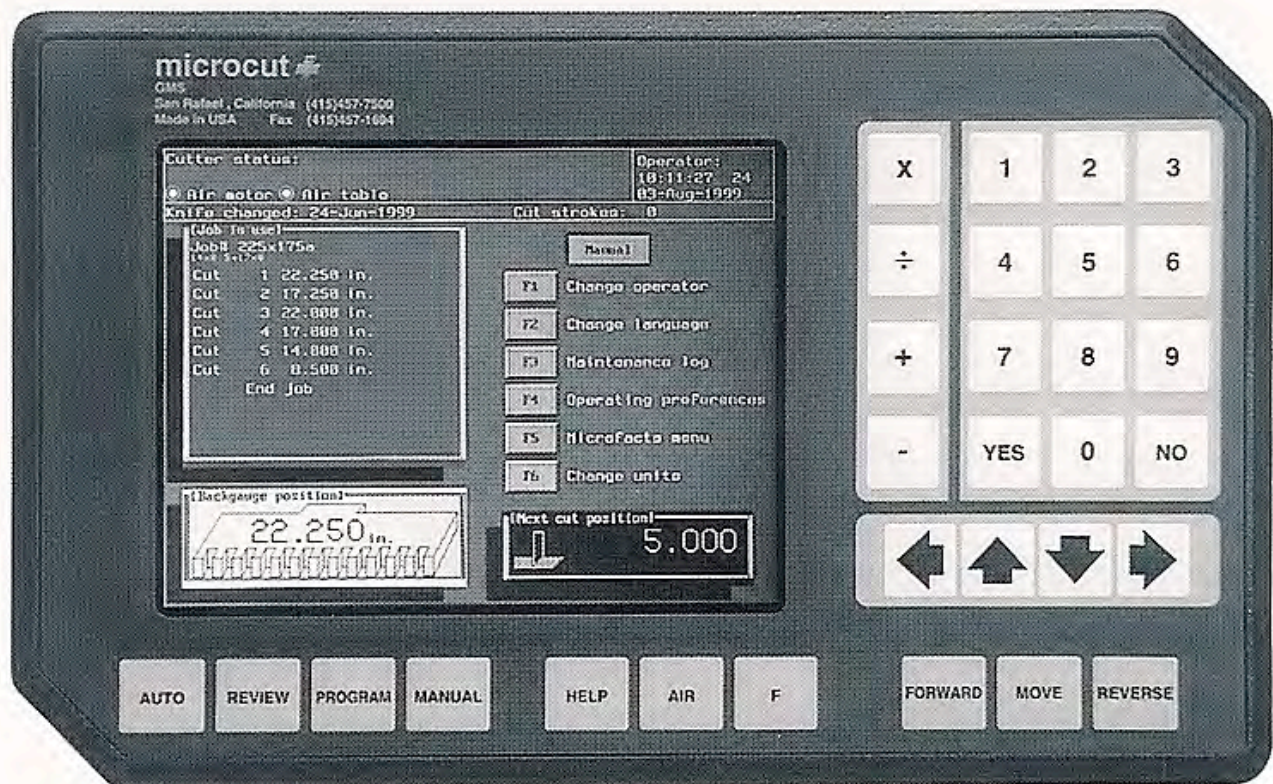


# microcut

## Cutter Automation System

# Owner's Manual

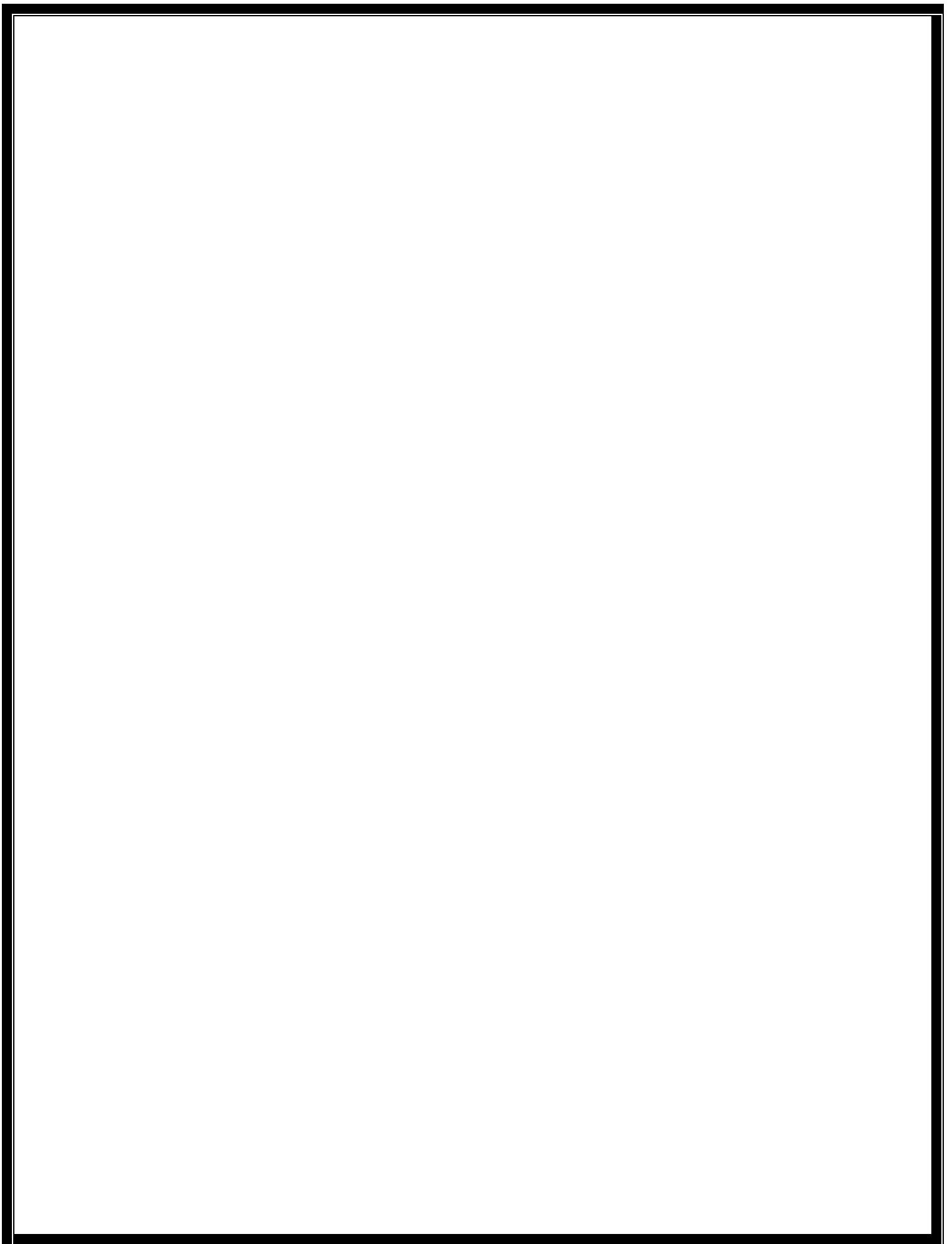


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Edition 4





# Introduction

Thank you for purchasing a **microcut** control system for your paper cutter. Having done so, you have joined over 20,000 **microcut** users worldwide who are enjoying the benefits of computer-controlled cutting. **microcut** is a state of the art system for controlling backgauge movement, with an intuitive, easy to use operator interface. **microcut** features room for thousands of on-board jobs with the option of storing jobs on floppy disks and in other computers as well. There are four basic operating methods—

- Turning the power on and getting started.
- Manual operation.
- Programming and reviewing jobs.
- Automatic operation.

Many of the features you will find in **microcut** have resulted from operator's ideas throughout the world. If you have any suggestions, we encourage your input. Where possible, we will make the revisions and update your unit. Our special thanks to all who have helped make **microcut** the world leader in cutter automation.

**microcut** can be installed on any type of guillotine paper cutter that uses a leadscrew for backgauge movement. Other methods of backgauge movement, such as chain or cable drive, cannot assure the accuracy or positioning speed. In these cases it is suggested that either a leadscrew kit be installed or that the machine be replaced.

**microcut is not intended to control the knife or the clamp on the paper cutter.** *Anything* dealing with the clamp or knife is *not* to be tampered with or adjusted during the installation or operation of **microcut**. *Any* alteration to the knife or clamp safeties, circuits, or operation, or *any* installation technique that compromises the safety of anyone working on or around the machine is STRICTLY FORBIDDEN. **Guarding may need to be altered or added** to offer proper protection when **microcut** parts and assemblies are added to the machine. *Never* operate the machine until *all* guarding is complete. *All* moving parts and hazards must be covered in such a way as to prevent accidental contact of *any* sort. Any nip, draw-in, crush, or shearing hazard must be evaluated and eliminated.

A demonstration mode is resident in the display console. This will allow the operator to learn the system before the installation is completed. Wire the display to the H-Drive and the H-Drive to line power to light the display. Refer to the Service Screen section of this manual for details on selecting demonstration mode (see *Configuration/Utilities/Demonstration*). Use the Operating section of this manual to guide you through the unit's features.

**microcut**<sup>®</sup>, **microfacts**<sup>®</sup>, and **cutternet**<sup>®</sup> are registered trademarks of C&P Microsystems LLC

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# Installation Basics

The **microcut** installation is basically mechanical. It involves mounting the display console; the H-drive box, the DC motor to drive the backgauge, the shaft encoder to signal backgauge movement to the computer, and four sensing switches to inform the computer of the machine status (clamp, knife, clamp shoe, and position). All low voltage cables are plug-in type. Hard wiring is required for the power and motor.

The following text gives a conceptual approach toward the installation. Use this manual to learn what each component must do. Mount each component in the fashion best suited to fulfill its purpose.

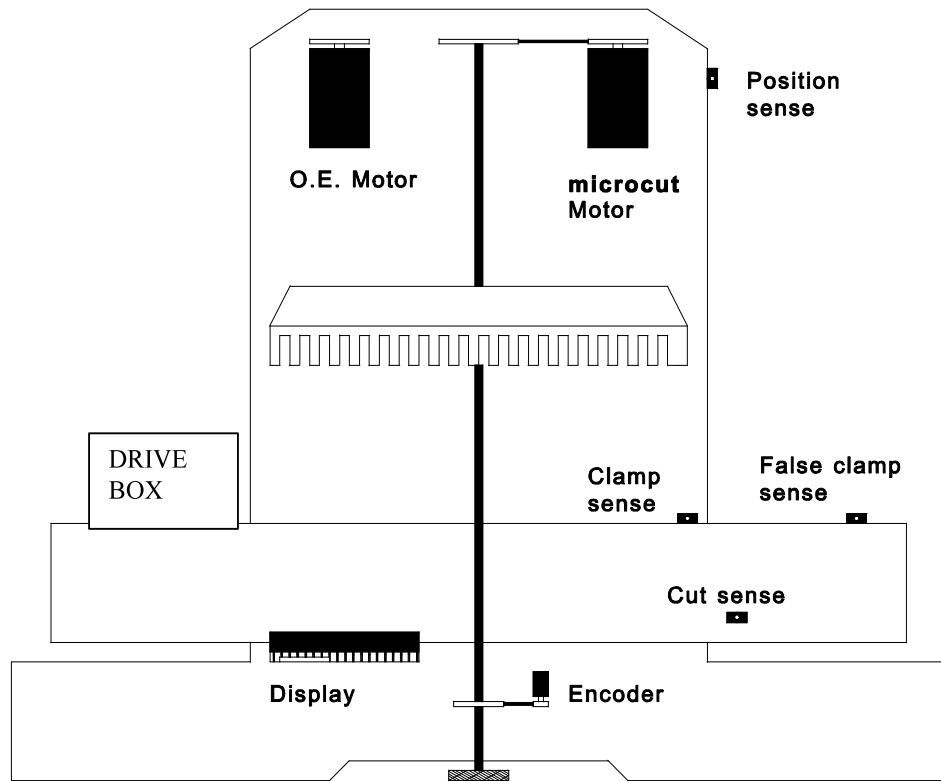
**microcut** is a retrofit system so every installation is unique. Install the components for function as well as fit. The brackets are designed with extra holes and slots. They are easily modified, and can be adapted for almost any requirement. Installation variables include the encoder sprockets, pulley (Schneider cutters have a flat belt drive), and motor size. Some machines may include special brackets. If the leadscrew diameter is known at the time of shipment, the leadscrew sprocket will be bored to the proper dimension. Otherwise, it may be necessary to have the sprocket bored to size. Check the sprocket before beginning the installation. If it must be bored, take care of this NOW to avoid unnecessary delays later. Cut the sprocket in half to allow easier installation.

Every display console is identical regardless of machine type. A brief setup routine is resident in the computer to allow simple adaptation to any machine. This routine *must* be completed on every installation in order for **microcut** to know the machine it is installed on and to operate safely and correctly.

## Hints—

1. Inspect the machine to insure all operations are correct. Fix problems now, not later.
2. Verify that the machine starts and operates correctly with the factory backgauge motor removed. If not, evaluate the start up procedures to see if they can be mimicked to enable operation. **DO THIS BEFORE microcut** is installed, not after.
3. The boxes are packed to facilitate the installation. The installation will be easier if the parts are not mixed up.
  - **Box 1** contains the backgauge drive motor.
  - **Box 2** contains the motor drive, encoder, sensors, and various brackets.
  - **Box 3** contains the encoder sprockets, manual, and display.
4. Use the thinnest drive belt possible to minimize belt flex around the pulley.
5. Do not over-tighten the backgauge. If there are nylon gliders supporting the backgauge keep them *loose* to minimize leadscrew flex.
6. Use only one belt per pulley. Multiple belts on any pulley will cause slower settling.
7. The H-drive servo control unit works best when the belt is fairly tight. This is in contrast with the older SCR drives that preferred a very loose belt.
8. A demonstration mode is resident in the display console. This will allow the operator to learn the system before the installation is completed. Wire the display to the H-Drive and the H-Drive to line power to light the display. Refer to the Service Screen section of this manual for details on selecting demonstration mode (see *Configuration/Utilities/Demonstration*). Use the Operating section of this manual to guide you through the unit's features.

# Installation Diagram



Top View

Part locations are for reference purposes only. Every installation will be unique. Mount components for function and form, not necessarily to mimic this diagram.

On some paper cutters, it is not always possible to find space to mount a second motor. It may be necessary to remove the original motor and install the **microcut** motor in the original equipment space.

If this is the case, completely insulate any bare wires, label all wires, and pack all mounting hardware with the original motor to facilitate reinstallation of the motor in the event **microcut** is moved to another machine at a later date. The installer should document how the original motor should be refitted. Some machines interlock with the drive motor. The knife and clamp will not operate if the motor is removed. In this case mount the motor on a cross leg or other convenient location and make sure if the pulley turns it is properly guarded.

# Guide and Tool List

You may want to adapt this list. The procedures are listed in their order of execution, as well as the tools required to proceed. An installation will be faster if all tasks in a given section are completed before starting the next.

DETERMINE ALL DRILLING LOCATIONS—Mark all holes that will be drilled to complete mounting of ALL components, including holes to secure ty strap brackets, at the same time.

- Slide T square with level
- Pencil

DRILL ALL HOLES—Protect the machine from drill shavings, then drill all holes necessary to mount all components. Use the pilot drill for all holes before increasing drill size to save time. Be careful not to drill any hole too large as the drill size is increased.

- Paper and rags to cover machine surfaces
- Pilot, #7, 5/16" high speed drill bits
- Electric hand drill
- Extension cord

TAP ALL HOLES—Complete all threads for all of the components.

- 1/4-20, 3/8-16 taps
- Tap handle (ratchet type is convenient)
- Tapping fluid

CLEAN THE MACHINE—Clean the machine to prevent future damage.

- Brush
- Rags
- Magnet

BOLT AND SECURE ALL PARTS TO THE MACHINE--

- 7/16, 9/16 wrenches and sockets
- Phillips screw driver
- Hacksaw to saw off excess threaded rod
- Allen (hex key) wrenches to tighten the motor pulley and encoder sprocket

ROUTE THE CABLES—Complete wiring of all components. Use ty straps to secure the wiring.

- Side cut pliers
- Wire strippers
- Screwdrivers

# Mechanical Installation

**Display Console**—The display console is the operator's interface with the system.

1. The display console should mount on the front of the cutter near the operator. The display mounts to the rod pivot bracket in Box 2.
2. Drill and tap the appropriate holes and mount the display so that it is secure.



microcut jr



microcut standard



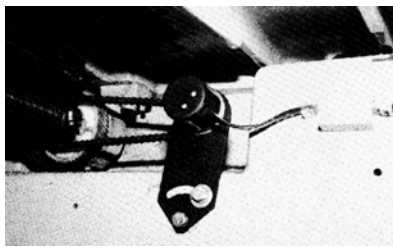
microcut+

**Shaft Encoder**—The shaft encoder sends pulses to the drive to indicate backgauge position.

1. Use the shaft encoder mounting brackets supplied to mount the shaft encoder near the leadscrew.
2. Install a sprocket on the encoder shaft that will allow it to turn at least two, but not more than four turns for one inch (25 mm) of backgauge movement.
3. Clamp the sprocket to the leadscrew with the hose clamp so that it aligns with the encoder sprocket. Depending upon the machine, the sprocket may need to be bored, or cut in half. It is easier to assure that the sprocket faces align if the chain is wrapped around the sprocket while the hose clamp is tightened. Insure the clamp does not interfere with the chain.
4. Install the chain on the sprockets, making sure both sprocket faces are aligned. Adjust the chain tension so that it is snug but not too tight.



Polar rear mounting



Polar behind housing



Typical front mounting

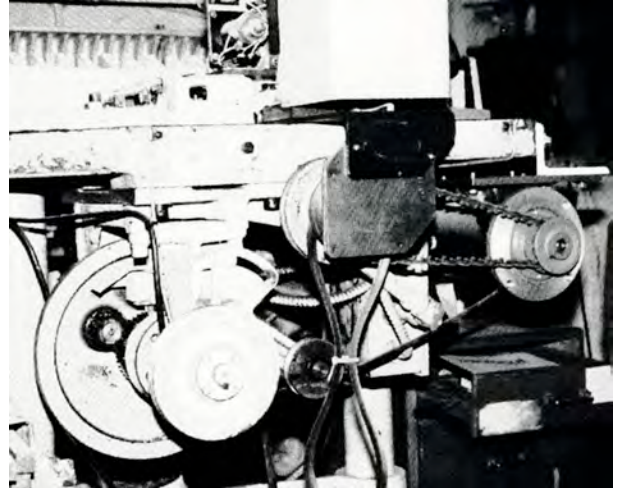


**DC Drive Motor**—The motor turns the leadscrew.

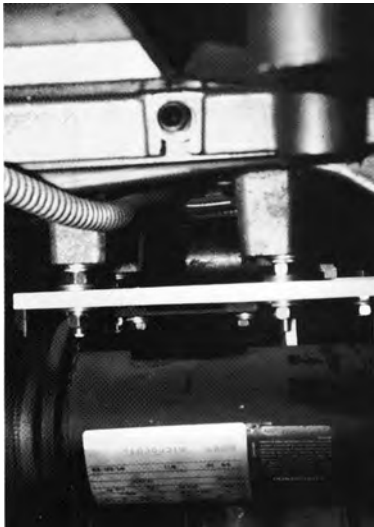
1. The motor **must** turn at least three, but not more than six times for each inch (25 mm) of backgauge movement. An adjustable pulley and a fixed one are supplied to insure that this can be achieved on most machines.
2. If possible mount the motor so that it lines up with the existing leadscrew drive pulley. In many cases the same belt can be used for the new motor as was used for the original equipment drive. If the motor mounting method does not isolate the original drive system, other means will be required.
3. If **microcut** is ordered for a Schneider cutter a one inch wide cog belt pulley will be included with the kit to drive with the original flat belt. If the original motor is removed make sure wires are labeled and taped.
4. On some cutters the brake will have to be disabled and the drive clutch enabled to allow proper operation.



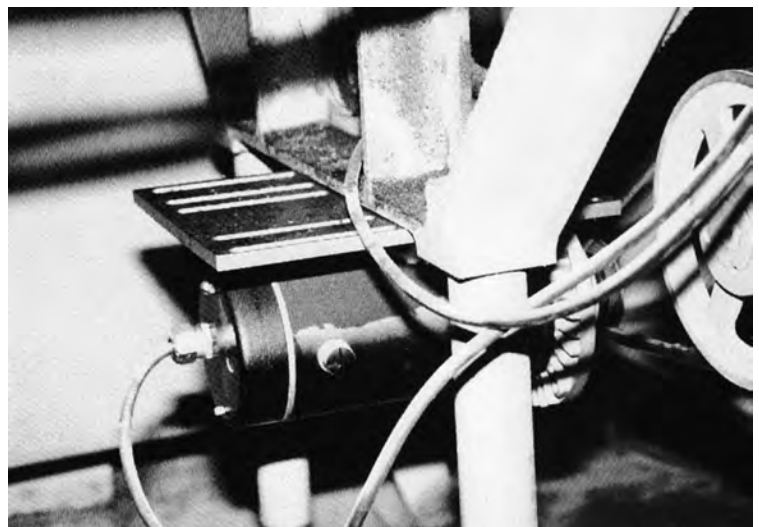
**Polar**



**Harris**



**Wohlenberg**



**Lawson**

CONTINUED ON NEXT PAGE.....

**Proximity Sensors**—These allow the system to know what the cutter is doing.

Each sensor is labeled and must be installed according to its designation. Use any combination of brackets and hardware to install each sensor securely to the machine according to requirements. NOTE: The electrical purpose of each sensor is supplied in case the sensor is replaced with a different type of a switch. When the sensor is not supplying ground it presents an open circuit. With the cable pointing up and the tab facing you, pin 1 is to the left. The wiring at pin 1 is 12VDC and pin 2 is ground. Pins 3 to 6 are the signal lines from each sensor as defined in the installation instructions above.

**Position Sensor**—supplies ground to pin 3 when the gauge is not near the rear of the table.

1. Move the backgauge to its rearmost position.
2. Mount the position sense so that it will be tripped by the gauge one or two inches (25 to 50 mm) before the backgauge reaches the maximum mechanical rear position.
3. Do not mount the position sensor so far forward that the backgauge may move behind it and allow the sensor to become "untripped" as the gauge is moved to the extreme rear.
4. Do not mount the rear position sensor more than ten full encoder revolutions from the mechanical rear of the cutter.
5. Use the supplied trip plate if the cutter is heavily painted or if the surface to be sensed is not flat.



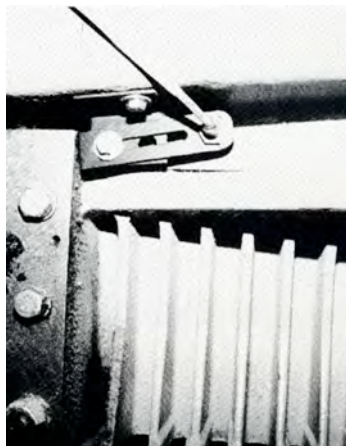
Above table

Under table



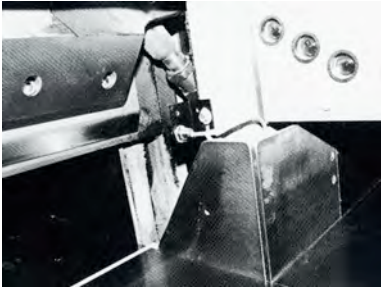
**Clamp Up Sensor**—supplies ground to pin 4 when the clamp is full up.

1. Mount this sensor so that it is tripped only when the clamp is in its full up position. Horizontal mounting of the sensor barrel prevents complications that can arise due to hydraulic sag.
2. Use the supplied trip plate if the cutter is heavily painted or if the surface to be sensed is not flat.



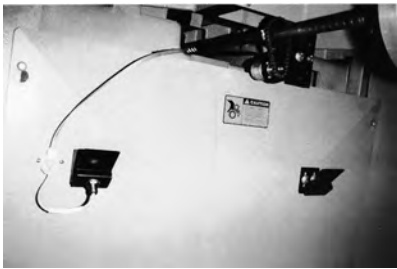
**Cut Sensor**—supplies ground to pin 5 when the knife is up.

1. Mount this sensor to the side of the opening in front of the knife bar so that it is tripped near the bottom of the knife stroke.
2. This sensor must be tripped for at least 1/4 second during the knife cycle to register a cut.
3. This sensor must only be tripped once per knife stroke. Beware the double-tripping effect that holes, lips, and bolt heads can cause.



**Clamp Shoe Sensor**—supplies ground to pin 6 when the clamp shoe is in the holder.

1. Mount this sensor so that it is tripped when the clamp shoe (also known as the false clamp or sole plate) is resting in its holder. If there is no clamp shoe holder, use the multi-angled brackets supplied to create one.



**Drive Box**—The drive box drives the gauge motor and acts as a junction box for the wiring.

1. Install this in a central location to all of the other parts. Make sure the cables will reach all of the components. Avoid mounting this box on a moving panel. Keep this box in the open to allow maximum cooling. Ideally the fins will be vertical to insure optimal cooling.



# Wiring and Power

Be sure that the original equipment backgauge motor cannot drive the leadscrew. Be certain that the original equipment backgauge brake will not energize during motor drive. If a clutch needs to be locked on (electrically or mechanically) to allow the **microcut** motor to drive, do this now. If any modifications are made completely insulate any bare wires, label all wires, and pack all original parts that were removed. To facilitate reinstallation of the original drive system in the event **microcut** is moved to another machine at a later date, the installer should document how the original motor should be refitted. **Check the machine for operation in case any of the above modifications may have affected operation.**

Refer to the wiring diagram near the rear of this manual for details. Choose cable paths that avoid all moving parts for all machine operations. Use the ty straps and ty strap mounting bases to secure all cables appropriately.

6 pin cables are supplied in various lengths for the proximity sensors. Plug a cable into a sensor. Route the cable along the desired route and plug it into the drive box. The four sensors may be plugged into the four receptacles in any order. Repeat the procedure for each sensor.

An 8 pin cable is supplied to connect the encoder to the drive box. Plug the cable into the encoder. Route the cable along the desired route and plug it into the drive box.

Plug the round cable into the display console. Route the cable along the desired route and plug it into the drive box.

Connect the motor cable (male terminal plug) to the motor using the connectors supplied. ***The earth (frame) wire should only be connected if the motor is not attached to the machine (separate floor mount, etc.).*** Route the cable along the desired route and plug it into the drive box. *NOTE: The earth recommendations here assume that the machine has a proper earth ground—earth should be supplied from a single location only to avoid earth loops. If the machine does not have an earth connection the motor may create interference on the display. If this is the case, connect a proper earth to the machine or, less preferably, connect the earth wire at the motor.*

**microcut** is equipped with an air table control line (relay not supplied). Refer to the schematic pages at the back of this manual for details.

Connect the power cable (female terminal plug) to any 85 to 250 VAC source. The center of the plug (yellow wire with green tracer) is the earth connection. The other two lines are for the power. Check the plug to make sure this is correct. Plug the cable into the drive box.

Refer to earth loop concerns stated in the motor cable paragraph above. It is possible that earth loops may be created at the H2 box if the paint is incorrectly scraped off of the mounting tabs during installation. In this case, the earth wire may be left unconnected at the power input, assuming the machine has a solid earth connection. It is preferred that the earth connections remain separate between the **microcut** and the machine whenever possible.

# Final Check

Insure that—

- The machine is fully cleaned from the installation.
- All parts are securely mounted to the machine.
- The motor pulley is secure.
- The motor drive belt is correctly aligned.
- The encoder chain is aligned.
- The encoder sprocket clamp does not interfere with the chain or machine.
- All cables are secure and clear of all machine operations.
- All machine operations are functioning properly.

Review the machine for any areas that could create hazards such as pinch points or exposed parts. Guard as appropriate. Remember **microcut is not intended to control the knife or the clamp on the paper cutter.** *Anything* dealing with the clamp or knife is *not* to be tampered with or adjusted during the installation or operation of **microcut**. *Any* alteration to the knife or clamp safeties, circuits, or operation, or *any* installation technique that compromises the safety of anyone working on or around the machine is STRICTLY FORBIDDEN. **Guarding may need to be altered or added** to offer proper protection when **microcut** parts and assemblies are added to the machine. *Never* operate the machine until *all* guarding is complete. *All* moving parts and hazards must be covered in such a way as to prevent accidental contact of *any* sort. Any nip, draw-in, crush, or shearing hazard must be evaluated and eliminated.

Show the operator the installation, making sure he is comfortable with all mounting locations. The set up routine (next page) **must** be completed to allow correct operation. It is a good idea to go through this routine with the operator so that he is familiar with the approach and can select the correct machine sizes and operating parameters.

# Setup Routine

All **microcut** units must be told what type of machine they have been installed on before they can operate properly. A resident setup routine exists to allow this to be done easily. After power is supplied and the display reaches the “Are all guards in place?” screen, press **3 1 7 5** to enter the service screen. This is a good time to select the languages you wish to have available. Make that selection from this screen and follow the instructions. You can also go into the configuration option to set maintenance intervals at this time. Now select **SETUP** and follow the instructions on each screen to allow **microcut** to fully understand the machine upon which it has just been installed and the preferred operating methods. Some of the things you will be required to do include—

1. Check the keys for correct operation.
2. Define the machine sizes in your selected unit of measurement.
3. Verify the motor drive direction.
4. Enter rear and front reference values to allow the leadscrew pitch to be calculated. Note that these positions must be as accurate as possible to insure correct calibration. If the leadscrew is an exact inch or cm pitch, mark the handwheel or pulley at the rear reference and align that mark again for the front reference.
5. Define machine operating preferences including speed, tolerance\*, auto push out, etc.
6. Finally, enter the installer’s name and the serial number of the machine to complete the routine.

The unit will exit directly to the manual mode of operation.

\* The tolerance allows the display to settle on a position. Almost all mechanical systems contain a certain amount of flex or vibration. If the tolerance is too small, any flex or vibration will cause the current position display to flutter between numbers. Generally the tolerance is set to .003 inches (.007 cm), although tighter tolerances can be selected. To insure the display is stable, the drive control will re-correct the gauge anytime that the error is more than half of the tolerance setting. A .003 setting will yield actual accuracy to .0015 inches (.004 cm). Larger tolerances allow faster positioning and faster cutting.



# The Display Console

The main sections on the video screen are—

- STATUS BOX*—Shows the current status of the machine.
- TIME, DATE, OPERATOR*—Shows the time and date as well as the current user.
- KNIFE INFORMATION*—Shows the last knife change date and the cut strokes since that date.
- JOB INFORMATION*—Shows the programmed data for the currently selected job.
- AVAILABLE FEATURES*—Shows the features available for use.
- BACKGAUGE POSITION*—Shows the current position of the backgauge.
- KEYED IN NUMBERS*—Shows the keyed in number value.

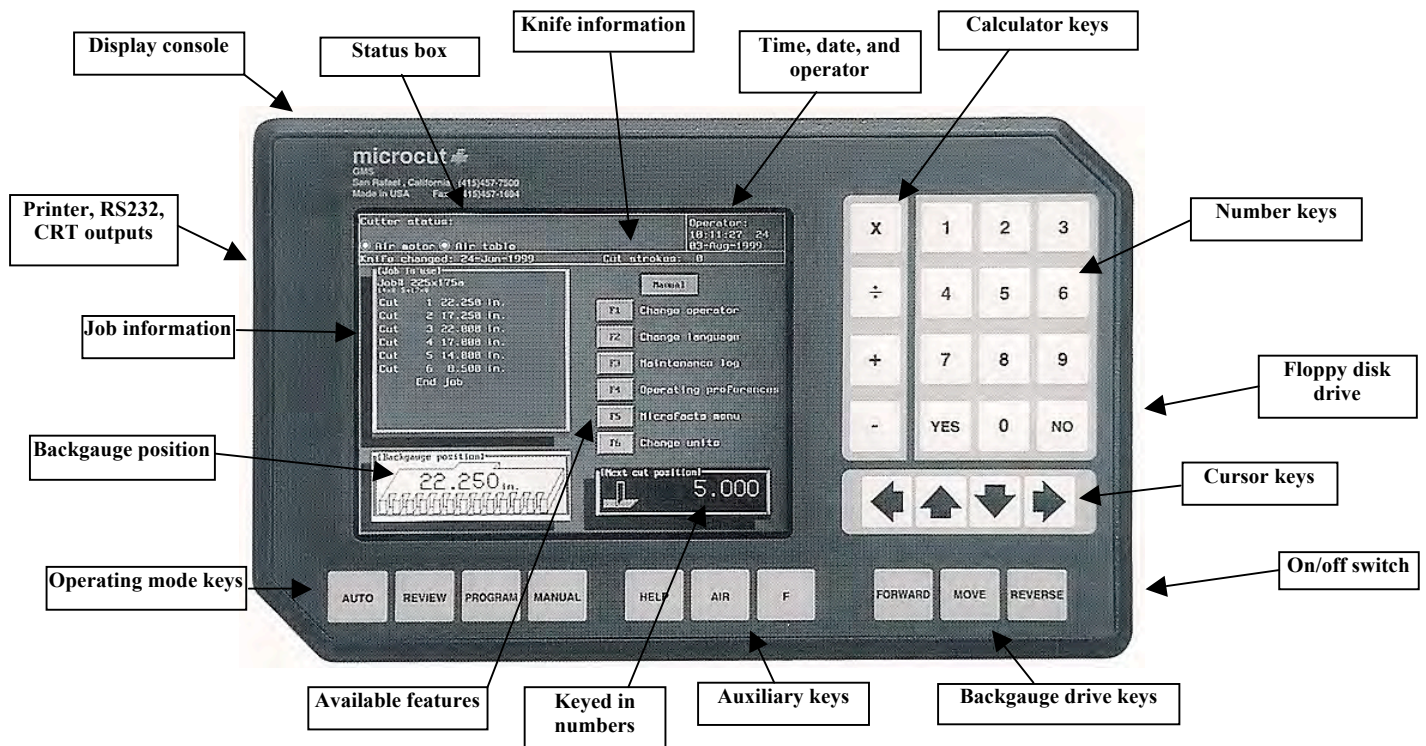
The main key groups are—

- CALCULATOR KEYS*—For adding or subtracting values and entering fractions.
- NUMBER KEYS*—For entering data.
- CURSOR KEYS*—For moving around the screen when making selections.
- OPERATING MODE KEYS*—For selecting what you want to be doing.
- AUXILIARY KEYS*—For getting help, controlling the air table (optional), and accessing features.
- BACKGAUGE DRIVE KEYS*—For moving the backgauge.

Connections on the display include—

- VIDEO*—For adding an extra display to large machines.
- RS232*—For connecting to an outside computer.
- PRINTER*—For printing out job information to attach to the job ticket.

Other items on the display include the floppy disk drive for data transfer and the on/off (sleep) switch.



# Basics of Operation

## OPERATING MODES:

Four basic operating modes are available: MANUAL for basic drive operations, PROGRAM to create new jobs, REVIEW to look up old jobs, and AUTOMATIC to sequence position to position as described by a selected job.

## MAKING CHOICES AT THE SELECTION SCREENS:

Several features have been built into **microcut**. These appear on the display. Each feature is preceded with **F1 ...**

**F9**. Press the corresponding key set (feature key and then the number) to make the selection.

## BACKGAUGE MOVEMENT:

Press **FORWARD** or **REVERSE** to move the backgauge slowly at first, faster with time. Manual forward drive will be slow only after any manual reverse drive. To move to a specific position, use **NUMBERS** and **+**, **-**, **/** to display the target value and press **MOVE**. In the case of the **FORWARD** or **REVERSE** keys, auto correction will remain off allowing the hand wheel to be used. Auto correction will engage after any move to a specific location (automatic operation or with **MOVE**).

## AIR TABLE OPERATION (Optional hardware and installation is required):

The air status will be displayed in the upper left corner. A filled circle is on, an empty circle is off. Press **AIR** to flip flop the air status. If this is done in PROGRAM, REVIEW, or AUTOMATIC modes the air status will be saved with the cut. The air table will then switch on and off automatically when using the job. It is also possible to program the air status for after the cut while the clamp is still in the down position. To do this in automatic mode, hold the clamp down with the foot treadle, cycle the knife, and then press the **AIR** key. The air after cut status defaults to the off position during programming to prevent small labels from being displaced after the cut. If a larger sheet is in front of the knife after the cut, and the air table is needed to move it, then turn the air after cut on. An optional air paddle switch can be installed under the front of the table to flip flop the air on or off without changing the programmed value. Refer to the D37 connector page for details.

## HELP:

A variety of options are available directly from any operating mode. Press **HELP** and the screen will show—

- F1 Standard Calculator:** A desk top type calculator for doing standard (non-dimensional) math.
- F2 Waste Calculator:** Displays a worksheet to enter height of stock cut, number of sheets per unit of height, and the number of signatures per sheet. There are also options to put in waste quantity. The display will then show the total good signatures, total waste, and the % yield.
- F3 Status Screen:** Allows the operator to monitor the status of many components in the **microcut** electronic control system. Software versions, factory set up data, and other information can be viewed as well.
- F0 Exit:** Goes back to where you entered this routine.



# Getting Started

Make sure everyone is clear of the machine and that all guards are in place. Flip the switch in the lower right side of the display console to the on position. **microcut** will check the electronics and then, if more than one language is installed, show a language selection screen. Using the up and down arrows highlight the language and press the **YES** key. The display will show—

**YES** Press this key when all guards are in place.

Make sure all the machine guards are in place. Press **YES**. The display will show—

**YES** Press this key when everyone is clear of the machine.

Look around the machine to make sure that no one is near any of the moving parts and that nothing has been left on the table surface which could be damaged. Press **YES** to continue. **microcut** will—

1. Check the circuits, and continue only if everything is OK. If there are any errors **microcut** will display the problems so that they can be corrected.
2. If full power has been removed from the control since the last use, then the backgauge will move slowly to the rear of the cutter to calibrate. NOTE: If **microcut** is already at the rear of the table it will move the backgauge forward before going back.

**microcut** is now ready to use.

# Manual Mode

MANUAL is the basic operating mode. The backgauge can be moved by pressing the **FORWARD** and **REVERSE** keys or by pressing **NUMBERS** and the **MOVE** key. Auto correcting will stay off unless the **MOVE** key is used. **microcut** contains several user selectable features—

- F1**     **Change operator:** **microcut** will request that a new operator access code be entered. Press **YES** after the correct code is entered. The operating limitations, preferences, and colors for that operator will be automatically installed. Refer to **microfacts** section below. If the access codes are not enabled, this key will be ignored.
- F2**     **Change language:** This allows a new language to be selected. If only one language is installed this key will be ignored. Press **3 1 7 5** at the GUARDS screen (power on) to access SERVICE ROUTINES to install additional languages.
- F3**     **Maintenance log:** This shows (and allows changes to) the dates that maintenance was last performed.
  - F1**     **Knife change:** Perform this when the knife is dull. The cut strokes will be returned to 0 and the date will be changed to the current date.
  - F2**     **Calibrate gauge:** This should be verified any time the knife is changed or accuracy is in question. Square the back gauge. Trim a lift of stock. Move the gauge to one half the last cut size value and cut the stock. Remove the top half of the pile in the cutter. Slide the top half of the front pile onto the bottom half of the back pile. Check the pile for smoothness. The top half is an exact size. If the bottom half is shorter, the cutter is cutting short. If the bottom half is longer, the cutter is cutting long. Use **NUMBERS** and **YES** to enter the true position. Check and repeat if necessary.
  - F3**     **Next screen:** A list of standard maintenance items will appear showing the last done date as well as the next due date. Press the corresponding **F** key after the maintenance has been done to enter the current date. If any due date is passed without the maintenance being performed, a warning reminder will appear each time MANUAL mode is entered.
  - F0**     **Exit:** Press this to record your new values and exit.
- F4**     **Operating preferences:** This allows the operator to adjust several of the system parameters. If access codes are enabled (see **microfacts** below) these selections will be saved individually for each operator—
  - F1**     **Inch units:** Toggles these units between available and locked out.
  - F2**     **Centimeter units:** Toggles these units between available and locked out.
  - F3**     **Millimeter units:** Toggles these units between available and locked out.
  - F4**     **Sun units:** Toggles these units between available and locked out.
  - F5**     **Decimal entry:** Limits number entry to whole numbers or allows decimals.
  - F6**     **Show all digits:** Controls the position display to 12.345 or 12.34.
  - F7**     **Auto push out:** Controls the auto push out feature so that if the gauge must move backwards after

a cut in automatic mode, it will push forward a specified distance first.

- F8** **Screen color selection:** Allows color selection for each part of the display.
- F9** **Next screen:** Advances to the second screen of operating preferences.
- F0** **Exit:** Returns to the manual mode of operation.

*Next screen (F9):*

- F1** **Side loading:** Drives the gauge to the maximum rear of the table at the end of each job sequence in automatic operation if this is on. Side loading requires an optional sensor to avoid potential collisions.
  - F2** **Auto advance after load:** Advances the gauge to the first stop value after the stock load is complete without any operator request. NOTE: Sensor required.
  - F3** **Screen saver:** Turns the screen saver mode on or off in the event that no operation is seen for a specified amount of time.
  - F4** **Gauge power meter:** This shows the required power to operate the back gauge.
  - F5** **Change backgauge tolerance:** Used to adjust the required accuracy.
  - F6** **Change time:** Adjusts the time clock value and selects display on or off.
  - F7** **Change date:** Adjusts the date value and selects display on or off.
  - F8** **Change backgauge speed:** Used to adjust the top speed for the gauge in forward, reverse, and push operations. The deceleration can also be set between 1 (most gradual) and 100 (quickest).
  - F9** **Previous screen:** Goes back to screen one.
  - F0** **Exit:** Returns to the manual mode of operation.
- F5** **microfacts:** This opens the options list for setting up the security and time management system.
- F6** **Change units:** This allows enabled units of measurement to be selected. Refer to the OPERATING PREFERENCES section for units.

# Program Mode

Program mode is used to define a series of targets so **microcut** can operate in automatic mode. These stops (and pushes and load points) can proceed without limitations of direction or motion. Press **PROGRAM**. Use **NUMBERS**, **LETTERS**, and **F1** to enter a job title or press **F2** and the lowest unused number will be found. Letters can be entered by using the **ARROW** keys and pressing **YES**.

Use **NUMBERS** and **LETTERS** to show a description if desired. Press **F1** to continue.

Programming can now be done by pressing **NUMBERS** to display the desired position and **YES** to record it, or by moving the backgauge and cycling the knife. The **+**, **-**, **/**, **\*** keys can be used to enter fractions or blind program from the previously programmed position. The **ARROW** keys can be used to scroll up and down the job to make adjustments or corrections.

Once programming is completed, press **AUTOMATIC** and **microcut** will drive the backgauge to the highlighted position. Once in automatic mode, the backgauge will move to the next position after each cut, or whenever **MOVE** is pressed.

## FEATURES IN PROGRAM MODE

Several features are available to help create the job and facilitate easier cutting. To select a feature press the corresponding **F** key--

### FEATURES SCREEN 1

**F1** **Cut options:** Allows stock pushes, load points, or cuts to be programmed.

NOTE: On OEM applications other cut options may be available such as CLAMP ONLY or AUTO TRIM. Additionally, where the proper hardware is supplied, the clamp pressure can be programmed by pressing the **HELP** key and following the instructions on the screen.

**F2** **Comments:** Allows comments to be entered along side each programmed position.

**F3** **Insert cut:** Adds a cut in front of the one that is highlighted on the display.

**F4** **Delete cut:** Removes the cut that is shown on the display. Press **YES** to confirm.

**F5** **Change cut:** Allows an already programmed cut to be adjusted.

**F6** **Next screen:** Offers additional features of the program mode.

## FEATURES SCREEN 2

- F1**     **Label mode:** Programs cut values for a step and repeat sequence. A worksheet for entering values will appear and a graphical “picture” of the cuts will be drawn as information is entered. **microcut** will automatically fill in the missing pieces of information if you do not know the first cut position or the gutter trim size.
- F2**     **Sheet divide:** Calculates stop values that will cut the sheet into equal sizes. A worksheet for entering values will appear and a graphical “picture” of the cuts will be drawn as information is entered.
- F3**     **Change units:** Shifts the position to the next allowed unit of measurement.
- F4**     **Copy job:** Allows you to copy a job to a new job with a different number. The description can also be changed. A protected job (see below) can be copied and will not be protected in case changes are required and the original owner does not want his job to reflect those changes. A copied job will start with zero lifts run and show the current date as the creation date. NOTE: This feature can be used to change just the job description if the job number is not altered.
- F5**     **Job protect:** This prevents unauthorized modification or erasure of special jobs. The owner’s access code (or the management code or, if the access codes are off then the universal operator’s code **2 9 8 4**) must be entered before changes are allowed. The protection is re-enabled any time manual mode is commenced. The job CAN be copied without the access code (see above) if changes are required.
- F6**     **Previous screen:** Allows you to display FEATURES SCREEN 1.

# Review Mode

Press **REVIEW** to review an existing job. The jobs will be sorted and displayed. Press the **ARROWS** to highlight the desired job. Press **YES** to recall the job (this allows you to view the job in the same manner as PROGRAM—see the previous pages). Press **AUTOMATIC** to use the job or **MANUAL** to exit.

## FEATURES IN REVIEW MODE

Several features are available to help find, copy, read, or delete jobs. To select a feature press the corresponding **F** key—

- F1**     **Page up:** Moves up a full screen of jobs.
- F2**     **Page down:** Moves down a full screen of jobs.
- F3**     **Options:** Allows you to sort or search the jobs by date, number, or description. Also allows you to delete or copy jobs, zero the lifts run counter, print jobs, or switch to the floppy disk drive. Follow the on-screen instructions for details.

## NOTES:

1. The **NO** key can be pressed from the entry screen to delete the highlighted job directly.
2. If a diskette containing a CIP4 compatible file (extension is .PPF) is placed in the floppy drive and pulled up a job will be created automatically using the job number and description contained in the CIP4 file. Push out, clamp only, and load point values will not be programmed. The operator will need to insert those while running the job.

# Automatic Mode

While in automatic operation **microcut** will read programmed locations from job memory and position the backgauge sequentially from one value to the next as the knife (or clamp if the target is a clamp only) is cycled, **MOVE** is pressed, or the location is reached (push out).

Program a new job or press **REVIEW** to select the desired job. Press **AUTOMATIC** and **microcut** will move to the highlighted value.

Press the **ARROW** keys to move the display to a previous or future value. Press **MOVE** to go there.

Use **FORWARD**, **REVERSE**, or **NUMBERS** and **MOVE** to move the backgauge to adjust a cut for this lift only.

Press any **MODE** key to exit automatic mode. Press **AUTOMATIC** to go back to automatic mode at the same place you exited.

## FEATURES IN AUTOMATIC MODE

The same features available in program mode are available in automatic mode with the features screen 2 addition of—

- F4 Lay compensate this lift only:** Adjusts all forward moving backgauge targets up to the end job or the next load point for only this lift.
- F5 Lay compensate all lifts:** Adjusts all forward moving backgauge targets up to the end job or the next load point for all lifts.

The lay comp feature allows an operator to program a label job with the convenience of the label mode regardless of the quality of the layout. On the first lift use the lay comp feature to adjust each trim out. All finished label sizes will be maintained but each trim will be adjusted.

Note that copy job and job protect options are not available in AUTOMATIC operation.

# CIP4

CIP4 is a standard for printing jobs. If you use this standard, files will be generated in your computer with a PPF suffix. If you have these files **microcut** can automatically convert the position information contained within into cut positions to run the job. CIP4 files take precedence over standard **microcut** files on the floppy disk. Do not mix these files on the same disk or you will not be able to read the standard files at the **microcut**.

CIP4 file translation is available at the **microcut** console from the REVIEW mode of operation—

1. Press **REVIEW** to enter the REVIEW mode.
2. Insert a floppy disk with one or more CIP4 formatted files.
3. Select the floppy disk drive from the OPTIONS menu. **microcut** will automatically list the CIP4 files.
4. Use the **ARROW** keys to highlight the desired job. Press **1** to convert the file, press **0** to exit.
5. A screen will appear asking for the gripper and guide orientation. Make your selection. *Refer to NOTES below on orientation—the guide may have to be flipped based upon perfecting and file orientation. Always use extreme caution when running the first lift.*
6. **microcut** will convert the CIP4 file into cut positions automatically. This may take some time as **microcut** converts the file into sub-files and subdivides the various logs to create the cutting sequences. If the CIP4 file that is being converted already exists the old job will be written over automatically.
7. When the conversion is complete the REVIEW screen will appear. The highlighted job will be the same as before the CIP4 conversion, allowing you to continue with the job you were using. If you wish to go directly to the new CIP4 job you will need to locate and select it (see REVIEW MODE for details). The name of the job will be the same as the PPF file. The job description will be the contents of the AdmJobName module in the PPF file.

Note: Converting CIP4 data creates many cuts in a single step. Orientation can change between creation of the CIP4 file and arrival at the paper cutter. The original orientation for gripper and guide can be specified to either corner and can have an affect on the way the data is extracted. The following items need to be considered when using CIP4 files.

1. CIP4 sizes do not take into account lay adjusts for the printing process. The first two cuts will require adjustments to make sure that the job aligns properly. This can be done by pressing **F5** to change the cut. Do this on the first lift and all remaining lifts will be correct.
2. Comments appear to the lower right corner box to guide the operator for stock loading/ unloading, or turning. These comments advise the operator of actions to take before cutting.
3. CIP4 can be used for complex jobs. To simplify the cutting operation we use a first out, last in policy. If a sheet is cut into logs the front log is removed from the cutter first. It is assumed that the log orientation stays the same as it is removed from the cutter (no rotation). After the later logs are fully processed the first log is finally put back into the cutter with a rotation comment to insure that the new orientation is correct.



4. A load point is programmed automatically as the first location. This is the sheet size (across from the gripper) less 10 inches. This value can be changed or deleted per the operator's desire.

#### NOTES ON GRIPPER AND GUIDE DIRECTIONS:

Depending upon a number of factors (the CIP4 file orientation when it is originally created, the guide side on the press, and whether the paper has been turned over) the guide location may have to be flipped to insure that the cuts are correct. Whenever CIP4 data is used, use extra caution cutting the first lift to insure the guide orientation is correct. If not, it may be necessary to rotate the stock a half turn after the fourth trim cut or go back and reprogram the CIP4 file with the guide to the opposite side. Orientation may change from job to job. Just because it worked on the last job do not assume it will work on the next job.

1. If you are running the job upside down (such as in perfecting jobs) flip the side the guide is on.
2. It is assumed that the CIP4 references are relative to the gripper. If the CIP4 file is aligned to the color bar the first four cuts will require changes and the pile will need to be turned 180 degrees after the four side trim out to allow the cuts to align.
3. If the position reference in the CIP4 file is changed from right to left the guide will have to be flipped as well. You will need to test your direct to plate software that creates the CIP4 file to evaluate if this is the case or not. **The same direct to plate software may orientate the stock differently based upon how the file is defined. Never assume that the orientation is correct when cutting the first lift.**

If the guide is selected to the wrong side then all of the rotation comments will be in the wrong direction. This will also place the sheet half a turn off after the four sided trim out is completed. This will require that the sheet be turned a half turn after the fourth cut to adjust for this. Once this is done the job will run correctly.

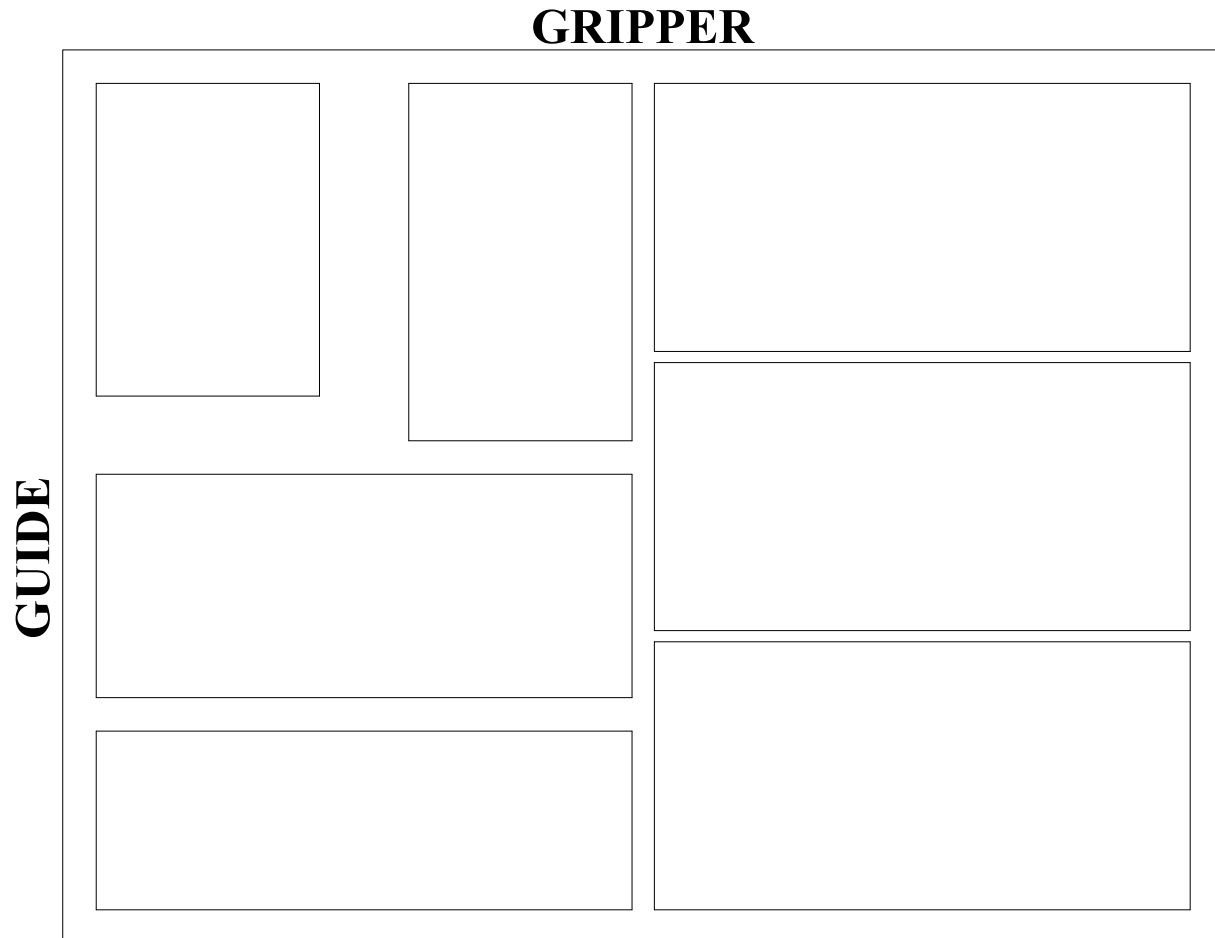
The comments created during the CIP4 conversion process are held in a separate file and cannot be altered by the operator. The operator can add comments to the right side of each cut in normal fashion. To remove the comments from the target box in the lower right corner you must delete the cut entirely and then insert it back into the program.

**Be critical of the target values on the first lift. Depending upon your direct to plate software, there is always the possibility of error in the conversion file that will lead to errors in the cut values. C&P Microsystems assumes no responsibility for damaged product if the cuts and/or comments are not correct.**

Contact C&P Microsystems for software to allow CIP4 conversion on an external computer. These converted files can then be moved to any **microcut** PLUS control system via RS-232 or floppy disk. See **microfacts** and **cutternet** in the following sections for more detail on using external computers.

# CIP4 Job Example with Comments

In this example the parent sheet looks as shown below.



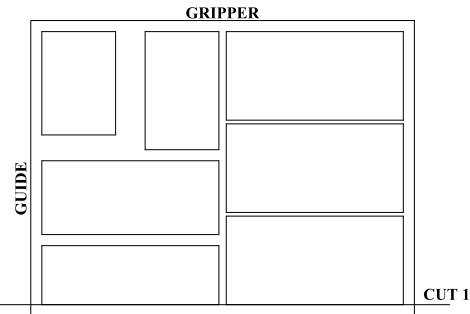
All jobs start with a load point 10 inches smaller than the sheet width from gripper to color bar. The first four cuts of any job trim out the waste along the sides. The first two cuts will need to be adjusted for the sheet lay as it was printed. Proper cutting technique for insuring the stock is square requires that only the back gauge support the lift for the first cut and the side gauge support the lift for the second cut. Thereafter the back gauge is considered to be the primary support to insure proper sizing.

Cut 5 on break out the logs and process them. As logs are broken out of the parent sheet they are set to the side for later processing. Comments will appear in the target box in the lower right corner of the display to guide the operator through the job. These comments advise the operator of what needs to be done BEFORE cutting is performed, not AFTER.

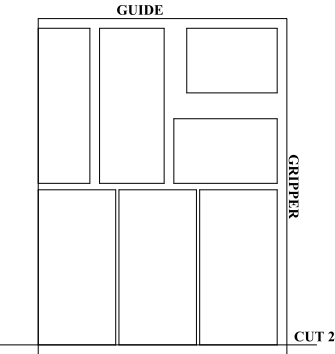
The dimensionless programmed locations and attached comments as they are automatically programmed are shown below. Each view places the back gauge to the top of the page and the knife to the bottom.

**Load** *Load lift, gripper to gauge*

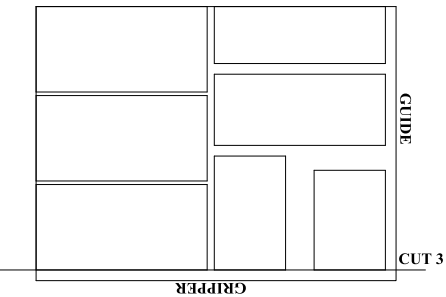
**Cut 1** No comments, push lift straight back  
Stock is supported by the back gauge



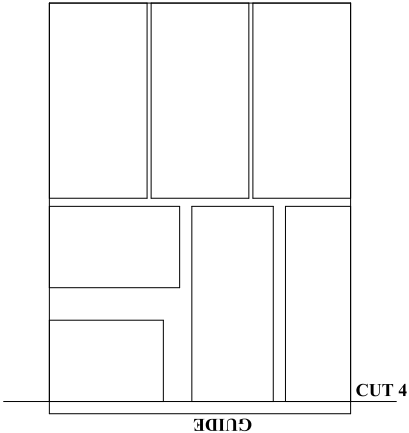
**Cut 2** *Turn left 90 degrees*  
Stock is supported by the side gauge



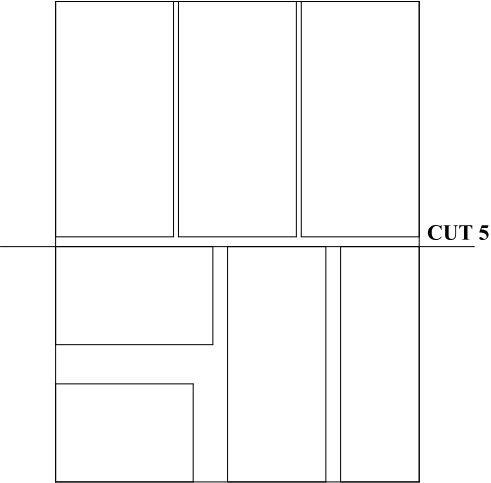
**Cut 3** *Turn left 90 degrees*



**Cut 4** *Turn left 90 degrees*

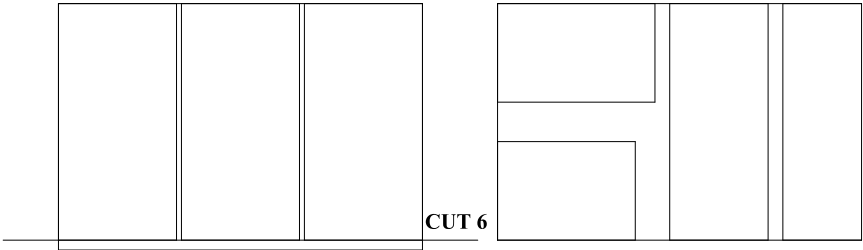


**Cut 5** No comments, push lift straight back

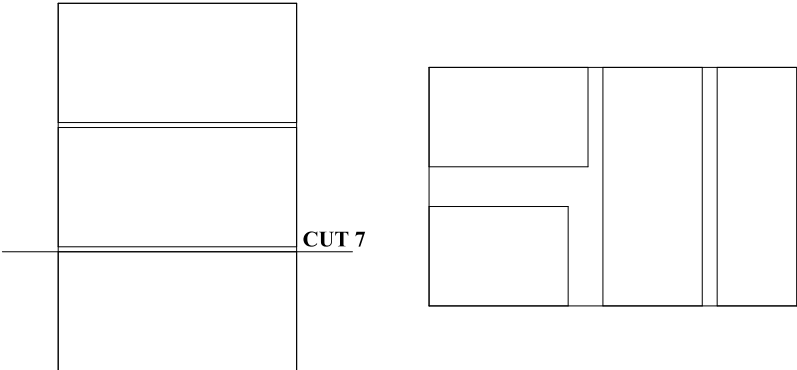


**Cut 6** *Remove log and set aside*

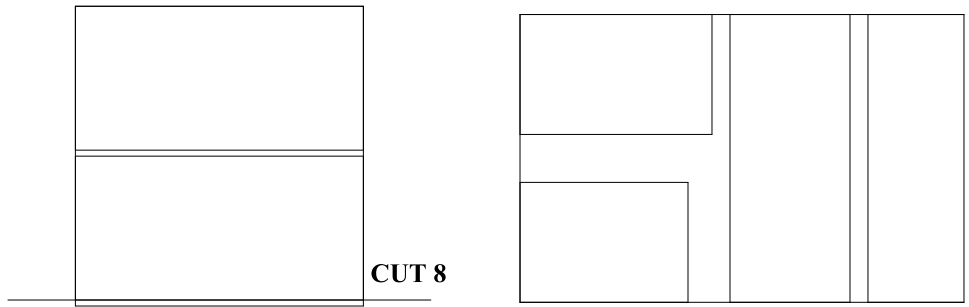
This log sits to the side until later



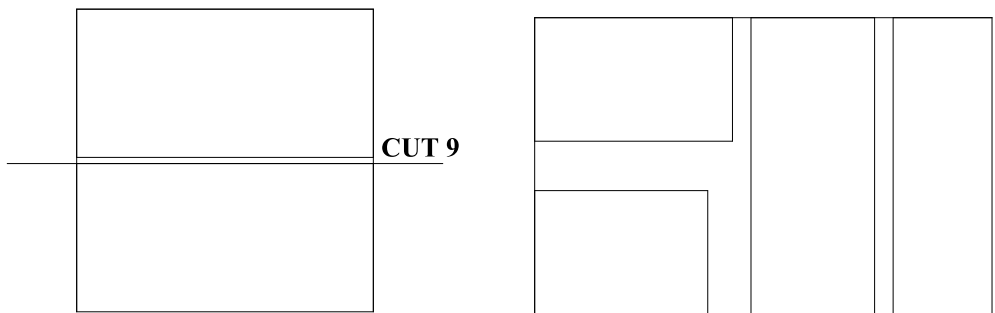
**Cut 7** *Turn left 90 degrees*



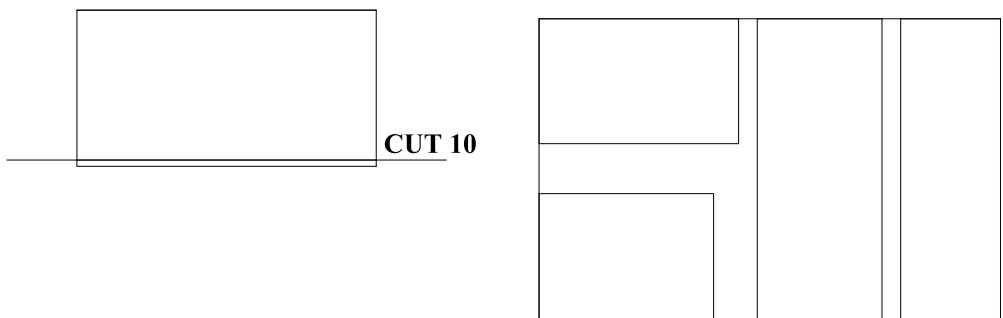
**Cut 8** *Remove finished block*



**Cut 9** No comments, push lift straight back

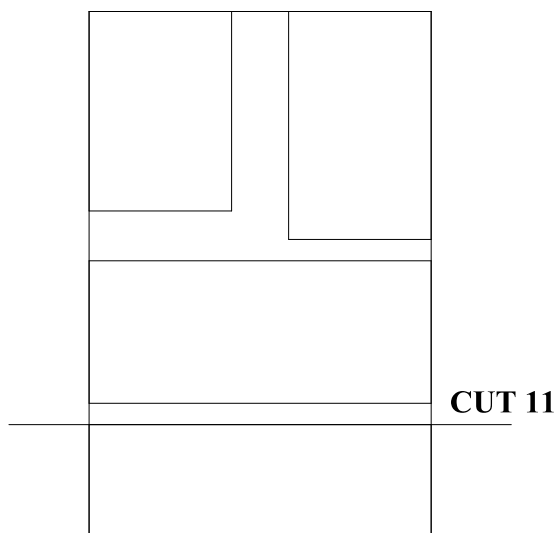


**Cut 10** *Remove finished block*

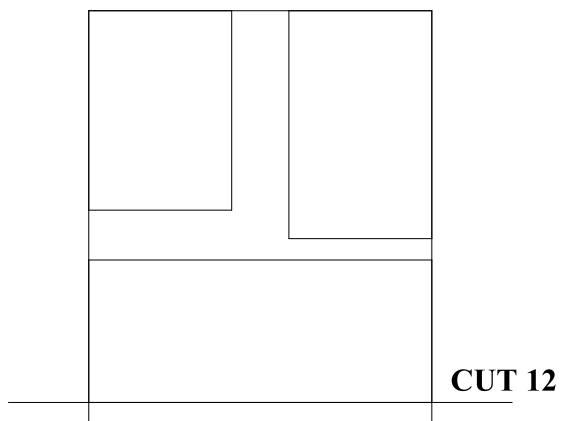


**Cut 11 *Remove finished block, load previous log, turn left 90 degrees***

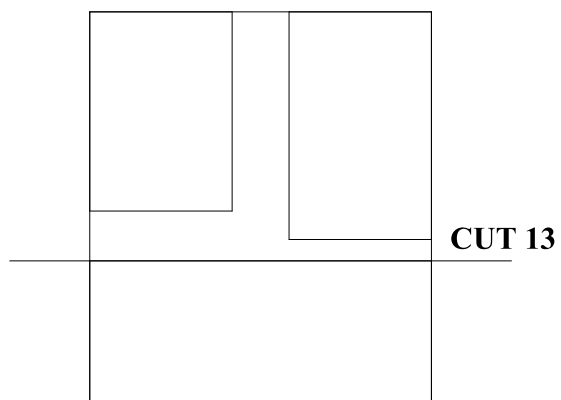
Saved log goes back into cutter



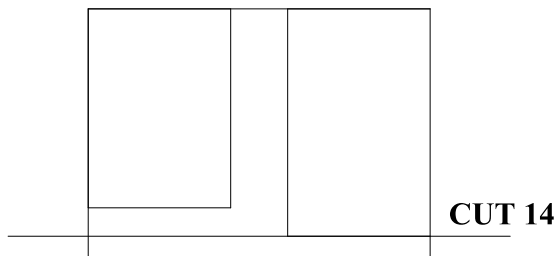
**Cut 12 *Remove finished block***



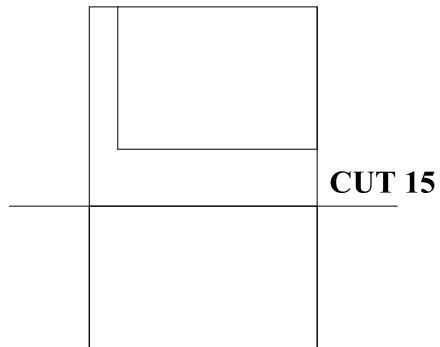
**Cut 13 No comments, push lift straight back**



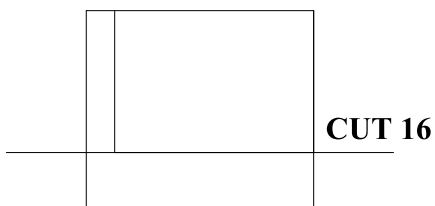
**Cut 14** *Remove finished block*



**Cut 15** *Turn left 90 degrees*

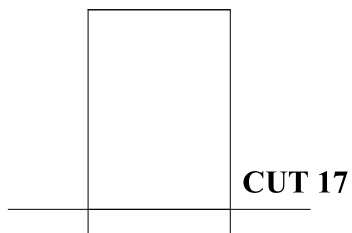


**Cut 16** *Remove finished block*



**Cut 17** *Turn right 90 degrees*

This is the orphan that needs to be turned differently



**End Job** No comments, it is assumed that the operator realizes that the block in the cutter is finished.

# microfacts

**microfacts** is an operator transparent real time based management system which tracks time spent on different cutting jobs. This is intended to aid in job costing, job estimating, security (preventing unauthorized use of the machine), and general tracking. This standard option on the **microcut+** consists of five main systems—

## ACCESS CODES:

These consist of up to 10 operator defined access codes as well two management codes (one fixed and one selectable). If these are not enabled, then the **microfacts** system is turned off. If the codes are enabled, then each operator code can be assigned or denied permission for a variety of features. This allows management to define job operations for each of the operators and eliminate machine usage by unauthorized personnel.

The only time that operator interface is required with **microfacts** is during the login period, or if idle time (see below) occurs. When logged in with a valid code, the operator is automatically set up for his preferences of screen color, key response, and operating parameters such as speed, auto push out, and viewable time clock.

The management code is used to define the operator codes, run data reports, and configure the idle time settings. There is a fixed code that will always work and a second code can be defined as desired.

## DATA COLLECTION:

When the access codes are enabled, the data collection option can also be enabled. This allows the computer to keep track of all mode changes, operations, and times as the machine is being used. This real time data can then be used to extract run time information on any job or series of jobs. Refer to REPORT GENERATION below for more details.

## IDLE TIME:

If data collection is on then idle time can be enabled. If this is done then time allowed without machine use (keystroke or knife operation) can be defined from 1 to 99 minutes. Anytime that the machine is not operated for the selected period a screen will appear requesting a number selection stating the reason for the idle time. These include normal items such as lunch, break, knife change, waiting for stock, and waiting for job approval. Additionally the operator can type in his own reason with the on-screen alpha keyboard.

## DATA TRANSFER:

Data can be sent to another computer at any time. Data can also be evaluated at the machine itself on the **microcut** console. Data transfer (also referred to as **cutternet**) can be handled by RS232 or via the floppy disk. Job data can also be transferred from one machine to another via either of these methods. The management access code is required for any time data. Job data can be transferred by anyone.

## REPORT GENERATION:

Reports can be generated, viewed on screen, and printed either at the **microcut** display console directly or at a remote computer once the data has been transferred (see previous section). The report generation software module is fully guided on the screen and allows filters for date range, operator codes, job numbers, idle time only, and more. The report can be shown on screen or printed in either full format with all details in real time, or in summary mode showing total elapsed times only. This allows management to evaluate bottlenecks and improve the overall work flow at and around the machine.

NOTE: Job data as well as maintenance data (proof of calibration, etc.) can also be printed from the **microcut** display (additional printer attached directly to the display required) or remote computer for customer tickets and ISO-9003 programs.

Press **MANUAL** and then the **F5** key for the **microfacts** menu. Enter the management access code. **microfacts** options can then be defined or adjusted. On screen reports can also be viewed after filters are set. Follow the instructions on the screen to proceed.



# cutternet

**microcut** can be connected to an external computer to assist in tracking machine use, perform job costing, or remotely program and move job information. The hardware and software that allow easy data flow on the **microcut** is referred to as **cutternet**. This system interfaces **microcut** to any PC compatible computer. This will allow fast, simple reading and storage of the time and usage data. This data can help evaluate bottlenecks in the bindery and allow true performance and profitability to be measured. This system is designed with the realization that different shops may require different features. It can be used in a number of different ways. If there are methods which you will require that do not seem to be in this package, please contact us directly. We will be happy to investigate your needs and add features as possible. There may be some instances where **cutternet** data need to be integrated into an existing management system. This manual contains information on file and data organization. If this interface is required, it may be necessary to contact the engineers for your existing management system for assistance.

**cutternet** allows enhanced operation from the standpoints of **microfacts** operation, job programming, job storage, and data manipulation. Press **MANUAL** and then the **F5** key for the **microfacts** menu. Enter the management access code. **cutternet** options and data can then be defined, adjusted, sent, or polled. Follow the on screen instructions to perform any of the below stated options.

**microfacts** enhancements offered by **cutternet** include—

1. **microfacts** can be polled during operation to evaluate job status to estimate when a customer's cutting job will be completed. Lifts run as well as time spent cutting the job can be seen.
2. Operating data can be stored and evaluated over a period of time with respect to date(s), operator(s), machine(s), job number(s), and idle time to help evaluate efficiency, productivity, and job costs.
3. Data can be "written" to screen (monitor) or to a printer attached to the computer.
4. The data can be manipulated to work on different management systems to better integrate it to the operation of the entire company.

**microcut** enhancements include—

1. Jobs can be stored on floppy or hard disk at a remote computer dramatically increasing the job flexibility in multi-user shops.
2. A copy of each job can accompany the customer time data information stored by **microfacts**.
3. Jobs can be created or modified as necessary at the computer terminal to adjust for layout changes BEFORE the operator receives the job at the cutter.
4. Jobs can be swapped between machines through the computer interface.
5. If a diskette containing a CIP4 compatible file (extension is .PPF) is placed in the floppy drive and pulled up a job will be created automatically using the job number and description contained in the CIP4 file. Push out, clamp only, and load point values will not be programmed. The operator will need to insert those while running the job.

# Additional Interface Options

**microcut** offers additional options—

1. A floppy diskette drive (1.44 MB high density double sided 3.5 inch type) for job and data transfer is located on the right side of the display console.
2. A video out connector on the left side of the display console can be used to attach an SVGA CRT with separate power supply to the system. This might be useful when installing the unit on a large machine and an extra display on the far side is required. The standard cable attached to the CRT plugs into the connector. No special set up is required.
3. A printer connector on the left side of the display console uses a standard cable to attach to any parallel printer. The print format is standard ASCII text. Jobs can be printed from REVIEW mode.
4. An RS-232 connector on the left side of the console that uses any standard cable can connect **microcut** to an outside computer. The RS-232 drivers used in **microcut** can run 9600 baud over a line distance of 100 feet (30 meters). If the cable must be longer than this it may be necessary to place a "repeater" in the line to boost signal strength. These are available from most computer stores. Any brand that is compatible with an RS-232 line is acceptable. Follow the manufacturer's instructions for attaching these devices. If there is a question about whether you require a repeater, try the system. If data transmission errors occur, then install the repeater(s).

If several **microcuts** are to be attached to the same computer in this manner, a switch box is recommended. The switch box can be used to select from one **microcut** to another. Alternatively, it may be easier to dedicate a small portable computer to **cutternet** and move the computer from one **microcut** to another.

Interface components can be used to convert the RS-232 to a network connection or for wireless operation. Contact C&P Microsystems for further information.

C&P Microsystems can supply additional software to program or read jobs at another computer. Jobs can be programmed remotely to load to the cutter. Jobs can be read from the cutter and then stored and transferred to other cutters. Job run time information can also be polled, sorted, and filtered for report generation. Refer to the **microfacts** and **cutternet** sections of this manual for details.

# External PC Requirements

**cutternet** and its associated PC software package need the following in order to operate:

## MINIMUM REQUIREMENTS--

1. A PC compatible computer with--
  - a. At least 640KB of on board memory.
  - b. A hard disk to hold the program and data.
  - c. Windows operating platform (any version).
  - d. A serial port (RS-232).
  - e. A printer if hard copies are desired.
  - f. A CD drive for down loading the software (specify drive size).
2. Interconnect cabling between the personal computer and any **microcuts** that are to be monitored--see ELECTRICAL HOOKUP.

## INSTALLING THE SOFTWARE--

1. Insert the CD and follow the instructions as they appear on the screen.

The necessary programs will be installed onto your hard disk under a directory titled C:\CUTRNET. The titles of the programs are CUTRNET.EXE and JOBS.EXE. **cutternet** will automatically create new directories and sub-directories for data as required.

# Data Formats

**microfacts:** When stored in a personal computer, all data is converted to ASCII text data delimited by (") and (,) in between the fields. If data is to be merged with a different management system it will be necessary to convert the data to the required format for evaluation. The real time data format consists of "Field 1", "Field 2", "Field 3", ... "Field 6", Carriage return; Next data line...End of data where—

Field 1 (2 characters long selected from the following) is the mode of operation—

>> = Operator log in, 01 = Manual mode, 02 = Program new job mode, 03 = Review job mode, 04 = Automatic mode, 05 = Job approval (idle time), 06 = Shift change (idle time), 07 = Wait for stock (idle time), 08 = Knife change (idle time), 09 = Lunch (idle time), 0 = Break (idle time), 0; = Cutter down (idle time), 0< = Maintenance (idle time), 0= = Memory full, 99 = Log out of operator

Field 2 is the Operator code--blanks unless >> at Field 1 (operator log in)--(4 characters in length)

Field 3 is hours, :, minutes, :, and seconds (time)--always has data--(8 characters in length)

Field 4 is month, /, date, /, and year--data at log in and log out only--(8 characters in length)

Field 5 is the job number being used--blanks only if LAST JOB was deleted--(8 characters in length)

Field 6 is number of lifts run in AUTOMATIC mode--(6 characters in length)

**Job data:** Every job has a job extension (.job). The jobs are located in a sub directory titled PC1 through PC10. This way each plus has its own directory. Each cut consists of 99 bytes of information—The job number (string \* 8), the job description (string \* 30), the cut number (integer), the cut type (string \* 4), air on/off (integer), the cut position (string \* 7), the cut units (string \* 6), number of lifts run (integer), the job creation date (string \* 10), the last job modification date (string \* 10), the protection status (integer), any temporary cut information (string \* 7), and the job owner (string \* 8). The job data format is as follows—

Data positions	Contents	Format	Comments
1 to 8	Job number	Text	
9 to 38	Job description	Text	
39 to 40	Cut number	Integer	From 1 to 255
41 to 44	Cut type	Text	Cut, clamp, load, push out, auto-trim
45 to 46	Air on of off	Integer	1 = air motor on, table off 3 = air motor on , table on
47 to 53	Target position	Text	“010.000”
54 to 59	Cut units	Text	Inch, cm, mm, sun
60 to 61	Lifts run	Integer	Increments each time a lift is run with cutting occurring.
62 to 71	Job date	Text	mm-dd-yyyy of creation date
72 to 81	Clamp pressure	Text	Used on machines with programmable clamp pressure
82 to 83	Job protection on/off	Integer	1 = job is protected
84 to 90	Temporary data	Text	Used for temporary lay comp adjustments
91 to 98	Job owner	Text	For unlocking the protection mode

Notes:

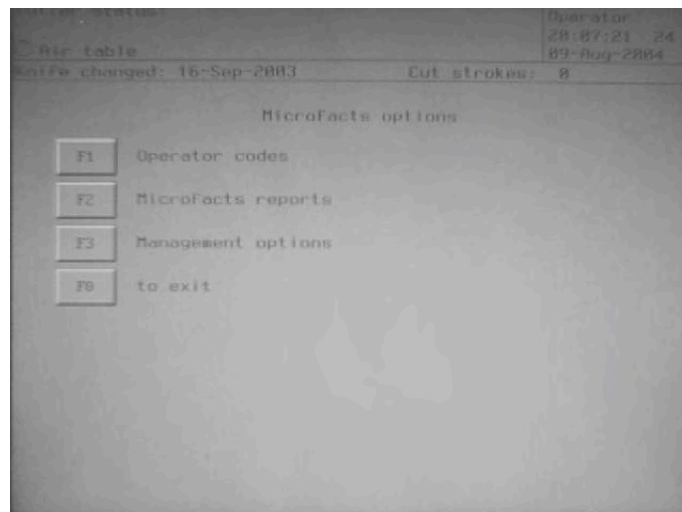
1. Some features are OEM only or require optional equipment.
2. All jobs are terminated with 5 extra cuts (text “End job”) in the cut field instead of a cut position.

# Navigating microfacts

**microfacts** can be accessed from the MANUAL mode by pressing the **F5** key. Job data and real time data can be copied to diskette and carried to another computer, or polled directly from the other computer (see External PC Requirements a few pages earlier in this manual). Once data is at another computer it can be reviewed and manipulated (please contact C&P Microsystems for the proprietary software required). From manual mode press **F5** and the following screen will appear—

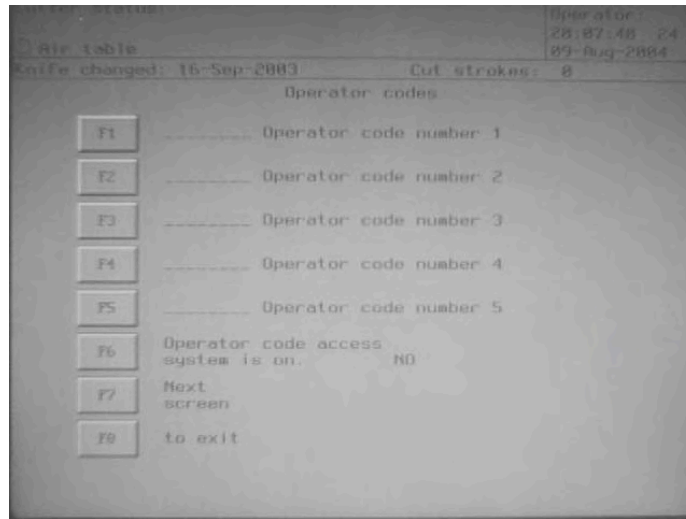


Type in your own management code (see further on) to gain access to the system. The main **microfacts** screen will appear—

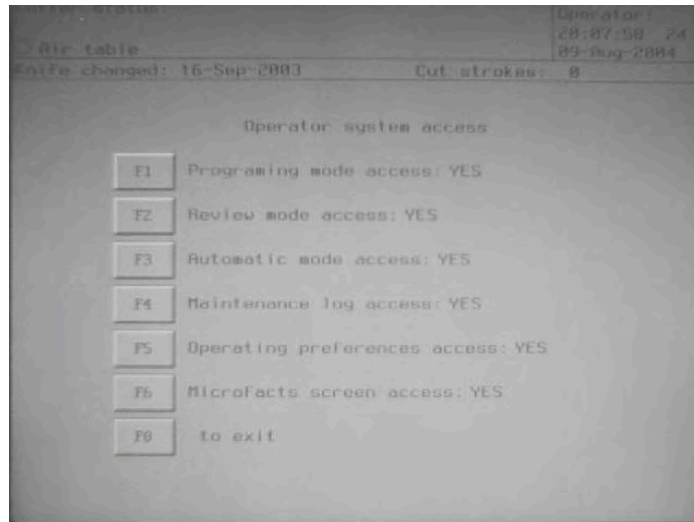


This allows you to set up operator codes, prepare real time reports, or define the management system.

From the main **microfacts** screen press **F1** to define the operator codes—

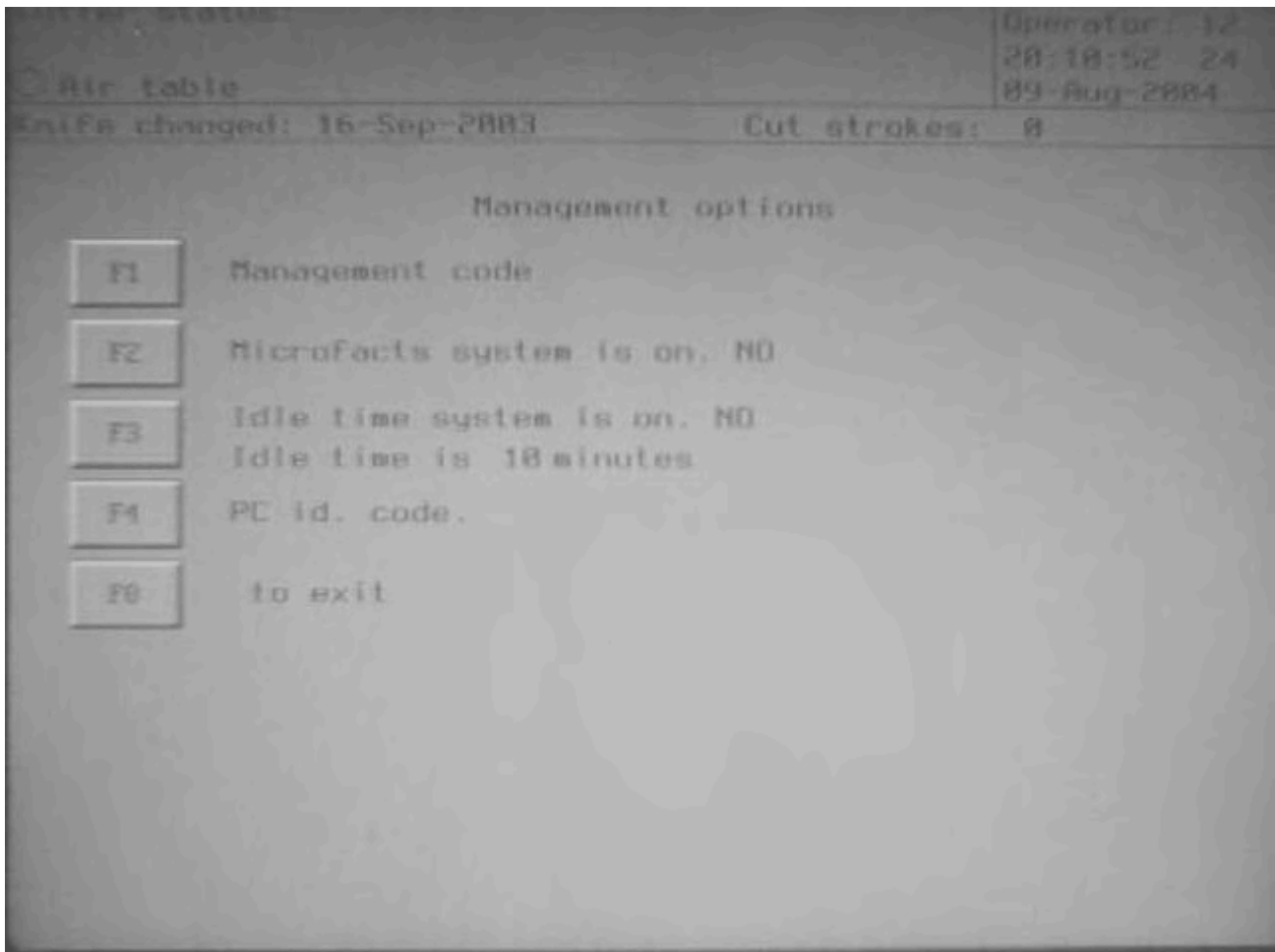


Up to 10 different operator codes can be defined using any combination of up to 8 numbers and letters. Select the operator to assign the code to by pressing the appropriate **F** key and typing in the code. The next screen will appear—



Use the **F** keys to define what this operator can or cannot have access to. Make your selections. Press the **F9** key to exit and automatically save the settings. Continue until all desired codes are entered. Before exiting the operator code screen select whether the codes should be active or not. NOTE: The codes must be active to enable the **microfacts** real time data collection system. If the codes are enabled then access to the operating system is denied until a legitimate code is entered. Each code carries its own set of operator preferences (screen color, background speed, etc.). This is a good option to install if you have multiple operators with a strong feeling about their own preferences.

From the main screen press the **F3** key to access the management options—



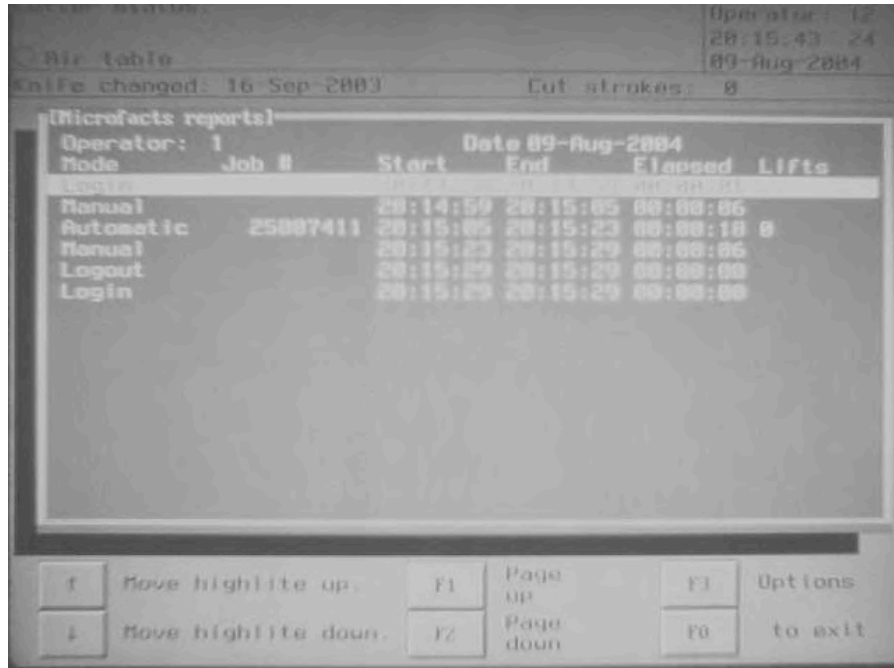
Press the **F1** key to define your own management code. The 3275 code hard programmed into the system will always work in case you forget yours.

Press the **F2** key to enable the time data collection system. The operator codes must be enabled for this to work.

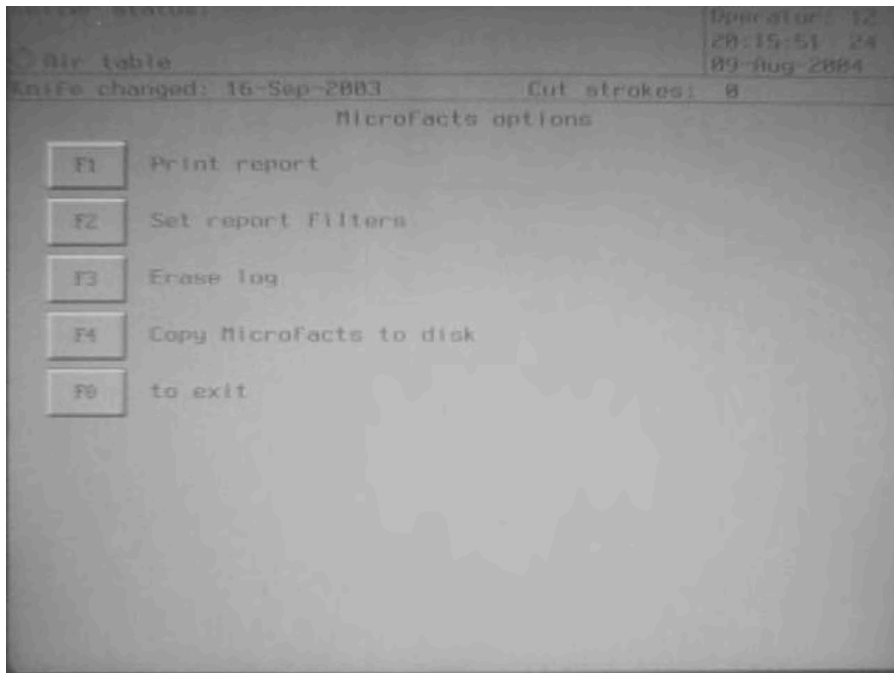
Press the **F3** key to enable idle time and define the time value.

Press the **F4** key to install an ID code to allow data to be polled or jobs loaded to this unit from a remote PC.

Additionally from the main **microfacts** screen pressing the **F2** key will allow you to see the time data—



Use the assigned keys to view the screen or press the **F3** key to view your options—



From this second screen the data can be manipulated and reports generated for printing (printer required), export, or on screen viewing. Follow the on screen instructions.



# PC microfacts Data Use

The following assumes that the proprietary software has been installed. If not, insert the C&P Microsystems CD and follow the on-screen instructions. Please contact C&P Microsystems if you need a copy of this CD. Upon start of the program the main menu screen will appear—

**cutternet** PC Interface System

- 1: **microfacts** data
- 2: **microcut** jobs
- 3: Utilities
- 4: Exit

Press a number for your selection

To work with the **microfacts** real time data press the NUMBER 1 key. The screen will show—

**cutternet** Data Menu

- 1: Get data from **microcut**
- 2: Review data stored from **microcut**
- 3: Previous menu

Press a number for your selection

Press the NUMBER 1 key to poll data remotely from any of the **microcut** units attached to your system. The screen will ask you to select a machine number from the list (so that the data can be stored in the correct file). Use the NUMBER and ENTER keys. Data will be transferred automatically. When the transmission is complete the data will be converted and added to the subdirectory of the **microcut** ID polled (FACTS.DAT file). NOTE: If a machine code is not present you may press the INSERT key to add the missing machine ID. The system will automatically poll the machine to determine maximum and minimum sizes for future error checking.

Press the NUMBER 2 key to view the data and set filters for reports.

Press the NUMBER 3 key to return to the main menu screen.

NOTE: **microfacts** data can also be transferred by floppy diskette. Insert the diskette and the data will be loaded automatically.

# PC Job Programming and Review

From the main menu (see previous page) press the NUMBER 2 key to program or poll jobs. The screen will ask you to select a machine number from the list (so that size limitations can be met and the data can be stored in the correct file). Use the NUMBER and ENTER keys. If a machine code is not present you may press the INSERT key to add the missing machine ID. The screen will show—

## Programming options

1. Program a new job
2. Review an old job
3. Previous menu

Press a number for your select

Press the NUMBER 1 key to create a new job. Follow the instructions for programming the job. The machine selected will automatically set limits on the sizes you can enter. Upon exiting the job programming mode you will be offered the chance to directly download the new job to the machine.

Press the NUMBER 2 key to review an old job. The jobs available to the selected machine will show on the screen for your selection. Upon exiting the job review mode you will be offered the option to download the job to any desired machine in your data base.

Press the NUMBER 3 key to return to the main menu.

NOTE: If a machine code is not present you may press the INSERT key to add the missing machine ID.

# PC Utilities

For proper operation of the PC certain set ups are required. Additionally, since time data can take up large amounts of memory, it is recommended that occasionally, the time management files be trimmed depending upon your application. Proceed to the UTILITIES menu (press 3 at the main menu—see two pages previous) and the screen will show—

## **cutternet** PC Interface Utilities Menu

- 1: Com port setup
- 2: Delete selective portions of **microfacts** file
- 3: Write delimited **microfacts** text file
- 4: Previous menu

Press a number for your selection

Press the NUMBER 1 key to define the serial com port that data should be transferred through.

Press the NUMBER 2 key to delete part or all of the time data. Each time data is downloaded into the facts file, it is appended at the end of the file. At some point in time you will find that the file has grown large enough to become cumbersome to view or print. This utility allows you to shrink the size of the file by deleting selected information depending on how the filters are set. The filters work with each other. The filter options are—

1. Date--Select data between these dates to delete.
2. Operator's--Delete a selected operator from the file or all operators from the file.
3. **microfacts** File ID--Go into ID directory and delete facts file data or choose one directory only.
4. Job number--Delete only one selected job from facts file or all jobs from facts file.
5. Idle time only--Delete idle time only from all facts files.

Set the desired filters and follow the on screen instructions to reduce the data file size.

Press the number 3 key at the **microcut** PC Interface Utilities Menu to gain direct access to the **microfacts** file data. The screen will first show the **microcut** ID selection directory. Each **microcut** ID has an individual **microfacts** file which is delimited ASCII text readable by programs such as DBASE. Please refer to the file format section in this manual for more information about how the file is organized.

Press the NUMBER 4 key to return to the main menu.

# Cutternet Problems & Diagnosis

1. When machine codes are called up, one (or more) always show unavailable.
  - a. Power is off to that **microcut**.
  - b. The RS-232 cable is not connected properly (or adequately).
  - c. The particular code(s) is (are) not programmed into a **microcut** that is on line.
2. Data is interrupted during transmission.
  - a. Power to that **microcut** was turned off.
  - b. The line losses are too great for proper operation. Line boosters need to be installed (see ELECTRICAL HOOKUP).
3. Response from **microcut** is sluggish.
  - a. **microcut** is being used in a non-interrupt mode and is sharing time between the operator and the computer.
4. Job(s) can not be located.
  - a. Job(s) is (are) stored under a different directory.
  - b. Job(s) was (were) not saved.
  - c. Job(s) was (were) deleted.
5. Printer does not respond.
  - a. No data is available for transmission--check the data and filter status. View the data on the screen to insure data exists.
  - b. The printer is not on. Check the power cable and switch.
  - c. The printer is not attached to the computer. Check cables carefully. Does the printer operate if the PRINT SCREEN key is pressed?
6. Job(s) is (are) not loaded to **microcut**.
  - a. Wrong **microcut** was selected for the data dump.
  - b. **microcut** code registered OFF at the selection screen (see 1 above).
  - c. There was not enough memory in **microcut** for the data transfer (an error would be shown on the computer screen).
7. Device time out error appears on screen.
  - a. There is a problem in the communications line to the **microcut** or printer. Check the lines carefully for bad connections or a wiring error.

C&P Microsystems supplies phone consultation during our normal work hours of 8:30 AM to 5:00 PM Pacific Time from Monday to Friday excluding holidays. We will do all that is possible to assist over the phone lines. Please have your OWNER'S MANUAL at hand AND the serial number of your machine before calling.



# Service Screen

**microcut** contains a service screen section to allow the controller to be configured for any type of machine. Before shipping new systems from the factory data files are deleted to force the Service Screen at power on. To get to the Service Screen after the unit has been set up for a specific machine at the ARE ALL GUARDS IN PLACE? screen press the **3 1 7 5** keys in that order—

- F1**     **Failure record files:** Used to view all failures recognized by the controller along with date and time of the problem for service evaluation.
- F2**     **History:** Shows all times of maintenance, total cut strokes, date of controller installation, etc.
- F3**     **Available languages:** This allows only the desired languages to be installed.
- F4**     **Configuration:** This allows several operations to be done—select logo (for power off and screen saver modes as well as enabling certain options for specific machines), utilities (for file manipulation, DOS operation, and demonstration mode), and for machine options (clamp only, auto cut, auto trim, and programmable clamp pressures—all original equipment options which require special hardware). NOTE: The drive box contains many options including sensing for mechanical loading, optical loading, safety curtain, guards, safety pin full in, shear bolt broken, hand wheel pushed in, auto-trim table full in, and one open input. Operation options include side load enable, clamp only, auto-cut, auto-clamp, main motor enable, auto-trim table drive, and two extras. There are also options for programmable clamp pressure and two analog inputs. Only items that are available with your hardware will affect your machine operation.
- F5**     **Maintenance schedule:** To define scheduled maintenance times.
- F6**     **Installation routine:** Done after installation to define table sizes, motor direction, encoder direction, and other critical operating data. **microcut** CANNOT operate correctly until this routine is completed.
- F7**     **Encoder pitch set up routine:** Allows the encoder pitch to be typed in so that the controller knows how to count up and down the table. This is not a replacement for the installation routine. This will allow exact entry of a given encoder pitch avoiding the risk of error due to inaccurate entry of gauge positions during the installation routine.
- F8**     **Encoder or position sensor installation routine:** This should be completed anytime the encoder or position sensor are replaced or repositioned. This will insure correct timing between the zero set in the encoder and the position sensor. This routine is automatically done during the installation routine.
- F0**     **Exit:** To return to the regular start up screen.



# Error Codes

**microcut** checks many operations continuously. If any error condition occurs, a message will appear on the screen. This message will contain an identification number as well as a description of the problem. Read the screen for details. Some of the possible errors are from the drive unit include—

## **MINOR ERRORS FROM THE DRIVE THAT DO NOT FORCE A FULL RESTART**

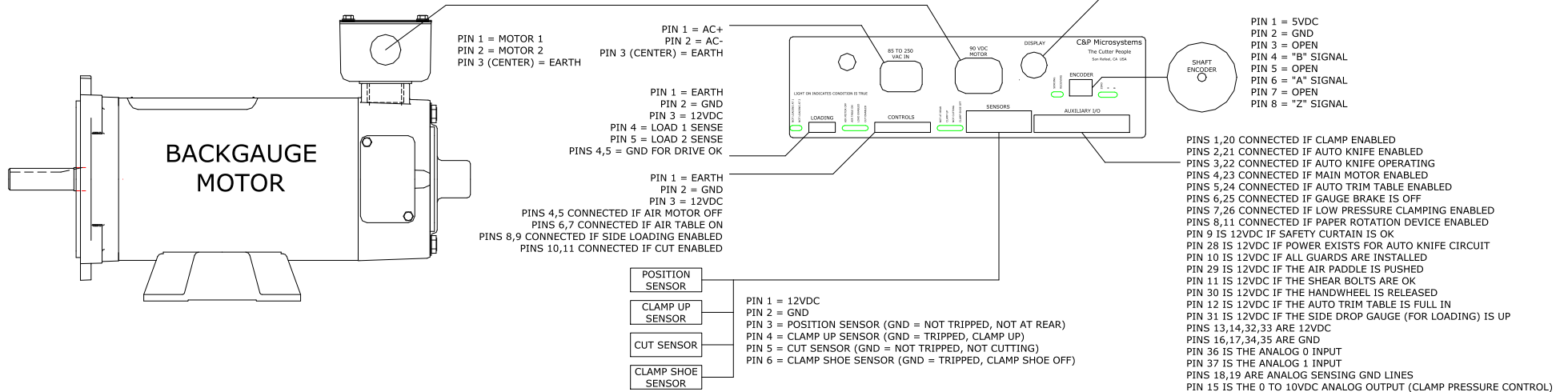
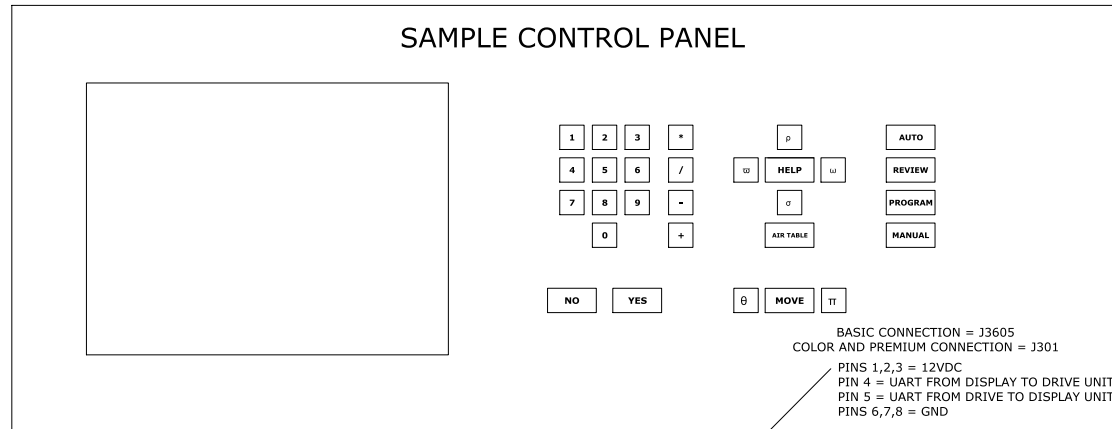
- b4 AC power sense not operating for motor drive
- 89 Check the D37 and 5 pin connectors on the drive box for looseness.
- 88 Too many drive motor overcurrents; speed is being lowered
- 87 Overcurrent on drive motor; check for binding in back gauge
- 81 No motion seen during motor drive
- 80 Target lost at H-Drive; requested target is beyond the limits of the table

## **MAJOR ERRORS FROM THE DRIVE THAT REQUIRE A FULL RESTART**

- c0 Too many shaft encoder counts without a zero set
- bf Duplicated shaft encoder zero set value has been lost
- be Impaired drive at forward test during start up
- bd No motion at start up on the forward drive test
- bb Impaired drive at reverse test during start up
- ba No motion at start up on the reverse drive test
- b9 Reverse drive is forward during the start up drive test
- b8 Shaft encoder zero set missing after position sense tripped on start up
- b7 No motion at start up preset reverse drive
- b6 Position sense error
- b5 No motion (or backwards) at start up drive; check motor; go through set up routine
- b0 Watchdog reset at the H-drive due to power problems; the computer has gotten entirely lost

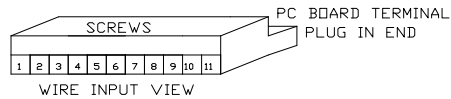
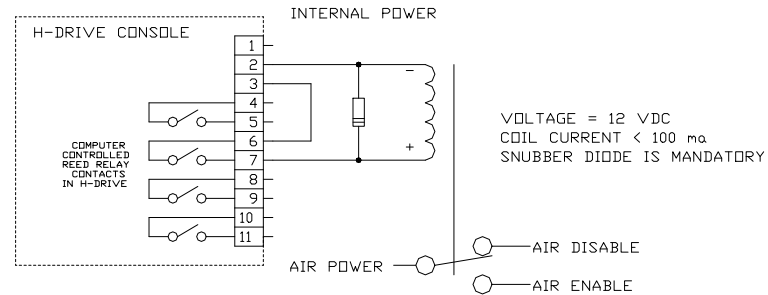
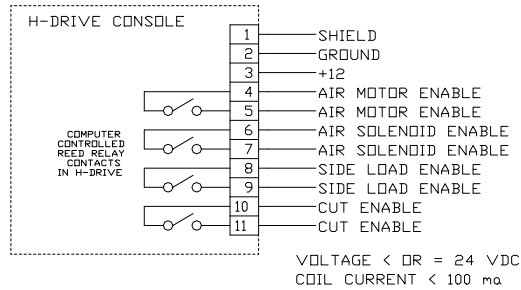


# H-DRIVE WIRING DIAGRAM



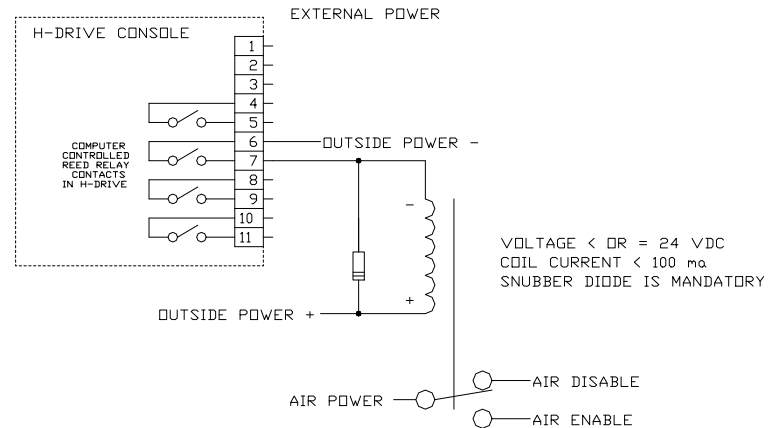
NOTE: Depending upon the model and application, the operator control panel will look quite different, but the wiring is always the same.

## 11 PIN CONNECTOR—AUXILIARY CONTROLS



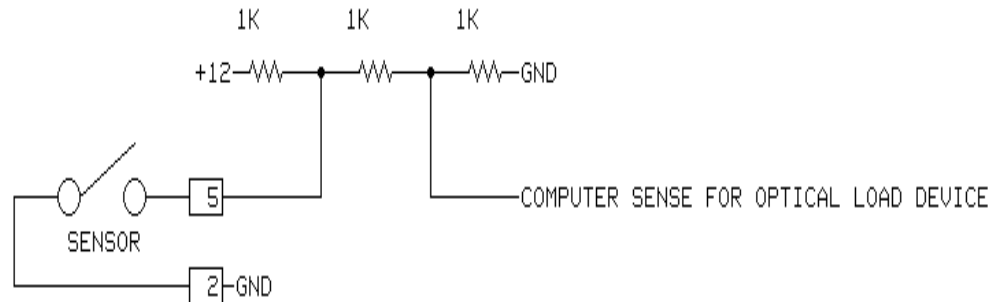
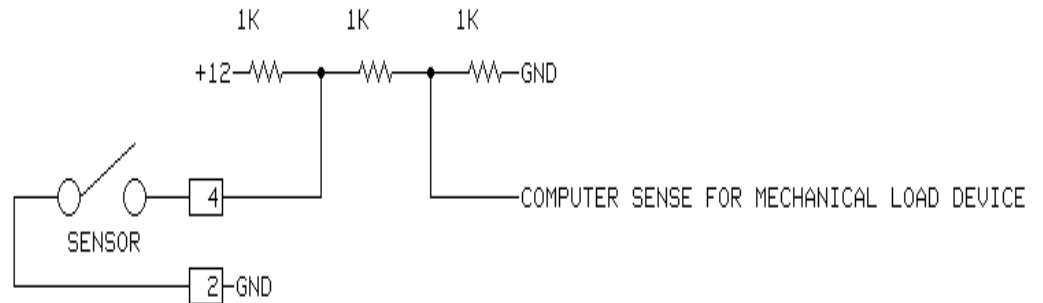
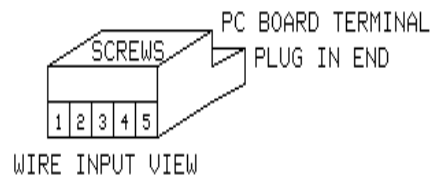
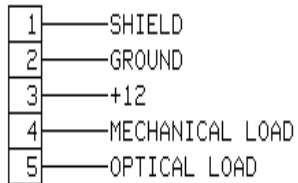
### DEFINITIONS

- AIR MOTOR--RELAY ON TO TURN AIR MOTOR OFF  
AIR MOTOR IS TURNED ON AFTER CALIBRATION.
- AIR TABLE--RELAY ON TO TURN AIR TABLE ON  
AIR SOLENOID IS CONTROLLED FROM THE KEYBOARD OR WITH THE CLAMP SENSE.
- SIDE LOAD--RELAY ON TO ENABLE SIDE LOADING  
LOAD CONTROL OPERATES AFTER THE GAUGE IS COMMANDED TO DRIVE TO ANY LOAD POINT AND HAS DONE SO.
- CUT ENABLE--RELAY ON TO ENABLE CUT OPERATION  
CUT ENABLE RELEASES RELAY AT LOADS, PUSH OUTS, CLAMP ONLY, END OF JOB, REVIEW MODE, AND SOME OTHER AREAS.



1. A spike suppressor must exist across the added relay coil to prevent damage to the H-DRIVE console reed relay contacts. For DC coils a snubber diode should be added (1N4002 or better). For AC coils an appropriate RC circuit should be added (100 to 150 ohms with a several uF cap). The striped end of the diode goes towards the + side of the relay coil. Failure to install or incorrect installation of this diode will cause failure in the control circuit.
2. The controls disable operation only. All outside circuits must have the integrity to stand alone.
3. Until power on is recognized (determined by a positive signal from the safety curtain (see the D37 connector on the next page, pin 29) the power up mode will be forced wherein the air motor, air solenoid (table), and load enable will be held off. The cut enable will be on (to allow circuit verification during the start up procedures).

## 5 PIN CONNECTOR FOR SIDE LOADING EQUIPMENT



### DEFINITIONS

MECHANICAL LOAD SENSE MUST SUPPLY A GROUND PATH TO ENABLE THE BACK GAUGE TO DRIVE.

OPTICAL LOAD SENSE MUST SUPPLY A GROUND PATH TO ENABLE THE BACK GAUGE TO DRIVE.

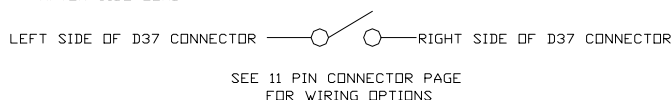
IF AUTO ADVANCE AFTER LOAD IS ENABLED, THEN WHEN EITHER SENSOR TRIPS OFF GROUND AND THEN BOTH RETURN TO GROUND THE GAUGE WILL AUTOMATICALLY ADVANCE TO THE NEXT POSITION.

Mechanical or proximity sensors can be used. If a proximity sensor is used it should be open collector type.

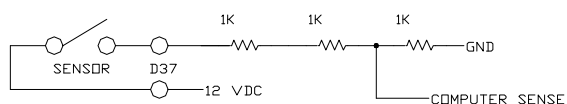
## D37 CONNECTOR—AUXILIARY SENSING AND CONTROLS

### AUXILIARY CONTROLS FOR DEM APPLICATIONS

CURTAIN DISABLES KNIFE  
 OIL AUTO KNIFE DRIVE POWER REQUIRED FOR AUTO KNIFE  
 COVERS DISABLE KNIFE AND MAIN MOTOR  
 AIR PADDLE FLIP FLOPS AIR WITHOUT CHANGING PROGRAM  
 OIL FILTER SIGNALS MAINTENANCE DUE EVERY 10 MINUTES  
 HANDWHEEL DISABLES DRIVE, WHEN RELEASED  
 THE NEW POSITION IS THE NEW TARGET  
 AUTO TRIM TABLE DISABLES GAUGE MOTOR  
 DROP GAUGE PREVENTS BACKGAUGE DRIVE  
 AND CAN BE USED FOR AUTO ADVANCE  
 AFTER SIDE LOAD



### AUXILIARY SENSORS FOR DEM APPLICATIONS

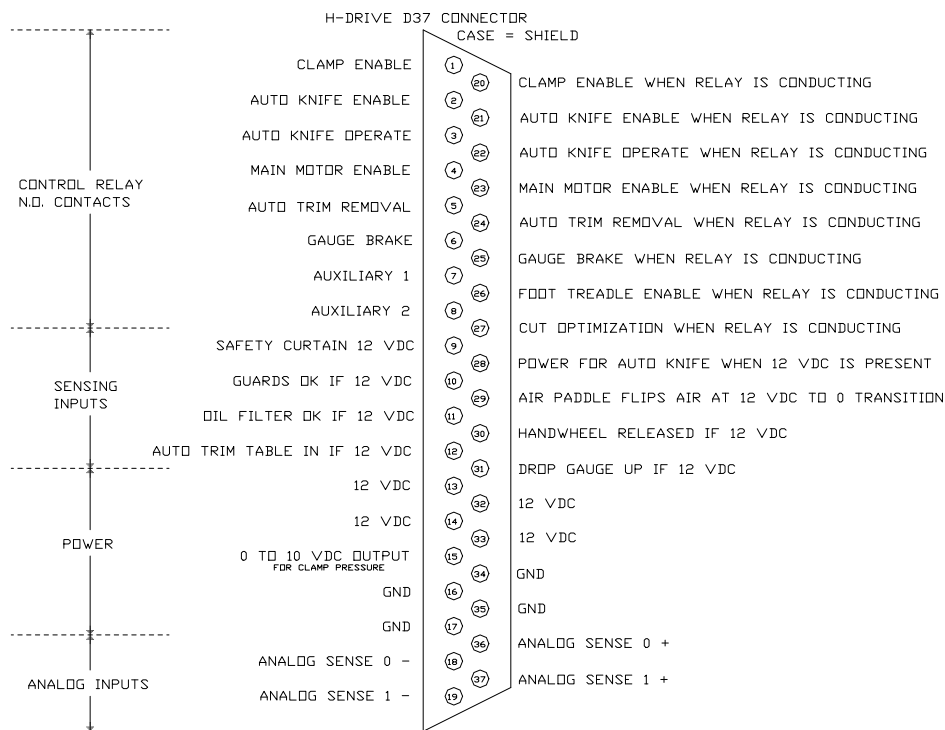


A MECHANICAL SWITCH OR PROXIMITY SENSOR CAN BE USED  
 USE THE 12 VDC AND GND CONNECTIONS AS REQUIRED

### POWER INCLUDING 0 TO 10 VDC OUTPUT FOR DEM APPLICATIONS

USE THE 12 VDC AND GND CONNECTIONS AS REQUIRED

### ANALOG INPUTS FOR DEM APPLICATIONS



1. A spike suppressor must exist across the added relay coil to prevent damage to the H-Drive console reed relay contacts. For DC coils a snubber diode should be added (1N4002 or better). For AC coils an appropriate RC circuit should be added (100 to 150 ohms with a several uF cap). The striped end of the diode goes towards the + side of the relay coil. Failure to install or incorrect installation of this diode will cause failure in the control circuit.
2. The controls disable operation only. All outside circuits must have the integrity to stand alone.
3. Until power on is recognized (determined by a positive signal from the safety curtain (D37 connector, pin 29) the power up mode will be forced wherein the auto knife enable, auto knife operate, and auto trim removal controls will be forced off. The gauge brake, main motor, low pressure clamp, and clamp enable controls will be on (to allow circuit verification during the start up procedures).

NOTE: The **microcut** controls and sensors are not dual redundant cross monitored failsafe circuits and should not be used as such.

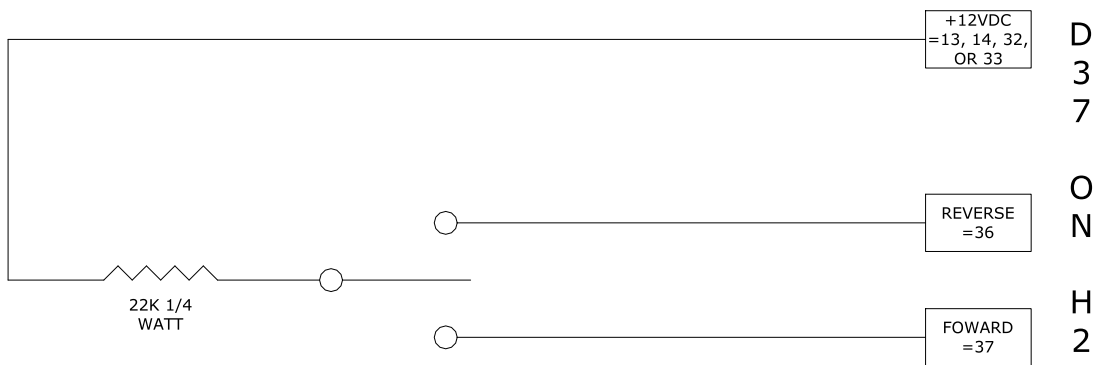
## ELECTRONIC HANDWHEEL

The H2 drive has been configured with an option to operate the back gauge in limited fashion with an electronic switch that can be mounted near the hand wheel. The parts required for this upgrade are:

1. New H2 software dated 17 May 2004 or later. To view the software date on **PLUS** units press the *HELP* key and select STATUS SCREEN. Then select SOFTWARE DATES. On the **BASIC** or **jr** units read the lower part of the screen at power on.
2. A 22K ¼ watt resistor used to drop the 12 volt power from the H2 drive to 5 volts for the sense inputs.
3. A momentary contact two pole switch suitable for mounting in place of the hand wheel for operator use.

The wiring is done at the D37 connector:

D37 pin	Pin description	Wired to
13, 14, 32, or 33	+12 VDC	One side of a 22K ¼ watt resistor. The other side of this resistor attaches to the common of the hand wheel switch.
36	Analog 0 input for reverse drive	To the reverse drive side of the hand wheel switch.
37	Analog 1 input for forward drive	To the forward drive side of the hand wheel switch.



### NOTES ON OPERATION:

1. When the hand wheel is used the gauge will change its target value by 1 encoder pulse for the first 125ms, then by 2 in the next 125 ms, and so forth, in an accelerated fashion up to a change of 255 per 125 ms period.
2. During the first adjustments auto correction will be used to insure absolute accuracy. This may cause some jerking of the gauge. As the speed increases auto correction is disabled to allow smoother operation until the hand wheel is released.
3. It is assumed that the hand wheel is used to move the stock and not to acquire a specific value on the display (which would be done with the NUMBER and MOVE keys). When the hand wheel is first engaged the target is adjusted to be the actual current position plus or minus 1 encoder count. If the gauge is auto-correcting at a specific target it is possible that the actual position is plus or minus several encoder counts based upon the selected settling tolerance. As a result a quick forward bump with the hand wheel switch from say, a displayed value of 10.000 inches, may result in an actual position of 10.002 inches being moved forward to 10.001 inches. While the gauge does move forward to position the stock, the display will indicate a .001 inch reverse drive.
4. Since the move involves encoder counts rather than using dimensional units, the first few counts may not affect the display at all (we could have as many as 8 encoder counts before moving the display .001 inch).

# Declaration by the Manufacturer

## (Directive 89/392/EEC, Art. 4.2 and Annex II, sub B)

C&P Microsystems LLC herewith declares that the product covered by this instruction manual is intended to be incorporated into machinery or to be assembled with other machinery to constitute machinery covered by Directive 89/392/EEC, as amended and that the following (parts/clauses of) harmonized standards and national technical standards have been applied:

EN 50082-2: 1995 “Electromagnetic Compatibility – Generic Immunity Standard, Part 2: Industrial Environment”

CISPR 22: “Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment”

FCC Part 15 stating: “This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.”

FCC warning stating: “Changes or modification not expressly approved by the party responsible for compliance could void the user’s authority to operate this equipment.”

ISO/IEC Guide 25 in the category of “Electrical (EMC)”, including in its scope the EMC standard AS/NZ 3548 under the authority of the A2LA and NATA laboratory accreditation agreement.

Class A warning requirement that “This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

The Japanese standard for “Voluntary Control Council for Interference (VCCI) by Data Processing Equipment and Electronic Office Machines, Technical Requirements” which is technically equivalent to CISPR 22 (1993).