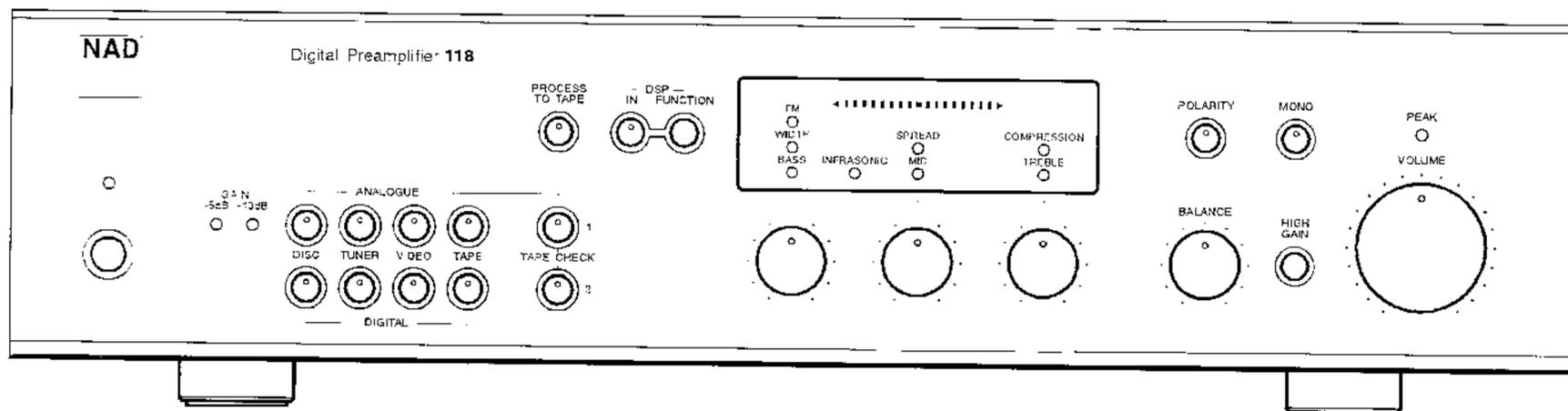


NAD 118



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GB

• **OWNER'S MANUAL**

F

• **MANUEL D'INSTALLATION**

D

• **BEDIENUNGSANLEITUNG**

PRECAUTIONS AND SAFETY INSTRUCTIONS



CAUTION

RISK OF ELECTRIC SHOCK DO NOT OPEN

ATTENTION:

RISQUE DE CHOC ELECTRIQUE NE PAS OUVRIR

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK).

ATTENTION: AFIN DE VITER UN CHOC ELECTRIQUE, ET LES CONSEQUENCES GRAVES QUI POURRAIENT EN RESULTEER, TENI FZ PAS D'OUVRIR L'APPAREIL ET DE TOUCHER AUX COMPOSANTS INTERNES SANS LA PRESENCE D'UNE SERVICE PERSONNEL.

Warning: To reduce the risk of fire or electric shock, do not expose this unit to rain or moisture.



The graphic symbol of a lightning flash with an arrow point within a triangle signifies that there is dangerous voltage within the unit and it poses a hazard to anyone removing the cover to gain access to the interior of the unit. **Only qualified service personnel should make any such attempt.**



The graphic symbol of an exclamation point within an equilateral triangle warns a user of the device that it is necessary to refer to the instruction manual and its warnings for proper operation of the unit.



Do not place this unit on an unstable cart, stand or tripod, bracket or table. The unit may fall, causing serious injury to a child or adult and serious damage to the unit. Use only with a cart, stand, tripod, bracket or table recommended by the manufacturer or sold with the unit. Any mounting of the device on a wall or ceiling should follow the manufacturer's instructions and should use a mounting accessory recommended by the manufacturer.

An appliance and cart combination should be moved with care. Quick stops, excessive force and uneven surfaces may cause the appliance and cart combination to overturn.

Read and follow all the safety and operating instructions before connecting or using this unit. Retain this notice and the owner's manual for future reference.

All warnings on the unit and in its operating instructions should be adhered to.

Do not use this unit near water; for example, near a bath tub, washbowl, kitchen sink, laundry tub, in a wet basement or near a swimming pool.

The unit should be installed so that its location or position does not interfere with its proper ventilation. For example, it should not be situated on a bed, sofa, rug or similar surface that may block the ventilation openings; or placed in a built-in installation, such as a bookcase or cabinet, that may impede the flow of air through its ventilation openings.

The unit should be situated from heat sources such as radiators, heat registers, stoves or other devices (including amplifiers) that produce heat.

The unit should be connected to a power supply outlet only of the voltage and frequency marked on its rear panel.

The power supply cord should be routed so that it is not likely to be walked on or pinched, especially near the plug, convenience receptacles, or where the cord exits from the unit.

Unplug the unit from the wall outlet before cleaning. Never use benzine, thinner or other solvents for cleaning. Use only a soft damp cloth.

The power supply cord of the unit should be unplugged from the wall outlet when it is to be unused for a long period of time.

Care should be taken so that objects do not fall, and liquids are not spilled into the enclosure through any openings.

This unit should be serviced by qualified service personnel when:

- A. The power cord or the plug has been damaged; or
- B. Objects have fallen, or liquid has been spilled into the unit; or
- C. The unit has been exposed to rain or liquids of any kind; or
- D. The unit does not appear to operate normally or exhibits a marked change in performance; or
- E. The device has been dropped or the enclosure damaged.

DO NOT ATTEMPT SERVICING OF THIS UNIT YOURSELF. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

Upon completion of any servicing or repairs, request the service shop's assurance that only Factory Authorized Replacement Parts with the same characteristics as the original parts have been used, and that the routine safety checks have been performed to guarantee that the equipment is in safe operating condition.

REPLACEMENT WITH UNAUTHORIZED PARTS MAY RESULT IN FIRE, ELECTRIC SHOCK OR OTHER HAZARDS.

ATTENTION

POUR EVITER LES CHOC ELECTRIQUES, INTRODUIRE LA LAME LA PLUS LARGE DE LA FICHE DANS LA BORNE CORRESPONDANTE DE LA PRISE ET POUSSER JUSQU'AU FOND.

CAUTION

TO PREVENT ELECTRIC SHOCK MATCH WIDE BLADE OF PLUG TO WIDE SLOT FULL INSERT.

If an indoor antenna is used (either built into the set or installed separately), never allow any part of the antenna to touch the metal parts of other electrical appliances such as a lamp, TV set etc.

CAUTION POWER LINES

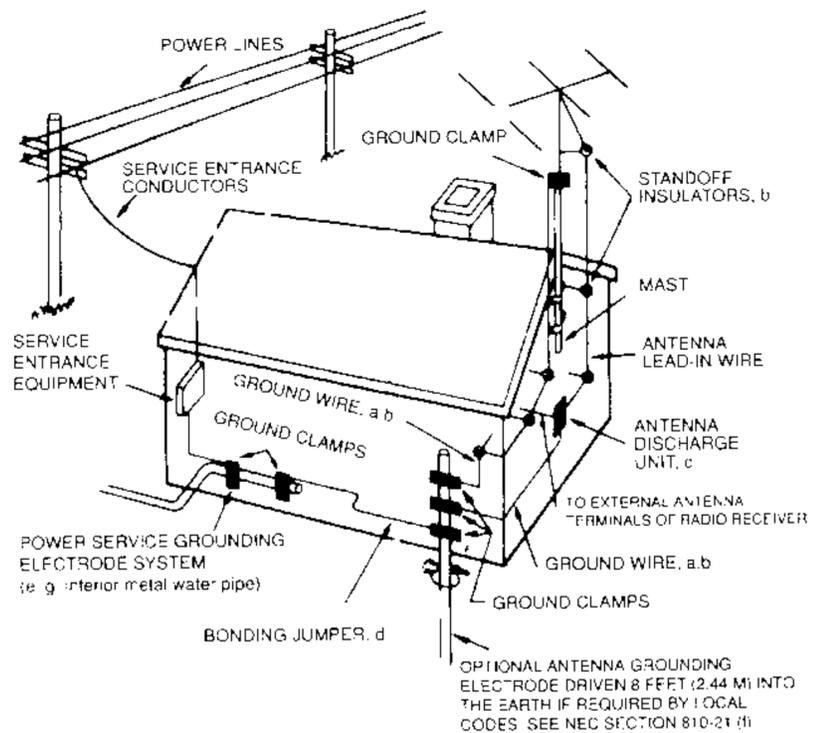
Any outdoor antenna must be located away from all power lines.

OUTDOOR ANTENNA GROUNDING

If an outside antenna is connected to your tuner or tuner-preamplifier, be sure the antenna system is grounded so as to provide some protection against voltage surges and built-up static charges. Section 810 of the National Electrical Code, ANSI/NFPA No. 70-1984, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna discharge unit, connection to grounding electrodes and requirements for the grounding electrode.

- a. Use No. 10 AWG (5.3mm²) copper, No. 8 AWG (8.4mm²) aluminium, No. 17 AWG (1.0mm²) copper-clad steel or bronze wire, or larger, as a ground wire.
- b. Secure antenna lead-in and ground wires to house with stand-off insulators spaced from 4-6 feet (1.22 - 1.83 m) apart.
- c. Mount antenna discharge unit as close as possible to where lead-in enters house.
- d. Use jumper wire not smaller than No.6 AWG (13.3mm²) copper, or the equivalent, when a separate antenna-grounding electrode is used. see NEC Section 810-21 (j).

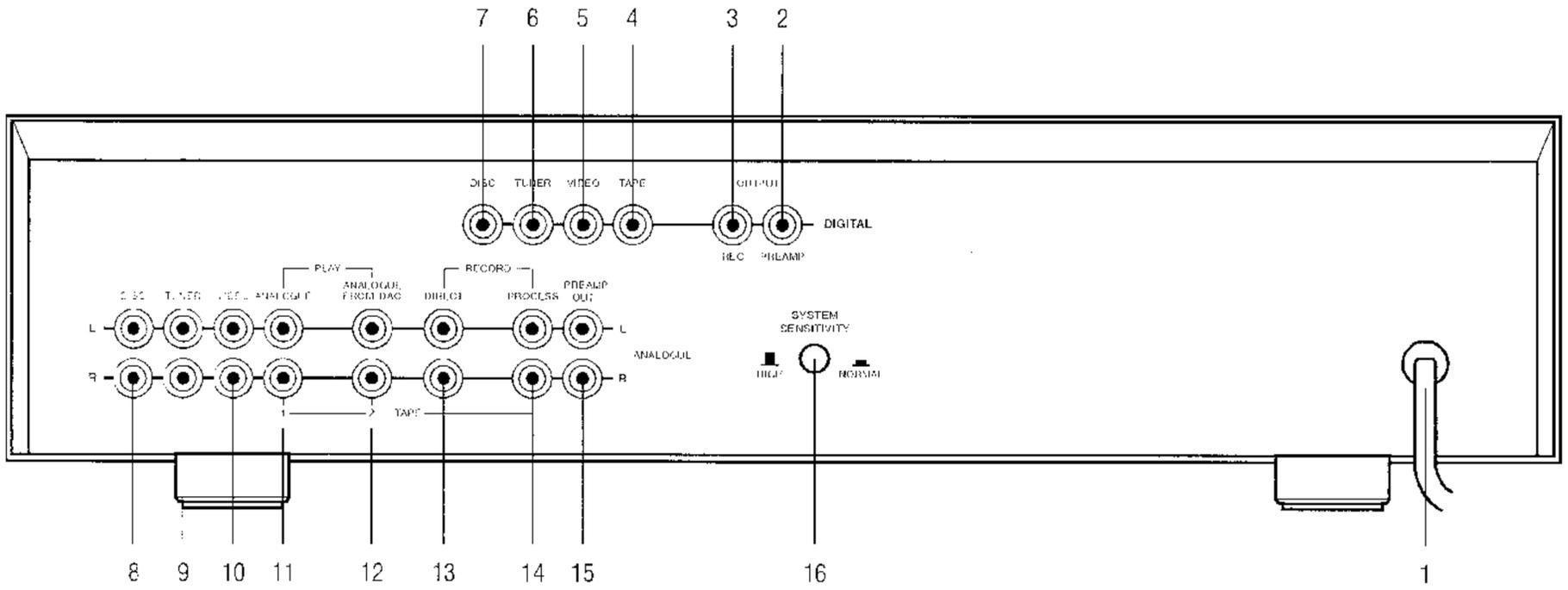
EXAMPLE OF ANTENNA GROUNDING AS PER NATIONAL ELECTRICAL CODE INSTRUCTIONS CONTAINED IN ARTICLE 810 - RADIO AND TELEVISION EQUIPMENT.



NOTE TO CATV SYSTEM INSTALLER: This reminder is provided to call the CATV system installer's attention to Article 820-22 of the National Electrical Code that provides guidelines for proper grounding and, in particular, specifies that the ground cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

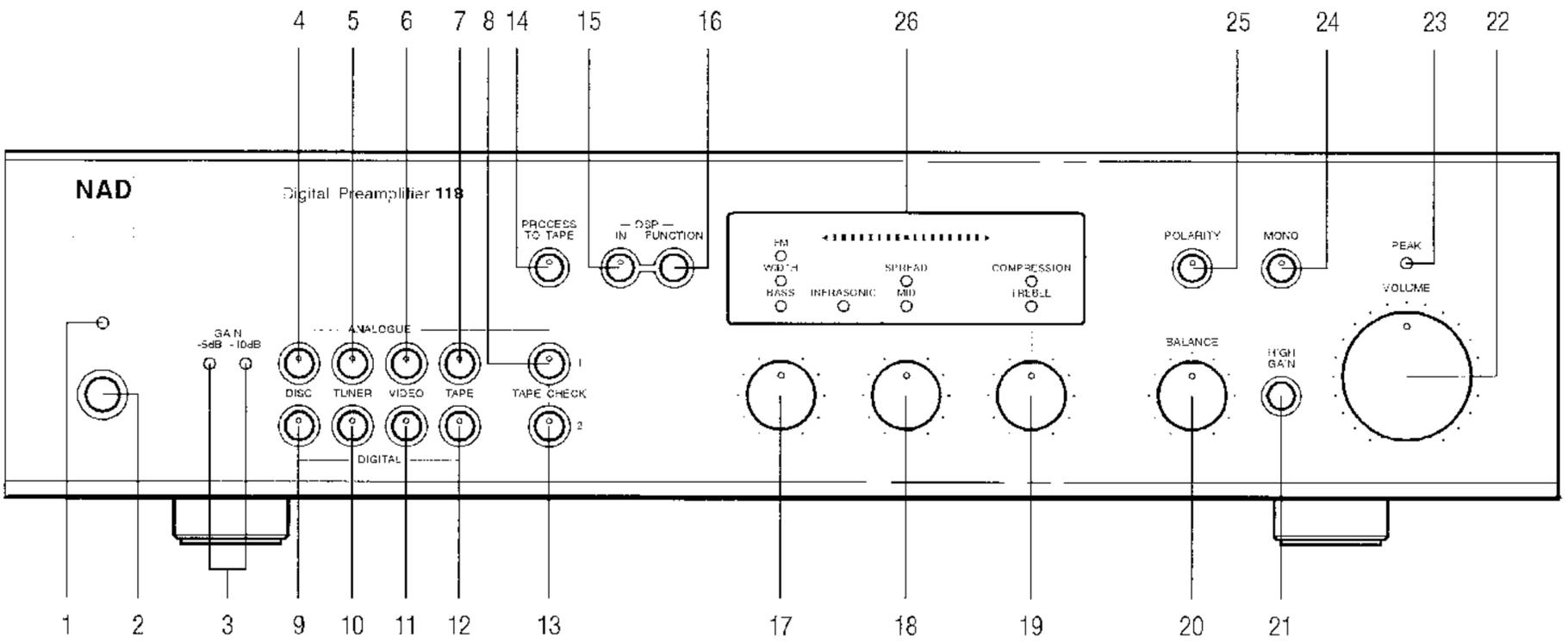
REAR PANEL CONNECTIONS - NAD 118

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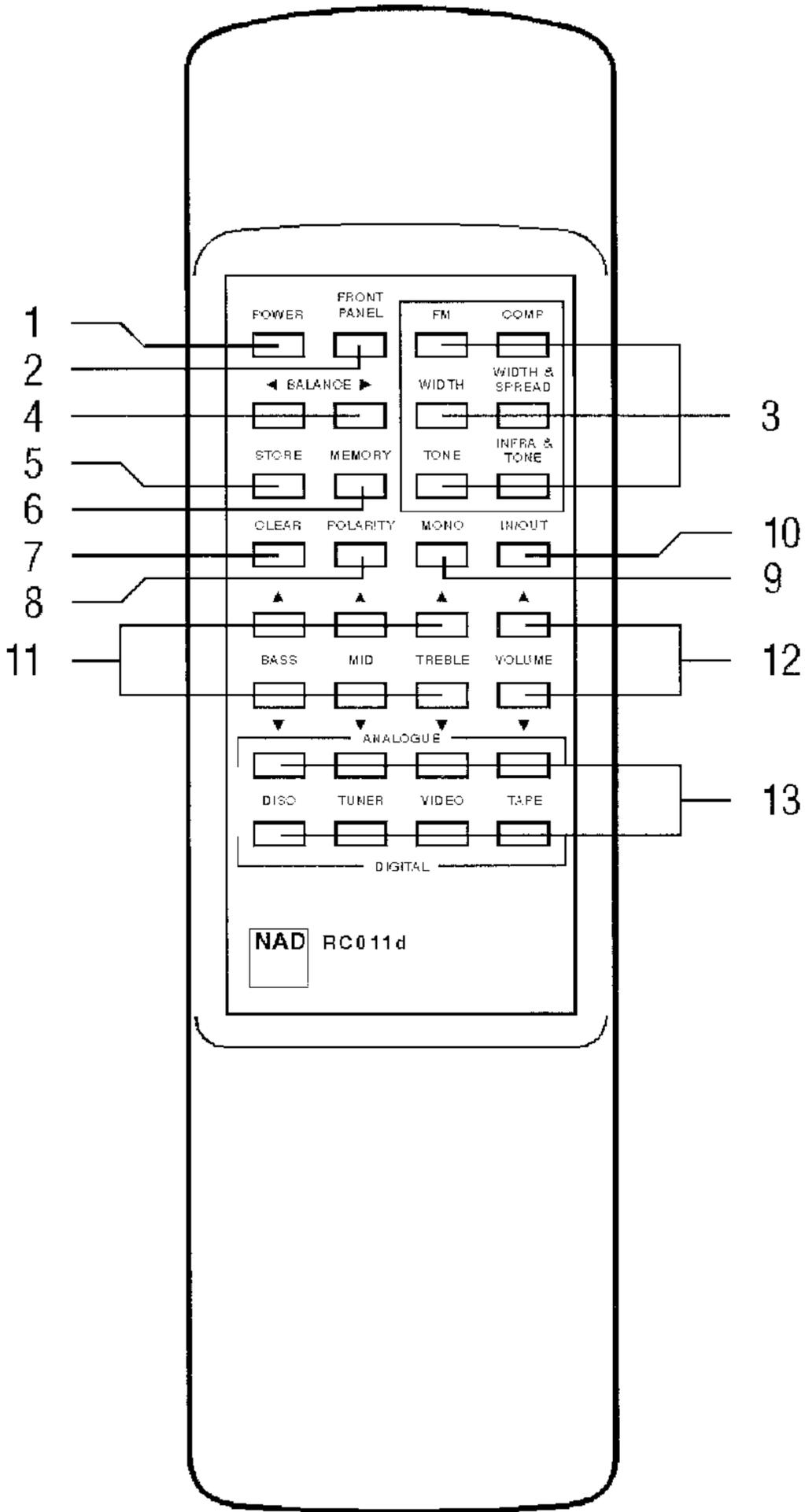
FRONT PANEL CONTROLS - NAD 118

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REMOTE CONTROL

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NAD 118 DIGITAL PREAMPLIFIER



Thank you for purchasing the NAD Model 118 Digital pre-amplifier. The Model 118 represents the very latest in Digital circuitry and Digital Signal Processing. Please read this manual carefully before installation and operation in order to gain the maximum benefits of its state-of-the-art performance and possibilities.

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1. INTRODUCTION

The NAD Model 118 Digital Pre-amplifier is different from conventional pre-amplifiers, both in the way it works and the features it offers. For a good understanding of this extraordinary pre-amplifier it can be useful to be familiar with some of the principles behind Digital and Analogue sound and signal processing. The following brief explanation can be of some help but is by no means complete.

Sound can be stored and reproduced in analogue or digital form. Analogue storage of sound means that the storage format follows exactly the pattern of the music; e.g. a record groove is an exact representation of the sound it stores. Similarly, sound can be processed (adding or subtracting bass and treble, changing volume, etc.) in an analogue fashion, where the electrical signal is again an exact representation of the sound. In digital form, sound is stored or processed in a way which isn't an immediate representation of sound; e.g. antique music boxes use a bar with many pins on it; by rotating this bar each pin triggers a series of blades in a specific sequence which then resonate, which we perceive as music. The bar with pins is in fact a digital way of storing music. Today, digital storage of music is done by transforming the analogue signal into a string of 0's and 1's, like computer language.

The whole process of storing and processing music in a digital form is in fact very similar to the way a personal computer processes and stores its data. The process of transforming an analogue signal into a digital signal is known as "Analogue to Digital conversion". For formats (such as CD) which carry the music in a digital form, this conversion was done during the recording or mastering process. Recordable digital formats (such as DAT, DCC and MD) can take digital data from a CD player direct but often have an A-to-D converter (known as ADC, Analogue to Digital Converter) built in to cope with analogue sources. The quality of the ADC plays a large part in the total sound quality.

Digital storage and processing of sound has several advantages; digital storage formats take up less space for the same amount and quality of sound when compared to its analogue counterparts and is, in general, less prone to degradation over time or through wear and tear. In the digital domain the sound signal can also be more elaborately processed without any of the artifacts analogue processing would bring.

Sound itself and the way we hear it is, is an entirely analogue process which means that sound stored in a digital form must be converted to back analogue before we can hear it. Most CD players, DAT, MD, DCC recorders, etc. have a Digital to Analogue Converter (known as DAC) built in. Many also have a digital output so an external DAC or processor (such as in the NAD Model 118) can be used. As with ADCs, the quality of the DAC is crucial to the quality of sound.

The NAD Model 118 does all its sound signal processing (volume, tone controls, compression, expansion, stereo simulation, etc.) in the digital domain. Processing in the digital domain is also referred to as DSP (Digital Signal Processing). The Model 118 has ADCs and DACs built in which means it can cope with sound sources in either digital or analogue form. There are 8 inputs in total; 4 for digital sources and 4 for analogue sources.

2. INSTALLATION: REAR PANEL CONNECTIONS & CONTROLS

The numbers refer to the rear panel drawing unless stated otherwise.

This unit may be installed on any level surface that is strong enough to support its weight. Due to the advanced and comprehensive digital circuitry within the NAD 118 there may be interference with radio reception, particularly if an indoor antenna is used and if the tuner is positioned directly on top of or beneath the NAD 118. In such instances use an outdoor antenna with high quality coaxial cable and move the tuner further away from the pre-amplifier.

Allow adequate ventilation. Do not place the unit on a soft surface like a carpet. Do not place it in an enclosed position such as a bookcase or cabinet that may impede the air-flow through the ventilation slots.

CAUTION: The pre-amplifier must always rest on its bottom feet. Never put the pre-amplifier down on its rear panel, with its front panel facing up. Doing so risks damage to the input/output connectors.

CAUTION: To prevent a fire or shock hazard, do not permit liquid or moisture to enter the pre-amplifier. If liquid is accidentally spilled on it, unplug the AC power cord immediately. Do not open the pre-amplifier, or attempt to modify or repair it yourself. There are no user serviceable parts inside. Refer all servicing to a qualified technician.

AC POWER CORD CONNECTOR (1).

Plug the AC power cord into a live wall socket. A notice printed on the rear indicates the AC power-line voltage that the Model 118 requires. In almost all cases only versions with the correct voltage settings for the country of purchase are supplied.

Note: Every Model 118 pre-amplifier has a "universal" power supply that can be modified for operation in most other countries. If you wish to transport your Model 118 to a country that employs a different power-line voltage, an authorised NAD dealer or service agency can convert it for such use. When you arrive at your destination you can have the appropriate AC power cord and/or plug fitted by an authorised NAD dealer or service agency for local electrical outlets.

ANALOGUE SOURCE INPUTS & RECORDING OUTPUTS (8 to 14)

The NAD Model 118 has the provision for 8 signal sources; up to 4 digital and 4 analogue sources can be connected; each with their own input jacks (and output jacks for recorders) and input select buttons on the front panel and remote Control handset. Analogue signal sources have separate RCA plugs for Left and Right for a stereo signal. On most equipment and cables the Left and Right channels are colour-coded: White or black for the Left channel; Red for the Right channel. When making connections make sure you connect the Left and Right channels correctly.

NOTE: Before making any connections make sure that the pre-amplifier and all other ancillary equipment is switched off (particularly outboard Digital-to-Analogue converters and power amplifiers).

NOTE: these inputs are for analogue audio signals only, not for the digital-code outputs of a CD player, DAT recorder, etc. Analogue audio signals use a separate RCA plug for the Left and Right signal. Digital audio signals use one cable and a single plug for both channels.

Disc (8):

Connect the analogue audio signal cables from a Compact Disc player to these jacks (normally labeled LINE OUT, AUDIO OUT, etc.)

Tuner (9):

Connect the analogue audio signal cable from a radio tuner (AM, FM, or digital radio) to this pair of jacks (normally labeled LINE OUT, AUDIO OUT, etc.).

Video (10):

Connect a video-related audio signal here, such as the analogue audio output from a video cassette recorder, laserdisc player, TV monitor/receiver, or stereo television NICAM decoder (normally labeled LINE OUT, AUDIO OUT, etc.).

Analogue Play (11) (tape input):

These jacks allow you to connect an analogue recorder of any type; a cassette deck, open reel tape recorders, etc. Connect a cable from the recorder's LINE OUT, TAPE OUT or PLAY-BACK jacks to the Analogue Play jacks (11).

NOTE: You can use this input for the analogue output of a digital recorder as well (DAT, MD, DCC, NT, etc.). However an extra input specifically for this purpose has been provided for: "Analogue from DAC" (12), see below and refer to section "Digital source Inputs and Outputs" of this chapter.

Analogue from DAC, Play (12):

Connect the analogue output (labeled ANALOGUE LINE OUT, TAPE OUT, PLAY BACK) of a digital recorder (DAT, MD, DCC, etc.) here. This connection will allow you to monitor the signal coming back from the recorder whilst making a recording. Refer to chapter "Operating Instructions" section "Making Recordings" for more information.

Analogue source outputs; Record Direct (13), Record Process (14):

Both sets of jacks allow you to take the signal from any selected source and feed it to the recording inputs of an analogue recorder (such as a cassette deck or reel-to-reel recorder) or the analogue inputs of a digital recorder (DAT, DCC, MD, etc.). Depending on which output to which you choose to connect your recorder, it is possible to record changes made from all sources using a DSP mode. Refer also to chapter "Operating Instructions" sections "DSP Functions" and "Making Recordings, Process to Tape" for more information.

The Record Direct output jacks (13) carry the signal from the selected analogue source without any alterations; the signal goes straight from the input to this output. Recording changes made using the DSP functions are therefore not possible with analogue sources

using the Record Direct output jacks. When copying from digital sources it is possible to record changes made using the DSP functions.

The Record Process output jacks (14) will enable you to use and record changes made with DSP functions from both analogue and digital sources.

If you always want to record the original source without any alterations using a DSP mode, it is advisable to connect your analogue recorder to the Record Direct outputs (13). Should you wish to make recordings from both analogue and digital sources copying alterations made using a DSP function, use the Record Process outputs (14).

NOTE: Analogue signals are always routed through the ADC and DAC to the Record Process output, even if Process to Tape and DSP In (respectively 14 and 15 on the front panel drawing) were not selected.

NOTE: The analogue recording outputs "Record Direct" and "Record Process" can be used simultaneously.

DIGITAL SOURCE INPUTS & RECORDING OUTPUT (3 TO 7)

The NAD Model 118 allows the operator to connect 4 digital sources each with its own RCA input jack for coaxial digital outputs. For a digital recorder there is also a RCA digital output. Unlike analogue signals, digital sound signals combine the Left and Right signals in one cable.

Disc (7):

Connect the digital output of a CD player or CD transport to this jack (normally labeled as DIGITAL OUT).

Tuner (6):

Connect the digital output of a digital tuner (DAB, DSR, etc.) to this jack (normally labeled as DIGITAL OUT).

Video (5):

Connect the digital output of a video-related audio signal here, such as the audio output from a digital video cassette recorder, laserdisc player, TV monitor/receiver, stereo television NICAM decoder, etc. (normally labeled as DIGITAL OUT).

Tape (4):

Connect the digital output of a digital recording device (DAT, DCC, MD, etc.) to this jack (normally labeled as DIGITAL OUT).

Output Rec (3):

Connect the digital input of a digital recording device (DAT, DCC, MD, etc.) to this jack (normally labeled as DIGITAL IN).

NOTE: It is important that cables with the right impedance (75) are used for all the digital connections. Using the wrong interconnects may result in the Model 118 not being able to recognise the digital source.

DIGITAL & ANALOGUE PRE-AMPLIFIER OUTPUTS (2 & 15)

The Model 118 can drive a power amplifier direct, using its high quality, built-in DAC. It is also possible to use an external DAC which in turn drives a power amplifier or active loudspeakers. There are loudspeakers available which have a built-in DAC and power amplifiers. In such a case, always use the Digital Pre-amp out (2).

Analogue Pre-amp Out (15):

Connect the input of a power amplifier or active loudspeakers in these jacks (normally labeled as LINE IN, MAIN IN, POWER IN, etc.). Ensure Left and Right channels are properly connected.

Digital Pre-amp Out (2):

Connect the input of a separate DAC or loudspeakers with built-in DAC to this jack (labeled as DIGITAL IN, COAX IN, etc.).

3. SET-UP AND INITIALISATION

Before the NAD Model 118 can be operated it might be necessary to adjust the Input Gain for the analogue inputs and the pre-amp's output level (System Sensitivity) to match the rest of the system in which it will be used. To obtain optimum performance it is recommended to go through the following procedures and adjust where necessary.

GAIN

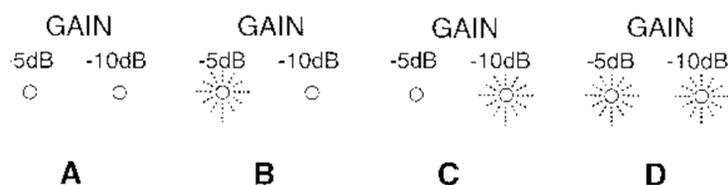
It is important that the input gain of the Model 118's selected source and the output level of the corresponding analogue source match up. If the output level from the source is too high (input gain is set too high) then the Model 118's ADC will be overloaded which will cause distortion at loud passages. Alternatively, if the output level from the source is too low (input gain is set too low) you will not get the maximum benefit of the high resolution and sound quality the Model 118 has to offer.

The input gain (sensitivity) can be set individually for all 4 analogue sources. There are 4 different selectable input levels for each analogue input: 0dB; -5dB, -10dB and -15dB, indicated by the 2 amber LEDs (3 on front panel drawing). With these 4 levels available it is possible to accommodate virtually all analogue line-level sources. The PEAK indicator (23 in front panel drawing) above the volume control gives a visual indication of when the level has been set correctly. To set the correct input sensitivity:

1. For the appropriate source, select some music with high dynamic and loud passages (Full orchestra on CD, loud radio station, action scene on video, etc.)
2. Select the analogue source for which you wish to adjust the gain (input sensitivity) by pressing either Disc, Tuner, Video or Tape (4,5,6 or 7) and play back the pre-selected loud passage.
3. Check the PEAK LED (23) to see if it illuminates. If it illuminates almost continuously then the level is too high (and sensitivity must be reduced), if it doesn't light up at all then the level is almost certainly too low (sensitivity must be increased). If the PEAK LED lights up

for a fraction of a second every few seconds the level is set correctly.

4. At moderate volume level, press the same source button and keep it pressed down whilst turning the volume control downwards to decrease input sensitivity or upwards to increase sensitivity. Only a slight turn of the volume control is required to change the input gain. The GAIN LEDs (3 on the front panel) give an indication of the input sensitivity level set:



A. Level set at 0dB (High gain) **B.** Level set at -5dB (Normal/high gain) **C.** Level set at -10dB (Normal/low gain) **D.** Level set at -15dB (Low gain)

5. Once the correct level is set (refer to No. 3 of this section) release the input select button. The setting will be retained for each of the 4 individual inputs even if the unit has been switched off for some time.

NOTE: The Model 118 factory default setting is at -15dB for all analogue inputs.

NOTE: Although both Tape Checks (8 & 13) are analogue inputs, gain cannot be adjusted for these. Gain for these inputs corresponds with 0dB Gain setting for the other analogue inputs

SYSTEM SENSITIVITY SWITCH (16)

Each HiFi system is different; the power amplifier can have more than usual gain (power amp needs little signal to be able to deliver full power) or the loudspeakers can be of a high efficiency type (the loudspeakers need relatively little power to produce high volume levels). In such circumstances it is possible to decrease the Model 118's output signal. To set the switch to the correct position:

1. Select a piece of music with many loud passages.
2. Turn down the volume and switch on the High Gain (21 on the front panel).
3. Select the "Normal" position of the System Sensitivity switch (16 on the back panel).
4. Select the appropriate input and play back the pre-selected music.
5. Turn up the volume so that the music plays at maximum sustainable level without signs of stress from the power amplifier or loudspeakers.
6. If maximum sustainable loudness is obtained with the volume control before the 11 o'clock position, press the System Sensitivity switch (16 on the back panel) to engage the "High" position (switch protrudes more). Turn the volume down to a normal level before pressing the System Sensitivity switch.

Some power amplifiers and active loudspeakers are fitted with "input gain", "sensitivity" or "volume" controls. In such a case select the "Normal" position for the System Sensitivity switch and adjust the controls on the power amplifier or active loudspeakers accordingly.

If you find that during normal playback the volume control consistently has to be set at the 12 o'clock posi-

tion or over with "High Gain" (21) switched on, it is recommended that the System Sensitivity switch is set to the "Normal" position.

NOTE: If there are significant differences in loudness levels between the digital sources and some or all of the analogue sources then it is likely that the Input Gain sensitivity for those analogue inputs hasn't been set correctly. Before choosing the final position of the System Sensitivity switch make sure all Input Gain levels for all analogue sources have been set correctly. Refer to section "Input Gain" of this chapter for more information.

NOTE: The System Sensitivity switch works only on the analogue pre-amplifier output. The switch doesn't have any effect on the pre-amp digital output (2 on back panel drawing).

4. OPERATION INSTRUCTIONS

The numbers refer to the front panel drawing unless stated otherwise.

POWER ON / OFF (2)

Press the Power button (2) to turn on the pre-amplifier. The status (Power) LED (1) glows green when the power is on and the pre-amplifier is ready for use. Press the Power button again to switch the pre-amplifier off.

By pressing the Power button on the remote control (1 the on remote control drawing) the pre-amplifier can be switched to "stand-by". In this state the majority of the pre-amplifier's circuits are powered down and power consumption is minimal, the Status LED (1) turns from green to red to indicate stand-by status.

Only a small section remains active, allowing the pre-amplifier to respond to the remote control; by pressing any button on the remote control or any button on the front panel (apart from the Power button (2) or High Gain (21), the pre-amplifier will power up and is ready for normal operation once the Status LED (1) has turned from red to green. From the stand-by mode the pre-amplifier will revert to the last selected input, DSP function and setting when powered up from the front panel or by the Power button on the remote control (1 on remote control drawing).

NOTE: When using the power On with the Power button (2) the pre-amplifier will always select the Digital Disc input and the tone control DSP mode with DSP switched Off, regardless of settings when it was switched off.

INPUT SELECTOR (4 to 13)

The NAD Model 118 has 8 inputs in total. On both the remote control and the front panel the top row of the input selector are for analogue sources, the bottom row is for digital sources.

Select the desired input by pressing the appropriate button on either the remote control or front panel. The LED in the button on the front panel will light up. In the case where a digital input has been selected, the LED will flash until it "locks in" on the digital source. If no source is connected to the selected digital input or it has been switched off, the LED will continue to flash.

NOTE: If the LED for a digital source continues to

flash whilst the source is connected and playing it may be that there is a cable mis-match. For digital sources use interconnects with the correct impedance (75).

NOTE: Some CD players mute the digital signal if the player is in stop mode which causes the LED in the input button of the pre-amp to flash until the CD players starts playing back a CD.

NOTE: Switch off either one of the tape check modes (8 & 13) in case these are engaged (the amber LED in the Tape Check button is lit when switched on). For more information also refer to the section below "Tape Check 1 & 2".

TAPE CHECK 1 & TAPE CHECK 2 (8 & 13)

During recording it can be desirable to be able to monitor the signal coming back from the recorder, particularly with analogue 3-head recorders and a few digital recorders whereby it is possible to listen to the recorded music itself whilst making the recording. For this purpose the NAD Model 118 is equipped with two Tape Check inputs.

Both Tape Check inputs are looped in the few analogue circuits of the NAD Model 118 and can be engaged at any time during recording or for play-back only. Both Tape Check buttons are switched on by pressing either button once; the amber LED in the button lights up. To switch Tape Check off, press Tape Check again.

The Tape Check 1 button (8) of the input selector will monitor the signal from a recorder connected to the analogue Tape input (7; 11 on the back panel).

The Tape Check button 2 (13) of the input selector will monitor the (analogue) signal from a digital recorder connected to the "Analogue from DAC" input (12 on the back panel). Besides the digital input and output the analogue output of the digital recorder has to be connected as well. Refer also to Chapter 2, section "Analogue source inputs and recording outputs".

NOTE: As both Tape Check inputs operate entirely in the analogue domain, the DSP functions, including balance control, the Mono and Absolute Phase buttons do not function on either one of the Tape Checks. The DSP functions can be heard through either one of the tape checks only during recording, provided "Process to tape" (14) and "DSP In" (15) have been selected, but changes made using the DSP functions will affect the recording.

NOTE: Tape Check 1 and Tape Check 2 work entirely in the few analogue circuits of the Model 118 only. When using the Model 118 with an external DAC the Tape Check buttons do not function, the amber LEDs will light up when either Tape Check button is pressed however.

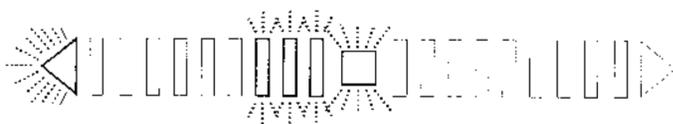
VOLUME CONTROL

To increase volume turn the volume control (22) clockwise; to decrease volume turn the control counter clockwise.

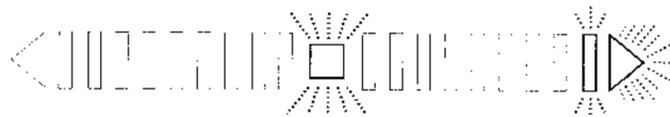
It is also possible to change volume with the remote control. To increase the volume by remote press volume Up; to decrease volume press Volume Down (section 12 of remote control drawing).

The bar in the display area (26) lights up to show the setting of the volume control. As the volume is

decreased the illuminated LED shifts to the left; as the volume is increased the illuminated LED shifts to the right; see examples below.:



Volume being lowered by remote control; indicated volume setting corresponds to approximately to 10 o'clock on volume control knob.



Volume being raised by remote control; indicated volume setting corresponds to approximately to 2 o'clock on volume control knob.

Once volume has been changed with the remote control, the position of the volume control knob (22) and the DSP function setting knobs (17, 18 and 19) do not necessarily bear any resemblance to the actual volume and DSP settings. By touching either the Volume Up or Down button on the remote control for an instance the display will be activated for one second showing the volume control setting.

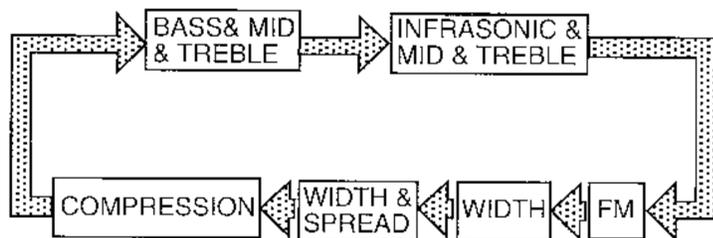
As soon as any one of the buttons or controls on the front panel are used (apart from High Gain) the volume setting and all settings for any of the DSP modes will default to the actual position of the controls of the front panel.

Alternatively, instead of touching any of the controls on the front panel, press the Front Panel button on the remote control (2 on remote control drawing) to go back to the front panel default setting.

DSP FUNCTIONS

The NAD Model 118 has several special Digital Signal Processing (DSP) functions which will allow you to change and enhance the overall sound quality. To engage DSP:

1. Select desired source.
- 2a. Select the desired DSP function on the front panel by pressing the Function button (16). This button scrolls through the various DSP functions:



The LEDs in the display area (26) indicate which function is engaged and which of the three controls (17, 18 or 19) can be used to change the settings of that particular DSP function.

2b. The desired DSP function can be accessed direct with the remote control by pressing the desired function button (from section 3 on remote control drawing). The LEDs in the display area (26) indicate which function is engaged and which buttons (section 11 on remote control drawing) can be used to change the settings of that function.

3. Press DSP IN/OUT (15) on the front panel or IN/OUT on the remote control (10 on remote control drawing); the LED in the button on the front panel will light up.

4a. The settings for the chosen DSP function can be altered on the front panel by using the control(s) (17, 18 or 19) which are directly underneath the LEDs which indicate which function was engaged.

4b. The settings for the chosen DSP function can be altered on the remote control by using the Bass, Mid, Treble up and down buttons (section 11 on remote control drawing). The Up/Down Bass buttons correspond with control 17 on the front panel; the Up/Down Mid buttons correspond with control 18 on the front panel; the Up/Down Treble buttons correspond with control 19 on the front panel.

The LED bar in the display area (26) works in a very similar fashion for the DSP functions as it does for the volume control (refer also to the section "Volume Control" in this chapter. Once a setting has been changed with the remote control, the position of the DSP function setting knobs (17, 18 and 19) and volume control knob (22) do not necessarily bear any resemblance to the actual DSP and volume setting. By touching the corresponding Up or Down button on the remote control for an instance the display will be activated for one second showing the DSP setting.

As soon as any one of the buttons or controls on the front panel is used (apart from High Gain) all settings for any of the DSP modes and the setting for the volume control will default to the actual position of the controls of the front panel.

Alternatively, instead of touching any of the controls on the front panel press the Front Panel button on the remote control (2 on remote control drawing) to go back to the front panel default setting.

NOTE: it is also possible to change DSP mode with DSP switched on (LED in DSP In button 15 is lit). However, as the DSP processor is active it takes about one second to switch to the next DSP mode when using the DSP Function button (16).

The following DSP functions are available:

- **Bass, Mid & Treble Tone controls:**

With this DSP function you can change the tonal balance of the music.

1. Select the Bass & Mid & Treble DSP function (16, button Tone on remote control, section 3 on remote control drawing).
2. Switch on DSP (15; button IN/OUT on remote control, 10 on remote control drawing).
3. BASS: Rotate control 17 on the front panel clockwise or the press the BASS + button on the remote control (section 11 on remote control drawing) to increase the relative level of low-frequencies in the sound. Rotate control 17 on the front panel counter clockwise or the press the BASS - button on the remote control (section 11 on remote control drawing) to decrease the relative level of low-frequencies in the sound. Changing the BASS control has a significant effect on contra-bass, kettle drums, bass guitar, etc.
4. MID: Rotate control 18 on the front panel clockwise or the press the MID + button on the remote con-

control (section 11 on remote control drawing) to increase the relative level of mid-frequencies in the sound. Rotate control 18 on the front panel counter clockwise or the press the MID - button on the remote control (section 11 on remote control drawing) to decrease the relative level of mid-frequencies in the sound. Changing the mid control has a significant effect on vocals, trumpets, violins, etc.

5. **TREBLE:** Rotate control 19 on the front panel clockwise or the press the TREBLE + button on the remote control (section 11 on remote control drawing) to increase the relative level of high-frequencies in the sound. Rotate control 19 on the front panel counter clockwise or the press the TREBLE - button on the remote control (section 11 on remote control drawing) to decrease the relative level of high-frequencies in the sound. Changing the TREBLE setting has a significant effect on cymbals, hi-hats and other percussion instruments.

• **Infrasonic, Mid & Treble tone controls.**

This DSP function works and operates in the same manner to the DSP function described above but BASS has been replaced by a non-adjustable Infrasonic filter.

The infrasonic filter removes very low frequencies which can sometimes have a disturbing effect on the overall music quality. These low frequencies, which often do not have any relation to the music itself, can emanate from a turntable or recordings made from it and sometimes even CD players. If these extremely low frequencies aren't filtered out they can put a significant strain on power amplifiers and loudspeakers. It is relatively easy to check if any of your program material contains unwanted infrasonic sounds:

1. Remove the grilles from the loudspeakers (check the owner's manual of the loudspeakers first for the correct procedure; note that not all loudspeakers have removable grills).

2. Select the Infrasonic & Mid & Treble DSP function (16; button Infra & tone on remote control, section 3 on remote control drawing), but do not switch DSP in yet.

3. Whilst playing music at a normal, realistic listening level observe the loudspeaker cones.

4. Without changing volume, switch DSP in (15; button IN/OUT on front panel, 10 on remote control drawing). If there is a significant reduction in loudspeaker cone movement then it is likely that that particular piece of music does contain unwanted low-frequency energy, in which case it is recommended you leave Infrasonic switched on.

• **FM**

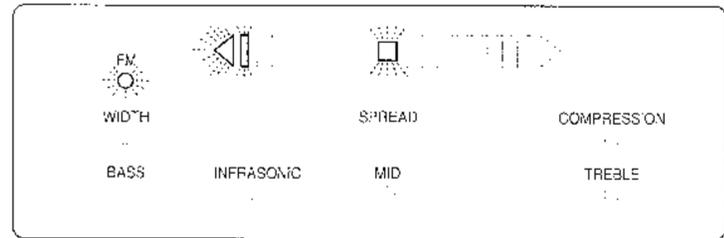
Often stereo FM radio reception is hampered by high levels of background hiss, caused by poor reception or the radio transmitter being too far away for clear reception. Under such circumstances switch the tuner to Mono. The noise will decrease significantly.

The FM DSP function allows you to reduce this hiss whilst maintaining a level of stereo or even create a simulated stereo depending on the level chosen.

1. Select the FM DSP function (16; button FM on remote control, section 3 on remote control drawing).

2. Switch on DSP (15; button IN/OUT on front panel, 10 on remote control drawing).

3. Rotate the control (17) fully counter clockwise, or if you are using the remote control, press BASS Down (section 11 on remote control drawing) until the LED bar in the display area (26) indicates minimum level, as in the drawing below.



4. Turn up control (17) or press the BASS + button on the remote control until the hiss has been reduced to an acceptable level. What in fact happens is that from full stereo (and maximum of hiss) the stereo separation is reduced more (and thus the hiss) as the setting is moved towards the maximum position. As stereo separation is reduced the FM DSP function generates spaciousness by using stereo simulation. At the maximum position the source itself is fully mono (no channel separation) but spaciousness and spread has been regained thanks to the stereo simulation.

NOTE: The FM DSP function works on all inputs which can be useful, e.g. to play back a recording of a broadcast containing a lot of hiss.

NOTE: For the Stereo simulation to work properly it is important that the perceived volume level from each speaker is identical.

• **Width**

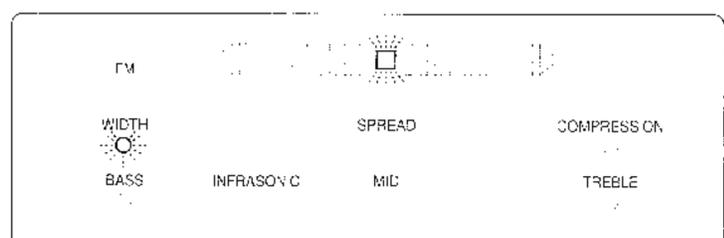
Many recordings, although stereo, can still sound restricted in terms of perceived imaging and soundstage, or the correct stereo effect cannot be enjoyed to the full because of physical restrictions in loudspeaker positioning (too close together).

Alternatively, on some recordings - particularly older ones - the Left / Right separation for stereo can be too severe, making for a very artificial overall sound. Using the stereo information available on the recording, the Width DSP function can make the stereo image wider or narrower.

1. Select the Width DSP function (16; button Width on remote control, section 3 on remote control drawing).

2. Switch on DSP (15; button IN/OUT on front panel, 10 on remote control drawing).

3. Start from the neutral setting (original stereo sound, no widening or narrowing) at the 12 o'clock position for the front panel control knob (17). When using the remote control, press the BASS + or - buttons (section 11 on remote control drawing) to adjust to the neutral position, indicated by the LED bar (only the square centre LED should light up) in the display panel (26):



4a. Turn control knob (17) clockwise or press the BASS + button on the remote control to widen the stereo image to the desired level.

4b. Turn control knob (17) counter clockwise or press the BASS - button on the remote control to make the stereo image narrower to the desired level. By adjusting the setting to minimum, width has effectively been reduced to full mono.

NOTE: The Width DSP function uses the stereo information embedded in the music to calculate the wider stereo image. If the music source is fully mono then the Width DSP function doesn't have any effect.

• **Width & Spread**

The Width & DSP Spread function is identical to the Width DSP feature as described but in this DSP function the possibility of Spread has been added.

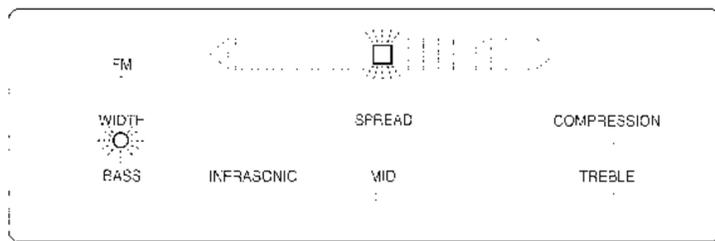
The Spread DSP function can make pure mono recordings sound more spacious by stereo simulation. In the past there have been attempts at stereo simulation but very often with questionable results. This Stereo Simulation program is subtle in the way it works but it does help to eradicate the "keyhole" effect (fixed, phantom image between the loudspeakers) when listening to a mono source over two loudspeakers.

When using stereo program material the additional spacious effect of the Spread DSP function can be used simultaneously with the Width DSP function (making a stereo image wider or narrower).

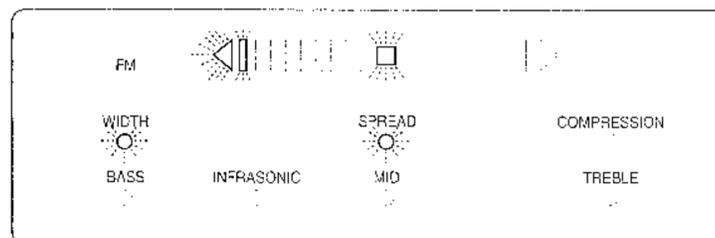
1. Select the Width & Spread DSP function (16; button Width & Spread on remote control, section 3 on remote control drawing).

2. Switch on DSP (15; button IN/OUT on front panel, 10 on remote control drawing).

3. Start from the neutral setting for Width (original stereo sound, no widening or narrowing) at the 12 o'clock position for the front panel control knob (17). When using the remote control, press the BASS + or - buttons (section 11 on remote control drawing) to adjust to the neutral position, indicated by the LED bar (only the square centre LED lights up) in the display panel (26):



4. Start from the neutral setting for Spread (original source's stereo or mono sound, no spread added) at the 7 o'clock position for the front panel control knob (17). When using the remote control, press the MID - button (section 11 on remote control drawing) to adjust to the neutral position, indicated by the LED bar in the display panel (26):



4a. Turn control knob for Width (17) clockwise or press the BASS + button on the remote control to widen the stereo image to the desired level.

4b. Turn control knob for Width (17) counter clockwise or press the BASS - button on the remote control to make the stereo image narrower to the desired level. By adjusting it to the maximum, width has effectively been reduced to full mono.

5. Turn control knob for Spread (18) clockwise or press the MID + button on the remote control to add the desired level of Simulated Stereo.

NOTE: The Width DSP function uses the stereo information embedded in the music to calculate the wider stereo image. If the music source is fully mono then the Width DSP function doesn't have any effect. The Spread DSP function will work with both mono and stereo program material, however.

• **Compression**

Although this particular DSP function is referred to as compression only, it can actually expand as well. In many cases high dynamics in music (large differences in volume level between the soft and loud passages) can cause difficulty in situations whereby one can't play very loud recordings or broadcasts, or doesn't wish to play loud, e.g. for background music. In such instances the loud passages become too loud if the soft passages are right, or the soft passages become too soft if the volume level for the loud passages is right.

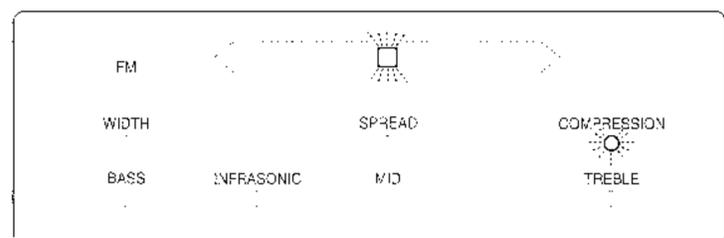
The Compression DSP function will raise the relative volume level of the soft passages without changing the volume for the very loudest passages. This way the differences in volume between soft and loud passages have become much smaller, making the music much more enjoyable at low volume levels.

Compression is also particularly useful for making recordings which will be played back in environments with lots of ambient noise (e.g. tapes for personal stereo or car stereo); as soft passages are difficult to hear because of the surrounding noise. To use the Compression DSP function:

1. Select the Compression DSP function (16; button "Comp" on remote control, section 3 on remote control drawing).

2. Switch on DSP (15; button IN/OUT on front panel, 10 on remote control drawing).

3. Start from the neutral setting for compression (original sound, no compression or expansion) at the 12 o'clock position for the front panel control knob (19). When using the remote control, press the Treble + or - buttons (section 11 on remote control drawing) to adjust to the neutral position, indicated by the LED bar (only the square centre LED lights up) in the display panel (26):



4. Turn control knob for compression (19) clockwise or press the TREBLE + button on the remote control to set the desired level of compression. Set the compres-

sion level so that you can hear both the soft and loud passages of the music at the desired volume level. Note that by increasing the level of compression the volume level for the soft passages will increase as well. If necessary, re-adjust the volume level in between setting the compression level.

Expansion is the reversed process of compression; the relative volume level for the soft passages will be lowered without changing the volume level for the loud passages; making the differences in loudness between the soft and loud passages bigger.

Some sound sources are already compressed, many radio stations tend to compress music making it easier for clear reception and transmission. The procedure to engage expansion is identical with Compression but instead of turning the control knob clockwise from the neutral position turn it counter clockwise, use the TREBLE - button on the remote control instead of the TREBLE +.

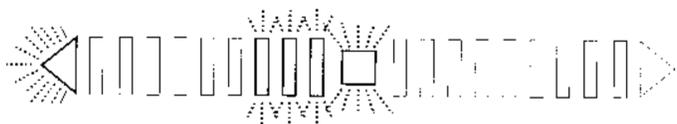
NOTE: If the music source contains a significant amount of hiss (old analogue recordings), then the compression circuit will raise the level of hiss as well as the soft passages. What you are hearing is the actual noise from the source itself, not from the circuitry which operates virtually noiselessly.

OTHER FEATURES.

BALANCE (20)

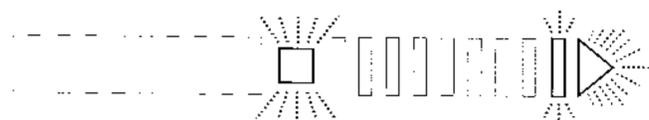
Recordings often contain small errors in channel balance, sometimes enough to degrade stereo imaging. Small compensating changes in the setting of the balance control can significantly improve the depth and stability of the stereo image.

The Balance control (20) or the Balance ◀ and Balance ▶ buttons on the remote control (section 4 on remote control drawing) adjust the relative levels of the left and right channels. It has no effect on recordings being made. Rotation of the Balance control to the right (clockwise) or pressing the Balance ▶ button gradually decreases the level of the left speaker until only the right speaker can be heard; when adjusting with the remote control to the right speaker only, the LEDs in the display area will light up like this:



Rotation of the Balance control to the left (counter clockwise) or pressing the Balance ◀ button gradually decreases the level of the right channel until only the left channel can be heard.

Rotation to the right shifts the sonic image to the right speaker (volume of the left speaker is gradually reduced). When adjusting with the remote control to the left speaker only, the LEDs in the display area will light up like this:



HIGH GAIN (21)

The High Gain switch raises the volume level by 10dB when engaged. When playing at low or moderate volume levels it is best to leave High Gain switched off, giving you a larger range of control.

Engage High Gain if you wish to play at higher volume levels. Provided the input gain for all analogue inputs has been set correctly (refer to chapter Set-up and Initialisation; section Input Gain for more information) the Peak indicator (23) will give an indication if High Gain needs to be engaged. If the Peak indicator (23) frequently lights up it indicates that the DAC may be overloaded which can potentially cause audible distortion. In such cases engage the High Gain function.

NOTE: The High Gain button only works in the analogue domain. If only the digital pre-amp output is used (2 on back panel drawing) then the High Gain button will have no effect.

MONO (24)

It can be useful sometimes to be able to switch from Stereo to Mono, e.g. when trying to find the right position for the loudspeakers; if the source is fed through only the Left or Right channel, etc.

To switch from Stereo to Mono, press the Mono button (24; 9 on the remote control drawing) to engage; the LED in the front panel button will light up. Press button again to switch back to normal stereo operation.

NOTE: By turning control (17) fully counter clockwise or using the remote control BASS - button (section 11 in remote control drawing) so that only the far left LED in the display panel (26) is lit with the Width DSP function engaged, the sound will also be fully mono. Refer to section Width of this chapter for more information.

NOTE: Unless Process to Tape (14) has been selected, the Mono button will not affect the recording. Switch Process to Tape on (LED in the button is lit) if you wish to record in mono.

POLARITY (25)

With the Polarity switch (25; 8 on the remote control drawing) you can reverse the polarity of the audio signal (the LED lights up in the button on the front panel). Reversing polarity (or absolute phase, as it is also known) causes a positive signal to be negative and vice versa.

Changing the polarity of a signal can improve the sound quality, as there isn't much consistency for polarity within the recording industry. The improvement (or deterioration, if the polarity was correct in the first place) can be very subtle; the effect depends on the original recording, the listening environment and the loudspeakers, sometimes no effect is noticeable at all. The correct position of the switch can be established by listening. For more information refer to chapter "Glossary". **NOTE:** The polarity switch operates both analogue and digital pre-amp outputs and on the analogue and digital recording outputs.

MAKING RECORDINGS; PROCESS TO TAPE (14)

Two types of recorder can be connected; analogue (compact cassette; reel to reel) and digital (DAT, MD, DCC). Most digital recorders also have analogue in-

and outputs, however it is recommended to use the digital in- and outputs whenever possible. Refer to chapter "Installation" on how to connect recorders.

The signal of the source selected is always available on both analogue recording outputs (13 & 14 on back panel drawing) and the digital recording output (3 on back panel drawing). The Volume (22) and Balance (20) control do not affect the recording.

Apart from making straight copies of the original source, the NAD Model 118 pre-amplifier also allows you to use any one of the DSP functions, mono and polarity reversal facilities for recording. This way you can e.g. adjust the tonal balance of the original source, reduce the dynamic range by using the Compression function if the recording will be played in noisy environments (car, portable cassette player), etc.

For an analogue recorder you have the choice of two recording outputs; Record Direct (13 on back panel drawing) and Record Process (14 on back panel drawing). Depending on which output you choose to connect your recorder to, it is possible to record changes made from all sources using a DSP mode, the Mono and/or Polarity facility.

RECORD DIRECT OUTPUT (13 on back panel drawing)

The Record Direct output jacks (13 on the back panel drawing) carry the signal from the selected analogue source without any alterations; the signal goes straight from the selected analogue input to this output. The output level of Record Direct is identical to that of the input; the selected Gain setting for the selected analogue input does not affect the output level. Recording changes made using the DSP functions are therefore not possible with analogue sources using the Record Direct output jacks. When copying from digital sources it is possible to record changes made using the DSP functions, Mono and Polarity facilities.

RECORD PROCESS OUTPUT (14 on back panel drawing)

The Record Process output jacks (14 on back panel drawing) will enable you to use and record changes made with DSP functions from both analogue and digital sources. As the analogue signals are always routed through the ADC and DAC, the Gain setting for the selected analogue input will affect the recording level.

NOTE: The analogue recording outputs "Record Direct" and "Record Process" can be used simultaneously.

MAKING RECORDINGS WITH AN ANALOGUE RECORDER

1. Select the source you want to record from.
2. Select the desired DSP mode, Polarity and Mono.
3. Switch DSP In (15); the LED in the button lights up.
4. Adjust the appropriate controls to obtain the desired settings.
5. Switch on Process to Tape (14); the LED in the button lights up.
6. Set the recording level controls on the recorder and start recording. During recording, do not alter the

DSP function settings as this will affect the recording.

You can monitor the signal from the recorder by switching on Tape Check 1 (8); this does not affect the recording.

MAKING RECORDINGS WITH A DIGITAL RECORDER

1. Select the source you want to record from.
2. Select the desired DSP mode, Polarity and Mono.
3. Switch DSP In (15); the LED in the button lights up.
4. Adjust the appropriate controls to obtain the desired settings.
5. Switch on Process to Tape (14); the LED in the button lights up.
6. Set digital recorder in Record mode and start recording.

If you want to make a straight copy without making any alterations, skip step 2 to 5. Check also that the Polarity button (25) is switched off in that case.

NOTE: With most digital recorders, the recording level cannot be altered when using a digital input on the recorder during recording. If the recording level as displayed on the digital recorder is either too low or too high, than the Gain for the analogue tape input has been set incorrectly. Set Gain to the correct level. Refer to Chapter "Set-up and Initialisation", section "Gain" for more information.

NOTE: The pre-amplifier's ADC has been factory pre-set to operate at a sampling frequency of 48kHz which is also commonly used for most DAT recorders. For digital recorders which operate at a different sampling frequency it is possible to change the ADC's sampling frequency from 48kHz to 44.1kHz. Refer to the chapter "Advanced Operation Instructions" section "Changing Sampling Frequency ADC" and your digital recorder's Instruction Manual should you encounter difficulties.

You can monitor the analogue signal from the recorder (if present and connected) by switching on Tape Check 2 (13), this does not affect the recording.

NOTE: Tape Check 1 & 2 only operate on the analogue pre-amp output only.

NOTE: The polarity switch always operates on both analogue and digital recording outputs, independent of either Process to Tape and/or DSP In having been selected. The Mono facility is available for recording only if Process to Tape has been selected.

NOTE: Both Process to Tape (14) and DSP In (15) have to be switched on to record the selected DSP function.

NOTE: Do not select the Digital Tape input (12) and set the digital recorder in Record mode at the same time.

MAKING COPIES FROM AN ANALOGUE RECORDER TO A DIGITAL RECORDER:

In principle, the procedure is the same as making a recording from any other source:

1. Select the Analogue Tape input (7).
2. Select the desired DSP mode, Polarity and Mono.
3. Switch DSP In (15); the LED in the button lights up.

4. Adjust the appropriate controls to obtain the desired settings.

5. Switch on Process to Tape (14); the LED in the button lights up.

6. Set digital recorder in Record mode and start recording.

NOTE: If you want to make a straight copy without making any alterations, skip step 2 to 5. Check also that the Polarity button (25) is switched off in that case.

MAKING COPIES FROM A DIGITAL TO AN ANALOGUE RECORDER:

Again, in principle the procedure is the same as making a recording from any other source:

1. Select the Digital Tape input (12).

2. Select the desired DSP mode, Polarity and Mono.

3. Switch DSP In (15); the LED in the button lights up.

4. Adjust the appropriate controls to obtain the desired settings.

5. Switch on Process to Tape (14); the LED in the button lights up.

6. Set the recording level controls on the analogue recorder and start recording. During recording, do not alter the DSP function settings as this will affect the recording.

NOTE: If you want to make a straight copy without making any alterations, skip step 2 to 5. Check also that the Polarity button (25) is switched off in that case.

5. REMOTE CONTROL

Apart from providing access to almost all features and functions found on the front panel, the remote control handset offers a few extra useful functions. The functions which can be found both on the front panel and the remote control handset have already been explained in the various sections above. This section concentrates only on the additional features. The numbers refer to the Remote Control drawing (figure 3) unless stated otherwise.

INSERTING BATTERIES

1. On the back of the remote control handset, open the battery compartment by inserting a fingernail in the indent, press on the lip of the battery compartment and lift at the same time.

2. Insert two long-life AA, R6P, R6 or LR6 sized batteries into the compartment with the polarity for each battery aligned as indicated in the compartment; press the minus (-) end of the battery firmly against the spring, then lower the battery inside the compartment.

3. Replace lid.

FRONT PANEL (2)

By using the remote control to change any of the settings for the DSP (Labeled Bass; Mid; Treble), volume and balance functions, the position of the corresponding controls on the front panel will bear no relation to the actual setting chosen. The actual setting of a function is displayed by the LED bar in the display (26 on the front panel drawing) as the remote control is used to change that function.

Press Front Panel button (2) to re-set all settings to match the position of the corresponding controls on the front panel. Alternatively, touching one of the controls or buttons on the front panel (apart from the High Gain button; 21 on the front panel drawing) will also cause for all settings to default to the front panel control settings.

CLEAR (7)

With the Clear (7) button it is possible to reset Balance to centre position and all settings for a DSP function to "neutral", disregarding the setting of the DSP function on the front panel, remote control or selected Memory Bank. To re-set all settings to neutral, press Clear (7).

NOTE: The Clear function does not operate if the last control used is Front Panel (2). Touch any of the + or - controls (11 & 12) for an instant before using Clear.

MEMORY BANKS: STORE (5) & MEMORY (6)

The NAD Model 118 pre-amp has an elaborate memory which will allow you to store your preferred balance and DSP settings. The NAD Model 118's Memory Banks are non-volatile; even if the unit has been unplugged from the mains for some time the pre-programmed Memory Banks settings will be retained. Programming and recalling Memory banks can only be done with the remote control. There are two types of Memory Banks:

MEMORY BANKS FOR EACH INDIVIDUAL INPUT (INPUT MEMORY BANKS)

These allow you to store your preferred settings for any DSP function and balance for each individual input. For instance, for the tape input you might choose to have balance set slightly towards to the left and add a bit of bass and treble; whereas you prefer the tuner input to have balance slightly towards to the right with less treble and midrange. Refer to table overleaf.

MEMORY BANKS FOR THE DSP MODES AND BALANCE (DSP MEMORY BANKS)

These allow you to store your preferred settings for each DSP mode and balance, regardless of the selected input. For instance, you might want to use the Width & Spread DSP function with the same setting for any selected input. Refer to table below.

TO PROGRAM A MEMORY BANK

Using the table above you can see which Memory Banks can be programmed and which buttons on the remote control have to be used for programming. Programming can be done from the remote control only using the Store (5), Memory (6) and any of the eight Digital and Analogue input select (13) buttons.

1. Select the desired input for which you want a setting to be memorised (only if you want to program an Input Memory Bank).

2. Select the desired DSP function and adjust the settings using the remote control (not the front panel controls) to the setting to be memorised. Do the same for the Balance control setting.

3. Press Store (5), release and, using the table above, choose and press the other appropriate button

for the desired Memory Bank, The Memory Bank for that particular input or DSP function has now been programmed.

4. Repeat procedure to program other Input and DSP Memory banks.

NOTE: A previously programmed Memory Bank setting will be replaced when re-programming.

TO CALL UP A DSP MEMORY BANK:

1. Select the desired DSP function.
2. Press Memory (6). The pre-amp will change all settings for that DSP function to the pre-programmed settings.
3. Press Clear (7) to re-set all settings to the "neutral" setting or Front Panel (2) to re-set all settings to match the position of the corresponding controls on the front panel. Refer also to the sections "Clear" and "Front Panel".

NOTE: When changing to a different DSP setting after having called up a DSP Memory Bank, the pre-amp will also engage the programmed DSP Memory Bank for the newly selected DSP function.

TO CALL UP AN INPUT MEMORY BANK:

1. Select the desired input.
2. Select the desired DSP function.
3. Press Memory (6). The pre-amp will change first to the settings for that DSP Memory Bank (see above). Release Memory and press the selected input button once again. The pre-programmed Input Memory Bank for the selected input has now been re-called.
4. Press Clear (7) to re-set all settings to the "neutral" setting or Front Panel (2) to re-set all settings to match the position of the corresponding controls on the front panel. If Clear has been pressed it is possible to re-call the Memory Bank by pressing the selected input button once again. Refer also to the sections "Clear" and "Front Panel".

NOTE: When changing to a different input after having called up a Memory Bank the pre-amp will also engage the Memory Bank for the newly selected input.

6. ADVANCED OPERATION INSTRUCTIONS

This section assumes a considerable understanding of digital and analogue sound processing and recording. Unless you fully understand the functions and their backgrounds it is recommended not to change any of the factory default settings as this can affect performance and usability of the pre-amp significantly.

DITHER & DIGITAL RECORD OUTPUT SIGNAL

The NAD Model 118 automatically dithers the digital signal for both the Digital Record and Digital Pre-amp Output (3 and 2 on the back panel drawing respectively) from the ADC to 18 bit level (the ADC's resolution).

When Process to Tape (14 on the front panel) is not selected then a digital signal fed to the pre-amp is passed straight through to the Digital Record Output. As the analogue ADC is automatically dithered to 18 bit level the Digital Record Output will also be dithered.

By engaging Process to Tape (14 on the front panel) but not engaging DSP the digital signal will be dithered to 16 bit level. This can be desirable when making digital copies with a 16 bit resolution digital recorder to avoid truncating errors. It is also possible to set the default settings so that the digital recording signal will always be dithered to 16 bit, regardless of the source's resolution or of Process to Tape being engaged or not. Refer also to section "Special functions" below.

Factory default setting & special functions

The unit is factory set in the following configuration:

1. ADC sampling frequency 48kHz.
2. Digital pre-out enabled.
3. Volume control enabled.
4. Process to Tape enabled to pass digital signals straight through or to add dither to 16 bit level.
5. All DSP function Memory Bank settings to neutral; Balance to centre position.
6. All analogue input gains to -15dB.

To change the configuration for numbers 1 to 4:

1. Press and hold the Digital Disc input selector button for 2 seconds; all input selector LEDs will start

	INPUT MEMORY BANKS								DSP MEM.B.
	Digital inputs				Analogue inputs				
	Disc	Tuner	Video	Tape	Disc	Tuner	Video	Tape	Any input
Tone*	<i>For all functions:</i>								
FM	Store & D. Disc	Store & D. Tuner	Store & D. Video	Store & D. Tape	Store & A. Disc	Store & A. Tuner	Store & A. Video	Store & A. Tape	Store & Memory
Width & Spread**									
Comp									
Balance									

*: Tone; Infrasonic & Tone use the same Memory Bank.

** : Width; Width & Spread use the same Memory Bank.

flashing. A short flash indicates a function is switched off; a long flash indicates it has been selected.

2. To change the function press the appropriate input; the LED in the button indicates if the function has been selected (long flash) or not (short flash).

See table below for available functions :

3. When the desired configuration has been selected, press any of the buttons on the front panel, apart from the High Gain (21) and the input selector buttons (4 to 12). The pre-amp now resumes normal operation with the new configuration.

Input selector LED	Function;
Digital inputs:	
Disc	On: ADC sampling frequency is 48kHz; off: 44.1kHz.
Tuner	Unassigned
Video	On: Disable Digital Pre-out
Tape	On: Disable volume control; digital gain set to 0dB
Analogue inputs:	
Disc On:	Clear EEPROM; return to factory default settings
Tuner	On: Dithering for dig. record output always switched on regardless of Process to tape button position
Video	Unassigned
Tape	Unassigned

7. GLOSSARY

ABSOLUTE PHASE

See "Polarity"

ADC

Analogue to Digital converter. Refer also to chapter "Introduction"

DAC

Digital to Analogue converter. Refer also to chapter "Introduction"

DSP

Digital Signal Processing

GAIN

Amplification factor; for the Model 118 the input sensitivity (and therefore the amplification factor) for the analogue sources can be changed to prevent overloading of the ADC (signal too loud) or not exploiting the ADC to its full potential (signal too low).

Infrasonic filter Filter to remove the lowest frequencies. Most loudspeakers cannot reproduce these frequencies yet the presence of these frequencies can put a significant strain on both power amplifiers and loudspeakers, in which case it is best filtered out.

PEAK

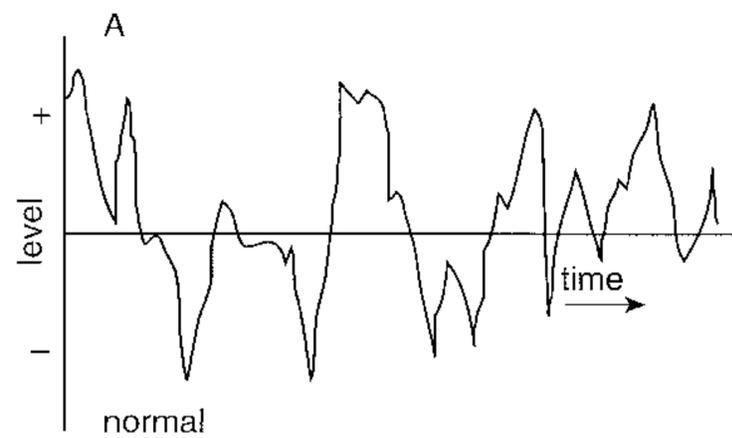
Sudden burst in the signal which can cause distortion if it overloads the ADC and/or DAC, indicated by the Peak LED (23). Setting the input gains, high gain and system sensitivity controls and switches correctly avoids overload.

POLARITY

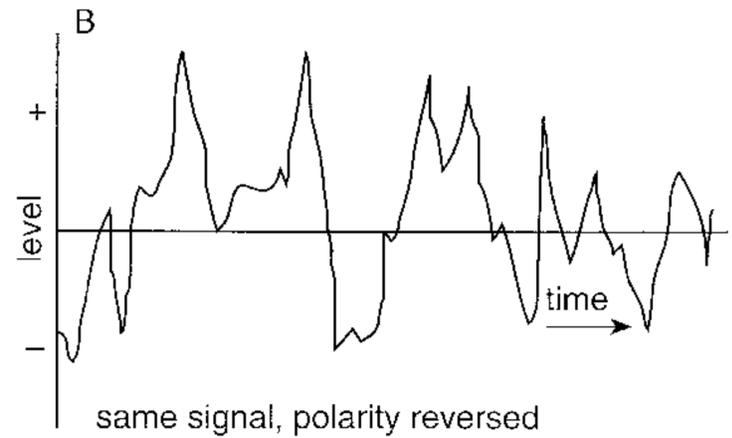
The sound shock wave created by hitting e.g. a drum starts with an increase of the air pressure, (represented normally as a positive electrical signal), then as the sound progresses in time, air pressure will rapidly decrease, represented as a negative signal. All this happens very fast, the slowest audible change (very low frequencies) from positive to negative and vice versa is approximately 40 times per second.

An analogue audio signal will change continuously in value from negative to positive and vice versa, a direct representation of sound. A good loudspeaker will transform this electrical signal exactly as changes in air pressure (sound) by rapidly moving the cone(s) in and out.

Please refer to graphs opposite; the signal in figure B is identical to that of figure A, but with reversed polarity (the length of time of the shown signal is extremely short, a fraction of a second). The peaks and troughs which are on the positive side at figure A are now at the negative side in figure B.



Analogue representation of an audio signal



B. Normal same signal, polarity reversed

SAMPLING FREQUENCY

The frequency with which an ADC or DAC calculates the digital signal. Three different sampling frequencies are commonly used: 32kHz for radio and television broadcasts, 44.1kHz for CD and 48kHz for DAT.

TROUBLE SHOOTING

In the unlikely event you should encounter problems with the operation of the NAD Model 118 preamplifier, the trouble shooting guide can help find the cause and rectify it before consulting your dealer.

SYMPTOM	CAUSE	REMEDY
Unit doesn't work; power LED (1) doesn't light up	Mains plug not connected to live wall socket	Check if mains plug is inserted in live wall socket.
Power LED (1) is lit but no sound.	Wrong input selected	Select input to which source is connected
	Source not connected to input Tape Check 1 or 2 (8 or 13) selected (amber LED in button is lit) without signal present.	Check connection from source to appropriate input Press the Tape Check button in which the LED is lit to dis-engage
	Volume control (22) turned down	Turn Volume control up to appropriate level
	Power amp not turned on	Turn on power amplifier
	Power amp not connected	Connect power amp.
Despite Volume control turned way up only a little bit of sound	Input sensitivity for analogue source has been set too low	Adjust input sensitivity for appropriate analogue source
	High Gain (21) hasn't been engaged	Switch High Gain on
	Power amp and speaker combination too insensitive; Sensitivity switch (16 on back panel) set to "High" position	Set Sensitivity switch to "Normal" position
No sound in one channel (with analogue sources only)	Faulty connection from source to input	Check connection between source and pre-amp
	(All digital and analogue sources) Faulty connection from analogue pre-amp output to power amplifier input	Check connection between pre-amp and power amp
	Faulty connection between power amp and loudspeaker	Check connection between power amp and loudspeaker
No sound with digital source; LED in input button blinks	Balance set to one channel only	Check setting of balance control
	Faulty connection from source to input	Check connection between source and pre-amp.
	Wrong type of cable	Use cable with 75 ohm impedance
Remote control, Buttons and controls have stopped working	The pre-amp has "locked up" due to static electricity.	Switch off pre-amp completely; switch on again after several seconds.
Remote control does not work or intermittently.	Distance from remote control to pre-amp is too large	Operate remote control from closer distance (within 8mtr/ 25ft.)
	Angle of operation to pre-amp is too large	Operate remote control within a narrower angle to the pre-amp (within 90° from front panel)
	Batteries flat	Replace batteries
	Batteries have been inserted the wrong way	Insert batteries correctly
	Line-of-sight from remote control IR. emitter to pre-amp's built-in IR. receiver is blocked	Ensure that the IR. emitter at the front of the remote control has a clear line-of-sight to the IR. receiver (located in the display panel; 26) of the pre-amp
All input selector LEDs are flashing	The pre-amp has inadvertently been set in configuration mode.	DO NOT press any of the input selector buttons, as this may change the configuration. Press any of the other buttons on the front panel (apart from High Gain) to resume normal operation.