Roland

AR-100   AUDIO RECORDER

OWNER'S MANUAL

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│ AR-100          AUDIO RECORDER                            │
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Introduction

Thank you for purchasing the Roland AR-100 Audio Recorder.

In order to take full advantage of the AR-100's functionality and to enjoy long years of trouble-free use, please read this manual carefully.

After reading the manual, please keep it for future reference.

* *This device does not contain memory for recording/playback. In order to record or playback, you will need to purchase one of the PC cards as described on page 22 "Applicable PC cards".*

Main features

● Roland's proprietary RDAC provides high sound quality with lower data volumes.

● The PC card-based recording system uses no moving parts. It provides excellent sound quality and superior reliability.

● A wide variety of control terminals are provided, allowing you to choose the playback method appropriate for your needs.

● Line inputs and MIDI connectors are provided, allowing recording and playback of audio signals, MIDI messages

● The compact half-rack size body takes little space, and can be conveniently transported. If a separately sold RAD-50 rack mount adaptor is used, the AR-100 can be installed in an EIA rack.

● Since external DC power supply is also supported, a wide variety of applications are possible.

● The line inputs feature a muting function. When phrase playback begins, the signal from the line inputs can be automatically cut.

● A headphone jack is provided for convenient monitoring while you record.

About the display

Please be aware that the displays shown in this manual may occasionally differ from the displays of the factory settings.

About PC cards

The PC cards used by the AR-100 are sold separately.
Refer to the section "Applicable PC cards" on page 22.

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Contents

Precautions

Be sure to use only the AC adaptor supplied with the unit. Use of any other AC adaptor could result in damage, malfunction, or electric shock.

■ Power Supply

● Before connecting this unit to other devices, turn off the power to all units; this will help prevent damage or malfunction.

● Do not use this unit on the same power circuit with any device that will generate line noise; an electric motor or variable lighting system for example.

● The power requirement for this unit is indicated on its nameplate (rear panel). Ensure that the voltage in your installation meets this requirement.

● Avoid damaging the power cord: do not step on it, place heavy objects on it, etc.

● When disconnecting the AC adaptor from the power outlet, grasp the plug itself; never pull on the cord.

● If the unit is to remain unused for an extended period of time, unplug the power cord.

■ Placement

● Do not subject the unit to temperature extremes (eg., direct sunlight in an enclosed vehicle). Avoid using or storing the unit in dusty or humid areas, or areas that are subject to high levels of vibration.

● Using the unit near power amplifiers (or other equipment containing large power transformers) may induce hum.

● This device may interfere with radio and television reception. Do not use this device in the vicinity of such receivers.

■ 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 mild, non-abrasive detergent. Afterwards, be sure to wipe the unit thoroughly with a soft, dry cloth.

● Never use benzene, thinners, alcohol or solvents of any kind, to avoid the possibility of discoloration and/or deformation.

■ Additional Precautions

● Protect the unit from strong impact.

● Do not allow objects or liquids of any kind to penetrate the unit. In the event of such an occurrence, discontinue use immediately. Contact qualified service personnel as soon as possible.

● Never strike or apply strong pressure to the display.

● Should a malfunction occur, or if you suspect there is a problem, discontinue use immediately. Contact qualified service personnel as soon as possible.

● To avoid the risk of electric shock, do not open the unit or its AC adaptor.
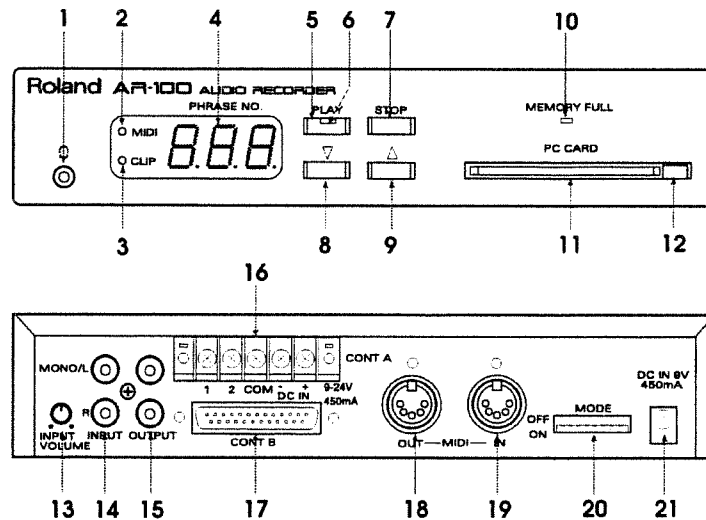
<< Front panel >>

1. PHONES jack
2. MIDI indicator
3. CLIP indicator
4. Display
5. PLAY button
6. PLAY indicator
7. STOP button
8. DECrement (▼) button
9. INCrement (▲) button
10. MEMORY FULL indicator
11. CARD slot
12. Eject button

<< Rear panel >>

13. INPUT VOLUME
14. INPUT jacks
15. OUTPUT jacks
16. Control input and DC input terminal (CONT A)
17. Control I/O connector (CONT B)

* This is not an RS-232C type connector. Never use improper cables or connect an incompatible unit to this connector.

18. MIDI OUT connector
19. MIDI IN connector
20. MODE switches
21. Power connector (for supplied AC adaptor)

* Be sure to use only the AC adaptor supplied with the unit.

1. Media handling

The AR-100 does not contain memory for recording/playback. In order to recording/playback of audio signal and MIDI data , you will need to purchase one of the PC cards. Please refer to the section "Applicable PC cards" on page 22.

■ Playback time
(recording type: MONO)

Playback time will depend on the RDAC-GRADE (p.8) and RDAC-Mode (p.8) settings.

○ RDAC-Mode 1

Capacity		Playback time		
(Bytes)	HIGH	STANDARD	LONG 1	LONG 2
2 M	01:29	02:02	02:58	04:05
4 M	03:03	04:12	06:06	08:25
8 M	06:09	08:28	12:18	16:57
12 M	09:14	12:44	18:29	25:28
20 M	15:25	21:15	30:52	42:31
40 M	30:53	42:34	1:01:48	1:25:08
80 M	1:01:48	1:25:11	2:03:40	2:50:22
184 M	2:22:17	3:16:06	4:44:43	6:32:12

○ RDAC-Mode 2

Capacity		Playback time		
(Bytes)	HIGH	STANDARD	LONG 1	LONG 2
2 M	00:59	01:21	01:58	02:43
4 M	02:02	02:48	04:04	05:36
8 M	04:06	05:39	08:12	11:18
12 M	06:09	08:29	12:19	16:58
20 M	10:17	14:10	20:34	28:20
40 M	20:35	28:22	41:12	56:45
80 M	41:12	56:47	1:22:27	1:53:34
184 M	1:34:52	2:10:44	3:09:49	4:21:28

• When stereo is used, the times will be 1/2 as long.

* *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 RDAC-GRADE and RDAC-Mode settings of each phrase recorded in each PC card.*

■ PC card handling

Insertion

Insert the PC card all the way into the card slot, until it is securely in place.
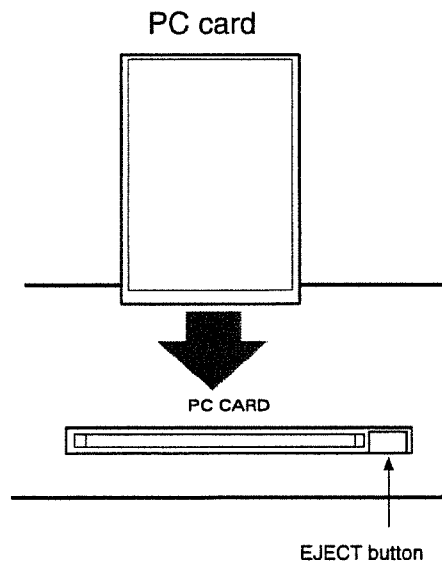
Removal

To remove the PC card, press the Eject button.

* *Never remove a PC card while playback/recording a phrase. It is possible that the data in the PC card will be damaged*

2. Basic operation using a Flash Disk card

■ Preparations

● What is a phrase?

On the AR-100, a piece of recorded data (Audio signals, MIDI messages) is referred to as a Phrase. Phrases are identified by their Phrase number.

● Mode Switches

The mode switches (rear panel) of AR-100 are possible a wide variety of settings.
Before using the AR-100, please set the MODE switches to the correct settings (p.17). If the settings are incorrect, the unit will not operate correctly.

● Example of a setup
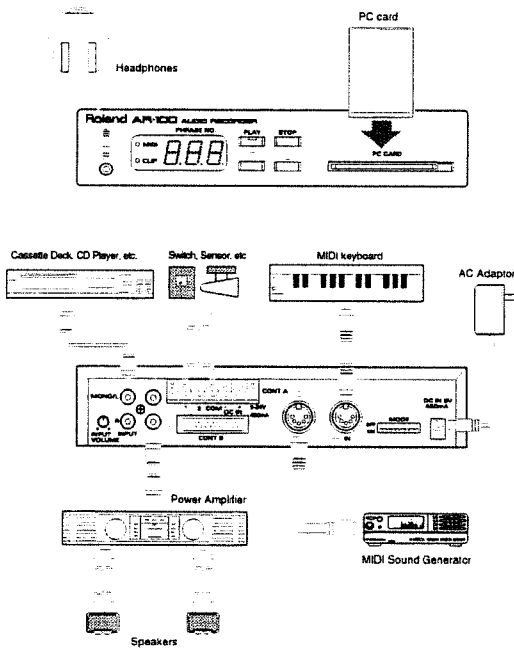
*   Before making connections, be sure to turn the power off. Power switch is not provided. Turn off the power remove the AC adaptor from the AR-100.

■ Rack mounting

By attaching a rack mount adaptor to the AR-100 (RAD-50: sold separately) you can install it in an EIA rack. One RAD-50 can accommodate up to two AR-100 units.

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

Note: Do not use these holes.
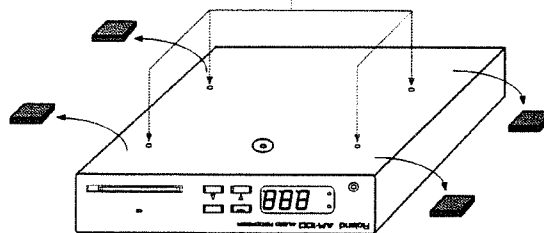
2. Attach the RAD-50 adaptor to the AR-100 using the screws that are supplied with the RAD-50.

RAD-50
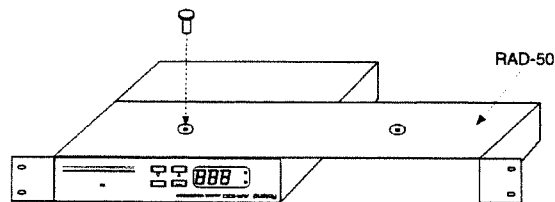
■ Attaching the Card Protector

By attaching the Card Protector (supplied) to the AR-100, you can prevent the PC card from inadvertently being removed from the AR-100.

1. Attach the Card Protector to the AR-100 using the screws that are supplied with it.

Card Protector
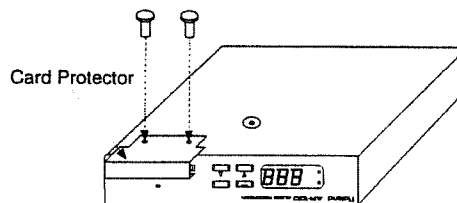
■ Playback procedure

● Manual playback

Here is how to playback the phrase to check the recording.
The sound will be output from the Phones jack and from the
output jacks.

1. Insert a PC card containing recorded phrases into a card
slot.

2. Press the Increment (▲)/Decrement (▼) button to select
the phrase you wish to playback.

•The non-recording phrase number in display is flashed.
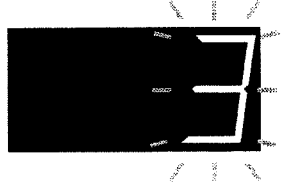
3. Press the PLAY button and the phrase will playback.
If you wish to interrupt phrase playback, press the STOP
button.
•The PLAY indicator and the dot in display is lit while
playing back.

■ Method of recording

● Recording procedure

1. Connect a cassette deck or CD player etc. to the input jacks
of the AR-100.

2. Insert a PC card into card slot.

3. Press the Increment (▲)/Decrement (▼) button to select
non-recording phrase.

•The non-recording phrase number in display is flashed.
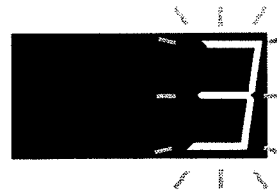
* *If you are re-recording over a previously recorded phrase, you
should delete the phrase.(p.14)*

4. While holding down the STOP button, press the PLAY
button. (Recording standby mode)

•The PLAY indicator is flashed while the recording stand-
by mode.

5. Input an audio signal from a cassette deck or CD player,
etc.,and use the INPUT VOLUME to adjust the recording
level so that the CLIP indicator do not light. (Nominal
input level : -10dBm, Maximum input level : -4dBm)

* *Press the STOP button and recording standby mode will end.*
* *If signals louder than -4 dBm are being input, rotate the input
volume knob to the left of center.*

6. Press the PLAY button and input an audio signal from a
cassette deck or CD player, etc.,and recording will begin.

* *Even after the PLAY button is pressed, recording will not begin
until sound is input.(trigger recording standby mode)*

•The PLAY indicator is lit while the trigger recording
standby mode.

Recording will begin automatically when the audio signal
input AR-100.

•The dot in display is flashed while the recording.

* *When the card becomes full, recording will stop automatically.*

• *When the remaining recording time is less than 10 seconds, the
remaining recording time display will automatically appear.*

* The MEMORY FULL indicator tells how much recording
time is left.
When 90% of the recording capacity has been used, the
MEMORY FULL indicator will blink. When 100% has been
used, the indicator will light.

7. Press the STOP button and recording will end.

7

● Mono Recording

- Recording will be mono if you select mono as the setting of the Recording Type setting (SW4) of the MODE switch.

- When recording in mono, input the audio signal from the MONO/L input jack.

- During mono recording and while waiting to record, the audio signal will be output only from the MONO/L output jack and from the left channel of the headphones. The recording signal cannot be monitored from the R output jack or from the right channel of the headphones.

- A phrase recorded in mono will be played back from both output jacks MONO/L and R, and also from both headphone channels L and R.

■ Recording settings

- You can select from a variety of recording methods as suitable for the recording time and sound quality that you require.

- Recording settings are determined by the settings of the rear panel MODE switches (p.17).

* *Record settings are valid only during recording. They are ignored during playback.*

● RDAC-GRADE (sampling rate)

HIGH	for high quality recording	(44.1 kHz)
STANDARD	for normal recording	(32 kHz)
LONG1	for long recording	(22.05 kHz)
LONG2	for even longer recording	(16 kHz)

( ) : sampling rate

- RDAC-GRADE setting

The combination of the settings of MODE switches SW1 and SW2 determines the RDAC-GRADE.

	SW1	SW2
HIGH	ON	ON
STANDARD	OFF	ON
LONG1	OFF	OFF
LONG2	ON	OFF

● RDAC-Mode(recording mode)

RDAC-Mode1	extended recording time
RDAC-Mode2	normal recording time

- RDAC-Mode setting

MODE switch SW3 sets the RDAC-Mode.

	SW3
RDAC-Mode1	OFF
RDAC-Mode2	ON

● Recording Type

MONO	Mono recording
STEREO	Stereo recording

- Recording Type setting

MODE switch SW4 sets the Recording Type.

	SW4
MONO	OFF
STEREO	ON

3. Control I/O

■ Control Input

● Playback by control signal

- You can connect a switch, relay, or program timer to control phrase playback from an external device.

- Four playback methods are available; Playback by card data, Direct Playback (Last-In), Binary Playback, and Interval Playback.

- Settings for the playback method are made using the MODE switches (rear panel).

When using a card that was created on the AR-2000, use "Playback by card data." With other playback methods, settings other than phrase settings will be ignored. (Refer to p.18, or the AR-2000 owner's manual.)

	SW5	SW6
Playback by card data	OFF	OFF
Direct Playback(Last-In)	ON	OFF
Binary Playback	OFF	ON
Interval Playback	ON	ON

Control signal:
An on/off (open/close) or open collector.

The control signals are input by electrically shorting (turning on) the COM (common) pin with Control Input and DC Input Terminal (CONT A) pin 1, 2, Control I/O Connector(CONT B) pin 1—9 or STOP (p.13).

Control Input and DC Input Terminal "1,2" have the same function as Control I/O Connector "1,2."

1) Playback by card data

a) Card made on the AR-2000

- *Playback will use the settings (playback method) recorded in the card.*
For details, refer to AR-2000 manual.

Some functions are not available. (p.18)

b) Card made on the AR-100

- Each phrase 1—9 can be assigned to each 1—9 of the Control I/O Connector pins.

- Playback mode is available Direct Playback(Normal).

Direct Playback (Normal) :
The desired phrase can be played back.
The phrase number have a priority order.

Control Input pins:

1-9: Playback the phrase that was specified for the pin on which the control signal was input.
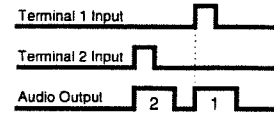
STOP: When a control signal is input during phrase play back, phrase playback will be interrupted.

Phrase 1 Interrupted
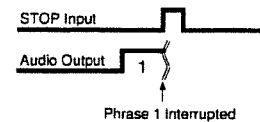
Priority:

The control input pins have a priority order.

The priority order is as follows:
1 > 2 > 3 > ... > 9

Phrase 2 Interrupted

Control Signal received by
Terminal 2 ignored
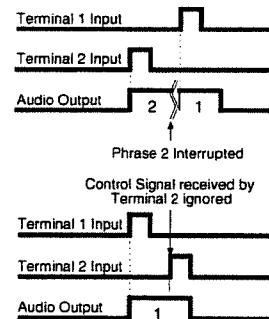
It is not possible to playback a lower-priority phrase while a higher-priority phrase is playing back.

Consecutive playback:

- While a control signal is continuously input to control input, the phrase will be repeatedly played back.

9

2) Direct Playback (Last-In)

The desired phrase can be played back.
  •Each phrase 1—9 can be assigned to each 1—9 of the Control I/O Connector pins.

* *Settings made on the AR-2000 will be ignored except for the phrase settings. (p.18)*

Control Input pins:

1—9: Playback the phrase that was specified for the pin on which the control signal was input.

```
Terminal 1 Input _____⌐⎺⎽_____
Terminal 2 Input ⌐⎺⎽_____
Audio Output _____⌐⎺2⎽⌐⎺1⎽_____
```

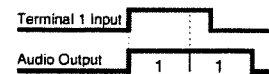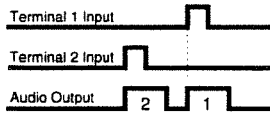STOP: When a control signal is input during phrase playback, phrase playback will be interrupted.

```
STOP Input _____⌐⎺⎽_____
Audio Output ⌐⎺1⎽⟩⎽
        ↑
    Phrase 1 Interrupted
```

Priority:

  •If a control signal is input while a phrase is playing back, the last-input control signal will take priority, and after the currently playing phrase is stopped, the specified phrase will playback.
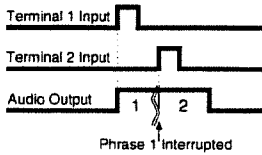
```
Terminal 1 Input ⌐⎺⎽_____
Terminal 2 Input _____⌐⎺⎽_____
Audio Output ⌐⎺1⎽⟩⌐⎺2⎽_____
        ↑
    Phrase 1 Interrupted
```

Consecutive playback:

  •While a control signal is continuously input to control input, the phrase will be repeatedly played back.

```
Terminal 1 Input ⌐⎺⎺⎺⎺⎽_____
Audio Output ⌐⎺1⎽⌐⎺1⎽_____
```
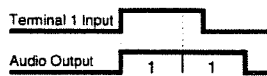
3) Binary Playback

  •Control signals (on/off switches, etc.) can select and playback any phrase. Complex devices such as a personal computer are not required.

Control Input pins:

1—8: Select the phrase number corresponding to the combination of pins on which control signals are input.

9/START: Playback the selected phrase.

STOP: If a control signal is input to this pin while a phrase is playing back, phrase playback will be stopped.

```
Binary Input ⌐⎺1⎽⎽⌐⎺5⎽_____
START Input ____⌐⎺⎺⎺⎽_____
Audio Output ⌐⎺1⎽⌐⎺1⎽⌐⎺5⎽____
```
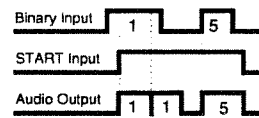
* *Phrase playback will begin when both the binary inputs and the "START" input are ON.*

* *When the control signals are continuously input to both the binary inputs and the "START" inputs, the specified phrase will be played back repeatedly.*

* *If the phrase is changed while a control signal is input to "START," the specified phrase will be played back.*

When the "START" control signal or the binary input goes OFF, playback will end when the currently-playing phrase is finished.

* *Settings made on the AR-2000 will be ignored except for the phrase settings. (p.18)*

Specifying and playing back a phrase

Example: To playback , Phrase number 112

1. Convert the phrase number to a binary signal.
   •Refer to the Phrase Number / Binary Signal chart (p.11) to convert the phrase number into a binary signal.
   0: OFF
   1: ON
   Phrase number: 112 → Binary signal: 01110000

2. Input the binary signal into each 1—8 of the Control I/O Connector pins..

87654321
112 01110000

3. Input the playback start signal to START.
   •To halt a phrase during playback, input a stop signal while the "START" input or the binary input is OFF.

Phrase Number / Binary Signal chart

Phrase No.	Binary 87654321	Phrase No.	Binary 87654321	Phrase No.	Binary 87654321	Phrase No.	Binary 87654321	Phrase No.	Binary 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

4) Interval Playback

The specified phrase will be played back at fixed intervals. The playback interval is fixed for each connector pin.

• Each phrase 1—9 can be assigned to each 1—9 of the Control I/O Connector pins.

* *Settings made on the AR-2000 will be ignored except for the phrase settings. (p.18)*

* *Repeat playback setting of phrase settings will be ignored.*

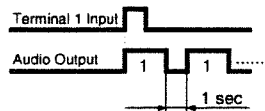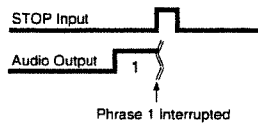1—9: Playback the phrase that was specified for the pin on which the control signal was input.

Pin Playback No. : Interval	Pin Playback No. : Interval	Pin Playback No. : Interval
1: 1 sec.	4: 15 sec.	7: 5 min.
2: 5 sec.	5: 30 sec.	8: 15 min.
3: 10 sec.	6: 1 min.	9: 30 min.

STOP: When a control signal is input during phrase playback, phrase playback will be interrupted.

■ Control Output

1) Busy Output

• The Busy Output outputs a control signal while a phrase is being played, when in the Recording standby mode, and when recording.

• This is a convenient way to turn on an external amplifier etc. during phrase playback.

• The Busy Output is an open collector signal.
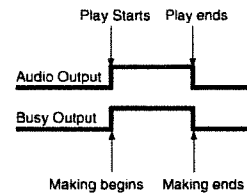
2) Control Output

• The Control Output outputs a control signal from the CONT OUT pin after phrase playback.

• This is a convenient way to control external devices after phrase playback.

• The Control Output is an open collector signal, with a make time of 1 second.
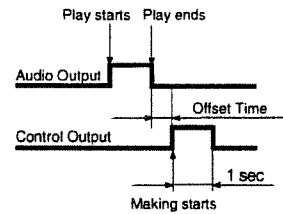
* *Only phrases that were set on the AR-2000 will be valid. (p.18) For details, refer to AR-2000 manual.*

■ Control I/O specifications

```
    13 ........................................ 1
     ┌──────────────────────────┐
     │ ╱ ○○○○○○○○○○○○○ ╲ │
     │   ○○○○○○○○○○○○      │
     └──────────────────────────┘
    25 ......................... 14
```

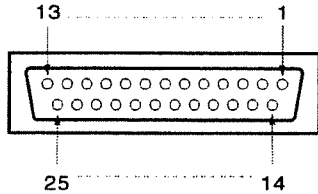| Pin no.	Signal name	
1	1/INC	┐
2	2	
3	3/DEC	
4	4	
5	5/EXCHANGE	├ Control Input
6	6	
7	7	
8	8	
9	9/START	
10	STOP	┘
11	COM	
12	COM	
13	BUSY OUT	┐
14	NC	├ Control Output
15	CONT OUT	┘
16	GND	
17	NC	
18	NC	
19	NC	
20	NC	
21	DC OUT (+5 V, Max :100 mA)	
22	GND	
23	GND	
24	DC IN (+9—24 V, 450 mA)	
25	DC IN (+9—24 V, 450 mA)	

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

* *When using Program Playback on a PC card created by the AR-2000, 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-100 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 (CONT A) or the Control I/O Connector (CONT B) DC IN and GND pins.
Power supply specifications: DC +9—24 V, 450 mA

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

* *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).*

> ## Caution:
>
> For reasons of safety, do not connect the DC IN + pin of the Control Input and DC Input Terminal (CONT A) to metal parts such as the chassis or the Control I/O Connector (CONT B).

4. Other function

■ Delete Phrase / Delete Card

Delete Phrase

•This function deletes a phrase.

Delete Card

•This function erases all phrases from a PC card.
•When you erase a card, all data settings in the card will be initialized.

* *Be aware that this will destroy all data on the PC card.*

1. Press the Increment (▲)/Decrement (▼) button to select the phrase number.

2. Hold down the STOP button for at least 5 seconds
   •The message "dEL" will appear in the display.(Delete Phrase)

   If you wish to erase a phrase, continue to step 3.

   Press the Increment (▲) button to delete card.
   •The message "ALL" will appear in the display.(Delete Card)
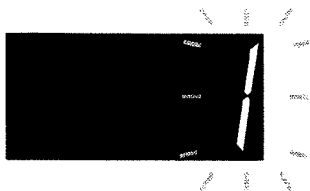

   •To switch between delete phrase "dEL" to delete card "ALL", press the Increment (▲) button.

3. Press the ENTER button to delete the phrase or the card.

   •If you press the STOP button, the Delete operation will be canceled.

4. When the phrase has been erased, the phrase number in the display will blink.

■ Format

•This function formats (initializes) a PC card so that it can be used by the AR-100.
•Cards formatted on the AR-2000 can be used just as they are.

* *It is not possible to use a PC card that has not been formatted in AR-100 or AR-2000.*

* *Be aware that this operation will erase all data in the PC card.*

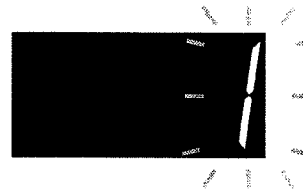1. Insert the PC card that you wish to format into card slot.
   •The message "Fot" will appear in the display.

2. Press the PLAY button, formatting will begin.
   •If you press the STOP button, the Format operation will be canceled.

3. When formatting is completed, the message is changed in the display.

5. MIDI

In addition to recording and playing back audio data, the AR-100 is also able to record/playback MIDI messages.

- It is also possible to use MIDI to control Phrase Playback.
- MIDI (Musical Instrument Digital Interface) is a worldwide standard that allows electronic musical instruments, sequencers, and computers to exchange musical data such as performance control data and sound selection data, etc.

* It is not possible to simultaneously playback audio phrases and MIDI phrases.

■ MIDI Receive Channel setting

- This sets the MIDI receive channel. This setting is valid for playback by MIDI.

1. While holding down the PLAY button, insert the PC card into the card slot.
2. The MIDI indicator will blink, and the display will indicate the receive channel.

3. Press the Increment (▲)/Decrement (▼) button to select the MIDI receive channel.

- When MIDI messages of any channel will playback phrases, select the message "ALL" in display.

- When MIDI messages will not playback phrases, select the message "OFF" in display.

4. Press the PLAY button to set the specified MIDI receive channel.

- If you press the STOP button, the MIDI receive channel setting will be canceled.

■ Playback using MIDI

Note On messages will playback the phrase corresponding to the note number.

1) Program Change: 1 (PC=1)

Note number	Phrase number
C -	001
:	:
G 9	128

2) Program Change: 2—6 (PC=2—6)

Program Change: 2 (PC=2)

Note number	Phrase number
C -	001
:	:
D#7	100

Program Change: 3 (PC=3)

Note number	Phrase number
C -	101
:	:
D#7	200

Program Change: 4 (PC=4)

Note number	Phrase number
C -	201
:	:
D#7	300

Program Change: 5 (PC=5)

Note number	Phrase number
C -	301
:	:
D#7	400

Program Change: 6 (PC=6)

Note number	Phrase number
C -	401
:	:
D#7	500

* The settings of the card created by the AR-2000 will be used only for "Playback by card data." (Refer to the AR-2000 operating manual.)

■ Recording MIDI messages

• The Time Base is fixed at 192.

* *A card that was created on the AR-2000 will use the settings of the card. (Refer to the AR-2000 operating manual.)*

The Time Base setting (called Resolution on some devices) determines the timing precision at which MIDI messages will be recorded. This differs between devices.

1. Connect a MIDI sequencer or MIDI keyboard etc.to the MIDI IN connector of AR-100.

2. Insert a PC card into the card slot.

3. Press the Increment (▲)/Decrement (▼) button to select non-recording phrase.

   • The non-recording phrase number in display is flashed.
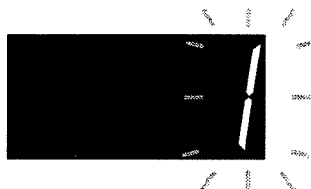
* *If you are re-recording over a previously recorded phrase, you should delete the phrase.(p.14)*

4. While holding down the STOP button, press the PLAY button. (Recording standby mode)

   • The PLAY indicator is flashed while the recording stand-by mode.

5. Hold down the Increment (▲) button for at least 5 seconds.

   • The MIDI indicator is lit.(MIDI recording mode)

* *Recording will begin when a System Realtime message "Start" (FAH) is received from the connected MIDI device.*

6. Press the PLAY button and recording will begin, then input a MIDI message from a MIDI sequencer, MIDI keyboard, etc.

   • The dot in display is flashed while recording.

* *The Busy Output outputs while recording.*

* *When the card becomes full, recording will stop automatically.*

   • The MEMORY FULL indicator tells how much recording time is left.
   When 90% of the recording capacity has been used, the MEMORY FULL indicator will blink. When 100% has been used, the indicator will light.

7. Press the STOP button and recording will end.

* *Recording will stop when a System Realtime message "Stop" (FBH) is received from the connected MIDI device.*

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6. Appendix

■ Mode switch setting

The eight mode switches are provided in rear panel. Various applications are possible by changing the settings of the MODE switches.

Each switch is OFF when in the upward position, and ON when in the downward position. Use a pointed object to change the ON/OFF settings of the MODE switches.

When the AR-100 is shipped from the factory, all switches will be OFF as shown below.

● How to use the mode switch

SW	Purpose	OFF	ON
SW1 SW2	RDAC-GRADE settings	<table><tr><td>SW1</td><td>SW2</td><td>RDAC-GRADE</td></tr><tr><td>ON</td><td>OFF</td><td>LONG2</td></tr><tr><td>OFF</td><td>OFF</td><td>LONG1</td></tr><tr><td>OFF</td><td>ON</td><td>STANDARD</td></tr><tr><td>ON</td><td>ON</td><td>HIGH</td></tr></table>	
SW3	RDAC-Mode settings	Mode1	Mode2
SW4	Recording Type settings	Mono	Stereo
SW5 SW6	Playback Mode settings	<table><tr><td>SW5</td><td>SW6</td><td>Playback Mode</td></tr><tr><td>OFF</td><td>OFF</td><td>Playback by card data</td></tr><tr><td>ON</td><td>OFF</td><td>Direct Playback (Last-in)</td></tr><tr><td>OFF</td><td>ON</td><td>Binary Playback</td></tr><tr><td>ON</td><td>ON</td><td>Interval Playback</td></tr></table>	
SW7	Switch Protect (*)	Protect OFF	Protect ON
SW8	not in use	Always set to the OFF position	

(*) This will prevent AR-100's settings from incorrect operation.
If Switch Protect is ON, it will not be possible to operate the unit
from the front panel buttons (such as PLAY, STOP,▼, ▲).
Use this setting to prevent accidental operation when a button
is pressed.

Caution:

If SW7 (Switch Protect) is ON, recording and manual playback etc. will not be possible. When you wish to operate the unit using the panel buttons, be sure to turn Switch Protect OFF.

■ Phrase data for recording

When a piece of Phrase data recorded by the AR-100, the settings of data on the card will be as follows.
If you will be using the card on the AR-2000, refer to this list.

Phrase settings

Playback Volume:	100
Delay time:	OFF
Control output:	OFF
Repeat playback:	OFF
Phrase name:	MESSAGE + Phrase number
Tempo:	120 (MIDI phrase only)

■ Settings after formatting

When a card is formatted by the AR-100, the settings of the card will be as follows.
If you will be using the card on the AR-2000, refer to this list.

Recording settings

RDAC-GRADE:	STANDARD
RDAC-Mode:	Mode2
Recording setting:	Stereo
Trigger recording:	OFF
Time base:	192 (MIDI phrase only)

Control input settings

Program playback:	Program playback 1: 1-100
	2-5: Unsetting
Direct playback:	CH1-CH16: 1-16
Control input select:	Direct playback(Normal)
Binary playback input trigger:	Level

MIDI settings

Recording MIDI messages:	OFF
MIDI note:	C- <-> G9(1-128)
MIDI receive channel:	OFF
MIDI OUT:	OUT
MIDI note trigger:	Trigger
DEVICE ID:	1

System settings

Line input select:	OFF
RS-232C/422A baud rate:	9600
Channel playback mode:	OFF
Recorded phrase protect mode:	OFF

ETC. settings

Recording phrase:	250
Linear recording:	OFF

■ AR-2000 settings that can be used

The following AR-2000 settings can be used by the AR-100.
Refer to this list if you will be using a card created by the AR-2000.

Setting	Playback by card	Other playback
Phrase settings(*1)	O	O(*2)
Program playback settings	O	X
Direct playback setting	O	X
Control input select setting	O(*3)	X
Binary playback input trigger setting	O	X
Channel playback mode setting	O	X
MIDI notes setting	O	X
MIDI receive channel setting	O	O
MIDI note trigger	O	X
Device ID setting	O	X
Recording phrase	O	O

(*1) The phrase name will not be displayed on the AR-100.

(*2) Repeat playback setting of phrase settings will be ignored at Interval Playback.

(*3) For binary playback, up to 250 phrases can be played back.

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:

E01

E02

Action: Consult a nearby Roland Service Station.

Display:

E03

Situation: It is possible that the data in the PC card or the PC card itself has been damaged.

Action: Erase all phrases from PC card (Delete Card:p.14). If delete card is not possible, or if the same message appears after the card has been delete card, it may be that the PC card is malfunctioning. Use a different PC card

Display:

E04

Situation: The card is of a type which the AR-100 is not able to use.

Action: Refer to the section "Applicable PC cards" on page 22 and use an appropriate PC card.

Display:

E05

Situation: No more data can be recorded in the card.

Action: Either delete unnecessary phrases (p.14), or use a different card.

Display:

E06

Situation: Either the phrase data is damaged, or the AR-100 is not able to handle the phrase.

Action: Check the phrase for which the message was displayed.

Display:

E07

Situation: The write protect switch on the PC card is set to the ON position.

Action: Refer to the manual for the PC card, and set the write protect switch to the OFF position.

Display:

E08

Situation: The backup battery in the PC card has run down.

Action: Refer to the manual for the PC card and replace the battery.

Display:

E09

Situation: A large amount of MIDI data was received in a short time, and could not be processed.

Action: Change the way in which MIDI data is being transmitted.

Display:

E10

Situation: Once an Active Sensing message was received, 300 msec elapsed without any message being received.

Action: Check the MIDI cable connect or turn off.

AUDIO RECORDER   Date : Jun. 16, 1995
Model AR-100   **MIDI Implementation Chart**   Version : 1.00

Media Player Section

	Function ...	Transmitted	Recognized	Remarks
Basic Channel	Default Changed	o x	1—16 1—16	Memorized
Mode	Default Message Altered	x o ***************	Mode 3, 1 x	Memorized
Note Number :	True Voice	0 —127 ***************	0 —127	
Velocity	Note ON Note OFF	o o	x x	
After Touch	Key's Ch's	o o	x x	
Pitch Bend		o	x	
Control Change	0 —119	o	x	
Program Change :	True #	o ***************	o 0 —10, 127	Program number : 1—11, 128
System Exclusive		o	o	
System Common	: Song Pos : Song Sel : Tune	x x x	x x x	
System Real Time	: Clock : Commands	o o	x x	
Aux Messages	: All Sounds OFF : Reset All Controllers : Local ON/OFF : All Notes OFF : Active Sensing : System Reset	o o x o x x	x x x x x x	
Notes				

Mode 1 : OMNI ON, POLY   Mode 2 : OMNI ON, MONO   o : Yes
Mode 3 : OMNI OFF, POLY   Mode 4 : OMNI OFF, MONO   x : No

AUDIO RECORDER   Date : Jun. 16, 1995
Model AR-100   **MIDI Implementation Chart**   Version : 1.00
MIDI Recording Section

	Function ...	Transmitted	Recognized	Remarks
Basic Channel	Default Changed	x x	all channels x	not Basic channel
Mode	Default Message Altered	x x ***************	x o 	
Note Number :	 True Voice	x ***************	0 —127 0 —127	
Velocity	Note ON Note OFF	x x	o o	
After Touch	Key's Ch's	x x	o o	
Pitch Bend		x	o	
Control Change	0 —119	x	o	
Program Change :	 True #	x ***************	o 0 —127	
System Exclusive		x	o	
System Common	: Song Pos : Song Sel : Tune	x x x	x x x	
System Real Time	: Clock : Commands	x x	x o	
Aux Messages	: All Sounds OFF : Reset All Controllers : Local ON/OFF : All Notes OFF : Active Sensing : System Reset	x x x x x x	o o o o (123—127) o x	
Notes				

Mode 1 : OMNI ON, POLY   Mode 2 : OMNI ON, MONO   o : Yes
Mode 3 : OMNI OFF, POLY   Mode 4 : OMNI OFF, MONO   x : No

Specifications

AR-100: Audio Recorder

● Recording Format

  RDAC (Roland Digital Audio Coding)

● RDAC-GRADE (Sampling rate)

  ● Record / Playback

HIGH	(44.1[kHz])
STANDARD	(32 [kHz])
LONG1	(22.05[kHz])
LONG2	(16 [kHz])

  ● Playback only

ANNOUNCE	(8 [kHz])

● RDAC-Mode (Recording mode)

  ● Record / Playback

  Mode 1: Extended recording time

  Mode 2: Normal recording time

  ● Playback only

  Linear: High quality recording

  (16-bit PCM recording,only for specified PC cards.)

● MIDI data record / playback

You can record and playback MIDI data.

* MIDI stands for Musical Instrument Digital Interface. MIDI is a world-wide standard, and performance data of one device can be transmitted to another device.

● Recording media

  PC card (PC Card Standard (1995) compatible)

● Applicable PC cards

  ATA FLASH PC cards:

  Roland ATA Flash PC Cards PM series

  SanDisk Inc. FLASH Disk SDP5, SDP5A, SDP3B equivalent

● Phrase types

  Audio phrases (stereo/mono)

  MIDI phrases

* In the AR-100, a "phrase" refers to a piece of recorded data

● Number of phrases

  ● Card made on the AR-100

  Maximum 250 Phrases

  ● Card made on the AR-2000

  Maximum 500 phrases

● Recording time

RDAC-GRADE \ RDAC-Mode	RDAC-Mode 1	RDAC-Mode 2
HIGH	Approx. 31min. 37sec.	Approx. 21min. 05sec.
STANDARD	Approx. 43min. 34sec.	Approx. 29min. 03sec.
LONG 1	Approx. 1hour 03min. 16sec.	Approx. 42min. 10sec.
LONG 2	Approx. 1hour 27min. 09sec.	Approx. 58min. 06sec.

* 40MBytes PC card (Monaural)

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● Playback methods

  ● Card made on the AR-100

  Direct playback: 9 phrases,2 modes (Normal, Last-In)

  Interval playback*: 9 phrases

  Binary playback*:   250 phrases

  MIDI playback: 250 phrases

● Card made on the AR-2000

  Direct playback: 9phrases, 3 modes(Normal, Last-In, Sequence)

  Interval playback: 9 phrases

  Binary playback: 250 phrases

  Program playback*: 100 phrases, 5 patterns

  MIDI playback: 500 phrases

* Binary playback: Method of playback whereby phrases are specified using binary code .

* Interval playback: Method of continuance phrase playback that occurs in predetermined interval time .

* Program playback: Method of phrase playback that occurs in predetermined order.

● Inputs

(* 0 dBm=0.775Vrms)

Input Sensitivity:	- 16 dBm
Nominal Input Level:	- 10 dBm
Input Impedance:	18 k-ohm
Recommended Source Impedance:	2 k-ohm or less

● Outputs

(* 0 dBm=0.775Vrms)

Nominal Output Level:	- 10 dBm
Output Impedance:	300 ohm
Recommended load Impedance:	600 ohm or more

● Phones

Recommended load Impedance:	30 ohm or more

● Control Inputs

Trigger Signal Format: On, Off(Open, Close), Pulse width: 20 msec or more

Control Inputs Terminal:

  Direct Playback   (Last-In, 9 Channels, STOP)

  Interval Playback (9 Channels, STOP)

  Binary Playback   (Phrase select (8 bits), START, STOP)

  Program Playback*(START, STOP, INC, DEC, EXCHANGE)

* Program playback: Use the card made on the AR-2000

● Control Outputs

Signal Format:	On, Off (Open, Close)
Contact Capacity:	DC 24 V, 30 mA

Control Outputs Terminal:

Busy Output	(During phrase playback)
Control Output*	

* Control Output: Use the card made on the AR-2000 .

● PC card slot

  Type I, II x 1 slot

● Display

  7 segments, 3 characters (LED)

● Indicators

  MIDI Indicator

  CLIP Indicator

  PLAY Indicator

  MEMORY FULL Indicator

● Controllers

  PLAY Button

  STOP Button

  INCrement (▲) Button

  DECrement (▼) Button

  INPUT VOLUME Knob (Rear panel)

  MODE Switch (Rear panel)

● Connectors
　Phones　　　　　(Stereo miniature phone jack)
　Input Jacks　　　(RCA phone Jacks;L/MONO, R)
　Output Jacks　　 (RCA phone Jacks;L/MONO, R)
　MIDI Jacks　　　 (5-pin DIN connector; IN, OUT)
　Control Input and DC Input Terminal (CONT A)
　(5 pin Terminal Block with M3 bolts)
　Control I/O Connector (CONT B)
　(DB-25 Connector)

● Power Supply
　DC 9 V　　　　　　　　　 (AC Adaptor)
　DC 9 V — DC 24 V (CONT A , CONT B)

● Current Draw
　450 mA

● Dimensions
　218 (W) x　 245　(D) x　44　(H) mm
　8-5/8(W)x　9-11/16 (D) x 1-3/4 (H) inches

● Weight
　1.2 kg
　2 lbs 11 oz

● Supplied Accessories
　Owner's Manual
　Card Protector (with screws)
　AC adaptor

* *The specifications for this product are subject to change without prior notice.*

DIMENSIONS

unit : mm

Index

24

AR-100 Control I/O Circuit

■Control Input Circuit Diagram

AR-100

IN

220 kΩ

0.1 µF

+5 V

22 kΩ

CMOS input

COM

Connection Example 1

Relay, switch, etc.

AR-100

IN

COM

Zero-voltage make contact
Off, On (Open, Close)

Connection Example 2

AR-100

IN

COM

Open collector output
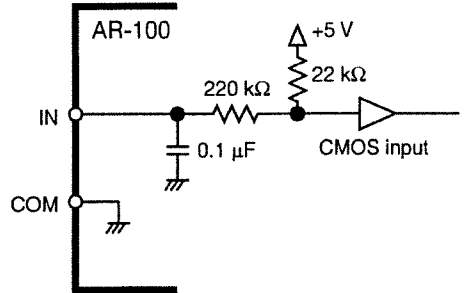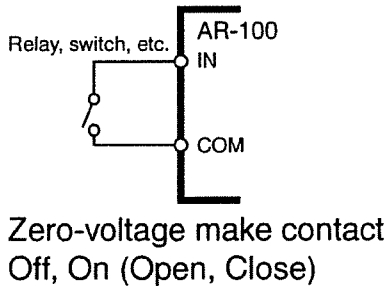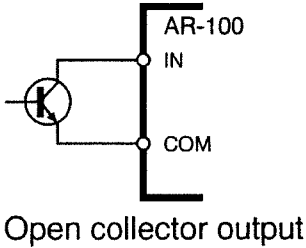
■Control Output Circuit Diagram

AR-100

Open collector output

0.1 µF

Collector-emitter current:
Maximum 30 mA

BUSY OUT or CONT OUT

GND

Connection Example 1

DC +5 V to +24 V (See note)

AR-100

BUSY OUT or CONT OUT

GND

LED

Connection Example 2

DC +5 V to +24 V (See note)
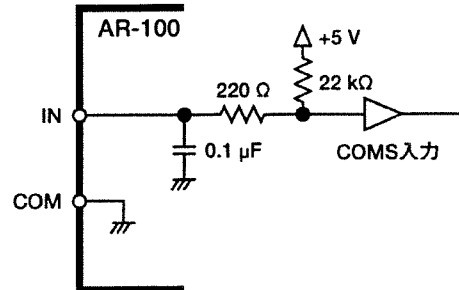
AR-100

BUSY OUT or CONT OUT

GND

Relay, etc.
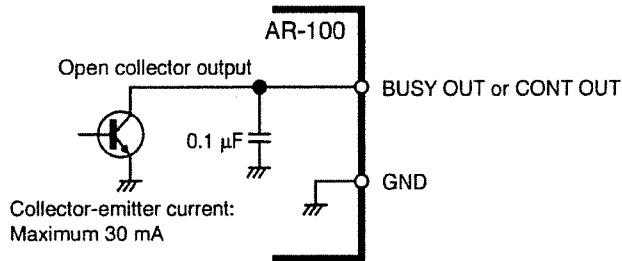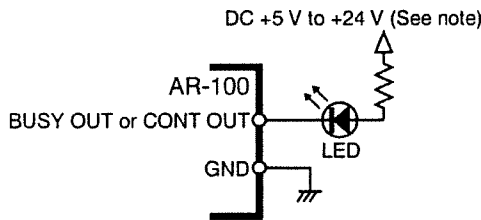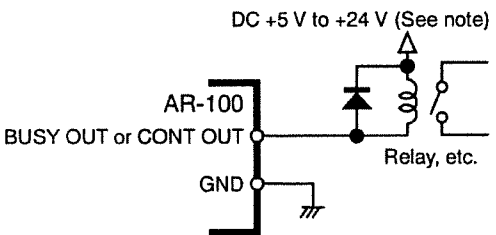
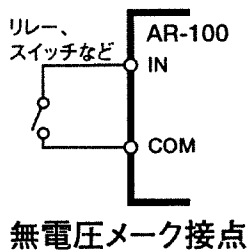The maximum contact capacity for control output is DC 24 V, 30 mA. Be careful not to exceed these values.

Note: The DC OUT pin can also be used as power supply. Be careful not to exceed the maximum rated current (100 mA).
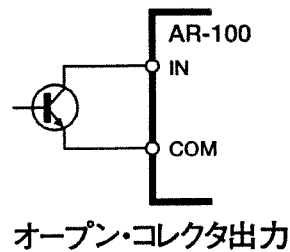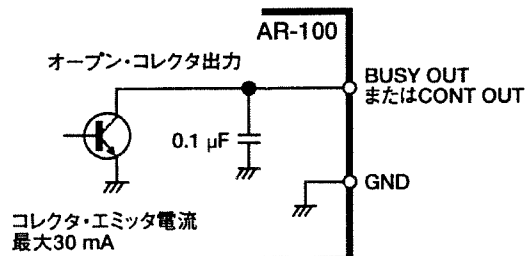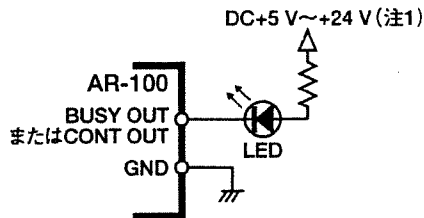
AR-100　制御入出力回路

■制御入力回路図

接続例1

無電圧メーク接点

接続例2

オープン・コレクタ出力

■制御出力回路図

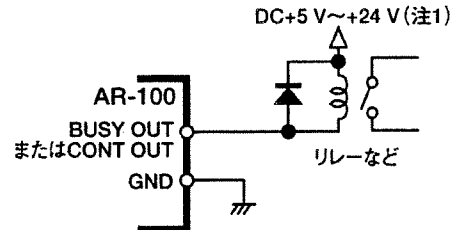### 接続例1

接続例2

制御出力の接点容量は、最大DC24V、30mAです。この値を越えないようご注意ください。

注1：　DC OUT端子を利用することもできます。最大定格電流（100mA）を越えないよう
　　　　ご注意ください。

Information

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

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20020 Arese Milano, ITALY
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