AUDIO RECORDER AR-200S

Owner's Manual

Thank you, and congratulations on your choice of the AR-200S Roland Audio Recorder. This manual mainly describes how to use the AR-200S as a playback device using CompactFlash cards that contain recordings made with other AR Series models.

* *When recording to CompactFlash cards with the AR-3000/2000/200/100, we recommend use of optional Roland CompactFlash cards (PM-***-CF Series).*

Before using this unit, carefully read the sections entitled: "USING THE UNIT SAFELY" and "IMPORTANT NOTES" (p. 2; p. 3). These sections provide important information concerning the proper operation of the unit. Additionally, in order to feel assured that you have gained a good grasp of every feature provided by your new unit, Owner's manual should be read in its entirety. The manual should be saved and kept on hand as a convenient reference.

Main Features

Simplified Panel, Specialized for Remote Control from Other Devices

The AR-200S can be used as a dedicated playback device, which is controlled by means of instructions from other devices, and which employs phrases created with the AR-3000/200 and saved on CompactFlash cards.

High-Quality Recording and Playback

Roland's innovative RDAC system enables high-quality recording and playback using less data. You can select recording settings tailored to the usage circumstances and the capacity of the card, with six different sampling frequencies and four levels of signal processing (RDAC-Mode). This ensures compatibility for recording and playback for a variety of situations and applications.

All recorded phrases are saved on memory cards, allowing you to quickly play phrases for any situation, simply by changing cards.

* *Maximum recording time with use of 128 MB CompactFlash cards (with monaural recording)*
HIGH (44.1 kHz)/16-bit Linear: 24 minutes (approximately 11 seconds/MB)
LONG1 (22.05 kHz)/RDAC-MODE 3: 2 hours 11 minutes (approximately 1 minute/MB)
ANNOUNCE (8 kHz)/RDAC-MODE 1: 9 hours (approximately 4 minutes 10 seconds/MB)

Audio Recording System Uses No Moving Parts

The AR-200S uses memory cards in an audio recording system that has no moving parts. The system uses no rotating parts or drive mechanism, so it's practically maintenance free. It also features excellent sound quality and superior reliability.

A Variety of Control Terminals for a Wide Range of Playback Methods

The AR-200S features "Control Input Terminals" as control connectors. This permits connection of switches, sensors, program timers, and other devices, enabling control of the unit from another location. In addition, the AR-200S can be controlled with a computer via the RS-232C port.

Compact Half-Rack Size Body

The 1U half-rack size body takes up practically no space. The AR-200S can be mounted in any standard 19-inch EIA rack using the optional rack mount adapter.

Allows DC-Powered Operation

The AR-200S features input terminals for DC power supplies, making the unit compatible in a variety of usage environments.

USING THE UNIT SAFELY

INSTRUCTIONS FOR THE PREVENTION OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS

About ⚠WARNING and ⚠CAUTION Notices

⚠WARNING	Used for instructions intended to alert the user to the risk of death or severe injury should the unit be used improperly.
⚠ CAUTION	Used for instructions intended to alert the user to the risk of injury or material damage should the unit be used improperly. * Material damage refers to damage or other adverse effects caused with respect to the home and all its furnishings, as well to domestic animals or pets.

About the Symbols

⚠	The △ symbol alerts the user to important instructions or warnings.The specific meaning of the symbol is determined by the design contained within the triangle. In the case of the symbol at left, it is used for general cautions, warnings, or alerts to danger.
	The ⃠ symbol alerts the user to items that must never be carried out (are forbidden). The specific thing that must not be done is indicated by the design contained within the circle. In the case of the symbol at left, it means that the unit must never be disassembled.
	The ● symbol alerts the user to things that must be carried out. The specific thing that must be done is indicated by the design contained within the circle. In the case of the symbol at left, it means that the power-cord plug must be unplugged from the outlet.

ALWAYS OBSERVE THE FOLLOWING

⚠WARNING

- Before using this unit, make sure to read the instructions below, and the Owner's Manual.
- Do not open (or modify in any way) the unit or its AC adaptor.
- Do not attempt to repair the unit, or replace parts within it (except when this manual provides specific instructions directing you to do so). Refer all servicing to your retailer, the nearest Roland Service Center, or an authorized Roland distributor, as listed on the "Information" page.
- Never use or store the unit in places that are:
  - Subject to temperature extremes (e.g., direct sunlight in an enclosed vehicle, near a heating duct, on top of heat-generating equipment); or are
  - Damp (e.g., baths, washrooms, on wet floors); or are
  - Humid; or are
  - Exposed to rain; or are
  - Dusty; or are
  - Subject to high levels of vibration.
- This unit should be used only with a rack mount adaptor (RAD-50) that is recommended by Roland.
- When using the unit with a rack mount adaptor recommended by Roland, the rack must be carefully placed so it is level and sure to remain stable. If not using a rack or stand, you still need to make sure that any location you choose for placing the unit provides a level surface that will properly support the unit, and keep it from wobbling.
- Be sure to use only the AC adaptor supplied with the unit. Also, make sure the line voltage at the installation matches the input voltage specified on the AC adaptor's body. Other AC adaptors may use a different polarity, or be designed for a different voltage, so their use could result in damage, malfunction, or electric shock.
- Take care not to exceed the maximum rated specifications (100 mA) when using the DC OUT terminal for the power supply.

⚠WARNING

- Do not excessively twist or bend the power cord, nor place heavy objects on it. Doing so can damage the cord, producing severed elements and short circuits. Damaged cords are fire and shock hazards!
- This unit, either alone or in combination with an amplifier and headphones or speakers, may be capable of producing sound levels that could cause permanent hearing loss. Do not operate for a long period of time at a high volume level, or at a level that is uncomfortable. If you experience any hearing loss or ringing in the ears, you should immediately stop using the unit, and consult an audiologist.
- Do not allow any objects (e.g., flammable material, coins, pins); or liquids of any kind (water, soft drinks, etc.) to penetrate the unit.
- Immediately turn the power off, remove the AC adaptor from the outlet, and request servicing by your retailer, the nearest Roland Service Center, or an authorized Roland distributor, as listed on the "Information" page when:
  - The AC adaptor or the power-supply cord has been damaged; or
  - If smoke or unusual odor occurs
  - Objects have fallen into, or liquid has been spilled onto the unit; or
  - The unit has been exposed to rain (or otherwise has become wet); or
  - The unit does not appear to operate normally or exhibits a marked change in performance.
- In households with small children, an adult should provide supervision until the child is capable of following all the rules essential for the safe operation of the unit.
- Protect the unit from strong impact. (Do not drop it!)
- Do not force the unit's power-supply cord to share an outlet with an unreasonable number of other devices. Be especially careful when using extension cords—the total power used by all devices you have connected to the extension cord's outlet must never exceed the power rating (watts/amperes) for the extension cord. Excessive loads can cause the insulation on the cord to heat up and eventually melt through.

⚠WARNING

- Before using the unit in a foreign country, consult with your retailer, the nearest Roland Service Center, or an authorized Roland distributor, as listed on the "Information" page.

⚠ CAUTION

- The unit and the AC adaptor should be located so their location or position does not interfere with their proper ventilation.
- Always grasp only the output plug or the body of the AC adaptor when plugging into, or unplugging from, this unit or an outlet.
- At regular intervals, you should unplug the AC adaptor and clean it by using a dry cloth to wipe all dust and other accumulations away from its prongs. Also, disconnect the power plug from the power outlet whenever the unit is to remain unused for an extended period of time. Any accumulation of dust between the power plug and the power outlet can result in poor insulation and lead to fire.
- Try to prevent cords and cables from becoming entangled. Also, all cords and cables should be placed so they are out of the reach of children.
- Never climb on top of, nor place heavy objects on the unit.
- Never handle the AC adaptor body, or its output plugs, with wet hands when plugging into, or unplugging from, an outlet or this unit.
- Before moving the unit, disconnect the AC adaptor and all cords coming from external devices.
- Before cleaning the unit, turn off the power and unplug the AC adaptor from the outlet.
- Whenever you suspect the possibility of lightning in your area, disconnect the AC adaptor from the outlet.
- Keep any removed screw terminals, the ground terminal screw, screw terminal cover, included Euroblock connector, rubber feet, and card protector attachment screws safely out of children's reach so as to prevent these pieces from being swallowed accidentally by young children.

IMPORTANT NOTES

In addition to the items listed under "USING THE UNIT SAFELY" on page 2, please read and observe the following:

Power Supply

- Do not connect this unit to same electrical outlet that is being used by an electrical appliance that is controlled by an inverter (such as a refrigerator, washing machine, microwave oven, or air conditioner), or that contains a motor. Depending on the way in which the electrical appliance is used, power supply noise may cause this unit to malfunction or may produce audible noise. If it is not practical to use a separate electrical outlet, connect a power supply noise filter between this unit and the electrical outlet.
- The AC adaptor will begin to generate heat after long hours of consecutive use. This is normal, and is not a cause for concern.
- Before connecting this unit to other devices, turn off the power to all units. This will help prevent malfunctions and/or damage to speakers or other devices.

Placement

- Using the unit near power amplifiers (or other equipment containing large power transformers) may induce hum. To alleviate the problem, change the orientation of this unit; or move it farther away from the source of interference.
- This device may interfere with radio and television reception. Do not use this device in the vicinity of such receivers.
- Noise may be produced if wireless communications devices, such as cell phones, are operated in the vicinity of this unit. Such noise could occur when receiving or initiating a call, or while conversing. Should you experience such problems, you should relocate such wireless devices so they are at a greater distance from this unit, or switch them off.
- When moved from one location to another where the temperature and/or humidity is very different, water droplets (condensation) may form inside the unit. Damage or malfunction may result if you attempt to use the unit in this condition. Therefore, before using the unit, you must allow it to stand for several hours, until the condensation has completely evaporated.

Maintenance

- For everyday cleaning wipe the unit with a soft, dry cloth or one that has been slightly dampened with water. To remove stubborn dirt, use a cloth impregnated with a mild, non-abrasive detergent. Afterwards, be sure to wipe the unit thoroughly with a soft, dry cloth.
- Never use benzine, thinners, alcohol or solvents of any kind, to avoid the possibility of discoloration and/or deformation.

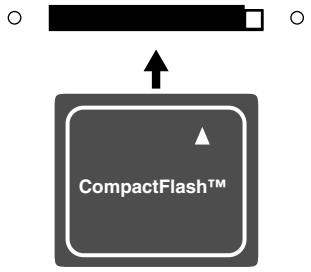
Additional Precautions

- Keep the included Euroblock connector in a safe place out of children's reach, so there is no chance of them being stepped on accidentally.
- Unfortunately, it may be impossible to restore the contents of data that was stored on a memory card once it has been lost. Roland Corporation assumes no liability concerning such loss of data.
- Use a reasonable amount of care when using the unit's buttons, sliders, or other controls; and when using its jacks and connectors. Rough handling can lead to malfunctions.
- Never strike or apply strong pressure to the display.
- When connecting / disconnecting all cables, grasp the connector itself—never pull on the cable. This way you will avoid causing shorts, or damage to the cable's internal elements.
- To avoid disturbing your neighbors, try to keep the unit's volume at reasonable levels (especially when it is late at night).
- When you need to transport the unit, package it in the box (including padding) that it came in, if possible. Otherwise, you will need to use equivalent packaging materials.
- Some connection cables contain resistors. Do not use cables that incorporate resistors for connecting to this unit. The use of such cables can cause the sound level to be extremely low, or impossible to hear. For information on cable specifications, contact the manufacturer of the cable.

Before Using Cards

Using Memory Cards

- Carefully insert the memory card all the way in—until it is firmly in place.



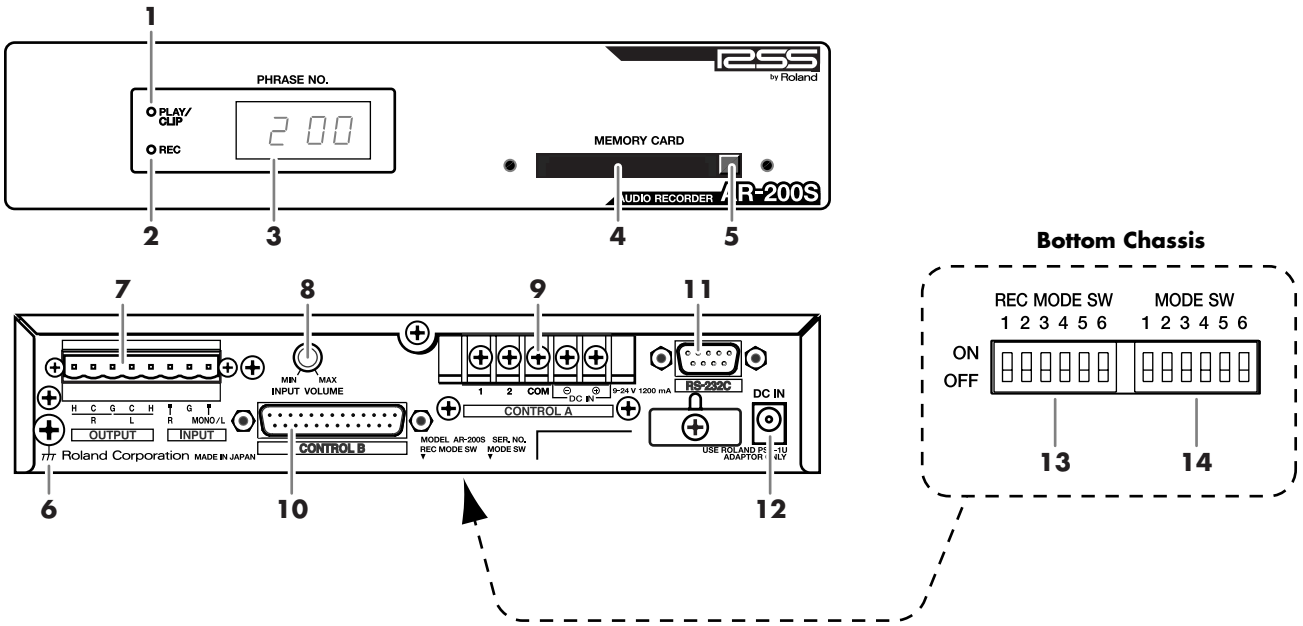
- Never touch the terminals of the memory card. Also, avoid getting the terminals dirty.
- This unit's memory card slot accepts CompactFlash memory cards. Microdrive storage media are not compatible.
- CompactFlash cards are constructed using precision components; handle the cards carefully, paying particular note to the following.
  - To prevent damage to the cards from static electricity, be sure to discharge any static electricity from your own body before handling the cards.
  - Do not touch or allow metal to come into contact with the contact portion of the cards.
  - Do not bend, drop, or subject cards to strong shock or vibration.
  - Do not keep cards in direct sunlight, in closed vehicles, or other such locations (storage temperature: -25 to 85° C).
  - Do not allow cards to become wet.
  - Do not disassemble or modify the cards.

Copyright

- Unauthorized recording, distribution, sale, lending, public performance, broadcasting, or the like, in whole or in part, of a work (musical composition, video, broadcast, public performance, or the like) whose copyright is held by a third party is prohibited by law.
- Do not use this unit for purposes that could infringe on a copyright held by a third party. We assume no responsibility whatsoever with regard to any infringements of third-party copyrights arising through your use of this unit.

Contents

Panel Descriptions



Front Panel

1. PLAY/CLIP Indicator
Lights during playback of phrases.
Also lights during recording of phrases when the input level is too high (at clipping level).

2. REC Indicator
Lights during recording of phrases.

3. Display
Phrase numbers are indicated here.

4. MEMORY CARD Slot
Slot for inserting CompactFlash cards.

5. Eject Button
Press to eject the CompactFlash card.

Rear Panel

6. Ground Terminal
Depending on the circumstances of a particular setup, you may experience a discomforting sensation, or perceive that the surface feels gritty to the touch when you touch this device, microphones connected to it, or the metal portions of other objects, such as guitars. This is due to an infinitesimal electrical charge, which is absolutely harmless. However, if you are concerned about this, connect the ground terminal (see figure) with an external ground. When the unit is grounded, a slight hum may occur, depending on the particulars of your installation. If you are unsure of the connection method, contact the nearest Roland Service Center, or an authorized Roland distributor, as listed on the "Information" page.

Unsuitable places for connection

- Water pipes (may result in shock or electrocution)
- Gas pipes (may result in fire or explosion)
- Telephone-line ground or lightning rod (may be dangerous in the event of lightning)

7. Audio I/O Terminals
Terminals for input and output of analog audio.

8. INPUT VOLUME Knob
Adjusts the volume level of signals input to the audio input terminals.

9. Control/Power Input Terminals (CONTROL A)
Terminals for external control signals used to control the AR-200S and for connecting to an external DC power supply (p. 10, p. 11).

* *The terminal block features a protective cover. Be sure not to lose the cover when making connections to the terminals or other times when the cover is removed. Also be sure to keep the removed cover out of the reach of children.*

10. Control I/O Terminals (CONTROL B)
Terminals for external control signals used to control the AR-200S and for connecting to an external DC power supply (p. 10, p. 11, p. 12, p. 13, p. 15, p. 23).

11. RS-232C Connector
Allows for communicating with computers or other equipment (p. 9, p. 17).

12. AC Adaptor Jack
Accepts connection of the supplied AC adaptor.

* *Be sure to use only the PSB-1U AC adapter.*

Bottom Chassis

13. REC MODE Switches
Used for recording settings (p. 14).

14. MODE Switches
Used for switching the playback mode and output level (p. 22).

Display Examples

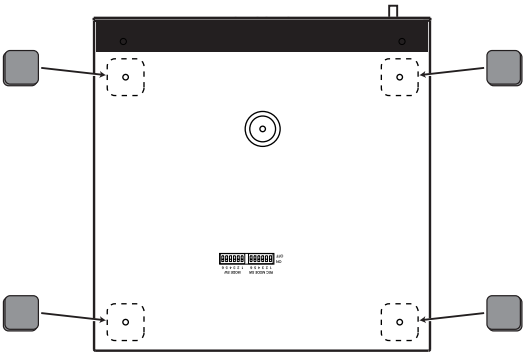
AR-200S Status	Display	
Stopped	1	The phrase number of the currently selected phrase is indicated.
	2	When a phrase without any data recorded to it is selected, the phrase number flashes.
During Phrase Playback	. . . 1	The phrase number of the phrase currently playing is indicated, and the four dots light.
	. . . 3	During playback of a MIDI phrase, the phrase number flashes and the four dots light.
During Phrase Recording	* * * 5	The phrase number of the phrase currently being recorded is indicated, and the four dots flash.

* *Depending on the playback mode (p. 10), a phrase with a different number than the one displayed may be played back.*

Installation

Attaching the Rubber Feet (Included Items)

Attach these as required, such as when you're using the AR-200S without mounting it on a rack or the like.
Peel off the double-sided tape from the rubber feet and affix the rubber feet at the locations shown in the following figure.



Rack Mounting (Important Notes on Heat Radiation)

When you are mounting the unit on a rack or the like, give attention to the following points to ensure efficient cooling.

- Install in a well-ventilated location.
- Avoid mounting in a sealed rack. Warm air within the rack cannot escape and is sucked into the unit again, making efficient cooling impossible.
- When you are using a stacked mounting arrangement, be especially sure to provide for adequate ventilation within the rack to keep discharged air from being sucked back into the unit. If the back surface of the rack cannot be kept open, then provide a ventilation port or ventilation fan at the upper area of the back surface of the rack, where warm air accumulates.
- When you are using the unit in a portable case or rack, remove the covers from the front and back surfaces of the case, so that the front and back surfaces of the unit are not obstructed.

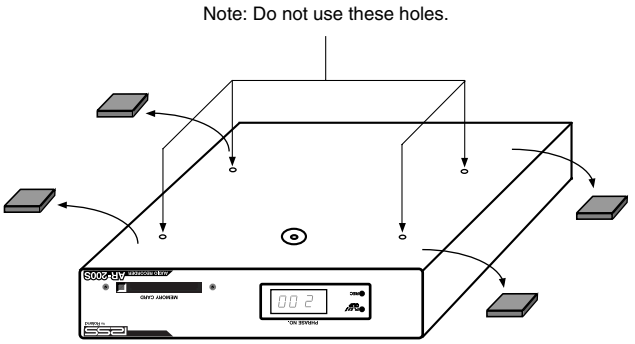
* *When placing the unit on the rack, be careful not to pinch your fingers.*

* *For more information about installation, also see* ***"Placement"*** *in the Important Notes (p. 3).*

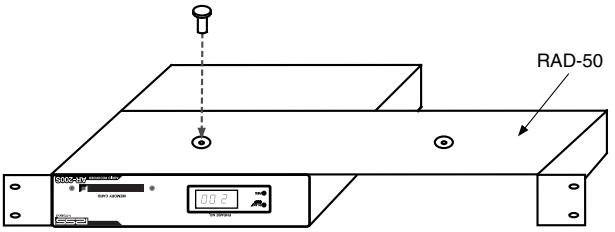
Rack-Mounting the AR-200S

By attaching a rack mount adaptor (RAD-50: sold separately) to the AR-200S, you can install it in an EIA rack. One RAD-50 can accommodate up to two AR-200S units.

1. Remove the four rubber feet from bottom of the unit.



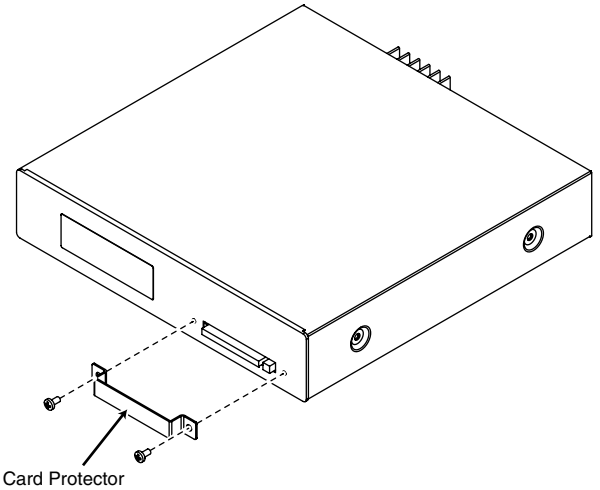
2. Attach the RAD-50 adaptor to the AR-200S using the screws that are supplied with the RAD-50.



Attaching the Card Protector

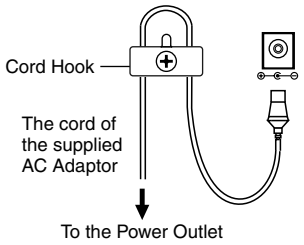
By attaching the Card Protector (supplied) to the AR-200S, you can prevent the memory card from inadvertently being removed from the AR-200S.

1. After confirming that the card is securely inserted in the card slot, use the provided screws to attach the Card Protector, as shown in the figure below.



Important Notes on Making Connections and Switching the Power On and Off

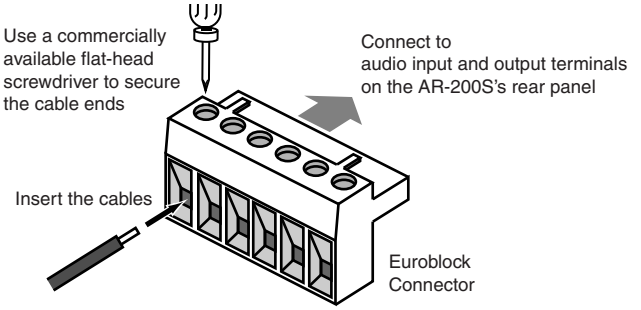
- To prevent malfunction and/or damage to speakers or other devices, always turn down the volume, and turn off the power on all devices before making any connections.
- To prevent the inadvertent disruption of power to your unit (should the plug be pulled out accidentally), and to avoid applying undue stress to the AC adaptor jack, anchor the power cord using the cord hook, as shown in the illustration.



- When connection cables with resistors are used, the volume level of equipment connected to the inputs (control/power input and control I/O terminals) may be low. If this happens, use connection cables that do not contain resistors.
- Once the connections have been completed, turn on power to your various devices in the order specified. By turning on devices in the wrong order, you risk causing malfunction and/or damage to speakers and other devices. (When turning the power off, reverse this procedure.)

  Connected device → AR-200 → Power amp, etc.
- This unit is equipped with a protection circuit. A brief interval (a few seconds) after power up is required before the unit will operate normally.
- To avoid risk of electric shock, do not touch the connectors while the unit is in operation.
- Never remove a card during recording of phrases. Furthermore, do not turn off the power or remove the AC adaptor cord during recording of phrases. Doing so may damage the card.
- To avoid the risk of malfunction and/or damage, insert only CompactFlash card into the MEMORY CARD slot. Never insert any other type of card. Avoid getting paper clips, coins, or any other foreign objects inside the drive.
- Do not remove the CompactFlash card while the card is being accessed. Doing so may corrupt the unit's data or the data on the CompactFlash card.
- Carefully insert the CompactFlash card all the way in—until it is firmly in place.

Connecting Cables to the Audio Input and Output Terminals



Turning On the Power

The AR-200S is not equipped with a power switch. Power is turned on when electricity is supplied to the AC adaptor jack, or to the control/power input, or control I/O terminals' DC IN.

Supplied AC adaptor: ACI or PSB series

Control/Power Input and Control I/O terminals' DC IN specifications

Voltage: 9 to 24 V DC
Current: 1200 mA

* *Refer also to* ***DC Power Supply*** *(p. 23).*

NOTE

Do not supply electrical power simultaneously to multiple terminals; doing so may result in damage to the unit.

Cards Handled by the AR-200S

With the AR-200S, recorded audio and non-audio information (phrase data) is stored on cards.

Optional Roland CompactFlash cards (PM-*-CF Series) are recommended for use with the AR-200S.**

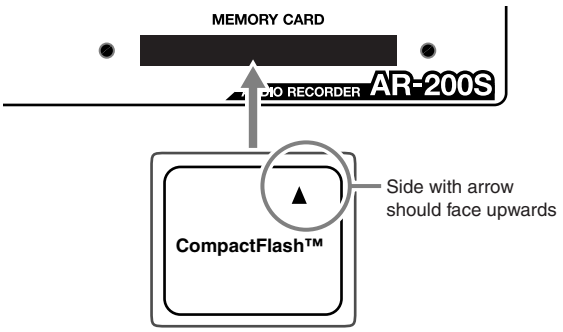
Up to a maximum of 1000 phrases can be saved to cards formatted with the AR-200S.

* *To format a card on the AR-200S, transmit the format command via the RS-232C port.*

Important Notes on Handling Cards

- **When Inserting**
  Insert the card all the way into the card slot.

* *Insert the card straight into the slot, with the card label facing upwards.*



- **When Removing**
  To remove the card, press the eject button.
  Press the eject button firmly, all the way in.

* *Never remove a card during recording, playback, or formatting. Furthermore, do not turn off the power or remove the AC adaptor cord during recording, playback, or formatting. Doing so may damage the card.*

Card Compatibility with Other Models in the AR Series

The AR-200S's file format is the same as the format for the AR-3000/200.

Using Cards Formatted on Earlier Model Units with the AR-200S

- Files on PC cards used on AR-3000/200/2000/100 models can be used by copying the data to CompactFlash with the ARE-3000.
  (Cards copied using AR models cannot be used.)

Using Cards Formatted on the AR-200S with Earlier Models

- Cards can be used as is with the AR-3000/200 by copying the data to PC card (PM series) with the ARE-3000.
- Cards cannot be used with the AR-2000/100.
  (Cards copied using other AR models cannot be used.)

Please download the ARE-3000 (free of charge) from the following URL.
http://www.rssamerica.com/

Examples of Usage and Connection for the AR-200S

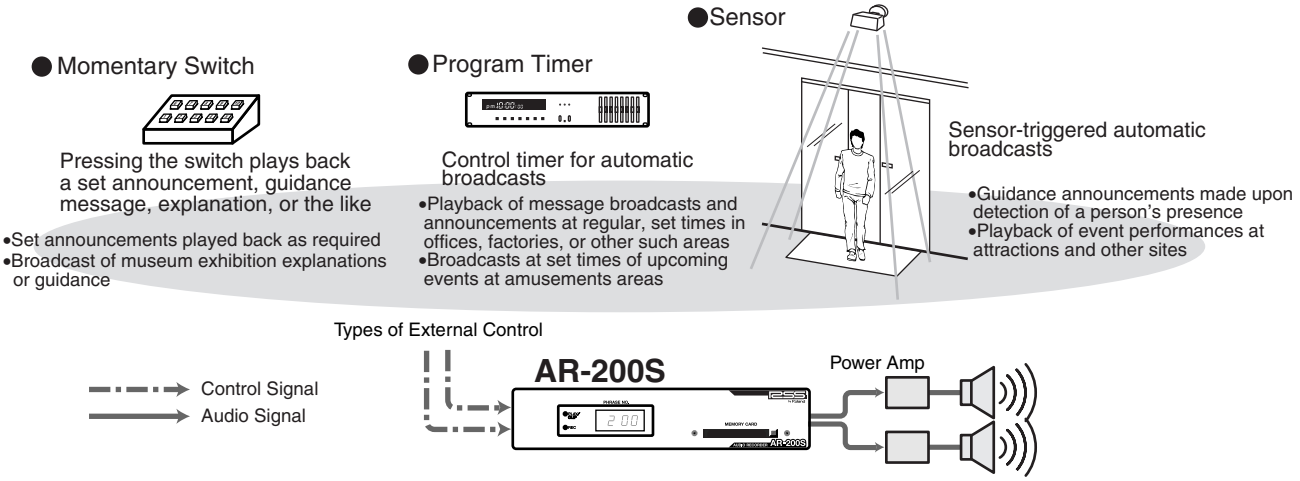
You can use the AR-200S alone or in combination with other AR-200S units or other equipment to play audio in a wide variety of scenes. This section shows some examples of these. You can use these examples as a starting point for making changes to match your own usage circumstances.

Together with Other Equipment (System Examples)

Using the Control Input and Output Connectors

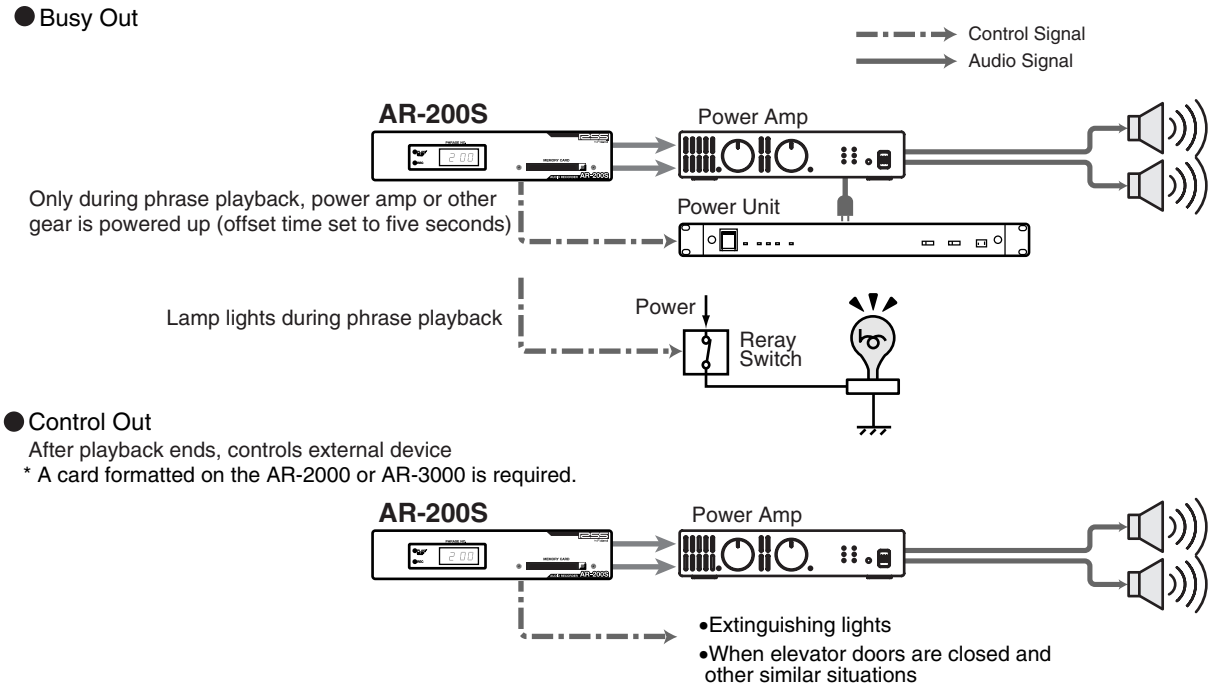
Control Input

Messages, explanations, warnings, announcements, effect sounds, and the like are played with high sound quality according to control signals from sensors, buttons, and switches (p. 10).



Control Output

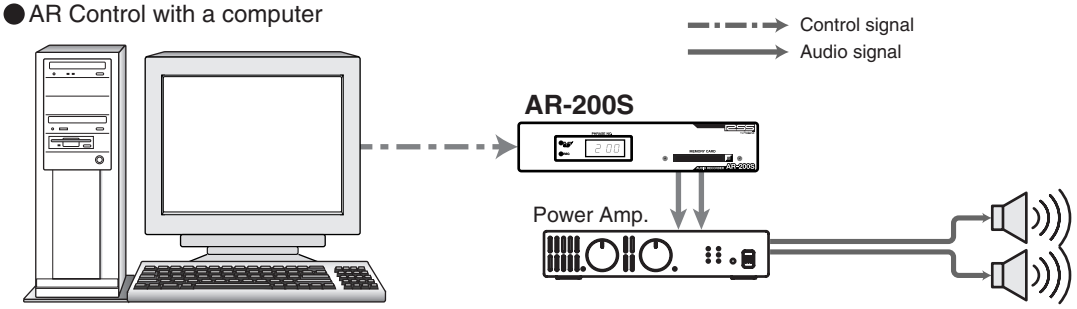
Control signals can be output during or after phrase playback to control an external device (p. 18).



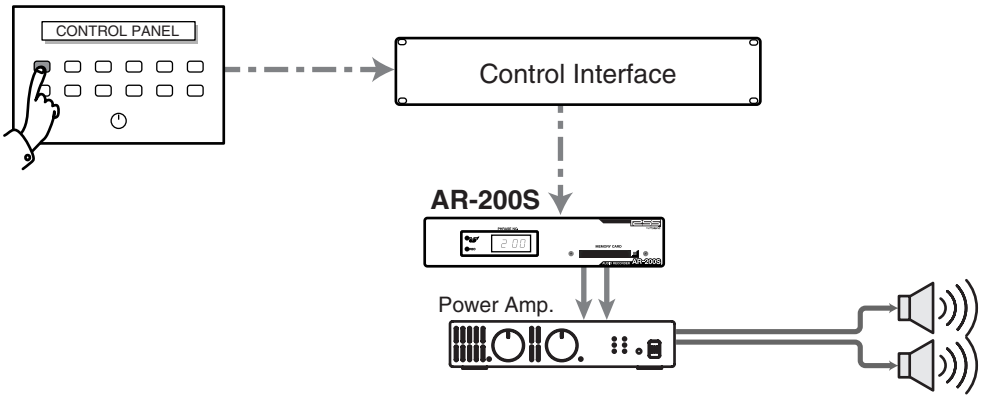
Using the RS-232C Connector

By connecting an RS-232C cable, you can control the AR-200S from an external control device, such as a computer or touch panel (p. 17).

● AR Control with a computer



● Explanatory messages and guidance for public facilities and museum exhibits



What You Can Do (Usage Tips)

Repeat Playback of the Same Phrase

There are several methods for doing this. Choose a playback method that matches your usage conditions.

Changing Playback Mode Settings to Interval Mode

You can have phrases be played back repeatedly at set intervals (p. 13).

Inputting a Continuous Make-contact Signal to the Control Input Connectors

You can repeat playback by continuously shorting the control input connectors.

Playing a Variety of Phrases in Succession

There are several methods for doing this. Choose a playback method that matches your usage conditions.

Using Direct Playback of Control Input

By inputting control signals to a connector number from 1 through 9, you can play back the phrase assigned to the number (p. 11).

Using Binary Playback of Control Input

You can select phrases by inputting binary signals to connector numbers 1 through 8, and play the selected phrases in succession each time you input control signals to the START connector (p. 12).

Playback Instructions (Control Input Playback)

You can use the control input and DC input screw terminals (CONTROL A) and the 25-pin D-sub-type control I/O connector (CONTROL B) on the AR-200S's rear panel to control the AR-200S from an external device.
This chapter explains how to connect external devices and make the settings for the AR-200S.

* *The control I/O connector cannot be used to switch the power to the AR unit on or off.*

About Phrases

On the AR-200S, a single unit amount of recorded data (audio signals) is called a phrase. Phrases are managed using phrase numbers.

Types of Control Input Playback

There are four types of control input playback: Playback by Card Data (p. 10), Direct Playback (Last-In) (p. 11), Binary Playback (p. 12), and Interval Playback (p. 13). You cannot use more than one type of playback at the same time.

Operational Specifications for Control Input Playback

Playback Mode	When new control signals are input during playback of a phrase	When control signals are input continuously
Direct Playback (Normal)	A phrase in progress is stopped, and playback of another specified phrase is begun only when the control signal being input is of a higher priority than that of the phrase currently being played back	Repeated
Direct Playback (Last-In)	Playback stopped, followed by playback of the specified phrase	Repeated
Interval Playback	Playback stopped, followed by playback of the specified phrase	Repeated
Binary Playback	Disabled	Repeated

* *The AR-200S features one type of control input recording, "Terminal Rec"(p. 14).*

What Is No-voltage/Make-contact?

This is contact that makes starting possible simply by connecting two lines to the control input connectors and shorting their ends. This is a general-use method that lets you create start systems easily using only a switch and without any need for a power source, enabling easy use for a variety of applications.
You can control playback and recording with the AR-200S using On/Off signals from No-voltage/Make-contact input from an external source.
By connecting infrared sensors or switches, relays, and timers, or other external starting connectors to the AR-200S, you can use the unit in an even wider variety of applications.
The AR-200S can help simplify installation operations by making the starting-side contact hot and sharing the ground as the common connector.

cf.

For more on the control input specifications, refer to **Control I/O Connector Specifications** (p. 23) in the Appendices.

Playback By Card Data

Cards Created on the AR-3000 or AR-2000

Playback will use the settings (playback method) recorded in the card. For more information, please refer to the owner's manuals for each device.

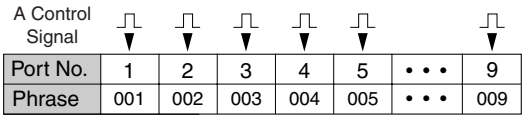
* *Some functions are not available. (p. 21)*

Card made on the AR-200/100

Playback mode is available Direct Playback (Normal).
Phrases 1 through 9 are assigned to the control I/O connector Port Nos. 1 through 9.

Direct Playback (Normal Playback)

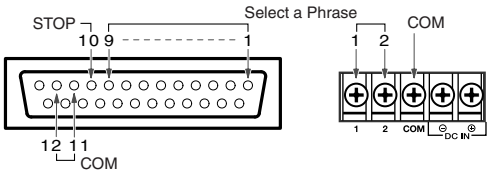
A phrase is played back when a control signal is input directly to the terminal with the number to which the phrase is assigned. Up to 9 phrases can be played back.Assign Phrases 1 through 9 beforehand to Port Nos. 1 through 9, respectively.
This makes it very convenient when you want to specify a desired phrase directly using a switch, relay, sensor, or other such means.



Port No.	1	2	3	4	5	• • •	9
Phrase	001	002	003	004	005	• • •	009

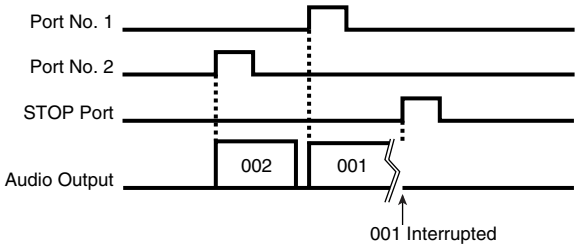
Connectors Used for Direct Play (Control I/O Connector)

1–9	Inputting a control signal directly to the terminal with the number corresponding to the phrase starts playback of the phrase.
10 (STOP)	This stops phrase playback.
11/12 (COM)	Shorting with the above terminals results in "ON."



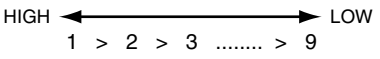
* *Control Input and DC Input Terminal (CONTROL A) "1, 2" are connected in parallel with Control I/O Connector (CONTROL B) "1, 2."*

Basic Operation of Direct Playback (Normal Playback)

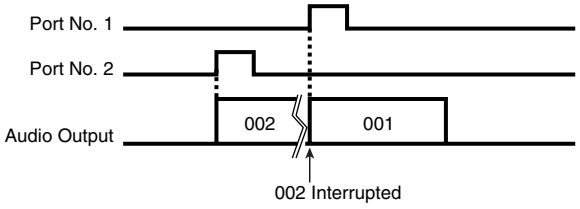


Playback: Input a control signal to a Port, 1–9.
→ The phrase assigned to the Port is played back.
Stopping: Input a control signal to Port 10 (STOP).
→ Playback of the phrase is stopped.

Terminal Priorities

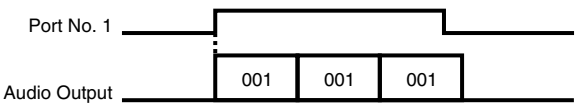


- **When a new high-priority control signal is input during phrase playback**
  Playback of the current phrase is stopped, and playback of the specified phrase begins.



* *If a control signal has a lower priority than that of the phrase currently being played back, the specified phrase is not played back.*

- **While the control signal is continuously input**
  Playback is repeated while the signal is input.



AR-200S Settings

Selecting the Control Input Mode

With the power to the AR-200S switched off, set the MODE switches on the bottom panel as shown below.

SW 1: OFF, **SW 2:** OFF

Assigning Phrases to the Terminals

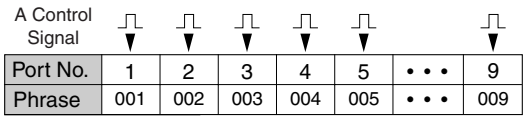
Assign phrases 1 through 9 to Port Nos. 1 through 9.

Settings in Effect When a Card Is Formatted

Port No.	1	2	3	4	5	•••	9
Phrase	001	002	003	004	005	•••	009

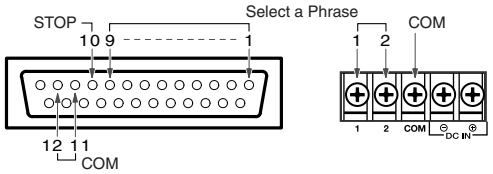
Playing Back Phrases Assigned to the Connectors (Direct Playback)

By inputting control signals directly to Port Nos. 1 through 9, you can play back the phrases assigned to those numbers. Up to 9 phrases can be played back. Assign phrases 1 through 9 beforehand to Port Nos. 1 through 9.
This is very convenient when you want to specify a desired phrase directly using a switch, relay, sensor, or other such means.



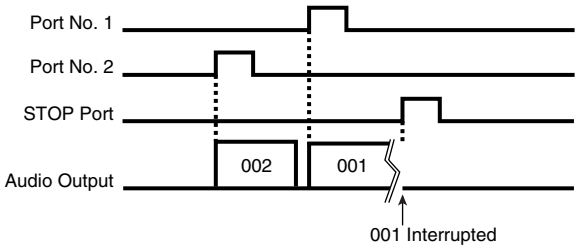
Connectors Used for Direct Play (Last-In) (Control I/O Connector)

1–9	Inputting a control signal directly to the terminal with the number corresponding to the phrase starts playback of the phrase.
10 (STOP)	This stops phrase playback.
11/12 (COM)	Shorting with the above terminals results in "ON."



* *Control Input and DC Input Terminal (CONTROL A) "1, 2" are connected in parallel with Control I/O Connector (CONTROL B) "1, 2."*

Operational Specifications for Direct Playback (Last-In)

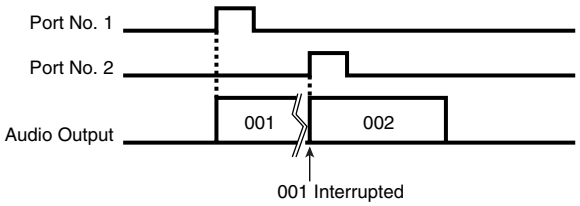


Playback: Input a control signal to a Port, 1–9.
→ The phrase assigned to the Port is played back.
Stopping: Input a control signal to Port 10 (STOP).
→ Playback of the phrase is stopped.

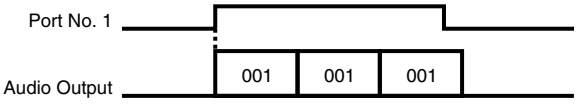
Priority Order

The most recently input control signal is given priority in playback.

- **If a new and different control signal is input during playback of a phrase**
  Playback of the current phrase is stopped, and playback of the specified phrase then begins.



- **While the control signal is continuously input**
  Playback is repeated while the signal is input.



AR-200S Settings

Selecting the Control Input Mode

With the power to the AR-200S switched off, set the MODE switches on the bottom panel as shown below.

SW 1: ON, **SW 2:** OFF

Assigning Phrases to the Terminals

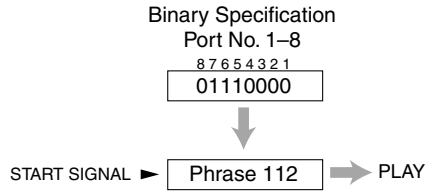
Assign phrases 1 through 9 to Port Nos. 1 through 9.

Settings in Effect When a Card Is Formatted

Port No.	1	2	3	4	5	•••	9
Phrase	001	002	003	004	005	•••	009

Specifying Phrases in Binary Notation (Binary Playback)

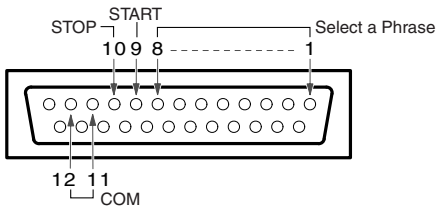
By inputting binary (Base 2) signals to Port Nos. 1 through 8 to select a phrase and inputting a start message to the START terminal, you can then play back the selected phrase. A maximum of 250 phrases can be selected and played back with this method.
This allows you to specify 250 phrases with control signals (from a switch or other ON/OFF signal device), without having to use computers or other complicated equipment.



* *To conduct Binary Playback, you will need to obtain a control device capable of generating binary signals.*

Connectors Used in Binary Playback

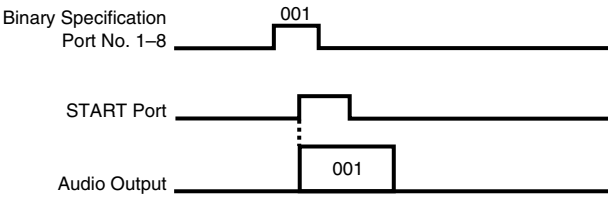
1–8	Phrases are specified in binary format using combinations of 0 (Off) and 1 (On).
9 (START)	Starts phrase playback.
10 (STOP)	Stops phrase playback.
11/12 (COM)	Shorting with the above terminals results in "ON."



MEMO

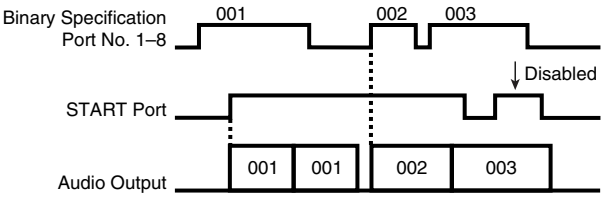
Even without connecting to all eight connectors used for making the binary specifications, you can still conduct Binary Playback. The number of phrases that can be specified is determined by the formula "two to the nth power minus one" (with "n" being the number of connectors used).
Example:
Using three timers or other such devices capable of outputting the necessary signals gives two to the third power minus one (i.e., 8 - 1 = 7), meaning you can specify the seven phrases 001 through 007.
However, start signals feature other special requirements.

Operational Specifications of Binary Playback



Playback: Specify the phrases using combinations of 0 (Off) and 1 (On) signals to Port Nos. 1 through 8, and Port Nos. 11 and 12, and input a control signal to the Port No. 9 (START).
→ This plays back the specified phrase.
Stopping: Input a control signal to Port No. 10 (STOP).
→ This stops playback of the phrase.

The basic operation of Binary Playback is shown below.



- Binary specified phrases are played back repeatedly.
- Playback is repeated while the start signal is continuously input.
- You can begin playback of phrases by specifying phrases in binary with the start signal continuously being input.
- When the START connector control signal switches to Off, the current phrase finishes, and then playback is stopped.
- No action results when a new start signal is input while a phrase is being played back.

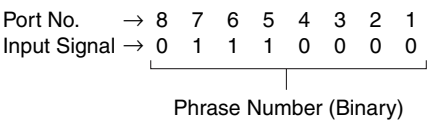
AR-200S Settings

With the power to the AR-200S switched off, set the MODE switches on the bottom panel as shown below.

SW 1: OFF, **SW 2:** ON

To Specify Phrases with Binary Signals

Example: Specifying Phrase 112 (Phrase #: 112)
Convert the phrase number to a binary signal number.
"0" (Off), "1" (On)
According to the **Phrase Number / Binary Signal chart** (p. 13), the phrase number "112" is converted to the binary number "01110000."



NOTE

Input of binary specifications should be completed in no more than 50 milliseconds.

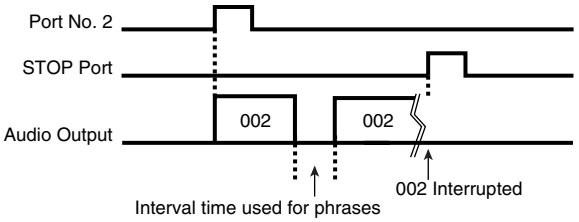
Repeated Playback of Phrases (Interval Playback)

The specified phrase will be played back at fixed intervals. Make each of the terminal settings beforehand for the playback interval and phrases to be played back.

- When making settings in Interval Playback mode, assign Phrases 1 through 9 to the control output connectors 1 through 9.
- The playback interval settings are shown below.

Port No.	Playback Interval
1	1 second
2	5 seconds
3	10 seconds
4	15 seconds
5	30 seconds
6	1 minute
7	5 minutes
8	15 minutes
9	30 minutes

Operational Specifications of Interval Playback



Playback: Input control signals to the control Input/output connectors No. 1 through 9.
→ Results in the repeated play of the phrase assigned to the terminal.

Stopping: Input a control signal to Port No. 10 (STOP).
→ This stops playback of the phrase.

AR-200S Settings

With the power to the AR-200S switched off, set the MODE switches on the bottom panel as shown below.

SW 1: ON, **SW 2:** ON

Phrase Number / Binary Signal chart

Phrase No.	Binary (Port 87654321)	Phrase No.	Binary (Port 87654321)	Phrase No.	Binary (Port 87654321)	Phrase No.	Binary (Port 87654321)	Phrase No.	Binary (Port 87654321)
001	00000001	051	00110011	101	01100101	151	10010111	201	11001001
002	00000010	052	00110100	102	01100110	152	10011000	202	11001010
003	00000011	053	00110101	103	01100111	153	10011001	203	11001011
004	00000100	054	00110110	104	01101000	154	10011010	204	11001100
005	00000101	055	00110111	105	01101001	155	10011011	205	11001101
006	00000110	056	00111000	106	01101010	156	10011100	206	11001110
007	00000111	057	00111001	107	01101011	157	10011101	207	11001111
008	00001000	058	00111010	108	01101100	158	10011110	208	11010000
009	00001001	059	00111011	109	01101101	159	10011111	209	11010001
010	00001010	060	00111100	110	01101110	160	10100000	210	11010010
011	00001011	061	00111101	111	01101111	161	10100001	211	11010011
012	00001100	062	00111110	112	01110000	162	10100010	212	11010100
013	00001101	063	00111111	113	01110001	163	10100011	213	11010101
014	00001110	064	01000000	114	01110010	164	10100100	214	11010110
015	00001111	065	01000001	115	01110011	165	10100101	215	11010111
016	00010000	066	01000010	116	01110100	166	10100110	216	11011000
017	00010001	067	01000011	117	01110101	167	10100111	217	11011001
018	00010010	068	01000100	118	01110110	168	10101000	218	11011010
019	00010011	069	01000101	119	01110111	169	10101001	219	11011011
020	00010100	070	01000110	120	01111000	170	10101010	220	11011100
021	00010101	071	01000111	121	01111001	171	10101011	221	11011101
022	00010110	072	01001000	122	01111010	172	10101100	222	11011110
023	00010111	073	01001001	123	01111011	173	10101101	223	11011111
024	00011000	074	01001010	124	01111100	174	10101110	224	11100000
025	00011001	075	01001011	125	01111101	175	10101111	225	11100001
026	00011010	076	01001100	126	01111110	176	10110000	226	11100010
027	00011011	077	01001101	127	01111111	177	10110001	227	11100011
028	00011100	078	01001110	128	10000000	178	10110010	228	11100100
029	00011101	079	01001111	129	10000001	179	10110011	229	11100101
030	00011110	080	01010000	130	10000010	180	10110100	230	11100110
031	00011111	081	01010001	131	10000011	181	10110101	231	11100111
032	00100000	082	01010010	132	10000100	182	10110110	232	11101000
033	00100001	083	01010011	133	10000101	183	10110111	233	11101001
034	00100010	084	01010100	134	10000110	184	10111000	234	11101010
035	00100011	085	01010101	135	10000111	185	10111001	235	11101011
036	00100100	086	01010110	136	10001000	186	10111010	236	11101100
037	00100101	087	01010111	137	10001001	187	10111011	237	11101101
038	00100110	088	01011000	138	10001010	188	10111100	238	11101110
039	00100111	089	01011001	139	10001011	189	10111101	239	11101111
040	00101000	090	01011010	140	10001100	190	10111110	240	11110000
041	00101001	091	01011011	141	10001101	191	10111111	241	11110001
042	00101010	092	01011100	142	10001110	192	11000000	242	11110010
043	00101011	093	01011101	143	10001111	193	11000001	243	11110011
044	00101100	094	01011110	144	10010000	194	11000010	244	11110100
045	00101101	095	01011111	145	10010001	195	11000011	245	11110101
046	00101110	096	01100000	146	10010010	196	11000100	246	11110110
047	00101111	097	01100001	147	10010011	197	11000101	247	11110111
048	00110000	098	01100010	148	10010100	198	11000110	248	11111000
049	00110001	099	01100011	149	10010101	199	11000111	249	11111001
050	00110010	100	01100100	150	10010110	200	11001000	250	11111010

Recording Instructions (Terminal Rec)

Required Settings for Recording Audio Signals (Recording Settings)

In order perform recording matched to usage conditions, including the connected equipment, recording source, sound quality, time, and playback system, you make recording settings.

- Recording settings are made in phrase units. You can mix phrases having different recording settings on a single card.
- The possible recording time of a card varies according to the recording settings. For a rough guide to maximum recording times with various settings, see **Card Audio Recording Time Chart** (p. 21).

MODE SW Setting

With the power to the AR-200S switched off, set the MODE switches on the bottom panel as shown below.

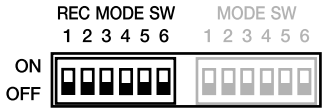
SW 6: ON

REC MODE SW Settings

The REC MODE switches are located on the AR-200S's bottom panel. You can change the recording settings by changing the settings of the REC MODE switches.
Each switch is ON when in the upward position, and OFF when in the downward position.
When the AR-200S is shipped from the factory, all switches will be OFF.

* *Use a pointed object to change the ON/OFF settings of the REC MODE switches.*

* *Set the REC MODE switches with the power to the AR-200S turned off.*



RDAC-Grade (Sampling Frequency)

The RDAC grade is the type of sampling frequency for digital recording.
On the AR-200S, you can select from among six grades.

RDAC-Grade	Sampling frequency	Sound quality	Amount of card memory consumed
S-HIGH	48kHz	High ↑	Large ↑↓ Small
HIGH	44.1kHz		
STANDARD	32kHz		
LONG1	22.05kHz		
LONG2	16kHz		
ANNOUNCE	8kHz		

STANDARD is best for ordinary recording. ANNOUNCE uses up the least card space, and is best for recording announcements, narration, and the like. When you are recording audio such as a narration with ANNOUNCE or LONG2, you can record with higher clarity by using the equalizer to cut the bass range. Select an RDAC grade that matches the circumstances of use.

Selecting RDAC-Grade

With the power to the AR-200S turned off, set the REC MODE switches on the bottom panel as shown below.

RDAC-Grade	SW 1	SW 2	SW 3
S-HIGH	ON	OFF	ON
HIGH	OFF	OFF	ON
STANDARD	ON	ON	OFF
LONG1	OFF	OFF	OFF
LONG2	OFF	ON	OFF
ANNOUNCE	ON	OFF	OFF

RDAC-Mode (Signal Processing Format)

The RDAC mode is a type of digital data processing system for recording.
On the AR-200S, you can select from among four modes.

RDAC-Mode		Sound quality	Amount of card memory consumed
LINEAR	16 bit PCM Recording	High ↑	Large ↑↓ Small
MODE3	About 2.5 times the recording time of LINEAR.		
MODE2	More than 2.5 times the recording time of LINEAR.		
MODE1	About 4 times the recording time of LINEAR.		

Selecting RDAC-Mode

With the power to the AR-200S turned off, set the REC MODE switches on the bottom panel as shown below.

RDAC-Mode	SW 4	SW 5
LINEAR	ON	ON
MODE3	OFF	ON
MODE2	ON	OFF
MODE1	OFF	OFF

MEMO

If the type of card does not provide the recording time you want, change the RDAC mode or RDAC grade setting to use less card capacity, then perform recording again.

cf.

Card Audio Recording Time Chart (p. 21)

What's RDAC?

RDAC (Roland Digital Audio Coding) is a proprietary audio recording standard from Roland.
It achieves high sound quality and also makes it possible to record for long times.

If You're Not Sure About Which Grade and Mode to Choose

The optimal grade and mode vary according to the usage conditions, including the connected equipment, recording source, sound quality, time, and playback system.
The factory default settings are RDAC-Grade: LONG1; and RDAC-Mode: MODE1.
First, try recording and playback with these settings. In most cases, this yields satisfactory sound quality.

Recording Type (Stereo/Mono)

Select either stereo recording or mono recording.
Choosing mono recording gives you recording times that are twice as long as with stereo recording.

Selecting Recording Type

With the power to the AR-200S turned off, set the REC MODE switches on the bottom panel as shown below.

Recording Type	SW 6
Stereo	ON
Mono	OFF

What is mono recording

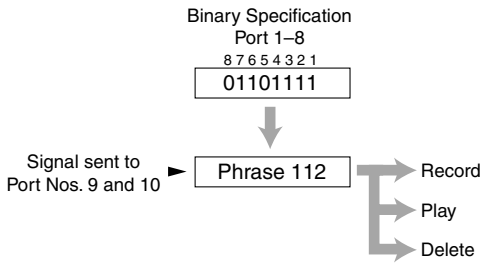
In the case of mono recording, input the audio signal to the "MONO/L" input terminal. When audio signals are input simultaneously to the "MONO/L" and "R" input terminals, L and R are mixed and recorded.

Line Thru Output (p. 19)

- REC MODE SW 6: OFF (Mono)
  When audio signals are input to "MONO/L," output is from OUTPUT L and R. When audio signals are input to "R," output is from OUTPUT R only. When audio signals are input to both "MONO/L" and "R," solely the signals input to "MONO/L" are output from OUTPUT L, while the "MONO/L" and "R" signals are mixed and output from OUTPUT R.
- REC MODE SW 6: ON (Stereo)
  Audio signals input to "MONO/L" are output from OUTPUT L, and audio signals input to "R" are output from OUTPUT R.

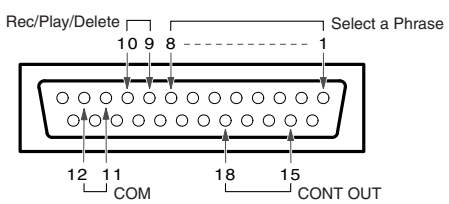
Connectors Used in Terminal Rec

You can specify phrases by inputting binary (base 2) signals to the Port Nos. 1 through 8, and perform record, playback, and delete functions by inputting control signals to Port Nos. 9 and 10. A total of 250 phrases can be specified with control signals (On/Off). This is convenient when you want to control recording from an external control device.



* *To conduct binary control, you need to provide a control device that can generate binary signals.*

1–8	Phrases are specified in binary format using combinations of 0 (Off) and 1 (On).
9, 10	Combinations of 0 (Off) and 1 (On) are used to specify record, delete, and playback.
15/18 (CONT OUT)	Outputs signals for confirming the presence or absence of phrases.
11/12 (COM)	Shorting with the above terminals results in "ON."



Operational Specifications for Terminal Rec

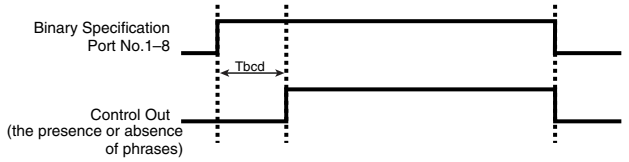
Phrases are specified by combinations of signals of 0 (Off) and 1 (On) to the Port Nos. 1 through 8 as well as Port Nos. 11 and 12, and record, playback, and delete functions are specified with combinations of control signals of 0 (Off) and 1 (On) to Port Nos. 9 and 10.

Presence or Absence of Phrases

If there is a binary-specified phrase that has already been recorded, a signal is output from the CONT OUT connector (Port No. 15). If there is an empty phrase, no signal is output.

* *During Terminal Rec, the CONT OUT connector functions as a connector for signals confirming the presence or absence of phrases. Note that this differs from the normal function of CONT OUT.*

Timing Chart (The presence or absence of phrases)



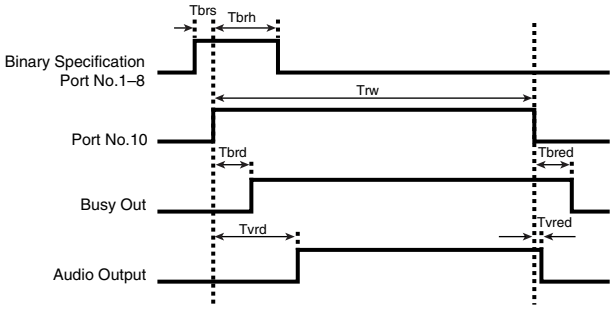
		min	max
Tbcd	: Binary Phrase Output Delay Times	–	250

(msec)

Recording

9: 0 (Off)
10: 1 (On)
While control signals are being input, the specified phrase is recorded. When input of the control signal stops, recording then ends.

Timing Chart (Rec)



		min	max
Trw	: Rec Pulse Width	300	–
Tbrs	: Binary Setup Time	200	–
Tbrh	: Binary Hold Time	100	–
Tbrd	: Busy Delay Time	–	300
Tvrd	: Audio Delay Time	–	300
Tbred	: End Busy Delay Time	–	100
Tvred	: End Audio Delay Time	–	100

(msec)

* *Recording does not start if there is a binary-specified phrase that has already been recorded (the recording instruction is disabled). When recording, either specify an empty phrase or delete the existing phrase before recording the new one. Additionally, in Terminal Rec, since a make signal is output from the CONT OUT connector when a specified phrase has already been recorded, this allows confirmation using a connected external control device.*

* *The remaining recording time appears in the display when ten seconds or less of recording time remains.*

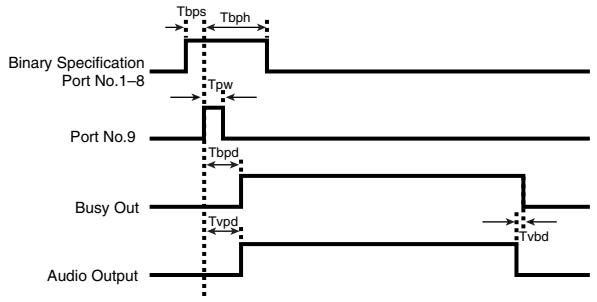
* *When you're using the Terminal Recording Mode, recording takes place immediately, without entering trigger recording standby.*

* *Use the INPUT VOLUME knob to adjust the recording level so that the PLAY/CLIP indicator does not light.*

Playback

9: 1 (On)
10: 0 (Off)
The specified phrase is played back.
Even when control signals are input continuously, the phrase is played back one time only and then ends.

Timing Chart (PLAY)



		min	max
Tpw	: Play Pulse Width	20	–
Tbps	: Binary Setup Time	200	–
Tbph	: Binary Hold Time	100	–
Tbpd	: Busy Delay Time	–	300
Tvpd	: Audio Delay Time	–	300
Tvbd	: End Busy Delay Time	–	100

(msec)

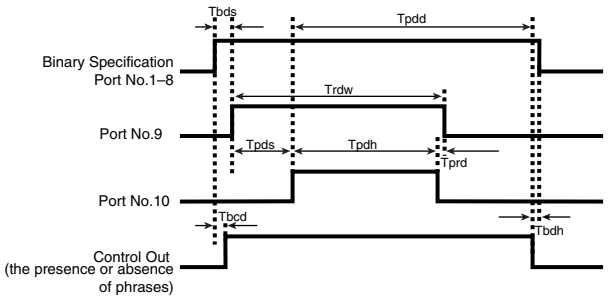
* *Playback does not begin if the binary-specified phrase is empty (the playback instruction is disabled). When playing back, specify a phrase that has already been recorded.*

Delete

9: 1 (On)
10: 1 (On)
First, when ON is input to Port No. 10, and then ON is input to Port No. 9, deletion of the specified phrase begins. Deletion ends when the signal from the CONT OUT connector confirming the presence or absence of the phrase changes to OFF.

* *Deletion does not begin if the binary-specified phrase is empty (the delete instruction is disabled). When deleting, specify a phrase that has already been recorded.*

Timing Chart (Delete)



		min	max
Trdw	: Delete Rec Pulse Width	100	–
Tpds	: Delete Play Setup Time	50	–
Tpdh	: Delete Play Hold Time	50	–
Tprd	: Delete Play Rec Delay Time	0	–
Tbds	: Delete Binary Setup Time	200	–
Tbdh	: Delete Binary Hold Time	20	–
Tbcd	: Binary Phrase Output Delay Time	–	250
Tpdd	: Play Phrase Output Delay Time	–	*2500(typ.)

(msec)

*Play phrase output delay time is dependent on the card used.

To Specify Phrases with Binary Signals

NOTE

Note that the way phrases are specified in Terminal Rec differs from that used in Binary Playback.

Example: Binary specification of Phrase 112 (Phrase #: 112)
Convert the phrase number to a binary signal number.
"0" (Off), "1" (On)
The phrase number "0001" is specified in the binary notation as "00000000," and as shown in the **Phrase Number / Binary Signal chart** (p. 13), each subsequent specification is shifted by one.

001 → 00000000

Phrase No.	87654321 Port No.
~~001~~	00000001
002	00000010
003	00000011
004	00000100
005	00000101
006	00000110
007	00000111
•	•
•	•
•	•
•	•
•	•
248	11111000
249	11111001
250	~~11111010~~

The phrase number "112" becomes the binary signal "01101111."

About Control Using RS-232C

The AR-200S can be controlled using serial communications from a computer, touch panel, or other device via RS-232C. You can control a number of operations including recording, playback, switching settings, and editing phrases.
The data transfer rate when the power is turned on and no card is inserted is 9,600 bps.

About RS-232C References

In addition to the owner's manual, the separate publication "RS-232C Reference Notes" is also available for those needing detailed documentation regarding RS-232C connector control.
Please download the PDF file (free of charge) from the following URL.

RS-232C Reference Notes cover the following topics:

- Setup
- Overviews, detailed descriptions, and lists of commands
- Examples of usage algorithms

http://www.rssamerica.com/

Controlling Another Device with the AR-200S (Control Output Connectors)

You can use the 25-pin D-sub-type control I/O connector (CONTROL B) on the AR-200S's rear panel to control an external device from the AR-200S.
The AR-200S outputs two kinds of control signals, Busy Out and Control Out. This chapter explains how to connect external devices and make the settings for the AR-200S.

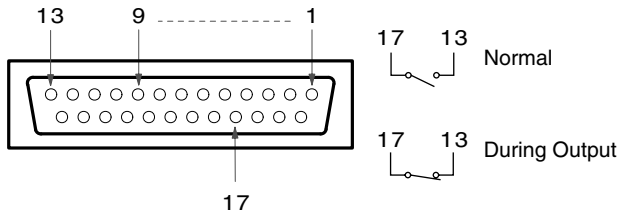
Starting Another Device (Busy Out)

Busy Out is a continuous signal output from the BUSY OUT pins during playback (as well as during recording and recording standby) of audio phrases, pattern phrases, and song phrases.
This signal can be used to start amplifiers and other external devices in sync with phrase playback.

Busy Out Specifications

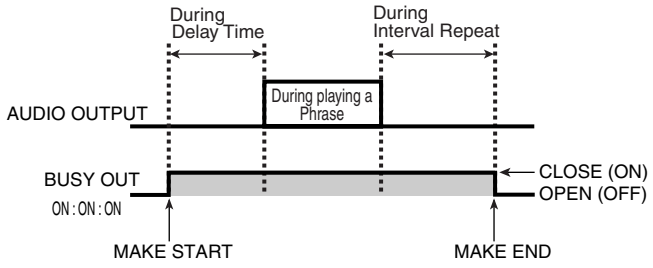
No-voltage/make-contact
Contact capacity: Max. DC 30 V, 3 A

Port Nos. **13** and **17** have Make-contact during output.



Output of Busy Out Signals In Dual Mono Mode (p. 19)

When in Dual Mono mode, the Busy Out signal of the left channel is output from the BUSY OUT pins (Port Nos. 13 and 17), and the right channel Busy Out signal is output from the CONT OUT pins (Port Nos. 15 and 18).



Controlling Another Device (Control Out)

The Control Out signal is output for a duration of one second from the CONT OUT pins after playback of audio phrases, pattern phrases, and song phrases. This signal can be used to start amplifiers and other external devices in sync with phrase playback.
You can set the time that is to pass after phrase playback before output is made to anything from 0 seconds to 59 minutes 59 seconds. Settings are made in phrase units.

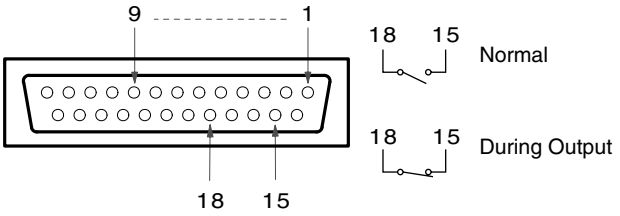
NOTE

Note that if playback of a phrase in progress is cut off, no Control Out signal is output.

Control Out Specifications

No-voltage/make-contact
Make-contact time: 1 second, **Contact capacity:** Max. DC 30 V, 3 A

Port Nos. **15** and **18** have Make-contact during output.



Output of Control Out Signals In Dual Mono Mode (p. 19)

Note that Control Out signals are not output in Dual Mono Mode (the Control Out settings are not effective).
In such instances, if the Busy Out output settings have been made, then the Busy Out signal of the left channel is output from the BUSY OUT pins (Port Nos. 13 and 17), and right channel's Busy Out signal is output from the CONT OUT pins (Port Nos. 15 and 18).

AR-200S Settings

Settings for these parameters cannot be made with the AR-200S. Only phrases set on the AR-3000 are effective. For detailed information, please refer to the AR-3000 owner's manual.

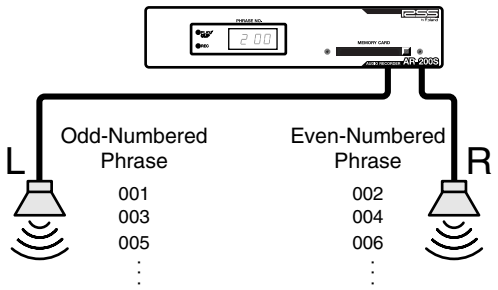
Other Useful Functions During Phrase Playback

Moreover, by using an optional AR-3000 to create and edit phrases, you can also use the following functions.
For detailed information, please refer to the AR-3000 owner's manual.

* *You cannot make settings for these parameters on the AR-200S. Furthermore, they are effective only with phrases whose settings have been made on the AR-3000.*

Playing Data for Two Units on the Left and Right (Dual Mono Mode)

The Dual Mono mode is a feature for playing different mono audio phrases independently on the left and right channels.
By outputting odd-numbered phrases (001, 003, ...) from the left channel and even-numbered phrases (002, 004, ...) from the right channel, you can play back two units' worth of phrases using only the one device.
You can also play back separate phrases on the left and right channels either simultaneously, or shifted.



MEMO

To Users of the AR-2000/100 (Legacy Models)

On the AR-2000/100 (legacy models), this "Dual Mono Mode" is the function called "Channel Playback Mode." When using them, please try to keep in mind that the two functions are identical.

Adjusting the Sound Quality During Audio Phrase Playback (EQ—Equalizer)

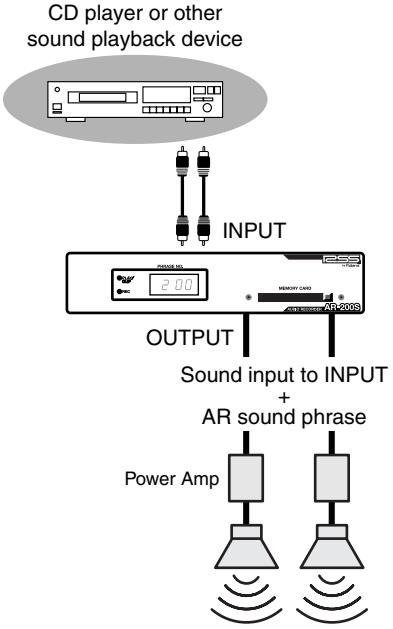
You can adjust the quality of the sound during audio phrase playback with two-band equalization.

Playing Back Phrases in the Order They Are Selected (Program Playback)

You can have the group of preset phrases play back in the order they are selected by inputting a control signal to the START port.
With program playback, you can register up to a maximum of 100 phrases in each of the five patterns of Programs 1 through 5.
Since the order and duration of the phrases is predetermined, this is a convenient option when you have only one contact, such as a timer or switch, with which to trigger this action.

Line Out (Thru) Setting During Phrase Playback

You can take audio from INPUT, mix it during phrase playback, and mixed it from OUTPUT.



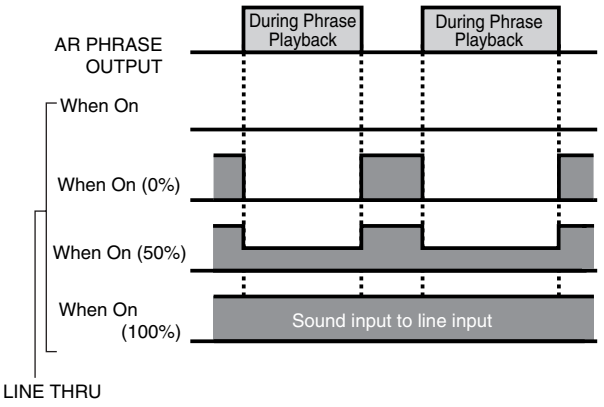
This is useful when you want to do things like taking music from INPUT and layering it with narration phrases as background music.
You can also make the Input sound fade out or in.

NOTE

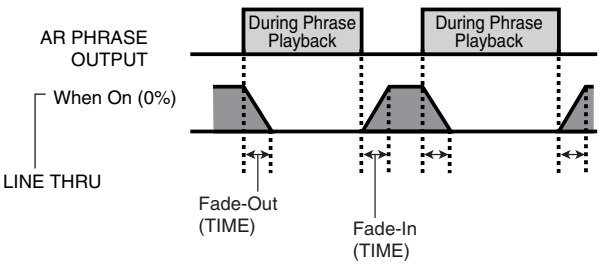
Line throughput is possible only for signals connected to the INPUT terminals.

Line Thru Output Specifications

The following output specifications apply, depending on the Line Thru settings.



When fade-out or fade-in settings have been made



Troubleshooting

About playback

Control Input Playback (Direct/Binary) does not work as intended

- Make sure the MODE switches' settings (Direct/Binary) are selected correctly. You cannot achieve control input playback merely by connecting a device to the port. Be sure to set the control input mode and match the method used for connecting to the connectors (p. 22).

Phrases in Direct Playback cannot be selected as intended

- When the card is formatted, phrase assignments for Port Nos. 1 through 9 are such that Phrase 001 is assigned to Port No. 1, Phrase 002 to Port No. 2, and so on up to Phrase 009, which is assigned to Port No. 9. Check to make sure that the phrases are properly selected.

Phrases play repeatedly in Direct Playback

- Check to make sure that "INTERVAL PLAYBACK" is not selected with the MODE switch settings (p. 22).

Card made on the AR-3000

Phrases are not played back (PLAY indicator is flashing)

- Is the MTC "Sync Source" set to "MTC?"
  When not synchronizing playback with MTC and using the AR-200S as a slave, set "Sync Source" on the AR-3000 to "Internal."

Pattern phrases and song phrases are not played back as intended

- Phrases composed from pattern phrases or song phrases will not be played back properly unless they are saved as actual phrases (if the composed phrase is not saved, the next phrase is sought and then played back). Check the AR-3000 to confirm whether or not the composite phrase has been saved.

The start of phrase playback is delayed when playback is controlled from an external device

- Has the "Delay Time" been set for the phrase?
  Check the AR-3000 to confirm whether or not the delay time has been set.
  Check the control signals being sent from the external control device, connections and so on once more.

Others

No sound

- Reconfirm that the power to the AR-200S or connected device is on.
- Reconfirm that the volume control on the AR-200S or connected device is turned up.
- Reconfirm that there are no shorts in any connector cables.

Phrase number flashes during playback

- This indicates that a MIDI phrases is playing back.
  Although the AR-200S is not MIDI phrase-compatible, if a specified phrase is a MIDI phrase, the phrase number will flash.

There is a scraping sound coming from the AR-200S

- In situations such as when control signals are input continuously, the movement of the internal relays may make a scraping sound, but this does not indicate any malfunction. To prevent overuse and failure of the relay, you may also switch to Interval Playback in order to have the relay move only once (p. 13).

The volume of the device connected to the output connector is low

- Could you be using a connection cable that contains a resistor?
  Use a connection cable that does not contain a resistor.

Error Messages

If an incorrect operation is attempted or execution is not possible, an error message will appear in the display.
Note the message that appears, and take the appropriate action.

Display	Situation	Action
Er 03	It is possible that the data in the memory card or the card itself has been damaged.	Delete all phrases. If delete card is not possible, or if the same message appears after the card has been delete card, it may be that the card is malfunctioning. Use a different card.
Er 05	No more data can be recorded in the card.	Either delete unnecessary phrases, or use a different card.
Er 06	Either the phrase data is damaged, or the AR-200S is not able to handle the phrase.	Check the phrase for which the message was displayed.
Er 11	The memory card is not formatted for use with the AR-200S.	Format the card.
Er 12	There is no phrase corresponding to the specified phrase.	Select a saved phrase or record a new phrase.
Er 13	Data was not written to or read from the card in time.	Change the RDAC-Grade, RDAC-Mode, or other recording conditions to reduce the amount of data.
Er 14	Card protect is set to ON, so data cannot be written to the card.	Set card protect to OFF.
Er 15	The AR-200S gets hot.	Ventilate well to avoid overheating, and keep the unit cool.

Regarding Cards

Card Audio Recording Time Chart

The following table shows recording times available for cards formatted for the AR-3000.

* *Recording times listed are for mono recording. Recording times are halved when data is recorded in stereo.*

* *These times are for when 1 phrase is recorded continuously, and are provided for your reference when recording. The recording time will depend on the combination of the grade settings of each phrase recorded in each memory card.*

PM-128-CF (128MB)		RDAC-Mode				
		H-LINEAR	LINEAR	MODE3	MODE2*	MODE1
RDAC-Grade	S-HIGH	15:08	22:43	1:00:35	1:00:35	1:30:53
	HIGH	16:28	24:43	1:05:55	1:05:55	1:38:53
	STANDARD	22:43	34:05	1:30:53	1:30:53	2:16:20
	LONG1	32:57	49:26	2:11:51	2:11:51	3:17:47
	LONG2	45:26	1:08:10	3:01:47	3:01:47	4:32:41
	ANNOUNCE	1:30:53	2:16:20	6:03:35	6:03:35	9:05:22

* *Minimum recording times are listed only for MODE2. Depending on conditions, you may be able to attain recording times longer than listed here.*

Recorded Phrase Data

When a piece of Phrase data recorded by the AR-200S, the settings of data on the card will be as follows.
If you will be using the card on the AR-3000, refer to this list.

Phrase settings	Playback Volume	100
	Delay Time	00s00f
	Playback Point	Start: 00h00m00s00f0sf End: The real time of the phrase
	Repeat Playback	OFF
	Loop Playback	OFF
	Fade	Fade In: OFF Fade Out: OFF
	Control Output	OFF
	MIDI Playback Tempo	120
	Phrase Name	MESSAGE 1 (MESSAGE + Phrase number)

AR-3000 Settings That Can Be Used

When cards created with an AR-3000 are played back on an AR-200S, the resulting playback could diverge from the original. This is due to a variety of factors, including the fact that data created for settings specific to the AR-3000 cannot be used by the AR-200S. For details, see the tables below.

Phrase Compatibility		
RDAC-Grade	ANNOUNCE	o
	LONG2	o
	LONG1	o
	STANDARD	o
	HIGH	o
	S-HIGH	o
RDAC-Mode	MODE1	o
	MODE2	o
	MODE3	o
	LINEAR	o
	H-LINEAR	o
Recording Type	Stereo	o
	Mono	o

1. Phrase messages		
1.1	Playback Volume	o
1.2	Delay Time	o
1.3	Playback Point	o
1.4	Repeat Playback	o
1.5	Loop Playback	o
1.6	Fade	o
1.7	Control Output	o
1.8	MIDI Playback Tempo	o (*1)
1.9	Phrase Name	o (*2)
2. Phrase Combination		
2.1	Pattern Phrase	o (*3)
2.2	Song Phrase	o (*3)
4. Card Edit		
4.1	Card Format (Number of Recorded Phrases)	o
4.5	Card Protect	o
4.6	Card Name	o (*4)
5. Control Input Settings (*5)		
5.1	Control Input Mode	o
5.2	Direct Playback Method	o
5.3	Program Playback Method	o
5.4	Binary Playback Method	o (*6)
5.5	Terminal Rec Method	o
6. MIDI Settings		
	All MIDI Settings	x
7. RS-232C Setting		
7.1	Data Transmission Speed Setting	o
8. AR-LINK Setting		
8.1	AR-LINK Mode	x
9. System Settings		
9.1	Dual Mono Mode	o
9.2	Line Thru Settings	o
9.3	EQ	o
9.4	Volume Thru	x
9.5	Busy Out	o
9.6	Display Extinguished	x

*1: MIDI phrases are played back silently for the duration of the phrase in accordance with the playback tempo.
*2: The phrase name will not be displayed on the AR-200S.
*3: If a MIDI phrase is set, playback is silent for the duration of that phrase.
*4: The card name will not be displayed on the AR-200S.
*5: Enabled only when the playback mode is set to "Playback by Card Data."
*6: For binary playback, up to 250 phrases can be played back.

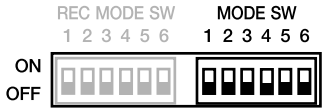
MODE SW Settings

MODE Switch Specifications

In addition to the REC MODE switches (p. 14), the AR-200S's bottom panel also houses the MODE switches. Various applications are possible by changing the settings of the MODE switches.
Each switch is ON when in the upward position, and OFF when in the downward position.
When the AR-200S is shipped from the factory, all switches will be OFF.

* *Use a pointed object to change the ON/OFF settings of the MODE switches.*

* *Set the MODE switches with the power to the AR-200S turned off.*



SW 1, 2: Playback Mode Settings

The AR-200S's playback modes (p. 10) are set by means of varying combinations of ON and OFF settings for SW 1 and 2.

PLAYBACK MODE	SW 1	SW 2
Playback by Card Data	OFF	OFF
Direct Playback (Last-In)	ON	OFF
Binary Playback	OFF	ON
Interval Playback	ON	ON

SW 3: Output Level Setting

Specifies the output level. Set this in accordance with the specifications for the device to which the playback is being output.

OFF: -10 dBV
ON: +4 dBu

SW 4: Programmed

Ordinarily, this should be set to "OFF."

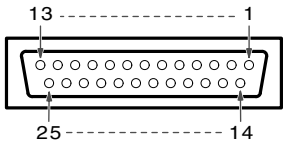
SW 5: Update Mode

Set this to "ON" when updating the AR-200S with the program files on a CompactFlash card or writing AR-200S programs to CompactFlash cards.
Ordinarily, this should be set to "OFF."

SW 6: Terminal Rec Setting

When conducting Terminal Rec (p. 14), set this to "ON."

Control I/O Connector Specifications



Port No.	Signal Name	Remark
1	1/INC	Control Input
2	2	
3	3/DEC	
4	4	
5	5/EXCHANGE	
6	6	
7	7	
8	8	
9	9/START	
10	STOP	
11	COM (GND)	
12	COM (GND)	
13	BUSY OUT	Control Output
14	NC	
15	CONT OUT	Control Output
16	GND	
17	BUSY OUT	Control Output
18	CONT OUT	
19	NC	
20	NC	
21	DC OUT	+5V, Max: 100 mA
22	GND	
23	GND	
24	DC IN	+9–24V, 1200mA
25	DC IN	

- Control Input and DC Input Terminal (CONTROL A) "1, 2" are connected in parallel with Control I/O Connector (CONTROL B) "1, 2."
- When using Program Playback on a PC card created by the AR-3000, use connectors 1 (INC), 3 (DEC), 5 (EXCHANGE), 9 (START), and 10 (STOP).

* *Do not make any connection to NC pins, since this will cause faulty operation.*

DC Power Supply

- Power can be supplied to the AR-200S from an external power supply unit (DC power supply) as well as from the AC adaptor.
- To supply power from an external power supply unit (DC power), use the Control Input and DC Input Terminal (CONTROL A) or the Control I/O Connector (CONTROL B) DC IN and GND pins.

Power Supply Specifications

DC +9–24 V, 1200 mA

* *The DC OUT pin of the Control I/O Connector (CONTROL B) can be used as power supply for a sensor, etc.*

NOTE

- Never short a power supply pin (21, 24, 25) to the GND pin, since this will damage the unit.
- When using the DC OUT, be careful not to exceed the maximum rating (100 mA).
- For reasons of safety, do not connect the DC IN + pin of the Control Input and DC Input Terminal (CONTROL A) to metal parts such as the chassis or the Control I/O Connector (CONTROL B).
- Do not supply electrical power simultaneously to multiple connectors or terminals; doing so may result in damage to the unit.

Specifications

AR-200S: Audio Recorder

Recording Format
RDAC (Roland Digital Audio Coding)

RDAC-Grade (Sampling Rate)
S-HIGH:	48 kHz
HIGH:	44.1 kHz
STANDARD:	32 kHz
LONG1:	22.05 kHz
LONG2:	16 kHz
ANNOUNCE:	8 kHz

Playback Rate Area
S-HIGH:	20 Hz–22 kHz
HIGH:	20 Hz–20 kHz
STANDARD:	20 Hz–15 kHz
LONG1:	20 Hz–10 kHz
LONG2:	20 Hz–7.5 kHz
ANNOUNCE:	20 Hz–3.7 kHz

RDAC-Mode (Signal Processing Method)
H-LINEAR:	24 bit PCM (playback only)
LINEAR:	16 bit PCM recording
MODE3:	2.5 times extended Recording time than LINEAR
MODE2:	2.5 times more extended Recording time than LINEAR
MODE1:	4 times more extended Recording time than LINEAR

Recording Media
Memory Card (PM-128-CF: option)

* *In order to recording/playback of audio signal, you will need to purchase one of the memory cards.*

CompactFlash Card Slot
1 slot

Phrase Types
Audio Phrases (stereo/mono)

Number of Phrases
Card made on the AR-200:	Maximum 250 Phrases
Card made on the AR-200S/3000:	Maximum 1000 Phrases

Playback Methods
Card made on the AR-200S

Direct Playback:	9 Phrases, 2 Modes (Normal, Last-in)
Interval Playback:	9 Phrases
Binary Playback:	250 Phrases
Computer-controlled playback:	1000 Phrases 100 Phrases (Continuous Play)

Card made on the AR-200

Direct Playback:	9 Phrases, 2 Modes (Normal, Last-in)
Interval Playback:	9 Phrases
Binary Playback:	250 Phrases
Computer-controlled playback:	250 Phrases 100 Phrases (Continuous Play)

Card made on the AR-3000

Direct Playback:	9 Phrases, 4 Modes (Normal, Fast-in, Last-in, Sequence)
Interval Playback:	9 Phrases
Program Playback:	100 Phrases, 5 Patterns
Binary Playback:	250 Phrases
Computer-controlled playback:	1000 Phrases 100 Phrases (Continuous Play)

Master Equalizer (Functions only when using cards that have been prepared on the AR-3000.)
High: -12 dB thru +12 dB (3/6 kHz, Shelving Type)
Low: -12 dB thru +12 dB (200/400 Hz, Shelving Type)

Residual Noise Level
-80 dBu (Input Short, INPUT VOLUME: middle, DIN-Audio, typ.)

S/N Ratio
Output: 84 dB (DIN-Audio, typ.)

RS-232C
Transmission Method:	Start-Stop Synchronous System (Asynchronous) Duplex Data Transmission
Baud Rate:	4800/9600/19200/38400 bps
Parity:	none
Data Length:	8 bit
Stop bit Length:	1 bit
Code:	ASCII

* *The setting for 38400 bps is for compatibility with legacy models (the AR-2000). However, it is a value for the communication speed that is not defined by the RS-232C standards. Make this setting as necessary when using a legacy model by means of card conversion.*

Display
7 segments, 4 characters (LED)

Controllers
INPUT VOLUME Knob
Card Eject Button
REC MODE Switches (Bottom Chassis)
MODE Switches (Bottom Chassis)

Indicators
PLAY/CLIP Indicator
REC Indicator

Connectors
LINE I/O Connector (8-pin Euroblock)
Control/Power In Terminal (5-pin Terminal Block with M3 bolts)
Control I/O Connector (DB-25 type)
RS-232C Connector (DB-9 type)

Power Supply
DC 9 V (AC Adaptor)
DC 9–24 V (Control/Power In Terminal, Control I/O Connector)

Current Draw
1000 mA (When Using the AC Adaptor)
1200 mA (When Using an External Power Supply Unit)

Dimensions
218 (W) x 233.3 (D) x 44 (H) mm
8-5/8 (W) x 9-3/16(D) x 1-3/4 (H) inches

Weight
1.5 kg / 3 lbs 5 oz (Excluding AC Adaptor)

Accessories
Rubber Feet
Card Protector (with screws)
Euroblock Connector
Owner's Manual
AC Adaptor (PSB-1U)

Options
Memory Card:	PM-128-CF
Rack Mount Adaptor:	RAD-50

* *0 dBu = 0.775 Vrms*

* *In the interest of product improvement, the specifications and/or appearance of this unit are subject to change without prior notice.*

* In addition to the owner's manual, the separate publication "RS-232C Reference Notes" is also available for those needing detailed documentation regarding RS-232C connector control.
Please download the PDF file (free of charge) from the following URL.

RS-232C Reference Notes cover the following topics:

- Setup
- Overviews, detailed descriptions, and lists of commands
- Examples of usage algorithms

http://www.rssamerica.com/

Input/Output Standard

Input Standard

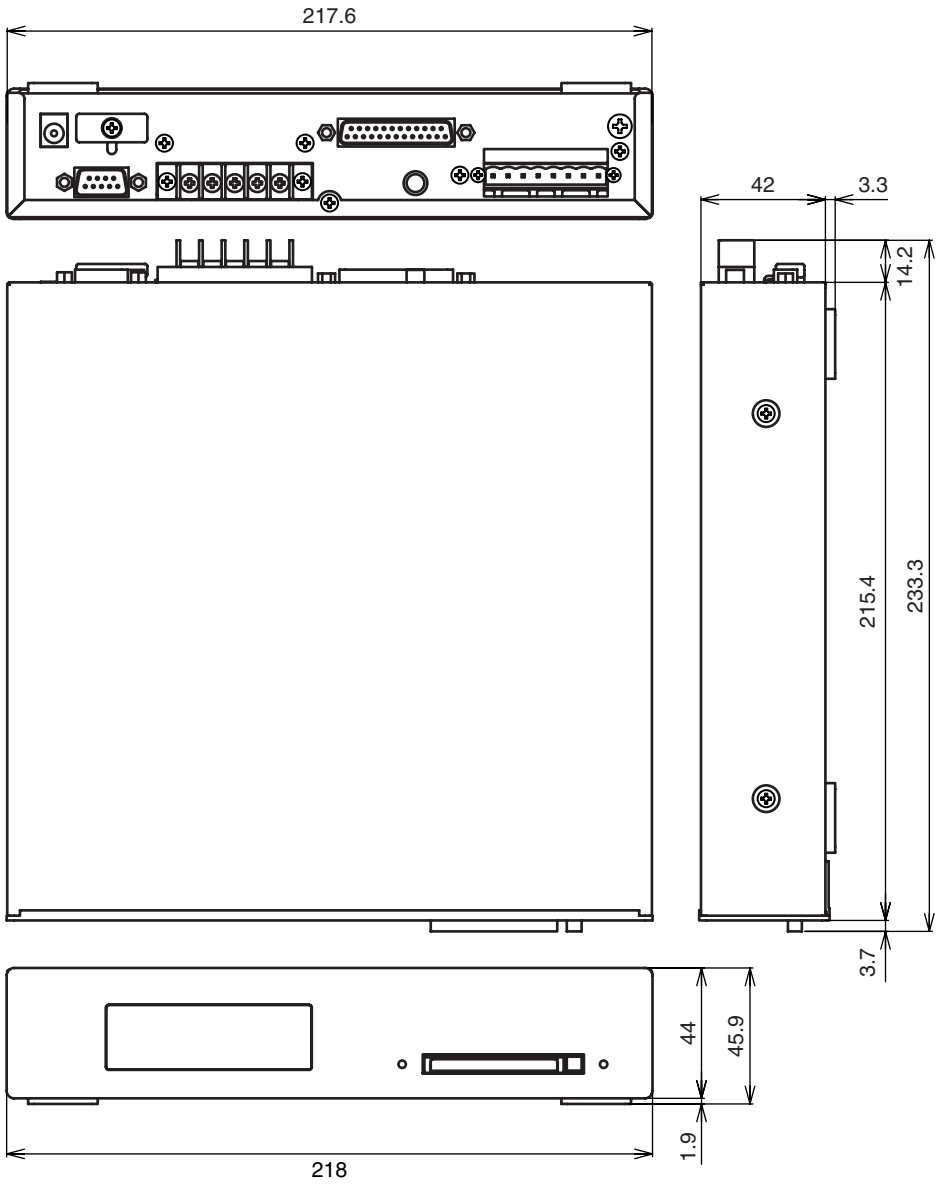
Input	Input Sensitivity	Nominal Input Level	Non-Clip Max Input Level	Input Impedance	Recommended Source Impedance
Line Inputs (Unbalanced)	-10 dBu	0 dBu	+20 dBu	10 k ohms	1 k ohms or less

Output Standard

Output	Nominal Output level	Non-Clip Max Output Level	Output Impedance	Recommended Load Impedance
Line Outputs (Balanced)	+4 dBu/-10 dBV	+18 dBu	600 ohms	600 ohms or greater

* *0 dBu = 0.775 Vrms, -10 dBV = -7.79 dBu*

Dimensions



* *Dimensions are with card inserted and rubber feet (included) attached.*

* *The power cord is not included.*

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For the U.K.

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

BLUE: NEUTRAL
BROWN: LIVE

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:
The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or coloured BLACK.
The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured RED.
Under no circumstances must either of the above wires be connected to the earth terminal of a three pin plug.

For the USA

DECLARATION OF CONFORMITY
Compliance Information Statement

Model Name : AR-200S
Type of Equipment : Audio Recorder
Responsible Party : Roland Systems Group U.S.
Address : 14830 Desman Road, La Mirada, CA 90638
Telephone : (714) 521-8000

For EU Countries

CE This product complies with the requirements of European Directive 89/336/EEC.

For the USA

FEDERAL COMMUNICATIONS COMMISSION
RADIO FREQUENCY INTERFERENCE STATEMENT

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.

Unauthorized changes or modification to this system can void the users authority to operate this equipment.
This equipment requires shielded interface cables in order to meet FCC class B Limit.

For Canada

NOTICE

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

AVIS

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

Information

When you need repair service, call your nearest Roland Service Center or authorized Roland distributor in your country as shown below.

ASIA

TAIWAN
ROLAND TAIWAN ENTERPRISE CO., LTD.
Room 5, 9fl. No. 112 Chung Shan N.Road Sec.2, Taipei, TAIWAN, R.O.C.
TEL: (02) 2561 3339

SINGAPORE/ MALAYSIA
Roland Asia Pacific Sdn. Bhd.
45-1, Block C2, Jalan PJU 1/39, Dataran Prima, 47301 Petaling Jaya, Selangor, MALAYSIA
TEL: 3-7805-3263

CENTRAL/LATIN AMERICA

Roland Systems Group U.S.
14830 Desman Road, La Mirada, CA 90638 U.S.A.
TEL: 714-521-8000

EUROPE

EAST EUROPE
Roland East Europe Ltd.
Warehouse Area 'DEPO' Pf.83
H-2046 Torokbalint, HUNGARY
TEL: (23) 511011

AUSTRIA/BELGIUM/ FRANCE/GERMANY/ HOLLAND/ LUXEMBOURG/ PORTUGAL/SPAIN/ SWITZERLAND
Roland Iberia, S.L.
Paseo García Faria, 33-35
08005 Barcelona SPAIN
TEL: 93 493 91 00

DENMARK
Roland Scandinavia A/S
Nordhavnsvej 7, Postbox 880,
DK-2100 Copenhagen
DENMARK
TEL: 3916 6200

FINLAND
Roland Scandinavia As, Filial Finland
Elannontie 5
FIN-01510 Vantaa, FINLAND
TEL: (0)9 68 24 020

NORWAY
Roland Scandinavia Avd. Kontor Norge
Lilleakerveien 2 Postboks 95
Lilleaker N-0216 Oslo
NORWAY
TEL: 2273 0074

SWEDEN
Roland Scandinavia A/S SWEDISH SALES OFFICE
Danvik Center 28, 2 tr.
S-131 30 Nacka SWEDEN
TEL: (0)8 702 00 20

UNITED KINGDOM/ IRELAND
Roland (U.K.) Ltd.
Atlantic Close, Swansea Enterprise Park, Swansea
SA7 9FJ,
UNITED KINGDOM
TEL: (01792) 702701

OCEANIA

Roland Corporation Australia Pty.,Ltd.
38 Campbell Avenue
Dee Why West, NSW 2099
AUSTRALIA

For Australia
TEL: (02) 9982 8266
For New Zealand
TEL: (09) 3098 715

NORTH AMERICA

CANADA
Roland Canada Music Ltd. (Head Office)
5480 Parkwood Way, Richmond B. C., V6V 2M4 CANADA
TEL: (604) 270 6626

Roland Canada Music Ltd. (Toronto Office)
170 Admiral Boulevard
Mississauga ON L5T 2N6
CANADA
TEL: (905) 362 9707

U. S. A.
Roland Systems Group U.S.
14830 Desman Road, La Mirada, CA 90638 U.S.A.
TEL: 714-521-8000

As of December 10, 2005 (RSS)

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