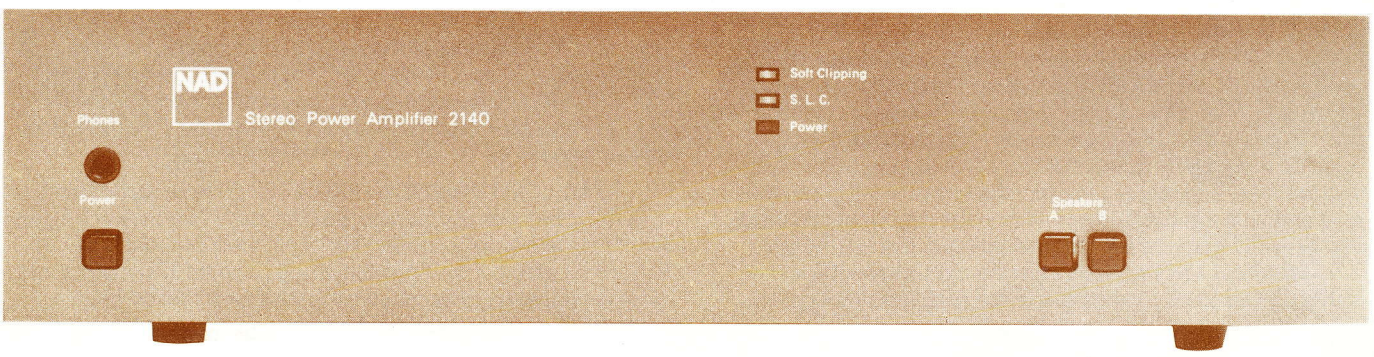
NAD

2140 STEREO POWER AMPLIFIER INSTRUCTIONS FOR INSTALLATION AND OPERATION

2140 BLOC DE PUISSANCE STEREO MANUEL D'INSTALLATION ET D'UTILISATION

2140 STEREO-KRAFTVERSTÄRKER BEDIENUNGSANLEITUNG



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8. Schalter für Speakers Lead Compensator (SLC*)
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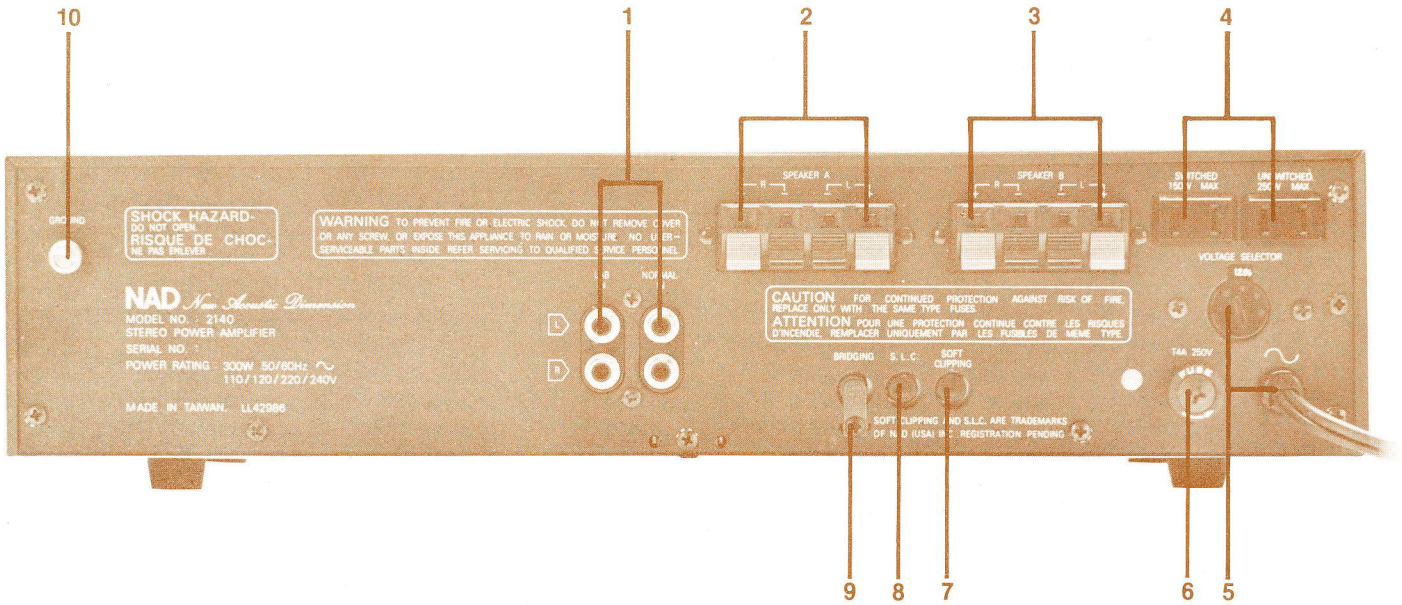

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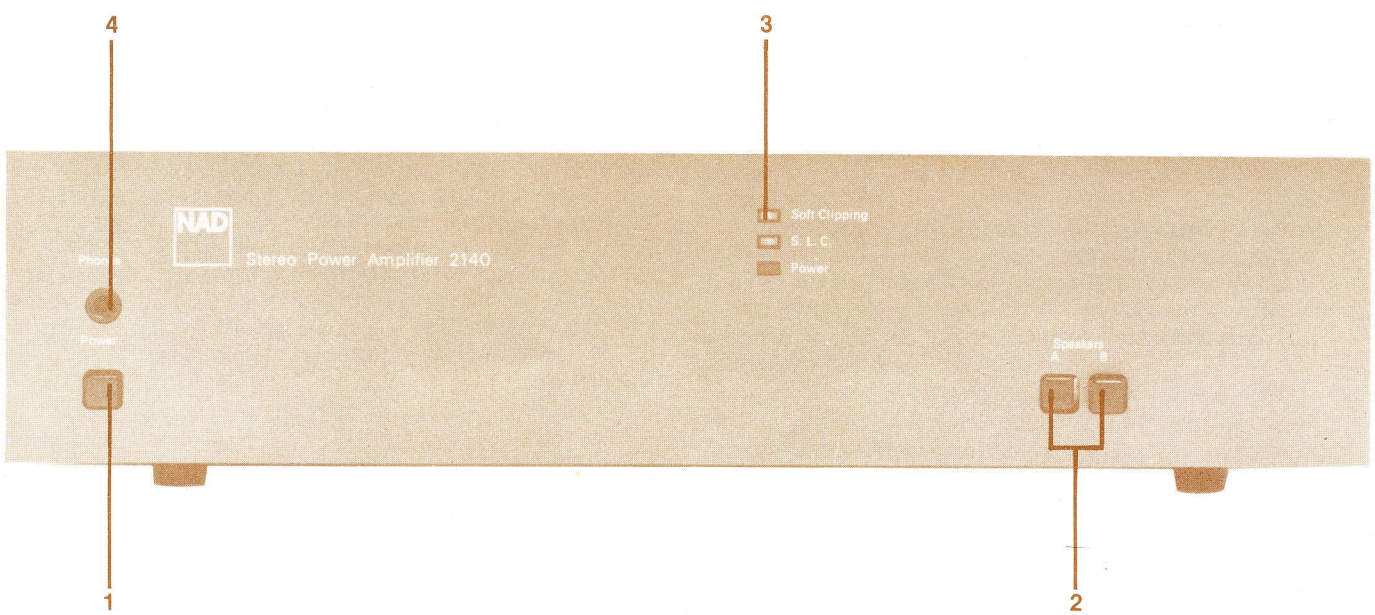
1. Power
2. Speaker selector
3. Status indicators
4. Headphones jack

1. Mise en route
2. Sélecteur de groupe H.P.
3. Indicateur de mise en service—soft clipping et SLC
4. Prise casque

1. Netzschalter
2. Lautsprecher-Wahlschalter
3. Anzeige-Leuchten
4. Kopfhörer-Buchse



ENGLISH

REAR PANEL CONNECTIONS

1. LAB and NORMAL INPUT JACKS. Two pairs of input jacks are provided on the amplifier. The LAB inputs have wideband frequency response extending uniformly from low infrasonic to high ultrasonic frequencies, and may be used for laboratory tests and special applications benefiting from such a wide frequency range. The NORMAL inputs are equipped with infrasonic and ultrasonic filters which limit the amplifier's "flat" response to the audio frequency range. These filters reject noise and interference occurring outside the audible frequency range, in order to prevent intermodulation distortion and to preserve the amplifier's power for music.

For conventional operation, connect signal cables from your preamplifier's main outputs to the NORMAL IN jacks. The upper jack is for the left channel and the lower jack for the right.

If your preamplifier contains its own infrasonic and ultrasonic filtering to eliminate non-audio signals, then you may prefer to connect the cables to the LAB inputs.

If you wish, you may interpose various signal-processing accessories in the signal path between the preamplifier and the power amplifier: a graphic or parametric equalizer, the special equalizer supplied with certain loudspeakers (e.g., Bose, E-V, KLH), a dynamic-range expander, a stereo-image processor, a time-delay ambience reproducer, etc. Simply connect signal cables from the preamplifier's main outputs to the signal processor's input jacks, and then connect signal cables from the processor's outputs to the 2140's inputs, instead of running cables from the preamp directly to the power amp.

NOTE: Any signal processor whose operation depends on the setting of a threshold, such as a dynamic noise filter, should be connected in a preamplifier tape-monitor or external-processor loop, where signal levels won't be affected by Volume and Tone controls.

BI-AMPLIFICATION. If you are using an electronic crossover to bi-amplify your loudspeakers, then the main output cables from your preamplifier should go directly to the inputs of the crossover unit. The "low" frequency output from the crossover must then be connected to the inputs of one power amplifier (such as this 2140), while the "high" frequency output from the crossover is connected to the inputs of a second power amplifier (such as another 2140, or the power-amplifier section of an NAD receiver).

2. SPEAKERS A. If the wiring to each speaker will be no longer than about 20 feet (6 meters), then connections should be made using 18-gauge wire such as common lamp cord ("zip" cord), available from hardware and electrical-supply stores in either white, brown, or black insulation. If the wiring to the speakers will be longer than about 20 feet, heavier 16-gauge zip cord is preferred. The use of heavy-duty wiring is especially desirable if you are using speakers of low impedance or two pairs of speakers wired in parallel. (If you will be using a thinner wire size or unusually long wires to the speakers, then you should use the Speaker Lead Compensator as described in section 8.)

To make connections, separate the two conductors of the cord, strip off about a half-inch (1 cm) of insulation from each, and in each conductor twist together the exposed wire strands. Fully depress the colored tab below each terminal in order to open up the small hole in the terminal, insert the bared wire into the hole, and release the tab; the terminal will grasp the wire and hold it in place. Repeat for each conductor, connecting the wires from the left-channel speaker to the (L+) and (L−) terminals and the wires from the right-channel speaker to the (R+) and (R−) terminals in the SPEAKERS A group. Check to be sure that no loose strand of wire is touching any adjacent terminal.

PHASING. Stereo speakers should operate in phase with each other in order to yield a good stereo image and to reinforce rather than cancel each other's output at low frequencies. If your speakers are easily moved, phasing can easily be checked. Make the connections to the speakers, place the speakers face-to-face only a few inches apart, play some music, and listen. Then swap the connection of the two wires at the back of *one* of the speakers, and listen again. The connection which produces the fullest, boomiest bass output is the correct one. Connect the wires securely to the speaker terminals, being careful to avoid leaving loose strands of wire which might touch the wrong terminal and create a partial short-circuit, and then move the speakers to their intended locations.

If the speakers cannot easily be set face-to-face, then phasing must rely on the "polarity" of the connecting wires. Note that the SPEAKERS terminals on the amplifier are color-coded: in each channel the terminal with the red tab has positive "+" polarity and the black terminal is negative "−". The terminals at the rear of the speakers are also marked for polarity, either via red and black connectors or by labels: "+", 8Ω, or 1 for positive; "−", G, or 0 for negative. As a general rule the positive (red) terminal on the amplifier is to be connected to the positive terminal of the speaker, in each channel. To facilitate this, the two conductors comprising the speaker wire in each channel are different, either in the color of the wire itself (copper vs. silver) or in the presence of a small ridge or rib pattern on the insulation of one conductor. Use this pattern to establish *consistent* wiring to both speakers of a stereo pair. Thus if you connect the copper-colored wire (or ribbed insulation) to the red amplifier terminal in the left channel, do the same in the right channel. And at the other end of the wire, if you connect the copper-colored wire (or the ribbed insulation) to the red or positive terminal on the left-channel speaker, do the same at the right-channel speaker.

3. SPEAKERS B. A second pair of loudspeakers may be connected to the 2140, using these terminals, in the same manner as the speakers connected to the SPEAKERS A terminals.

If the second pair of speakers is located near the first pair in the same room, then they must be correctly phased with respect to the first pair as well as with each other. But if the second pair of speakers is located away from the first pair—in another room for example—then their phasing need not be consistent with that of the first pair. (Of course, as with any stereo pair of speakers, the extension speakers still must be in phase with each other.)

The SPEAKERS B terminals may also be used to connect an adapter unit for electrostatic headphones.

Another useful option for the SPEAKERS B terminals is to connect a second pair of speakers wired for "ambience recovery," enhancing the apparent spaciousness of stereo recordings. Locate a pair of small loudspeakers in the rear corners of the room, slightly behind the main listening area and as far as possible to the left and right. Connect a wire from the (L+) terminal to the "positive" or 8-ohm input terminal of the left-rear speaker, and a wire from the (R+) terminal to the "positive" terminal of the right-rear speaker. Make no connection to the (L−) and (R−) terminals; instead, connect a wire from the "negative" or "ground" terminal of the left-rear speaker to the same terminal of the right-rear speaker. Thus wired, these rear speakers receive the left-minus-right "difference" portion of the stereo signal.

4. AC CONVENIENCE OUTLETS. (Where applicable.) The AC line cords of other stereo components may be plugged into these accessory outlets. The SWITCHED outlet is intended for all-electronic products (e.g., a radio tuner, equalizer, or other signal processor), and it will be switched on and

off by the main POWER button on the front panel. The UNSWITCHED outlet is intended to power any product involving mechanical operations (e.g., a turntable or tape deck); such products should be turned on and off with their own power switches.

5. AC LINE CORD and VOLTAGE SELECTOR. The AC line cord should be plugged into a "live" wall socket or into a convenience outlet on your preamplifier. The NAD 2140 will operate with AC line voltages from 100 to 240 volts, and a line frequency of either 50 or 60 Hz. Use a small coin or screwdriver blade to adjust the Voltage Selector to match the AC powerline voltage in your area. (Normally this will be done by the NAD distributor before the amplifier is delivered to your retailer.) If you travel overseas you can reset the Voltage Selector for each country.

6. FUSE. The fuse protects the amplifier from damage in case of internal parts failure. If the fuse blows, the amplifier will not operate and the front-panel LED display will not illuminate.

If the fuse blows, unscrew the fuse holder and install a replacement fuse of the same size and type (a 4-ampere slow-blow fuse in areas where the AC line voltage is 110 or 120 volts, a 2-amp fuse where the power line is 220 or 240 volts).

CAUTION: Unplug the AC line cord before changing the fuse.

7. SOFT CLIPPING.™ When an amplifier is overdriven beyond its specified power output it normally produces "hard clipping" of the signal with harsh distortion and power-supply buzz as the output transistors saturate. The NAD Soft Clipping circuit gently limits the output waveform and minimizes audible distortion when the amplifier is overdriven. If your listening involves only relatively low peak power levels the Soft Clipping circuit may be left off (button OUT). But in general we recommend that it be switched on (button depressed), especially when playing music containing high peak levels.

8. SPEAKER LEAD COMPENSATOR (SLC™). When a speaker is connected to an amplifier through a length of wire, the resistance of the wire will affect the signal reaching the speaker terminals. If the wire is sufficiently short or sufficiently large in diameter, its resistance will be negligible. As a general rule, 18-gauge or heavier wire should be used for lengths of up to 20 feet (6 meters) and 16-gauge or heavier wire for lengths of up to 30 feet (10 meters). But if you use thinner wire, or greater lengths, the wire resistance may have a directly audible effect on the speaker's sound—especially with low-impedance speakers, or pairs of speakers wired in parallel. This effect is of four kinds:

(1) Some power is dissipated in the wires, and the signal delivered to the speaker is slightly reduced in level.

(2) Since the speaker's impedance varies with frequency, the reduction in signal level varies in proportion; i.e., the tonal balance of the signal is altered.

(3) Typical speaker impedances are complex, varying with signal level (for example, the voice-coil inductance varies as the coil moves in and out of the magnet gap), and may become non-linear at high volume levels. The resulting non-linear current flow produces a non-linear (i.e., distorted) voltage across the resistance of the speaker leads. Thus the audio signal may be completely distortion-free at the amplifier's output terminals, yet exhibit several percent of distortion at the far end of the leads where they connect to the speaker terminals.

(4) Finally, the wire resistance reduces the amplifier's damping factor.

The Speaker Lead Compensator (SLC) cancels the effects of the wire resistance, eliminating the distortion and restoring the performance which would be obtained if the wire had no resistance. The SLC is calibrated for a specific amount of wire resistance, corresponding to the following lengths of standard wire sizes:

GAUGE	FEET	METERS
14	97	30
16	61	19
18	38	12
20	24	7
22	15	5
24	12	4
26	10	3
28	6	2

Compare your speaker wire size and length to these figures. (If your speaker leads are of differing lengths in the two channels, use the average.) If your speaker leads are less than half of the length specified above, leave the SLC switched off. If your speaker leads are more than half of the length in the table, depress the SLC button to engage the Speaker Lead Compensator. The more nearly your speaker leads match the length in the table, the more precise will be the SLC's cancellation of the effects of the wire resistance.

Example: if your speaker connecting leads are 18-gauge wires and are less than 19 feet in length from amp to speaker, leave the SLC switched off (button OUT). If the wires are longer than 19 feet, switch the SLC on (button IN).

9. BRIDGING MODE SWITCH. This switch "bridges" the NAD 2140's two power amplifier channels to form a monophonic amplifier with more than double the output power. To convert to bridged operation, the following procedure should be followed.

(1) Disconnect the signal cable from the left-channel input to the 2140. In the bridged (monophonic) mode the amplifier is driven through its right-channel input only (either the NORMAL or LAB input socket). If another 2140 in bridged mode is used for the second channel, it too will be driven through its right channel power amp input regardless of whether it is used for the right or left speaker.

(2) Disconnect any speaker wires from both the SPEAKERS A and SPEAKERS B terminals. From the speaker which is to be driven by the 2140, connect its positive lead to the red R+ terminal, and its negative lead to the red L+ terminal, in the SPEAKERS A group of terminals.

NOTE: Do *not* connect any wires to the black (R− and L−) terminals.

If you want to drive two speakers in parallel, connect the second speaker's leads to the red (R+ and L+) terminals in the SPEAKERS B group; make no connection to the black (R− and L−) terminals.

NOTE: In the bridged monophonic mode, the loudspeaker's impedance appears to be halved as "seen" by the amplifier. An 8-ohm load looks like 4 ohms, a 4-ohm load looks like 2 ohms, and a pair of 4-ohm speakers operated in parallel will look like a 1-ohm load. Driving a pair of such speakers to high levels may cause the amplifier to overheat, activating its protection circuits.

CAUTION: In the bridged mode the speaker wires must be "floating" with respect to ground. Do NOT connect the speaker wires to anything which shares a common ground between stereo channels (such as a headphone adapter) nor a common ground with the 2140's inputs (such as a switching comparator or a distortion analyzer).

(3) After the preceding conditions have been satisfied, use the bridging switch. It is normally covered by a metal bracket to prevent its accidental use. Loosen the screw which holds the bracket in place and swing it out of the way or remove it altogether. Press and release the BRIDGING button. The button has two settings:

IN—normal stereo mode

OUT—bridged monophonic mode