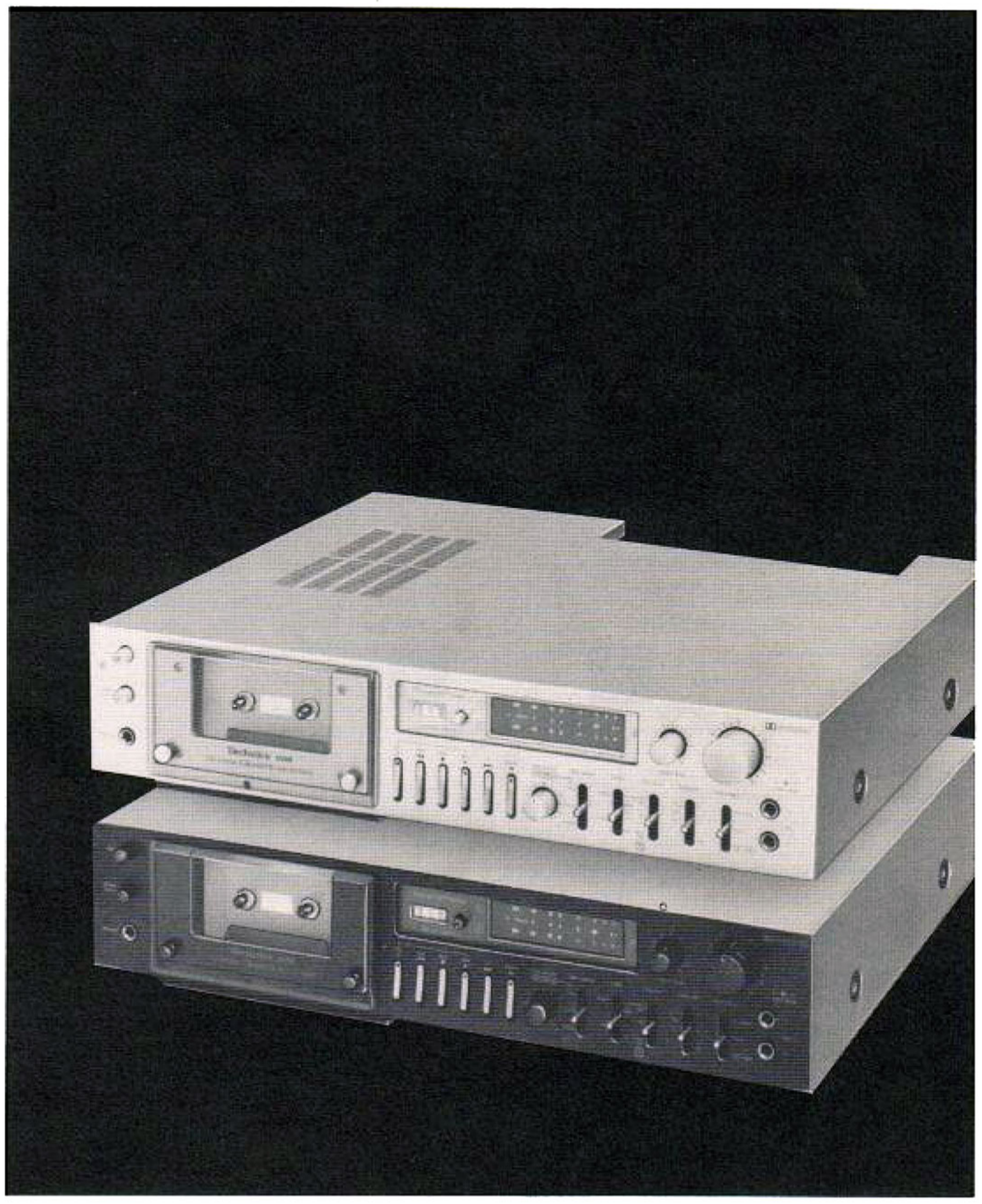
Technics

TAPE DECK

RS-M88

OPERATING INSTRUCTIONS



Before operating this set, please read these instructions completely.

IMPORTANT (FOR ENGLAND)

THE WIRES IN THIS MAINS LEAD ARE COLOURED IN ACCORDANCE WITH THE FOLLOWING CODE:

BLUE: NEUTRAL BROWN: LIVE

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

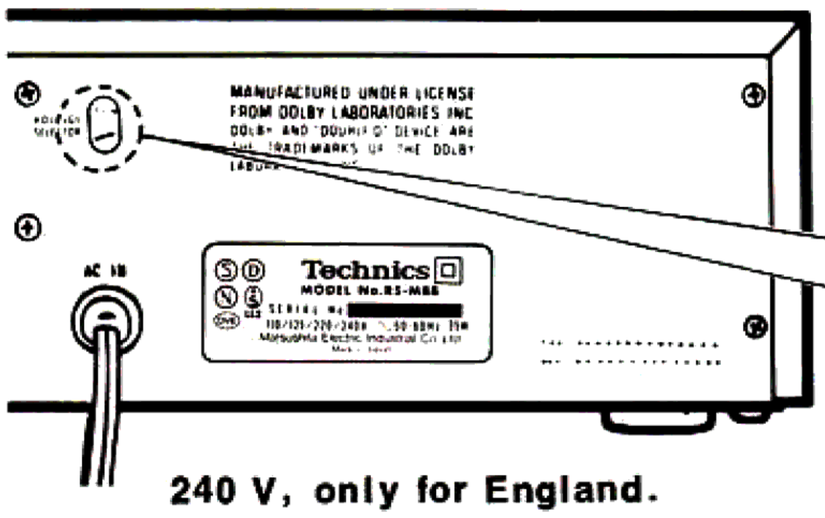
* The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.
* The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

If a 13-amp (B.S. 1363) plug is used, a 3-amp fuse must be fitted, or if any other type of plug is used, a 5-amp fuse must be fitted either in the plug or adaptor or at the distribution board.

NOTICE:

This apparatus was produced to B.S.800:1977

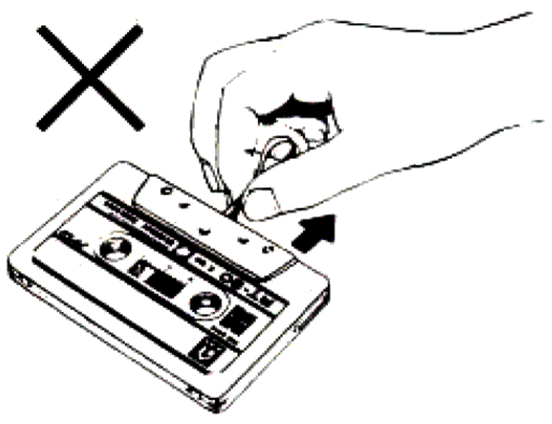
1 VOLTAGE ADJUSTMENT / SPÄNNINGSJUSTERING / REGLAGE DU VOLTAGE / INSTELLING VAN DE NETSPANNING / INDSTLLING AF SPÆNDINGEN / EINSTELLEN DER SPANNUNG / REGOLAZIONE DEL TENSIONE

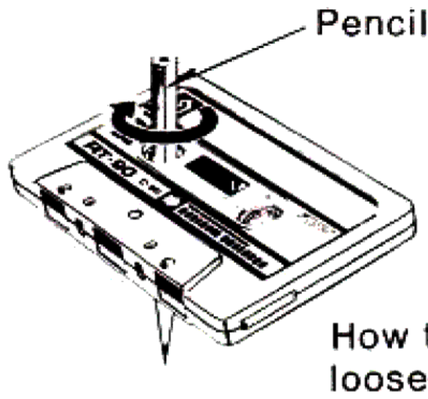


240 V, only for England.

• SETTING OF VOLTAGE SELECTOR • INSTÄLLNING AV SPÄNNINGSVÄLJAREN • REGLAGE DU SELECTEUR DE VOLTAGE • STAND VAN DE NETSPANNINGS SELEKTOR • SPÆNDINGSVÆLGERENS STILLING • EINSTELLUNG DES SPANNUNGSWAHLERS • POSIZIONE DEL SELETTORE DELLA TENSIONE	110V 110V	125V 125V	220V 220V	240V 240V
• LOCAL VOLTAGE • LOKAL SPÄNNING • TENSION LOCALE • PLAATSELIJKE NETSPANNING • DEN STEDLIGE NETSPÆNDING • ÖRTL. NETSPANNUNG • TENSIONE DEL LUOGO	AC: 110, 115V 50-60 Hz	AC: 120, 125, 127V 50-60 Hz	AC: 210, 220V 50-60 Hz	AC: 230, 240, 250V 50-60 Hz

2 ABOUT CASSETTE TAPE / OM KASSETTBÅND / LES CASSETTES / KASSETTE BAND / OM KASSETTEBAND / DIE CASSETTE



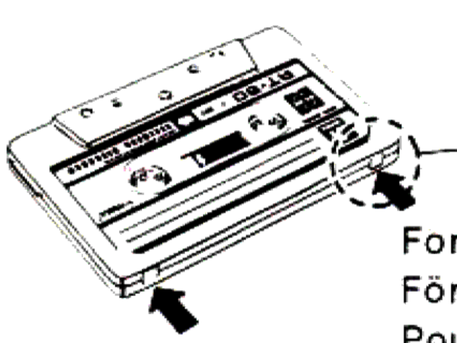


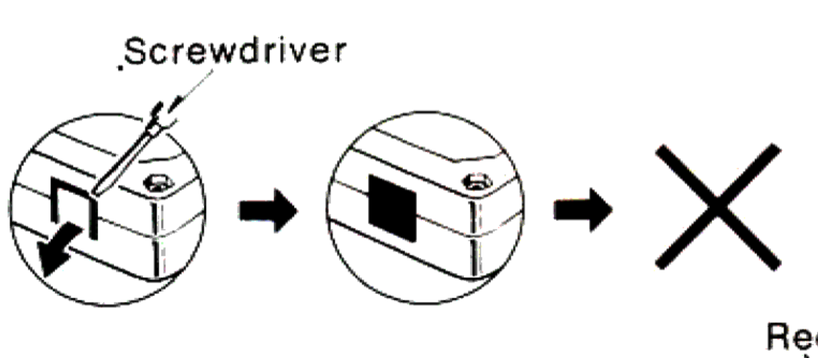
How to correct tape looseness.

Use standard cassette.

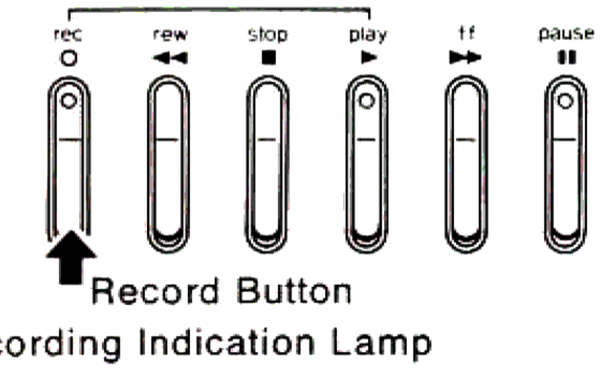
Do not use this type.

3 ACCIDENTAL-ERASE PREVENTION / SKYDD MOT OAVSIKTLIG RADERING / DISPOSITIF DE PREVENTION D'EFFACEMENT ACCIDENTEL / VOORKOMEN VAN ABUISIEVELIJK UITWISSEN / BESKYTTELSE MOD SLETNING / LÖSCHSCHUTZVORRICHTUNG / PREVENZIONE DELLE CANCELLAZIONI INVOLONTARIE





Cover hole with cellophane tape.



*'Dolby'and the double-D symbol are trademarks of Dolby Laboratories.

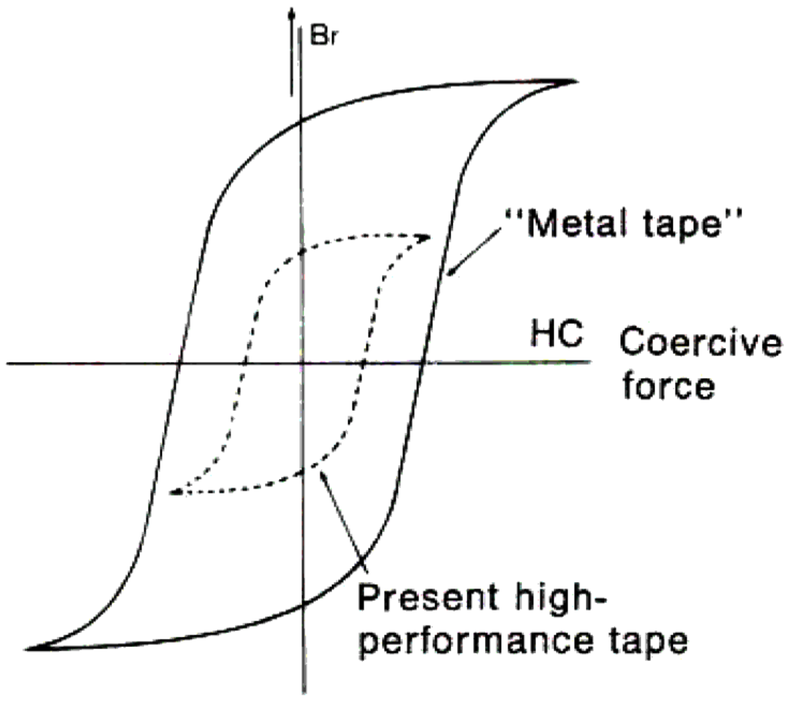
4

- **"Metal tape"**
- **"Metal tape"**
- **"Metal tape"**

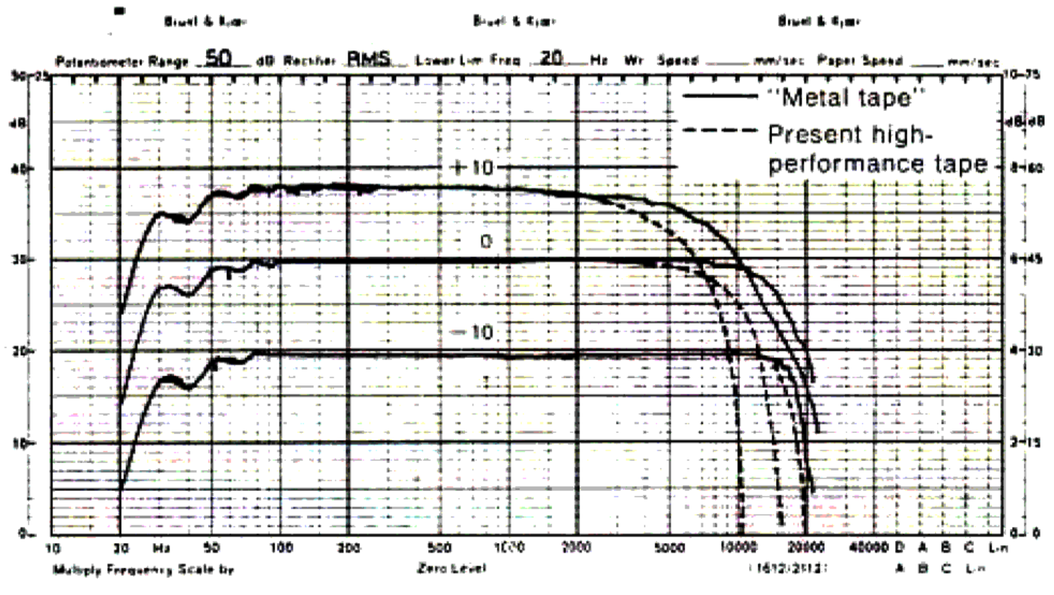
- **"Metal tape"**
- **"Metal tape"**
- **"Metal tape"**

- **"Metal tape"**

- "Metal tape" magnetic characteristics
- Magnetisk karakteristik för "Metal tape"
- Caractéristiques magnétiques de bande la "Metal tape"
- Magnetische karakteristieken van de "Metal tape"
- Magnetisk karakteristik for metalbånd (Metal tape)
- Mangnetisierungskennlinie des "Metal tape"
- Caratteristiche nastro magnetico "Metal tape"



- "Metal tape" frequency response example
- Exempel på frekvensgång med "Metal tape"
- Exemple de courbe de réponse de la bande "Metal tape"
- Voorbeeld van weergeefkarakteristick van "Metal tape"
- Frekvensgang for et metalbånd (Metal tape)
- Frequenzgang des "Metal tape"
- Esempio risposta di frequenza nastro "Metal tape"



5

CONNECTIONS

ANSLUTNINGAR

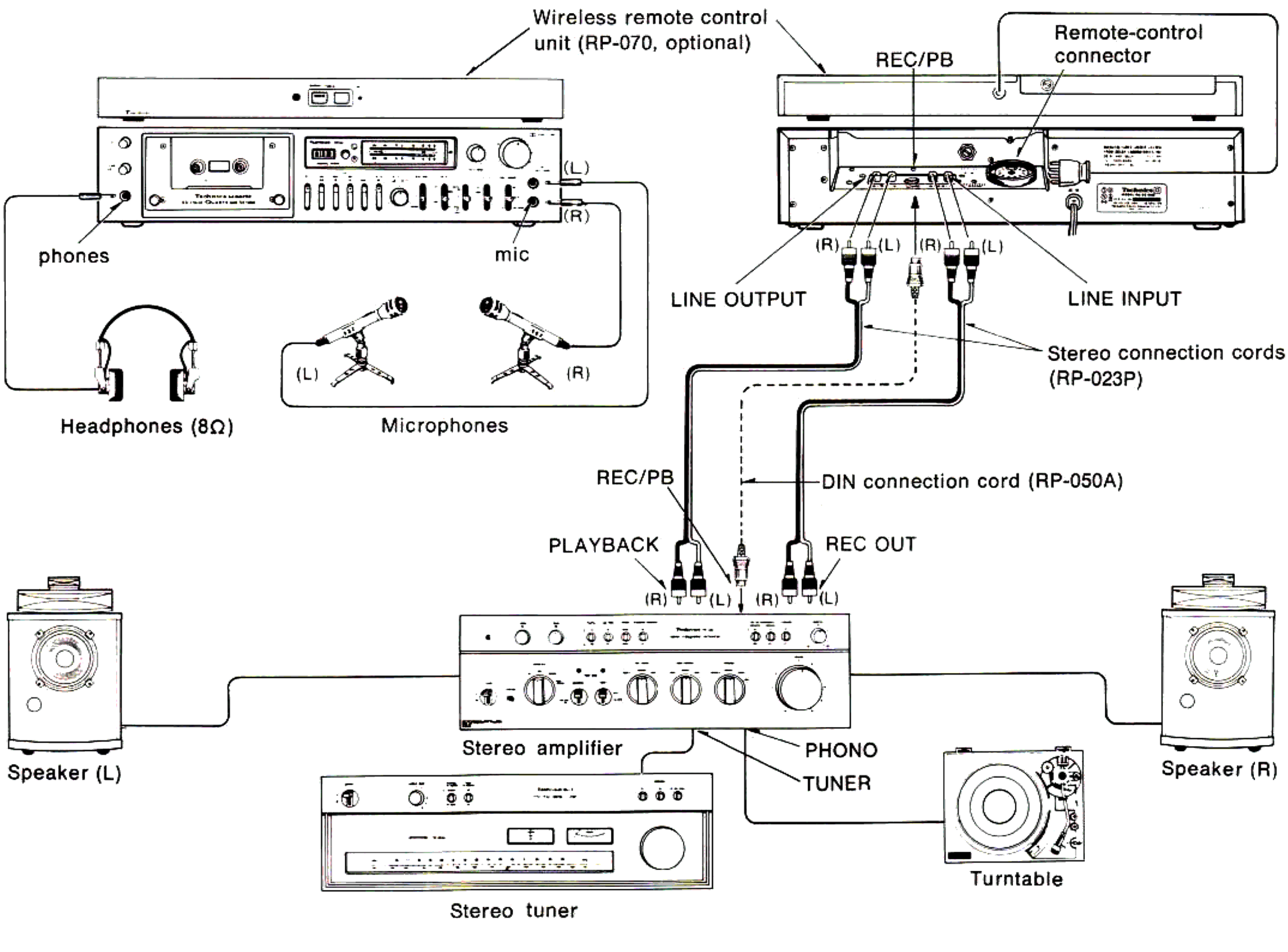
BRANCHEMENTS

AANSLUITINGEN

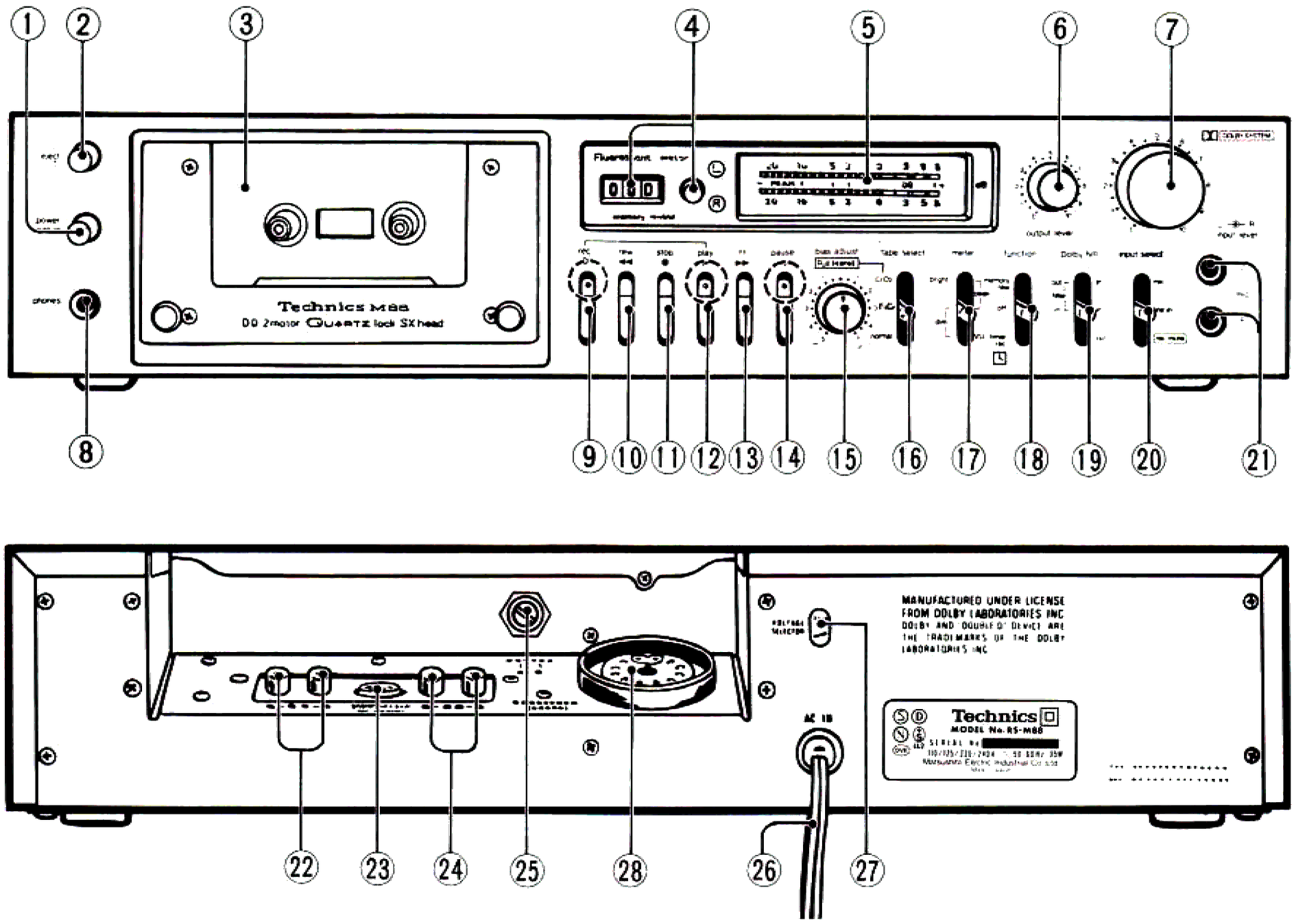
TILSLUTNING

ANSCHLÜSSE

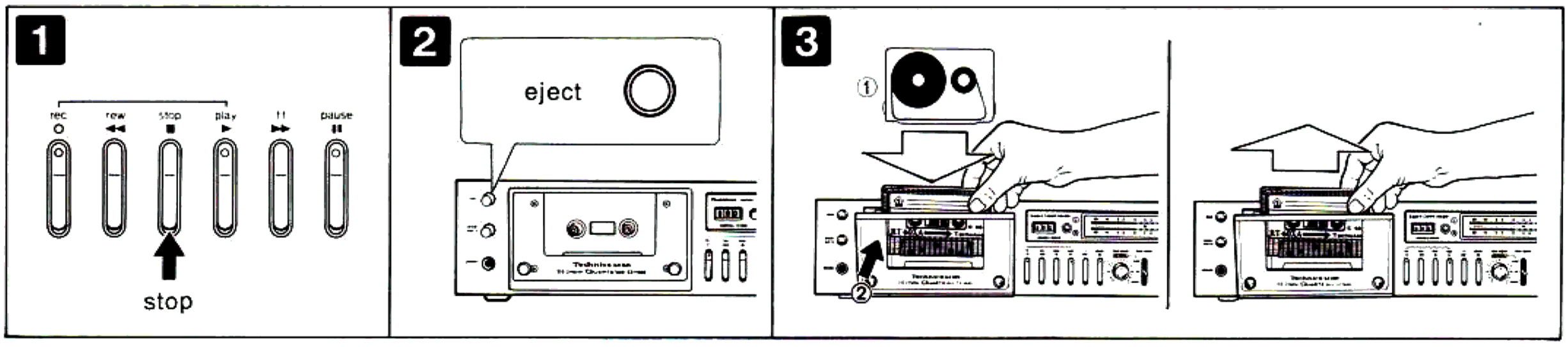
COLLEGAMENTI



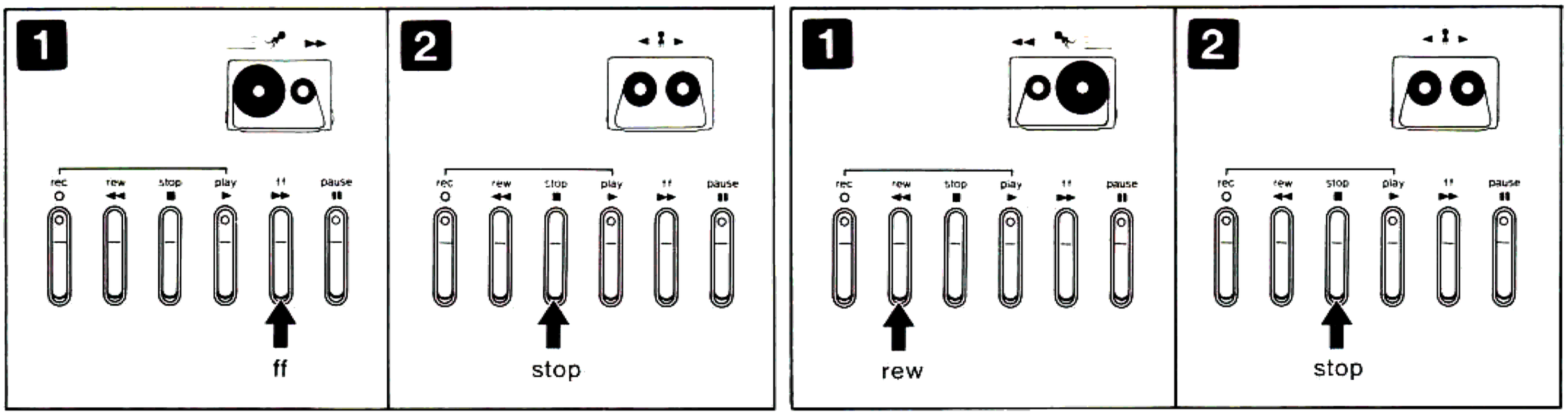
6 CONTROLS
KONTROLLER
LES COMMANDES
BEDIENINGSKNOPPEN
BETJENING
BEDIENUNGSELEMENTE
CONTROLLI



7 CASSETTE INSERTION AND REMOVAL
ILAGGNING OCH UTTAGNING AV KASSETTEN
MISE EN PLACE ET ENLEVEMENT DES CASSETTES
KASSETTE INLEGGEN EN UITNEMEN
ISÆTNING OG UDTAGING AV KASSETTEN
EINLEGEN UND ENTNEHMEN DER CASSETTEN
INSERZIONE ED ESTRAZIONE DELLA CASSETTA



8 FAST FORWARD AND REWIND
FRAM-OCH ÅTERSPOLNING
BOBINAGE RAPIDE ET REBOBINAGE
SNEL OPSPOELEN EN TERUGSPOELEN
HURTIG FREMSPOLING OG TILBAGESPOLING
SCHNELLVORLAUF UND RÜCKLAUF
AVANTI RAPIDO E RIAVVOLGIMENTO



9

TAPE SELECTOR SETTINGS FOR VARIOUS TAPES

BANDVÄLJARENS LÄGE FÖR TYPER AV BAND

BAND SELEKTOR POSITIES VOOR VERSCHILLENDE SOORTEN BANDEN

INDSTILLING AF BÅNDVÆLGEREN FOR FORSKELLIGE BÅNDTYPER

POSITION DU SELECTEUR DE BANDE POUR DIFFERENTES BANDES

WAHLSCHALTERSTELLUNG FÜR VERSCHIEDENE BÄNDER

POSIZIONI DEL SELETTORE DEL NASTRO PER I VARI TIPI DI NASTRO

Tape selector	Tape Brand	Tape Type
normal	Technics XD	C-45, C-60, C-90
	Technics LN	C-60, C-90
	BASF PROFETIONAL I	C-60, C-90
	BASF LH I	C-60, C-90
	BASF SLH	C-60, C-90
	FUJI FX I	C-60, C-90
	MAXELL UD	C-60, C-90
	MAXELL UDXL I	C-60, C-90
	SONY AHF	C-60, C-90
	TDK AD	C-60, C-90
Fe-Cr	BASF ferrochrom	C-60, C-90
	SONY Fe-Cr	C-60
CrO_2	Technics XA	C-45, C-60, C-90
	FUJI FX II	C-45, C-60, C-90
	MAXELL UDXL II	C-60
	SCOTCH MASTER II	C-45, C-60
	TDK SA	C-45, C-60
Metal		

10

SETTINGS OF THE BIAS-ADJUSTMENT CONTROL FOR VARIOUS BRANDS OF "LOW-NOISE" TAPE

INSTÄLLNINGAR AV KONTROLLEN FÖR FÖRSPÄNNINGSJUSTERING FÖR OLIKA MÄRKEN AV "LÅGBRUS" BAND

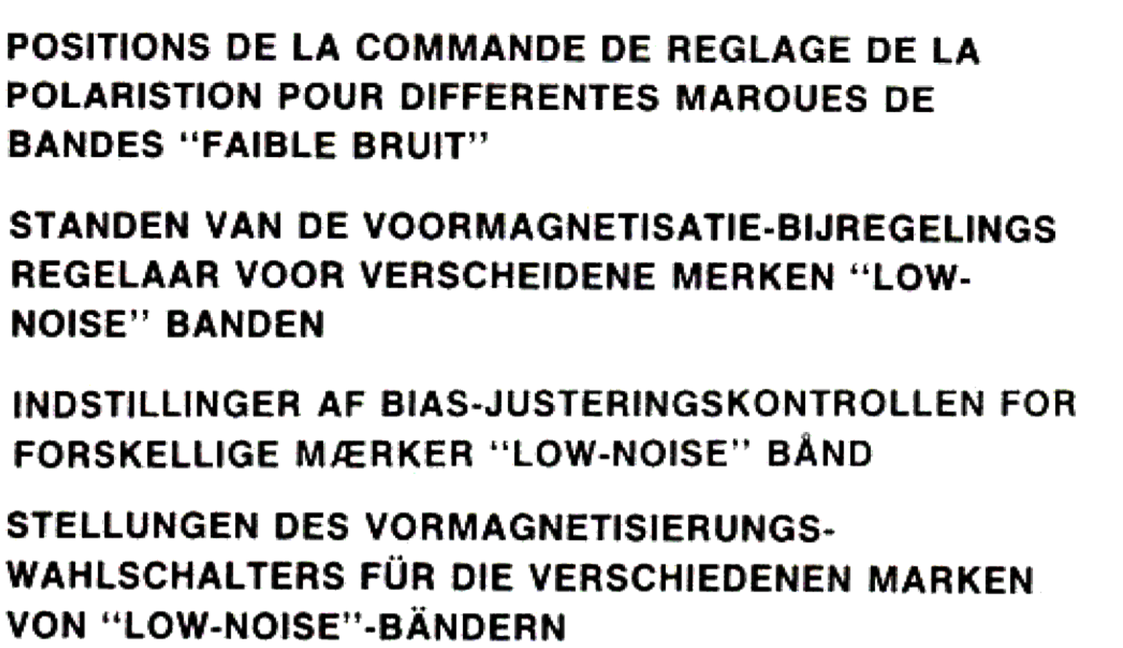
POSITIONS DE LA COMMANDE DE REGLAGE DE LA POLARISTION POUR DIFFERENTES MAROUES DE BANDES "FAIBLE BRUIT"

STANDEN VAN DE VOORMAGNETISATIE-BIJREGELINGS REGELAAR VOOR VERSCHEIDENE MERKEN "LOW-NOISE" BANDEN

INDSTILLINGER AF BIAS-JUSTERINGSKONTROLLEN FOR FORSKELLIGE MÆRKER "LOW-NOISE" BÅND

STELLUNGEN DES VORMAGNETISIERUNGS-WAHLSCHALTERS FÜR DIE VERSCHIEDENEN MARKEN VON "LOW-NOISE"-BÄNDERN

POSIZIONI DEL CONTROLLO DI REGOLAZIONE DELLA POLARIZZAZIONE PER I DIVERSI TIPI DI NASTRO "BASSO RUMORE"



FREQUENCY RESPONSE VS. BIAS LEVEL

FREKVENSGÅNG VID ÄNDRING AV BIAS

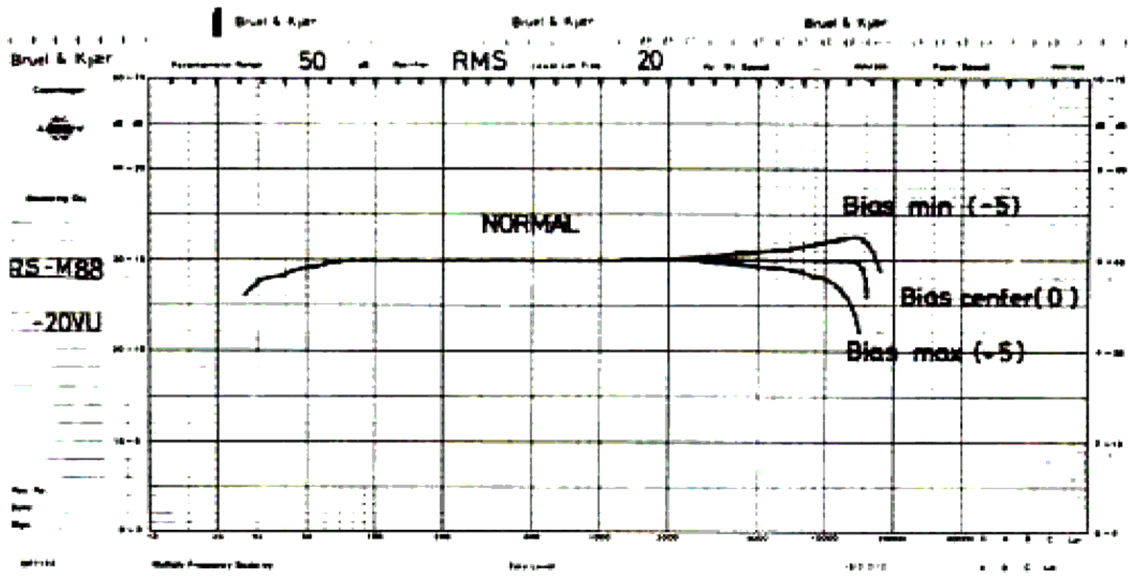
COURBE DE REPONSE LORS DU CHANGEMENT DE LA POLARISATION

FREKWENTIE BEANTWOORDING MET VERANDERING VAN VOORMAGNETISATIE

FREKVENSGANG MED FORSKELLIGE BIAS JUSTERINGER FOR DET SAMME BÅND

FREQUENZGANG BEI GEÄNDERTER VORMAGNETISIERUNGS-EINSTELLUNG

RISPOSTA DELLA FREQUENZA COL CAMBIAMENTO DEL LIVELLO DI POLARIZZAZIONE



11 PLAYBACK / AVSPELNING / LECTURE / TERUGSPELEN / AFSPILNING / WIEDERGABE / ASCOLTO

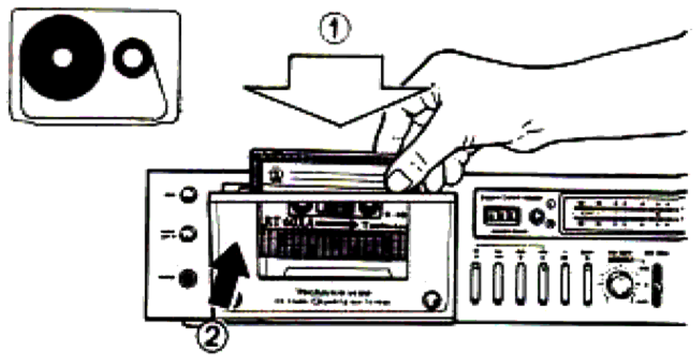
1

power
push on

2

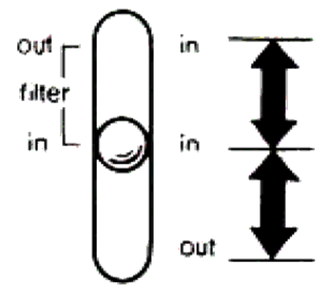
eject

3



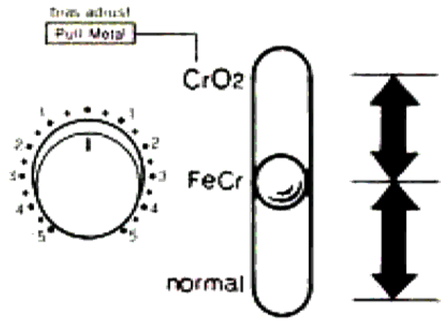
4

Dolby NR



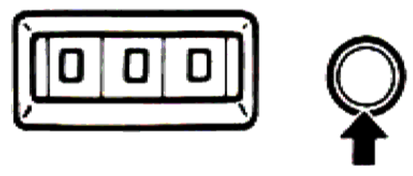
5

tape select



- Refer to fig. 9.
- Se fig. 9.
- Se reporter á fig. 9.
- Zie fig. 9.
- Se fig. 9.
- Siehe Abb. 9.
- Vedere la Fig. 9.

6



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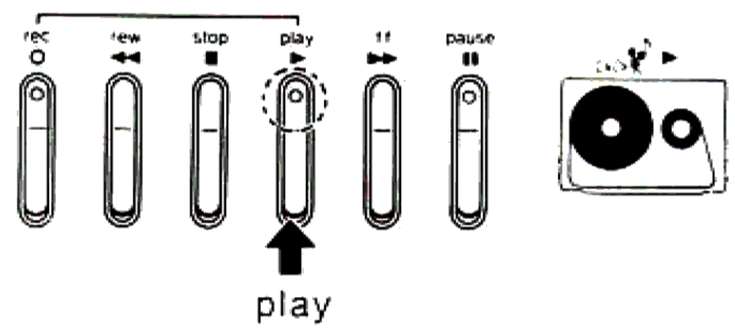
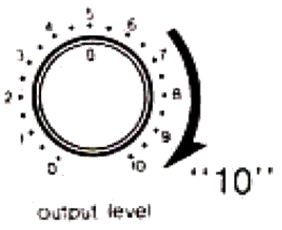


play

8



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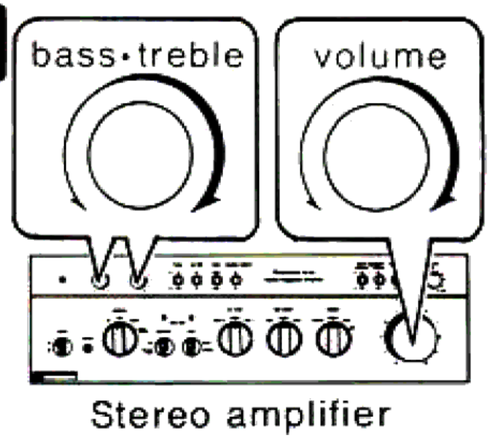
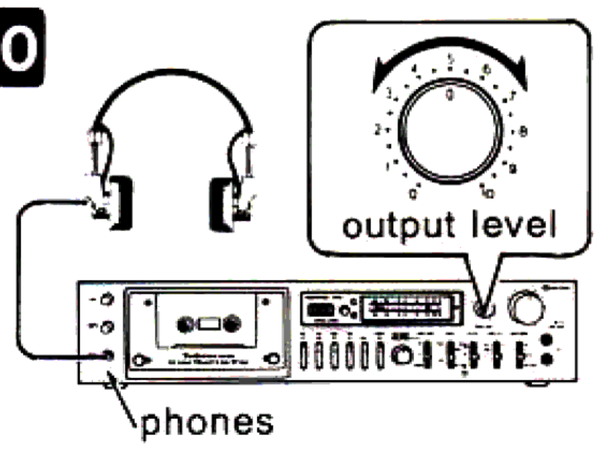


Stereo amplifier

10



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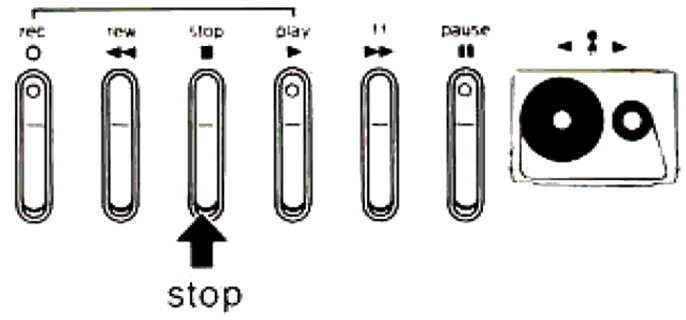
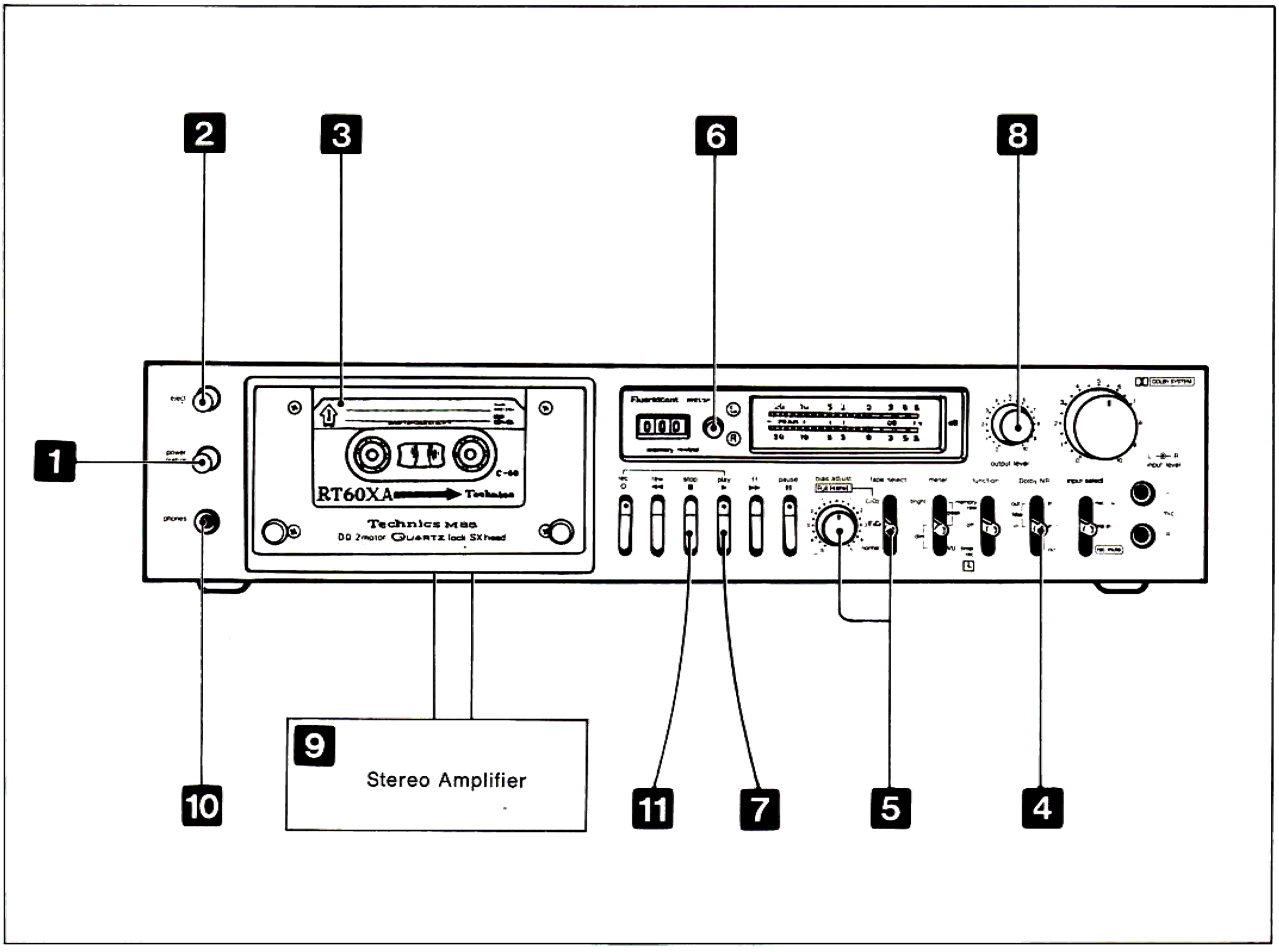


stop



12

RECORDING
INSPELNING
ENREGISTREMENT
OPNEMEN
INDSPILNING
AUFNAHME
REGISTRAZIONE

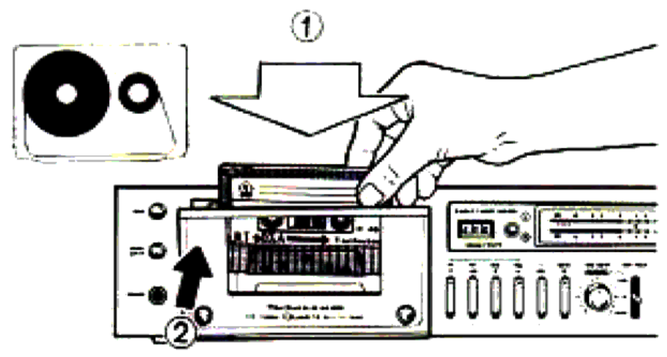
1

power
push on

2

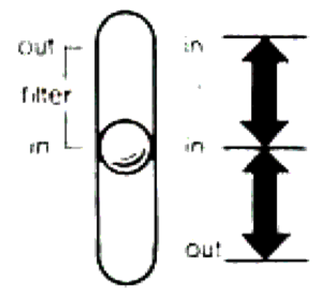
eject

3



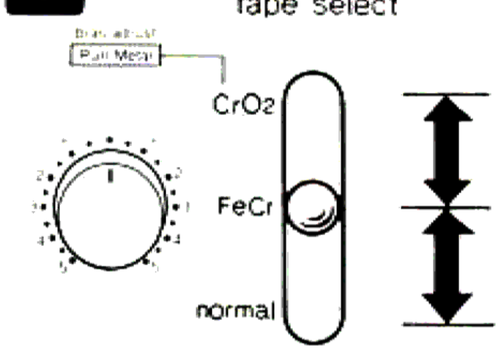
4

Dolby NR



5

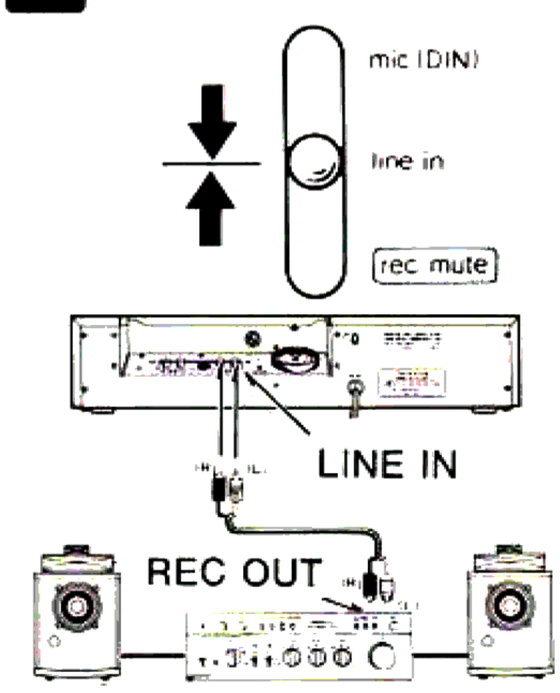
tape select



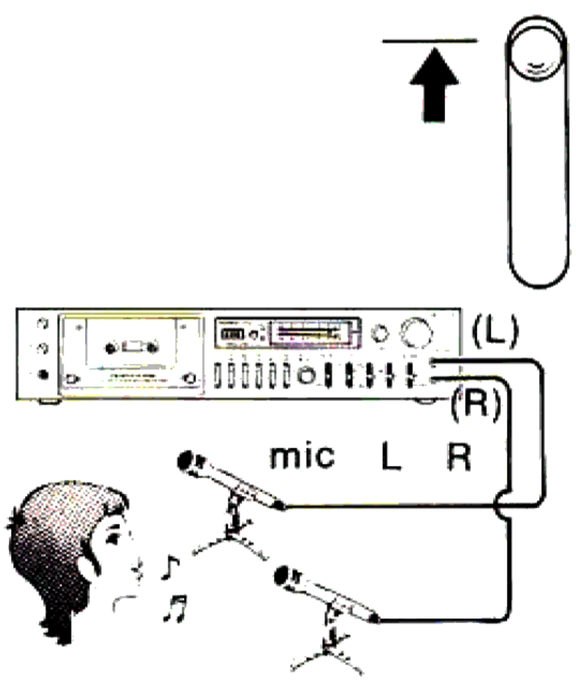
- Refer to fig. 9.
- Se fig. 9.
- Se reporter á fig. 9.
- Zie fig. 9.
- Se fig. 9.
- Siehe Abb. 9.
- Vedere la Fig. 9.

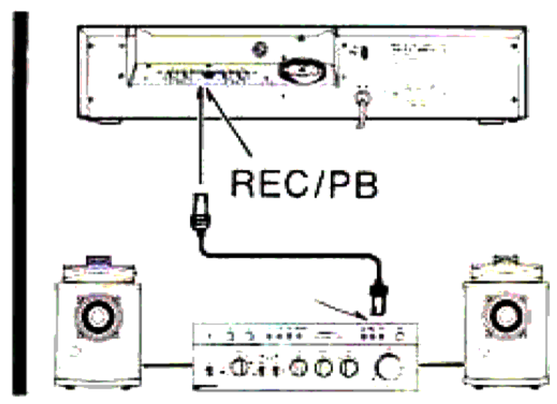
6

input select



input select





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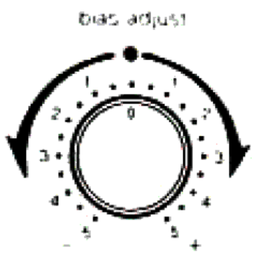
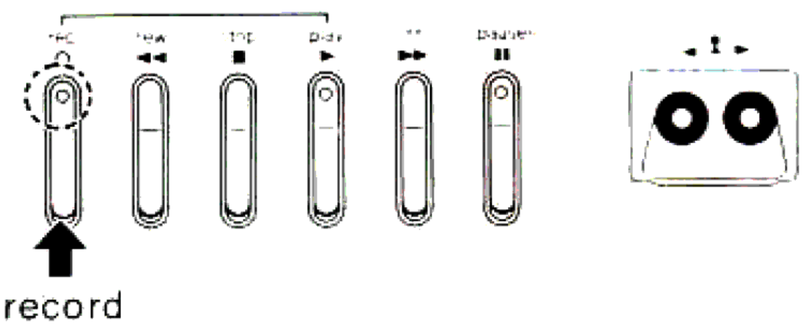


- See page E-2.
- Se sid SV-2.
- Voir page F-2.
- Zie naar blad N-2.
- Se side D-2.
- Siehe Seite D-2.
- Vedere a pag. I-2.

8



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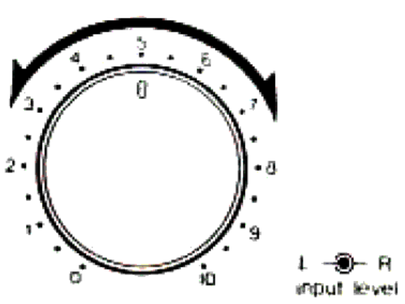
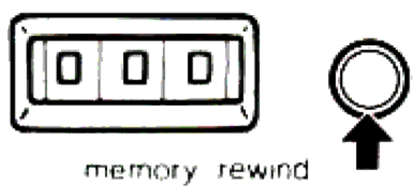


- Refer to fig. 13.
- Se fig. 13.
- Se reporter á fig. 13.
- Zie fig. 13.
- Se fig. 13.
- Siehe Abb. 13.
- Vedere la Fig. 13.

10



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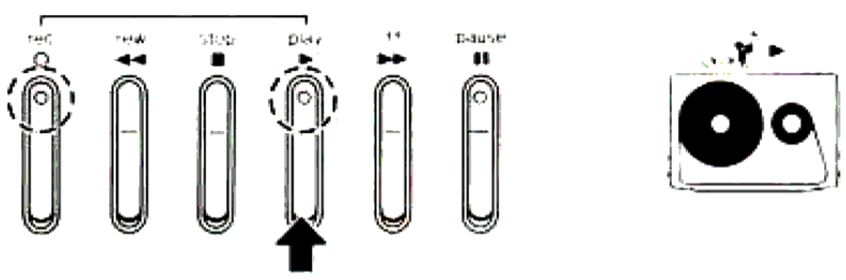

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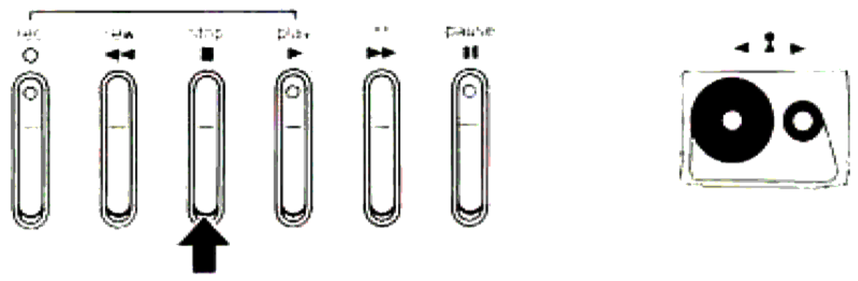
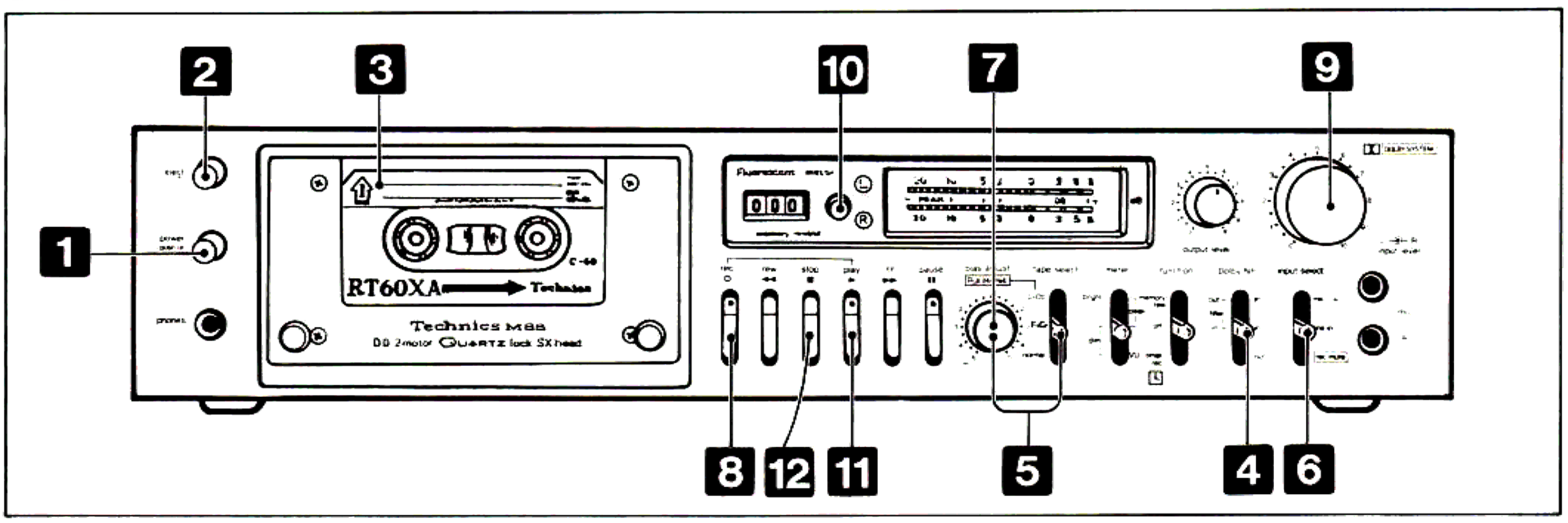
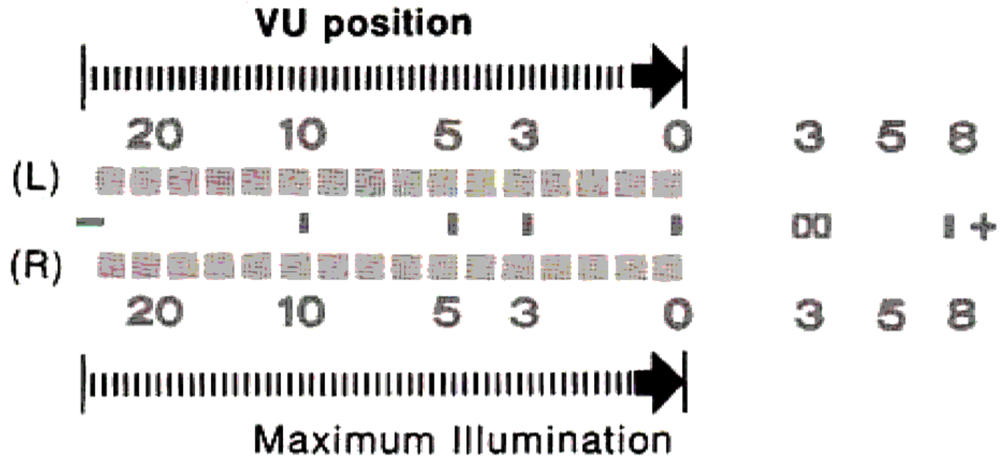




13

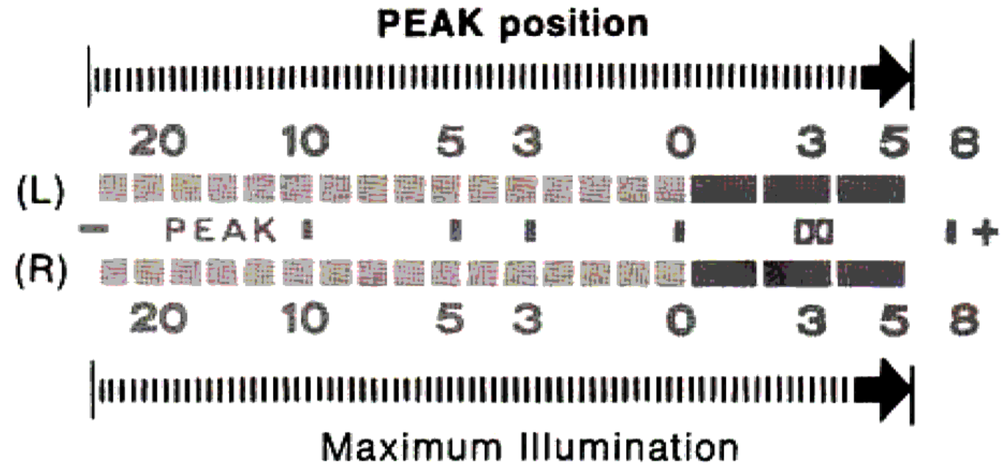
- **RECORDING LEVEL ADJUSTMENT**
- **REGLERING AV INSPELNINGSNIVÅ**
- **REGLAGE DU NIVEAU D'ENREGISTREMENT**
- **REGOLAZIONE DEL LIVELLO DI REGISTRAZIONE**
- **INSTELLING VAN HET OPNAMENIVEAU**
- **REGULERING AF INDSPILNINGSNIVEAU**
- **EINSTELLEN DES AUFNAHMEPEGELS**

VU position

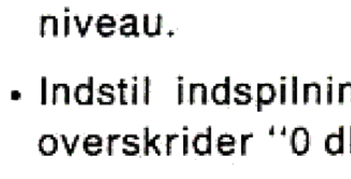


- Make the adjustment so that the illumination is up to the "0 dB" indication, but does not exceed it, at maximum input signal level.
- Reglera med nivåkontrollerna så att mätarna lyser upp till "0 dB" utan att överskrida denna nivå vid maximal insignal. Maximal upplysning.
- Procéder à un réglage de telle sorte que l'illumination arrive au point "0 dB" sans toutefois le dépasser, au niveau de signal d'entrée maximal.
- Effettuate la regolazione in modo che l'illuminazione raggiunga l'indicazione "0 dB" al livello massimo di ingresso del segnale senza superaria.
- Stel zodanig in dat de verlichting tot de 0 dB aanduiding komt, maar deze niet overschrijdt bij maximaal ingangsniveau.
- Indstil indspilningsniveauet således, at udslagene ikke overskrider "0 dB" mærket i de craftigste passager.
- Die Einstellung so vornahmen, daß die Beleuchtung bis zur Anzeige "0 dB" reicht, diese aber bei maximalem Eingangssignalpegel nicht überschreitet.

PEAK position

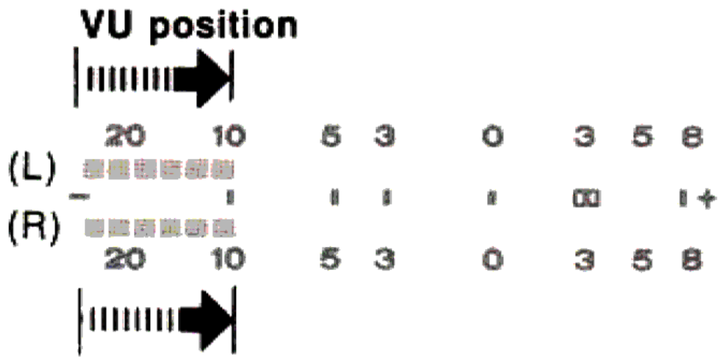


- Make the adjustment so that the illumination is up to the " +5 dB" indication, but does not exceed it, at maximum input signal level.
- Reglera så att mätarna lyser upp till " +5 dB" utan att överskrida denna nivå vid maximal insignal.
- Procéder à un réglage de telle sorte que l'illumination arrive au point " +5 dB", sans toutefois le dépasser, au niveau de signal d'entrée maximal.
- Effettuate la regolazione in modo ché l'illuminazione raggiunga l'indicazione " +5 dB" al livello massimo del segnale in ingresso senza superaria.
- Stel zodanig in dat de verlichting tot de +5 dB aanduiding komt, maar deze niet overschrijdt bij maximaal ingangsniveau.
- Indstil indspilningsniveauet således, at udslagene ikke overskrider +5 dB mærket i de kraftigste passager.
- Die Einstellung so vornehmen, daß die Beleuchtung bis zur Anzeige " +5 dB" reicht, diese aber bei maximalem Eingangssignalpegel nicht überschreitet.

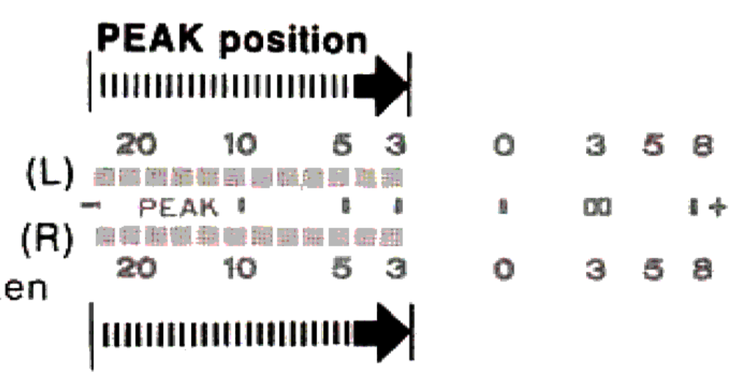


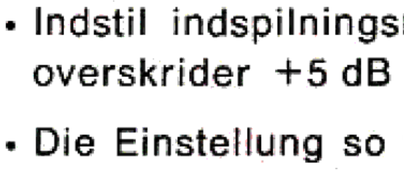
Momentary sound
Momentant
Son momentane
Kortstondig geluid
Kortvarig lydimpuls
Momentane Klangspitzen
Suono momentaneo

VU position



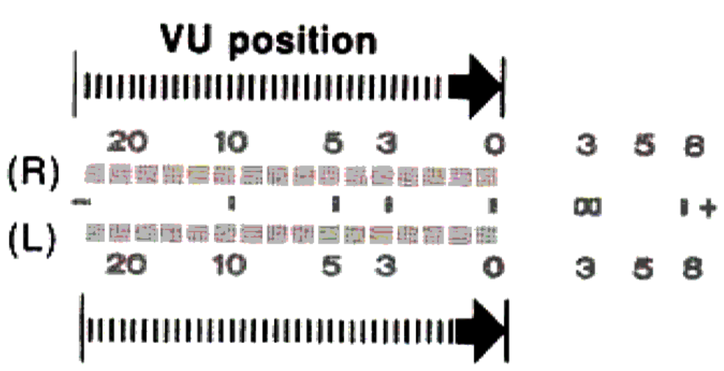
PEAK position



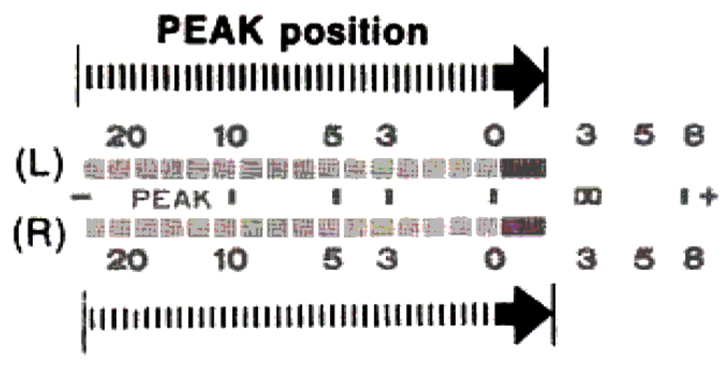


Continuous sound
Kontinuerligt
Son continu
Aanhoudend geluid
Fortsatte lydimpulser
Kontinuierlicher Klang
Suono continuo

VU position



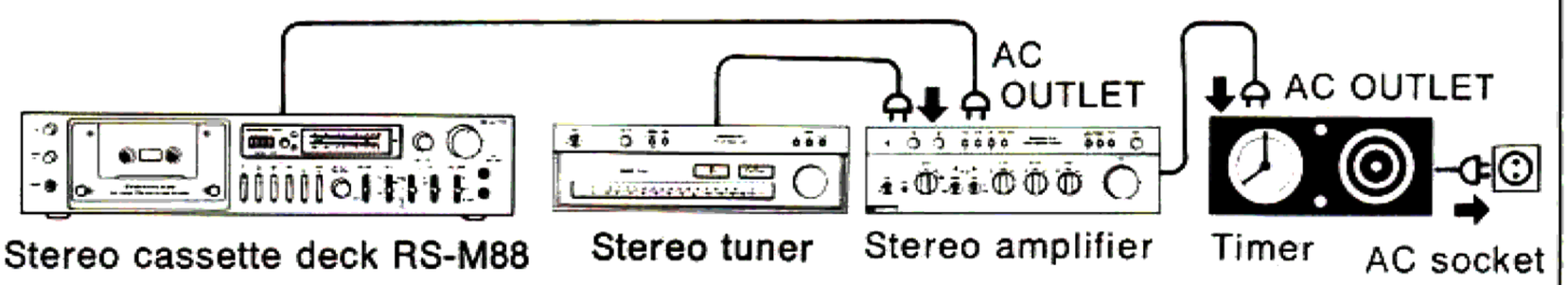
PEAK position



14

TIMER RECORDING AND PLAYBACK
INSPELNING OCH AVSPELNING MED TIDUR
ENREGISTREMENT ET LECTURE AVEC MINUTERIE
TIJDKLOK OPNAMEN EN TERUGSPELINGEN
INDSPILNING OG AFSPILNING MED PROGRAMUR
AUFNAHME UND WIEDERGABE MIT EINER SCHALTUHR
REGISTRAZIONE E ASCOLTO COL TEMPORIZZATORE

- Connections to the power source
- Nätanslutning
- Branchements à l'alimentation
- Aansluitingen aan het voedings net
- Tilslutningsmuligheder på strom for syning
- Anschluß ans Netz
- Collegamento a rete



■ **Recording with a timer**
■ **Inspelning med tidur**

■ **Enregistrement avec minuterie**
■ **Opname met een tijdklok**

■ **Indspilning med programur**
■ **Aufnahme mit einer Schaltuhr**
■ **Registrazione col temporizzatore**

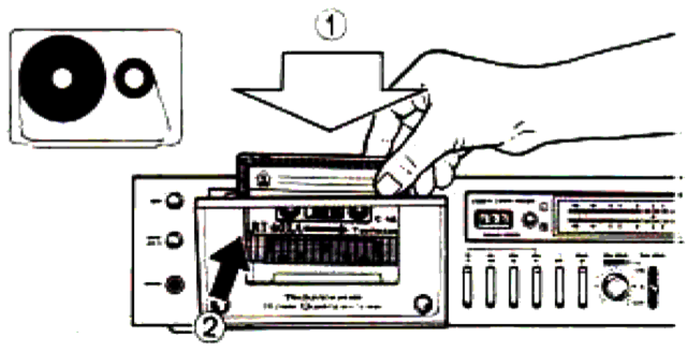
1

power
push on

2

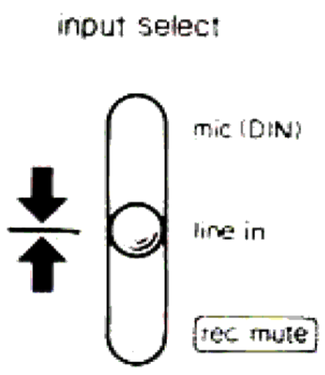
eject

3



- See to page E- 4.
- Se sid SV- 4.
- Voir page F- 4.
- Zie naar blad N- 4.
- Se side D- 4.
- Siehe Seite D- 4.
- Vedere a pag. E-4

4



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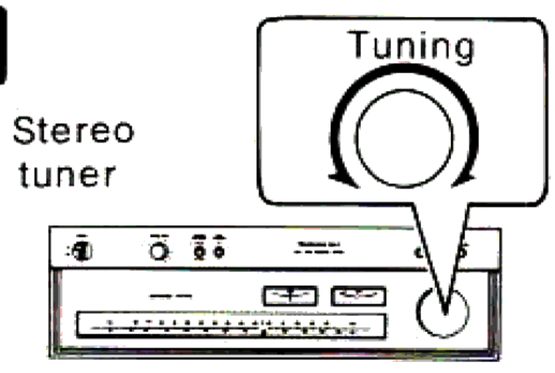
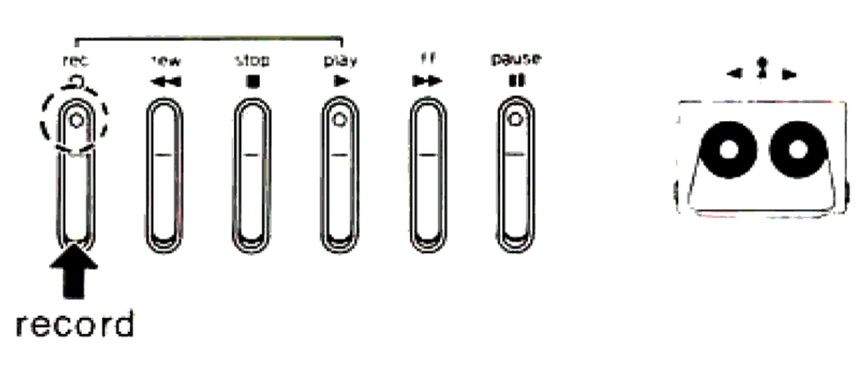
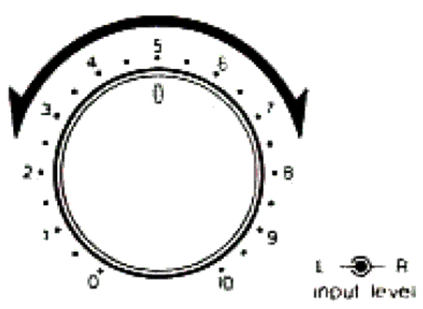


6



7



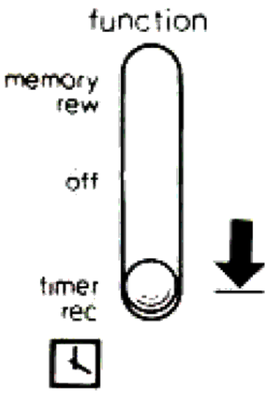
- See to page E-3.
- Se sid SV-3.
- Voir page F-3.
- Zie naar blad N-3.
- Se side D-3.
- Siehe Seite D-3.
- Vedere a pag. I-3.

8

Timer

- See to page E- 4.
- Se sid SV- 4.
- Voir page F- 4.
- Zie naar blad N- 4.
- Se side D- 4.
- Siehe Seite D- 4.
- Vedere a pag. I-4

9



■ **Playback with a timer**
■ **Avspelning med tidur**

■ **Lecture avec minuterie**
■ **Terug spelen met behulp van een tijdklok**

■ **Afspilning med programur**
■ **Wiedergabe mit einer Schaltuhr**
■ **Ascolto col temporizzatore**

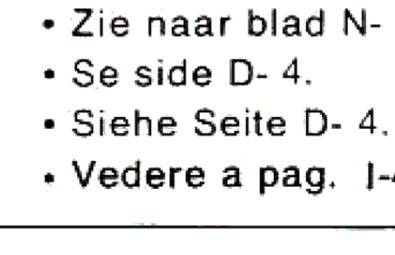
1

power
push on

2

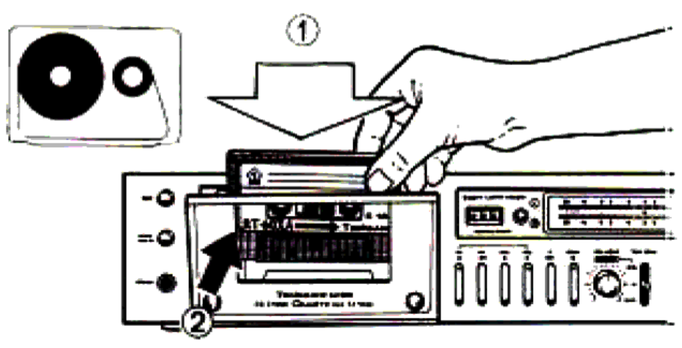
eject

3



- See to page E- 4.
- Se sid SV- 4.
- Voir page F- 4.
- Zie naar blad N- 4.
- Se side D- 4.
- Siehe Seite D- 4.
- Vedere a pag. I-4

4



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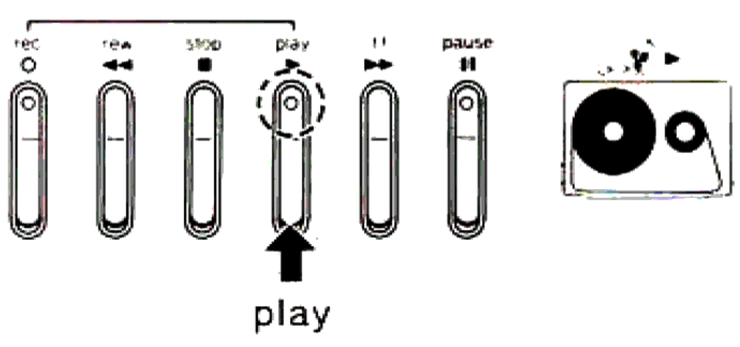
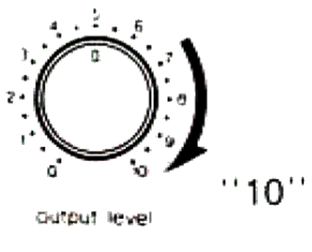


6



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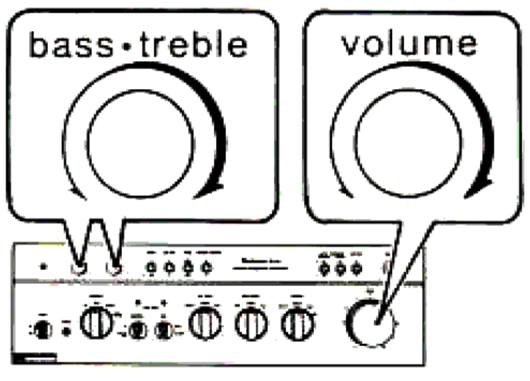
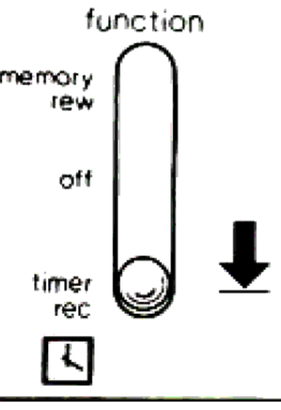


8

Timer

- See to page E- 4.
- Se sid SV- 4.
- Voir page F- 4.
- Zie naar blad N- 4.
- Se side D- 4.
- Siehe Seite D- 4.
- Vedere a pag. I-4

9



15

MEMORY REWIND

ÅTERSPOLNINGSMINNE

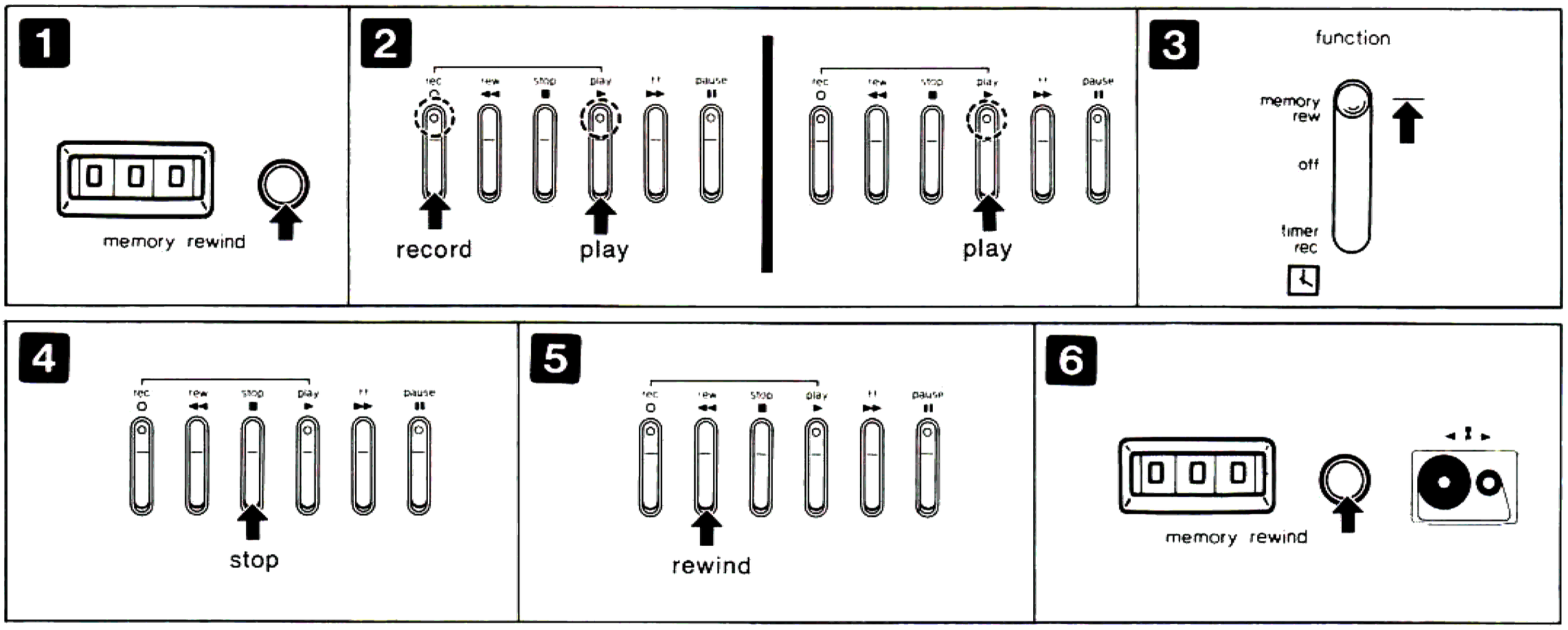
REBOBINAGE A MEMOIRE

HERINNERING TERUGSPOELEN

TILBAGESPOLINGSHUKOMMELSE

MEMORY-RÜCKSPULUNG

RIAVVOLGIMENTO CON LA MEMORIA



16

ERASING

RADERING

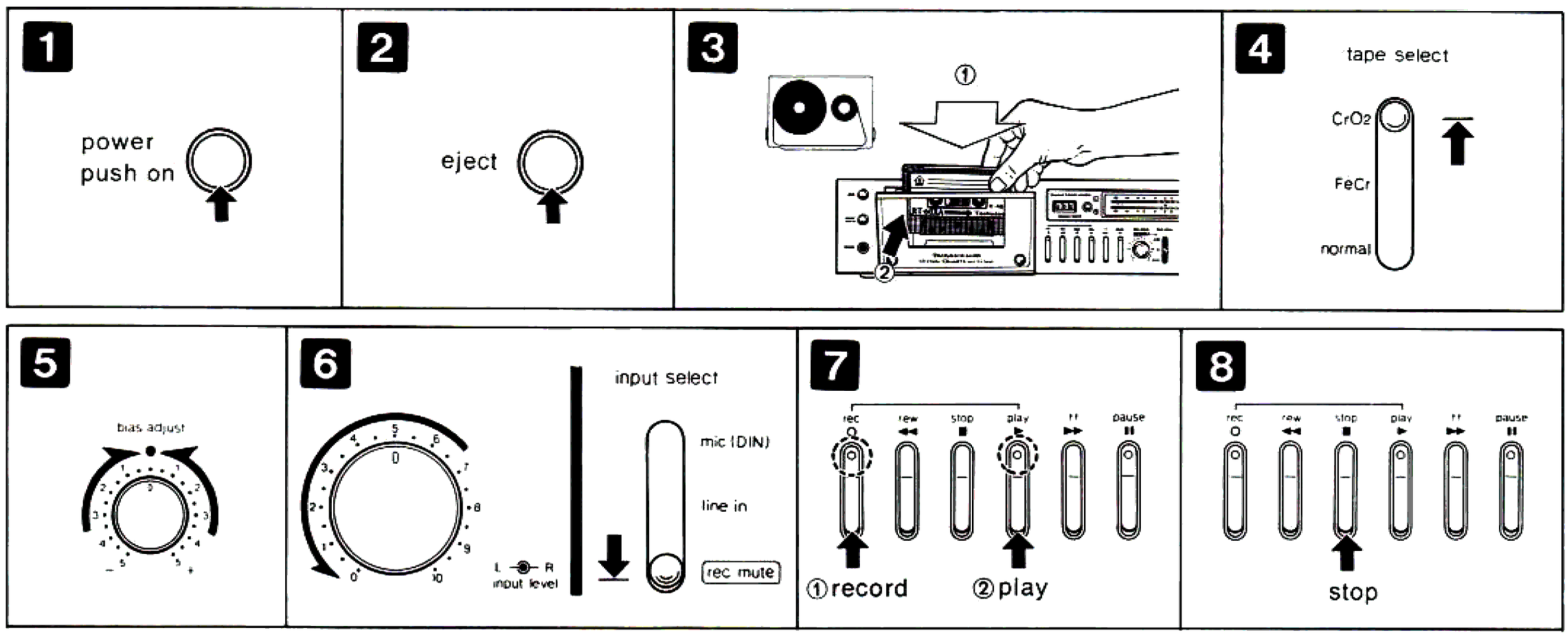
EFFACEMENT

UITWISSEN

SLETNING

LÖSCHEN

CANCELLAZIONE



17

MAINTENANCE

VARD

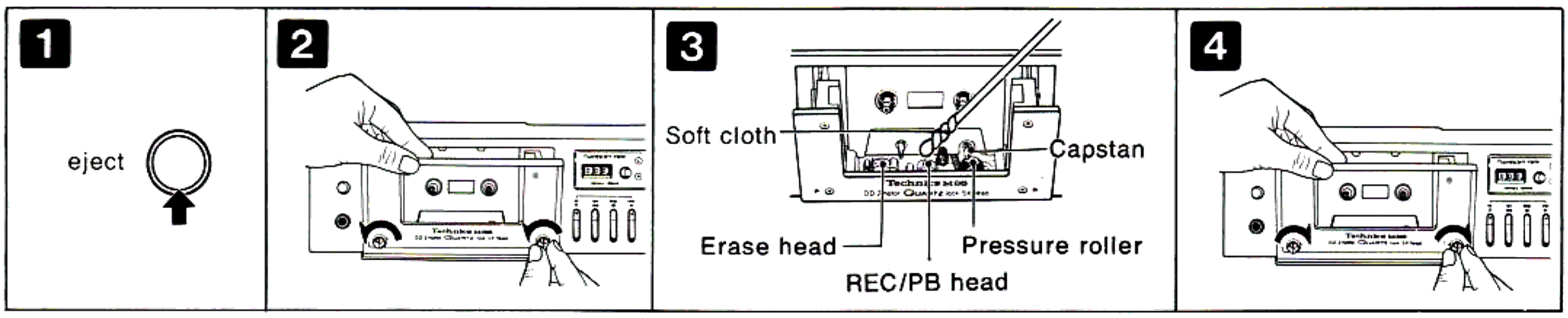
ENTRETIEN

ONDERHOUD

VEDLIGEHOLDELSE

WARTUNG

MANUTENZIONE



(ENGLISH)

We want to thank you for selecting the model RS-M88 Technics cassette tape deck for your recording and playback enjoyment. To obtain the maximum benefit of the many features of this deck, please carefully read these operation instructions.

OPERATION NOTES

1. **Horizontal placement**
   For best performance, place this unit in a horizontal position.
2. **Location**
   Performance may be adversely affected by extremely hot [above 100°F. (35°C.)] or extremely cold [below 40°F. (5°C.)] locations, direct sunshine, or excessive vibration.
3. **Power source**
   This unit features a DC operated motor which makes it possible to operate on 50 Hz or 60 Hz AC line voltage without any conversion. The voltage source should be within ±5% of the unit's rated voltage. Variations in excess of ±10% of rated voltage may cause uneven performance, or possible damage to the unit.
4. **Clean the head assembly**
   One of the most important factors in the determination of good tape recorder performance is regular cleaning of the head assembly.
5. A "click" noise may be heard when the power switch is turned on or off. To avoid this, be sure to set the volume control of the amplifier to the minimum position.

ABOUT CASSETTE TAPE (Refer to fig. 2.)

Notes:

1. Do not pull the tape out of the cassette openings.
2. If the tape is loose in the cassette, the tape may become wound onto the pressure roller and result in breakage or damage. Tighten looseness of the tape, if necessary, by using a pencil as shown in the figure.
3. Avoid using C-120 cassette tape with this unit because this tape can easily become broken, stretched or twisted if not used with extreme care.
4. Avoid storing this unit in places where the temperature is high and/or where the humidity is high.
5. If the tape is very tightly wound or unevenly wound, fast forward it and then rewind it before use.

"Metal tape" (Refer to fig. 4.)

A word about "Metal tape" tape

Conventional cassette tapes can be broadly classified into 2 categories according to the magnetic material coated on the tape surface: the ferric-oxide (γ-Fe_2O_3) type, including ordinary LH tape, etc.; and the chrome-dioxide (CrO_2) type.

Continued technological advances have been made in an attempt to develop these tapes to a high level of performance, but recently there has been a recognized need for the development of a new material to improve performance much further.

In response to this need, "Metal tape" has been developed as a new kind of tape, employing a magnetic alloy of pure iron (Fe) as the main component in the magnetic substance. In comparison with conventional cassette tape, "Metal tape" can record a far greater amount of information at a high density. As a result, the maximum output level (MOL) has been improved throughout the entire range, and, in particular, the frequency response characteristics at high levels and the dynamic range in the high range have been greatly improved.

This means, therefore, that a remarkable improvement of sound quality has been made possible.
(It should be noted that the tape base and parts of the tape other than the magnetic substance are composed of the same material as previously used.)

Advantages and magnetic characteristics of "Metal tape"

1. Maximum output level (MOL) is greater at all frequencies.
2. Excellent frequency response characteristics at high input level.
3. Wide dynamic range at high frequencies.
4. Excellent signal-to-noise ratio at high frequencies.
5. Low distortion.

The "Metal tape" selector

"Metal tape" significantly improves the performance of the tape deck, but, because there is a difference of bias characteristics and the erase characteristics between conventional and "Metal tape", it is now necessary to have a special tape selector position for "Metal tape".
Our tape recorders will bear the "Metal" designation for this position of the Tape selector.

The "Metal" position

1. **Playback time-constant**...70μS (same as at the "CrO_2" position).
2. **Bias current**.....about 150% (compared to "CrO_2" position).
3. **Erase current** .....about 150% (compared to "CrO_2" position).
4. **Recording equalization**.....Special equalization

Technological developments to accomodate "Metal tape"

"Metal tape" is a totally new kind of high performance tape, and conventional cassette tape decks cannot sufficiently bring out its performance potential.
Our company has succeeded in developing the following technology to exploit the advantages of "Metal tape" to its fullest extent.

1. **Development of SX head with minimal distortion accompanying high input signal levels**
   The SX (sendust) head has a high level of saturation magnetic flux density and it is ideal for metal tapes which feature a high MOL (maximum output level).
   We have further improved the conventional SX head.

2. **High efficiency Erase head**
   Conventional Erase head does not adequately, erase "Metal tape."
   Our company has developed a new Erase head with a Sendust tip.

3. **Increased power in the bias oscillation circuitry**
   "Metal tape" requires an erase current and a bias current that are both 1.5 times greater than those of chrome dioxide tape.

   We have increased the power in order to provide this current and maintain a low distortion ratio.

CONNECTION NOTES (Refer to fig. 5.)

1. Connections should be made in accordance with the connection diagram and the following instructions: When 2 microphones are used in order to record in stereophonic sound, be sure both of them have the same performance and specification standards.
2. Do not connect both a DIN connection cord and ordinary connection cords to this unit at the same time because to do so will result in abnormal oscillation from the amplifier, and recording and playback will be impossible.
3. Note that a DIN connection cord cannot be used to connect this unit with another tape deck because a complete circuit is not made.

Location of this unit and stereo amplifier

If this unit is placed on top of the stereo amplifier or next to it, a "hum" noise may be heard during tape playback. Refer to the information below in order to avoid this.

(1) If the stereo amplifier and this unit are placed one above the other, leave as much space as possible between them, and place them where there is the least amount of hum.

(2) If the stereo amplifier and this unit are placed one beside the other, try reversing their positions, and place them where there is the least amount of hum.

CONTROLS (Refer to fig. 6.)

① Power Switch (power)
② Eject Button (eject)
③ Cassette Holder
④ Tape Counter, Reset Button
⑤ FL (Fluorescent Level) Meters
⑥ Output Level Control (output level)
⑦ Input Level Controls (input level)
⑧ Headphones Jack (phones)
⑨ Record Button with Record Indication Lamp (record) (○)
⑩ Rewind Button (rewind) (◀◀)
⑪ Stop Button (stop) (■)
⑫ Playback Button with Playback Indication Lamp (play) (▶)
⑬ Fast-Forward Button (ff) (▶▶)
⑭ Pause Button with Pause Indication Lamp (pause) (❚❚)
⑮ Bias-Adjustment Control/"Metal tape" selector (bias adjust)(pull Metal)
⑯ Tape Selector (tape select)
⑰ Meter-Brightness/Function Selector (meter)
⑱ Function Selector (function)
⑲ Dolby Noise-Reduction Switch (Dolby NR)
⑳ Input Selector (input select)
㉑ Microphone Jacks (mic)
㉒ Line Output Jacks (LINE OUT) (R, L)
㉓ Record/Playback Connection Socket (REC/PB)
㉔ Line input Jacks (LINE IN) (R, L)
㉕ Meter-Brightness-Adjustment Control (meter light)
㉖ Power Cord
㉗ Voltage Selector (VOLTAGE SELECTOR)
㉘ Remote-Control Connector (REMOTE CONTROL)

CASSETTE INSERTION AND REMOVAL (Refer to fig. 7.)

Notes:

* Be sure the cassette is placed so that the edge with the holes is facing downward.
  The cassette holder cannot be closed if the cassette is inserted incorrectly.
* The operation buttons of this unit will not function if they are pressed while the cassette holder is open.

CASSETTE EJECTION MECHANISM

Be careful not to press the Eject Button while the tape is moving, because the cassette will stop the operation and the holder will open.

TAPE SELECTOR (Refer to fig. 9.)

In order to get the best performance from tape, and to record and playback with little distortion, the Tape Selector should be set as shown in figure 9.
Note that there may be a difference in sensitivity of 2 or 3 dB, depending on the type of tape.

"Metal" POSITION SETTING

1. Set the Tape selector to the "CrO_2" position.
2. Pull out the Bias adjustment control/"Metal tape" selector toward you.
3. Unless using a metal tape, make sure that you depress the Bias-adjustment control/"Metal tape" selector and use it at the depress position.

HOW TO USE THE BIAS-ADJUSTMENT CONTROL (Refer to fig. 10.)

This unit includes a system for minor adjustments of the recording bias. The system is designed so that optimum peformance can be obtained when the Blas-Adjustment Control is set to its center "click-stop" position, and, therefore, it should be set to this position for best recording results under ordinary conditions.
A great many types of "low-noise, high-output" tapes have appeared recently, however, and the optimum bias value which will result in the flattest frequency response characteristic is, to be most precise, slightly different for each of them.
As a result, in order to obtain the finest possible performance from each of these types of "low-noise, high-output" tapes, a flatter frequency response characteristic can be obtained by making minor adjustment of the bias while referring to figure 10.
Although the Bias-Adjustment Control will function when the Tape Selector is set to either the "CrO_2" position or the "Fe-Cr" position, it is suggested that this control be set to the center "click-stop" position when CrO_2 or Fe-Cr tape is used, because there are not a great many types of these tapes, and there is not much difference in the optimum bias setting for each type.
For brands of tape other than those shown in figure 10, the optimum bias value can be determined by recording (at a recording level of about −20 dB) the characteristic noise heard between FM broadcast stations, and then, when this recorded noise is played back, by adjusting the Bias-Adjustment Control to the position where the tone quality of the recorded noise (from the tape) and the tone quality of the same noise as heard directly from the tuner seem to be almost the same. This setting of the Bias-Adjustment Control, then, is the best position for use with such tape.

* The examples in figure 10 are based upon the Tape Selector set to the "normal" position.
* There may be a slight difference even for tapes of the same brand.
* The Bias-Adjustment Control has no effect during playback.
* The Bias cannot be finely adjusted will "Metal tape".

PLAYBACK (Refer to fig. 11.)

Notes:

1. Note that the operation buttons will not function until about 5 seconds have passed after the power is turned on.
   The muting circuitry is used in order to make playback starts better.
2. This unit is designed so that the rated output of the Line-Output Terminals ("LINE OUT") is 700 mV when the Output-Level Control is set to its maximum position ("10") and the "0 dB" indication of the Fluorescent Level Meters is illuminated.
3. When listening through headphones, adjust the volume level by using the Output-Level Control of this unit.
4. When a record player, tuner or other equipment is connected to the stereo amplifier to which this unit is connected, it is suggested (for convenience when using the input selector of the stereo amplifier) that the output level of this unit and of other connected equipment be set to the same level.

RECORDING (Refer to fig. 12.)

Notes:

1. After making a valuable recording, it is suggested that the accidental-erase prevention tabs be broken out, using a screwdriver or similar tool, in order to prevent accidental erasing of the recording by later re-recording over it.
2. For recording, therefore, be sure that the cassette has the tabs intact, or that the holes (where the tabs were) are covered by cellophane tape.
3. For recording level adjustment, refer to the section "Adjustment of the recording level."
4. Note that no sound will be recorded on the tape if the Input Selector is in the "rec mute" position, even though monitor sound can be heard and the Fluorescent Level Meters continue to function.
5. For recording, the Record Button must be pressed first, then the Playback Button.
   * For information concerning record muting, refer to page E-3~4.

FLUORESCENT LEVEL METERS (Refer to fig. 13.)

The FL Level Meters of this unit are a new type of meters, and are completely different in principle than conventional level meters which have an indication needle. They can, however, be used in almost the same way for adjustment of the recording level. During playback they indicate the playback level, and during recording they indicate the recording level.

In addition, because the meters of this unit can be used for both peak and VU indication, it is possible to make recordings with a good signal-to-noise ratio, with little distortion, and with the tape recorded to its very limit of saturation.

When the Meter-Brightness/Function Selector is set to the "PEAK" position, the word "PEAK" will illuminate on the surface of the meters.

1. Adjustment of the recording level

In the same way as for the "VU" indication, adjust so that the illumination does not exceed the "0 dB" indication. Then set the Meter-Brightness/Function Selector to the "PEAK" position, and, if the illumination moves as high as the "+8 dB" position, use the Input Level Controls to reduce the level so that the meters illuminate up to the "+5 dB" position when the Meter-Brightness/Function Selector is set to the "PEAK" position.

2. Difference in illumination at the "PEAK" and "VU" positions:

Unlike ordinary level meters, the FL Level Meters of this unit have a fast indication response, responding with perfect correspondence to input signals. They can, therefore, be used for very precise indication of peak signals.

The illuminated indications differ, as shown in figure 11, depending upon whether the setting is to the "PEAK" position or to the "VU" position.

3. Selection of brightness of FL Level Meters:

The Meter-Brightness/Function Selector can be used to select either of two degrees of brightness of the Fluorescent Level Meters.

When it is set to the "dim" position, the brightness is less than at the "bright" position, and, when it is set to the "bright" position, the Meter-Brightness-Adjustment Control on the rear panel can be used for further adjustment to any desired degree of brightness between the "dim" and "bright" illumination.

MONITORING

To listen to the recording as it is being made, simply connect stereo headphones (8Ω) to the Headphones Jack. You may also listen to the program as it is being recorded if your receiver or amplifier is equipped with a tape-monitor switch.

Note:
In the same way as for playback, an amplifier can also be used for monitoring. Note, however, if the recording is being made via a connection made to the Record/Playback Connection Socket, that monitoring can be done only with headphones.

RECORDING MUTING

The recording-muting feature is convenient to prevent recording such unwanted material as commercial messages when recording FM radio broadcasts, or the "click" noise heard when the stylus descends to the disc surface.

Because this unit is designed so that switching can be made by using the Input Selector, use this feature when recording from a source connected to the Line Input Jacks.

Use of the recording-muting function

When the Input Selector is set to the "rec mute" position, the sound source can still be heard and the Fluorescent **Level Meters will not continue to show an indication, and no sound will be recorded on the tape.**

1. When recording an FM radio broadcast

To avoid recording unwanted material such as commercial messages when recording an FM radio broadcast, and thus use the tape most effectively, listen to the monitor sound and, when a tune reaches its end, set the Input Selector to the "rec mute" position. Next, push the Pause Button after letting the tape continue to move for about 5 seconds, and then return the Input Selector to the "line in" position. Then, while listening to the monitor sound, once again press the Playback Button just before the next tune begins.
By following these steps, it is easy to avoid recording unwanted commercials, and an unrecorded space of about 5 seconds can be left between each tune.

2. When recording from a phono disc

To avoid recording the "click" noise which occurs when the stylus descends to the record surface, first press the Record Button and the Pause Button, and then begin the disc play and adjust the recording level. Next, lift the stylus up from the disc, and set the Input Selector to the "rec mute" position. Then press the Playback Button to begin the tape moving in the recording mode, and, after lowering the stylus to the disc surface, set the Input Selector to the "line in" position. By following these steps, the "click" noise will not be recorded.

3. Other uses

The tape can be erased by setting the Input Selector to the "rec mute" position and moving the tape in the recording mode, without setting the Input Level Controls to the minimum position.

Nete:
Before beginning a recording, always first check to be sure that the Input Selector is not set to the "rec mute" position. If it remains in that position, monitor sound will still be heard and the FL Level Meters will not function, and no sound will be recorded on the tape.

TIMER RECORDING AND PLAYBACK (Refer to fig. 14.)

This unit is designed so that timer recordings and playback are possible simply by setting the Function Selector.
Recording or playback will automatically begin, if the Function Selector is set to the "timer rec" position, when the power is turned on by the timer.
If the recording-prevention tabs of the cassette are intact, a timer recording will then be made. If they are not intact, timer playback will begin automatically. When not using the unit for a timer recording or timer playback, therefore, be sure to set the Function Selector to the "off" position.

- **If the accidental erasure-prevention tabs of the cassette are intact, a timer recording will then be made. If they are not intact, timer playback will begin automatically.**
- When preparing for timer playback, first play the tape in order to adjust (by using the controls on the stereo amplifier) the volume and tone as desired. When these adjustments are finished, rewind the tape to the position from which the timer playback is to begin.
- Before using the timer, refer to its operation instructions.
- For timer recording and playback, the muting circuitry will operate when the power is turned on, delaying the start of operation for about 5 seconds.

MEMORY REWIND (Refer to fig. 15.)

The "Memory Rewind" system can be used to conveniently return the tape automatically, during rewind, to any desired position.

"Metal tape" ERASURE (Refer to fig. 16.)

To erase "Metal tape", set the "Metal tape" selector to the "Metal" position and then allow the tape to run as instructed under the procedure for recording.

MAINTENANCE (Refer to fig. 17.)

Because the head assembly and the capstan are in constant contact with the moving tape, dirt or residue from the tape on these parts will decrease the sound quality. They should be cleaned after every 10 hours of use, as shown in figure 17.

Notes:
1. Don't allow magnetic materials, such as a screwdriver or a magnet, near the head assembly.
2. When cleaning, be careful not to bend the tape guides.
3. Don't attempt to clean the cabinet with alcohol, benzine or thinner, because it may damage the finish. If the cabinet is dirty, clean with a soft cloth dampened with a soap-and-water solution.
4. Handle the glass window (removed to facilitate cleaning of the heads) with care, because it might break if dropped.
5. When "Metal tape" is used, the Head assembly should be cleaned after each 10 times of use.

DOLBY RECORDING

This unit includes the Dolby noise-reduction system, which reduces tape noise to a remarkable degree.
Briefly, the system works as follows: At low sound levels (where tape noise is most noticeable), the high-frequency portion of the sound is recorded at a higher level. Tape noise is not amplified.
During playback, the level of only that portion of the signal which was increased at the time of the recording, as well as tape noise, is reduced by a like amount. This causes the signal to be heard at a normal level, and the tape noise to be reduced significantly.

MULTIPLEX FILTER

FM stereo broadcast signals consist of a 19-kHz pilot signal and a 38-kHz sub-carrier. When a Dolby recording is made of an FM stereo broadcast, the Dolby circuitry will not function correctly because it detects signals leaking from the FM tuner. For this reason, the broadcast signals pass through a multiplex filter system to remove the unwanted signals, thus assuring that Dolby recordings can be correctly made.
When making a Dolby recording of an FM stereo broadcast, be sure to set the Dolby Noise-Reduction Switch to the "filter in" position.

AUTOMATIC-STOP SYSTEM (Full-Auto-Stop System)

This unit has an automatic-stop system which, when the tape comes to its end during recording, playback, fast forward or rewind, releases the tape-transport mechanism automatically and places the unit into the stop mode.

* Because the mechanism automatically stops when the tape comes to its end, both the operating parts and the tape itself are protected. This unit is free from problems such as pressure roller deformation resulting from leaving the unit in the stop condition (without pushing the Stop Button) for a long period of time.

REMOTE-CONTROL OPERATION

Because this unit employs an electronically-controlled system for operation, using IC logic circuitry, the operations of the unit can be controlled from a distance by using the RP-070 wireless remote-control unit or the PR-9690 remote-control unit (both available optionally as a separate purchase).

TROUBLESHOOTING

If operation of this unit does not seem normal, check the following points before requesting service. If the trouble cannot in this way be determined and corrected, contact the dealer from whom the unit was purchased.

1. **After the tape cassette is inserted, the tape does not move when the Play Button is pushed.**
   - Is the power cord correctly connected?
   - Is the Power Switch pushed in to the "on" position?
2. **Although the tape moves, no sound is heard.**
   - Is the tape blank?
   - Are the connections of amplifier and speakers correct?
   - Are connection cords from this unit to the amplifier correctly connected?
   - Is the volume control of the connected amplifier set to the correct position?
   - Is the monitor switch of the connected amplifier set to the correct position?
3. **Sound is distorted.**
   - Is the recording level too high?
   - Is the playback output level too high?
   - Is the input impedance of the connected amplifier appropriate?
4. **The Record-Indication Lamp does not illuminate when the Record Button is pressed.**
   - Is the tape cassette inserted correctly?
   - Have the recording-prevention tabs of the cassette been removed?
5. **Tape moves, but no sound can be recorded.**
   - Is the Input Selector set, in error, to the "rec mute" position?
   - Is the Input Selector set to the incorrect position?
6. **Playback sound is hoarse or vibrates. Recorded sound is not clear.**
   - Are the head surfaces dirty?
   - Is foreign material adhered to the pressure roller and/or the capstan?

SPECIFICATIONS

Track System:	4-track 2-channel stereo recording and playback
Tape Speed:	4.8 cm/s
Wow and Flutter:	0.035% (WRMS), ±0.10% (DIN)
Frequency Response:	Metal tape; 20 ~ 20,000 Hz
	30 ~ 18,000 Hz (DIN)
	30 ~ 17,000 Hz ±3 dB
	(0VU) 40 ~ 13,000 Hz ±3 dB
	CrO_2/Fe-Cr tape;
	20 ~ 18,000 Hz
	30 ~ 18,000 Hz (DIN)
	30 ~ 16,000 Hz ±3 dB
	Normal tape; 20 ~ 16,000 Hz
	30 ~ 16,000 Hz (DIN)
	30 ~ 14,000 Hz ±3 dB
Signal-to-Noise Ratio:	Dolby NR in; 69 dB (above 5 kHz)
	Dolby NR out; 59 dB
	(signal level = max. recording level, Fe-Cr/CrO_2 type tape)
Fast Forward and Rewind Time:	Approx. 80 seconds with C-60 cassette tape
Inputs:	MIC; sensitivity 0.25 mV, applicable microphone impedance 400 Ω ~ 10 kΩ
	LINE; sensitivity 60 mV, input impedance 68 kΩ
Outputs:	LINE; output level 700 mV, load impedance 22 kΩ over
	HEADPHONE; output level 140 mV, load impedance 8 Ω
Rec/PB Connection:	5p DIN type; input sensitivity 0.25 mV, impedance 6.4 kΩ
	output level 700 mV, impedance 1.5 kΩ
Bias Frequency:	85 kHz
Motors:	2-motor system
	Capstan; 1-quartz control phase-locked DC brushless direct-drive motor
	Reel table; 1-DC coreless motor
Heads:	2-head system
	1-SX (Sendust Extra) head for rec/playback
	1-sendust/ferrite double-gap head for erasure
Power Requirements:	AC; 110/125/220/240 V, 50-60 Hz
	Preset power voltage; 240 V only for England.
Power Consumption:	35 W
Dimensions (W × H × D):	45.0 cm × 9.7 cm × 40.3 cm
Weight:	10.5 kg

Specifications are subject to change without notice.

National

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