Roland®

4CH D/A CONVERTER



OWNER'S MANUAL

© Roland DA-400 40104 (DA CONVENTER		0
DIGITAL IN OPTICAL R COAVIAL	POWER	
⊚		0





ATTENTION: RISQUE DE CHOC ELECTRIQUE NE PAS QUVRIR

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



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

INSTRUCTIONS PERTAINING TO A RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS.

IMPORTANT SAFETY INSTRUCTIONS SAVE THESE INSTRUCTIONS

WARNING - When using electric products, basic precautions should always be followed, including the following:

- 1. Read all the instructions before using the product.
- Do not use this product near water for example, near a bathtub, washbowl, kitchen sink, in a wet basement, or near a swimming pool, or the like.
- This product should be used only with a cart or stand that is recommended by the manufacturer.
- 4. This product, 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 consult an audiologist.
- The product should be located so that its location or position does not interfere with its proper ventilation.
- The product should be located away from heat sources such as radiators, heat registers, or other products that produce heat
- The product should be connected to a power supply only of the type described in the operating instructions or as marked on the product.

- 8. The power-supply cord of the product should be unplugged from the outlet when left unused for a long period of time.
- Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.
- 10.The product should be serviced by qualified service personnel when:
 - A. The power-supply cord or the plug has been damaged; or
 - B. Objects have fallen, or liquid has been spilled onto the product; or
 - C. The product has been exposed to rain; or
 - D. The product does not appear to operate normally or exhibits a marked change in performance; or
 - E. The product has been dropped, or the enclosure damaged.
- 11.Do not attempt to service the product beyond that described in the user-maintenance instructions. All other servicing should be referred to qualified service personnel.

-For the USA

GROUNDING INSTRUCTIONS

This product must be grounded. If it should malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce the risk of electric shock.

This product is equipped with a cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into an appropriate outlet that is properly installed and grounded in accordance with all local codes and ordinances.

DANGER: Improper connection of the equipment-grounding conductor can result in a risk of electric shock. Check with a qualified electrician or serviceman if you are in doubt as to whether the product is properly grounded.

Do not modify the plug provided with the product — if it will not fit the outlet, have a proper outlet installed by a qualified electrician.

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.

Introduction

Thank you for purchasing the Roland DA-400 Digital/Analog converter.

The DA-400 is a 4 channel (2 stereo pairs) D/A converter that can convert digital audio signals (from devices such as the Roland S-770/760 Digital Sampler, CD players or DAT decks) into analog audio signals.

In order to take full advantage of the DA-400's functionality, please read this manual carefully.

Main Features

- Extremely simple connection and operation ensure professional results with minimal effort.
- Two types of digital input jacks are provided; coaxial and optical. Because of this flexible design, the DA-400 can accommodate
 just about any digital input source.
- Sampling frequency and emphasis on/off of the incoming digital audio is automatically detected. There is no need for you to be aware of differences in sampling frequency or emphasis on/off even when connecting the DA-400 to a variety of devices with different sampling frequencies, such as the Roland S-770/760, CD players, or DAT decks.

Precautions

In addition to the items listed under Safety Precautions inside the front cover, please read and observe the following:

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.

Placement

- 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.
- A small amount of heat will radiate from the unit during normal operation.
- Before using the unit in a foreign country, consult with qualified service personnel.

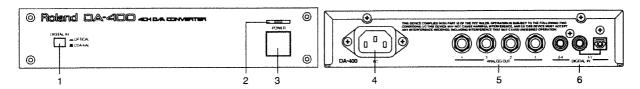
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Front and Rear Panels



[1]. OPTICAL/COAXIAL Selector Switch

This switch allows you to select either the coaxial or optical input for DIGITAL IN 1/2. Note that it is not possible to use both inputs simultaneously.

- When the switch is in, the optical jack will be selected.
- When the switch is out, the coaxial jack will be active.

[2]. POWER Indicator

This indicator lights when the unit is switched on.

[3]. POWER Switch

This switch turns the unit on and off.

[4]. AC Inlet

Connect the included AC cable to this connector. (Use only the supplied cable; use of any other cable could result in damage, malfunction or electric shock.)

[5]. ANALOG OUT Jacks

These are the analog output jacks; two stereo pairs or four individual (mono) outputs.

[6]. DIGITAL IN Jacks

These are the digital input jacks; two stereo pairs or four individual (mono) inputs.

* The DIGITAL IN jacks (coaxial/optical) are compatible with the S/P DIF format.

About the DA-400's Inputs and Outputs

A digital signal that is input to DIGITAL IN 1/2 (L/R) is output from ANALOG OUT 1/2. A digital signal that is input to DIGITAL IN 3/4 (L/R) is output from ANALOG OUT 3/4.

For DIGITAL IN 1/2 you can select either the coaxial or optical jack. The OPTICAL/COAXIAL selector switch (front panel) determines which jack will be used. (It is not possible to use both inputs simultaneously.)

- * The DA-400 does not contain a mixer stage. Therefore it is not possible to mix incoming digital signals, or reroute them to a specific ANALOG OUT, or to adjust the output level.
- * The output level at any ANALOG OUT will depend on whether a balanced or unbalanced output is being used. For details refer to the following "Which Cables to Use".

Which Cables to Use

DIGITAL IN Jacks

If you wish to connect your digital audio source to the DA-400 using the coaxial input jack, use a coaxial cable with RCA phono type plugs.

If you wish to connect your digital audio source to the DA-400 using the optical input jack, use an optical cable.

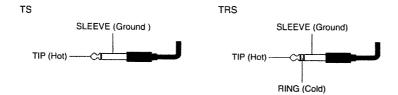
ANALOG OUT Jacks

You can use either a balanced or unbalanced output.

For unbalanced output, use a cable with 1/4 inch TS (Tip/Sleeve; mono) type phone plugs. For balanced output, use a cable with 1/4 inch TRS (Tip/Ring/Sleeve; stereo) type phone plugs.

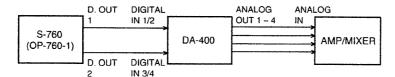
Caution!

When using a balanced output, be aware that the output level will be approximately twice as great as when using an unbalanced output.



Connections with an \$-760

If an OP-760-1 Power Sampling Expansion has been installed in your Roland S-760 Digital Sampler, the digital audio from the Digital Out jacks 1/2 (stereo C/D or individual 5—8) can be sent to the DA-400 and output as analog signals. This allows the output of the S-760 to consist of 4 stereo pairs or 8 individual outputs.



Making Connections

Before making any connections, be sure that the power to all of your equipment is turned off; this will help prevent damage to any of the components in the system.

- * 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.
- 1. Set the OPTICAL/COAXIAL selector switch on the DA-400 to COAXIAL (switch out).
- 2. Using a coaxial cable, connect the S-760's Digital Out jack 1 (stereo C, or individual 5/6) to the DA-400's DIGITAL IN 1/2.
- 3. Using another coaxial cable, connect the S-760's Digital Out jack 2 (stereo D, or individual 7/8) to the DA-400's DIGITAL IN 3/4.
- 4. Using audio cables with TS (Tip/Sleeve; mono) type phone plugs, connect the DA-400's ANALOG OUT jacks (1—4) to the analog input jacks of your amp/mixer system.
- * If you are using an unbalanced output from the DA-400, the output level will be approximately the same as the S-760's output level. However, depending on the amp/mixer to which the DA-400 is connected, the output level of the DA-400 may be slightly greater than that of the S-760.

S-760 Output Settings

Depending on the output settings of the S-760, the sound that is output from the DA-400 may not be as expected. Please be aware of the following points.

- 1. Set the System Output Mode to something other than "Mix".

 If the System Output Mode is set to "Mix", the sound that is output from Digital Out jack 1 (stereo C) will be the same as the sound output from Stereo Out jack 1 (stereo A).
- 2. Set the System Output Assign to "C/D".

If the System Output Assign is set to "A/B", the sound that should be output from Digital Out jacks 1/2 (stereo C and D) will be mixed with the output of Stereo Out jacks 1/2 (stereo A and B). In addition, after this mix takes place, the sound that is output from Stereo Out jacks 1/2 (stereo A and B) will also be output from Digital Out jacks 1/2 (stereo C and D). This means that the output from the S-760's Stereo Out jacks 1/2 (stereo A and B) will be the same as the output of the DA-400's Analog Out jacks 1—4.

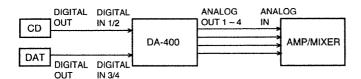
For details on the audio outputs of the S-760, refer to the S-760 owner's manual; "Equalizer and Output Jacks" (Basic Operation p.3-11) and "Output Assignments" (Advanced Operation p.4-2).

Connections with Audio Equipment

Digital audio signals from a CD player or DAT deck can be input into the DA-400 and output as analog audio.

NOTE:

There's no problem if the digital signals being sent to the DA-400's DIGITAL IN 1/2 have a different sampling frequency than the digital signals being input to DIGITAL IN 3/4; the DA-400 automatically detects the sampling frequency of each input signal. For example, there will be no problem if DIGITAL IN 1/2 is receiving digital audio from a CD player (44.1 kHz) and DIGITAL IN 3/4 is receiving digital audio from a DAT deck (48 kHz).



Making Connections

Before making any connections, be sure that the power to all of your equipment is turned off; this will help prevent damage to any of the components in the system.

• 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.

Set the OPTICAL/COAXIAL selector switch to accommodate the device connected to DIGITAL IN 1/2.

Specifications

DA-400: 4CH D/A Converter

Sampling Frequency

48, 44.1, 32kHz (Auto Select)

Signal Processing

D/A Conversion

18 bit linear, 8-times Oversampling

•Frequency Response

Sampling Frequency

48kHz : 10 Hz - 23 kHz (+0/–3dB) 44.1kHz : 10 Hz - 21 kHz (+0/–3dB)

32kHz : 10 Hz - 15 kHz (+0/–3dB)

•Maximum Output Levels

Output (Unbalanced) : +15 dBm Output (Balanced) : +21 dBm

* 0dBm = 0.775 Vrms

Output Impedance

300 Ω (Unbalanced) 600 Ω (Balanced)

Connectors

Digital Input Connectors

Coaxial (1/2, 3/4): 2 (conformable to the S/P DIF)

Optical (1/2):1 (conformable to the S/P DIF)

Analog Output Jacks

1/4 inch phone type (1, 2, 3, 4):4

AC Inlet

•S/N Ratio

110 dB (IHF-A, Typ.)

• Dynamic Range

Greater than 102 dB

Power Supply

AC117V, AC230V or AC240V (50/60 Hz)

Power Consumption

12 W (AC117V), 15 W (AC230V), 13 W (AC240V)

Dimensions

218 (W) x 230 (D)x 45 (H) mm

8-5/8 (W) x 9-1/16 (D) x 1-13/16 (H) inches

Weight

2.0 kg / 4 lbs 7 oz

Accessories

Owner's Manual

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

For Germany -

Bescheinigung des Herstellers/Importeurs

Hiermit wird bescheinigt, daß der/die/das 4CH D/A CONVERTER DA-400

(Gerät, Typ, Bezeichnung)

in Übereinstimmung mit den Bestimmungen der BMPT-AmtsblVfg 243/1991 funk-entstört ist. Der vorschriftsmäßige Betrieb mancher Geräte (z. B. Meßsender) kann allerdings gewissen Einschränkungen unterliegen. Beachten Sie deshalb die Hinweise in der Bedienungsanleitung.

Dem Zentralamt für Zulassungen im Fernmeldewesen wurde das Inverkehrbringen dieses Gerätes angezeigt und die Berechtigung zur Überprüfung der Serie auf die Einhaltung der Bestimmungen eingeräumt.

Roland Corporation

4-16 Dojimahama 1-Chome Kita-ku Osaka 530 Japan

(Name und Anschrift des Herstellers/Importeurs)

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.

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

CLASS B

NOTICE

This digital apparatus does not exceed the Class B limits for radio noise emissions set out in the Radio Interference Regulations of the Canadian Department of Communications.

CLASS B

AVIS

Cet appareil numérique ne dépasse pas les limites de la classe B au niveau des émissions de bruits radioélectriques fixés dans le Réglement des signaux parasites par le ministère canadien des Communications.

Information

When you need repair service, call your local Roland Service Station or the authorized Roland distributor in your country as shown below.

U. S. A.

Roland Corporation US 7200 Dominion Circle Los Angeles, CA. 90040-3696, U.S.A. TEL: (213) 685-5141

CANADA Roland Canada Music Lid.

(Head Office)

5480 Parkwood Way Richmond B. C., V6V 2M4 CANADA TEL: (604) 270-6626

Roland Canada Music Itd.

(Montreal Office)

9425 Transcanadienne Service Rd. N., St Laurent, Quebec H45 1V3, CANADA TEL: (514) 335-2009

Roland Canada Music Ltd.

(Toronto Office)

346 Watline Avenue, Mississauga, Ontario L4Z 1X2, CANADA TEL: (416) 890-6488

AUSTRALIA Roland Corporation Australia Pty. Ltd.

38 Campbell Avenue Dee Why West. NSW 2099 AUSTRALIA TEL: (02) 982-8266

NEW ZEALAND Roland Corporation (NZ) Ltd.

97 Mt. Eden Road, Mt. Eden, Auckland 3, NEW ZEALAND TEL: (09) 3098-715

UNITED KINGDOM Roland (U.K.) Ltd.

Rye Close Ancells Business Park Fleet, Hampshire GU13 **BUY, UNITED KINGDOM** TEL: 0252-816181

Roland (U.K.) Ltd., Swansea Office

Atlantic Close, Swansea Enterprise Park, Swansea, West Glamorgan SA79FJ, UNITED KINGDOM TEL: (0792) 700-139

IRELAND

The Dublin Service Centre Audio

Maintenance Limited 11 Brunswick Place Dublin 2 Republic of Ireland TEL: 010 353 1677322

ITALY

Roland Italy S. p. A. Viale delle Industrie 8 20020 ARESE MILANO ITALY TEL: 02-93581311

SPAIN Roland Electronics de España, S. A.

Calle Bolivia 239 08020 Barcelona, SPAIN TEL: 93-308-1000

GERMANY **Roland Elektronische** Musikinstrumente

Handelsgesellschaft mbH. Oststrasse 96, 22844 Norderstedt, GERMANY TEL: 040/52 60 090

FRANCE Guillard Musiques Roland

ZAC de Rosarge Les Echets 01700 MIRIBEL FRANCE TEL: (7) 226-50 60

Guillard Musiques Roland (Paris Office) 1923 rue Léon Geoffroy

94400 VITRY-SUR-SEINE FRANCE TEL: (1) 4680 86 62

BELGIUM/HOLLAND/ LUXEMBOURG

Roland Benelux N. V. Houtstraat 1 B-2260 Oevel-Westerlo BELGIUM TEL: (0032) 14-575811

DENMARK

Roland Scandinavia A/S Langebrogade 6 Box 1937 DK-1023 Copenhagen K. DENMARK TEL: 31-95 31 11

SWEDEN

Roland Scandinavia A/S Danvik Center 28 A, 2 tr. S-131 30 Nacka SWEDEN TEL: 08-702 00 20

NORWAY Roland Scandinavia Avd. **Kontor Norge**

Lilleakerveien 2 Postboks 95 Lilleaker N-0216 Oslo 2 NORWAY TEL: 22-73 00 74

FINLAND

Fazer Musik Inc. Länsituulentie POB 169, SF-02101 Espoo FINLAND TEL: 0-43 50 11

SWITZERLAND Roland CK (Switzerland) AG

Gerberstrasse 5, CH-4410 Liestal, SWITZERLAND TEL: 061/921 16 15

AUSTRIA

E. Dematte &Co.

Neu-Rum Siemens-Strasse 4 A-6040 Innsbruck P.O.Box 83 AUSTRIA

TEL: (0512) 26 44 260

GREECE

V. Dimitriadis & Co. Ltd. 20, Alexandras Avn., GR 10682 Athens, GREECE TEL: 01-8232415

PORTUGAL

Casa Caius Instrumentos Musicais Lda.

Rua de Santa Catarina 131 4000 Porto, PORTUGAL TEL: 02-38 44 56

HUNGARY

Intermusica Ltd. Warehouse Area 'DEPO' Torokbalint, Budapest HUNGARY

TEL: (1) 1868905

ISRAEL

D.J.A. International Ltd. 11 Bar Gyiora St., Tel Aviv ISRAFL

TEL: 972-3-525-3834

CYPRUS Radex Sound Equipment Ltd.

17 Diagorou St., P.O.Box 2046, Nicosia CYPRUS TEL: 453426, 466423

U.A.E Zak Electronics & Musical Instruments Co.

P.O. Box 8050 DUBAI, U.A.E TEL: 9714-360715

KUWAIT

Easa Husain Al-Yousifi P.O. Box 126 Safat 13002 KUWAIT TEL: 965-5719499

LEBANON

A. Chahine & Fils P.O. Box 16-5857 Beirut, LEBANON TEL: 335799

TURKEY

Barkat Sanayi ve Ticaret Siraselviler Cad. 86/6 Taksim Istanbul, TURKEY

TEL: 212-2499324

EGYPT

Al Fanny Trading Office

9, Ebn Hagar Ai Askalany Street, Ard El Golf, Heliopolis, Cairo, 11341 **FGYPT**

TEL: 2917803-665918

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Badie Studio & Stores

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BAHRAIN

Moon Stores

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Roland Brasil Ltda.

R. Coronel Oaviano da Silveira 203 05522-010 Sao Paulo BRAZIL TEL: (011) 843-9377

MEXICO

Casa Veerkamp, s.a. de

Mesones No. 21 Col. Centro MEXICO D.F. 06080 TEL: (5) 709-3716

La Casa Wagner de Guadalajara s.a. de c.v.

Av. Corona No. 202 S.J. C.P.44100 Guadalaiara. Jalisco MEXICO TEL: (36) 13-1414

VENEZUELA Musicland Digital C.A.

Av. Francisco De Miranda, Centro Parque de Cristal, Nivel C2 Local 20 Caracas VENEZUELA TEL: (2)285-9218

PANAMA

Productos Superiores, S.A.

Apartado 655 - Panama 1 REP. DE PANAMA TEL: 26-3322

ARGENTINA Instrumentos Musicales

S.A. Florida 638 (1005) Buenos Aires ARGENTINA TEL: (1)394-4029

HONG KONG Tom Lee Music Co., Ltd. Service Division

22-32 Pun Shan Street, Tsuen Wan, New Territories, HONG KONG TEL: 415-0911

KOREA

Cosmos Corporation Service Station

261 2nd Floor Nak-Won Arcade Jong-Ro ku, Seoul, KOREA TEL: (02) 742 8844

SINGAPORE

Swee Lee Company

BLOCK 231. Bain Street #03-23 Bras Basah Complex, Singapore 0718 TEL: 3367886

PHILIPPINES

G.A. Yupangco & Co.

Inc. 339 Gil J. Puyat Avenue Makati, Metro Manila 1200, PHILIPPINES TEL: 02 (817) 0013

THAILAND

Theera Music Co., Ltd.

330 Verng Nakorn Kasem, Soi 2, Bangkok 10100. THAILAND TEL: 2248821

MALAYSIA

Bentley Music SDN BHD No.142, Jalan Bukit Bintang

55100 Kuala Lumpur, MALAYSIA TEL: (03) 2443333

INDONESIA

PT CITRARAMA **BELANTIKA** Kompleks Perkantoran Duta Merlin Blok E No.6-7 Jl. Gajah Mada No.3-5, lakarta 10130. INDONESIA TEL: (021) 3850073

TAIWAN Siruba Enterprise

(Taiwan) Co., LTD. Room. 5, 9fl. No. 112 Chung Shan N.Road Sec.2 Taipei, TAIWAN, R.O.C. TEL: (02) 571-5860

SOUTH AFRICA That Other Music Shop (PTY) Ltd.

11 Melle Street (Cnr Melle and Juta Street) Braamfontein 2001 Republic of South Africa TEL: 27 11 403-4105

Paul Bothner (PTY) Ltd.

17 Werdmuller Centre Claremont 7700 Republic of South Africa TEL: 021-64-4030

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