

Nº52

REFERENCE PREAMPLIFIER OWNER'S MANUAL

mark
LEVINSON®
by HARMAN

TABLE OF CONTENTS

About This Document	1
Special Design Features	2
Setup Menu Input Setup, Aux Output, Volume Control, Power Management, Advanced	4
Using Aux Mode	11
SSP Setup	12
Troubleshooting	14
Specifications	16

ABOUT THIS DOCUMENT

This User Guide primarily covers the system functions and advanced options contained in your N°52's Setup menus. This guide also covers setup for SSP (Surround Sound Processor) mode. These resources allow you to finely tailor the behavior and performance of the N°52 to fit your preferences and the particulars of your equipment and listening room.

Before you read this User Guide, we recommend that you thoroughly read the *N°52 Quick-Start Guide*, supplied with your N°52 in printed form. The *Quick-Start Guide* contains all the information you will need to unpack and place your N°52, connect it to the rest of your audio system and have a first listen.

NOTE: Within this User Guide, the term “Controller” is used to refer to the N°52 Controller chassis and the term “Preamplifier” is used to refer to the N°52 Preamplifier chassis. The term “N°52” is used to refer to the dual-chassis combination.

For the sake of brevity, instructions in this guide refer only to the use of front-panel controls. Functions accomplished by using the front-panel Select knob, Setup button, and Enter button may also be accomplished using the remote-control Select +/- buttons, Setup button, and Enter button.

SPECIAL DESIGN FEATURES

Thank you for purchasing the N^o52 Reference Preamplifier, featuring an innovative dual-chassis design that allows the audio circuits to deliver unrivaled musical reproduction. The N^o52 Preamplifier chassis isolates the audio circuits so that only audio signals and extremely pure DC power are present. The power supply and control circuits are combined in the other chassis, protecting the sensitive audio signals.

Like most high-performance audio components, the N^o52 relies on clean, noise-free power to deliver maximum performance. Unfortunately, most AC power does not meet these standards. Common household appliances such as refrigerators, TVs and computers often contaminate AC power lines with line noise, spikes and other irregularities that make it difficult for audio circuits to perform up to their full potential.

To protect audio circuits from contamination, the N^o52 generates its own “secondary” AC power. An independent power supply is dedicated to each audio channel, generating AC power for a special power amplifier optimized to reproduce just one frequency: 200Hz. This 200Hz frequency is rectified, filtered and regulated again to create extraordinarily clean DC power. A third cable supplies control signals between the Controller and Preamplifier chassis, preventing potentially noisy control signals from coupling into the power supplies.

An advanced dual-mono design allows the N^o52 to achieve exceptional channel separation. Both audio channels use independent power supplies, communication circuits, and audio circuits. The Preamplifier chassis provides complete isolation between the left and right channels, which are physically and electrically separated by a thick aluminum wall. This innovative approach isolates each channel, allowing the N^o52 to produce vividly detailed, three-dimensional sonic images.

For even greater isolation, the N^o52 effectively deactivates unused inputs to prevent interference from other components. Discrete “T-switch” input switching, special shielding and optimal circuit board placement allow the N^o52 to “unplug” inputs not in use – achieving more than 120dB separation between even adjacent input connectors. As a result, input signals pass through the N^o52 with remarkable freedom from interference.

The N^o52 offers seven configurable inputs, each of which is assigned to one of its three balanced (XLR) or four unbalanced (RCA) stereo connectors. Unbalanced input signals are converted to balanced signals upon entering the Preamplifier chassis, and processed as balanced signals thereafter. During this rigorous conversion process, meticulously balanced circuits preserve all input signal information, passing it to the associated power amplifier without the limitations of asymmetrical designs.

In addition to the above-mentioned inputs, the N^o52 also offers a dedicated phono input featuring a proprietary Mark Levinson-designed RCA connector that provides the same common mode noise rejection benefits as a balanced XLR connector. The input gain stage produces a symmetrical pair of opposite polarity signals, based solely on voltage differences present at the input. Each balanced signal follows the same signal path, including identical RIAA equalization. Gain is distributed over two stages, allowing ample bandwidth and open-loop gain for superior performance – even at the 60dB input gain required for moving-coil phono cartridges. Originally introduced with the N^o38, the instrumentation amplifier stage resolves tiny electrical signals from potentially noisy environments. This method offers high common mode noise rejection without the limitations of transformer-based designs. And to prevent the introduction of radiated noise, the phono section is double isolated from the rest of the preamplifier.

A balanced pair of RIAA equalization circuits follows the input gain stages. These circuits include a filter constructed with 0.1% non-inductive thin-film resistors and 5% stacked-film capacitors for uncompromised RIAA curve accuracy.

The Setup menu for the Phono input provides multiple loading and input gain options that allow compatibility with most phono cartridges, including moving-coil, moving-magnet, high-output and low-output designs. The menu also provides a switchable 20Hz high-pass filter and allows compensation for left/right phono playback device imbalances of up to 3.0dB in 0.1dB increments.

A Mark Levinson-designed discrete volume attenuator controls the master volume level with unprecedented accuracy and sonic neutrality. Constructed from Nelco[®] 4000-13SI circuit boards with local power supply regulation and bypass capacitors, this volume attenuator generates optimal power and isolation for even the most sensitive adjustments. Sixty-eight surface-mounted, precision resistors per channel provide more than 65,000 possible settings between 0dB (maximum attenuation) and 80dB, accommodating adjustments in 1.0dB increments up to 23.0dB and in 0.1dB increments above 23.0dB.

The N^o52 is designed to integrate with multichannel surround-sound processors without the complications associated with competing stereo and multichannel volume controls. A unique surround-sound processor (SSP) mode deactivates N^o52 volume controls and sends line-level input signals to the associated processor. With no interference from the N^o52, the processor controls the relative volume level of all channels, maintaining its carefully calibrated output levels.

To maximize channel separation, left-channel and right-channel connectors are located on opposite sides of the rear panel. The connector complement includes separate Main and Auxiliary stereo outputs, available on both balanced (XLR) and unbalanced (RCA) connectors. Flexible Auxiliary output configuration options allow them to be used to feed powered subwoofers, recording devices or a second zone.

The N°52 represents the ultimate combination of compelling performance and almost limitless potential. Its unique dual-chassis structure shields audio circuits to create truly spectacular sound, while its advanced design – including eight configurable inputs, separate Main and Auxiliary outputs, complete surround-sound processor integration, and extensive control possibilities – accommodates even the most demanding applications. All of this makes the N°52 a reference-quality component befitting the most sophisticated music reproduction systems.

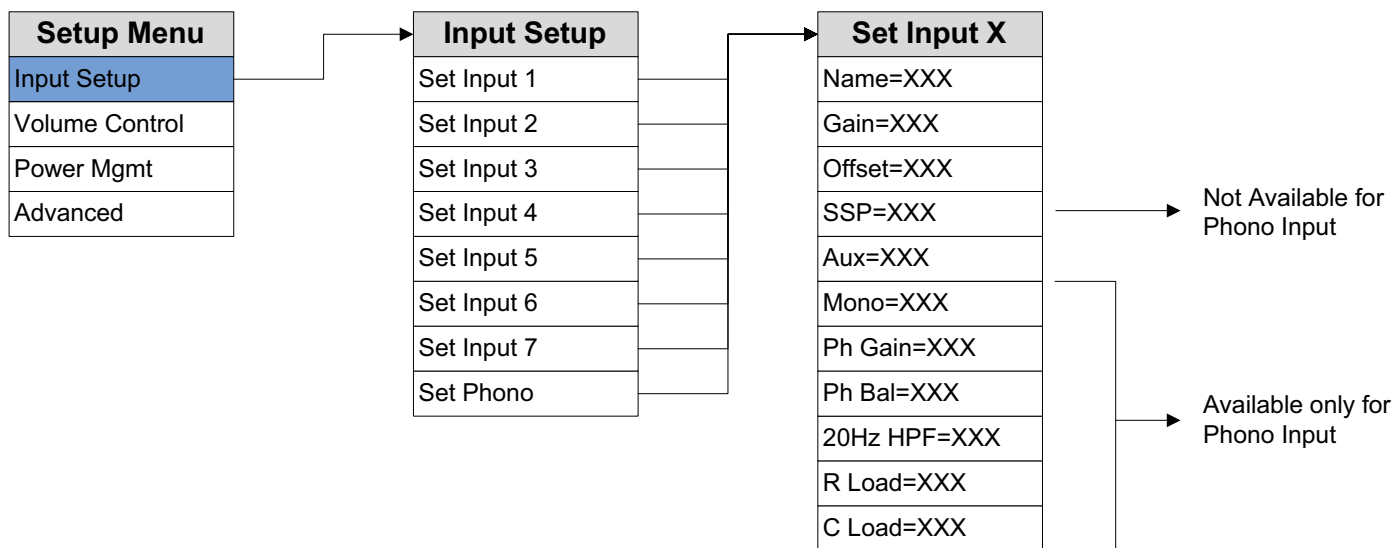
SETUP MENU

This section explains the use of the Setup menus on your N°52, which allow you to customize and configure the unit.

SETUP MENU NAVIGATION

Pressing the Setup button displays the Setup menu on the Controller’s front-panel display. When the Setup menu is active, use the Select knob to scroll through options, the Enter button to select and deselect options, and the Volume knob to adjust parameters. To move back a level in the menu structure (or exit the Setup menu), press the Setup button repeatedly until the desired menu is shown in the display.

INPUT SETUP



The Input Setup menu allows you to customize the following parameters for the selected input:

The following settings are available for all inputs.

Name: This option offers a choice of preset names for the selected input (CD, SACD™, DVD, Blu-ray™, DAC, EQ) as well as the following special names:

Unused: This option removes the selected input from the list of available inputs. The input will be skipped when selecting the active input.

NOTE: To prevent noise due to the input’s high gain factor, if you are not connecting a phono source to the Phono input set the Phono input name to “Unused.”

Manual Entry: This option allows you to enter a custom name for the selected input. Use the Select knob to select the character you want to change, use the Volume control to choose from the list of available characters and press the Enter button to confirm each character. After the eighth character is entered, the new name will be saved.

Gain: The output level of audio devices can vary from brand-to-brand and model-to-model, making some devices sound louder or quieter than others. The Gain and Offset parameters combine to let you precisely compensate for that variance, allowing all associated devices in your system to output at a similar volume level.

The Gain setting offers a choice of 0dB, +6dB, +12dB, or +18dB of gain boost for the selected input. Use this parameter to boost any lower-output devices in your system near to the level of higher-output devices. For finer control of input gain, use the Offset parameter, as described below.

NOTE: The Gain parameter should be set before the Offset parameter.

Offset: This setting works to fine-tune the gain value established by the Gain parameter (see above). It offers a setting range of -20.0dB to +20dB, in 0.1dB steps, starting from the setting of the Gain parameter. Whenever an input is selected, the N^o52 applies the setting of the Offset parameter to the volume level of the Main and Auxiliary outputs.

SSP: The SSP setting configures the selected input for complete integration with a multichannel surround sound processor. See *SSP Setup* on page 11 for more information. (Note: The SSP setting is not available for the Phono input.)

Aux: This setting lets you select the Auxiliary output connectors to which the input will be routed when that input is selected with the Aux mode:

Both: The input is routed to the unbalanced (RCA) and balanced (XLR) Auxiliary output connectors.

RCA Only: The input is routed only to the unbalanced (RCA) Auxiliary output connectors.

XLR Only: The input is routed only to the balanced (XLR) Auxiliary output connectors.

Off: The input is not routed to either set of Auxiliary output connectors.

NOTE: The following Auxiliary output conditions will apply if you use the Aux mode to set the Auxiliary output signal to anything other than "Off" or "Main Var[iable]:"

Input Setup Menu Aux Setting for Selected Input	RCA Auxiliary Outputs	XLR Auxiliary Outputs
Both	Active (0dB gain)	Active (+6dB gain)
RCA only	Active (0dB gain)	Muted
XLR Only	Muted	Active (0dB gain)
Off	Muted	Muted

See *Using the Aux Mode*, on page 10, for more information.

The following settings are available only for the Phono input.

Mono: This menu lets you select from the following mono configuration options:

Off: The Phono input operates in stereo mode.

L+R: This setting sends an equal combination of left-channel and right-channel Phono input signals to the left-channel and right-channel Main output connectors.

L-R: This setting sends the difference between the left-channel and right-channel Phono input signals to the left-channel and right-channel Main output connectors. See *Using L-R Mono Mode to Align Phono Cartridge Azimuth*, below, for additional information.

Using L-R Mode to Align Phono Cartridge Azimuth

L – R mono playback simplifies the process of aligning phono cartridge azimuth.

1. Enable L-R mode in the Setup > Input Setup > Set Phono > Mono menu.
2. Play the desired mono recording.
3. Adjust the phono cartridge azimuth to achieve the quietest possible output signal. Note: Perfect phono cartridge azimuth alignment will result in silence in the L-R mono playback mode.
4. Select another mono mode (or Mono=Off for stereo) from the Setup > Input Setup > Set Phono > Mono menu to continue listening as normal.

Ph Gain: This setting lets you choose from two preset gain settings (+40.0dB or +60dB) for the Phono input. The +60dB setting is useful for boosting signals from moving-coil and other lower-output phono cartridge types.

Ph Bal: This setting lets you compensate for subtle left-to-right channel imbalances in the phono playback system. Adjustment ranges from +3.0dB left to +3.0dB right, in 0.1dB increments.

20Hz HPF: This setting lets you engage or disengage a 20Hz high-pass filter for the Phono input, allowing for a reduction of infrasonic interference.

R Load: This setting offers a choice of resistive loading values for the Phono input:

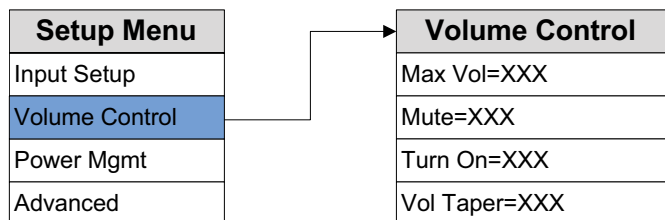
- 47k ohms: The most commonly specified value for most phono cartridges.
- 3.3, 5.0, 7.7, 10, 33, 50, 77, 100, and 330 ohms
- Other: Enables the use of a custom-installed load. If you require a custom load to match your phono setup, contact your authorized Mark Levinson dealer for details

C Load: This setting offers a choice of capacitive loading values for the Phono input:

- None: No capacitive load is introduced to the phono input.
- 50pF, 100pF, 150pF, 200pF, 250pF, 300pF, 350pF, 0.01uF

NOTE: We recommend initially setting the R Load and C Load parameters to match your phono cartridge manufacturer's recommendations. Feel free to experiment with other values to fine-tune phono performance to your preference.

VOLUME CONTROL



Max Vol: This setting lets you set a maximum Main output (and Auxiliary output, if set to “Main Var” in the Aux mode) volume level setting in 0.1dB increments between 40.0dB and 80.0dB. The factory default maximum volume is 80.0dB.

Mute: This setting lets you set the amount of Main output (and Auxiliary output, if set to “Main Var” in the Aux mode) volume level attenuation that occurs when the Mute button is engaged, in 0.1dB increments between -10dB and -80.0dB. The factory default mute attenuation is -40dB.

Turn On: This setting lets you set a Main output (and Auxiliary output, if set to “Main Var” by the Aux button) volume level to which your N°52 will default every time you turn it on.

- 10.0dB – 60.0dB: Choose a turn-on volume level in 0.1dB increments between 10.0db and 60.0db. The factory default setting is 40.0dB.
- Last: The volume level setting from the previous time the unit was powered down is retained.

CAUTION: Setting the Turn On parameter to Last can result in louder-than-expected power-up volume if the N°52 was set to a high volume level setting when last powered down.

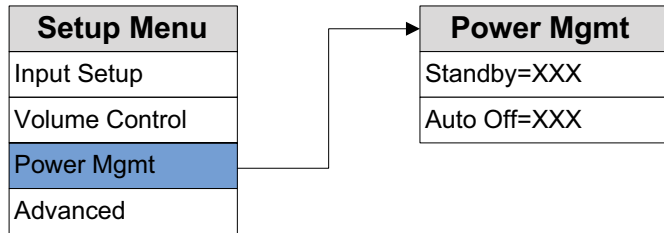
Vol Taper: This setting lets you choose the desired taper for the volume control, from the following options:

Mode 1: The faster you rotate the volume knob the more quickly the volume will change. Rotating the knob slowly slows the rate the volume changes, allowing you to make very precise adjustments in the listening level.

Mode 2: Similar to Mode 1, with a “faster” response curve, with more gain change for a similar range of knob travel.

Mode 3: When increasing the volume the volume changes quickly through the low volume range, and then decelerates in the higher range, for precision adjustments. When decreasing the volume the control works in the opposite fashion, changing quickly through the high volume range and decelerating in the lower range.

POWER MANAGEMENT



The Power Management parameters let you customize power-related functions.

Standby: This setting lets you set the Standby mode to one of the following options:

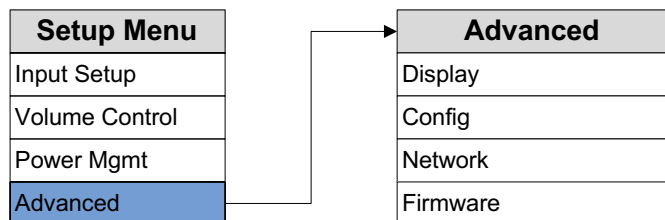
Green: This mode removes power from almost all of the N^o52's circuits, allowing the unit to be activated only via an IR control signal, a 5V – 12V trigger voltage or a press of the Standby button. This mode provides maximum power conservation and is the factory-default Standby mode.

Power Save: This mode removes power from the N^o52's audio circuits, but keeps the control circuitry powered and ready to receive commands from either the front-panel controls or the remote control. This mode provides moderate power conservation.

Normal: This mode shuts off the N^o52's display and mutes its audio outputs, but keeps all of its control and audio circuits powered. This mode provides the least amount of power conservation but allows the N^o52's audio circuits to remain warmed up to deliver optimal performance at all times.

Auto Off: This setting lets you engage or disengage the Auto Off function, which puts your N^o52 into the Standby mode after 20 minutes of inactivity (no audio signal, and no user-control input).

ADVANCED



The Advanced section of the Setup menu gives you access to a range of configuration and administrative settings and functions.

Display: This menu gives you access to the following display-related parameters:

Intensity: Lets you set the brightness of your N°52's display and front-panel LEDs to High, Med, Low, or Off (which turns the display and LEDs off entirely until a control is operated). The factory default setting is High.

Timer (only applies when the display intensity is set to Off): Lets you choose how long the display and LEDs remain lit after the last time a control is operated. Choose from 10 seconds, 4 seconds, or 2 seconds. The factory default setting is 10 seconds.

Config: This menu lets you import or export Setup menu configuration settings, and also offers other administrative functions.

Export: Press Enter to export all setup configuration information to a thumb drive inserted in the rear-panel USB port. This data can then be used to identically configure other N°52 units, or serve as a backup to easily reconfigure your N°52.

Import: Press Enter to import all setup configuration information from a thumb drive inserted in the rear-panel USB port.

Lock: Engage the Lock to prevent accidental changing of Setup menu parameters. The factory default setting is Off.

Restore: Lets you restore all N°52 parameters to their factory-default condition.

Network: This menu offers access to the following network-related parameters:

Name: N°52_XXXXXX: Displays your N°52's network name (the X's represent the last six digits of the unit's unique MAC address). This setting is informational only and does not provide any user adjustments.

DHCP: Lets you toggle DHCP mode (network auto-configuration) on or off. The factory default behavior is On.

Current IP: Shows the IP address currently assigned (by DHCP or manually) to your N°52. (This setting is informational only and does not provide any user adjustments.)

Current Subnet: Shows the subnet address currently assigned (by DHCP or manually) to your N°52. (This setting is informational only and does not provide any user adjustments.)

Renew IP: Lets you refresh your DHCP configuration, assigning a new IP address to your N°52. This function is often useful when troubleshooting a network connection.

Static IP: Lets you specify a static IP address for your N°52. The factory default setting is 192.168.50.10. DHCP must be disabled to set a static IP address.

Static Sub: Lets you specify a static subnet address for your N°52. The factory default static subnet is 255.255.0.0. DHCP must be disabled to set a static subnet address.

Firmware: This menu gives you access to the following firmware-related functions:

Ver: Displays the version number of the currently loaded firmware. (This setting is informational only, and does not provide any user adjustments.)

Update: Lets you update your N°52's firmware, either from a flash drive inserted in the rear-panel USB port or from a connected computer over the network.

USING THE AUX MODE

The Auxiliary outputs on your N°52 are two supplementary sets of stereo output connectors, one balanced (XLR) and one unbalanced (RCA), that are configurable independently from the Main outputs. You can use them to send the signal of your choice to a secondary device (such as a powered subwoofer, second zone or audio recorder).

Pressing the Aux button enters the Aux mode, in which you can choose from the following Aux output settings:

Off: No signal is routed to the Aux outputs.

Input 1 – Input 7: The selected input is routed to the Aux output on the connectors you specified in the Setup > Input Setup > Aux menu.

Phono: The Phono input is routed to the Aux output on the connectors you specified in the Setup > Input Setup > Aux menu.

Main Var (variable gain): The signal at the Main outputs is also routed to the Aux outputs, at a level that mirrors the Main output volume setting. This mode is useful in configurations where Main and Aux signals and levels must match, such as when you are using the Aux output to drive a powered subwoofer.

Main Fix (fixed gain): The signal at the Main outputs is also routed to the Aux outputs at a fixed gain setting. This mode is useful when the Aux output is routed to a recording device, or in any other instance when variable gain is not desired.

Once you've selected the desired Aux output setting, press Enter to confirm.

NOTE: If you choose Input 1 – Input 7, Phono, or Main Fix, the signal level at the Aux output depends on the chosen input's setting in the Setup > Input Setup > Aux menu, as follows:

Input Setup Menu Aux Setting for Selected Input	RCA Auxiliary Outputs	XLR Auxiliary Outputs
Both	Active (0dB gain)	Active (+6dB gain)
RCA only	Active (0dB gain)	Muted
XLR Only	Muted	Active (0dB gain)
Off	Muted	Muted

SSP SETUP

In the past, the differing number of channels in each component made integration between two-channel and multichannel components difficult. Sending multichannel processor output signals to a stereo Preamplifier distorts calibrated processor output levels. Multichannel processor volume controls adjust the relative volume level of all channels in unison. However, stereo Preamplifier volume controls adjust the relative volume level of just the front left and right channels, leaving the center, surround, and subwoofer channels unaffected.

To avoid these problems when the N^o52 is connected with an associated surround-sound processor, the SSP mode allows selected input sources to pass through the N^o52 without interference. When SSP mode is activated the N^o52 volume control is deactivated to prevent the N^o52 from distorting channel balance. As a result, the processor controls the relative volume level of all channels while maintaining its calibrated output levels.

NOTE: Although you still have the ability to adjust the gain setting for an input that will have SSP mode active, we recommend setting the gain to 0dB for XLR inputs and +6dB for RCA inputs.

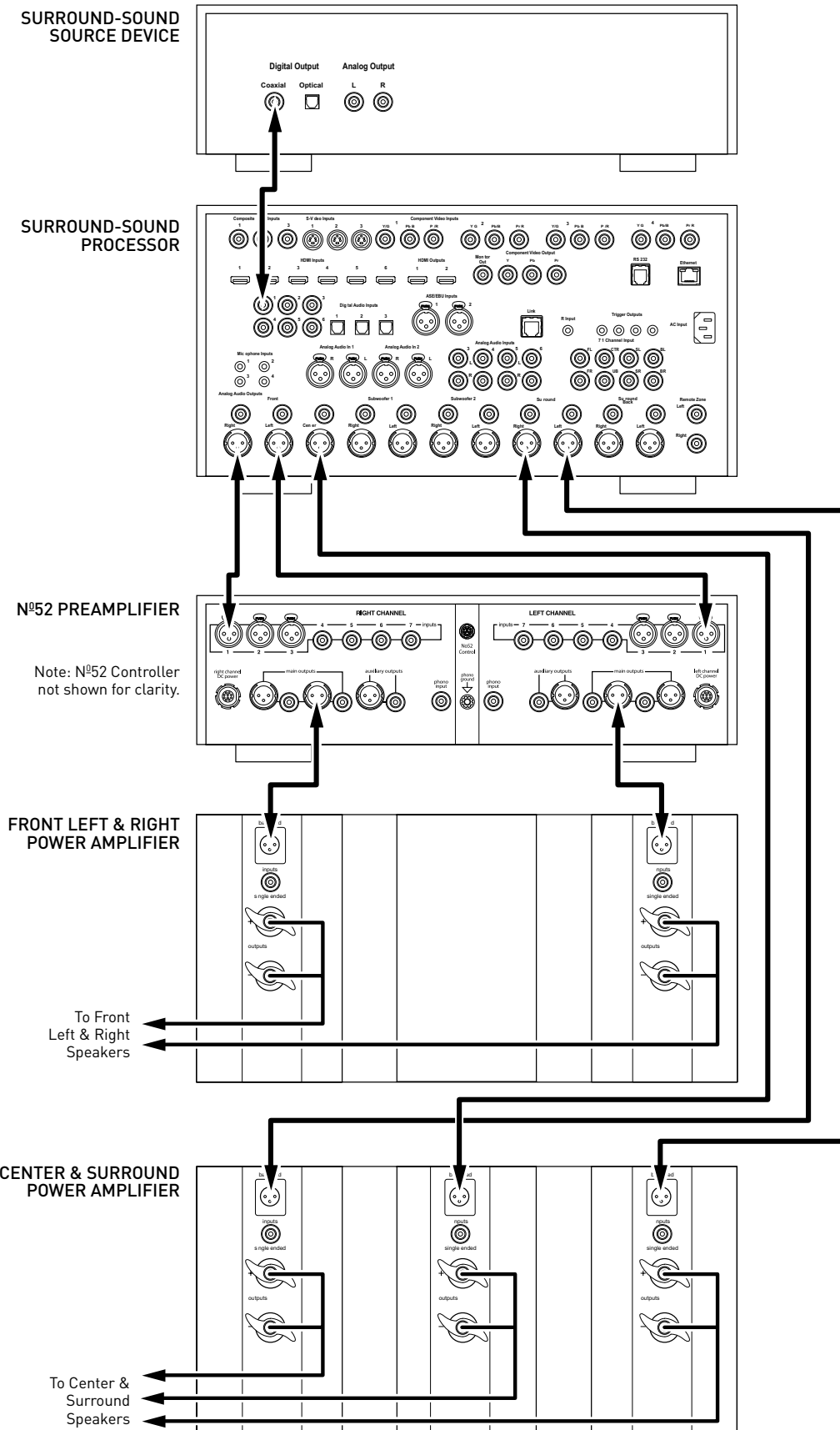
To connect the N^o52 with a surround-sound processor (see illustration on next page):

1. Make sure the N^o52 and all associated components are powered off and disconnected from electrical outlets.
2. Connect the output connectors on the surround-sound source component to the input connectors on the surround-sound processor. For example, if the source component is a DVD player, connect it to the appropriate input connectors on the surround-sound processor.
3. Connect the front left and right output connectors on the processor to the desired input connectors on the N^o52. For best performance, use balanced connections whenever possible.
4. Connect the center, surround, and subwoofer output connectors on the processor to the appropriate input connectors on the power amplifier(s).
5. Connect the desired main output connectors on the N^o52 to the appropriate input connectors on the power amplifier.

To activate the SSP mode for a selected input:

CAUTION: Before activating the SSP mode for any input, set the associated surround sound processor volume control to a reasonable level to prevent sending dangerous signal levels to the associated loudspeakers.

1. Activate the Setup menu by pressing the Setup button.
2. Select Input Setup, and press Enter.
3. Select the input you wish to configure for SSP use, and press Enter.
4. Select SSP, and press Enter.
5. Set the SSP parameter to On.
6. Press the Setup button four times to step backward through the menu hierarchy and exit the Setup menu.



TROUBLESHOOTING

Incorrect operation is sometimes mistaken for malfunction. If problems occur, see this section for troubleshooting information. If problems persist, contact your authorized Mark Levinson dealer.

NO POWER

Examine the power cord to ensure that it is connected to both the AC mains connector and a working, *unswitched* electrical outlet.

Make sure the N°52 is powered on with the Controller's rear-panel Power switch.

Examine the electrical circuit breaker to ensure that power is being supplied to the electrical outlet to which the N°52 is connected.

Make sure the N°52 is *not* in standby. The Controller's front-panel standby and Preamplifier LEDs illuminate fully and continually when the N°52 is On. The LEDs illuminate dimly when it is in the Green or Power Save Standby modes and flash slowly in unison when it is in the Normal Standby mode.

REMOTE CONTROL DOES NOT OPERATE

Eliminate obstructions between the remote control IR transmitter and the IR receiver on the Controller's front-panel display.

Make sure the rear-panel IR input connector is *not* being used.

Make sure the remote control's IR transmitter LED lights when remote control buttons are pressed, indicating that IR signals are being transmitted.

Make sure the remote control is positioned within 17 feet (5m) of the Controller's front panel. If the Controller chassis is placed inside a glass cabinet, tinted glass will reduce the remote control range.

Make sure the remote control signal is being received at the IR receiver on the Controller's front-panel display at a reasonable angle.

Make sure the IR receiver on the Controller's front-panel display is not exposed to strong sunlight, halogen light, or fluorescent light. This can cause IR reception to become unreliable.

Replace the remote control batteries.

NO SIGNAL AT THE MAIN OUTPUTS

Examine all audio cables to ensure a solid connection between the N°52 and all associated components.

Make sure the volume is set to an audible level.

Make sure the mute is deactivated.

Make sure the Gain/Offset parameters for the selected input are not reducing the volume to an inaudible level.

Make sure the N°52 Main output connectors are connected to an operational power amplifier, and that the associated power amplifier is connected to operational loudspeakers.

Make sure all associated components are connected to working electrical outlets and powered on.

Make sure the source device connected to the selected N°52 input is producing an output signal.

NO SIGNAL AT THE AUXILIARY OUTPUTS

Apply all of the items for *No Signal at the Main outputs*, above, to the Auxiliary outputs.

Make sure that the desired Input has been selected via the Aux mode.

Make sure that the selected Input has been routed to the desired Auxiliary output connectors in the Setup menu.

“MISSING” INPUT

Make sure the Name parameter for the selected input has not been set to Unused in the Setup menu.

AUDIO HAS A HUMMING SOUND

Disconnect components one at a time to isolate the problem.

Once the problem is identified, make sure the problematic component is properly grounded and connected to the same electrical circuit as the N°52.

VOLUME CAN'T BE SET TO MAXIMUM

You have the option of establishing a maximum volume level in the Setup menu. If this option is set, it can prevent the N°52's maximum volume level of 80.0 from being reached. Refer to *Volume Control / MaxVol* on page 7 for more information.

FRONT-PANEL DISPLAY NOT WORKING

Verify that the Intensity parameter in the Setup menu is not set to Off.

NO CONNECTIVITY VIA ETHERNET

Verify that the network cables are properly connected between the router, switch or hub and the N°52. If you have connected directly to a computer, verify that the computer network cable is in the correct port.

Verify the age of the router, switch or hub. If the router, switch or hub is more than ten years old, there may be a communication issue with the N°52. Power cycle the N°52 and use a newer router, switch or hub between the network and the N°52.

IF ALL ELSE FAILS...

Power cycle the N°52 with the Controller's rear-panel Power switch, waiting at least 10 seconds between powering the N°52 off and on.

Restore factory-default settings (See *Advanced: Config / Restore* on page 9).

Contact your authorized Mark Levinson dealer.

Contact Mark Levinson Customer Service at 781-280-0300 or www.marklevinson.com.

SPECIFICATIONS

Power Consumption:	65W (maximum)		
Operating Voltage:	100V – 240V AC, 50Hz/60Hz		
Gain (line-level stage):	0dB, +6dB, +12dB, or +18dB (user-selectable)		
Gain (phono stage):	+40dB, +60dB @1kHz (user-selectable)		
Volume Control Range:	80.0dB		
Gain Resolution:	1.0dB increments up to 23.0dB on display (–57dB to –80dB); 0.1dB increments above 23.0dB on display (0dB to –57dB)		
Input Overload (line-level):	Gain	XLR Inputs	RCA Inputs
	+18dB	2V	1V
	+12dB	4V	2V
	+6dB	8V	4V
	0dB	16V	8V
Input Overload (phono):	>100mV @1kHz (40dB gain); >10mV @1kHz (60dB gain)		
Input Impedance (line-level):	100k ohms		
Input Impedance (phono):	Resistive: 3.3Ω, 5.0Ω, 7.7Ω, 10Ω, 33Ω, 50Ω, 77Ω, 100Ω, 330Ω, 47kΩ (user-selectable) Capacitive: 50pF, 100pF, 150pF, 200pF, 250pF, 300pF, 350pF, 0.01μF (user-selectable)		
Output Impedance:	<20 ohms – balanced (XLR) connectors <10 ohms – unbalanced (RCA) connectors		
Maximum Main Output:	16V – balanced (XLR) connectors 8V – unbalanced (RCA) connectors		
THD + N:	<0.001% (balanced line-level); <–0.02% (phono)		
Crosstalk:	<120dB (any input to any output, input unterminated) <140dB (any input to any output, input terminated)		
Residual Noise:	<120dB (20Hz – 20kHz, input terminated, balanced)		
Frequency Response (line-level):	10Hz – 40kHz (±0.2dB)		
Frequency Response (phono):	±1dB (RIAA response)		
Overall Dimensions (H x W x D):	Controller – 3-1/4" (w/feet) x 17-1/4" x 13" (79mm x 438mm x 330mm); Preamplifier – 5-1/2" (w/feet) x 17-1/4" x 13" (140mm x 438mm x 330mm)		
Net Weight:	Controller – 25 lb (11.4kg); Preamplifier – 35 lb (15.9kg)		

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