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Nakamichi TD-1200

Mobile Tuner/Cassette Deck

Owner's Manual

Congratulations!
You have chosen one of the most advanced components for true mobile high fidelity. The TD-1200 is a tuner/cassette deck unit with auto-reverse, specially designed for optimum performance in an automobile while incorporating the best of Nakamichi's highly sophisticated cassette deck technology.

The TD-1200 employs the epoch-making NAAC (Nakamichi Auto Azimuth Correction) system, which is widely acclaimed for completely resolving a major problem of conventional auto-reverse decks, namely the difference in sound quality between the forward and reverse modes. Thanks to this system, the superb playback head with extremely narrow 0.6 micron gap can develop its full qualities, resulting in perfect playback sound under all conditions. Nakamichi's brushless, coreless, slotless Super Linear Torque motor serves as main tape drive motor, for significantly reduced wow-and-flutter.
The other features of this unit are almost too numerous to mention. To name but a few, it possesses Dolby B-C type noise reduction, bass, midrange and treble controls for precise tonal adjustments, a quartz PLL synthesizer tuner section with a total of 10 programmable memories for AM and FM stations, etc.

In order to take full advantage of this unit's superior features and performance, please read this manual in its entirety.

Thank you.

Nakamichi Corporation.

WARNING
TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

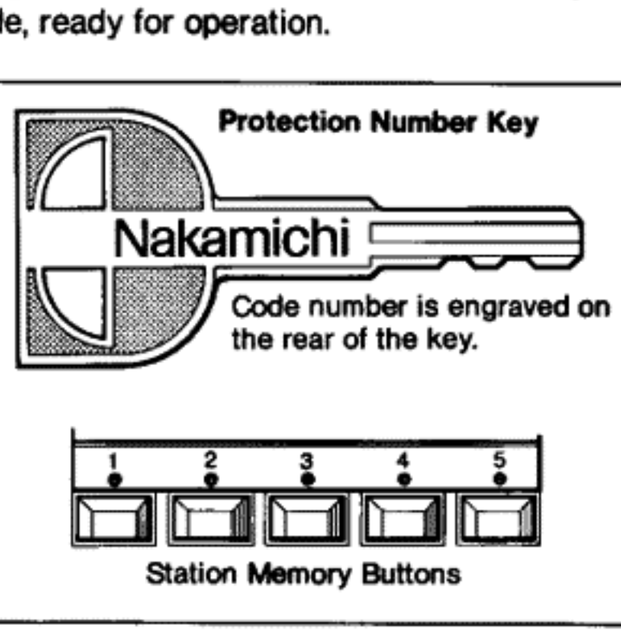
Please record the Model Number and Serial Number in the space provided below and retain these numbers.
Model Number and Serial Number are located on the rear panel of the unit.
Model Number: TD-1200
Serial Number: _____

CONTENTS

Precautions

Theft-Protection System

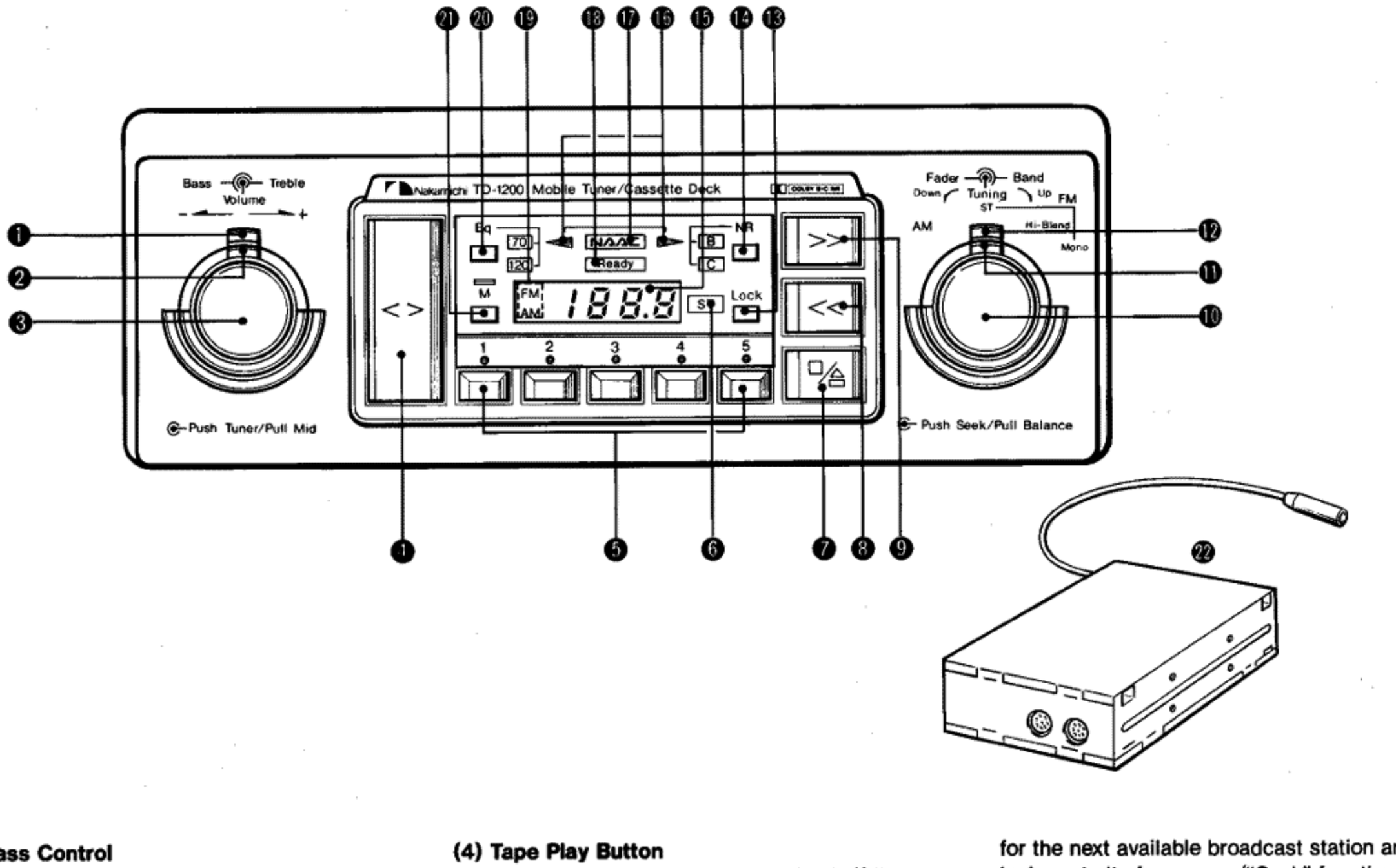
None of this unit's tape playback, FM/AM reception or other functions will operate as long as the theft-protection system is active. In order to deactivate the protection system, you must input the 5-digit protection number via the unit's station memory buttons. The protection number for your unit is engraved on the protection number key supplied with the unit. After input of the correct code number is completed, the "Ready" indicator will light up, to signal that the unit is now in the standby mode, ready for operation.



- The protection system is activated as follows: Press the lock switch. The "Ready" indicator will go out. If now the car's ignition key is turned off or the unit is disconnected from the battery, the protection system will become active. If the ignition key is turned off with the "Ready" indicator lit, the indicator will immediately come on again the next time the key is set to On, and the unit will be in the ordinary operative mode.
- If a wrong button was pressed during input of the code number, repeat the procedure from the beginning.
- For a period of 3 minutes after battery connections were established, the protection system cannot be deactivated even if the correct code number is pressed. Therefore start the input procedure only after more than 3 minutes have elapsed.
- If the TD-1200 does not operate at all or operates improperly although the correct code number was pressed, set the car's ignition key to Off, disconnect the unit's battery power supply cable, and then re-establish the battery connection.

1. This unit is designed for use in cars with 13.2 V negative ground systems only.
2. Do not use C-120 cassettes (playing time one hour per side) with this unit, as such cassettes contain very thin tape which breaks or snarls easily.
3. Inserting a cassette with tape slack can result in damage to the unit or the tape. Be sure to take up any slack in the tape before inserting a cassette.
4. Do not store cassettes in locations subject to high temperature or humidity. Always put the cassettes back into their cases, to prevent dust accumulation, tape slackening, etc.
5. When a closed car is parked in the sun, the temperature inside the car will reach very high levels. In such a case, use the unit only after the ambient temperature has returned to normal.
6. If the fuse is blown, check all connections and then replace it with a new fuse of the identical type. If the fuse blows again, contact your dealer for servicing.
7. For reasons of traffic safety, you should keep the listening volume while driving to a level which will not mask outside noises.

Controls and Features



(1) Bass Control
Turning this control from its center clickstop position clockwise provides low-frequency boost (up to 18 dB at 40 Hz). Turning the control counterclockwise provides low-frequency attenuation (up to 18 dB at 40 Hz).

(2) Treble Control
Turning this control from its center clickstop position clockwise provides high-frequency boost (up to 12 dB at 20 kHz). Turning the control counterclockwise provides high-frequency attenuation (up to 12 dB at 20 kHz).

(3) Tuner On/Off Knob (Also Volume Control and Midrange Control)
- By pushing this knob, the tuner section is switched on for reception of FM/AM broadcasts. Pushing the knob once more switches the tuner off.
- By turning the knob clockwise, the listening level is raised.
- Pulling the knob and turning it clockwise from its center clickstop position provides mid-frequency boost (up to 10 dB at 200 Hz). Pulling the knob and turning it counterclockwise provides mid-frequency attenuation (up to 10 dB at 200 Hz). This can be used to compensate for midrange frequency response irregularities caused by the shape and size of the car's interior and speaker characteristics. (Refer to the chart of tone control characteristics on p.10.)

(4) Tape Play Button
Pushing this button starts tape playback. If the button is pushed once more during playback, the tape travel direction is reversed. The respective direction indicator is lit to show the playback direction.

(5) Station Memory Buttons
By using the memory switch in conjunction with the station memory buttons, a total of ten broadcast stations, five each for the FM and AM band, can be programmed into the memory. These buttons are also used to input the individual code number for deactivation of the theft-protection system. (→ p. 2)

(6) Stereo Indicator
Lights up during reception of FM stereo broadcasts.

(7) Stop/Eject Button
Pressing this button once during tape playback will stop the tape transport. Pressing the button once more releases the lock of the cassette compartment for removal of the cassette.

(8) Fast Reverse Button

(9) Fast Forward Button

(10) Tuning Knob (Also Balance Control)
- When this knob is pushed during FM/AM reception, the tuner automatically searches for the next available broadcast station and locks onto its frequency ("Seek" function). By turning the knob towards "Down" (counterclockwise) or "Up" (clockwise), manual tuning can be performed. (→ p. 8)
- By pulling the knob and turning it, the right/left channel balance can be adjusted.

(11) Fader Knob
This knob serves to adjust the front/rear balance in a 4-speaker setup.

(12) Band Selector (Also FM High-Blend and FM Monaural Switch)
The frequency band for broadcast reception (FM or AM) is chosen with this selector, which also provides positions for the FM High-Blend and FM Monaural mode.

(13) Lock Switch
This switch serves to activate the theft-protection system. (→ p. 2)

(14) Dolby NR Switch
During tape playback, the Dolby NR Off, B-Type NR On, and C-Type NR On modes can be selected with this switch. During FM reception, the Dolby NR Off and B-Type NR On modes (the latter for reception of Dolby-encoded FM broadcasts) can be selected.

(15) Frequency Display
Shows the FM/AM frequency being received.

Installation

(16) Direction Indicators
Show the tape playback direction. If a tape is inserted and the unit is in the stop mode, both indicators are lit. When no tape is inserted, both indicators are off. If in this condition (no cassette inserted in the unit) the tape play or fast-winding buttons are pressed by mistake, both indicators are flashing as a warning indication. In such a case, press the stop/eject button or operate the tuner section to release the alarm.

(17) NAAC (Nakamichi Auto Azimuth Correction) Indicator
This indicator flashes during operation of the NAAC system, and it is constantly lit when the adjustment is completed. Every time the tape play button is pushed, the NAAC system is activated for automatic adjustment of playback head azimuth.

(18) Ready Indicator
When this indicator is lit, the unit is in the standby mode, ready for tape playback operation or FM/AM broadcast reception. When the lock switch is pressed, the indicator goes out and the theft-protection system will be activated when the car's ignition key is turned off. (→ p. 2)

(19) FM/AM Indicators

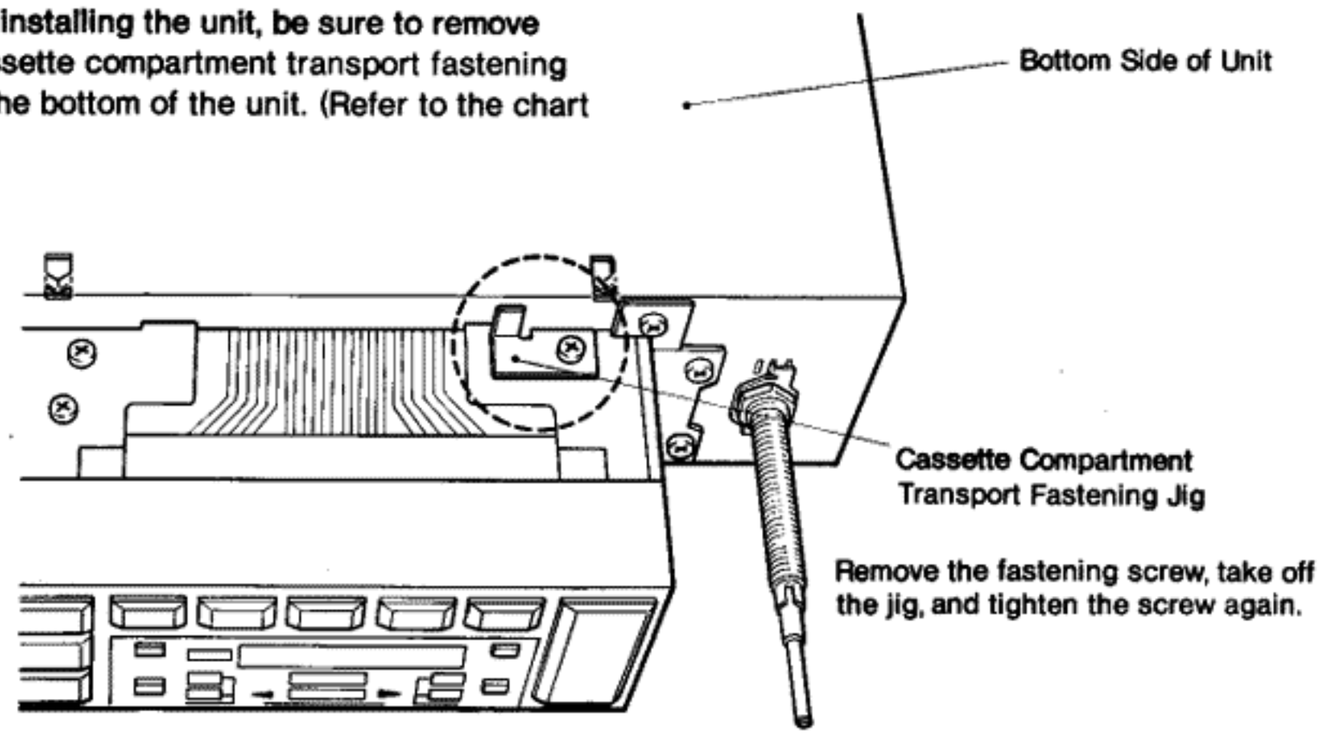
(20) Equalizer Switch
Serves to select the correct playback equalization for the tape in use.
Normal-position tapes should be played with 120 μs, and chrome-position and metal tapes with 70 μs equalization.

(21) Memory Switch
This switch is used to store FM/AM broadcast stations in the station memory buttons.
(→ p. 8)

(22) Additional Electronics Enclosure

IMPORTANT: Read this before starting the installation procedure.

Before installing the unit, be sure to remove the cassette compartment transport fastening jig on the bottom of the unit. (Refer to the chart below.)

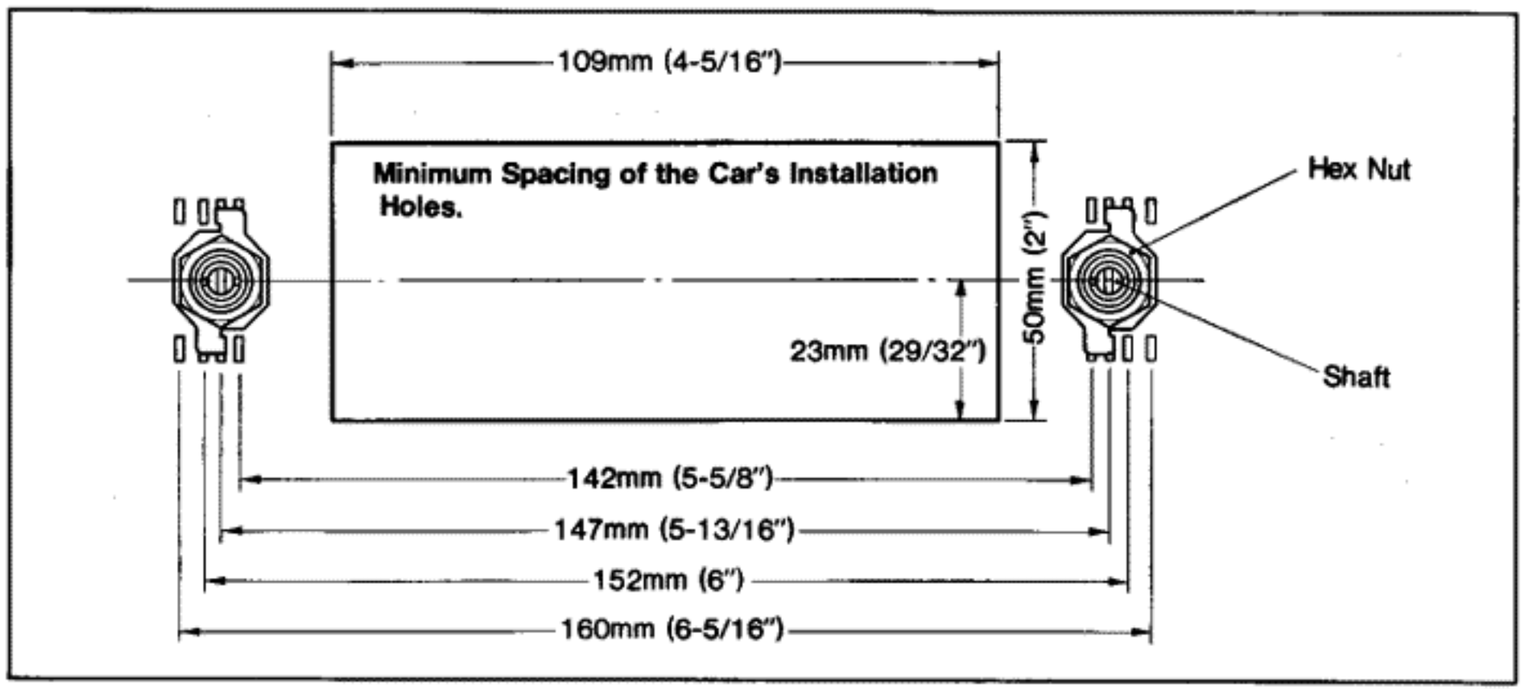


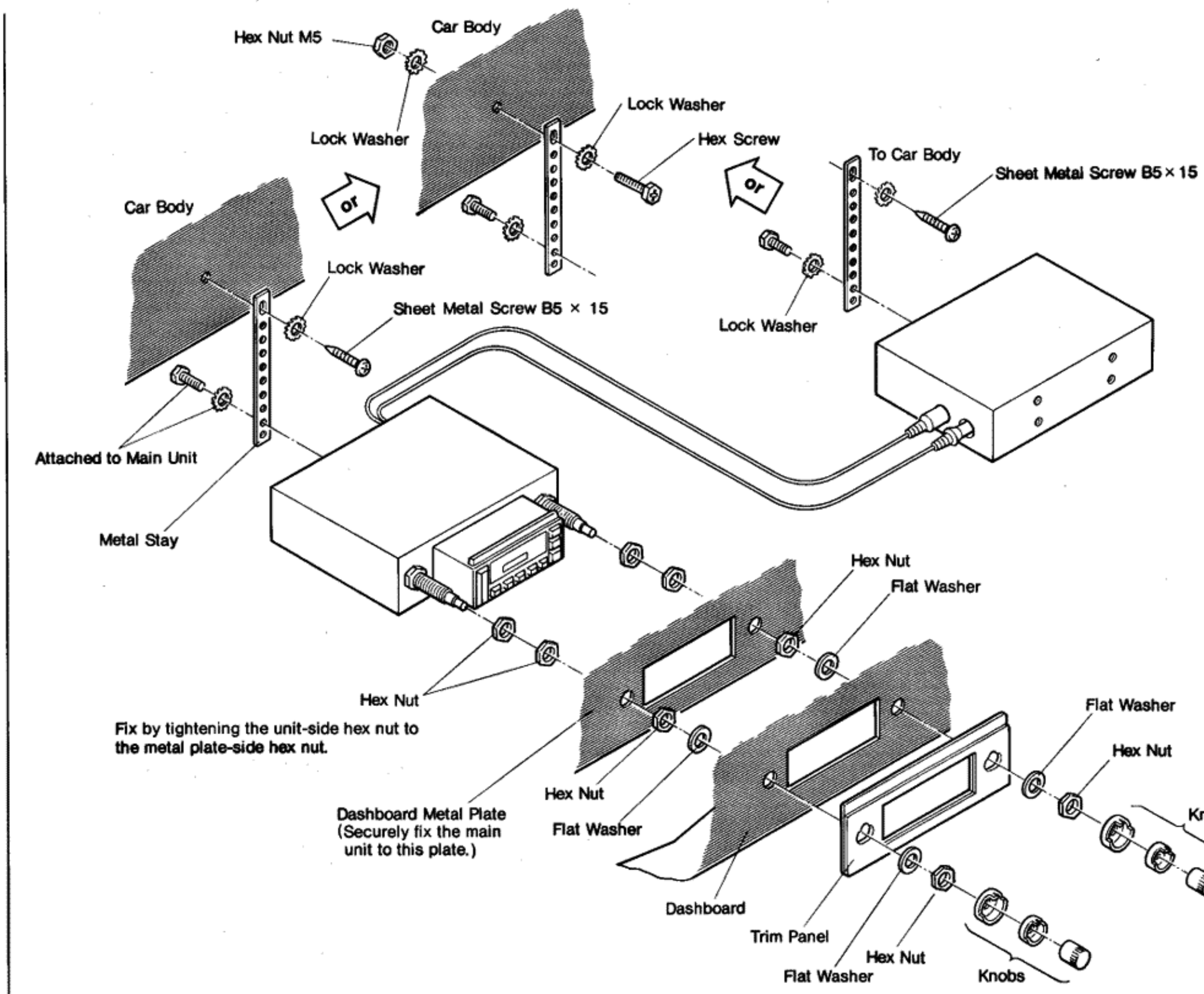
Auxiliary Parts For Installation

Before starting the installation of the unit, check whether the supplied auxiliary parts are complete.

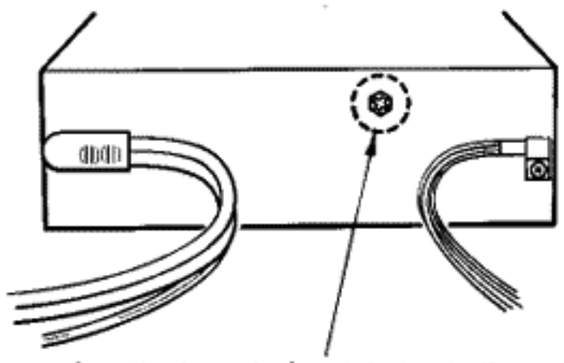
	Qty		Qty
Trim Panel	1	Antenna Extension Cable	1
Metal Stay	2	Hex Screw (M5 × 20)	2
Knobs (large, medium, small, 2 each)	6	Sheet Metal Screw (B5 × 15)	2
Spare Fuses (5A, 500mA, 1 each)	2	Lock Washer	4
Shielded Cable with RCA-Type Phono Plugs	1	Hex Nut (M5)	2
Protection Number Key	1	Hex Nut (M10)	8
		Flat Washer	4

(1) Check whether the right and left shafts on the front side of the unit fit the installation holes in the dashboard of the car. The shaft distance is adjusted to 147 mm (5-13/16") before shipping, but it can be changed to suit other requirements. For re-adjustment, loosen the hex nut which fixes the shaft to the main unit.
(2) Attach the metal stay to the rear panel of the unit, using the hex screw and lock washer. (The hex screw and lock washer are already temporarily fixed to the unit for shipping. Remove these parts and use them for the installation.) Attach the other end of





the metal stay to the car body, using the supplied hex screw (M5 × 20) or sheet metal screw (B5 × 15) and lock washer.


Screw for attachment of metal stay to the unit.

(3) Screw two hex nuts each onto the right and left shaft, and fasten them in the required position, depending on the thickness of the dashboard.

(4) Mount the unit by sticking the shafts through the installation holes in the dashboard. Use the hex nuts and lock washers to securely fix the unit to the dashboard metal plate.

For the attachment of the trim panel, the cassette compartment must be in the extended position. Therefore establish the necessary connections and deactivate the theft-protection system (→ p. 2). Then open the cassette compartment and proceed with the trim panel installation.

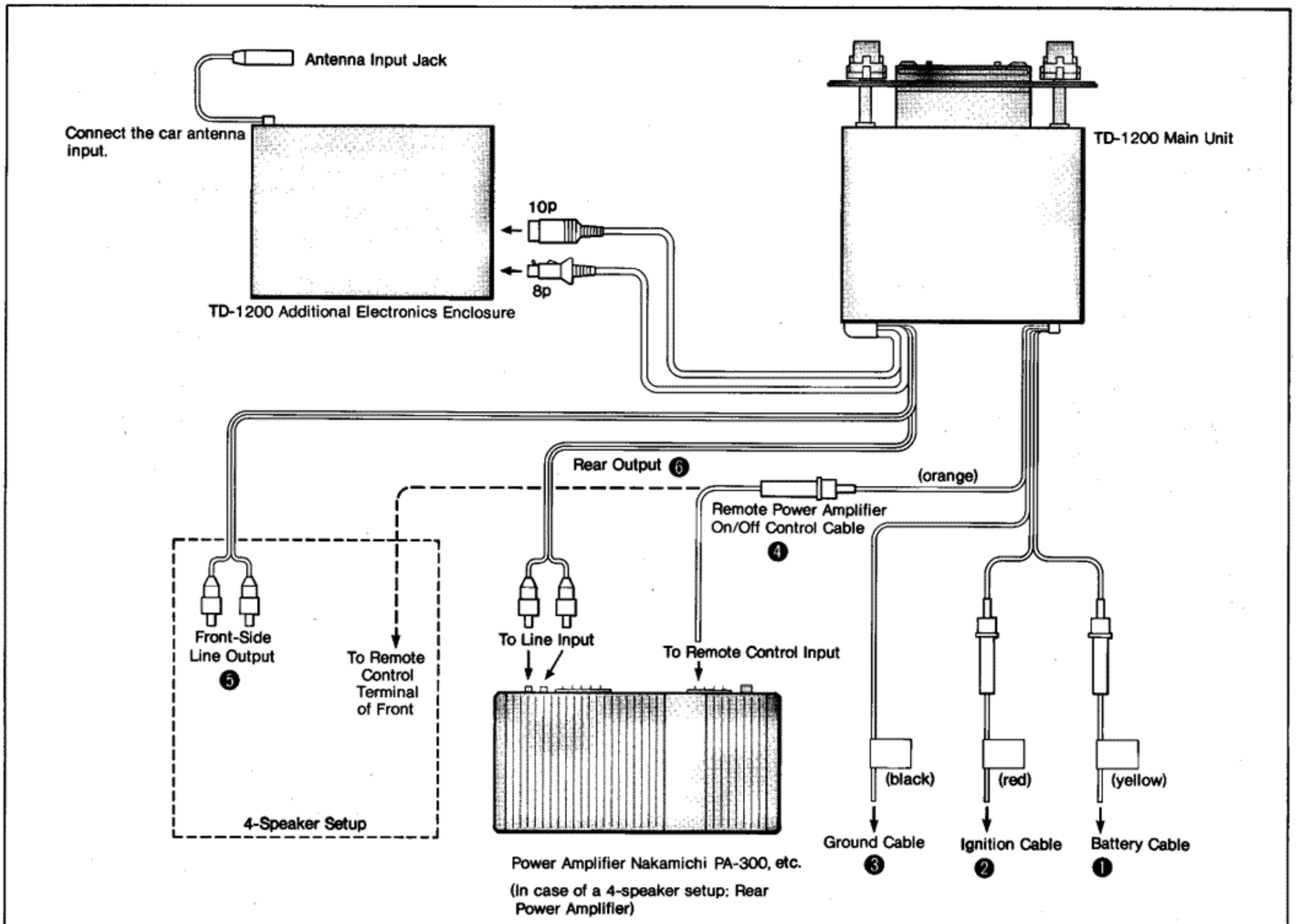
(5) Mount the trim panel onto the main unit from the outside and fix it with the hex nuts. (The height and width of the trim panel can be adjusted by cutting it along the V-shaped groove on the rear.)

(6) Mount the 6 knobs on the right and left shaft, by aligning each knob with the respective cutout on the shaft.

(7) Install the additional electronics enclosure in a convenient location within the range of the two connection cables which must be routed from the main unit to the additional enclosure. As with the main unit, use the hex screw and lock washer, which are already temporarily attached to the enclosure, to fix the metal stay to the enclosure. Then use the supplied hex screw (M5 × 20) or sheet metal screw (B5 × 15) and lock washer to attach the metal stay to the car body.

- To reduce the risk of noise pickup, do not install the additional electronics enclosure too close to the power amplifier, etc.

Connections



(1) Battery Cable (yellow)
[BATTERY (+), red label] (Fuse 5 A)
To be connected directly to the car battery's positive (+) terminal. Serves as back-up power supply for the TD-1200's memory circuit.

(2) Ignition Cable (red)
[IGNITION (+), red label] (Fuse 5 A)
To be connected to the ignition circuit on the car's fuse block (which is switched on and off by the car's ignition key).

First connect the battery cable, and then the ignition cable.

(3) Ground Cable (black)
[GND (−), black label]
If the main unit's metal stay has direct contact with the car's chassis, it is not necessary to connect this cable.
If the metal stay has no direct contact, connect the cable to the nearest ground point (metal point) on the car chassis. (Keep this connection as short as possible, as a long ground cable can lead to noise pickup.)

(4) Remote Power Amplifier On/Off Control Cable (orange)
[Power Amp. On/Off Control (+), white label] (Fuse 500 mA)
When this cable is connected to the remote control input terminal of the jointly used power amplifier, the amplifier will automatically switch on when the TD-1200 is turned on for radio reception or tape playback.

- This cable is designed only as a power supply for remote switching of the power amplifier. Do not use it as the main power supply for the power amplifier.
- Approximately 1 minute after radio reception or tape playback with the TD-1200 is terminated, the power amplifier will automatically switch off.

(5) Front Output [FRONT, white label; white plug: left channel, red plug: right channel]

(6) Rear Output [REAR, white label; white plug: left channel, red plug: right channel]
These are line-level outputs for connection to the line input terminals of the power amplifier. For a 4-speaker setup, connect the front output to the front-side power amplifier and the rear output to the rear-side power amplifier.

Connection of the Additional Electronics Enclosure

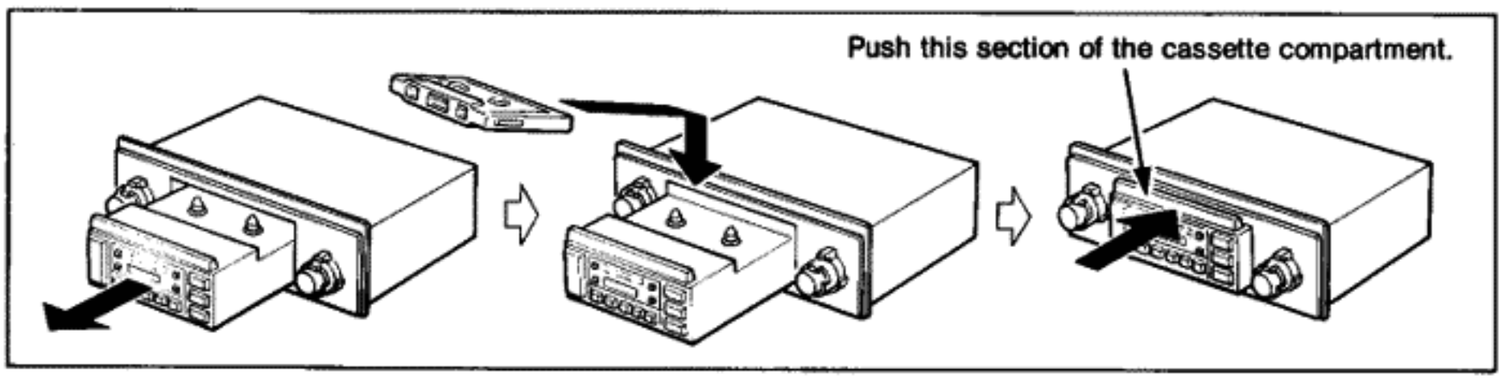
Insert the plugs of the 10-p connector cable and the 8-p connector cable coming from the main unit into the respective connectors of the additional electronics enclosure. Insert the car antenna cable into the antenna input jack of the additional electronics enclosure. If this unit is mounted in a separate location such as under the driver's seat, use the supplied antenna extension cable.

As long as the theft-protection system is active, this unit will not operate, even if all connections have been properly established. 3 minutes after all power connections are completed, the deactivation of the protection system becomes possible. Perform the required steps as described on page 2.

Tape Playback

(1) Press the stop/eject button to release the lock of the cassette compartment.
(2) Pull out the cassette compartment until it locks in its extended position. Insert the cassette to be played back. Then push the cassette compartment fully back in until it is firmly locked in its initial position.
(3) When the cassette compartment is closed, tape playback starts automatically in the forward direction.
- If the compartment was opened and closed without taking out and re-inserting the cassette, playback will be resumed in the same direction as before.

(4) Select the correct 70 μs or 120 μs equalization for the tape in use with the equalizer switch. By pressing the switch, the setting changes from 120 μs → 70 μs. For playback of normal-position tapes, use the 120 μs setting, and for chrome-position and metal tapes the 70 μs setting.
(5) Select the correct Dolby NR setting with the Dolby NR switch. For playback of tapes which were recorded with Dolby C-Type noise reduction, use the C-Type position. For playback of tapes recorded with Dolby B-Type noise reduction, use the B-Type position. For playback of tapes recorded without Dolby noise reduction, set the Dolby NR to Off. Each push of the Dolby NR switch changes the setting in the order Off → B-Type → C-Type . The respective indicator lights up.
(6) Turn the tuner On/Off knob (volume control) in the clockwise direction to adjust the listening volume.
If the tape playback direction is to be changed from forward to reverse, press the tape play button.
The respective direction indicator lights up to show the playback direction.
When playback starts, the NAAC system is activated and automatically adjusts the playback head azimuth to the optimum position for the cassette in use.
(7) To terminate tape playback, press the stop/eject button once. When the button is pressed once more, the cassette compartment lock is released and the compartment can be pulled out for removal of the cassette.
- This unit permits direct mode change for example from forward to reverse playback, from forward playback to fast forward, etc. without having to press the stop/eject button.



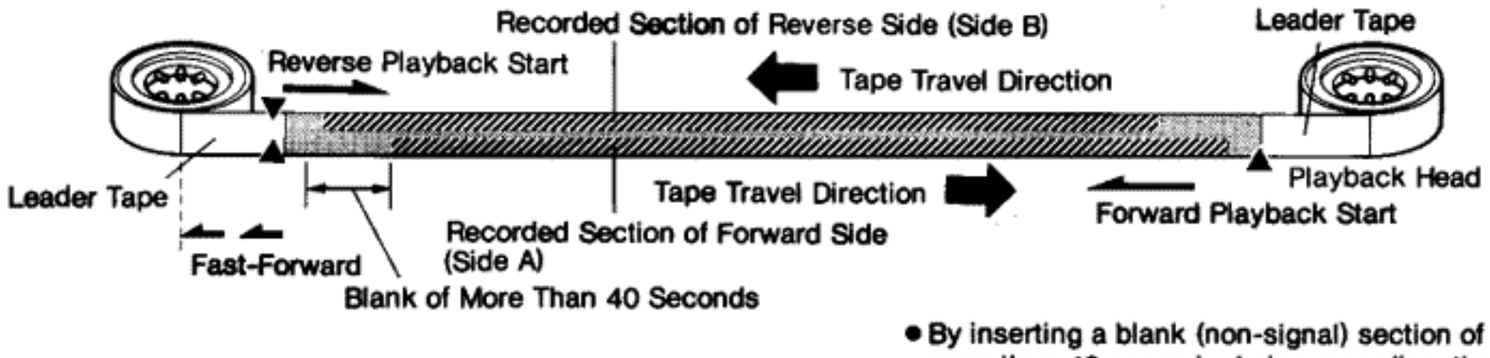
The Playback Auto-Reverse System

This cassette deck incorporates an auto-reverse system which automatically proceeds to playback of side B when playback of side A is completed. Therefore both sides of a cassette can be played back without the need to remove the cassette and turn it over.
The unique auto-reverse system of this unit operates as follows: If during playback of side A (B), a blank section (recording level below −30dB) of more than 40 seconds is detected, the tape is automatically fast-forwarded to the tape end for direction reversal. Playback then starts at the beginning of side B (A).
- If the tape in use contains a low-level section (recording level below −30dB) which extends for more than 40 seconds, the auto-reverse function of this unit may be triggered also during playback of a program.

NAAC (Nakamichi Auto Azimuth Correction) System

In order to ensure perfect performance of the auto-reverse feature, this unit incorporates a revolutionary system called NAAC for automatic adjustment of the playback head azimuth. When playing back a tape, slight differences in tape travel characteristics between sides A and B would lead to azimuth losses (due to misalignment of the head vs. the tape). The NAAC system automatically corrects playback head azimuth, so that no such losses can occur. Thereby the difference in sound quality between playback of side A and B, which tended to be a problem in conventional auto-reverse systems, has been completely eliminated.

When automatic adjustment of playback head azimuth is being performed, the NAAC indicator flashes as a visual indication.
- The NAAC operation is controlled by musical signals of more than 3 kHz recorded on the tape. If a tape which contains little energy in this range is used, the NAAC indicator may flash sometimes and the adjustment procedure may require a little more time.
- After ejecting the cassette tape, performing fast-winding, stop or direction reversal, the playback head azimuth is set to the standard position (ordinary azimuth angle). If in this condition a cassette which requires no azimuth correction is played, the NAAC system may not be activated.



- By inserting a blank (non-signal) section of more than 40 seconds during recording, the reverse operation can be triggered at any desired spot on the tape, without performing playback to the tape end.

FM/AM Broadcast Reception

(1) Press the tuner On/Off knob and select the FM or AM band with the band selector.

(2) **Tuning Operation**

(1) When the tuning knob is pushed, the unit automatically scans the selected frequency band and stops at the next available broadcast station. This Seek function is resumed when the knob is pushed again.

(2) When the tuning knob is turned clockwise and held in this position (See Fig. A), the tuning frequency changes continuously towards higher indications. Likewise, keeping the knob turned in the counterclockwise direction will cause the frequency to change continuosly towards lower indications. When approaching the frequency of the desired broadcast station, performing the operation as shown in Fig. B will change the frequency in 200 kHz steps for FM and in 10 kHz steps for AM. This permits exact tuning to the desired frequency.

Continuous Frequency Change

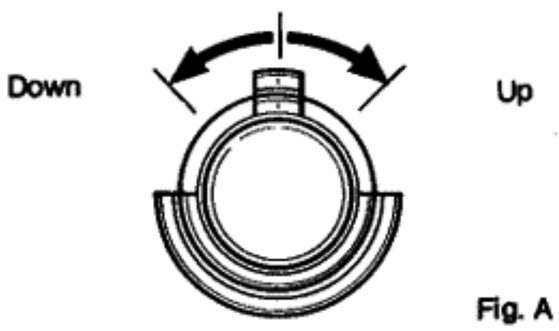


Fig. A

Manual Frequency Change in 200 kHz Steps for FM and 10 kHz Steps for AM

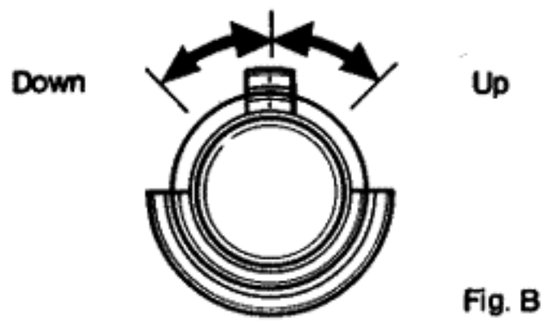


Fig. B

(3) When an FM stereo broadcast is received, the Stereo indicator will light up. If reception of an FM stereo broadcast sounds noisy, set the selector to the "Hi-Blend" or "Mono" position. For reception of a Dolby-encoded FM broadcast, set the unit to the B-Type mode with the Dolby NR switch. (During FM reception, the C-Type mode cannot be selected.)

(4) Turn the tuner On/Off knob (volume control) in the clockwise direction to adjust the listening volume.

(5) To switch the tuner off, press the tuner On/Off knob once more.

- If during FM/AM broadcast reception one of the tape controls is operated, the tuner output is interrupted and the tape operation is given priority. During this time, the station memory button indicators glow dimly to indicate that the tuner is still operative. When the tape control is stopped, the tuner output is heard again.

Broadcast Station Programming

This unit has a memory circuit which permits the presetting of a total of 10 broadcast stations, five for the FM band and five for the AM band. For reception of Dolby-encoded broadcasts, the Dolby NR system's On/Off condition can also be memorized.

(1) Extend the car antenna fully and adjust the tuner to receive the desired broadcast station.

(2) Press the memory switch. The indicator lights up.

(3) Out of the five station memory buttons, press the one you want to program the station into.
The indicator above the station memory button, which was glowing dimly, is now lit brightly to indicate that a station has been programmed.
Program the other station memory buttons in the same way.

(4) For re-programming of a station memory button which already has been set with a station, perform the above steps (1) ~ (3) in the same way.

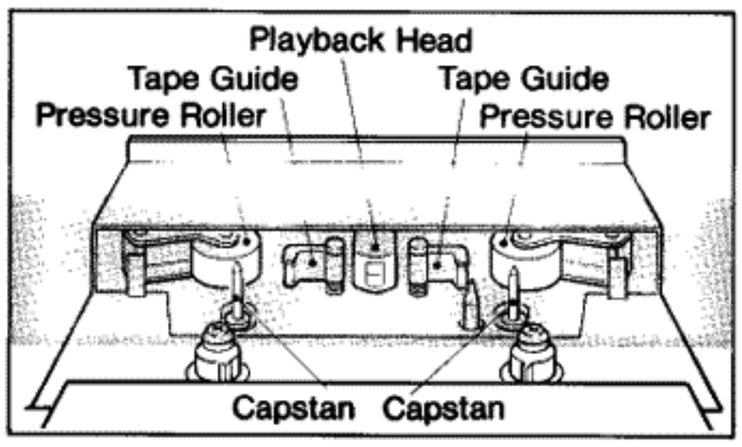
Maintenance

It is very important to regularily clean the playback head, capstans, pressure rollers and all other parts which come in contact with the tape. Tiny particles shedded from the tape onto these parts, as well as dust accumulations etc. become the cause of drop-outs and severely degrade frequency response and wow-and-flutter characteristics. With some low-quality tapes, head contamination is especially severe. Avoid the use of such tapes whenever possible and be sure to keep all parts spotlessly clean.

Cleaning Procedure

With the cassette compartment in the extended position, clean the parts indicated in white on the illustration. Use commercially available cotton-tipped sticks or the like and wipe the parts with very light pressure. In case of severe contamination, dip the cotton tip in cleaning fluid.

- Be careful not to apply too much force in cleaning, as the respective parts are critically aligned. Take special care not to damage the tape guide.
- Do not use an excessive amount of cleaning fluid, and give the cleaned surfaces a minute or two to dry off completely before playing a tape.



- If you have used cotton-tipped sticks, be sure not to leave any cotton strands on the cleaned parts.

Cleaning of the Unit

Clean the unit only by wiping it with a soft, dry cloth. Never use alcohol, solvents, ammonia or abrasive cleaning agents.

Lubrication

All important moving parts of this unit are fitted with long-life, oil-less bearings. Periodic lubrication is therefore not necessary.

Troubleshooting

Condition	Probable Cause	Remedy
Tape does not run or playback is not at normal speed.	1. Cassette compartment not completely closed. 2. Tape is not gripped between pressure roller and capstan.	1. Press the stop/eject button and repeat the tape insertion procedure. 2. Remove the cassette, take up any tape slack, and re-insert the cassette.
Uneven sound levels, drop-outs during tape playback.	3. Head and/or capstans, pressure rollers etc. are dirty. 4. Faulty cassette.	3. Clean these parts. 4. Use a high-quality cassette.
Distorted tape playback sound.	5. Head is dirty. 6. Equalizer switch not set correctly.	5. Clean head. 6. Select correct position for tape in use.
Cannot playback.	7. Improper connections. 8. Head is dirty.	7. Check all connections. 8. Clean head.
Dull high frequencies.	9. Heads is dirty. 10. Dolby NR switch and/or equalizer switch not set correctly.	9. Clean head. 10. Select correct positions.
No tape playback or FM/AM reception possible.	11. Theft-protection system is active.	11. Deactivate protection system.
High noise level during AM reception.	12. Additional electronics enclosure placed too close to power amplifier or other interference sources.	12. Change the location of additional electronics enclosure.
Ignition noise heard during broadcast reception.	13. Unit's ground wiring is too long.	13. Make ground connection as short as possible.

Specifications

• Tuner Section

—FM—

Frequency Range	87.9—107.9 MHz
Sensitivity	20 dBf (IHF)
50 dB Quieting Sensitivity	
Mono	26 dBf
Total Harmonic Distortion	0.08% (Mono 1 kHz) Input 65 dBf 0.13% (Stereo 1 kHz) Input 65 dBf
S/N Ratio	
Mono	65 dBf
Frequency Response	30—15,000 Hz ±3 dB
Alternate Channel Selectivity	60 dB
Image Rejection at 98 MHz	65 dB
IF Rejection at 98 MHz	80 dB
Stereo Separation	35 dB (1 kHz) at 65 dBf
Antenna Terminals	75 ohms (unbalanced)

—AM—

Frequency Range	530—1620 kHz
Sensitivity	36 μV
Selectivity	20 dB (±9 kHz)
Image Rejection at 1400 kHz	50 dB
Total Harmonic Distortion	2% (400 Hz, 30% modulation)

• Preamplifier Section

Frequency Response	10—50,000 Hz ±1 dB
Output Level/Impedance	1.1 V/1 kΩ
Total Harmonic Distortion	Less than 0.005%
Tone Control	
Bass	40 Hz ±18 dB
Mid	200 Hz ±10 dB
Treble	20 kHz ±12 dB

• Cassette Deck Section

Tape Speed	1-7/8 ips (4.8 cm/sec)
Wow and Flutter	Less than 0.045% WTD RMS Less than 0.09% WTD Peak
Frequency Response	20—22,000 Hz ±3 dB (Nakamichi Test Tape)
Signal-to-Noise Ratio	**Dolby C-Type NR On** <70 μs, ZX Tape> Better than 70 dB (400 Hz, 3% THD, IHF A-WTD RMS) **Dolby B-Type NR On** <70 μs, ZX Tape> Better than 64 dB (400 Hz, 3% THD, IHF A-WTD RMS)
Channel Separation	Better than 35 dB (1 kHz, 0 dB)
Cross Talk	Better than 60 dB (1 kHz, 0 dB)

• Dimensions

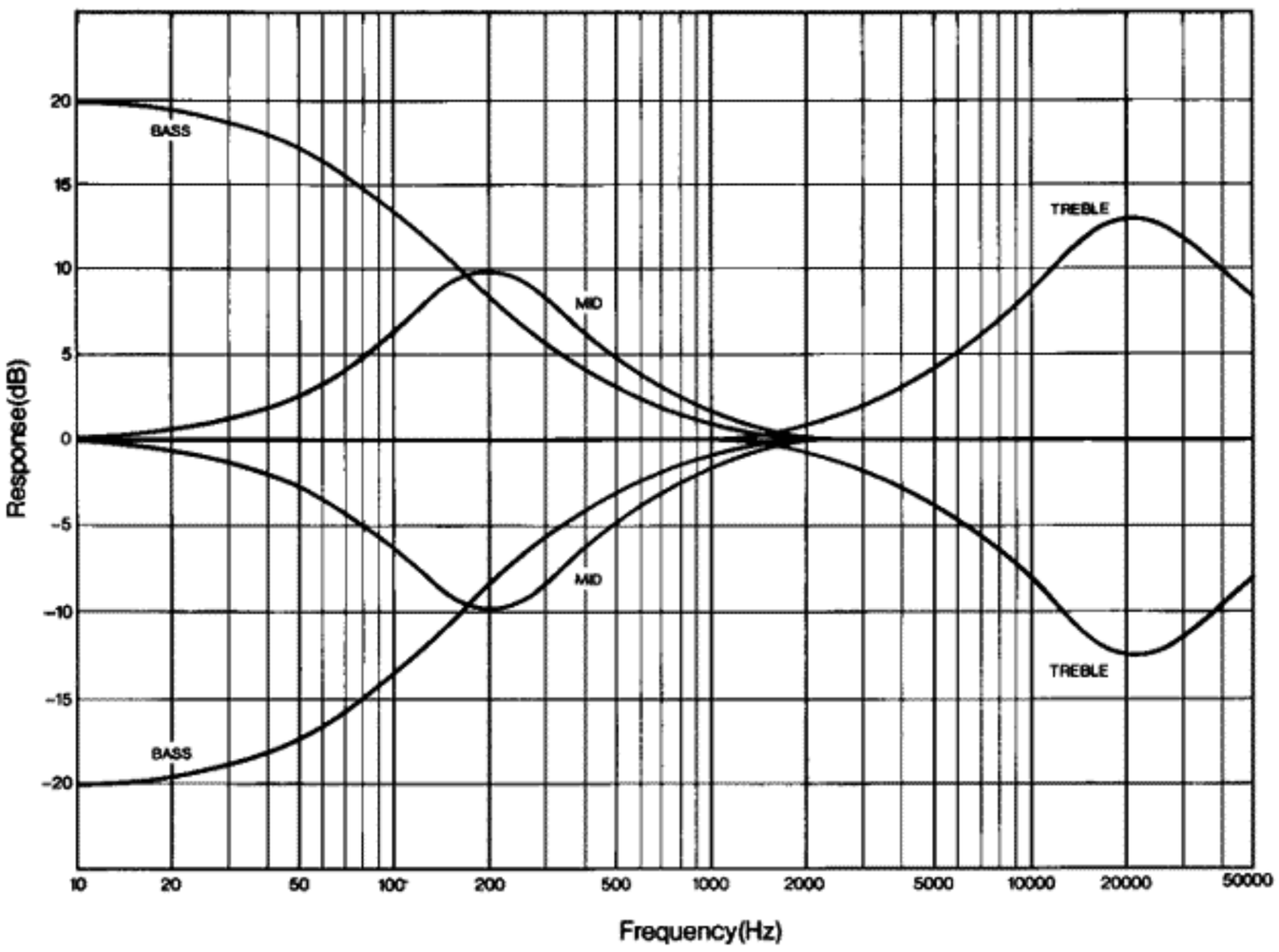
Main Unit	
[Transport/Control]	184(W) × 56(H) × 182(D) mm 7-1/4(W) × 2-1/4(H) × 7-3/16(D) inches
Additional Electronics	
Enclosure	181(W) × 50(H) × 133(D) mm 7-1/8(W) × 2(H) × 5-1/4(D) inches

• Approximate Weight

Main Unit	
[Transport/Control]	2.5 kg 5 lb 8 oz
Additional Electronics	
Enclosure	0.85 kg 1 lb 14 oz

Power Source	13.2 V DC negative ground (10.8—15.6 V allowable)
Power Consumption	3 A Maximum

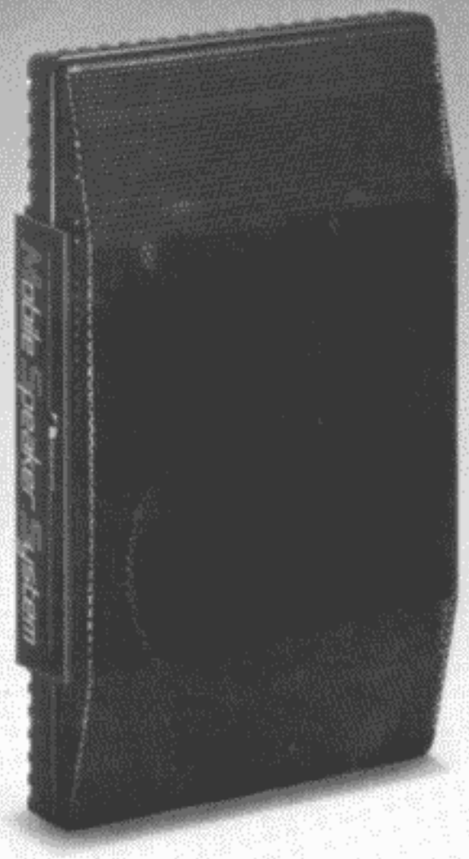
- Specifications and appearance design are subject to change for further improvement without notice.
- Dolby NR under license from Dolby Laboratories Licensing Corporation.
- The word "Dolby" and the Double-D-Symbol are trademarks of Dolby Laboratories Licensing Corporation.

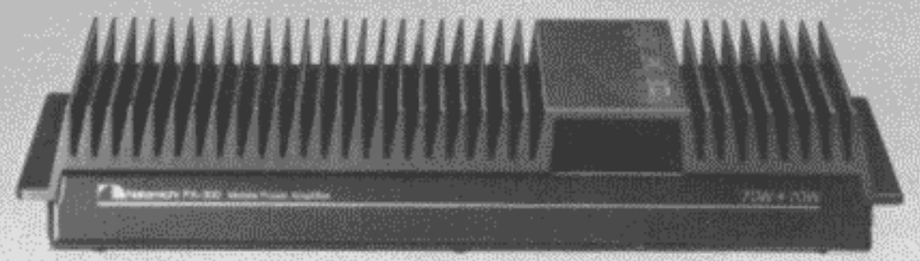


Tone Control Characteristics

Nakamichi Mobile Sound System

TD-1200/PA-300/SP-400





PA-300 Mobile Power Amplifier

TD-1200 Mobile Tuner/Cassette Deck

SP-400 Mobile Speaker System

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O-821220A Printed in Japan