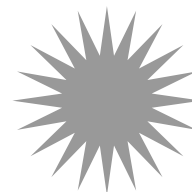




DESKTOP SIGN MAKER

CAMM-1

by ROLAND DIGITAL GROUP



CM-24 CM-12

USER'S MANUAL

This User's Manual is intended for CM-24 and CM-12.

Thank you very much for purchasing the CM-24/12.

- 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.

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.

NOTICE

Grounding Instructions

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

Check with qualified electrician or service personnel if the grounding instructions are not completely understood, or if in doubt as to whether the tool is properly grounded.

Use only 3-wire extension cords that have 3-prong grounding plugs and 3-pole receptacles that accept the tool's plug.

Repair or replace damaged or worn out cord immediately.

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 Shinmiyakoda, 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)



Table of Contents

To Ensure Safe Use	2
About the Labels Affixed to the Unit	4
1 Checking Supplied Items	5
2 Part Names and Functions	5
2-1 Front View	5
2-2 Rear View	6
2-3 Operation Panel	6
3 Basic Operation	7
3-1 Setting Up and Connection	7
3-2 DIP Switch Settings	8
3-3 Installing a Blade	9
3-4 Turning on the Power	10
3-5 Loading the Material	10
3-6 Setting the Origin Point	14
3-7 Cutting Test (How to Adjust Blade Force/Adjusting the Cutter Blade)	15
3-8 Downloading Cutting Data	17
3-9 Applying the Completed Cutout	18
3-10 When Cutting is Completed	19
4 Settings for Each Function	21
4-1 Using a Material Effectively and Cutting along the Vertical Dimension (Rotate Function)	21
4-2 Plotting on Paper Media	22
4-3 Repeating the same cutting	23
5 About the Blade	24
6 What to do if... ..	25
7 Instruction Support Chart	27
8 Character Sets	28
9 Specifications	29




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To Ensure Safe Use

About ⚠ WARNING and ⚠ CAUTION Notices

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

About the Symbols

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

⚠ WARNING



Do not disassemble, repair, or modify.

Doing so may lead to fire or abnormal operation resulting in injury.



Ground the unit with the ground wire.

Failure to do so may result in risk of electrical shock in the even of a mechanical problem



Do not use with any electrical power supply that does not meet the ratings displayed on the unit.

Use with any other power supply may lead to fire or electrocution.



Do not use while in an abnormal state (i.e., emitting smoke, burning odor, unusual noise, or the like).

Doing so may result in fire or electrical shock.

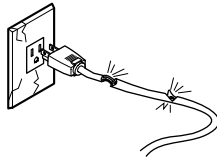
Immediately switch off the power, unplug the power cord from the electrical outlet, and contact your authorized Roland dealer or service center.

CAUTION



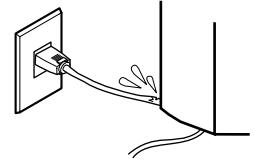
Do not use with a damaged power cord or plug, or with a loose electrical outlet.

Use with any other power supply may lead to fire or electrocution.



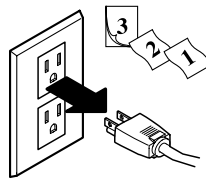
Do not injure or modify the electrical power cord, nor subject it to excessive bends, twists, pulls, binding, or pinching, nor place any object of weight on it.

Doing so may damage the electrical power cord, leading to electrocution or fire.



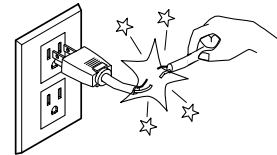
When not in use for extended periods, unplug the power cord from the electrical outlet.

Failure to do so may result in danger of shock, electrocution, or fire due to deterioration of the electrical insulation.



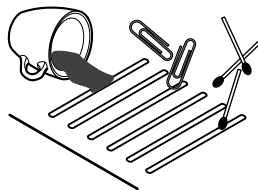
When unplugging the electrical power cord from the power outlet, grasp the plug, not the cord.

Unplugging by pulling the cord may damage it, leading to fire or electrocution.



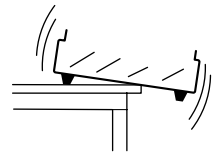
Do not allow liquids, metal objects or flammables inside the machine.

Such materials can cause fire.



Install on a stable surface.

Failure to do so may result in falling of the unit, leading to injury.



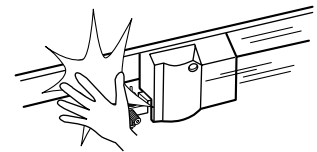
Do not touch the tip of the blade with your fingers.

Doing so may result in injury.



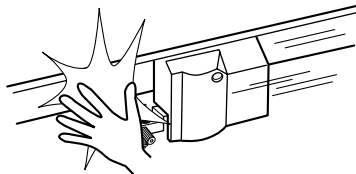
Do not place the hands or anything else on the platen when switching on the power.

Doing so may result in injury. (The cutting carriage moves simultaneously when the power is switched on.)



Do not place hands near the platen while in operation.

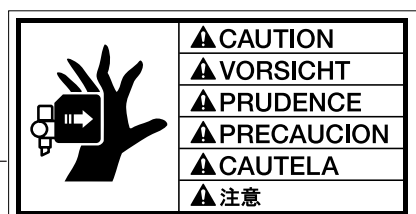
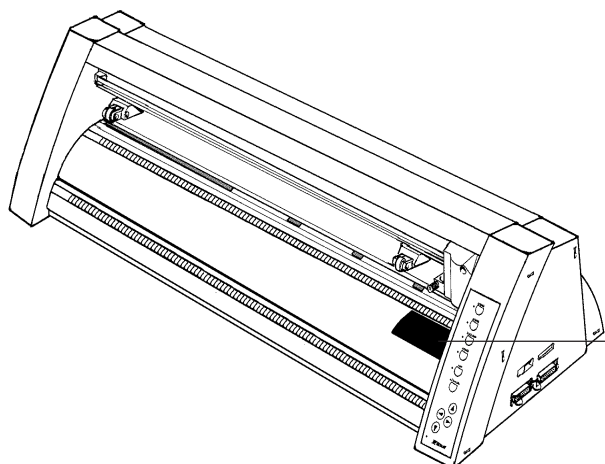
Doing so may result in injury.



About the Labels Affixed to the Unit

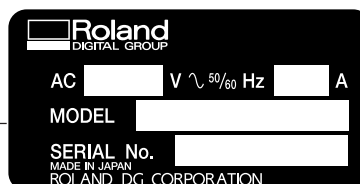
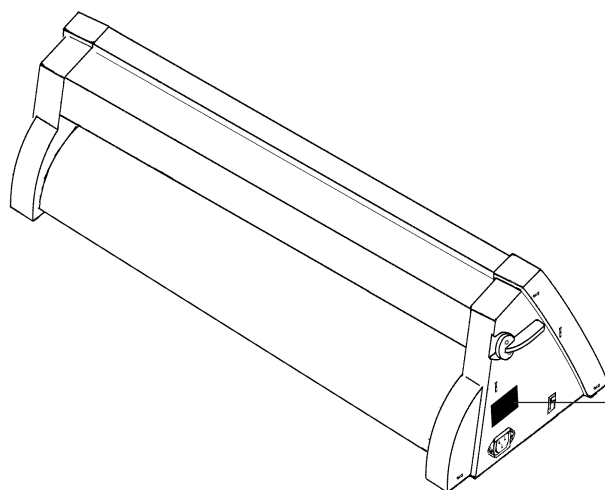
These labels are affixed to the body of this product.

The following figure describes the location and content of these messages.



Do not place hands near the platen while in operation.

N'approchez pas vos mains du plateau de travail quand le chariot est en mouvement.



Model name

Rating label

In addition to the **⚠ WARNING** and **⚠ CAUTION** symbols, the symbols shown below are also used.



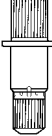
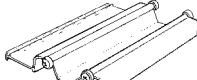
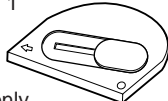

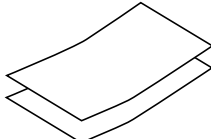


NOTICE : Indicates information to prevent machine breakdown or malfunction and ensure correct use.



: Indicates a handy tip or advice regarding use.

1 Checking Supplied Items

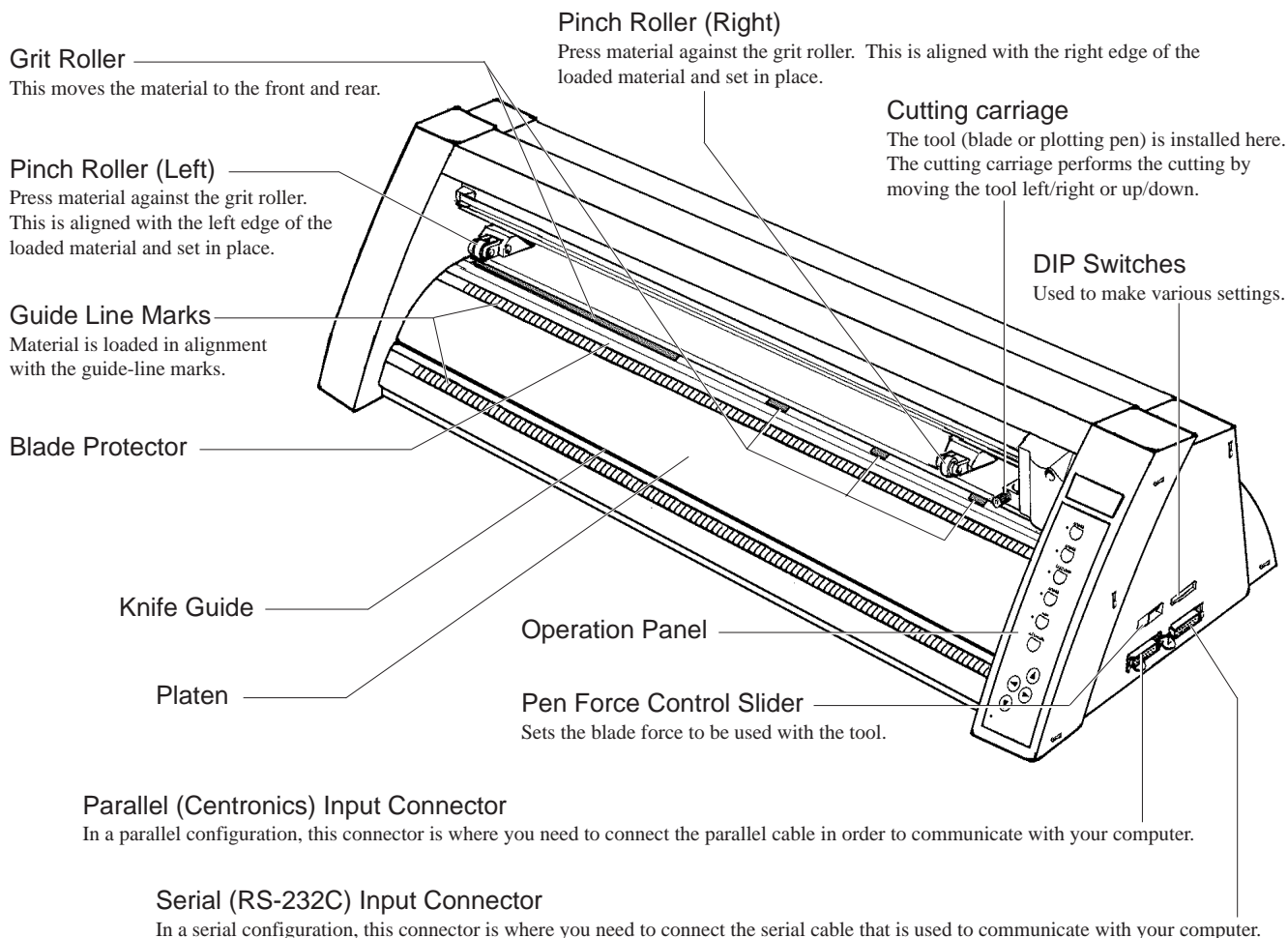
Check the following to make sure that you received all the items that were shipped along with the unit.

Power cord: 1 	Blade (ZEC-U1005) : 1 	Blade holder (XD-CH3) : 1 	Roller base: 1  <i>* CM-24 only</i>
Cutter tool (for trimming material) : 1  <i>* CM-24 only</i>	Tweezers: 1  <i>* CM-24 only</i>	Material for test cuts: 1 Test-use application tape: 1 	
User's manual: 1 	CAMM-1 DRIVER for Windows® 95 : 1 		

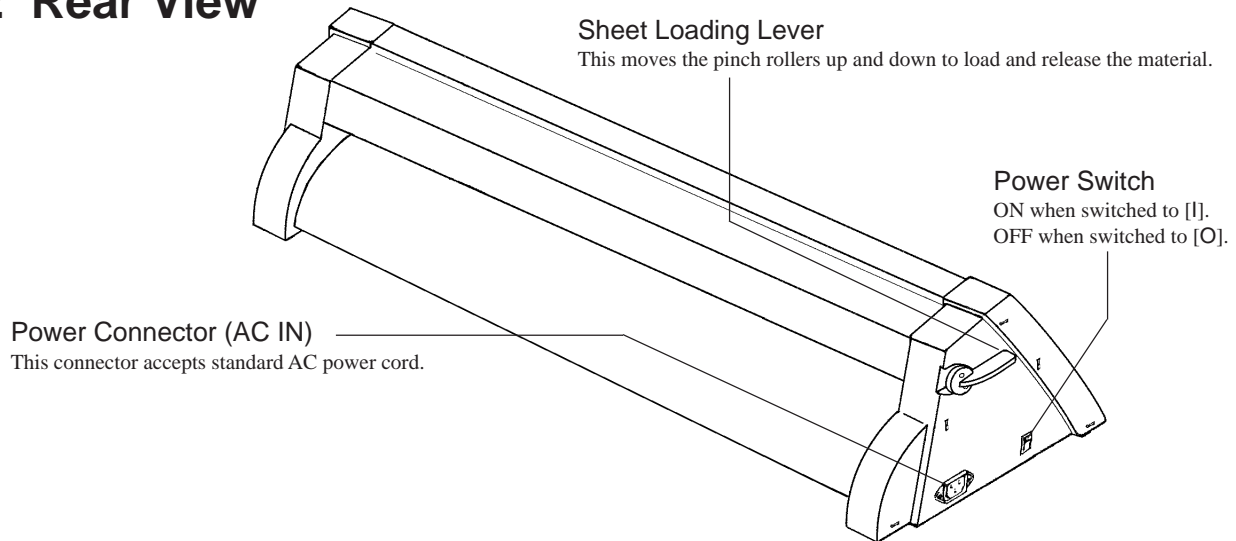
2 Part Names and Functions

* In this manual, the sections that explain both the CM-24 and the CM-12 shown only illustrations of the CM-24.

2-1 Front View

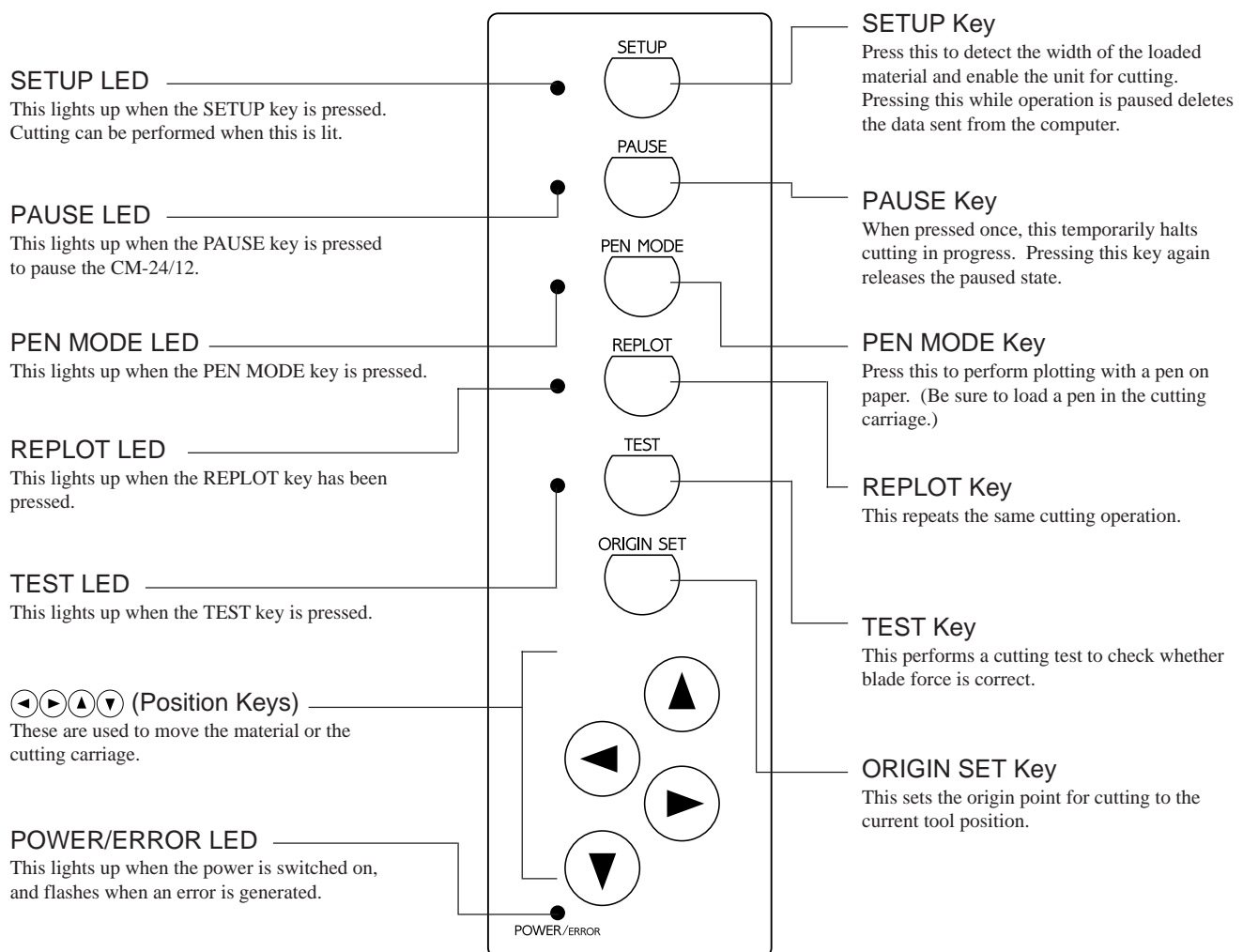


2-2 Rear View



2-3 Operation Panel

* The TEST key and the position keys function only when the SETUP LED is lighted.



The PEN MODE LED and POWER/ERROR LED blink simultaneously.

This flashes if the location of the pinch rollers is not correct.

If DIP switch SW-9 on the CM-24 is set to ON (piece material) and material with a vertical length of 100 mm (3-15/16") or less has been loaded, or if SW-9 is set to ON and there is no material over the front and rear paper sensors.

For more details, see "3-5 Loading the Material".

3 Basic Operation

3-1 Setup and Connection

⚠ WARNING



Ground the unit with the ground wire.

Failure to do so may result in risk of electrical shock in the even of a mechanical problem



Do not use with any electrical power supply that does not meet the ratings displayed on the unit.

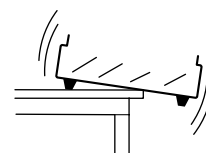
Use with any other power supply may lead to fire or electrocution.

⚠ CAUTION



Install on a stable surface.

Failure to do so may result in falling of the unit, leading to injury.



NOTICE

Do not try to pick up or move the CM-24/12 by grasping the top area of the unit. Be sure to use both hands to grip the CM-24/12 securely on the left and right sides.

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

Places where the installation surface is unstable or not level.

Places with excessive electrical noise.

Places with excessive humidity or dust.

Places with poor ventilation, because the CM-24/12 generates considerable heat during operation.

Places with excessive vibration.

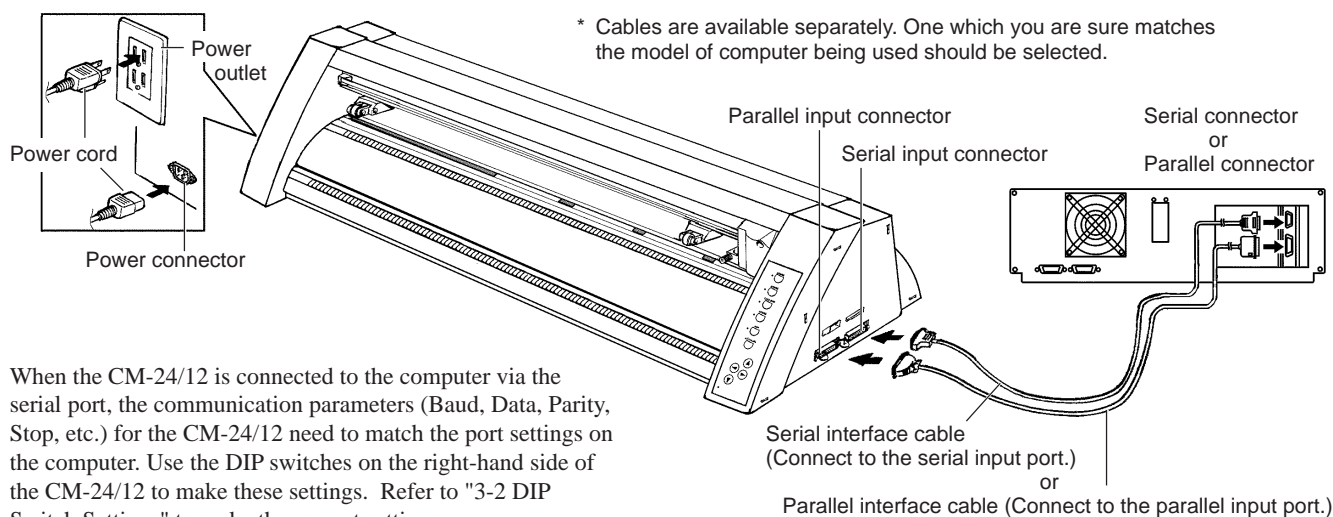
Connect the cable to either the parallel or the serial port. Be sure that the power to both the computer and the main unit is switched off when connecting the cable.

Securely connect the power cord, computer I/O cable and so on so that they will not be unplugged and cause failure during operation. Doing so may lead to faulty operation or breakdown.

Make sure the unit is placed on a stable, sturdy surface.

When arranging setup space for the CM-24, make sure you have a space that is at least 950 mm (37-7/16") wide, 500 mm (19-11/16") in depth, and 230 mm (9-1/16") in height. For the CM-12, a space that is at least 650 mm (25-5/8") wide, 500 mm (19-11/16") in depth, and 230 mm (9-1/16") in height.

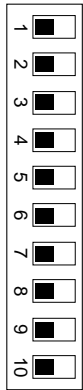
Since the material moves during cutting, make sure there is nothing that can block the material at both front and rear.



3-2 DIP Switch Settings

NOTICE DIP switches settings must be made only when the power is turned off.

OFF ← ON



DIP switch	Function	OFF	ON
SW-1	Baud rate	9600	4800
SW-2	Parity check	Disable	Enable
SW-3	Parity check	ODD	EVEN
SW-4	Data bits	8-bits	7-bits
SW-5	Stop bits	1-bit	2-bits
SW-6	Rotate	Do not rotate	Rotate
SW-7	Blade offset	0.25	0.5
SW-8	Material weight	Light	Heavy
SW-9 *	Material size	Roll	Piece
SW-10	Smoothing	ON	OFF

* On the CM-12, SW-9 is not used. This switch should always be set to "OFF."

- All DIP switches are set to OFF when shipped from the factory.
- When SW-2 is set to OFF, SW-3 may be set to either ON or OFF.
- When SW-8 has been set to ON (heavy), cutting speed is limited to the range of 10 to 100 mm/sec. At this time, operation never exceeds 100 mm/sec., even is an instruction for a speed greater than 100 mm/sec. is received from the computer.

- SW-1—5 : Sets the communication parameters for a serial connection. When the CM-24/12 is connected to the computer through the serial port, be sure that the communication parameters for SW-1 to SW-6 are set correctly, matching the computer port settings.
- SW-6 : Rotates the text (or graphics) 90 degrees. When set to ON (rotate), the origin point is set at the bottom right of the material, and the direction of cutting is rotated 90 degrees.
- SW-7 : Sets the amount of offset for the cutter blade. Set to OFF when using a tool with a blade offset of 0.25 mm, or to ON when using a tool with a blade offset of 0.5 mm.
When using the included blade, set to OFF (0.25 mm).
- SW-8 : Sets the weight of the material. If material feed is not performed smoothly, set this switch to ON (heavy). When set to ON, the upper limit for cutting speed is set to 100 mm/sec., and the force used to move the material and the blade increases. This switch should normally be set to OFF (light).
- SW-9 : Sets the size of the material. Set this to ON when using a piece material (piece), and set it to OFF (roll) when using a rolled material.
- SW-10 : Smoothing is a function for cutting smooth circles and arcs. Smoothing is enabled when this switch is set to OFF (enabled).

3-3 Installing a Blade

⚠ CAUTION



Do not touch the tip of the blade with your fingers.

Doing so may result in injury, and the cutting performance of the blade will be impaired.



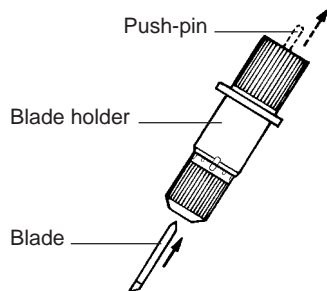
NOTICE

Be sure to support the tool mounting screw from below when installing the blade holder. Cutting quality may become poor if installed without supporting the screw in this way.

Installing the Blade

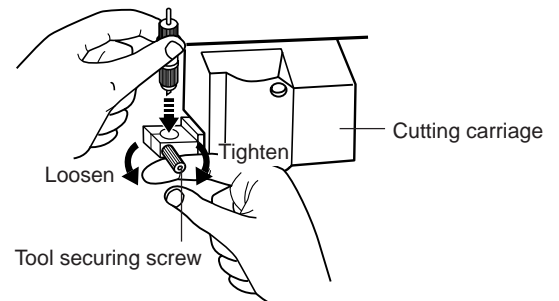
1

Insert a blade into the blade holder until it snaps into place with an audible click.



2

- (1) Loosen the tool securing screw on the cutting carriage.
- (2) Support the tool-securing screw from below and install the blade holder. Insert the blade holder until the collar is flush with the carriage.
- (3) Tighten the tool securing screw until the blade holder is secured in place.



Depending on the material in use, it may be necessary to adjust the tip of the blade. For more information, see "3-7 Cutting Test."

3-4 Turning on the Power

⚠ CAUTION



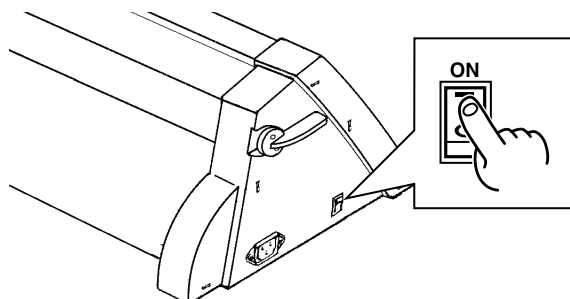
Be sure not to place the hands or anything else on the platen when switching on the power.

Doing so may result in injury.

(The cutting carriage moves simultaneously when the power is switched on.)



Switch on the power switch on the left side of the CM-24/12.



POWER/ERROR LED lights up



3-5 Loading the Material

Loading the Material

Acceptable media widths

	Width (horizontal dimension)	Length (vertical direction)
CM-24	50—711 mm (1-15/16"—28")	100 mm (3-15/16") or more when DIP switch SW-9 is set to "ON" No other restrictions (* Accuracy assured within a range of up to 1,600 mm (63"))
CM-12	50—406 mm (1-15/16"—16")	No restrictions (* Accuracy assured within a range of up to 1,600 mm (63"))


Depending on the type of material, it may be necessary to make DIP switch settings on the CM-24. To do this, first switch off the power to the unit, then set DIP switch SW-9 to ON if loading piece material, or to OFF if loading roll material. After making the setting, turn the CM-24 back ON. On the CM-12, it is not necessary to make any DIP switch settings.

The grit rollers on the CM-24 are divided into four areas that can secure the material with the pinch rollers. Also, The grit rollers on the CM-12 are divided into two separate areas. The range of movement is determined by the pinch rollers on the left and right (see "Material Loading Position"). Experiment with the range of the left and right pinch rollers to determine usable area.

When loading a material, first place it atop the grit rollers and make sure that it is positioned where it can be secured by the pinch rollers.

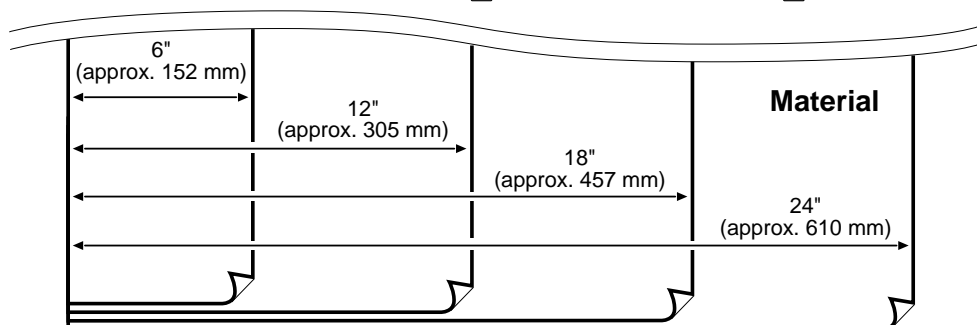


Material Loading Position

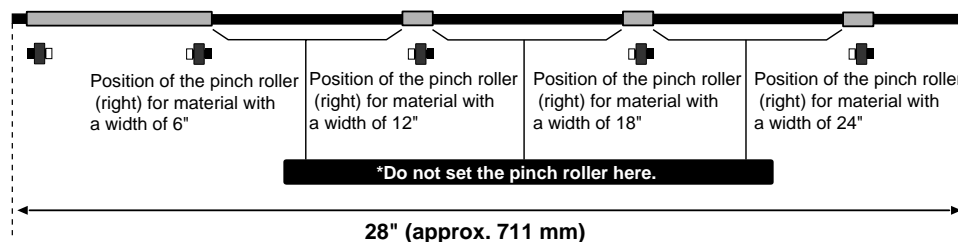
 : Grit roller

 : Pinch roller (left)

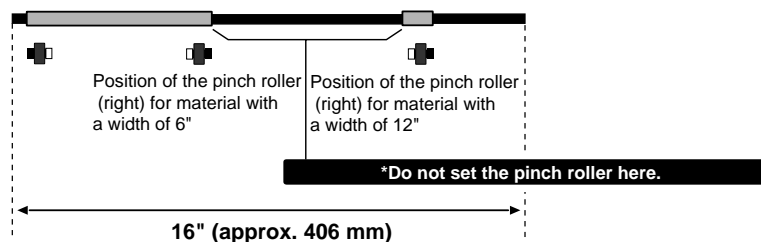
 : Pinch roller (right)



CM-24



CM-12



The left-hand pinch roller can be moved within this range.
When loading material with a width other than one indicated above, move the left-hand pinch roller.

- If you are using roll material, start with step 1.
- If you are using piece material, start with step 2.

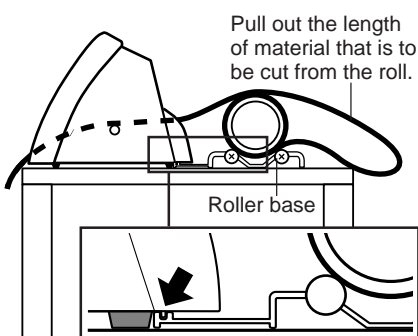
If you are using the CM-24, set DIP switch SW-9 to OFF (roll) when roll material is loaded, or to ON (piece) when flat (piece) material is loaded. Be sure the power to the CM-24 is off when changing the DIP switch setting.
 (On the CM-12, SW-9 is not used. This switch should always be set to "OFF.")

1

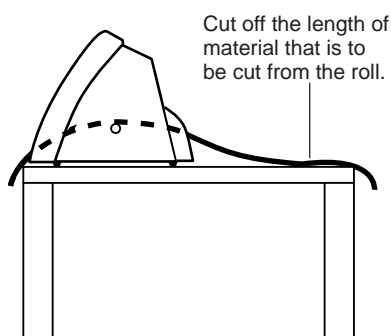
Raise the sheet loading lever.

Pass the end of the material between the pinch rollers and the grit rollers so that it extends from the front of the unit..

[If You Are Using the Roller Base]



[If You Are Not Using the Roller Base]



Do not load the material as shown in the figure, because correct material feed will be impossible.



* If you are using the CM-12, use a substitute of the roller base to secure the rolled material in place.

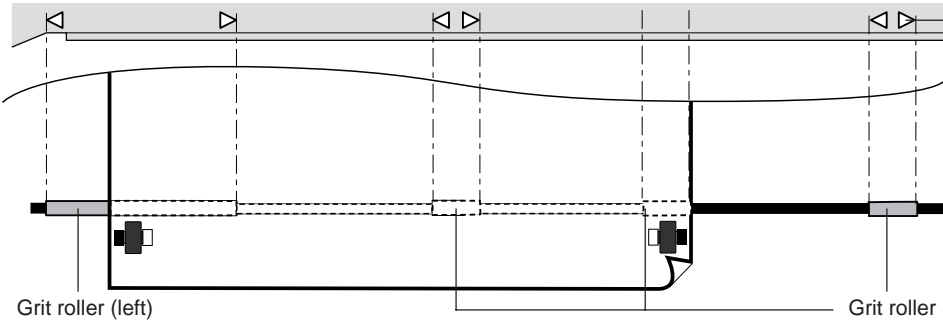
2

For the CM-24: Position so that the right-hand edge of the material lies over any one of the grit rollers.

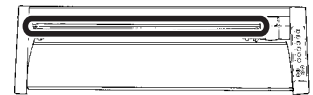
Move the material from side to side and position so that the left-hand edge of the material lies over the leftmost grit roller.

For the CM-12: Position so that the right-hand edge of the material lies over the right-hand grit roller and the left-hand edge lies over the left-hand grit roller.

When loading material that is 6" in width, position the material over the leftmost grit roller.



With the material set in place, make sure the grit rollers are positioned correctly.

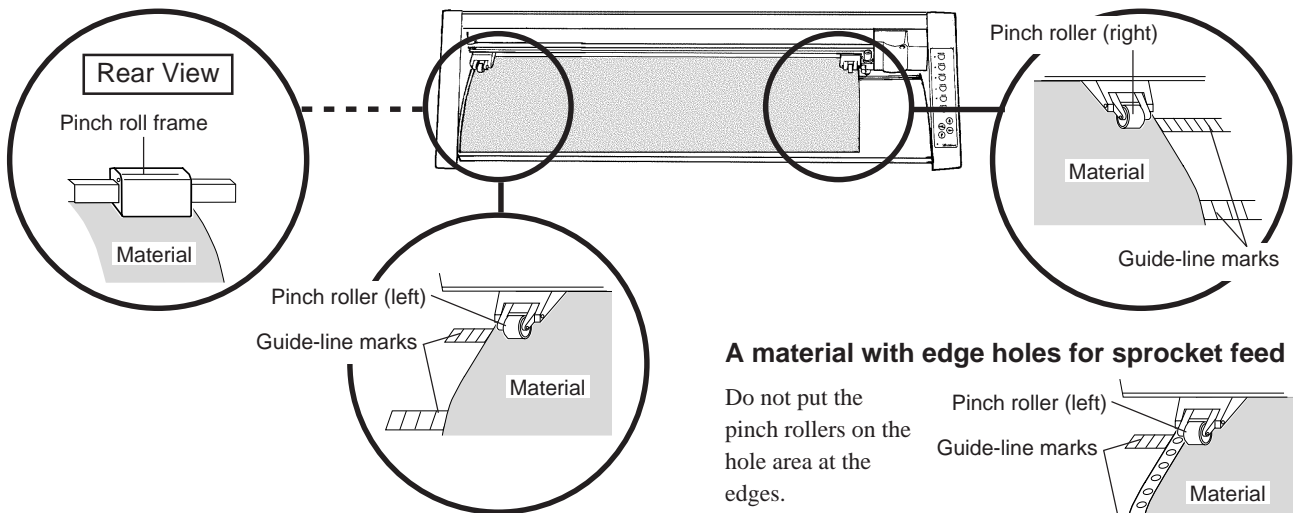


(An indicator mark is present in the area enclosed by the lines.)

3

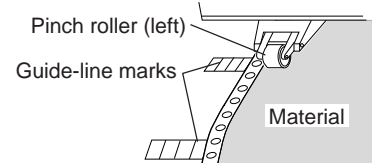
Load the material so that it lies straight and is aligned with the guide-line marks, then move the left and right pinch rollers so that they are above the grit rollers.

If a pinch roller does not move easily, it may help to grasp the corresponding pinch roll frame at the back of the unit and move it together with the pinch roller.



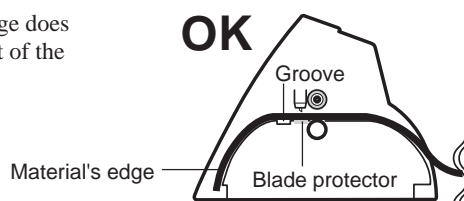
A material with edge holes for sprocket feed

Do not put the pinch rollers on the hole area at the edges.

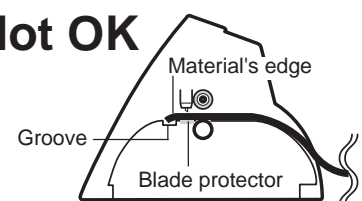


Load the material so that its edge does not catch on the groove in front of the blade protector.

OK



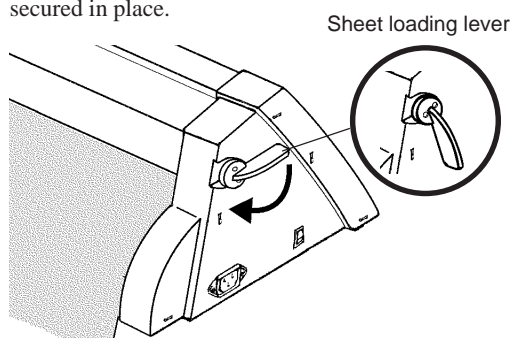
Not OK



4

Lower the sheet loading lever.

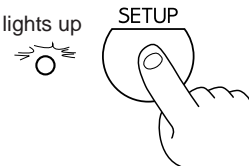
The pinch rollers are lowered and the material is secured in place.



5

Press the SETUP key.

SETUP LED lights up

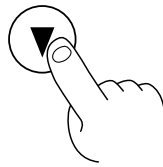


The width of the material is detected and the unit is made ready for cutting.
The cutting carriage moves to the cutting origin point.

6 Feed out the length of material to be cut.



7 Return the fed-out material.



For a cut piece of material or material whose left- or right-hand edge is at an angle, do not place the pinch rollers over the far ends of the material.

Make sure that the material remains held by the pinch rollers. If the material does come loose from the pinch rollers, set it in place again.

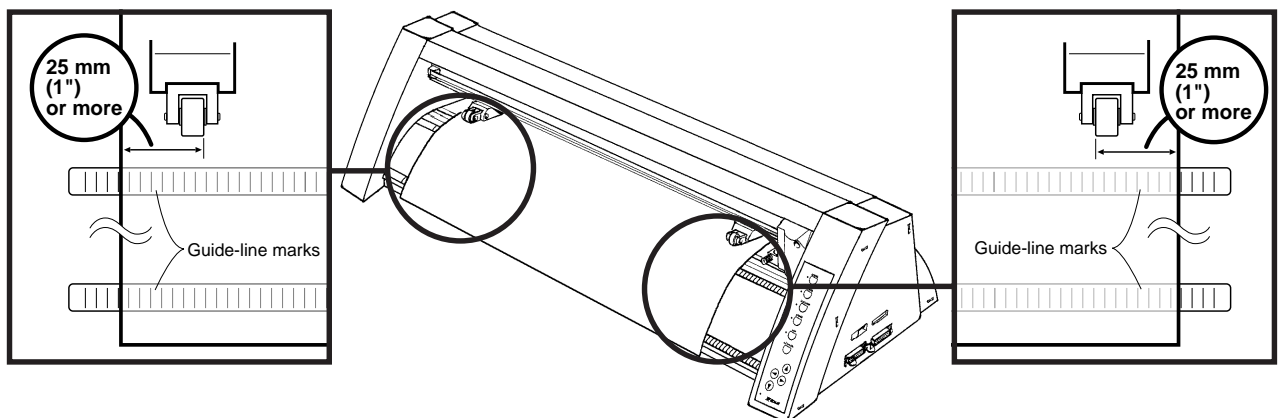
To Perform Long Cutting

When performing cutting over a length of 1.5 m (60") or more, first feed out the required length of material. Then follow the steps below to load the material.

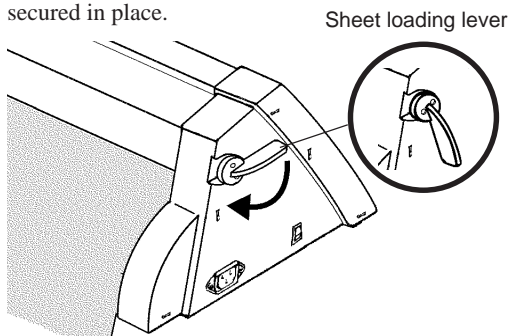
1 Use material that is wider by 50 mm (2") or more than the width of the cutting to be performed.

2 Perform steps 1 through 3 of "Loading the Material". Pull out the material from the roll and pass it through the unit.

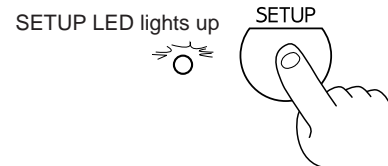
3 Position the pinch rollers as shown in the figure.



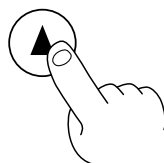
4 Lower the sheet loading lever. The pinch rollers are lowered and the material is secured in place.



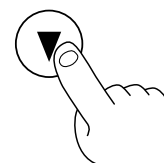
5 Press the SETUP key.



6 Feed out the length of material to be cut.

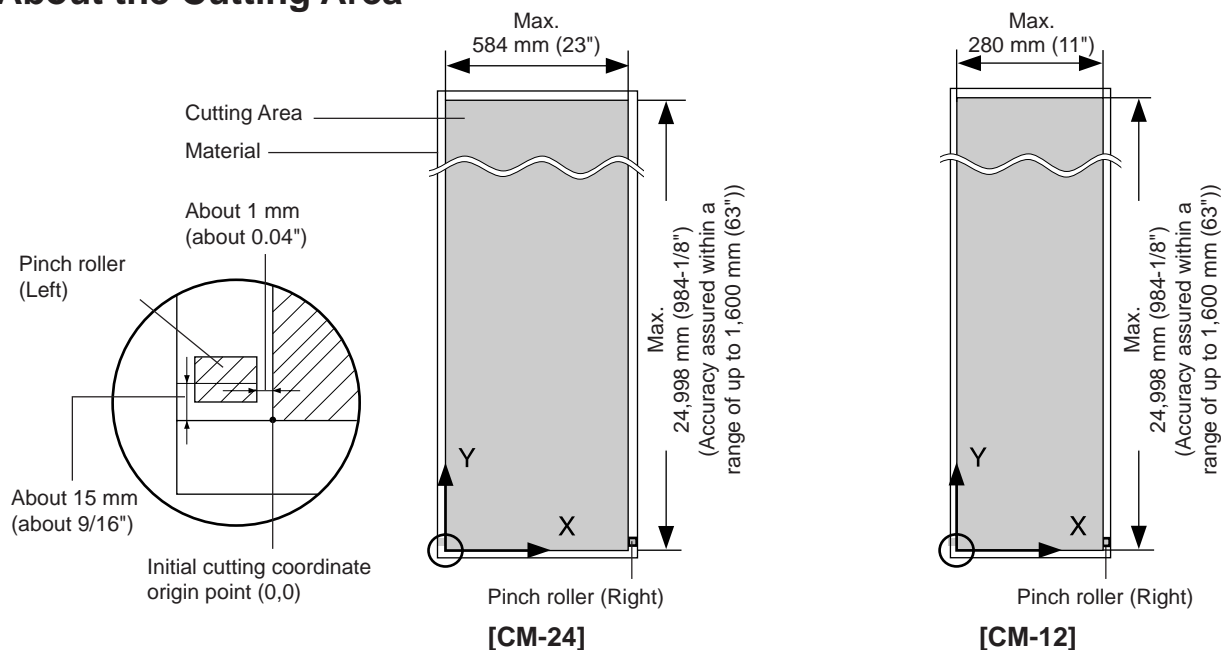


7 Return the fed-out material.



Make sure that the material remains held by the pinch rollers. If the material does come loose from the pinch rollers, set it in place again.

About the Cutting Area



* The arrows in the figure indicating the X and Y directions indicate respectively the positive directions of the X axis and Y axis when the Rotate function is off.

3-6 Setting the Origin Point

The CM-24/12 allows the origin point (0,0) to be set at any position in the cutting area. Loading material and pressing the SETUP key causes the first origin point to be determined. The first origin point determined by pressing the SETUP key varies according to the model and the DIP switch settings.

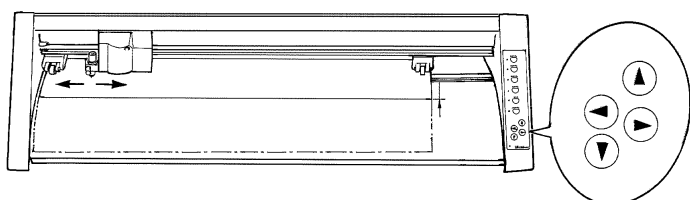
	DIP switch	Position where the origin point is set
CM-24	SW-9: OFF (roll material) SW-9: ON (piece material)	Set near the left-hand pinch roller (When SW-6 has been set to ON (rotate) : set near the right-hand pinch roller) Material size is detected and the origin is set at the lower-left area of the material (When SW-6 has been set to ON (rotate) : material size is detected and the origin is set at the lower-right area of the material)
CM-12	SW-9: OFF (This switch should always be set to "OFF." It is not necessary to make any DIP switch settings.)	Set near the left-hand pinch roller (When SW-6 has been set to ON (rotate) : set near the right-hand pinch roller)

If there is no need to move the origin initially set, then it is not necessary to make the origin point setting immediately after loading a material.

You can also set the origin to an uncut area of a material in order to use the material with maximum effectiveness.

* If a material has not yet been loaded, then before setting the origin point, refer to "3-5 Loading the Material" to load the material correctly. Loading a material after the origin has been set (by pressing the SETUP key to extinguish the SETUP LED) cancels the origin that has been set.

- 1 Use the , , , and keys to move the center of the blade holder. Move it to the point where the origin is to be set.



- 2 Press the ORIGIN SET key.



The SETUP LED flashes once and the origin point is set.

3-7 Cutting Test (How to Adjust Blade Force/Adjusting the Cutter Blade)

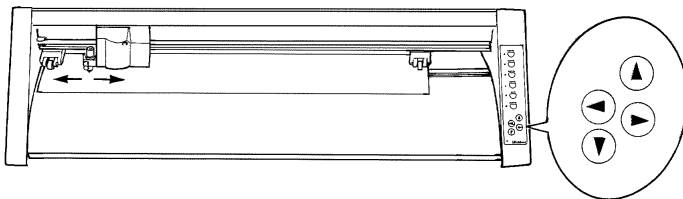
Before carrying out actual cutting, you may wish to perform a "cutting test" to check whether the unit produces the cutout satisfactorily. This is done by examining the results of the cutting test, and adjusting the blade force and the amount of blade extension. The cutting test should be repeated until the appropriate cutting conditions for the material in use are discovered.

If the cutting results are unsatisfactory, first use the pen force control slider to adjust the blade force (see "How to Adjust Blade Force"). To start with, move the pen force control to the left-most indicator mark (minimum blade force). Increase blade force gradually, until cut quality is satisfactory.

If favorable cutting results are not obtained even after adjusting the blade force, then you should adjust the cutter blade (see "Adjusting the Cutter Blade"). After adjusting the cutter blade, perform a cutting test and adjust the blade force.

If a material has not yet been loaded, then refer to "3-5 Loading the Material" to load the material correctly.

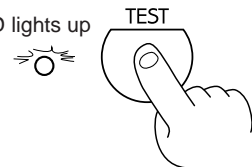
- 1** Use the ▲, ▼, ◀, and ▶ keys to move the center of the blade holder. Move to the position where the cutting test is to be performed.



* Note that an area of approximately 2 square centimeters (a little less than a square inch) is required to make a test cutout (given that the tip of cutter after it has moved is at the origin at lower-left).

- 2** Press the TEST key.

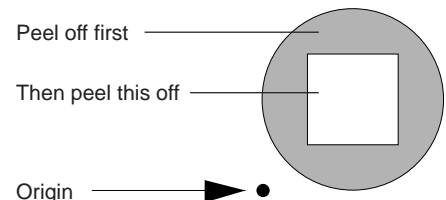
The TEST LED lights up



Cutting test starts.

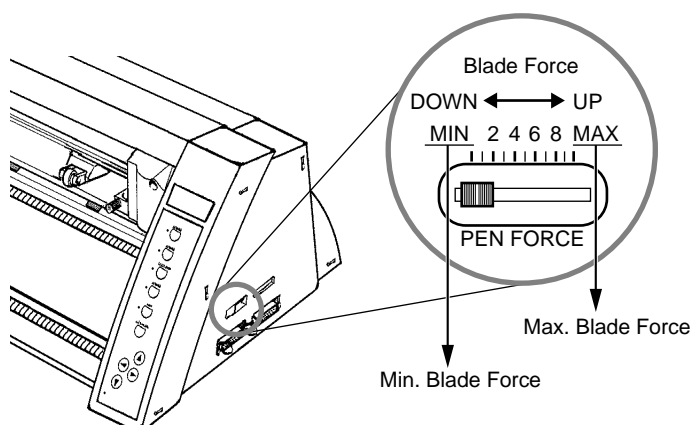
- 3** (1) First peel off the round section (shaded as shown).
- When it can be peeled off by itself, without disturbing the square, the blade force is set appropriately.
- (2) Next, peel off the square, and look at the backing behind it.
- The optimum blade pressure is correct if you can clearly make out the lines left by the blade.

Adjust the pen force control slider until results as shown above are obtained. (Gradually increase the cutter force until you reach the optimum level.)



How to Adjust Blade Force

The pen force control slider is located on the right side of the unit. Move the blade force control slider sideways to alter the blade force. The pen force control slider can be positioned at marks indicating the 11 levels available.



When making the blade force setting, it is important to take into consideration the hardness of the blade as well as the thickness and type of the material to be cut, and adjust blade force accordingly. If the blade force is weak, the material may not be cut satisfactorily. If the blade force is too strong, blade life will be shortened and cutting may be impaired.

Additionally, be aware that problems such as the following may occur:

- The material may be torn
- The blade may pierce the material and backing
- Cutter blade extends through the base paper, and normal advancing of the material becomes impossible
- The unit may suffer damage

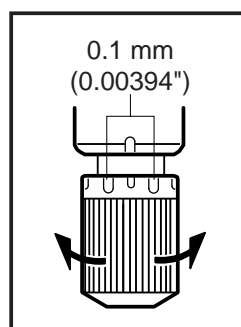
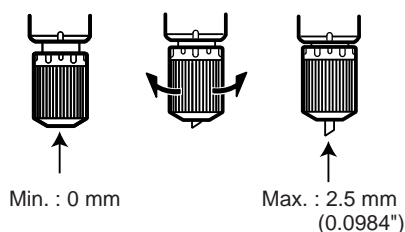
Adjusting the Cutter Blade

The amount of cutter blade extension can be adjusted by rotating the cap. If it is necessary to adjust the amount of blade extension, remove the blade holder, adjust the amount of blade extension as shown in the figure below, then remount the blade holder on the cutting carriage.



When using the included material or a general type of equivalent material, the unit should generally be used with the cap tightened at its highest position (maximum blade extension = 2.5 mm (0.0984")). When cutting material having base paper that is thin with respect to the material (material thickness), or material having no base paper, the amount of blade extension should be adjusted so that the blade does not cut through the base paper.

Turning the tip by an amount corresponding to one large scale gradation extends the blade by 0.1 mm (0.00394"). Adjustment for 0.5 mm (0.0197") can be made by rotating the cap one full turn.



[Adjusting the amount of blade extension]

Perform a cutting test and gradually extend the blade. Take care to ensure that the amount of blade extension does not exceed the thickness of the material portion plus the thickness of the base paper.

$$\text{Amount of cutter blade extension} = \text{Thickness of the material portion} + \frac{\text{Thickness of the base paper}}{2}$$

If the blade leaves a faint mark on the base paper, the amount of blade extension is optimal.

3-8 Downloading Cutting Data

NOTICE

When loading a flat material the CM-12 that has been cut, be sure to use a flat material that is about 100 mm (3-15/16") longer than the vertical size of the cutting data. If data larger than the vertical length of the material is sent, the CM-12 will attempt to cut the data even if it does not all fit in the material. This means that the material is dislodged from the grit roller, and cutting continues with no material. This can cause not only breakage to the blade but also damage to the unit, and adequate care is required to prevent this.

If the material becomes dislodged, immediately press the PAUSE key or turn off the power switch.

The unit will begin cutting when it receives cutting data sent from the computer.



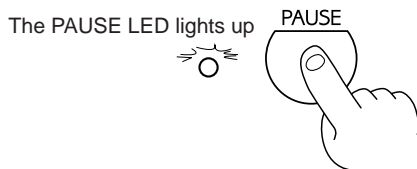
For information on how to install the CAMM-1 DRIVER for Windows® 95, please refer to the "Readme.txt" file. (This "Readme.txt" file is located on the corresponding disk.)

Pausing Cutting Operations

If you wish to pause operation while cutting is in progress, follow the steps described below.

Press and hold the PAUSE key until the PAUSE LED lights up.

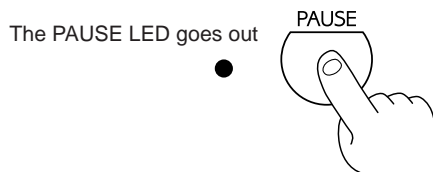
Cutting is paused.



[To Resume Cutting]

Press the PAUSE key.

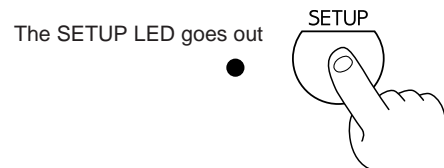
Cutting resumes.



[To Terminate Cutting]

(1) Halt transmission of cutting instructions from the computer.

(2) Press the SETUP key. Hold down for about 1 sec.



Cutting instructions already sent from the computer to the CM-24/12 are deleted, the cutting carriage moves to the right, and cutting stops.

Continuing Cutting

[Cutting After Changing the Material]

Follow the procedure described from "3-5 Loading the Material" to "3-8 Downloading Cutting Data".

* If the same type of material is used, then a cutting test is not necessary.

[Continuing Cutting on the Same Material]

Refer to "3-6 Setting the Origin Point" and set the origin at a place which has not yet been cut (i.e., at the place to be cut next).

Then send cutting data from the computer to the CM-24/12.

3-9 Applying the Completed Cutout

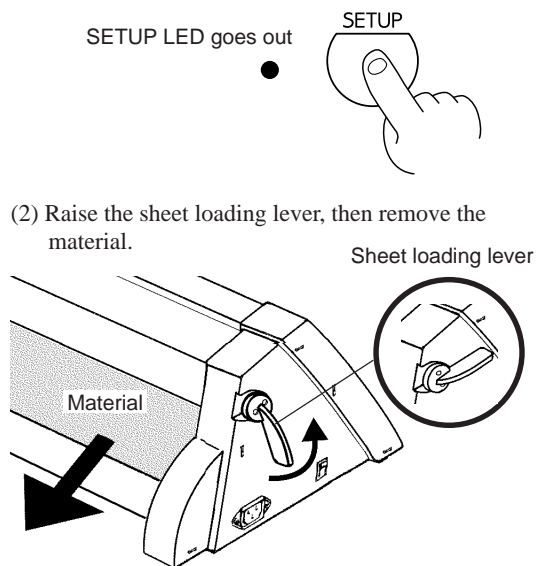
Once cutting has been completed, follow the procedure below for application instructions.



- Make sure beforehand that the surface where the work is to be stuck is clean and free of all dust or oily deposits.
- When applying the work to a transparent surface, such as a window, you can use a water-based pen (which can be wiped off afterwards) to mark guidelines on the reverse side of the glass, to aid in getting the work aligned properly.
- If you discover after it is stuck in place that air bubbles were trapped under the work, use a needle to puncture them. Then you can smooth out the material so that it sticks securely.

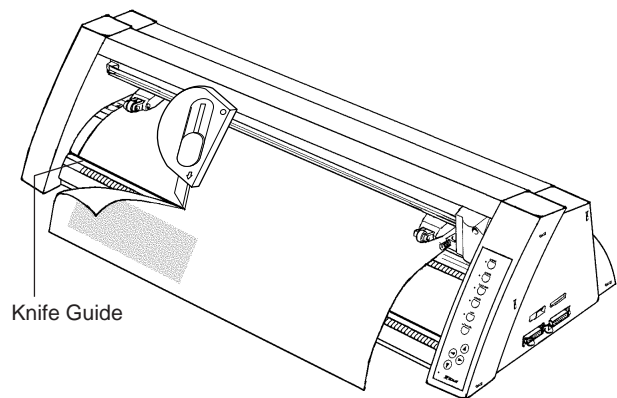
1 [For Piece Materials]

- (1) Press the SETUP key. Hold down for about 1 sec. The SETUP LED goes out and the cutting carriage moves to the right edge of the cutting area.

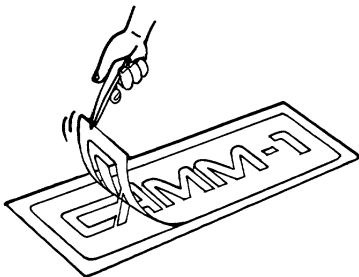


[For Roll Materials, or When Detaching Only a Cut Portion]

Detach the cut portion by cutting along the knife guide. For the CM-12, use a commercially available craft knife to detach the cut portion.



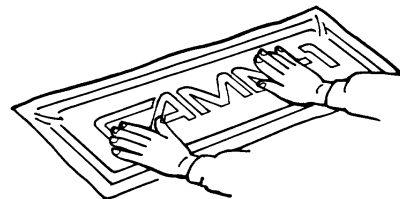
2 Strip/Weed uses all unneeded portions from the completed work.



* You should have weed borders or rectangles drawn around work to facilitate weeding.

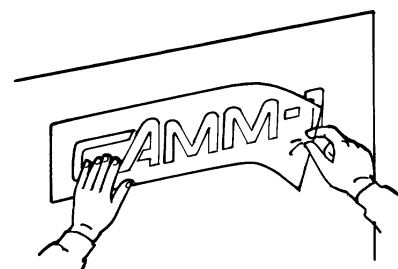
3

Stick application tape over the completed work. Press down firmly on the application tape to remove air bubbles. If you do not press firmly enough the cut area will not stick to the surface.



4

Transfer the material to the application tape, position it, and carefully affix it, making sure that it is aligned correctly. Rub over the application tape to make sure the work is firmly stuck in place. Then peel off the application tape.



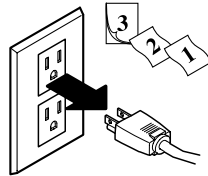
3-10 When Cutting is Completed

CAUTION



When not in use for extended periods, unplug the power cord from the electrical outlet.

Failure to do so may result in danger of shock, electrocution, or fire due to deterioration of the electrical insulation.

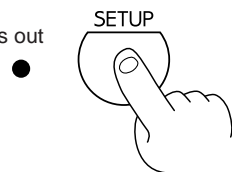


NOTICE

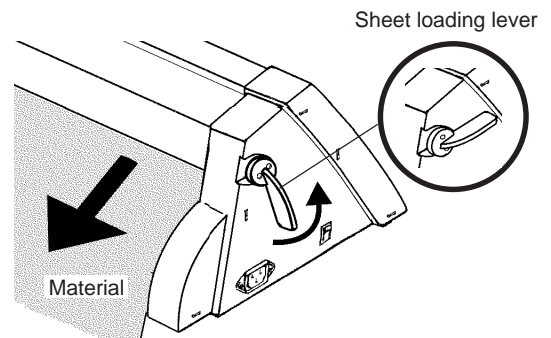
Do not leave the tool mounting screws tightened. Tightening the screw makes it more difficult to install the blade holder.

- 1 Press the SETUP key. Hold down for about 1 sec. The SETUP LED goes out and the cutting carriage moves to the right edge of the cutting area.

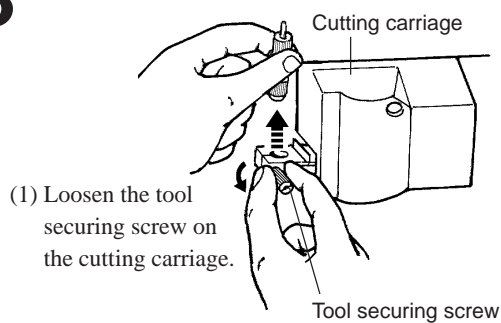
SETUP LED goes out



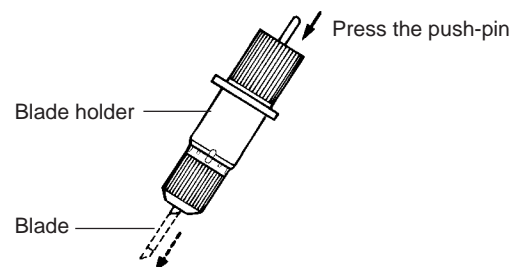
- 2 Raise the sheet loading lever, then remove the material.



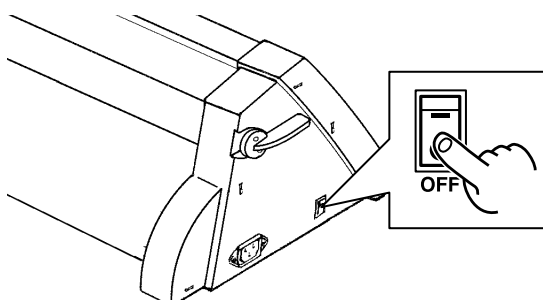
- 3 (2) Remove the blade holder from the cutting carriage.



- 4 Press the push-pin and remove the blade from the blade holder. If a blade was used, wipe the blade with a soft cloth to remove any material that may cling to it.



- 5 Turn off the power.



POWER/ERROR LED goes out



Use a soft, dry cloth to wipe down the CM-24/12.

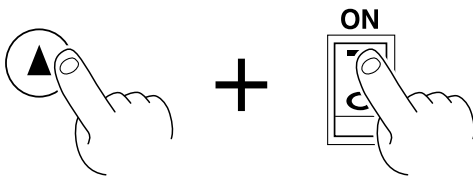
Performing a Self-test

The CM-24/12 is equipped with a "self-test" function to conveniently allow you to check whether or not it is capable of operating normally. If the CM-24/12 is not performing correctly, follow the steps below to perform a self-test.
A computer is not required in order to carry out the self-test.

- 1** Refer to "3-3 Installing a Blade" and install a blade holder (or pen) in the CM-24/12's cutting carriage.

- 2** Set the blade force to the smallest possible value (the pen force slider should be at the furthest point to the left). If after the cutting test you feel that the material was not cutout clean enough, you can try gradually increasing the blade force until you have the optimum level.

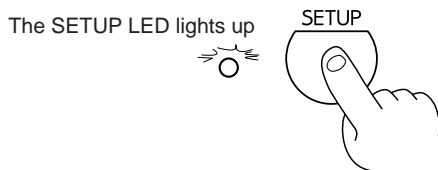
- 3** Hold down the ▲ key on the panel while you turn the power on.



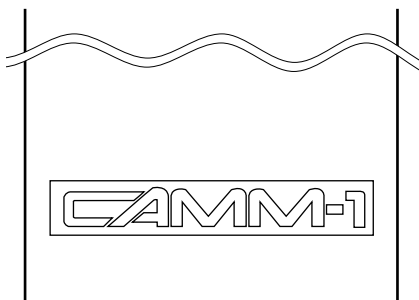
- 4** Load the material (or some paper), following the procedure described in "3-4 Loading the Material" .

* If a pen and material have been loaded, press the PEN MODE key to light up the PEN MODE LED.

- 5** Press the SETUP key.
Demo cutting starts.



Operations is normal if the figure shown at right is cut.

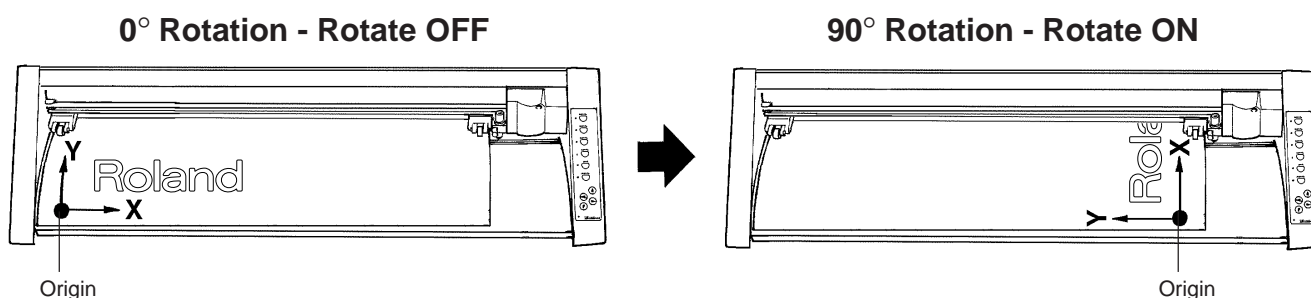


4 Settings for Each Function

4-1 Using a Material Effectively and Cutting along the Vertical Dimension (Rotate Function)

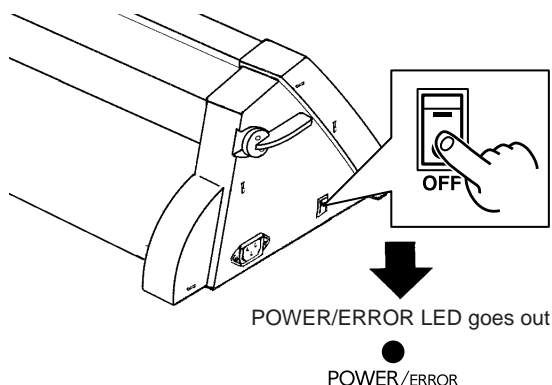
This function sets the origin point at the bottom right and rotates the text or graphics 90° (see pictures below). This function is used when the intended design will not fit in the width (horizontal dimension) of the material, such as long strings of text. If there is still unused material on the right side, rotation allows you to use this remaining material effectively.

When the character string “Roland” is rotated by 90°, the X axis, Y axis, and origin change as follows:

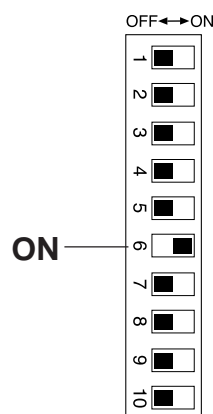


* The pairs of arrows indicate the positive directions along the X and Y axis.

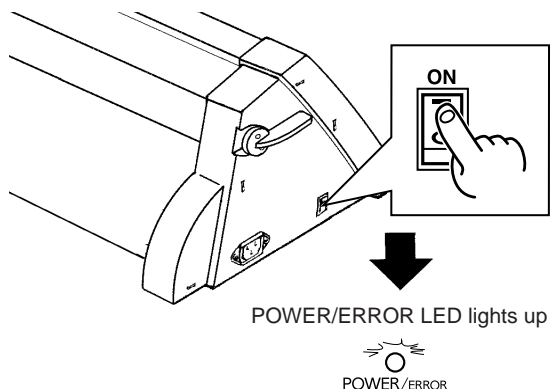
1 Turn off the power.



2 Set DIP switch SW-6 to ON (rotate).

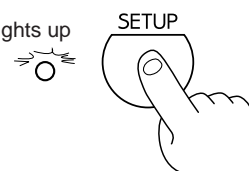


3 Turn on the power.



4 Press the SETUP key.

The SETUP LED lights up



The SETUP LED lights up and the tool carriage moves to the left and right, then returns.

5 Send cutting data from the computer.

Canceling the Rotate Function

Switch off the power to the CM-24/12, then set DIP switch SW-6 to OFF (do not rotate).

4-2 Plotting on Paper Media

The CM-24/12 is also capable of plotting on paper media using plotter pens made by this company. Before cutting, plotting using pen and paper can ensure that your design is correct without wasting materials.

* Since the design of the CM-24/12 differs inherently from that of dedicated plotters, it does not accommodate functions such as high-speed plotting, automatic pen changes, pen dry protection, or the like.

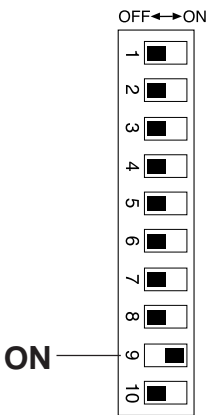
Acceptable pens and paper media

	Acceptable paper	Acceptable paper widths	Acceptable pens
CM-24	High-quality paper	50 mm (1-15/16") — 711 mm (28")	Water-based fiber-tipped pens Thick water-based fiber-tipped pens
CM-12	High-quality paper	50 mm (1-15/16") — 406 mm (16")	Water-based fiber-tipped pens Thick water-based fiber-tipped pens

- If you are using the CM-24, then start with step 1.
- If you are using the CM-12, then start with step 4.

1 Turn off the power.

2 Set DIP switch SW-9 to ON (piece).

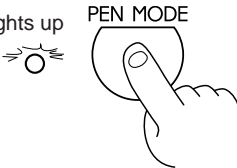


3 Turn on the power.

4 Refer to "3-3 Installing a Blade" and install a pen in the same way as you would install a blade.

5 Refer to "3-4 Loading the Material" and load a material in the same way as you would load cutting material. You can load a material with a width (horizontal dimension) of 50 (1-15/16") to 711 (28") mm on the CM-24, or a material with a width (horizontal dimension) of 50 (1-15/16") to 406 (16") mm on the CM-12.

6 Press the PEN MODE key.
The PEN MODE LED lights up



7 Plotting begins when plotting instructions are sent from the computer.

Stopping Plotting on Paper Media

Press the PEN MODE key. The PEN MODE LED is extinguished and the unit returns to the cutting mode. Remove the pen from the cutting carriage, and cap securely to prevent the pen tip from drying out.

Pen Replacement

Pens will eventually wear out. Should the tip become rough and produce scratchy lines, try gradually increasing the pen force (refer to "3-7 Cutting Test to Check Blade Force"). If smudging occurs even when pen force is increased, or if the pen tip becomes frayed, replace with a new pen.

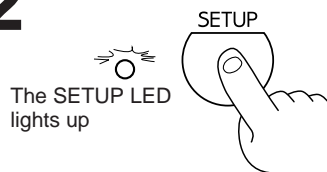
4-3 Repeating the same cutting

The CM-24/12 can store the data sent from the computer in a buffer (a temporary memory area), and use this data to repeat cutting. When the SETUP key has been pressed and cutting data is sent, the data is stored in the buffer at the same time that it is cut. After cutting has finished, the data that has already been sent can be used to perform cutting again until the SETUP key is pressed.

- Even when the SETUP key has been pressed to cancel the setup state (making the SETUP LED go dark), the data for repeating cutting is not erased until new data is sent from the computer.
- When the power is switched off, any existing data in the buffer is deleted.
- If the buffer becomes full while data is still being sent, replotting (recutting) cannot be performed. Pressing the REPLOT key while in this state makes the REPLOT LED start to flash.
- Pressing the REPLOT key while the buffer contains no data makes the REPLOT LED start to flash.

1 Install a blade and load material on the CM-24/12.

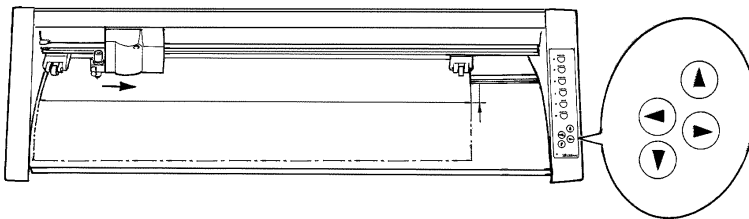
2 Press the SETUP key.



3 The unit will begin cutting when it receives cutting data sent from the computer.

4 [Repeating cutting on the same material]

- 1) After cutting finishes, use the ▲, ▼, ◀, and ▶ keys to move the center of the blade holder. Move it to the point where the origin is to be set.



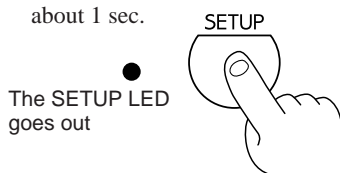
- 2) Press the ORIGIN SET key.



The SETUP LED flashes once and the origin point is set.

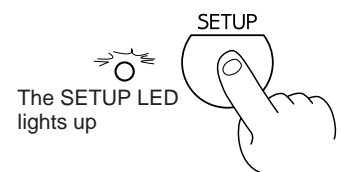
[Repeating cutting on different material]

- 1) After cutting finishes, press the SETUP key. Hold down for about 1 sec.



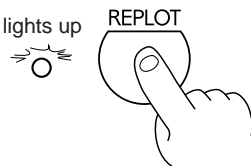
- 2) Remove the material and load a different piece of material.

- 3) Press the SETUP key.



5 Press the REPLOT key.

The REPLOT LED lights up



To stop repeated cutting

- 1) Press and hold the PAUSE key until the PAUSE LED lights up.
- 2) Press the SETUP key. Hold down for about 1 sec. (The SETUP LED goes out.)

5 About the Blade

This section indicates the proper cutting conditions for various types of materials, as well as blade lifespans. Cutting conditions and blade life may vary according to the quality of the material and conditions of use.

Making the settings for the conditions described below does not automatically guarantee attractive cutting results in all situations. Before performing actual cutting, be sure to carry out a cutting test and make any necessary adjustments (refer to "3-7 Cutting Test to Check Blade Force"). If cutting is incomplete even after using the pen-force scale in the following table to increase blade force by at least three or four scale marks, it means that the useful life of the blade has ended. Replace with a new blade.

Blade	Material	Pen-force scale	Speed	Amount of cutter blade extension	Life of a blade (General guide)
ZEC-U1005	General Signage Vinyl	1 — 7	40 cm/sec.	0.25 mm (0.01")	8000 m
ZEC-U5025	General Signage Vinyl	MIN — 4	40 cm/sec.	0.25 mm (0.01")	4000 m
	Reflective Vinyl	5 — MAX	40 cm/sec.	0.25 mm (0.01")	4000 m
	Fluorescent Vinyl	4 — MAX	40 cm/sec.	0.25 mm (0.01")	4000 m
ZEC-U1715	Rubber material for sandblasting stencil	4 — MAX	20 cm/sec.	0.25 mm (0.01")	Varies according to material type

* The values for lifespan are intended to serve as a general guide when cutting materials of identical type.

Rubber materials for sandblasting stencils which can be cut:

- A) Materials with a material thickness of 1 mm (0.04") or less
- B) Materials with only carrier paper on both flanks of the material (Position the left and right pinch rollers above the strips of carrier paper.)
- C) Materials with carrier paper which is hard enough to withstand material feed



6 What to do if...

If the CM-24/12 doesn't run...

Is the CM-24/12 power on?

Turn on the power (refer to "3-4 Turning on the Power").

Is the unit in SETUP status (the SETUP LED is lit)?

If the SETUP LED is not illuminated, make sure the sheet is loaded correctly and press the SETUP key to illuminate the SETUP LED.

Is the PAUSE LED illuminated?

If the PAUSE key has been pressed and the PAUSE LED is lit up, the unit has been paused (refer to "3-8 Downloading Cutting Data Pausing Cutting Operations"). If you want to resume cutting, press the PAUSE key again. The PAUSE LED is extinguished, and cutting resumes. If you want to terminate cutting, first stop the transmission of cutting instructions from the computer to the CM-24/12. Then press the SETUP key. This deletes the cutting instructions that have already been sent from the computer to the CM-24/12, and cutting is stopped.

If connected via the serial port, do the communication parameters for the CM-24/12 match those of the computer?

Set the DIP switches correctly (refer to "3-2 DIP Switch Settings").

Is the computer set up correctly?

Check the following items:

- DIP switches
- Memory switches
- Interface board
- Communication parameters
- Other settings

Read the computer user's manual and set it up correctly.

Are the computer and the CM-24/12 linked with the right cable?

The type of cable you need is determined by your computer and the software you are using. Even if the computer is the same, running different software may require a different cable. Use the cable specified in your software.

Is the cable making a secure connection?

Connect securely (refer to "3-1 Setting Up and Connection").

Are the application software settings correct? (Using with MS-DOS.)

Check the following items:

- Output device specifications (select a device name that matches the instruction system. If the wrong device is selected an incorrect instruction may be output, resulting in an error).
- Communication parameters
- Other settings Check the software user's manual and set it up correctly.

Has the correct driver selection been made for the application software? (Using with Windows.)

Select the appropriate CM-24/12 driver.

Are the settings for the driver software correct? (Using with Windows.)

Make the correct settings for the output port and communication parameters.

The POWER/ERROR LED is blinking

If there is an error in the data downloaded to the CM-24/12 from the computer, the CM-24/12 generates an error (the POWER/ERROR LED begins to blink), and cutting cannot be carried out. The error can be canceled by switching off the power. After turning off the power, check the following.

If you are using application software, has the correct output device been selected? (Using with MS-DOS.)

Select "CM-24/12" as the output device. If this selection is not available, select any model in the PNC-960, PNC-910, PNC-950, PNC-900, or PNC-1100.

If you are using a program that you have created yourself, have correct commands been sent?

The CM-24/12 is equipped with the CAMM-GL III instruction system. For more details, see "7 Instruction Support Chart" and the separately available "CAMM-GL III Programmer's Manual."

Does the connecting cable match the settings for the application software and the computer?

Refer to the operation manuals for your application software and computer to select and connect the appropriate cable.


The material slips away from the pinch rollers during the cutting process

Are the sheet loading levers lowered?

If the sheet loading levers are raised, then make sure the left and right pinch rollers are within the edge of the material and lower the sheet loading levers. (Refer to "3-5 Loading the Material".)

Make sure the material is parallel with the grit roller.

If the front edge of the material you are working with is at an angle, cut off the odd-shaped part to make it straight, then align it so that it is parallel with the grit roller.

If the material is to be advanced over a long distance, moving the pinch roller inward slightly can help prevent the material from becoming dislodged. Also, after loading the material, it is recommended that you carry out an alignment test by using the  key to advance the material by the amount that will be used for cutting, and make sure that the material travels correctly through the machine.

If a roll material is used, carry out cutting after first pulling out the amount of material that is to be used. The material may easily slip if cutting is performed while pulling a material that is still rolled up into the CM-24/12.

Make sure that the left and right edges of the material do not touch the inner surfaces of the CM-24/12 during cutting. Such contact may not only damage the material, but could also make normal material advancing impossible and cause the material to slip.

The material is not cut properly

Are the blade and blade holder installed correctly and securely?

Install these so that there is no looseness (refer to "3-3 Installing a Blade" Installing the Blade").

Is the blade chipped?

If it is, replace it with a new one (refer to "5 About the Blade").

Check if there are any dirty deposits on the blade. If dirty, remove and clean the blade.

Is there any grime or material adhesive on the blade?

If there is buildup of grime, remove the blade and clean it.

Is the PEN MODE LED lit up?

When the PEN MODE LED is lit up, it means that the CM-24/12 is set up for plotting on paper. Press the PEN MODE key to make the PEN MODE LED go dark, then carry out cutting (refer to "4-2 Plotting on Paper Media").

Make sure you are using an appropriate blade force setting.

Perform a "cutting test," then adjust the blade force slider as necessary to obtain the optimum blade force (refer to "3-7 Cutting Test to Check Blade Force").

Is a thick material being used?

When cutting a thick material, set DIP switch SW-8 to ON (heavy). (Refer to "3-2 DIP Switch Settings".)

The PEN MODE LED and POWER/ERROR LED blink simultaneously

This flashes if the location of the pinch rollers is not correct (that is, if the pinch rollers are not positioned above the grit rollers).

If DIP switch SW-9 on the CM-24 is set to ON (piece material) and material with a vertical length of 100 mm (3-15/16") or less has been loaded, or if SW-9 is set to ON and there is no material over the front and rear paper sensors. You can cancel the error by pressing the SETUP key. Refer to "3-5 Loading the Material" to load the material correctly.

The REPLOT LED flashes

The REPLOT LED flashes when recutting is attempted by pressing the REPLOT key

Recutting is impossible because the buffer holds no data or the buffer is full (see "4-3 Repeating the same cutting").

7 Instruction Support Chart

A "CAMM-GL III Programmer's Manual" is available for separate purchase for those wishing to create their own programs for this machine. For further information, please contact your authorized Roland dealer or service center.

The list uses marks, each of which means:

- : Compatible
- × : Ignored
- : Incompatible

mode 1

Instruction	Compatibility	Instruction	Compatibility	Instruction	Compatibility	Instruction	Compatibility	Instruction	Compatibility
H	○	D	○	M	○	I	○	R	○
L	○	B	○	X	○	P	○	S	○
Q	○	N	○	C	○	E	○	A	○
G	○	K	○	T	○	^	○		

mode 2

Instruction	Compatibility	Instruction	Compatibility	Instruction	Compatibility	Instruction	Compatibility	Instruction	Compatibility
AA	○	AR	○	CA	○	CI	○	CP	○
CS	○	DF	○	DI	○	DR	○	DT	○
EA	○	ER	○	EW	○	FT	○	IM	○
IN	○	IP	○	IW	○	LB	○	LT	○
OA	○	OC	○	OE	○	OF	○	OH	○
OI	○	OO	○	OP	○	OS	○	OW	○
PA	○	PD	○	PR	○	PT	○	PU	○
RA	○	RR	○	SA	○	SC	○	SI	○
SL	○	SM	○	SR	○	SS	○	TL	○
UC	○	VS	○	WG	○	XT	○	YT	○
WD	●	SP	●						

Instruction in mode 1 and mode 2

Instruction	Compatibility	Instruction	Compatibility	Instruction	Compatibility	Instruction	Compatibility
!NR	○	!PG	○	!ST	○	!FS	●

Device control instruction

Handshake instructions




Instruction	Compatibility	Instruction	Compatibility	Instruction	Compatibility	Instruction	Compatibility	Instruction	Compatibility
ESC.B	○	ESC.M	○	ESC.N	○	ESC.H	○	ESC.I	○
ESC.@	○	ESC.O	○	ESC.E	○	ESC.L	○		

About instructions

Instruction	Compatibility	Instruction	Compatibility	Instruction	Compatibility
ESC.J	○	ESC.K	○	ESC.R	○

8 Character Sets

9 Specifications

	CM-24	CM-12
Mechanism	Media-movement method	
Driving method	Stepping motor (Micro-step)	
Maximum cutting area	Width: 584 mm (23") Length: 24,998 mm (984-1/8")	Width: 280 mm (11") Length: 24,998 mm (984-1/8")
Acceptable media widths	50 mm—711 mm (1-15/16"—28")	50 mm—406 mm (1-15/16"—16")
Acceptable paper widths	50 mm—711 mm (1-15/16"—28")	50 mm—406 mm (1-15/16"—16")
Acceptable paper types	High-quality paper	
Tools	Cutters: Special cutter for CAMM-1 series Pens: Water-based fiber-tipped pens, and Thick water-based fiber-tipped pens (options)	
Max. cutting speed	During cutting: 400 mm/sec. (15-11/16"/sec.) (When DIP switch SW-8 is at ON: 100 mm/sec. (3-7/8"/sec.))	
Blade force	30 gf—200 gf	
Mechanical resolution	0.05 mm/step (0.00197"/step)	
Software resolution	0.025 mm/step (0.000984"/step)	
Distance accuracy	Error of less than +/- 0.2% of distance traveled, or 0.1mm (0.00394"), whichever is grater	
Repetition accuracy	0.1 mm (0.00394") or less (Excluding stretching/contraction of the material, and provided that material length is under 1600 mm (63"))	
Interface	Parallel (Centronics compatible), Serial (RS-232C)	
Buffer size	1M bytes	
Instruction system	CAMM-GLIII (mode1 and mode2)	
Switches	Power switch, Pen force slider, DIP switches	
Control switches	SETUP, PAUSE, PEN MODE, REPLOT, TEST, ORIGIN SET,  ,  ,  , 	
LED	POWER/ERROR LED, SETUP LED, PAUSE LED, PEN MODE LED, REPLOT LED, and TEST LED	
Power consumption	0.8 A /117 V, 0.4 A / 220-230 V, 0.4 A / 230 -240 V	
Acoustic noise level	[Cutting mode] : less than 70 dB (A) [Standby mode] : less than 40 dB (A) (According to ISO 7779)	
Dimensions	840 mm (W) x 278 mm (D) x 221 mm (H) (33-1/8" (W) x 11" (D) x 8-3/4" (H))	535 mm (W) x 278 mm (D) x 221 mm (H) (21-1/8" (W) x 11" (D) x 8-3/4" (H))
Weight	14 kg (30.9 lb.)	9.5 kg (20.9 lb.)
Operating temperature	5—40°C (41—104°F)	
Operating humidity	35%—80% (non-condensing)	
Accessories	Power Cord x 1, Blade (ZEC-1005) x 1, Blade Holder (XD-CH3) x 1, Material for Test Cuts x 1, Test-use Application Tape x 1, User's Manual x 1, CAMM-1 DRIVER for windows 95 x 1, Roller base x 1*, Cutter Tool (for trimming material) x 1*, Tweezers x 1*	

*..... CM-24 only

Interface specifications

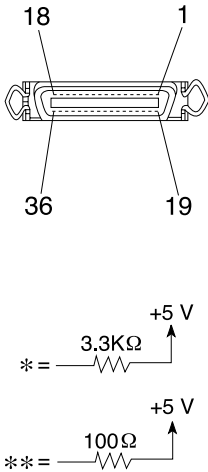
Parallel

Standard	In compliance with the specifications of Centronics
Input signals	$\overline{\text{STROBE}}$ (1 BIT), DATA (8 BITS)
Output signals	BUSY (1 BIT), $\overline{\text{ACK}}$ (1 BIT)
Level of input/output signals	TTL level
Transmission method	Asynchronous

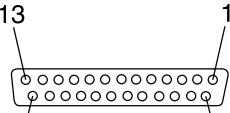
Serial

Standard	RS-232C specifications
Transmission method	Asynchronous, duplex data transmission
Transmission speed	4800, 9600 (Selected using DIP switches.)
Parity check	Odd, Even, or None (Selected using DIP switches.)
Data bits	7 or 8 bits (Selected using DIP switches.)
Stop bits	1 or 2 bits (Selected using DIP switches.)
Handshake	Hardwire (power on) or XON/XOFF (switched by commands)

Parallel connector (in compliance with specifications of Centronics)

Signal number	Terminal number		Signal number	Pin Connection
NC	36	18	HIGH**	
HIGH*	35	17	GND	
NC	34	16	GND	
GND	33	15	NC	
HIGH*	32	14	NC	
NC	31	13	HIGH*	
GND	30	12	GND	
	29	11	BUSY	
	28	10	$\overline{\text{ACK}}$	
	27	9	D7	
	26	8	D6	
	25	7	D5	
	24	6	D4	
	23	5	D3	
	22	4	D2	
	21	3	D1	
	20	2	D0	
	19	1	$\overline{\text{STROBE}}$	

Serial connector (RS-232C)

Signal number	Terminal number		Signal number	Pin Connection
NC	25	13	NC	
NC	24	12	NC	
NC	23	11	NC	
NC	22	10	NC	
NC	21	9	NC	
DTR	20	8	NC	
NC	19	7	SG	
NC	18	6	DSR	
NC	17	5	CTS	
NC	16	4	RTS	
NC	15	3	RXD	
NC	14	2	TXD	
		1	FG	

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