

TECHNO VISION BASIC USER MANUAL

For Techno Vision
Digital Image Verification System



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DISCONNECT ALL POWER TO THE MACHINE BEFORE ANY HARDWARE INSTALLATION! READ THROUGH THE FOLLOWING MANUAL BEFORE BEGINNING ANY VISION SYSTEM OPERATION.



In this manual all warnings will be visual represented by the triangular symbol with an exclamation point  .



All notes will be visually represented by pointed finger symbol  .

i. TERMS AND CONDITIONS FOR LIMITED WARRANTY AND REPAIRS

Warranty

All Techno mechanical components are warranted against manufacturer's defects in material and workmanship for a period of (1) year from the time of shipment from Techno facilities. All Techno electrical components are similarly warranted for a period of one (1) year from the time of shipment from Techno facilities. Techno's sole obligation under this warranty is limited to repairing the product or, at its option, replacing the product without additional charge, provided the item is properly returned to Techno for repair as described below. The provisions of this warranty shall not apply to any product that has been subjected to tampering, abuse, improper setup or operating conditions, misuse, lack of proper maintenance, or unauthorized user adjustment. Techno makes no warranty that its products are fit for any use or purpose to which they may be put by the customer, whether or not such use or purpose has been disclosed to Techno in specifications or drawings previously or subsequently provided, and whether or not Techno's products are specifically designed and/or manufactured for such a purpose. NOTE: Drive motors (servo or stepper) are considered "mechanical components".

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED. ALL OTHER WARRANTIES, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WHETHER EXPRESSED, IMPLIED, OR ARISING BY OPERATION OF LAW, TRADE USAGE, OR COURSE OF DEALING, ARE HEREBY DISCLAIMED. THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF.

Limitation of Remedy

In no event shall Techno be liable for any incidental, consequential, or special damages of any kind or nature whatsoever. Techno is in no way liable for any lost profits arising from or connected to this agreement or items sold under this agreement, whether alleged to arise from breach of contract, expressed or implied warranty, or in tort, including, without limitation, negligence, failure to warn, or strict liability.

Return Procedure

Before returning any equipment in or out of warranty, the customer must first obtain a return authorization number and packing instructions from Techno. No claim will be allowed nor credit given for products returned without such authorization. Proper packaging and insurance for transportation is solely the customer's responsibility. After approval from Techno, the product should be returned with a statement of the problem and transportation prepaid. If, upon examination, warranted defects exist, the product will be repaired or replaced at no charge, and shipped prepaid back to the customer. Return shipment will be by common carrier (i.e., UPS). If rapid delivery is requested by customer, then such transport is at the customer's expense. If an out-of-warranty situation exists, the customer will be notified of the repair costs immediately. At such time, the customer must issue a purchase order to cover the cost of the repair or authorize the product to be shipped back as is, at the customer's expense. In any case, a restocking charge of 20% will be charged on all items returned to stock.

Field Service

Repairs are ordinarily done at Techno's New Hyde Park, New York facility, where all necessary instrumentation is available. This instrumentation is difficult to transport, so field service is severely limited, and will only be supplied at Techno's discretion. If field service is required and is performed at Techno's sole discretion, all relevant expenses, including transportation, travel time, subsistence costs, and the prevailing cost per hour (eight hour minimum) are the responsibility of the customer.

Unforeseen Circumstances

Techno is not liable for delay or failure to perform any obligations hereunder by reason of circumstances beyond its reasonable control. These circumstances include, but are not limited to, accidents, acts of God, strikes or labor disputes, laws, rules, or regulations of any government or government agency, fires, floods, delays or failures in delivery of carriers or suppliers, shortages of materials, and any other event beyond Techno's control.

Entire Agreement/Governing Law

The terms and conditions contained herein shall constitute the entire agreement concerning the terms and conditions for the limited warranty described hereunder. No oral or other representations are in effect. This Agreement shall be governed in all respects by the laws of New York State. No legal action may be taken by any party more than one (1) year after the date of purchase.

Techno reserves the right to change designs, specifications, prices and any applicable documentation without prior notice.

ii. SOFTWARE LICENSE AGREEMENT

If you agree to these terms and conditions, Techno, Inc. ("TECHNO") grants you a nonexclusive license to use the accompanying software (the "Software") and documentation. The Software and documentation are referred to in this Agreement as "Licensed Materials". If you do not agree with these terms and conditions, then return the Techno Software CD-ROM to Techno.

1. License of Ownership

Title to the Licensed Materials is not transferred to the customer, but is the sole and exclusive property of TECHNO and/or its licensed dealers. The customer is entitled solely to use the Licensed Materials according to the terms and conditions of this Agreement.

2. Grant of License

The terms of this Agreement, set forth by Techno and contingent upon the customer's legally bound acceptance, grants the nonexclusive right to use one copy of the Software on a single computer. Physically transferring the Software from one computer to another is allowed only if the Software is used on one computer at a time. Each computer on a network must have its own separately licensed software.

3. Non Transferable

You may not transfer the program to another party without prior written consent of TECHNO. You may not sublicense, lease, rent, share or otherwise transfer your right to use the Licensed Materials, nor any other rights granted to you under this Agreement, except as stated in this Agreement.

4. Copyright Restrictions

This software is owned by TECHNO and is protected by the United States copyright laws. You may make one copy of the Software for backup purposes and/or to transfer the Software to a single hard disk. You agree not to remove any existing copyright notice from many of the Licensed Materials. You also agree not modify or translate the program or the related documentation without prior written consent of TECHNO.

5. Agreement of Restrictions

You agree to communicate, within reason, the restricted conditions of this Agreement to those persons directly employed, or under the customer's direction and control, that come into contact with the Licensed Materials. You agree to take reasonable steps to ensure that the terms of this Agreement are followed and that no unauthorized copy, publication or distribution of any of the Licensed Materials is made.

6. Compliance

The customer shall notify TECHNO in writing of any unauthorized use in the event that such unauthorized use does not cease.

iii. MINIMUM SYSTEM REQUIREMENTS

- WIN 98/ME/2000/XP (XP Users must download the Service Pack 2)
- Pentium 4 or Equivalent Processor
- 512MB Memory
- Minimum of 3 Available PCI Slots
- Techno Vacuum Hold-down



The installation of the Techno Vision Software is in addition to the Techno G-Code Interface Software. The machine must be completely setup and the Techno G-Code Interface must be installed before beginning the Techno Vision Systems setup and operation.

iv. TECHNO VISION REFERENCE

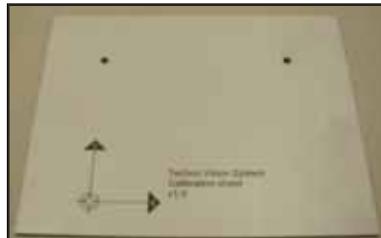


This is a complete manual for the Techno Vision Digital Image Verification System, verify that the parts below were shipped with your order. If you are missing any, contact Techno immediately.

- (1) Monochrome Camera
- (1) Mounting Bracket



- (1) Calibration Sheet



- (1) Firewire Card



- (1) Camera Software



- (1) Techno Vision



I. INSTALL FIREWIRE CARD

Step 1: Shutdown PC and remove side cover. Find an available PCI Card that is not currently in use.



Step 2: Insert Firewire Card into available PCI slot making sure not to force the Firewire Card into the slot incorrectly.



Step 3: Replace PC cover and reconnect power. Windows will automatically find a suitable driver for the Firewire Card. Follow the on screen prompts after Windows detects the "New Hardware."

Step 4: Attach the Firewire Cable from the machine mounted Camera to the Firewire Slot on the PC. Continue on to the next section **II. SOFTWARE (CAMERA) DRIVERS.**

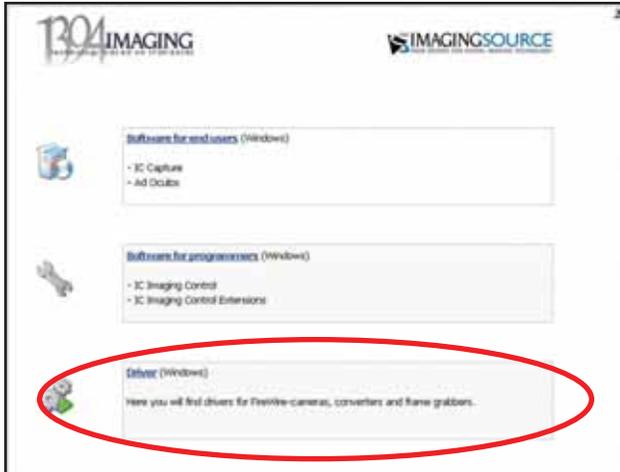


II. SOFTWARE (CAMERA) DRIVERS

INSTALL CAMERA DRIVERS

Step 1: Insert Camera Driver CD, then choose Install Options.

Step 2: Click on the **Driver (Windows)** section and Install the WDM Stream class driver for the imaging source camera driver (blue camera), you will need the License Key that came with the IC Imaging Control 3.0 TIS CD.



Step 3: Return the main menu after following all installation prompts. Click on “Software for Programmers (Windows)” section.



Step 4: Select the section for “.NET component/Active X/C++ Class Library” . Next click on “Install IC Imaging Control Professional” and follow the steps to install the camera controls.



III. INSTALL TECHNO CNC INTERFACE + VISION SOFTWARE

 *Reconnect power, turn your computer on, Windows will detect "New Hardware" upon start-up. Make sure there are no running programs before beginning installation.*

Step 1: Follow the Window's prompts. When asked to "Search" for a suitable driver, insert the Techno CD and choose your computer's CD Drive when asked for "Optional Search Locations."

Step 2: Click on **Setup Techno CNC Interface**. Follow the prompts and change the installation directory if needed.

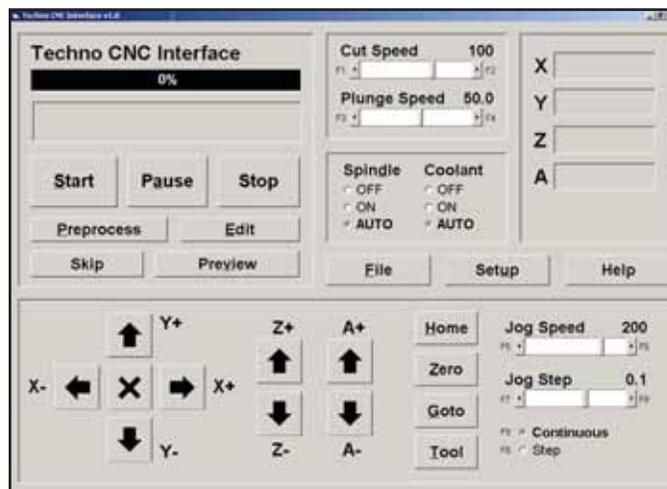


Step 3: Click "OK" once the installation has been completed.

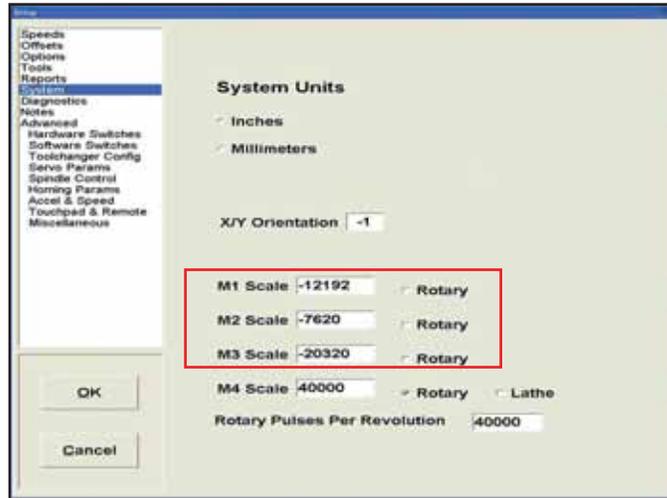
 *KEEP THE TECHNO CD IN A SAFE PLACE, IT CONTAINS ADDITIONAL MANUALS AND DOCUMENTATION (PDF FILES).*

SCALE FACTOR INTERFACE SETUP

Step 4: Start the Techno CNC Interface.



Step 5: From the Main Menu, go to **Setup / Systems**. Input the numbers printed on the Scale Factor Sticker located on the front leg of the machine. There will be three numbers, M1, M2, and M3. Click OK to save changes.

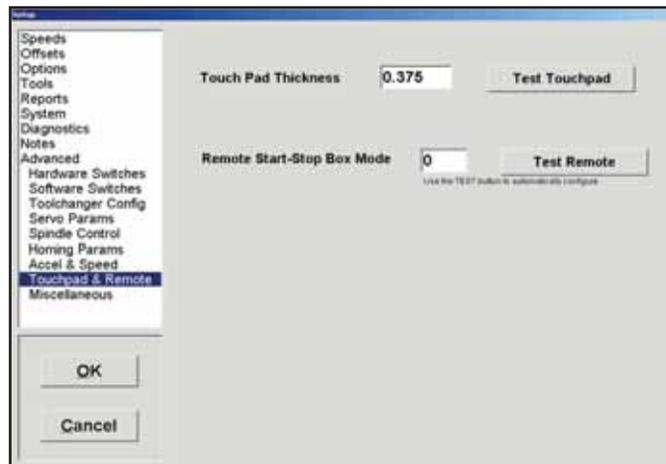
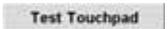


 Make sure to type the numbers exactly how they appear on the sticker including any negative values (i.e. -20320). If the values are not written on the front leg of your TECHNO CNC ROUTER then the interface default values should apply.

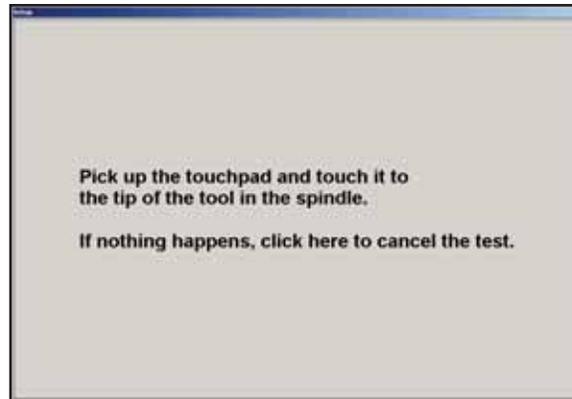
TOUCHPAD INTERFACE SETTINGS

 The settings for the Touchpad need to be tested and/or configured in the Techno CNC Interface prior to using the machine.

Step 6: From the Main Menu go to **Setup / Advanced / Touchpad & Remote**, click on



The message in the following screen capture should then appear. Follow the prompts.



 If the "Test Passed" screen appears, click "OK", the test has indicated that the Touchpad is functioning properly. Click "OK" in the Setup to exit.

 If the test failed (nothing happened), click in the area where indicated "Click Here" on the screen. The "Test Cancelled" screen should appear. Click "OK" in the "Test Cancelled" screen.

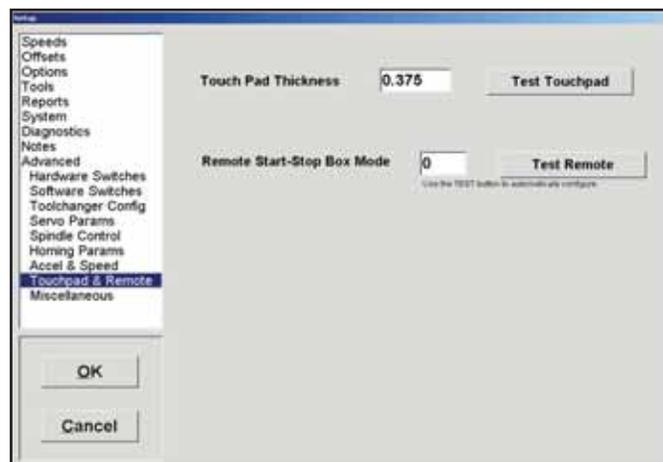
Step 7: Repeat the test again. If it fails:

1. Turn the power off.
2. Check the connections.
3. Call Tech-Support for further assistance.

E-STOP START/STOP BOX INTERFACE SETTINGS

 The settings for the E-Stop Start/Stop Box need to be entered and/or configured in the Techno CNC Interface prior to using the machine.

Step 8: From the Main Menu go to **Setup / Advanced / Touchpad & Remote**, click on



Step 9: Press the "Start" button on your remote E-Stop Start/Stop Box.



Step 10: Press the "Pause" button on your remote Start Stop Box.



 *If the test passes, you should get the message: "Remote test passed".*

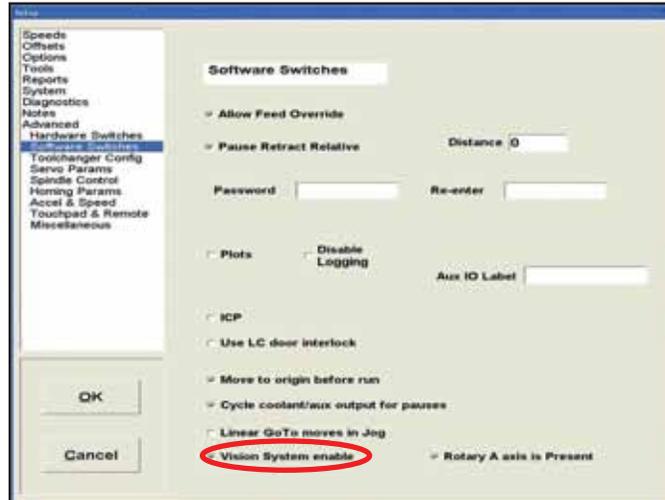


Step 11: Repeat the test again. If it fails:

1. Turn the power off.
2. Check the connections.
3. Call Tech-Support for further assistance.

ENABLING TECHNO VISION SYSTEM

Step 12: In the Main Menu, go to *Setup/Advanced/Software Switches*. Click the check box next to *Vision System Enable*. Continue to the next section, **IV. CALIBRATION OF CAMERA**.

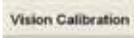


IV. CALIBRATION OF CAMERA

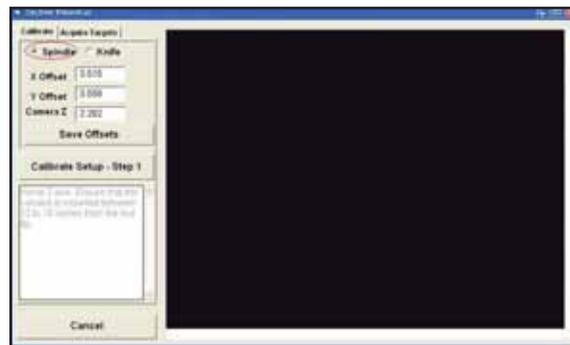
 Make sure the Vision Camera is connected to the computer.

Step 1: Open the Techno CNC Interface + Vision System program and select the correct Video Capture Device.



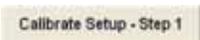
Step 2: Through the Techno CNC Interface, home all the axes and click .

 If the Vision Calibration Button is not visible on the screen, go to **Setup/Software Switches** and check the box next to Vision System Enable.

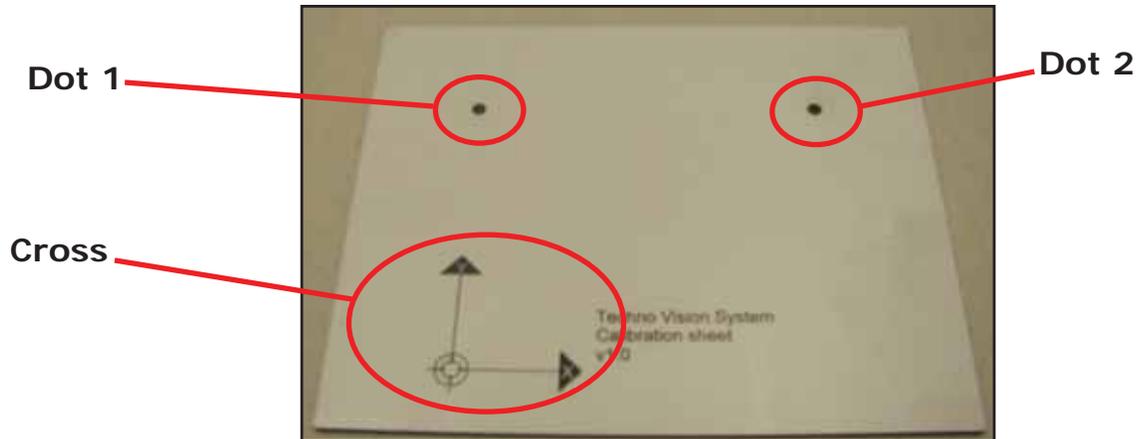


Step 3: Select the  **Spindle** option under **Calibrate**.

Step 4: Minimize the interface so that you can view both the Calibration Setup screen and the G-Code Interface screen on your desktop at the same time.

Step 5: In the Techno CNC Interface + Vision System screen click . Now the z-axis will home, click "Yes" when prompted.

Step 6: Place the Camera over the first dot of the calibration sheet by jogging the x- and y-axes through the CNC Interface. Click OK and .



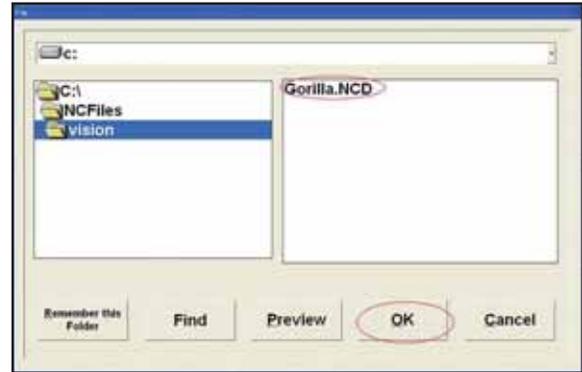
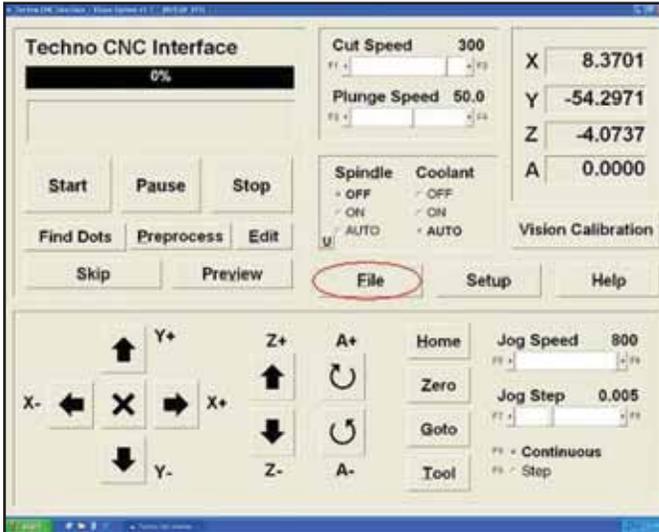
Step 7: Position the camera over the second dot as in Step 6. Click "OK" and .

Step 8: Position the tool tip over the cross using the "Step" function, getting as close to the paper as possible. Click .

Step 9: Follow the prompt, click OK. Continue on to the next section of this user manual: **V. RUNNING A G-CODE FILE.**

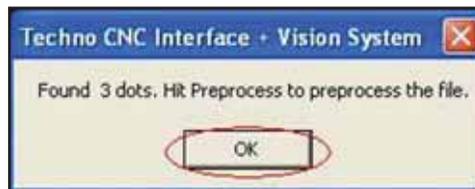
V. RUNNING A G-CODE FILE

Step 1: Go to **File** in the Techno CNC Interface and choose the desired file that is going to be cut. Click "OK" when information extraction of file is complete.

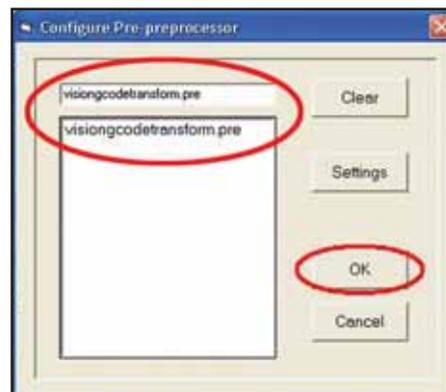


 The file you choose to cut must contain the proper Vision Markers (T99). Ensure that the spindle options are selected appropriately in the Vision Calibration tab.

Step 2: Set the Origin of the Spindle according to your drawing. Select **Find Dots** and the Camera should locate all three dots automatically. Click "OK" when all three are found.



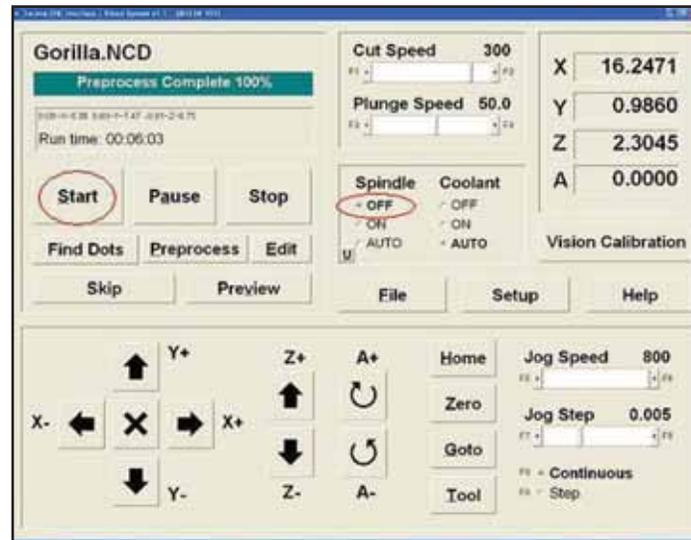
Step 3: Hold **Preprocess** down (CNC Interface Main Menu) for about 30 seconds, and a new pop-up window should appear. Double-click on "visioncodetransform.pre" making sure this file appears in the text box, click "OK".



 You will only have to perform Step 3 once. The "visioncodetransform.pre" preprocessor will remain selected until you remove it.

Step 4: Select **Preprocess** again, this time not holding it down, and pre-process the G-Code file.

Step 5: Select **Start** and the pre-processed file should run.



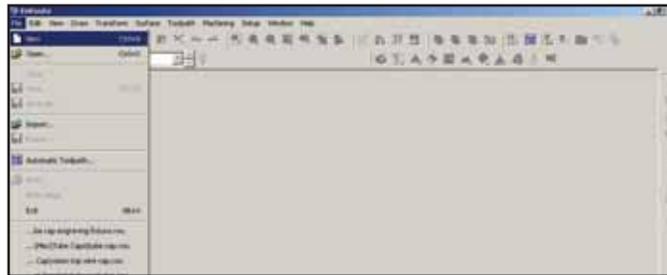
APPENDIX A - SETTING UP ENROUTE

Before beginning the EnRoute setup, you must perform the following tasks:

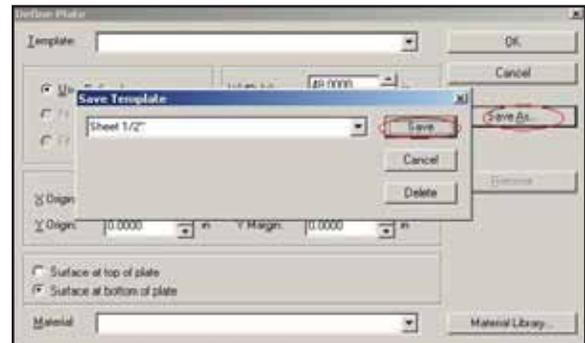
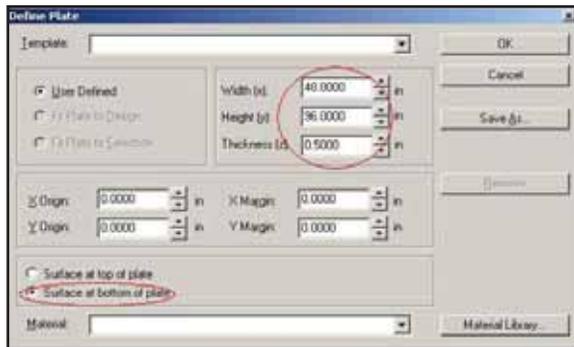
- 1) Copy Enroute3_G.exe into the Enroute3 Folder
- 2) Copy Techno.ini into the Enroute3\pt folder
- 3) Copy Techno_G.enf and Techno_G.dll into the Enroute3\Ndrivers
- 4) Create a shortcut on your desktop to start Enroute3_d.exe

Setting Up User Defined Preferences

Step 1: Begin Enroute 3 Software, **New File / Define Plate** should appear.



Step 2: Select **User Defined / Surface at bottom of plate**, then enter the appropriate size output of the application. Save this as Template 1.



The maximum output can be no larger than the length of the routers table.

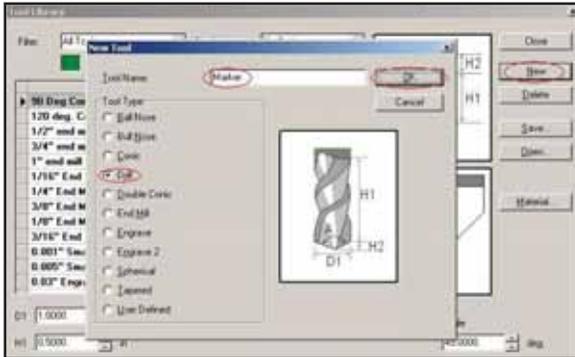
Ex.) An LC Series 4896 would have the maximum table size as 96 inches.

Step 3: Go to **Setup / Preferences / Units**. Select Inches/Seconds, and Inches/Minute, click "OK".



Setting Tool Preferences

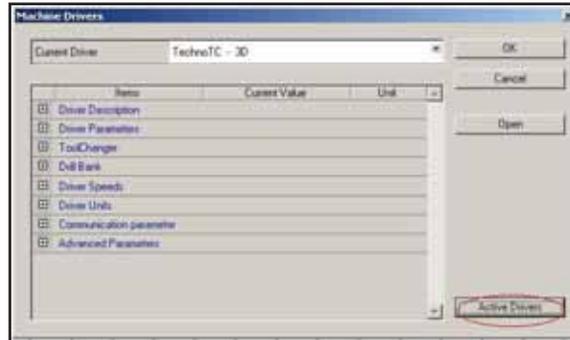
Step 4: Go to **Setup / Tool Library**. Select "New", then select "Tool Type"; drill and name the new drill "Marker". Change the D1 (diameter of the drill bit) to .03 and save all updates.



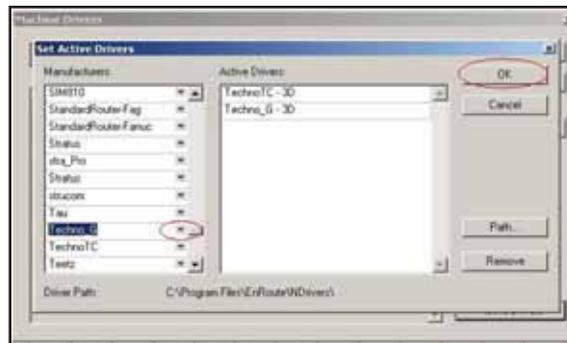
Setting Active Drivers

Step 5: Go to **Setup / Machine Drivers** and select **Active Drivers**.

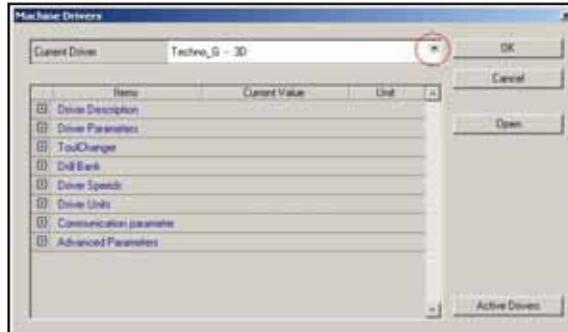
 If the Active Drivers do not appear you must close EnRoute and recopy the appropriate files.



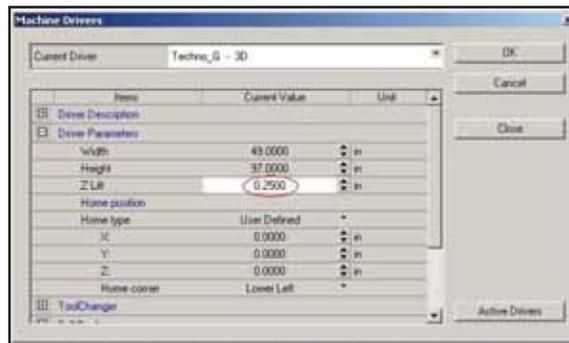
Step 6: Double-click the *Techno_All-3D* from the **Manufacturers Menu**; it should now appear under Active Drivers, click "OK".



Step 7: Set the Current Driver to the New Techno_All-3D, chosen in STEP 6.

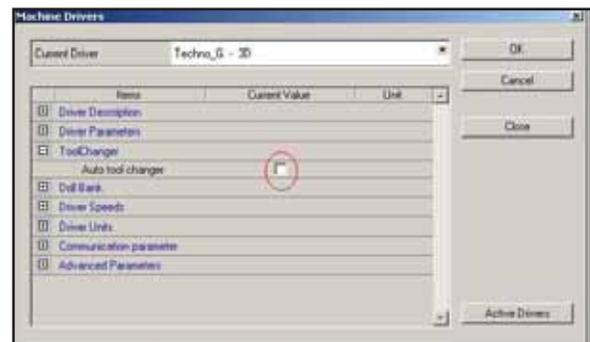
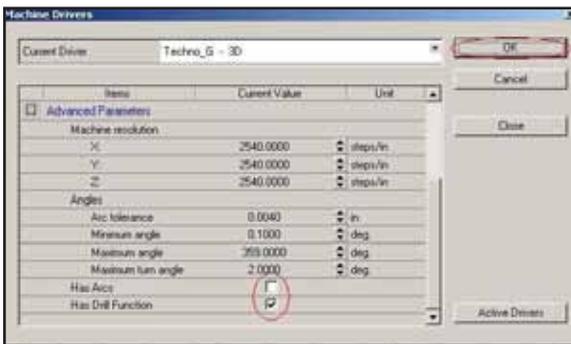


Step 8: Under **Driver Parameters**, set the Z-axis lift to a small value, such as .2500. Turn off the Auto Tool Changer option (under **Tool Changer**).



Step 9: In **Driver Units**, set the proper units for length-inches, speed-inches/minute and time-inches/second.

Step 10: Lastly, set **Advanced Parameters** so that the Has Arcs function is OFF, and Has Drill Function is On. Click "OK".



Step 11: Exit Enroute and restart the program.

 *Techno_TC-3D will have to be selected as the current driver before you can output any "Non-Vision" files.*

APPENDIX B - CREATING A FILE IN ENROUTE

 You must have three registration points within your graphic file. If you have less than three, or three registration points that are not 1/4 of an inch in diameter, you will not be able to cut the graphic. Additionally, each point should be placed 1 1/2 inches away from any artwork, picture and page borders.

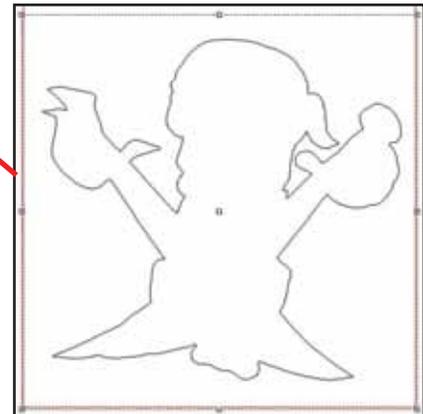
Step 1: Begin Enroute 3 and open a new document. The program will now ask for a plate. Select the Template 1 you created in Appendix A.



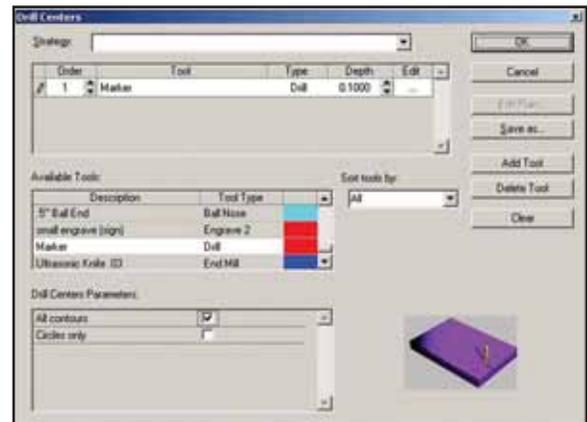
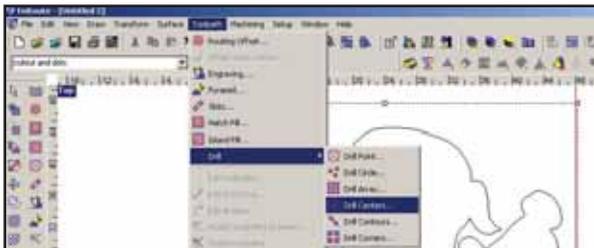
Step 2: Import the appropriate graphics file you will be using through **File / Import**. Select all three registration points surrounding the graphic you will be cutting.



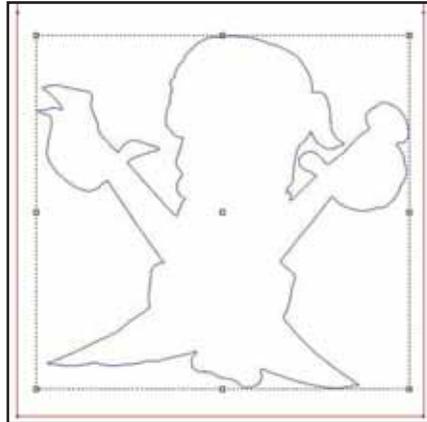
Sample Graphic



Step 3: Go to **Toolpath / Drill / DrillCenters**, select the Marker Tool and click the "Add Tool", set the **Parameters** and then click "OK".

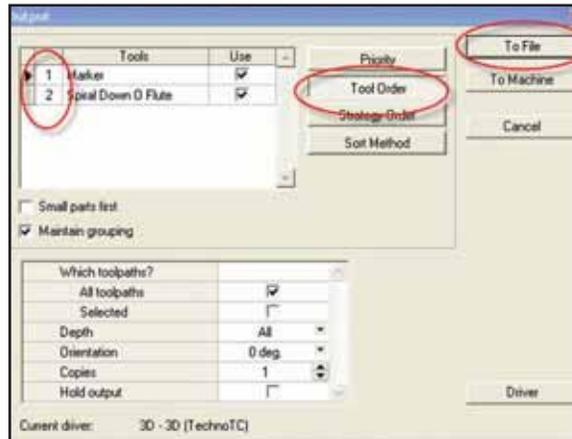


Step 4: Now select the outline of your graphic. Go to **Toolpath / RoutingOffset**.



 *The depth should be equal to the plate thickness defined earlier.*

Step 5: Select all toolpaths to be output, go to **Machining / Output** and click on the "To File" button.



 *This will save your toolpaths as a ".nc" file and will be the G-Code file you will run in the Techno CNC + Vision Interface to cut your application. (Refer to Section V. **RUNNING A G-CODE FILE.**)*