
HS750 plus
User Manual

COPYRIGHT NOTICE

This document is furnished to support the ***HS750 plus***. In consideration of the furnishing of the information contained in this document, the party to whom it is given assumes its custody and control and agrees to the following:

1. The information herein contained is given in confidence, and any part thereof shall not be copied or reproduced without written consent of Gerber Scientific Products, Inc.

2. This document or the contents herein under no circumstances shall be used in the manufacture or reproduction of the article shown and the delivery of this document shall not constitute any right or license to do so.

PRINTED IN USA

FCC NOTICE

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 risk.

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

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de la classe B prescrites dans les Reglements sur le brouillage radioelectrique edicte par le Ministere des Communications du Canada.

Table of Contents

INTRODUCTION

The HS750*plus*™ is a state-of-the-art 30-inch plotter designed for use with the GRAPHIX ADVANTAGE® system.

Performance

The HS750*plus* is designed to precisely register graphics up to 50 yards long using carbide blades for crisp, sharp cuts.

The HS750*plus* features Gerber's exclusive Knife Mode Switching™ technology, which offers you a choice of two cutting modes selected from the plotter keypad:

- **Tangential Knife Mode** keeps the blade aligned with the direction of plotting motion for cutting thick materials (such as sandblast stencil) and for pouncing patterns.

- **Swivel Knife Mode** cuts faster than tangential knife mode for rapid cutting of all but the most demanding materials, such as sandblast. Gerber's exclusive Corner Correcting Technology™ ensures sharp, easy-to-weed corners in swivel knife mode.

Able to handle complex jobs, the HS750*plus* cuts at 20 inches per second on a straight line (X or Y axis). When used with the GRAPHIX ADVANTAGE, the HS750*plus* uses the Plot Spooler feature to queue and transmit jobs while the operator continues to design at the system.

Convenience

HS750*plus* has many features that make it easy and convenient to use:

- Accepts any standard Gerber materials in 30-inch wide rolls.
- Draws, cuts, and pounces up to 27.25 inches high. Using the GRAPHIX ADVANTAGE system Panel feature, the HS750*plus* can cut text or graphics in strips up to 96 feet long.
- Adjustable tool force for uniform cutting with the turn of a dial.
- Servo motors for quiet, fast performance.
- On-board 4K buffer in addition to GRAPHIX ADVANTAGE buffers.
- Quick installation.
- Simple user panel requires minimum training.

About This Manual

This manual explains the installation and operation of the HS750*plus* plotter. It assumes you are familiar with the GRAPHIX ADVANTAGE system. It tells you how to assemble, install, operate, and maintain your HS750*plus* as follows:

- The “Introduction” provides information about the HS750*plus* and a list of contents of the shipping crates.
- “Installation” contains instructions for plotter assembly, and configuration to the GRAPHIX ADVANTAGE.
- “Materials and Tools” gives information about material and loading the vinyl, and discusses procedures on using and replacing the pen, knives, and pounce wheel.
- “Operation” provides information about plotter operation and slew key functions.
- “Special Diagnostics” presents examples and instructions for diagnostic tests.

- "Error Conditions" lists common error conditions and corrective procedures.
- "Maintenance" provides cleaning, lubricating, and fuse replacement instructions.
- "Plotter Adjustments" includes a troubleshooting guide as well as symptoms of plotter adjustment problems.

Conventions

The following conventions are used in this manual:

Note: A note contains important information that could affect successful completion of a task.

CAUTION: A caution statement contains information that, if not observed, could result in damage to the equipment.

WARNING: A warning statement contains information that, if not observed, could result in personal injury.

Support Information

Gerber pioneered plotter technology with quality engineering designs that consider operator convenience. Performance of the HS750*plus* plotter is assured by:

- 38 hours of finished product testing before shipment, in addition to testing during the manufacturing process.
- Customer support through Gerber Field Service Department.
- Step-by-step user's manual.

If you require assistance installing or operating your HS750*plus* plotter, contact your distributor or Gerber Field Service at 800-828-5406 (in the USA), or fax at 203-645-2448.

Package Contents

This section lists the contents of the HS750*plus* shipping carton. After you unpack the HS750*plus* plotter, inventory the contents before you begin to assemble the plotter. Report any discrepancies to your distributor at once. Save all packaging materials in case it becomes necessary to transport the plotter in the future.

The unpacking and positioning of the HS750*plus* requires at least two people.

The HS750*plus* is securely packaged in three shipping boxes:

- the **Plotter Assembly Box** contains the HS750*plus* plotter
- the **Control Module Assembly Box** contains the control module and the small components box (see next page)
- the **System Components Box** contains the following:

  (1) Left stand leg
  (1) Vanity panel
  (1) Stand base kit including the base, feet, and installation hardware
  (3) Roller bars
  (1) 10-yard roll of high performance vinyl
  (1) 10-yard roll of 20-pound paper
  (1) Hardware kit including:
    (4) Tube caps
    (8) #6 pan head screws
    (6) white plastic grommets for the roll support bar holes
    (4) #8 pan head locking screws
    (4) lock washers
    (4) #8 pan head screws
    (6) material core plugs

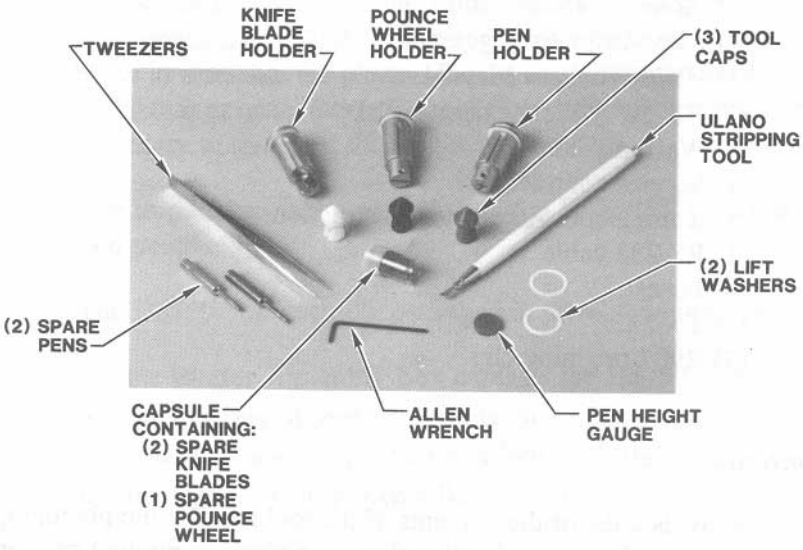
Small Components Box

(1) Plotter power cord
(1) Plotter interface cable
(1) Vinyl letter squeegee
(1) HS750*plus* User Manual
(1) HS750*plus* Plotter Option diskette
(1) Warranty card
(1) Service contract
(1) Knife Depth Adjustment Instructions
(1) RS-232 cable
(4) Fuses
(1) Tool kit
(1) R907 retaining clip

Tool Kit Contents

Below is a list of the contents of the tool kit. See the photograph on the next page for parts identification. The photograph may not contain all the parts listed.

1 Pen holder with pen
1 Tangential knife holder with blade
1 Pounce wheel holder
3 Tool lift washers (on tool holders)
1 Allen wrench
1 Pair tweezers
1 Spare red pen
1 Spare blue pen
1 Envelope containing 2 spare lift washers
3 Spare cone-shaped tool caps
1 Capsule containing:
    2 Spare knife blades
    1 Spare pounce wheel
    1 Pen height gage



Tool Kit Contents

INSTALLATION

As you unpack the plotter boxes, inventory the contents before you begin to assemble the plotter. Remember to save all packaging materials in case it becomes necessary to transport the plotter in the future.

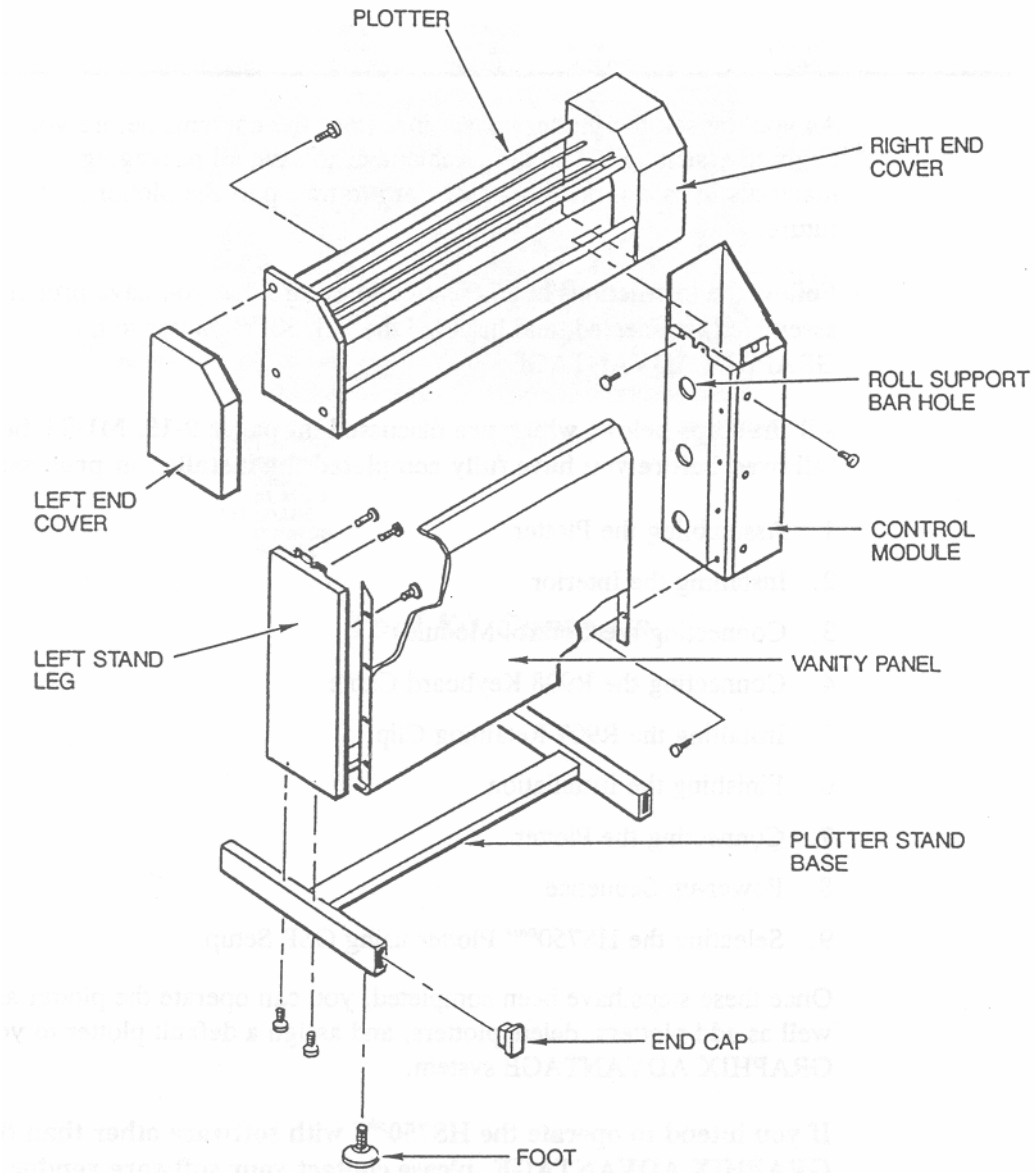
Follow the instructions in this section to ensure that you have properly assembled, connected, and installed the HS750*plus* plotter to the GRAPHIX ADVANTAGE.

All the steps below, which are discussed on pages 9-15, MUST be followed before you have fully completed the installation process:

1. Assembling the Plotter
2. Installing the Interior
3. Connecting the Control Module
4. Connecting the R908 Keyboard Cable
5. Installing the R907 Retaining Clip
6. Finishing the Installation
7. Connecting the Plotter
8. Power-up Sequence
9. Selecting the HS750*plus* Plotter using GSP Setup

Once these steps have been completed, you can operate the plotter as well as add plotters, delete plotters, and assign a default plotter to your GRAPHIX ADVANTAGE system.

If you intend to operate the HS750*plus* with software other than the GRAPHIX ADVANTAGE, please contact your software vendor for an HS750*plus* plotter driver and installation instructions specific to your software.


PLOTTER
RIGHT END COVER
ROLL SUPPORT BAR HOLE
LEFT END COVER
CONTROL MODULE
LEFT STAND LEG
VANITY PANEL
PLOTTER STAND BASE
END CAP
FOOT

Assembling the Plotter

Refer to the illustration on the preceding page to help you assemble the plotter. The diagram is intended to assist you in assembly. It is not intended to be an exact depiction of the HS750*plus*.

1. Use four #6 pan head screws to secure the vanity panel to the left stand leg.
2. Place the control module (which includes the right stand leg) on the floor with the four screw holes facing up. Use four #6 pan head screws to secure the vanity panel and left stand leg to the control module.
3. To put on feet or casters, thread one jam nut onto the shaft of each adjustable foot. Thread the feet into the holes near the ends of the stand base.

   OR

   Thread one jam nut onto the shaft of each caster. Thread the casters into the holes near the ends of the stand base.
4. Install an end cap in the each of the open ends of the stand base (four places).
5. Align the two holes at each side of the stand base with the holes on the top and bottom stand legs. Press the stand base firmly against the stand legs.
6. Insert a #8 locking pan head screw, with a washer, into each of the two holes of the bottom stand base (the control module). Start the two screws but do not tighten them at this time.
7. Insert a #8 locking pan head screw, with a washer, into each of the two holes of the top stand base. Start the two screws but do not tighten them at this time.
8. Verify that the alignment between the stand base and the stand legs is correct, then tighten the screws.
9. Place the stand upright.

Installing the Interior

1. Install the roll support bar hole grommets by twisting the grommet to separate the ends. Press one end into the hole so that the plastic encases the metal. Work around the grommet, pressing the plastic over the edge of the metal until the loose end snaps into place closing the ring.

2. Remove the cover from the control module by removing the three screws on the front and the two screws on the back.

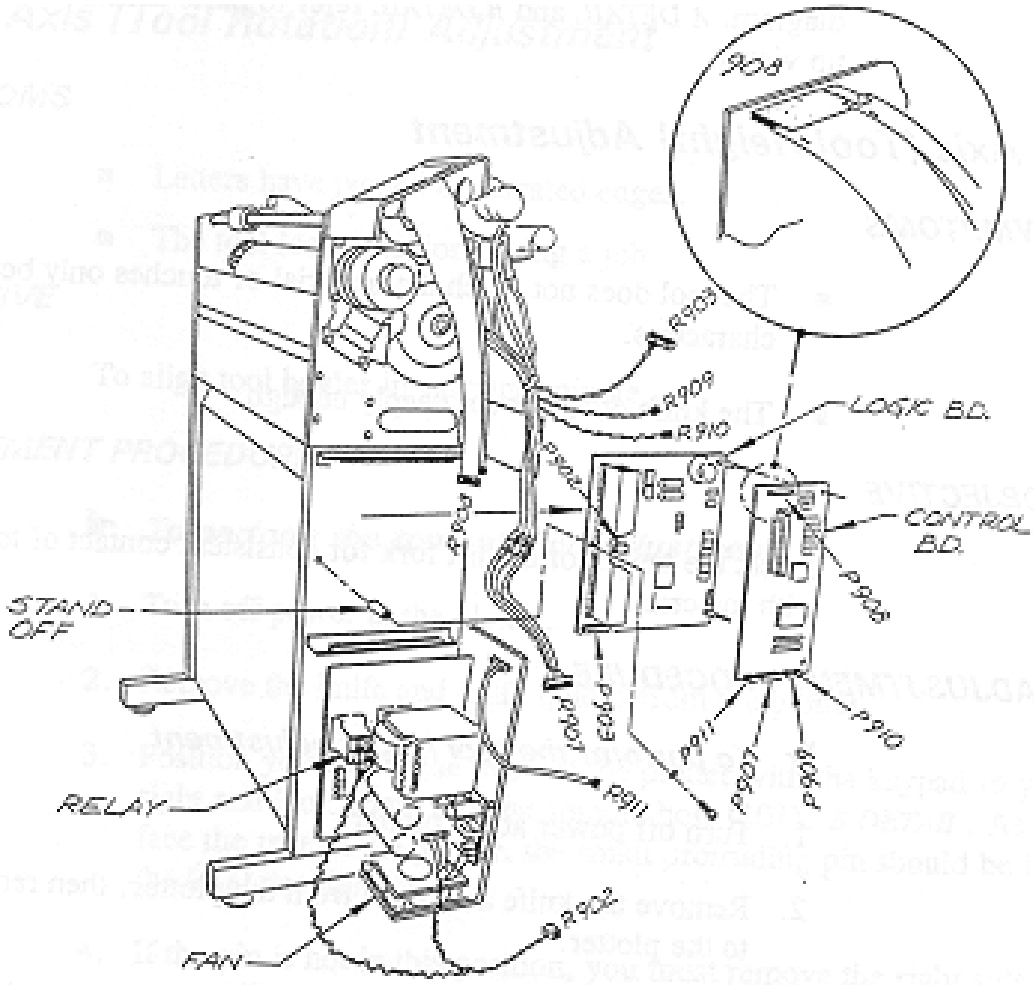
3. Remove the three screws holding the left end cover of the plotter and remove the cover. Remove the three screws holding the right end cover of the plotter and remove the cover. Save all screws.

4. Mount the plotter on top of the stand assembly. Carefully align the projecting tabs of the stand with the corresponding holes in the plotter. Use four #8 pan head screws, four lock washers, and four flat washers to secure the plotter to the stand.

Connecting the Control Module

In the control module, connect the objects marked R902, R903, R904, etc., to their counterparts (P902, P903, P904, etc.), as shown in the illustration.

Special instructions for connecting the keyboard cable (R908) follow on the next page.

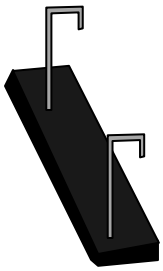


Connecting the R908 Keyboard Cable

There are two connections at the end of the R908 cable. Each cable is marked with a number 1 on its top side when connected to P908. The expanded diagram on the previous page shows this connection.

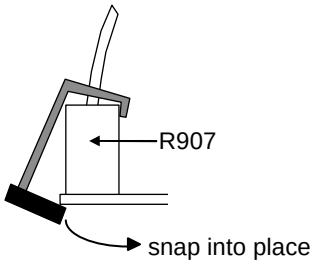
1. Locate the R908 cable.
2. With the numbers facing up toward you, insert the cables into P908. The smaller of the two cables inserts into the pins on the right side of P908. The larger cable inserts into the left side of P908.

Installing the R907 Retaining Clip



The retaining clip secures the R907 plug to the motherboard. The retaining clip is packaged in the small components box.

1. Remove the retaining clip from the small components box.
2. Locate the R907 plug in the diagram on the previous page.
3. Position the retaining clip over the R907 plug and snap into place, securing the R907 plug to the mother board.



Finishing the Installation

1. Replace the left end cover on the plotter and secure with the three saved screws. *Do not replace the right end cover or control module cover at this time*.

   Note: If you purchased the Long Sign Material Catcher, install at this point.

2. Install the three roll support bars between the stand legs behind the vanity panel. Insert the end of the roll support bar into one of the stand leg holes as far as it will go, then insert the other end into the corresponding hole on the other stand leg. Center the bar.

Connecting the Plotter

CAUTION: Be sure power is turned off and the power cord is unplugged at both the GRAPHIX ADVANTAGE and the plotter.

CAUTION: When power is on, never try to manually move the carriage, move the plotter drum, rotate the tool, or force the tool up or down. Attempting to manually move the HS750*plus* in any axis of movement while the power is on may damage the machine.

1. Place the HS750*plus* near the GRAPHIX ADVANTAGE system. The cable is 10 feet long, so the plotter need not be located immediately beside the console; however, it should be close enough so there will be no strain on the cable after installation.

2. Insert the 9-pin connector at the end of the RS-232 cable into the 9-pin RS-232 connector on the back of your GRAPHIX ADVANTAGE. This connector is normally labeled *Plotter* or *COM Port 2.*

3. Carefully align all pins. Use the connector thumb screws to secure the cable to the GRAPHIX ADVANTAGE.

4. Insert the 25-pin connector at the end of the RS-232 cable into the 25-pin RS-232 connector on the back of the plotter.

5. Carefully align all pins. Use the connector thumb screws to secure the cable to the plotter.

   Note: If a plotter is already installed in the ***PLOTTER*** *port on the GRAPHIX ADVANTAGE, use the* ***TABLET*** *port to install a second plotter.*

6. Insert the female connector of the HS750*plus* plotter power cord into the socket on the rear panel of the plotter.

7. Connect the power cords for both the GRAPHIX ADVANTAGE system and the HS750*plus* to a multiple outlet strip. The strip should be plugged into a standard, grounded electrical outlet (115V +/- 10% AC, 60 Hz or 230V AC, 50 Hz).

8. Turn power on at the system and the plotter.

Communication Parameters

If you are connecting the HS750 *plus* to a system other than the GRAPHIX ADVANTAGE, the plotter uses these RS-232 communication parameters:

Communication Parameters
9600 Baud
No Parity
8 Data Bits
1 Stop Bit
Xon/Xoff Flow Control

The plotter has a 25DB female connector with these pin assignments:

Pin	Signal
2	Tx
3	Rx
4	RTS
5	CTS
7	Sig Gnd

All other pins are not connected.

Power-up Sequence

When the HS750*plus* is turned on, the following sequence occurs:

1. The light labeled POWER comes on. A short beep sounds, and the lights over RUN CONT, RUN SINGLE, and SWIVEL KNIFE blink on, then off.

2. As the HS750*plus* performs self-check tests, the lights over the RUN CONT, RUN SINGLE, and SWIVEL KNIFE keys flash, and two additional beeps sound.

3. When the self-check tests are completed, the lights blink and the beep sounds three times.

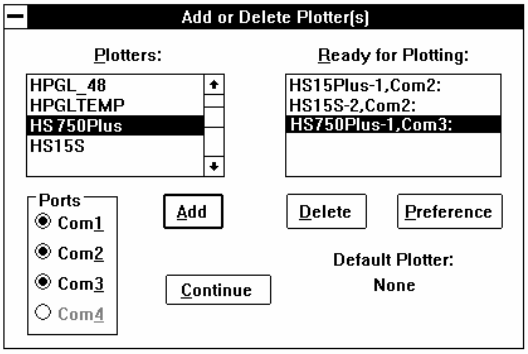
4. The plotter goes off-line in tangential knife mode. Only the power light remains on. This is the initial setting at power-up.

   Note: Rapid, continuous beeping and flashing lights may signal a self-check error. See the "Error Conditions" section for more information.

Selecting the HS750plus Plotter

Use the GSP Setup program in the GRAPHIX ADVANTAGE to add the HS750*plus* plotter to your system. Refer to the *GRAPHIX ADVANTAGE Reference* for more information on configuring your system.

1. Double-click on GSP Setup.
2. Click on Setup. The Setup drop-down menu appears.
3. Click on Plotter. The Add or Delete Plotter(s) Dialog Box appears.



4. Scroll through the list and click on HS750*plus* in the Plotters list box to highlight it.
5. Choose the port in the Ports box that you connected the plotter to.
6. Click on Add. The added plotter appears in the Ready for Plotting list box. Your system is now set up to use the HS750*plus* plotter.

   Note: The Default Plotter note in the lower right corner of the dialog box tells you the name of the plotter your jobs will be sent to unless otherwise specified in the Plot program.

7. Click on Continue. The screen will return to the GSP Setup menu.

8. Double-click on the control bar to exit the GSP Setup Menu. The system returns to the GSP GRAPHIX ADVANTAGE program group and you can now access the HS750*plus* plotter.

Assigning Default Plotter

A default plotter can be assigned if more than one plotter is connected to the GRAPHIX ADVANTAGE.

Note: There must be at least two plotter names in the Ready for Plotting Box to select a default plotter. If only one plotter is installed to the GRAPHIX ADVANTAGE system, that plotter is automatically specified as the default plotter.

1. Highlight the name of the desired default plotter in the Plotters Box.

2. Click on Preference. The Set Preferences Message Box appears.

3. Click on OK. The name of the default plotter selected will appear below the words *Default Plotter*.

4. Click on Continue. The screen returns to the GSP Setup menu.

5. Double-click on the control bar to exit the GSP Setup menu. The system returns to the GSP GRAPHIX ADVANTAGE program group**.**

MATERIALS AND TOOLS

Material Products

The HS750*plus* uses the same plotting materials as all Gerber plotters. Gerber vinyl products in high performance or intermediate grades are translucent, reflective, or metallic and come in a wide range of colors. Also available are direct cut silk screen, ruby photo film, paint masking material, rubber sandblast stencil material, and heat transfer materials.

Consult your Gerber distributor for further information about available materials, colors, and prices. Always insist on Gerber authorized materials for highest quality results.

Loading Material

There are several precautions you should take before and as you load the material. These are as follows:

CAUTION: You can load material into your HS750*plus* plotter with a tool installed, but it is preferable to load material with no tool in the carriage. Otherwise, damage can result to the blade.

CAUTION: While power is off, center the carriage by gently pushing toward the center of its travel. Take care to move the carriage slowly and firmly by gripping the right end of the carriage housing, not by gripping the carriage spindle.

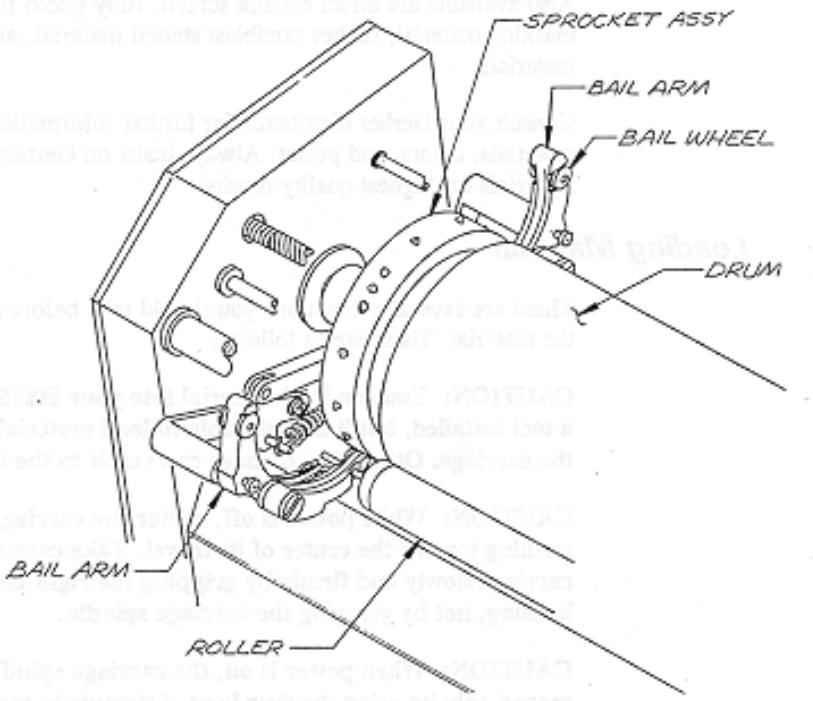
CAUTION: When power is on, the carriage spindle must be moved only by using the slew keys. Attempts to manually move the plotter drum, rotate or force the tool up or down may damage the plotter.

CAUTION: Do not use the way shafts to lift or turn the HS750*plus*. This can damage the system and reduce plotting accuracy.

▶ *To prepare the plotter*

1. Center the carriage spindle preferably by using the slew keys (see “Front Panel” section) or manually (with certain precautions, as noted in “Loading Material”). Be sure that the carriage spindle is not located at either extreme end of its travel and that both ends of the rubber drum can be reached easily.

2. Open the bail arms at either end of the drum by pulling them away from the drum.



3. Using the slew (arrow) keys, rotate the drum until three closely spaced pins are visible. These three sprocket pins are used to align the material.

▶ *To feed and align the material*

1. Feed the material through the plotter, under all the guide bars and over the drum.

2. Place the holes in the material over the adjustable sprockets on the drum first (toward the rear of the plotter), making sure to match the three closely-spaced sprocket pins and holes.

3. Place the holes in the material over the fixed sprockets at the keypad end of the plotter, making sure to match the three closely-spaced sprocket pins and holes

4. Center the front bail arm over the fixed sprockets and secure into place.

5. Adjust the sliding sprockets at the rear of the plotter slightly forward or backward to accommodate small differences in the material width.

6. Securely close the adjustable bail arm over the adjustable sprockets.

HELPFUL HINTS

- When you change materials, open the bail arms and roll the material back onto the roll. Tape the ends securely to prevent the roll from unraveling.

- The HS750*plus* plots so fast that heavy rolls of material such as reflective vinyl cannot turn as rapidly as the plotter tries to pull them. This can result in a material jam and cause the plotter to stall. When using heavy rolls of material such as reflective vinyl or sandblast stencil, advance enough vinyl for an entire job before you start to plot to eliminate the possibility of scrapping a large job in the event of a material jam.

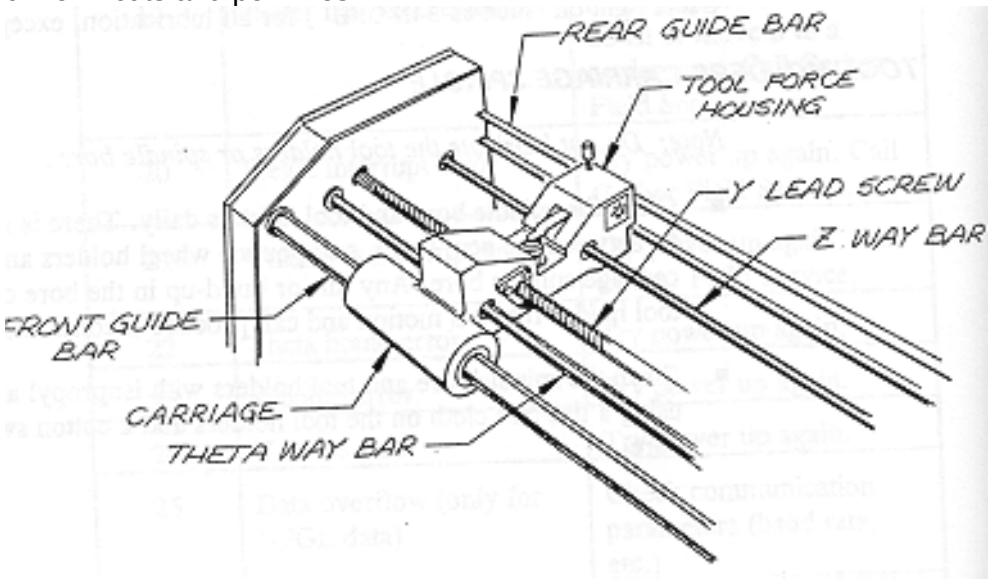
- Before unrolling the vinyl for a job, determine how much material you need. Check the length of the longest line in the job, or the width of an automatically laid out sign or digitized design. Remember that if you are plotting in the Axis Swap mode, you need to consider the height of the job rather than its width.

- The most practical way to unroll material for a job is to use the slew keys on the plotter. It is best to unroll more than enough material, rather than "just enough," in case your estimate is not accurate. You may also pull material from the roll by hand. This may be the simplest method if you are plotting relatively small jobs.

- When you have advanced enough material for the job, feed it back through the plotter, or otherwise position it appropriately according to the start position selected at the GRAPHIX ADVANTAGE and the resulting tool starting location. If you have a large quantity of material piling up on the table, be sure to arrange the material in loose accordion folds so it can feed easily. Make sure the material is positioned to feed straight into the plotter rather than at an angle.

Tool Force Dial

The tool force dial on the front of the housing indicates the tool force setting and the amount of tool force, or pressure, that is applied to the tool during operation. This pressure ensures uniform cuts and pen lines.



Tool force can be adjusted by turning the small knob on the top of the tool force housing.

SETTINGS

The *HS750plus Tool Force Settings Reference Card* at the back of this manual lists tool force settings. Be sure to refer to this list of settings when changing materials or applications. Below are some initial suggestions:

- For drawing, start with a tool force setting between .5 and 1. If your pen does not make a clear dark line, you may wish to increase the tool force setting.
- For pouncing, start with a setting between 5 and 6.
- When cutting regular vinyl in tangential knife mode, try a tool force setting of .5 and 1.
- When cutting regular vinyl in swivel knife mode, set the tool force setting at 1. The swivel knife will not pivot at corners and will begin to cut through the material if the pressure is set too high.
- Heavier material, such as reflective vinyl, requires increased tool force settings.
- Worn blades require a higher tool force setting.
- Before cutting, refer to the *HS750plus Tool Force Settings Reference Card* at the back of this manual for suggested tool force settings for different tools and materials. Set the tool force accordingly. If you find that different tool force settings produce more satisfactory results with your particular system, tools, and materials, be sure to mark the preferred settings on your card for future use.

ADJUSTMENTS

Several factors affect tool force and require setting changes:

- Type of material -- See the *HS750^{plus} Tool Force Settings Reference Card.*
- Knife mode and tool -- Drawing, pouncing, cutting, knife mode, and blade angle all affect the tool force setting.
- Blade wear -- Increase tool force after several thousand cuts.

Gerber recommends experimenting with tool force settings as well as keeping a logbook of the settings. Refer to the *HS750^{plus} Tool Force Settings Reference Card* for guidelines.

Tool Holders

For quick identification, each tool holder has a different colored cap. The cap helps lock the tool in place in the carriage spindle during operation. In addition, red sleeves protect tool tips from accidental damage during storage. Remove the protective sleeve before installing a tool holder in the carriage spindle.

Pen Holder and Pens

The pen holder is shipped with a black pen installed. After loading the plotting paper, install the pen holder in the carriage spindle as follows:

▶ ***To install the pen holder***

1. Select the pen holder with pen installed.
2. A plastic lift washer is used to reduce friction between the tool holder and the lift fork of the carriage spindle during operation. There should be one installed on the pen holder. If not, slip a lift washer from the tool kit over the barrel and slide the washer to the top of the holder.

3. Drop the pen holder into the carriage spindle. A slot, or keyway, in the barrel of the pen holder ensures proper orientation. If necessary, rotate the pen holder until it drops completely into the carriage spindle.

4. When the pen holder is in place, swing the tool force arm and snap it over the tool cap.

5. For pen plotting, either swivel knife or tangential knife mode is acceptable. Start with a tool force setting between .5 and 1. If the pen does not make a clear, dark line, increase the tool force setting.

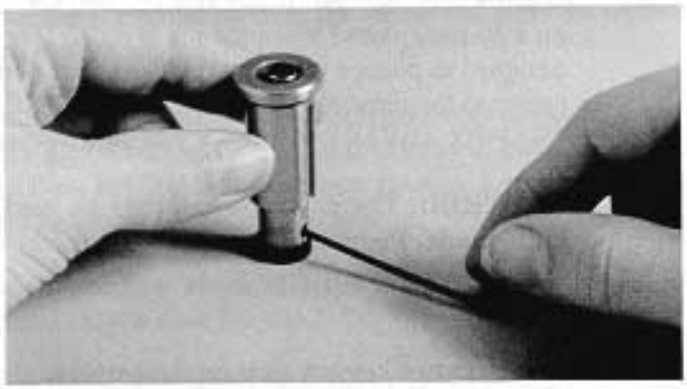
PEN REPLACEMENT

Spare pens in blue and red are included in the tool kit. Additional pens are available through your Gerber distributor.

▶ *To replace a pen*

1. Insert a flat-tip screwdriver into the notch (see below) at the base of the tool cap and pry out the cap.

2. Use an Allen wrench to loosen the hex screw located near the tip of the pen. Remove the pen through the top of the holder.



3. Insert a new pen, tip first, into the top of the holder.

4. The pen height gage included with the tool kit is a washer 1/8 inch thick. Place the pen height gage on a smooth, hard surface like a table top. Position the lower end of the pen holder on the gage.

5. Use the Allen wrench to tighten the set screw near the tip of the pen. Do not over-tighten the set screw or the pen could be crushed.

6. Replace the cap in the barrel.

Pounce Wheel Holder

Pouncing is a technique used to create an outline for a sign that will later be hand-painted. It can also be used for vinyl character alignment on a 30-inch plotter when the job is much longer. The pounce wheel is designed to pounce (perforate) holes either perfectly aligned or off-center to the direction of travel. Select CUT in VIEW/PLOT/CUT at the GRAPHIX ADVANTAGE when you desire pouncing.

CAUTION: The pounce wheel may be used only in tangential knife mode. Pouncing in swivel knife mode will tear the paper.

ALIGNED HOLES

There are two keyway slots on the barrel of the pounce wheel holder. The standard keyway aligns the pounce wheel with the drum axis. Use this position to produce small holes in lightweight paper or for light dusting applications.

OFF-CENTER HOLES

The second keyway holds the tool at 11 degrees off-center to the direction of tool travel. Using the pounce wheel in the angled position causes the points to drag slightly as the wheel moves forward. This produces larger, slightly elongated holes suited for heavy or clay-coated paper and for bold dusting applications.

PLOTTER SPEED

In the straight (aligned) position, the pounce wheel works best at reduced plotter speeds. The angled (off-center) position produces distinctive holes at any plotting rate up to full speed. See the *GRAPHIX ADVANTAGE Reference* for more information on controlling the plotter speed.

POUNCE WHEEL HOLDER INSTALLATION

▶ ***To install the pounce wheel holder***

1. Select the pounce wheel holder from the tool rack attached to the rear cover.

2. A plastic lift washer is used to reduce friction between the tool and the lift fork of the carriage spindle during operation. There should be one installed on the pounce wheel holder. If not, slip a lift washer from the tool kit over the barrel and slide the washer to the top of the holder.

3. Hold the pounce wheel holder upright over the carriage spindle. Rotate the barrel until the desired keyway is oriented above the protruding key inside the carriage spindle. Lower the pounce wheel holder into the carriage spindle.

4. When the pounce wheel holder is in place, swing the tool force arm and snap it over the cap.

5. Check the pounce wheel position by looking under the carriage to make sure the wheel is oriented at the desired angle.

6. Pouncing generally requires higher tool force settings than drawing or cutting. To begin, set the tool force dial between 5 and 6. Adjust, if necessary, for paper thickness or desired hole size. Reduce plotter speed if pouncing small holes.

POUNCE WHEEL REPLACEMENT

One pounce wheel supplied is installed in the tool holder and a spare is included in the tool kit.

▶ ***To replace the pounce wheel***

1. Using the Allen wrench from the tool kit, remove the hex screw that serves as the wheel's axle.

2. Remove the old wheel. Position the new wheel in the holder.

3. Slide hex screw through holder and wheel (as an axle) and tighten.

Knife Holder and Blades

Gerber blades are extremely wear-resistant. In testing, Gerber cut over 10,000 one-inch letters using a single blade before testing was discontinued with the blade still cutting satisfactorily. Other blade manufacturers have unsuccessfully attempted to duplicate this cutting precision and durability. Gerber warrants cutting quality of the HS750*plus* only when Gerber blades are used.

KNIFE HOLDER INSTALLATION

The HS750*plus* comes with two different knife holders:

- **Swivel Knife** - Used to cut all but the thickest materials (such as sandblast stencil) at high speed.
- **Tangential Knife** - For all materials, including thick materials such as sandblast stencil.

▶ ***To install a knife holder***

1. Load vinyl or other material.
2. Select the knife holder that matches the knife mode you want to use.
3. A plastic lift washer is used to reduce friction between the tool holder and the lift fork of the carriage spindle during operation. There should be one installed on the knife holder. If not, slip a lift washer from the tool kit over the barrel and slide the washer to the top of the holder.

   CAUTION: Carefully install the knife holder, taking care not to strike the tip of the blade against the bore of the carriage spindle.

4. A slot, or keyway, in the barrel of the knife holder ensures proper orientation. If necessary, rotate the knife holder. until it drops completely into the carriage spindle.
5. When the knife holder is in place, swing the tool force arm and snap it into place over the tool cap.

6. If using the vinyl included with the plotter, start with a tool force setting of .5. Approximate tool force settings for cutting other vinyl materials are listed in the following chart.

TOOL FORCE SETTINGS

You will need to adjust the tool force setting on the plotter for various reasons. Primary considerations for changing the settings include the knife mode chosen and the kind of material used. Refer to the *HS750^{plus} Tool Force Settings Reference Card* for guidelines.

Additional reasons for determining if adjustment of the tool force setting is required are as follows:

- The weed should peel off easily.
- There should be no cuts through the backing material.
- New blades should receive the lowest values.

Suggested Tool Force Settings

Material	Recommended Starting Tool Force	Tangential Knife Blade	HS Plotter Swivel Knife
Controltac 180 Delux 210 Gold/Silver Dusted Crystal 210 Florescent 210 Scotchcal™ 220 Translucent 230	.05-1	30 °	HS-42°
Gerber Cal® Gerber IP Plus Gerber Mask™ I & II Heat Transfer Flock Hot Split Plastisol Metalized Polyester	1	30°	HS-42°
Screen Print Static Cling	.05	30°	HS-42°
Sandblast 521 Sandblast 522	4-5	45° or 60°	
Lightweight or coated paper-pouncing	5-6 *(pounce wheel)*		
Plotting Paper - drawing	.5-1 *(pen)*		

SHOE SETTING

The tangential and swivel knife blade holders both have adjustment shoes. The shoe acts as a cutting depth stop to prevent the knife blade from cutting through the vinyl backing material. This dramatically reduces the plotter's sensitivity to tool force selection.

When shipped to you, the shoe setting is appropriate for use with most Gerber vinyl materials. (The assembly, however, is not intended for use with rubber stencil material.)

Before cutting any jobs, select the appropriate tool (tangential or swivel) and make sure the tool force is set according to the *Suggested Tool Force Settings Chart*. Then cut and weed a test sign; check the shoe setting and make any adjustment required. The weed should peel off easily but the knife should not cut through the backing material.

Cutting quality is dependent more on the amount of knife blade exposed than on the tool force setting.

- If the tool force setting is correct but the weed does not peel up easily, or letters peel up with the weed, adjust the shoe to expose more of the blade rather than increasing the tool force setting.
- If the tool force setting is correct but the knife cuts through the backing, adjust the shoe to expose less of the blade rather than decreasing the tool force setting.

BLADE WEAR

The knife blade will dull slightly after cutting thousands of characters. Blade wear is always a gradual change. Adjusting tool force will extend blade life for a period of many days and even weeks of use.

BLADE DAMAGE

CAUTION: Carbide blades are brittle and can be ruined by the slightest chip of the cutting tip.

Because they are ground to a controlled length, the blades cannot be resharpened. A sudden decline in cutting quality indicates that the knife blade is chipped. Replace and discard any chipped blade.

Blades are available in 30°, 45°, and 60° angles. The 45° and 60° blades are designed for cutting thick materials; the 30° blade is designed for all other materials.

BLADE REPLACEMENT

Extra blades and special angled blades for sandblast vinyls are available from your Gerber distributor. Included with the HS750*plus* are five carbide knife blades:

- one installed in the tangential knife holder
- two tangential knife spares
- one installed in the swivel knife holder
- one swivel knife spare

Replacement procedures for the tangential and swivel knife blades are different. Be sure to follow the appropriate procedure.

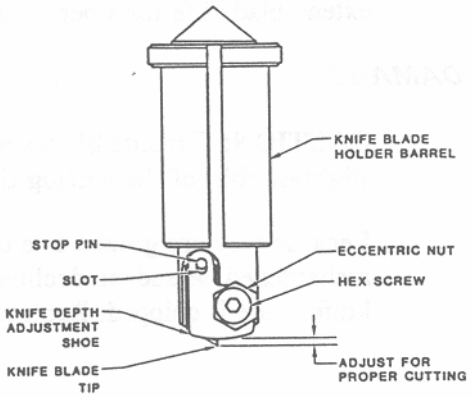
▶ *To replace the tangential knife blade*

WARNING: Blades are very sharp. Take care when handling the knife holder and blade.

CAUTION: Do not handle the blade with other tools. It is fragile and subject to breakage if mishandled.

1. Loosen the hex screw with the Allen wrench from the tool kit.

2. Carefully remove the old blade from the tool holder.



3. Insert the new blade between the tool holder and the knife depth adjustment shoe. Keep the point of the blade toward the center of the tool holder.
4. Gently seat the flat end of the blade against the pin stop with the blade point toward the center of the tool. Retighten the hex screw.

▶ *To change the shoe setting*

CAUTION: Do not use a micrometer or calipers to measure the vertical distance. The knife blade tip is very delicate and can easily be broken by the use of such instruments.

CAUTION: Knife tool blades are brittle. Do not strike the tip against the carriage spindle during installation.

1. Loosen the hex screw with the Allen wrench, but only enough to allow you to turn the eccentric nut.

2. While turning the nut, observe the shoe as it pivots to cover more or less of the knife tip. The shoe setting must be adjusted by eye.

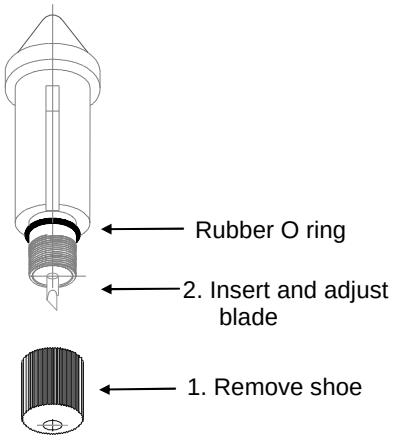
3. Change the setting only a little bit at a time between test cuts so that adjustments are made in a continuous direction, rather than by rotating the nut alternately back and forth.

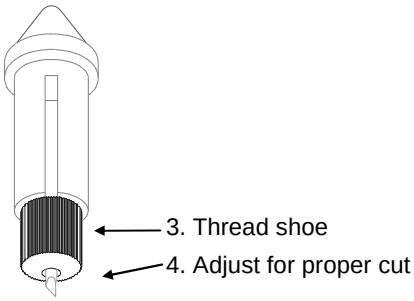
▶ *To replace and adjust the swivel knife blade*

WARNING: Blades are very sharp. Take care when handling the knife holder and blade.

CAUTION: Do not handle the blade with other tools. It is fragile and subject to breakage if mishandled.

1. Remove the plastic adjustment shoe from the base of the tool holder by rotating it counterclockwise until it comes completely off the tool holder. Leave the rubber O ring in place.
2. With the shoe removed, care-fully remove the old blade by grasping it with needle nose pliers and pulling gently.
3. Install a new blade in the hole provided, pushing the blade in gently until completely seated.
4. Carefully thread the shoe onto the knife holder, turning it clockwise until it is fully seated. This will fully expose the knife blade.
5. Rotate the shoe counterclockwise until approximately .005 inches (about the thickness of two sheets of paper) of the knife is showing.





OPERATION

Travel Limits

Each time that you turn on the HS750*plus*, the carriage moves to the keypad end of the plotter and touches the bumper. This tells the controller the plotters' travel limits. The carriage backs away from the bail arms to allow you to open the bail arms for material loading.

The HS750*plus* will not plot or slew beyond the travel limits, nor can it "crash" or lose position. Instead, the "clipping" feature allows a job exceeding the plotter's limits to be truncated. Any portion of the job which does not fit on the material is not plotted.

A "clipped" job is indicated by RUN CONT and RUN SINGLE lights on and a three-second beep. Lights are returned to normal state when a key is pressed.

Power Up

When the HS750*plus* is turned on, the following sequence occurs:

1. The light labeled POWER comes on. A short beep sounds, and the lights over RUN CONT, RUN SINGLE, and SWIVEL KNIFE blink on, then off.

2. As the HS750*plus* performs self-check tests, the lights over the RUN CONT, RUN SINGLE, and SWIVEL KNIFE keys flash twice, and two additional beeps sound.

3. When the self-check tests are completed, the lights blink and the beep sounds three times.

4. The plotter goes off-line in tangential knife mode. Only the Power light remains on. This is the initial setting at power-up.

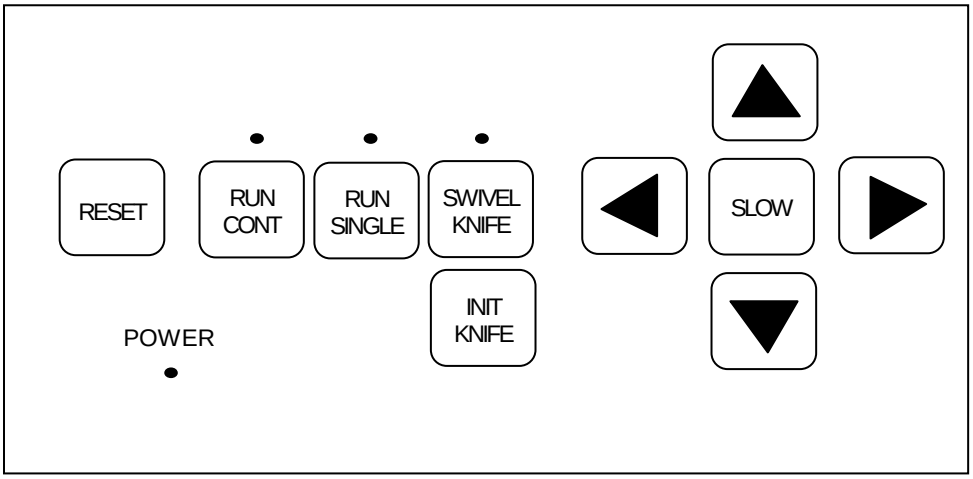
5. The HS750*plus* "homes" the carriage toward the keypad end of the machine. (The HS750*plus* home position is at the keypad

end of the plotter and the adjustable sprockets are at the opposite end.)

Front Panel

The HS750*plus* front panel keys shown below are used to perform all of the following operations:

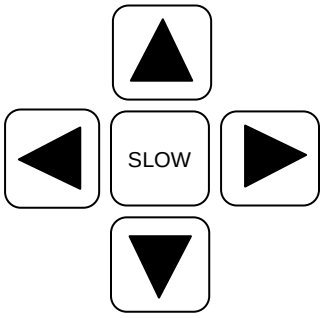
- Position the carriage and material.
- Put the plotter on-line for drawing, cutting, and pouncing.
- Select single or continuous job processing.
- Select knife mode.
- Initialize knife tool.
- Access diagnostic modes, as needed. See the “Special Diagnostics” and “Error Conditions” sections for more information.



A further explanation of key functions and several test exercises follow.

Slew Keys

Slew keys are the four keys surrounding the SLOW key.



Press the left and right slew keys to unroll material before plotting, to position the tool for plotting, to position the carriage and material between jobs, and to rotate the drum and feed material through the plotter or back toward the roll holder.

Press the up or down slew keys to move the carriage between the rear and the front of the plotter.

The slew and SLOW keys do not function during the following:

- while a job is plotting
- during an error condition
- if a Run light is on, even if the plotter is idle.

SLOW

Use the **SLOW** key to access slow slew mode. Slow slew mode permits you to move the drum or carriage one step at a time or continuously at a very slow speed.

▶ ***To use slow slew***

1. To select slow slew mode, press the **SLOW** key. You will hear a single beep indicating the plotter is in slow slew mode.

2. When you press a slew key, the drum or carriage will move at a very slow speed.

Fast slew

For faster slewing, hold down the left or right slew keys for more than 2 seconds and slewing begins moving at a higher speed. The plotter will beep as the plotter speeds up. The faster speed allows material to be moved through the plotter at a much faster rate.

▶ ***To use fast slew***

1. To return to normal mode, press the **SLOW** key again. You will hear two beeps indicating the plotter is in normal slew mode.

2. Hold down a left or right slew key for more than 2 seconds, and the drum will ramp up to a high speed as long as you hold the key down.

Function Keys

The function keys are RESET, INIT KNIFE, SWIVEL KNIFE, RUN CONT, and RUN SINGLE.

SWIVEL KNIFE

CAUTION: Be sure that the knife you use matches the mode you select.

The **SWIVEL KNIFE** key controls the selection of swivel knife mode or tangential knife mode. The swivel knife is for faster speeds than the tangential knife.

Note: When doing demanding jobs where high accuracy is desired (such as Repeats, EDGE jobs), Gerber recommends that you use tangential knife mode rather than swivel knife mode.

- When swivel knife mode is selected, the light over the **SWIVEL KNIFE** key is on.
- If tangential knife mode is desired, **the light must be off**. Press **SWIVEL KNIFE** to turn the light on and off.
- When cutting regular vinyl in tangential knife mode, try a tool force setting of .5. When cutting regular vinyl in swivel knife mode, set the tool force setting at .5 (too much pressure will cut through the material).
- Heavier material (such as reflective vinyl) requires increased tool force settings, no matter what mode. For more information on approximate tool force settings, refer to the *HS750^{plus} Tool Force Settings Reference Card* at the back of this manual.
- The plotter will not allow you to change knife mode in the midst of a job. You must take the plotter off-line to switch modes and *be between jobs*. If you attempt to change modes and are unable to do so, press RESET and continue to switch knife modes.

INIT KNIFE

The **INIT KNIFE** key is for initializing the swivel knife so that it is in a known position (blade faces 0°). We recommend that you initialize the swivel knife before every job, if you have changed material, or after the tool has been loaded. It is not necessary to initialize the tangential knife.

- Load material, the swivel knife, and select the swivel knife mode.
- Press the **INIT KNIFE** key.

CAUTION: Pressing the INIT KNIFE key when in swivel knife mode causes the knife to be lowered into the vinyl and a short line to be cut. It is important to have material in the plotter so that the knife does not cut the drum surface.

RUN SINGLE

Use **RUN SINGLE** to plot a single job. This plot mode allows the operator to reposition material between jobs and/or to pen plot using paper before cutting vinyl. **RUN SINGLE** may be used with either swivel knife mode or tangential knife mode.

Plot

1. Press **SWIVEL KNIFE** to select a knife mode. (For swivel knife mode, the light over the **SWIVEL KNIFE** key is on. For tangential knife mode, the light is off.)

2. Press **RUN SINGLE**. The light over the **RUN SINGLE** key comes on and the HS750*plus* plots a single job. If other plot files are received from the GRAPHIX ADVANTAGE while the first job plots, then a waiting list (called *queue*) of these jobs is created in the GRAPHIX ADVANTAGE.

The HS750*plus* returns to the off-line status after the job plots. It remains in the knife mode selected.

The HS750*plus* waits for the operator to press the **RUN SINGLE** key again to plot the next job. If other jobs are lined up in the queue, the green lights above the two Run keys will flash.

Controlled Stop

Use **RUN SINGLE** (or **RUN CONT**) to pause plotting and check the current job.

1. During a job, press the Run key which is currently selected (lit). The HS750*plus* stops the plot at the next logical break in the program.

   Note: The slew keys may be pressed to maneuver the carriage or material. However, when the Run key is pressed again to exit the pause mode, the plotter will return the carriage and material to the point where the job was paused.

2. Press the same Run key to resume plotting at the exact same point.

Single Plot Exercise

1. Turn on the HS750*plus*. Load plotting paper, install the pen and pen holder, and set the tool force to .5.

2. Using the slew keys, position the carriage spindle approximately 1" from the front edge of the plotting paper. Also, be sure that there are several inches of paper extending past the carriage spindle and to the left of the plotter.

3. Send a plot file to the HS750*plus* plotter.

4. Press the **RUN SINGLE** key to plot the test exercise.

RUN CONT

Use **RUN CONT** to access the continuous plotting mode and maximize the plotter's productivity.

▶ *To plot in continuous mode*

1. Select either swivel or tangential knife mode by pressing the **SWIVEL KNIFE** key. When swivel knife mode is selected, the light above the **SWIVEL KNIFE** key is on.

2. Press **RUN CONT**. The light over the **RUN CONT** key comes on and the HS750*plus* plots one job after the other without waiting for user prompting between the jobs.

   The HS750*plus* creates a queue of jobs to be plotted. When one job finishes plotting, the next job in the queue begins immediately. When all jobs in the queue are plotted, the HS750*plus* remains on-line until the operator presses either Run key or the **RESET** key to return to off-line status.

Controlled Stop

Use **RUN CONT** (or **RUN SINGLE**) to stop plotting and check the current job.

▶ ***To stop a continuous mode plot***

1. Press the active Run key. The HS750*plus* stops the plot at the next logical break in the program.

   Note: The slew keys may be pressed to maneuver the carriage or material. However, when the Run key is pressed again to exit the pause mode, the plotter will return the carriage and material to the point where the job was paused.

2. Press either Run key to resume plotting at the exact same point.

Continuous Plot Exercise

1. Turn on the HS750*plus*. Load plotting paper, install the pen holder, and set the tool force to .5.

2. Using the slew keys, position the carriage spindle approximately 1" from the front edge of the plotting paper. Also, be sure that there are several inches of paper extending past the carriage spindle and to the left of the plotter.

3. Prepare two plot files. In the Plot Program, choose a left Start Position and a right End Position for both plots before sending them to the plotter.

   Note: If both plot files have a left Start and left End Position, they may plot on top of each other.

   Note: Entering an X,Y pre-position in the Plot Program is another way to be sure that plots done in the **RUN CONT** *mode will not plot on top of each other. (See* ***GRAPHIX ADVANTAGE Reference****.)*

4. Press the **RUN CONT** key. Both jobs will plot without going off-line between them.

RESET

Use the **RESET** key to stop plotter operation in case of emergency, to clear error signals, and to access Special Diagnostics.

▶ *To cause an emergency stop*

Press the **RESET** key while a job is plotting. The following sequence occurs:

1. The HS750*plus* operation stops immediately.
2. Only the current job is cleared; all other jobs in the queue remain intact.
3. The HS750*plus* returns to off-line status, as at power-up.

▶ *To clear an error signal*

Press the **RESET** key to clear an error signal (rapid beeping and flashing) after a power-up or plotting failure. (See the “Error Conditions” section.)

▶ *To access diagnostics*

Hold the **RESET** key at power-up to access additional diagnostics. (See the “Special Diagnostics” section.)

SPECIAL DIAGNOSTICS

In addition to the self-check tests that are part of the power-up sequence, the HS750*plus* plotter can perform other special diagnostics. The functions of these diagnostics and the steps to access them are outlined below.

▶ ***To access special diagnostic***

1. Hold down the **RESET** key while turning the power switch on.

2. After the first beep, release the **RESET** key. The power-up self test will complete normally. Then the lights over **RUN CONT** and **RUN SINGLE** keys will alternate. These alternating lights mean that **RESET** was held at power-up and that a special diagnostic can now be performed.

3. Access one of the special diagnostics described next by pressing the slew key noted in the description.

   Note: Only one special diagnostic can be accessed at each power-up sequence. To access another diagnostic, turn the plotter power off and then on again (as described above).

Diagnostic Options

The following diagnostics are available:

- **RS-232 Loop Back**– Press the up arrow key to access. Used to check internal workings of the communications hardware. Beeps indicate a communications error. (A loop-back connector is needed for this test; see your Gerber distributor.)

- **Wagon Wheel Test Plot** – Press the left arrow key to access. Used to check X, Y, Z axes in plot mode and to verify operation after adjustments are made.

- **Square/Circle Test Plot** – Press the **SLOW** key. Used to check X, Y, Z, and theta axes in cut mode and to verify operation after adjustments are made.

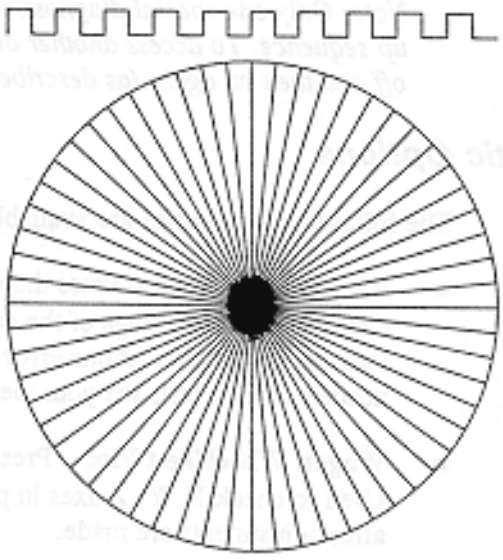
- **X08 Cut Test** – Press the down arrow key to access. Used to test cut quality.

Note: If the plotter consistently fails a special diagnostic, contact Gerber Field Service Department at 800-828-5406, or fax at 203-645-2448.

WAGON WHEEL TEST PLOT

▶ *To plot the Wagon Wheel Test Plot*

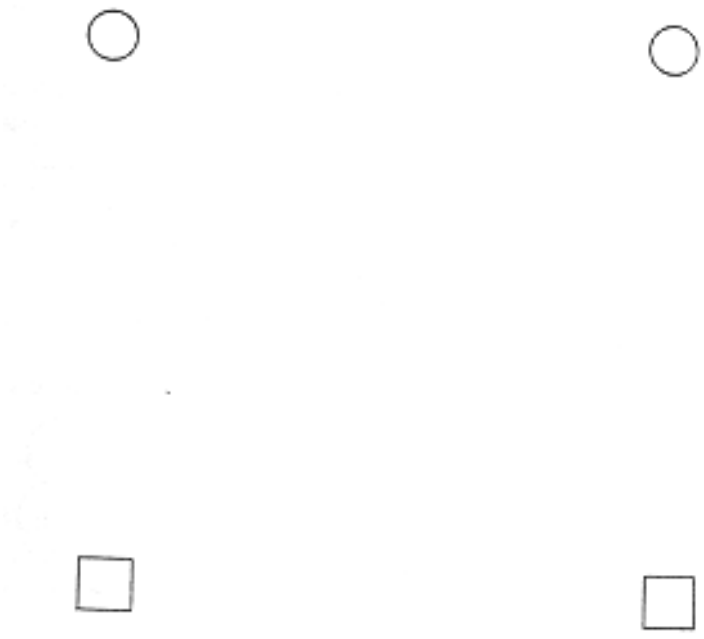
1. Load plotting paper and install the pen holder.
2. Press left arrow key to access diagnostic.
3. Press **RUN SINGLE** to plot once or **RUN CONT** to plot continuously.
4. Compare the test plot to the illustration below. If they do not look the same, call Gerber Field Service.



SQUARE/CIRCLE TEST PLOT

▶ *To plot the Square/Circle Test Plot*

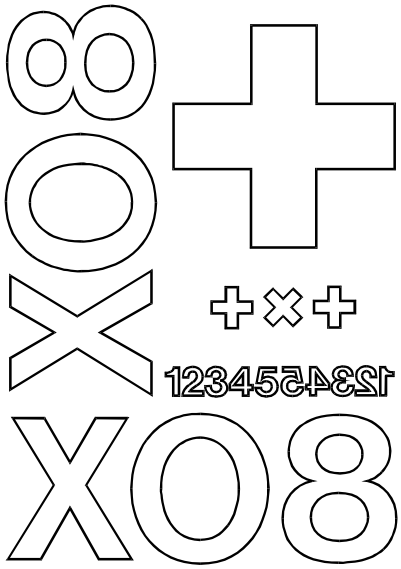
1. Load vinyl and install the knife holder (tangential or swivel).
2. Press **SLOW** key to access diagnostic.
3. Select swivel or tangential knife mode according to the knife holder loaded.
4. Press **RUN SINGLE** to plot once or **RUN CONT** to plot continuously.
5. Compare the test plot to the illustration below. If they do not look the same, call Gerber Field Service.



X08 CUT TEST

▶ *To plot the X08 Cut Test*

1. To access the X08 cut test plot, hold the RESET key while powering up.
2. Load vinyl and install the knife holder.
3. Press the down arrow to access diagnostic.
4. Press RUN SINGLE to plot once or RUN CONT to plot continuously.
5. Compare the test plot to the illustration below. If the plot is different, contact Gerber Field Service.



ERROR CONDITIONS

The HS750*plus* is programmed to detect certain mechanical/electrical error conditions at power-up or during operation. When an error condition occurs, the plotter may turn off power to the servo motors. There will be continuous beeping and flashing lights.

Error Signals

There are three kinds of error signals:

- **3-second steady tone, lights on (running job)**

  The plotter continues but the job is clipped (parts are not plotted). This happens when the job has exceeded the boundaries of the plotter. There is no recovery and the job must be sent again with a starting position that allows the job to fit within the plotting area.

- **3-second steady tone, lights on (no running job, slewing only, part of plotter jarred)**

  One or more axes are shut down because of excessive lag. For recovery, press the RESET button to turn the axes on again. The Z, theta, and Y axes will rehome their position. If a job was pending, it must be resent.

- **Continuous beep and flashing lights**

  With this warning a procedure has been established to determine which error condition may have occurred. See the next page for determining error numbers.

DETERMINING ERROR NUMBERS

The number of beeps and blinking lights signify the type of error that has occurred. Error conditions are assigned a 2-digit number. The number is displayed by flashing lights and beeping, one digit at a time. The **RUN CONT** key displays the first (tens) digit; the **RUN SINGLE** key displays the second (ones) digit. For example, an error number of 25 is displayed by pressing **RUN CONT,** which flashes lights 2 times, and pressing **RUN SINGLE ,** which flashes 5 times. Follow the procedure below to find the number of the error.

1. Press the **RESET** key to clear the error signal (continuous beeping).
2. Press the **RUN CONT** key to hear the number of beeps which represent the “tens” error code number. (No beeps means that the error message number falls between one and nine). The Run lights flash the same number of times as the “tens” error number. Press the **RUN CONT** key again to repeat the message, if needed.
3. Press the **RUN SINGLE** key to hear the number of beeps which represent the “ones” error code number. No beeps means that there is no “ones” error number (a zero). The Run lights flash the same number of times as the “ones” error number. Press the **RUN SINGLE** key again to repeat the message, if needed.
4. Press the **RESET** key to clear the error display mode and return to the initial off-line status.

The following examples may help you to understand how to determine your error number:

- If the **RUN CONT** key beeps twice and the **RUN SINGLE** key beeps once, the error message code is 21.
- If the **RUN CONT** key beeps once and the **RUN SINGLE** key beeps twice, the error message code is 12.
- If the **RUN CONT** key beeps once and the **RUN SINGLE** key does not beep, the error message code is 10.
- If the **RUN CONT** key does not beep and the **RUN SINGLE** key beeps eight times, the error message code is 8.

ERROR CODES

The error code numbers and suggested operator responses are listed below as well as on the *HS750plus Reference Card*.

Error Number	Error Description	Operator Response
1	Program checksum failure	Try power up again.
2	RAM memory failure	Try power up again.
3	Power relay closed	Call Gerber Field Service.
4	Power relay open	Call Gerber Field Service.
5	Peripheral control chip error	Call Gerber Field Service.
6	Heartbeat error	Call Gerber Field Service.
7	Motor encoder failure	Call Gerber Field Service.
8	X motor encoder failure	Call Gerber Field Service.
9	Y motor encoder failure	Call Gerber Field Service.
10	Z motor encoder failure	Call Gerber Field Service.
11	Theta motor encoder failure	Call Gerber Field Service.
12	Power relay off	Try power up again or call Gerber Field Service.
13	X axis error	Call Gerber Field Service.

Call Gerber Field Service Department at 800-828-5406 (in the USA), or fax at 203-645-2448.

Error Number	Error Description	Operator Response
14	Y axis error	Call Gerber Field Service.
15	Z axis error	Call Gerber Field Service.
16	Theta axis error	Call Gerber Field Service.
17	RS-232 test failure	Call Gerber Field Service.
18	Illegal plot data command	Check plot data; resubmit plot.
19	Plotter has overheated	Allow plotter to cool down or move it to a cooler area. Call Gerber Field Service.
20	Illegal interrupt error	Try power up again. Call Gerber Field Service.
21	Unknown interrupt error	Try power up again. Call Gerber Field Service.
22	Theta home error	Try power up again.
23	Z home error	Try power up again.
24	Y home error	Try power up again.
25	Data overflow (only for HPGL data)	Check communication parameters (baud rate, etc.)
26,27,28	Problems with baud rate, data bits, parity bits, stop bits	Call Gerber Field Service.

MAINTENANCE

This section includes instructions for routine cleaning and lubrication to keep the HS750*plus* plotter in good working order, as well as instructions for fuse replacement.

Cleaning/Lubrication

Routine cleaning and lubrication should be done monthly or after every 160 hours of use, whichever occurs first.

For cleaning , use isopropyl alcohol to clean dirty parts. *When using isopropyl alcohol, lubricate the parts immediately to prevent corrosion*.

Use a light oil (such as 3-IN-ONE®) for all lubrication, except as noted.

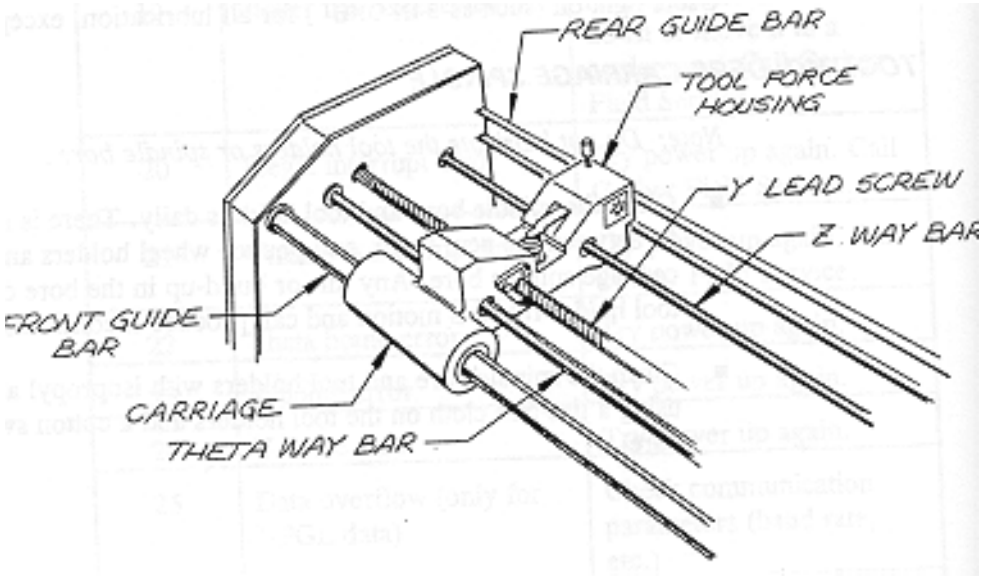
TOOL HOLDERS CARRIAGE SPINDLE

Note: Do not lubricate the tool holders or spindle bore.

- Clean the spindle bore and tool holders daily. There is a very close fit between the pen, knife, and pounce wheel holders and the carriage spindle bore. Any dirt or build-up in the bore or on the tool holder restricts motion and can produce inconsistent results.
- Clean the spindle bore and tool holders with isopropyl alcohol using a lint-free cloth on the tool holders and a cotton swab in the bore.

Z WAY BAR/Y LEAD SCREW/THETA WAY BAR/FRONT GUIDE BAR

- Use a lint-free cloth to wipe any dust or debris from the Z way bar, the Y lead screw, the theta way bar, and the front guide bar. Move the carriage to gain access to the entire length of these shafts.
- Look for any vinyl pieces adhering to these parts. Use isopropyl alcohol to clean excessively dirty parts.
- Lubricate the Z way bar, the theta way bar, and the front guide bar immediately after cleaning to prevent corrosion. Apply a light oil (such as 3-IN-ONE) with a lint-free cloth.
- Use a small amount of silicon spray on the Y lead screw by spraying the silicon on a lint-free cloth and wiping the Y lead screw. *Do not spray directly on the Y lead screw*.

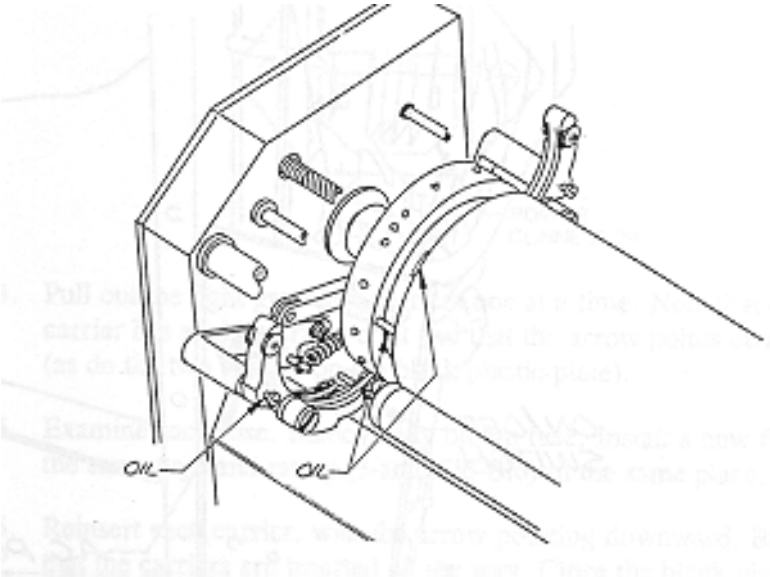


CARRIAGE/BALL BUSHING

1. Use a lint-free cloth and isopropyl alcohol to clean any dust or debris from the front guide bar, Z way bar, theta way bar, and rear guide bar. Rotate the Z way and rear guide bar (the front guide bar does not turn) and move the carriage spindle for access to the entire length of these shafts.

2. The Z way bar, theta way bar, and front and rear guide bars should be given a light coat of oil. This is best done by applying with a lint-free cloth.

3. Place one or two drops of oil on each side of the ball bushing and in the oil hole (as indicated).



SPROCKETS AND BAIL ARMS

1. Inspect the teeth of the drum sprockets for adhesive buildup from the use of vinyl films.

2. Use a small stiff brush (such as a toothbrush) dipped in isopropyl alcohol to clean the sprockets.

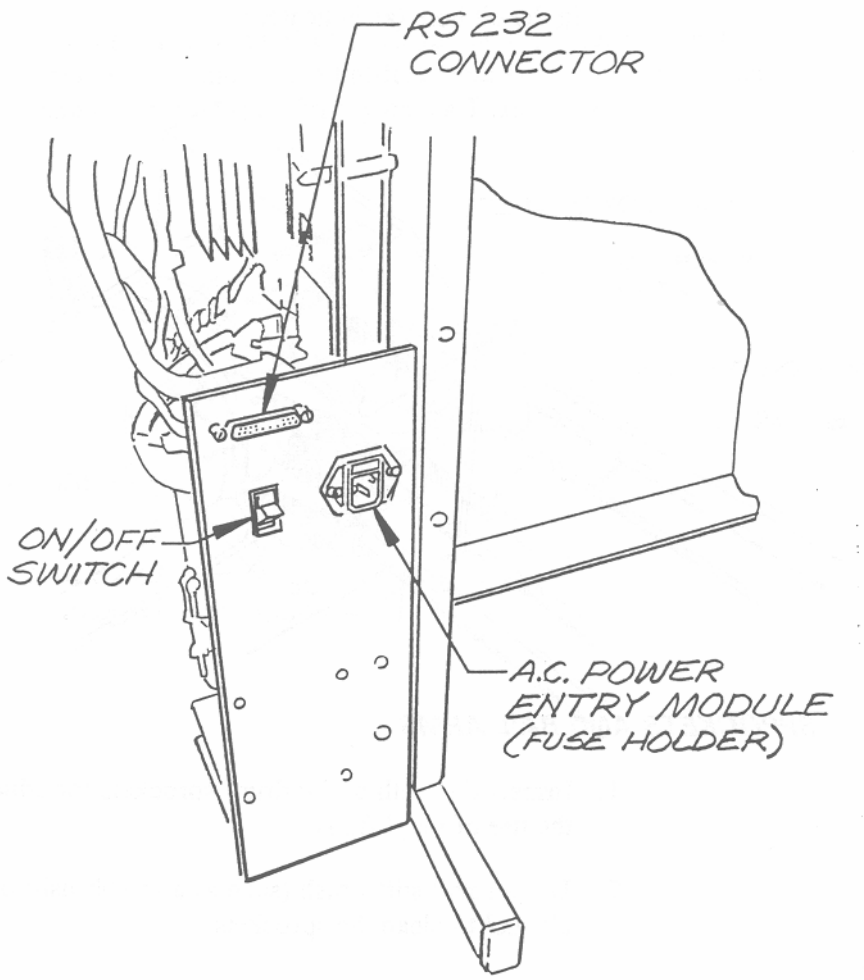
3. After using isopropyl alcohol to clean them, immediately dry the sprockets and drum with a lint-free cloth.

4. Place one drop of oil in each pin of the sliding sprocket.

5. Slide the sprocket back and forth to work the oil into the bushing. Oil the bail arm pins. *Do not oil excessively.*

Fuse Replacement

The fuse holder is located between the on/off switch and the power cord connector on the rear panel of the plotter.



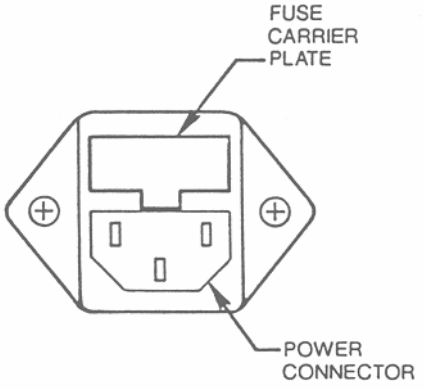
▶ *To replace the fuse*

WARNING: Turn off power at the plotter and the system and disconnect the power cord from the power supply.

1. Unscrew and remove the RS-232 cable from the rear panel of the HS750*plus*.

2. Remove the plotter power cord from the socket.

3. Find the small notch at the right edge of the black plastic plate on the rear panel. Insert a flat-tip screwdriver into the notch and flip the black plastic plate open.



z

4. Pull out the light gray fuse carriers one at a time. Note that each carrier has a white arrow on it and that the arrow points downward (as do the two arrows on the black plastic plate).

5. Examine each fuse. Remove any blown fuse. Install a new fuse of the same type and rating in the same place.

6. Reinsert each carrier, with the arrow pointing downward. Be sure that the carriers are inserted all the way. Close the black plastic plate firmly.

7. Reinstall the power cord and the cable connector. Turn the power on at the system and at the plotter.

PLOTTER ADJUSTMENTS

This section contains a troubleshooting guide to help identify possible error conditions according to the symptoms displayed and the recommended adjustment procedures.

It also contains a brief description of plotter adjustment problems that should be handled by contacting Gerber Field Service (800-828-5406).

Note: Gerber warranties do not cover unauthorized repair. Some service procedures require delicate adjustment of plotter parts. If damage to your HS750^{plus} plotter results from improper unauthorized service, repair will NOT be covered by any Gerber warranty.

Troubleshooting Guide

This chart of symptoms is designed to help identify the possible problem and the probable adjustment procedure.

CAUTION: Turn off the GRAPHIX ADVANTAGE and the HS750plus plotter before checking connections or attempting to make any adjustments, unless otherwise directed.

Symptom	Recommended Procedure
No power	Check power cable and plugs, check ON/OFF switches, and check the fuse.
Poor performance	Do routine cleaning and lubrication.
Plotter error	Press RESET button. Verify and resend the job.
Inconsistent tool/ material contact	Clean spindle bore and tool holder. Change knife blade. Check for proper Z home. Perform Z adjustment for tool height.
Jagged or serrated cutting edges	Replace the knife. Check for proper theta home. If improper, perform theta adjustment.

Replacing Boards

If you need to change a board because of repair or update, refer to the diagram on the next page when you talk to Gerber Field Service. Follow the procedures to access the boards.

▶ ***To access the logic and control boards***

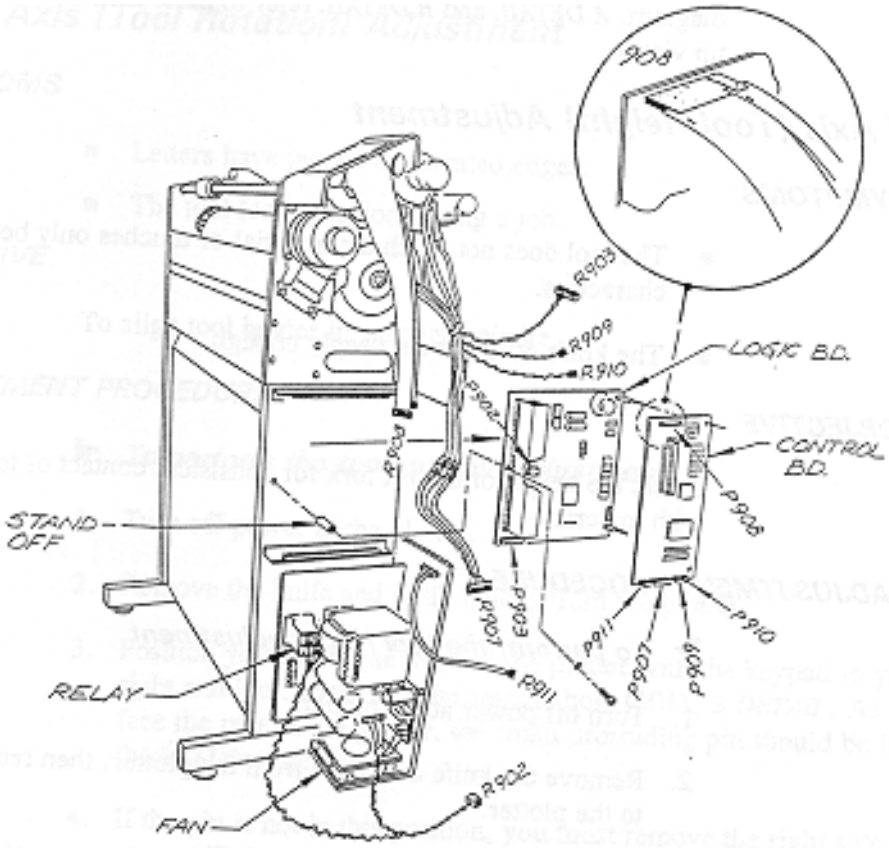
CAUTION: Do not attempt to access the logic and control boards without first contacting Gerber Field Service at 800-828-5406 for assistance.

1. Turn off power at the plotter.
2. Remove all screws from the right lower cover and pull the panel off.

▶ ***To remove the logic and control boards***

CAUTION: Static electricity is a serious threat to modern integrated circuits. Before reaching into the interior of the plotter or handling any components, touch any bare metal of the plotter surface. This discharges any potentially harmful static charge being carried.

1. Remove the center hold-down screw on the logic board.
2. Disconnect all connections: R902, R903, R904, R905, R906, and R907.



3.

Slide out the logic and control boards (all one piece) and place on a **static free, non-conductive surface**.

4. If the boards need to be separated, locate the white tabs in the corners of the logic board (5). Push the tabs back and loosen the control board.

5. Gently rock the control board back and forth until it easily lifts off the bottom board.

CAUTION: Do not overflex the board or you may damage it.

Plotter Adjustments

When making plotter adjustments, refer to the diagram on page 71 in the Appendix and the *HS750plus Plotter Parts List* for part identifica-tion. Numbers in parentheses in the text refer to the numbers in the diagram. *A DETAIL* and *B DETAIL* refer to parts identified in the close-up views.

Z Axis (Tool Height) Adjustment

SYMPTOMS

- The tool does not touch the material or touches only between characters.
- The knife does not cut deeply enough.

OBJECTIVE

To set the height of the lift fork for consistent contact of tool holder with material.

ADJUSJTMENT PROCEDURE

▶ ***To perform the tool height adjustment***

1. Turn off power at the plotter.

2. Remove the knife and vinyl from the plotter, then return the knife to the plotter.

3. Remove carriage cover (110) by removing screws (111).

4. Locate the cam shaft (19) and rotate it by hand until the lifting fork (123, *B DETAIL*) is at its lowest position. There should be a small gap between the top of the fork and the bottom lip of the tool holder.

5. Place a double thickness of vinyl horizontally between the fork and the lip of the tool holder.

6. In *B DETAIL*, locate the lifting fork adjustment screw (117) behind the lifting fork (123).

7. Turn the adjustment screw (117) as needed to raise or lower the fork so that the gap between the lifting fork (123) and the lip of the tool holder is about the double thickness of a piece of vinyl.

8. When adjusted, replace the cover, load vinyl, and run a test.

Theta Axis (Tool Rotation) Adjustment

SYMPTOMS

- Letters have jagged or serrated edges.
- The tool loses position during a job.

OBJECTIVE

To align tool holder in carriage spindle.

ADJUSTMENT PROCEDURE

▶ ***To perform the tool rotation adjustment***

1. Turn off power at the plotter.

2. Remove the knife and knife holder from the plotter.

3. Position yourself at the front of the plotter with the keypad to your right and look down into the spindle hole (101), *B DETAIL*. As you face the rear of the plotter, the small protruding pin should be in the 9:00 position.

4. If the pin is not in this position, you must remove the right side cover (47, large diagram) of the plotter. Remove the three

Phillips screws from the plotter right side plate, then slide the cover straight off to the right.

5. Remove the keypad assembly (55) by taking out the two hex lead screws from the right side plate.

6. On the large diagram, locate the theta motor (84) on the far right closest to the front top of the plotter.

7. Find the pinion gear at the center of the motor, which meshes with the theta gear and opto-disk assembly (49) on the rear way shaft (45). Now locate the opto-sensing disk next to the drive gear (49). It is a flat black disk about 1" in diameter.

8. Check to be sure that the disk is clean and centered between the opto-sensors. These sensors are small black cubes protruding from a small PC board (68).

   - If the disk is off-center, you must center the disk. To do so, loosen the Allen set screw on the silver clamp next to the disk (48). This allows the disk to be slid forward or backward. When the disk is centered, tighten the Allen set screw.
   - If the disk is dirty, shut off the plotter and the system. Clean the disk with isopropyl alcohol using a lint free cloth or a pipe cleaner, making sure all sides of the disk and opto-sensors are clean.

9. Turn the rear way shaft (45) by hand until the slot in the disk faces straight up.

   CAUTION: The keypad needs to be insulated from any metal contact or it may short out.

10. Turn the machine on and watch the disk (49). It should rotate and stop between the opto-sensors (located on 68)). If this does not occur, call Gerber Field Service. Otherwise, continue with the next step.

11. If the disk is clean and centered and homed correctly, loosen the Allen set screw (48) but DO NOT MOVE THE DISK.

12. Turn the rear way shaft (45) until the locking pin (inside 101) is moved to the 9:00 position.

13. Tighten the screw, being careful not to move any of the parts.

14. To test, turn off the plotter and rotate the rear way shaft (45) a quarter turn. Turn on the machine. The pin should home to 9:00.

15. Repeat the above procedures if you were unsuccessful.

X Axis Backlash Adjustment

SYMPTOMS

Text cut in Axis Swap mode has closure problems.

OBJECTIVE

To adjust the mesh of the X axis gear and the X motor pinion to produce good letter quality in Axis Swap mode.

ADJUSTMENT PROCEDURE

Please call Gerber Field Service at 800-828-5406 for assistance. You may find it helpful to refer to the plotter diagram in the Appendix while performing the adjustment procedure.

Y Axis Backlash Adjustment

SYMPTOMS

Text cut in Normal mode has closure problems.

OBJECTIVE

To adjust the mesh of the jackshaft gear with the Y motor pinion to produce good letter quality in Normal mode.

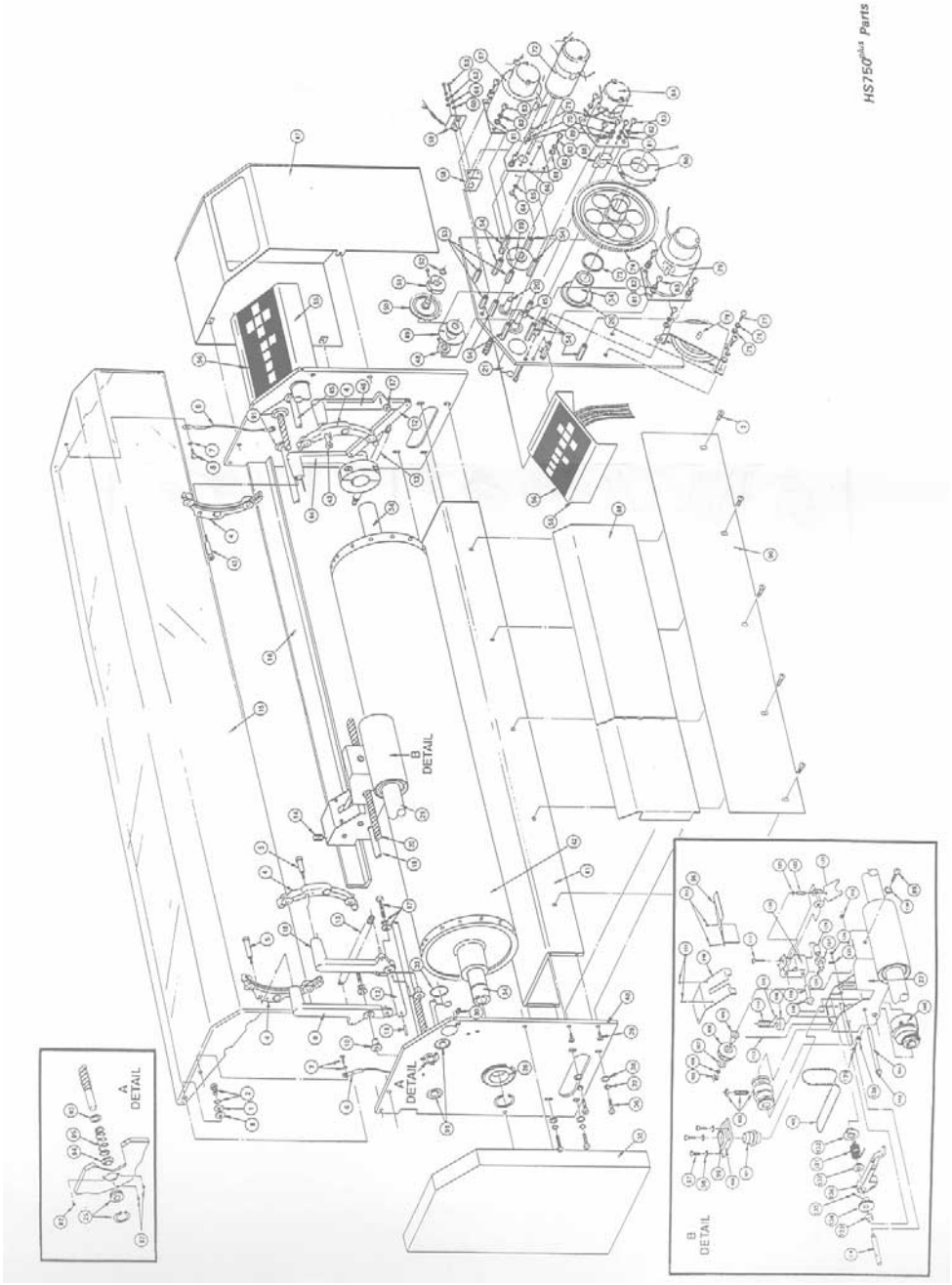
ADJUSTMENT PROCEDURE

Please call Gerber Field Service at 800-828-5406. You may find it helpful to refer to the plotter diagram in the Appendix while performing the adjustment procedure.

APPENDIX

This appendix contains diagrams of the interior and parts of the HS750*plus* plotter. Gerber Field Service may refer you to this diagram to help you identify parts when you need to make plotter adjustments. The names of the parts are listed in the "HS750*plus* Plotter Parts List" following the diagram. The numbers in the table refer to the numbered parts in the diagram.

HS750plus Parts List



HS750plus Parts

Enlarged A Detail and B Detail

HS750^{plus} Plotter Parts List

Number	Part Description
1	Washer Flat 008 (2 Req'd)
2	Screw 8-32 x .625 with Lockwasher (2 Req'd)
3	Screw Stripper 6-32 x .375 (10 Req'd)
4	Paper Bail Assy. (4 Req'd)
5	Shoulder Screw 8-32 x .187 x .625 (2 Req'd)
6	Strap, Cover Stop (2 Req'd)
7	Screw 6-32 x .25 with Lockwasher (4 Req'd)
8	Washer Nylon Spacer (4 Req'd)
9	Long Bail Arm Assy. - Right
10	Bail Arm Pivot (4 Req'd)
11	Pin Dowel .375 (4 Req'd)
12	Connecting Link (2 Req'd)
13	Spring 4.5 x .375 x .045 (2 Req'd)
14	Knob
15	Machine Cover
16	Long Bail Arm Assy. - Left
17	Bail Arm Screw 8-32 x .75 (4 Req'd)
	Flat Washer 008 (4 Req'd)
	Lock Washer 008 (4 Req'd)
18	Right Angle Way Assy.
19	Lifter Shaft Assy.
20	Leadscrew - Y Axis
21	Roundway

HS750plus Plotter Parts List

25	Bearing - Y Axis Leadscrew
26	Bearing .984 x 1.85 x .472 (2 Req'd)
27	Carriage Sub-Assy.
30	Screw Set Cup LKG 8-32 x .375 (2 Req'd)
33	Seal O-Ring 1 x 1.25 x 1/8 (2 Req'd)
34	Drum Shaft
35	End Cover
36	Screw 10-32 x .75 Panhead (4 Req'd)
37	Washer Lock 010 (4 Req'd)
38	Washer Flat 010 (4 Req'd)
39	Screw 8-18 x .5 "AB" (4 Req'd)
40	Left Endplate
41	Base Machining
42	Drum Assy.
43	Shoulder Screw 8-32 x 1.0005 (2 Req'd)
44	Short Bail Arm Assy. - Left
45	Theta Axis Splined Shaft
46	Short Bail Arm Assy. - Right
47	Top Control Cover
48	Clamp - Theta Gear
49	Theta Gear & Sensor Disk
50	Leadscrew Gear & Hub
51	Clamp - Leadscrew
52	Retainer .375 EXT Crescent
53	Spacer 6-32 x .25 x 1 (3 Req'd)

HS750plus Plotter Parts List

54	Spacer 6-32 x .25 x 1.375 (11 Req'd)
55	Keypad Support
56	Keypad
57	Limit Switch & Sensor Assy.
58	Sensor Bracket
59	Wired Opto Board - Z Axis
60	Washer Flat Fiber (2 Req'd)
61	Washer Flat 002 (2 Req'd)
62	Washer Lock 002 (2 Req'd)
63	Screw 2-56 x .375 (2 Req'd)
64	Screw M3 x 5-6g x 8mm (4 Req'd)
65	Washer Lock 005 (4 Req'd)
66	Lifter Motor Plate
64	Screw M3 x 5-6g x 8mm (4 Req'd)
65	Washer Lock 005 (4 Req'd)
66	Lifter Motor Plate
67	Servo Motor Y Axis
68	Sensor Assy. - Theta
69	Washer Flat 004 Narrow (3 Req'd)
70	Washer Lock 004 (4 Req'd)
71	Screw 4-40 x .375 (4 Req'd)
72	Lifter Servo Motor Assy.
73	Spacer 1 ID x .165 W
74	Drum Gear & Hub Assy.
75	Washer Flat 006 (3 Req'd)

HS750plus Plotter Parts List

76	Washer Lock 006 (3 Req'd)
77	Screw 6-32 x .375 (3 Req'd)
78	Idle Gear & Bracket Assy.
79	Drum Motor Assy.
80	Drum Gear Clamp
81	Washer Flat 006 Narrow (3 or 4 Req'd)
82	Washer Lock 006 (3 or 4 Req'd)
83	Screw 6-32 x .375 (3 or 4 Req'd)
84	Theta Motor Assy.
88	Front Trim Assy.
89	Screw 6-32 x .75
90	Stripper (2 Req'd)
91	Bearing .375 x .875 x .281 (5 Req'd)
92	Screw 4-40 x .25 (3 Req'd)
93	Leadscrew Spring Stop
94	Leadscrew Bearing Support
95	Leadscrew Spring
96	Theta Gearing Cover
97	Screw 4-40 x .375 (3 Req'd)
98	Washer Flat 004 Narrow (3 Req'd)
99	Top Bearing Plate
100	Bearing .75 x 1 x .156 (2 Req'd)
101	Spindle - Pin Assy.
102	Timing Belt .1P x 118T x .203

HS750plus Plotter Parts List

103	Ball Bushing Housing Assy.
	Special Adjusting Screw w/ Nut
104	Tool Lifter Shaft
105	Nut 6-32 Hex
106	Washer Lock 006
107	Washer Flat 006
108	Front Idler Pulley Assy.
109	Front Idler Sleeve
110	Force Arm Cover
111	Screw 4-40 x .25 (4 Req'd)
112	Retainer (2 Req'd)
113	Worm Shaft
114	Worm Mod.
115	Screw 2-56 x .093 (2 Req'd)
116	Lower Worm Bushing
117	Screw 4-40 x .375
118	Pin Dowel
119	Retainer (2 Req'd)
120	Cam Follower Plate
121	Washer Flat 004 Narrow
122	Spring .022 x .18 x .312
123	Tool Lifter
124	Spacer
125	Pointer
126	Screw - Special 4-40 x .375

HS750plus Plotter Parts List

127	Bearing
128	Spacer
129	Torsion Shaft
130	Washer Flat 006
131	Torsion Spring
132	Spring Winder Plate
133	Spacer
134	Worm Gear Mod.
135	Screw 2-56 x .375
136	Tool Force Arm Assy.
137	Spring Guide Washer
138	Bearing (2 Req'd)
	Spacer (2 Req'd)
139	Top Screw
	Bottom Screw
	Nut
140	Lifter Cam Assy.

HS750plus Plotter Error Codes

Error Number	Error Description	Operator Response
1	Program checksum failure	Try power up again.
2	RAM memory failure	Try power up again.
3	Power relay closed	Call Gerber Field Service.
4	Power relay open	Call Gerber Field Service.
5	Peripheral control chip error	Call Gerber Field Service.
6	Heartbeat error	Call Gerber Field Service.
7	Motor encoder failure	Call Gerber Field Service.
8	X motor encoder failure	Call Gerber Field Service.
9	Y motor encoder failure	Call Gerber Field Service.
10	Z motor encoder failure	Call Gerber Field Service.
11	Theta motor encoder failure	Call Gerber Field Service.
12	Power relay off	Try power up again or call Gerber Field Service.
13	X axis error	Call Gerber Field Service.
14	Y axis error	Call Gerber Field Service.
15	Z axis error	Call Gerber Field Service.
16	Theta axis error	Call Gerber Field Service.
17	RS-232 test failure	Call Gerber Field Service.
18	Illegal plot data command	Check plot data; resubmit plot.
19	Plotter has overheated	Allow plotter to cool down or move it to a cooler area. Call Gerber Field Service.
20	Illegal interrupt error	Try power up again. Call Gerber Field Service.

HS750plus Plotter Error Codes

Error Number	Error Description	Operator Response
21	Unknown interrupt error	Try power up again. Call Gerber Field Service.
22	Theta home error	Try power up again.
23	Z home error	Try power up again.
24	Y home error	Try power up again.
25	Data overflow (only for HPGL™ data)	Check communication parameters (baud rate, etc.)
26, 27, 28	Problems with baud rate, data bits, parity bits, stop bits	Call Gerber Field Service.

HS750plus Reference Card

KEY/FUNCTION	DESCRIPTION
RUN SINGLE Key --	
Plot	Press RUN SINGLE to plot single jobs. The HS750*plus* returns to the off-line status (as at power-up) after each job and waits for the operator to press RUN SINGLE key again to plot the next job.
Controlled Stop	Press either Run key to pause plotting at the next logical break in the program and check current job. *Slewing while in pause will result in the plotter returning to the position in the job and resuming the job when RUN SINGLE is pressed again.*
RUN CONT Key --	
Plot	Press RUN CONT to plot two or more jobs continuously. The HS750*plus* plots one job after the other without pausing between them and remains on-line until the RUN CONT key is pressed again or RESET is pressed.
Controlled Stop	Press either Run key to pause plotting at the next logical break in the program and check current job. *Slewing while in pause will result in the plotter returning to the position in the job and resuming the job when RUN CONT is pressed again.*
Slew Keys (Arrow Keys)	The arrow and SLOW keys do not function while a job is plotting, during an error condition, or while a Run light is on, even if the plotter is idle.
	Press arrow keys to position carriage and material between jobs. • Up and down arrow keys move the carriage between the rear and the front of the plotter. • Left and right arrow keys rotate the drum and feed material through the plotter or back toward the roll holder.
SLOW Key	Press the SLOW key (a single beep indicates slow slew mode) and press the arrow keys to slow slew. Press the SLOW key again (two beeps indicate normal slew mode) and hold down a right or left arrow key to ramp up to high speed slew.
RESET Key --	
Emergency Stop	Press RESET key to stop HS750*plus* operation, clear the current job from the buffer, and return the plotter to off-line status.
Clear	Press the RESET key to stop the error signal after a power-up or plotting failure. (See “Error Conditions” section in this manual.)
Access	Hold the RESET key at power-up to access additional diagnostics. (See “Special Diagnostics” section in this manual.)

HS750plus Reference Card

KEY/FUNCTION	DESCRIPTION
SWIVEL KNIFE Key	Press SWIVEL KNIFE to select swivel knife mode (light above the key is on) or press again to select tangential knife mode (light above the key is off).
INIT KNIFE Key	Press INIT KNIFE to initialize the swivel knife so it is in a known position (blade faces 0°) before every job or after changing material.

HS750plus Suggested Tool Force Settings Reference Card

Material	Recommended Starting Tool Force	Tangential Knife Blade	HS Plotter Swivel Knife
Controltac 180 Delux 210 Gold/Silver Dusted Crystal 210 Florescent 210 Scotchcal™ 220 Translucent 230	.05-1	30 °	HS-42°
Gerber Cal® Gerber IP Plus Gerber Mask™ I & II Heat Transfer Flock Hot Split Plastisol Metalized Polyester	1	30°	HS-42°
Screen Print Static Cling	.05	30°	HS-42°
Sandblast 521 Sandblast 522	4-5	45° or 60°	
Lightweight or coated paper-pouncing Plotting Paper - drawing			

Gerber Field Service Department 800-828-5406
Outside the USA please fax: 203-645-2448

Index

K

L

M

P

R

S

T

U

V

W

X

Y

Z

Gerber
Scientific Products

A Gerber Scientific Company

151 Batson Drive Manchester, CT 06040
U. S. A.

P57350A Rev B