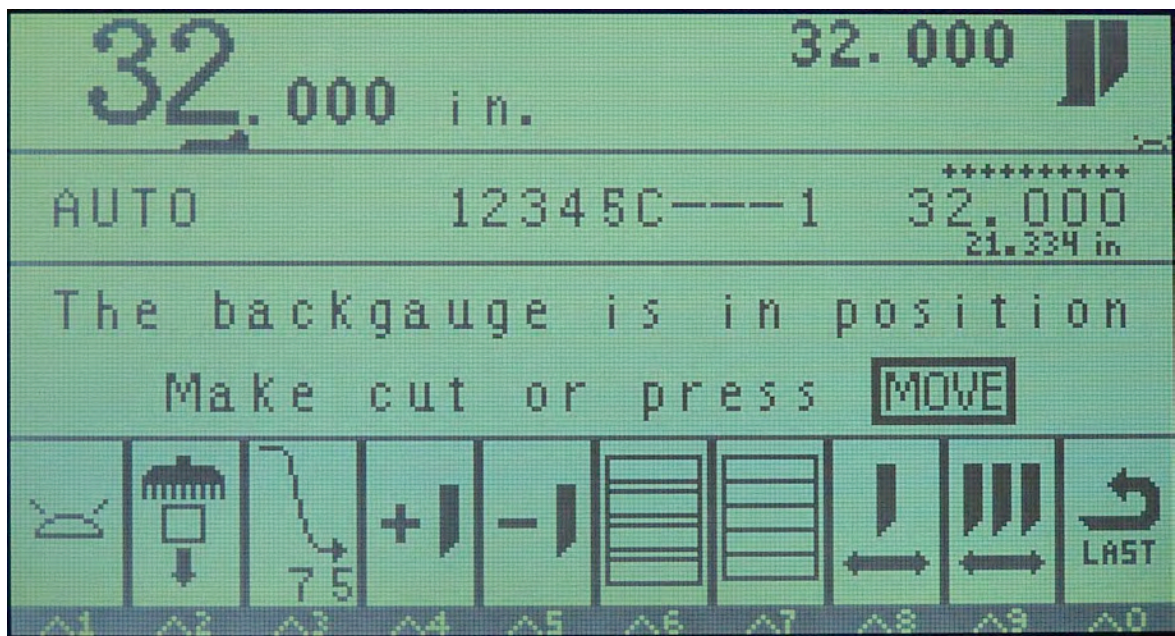


microcut[®]

Cutter Automation System

BASIC Owner's Manual



C&P microsystems

1260 Holm Road, Suite C
Petaluma, CA USA 94954 Phone 707-776-4500 FAX 707-776-4555
e-mail info@cp-microsystems.com
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 4,000 cuts, divided into as many jobs. After turning the power on and getting started, there are three basic operating methods—

- 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.

NOTE: Revisions occur as requests are made from operators, supervisors, and others. This manual may be incomplete.

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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. 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.

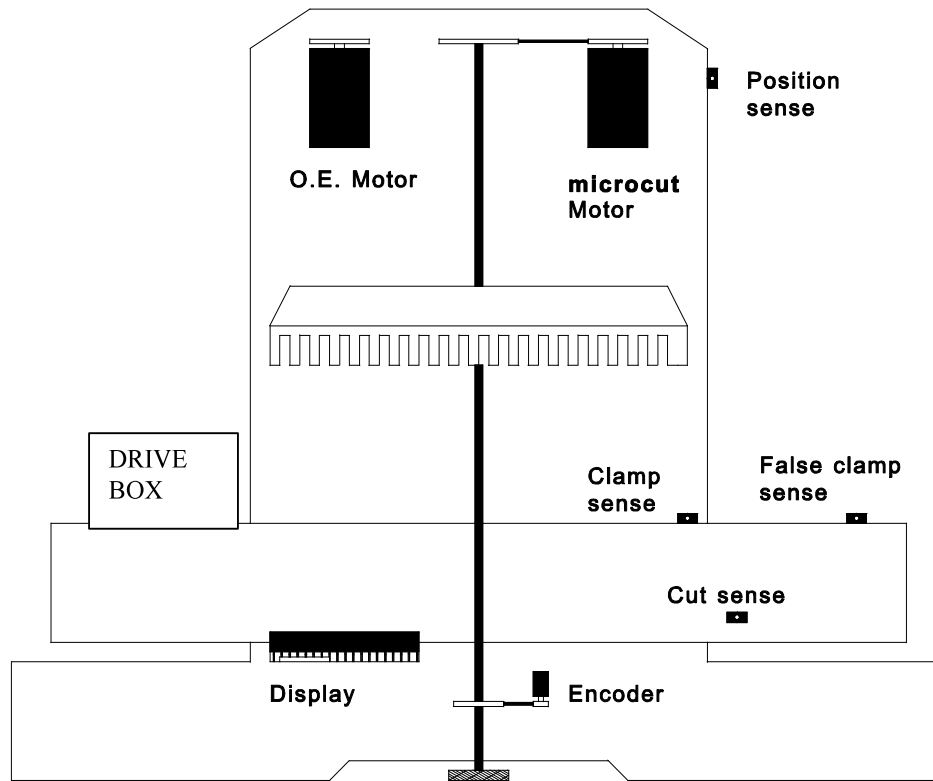
microcut is a retrofit system so every installation is unique. Install the components for function as well as fit. The brackets are designed with extra holes and slots. They are easily modified, and can be adapted for almost any requirement. Installation variables include the encoder sprockets, pulley (Schneider cutters have a flat belt drive), and motor size. 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 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. 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, display, and mounting bracket.
3. Use the thinnest drive belt possible to minimize belt flex around the pulley.
4. Do not over-tighten the backgauge. If there are nylon gliders supporting the backgauge keep them *loose* to minimize leadscrew flex.
5. Use only one belt per pulley. Multiple belts on any pulley will cause slower settling.
6. 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.
7. Wire the display to the H-Drive, the H-Drive to line power, and hold the MANUAL key at power on to access demonstration mode. Let the operator learn the system while the installation is occurring.

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.

TOOL LIST

You may want to adapt this list. Substitute metric drills and taps if you wish to supply your own hardware. 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

ROUTE THE CABLES—Wire 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 3.
2. Drill and tap the appropriate holes and mount the display so that it is secure.



microcut jr



microcut standard



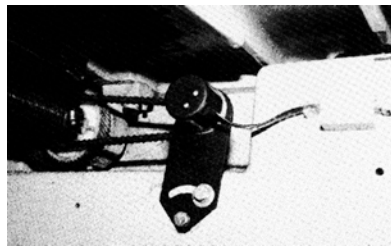
microcut+

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



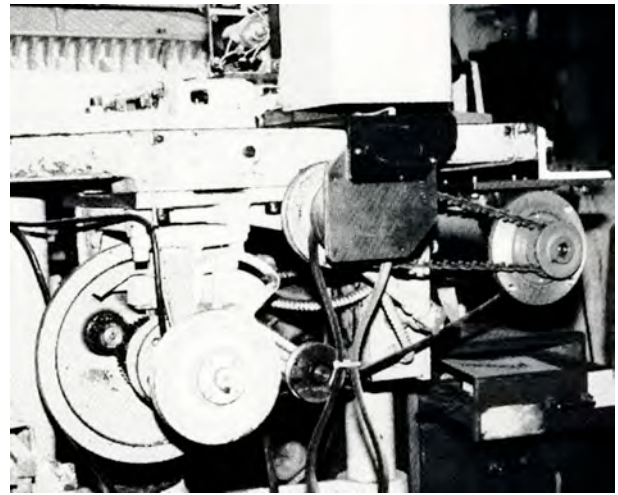
Typical front mounting

DC Drive Motor—The motor turns the leadscrew. Please note:

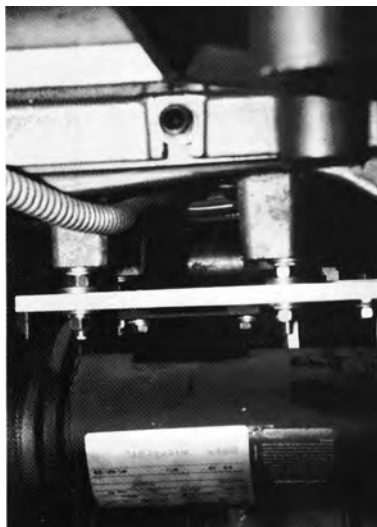
1. The motor **must** turn at least three, but ideally not more than six times for each inch (25 mm) of backgauge movement. An adjustable pulley and a fixed one are supplied to insure that this can be achieved on most machines.
2. The motor mounts with angles and a swing bracket. Use these as needed to 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. The motor mounting method must isolate the original drive system to avoid contention between the two.
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.



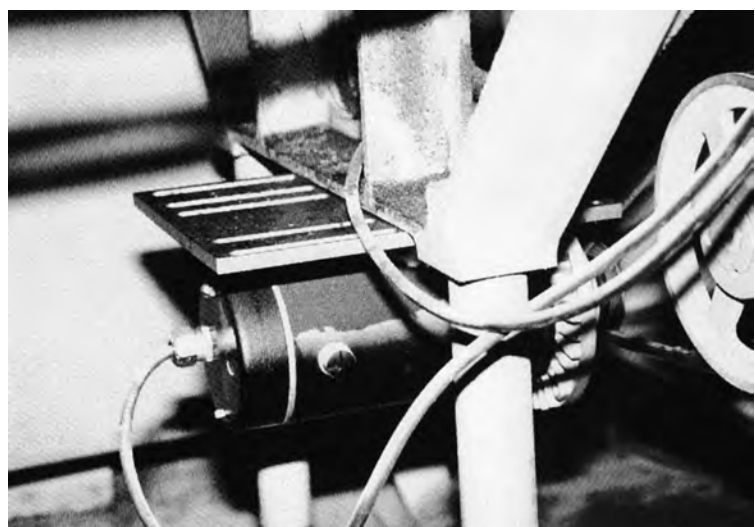
Polar



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 the following criteria:

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.

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 inch (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.



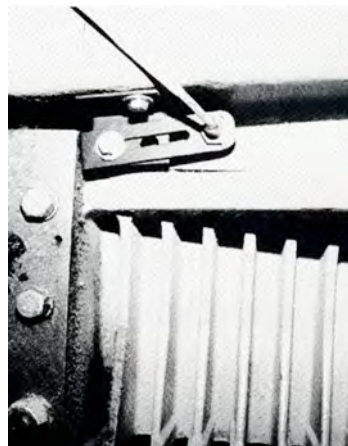
Above table



Below table

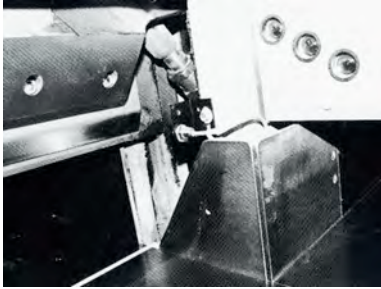
Clamp Up Sensor—supplies ground to pin 4 when the clamp is full up.

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 (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.

The 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.

The 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. To avoid this, 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 and fairly tight.
- The encoder chain is aligned and snug.
- 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 (cutting, clamping, etc.) 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.

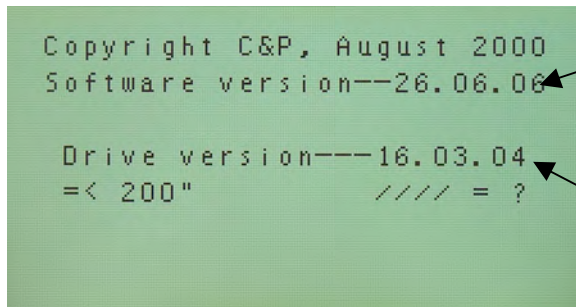
Show the operator the installation, making sure he is comfortable with all mounting locations. **microcut** is designed for all machines. When shipped the unit has no idea what type of machine it is on. The set up routine (next page) allows **microcut** to understand the machine it has been installed on. This **must** be completed to allow correct operation. Until then motor and counting direction may be wrong and the machine sizes may be wrong. Serious damage may be inflicted on the machine while this is the case. Do not operate **microcut** until the set up routine has been completed. 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.

microcut Basic Set-up Routine

The set-up routine can be used to install different languages, erase all of the job memory, enable different units of measurement, enable air table control, set machine sizes, define backgauge speed, and adjust the settling tolerance. There are two methods of starting the set-up routine. The first method is the default with a brand new unit.

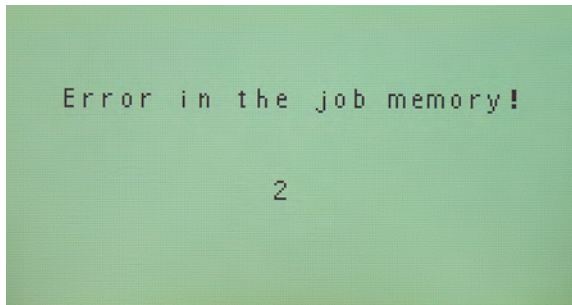
When you turn on the unit for the first time, if the unit has not been through the set-up routine, the following will occur:

Opening screen



Software Version of front panel (DD.MM.YY).

Software Version of drive box (DD.MM.YY).



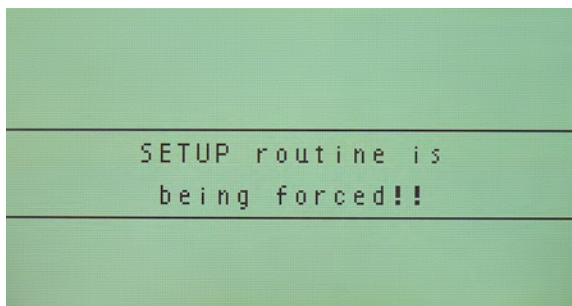
This screen notes that the memory does not have the set-up parameters installed.

Press



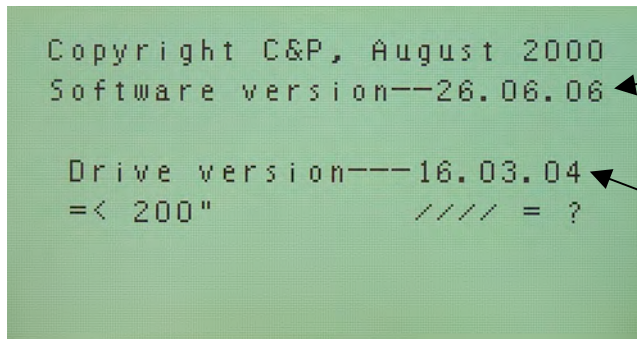
to continue.

You can also press any key on the keypad to continue



The next page describes the alternate method of entering the set-up routine if the routine has been completed.

If **microcut** has been through the set-up routine and you would like to change some aspect of the routine, please turn the system off and then on for the opening screen to appear.



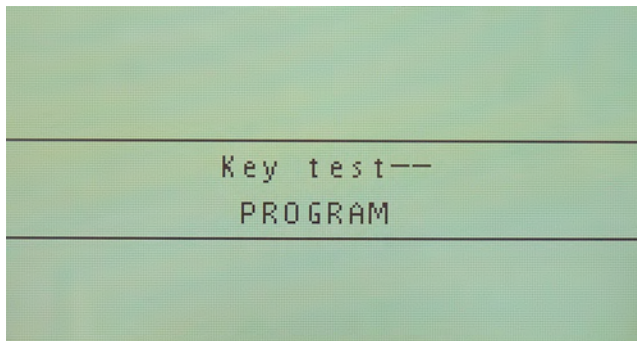
Software Version of front panel (DD.MM.YY).

Software Version of attached drive box (DD.MM.YY).

Hold in the



key at the above screen.

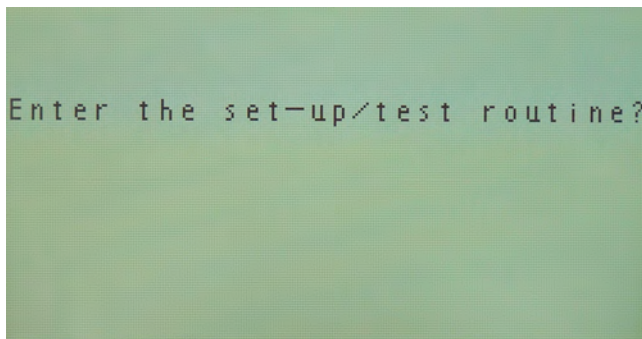


Note: During a normal power on, this screen would denote a stuck key.

When this screen appears release the



key.



Set-up routine entry screen.

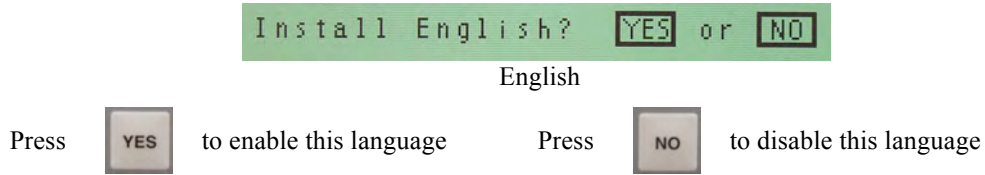
When this screen appears press the



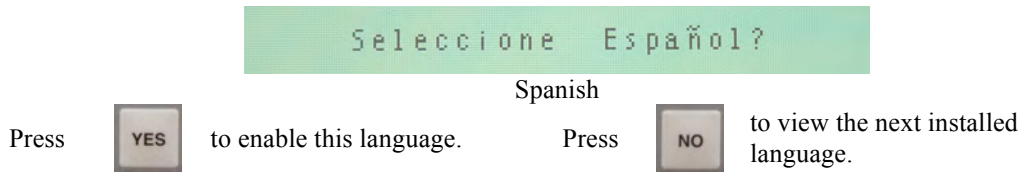
key.

microcut will now continue with the following screens:

The first part of the set-up routine is language installation. You will be presented with a number of screens asking whether you want to install the named language or not. The current languages available are English, Chinese, Spanish, German, French, Russian, Italian, Netherlands, and Danish. An example of this is shown.



If you press the **YES** key on only one language, the unit will default to that language. If you press the **YES** key to more than one language, you will be presented with a screen that will ask you to select a language whenever the unit is turned on. An example screen follows:



microcut will now continue with the following screens:

Erase all of the job memory?

Press to erase the job memory.

Press to proceed to next set-up step.

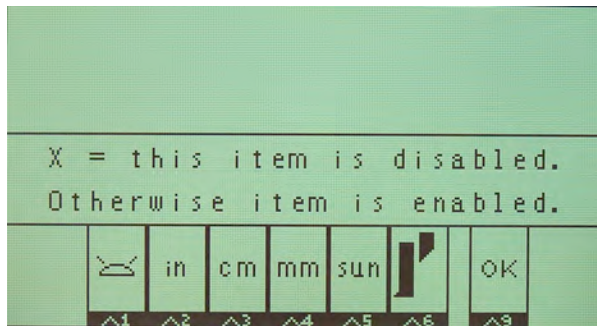
Save the jobs?

Press if you want to save your jobs and continue.







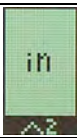
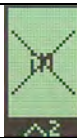


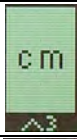







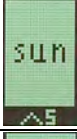
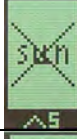








Press to erase all the jobs programmed and continue.

Note: This will only erase your jobs and not any other set-up parameters. The two questions require two different keys to make accidental job erasure less likely.

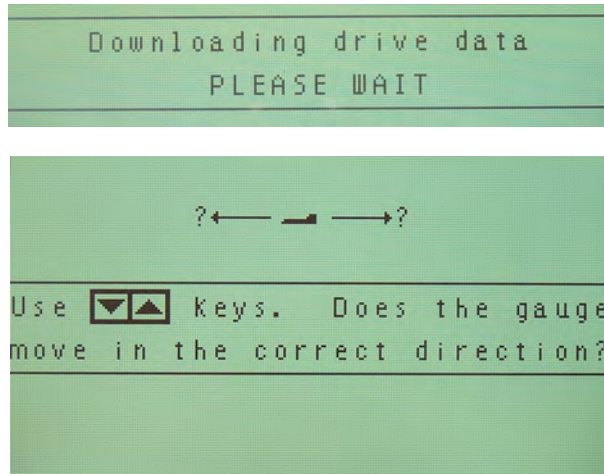
microcut will now continue with the following screen:



This screen allows you to enable/disable the air, inches, centimeters, millimeters, sun and cut optimization features of the unit.

To enable or disable feature	Shown enabled	Shown disabled
Hold in  and then press the  to enable or disable the air control. Disable this unless the air control line is installed.		
Hold in  and then press the  to enable or disable inches.		
Hold in  and then press the  to enable or disable cm.		
Hold in  and then press the  to enable or disable mm.		
Hold in  and then press the  to enable or disable sun.		
Hold in  and then press the  to enable or disable cut optimization. This is for original equipment only. Disable it unless the cut optimization lines are installed.		
Hold in  and then press the  to continue. When the screen shows your desired configuration. You can also press  to continue.		

microcut will now continue with the following screens:




Press the **DOWN ARROW** key. Does the gauge move in the forward direction?



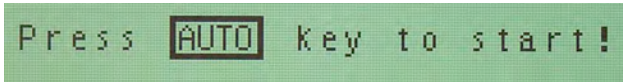
Press the **UP ARROW** key. Does the gauge move in the reverse direction?


If the direction is wrong, then you will need to turn the unit off and invert the motor wires.

Press  if the motor direction is correct.

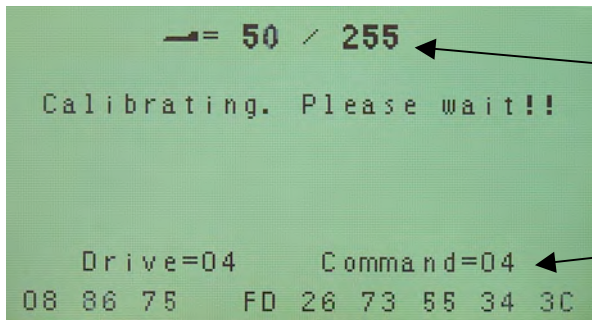
If **microcut** found that the encoder is turning the wrong way, it will correct it automatically and return you to the previous screens.

If everything is okay, the screen will then show:



Press the  key.

The screen will show:



Power being used to the motor.

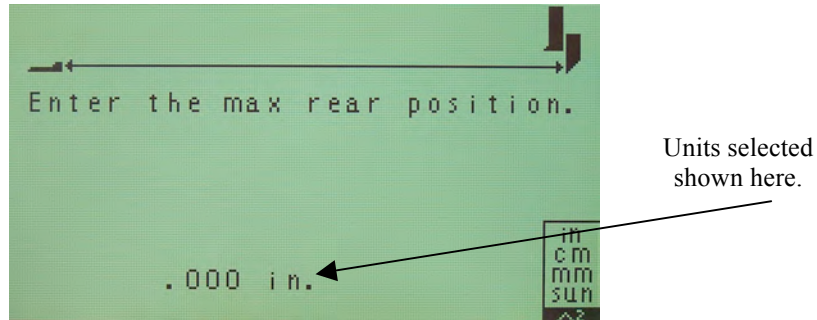
Internal data used for trouble shooting in case an error occurs.

The gauge will move to the rear of the machine.

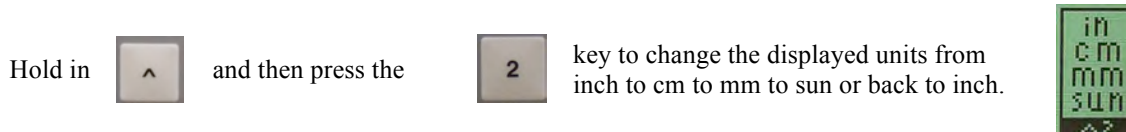
microcut will now continue with the following screen:

NOTE: For some OEM applications where the leadscrew pitch is already known the reference position steps

will be skipped.



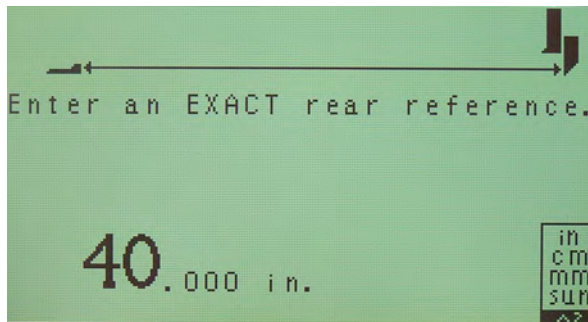
Examine the screen and determine if the units of measurement are correct. If not, then do the following:




Measure the distance from where the backgauge is currently stopped to the cut line. Use the hand wheel and measuring device to carefully move the backgauge forward to the nearest exact number. As an example, if the measurement was 40.250 inches, then move the backgauge forward to exactly 40 inches.

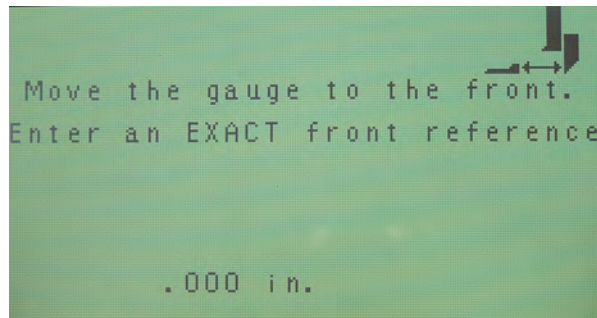
Use the **NUMBER** keys on the keypad to show the measured value in the display.

Using the previous example the screen will show:



Press  when you are finished to enter your reference value and continue.

microcut will now continue with the following screen:

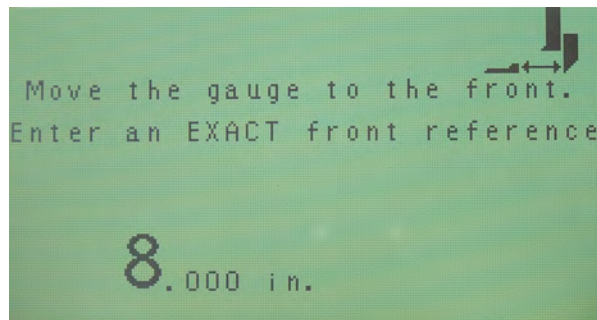


Press the **DOWN ARROW** key to drive in the forward direction. Release the key when the backgauge is less than 10 inches from the cut line.

Measure the distance from where the backgauge is currently stopped to the cut line. Use the hand wheel to move the backgauge forward to the nearest exact number. As an example, if the measurement was 8.250 inches, then move the backgauge forward to 8 inches.

Use the **NUMBER** keys on the keypad to show the measured value in the display.

Using the previous example the screen will show:

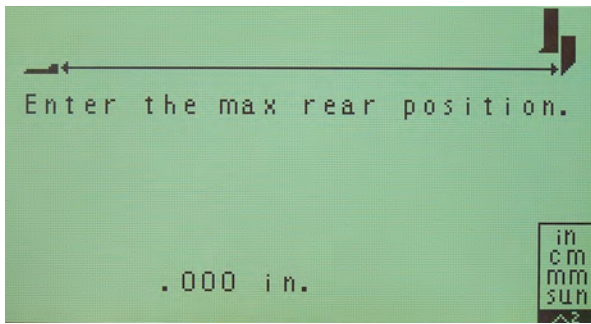


Press




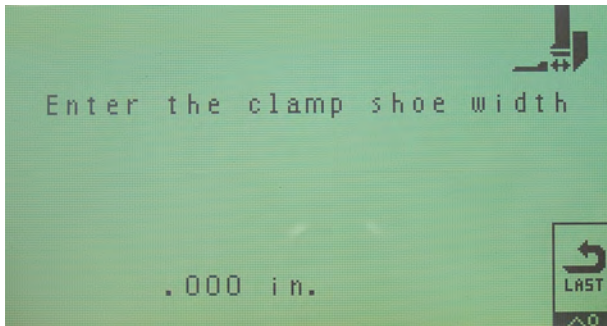
when you are finished to enter your reference value and continue.

microcut will now continue with the following screens:




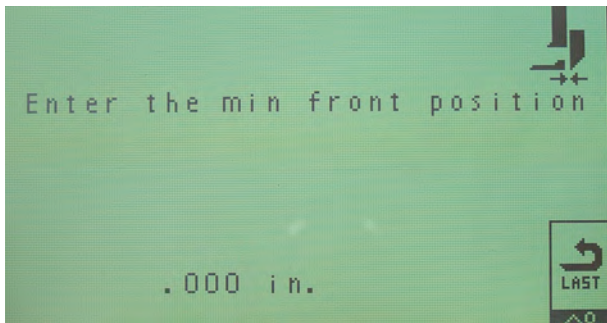
Use the **NUMBER** keypad to display the actual maximum rear of the paper cutter. This value must be greater than where the rear proximity sensor is tripped.

Press  to enter the value and continue.




Use the **NUMBER** keypad to enter the width of the removable plate that mounts to the clamp. If you do not have this plate then enter the minimum cut (how far the backgauge can travel to the front).



Press  to enter the value and continue.



Use the **NUMBER** keypad to enter the minimum cut (how far in the backgauge can travel to the front).

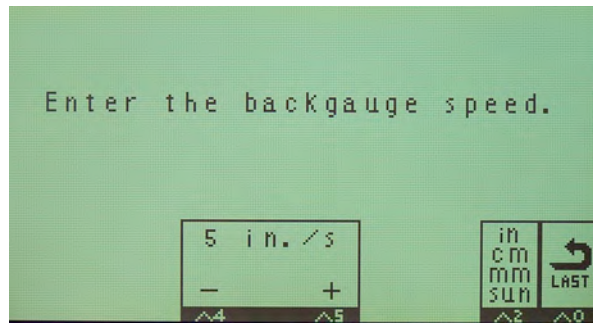
Press  to enter the value and continue.

If you enter a value on the previous screens that you feel may be inaccurate, back up to the entry you would like to redo by:

Holding  and pressing  to back up to a previous screen .





microcut will now continue with the following screen:

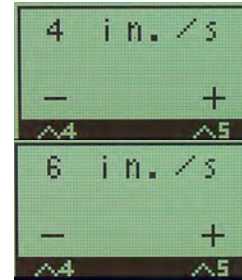



Please note a good starting speed value is size of the paper cutter divide by 6.

To change the listed speed:

Hold in  and tap  to decrease the shown speed.

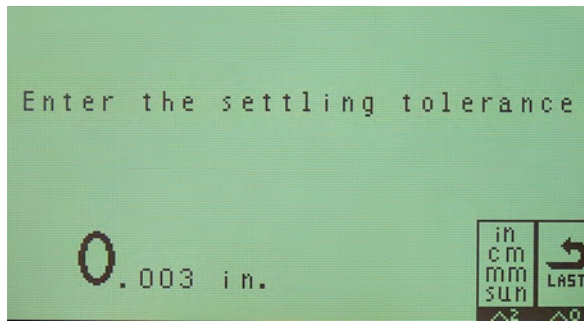
Hold in  and tap  to increase the shown speed.



When you are finished entering the value, press  to continue.


Note: speed is approximate. Absolute maximum speed is based upon pulley ratios and the mechanical condition of your cutter.

microcut will now continue with the following screen:



Use the **NUMBER** keypad to change the listed tolerance setting.

The tolerance allows the display to settle on a position. 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 or looser 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 inches setting will yield actual accuracy to .0015 inches (.004 cm). Larger tolerances allow faster positioning and faster cutting.

Press  when you are finished entering the value to continue.

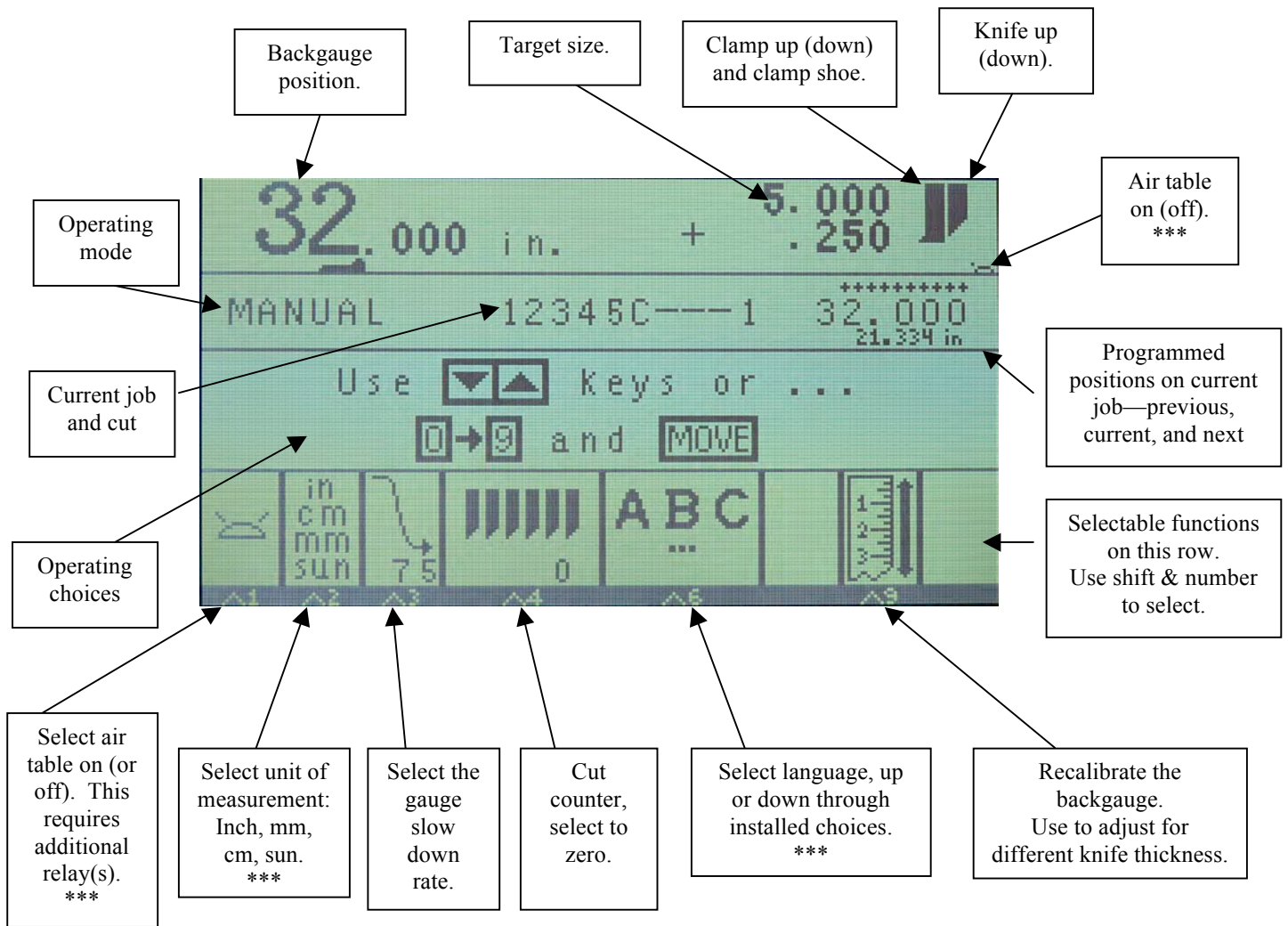
The set-up routine is now complete.

The unit will restart automatically. After the unit reaches the rear of the machine and calibrates, move it to a known position and check for accuracy. Use the MANUAL MODE ^9 option (see next page) to make any necessary adjustments.

Note: The deceleration rate is forced to 75% during the set-up routine. This can be later adjusted from **MANUAL** mode, after power on and calibration.

POWER ON AND MANUAL MODE

At power on the computer must calibrate to the machine. Follow the instructions on the screen to select a language and do the calibration. After this the manual mode screen will appear—



Manual mode is used when the operator wants to manually control the position of the backgauge for every cut. The **DRIVE** keys will move the backgauge and turn off auto-correction. The **MOVE** key will enable auto-correction of the backgauge. For fractions, key in the whole size and then add the fraction: 20.000 + 1 / 4. Press **MOVE** or **YES** to total the value.

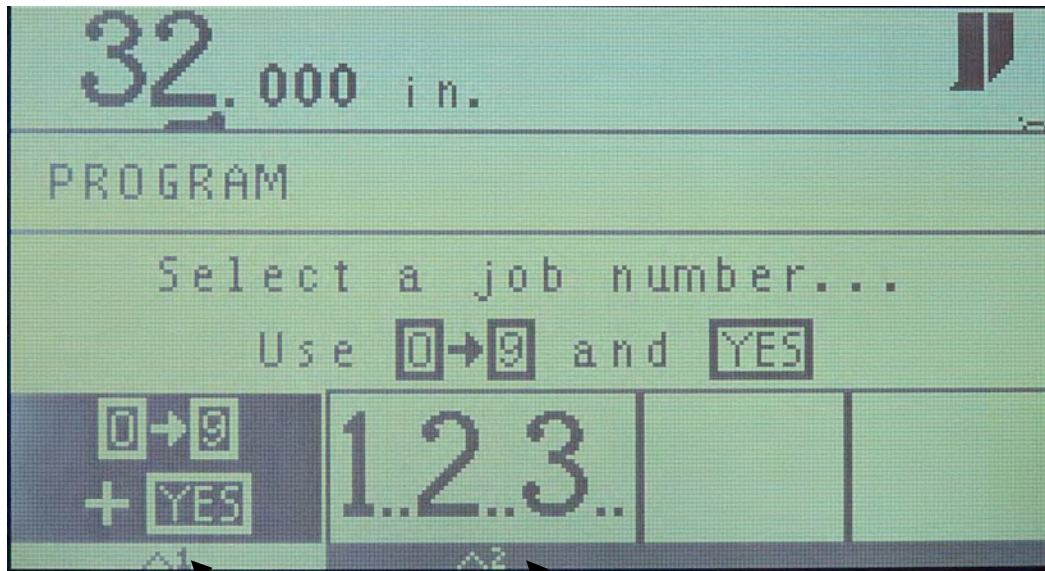
To select a desired function, hold the ^ (**SHIFT**) key and then press the number required.

Press the **MANUAL** key from any mode to return to manual mode.

*** The ^I option and air icon will only show if the air control is enabled. An optional paddle switch can be mounted under the front of the table to allow the operator to flip flop the air status at any time without changing the programmed value. Refer to the D37 connector section later in this manual. The ^2 option will show only the enabled units and will be blank if only one unit is enabled. The ^6 option will be available only if more than one language is installed. In MANUAL mode you can press ^5 and then ^7 to access the air, units, speed, and tolerance options. Refer to the SET UP ROUTINE for language selections.

PROGRAM MODE

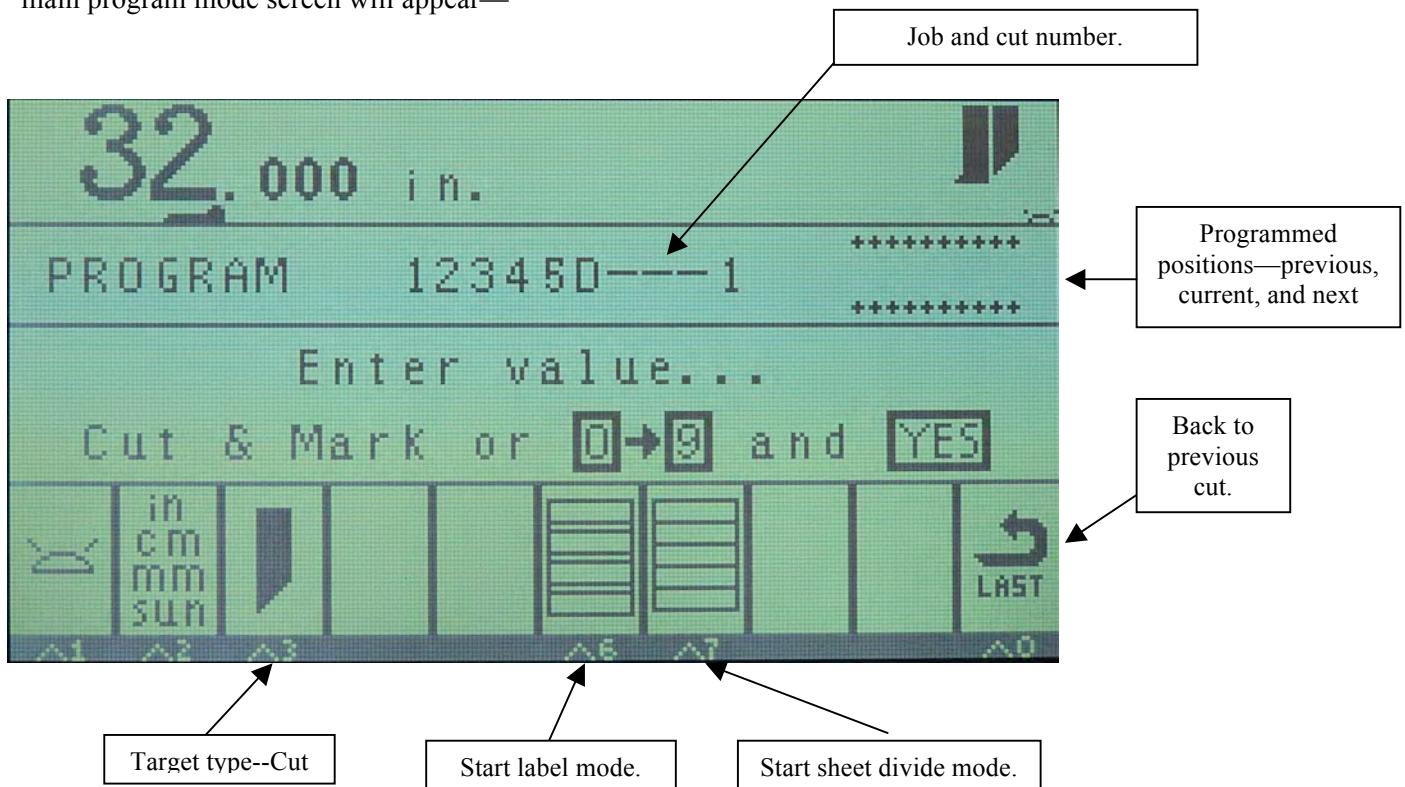
Program mode allows you to define a set of positions for the backgauge to cycle through. To program a job press the **PROGRAM** key—



Default option. Key in the number you want for new job & press **YES**. Use the **ARROW** keys to scroll into the alphabet.

Select to let computer choose the lowest new job number for you.

A job number must be supplied before programming can begin. Use the **NUMBER** and **YES** keys to select a job or use ^2 for the computer to find the lowest available job number. After a job number is selected the main program mode screen will appear—



Job and cut number.

Programmed positions—previous, current, and next

Back to previous cut.

Target type--Cut

Start label mode.

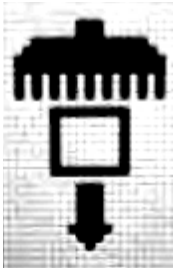
Start sheet divide mode.

Options will appear on the bottom part of the screen only when appropriate. For instance insert will appear only if a cut already exists after the location displayed. Delete will not be shown unless the location is already programmed.

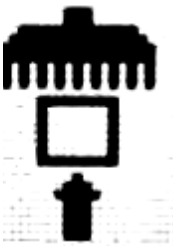
To program positions, move the backgauge and make cuts or key in the positions and press **YES**. Use ^3 to adjust the target type. The side of a knife is for a cut (see previous picture). The side of a clamp is for a clamp



Clamp only location. Some OEM applications have this feature. If your cutter does not, then this can be programmed as a reminder to use the foot treadle only.



Push out shows the arrow away from the gauge. The screen's job/target area will show a vertical bar and an arrow pointing away from it.



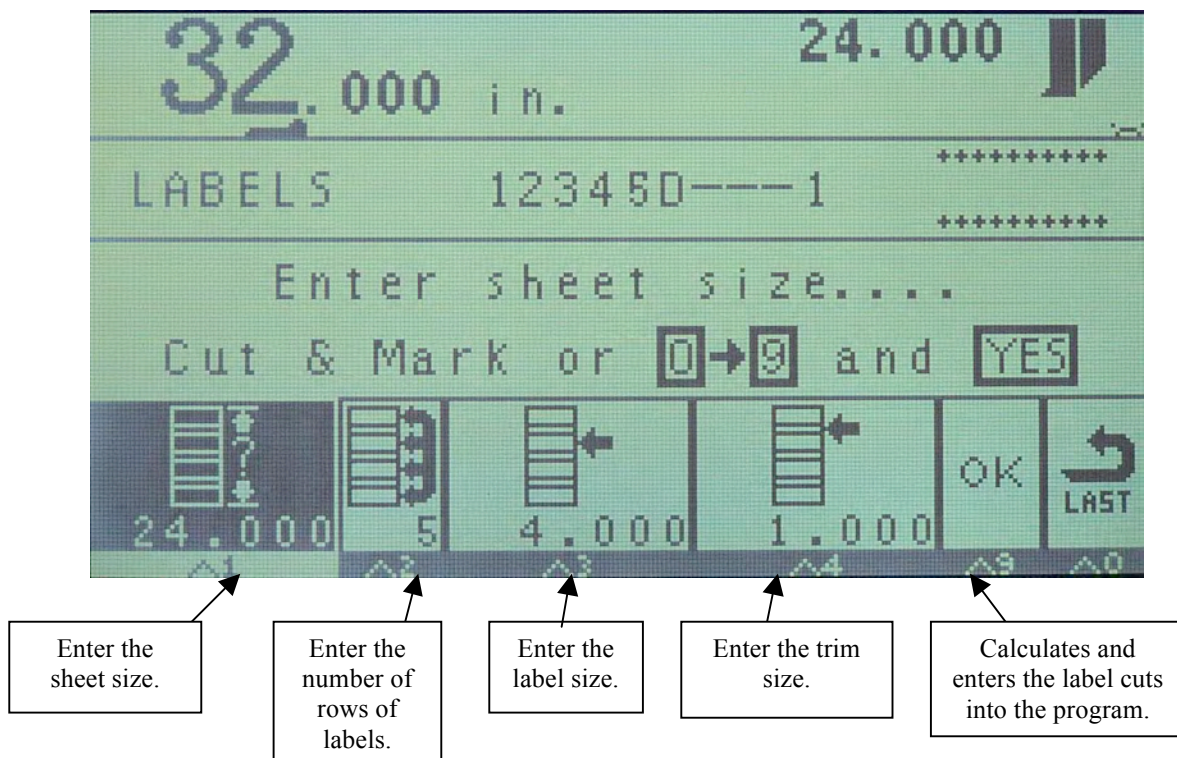
Loading point shows the arrow towards the gauge. The screen's job/target area will show a vertical bar and an arrow pointing toward it.



Cut optimization. This is a feature available on some OEMs only. If your cutter does not have this feature and you would like to disable it, please refer to the Set Up Routine section of this manual.

SEE NEXT PAGE FOR ADDITIONAL PROGRAMMING INFORMATION

This is the screen when the label function is selected—



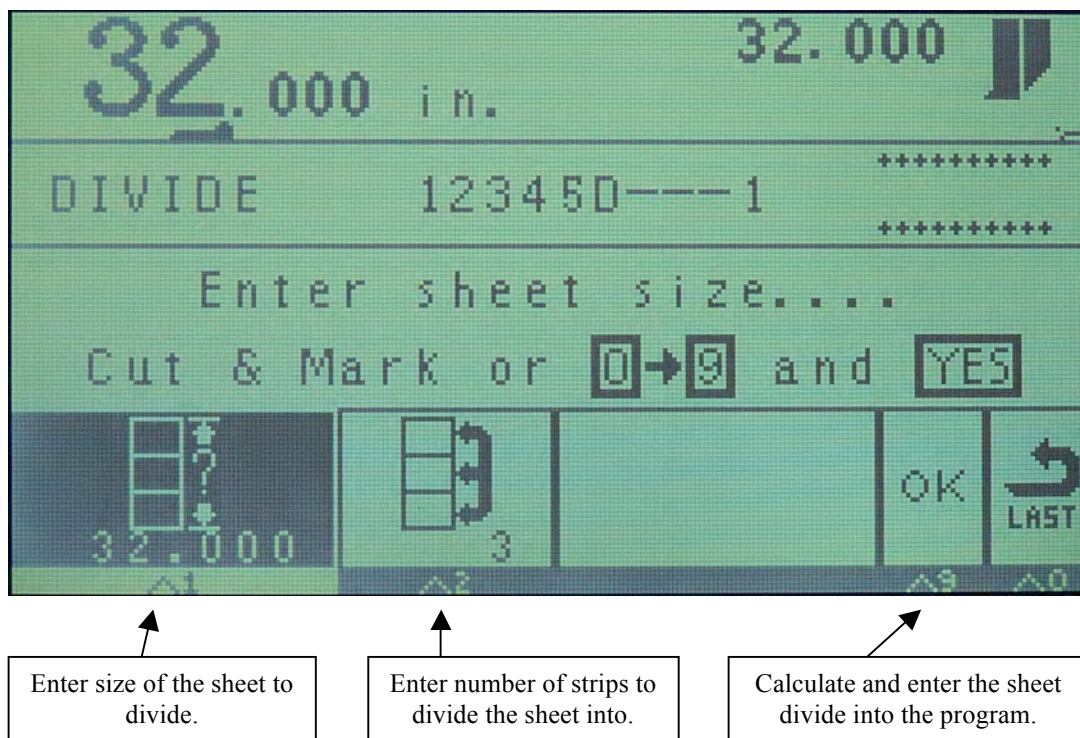
The screen will guide you to enter the values required to automatically calculate all the stop positions required for the label work. The reverse lighted box is the one you are working with—

1. First it will ask for the first cut size. Key this value in and press the **YES** key.
2. Now the second function will be selected, asking for the number of label rows. Key this value in and press the **YES** key.
3. The third function will now ask for the label size. Key this in and press **YES** as before.
4. The fourth function will now suggest what the trim-out size should be in the target size display (top right screen). You can accept it or enter your own value. Press the **YES** key when complete.

Note that as you enter the values, they are recorded at the bottom of each function icon. You can go back and make changes if needed.

Finally select OK (^9) to command the computer to place all the required cuts into the program. Select LAST (^0) to exit without programming.

This is the screen when the sheet divide function is selected—



The screen will guide you to enter the values required to automatically calculate all the stop positions required to divide the sheet equally. The reverse lighted box is the one you are working with —

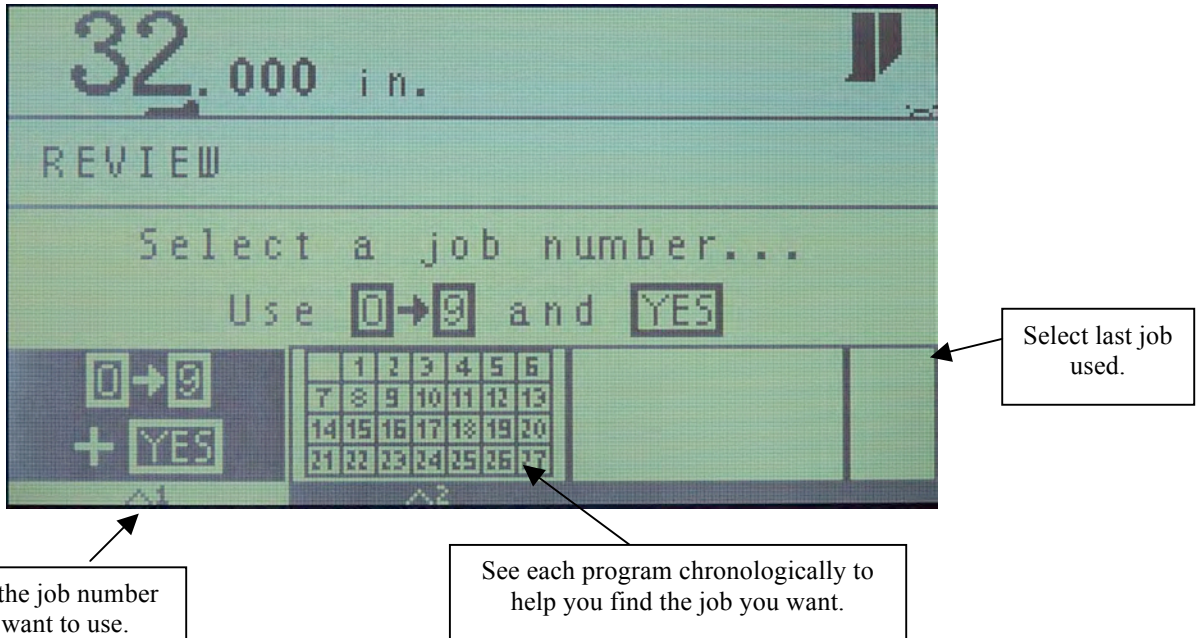
1. First it will ask for the whole sheet size. Key this value in and press the **YES** key.
2. Now the second function will be selected, asking for the number to divide the sheet by. Key this value in and press the **YES** key.

Note that as you enter the values, they are recorded at the bottom of each function icon. You can go back and make changes if needed.

Finally select OK (^9) to command the computer to place all the required cuts into the program. Select LAST (^0) to exit without programming.

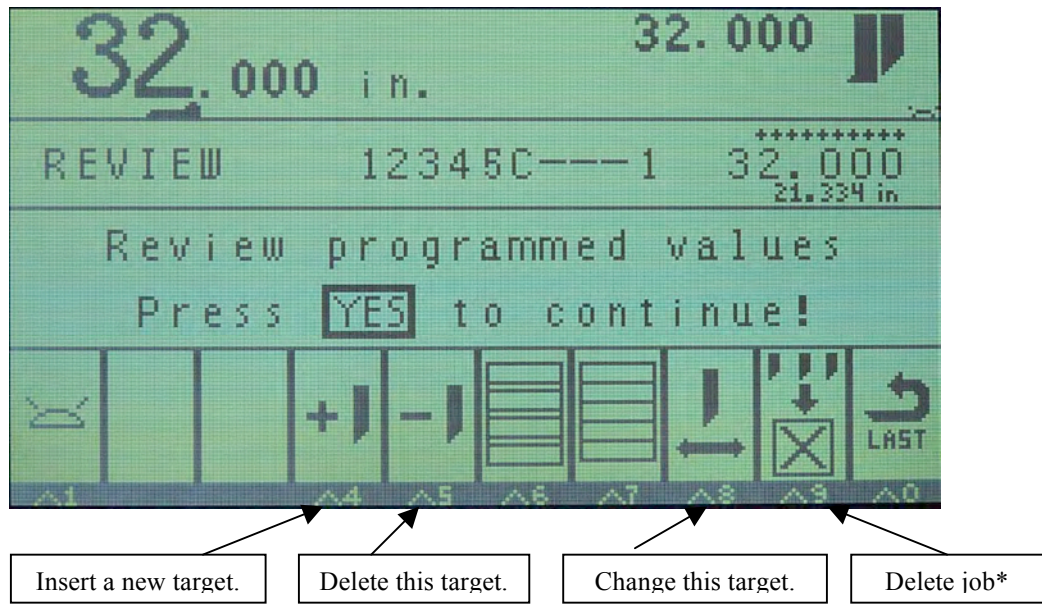
REVIEW MODE

Review mode allows you to recall jobs that were programmed previously. To enter this mode, press the **REVIEW** key. The review screen will appear—



For a specific job (^1) use the **NUMBER** and **YES** keys. For chronological selection (^2) press **NO** to go to the next job or press **YES** to select the job.

Once a job is selected the program mode options will appear on the lower part of the display allowing you to review the job (the same as in PROGRAM MODE) and, if necessary, make adjustments—



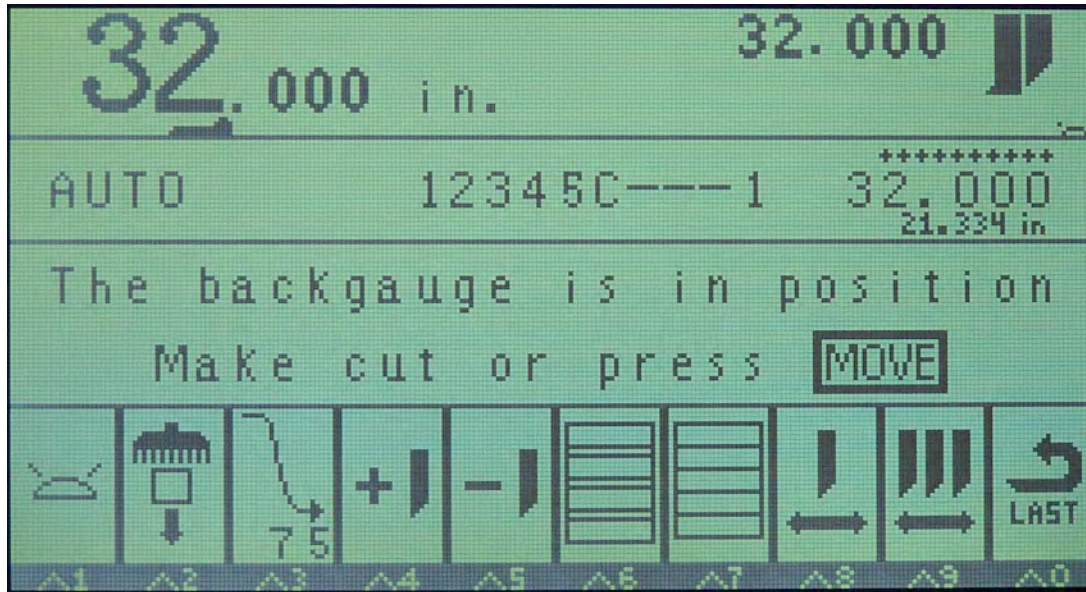
Options will appear on the screen only when appropriate.

Press the **AUTO** key to enter automatic operation at the displayed position.

*Press and hold the **REVIEW** key at power on for a choice to erase ALL jobs—when the screen shows REVIEW KEY IS PRESSED release the key for the option.

AUTOMATIC MODE

Automatic mode is used to allow the computer to position the backgauge correctly throughout a job. Program a job or select an old job (see previous pages). Press the **AUTO** key. The automatic mode screen will appear—



Auto push out—enabled when arrow is filled in.

Begin a lay compensate.

The backgauge will move from one target to the next as the knife cycles or when the **MOVE** key is pressed. The **YES** or **LAST** key is used to move forward or backwards through a job. You can make changes in the same way as when you created the job.

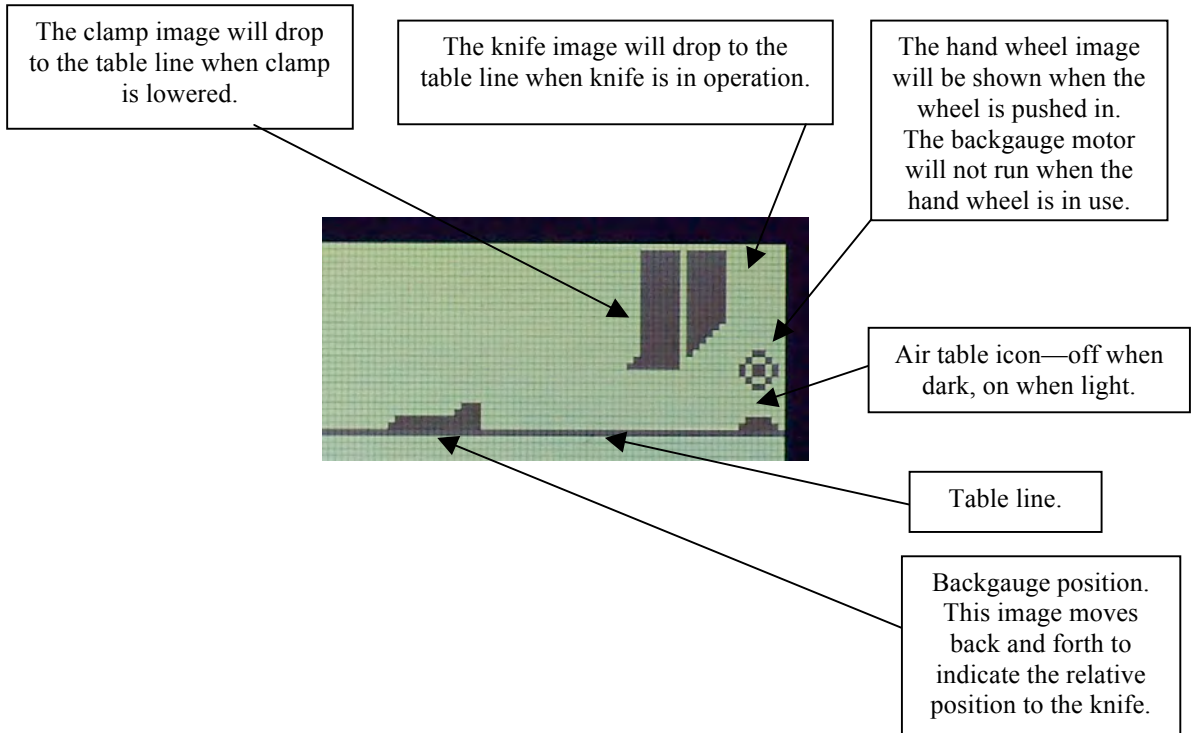
Options will only appear on the screen when appropriate. For instance ^2 will convert to change units only when a target is being modified or inserted. ^3 will show change units only under those same circumstances.

Lay compensate allows you to move all forward moving cuts by the same amount (to adjust for movements of the printed image on the sheet). It will not change any cuts after a push, a load, a reverse gauge move, or the end of the job.

The air will turn on for any reverse drive or push out. The air will turn off when the clamp is lowered. It is possible to program the air table after the cut but before the clamp is raised. This is useful for moving work across to the side tables. You can do this by using the air table function after a cut while holding the clamp down. The air after cut feature defaults to the off state during programming.

SENSOR ICONS ON THE SCREEN

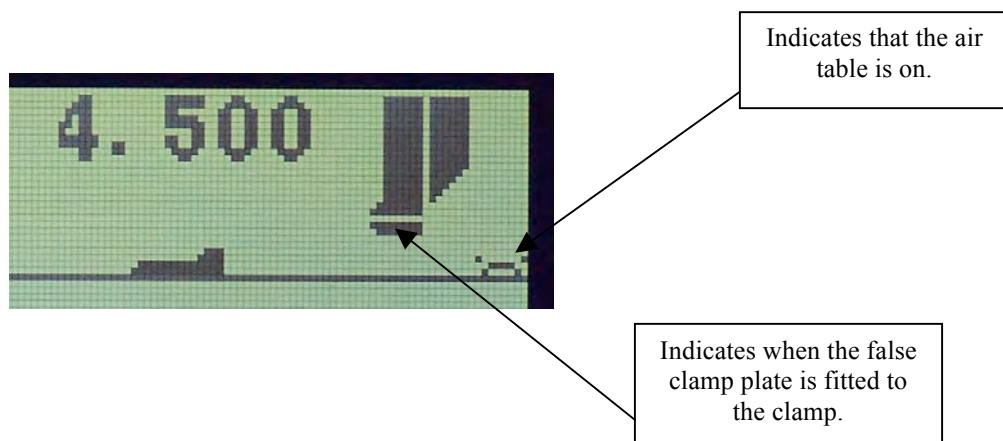
There are several sensors attached to the computer to insure that correct operation can occur. The top section of the screen shows the states of several of these sensors. Refer to the next three diagrams for details—



Operation of the clamp and knife in automatic mode will advance the controller to the next position. The backgauge motor will not move if either the clamp and/or knife are down.

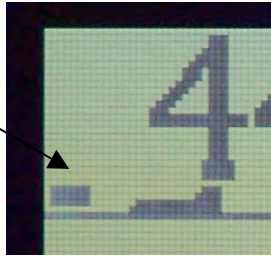
If the handwheel is pressed, upon release the backgauge will auto-correct to the new position. Refer to the section D37 CONNECTOR—AUXILIARY SENSING AND CONTROLS for handwheel sensing details.

The air is controlled by the air function as well as programming (when in automatic mode). With the clamp up the air will be on or off based upon the air status (^I). The air will go off when the clamp is down and stay off unless the unit is in AUTOMATIC mode and the air after cut feature is programmed for on. The air will also be forced on for any push out or reverse drive.



When the false clamp (sometimes called the clamp shoe or sole plate) is attached to the clamp the minimum forward drive will be larger. If a program contains positions that are smaller than the false clamp size and the false clamp is installed, an error message will occur when the backgauge is asked to go to that position.

Shows that the position sensor is tripped (covered)--If this is tripped, the backgauge should be near the back.



If any icons are different from the machine, then check all cables, connectors, sensors, and mechanical adjustments carefully.

ERROR MESSAGES

The control system is constantly checking to make sure that everything is correct during operation. If anything appears to be wrong, a message will appear on the screen. These can be of two different types—

1. Minor, where pressing any key will clear the screen and resume normal operation.
2. Major, where the power will have to be turned off and back on again, or repairs may be necessary.

Note: If the minor error is not corrected, the message will continue.

Minor error prompts:

Entered value is too small!!!

This value cannot be zero!!

Cut stroke early!!

Job number already used!

Out of job programming memory!

Job number not found!!

There are no more jobs!!

Not enough available memory!

The information is incomplete!

Target is out of table range!!

Target lost!!!

No motion seen at backgauge

No motion seen!!

Loose cable in drive box—fix!

Loose cable on drive box

Error in the job memory!

Error in leadscrew values!

Error in machine sizes!!

Check keyed in value to move to

Cannot divide by 0

Wait longer before cutting

Choose a different number

Memory chip is full, erase some of the jobs

Try another number

First 999 used OR no more jobs to review

Label or divide require too much space

Not enough input to continue

Trying to go too far back or forward

Information in computer was lost

Bind error or mechanical problem

Check encoder or mechanical binding

Ribbon cable in H-Drive is disconnected

D or 5 pin connector are disconnected

Data in memory is invalid, setup will be forced

Inch, cm mm, sun pitches disagree, setup will be forced

Machine sizes are impossible for machine, setup will be forced

Major error prompts:

Watchdog reset, turn power off

Key pressed during calibration

Watchdog reset-drive unit

No motion-forward drive test!

Position sense error!!

No motion-reverse drive test!

Zero set missing-calibration!

Reverse drive is forward!!

No motion at start up reverse!

Impaired drive at reverse test

No motion at start up forward!

Impaired drive at forward test

H-Drive data lost on zero set!

Encoder error-missed zero set

Improper data download!

Value is out of range. Must be ...

Computer seized, check power and all connections

Instant shut off

Computer in H-Drive seized, check power and all connections

Drive test failed, check motor

Check for unplugged connector

Drive test failed, check motor

Check for loose cable to the encoder

Drive test failed, reverse motor wires

Drive test failed, check motor

Drive test failed

Drive test failed, check motor

Drive test failed, check motor

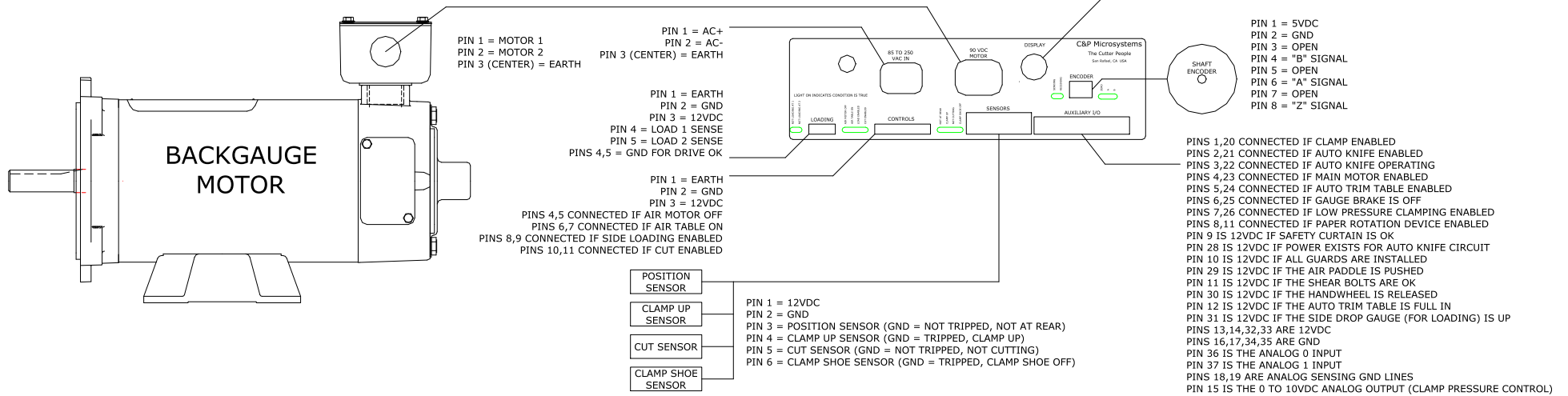
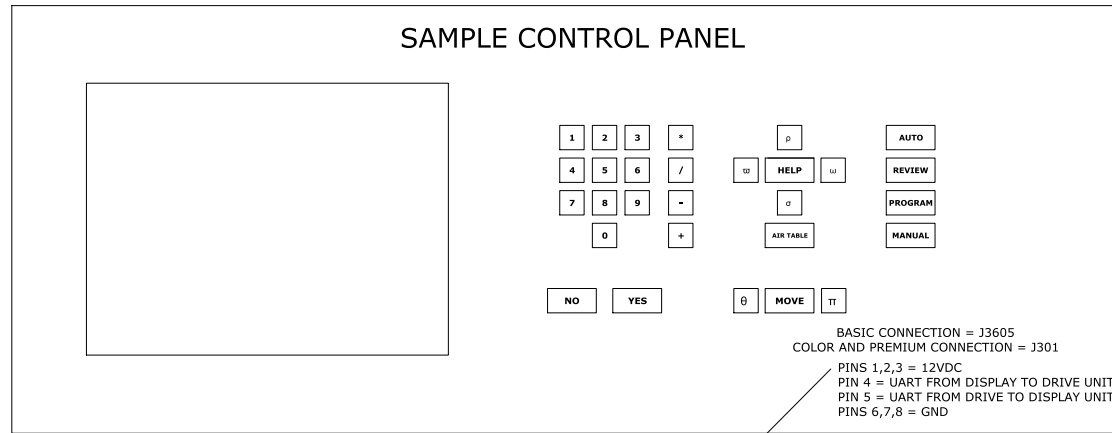
Computer malfunction, check power and all connections

Check connections to the encoder

Check connections between drive box and display

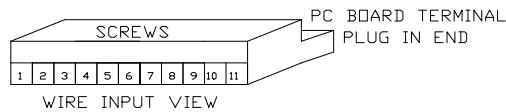
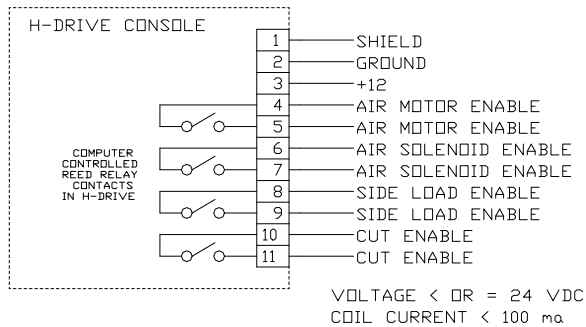
Recalibration value error, check the displayed range and try again

H-DRIVE WIRING DIAGRAM



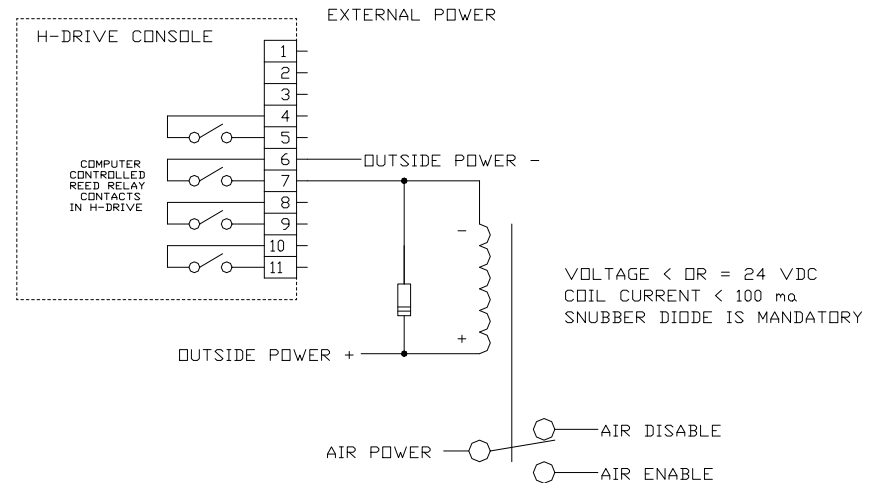
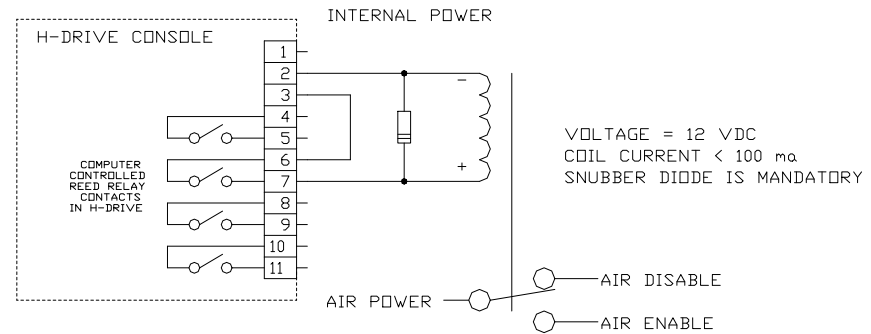
NOTE: Depending upon the model and application, the operator control panel will look quite different, but the wiring is always the same.

11 PIN CONNECTOR—AUXILIARY CONTROLS



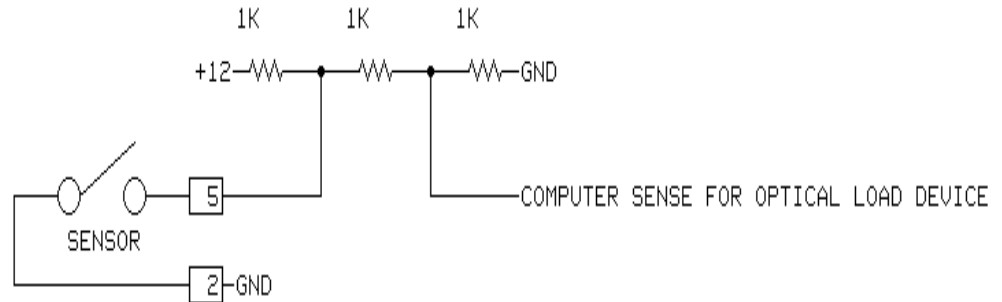
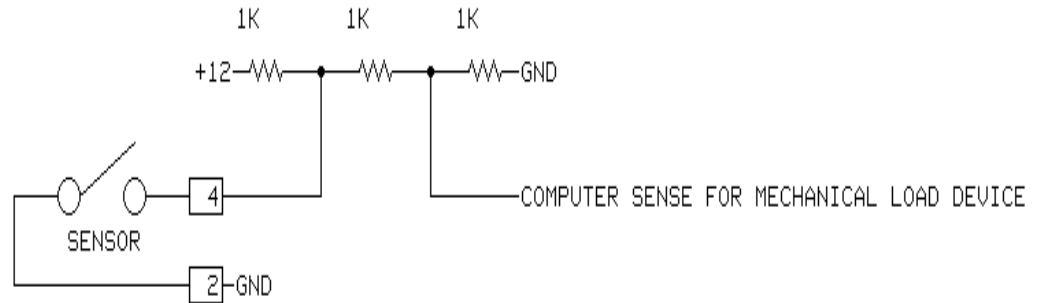
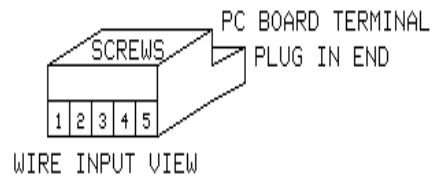
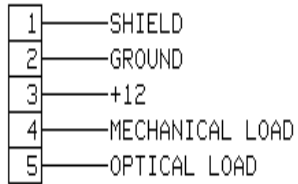
DEFINITIONS

- 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.

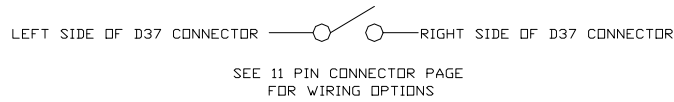
IF AUTO ADVANCE AFTER LOAD IS ENABLED, THEN WHEN EITHER SENSOR TRIPS OFF GROUND AND THEN BOTH RETURN TO GROUND THE GAUGE WILL AUTOMATICALLY ADVANCE TO THE NEXT POSITION.

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

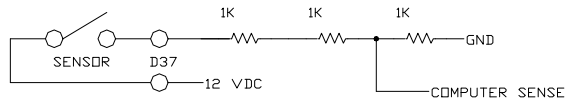
D37 CONNECTOR—AUXILIARY SENSING AND CONTROLS

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

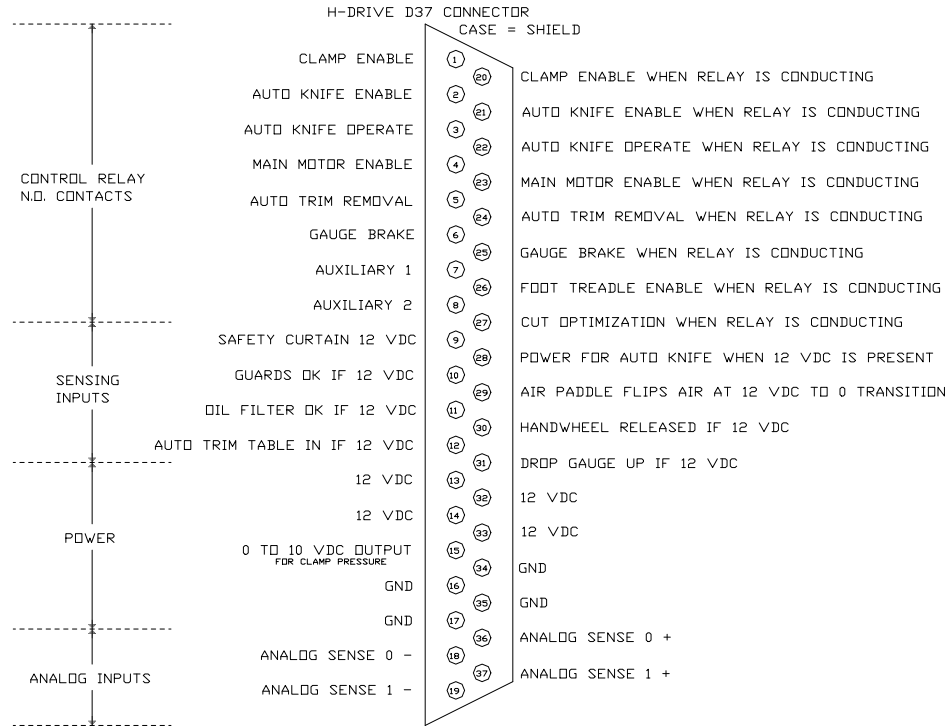


A MECHANICAL SWITCH OR PROXIMITY SENSOR CAN BE USED
 USE THE 12 VDC AND GND CONNECTIONS AS REQUIRED

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.

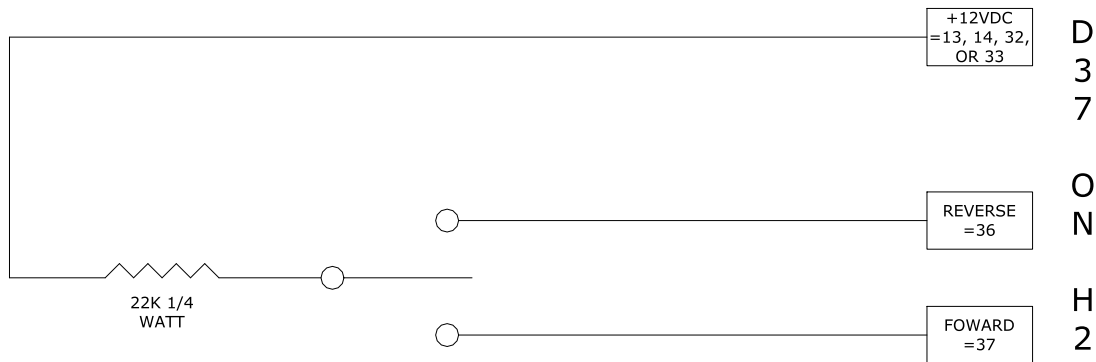
ELECTRONIC HANDWHEEL

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).