

FC5100A-75/100/130/150

CUTTING PRO

user manual

MANUAL NO. FC5100-UM-154



GRAPHTEC



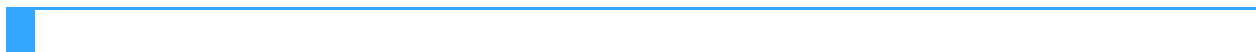
Thank you for choosing an FC5100A Cutting Plotter.

The FC5100A is a high-performance grit-rolling cutting plotter that incorporates a 16-bit CPU and digital servo drive system for highly precise cutting of color adhesive film at high speed.

For more information about Graphtec and Graphtec products, visit Graphtec's corporate web sites at:

www.graphtecusa.com (USA, Canada, South America)

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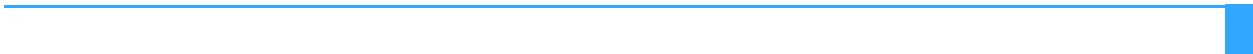




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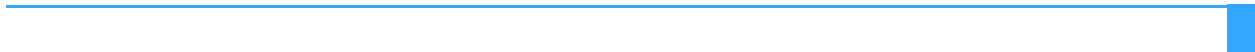




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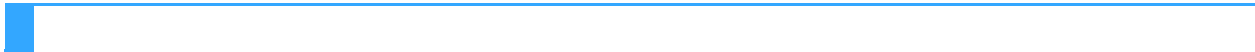


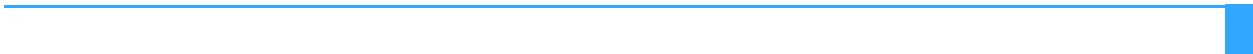
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Chapter 1: Special Precautions

This section covers special precautions you should take when operating or storing your plotter.



NOTE: Information to simplify or correctly complete a task.



CAUTION: Will cause damage to the unit.



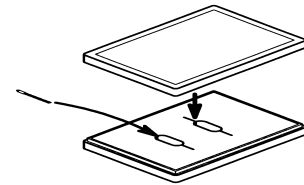
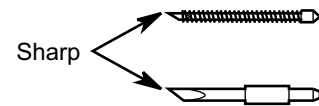
WARNING: Will cause injury to the Operator!

Handling the Cutting Blades



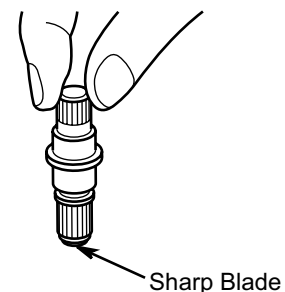
WARNING: Sharp cutter blades are used with this plotter. Handle the cutter blades and holders with care to prevent bodily injury.

- Cutter blades are very sharp. While handling a cutter blade or cutter pen, be careful to avoid cutting your fingers or other parts of your body.
- Promptly return used blades to the cutter case provided. When the case is completely filled, discard the used blades together with the case.



Handling the Cutters

- The tip consists of a sharp blade. Be sure not to extend it too far.
- Instructions on replacing the blade or adjusting the blade length are provided in **Cutters and Holders**.



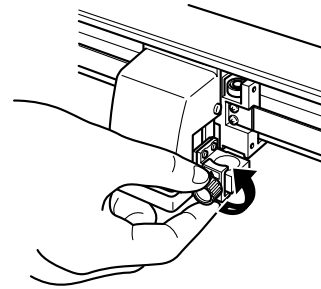
Attaching a Cutter Pen



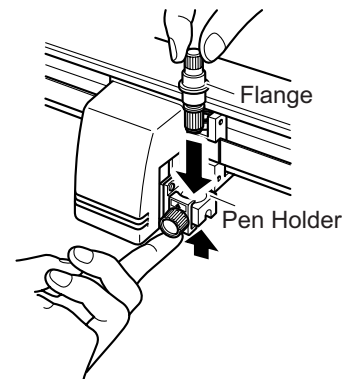
WARNING: To avoid bodily injury, do not touch the pen tip after the plotter is turned on.

Follow the procedure below to attach a cutter pen to the pen carriage.

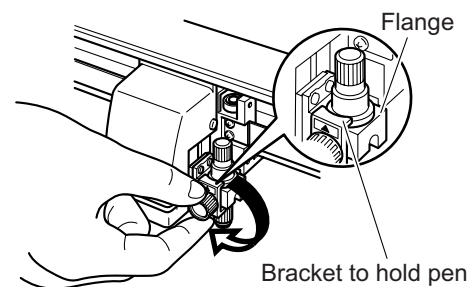
- 1 Make sure that the pen holder screw is loose.



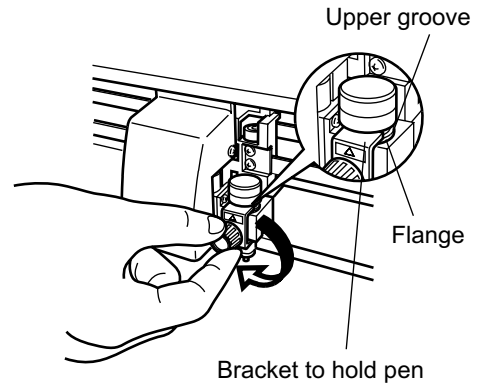
- 2 While positioning the pen holder upward, push the cutter pen all the way into the holder until its rim contacts the pen stopper.



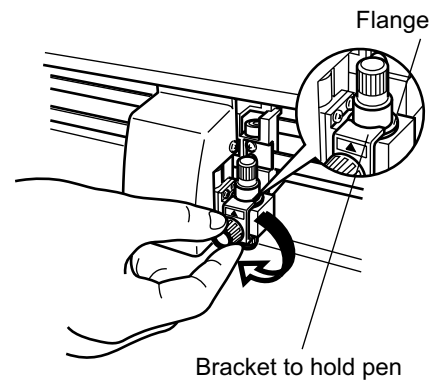
- 3 Once the pen has been properly mounted, tighten the screw.



CAUTION: The pen has two flanges and must be fully seated (the pen holder is engaged on the second flange) before tightening the screw.



CAUTION: The cutter must be properly seated (the pen holder is engaged on the flange) before tightening the screw.

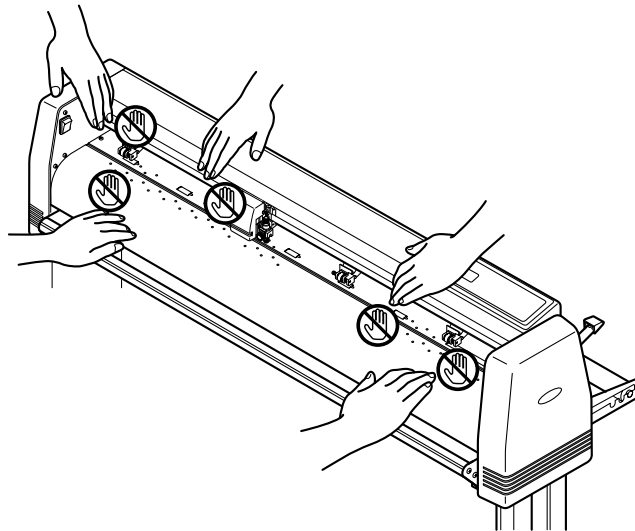


After Turning on the Plotter

During the course of turning on the plotter, be sure to observe the following precautions:

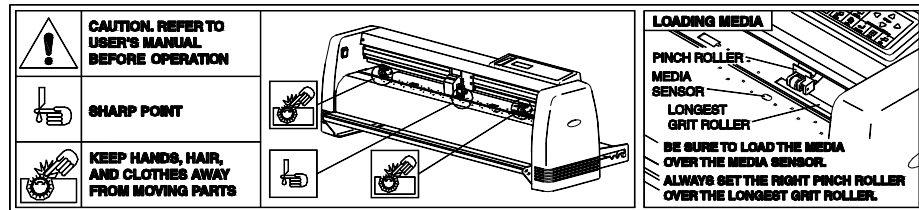


- The pen carriage and loaded media may suddenly move during the cutting operation, immediately afterward and when setting the plotter's functions.
- Keep hands, hair, clothing and other objects out of the vicinity of the pen carriage, grit rollers and loaded media.
- To prevent operator injury and poor cutting results, be careful not to allow hands, hair, clothing or other foreign objects to become entangled with the pen carriage or loaded media while the plotter is operating.



Machine Caution Label

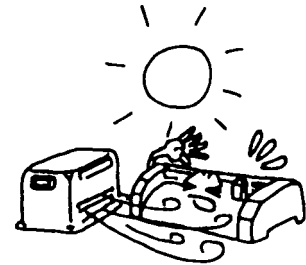
The machine's Caution Label is located on the top cover.



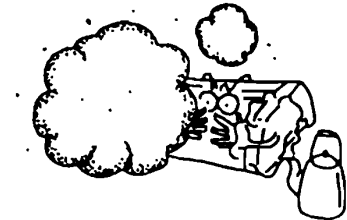
Notes on Working Environment

Be sure to observe the following regarding the working environment of your plotter:

- Avoid use or storage of the plotter in locations subject to direct sunlight or the direct draft from air-conditioning.



- Avoid locations which are extremely dusty.

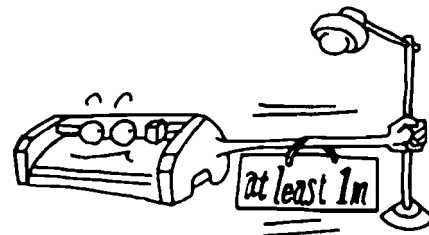


- Prior to cutting, ensure that no obstacles are placed in the vicinity of the pen carriage or loaded media.



CAUTION: Impeded movement of the pen carriage or loaded media may prevent accurate cutting, or may trigger the position alarm to reset the system or system overload. An overloaded system triggers the product's circuit protection. Should the system overload, causing the power to shut down, turn off the power switch and unplug the power cord. Wait 5 to 10 minutes then reconnect the power cord and turn on the system. For more information, see **Test Modes and Troubleshooting**.

To prevent malfunctions of the plotter's sensors, position the plotter at least one meter (3 feet) away from fluorescent lamps, electric lamps and any other source of indoor illumination.



Notes on Use

Be sure to observe the following on the use of your plotter:

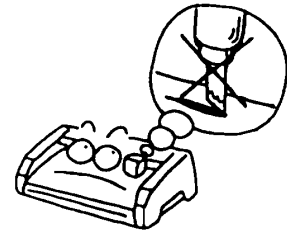


CAUTION: Make sure your computer and power sources are adequately grounded (the RS-232 interface cable should meet the CCITT V24, EIA RS-232 standards. Graphtec's RS-232 serial interface cable conforms to the EIA standard). Inadequate grounding may result in severe damage to your plotter or computer and constitute misuse of the plotter.

- Never lubricate the plotter mechanisms, this will result in plotter malfunction.



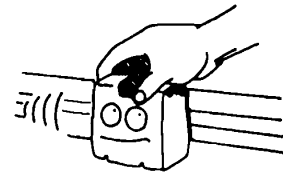
- To avoid scratching the cutting mat, ensure that the cutter pen blade is not excessively extended.



- Do not touch the moving parts of the plotter while it is operating.



- When manually moving the pen carriage to load the media, be sure to move the carriage *slowly*.



CAUTION: Do not unplug or plug in the USB connector when the plotter is working or you will lose data when the computer restores the USB directory.

Daily Maintenance

During the course of daily plotter operation, be sure to observe the following precautions:

- Never lubricate the mechanisms of the plotter.
- Clean the plotter's casing using a dry cloth that has been moistened in a neutral detergent diluted with water. Never use thinner, benzene, alcohol, or similar solvents to clean the casings; they will damage the casing's finish.
- Clean the cutting mat using a dry cloth. In case of stubborn stains, use a cloth that has been moistened in alcohol or in a neutral detergent diluted with water.
- Clean the plotter's paper sensors using a cloth moistened in a neutral detergent diluted with water. Never use thinner, benzene, alcohol, or similar solvents to clean the sensors; cleaners such as these will damage the sensors.

Storing the Plotter

When your plotter is not in use, be sure to observe the following points:

- Remove the pen attached to the penholder
- Cover the plotter with a cloth to protect it from dust and dirt
- Do not store the plotter in direct sunlight or in high temperatures

Chapter 2: Out of the Box

This chapter describes plotter nomenclature and how to install your plotter.

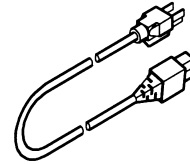
Checking the Contents

After unpacking your plotter, check that all of the standard accessories shown below are present. If any accessory is missing, contact your sales representative or the nearest Graphtec dealer.

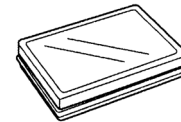
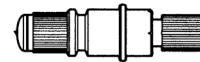
Accessories

The Stand Kit is an option for the FC5100A-75 and is standard for the FC5100A-100, FC5100A-130 and FC5100A-150 cutters.

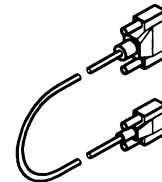
Power cord. The configuration pictured may differ from the actual cord supplied.



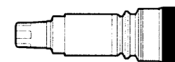
Cutter Pen Set. Cutter holder PHP32-CB09N with two CB09UA cutter blades.



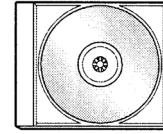
RS-232 cable with adapter (US market only).



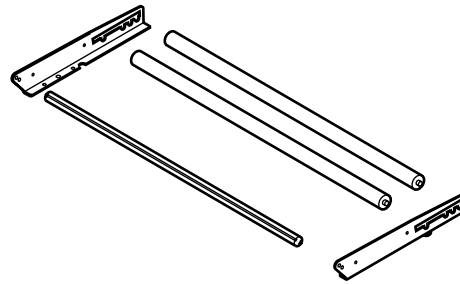
Black water-based fiber-tip pen (KF552-BK-P).



User's manual



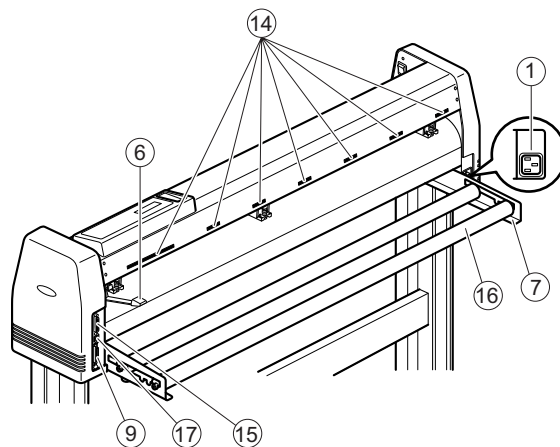
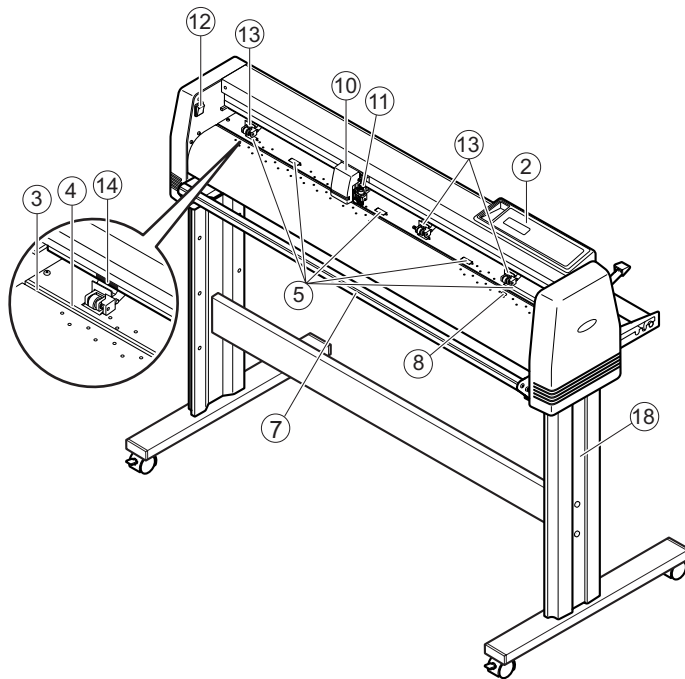
Accuload™ System components.



Nomenclature

- 1 **AC Line Inlet:** Inlet where the power cord is connected.
- 2 **Control Panel:** Used to access various plotter functions.
- 3 **Cutting Channel:** A channel running along the cutting mat area. Used to reduce pouncing tool wear.
- 4 **Cutting Mat:** A black strip placed under the cutting area. Used to reduce cutting blade wear.
- 5 **Grit Rollers:** Metallic rollers which have a file-like surface.
- 6 **Media Set Lever:** Used to raise or lower the push rollers during loading or unloading media.
- 7 **Accuload™:** Used to carry rolled media and ensure its proper rotation.
- 8 **Paper Sensors:** The front sensor is used to sense the leading edge of the media. The rear sensor is used to sense the trailing edge of the media.
- 9 **Parallel Interface Connector:** Used to connect the plotter to the computer with a Centronics-compatible parallel interface cable.
- 10 **Pen Carriage:** Moves the pen across the media during cutting or plotting.
- 11 **Pen Holder:** Holds the pen onto the pen carriage.
- 12 **Power Switch:** Used to turn the plotter on and off.
- 13 **Pinch Rollers:** Black rubber rollers that push the media against the grit rollers.

- 14 **Roller Location Guide:** Yellow markings on the rail and rear side of the top cover that show the position of each grit roller. Use these guides as an aid in locating the push rollers and in locating the media roll on the stock roller.
- 15 **Serial Interface Connector:** Used to connect the plotter to the computer with a RS-232 serial interface cable.
- 16 **Stock Rollers:** Area of the media stoker where the media is mounted.
- 17 **USB Connector:** Used to connect the plotter to the computer with a USB interface cable.
- 18 **Stand:** Used to make the plotter more portable and free-up counter space.

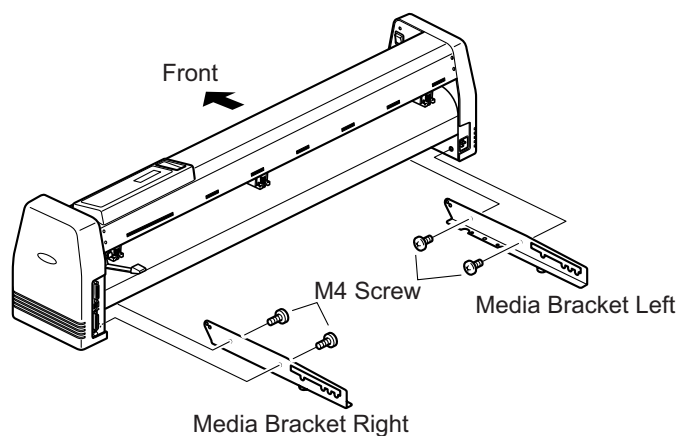


Installing the Accuload System

The Accuload™ system consists of two media brackets, two stock rollers and one media alignment bar.

Installation procedure:

- 1 Place the right media bracket against the inside surface of the plotter's side box (right).



- 2 Insert an M4 screw in the second hole from the front side of the plotter.

NOTE: Do not over tighten. The bracket should rotate easily.

NOTE: When attaching the bracket onto the cutter, use the foam shipping cover to protect the cutter.

CAUTION: Do not lay the cutter on its back side, this may damage the Media Set Lever.

- 3 Insert an M4 screw in the third hole from the front side of the plotter.

4 Secure the first screw.

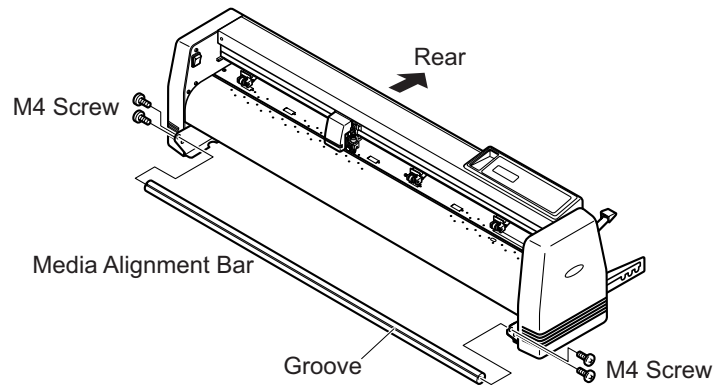
5 Secure the second screw.

6 Repeat steps 1-5 with the left Media Bracket.

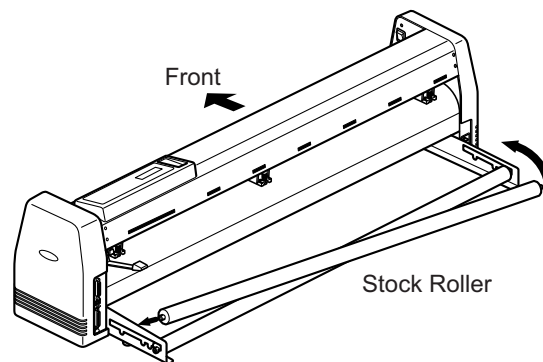
- 7 Place the media alignment bar in between the tabs of the media brackets that protrude from the front side of the plotter.



- 8 Secure the media alignment bar to the tabs at both ends with M4 screws.



- 9 Install the stock rollers into the holes on the rear side of the media brackets.



NOTE: Be sure to tighten *all* the screws to ensure accurate media loading. The Accu-load™ system may not function properly if even one of the screws is loose.

NOTE: Be sure to place the plotter on an acceptable work surface. Refer to dimensions below:

FC5100A-75: 45 inches (114cm) wide by 19 inches (48cm) deep.

FC5100A-100: 57 inches (144cm) wide by 19 inches (48cm) deep.

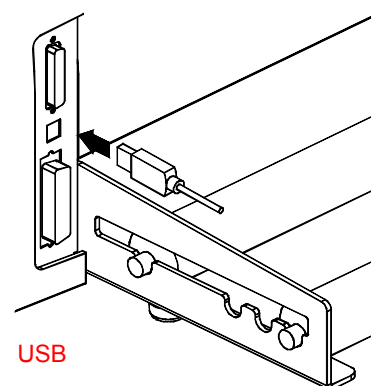
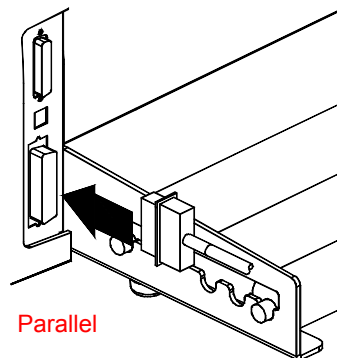
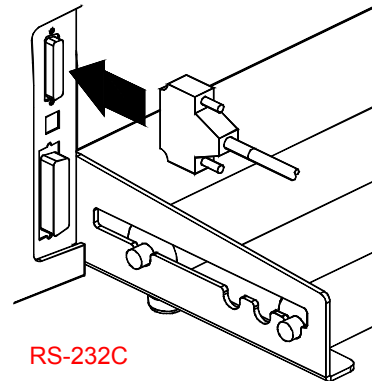
FC5100A-130: 67 inches (170cm) wide by 19 inches (48cm) deep.

FC5100A-150: 73 inches (186cm) wide by 19 inches (48cm) deep.

Connecting the Plotter

Connecting to the Computer

The FC5100A Plotter is equipped with an RS-232 Serial Interface Cable in the accessory kit.



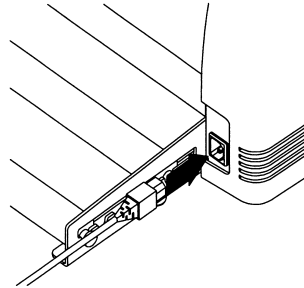
1 Connect the 25-pin connector to the RS232-C connector on the plotter and tighten the screws. If you are using a Centronics-compatible parallel interface cable, connect the 36-pin connector to the Parallel connector on the plotter and lock the levers. If you are using a USB connector, connect the connector to the USB connector on the plotter.

2 Connect the 9-pin connector to the connector on the computer COM port and tighten the screws. If your computer has a 25-pin connector port, use the 9-pin to 25-pin adapter that is supplied in the accessory kit.

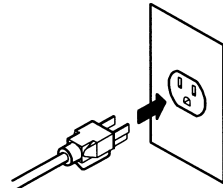
Connecting to the Power

The FC5100A Plotter is equipped with a Power Cord in the accessory kit.

- 1 Connect the provided power cord to the AC inlet of the plotter.



- 2 Connect the other end of the power cord to an electrical socket of the rated supply voltage.



Power to the Plotter

To turn on the plotter, perform the following steps:

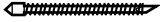




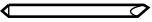

- 1 Make sure that the plotter is turned off (the "O" side of the POWER switch is depressed).
- 2 Connect the plotter to a computer and then configure your software application to the desired interface conditions, (if the RS-232-C serial interface is used), command mode and programmable resolution.
- 3 Connect one end of the provided power cord to the plotter's AC line inlet then connect the other end of the power cord to an electrical socket of the rated supply voltage. The plotter's power supply accepts multi-voltage (100VAC to 240VAC) without changing switches.
- 4 Turn on the computer.
- 5 Turn on the plotter by depressing the "I" side of the POWER switch.



Chapter 3: Cutters and Holders

This chapter describes the different cutters and their uses.

Blade Application and Features

Blade part no. and type	Diameter and blade offset value	Plunger part no.	Applications and features
CB09UA (supersteel) 	0.9 mm 0.45	PHP32-CB09N or PHP32-CB09	Standard blade for cutting color adhesive media. Suitable for cutting media up to 0.25 mm thick. Maximum cutting distance of approximately 4000 m.
CB15U (supersteel) 	1.5 mm 0.75	PHP32-CB15N or PHP32-CB15	For cutting media which is too thick for the CB09UA blade to handle. Suitable for cutting media from 0.25 mm to 0.5 mm thick.
CB15UA (supersteel) 	1.5 mm 0.75	PHP32-CB15N	For cutting high intensity reflective media.
CB15UB (supersteel) 	1.5 mm 0.75	PHP32-CB15N	For cutting small characters on mono-vinyl chloride media. Suitable for cutting small size characters that are less than 10mm.
CB15U-K30 (supersteel) 	1.5 mm 0.75	PHP32-CB15N or PHP32-CB15	For cutting sandblast rubber. The sharply angled point provides a longer cutting edge. Suitable for cutting material from 0.05 mm to 1.5 mm thick.
CB15-10C (ceramic) 	1.5 mm 0.50	PHP31-CB15	This is the hardest blade, but may chip or shatter if dropped or subjected to impact. Suitable for cutting material up to 0.05 mm thick.
CB15-05S (sapphire) 	1.5 mm 0.25	PHP31-CB15	For cutting masking media. Suitable for cutting material up to 0.05 mm thick.

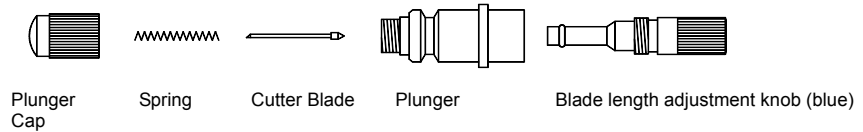
Cutter Pen Nomenclature



WARNING: To avoid bodily injury, handle cutter blades with care.

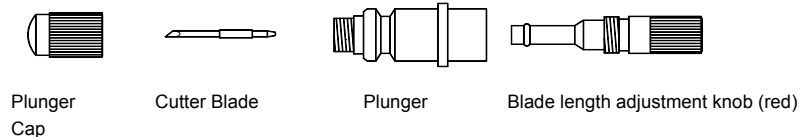
PHP32-CB09N Cutter Pen

(For cutter blades of 0.9 mm diameter)



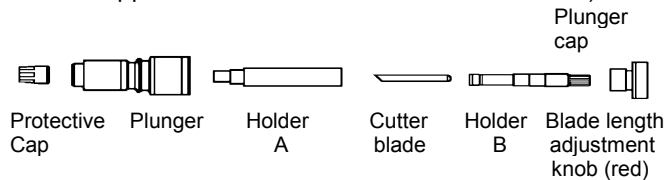
PHP32-CB15N Cutter Pen

(For supersteel cutter blades of 1.5 mm diameter)



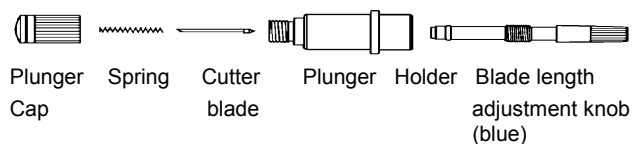
PHP31-CB15 Cutter Pen

(For ceramic and sapphire cutter blades of 1.5 mm diameter)



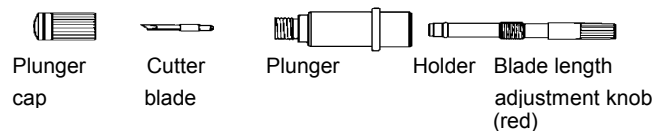
PHP32-CB09 Cutter Pen

(For cutter blades of 0.9 mm diameter)



PHP32-CB15 Cutter Pen

(For supersteel cutter blades of 1.5 mm diameter)



Replacing the Cutter Blade



WARNING: Will cause injury to the operator.

Various types of plungers are available which correspond to the diameter and type of blade used. Check the cutter blade you are going to use and its appropriate cutter offset value against the table below:

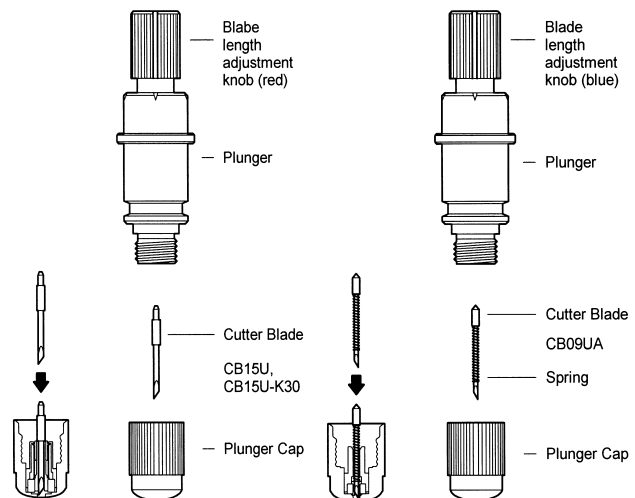
Cutter Offset Value Settings

Cutter pen	Color classification	Compatible blade types	Blade Material	Cutter offset values
PHP32-CB09N	Blue	CB09UA	Supersteel	18 ± 2
PHP32-CB15N	Red	CB15U CB15U-K30 CB15UB	Supersteel Supersteel Supersteel	28 ± 2 28 ± 2 5 ± 5
PHP31-CB15	Red	CB15-10C CB15-05S	Ceramic Sapphire	18 ± 2 9 ± 2

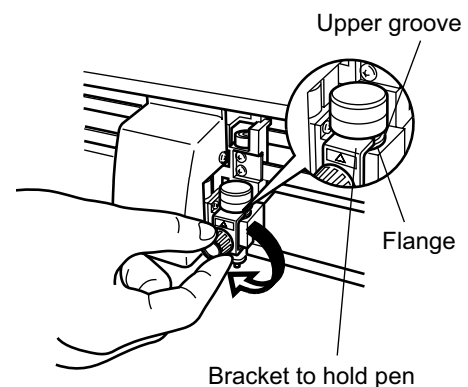
Replacing Super-steel Blades

For the PHP32-CB09(N) & PHP32-CB15(N):

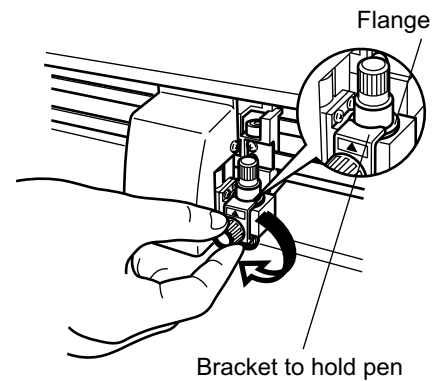
- 1 Turn the plunger cap counterclockwise.
- 2 Remove the plunger cap.
- 3 Remove the blade and spring from the plunger cap.
- 4 Stand the cap upright.
- 5 Insert the new blade and spring into the hole.
- 6 Reattach cap to the plunger.



CAUTION: The pen has two flanges and must be fully seated (the pen holder is engaged on the second flange) before tightening the screw.



CAUTION: The cutter must be properly seated (the pen holder is engaged on the flange) before tightening the screw.



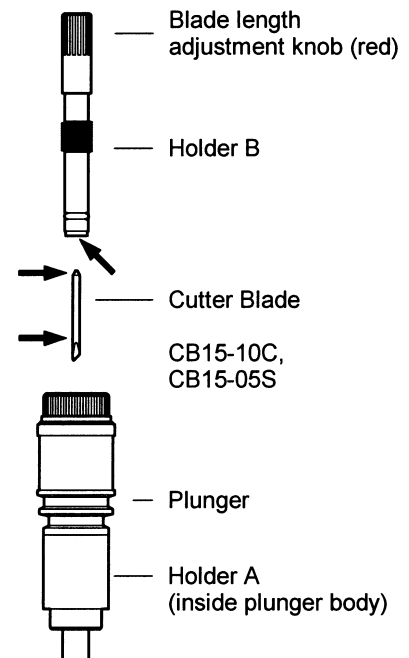
Replacing Ceramic & Sapphire Blades

For the PHP31-CB15:

- 1 Turn the blade length adjustment knob counterclockwise.
- 2 Remove Holder B.
- 3 Remove the blade from Holder A.
- 4 Point the tip of Holder A downward.
- 5 Insert new blade.
- 6 Make sure blade is inserted straight. Gently tap the plunger to correct angled blades.
- 7 Point the tip of Holder A downward.
- 8 Attach the holder cap.
- 9 Turn the blade length adjustment knob clockwise until the blade tip is visible.

NOTE: If the blade does not rotate smoothly or the blade falls off after attaching the cutter pen to the pen carriage, the inside of the holder is insufficiently lubricated. Apply the provided grease to the three (3) points indicated by arrows in the figure above.

- NOTE:** The blades can also be replaced from the front of the plunger.
1. Turn the blade adjustment knob fully clockwise.
 2. Remove the blade from the front of the plunger.
 3. Replace the blade.
 4. Turn the blade adjustment knob counterclockwise.



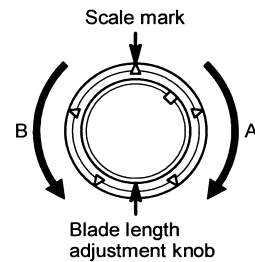
Blade Length



CAUTION: Make sure to correctly adjust the blade length. If the blade length is too long for the thickness of the media being used, you may cut through the cutting mat and damage your plotter.

Adjusting the Blade Length

- 1 Retract the blade by turning the blade adjustment knob in a counterclockwise direction (Direction B) until the blade tip is aligned with the tip of the cutter pen, then extend the blade by turning the blade adjustment knob in a clockwise direction (Direction A) until the blade tip reaches a suitable length.
- 2 Observe the scale on the plunger cap to determine how far to move the blade. When the knob is turned the distance of one scale unit, the blade moves 0.1 mm. One full turn moves the blade 0.5 mm.

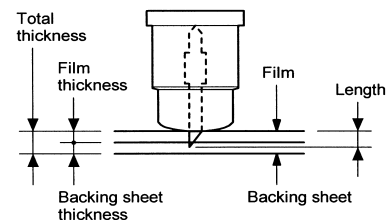


Obtaining the Correct Blade Length

The blade length should never be greater than the combined thickness of the media and its backing sheet.

If the media thickness cannot be accurately determined, adjust the blade length gradually until only traces of the blade appear on the backing sheet when a cutting test is executed.

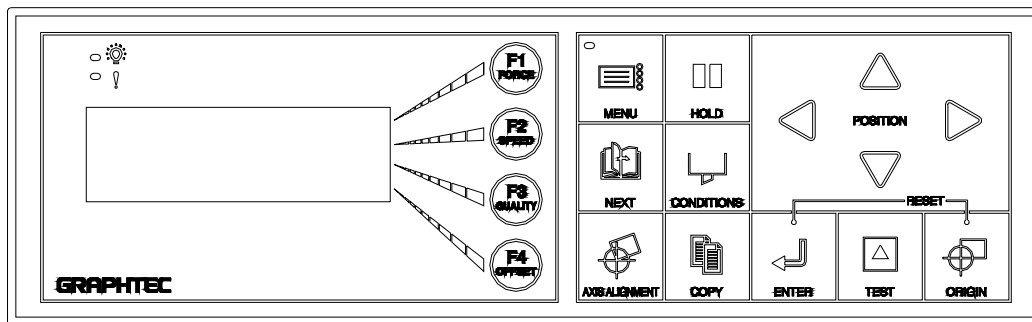
For more information about the cutting test, see “Running a Cutting Test.”



Chapter 4: Preparing to Cut

This chapter describes how to use the control panel, load the media, select and install the appropriate cutting tools, and to achieve the best cutting results.

Control Panel



Indicator Lamps



The POWER lamp remains lit (green) while the plotter is on.

The PROCESSING INDICATOR lamp lights green when the cutting data goes beyond the effective cutting area.

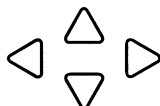
Function Keys



These four keys [F1, F2, F3 and F4] have functions which change as each menu changes. Depending on the menu being displayed, these keys are used to:

- Load a group of cutting conditions retained in the plotter's memory
- Select the desired submenu
- Select the desired parameters

Position Keys



All four keys are used to move the pen carriage when setting a function that requires the specification of a coordinate position. The moving speed of the pen carriage can be controlled in two levels by changing pressure applied to the position keys.

- Used to raise the displayed numeric setting of a function.
- Used to select the numeric setting of a function.
- Used to select the pen type when setting a group of cutting conditions.
- Used to shift the cursor when setting a numeric value for a function.

Menu Keys



Press MENU CONTROL to access the MENU mode to set functions on the control panels (green lamp lights). Press MENU CONTROL again to cancel MENU mode.

The plotter continues to store data from the computer in the plotter's receive buffer although the cutting or plotting operation is temporarily suspended.



Press ENTER after setting a function on the control panel to register your setting. The cutting area can also be displayed by pressing the ENTER key in ready status.



To reset the plotter, press ENTER and ORIGIN together while in the MENU mode.



Press ORIGIN to move the origin point. **See the section ORIGIN in Advanced Functions and Settings for details.**



Press COPY to repeat the cutting operation defined by the data in the plotter's receive buffer. **See the section COPY in Advanced Functions and Settings for details.**



Press CONDITION to set the four groups of cutting conditions retained in the plotter's internal memory. **See the section Setting Conditions in this chapter for details.**



CAUTION: Excessive speed and quality parameters in the CONDITION mode may trigger the position alarm to reset the system or cause system overload. An overloaded system triggers the product's circuit protection.

Should the system overload, causing the power to shut down, turn off the power switch and unplug the power cord. Wait 5 to 10 minutes, then reconnect the power and turn on the system. For more information, see **Test Modes and Troubleshooting**.



Press TEST to run a cutting test to check whether the currently selected cutting conditions are compatible with the media loaded. **See Running Cutter Tests in this chapter for details.**



Press NEXT to scroll through the functions of the control panel or to return to the previous menu with no registration of the setting.



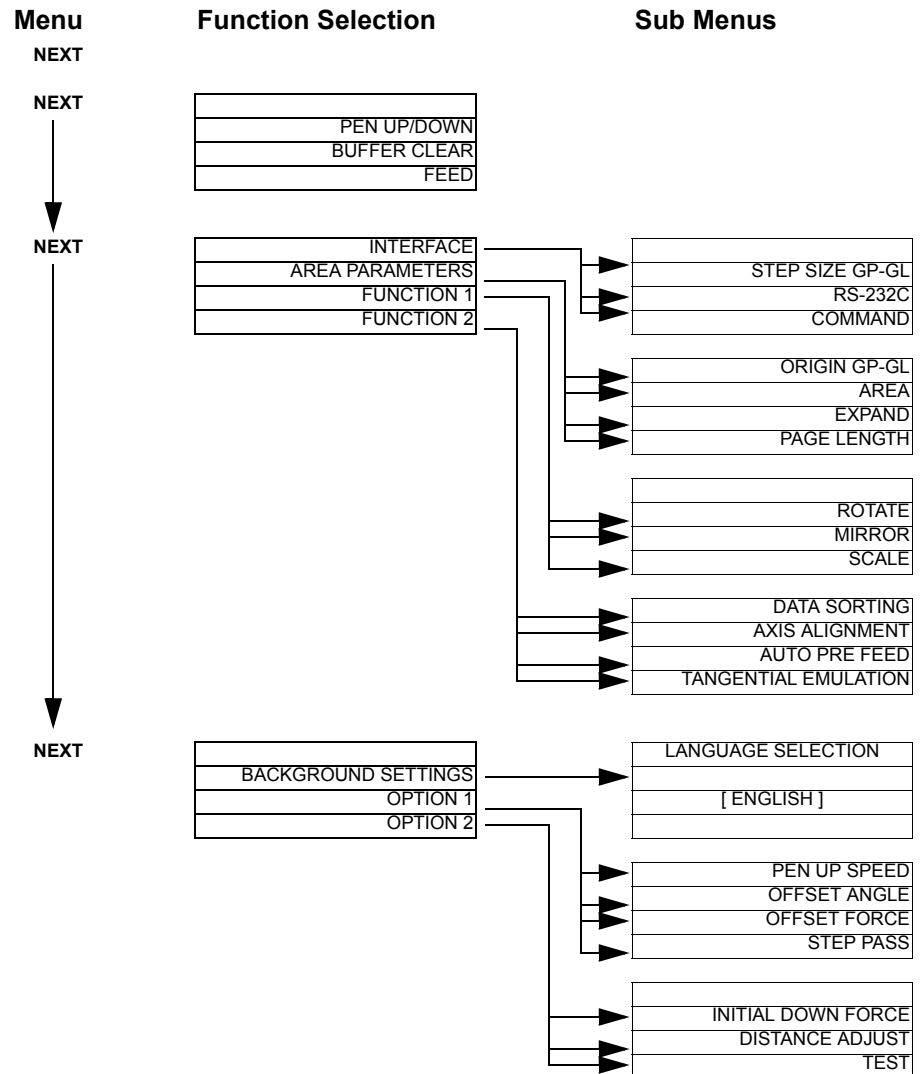
Press HOLD to temporarily suspend cutting or plotting. While the cutter is suspended, the media set lever can be lowered to reset the media, if necessary. The plotter is *not* initialized, but is ready to continue or quit the suspended job.



Press AXIS ALIGN to access the axis alignment adjustment mode and the auto registration mark mode. **See the sections Axis Alignment and Auto Reg. Mark in Advanced Functions and Settings for details.**

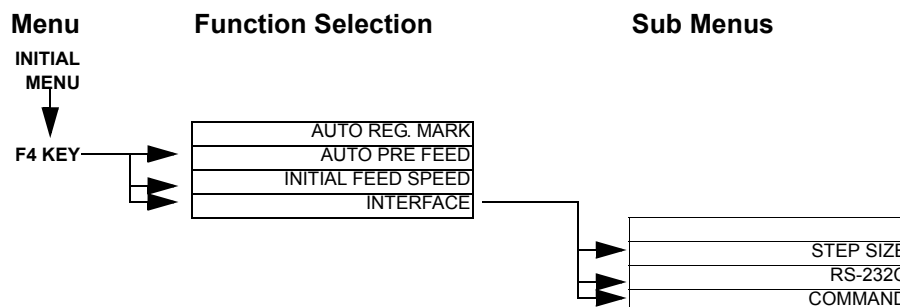
Selecting a Function Menu

When the plotter is in MENU mode (the MENU lamp is lit), each of the functions listed below in the “Function Selection” column can be accessed by pressing the NEXT key until the desired menu appears and then pressing the select key indicated by a box.



Initial Menu

When the paper set lever is lowered, the INITIAL menu appears on the LCD.



Setting the Multilanguage Display

Your plotter's display can be set to one of 12 different languages. To select the language:

Method 1:

- Press the MENU key to select MENU MODE.
- Press the NEXT key until you get to BACKGROUND SETTING menu.
- Press the F2 key to select BACKGROUND SETTING menu; the LANGUAGE SELECTION menu appears.
- Press the UP and DOWN ARROW keys to scroll through the languages (Danish, Dutch, English, French, German, Hungarian, Italian, Japanese, Norwegian, Portuguese, Spanish and Swedish).
- Press the ENTER key to select the desired language, the next menu appears with the newly selected language.
- Press the MENU key to cancel MENU MODE.

Method 2:

- Turn the power on while pressing the DOWN ARROW key; the Menu selection display appears.
- Press the UP and DOWN ARROW keys to scroll through the languages (Danish, Dutch, English, French, German, Hungarian, Italian, Japanese, Norwegian, Portuguese, Spanish and Swedish).
- Press the ENTER key to select the desired language and then turn the power off and then on again.

Turn on the Plotter

- Check to make sure that the pen carriage is not located near the pinch rollers so that it does not interfere with the pinch roller settings.
- After checking that both ends of the plotter's power cord are securely connected, turn on the plotter by pressing the "I" side of the POWER switch.
- The control panel's POWER lamp lights (green) and the plotter initializes. The MAIN menu is displayed. This screen displays the firmware's version number and selected command set. The screen displays either GL or HL. If GL is displayed the GP-GL command set is selected. If HL is displayed the HP-GL command set is selected.

```
V 5.00 GL
Buffer RAM Checking
```

If you have already loaded media, the MEDIA TYPE menu appears.

```
ROLL-1>
ROLL-2>
SHEET>
CONTINUE>
```



NOTE: CONTINUE does not appear in the MEDIA TYPE menu during the first initialization after turning the power on. All the menus in this section include CONTINUE assuming that it is in the *second* or a later initialization.

- If no media is loaded, you are prompted to do so.

```
LOAD MEDIA!

INITIAL MENU>
```

- Press the F4 key to change parameters such as initial feed speed or interface settings.

```
ROLL-1>
ROLL-2>
SHEET>
CONTINUE>
```



NOTE: If you are using media that tends to skew while cutting, the initial feed speed setting should be set to SLOW.

The MEDIA TYPE menu appears when the media set lever is raised to secure the loaded media.

Loading Media

This section describes the steps for loading media in the plotter. Note that the media can be loaded either before or after turning on the plotter.



CAUTION: Be sure to move the pen carriage slowly. Moving the pen carriage quickly may damage the plotter.

NOTE: If necessary, *slowly* move the pen carriage out of the way while the power is off. After the first initialization, use the arrow keys to move the pen carriage.

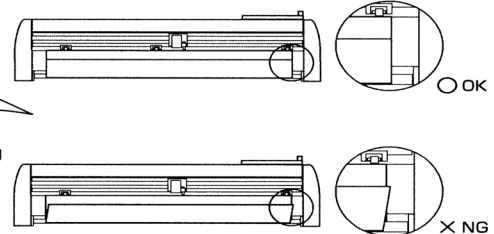
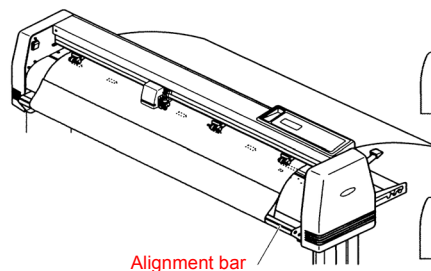
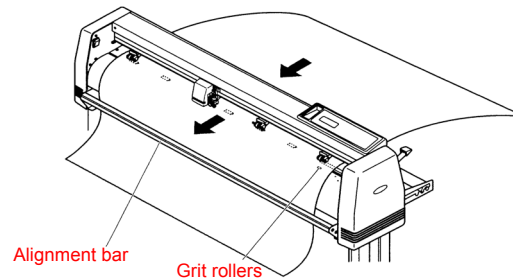
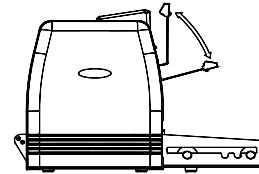
Sheet Media



CAUTION: To avoid damaging the cutting mat, make sure to set the media type to SHEET when using sheet media. Whenever possible, use sheet media of rectangular shape.

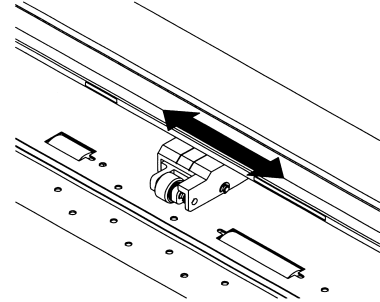
To load sheet media:

- Lower the media set lever to raise the pinch rollers.
- Load the media in the plotter. Use the yellow markings to locate the grit rollers. Place the media so that its edges align with the grit rollers.
- Wrap media behind and around the media alignment shaft. While keeping tension on the vinyl, adjust the vinyl edges so that both edges match accurately.

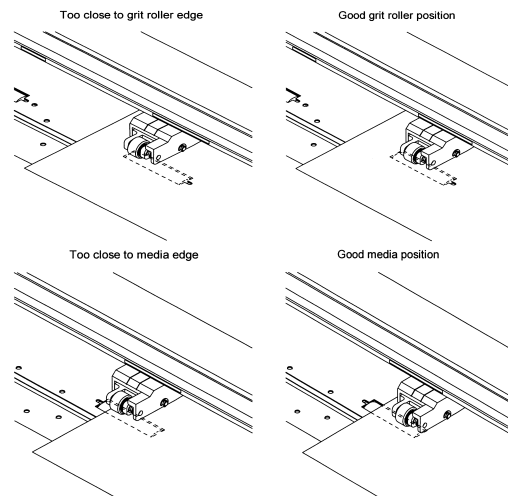


To adjust the pinch roller positions:

- Position the left and right pinch rollers to correspond with the width of the media.

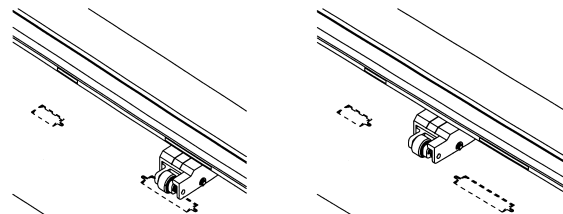


- When moving the media to the left or right be sure to move the pinch rollers as required to hold down the media within the appropriate range.
- Be sure to position the pinch rollers so that they are not located right at the edges of the media or grit rollers.
- The FC5100A-100, FC-5100A-130, and FC5100A-150 plotters have a middle pinch roller that should be positioned in the center of the media.



CAUTION: The location of the middle pinch roller on the FC5100A-100, FC5100A-130, and FC5100A-150 cutting plotters affects the cutter's performance.

- If the middle pinch roller is not positioned in the center range of the media *and* located over the grit roller, the media will not feed evenly.



Good Pinch Roller Position

Poor Pinch Roller Position

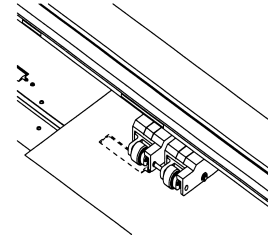


CAUTION: When cutting narrow media that is 10 inches or less, the position of the left and middle pinch rollers will affect the performance of the FC5100A-100, FC5100A-130, and FC5100A-150 cutting plotters. The position of the narrow media will affect the media sensors.

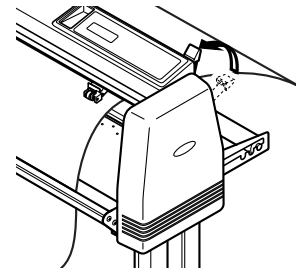
CAUTION: Always load media from the largest grit roller so that the photo sensor can sense the media.

To load sheet media:

- Lower the media set lever to raise the pinch rollers.
- Move the left pinch roller next to the middle pinch roller.
- Move both the left and middle pinch rollers together until they reach the right stop.
- Load the media so that the left side of the narrow media is under the left pinch roller.
- Adjust the right pinch roller over the right side of the media.
- Raise the media set lever to lower the pinch rollers.
- Lower the pinch rollers (raise the lever) and pull the vinyl out from the alignment bar. Turn on the power if it is off.
- Plotter performs the initialization routine.



Good Pinch Roller Position



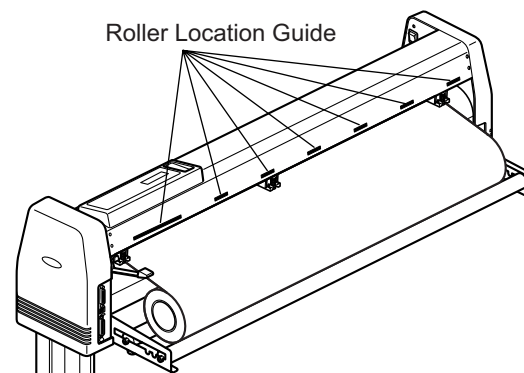
V 5.00 GL
Buffer RAM Checking

- Loading of the media is complete.

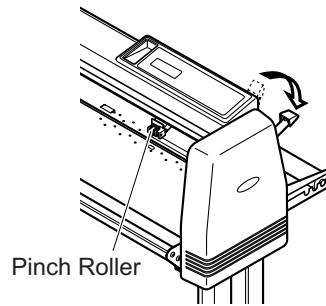
Roll Media

To load rolled media:

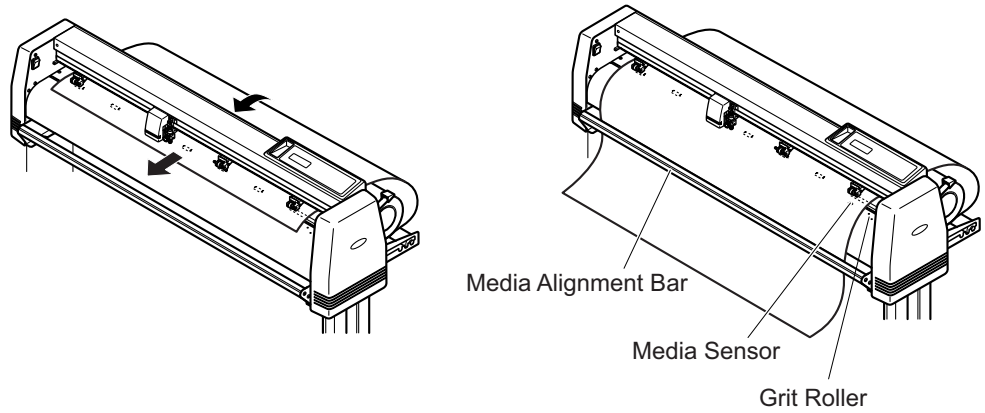
- Place the roll of media on the media stocker. Use the yellow markings to locate the grit rollers. Place the media so that its edges align with the grit rollers.



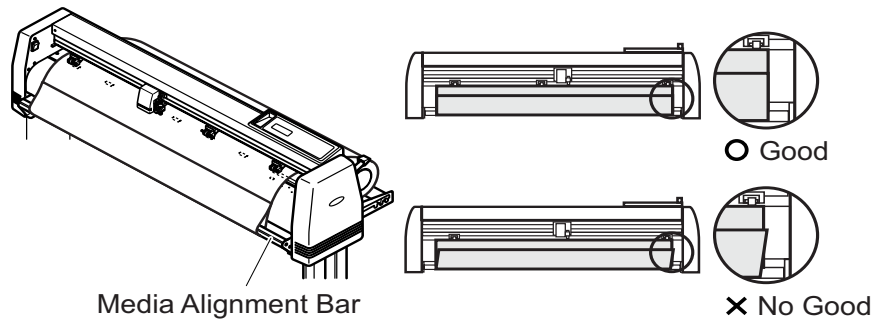
- Lower the media set lever to raise the pinch rollers.



- Load the media in the plotter as shown.

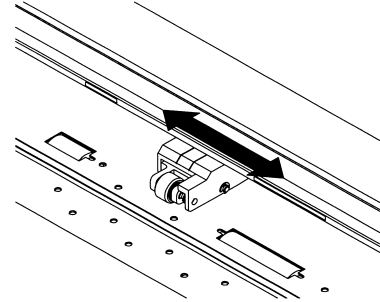


- Wrap media behind and around the media alignment shaft. While keeping tension on the vinyl, adjust the edges of the vinyl so that both edges match accurately.



To adjust the pinch roller positions:

- Position the left and right pinch rollers to correspond with the width of the media.

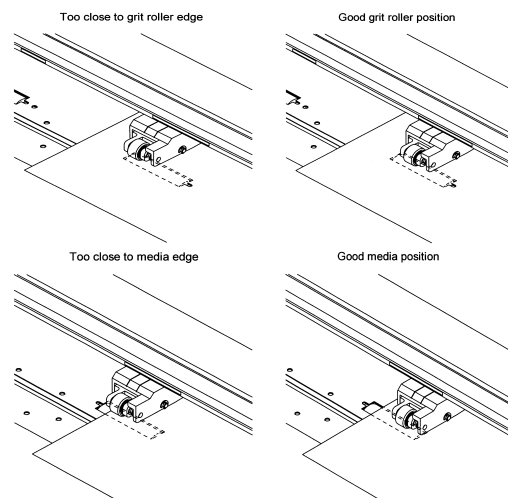


- When moving the media to the left or right be sure to move the roll as required to ensure that no slack develops in the media.

- When moving the media to the left or right be sure to move the pinch rollers as required to hold down the media within the appropriate range.

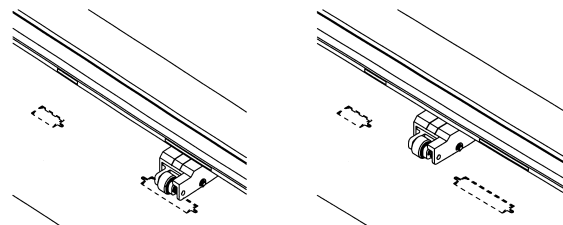
- Be sure to position the pinch rollers so that they are not located right at the edges of the media or grit rollers.

- The FC5100A-100, FC5100A-130, and FC5100A-150 cutting plotters have a middle pinch roller that should be positioned in the center of the media.



CAUTION: The location of the middle pinch roller on the FC5100A-100, FC5100A-130, and FC5100A-150 cutting plotters affects the cutter's performance.

- If the middle pinch roller is not positioned in the center range of the media *and* located over the grit roller, the media will not feed evenly.



Good Pinch Roller Position

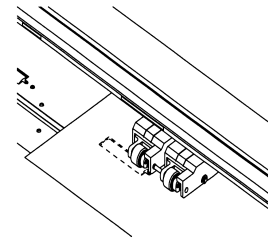
Poor Pinch Roller Position



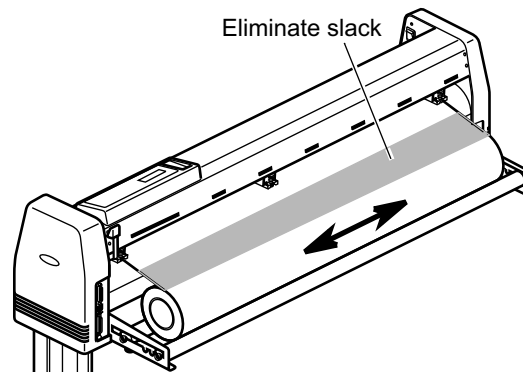
CAUTION: When cutting narrow media that is 10 inches or less, the position of the left and middle pinch rollers will affect the performance of the FC5100A-100, FC5100A-130, and FC5100A-150 cutting plotters.

- Lower the media set lever to raise the pinch rollers.

- Move the left pinch roller next to the middle pinch roller.
- Move both the left and middle pinch rollers together until they reach the right stop.
- Load the media so that the left side of the narrow media is under the left pinch roller.
- Adjust the right pinch roller over the right side of the media.
- Raise the media set lever to lower the pinch rollers.
- Lower the pinch rollers (raise the lever) and pull the vinyl out from the alignment bar.
- Re-adjust the position of the media roll as necessary to eliminate slack between the roll and pinch rollers.



Good Pinch Roller Position



NOTE: The length of the media at the front of the plotter should be sufficient to completely cover the paper sensor. If the front edge extends too far when you have pulled the media taut, wind the media back onto the roll.

Hold the media down:

- Check that there is no slack in the media between the roll and the front edge; reposition the media roll if necessary.
- Turn the roll of media so that you can pull out the amount required for your cutting operation. (You can also use the plotter's feed function to feed out the specified amount of media).
- Before you begin a long-length cutting operation, pull out the approximate length of media which will be required for your cutting operation. Let the media

sit for 30 minutes to become acclimated to the environment before starting the cutting operation. Next, use the plotter's feed function to feed out the specified amount of media needed for your cutting operation.

- Turn on the power if it is off.
- Plotter performs the initialization routine.

```
V 5.00 GL  
Buffer RAM Checking
```

- Loading of the media is complete.

Select the Media Type



CAUTION: To avoid damaging the cutting mat, be sure to set the media type to SHEET when using sheet media. Whenever possible, use sheet media of rectangular shape.

If you have already loaded the media, the MEDIA TYPE menu appears. Select the media type.

```

ROLL-1>
ROLL-2>
SHEET>
CONTINUE>

```

ROLL-1

Roll-1 detects the width and leading edge of roll media. The coordinate origin is initialized with respect to the media's leading edge.

Press the F1 key to select ROLL-1.

```

ROLL-1>
ROLL-2>
SHEET>
CONTINUE>

```

The initialization routine is executed to determine the paper size and origin point.

CUT AREA shows the effective cut area that is determined by the position of the pinch roller and the page length setting.

```

CUT AREA
X=2000mm Y=730mm

```

ROLL-2

ROLL-2 detects the width but the leading edge of the roll media is not detected, and the coordinate origin is initialized with respect to the cutting mat.

Press the F2 key to select ROLL-2

```

ROLL-1>
ROLL-2>
SHEET>
CONTINUE>

```

The initialization routine is executed to determine the paper size and origin point.

CUT AREA shows the effective cut area that is determined by the position of the pinch roller and the page length setting.

```
CUT AREA
X=2000mm Y=730mm
```



NOTE: After initializing the plotter by choosing ROLL-1 or ROLL-2, use the FEED function to pre-feed the length of media needed for the job. This embosses the grit roller pattern onto the media to help prevent media skewing or excessive system torque which triggers the position alarm. The position alarm resets the system, or if the system is overloaded, it triggers the product's circuit protection causing the power to shut down.

Should the system overload causing the power to shut down, turn off the power switch and unplug the power cord. Wait 5 to 10 minutes, reconnect the power and turn on the system. For more information, see *Chapter 6 Test Modes and Troubleshooting*.

SHEET

SHEET detects the width and both the leading and trailing edges of the media.

Press the F3 key to select SHEET

```
ROLL-1>
ROLL-2>
SHEET>
CONTINUE>
```

The initialization routine is executed to determine the paper size and origin point.

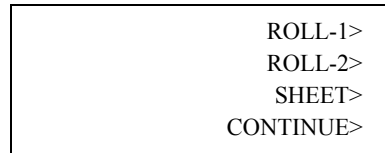
CUT AREA shows the effective cut area that is determined by the position of the pinch roller and the page length setting.

```
CUT AREA
X= 830mm Y= 730mm
```

CONTINUE

The CONTINUE function is useful and will save time if you intend to cut a large quantity of the same-size media. This selection is available from the *second* initialization after turning on the power. CONTINUE does *not* appear in the media selection menu on the first initialization after turning on the power. The plotter assumes that the current media is the same size as the last media that was loaded on the plotter and does not detect the media's edges. To use CONTINUE effectively, set the media so that the current pen carriage position can be located at the same place as it was on the last media.

Press the F4 key to select CONTINUE

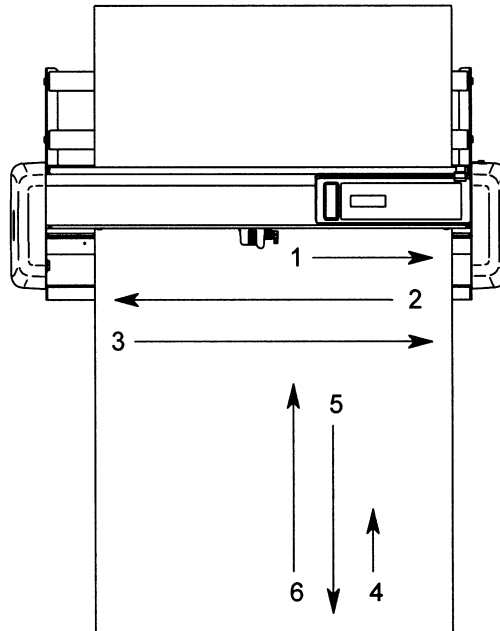


No sensing operations are performed. Set the various functions of the plotter as desired.



NOTE: Make sure to set the correct cutting conditions to suit the cutter blade and media being used. For details see **Setting Conditions**.

Initializing Routine



ROLL-1

- 1 During initialization, the pen carriage moves right until it detects the mechanical home position.
- 2 The pen carriage then moves left until it detects the left-hand side of the media edge.
- 3 It then returns to the right edge of the media.
- 4 The media is fed backwards until the media's leading edge is detected.

ROLL-2

- 1 During initialization, the pen carriage moves right until it detects the mechanical home position.
- 2 The pen carriage then moves left until it detects the left-hand side of the media edge.
- 3 It then returns to the right edge of the media.

SHEET

- 1 During initialization, the pen carriage moves right until it detects the mechanical home position.
- 2 The pen carriage then moves left until it detects the left-hand side of the media edge.
- 3 It then returns to the right edge of the media.
- 4 The media is fed backwards until the media's leading edge is detected.
- 5 The media is then fed forward until the media's trailing edge is found.
- 6 The media is fed backwards until the pen carriage locates the lower left position of the cutting area.

CONTINUE

CONTINUE does not perform initialization but begins plotting from the pen carriage's current position. Set the various functions of the plotter as desired.



NOTE: Make sure to set the correct cutting conditions to suit the cutter blade and media being used. For details see [Setting Conditions](#).

Setting Conditions

This function allows you to register eight different groups of conditions in the plotter's memory. These conditions greatly affect the finished quality of the cutting operation. The desired group can be quickly loaded by simply pressing the corresponding function key [F1] through [F4] on the control panel. Each key corresponds to two conditions. Press the key to switch from one condition to the other. Use the F1 key to toggle between CONDITION 1 and CONDITION 5. Use the F2 key to toggle between CONDITION 2 and CONDITION 6. Use the F3 key to toggle between CONDITION 3 and CONDITION 7. Use the F4 key to toggle between CONDITION 4 and CONDITION 8.

CONDITION 1 - To get the factory default setup conditions for the cutter, press the F1 key.

CONDITION 2 - To get the factory default setup conditions for the pen, press the F2 key.

CONDITION 3 - To get the factory default setup conditions for the cutter intermediate, press the F3 key.

CONDITION 4 - To get the factory default setup conditions for the cutter reflective, press the F4 key.

CONDITION 5 - To get the factory default setup conditions for the high intensity reflective, press the F1 key.

CONDITION 6 - To get the factory default setup conditions for the sandblast with tangential emulation turned off, press the F2 key. Using tangential emulation will give better results when cutting sandblast media. ***For more details see TANGENTIAL EMULATION.***

CONDITION 7 - To get the factory default setup conditions for a user-selected condition, press the F3 key.

CONDITION 8 - To get the factory default setup conditions for the pounce, press the F4 key.

NOTE: The parameters set within each of these conditions greatly affect the finished quality of cutting operations. The factory set default parameters for each of the eight conditions are a starting point for the user to fine tune the parameters of each condition.



Each group consists of four parameters as described below:

- **Cutting Force (Pen Pressure):** Sets the force to be applied by the cutter blade during cutting, the hole punching force during pouncing, and the plotter pen pressure during plotting.
- **Speed:** Sets the traveling speed of the lowered pen.
- **Quality:** Sets the acceleration rate of the pen during cutting or plotting. When you select a speed that is faster than 60, you cannot select quality. At that time an "xx" appears.
- **Cutter Offset:** Sets the cutter blade control factor that greatly affects the shape of corners. CUTTER OFFSET accesses parameters such as the tool type and the offset value. Select the tool you wish to use first, then set the value.

The following is a list of all eight conditions and their respective settings.

Condition	Comments	Tool	Force	Speed	Quality	Offset
1	Cutter	CB09Ux	14	30	4	0
2	Pen	PEN	14	60	4	
3	Cutter Immediate	CB09Ux	20	30	4	0
4	Cutter Reflective	CB015Ux	30	15	4	0
5	Cutter High Intensity Reflective	CB015Ux	38	15	4	0
6	Cutter Sandblast with Tangential Emulation turned off	CB015U-K30x	38	10	2	0
7	Other	OTHER	17	30	4	17
8	Pounce	POUNCE	12	30	4	1



NOTE: The selected conditions greatly affect the finished quality of cutting operations.



NOTE: Raising the SPEED and QUALITY values results in lower precision but reduced overall cutting time. This is useful when making test runs.



NOTE: Lowering the SPEED and QUALITY values results in high-precision but increased overall cutting time.

Select the Tool from the Menu

Press the function keys [F1] through [F4] corresponding to the number of the group whose registered tool you wish to change.

CONDITION 1	14
	30
READY	4
CB09Ux	0

- Press the CONDITION key to select the tool.
- Press the F4 key to select the tool you wish to use. A blinking cursor appears next to your choice.

SET	14
CONDITION 1	30
	4
CB09Ux	0 ■

- Press the RIGHT or LEFT ARROW key to scroll through the tool selection.
- Select one of the following cutter blades: CB09Ux, CB15-10Ux, CB15Ux, CB15U-K30x, CB15-10Cx, CB15-05Sx, CB15-10Ux, CB15UBx.

- Select OTHER when above preset values and their deviation ranges cannot cover the range needed for satisfactory results.
- Select PEN to use a plotter pen.
- Select POUNCE to use the pouncing pen.



NOTE: These tool names are actually the names of preset offset values, and each value can be changed within a range from -5 to +5.

NOTE: The suffix “x” represents any cutter suffix within the family. For example, select CB09Ux when using a CB09UA cutter.

NOTE: When you select POUNCE, the cutter offset refers to the spacing between the holes.

Press the ENTER key to select the desired tool.

TANGENTIAL mode

Beside the cutter blade selection noted above, you can select the tangential emulation mode to cover additional selection of media. **For details see *Tangential Emulation in Advanced Functions and Settings*.**

Cutter Conditions

- To change the setting of a group of conditions, press function keys [F1] through [F4] corresponding to the number of the group you wish to change. For example, press the F1 key to select CONDITION 1. If CONDITION 5 appears, then press the F1 key again to select CONDITION 1.
- Press the CONDITION key to access the condition menu.

SET	14
CONDITION 1	30
	4
CB09Ux	0

- Press the NEXT key to cancel the condition where you are currently set and return to the main menu.



NOTE: If the TANGENTIAL EMULATION mode is enabled for the condition number that you are currently working on, the overcut menu appears as soon as the ENTER key is pressed. Change the values, if necessary. *For details see *Tangential Emulation*.*

TO CHANGE THE CUTTER FORCE

- Press the F1 key to change FORCE. The blinking cursor indicates that you can change its setting.

SET	14	█
CONDITION 1	30	
	4	
CB09Ux	0	

- Press the UP or DOWN ARROW key to raise or lower the numeric value from 1 to 40.
- If you wish to change another parameter:
 - Press the F2 key to change SPEED.
 - Press the F3 key to change QUALITY.
 - Press the F4 key to change OFFSET.
- If all of the parameters are set, press the ENTER key to register your setting.

To CHANGE THE CUTTER SPEED

- Press the F2 key to change SPEED. The blinking cursor indicates that you can change its setting.

SET	14
CONDITION 1	30 ■
	4
CB09Ux	0

- Press the UP or DOWN ARROW key to raise or lower the numeric value from 1 to 100. [1 to 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 70, 80, 90, 100]
- If you wish to change another parameter:
 - Press the F1 key to change FORCE.
 - Press the F3 key to change QUALITY.
 - Press the F4 key to change OFFSET.
- If all of the parameters are set, press the ENTER key to register your setting.

To CHANGE THE CUTTER QUALITY

- Press the F3 key to change QUALITY. The blinking cursor indicates that you can change its setting.

SET	14
CONDITION 1	30
	4 ■
CB09Ux	0

- Press the UP or DOWN ARROW key to raise or lower the numeric value from 1 to 8. The smaller the value, the higher the quality. When you select a speed that is faster than 60, you cannot select quality. At that time an “xx” appears.
- If you wish to change another parameter:
 - Press the F1 key to change FORCE.
 - Press the F2 key to change SPEED.

- Press the F4 key to change OFFSET.
- If all of the parameters are set, press the ENTER key to register your setting.

TO CHANGE THE CUTTER OFFSET

- Press the F4 key to change OFFSET. The blinking cursor indicates that you can change its setting.

SET	14
CONDITION 1	30
	4
CB09Ux	0 ■

- Press the UP or DOWN ARROW key to raise or lower the numeric value from –5 to +5. *For more information, see **Running Cutting Test**.*
- If all of the parameters are set, press the ENTER key to register your setting.

FINE ADJUSTMENT

- 1 Set the blade type to OTHER to permit fine adjustment of the CUTTER OFFSET value.
- 2 While referring to the figures above, gradually adjust the cutter offset value while checking the results by running a cut test.

Running Cutting Tests



The TEST function allows you to check the suitability of your condition settings. If the test results are not satisfactory, adjust the settings as described in **Cutter Conditions**.

WARNING: The cutter pen starts moving as soon as a cutting test is selected. To avoid bodily injury and damage to the plotter, load the media before pressing the [TEST] key and keep your hands, face and other objects out of the vicinity of the cutting mat and media.

The cutter condition is critical to achieve the best cut quality and to increase the life of the blade. Since the cutter condition depends on the media type and thickness, perform a cut test to check your settings and fine-tune the cut quality *before* starting your new cutting job.

Observe the following steps to achieve good cutter condition settings:

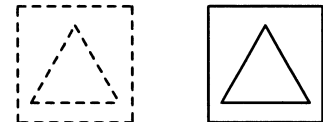
- 1 Cut the test pattern (Test 1, Test 2, Cutting-Pro) in three locations: the far right side, the center and the far left side of the media.
- 2 Check the shape of the pattern.
- 3 Change the condition parameters if needed.
- 4 Repeat steps 1 through 3 until the test results are satisfactory.

The following illustrations display test pattern results:

- 1 Peel off the outside triangle first to view the shape of the corners. The corner's shape represents the cutter offset setting. If the corners are rounded, the cutter offset value should be decreased; if the corners are too sharp, the cutter offset value should be increased.



- 2 Next peel off the triangle from the liner to view the depth of the cutter trail. The depth of the cutter trail represents the blade length. The best setting creates a light scratch on the liner.



- 3 If the scratch is too light and the trail breaks in places, increase the blade length; if the scratch is so heavy that it cuts the liner, the blade should be shortened.
- 4 Change the parameters as needed.
- 5 Repeat steps 1 through 3 until the test results are satisfactory.

Test 1

Use this TEST 1 triangle pattern to test your condition settings. With the media loaded in the plotter and the READY mode displayed on the menu, press the TEST key on the control panel.

CONDITION 1	14
	30
READY	4
CB09Ux	0

You will see the following test menu:

TEST 1>
TEST 2>
CUTTING PRO>

Press the F2 key to select TEST 1.

The plotter will immediately cut one (1) triangle from the current pen position.

- Adjust the cutting conditions and re-run the cutting test.
- Repeat this process until you achieve the desired results.
- Press the ENTER key to return to the READY mode when the results are satisfactory.

Test 2

When you believe that you are nearing the most desirable condition setting, use the TEST 2 pattern. This test cuts three triangle patterns using three different cutting forces. The center triangle is cut using the force which you selected. The left triangle is cut using a force that is one step lower than your selection. The right triangle is cut using a force that is one step higher than your selection. This range allows you to confirm that your force selection is the best.

With the media loaded in the plotter and the READY or PAUSE mode displayed on the menu,

CONDITION 1	14
	30
READY	4
CB09Ux	0

press the TEST key on the control panel. You will see the following test menu:

TEST 1 >
TEST 2 >
CUTTING PRO >

Press the F3 key to select TEST 2.

The plotter will immediately cut three (3) triangles from the current pen position.

- Adjust the cutting conditions and re-run the cutting test.
- Repeat this process until you achieve the desired results.

Press the ENTER key to return to the READY mode when the results are satisfactory.

Cutting Pro

Use the CUTTING PRO Test pattern to check your cutting quality with an actual cut pattern without having to access your application software.

With the media loaded in the plotter and the READY or PAUSE mode displayed on the menu,

CONDITION 1	14
	30
READY	4
CB09Ux	0

press the TEST key on the control panel. You will see the following test menu:

TEST 1 >
TEST 2 >
CUTTING PRO >

Press the F4 key to select CUTTING PRO.

Press the F3 key to select YES and start.

PATTERN CUTTING PRO	
OK?	
	YES>
	NO>

Press the F4 key to select NO and cancel.

- Adjust the cutting conditions and re-run the cutting test.
- Repeat this process until you achieve the desired results.
- Press the ENTER key to return to the READY mode when the results are satisfactory.

Plotter Pen Conditions

To change the setting of a group of conditions, press the function key [F1] through [F4] corresponding to the number of the group you wish to change. For example, press the F2 key to select CONDITION 2. If CONDITON 6 appears, then press the F2 key again to select CONDITION 2.

PEN REFERENCE VALUES

The table below gives the recommended settings for each pen condition.

Pen type	Force	Speed	Quality
Water-based fibertip pen	10 to 12	30	4
Oil-based fibertip pen	10 to 12	20	2
Water-based ballpoint pen	15 to 18	60	4
Ceramic pen	7 to 8	20	2
Ink pen	4 to 7	10	2



NOTE: The condition settings will vary according to the type of paper being used. To prolong the life of your pen keep the FORCE setting as low as possible. Set the SPEED according to the type of output quality required.

Press the CONDITION key to access the condition menu.

SET	14
CONDITION 2	60
	4
PEN	



NOTE: Press the NEXT key to cancel the condition that you are currently setting and return to the main menu.

To CHANGE THE PEN FORCE

- Press the F1 key to change FORCE. A blinking cursor indicates that you can change its setting.

SET	14 ■
CONDITION 2	60
	4
PEN	

- Press the UP or DOWN ARROW key to raise or lower the numeric value from 1 to 40.
- If you wish to change another parameter then:
 - Press the F2 key to change SPEED.
 - Press the F3 key to change QUALITY.
- If all of the parameters are set press the ENTER key to register your setting.

To CHANGE THE PEN SPEED

- Press the F2 key to change SPEED. A blinking cursor indicates that you can change its setting.

SET	14
CONDITION 2	60 ■
	4
PEN	

- Press the UP or DOWN ARROW key to raise or lower the numeric value from 1 to 100. [1 to 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 70, 80, 90, 100.]
- If you wish to change another parameter then:
 - Press the F1 key to change FORCE.
 - Press the F3 key to change QUALITY.
- If all of the parameters are set, press the ENTER key to register your setting.

TO CHANGE THE PEN QUALITY

- Press the F3 key to change QUALITY. A blinking cursor indicates that you can change its setting.

SET	14
CONDITION 2	60
	4 ■
PEN	

- Press the UP or DOWN ARROW key to raise or lower the numeric value from 1 to 8. The smaller the value, the higher the quality. When you select a speed that is faster than 60, you cannot select QUALITY. At that time an “xx” appears.
- If you wish to change another parameter then:
 - Press the F1 key to change FORCE.
 - Press the F2 key to change SPEED.
- If all of the parameters are set, press the ENTER key to register your setting.

Pounce Condi- tions

To change the setting of a group of conditions, press the function key [F1] thru [F4] corresponding to the number of the group you wish to change. For example, press the F4 key to select CONDITION 8. If CONDITION 4 appears, then press the F4 key again to select CONDITION 8.

SET	12
CONDITION 8	30
	4
POUNCE	1

Press the CONDITION key to access the condition menu.

Press the NEXT key to cancel the condition where you are currently set and return to the main menu.

TO CHANGE THE POUNCE FORCE

- Press the F1 key to change FORCE. The blinking cursor indicates that you can change its setting.

SET	12 ■
CONDITION 8	30
	4
POUNCE	1

- Press the UP or DOWN ARROW key to raise or lower the numeric value from 1 to 40.
- If you wish to change another parameter then:

- Press the F3 key to change QUALITY.
- Press the F4 key to change OFFSET.
- If all of the parameters are set, press the ENTER key to register your setting.

To CHANGE THE POUNCE SPEED

- Press the F2 key to change SPEED. The blinking cursor indicates that you can change the setting.

SET	12
CONDITION 8	30 ■
	4
POUNCE	1

- Press the UP or DOWN ARROW key to raise or lower the numeric value from 1 to 100. [1 to 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 70, 80, 90, 100.]
- If you wish to change another parameter:
 - Press the F1 key to change FORCE.
 - Press the F3 key to change QUALITY.
 - Press the F4 key to change OFFSET.
- If all of the parameters are set, press the ENTER key to register your setting.

To CHANGE THE POUNCE QUALITY

- Press the F3 key to change QUALITY. The blinking cursor indicates that you can change the setting.

SET	12
CONDITION 8	30
	4 ■
POUNCE	1

- Press the UP or DOWN ARROW key to raise or lower the numeric value from 1 to 8. The smaller the value, the higher the quality. When you select a speed that is faster than 60, you cannot select QUALITY. At that time an “xx” appears.
- If you wish to change another parameter:
 - Press the F1 key to change FORCE.
 - Press the F2 key to change SPEED.
 - Press the F4 key to change OFFSET.
- If all of the parameters are set, press the ENTER key to register your setting.

TO CHANGE THE POUNCE OFFSET

- Press the F4 key to change OFFSET. The blinking cursor indicates that you can change the setting.

SET	12
CONDITION 8	30
	4
POUNCE	1 ■

- Press the UP or DOWN ARROW key to raise or lower the numeric value from 1 to 99.
- If all of the parameters are set, press the ENTER key to register your setting.



NOTE: For the pounce condition, the cutter offset refers to the spacing between holes in mm units.

Changing Feed Speed

This function allows you to change the media feed speed from SLOW to NORMAL. In the case of selecting ROLL-1 and SHEET on the media type menu, the plotter uses SLOW to ensure the accuracy of the leading and trailing edges of the media. After the initialization, the feed speed can increase once the grit rollers and the pinch rollers secure the media. Always select SLOW for heavy media or media with a slippery surface, otherwise select NORMAL to shorten the initialization time. Remember that the media will back up at the pen up speed when NORMAL is selected. **For details see FEED – Advancing Media.**

When the media set lever is lowered, the following menu appears on the display:

LOAD MEDIA!
INITIAL MENU>

- Press the F4 key.
- Press the F3 key to select INITIAL FEED SPEED.

AUTO REG. MARK>
AUTO PRE FEED>
INITIAL FEED SPEED>
INTERFACE>

- Press the F3 key to select NORMAL or the F4 key to select SLOW.

```

INITIAL FEED SPEED

                                NORMAL
                                SLOW

```

- Press the ENTER key to return to the previous menu.
- Press the NEXT key to advance to the next menu.
- Press the F4 key to set parameters such as STEP SIZE, RS232C CONDITIONS AND COMMANDS. ***For details see Setting the Interface Conditions.***

```

                AUTO REG. MARK>
                AUTO PRE FEED>
                INITIAL FEED SPEED>
                INTERFACE>

```

- Raise the media set lever to engage the media. The media type menu appears on the display; press the key which corresponds to the type of media that is loaded for cutting/plotting.

```

                                ROLL-1>
                                ROLL-2>
                                SHEET>
                                CONTINUE>

```

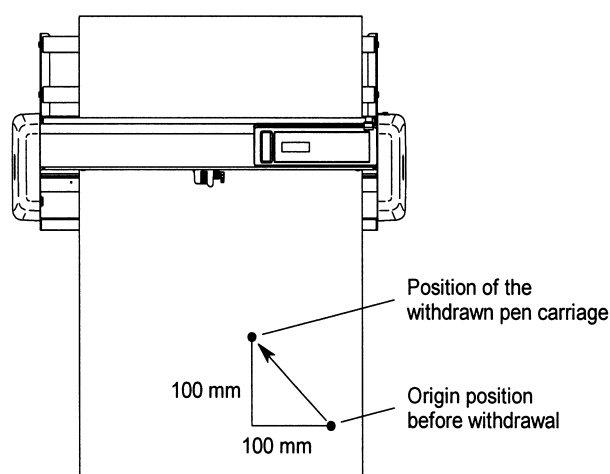
- Press the F1 key to select ROLL-1.
- Press the F2 key to select ROLL-2.
- Press the F3 key to select SHEET.
- Press the F4 key to select CONTINUE.

Withdrawal of the Pen Carriage

This function moves the pen carriage from its current position to a position that is +100 mm away along both the X and Y axis. This also helps to confirm the job is completed.

While holding down the ENTER key, press the UP ARROW key, and then release it.

Repeat this process as needed to move the pen carriage away from the cutting/plotting job.



Returning the Pen Carriage to Origin

This function moves the pen carriage from its current position to the origin point.

While holding down the ENTER key, press the DOWN ARROW key and then release it. The pen carriage will return to the origin point.

Chapter 5: Advanced Functions and Settings

This chapter describes the advanced functions and settings for your cutter. You can access these functions through the menu, however, some functions have quick keys on the control panel to provide faster access to these settings.

Control Panel Quick Keys

Origin – Sets the cutting origin.

Copy – Copies the data in the plotter's buffer memory.

Condition – Sets the cutter conditions; see *Preparing to Cut*.

Test – Tests the cutter conditions; see *Test Modes and Troubleshooting*.

Axis Alignment - Aligns pre-printed material for cutting; see *Menu Controls*.

Menu Controls

Pen UP/DOWN –Raises or lowers the pen.

Buffer Clear – Clears the plotter's receiving buffer.

Feed – Feeds the media before cutting when the cutting area is known.

Interface:

Step Size – For details see *Setting the Interface Functions*.

RS-232C – For details see *Setting the Interface Functions*.

Command – For details see *Setting the Interface Functions*.

Area Parameters:

Origin – Sets the Origin in HP-GL™ mode.

Area – Specifies the effective cutting area of the plotter.

Expand – Expands the cut width instantly.

Page Length – Specifies the length of individual pages when using roll media.

Function 1:

Rotate – Rotates the coordinate axes by 90°.

Mirror – Cuts a reverse image of the original data.

Scale – Enlarges or reduces an image.

Function 2:

Data Sorting – Groups the line segments.

Axis Alignment – Aligns pre-printed material for cutting.

Auto Pre Feed – Prevents slippage on large media jobs.

Tangent Emulation – Enables special blade control under specific circumstances.

Background Settings - For details see **Background Settings**.

Option 1:

Pen Up Speed – Reduces overall cutting time.

Offset Angle – Smooths curves on large characters.

Offset Force – Controls blade angle under special circumstances.

Step Pass – Smooths curves on small characters.

Option 2:

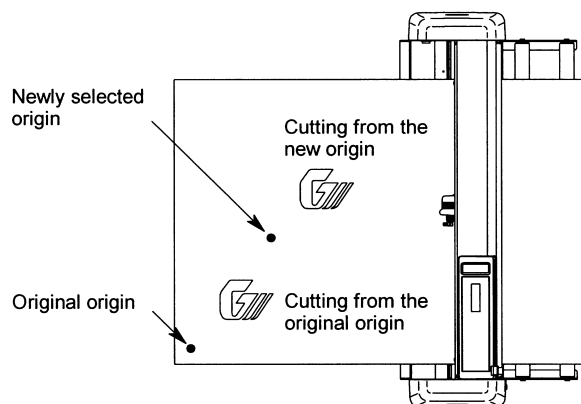
Initial Down Force - Enables special blade control during initial cutting of media.

Distance Adjust –Corrects the distance distortion under special circumstances.

Test – For details see **Test Modes and Troubleshooting**.

ORIGIN - Setting the Cutting Origin

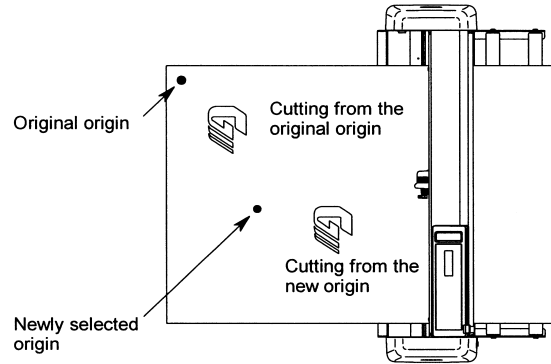
This function allows you to move the origin point of cutting.



Use the UP, DOWN, RIGHT or LEFT ARROW keys to move the cutter to the desired origin position.

- **Press the ORIGIN key. The beeper sounds and the LCD displays a message indicating that the new origin is in effect.**

Origin Point with ROTATE function



NOTE: The coordinates being displayed represent displacements along the X and Y-axes from the original origin.

NOTE: If you intend to use the ORIGIN function in combination with the ROTATE or MIRROR function, be sure to set the ORIGIN function first.

COPY - Copying the Data in Plotter Buffer Memory

This function allows you to automatically cut duplicates of the data sent from the computer.

The data sent from the computer is always stored automatically in the plotter's receive buffer while it is cutting/plotting. Once the data has been stored in the plotter's receive buffer, it can be repeatedly cut by using this function.

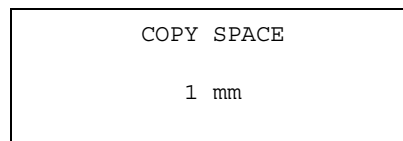


CAUTION: While a copy operation is in process, do not send new data to the plotter.

Use the UP, DOWN, RIGHT or LEFT ARROW keys to move the cutter to the desired starting position for cutting, this is the Copy origin.

- Press the **COPY** key to select the **COPY** mode.

If the data for copy is available in the receive buffer, the following menu will appear:



If the receive buffer is empty the following message will appear. You will need to re-send the data to the plotter by returning to the previous menu.

```
NO DATA FOR COPY
IN BUFFER !
```

If one block of the data sent from the computer has exceeded the plotter's receive buffer size (2Mbyte), the following message will appear. Return to the previous menu. You will need to divide the data into smaller sizes or segments so that it fits the plotter's receive buffer. After doing so re-send the data.

```
BUFFER IS FULL
CANNOT COPY!
```

Use the UP or DOWN ARROW key to increase or decrease the copy space after the COPY SPACE menu appears.

```
COPY SPACE
5 mm
```

- Press the ENTER key to store the setting. If the effective cutting area is smaller than the area required to cut one copy, the following menu appears:

```
CANNOT COPY
CUT AREA TOO SMALL
OK>
```

- Press the F4 key to return to the start menu. If the effective cutting area is available, the following menu appears:

```
COPY MODE
NUMBER OF COPIES
[ 1 ]
```



CAUTION: The number of copies is limited by the PAGE LENGTH setting.

- Press the UP and DOWN ARROW keys to increase or decrease the number of copies. The number can be increased up to the maximum number of copies that can be cut out of the currently loaded media. You may re-load

additional media to achieve the number of copies you wish to cut. Then reset the copy function again.

- Press the ENTER key, the following menu will appear:

CONDITION 2	14
	30
COPY	4
CB09Ux	0

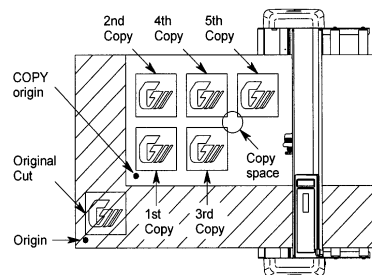
The plotter will start cutting/plotting as soon as the ENTER key is pressed.

If you wish to continue cutting additional copies, reload the media and begin again by pressing the COPY key.

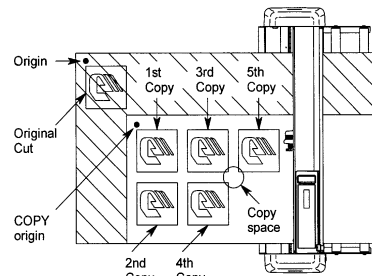
NOTE: If there is an interval of ten seconds or greater when the data is sent, the previous data is cleared.

Copying Sequence

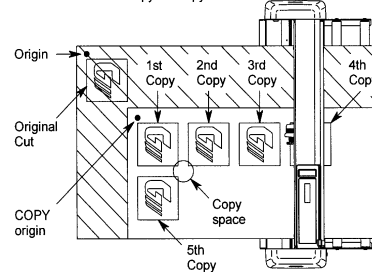
The following figures illustrate the sequence in which copies are cut, with the shaded areas representing the *uncut* areas of the media.



Copies are normally cut in this sequence.



If MIRROR mode is selected, the copies are cut in this sequence.



If ROTATE mode is selected, the copies are cut in this sequence.

PEN UP/DOWN - Raising/Lowering the Pen

The PEN UP/DOWN function allows you to raise or lower the pen from the control panel.



WARNING: While using this function, keep your hands out of the vicinity of the pen holder (especially the pen).

- Press the MENU key to select MENU mode.
- Press the NEXT key.
- Press the F2 key to toggle between PEN UP and PEN DOWN. The Pen UP/DOWN message does not change, but the pen will move up or down.

```
PEN UP/DOWN>
BUFFER CLEAR>
FEED>
```

- Press the MENU key to cancel MENU mode.

BUFFER CLEAR - Clearing the Buffer

The BUFFER CLEAR function is used to clear the plotter's receive buffer of all data that has been sent from the computer.



WARNING: Do not execute the BUFFER CLEAR function until the computer has completed data output. If you clear the buffer while the computer is still sending data to the plotter, the data received up to the time that MENU mode was selected is cleared, but the computer resumes sending subsequent data which remains in its buffer. At such time, the pen carriage may suddenly start moving so be sure to keep your hands, face and other obstacles out of the vicinity of the cutting mat and media.

- Press the MENU key to select MENU mode.
- Press the NEXT key.
- Press the F3 key to select BUFFER CLEAR

```
PEN UP/DOWN>
BUFFER CLEAR>
FEED>
```

The NOTE message then prompts you to stop sending data from the computer before clearing the buffer. If you wish to quit the current job, cancel the current plotting on the application software.

- This menu appears 3 seconds after you select **BUFFER CLEAR**.

NOTE:
CONFIRM DATA FROM
HOST STOPPED

- Press the **F3** key to clear the buffer or press the **F4** key to resume the cutting/plotting job.

BUFFER CLEAR OK?

CLEAR>
CANCEL>

- If the **F3** key is pressed, the following menu appears, clearing of the buffer is then complete.

CLEARING BUFFER !

PLEASE WAIT

BUFFER CLEAR

COMPLETED !

- Press the **MENU** key to cancel **MENU** mode.

FEED - Advancing the Media

The FEED function is used to prevent the loaded media from slipping by automatically advancing the media and imprinting it with grit roller marks; the media is then returned to its original position.

If you know approximately how much media you will require for the next cut, advance the media prior to starting the cut by using this function. Otherwise, enable the AUTO PRE-FEED FUNCTION.



CAUTION: Do not use the FEED function with media that is shorter than 1 meter. If the FEED LENGTH setting exceeds the actual length of loaded media, the media will fall out in front of the plotter. If this happens, shorten the FEED LENGTH.

- Press the **MENU** key to select **MENU** mode.
- Press the **NEXT** key.

- Press the F4 key to select FEED.

```

PEN UP/DOWN>
BUFFER CLEAR>
FEED>

```

- Press the UP and DOWN ARROW keys to obtain the desired FEED LENGTH.

```

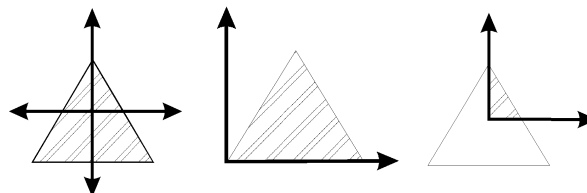
FEED LENGTH
1 m

```

- Press the ENTER key to register your settings. The plotter will start feeding as soon as the ENTER key is pressed.
- Press the MENU key to cancel MENU mode.

ORIGIN - Setting the Origin in HP-GL Mode

There are two types of origins: Center and Lower Left. If HP-GL™ utilizes the Center mode and the plotter utilizes the Lower Left Origin point, you may lose plot data that is located in the upper right quadrant. The ORIGIN mode allows you to alternate between both origin types in HP-GL™ mode.



Center Origin

Lower Left Origin

Designed with
Center Origin and
plotted with a
Lower Left Origin

- Press the MENU key to select MENU mode.
- Press the NEXT key two times.
- Press the F2 key to select AREA PARAMETERS.

```

INTERFACE>
AREA PARAMETERS>
FUNCTION 1>
FUNCTION 2>

```

- Press the F1 key to select ORIGIN. If there is no ORIGIN in the menu, the plotter is in GP-GL mode. Change the mode if necessary.

```

ORIGIN>
AREA>
EXPAND>
PAGE LENGTH>

```

- Press the F3 key to select LOWER LEFT or press the F4 key to select CENTER.

```

ORIGIN POINT

LOWER LEFT
CENTER

```

- Press the ENTER key to register your settings or press the MENU key to cancel MENU mode.



NOTE: Your ORIGIN setting is retained in the plotter's internal memory even while the plotter is turned off. When the origin has been set to CENTER, the X- and Y-axis coordinate values shown on the display panel represent the respective distances from the lower left point of the effective cutting (plotting) range.

AREA - Setting the Cutting Area

The Upper Right (UR) and Lower Left (LL) functions are used to specify the effective cutting area of the plotter so that any data specifying coordinate positions outside of the effective cutting area are disregarded.



WARNING: As soon as both the LL and UR points are set, the pen carriage will move to the new origin. To avoid injury, keep your hands, face and other obstacles out of the vicinity of the cutting mat and media.

- Press the MENU key to select MENU mode.
- Press the NEXT key two times.
- Press the F2 key to select AREA PARAMETERS.

```

INTERFACE>
AREA PARAMETERS>
FUNCTION 1>
FUNCTION 2>

```


- Press the F2 key to select AREA. (ORIGIN in the 1st row appears in HP-GL mode only). The following menu appears:

```

ORIGIN>
  AREA>
EXPAND>
PAGE LENGTH>

```

Use the POSITION Keys to specify a new LL position. The X- and Y- coordinate values will represent the current pen position as X- and Y-axis offsets from the original origin.

```

SET LOWER LEFT
X= 0 mm
Y= 0 mm
      DEFAULT>

```

- Press the ENTER key to register the newly specified LL position.
- Press the F4 key to select the DEFAULT if you wish to return to the original origin point.

The following menu appears:

```

SET UPPER RIGHT
X= 1000 mm
Y= 1000 mm
      DEFAULT>

```

Use the POSITION Keys to specify a new UR position. The X- and Y- coordinate values will represent the current pen position as X- and Y-axis offsets from the original origin.

- Press the ENTER key to register the newly specified UR position.
- Press the F4 key to select the DEFAULT if you wish to withdraw the current upper right setting. The origin point returns to the original upper right point which is determined by loaded media size.
- Press the MENU key to cancel MENU mode.



NOTE: When the plotter is initialized, your LL and UR settings are erased, and are initialized to their default position (the lower left and upper right corners of the maximum effective cutting area) *unless* CONTINUE is selected on the media type menu.



NOTE: The LL and UR positions cannot be specified outside of the actual area of the loaded media.



NOTE: The effective cutting area can only be set by specifying the lower left and upper right points. If the effective cutting area is incorrectly specified (for example, by specifying the Upper Left or Lower Right point or specifying the same point for

both UR and LL positions), the message below appears for several seconds. In this case, reset the effective cutting area.

ILLEGAL PLOT AREA

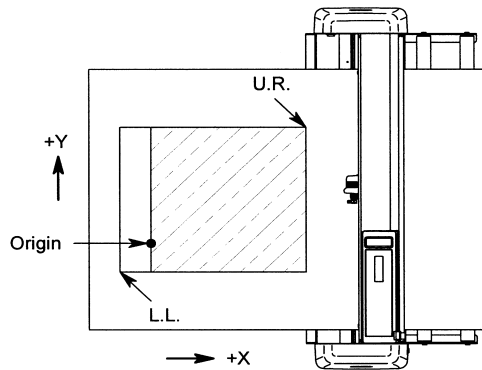


NOTE: When the ROTATE and MIRROR mode is selected or canceled after specifying new LL and UR positions, your LL and UR settings are initialized to their default positions.

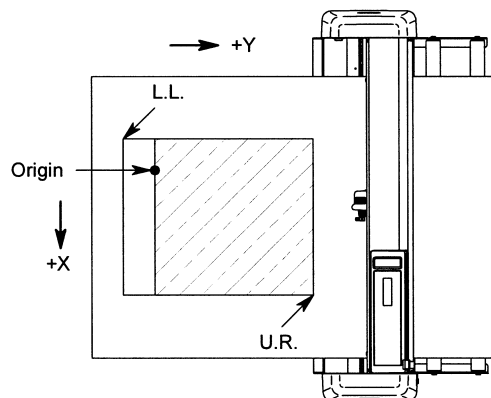


NOTE: The effective cutting area cannot be specified past the origin in the direction of media feeding.

When the origin is set as shown in the example below, the shaded area represents the effective cutting area defined by the LL and UR points.



When the ROTATE mode has been selected to rotate the coordinate axes by 90° as shown in the example, the shaded area represents the effective cutting area defined by the LL and UR points.



EXPAND - Expanding the Cut Area

EXPAND mode allows you to both widen and narrow the cutting area. The cutting area is automatically determined by the position of the pinch rollers when the plotter is initialized.

Select EXPAND when cutting a pattern that is nearly as wide as the media, *and* you do not mind the footprint caused by the grit rollers along the edges of the pattern. However, this function can be used to protect the cut pattern from the footprint by narrowing the cut area.

When the parameter of the EXPAND mode is set to zero (default), the limit of the cutting area is set at 1mm from the inside edge of the pinch roller tracks. The parameter of the EXPAND mode ranges from -10 to +10 mm. This parameter represents the allowable range on each side of the cutting area.

A positive setting indicates the limit of both sides move toward the outside of the cutting area while a negative setting indicates the limit of both sides move toward the inside of the cutting area.

For example, a setting at +5 allows a 10mm *wider* cutting area than the size of the default cutting area, whereas a setting at -5 allows a 10mm *narrower* cutting area than the default size cutting area.



CAUTION: In the case of setting the positive figure for the parameter, be sure to load the media on to the plotter accurately so that the media does not skew during cutting. The cutter blade may damage the cutting mat if the media skews.



CAUTION: In the case of setting +8 mm or more, be sure to set the Initial Blade Control Position to "2mm below". The cutter blade will damage the cutting mat if it is set to "OUTSIDE". See *Initial Blade Control Position* in the *Background Setting*.



NOTE: This function should be set before the cutting/plotting job is started since changing the setting of this mode will cause the plotter to initialize which will clear *all* data in the buffer.

- Press the MENU key to select MENU mode.
- Press the NEXT key two times.
- Press the F2 key to select AREA PARAMETERS.

```

INTERFACE>
AREA PARAMETERS>
FUNCTION 1>
FUNCTION 2>

```

- Press the F3 key to select **EXPAND**. (**ORIGIN** in the 1st row appears in HP-GL mode only.)

```

ORIGIN>
AREA>
EXPAND>
PAGE LENGTH>

```

- Press the UP or DOWN ARROW key to select the value.

```

SET EXPAND LIMIT

0 mm
DEFAULT>

```

- Press the F4 key to select **DEFAULT (0)**, if you wish to return to the original cutting area.
- Press the ENTER key to store your setting, the following menu will appear:

```

THIS OPERATION
RESETS THE PLOTTER !
CONTINUE>
CANCEL>

```

If the F4 key is pressed, return to the previous menu.

- Press the F3 key to select **CONTINUE** or press the F4 key to select **CANCEL**.

If CONTINUE is selected, the MEDIA TYPE MENU will appear. Select the media type you wish to use.

```

ROLL-1>
ROLL-2>
SHEET>

```

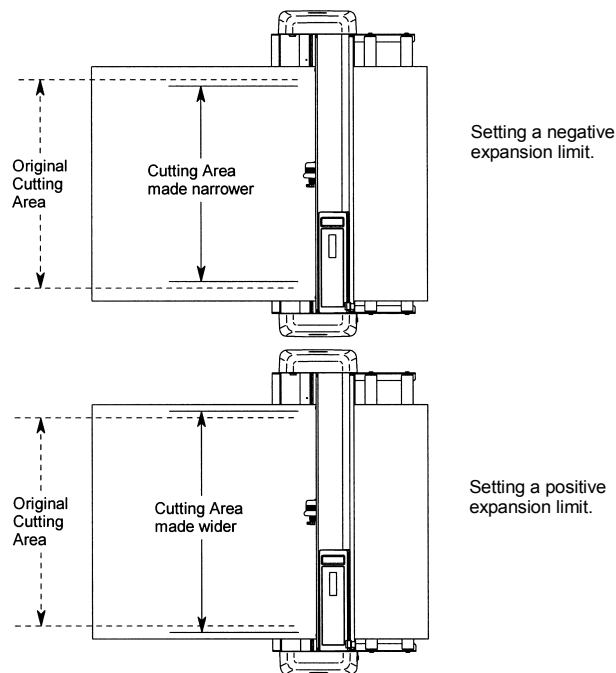
- Press the F1 key to select **ROLL-1**, press the F2 key to select **ROLL-2** or press the F3 key to select **SHEET**.

If CANCEL is selected, return to the previous menu. Press the MENU key to cancel MENU mode.

```

ORIGIN>
AREA>
EXPAND>
PAGE LENGTH>

```



PAGE LENGTH - Setting the Length of the Page with Roll Media

This function is used to specify the length of individual pages when using roll media.



CAUTION: For optimum precision, specify the PAGE LENGTH to 2m or less.



CAUTION: When PAGE LENGTH is set to over 2m, be especially careful to load the media properly to prevent it from coming loose from the rollers during cutting or plotting.



CAUTION: When using roll media or roll paper, be sure to pull out the entire amount of media required for the operation *before* you begin cutting or plotting, unless the AUTO PRE FEED function is enabled.

- Press the MENU key to select MENU mode.
- Press the NEXT key two times.
- Press the F2 key to select AREA PARAMETERS.

```

INTERFACE >
AREA PARAMETERS >
FUNCTION 1 >
FUNCTION 2 >

```

- Press the F4 key to select **PAGE LENGTH**. (**ORIGIN** in the 1st row appears in HP-GL™ mode only.)

```

ORIGIN>
AREA>
EXPAND>
PAGE LENGTH>

```

- The following page length menu appears:

```

PAGE LENGTH
L = 02000 mm

```

- Press the **LEFT** or **RIGHT ARROW** key next to the blinking cursor to the next digit to the left or right.
- Press the **UP** or **DOWN ARROW** key to increase or decrease the L value.
- Press the **ENTER** key to register your settings or press the **MENU** key to cancel **MENU** mode.



NOTE: Your **PAGE LENGTH** setting is retained in the plotter's internal memory even while the plotter is turned off. By specifying a long **PAGE LENGTH**, your plotter can perform long-axis plotting to produce banners of up to 50m in length.

ROTATE - Rotating the Coordinate Axes

This function is used to move the origin and rotate the coordinate axes by 90° as shown in the figure below.

- Press the **MENU** key to select **MENU** mode.
- Press the **NEXT** key two times.
- Press the **F3** key to select **FUNCTION 1**.

```

INTERFACE>
AREA PARAMETERS>
FUNCTION 1>
FUNCTION 2>

```

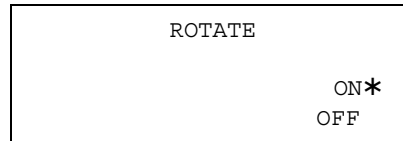
- Press the **F2** key to select **ROTATE**.

```

ROTATE>
MIRROR>
SCALE>

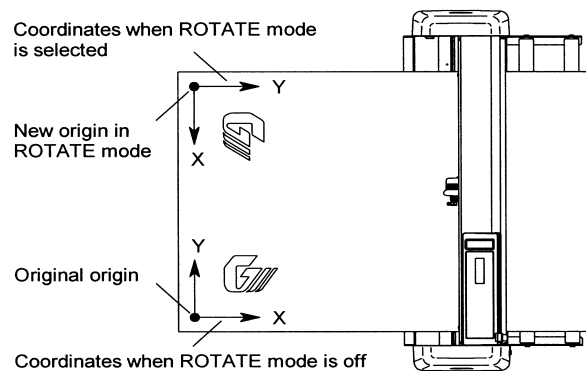
```

- Press the F3 key to turn ON the function or press the F4 key to turn OFF the function.



- Press the ENTER key to register your settings or press the MENU key to cancel MENU mode.

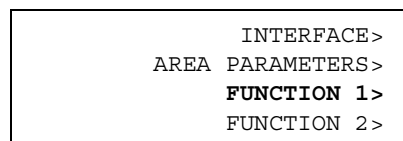
When the ROTATE mode is selected or canceled, the displacement of the new origin remains valid in the “a” direction, but is reset to its default position in the “b” direction.



MIRROR – Reversing the Image

To cut a reversed image of the original data, use the mirror mode. When the mirror mode is enabled, the origin and coordinate axes are changed as shown in the figure below. A mirror image of the original data is cut.

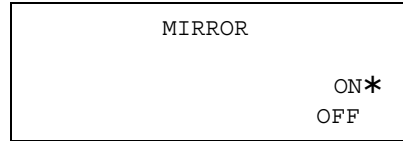
- Press the MENU key to select MENU mode.
- Press the NEXT key two times.
- Press the F3 key to select FUNCTION 1.



- Press the F3 key to select MIRROR.

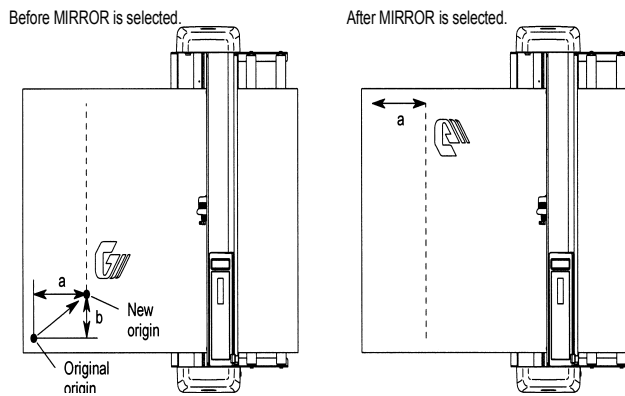


- Press the F3 key to turn ON the function or press the F4 key to turn OFF the function.



- Press the ENTER key to register your settings.
- Press the MENU key to cancel the menu mode.

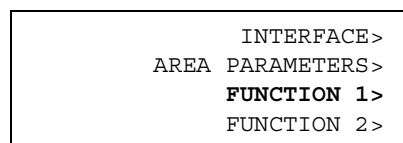
When the MIRROR mode is selected or canceled, the displacement of the new origin remains valid in the “a” direction, but is reset to its default position in the “b” direction.



SCALE - Enlarging and Reducing an Image Size

This function sets the SCALE factor for enlarging or reducing an image to be cut or plotted.

- Press the MENU key to select MENU mode.
- Press the NEXT key two times.
- Press the F3 key to select FUNCTION 1.



- Press the F4 key to select SCALE.



- Press the UP or DOWN ARROW keys to select the desired SCALE factor within the magnification range of 1/8, 1/4, 1/2, 1, 2, 3, 4, 5, 6, 7, and 8.

```

SCALE
SCALE FACTOR = 1

```

Press the ENTER key to register your settings or press the MENU key to cancel MENU mode.

DATA SORTING - Sorting the Cut Data

DATA SORTING allows you to shorten the throughput time by minimizing the movements of the pen carriage and the media by means of sorting receiving data. In cases when the order of cut data from the application software is not well optimized, this function will increase throughput. The plotter has two modes to sort data:

Area Sorting: The plotter sorts cut data to optimize the movement of the media.

Pen Sorting: The plotter sorts cut data to optimize the changing of the pen. This mode is only available when the two pen option is installed on the plotter.

Use this function when the pen carriage and the media move back and forth excessively, and their movement is not minimized by the application software.

If your application software is able to efficiently manage the order of data, disable this function as it unnecessarily burdens the plotter's CPU.

- Press the MENU key to select MENU mode.
- Press the NEXT key two times.
- Press the F4 key to select FUNCTION 2.

```

INTERFACE>
AREA PARAMETERS>
FUNCTION 1>
FUNCTION 2>

```

- Press the F1 key to select DATA SORTING.

```

DATA SORTING>
AXIS ALIGNMENT>
AUTO PRE FEED>
TANGENT EMULATION>

```

- Press the F3 key to turn AREA sorting ON or OFF. Press the F4 key to turn PEN sorting ON or OFF.

```

DATA SORTING

                AREA ON*
                PEN OFF

```

- Press the ENTER key to store your setting. If the sorting OFF is selected, return to the previous menu.

```

DATA SORTING>
  AXIS ALIGNMENT>
    AUTO PRE FEED>
      TANGENT EMULATION>

```

If sorting ON is selected, the following menu will appear.

```

THIS OPERATION
RESETS THE PLOTTER!
                CONTINUE>
                CANCEL>

```

- Press the F3 key to select CONTINUE or press the F4 key to select CANCEL for the data sorting mode setting.

If CONTINUE is selected, the MEDIA TYPE MENU then appears. Select the media type you wish to use.

```

                ROLL-1>
                ROLL-2>
                SHEET>
                CONTINUE>

```

- Press the F1 key to select ROLL-1, press the F2 key to select ROLL-2, press the F3 key to select SHEET. The following menu appears:

```

CONDITION 1      14
                30
  SORTING        4
                CB09Ux  0

```

The plotter immediately begins sorting when it receives the cut data from the PC.

If CANCEL is selected, return to the previous menu.

```

DATA SORTING>
  AXIS ALIGNMENT>
    AUTO PRE FEED>
      TANGENT EMULATION>

```

- Press the MENU key to cancel the menu mode.



NOTE: The plotter immediately begins sorting when it receives the cut data from the PC, however, the cutting/plotting may experience a delay due to the data sorting process. While the plotter is data sorting, following key operations becomes invalid.

Direct keys: COPY, ORIGIN, AXIS ALIGNMENT, CONDITION, F KEYS TO SELECTING CONDITION NUMBER

Menu mode: All the functions except for PEN UP/DOWN, BUFFER CLEAR and FEED



NOTE: Your data sorting setting is retained in the plotter's internal memory even while the plotter is turned off.

AXIS ALIGNMENT - Axis Alignment Parameter Setting

AXIS ALIGNMENT is a very important function that should be used when you intend to cut pre-printed media, such as stickers or decals. When the media is loaded in the plotter, it should be loaded at exactly the same angle and position as it was on the printer which printed the images to ensure that the position of the contour matches the printed images. Since this cannot be done manually, the AXIS ALIGNMENT function allows one to adjust the angle and position of the media on the plotter electrically, as if it were being loaded on the same printer.

The direct key for AXIS ALIGNMENT is located on the operation panel so that you can rapidly access this function.

The Axis Alignment method should be configured prior to performing the AXIS ALIGNMENT function. There are three methods: 2 points, 3 points, and 4 points. Each number represents the points that will be digitized for the angle adjustment.

- 2 POINTS: This method should be used in cases where the printed media has two registration marks. This method is also applicable when there is one registration mark for the origin point of the printing, and parallelism between the axis of the printed image and the side edge of the media is guaranteed. For example, in the case of the tractor feed printer, if the axis of the printed image is parallel with the axis of the media edge, then a 2-point axis alignment can be performed. This is done by pointing at two different points on the edge of the media. The origin point can be set independently.
- 3 POINTS: This method should be used if the printed media has three registration marks. If the relative position of each of the three marks is already known,

then the distortion of the printed image can be taken into account. The origin point can be set independently.

- **4 POINTS:** This method should be used if the printed media has four registration marks. If the relative position of each of the four marks is already known then the distortion of the printed image can be taken into account. The origin point can be set independently.

Selecting the Axis Alignment Method

TWO-POINT METHOD

The two-point method requires you to enter "AXIS POINT 1", "AXIS POINT 2" and the "AXIS ORIGIN POINT" which are shown at the bottom. The origin point may be located at the same position as that of point one. The virtual angle of the X Axis and the position of the origin point can be adjusted individually.

THREE-POINT METHOD

The three-point method requires you to enter "AXIS POINT 1", "AXIS POINT 2", "AXIS POINT 3" and the "AXIS ORIGIN POINT" which are shown at the bottom. The origin point may be located at the same position as that of point one. You may adjust the virtual angle of both X and Y axes and the position of the origin point individually, as with the 2-point method, and you may match the plotter's distance scale to that of the printed image.

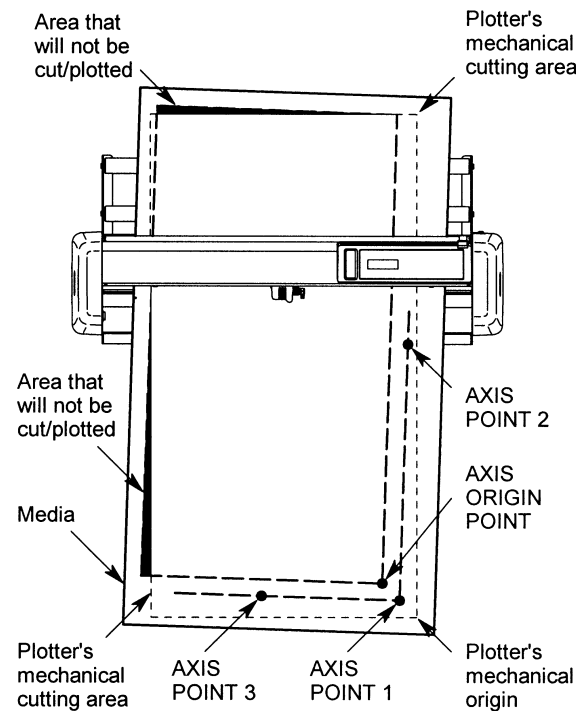
FOUR-POINT METHOD

The four-point method requires you to enter "AXIS POINT 1", "AXIS POINT 2", "AXIS POINT 3", "AXIS POINT 4", and the "AXIS ORIGIN POINT". The origin point may be located at the same position as that of point one. You may adjust the virtual angle of both X and Y axes and the position of the origin point individually, as with the 2-point and 3-point methods, and you may match the plotter's distance scale to that of the printed image.

To match the plotter's distance scale to that of the printed image, the distance between points 1 and 2, points 1 and 3, and points 1 and 4 must be known. This function helps when the dimensions of the printed image change during printing, laminating or storage.

- **AXIS POINT 1: Registration mark. In both the two and three-point methods, this point is commonly used as the reference for X and/or Y axis alignment.**
- **AXIS POINT 2: Registration mark or any point on the line which goes through AXIS POINT 1 and along the X axis of the pre-printed image.**
- **AXIS POINT 3: Registration mark or any point on the line which goes through AXIS POINT 1 and along the Y axis of the pre-printed image. This is only available when the three-point method is selected.**
- **AXIS POINT 4: Registration mark diagonally opposite registration mark 1 or any point on the line which goes through AXIS POINT 2. This is only available when the four-point method is selected.**

- **AXIS ORIGIN POINT:** Origin point of pre-printed image.



- Press the **MENU** key to select **MENU** mode.
- Press the **NEXT** key two times.
- Press the **F4** key to select **FUNCTION 2**.

```

INTERFACE>
AREA PARAMETERS>
FUNCTION 1>
FUNCTION 2>

```

- Press the **F2** key to select **AXIS ALIGNMENT**.

```

DATA SORTING>
AXIS ALIGNMENT>
AUTO PRE FEED>
TANGENT EMULATION>

```

- Press the **F2** key to select **2-Point Method**, or the **F3** key to select **3-Point Method**, or the **F4** key to select **4-Point method**.

```

AXIS ALIGNMENT
METHOD
2POINT*
3POINT
4POINT

```

- Press the ENTER key to register your settings.

The following menu appears. If you wish to change another setting, press the key corresponding to that setting.

```

DATA SORTING>
  AXIS ALIGNMENT>
    AUTO PRE FEED>
      TANGENT EMULATION>
  
```

- Press the MENU key to cancel the menu mode.

Axis Alignment Adjustment

Mount the optional loupe in the pen carriage.

Press the ALIGNMENT key to select the Axis Alignment mode.

The Axis Alignment menu appears:

```

AXIS POINT 1

X=    0 mm
Y=    0 mm
  
```

- Press the POSITION key to move the loupe to Axis Point 1.

```

AXIS POINT 1

X= +   0 mm
Y= +   0 mm
  
```

- Press the ENTER key to store the setting. The following menu appears:

```

AXIS POINT 2

X= +  410 mm
Y= +   9 mm
  
```

- Press the POSITION key to move the loupe to Axis Point 2.
- Press the ENTER key to store the setting.

If you select the two-point method, the Axis Origin Point menu appears. If you select the three-point method, Axis Point 3 menu appears.

```

AXIS POINT 3

X= +   9 mm
Y= +  408 mm
  
```

- Press the POSITION key to move the loupe to Axis Point 3.

- Press the ENTER key to store the setting.

The following menu appears:

DISTANCE	
POINT 1-2	
	00399.6 mm
OK?	00400.0 mm

If the distance between point 1 and point 2 is unknown, press the ENTER key to skip to the next step.

If the distance between point 1 and point 2 is a known value, use the POSITION key to change the distance value to that of the printed image, i.e., the distance between point 1 and point 2. The measured distance is shown on the 3rd row. Set the actual distance on the 4th row.

- Press the RIGHT or LEFT ARROW key to move the cursor.
- Press the UP or DOWN key to increase or decrease the number for the distance value.
- Press the ENTER key to store the setting.

The following menu appears:

DISTANCE	
POINT 1-3	
	00399.6 mm
OK?	00400.0 mm

Use the POSITION key to change the distance value to that of the printed image, i.e., the distance between point 1 and point 3.

- Press the RIGHT or LEFT ARROW key to move the cursor.
- Press the UP or DOWN key to increase or decrease the number for the distance value.
- Press the ENTER key to store the setting.

The following menu appears:

AXIS ORIGIN POINT	
X=	mm
Y=	mm

The loupe moves back to the Axis Point 1.

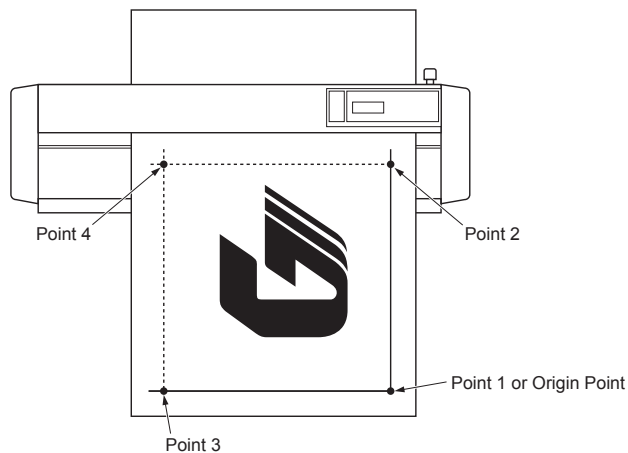
If the Axis Point 1 is not the origin point of the pre-printed image, press the POSITION key to move the loupe to the desired origin point for cutting.

If the Axis Point 1 is the origin point of the pre-printed image, press the ENTER key. Then press the ENTER key to store the setting. The READY menu appears, the plotter is ready to start the cutting operation.

CONDITION 1	14
	30
READY	4
CB09Ux	0

If you select the four-point method, please refer to the following.

Four-Point Method



- Press the Alignment key to display the following menu.

AXIS POINT 1	
X=	0 mm
Y=	0 mm

- Press the POSITION key to move the loupe to Axis Point 1. The coordinates displayed for X and Y are the distances from the Origin Point.
- Press the ENTER key to store the setting. The following menu appears.

AXIS POINT 2	
X=	0 mm
Y=	0 mm

- Press the POSITION key to move the loupe to Axis Point 2.
- Press the ENTER key to store the setting. The following menu appears.

AXIS POINT 3	
X=	0 mm
Y=	0 mm

- Press the POSITION key to move the loupe to Axis Point 3.
- Press the ENTER key to store the setting. The following menu appears.

AXIS POINT 4	
X=	0 mm
Y=	0 mm

- Press the POSITION key to move the loupe to Axis Point 4.
- Press the ENTER key to store the setting. The following menu appears.

DISTANCE	
POINT 1-2	
	00099.8 mm
OK?	00100.0 mm

- Use the POSITION key to change the distance value to that of the printed image, i.e. the distance between point 1 and point 2. The measured value is shown on the 3rd row. Set the actual distance on the 4th row. If no changes need to be made, press the ENTER key.
- Press the RIGHT or LEFT ARROW key to move the cursor.
- Press the UP or DOWN arrow key to increase or decrease the number for the distance value.
- Press the ENTER key to store the setting.

The following menu appears:

DISTANCE	
POINT 1-3	
	00101.1 mm
OK?	00100.0 mm

- Use the POSITION key to change the distance value to that of the printed image, i.e. the distance between point 1 and point 3. If no changes need to be made, press the ENTER key.
- Press the RIGHT or LEFT ARROW key to move the cursor.
- Press the UP or DOWN arrow key to increase or decrease the number for the distance value.
- Press the ENTER key to store the setting.
- The READY menu appears, and the plotter is ready to start the cutting operation.

**NOTE:**

- 1 The Axis Alignment settings are cancelled if any of the following operations are performed:
 - A new Origin is set
 - The media is reloaded
 - Rotation and/or Mirror settings are made (make these settings before performing axis alignment).
- 2 If the axis is slanted too much between points 1 and 2, 1 and 3, 3 and 4, and 2 and 4, an axis error message is displayed. Reload the media to reduce the axis slant.
- 3 If points 1 and 2 are specified as the same point, the axis alignment settings are cleared.



CAUTION: If the media is loaded at an angle, make sure that it does not come loose from the pinch rollers while it is being moved.

AUTO REG. MARK - Auto Registration Mark Sensor

The FC5100A Auto Registration Mark Sensor allows the plotter to automatically locate the Registration Marks used in the AXIS ALIGNMENT function.

The AXIS ALIGNMENT function is a very important function that should be used when you intend to cut pre-printed media, such as stickers or decals. When the media is loaded in the plotter, it should be loaded at exactly the same angle and position as it was on the printer which printed the image, to ensure that the position of the contour matches the printed images. Since this cannot be done manually, the AXIS ALIGNMENT function allows one to adjust the angle and position of the media on the plotter electrically, as if it were being loaded on the same printer.

The AXIS ALIGNMENT function locates any distortion of the printed image by first using a reference point to create a virtual angle between the X and Y-axis and then applying a scaling factor to match the cutting data to the printed image. This can be done either manually using the Light Pointer with the AXIS ALIGNMENT key, or automatically using the AUTO REG. MARK sensing function. NOTE: The Light Pointer cannot be used if the Auto Registration Mark Sensor is installed.

The AUTO REG. MARK sensing function senses the registration mark using an optical sensor that reflects light off the white media. If you use media that is thicker than 0.3mm the registration mark will be too close to the optical sensor and will be out of sensing range. When you are using transparent, colored or crumpled media the light will not reflect back to the optical sensor as well as it does with white media. In both cases, when the media is not white or is thicker than 0.3 mm, use the AXIS ALIGNMENT key with the Light Pointer. NOTE: The Light Pointer cannot be used if the Auto Registration Mark Sensor is installed. See **AXIS ALIGNMENT** for more details.

When using the AUTO REG. MARK sensing function, you must have both the pre-printed media with registration marks and the cutting data. It is important that you keep this information *after* creating the printing image and the cutting data in order to utilize the AXIS ALIGNMENT function.



Caution: The type of media you use affects the AUTO REG. MARK sensing function. Always use white media that is no thicker than 0.3 mm.



Caution: Always print the image and registration marks at the same time.

- **Registration mark sensing precision*: Max. 0.3 mm**

* Precision measured when sensing a specified pattern using the pen provided as a standard accessory and Graphtec's PC-type non-glossy paper.



WARNING

- **Registration marks used in the application software cannot be used.**
- **Registration marks must be created as data on the software.**
- **The following points must be noted when creating registration marks.**
 - **Registration mark line thickness: 0.3 mm to 1.0 mm**
 - **Registration mark size: 5 mm to 20 mm (See " P. 106, Specifying the Registration MARK SIZE.)**
 - **Registration marks should be either pattern 1 or pattern 2.**

- **Registration marks should use single lines with the required line thickness specified. The center of the lines is used as the reference point.**

AUTO REG. MARK

Remember, when using automatic registration mark recognition, pay special attention to the following points:

- The registration mark pattern
- The registration mark location
- The reading area required for registration mark detection
- The position of the origin point
- Media for which registration marks cannot be detected
- If registration mark cannot be automatically recognized

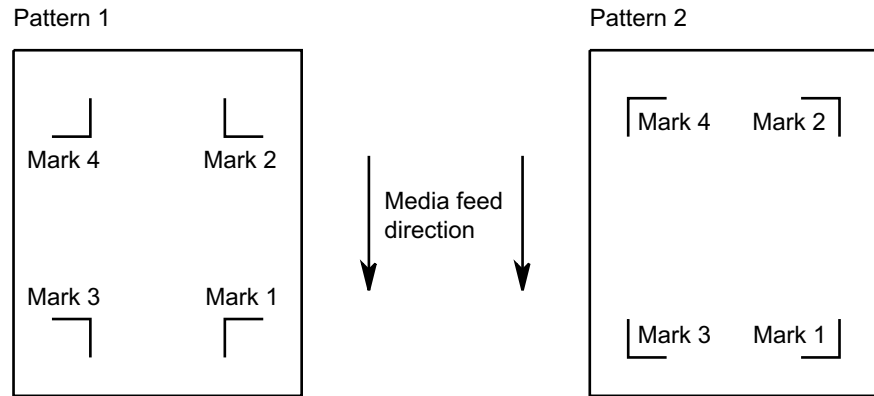
THE REGISTRATION MARK PATTERN

You can print two, three, or four registration marks depending on the method of axis alignment. Registration mark 1 is located in the lower left corner of the printed image. Registration mark 2 is located along the X-axis of the pre-printed image on a line that goes through registration mark 1. Registration mark 3 is located along the Y-axis of the pre-printed image on a line that goes through registration mark 1. Registration mark 4 is located diagonally opposite Registration mark 1. Registration marks 3 and 4 are optional.

The distance between the registration marks is unlimited. There are four ways to set the distance between registration marks: free length, 5 mm resolution, 10 mm resolution and 50 mm resolution. While in the application software, you must measure and record the distance between the registration marks. The plotter will use this information later to make axis alignment adjustments to ensure accurate contour cuts on the printed image.

The function of the application software is to create the registration mark. You may use that function if the registration mark is matched to the specification of the registration mark for this plotter.

The plotter can read (recognize) the designated registration mark patterns shown below:

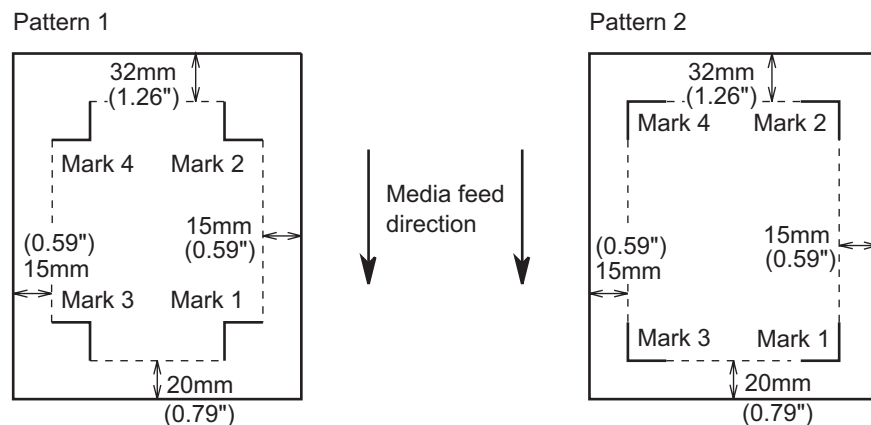


Note: For instructions on how to change the registration mark pattern, see [Setting the Type of Registration Mark](#) for more details.

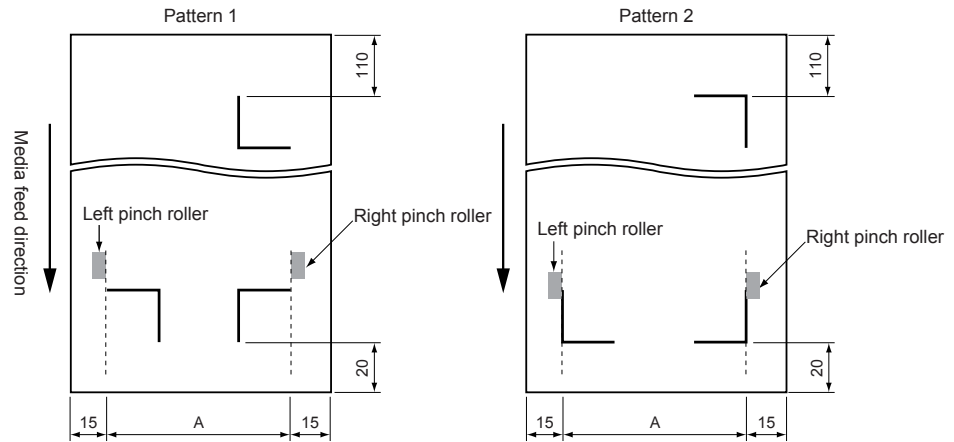
Caution: The size of the registration mark is important; the plotter may not sense a mark that is the wrong width or length. Correct line width is between 0.3mm and 1.0mm. Correct line length is between 5mm and 20mm. See [Size Of Registration Mark](#) for more details.

THE REGISTRATION MARK LOCATION

The location of the registration mark is important. The registration mark must be at least 20mm from the leading edge of the media, 15mm from the left or right edge of media, and 32mm from the back edge of the media. The plotter cannot scan a registration mark that resides along the edge of the media. The following illustrates the location of the registration marks:



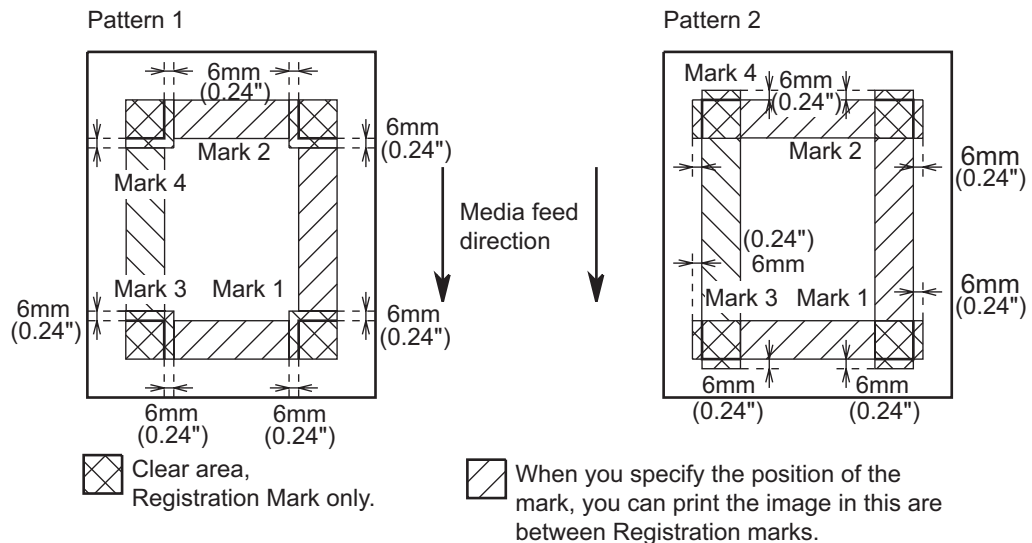
With roll media, the registration mark must be at least 110 mm from the back edge of the media.



THE REGISTRATION MARK READING AREA

In the default setting, the AUTO REG. MARK sensing function senses the registration mark by moving the media or sensor until the plotter locates the registration mark. Normally there is no printed image within 6mm of the registration marks.

If you desire images between the registration marks, you may set the plotter to move a set distance sensing for the registration mark. See **Setting the Registration Mark Reading Area** for more details. The following illustrates the reading area the plotter requires for detecting registration marks:





Caution: Do not plot anything except registration marks within the registration mark reading area.



Caution: If dirt, dust or other foreign matter adheres to the media, the plotter may recognize it as a registration mark.

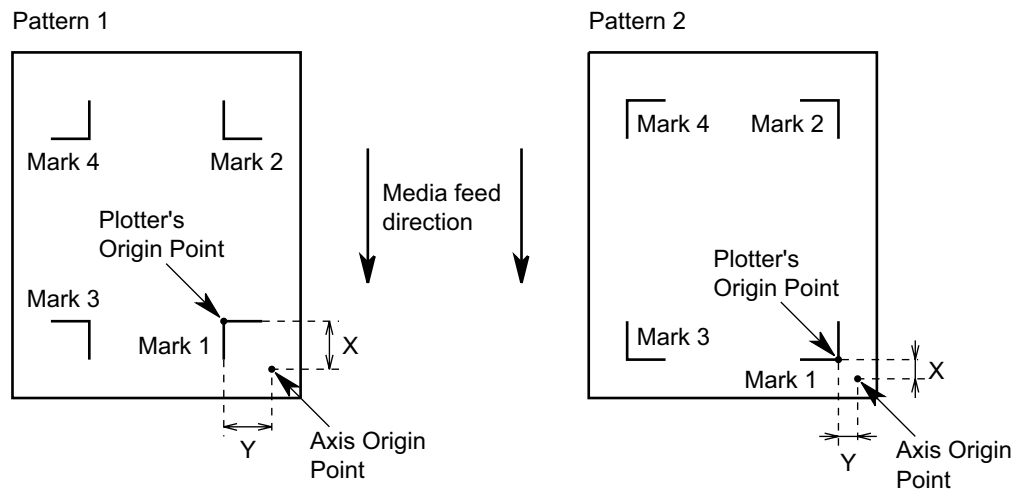


Caution: Be sure to use only black ink for plotting registration marks.

THE POSITION OF THE ORIGIN POINT

After the registration marks are recognized, the origin point for plotting must be positioned. When you create the cutting data by using the application software, you must know the relationship between the axis origin point and the registration mark. The cutting data contains many coordinate points for cutting. These coordinates are specified from the axis origin point. The plotter sets the origin point at the first corner of the registration mark after it senses the registration marks. If that is *not* the axis origin of the cutting data, you must set the origin point of the cutting data to match the cutting data and the pre-printed image. To set the axis origin point, you must specify the distance from the corner of registration mark 1 to the axis origin point.

The following illustrates when the axis origin point is *not* in the corner of the first registration mark:



To align the axis origin with the registration mark, measure the offset between the axis origin and the registration mark. Input the measured distance into the plotter. See **Setting of Axis Origin Offset** for more details.



Note: You can measure the distance between the axis origin point and the registration mark using one of two methods. You can read the numeric values (representing the distance from the axis origin to the first registration mark) on the screen display of your software application; or you can plot your registration mark and origin point and then actually measure the distance between the registration mark and the origin point.



Caution: You must specify the axis origin correctly. If the location of the axis origin is wrong, then you will not be able to match the cut pattern to the pre-printed image.

MEDIA FOR WHICH REGISTRATION MARKS CANNOT BE DETECTED

The plotter cannot detect registration marks on the following types of media:

- **Transparent media.** Due to the media's transparency, the sensor will detect the surface of the plotter's writing panel, preventing the accurate recognition of registration marks.
- **Any that is not white or ink that is not black.** Use of a colored medium or registration marks of any color *other* than black, prevents the accurate recognition of registration marks.
- **Coarsely textured drawings or media.** A medium with a stained or wrinkled surface or with faintly plotted registration marks prevents the accurate recognition of registration marks.
- **Improperly secured media.** If the media comes loose, the registration marks cannot be recognized.
- **Excessively thick media.** Registration marks cannot be recognized if the media's thickness exceeds 0.3mm because it raises the registration mark to a point outside of the sensor's focal point.

IF REGISTRATION MARK CAN NOT BE AUTOMATICALLY RECOGNIZED

The registration mark can be recognized either automatically using the AUTO REG. MARK sensing function or manually using the Light Pointer with the AXIS ALIGNMENT key. NOTE: The Light Pointer cannot be used if the Auto Registration Mark Sensor is installed. See *Specifying the Registration Mark Mode* for more details.

SPECIFYING THE REGISTRATION MARK MODE

The parameters for the AUTO REGISTRATION MARK sensor should be configured prior to performing the axis alignment. There are two main parameters, the axis alignment method and the scanning method.

AXIS ALIGNMENT METHOD

There are two types of axis alignment methods, 2 point and 3 point. Each number represents the number of registration marks that will be digitized for the angle and the distance adjustment.

- 2 POINT:** The two-point method requires you to create mark 1 and mark 2. Enter the distance between the registration marks; the plotter will adjust the virtual angle of the X-axis and the distance. Enter the axis origin point individually to adjust the offset between the cutting data and the printed image.

- 3 POINT:** The three-point method requires you to create mark 1, mark 2 and mark 3. Enter the distance between the registration marks; the plotter then adjusts the virtual angle of both the X- and Y-axis and the distance of both X- and Y-axis. Enter the axis origin point individually to adjust the offset between the cutting data and the printed image.
- 4-POINT:** The four-point method requires you to create mark 1, mark 2, mark 3 and mark 4. Enter the distance between the registration marks; the plotter then adjusts the virtual angle of both the X- and Y-axis and the distance of both the X- and Y-axis. Enter the axis origin point individually to adjust the offset between the cutting data and the printed image.

SCANNING METHODS

There are two types of scanning methods, AUTO and MANUAL. When the ALIGNMENT key is pressed, the following menu appears.

```

      AUTO REG. MARK>
                SKIP>
                AUTO>
                MANUAL>
  
```

Selecting the F2 key (SKIP) displays the following screen, and returns to the READY status.

```

      CONDITION      14
                   30
      READY          4
      CB09Ux        0
  
```

- AUTO:** In this mode, the plotter automatically starts scanning for the registration mark until it locates the specified number of registration marks. When using the AUTO method, you must load the pre-printed media in a specific location. Otherwise the plotter may not sense the registration marks.
- MANUAL:** Using the ARROW keys, move the pen near to a registration mark before you select MANUAL. Once MANUAL is selected, the plotter will automatically scan for the registration mark(s) until it locates the specified number of registration marks.



Note: If you select the 2-POINT, 3-POINT, or 4-POINT methods, the AUTO REG. MARK sensing function automatically executes after you press the ALIGNMENT key. Once the AUTO REG. MARK sensing function begins, none of the control panel keys will respond when pressed. To cancel AUTO REG. MARK sensing, lower the media set lever and then select the INITIAL MENU.



Caution: The size of the registration mark is important; the plotter may not sense a mark that is the wrong width or length. The line width must be between 0.3mm and 1.0mm. The line length must be between 5mm and 20mm.



Caution: Use white media and print the registration mark in black. If any other color is used the plotter may not sense the mark.



Caution: When the edge of the registration mark is blurry or the media is crumpled, the plotter may not sense the mark or sense it inaccurately.

Note: When the plotter cannot sense the registration mark, use the AXIS ALIGNMENT key with the Loupe.

Selecting the Axis Alignment Method

The following procedures describe how to align the coordinate axes based on the two-point, three-point or four-point methods.

TWO-POINTS METHOD

The two-points method reads two points on the X axis, and performs distance adjustment between the two points.

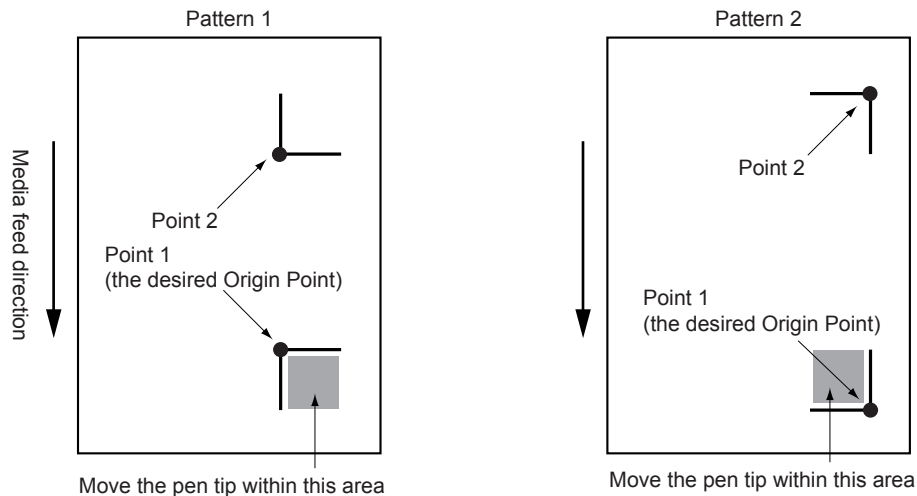
- Select 2POINTS for the MARK SCAN mode, load media in the plotter, and then press the ALIGNMENT key. The following menu appears

```

AUTO REG MARK>
SKIP>
AUTO>
MANUAL>

```

- If you want to skip the registration mark sensing function, press the F2 key (SKIP) to display the READY menu.
- If you press the F3 key (AUTO), sensing begins from the current pen position. Use the POSITION key to move the pen tip to the shaded area in the following diagrams, and then press the F3 key.



- If you press the F4 key (MANUAL), the following message is displayed. Use the POSITION key to move the pen tip to MARK 1, and then press the ENTER key.

```
MOVE TO MARK 1
USE THE POSITION KEY
TO MOVE THE PEN AND
THEN PRESS ENTER.
```

When the ENTER key is pressed, the plotter will start scanning for the registration mark.

- When both the points have been scanned, the display changes to the following (only displayed if OFF has been selected for DISTANCE ADJUST). The measured value for the distance between points 1 and 2 is shown on the 3rd row. Set the actual distance on the 4th row.

```
DISTANCE
POINT 1-2           00303.5 mm
OK?                 00303.5 mm
```

Press the RIGHT or LEFT ARROW key to move the cursor. Press the UP or DOWN arrow key to increase or decrease the number for the distance value.

- Press the ENTER key to store the setting.
- The READY menu appears, and the plotter is ready to start the cutting operation.

THREE-POINTS METHOD

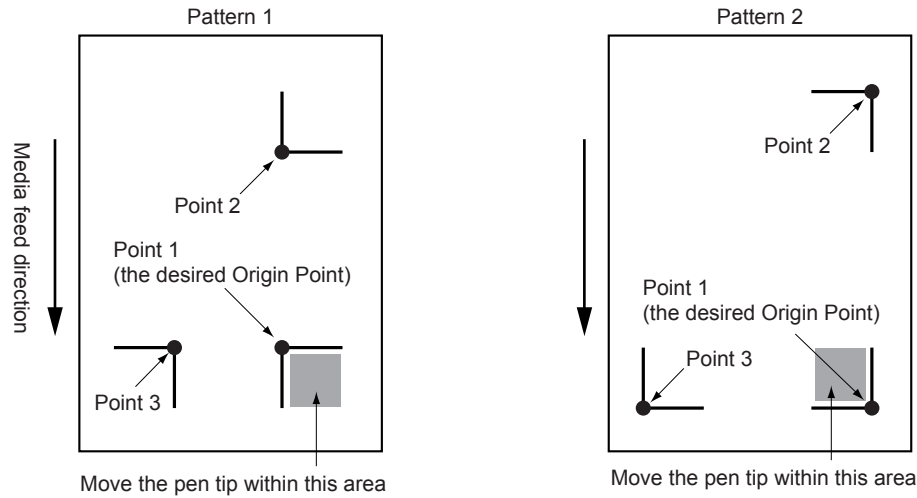
The three-points method reads three points, and performs distance adjustment on two axes.

- Select 3POINTS for the MARK SCAN mode, load media in the plotter, and then press the ALIGNMENT key. The following menu appears

```
AUTO REG MARK>
SKIP>
AUTO>
MANUAL>
```

- If you want to skip the registration mark sensing function, press the F2 key (SKIP) to display the READY menu.

- If you press the F3 key (AUTO), sensing begins from the current pen position. Use the POSITION key to move the pen tip to the shaded area in the following diagrams, and then press the F3 key.



- If you press the F4 key (MANUAL), the following message is displayed. Use the POSITION key to move the pen tip to MARK 1, and then press the ENTER key.

```

MOVE TO MARK 1
USE THE POSITION KEY
TO MOVE THE PEN AND
THEN PRESS ENTER.

```

When the ENTER key is pressed, the plotter will start scanning for the registration mark.

- When the three points have been scanned, the display changes to the following (only displayed if OFF has been selected for DISTANCE ADJUST). The measured value for the distance between points 1 and 2 is shown on the 3rd row. Set the actual distance on the 4th row.

```

DISTANCE
POINT 1-2          00099.8 mm
OK?                00100.0 mm

```

Press the RIGHT or LEFT ARROW key to move the cursor. Press the UP or DOWN arrow key to increase or decrease the number for the distance value.

- Press the ENTER key to store the setting. The display changes to the following (only displayed if OFF has been selected for DISTANCE ADJUST). The mea-

sured value for the distance between points 1 and 3 is shown on the 3rd row. Set the actual distance on the 4th row.

DISTANCE	
POINT 1-3	
	00101.1 mm
OK?	00100.0 mm

Press the RIGHT or LEFT ARROW key to move the cursor. Press the UP or DOWN arrow key to increase or decrease the number for the distance value.

- Press the ENTER key to store the setting.
- The READY menu appears, and the plotter is ready to start the cutting operation.

FOUR-POINTS METHOD

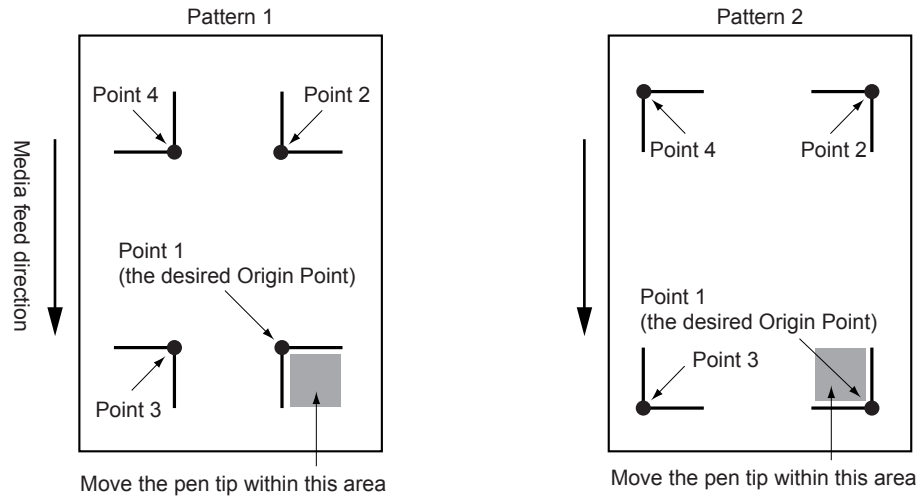
The four-points method reads four points, and performs distance adjustment on two axes.

- Select 4POINTS for the MARK SCAN mode, load media in the plotter, and then press the ALIGNMENT key. The following menu appears

AUTO REG MARK>
SKIP>
AUTO>
MANUAL>

- If you want to skip the registration mark sensing function, press the F2 key (SKIP) to display the READY menu.

- If you press the F3 key (AUTO), sensing begins from the current pen position. Use the POSITION key to move the pen tip to the shaded area in the following diagrams, and then press the F3 key.



- If you press the F4 key (MANUAL), the following message is displayed. Use the POSITION key to move the pen tip to MARK 1, and then press the ENTER key.

```

MOVE TO MARK 1
USE THE POSITION KEY
TO MOVE THE PEN AND
THEN PRESS ENTER.

```

When the ENTER key is pressed, the plotter will start scanning for the registration mark.

- When the four points have been scanned, the display changes to the following (only displayed if OFF has been selected for DISTANCE ADJUST). The measured value for the distance between points 1 and 2 is shown on the 3rd row. Set the actual distance on the 4th row.

```

DISTANCE
POINT 1-2           00303.5 mm
OK?                 00303.5 mm

```

Press the RIGHT or LEFT ARROW key to move the cursor. Press the UP or DOWN arrow key to increase or decrease the number for the distance value.

- Press the ENTER key to store the setting. The display changes to the following (only displayed if OFF has been selected for DISTANCE ADJUST). The measured value for the distance between points 1 and 3 is shown on the 3rd row. Set the actual distance on the 4th row.

DISTANCE	
POINT 1-3	
	00303.5 mm
OK?	00303.5 mm

Press the RIGHT or LEFT ARROW key to move the cursor. Press the UP or DOWN arrow key to increase or decrease the number for the distance value.

- Press the ENTER key to store the setting.
- The READY menu appears, and the plotter is ready to start the cutting operation.

Setting the Registration Mark Reading Area

The AUTO REG. MARK sensing function senses the registration mark by moving the media or the sensor until the plotter locates the registration mark. Normally there is nothing printed in between the registration marks in order to prevent any sensing errors, however an image can be printed between the registration marks if you tell the plotter *where to read* the registration marks.

You can specify areas that the plotter will not sense by simply specifying the distance between the registration marks. Once the plotter locates the first registration mark, it will automatically move the specified distance and begin scanning for the next mark. You can also use this function to reduce mark-sensing time. Before you begin, you must know the distance between registration marks. The plotter can save up to three sets of settings.

- Press the ALIGNMENT key.
- Press the F1 key to select AUTO REG. MARK.

AUTO REG. MARK>
SKIP>
AUTO>
MANUAL>

- Press the F1 key to select MARK SCAN MODE.

MARK SCAN MODE>
MARK TYPE>
OTHER SETUPS>
DISTANCE ADJUST>

- Press the F3 key to select ENABLED. A * mark appears next to the current setting

```

MARK SCAN MODE
      ENABLED*
      DISABLED

```

- Press the ENTER key to register your setting and display the following screen.

```

MARK SCAN MODE
      2POINTS
      3POINTS*
      4POINTS

```

- Select 2, 3, or 4 and then press the ENTER key to advance to the next menu.
- Press the F1, F2 or F3 key to select the number you wish to store the settings under. A * mark appears next to the current setting.

```

SCAN MARK          *1>
                   2>
                   3>

```

- Press the F3 key or the F4 key to select the axis for setting the distance.
- Press the LEFT or RIGHT ARROW key to move the blinking cursor for selecting the digit, and then press the UP or DOWN ARROW key to change the number.

```

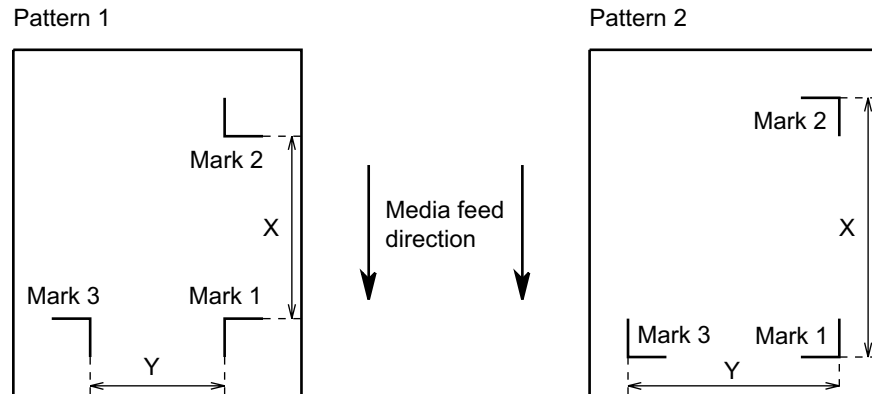
MARK POSITION
      X =  0000 mm
      Y =  0000 mm

```

- The value representing the distance between registration mark 1 and mark 2 is stored in the X-axis. The value representing the distance between registration mark 1 and mark 3 is stored in the Y-axis.



Note: If you select the 2-POINTS method, the Y-axis information is ignored.



Enter distance X to the "X=", distance Y to the "Y=".



Note: After the plotter senses the first registration mark, it discontinues sensing, moves to the specified distance and starts searching for the next registration mark.



Note: If the distance is set at 0mm, the plotter moves slowly searching for the next registration mark.



Note: Always enter a distance value that is shorter than the actual distance between the registration marks. The plotter will move to the new location and start searching for the registration mark. If the sensor starts searching *after* it passes the registration mark, the sensor will not locate the registration mark.



Caution: If you set the distance of the X-axis to longer than the length of the media, the plotter will move the required distance and the media will fall off of the plotter.

- Press the ENTER key to register your setting.
- The following menu appears. If you wish to set another parameter, press the key corresponding to that setting.

```
MARK SCAN MODE>
  MARK TYPE>
    OTHER SETUPS>
    DISTANCE ADJUST>
```

Selecting the Registration MARK TYPE

The MARK TYPE function is used to select the registration mark pattern. There are two types of registration patterns that the plotter can sense, pattern 1 and pattern 2.

- Press the ALIGNMENT key.
- Press the F1 key to select AUTO REG. MARK.

```
AUTO REG. MARK>
  SKIP>
  AUTO>
  MANUAL>
```

- Press the F2 key to select MARK TYPE.

```

MARK SCAN MODE>
  MARK TYPE>
    OTHER SETUPS>
    DISTANCE ADJUST>

```

- Press the F3 key for pattern type 1 or the F4 key to select pattern type 2 to be used when printing the image and registration mark on the media. A * mark appears next to the current setting.

```

MARK TYPE
                                     1*
                                     2

```

- Press the ENTER key to register your setting. The following menu appears. If you wish to set another parameter, press the key corresponding to that setting.

```

MARK SCAN MODE>
  MARK TYPE>
    OTHER SETUPS>
    DISTANCE ADJUST>

```

- Press the NEXT key to return to READY status.

Specifying the Registration MARK SIZE

The MARK SIZE function allows you to specify the size of the registration mark. The size of the registration mark is important. The line width must be between 0.3 mm and 1.0 mm and the length must be between 5 mm and 20 mm.

- Press the ALIGNMENT key.
- Press the F1 key to select AUTO REG. MARK.

```

  AUTO REG. MARK>
    SKIP>
    AUTO>
    MANUAL>

```

- Press the F3 key to select OTHER SETUPS.

```

MARK SCAN MODE>
  MARK TYPE>
    OTHER SETUPS>
    DISTANCE ADJUST>

```

- Press the F1 key to select MARK SIZE

```

MARK SIZE>
SENSOR OFFSET ADJ>
AXIS ORIGIN OFFSET>
PAPER-WEIGHT>

```

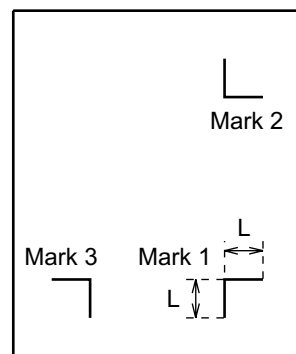
- Press the UP or DOWN ARROW key to set the length. The length can be set from 5 mm to 20 mm in 1 mm increments.

```

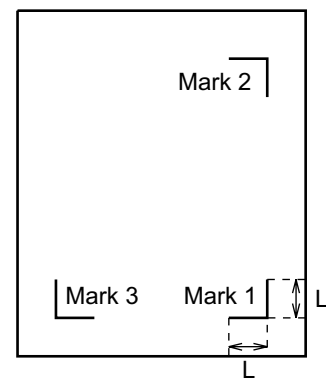
MARK SIZE
15mm

```

Pattern 1



Pattern 2



Media feed
direction

Enter length L into the MARK SIZE menu.

- Press the ENTER key to register your setting. The following menu appears. If you wish to set another parameter, press the key corresponding to that setting.

```

MARK SIZE>
SENSOR OFFSET ADJ>
AXIS ORIGIN OFFSET>
PAPER-WEIGHT>

```

- Press the NEXT key to return to READY status.

Setting the DISTANCE ADJUSTMENT

The DISTANCE ADJUST function allows you to specify the method to precisely adjust the distance between the registration marks. The distance between registration marks is automatically corrected to a value.

There are two types of distance adjustment methods available, manual and auto. When manual is selected, you must enter the distance between the registration marks to set the scaling factor, therefore, you must know the distance between the registration marks. When auto is selected, the plotter sets the scaling factor automatically by digitizing the distance between the registration marks and by setting the resolution. You may select 5mm resolution, 10mm resolution or 50mm resolution.

- Press the ALIGNMENT key.
- Press the F1 key to select AUTO REG. MARK.

```

AUTO REG. MARK>
      SKIP>
      AUTO>
      MANUAL>
  
```

- Press the F4 key to select DISTANCE ADJUST.

```

MARK SCAN MODE>
      MARK TYPE>
      OTHER SETUPS>
      DISTANCE ADJUST>
  
```

- Press the F2 (DISTANCE ADJUST) key to display the following screen.

```

DISTANCE ADJUST
      OFF
      CUSTOM*
      STANDARD
  
```

- The item marked with the asterisk is the current setting.
To turn off distance adjustment (manual input), press the F2 key (OFF).
For Custom distance adjustment, press the F3 key (CUSTOM).
For Standard distance adjustment, press the F4 key (STANDARD).
- If the settings are OK, press the Enter key.
- If distance adjustment is CUSTOM, the following screen is displayed.

```

DISTANCE ADJUST
      5mm*
      10mm
      50mm
  
```

- The item marked with the asterisk is the current setting.
To set a distance adjustment of 5 mm (rounded up for less than 5), press the F2 key (5 mm).
To set a distance adjustment of 10 mm (rounded up for less than 10), press the F3 key (10 mm).
To set a distance adjustment of 50 mm (rounded up for less than 50), press the F4 key (50 mm).
- Press the ENTER key to register your setting. The following menu appears. If you wish to set another parameter, press the key corresponding to that setting.

```

MARK SIZE>
SENSOR OFFSET ADJ>
AXIS ORIGIN OFFSET>
PAPER-WEIGHT>

```

- Press the NEXT key to return to READY status.

Setting of AXIS ORIGIN OFFSET

Unless the origin point has been moved to a new position, it is always located in the corner of the registration mark. Use the AXIS ORIGIN OFFSET function when you wish to move the origin of the plotter.

In order to set the origin point of the cutting data to match the cutting data and pre-printed image, you must know the location of the axis origin point from the registration mark. Next, use the following procedure to set the axis origin point a specific distance from the corner of registration mark 1.

- Press the ALIGNMENT key.
- Press the F1 key to select AUTO REG. MARK.

```

AUTO REG. MARK>
SKIP>
AUTO>
MANUAL>

```

- Press the F3 key to select OTHER SETUPS.

```

MARK SCAN MODE>
MARK TYPE>
OTHER SETUPS>
DISTANCE ADJUST>

```

- Press the F3 key to select AXIS ORIGIN OFFSET

```

MARK SIZE>
SENSOR OFFSET ADJ>
AXIS ORIGIN OFFSET>
PAPER-WEIGHT>

```

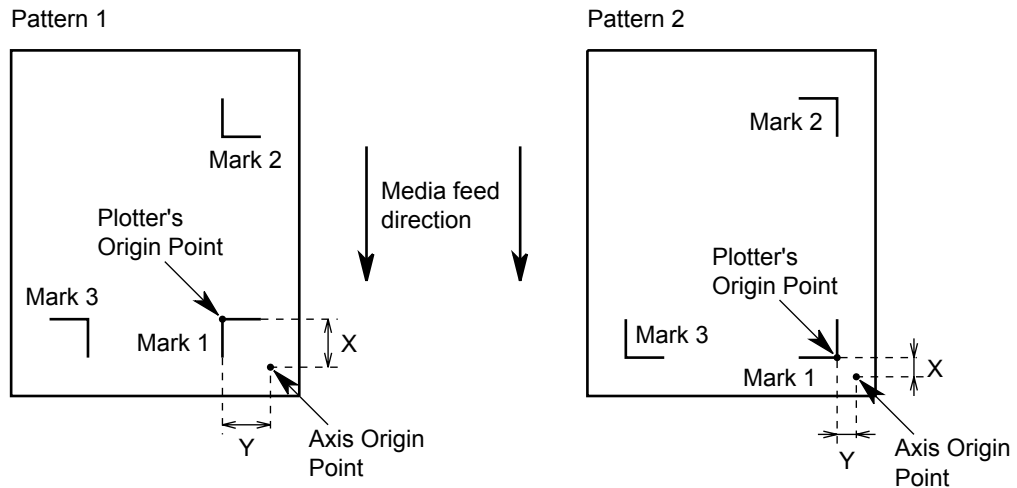
- Press the F3 or F4 key to select the axis for setting distance. Press the F2 key to change polarity for distance setting. Press the LEFT or RIGHT ARROW key to move the blinking cursor to select a digit, then press the UP or DOWN ARROW key to change the number.

```

AXIS ORIGIN OFFSET
                    +/- >
X =      000.0 mm
Y =      000.0 mm
  
```

In the X-Axis, enter the distance between registration mark 1 and the axis origin point on the X-axis. In the Y-Axis, enter the distance between registration mark 1 and the axis origin point on the Y-axis. The distance can be set from -200mm to 200mm.

Press the F2 key to toggle polarity, the “-” mark appears on the distance setting when you’ve selected negative.



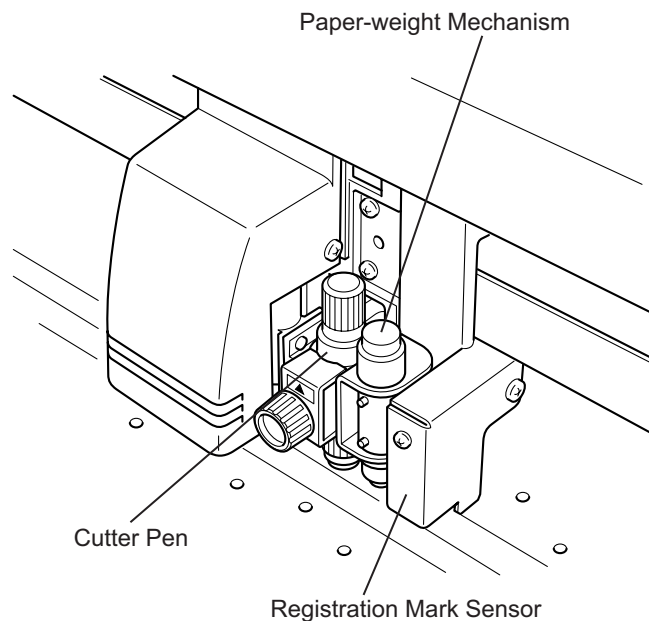
- Press the ENTER key to register your setting. The following menu appears. If you wish to set another parameter, press the key corresponding to that setting.

```

MARK SIZE>
SENSOR OFFSET ADJ>
AXIS ORIGIN OFFSET>
PAPER-WEIGHT>
  
```

Setting of PAPER-WEIGHT Function

The PAPER-WEIGHT function adds extra weight to hold the media down against the cutting surface to prevent a sensing error caused by media rising up from the cutting surface.



Use the following procedure to enable or disable this function:

- Press the ALIGNMENT key.
- Press the F1 key to select AUTO REG. MARK.

```
AUTO REG. MARK>
SKIP>
AUTO>
MANUAL>
```

- Press the F3 key to select OTHER SETUPS.

```
MARK SCAN MODE>
MARK TYPE>
OTHER SETUPS>
DISTANCE ADJUST>
```

- Press the F4 key to select PAPER-WEIGHT

```
MARK SIZE>
SENSOR OFFSET ADJ>
AXIS ORIGIN OFFSET>
PAPER-WEIGHT>
```

- Press the F3 key to enable this function. Press the F4 key to disable this function. A * mark appears next to the current setting.

```
PAPER-WEIGHT
                                     ON*
                                     OFF
```



Note: When ON is selected, the plotter will move to the home position to enable the PAPER-WEIGHT mechanism before and after the plotter scans the registration mark.

- Press the ENTER key to register your setting. The following menu appears. If you wish to set another parameter, press the key corresponding to that setting.

```
MARK SIZE>
SENSOR OFFSET ADJ>
AXIS ORIGIN OFFSET>
PAPER-WEIGHT>
```

Setting the SENSOR OFFSET Adjustment

The SENSOR OFFSET ADJ function is used to determine the corrective values you should input in order to adjust the precision of the registration mark sensor.

The plotter utilizes an optical sensor to sense or read a registration mark that is not in the same location as the pen. There are two methods available to adjust the offset factor:

METHOD 1: The plotter scans a printed cross mark then plots a second cross mark based on the reading of the printed cross mark. The plotter then adjusts for offset.

METHOD 2: The plotter plots the cross mark, reads it, then plots another cross symbol for use in determining the corrective values to be input in order to adjust the precision of the registration mark sensor. The plotter plots the second cross mark based on the reading of the first cross mark then adjusts for offset.



Note: To avoid confusion, plot using different color pens between the first and second cross marks.

- Load the media and set the pen in the plotter. If you wish to use METHOD 1, you must load media with a printed cross mark.
- Press the ALIGNMENT key
- Press the F1 key to select AUTO REG. MARK

```
AUTO REG. MARK>
SKIP>
AUTO>
MANUAL>
```


- Press the F3 key to select OTHER SETUPS

```

MARK SCAN MODE>
  MARK TYPE>
    OTHER SETUPS>
      DISTANCE ADJUST>
  
```

- Press the F2 key to select SENSOR OFFSET ADJ.

```

MARK SIZE>
  SENSOR OFFSET ADJ>
    AXIS ORIGIN OFFSET>
      PAPER-WEIGHT>
  
```

- Press the F3 or F4 key to select METHOD 1 or METHOD 2

```

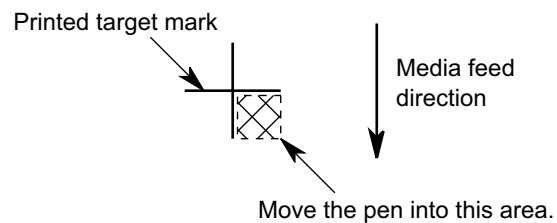
SENSOR OFFSET ADJUST
  METHOD 1 >
  METHOD 2 >
  
```

Select either METHOD 1 or METHOD 2

SELECTING METHOD 1

The plotter scans a printed cross mark and then plots a second cross mark based on the reading of the printed cross mark. The plotter then adjusts for offset.

- Press the POSITION key to move the pen near to the pre-printed cross mark.



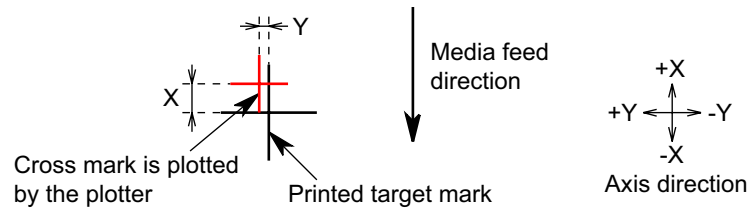
- Press the F4 key to select SCAN

```

SENSOR OFFSET ADJUST
  PARAMETER SET>
    SCAN>
  
```

The plotter scans the pre-printed cross mark, then plots the cross mark.

You must measure the distance between the pre-printed cross mark and the cross mark plotted by your plotter. If the location of the two cross marks match, press the NEXT key to cancel this mode. If the location of the cross marks do not match, change the PARAMETER SET.



- Press the F3 key to select PARAMETER SET. The following menu appears:

```

SENSOR OFFSET ADJUST

                PARAMETER SET>
                SCAN>
  
```

Press the F3 or F4 key to select the axis for setting distance. Press the F2 key to toggle polarity for the distance setting, the “-” mark appears on the distance setting when negative is selected.

Press the LEFT or RIGHT ARROW key to move the blinking cursor to select the digit, then press the UP or DOWN ARROW key to change the number.

```

SENSOR OFFSET ADJUST

                +/- >
X =      00.0 mm
Y =      00.0 mm
  
```

If the two cross marks match, set 00.0 mm on both the X and Y-axis.

- Press the ENTER key to register your setting. The following menu appears. If you wish to set another parameter, press the key corresponding to that setting.

```

SENSOR OFFSET ADJUST

                METHOD 1>
                METHOD 2>
  
```

SELECTING METHOD 2

The plotter plots the cross mark, reads it, and plots another cross symbol for use in determining the corrective values to be input in order to adjust the precision of the registration mark sensor. The plotter plots the second cross mark based on the reading of the first cross mark then adjusts for offset.

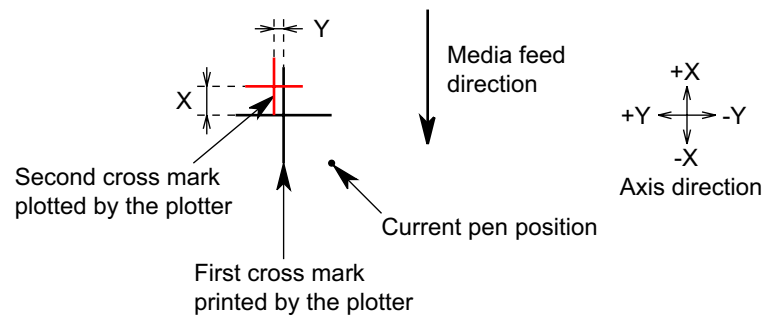
- Press the POSITION key to move the pen to plot the first cross mark.

- Press the F4 key to select SCAN

```

SENSOR OFFSET ADJUST

PARAMETER SET>
SCAN>
  
```



The plotter plots the first cross mark. The following menu appears.

- Change the pen to a different color. Press the ENTER key to continue the process.

```

CHANGE PEN

PRESS ENTER KEY!

.
  
```

You must measure the distance between the first and second cross marks plotted by the plotter. If the location of the two cross marks match, press the NEXT key to cancel this mode. If the cross marks do not match, change the PARAMETER SET.

- Press the F3 key to select PARAMETER SET.

```

SENSOR OFFSET ADJUST

PARAMETER SET>
SCAN>
  
```

- The following menu appears. Press the F3 or F4 key to select the axis for setting distance. Press the F2 key to toggle polarity for the distance setting, the “-“ mark appears on the distance setting when negative is selected. Press the LEFT or RIGHT ARROW key to move the blinking cursor to select the digit, then press the UP or DOWN ARROW key to change the number.

```

SENSOR OFFSET ADJUST
                +/- >
X =      00.0 mm
Y =      00.0 mm

```

If the two cross marks match, set 00.0 mm on both the X and Y-axis.

- Press the ENTER key to register your setting. The following menu appears. If you wish to set another parameter, press the key corresponding to that setting.

```

SENSOR OFFSET ADJUST

PARAMETER SET>
SCAN>

```

Using the AUTO REG. MARK Sensing Function

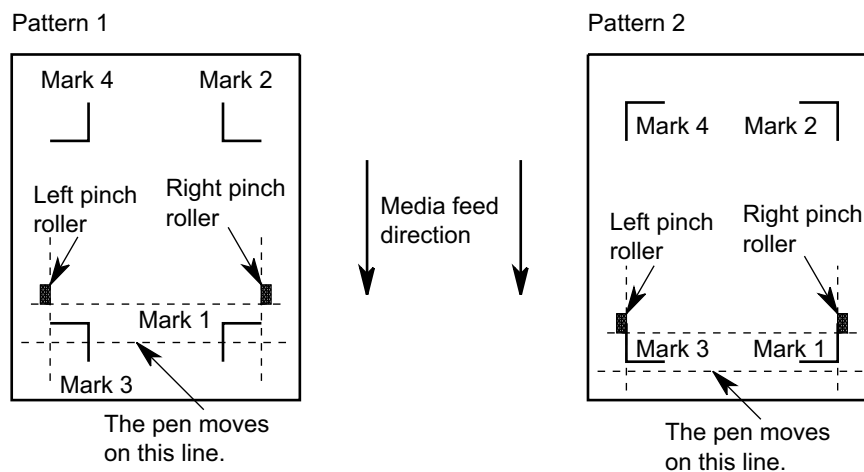
- Load pre-printed media into the plotter. Make sure that the pinch roller is set outside of the registration mark. If you wish to use the auto-scanning mode, set the pinch roller to just outside of the registration mark.
- Press the ALIGNMENT key.
The following menu appears.

```

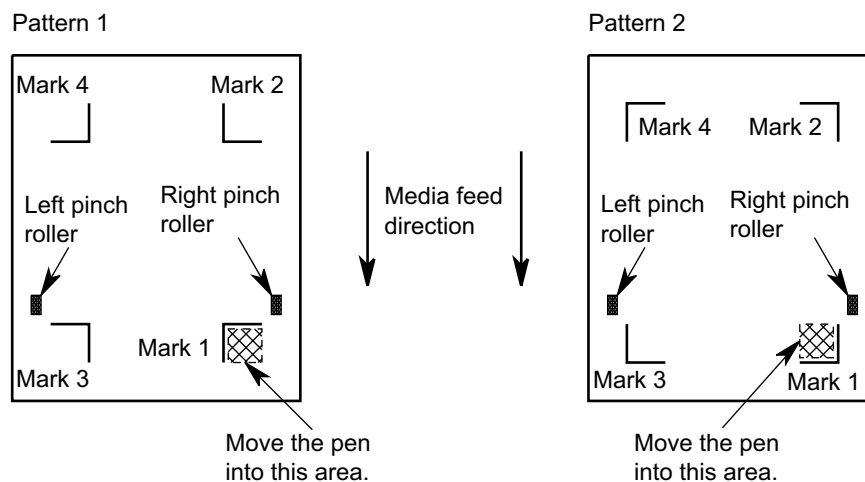
AUTO REG. MARK>
SKIP>
AUTO>
MANUAL>

```

Press the POSITION key to move the pen and media to the area necessary for scanning the first registration mark. When using AUTO scan mode, move the media to the first registration mark that is located between the pinch roller and the pen.



When using MANUAL scan mode, move the pen and the media to the square area that is created by the first registration mark.



After setting the location of the registration mark, press the F3 key or F4 key to select AUTO to automatically read the registration marks, or MANUAL to set the starting point to manually read the registration marks. The plotter starts searching or scanning for the first registration mark.

- When you select the auto distance adjustment for the 5, 10, or 50 mm resolution mode, the plotter reads the distance between the registration marks and then automatically aligns the axes and adjusts the distance.

After all the registration marks are read, the plotter moves the pen and media to the AXIS ORIGIN POINT. The axis origin location is set in the AXIS ORIGIN OFFSET menu and then the READY menu appears.

- When you disable auto DISTANCE ADJustment, the following menu appears after the plotter scans the registration marks:

DISTANCE	
POINT 1-2	
	00302.0 mm>
OK?	00302.0 mm>

The measured distance between registration mark 1 and mark 2 is shown on the third row. If the distance between the marks is a known value, set the actual distance on the fourth row. Press the RIGHT or LEFT ARROW key to move the blinking cursor and press the UP or DOWN ARROW key to change the number for setting the actual distance.

- Press the ENTER key to store the setting.
- When selecting the 2-POINTS scan mode, the plotter moves the pen and media to the AXIS ORIGIN point. The AXIS ORIGIN OFFSET menu is used to set the AXIS ORIGIN point location; the READY menu then appears.
- When selecting the 3-POINTS or 4-POINTS scan mode, the following menu appears:

DISTANCE	
POINT 1-3	
	00302.0 mm>
OK?	00302.0 mm>

The measured distance between registration mark 1 and mark 3 is shown on the third row. If the distance between the marks is a known value, set the actual distance on the fourth row. Press the RIGHT or LEFT ARROW key to move the blinking cursor and press the UP or DOWN ARROW key to change the number for setting the actual distance.

- Press the ENTER key to store the setting.

When selecting the 3-POINTS scan mode, the plotter moves the pen and media to the AXIS ORIGIN point. The AXIS ORIGIN OFFSET menu is used to set the AXIS ORIGIN point location, the READY menu then appears.

In the 4-POINTS scan mode, the pen is moved to the first point.

AUTO PRE-FEED - Advancing the Media Automatically

The auto pre-feed function is used to prevent the loaded media from slipping caused by pulling the media out from the stock roll during cutting/plotting.

If this function is enabled, the plotter begins feeding as soon as initialization is complete. During cutting/plotting, the plotter stops its job if the next cut/plot data goes beyond the length that has been pulled out from the stock roll. If this occurs, feed the media length in accordance with the Feed Length setting, then resume the cutting/plotting job.

Please note that this function should be set *before* the cutting/plotting job is started since changing the setting of this mode leads to the plotter's initialization, clearing all the data needed to continue the suspended job in the buffer.

- Press the **MENU** key to select **MENU mode**.
- Press the **NEXT** key two times.
- Press the **F4** key to select **FUNCTION 2**.

```

INTERFACE>
AREA PARAMETERS>
FUNCTION 1>
FUNCTION 2>

```

- Press the **F3** key to select **AUTO PRE-FEED**.

```

DATA SORTING>
AXIS ALIGNMENT>
AUTO PRE FEED>
TANGENT EMULATION>

```

- Press the **F3** key to select **ENABLED** or press the **F4** key to select **DISABLED**.

```

AUTO PRE FEED
ENABLED
DISABLED

```

- Press the **ENTER** key to store the selection.

If the F3 key is pressed, the following menu will appear:

```

AUTO PRE FEED
FEED LENGTH= 1 m

```

- Press the **UP** or **DOWN ARROW** to lengthen or shorten the **FEED LENGTH**. The menu will cycle through the available lengths in sequence.

The FEED LENGTH can be set in a range of 1 to 50 meters. If the feed length is set too high (too long), the media will unwind. Unwound media will not cut as easily as wound media.

- Press the **ENTER** key to register your settings or press the **MENU** key to cancel **MENU** mode.

NOTE: The plotter begins pre-feeding as soon as the cutting data is sent from the PC when the auto pre-feed is enabled AND the new origin point is within 50mm of the previous feed's border.

You may access the auto pre-feed menu from the initial menu which appears on the LCD when the paper set lever is lowered.

LOAD MEDIA!

INITIAL MENU>

- Press the **F4** key to select the initial menu while the initial menu appears on the LCD.
- Press the **F2** key to select **AUTO PRE-FEED**.

AUTO PRE FEED>
INITIAL FEED SPEED>
INTERFACE>

- Press the **F3** key to select **ENABLED** or press the **F4** key to select **DISABLED**.

AUTO PRE FEED

ENABLED*
DISABLED

If the **F3** key is pressed, the following menu will appear:

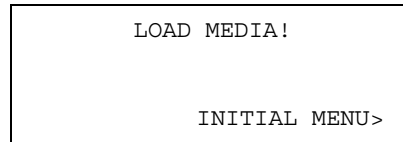
AUTO PRE FEED
FEED LENGTH= 1 m

- Press the **UP** or **DOWN ARROW** to lengthen or shorten the **FEED LENGTH**. The menu will cycle through the available lengths in sequence.
- Press the **ENTER** key to store the setting. The following menu appears:

AUTO PRE FEED>
INITIAL FEED SPEED>
INTERFACE>

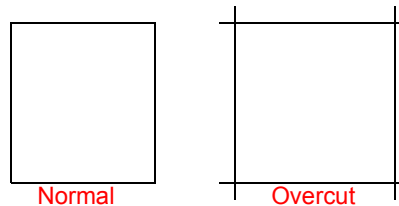
- **Press the NEXT key.**

The LOAD MEDIA message then appears again. Mount the media and raise the media set lever.



TANGENTIAL EMULATION - Cutting Thick & Thin Material

Tangential emulation blade control prevents the problems listed below from occurring in the normal blade control.



- Dull corner shapes on thick material.
- Inadequate line length particularly on thick material.
- Broken corners on thick and thin material.

When tangential emulation is enabled a special blade rotation control and cut pressure control are performed at turning points such as corners, to ensure a quality cut. In addition, an overcut function which eliminates uncut portions from thick material is available when tangential emulation is enabled.

Be sure to set TANGENTIAL settings to suit the media being cut.

Selecting Tangential Emulation Mode

There are two modes available for tangential emulation control, MODE 1 and MODE 2. MODE 1 is overcut with start and end point control, plus, if the line is curved, MODE 1 uses a series of overcuts to ensure that curved lines are cut precisely. Mode 2 is also overcut with start and end point control, but it follows the curve of the line without overcuts. The quality of Mode 1 is superior to that of MODE 2, however, Mode 2 has the best overall time. If the cut/plot time is too slow due to the excessive up/down pen movements of MODE 1, select MODE 2 to shorten the cut/plot time. Remember that the cutting quality with MODE 2 is inferior to that of MODE1.

- **Press the MENU key to select MENU mode.**
- **Press the NEXT key two times.**

- Press the F4 key to select **FUNCTION 2**.

```

INTERFACE>
AREA PARAMETERS>
FUNCTION 1>
FUNCTION 2>

```

- Press the F4 key to select **TANGENT EMULATION**.

```

DATA SORTING>
AXIS ALIGNMENT>
AUTO PRE FEED>
TANGENT EMULATION>

```

- Press the F3 key to select mode.

```

TANGENT
EMULATION
                                MODE>
                                ENABLE/DISABLE>

```

- Press the F3 key to select **MODE 1** or press the F4 key to select **MODE 2**.

```

TANGENT
EMULATION
                                MODE 1>
                                MODE 2>

```

- Press the ENTER key to register your settings or press the MENU key to cancel MENU mode.

Enabling Tangential Emulation

Tangential emulation control can be individually enabled or disabled by pen condition.

- Press the MENU key to select MENU mode.
- Press the NEXT key two times.
- Press the F4 key to select **FUNCTION 2**.

```

INTERFACE>
AREA PARAMETERS>
FUNCTION 1>
FUNCTION 2>

```

- Press the F4 key to select **TANGENT EMULATION**.

```

DATA SORTING>
  AXIS ALIGNMENT>
    AUTO PRE FEED>
      TANGENT EMULATION>

```

- Press the F4 key to toggle between **ENABLE/DISABLE**.

```

TANGENT
EMULATION
                                MODE>
                                ENABLE/DISABLE>

```

- Press the **LEFT** or **RIGHT ARROW** key as required to enable/disable the tangential emulation mode per each condition of numbers. Press the **UP** or **DOWN ARROW** key to select **ENABLE** or **DISABLE**. The **V** mark appears when enable is selected for that tangential emulation mode.

```

TANGENTIAL EMULATION
CONDITION 1 2 3 4 5 6 7 8
                                V    V

```

- Press the **ENTER** key to register your settings or press the **MENU** key to cancel **MENU** mode.

In **READY** status, the message **TANGENTIAL** appears along with the condition menu when the condition on which the enabled tangential emulation is selected.

```

CONDITION 6           38
TANGENTIAL           60
READY                2
                   CB15U-K30x  0

```

Setting Overcut

An overcut function is available when tangential emulation is enabled. The overcut function enables the plotter to cut a line longer than the cutting data specifies. Overcutting eliminates uncut portions when using thick material. You can specify the overcut length by entering the start and end points of the overcut.

Press the function key [F1] thru [F4] corresponding to the condition that enables the tangential emulation mode and requires an overcut setting.

```

CONDITION 6           38
TANGENTIAL           60
READY                2
                   CB15U-K30x  0

```

- Press the condition key.

SET	38
CONDITION 6	60
	2
CB15U-K30x	0

- Set the parameters if necessary, then press the ENTER key to register your settings.
- Press the F3 key or the F4 key to select the start point or end point. Press the UP or DOWN ARROW key to set the overcut length. The overcut length can be set from 0.0mm to 0.9mm in 0.1mm increments.

OVERCUT
START = 0.2mm ■
END = 0.2mm

- Press the ENTER key to register your settings.

SPEED - Setting the Pen-Up Speed

To reduce the overall cutting time, this function allows you to set the traveling speed of the pen in raised status, separately from the cutting SPEED setting.

- Press the MENU key to select MENU mode.
- Press the NEXT key three times.
- Press the F3 key to select OPTION 1.

BACKGROUND SETTINGS>
OPTION 1>
OPTION 2>

- Press the F1 key to select PEN-UP SPEED.

PEN UP SPEED>
OFFSET ANGLE>
OFFSET FORCE>
STEP PASS>

- Press the UP or DOWN ARROW key to sequence through the available choices.

The PEN-UP SPEED can be set to AUTO or to 10, 20, 30, 40, 50 or 60 cm/s. When AUTO is selected the PEN UP-SPEED is set to match the current cutting SPEED setting.

```
PEN UP SPEED
```

```
SPEED = AUTO
```

- Press the ENTER key to register your settings or press the MENU key to cancel MENU mode.



NOTE: Your PEN-UP SPEED setting is retained in the plotter's internal memory even while the plotter is turned off.

OFFSET ANGLE - Adjusting the Blade Offset Angle

Use this function to smooth curves on large characters or shapes. At the joints of each line segment, the plotter stops cutting and very quickly rotates the blade tip. This ensures the accurate cutting of the computer data. In some cases, it is better to bypass this blade rotation and drag the blade in order to make the shape smoother and to shorten overall cutting time. This action will result in a slightly different shape from the original computer data.

With the OFFSET ANGLE function you may set the reference angle of connection and eliminate the blade control at the connections whose angles are under that reference angle.

- Press the MENU key to select MENU mode.
- Press the NEXT key three times.
- Press the F3 key to select OPTION 1.

```
BACKGROUND SETTINGS>
```

```
OPTION 1>
```

```
OPTION 2>
```

- Press the F2 key to select OFFSET ANGLE.

```
PEN UP SPEED>
```

```
OFFSET ANGLE>
```

```
OFFSET FORCE>
```

```
STEP PASS>
```

- Press the UP or DOWN ARROW key to sequence through the available choices. The OFFSET ANGLE can be set in a 61-step range from 0 to 60.

```

OFFSET ANGLE
ANGLE = 30

```

- Press the ENTER key to register your settings or press the MENU key to cancel MENU mode.



NOTE: Your OFFSET ANGLE setting is retained in the plotter's internal memory even when the plotter is turned off.

NOTE: Excessive settings may deform the shape of characters. Be sure to perform adequate testing before performing your final cut to ensure that you have located the appropriate setting which offers the proper quality.

OFFSET FORCE - Setting the Offset Cut Pressure

Since the direction in which the blade tip is facing cannot be determined during initialization of the plotter, initial blade control is performed to adjust the offset angle of the blade (See OFFSET FORCE - Adjusting the Blade Offset Angle).

The Offset Cut Pressure function is used to specify the force applied during initial blade control.

The Offset Cut Pressure is also used to offset the blade angle in TANGENTIAL EMULATION MODE. This pressure should be set as low as possible to ensure cutting quality. If the pressure is too great the corners may break or lack a clear cut, particularly when using very thin material. Start with the default setting (4), then change the value if necessary.

- Press the MENU key to select MENU mode.
- Press the NEXT key three times.
- Press the F3 key to select OPTION 1.

```

BACKGROUND SETTINGS>
OPTION 1>
OPTION 2>

```

- Press the F3 key to select OFFSET FORCE.

```

PEN UP SPEED>
OFFSET ANGLE>
OFFSET FORCE>
STEP PASS>

```

- Press the **UP ARROW** or **DOWN ARROW** key to sequence through the available choices. The **OFFSET PRESSURE** can be set in a 40-step range from 1 to 40.

```
OFFSET FORCE
```

```
FORCE = 4
```

- Press the **ENTER** key to register your settings.
- Press the **MENU** key to cancel the menu mode.



NOTE: Your **OFFSET PRESSURE** setting is retained in the plotter's internal memory even when the plotter is turned off.

NOTE: The **OFFSET PRESSURE** setting specifies the pressure being applied during initial blade control and during offset control in **TANGENTIAL EMULATION MODE**. This is separate from the cutting force setting which specifies the down force of the lowered cutter pen during cutting.

STEP PASS - Setting the Step Pass

Use this function when the cut line is jagged in detailed shapes such as small characters with tiny curves. The jaggedness is caused by the excessive number of line segments used for small characters. This slows the cutting speed.

Use this function to skip or **PASS** some of the **STEPS**, make the line smoother and to accelerate the cutting time.

- Press the **MENU** key to select **MENU** mode.
- Press the **NEXT** key three times.
- Press the **F3** key to select **OPTION 1**.

```
BACKGROUND SETTINGS>
```

```
OPTION 1>
```

```
OPTION 2>
```

- Press the **F4** key to select **STEP PASS**.

```
PEN UP SPEED>
```

```
OFFSET ANGLE>
```

```
OFFSET FORCE>
```

```
STEP PASS>
```

- Press the **UP** or **DOWN ARROW** key to sequence through the available choices. The **STEP PASS** can be set in a 21-step range from 0 to 20. The

higher the number, the more steps of data will be passed between each data point. These data points represent actual cut line segments.

```
STEP PASS
STEP PASS = 0
```

- Press the ENTER key to register your settings or press the MENU key to cancel MENU mode.



NOTE: Your STEP PASS setting is retained in the plotter's internal memory even when the plotter is turned off.

NOTE: Excess settings may deform the shape of characters, therefore this value should be kept at zero if it is not needed. Always perform a cut test to verify the settings.

INITIAL DOWN FORCE- Adjusting the Initial Media Cut Force

This function is only valid when the TANGENTIAL EMULATION is enabled. The TANGENTIAL EMULATION is suitable for cutting thick material. In TANGENTIAL EMULATION mode, the plotter raise the blade when changing cutting directions and then lowers the blade into the media to cut.

The actual force needed to cut media may vary from the actual force needed to lower the blade into the media. In this case, use the INITIAL DOWN FORCE function to set the force needed to lower the blade into the media. Should a different orce be needed to plunge thru the media than is needed to cut the media, use the INITIAL DOWN FORCE.

- Press the MENU key to select MENU mode.
- Press the NEXT key three times.
- Press the F4 key to select OPTION 2.

```
BACKGROUND SETTINGS>
OPTION 1>
OPTION 2>
```

- Press the F2 key to select INITIAL DOWN FORCE.

```
INITIAL DOWN FORCE>
DISTANCE ADJUST>
TEST>
```


- Press the UP or DOWN ARROW key to sequence through the available choices. The INITIAL DOWN FORCE can be set from 0 to 40.

```

INITIAL DOWN FORCE
FORCE = 0

```

- Press the ENTER key to register your settings.
- Press the MENU key to cancel the menu mode.

NOTE: Your INITIAL DOWN FORCE setting specifies additional pressure. The plotter applies higher force on the blade for a short time after it changes the direction of the blade in TANGENTIAL EMULATION MODE and then the plotter returns to the original cutting force on the blade for cutting the material. The higher force is the total of the original cutting force setting plus the INITIAL DOWN FORCE setting.

DISTANCE ADJUST - Adjusting the Length of Line Segments

The actual length of cut line segments may vary according to the thickness of the media being used. In this case, use the DISTANCE ADJUST function to correct the distance.

Each of the DISTANCE ADJUST settings represents a percentage. For example, if the cutting length is 2000mm and the DISTANCE ADJUST setting is 0.5% then the cutting length would be 2001mm.

- Press the MENU key to select MENU mode.
- Press the NEXT key three times.
- Press the F4 key to select OPTION 2.

```

BACKGROUND SETTINGS>
OPTION 1>
OPTION 2>

```

- Press the F3 key to select DISTANCE ADJUST.

```

INITIAL DOWN FORCE>
DISTANCE ADJUST>
TEST>

```

- Press the RIGHT or LEFT ARROW key to move the cursor to the number of the condition group you wish to use under DISTANCE ADJUST. Press the

UP or DOWN ARROW key to enable or disable the DISTANCE ADJUST function. When the DISTANCE ADJUST function is enabled a “v” mark appears.

```

DISTANCE ADJUST
CONDITION 1 2 3 4 5 6 7 8
          v
  
```

- Press the ENTER key to register your settings.
- Press the MENU key to cancel the MENU mode.

Setting Distance Adjust Parameter

Press the [F1] thru [F4] key to select the number of the condition requiring distance parameter adjustment.

```

CONDITION 1      14
                30
READY           4
                CB09Ux 0
  
```

- Press the CONDITION key.

```

SET             14
CONDITION 1    30
                4
                CB09Ux 0
  
```

- Set the parameters if necessary, then press the ENTER key to register your settings.
- Press the F2 key or the F3 key to select the X or Y Axis. Press the UP or DOWN ARROW key to set the DISTANCE ADJUST parameter. DISTANCE ADJUST can be set from -2.00% to +2.00% in 0.05% increments.
- Press the F4 key to reset the DISTANCE ADJUST parameter to 0% on the X and Y Axes.

```

DISTANCE ADJUST
CONDITION 1    X = 0.00%
                Y = 0.00%
                RESET>
  
```

- Press the ENTER key to register your settings.

RS-232C Serial Interface

The RS-232C Serial interface of your plotter conforms to the RS-232C Standard of Electronic Industries Association (EIA). This serial interface performs the serial transfer of digital binary data, control signals and SYNC signals.

Table 1: RS232 Serial Interface Specifications

Standard	CCITT V.24, EIA RS-232C, JIS X5101
Synchronization	Asynchronous start-stop
Transfer Rate	19200 bits/s
Stop Bit	2 stop bits
Parity	Even, odd, none
Character length	7 or 8 bits

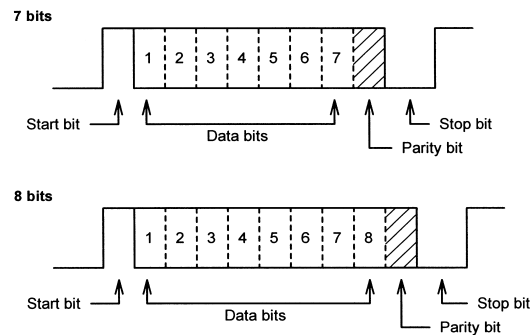


Table 2: RS232-C Electrical Characteristics

	RD, SD (Negative Logic)	RS, CD, DR, ER (Positive Logic)
Input voltage level	+5V to +12V -5V to -12V	Logical "0" "ON" Logical "1" "OFF"
Output voltage level	+5V to +8V -5V to -8V	Logical "0" "ON" Logical "1" "OFF"

Pin Assignment of the Serial Connector

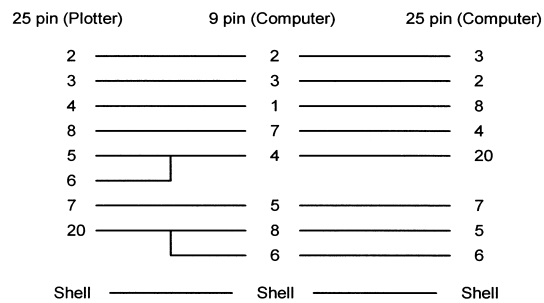
The pin assignment of the serial interface connector is described in the table below.

Table 3: Pin Assignment of the Serial Connector

Pin	Signal Name	Pin	Signal Name
1	GND (Frame)	14	Not used
2	SD (TxD)	15	Not used
3	RD (TxD)	16	Not used
4	RS (RTS)	17	Not used
5	CS (CTS)	18	Not used
6	DR (DSR)	19	Not used
7	GND (Logic)	20	ER (DTR)
8	Not used	21	Not used
9	Not used	22	Not used
10	Not used	23	Not used
11	Not used	24	Not used
12	Not used	25	Not used
13	Not used		

Cable Connection

The cable pin assignment of the serial interface connector from the 25-pin plotter connector to the 9-pin computer connector or the 25-pin computer connector is described below:



Chapter 6: Background Settings

This chapter discusses your plotter's background settings.



NOTE: Your settings are registered in the plotter's internal memory and retained even when the plotter is turned off.

This menu can be accessed by two methods.

Method 1:

- Press the MENU key to select MENU MODE.
- Press the NEXT key until you get to BACKGROUND SETTING menu.
- Press the F2 key to select BACKGROUND SETTING menu.

```

BACKGROUND SETTINGS>
      OPTION 1>
      OPTION 2>
  
```

Method 2:

- Turn the power on while pressing the DOWN ARROW key; the Menu selection display then appears.

```

LANGUAGE SELECTION

[ ENGLISH ]
  
```

There are two different menu sequences. Each of them belongs to GP-GL and HP-GL commands.

When the plotter is turned on, the following menu sequence appears if GP-GL is selected as the plotter's data command:

```

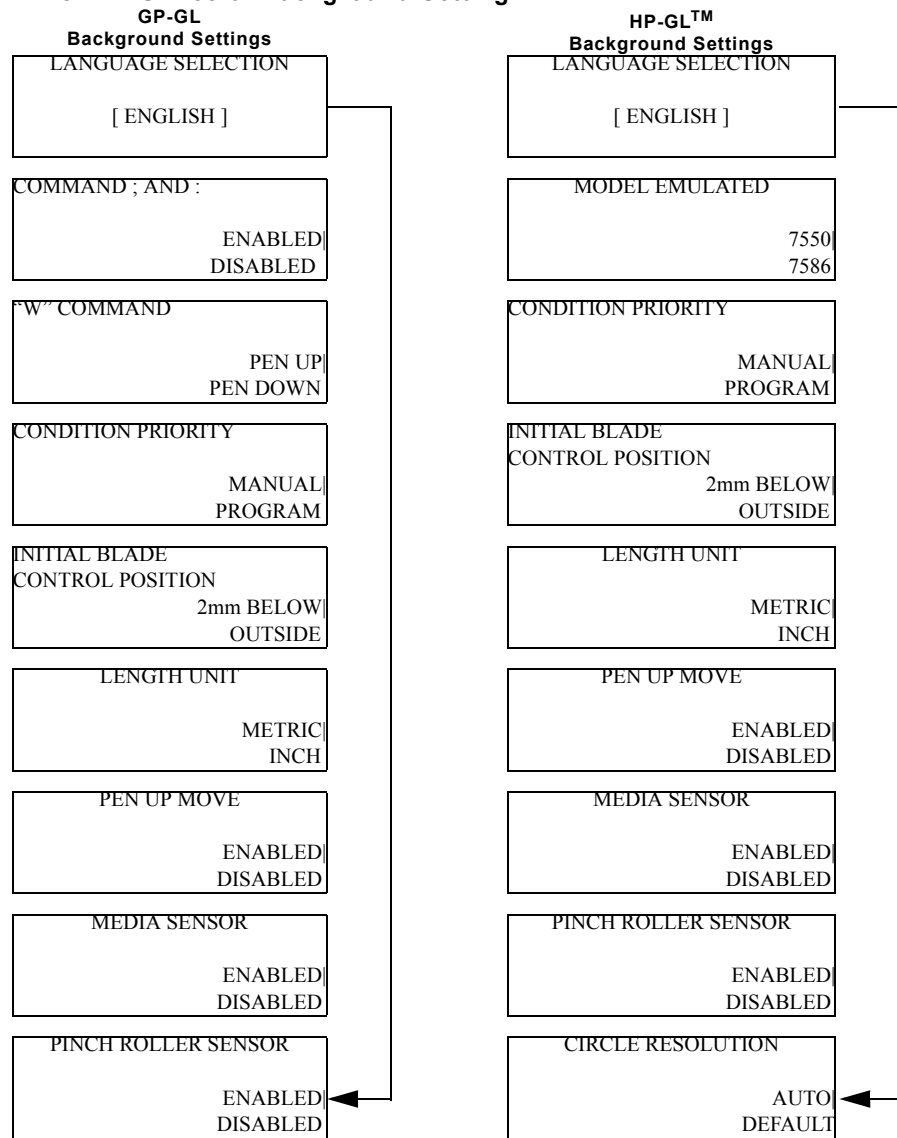
V 5.00 GL
  
```

This menu sequence appears if HP-GL is selected as the plotter's data command:

```

V 5.00 HL
  
```

The MENU Tree of Background Setting



Background Settings for GP-GL

LANGUAGE SELECTION

You may select one of the following 12 languages for the operation menu: Danish, Dutch, English, French, German, Hungarian, Italian, Japanese, Norwegian, Portuguese, Spanish and Swedish.

- Press the UP and DOWN ARROW keys to select the desired language.

```

LANGUAGE SELECTION

[ ENGLISH ]
  
```

- Press the ENTER key to register your setting and to proceed to the next menu. The next setting menu appears in the select language. If you used METHOD 1 to select BACKGROUND SETTINGS, press the MENU key if you do not wish to make any changes. If you used METHOD 2 to select BACKGROUND SETTINGS, turn off the plotter if you do not wish to make any changes.

```

COMMAND ; AND :

                ENABLED ■
                DISABLED
  
```

- Press the NEXT key if you wish to bypass this setting with no changes.

“:” “;” Command Control (“:” “;” COMMAND)

When the GP-GL command mode is selected, set this function to enable or disable the recognition of “:” and “;” commands set from the computer.

These commands may adversely affect the cutting results if the leading section of data is missing. In such cases, set this function to DISABLED.

- Press the F3 key to select ENABLED or press the F4 key to select DISABLED. A blinking cursor appears beside your choice.

```

COMMAND ; AND :

                ENABLED ■
                DISABLED
  
```

Press the ENTER key to register your setting and to proceed to the next menu. Press the NEXT key if you wish to bypass this setting with no changes. If you used METHOD 1 to select BACKGROUND SETTINGS, press the MENU key if you do

not wish to make any changes. If you used METHOD 2 to select BACKGROUND SETTINGS, turn off the plotter if you do not wish to make any changes

<p>"W" COMMAND</p> <p>PEN UP <input checked="" type="checkbox"/></p> <p>PEN DOWN</p>
--

Pen UP/DOWN for the "W" Com- mand

When a command specifying the plotting of an arc is sent from the computer, this function determines whether to raise the pen or leave it in its current status (for example, the pen remains lowered if it was lowered when the command was received) before moving it to the starting position for plotting.

When PEN DOWN is selected, the pen is moved to the starting position in its current status.

When PEN UP is selected, the pen is raised before moving to the starting position. *These settings are effective in cutting mode only.*

- Press the F3 key to select PEN UP or press the F4 key to select PEN DOWN. A blinking cursor appears beside your choice.

<p>"W" COMMAND</p> <p>PEN UP <input checked="" type="checkbox"/></p> <p>PEN DOWN</p>
--

- Press the ENTER key to register your setting and to proceed to the next menu. Press the NEXT key if you wish to bypass this setting with no changes.

<p>CONDITION PRIORITY</p> <p>MANUAL <input checked="" type="checkbox"/></p> <p>PROGRAM</p>
--

If you used METHOD 1 to select BACKGROUND SETTINGS, press the MENU key if you do not wish to make any changes. If you used METHOD 2 to select BACKGROUND SETTINGS, turn off the plotter if you do not wish to make any changes

Condition Prior- ity

This function determines the priority of programmed versus manual cutting conditions.

When MANUAL is selected, commands specifying cutting conditions from the computer are ignored and the cutting conditions can only be set at the control panel. The registered conditions are retained in the plotter's internal memory even while the plotter is turned off.

When PROGRAM is selected, the cutting conditions can be set either at the plotter's control panel or by command input from the computer. When the plotter

is turned off, the registered conditions by command input from the computer are *not* retained. The registered conditions by the plotter's control are retained.

- Press the F3 key to select MANUAL or press the F4 key to select PROGRAM. A blinking cursor appears beside your choice.

<p>CONDITION PRIORITY</p> <p>MANUAL ■</p> <p>PROGRAM</p>
--

- Press the ENTER key to register your setting and to proceed to the next menu. Press the NEXT key if you wish to bypass this setting with no changes.

<p>PEN SELECT</p> <p>ENABLED ■</p> <p>DISABLED</p>
--

If you used METHOD 1 to select BACKGROUND SETTINGS, press the MENU key if you do not wish to make any changes. If you used METHOD 2 to select BACKGROUND SETTINGS, turn off the plotter if you do not wish to make any changes.

Pen Select

This setting is available when the 2 Pen option is installed. The 2 Pen option installed machine can hold one blade or pen in the pen holder on the pen carriage (which is referred to as PEN 1) and one pen in the pen holder on the right side plate (which is referred to as PEN 2).

This function enables or disables the PEN SELECT command ("J" Command in GP-GP or the "SP" command in HP-GL).

The CONDITION PRIORITY is not affected by this setting.

When ENABLE is selected, the plotter changes pen either by the plotter's control panel or by command input from the computer.

When DISABLE is selected, commands specifying the pen number from the computer is ignored.

- Press the F3 key to select ENABLE or press the F4 key to select DISABLE. A blinking cursor appears beside your choice.

<p>PEN SELECT</p> <p>ENABLED ■</p> <p>DISABLED</p>
--

- Press the ENTER key to register your setting and to proceed to the next menu. Press the NEXT key if you wish to bypass this setting with no changes.

```

INITIAL BLADE
CONTROL POSITION
                2mm BELOW ■
                OUTSIDE
  
```

If you used METHOD 1 to select BACKGROUND SETTINGS, press the MENU key if you do not wish to make any changes. If you used METHOD 2 to select BACKGROUND SETTINGS, turn off the plotter if you do not wish to make any changes.

NOTE: This menu only appears when the 2 Pen option is installed.



Initial Blade Control Position (INITIAL BLADE CONTROL)

This function specifies the position at which initial blade control is performed (for more information about initial blade control see *Adjusting the Blade Offset Angle*.)

When 2mm BELOW is selected, initial blade control is performed 2mm below the starting point of cutting.

When OUTSIDE is selected, initial blade control is performed outside of the effective cutting area.

- Press the F3 key to select 2mm BELOW or press the F4 key to select OUTSIDE. A blinking cursor appears beside your choice.

```

INITIAL BLADE
CONTROL POSITION
                2mm BELOW ■
                OUTSIDE
  
```

- Press the ENTER key to register your setting and to proceed to the next menu. Press the NEXT key if you wish to bypass this setting with no changes.

```

                LENGTH UNIT
                METRIC ■
                INCH
  
```

If you used METHOD 1 to select BACKGROUND SETTINGS, press the MENU key if you do not wish to make any changes. If you used METHOD 2 to select BACKGROUND SETTINGS, turn off the plotter if you do not wish to make any changes.

Length Unit

This selection enables you to set the unit for coordinates appearing on the display panel to either units of millimeters or inches.

- Press the F3 key to select METRIC or press the F4 key to select INCH. A blinking cursor appears beside your choice.

LENGTH UNIT
METRIC <input checked="" type="checkbox"/>
INCH

- Press the ENTER key to register your setting and to proceed to the next menu. Press the NEXT key if you wish to bypass this setting with no changes.

PEN UP MOVE
ENABLED <input checked="" type="checkbox"/>
DISABLED

If you used METHOD 1 to select BACKGROUND SETTINGS, press the MENU key if you do not wish to make any changes. If you used METHOD 2 to select BACKGROUND SETTINGS, turn off the plotter if you do not wish to make any changes.

UP Movement Control (PEN UP MOVE)

When the Plotter receives commands that specify consecutive pen movements in raised status, the PEN UP MOVE function determines whether to move the pen to each coordinate point or to move the pen directly to the final coordinate point.

When ENABLED is selected, the pen moves to each coordinate point in sequence.

When DISABLED is selected, the pen moves directly to the final coordinate point.

- Press the F3 key to select ENABLED or press the F4 key to select DISABLED. A blinking cursor appears beside your choice.

PEN UP MOVE
ENABLED <input checked="" type="checkbox"/>
DISABLED

- Press the ENTER key to register your setting and to proceed to the next menu. Press the NEXT key if you wish to bypass this setting with no changes.

MEDIA SENSOR
ENABLED <input checked="" type="checkbox"/>
DISABLED

If you used METHOD 1 to select BACKGROUND SETTINGS, press the MENU key if you do not wish to make any changes. If you used METHOD 2 to select

BACKGROUND SETTINGS, turn off the plotter if you do not wish to make any changes.

Media Sensor Control

This function allows you to disable the media length sensor function which is performed after selecting the media type during the plotter's initialization.

When ENABLED is selected, the media length sensor will perform.

When DISABLED is selected, the media length sensor will not perform.

In cases where the media length sensor function is disabled, the pen carriage may go beyond the edge of the media.



CAUTION: Always set the AREA function to limit the cutting area and protect the machine.

- Press the F3 key to select ENABLED or press the F4 key to select DISABLED. A blinking cursor appears beside your choice.

MEDIA SENSOR ENABLED ■ DISABLED

- Press the ENTER key to register your setting and to proceed to the next menu. Press the NEXT key if you wish to bypass this setting with no changes.

PINCH ROLLER SENSOR ENABLED ■ DISABLED
--

If you used METHOD 1 to select BACKGROUND SETTINGS, press the MENU key if you do not wish to make any changes. If you used METHOD 2 to select BACKGROUND SETTINGS, turn off the plotter if you do not wish to make any changes

Pinch Roller Sensor Control

This function allows you to disable the pinch roller position sensor function of sensing media width is performed after selecting the media type during the plotter's initialization.

When ENABLED is selected, the pinch roller position sensor will perform.

When DISABLED is selected, the pinch roller position sensor will not perform.



NOTE: When disable is selected, the new home position will be the point that the pen is when the unit is powered up. The pen carriage can only move to the left from the new home position. Always, set the new home position manually BEFORE the plotter is powered down.

In cases where the pinch roller sensor function is disabled, the pen carriage may go beyond the edge of the media. Always set the AREA function to limit the cut area and to protect the cutting mat from damage.



CAUTION: Always set the AREA function to limit the cutting area and protect the machine.

- Press the F3 key to select ENABLED or press the F4 key to select DISABLED. A blinking cursor appears beside your choice.

PINCH ROLLER SENSOR ENABLED ■ DISABLED
--

- Press the ENTER key to register your setting and to proceed to the next menu. Press the NEXT key if you wish to bypass this setting with no changes.

LANGUAGE SELECTION [ENGLISH]

If you used METHOD 1 to select BACKGROUND SETTINGS, press the MENU key if you do not wish to make any changes. If you used METHOD 2 to select BACKGROUND SETTINGS, turn off the plotter if you do not wish to make any changes.

Background Settings for HP-GL

LANGUAGE SELECTION

You may select one of the following 12 languages for the operation menu: Danish, Dutch, English, French, German, Hungarian, Italian, Japanese, Norwegian, Portuguese, Spanish and Swedish.

- Press the UP and DOWN ARROW keys to select the desired language.

LANGUAGE SELECTION [ENGLISH]

- Press the ENTER key to register your setting and to proceed to the next menu. Press the NEXT key if you wish to bypass this setting with no changes. The next setting menu appears in the select language.

MODEL EMULATED 7550 ■ 7586

If you used METHOD 1 to select BACKGROUND SETTINGS, press the MENU key if you do not wish to make any changes. If you used METHOD 2 to select BACKGROUND SETTINGS, turn off the plotter if you do not wish to make any changes.

Model No. Response (MODEL EMU- LATED)

When the HP-GL™ command mode is selected, this function selects the plotter's response to an "OI" request sent from the computer. When 7550 is selected, the plotter's response is 7550. When 7586 is selected, the plotter's response is 7586.

- Press the F3 key to select 7550 or press the F4 key to select 7586. A blinking cursor appears beside your choice.

MODEL EMULATED	
	7550 ■
	7586

- Press the ENTER key to register your setting and to proceed to the next menu. Press the NEXT key if you wish to bypass this setting with no changes.

CONDITION PRIORITY	
	MANUAL ■
	PROGRAM

If you used METHOD 1 to select BACKGROUND SETTINGS, press the MENU key if you do not wish to make any changes. If you used METHOD 2 to select BACKGROUND SETTINGS, turn off the plotter if you do not wish to make any changes.

Condition Prior- ity

This function determines the priority of programmed versus manual cutting conditions.

When MANUAL is selected, commands specifying cutting conditions from the computer are ignored and the cutting conditions can only be set at the control panel. The registered conditions are retained in the plotter's internal memory even while the plotter is turned off.

When PROGRAM is selected, the cutting conditions can be set either at the plotter's control panel or by command input from the computer. When the plotter is turned off, the registered conditions by command input from the computer are *not* retained. The registered conditions by the plotter's control are retained.

- Press the F3 key to select MANUAL or press the F4 key to select PROGRAM. A blinking cursor appears beside your choice.

```

CONDITION PRIORITY
                MANUAL █
                PROGRAM
  
```

- Press the ENTER key to register your setting and to proceed to the next menu. Press the NEXT key if you wish to bypass this setting with no changes.

```

                PEN SELECT
                ENABLED █
                DISABLED
  
```

If you used METHOD 1 to select BACKGROUND SETTINGS, press the MENU key if you do not wish to make any changes. If you used METHOD 2 to select BACKGROUND SETTINGS, turn off the plotter if you do not wish to make any changes.

Initial Blade Control Position (INITIAL BLADE CONTROL)

This function specifies the position at which initial blade control is performed (for more information about initial blade control see *Adjusting the Blade Offset Angle*.)

When 2mm BELOW is selected, initial blade control is performed 2mm below the starting point of cutting.

When OUTSIDE is selected, initial blade control is performed outside of the effective cutting area.

- Press the F3 key to select 2mm BELOW or press the F4 key to select OUTSIDE. A blinking cursor appears beside your choice.

```

INITIAL BLADE
CONTROL POSITION
                2mm BELOW █
                OUTSIDE
  
```

- Press the ENTER key to register your setting and to proceed to the next menu. Press the NEXT key if you wish to bypass this setting with no changes.

```

                LENGTH UNIT
                METRIC █
                INCH
  
```


If you used METHOD 1 to select BACKGROUND SETTINGS, press the MENU key if you do not wish to make any changes. If you used METHOD 2 to select BACKGROUND SETTINGS, turn off the plotter if you do not wish to make any changes.

Length Unit

This selection enables you to set the unit for coordinates appearing on the display panel to either units of millimeters or inches.

- Press the F3 key to select METRIC or press the F4 key to select INCH. A blinking cursor appears beside your choice.

LENGTH UNIT
METRIC <input checked="" type="checkbox"/>
INCH

- Press the ENTER key to register your setting and to proceed to the next menu. Press the NEXT key if you wish to bypass this setting with no changes.

PEN UP MOVE
ENABLED <input checked="" type="checkbox"/>
DISABLED

If you used METHOD 1 to select BACKGROUND SETTINGS, press the MENU key if you do not wish to make any changes. If you used METHOD 2 to select BACKGROUND SETTINGS, turn off the plotter if you do not wish to make any changes.

UP Movement Control (PEN UP MOVE)

When the Plotter receives commands that specify consecutive pen movements in raised status, the PEN UP MOVE function determines whether to move the pen to each coordinate point or to move the pen directly to the final coordinate point. When ENABLED is selected, the pen moves to each coordinate point in sequence. When DISABLED is selected, the pen moves directly to the final coordinate point.

- Press the F3 key to select ENABLED or press the F4 key to select DISABLED. A blinking cursor appears beside your choice.

PEN UP MOVE
ENABLED <input checked="" type="checkbox"/>
DISABLED

- Press the ENTER key to register your setting and to proceed to the next menu. Press the NEXT key if you wish to bypass this setting with no changes.

MEDIA SENSOR ENABLED <input checked="" type="checkbox"/> DISABLED

If you used METHOD 1 to select BACKGROUND SETTINGS, press the MENU key if you do not wish to make any changes. If you used METHOD 2 to select BACKGROUND SETTINGS, turn off the plotter if you do not wish to make any changes.

Media Sensor Control

This function allows you to disable the media length sensor function which is performed after selecting the media type during the plotter's initialization. When ENABLED is selected, the media length sensor will perform. When DISABLED is selected, the media length sensor will not perform.

In cases where the media length sensor function is disabled, the pen carriage may go beyond the edge of the media.



CAUTION: Always set the AREA function to limit the cutting area and protect the machine.

- Press the F3 key to select ENABLED or press the F4 key to select DISABLED. A blinking cursor appears beside your choice.

MEDIA SENSOR ENABLED <input checked="" type="checkbox"/> DISABLED

- Press the ENTER key to register your setting and to proceed to the next menu. Press the NEXT key if you wish to bypass this setting with no changes.

PINCH ROLLER SENSOR ENABLED <input checked="" type="checkbox"/> DISABLED
--

If you used METHOD 1 to select BACKGROUND SETTINGS, press the MENU key if you do not wish to make any changes. If you used METHOD 2 to select BACKGROUND SETTINGS, turn off the plotter if you do not wish to make any changes.

Pinch Roller Sensor Control



This function allows you to disable the pinch roller position sensor function of sensing media width is performed after selecting the media type during the plotter's initialization.

NOTE: When disable is selected, the new home position will be the point that the pen is when the unit is powered up. The pen carriage can only move to the left from the new home position. Always, set the new home position manually BEFORE the plotter is powered down.

In cases where the media length is disabled, the pen carriage may go beyond the edge of the media. Always set the AREA function to limit the cut area and to protect the cutting mat from damage.



CAUTION: Always set the AREA function to limit the cutting area and protect the machine.

- Press the F3 key to select ENABLED or press the F4 key to select DISABLED. A blinking cursor appears beside your choice.

PINCH ROLLER SENSOR ENABLED <input checked="" type="checkbox"/> DISABLED
--

- Press the ENTER key to register your setting and to proceed to the next menu. Press the NEXT key if you wish to bypass this setting with no changes.

CIRCLE RESOLUTION AUTO <input checked="" type="checkbox"/> DEFAULT
--

If you used METHOD 1 to select BACKGROUND SETTINGS, press the MENU key if you do not wish to make any changes. If you used METHOD 2 to select BACKGROUND SETTINGS, turn off the plotter if you do not wish to make any changes.

Circle Resolution

Use this selection to achieve smoother cut/plot quality on large circles or arcs when drawing with the circle or arc commands.

When AUTO is selected, the resolution of circles and arcs will be automatically optimized.

When DEFAULT is selected, the resolution of circles and arcs is always 5 degrees. If the circle or arc consists of short line segments, the quality of the circle or arc will not change by this setting.

- Press the F3 key to select AUTO or press the F4 key to select DEFAULT. A blinking cursor appears beside your choice.

CIRCLE RESOLUTION AUTO <input checked="" type="checkbox"/> DEFAULT
--

- Press the ENTER key to register your setting and to proceed to the next menu. Press the NEXT key if you wish to bypass this setting with no changes.

LANGUAGE SELECTION [ENGLISH]

If you used METHOD 1 to select BACKGROUND SETTINGS, press the MENU key if you do not wish to make any changes. If you used METHOD 2 to select BACKGROUND SETTINGS, turn off the plotter if you do not wish to make any changes.

Chapter 7: Test Modes and Troubleshooting

This chapter describes the check points and possible solutions to use for troubleshooting if the plotter does not operate or operates abnormally.

CONDITION LIST - Listing the Cutting Conditions

The CONDITON LIST function allows you to print a list of the settings of the four groups of cutting conditions, so you can check all of your current settings at a glance.



WARNING: The pen starts moving as soon as the **CONDITION PRINT** function is selected. To avoid injury to yourself and damage to the plotter, keep your hands, face and other obstacles out to the vicinity of the cutting mat and paper.



CAUTION: Mounting the cutter pen for this mode may cause fatal damage to the cutting mat. Be sure to mount the plotter pen.

Load paper *larger* than either ISO (A3) or Tabloid size (11" x 17") and mount the plotter pen.

- Press the MENU key to select MENU mode.
- Press the NEXT key three times.
- Press the F4 key to select OPTION 2.

```
BACKGROUND SETTINGS>
OPTION 1>
OPTION 2>
```

- Press the F4 key to select TEST.

```
INITAL DOWN FORCE>
DISTANCE ADJUST>
TEST>
```

- Press the F2 key to select CONDITION LIST.

```
CONDITON LIST>
SELF TEST>
DATA DUMP>
```

The following message appears:

MOUNT THE PEN!

DONE>

CANCEL CONDITIONS>

Confirm that the pen is mounted on the carriage.

- Press the F3 key to select DONE and start plotting or press the F4 key to select CANCEL CONDITIONS.

You have to turn off the plotter to cancel CONDITION if the plotter is in CONDITION mode. The following message appears and the plotter begins printing a list of the currently set cutting conditions.

PRINT CONDITIONS

When all of the data has been printed, turn off the plotter to cancel CONDITION mode.

Sample printout of the CONDITION function

FC5100 CONDITIONS

		COND	FORCE	SPEED	PEN TYPE	OFST	ACCL	TANGNT	OVCUT	DIST. ADJ.
		1	14	30	CB09Ux	0	4	OFF		OFF
		2	14	60	PEN	0	4	OFF		OFF
		3	20	30	CB09Ux	0	4	OFF		OFF
		4	30	15	CB15Ux	0	4	OFF		OFF
		5	38	15	CB15Ux	0	4	OFF		OFF
		6	38	10	CB15U-K30x	0	2	OFF		OFF
		7	17	30	OTHER	+17	4	OFF		OFF
		8	12	30	POUNCE	+1	4	OFF		OFF
			RS232C	BAUD RATE	PARITY	DATA BIT	HANDSHAKE			
			*1	9600	N	8	H			
			2	9600	E	7	H			
			3	9600	E	8	H			
COMMAND	GP-GL		STEP SIZE	0.100	::: COMMAND	ENABLED	MODEL EMULATED		7550	
HP-GL ORIGIN	L.L.		PAGE LENGTH	2000	W COMMAND	PEN DOWN	PEN UP MOVE		ENABLED	
PEN UP SPEED	AUTO		STEP PASS	0	COND. PRIORITY	MANUAL	MEDIA SIZE SENSOR		OFF	
OFFSET FORCE	4		OFFSET ANGLE	30	INIT. BLADE CTRL	2mm BELOW	PINCH ROLLER		OFF	
ROTATE	OFF		MIRROR	OFF	DISPLAY LANG	English	HL CIR RESOL		DEFAULT	
			INIT. DOWN F.	0						
DISPLAY UNIT	mm		COPY SPACE	1						
			AXIS METHOD	2 POINT						
AUTO PRE FEED	DISABLED		PRE-FEED LENG	1						
TANGENTIAL MODE	MODE 1		FEED SPEED	NORMAL						
EXPAND LENG	0		SORT	DISABLED			ROM Version		1.20	

DATA DUMP - Using the Character Dump Mode

This mode enables experienced users to detect the exact cause of communication problems between the plotter and the computer. In character dump mode, the plotter produces an exact print-out of the codes reaching the plotter.



NOTE: When the plotter receives READ commands that instruct it to output data, it will output dummy data (except in the case of READ commands that request the output of the plotter's status data). Note that printing in dump mode will be based on that dummy data.

If the cutting/plotting results are not what you expected, but the received data and the transmitted program are identical, recheck the program at the computer.

If the cutting/plotting results are not what you expected, and the received data and the transmitted program are different, check the interface conditions and the connection of the interface cable.



WARNING: The pen starts moving as soon as the data is transmitted to the plotter from the computer. To avoid injury to yourself and damage to the plotter, keep your hands, face and other obstacles out of the vicinity of the cutting mat and paper.



CAUTION: Mounting the cutter pen for this mode may cause fatal damage to the cutting mat. Be sure to mount the plotter pen.

Load paper *larger* than either ISO (A4) or Letter size (11" x 8½") and mount the plotter pen.

- Press the MENU key to select MENU mode.
- Press the NEXT key three times.
- Press the F4 key to select OPTION 2.

```
BACKGROUND SETTINGS>
OPTION 1>
OPTION 2>
```

- Press the F4 key to select TEST.

```
INITIAL DOWN FORCE>
DISTANCE ADJUST>
TEST>
```

- Press the F4 key to select DATA DUMP.

```
CONDITON LIST>
SELF TEST>
DATA DUMP>
```


The following message appears:

```
MOUNT THE PEN!
                                     DONE>
                                CANCEL DATA DUMP>
```

Confirm that the pen is mounted on the carriage.

- Press the F3 key to select DONE and start plotting or press the F4 key to select CANCEL DATA DUMP.

You have to turn off the plotter to cancel DUMP if the plotter is in DUMP mode.

The following prompt message appears:

```
PRINT DATA DUMP
```

Transmit the data from the computer. As the data is received, the character data is printed as ASCII codes and the non-character (control) data is plotted as two-digit hexadecimal values (e.g., Line Feed = 0A, Carriage Return = 0D, ETX = 03).

When all of the data has been printed, turn off the plotter to cancel DUMP mode.

SELF TEST - Running the Self Test

Your plotter is provided with a self-test function that enables it to check its own functions. Because a correctly drawn self-test pattern signifies that all of the functions of the plotter (excluding the interface settings) have been tested and found normal, this function is useful for determining whether the source of a problem is the plotter itself or in the connection between the plotter and the computer.



WARNING: The pen starts moving as soon as SELF TEST mode is executed. To avoid injury to yourself and damage to the plotter, keep your hands, face and other obstacles out of the vicinity of the cutting mat and paper.

Load paper *larger* than either ISO (A3) or Tabloid size (11" x 17") and mount the plotter pen.



CAUTION: Mounting the cutter pen for this mode may cause fatal damage to the cutting mat. Be sure to mount the plotter pen.

- Press the MENU key to select MENU mode.
- Press the NEXT key three times.

- Press the F4 key to select OPTION 2.

```

BACKGROUND SETTINGS>
      OPTION 1>
      OPTION 2>
  
```

- Press the F4 key to select TEST.

```

INITIAL DOWN FORCE>
DISTANCE ADJUST>
      TEST>
  
```

- Press the F3 key to select SELF TEST.

```

CONDITON LIST>
      SELF TEST>
      DATA DUMP>
  
```

The following message appears:

```

MOUNT THE PEN!

                        DONE>
      CANCEL SELF TEST>
  
```

Confirm that the pen is mounted on the carriage .

- Press the F3 key to start plotting or press the F4 key to cancel plotting.

You may have to turn off the plotter to cancel SELF TEST if the plotter is in the SELF TEST mode.

The following message appears:

```

SELF TEST
  
```

When you have finished printing the SELF TEST pattern, turn off the plotter to cancel SELF TEST mode.



NOTE: The self-test pattern is repeatedly printed until the plotter is turned off. To stop printing, even if a pattern is not completely printed, simply turn off the plotter

Troubleshooting

Table 4: The plotter is turned on, but it doesn't work

Symptom	Cause	Solution
The control panel's POWER lamp does not light	<p>The plotter is not being supplied with power.</p> <p>The circuit protection on the machine is activated by overloading and it had not yet been deactivated.</p> <p>The plotter is defective.</p>	<p>Check that the power cord is securely connected to the plotter's AC line inlet and the electrical output.</p> <p>Turn off the plotter and unplug the power cord. After 5 or 10 minutes, connect the power cord and turn on the system. If it does not reactivate, turn off the plotter and unplug the power cord and wait. The recovery time can vary from case to case.</p> <p>If the plotter does not reactivate after 30 minutes, contact your sales representative or nearest Graphtec dealer.</p> <p>Contact your sales representative or nearest Graphtec dealer.</p>
The control panel's POWER lamp lights but the plotter does not operate.	The ROM or RAM is defective.	Contact your sales representative or nearest Graphtec dealer.
The control panel's MENU lamp flickers and nothing appears on the display panel.	The ROM or RAM is defective.	Contact your sales representative or nearest Graphtec dealer.
<p>The control panel's POWER lamp lights but the plotter does not operate.</p> <p>The message below appears:</p> <p>Sum-Ck ROM RAM ERR!!</p>	The ROM or RAM is defective.	Contact your sales representative or nearest Graphtec dealer.

Table 5: Improper initialization

Problem	Cause	Solution	See section
Media falls down during initialization.	The media sensors may be deactivated.	Contact your sales representative or nearest Graphtec dealer. You can start your job by temporarily disabling the media size sensing function.	Media size sensor settings in Background Settings.
Media skews as soon as media starts to move.	One of the pinch rollers is not set on a grit roller.	Check position of pinch rollers.	Loading media
After pen carriage moves across the plotter, media does not move.	The pinch rollers may not be set on the grit rollers.	Check position of pinch rollers.	Loading media
One side of the media edge comes off the pinch roller.	The front or rear edge of the media is not cut straight.	Cut the media edge straight.	
After selecting media type, pen carriage moves slowly and hits the side wall on the right hand side, then a position error occurs.	Pinch roller sensor may be defective.	Contact your sales representative or nearest Graphtec dealer. You can start your job by temporarily disabling the pinch roller sensing function.	Pinch roller sensor settings in Background Settings.
Even when the media set lever is raised and locked, the menu keeps showing the-LOAD MEDIA! message.	Media set lever may be defective.	Contact your sales representative or nearest Graphtec dealer.	

Table 6: Plotter does not operate properly

Problem	Cause	Solution	See section
As soon as the data is sent to the plotter, pen carriage or media stops. Display shows WORKING. Processing Indicator LED lights.	Position of the plot data is located beyond the effective cutting area.	Adjust the position of the data on application software.	

Table 6: Plotter does not operate properly

Problem	Cause	Solution	See section
As soon as the data is sent to plotter, pen carriage or media do not move at all. Display shows WORKING. Processing Indicator LED lights.	Origin point might be set at lower left although the plot data was created based on center origin.	Check the origin setting.	Origin
Origin point seems to be shifted to center, although origin button was not pressed.	Origin point might be set at center although the plot data was created based on lower left origin.	Check the origin setting.	Origin
As soon as the data is sent to the plotter, the media comes off then MEDIA END message appears.	ROLL-1 or ROLL-2 is selected for sheet media and the origin is set as center.	Select SHEET for sheet media.	Loading media
COMMAND ERROR message appears.	Data from PC was not received correctly.		
INSTRUCTION NOT RECOGNIZED message appears.	Data from PC was not received correctly.		
Plotter does not cut beyond certain length.	PAGE LENGTH is not set correctly.	Check the cut area by pressing the ENTER key. Set PAGE LENGTH correctly.	Page Length
Too much pen up/down action is performed.	TANGENTIAL EMULATION is enabled.	Normal. If TANGENTIAL is displayed on the READY menu, change condition number on which TANGENTIAL EMULATION is not enabled or disable the EMULATION.	Tangential Emulation
Plotter cuts on foot print of grit rollers.	EXPAND setting is enabled.	Set EXPAND to zero if necessary.	Expand
Cutting CONDITION setting can not be changed.	DATA SORTING is enabled.	Normal. Disable DATA SORTING if necessary.	Data Sorting
Currently selected cutting conditions are disregarded or cannot be changed.	The parameter priority setting is set to program mode. The ENTER key was not pressed after changing settings.	Change the parameter from priority setting to manual mode. Verify setting the conditions correctly.	Setting Cutting Conditions Setting Cutting Conditions

Table 6: Plotter does not operate properly

Problem	Cause	Solution	See section
Media is fed at an angle.	Media was loaded at an angle. The total amount of roll media to be cut was not pulled out in advance.	Reload media correctly. Pull out the required amount of media in advance.	Loading Media Loading Media
Media is abruptly fed forward.	Incorrectly selected media type.	Select the correct media type to match your needs.	Selecting Media
The length of cutting results differ from the program (slight distance error).	The media is slipping. The distance correction requires adjustment.	Lower the cutting SPEED or the PEN UP SPEED setting. Adjust the distance correction.	Setting Cutting Conditions or Pen Up Speed Distance Adjust
When the plotter is receiving data, the Process Indicator LED lights (an off-scale error occurs).	The programmable resolution (STEP SIZE) has been set differently at the plotter and the software application. The computer sent coordinate data that exceeds the specified effective cutting area. The computer sent coordinate data that exceeds the maximum effective cutting area.	Set both the plotter and the software to the same resolution. Set the effective cutting area to a larger area. Switch to a larger media or change the coordinate data.	Step Size Area Loading Media Area
Media is loaded but the LOAD PAPER!! message appears.	Media that is nearly transparent cannot be detected by the paper sensors. Strong reflected light is preventing the paper sensors from detecting the media. Loaded media has not been positioned over the paper sensors.	Disable the paper sensors using media size sensor control in the background settings. Change the position of the light source. Properly reload the media.	Media size sensor setting in the Background Settings. Loading media

Table 7: Poor cutting results

Problem	Cause	Solution	See section
The cut corners are too rounded.	The CUTTER OFFSET is incompatible with the blade type being used.	Adjust CUTTER OFFSET value. If too low, corners become rounded.	Setting Cutting Conditions

Table 7: Poor cutting results

Problem	Cause	Solution	See section
The cut corners are too pointed.	The CUTTER OFFSET is incompatible with the blade type being used.	Adjust the CUTTER OFFSET value. If too high, the corners become pointed.	Setting cutting conditions.
The cut line starts out crooked.	The blade mounted in the holder does not rotate smoothly.	Grease the blade and holder. Remove any foreign matter inside the pen holder.	Replacing Cutter Blade
	The Offset Cut Pressure is too low.	Raise the Offset Cut Pressure setting (this is separate from the cutting force).	Offset Force
	With the 0.9mm cutter pen (has a blue blade adjustment knob), the spring has come loose from the blade.	Replace the blade with a new one which has a spring.	Replacing Cutter Blade
	With the 1.5mm cutter pen (has a red blade adjustment knob), the blade has fallen out.	Grease blade and holder.	Replacing Cutter Blade
The blade skips and does not completely cut lines that should be solid.	The blade is extended too far.	Adjust the blade length.	Blade Length
	The cutting SPEED is too high.	Lower the SPEED setting.	Setting Cutter Conditions
Solid lines are not cut at a constant depth.	The blade is extended too far.	Adjust the blade length.	Blade Length
	The cutting SPEED is too high.	Lower the SPEED setting.	Setting Cutter Conditions
Coarse resolution of curved lines.	The software's resolution setting is too low.	Adjust the software's resolution setting.	
	The blade offset angle is too low.	Raise the blade offset angle.	Setting Cutter Conditions
The blade is cutting into the backing sheet.	The blade is extended too far.	Adjust the blade length.	Replacing Cutter Blade
	The cutting FORCE is too high.	Lower the FORCE setting.	Setting Cutter Conditions
The blade falls out of the plunger.	The blade is too small for the holder.	Use a blade that fits securely in the holder.	Replacing Cutter Blade.
	Insufficient grease.	Grease the cutter blade and holder.	Replacing Cutter Blade.

Table 7: Poor cutting results

Problem	Cause	Solution	See section
The media curls up at the corners.	The blade is extended too far.	Adjust the blade length.	Blade Length
	The CUTTER OFFSET is incompatible with the blade type being used.	Adjust CUTTER OFFSET value. If too low the corners become rounded. If too high the corners become pointed.	Setting Cutter Conditions
	The cut pattern is too fine.	Use the tangential emulation mode.	Tangential Emulation
	The cutting SPEED is too high.	Lower the SPEED setting.	Setting Cutter Conditions
	The blade is dull.	Replace the blade.	Replacing Cutter Blade
	The QUALITY setting is too high.	Lower the QUALITY setting.	Setting Cutter Conditions
The media is discolored when the blade has passed.	Media is stuck in the tip of the cutter plunger.	Adjust the blade length. Adjust the cutting FORCE setting.	Blade Length Setting Cutter Conditions.
Cut media cannot be pulled up using retack sheet.	The retack sheet is not sticky enough.	Switch to a stickier retack sheet.	Blade Length Setting Cutter Conditions.
	Media gets entangled during cutting.	Reduce the blade length.	
	Cleaning of cut media was postponed too long.	Lower the cutting FORCE setting. Promptly weed cut media.	
Media can be cut but it is hard to weed afterwards.	The retack sheet is not sticky enough.	Switch to a stickier retack sheet.	Blade Length Setting Cutter Conditions.
	Media gets entangled during cutting.	Reduce the blade length.	
	Cleaning of cut media was postponed too long.	Lower the cutting FORCE setting. Promptly weed cut media.	
Abnormal noise generated by cutter pen during cutting.	Media is stuck in the tip of the cutter plunger.	Adjust the blade length.	Blade Length
		Adjust the cutting FORCE setting.	Setting Cutter Conditions.

Table 7: Poor cutting results

Problem	Cause	Solution	See section
The cutting results differ from specified size.	The programmable resolution (STEP SIZE) has been set differently at the the plotter and the software application.	Set both the plotter and the software to the same resolution. Check whether scaling has been specified.	Step Size Scale
Some parts of the media cannot be cut.	The programmable resolution (STEP SIZE) has been set differently at the the plotter and the software application. The computer sent coordinate data that exceeds the specified effective cutting area. The computer sent coordinate data that exceeds the maximum effective cutting area.	Set both the plotter and the software to the same resolution. Set the effective cutting area to a larger area. Switch to a larger media or change the coordinate data.	Step Size Area Loading Media Area
Characters or lines are deformed during pen plotting.	The plotter is in cutting mode.	Set the blade type on the CUTTER OFFSET function to PEN (0)	Setting Cutter Conditions
Cut characters are deformed.	The STEP pass setting is set too high.	Lower the STEP pass setting.	Step Pass
The starting and end points of cutting do not match.	Coordinate points are incorrectly specified. The Offset Cut Pressure is too low. The media is too flimsy. Blade rotation is not smooth.	Check the coordinate data by plotting it with a pen. Raise the Offset Cut Pressure setting. Switch to a stronger media. Grease the cutter blade and holder.	Setting Cutter Conditions Replacing the Cutter Blade
The starting and end points of cutting thick material do not match.	Over Cut Distance is too short.	Set Over Cut Distance correctly.	Tangential Emulation
The starting and end points of cutting do not match when the auto prefeed function is used.	Pen Speed is too high or the Quality setting is incorrect.	Set pen condition correctly.	Setting Pen Conditions

Error Messages

Table 8: Possible Causes and Solutions

Symptom	Cause	Solution
<p>The beeper sounds</p> <div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>OVER CURRENT POWER OFF THEN ON</p> </div>	<p>Excessive load is causing the current to the motor to exceed the rated value.</p> <p>Cutting conditions do not suit the media.</p> <p>Movement of the pen carriage is obstructed.</p> <p>Media scraps stuck in moving parts and impeding plotter operation.</p> <p>The pen carriage was subjected to external pressure during cutting.</p> <p>Abnormal acceleration rate table.</p>	<p>If error occurs frequently, contact your sales representative or nearest Graphtec dealer.</p> <p>Lower the cutting SPEED and/or the cutting FORCE</p> <p>Turn off the plotter, remove the obstacle, then turn the plotter back on.</p> <p>Turn off the plotter, remove the scraps, then turn the plotter back on.</p>
<p>The beeper sounds</p> <div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>SPEED ALARM POWER OFF THEN ON</p> </div>	<p>Immediately after turning on the plotter, excessive force was used to manually move the pen carriage.</p> <p>Internal speed control is faulty.</p>	<p>Turn off the plotter, then turn the plotter back on.</p> <p>Turn off the plotter, then turn the plotter back on.</p> <p>If error occurs frequently, contact your sales representative or nearest Graphtec dealer.</p>
<p>The beeper sounds</p> <div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>POSITION ALARM POWER OFF THEN ON</p> </div>	<p>Excessive load is causing the current to the motor to exceed the rated value.</p> <p>Cutting conditions do not suit the media.</p> <p>Movement of the pen carriage is obstructed.</p> <p>Media scraps stuck in moving parts and impeding plotter operation.</p> <p>The pen carriage was subjected to external pressure during cutting.</p> <p>Abnormal acceleration rate table.</p>	<p>If error occurs frequently, contact your sales representative or nearest Graphtec dealer.</p> <p>Lower the cutting SPEED and/or the cutting FORCE</p> <p>Turn off the plotter, remove the obstacle, then turn the plotter back on.</p> <p>Turn off the plotter, remove the scraps, then turn the plotter back on.</p>

Table 9: Error Messages in GP-GL Command Mode

Symptom	Cause	Solution
<div style="border: 1px solid black; padding: 5px; width: fit-content;"> ERROR 1 COMMAND ERROR </div>	<p>The plotter received an unrecognizable command.</p> <p>Noise was input to the plotter upon execution of the software application.</p> <p>The software configuration regarding the output device has been changed.</p> <p>The plotter's interface conditions have been changed.</p>	<p>Press the ENTER key.</p> <p>Configure the software to drive your plotter. Ensure that the software's interface conditions are correctly set.</p> <p>Ensure that the plotter's interface conditions are set to match those of the software.</p>
<div style="border: 1px solid black; padding: 5px; width: fit-content;"> ERROR 4 PARAMETER OVERFLOW </div>	<p>A command was received containing numeric parameters that exceed that command's permissible range.</p> <p>The software configuration regarding the output device has been changed.</p> <p>The plotter's interface conditions have been changed.</p>	<p>Configure the software to drive your plotter. Ensure that the software's interface conditions are correctly set.</p> <p>Ensure that the plotter's interface conditions are set to match those of the software.</p>
<div style="border: 1px solid black; padding: 5px; width: fit-content;"> ERROR 5 I/O ERROR </div>	<p>An error occurred during data transfer.</p> <p>The software configuration regarding the output device has been changed.</p> <p>The plotter's interface conditions have been changed.</p>	<p>Configure the software to drive your plotter. Ensure that the software's interface conditions are correctly set.</p> <p>Ensure that the plotter's interface conditions are set to match those of the software.</p>

Error Messages in HP-GL Command Mode

If any of the following command errors occur, they are nearly always caused by one of the reasons listed below:

- The software configuration regarding the output device has been changed; or
- The plotter's interface conditions have been changed.

When a command error occurs in HP-GP™ emulation mode, first check that you have:

- Configured the software to drive your plotter
- The software's interface conditions are set correctly.

- Set the plotter's interface conditions to match the software's interface conditions.

Table 10: Error Messages in HP-GL Command Mode

Symptom	Cause	Solution
ERROR 1 NOT RECOGNIZED	An unrecognizable instruction was executed.	Execute a recognizable command.
ERROR 2 WRONG NUMBER OF PARAMETERS	A command was executed with the wrong number of parameters.	Execute the command with the correct number of parameters.
ERROR 3 OUT OF RANGE PARAMETERS	A command containing an unusable parameter was specified.	Execute the command with parameters specified within their permissible ranges.
ERROR 5 UNKNOWN CHARACTER SET	An unrecognizable instruction was executed.	Specify a recognizable command.
ERROR 6 PARAMETER OVERFLOW	A command was executed with coordinated data that exceeds the effective cutting/plotting area.	Execute the command with its coordinate data specified within the effective cutting/plotting area.
ERROR 7 BUFFER OVERFLOW	The data being input exceeds the capacity of the plotter's downloadable character buffer, polygon buffer, etc.	Increase buffer size.
ERROR 10 INVALID I/O OUTPUT REQUEST	During the execution of an output command, another output command was executed.	Check the flow of your programmed data.

Table 10: Error Messages in HP-GL Command Mode

Symptom	Cause	Solution
ERROR 11 INVALID BYTE FOLLOWING ESC	The ESC character was followed by an invalid byte.	Check the ESC command in your program.
ERROR 12 INVALID BYTE IN I/O CONTROL	A device control command containing an invalid byte was received.	Check the device control commands in your program.
ERROR 13 OUT OF RANGE I/O PARAMETERS	A parameter outside of the permissible range was specified.	Check the parameter ranges in your program.
ERROR 14 TOO MANY I/O PARAMETERS	Too many parameters were received.	Check the number of command parameters in your program.
ERROR 15 ERROR IN I/O TRANSMISSION	During data transfer, a framing error, parity error or overrun error occurred.	Check the settings of the interface conditions.
ERROR 16 I/O BUFFER OVERFLOW	The I/O buffer received data at a faster pace than it could process indicating that handshake was not successful.	Check the settings of the handshake mode and other interface conditions.

Chapter 8: Setting the Interface Functions

This chapter describes how to connect your plotter to your computer using either the Parallel, USB or Serial interface.

Setting the Parallel Interface

- To use the Centronics-compatible parallel interface, connect the plotter's parallel connector to the computer's parallel port by cable.
- Next, simply set the command mode plus the programmable resolution (when GP-GL command is selected), or origin (when HP-GL command is selected).

For instructions on setting the functions, see **Selecting the Command Mode** and **Setting the Programmable Resolution**.



NOTE: For the specifications of your plotter's parallel interface, see **Centronics-Compatible Parallel Interface**.

CAUTION: The interface cable should be no longer than two meters.

Setting the USB Interface

To use the USB interface, connect the plotter's USB connector to the computer's USB port by cable.

Next simply set the command mode plus the programmable resolution (when the GP-GL command is selected) or ORIGIN (when the HP-GL command is selected.)

For instructions on setting the functions, see **Selecting the Command Mode** and **Setting the Programmable Resolution**.



NOTE: When using the USB interface to transfer data, you must have the driver which supports the USB port installed on the computer. A general purpose driver for windows operating system is available that will support the USB port.

CAUTION: Do not disconnect/connect the USB cable in the following cases:

While installing the USB driver onto the computer.

When the computer or the plotter are initializing.

Do not disconnect the USB cable within a 5-second period of connecting the USB cable.

While the computer is transmitting data to the plotter.



CAUTION: Do not connect multiple plotters to a single computer using the USB interface.

Setting the Serial Interface

- To enable prompt compatibility with multiple software applications, you can register three different groups of interface settings (RS-1, RS-2, and RS-3) in the plotter's memory.
- The desired group of RS-232C interface settings can be loaded from the control panel.
- Incorrectly set interface conditions can cause the plotter to malfunction.
- Be sure to set the plotter's interface conditions to match those of your computer and the target software application.



NOTE: For the specifications of your plotter's serial interface, see [RS-232C Serial Interface](#).

Factory Preset Interface Settings

Your plotter comes with three groups of interface conditions set to the factory presets listed below.

RS-1	9600 BAUD 8 BIT NONE PARITY HARDWIRE
------	---

RS-2	9600 BAUD 7 BIT EVEN PARITY HARDWIRE
------	---

RS-3	9600 BAUD 8 BIT EVEN PARITY HARDWIRE
------	---

INTERFACE - Setting the Interface Functions

The Interface Functions (Step Size, RS-232C and COMMAND Settings) can be set before or after loading the media.

How to access the INTERFACE menu before loading the media

When the media set lever is lowered, the following menu appears:

LOAD MEDIA!
INITIAL MENU>

- Press the F4 key to select INITIAL MENU.

AUTO REG. MARK>
AUTO PRE FEED>
INITIAL FEED SPEED>
INTERFACE>

- Press the F3 key to select RS-232C; the INTERFACE menu appears:

```

STEP SIZE>
RS-232C>
COMMAND>

```

- Press the NEXT key twice to return to the LOAD MEDIA menu.

How to access the INTERFACE menu after loading the media

After the media is loaded and initialization is performed, the plotter goes to READY mode.

```

CONDITION 1      14.
                  30.
READY            4.
CB09Ux...0.

```

- Press the MENU key to select MENU mode.
- Press the NEXT key two times.
- Press the F1 key to select INTERFACE.

```

INTERFACE>
AREA PARAMETERS>
FUNCTION 1>
FUNCTION 2>

```

- Press the F3 key to select RS-232C; the INTERFACE menu appears:

```

STEP SIZE>
RS-232C>
COMMAND>

```

- Press the MENU key to return to READY mode.

STEP SIZE - Setting the Programmable Resolution

When HP-GL™ command mode is selected, STEP SIZE is not displayed. When the GP-GL command mode is selected, this function allows you to set the distance of pen movement corresponding to the coordinate value of 1.



NOTE: Be sure to set the step size to match the step size setting of your software application.

NOTE: Your step size setting is retained in the plotter's internal memory even while the plotter is turned off.

- Press the F2 key to select STEP SIZE.

```

STEP SIZE>
RS-232C>
COMMAND>

```

- Press the F1 key to select 0.100, press the F2 key to select 0.050, press the F3 key to select 0.025, or press the F4 key to select 0.010.

```

STEP SIZE      0.100>*
IN mm         0.050>
              0.025>
              0.010>

```

- Press the Enter key to register your setting and return to the INTERFACE menu.

```

STEP SIZE>
RS-232C>
COMMAND>

```

RS-232C – Setting the Data Transmitting Conditions

This function selects and sets the data transmitting conditions of the serial interface. Three preset conditions are available for easy access.



NOTE: Be sure to set the transmitting conditions to match the setting of your software applications.

NOTE: Your RS-232C setting is retained in the plotter's internal memory even while the plotter is turned off.

- Press the F3 key to select RS-232C.

```

STEP SIZE>
RS-232C>
COMMAND>
  
```

- Press the F1 key to select factory setting 1, press the F2 key to select factory setting 2, or press the F3 key to select factory setting 3.

```

RS-232C          1>
CONDITION NO    2>
                3>
  
```

The asterisk is displayed beside the currently selected condition number. The menu that corresponds to the number you selected will appear.

```

RS-1   9600 BAUD
        8 BIT
        NONE PARITY
        HARDWARE
  
```

```

RS-2   9600 BAUD
        7 BIT
        EVEN PARITY
        HARDWARE
  
```

```

RS-3   9600 BAUD
        8 BIT
        EVEN PARITY
        HARDWARE
  
```

You can modify any of the RS232-C settings by pressing the F1, F2, F3 or F4 keys. The blinking cursor will move to the parameter that corresponds with that key.

- Press the F1 key to change BAUD RATE, press the F2 key to change DATA LENGTH, press the F3 key to change PARITY BIT or press the F4 key to change HANDSHAKING.

```

RS-1           9600 BAUD.
                8 BIT.
                NONE PARITY.
                HARDWARE.
  
```

- Press the UP or DOWN ARROW key to change the parameter setting.

- Press the ENTER key to register your settings and return to the INTERFACE menu.

COMMAND - Selecting the Command Mode



This function selects the command mode, either HP-GL™ or GP-GL.

NOTE: Be sure to set the command mode to match the command mode setting of your software application.

NOTE: Your command setting is retained in the plotter's internal memory even while the plotter is turned off.

- Press the F4 key to select COMMAND.

```
STEP SIZE>
RS-232C>
COMMAND>
```

- Press the F3 key to select GP-GL command mode or press the F4 key to select HP-GL command mode.

```
COMMAND
GP-GL*
HP-GL
```

- Press the Enter key to register your setting. The following menu appears

```
THIS OPERATION
RESETS THE PLOTTER
CONTINUE>
CANCEL>
```

If you started at the LOAD MEDIA menu you will return to the INTERFACE MENU.

If you started at the READY menu you will return to the MEDIA TYPE menu.

Centronics-Compatible Parallel Interface

The eight-bit Centronics-compatible parallel interface is generally used for interfacing printers.

The input signals are grouped into the eight bits of DATA signals (DB0 to DB7), and each group of eight DATA signals is followed by the input of an active-LOW STROBE signal. Upon receipt of the STROBE signal, the plotter activates its BUSY signal, outputs an ACK signal, then reads the input DATA Signals to begin a

cutting or plotting operation. When the specified operation is completed, the plotter awaits the input of subsequent DATA signals.



CAUTION: The interface cable should be no longer than two meters.

Specifications

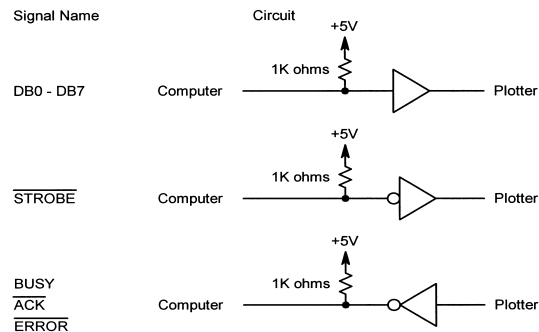
- While the parallel interface is used, data cannot be output from the plotter (that is, READ commands cannot be used with the exception of the “BS” command).
- Asynchronous transmission by handshaking is based on STROBE and BUSY signals by way of the synchronization method.

Electrical Characteristics

Electrical characteristics are based on TTL-level compatibility with the logic states outlined below.

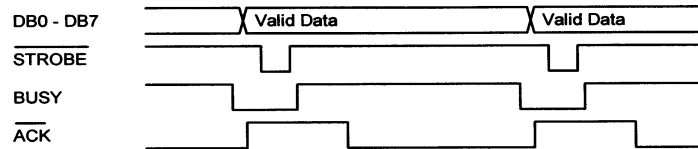
Positive logic	“1” + 2.2V or more “0” + 0.8V or less	DATA, BUSY
Negative logic	“1” + 0.8V or more “0” + 2.2V or less	$\overline{\text{ERROR}}$ $\overline{\text{ACK}}, \overline{\text{STROBE}}$

Input/Output Circuitry

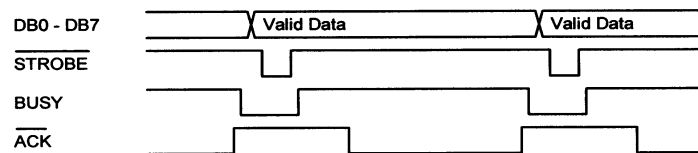


Input/Output Timing Chart

Parallel Interface, Select parameter 1 Default setting



Parallel Interface, Select parameter 2



Contact Graphtec Technical Service for assistance if the default setting or the alternate setting are not appropriate.

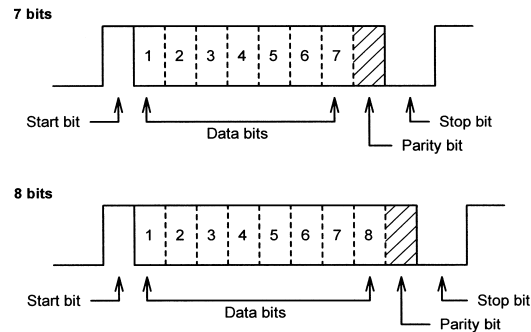
Pin Assignment of the Parallel Connector

The pin assignment of the Centronics-compatible parallel interface connector is described below.

Pin No.	Signal Name	Pin No.	Signal Name
1	STROBE	19	GND
2	DB 0	20	GND
3	DB 1	21	GND
4	DB 2	22	GND
5	DB 3	23	GND
6	DB 4	24	GND
7	DB 5	25	GND
8	DB 6	26	GND
9	DB 7	27	GND
10	ACK	28	GND
11	BUSY	29	GND
12	GND	30	GND
13	SLCT	31	Not used
14	Not used	32	ERROR
15	Not used	33	GND
16	GND	34	Not used
17	Not used	35	+ 5V pulled up.
18	+ 5V pulled up	36	Not used

RS-232C Serial Interface

The RS-232C Serial interface of your plotter conforms to the RS-232C Standard of Electronic Industries Association (EIA). This serial interface performs the serial transfer of digital binary data, control signals and SYNC signals.



Standard	CCITT V.24, EIA RS-232C, JIS X5101
Synchronization	Asynchronous start-stop
Transfer Rate	19200 bits/s max.
Stop Bit	2 stop bits
Parity	Even, odd, none
Character length	7 or 8 bits

Table 11: RS232-C Electrical Characteristics

	RD, SD (Negative Logic)	RS, CD, DR, ER (Positive Logic)
Input voltage level	+5V to +12V -5V to -12V	Logical "0" "ON" Logical "1" "OFF"
Output voltage level	+5V to +8V -5V to -8V	Logical "0" "ON" Logical "1" "OFF"

Pin Assignment of the Serial Connector

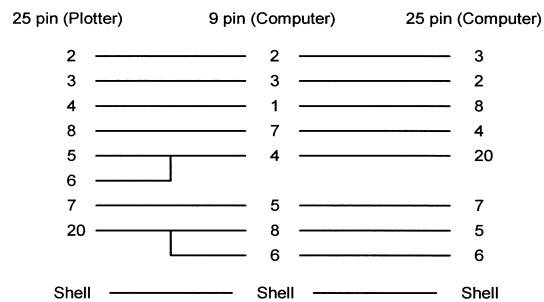
The pin assignment of the serial interface connector is described in the table below.

Pin	Signal Name	Pin	Signal Name
1	GND (Frame)	14	Not used
2	SD (TxD)	15	Not used
3	RD (TxD)	16	Not used
4	RS (RTS)	17	Not used

Pin	Signal Name	Pin	Signal Name
5	CS (CTS)	18	Not used
6	DR (DSR)	19	Not used
7	GND (Logic)	20	ER (DTR)
8	Not used	21	Not used
9	Not used	22	Not used
10	Not used	23	Not used
11	Not used	24	Not used
12	Not used	25	Not used
13	Not used		

Cable Connection

The cable pin assignment of the serial interface connector from the 25-pin plotter connector to the 9-pin computer connector or the 25-pin computer connector is described below.



Chapter 9: Specifications

This chapter describes the plotter's main specifications

Main Specifications: FC5100A-75

CPU	16-Bit
Configuration	Grit-rolling cutting plotter
Drive	Digital servo
Max. Cut Width (expanded mode)	758 mm (29.6 in.)
Guaranteed precision cutting area	9m (30 ft.) with approved media
Max. Loadable Media Width	914 mm (36 in.)
Max. cutting speed (Axial)	1414 mm/sec (55.7 ips) Diagonal Direction
Cutting Pressure	10 to 500 g
Min. character size	3mm (0.125 in.) alphanumeric Helvetica med. Font
Mechanical resolution	0.005mm (0.0002 in.)
Programmable resolution	GP-GL: 0.01mm (0.0004 in.) and HP-GL ^{TMa} 0.025mm (0.001in.)
Number of cutters/pens	1
Cutter types	Supersteel, ceramic and sapphire blades
Pen types	Water and oil based fiber-tip, water based ballpoint, ceramic, refillable ink, and disposable ink pens
Pounce types	1.2mm diameter pin
Compatible media	Mono-vinyl chloride media, fluorescent media, and media for illuminated displays, high reflective media, up to 0.25mm thick, Sandblast rubber up to 1mm thick ^b
Standard interfaces	RS-232C, Centronics, USB (USB1.1 Full Speed)
Buffer memory	2 Mb
Resident command sets	HP-GL, GP-GL
LCD Panel	LCD 20x4 - Supports 12 languages: Danish, Dutch, English, French, German, Hungarian, Italian, Japanese, Norwegian, Portuguese, Spanish, Swedish
Compatible paper for pouncing	Regular paper from 0.06 to 0.13 mm thick
Power supply	100-240VAC/48-62 Hz Universal Power Supply
Power consumption	140VA max.
Operating environment	Temperature: +10° C to +35° C or +50° F to +95° F Humidity: 35% to 75% (non-condensing)
External dimensions without stand	1135mm x 350mm x 485 mm or 44.5" x 14" x 19"
Weight	29 kg or 64 lbs.

a. HP-GL is a trademark of Hewlett-Packard Company

b. Using CB15U-K30 blades to cut sandblast rubber

Main Specifications: FC5100A-100

CPU	16-Bit
Configuration	Grit-rolling cutting plotter
Drive	Digital servo
Max. Cut Width (expanded mode)	1067 mm (41.6 in.)
Guaranteed precision cutting area	9m (30 ft.) with approved media
Max. Loadable Media Width	1219 mm (48 in.)
Max. cutting speed (Axial)	1414 mm/sec (55.7 ips) Diagonal Direction
Cutting Pressure	10 to 500 g
Min. character size	3mm (0.125 in.) alphanumeric Helvetica med. Font
Mechanical resolution	0.005mm (0.0002 in.)
Programmable resolution	GP-GL: 0.01mm (0.0004 in.) and HP-GL ^{TMa} 0.025mm (0.001in.)
Number of cutters/pens	1
Cutter types	Supersteel, ceramic and sapphire blades
Pen types	Water and oil based fiber-tip, water based ballpoint, ceramic, refillable ink, and disposable ink pens
Pounce types	1.2mm diameter pin
Compatible media	Mono-vinyl chloride media, fluorescent media, and media for illuminated displays, high reflective media, up to 0.25mm thick, Sandblast rubber up to 1mm thick ^b
Standard interfaces	RS-232C, Centronics, USB (USB1.1 Full Speed)
Buffer memory	2 Mb
Resident command sets	HP-GL, GP-GL
LCD Panel	LCD 20x4 - Supports 12 languages: Danish, Dutch, English, French, German, Hungarian, Italian, Japanese, Norwegian, Portuguese, Spanish, Swedish
Compatible paper for pouncing	Regular paper from 0.06 to 0.13 mm thick
Power supply	100-240VAC/48-62 Hz Universal Power Supply
Power consumption	140VA max.
Operating environment	Temperature: +10° C to +35° C or +50° F to +95° F Humidity: 35% to 75% (non-condensing)
External dimensions without stand	1440 mm x 350 mm x 485 mm or 56.5" x 14" x 19"
Weight without stand	37 Kg or 81 lbs.

a. HP-GL is a trademark of Hewlett-Packard Company

b. Using CB15U-K30 blades to cut sandblast rubber

Main Specifications: FC5100A-130

CPU	16-Bit
Configuration	Grit-rolling cutting plotter
Drive	Digital servo
Max. Cut Width (expanded mode)	1372 mm (54 in.)
Guaranteed precision cutting area	9m (30 ft.) with approved media
Max. Loadable Media Width	1500 mm (59 in.)
Max. cutting speed (Axial)	1414 mm/sec (55.7 ips) Diagonal Direction
Cutting Pressure	10 to 500 g
Min. character size	3mm (0.125 in.) alphanumeric Helvetica med. Font
Mechanical resolution	0.005mm (0.0002 in.)
Programmable resolution	GP-GL: 0.01mm (0.0004 in.) and HP-GL ^{TMa} 0.025mm (0.001in.)
Number of cutters/pens	1
Cutter types	Supersteel, ceramic and sapphire blades
Pen types	Water and oil based fiber-tip, water based ballpoint, ceramic, refillable ink, and disposable ink pens
Pounce types	1.2mm diameter pin
Compatible media	Mono-vinyl chloride media, fluorescent media, and media for illuminated displays, high reflective media, up to 0.25mm thick, Sandblast rubber up to 1mm thick ^b
Standard interfaces	RS-232C, Centronics, USB (USB1.1 Full Speed)
Buffer memory	2 Mb
Resident command sets	HP-GL, GP-GL
LCD Panel	LCD 20x4 - Supports 12 languages: Danish, Dutch, English, French, German, Hungarian, Italian, Japanese, Norwegian, Portuguese, Spanish, Swedish
Compatible paper for pouncing	Regular paper from 0.06 to 0.13 mm thick
Power supply	100-240VAC/48-62 Hz Universal Power Supply
Power consumption	140VA max.
Operating environment	Temperature: +10° C to +35° C or +50° F to +95° F Humidity: 35% to 75% (non-condensing)
External dimensions without stand	1700 mm x 350 mm x 485 mm or 67" x 14" x 19"
Weight without stand	42 Kg or 92 lbs.

a. HP-GL is a trademark of Hewlett-Packard Company

b. Using CB15U-K30 blades to cut sandblast rubber

Main Specifications: FC5100A-150

CPU	16-Bit
Configuration	Grit-rolling cutting plotter
Drive	Digital servo
Max. Cut Width (expanded mode)	1514 mm (59.6 in.)
Guaranteed precision cutting area	9m (30 ft.) with approved media
Max. Loadable Media Width	1600 mm (63 in.)
Max. cutting speed (Axial)	1414 mm/sec (55.7 ips) Diagonal Direction
Cutting Pressure	10 to 500 g
Min. character size	3mm (0.125 in.) alphanumeric Helvetica med. Font
Mechanical resolution	0.005mm (0.0002 in.)
Programmable resolution	GP-GL: 0.01mm (0.0004 in.) and HP-GL ^{TMa} 0.025mm (0.001in.)
Number of cutters/pens	1
Cutter types	Supersteel, ceramic and sapphire blades
Pen types	Water and oil based fiber-tip, water based ballpoint, ceramic, refillable ink, and disposable ink pens
Pounce types	1.2mm diameter pin
Compatible media	Mono-vinyl chloride media, fluorescent media, and media for illuminated displays, high reflective media, up to 0.25mm thick, Sandblast rubber up to 1mm thick ^b
Standard interfaces	RS-232C, Centronics, USB (USB1.1 Full Speed)
Buffer memory	2 Mb
Resident command sets	HP-GL, GP-GL
LCD Panel	LCD 20x4 - Supports 12 languages: Danish, Dutch, English, French, German, Hungarian, Italian, Japanese, Norwegian, Portuguese, Spanish, Swedish
Compatible paper for pouncing	Regular paper from 0.06 to 0.13 mm thick
Power supply	100-240VAC/48-62 Hz Universal Power Supply
Power consumption	140VA max.
Operating environment	Temperature: +10° C to +35° C or +50° F to +95° F Humidity: 35% to 75% (non-condensing)
External dimensions without stand	1860 mm x 350 mm x 715 mm or 73" x 14" x 28"
Weight without stand	46.5 Kg or 102 lbs.

a. HP-GL is a trademark of Hewlett-Packard Company

b. Using CB15U-K30 blades to cut sandblast rubber

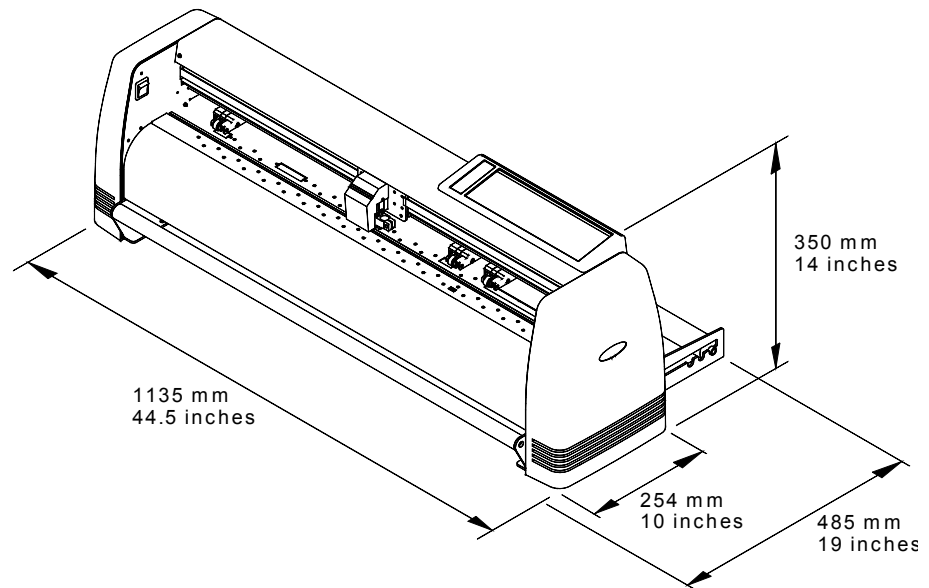
Options

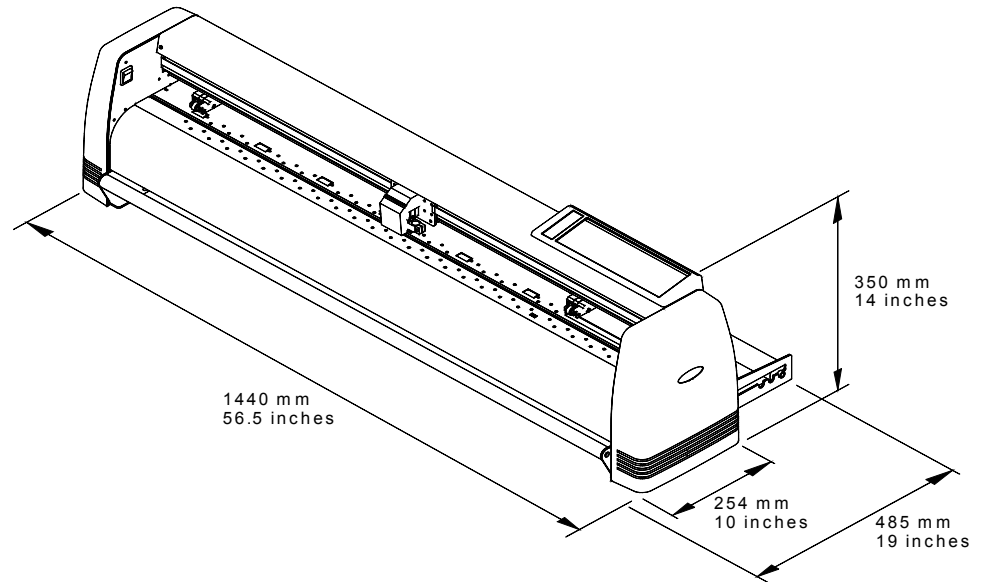
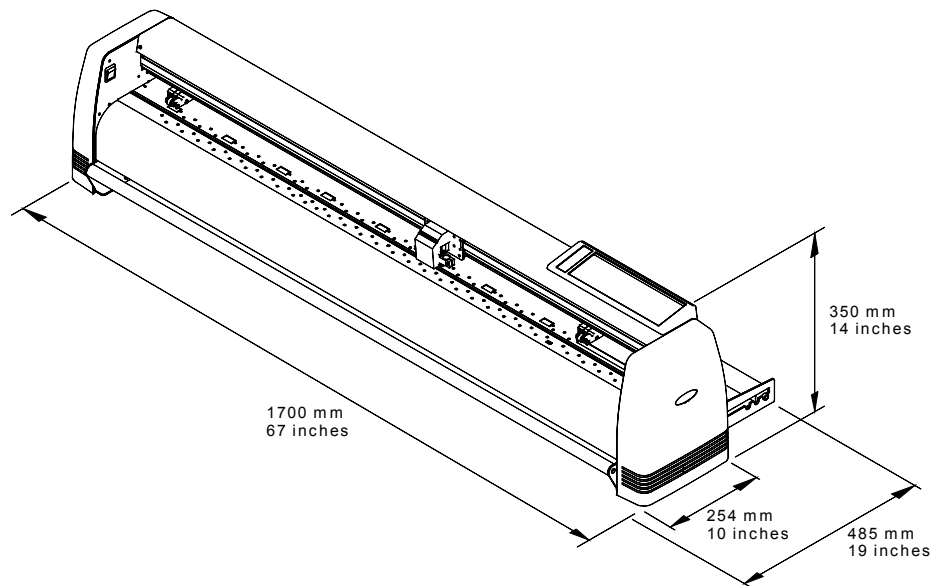
The following are the options for the FC5100A series of Cutting Pros.

Item	Contents
Stand FC5100-75	Stand
Media Basket FC5100-75	Collapsible media basket
Media Basket FC5100-100	Collapsible media basket
Media Basket FC5100-130	Collapsible media basket
Media Basket FC5100-150	Collapsible media basket
Multi Media Supply Kit FC5100-75	Rollers, Brackets
Multi Media Supply Kit FC5100-100	Rollers, Brackets
Multi Media Supply Kit FC5100-130	Rollers, Brackets
Multi Media Supply Kit FC5100-150	Rollers, Brackets
Pounce Tool	Pouncing tool assembly
Loupe (bombsight)	Used for axis alignment

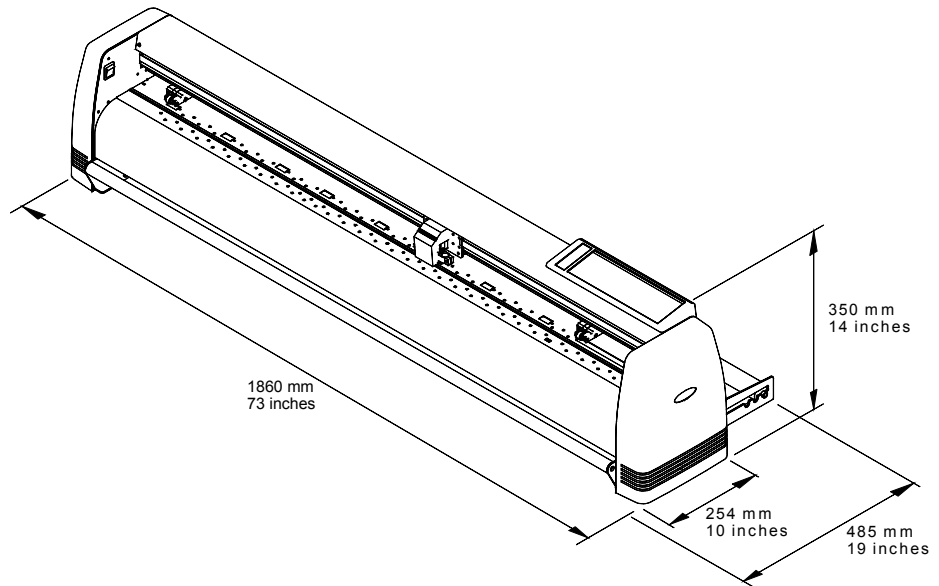
External Dimensions

FC5100A-75 with- out Stand

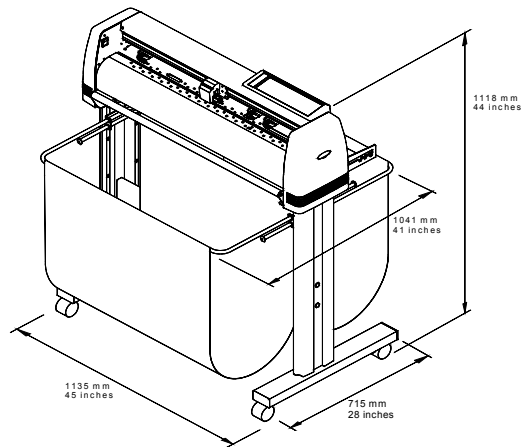


**FC5100A-100
without Stand****FC5100A-130
without Stand**

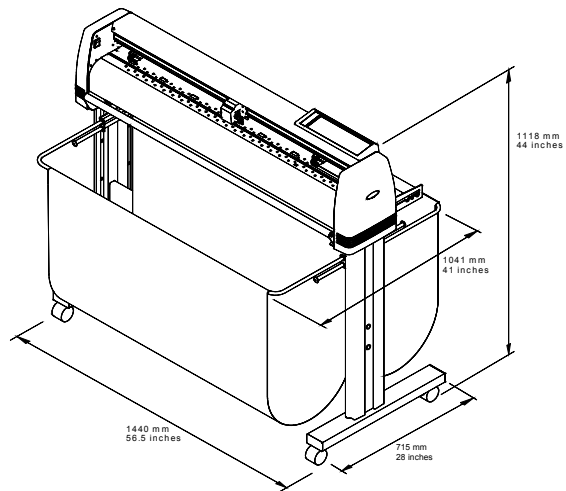
**FC5100A-150
without Stand**



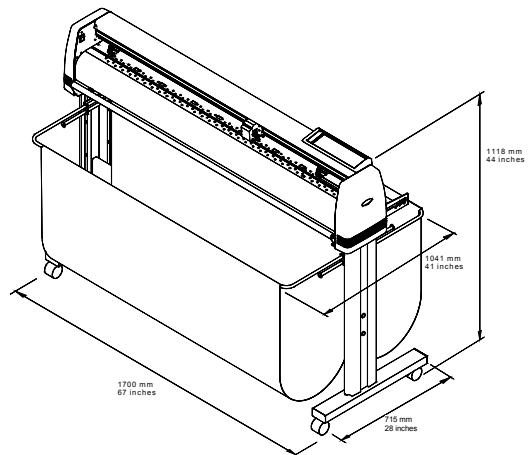
**FC5100A-75 with
Stand and Basket
Option**



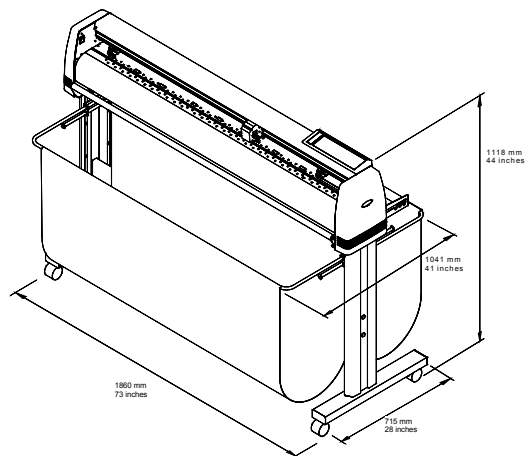
FC5100A-100
with Standard
Stand and Basket
Option



FC5100A-130
with Standard
Stand and Basket
Option



FC5100A-150
with Standard
Stand and Basket
Option



Chapter 10: Options

This chapter contains information regarding the various FC5100A Option User Manuals.

FC5100A Pounce Tool Manual

Pouncing is a method used to create a punched outline on media. This is done by inserting a special tool in the plotter that produces tiny holes instead of plotting with a pen or cutting with a blade. This outline or pattern has many uses such as aligning letters on a large job or creating a chalk outline for graphics that will be hand-painted.

The pounce tool has a small point that is pressed into the media. The pounce conditions are set from the CONDITIONS menu.

Force: Sets the hole punching force during pouncing.

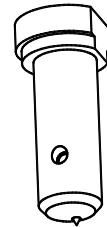
Speed: Sets the traveling speed of the lowered pouncing tool.

Quality: Sets the acceleration rate of the pouncing tool.

Offset: Sets the spacing between holes in mm units.



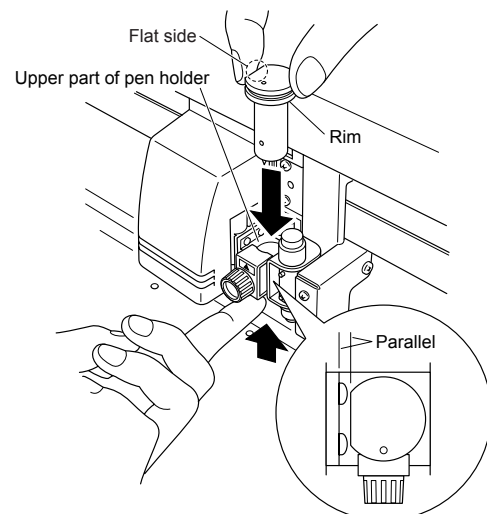
WARNING: To prevent bodily injury, handle the pouncing tool with care. Pounce tool points are extremely sharp. While handling the pounce tool use caution to avoid cutting your fingers or other parts of your body.



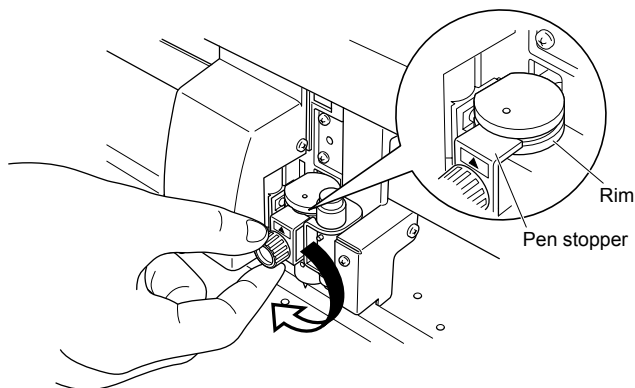
Inserting the Pounce Tool

Follow the procedure below to attach a pounce tool to the pen carriage:

- 1 Loosen the pen holder screw.
- 2 While holding the pen holder upward, push the pouncing tool all the way into the holder until its rim contacts the pen stopper. The flat side of the tool must face the pen carriage.



- 3 When the pouncing tool has been properly mounted, tighten the screw.



Select Pounce Tool from the Menu

- Press the function key [F1] through [F4] corresponding to the number of the group whose registered tool you wish to change.
- Press the CONDITION key to select the tool.
- Press the F4 key to select the tool you wish to use.
- Press the RIGHT or LEFT ARROW key to scroll through the tool selection until you select POUNCE to use the pouncing pen.
- Press the ENTER key to select POUNCE.

Pounce Conditions

To change the setting of a group of conditions, press the function key [F1] to [F4] corresponding to the number of the group you wish to change. For example, press the F4 key to select CONDITION 8. If CONDITON 4 appears, then press the F4 key again to select CONDITION 8.

- Press the CONDITION key to access the condition menu.
- Press the NEXT key to cancel the condition where you are currently set and return to the main menu.

TO CHANGE THE POUNCE FORCE

- Press the F1 key to change FORCE. The blinking cursor indicates that you can change its setting
- Press the UP or DOWN ARROW key to raise or lower the numeric value 1-40.
- Press the F2 key to change SPEED.
- Press the F3 key to change QUALITY.
- Press the F4 key to change OFFSET.
- Press the ENTER key to register your setting.

TO CHANGE THE POUNCE SPEED

- Press the F2 key to change SPEED. The blinking cursor indicates that you can change its setting.

- Press the UP or DOWN ARROW key to raise or lower the numeric value from 1 to 100. [1 to 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 70, 80, 90, 100.]
- Press the F1 key to change FORCE.
- Press the F3 key to change QUALITY.
- Press the F4 key to change OFFSET.
- Press the ENTER key to register your setting.

To CHANGE THE POUNCE QUALITY

- Press the F3 key to change QUALITY. The blinking cursor indicates that you can change its setting.
- Press the UP or DOWN ARROW key to raise or lower the numeric value 1 -8. The smaller the value, the higher the quality. The smaller the value, the higher the quality. When you select a speed that is faster than 60, you cannot select quality. At that time and "xx" appears.
- Press the F1 key to change FORCE.
- Press the F2 key to change SPEED.
- Press the F4 key to change OFFSET.
- Press the ENTER key to register your setting.

To CHANGE THE POUNCE OFFSET

- Press the F4 key to change OFFSET. The blinking cursor indicates that you can change its setting.
- Press the UP or DOWN ARROW key to raise or lower the numeric value 1-99.
- Press the F1 key to change FORCE.
- Press the F2 key to change SPEED.
- Press the F3 key to change QUALITY.
- Press the ENTER key to register your setting.



NOTE: For the Pounce Condition, the Cutter Offset refers to the spacing between holes in mm units.

FC5100A Stand Manual

The FC5100A Stand is used to make the unit more portable, free-up counter space and make storing your plotter easier. The Stand is optional for the FC5100A-75. It is a standard accessory for the FC5100A-100, FC5100A-130, and FC5100A-150 cutters.



WARNING: Use two people to pick up the plotter.



CAUTION: Do not install the plotter onto the stand with the conveyor rollers or media installed. The unit becomes unstable when heavy loads are added. In extreme cases, the unit may tip over.



CAUTION: Improper assembly of the stand may cause the unit to become unstable when heavy loads are added. In extreme cases, the unit may tip over.



CAUTION: The longer length leg platform is installed *towards the back* of the unit.



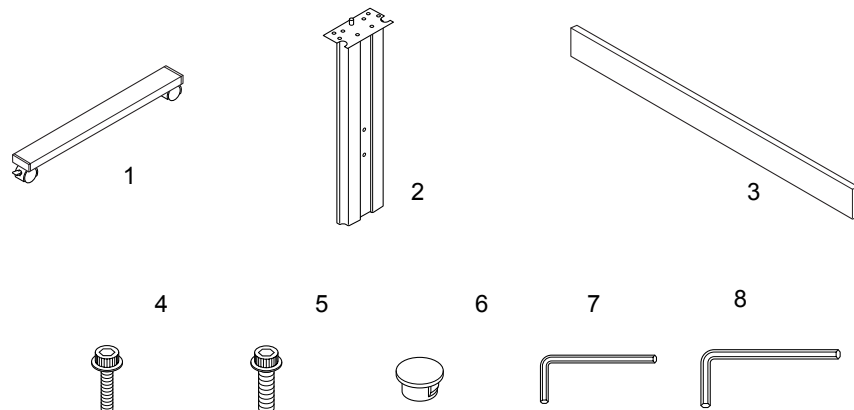
CAUTION: To ensure the stability and strength of the stand, all screws should be periodically inspected and re-tightened as needed.



NOTE: Always keep the wheels in a locked position when operating your plotter.

Contents

- 1 **Base assembly** (Qty. 2)
- 2 **Stand side** (Qty. 2)
- 3 **Middle Bar** (Qty. 1)
(For FC5100A-100, FC5100A-130, and FC5100A-150 models, the middle bar is supplied in the cutting plotter shipping box.)
- 4 **Socket head cap screw A** (M5) (Qty. 8)
- 5 **Socket head cap screw B** (M6) (Qty. 8)
- 6 **Cap plug** (Qty. 4)
- 7 **L wrench hex key tool A** (M5) (Qty. 1)
- 8 **L wrench hex key tool B** (M6) (Qty. 1)



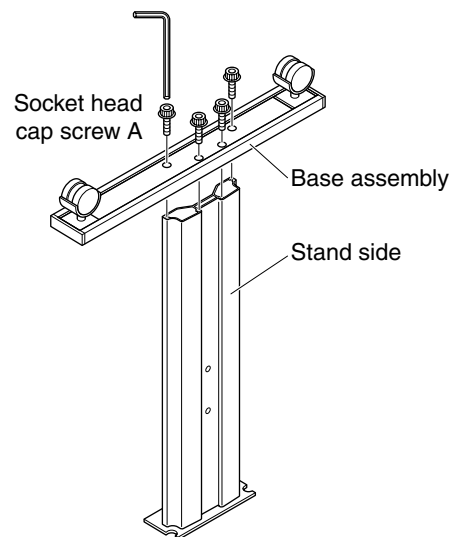
Stand Assembly

The following information will give you step-by-step instructions on how to assemble the Stand for the GRAPHTEC FC5100A Cutting Plotter. For best results, follow all instructions carefully.

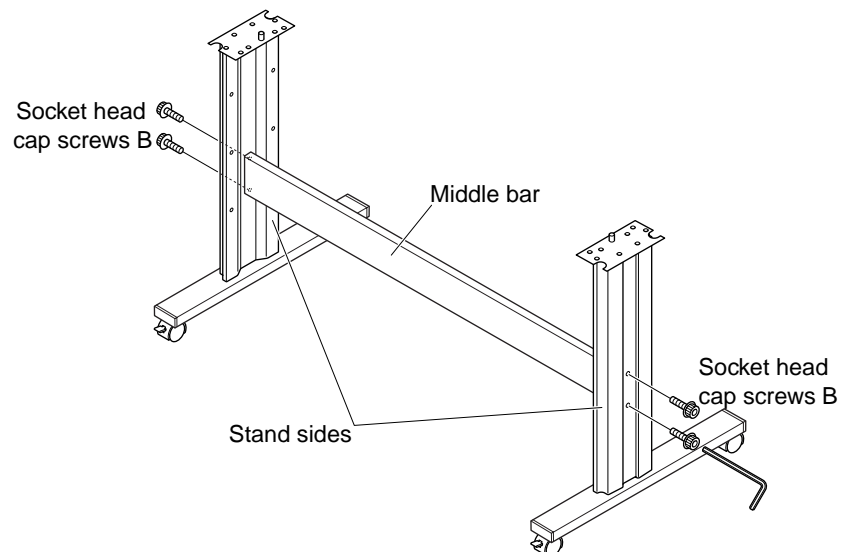
ASSEMBLY AREA

Assemble the Stand on a secure, flat surface. You will be using the Hex Key Tools provided with your Stand assembly.

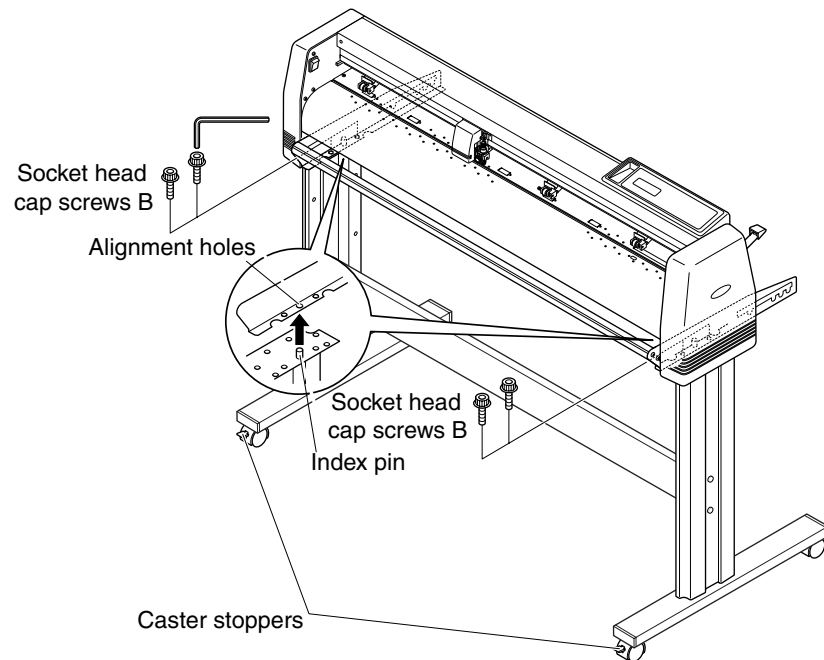
- 1 Lay one stand side horizontally and attach the right base assembly to the stand side with four socket head cap screws A using the L wrench hex key tool A. Repeat this step with the other side.



- 2 Lay the middle bar horizontally and attach it to one stand side with two socket head cap screws B using the L wrench hex key tool B. Repeat this step with the other side.

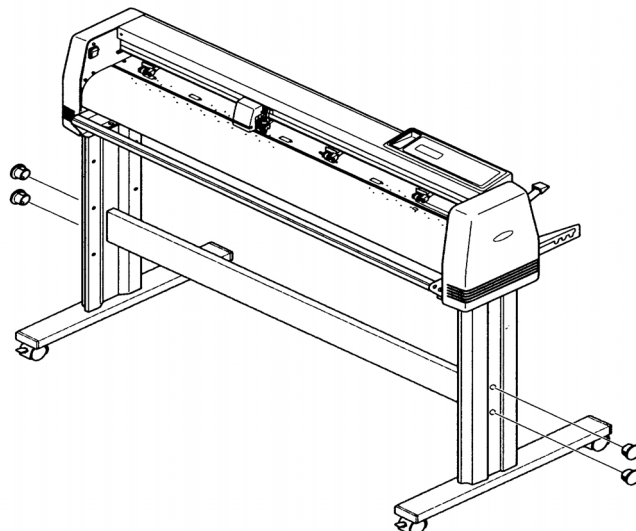


- 3 Lock the casters.
- 4 Have two people set the plotter (*without* the conveyor rollers and media installed) onto the stand assembly, aligning the index pins with the left and right top mounting brackets of the stand.
- 5 Secure the unit with the four socket head cap screws B using the L wrench hex key tool B.



WARNING: Make sure that the casters with stoppers are fitted at the front of the plotter.

- 6 Insert the cap plugs over the holes of the four (4) M6 x 16mm socket button head cap screws installed in the left and right stand sides.



FC5100A Basket Manual

The FC5100A Basket is used to keep your media clean during long length cuts.



WARNING: Use two people to pick up the plotter.



CAUTION: Remove the plotter from the stand before assembling the basket onto the stand.



NOTE: The basket was designed to be used with Graphtec recommended media only. Other media may be stiffer and will not flow into the basket smoothly.



NOTE: Always keep the wheels in a locked position when operating your plotter.

Contents

- 1 **M6 x 12mm socket flange head cap screws** (Qty. 4)
- 2 **Cloth basket** (Qty. 1)
- 3 **Basket holder assembly** (which consists of a front basket tube and a rear basket tube assembled on the tube bracket.) (Qty. 1)
- 4 **Middle basket tube** (Qty. 1)
- 5 **4mm L wrench hex key tool** (Qty. 1)

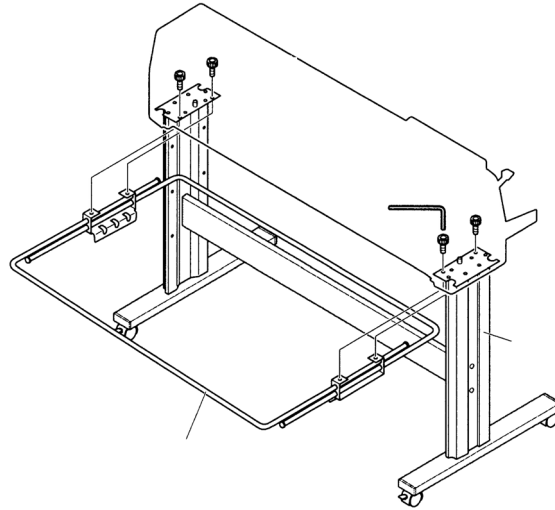
Basket Assembly

The following information will give you step-by-step instructions on how to assemble the Basket Assembly for the GRAPHTEC FC5100A Cutting Plotter. For best results, follow all instructions carefully.

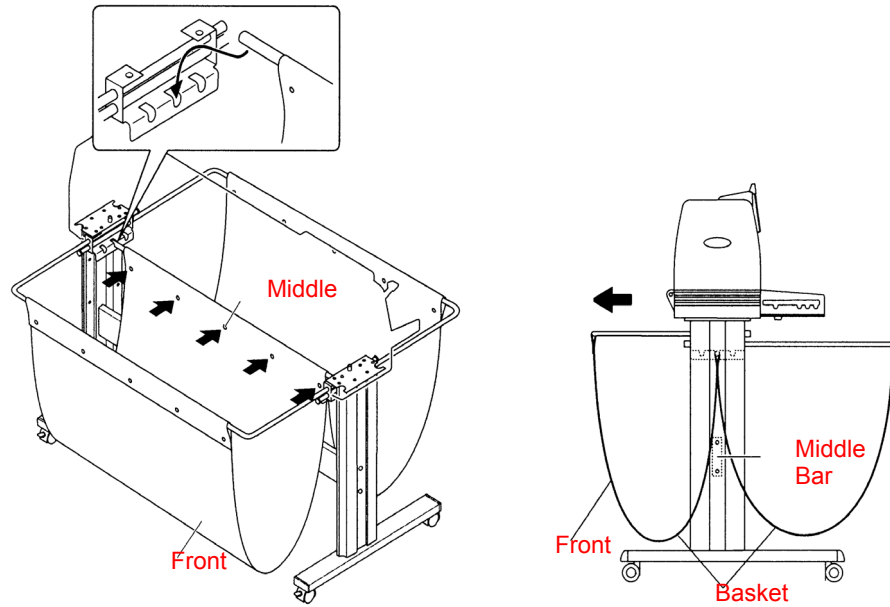
ASSEMBLY AREA

Assemble the Basket on a secure, flat surface. You will be using the 4mm L wrench hex key tool provided with your Basket assembly.

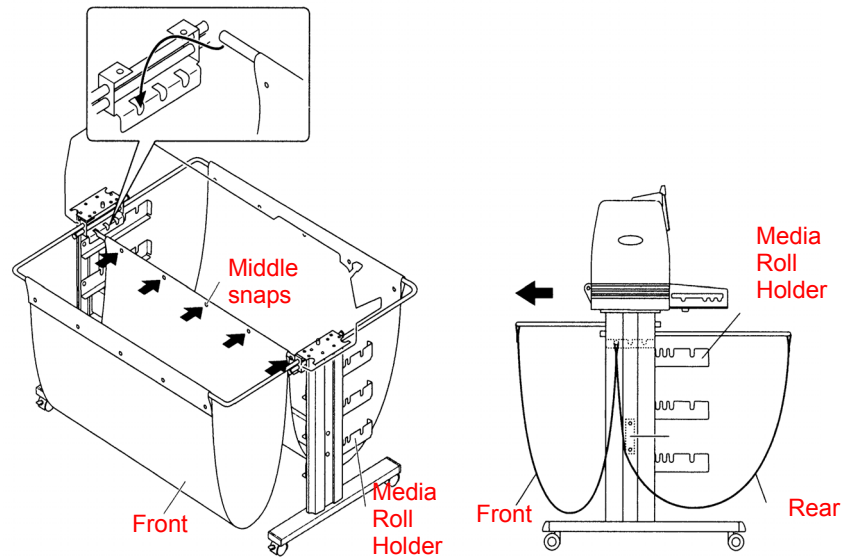
- 1 Lock the casters. The front and rear basket tubes have been assembled into the tube brackets. Attach one (1) of the tube brackets to the upper two (2) holes in the left side of the stand with two (2) M6 x 12mm socket flange head cap screws using the L wrench hex key tool. Repeat this step with the other side.



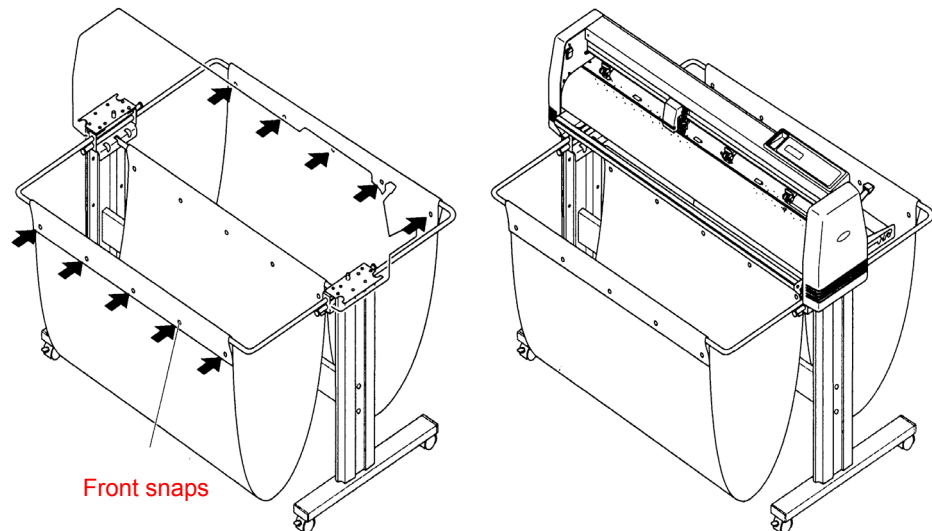
- 2 Place the middle tube between the stand sides in the slots provided on the tube brackets. Use the center slot when only the stand and basket options are installed.



- 3 Use the most front facing slot when the media roll holder option is installed.



- 4 With the snaps facing down, drape the cloth basket over the basket tubes. Snap the middle section of the cloth basket around the middle tube. Snap the front side of the cloth basket around the front basket tube. Snap the rear side of the cloth basket around the rear basket tube.



FC5100A Media Roll Holder Manual

The FC5100A Media Roll Holder allows for multiple roll capability and easy storage of your common media colors. The Media Roll Holder is optional for the FC5100A-75, FC5100A-100, FC5100A-130, and FC5100A-150 cutter models.

To use the media stored in the Media Roll Holder:

- Always move the roll holders closer together as the rolls become smaller with use.
- Make sure the diameter of the media is no larger than 6 inches.



WARNING: Use two people to pick up the plotter.



CAUTION: Removing the plotter from the stand when the conveyor rollers are loaded will cause the unit to become unstable and tip over.



NOTE: Keep casters locked during assembly.

Contents

- 1 **Left Media Roll Holder Bracket** (Qty. 1)
- 2 **Right Media Roll Holder Bracket** (Qty. 1)
- 3 **Conveyor Rollers** (Qty. 2)
- 4 **M6 x 16mm socket button head cap screws** (Qty. 4)
- 5 **4mm L wrench hex key tool** (Qty. 1)

Media Roll Holder Assembly

The following information will give you step-by-step instructions on how to assemble the Media Roll Holder Assembly for the GRAPHTEC FC5100A Cutting Plotter. For the best results follow all instructions carefully.

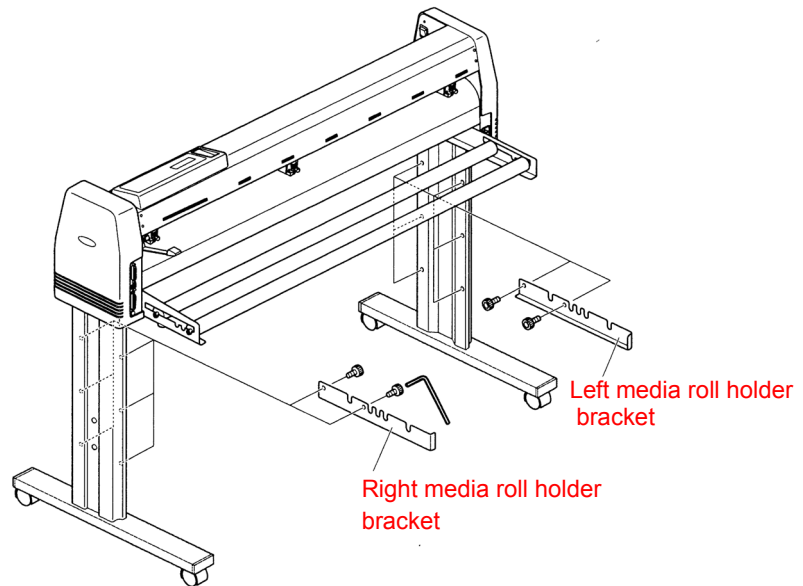
ASSEMBLY AREA

Assemble the Media Roll Holder on a secure, flat surface. You will be using the 4mm L wrench hex key tool provided with your Media Roll Holder assembly.

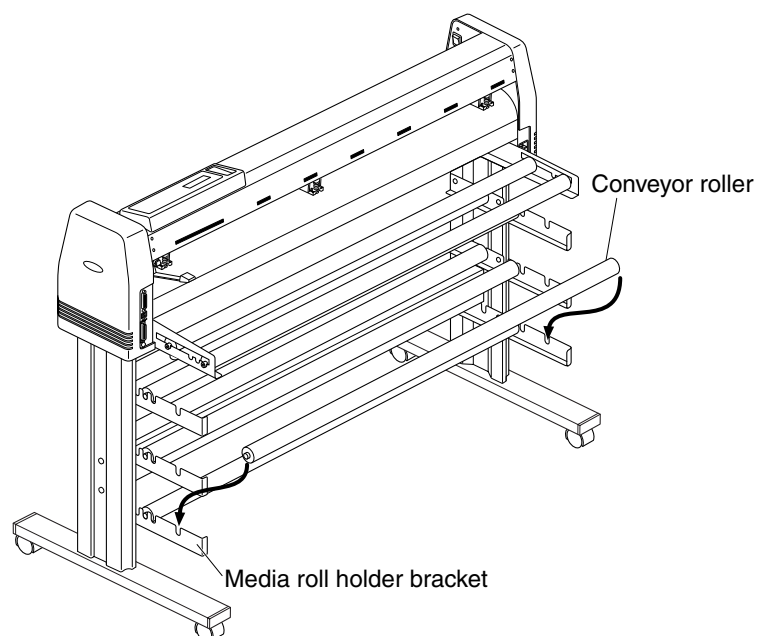


NOTE: The two conveyor rollers, two media roll holders, and screw/wrench set are packed together with the plotter unit.

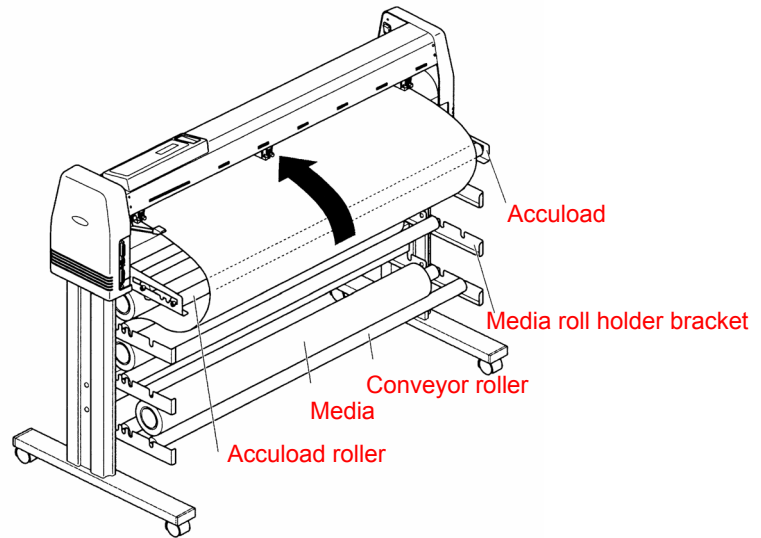
- 1 Attach the left media roll holder bracket to the left side of the stand assembly with two socket head cap screws using the L wrench hex key tool. Repeat this step with the right media roll holder bracket.



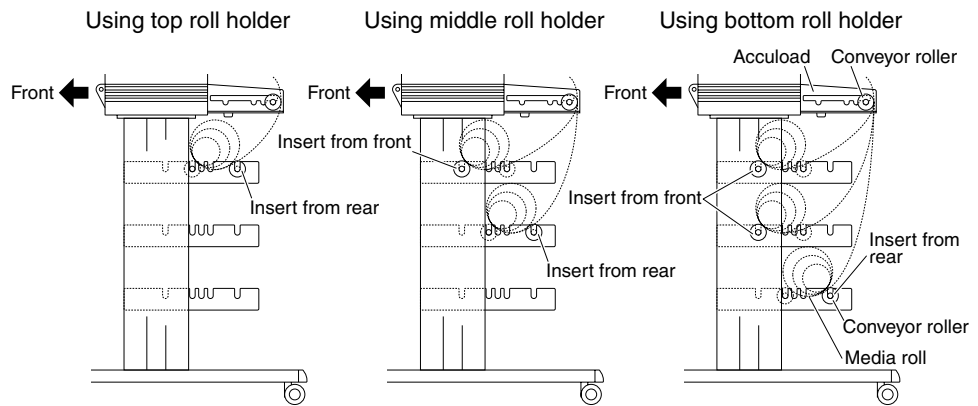
- 2 Insert the conveyor rollers into the slots on the media roll holder brackets. Insert the conveyor rollers from the rear for the bottom media roll holder bracket, and from the front for the top media roll holder bracket, depending on the number of rolls to be used.



- 3 Remove the roll of media from your Accuload™ system. Load the Media using the outside Accuload™ roller as an idler, making sure to feed the media correctly.



- 4 Insert the media rolls from the rear for the bottom media roll holder, and from the front for the top media roll holder, depending on the number of rolls to be used. Always insert using the conveyor roller on the Accuload.



WARNING: Do not load media rolls on the Accuload when using the media roll holders.

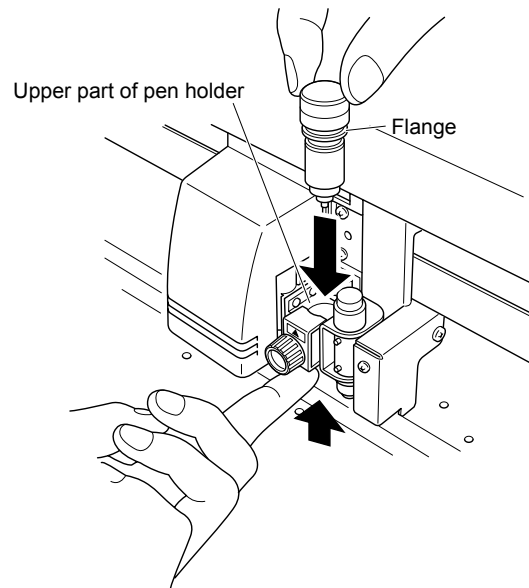
FC5100A Loupe (PHP-61) Loupe

The loupe (bombsight) is used to align points for adjustment during axis alignment operations, and to indicate the current pen position. The loupe is mounted in the pen holder.

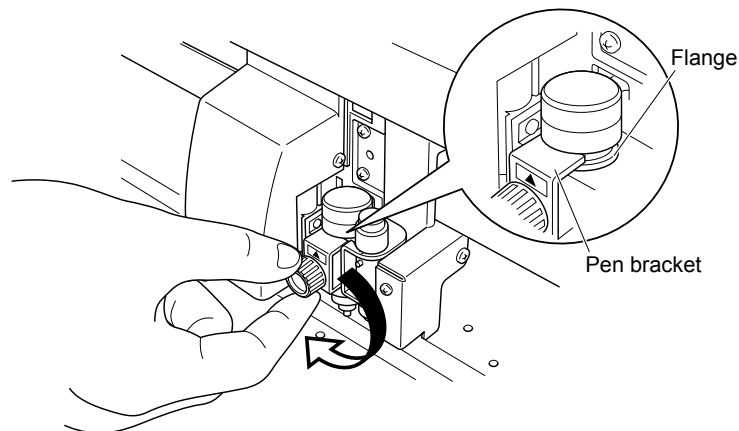
Attaching the Loupe

Follow the procedure below to attach the loupe to the pen carriage.

- 1 Loosen the pen holder screw, and check that the p mark is facing upward.
- 2 While holding the pen holder upward, push the loupe all the way into the holder until the flange contacts the pen stopper.

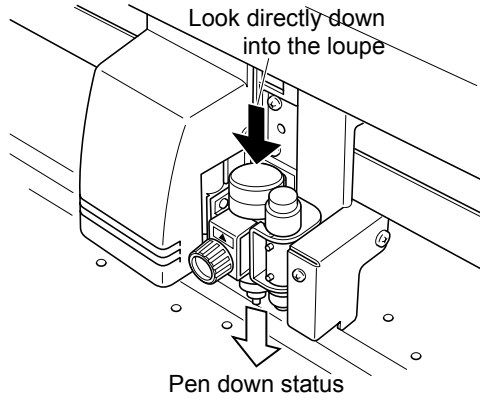


- 3 Make sure that the pen bracket is mounted firmly over the flange, and then tighten the screw.



Using the Loupe

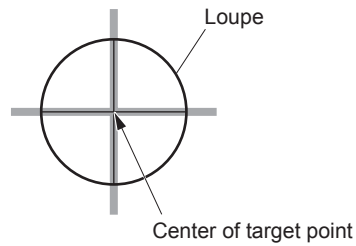
Look through the loupe when it is in the pen down status. Position your line of sight so that you are looking directly down into the loupe.



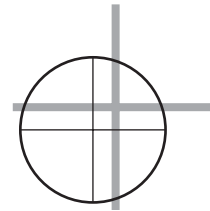
CAUTION: If you look at the loupe from an angle, the center point will be shifted and you will not get a correct reading.

When aligning the loupe with a point, use the POSITION key to move the loupe so that the crosshairs are aligned with the center of the target point.

Example of Good Alignment



Example of Poor Alignment



Appendix

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.

The specifications, etc., in this manual are
subject to change without notice.

FC5100-UM-154

January 10, 2004 1st edition-01

GRAPHTEC CORPORATION
