be placed on a shelf or in a cabinet where it's convenient to operate.

Three DC cables are provided to connect the PLS-330 to the Nº30. Their lengths allow you to place the PLS-330 so that it won't induce hum in the Nº30 and other sensitive components. Other associated equipment should also be placed so that it doesn't induce hum in the Nº30 and other sensitive components.

Ventilation

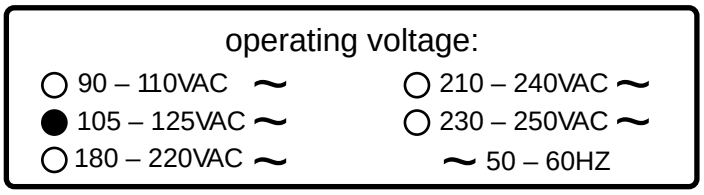
Be sure to allow 3 to 4 inches of clearance above both the Nº30 and the PLS-330, to allow heat dissipation through air circulation.

Custom installations

Drawings are included in this manual to facilitate special installations and custom cabinetry (see "Dimensions").

Voltage selection

The PLS-330 is factory-set (internally) for 100V, 120V, 200V, 220V, or 240V AC mains operation @ 50 or 60Hz. Make sure that the label on the rear panel of the PLS-330 indicates the correct AC operating voltage for your location:



If the voltage indicated is incorrect, or if you wish to change the AC operating voltage of the Nº30/PLS-330, see your Mark Levinson dealer.

The Nº30/PLS-330 can be powered by a normal 15-ampere AC mains line. If other devices are also powered from the same AC line, their additional power consumption must be taken into account.

Set-up and installation

PRECAUTION

For your protection, review "Important safety instructions" before you install your N°30/PLS-330.

Assigning input aliases

The Nº30 allows you to assign one of six "aliases" to each of the eight digital inputs. The alias you assign to an input is shown on the Display when a source is selected (see "Display, Nº30"). Before operating your Nº30, you'll want to customize it to match the digital sources in your system.

Note: The Nº30 is shipped with certain aliases already assigned (see *"Preset input aliases"*). If these preset aliases match the digital sources in your system (and if you connect your digital sources to the corresponding inputs), you needn't make any internal adjustments.

PRECAUTION

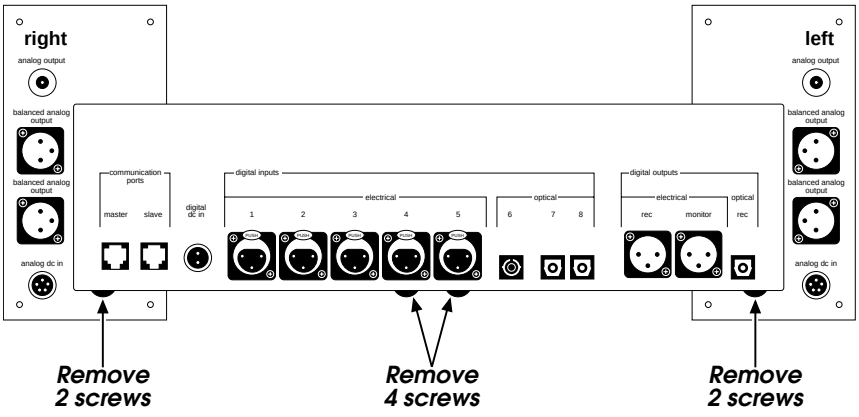
Disconnect the PLS-330 from the AC mains and disconnect all associated equipment from the N°30 BEFORE making any internal adjustments.

PRECAUTION

The N°30 contains static-sensitive components. To help prevent damage to the N°30 from electrostatic discharge, we recommend that you wear a properly grounded wrist strap while performing this procedure. If you're unfamiliar with such precautions, see your Mark Levinson dealer.

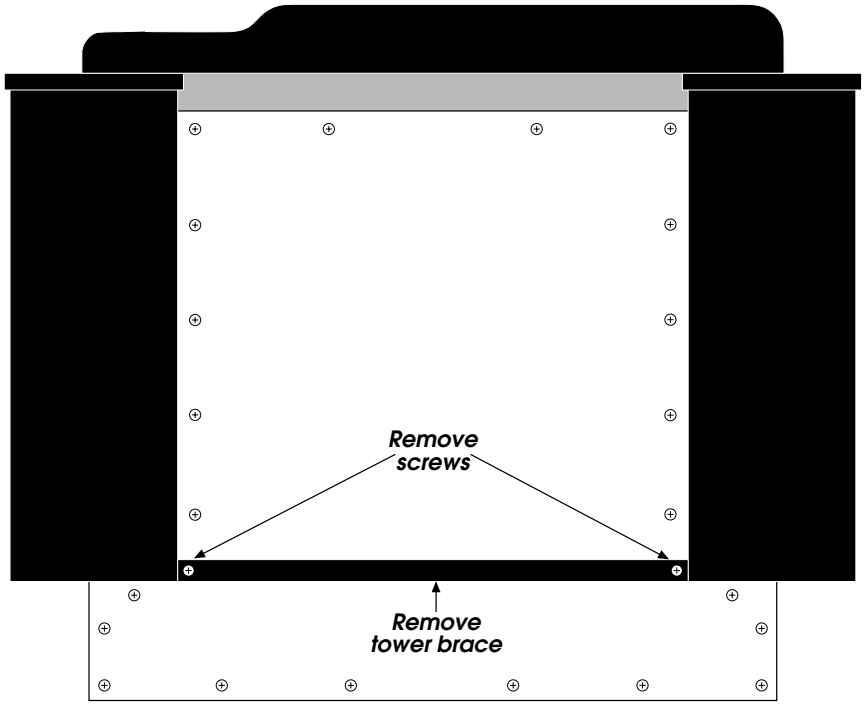
1. Place the Nº30 on a stable, level surface. Carefully tip the unit onto its side (protect the finish with a towel or soft cloth).

2. Using a 5/64" hex key, remove the eight screws securing the Nº30's top cover.



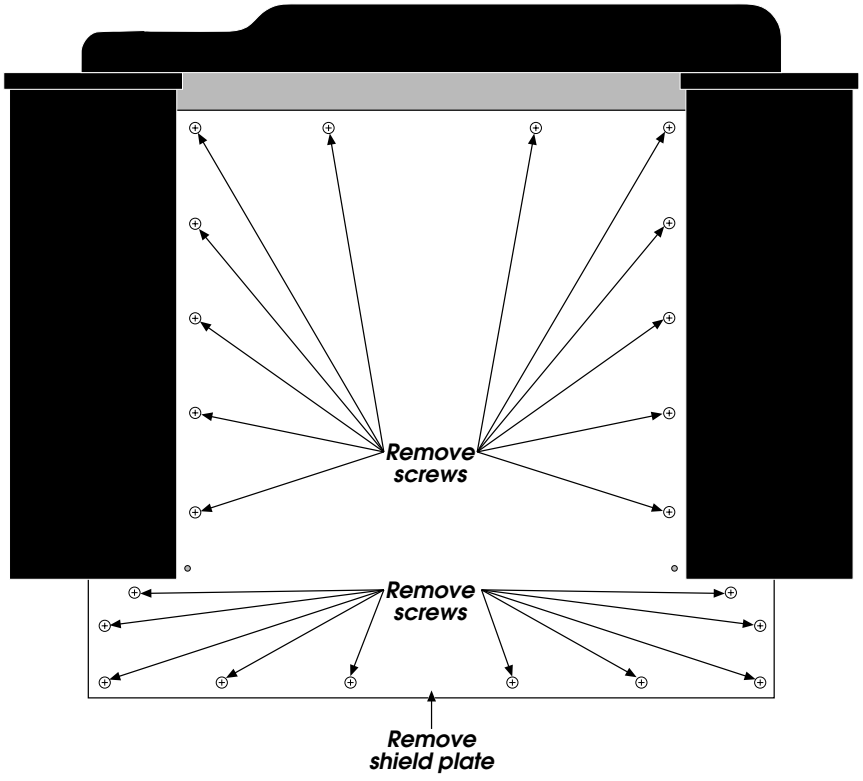
3. Carefully slide the top cover toward the rear of the unit and remove it.

4. Set the Nº30 upright again. Using a #1 Phillips screwdriver, remove the two screws securing the tower brace. Remove the brace and set it aside.

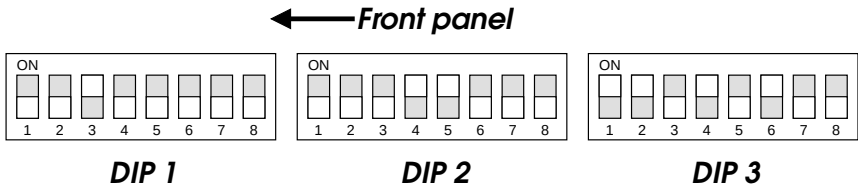


5. Touch the shield plate to equalize any remaining static charge.

6. Using a #1 Phillips screwdriver, remove the twenty-two screws securing the shield plate. Slide the shield plate to the rear; remove it and set it aside.



7. As you view the inside of the N°30 with the front panel facing you, you'll see three eight-place DIP switches along the left side:



Each of these DIP switches' eight miniature switches corresponds to digital inputs 1 through 8. To assign an alias to an input, you must set the corresponding miniature switch to the proper position on each of the three DIP switches.

Here are the settings for the six available aliases:

DIP switch positions for input aliases

Digital source	Alias	DIP 1	DIP 2	DIP 3
Compact Disc	**CD**	OFF	OFF	ON
Laser Disc	**LD**	ON	OFF	OFF
Digital Broadcast	**DBS**	OFF	ON	ON
Digital Audio Tape	**DAT**	OFF	ON	OFF
Video Cassette	**VCR**	ON	OFF	ON
Other digital sources	**AUX**	OFF	OFF	OFF

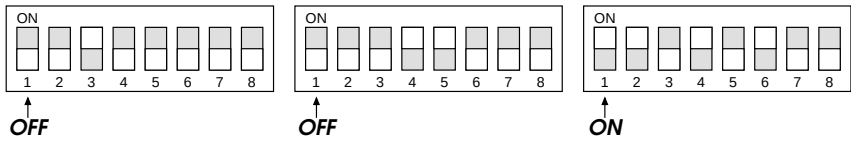
The N°30 is shipped with its DIP switches in these preset positions:

Preset DIP switch positions

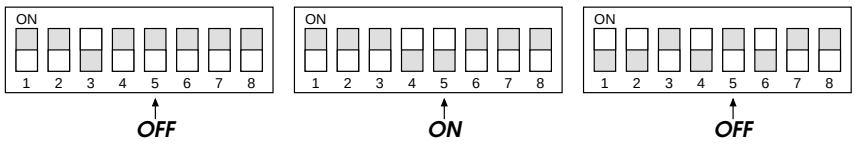
Digital input	Alias	DIP 1	DIP 2	DIP 3
1 and 2	**CD**	OFF	OFF	ON
3	**LD**	ON	OFF	OFF
4	**DBS**	OFF	ON	ON
5	**DAT**	OFF	ON	OFF
6	**CD**	OFF	OFF	ON
7 and 8	**AUX**	OFF	OFF	OFF

You may take advantage of these presets (and make no adjustments), or you may customize the N°30 to match the digital sources in your system.

Example: The **CD** alias is assigned to input 1:



Example: The **DAT** alias is assigned to input 5:



8. After setting the DIP switches, replace the shield plate and the twenty-two screws securing it.

9. Replace the tower brace and the two screws securing it.

10. Tip the Nº30 onto its side again and carefully slide the top cover into place.

11. Replace the eight screws securing the top cover.

Connectors and cable

The Nº30 incorporates RCA-type and XLR-type electrical connectors, and EIAJ-type and ST-type optical connectors for audio signal input and output.

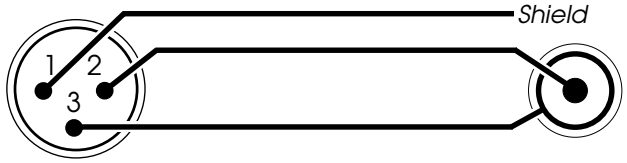
For analog audio interconnection, we recommend Madrigal HPC Interconnect Cable. HPC is available from your Mark Levinson dealer, in various lengths and terminated with RCA, XLR, and Camac connectors.

For electrical digital interconnection, we recommend Madrigal MDC cable. MDC-1 Pro is designed for AES/EBU interconnection (via XLR-type connectors); MDC-2 FatBoy is designed for SPDIF interconnection (via RCA-type connectors). HPC is available from your Mark Levinson dealer, in various lengths and terminated with RCA and XLR connectors.

Accommodating digital sources with only RCA digital output

If connecting a digital source which provides only an RCA-type digital output, it's possible to use an RCA-to-XLR cable for connection to one of the Nº30's XLR-type digital inputs.

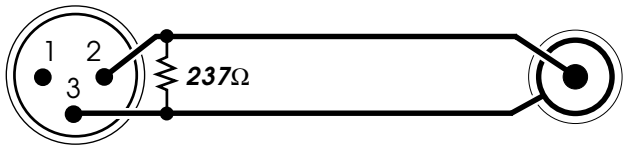
For the best performance, we recommend using a high-bandwidth (up to 300MHz), three-conductor, 110Ω cable such as Madrigal MDC-1 Pro (available from your Mark Levinson dealer). You may also fashion one according to the diagram below.



Male XLR
(connect to Nº30)

Male RCA
(connect to source)

If using a two-conductor 75Ω cable, including a 237Ω resistor as close as possible to the XLR termination may, in some cases, improve sonic performance; follow the diagram below.



Male XLR
(connect to Nº30)

Male RCA
(connect to source)

Power connection and system activation

Be sure all associated equipment is disconnected from the AC mains.

After making all signal connections and internal adjustments, connect the left channel's **analog dc in** on the rear panel of the Nº30 to the **left audio dc out** on the rear panel of the PLS-330; likewise, connect the right channel's **analog dc in** on the rear panel of the Nº30 to the **right audio dc out** on the rear panel of the PLS-330.

Connect **digital dc in** on the rear panel of the Nº30 to the **digital dc out** on the rear panel of the PLS-330.

Connect the AC cord to the AC power connector on the bottom panel of the PLS-330, then connect the AC cord to the AC mains; the LED on the PLS-330 and the **standby** LED on the Nº30 will light. After a few seconds, the Nº30 will begin its self-test (the Display first shows **INITIALIZING**, then each of the eight input aliases, and finally **LOCKING** as it attempts to lock onto input 1).

Allow the Nº30's circuitry to stabilize for 1 to 2 minutes, then connect all associated equipment to the AC mains and activate it.

The Nº30 is now ready to operate.

For optimal sonic performance and longevity, the Nº30/PLS-330 is designed to remain powered at all times. The **standby** button is provided so that you may turn off the Display and disable the front-panel controls when the Nº30 isn't in use (see "Front panel, Nº30").

Care and maintenance

To remove dust from the cabinet of the Nº30, use a feather duster. To remove dirt and fingerprints, we recommend isopropyl alcohol and a soft cloth.

Specifications

The correlation between published specifications and sonic quality is unreliable. A list of numbers reveals virtually nothing. All technical measurements must be subject to qualitative as well as quantitative interpretation.

Measurements of the Nº30 yield excellent results by any standards. However, only those specifications that apply to its actual operation are included here.

■ Frequency response:	10Hz - 20kHz +0dB, –0.2dB
■ Total harmonic distortion (THD):	0.003% @ 1 kHz, 0dB, A-weighted
■ Dynamic range:	98dB (or better)
■ Signal-to-noise ratio:	105dB
■ Channel separation:	Better than 110 dB
■ Intermodulation distortion (SMPTE IMD):	Less than 0.005%
■ Digital-to-analog conversion:	Two custom 20-bit DACs
■ Digital filter:	8x oversampling
■ Analog filter:	Bessel-tuned, linear phase to 40kHz
■ Low-level linearity:	Deviation unmeasurable to below –70dB, approximately +1.7dB below –90dB (undithered, referenced to 0dB @ 1kHz)
■ Output impedance:	Less than 6Ω
■ Mains voltage:	100V, 120V, 200V, 220V, 240V
■ Mains frequency:	50/60 Hz
■ Overall dimensions:	See "Dimensions"
■ Shipping weight (2 boxes):	89 lbs. (40.37kg)
■ Connector complement, Nº30:	2 female RCA-type connectors 5 XLR-type female connectors 6 XLR-type male connectors 3 EIAJ-type connectors 1 ST-type connector 2 five-pin female DC connectors 1 two-pin female DC connector
■ Connector complement, PLS-330:	2 five-pin female DC connectors 1 two-pin female DC connector 1 IEC mains connector

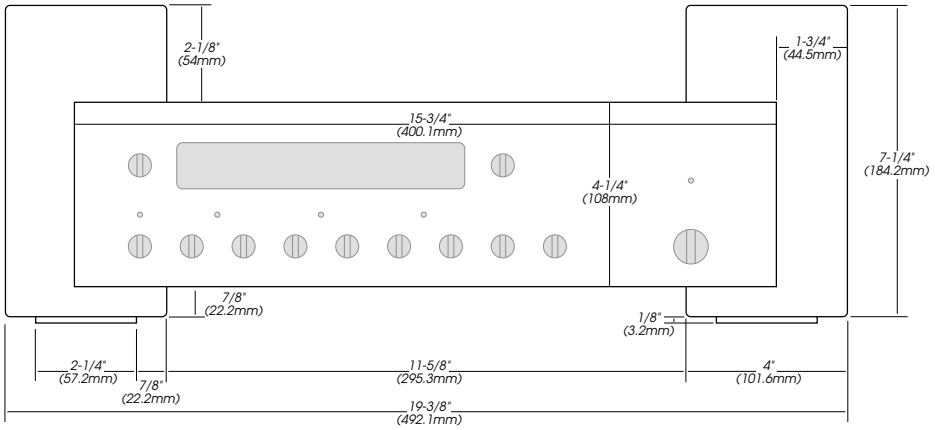
About de-emphasis…

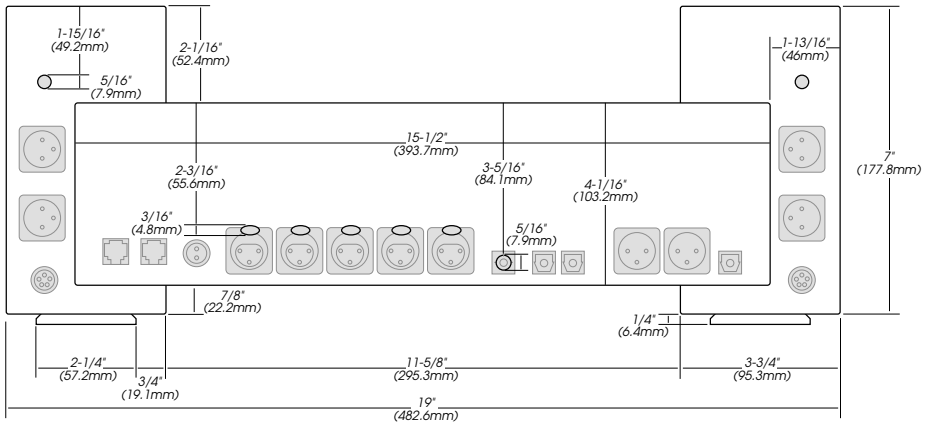
The compact disc standard, as created by Sony and Philips, allows a high-frequency boost to be employed during recording. This boost, called recording pre-emphasis, increases the signal-to-noise ratio at high frequencies, but must be countered by a high-frequency cut before playback to restore a recording's normal frequency response. De-emphasis may be done as the recording is being mastered, or the compact disc (or digital audio tape) may be made with the pre-emphasis still on, and the de-emphasis performed in the playback unit.

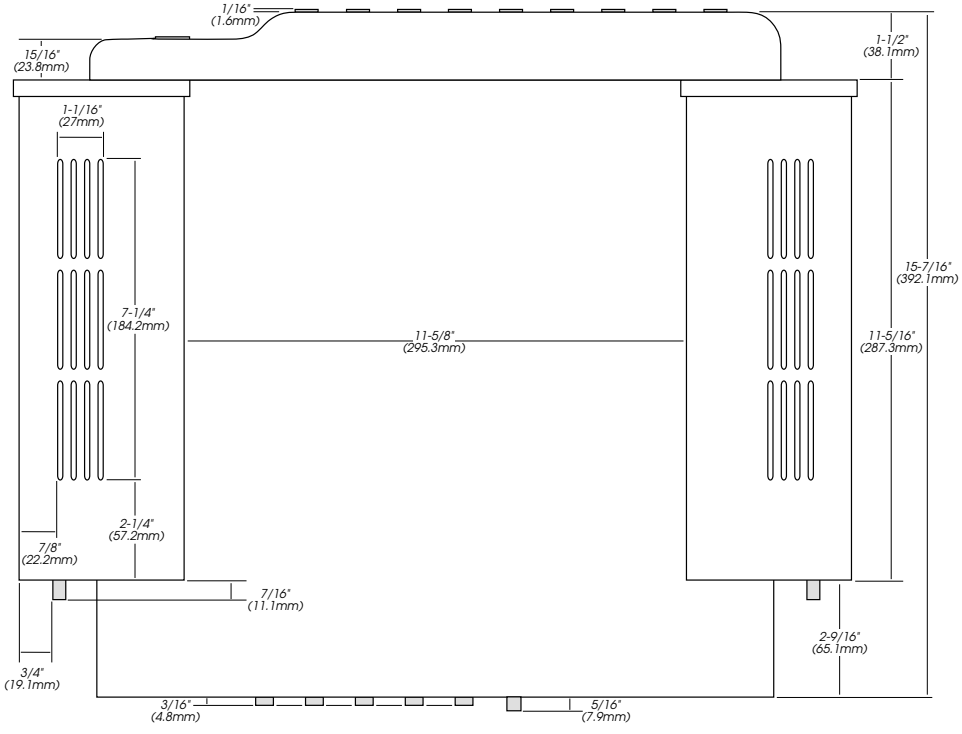
In the Nº30, the de-emphasis filtering is done in the digital domain.

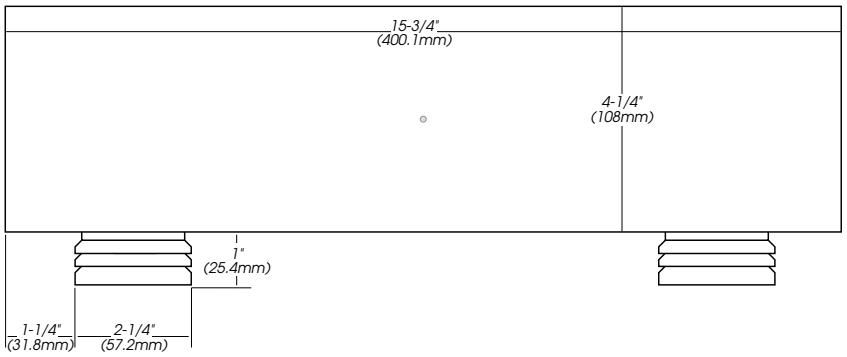
Dimensions

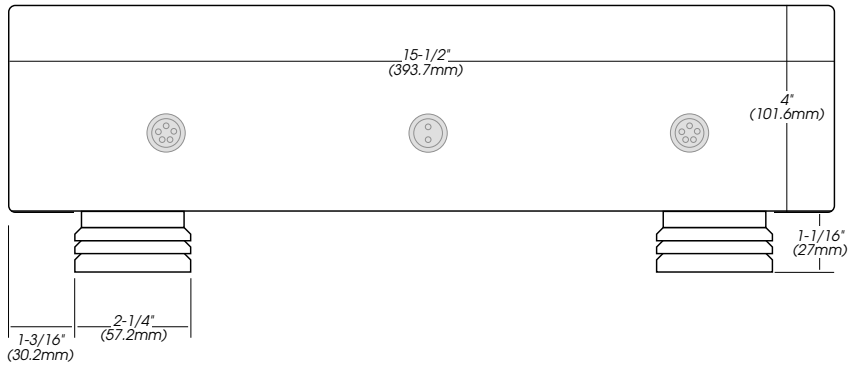
Nº30 Reference Digital Processor

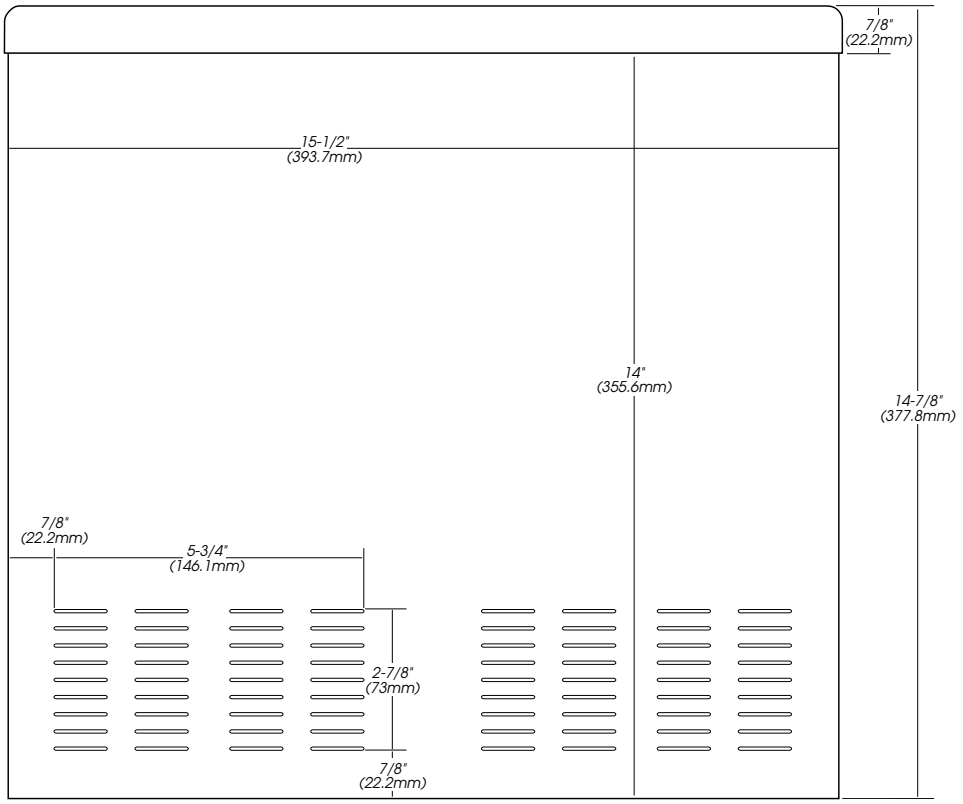







15-3/4"
(400.1mm)
4-1/4"
(108mm)
1"
(25.4mm)
1-1/4"
(31.8mm)
2-1/4"
(57.2mm)


15-1/2"
(393.7mm)
4"
(101.6mm)
1-1/16"
(27mm)
2-1/4"
(57.2mm)
1-3/16"
(30.2mm)


7/8"
(22.2mm)
15-1/2"
(393.7mm)
14"
(355.6mm)
14-7/8"
(377.8mm)
7/8"
(22.2mm)
5-3/4"
(146.1mm)
2-7/8"
(73mm)
7/8"
(22.2mm)

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