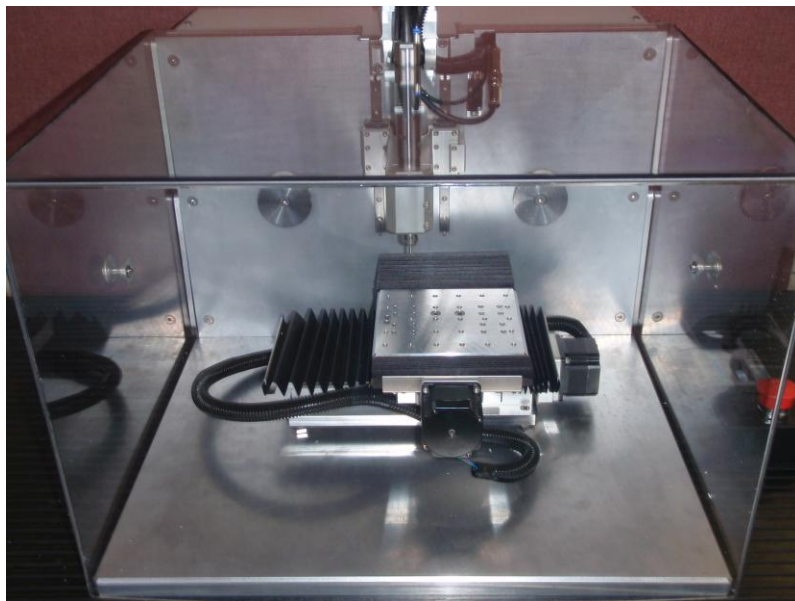


Treat Enterprises, Inc. Presents



**Precision CNC Micro Milling &
Drilling Centers**

Model E-Machine



User & Technical Manual



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1. ABOUT THIS MANUAL

What you will find:

OPERATION

All the information necessary to safely and predictably operate the system is included in this manual. Operators should be familiar with the information in this manual before operating the system.

INSTALLATION

Detailed installation procedures for the system and its accessories, including power and space requirements.

SAFETY

The proper and safe operation of this machine, safety tips and safety systems are included in this manual.

MAINTENANCE

Maintenance and Adjustment sections are included for ease of maintenance and periodic adjustment scheduling.

TROUBLESHOOTING

A troubleshooting section is included. This section is limited to simple checks and fixes an operator can make. Any troubleshooting activities beyond those listed in this section should not be attempted without input from a Treat Enterprises, Inc. representative.

RECOMMENDED SPARE PARTS

A recommended spare parts list is included. Stocking these parts at your facility may reduce downtime.



NOTICE

OPERATORS MUST READ THE SAFETY TIPS AND WARNINGS CONTAINED IN THESE BOXES. EACH WILL BE ACCOMPANIED BY ONE OF THE FOLLOWING HEADINGS:

DANGER

THIS HEADING INDICATES AN IMMINENTLY HAZARDOUS SITUATION THAT, IF NOT AVOIDED, WILL RESULT IN DEATH OR SEVERE INJURY.

WARNING

THIS HEADING INDICATES A POTENTIALLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN DEATH OR SEVERE INJURY.

CAUTION

THIS HEADING INDICATES A POTENTIALLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN MODERATE OR MINOR INJURY

CAUTION

THIS HEADING INDICATES A POTENTIALLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN PROPERTY DAMAGE.

NOTICE

THIS HEADING INDICATES A HELPFUL TIP.

1.1 Definition of Terms

The following words and phrases may be a part of the language used at your facility. If a word or phrase is not familiar to the reader, its definition should be found here.

Base: The aluminum plate, to which the CNC and its safety enclosure are attached.

VEF: Video Edge Finder

PIC: Process Inspection Camera

FlashCut™: The CNC Controller, made by FlashCut™ CNC, Inc.

CAUTION

USING CNC MACHINERY REQUIRES KNOWLEDGE AND EXPERIENCE! TO USE A CNC MACHINE, YOU MUST KNOW HOW TO USE IT AND UNDERSTAND G-CODE CNC SOFTWARE. MISUSE VOIDS THE WARRANTY!



2. INTRODUCTION

Thank You for Purchasing the Cameron CNC Micro Milling & Drilling Center Model E-Machine

Cameron CNC Micro Milling & Drilling Centers are ultra-precision small-hole drilling and drilling/milling machines with speeds up to 30,000 rpm

You will appreciate the ultra-precision and easy operation of Cameron CNC Micro Milling & Drilling Centers.

The Cameron Product Line was designed with all the critical areas of drilling and milling center performance:

- **Rigidity** (sturdy gussets and plates support the X-Y table and spindle head)
- **Concentricity** (of spindle rotation with related parts)
- **Parallelism** (all parallel planes are precisely aligned and mounted to remain so)
- **'Squareness'** (the X-Y table and spindle positions are absolutely square to each other, providing precise performance).

Our goal is to produce affordable systems with unequaled quality and precision.

All Models of Cameron CNC Micro Milling & Drilling Centers have incorporated in them unique features to meet or exceed the many varied applications of our Customers.



Manufactured with pride in the USA since 1964.

50 years of Successful Small Hole Drilling!

2.1 Key Features

2.1.1 Model E-Machine Micro Drilling Center

- ⇨ X, Y & Z Axis travel: X=6" Y=4" Z=4"
- ⇨ Axis repeatability is 0.0005" (0.0127mm)
- ⇨ 30,000 RPM
- ⇨ Up to 30 IPM feed rates
- ⇨ **FLASHCUT CNC**™ G-Code Software
- ⇨ NEMA 23 Stepper Motors for Each Axis
- ⇨ 125W Brushless DC Motor on Spindle
- ⇨ Spindle run-out within 1 UM
- ⇨ Linear Guide Rails
- ⇨ Acme thread .0625" Pitch Lead Screw
- ⇨ Precision Collet System with 1/8" Collet standard (1mm to 6mm in increments of .1mm, and also 1/4" (.250"))
- ⇨ Safety Enclosure with a 2" dia. Vacuum Nozzle

2.2 Optional Equipment & Accessories

The optional equipment listed below may be purchased for any Cameron CNC System.

2.2.1 - VEF 100

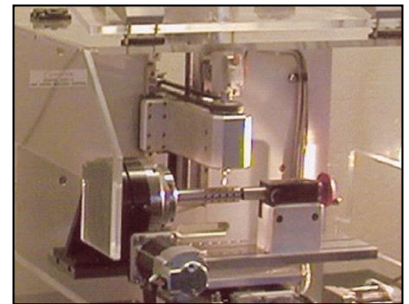
Video Edge Finder with Cross Hair Generator

The VEF-100 is recommended for tool setup and is the perfect instrument for monitoring milling and drilling processes and for dimensional verification.



2.2.2 - Fourth Axis

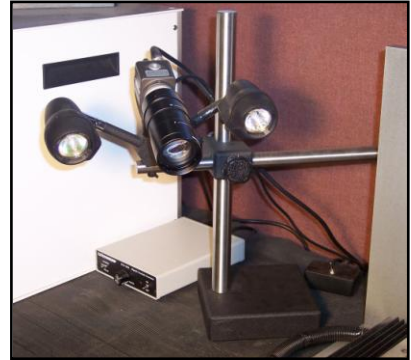
With tailstock, right angle bracket, base plate, fixtures, mounting, motor and drive.



2.2.3 - Process Inspection Camera

Camera, Monitor & Light System – Light System 6" to Infinity, The video camera is a 1/3" Interline Color CCD with 480 Line Resolution camera (768h x 494v).

It has a 'CS' or 'C' adapter Lens Mount System. At approximately 10" from the object the lens has a magnification range of approximately 5.5x to 62x on our 17" monitor. The lamps are a 12V, 12W Halogen.



2.2.4 - Powder Coated Worktable

With Shelf -1" x 2" x .095" Tubular Steel, 5" Casters with Brake and Rubber Matting – Perfect for supporting the Cameron or any CNC system.

2.2.5 - Granite Base

Place under the CNC machine to keep it flat and square. It is 24" x 36" x 4" and the flatness is +/- .0003.

2.2.6 - Micro Spray System (Spray Mister)

A system that delivers fluid that is accurate, measurable and has an automatic variable fluid to air ratio. Includes magnets for regulator and positioner, 110VAC solenoid and programmable electrical circuit allow for control by the program M-codes.



3. INSTALLATION

The **Cameron CNC Micro Milling & Drilling Center** is a stand-alone system requiring only connection to the proper power and air for operation.

CAUTION

USING CNC MACHINERY REQUIRES KNOWLEDGE AND EXPERIENCE! TO USE A CNC MACHINE, YOU MUST KNOW HOW TO USE IT AND UNDERSTAND G-CODE CNC SOFTWARE. MISUSE VOIDS THE WARRANTY!

3.1 Electrical Requirements

Nominal 110 VAC, 50-60 HZ @ 5 Amperes. A power transformer will be required where 240V is used.

WARNING

ALWAYS CONNECT THE POWER CABLE TO THE MACHINE FIRST! DO NOT CONNECT THE POWER CABLE TO ANY POWER SOURCE UNTIL THE MACHINE IS IN ITS FINAL LOCATION, ALL COVERS ARE CLOSED AND ALL OTHER CONNECTIONS HAVE BEEN MADE!

3.2 Dimensions

E-Machine

Width: 22"

Depth: 24"

Height: 20"

Weight: Approx 120 lbs

The Cameron CNC Micro Milling & Drilling Center is designed for use in nearly any dry environment. We recommend that you use our optional Powder Coated Mobile Workstation as a home for the Press.

Cameron CNC Micro Milling & Drilling Centers are designed and constructed to function in various manufacturing atmospheres. These are precisely calibrated pieces of equipment. Please try to avoid rough handling when moving and installing the machine.

Use the following procedure to install the Cameron CNC Micro Milling &



Drilling Center.

3.3 Uncrating the System

Rest assured your system has been packaged as safely and reasonably as is possible. We expect the system to be received without damage to it or any of its parts.

All Cameron equipment is shipped F.O.B. (Freight on Board) Sonora (our shipping dock).

If upon receipt of your crate(s) you see that there has been damage, such that you fear the contents may have been damaged, immediately inform the shipper. They are responsible for bringing the system safely to you.

Please use caution when uncrating the system. At least two people should be involved, as one person may not be able to handle the weight and size of the system.

3.4 Moving the Machine

The **Cameron CNC Micro Milling & Drilling Center** is separated into a few modules and can be handled by two persons with average lifting capabilities.

Keep the machine upright and set it down gently on its workbench. We recommend using the Cameron **Powder Coated Mobile Workstation**.

Here are some simple moving tips:

- ✓ At least two persons with average lifting capabilities are required to move the equipment
- ✓ **Do not** tip or jar the equipment
- ✓ **Do not** drop the equipment
- ✓ **Do not** lift the system by its covers or motors. Lift only from the bottom plate

CAUTION

WATCH YOUR FINGERS! WHEN SETTING THE CNC DOWN ON ITS BENCH, MAKE SURE YOU DO NOT SET THE MACHINE ON YOUR FINGERS! ALTHOUGH THE UNIT IS NOT HEAVY ENOUGH TO CAUSE DAMAGE TO YOU, IT MAY CAUSE PAIN IF LOWERED ONTO A FINGER OR HAND.

- ✓ **Do not** open crate in a dusty or moist place.
- ✓ Inspect the equipment immediately for obvious damage from

shipping.

- ✓ Be sure the table or bench is sturdy enough to hold the CNC (120lbs).

3.5 Wire Numbering List for E-machine

All Power cords plug to a power strip for on/off operation

USB plug into a computer

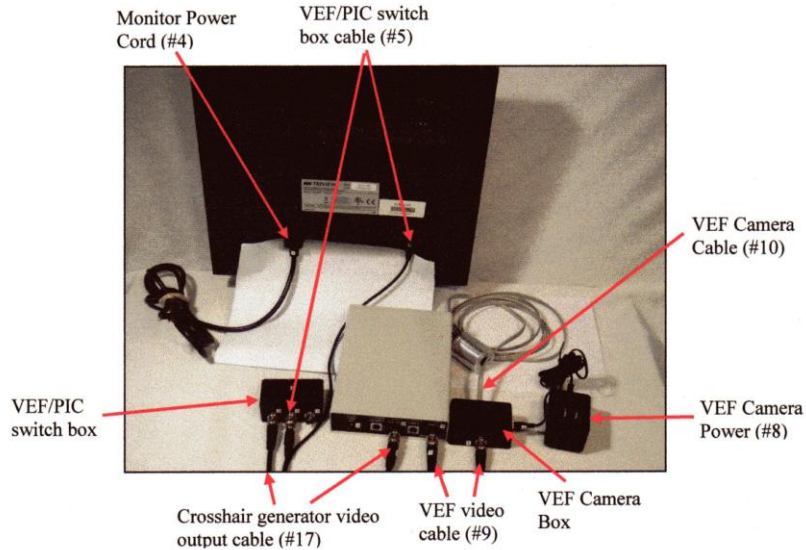
Spindle controlled manually – see Spindle Control Manual

Spray Mister controlled manually – see Spray Mister manual

VEF/PIC controlled manually

3.6 Set-up Procedure

1. **Please read the manual for complete operating instructions before operating your Cameron CNC Center.**
2. Remove the CNC Machine from the carton. Place the CNC Machine on a sturdy, level surface.
3. Plug CNC power source into power strip. Turn Power Strip on.
4. For units with the PIC:
5. Remove the Process Inspection Camera from its carton.
6. Assemble the camera.
7. Connect the video cable (#7) for the process inspection camera to the VEF/PIC switch box.
8. Connect the video cable (#5) from the VEF/PIC switch box to the monitor.
9. Connect the power supply (#6) to the PIC. Plug the power supply into the Power Strip. If you want to prolong the life of the camera, only plug it in when needed.
10. To see images from the Process Inspection Camera, switch the VEF/PIC switch box to ‘PIC’.



11. For units with the VEF/Crosshair Generator:

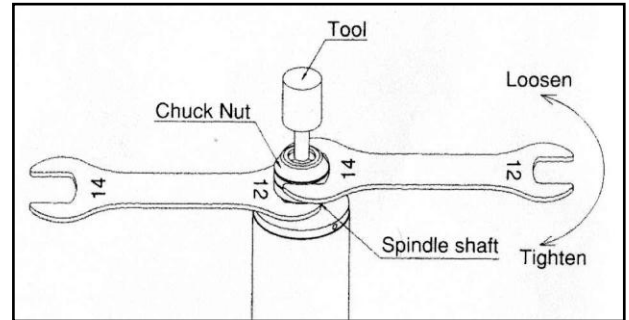
- a) Remove the Crosshair Generator from its carton.
- b) Connect the video cable (#5) from the VEF/PIC switch box to the monitor.
- c) Connect the VEF camera cable (#10) to the Crosshair Generator.
- d) Connect the video cable (#9) to the VEF camera power/signal box to the crosshair generator.
- e) Connect the power supply (#8) to the VEF camera power/signal box.
- f) Plug the power supply into the Power Strip.
- g) Connect the crosshair generator video output cable (#17) to the VEF/PIC switch box.
- h) Plug the power supply into the Power Strip. To prolong the VEF Camera life, only plug in when needed.
- i) Turn the crosshair generator on. To see images from the VEF/Crosshair generator, switch the VEF/PIC switch box to 'VEF'. For more instructions on operating the VEF camera system, please refer to your manual.

12. For units with the spray mister:

- a) Connect an air supply to the spray mister unit and it will be operated manually using the on/off valve on the spray mister unit. See manufacturer's instructions.

3.8 Changing Tools

1. Set the 12mm wrench on the spindle.
2. Place the 14mm wrench on the chuck nut and turn it counterclockwise to loosen the collet and remove the cutting tool. (The first turn will loosen the chuck nut, but the tool will not release and turning will become stiff.)
3. Insert the new tool and tighten the collet by turning clockwise.



CAUTION

NEVER TIGHTEN THE COLLET WITHOUT MOUNTING A CUTTING TOOL AS THIS WILL RESULT IN DAMAGE TO THE COLLET, SPINDLE AND COLLET NUT AND MAKE IT IMPOSSIBLE TO REMOVE THE COLLET. THIS ALSO VOIDS THE MANUFACTURER'S WARRANTY

3.12 Mounting the Work Piece

1. Your CNC may have been delivered with a work piece-mounting fixture, which has been installed on the standard mounting plate. Refer to the System Specification Sheet supplied with your system for details.
2. If your system does not have a custom-built plate, the standard mounting plate is installed. The standard plate is 5.5" x 6" and is equipped with 10-32 tapped holes on 1" centers (where there is no interference).
3. Your mounting fixture should be made to adapt to this hole pattern.

CAUTION

NEVER LOOSEN THE BOLTS HOLDING THE MODULES TOGETHER AND TO THE BASE PLATE. THIS MAY CAUSE THE SYSTEM TO BECOME MISALIGNED. LOOSENING THE BOLTS VOIDS THE WARRANTY!

CAUTION

4TH AXIS SAFETY PRECAUTIONS

WHEN SETTING UP THE 4TH AXIS UNIT, CARE MUST BE TAKEN TO SET IT SO THE MOTOR WILL NOT CONTACT THE SAFETY COVER WHEN THE X-Y

TABLE IS MOVED TO THE RIGHT (THE HOME END OF THE X AXIS) OR IN THE NEGATIVE DIRECTION. THE SAFETY COVER FRONT DOOR HAS A SLOT TO PROTRUDE OUTSIDE THE SAFETY DOOR.

WHEN SETTING UP THE 4TH AXIS, MOVE THE X AXIS TO ITS FAR RIGHT (HOME) BEFORE ATTACHING THE 4TH AXIS TO THE CNC TABLE TOP. SET THE 4TH AXIS TO ALLOW THE SPINDLE HEAD TO CLEAR THE 4TH AXIS CHUCK DURING PART MACHINING. THIS WILL ENSURE THAT THE MOTOR WILL NOT CONTACT THE SAFETY COVER DOOR DURING ANY MACHINE TRAVEL.

4. OPERATIONAL SET-UP

The following sections explain how to safely set the system up for operation.

4.1 Safety Precautions

The first and most critical step toward the safe and efficient operation of this or any other piece of equipment is to **READ AND UNDERSTAND ALL SECTIONS OF THIS MANUAL** prior to operating the equipment.

We know you plan to follow all of the safety precautions required by the machine's owner as well as state, federal and local codes. In addition to the rules of **common sense** the following safety rules should also be known:

- ⊗ **Keep extremities**, hair, clothing, jewelry or other personal items that may get caught up in the moving parts of the machine away from those parts whenever the machine is running.
- ⊗ **Long hair should be tied back while operating or standing close to an operating machine.**
- ⊗ **Do not wear loose clothing** or dangling jewelry while operating or standing close to an operating machine.
- ⊗ **Do not** insert any object, other than the material for which the machine was constructed to process, into the machine at any point.
- ⊗ The machine must **never be operated** with safety covers removed.
- ⊗ Even though machine power is switched OFF, dangerous voltages are still present within the control enclosure.

- ⊗ **Disconnect the machine from the AC power line prior to removing any cover! The law and common sense dictate that this machine must be de-energized prior to maintenance or repair. Keep the line cord under your control after disconnection.**

4.2 Safety Features

The **Cameron CNC Micro Milling & Drilling Center** has the following built-in safety features:

4.2.1 Safety Covers

Panels through which access to electrical dangers are possible can only be opened with a tool.

An acrylic safety shield is provided around the drill center for protection of the operator.

The CNC shield has hinged access panels, which do not shut the system down when opened.

WARNING

NEVER OPEN THE ACCESS DOORS WHILE THE CNC IS IN OPERATION! WITHIN THE SAFETY COVER ARE PINCH POINTS, CUTTING POINTS AND ELECTRICAL HAZARDS. ALWAYS SHUT DOWN POWER TO THE ENTIRE SYSTEM PRIOR TO ACCESSING THE CNC'S INTERIOR.

4.2.2 EPO (Emergency Power Off) Switch

A Red EPO switch is located on the Spindle Control Box. It may be pushed in to immediately stop the X, Y, & Z motors from moving.

WARNING

PUSHING IN THE EPO BUTTON DOES NOT REMOVE POWER FROM THE ENTIRE SYSTEM. THERE IS STILL ELECTRICAL POWER INSIDE THE CONTROL ENCLOSURE AND THE CNC AFTER THE EPO IS ACTIVATED.

4.3 Preparing the FlashCut™ Controller & Start-up

If you have questions about the FlashCut™ Software, refer to the



manual(s) included or call FlashCut's™ Technical Service at:

Phone: (847) 940-9305 (9am to 5pm, CST, M-F)

Fax: (847) 940-9315

Email: support@flashcutcnc.com

Web site: www.flashcut.com

The following procedure is for setting up and starting operation on the **Cameron CNC Micro Milling & Drilling Center** and FlashCut™ Controller. Assuming you have made all the proper connections, mounted the work piece and bit, and power is available throughout the system (including the light, camera and monitor), you may begin the process of preparing the FlashCut™ controller for operation.

Use this sequence to set up the FlashCut™ Program:

- Step 1 For E-Machine, turn power strip on and check that e-stop is pulled up.
- Step 2 If the system has not yet opened the FlashCut™ program; simply select the appropriate icon on the desktop window of the computer.

Here you will be asked certain questions in pop-up windows:
Q.1 Reset to Previous values? Answer YES.
Q.2 Do you accept the safety message? Answer YES.
(After you have read and understand the message!)
- Step 3 Ensure that the computer is “online” or “connected” with the drilling system. If it is offline, go online, or the system will not respond.
- Step 4 Set the tool offset. Select file tab on top of screen. Select open G code tab, find the file you wish to run, select it and click open tab. Select the G code tab, and select the start tab.
- Step 5 Select the Start key again. The program will begin and, assuming you have loaded the work piece correctly, start drilling or milling.
- Step 6 Make a Test Run without the Drill Bit or Milling Cutter

4.4 Using the FlashCut™ Software

If you have purchased a pre-programmed and pre-set system from Treat Enterprises, a program readout and disc are included elsewhere in this binder. There should be no need for any reprogramming on your part. However, once you have powered up the laptop and accessed the FlashCut™ software, you can perform certain tasks from the main screen, which will not affect the program, but may be useful to the operator.

A copy of the manuals provided by FlashCut™ software and hardware can be found on the laptop computer sent with the unit. Please read that manual prior to attempting any process, other than those described in the previous section and the few functions listed below. You will not be able to use these functions while the machine is in the middle of a process run. You will need to stop the current process.

Jog: The Jog function allows the user to move the X-Y-Z Plate in any direction, in pre-set increments. When you select the Jog key, a window will open allowing this function. The screen has a display showing you the position of the X-Y table at all times.

Point to Point: The Point to Point function allows the user to move the base from one specific, precise position to another. When you select the Point-to-Point key, a window will open allowing this function.

Home: The Home function allows the user to move the base to the programmed Home position. When you select the Home key, a window will open allowing this function.

Aux: The Aux function allows the user to turn auxiliary devices (such as the Spindle Motor) on or off. When you select the Aux key, a window will open, showing the auxiliary devices controlled here and allowing this function. Not applicable to the E-Machine as shipped.

4.5 Operating the CNC

CAUTION

USING CNC MACHINERY REQUIRES KNOWLEDGE AND EXPERIENCE! TO USE ANY CAMERON CNC MACHINE, YOU MUST KNOW HOW TO OPERATE A CNC AND UNDERSTAND G-CODE CNC SOFTWARE. MISUSE VOIDS THE WARRANTY!

DO NOT USE FLOOD COOLANT METHODS ON THE CNC. NEVER GET COOLANT ON ANY MOTOR! WE RECOMMEND USING A LIGHT SPRAY COOLANT OR AIR COOLING.

Assuming you have mounted the correct work piece properly, the program is written and ready for use and the proper drill bit or cutter is installed, you may proceed to process parts.

Simply select the Start key on the main FlashCut™ screen on the laptop. Refer to the FlashCut™ manual provided with the system for more information about using that program.

4.6 Work Piece Change out

If the work piece-mounting fixture was designed and built at the factory, refer to the System Specification Sheet for information.

WARNING

ALWAYS SHUT DOWN THE POWER TO THE MACHINE FIRST! DO NOT ATTEMPT TO REMOVE OR INSTALL A WORK PIECE WITH POWER ON!

4.7 Shutdown

When you have finished the job at hand, shutting down the system is simple. When the job cleanup tasks are complete, according to the rules of your facility, we recommend the following machine-specific cleanup and maintenance.

Step 1 Check all lead screws for mineral oil and re-apply if required.

NOTICE

WE RECOMMEND THAT YOU SET THE COMPUTER TO THE ‘OFFLINE’ STATE PRIOR TO PUTTING THE LAPTOP IN SLEEP MODE. THIS FORCES THE NEXT USER TO GO ‘ONLINE’ AT THE NEXT START UP. GOING ONLINE AT EACH POWER-UP ENSURES A PROPER CONNECTION TO THE DRILL.

Step 2 Close the Laptop to place it into sleep mode.

CAUTION
LEAVING THE VEF 100 ON FOR AN EXTENDED PERIOD OF TIME CAN CAUSE DAMAGE.

4.8 Storage

If the machine is not going to be used for a long period, you should follow these instructions to protect the system:

- Clean all non-metal surfaces thoroughly with a non-detergent cleaner and a soft cloth.
- Removing all loose particles from the CNC
- Put mineral oil on the lead screws, table and bearing rails.
- Completely cover the system with plastic to prevent dust from entering.

5. MAINTENANCE

To prevent excessive wear on the machine, and premature breakdown, please complete these maintenance activities as described.

For maintenance information for accessories or optional equipment, refer to the 3rd Party Instructions included in this binder.

MAINTENANCE OBJECT	FREQUENCY / PROCEDURE
Sliding Rails (all Models)	After Each Process Run: Wipe clean and Lubricate lightly with mineral oil, wipe down entire machine
Lead Screws (all Models)	As Required: Lightly coat the lead screws with mineral oil.

5.1 Lubrication of the Leads Screws and Rails

NOTICE
ALWAYS USE MINERAL OIL FOR LUBRICATING.

The length of time between lubrication will vary according to use. If there is any squeaking during movement it is time to lubricate the screws and rails. It is easiest if you use a squeeze bottle or an oilcan with a long spout in order to reach the areas needed.

To apply oil to the X and Y lead screws and rails, jog the table to one end of travel. Lift up the way cover and apply oil to the screw. Reach in toward the anti-backlash nut and coat the screw along its full length. Also apply oil to the radius grooves that run along both sides of the rail. Jog the table to the other side, using low or medium speed, and repeat the process.

Apply oil to the Z lead screw and rails and raise the spindle head to the top of the travel. Coat the lower section of the screw with oil. Also apply oil to the radius grooves that run along both sides of the rail. Jog the head down, using low or medium speed, and repeat the process.

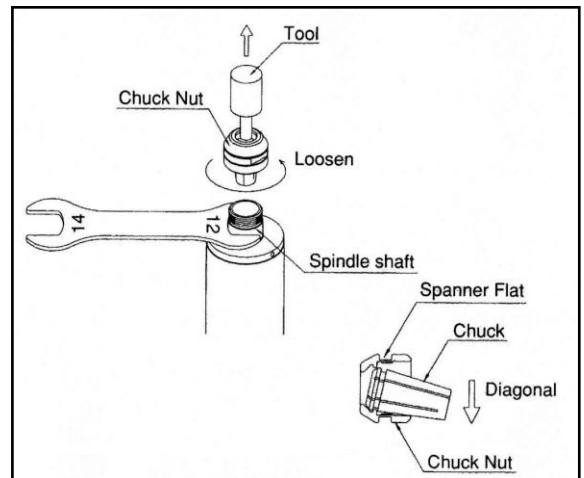
5.2 Collet Removal

The following procedure should be completed when removing or replacing the collet. No tools are required for this procedure other than those supplied with the CNC.

WARNING

UNPLUG THE UNIT FROM ITS POWER SOURCE BEFORE BEGINNING REMOVAL. SAFETY DICTATES REMOVAL OF POWER SOURCE AS THE FIRST STEP.

1. Remove the cutting tool according to section '3.8 Changing Tools' and remove the chuck nut assembly.
2. The collet and chuck nut are held together by a groove in the collet and a flange in the chuck nut. To remove the collet, hold the chuck nut in one hand and push diagonally down on the collet. The collet should pop out.
3. Install the new collet in the chuck nut by positioning the collet in the chuck nut and pressing down on a flat surface.



CAUTION

NEVER INSTALL A COLLET INTO THE SPINDLE QUILL WITHOUT FIRST ASSEMBLING IT IN THE CHUCK NUT.

WARNING

CLOSING THE COLLET WITHOUT A TOOL OR PIN INSERTED GREATLY REDUCES THE LIFE EXPECTANCY OF THE COLLET. THIS ALSO VOIDS THE MANUFACTURER'S WARRANTY.

5.3 Adjustments

The following adjustment procedures can be made to the machine as deemed necessary by the manager or maintenance person responsible for machine operation.

When the machine was delivered, all of these adjustments were set to the optimal operating condition. No further adjustment should be necessary, unless there has been a change in the materials used or a component has been moved out of adjustment.

NOTICE

NO ADJUSTMENTS, OTHER THAN THOSE DESCRIBED BELOW, ARE TO BE MADE ON THE CAMERON CNC MICRO MILLING & DRILLING CENTER WITHOUT TREAT ENTERPRISES ENGINEERING INPUT.

DANGER

HUMAN INJURY RISK! REMOVE ALL POWER FROM THE MACHINE PRIOR TO MAKING ANY OF THE FOLLOWING ADJUSTMENTS. FAILURE TO DO SO CAN RESULT IN HUMAN INJURY.

5.3.1 Set Program Zero

To set the program zero use the VEF to find the two edges of the part if rectangular or square. For a round part find the outside edge with the VEF. Move the part $\frac{1}{2}$ the diameter toward the center of the part. Repeat the process for the other axis. Double check to verify you are on center line.

Move the part to adjust for the VEF center to the drill center line. These values are on the Cameron Q&A checklist, located at the

beginning of this manual.

Right click the mouse in the machine coordinate area, pick the define fixture offset. Make sure only X and Y axis are selected. Pick set. Click ok to reset.

You can if you prefer set X and Y program coordinates to zero in the program coordinate box.

You are ready to run a program.

5.3.2 Tool Offset Procedure

1. Load tool into collet making sure the flutes of the drill extend below the face of the video edge finder.
2. Jog the tool above the part you want to set the tool to.
3. Turn on the spindle.
4. Carefully jog the tool down to the top of the part until the drill just touches. Use the process inspection camera to determine when you are at the top of the part.
5. Right click in the machine coordinate area and pick the define tool offset to open a window. In the use DRO box, set to machine. In the set access box set Z-only. Select the correct tool number and pick set.
6. FlashCut will let you know you have made a configuration change and the program will need to be reset, do you want to proceed? Click the ok button.
7. Jog the tool up off of the part to a safe distance.

5.3.3 Setting Up Optional Equipment

Please refer to the manuals provided in this binder for instructions on adjusting optional equipment and accessories.

6. TROUBLESHOOTING

The troubleshooting activities listed below are limited to the simple things an operator can do to try to address a problem with the machine.

PROBLEM	WHERE TO LOOK
The machine will not turn on when the power strip is turned on	<ol style="list-style-type: none"> 1. The EPO button is not pulled out (up). 2. Check to see if FlashCut is on line

Power is “on”, but the CNC will not run	1. Check the connections from the control enclosure to the CNC.
Drill will not run, although power is available and the program is running correctly	1. Check the speed control on the control enclosure.
Machine stops mid-run	1. Check if the x-y table is resting over a limit switch – if yes; jog the table until it is free. 2. Check power 3. Check computer
Drills holes off-center	1. Refer to VEF 100 manual
Drill will not run	1. Check to make sure that the ‘Auto/Manual’ switch on the spindle control panel is set to ‘manual’.

6.1 Alarms

The FlashCut™ program will send certain ‘warning messages’ to the screen to alert the operator of machine and program issues. The alarms that may pop up have been determined by Treat Enterprises. For a listing of possible warning messages, see the FlashCut™ CNC User’s Guide.

The spindle will send error codes to the spindle control screen. Refer to the label on the side of the control box for error code information. Correct the problem and press the reset button to clear the error code.

7. REPLACEMENT PARTS LIST

The following is a partial list of replacement parts., Parts are available at the factory, please call for pricing.

<u>Part #</u>	<u>Description</u>
CNC102-3	Y-Axis Lead Screw (8.5”, 16 TPI)
CNC103-1	X-Axis Lead Screw (9.8”, 16 TPI)
CNC104-3	Z-Axis Lead Screw (14.7”, 16 TPI)
CNC105	Super Nut
CNC109	Flex Coupling
CNC110	Limit Switch
CNC111	Way Cover (Set)
CNC112	X-Axis Linear Rail Guide (Set)
CNC113	Z-Axis Linear Rail Guide (Set)
CNC114	Y-Axis Linear Rail Guide (Set)
CNC125	Stepper Motor



8. TECHNICAL SERVICE

Cameron CNC Micro Milling & Drilling Centers have been designed and constructed using the highest quality standards. However, should your unit fail to function properly, in spite of regular maintenance, and you cannot find the solution to the issue in the Troubleshooting section of this manual, contact Treat Enterprises for technical support. Our engineers can probably determine how to correct the problem, with telephone support.

8.1 How to Get Technical Support

Treat Enterprises provides complete after sale service and support for all Cameron products.

Our Hours of Operation are:

Monday-Friday 7am-3:30pm Pacific Standard Time

Treat Enterprises observes the following U.S. holidays:

- ☞ New Year's Day (1 day)
- ☞ Memorial Day (1 day)
- ☞ Independence Day (1 day)
- ☞ Labor Day (1 day)
- ☞ Thanksgiving (1 day)
- ☞ Christmas Day (1 day)

To obtain service, contact Treat Enterprises per Telephone, Fax or Email.

Telephone:1-800-369-7769 or (209) 532-7201

Fax:(209) 532-1211

Address:19401 Rawhide Road, Sonora, CA. 95370

Email:camerondp@mlode.com

Http:www.cameronmicrodrillpress.com

9. OUR WARRANTY

Treat Enterprises, Inc. warrants that items of its own manufacture will be free from defects in material and/or workmanship at the time of delivery and will be so for a period of 6 months (180 days) after leaving the Treat Enterprises facility. If any such item proves to be defective (assuming the item has been used and maintained as intended during the warranty period, which will be determined by Treat Enterprises), as a first step, Treat Enterprises personnel will attempt to troubleshoot the issue per phone and other communication with the Customer and evaluate the need for action. Typically, any parts that fail prematurely are able to be replaced by the Customer with the guidance of Treat Enterprises personnel, and Treat Enterprises reserves the right to attempt to solve the issue in this manner prior to any other warranty activities.

If it is determined that the system or machine, or any part thereof, needs to be returned to the Treat Enterprises factory for further investigation, a Return Authorization will be issued. After contacting Treat Enterprises' Service Department and receiving Return Authorization, the machine's Owner is required to ship the item, freight prepaid, to the Treat Enterprises facility. Final responsibility for shipping costs will be determined by Treat Enterprises, after inspection of the part(s) or machine. Treat Enterprises retains the option to repair or replace the item(s) in question at its own expense.

Warranties on components not manufactured by the Treat Enterprises, but included and sold as part of the system, are limited to those provided by their original manufacturers. However, Treat Enterprises will handle returns of those components as well. The Owner must still ship the component(s) prepaid.

This warranty is expressly limited to the repair or replacement of defective items as described above. In no event shall Treat Enterprises be held liable or accountable for incidental or consequential damages due to any breach of warranty, defect in material, workmanship or omissions/misstatements in this or any documentation. Treat Enterprises shall not be responsible for repair or replacement of items which have been subjected to neglect, accident or misuse, or which have been altered by anyone other than Treat Enterprises personnel.

Treat Enterprises retains all protected, proprietary rights, including patent rights, rights to devices originated by Treat Enterprises, which are part of the equipment, and rights to designs or data furnished to the Owner.

An extended Warranty Period of up to One Year is available. Ask our Customer Service Department or Sales Representatives for details.



10. THIRD PARTY DOCUMENTATION

The original manufacturers of components, which are not manufactured by Treat Enterprises, Inc., have supplied some information. These are referred to as “Third Party Documentation. The information is included in the form it was received by Treat Enterprises, Inc., with no changes, deletions or additions. Treat Enterprises, Inc. accepts no responsibility or liability based on the information included in this 3rd party information. If you believe the information is false or not complete, please contact the manufacturer of the component.

The Third Party Manuals and/or Data Sheets either are bound together with this manual or have been supplied as part of a complete document package, typically delivered with the machine.

11. PROGRAM DISKETTES/CDS

Any Diskettes or CDs required to use or configure the system are included in a Disk Protector found in this binder or provided separately.

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