DENON

OPERATING INSTRUCTIONS
STEREO CASSETTE TAPE DECK

DR-M4
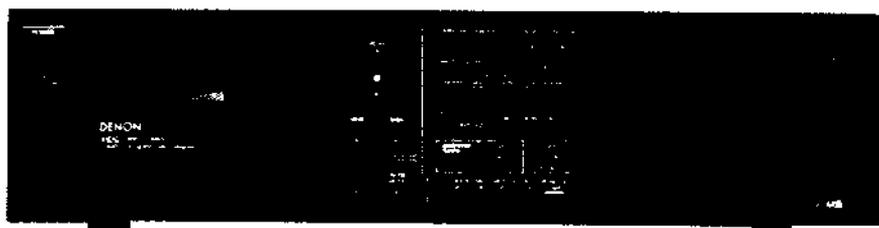
NIPPON COLUMBIA CO., LTD.

SPECIFICATIONS

- **Type** .... Vertical tape loading 4-track 2-channel stereo cassette tape deck
- **Heads** .... SF Recording/Playback combination head × 1
  Erase head (Ferrite) × 1
- **Motors** .... FG Servo Direct Drive motor (for capstan) × 1
  DC motor (for reel winding) × 1
- **Tape Speed** .... 4.8 cm/sec.
- **Fast forward, rewind time.** Approx. 90 sec. with a C-60 cassette
- **Recording bias** .... Approx. 105 KHz
- **Overall S/N ratio** .... Dolby C NR on ... more than 73 dB (CCIR/ARM)
  (at 3% THD level)
- **Overall frequency response.** 20~23,000 Hz (at −20 dB METAL tape)
  30~20,000 Hz (at −20 dB CrO_2 tape)
  30~19,000 Hz (at −20 dB LH tape)
- **Channel separation** .... more than 40 dB (at 1 KHz)
- **Crosstalk** .... more than 65 dB (at 1 KHz)
- **Wow & flutter** .... less than 0.027% w.rms
- **Inputs**
  microphone .... 0.35 mV (−67 dB) input level at maximum

  Input impedance: 10 Kohm unbalanced

  line .... 77.5 mV (−20 dB) input level at maximum
  Input impedance: 50 Kohm unbalanced
- **Outputs**
  line .... 775 mV (0 dB) output level at maximum (with 10 Kohm load, recorded level of 200 pwb/mm)

  headphone .... 1.2 mW output level at maximum (optimum load impedance 8 ohm ~2 Kohm)
- **Accessories** .... parallel pin cord × 2
- **Power supply** .... 50 Hz/60 Hz compatible
- **Power consumption** 22W
- **Dimensions** .... 434 (W) × 115 (H) × 286 (D)

  464 (W) × 115 (H) × 286 (D) for US model only
- **Weight** .... 6 kg

  6.5 kg for US model only

● **Above specifications and design styling are subject to change for improvement.**

● "Dolby" and the symbol ▯▯ are the registered trademarks of Dolby Laboratories Licensing Corporation. The Dolby Noise reduction system is licensed by Dolby Laboratories Licensing Corporation.

> **Best results will be obtained with use of DENON DX Series cassette tapes.**
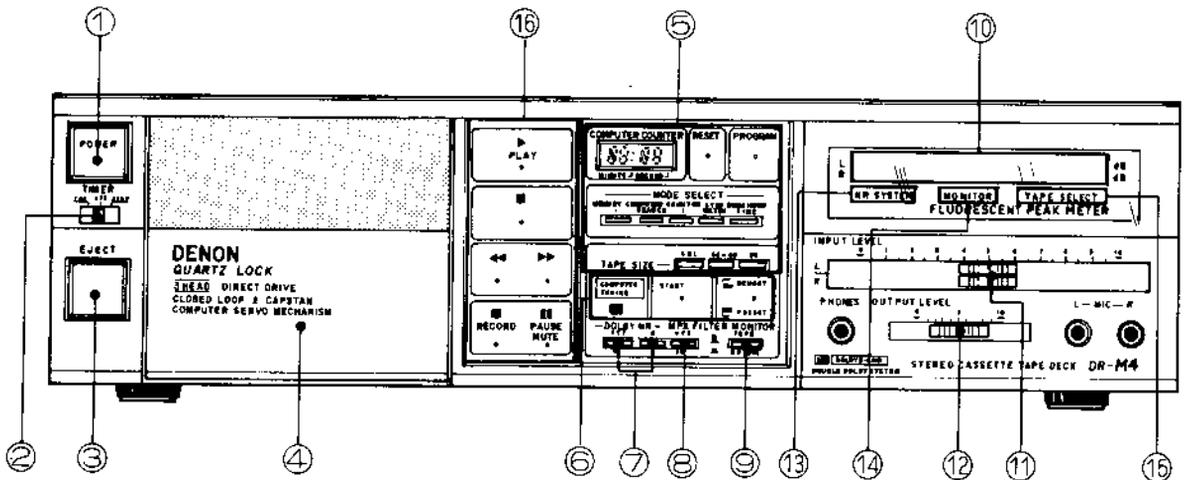
Fig. 1

1. POWER switch

Controls the supply of AC power to the deck. One push turns the deck on, a second push turns it off. The deck remains in a stand-by (non-operative) mode for approximately 4 seconds after it is switched on.

2. TIMER switch

This switch is provided for use with an optional audio timer for unattended recording or morning-alarm playback. For non-timer operation, this switch should be set in the "off" position (see page 17).

3· EJECT button

Press this button to eject the cassette. When the deck is operating (tape is running), press the stop (■) key first to stop the tape transport; then press the EJECT button.

4. CASSETTE COMPARTMENT COVER

If this compartment cover is not closed completely, the deck's transport controls will remain inoperative.

5. COMPUTER COUNTER

A four-digit readout indicates "COMPUTER SEARCH", "COUNTER" "STOP WATCH" and "REMAINING TIME" thanks to the Computer Counter Mode Select Switch (see page 12).

6. COMPUTER TUNING SYSTEM

This automatic system adjusts the tape for optimum recording characteristics for the individual tape being used (see page 10).

7. DOLBY NR switches

The left most Dolby NR switch activates (in) or deactivates (out) the deck's Dolby noise reduction circuitry. The right most switch selects between Dolby B-Type (out) or C-Type NR (in). (see page 18).

8. MPX FILTER switch

The MPX FILTER switch should be used to prevent interference with the Dolby NR circuit when making Dolby NR encoded recordings of FM stereo programs. When making Dolby NR -encoded recordings from any program source other than FM stereo, leave this switch in the "off" (out) position.

9. MONITOR switch

The SOURCE (in) position of this switch allows you to monitor the source program before it is recorded. The TAPE (out) position of this switch is used for tape playback monitoring or simultaneous monitoring during recording (see page 16).

10. FLUORESCENT PEAK METERS

These meters indicate recording or playback peak levels for each channel. For peak levels exceeding −1dB, the Auto Peak Hold feature holds the peak level reading for approximately 1.5 seconds.

11. INPUT LEVEL controls

Linear slide controls are used to adjust recording levels for each channel. The upper control is for the left channel; the lower control for the right channel (see page 16).

12. OUTPUT LEVEL control

This control adjusts playback, recording monitor, and headphone output levels for the both channel simultaneously.

13. NR SYSTEM indicator

This indicator light is interlocked with the Dolby NR switch and informs the user that Dolby NR is in use as well as which B or C-Type.

14. MONITOR indicator

This indicator light is interlocked with the MONITOR switch to inform the use of the selected monitoring source—TAPE or SOURCE.

15. TAPE SELECT indicator

This indicator light is interlocked with the Auto Tape Select feature which automatically adjusts the deck to the type of tape in use. (NORMAL, CrO_2, or METAL).

16. Tape transport controls

▷ PLAY ●	▷ PLAY KEY	Press to playback tape.
■ ●	■ STOP KEY	Press to stop tape in any mode.
◀◀ ▶▶ ● ●	◀◀ REW KEY	Press for fast rewind.
	▶▶ FF KEY	Press for fast forward tape winding.
□ ▯▯ RECORD PAUSE MUTE ● ●	□ RECORD KEY	To begin recording, press the RECORD and PLAY keys simultaneously. If only the RECORD key is pressed, the deck is placed in the REC PAUSE (record standby) mode.
	▯▯ PAUSE/MUTE KEY	The PAUSE key causes the tape to stop momentarily during recording or to mute the recording input to create blank (non-recorded) portions on the tape (see page 18).

○ Switch on your amplifier or receiver.
○ Set the TAPE MONITOR switch on your amplifier or receiver to the TAPE position.
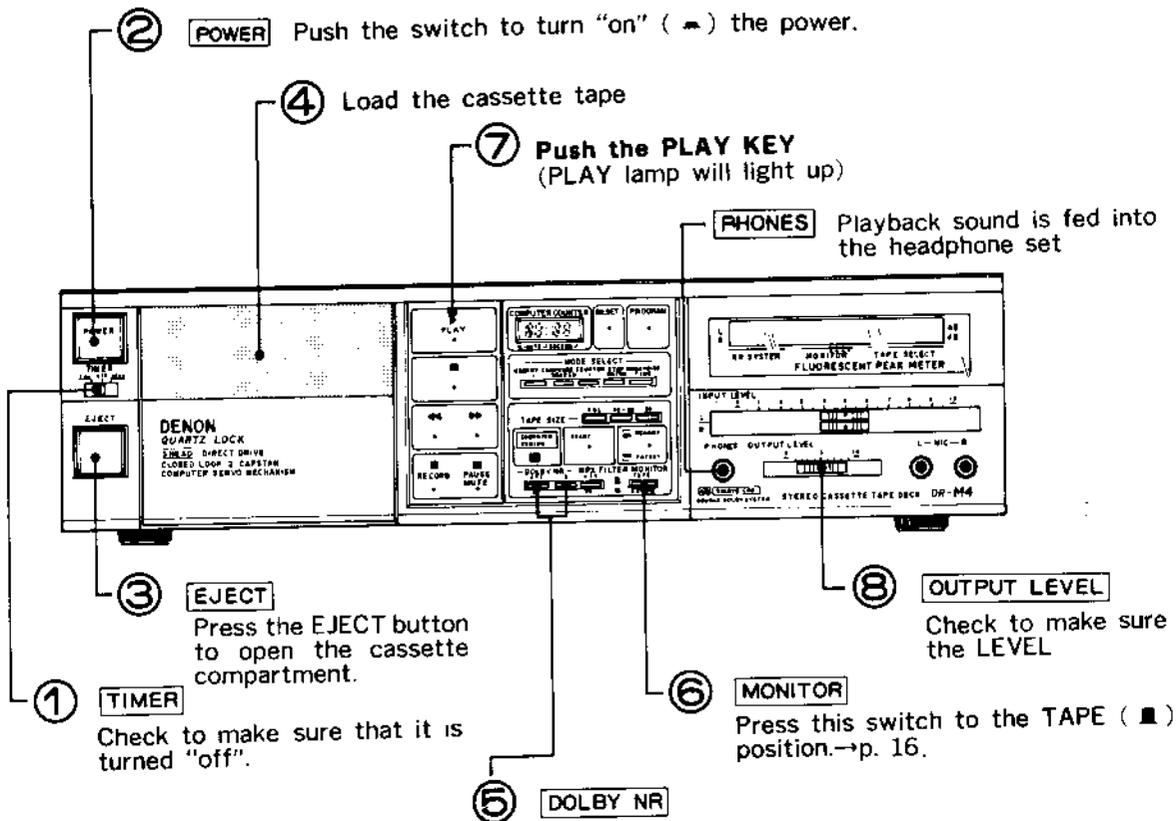○ Operate the deck as illustrated below:

② POWER Push the switch to turn "on" (⏻) the power.

④ Load the cassette tape

⑦ **Push the PLAY KEY**
(PLAY lamp will light up)

PHONES Playback sound is fed into
the headphone set

Fig. 8

③ EJECT
Press the EJECT button
to open the cassette
compartment.

① TIMER
Check to make sure that it is
turned "off".

⑧ OUTPUT LEVEL
Check to make sure
the LEVEL

⑥ MONITOR
Press this switch to the TAPE (■)
position.→p. 16.

⑤ DOLBY NR
Set, in accordance with the recording is made.
For regular recordings, set to "off", for Dolby
NR recordings, set to either "B" or "C". Future
mistakes during playback can be avoided if
the cassette is so marked for Dolby NR en-
coded recordings.

When playback is finished, press the stop (■) key.
To pause during playback, press the PAUSE/MUTE
(◫) key.
To restart the tape, press the PLAY (▷) key.

○ If different types of Dolby Noise Reduction are used for record and playback, playback response
will be adversely effected.

RECORDING

- Switch on the source equipment (tuner, amplifier, etc.)
- Set the TAPE MONITOR switch on your amplifier or receiver to the SOURCE position.
- When recording with Microphones, plug the microphones into the MIC jack (the line inputs are automatically cut out).
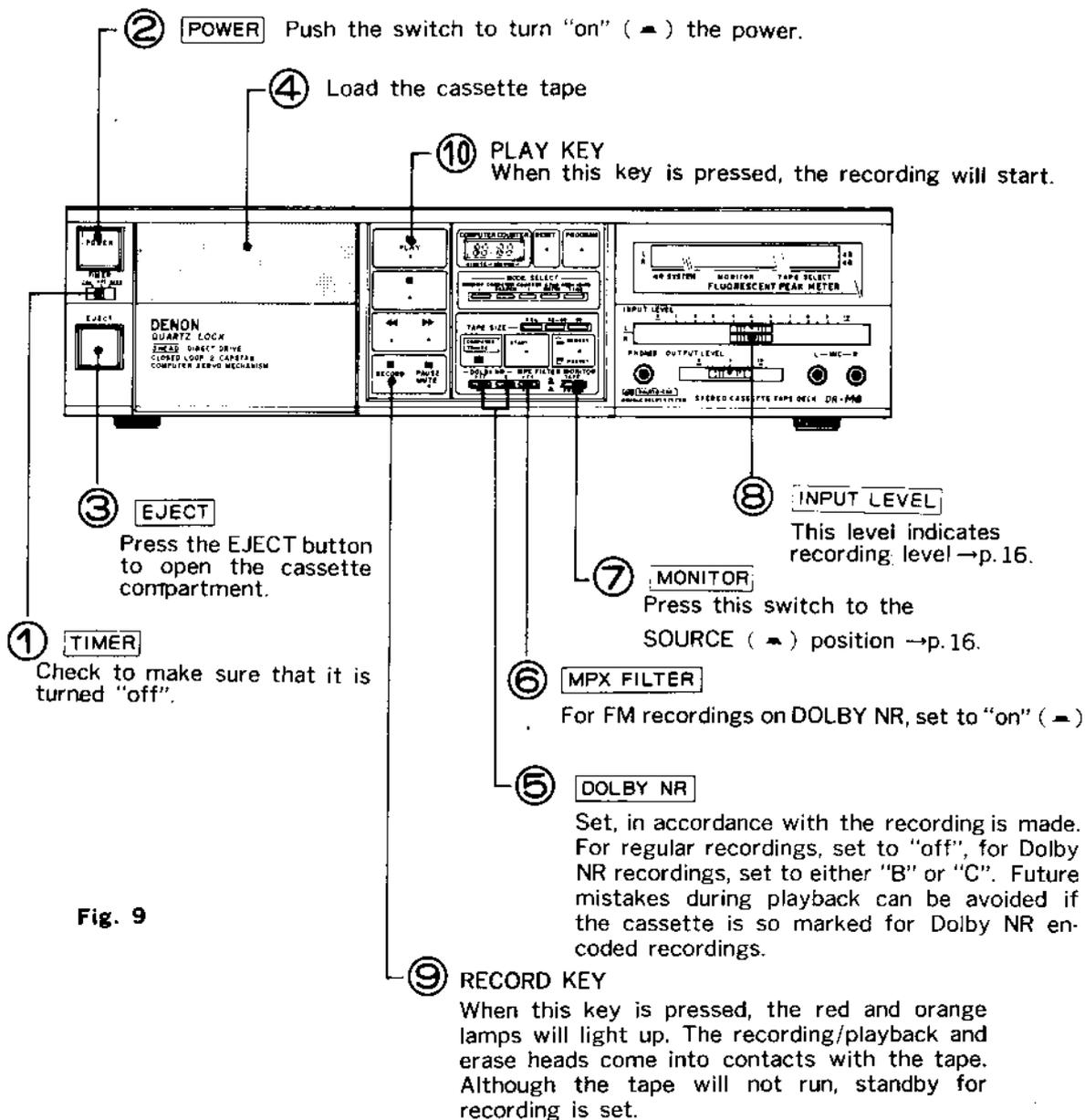
② POWER Push the switch to turn "on" (▲) the power.

④ Load the cassette tape

⑩ PLAY KEY
When this key is pressed, the recording will start.

Fig. 9

③ EJECT
Press the EJECT button to open the cassette compartment.

① TIMER
Check to make sure that it is turned "off".

⑧ INPUT LEVEL
This level indicates recording level →p.16.

⑦ MONITOR
Press this switch to the SOURCE (▲) position →p.16.

⑥ MPX FILTER
For FM recordings on DOLBY NR, set to "on" (▲)

⑤ DOLBY NR
Set, in accordance with the recording is made. For regular recordings, set to "off", for Dolby NR recordings, set to either "B" or "C". Future mistakes during playback can be avoided if the cassette is so marked for Dolby NR encoded recordings.

⑨ RECORD KEY
When this key is pressed, the red and orange lamps will light up. The recording/playback and erase heads come into contacts with the tape. Although the tape will not run, standby for recording is set.

■ **Consecutive recording following playback**

This permits recording consecutive to playback, without stopping the tape.
1. Since it is in the playback mode, the green lamp is lit while the tape is being blayed back.
2. Press RECORD (□) key at the same time as the PLAY (▷) key. The red lamp will light up indicating that it is in the recording mode.

Caution :
Be careful not to erase important recordings by mistake. Mis-erasing can be avoided by following the two steps below :
1. If the PLAY (▷) key is pressed while the red lamp is on, the tape will be recorded.
2. If the PLAY (▷) and RECORD (□) key are pressed at the same time, the tape will be recorded.

The same type of tape can have slightly different performance characteristics depending on the tape brand or individual tape characteristics. This occurs even though the deck automatically selects bias according to type of the tape inserted in the deck. The Computer Tuning system automatically further fine tunes the deck to select the optimum recording response according to individual tape characteristics, and store this information in its memory.

Computer Tuning System Controls and Indicators

MEMORY indicator lamp (green): Lights when optimum tuning is completed and the information stored in memory.

MEMORY/PRESET Key: Operation of this key alternately selects the stored response (after computer tuning) and the factory preset standard response.

Fig. 10

PRESET indicator lamp (orange): This indicator lights before tunings indicating that the tape is in the factory preset tuning condition.

START key: This begins the tuning sequence.

TUNING indicator: This light flashes during the tuning sequence.

Computer Tuning System Operation

1. Insert the cassette. (The TAPE SELECT indicator will indicate the tape type).
2. Press the START key.
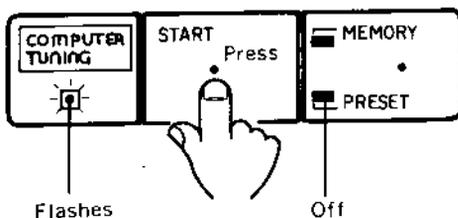
(1) Tuning begins and the TUNING indicator lamp starts flashing.
(The deck enters the record mode)

Fig. 11

Comes on

Turns off   **Fig. 12**
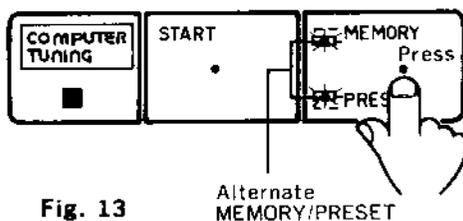

Fig. 13   Alternate
MEMORY/PRESET
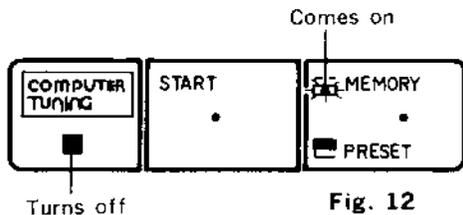
(2) When tuning is completed after approximately 6 seconds, the tape automatically rewinds to a point just preceding the original start point. The tuned response is stored in memory. (The MEMORY lamp comes on and the deck returns to the STOP mode). The deck is now ready for recording.

(3) Tuned response (MEMORY) and standard response (PRESET) can be selected alternatively by pressing the MEMORY/PRESET key.

○ The Computer Tuning system can store one optimized recording response setting each for NOMAL, CrO_2, and METAL positions. (e.g.)

Tape position	NORMAL	CrO$_2$	METAL
COMPUTER TUNING START → MEMORY Optimum recording response	⬤ Memory	⬤ Blank	⬤ Memory
PRESET Standard response Normal tape	⬤ (DX-3)	⬤ (DX-7)	⬤ (DX-M)

○ For tape positions with optimum recording responses stored in memory, the MEMORY and PRESET responses can be selected alternatively by pressing MEMORY/PRESET key. (The MEMORY and PRESET indicator lamps correspond to the selected key position.)
○ For a tape position (CrO_2 in this example) with no optimum response stored, a new tape response can be quickly optimized and stored in memory.
○ When a tape response for each of the three positions is stored in memory, six different recording responses can be selected.


• If tuning is attempted more than once for the same type of tape, the optimized response for the last tape will remain in memory and all the previous responses will be cleared.
• If the tape is started from the clear leader tape, the time that it takes for the leader tape to clear the heads will be added to the tuning time. In these cases, the tape will be rewound to a position just prior the beginning of the magnetic tape. The counter may not indicate the original start position.
• Before the tuning sequence is performed, MEMORY response cannot be selected even if the MEMORY/PRESET key is pressed.
• All memory contents are cleared when the deck is switched off.
• If the START key is pressed during recording, the MEMORY response automatically will be switched into the PRESET response.
• If the START key is pressed during playback of a recorded tape with the erasure prevention tab intact, the tuning sequence will begin and part of the recorded tape will be erased. Be sure to remove the erasure prevention tabs from recorded tapes.

FeCr Tape

Since the Auto Tape Select feature does not have a separate position for FeCr, the optimum recording response for FeCr tapes will be achieved only if the Computer Tuning feature is used. (When playing a FeCr tape recorded on the DR-M4 Deck on another deck, set the deck's tape selector to the NORMAL position).

Controls and Indicators for the Computer Tape Counter

Four-digit fluorescent digital counter
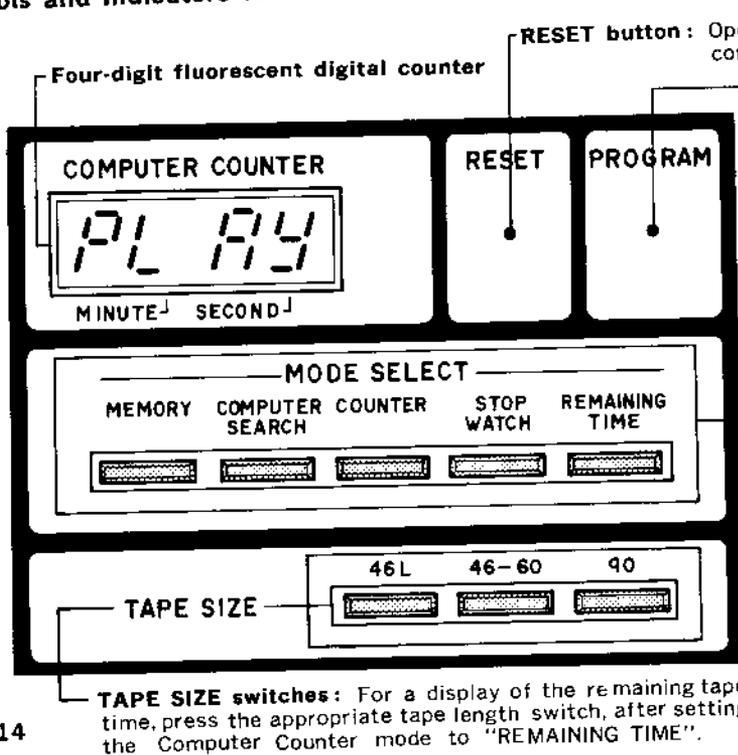
RESET button : Operation of this button resets the counter to all zeros.

PROGRAM button : Press this button to search the desired selection in the " COMPUTER SEARCH " mode.

COMPUTER COUNTER   RESET   PROGRAM

PLAY

MINUTE⌐   SECOND⌐

—MODE SELECT—

MEMORY   COMPUTER COUNTER   STOP   REMAINING
         SEARCH   WATCH   TIME

—TAPE SIZE—

46L   46–60   90

MODE SELECT switches : Use these switches to select the computer counter mode.

MEMORY : The tape stops when the counter indicates "0000" during fast forward or fast rewind.

COMPUTER SEARCH : Up to max. 20 music selections can be searched.

COUNTER : The counter functions as a 4-digit tape counter.

STOP WATCH : During recording or playback operation, the tape running time is indicated.

REMAINING TAPE TIME : During recording or playback operation, the tape remaining time is indicated.

TAPE SIZE switches : For a display of the remaining tape time, press the appropriate tape length switch, after setting the Computer Counter mode to "REMAINING TIME".

Fig. 14

■ Computer Tape Counter Operating Instructions

1) How to check remaining tape time

Remaining tape time can be checked during recording or playback.

COMPUTER COUNTER   RESET   PROGRAM

05:16

MINUTE⌐   SECOND⌐

MODE SELECT
MEMORY   COMPUTER COUNTER   STOP   REMAINING
         SEARCH   WATCH   TIME

TAPE SIZE   46L   46–60   90
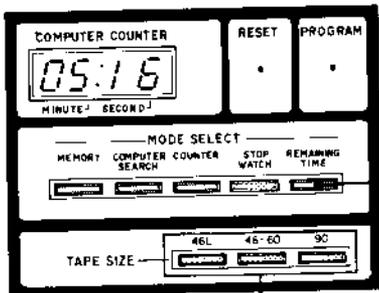
(1)
Press the REMAINING TIME switch (▬).

(2)

Fig. 15   Press the appropriate switch for the length of the tape loaded.

When the tape starts running, the word "PL AY" is erased from the readout. After approximately five seconds the remaining time is displayed. (It takes this much time for the computer to compute the remainning tape time.) If the remaining tape time exceeds 6 minutes, the display is shown only in minutes. If the remaining tape time is less than 6 minutes, the display is shown in minutes and seconds.

∘ The remaining time counter on the DR-M4 can handle any tape length. Press the appropriate TAPE SIZE switch according to the following table :

Tape length	TAPE SIZE switch
C-90、C-84、C-80	C-90
C-60、C-54、C-50 C-46、C-30、C-15	C-46／60
C-46 large hub	C-46 L

For tapes other than those listed in this table, select the nearest position.
∘ Note that the large hub cassette used for some C-46 tapes has a larger-than-normal hub diameter as shown below :
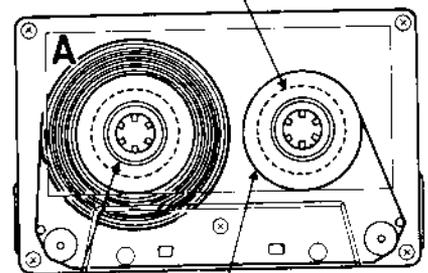
Small hub (22mm in diameter)

A

Fig. 16
∘Hub

Large hub (30mm in diameter)

■Remaining tape time display accuracy

The remaining tape time counter detects the number of supply reel rotations and computes the remaining time with its internal computer. Therefore, it is not necessarily as accurate as a clock. For the same nominal tape length, the counter may deviate from the actual recording or playback time due to variations in tape (tape base thickness, hub size, etc.).

●Error range
Beginning of tape............Within 3 minutes
End of tape ....Within 30 seconds

●Since a 3 minute error may occur at the beginning of tape, the tape time readout may not agree with the total time indicated on the cassette. Although the remaining tape time readout error lessens as the tape approaches the end, the tape may run out before the remaining time readout becomes zero (even if the recording is started from near the end of the tape.)

2) Tape counter operation

(2) Press the RESET button (The counter is reset to "0000").
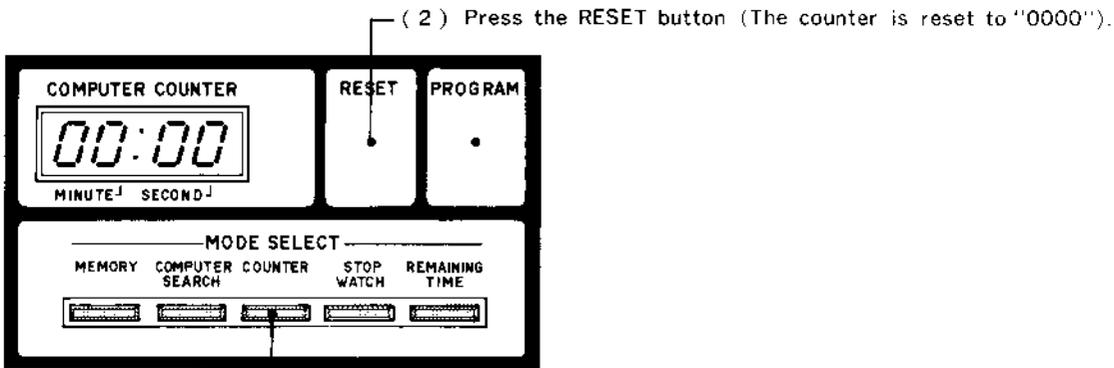
Fig. 17 — (1) Press the COUNTER switch (▲).

The tape counter can be used for easy reference, indexing of selections and precise program selection on any cassette.

●Once the deck is turned off, the tape counter will read "0000" when the deck is switched on again.
●The counter readout on the DR-M4 has no correlation with that on other type of deck.

3) How to use as a stop watch

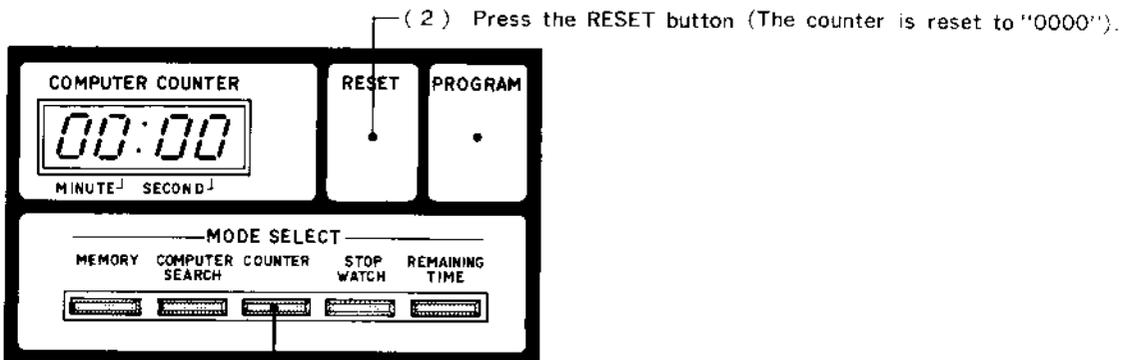During recording or playback, the tape running time is indicated in minutes and seconds.

(2) Press the RESET button (The counter is reset to "0000").

Fig. 18 — (1) Press the STOP WATCH switch (▲).

●The counter is reset to "0000" automatically by pressing the REW (◀◀) key or the FF (▶▶) key after recording or playback, by changing the position of the MODE SELECT switches or by setting the POWER switch to "OFF" and then to "ON".
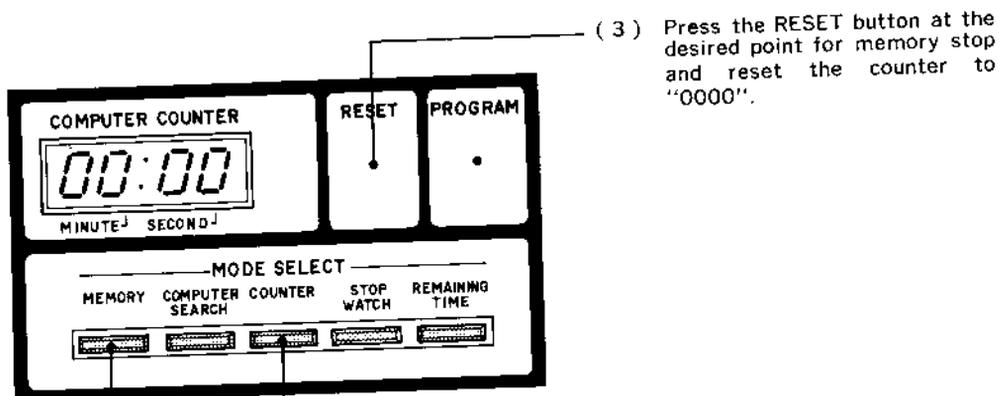
4) How to use the memory stop

COMPUTER COUNTER

00:00

MINUTE SECOND

RESET   PROGRAM

─── MODE SELECT ───

MEMORY   COMPUTER COUNTER   STOP   REMAINING
          SEARCH   WATCH   TIME

Fig. 19

(2) Press the COUNTER switch (━).

(1) Press the MEMORY switch (━).

(4) Press the REW (◀◀) key after recording or playback is finished. Rewinding starts and will stop automatically when the counter indicates "0000".

● Memory stop functions also during fast forwarding. In this case the tape will automatically stop when the counter indicates "0000".
● Memory stop works with any position of the MODE SELECT switches.
● Set the MEMORY switch to OFF (▮) position if you do not want to use the memory function.
● The memory stop position error range is within plus minus 3 digit to the counter read out "0000".
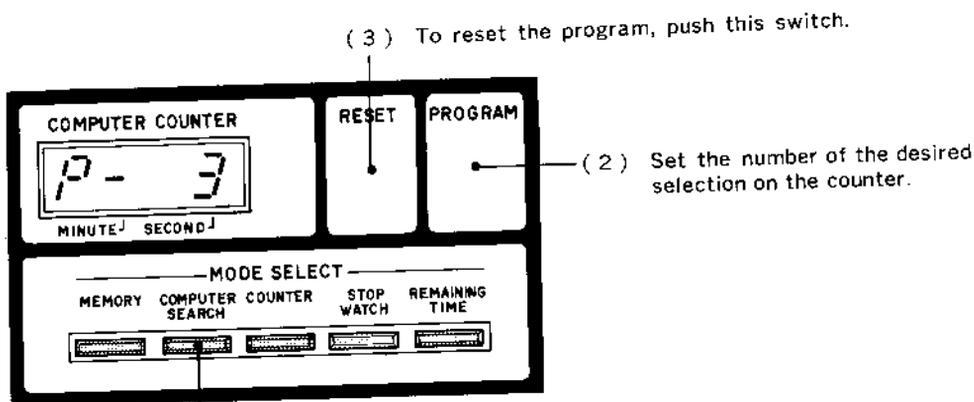
5) How to use the computer search

(3) To reset the program, push this switch.

COMPUTER COUNTER

P - 3

MINUTE SECOND

RESET   PROGRAM

─── MODE SELECT ───

MEMORY   COMPUTER COUNTER   STOP   REMAINING
          SEARCH   WATCH   TIME

(2) Set the number of the desired selection on the counter.

Fig. 20

(1) Press the COMPUTER SEARCH switch (━).

How to count the selections

Computer search is done by detecting the blank spaces between the music selections. The number of blank spaces from the present tape position to the blank space before the desired selection have to counted. Set this number on the counter by using the PROGRAM button,
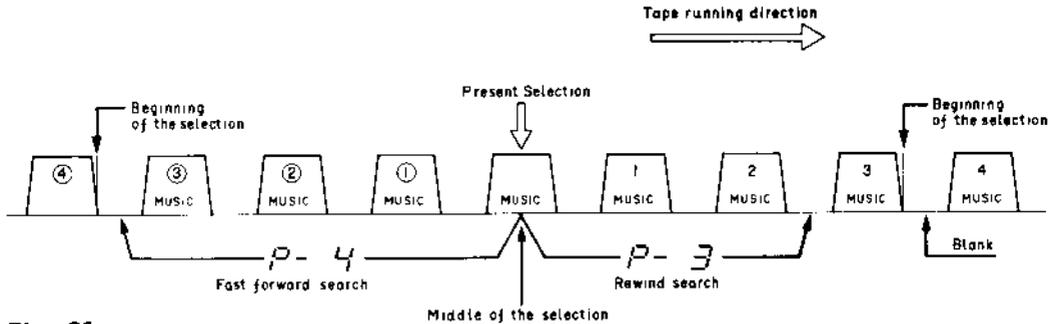
Example

Fig. 21

■ In the example (see Fig. 21), there are 4 blanks between the present tape position and selection ④ ahead on the tape. This means that the counter should be set to "P- 4". However, there are 3 blanks between the present tape position and selection 2 back on the tape. So in this case the counter should be set to "P- 3".

※When searching in the fast forward direction, the present music should not be counted. Count to the desired music selection.
When searching in the rewind direction, the present music should be counted.

After setting the selection number on the counter. . . . . .
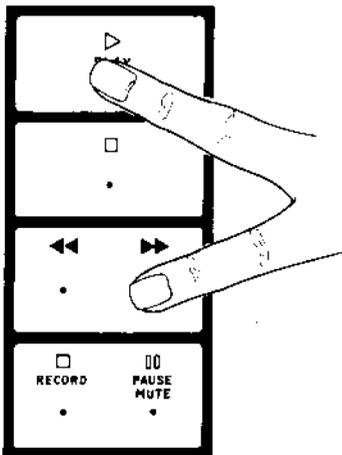
Press the FF (▶▶) key or the REW (◀◀) key while holding down the PLAY (▷) key.

Fig. 22

● The computer search system operates by detecting blank spaces of sufficient length (more than 4 seconds). Under the following conditions, the system may malfunction.

• If there are long unrecorded spaces or pianissimo (very soft sound) in the selection.
• If the recording level was very low.
• If the blank spaces are too short (less than 4 seconds).
• If there happened to be loud noise or hum in the blank spaces.

PROPER RECORDING LEVEL

A too high a recording level can saturate the tape and cause distortion. On the other hand, if recording levels are set too low, soft passages would be marked by residual noise. Proper recording level is the single most important factor for making will balanced recordings.

● The tape select indicators—NORMAL, CrO₂, and METAL—provide guidelines for the maximum allowable recording levels for each tape type. Adjust the INPUT LEVEL controls while checking the FL PEAK METER.

Table : Guideline for maximum recording level

Normal tape	+2 dB levels on peaks
CrO₂ tape	+3 dB levels on peaks
Metal tape	+5 dB levels on peaks

Note : Optimum recording levels can differ depending on program sources or the type of tape used. Make trial recordings, using the simultaneous monitoring. See the description under "MONITOR SWITCH"

● For input levels between −1 dB and +8 dB, the Auto Peak Hold feature holds the peak level on the meter for approximately 1.5 seconds, for easier reading.

● **Meter reading difference between L and R channels**

The left and right channel readings of the FL PEAK METER can differ due to variations in input signal levels. In such cases, adjust the individual channels of the INPUT LEVEL controls until identical meter readings are obtained for both channels.

MONITOR SWITCH

The DR-M4 Stereo Cassette Deck uses three-head system which permits simultaneous "off-the-tape monitoring" during recording. Use the MONITOR switch to select monitoring sources. The MONITOR indicator shows the selected monitoring source, "TAPE" or "SOURCE".

Recording	Monitor Switch ➡ "TAPE(▮)" Tape Rec Head P/B Head Input O──▷───◁──O Output	The signal recorded on the tape monitores simultaneously "off-the-tape". This monitoring mode enables you easy check for optimum recording levels. In the "TAPE" mode, the FL PEAK METER indicates the signal levels played back off-the-tape.
	Monitor Switch ➡ "SOURCE(▲)" Tape Rec Head Input O──▷───◁──O Output	The MONITOR position enables you to monitor the input source signal before it is recorded on the tape. Using the FL PEAK METER, this mode is convenient for setting recording levels or input level monitoring during recording.
Playback	Monitor Switch ➡ "TAPE(▮)" Tape P/B Head ──◁──O Output	During playback, the MONITOR switch must be placed in the TAPE position. If it is set in the SOURCE position, the signal played from the tape won't be heard.

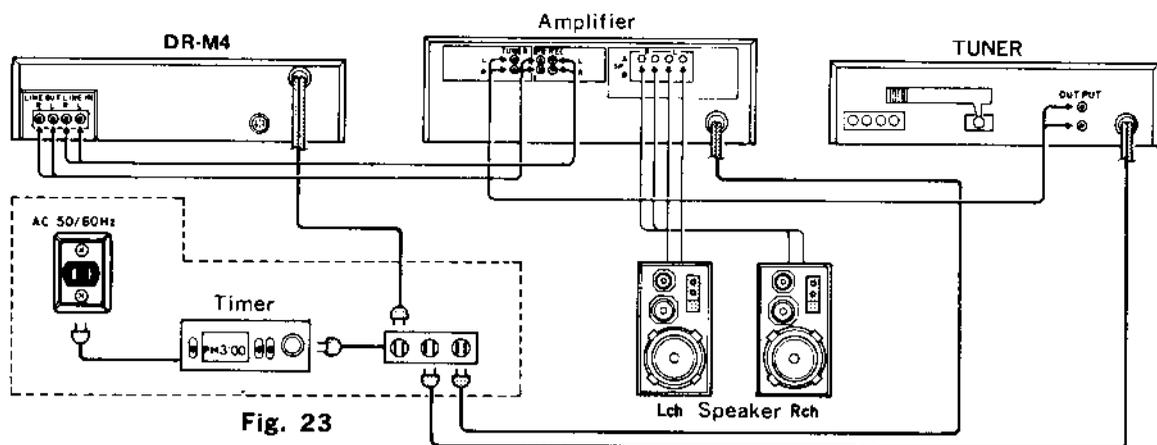Timer recording/playback can be made using a timer available on the market.

Fig. 23

Timer recording procedure

1. Make sure the connections are correct, especially the power supply connections.
2. Turn "on" the power switch of each appliance.
3. Tune the desired station on the tuner.
4. Load the tape for recording. (Make sure the erase prevention tab is not broken off; if it is, cover the hole by plastic tape).
5. Set the Dolby NR switch to the appropriate position.
6. Press the monitor switch to the SOURCE position (▬).
7. Adjust the recording input level.
8. Set the starting position of the tape.
9. Set the timer switch (TIMER) to the "rec" side.
10. Set the timer to the desired time. (At this point, the timer will turn the power supply off.)

Note : When making Dolby NR encoded recordings from FM broadcasting, set the DOLBY NR switch to either B or C. Turn the MPX FILTER switch on (▬).

*Please read the operating instructions for the timer before use. With the above procedures, the timer controlled recording is ready. When the preset time comes, power is supplied and the FM broadcast can be recorded.

●Timer playback procedure

1. Make sure the connections are correct, especially the power supply connections.
2. Turn "on" the power switch of each appliance.
3. Load the pre-recorded tape to be played back.
4. Set the DOLBY NR switch to the appropriate positions.
5. Set the monitor switch to the TAPE (▮) position. (The green lamp will light up.)
6. Press the PLAY (▷) key and playback the tape; adjust the playback level.
7. Set the timer switch (TIMER) to the "play" side.
8. Set the timer to the desired time. (At this point, the timer will turn the power supply off.)

*With the above procedures, the timer playback is ready. When the preset time comes, the power is supplied and playback will start.

Note : • If the timer recording or playback is not desired, be sure to switch the timer switch (TIMER) "off".
   • When the power supply is turned "on", when the timer switch is set to the "rec" side, the computer tuning system will operate first. The EQ and the sensitivity will be automatically adjusted for the tape being used. When the adjustments are completed, the tape will be rewound to the point where the computer tuning was started, followed by the starting of the timer recording. When setting the timer, always remember to allow some time for the computer tuning system to operate.

● **DENON Original Muted recording** (REC/MUTE) consecutive to the standby condition for recording (REC/PAUSE).

▷
PLAY
•

■
•

◀◀   ▶▶
•   •

□   □□
RECORD   PAUSE
•   MUTE
         •
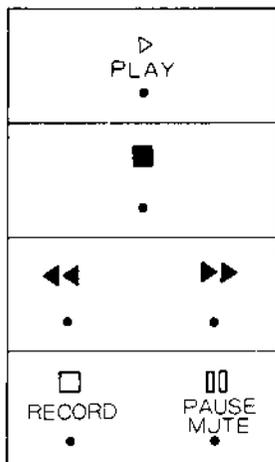
Fig. 24

1. Keep depressing the PAUSE/MUTE (□□) key as long as desired to provide a blank portion (REC/MUTE).

2. When the key is released, the stand-by condition for recording is set (REC/PAUSE).

3. Press PLAY (▷) key for recording again.

DOLBY C NOISE REDUCTION SYSTEM

● The Dolby noise reduction system substantially reduces the tape background noise (hiss) inherent in the cassette medium. Dolby B-Type NR is most widely in use. However, Dolby C-Type NR is a much more recent development and represents a significantly improved version of Dolby B-Type NR.

● Tape background noise consists primarily of high frequency information which is particularly annoying during soft passages. The Dolby NR system increases the level of low volume mid and high frequency signals during recording and reduces the level of these signals by an identical amount during playback.   As a result, the playback signal is identical to the original source signal, but the level of background noise generated by the tape is greatly reduced.

● The operating principle of Dolby C-Type NR is identical to that of B-Type with the exception for the encoding/decoding response curves.   The noise reduction effect obtained by C-Type is up to 20 dB, comared to B-Type of 10 dB.   In addition, C-Type uses an antisaturation network and spectral skewing circuitry and significantly improves the dynamic range in the mid to high frequencies.
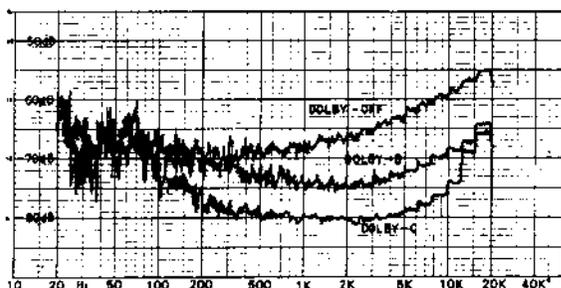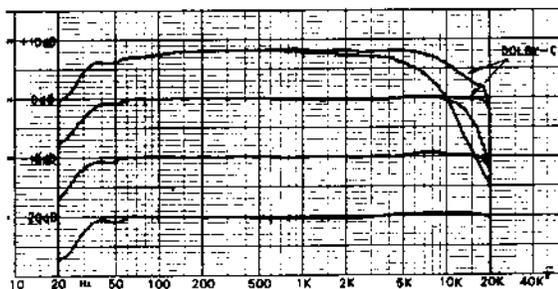
Fig. 25

Fig. 26