PROFESSIONAL

Model PMD520 User Guide

3-Head Double Cassette Deck

marantz ®

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK)
NO USER-SERVICEABLE PARTS INSIDE
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL
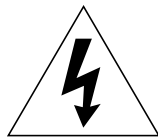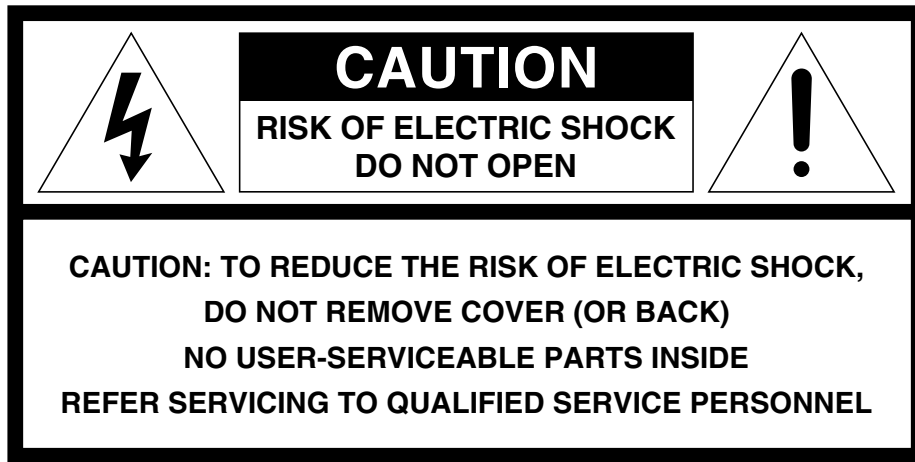
The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING
TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK,
DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

CAUTION: TO PREVENT ELECTRIC SHOCK, MATCH WIDE BLADE OF PLUG TO WIDE SLOT, FULLY INSERT.

ATTENTION: POUR ÉVITER LES CHOCS ÉLECTRIQUES, INTRODUIRE LA LAME LA PLUS LARGE DE LA FICHE DANS LA BORNE CORRESPON-DANTE DE LA PRISE ET POUSSER JUSQU'AU FOND.

SAFETY INSTRUCTIONS

READ BEFORE OPERATING EQUIPMENT

This product was designed and manufactured to meet strict quality and safety standards. There are, however, some installation and operation precautions which you should be particularly aware of.

1. Read Instructions — All the safety and operating instructions should be read before the appliance is operated.

2. Retain Instructions — The safety and operating instructions should be retained for future reference.

3. Heed Warnings — All warnings on the appliance and in the operating instructions should be adhered to.

4. Follow Instructions — All operating and use instructions should be followed.

5. Water and Moisture — The appliance should not be used near water — for example, near a bathtub, wash-bowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, etc.

6. Carts and Stands — The appliance should be used only with a cart or stand that is recommended by the manufacturer.

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

8. Wall or Ceiling Mounting — The appliance should be mounted to a wall or ceiling only as recommended by the manufacturer.

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

10. Heat — The appliance should be situated away from heat sources such as radiators, heat registers, stoves, or other appliances (including amplifiers) that produce heat.

11. Power Sources — The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.
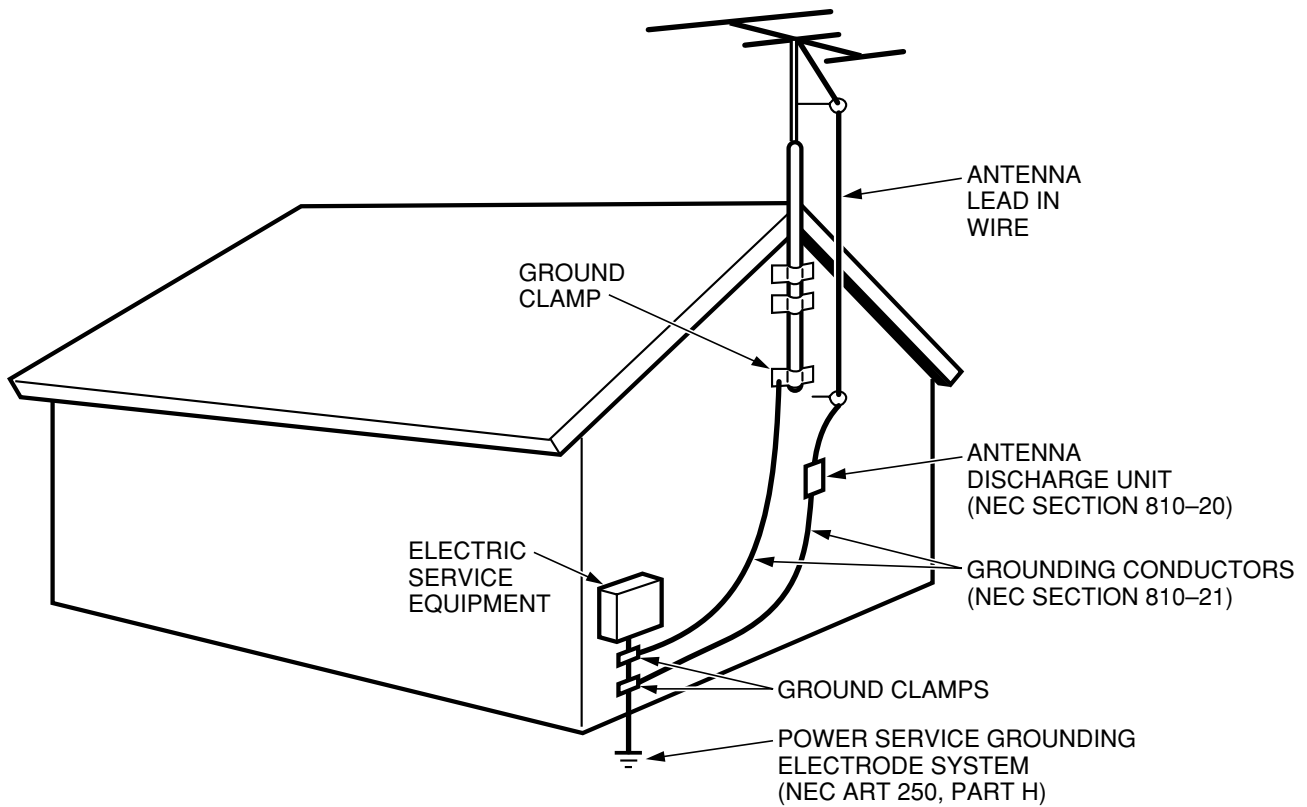
12. Grounding or Polarization — The precautions that should be taken so that the grounding or polarization means of an appliance is not defeated.
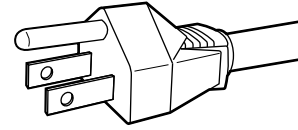
AC POLARIZED PLUG

13. Power-Cord Protection — Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.

14. Cleaning — The appliance should be cleaned only as recommended by the manufacturer.

15. Power Lines— An outdoor antenna should be located away from power lines.

16. Outdoor Antenna Grounding — If an outside antenna is connected to the receiver, be sure the antenna system is grounded so as to provide some protection against voltage surges and built up static charges. Section 810 of the National Electrical Code, ANSI/NFPA No. 70-1984, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna-discharge unit, connection to grounding electrodes, and requirements for the grounding electrode. See Fig. 1.

17. Nonuse Periods — The power cord of the appliance should be unplugged from the outlet when left unused for a long period of time.

18. Object and Liquid Entry — Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

19. Damage Requiring Service — The appliance should be serviced by qualified service personnel when:

    A. The power-supply cord or the plug has been damaged; or

    B. Objects have fallen, or liquid has spilled into the appliance; or

    C. The appliance has been exposed to rain; or

    D. The appliance does not appear to operate normally or exhibits a marked change in performance; or

    E. The appliance has been dropped, or the enclosure damaged.

20. Servicing — The user should not attempt to service the appliance beyond that described in the operating instructions. All other servicing should be referred to qualified service personnel.

FIG. 1

**EXAMPLE OF ANTENNA GROUNDING ACCORDING TO
NATIONAL ELECTRICAL CODE INSTRUCTIONS
CONTAINED IN ARTICLE 810 - "RADIO AND TELEVISION EQUIPMENT"**

ANTENNA
LEAD IN
WIRE

GROUND
CLAMP

ANTENNA
DISCHARGE UNIT
(NEC SECTION 810–20)

ELECTRIC
SERVICE
EQUIPMENT

GROUNDING CONDUCTORS
(NEC SECTION 810–21)

GROUND CLAMPS

POWER SERVICE GROUNDING
ELECTRODE SYSTEM
(NEC ART 250, PART H)

NEC – NATIONAL ELECTRICAL CODE

This Class B digital apparatus meets all requirements of the Canadian Interference - Cansing Equipment Regulations.

Cet appareil numérique de la Classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

NOTE TO CATV SYSTEM INSTALLER:

This reminder is provided to call the CATV system installer's attention to Article 820–40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

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INTRODUCTION

Thank you for selecting the Marantz Model PMD520 3-head Independent Dual Well Cassette Deck.

Please read these operating instructions carefully. We recommend that you read the entire user guide before you connect or operate the unit.

After you have reviewed the contents this manual, we suggest that you make all system connections before you attempt to operate the unit.

Refer to the Figures on Pages 54 – 57 of this user guide.

The callout numbers on the Figures correspond to those found in the text. All references to connections and controls are printed in BOLD type, as they appear on the unit.

PRECAUTIONS

The following precautions should be considered when operating the equipment.

When setting the equipment ensure that :

– air is allowed to circulate freely around the equipment

– the equipment is on a vibration free surface

– the equipment will not be exposed to interference from an external source

– the equipment will not be exposed to excessive heat, cold, moisture or dust

– the equipment will not be exposed to direct sunlight

– the equipment will not be exposed to electrostatic discharges

- In addition, never place heavy objects on the equipment.
- If a foreign body or water does enter the equipment, contact your nearest dealer or service center.
- Do not pull out the plug by pulling on the mains lead. Hold the plug.

FEATURES

- COMPLETELY INDIVIDUAL DUAL SYSTEM

  Well A and Well B can be controlled independently for both recording and playback. There are two sets of inputs and outputs which allow for many modes of recording and playback. Two separate input sources can be recorded simultaneously and independently on the two decks; two different tapes can be played back simultaneously on the two decks; and lastly, it is possible to play a cassette on one well, and record a different source (such as a mixer) on the other well simultaneously.

  There are also several modes in which the two decks work together.

- CONTINUOUS RECORDING AND PLAYBACK

  In the continuous mode, Well A will play (or record) side one, and then automatically switch to Well B, which will play (or record) side one. In this way 1-1/2 hours of uninterrupted playback or recording is possible using C-90 cassettes.

- CASCADE CONNECTION FOR SERIAL CONNECTION OF MULTIPLE UNITS

  By connecting several PMD520s in series by way of the cascade connection, multiple units can play or record continuously for logging and other long-time recording applications. In this case, Wells A and B of unit #1 will play (or record) as in the example above, then they will trigger the start of continuous playback (or record) of unit #2, and so on.

- OVERLAP SERIES RECORDING

  This feature records long events such as a conference, without interruption. The recording of the next tape starts when the remaining time on the previous tape is approximately 3 minutes.

- PARALLEL RECORDING (DUPLICATION)

  When multiple copies of the same source are required, it is possible to record both Well A and Well B simultaneously, in parallel, from a single source.

- TIMER REC/PLAY

  Time-activated playback and recording are available using a commercially available timer.

- FINE SPEED CONTROL

  Each Well features ±3% speed control.

- METERS AND LINEAR TIME TAPE COUNTERS

  Each Well features independent FL bargraph meters, and a linear time (minutes and seconds) counter. The display on these counters is only an approximate indication of minutes and seconds and its accuracy depends on the match between the Tape and the correct TAPE TIME setting.

- TAPE STOP ALARM

  A buzzer sound is generated to indicate the end of tape after playback or recording.

- DOLBY B/C NR SYSTEMS

  The Dolby NR (Noise Reduction) systems compress and amplify signals during recording in order to raise the signal-to-noise ratio on the tape. During playback, these signals are expanded and attenuated by the same amount in order to regain the original dynamic range of the music. An additional result of this expansion and attenuation is that the noise floor of the recording is reduced significantly. Dolby B typically reduces noise by 10 dB, while Dolby C typically reduces noise by 20 dB.

- DOLBY HX PRO HEADROOM EXTENSION

  The Dolby HX PRO system monitors the total amount of effective bias during recording and instantaneously compensates for any excess bias by reducing the deck's bias signal level accordingly.

  The system operates independently on each channel. HX PRO is unlike a noise reduction system because it functions only during recording and no decoding is required. Therefore, a tape recorded with the HX PRO system can be played back on any other cassette deck while retaining the benefits of HX PRO.

  Dolby noise reduction and HX Pro headroom extension are manufactured under license from Dolby Laboratories Licensing Corporation. HX Pro originated by Bang & Olufsen.

  "DOLBY" the double-D symbol and "HX PRO" are trademarks of Dolby Laboratories Licensing Corporation.

REAR PANEL CONNECTIONS

Ⓐ DECK A/B LINE INPUT

These jacks should be connected to LINE OUTPUT of your source.

Note:

Short pins are installed from the factory in the Deck B IN-PUT.

The short pins should be removed only if an input source is connected directly to Deck B. They have been installed to avoid crosstalk from one deck to the other, in case one deck is recording and the other deck is playing back.

Ⓑ DECK A/B LINE OUTPUT

These jacks should be connected to the LINE INPUT of your PA or monitoring system.

Ⓒ LOOP THROUGH A OUTPUT

These jacks output the same signal input to the LINE INPUT jacks of Well A as they are input.

Ⓓ INPUT SELECT SWITCH

This switch selects the input mode for the LINE INPUT jacks.

- Position A, B : Deck A receives its input from LINE A.
  Deck B receives its input from LINE B.
- Position A : Both decks receive the same input from LINE INPUT A.

Ⓔ RC-5 REMOTE CONTROL JACKS

These jacks are for use with the remote control accessories. Connect the output of an RC-5 based remote control to the RC-5 input of the PMD520. The RC-5 output of the PMD520 may be connected to the RC-5 input of other machines for multiple-machine control from the same remote control accessory.

Refer to the specifications for the complete RC-5 command set.

Ⓕ EXT (EXTENSION) REMOTE CONTROL JACKS

This jack is used to cascade several PMD520s for continuous serial recording and playback.

Connect the EXT OUT jack to the EXT IN jack of the next unit in the chain.

Ⓖ MPX FILTER SWICH

When recording FM broadcasts, set this switch to ON.

Ⓗ PARALLEL CONTROL I/O

These terminals contain a control signal input for almost all of the operations of the unit and output the A+B and HIGH signals.

The application range of this unit can be expanded greatly by using these terminals properly.

```
13 12 11 10 9 8 7 6 5 4 3 2 1
 ● ● ● ● ● ● ● ● ● ● ● ● ●
  ● ● ● ● ● ● ● ● ● ● ● ●
 25 24 23 22 21 20 19 18 17 16 15 14
```
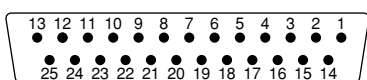
CONTROL I/O Pin assign

Pin No.	Function	Pin No.	Function
1	REW A IN	14	NORM IN
2	REW B IN	15	HIGH IN
3	FF A IN	16	AUTO REW IN
4	FF B IN	17	TAPE TIME A IN
5	PLAY A IN	18	TAPE TIME B IN
6	PLAY B IN	19	COUNTER RESET A IN
7	STOP A IN	20	COUNTER RESET B IN
8	STOP B IN	21	AUTO BIAS A IN
9	REC A IN	22	AUTO BIAS B IN
10	REC B IN	23	HIGH OUTPUT
11	REC MUTE A IN	24	GND
12	REC MUTE B IN	25	A+B OUTPUT
13	A+B REC IN		

- All input is active low.
- All output is open collector.

Ⓘ AC POWER INPUT

Connect one end of the power cord to this receptacle.

FRONT PANEL FEATURES

① POWER SWITCH

For switching the unit on and off.

② CASSETTE HOLDER A/B

Insert cassettes into these holders with the exposed tape facing downward.

③ CONTROL BUTTONS

■ STOP
Press this button to cancel any operation modes and to stop tape travel.

▶ PLAY
Press this button to start playback.

◀◀ ▶▶ FAST WIND
Press these buttons to fast wind in the direction of the arrows. If the Well is in play mode, these buttons will place the well in CUE/REVIEW Mode. In CUE/REVIEW mode, if these buttons are pressed the Well will enter the fast wind mode.

● REC
Press this button to enter the REC-PAUSE mode. Press PLAY to initiate recording. Press this button again to re-enter the REC-PAUSE mode.

REC MUTE
When in REC-PAUSE mode, press this button to record 3 seconds of no sound.

④ COUNTER BUTTONS

● TAPE TIME

This button changes the reference time of tape (tape type) so that the time counter can show accurate time information. The initial setting when the unit is turned on is "60". The first press of this button displays the current setting. Every time this button is pressed while the time setting is displayed, it is changed in a cyclic order of 60 → 90 → 120 → 10 → 20 → 30 → 46 → 60...

● RESET

Pressing this button will reset the counter time to 00.00 (0 minutes, 0 seconds).

⑤ AUTO REW (AUTO REWIND) BUTTON

Used to switch the auto rewind mode ON or OFF.
The indicator lights up when the auto rewind mode is on.
When the auto rewind mode is on, each well enters rewind mode upon detection of the end of tape.
The auto rewind mode is switched on or off simultaneously for both Wells A and B.
The initial setting is off.

⑥ CONT (CONTINUOUS) BUTTON

Used to switch the continuous mode ON or OFF.
Every time this button is pressed, the CONT indicator status changes in cycle of On → Blinking → Off → On...
The lighting of the indicator indicates that the continuous mode of PMD520 is " ➞ ". (A → B → C → D → E →...)
The blinking of the indicator indicates that its continuous mode is " ⊃ ". (A → B → A → B → A →...)
The initial setting when the unit is turned on is off.
Pressing the PLAY ▶ or REC ● button while the continuous mode is on starts continuous playback or continuous recording.

⑦ A+B REC BUTTON

Check to insure that both wells are in STOP mode prior to pressing the A+B REC button.
Pressing the A+B REC button once will cause both wells to enter a REC-PAUSE mode to adjust recording levels. Pressing the A+B REC button a second time, will cause both wells to enter a REC mode simultaneously. Pressing the A+B REC button a third time, will cause both wells to enter a REC-PAUSE mode again and pressing the A+B REC button a fourth time , will resume the REC mode.

⑧ TAPE SPEED BUTTONS

These switches determine the playback/recording speed of tapes in both Wells A and B.

● HIGH

Press this button to set the tape speed for duplication to 3-6/8 ips (9.5 cm/sec).
The HIGH indicator lights when HIGH is selected.
When HIGH is selected, Dolby NR is disabled.

● NORM

Press this button to set the tape speed for duplication to 1-7/8 ips (4.75 cm/sec).
The NORM indicator lights up when NORM is selected.

⑨ OVERLAP REC (OVERLAP RECORD) BUTTON

Pressing the OVERLAP REC button when the continuous mode is " ➞ " or " ⊃ " switches the overlap series recording mode alternately to Off → On → Off. The OVERLAP REC indicator lights up when the overlap series recording mode is on.
The operation in the overlap series recording mode is variable depending on the current continuous mode.

⑩ MONITOR BUTTONS

Pressing this button switches the monitoring mode between Tape and Source.
The MONITOR indicator lights up when monitoring from the tape, and is off when monitoring from the input source.
The initial setting when the unit is turned on is tape monitor.

⑪ BIAS RESET BUTTONS

Used to reset the bias setting to the factory setting.
The indicator is off when the factory-set bias setting is used.
The indicator will light up after the Auto Bias program is run.

⑫ DOLBY NR B/C SELECTORS

This switch is used to select Dolby B or C noise reduction for recording or playback.
Most commercially available cassettes which display the double-D symbol are encoded with Dolby B noise reduction.

Note:

When the TAPE SPEED is set to HIGH, the Dolby NR is switched off regardless of the position of the selectors.

⑬ **TIMER**

This switch is used to set the timer operation mode.

● OFF

No timer operation is used when the switch is set to this position.

● REC

Timer recording operation is activated when the switch is set to this position. The tape will automatically start recording when the power is switched on.

● PLAY

Timer playback operation is activated when the switch is set to this position. The tape will automatically start playing when the power is switched on.

⑭ **REC LEVEL CONTROL**

For adjusting the record input level.

⑮ **REC BALANCE CONTROL**

Used to adjust the left-right balance of channels while recording.

⑯ **FINE SPEED**

Each well features ±3% speed control.

⑰ **PHONES SELECTOR SWITCH**

This switch allows you to select Well A, Well B, or a mix of both Wells (A+B) in the phones.

⑱ **PHONES LEVEL CONTROL**

This control adjusts the volume of the headphone output.

⑲ **PHONES JACK**

Use this jack to connect a pair of headphones with a stereo 1/4" connector.

DISPLAYS

ⓐ **TAPE TIME COUNTERS**

These counters display the tape position for each Well in Minutes and Seconds.

ⓑ **BARGRAPH LEVEL METERS**

These meters display the signal levels for each Well in stereo.

ⓒ **AUTO REW INDICATOR**

These indicators will light up when the AUTO REW mode button ⑤ is pressed.

ⓓ **CONT (CONTINUOUS) INDICATORS**

These indicators will light up when the CONT mode button ⑥ is pressed.

ⓔ **A+B INDICATOR**

These indicators will light up when the A+B mode button ⑦ is pressed.

ⓕ **TAPE SPEED INDICATORS**

● HIGH SPEED INDICATOR

This indicator will light up when the HIGH SPEED mode button ⑧ is pressed.

● NORMAL SPEED INDICATOR

This indicator will light up when the NORMAL SPEED mode button ⑧ is pressed.

ⓖ **OVERLAP RECORDING INDICATOR**

This indicator will light up when the OVERLAP REC mode button ⑨ is pressed.

ⓗ **MONITOR INDICATORS**

These indicators will light up when in the TAPE MONITOR mode.

ⓘ **BIAS RESET INDICATORS**

These indicators will light up after the BIAS RESET program is run.

OPERATION

PLAYBACK

PLAYBACK ON ONE WELL (Same procedure for Well A or Well B) OR BOTH WELLS

1. Set the POWER button to ON.
2. Insert a prerecorded cassette in the cassette holder(s).
3. Reset the tape counter by pressing the RESET button.
4. If the tape has been encoded with Dolby NR, set the DOLBY NR switches accordingly.
5. Press the PLAY ▶ button to play the cassette.
6. Press the STOP ■ button to stop playback.

CONTINUOUS PLAYBACK

1. Set the POWER button to ON.
2. Insert recorded cassettes into both Wells.
3. If the tape has been encoded with Dolby NR, set the DOLBY NR switches accordingly.
4. Press the CONT button to select the continuous mode. The lighting of the CONT indicator indicates the " ➞ " mode and the blinking indicates the " ⊃ " mode.
5. Press one of PLAY ▶ buttons. Playback will start. When that Well finishes playing , the second well will begin playing.
6. When the continuous mode is " ➞ ", the tape stops after the second well is finished or triggers another deck via the EXT output.
7. When the continuous mode is " ⊃ " and the AUTO REW mode is on, the tape in the first well that has been rewound is played after the second well is finished.
8. Press the STOP ■ to stop playback.
9. Press CONT to cancel CONT mode.

Note:
　　During continuous playback, the signal from both wells goes to line output A.

TIMER PLAYBACK (Same procedure for Wells A and B)

1. Connect the power cord of this unit to a timer.
2. Insert a prerecorded cassette in the cassette holder(s).
3. If you wish to use Dolby NR, set the DOLBY NR switches to select B- or C-type noise reduction.
4. Set the POWER switch of this unit to ON.
5. Set the TIMER switch to the PLAY position.
6. Set the timer to the desired time.
7. When the set time comes and the timer turns on, power is supplied to the unit and playback starts automatically.

Note:
　　Use a timer which can turn on at the desired time of the day.

RECORDING

SINGLE WELL RECORDING
(Same procedure for Well A or Well B)

1. Insert a blank cassette into the cassette holder(s).
2. Reset the tape counter by pressing the RESET button.
3. If you wish to use Dolby NR, set the DOLBY NR switches accordingly.
4. Press the REC ● button to enter REC-PAUSE mode.
5. Adjust the record level using the REC LEVEL control, so that the red LEDs light only at peaks in the music.
6. Press the PLAY ▶ button to initiate RECORD.
7. Press the STOP ■ button to end recording, or press REC ● again to re-enter REC-PAUSE mode.

Note:
　　Be aware of the setting of the input select switch on the rear panel.

- ● A, B Position　：　Well A receives input from input A, Well B receives input from input B.
- ● A Position　：　Both wells receive input from input A.

Tape Types and Length

Any type of tape (Normal, High, or Metal) can be used with the PMD520. High or Metal tapes have superior performance compared to Normal Tapes. The PMD520 can sense which kind of tape is being used, and will automatically adjust bias, EQ, etc. C-60 or C-90 length tapes are recommended, as C-120 tapes are often too thin, and can become entangled in the transport mechanism.

Remote Operation

The period (00 ! 00) of the time display will flash depending on which Well is being addressed by a conected remote control.

CONTINUOUS RECORDING

1. Insert blank cassettes into both Wells. Be sure that both decks are rewound.

2. If you wish to use noise reduction, set the DOLBY NR switches accordingly.

3. Reset the tape counters to "00.00" by pressing the RESET buttons.

4. Press the CONT button. Pressing it once sets the " ➔ " mode, in which the indicator lights up. Pressing it twice sets the " ⊃ " mode, in which the indicator blinks.

5. Press the REC ● buttons of both wells to enter REC-PAUSE mode.

6. Adjust the record level using the REC LEVEL control.

7. Press the PLAY ▶ button on Well A to initiate RECORD.

8. When the tape in Well A is finished, recording starts automatically in Well B. If the continuous mode is " ➔ ", recording ends when tape in Well B is finished and another deck is triggered with the EXT output. If the continuous mode is " ⊃ ", recording in Well A restarts at the moment recording in Well B is finished. At this time, the tape in Well A should be reversed manually or replaced with a new tape.

9. Press STOP ■ button to end the Recording.

10. Press the CONT button to cancel continuous mode.

Note:
   All input for continuous recording will come from Line Input A.

PARALLEL RECORDING

1. Insert blank cassettes into both Wells. Be sure that both decks are rewound.

2. If you wish to use noise reduction, set the DOLBY NR switches accordingly.

3. Reset the tape counters to "00.00" by pressing the RESET buttons.

4. Press the A+B REC button. This will set both Wells for record, and the REC lights will blink.

5. Adjust the record level using the REC LEVEL control.

6. Press the A+B button again to start the recording.

7. Press both STOP ■ buttons to stop recording, or press the A+B button to re-enter record-pause mode.

Note:
   All input for parallel recording will come from Line Input A.

TIMER RECORDING
(Same procedure for Wells A and B)

1. Connect the power cord of this unit to a timer.

2. Insert a blank cassette in the cassette holder(s).

3. Set the POWER button to on.

4. If you wish to use Dolby NR in your recording, set the DOLBY NR switches to select B- or C-type noise reduction.

5. Press the REC ● button to enter record-pause mode.

6. While observing the level meter, adjust the REC LEVEL Control.

7. Set the TIMER switch to the REC position.

8. Set the timer to the desired time.

9. When the set time comes and the timer turns on, power is supplied to the unit and recording starts automatically.

Note:
   Use a timer which can turn on at the desired time of the day.

OVERLAP SERIES RECORDING

1. Insert blank cassettes in the cassette holders of both wells.

2. Press the CONT button. Pressing it once sets the " ➔ " mode, in which the indicator lights up. Pressing it twice sets the " ⊃ " mode, in which the indicator blinks.

3. Press the OVERLAP REC button. The OVERLAP REC indicator lights up to indicate the overlap series recording mode.

4. Press the REC ● buttons of Wells A and B to enter record-pause mode.

5. In record-pause mode, adjust the REC LEVEL controls of both wells.

6. Press the PLAY ▶ button of Well A or B to start recording.

7. When the remaining time on the tape in the first Well is approximately 3 minutes, the other well starts recording automatically.

8. If the auto rewind mode is switched on, the finished tape is rewound automatically to the beginning. If the auto rewind mode is off, reverse the finished tape manually to prepare for the next recording.

9. To terminate the overlap series recording mode, press the OVERLAP REC button again.

Note:
   If AUTO REW is activated during the " ⊃ " mode or the continuous loop is fed back to the first deck, the information recorded will be erased and recorded over.

CASCADE OPERATION

Refer to Fig. 5
CASCADE CONTINUOUS PLAYBACK

1. Set the POWER button to ON.
2. Connect the EXT output of the first unit into the EXT input of the second unit.
   Then connect the EXT output of the second deck into the next unit in the chain or back into the first unit.
3. Insert recorded cassettes into all wells.
4. If the tape has been encoded with Dolby NR, set the DOLBY NR switches accordingly.
5. Press the CONT buttons on all units. The CONT Indicator will light.
6. Press the PLAY ▶ button of Well A, of Unit #1.
7. When Well A of Unit #1 finishes, Well B of Unit #1 will start automatically.
8. When Well B of Unit #1 finishes, Well A of Unit #2 will start automatically.
9. To stop playback, press the CONT button, and STOP ■ buttons on all units.

Note:
   Output from both Wells of each unit will be sent to LINE Output A on each unit. Line output B is not used on any unit.

CASCADE CONTINUOUS RECORDING

1. Set the POWER button to ON.
2. Connect the EXT output of the first unit into the EXT input of the second unit.
   Then connect the EXT output of the second deck into the next unit in the chain or back into the first unit.
3. Insert recorded cassettes into all wells.
4. If the tape has been encoded with Dolby NR, set the DOLBY NR switches accordingly.
5. Press the CONT buttons on all units. The CONT Indicator will light.
6. Press the REC ● buttons on both Wells of each unit. Check to see that every Well indicates REC-PAUSE mode.
7. Adjust the recording level of each Well.
8. Press the PLAY ▶ button on Well A of Unit #1.
9. When Well A of Unit #1 finishes, Well B of Unit #1 will start automatically.
10. When Well B of Unit #1 finishes, Well A of Unit #2 will start automatically.
11. To stop Recording , press the CONT button, and STOP ■ buttons on all units.

Note:
   Input to both Wells of each unit will be received from Line Input A on each unit. Line Input B is not used on any unit.

SYNCHRONOUS RECORDING

Synchronous Recording is possible only when this unit is connected with a Marantz Professional product equipped with the Sync Recording function.
The Synchronous Recording connection consists of a single RCA cable which runs to the RC-5 REMOTE input jack on the rear panel of the PMD520, from the REMOTE output jack on the rear panel of the Marantz source.

1. Set the POWER button to ON.
2. Insert blank cassettes into the appropriate Wells.
3. If the tape has been encoded with Dolby NR, set the DOLBY NR switches accordingly.
4. press the REC ● button on the appropriate Wells of the unit. Check to see that REC-PAUSE mode is indicated.
   When recording two tapes in parallel, press the A+B button instead the REC ● button.
5. Adjust the recording level with source playing.
6. Press the PLAY ▶ button of the source player.

CASCADE OVERLAP SERIES RECORDING

1. Connect the units as shown in Figure 6.
2. Insert blank cassettes in both Wells A and B of all the connected units.
3. Press the CONT button of all the units so that their CONT indicator light up (the continuous mode is "➡").
4. Press the OVERLAP REC buttons of the all the units.
   The OVERLAP REC indicators light up to indicate the overlap series recording mode.
5. Press the REC ● buttons of both Wells A and B of all the units to put all the wells in record-pause mode.
6. Adjust the REC LEVEL controls of Wells A and B in record-pause mode.
7. Press the PLAY ▶ button of Well A or B of unit #1 to start recording.
8. When the remaining time on the tape in the first well becomes about 3 minutes, the other well starts recording automatically.
9. Similarly, when the remaining time on the tape in the second well of unit #1 is approximately 3 minutes, Well A of unit #2 starts recording automatically.
10. If the auto rewind mode is switched on, the finished tape is rewound automatically to the beginning. If the auto rewind mode is off, reverse the finished tape manually to prepare for the next recording.
11. To terminate the overlap series recording mode, press the OVERLAP REC button again.
12. To terminate the continuous mode, press the CONT button twice.

Note:
   If AUTO REW is activated during the "⊃" mode or the continuous loop is fed back to the first deck, the information recorded will be erased and recorded over.

OTHER OPERATIONS

Caution:

- If you must stop playback or recording in the middle of a tape, be sure to press the **STOP ■** button first, then turn the power off. If the power is turned off in the middle of an operation, the cassette tape remains loaded, and it may be impossible to eject. In such a case, turn the power on, enter PLAY mode, then press **STOP ■** button, and then eject the tape.

- The same caution as above applies in cases of power failure. To prevent damage, never attempt to force the removal of a cassette while the power is off.

ERASURE OF TAPE

When a program source is recorded onto a tape, the previously recorded sound is erased automatically, and replaced with the new recording. If you wish to erase a tape without recording, set the REC LEVEL control to the minimum (0) position or remove the input source, and let the tape travel in the REC mode.

AUTO TAPE SELECTOR

This unit is equipped with auto tape selector which automatically sets the bias and equalizer level using the detection holes provided in the cassette shell. The bias and equalizer level is automatically set according to the type of cassette as follows. (See Figure 7)

- Normal tapes   EQ ; 120 μS , Bias ; Low
- High tapes   EQ ; 70 μS , Bias ; High
- Metal tapes   EQ ; 70 μS , Bias ; Metal

AUTOMATIC BIAS ADJUST

With this feature, the microcomputer built into the PMD520 adjusts the bias and record gain automatically so that the characteristics of the tape in use can be exhibited fully. (Refer to page 15 for more information)

1. Insert the cassette in the cassette holder of the well to be subjected to bias setting.
2. While holding down the REC ● button Press the REC MUTE button.
3. Ab will appear on the display followed by a number that will count down until the adjustment is complete.
4. If an Error occurs during this process, please refer to the next section.
5. When the bias has been set, the BIAS RESET indicator lights up.
6. To reset the bias to the factory setting, press the BIAS RESET button. The indicator is extinguished and the factory-set bias is recalled.
7. To return to the set bias, press the BIAS RESET button so the indicator lights up.
8. To change the bias setting, start the adjustment from the beginning.

Error Message

If a problem occurs during the AUTOMATIC BIAS routine, an Error message will appear on the display. Please refer to the following table.

Err No.	Meaning
Err 1	Tape End Error
Err 2	Internal Oscillator Error
Err 3	Bias setting Error
Err 4	REC EQ Adjust Error
Err 5	Total Adjust Error

Errors 2-5 are probably the result of a bad tape. Please rerun the AUTO BIAS program with a different tape.

TAPE STOP ALARM

When either Well A or B reaches the end of a tape, the PMD520 generates a buzzer sound to indicate it.

AUTO COUNTER RESET

When a cassette is removed from a cassette holder and another tape is inserted, the tape counter is reset automatically to "00:00".

TO PROTECT VALUABLE RECORDINGS

In the record mode, information previously recorded on the tape will automatically be erased. To prevent this from happening, use a small screwdriver to break out one or both safety tabs (See Figure 8). It is possible to restore the recording capability of either side of the cassette by covering the opening with clear adhesive tape (See Figure 9).

ENHANCED REMOTE CONTROL OPERATIONS

SIMULTANEOUS (PARALLEL) RECORDING

Check to insure that both wells are in REC PAUSE mode after pressing the A+B REC button on the front of the unit. The unit will start recording when either a PLAY or A+B command from the remote controller has been received. During the REC mode, the unit can be placed into a REC PAUSE mode by sending a PAUSE, A+B, or REC command from the remote controller and started again by a PLAY or A+B command from the remote controller. Pressing the STOP ■ button on the front of the unit or sending a STOP command from the remote controller will cancel this operation.

13

DUPLICATION SYNCHRONIZATION

Refer to Fig. 6
CONNECTION

1. Connect the WRC220 * to the RC-5 IN jack of unit #1.

2. Connect the RC-5 OUT jack of unit #1 with the RC-5 IN jack of unit #2.

3. Connect the RC-5 OUT jack of unit #2 with the RC-5 IN jack of unit #3.

4. Up to 100 units can be connected in the same way as described above.

5. Connect the DECK A OUTPUT jacks of unit #1 with the DECK A INPUT jacks of unit #2.

6. Connect the LOOP THROUGH A OUT jacks of unit #2 with the DECK A INPUT jacks of unit #3.

7. Similarly, connect the LOOP THROUGH OUT and DECK A INPUT jacks of other units up to unit #100.

8. Set the INPUT SELECT switches of units #2 and after to A.

   * WRC220 is sold separately.

NORMAL SPEED DUPLICATION

1. Insert the blank cassettes in both Wells A and B of all units.

2. Press the TAPE SPEED NORM buttons of all the units so that the NORMAL indicators of all the units light up.

3. Set the DOLBY NR switches to the desired setting on all the units to record the tapes with noise reduction.

4. Press the A+B button on the WRC220. All the slave units enter record-pause mode.

5. Play the source adjust the REC LEVEL controls of the slave units so that the red segments of their level meters light only at peaks in the music.

6. Press the A+B button on the WRC220. All units will start recording.

7. To stop duplication, press the A+B button on the WRC220.

Note:

Observe the following notes when dubbing a Dolby NR encoded master tape at normal speed.

1) The difference in signal levels between the duplicated tape and source master tape should be no more than 1 dB ; if the PMD520 is used as the source. The PMD520 has been designed so that the difference in level between these tapes is within the standard when the **REC LEVEL** control is set to the center click position.

2) If the master tape was recorded with Dolby NR and the slaves are to have the same Dolby NR, set Dolby NR off for both the master and the slave.

HIGH SPEED DUPLICATION

1. Insert the master tape in Well A of unit #1.

2. Insert the blank cassettes in both Wells A and B of units #2 and after.

3. Press the TAPE SPEED HIGH buttons of all the units so that the HIGH indicators of all the units light up.

4. DOLBY NR is automatically switched off for high speed duplication. See Note 1 below.

5. Press the A+B button of the WRC220. All the slave units enter record-pause mode.

6. Set the REC LEVEL controls of the slave units to the center click positions. See Note 2 below.

7. Press the TAPE A button of the WRC220. This button should be pressed only once and need not be pressed even when duplication is performed later.
   Press the PLAY ▶ button of the WRC220. The master tape in Well A of unit #1 starts to be played and both Wells A and B of the units #2 and after start recording.

8. To stop duplication, press the STOP button of the WRC220.

Notes

Observe the following notes when dubbing a Dolby NR encoded master tape at high speed.

1) Dolby NR has a special dynamic characteristic (with respect to the time axis) by responding to the frequency and level and can process signals correctly only in real time. However, as the high speed duplication alters the relationship between the audio signals and time considerably, the Dolby NR is switched automatically off in the high speed duplication mode. If the source was recorded with Dolby NR, the copies will be recorded with the same Dolby NR.

2) The difference in signal levels between the duplicated tape and source master tape should be no more than 1 dB ; if the PMD520 is used as the source. The PMD520 has been designed so that the difference in level between these tapes is within the standard when the **REC LEVEL** control is set to the center click position.

3) Do not connect a tone control or equalizer components for these components may affect the duplication characteristics.

4) During High Speed Operation the factory bias setting is used.

QMS (QUICK MUSIC SEARCH)

The QMS is available only via a remote control when the well is in stop or play mode.

1. From the remote control unit, select the well (Well A or B).

2. Using the numeric keys of the remote control unit, input the number of music programs to be skipped (up to 15).

3. The input number is shown as "P-☐ ☐ " on the display.

4. Press the FF ▶▶ or REW ◀◀ button of the remote control unit to start the QMS operation.

5. The unit winds tape at a high speed while detecting blanks between music programs, and enters pause mode when the set number of blank space have been detected.

6. Press the PLAY ▶ button to start playback.

AUTO BIAS & EQ SYSTEM

System Operation Description

This system sets the recording bias, recording gain, medium-frequency gain, high-frequency gain and high-frequency peak automatically so that the characteristics of the tape in use can be exhibited fully.

D/A output from the microcomputer

As shown in Figure 1, the microcomputer adjusts each of the bias, gain, medium-frequency gain, high-frequency gain and high-frequency peak levels to one of 64 steps every 100 msec. by using a 6-bit digital-to-analog converter.

Figure 1
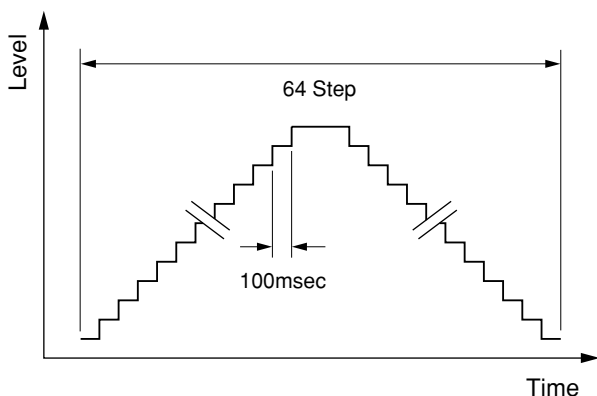
Bias setting

The recording bias is set as shown below according to the characteristics of the record head.

Set frequency: 6.3 kHz

Set bias point: As shown in Figure 2, the bias point is set so that the output level is lower by -5 dB (Normal or High tape) or -2.5 dB (Metal tape) than the peak point. This setting is the optimum point for utilizing the tape performance (MOL, third-order distortion) available from the record head in use.
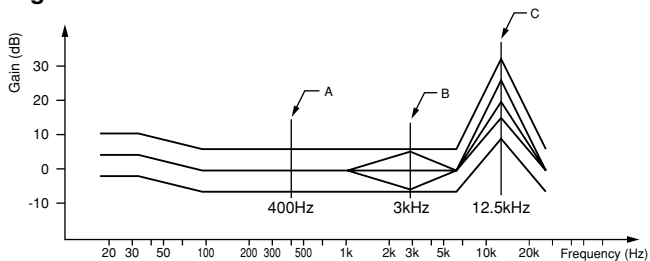
Figure 2
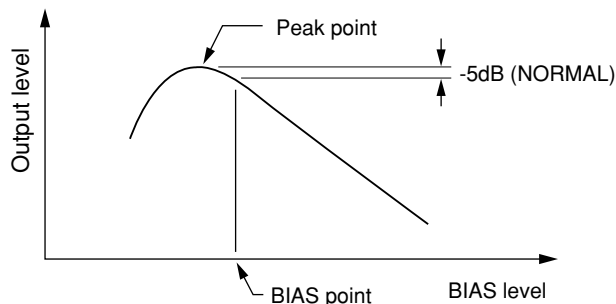
Recording gain setting

An internal oscillator outputs a 400 Hz signal in the range of ±5 dB. This signal is recorded and played to adjust the recording gain so that the output level becomes the standard level. This adjustment is not performed at a specific frequency but varies only the gain, regardless of the frequency, as shown by A in Figure 3.

Medium-frequency gain

The internal oscillator outputs a 3 kHz signal in the range of ±4 dB. This signal is recorded and played to adjust the recording gain at around 3 kHz so that the playback output becomes the standard level as shown by B in Figure 3.

Figure 3

High-frequency gain

The internal oscillator outputs a 12.5 kHz signal in the range of ±3 dB. This signal is recorded and played to adjust the recording gain at around 12.5 kHz so that the playback output becomes the standard level as shown by C in Figure 3.

The following conditions should be met so that the adjustment can be started.

● A cassette tape with unbroken erasure protect tabs should be loaded.

● The mechanism should be in stop mode.

● The tape speed should be set to normal. (The adjustment is not available with the high speed.)

To start the adjustment, press the REC MUTE while pressing the REC ● button.

Ab will appear on the display followed by a number that will count down until the adjustment is complete.

Pressing the STOP ■ button during adjustment cancels it.

If an Error occurs please refer to page 13.

After the adjustment, the tape is rewind automatically to the point where the adjustment was started.

The AUTO BIAS indicator lights up after the adjustment.

– The AUTO BIAS and EQ system uses 3 memory areas for the normal, High and Metal tapes.

– The BIAS RESET buttons will return to the standard characteristics for the normal, High and Metal tapes.

– The data obtained by the adjustment is held in the EEPROM even after the unit is turned off.

– In case the adjustment fails, "Err" (error) is displayed on the counter for 15 seconds, then the factory-set data is recalled.

– In case the adjustment is canceled in the middle or the unit is turned off during the adjustment, all data adjusted until then are invalidated.

– The tape is not rewound in case an adjustment error occurs or the adjustment is canceled in the middle.

– When the data obtained by the adjustment is held in memory and the BIAS RESET indicator is lit, the adjusted setting is recalled at the moment a tape is loaded.

– To use the factory-set data, press the BIAS RESET button so that the indicator is off.

– Performing this adjustment overwrites the previously stored adjustment data.

CARE AND MAINTENANCE

This section describes the care and maintenance tasks that must be performed to optimize the operation of your Marantz equipment.

MAINTENANCE

HEAD CLEANING

If the heads are not cleaned for a long period, dirt or dust may be deposited on the heads and capstans, causing degraded high-frequency characteristics, volume drop, or degraded recording and erasure performances.
To prevent this, clean the heads, etc., periodically as follows.

1. Turn the power off.

2. As shown in Figure 10, clean the parts which come in contact with tape, including the heads, capstans, tape guides, pinch wheels, etc., with a cotton swab soaked in head cleaning solution or denatured alchohol.

HEAD DEMAGNETIZATION

When a magnetized metallic objects (such as a screwdriver tip, etc.) comes in contact with a head or capstan, or when the deck has been used for a long period of time, the head may be magnetized and noise may be generated. If the head is extremely magnetized, the high frequencies in recorded tapes could even be erased due to it. To prevent this, demagnetize the heads and capstans periodically (every 20 hours of use) using a commercially-available head demagnetizer. (For the operation, please refer to the instruction manual supplied with your head demagnetizer.)

Caution:
Be sure to turn the power of the cassette deck off before using a head demagnetizer.

CLEANING OF EQUIPMENT EXTERNAL SURFACES

The exterior finish of your unit will last indefinitely with proper care and cleaning. Never use scouring pads, steel wool, scouring powders or harsh chemical agents (e.g., lye solution), alcohol, thinners, benzine, insecticide or other volatile substances as these will mar the finish of the equipment. Likewise, never use cloths containing chemical substances. If the equipment gets dirty, wipe the external surfaces with a soft, lint -free cloth. If the equipment becomes heavily soiled:

– dilute some washing up liquid in water, in a ratio of one part detergent to six parts water

– dip a soft, lint free cloth in the solution and wring the cloth out until it is damp

– wipe the equipment with the damp cloth

– dry the equipment by wiping it with a dry cloth

REPAIRS

Only the most competent and qualified technicians should be allowed to service your unit. Marantz and its factory trained warranty station personnel have the knowledge and special equipment needed for repair and calibration of this precision instrument.
In the event of difficulty, call the toll-free telephone number listed on the face of the warranty to obtain the name address of the Marantz Authorized Service Center nearest you. In many cases, the dealer where you purchased your Marantz unit may be equipped to provide service. Please include the model, serial number of your unit together with a copy of your purchase receipt and a full description of what you feel is abnormal in its behavior.

TROUBLESHOOTING

Should faults occur, it is in many cases not necessary to consult your dealer or technical service department. On the basis of the following checks you will be able to rectify a number of faults yourself without difficulty.
If the fault cannot be remedied after the following check, please consult your dealer or nearest Marantz service agent.

The tape does not travel.
1. Check that the power cord is plugged properly.
2. Check that the POWER switch is set to ON.
3. Check that the tape is rewound.

The tape travels, but no sound is output.
1. Check that the cassette tape is recorded.
2. Check that the mixer, amplifiers and speakers are connected and functioning properly.

Tape will not record.
1. Check that the protection tabs of cassette tape are not broken.
2. Check that the recording level is set properly.

Sound is distorted.
1. Check that the recording level is not too high.
2. Check that the head is not dirty.

Sound is unstable.
1. Check that the head is not dirty.
2. Check that the pinch wheels (capstans) are not dirty.
3. Check that the tape is wound regularly.

Noise is noticeable.
1. Check that the head is not dirty.
2. Check that the head is not magnetized.
3. Check that the DOLBY NR switch is set properly according to the tape.

Hum interferes with the sound.
1. Check that cords are connected properly.
2. Check that there is not any source of magnetism (TV, motor, transformer, etc.) placed near the unit ?
3. When this unit and amplifier are stacked, hum noise is sometimes generated depending on the amplifier model. In such a case, place the components in positions where interference does not occur.

NOTICE
The tape counters are only approximate measurements of minutes and seconds and are not intended for timing-critical applications.

TECHNICAL SPECIFICATIONS

Track System .... 4 Track, 2 Channel
Head System
    Rec Play Head .... Hard Permalloy
    Erase Head .... Dual Gap Ferrite
    Approx Head Life 1000H
Recording/Erasure System .... AC 105 kHz Bias
Motor System
    Capstan .... DC Servo Controlled Motor
    Reel .... DC Motor
Overall S/N, NR off, "A" weighted
    Normal 57dB
    High 58dB
    Metal 58dB
Overall S/N, Dolby C NR, "A" weighted
    Normal 74dB
    High 75dB
    Metal 75dB
Frequency Response, Rec/Play, NR off
    Normal 40Hz–16kHz
    High 40Hz–17kHz
    Metal 40Hz–18kHz
Dolby NR effect, B/C , S/N improvement,
CCIR/ARM weighted .... B 8dB, C 17dB
Output
    Line 540mV
    Phone 50mV
Output Impedance
    Line 47Ω
    Phone 120Ω
Input Sensitivity
    Line 100mV
Input Impedance
    Line 100kΩ
Fine Speed Control .... ±3%
Wow & Flutter
    W RMS .... 0.07% (Jis WTD)
Power Supply
    Power Requirement .... 120V AC 60Hz
    Power Consumption 0.25A
Dimensions
    Width .... 19 inches (483mm)
    Height .... 5 3/16 inches (132mm)
    Depth .... 13 3/8 inches (340mm)
Net Weight .... 15.4 lbs. (7kg)

Specifications subject to change without prior notice.

RC-5 Command Table

Command	RC-5 Code
0	1800
1	1801
2	1802
3	1803
4	1804
5	1805
6	1806
7	1807
8	1808
9	1809
Next	1832
Previous	1833
Monitor Select	1838
Recording Pause	1840
Record Blank	1842
Mechanism A	1844
Mechanism B	1846
Pause	1848
Auto Rewind	185000
Play	1853
Normal Speed	185311
High Speed	185312
Stop	1854
Wind	1852
Rewind	1850
Record	1855
Auto Bias	185509
A+B Synchronous Recording	185510
Connect	1856
Disconnect	1857

Figure 4

CASCADE OPERATION

Figure 5

DUPLICATION SYNCHRONIZATION

WRC220

Figure 6
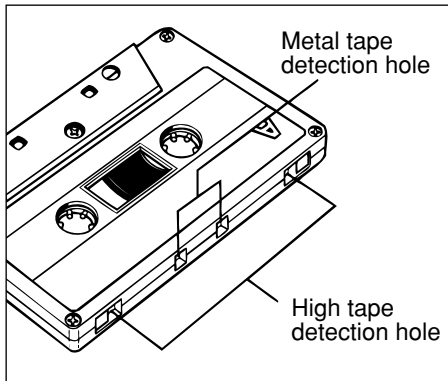
Metal tape
detection hole

High tape
detection hole
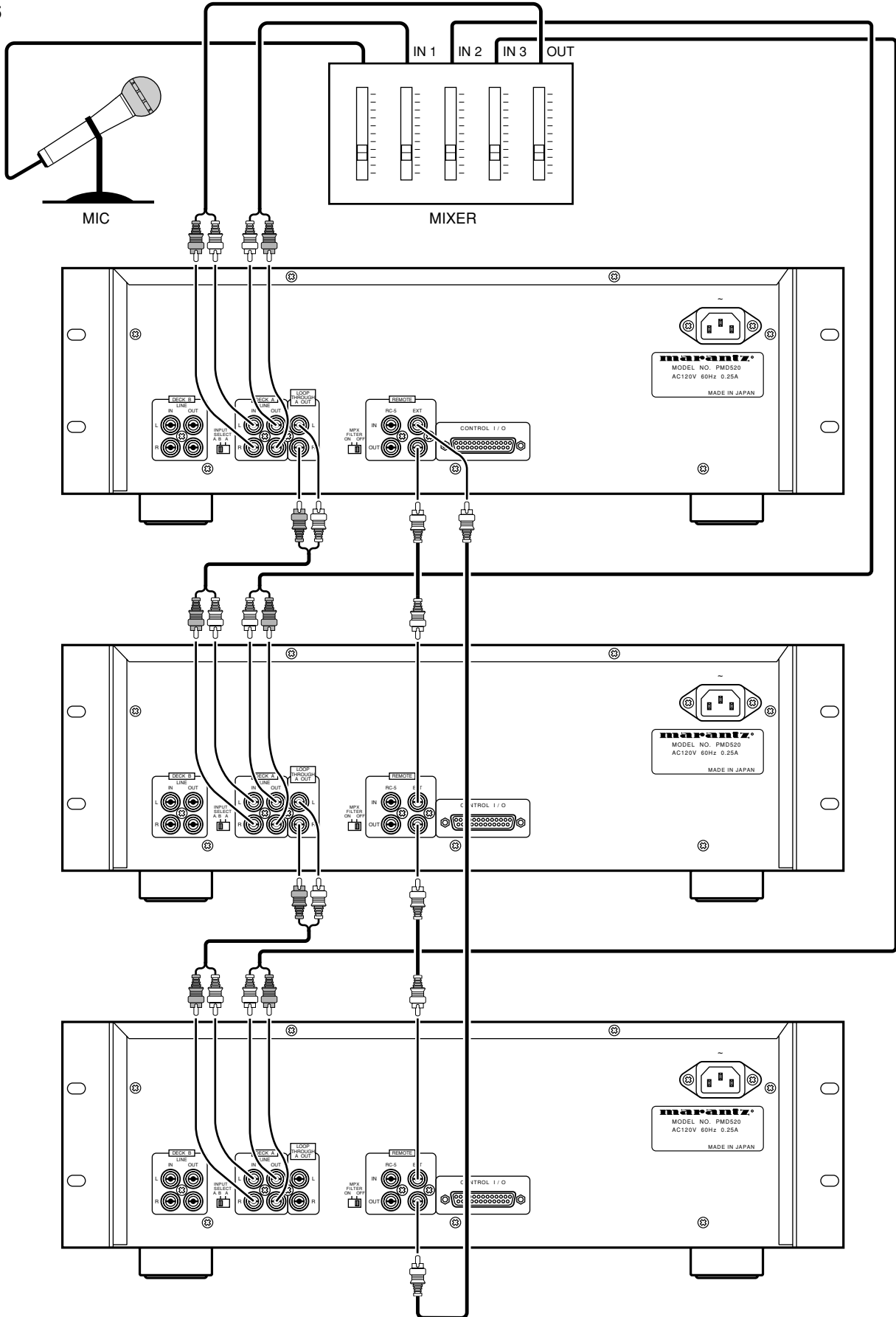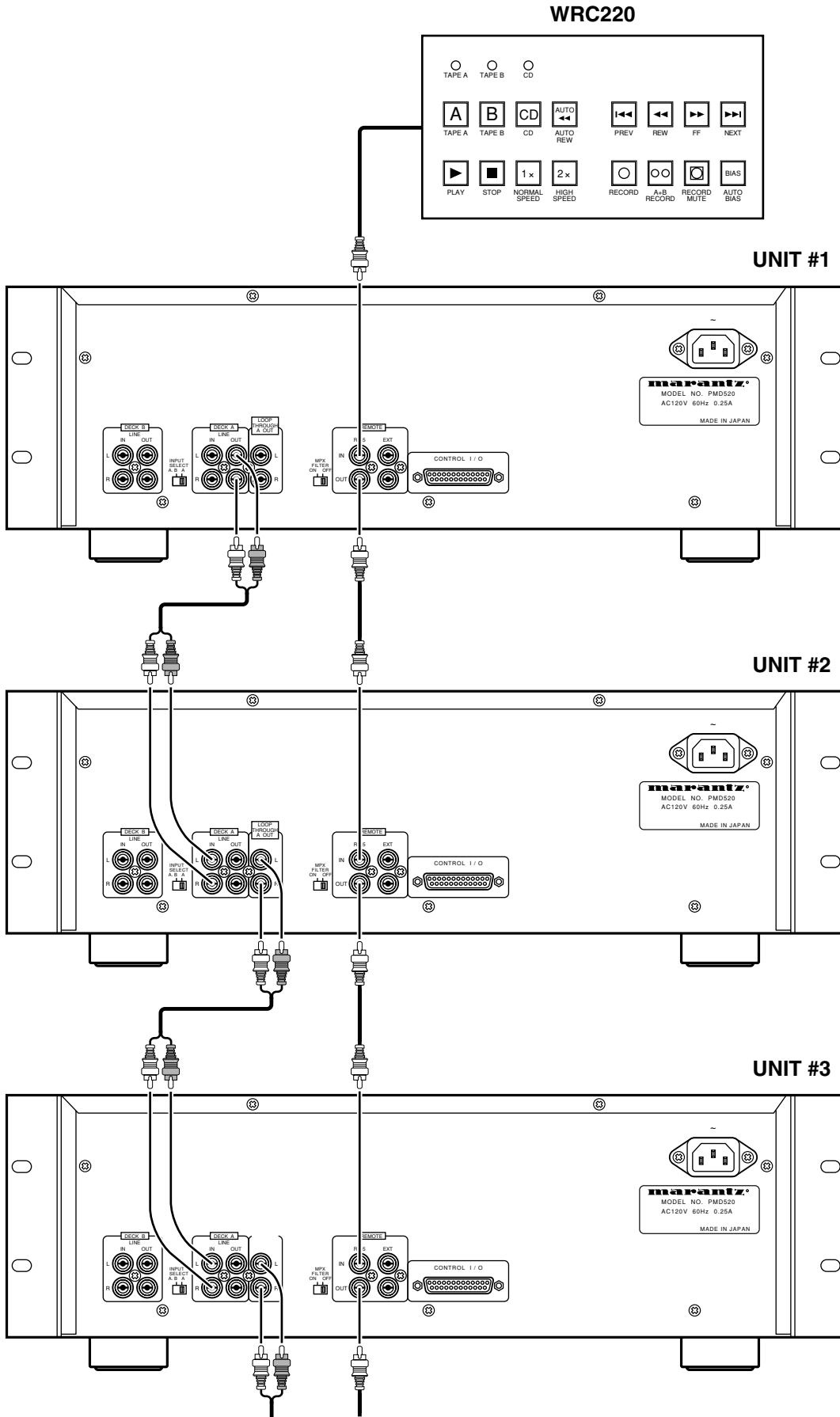
Figure 7

Figure 8

Figure 9
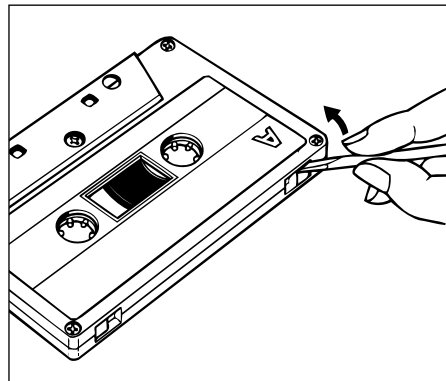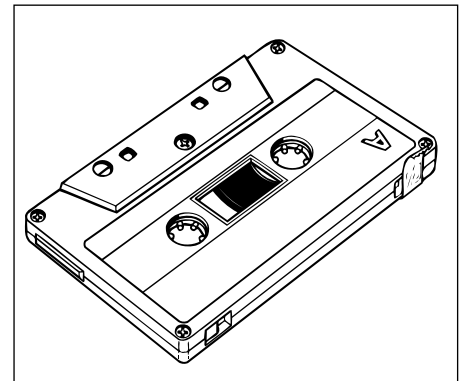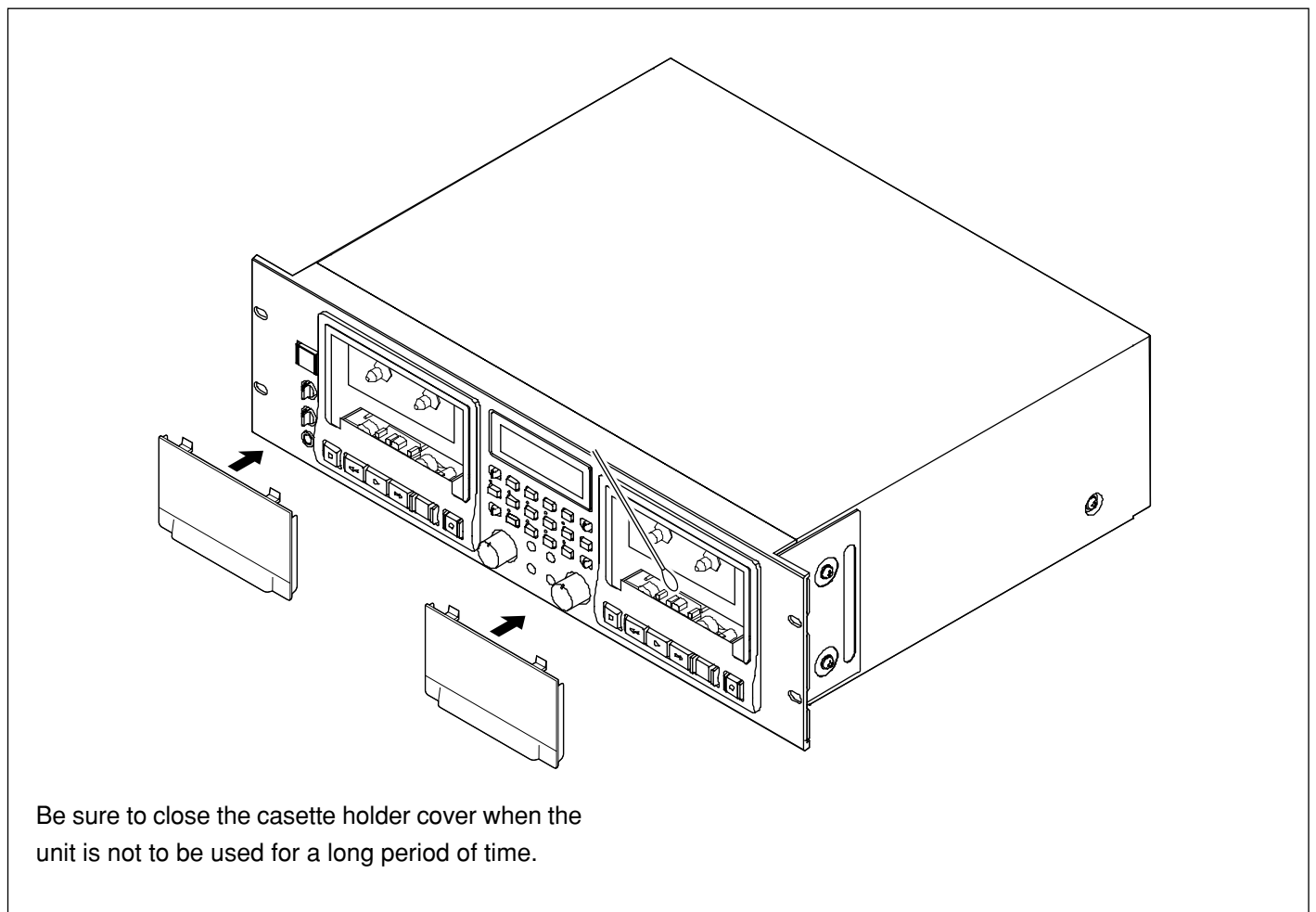

Be sure to close the casette holder cover when the
unit is not to be used for a long period of time.

Figure 10