

3020A

**STEREO
AMPLIFIER**

**AMPLIFICATEUR
INTEGRE**

**STEREO
VERSTÄRKER**

**INSTRUCTIONS
FOR INSTALLATION
AND OPERATION**

**MANUEL D'INSTALLATION
ET D'UTILISATION**

BEDIENUNGSANLEITUNG

ENGLISH

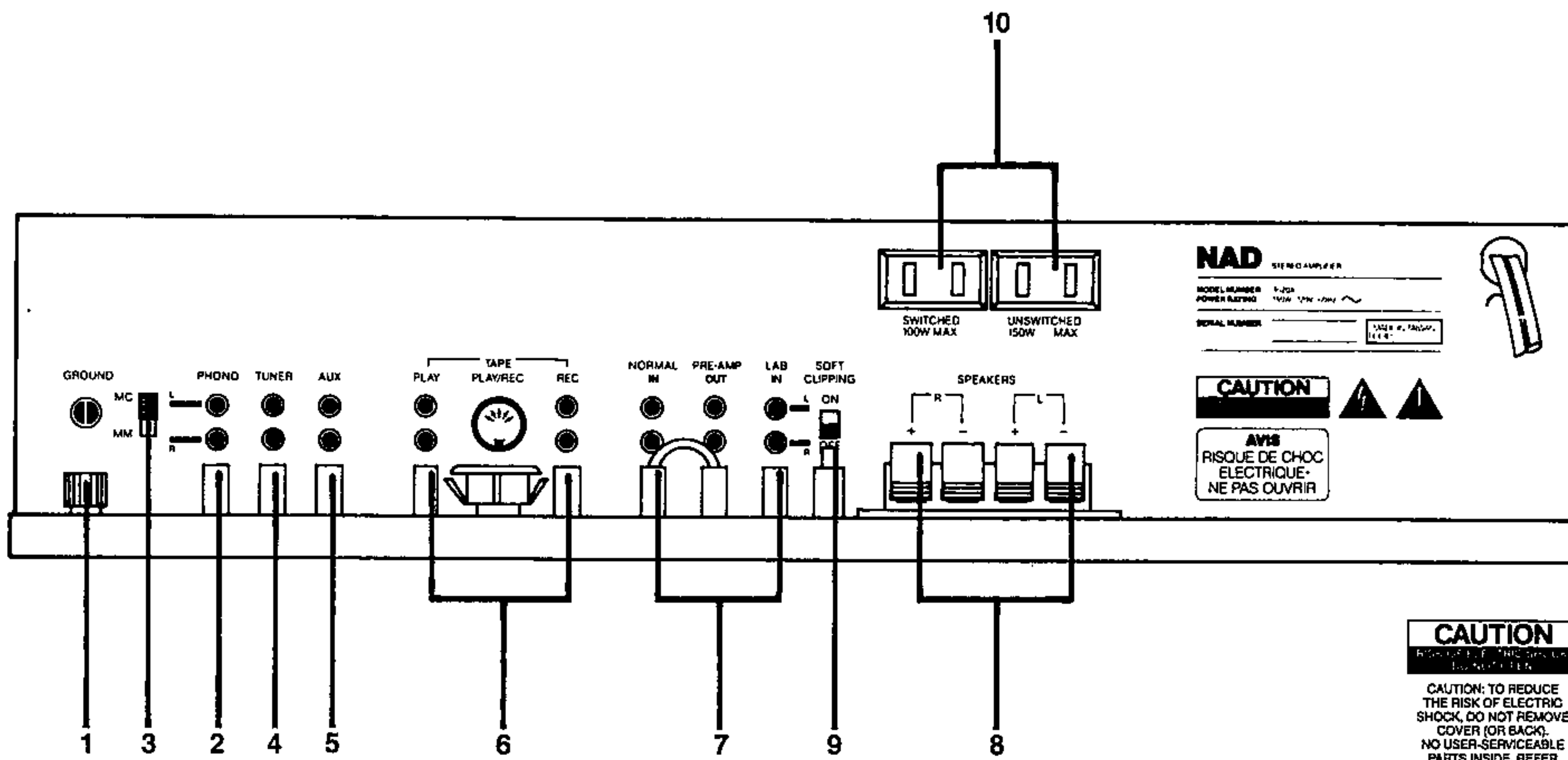
1. Ground
2. Phono
3. MM/MC Phono Selector
4. Tuner
5. Aux
6. Tape Play/Record
7. Pre-Amp Out, Normal In, Lab In
8. Speakers
9. Soft Clipping
10. AC Convenience Outlets

FRANÇAIS

1. Masse
2. Entrée phono
3. Sélecteur Bobine mobile/Aimant mobile
4. Entrée tuner
5. Entrée auxiliaire
6. Entrées/Sorties -Magnétophone-
7. Sortie préampil, entrée ampli de puissance -normal-, entrée ampli de puissance -labo-
8. Bornes pour haut-parleurs
9. Ecrêtage en douceur
10. Prises de courant CA

DEUTSCH

1. Erde
2. Plattenspieler-Eingang
3. MM/MC-Schalter
4. Rundfunkeingang
5. Zusatzzugang
6. Tonband-Wiedergabe/Aufnahme
7. Vorverstärker-Ausgang, Normal-Eingang, Labor-Eingang
8. Lautsprecheranschluß
9. Lautsprecherimpedanzschalter
10. Netzkabel



ENGLISH

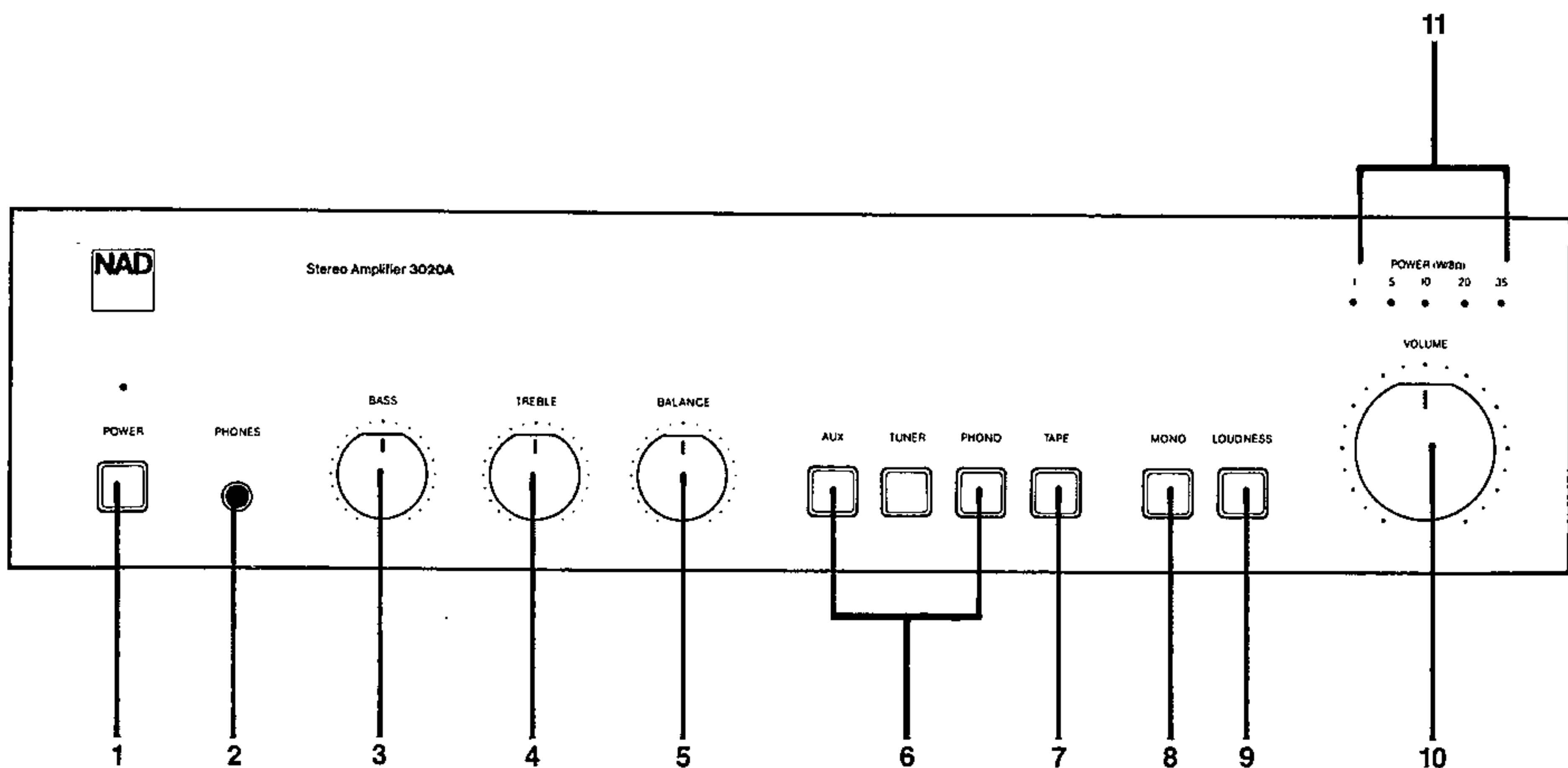
1. Power
2. Phones
3. Bass
4. Treble
5. Balance
6. Aux/Tuner/Phono
7. Tape
8. Mono
9. Loudness
10. Volume
11. LED Power Meter

FRANÇAIS

1. Alimentation
2. Casque d'écoute
3. Graves
4. Aigus
5. Balance entre canaux
6. Aux/Tuner/Phono
7. Magnétophone
8. Mono
9. Compensateur physiologique
10. Volume/Équilibrage
11. Indicateur de puissance par diodes photoluminescentes

DEUTSCH

1. Netz
2. Kopfhörerausgang
3. Bassregler
4. Höhenregler
5. Balanceregler
6. Zusatzgerät, Radio, Plattenspieler
7. Tonbandschalter
8. Monoschalter
9. Gehörliche Lautstärkenregelung
10. Lautstärke
11. LED-Leistungsanzeige



ENGLISH

REAR PANEL CONNECTIONS

1. GROUND. If your turntable is equipped with a separate grounding wire, connect it here as follows. Turn the thumb-nut counter-clockwise. If the grounding wire is terminated in a U-shaped spade lug, place it under the thumb-nut and tighten the nut clockwise to secure the lug. If the grounding wire has no terminal lug, strip off a half-inch (1 to 2 cm) of insulation to expose the bare wire, twist the wire strands tightly together, insert the wire through the small hole in the shaft of the Ground terminal, and tighten the thumb-nut.

2. PHONO. Plug the signal cables from your turntable into these jacks. If the cables or plugs are color-coded, refer to your turntable's instructions to learn which cable or plug is for the Left channel and which is for the Right channel. Be careful to insert each plug *fully* into the jack so that the plug's metal skirt fits tightly over the exterior of the jack. If necessary, carefully crimp the plug's metal skirt slightly so as to obtain a tight fit with the jack.

The impedance of the phono input is 47,000 ohms resistance and 47 picofarads capacitance, which (when considered together with the cable capacitance of a typical turntable) is suitable for the majority of phono pickup cartridges.

3. MM/MC SELECTOR. This switch sets the input sensitivity and gain of the phono preamplifier circuit. Set it according to the output level of your phono cartridge. Move the switch **DOWN** (to MM) for cartridges of the moving magnet, induced magnet, moving flux, and moving iron (variable reluctance) types, and for "high-output" moving-coil pickups (i.e., those with a rated output of 1.0 mV or greater). If your cartridge is a low-output moving-coil pickup (with a rated output of less than 1.0 mV), move the switch **UP** (to MC).

Here is another way to determine the preferred setting of the MM/MC switch. Begin by setting it to MM. After you have completed the installation and wiring of the amplifier, play a record. You should obtain a satisfyingly loud volume level with a VOLUME control setting between 9 o'clock and 3 o'clock. If you have to turn up the VOLUME control beyond 3 o'clock to get adequately loud sound, turn the VOLUME back down and re-set the MM/MC switch to MC.

4. TUNER. Plug the signal cables from your radio tuner into these jacks.

5. AUX. The auxiliary input jacks enable you to connect any "line level" signal source to the system—such as an eight-track tape player, a television sound tuner, a child's record player with ceramic pickup cartridge, or the playback signal from a second tape deck.

6. TAPE PLAY/RECORD. Two types of connectors are provided for use with a stereo tape recorder: separate pairs of RECORD and PLAY phono jacks, and a five-pin DIN socket. If your recorder has only DIN-type plugs, use the DIN connector. If your recorder has both a DIN plug and pairs of phono plugs, it is preferable to use the phono plug connections. (Do not use both the phono plugs and the DIN plug simultaneously.)

The tape connections may be used with tape recorders of all kinds: cassette, open-reel, eight-track, Elcaset, digital, etc. To make recordings, connect a stereo patch cord from the RECORD jacks to the LINE or RADIO input jacks on the recorder (not to its microphone inputs). To play back tapes, connect a stereo patch cord from the recorder's LINE output jacks to the 3020A's PLAY inputs.

7. PRE-AMP OUT, NORMAL IN, LAB IN. Each channel of the amplifier is comprised of two independent sections or stages: the control preamplifier (including the phono preamp and most front-panel controls), and the power amplifier (which provides the power to drive loudspeakers). In normal operation the preamp and power amp are connected together via U-shaped metal jumpers; check to be sure that they are fully inserted into the jacks and that nothing is touching them.

Two sets of power amp inputs are provided. 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. The NORMAL inputs are equipped with infrasonic and ultrasonic filters to reject interference occurring outside of the audible frequency range, minimizing intermodulation distortion and preserving the amplifier's power for music.

For conventional operation the PRE-AMP OUT jacks are connected to the NORMAL IN jacks by means of the metal jumpers. Removal of the jumpers (*with the POWER switched OFF*) enables various signal-processing accessories to be connected in the signal path between preamp and power amp: a special speaker equalizer (such as that supplied with certain Bose and Electro-Voice speakers), a graphic equalizer, a dynamic-range expander, a time-delay ambience reproduction system, etc. To use a signal processor, connect a stereo patch cord from the PRE-AMP OUT jacks to the processor's line-level input jacks, and connect a second patch cord from the processor's line-level outputs to the NORMAL IN jacks.

NOTE: Any signal processor whose operation depends on the setting of a threshold, such as dynamic noise filter or DBX decoder, should be connected to the TAPE RECORD/PLAY jacks—where the signal levels are unaffected by volume and tone controls—rather than to the PRE-AMP OUT jacks.

Save the metal jumpers in case you may want to disconnect the signal processor and return to normal operation at a later time. If the jumpers should be lost, a conventional stereo patch cord can be used to connect PRE-AMP OUT to either NORMAL IN or LAB IN.

The NAD 3020A can be used as the heart of an elaborate audiophile sound system. For example the PRE-AMP OUT jacks may be connected via a stereo patch cord to any high-quality separate power amplifier. To use a separate high-power amplifier for your main stereo speakers while continuing to use the NAD 3020A's built-in power amp for headphones or extension speakers, simply install Y-connector adapters to split the signal from the PRE-AMP OUT jacks. The preamp stage is capable of driving several power amplifiers in parallel, or the long signal cables required to connect to power amps which are located near the speakers, or to "powered" loudspeakers with built-in power amps. The preamp output can be used to drive a time-delay ambience system, with the 3020A's built-in power amp used to drive either the main stereo speakers or the time-delayed secondary speakers. And in an elaborate bi-amplified system the preamp output would be fed to the input of the electronic crossover while the high-frequency output of the crossover unit is fed to the NORMAL IN or LAB IN jacks and the speaker's tweeters are connected directly to the SPEAKER terminals.

8. SPEAKERS. 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. The smaller-diameter 20- or 22-gauge wire sold in some shops is *not* recommended, even though it may be identified as

"speaker wire." If the wiring to the speakers will be longer than about 20 feet, heavier 16-gauge zip cord is preferred. The use of adequately heavy-duty wiring is especially important if you are using speakers of low impedance or two pairs of speakers wired in parallel.

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 the exposed wire strands together. Fully depress the colored tab below the connecting 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. Then 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.

Connecting Additional Speakers. The easiest way to connect two or more pairs of speakers to the 3020A is to obtain an outboard Speaker Selector switch, a common and inexpensive accessory item. Connect short wires from the amplifier's speaker terminals to the "amplifier" terminals of the speaker switch, and then connect wires from the switch to each set of speakers. Usually the switch will permit you to select your main stereo speakers, a second (and perhaps third) pair of extension speakers, or two pairs operating simultaneously.

If you have a second pair of speakers located near the first pair in the same room and operating in parallel with them, 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 (e.g., in another room), their phasing need not be consistent with that of the first pair. (As with any stereo pair of speakers, they still must be in phase with each other.)

9. SOFT CLIPPING.™ This switch activates the unique

NAD Soft Clipping circuit to reduce distortion when the amplifier is overdriven beyond its rated power. It may be left OFF for testing or for extended low-level listening. But in general we recommend that it be switched ON, especially when playing music with high peak levels.

10. AC CONVENIENCE OUTLETS. (Where applicable.) The AC line cords of other stereo components may be plugged into these outlets. The SWITCHED outlet is intended for an all-electronic product (e.g., a radio tuner, equalizer, or other signal processor), and it will be turned on and off by the main POWER button on the front of the receiver. The UNSWITCHED outlet is intended to power any product involving mechanical operation (e.g., a turntable or tape deck); such devices should be switched on and off with their own power switches.

FRONT PANEL CONTROLS

1. POWER. Depress to switch on the amplifier and any other equipment plugged into the SWITCHED convenience outlets on the rear panel. To switch off the power, depress the button again and release it.

If you prefer you may leave the 3020A's POWER switch permanently engaged and use an external switch (such as a timer) to turn the power on and off.

2. PHONES. Plug stereo headphones in here. The circuit will provide proper drive signals for all conventional stereo headphones regardless of their impedance, with just one exception: electrostatic headphones usually are supplied with an adapter box which must be connected directly to the speaker terminals at the rear.

Before plugging conventional headphones into the PHONES jack, turn down the VOLUME control for safety. And when you are not listening to the headphones it is wise to unplug them from the PHONES jack. Otherwise, when listening to loudspeakers you might turn up the volume to a level which would feed excessively strong signals to the headphones and damage them.

3. BASS. The Bass control adjusts the relative level of the low frequencies in the sound. The electrical response of the amplifier is flattest when the control is set in the detent at the 12 o'clock position. Rotation of the knob to the right (clockwise) increases the level of low-frequency sounds, and rotation counter-clockwise decreases their level. Adjust it to achieve the tonal balance which sounds most natural to you. You will note that at moderate rotations the effect of the Bass control usually is subtle because its action is confined to the lowest audible frequencies. Only at large rotations away from center is there a substantial boost or cut at the mid-bass frequencies which are prevalent in music.

4. TREBLE. The Treble control adjusts the relative level of the high frequencies in the sound. The electrical response of the amplifier is flattest when the control is set in the detent at the 12 o'clock position. Rotation of the knob to the right (clockwise) increases the level of high-frequency sounds, and rotation counter-clockwise decreases their level. Adjust it to achieve the tonal balance which sounds most natural to you. You will note that boosting the Treble increases the brilliance and clarity of details in the sound, but also makes any noise more prominent. Cutting the treble makes the sound mellower and suppresses hiss and record surface noise, but too much Treble cut will make the sound dull.

5. BALANCE. Adjusts the *relative* levels of the left and right channels. A detent at the 12 o'clock position marks the point of equal balance. Rotation to the right (clockwise) decreases the level of the left channel so that only the right

channel is heard, i.e., shifting the sonic image to the right. Rotation to the left shifts the sonic image toward the left speaker.

Ideally the detented center position of the BALANCE control will be the normal setting. But several common circumstances may cause unequal balance, requiring a compensatory off-center BALANCE setting to restore the most uniform spread of stereo sound between the speakers. These include unequal output from the two channels of the phono cartridge, differing acoustical environments around the two speakers, or simply a listening position which is closer to one speaker than to the other. Adjust the BALANCE control to produce a natural spread of sound across the space between the speakers, with any monophonic sound (such as a radio announcer's voice) appearing as a phantom image centered midway between them.

6. AUX/TUNER/PHONO. These three buttons, and the adjacent TAPE button, select the signal source to be heard. When the AUX, TUNER, or PHONO input is selected, the corresponding input signal is fed to the amplifier's circuits and also to the RECORD output jacks for recording.

7. TAPE. When this button is disengaged (out), the input signal chosen by the SELECTOR switch (aux, phono, tuner) is fed to the controls and to the power amplifier for listening. When the TAPE button is engaged, the output signal from a tape recorder (or any signal processor connected to the rear-panel PLAY jacks) is heard.

The signal to be recorded on tape is chosen exclusively by the SELECTOR switch, and is not affected by the VOLUME or any other control.

When you are making a tape recording, engaging the TAPE switch enables you to hear the signal as it passes through the tape machine's electronics and recording-level controls. However, engaging and disengaging the TAPE button may slightly alter the signal levels fed out to a tape recorder; therefore, the button should be kept engaged during the entire duration of a recording.

With a three-head recorder equipped for off-the-tape monitoring, the TAPE switch permits you to hear the playback signal from the tape immediately after the recording is made, in order to check its quality. In this case use the tape source switch on the recorder for switching between the original and recorded signal.

If you have connected a signal processor such as a graphic equalizer or dynamic-range expander to the RECORD/PLAY jacks, the TAPE button must be depressed in order to hear the effects of the processor. Normally the processor will have its own RECORD/PLAY jacks and tape monitor switch for use with a tape recorder.

8. MONO. Engaging this button combines the two stereo channels together to produce monophonic sound, minimizing vertical rumble and surface noise when listening to old monophonic recordings. The button must be OUT for normal stereo listening.

9. LOUDNESS. Pressing this button engages a "loudness compensation" circuit which, at low-to-medium

settings of the Volume control, boosts the bass and treble response of the amplifier. This is to compensate for the human ear's reduced sensitivity to low-frequency sounds at low loudness levels, and for the "masking" of high-frequency details by environmental noise. The LOUDNESS function should be disengaged when you are listening to music at life-like volume levels. And at low levels a more accurate, if less convenient, loudness compensation may be obtained by boosting the Bass control.

10. VOLUME. Adjusts the overall loudness of the sound, in conjunction with the Audio Muting button. The control is designed for accurate tracking of the two channels, so that the stereo balance will not shift as the VOLUME control setting is varied.

11. LED POWER METER. This row of five LEDs continually indicates the peak power level which the amplifier is delivering to the loudspeakers. The circuit monitors both channels and displays the higher output at each instant. The calibrated level ranges from 1 watt to 35 watts into an 8-ohm impedance; with a 4-ohm impedance the nominal power is twice the indicated value, so the LEDs range from 2 to 70 watts.

In addition to providing general information on power levels, the LED Power meter also tells you when you should be using the Soft Clipping circuit. If you find that only the first two or three LEDs ever illuminate when you are playing music, then you may leave the Soft Clipping switched OFF. But whenever you find that you are causing all five LEDs to illuminate, even if only momentarily during the highest musical peaks, then you should switch ON the Soft Clipping on the rear panel in order to minimize any harshness or distortion which would occur when the amplifier is over-driven beyond its rated power.

A Note on Protection. Because the 3020A sounds so clean and musical when driven beyond its nominal power rating and when used to drive low-impedance loudspeakers, you may be tempted to stress it beyond its design capacity. For example it can safely and cleanly drive a 2-ohm impedance with wide-range musical signals whose peak level is several tens of watts and whose average level is much lower; but it will overheat if called upon to deliver high power *continuously* into a low impedance. There are thermostatic circuit breakers in the output stage, which are activated if the output transistors become dangerously hot. When this occurs in either channel the output stage automatically shuts down to protect itself.

Thus if one or both channels of sound go silent while the front-panel LEDs remain illuminated (indicating that the main power-supply fuses and operating voltages are still normal), the thermostatic circuit breakers may have been activated. To resume operation simply turn down the volume and wait a minute or so for the output stage to cool and the circuit breakers to automatically re-set. If the protective circuit breakers interrupt the sound repeatedly, examine the speaker wiring for a possible loose strand of wire causing a partial short-circuit, or reduce the volume level slightly.



The lightning flash with arrowhead, within an equilateral triangle, is intended to alert the user of the presence of uninsulated "dangerous voltage" within the product's enclosure; that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user of the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.