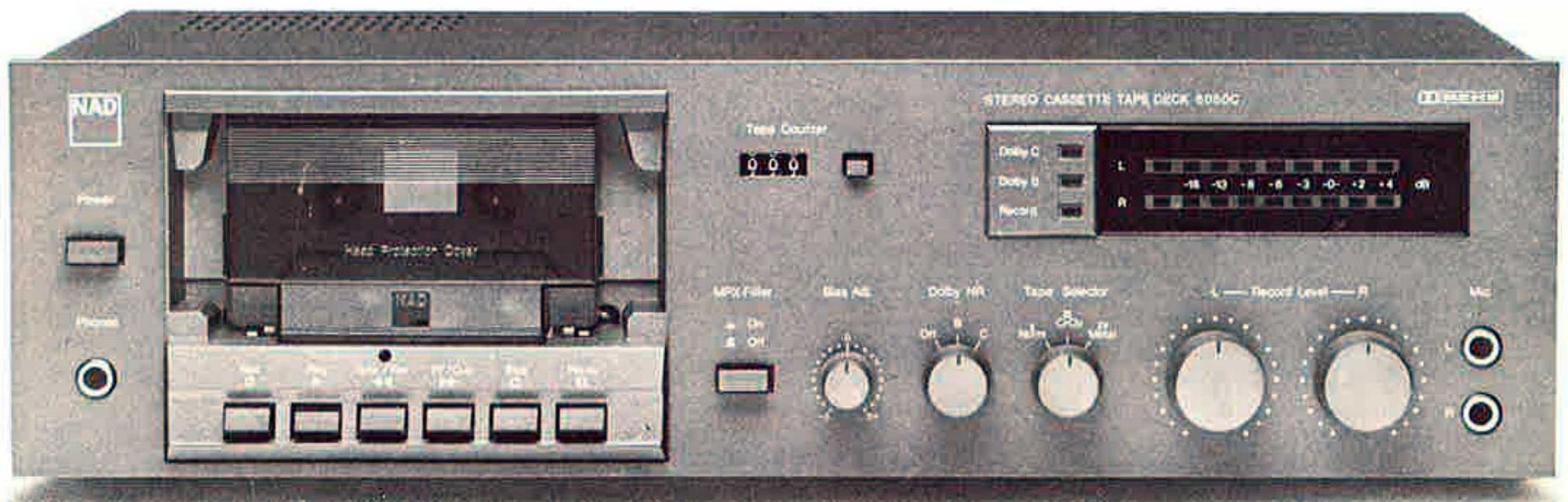
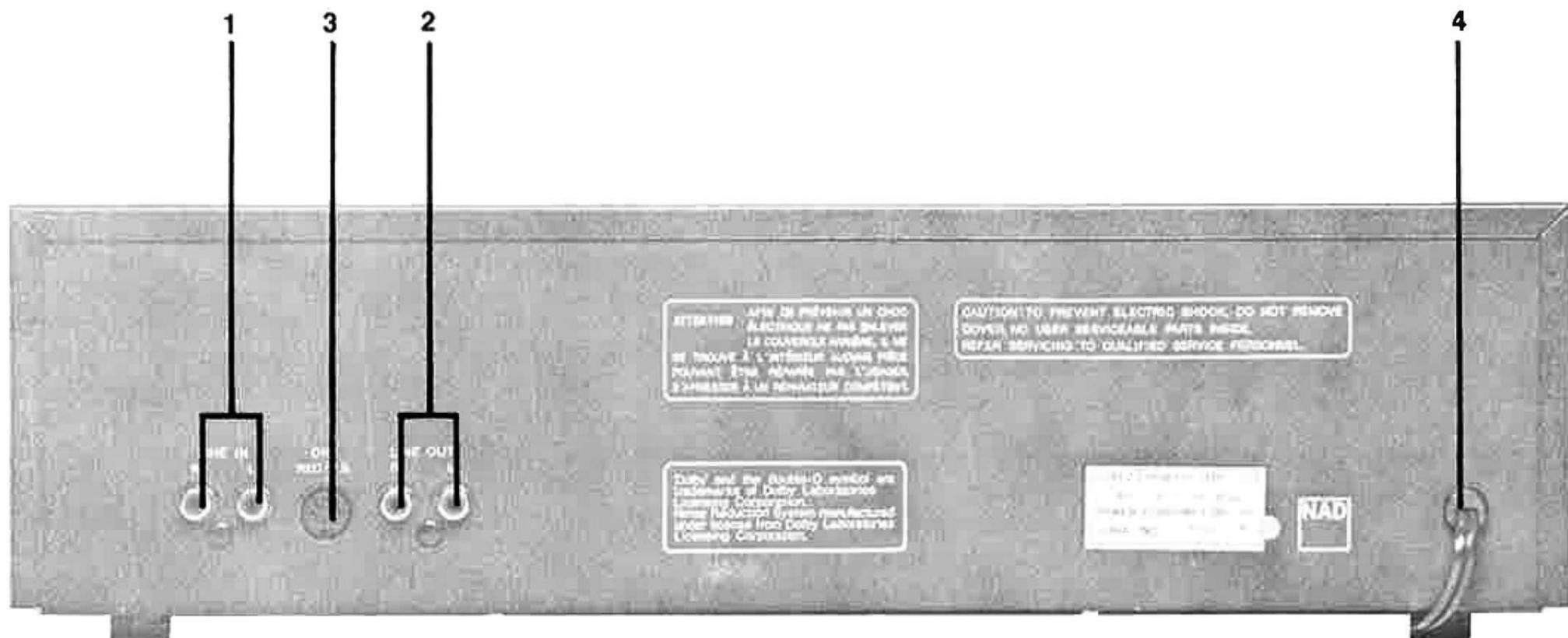


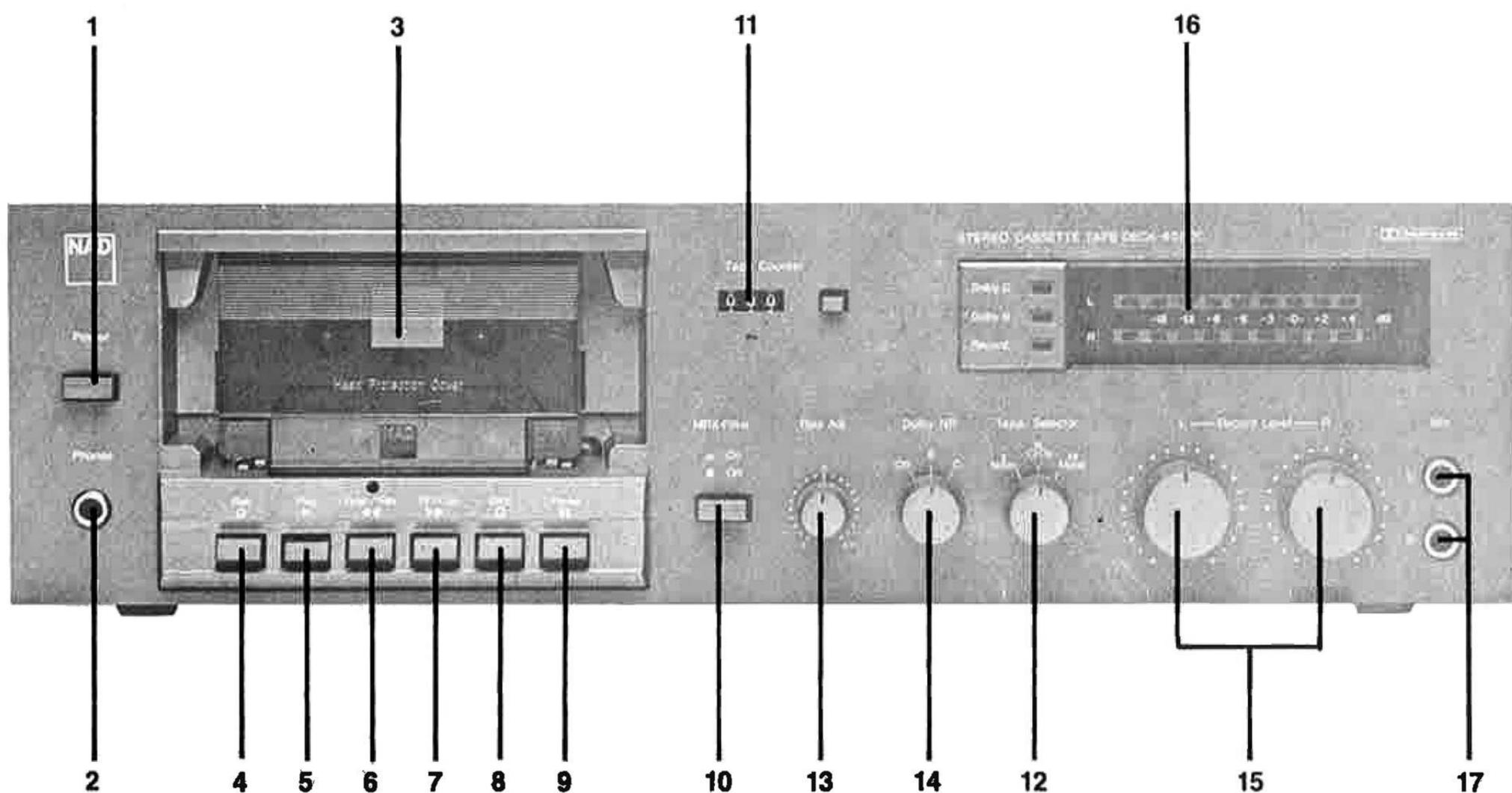
NAD 6050C CASSETTE DECK WITH DOLBY C NOISE REDUCTION INSTRUCTIONS FOR INSTALLATION AND OPERATION



1. Line In
2. Line Out
3. DIN Rec/PB. Connector
4. AC Power Cord



1. Power
2. Phones
3. Cassette Compartment
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5. Play
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INTRODUCTION

Congratulations on your purchase of the NAD 6050C stereo cassette deck. This recorder employs a precision-engineered transport, the latest ICs, low-distortion circuitry, and a Permalloy record/play head to extract the fullest performance from today's high-energy cassette tapes. It combines simplicity of control layout and ease of use with all of the essential characteristics required for making the most accurate recordings—accurate tape speed, ultra-low flutter, low noise and distortion, wide dynamic range, and a wide and flat frequency response. Some of its special features:

Dolby[®] C Noise Reduction. The universally accepted Dolby[®] B noise-reduction circuit reduces audible tape hiss by about 10 dB. The newly developed Dolby[®] C circuit provides twice as much suppression of tape hiss (20 dB) at the midrange frequencies where the ear is most sensitive. With Dolby[®] C NR, you can record the full dynamic range of live music, or copy the widest-range direct-to-disc and digitally mastered records, without being bothered by tape hiss. Moreover, with background noise virtually abolished, you can use conservative recording levels and avoid tape saturation during peaks—thus preserving all of the brilliance, power, and impact of the live musical sound.

The NAD 6050C includes both Dolby[®] C noise reduction, for the widest-range recording, and Dolby[®] B for compatibility with older tape decks and most pre-recorded cassette tapes.

Of course the Dolby circuits could not be fully effective if the noise levels in the 6050C were high to begin with; the 6050C employs quiet electronics which are well matched to the sensitivity and gap width of the record/play head, ensuring that the useful dynamic range of the 6050C is ultimately limited only by the characteristics of the tape and is not compromised by the electronics.

Bias Fine-Tuning Control. An accurate recording with flat frequency response is a desirable goal with any tape recorder, and is especially important for correct operation of the Dolby[®] C system. But cassette tapes vary significantly in response from one brand or type to the next. So in addition to the usual three-position Tape Selector switch on its front panel the 6050C is also equipped with a front-panel Bias Fine Tuning control to compensate for these differences and produce the most accurate recordings with any high-quality tape.

DC Servo-Control. Tape motion is provided by a DC servo motor whose exact and stable rotational speed is electronically controlled, independent of variations in AC line voltage or frequency. Combined with a dynamically balanced flywheel and precisely machined capstan, it yields extremely stable tape flow with a weighted wow-and-flutter value of typically only 0.04% (JIS WRMS). This freedom from flutter contributes significantly to the NAD 6050C's clear and transparent sound quality.

Solid-state LED Peak Level Display. When recording dynamic music it is important not to permit the transient peaks in music to saturate the tape; yet setting the recording level too low will result in poor signal-to-noise ratio. Thus a fast, accurate level metering system contributes to making the best recordings. For this purpose the NAD 6050C employs a high-visibility LED level display which provides an accurate reading of the dynamically changing levels in music without the slow response, overshoot, and physical delicacy of moving-needle meters.

Metal Ready Design. The NAD 6050C is equipped with a hard Permalloy recording head, high-efficiency erase head, and high-bias recording circuits to take advantage of the high coercivity of metal-particle tapes, yielding a significant improvement in high-frequency dynamic range.

REAR PANEL

1. LINE IN. For normal operation the NAD 6050C is intended to be connected to the Tape Output and Input (REC and PLAY) phono jacks at the rear of any conventional stereo amplifier, preamp, or receiver. Insert the phono plugs of a stereo patch cord fully into the LINE IN sockets on the 6050C. At the other end of the patch cord connect the plugs to the RECord or TAPE OUT jacks of the amplifier. Use the color coding of the plugs to identify the channels; for instance, if one of the plugs at each end of the patch cord is red, connect the red plugs to the Right channel of both the amplifier and the NAD 6050C.

2. LINE OUT. To play back tapes, connect a stereo patch cord from the NAD 6050C's LINE OUT jacks to the PLAY, TAPE IN, or TAPE MONitor jacks of the amplifier. Make sure that each plug is inserted fully into its socket, and use the color coding of the plugs to ensure that the stereo channels are connected consistently.

3. DIN REC/P.B. CONNECTOR. If your amplifier is equipped with both a DIN connector and pairs of phono jacks for REC and PLAY, it is generally preferable to use the phono jacks as described above. In most cases those connections will provide a better impedance match, with better freedom from noise and interference, than the DIN connections.

If your amplifier is equipped only with a DIN connector for mating to a tape recorder, then connect a standard 5-conductor DIN patch cord from the amplifier to the DIN socket on the 6050C.

4. AC POWER CORD. Connect the AC line cord to a convenient wall outlet or to an "Unswitched" convenience outlet at the rear of your amplifier.

A note on installation. The superb performance of the 6050C depends on an array of precisely machined parts, fine bearings, smoothly polished surfaces, sensitive detection of the weak magnetic fields in tape recordings, and amplification of weak signal voltages. Consequently its performance can be adversely affected by external magnetic fields, electrical interference, vibration, heat, moisture, or chemical fumes. Thus if placed directly adjacent to or on top of a power amplifier, the 6050C may pick up hum from the amplifier's power transformer. It should not be placed on a loudspeaker or television set (a source of magnetic fields as well as vibration), nor in direct sunlight, nor very close to a steam radiator, nor in a workshop where metal filings and chemicals are found. If located near a radio or TV transmitter (including a CB or short-wave unit) it may pick up interference. In general it will function best at temperatures and humidities which are comfortable for people, and can conveniently be stacked or shelved with the remaining components in your stereo system.

Connecting two recorders. Many modern stereo amplifiers have two sets of tape input/output jacks, with front-panel switching to permit using either machine for recording or playback and to permit copying tapes from one to the other. But if your amplifier has just one set of connections for a tape recorder, it is still possible to hook up two recorders without adverse effects, as follows. Obtain two "Y-connector" adapters each having two female phono sockets and one male plug (e.g., Radio Shack #42-2436 or equivalent). Plug one of the Y-connectors into the amplifier's Left channel Tape Out (REC) jack. Connect the left-channel plugs of two stereo patch cords to the Y-connector's two sockets. Repeat this process for the Right channel. At the other end connect one of the patch cords to the LINE INPUT jacks of one recorder, and the second patch cord to the second recorder's LINE IN jacks. With this hookup you can use either or both recorders to tape signals from the amplifier.

But connecting the two recorders for playback requires a different approach. You *cannot* couple the LINE OUT signals from the recorders together with Y-connectors in order to feed a single pair of tape monitor (PLAY) jacks on the amplifier; doing so is likely to cause a drastic reduction in volume and increased distortion. The playback signals from the two machines should be connected to different inputs on the amplifier; connect the LINE OUT signals from one recorder to the normal tape input (PLAY) jacks on the amplifier, and connect the LINE OUT signals from the other recorder to the amplifier's AUXiliary high-level inputs. This arrangement permits listening to tapes from either recorder, and copying of tapes from one machine (the recorder connected to AUX) onto the other (the recorder connected to the standard tape input jacks). However, one precaution is necessary: never switch your amplifier's selector to AUX while making a recording on the machine whose outputs are connected to AUX; the resulting feedback howl could damage your loudspeakers.

There is an alternative hookup which eliminates any risk of feedback but also precludes easy copying of tapes: obtain an inexpensive stereo selector switch (Switchcraft #668), connect the LINE OUT signals of both recorders to it, and connect the output of the switch to the amplifier's normal tape input (PLAY) jacks. You can record on both machines as before, and the outboard switch is used to select which recorder's playback will be heard. If you should wish to copy a tape, it would be necessary to disconnect some cables and run a patch cord from the LINE OUT jacks of one recorder directly to the LINE IN jacks of the other machine.

FRONT PANEL

1. POWER. Pressing this switch turns on the power to the cassette deck, assuming that its AC power plug has been plugged into a "live" AC outlet.

2. PHONES. Any conventional (non-electrostatic) stereo headphones may be plugged in here, in order to listen to the signal as it is recorded or played back. The volume of the signal will depend on the impedance of the headphones as well as the strength of the audio signal in the recording. The circuit is optimised for low-impedance headphones.

3. CASSETTE COMPARTMENT. To play a recorded tape, or to make a new recording, a cassette must be installed in this compartment.

The 6050C is equipped with a plastic DUST COVER which is normally installed in the cassette compartment when the machine is not being used. The cover prevents dust from accumulating in the head assembly area. To remove the dust cover, grasp it at both ends and pull straight out. To re-install it when you finish using the 6050C, tilt it forward and insert its top edge into the compartment first; then the lower part of the cover may easily be pressed into place.

The procedure for installing a cassette is similar. Hold the cassette at both ends, with its thick section at the bottom, and insert the top edge of the cassette under the lip of the compartment; then press the lower part of the cassette into place. Be sure that it is fully inserted, resting firmly against the rear wall of the compartment.

To remove the cassette, simply grasp it and pull straight out. **DO NOT ATTEMPT TO REMOVE THE CASSETTE WHILE THE TRANSPORT IS ENGAGED. TO BE CERTAIN, ALWAYS PRESS THE STOP BUTTON BEFORE REMOVING A CASSETTE.** (The fact that the tape is not moving does not necessarily mean that the transport is disengaged; it could be in the PLAY mode with the PAUSE engaged.)

4. RECORD. Pressing this button activates the recording circuits and also engages the tape transport to move the tape past the heads so that a recording can be made. When the recording circuits are activated, a red LED is illuminated next to the Peak-Reading Level Display.

To stop recording and de-activate the recording circuits, press the STOP button. The recording circuits are also de-activated automatically when the REWIND or FAST FORWARD mode is engaged.

NOTE: In many tape recorders the REC button only activates the recording circuits, and it is necessary to press both the REC and PLAY buttons to engage the tape and make a recording. But in the 6050C the single REC button commands the recording process.

CAUTION: When playing tape recordings that you have already made, be careful not to press the REC button when you only want to press the PLAY button. If you accidentally press REC, the 6050C will go into the recording mode and erase the previous recording. To prevent such accidents, it is wise to knock out the erasure-prevention tabs (described later) on cassettes which you don't intend to re-record on. With the tabs removed, the REC button cannot be depressed.

5. PLAY. When this button is pressed, the tape is moved from left to right at normal playing speed, the recorder's heads are brought into contact with the tape, and the playback circuits are activated. At the end of the tape, the transport automatically stops and disengages itself from the tape.

6. REWIND/REVIEW. This button winds the tape rapidly from the right (the take-up spool) to the left (onto the supply spool).

If the tape transport is in the STOP mode, i.e., disengaged from the tape, then pressing this button activates the REWIND mode. The button will latch down and the tape will

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rewind until you press STOP, or until it reaches the end of the tape. When it reaches the end of the tape, the transport automatically returns to the STOP mode. Since the head remains disengaged from the tape during rewind, no sound is heard.

If the tape transport is in the PLAY mode, pressing this button activates the REVIEW mode. The tape will rewind *only as long as you hold the button down*. The transport remains engaged, and automatically resumes PLAY when you release the button. The *heads remain in contact with the tape*, so the recording will be heard as a loud high-pitched squeal; this allows you easily to locate the beginning of a recording, by listening for a gap in the squeal. **TURN DOWN YOUR AMPLIFIER'S VOLUME CONTROL TO A LOW LEVEL TO PREVENT DAMAGE TO YOUR SPEAKER'S TWEETERS when you use this mode.**

If you press this button while making a recording, the machine will automatically STOP momentarily, disengage the recording circuits, and then go into the REWIND mode.

7. FAST-FORWARD/CUE. This button winds the tape rapidly forward from the left to the right, i.e., from the beginning toward the end of a recording.

If the transport is in the STOP mode, disengaged from the tape, then pressing this button activates the FAST FORWARD mode. The button will latch down, and the tape will wind forward until you press STOP or until the end of the tape is reached. At the end of the tape the machine automatically disengages, returning to the STOP mode. Since the head remains disengaged from the tape during fast-forward, no sound is heard.

If the transport is in the PLAY mode, pressing this button activates the CUE function. The tape will wind forward *only as long as you hold the button down*. The transport remains engaged, automatically resuming PLAY when you release the button. The heads remain in contact with the tape, so the recording will be heard as a high-pitched squeal; this allows you easily to locate the beginning of a selection. **TURN DOWN YOUR AMPLIFIER'S VOLUME CONTROL TO PREVENT DAMAGE TO YOUR SPEAKER'S TWEETERS when you use this mode.**

If you press this button while making a recording, the machine will automatically STOP momentarily, disengaging the recording circuits, and then go into the FAST FORWARD mode.

8. STOP. This button stops the tape motion and disengages all of the tape transport controls (except PAUSE). If the machine was in PLAY or RECORD, pressing STOP will retract the heads in addition to halting the motion of the tape. Always press STOP before trying to remove a cassette.

9. PAUSE. Pressing this button once retracts the rubber pinch roller from the capstan, thus halting the motion of the tape in the PLAY and RECORD modes, while leaving the recording and playback circuits active. Pressing the PAUSE button a second time provides an instant resumption of tape motion. This control provides a convenient means of temporarily interrupting the playback or recording process (to edit out announcements when taping a radio broadcast, for example).

Pressing PAUSE and then RECORD allows you to activate the recording circuits, in order to set recording levels, without actually making a recording. When you are ready to proceed with the recording, press PAUSE again to start the tape moving.

NOTE: the PAUSE control is intended to stop the tape motion *temporarily*. To stop the tape for more than a few minutes, use the STOP button.

DO NOT TRY TO REMOVE THE CASSETTE WHILE IN THE PAUSE MODE. Always press STOP to disengage the

heads before removing the tape.

If you are in the PAUSE mode and then press STOP, or if you are in the STOP mode and then press PAUSE, you may find the machine's subsequent behavior puzzling. When you press PLAY, for example, the heads will engage the tape briefly and then spring back, automatically disengaging from the tape. In order to go from STOP/PAUSE into play you must hold the PLAY button down long enough for the heads to engage and latch into place; then you can resume play by pressing the PAUSE button to release the Pause mode and start the tape moving.

10. MPX FILTER. The Multiplex filter is intended for use in conjunction with the Dolby[®] noise reduction circuit. Any ultrasonic interference in the input signal, such as unfiltered multiplex pilot signals in an FM tuner, may cause mistracking of the Dolby[®] circuits and yield dull sound when the recording is played back. To prevent mistracking and **preserve flat response with Dolby[®] NR**, the MPX filter should be **switched ON** whenever the Dolby[®] circuit is used in making recordings. The MPX filter sharply rejects signal components at frequencies higher than about 17 kHz. On those occasions when you choose to make or play a recording without Dolby[®] noise reduction, you may switch the MPX filter OFF and gain a slight extension of the recorder's high-frequency bandwidth. But remember to switch the filter back ON when you make recordings using the Dolby[®] NR.

11. TAPE COUNTER. If you press the button to set the counter to 000 at the beginning of a tape, then the counter provides a handy way of identifying the location of selections on the tape. Alternatively you may set the counter to zero at any point in the tape to which you wish to return later. The counter will accumulate a maximum count of approximately 500 over the length of a C-60 cassette; about 700 for a C-90, and about 900 for a C-120.

12. TAPE SELECTOR. This switch selects the correct recording bias and playback equalization for each of three classes of cassette tape.

There are many different types of cassette tape on the market, varying in sensitivity and frequency response. If you wish, you may exploit these variations to produce recordings which differ in tonal quality from the original sound (using the recorder, in effect, as an elaborate tone control). However, the basic design goal of the recorder is to precisely "replicate" any original sound, capturing and preserving it without alteration for later playback. For this purpose the NAD 6050C has been designed to be able to make accurate recordings with a wide and flat frequency response. The TAPE SELECTOR allows you to match the recorder's characteristics to tapes of three types in order to achieve the most accurate recording quality with each.

I. Normal. The largest variety of cassette tapes are intended for use with the NORMAL setting of the TAPE SELECTOR. Look at the cassette package for a statement of "normal bias" or "120 μ sec" equalization. In general, tapes described as "ferric oxide," "low noise," or having the Roman numeral I in their designation, are intended for the NORMAL setting.

II. CrO₂. The CrO₂ setting is intended for tapes of chromium dioxide, Crolyn[®] or "chrome-equivalent" tapes made of cobalt-doped ferric oxide. Usually these are identified as requiring "high bias," "70 μ sec" equalization, or have the Roman numeral II in their designation.

IV. Metal. The Metal setting should be used with metal-particle tapes, which may be labeled with the Roman numeral IV.

13. BIAS ADJUST. While the TAPE SELECTOR switch provides the large changes in recording bias and playback equalization which are needed to accommodate the major classes of tape, there are significant brand-to-brand differ-

ences in response among tapes *within* each class. The BIAS ADJUST control allows you to compensate for these differences and make the most accurate recording with any reputable brand of tape. This is especially important when Dolby C noise reduction is used, because any departure from flat high-frequency response in the recording will cause decoding errors in the Dolby circuit during playback—which in turn cause larger response errors, making the sound excessively bright or dull. The procedure for fine-tuning the bias to obtain accurate response involves making brief trial recordings, as follows:

(1) Install the selected cassette in the recorder and fast-wind the tape forward for a few seconds to get past the blank leader tape at the beginning.

(2) Set the TAPE SELECTOR switch to the correct position for the tape, as described above.

(3) Set the Dolby NR switch to "C" and switch the MPX Filter ON. (Even though you may be planning to make a recording with the NR Off or set to Dolby B, it is best to use Dolby C while adjusting the bias because it enhances the audibility of any response errors.)

(4) Press the re-set button to set the Tape Counter to 000. Set the BIAS ADJUST control to 0 (i.e., to the detented position at the center of its range), unless you have reason to prefer a different trial setting.

(5) Record a brief sample of music at normal recording levels. For best results the music should have obvious high-frequency content. A convenient alternative, especially when the most critical results are desired, is interstation hiss from an FM tuner recorded at a level of about -8 to -13 dB.

(6) Rewind the tape to the beginning of the test recording (at 000 on the counter) and stop. Play the recording and evaluate its tonal balance.

(7) If the recording bias is excessively high, the recording will be dull; if the bias is too low, the high frequencies will be exaggerated in the recording and the distortion will be increased. So, if the trial recording is duller than the original sound, turn the BIAS ADJUST control *down* (counterclockwise) to decrease the bias and bring the treble response up to flat. If the trial recording is brighter than the original sound, turn *up* the BIAS ADJUST to increase the bias and flatten the boosted treble.

(8) The bias operates only in recording, not during playback. To test the new bias setting, make another brief trial recording and rewind the tape again to compare the recorded sound versus the original input signal. With metal-particle tapes, you will find that the effect of bias change is relatively subtle and you may have to turn the bias control all the way to the end of its range to produce an audible change in tonal balance. But with conventional tapes a modest shift of the control will usually have a plainly audible effect.

(9) After you have discovered the setting of the BIAS ADJUST control which produces the best results with a particular brand and type of tape, write it down (perhaps on the cassette label). Then you can easily reset the control to the correct position the next time you make a recording using the same brand and type of tape. If you use the same brand of tape regularly, of course, you should leave the BIAS ADJUST control at its optimum setting. But if you record on a variety of tapes, you may want to compile a list of optimum bias settings as you discover them, for convenient reference.

(10) Remember, the BIAS ADJUST control affects recordings only while they are being made. It cannot be used to improve the quality of tapes after they are recorded.

14. DOLBY NR. The recorder is equipped with two types of Dolby noise reduction: Dolby C for the widest-range recording, and Dolby B for compatibility with older equipment and existing recordings. Each type of NR involves a com-

plementary two-step process which should be used in *both* recording and playback, or in neither. Indicator lights adjacent to the Recording Level display glow when the corresponding Dolby NR circuit is engaged.

Both types of Dolby NR operate by selectively compressing the dynamic range of the middle and high frequencies in the signal during recording, i.e., by selectively boosting the level of those middle-to-high frequency sounds which occur at a naturally low level, so that these sounds are then recorded on the tape at a level substantially higher than the tape's own hiss. Then, in playback, the dynamic range of these signals is expanded back to its former state; the middle and high frequency sounds which were boosted are cut back down to their original levels, and the tape's hiss is cut at the same time.

Dolby B and C differ in the amount of boost/cut they provide and in its frequency distribution. Dolby B operates mainly at high frequencies and suppresses hiss by a maximum of 10 dB. Dolby C operates at both middle and high frequencies and reduces hiss by as much as 20 dB. They are *not* interchangeable: if a tape is recorded with type B NR, it should also be played back with the NR switch set to B. Similarly, recordings made with type C NR should be played back in the C mode. To avoid confusion it is strongly recommended that you label your cassettes "B" or "C" to indicate which type of noise-reduction encoding was used in the recording.

Any ultrasonic interference in the input signal, such as the stereo pilot tones in an FM tuner, may cause "mistracking" in the Dolby circuits, yielding dull sound in playback. To prevent this the 6050C is equipped with an MPX (multiplex) filter which should normally be ON when recording with Dolby NR.

Equally, any brightening or dulling of the sound caused by a mismatch between the recorder and the tape will produce mistracking in the Dolby circuits and yield a much larger brightening or dulling of the sound in playback. So when the Dolby circuits are used it is especially important that the TAPE SELECTOR be correctly set for the tape in use, during both recording and playback, and that the BIAS ADJUST be correctly adjusted prior to recording.

15. RECORDING LEVEL. This pair of knobs controls the strength of the audio signal fed to the tape when recording. Unlike most stereo recorders, which use a single ganged dual-section control to set the recording level in both channels, the 6050C uses a separate knob to control the level in each of the two stereo channels. This makes it very easy to use differing settings to compensate for channel balance errors in a phono cartridge or any other imbalance between the channels.

Correct channel balance is an important factor in stereo recording; a balance shift of 1 dB is audible. Just setting the two RECORD LEVEL controls to the same setting by eye is not sufficient to ensure that degree of accuracy. More precise balancing may be obtained by switching your FM receiver into the monophonic mode and adjusting the RECORD LEVEL controls for equal readings on the two channels of the Peak Level Display. But the best method is simply to listen to recordings as you make them. Use the Tape Monitor switch on your amplifier to hear the recorder's output signal. When the 6050C is in the RECORD mode, the signal being recorded is also fed to the recorder's output jacks; thus by using your amplifier's Tape Monitor inputs you can hear the signal and judge the channel balance by ear. Typically the correct setting of balance will be that which places the image of a lead soloist precisely midway between your speakers, or that which yields the most uniform spread of sound across the space between the speakers while providing the best reproduction of "depth" in the image.

16. PEAK LEVEL DISPLAY. This dual row of LEDs displays the peak level of the signal in each channel during recording or playback. The left-most LED in each row serves as a pilot light, illuminated whenever the 6050C is on. The LEDs ranging from -18 dB to 0 dB are green and indicate normal recording levels; the $+2$ and $+4$ dB LEDs are red and indicate the maximum permissible levels. In general you should adjust the RECORD LEVEL controls so that the loudest portions of the music are recorded at levels between -3 and $+2$ on the display. With music which spans a large range of volume levels, such as a symphony, this may mean that the softer portions of the music will be recorded at an indicated level of -18 dB or even lower; this is normal.

To learn how to set optimum recording levels, the following experiment is recommended. Select a typical recording of music which you enjoy, and record an excerpt from it several times in succession, setting the recording level progressively higher each time (i.e., with a maximum peak level of about -6 dB the first time, repeated at -3 dB, 0 dB, $+2$ dB, and above $+4$ dB). Then play back the recording and listen for symptoms of tape saturation in the resultant sound. At a peak level of -6 dB the sound should be clear, open, and detailed, but the background of tape hiss may be noticeable. At levels of $+4$ dB some tape saturation may be evident either as a boomer bass, mushy midrange, or dulled treble. Also, tape saturation will reduce the peak levels; a signal recorded at $+4$ dB may play back at $+2$ or lower. The optimum recording level is the highest level you can use (for best signal-to-noise ratio) *without* encountering audible symptoms of saturation. With premium-quality tapes, you will typically find that you can use peak recording levels in the 0 to $+4$ dB range. But with music containing very heavy bass energy the peak level usually should be set no higher than -3 dB.

When in doubt it usually is best to err on the conservative side, sacrificing a bit of potential signal-to-noise ratio in favor of a little extra undistorted headroom for musical peaks. With Dolby[®] C NR minimizing audible tape hiss, you can afford to under-record slightly, and this practice will ensure that you will preserve all of the air, brilliance, and detail in the original sound.

You may find that, in order to achieve peak levels near 0 dB, you have to set the RECORDING LEVEL to a different position when recording FM broadcasts than when recording from phonograph records. This is normal.

17. MIC. The MICrophone jacks will accept signals from any conventional microphone whose cable terminates in a $\frac{1}{4}$ " (6mm) phone plug. Microphones of all types may be used, although the electret type is generally recommended for best results. If your microphone terminates in another type of connector, plug adapters can be used to convert to the standard phone plug. Microphones of any impedance can be used, but low or medium impedance mikes will yield the best sound. To record a spoken voice or a soft instrument (such as acoustic guitar), place the mikes at a distance of about one foot (30 cm.). Holding the mike very close to the mouth, in the manner of rock singers, will usually produce poor sound. To record a group of performers or a loud instrument such as a piano or trumpet, a microphone distance of several feet (1 to 2 meters) is preferred.

When a microphone plug is inserted into the MIC jack, the input signal from the LINE IN jack is automatically disconnected. In order to resume recording from a tuner or amplifier via the signal cables, the microphone plugs must be removed from the MIC jacks. (Actually, if a loud signal is present at the LINE IN jacks, a faint trace of it may still leak into the microphone inputs, so if you are making a critical recording with microphones the signal cables should be disconnected from the LINE IN jacks while the mikes are used.)

CAUTION: When the NAD 6050C is in the RECORD mode, the signal which is being recorded also appears at the LINE OUT jacks and so is fed to your stereo amplifier for monitoring. If you record with microphones in the same room, their signal will then be amplified and reproduced by your loudspeakers, and the amplified sound may then be picked up by the microphones. The resulting "feedback" howl could damage your loudspeakers. To prevent this possibility, when you record with microphones you should turn off your amplifier or switch it so that the tape recorder's output cannot be amplified.

OPERATING PROCEDURES AND HINTS

To Make a Recording

1. Before inserting the cassette, check it to be sure that the tape is straight and taut where it is exposed at the lower edge of the cassette. If necessary, insert a pencil into either tape spool and manually wind the tape until any slack is taken up.

2. Remove the plastic head protection cover from the cassette compartment and insert a blank cassette with side 1 (or A) facing you. Through the window in the cassette you should see a full spool of tape on the left side.

3. If the tape is fresh and has just been unwrapped for the first time, the tape pack may have developed some "friction" during months of storage since it left the factory. To free up any friction, press FAST FORWARD (▶▶) to wind the tape through its entire length, then press REWIND (◀◀) to return to the beginning.

4. Set the tape counter to 000. Then, as you make the recording, you can take note of the counter reading corresponding to each recorded selection.

5. Set the TAPE SELECTOR switch to the correct position for the tape in use.

Adjust the BIAS ADJUST control to the setting which you have found to be optimum for the tape in use. If necessary, do a trial recording to find the setting which provides accurate high-frequency response using Dolby[®] C NR.

6. The Dolby[®] NR switch should be set to C unless you are making a tape for playback on a machine equipped only with Dolby[®] B NR. When using Dolby[®] NR (either B or C) the MPX filter should also be ON.

7. In order to determine the optimum setting of the RECORD LEVEL controls, it is desirable to activate the recording circuits without actually making a recording. To do this, press PAUSE and then REC. (If there is any difficulty engaging REC, press PLAY for a moment and then REC.) Observe the Peak Level Display while setting the RECORD LEVEL controls so that the highest levels in the music register at about 0 dB. To check the channel balance, listen to the output of the 6050C via headphones or your amplifier's Tape Monitor circuit and fine-tune the relative settings of the RECORD LEVEL controls for correct left-right imaging. When you are ready to proceed with the recording, press PAUSE to release the Pause mode and start the tape moving. Since the recording circuits have already been activated, it is not necessary to press REC again.

8. To interrupt the recording at any point, press PAUSE and the tape will stop moving, while the recording circuits and level display remain active. To resume recording, press PAUSE again.

9. At the end of the recording session, press STOP. If you want to continue recording on the other side of the cassette, press FAST FORWARD to advance the tape to the end of side A, remove the cassette, turn it over, and insert it with side B facing you. Press REC to resume recording. (If there is any difficulty engaging REC, press PLAY for a moment and then REC.)

10. In most cassettes the first few inches of tape at either end is a "leader" with no magnetic coating. If the tape counter is set to 000 at the beginning of the cassette, remember to let the tape advance by 4 or 5 counts before beginning the recording.

Prevention of Accidental Erasure

Every cassette is equipped with two plastic tabs in cutaway holes in the top edge of the cassette. One tab corresponds to Side A of the cassette and the other to Side B; when you hold the cassette so that Side A faces you, the corresponding tab is near the left edge. This tab engages a safety interlock in the recorder and permits the recording and erasing circuits to be activated. If you think that you may wish to erase and re-use a cassette that you have recorded, leave the tabs alone. But if you have made a recording which you value, you can safeguard it against any possibility of accidental erasure by breaking off the corresponding tab. (If the valued recording occupies both sides of the cassette, break off both tabs.)

If you should ever change your mind and decide to re-record over the tape after having broken off the erasure-prevention tab, simply cover the cutout with a piece of cellophane or other adhesive tape.

To Erase Tapes

The recorder automatically erases previous recordings as a fresh recording is made. To erase a complete tape, simply set the RECORD LEVEL control to minimum, press REC and record over the full length of the tape.

To Play Recorded Tapes

1. Before inserting the cassette, check for slack tape and manually wind either spool to take up any slack.

2. If the cassette to be played has been in storage for several months it may be useful to fast-wind the tape through its length and back in order to free up any internal friction, before playing.

3. If the tape was recorded on the 6050C with Dolby[®] C NR, set the Dolby[®] NR switch to C for playback. If the tape was recorded on a machine equipped only with Dolby B, or is a commercially pre-recorded tape, set the Dolby switch to B for playback. There are three exceptions to this general rule. One is that, as time goes by, some pre-recorded tapes may be produced with type C encoding; these will be clearly identified as such, and should be played with the Dolby[®] NR switch set to C. Two, some pre-recorded tapes are produced with DBX encoding; to play these, the Dolby switch should be OFF and an external DBX II unit must be used to decode the tape. Three, some older pre-recorded tapes are poorly processed and are so dull that they may sound better with the Dolby[®] NR switched off.

4. Set the TAPE SELECTOR switch to the position which corresponds to the type of tape being played. (It is not necessary to adjust the BIAS ADJUST; that control operates only during recording.)

Maintenance

The bearings and other moving parts in this recorder are assembled with long-life lubricants and require no periodic maintenance. But in order to preserve the NAD 6050C's high level of performance, all surfaces which the tape comes into contact with must be maintained free of dirt and free of magnetic fields.

Regular cleaning is the primary requirement: dirt particles thinner than a thousandth of an inch, if lodged on the polished surface of the record/play head, can cause a large falloff in high-frequency response. One easy way to clean the heads on a daily basis is to use a head-cleaning cassette, a cassette which contains a textured paper tape instead of a magnetic tape. Place it in the recorder and activate the PLAY mode for several seconds before each recording or playback session, and as the cleaning tape rubs over the heads it removes accumulated particles of dust and tape oxide.

At longer intervals—weekly or monthly depending on how heavily you use the machine—a liquid solvent should be used to remove tape oxides or greasy residue deposited on the heads, capstan, and other surfaces which the tape makes contact with. Denatured alcohol is recommended, although numerous other satisfactory head cleaning sprays and fluids are available from your hi-fi dealer and other sources. Most of these contain either isopropyl alcohol or fluorinated hydrocarbon compounds such as Freon. If you use isopropyl alcohol, check to be sure that the solution does not contain any unwanted oily substances such as Lanolin. To clean the tape transport, remove any cassette from the machine. Use the fluid or spray to moisten a cotton swab, and use the moist swab to scrub the black erase head, the silver-colored record/play head, the capstan, and the rubber pinch roller.

During the months of regular use the heads and metal capstan may acquire a magnetic charge which will add hiss to all tapes played or recorded in the machine. Every few months this charge should be removed with the aid of a head demagnetizer. Before using the demagnetizer, turn off the power to the recorder, open the cassette compartment, and remove any cassettes from the vicinity. Hold the demagnetizer away from the machine, switch it on, slowly pass the demagnetizer's probe tip over the heads and capstan, slowly withdraw the demagnetizer until it is several feet away from the recorder, and finally switch it off. It is important not to switch off the demagnetizer when it is close to the recorder's tape path.

