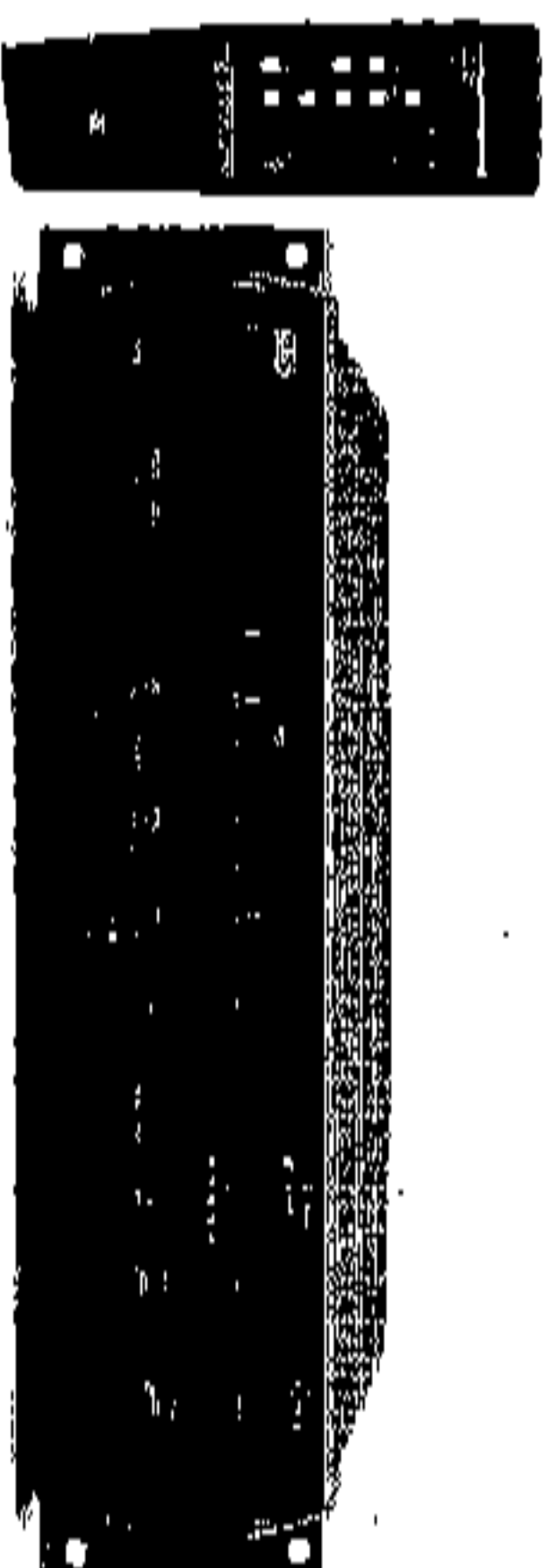




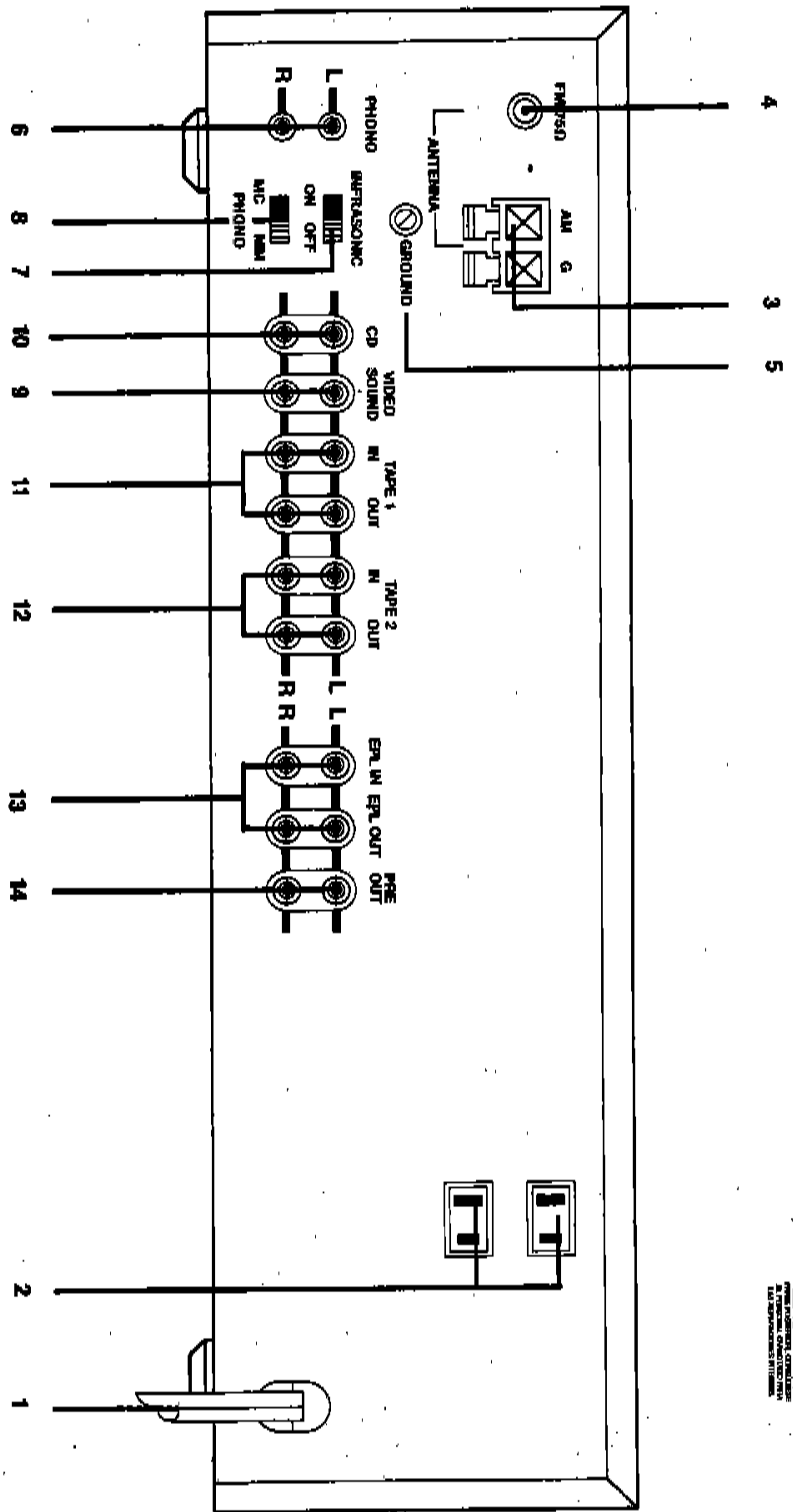
16000



**OWNER'S MANUAL
MANUEL D'UTILISATION
BEDIENUNGSANLEITUNG
MANUAL DEL USUARIO**

NAD 1600

REAR PANEL CONNECTIONS




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ATTENTION:
 ET LES CONSOMMATEURS
 QUI NE PARLENT PAS FRANÇAIS
 S'IL VOUS PLAIT, LIRE
 LA NOTICE EN ANGLAIS
 QUI ACCOMPAGNE L'APPAREIL

CAUTION:
 TO PREVENT THE RISK OF
 ELECTRIC SHOCK, DO NOT
 TOUCH THE REAR PANEL
 CONNECTIONS WHEN THE
 POWER IS ON. ONLY
 QUALIFIED SERVICE PERSONNEL
 SHOULD SERVICE THIS
 EQUIPMENT.

PRECAUTION:
 POUR ÉVITER LE RISQUE DE
 CHOC ÉLECTRIQUE, NE
 TOUCHEZ PAS LES
 BORNES DE LA FACE ARRIÈRE
 DE L'APPAREIL QUAND
 L'APPAREIL EST ALLUMÉ.
 SEULEMENT LE PERSONNEL
 QUALIFIÉ DOIT RÉPARER
 CÉLUI-CI.


 The lightning flash with arrowhead, within an equilateral triangle, is intended to alert the user of the presence of unshielded "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.

FRONT PANEL CONTROLS

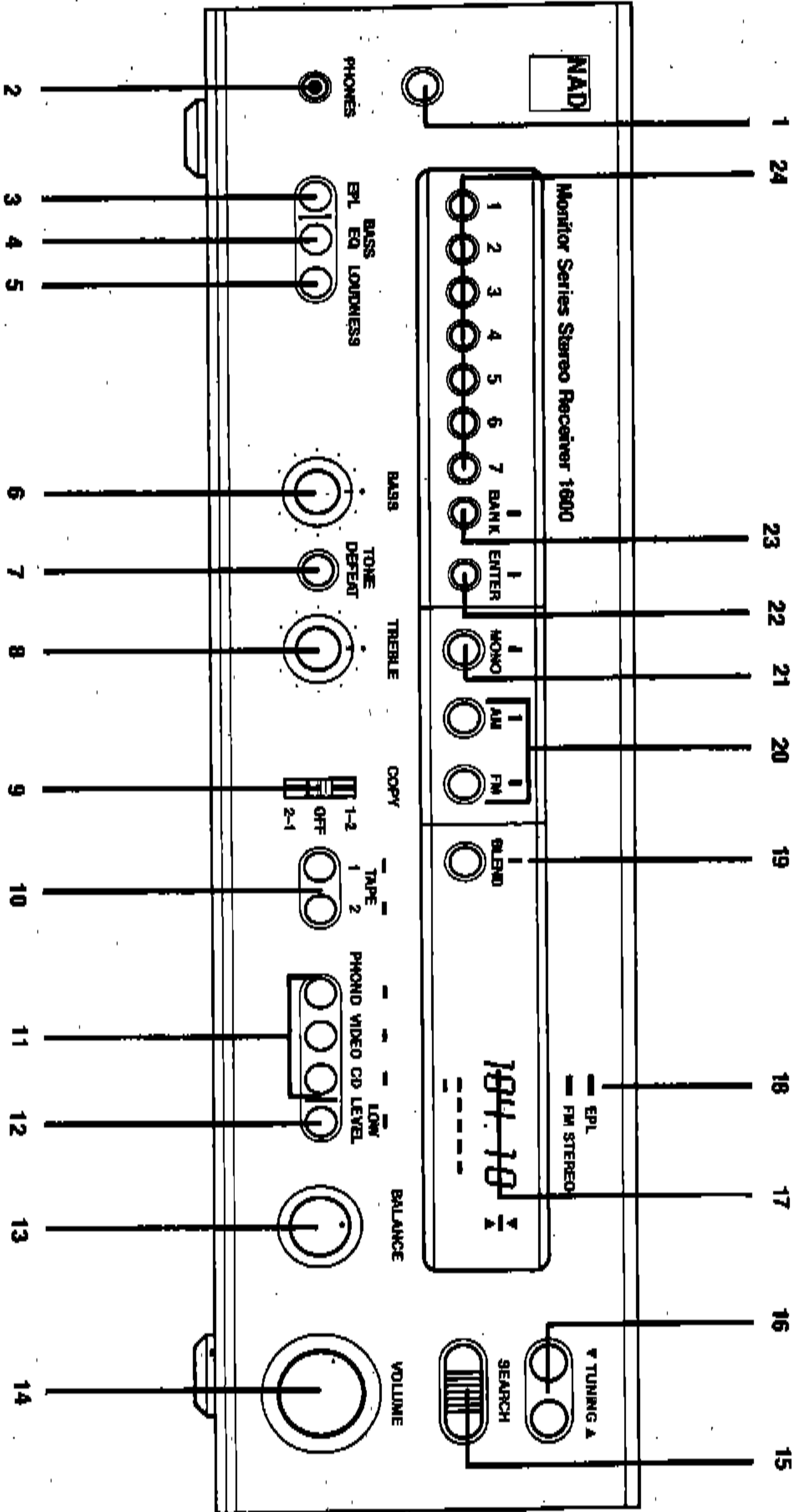


Figure 1

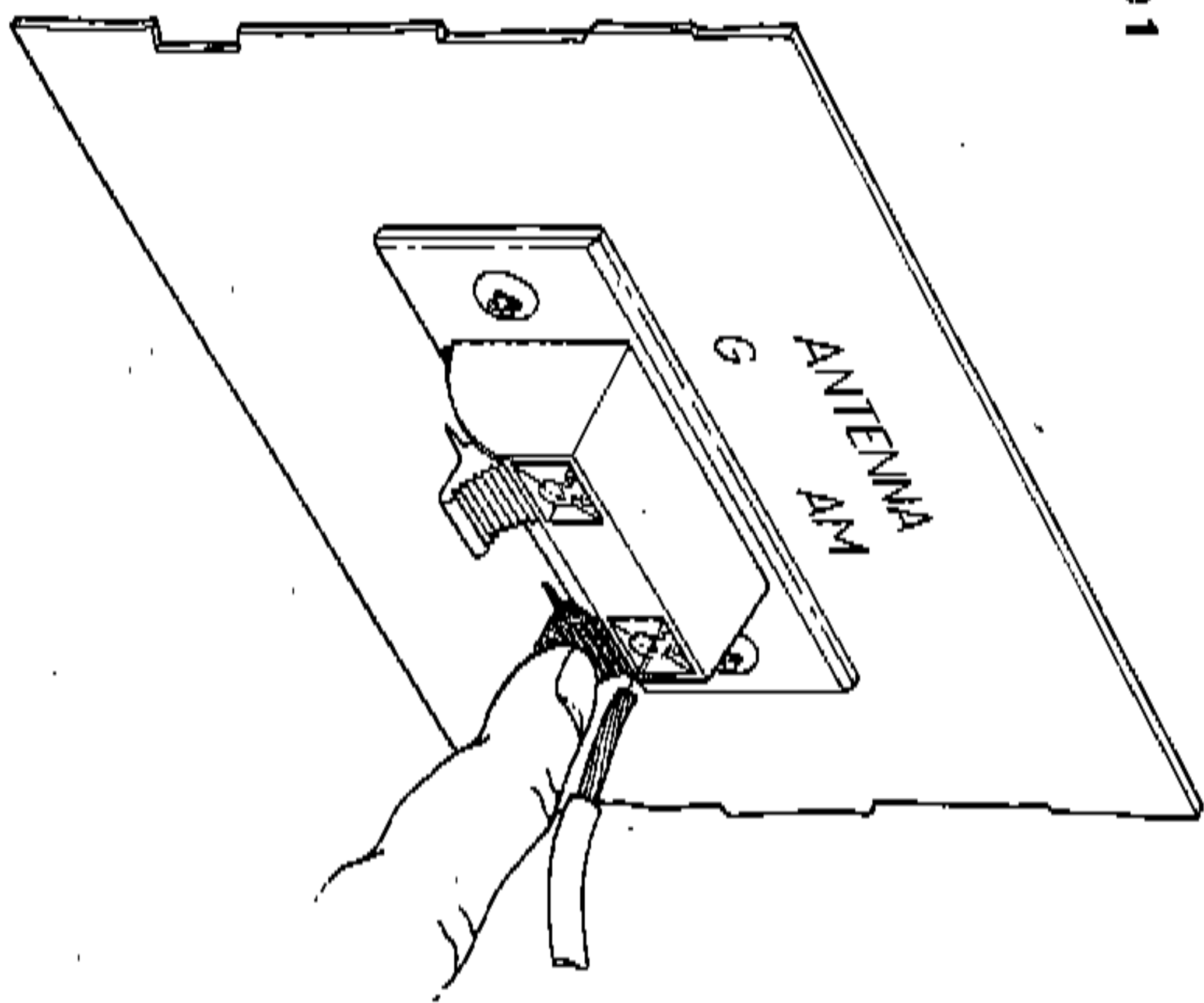


Figure 2

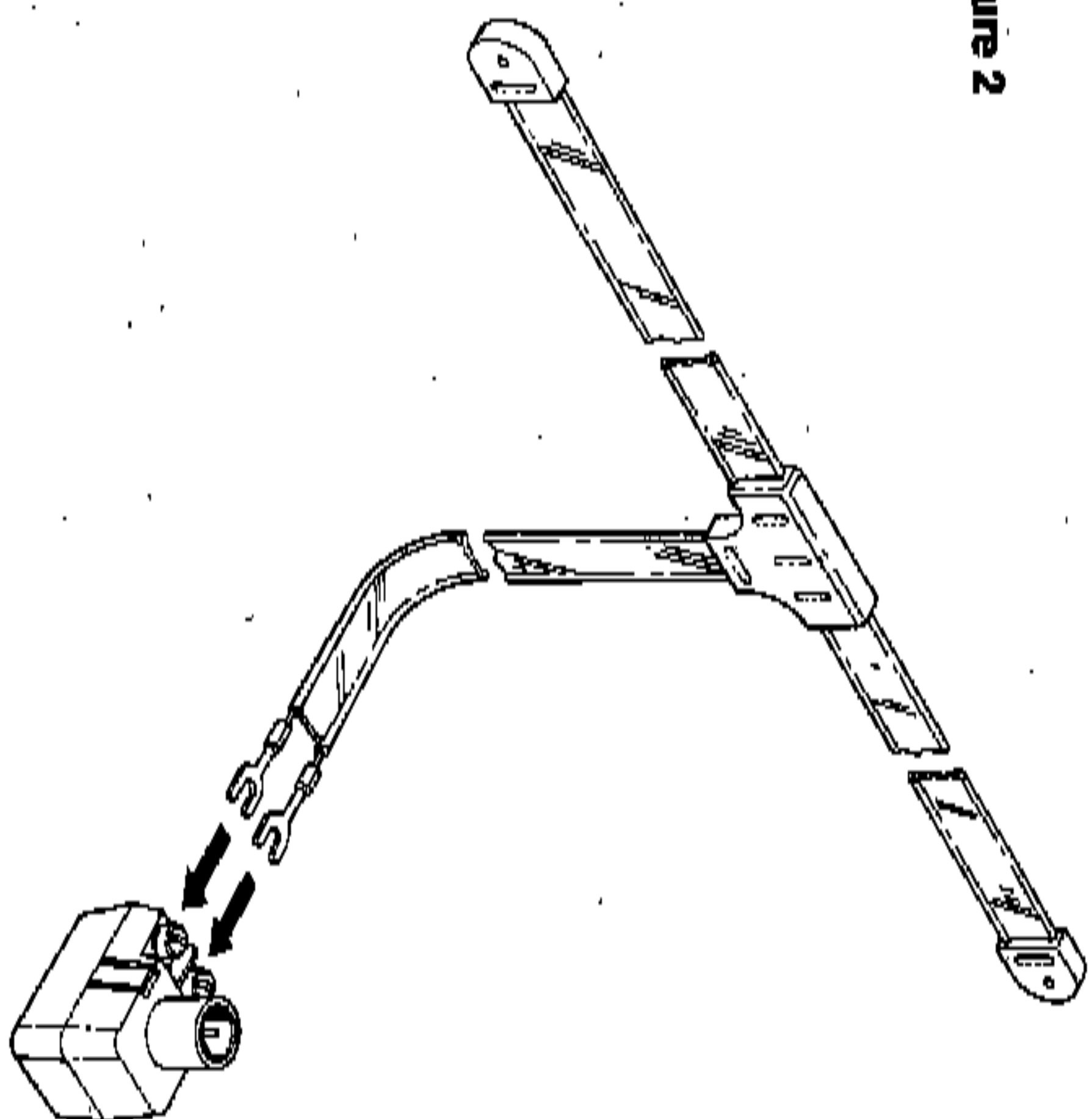


Figure 3

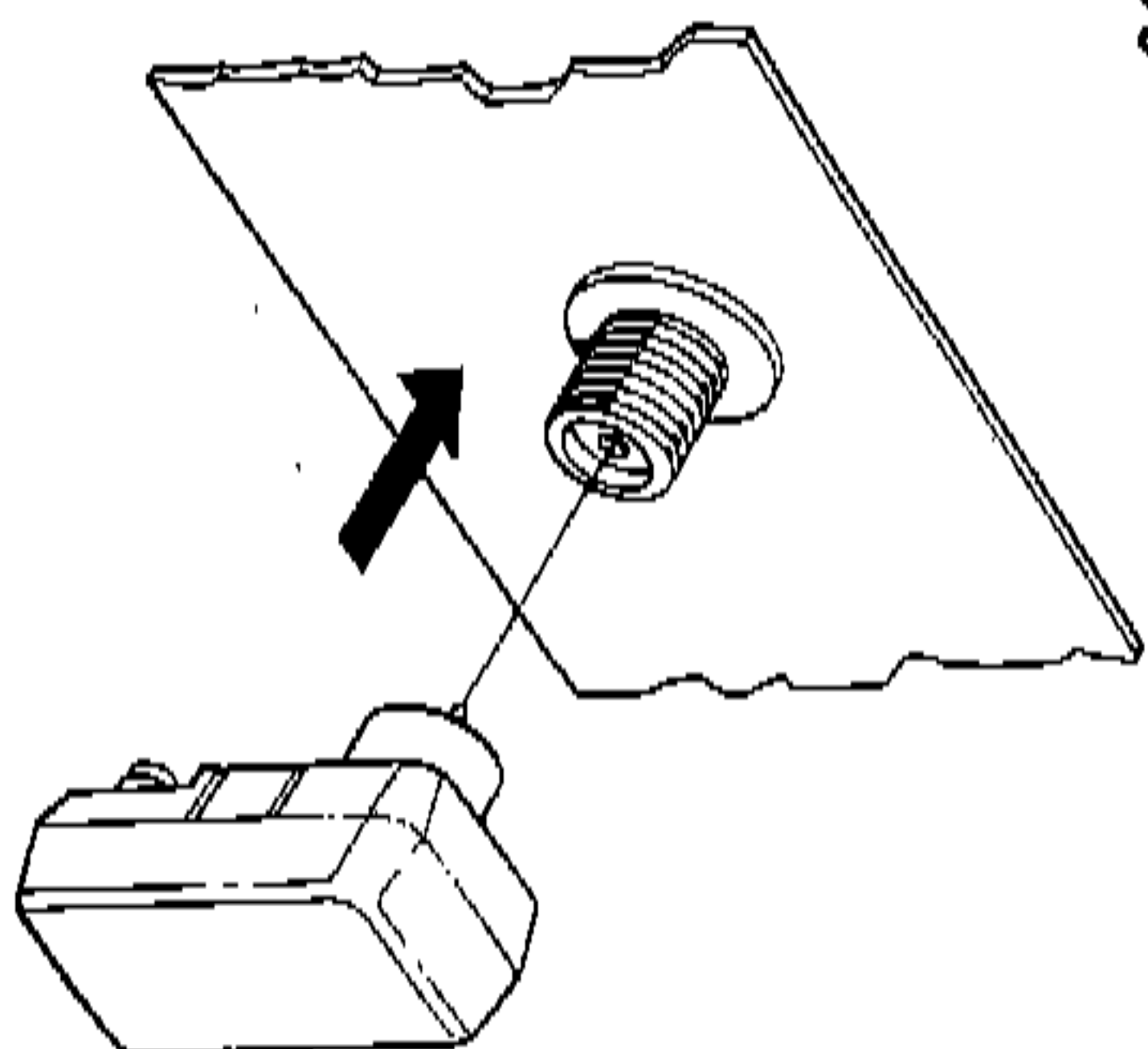


Figure 4

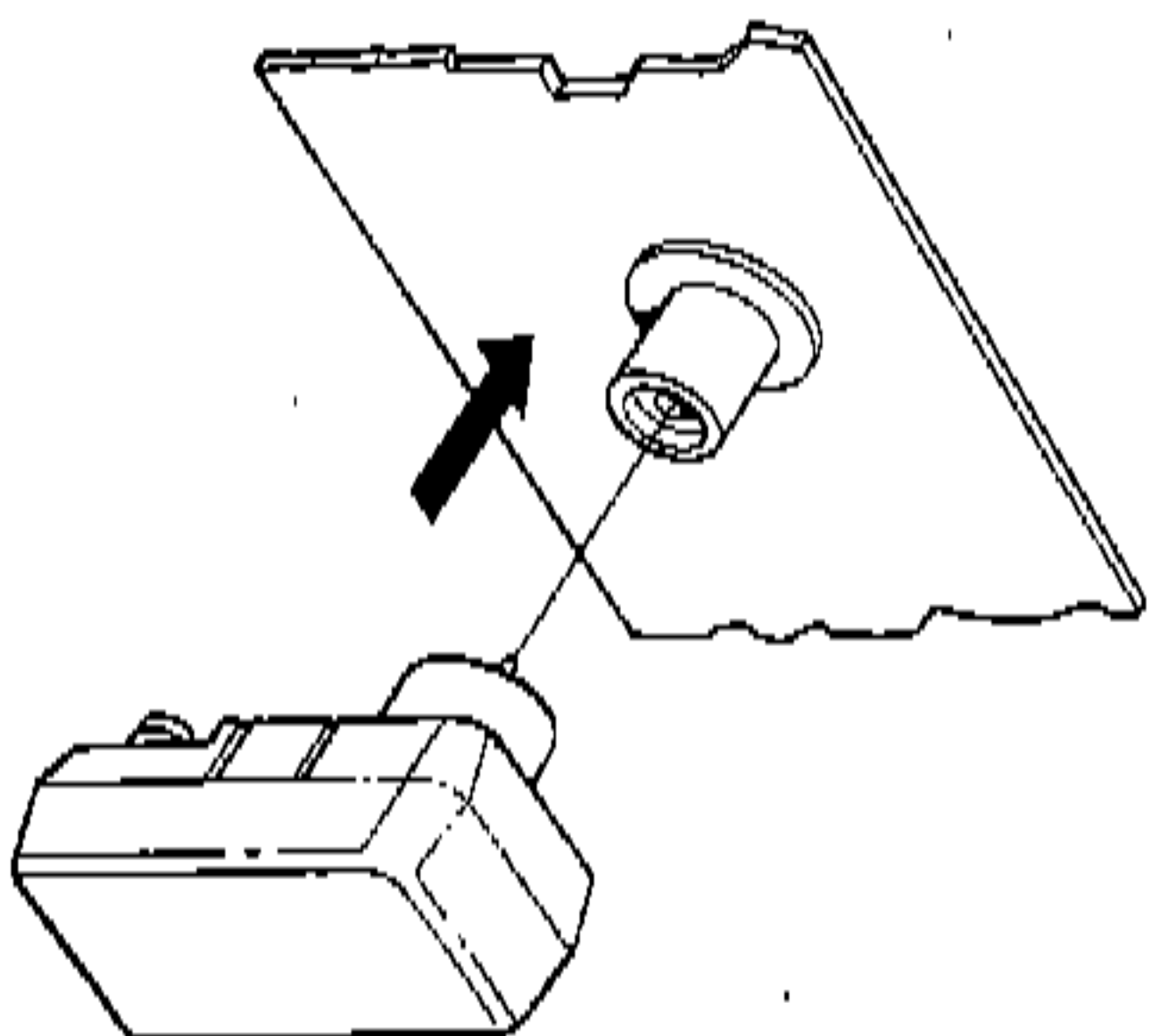


Figure 5a

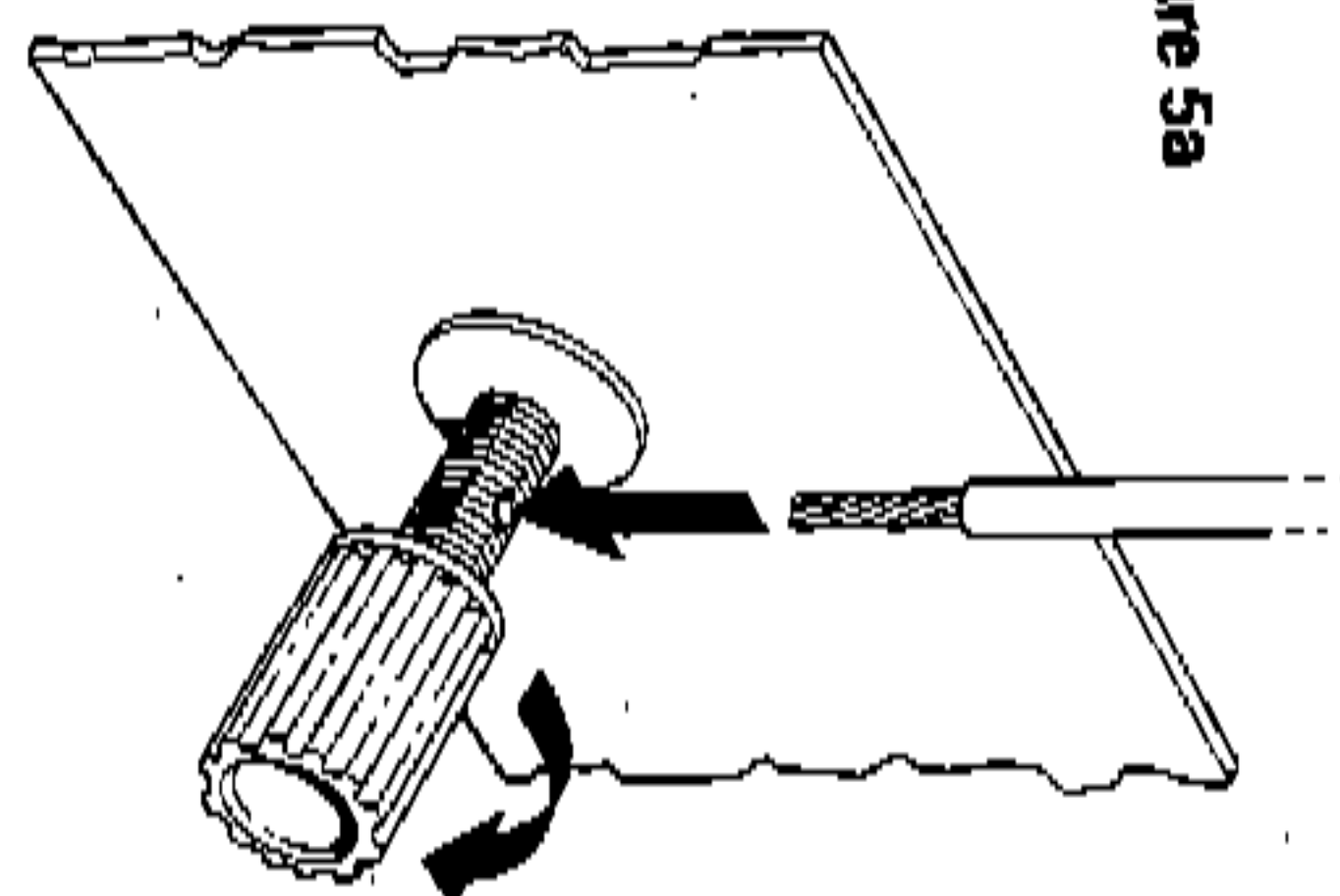


Figure 5b

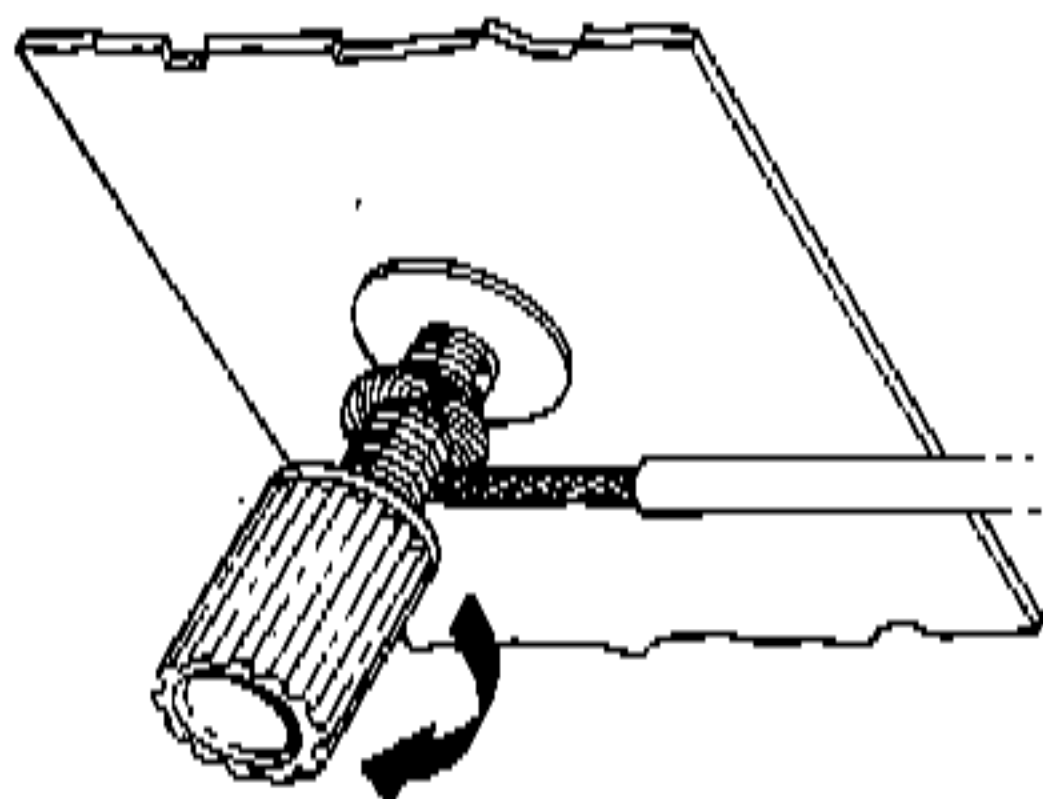


Figure 5c

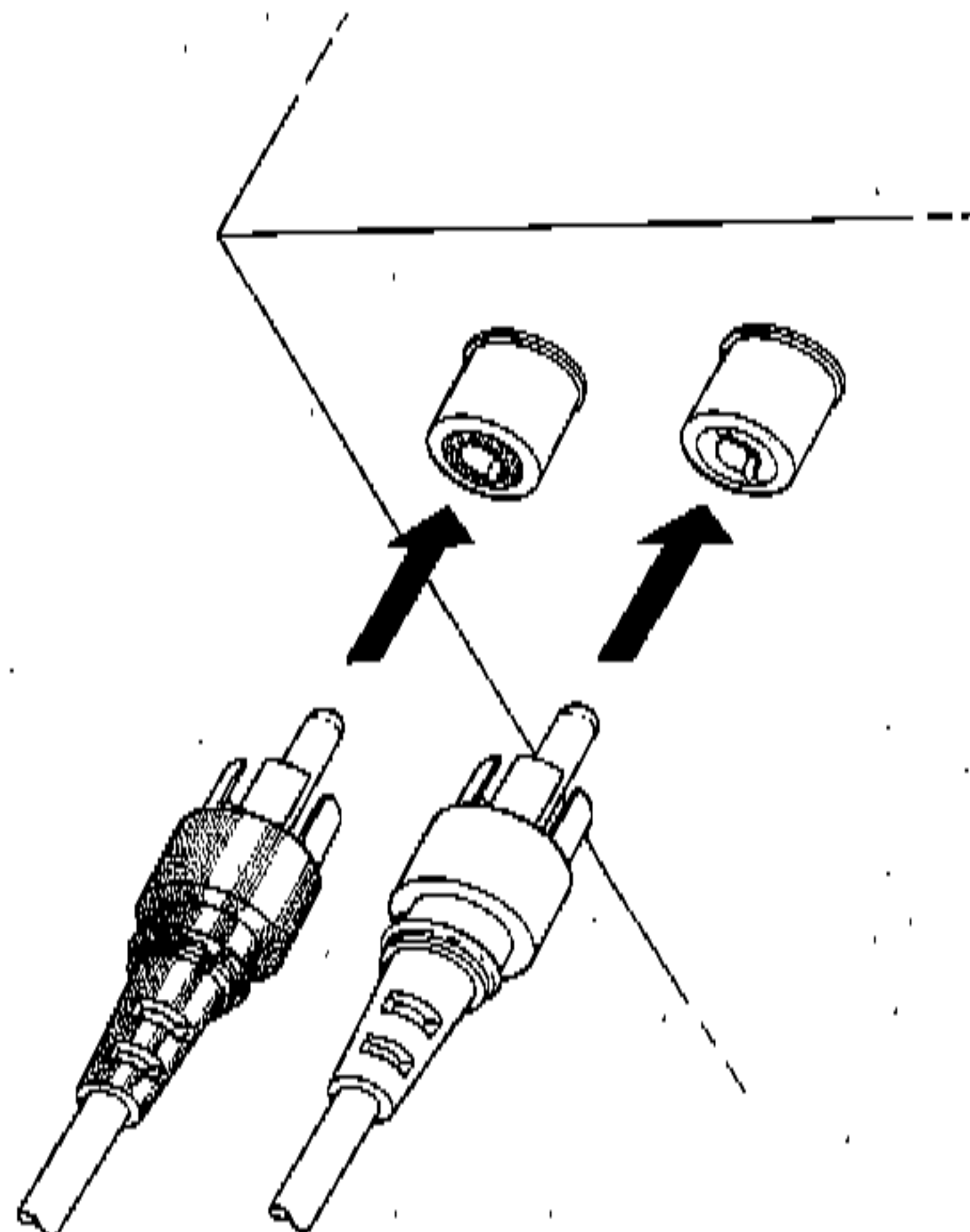
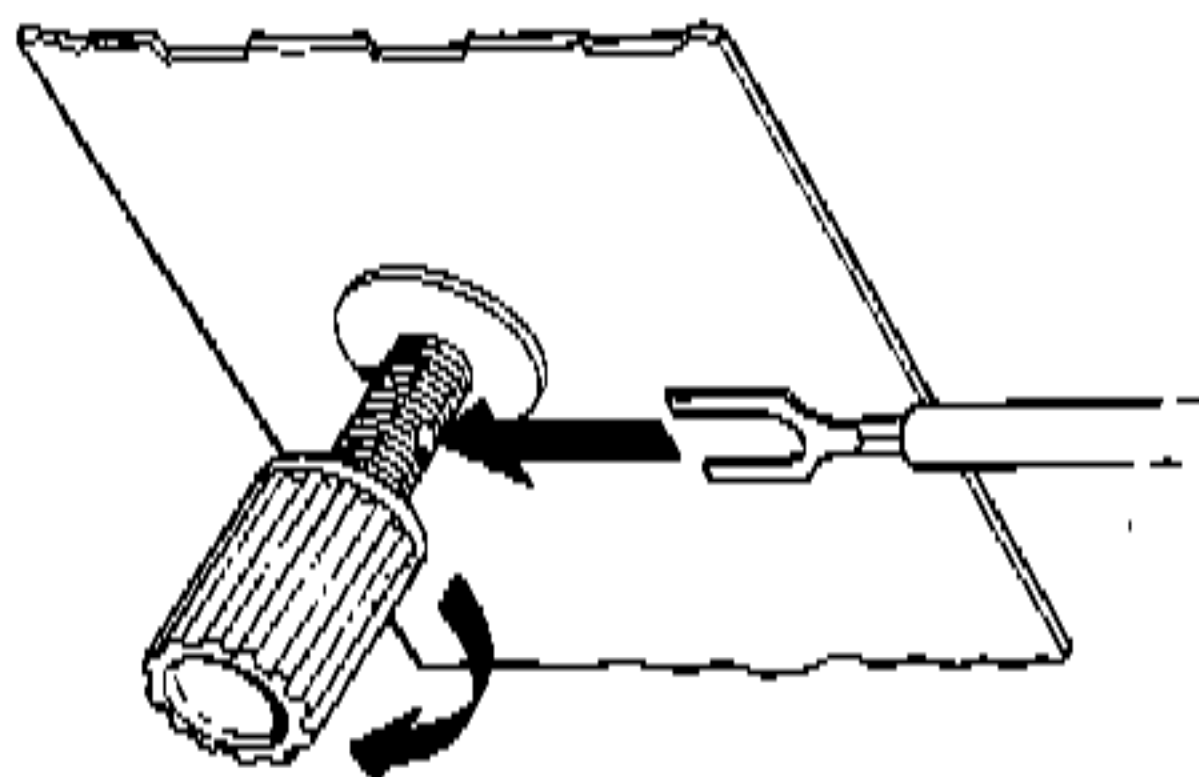


Figure 6

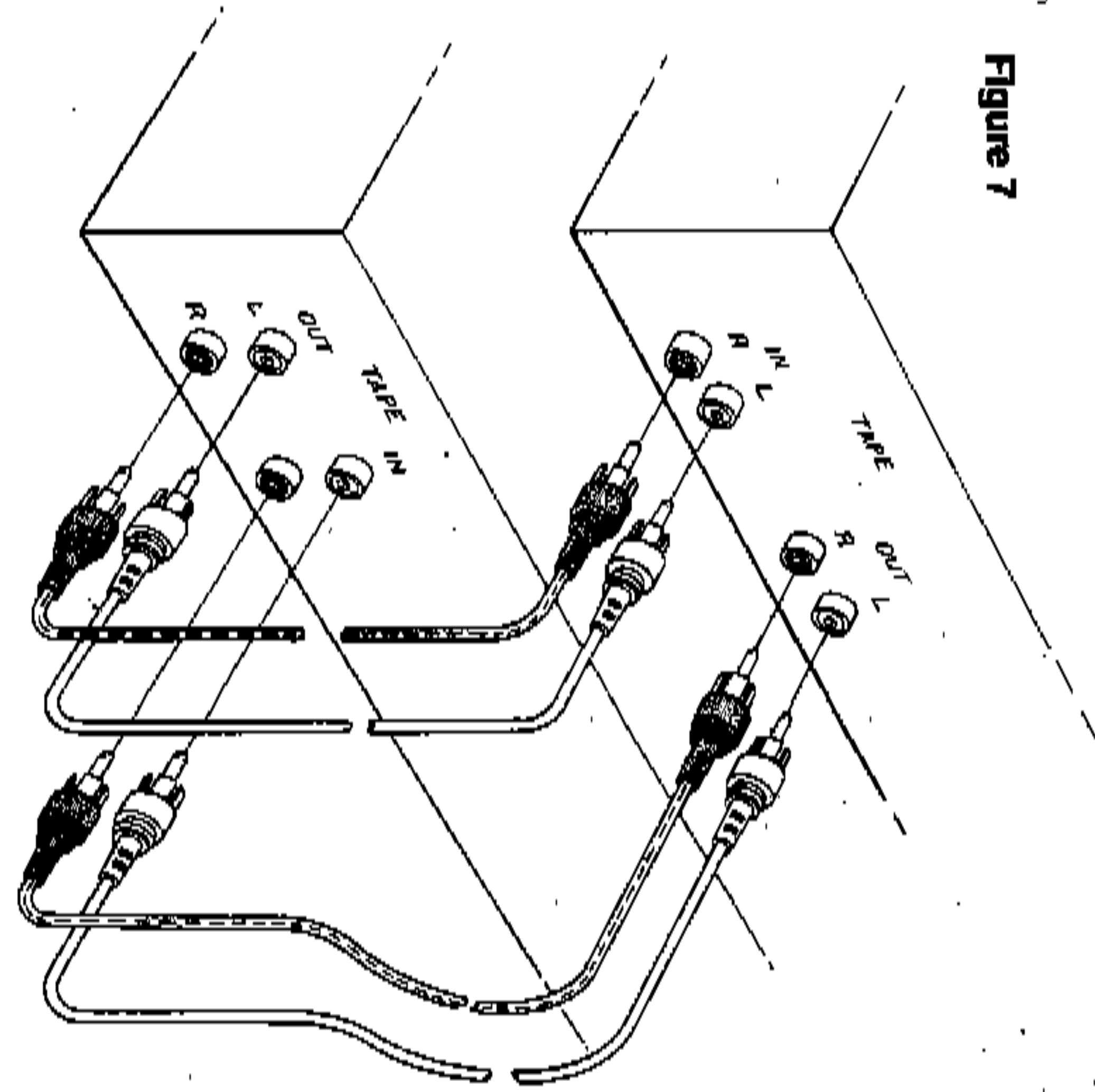


Figure 7

NAD 1600 PREAMPLIFIER/TUNER SPECIFICATIONS

PREAMPLIFIER SECTION

Phono input
 Input impedance (R and C)
 Input sensitivity rel. 0.5 V 1kHz
 Input overload at 20 Hz/1 kHz/20 kHz
 Signal/Noise ratio
 (A-weighted with cartridge connected)
 THD (20 Hz - 20 kHz) and IMD at +30 dB level
 RIAA response accuracy

NAD & NCC: 47 kohm + 100 pF
 NAL: 1.3 mV
 NAC: 0.1 mV
 NMF: 20 mV/180 mV/1.5 V
 NCC: 1.9 mV/13 mV/100 mV
 NMF: 75 dB rel. 5 mV
 NCC: 75 dB rel. 1.5 mV
 <0.04%
 10.5 dB

Line Level Inputs (CD, Video, Tape)

Output impedance

Pre-amp
 Tape
 EPIL
 Phones
 Pre-amp
 Tape
 Phones

600 ohms
 100 ohms (buffered)
 2000 ohms
 120 ohms
 > 10 V
 > 10 V
 > 8 V into 600 ohms
 > 250 mV into 8 ohms
 -3 dB at 12 Hz, 12 dB/octave

Maximum output level

Tape output, infrasonic filter

19 dB at 10 Hz
 ±10 dB at 50 Hz
 +3 dB at 56 Hz
 +6 dB at 36 Hz
 -3dB at 12 Hz
 12 dB/octave
 -20 dB

Controls

Treble
 Bass
 Bass EQ

Infrasonic filter (switchable)

Low level (audio muting)

FIL TUNER SECTION

Input sensitivity

Mono, -30 dB THD+N
 Mono, 50 dB SN
 Stereo, 50 dB SN
 Stereo, 80 dB SN

dB
 11
 14
 36
 46
 <1.6 dB
 > 60 dB

µV into
 75 ohm
 1.0
 1.4
 17
 85

Capture ratio (45 to 85 dB)
 AM rejection (45 to 85 dB)
 Selectivity

Alternate channel
 Adjacent channel

60 dB
 6 dB
 >60 dB
 >60 dB
 70 dB
 80 dB (18 and 38 kHz)
 75 µs
 <0.1%
 <0.2%
 <0.1%
 <0.3%
 82 dB
 76 dB
 10.5 dB
 50 dB
 35 dB

Image rejection
 R.F. intermodulation
 SCA rejection
 Subcarrier suppression
 De-emphasis
 THD at 100% modulation

Mono, 1 kHz
 100 Hz-6 kHz
 Stereo, 1 kHz
 100 Hz-6 kHz
 Mono
 Stereo

Frequency response, 30 Hz-15 kHz
 Stereo separation
 1 kHz
 30 Hz-10 kHz

AM SECTION

Usable sensitivity
 Selectivity
 Image rejection
 I.F. rejection
 Signal/Noise ratio (30% modulation, 50 mV input)
 THD

5 µV
 35 dB
 38 dB
 35 dB
 45 dB
 0.5%

Dimensions (Width x Height x Depth)

43.5 x 11 x 38.9 cm

Net Weight

(17.1 x 4.35 x 15.3 in.)

Shipping Weight

8.25 Kg (18 lb 12 oz)

Power Consumption

7.8 Kg (17 lb 3 oz)
 30 W

Specifications are those in effect at the time of printing. NAD reserves the right to change specifications or design any time without notice.

REPEAT CONTROL

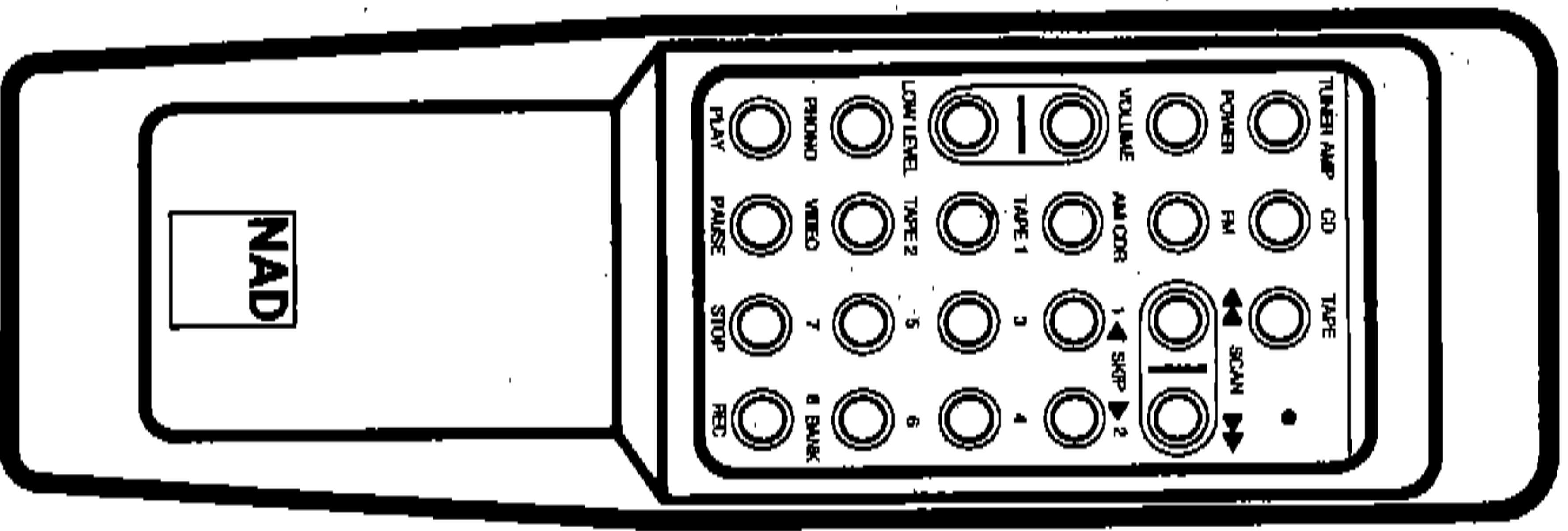
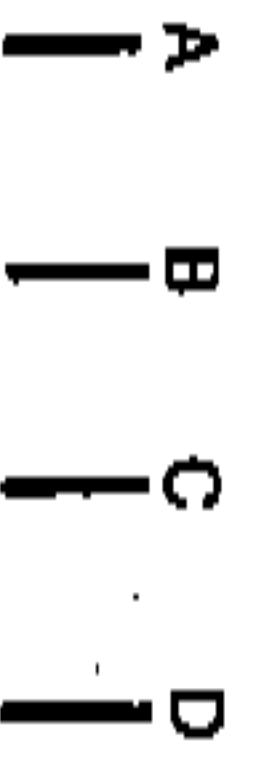


Figure 8

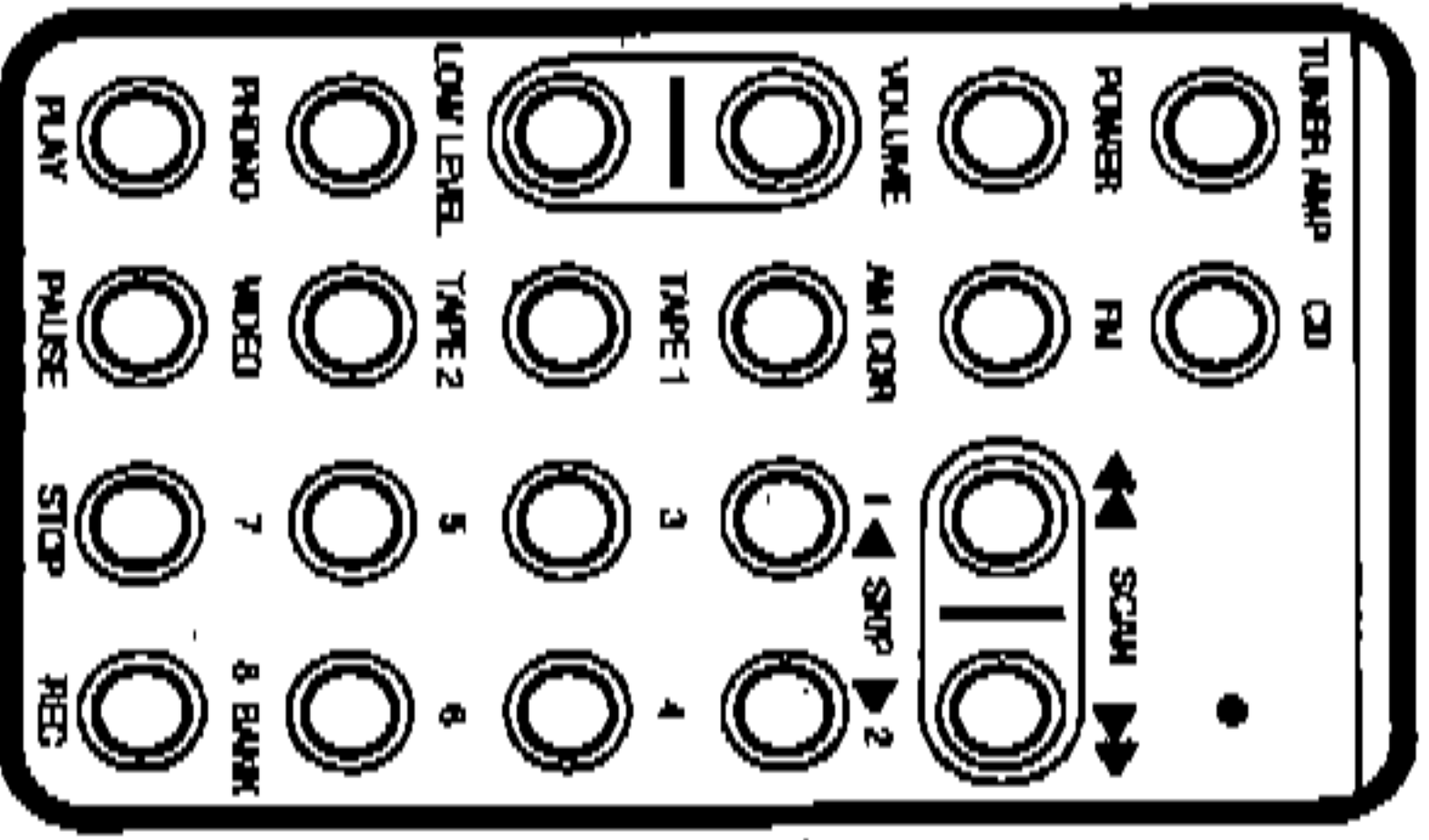


Figure 9

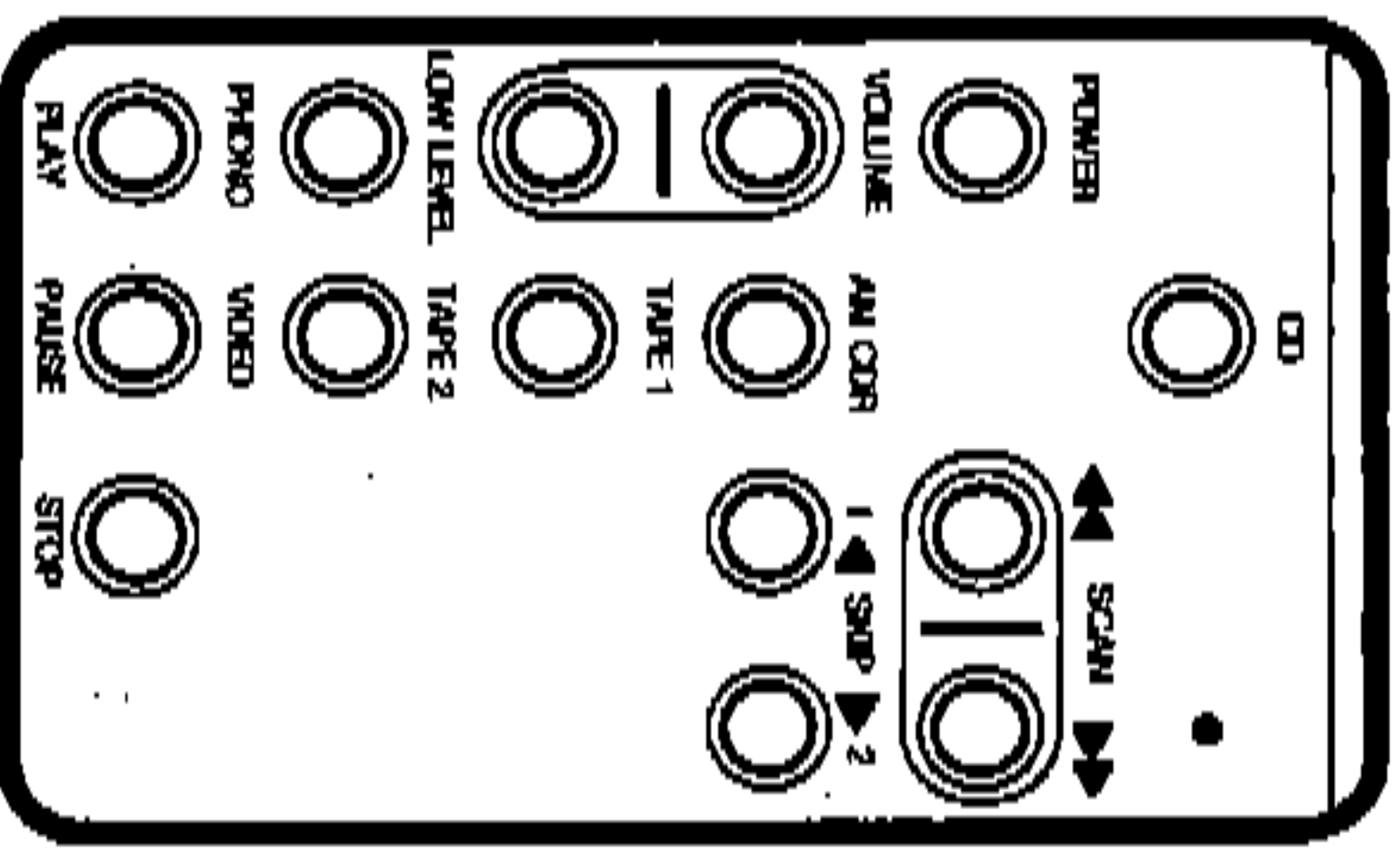
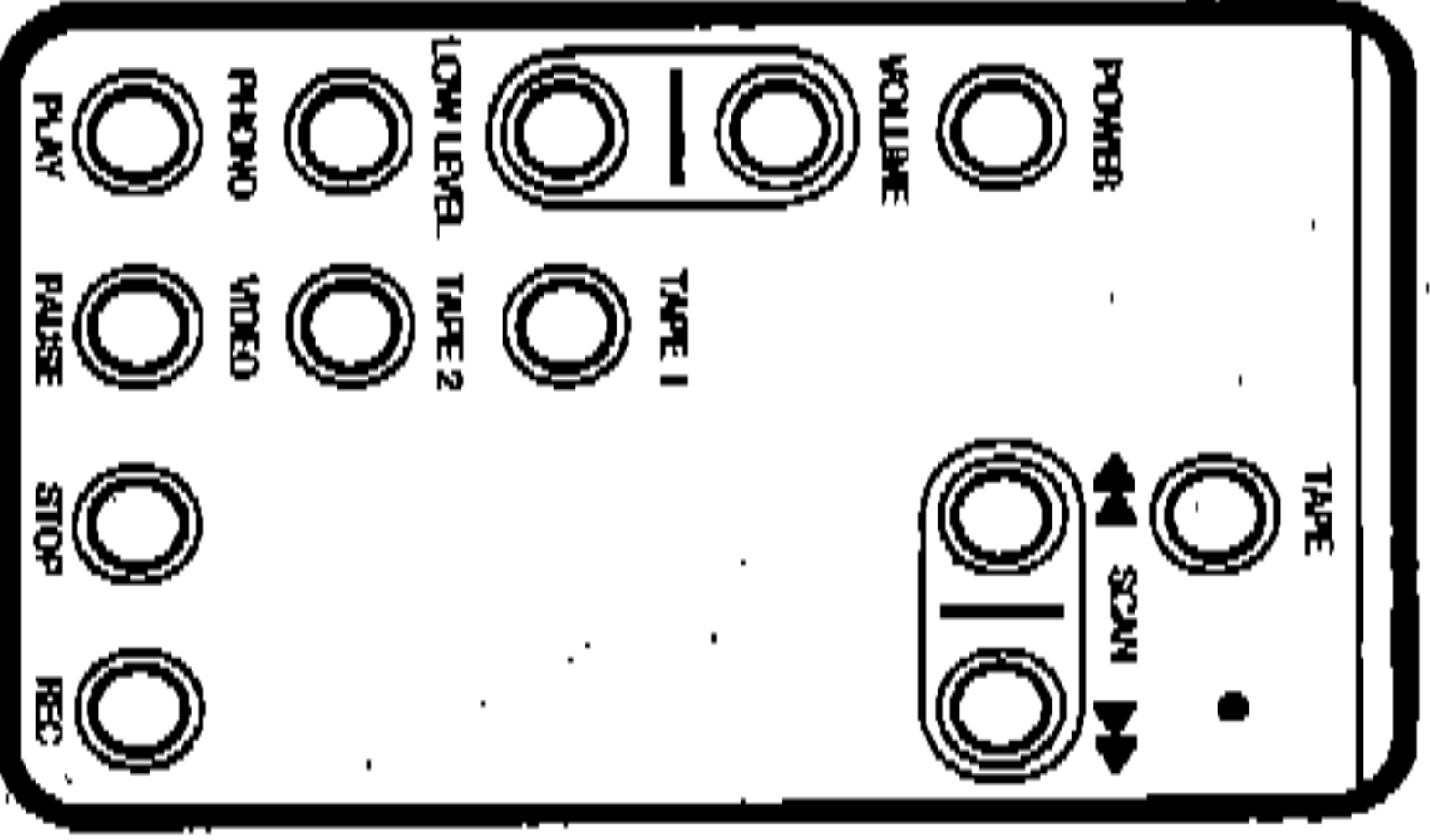


Figure 10



AMP/TUNER MODE

CD MODE

CASSETTE MODE

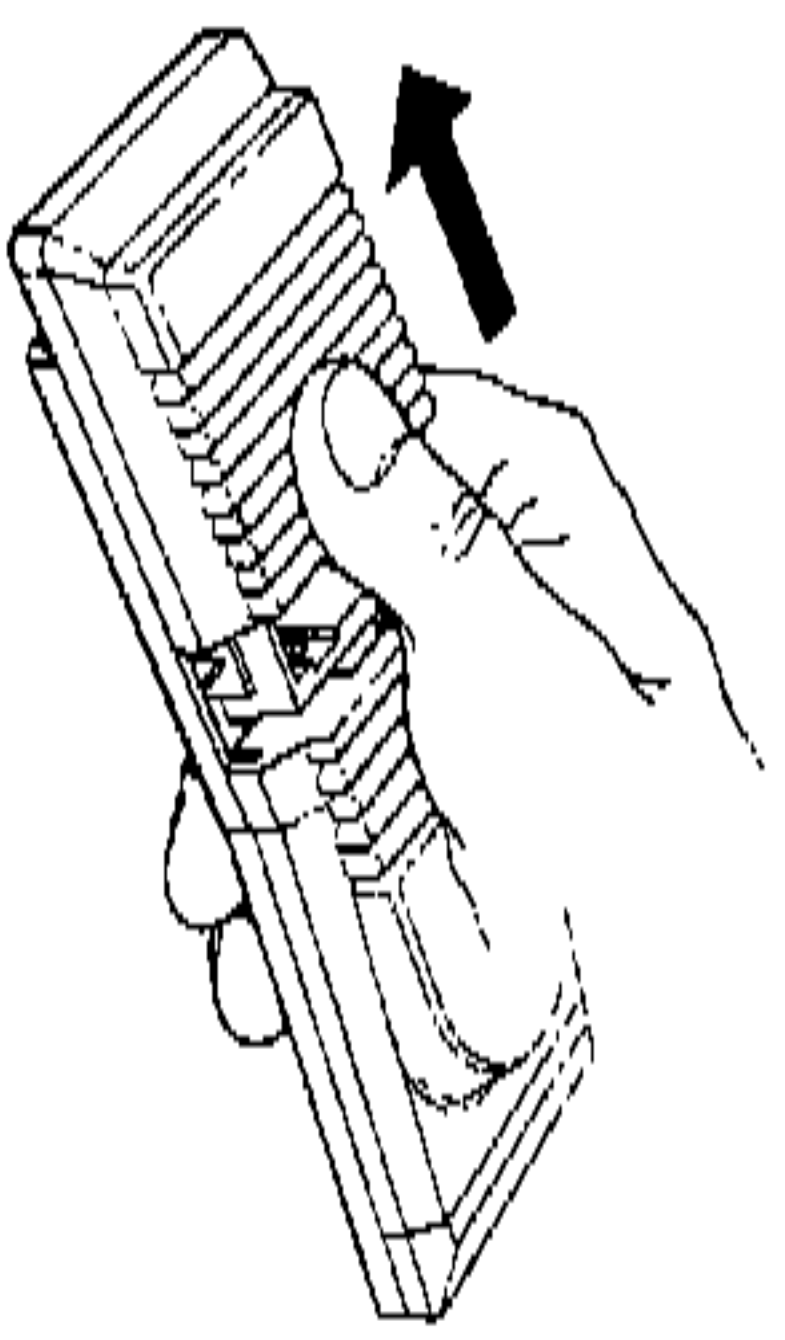
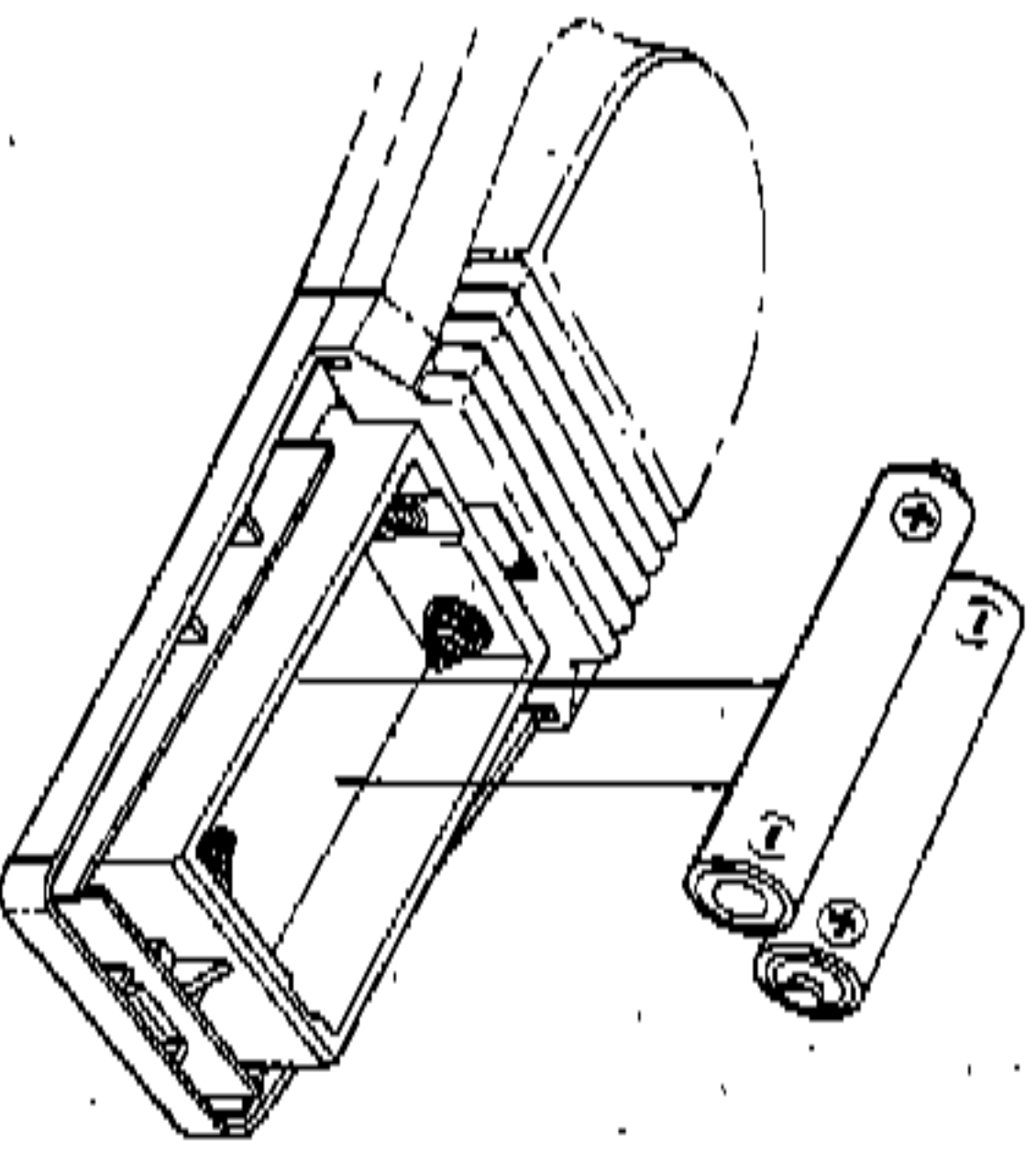


Figure 11



NAD 1600 PREAMPLIFIER/TUNER

A NOTE ON INSTALLATION

This unit may be installed on any sturdy, level surface. Since its power transformer generates a magnetic hum field of moderate strength, a turntable (especially one with moving-coil pick-up cartridge) should not be located directly to the left of the amplifier nor directly above it.

The preamplifier/tuner requires ventilation. Do not place the amplifier on a rug or other soft surface that it could sink into, obstructing the air inlets on its bottom.

REAR PANEL CONNECTIONS

1. AC LINE CORD.

Plug the AC line cord into a "live" AC socket.

2. AC CONVENIENCE OUTLETS (120 V units only)

The AC power line cords of other stereo components may be plugged into these accessory outlets. The SWITCHED outlet is intended for all-electronic products (e.g. an amplifier, equalizer, or other signal processor); it is switched on and off by the POWER button. A power amplifier rated at up to 100 watts per channel may be turned on and off via the SWITCHED outlet. If your amplifier is larger than that, use its own power switch to turn it on and off, or plug it into a multi-outlet power-socket strip containing a high-current switch.

The UNSWITCHED outlet should be used to power products involving mechanical operations (e.g. a turntable or tape deck); such products should be switched on and off with their own power switches. The UNSWITCHED outlet may also be used to provide power to a device such as a VCR whose clock timer and digital tuner require uninterrupted AC power to maintain information stored in its memory.

3. AM ANTENNA TERMINALS.

An external antenna is required for satisfactory reception of AM broadcasts. For local broadcasts a simple wire up to one meter (three feet) in length will provide ample signal strength, and such a single-wire antenna is included with the preamp/tuner.

Connect one end of the wire to the AM terminal. Press down the spring tab below the terminal, and insert the bare end of the wire into the terminal. When you release the spring tab, the terminal will grasp the wire. (See Figure 1.)

The remainder of the antenna may be allowed to hang down behind the preamp/tuner or may be tacked in place horizontally along the rear of a wooden shelf. (If your equipment is installed on metal shelves, they may impair reception; in that case, stretch out the wire along the wall away from the shelf and tack it in place.) You may wish to experiment with the orientation of the AM antenna, in order to find the position that provides the best reception of the stations you listen to most.

The short-wire antenna usually will provide satisfactory reception of local AM broadcasts. For better reception of distant AM stations, attach a long-wire outdoor antenna to the AM terminal. As its name implies, a "long-wire" antenna is a straight wire whose length may be anything from a few feet up to about

100 feet (30 meters), mounted parallel to the earth and as high above the ground as you can manage.

The effectiveness of a long-wire antenna may be improved by connecting a second wire from the Ground (G) antenna terminal to a true earth-ground, i.e. a copper-plated rod driven several feet into the earth. A substitute electrical ground, such as a cold-water pipe, may also prove effective.

4. FM ANTENNA INPUT.

An antenna must be connected to the preamp/turner for effective reception of stereo FM broadcasts. A ribbon-wire "folded dipole" antenna and a balun adapter are included to get you started.

When you stretch out the ribbon-wire antenna you will note that it is in the form of a T. The "crossbar" portion of the T should be stretched out horizontally and tacked in place (on a wall, on the back of a cabinet, or on the floor). The "vertical" section of the T goes to the preamp/turner's antenna input. Connect its two wires to the screw terminals on the balun adapter, then plug the balun into the 75-ohm socket. (See Figures 2-4.)

In view of the exceptional sensitivity of this tuner, you may find that the ribbon-wire dipole antenna is all you need for reception of strong local stations. But the ribbon antenna is not very efficient at rejecting "multipath" and other forms of FM interference, and it cannot easily be aimed to optimize its pickup pattern for best reception of stations in different directions. Therefore, in most cases you should use a better antenna. See the enclosed supplement for more information.

5. PHONO GROUND.

If your LP turntable is equipped with a grounding wire (usually a green wire terminating in a U-shaped spade lug), connect it to this terminal. Turn the thumb-nut counter-clockwise, place the spade lug under the nut, and tighten the thumb-nut clockwise to secure the lug. If the grounding wire has no spade lug, strip off 1 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 to fasten the wire in place. (See Figures 5a-5c.)

If you encounter a persistent low-level hum or buzz in the sound, connect a wire from the Ground terminal to a true earth-ground, i.e. a copper-plated rod driven several feet into the earth. A substitute electrical ground, such as a cold water pipe, may also prove effective.

6. PHONO INPUT.

Plug the signal cables from your turntable into these jacks. If the cables or plugs are color-coded, refer to your turntable's instruction manual to learn which cable or plugs fit the Left channel (upper jack) and which for the Right (lower jack). Be careful to insert each plug fully into the socket so that the plug's metal skirt fits tightly over the exterior of the socket. If necessary, crimp the plug's metal skirt slightly so as to obtain a tight fit with the socket. (See Figure 6.)

7. INFRASONIC FILTER.

The output from a record player contains strong but inaudible signals at infrasonic frequencies (below 20 Hz) caused by disc warps, stylus/turnarm resonance, and vibrations reaching the turntable. If these non-musical signals are amplified at full strength they may waste amplifier power and produce excessive woofer cone motion, muddying the sound. The infrasonic filter attenuates this unwanted contamination.

Loudspeakers with "vented" cabinets (i.e. bass-reflex, ported, auxiliary bass radiator, and drone-cone designs) are especially susceptible to being overdriven by infrasonic signals. If your speakers are of this type, you should keep the Infrasonic Filter switched ON, especially when playing LP records.

If you have sealed-cabinet (acoustic suspension) loudspeakers, or if you listen mainly to Compact Discs or tapes, the infrasonic filter may be switched OFF.

NOTE: A second infrasonic filter is included in the BASS EQ circuit and is automatically engaged when the bass equalization is used. It is not affected by the Infrasonic Filter switch.

8. 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 pickup cartridge. Set the switch at 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), set the switch at 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 system, play a record. With the front-panel LOW LEVEL switch disengaged 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.

9. VIDEO SOUND INPUT.

Connect a video-related audio signal here, such as the audio output from a video cassette recorder, video disc player, TV monitor/receiver, or stereo television decoder. Alternatively, any "line-level" audio signal may be connected here, such as the playback from a spare tape deck.

10. CD INPUT

Connect the audio signal cables from a digital Compact Disc player to these jacks. The input signal will be fed to the Volume control before reaching any active circuitry, so the amplifier's circuits cannot be overloaded by high-level signals from the digital player.

FRONT PANEL CONTROLS

1. POWER

Press to switch on the power to the 1600 and to any other products plugged into the SWITCHED convenience outlet on the rear panel. To switch the power off, press the button again.

When the AC line cord is plugged in but the power is switched off, a green LED at the bottom of the tuning display glows to indicate that the 1600 is in standby mode, ready to receive remote-control commands. When the power is switched on, the LED turns off; thereafter it glows only when commands are received from the remote control.

When the power is switched on, the LOW LEVEL mode is automatically engaged. Press the LOW LEVEL button to raise the volume to normal.

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 unit which must be connected directly to the speaker terminals on your power amplifier.

NOTE: When listening to headphones, turn off your loudspeakers by using your power amplifier's A/B selector switch, or by turning down the amplifier's input-level controls, or by switching off the amplifier's AC power.

3. EPL (EXTERNAL PROCESSOR LOOP)

Press this button to hear the output of any signal-processing accessory connected to the EPL jacks. If the processor is a special equalizer used with your loudspeakers, press this button IN when listening to those speakers, and leave this button OUT when the equalization is not wanted (i.e. when using headphones or extension speakers).

If you engage the External Processor button

If you don't have a CD player, any other line-level signal source (such as a spare tape deck) may be connected to the CD input.

11. TAPE 1 INPUT/OUTPUT.

The tape connections may be used with recorders of all types: cassette, micro-cassette, open-reel, digital, etc. To make recordings, connect a stereo patch cord from the TAPE 1 OUT jacks of the 1600 to the recorder's LINE IN jacks (not its microphone inputs). To play-back tapes, connect a stereo patch cord from the recorder's LINE OUT jacks to the TAPE 1 IN jacks of the 1600. (See Figure 7.)

12. TAPE 2 INPUT/OUTPUT.

These jacks allow you to connect a second tape recorder of any type, and the preamplifier is wired to permit copying tapes from one recorder to the other. Connect a cable from the TAPE 2 OUT jacks of the 1600 to the recorder's LINE IN jacks, and another cable from the recorder's LINE OUT jacks to the TAPE 2 IN jacks.

The TAPE 2 jacks may be used for a signal-processing accessory instead of a second tape recorder. Examples of such accessories include a dynamic range processor, a dynamic noise filter, or a graphic equalizer. Connect a patch cord from the TAPE 2 OUT jacks to the processor's inputs, and another patch cord from processor's outputs to the TAPE 2 IN jacks.

13. EXTERNAL PROCESSOR INPUT/OUTPUT.

An equalizer or other signal processor may be connected here, leaving the Tape connections free for tape recorders. Connect a stereo patch cord from the EPL OUT jacks of the 1600 to the main input jacks of the processor. Connect a second cable from the main output jacks of the processor to the EPL jacks of the 1600.

The External Processor is "downstream" from the Tape connections, so its processing may be used to

alter the sound of the playback from tapes as well as from other sources. But the processing cannot be used to alter signals that are being recorded.

If you want to record the processed sound, connect the processor to Tape 2 instead, and Copy the processor's output onto Tape 1 (or vice versa). Or you may simply connect a tape deck to the processor's own Tape in/out jacks.

The External Processor circuit is identical to the Tape circuits, except that it does not participate in the Copy function. If you connect a tape deck to the External Processor jacks, you may use the External Processor button on the front panel as a tape monitor (to hear the output from that tape deck). Tapes may be copied from Tape 1 or Tape 2 to External Processor, by setting Copy to OFF and Monitor to 1 or 2.

14. PRE OUT.

This is the normal output from the preamplifier. Connect a stereo signal cable from these jacks to the main input jacks on your power amplifier.

If you have a surround-sound unit, or another signal processor that should be installed in the signal path after the volume control, connect a cable from the PRE OUT jacks to the input of the processor, and a second cable from the output of the processor to the main input of your power amplifier.

The preamp has a low output impedance (600 ohms). It can drive several amplifiers connected in parallel, and it can be used with long signal cables in order to drive power amplifiers that are located near the speakers (or "powered" speakers having built-in power amplifiers).

when no processor is connected (or when a processor is connected but turned off), you will hear only silence — regardless of any other control setting.

If you use the EPL connections for an extra tape recorder, press this button to hear the output signal from the recorder. Leave the button OUT to hear the signal chosen by the input selector and Tape Monitor.

4. BASS EQ.

This circuit boosts the lowest bass frequencies, those below 60 Hz. In virtually all loudspeakers the useful output rolls off at frequencies below the woofer/cabinet resonance (which typically occurs between 40 and 70 Hz). The BASS EQ circuit compensates for this rolloff, extending the useful response of the speakers significantly lower in frequency.

Sometimes you may find that switching it in and out does not produce any apparent change in the sound, simply because the recording contains no energy at very low frequencies. But usually the BASS EQ will provide an audible (and occasionally a dramatic) strengthening of the deepest bass.

The BASS EQ circuit also includes an intrasonic filter that rolls off the response below 25 Hz to prevent inappropriate amplification of non-musical signals below the audio range.

5. LOUDNESS COMPENSATION.

This button engages a "loudness compensation" circuit which, at low-to-medium settings of the Volume control, boosts the bass response of the amplifier in order to compensate for the human ear's diminished sensitivity to low-frequency sounds at low loudness levels. The circuit also provides a slight treble boost to overcome the "masking" of subtle high-frequency details by background noise.

You may also use the tone controls and BASS EQ to obtain the tonal balance that sounds most natural to you, at any volume level.

6. BASS.

The Bass control adjusts the relative level of the low frequencies in the sound. The electrical response of the preamplifier 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 the Bass control to achieve the tonal balance that sounds most natural to you.

At moderate rotations away from center the effect of the Bass control is subtle, because its action is confined to the lowest audible frequencies where significant energy is seldom found in recordings. Only at large rotations away from center is there a substantial boost or cut at the mid-bass frequencies that are common in music.

7. TONE DEFEAT.

When this button is pressed the Bass and Treble circuits are bypassed, restoring precisely flat frequency response. This provides a convenient way to evaluate settings of the Bass and Treble controls. By adjusting the tone controls and then switching them in and out of the signal path, you can easily evaluate their effect on the musical sound.

The Bass EQ (on the front panel) and the Intrasonic filter (on the rear panel) are not affected by the Tone Defeat button.

8. TREBLE.

The Treble control adjusts the relative level of the high frequencies in the sound. The response of the preamplifier is flattest when the control is set in the detent at the 12 o'clock position. Rotation of the Treble control to the right (clockwise) increases the level of high-frequency sounds, and rotation counter-clockwise decreases their level. Adjust the Treble control to achieve the tonal balance that sounds most natural to you.

Boosting the Treble increases the brilliance and clarity of details in the sound, but also makes any

noise more prominent. Turning down the Treble makes the sound mellow while suppressing hiss and record surface noise; but too much Treble roll-off will make the sound dull.

9. COPY.

The Copy switch selects the signal that is fed to the Tape Out jacks for recording or signal processing. It has three settings.

OFF. When the Copy switch is OFF, the signal chosen by the Input Selector (CD, Phono, et al) is fed to both Tape Out jacks.

1-2. When the Copy switch is set at 1-2, the playback signal from Tape 1 In is fed to Tape 2 Out. This permits recordings to be copied from Tape 1 to Tape 2.

2-1. When the Copy switch is set at 2-1, the direction of copying is reversed: the playback signal from Tape 2 In is fed to Tape 1 Out. This permits recordings to be copied from Tape 2 to Tape 1.

NOTICE: Tape copying is a convenience intended for personal use. If you copy commercially produced recordings and sell or give away the copies, you may be violating the copyright or the property rights of the producer of the recording.

10. TAPE 1, TAPE 2 (MONITOR).

The Tape buttons let you hear the output signal from tape decks or signal processors connected to the Tape 1 and Tape 2 jacks. Press Tape 1 or Tape 2 to hear the corresponding signal. Unlike most buttons, Tape 1 and 2 are "togglers;" presses to engage, press again to disengage.

When Tape 1 or 2 is engaged, the source selected by the Input Selector or Copy switch continues to be fed to the Tape Out jacks for recording or processing, but the signal returning from the tape recorder (or signal processor) is selected for listening.

Note that the Tape buttons have no effect on the signals that are being recorded. Selection of a

signal for recording is controlled only by the Input Selector and the Copy switch.

The Tape buttons allow you to listen to recorded tapes and to check on your own tape recordings as they are being made. If you have a three-head audio recorder that permits off-the-tape monitoring, then by engaging the Tape buttons on both the amplifier and the recorder, you can hear the playback signal from the tape immediately after it is recorded, to monitor its quality.

With two-head audio recorders, Hi-Fi VCRs, and most digital recorders, the "monitor" signal heard while recording is not from the tape but is merely the signal passing through the recorder's electronics (including its Recording Level controls). In this case the Tape buttons allow you to check the left/right balance of the signal as it is recorded.

NOTE: If Tape 1 or 2 is engaged with no tape deck connected, or with a tape machine connected but not running, you will hear only silence — regardless of the settings of any other controls.

11. INPUT SELECTOR (PHONO, CD, VIDEO SOUND)

These buttons, together with the AM and FM buttons on the tuner panel, select the input signal for the preamplifier. If the COPY switch is OFF, the selected input signal is also led to the TAPE OUT circuits for recording.

If Tape 1 and 2 are disengaged, the selected input signal is fed to the power amplifier and so to the loudspeakers. When Tape 1 or 2 is engaged, the selected input signal continues to be fed to the Tape Out jacks for recording (or signal-processing), but the signal returning from the tape recorder (or processor) is selected for listening.

12. LOW LEVEL

This button reduces the volume of the amplified sound by approximately 20 decibels. It has no effect on the signal fed to the TAPE OUT jacks for taping or processing. When the Low Level mode is disengaged, the volume returns to the previous setting.

NOTE: The LOW LEVEL mode is always engaged when the 1600 is turned on, in order to avoid a blast of sound from an inadvertently high setting of the Volume control.

13. BALANCE

The Balance control adjusts the relative levels of the left and right channels. It has no effect on recordings being made. A detent at the 12 o'clock position marks the point of equal balance. Rotation of the Balance control to the right (clockwise) decreases the level of the left channel so that only the right channel is heard, thus shifting the sonic image to the right. Rotation of the control to the left shifts the sonic image toward the left speaker.

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.

14. VOLUME

The Volume control adjusts the overall loudness level of the sound. It has no effect on the level of the signals fed to the TAPE OUT jacks for recording. The Volume control is designed for accurate tracking of its two channels, so that the stereo balance will not shift noticeably as the loudness of the sound is varied.

15. SEARCH MODE

This button engages a SEARCH mode in which the tuner scans station-by-station rather than in small frequency steps. When one of the Up/Down Tuning buttons is tapped, the tuner scans rapidly up or down in frequency and automatically stops at the next

station whose signal is strong enough for good reception. A muting circuit silences the output during the scan, until the tuning circuits lock onto a station.

The manual tuning mode (with the SEARCH button OUT) partially overrides the scan muting. In this mode all stations (and the inter-station noise) remain audible at a reduced volume level while the tuning is being scanned up or down in frequency.

If you want to tune very weak signals, or if you need to fine-tune away from the center of a station's broadcast channel in order to cure an interference problem, disengage the SEARCH mode.

16. TUNING

Press the right-hand TUNING button (↗) to tune upward to higher frequencies, or the left-hand button (↖) to tune downward to lower frequencies.

When a Tuning button is pressed momentarily, the tuned frequency shifts up or down by one step. With FM the minimum tuning step is 0.05 MHz. With medium-wave AM the tuning step is 10 kHz in North America, 9 kHz in Europe and elsewhere.

If either Tuning button is held down with continuous pressure rather than just being tapped, the circuit pauses briefly and then scans rapidly up or down in frequency. If the SEARCH is engaged the tuner scans in a station-by-station mode rather than in small tuning steps.

To tune a broadcast signal, press continuously on either Tuning button until the tuned frequency is close to the desired broadcast frequency. Then fine-tune in small increments by tapping a Tuning button. If you know the exact frequency of the broadcast station, simply tune to that frequency. If you don't know the exact frequency, tune to the vicinity of the correct frequency and then observe the signal strength and center-tune indicators while fine-tuning. For AM broadcasts, fine-tune to obtain maximum signal strength. On FM, fine-tune until the center-tune indicator is illuminated.

17. TUNING DISPLAY.

This display is in three parts: frequency, signal strength, and tuning.

FREQUENCY. The numerical display shows the tuned frequency.

SIGNAL STRENGTH. The signal strength meter is a row of five bars below the frequency display. The number of illuminated bars increases with the strength of the received signal. If only one or two bars illuminate, the signal is too weak for noise-free reception in stereo, but reception may be satisfactory in mono. Strong signals are indicated by four or five illuminated bars.

TUNING. The center-tuning indicator is located to the right of the digital frequency display. It consists of an illuminated rectangular bar and two triangular pointers. The pointers glow when the tuning is within an FM station's channel but not at the center of that channel. The orientation of the illuminated pointer shows whether the tuning frequency should be increased or decreased. If the arrow points upward, tune to a slightly higher frequency. If the arrow points down, tune to a lower frequency. When the broadcast is accurately center-tuned, the triangular pointers fade out and only the middle bar is illuminated. At the bottom of the display window is a green LED that glows when remote commands are received. This LED also glows when the unit is in standby mode (plugged in but turned off).

18. STATUS INDICATORS.

The EPL indicator illuminates when the EPL (external processor) button is engaged.

The FM STEREO indicator illuminates when a stereo FM broadcast is received and decoded. Note that if the MONO button is engaged, all broadcasts will be received in mono.

If an FM station is broadcasting only in mono, or if a stereo broadcast signal is too weak for rea-

sorably noise-free reception in stereo, then the tuner will automatically switch into the mono mode, and the FM STEREO light will not illuminate. Also, if you have mis-tuned away from the center of a station's broadcast channel, the stereo decoding circuits may not lock onto the signal and it may be received only in mono.

19. FM BLEND.

The Blend circuit reduces noise in weak FM stereo signals by reducing the stereo separation at high frequencies.

It is characteristic of stereo FM that the stereo subcarrier becomes noisier as the received signal becomes weaker. When the Blend is engaged, the contribution of the stereo subcarrier to the sound is reduced at high frequencies, giving up some stereo separation in favor of quieter reception.

Disengage the Blend for normal reception of strong signals.

20. FM/AM.

When the FM or AM button is pressed it switches the preamplifier to the tuner input and selects the FM or medium-wave AM band.

21. MONO.

The MONO button blends the two stereo channels together to produce monophonic sound. This blend minimizes rumble and surface noise in old monophonic records. Switch the Mono mode off for normal stereo listening.

NOTE: If you are making a tape recording, engaging the MONO button may affect the signal being recorded — depending on whether one of the TAPE monitor buttons is also engaged. If a TAPE monitor is not engaged, then pressing MONO will blend the input signal into mono, and the monophonic signal will be recorded. If either TAPE monitor is engaged, then pressing MONO will affect only the sound that you hear as it returns from the recorder; the signal going to the tape will be recorded in stereo.

The MONO button also disables the stereo FM circuits in the tuner. Normally the tuner receives monophonic transmissions in mono and automatically switches on its multiplex decoding circuits when a stereo FM broadcast is received (as shown by the FM STEREO indicator). But when a very weak FM stereo signal is received, it may be excessively noisy because of the multiplex encoding technique used for stereo broadcasting. In that case, press the MONO button to lock the tuner in the mono mode, in order to obtain consistently quieter and cleaner sound.

Remember to disengage the MONO button when you re-tune to a stronger signal. As long as MONO is engaged, no broadcasts can be received in stereo.

22. MEMORY ENTER.

This button engages the Memory Enter mode. Use this mode to enter the frequencies of your favorite stations into the fourteen memory pre-sets (two banks of seven). The procedure is as follows.

(1) Decide which station you want to assign to each of the fourteen pre-sets. You may arrange the stations in any order that you find easy to remember or convenient to use.

(2) Tune to the first station on your list. Check the center-tune indicator to be sure that you have tuned precisely to the center of the station's broadcast channel.

Press the BANK button to select the bank that you want to store the first station in. Press the ENTER button and, within ten seconds, press Pre-set #1 to store the first station in the tuner's memory.

(3) Tune to the second station on your list. Press the ENTER button and, within ten seconds, press Pre-set #2 to store the second station.

(4) Continue in this manner until you have stored seven stations in the first seven pre-sets. Then press the BANK button to switch to the second bank of pre-sets, and continue the process for the second group of seven stations.

If you make a mistake or change your mind, it is not necessary to re-program the pre-sets in sequence. You can re-program any pre-set simply by tuning to the desired frequency, pressing ENTER, and pressing the pre-set button that you want to re-program.

After you finish programming the pre-sets, you may wish to post your list of stations and associated pre-set numbers nearby for reference.

CAUTION: In day-to-day operation, be careful not to press the ENTER button by accident. Doing so will activate the ENTER mode, and if you then press any of the pre-set buttons you will unintentionally re-program that pre-set. You would then have to manually re-tune to the station you wanted, and re-ENTER it into the pre-set.

23. BANK SELECTOR.

This button selects which group of seven programmed stations is assigned to the pre-set buttons. The LED above the BANK button changes color to indicate which bank is in use.

24. STATION PRE-SETS

You can store the frequencies of fourteen stations in these pre-sets, using the BANK and ENTER buttons. Then, to tune those stations from day to day, just select the appropriate bank and press the desired pre-set button. The tuner will automatically switch to AM or FM accordingly.

The circuit has a "last station tuned" memory. When the power is switched on it automatically re-tunes to the last station that you were tuned to.

The pre-sets preserve their frequency assignments when the AC line cord is unplugged, for a period of at least two weeks. Thus you can rearrange your stereo system, or move the equipment from room to room, without losing the pre-set frequencies. But if you leave the power off for a month or more, you may have to re-program the tuning pre-sets.

REMOTE CONTROL

A wireless remote control is provided with the Model 1600, enabling you to operate most functions from the comfort of your chair (or from virtually anywhere in the room).

This is a "system" remote, designed to operate a system of NAD electronics. In addition to operating the controls of the 1600 preamplifier/tuner, it also operates most NAD CD players and tape recorders.

OPERATING HINTS

The buttons are logically arranged in groups. The three buttons in the top row are mode selectors; they select (by product category) the remote-control codes that are produced by the remaining buttons. The two left-hand columns, identified as columns A and B in this manual, operate preamplifier controls in the 1600 (selecting the signal source and volume level), and also operate playback controls in a NAD CD player and/or tape deck. The two right-hand columns (columns C and D) select radio stations in the 1600, tracks on a CD, or positions on a tape.

The POWER button switches on or off the power to the 1600, regardless of which mode button may have been pressed previously. (If your CD player or tape deck is plugged into the Switched AC outlet on the rear, it will be turned on or off at the same time.) When the 1600 is plugged in but the power is switched off, a green LED at the bottom of the tuning display glows to indicate that the 1600 is in standby mode, ready to receive remote commands. When the power is switched on, the LED turns off; thereafter it glows only when remote commands are being received.

When the power is switched on, the LOW LEVEL mode is automatically engaged. Press the LOW LEVEL button to raise the volume to normal.

Several preamp functions (Volume Up/Down, Low Level, Tape 1 and Tape 2 Monitor) remain active in all modes. Thus if you have connected an equalizer or other signal processor to Tape 2, you can switch it in or out while playing a CD or any other source. If

you are recording from FM or CD onto tape, or copying from Tape 1 to Tape 2, you can engage Tape 1 or 2 to monitor the recording, without leaving the CD or Tape control mode. And you can always adjust playback volume, no matter what product you are controlling and what source you are listening to. (Note: In all modes the Volume Up/Down buttons operate the 1600's volume control, not the output level control of a CD player.)

Press the Tuner/Amp mode button to operate other controls on the 1600 preamplifier/tuner.

The CD mode button performs a dual function: it selects the CD input on the 1600 and also assigns CD player codes to the keys. To play a CD, simply press the CD mode button followed by PLAY. In the CD mode the Play and Pause buttons have the same effect; each alternates between Play and Pause functions.

To hear a tape, press Tape 1 or Tape 2 to hear the output from the tape deck. Then press the Tape mode button to select the recorder control codes in the handset.

A remote control can transmit only one command at a time. Commands that require pressing two buttons at the same time (e.g. "punch-in" recording, holding down PLAY while activating RECORD) cannot be executed by remote control.

Figures 8, 9, and 10 illustrate which remote control keys are effective in each mode. Each button on the remote control produces the same effect as the corresponding button on the corresponding NAD product.

BATTERY REPLACEMENT

If the Transmit indicator (in the upper-right corner of the keypad) does not glow brightly when remote control buttons are pressed, or if the 1600 does not respond to remote commands, the batteries may be weak and should be replaced. The unit requires two 1.5-volt AA-size penlight cells. Alkaline cells are recommended, to obtain maximum operating life.

To open the battery compartment, press down with the thumb at the center of the ribbed area on the back of the remote control unit. The cover of the battery compartment will slide down and off. (See Figure 11.) Install fresh AA cells, orienting them as shown on the diagram within the compartment. The coil springs should contact the (-) end of each cell. Slide the battery compartment cover back on until it latches.