



**PHILIPS**

N 4504/44



**hi**  
HIGH FIDELITY **fi** INTERNATIONAL



## WARNING

**To prevent fire or shock hazard, do not expose this appliance to rain or moisture.**

The model and serial number of your Philips High Fidelity Laboratories Tape Recorder will be found on the rear of the instrument. Please record this model and serial number in the space provided below.

Model number: \_\_\_\_\_

Serial number: \_\_\_\_\_

## Operating Instructions

### Controls and connection sockets

*Figures 1, 2 and 3 (page 5)*

- ① reel spindles with rotatable tops
- ② tape tension controls
- ③ counter
- ④ zero reset button for counter
- ⑤ tape slot
- ⑥ power switch
- ⑦ power on/off indicator
- ⑧ recording level meter - left channel
- ⑨ recording level meter - right channel
- ⑩ recording level control
- ⑪ recording level balance control
- ⑫ headphone volume control
- ⑬ headphone balance control
- ⑭ fast rewind key
- ⑮ fast forward wind key
- ⑯ start key
- ⑰ pause key - to disengage, press again
- ⑱ record key
- ⑲ record, playback and fast wind stop key
- ⑳ monitor selector
- ㉑ track selector
- ㉒ speed selector
- ㉓ DNL on/off indicator
- ㉔ DNL switch
- ㉕ socket for stereo headphones
- ㉖ socket for the left channel microphone
- ㉗ socket for the right channel microphone
- ㉘ power cable
- ㉙ combined input/output DIN socket for radio, amplifier or recorder
- ㉚㉛ right/left channel output receptacles for amplifier or recorder
- ㉜㉝ right/left channel input receptacles for receiver, preamplifier or recorder

㉞ monitor output DIN socket for amplifier or recorder

㉟ socket for remote control unit

*Note:* Do not expose the recorder for any great length of time to excessive heat from heating equipment or direct sunshine.

### Horizontal use

The recorder can be used either vertically or horizontally. For horizontal use the two support pins supplied can be inserted in the holes at the rear of the recorder as shown in fig. 8 on page 6.

### Connection to AC

Insert the plug of the power cord ㉘ into a standard AC wall outlet supplying 117 Volts, 60 Herz power.

### Switching on and off

- To switch on: press power switch ⑥; indicator ⑦ now lights.
- To switch off: press power switch ⑥ again; indicator ⑦ now goes out.

*Note:* If the tape is moving, never switch off the recorder without first pressing stop key ⑲.

### Adjustment for type of tape in use

Press in the narrow sides of the lower head cover and remove (fig. 4, page 6).

- If tapes with a glossy rear side are used, bracket X must be to the left (page 6, fig. 5, position A).
- If rear side coated tapes are used, bracket X must be to the right (page 6, fig. 5, position B). This prevents undue wear of the pressure felt.

### Threading the tape

- Place a full reel of tape on the left-hand reel disc. This reel must turn anti-clockwise when unwinding. Now draw out the top of reel spindle ①, turn it slightly and allow it to spring back on the reel. The reel is now clamped to the disc. Attach an empty reel to the right-hand reel disc by proceeding in the same way.
- Unwind about 12' (30 cm) of tape and, holding it taut between both hands, lead it around the tape tension controls ② and through tape slot ⑤.
- Still holding the tape taut, press the start of the tape against the core of the empty reel and turn this reel anti-clockwise until it begins to take up the tape.
- Press start key ⑯, keep it depressed until the leader tape and the metal switching foil have



passed through tape slot ⑤, then press stop key ⑱.

### Four-track system

This four-track recorder allows four recordings to be made over the full length of the tape. The four recording tracks lie above each other. Each tape can thus take four mono recordings or two stereo recordings (a stereo recording consists of two mono recordings).

- To make mono recordings on each of the four tracks, set track selector ⑳ to '1-4'. Only recording level meter ⑧ lights. You can now record on track 1. When the right-hand reel is full, transpose the two reels. Leaving the track selector at '1-4', your next recording will be on track 4. Again transpose the reels when the right-hand reel is full and set track selector ⑳ to '3-2'. Only recording level meter ⑨ lights. The recording which you now make will be on track 3. When the right-hand reel is full, again transpose the reels, leaving the track selector at '3-2'. Your fourth recording will be made on track 2. When the right-hand reel is again full, all four tracks contain recordings over their full length.

- To make two stereo recordings on the four tracks, set track selector ⑳ to stereo. Both recording level meters, ⑧ and ⑨, now light. The recording which you now make will be on tracks 1 and 3. When the right-hand reel is full, transpose the two reels as before. Leaving the track selector at stereo, you can now make the second stereo recording, which will be on tracks 4 and 2. When the end of the tape is reached, all four tracks contain recordings over their full length.

### Automatic stop

When the metal switching foil at the start and end of the tape passes the switching contact in tape slot ⑤, pressed keys are automatically disengaged and the tape comes to a stop. The automatic stop operates during recording, playback and fast winding. To avoid unwanted stoppages at the start of the tape, therefore, keep start key ⑰ or wind key ⑮ pressed until the metal foil has passed through the tape slot. If tapes without metal switching foil are used, any depressed keys are disengaged by the integral tape-breakage protection mechanism.

### Counter

Make a habit of setting counter ③ to '0000' by pressing zero reset button ④ immediately after threading a tape. You can make a note of the

counter reading at which each recording starts on the index of the tape storage box. Later, you can swiftly locate any recording desired by rewinding or winding to the counter reading concerned. Note that the counter gives no indication as to the length or playing time of the tape.

### Dynamic Noise Limiter - DNL

The DNL suppresses tape noise without greatly affecting the naturalness of the music signal. It operates only during quiet passages and in the absence of signal on the tape, which is when noise is most apparent. The DNL operates during monitoring with monitor selector ㉔ at 'A' and during playback. Thus recordings being made on this recorder are entirely unaffected by the DNL.

The DNL is operated by switch ㉔; indicator ㉓ lights when the DNL is switched on.

### Connections

- Socket ㉕: output for stereo headphones with an impedance between 4 and 600 Ohms.
- Socket ㉖: input for the left channel microphone when making stereo recordings.
- Socket ㉗: input for the right channel microphone when making stereo recordings.
- Socket ㉙: for use with DIN connectors: input for record player or combined input/output (recording and playback) for equipment having a DIN recorder connection socket. *Note:* Record players with a HiFi pick-up cartridge (magnetic or HiFi-ceramic) must have a preamplifier.
- Receptacles ㉚ and ㉛: output receptacles for the right and left channel, respectively, for playing back pre-recorded tapes via equipment having input receptacles for recorder reproduction. These output receptacles also enable listening-in during recording (monitoring).
- Receptacles ㉜ and ㉝: input receptacles for the right and left channel, respectively, for making recordings from equipment having output receptacles for connection of a tape recorder (receivers, preamplifiers etc.).
- Socket ㉞, for use with DIN connectors: monitor output for amplifier (allowing listening-in during recording) or for a second recorder (allowing simultaneous recording by two recorders).
- Socket ㉟: for remote control unit N 6718 (separately available), by which the tape can be started and stopped during recording and playback. When the remote control unit is employed, pause key ⑰ must always be pressed, either together with start key ⑰ for



playing back or with start key ①⑥ and record key ①⑧ for recording.

### Use of microphones

For microphone recordings you can connect two microphones, one to socket ②⑥ and the other to socket ②⑦.

Depending on the position of track selector ②①, the recordings made in each case will be either stereo (position 'ST') or mono (position '1-4' or '3-2'). For mono recordings you can, if desired, connect only one microphone to socket ②⑥ or ②⑦. In this case, the recording level balance control ①① must be turned fully left if socket ②⑥ is used, or fully right if socket ②⑦ is used.

For stereo recordings the microphone for the left channel must face the left and that for the right channel the right of the sound source.

For speech recordings the distance between mouth and microphone should be about 12" (30 cm).

For music recordings, trial recordings should be made to determine the best distance.

To prevent unwanted recorder noise being picked up by the microphones, these should be placed away from the recorder.

### Introduction to recording

- Copying of phonograph records and recording of radio programs is permissible only insofar as copyright or other rights of third parties are not thereby infringed.

- The strength at which the sound is recorded on the tape determines the quality of the sound obtainable on playback. The 'recording level', as this is called, is adjusted both for stereo and mono recording with recording level control ①⑩, and checked by reference to the recording level meters ⑧ and ⑨ in the case of stereo recording or either of those meters in the case of mono recording. Differences in the recording level between the left and right channel can be corrected with balance control ①①. In mono recording with one microphone, balance control ①① must be turned fully left if socket ②⑥ is used, or fully right if socket ②⑦ is used.

- The recording level is correctly set if, during the loudest passages, the pointer of the recording level meter ⑧ and/or ⑨ deflects just to the 100% mark (page 6, fig. 6). If the level is too high or too low, either distortion or disturbing tape noise, respectively, will be heard on playback.

- During recording, any previous recording on the same part of the tape is automatically erased. You can, however, erase a recording with-

out adding a new one by keeping recording level control ①⑩ at '0' as you record. Erasure is fastest with speed selector ②② at '19' cm/s (7½ ips).

- Recordings being made from an apparatus having a recorder connection are not affected by the settings of the volume or tone controls of that apparatus.

- During the making of microphone recordings, no apparatus must be connected to socket ②⑨ or to the input receptacles ③②③③. Similarly, during the making of other than microphone recordings, no microphones must be connected. To prevent unwanted noise being recorded, sockets not in use should not be touched during recording.

### Recording

- Set speed selector ②② to the speed desired. The lowest speed gives the longest playing time, the highest speed the best sound quality: '19' (cm/s) = 7½ ips, '9.5' = 3¾ ips, '4.75' = 1⅞ ips.

- Set track selector ②① to 'ST' (stereo) or - for mono recordings - to '1-4' or '3-2'.

- Press pause key ①⑦.

- Press start key ①⑥ and record key ①⑧ at the same time.

- Allow the apparatus which is connected to play, or speak or sing into the microphone and adjust the correct recording level with control ①⑩. If necessary, correct the balance with control ①①.

- Now start recording by pressing pause key ①⑦ again. Check the recording level from time to time and readjust it, gradually, if necessary.

- For brief interruptions press pause key ①⑦.

- To stop, press stop key ①⑨.

**Note:** To record with two recorders simultaneously, connect the second recorder to the output receptacles ③⑩ ③① or to the monitor socket ③④ and keep monitor selector ②⑩ at 'B'.

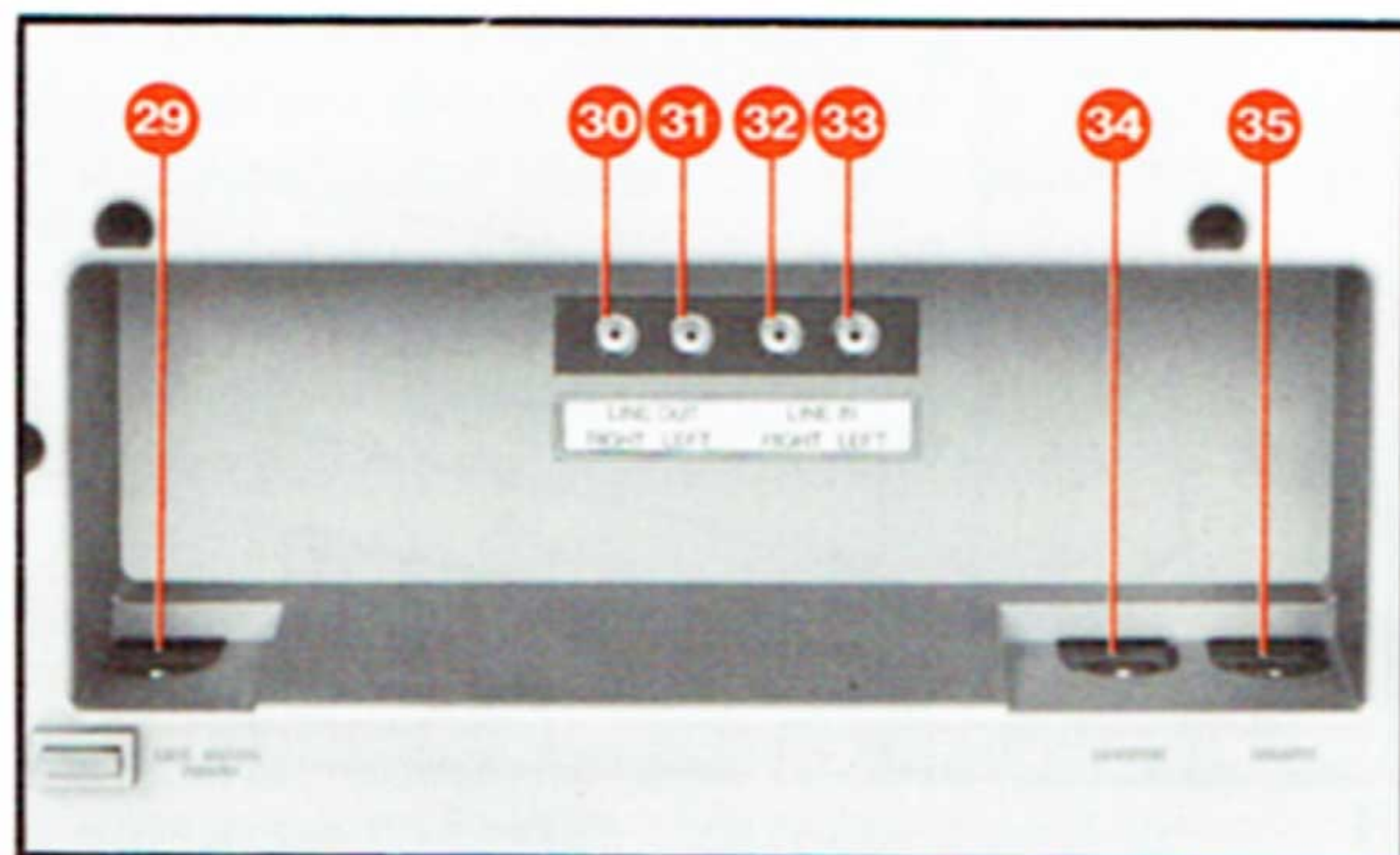
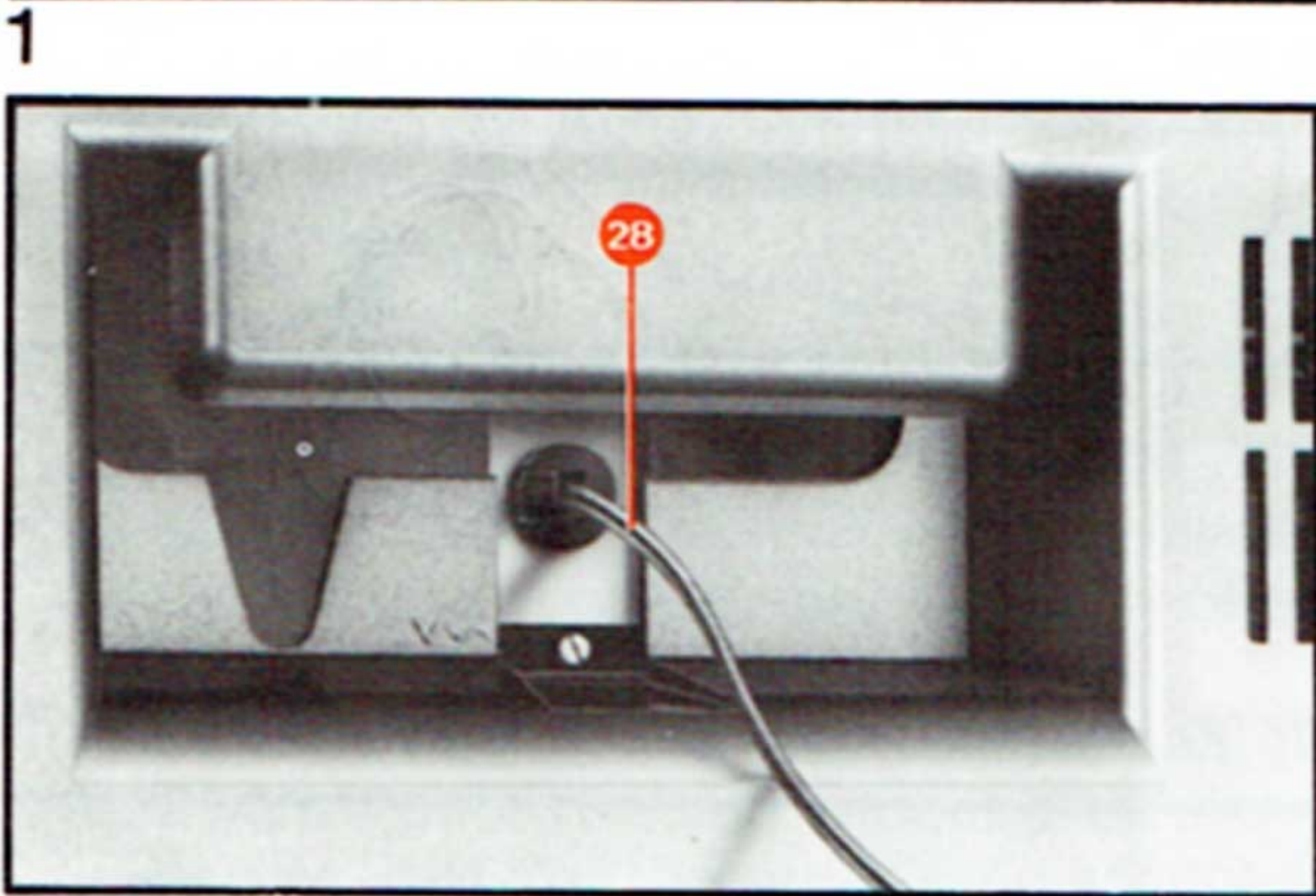
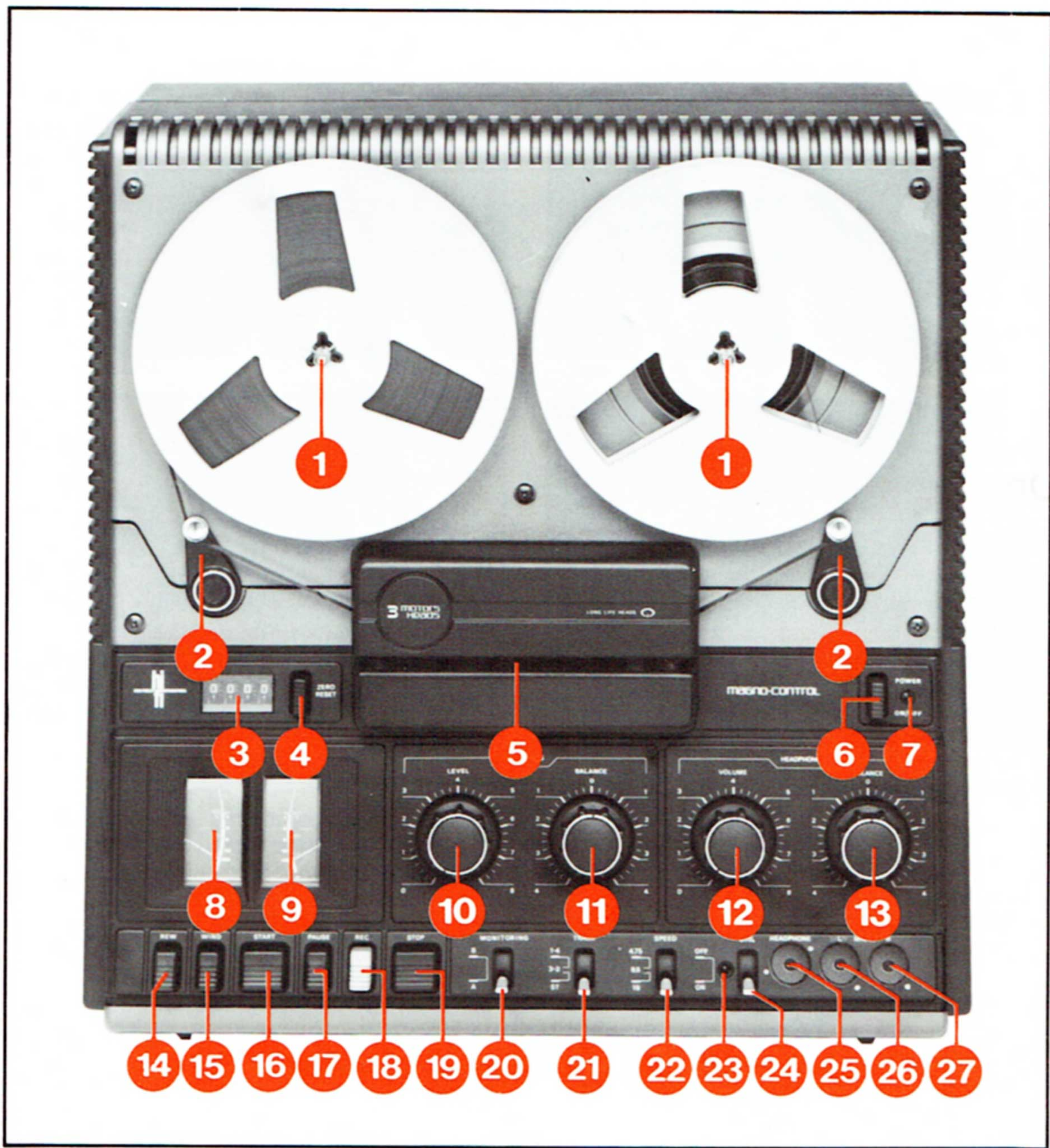
### Listening-in during recording (monitoring)

You can check what is going onto the tape by monitoring through either an amplifier or headphones.

The headphone method is of particular advantage when making microphone recordings since it averts the danger of the microphone picking up sound from the loudspeakers and causing a whistling noise ('howling').

By means of monitor selector ②⑩, which operates only during recording, you can choose between 'after tape' and 'before tape' monitoring. — 'A' is the after tape switch position. The sig-

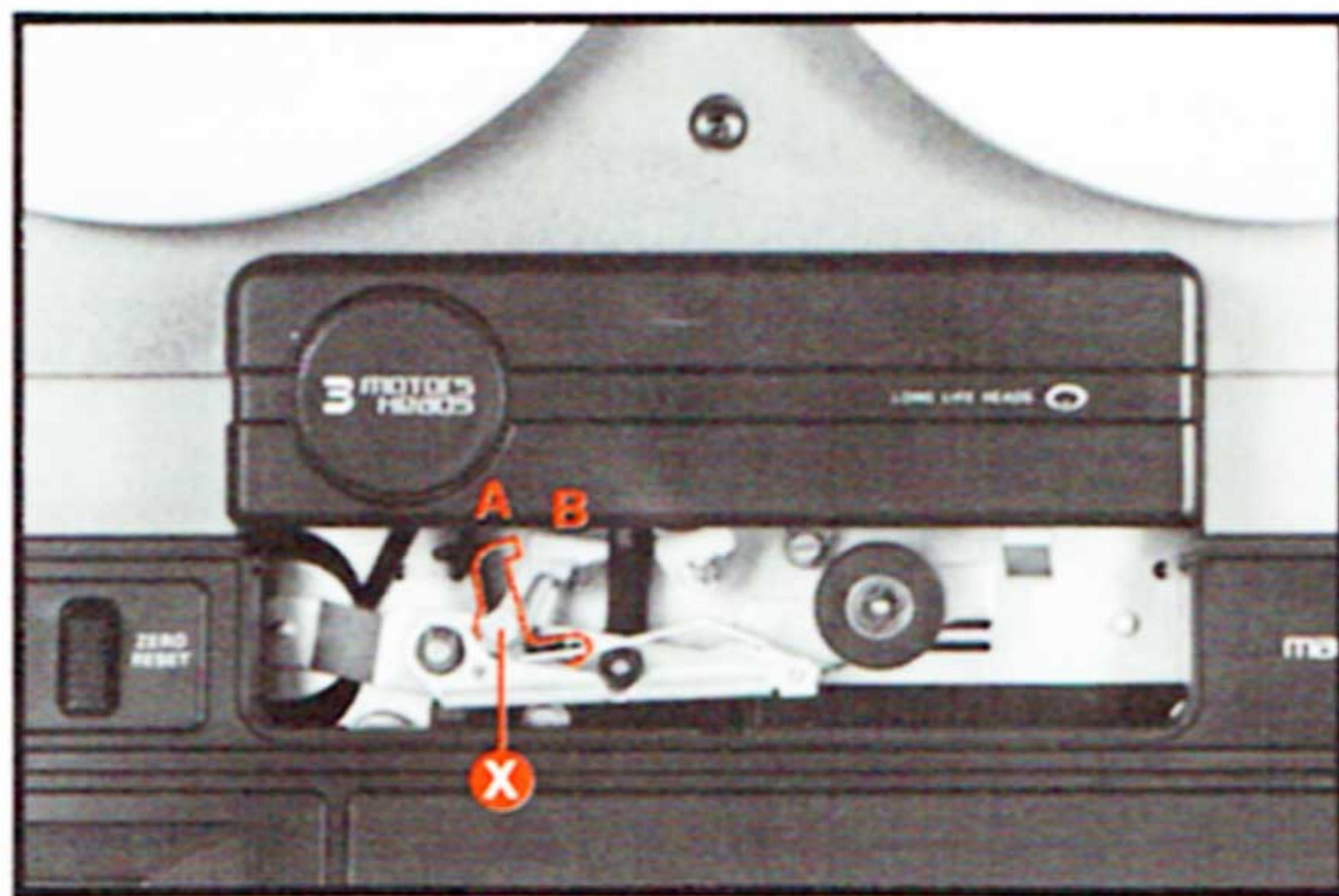




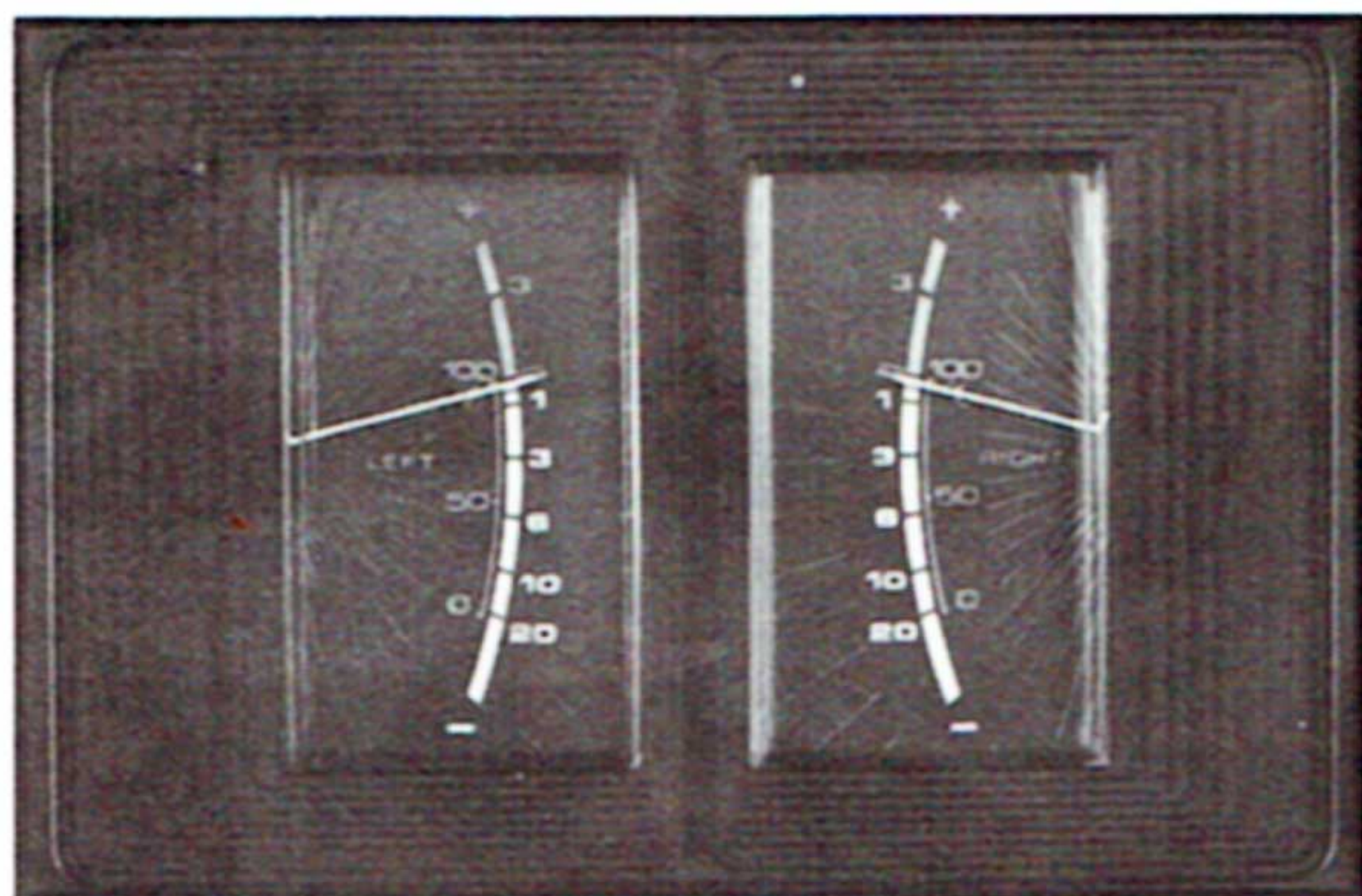




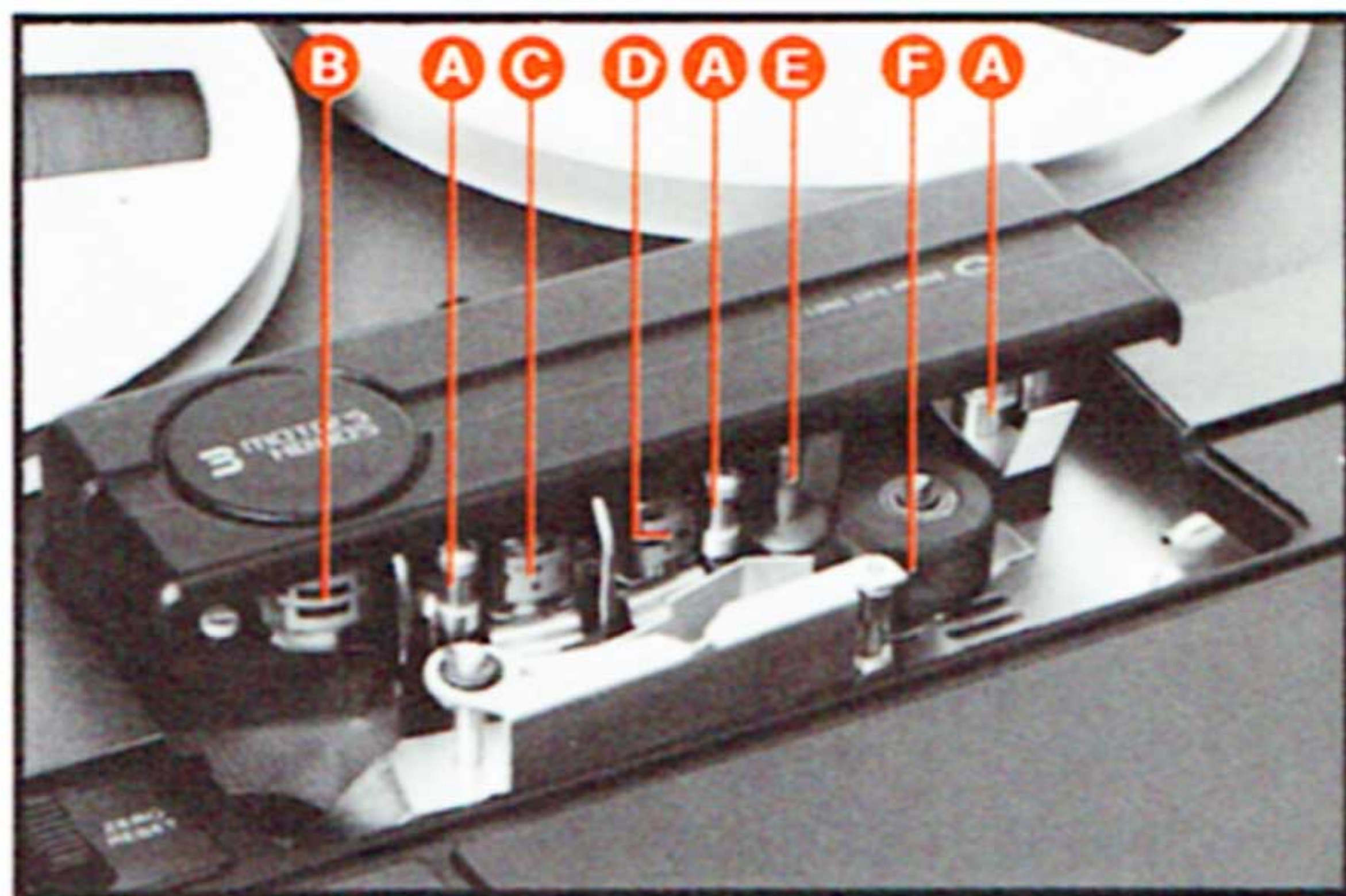
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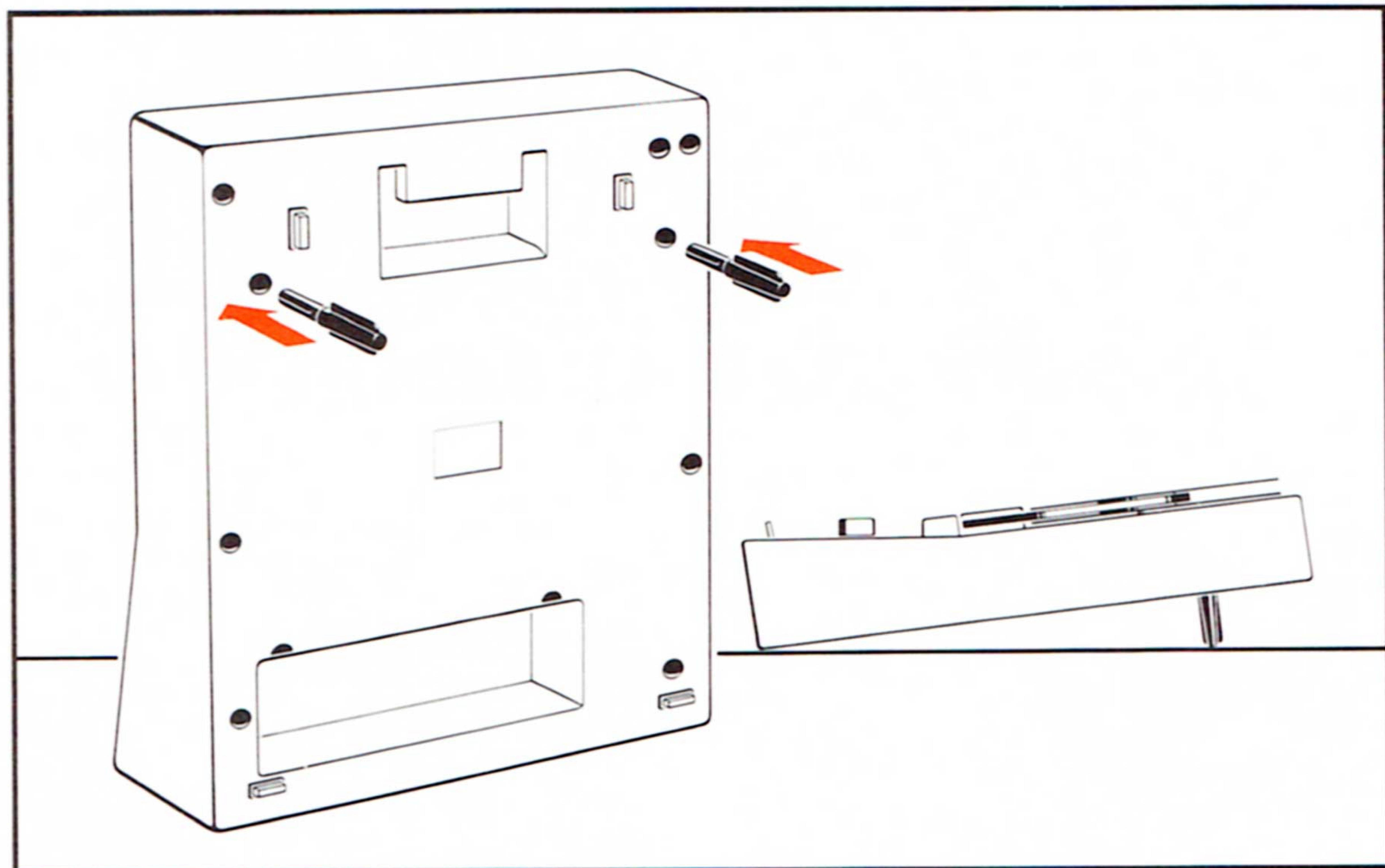
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nal which the record head has put on the tape is reproduced immediately afterwards by the playback head. Thus what you then hear is the signal as recorded. Note that with monitor selector ②① at 'A' and the tape stationary (the pause key being engaged), the playback head gives no signal and so nothing is heard.

— 'B' is the before tape switch position. What is heard in this case is the signal as it sounds before the record head has put it on the tape. With the monitor selector at 'B' and the tape stationary (the pause key being engaged), the signal as it sounds prior to recording is continuously heard.

To monitor, proceed as follows:

- Connect headphones to socket ②⑤ and/or adjust the amplifier - connected to the output receptacles ③① ③② or to the monitor socket ③④ - for monitor playback.
- Set monitor selector ②① to the desired position.
- Adjust the volume and balance for the headphones with controls ①② and ①③. When monitoring through an amplifier the volume is adjusted on the amplifier. If desired, the DNL can also be switched on with switch ②④.

### Playback

The recordings made can be reproduced through:

- Headphones connected to socket ②⑤. Set track selector ②① and speed selector ②② to the positions in which the recording was made, press start key ①⑥, adjust the volume and balance with controls ①② and ①③ and, if desired, switch on the DNL with switch ②④.
- An integrated amplifier, a receiver or a pre-amplifier, the tape play receptacles of which are connected to the receptacles ③① ③② of the recorder (or to the DIN sockets ②⑨ or ③④). Adjust the amplifier for recorder playback and set track selector ②① and speed selector ②② to the positions in which the recording was made. Now press start key ①⑥, adjust the volume, balance etc. on the amplifier and, if desired, switch on the DNL with switch ②④.

### Maintenance

It is advisable to remove at regular intervals the dust and dirt which has collected on the heads. This should be done after, say, every 50 hours of operation or, on average, once a month.

The heads may be cleaned using a soft cloth or a cotton bud. To clean, proceed as follows:

- Ensure that the recorder is disconnected

from the wall outlet.

- Press in the narrow sides of the lower head cover and remove (page 6, fig. 4).
- Moisten the cloth or cotton bud with a little alcohol or spirit.
- Now clean the tape tension controls ②, the tape guides A, the fronts of erase head B, record head C and playback head D, the capstan E and the rubber pressure roller F (page 6, fig. 7). Never use any other cleaning agents and do not touch the heads with sharp or metal objects.
- Allow all parts to dry before replacing the head cover and reconnecting the recorder to the wall outlet.
- *The drive mechanism must not be lubricated!*

### Storage of tapes

After use, return each tape to its box, where it is protected against dust. Store the tapes at room temperature, not in the sun and away from magnetic fields caused by the recorder, radio- and TV-sets and loudspeaker enclosures.

### Technical data

(subject to change without notice)

- Line voltage: 117 V.
- Line frequency: 60 Hz.
- Primary current: approx. 0.4 A.
- Frequency range, acc. to NAB, at:  
19 cm/s (7½ ips): 35-26,000 Hz;  
9.5 cm/s (3¾ ips): 35-20,000 Hz;  
4.75 cm/s (1⅞ ips): 35-11,500 Hz.
- Signal-to-noise ratio, acc. to NAB, without DNL, at:  
19 cm/s (7½ ips): ≥ 60 dB;  
9.5 cm/s (3¾ ips): ≥ 60 dB;  
4.75 cm/s (1⅞ ips): ≥ 58 dB.
- Improvement of the signal-to-noise ratio in the 4,000-14,000 Hz range using the DNL: ≥ 10 dB (via a 5.6 kHz HP-filter - 18 dB/oct).
- Wow and flutter acc. to NAB (WRMS) at:  
19 cm/s (7½ ips): ≤ 0.05%;  
9.5 cm/s (3¾ ips): ≤ 0.07%;  
4.75 cm/s (1⅞ ips): ≤ 0.2%.
- Maximum speed deviation: ≤ ± 1%.
- Suitable for reels up to 7" (18 cm) diameter.
- Dimensions, width x height x depth: approx. 16⅜" x 16¾" x 7¼" (415 x 425 x 185 mm).
- Weight: approx. 18 pounds (8.2 kg).
- Socket ②⑤, headphones: impedance 600 Ω.
- Sockets ②⑥ and ②⑦, microphones: nominal input sensitivity 0.2 mV/2 kΩ.
- Socket ②⑨, DIN line in/out: nominal input sensitivity 2 mV/20 kΩ (pins 1 and 4) or 100 mV/1 MΩ (pins 3 and 5);



nominal output voltage 250 mV/5 k $\Omega$ , load impedance  $\geq 50$  k $\Omega$  (pins 3 and 5, no output signal during recording).

- Receptacles ③② ③③: nominal output voltage 250 mV/5 k $\Omega$ , load impedance  $\geq 50$  k $\Omega$  (output signal during recording and playback).

- Receptacles ③② ③③: nominal input sensitivity 100 mV/1 M $\Omega$ .

- Socket ③④, DIN monitor: nominal output voltage 250 mV/5 k $\Omega$ , load impedance  $\geq 50$  k $\Omega$  (pins 3 and 5, output signal during recording and playback).

- Socket ③⑤, remote control unit (motor circuit breaker), pins 1 and 5.