

ADVANTAGE ROUTER™ 600
USER MANUAL

Gerber
Scientific Products

not specified.

Error! Switch argument

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

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INTRODUCTION

The ADVANTAGE Router 600 can provide all the lettering and graphic design capabilities of the GRAPHIX ADVANTAGE® Composer to dimensional signage.

The ART Path™ Software Option enables the GRAPHIX ADVANTAGE to fully control the router operation. The user routes jobs directly from the GRAPHIX ADVANTAGE through the Router Control Station (ARC Box) communicator. The ADVANTAGE Router can cut designs from a wide variety of materials, as well as scribe, engrave, or draw all types of text or graphics.

This manual provides instructions in safety, operation, and maintenance for the ADVANTAGE Router 600, referred to as AR600.

Your ADVANTAGE Router is a computer-controlled machine tool, and should be operated only by trained operators. The safety guidelines in this manual must be followed at all times to avoid risk of injury.

Manual Contents

This manual covers the basic information needed for using the AR600. It is arranged as follows:

- Requirements and package contents
- Safety guidelines
- Principles of operation
- Basic system preparation and use
- Cleaning and maintenance procedures

Conventions

The following conventions are used in this manual:

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

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

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

ROUTER REQUIREMENTS

System Specifications

The purchase of a Router 600 includes complete unpacking, installation, and testing performed by Gerber Field Service when installed within the continental United States.

However, the system does have specific work area, power, and compressed air requirements which must be supplied before Gerber Field Service can uncrate and install the system.

ELECTRICAL

A 208, 230, or 250 V single-phase 20 Amp circuit (47/63 Hz) on a dedicated line. Gerber supplies a receptacle to be installed by a licensed electrician.

COMPRESSED AIR

The mist coolant system requires 0.5 CFM at 40 to 90 psi, which can be supplied by a 1/4 to 1/2 horsepower compressor.

ROUTER TABLE

100" (2,500mm) wide x 140" (3,500mm) long x 54" (1,350mm) high (assembled).

ELECTRICAL CABINET

18" (450mm) wide x 33" (825mm) long x 32" (800mm) high.

Router Package Contents

The Router 600 is packed in four crates. Check each part against the list and inspect all parts for any damage which may have occurred during shipping.

Crate 1 (Packaged Beam Assembly):

- 1 Beam assembly

Crate 2 (Packaged Large Components):

- 5 Cross member machining
- 8 Angle support machining
- 4 Leg assembly

Crate 3 (Packaged Frame and Table Top):

- 1 Left side frame assembly
- 1 Right side frame assembly
- 1 Frame cable assembly
- 12 Router 600 table top assemblies
- 2 Table end machining
- 1 Cable support plate
- 1 Cable guide

Crate 4 (Packaged Small Components):

- 1 Accessory kit
- 1 Electrical cabinet assembly
- 1 Hardware kit
- 1 1 gallon coolant tank
- 1 Router Control Station (ARC Box)
- 1 3 1/4 hp motor
- 1 Hose and cable guard box
- 1 GRAPHIX ADVANTAGE interface components
- 1 Vacuum shroud and pressure foot
- 1 Hose channel assembly

Tool Kit Contents

Tool Kit contents are listed below and are identified in the photograph. Metric sizes are shown in parenthesis

3	1/4" (6 mm) 2-spiral flute bit, solid carbide endmill cutters
3	1/8" (3 mm) 2-spiral flute bit, solid carbide endmill cutters
1	7/8" carbide V cutter
1	3/4" carbide ball cutter
1	Scribe tool
1	Pen tool
8	Knob and screw assemblies
8	"T" nuts
6	Work clamps
1	Tool height gage
1	Step height gage
1	1/4" socket coupling hose
1	1/4" plug coupling hose
1	1/8" tool collet adapter
1	1/4"(3 mm) tool collet
1	1/2" (6 mm) tool collet
1	Collet wrench set
4	Spare fuses

SAFETY GUIDELINES

WARNING: The ADVANTAGE Router is a high-speed cutting machine which throws out chips of metal, wood, or plastic. Its use may be hazardous if you do not observe the following precautions. These guidelines are necessary for the safe and efficient operation of the ADVANTAGE Router.

WARNING: Do not store wet aluminum chips in a closed container and do not use the vacuum hose to clean up wet aluminum. Wet aluminum produces hydrogen gas. This gas may reach explosive concentrations when wet aluminum chips are stored in a closed container.

1. Only a trained operator should attempt to run the equipment.
2. Do not use the router in a damp or wet location.
3. Stand in front of the ARC box during system operation to provide easy access to the RESET key and the system power circuit breaker. This also prevents any clothing from getting caught in the machine.
4. Keep the work area clear for easy access to the emergency stop switches. These are located at each end of the router table beam.
5. Turn the router motor OFF or unplug the router when changing tools.
6. Wear protective eyewear, such as goggles or safety glasses, to cover the front and sides of the face.
7. Tie back or cover long hair.
8. Remove loose jewelry, ties, and loose clothing. Wearing a long-sleeved shop coat is strongly recommended.

9. Wear ear protection.
10. Do not operate the machine with the electrical cabinet doors open. Doing so will expose high voltage circuitry to material chips and affect cooling airflow.
11. Keep all personnel at a safe distance from the machine when it is operating.
12. Carefully secure the workpiece with clamps.
13. Use the proper tool for the material. Do not use small tools with heavy material.
14. Make a test cut whenever possible to test the tool in the material.
15. Perform all periodic maintenance procedures on a regular basis.

OPERATING PRINCIPLES

Overview

The ADVANTAGE Router 600 consists of these major components:

- the Router Table, which includes the work table, the beam, and the router motor carriage
- the electrical cabinet
- the Router Control Station, also called the ARC Box, which controls the start, stop, slew, Z initialization, and job home position functions.

Text and graphics are cut, engraved, scribed, or drawn at the router table after being created and sent from the GRAPHIX ADVANTAGE system.

During router operation, the cutting table and clamped workpiece remain stationary. All operating motion is performed by the router motor, beam and tool.

Note: It is essential to read this section before trying to operate the ADVANTAGE Router. This section introduces the operating principles of the router system.

X, Y, Z Axes

The ADVANTAGE Router 600 has three basic axes of movement:

- The X (horizontal) axis is oriented from left to right.
- The Y (horizontal) axis is oriented from front to back.
- The Z (vertical depth) axis is oriented up and down.

When the router cuts a sign, the tool moves in the X, Y and Z axes of movement.

References in this manual to "travel limits" refer to the size of the table in the X and Y axes of movement unless otherwise specified.

Z Axis

The Z Axis of the router is the up and down movement of the tool.

The Z Axis represents the thickness of the material, the cutting depth, the engraving depth, or, when drawing, the amount of downward pressure on the pen.

This axis of movement is controlled by:

- the Z INIT function key
- a Z Axis adjustment knob located above the router motor
- the ART Path depth of cut.

Initializing the Z Axis is an essential procedure when using the ADVANTAGE Router 600. It establishes the location of the tool above the workpiece initially or at the start of a job.

Note: The Z Axis must be initialized every time the tool or material is changed, and whenever the operator prepares to cut, draw, or engrave. Failure to initialize the Z Axis properly will cause the machine to cut at the wrong depth. This may destroy the material and cause the tool to cut into the router table.

The workpiece and sacrificial material must be mounted on the router table when the Z Axis is initialized. See the Z INIT portion in the ARC Box section in this manual for instructions on initializing the Z Axis.

Job Home Position

The job home position is the position on the router table that corresponds to the job 0,0 point or starting position of the job. The job home position is stored in the ARC Box and is maintained even when power is interrupted.

The job home position (start position) is also controlled by ART Path. ART Path considers the current tool position to be job home. The actual job starting position may be modified by a preposition (either absolute or relative) set in the ART Path Output dialog box.

The SET JOB HOME ARC Box function allows the router operator to modify the home position *after* a job has been received at the ARC Box and the job header, material and tool messages have been displayed.

The job home position of each job is stored when the job starts. The RETURN HOME ARC Box function returns the carriage to the stored job home position. In the event of a power failure or other job interruption, the operator can use the RETURN HOME function to return the router carriage easily to the stored home position. This also simplifies starting multiple jobs from the same position.

See the SET JOB HOME and RETURN HOME descriptions in the ARC Box section of this manual for more information. Also see the ART Path User Manual for information on job positioning.

Power Switches

MAIN POWER SWITCH

This power switch turns the router power on and off.

The Router 600 main power switch is located on the front panel of the electrical cabinet.

Before turning on the main power switch, make sure that the control station power supply is connected to both the control station and the appropriate grounded outlet.

EMERGENCY POWER SWITCHES

The emergency stop switches look like red "mushrooms". If an emergency occurs, the operator can stop the router instantly by pressing the emergency stop switch.

The Router 600 table has two emergency power switches located on top of each beam end housing.

Restoring Power

The emergency power switches turn off all power to the router. Restore power by turning on the main power switch specific to each router.

The router table emergency power switches on the Router 600 cannot be used to turn the router power on.

Router Motor Power Switch

The router motor power switch turns the motor on and off. The router motor has a thumb switch on the top labeled ON and OFF.

CAUTION: The router motor switch should be off until the job is ready to begin. **DO NOT** turn the router motor on when pen plotting or scribing.

The router motor must be OFF during vacuum shroud installation, tool changing, Z Axis initialization, or when performing any other functions around the cutter.

When the job is ready to begin, turn ON the router motor power switch.

Press the START key to start the job.

Note: There is a delay before the tool begins cutting. This delay gives the router motor time to come up to full speed before cutting begins, and the operator time to stop the job if the router motor is not ON.

ARC Box (Router Control Station)

OVERVIEW

The ARC Box is the communication link between the GRAPHIX ADVANTAGE and the router system. It can:

- send and receive messages and commands to and from the GRAPHIX ADVANTAGE
- display messages to the operator
- control router motor movements
- change feed rates
- return the router carriage to the job home position
- set motor delay

FRONT PANEL

The front panel of the ARC Box consists of a message display panel and nine function keys:

- START/STOP
- RESET
- Z INIT
- SELECT
- right, left, up, and down arrow keys.

The ENTER key is not used.

DISPLAY PANEL

The bottom right of the message display panel may contain four indicators for the operator:

- **W, w** - Alternating uppercase and lowercase indicates that the router is waiting for a job.
- **J, j** - Alternating uppercase and lowercase indicates that there is a job ready for routing. Pressing START will begin or continue processing the job.
- **I, i** - Alternating uppercase and lower case indicates the job is incomplete, which occurs when a partial job is sent from ART Path. Power interruption at the GRAPHIX ADVANTAGE or a pause status in the Plot Spooler application will cause partial transmission.

WARNING: When the incomplete job indicator (I,i) and START JOB are displayed, the router may move without further warning.

The top right of the message display panel at times may contain an asterisk (*). When a job is running and the operator presses the STOP key, the asterisk appears to show that the machine has received the message and will stop at the next logical point.

Power-Up Tests

When the power is turned ON, the ARC Box performs diagnostic self-tests, and displays the operating set revision level. If the Advantage router is equipped with the job home feature, the ARC Box requests the operator to slew the motor carriage near the point of orientation, which is the absolute 0,0 point. To slew to the point of orientation, use the arrow keys to move the motor carriage as far toward the front and to the left as possible.

When the carriage is at 0,0, the carriage will move away from the limit a preset distance in X and Y. The ORIENTATION message will appear in the display panel, followed by the STOP READY message.

If an error occurs:

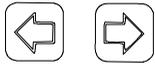
- The system emits a constant audible tone.
- Press the RESET key to clear the error and to rerun the failed test(s).
- If the same error recurs or if RAM ERROR, ROM ERROR, or INTR_ERROR is displayed, contact the Router Support Group at 800-336-1698 (USA and Canada).

When testing successfully completes, the STOP READY message displays.

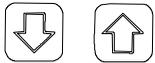
Function Keys

The function keys located on the front panel of the ARC Box perform specific routines. Each function key is discussed individually in the following pages.

ARROW KEYS



The arrow keys are most frequently used to slew the router carriage into position. Slewing refers to positioning the X and Y axes where desired.



The arrow keys are also used to scroll through available choices after a selection has been made in the Menu Select mode. See the page in this section on Menu Select mode.

► *To slew the carriage*

- To position the tool to the left or right over the router table surface, press the left or right arrow keys until the desired placement is reached.
- To position the tool forward or backward over the table surface, press the up or down arrow keys until the desired placement is reached.
- To slew diagonally, press two keys at the same time (left or right with up or down).
- You cannot slew past the table edges if the router is equipped with the limit switch feature.

Start/Stop

This key toggles between the START and STOP modes.



START MODE

START mode, as shown by a message in the display panel, may be in one of two states:

- START READY - the system is ready to receive a job
- START JOB - the system has received a job and is processing it

The following keys are available in START mode:

- RESET - immediately aborts router movement and purges the job
- START/STOP - pauses processing the job

START READY

1. While in the STOP READY mode, use the arrow keys to slew the carriage to the starting location of the job.
2. Press the START/STOP key to display the START READY message. The AR600 is now in a "ready" state and the message remains until the data arrives from the GRAPHIX ADVANTAGE.

CAUTION: In START READY mode, the router carriage may move without further warning.

The current tool position becomes the start point for the job.

START JOB

When the job data is received from the GRAPHIX ADVANTAGE, the START JOB message appears, indicating that the machine is in a "run" state. The GRAPHIX ADVANTAGE sends a header or tool message, the machine goes into STOP JOB mode, and instructs the operator to load material. Press START/STOP again to display the tool assignment. To begin the job, press START/STOP again.

CAUTION: The router carriage may move without further warning.

STOP MODE

STOP mode, as shown by a message in the display panel, may be in one of two states:

- STOP READY - the router is in an "idle" state waiting to receive data
- STOP JOB - the router is in a "pause" state during a job

The following keys are available in STOP mode:

- START/STOP
- RESET
- Z INIT
- SELECT
- arrow keys

STOP READY

In STOP READY, the GRAPHIX ADVANTAGE sends data to the ARC Box. The system beeps when data is received and **J,j** is displayed in the lower right corner of the message display panel.

- Press the START/STOP key to begin the job.
- The carriage can be slewed to establish a start position for the next job.

The job start position can be changed in the STOP READY mode. It can also be changed when one of the following occurs:

- SET HOME is selected from the menu
- the job completes
- the operator presses RESET to abort the job and clear it from the ARC Box
- the ARC Box receives a terminate command from the GRAPHIX ADVANTAGE Plot Spooler.

STOP JOB

Pressing the START/STOP key while in the START JOB mode enters PAUSE mode and results in the following:

- the STOP JOB message appears
- no incoming data processes
- the job stops at the next logical break point
- the tool raises
- the router motor turns off
- an asterisk appears in the upper right corner of the message display.

When in PAUSE mode, you can slew the router for tool changes or other tasks. Press START/STOP to return the router tool to the position in the job where the system was paused. The job can be resumed without position or data loss.

RESUME PROCESSING

1. After pausing temporarily, press the START key to resume processing without position or data loss.

CHANGE TOOLS

If a tool change is required, follow these steps:

1. In STOP JOB mode, slew the machine to a safe tool change position.

Note: The machine remembers the tool position when a tool is changed during a job and returns from slew to the appropriate location.

2. Turn OFF the router motor and disconnect the power cable
3. Change the tool. (See the sections on Tool Installation and Tool Replacement in this manual, if necessary.)
4. Initialize the Z Axis. (See the Z INIT function key explanation in this section of the manual, if necessary.)

5. Change the Feed Rate parameter, if necessary.
6. Turn ON the router motor.
7. To avoid hitting clamps, manually slew close to where the job will resume.
8. Press the START/STOP key to continue the job. The router will return to the pause position, then enter STOP JOB mode. Press START/STOP again to resume the job.

REPEAT JOB

To repeat a job at the same position as the previous job, before pressing START/STOP:

1. Press SELECT while in the STOP READY or STOP JOB mode to access the Menu Select mode.
2. Press the right or left arrow key until Return Home appears in the message box.
3. Press SELECT. The motor carriage will move to the job home position.
4. Press START/STOP to begin processing the job.

Reset



The RESET function key immediately halts the job that is running.

IN START MODE

If in START JOB mode and the operator presses the RESET key:

- the tool raises
- X and Y travel stops
- current job data from the router and the GRAPHIX ADVANTAGE clears
- the STOP READY message displays.

Note: The tool completes its drill cycle (plunge and raise) before stopping.

IN MENU SELECT MODE

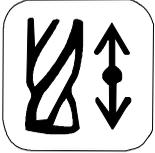
RESET exits the menu without saving changes.

IN OTHER MODES

If in any other mode and the operator presses the RESET key, the ABORT ??? message appears.

- To cancel the job, press the RESET key again.
- To continue the job without data loss, press START/STOP.

Z INIT



The Z INIT function key initializes the Z Axis tool height above the work surface. The Z INIT key may be used only when the STOP JOB or STOP READY message displays. You may use either the tool height gage or the step height gage for initialization. Use of the step height gage is described in the Engraving section of this manual.

PERFORM Z INIT

1. Place the tool height gage on top of the material to be cut.
2. Slew the tool over the gage.
3. Press the Z INIT key. The Z motor is now OFF to allow for manual adjustment. The "Z Unlocked ..." message appears.
4. Turn the Z axis knob to lower the tool until it just touches the surface of the tool height gage.

Note: Excessive pressure will cause tool damage.

5. Press Z INIT to raise the tool.

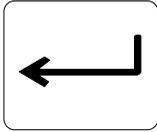
Note: If RESET is pressed, the Z motor locks and the Z INIT process is exited.

6. Remove the tool height gage.

CAUTION: Do not turn the Z Axis knob after the Z axis has been initialized.

The Z Axis must be initialized every time the tool or material is changed. Failure to initialize the Z Axis properly will make the tool cut into the material at the wrong depth. This may destroy the material and cause the tool to cut into the router table.

Enter



This function key is not used in this release. Press SELECT to exit a selection and store values. Press RESET to exit a selection without storing values.

Select



This function key allows access to the Menu Select mode to set system parameter values. It is available in STOP mode when the STOP READY or STOP JOB message is displayed.

USING SELECT

To access the Menu Select mode, press SELECT while in the STOP READY or STOP JOB mode.

The choices available are as follows:

- Absolute (X,Y):
- Feed Rate:
- Motor Delay:
- Set Job Home
- Return Home
- Test:
- Default
- Display:

A colon (:) following a menu selection indicates additional choices are available when the item is selected. Each menu selection is explained and contains directions on changing parameters.

To exit the Menu Select mode and return to STOP JOB mode **without changing settings**, press RESET.

► ***To make a selection in Menu Select mode***

1. Press the right arrow key to scroll forward (right) through the menu list or press the left arrow key to scroll backward (left) through the menu list.
2. When the desired menu item appears, press the SELECT key to display the choices available under the selected menu item if the item is followed by a colon (:), or to execute the function.
3. Use the arrow keys to display available choices.

ABSOLUTE X,Y:

The Absolute X,Y function displays the exact position of the router tool relative to the absolute 0,0 position on the router table established during orientation when the router was turned on. The Absolute X,Y display allows you to position the router tool with great precision and helps set the job home position. Each coordinate is precise to three decimal places (000.000) in inches, two decimal places (0000.00) in mm.

Note: On systems that have not been upgraded to include limit switches, the 0,0 position is the tool position when power is turned on.

► To display the absolute X,Y position

1. Press SELECT while in the STOP READY or STOP JOB mode.
2. Press the right or left arrow key until **Absolute (X,Y):** appears in the message box.
3. Press SELECT to display the current position.

X: +000.000 INCH

Y: +000.000 INCH

4. Press any arrow key to move the router carriage. Release the arrow key to display the message box with the new coordinate position. Press any key to exit.

SET JOB HOME

The job home position is the point that corresponds to the starting point of the job. It is the point by which a job is positioned on the router table. ART Path considers the current tool position to be job home. The actual job starting position may be modified by a preposition (either absolute or relative) set in the ART Path Output dialog box.

The SET JOB HOME function allows the router operator to modify the home position *after* a job has been received at the ARC Box and the job header, material and tool messages have been displayed.

The job home position of each job is stored when the job starts. The RETURN HOME function returns the carriage to the stored job home position. In the event of a power failure or other job interruption, the operator can use the RETURN HOME function to return the router carriage easily to the stored home position.

To place multiple jobs in the same home position on the table, the operator must use the Return Home parameter prior to sending the job from the GRAPHIX ADVANTAGE to move the motor carriage to the exact job home position.

Note: If the motor carriage hits a clamp or fixture when moving, position may be lost. Turn power to the system off and on. As instructed on the message display, reestablish position by using the arrow keys to move the router carriage to the extreme front, left point (the point of orientation).

► ***To set job home***

The tool position when you press START/STOP is the job home position, unless a job preposition has been set in the Output dialog box in ART Path. The preposition becomes the job home position. You can set job home from the ARC Box using the following procedure.

1. Slew the carriage to the desired job home position by pressing the arrow keys. This position will be stored as job home when you press START/STOP.
2. Press SELECT while in the STOP JOB mode.
3. Press the right or left arrow key until **Set Job Home** appears in the message box.
4. Press SELECT. The ARC Box will beep twice to indicate the position has been stored.

WARNING: Do not use the Set Job Home parameter to reset job home after cutting has begun. The carriage will move unpredictably when the job is restarted.

► ***To change job home***

Move the carriage to any position on the table and repeat the steps above. The new position replaces the previously stored position in the ARC Box.

▶ ***To display current job home***

1. To avoid hitting clamps, slew the carriage near the home position using the arrow keys.
2. Press SELECT while in the STOP READY or STOP JOB mode.
3. Press the right or left arrow key until **Return Home** appears in the message box.
4. Press SELECT to move the carriage to the precise Job Home position.
5. Press the right or left arrow key until **Absolute (X,Y):** appears in the message box.
6. Press SELECT to display the current position. This is the current Job Home position.

Note: Make note of this position. If the carriage hits a clamp or fixture and router position is lost, you can slew to this position or set an absolute preposition in ART Path and repeat the job.

JOB HOME POSITION AND JOB BOUNDARIES

Job boundaries cannot exceed the active cutting area of the router table. The Advantage Router and ART Path interpret job boundaries for certain job types in these ways:

- **Output repeats** includes all repeats within the job boundary.
- **Paneled jobs** are treated as separate jobs. The largest panel must fit on the table (within job boundaries).
- **Inplace repeats** includes the park position within the job boundary.
- **Preposition** set in ART Path is included in the job boundary.

If the Job Home position will cause the job being processed to exceed the table boundaries, the ARC Box displays **Job Will Exceed Table Boundary** in the message box.

► *To clear the Boundary message*

1. Press START/STOP to display the correction necessary to permit the job to fit.
2. Press the arrow keys to move the carriage the distance in X and Y indicated in the message. When the carriage is in an acceptable position, the X and Y distances will be zero.
3. Press START/STOP again. If the job still exceeds boundaries, the correction message is displayed again. If the job fits, **Press START to SET HOME** is displayed.
4. Press START/STOP again to set the current position as Job Home and start the job.

RETURN HOME

The Return Home feature allows the operator to return the carriage to the last Job Home position. The Job Home position is stored when a job is started or when the **Set Home** function is used.

▶ *To return home*

1. To avoid hitting clamps or fixtures, move the carriage near the home position using the arrow keys.
2. Press SELECT while in the STOP READY or STOP JOB mode.
3. Press the right or left arrow key until **Return Home** appears in the message box.
4. Press SELECT to move the carriage to the precise Job Home position.

FEED RATE:

The Feed Rate is set in ART Path at the GRAPHIX ADVANTAGE. It is the absolute speed in inches per minute or millimeters per second at which the tool travels along the tool path. To override this rate and reduce or increase the feed rate, change the established Feed Rate by a percentage described below. The feed rate will not exceed maximum velocity of the router.

Note: The feed rate will not exceed the maximum velocity of the router. However, if the Feed Rate set in ART Path is less than the maximum, you may increase it using the Feed Rate parameter. A Feed Rate of 200% would double the Feed Rate set in ART Path.

► To change feed rate

1. Press SELECT while in the STOP READY or STOP JOB mode.

Note: The Feed Rate parameter is most frequently changed in the STOP JOB mode when the Feed Rate has been set too high or too low for the job in progress.

CAUTION: The feed rate override is not cleared after the job completes and will be applied to the next job received.

2. Press the right or left arrow key until **Feed Rate:** appears in the message box.
3. Press SELECT to obtain the Feed Rate percentage.

Feed Rate: 1. % 100

4. Press the right or left arrow keys to move the cursor to the desired digit.
5. Press the up or down arrow keys to increase or decrease the digit under the cursor. Acceptable values are 1% to 1000%.

6. Press SELECT to save the new value.

If the value is valid (1 - 1000%), the system beeps twice and returns to the STOP READY or STOP JOB mode.

If the value is not valid, the display remains until a valid value is entered or until RESET is pressed to exit the menu without changing the Feed Rate.

MOTOR DELAY:

The Motor Delay parameter sets the time the tool will wait for the router to reach full speed before it descends to the material. Valid values are 0 to 99 seconds.

► To change motor delay

1. Press SELECT while in the STOP READY or STOP JOB mode.
2. Press the right or left arrow key until **Motor Delay:** appears in the message box.
3. Press SELECT to obtain the Motor Delay time.

Motor Delay: 01

4. Press the right or left arrow keys to move the cursor to the desired digit.
5. Press the up or down arrow keys to increase or decrease the digit under the cursor. Acceptable values are 00 to 99.
6. Press SELECT to save the new value, or RESET to exit without saving the value.

TEST

This function allows testing the router and the ARC Box to ensure machine accuracy and integrity. The ARC Box does not accept data from the GRAPHIX ADVANTAGE during testing.

A power-on test restarts the system, displays the revision level of the system, and repeats orientation of the motor carriage at the lower left corner of the table.

The remaining tests are not used by the operator.

CAUTION: The X and Y line test must be started only from the extreme lower left position (orientation point) on the table.

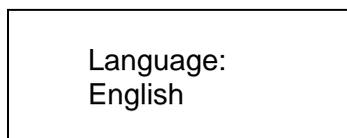
DISPLAY

This function allows the user to set the language and units which display in the ARC Box message box, and to turn Auto Scroll on or off. When on, Auto Scroll automatically scrolls messages that are too long to fit in the message box. When Auto Scroll is off, truncated messages are displayed.

Normally, Auto Scroll should be left on.

► **To change the language**

1. Press SELECT while in the STOP READY or STOP JOB mode.
2. Press the right or left arrow key until **Display:** appears.
3. Press SELECT.
4. Press the right or left arrow key until **Language:** and the current language appear.
5. Press the right or left arrow key to scroll through the language choices.

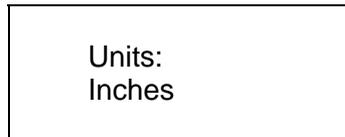


Language:
English

6. Press SELECT to save the selected choice.
7. The system beeps twice and returns to the STOP READY or STOP JOB mode displayed in the entered language.

► **To change units**

1. Press SELECT while in the STOP READY or STOP JOB mode.
2. Press the right or left arrow key until **Display:** appears.
3. Press SELECT.
4. Press the right or left arrow key until **Units:** and the current units appear.
5. Press the right or left arrow key to scroll through the units choices (inches or millimeters).



6. Press SELECT to save the selected choice.
7. The system beeps twice and returns to the STOP READY or STOP JOB mode displayed.

► **To turn Auto Scroll on or off**

1. Press SELECT while in the STOP READY or STOP JOB mode.
2. Press the right or left arrow key until **Auto Scroll:** appears.
3. Press SELECT.
4. Press the right or left arrow key to display **On** and **Off**.
5. Press SELECT to save the choice.

DEFAULT

This function allows the user to reset all value parameters back to the factory default settings.

▶ *To reset the defaults*

1. Press SELECT while in the STOP READY mode.
2. Press the right or left arrow key until **Default** appears.
3. Press the SELECT key to reset all value parameters to the factory default settings. The system beeps twice and returns to the STOP READY mode.

EQUIPMENT INSTALLATION

Chip Removal System

Because the router creates scrap chips while routing, a shop vacuum is needed to remove the debris from the work area. The shop vacuum is not supplied with the router system, but all necessary extension hoses and fittings are provided.

A standard heavy duty wet/dry shop vacuum such as the Sears Craftsman™ wet/dry vacuum with a 2.5-inch (63.5 mm) hose diameter is recommended.

WARNING: Before installing the Chip Removal System, turn OFF the router and unplug it from its electrical source. Also, unplug the router motor from the Z Axis housing.

OVERVIEW

The following steps outline the process for installing the Chip Removal System:

- Install the vacuum shroud.
- Connect the shop vacuum to the vacuum block.

Before beginning installation, be sure the collet retaining nut is installed on the router motor (a tool need not be installed).

CONNECT THE VACUUM TO THE ROUTER

1. Connect the free end of the long vacuum extension hose into the open end of the vacuum tube.
2. Connect the shop vacuum to the vacuum tube.
3. Plug the shop vacuum power cord into the outlet marked VACUUM located on the rear panel of the electrical cabinet.

SYSTEM PREPARATION AND USE

This section discusses procedures to follow prior to and during the operation of the Router 600. Procedures covered are as follows:

- Selecting, installing, removing, and replacing tools
- Choosing sacrificial material
- Attaching the workpiece using tapes or spray adhesive
- Mounting the workpiece
- Using the Chip Removal System
- Using the Mist Coolant System

Before preparing the Router 600 for operation, complete the following steps:

1. Turn OFF the electrical cabinet power switch.
2. Move the router motor up by manually turning the Z Axis adjustment knob, located on top of the Z Axis motor.
3. Turn OFF the router motor.

Tool Selection

PENS AND SCRIBE TOOLS

The pen and scribe tools included in the tool kit look similar. However, the pen tool can be distinguished by making sure that it writes on paper.

When first learning to use the Router 600, be sure to learn as many system functions as possible with the pen tool. Do not try to cut material with the router until you have mastered the basic system functions using the pen. Lightly tighten the pen tool in the spindle.

ENGRAVING TOOLS

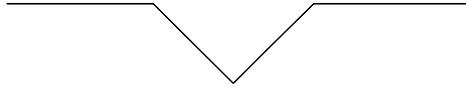
A Cove Cutter and V-Cutter are included in the tool kit. Both engraving tools can be used to create specialized edge effects.

The Cove Cutter creates a rounded channel around the character.



Cove Cutter Channel

The V Cutter creates a pointed channel around the character. The V Cutter creates a channel with a 90 degree angle. Each side of the channel is 45 degrees.



V Cutter Channel

Note: Materials which have an uneven thickness may produce poor results when engraving.

CUTTING TOOLS

The tool kit contains six spiral fluted solid carbide cutting tools. Cutters used with the Router 600 must have a .499 - .500, .249 - .250, or .124 - .125 inch shank for use with the .50, and .25-inch collets, or the .125-inch collet adapter supplied in the tool kit. All tool bits must have plunge capabilities.

Note: Metric collets and tools are available from a Gerber distributor.

Tool Information

The tools supplied in the tool kit are basic tools for average cutting jobs. As you gain more experience, you may wish to purchase additional cutters.

The information below may be helpful in your use and selection of tools.

- The .25-inch cutter is the strongest cutter supplied and has a longer cutting edge length than the .125-inch cutter.
- The .25-inch cutter has a higher surface speed at the outside edge, creating a higher chip removal rate and a smoother edge finish.
- The .25 inch cutter has a 0.75" cutting edge length. Any material which is thicker than 0.75" requires a router bit with a longer cutting edge length.
- The .25-inch cutter creates a .125-inch radius on all inside corners.
- The .125-inch cutter creates a .0625-inch radius on all inside corners.
- A .25-inch bit may not fit through some openings. If this occurs, use the .125 inch cutter if possible.
- You may discover that characters can be cut smaller than the recommended limits. If a .25-inch cutter is used, double the size limit for the smallest characters in each style. If larger bits are purchased, scale the limitations proportionally for larger cutters.
- Gerber sells a complete line of high quality cutting tools that provide optimum cutting performance. Contact your Distributor for details.

Collets

The tool kit contains two collets. One is a .50 inch collet intended for use with the pen, scribe tool, or cutting tool with a ½" diameter shank. The other is a .25 inch collet intended for use with all .25 inch routing and engraving bits.

- A .25 inch bit must have a shank diameter of .249-.250, and a .50 inch bit must have a shank diameter of .499-.500 inches.
- If the routing bit has a .125 inch shank, insert it into the .125 inch sleeve adapter provided and use the .25 inch collet.
- The cleanliness of the collet and the spindle is essential. Damaged surfaces will affect the holding ability of the collet.

Note: Always make sure that the taper inside the spindle, the taper outside the collet, and the inside diameter of the collet are free of chips and debris.

- The outside shank diameter of the cutting tool is an important factor in the collet's ability to hold tools tightly in place. Use only cutting tools that are not more than 0.001 inch less than the nominal outside shank diameter. Gerber authorized cutters comply with these tolerances.

Tool Installation

Solid carbide tools, such as those included in the tool kit, **must** be handled very carefully. Do not strike the cutting edge with the collet or adapter during tool installation.

▶ *To install the tool*

1. Turn OFF the router motor.
2. Select the desired tool (pen, scribe, engraver, or cutter) and the appropriate collet from the tool kit.
3. Insert the tool into the collet. Make sure the narrow end of the tapered collet points upward as shown below.

- When installing the pen or scribe tool, the bottom of the collet should be positioned about half-way up the barrel of the tool.
 - When installing an engraving bit, position the bottom of the collet about halfway up the shank of the tool.
 - When installing a router bit, position the bottom of the collet approximately even with the top of the flutes. The collet should not cover any portion of the flutes, and very little of the straight portion of the shank should be exposed below the collet.
4. Slew the router motor near the front edge of the router table.
 5. Remove the retaining nut from the base of the router motor using the wrenches supplied in the tool kit.

Tool Removal

CAUTION: When removing a tool, do not attempt to gain leverage by jamming one wrench against the carriage while pushing on the other.

DO NOT position the router motor over the table without any material underneath. The tool might fall out when the retaining nut is loosened, breaking or damaging the cutting edge.

▶ ***To remove a tool***

1. Use the slew keys to position the router motor near the front of the router table.
2. Turn OFF the router motor.
3. Loosen the retaining nut using one wrench while holding the router motor chuck firmly with the other wrench.

CAUTION: Never strike the tool from the side to remove it. Striking the tool will damage the spindle motor bearings.

4. Remove the tool from the collet.

Tool Replacement

▶ *To replace a pen*

1. Unscrew the top of the pen assembly.
2. Remove the spring.
3. Remove the pen.
4. Insert the replacement pen into the pen barrel.
5. Replace the spring, and replace the cover on top of the barrel.

▶ *To replace a scribe tip*

1. Unscrew the top of the scribe assembly.
2. Remove the spring.
3. Remove the scribe tip.
4. Insert the replacement scribe tip into the barrel and replace the spring.
5. Replace the cover on top of the barrel.

Replacement Cutters

Replacement cutters are available from Gerber. Different cutters purchased from other dealers may or may not provide satisfactory results with the Router 600.

Gerber is not responsible for results obtained with cutters not recommended in this manual or purchased from other dealers. Be sure to get only the highest quality tool bits for use with the Router 600.

Material Selection and Preparation

The Router 600 can draw on any kind of material suitable for a ballpoint pen, and cut virtually any routable material including those listed below.

ROUTABLE MATERIALS

Plastics_____	Woods	Metals*
Acrylic	Hard	Aluminum
Polycarbonate	Soft	Brass
Phenolic	Masonite	Copper
Styrene	Plywood	Bronze
Foam Board	Particle Board	

CAUTION: Steel or stainless steel is not recommended for use with the Router 600.

Because different routable materials have different densities, varying cutting speeds are required. A table of recommended cutting speeds for various materials is included at the back of this manual.

* All metals require use of the Mist Coolant system.

CHOOSING SACRIFICIAL MATERIAL

Place a piece of sacrificial material under the paper or workpiece when cutting. The best sacrificial materials are foam, acrylic, or pressed boards such as chip board and masonite.

- Acrylic is recommended over pressed board because pressed board contains glue, which is abrasive to cutters. Abrasive materials can wear out the tips of cutters and degrade their plunge capabilities.
- When using acrylic as a sacrificial material, remove the protective paper coating from the sacrificial acrylic surface.
- Select sacrificial material of similar density to the material being cut.
- No sacrificial material is required when engraving.

Attaching the Workpiece to Sacrificial Material

When not cutting to the mask, attach the workpiece to the sacrificial material using one of the following methods:

- Double-Sided High Tack Tape
- Double-Sided Tape
- Spray Adhesive

Follow the guidelines below when attaching the workpiece to the sacrificial material before mounting the workpiece on the table mats.

HARD METALS

- **For brass, other metals, or hard wood:**

Use Double-Sided High Tack Tape. Specially formulated Double-Sided High Tack Tape is unaffected by mist coolant spray and is especially suitable for securing metals which produce high cutting forces.

High Tack Tape is available through Gerber or most industrial and office supply distributors.

Note: Using both tape and spray adhesive is a good alternative on rough-textured wood.

THIN METALS

- **For thin aluminum or other thin metals:**

Use less aggressive Double-Sided Tape. The 3M™ #410 Double-Sided Tape is especially suitable for securing thin aluminum or other light materials to avoid bending the metal when lifting the material after cutting.

The 3M tape is available at most industrial and office supply distributors.

Note: Do not use foam-filled Double-Sided mounting tape. Spray adhesive works well on thin aluminum.

NON-METALS

- **For plastic, styrofoam, thin wood or other non-metallic materials:**

Use Spray Adhesive. Spray Adhesive is especially suitable for securing plastic, styrofoam, wood or other non-metallic materials.

Spray Adhesive is available at most industrial and office supply distributors. The 3M Super 77 Spray Adhesive is recommended.

Low-tack tape may also be appropriate for certain types of wood, which tend to splinter when the tape is removed if the tape is the high-tack type.

*Note: When using acrylic materials as workpieces, **do not** remove the protective paper sheets which preserve the acrylic surface from scratches during cutting. If the acrylic materials are supplied unmasked, you may wish to apply the transfer tape before spraying on the adhesive.*

USING TAPE

Follow these guidelines when using tape to attach the workpiece to the sacrificial material:

- Place the tape in closely spaced strips.
- Do not overlap the strips.
- Make sure the centers of letters like O, B, and P are held securely by the tape.

▶ *To use double-sided tape*

Follow these steps when using double-sided tape to secure the workpiece to the sacrificial material:

1. Lay the tape across the underlying material.
2. Place the workpiece on top of the tape.
3. Press firmly to bond securely.

USING SPRAY ADHESIVE

Refer to the manufacturer's suggestion on the can. Follow these steps when using spray adhesive to attach the workpiece to the sacrificial material:

WARNING: Apply spray adhesive only in a well-ventilated area.

1. Spray the adhesive in smooth, even strokes across the back of the workpiece. Coat the entire surface uniformly, including edges and corners, until tacky but not wet.
2. Then press the workpiece firmly onto the sacrificial material.

CAUTION: Spray adhesive is sticky. Do not spray near the router table.

Mounting the Workpiece

USING CLAMPS

After adhering the workpiece to the sacrificial material, attach the entire workpiece to the router table with work clamps. The more work clamps used, the more securely the workpiece will be held in place.

The appropriate number of work clamps depends on several factors:

- the size of the letters being cut
- the size of the workpiece
- the density of the workpiece material
- the selected cutting speed.

If the workpiece is thick, use a clamp block of equal thickness under the free end of the work clamp to keep the clamp level and maximize its holding ability. **Make sure the work clamps are not in the tool path.**

DRAWING

When drawing, use two to four work clamps to hold the paper and sacrificial material securely in place. If the workpiece is small, two clamps located opposite each other should work well.

CUTTING

When cutting, use four or more work clamps to hold the workpiece and sacrificial material securely in place.

Clamping the Material

After attaching the workpiece to the sacrificial material on the table mats, complete the following steps:

1. Press the slew key to move the router carriage to the back of the router table.
2. Place the workpiece in the center of the router table.
3. Locate the work clamps in the tool kit. Each work clamp consists of a T-nut, a clamp, and a knob-and-screw assembly.
4. Insert the knob-and-screw assembly through the center of the clamp.

5. Screw the T-nut onto the bottom of the knob and screw assembly and then slide the work clamp into the router table slot.

6. Position the work clamp next to the edge of the workpiece.

7. Tighten the work clamp.

8. Slew the router motor and tool over the workpiece.

CAUTION: When moving the router motor with the slew keys, or during router operation, take care not to run the vacuum shroud into the work clamps.

Using the Chip Removal System

Use the Chip Removal System when cutting plastic, Styrofoam, and wood. Disconnect the removal system when pen plotting, scribing, or cutting metals such as aluminum or brass.

The Chip Removal System cannot be used with the Mist Coolant System.

▶ *To use the chip removal system*

1. Make sure that the Chip Removal System has been properly installed.
2. Turn ON the vacuum at the start of the job.
3. Press the START key on the ARC Box to start the job

PRESSURE FOOT AND PRESSURE FOOT PAD

The Chip Removal System includes a pressure foot to hold material flat against the router table to prevent it from lifting while routing.

The pressure foot also makes the router safer by preventing chips and small pieces of material from being thrown out of the machine while routing.

Using the pressure foot saves time and money by reducing the need for bonding and sacrificial material.

The pressure foot has a removable pad that rests on the workpiece and slides smoothly over it during cutting operations. The tool extends through an opening in the pressure foot pad. Two pads are supplied, one with a 1.5" (38 mm) diameter opening for normal use, and one with a 0.4" (10 mm) diameter opening for cutting very small pieces without risk of pulling the piece off the table and into the vacuum.

► *To replace the pressure foot pad*

Use the following procedure to change the pressure foot pad.

HELPFUL HINT: You may want to remove the router motor or vacuum shroud to make replacement easier.

1. Remove the pressure foot window by removing two screws that secure it to the pressure foot.
2. Remove four screws that secure the pressure foot pad to the pressure foot.
3. Remove the cushion from the pad and place it on the replacement pad, aligning the screw holes.
4. Align the pad screw holes with the holes on the pressure foot.
5. Replace the screws and tighten just enough to compress the cushion slightly.

6. Replace the pressure foot window.
7. Replace the screws and tighten.

Using the Mist Coolant System

The Mist Coolant System has been designed to be used with Gerber Cool coolant. Using other types of fluids may damage the system.

Note: Gerber Cool should not be diluted prior to use.

CAUTION: DO NOT use toxic or volatile liquids.

The adjustable drip rate allows for a wide range of mist "wetness" and cooling capability. The evaporation of the mist provides the desired cooling effect and minimizes heat build-up of the remaining lubricant as well.

1. Turn on the compressor and set the air pressure at 20-40 psi as indicated on the mist coolant air pressure gage. To *increase* air pressure, turn the air pressure regulator *clockwise*. To *decrease* air pressure, turn the air pressure regulator *counterclockwise*.
2. Remove the brass filler plug using a flat head screwdriver and fill the reservoir with Gerber Cool coolant. The reservoir should remain full to assure proper lubrication. Add coolant periodically to maintain the level.
3. Adjust the coolant nozzle so that it is directed at the point of cutting.

CAUTION: Keep the nozzle at a safe distance to avoid damaging it with the cutter.

4. Open the shut off valve near the nozzle coupling mounting block. When open, the handle is aligned vertically with the coolant tubing.

5. Starting with a drip rate of six drops per minute, adjust the drip rate and air pressure to provide a mist wet enough to create a slight beading of moisture on the workpiece. Avoid an excessively "dry" mist. Better cooling and mist placement are achieved when larger mist droplets are used. Ideally the coolant should evaporate during cutting.

Adjust the drip rate and lubricant flow by turning the drip regulator on the top of the coolant reservoir. To increase the drip rate, turn the regulator counterclockwise. To decrease the drip rate, turn the regulator clockwise.

CLEANING AND MAINTENANCE

The Router 600 is a sophisticated microprocessor-based system, yet it is relatively simple to operate and service. A committed program of preventative maintenance can significantly reduce the likelihood of major problems.

Router maintenance is based on daily inspection of the equipment and daily and weekly cleaning procedures.

Daily and weekly inspections of the router are recommended to help establish a cleaning schedule appropriate to the environment. Use the charts provided as inspection guidelines.

Daily Inspection

COMPONENT	WHAT TO CHECK FOR
Work table	Chip buildup, mist coolant buildup
End housings assembly	Chips in and around the motor blies
Belt wipers bristles	Chip buildup, worn or missing
X and Y motors	Dirt buildup on gear teeth
End housing pillow bearing seals	Debris and oil buildup
X and Y ways	Chip buildup
X and Y belts	Chip buildup
Router motor carriage linear bearing seals	Debris and oil buildup
Mist coolant nozzle	Coolant buildup
Mist coolant tank	Coolant level

Daily Cleaning

The daily cleaning procedures recommended are based on average use of the Router 600.

Use the daily inspection to help establish a cleaning schedule that is appropriate for the router environment.

WARNING: Before performing ANY cleaning procedure, turn OFF the router and unplug it from its electrical source.

SUPPLIES

The following tools and supplies are recommended for the cleaning procedures:

- Shop vacuum
- Lint-free cloth
- Hand broom
- 1" (25 mm) nylon or natural bristle brush
- 2.5 mm and 4 mm hex wrenches
- Light machine oil (3-in-1® or equivalent)

CAUTION: Do not use shop air to clean the Router 600. Shop air can drive chips into circuitry and cause damage.

Cleaning the AR600

WORK TABLE

Use a hand broom and lint-free cloth to clean the router work table after each operation. Use the hand broom to remove chips from around the router motor and the work table, and the cloth to wipe the table clean.

END HOUSINGS

The two end housings are located at either end of the router table beam. Vacuum the chips from the end housings on a regular basis.

Complete the following steps to clean the end housings (the steps are the same for both end housings):

Note: Clean the X and Y belts before and after cleaning the end housings.

1. Remove the end housing hood by lifting it up and off the housing.
2. With a shop vacuum, carefully remove any chips that may have entered the housing area.
3. Before replacing the end housing hood, determine if the motor gears need cleaning. If not, replace the hood by sliding it back into place.

X AXIS MOTOR GEARS

The X axis motor is located inside the end housing to the left of the router motor. Complete the steps below to clean the X axis motor gear teeth.

1. Unplug the router from its electrical source.
2. Unplug the X motor by removing the X motor connector from its plug on the rear of the electrical cabinet. The X motor connector is clearly labeled and marked with a number on both the electrical cabinet and the connector.
3. Remove the end housing hood by lifting it up and off the housing.
4. Locate the two white gears in the X axis motor.

5. Use a small dry brush to clean the gear teeth. Use the silver damper located on top of the blue motor to turn the gears so that the entire surface on both gears can be cleaned.

6. When finished, replace the end housing hood.

7. Plug in the X motor cable at the rear of the electrical cabinet.

CAUTION: Be sure the X, Y and Z motors are plugged in at the rear of the electrical cabinet before turning ON the router.

Y AXIS MOTOR GEARS

The Y axis motor is located to the right of the router motor. Complete the steps below to clean the gear teeth in the Y axis motor:

Note: There is more circuitry surrounding the Y axis motor than the X axis motor. Use caution when cleaning the gear teeth.

1. Unplug the router from its electrical source.
2. Unplug the Y motor by removing the Y motor connector from its plug on the rear of the electrical cabinet. The Y motor plug is clearly labeled and marked with a number on both the plug and the connector.
3. Remove the end housing hood by lifting it up and off the housing.
4. Locate the white gear on the torque tube.

5. Clean the gear teeth using a small dry brush. Brush the debris out and away from the drive pulley.
6. Reach in and around the gear box to locate the damper.
7. Move the gear by turning the silver damper located on the end of the blue motor so the entire gear surface can be cleaned.

8. When finished, replace the end housing hood.
9. Plug in the Y motor cable at the rear of the electrical cabinet.

CAUTION: Be sure the X, Y and Z motors are plugged in at the rear of the electrical cabinet before turning ON the router.

BELT WIPERS

The belt wipers constantly sweep the Y belts, keeping large chips from entering the end housing. There is no need to remove the wipers to clean them. Clean the wipers by using a shop vacuum to remove any chips.

Always inspect the belt wipers for worn or missing bristles. Occasionally, replacement is required.

REPLACING BELT WIPERS

Follow the steps below to replace a belt wiper.

1. Using a 2.5 mm hex wrench, remove the two screws that hold the belt wiper in place, and remove the old belt wiper.
2. Align the new belt wiper so that the bristles are touching the belt.
3. Replace and fully tighten the two screws that hold the belt wiper in place.

END HOUSING LINEAR BEARING SEALS

1. Locate the linear bearing seals beneath the two end housings (one linear bearing seal on either side of the end housing).
2. Clean the linear bearings by wiping them with a lint-free cloth to remove any debris.

Y WAYS

The Y ways are the rods on which the beam moves. There is one Y way on each side of the work table, running the length of the work table.

1. Locate the Y ways.
2. Clean the Y ways by wiping them with a lint-free cloth.
3. Lightly oil the Y ways with light machine oil (3-in-1 or equivalent).

Y BELTS

Next to each of the Y ways is a belt that is used by the Y axis motor to move the router beam along the Y ways. Although each belt is swept constantly by a belt wiper, regular cleaning is still required.

1. To clean the Y belts, brush away chips and debris that may be clinging to the belts.

X WAYS

Complete these steps to clean the X ways:

1. Locate the two X ways. The X ways are the rods located on the beam on which the router motor carriage moves.
2. Clean the X ways by wiping them with a lint-free cloth.
3. Lightly oil the X ways with light machine oil (3-in-1 or equivalent).

X BELT

Complete these steps to clean the X belt:

1. Locate the X belt between the two X ways.
2. Use a small brush to remove any chips or debris that might be clinging to the belt.
3. Move the carriage to the extreme right and clean. Then move the carriage to the extreme left and clean. This allows more area of the belt to be cleaned that cannot be reached inside the beam.

Note: Clean the belts before and after cleaning the end housings.

ROUTER MOTOR LINEAR BEARING SEALS

Locate the four linear bearings used by the router motor carriage to move along the X ways.

1. Clean the linear bearings by wiping them with a lint-free cloth to remove any debris.

Mist Coolant Tank and Nozzle

The mist coolant system requires two maintenance procedures:

- Checking the mist coolant fluid level
- Cleaning the mist coolant nozzle.

CHECK MIST COOLANT

Regularly check the mist coolant tank to ensure that it contains enough coolant to avoid running out during a job. If the coolant level is low, fill the tank to within 1" (25 mm) of the top of the level indicator. Overfilling may result in leakage from the tank.

CLEAN MIST COOLANT NOZZLE

The mist coolant nozzle, which is blue, is located on the router motor assembly. Complete these steps to clean the mist coolant nozzle:

1. Unscrew the white cap on the end of the nozzle.
2. Use a lint-free cloth to clean the tip of the nozzle.
3. Replace the white cap.

Weekly Inspection

COMPONENT	WHAT TO CHECK FOR
Z Axis ways	Debris buildup
Router motor screen	Chip and coolant buildup
Electrical cabinet air filter	Dirt buildup on filter element

Weekly Cleaning

The weekly cleaning procedures include the following:

- the Z Axis ways
- the router motor chip shield
- the electrical cabinet air filters.

Z AXIS WAYS

1. Locate the Z Axis ways on either side of the router motor.
2. The Z Axis ways may be protected by spring-like metal covers.
3. Lower the router motor to its lowest position by turning the Z Axis adjustment knob.
4. Clean and oil the upper part of the Z Axis ways using a light oil such as 3-in-1. For each way, first slide the metal cover upward and hold it in place.

ROUTER MOTOR CHIP SHIELD

The router motor chip shield is located above the tool assembly. Clean the screen by wiping it with a damp cloth. If there is a noticeable build-up of debris, use a brush to clean the screen.

ELECTRICAL CABINET AIR FILTERS

The air filters help prevent debris from entering the electrical cabinet and ensure clean air circulation, which prevents the electrical cabinet from overheating.

There are two air filters located inside the electrical cabinet. The Air Intake Filter is located on the front panel of the electrical cabinet. The Air Exhaust Filter is located in the rear door of the electrical cabinet. Both filters should be checked and cleaned weekly until a cleaning schedule appropriate for the environment can be established.

WARNING: Before opening the electrical cabinet, always turn it off and unplug it from its electrical source.

Complete the following steps to clean the electrical cabinet air filters:

1. Use a 4 mm hex wrench to open the front door of the electrical cabinet.
2. Make sure the circuit board lights are OFF. If the circuit board lights are ON, wait for them to fade out.

WARNING: Electrical Shock. Do not reach inside the electrical cabinet if the circuit board lights are ON.

3. Reach inside the electrical cabinet and release the Air Intake Filter from its bracket and carefully remove it.
4. Avoid touching any of the electrical cabinet circuitry with the filter as you remove it.
5. The Air Intake Filter is lined with black foam. DO NOT remove the foam from the filter.
6. Use a shop vacuum to clean the filter. Make sure the vacuum is pointed at the black foam so the particles that are lodged in the foam will be forced out.
7. Return the Air Intake Filter to its bracket with the foam side facing the door.
8. Close the cabinet door.
9. Use a 4 mm hex wrench to open the rear door of the electrical cabinet. The Air Exhaust Filter is installed in the door itself. There is no need to remove the Air Exhaust Filter.
10. Use the shop vacuum to clean the filter.
11. Close the cabinet door.
12. Plug in the electrical cabinet and turn ON the power.

Table Surfacing

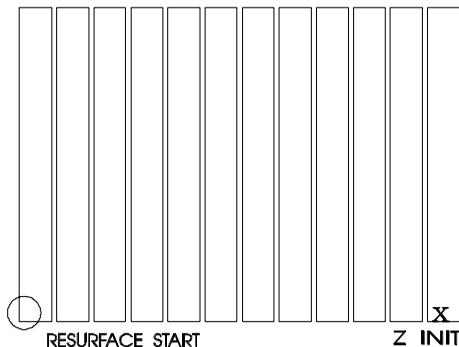
The table of the Router 600 may need to be resurfaced periodically. The frequency of resurfacing depends on how badly the surface is scratched or marred.

The resurfacing process takes about two hours total run time (approximately ten minutes per slat).

Resurfacing Procedure

1. Change the tool to a 1 inch (25 mm) end mill.
2. Perform Z initialization.

Note: It is recommended that Z initialization be performed on the extreme right slat so that if reinitialization is needed during the resurfacing process, the surface will be at the original height rather than the modified height from the resurfacing.



2.

Establish Start Location

3. Slew the machine all the way to the left front.
4. Position the tool so there is a .200 inch (5 mm) overlap extending beyond both edges of the corner on the left front slat as shown in the diagram.

Set Up Job

5. At the GRAPHIX ADVANTAGE, select the output device GAGR3MILL-1 in the Router Select option in Art Path.
6. Open a file called AR600MIL.RTP. If cutlines appear, select the output device again.

Note: A plot file called AR600MIL.RTP in Art Path is available if changes to the size of the table are necessary.

7. Double-click on AR600MIL.RTP. The Current Engraving Info Dialog Box appears.
8. Set the Total Depth to the amount of surface to be removed (depending on the roughness of the table surface).
9. Click on Generate.
10. Click on Output.
11. Click on Rout in the Job Output Dialog Box.
12. After the data is received at the console, the system beeps.
13. Press START to run the job.

Maintain Overlap

14. Check every third slat to ensure that the tool remains lined up correctly.
15. If the overlap is lost, do the following:
 - Press STOP
 - Reposition the tool
 - Press RESET.
16. Return to AR600MIL.RTP in Art Path and delete the completed slats (ones which have been resurfaced).
17. Resend the job from the GRAPHIX ADVANTAGE.
18. At the STOP READY message, press START to run the job.

FEED AND DEPTH PER PASS VALUES

This section lists the **recommended** Feed Rate (in inches per minute) and Depth Per Pass values used with a 1/4" and 1/8" cutter for various materials and thicknesses. With experience, noting the variations in workpiece size, configuration, rigidity of setup, hardness of materials, spindle speed (in revolutions per minute), and desired surface finish, you may discover faster speeds are possible.

You may also decide to change the recommended Depth Per Pass amounts.

Pass	Tool (carbide)	Depth per Pass	Feed Rate (in/min)	Plunge (in/min)
1/4" acrylic, 1/8" tool, multipass				
Basic	1/8"	.126	45	15
Finish	1/8"		40	15
1/4" acrylic, 1/4" tool, single pass				
Basic	1/4"	.250	30	15
1/8" acrylic, 1/8" tool, single pass				
Basic	1/8"	.125	40	15
1/2" PVC, 1/4" tool, multipass				
Basic	1/4"	.251	54	15
Finish	1/4"		54	15
1/2" hardwood, 1/4" "O" flute, multipass				
Basic	1/4"	.210	54	20
Finish	1/4"		54	20
1/8" aluminum, 1/8" tool, single pass				
Basic	1/8"	.135	15	5
1/4" aluminum, 1/8" tool, multipass				
Basic	1/8"	.131	15	5
Finish	1/8"		20	5
1/4" aluminum, 1/4" tool, single pass				
Basic	1/4"	.260	10	5

1/4" aluminum, 1/4" tool, multipass				
Basic	1/4"	.100	30	5
Finish	1/4"		15	5
1/8" brass, 1/8" tool, single pass				
Basic	1/8"	.135	10	4
1/4" brass, 1/4" tool, multipass				
Basic	1/4"	.087	20	5
Finish	1/4"		15	4

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