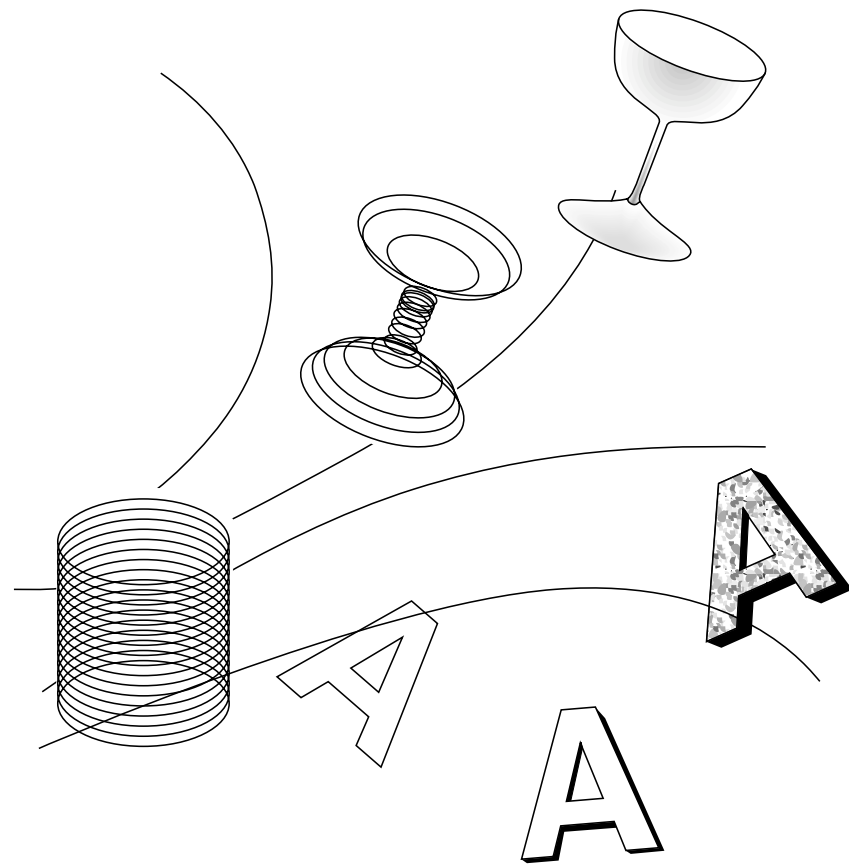


MODELA 3D PLOTTER (MDX-3) Main unit User's Manual

Roland

Thank you very much for purchasing the MODELA.

- To ensure correct and safe usage with a full understanding of this product's performance, please be sure to read through this manual completely and store it in a safe location.
- Unauthorized copying or transferral, in whole or in part, of this manual is prohibited.
- The contents of this operation manual and the specifications of this product are subject to change without notice.
- The operation manual and the product have been prepared and tested as much as possible. If you find any misprint or error, please inform us.



Windows® is registered trademark or trademark of Microsoft® Corporation in the United States and/or other countries.

Copyright © 1996-2000 ROLAND DG CORPORATION

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 A digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Unauthorized changes or modification to this system can void the users authority to operate this equipment.

The I/O cables between this equipment and the computing device must be shielded.

Operating Instructions

KEEP WORK AREA CLEAN. Cluttered areas and benches invites accidents.

DON'T USE IN DANGEROUS ENVIRONMENT. Don't use power tools in damp or wet locations, or expose them to rain. Keep work area well lighted.

DISCONNECT TOOLS before servicing; when changing accessories, such as blades, bits, cutters, and like.

REDUCE THE RISK OF UNINTENTIONAL STARTING. Make sure the switch is in off position before plugging in.

USE RECOMMENDED ACCESSORIES. Consult the owner's manual for recommended accessories. The use of improper accessories may cause risk of injury to persons.

NEVER LEAVE TOOL RUNNING UNATTENDED. TURN POWER OFF. Don't leave tool until it comes to a complete stop.

For Canada

CLASS A NOTICE

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

CLASSE A AVIS

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



ROLAND DG CORPORATION
1-6-4 Shimmyakoda, Hamamatsu-shi, Shizuoka-ken, JAPAN 431-2103
MODEL NAME : See the MODEL given on the rating plate.
RELEVANT DIRECTIVE : EC MACHINERY DIRECTIVE (89/392/EEC)
EC LOW VOLTAGE DIRECTIVE (73/23/EEC)
EC ELECTROMAGNETIC COMPATIBILITY DIRECTIVE (89/336/EEC)

Typographic Conventions

This manual uses typographic conventions which are outlined at the right.

▲ This indicates a point requiring particular care to ensure safe use of the product.

- ▲ DANGER** : Failure to heed this message will result in serious injury or death.
- ▲ WARNING** : Failure to heed this message may result in serious injury or death.
- ▲ CAUTION** : Failure to heed this message may result in minor injury.
- NOTICE** : Indicates important information to prevent machine breakdown or malfunction and ensure correct use.
- ☞ : Indicates a handy tip or advice regarding use.

▲ To Ensure Safe Use

| | | | |
|-------------------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| ▲ WARNING Never disassemble or modify this product. | ▲ CAUTION Handle the power cord with care. | ▲ CAUTION When pulling the power cord from an electrical socket, be sure to grip the plug. | ▲ CAUTION Do not use with a damaged AC adapter or power cord, or with a loose electrical outlet. |
|-------------------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|

| | | | | | | | |
|-----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-----------------------------------------------------|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|---------------------------------------------------|------------------------------------------------------------------------|--------------------------------------------------------------|
| ▲ CAUTION Do not allow liquids, metal objects or flammables inside the machine. | ▲ CAUTION Do not install in an unstable or high location. | ▲ CAUTION Handle the blade with care. | ▲ CAUTION Keep hands away when a tool longer than the spindle unit is mounted. | ▲ CAUTION Do not use cutting oil when performing cutting. | ▲ CAUTION Wash hands when finished. | ▲ CAUTION Keep hands away from the blade during cutting. | ▲ CAUTION Keep children away during operation. |
|-----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-----------------------------------------------------|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|---------------------------------------------------|------------------------------------------------------------------------|--------------------------------------------------------------|

| | | |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| ▲ CAUTION In case of emergency, immediately unplug the AC adapter. | ▲ CAUTION When the unit is not in use for an extended period, detach the AC adapter from AC outlet. | NOTICE Do not attempt to move the workpiece plate or spindle-unit mounting area by hand except when repacking the unit. |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|

| | | | |
|-----------------------------------------------------------|-----------------------------------------------------------|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| NOTICE Do not attempt to cut metal objects. | NOTICE Do not use an air-gun when cleaning. | NOTICE This product is a precision instrument and must be handled with care. | NOTICE Do not install in an area subject to dust, high humidity or poor ventilation. |
|-----------------------------------------------------------|-----------------------------------------------------------|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|

To Ensure Correct Use

▲ About the Labels Affixed to the Unit

These labels are affixed to the body of this product. The following figure describes the location. The configuration of the AC adapter varies according to regional differences in voltage. Please note that the descriptions in this manual are for the 117 V adapter.

| | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CAUTION DISCONNECT MAIN PLUG FROM SUPPLY SOCKET WHEN NOT IN USE. MAIN LEADS COLOR CODE: BROWN: LIVE, BLUE: NEUTRAL ATTENTION Quand la machine n'est pas utilisée, déconnecter le câble de la prise de courant. Code des couleurs: Marron: Phase, Bleu: Neutre | ACHTUNG Lösen Sie den Netzanschluß, wenn das Gerät nicht verwendet wird. Die Farbkodierung des Netzsteckers lautet folgendermaßen: Braun: Spannung, Blau: Masse 注意 使用していない場合は、ACアダプタをコンセントから抜いてください。 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| | | |
|----------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------|
| Rear view Keep hands away from the blade during cutting | Model label | CAUTION INDOOR USE ONLY PRECAUTION DOMESTIQUE USAGE SEULEMENT Rating label Use a rated power supply. |
|----------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------|

Getting Started

Check the included items

| | | | | |
|-------------------------------------|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Roland Software Package | AC adapter | Spindle unit The spindle unit is included with a tool-mounting portion having a diameter of 6 mm or 1/4" Diameter 6 mm spindle unit Diameter 1/4" spindle unit | Tool (with case) A tool with a width of either 3 mm or 1/8" is included. Check the width value that is inscribed on the tool. 3 mm or 1/8" | Material for test cuts x 2 100 x 150 x 15 mm (3-15/16" x 5-7/8" x 9/16") |
| Hexagonal wrench 1.5 mm (1/16") | Set screw x 2 (one spare) | Double-sided tape | MODELA (MDX-3) Main unit user's manual | User's Manual for MODELA 3D DESIGN/ MODELA 3D TEXT/ MODELA PLAYER |
| | | | MODELA PLAYER for Mac OS User's Manual | |

Connect to the computer

NOTICE

Never install this unit in any of the following situations, as it could result in damage:

- Places with excessive electrical noise.
- Places with poor ventilation, because the MDX-3 generates considerable heat during operation.
- Places with excessive vibration.

Make sure the power to the computer and the MDX-3 is switched off before attempting to connect the cables.

Securely connect the power cord, computer I/O cable and so on so that they will not be unplugged. Otherwise, faulty operation or breakdown may result.

Switch Panel

| | |
|---------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| STANDBY LED This lights up when the STANDBY key is pressed, and flashes when an error has occurred. | STANDBY Key This is the power switch. |
| VIEW LED This lights up when the VIEW key is pressed. | VIEW Key This is used to pause operation temporarily and put the unit in a state where material or a tool may be loaded, installed, or removed. |
| DOWN Key This lowers the blade tip and determines the depth-direction reference point for cutting. | UP Key This raises the tip of the blade. |

Do not place any object within the area

30 cm (11-13/16")

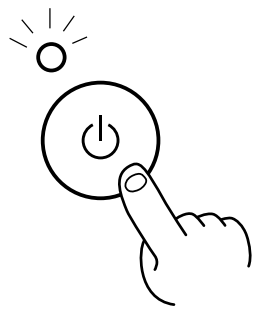
The AC adapter plugs in here
When connected to the AC adapter, the POWER LED and VIEW LED flash in alternation, then go dark.

Connect the unit to the Computer
The cable is available separately. Be sure to use the correct cable for the computer.

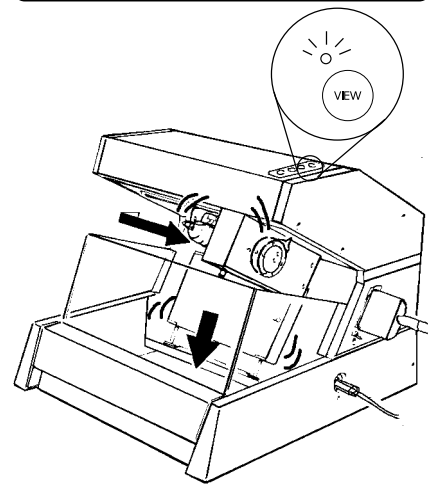
Use two hands to securely grip this area on the left and right sides.

1 Power ON!

1 Pressing the STANDBY key makes the STANDBY LED light up.



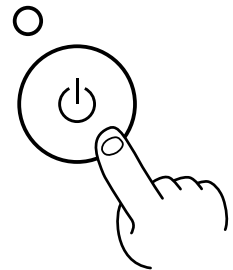
2 Initialization is performed, and the VIEW LED lights up.



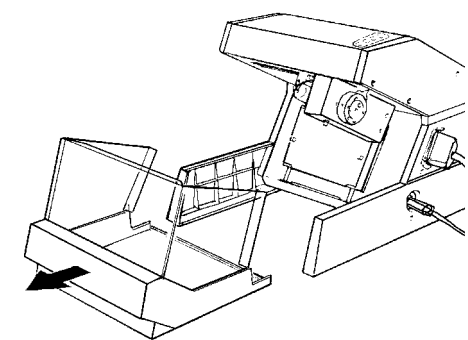
2 Install a blade and load material

Before Installation and Loading

1 Press the STANDBY key to turn off the power.

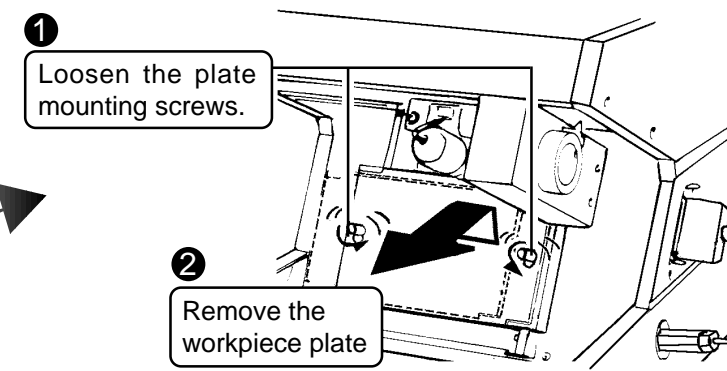


2 Pull the dust tray completely out.



Load the material

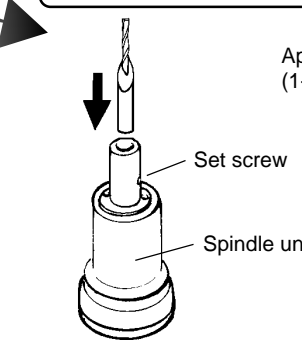
1 Remove the workpiece plate



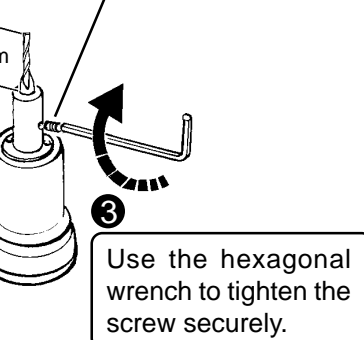
Install the blade

1 Install the blade

1 Insert the blade shank into the spindle unit.



2 Attach a mounting screw on one side only. Either side may be used.



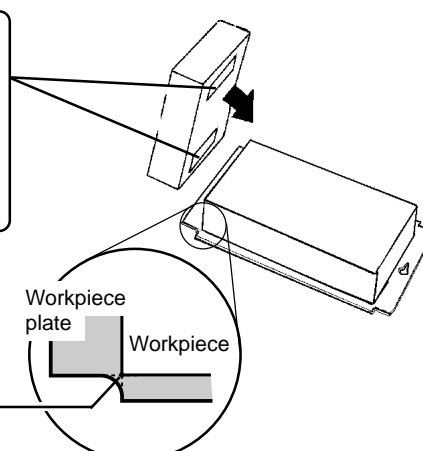
3 Use the hexagonal wrench to tighten the screw securely.

CAUTION
Take care not to injure the hands when installing the blade

2 Secure the material to the workpiece plate

1 Apply double-sided tape to the back of the material. Make sure that no double-sided tape sticks out beyond the material. Use material with a surface that is as even as possible.

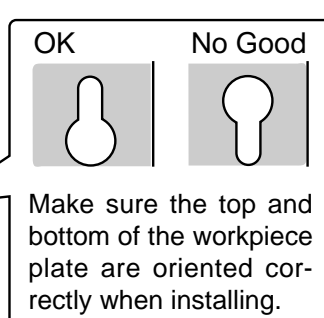
2 Align with the machining reference point (the XY origin point) and secure to the workpiece plate.



3 Secure the workpiece plate to the table

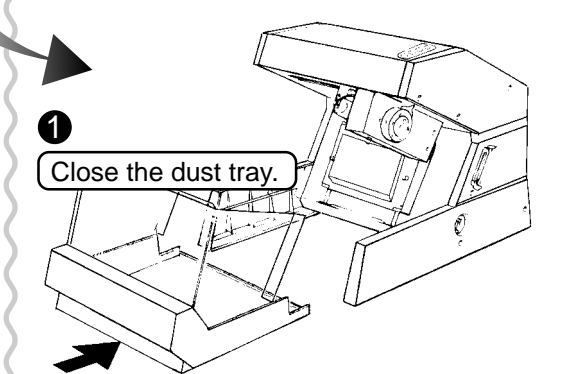
1 Attach the workpiece plate

2 Tighten the plate mounting screws securely.



OK No Good
Make sure the top and bottom of the workpiece plate are oriented correctly when installing.

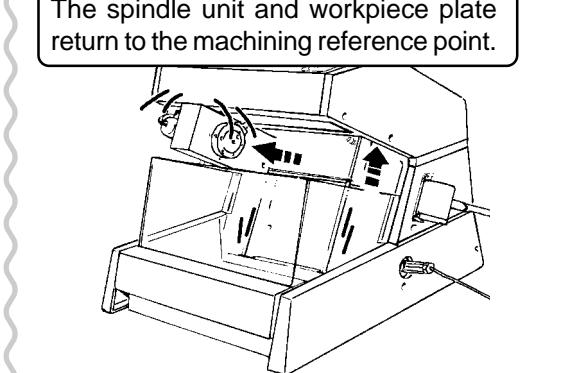
After Installation and Loading



1 Close the dust tray.

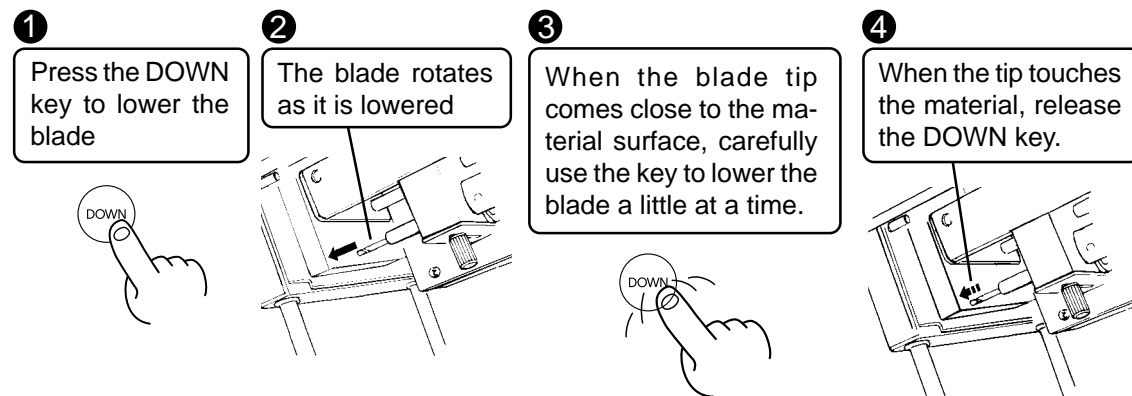
2 Press the STANDBY key to turn on the power.

3 Press the VIEW key.



3 Set the reference point for depth (the Z origin point)

Be sure to do this before sending data from the computer. Loading is not possible while the VIEW LED is lit up or while cutting is in progress. One press of the DOWN key: 0.1 mm (0.00393") of movement. Hold down the DOWN key for 0.5 sec. or more to move at 3 mm (1/16")/sec.



1 Press the DOWN key to lower the blade

2 The blade rotates as it is lowered

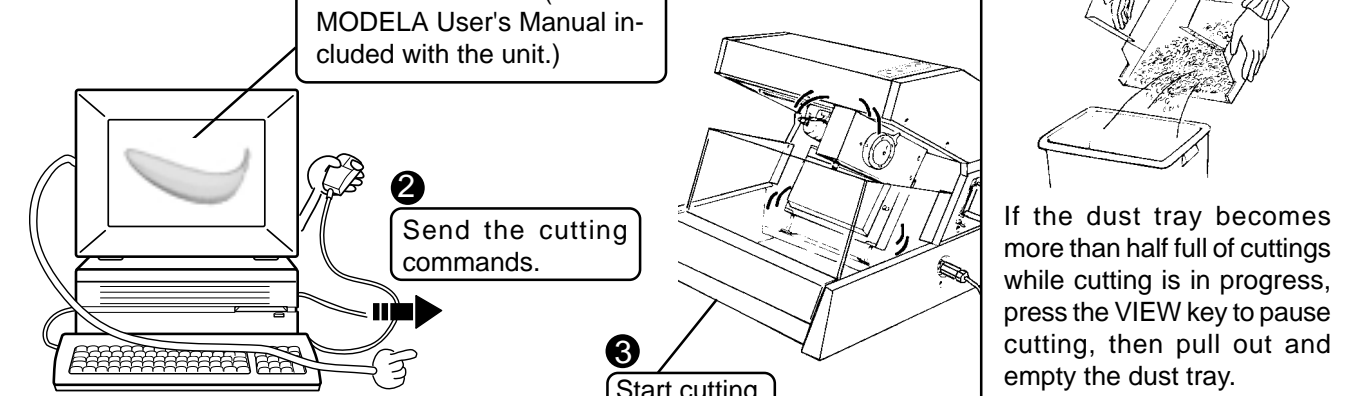
3 When the blade tip comes close to the material surface, carefully use the key to lower the blade a little at a time.

4 When the tip touches the material surface, release the DOWN key.

The reference point for depth has now been set. The MDX-3 takes the position when data is sent from the computer as the depth-direction reference point for operation. After making the setting, do not press the UP or DOWN key.

4 Perform cutting

NOTICE
Be sure the dust tray is closed before starting cutting.



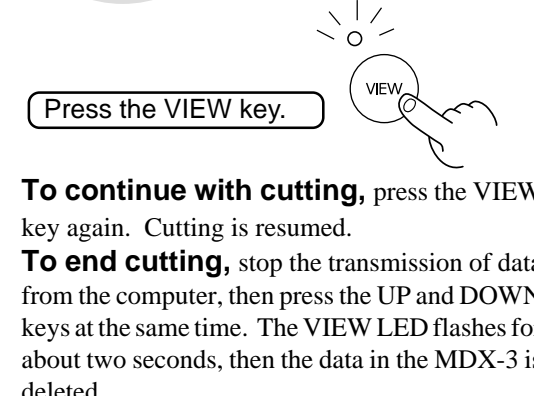
1 Use the application software to create the data. (See the MODELA User's Manual included with the unit.)

2 Send the cutting commands.

3 Start cutting

If the dust tray becomes more than half full of cuttings while cutting is in progress, press the VIEW key to pause cutting, then pull out and empty the dust tray.

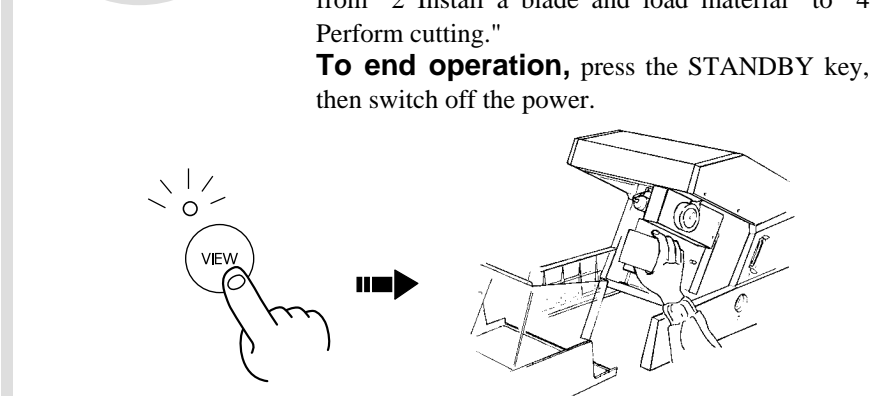
5 Pausing or stopping operation



Press the VIEW key.

To continue with cutting, press the VIEW key again. Cutting is resumed. To end cutting, stop the transmission of data from the computer, then press the UP and DOWN keys at the same time. The VIEW LED flashes for about two seconds, then the data in the MDX-3 is deleted.

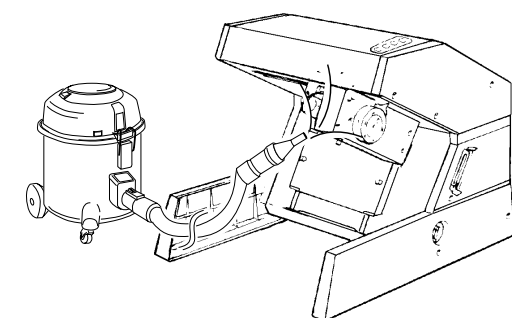
6 When cutting is finished



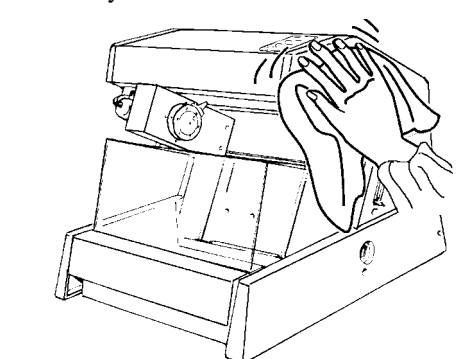
Press the VIEW key and pull out the dust tray. Remove the material that has been cut. To continue with operation, repeat the steps from "2 Install a blade and load material" to "4 Perform cutting." To end operation, press the STANDBY key, then switch off the power.

Care and cleaning

Use a vacuum cleaner to clean up cuttings.



If an exterior part becomes soiled, wipe gently with a dry cloth.



NOTICE
Do not use an air-gun. Never lubricate the mechanisms. Use a small amount of water or alcohol for cleaning. Never use solvents such as benzene or thinner can smooth out the material so that it sticks securely.

Option Lists

| Name | Model No. | Specifications |
|--------------------------------|-----------|-----------------------------------------------------------------|
| Tool | ZHS-3015 | Shank diameter: 6 mm, mill diameter 3 mm, overall length: 50 mm |
| | MS-3 | Tool-mounting portion: 3 mm |
| Spindle unit | MS-6 | Tool-mounting portion: 6 mm |
| | MS-8A | Tool-mounting portion: 1/8" |
| | MS-4A | Tool-mounting portion: 1/4" |
| Replacement spindle motor unit | MM-3 | Exclusively for MDX-3 |

What to do if...

- The MDX-3 doesn't operate
Is the STANDBY key on (with the STANDBY LED lit up)?
Has operation not been paused by pressing the VIEW key (lighting up the VIEW LED)?
Are the cable connected correctly?
Are the settings for the computer and software correct?
- Speed drops during cutting
When cutting a material of uneven hardness, such as wood, the MDX-3 may slow down automatically (to a minimum speed of 0.1 mm (0.00394")/sec.). Once the MDX-3 has gone beyond the hard area, cutting continues at normal speed.
- The STANDBY LED is flashing slowly (every 0.5 sec.)
The material cannot be cut, even when the speed is reduced. Switch the power off and back on. Switch the power off and back on again. Make sure the blade being used is appropriate for the hardness of the material in use. Modify the software settings to cut the material a little at a time.
- The STANDBY LED is flashing rapidly (every 0.1 sec.)
Switch off the power, and check the cable connections as well as the settings for the computer and software.
- Tool movement is different than the data
If an attempt is made to cut more deeply than the range of movement for the MDX-3 allows, the tool automatically rises to the uppermost point. Check to make sure that depth settings in the cutting data are not too deep, and that the tool extending from the spindle unit is not too short.
- Correct cutting is impossible
Are the blade, spindle, and workpiece all installed and loaded securely? Retighten the setting screw for the blade and the mounting screws for the spindle.
- Unusual noise is heard from the spindle
The spindle unit is a consumable part. Replace with a new spindle unit after 700 hours of use.
- The spindle motor does not run
The spindle motor is a consumable part. Replace with a new spindle motor after 700 hours of use.
- Pressing the STANDBY key does not switch off the power
Unplug the AC adapter from the unit.

Specification

| | | | |
|-----------------------|---------------------------------------------------------------------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| XY table size | : X: 170 mm, Y: 110 mm (6-11/16" x 4-5/16") | Power consumption | : Exclusive AC adapter (DC+12V 1.5A) |
| Max. cutting area | : 152.4 mm (X) x 101.6 mm (Y) x 40.65 mm (Z) (6" (X) x 4" (Y) x 1-9/16" (Z)) | Acoustic noise level | : Standby mode : under 24 dB (A), Cutting mode (when not performing cutting) : under 52 dB (A) (According to ISO 7779) |
| Feed rate | : 0.1 mm/sec. — 15 mm/sec. (0.00393"/sec. — 9/16"/sec.) | External dimensions | : 350 mm (W) x 380 mm (D) x 310 mm (H) (13-13/16" (W) x 15" (D) x 12-1/4" (H)) |
| Software resolution | : 0.025 mm/step (0.000984"/step) | Weight (unit only) | : 7 kg (15.4 lb.) |
| Mechanical resolution | : X, Z-axis : 0.025 mm/step (0.000984"/step) Y-axis : 0.05 mm/step (0.00197"/step) | Acceptable tool | : Endmill, Drill |
| Spindle motor | : 5 W (DC motor) | Acceptable material | : Wood, Plaster, Resin (modeling wax, styrenefoam) |
| Revolution speed | : 4500 rpm (±10%) | Operation temperature | : 5—40°C (41—104°F) |
| Tool chuck | : 6 mm or 1/4" tool chuck included | Operation humidity | : 35%—80% (no condensation) |
| Interface | : Parallel (in compliance with the specification of Centronics) | Accessories | : Roland Software Package, MODELA (MDX-3) Main unit User's Manual, User's Manual for MODELA 3D DESIGN/MODELA 3D TEXT/MODELA PLAYER, MODELA PLAYER for Mac OS User's Manual, AC adapter, Tool, Spindle unit, Material for test cuts x 2, Hexagonal wrench, Set screw x 2, Double sided tape |
| Control keys | : STANDBY, VIEW, UP, DOWN, STANDBY LED, VIEW LED | | |

Interface Specification
[Parallel]
Standard : In compliance with the specification of Centronics
Input signal : STROBE(1BIT), DATA(8BIT)
Output signal : BUSY(1BIT), ACK(1BIT)
I/O signal level : TTL level
Transmission method : Asynchronous