

microcut[®]

Please Note:

The following product manual is presented in its original form. The contact information included may be outdated. Please use the current contact information below.

Thank you.

C&P Microsystems
1260 Holm Road
Suite C
Petaluma, CA 94954

Main Number: 1.707.776.4500

Fax Number: 1.707.776.4555

www.cp-microsystems.com

 **microsystems**

microcut[®]

Owners Manual



Graphics West
Micro Systems

!!!!WARNING!!!!

READ THIS BEFORE INSTALLING MICROCUT

MICROCUT IS NOT INTENDED TO CONTROL THE KNIFE OR THE CLAMP ON THE PAPER CUTTER (MILL TRIMMER). ANY ALTERATIONS TO THE KNIFE OR CLAMP SAFETIES, CIRCUITS, AND OPERATION, OR ANY INSTALLATION TECHNIQUE WHICH COMPROMISES THE SAFETY OF ANYONE WORKING ON OR AROUND THE PAPER CUTTER (MILL TRIMMER) WILL VOID ANY AND ALL WARRANTIES ON MICROCUT. THIS POLICY ALSO APPLIES TO CASES WHERE MICROCUT IS INSTALLED ON DIFFERENT TYPES OF EQUIPMENT OR MACHINERY.

MICROCUT CONSISTS OF PARTS AND ASSEMBLIES WHICH ARE ADDED TO THE MACHINE. GUARDING MAY NEED TO BE ALTERED OR ADDED TO OFFER PROPER PROTECTION. THIS MUST BE DONE BEFORE MICROCUT IS OPERATED. DO NOT 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.

Check the motor rating BEFORE supplying the power. Refer to the INSTALLATION MANUAL. 100/110/115/120VAC operation requires a 90VDC motor. 200/220/230/240VAC operation requires a 180VDC motor. Power should be supplied from a DEDICATED breaker.

Go through the OWNER'S MANUAL with ALL appropriate personnel and complete the DEALER and CUSTOMER information sheets. Fill out and mail the warranty registration card and mail it BEFORE leaving the installation site.

Please report any problems or suggestions to the factory:

Graphics West Micro Systems
3000 Kerner Blvd.
San Rafael, CA USA 94901
Phone: 415-457-7500
FAX: 415-457-1694

This includes but is not excluded to: packing; parts supplied; design and quality of parts and assemblies; and anything else that may affect your ability to install and use **MICROCUT** in a productive professional manner.

Thank you,

Wayne Smith

Wayne Smith
Vice President
Graphics West Micro Systems

MICROCUT POWER REQUIREMENTS

The power for MICRO CUT should be from a DEDICATED breaker. 90 to 130VAC operation requires a 90VDC motor. 180 to 250VAC requires a 180VDC motor. Verify the motor rating BEFORE supplying the power. Due to inductive characteristics of the 1 HP DC motors on some machines, it is recommended that the lower voltage range with a 90VDC motor be used for installations requiring a 1 HP motor.

Supply an outlet near the machine that MICRO CUT can be plugged in to (read the rest of the page). MICRO CUT comes equipped with a standard US 3 prong power plug. Use an appropriate receptacle or supply a different plug (capable of supplying adequate current--see below). The power lines for MICRO CUT should be run in their own conduit. Other lines contained in the same conduit can affect the power supplies and computers in MICRO CUT.

AN UNCLEAN POWER LINE WILL SEND SPIKES INTO THE COMPUTER AND ITS SURROUNDING CIRCUITRY. WHILE MICRO CUT IS DESIGNED AS BEST AS POSSIBLE TO OVERCOME THESE SPIKES, IN TIME THE SPIKES CAN COMPROMISE THE CIRCUITRY AND FAILURE CAN RESULT. THE CLEANER THE POWER, THE BETTER. START FROM THE BEGINNING WITH A GOOD CLEAN POWER LINE. DO NOT WAIT FOR PROBLEMS.

The MICRO CUT earth ground connects ONLY to the shields on the signal cables and to the computer power supply. The MICRO CUT earth ground will not supply a connection to the cutter. It can not be used as a substitute for the machine ground. Some machines may have been connected to the power panels using the conduit as an earth ground. While this method of grounding is accepted in many areas, the connections between pieces of conduit can corrode causing the ground connection to be inadequate. IT IS ABSOLUTELY REQUIRED THAT A SEPARATE EARTH GROUND WIRE BE RUN TO THE MACHINE AS WELL AS TO MICRO CUT. AN INADEQUATE MACHINE EARTH GROUND CAN CAUSE STATIC BUILDUP TO "JUMP" TO THE SHIELDS ON THE MICRO CUT SWITCH CABLES. THIS CAN CAUSE ERRORS IN MICRO CUT. MAKE SURE THE MACHINE IS PROPERLY GROUNDED.

POWER CONSUMPTION--for calculating feed wire gauge

COMPUTER--30 watts. DRIVE--up to 3000 watts during acceleration and deceleration. Standard power draw should be within the specifications of the steady state current shown on the motor identification plate. If the power requirement (from current/voltage readings) is greater than this a full mechanical and electrical inspection should be made.

NOTE: The time duration for motor overpower (from the feed line) is such that a standard current rated breaker should not trip off.

Graphics West
Micro Systems

Dear Valued Customer:

Thank you for purchasing **MICROCUT**. As part of a user base that numbers in the thousands worldwide, you will soon begin enjoying the benefits of **MICROCUT** and experience, first hand, why we are the leader in the field of cutter automation.

We would ask, before installing **MICROCUT**, that you take a few moments to review the following points with your Authorized Dealer. In so doing, you will insure that **MICROCUT** is a safe and productive addition to your operation for many years to come.

MICROCUT SHOULD NEVER BE INSTALLED ON A CUTTER THAT DOES NOT MEET EXISTING SAFETY STANDARDS. These standards include, but are not limited to, two hand start and hold for knife activation, and a latching device for the knife when at the top of its cycle. Safety retrofit kits are available from a number of sources to address these specific features. If you have any questions, seek expert opinion before installing **MICROCUT**.

MICROCUT includes its own DC drive motor. Whenever possible, your cutter's existing motor should be left in place, giving redundancy to the machine. IT IS IMPORTANT THAT MOTORS AND PULLEYS BE PROPERLY GUARDED AND THE ENCLOSED WARNING LABEL AFFIXED BY THE GUARD. The addition of the **MICROCUT** motor may require the modification of an existing guard or its replacement. UNDER NO CIRCUMSTANCES SHOULD **MICROCUT** BE USED WITH AN UNGUARDED MOTOR PULLEY.

Complete and return the warranty registration card immediately upon installation of **MICROCUT**. This information will allow us to notify you of any future software updates and facilitate any future service requirements.

Sincerely,

Wayne T. Smith

Wayne T. Smith
Vice President, Engineering & Operations

WARRANTY

Graphics West Micro Systems

Graphics West Micro Systems ("GWMS") warrants to the original end user that this product, when installed by an Authorized Dealer, will be free from defects in material and workmanship for a period of NINETY (90) DAYS from the date of installation, as evidenced by the date shown on the warranty registration card. For warranty service, the end user must return this product (transportation charges prepaid) either to the Authorized Dealer from whom it was purchased or directly to GWMS at the address given below. Any product returned must include the end user's name, address, and telephone number, as well as a brief description of the defect. GWMS will, at its option, repair or replace any defective product at no further charge to the end user on determination, by GWMS, in its good faith discretion, that the product was defective and that such defect arose within the duration of this limited warranty.

This warranty does not apply if, in the good faith discretion of GWMS, the product has been tampered with, or has been damaged by neglect, accident, abuse, misuse, or misapplication, or as a result of improper installation, service or modification by any party, including any Authorized Dealer, other than GWMS, or if the GWMS serial number has been removed or defaced. GWMS shall not be responsible in any way for any service or modification to this product by any party, including any authorized dealer, other than GWMS.

All warranties extending beyond repair or replacement as described above are disclaimed, and the liability of GWMS and its agents under all warranties is limited to such repair and replacement.

Seller makes no representations, assurances or warranty, expressed or implied, of the safety, merchantability or fitness of the equipment to which this product is attached or of such equipment meeting standards of safety and fitness for use established by any governmental entity. GWMS shall not be responsible for special, incidental, or consequential damages resulting from the breach of any express or implied warranty or in connection with the manufacture, sale, or use of this product under any legal theory, which damages shall include, but not be limited to, lost profits, damages to property or damages for personal injury.



**Graphics West
Micro Systems**

3000 Kerner Blvd.
San Rafael, CA 94901
415 457 7500
FAX 415 457 1694

Please detach and mail

For your permanent records

Model No. _____
 Serial No. _____
 Date installed _____
 Authorized dealer:

Name _____
 Address _____
 City _____
 State/Zip _____
 Date installed _____
 Model No. _____
 Purchased from:

 Cutter Modified:
 Manufacturer _____
 Size _____
 Serial No. _____
 By: _____
 Customer's Representative
 Date _____

What type of business?
 Commercial Printer
 Bindery
 Paper Merchant/Converter
 Label Manufacturer
 In-Plant
 Other _____

Where have you seen or heard of Microcut?
 Magazine advertisement
 Which magazine?

 Saw at trade show
 Recommended by friend
 Recommended by dealer
 Other _____

By: _____
 Authorized Dealer representative

Date _____



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 431 SAN RAFAEL, CA

POSTAGE WILL BE PAID BY ADDRESSEE



Graphics West Micro Systems
3000 Kerner Blvd.
San Rafael, CA 94901

DEALER INFORMATION SHEET FOR MICRO CUT INSTALLATION

Customer name _____
Street address _____
City, State, Zip _____
Phone _____

Installation date Day _____ Month _____ Year _____
Warranty good through Day _____ Month _____ Year _____

Installed by _____
Warranty registration card mailed on Day _____ Month _____ Year _____

(WARRANTY NOT HONORED UNTIL THE WARRANTY CARD IS RECEIVED)

Machine make _____ Model _____ Year _____
Serial number _____ Width _____ Length _____
Mechanical condition _____
MICROCUT model and serial number _____

External buzzer installed on	Day _____	Month _____	Year _____
Printer installed on	Day _____	Month _____	Year _____
Computer interface installed on	Day _____	Month _____	Year _____
1 HP motor installed on	Day _____	Month _____	Year _____
Mill spec kit installed on	Day _____	Month _____	Year _____
Brake control line installed on	Day _____	Month _____	Year _____
Air control line installed on	Day _____	Month _____	Year _____
Mechanical paddle sense installed on	Day _____	Month _____	Year _____
Optical side load sense installed on	Day _____	Month _____	Year _____
Other installed on _____	Day _____	Month _____	Year _____

Software versions:
Drive _____ Display _____ Count _____ Prompt _____

Set up parameters:
Maximum rear _____ False clamp _____ Minimum front _____

Power connector is **PLASTIC** (black) OR **METAL** (silver)
Motor is _____ horsepower at _____ VDC and _____ RPM
Dedicated power supply line is 100 110 120 200 220 240 VAC
Motor turns per inch of backgauge drive _____
Encoder turns per inch of backgauge drive _____
Encoder sprocket is _____ teeth, leadscrew sprocket is _____ teeth
Encoder make is _____ and model is _____
Leadscrew diameter is _____

Office contact _____ Department _____
Operator 1 _____ Trained on _____
Operator 2 _____ Trained on _____
Operator 3 _____ Trained on _____
Operator 4 _____ Trained on _____
Operator 5 _____ Trained on _____

Method to revert to OE control:
1.
2.
3.
4.

Customer approval _____ Date _____

CUSTOMER INFORMATION SHEET FOR MICRO CUT INSTALLATION

Dealer name _____
Street address _____
City, State, Zip _____
Phone _____

Installation date Day _____ Month _____ Year _____
Warranty good through Day _____ Month _____ Year _____

Installed by _____
Warranty registration card mailed on Day _____ Month _____ Year _____
(WARRANTY NOT HONORED UNTIL THE WARRANTY CARD IS RECEIVED)

Machine make _____ Model _____ Year _____
Serial number _____ Width _____ Length _____
Mechanical condition _____
MICROCUT model and serial number _____

External buzzer installed on	Day _____	Month _____	Year _____
Printer installed on	Day _____	Month _____	Year _____
Computer interface installed on	Day _____	Month _____	Year _____
1 HP motor installed on	Day _____	Month _____	Year _____
Mill spec kit installed on	Day _____	Month _____	Year _____
Brake control line installed on	Day _____	Month _____	Year _____
Air control line installed on	Day _____	Month _____	Year _____
Mechanical paddle sense installed on	Day _____	Month _____	Year _____
Optical side load sense installed on	Day _____	Month _____	Year _____
Other installed on _____	Day _____	Month _____	Year _____

Software versions:
Drive _____ Display _____ Count _____ Prompt _____

Set up parameters:
Maximum rear _____ False clamp _____ Minimum front _____

Power connector is **PLASTIC** (black) OR **METAL** (silver)
Motor is _____ horsepower at _____ VDC and _____ RPM
Dedicated power supply line is 100 110 120 200 220 240 VAC
Motor turns per inch of backgauge drive _____
Encoder turns per inch of backgauge drive _____
Encoder sprocket is _____ teeth, leadscrew sprocket is _____ teeth
Encoder make is _____ and model is _____
Leadscrew diameter is _____

Method to revert to OE control:

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

Comments and notes on service and updates:

*THE INFORMATION IN THIS MANUAL IS ESSENTIAL.
READ AND UNDERSTAND THIS INFORMATION COMPLETELY
BEFORE OPERATING THIS EQUIPMENT!!!*

MICROCUT III SAFETY MANUAL

Graphics West Micro Systems
3000 Kerner Boulevard
San Rafael, California, USA 94901
Telephone: (415) 457-7500
FAX: (415) 457-1694
June 1990
Revision A3

THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION WHICH IS PROTECTED BY COPYRIGHT. ALL RIGHTS ARE RESERVED. NO PART OF THIS DOCUMENT MAY BE PHOTOCOPIED, REPRODUCED, OR TRANSLATED TO ANOTHER LANGUAGE WITHOUT THE PRIOR WRITTEN CONSENT OF GRAPHICS WEST MICRO SYSTEMS.

MICROCUT, MICROFACTS, AND CUTTERNET ARE REGISTERED TRADE MARKS OF GRAPHICS WEST MICRO SYSTEMS

TABLE OF CONTENTS

<i>INTRODUCTION</i>	<i>1</i>
<i>MACHINE LOCATION</i>	<i>2</i>
<i>OPERATOR RESPONSIBILITY</i>	<i>3</i>
<i>LUBRICATION</i>	<i>4</i>
<i>MAINTENANCE</i>	<i>5</i>
<i>KNIFE HANDLING</i>	<i>6</i>
<i>OBSOLESCENCE</i>	<i>7</i>

INTRODUCTION

This manual is intended to help establish safety guidelines. Graphics West Micro Systems **DOES NOT IMPLY THAT THE RULES SET FORTH IN THIS MANUAL ARE COMPLETE AND CAN NOT ASSUME RESPONSIBILITY FOR SAFETY STANDARDS SET UP BY THE PURCHASER.** For additional information on safety, please contact:

"How to Establish and Implement a Plantwide Safety Program"
The National Association of Printers and Lithographers
570 Seventh Avenue
New York, New York 10018

MICROCUT CONSISTS OF PARTS AND ASSEMBLIES WHICH ARE ADDED TO THE MACHINE. GUARDING MAY NEED TO BE ALTERED OR ADDED TO OFFER PROPER PROTECTION. THIS MUST BE DONE BEFORE MICROCUT IS OPERATED. DO NOT 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.

Many older machines were connected to the power panels using the conduit as an earth ground. While this method of grounding is accepted in many areas, the connections between pieces of conduit can corrode causing the ground connection to be inadequate. It is **mandatory** that a separate earth ground wire be run to the machine if this is not already the case.

The **MICROCUT** earth ground connects ONLY to the shields on the signal cables (and console) and to the computer power supply (this is essential for proper filtering and protection of the power supply and computer--if earth is not available then attach this to the neutral line feeding the power). The **MICROCUT** earth ground will not supply a ground to the cutter, nor will it cause any ground loop conditions.

MACHINE LOCATION

The paper cutter should be placed away from distractions (water coolers, break room, main passages), traffic, and open doors (wind which can blow stock can create real hazards).

The floor should be able to support the weight of the paper cutter in a level position without excessive vibration. If there are any questions about this consult with a structural or mechanical engineer BEFORE installation begins.

The paper cutter must have enough space around it to allow the operator access for lubrication and maintenance. Space should be supplied for storage of tools, lubricants, spare knives, cutting sticks, and other equipment.

Rails should be placed around this area to prevent unauthorized or incidental entry into the cutter work area.

MICROCUT WILL INCREASE THE PRODUCTIVITY OF YOUR PAPER CUTTER. YOUR EXISTING WASTE DISPOSAL PROCEDURES AND WORK AREA MAY NEED MODIFICATION TO SAFELY ALLOW FOR THIS.

Adequate waste disposal must be supplied so that material will not build up and impair the operator's mobility. Remember that waste or cut stock laying on the floor can cause slips and trips which could be dangerous.

OPERATOR RESPONSIBILITY

1. Keep the work area clean. Do not pile items where they can fall or reduce mobility. Do not stack anything on the top of the cutter housing. Keep the cutter surface clean and free of debris.
2. Do not allow any machine to be operated if any guard or safety is out of place.
3. Lubricate and maintain the machine correctly and on a regular basis according to schedule.
4. Turn the machine off when unattended.
5. Continuously check machine operation for changes in noise, vibration, knife stop location (at the top), clamp response (and return to top), and general performance. Report any changes immediately and take steps to correct any problems that these changes may be pointing to. If there is any question about performance or safety **BEFORE USING THE MACHINE AGAIN**.
6. Use jogging sticks, backup boards, and the PUSH feature to avoid putting any part of your body near or under the knife or clamp. Never use your hands to support or catch a pile of stock.
7. Avoid distractions while operating the cutter.
8. Use extreme caution when changing the knife--**MAKE SURE EVERYONE IS WELL BACK WHILE REMOVING THE KNIFE FROM THE CUTTER AND BEFORE THE KNIFE IS SECURED IN THE KNIFE CARRIER**. Keep your fingers out of any holes in the clamp at all times, if the clamp should return to the top of its stroke severe injury could occur.
9. If an assistant is working with you, **DO NOT ALLOW THE HELPER TO PUT THEIR HANDS ANYWHERE NEAR THE CLAMP, KNIFE, OR CONTROLS**. Make sure they are well clear of the cutter before operating either the clamp or the knife.
10. Maintain finishes on the machine with appropriate protection materials (wax the table, etc.). Avoid using agents that contain silicone products since these can cause scratching and excessive wear.
11. Make sure that knife carriers are in good condition before using.

LUBRICATION

Lubrication errors can cause machine failures and subsequent accidents. Make sure that all machine parts are properly lubricated. **MICROCUT** will allow greater productivity, resulting partly from greater movement of the backgauge. The leadscrew and gibbs should be lubricated at the beginning of each shift. Use a light machine oil which will help clean the screw and gibbs at the same time it lubricates. Grease will attract dirt and abrasives. DO NOT USE GREASE.

MAINTENANCE

Perform maintenance checks in accordance to the schedules set forth in the paper cutter's OWNER'S MANUAL. As machines become older, clearances between parts increase. This can cause wear to occur more rapidly and maintenance should be performed more frequently (refer to OBSOLESCENCE in this manual).

KNIFE HANDLING

Knives **MUST** be handled with great care. Even a dull knife is a dangerous instrument if not handled with utmost respect.

Always follow the recommended knife changing procedure described in the paper cutter's **OWNER'S MANUAL**. Never hold a knife by anything other than the manufacturer's knife handles.

BEFORE using the knife handles check their threads for wear. **REPLACE ANY HANDLE IF THE THREADS APPEAR TO BE WORN.**

Do not use any knife if it has burrs on it.

Inspect any knife carrier before putting a knife into it. If it is cracked, worn, or damaged **DO NOT USE IT.**

Never carry a knife if it is not in its knife carrier. When transporting a knife place it level on a truck or dolly.

Always remove the knife from the cutter **BEFORE** honing it. If honing is to be performed use a stone with grooved side surfaces which will prevent fingers or hands from coming into contact with the knife.

Do not use crocus cloth to hone the knife unless it is attached to a back up pad which will prevent accidental hand contact with the knife.

Always check knives for "true" before installing them in the cutter. If the knife is bowed contact your local knife grinding shop for assistance.

BEFORE discarding any knife grind the cutting edge so that it has at least a 1/8 inch flat surface.

OBSOLESCENCE

Any machine has a lifetime. These lifetimes CAN BE EXTENDED through proper lubrication, maintenance, and care. As a machine ages, the clearances between parts alters from the manufacturers specifications and reliability as well as production may suffer. More significantly, control circuits may start to fail causing significant hazards. Refer to the manufacturer's specifications for machine life expectations. If the machine is to be kept in operation beyond the manufacturer's expectations, it is recommended that all components contributing to the safety of the machine be rebuilt or replaced. These parts include but are not limited to:

- Friction plates and clutches
- Hydraulic rams and controls (including valves and lines)
- All seals dealing with the hydraulic unit
- All springs dealing with the hydraulic unit
- All sensing and limit switches
- All relays
- All solenoids (clamp/knife, safety pin, air)
- All control panels
- The hoses dealing with the air manifold

The cutter should be thoroughly tested before being brought back into service. Consult a trained qualified service person.

Any machine MAY wear faster than the expectations of the manufacturer. It is advised that periodic checks by a trained service person be performed on the machine to insure that it is safe and in good working order.

MICROCUT III

OPERATOR'S MANUAL

Graphics West Micro Systems
3000 Kerner Boulevard
San Rafael, California, USA 94901
Telephone: (415) 457-7500
FAX: (415) 457-1694
June 1990
Revision A3

THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION WHICH IS PROTECTED BY COPYRIGHT. ALL RIGHTS ARE RESERVED. NO PART OF THIS DOCUMENT MAY BE PHOTOCOPIED, REPRODUCED, OR TRANSLATED TO ANOTHER LANGUAGE WITHOUT THE PRIOR WRITTEN CONSENT OF GRAPHICS WEST MICRO SYSTEMS.

MICROCUT, MICROFACTS, AND CUTTERNET ARE REGISTERED TRADE MARKS OF GRAPHICS WEST MICRO SYSTEMS

FOREWORD

The keys on **MICROCUT** have been carefully labeled and all operations are fully prompted to guide an operator. There are only a few basic operating methods a user needs to be concerned with during normal operation. These are:

1. Turning the power on and getting started.
2. **MANUAL** operation.
3. **PROGRAMMING** and **REVIEWING** jobs.
4. **AUTOMATIC** operation.
5. Making modifications (**OPTIONS** key).

MICROCUT has been designed with only 24 keys on the display console. It is natural that even this small number of keys will overwhelm an operator at first, but if the keys are split into "purpose groups" learning **MICROCUT** can be very easy:

Three are for operating mode selection--

MANUAL (spacer off, manual operation)

PROGRAM (to program and review job memory)

AUTOMATIC (spacer on)

Three are for the motor drive (**UP & DOWN ARROWS, MOVE**)

One is for changing measurement **UNITS**

Ten keys are **NUMBERS** 0, 1, 2, ... , 9

Three are for the calculator (+, -, and /)

YES (**ENTER** display entry) or answer question

NO (**CLEAR** display entry) or answer question

LAST (back up to previous event)

OPTIONS (the key for getting the most from **MICROCUT**)

Advanced methods for using **MICROCUT** are included in the **OPERATOR'S REFERENCE MANUAL**.

Many of the features you will find in **MICROCUT** have resulted from operator's suggestions throughout the world. If you have any suggestions, we encourage you to contact our engineers at the address, phone number, or FAX listed on the front of this manual. Whenever possible, we will make the revisions and update your unit. Our special thanks to all who have contributed to making **MICROCUT** the leader in cutter automation. Your efforts and concerns are reflected in the product.

MICROCUT controls the backgauge drive system only. It is not intended to control either the knife or clamp operation of the machine it is installed on. All operations of the knife and clamp should be the same after **MICROCUT** is installed as before (including knife change operation).

TABLE OF CONTENTS

<i>MAKING CHOICES AT THE SELECTION SCREENS</i>	<i>0-1</i>
<i>TURNING POWER ON TO MICRO CUT</i>	<i>0-2</i>
<i>OPERATIONAL CHART</i>	<i>0-3</i>
<i>BACK GAUGE DRIVE OPERATION</i>	<i>0-4</i>
<i>PROGRAMMING A JOB</i>	<i>0-5</i>
<i>AUTOMATIC OPERATION</i>	<i>0-6</i>
<i>MANUAL MODE OPTIONS</i>	<i>0-7</i>

MAKING CHOICES AT THE SELECTION SCREENS

Several different selection screens have been built into MICRO CUT. It is important to understand how to make selections at these screens when using MICRO CUT. All of these screens have an arrow that moves up and down on the left side, and a number in the upper right corner. There are three ways a selection can be made. Use whichever one feels right to you.

METHOD 1:

Use the **UP** and **DOWN ARROWS** to position the arrow at the line choice you want. Press the **YES** key.

METHOD 2:

Use the **NO** key to position the arrow at the line choice you want. Press the **YES** key.

METHOD 3:

Choose the desired line by pressing the # 1, 2, or 3 key.

These screens appear whenever a choice can be made. They will help guide you through the use of MICRO CUT and make your job much easier. Read the screens, read the keys. Everything becomes self explanatory when this is done.

TURNING POWER "ON" TO MICRO CUT

MAKE SURE THAT ALL GUARDS AND SAFETIES ARE IN PLACE BEFORE TURNING ON POWER. INSPECT THE MACHINE FOR ANY MOVING PARTS OR HAZARDS THAT ARE NOT FULLY GUARDED. CORRECT ANY SAFETY PROBLEMS BEFORE CONTINUING. MAKE SURE THERE ARE NO OBSTRUCTIONS TO NORMAL OPERATION. MAKE SURE EVERYONE IS CLEAR OF DANGER.

MICROCUT automatically controls power to attain required speeds while driving the backgauge. There are built in power limiting factors so that mechanical damage is not likely to occur in the event that proper lubrication schedules are not followed. **MICROCUT** is not intended to correctly drive a machine which is bound. The handwheel should turn easily with one hand. If two hands are required to turn the handwheel the leadscrew, gibbs, and backgauge should be closely inspected and adjustments should be made **BEFORE** operation proceeds.

Locate the ON/OFF switch on the rear of the DISPLAY CONSOLE and toggle it. Select the language you would like to use (refer to **MAKING CHOICES AT THE SELECTION SCREEN**). **MICROCUT** will display a copyright message and then perform a test on machine specifications and job memory.

When the display reads **ARE ALL THE GUARDS IN PLACE?** and **AFTER** the guards have been inspected to make sure that the machine can be operated safely, press the **YES** key.

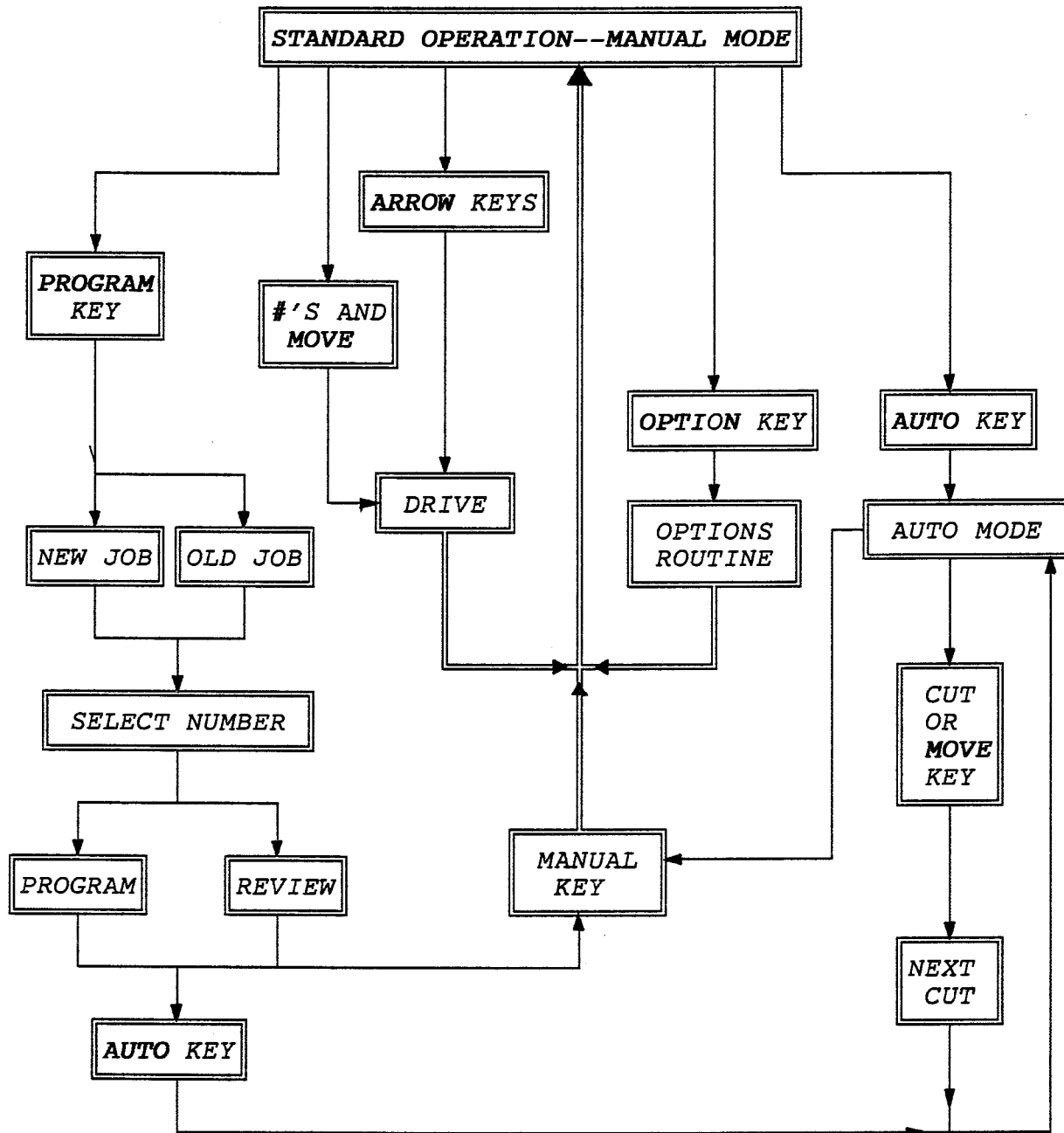
The display will read **HAS DAILY LUBRICATION BEEN PERFORMED?** The leadscrew should be lubricated with a light machine oil and any fluid levels and routine cleaning should be performed on the machine at this time. Press the **YES** key when these things have been performed.

The display will read **IS EVERYONE 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 the **YES** key to continue.

The display will read **PRESS THE AUTOMATIC KEY TO CALIBRATE.** Press the **AUTOMATIC** key and **MICROCUT** will move the backgauge slowly to the rear of the cutter. When it reaches the rear it will move forward slightly to calibrate itself. **MICROCUT** is now ready to use.

OPERATIONAL FLOW CHART

The following flow chart briefly outlines the standard operating procedure of MICRO CUT. It is hardly complete. Please refer to the TABLE OF CONTENTS for sections of this manual which deal with the specifics.



BACKGAUGE DRIVE OPERATION

Backgauge drive can be used in either FORWARD or REVERSE while in MANUAL or PROGRAMMING modes of operation.

SLOW FORWARD DRIVE

1. Tap the **UP ARROW** key (reverse) and then press and hold the **DOWN ARROW** key.
2. Press the **DOWN ARROW** key and then release for less than 1/2 second before pressing and holding it again.
3. Lower the clamp while pressing the **DOWN ARROW** key. Slow speed will be maintained even after the clamp is raised.

SLOW REVERSE DRIVE

1. Press the **DOWN ARROW** key and then release for less than 1/2 second before pressing and holding it again.

FAST DRIVE

1. Press and hold the **UP** or **DOWN ARROW** key. If slow speed is obtained, release the key for at least 1/2 second and then press it again.

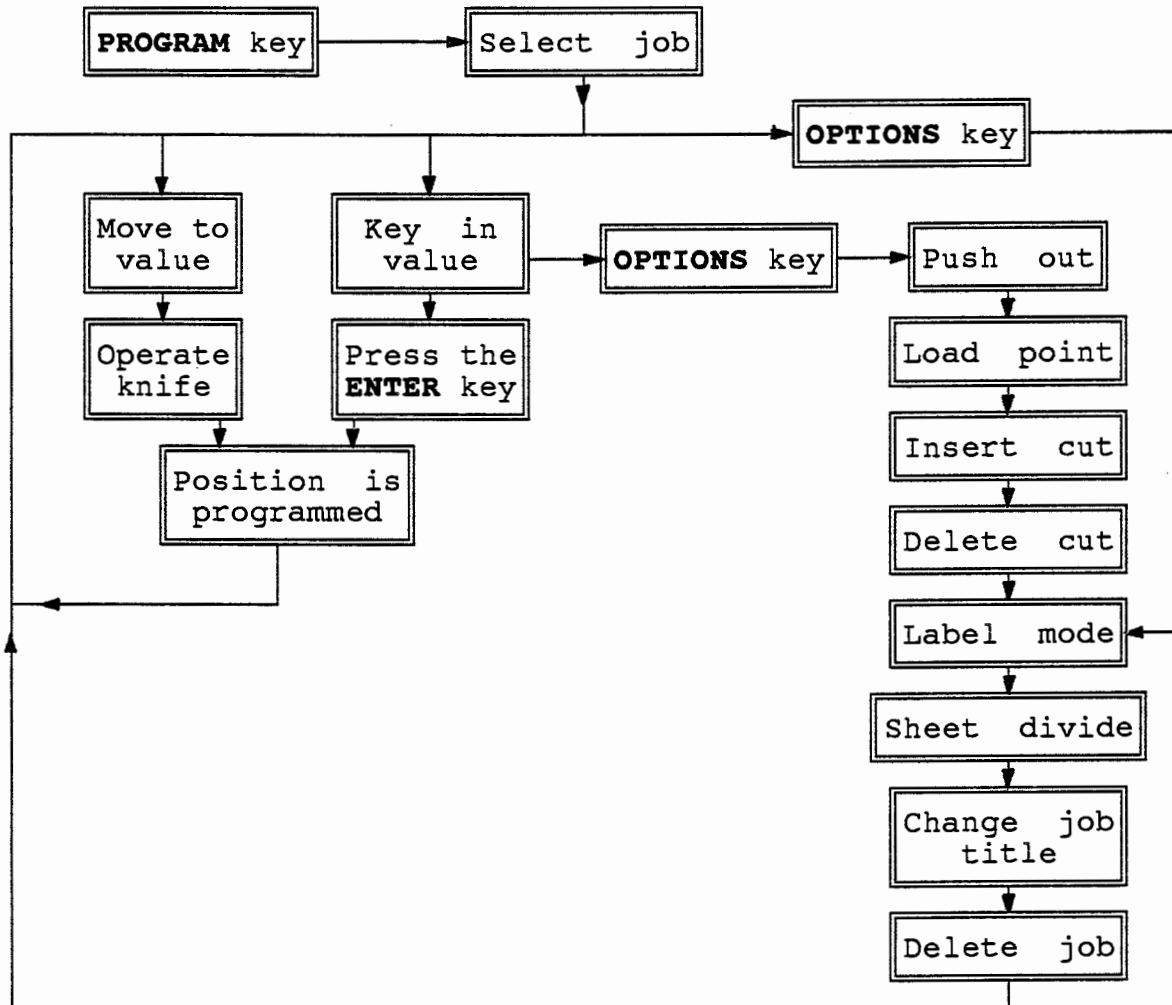
SEMI-AUTOMATIC DRIVE OPERATION

This routine is used to move the backgauge to a position in the MANUAL, PROGRAM, and OPTIONS modes of operation. Enter a position using the **NUMBER** keys. Press the **MOVE** key. To move a distance, press the **+** or **-** key and enter the distance to move. Then press the **MOVE** key.

NOTE: THE BACKGAUGE SHOULD ALWAYS BE POSITIONED MOVING IN THE FORWARD DIRECTION TO PREVENT BACKLASH AND INACCURATE CUTTING.

PROGRAMMING A JOB

The PROGRAM NEW JOB routine is used to program a series of stop points into MICRO CUT so that it can operate in AUTOMATIC MODE. These stops (and pushes) can proceed without limitations of direction or motion. PROGRAM MODE is entered from the MANUAL MODE (press the MANUAL key).



CORRECTING OR REVIEWING CUT LOCATIONS:

LAST key -- backs up the CUT #, allows reprogramming if desired.

YES (ENTER) key -- enters the cut value shown in the display.

CLEAR (NO) key -- clears the lower line of the display.

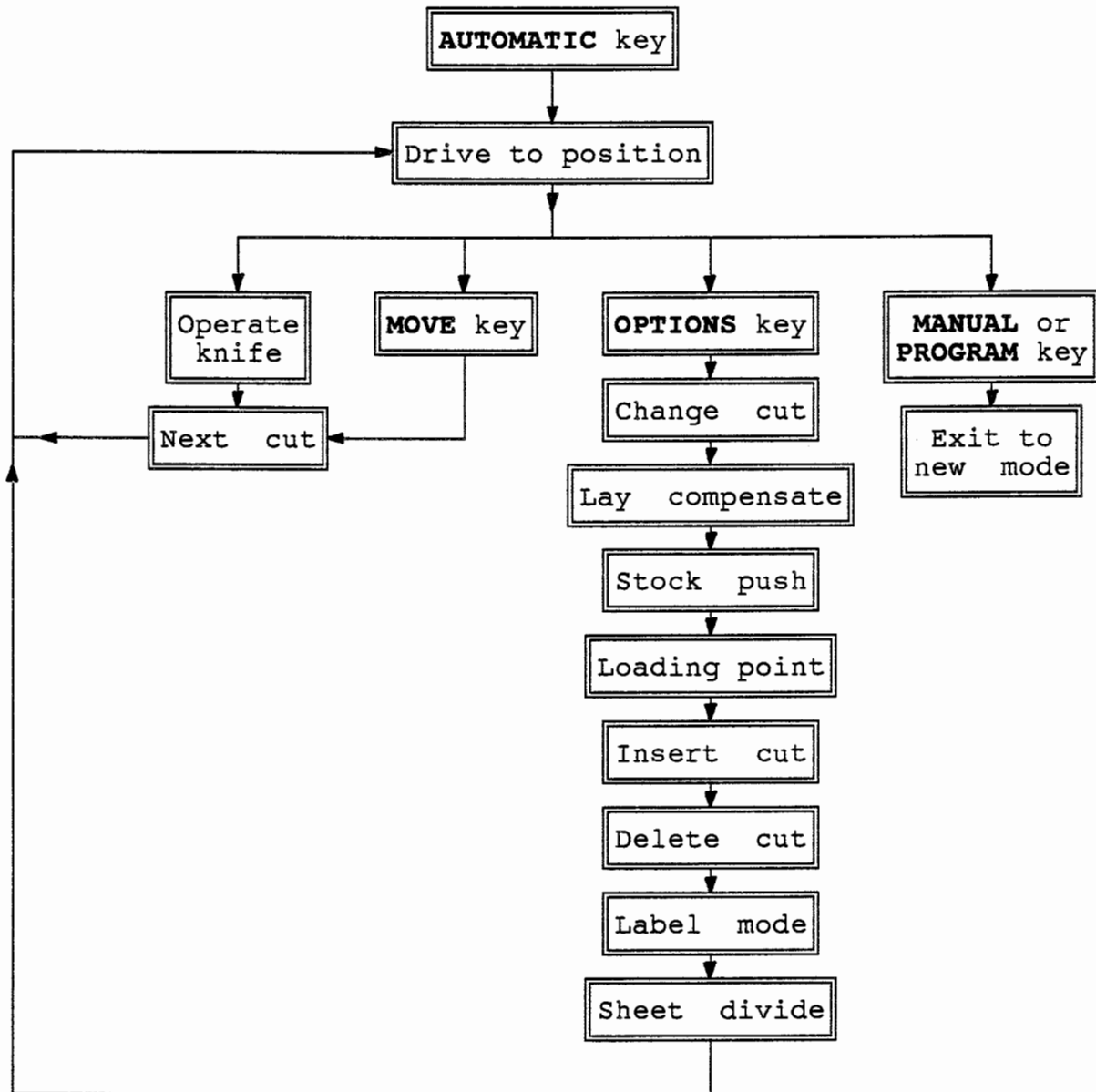
OPTION key -- accesses choices for alternative programming methods

KNIFE STROKE -- enters the current position as the cut value.

MANUAL or **AUTOMATIC** -- exit programming, enter new operating mode.

AUTOMATIC OPERATION

In **AUTOMATIC** mode **MICROCUT** will position the backgauge according to job memory. Before entering **AUTOMATIC**, select the desired job number (or program a new one). Make sure that the desired job and starting cut number are displayed in the third line of the prompting display.



MANUAL MODE OPTIONS

MICROCUT contains several user selectable features. These are contained in a single operation area referred to as **MANUAL OPTIONS**. To enter the **MANUAL OPTION** routine, the second line of the prompt display must show **MANUAL MODE**. Press the **MANUAL** key if it does not show this.

Press the **OPTION** key to see the current status of **MICROCUT**'s features. The **UP**, **DOWN**, **YES**, **NO**, **LAST**, and **NUMBER** keys can be used to select any of the features you want to change or know more about. The **OPTIONS** key can be used to progress on to the next screen.

Options which are offered include:

1. False clamp
2. Calibrate gauge
3. Last date of knife change
4. Cut strokes since last knife change
5. Time change (if management system is not active)
6. Shift change (if management system is active)
7. Print job data (printer must be attached for printing)
8. Job memory usage
9. Specified table sizes

Further options available only with authorized service code:

10. Key beeper
11. Volume adjustment of buzzer
12. Fast gauge speed
13. Slow gauge speed
14. Manual drive acceleration rate
15. Automatic drive acceleration rate
16. Gauge backlash setting
17. Drive options when clamp is not in the full up position
18. Settling tolerances
19. Auto repositioning in event that gauge is moved
20. True size shown at CUT READY in AUTOMATIC mode
21. Use all digits or blank final digit
22. Side loading
23. Auto advance after side load
24. Units status
25. Decimal enable
26. Power meter
27. Amp meter

MICROCUT III

REFERENCE MANUAL

Graphics West Micro Systems
3000 Kerner Boulevard
San Rafael, California, USA 94901
Telephone: (415) 457-7500
FAX: (415) 457-1694
June 1990
Revision A3

THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION WHICH IS PROTECTED BY COPYRIGHT. ALL RIGHTS ARE RESERVED. NO PART OF THIS DOCUMENT MAY BE PHOTOCOPIED, REPRODUCED, OR TRANSLATED TO ANOTHER LANGUAGE WITHOUT THE PRIOR WRITTEN CONSENT OF GRAPHICS WEST MICRO SYSTEMS.

MICROCUT, MICROFACTS, AND CUTTERNET ARE REGISTERED TRADE MARKS OF GRAPHICS WEST MICRO SYSTEMS

FOREWORD

This manual has been written with the hopes of helping the operator LOOK UP information. While it is believed that **MICROCUT** is simple enough (once a few basics are understood) to operate without any documentation, all operations have been thoroughly discussed. Many routines (like inserting a cut) are virtually identical no matter what operating mode you are using, but we have included instructions for these procedures in several parts of the manual. Advanced ideas for using **MICROCUT** are included in later sections. The early sections deal with the basics to allow an operator to perform day to day tasks. There are only a few basic operating methods a user needs to be concerned with during normal operation. These are:

1. Turning the power on and getting started.
2. **MANUAL** operation.
3. **PROGRAMMING** and **REVIEWING** jobs.
4. **AUTOMATIC** operation.
5. Making modifications (**OPTIONS** key).

MICROCUT has been designed with only 24 keys on the display console. It is natural that even this small number of keys will overwhelm an operator at first, but if the keys are split into "purpose groups" learning **MICROCUT** can be very easy:

Three are for operating mode selection--

MANUAL (spacer off, manual operation)

PROGRAM (to program and review job memory)

AUTOMATIC (spacer on)

Three are for the motor drive (**UP & DOWN ARROWS, MOVE**)

One is for changing measurement **UNITS**

Ten keys are **NUMBERS** 0, 1, 2, ... , 9

Three are for the calculator (**+**, **-**, and **/**)

YES (**ENTER** display entry) or answer question

NO (**CLEAR** display entry) or answer question

LAST (back up to previous event)

OPTIONS (the key for getting the most from **MICROCUT**)

Refer to the **TABLE OF CONTENTS** to find the page which deals with any questions you may have. Read the prompting display, read the labels on the keys, operation becomes easy when this is done.

Many of the features you will find in **MICROCUT** have resulted from operator's suggestions throughout the world. If you have any suggestions, we encourage you to contact our engineers at the address, phone number, or **FAX** listed on the front of this manual. Whenever possible, we will make the revisions and update your unit. Our special thanks to all who have contributed to making **MICROCUT** the leader in cutter automation. Your efforts and concerns are reflected in the product.

MICROCUT controls the backgauge drive system only. It is not intended to control either the knife or clamp operation of the machine it is installed on. All operations of the knife and clamp should be the same after **MICROCUT** is installed as before (including knife change operation).

TABLE OF CONTENTS

MICROCUT DESCRIPTION	R-1
MICROCUT SPECIFICATIONS	R-2
MAKING CHOICES AT THE SELECTION SCREENS	R-3
TURNING POWER ON TO MICROCUT	R-4
OPERATING FLOW CHART	R-5
BASIC OPERATION	
Inch, metric, and sun operation	R-6
IN-MM-CM-SUN comparison table	R-7
Manual drive	R-8
Semi automatic drive	R-9
Calculator keys	R-10
MANUAL MODE OPTIONS OFFERED IN MICROCUT	
General description of options	R-11
False clamp on/off selection	R-12
Calibrate gauge routine	R-13
Knife strokes and date changed	R-14
Changing time clock	R-15
Changing shifts (& language)	R-16
Printing job memory	R-17
Viewing job memory usage	R-18
Viewing machine size parameters	R-19
Turning key beeper on/off	R-20
Adjusting beeper volume	R-21
Fast speed adjustment	R-22
Slow speed adjustment	R-23
Manual drive acceleration	R-24
Automatic drive acceleration	R-25
Backlash setting	R-26
Clamp down drive option	R-27
Adjusting settling tolerances	R-28
Auto correction on/off	R-29
True size options at CUT READY	R-30
Last digit off option	R-31
Side loading option	R-32
Auto advance after side load	R-33
Units selection	R-34
Decimal point control	R-35
Power meter	R-36
Amp meter	R-37

CONTINUED ON NEXT PAGE

Table of contents (continued)

PROGRAMMING A JOB	
Selecting a new job number	R-38
Keyboard entry of new cut values	R-39
Cut & mark entry of new cuts	R-40
Reviewing the job contents	R-41
Recalling an old job	R-42
PROGRAMMING MODE OPTIONS--NEW OR OLD JOB	
Changing a cut value	R-43
Entering a stock push	R-44
Entering a jog/load point	R-45
Inserting a cut	R-46
Deleting a cut	R-47
Program/insert of a label job	R-48
Program/insert of a sheet divide	R-49
Changing a job number	R-50
Deleting a job	R-51
AUTOMATIC OPERATION	
General notes	R-52
Changing a cut-eject-jog/load	R-53
Adjusting all forward moving cuts	R-54
Inserting a cut-eject-jog/load	R-55
Deleting a cut-eject-jog/load	R-56
Adding a label job	R-57
Adding a sheet divide	R-58
ADVANCED OPERATING TECHNIQUES	
Attaching the printer	R-59
Tips on programming	R-60
Memory organization	R-62
Variation of backgauge speeds	R-63
Determining the software versions	R-64
Miscellaneous methods	R-65
CALIBRATION & TEST ROUTINE (SET UP)	
Setting up MICRO CUT	R-66
Job memory test	R-67
Job memory erase	R-68
Sensing switch checks	R-69
Motor drive/direction test	R-70
Entering calibration points	R-71
Entering machine sizes	R-72
Finishing off the set up routine	R-73
DEMONSTRATION MODE OF OPERATION	R-74
USE OF ORIGINAL EQUIPMENT CONTROLS	R-75
SQUARING THE BACKGAUGE	R-76
KNIFE SHARPENING	R-77
PROMPTS IN MICRO CUT	R-80

MICROCUT DESCRIPTION

MICROCUT is a solid state electronic motor drive control system that contains programmable jobs and 2000 storage locations.

In the **AUTOMATIC MODE** of operation **MICROCUT** will position the backgauge sequentially according to the stop points that have been programmed on the selected job. At the end of the sequence it will then return to the beginning again.

MICROCUT controls the backgauge drive system only. It is not intended to control either the knife or clamp operation of the machine it is installed on. All operations of the knife and clamp should be the same after **MICROCUT** is installed as before (including knife change operation).

The **DISPLAY CONSOLE** mounts on the front of the cutter and is used for display readouts and all operator inputs.

The display console keys have been thoughtfully labeled. Read them **AND** the prompting display--the operating methods and options of **MICROCUT** will then be very simple. At several points **MICROCUT** may give choices to the operator. The **UP ARROW**, **DOWN ARROW**, **YES**, **NO**, **LAST**, **OPTION**, and **NUMBER** keys can be used for making these choices (see page R-3).

This manual is designed to allow an operator to train himself. Please refer to the **TABLE OF CONTENTS** for any of the operations you may require. **MICROCUT IS DESIGNED TO BE USED IN MANY DIFFERENT WAYS. THIS MANUAL GIVES THE BASICS OF OPERATION, NOT EVERY OPTION. PLAY WITH MICROCUT TO SEE WHAT IT CAN REALLY DO FOR YOU.**

The **OPTION** key is used to select different features contained within **MICROCUT**. Use this key to "find" new ways to use the system.

MICROCUT III SPECIFICATIONS

All specifications are subject to change without notification. List is not all inclusive of features and options.

Does not interfere or affect existing knife/clamp controls
Fully redundant system
Multi language fully prompted operating system
1/2 or 1 HP motor supplied
Printer capable for printing jobs and time data
Full switch set for all required standard machine sensing
4 line by 20 character vacuum fluorescent display
Microprocessor full closed loop control drive system
Independent DC drive system with braking
Two thousand memory locations for cut storage
Inch/fractional/cm/mm/Japanese display units
Step & Repeat programming (for labels)
Sheet divide programming for error adjust
Full operator prompting for easy use
Demonstration mode for training away from machine
Self correcting backgauge in AUTOMATIC mode
Program entry by keyboard AND/OR knife stroke
Automatic computation of fractions
Insertion and deletion of cuts in a programmed job
Self diagnostic electronics
Automatic stock ejects
Infinite lay compensates for any number of sides
Non-volatile memory with 10 year retention
Keyboard control of calibration, false clamp, and more
Cut stroke counter with last date of knife change
Speed range from 3 to 960 inches per minute
Automatic adjustment for 50/60 Hz power
Electrical switch over for 90-130/200-260VAC input
Computer/display power--30 watts
Motor drive power--variable up to 3KVA

MAKING CHOICES AT THE SELECTION SCREENS

Several different selection screens have been built into MICRO CUT. It is important to understand how to make selections at these screens when using MICRO CUT. All of these screens have an arrow that moves up and down on the left side, and a number in the upper right corner. There are three ways a selection can be made. Use whichever one feels right to you.

METHOD 1:

Use the UP and DOWN ARROWS to position the arrow at the line choice you want. Press the YES key.

METHOD 2:

Use the NO key to position the arrow at the line choice you want. Press the YES key.

METHOD 3:

Choose the desired line by pressing the # 1, 2, or 3 key.

These screens appear whenever a choice can be made. They will help guide you through the use of MICRO CUT and make your job much easier. Read the screens, read the keys. Everything becomes self explanatory when this is done.

TURNING POWER "ON" TO MICRO CUT

MAKE SURE THAT ALL GUARDS AND SAFETIES ARE IN PLACE BEFORE TURNING ON POWER. INSPECT THE MACHINE FOR ANY MOVING PARTS OR HAZARDS THAT ARE NOT FULLY GUARDED. CORRECT ANY SAFETY PROBLEMS BEFORE CONTINUING. MAKE SURE THERE ARE NO OBSTRUCTIONS TO NORMAL OPERATION. MAKE SURE EVERYONE IS CLEAR OF DANGER.

MICROCUT automatically controls power to attain required speeds while driving the backgauge. There are built in power limiting factors so that mechanical damage is not likely to occur in the event that proper lubrication schedules are not followed. Therefore, **MICROCUT** is not intended to correctly drive a machine which is bound. The handwheel should turn easily with one hand. If two hands are required to turn the handwheel the leadscrew, gibbs, and backgauge should be closely inspected and adjustments should be made **BEFORE** operation proceeds.

Locate the ON/OFF switch on the rear of the DISPLAY CONSOLE and toggle it. Select the language you would like to use (refer to **MAKING CHOICES AT THE SELECTION SCREEN**). **MICROCUT** will display a copyright message and then perform a test on machine specifications and job memory. The next prompt will read **ARE ALL GUARDS IN PLACE?**

NOTE: If this is a **MICROFACTS** unit with access codes and time clock enabled, it will be necessary to confirm (or correct) the time and enter your access code before continuing (refer to the **MICROFACTS MANUAL**).

When the display reads **ARE ALL THE GUARDS IN PLACE?** and **AFTER** the guards have been inspected to make sure that the machine can be operated safely, press the **YES** key.

The display will read **HAS DAILY LUBRICATION BEEN PERFORMED?** The leadscrew should be lubricated with a light machine oil and any fluid levels and routine cleaning should be performed on the machine at this time. Press the **YES** key when these things have been performed.

The display will read **IS EVERYONE 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 the **YES** key to continue.

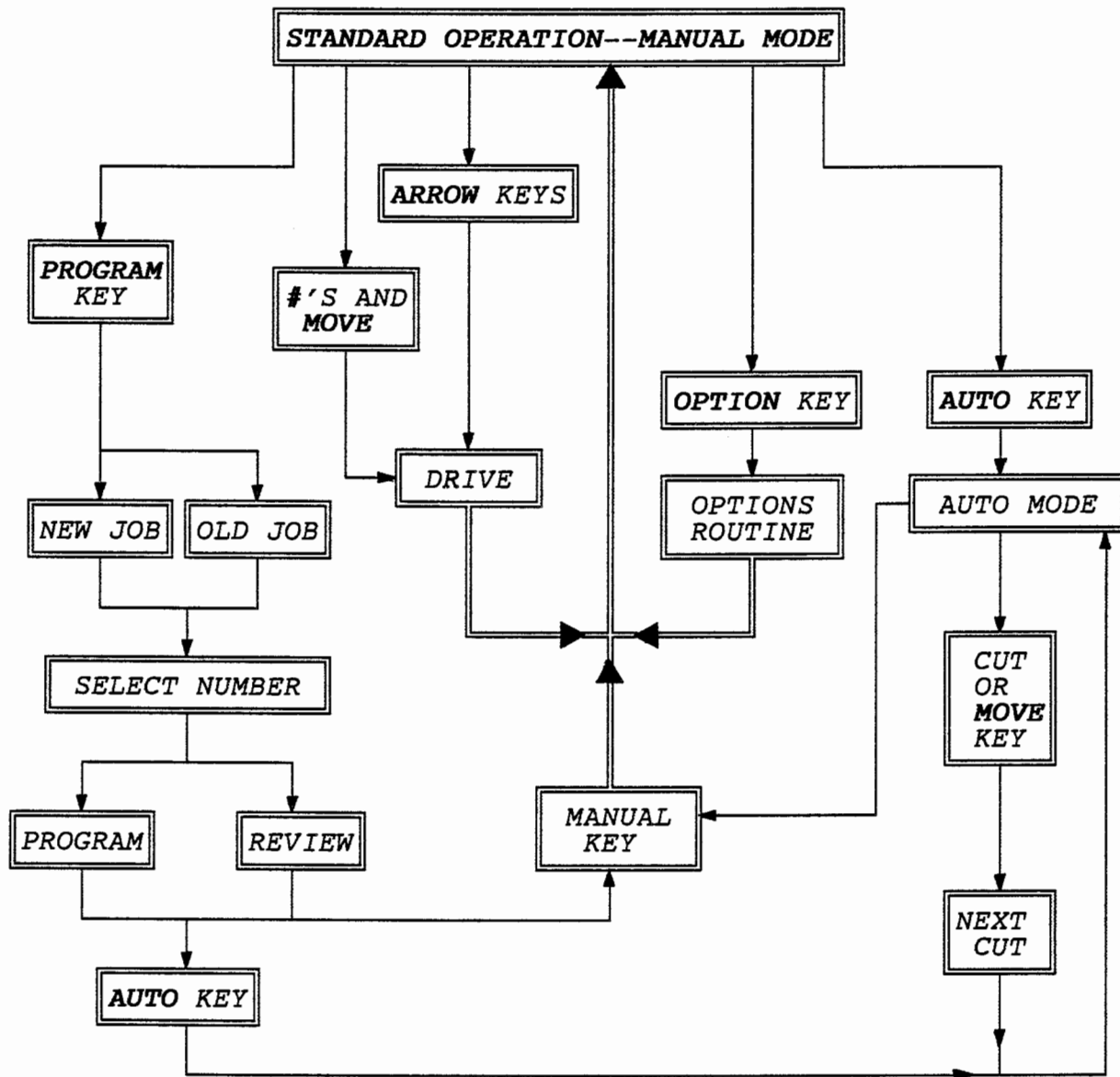
The display will read **PRESS THE AUTOMATIC KEY TO CALIBRATE.** Press the **AUTOMATIC** key and **MICROCUT** will move the backgauge slowly to the rear of the cutter. When it reaches the rear it will move forward slightly to calibrate itself. **MICROCUT** is now ready to use.

NOTE: The display will read **PRESS ANY KEY FOR IMMEDIATE DRIVE STOP** while calibration is occurring. This is an emergency stop only. Pressing **ANY KEY** will halt motion and require a restart of **MICROCUT**. **YOU WOULD NOT NORMALLY PRESS A KEY HERE UNLESS THE BACKGAUGE HAD TO BE STOPPED.**

NOTE: When the display reads **PRESS THE AUTOMATIC KEY TO CALIBRATE** the **OPTION** key is also active. Use this key to select **DEMO MODE** or **CALIBRATE & TEST MODE** of operation (see appropriate sections in this manual).

OPERATIONAL FLOW CHART

The following flow chart briefly outlines the standard operating procedure of MICRO CUT. It is hardly complete. Please refer to the TABLE OF CONTENTS for sections of this manual which deal with the specifics.



INCH, METRIC, AND SUN OPERATION

Cuts can be entered in INCHES, FRACTIONS, CENTIMETERS, MILLIMETERS, SUN, or any combination of these units. Simply press the UNITS key to change units. The units that are being used will show in the upper line after the current position information. The sequencing of units will be:

INCHES
 FRACTIONAL INCH READOUT (inches, 1/16ths, 1/64ths, remainder)
 CENTIMETERS
 MILLIMETERS
 SUN (1 sun=3.03cm)
 BACK TO INCHES

INCHES = MM/25.4 = CM/2.54 = SUN/.838
 MM = 10 x CM = SUN X 30.3 = 25.4 x INCHES
 CM = SUN X 3.03 = 2.54 x INCHES = MM/10
 SUN = INCHES X .838 = MM/30.3 = CM/3.03

NOTE: The SUN is a traditional Japanese measuring unit

Explanation of FRACTIONAL INCH READOUT--

Harris and Lawson cutters have handwheels which are calibrated in 1/16th's of an inch (.063) with further subdivisions of 1/64th's of an inch (.016). Operators of these machines would frequently maintain job stop values in units of inches, 1/16th's, 1/64th's, and remainder (+, ++, -, --). The fractional readout is offered on MICRO CUT to allow this same measuring system to be used.

IN-MM-CM-SUN COMPARISON TABLE

INCHES = MM/25.4 = CM/2.54 = SUN/.838
 MM = 10 x CM = SUN X 30.3 = 25.4 x INCHES
 CM = SUN X 3.03 = 2.54 x INCHES = MM/10
 SUN = INCHES X .838 = MM/30.3 = CM/3.03

NOTE: The SUN is a traditional Japanese measuring unit

<u>INCHES</u>	<u>MM</u>	<u>CM</u>	<u>SUN</u>
5-----	127-----	12.7-----	4.19
15-----	381-----	38.1-----	12.57
25-----	635-----	63.5-----	20.96
35-----	889-----	88.9-----	29.34
45-----	1143-----	114.3-----	37.72
55-----	1397-----	139.7-----	46.11
65-----	1651-----	165.1-----	54.49
75-----	1905-----	190.5-----	62.87
85-----	2159-----	215.9-----	71.25
95-----	2413-----	241.3-----	79.64
105-----	2667-----	266.7-----	88.02

MANUAL DRIVE OPERATION

Pressing the **DOWN ARROW KEY** will drive the backgauge toward the knife, slowly at first, then faster. The speed will be limited to slow if the **UP ARROW KEY** (reverse) was just pressed. To obtain high speed forward release the **DOWN ARROW** (wait at least 1/2 second) and then press it another time. To obtain JUST slow forward tap the **UP ARROW** key before using the **DOWN ARROW** or release the **DOWN ARROW KEY** for less than 1/2 second and then press it again or lower the clamp with the foot treadle during drive operation. The speed will slow automatically as the backgauge nears the front of the table.

Pressing the **UP ARROW KEY** will move the backgauge in reverse. Slow reverse can be obtained if the **UP ARROW KEY** is released for less than 1/2 second and then is pressed again. The speed will slow automatically as the backgauge nears the rear of the table.

The gauge can be driven forward manually (at reduced speed and reduced power--computer controlled) with the clamp lowered.

If greater control is desired the speed and acceleration rate of the gauge can be adjusted. Refer to **OPTIONS OFFERED IN MICRO CUT** for assistance.

If the current position display is in fractional readout it will convert to decimal until drive is stopped. This is for visual affect to keep the fractions from "bumping" during drive. When the drive is stopped the fractional readout will reappear.

NOTE: THE BACKGAUGE SHOULD ALWAYS BE POSITIONED MOVING IN THE FORWARD DIRECTION TO PREVENT BACKLASH AND INACCURATE CUTTING.

NOTE: Even with a recirculating ball type leadscrew some backlash can occur. The stop position should always be approached from the rear of the machine to insure that the backlash is removed so that the gauge is accurately positioned. Positioning must be done slowly to allow response to location and prevent the gauge from coasting off of the leadscrew thread. If positioning is done manually (with the handwheel) be careful not to turn the handwheel backwards when removing your hand. This will cause an error between the display and the true position.

SEMI-AUTOMATIC DRIVE OPERATION

This routine is used to move the backgauge to a position the **MANUAL**, **PROGRAM**, and **OPTIONS** modes of operation.

Enter a position using the **NUMBER** keys. Example: 8 inches--press the **8** key and then press the **0** (zero) key three times. **NOTE**--holding the **0** key will "roll out" the number three places.

Press the **MOVE** key. The **MANUAL** key will stop the backgauge **BEFORE** it reaches position.

For entering fractions see **CALCULATOR KEY OPERATION**.

NOTE: When entering a position, unless the left side decimal is disabled (see **MANUAL MODE OPTIONS**), you must roll out the number or an error will occur (8 inches = **8.000**, 8 1/2 inches = **8.500**, just **9** = 9/1000ths).

To move a distance, press the **+** or **-** key and enter the distance to move. Then press the **MOVE** key.

If the current position display is in fractional readout it will convert to decimal until the position is reached. This is for visual affect to keep the fractions from "bumping" during drive. When the drive is stopped the fractional readout will reappear.

CALCULATOR KEYS

The calculator keys are used just like a normal calculator, the numbers will appear on the right hand side of the prompting display after the + or - key is hit. The / key can be used for fractions. The ENTER, + or - key will total the display. The CLEAR/NO key will clear the right side of the display line first and then the left side if pressed again.

Calculator keys can be used in all methods of operation.

Calculations can also be chained together. For instance--

<u>KEY PRESSED</u>	<u>DISPLAY SHOWS</u>
8	. 8
0	. 80
0	.800
0	8.000
+	8.000 + .
3	. 8.000 + . 3
/	8.000 + 3/
4	8.000 + 3/ 4
-	8.750 - .
1	8.750 - . 1
/	8.750 - 1/
8	8.750 - 1/ 8
YES	8.625

OPTIONS IN MANUAL MODE

MICROCUT contains several user selectable features. These are contained in a single operation area referred to as **MANUAL OPTIONS**. Each is discussed in detail on the following pages.

To enter the **MANUAL OPTION** routine, the second line of the prompt display must show **MANUAL MODE**. Press the **MANUAL** key if it does not show this.

Press the **OPTION** key to see the current status of **MICROCUT**'s features. The **UP**, **DOWN**, **YES**, **NO**, **LAST**, and **NUMBER** keys can be used to select any of the features you want to change or know more about. The **OPTIONS** key can be used to progress on to the next screen.

The **MANUAL** key can be used at any time to exit back to **MANUAL MODE**. The **PROGRAM** and **AUTOMATIC** keys are also operational.

Options which are offered include:

1. False clamp
2. Calibrate gauge
3. Last date of knife change
4. Cut strokes since last knife change
5. Time change (if management system is not active)
6. Shift change (if management system is active)
7. Print job data (printer must be attached for printing)
8. Job memory usage
9. Specified table sizes
10. Key beeper
11. Volume adjustment of buzzer
12. Fast gauge speed
13. Slow gauge speed
14. Manual drive acceleration rate
15. Automatic drive acceleration rate
16. Gauge backlash setting
17. Drive options when clamp is not in the full up position
18. Settling tolerances
19. Auto repositioning in event that gauge is moved
20. True size shown at **CUT READY** in **AUTOMATIC** mode
21. Use all digits or blank final digit
22. Side loading
23. Auto advance after side load
24. Units status
25. Decimal enable
26. Power meter
27. Amp meter

FALSE CLAMP ON/OFF SELECTION

THIS IS THE START OF THE OPTIONS ROUTINE. THE OPTIONS KEY CAN BE USED TO PROCEED PAGE TO PAGE IN THIS MANUAL. THE LAST KEY CAN BE USED TO BACK UP TO THE PREVIOUS PAGE. THE MANUAL, PROGRAM, OR AUTOMATIC KEY CAN BE USED TO EXIT THIS ROUTINE. IF YOU ARE IN THE CALIBRATION & TEST ROUTINE IT WILL BE NECESSARY TO FOLLOW ALL THE WAY THROUGH.

NOTE: The false clamp is a metal plate which attaches to the bottom of the clamp for some paper cutters. It is removed to make very short cuts. MICRO CUT can have two different front travel limit values. If there is not a false clamp, then the two front travel limit values will be the same.

Make sure that MICRO CUT is in the MANUAL MODE. If MICRO CUT is not in the MANUAL MODE press the MANUAL key. Press the OPTIONS key until the display shows STATUS SCREEN 1 on the top line. At the end of the second line in brackets will be the word ON or OFF. To change the status select the FALSE CLAMP option (refer to MAKING CHOICES AT THE SELECTION SCREENS). Press the YES key if the false clamp is on the cutter. Press the NO key if it is not.

DO NOT PRESS THE NO KEY IF THE FALSE CLAMP IS ON THE CUTTER. While MICRO CUT is programmed to slow before proceeding into the false clamp region, accidental contact under motor drive could cause damage.

NOTE: The false clamp question will appear in SEMI-AUTOMATIC or AUTOMATIC mode of operation if the target value is between the false clamp value and the minimum front value AND the false clamp is ON. If YES is pressed at this point MICRO CUT will issue an error message (TOO FAR FORWARD) and exit to MANUAL (or PROGRAM) mode of operation. If NO is pressed, then the false clamp will be "SOFT OFF" which means that it will be OFF until the SEMI-AUTOMATIC or AUTOMATIC mode of operation is exited, at which point MICRO CUT will re-instate the ON status. This should help avoid errors in shops where several workers operate the cutter.

CALIBRATE GAUGE ROUTINE

This option does not appear in the CALIBRATION & TEST ROUTINE (continue to next page).

1. **Square the backgauge** (see SQUARING section). If the backgauge is not adjusted and squared properly, it is impossible to calibrate the gauge or cut material accurately.
2. Make sure that **MICROCUT** is in the **MANUAL MODE**. If **MICROCUT** is not in the **MANUAL MODE** press the **MANUAL** key. Press the **OPTIONS** key until the display shows **STATUS SCREEN 1** on the top line. Select the **CALIBRATE GAUGE** option (refer to **MAKING CHOICES AT THE SELECTION SCREENS**).
3. Four side trim a lift of stock. This stock should be at least **2/3 the height of the clamp opening** and **3/4 of the cutter width**. Refer to **KNIFE SHARPENING** in this manual for proper knife angles and clamp pressure to insure that the cutter is performing properly. If the knife is not cutting properly it will be impossible to calibrate the gauge accurately.
4. Move the backgauge to an even value (10, 15, 20, etc.). Refer to **MANUAL DRIVE** and **SEMI-AUTOMATIC DRIVE** sections of this manual.
5. Cut the stock.
6. Move the backgauge to one half that value and cut the stock. Refer to **MANUAL DRIVE** and **SEMI-AUTOMATIC DRIVE** sections of this manual.
7. Remove the top half of the back pile of the stock (in the cutter).
8. Slide the top half of the front pile onto the bottom half of the back pile. Move the rest of the front pile to the side. Check the lift of paper remaining inside the cutter for smoothness (with your fingers). The front pile (top half) has been cut exactly. If the rear pile (bottom half) is shorter, the cutter is cutting short. If the rear pile (bottom half) is longer, the cutter is cutting long.
9. Estimate the error and use the **NUMBER** and **YES** keys to enter the approximate true position of the backgauge.
10. Repeat steps 2 through 9 until satisfactory smoothness is achieved at step 8.

KNIFE STROKES AND DATE CHANGED

This option does not appear in the CALIBRATION & TEST ROUTINE (continue to next page).

MICROCUT has a built in counter to track the number of times the knife is cycled between knife changes. This will help to plan change times as well as evaluate the life expectancy of your knives. Along with the knife strokes **MICROCUT** remembers the last knife change date. In shops where the knife is changed many times in a day, it may be useful to enter the time between the "/" marks instead of the date.

The knife counter increments the stored value only when **MICROCUT** is in the **MANUAL**, **PROGRAM** (new or review), **AUTOMATIC**, or **CALIBRATION** modes of operation. It is assumed that knife strokes made at any other time would not involve stock being cut.

Make sure that **MICROCUT** is in the **MANUAL MODE**. If **MICROCUT** is not in the **MANUAL MODE** press the **MANUAL** key. Press the **OPTIONS** key until the display shows **KNIFE STATUS** on the top line. The number of knife strokes since the last knife change will be displayed at the end of the second line. The date the knife was last changed will be displayed at the end of the third line.

Select the **CHANGED** line option (refer to **MAKING CHOICES AT THE SELECTION SCREENS**). **MICROCUT** will ask if you have just changed the knife. If you have not, press the **NO** (or **LAST**) key to return to the first screen. If you have just changed the knife press the **YES** key. **MICROCUT** will ask you to enter a new date. Use the **NUMBER** keys to display the current day, month, and year. Press the **YES** key when this is correct. **MICROCUT** will zero out the cut strokes automatically.

The **LAST** key can be used to back out of this routine from any point.

CHANGING TIME CLOCK

This option does not appear in the CALIBRATION & TEST ROUTINE (continue to next page).

The time clock can only be changed if it is ON. Refer to THE MICROFACTS MANUAL for turning the clock on (or off).

Changing the clock is performed only during start up if the MICROFACTS management system is on. If this is the case turn the power off and then back on. Skip to the next paragraph. If MICROFACTS is not on, make sure that MICRO CUT is in the MANUAL MODE. If MICRO CUT is not in the MANUAL MODE press the MANUAL key. Press the OPTIONS key until the display shows MICROFACTS INFO on the top line. Select the CHANGE TIME option (refer to MAKING CHOICES AT THE SELECTION SCREENS).

Use the NUMBER keys to enter the correct hours, minutes, and seconds. The UNITS key will shift AM and PM. Press the YES key when the correct time appears. MICRO CUT will ask if this is correct. Press the NO key if you have made an error. Press the YES key if it is correct.

Use the NUMBER keys to enter the correct day, month, and year. Press the YES key when this is correct. MICRO CUT will show the new time and date and ask if this is correct. Press the NO key if you have made an error. Press the YES key if it is correct.

The time clock has now been reset.

CHANGING OPERATORS

This option does not appear in the CALIBRATION & TEST ROUTINE (continue to next page).

The **MICROFACTS** management system must be on for the change shift option to appear. Refer to the **MICROFACTS MANUAL** for turning the management system on (or off). Make sure that **MICROCUT** is in the **MANUAL MODE**. If **MICROCUT** is not in the **MANUAL MODE** press the **MANUAL** key. Press the **OPTIONS** key until the display shows **MICROFACTS INFO** on the top line. Select the **OPERATOR CHANGE** option (refer to **MAKING CHOICES AT THE SELECTION SCREENS**).

MICROCUT will offer a variety of languages on the screen. Select a language (refer to **MAKING CHOICES AT THE SELECTION SCREENS**). **MICROCUT** will request that a new operator access code be entered. Use the **NUMBER** keys to display a new operator access code. Press the **YES** key when the correct code is shown. The shift change is complete.

NOTE: **MICROCUT** will not be programmed (due to limited space) with every language. If the language you select is not offered in your unit, and this is one which you will need, please contact Graphics West Micro Systems for assistance.

PRINTING JOB MEMORY

This option does not appear in the CALIBRATION & TEST ROUTINE (continue to next page).

Refer to ATTACHING THE PRINTER (Advanced Operating Techniques--Table of Contents) for specifications and proper attachment of the printer.

Make sure that MICRO CUT is in the MANUAL MODE. If MICRO CUT is not in the MANUAL MODE press the MANUAL key. Press the OPTIONS key until the display shows PRINTOUT OPTIONS on the top line. Select the PRINT JOBS option (refer to MAKING CHOICES AT THE SELECTION SCREENS).

MICRO CUT will show another selection screen offering that ALL JOBS or a SINGLE JOB can be printed. If ALL JOBS are selected the printing process will begin immediately (see next paragraph). If a SINGLE JOB is requested another selection screen will appear. Select LAST JOB USED if this is the job to be printed. Otherwise choose SELECT A JOB # and proceed to enter the desired number (NUMBER keys and YES). When a job number is entered the printing process will begin.

THE PRINTING PROCESS

MICRO CUT will ask if the printer is at the top of the page. Check this. Adjust the paper position if necessary. Press the YES key. MICRO CUT will begin printing. During the print operation the display will read PRESS MANUAL KEY TO STOP. Unless there is a problem do not press the MANUAL key. Wait for the printout to complete. MICRO CUT will return to the original SELECTION SCREEN at the end of the print operation.

POSSIBLE PROBLEMS:

- Printer switch must be ON LINE to print data from MICRO CUT.
- Cables must be securely fastened at both the printer and MICRO CUT.
- Printer must be plugged in and switched ON.
- Paper must be in the printer.
- All printer functions (check indicators on printer) must be OK.
- The printer cable must be attached to the correct connector on the back of the MICRO CUT display console.

VIEWING JOB MEMORY USAGE

This option does not appear in the CALIBRATION & TEST ROUTINE.

Make sure that **MICROCUT** is in the **MANUAL MODE**. If **MICROCUT** is not in the **MANUAL MODE** press the **MANUAL** key. Press the **OPTIONS** key until the display shows **JOB MEMORY** on the top line.

MICROCUT will display the job memory (locations) used and those remaining. Press the **YES**, **OPTIONS**, **3**, or **LAST** key to cycle on to a different screen or the **MANUAL**, **PROGRAM**, or **AUTOMATIC** keys to change to one of the other operating routines.

Job memory is stored in a device which has its own resident power supply (10 year Lithium battery backup). The lower area contains the specifics of the machine **MICROCUT** is installed on (leadscrew pitch, table sizes, mechanical measurements, etc.). This is duplicated at the very top of the same memory device. The area in the middle (2000 locations) is reserved for **JOB PROGRAMS**.

NOTE: The memory device has 8192 addresses. 192 addresses are used for machine values. This leaves 8000 addresses free for job memory. Every cut takes 4 addresses (one for type of cut--inch/fractional/cm/mm/sum/cut/load/eject, one for 100's and 10's, one for 1's and .1's, and one for .01's and .001's). We can divide 8000 by 4 and get 2000 cut locations. Each job requires a start address (to allow the computer to find the job), 6 addresses for the job number, and an end address (so the computer knows when to return to the beginning of the job). This totals 8 addresses or two cut locations. Therefore **MICROCUT** could contain one job of 1998 cuts, two jobs of 1996 total cuts, three jobs of 1994 total cuts, etc. It can be seen that **MICROCUT** is limited to no more than 666 jobs (of one cut each). Therefore it is recommended that older unused jobs be deleted to allow space for newer jobs.

VIEWING MACHINE SIZE PARAMETERS

This option does not appear in the CALIBRATION & TEST ROUTINE.

Make sure that MICRO CUT is in the MANUAL MODE. If MICRO CUT is not in the MANUAL MODE press the MANUAL key. Press the OPTIONS key until the display shows ARE SIZES CORRECT on the top line.

MICRO CUT will display the table travel limits for MAXIMUM REAR, FALSE CLAMP ON, and MINIMUM FRONT. If these values are correct press the YES or OPTIONS key to cycle on to STATUS SCREEN 1, the LAST key to back up to VIEWING JOB MEMORY USAGE, or the MANUAL, PROGRAM, or AUTOMATIC keys to change to one of the other operating routines.

If these values are not correct it will be necessary to go through the CALIBRATION & TEST ROUTINE to correct them. Refer to CALIBRATION AND TEST ROUTINE in this manual.

NOTE: This is the end of the MANUAL MODE operator accessed OPTIONS routine. If the OPTIONS key is pressed MICRO CUT will request the authorized service code. Access is denied unless the correct code is used. The service code is bypassed in the CALIBRATION & TEST routine.

TURNING KEY BEEPER ON/OFF

From the **MANUAL MODE** of operation press the **OPTIONS** key until the service code is requested. Use the **NUMBER** keys and then **ENTER** to supply **MICROCUT** with the authorized service code. **MICROCUT** will display **STATUS SCREEN 2** on the top line. Select the **KEY BEEPER** option (refer to **MAKING CHOICES AT THE SELECTION SCREENS**).

When enabled this feature will cause a short beep to occur whenever the **YES**, **LAST**, or **OPTIONS** key is pressed. These keys repeat every 3/4 second. The beeper is helpful when using these keys to browse through memory as well as in other routines.

Press the **YES** key to turn the beeper on. Press the **NO** key to turn the beeper off.

ADJUSTING BEEPER VOLUME

From the MANUAL MODE of operation press the **OPTIONS** key until the service code is requested. Use the **NUMBER** keys and then **ENTER** to supply **MICROCUT** with the authorized service code. **MICROCUT** will display **STATUS SCREEN 2** on the top line. Select the **VOLUME ADJUST** option (refer to **MAKING CHOICES AT THE SELECTION SCREENS**).

Push and hold the **UP** or **DOWN ARROW** key to adjust the volume up and down. Release the key to hear the "true" volume setting that has been selected. Press the **YES** key when satisfied.

NOTE: This will adjust the buzzer volume for all buzzer operations. The volume adjust is limited and can not be turned all the way off. In some loud environments it is possible that the buzzer may not be loud enough even at maximum volume. The volume adjust is not linear. It may be necessary to hold the adjustment key in for a few seconds before a difference is realized.

Graphics West Micro Systems has tried to supply a buzzer which will work in most shops. This buzzer may not be loud enough in some shops. If that is the case an external buzzer may be supplied. This is available from Graphics West Micro Systems through your dealer. If you opt to supply an external buzzer yourself, please refer to the note below.

NOTE: If an external buzzer is hooked up through the D9 printer cable it will be necessary to make revisions on Rev A2 and earlier boards. The connection from J3 (printer connector) pin 3 to the 1229 pin 7 should be cut. J3 pin 3 should be reconnected to J5 pin 1 (which also connects to the DS3632 pin 3). J3 pin 4 should be connected to 12VDC which can be obtained at J4 pin 21 and 22. The ribbon cable from J3 should be checked to make sure that pin 4 connects to the pin 4 of the D9 connector on the back of the display. The outside buzzer should be a 12VDC device requiring less than 200ma to operate. A piezo electric buzzer works nicely if put in series with a 1000 ohm potentiometer (used for volume control). Mount the buzzer in a small box. Magnetic strips on the back of the box **MAY** work for securing it to the machine. Pin 4 on the printer connector supplies the +12VDC signal for the buzzer. Pin 1 is the control (on/off) line. Also refer to the references in the **CONNECTING THE PRINTER** section of this manual.

FAST SPEED ADJUSTMENT

From the MANUAL MODE of operation press the **OPTIONS** key until the service code is requested. Use the **NUMBER** keys and then **ENTER** to supply **MICROCUT** with the authorized service code. **MICROCUT** will now show various status screens to make selections from. Press the **OPTIONS** key until the display shows STATUS SCREEN 3 on the top line. Select the **FAST=** option (refer to MAKING CHOICES AT THE SELECTION SCREENS).

MICROCUT limits the maximum speed by selecting the smallest number from the following calculations:

1. (Table size divided by 6) + 1 (for possible roundoff error)--this prevents overdriving with consequent wear on smaller cutters.
2. Speed limitation imposed by shaft encoder gearing (see NOTE below).
3. 16 inches per second (software imposed maximum limit).

MICROCUT does not know the mechanical limitations of the machine it is installed on. Spring loaded compensating nuts can sag at speed and cause a mechanical bind that could trip off the thermal circuit breaker in **MICROCUT**. A loose pin in the Acme nut of the backgauge carriage could cause similar problems. Some cutters may develop excessive vibration if the speed is turned too high. Use caution whenever increasing the backgauge drive speed.

Use the **NUMBER** or **ARROW** keys to display the desired fast speed for the backgauge. Press the **YES** key when the proper value is shown. A good rule of thumb is to divide the length of the table by 7. This would be the "ideal" fast speed value. A 42 inch table would travel at 42/7 or 6 inches per second. This same 42 inch table is about 1050 mm long and 1050/7 would be 150 mm per second. Naturally, different jobs have different "ideal" speeds. If most of your moves are short, reduce the fast speed value to allow **MICROCUT** to approach more closely to each stop point in fast speed without disrupting the stock. If most of your moves are long, use a higher fast speed value to avoid having to wait.

NOTE: **MICROCUT** must read the movement of the backgauge from the shaft encoder which was mounted during **INSTALLATION**. This encoder turns at different rates on different installations. **MICROCUT** can only read this reliably up to 32 full turns per second (64KHz signal frequency). **MICROCUT** automatically calculates the maximum allowable speed from the encoder gearing (and leadscrew pitch) and does not allow a faster speed to appear on the display. If the encoder was properly installed the maximum speed may range from 8 to 16 inches per second (200 to 400 mm per second). The actual speed that **MICROCUT** will try to achieve is related to the chosen high speed, the chosen acceleration rate, and the distance the backgauge is moved. The actual speed that the backgauge does obtain may be ultimately limited by the size of the backgauge drive motor and the gearing between the motor and leadscrew as well as the leadscrew pitch.

If **MICROCUT** accelerates past the maximum encoder speed it is possible that a position error will occur. If this happens **MICROCUT** will disable operation and display an error message describing what has happened (refer to the SERVICE MANUAL--PROMPT ERROR MESSAGE LIST). Reducing either the speed or the acceleration rate is recommended.

ADVICE: Production is not increased by having the backgauge get into position 5 seconds before the cut is made instead of 1/10th of a second. Higher speeds cause additional wear and tear on the machinery. Set the speeds so that the backgauge just barely beats the operator and no faster to insure longest life and best performance from the equipment.

SLOW SPEED ADJUSTMENT

From the MANUAL MODE of operation press the **OPTIONS** key until the service code is requested. Use the **NUMBER** keys and then **ENTER** to supply **MICROCUT** with the authorized service code. **MICROCUT** will now show various status screens to make selections from. Press the **OPTIONS** key until the display shows STATUS SCREEN 3 on the top line. Select the **SLOW=** option (refer to MAKING CHOICES AT THE SELECTION SCREENS).

Use the **NUMBER** or **ARROW** keys to display the desired slow speed for the backgauge. Press the **YES** key when the proper value is shown.

NOTE: Slow speed occurs **ONLY** in manual drive directly **AFTER** manual reverse drive has been used (see MANUAL DRIVE OPERATION). The value of the slow speed drive is up to the preference of the operator and must be determined by experimentation. As the operator becomes more familiar with the response of the **MICROCUT** drive system he/she may find that the gauge can be stopped just behind the desired position, and a low slow speed is good. If the gauge is more apt to stop well behind the desired position, then a higher slow speed will help. The acceleration rate (see next page) may be used to tune this to an individual operator's requirements as well.

NOTE: Even with a recirculating ball type leadscrew some backlash can occur. The stop position should always be approached from the rear of the machine to insure that the backlash is removed so that the gauge is accurately positioned. Positioning must be done slowly to allow response to location and prevent the gauge from coasting off of the leadscrew thread. If positioning is done manually (with the handwheel) be careful not to turn the handwheel backwards when removing your hand. This will cause an error between the display and the true position.

MANUAL DRIVE ACCELERATION

From the **MANUAL MODE** of operation press the **OPTIONS** key until the service code is requested. Use the **NUMBER** keys and then **ENTER** to supply **MICROCUT** with the authorized service code. **MICROCUT** will now show various status screens to make selections from. Press the **OPTIONS** key until the display shows **STATUS SCREEN 4** on the top line. Select the **MANUAL ACCEL=** option (refer to **MAKING CHOICES AT THE SELECTION SCREENS**).

Use the **NUMBER**, **UP** or **DOWN ARROW** keys to adjust the value shown on the display. When the desired value is shown press the **YES** key. **MICROCUT** will return to the previous screen.

If **MANUAL DRIVE** is used to make long moves with little accuracy, set the acceleration to a high value. If small moves are used to position the backgauge controllably, select a lower value. It is recommended that 50% be tried initially, with adjustments made as experience is gained.

Acceleration can be compared to how far down a gas pedal is pushed when starting a car from a stop. The harder you push, the faster you obtain speed. At 99%, **MICROCUT** will "floor" the backgauge accelerator and the maximum speed (see previous sections) will be reached rapidly. At 1%, the pedal is barely pushed and speed will be reached very slowly. Lower acceleration gives more control, but more delay in reaching speed. Therefore a lower value is recommended for **MANUAL DRIVE** and a higher value for **AUTOMATIC**.

AUTOMATIC DRIVE ACCELERATION

From the MANUAL MODE of operation press the OPTIONS key until the service code is requested. Use the NUMBER keys and then ENTER to supply MICRO CUT with the authorized service code. MICRO CUT will now show various status screens to make selections from. Press the OPTIONS key until the display shows STATUS SCREEN 4 on the top line. Select the AUTO ACCEL= option (refer to MAKING CHOICES AT THE SELECTION SCREENS).

Use the NUMBER, UP or DOWN ARROW keys to adjust the value shown on the display. When the desired value is shown press the YES key. MICRO CUT will return to the previous screen.

The acceleration is usually set quite high (99%) for AUTOMATIC OPERATION since MICRO CUT controls accuracy automatically. For some jobs involving small moves, a lower acceleration rate may prevent stock shifting which would result in much more work preparing for each cut.

Acceleration can be compared to how far down a gas pedal is pushed when starting a car from a stop. The harder you push, the faster you obtain speed. At 99%, MICRO CUT will "floor" the backgauge accelerator and the maximum speed (see previous sections) will be reached rapidly. At 1%, the pedal is barely pushed and speed will be reached very slowly. Lower acceleration gives more control, but more delay in reaching speed. Therefore a lower value is recommended for MANUAL DRIVE and a higher value for AUTOMATIC.

ADVICE: PRODUCTION IS NOT INCREASED BY HAVING THE BACKGAUGE GET INTO POSITION 5 SECONDS BEFORE THE CUT IS MADE INSTEAD OF 1/10TH OF A SECOND. HIGHER SPEEDS CAUSE ADDITIONAL WEAR AND TEAR ON THE MACHINERY. SET THE SPEEDS SO THAT THE BACKGAUGE JUST BARELY BEATS THE OPERATOR AND NO FASTER TO INSURE LONGEST LIFE AND BEST PERFORMANCE FROM THE EQUIPMENT.

BACKLASH SETTING

From the **MANUAL MODE** of operation press the **OPTIONS** key until the service code is requested. Use the **NUMBER** keys and then **ENTER** to supply **MICROCUT** with the authorized service code. **MICROCUT** will now show various status screens to make selections from. Press the **OPTIONS** key until the display shows **STATUS SCREEN 5** on the top line. Select the **BACKLASH** option (refer to **MAKING CHOICES AT THE SELECTION SCREENS**).

Use the **NUMBER** and **UNITS** keys to display the desired distance **MICROCUT** should go behind the target before moving forward to position the gauge (backlash value). Press the **YES** key to enter this value. **MICROCUT** will automatically return to the previous screen.

NOTE: The term backlash refers to the distance the leadscrew will move **BEFORE** the backgauge starts to move when the direction of rotation is changed. Even re-circulating ball type leadscrews and spring loaded systems may have a certain amount of backlash. The stop position should always be approached from the rear of the machine to insure that the backlash is removed. Measure the backlash by watching how far the **MICROCUT** display moves when you reverse the handwheel rotation **BUT BEFORE** the resistance of the backgauge movement resumes. Double this value to be safe and enter as the backlash value. This measurement should be taken where the most frequent cutting is done (generally between 10 and 25 inches--250 to 625 mm) since the leadscrew will be most worn in this region.

If 0 backlash is entered **MICROCUT** will position the gauge going backwards the same way it does coming forward.

CLAMP DOWN DRIVE OPTION

From the MANUAL MODE of operation press the OPTIONS key until the service code is requested. Use the NUMBER keys and then ENTER to supply MICRO CUT with the authorized service code. MICRO CUT will now show various status screens to make selections from. Press the OPTIONS key until the display shows STATUS SCREEN 5 on the top line. Select the CLAMP DRIVE option (refer to MAKING CHOICES AT THE SELECTION SCREENS).

Press the YES key to allow the backgauge to be driven backwards in SEMI-AUTOMATIC and AUTOMATIC while the clamp is in the lowered position. Press the NO key to disable SEMI-AUTOMATIC and AUTOMATIC drive whenever the clamp is lowered.

NOTE: NO should be pressed if the handwheel protrudes in front of the cutter in a way which could cause it to snag the operator during stock handling operations or other work the operator may be performing before releasing the clamp.

If YES is pressed, then if the target is behind the current position the gauge will be moved back AND positioned forward into the next target UNLESS the clamp has been raised. If the clamp is raised during drive and then lowered during approach to target the warning buzzer will operate and the CLAMP DOWN message will appear on the lower line of the display.

ADJUSTING SETTLING TOLERANCES

From the **MANUAL MODE** of operation press the **OPTIONS** key until the service code is requested. Use the **NUMBER** keys and then **ENTER** to supply **MICROCUT** with the authorized service code. **MICROCUT** will now show various status screens to make selections from. Press the **OPTIONS** key until the display shows **STATUS SCREEN 6** on the top line. Select the **SETTLING @** option (refer to **MAKING CHOICES AT THE SELECTION SCREENS**).

Use the **NUMBER** and **UNITS** keys to display the settling accuracy which is desired. Press the **YES** key to enter the value. **MICROCUT** will automatically return to the previous screen.

NOTE: After the tolerance has been reached **MICROCUT** will try for a certain number of drive cycles to obtain 0 error regardless of the settling value. A larger settling value will increase the drive pulse size at the final positioning routines and will speed up the settling process. If the settling accuracy is set too small the **CUT READY INDICATOR** may have a tendency to flicker on and off when **MICROCUT** reaches the stop position in **AUTOMATIC MODE**. This flickering will not damage **MICROCUT** but it does tend to be annoying to the operator. Refer to **INSTALLATION NOTES** in the **INSTALLATION MANUAL** for tips on improving the settling capability of **MICROCUT**. A value of .002 or .003 inches (.005 to .008 cm) is recommended for an initial value. Increase or decrease this according to performance.

AUTO CORRECTION ON/OFF

From the **MANUAL MODE** of operation press the **OPTIONS** key until the service code is requested. Use the **NUMBER** keys and then **ENTER** to supply **MICROCUT** with the authorized service code. **MICROCUT** will now show various status screens to make selections from. Press the **OPTIONS** key until the display shows **STATUS SCREEN 6** on the top line. Select the **CORRECTING** option (refer to **MAKING CHOICES AT THE SELECTION SCREENS**).

Press the **YES** key if **MICROCUT** should reposition the gauge if it is moved beyond the settling tolerance (see previous page). Press the **NO** key if the gauge should not correct.

NOTE: The gauge could be moved as stock is jogged against it. To maintain accuracy turn **CORRECTING ON**. If **MICROCUT** is used to roughly position stock which must be cut to "image" (or which is to be run through a die cutter later) it may be preferred that **CORRECTING** be turned **OFF**.

TRUE SIZE OPTIONS AT CUT READY

From the **MANUAL MODE** of operation press the **OPTIONS** key until the service code is requested. Use the **NUMBER** keys and then **ENTER** to supply **MICROCUT** with the authorized service code. **MICROCUT** will now show various status screens to make selections from. Press the **OPTIONS** key until the display shows **STATUS SCREEN 7** on the top line. Select the **TRUE SIZE** option (refer to **MAKING CHOICES AT THE SELECTION SCREENS**).

Press the **YES** key to allow **MICROCUT** to display the true position when **CUT READY** appears in **AUTOMATIC OPERATION**. Press the **NO** key to force **MICROCUT** to show the programmed stop value if **CUT READY** is displayed.

NOTE: Some operators may be distracted to see that the display may show 25.001 when they expected to position to 25.000. If this is too traumatic, turn true size **OFF**. The problem with this is that the operator does not have a chance to appreciate just how accurate **MICROCUT** really is. Remember when evaluating accuracy that an average human head hair is .004 inches thick (.1 mm). The draw of a sharp knife on a full load of stock will usually exceed .005 inches (.12 mm).

LAST DIGIT OFF OPTION

From the **MANUAL MODE** of operation press the **OPTIONS** key until the service code is requested. Use the **NUMBER** keys and then **ENTER** to supply **MICROCUT** with the authorized service code. **MICROCUT** will now show various status screens to make selections from. Press the **OPTIONS** key until the display shows **STATUS SCREEN 7** on the top line. Select the **FINAL DIGIT** option (refer to **MAKING CHOICES AT THE SELECTION SCREENS**).

Press the **YES** key to show the final digit. Press the **NO** key to blank it.

NOTE: **MICROCUT** will automatically adjust to final digit **ON** or **OFF** during keyboard entry and calculator operations. **MICROCUT** will position to the settling accuracy chosen (see **ADJUSTING SETTling TOLERANCES**) regardless of the final digit option.

SIDE LOADING OPTION

From the **MANUAL MODE** of operation press the **OPTIONS** key until the service code is requested. Use the **NUMBER** keys and then **ENTER** to supply **MICROCUT** with the authorized service code. **MICROCUT** will now show various status screens to make selections from. Press the **OPTIONS** key until the display shows **STATUS SCREEN 8** on the top line. Select the **SIDE LOAD** option (refer to **MAKING CHOICES AT THE SELECTION SCREENS**).

Press the **YES** key if you want the gauge to go to the maximum rear of the table at the end of each job sequence in **AUTOMATIC OPERATION**. Press the **NO** key if **MICROCUT** should sequence directly to the first stop value.

NOTE: Side load is offered for customers who load their stock from the rear side of the machine.

AUTO ADVANCE AFTER SIDE LOAD

From the **MANUAL MODE** of operation press the **OPTIONS** key until the service code is requested. Use the **NUMBER** keys and then **ENTER** to supply **MICROCUT** with the authorized service code. **MICROCUT** will now show various status screens to make selections from. Press the **OPTIONS** key until the display shows **STATUS SCREEN 7** on the top line. Select the **AUTO ADVANCE** option (refer to **MAKING CHOICES AT THE SELECTION SCREENS**).

Press the **YES** key if during **AUTOMATIC OPERATION MICROCUT** should advance the gauge to the first stop value after the stock load is complete without any operator request. Press the **NO** key if operator input should be required.

NOTE: **AUTO ADVANCE** can not be turned on unless **SIDE LOAD** is on (see previous page) **AND** **MICROCUT** was installed with a mechanical paddle sense and/or optical sense device (see **INSTALLATION MANUAL--OPTIONAL SIDE LOADING KIT**).

UNITS SELECTION

From the **MANUAL MODE** of operation press the **OPTIONS** key until the service code is requested. Use the **NUMBER** keys and then **ENTER** to supply **MICROCUT** with the authorized service code. **MICROCUT** will now show various status screens to make selections from. Press the **OPTIONS** key until the display shows **UNITS STATUS** on the top line. There are actually three different screens that share this title. Progress through these screens until the desired units are offered. Along side each unit will be the word **ON** (units is available for use) or **OFF** (not available).

To change the status select the unit (refer to **MAKING CHOICES AT THE SELECTION SCREENS**). Press the **YES** key to enable the unit, press the **NO** key to disable the unit.

NOTE: If the unit is disabled, it will be skipped over when the **UNITS** key is pressed. **MICROCUT** will not accept all units disabled. If this occurs, **MICROCUT** will enable all units. Any jobs programmed will retain their existing units regardless of the status (on/off) selected at this stage.

DECIMAL POINT CONTROL

From the MANUAL MODE of operation press the OPTIONS key until the service code is requested. Use the NUMBER keys and then ENTER to supply MICRO CUT with the authorized service code. MICRO CUT will now show various status screens to make selections from. Press the OPTIONS key until the display shows UNITS STATUS on the top line. There are actually three different screens that share this title. Progress through to the third screen. The option of LEFT DECIMAL (ON or OFF) will appear in the third line.

If the status is OFF then whenever numbers are keyed in on the left side they will appear to the left of the decimal point (whole numbers only). In this case, the + key will be required to create a decimal or fractional number. If the status is ON then all numbers will roll in from the right side of the decimal point.

To change the status select the unit (refer to MAKING CHOICES AT THE SELECTION SCREENS). Press the YES or the NO key as desired.

**THIS IS THE END OF THE
CALIBRATION & TEST ROUTINE.
IF YOU WERE IN TEST AND
CALIBRATION ROUTINE THEN
MICRO CUT WILL AUTOMATICALLY
EXIT TO MANUAL MODE.
OTHERWISE CONTINUE TO THE
NEXT PAGE.**

POWER METER

From the **MANUAL MODE** of operation press the **OPTIONS** key until the service code is requested. Use the **NUMBER** keys and then **ENTER** to supply **MICROCUT** with the authorized service code. **MICROCUT** will now show various status screens to make selections from. Press the **OPTIONS** key until the display shows **MOTOR METERS** on the top line. Select the **POWER METER** option (refer to **MAKING CHOICES AT THE SELECTION SCREENS**).

If the power meter is turned on **MICROCUT** will display a number of stars in proportion to the power being required to drive the motor. If the *s fill more than half of the lower line it may be beneficial to oil the leadscrew or reduce the backgauge drive speed.

Press the **YES** key if you want *s to appear in the lower right corner of the display. Press the **NO** key to keep the *s off.

AMP METER

From the MANUAL MODE of operation press the OPTIONS key until the service code is requested. Use the NUMBER keys and then ENTER to supply MICRO CUT with the authorized service code. MICRO CUT will now show various status screens to make selections from. Press the OPTIONS key until the display shows MOTOR METERS on the top line. Select the AMP METER option (refer to MAKING CHOICES AT THE SELECTION SCREENS).

If the amp meter is turned on MICRO CUT will display a number of stars in proportion to the current being required to drive the motor. If the *s fill more than half of the lower line it may be beneficial to oil the leadscrew or reduce the backgauge drive speed.

Press the YES key if you want *s to appear in the lower right corner of the display. Press the NO key to keep the *s off.

NOTE: The amp meter circuitry is not installed in all units. If the circuitry is not installed then no *s will appear if this choice is selected.

**THIS IS THE END OF THE OPTIONS
ROUTINE. MANUAL MODE WILL BE
ENTERED BY PRESSING THE OPTIONS OR
#3 KEY.**

SELECTING A NEW JOB NUMBER

The **PROGRAM NEW JOB** routine is used to program a series of stop points into **MICROCUT** so that it can operate in **AUTOMATIC MODE**. These stops (and pushes) can proceed without limitations of direction or motion--they can go backward or forward or stay in the same place. **PROGRAM MODE** is entered from the **MANUAL MODE** (press the **MANUAL** key).

Press the **PROGRAM** key. Select the new job option from the prompt. The next prompt asks if the job number selection should be done automatically or if the operator wants to assign a number. **AUTO JOB SELECT** means the computer will select the lowest unused job number for you. **MANUAL SELECT** means you will assign a job #.

If several jobs are already programmed, it may take the computer some time to find the next lowest number, since it must look through the entire used memory area for each job individually. If this time is too long, it is advisable that some of the less used jobs be deleted.

If manual select is preferred, up to a six digit job number can be entered. If letters are to be used, first press a number key to initiate the column entry, then use the **UP** and **DOWN ARROWS** to step up and down the alphabet. Press any **NUMBER** key to start the next column or the **YES** key to enter the job. The **+**, **-**, and **/** keys can also be used for the job designation.

When the job number has been chosen, programming can begin. Refer to the following pages for programming methods.

KEYBOARD ENTRY OF NEW CUT VALUES

MICROCUT allows any job to be programmed using any combination of **KEY** entry, **CUT & MARK** entry, **LABEL MODE** entry, and **SHEET DIVIDE** entry, as well as a variety of options (insert, delete, stock push,...). Refer to other sections of this manual for information on alternative methods.

Stop positions can be programmed by pressing the **NUMBER** keys until the correct value shows on the lower line of the prompting display. The **CALCULATOR** keys can be used for entering additions, subtractions, and fractions. When the correct value is displayed press the **YES** key. If the next position is to be calculated from the last one, press the - (or +) key and use the **NUMBER** keys to show the amount to move on the lower right side of the display. Press the **YES** key to enter this.

CORRECTING OR REVIEWING CUT LOCATIONS:

LAST key -- backs up the **CUT #**, allows reprogramming if desired.

YES (ENTER) key -- Enters the cut value shown in the display.

CLEAR (NO) key -- clears the lower line of the display.

OPTION key -- allows pushes, loads, cuts to be added or deleted, other methods, etc.

KNIFE STROKE -- Enters the current position as the cut value.

When you are finished programming the job press the **AUTOMATIC** key. **MICROCUT** will end the job and move the backgauge to the first cut position.

CUT & MARK ENTRY OF NEW CUT VALUES

MICROCUT allows any job to be programmed using any combination of **KEY** entry, **CUT & MARK** entry, **LABEL MODE** entry, and **SHEET DIVIDE** entry, as well as a variety of options (insert, delete, stock push, jog/load). Refer to other sections of this manual for information on alternate methods.

The **FORWARD**, **REVERSE**, and **MOVE** (with #s) keys as well as the handwheel can be used to position the backgauge (see **MANUAL** and **SEMI AUTOMATIC DRIVE** sections). Stop positions will be programmed when the **KNIFE** is operated.

CORRECTING OR REVIEWING CUT LOCATIONS:

LAST key -- backs up the **CUT #**, allows reprogramming if desired.

YES (ENTER) key -- Enters the cut value shown in the display.

CLEAR (NO) key -- clears the lower line of the display.

OPTION key -- allows pushes, cuts to be added or deleted, etc.

KNIFE STROKE -- Enters the current position as the cut value.

When you are finished programming the job, press the **AUTOMATIC** key. **MICROCUT** will end the job and move the backgauge to the first cut position.

REVIEWING JOB CONTENTS WHILE PROGRAMMING

The **LAST** key will back you up through the programmed cuts. If the **LAST** key is pressed at the first position, **MICROCUT** will automatically back you around to the top of the job to allow further programming in **PROGRAM** mode.

The **YES** key will move you forward from one position to the next in memory. As the job is being reviewed, the cut number will change automatically to track the position in the job (this may also read **PUSH TO** or **JOG/LOAD** if appropriate).

Holding the **LAST** or **YES** keys will cause **MICROCUT** to strobe through the program. Refer to **TURNING KEY BEEPER ON/OFF** in the **OPTIONS OFFERED IN MICROCUT** section.

RECALLING AN OLD JOB

PROGRAM REVIEW can be entered from either **MANUAL** or **AUTOMATIC** operation. If **MICROCUT** is in **AUTOMATIC**, pressing the **PROGRAM** key will skip over the **JOB SELECT** routine and place you directly in review mode at the current **CUT** for that **JOB**. If **MICROCUT** is in **MANUAL** operation it will be necessary to select an old job before continuing.

Press the **PROGRAM** key. Selection of the **LAST JOB** option will pull up cut 1 of the last job which was used. Program review is entered directly.

If the **REVIEW JOB(S)** option is selected **MICROCUT** will display another screen. This next prompt asks for **SCROLLING JOBS** or **KEYING IN NUMBER**. If **SCROLLING JOBS** is selected **MICROCUT** will review all jobs in memory chronologically, showing each cut of each job. The **NO** key will advance to the next job, the **LAST** key will back up to the previous job, and the **YES** key will select the job for **JOB REVIEW**. If the strobe rate is too fast or too slow, the **UP ARROW** key will increase the display time while the **DOWN ARROW** will decrease the time.

If **KEYING IN NUMBER** is selected, **MICROCUT** will ask that a number be entered. Use the **NUMBER** keys to display the correct job number. If letters are to be used, first press a number key to initiate the column entry, then use the **UP** and **DOWN ARROWS** to step up and down the alphabet. Press any **NUMBER** key to start the next column. The **+**, **-**, and **/** keys can also be used for the job designation. Press the **YES** key to tell **MICROCUT** when this is the number you want. **MICROCUT** will search memory for that job. If the job does not exist **MICROCUT** will signal an error and return to the previous screen. If the job does exist **MICROCUT** will display the first programmed value and enter **JOB REVIEW**.

Refer to the following pages for **JOB REVIEW** methods.

CHANGING A CUT VALUE

This routine is used to change a stop value in the selected job while in PROGRAM MODE of operation.

OPTION 1:

This is available only when programming a new job. Use OPTION 3 for making revisions when reviewing a job. Use the **LAST** and/or **YES** keys to find the value to be changed (shown on the lower line). Press the **NO** key to clear the lower line of the display. Use the **NUMBER** keys to display the new value. Press the **YES** key to enter the value or the **OPTIONS** key to select a **PUSH** or **JOG/LOAD**. To see the original value press the **LAST** key to back out of that cut # and then press the **YES** key to enter forward to the original value.

OPTION 2:

This is available only when programming a new job. Use OPTION 3 for making revisions when reviewing a job. If **CUT & MARK** programming, press the **LAST** or **YES** keys to find the cut to be changed (shown on the lower line). Use the handwheel, the **ARROW** keys, or **NUMBER** and **MOVE** keys to reposition the backgauge. Do a **KNIFE STROKE**. The cut will change the value automatically.

OPTION 3:

Use the **LAST** and/or **YES** keys to display the value to be changed on the lower line. Tap the **OPTIONS** key until the display gives the choice of **CHANGE THIS CUT**. Select the choice.

- a. Use the **NUMBER** keys to enter the new value. Press **YES** to enter this as a cut or tap the **OPTIONS** key again to give the choice of **EJECT** or **JOG/LOAD** entry. Press the **LAST** or **PROGRAM** key if you decide you do not want to change the cut after all. To change a cut to an **EJECT** or **JOG/LOAD** simply press the **OPTIONS** key once and make your selection.
- b. Use the handwheel, the **ARROW** keys, or **NUMBER** and **MOVE** keys to reposition the backgauge. Do a **KNIFE STROKE**. The cut will change the value automatically.

ENTERING A STOCK PUSH

MICROCUT allows any job to be programmed using any combination of **KEY** entry, **CUT & MARK** entry, **LABEL MODE** entry, and **SHEET DIVIDE** entry, as well as a variety of options (insert, delete, stock push, jog/load). Refer to other sections of this manual for information on alternate methods.

A stock push is programmed to push the stock out from under the clamp or to move the backgauge to the rear of the table to allow a stock turn within the machine. If a position is programmed as a **PUSH**, **MICROCUT** will drive the backgauge to this position. **MICROCUT** will not wait for an advance command, but instead drive to the next position immediately.

Use the **NUMBER** keys to show the value for the push (or turnaround) in the display. Tap the **OPTION** key until the display asks if you want an **EJECT** or a **JOG/LOAD POINT**. Select the **EJECT** option (refer to **MAKING CHOICES AT THE SELECTION SCREENS**).

If the push (or turnaround) is to be a specific distance from the last entry, press the - (or +) key and then use the **NUMBER** keys to show the distance to move on the lower right side of the display. Then use the **OPTIONS** key as described above.

NOTE: **MICROCUT** has four different ways of performing a forward moving push. **MICROCUT** determines the method automatically:

1. Push is in front of the false paper clamp--**MICROCUT** will position the gauge to the false paper clamp value AND THEN reposition the gauge to the programmed push value before continuing to the next memory location value.
2. Push is to within one inch (25MM) of the false paper clamp--**MICROCUT** will position the gauge to within a few thousandths of the programmed push value before continuing to the next memory location value.
3. Push is to well behind the false paper clamp but only a few inches (less than 50MM) from the last position value--**MICROCUT** will drive the gauge in high speed and slow speed to insure that the eject goes slightly past the programmed value before continuing to the next memory location value.
4. Push is to well behind the false paper clamp and more than a few inches (more than 50MM) from the last position value--**MICROCUT** will drive the gauge in high speed to just before the programmed value and then continue to the next memory location value without bothering with slow speed.

ENTERING A JOG/LOAD POINT

MICROCUT allows any job to be programmed using any combination of **KEY** entry, **CUT & MARK** entry, **LABEL MODE** entry, and **SHEET DIVIDE** entry, as well as a variety of options (insert, delete, stock push, jog/load). Refer to other sections of this manual for information on alternate methods.

A jog/load is programmed to stop the backgauge at a position but not advance the cut number. If a position is programmed as a **JOG/LOAD MICROCUT** will drive the backgauge to this value and display **TAP MOVE TO CONTINUE**. The cut # area of the display will read **JOG/LOAD**. The cut number will not be incremented. Press the **MOVE** key to continue to the next location.

Use the **NUMBER** keys to show the value for the jog/load point in the display. If the **JOG/LOAD** point is to be a specific distance from the last entry, press the - (or +) key and then use the **NUMBER** keys to show the distance to move on the lower right side of the display. Tap the **OPTION** key until the display offers **JOG/LOAD**. Select the **JOG/LOAD** option (refer to **MAKING CHOICES AT THE SELECTION SCREENS**). The location is programmed automatically.

INSERTING A CUT

MICROCUT allows any job to be programmed using any combination of **KEY** entry, **CUT & MARK** entry, **LABEL MODE** entry, and **SHEET DIVIDE** entry, as well as a variety of options (insert, delete, stock push, jog/load). Refer to other sections of this manual for information on alternate methods.

Use the **YES** or **LAST** key to find the place that you wish to insert a position **IN FRONT OF** (see **REVIEWING THE JOB CONTENTS**). Press the **OPTIONS** key until the display offers **INSERT CUT**. Select the **INSERT CUT** option (refer to **MAKING CHOICES AT THE SELECTION SCREENS**). Use either the **KEYBOARD** or **CUT & MARK** methods of programming to enter the additional value. Refer to **ENTERING A STOCK PUSH** or **JOG/LOAD POINTS** on previous pages if this is to be an eject (or turnaround) or a jog/load point.

DELETING A CUT

Use the **YES** or **LAST** key to find the value that you wish to delete. Press the **OPTIONS** key until the display offers **DELETE CUT**. Select the **DELETE CUT** option (refer to **MAKING CHOICES AT THE SELECTION SCREENS**). That entry has now been deleted and all following locations are automatically moved down one memory location to compensate.

PROGRAM/INSERT OF A LABEL JOB

MICROCUT allows any job to be programmed using any combination of **KEY** entry, **CUT & MARK** entry, **LABEL MODE** entry, and **SHEET DIVIDE** entry, as well as a variety of options (insert, delete, stock push, jog/load). Refer to other sections of this manual for information on alternate methods.

This routine enters a number of equally spaced stops. It can be used for labels or coupons.

In review mode where a **LABEL JOB** is placed in the middle of the job, the values will be placed in front of the last viewed cut on the screen (refer to **REVIEWING THE JOB CONTENTS**).

Tap the **OPTION** key until the display offers **LABEL MODE**. Select this option (refer to **MAKING CHOICES AT THE SELECTION SCREENS**).

The display will issue a number of questions to allow you to enter the starting value (if known), number of labels, label size, and trim (if a trim is needed). **MICROCUT** will calculate all of the required stops.

NOTE ON BACKTRIM: The first stop should be kept if the sheet has not been trimmed to size before starting the **LABEL JOB** sequence (answer **YES**). If the sheet has been through a four side trim to remove variances due to gripper adjustments, then you will probably not want to backtrim (answer **NO**). If the starting value is entered with the knife stroke the first cut **WILL** be saved and **MICROCUT** will not offer the backtrim option.

On a complex job it may not be a simple task to calculate the value of the first cut. If this is the case press the **NO** key when **MICROCUT** asks if the first cut is known. After all of the other information is completed, **MICROCUT** will figure the first cut value automatically. If the sheet is a complex label job containing additional cuts after this sequence, the first cut value calculated will not adjust for the extra cuts. Use the **LAY COMP** feature to correct for this on the first time through the job in **AUTOMATIC** mode.

NOTE: **MICROCUT** will allow entry of a sheet size up to twice the maximum size of the cutter so that a 2 label job with no backtrim can be done. However, if the first calculated stop is greater than the maximum rear limit **MICROCUT** will give you a **TOO FAR BACK** error message.

PROGRAM/INSERT OF A SHEET DIVIDE

MICROCUT allows any job to be programmed using any combination of **KEY** entry, **CUT & MARK** entry, **LABEL MODE** entry, and **SHEET DIVIDE** entry, as well as a variety of options (insert, delete, stock push, jog/load). Refer to other sections of this manual for information on alternate methods.

This routine is used **WHILE IN THE PROGRAMMING MODE** to divide a sheet into equal sizes. It is useful for spreading a size error equally when splitting an undersized sheet into logs.

If the **LAST** key is used to review the job and a **SHEET DIVIDE** is placed in the middle of the job, the values will be placed in front of the last viewed cut on the screen (refer to **REVIEWING THE JOB CONTENTS** on the next page).

Tap the **OPTION** key until the display offers **SHEET DIVIDE**. Select this option (refer to **MAKING CHOICES AT THE SELECTION SCREENS**).

The display will issue a series of questions to allow you to enter the starting value and the number of divides. **MICROCUT** will calculate all of the required stops.

NOTE ON BACKTRIM: The first stop should be kept if the sheet has not been trimmed to size before starting the **SHEET DIVIDE** sequence (answer **YES**). If the sheet has already been cut to size then you will probably not want to backtrim (answer **NO**). If the starting value is entered with the knife stroke the first cut **WILL** be saved and **MICROCUT** will not offer the backtrim option.

NOTE: **MICROCUT** will allow entry of a sheet size up to twice the maximum size of the cutter so that a divide by 2 with no backtrim can be done. However, if the first calculated stop is greater than the maximum rear limit **MICROCUT** will give you a **TOO FAR BACK** error message.

CHANGING A JOB NUMBER

This routine is used to change a job number. It is available only in the **PROGRAM** or **REVIEW** modes of operation.

Select the desired job to change (see **RECALLING AN OLD JOB**). Press the **OPTION** key until the display offers **CHANGE JOB NUMBER?** Select the **CHANGE JOB #** option. **MICROCUT** will ask you to enter a new number.

Use the **NUMBER** keys to display the correct job number. If letters are to be used, first press a number key to initiate the column entry, then use the **UP** and **DOWN ARROW** keys to step up and down the alphabet. Press any **NUMBER** key to start the next column. The **+**, **-**, and **/** keys can also be used for the job designation. Press the **YES** key to tell **MICROCUT** when this is the number you want. **MICROCUT** will search memory for that job. If the job already exists **MICROCUT** will signal an error and return to the previous screen. If the job does not already exist **MICROCUT** will change the old number to the new and return to **JOB REVIEW**.

Press the **LAST** or **OPTION** key if the job number is not to be changed.

DELETING A JOB

This routine is used to remove a no longer wanted job from memory. It is available only in the PROGRAM or REVIEW modes of operation.

Press the **OPTION** key until the display offers **DELETE THIS JOB?**. Press the **YES** key to remove the job from memory. Press the **NO**, **LAST**, or **OPTION** key if the job is not to be deleted.

NOTE: While **MICROCUT** contains 2000 memory locations to store jobs, if jobs are not erased as they become obsolete, memory will be filled and new jobs will not be able to be programmed.

Refer to **VIEWING JOB MEMORY USAGE** in **OPTIONS OFFERED IN MICROCUT** section.

AUTOMATIC OPERATION--GENERAL NOTES

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 is cycled, the **MOVE** key is pressed, or the location is reached (ejects and turn arounds).

Select the desired job number (or program a new one)--refer to the **TABLE OF CONTENTS** for sections dealing with programming and reviewing jobs. Make sure that the desired job and starting cut number are displayed in the third line of the prompting display.

Press the **AUTOMATIC** key. **MICROCUT** will position the backgauge at the programmed stop value.

If the current position display is in fractional readout it will convert to decimal until the position is reached. This is for visual affect to keep the fractions from "bumping" during drive. When the drive is stopped the fractional readout will reappear.

If the **CUT READY** indicator flickers the tolerances may be set too tightly (see the **OPTIONS IN THE MANUAL MODE** section of this manual).

The **LAST** key will back **MICROCUT** up to the previous stop.

The **MOVE** key, **YES** key, or the **KNIFE STROKE** will advance **MICROCUT** to the next stop.

The **OPTION** key allows program changes.

The **MANUAL** key exits **AUTOMATIC MODE**.

The **PROGRAM** key accesses **JOB REVIEW MODE**.

Tap or hold either the **YES** or the **LAST** key to view the job directly from **AUTOMATIC** mode. **MICROCUT** will go to the displayed position when you stop activating either of these keys.

To temporarily exit **AUTOMATIC MODE** press the **MANUAL** key. **MANUAL** and **SEMI-AUTOMATIC MODES** can be used without affecting the **JOB #** and **CUT #** in the prompt display. Press the **AUTOMATIC** key to go back to the **AUTOMATIC MODE** at the same place you exited.

CHANGING A CUT-EJECT-JOG/LOAD

This routine is used to change a programmed value in the selected job.

OPTION 1:

Press the **PROGRAM** key and modifications to the job can be performed in **JOB REVIEW** (refer to other sections of this manual).

OPTION 2:

Press the **OPTION** key until the display offers the choice **CHANGE THIS CUT**. Select this choice. **MICROCUT** will ask if this change is permanent (or for this lift only). Press the **YES** or the **NO** key.

Use the handwheel, the **ARROW** keys, or **NUMBER** and **MOVE** keys to reposition the backgauge. Do a **KNIFE STROKE** or press the **ENTER** key to make this a cut value. This will change the value of the cut at that particular location only. **MICROCUT** will sequence to the next memory location. Press the **OPTIONS** key to make this value an eject or a jog/load.

Press the **LAST**, **AUTOMATIC**, or the **MANUAL** key if you decide you do not want to change the cut after all.

ADJUSTING ALL FORWARD MOVING CUTS

This is used to adjust all FORWARD MOVING stop values in the current job. If it is done in the middle of a side of cuts it WILL NOT AFFECT cuts already made on that side. This is a useful feature if trims (gutters) were not laid out accurately before printing (adjustments can be made at the trim point and all labels will remain on size). It is also useful when compensating for gripper adjustments in cases where a four side trim out is not performed before cutting the printed sheet. There is no limit to the number of times this feature can be used on a job. **Every trim (gutter) could be different and the LABEL MODE of programming can still be used to assure equal sized labels.**

This feature can be accessed in AUTOMATIC mode ONLY. Tap or hold the OPTION key until the display offers the choice START LAY COMP. Select this choice. MICRO CUT will ask if this change is permanent (or for this lift only). Press the YES or the NO key.

Use the handwheel, the ARROW keys, or the NUMBER and MOVE keys to reposition the backgauge. Do a KNIFE STROKE or press the ENTER key. This will change the value of all FORWARD MOVING cuts (up to the END JOB) by the same amount.

Press the LAST, AUTOMATIC, or the MANUAL key if you decide you do not want to change the forward moving cuts after all.

INSERTING A CUT-EJECT-JOG/LOAD IN AUTOMATIC MODE

While in **AUTOMATIC** mode press the **OPTIONS** key until the display offers **INSERT CUT**. Select the **INSERT CUT** option (refer to **MAKING CHOICES AT THE SELECTION SCREENS**). Use either the **KEYBOARD** or **CUT & MARK** methods of programming to enter the additional value. Refer to **ENTERING A STOCK PUSH** or **JOG/LOAD POINTS** on previous pages if this is to be an eject (or turnaround) or a jog/load point.

DELETING A CUT IN AUTOMATIC MODE

OPTION 1:

While in **AUTOMATIC** mode and while the display shows the value that is to be deleted press the **OPTIONS** key until the display offers **DELETE CUT**. Select the **DELETE CUT** option (refer to **MAKING CHOICES AT THE SELECTION SCREENS**). That entry has now been deleted and all following locations are automatically moved down one memory space to compensate.

OPTION 2:

Press the **PROGRAM** key to enter **JOB REVIEW** mode. Use the **YES** or **LAST** key to locate the cut, push, or jog/load which is to be deleted. Press the **OPTIONS** key until the display offers **DELETE CUT**. Select the **DELETE CUT** option (refer to **MAKING CHOICES AT THE SELECTION SCREENS**). That entry has now been deleted and all following locations are automatically moved down one memory space to compensate. Press the **AUTOMATIC** key to return to **AUTOMATIC** operation without deleting the value.

ADDING A LABEL JOB IN AUTOMATIC MODE

This routine enters a number of equally spaced stops **WHILE PROGRAMMING A JOB**. If used in the **AUTOMATIC MODE** the cuts will be inserted into the job before the current cut number. It can be used for labels or coupons.

Tap the **OPTION** key until the display offers **LABEL MODE**. Select this option (refer to **MAKING CHOICES AT THE SELECTION SCREENS**).

The display will issue a number of questions to allow you to enter the starting value (if known), number of labels, label size, and trim (if a trim is needed). **MICROCUT** will calculate all of the required stops.

NOTE ON BACKTRIM: The first stop should be kept if the sheet has not been trimmed to size before starting the **LABEL JOB** sequence (answer **YES**). If the sheet has been through a four side trim to remove variances due to gripper adjustments, then you will probably not want to backtrim (answer **NO**). If the starting value is entered with the knife stroke the first cut **WILL** be saved and **MICROCUT** will not offer the backtrim option.

On a complex job it may not be a simple task to calculate the value of the first cut. If this is the case press the **NO** key when **MICROCUT** asks if the first cut is known. After all of the other information is completed, **MICROCUT** will figure the first cut value automatically. If the sheet is a complex label job containing additional cuts after this sequence, the first cut value calculated will not adjust for the extra cuts. Use the **LAY COMP** feature to correct for this on the first time through the job in **AUTOMATIC** mode.

NOTE: **MICROCUT** will allow entry of a sheet size up to twice the maximum size of the cutter so that a 2 label job with no backtrim can be done. However, if the first calculated stop is greater than the maximum rear limit **MICROCUT** will give you a **TOO FAR BACK** error message.

ADDING A SHEET DIVIDE IN AUTOMATIC MODE

This routine is used while in the **AUTOMATIC** mode to divide a sheet into equal sizes. It is useful for spreading a size error equally when splitting an undersized sheet into logs. The cuts will be inserted into the job before the current cut number.

Tap the **OPTION** key until the display offers **SHEET DIVIDE**. Select this option (refer to **MAKING CHOICES AT THE SELECTION SCREENS**).

The display will issue a series of questions to allow you to enter the starting value and the number of divides. **MICROCUT** will calculate all of the required stops.

NOTE ON BACKTRIM: The first stop should be kept if the sheet has not been trimmed to size before starting the **SHEET DIVIDE** sequence (answer **YES**). If the sheet has already been cut to size then you will probably not want to backtrim (answer **NO**). If the starting value is entered with the knife stroke the first cut **WILL** be saved and **MICROCUT** will not offer the backtrim option.

NOTE: **MICROCUT** will allow entry of a sheet size up to twice the maximum size of the cutter so that a divide by 2 with no backtrim can be done. However, if the first calculated stop is greater than the maximum rear limit **MICROCUT** will give you a **TOO FAR BACK** error message.

ATTACHING THE PRINTER

The printer can be attached (for job printouts) with or without the MICROFACTS option.

Almost any RS-232 serial input printer operating at a 1200 baud data transmission rate can be used with MICROCUT. Refer to the manufacturers handbook to determine how the printer cable needs to be made to connect to MICROCUT correctly. The lines from the D-9 connector on the back of the MICROCUT display console are:

<u>MICROCUT PIN #</u>	<u>PIN PURPOSE</u>
1	External buzzer control line
2	CTS
3	RTS (not used)
4	12VDC for external buzzer
5	TXD
6	Earth ground (shield)
7	RXD (not used)
8	Signal ground
9	Open

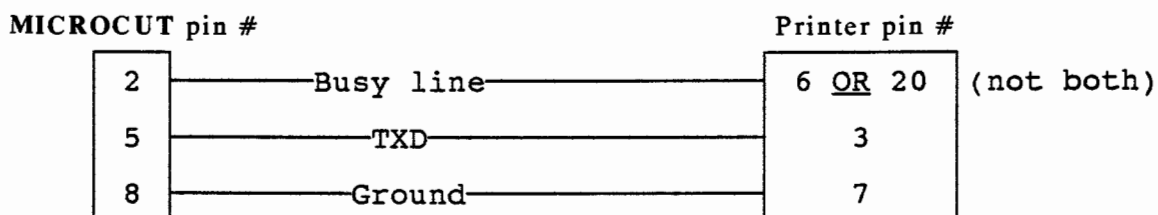
TXD is the data transmit line from MICROCUT. This should be connected to the printer receive (RXD) line. Early units require board mods for the external piezo electric buzzer.

DIFFERENT PRINTERS HAVE DIFFERENT DESIGNATIONS ON THEIR OUTPUT CONNECTOR, MAKING IT IMPOSSIBLE TO DESIGN A "UNIVERSAL" CABLE. BEFORE ATTACHING ANY PRINTER TO MICROCUT CHECK THE OWNER'S MANUAL FOR THAT PRINTER. THE INTERCONNECT CABLE MUST MATE TO MICROCUT CORRECTLY OR THE PRINTING OPERATION WILL NOT WORK. NOTE--GRAPHICS WEST MICRO SYSTEMS CAN FURNISH PRINTERS AND CABLES IF YOU DO NOT WISH TO ADAPT YOUR OWN. CONTACT YOUR LOCAL DEALER FOR DETAILS.

Only three lines are used plus the shield. A three conductor shielded cable works fine for making the cable. The shield should be connected at one end only to avoid ground loops. Connectors and cables are available at most electronic or computer stores. When the cable has been assembled connect it to the printer and to the upper D-9 connector on the back of the MICROCUT display console (the cable may not be end for end interchangeable).

MICROCUT supplies the printer with an 8 bit word without parity bit, cross talk off (XON/XOFF disabled), and a line feed. To insure proper operation refer to the PRINTER OWNER'S MANUAL (dip switch settings).

SAMPLE CABLE CONNECTIONS FOR MANY PRINTERS (see Printer Owner's Manual)
This works for many (but not all) printers.



TIPS ON PROGRAMMING

This manual has been written with the hopes of helping the operator look up information. The following sections give ideas which may help an advanced operator perform yet more successfully with the MICROCUT control system.

When programming STOCK LOADS to load stock before cutting, place these at the beginning of the job rather than the end. This will bypass the END OF THIS JOB waiting time after you have pressed the MOVE key. The STOCK LOAD could be programmed BEFORE programming cuts or inserted AFTER the job programming is completed. A small PUSH after the stock load may be useful in some cases.

Use the PUSH feature to move the stock out of the machine for handling. This will keep your hands and arms away from the clamp and knife and reduce bending which can cause back strain and injury.

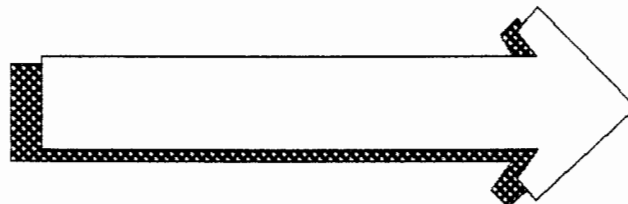
In some cases it may be useful to "PUSH" the gauge to the rear of the cutter while turning stock. The further back this point is programmed the more time you will have to turn the stock within the machine. If necessary a series of PUSHES could be performed moving the gauge back and forth a few inches at the rear of the table to increase the delay time.

The LAY COMP feature in MICROCUT (ADJUST ALL FORWARD MOVING CUTS) is unique. It allows an operator to program a label job with the convenience of the LABEL MODE regardless of the quality of the layout. Use the LABEL MODE to program the job, and on the first lift use the LAY COMP feature to adjust each trim out (at the beginning cut of the label). All label sizes will be maintained but each trim will be adjusted.

For jobs where the lay comp may want to be temporary (cutting "paint splotches" or solid colors into equal lengths--sometimes the stock requires an occasional adjustment for a single lift) press the NO key when MICROCUT displays IS THIS PERMANENT after the LAY COMP has been selected.

The YES, LAST, and OPTIONS keys "repeat" at about a one second interval. If the KEY BEEPER is on (see MANUAL OPTIONS) holding these keys in can create an easy way to review a job or options which are available.

The rate that jobs are reviewed in the JOB SCROLL mode can be adjusted with the UP and DOWN ARROW keys during the scrolling process. Adjust these rates for your best comfort level.



CONTINUE TO NEXT PAGE

On some jobs (labels in particular) an operator may make several cuts without handling the stock. In these cases the operator will find that any drive system makes him wait. **MICROCUT** has an optional additional control line package (see **INSTALLATION MANUAL**) which could be used to help. Wire the **BRAKE ENABLE** to a relay which controls power to an incandescent light bulb which can be mounted near the cutter. When the light bulb lights, **MICROCUT** is in position. This bulb can be seen more easily than the **CUT READY** indicator and can reduce operator fatigue. **NOTE: MICROCUT** will give an audible warning buzzer if the clamp is brought down before position is obtained. In some shops this may not be loud enough. In this case an external buzzer can be installed. Contact your local **MICROCUT** representative for assistance (refer to **ADJUSTING BEEPER VOLUME** in this manual).

Refer to the **INSTALLATION MANUAL** for **OPTIONAL AUXILIARY CONTROL LINES** to see other things which **MICROCUT** can do for you.

If several cuts need to be changed while in **AUTOMATIC OPERATION**, it may be easier to press the **PROGRAM** key and make the changes in **PROGRAM REVIEW**.

If your shop tracks jobs by customer orders, select your job number accordingly. If jobs are tracked sequentially, see if reference to the last used number for each job can be included on the job ticket. Then use the **CHANGE JOB NUMBER** feature to update the job number for easier referencing. Otherwise it will be necessary to keep a log book, or erase jobs as you go. For a log book jobs 1 to 99 may want to be reserved for common jobs or quick run jobs, jobs 100 to 199 might want to be saved for operator 1, 200 to 299 for operator 2, etc.

Slow forward speed during **MANUAL** drive can be forced by slightly lowering the clamp with the foot treadle.

Any job can be code protected so that unauthorized modifications can be prevented. If the operator access codes are on (see the **MICROFACTS MANUAL**) the enable code will be that of the logged in operator. Otherwise the enable code will be a default value of 2984. Enter the program (review or new) mode and press the **OPTIONS** key until the **CHANGE JOB NUMBER** appears. Select this choice and press the **OPTIONS** key. **MICROCUT** will ask if the job should be code protected. If **YES** is pressed, then the code for the presently logged in operator (or 2984) will be required before the **OPTIONS** key is recognized in the **PROGRAM** and **AUTOMATIC** modes of operation. If **NO** is pressed, the code will not be required. When the **OPTIONS** key is first pressed in **PROGRAM** or **AUTOMATIC** modes **MICROCUT** will request a code referenced from 00 to 12. 00 is requested if the job was saved when the operator access codes were off (or if they are off now). 01 to 12 represent the numbered lines which are displayed when the four digit operator access codes were entered (see the **MICROFACTS MANUAL**). Once the enable code is entered (in **PROGRAM** or **AUTOMATIC** modes), the **OPTIONS** key will be seen immediately until **MANUAL** mode is initiated.

The **OPTION** key works almost everywhere. Play with it to see if there are hidden features you have overlooked.

MEMORY ORGANIZATION

If your shop tracks jobs by customer orders, select your job number accordingly. If jobs are tracked sequentially, see if reference to the last used number for each job can be included on the job ticket. Then use the CHANGE JOB NUMBER feature to update the job number for easier referencing. Otherwise it will be necessary to keep a log book, or erase jobs as you go. For a log book jobs 1 to 99 may want to be reserved for common jobs or quick run jobs, jobs 100 to 199 might want to be saved for operator 1, 200 to 299 for operator 2, etc.

Job memory is stored in a device which has its own resident power supply (10 year Lithium battery backup). The lower area contains the specifics of the machine MICRO CUT is installed on (leadscrew pitch, table sizes, mechanical measurements, etc.). This is duplicated at the very top of the same memory device. The area in the middle is reserved for JOB PROGRAMS.

NOTE: The memory device has 8192 addresses. 192 addresses are used for machine values. This leaves 8000 addresses free for job memory. Every cut takes 4 addresses (one for type of cut--inch, fractional, cm, mm, sun, cut, eject, jog/load; one for 100's and 10's; one for 1's and .1's; and one for .01's and .001's). We can divide 8000 by 4 and get 2000 cut locations. Each job requires a start address (to allow the computer to find the job), 6 addresses for the job number, and an end address (so the computer knows when to return to the beginning of the job). This totals 8 addresses or two cut locations. Therefore MICRO CUT could contain one job of 1998 cuts, two jobs of 996 total cuts, three jobs of 664 total cuts, etc.

Notice that MICRO CUT stores cut values in true position (rather than shaft encoder counts). If MICRO CUT is moved from one machine to another the current job memory is still good as long as the ERASE MEMORY option is not selected in the CALIBRATION & TEST ROUTINE.

Memory usage can be viewed from the OPTIONS OFFERED IN MICRO CUT routine. Memory organization can be viewed from the TOOLKIT.

VARIATION OF BACKGAUGE SPEEDS

MICROCUT has provisions to adjust both the backgauge speed AND the acceleration (refer to these sections in the MANUAL OPTIONS portion of this manual). As a general rule of thumb, jobs with short moves (particularly label jobs) or fussy cutting (requiring perfect jogging of the stock) will do better with either lower speeds or lower acceleration rates. Four side trim jobs requiring long moves or PUSHES will do better with higher speeds and acceleration rates. Shops may have a variety of these jobs from day to day. MICROCUT has been designed to allow easy alteration to these values.

ADVICE: PRODUCTION IS NOT INCREASED BY HAVING THE BACKGAUGE GET INTO POSITION 5 SECONDS BEFORE THE CUT IS MADE INSTEAD OF 1/10TH OF A SECOND. HIGHER SPEEDS CAUSE ADDITIONAL WEAR AND TEAR ON THE MACHINERY. SET THE SPEEDS SO THAT THE BACKGAUGE JUST BARELY BEATS THE OPERATOR AND NO FASTER TO INSURE LONGEST LIFE AND BEST PERFORMANCE FROM THE EQUIPMENT.

At higher speeds MICROCUT has a harder time determining exactly where it is at any given time (try looking out the side of a car at speed to gauge when to slow down for a stop sign based upon sign posts). Higher speeds require that MICROCUT slow down sooner. If MICROCUT speed is decreased it may take a while for MICROCUT to adjust to the lower speed. MICROCUT will self adjust and no operator modification is required.

MICROCUT is fully self adapting. However, the tighter the settling tolerances the more finely MICROCUT must adapt. This requires that speed be reduced earlier and approach to a target be performed more gradually. Tolerances of .002 to .005 inches (.05 to .12 mm) are generally fine for any paper cutter. Some cutters can accept even tighter tolerances. Refer to the SETTLING section in the MANUAL OPTIONS section of this manual for further information. MICROCUT will attempt to position with 0 error regardless of the settling tolerance value. If the tolerances are tight, it just takes longer to insure that the requirements are met.

DETERMINING THE SOFTWARE VERSIONS

MICROCUT contains four different computer systems. One of these resides on the vacuum fluorescent display board manufactured as a complete assembly by another company (IEE). This computer's software is "constant" and is not coded. The other three computers are specially designed by Graphics West Micro Systems and are coded with software versions to facilitate updates and error tracking. To determine the software versions in your MICROCUT make sure power is turned OFF. Turn the power back ON. Select the desired language for operator use. The display will read COPYRIGHT GRAPHICS WEST MICRO SYSTEMS. Immediately press and hold the MANUAL key. The software versions for the three computers will appear in the screen. These will stay there until the MANUAL key is released. MICROCUT will then continue through the START UP ROUTINE in normal fashion.

The software versions for the DRIVE and DISPLAY represent the last date that modifications were made (month/day/year). The format of the COUNT ETC software line is ABCDEFGH where--

- A = The actual count software version label 1
- B = The actual count software version label 2
- C = The actual count software version label 3
- D = Country of manufacture (A is American--USA)
- E = Y if optical paddle software is enabled (N if not)
- F = Y if side loading software is enabled (N if not)
- G = Y if drive component thermal sense software is enabled (N if not)
- H = Y if auto forward drive in CALIBRATION & TEST (front limit required) software is enabled (N if not)

MISCELLANEOUS METHODS

To erase all memory enter the CALIBRATION & TEST ROUTINE and respond to the first few questions. After the memory has been erased, press the LAST key until you have backed up to the START UP option screen.

MICROCUT job memory is stored in real numbers (not specific to the machine it is installed on or the leadscrew pitch). **MICROCUT** can be removed from one machine, placed on another, run through the CALIBRATION & TEST ROUTINE (see other sections in this manual)--**BUT DO NOT ERASE THE JOB MEMORY**, and all jobs will be useable on the different machine.

SETTING UP MICRO CUT

This routine is used for new installations to tell MICRO CUT what type of machine it is on. This involves tests on the job memory, wiring, and switches. Position information is required for calibration and maximum drive limits. Completion of the CALIBRATION & TEST ROUTINE automatically resets the settling parameters which MICRO CUT uses to position the backgauge accurately. It is normal for the backgauge to rock back and forth around the target the first few times MICRO CUT tries to position the backgauge AFTER the CALIBRATION ROUTINE has been completed.

Refer to TURNING POWER ON--START UP in this manual BUT DO NOT PRESS THE AUTOMATIC KEY TO CALIBRATE. Return to this point in the manual when that request prompt is shown.

The display will read PRESS THE AUTOMATIC KEY TO CALIBRATE. Press the OPTION key and MICRO CUT will offer options for either DEMONSTRATION or CALIBRATE & TEST modes. Select the CALIBRATE & TEST option (refer to MAKING CHOICES AT THE SELECTION SCREEN).

MICRO CUT will ask a series of questions and perform a series of tests in order to calibrate to the machine it is now on. Refer to the following pages for assistance with various parts of the CALIBRATION & TEST ROUTINE.

The LAST key can be used to back up to any previous step in the CALIBRATE & TEST routine.

MICRO CUT will automatically enter the MANUAL operating mode at the end of CALIBRATE & TEST routine.

NOTE: In the event of a memory discrepancy, MICRO CUT will force the CALIBRATION & TEST ROUTINE automatically and perform the MEMORY TEST (see next page).

NOTE: If the CALIBRATION & TEST is followed to the first calibration point but not completed before power is interrupted, MICRO CUT will force the CALIBRATION & TEST ROUTINE at the next power on (unless DEMONSTRATION MODE is selected).

NOTE: DEMO mode can be used in CALIBRATION & TEST ROUTINE as well. This will do a fake check on the switches as well as fake drive of the backgauge. This may be useful to train a new installer prior to installation. Enter the CALIBRATE & TEST routine and when the display says TEST MEMORY? press the OPTIONS key. Press YES in response to the question DEMO MODE? The CALIBRATION & TEST ROUTINE will be the same as the following pages describe but the leadscrew pitch will not be calculated and the switch package options offered will not be recorded. Table parameters WILL be recorded making the DEMO CALIBRATION & TEST ROUTINE useful if only the machine sizes are to be changed.

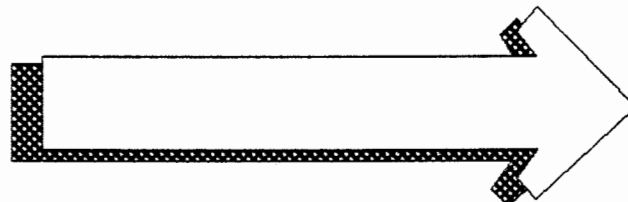
JOB MEMORY TEST ROUTINE

Enter the CALIBRATION & TEST ROUTINE. When the display shows TEST MEMORY? press the YES key. MICRO CUT will show the memory area being tested. If a memory error exists MICRO CUT will inform you. If not MICRO CUT will continue to the next step.

This is a non-destructive memory test. Any job memory that may be contained in MICRO CUT will still be valid.

Use the LAST key to return to the START UP options screen.

NOTE: If MICRO CUT defaults to the CALIBRATION & TEST ROUTINE due to a memory discrepancy the MEMORY TEST will be performed automatically. This can be by passed by selecting the CALIBRATION & TEST ROUTINE in the start up options screen.



CONTINUE TO NEXT PAGE

JOB MEMORY ERASE ROUTINE

Enter the CALIBRATION & TEST ROUTINE. Follow through previous procedures until the display shows SAVE MEMORY? Press the YES key to continue WITHOUT erasing the job memory. Press the NO key to remove the job memory. The display will show ERASE JOBS? Press the NO key to continue WITHOUT erasing the job memory. Press the YES key to erase all of the job memory. Note that two different keys must be pressed in order to delete the job memory.

IF THIS IS A NEW INSTALLATION ERASE THE MEMORY !!!!!!!

If the MICROFACTS management system is enabled, after the MEMORY ERASE option the display will show ERASE MANAGEMENT MEMORY? Press YES to erase the memory, NO to save it. The MANAGEMENT code must be entered to erase the MANAGEMENT memory.

IF THIS IS A NEW INSTALLATION ERASE THE MEMORY !!!!!!!



CONTINUE TO NEXT PAGE

SENSING SWITCH CHECKS

Enter the CALIBRATION & TEST ROUTINE. Follow through previous procedures until the display shows SIDE LOADING KIT (see INSTALLATION MANUAL). Follow the prompts and give responses with the YES and NO keys until the display shows SELECT UNITS. Select the units you wish to perform the calibration in. The display will ask if the motor turns ratio is within specification (the motor should turn between 3 and 6 full turns when the backgauge is moved 1 inch/2.5 cm/25 mm/1 sun). Verify that this is correct by having someone turn the handwheel to move the gauge the proper distance while the motor pulley is watched. Adjust (or change) the pulley if necessary. Press the YES key when the turns ratio is verified.

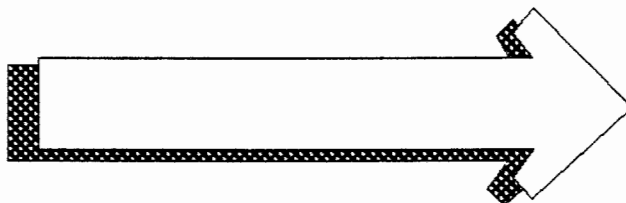
MICROCUT will ask a series of questions concerning mounting and position of various sensing switches (refer to the INSTALLATION MANUAL for questions about any of these devices). Use the YES and NO keys to respond.

NOTE: If there are any wiring or adjustment errors, MICROCUT will advise you accordingly. Check to be sure that the switch is positioned and wired correctly and that all connections (screws and plug in cables) are secure and tight.

- Mechanical side load sense switch--conducts when away from table.
- Optical side load sense--conducts to enable drive (side load area is clear).
- Clamp sense switch--conducts to enable drive (clamp full up).
- Cut sense switch--conducts when knife is full up.
- Rear limit (position) switch--conducts for full reverse drive.
- Front limit switch (optional)--conducts for full forward drive.

IF AN ERROR EXISTS:

Remove the extension cable from the back of the MICROCUT display console. Refer to the wiring section in the INSTALLATION MANUAL for pin numbers for the particular switch in concern. Use an ohm meter to check across those pins on the cable connector while the switch is operated (WITHOUT EXPOSING THE COMPUTER SYSTEM TO THE HIGH VOLTAGES SOMETIMES GENERATED BY AN OHM METER--since the cable is disconnected). This will allow a full check of the switch and cable set. If an error is detected here, check again at the fan out cable. Then check directly at the switch.



CONTINUE TO NEXT PAGE

MOTOR DRIVE/DIRECTION TEST

Enter the CALIBRATION & TEST ROUTINE. Follow through previous procedures until the display shows IS THE BACKGAUGE AT LEAST 10 INCHES (OR CM, MM, SUN) FROM THE MAX REAR? Use the handwheel to make sure this is so. Press the YES key to continue.

MICROCUT will ask you to use the UP ARROW key to check the backgauge drive direction. BOTH the UP and DOWN ARROW keys will work. Only the UP ARROW will allow MICROCUT to simultaneously test the encoder direction (position and counting). Make sure that the backgauge travels in the correct direction. Answer YES or NO as is appropriate.

If the drive direction is wrong it will be necessary to reverse the wires at the motor--TURN THE POWER OFF AND DISCONNECT THE POWER LINE BEFORE DOING THIS. MICROCUT will automatically adjust for whichever direction the encoder is turning.

If an error message occurs here of NO MOTION SEEN press the MANUAL key, turn the handwheel, and check for position change in the top line of the display. The shaft encoder gives 2000 pulses per revolution. The display should reflect this value as the handwheel is turned. If not check to see that the encoder is mechanically AND electrically connected. Check the lines carefully. Refer to the SERVICE MANUAL--SHAFT ENCODER.

When everything checks out, MICROCUT will drive the backgauge to the rear of the cutter to begin the calibration procedure (see next page).

NOTE: When either the UP or DOWN ARROW keys are hit MICROCUT will reset the major settling parameters to assume that it is operating on a machine with no coast, inertia, or friction. If the CALIBRATION ROUTINE is followed to this point, it is expected that MICROCUT will overshoot the target on the next few positioning attempts, although the computer will not be satisfied until the target is actually achieved.



CONTINUE TO NEXT PAGE

ENTERING CALIBRATION POINTS

Enter the CALIBRATION & TEST ROUTINE. Follow through previous procedures until the display shows CALIBRATING--PLEASE WAIT. MICRO CUT will move the backgauge to the rear of the cutter in slow speed and then request entry of a rear reference position.

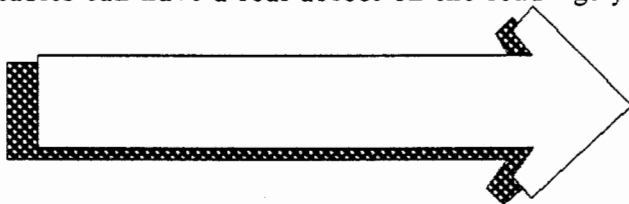
MICROCUT USES THE REFERENCE POSITIONS TO CALCULATE THE LEADSCREW PITCH AND CALIBRATION VALUES. THESE POSITIONS MUST BE AS ACCURATE AS POSSIBLE OR MICRO CUT WILL NOT BE ABLE TO POSITION THE BACKGAUGE ACCURATELY. MICRO CUT REQUIRES THAT THESE VALUES BE WHOLE NUMBERS. USE THE HANDWHEEL TO POSITION THE GAUGE ACCURATELY BEFORE ENTERING THE VALUE.

Turn the handwheel until the backgauge is at a exact unit value (inch, cm, mm, or sun). Use the NUMBER keys to display the position of the backgauge. Press the YES key to tell MICRO CUT where the backgauge is positioned.

If MICRO CUT is equipped with AUTO DRIVE software (see DETERMINING THE SOFTWARE VERSIONS) it will move the backgauge to the front limit switch automatically. If not it will be necessary to move the backgauge by pressing the DOWN ARROW key until the gauge is within 10 inches (25 cm, 250 mm, or 8 sun) of the knife. Press the DOWN ARROW key being careful not to drive the backgauge into the clamp. When the key is released the display will read IS THE BACKGAUGE LESS THAN 10 INCHES (or 25 cm or 250 mm or 8 sun) FROM THE KNIFE? Press YES if it is. If not press the NO key and MICRO CUT will return you to the forward drive routine.

When in the forward position, turn the handwheel until the backgauge is at an exact unit value. Use the NUMBER keys to display the position of the backgauge. Press the YES key to tell MICRO CUT where the backgauge is positioned. MICRO CUT will spend a few seconds calculating the leadscrew pitch, switch location(s), and preset value. These values are automatically saved.

NOTE: Final (absolute) calibration can be performed later. It is more important that the backgauge DISPLACEMENT between the rear reference and the front reference be precise rather than the actual positions exact. These calibration points allow MICRO CUT to calculate the leadscrew pitch. If the displacement is not accurate MICRO CUT will not be able to calculate the leadscrew pitch properly. If MICRO CUT can not do this, an accumulating position error will occur as the backgauge is moved up or down the cutter. If possible, reference the positions to the handwheel or leadscrew pulley (this lets you read more accurately in the same way that a dial gauge assists a machinist reading a pair of calipers). If a tape band or periscope must be used keep in mind that backlash, tape band stretch, and non-level (or warped) tables can have a real affect on the readings you take.



CONTINUE TO NEXT PAGE

ENTERING MACHINE SIZES

Enter the CALIBRATION & TEST ROUTINE. Follow through previous procedures until the display shows FURTHEST POSITION BACK IS. Use the NUMBER keys to display this value (the UNITS key can be used to change entry units if desired). Press the YES key to enter the value. MICRO CUT will ask for the FALSE CLAMP WIDTH (see GLOSSARY and MANUAL OPTIONS) and the MOST FORWARD CUT. Again use the NUMBER keys and YES. MICRO CUT will display the table values that have been entered. Press the YES key if they are correct (this will let you continue) or the NO or LAST key to re-enter the values.

NOTE: MICRO CUT will not allow entry of a MOST FORWARD CUT that is larger than the FALSE CLAMP WIDTH.



CONTINUE TO NEXT PAGE

FINISHING THE CALIBRATION & TEST ROUTINE

Enter the CALIBRATION & TEST ROUTINE. Follow through previous procedures until the display shows IS THE FALSE PAPER CLAMP (SOLE PLATE) ATTACHED TO THE CLAMP (see GLOSSARY and MANUAL OPTIONS).

MICROCUT will ask questions (in procession) as described in the OPTIONS OFFERED IN **MICROCUT** section of this manual. Refer to these pages for help and suggested initial values. **SOME OF THE OPTIONS WILL BE SKIPPED OVER** (calibrate gauge, knife change, shift change, time change, print job data, job memory usage, and table sizes). Answer all questions that do appear.

When **MICROCUT** has all of the operating information required, it will flow into **MANUAL OPERATION** and is ready to use.

The **LAST** key can be used throughout this procedure to back up to the previous screens.

DEMONSTRATION MODE OF OPERATION

MICROCUT has a built in **DEMONSTRATION MODE** to allow it to be used (in a limited capacity) while it is not attached to the machine. This is useful for training new operators as well as showing the unit to people away from the machine. **DEMONSTRATION MODE** can also be used while **MICROCUT** is attached to the cutter. It will not affect any of the spacer parameters. If **MICROCUT** is not installed on the cutter, plug the power cable into the back of the **MICROCUT** display console.

This cable also contains the motor connection. Make sure that the ends of the wires of this cable are adequately covered (wire nuts or electrical tape) so that no contact with the wires **OR BETWEEN** the wires can occur. **Make sure that the power selector switch (accessible from the back side of the console) is in the OFF position.**

It is not necessary to attach any other cables. Plug the power line into a wall outlet.

Locate the ON/OFF switch on the rear of the **DISPLAY CONSOLE** and toggle it. Select the language you would like to use (refer to **MAKING CHOICES AT THE SELECTION SCREEN**). **MICROCUT** will display a copyright message and then perform a test on machine specifications and job memory. The next prompt will read **ARE ALL GUARDS IN PLACE?**

NOTE: If this is a **MICROFACTS** unit with access codes and time clock enabled, it will be necessary to confirm (or correct) the time and enter your access code before continuing (refer to the **MICROFACTS MANUAL**).

When the display reads **ARE ALL THE GUARDS IN PLACE?**, press the **YES** key. The display will read **HAS DAILY LUBRICATION BEEN PERFORMED?** Press the **YES** key. The display will read **IS EVERYONE CLEAR OF THE MACHINE?** Press the **YES** key. The display will read **PRESS THE AUTOMATIC KEY TO CALIBRATE.** Press the **OPTION** key and **MICROCUT** will offer options for either **DEMONSTRATION** or **CALIBRATION & TEST ROUTINE** modes. Select the **DEMONSTRATION MODE** (refer to **MAKING CHOICES AT THE SELECTION SCREENS**).

MICROCUT will enter the **DEMONSTRATION MODE**. The keys on the display console can be used to operate **MICROCUT**. Refer to the appropriate sections of this manual for operation.

NOTE: **DEMO MODE** can also be used for the **CALIBRATION & TEST ROUTINE** to train an installer **BEFORE** the installation. Refer to that section of this manual.

USE OF ORIGINAL EQUIPMENT CONTROLS

MICROCUT uses its own drive motor. To insure that this does not conflict with the original equipment drive sometimes it is necessary to remove drive belts or fuses (for electric backgauge brakes) or add switches (to activate drive clutches). **ANY ALTERATIONS TO THE PAPER CUTTER TO ACCOMMODATE MICRO CUT INVOLVE THE BACKGAUGE DRIVE ONLY. NO ALTERATION TO ANY OTHER PART OF THE MACHINE IS ALLOWED. THE ORIGINAL EQUIPMENT LIMIT SWITCHES ARE NOT TO BE USED WHEN INSTALLING MICRO CUT. THIS SHOULD MAKE RETURNING TO THE ORIGINAL CONTROLS FAIRLY STRAIGHT FORWARD. IN SOME CASES THE ORIGINAL MOTOR MAY HAVE TO BE RE-MOUNTED.**

Follow the instructions written below by the installer to convert the machine back to its original equipment drive:

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

SQUARING THE BACKGAUGE

Squaring should be performed three ways. These checks must be done in proper order to insure correct square. **DO NOT perform step 2 before step 1. DO NOT perform step 3 before step 2.**

The backgauge must be secure to the table or squaring can not be performed. Problems with the gibbs and carriage can cause the gauge to be loose. If this is the case consult a trained service person.

1. The sidegauges must be square to the knife (bring the knife to the bottom position, release the clamp, and check the knife against the side gauges with a good machinist's square). If it is not square, refer to the PAPER CUTTER OWNER'S MANUAL for assistance. Recheck the square.
2. The backgauge must be square to the table surface. Place a good machinist's square on the table and against a finger of the backgauge fork. If the gauge is not square, refer to the PAPER CUTTER OWNER'S MANUAL for assistance. Test for square again on other backgauge fingers.

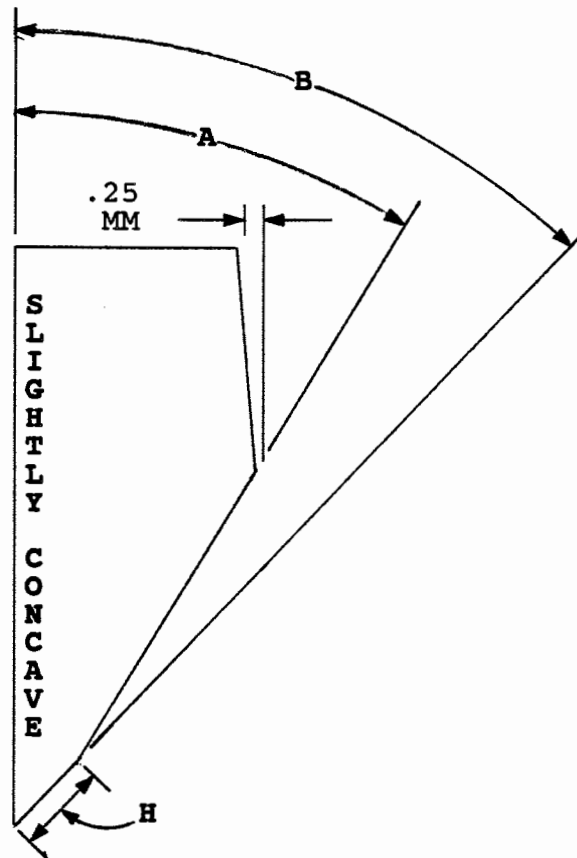
NOTE: Due to clamp pull on the stock, knife draw, knife angle, knife material, table level, stock type, and other factors, the backgauge may need to be tilted slightly in order to insure proper cutting. This angle may require a certain amount of experimentation. Consult a qualified technician for assistance or a more detailed evaluation of your particular cutting requirements.

3. The backgauge must be parallel to the knife. Four side trim a lift of the widest stock available which is at least half the height of the clamp opening. Move the backgauge so that the stock extends just beyond the clamp. Cut the stock. Swing the top half of the stock one half turn and jog the entire lift against the backgauge. Feel the right front corner of the lift with your fingers (you will be able to feel a few thousandths of an inch). If the top half of the lift is different than the bottom half, the gauge is not parallel. Refer to the PAPER CUTTER OWNER'S MANUAL for assistance. If the adjustment is secured by a bolt with a locking nut, it is generally recommended that you only snug the adjusting bolt (do not overtighten this bolt--the backgauge can be warped if this is too tight). Move the backgauge a few feet up and down the table to make sure it has settled into "true" position. Test for parallel again.

KNIFE SHARPENING

Different materials require different cutting techniques. Knife sharpening angles and clamp pressures will vary. Some experimentation may be required to find the best way to cut your material with minimum error. The following tries to cover the most commonly cut materials. Angles A and B are in degrees, measurement H is in mm, and pressure is in Kilograms. The pressures are for a lift of stock 3 inches in height and 35 inches in width. Reduce pressure for less height or width. Increase pressure for greater height or width. An * is used where Swedish steel is preferred. An ! is used for materials requiring the false paper clamp.

The knife must be thinner at the top than it is at the bottom (knife relief clearance). The back of the knife should be slightly concave so that if a straight edge were held top to bottom a small amount of light could shine through at the middle. The edge of the knife (H in the drawing below) must be flat (not concave or convex AT ALL). Cutting problems may occur otherwise. Refer to the blade diagram. The knife bolt holes should be countersunk.



KNIFE SHARPENING DATA STARTS ON NEXT PAGE

<u>MATERIAL</u>	<u>NOTES</u>	<u>A</u>	<u>B</u>	<u>H</u>	<u>PRESSURE</u>
Acetate sheets	*!	25			2500-3000
Aluminum sheets	*!	19			200 up
Aluminum sheets--coupled	*	19	22	3.5	1000 up
Asbestos	*!	19	23	3.5	3000-4000
Astralon transparent sheets	*!	24			2000-2500
Bible paper	!	22			2500
Blotting paper	!	19			1500-2000
Bristol board	*	21	23	3.5	1500
Carbon paper	!	19			200
Caoutchouc--soft	!	17			150 up
Caoutchouc--raw	!	17			150 up
Caoutchouc vulcanized	*!	22			1500 up
Cellophane	*!	22	24	3.5	2000-3000
Cellucotton	!	19			1500
Celluloid	*!	22			2000
Cellulose acetate	*!	24			3000
Cellulose acetate sheets	*!	25			2500
Cellulose glass	*!	26			2500-3000
Cellulose hydrate sheets	*!	24			2500
Chromolux	*	22	24	3.5	2000
Coated paper	*	22	24	3.5	2500
Confections board	*!	22			2500
Copying paper	!	19			3000-4000
Cork	!	19			1000
Detail paper	*	24			3000
Double waxed paper	*!	22	24	3.5	2500
Emery cloth	*!	19			150 up
Felt	*!	19			1000
Felt board	!	22			1500-2000
Felt paper	!	22			1500-2000
Finnish board, coupled	*!	19	22	3.5	2000
Foil paper	*	22	26	3.5	3000
Glass paper	*!	22			2000
Glassine	*	24			3
Grey board	!	22			2500
Gummed papers	*	22	24	3.5	2500
Hand pressed board	*!	22			2500
Index board	*	22			2500
Lead sheets	*!	19			150
Leatherboard	*!	22	24	3.5	2000
Letter paper		22			2000-2500
Linoleum	!	22			1800
Manila board	*	24			3000
Multiple board	*	22	24	3.5	2000
NCR paper, chemical paper		19			200
Packing board	*!	22			2500
Packing material	*!	22			2000-2500
Parchment paper	*!	22	24	3.5	2500
"Pelure" paper	!	19			3000
Photographic papers	*	24			2000-2500
Plywood	*!	19	22	3.5	1000
Polyethylene sheets	*!	25			2500

<u>MATERIAL</u>	<u>NOTES</u>	<u>A</u>	<u>B</u>	<u>H</u>	<u>PRESSURE</u>
Postcards	*	22			2500
Presspahn	*!	24			2500
Presspahn for transformers	*!	24			2500
Printing paper, normal		22			2000
PVC--hard	*!	22	24	3.5	2500
PVC--plates for floors	*!	19	22	3.5	2000-2500
PVC--soft	*!	22			2000-2500
Safety papers (bank notes)	*	22			2500
Skins	*!	23			2000-3000
Straw board, duplex, card	*!	24			2500
Synthetic fiber paper	*!	26			2500
Tag paper	*	22	24	3.5	3000
Tin sheets	*	19			200 up
Tissue paper	!	19			2000
Velour paper	!	19			1500
Very hard board	*!	25			3000
Wood mixture, board--soft	*!	22			2500
Zinc sheets	*!	19			200 up

* = *Swedish steel preferred*
 ! = *False paper clamp required*

PROMPTS IN MICRO CUT

Graphics West Micro Systems is pleased to offer **MICROCUT** in several different languages. If you require a currently unavailable language, please contact:

Graphics West Micro Systems
3000 Kerner Blvd.
San Rafael, CA USA 94901
Attention Engineering

An English prompting list can be supplied for translation to another language is desired. While space and character limitations may make certain languages difficult to translate, with your assistance, we will try to adjust the programming to give you options for most languages that may be required.

Prompts can be reviewed if the + key is pressed when the display reads **COPYRIGHT GRAPHICS WEST MICRO SYSTEMS** during the start up procedure. The **UP** and **DOWN ARROWS** can then be used to stroll through the various prompts. The + key can be pressed to see the equivalent **ENGLISH** translation (the buzzer will be on and the English version will be displayed while the + key is held).

NOTE: MICRO CUT has room for up to five resident languages. Please contact us for further information on alternative language options.

**MICROCUT III
MICROFACTS MANUAL**

Graphics West Micro Systems
3000 Kerner Boulevard
San Rafael, California, USA 94901
Telephone: (415) 457-7500
FAX: (415) 457-1694
June 1990
Revision A3

THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION WHICH IS PROTECTED BY COPYRIGHT. ALL RIGHTS ARE RESERVED. NO PART OF THIS DOCUMENT MAY BE PHOTOCOPIED, REPRODUCED, OR TRANSLATED TO ANOTHER LANGUAGE WITHOUT THE PRIOR WRITTEN CONSENT OF GRAPHICS WEST MICRO SYSTEMS.

MICROCUT, MICROFACTS, AND CUTTERNET ARE REGISTERED TRADE MARKS OF GRAPHICS WEST MICRO SYSTEMS

FOREWORD

MICROFACTS is an option which can be purchased to allow real time evaluation of any **MICROCUT III** system. It is hoped that this will help prevent bottlenecks in the bindery and allow true performance and profitability to be realized. 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 our engineers at:

*Graphics West Micro Systems
3000 Kerner Blvd.
San Rafael, CA USA 94901*

*Phone 415-457-7500
FAX 415-457-1694*

We will be happy to investigate your needs and add features as possible.

TABLE OF CONTENTS

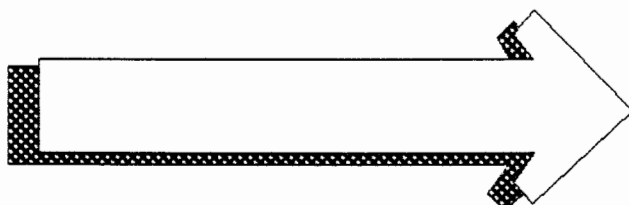
Overview	M-1
Operator access codes	M-3
Real time clock	M-4
Management system	M-5
Idle time	M-6
Changing operator access codes	M-7
Changing the management code	M-8
Exiting MICROFACTS options	M-9
Printing the time data	M-10
Attaching the printer	M-11

OVERVIEW--USING THE MICROFACTS MANAGEMENT SYSTEM

FOR MICRO CUT SYSTEMS EQUIPPED WITH MANAGEMENT SYSTEM ONLY!!!!

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. Up to 12 different 4 digit operator codes can be designated along with a single 4 digit management code. Data can then be dumped to a printer attached directly to **MICROCUT** or to a personal computer (PC) in the form of an ASCII text code which can then be adapted to whatever management evaluation system may be desired. Different elements of the **MICROFACTS** system can be enabled (or disabled) allowing the user to tailor it to specific needs. Options include:

1. Full system disabled. There is no need to verify time or sign in (with an operator access code) at power on.
2. Time clock only on. Time and date will show in the MANUAL OPTIONS routine. There is no need to verify time or sign in (with an operator access code) at power on.
3. Access codes only on. To gain entrance to **MICROCUT** at power on IT IS necessary to sign in with a legitimate operator access code.
4. Time clock and access codes on. Time and date will show in the MANUAL OPTIONS routine. There is no need to verify time at power on. To gain entrance to **MICROCUT** at power on IT IS necessary to sign in with a legitimate operator access code.
5. Time clock; access codes, and management system on. **OPERATOR CHANGE** (instead of **TIME CHANGE**) will show in the MANUAL OPTIONS routine. Time must be verified at power on. To gain entrance to **MICROCUT** at power on IT IS necessary to sign in with a legitimate operator access code. **MICROCUT** will store real time data for timely printouts. Idle time is off.
6. Time clock, access codes, management system, and idle time are on. **OPERATOR CHANGE** (instead of **TIME CHANGE**) will show in the MANUAL OPTIONS routine. Time must be verified at power on. To gain entrance to **MICROCUT** at power on IT IS necessary to sign in with a legitimate operator access code. **MICROCUT** will store real time data for timely printouts. An idle time is assigned from 1 to 99 minutes and if **MICROCUT** does not sense any use in that time period the operator will have to respond to a selection screen explaining why the idle time occurred. This will be reflected in the management printout.



CONTINUE TO NEXT PAGE

MICROFACTS data is accessible in either of three ways:

1. At power on after the language has been selected and while the display reads **COPYRIGHT GRAPHICS WEST MICRO SYSTEMS**, press the **OPTIONS** key before the display changes to **MEMORY TEST IN PROCESS**. It will be necessary to know the programmed management access code to continue. An auxiliary (constant) access code exists within the programming base of **MICROFACTS** in the event that the programmed access code is forgotten or lost. If this constant code is required please contact Graphics West Micro Systems directly (415-457-7500--United States). Choices offered after the access code is accepted include:
 - a) Turn operator access codes on (off)
 - b) Turn real time clock on (off)
 - c) Turn management system on (off)
 - d) Turn idle time on (off)
 - e) Adjust value of idle time
 - f) Alter access codes
 - g) Print time data
 - h) Exit
2. During normal operation in the **MANUAL** mode press the **OPTIONS** key until the **OPERATOR CHANGE** choice appears. Select **OPERATOR CHANGE** but do not attempt to enter an operator code when the screen asks for that. Instead press the **OPTIONS** key again and enter the management access code. Options are limited to **ONLY** printing time data when **MICROFACTS** is accessed in this manner.
3. The software supplied with the PC interface kit (optional--extra charge--see **INSTALLATION MANUAL**) allows hookup to **MICROCUT**. While **MICROCUT** is being used (the display console must be powered on) data can be polled from an IBM compatible personal computer. If this option is used it will take up to a minute to transfer all of the ASCII text form data from **MICROCUT**. This data is in .

NOTE: If **MICROFACTS** is enabled, then (if any management data exists) just after the operator code is entered a screen will appear for about three seconds which informs the operator as to the memory status of the **MICROFACTS** system. This will include the percent amount of **MICROFACTS** memory used as well as the date range of the stored data. It is recommended that any time that the used memory exceeds 80% the data be printed to avoid losing data or inconveniencing the operator during his shift.

OPERATOR ACCESS CODES

MICROCUT systems which contain **MICROFACTS** (denoted by the printing on the front of the display console) have a real time clock and additional memory installed. The operator access codes associated with **MICROFACTS** can be enabled or disabled by command.

Operator access codes are four digit numbers which (if enabled) must be used to gain access to **MICROCUT**. They can be used for tracking operator procedures (**MICROFACTS** on) or to control who can operate the machine. If they are enabled, it will be necessary for an operator to know a legitimate (programmed) four digit code to gain access to the system at power on. **MICROCUT** will display **ENTER OPERATOR CODE**. Use the **NUMBER** and **YES** keys to enter your assigned code.

At power on after the language has been selected and while the display reads **COPYRIGHT GRAPHICS WEST MICRO SYSTEMS**, press the **OPTIONS** key before the display changes to **MEMORY TEST IN PROCESS**. It will be necessary to know the programmed management access code to continue. An auxiliary (constant) access code exists within the programming base of **MICROFACTS** in the event that the programmed access code is forgotten or lost. If this constant code is required please contact Graphics West Micro Systems directly (415-457-7500--United States). The display will ask you to enter the management code. Use the **NUMBER** keys to show the proper management code on the display. Press the **YES** key. If the code is correct **MICROCUT** will enter the **MICROFACTS OPTIONS ROUTINE**. Press the **OPTIONS** key until the display shows the **ACCESS CODE** status. Select this option. Press the **YES** key to enable this feature. Press the **NO** key to disable it. **MICROCUT** will return to the original screen and display the new status.

NOTE: If the operator access codes are disabled, **MANAGEMENT** will automatically be disabled as well. If **MANAGEMENT** is disabled, print outs and idle time are disabled as well. Access to changing operator or management codes will also be locked out.

REAL TIME CLOCK

MICROCUT systems which contain **MICROFACTS** (denoted by the printing on the front of the display console) have a real time clock and additional memory installed. The clock can be turned on or off by command.

The real time clock keeps track of actual time and date. This can be used with or without **MICROFACTS** enabled. It is absolutely required in order to operate with **MICROFACTS**.

At power on after the language has been selected and while the display reads **COPYRIGHT GRAPHICS WEST MICRO SYSTEMS**, press the **OPTIONS** key before the display changes to **MEMORY TEST IN PROCESS**. It will be necessary to know the programmed management access code to continue. An auxiliary (constant) access code exists within the programming base of **MICROFACTS** in the event that the programmed access code is forgotten or lost. If this constant code is required please contact Graphics West Micro Systems directly (415-457-7500--United States). The display will ask you to enter the management code. Use the **NUMBER** keys to show the proper management code on the display. Press the **YES** key. If the code is correct **MICROCUT** will enter the **MICROFACTS OPTIONS ROUTINE**. Press the **OPTIONS** key until the display shows the **TIME CLOCK** status. Select this option. Press the **YES** key to enable this feature. Press the **NO** key to disable it. **MICROCUT** will return to the original screen and display the new status.

NOTE: If the real time clock is disabled, **MANAGEMENT** will automatically be disabled as well. If **MANAGEMENT** is disabled, print outs and idle time are disabled.

MANAGEMENT SYSTEM

MICROCUT systems which contain **MICROFACTS** (denoted by the printing on the front of the display console) have a real time clock and additional memory installed. The management system can be turned on or off by command.

The management system (**MICROFACTS**) tracks operator action (jobs, programming, general machine use) with respect to time and date. This information can then be printed out or loaded to a personal computer for evaluating costs.

At power on after the language is selected and while the display reads **COPYRIGHT GRAPHICS WEST MICRO SYSTEMS**, press the **OPTIONS** key before the display changes to **MEMORY TEST IN PROCESS**. It will be necessary to know the programmed management access code to continue. An auxiliary (constant) access code exists within the programming base of **MICROFACTS** in the event that the programmed access code is forgotten or lost. If this constant code is required please contact Graphics West Micro Systems directly (415-457-7500--United States). The display will ask you to enter the management code. Use the **NUMBER** keys to show the proper management code on the display. Press the **YES** key. If the code is correct **MICROCUT** will enter the **MICROFACTS OPTIONS ROUTINE**. Press the **OPTIONS** key until the display shows the **MANAGEMENT** status. Select this option. Press the **YES** key to enable this feature. Press the **NO** key to disable it. **MICROCUT** will return to the original screen and display the new status.

NOTE: For the management system to operate both the time clock and access codes must be enabled. If **BOTH** of these conditions are not met **MICROCUT** will advise you with a prompt display and branch you to either of the missing selections.

NOTE: If **MICROFACTS** is enabled, then just before the operator code input is requested a screen will appear for about three seconds which informs the operator as to the memory status of the **MICROFACTS** system. This will include the amount of **MICROFACTS** memory used as well as the date range of the stored data. It is recommended that any time that the used memory exceeds 80% the data be printed to avoid losing data or inconveniencing the operator during his shift.

IDLE TIME

MICROCUT systems which contain **MICROFACTS** (denoted by the printing on the front of the display console) have a real time clock and additional memory installed. The idle time feature can be turned on or off by command.

Idle time is the amount of time which **MICROCUT** will allow (with no keys hit and no knife operation) before it requires an explanation from the operator in regard to why nothing has been happening. Answers the operator may give include:

- Job approval
- Shift change--requires new operator to log in
- Wait for stock
- Knife change
- Lunch
- Break
- Cutter down
- Maintenance

At power on after the language has been selected and while the display reads **COPYRIGHT GRAPHICS WEST MICRO SYSTEMS**, press the **OPTIONS** key before the display changes to **MEMORY TEST IN PROCESS**. It will be necessary to know the programmed management access code to continue. An auxiliary (constant) access code exists within the programming base of **MICROFACTS** in the event that the programmed access code is forgotten or lost. If this constant code is required please contact Graphics West Micro Systems directly (415-457-7500--United States). The display will ask you to enter the management code. Use the **NUMBER** keys to show the proper management code on the display. Press the **YES** key. If the code is correct **MICROCUT** will enter the **MICROFACTS OPTIONS ROUTINE**. Press the **OPTIONS** key until the display shows the **IDLE TIME** status. Select this option. Press the **YES** key to enable this feature. Press the **NO** key to disable it. If **YES** is pressed, **MICROCUT** will ask for a value to set idle time to. This value can be anywhere from 1 to 99 minutes. Use the **NUMBER** keys to display the desired value. Press **YES** when the correct value is displayed. **MICROCUT** will return to the original screen and display the new status.

NOTE: The **MANAGEMENT** system must be on before idle time can be enabled. If this condition is not met **MICROCUT** will advise you with a prompt display and branch you to that specific selection.

CHANGING OPERATOR ACCESS CODES

MICROCUT systems which contain **MICROFACTS** (denoted by the printing on the front of the display console) have a real time clock and additional memory installed. The memory contains space for up to 12 different 4 digit operator codes.

At power on after the language has been selected and while the display reads **COPYRIGHT GRAPHICS WEST MICRO SYSTEMS**, press the **OPTIONS** key before the display changes to **MEMORY TEST IN PROCESS**. It will be necessary to know the programmed management access code to continue. An auxiliary (constant) access code exists within the programming base of **MICROFACTS** in the event that the programmed access code is forgotten or lost. If this constant code is required please contact Graphics West Micro Systems directly (415-457-7500--United States). The display will ask you to enter the management code. Use the **NUMBER** keys to show the proper management code on the display. Press the **YES** key. If the code is correct **MICROCUT** will enter the **MICROFACTS OPTIONS ROUTINE**. Press the **OPTIONS** key until the display shows the **CHANGE CODES** option. Select this option.

Use the **ARROW** keys to move up and down the screen to alter any of the twelve codes. When the pointer is at the position to be changed, use the **NUMBER** keys to display the desired value. If the pointer is at 6 and the **DOWN ARROW** is pressed the screen will roll over to choices 7 to 12. Press the **YES** key to record all changes. **MICROCUT** will display **ANYMORE CHANGES?** Press the **YES** key to make more changes. Press the **NO** key to return to the original selection screen.

NOTE: MICRO CUT will not allow any changes if the **OPERATOR CODES** are **OFF**.

CHANGING THE MANAGEMENT CODE

MICROCUT systems which contain **MICROFACTS** (denoted by the printing on the front of the display console) have a real time clock and additional memory installed. The memory contains space for up to 12 different 4 digit operator codes and one 4 digit management code. The management code does not have to be unique (it could be duplicated as one of the operator access codes).

At power on after the language has been selected and while the display reads **COPYRIGHT GRAPHICS WEST MICRO SYSTEMS**, press the **OPTIONS** key before the display changes to **MEMORY TEST IN PROCESS**. It will be necessary to know the programmed management access code to continue. An auxiliary (constant) access code exists within the programming base of **MICROFACTS** in the event that the programmed access code is forgotten or lost. If this constant code is required please contact Graphics West Micro Systems directly (415-457-7500--United States). The display will ask you to enter the management code. Use the **NUMBER** keys to show the proper management code on the display. Press the **YES** key. If the code is correct **MICROCUT** will enter the **MICROFACTS OPTIONS ROUTINE**. Press the **OPTIONS** key until the display shows the **CHANGE CODES** option. Select this option.

Press the **OPTIONS** key again. **MICROCUT** will display **MANAGEMENT CODE IS**. Use the **NUMBER** keys to display the desired management code. Press the **YES** key when the correct number is displayed.

NOTE: MICRO CUT will not allow any changes if the **OPERATOR CODES** are **OFF**.

EXITING THE MICROFACTS OPTIONS

Press the **OPTIONS** key until the display offers the **EXIT** option. Select this choice. **MICROCUT** will return to the start up procedure.

PRINTING THE TIME DATA

Time data can be printed either from the **MICROFACTS** option routine at startup or the **MANUAL OPTIONS** routine at the **MICROFACTS INFORMATION** screen.

1. **START UP**--At power on after the language has been selected and while the display reads **COPYRIGHT GRAPHICS WEST MICRO SYSTEMS**, press the **OPTIONS** key before the display changes to **MEMORY TEST IN PROCESS**. It will be necessary to know the programmed management access code to continue. An auxiliary (constant) access code exists within the programming base of **MICROFACTS** in the event that the programmed access code is forgotten or lost. If this constant code is required please contact Graphics West Micro Systems directly (415-457-7500--United States). The display will ask you to enter the management code. Use the **NUMBER** keys to show the proper management code on the display. Press the **YES** key. If the code is correct **MICROCUT** will enter the **MICROFACTS OPTIONS ROUTINE**. Press the **OPTIONS** key until the display shows the **PRINT DATA** option. Select this option. See below for the printing operation.
2. **MANUAL OPTIONS**--Make sure that **MICROCUT** is in the **MANUAL MODE**. If **MICROCUT** is not in the **MANUAL MODE** press the **MANUAL** key. Press the **OPTIONS** key until the display shows **MICROFACTS INFO** on the top line. Select the **OPERATOR CHANGE** option (refer to **MAKING CHOICES AT THE SELECTION SCREENS**). The display will show **ENTER OPERATOR CODE**. Press the **OPTIONS** key. **MICROCUT** will ask for your management code. Use the **NUMBER** keys to display the correct code. Use the **YES** key to enter it. The printing operation will commence (see next paragraph). It will be necessary to log in with the operator code after the printout is completed.

PRINTING OPERATION--**MICROCUT** will display **IS THE PRINTER AT THE TOP OF THE PAGE?** Check to make sure the paper is loaded properly. When ready press the **YES** key. During the printing **MICROCUT** will display **PRESS MANUAL TO STOP**. Press the **MANUAL** key only if an error occurs which requires that printing be stopped. Different printers contain different sized data buffers. Printing may not stop as soon as the **MANUAL** key is pressed. After the printout is completed, **MICROCUT** will display **WAS THE PRINTOUT OK?** If not press the **NO** key and return to the beginning. If it was **OK** press the **YES** key. **MICROCUT** will erase the data (making space for new data) and return you to the original selection screen.

PRINTING MANAGEMENT DATA ALLOWS MICRO CUT TO ERASE THIS DATA. IF YES IS PRESSED AT THE DISPLAY QUESTION "IS PRINTOUT OK?" DATA WILL BE ERASED MAKING ROOM FOR NEW DATA. IF DATA IS NOT ERASED, EVENTUALLY ALL MEMORY SPACE WILL BE FILLED. IF THIS OCCURS MICRO CUT WILL ISSUE AN ERROR MESSAGE AND REQUEST THAT DATA BE PRINTED.

ATTACHING THE PRINTER

The printer can be attached (for job printouts) with or without the MICROFACTS option.

Almost any RS-232 serial input printer operating at a 1200 baud data transmission rate can be used with MICROCUT. Refer to the manufacturers handbook to determine how the printer cable needs to be made to connect to MICROCUT correctly. The lines from the D-9 connector on the back of the MICROCUT display console are:

<u>MICROCUT PIN #</u>	<u>PIN PURPOSE</u>
1	External buzzer control line
2	CTS
3	RTS (not used)
4	12VDC for external buzzer
5	TXD
6	Earth ground (shield)
7	RXD (not used)
8	Signal ground
9	Open

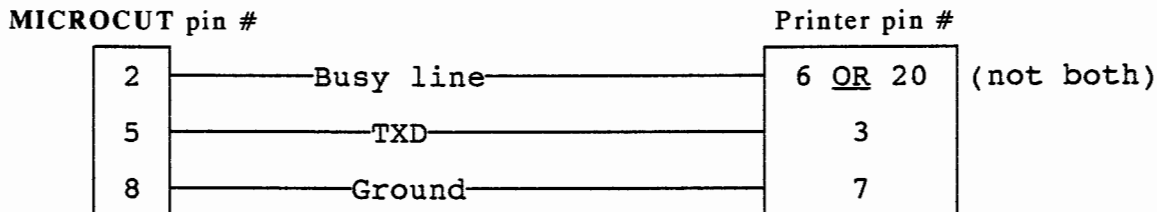
TXD is the data transmit line from MICROCUT. This should be connected to the printer receive (RXD) line. Early units require board mods for the external piezo electric buzzer.

DIFFERENT PRINTERS HAVE DIFFERENT DESIGNATIONS ON THEIR OUTPUT CONNECTOR, MAKING IT IMPOSSIBLE TO DESIGN A "UNIVERSAL" CABLE. BEFORE ATTACHING ANY PRINTER TO MICROCUT CHECK THE OWNER'S MANUAL FOR THAT PRINTER. THE INTERCONNECT CABLE MUST MATE TO MICROCUT CORRECTLY OR THE PRINTING OPERATION WILL NOT WORK. NOTE--GRAPHICS WEST MICRO SYSTEMS CAN FURNISH PRINTERS AND CABLES IF YOU DO NOT WISH TO ADAPT YOUR OWN. CONTACT YOUR LOCAL DEALER FOR DETAILS.

Only three lines are used plus the shield. A three conductor shielded cable works fine for making the cable. The shield should be connected at one end only to avoid ground loops. Connectors and cables are available at most electronic or computer stores. When the cable has been assembled connect it to the printer and to the upper D-9 connector on the back of the MICROCUT display console (the cable may not be end for end interchangeable).

MICROFACTS supplies the printer with an 8 bit word without parity bit, cross talk off (XON/XOFF disabled), and a line feed. To insure proper operation refer to the PRINTER OWNER'S MANUAL (dip switch settings).

SAMPLE CABLE CONNECTIONS FOR MANY PRINTERS (see Printer Owner's Manual)
This works for many (but not all) printers.



M I C R O C U T I I I
C U T T E R N E T P E R S O N A L
C O M P U T E R I N T E R F A C E
M A N U A L

Graphics West Micro Systems
3000 Kerner Boulevard
San Rafael, California, USA 94901
Telephone: (415) 457-7500
FAX: (415) 457-1694
April 1990
Revision A1

THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION WHICH IS PROTECTED BY COPYRIGHT. ALL RIGHTS ARE RESERVED. NO PART OF THIS DOCUMENT MAY BE PHOTOCOPIED, REPRODUCED, OR TRANSLATED TO ANOTHER LANGUAGE WITHOUT THE PRIOR WRITTEN CONSENT OF GRAPHICS WEST MICRO SYSTEMS.

MICROCUT, MICROFACTS, AND CUTTERNET ARE REGISTERED TRADE MARKS OF GRAPHICS WEST MICRO SYSTEMS

FOREWORD

CUTTERNET is an option which can be purchased to interface any **MICROCUT III** system to an IBM compatible personal computer. It is hoped that this will help prevent bottlenecks in the bindery and allow true performance and profitability to be realized. 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 our engineers at:

*Graphics West Micro Systems
3000 Kerner Blvd.
San Rafael, CA USA 94901*

*Phone 415-457-7500
FAX 415-457-1694*

We will be happy to investigate your needs and add features as possible. There may be some instances where **CUTTERNET** needs to be integrated into an existing management system. This manual contains information on the file and data organization for **CUTTERNET**. If interface is required, it may be necessary to contact the engineers for your existing management system for assistance.

NOTE: **CUTTERNET** can be used for either the OE **SABER** paper cutter electronic package or the **MICROCUT III** retrofit system. In shops with both, a single **CUTTERNET** package can used to "tie" the machines together.

TABLE OF CONTENTS

CUTTERNET PERSONAL COMPUTER INTERFACE	
Description	C-1
Requirements	C-2
INSTALLATION	
Software	C-3
Electrical hookup	C-4
Designating MICROCUT machine codes	C-5
MICROFACTS DATA	
Polling and storing the MICROFACTS data	C-6
Data filters and viewing/printing data	C-7
File format and alterations	C-8
Data format	C-9
MICROCUT JOBS	
Polling and storing the job data	C-10
Reviewing jobs on the computer	C-11
Working with jobs on the computer	C-12
Job file format	C-13
POSSIBLE PROBLEMS AND DIAGNOSIS	C-14

DESCRIPTION

The **CUTTERNET** personal computer interface system for **MICROCUT III** allows a user to operate any IBM compatible computer to communicate with up to 12 different **MICROCUT III** systems simultaneously. When installed, this will allow enhanced operation from both the standpoint of **MICROFACTS** operation and job programming/storage/adjustment.

MICROFACTS enhancements:

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 plant.

MICROCUT enhancements:

1. Jobs can be stored on floppy or hard disk at the computer dramatically increasing the job storage.
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. Jobs can be created from **STEP & REPEAT** machines or **CAMERAS** which have onboard programming systems. These can then be massaged into **MICROCUT** job file formats and directly loaded to the **MICROCUT** display console even before the operator receives the material to cut.

An individual code is assigned to each **MICROCUT** to be included on the **CUTTERNET** system. This allows communication to all of the **MICROCUTs** on a single output from the personal computer.

REQUIREMENTS

The personal computer interface needs the following in order to operate:

1. An IBM compatible computer with--
 - a. At least 640KB of on board memory.
 - b. A hard disk to hold the program and data.
 - c. DOS operating software.
 - d. A serial port (RS-232).
 - e. A printer if hard copies are desired.
 - f. A floppy disk drive for down loading the software (specify drive size).
2. A **MICROCUT** which has been stuffed with the Dallas DS1229 IC and extra ribbon cable to allow interface with the computer.
3. Interconnect cabling between the personal computer and any **MICROCUTs** that are to be monitored--see **ELECTRICAL HOOKUP**.
4. Signal line boosters (repeaters) if the lines need to go long distances--see **ELECTRICAL HOOKUP**.

INSTALLING THE SOFTWARE

Power up the personal computer and go to the DOS command line.

Insert the **MICROCUT PC INTERFACE** floppy disk into the drive on the computer.

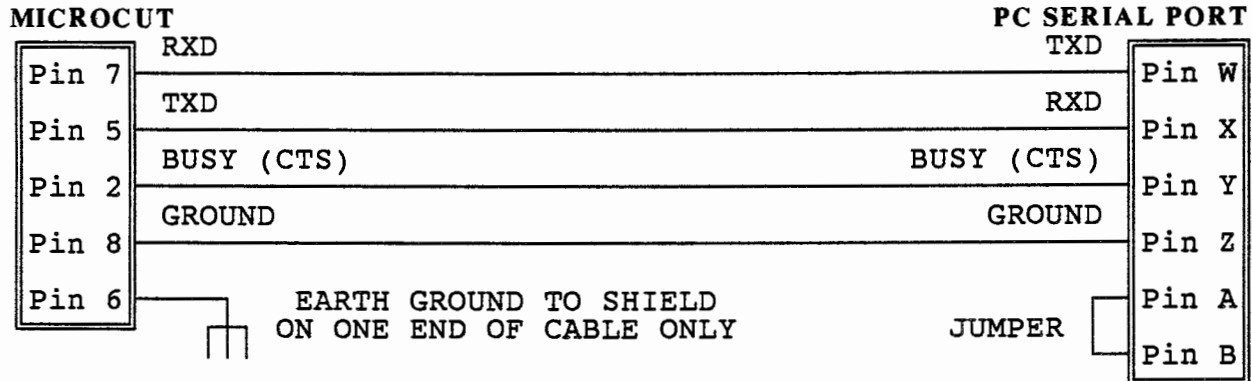
Type either **A:** or **B:** depending upon the drive configuration. Then press **ENTER**.

Type **INSTALL** and then press the **ENTER** key.

The program will be installed onto your hard disk under a directory titled **C:\CUTRNET**. A data file will also be created titled **C:\CUTRNET\MICRO.DAT** and will be used to store all of the data polled from **MICROFACTS**. A sub directory will be created titled **C:\CUTRNET\JOBS** to store all jobs created or copied (until deleted). These saved jobs will be stored as **C:\CUTRNET\JOBS\MACHINE CODE(or PC)\TITLE.JOB**.

ELECTRICAL HOOKUP

Four conductor 18 AWG shielded cable is recommended for connecting the PC to the MICROCUT(s). A MALE D-9 subminiature male connector is required at the MICROCUT. Consult the information below for the required connector at the PC serial port. The EARTH should be connected to the shield at one end of the cable only to avoid potential ground loops.



Computer serial ports come in two versions--9 pins and 25 pins. Refer to the following chart for the proper pin designations for your application:

PIN LETTER	9 PIN CONNECTOR NUMBER	25 PIN CONNECTOR NUMBER
W	3	2
X	2	3
Y	7	4
Z	5	7
A	4	6
B	6	20

The RS-232 drivers used in MICROCUT can run 9800 baud over a line distance of 100 feet (30 meters). If the cable must be longer than this it will be necessary to place a "repeater" in the line to boost signal strength or poor data reception may occur. These are available from most computer stores. Any brand that is compatible to 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).

DESIGNATING MICRO CUT MACHINE CODES

Turn power on to the personal computer and progress to the DOS command line.

Type **C:** to go to the hard disk drive (it is assumed that the interface software has been installed on the C: hard disk drive).

Type **CD CUTRNET** and press **ENTER** to select the interface software package. The display will show:

```
CUTTERNET PC Interface System
1: Microfacts data
2: User jobs
3: Set up
4: Exit

Press a number for your selection
```

Press the **NUMBER 3** key. The display will show the available languages offered with this package. Select the desired language by pressing the appropriate **NUMBER** key. The display will now show spaces which can be filled with **MICROCUT** access codes.

Use the **NUMBER** and **ENTER** keys to display all desired **MICROCUT** designation codes. To get rid of a code use the **ENTER** key to highlight the unwanted value and then press the **DELETE** key. There must be a unique code for every **MICROCUT** that is to be on line with the computer. Up to four numbers can be used per code. Press the **ESC** key to save the information and exit back to the previous menu.

These same codes also have to be entered at each **MICROCUT** unit. To do this, at power on, press the **OPTION** key after the language is selected and while **COPYRIGHT GRAPHICS WEST** is still shown on the **MICROCUT** display. Enter the management access code (3275 if one has not been selected). Press the **OPTIONS** key until **CHANGE CODES** can be selected. Make this selection and press the **OPTIONS** key two more times. The first time will give a screen that shows **MANAGEMENT CODE IS:** and the second will show **MICROCUT ACCESS CODE**. Use the **NUMBER** and **ENTER** keys to program the selected code for each unit.

POLLING AND SAVING DATA FROM MICROFACTS

Turn power on to the personal computer and progress to the DOS command line.

Type **C:** to go to the hard disk drive (it is assumed that the interface software has been installed on the C: hard disk drive).

Type **CD CUTRNET** and press **ENTER** to select the interface software package. The display will show:

```
                CUTTERNET PC Interface System

1:  Microfacts data
2:  User jobs
3:  Set up
4:  Exit

                Press a number for your selection
```

Press the **NUMBER 1** key. The display will show:

```
                CUTTERNET Microfacts Data Menu

1:  Get data from MICRO CUT/SABER
2:  Review data stored from MICRO CUT/SABER
3:  Utilities
4:  Previous menu

                Press a number for your selection
```

Press the **NUMBER 1** key. The display will show you the available machine codes to select from and their status (**MICROCUT** power on or off--note that data can not be polled if power is off). Use the **ARROW** keys to highlight the desired **MICROCUT**. Press the **ENTER** key. Data will be transferred automatically. When complete and all data is confirmed, the data will be converted and added to the end of C:\CUTRNET\MICRO.DAT file. It will also be deleted from the **MICROFACTS** memory at the **MICROCUT** display.

DATA FILTERS AND VIEWING/PRINTING DATA

Proceed to the Microfacts Data Menu screen (see page C6):

```
CUTTERNET Microfacts Data Menu
1:  Get data from MICROCUT/SABER
2:  Review data stored from MICROCUT/SABER
3:  Utilities
4:  Previous menu

      Press a number for your selection
```

Press the **NUMBER 2** key. The display will show filter options for sorting the time data. The filters are initially in the ALL DATA state. If data is viewed in this manner, then all data will be displayed.

NOTE: A help screen will appear at the bottom of the screen to advise you of the operating keys on the computer and how to use them.

Select the filters you wish to adjust. Follow the instructions on the screen.

VIEWING/PRINTING THE DATA

Data can be either viewed on the CRT screen (choice 6) or loaded to a printer (choice 8). In each case the option for "All data requested" or "Summary of data requested" will be offered. The second choice (summary only) will skip over the details and show the final tallies only.

If the **SCREEN** option is chosen, then the data will be loaded to the CRT screen. The **ENTER** key can be used to scroll down the data. The **ESC** key will exit you back to the Microfacts Data Menu screen.

If the **PRINTER** option is chosen, the display will ask if the printer is at the top of form. Check to make sure this is the case. Press **ENTER** when you are ready to print. Press any key to cancel the print job.

FILE FORMAT AND ALTERATIONS

The PC interface system stores MICROFACTS data in a single file labeled C:\CUTRNET\MICRO.DAT whenever data is polled FROM ANY MICRO CUT unit. This file can be copied, merged, or deleted as required. Copying may be desired before adjusting the data to operate with a different management system. Merging may be desired to maintain a complete copy of all operating data. Deleting may be desired to prevent doubling up information in the event that data is used with a different management system.

Proceed to the Microfacts Data Menu screen (see page C6):

```

          CUTTERNET Microfacts Data Menu

1:  Get data from MICRO CUT/SABER
2:  Review data stored from MICRO CUT/SABER
3:  Utilities
4:  Previous menu

          Press a number for your selection

```

Press the NUMBER 3 key. The display will show:

```

          CUTTERNET PC Interface Utilities Program

1:  Copy MICRO.DAT data to another file
2:  Merge MICRO.DAT data with another file
3:  Delete data in MICRO.DAT file
4:  Previous menu

          Press a number for your selection

```

Use the NUMBER keys to make your selection. If copying or merging is to be done, the display will give a selection of possible files to transfer data to. Make the appropriate selection (if NEW/OTHER file is selected it will be necessary to key in the file name). If delete is selected a prompt will ask ARE YOU SURE. Press the Y (yes) or N (no) keys at this point. If YES is selected the system will delete C:\CUTRNET\MICRO.BAK and rename the C:\CUTRNET\MICRO.DAT file to C:\CUTRNET\MICRO.BAK (back up file in case of a mistake).

DATA FORMAT

CUTTERNET condenses the real time data in its own unique manner. When stored in the computer (at C:\CUTRNET\MICRO.DAT), all data is converted to ASCII text data delimited by (") and (,) in between the fields. If **MICROFACTS** data is to be used with a different management system it will be necessary to convert the data to the required format for evaluation. Someone familiar with the software package of your management system will need to be consulted for assistance. The **MICROFACTS** data format is as follows:

General format as--

"Field 1", "Field 2", "Field 3", ... "Field 6", Carriage return

Next data line

...

End of data

Where--

Field 1 is the mode of operation--always has data
(2 characters in length)

- >> = 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
(6 characters in length)

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

POLLING AND STORING MICRO CUT JOB DATA

Turn power on to the personal computer and progress to the DOS command line.

Type **C:** to go to the hard disk drive (it is assumed that the interface software has been installed on the C: hard disk drive).

Type **CD CUTRNET** and press **ENTER** to select the interface software package. The display will show:

```
                CUTTERNET PC Interface System

1:  Microfacts data
2:  User jobs
3:  Set up
4:  Exit

                Press a number for your selection
```

Press the **NUMBER 2** key. The display will show:

```
                User Jobs Menu

1:  Poll jobs
2:  Review jobs on computer
3:  Program a new job
4:  Previous menu

                Press a number for your selection
```

Press the **NUMBER 1** key. The display will show you the available machine codes to select from and their status (**MICROCUT** power on or off--note that data can not be polled if power is off). Use the **ARROW** keys to highlight the desired **MICROCUT**. Press the **ENTER** key.

Data will be transferred automatically. When complete and all data is confirmed, the data will be saved at C:\CUTRNET\JOBS\TITLE.VERSION #. The memory in **MICROCUT** will not be affected.

REVIEWING JOBS ON THE COMPUTER

Proceed to the **MICROCUT JOBS MENU** screen (see previous page). The display will show:

```

      User Jobs Menu
1:  Poll jobs
2:  Review jobs on computer
3:  Program a new job
4:  Previous menu

      Press a number for your selection

```

Press the **NUMBER 2** key. The computer will display a list of available jobs (and directories of additional jobs) that are currently stored on the computer. The function of all active keys is displayed at the bottom of the screen. Select the desired job. Refer to the next page for revising the job or downloading it to **MICROCUT**.

WORKING WITH JOBS ON THE COMPUTER

Proceed to the **MICROCUT JOBS MENU** screen (see page C-10). The display will show:

```

                User Jobs Menu
1:  Poll jobs
2:  Review jobs on computer
3:  Program a new job
4:  Previous menu

                Press a number for your selection
```

Press the **NUMBER 3** key. The display will show the active keys and their function at the bottom of the screen. Note the options available in the right column. The **O (OPTIONS)** key will allow you to select options from the right column.

Comments can be placed at the top of the job field. Only the essential data will be loaded to **MICROCUT** when the job is down loaded.

If a job is to be saved for later use, press the **O (OPTIONS)** key. Use the **DOWN ARROW** key to highlight the **SAVE JOB** option. Press the **ENTER** key.

If a job is to be transferred to **MICROCUT**, press the **O (OPTIONS)** key. Use the **DOWN ARROW** key to highlight the **SAVE AND TRANSFER JOB** option. Press the **ENTER** key. The screen will display the status of all **MICROCUT** systems attached to the PC. Use the **DOWN ARROW** key to highlight the desired **MICROCUT** to transfer the job to. Press the **ENTER** key. If the job is to be printed, select the **PRINTER** option at the bottom of the list of available **MICROCUTs**.

NOTE: If you try to transfer more data than available memory allows, an error message will appear. Some of the memory will need to be erased at the **MICROCUT** (save it to the computer first please). Any deletion must be done at the **MICROCUT** display console. Refer to the **MICROCUT OPERATOR'S REFERENCE MANUAL** for assistance.

JOB FILE FORMAT

All jobs follow this data format--

First byte = >> for begin job flag

Next six bytes = ASCII value of job number (label)

Next byte = blank (ASCII 20)

Cuts = four bytes formatted as:

Byte 1 = type of byte where

bit 0 = Eject if set

bit 1 = Air off for entire cut if set

bit 2 = Set if stock load position

bit 3 = CM display if set

bit 4 = MM display if set

bit 5 = SUN display if set (traditional Japanese measurement)

bit 6 = Inch display if set

bit 7 = Fractional inch display if set

Byte 2 = Dense packed BCD of 100's and 10's of units

Byte 3 = Dense packed BCD of 1's and .1's of units

Byte 4 = Dense packed BCD of .01's and .001's of units

Note that the .001's value must be 0 if the last digit is turned off.

End of job = #0ffh

Origination date in the PC memory = day, day, month, month, year, year

Last revision date in the PC memory = day, day, month, month, year, year

POSSIBLE PROBLEMS AND DIAGNOSIS

1. When machine codes are called up, one (or more) always show power off.
 - a. Power is off to that (those) **MICROCUTs**.
 - 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 **MICROCUTs** or printer. Check the lines carefully for bad connections or a wiring error.

Graphics West Micro Systems supplies phone consultation during our normal work hours of 8:30 AM to 5:00 PM Pacific Coast 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 unit before calling.

*Graphics West Micro Systems
3000 Kerner Blvd.
San Rafael, California, USA 94901*

*Phone 415-457-7500
FAX 415-457-1694*

MICROCUT. III

SERVICE MANUAL

Graphics West Micro Systems
3000 Kerner Boulevard
San Rafael, California, USA 94901
Telephone: (415) 457-7500
FAX: (415) 457-1694
June 1990
Revision A3

THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION WHICH IS PROTECTED BY COPYRIGHT. ALL RIGHTS ARE RESERVED. NO PART OF THIS DOCUMENT MAY BE PHOTOCOPIED, REPRODUCED, OR TRANSLATED TO ANOTHER LANGUAGE WITHOUT THE PRIOR WRITTEN CONSENT OF GRAPHICS WEST MICRO SYSTEMS.

MICROCUT, MICROFACTS, AND CUTTERNET ARE REGISTERED TRADE MARKS OF GRAPHICS WEST MICRO SYSTEMS

FOREWORD

Graphics West Micro Systems supplies phone consultation during our normal work hours of 8:30 AM to 5:00 PM Pacific Coast 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 before calling.

MICROCUT automatically controls power to attain required speeds while driving the backgauge. There are built in power limiting factors so that mechanical damage is not likely to occur in the event that proper lubrication schedules are not followed. Therefore, **MICROCUT** is not intended to correctly drive a machine which is bound. The handwheel should turn easily with one hand. If two hands are required to turn the handwheel the leadscrew, gibbs, and backgauge should be closely inspected and adjustments should be made **BEFORE** operating **MICROCUT**.

MICROCUT is designed to be very easy to service and maintain. In general complications in the computers should be attacked by turning the power off and back on to see if things straighten out automatically. If this occurs frequently (more than once a year, excluding thunder storms), the AC power supply should be checked. This should be a solid 200/220/240/260VAC line with a 10 amp breaker or a 100/110/120VAC line with a 15 amp breaker. A selector switch can be accessed through the back of the display console for power selection. **A separate ground should be run as well. CONDUIT DOES NOT ACT AS A PROPER GROUND.** Conduit is connected with pot metal which will suffer from electrolysis over a period of time and subsequently will not make proper connection. This is very important since the computer power supplies depend upon the ground line for filtering. Refer to the **INSTALLATION MANUAL--POWER**.

Refer to the **TABLE OF CONTENTS** for the appropriate page number in this manual for any problems you may have.

TABLE OF CONTENTS

<i>BASIC TROUBLESHOOTING</i>	<i>S-1</i>
<i>PROMPT ERROR MESSAGE LIST</i>	<i>S-6</i>
<i>ADJUSTING THE LIMIT POWER</i>	<i>S-16</i>
<i>MAINTENANCE</i>	<i>S-17</i>
<i>MOVING THE ENTIRE MACHINE</i>	<i>S-18</i>
<i>MOVING TO ANOTHER MACHINE</i>	<i>S-19</i>
<i>THE SHAFT ENCODER</i>	<i>S-20</i>
<i>TESTING THE KEYBOARD</i>	<i>S-22</i>
<i>CHANGING SOFTWARE IN MICRO CUT</i>	<i>S-23</i>
<i>PHONE CONSULTATION & RETURNS FOR REPAIR</i>	<i>S-24</i>
<i>DRAWINGS</i>	<i>S-25</i>

BASIC TROUBLESHOOTING

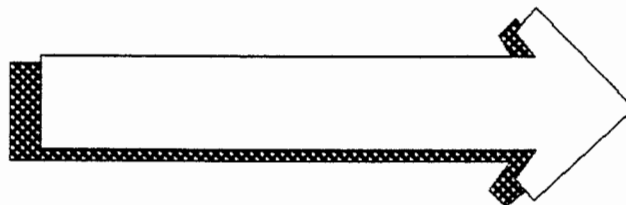
The MICRO CUT display console houses four printed circuit boards--the CPU board, the display control board, the display, and the power supply. There are four computers in the display console. In general, these are not user serviceable. The display console has been designed with a universal mount and plug-in connecting cables so that it is very easy to remove and exchange. This would be the procedure for any serious problems in the display.

There are, however, a number of problems that can be taken care of by the user. The following pages contain titles of possible problems and steps to take if that problem does exist.

During thunderstorms or in the event of an electrical disturbance, it is possible for any computer to "lose track" of itself. If such a failure occurs, turning the power off and then back on should correct it. See the FOREWORD of this manual.

NOTE: MICRO CUT uses 10 year non volatile memory for job data storage. There are no batteries to change.

MICRO CUT automatically controls power to attain required speeds while driving the backgauge. There are built in power limiting factors so that mechanical damage is not likely to occur in the event that proper lubrication schedules are not followed. Therefore, MICRO CUT is not intended to correctly drive a machine which is bound. The handwheel should turn easily with one hand. If two hands are required to turn the handwheel the leadscrew, gibbs, and backgauge should be closely inspected and adjustments should be made BEFORE operating MICRO CUT.



CONTINUE TO NEXT PAGE

1. MICROCUT WILL NOT SWITCH ON:

- a. The power switch on the display console has not been toggled.
- b. The wall circuit breaker has been turned off or is tripped.
- c. The power plug into the back of the console is loose.
- d. The MICROCUT fuse is blown (or the thermal breaker is tripped). Check and replace if necessary with a 15 amp equivalent (or reset the thermal breaker). If this is blown, the machine should be checked for mechanical bind and the motor should be checked for a shorted condition.
- e. The power selector switch in the back of the console is in the wrong position.
- f. The power supply fuse (attached to the inside the hump of the console) is blown. The console will need to be opened to check this fuse (see CHANGING SOFTWARE IN MICROCUT). The power line should be checked carefully if this problem exists. Make sure that the 110/220 selector switch is in the correct position.

2. MICROCUT SHOWS TURN POWER OFF WHEN AUTOMATIC IS PRESSED

- a. A key is stuck. Refer to TESTING THE KEYBOARD.

3. MICROCUT DEFAULTS INTO CALIBRATION & TEST ROUTINE.

- a. The power line into MICROCUT is inadequate. Check the ground and verify that the circuit is dedicated and capable of supplying adequate power (see the INSTALLATION MANUAL--ELECTRICAL POWER).

4. KEY(S) FAIL TO RESPOND (OR RESPOND) WHEN NOT PRESSED.

Refer to the prompting display to make sure the key failure is not due to the operational approach. For instance:

- a. No keys respond--prompt reads PRESS AUTOMATIC TO START or MICROCUT is in the AUTOMATIC MODE.
- b. The MOVE key does not respond--there is no number in the prompt to move to.
- c. The AUTOMATIC key does not respond--MICROCUT is already in the AUTOMATIC MODE or there is no JOB # in the prompting display.

NOTE--There are other possibilities as well--for instance if MICROCUT is waiting for a reply to a question.

- d. There is a stuck or broken key. Refer to TESTING THE KEYBOARD (see TABLE OF CONTENTS).

5. UNIT IS OFF CALIBRATION BY ONE SHAFT ENCODER REVOLUTION.

- a. Zero set timing is off. Loosen the shaft encoder chain and rotate the shaft encoder gear 1/3 turn. Retension and go through the CALIBRATE GAUGE ROUTINE to recalibrate (see REFERENCE MANUAL). OPTIONAL APPROACH--loosen and move the rear position switch a fraction of an inch (a few MM). Refer to INSTALLATION MANUAL--NOTES paragraph N.

6. MICROCUT IS OUT OF CALIBRATION:

- a. Check the dimension units (INCH, FRACTIONAL, CM, MM, SUN).
- b. Refer to the REFERENCE MANUAL--CALIBRATE GAUGE ROUTINE.

7. MICROCUT DOES NOT COUNT ONE FOR ONE WITH THE TABLE:

- a. The wrong units are selected. Tap the UNITS key.
- b. The reference values used in the CALIBRATION & TEST ROUTINE (see REFERENCE MANUAL) were not exact.
- c. The shaft encoder is not mechanically following the backgauge. Mark the sprockets at a mechanical reference point and run the backgauge back and forth. Check the markings at the same reference point for alignment AFTER a difference is realized in the MICROCUT position display at this same reference point.

NOTE--MICROCUT positions the encoder and assumes that the leadscrew and backgauge follow accurately. If the gauge does not stop correctly, it is important to separate between a mechanical and an electrical problem. A few of the most common errors seen include grease acting as a hydraulic cushion between the leadscrew and compensating nut, loose handwheel calibration band, loose leadscrew bearing support blocks, slipping or misadjusted Acme or compensating nuts in the backgauge carriage, slipping encoder or encoder drive sprockets, and a misadjusted encoder chain which can "walk" around the sprocket set. Mechanical failure is the most common cause of any positioning error in MICROCUT. Check these BEFORE assuming an electrical problem exists.

- d. Failed shaft encoder--replace.

8. IMPROPER OR ERRATIC COUNTING (BACKGAUGE POSITION):

- a. The encoder sprocket is slipping or the chain is walking over the sprocket teeth. Mark the sprockets and check at a given reference point to make sure that the marks stay timed. See paragraph 7c above.
- b. The shaft encoder cable has failed. Check the cable for bad solder joints. Replace if necessary. Refer to THE SHAFT ENCODER section of the service manual for cable pin numbers.

NOTE: Cable connections can fail due to contamination. Keep the cable ends away from dirt and oil (etc.) when they are not connected. Sometimes a connection problem here can be cured just by removing the connector and putting it back on. The sliding action of the pins can help self clean them. It is a good idea to insert and remove the cables a few times at the time of installation. Refer to the section titled MAINTENANCE in this manual.

9. CUT READY INDICATOR FLICKERS ON AND OFF

- a. The settling tolerances are set at too small a value. Refer to REFERENCE MANUAL--OPTIONS IN MANUAL MODE.

10. NO BACKGAUGE DRIVE.

- a. The motor belt or pulley is loose, broken, or missing.
- b. Check for a mechanical bind--oil the leadscrew or adjust the backgauge.
- c. The motor brushes are bad. Examine them for wear. Carefully clean the motor to remove all built up carbon dust. Check to commutator carefully for pitting and/or scoring. If damage is excessive replace the motor.
- d. The internal fuse for the motor drive circuit is blown. Replace with a 20 amp equivalent. This fuse is for GREEN BOARD versions only. It will not exist on BLUE BOARD versions of MICRO CUT.

NOTE: This is an oversized fuse strictly for board protection. If it is blown, check to make sure that the external fuse on the hump of the display console is rated for 15 amps only (not applicable in the case of thermal breaker equipped MICRO CUTs). Check for mechanical bind and motor failure.

- e. The auxiliary control line for the BRAKE control is wired improperly and is preventing the release of the brake or is causing the display console relay to operate correctly. Check these lines (if installed) carefully (see also INSTALLATION MANUAL--OPTIONAL CONTROL LINES).

11. OUT OF MEMORY.

- a. Memory was not erased at the time of installation. Enter the CALIBRATION & TEST ROUTINE and erase all of the job memory (see the REFERENCE MANUAL).
- b. All of the job memory space has been used. Delete unused jobs as desired or enter the CALIBRATION & TEST ROUTINE and erase all of the job memory (see the REFERENCE MANUAL).

Refer to REFERENCE MANUAL--VIEWING JOB MEMORY USAGE and MEMORY ORGANIZATION.

12. THERE IS GARBAGE IN THE MEMORY.

- a. The memory was not erased at the time of installation. Enter the CALIBRATION & TEST ROUTINE and erase the job memory (see the REFERENCE MANUAL).

13. CUT IS NOT RECOGNIZED.

- a. The cut sensing switch is out of adjustment. Adjust the switch as necessary. See the INSTALLATION MANUAL--CUT SWITCH.
- b. MICRO CUT was told that the CUT SENSE switch was not installed during the CALIBRATION & TEST ROUTINE. Enter this routine (see REFERENCE MANUAL) and progress until the CUT SENSE ON? screen appears. Respond YES (assuming the switch is actually installed). Press the LAST key until the display reads PRESS AUTOMATIC TO START OR turn the power off and restart.

14. BACKGAUGE DRIVES INTO THE FALSE CLAMP

- a. The false clamp option is incorrect. See the REFERENCE MANUAL--OPTIONS IN MANUAL MODE.
- b. Improper table size values. Refer to VIEWING THE MACHINE SIZE PARAMETERS in the OPTIONS section of the REFERENCE MANUAL.

15. MICROCUT TENDS TO SUFFER COUNT FAILURES.

- a. MICRO CUT has an inadequate power supply. A poor power line forces MICRO CUT to compensate more and more in its count protection software and slows down the maximum counting speed which it can handle before defaults occur. Refer to ELECTRICAL POWER in the INSTALLATION MANUAL.
- b. Connection problem. See previous paragraphs (7 and 8).
- c. The shaft encoder is failing. This can cause a degradation of the A and B signals (see the SHAFT ENCODER section of this manual) which can cause subsequent count detection errors. Replace the shaft encoder.

NOTE: A TEMPORARY solution may be to reduce the backgauge speed and/or the acceleration rate. Refer to appropriate sections in the REFERENCE MANUAL.

16. MICROCUT SETTLES INTO POSITION POORLY

- a. The motor is not making between 3 and 6 turns per inch of backgauge drive. Check this carefully and correct if necessary.
- b. The drive belt tension is incorrect.
- c. There are doubled drive belts in the motor drive system. Remove one of the double belts. Positioning will be compromised if more than one belt is used on a pulley.

17. EXCESSIVE VIBRATION OCCURS DURING SLOWDOWN

- a. The backgauge drive belt is too tight. Adjust this to be looser (see NOTES section in the INSTALLATION MANUAL).

18. BACKGAUGE DRIVE IS SLUGGISH

- a. The speed is set too low. Refer to SPEED ADJUSTMENT in the REFERENCE MANUAL.
- b. Refer to ACCELERATION sections contained in the OPTIONS section of the REFERENCE MANUAL.

PROMPT ERROR MESSAGE LIST

MICROCUT retrofit spacer systems have several prompts to tell the operator of existing or pending error conditions. The following alphabetical list is a synopsis of most of the codes from these units. Refer to other sections of the **SERVICE MANUAL** for additional information.

A SENSING SWITCH FOR THE LOADING DEVICE MUST BE INSTALLED TO USE AUTO ADVANCE

If the **AUTO ADVANCE AFTER SIDE LOAD** option is to be used it is necessary to install a sensing switch which will inform **MICROCUT** of when the loading operation is complete.

CALIBRATION ERROR IS TOO GREAT

MICROCUT allows alterations in calibration of 3/8 inch (1 cm). If the change is greater than this it assumes an error has been made. If the change is greater than this there is probably a mechanical error which needs to be corrected, or the **CALIBRATION & TEST ROUTINE** may need to be used. At power on **MICROCUT** verifies that the calibration was within range. If there is an error it will request new position data.

CALIBRATION LOST

The cutter data that allows **MICROCUT** to operate on this machine has been damaged. It will be necessary to go through the **CALIBRATION & TEST ROUTINE** to recover this information.

CANNOT BE ZERO

The fraction when using the calculator keys cannot have zero in the denominator.

CLAMP DOWN

The clamp sensing switch is not tripped properly. This may be due to a mechanical problem with the clamp or the switch or there may be a connection problem between the switch and **MICROCUT**.

CLAMP SWITCH HAS A WIRING PROBLEM

Calibration routine--**MICROCUT** senses that the clamp is down when it is supposed to be up. Check the wires for continuity through the switch (see the **INSTALLATION MANUAL**). During knife operation--the clamp switch has not operated. Check the switch for malfunction. Check the pile height of the stock being cut with reference to the trip point of the switch. Adjust if necessary.

COUNTING SYSTEM ERROR--RESTART

MICROCUT's intelligent counting system has detected an out of range error condition and can not correct itself back to within limits. The backgauge drive is disabled and the buzzer will go on and off. Refer to other sections in this manual--**BASIC TROUBLESHOOTING** and **THE SHAFT ENCODER**.

CUT POSITIONS AVAILABLE:

This prompt warns the operator of remaining job memory space (only if that space is less than 100).

CUT STROKE EARLY

MICROCUT is not in position yet but sees that the knife is activated. **DRIVE ERROR!** The gauge has moved in the wrong direction for too long. Try again or go into the **CALIBRATION & TEST ROUTINE** and check motor direction.

**DRIVE OVERHEATED WAIT FOR COOLING
OIL LEADSCREW OR REDUCE SPEED!**

The backgauge drive circuitry has been run hard enough to heat past 80% of its rated capability. **MICROCUT** will not allow additional drive until the components cool down adequately.

ENCODER DIRECTION DATA HAS BEEN LOST

Memory pertaining to the type of cutter **MICROCUT** is installed on has been lost. It will be necessary to go through the **CALIBRATION & TEST ROUTINE** to correct this.

**ENCODER TURNS RATIO IS TOO GREAT FOR MM.
CALIBRATION ON THIS MACHINE--USE CM.**

There are too many turns of the encoder for **MICROCUT** to calibrate this machine in **mm** during the **CALIBRATION & TEST ROUTINE**. Use **cm** instead.

ERROR--ACCESS CODES ARE NOT TURNED ON

The access codes must be on before the **MICROFACTS** system can be enabled.

ERROR--CORRECT POSITION UNKNOWN

MICROCUT has lost the ability to know where the backgauge is accurately. It will be necessary to turn the power off and start again. Refer to other sections of this manual--**BASIC TROUBLESHOOTING** and **THE SHAFT ENCODER**.

ERROR--MANAGEMENT IS NOT TURNED ON

The **MICROFACTS** management system must be on before the idle time can be enabled.

**ERROR--POWER INTERRUPTION. DATA HAS BEEN LOST.
TURN POWER OFF--RESTART.**

A power disturbance has caused a data error in the main computer. It will be necessary to power down and restart the system to insure proper cutting accuracy.

ERROR--TIME CLOCK IS NOT TURNED ON

The time clock must be turned on before the MICROFACTS system can be enabled.

**FAILURE RECOGNIZED AC POWER ZERO
CROSS DETECTION FAILED!!**

MICROCUT has not sensed the AC power line correctly. Either the external thermal breaker on the back of the display console has popped or a fuse inside the console has blown or a component has failed. Service accordingly.

NOTE: The display must be taken apart to replace the fuse. The fuse and circuitry is well oversized and if the fuse does fail a severe mechanical problem, motor failure, or line short should be suspected. Use a screw driver to twist/break the glue seal between the front and back halves of the display console. Remove the top board support bracket to gain access to the inside. Replace the fuse with another (AGC20). Replace the board holder. Lay the display console on its back. Reassemble using standard PVC cement (black) along one or two inches of the sides, top, and bottom. Position the display front so that none of the keys stick when pressed. Allow glue to dry for at least ten minutes before installing on the cutter.

**FAILURE RECOGNIZED JOB MEMORY IS LOSING DATA--
SERVICE NEEDED BEFORE OPERATING**

Try turning the power off and on again. Service is probably required.

FAILURE RECOGNIZED MAIN CPU HAS FAILED TO POWER ON PROPERLY

The main computer has not powered up properly. Turn power off and count to ten. Try turning power on again. Service may be required.

FAST DRIVE PROBLEM

MICROCUT has not detected any motion during a period of time when the backgauge should have been moving. This may be due to either a drive or a counting error. If the backgauge moves a bit and then stops, MICRO CUT is not seeing the motion and has a counting problem. If no motion occurs then MICRO CUT is suffering from a drive error. Refer to other sections of this manual--BASIC TROUBLESHOOTING and THE SHAFT ENCODER.

FRONT LIMIT ERROR

MICROCUT has sensed that the front limit has tripped even though it should not have. Check the switch carefully. If a front limit was not installed on this installation, check to make sure that the wires for the switch are shorted together.

FRONT LIMIT HAS A WIRING PROBLEM

MICROCUT senses that the front limit is tripped when it is not supposed to be. Check the wires for proper connection (see the **INSTALLATION MANUAL**). If a front limit was not installed on this installation, check to make sure that the wires for the switch are shorted together.

INCOMPLETE SETUP!! FOLLOW PROCEDURE ALL THE WAY THROUGH--DO NOT TURN POWER OFF

The **CALIBRATION & TEST ROUTINE** must be fully completed before continuing.

INVALID CODE!!!!

The code that has been entered to gain access to the machine is not one that matches any of the programmed codes. Try entering the code again or check with someone authorized to use the machine. If an error exists and codes need to be added or changed, it will be necessary to select the management options at power on. Refer to the **REFERENCE MANUAL** for assistance.

INVERT MOTOR WIRES

The motor is driving in the wrong direction (**CALIBRATION & TEST ROUTINE** for new installations only). It will be necessary to invert the motor wires so that the motor can drive in the right direction before setting up **MICROCUT** to operate on its new machine.

JOB NOT FOUND

The old job that was manually selected is not in the job memory. Try a different job number or review all of the jobs.

JOB NUMBER ALREADY USED

The new job that has been manually selected is already programmed. It will be necessary to choose a different number or erase this number before programming.

KNIFE DOWN

MICROCUT will show this display whenever the cut sensing switch is not conducting current.

LIMIT ERROR CHECK SWITCHES

MICROCUT has sensed that **BOTH** the front and rear limit switches are tripped at the same time. This should be an impossibility and needs to be checked out carefully.

MAKE ADJUSTMENTS TO CONTINUE

The NO key has been pressed in response to one of MICRO CUT's questions. Adjustments will need to be made (depending upon the question) before a routine can be continued (this prompt is used while checking switches in the CALIBRATION & TEST ROUTINE).

**MECHANICAL CHANGES ARE REQUIRED FOR THE
INSTALLATION TO BE TO SPECIFICATION**

This will appear after another (clarifying) prompt if certain requirements have not been met.

**MECHANICAL LOADING PADDLE IS NOT IN ITS CORRECT
POSITION FOR BACKGAUGE DRIVE!**

The side load paddle is tripped in the wrong direction for drive or there is a wiring or connection error. Check the switch and the cabling.

MECHANICAL PADDLE SWITCH WIRING ERROR

MICRO CUT has determined a wiring error in the mechanical paddle switch during the CALIBRATION & TEST ROUTINE. Corrections will need to be made before continuing.

MEMORY FAILURE TURN POWER OFF

MICRO CUT has sensed a failure in the job memory and will not let operation continue. Turn the power off. It is advisable to enter the CALIBRATION & TEST ROUTINE and test the memory. If the error is fairly high in the address range, it may be possible to erase some of the lower jobs and continue on. MICRO CUT may skip over the bad location after power is turned off but memory errors may occur if jobs are altered in the future. Schedule service on the memory chip as soon as possible.

MEMORY POSITIONS AVAILABLE:

MICRO CUT is warning the operator that there are only so many memory positions left (at the entrance to programming a new job). If the job will require more than the shown number of cuts left, delete some of the older less used jobs before continuing.

**MICROFACTS FULL-- [1]
-> PRINT DATA
ERASE DATA
CONTINUE ANYWAY**

The management memory which contains the data for MICROFACTS is completely filled and can not hold new time information until it is printed. The operator is given the option of stopping to allow data to be printed, erasing the data (management code entry required), or continuing with no more data being collected.

**MICROFACTS MEMORY IS CONTAMINATED WITH BAD DATA.
MICROFACTS HAS BEEN SHUT OFF.**

A power problem has caused the MICROFACTS data to be contaminated. The management system has been disabled to prevent further errors. All operator features are still enabled and MICROCUT can be used in normal fashion (management off) until MICROFACTS is reset (see REFERENCE MANUAL).

MICROFACTS MEMORY IS FULL!!!

This is a gentle reminder to the operator (after the options screen above is shown) that will appear whenever the operator changes modes while the management memory is full.

NO MORE AUTO SELECT JOBS

Early units had only 255 auto select jobs available. These units could use up all of these jobs before the memory was full. If the auto select jobs are all used it will be necessary to select the job number manually (a number larger than 255 will be required) or delete one of the older jobs.

NO MOTION SEEN

MICROCUT has not detected any motion during a period of time when the backgauge should have been moving. This may be due to either a drive or a counting error. If the backgauge moves a bit and then stops, MICROCUT is not seeing the motion and has a counting problem. If no motion occurs then MICROCUT is suffering from a drive error. Refer to this manual--BASIC TROUBLESHOOTING and THE SHAFT ENCODER.

NOT ENOUGH MEMORY

MICROCUT does not have enough unused job memory available to program the number of stops requested in either the LABEL MODE or DIVIDE SHEET routine.

NUMBER TOO BIG

The sum of numbers when using the calculator keys is larger than the maximum allowed value (maximum rear value usually, twice the maximum rear value in LABEL MODE or SHEET DIVIDE ROUTINE).

NUMBER TOO SMALL

The result of a subtraction is less than zero or the position to MOVE to is less than the physical table limit (see TOO FAR FORWARD).

OIL LEADSCREW OR REDUCE SPEED

The backgauge drive circuitry has been run hard enough to heat past 80% of its rated capability. MICRO CUT will not allow additional drive until the components cool down adequately. Perform maintenance on the cutter to avoid this problem again, or slow down the drive speed (see the REFERENCE MANUAL or SERVICE MANUAL). See the prompt **DRIVE OVERHEATED WAIT FOR COOLING**.

ONE OF THE LIMITS HAS A WIRING PROBLEM

MICRO CUT has sensed that one of the limits switches is wired incorrectly. Check the connections at all cables from MICRO CUT or go into the CALIBRATION & TEST ROUTINE to evaluate this.

OPTICAL PADDLE SENSE HAS A WIRING ERROR OR IS NOT POWERED ON. PLEASE CHECK!!!

MICRO CUT has determined a wiring error in the optical paddle sense switch during the CALIBRATION & TEST ROUTINE. Corrections will need to be made before continuing.

OUT OF MEMORY

All of the available job memory has been used. Note that while MICRO CUT has the option for an almost infinite selection of job numbers, each job may take up several of the available memory locations. The memory space will be used up before all job numbers are programmed. Delete some of the unused or seldom used jobs to make room for the new ones.

*****OUT OF POSITION*****

MICRO CUT is not in position for the knife stroke but it senses that the knife is being operated. Bring the knife back up to the top of its stroke and allow MICRO CUT to position the backgauge correctly. See the prompt **CUT STROKE EARLY**.

OUT OF TOLERANCE

The duplicated memory in MICRO CUT does not match. Go through the CALIBRATION & TEST ROUTINE (REFERENCE MANUAL) to correct this. If the prompt comes up again there may be a failed memory chip in MICRO CUT. Test the memory in the CALIBRATION & TEST ROUTINE to see if this is the case.

PAPER JAM ON SIDE LOAD EQUIPMENT

The optical sensing switch on the side loading equipment is indicating that there is paper or some obstruction on the side loading equipment. Check to correct.

***** POSITION OUT *****

MICROCUT has been knocked out of position while in **AUTOMATIC** mode. The gauge **HAS BEEN** in position and **MICROCUT** will still recognize the **CUT SENSE** if the knife is operated.

POWER OFF REQUIRED TO CHANGE CODES

The operator access codes can only be adjusted during the power on management selection routine. Please refer to the **REFERENCE MANUAL** for assistance.

PRESS ANY KEY TO STOP

This prompt appears only when **MICROCUT** is starting up. **ANY KEY WILL STOP MICRO CUT FROM MOVING THE BACKGAUGE.**

REAR LIMIT ERROR

MICROCUT has sensed that the rear limit has been tripped for much too long a distance moving forward. **NOTE:** This error will occur during calibration (when power is first turned on) if **MICROCUT** has to move forward more than a few inches to get off of the rear limit switch. In some cases the rear limit may trip several inches before the rear of the table (although this is not the preferred manner of installation). If this is the case then turn the power off and restart normally. If this sense were not in **MICROCUT** and an error (bad connection) occurred from the rear limit switch, **MICROCUT** could run the backgauge into the front of the cutter. This check prevents that from happening if such a failure occurs.

REAR LIMIT HAS A WIRING PROBLEM

MICROCUT senses that the rear limit switch is tripped when it is not supposed to be. Check the wires for proper connection (see the **INSTALLATION MANUAL**).

**SIDE LOADING MUST BE ENABLED BEFORE THE AUTO
ADVANCE OPTION CAN BE SELECTED**

It is necessary to have **SIDE LOADING** active in order to use the **AUTO ADVANCE AFTER SIDE LOAD** option.

SLOW DRIVE PROBLEM

MICROCUT has not detected any motion during a period of time when the backgauge should have been moving. This may be due to either a drive or a counting error. If the backgauge moves a bit and then stops, **MICROCUT** is not seeing the motion and has a counting problem. If no motion occurs then **MICROCUT** is suffering from a drive error. Refer to this manual--**BASIC TROUBLESHOOTING** and **THE SHAFT ENCODER**.

SYSTEM ERROR SOFTWARE INVALID

This designates a software error. Try restarting MICRO CUT. Service is probably required.

!!!TARGET VALUE LOST!!!

At least one of MICRO CUT's internal data backup registers does not agree with the others in regards to the position which MICRO CUT is supposed to drive to. MICRO CUT performs its operations in several areas at the same time in order to compare results--if electrical disturbances occur which prevent the results from being equal, MICRO CUT halts operation with this error prompt. This safety gives assurance that MICRO CUT will not make errors in positioning. If this message occurs often check the MICRO CUT power supply line very carefully. Refer to the INSTALLATION MANUAL--NOTES, HINTS, or POWER SUPPLY.

THE CUT SWITCH HAS A WIRING ERROR

MICRO CUT has determined a wiring error in the cut switch during the CALIBRATION & TEST ROUTINE. Corrections will need to be made before continuing.

THE FRONT LIMIT HAS A WIRING ERROR

MICRO CUT has determined a wiring error in the front limit switch during the CALIBRATION & TEST ROUTINE. Corrections will need to be made before continuing.

THE REAR LIMIT HAS A WIRING ERROR

MICRO CUT has determined a wiring error in the rear limit switch during the CALIBRATION & TEST ROUTINE. Corrections will need to be made before continuing.

**SHAFT ENCODER IS TURNING TOO QUICKLY--
CHANGE GEARING FOR 2 TO 4 TURNS PER INCH**

MICRO CUT has determined that the encoder gearing is incorrect. It will be necessary to change the sprockets in order to correct this. The MANUAL key can be pressed to over ride this, but corrections will need to be made for operation to be as good as possible.

**THE SHAFT ENCODER IS TURNING TOO SLOWLY--
CHANGE GEARING FOR 2 TO 4 TURNS PER INCH**

MICRO CUT has determined that the encoder gearing is incorrect. It will be necessary to change the sprockets in order to correct this. The MANUAL key can be pressed to over ride this, but corrections will need to be made for operation to be as good as possible.

**THIS LANGUAGE IS NOT AVAILABLE WITH THE
SOFTWARE PACKAGE IN THIS MICRO CUT**

MICRO CUT is equipped with up to eight different languages. If the language you desire is not in this unit, please contact your dealer or Graphics West Micro Systems for assistance.

TOO FAR BACK

The position that was requested is beyond the physical limits of the table. MICRO CUT limits the prompt display to realistic values as the number keys are pressed (if the resulting number is larger than the maximum rear it blanks the leading digit). However in the CALCULATOR and SHEET DIVIDE routines MICRO CUT temporarily allows values to twice the maximum rear. However, if the final result calculated is larger than the maximum rear value this prompt will show. If a cut is made in the PROGRAM mode that is behind the maximum rear value (entered in the CALIBRATION & TEST ROUTINE) this error will appear.

TOO FAR FORWARD

The position that was requested is beyond the physical limits of the table. If the position is between the minimum front and the false paper clamp (false clamp ON in the MODIFICATION ROUTINE--OWNER'S MANUAL) MICRO CUT will continue with the prompt FALSE CLAMP ON? and wait for a YES or a NO response.

**!!TURN POWER OFF!! CORRECTIONS MUST
BE MADE IN ORDER TO GO FURTHER!**

An error has been seen in the CALIBRATION & TEST ROUTINE and power must be turned off so that corrections can be made.

**TURN POWER OFF!! INVERT MOTOR WIRES.
DO NOT DO THIS WITH POWER ON!!!**

The motor has been determined to be moving in the wrong direction (new installations only) and the 2 wires going to the motor will have to be inverted at the motor itself before proper operation can commence.

TURN POWER OFF RESTART REQUIRED!

MICRO CUT has been told to stop or it has completed a routine which requires a full restart to recalibrate. Turn the power off, then back on and press the AUTOMATIC key to start.

**ZERO SET ERROR--TOO MANY COUNTS SEEN
or ZERO-SET MISSED
or ZERO SET OCCURRED TOO EARLY**

MICRO CUT has diagnosed an error in counting. Check the connection between the display console and the shaft encoder. Turn the power off and restart MICRO CUT. Refer to other parts of this manual for assistance.

ADJUSTING LIMIT POWER

MICROCUT has an adjustable power limit to reduce the available motor drive power when either of the limit switches is tripped. The REAR LIMIT (POSITION) SWITCH will limit power in reverse drive when tripped (not conducting). The OPTIONAL FRONT LIMIT will limit power in forward drive when tripped (not conducting).

If the error message NO MOTION SEEN appears while MICROCUT is trying to drive the backgauge only during the conditions stated in the previous paragraph it will be necessary to increase the limit drive power or reduce the machine drag (resistance to movement).

To adjust the limit power remove the inner plug on the back side of the MICROCUT display console. A small black potentiometer can be seen which has calibration marks from 0 to 100 (0 = no inhibit, 100 = full inhibit). Turn the potentiometer down one mark and check for drive.

**DO NOT ADJUST THE POTENTIOMETER TO SUPPLY MORE
POWER THAN IS ABSOLUTELY NECESSARY SINCE THIS
WOULD OVER RIDE THE PURPOSE OF THE LIMIT SWITCH.**

MAINTENANCE

MICROCUT has been designed to be virtually maintenance free. Memory is non-volatile requiring no battery backup. The power supplies are self adapting.

Motor brushes should be checked every 5000 hours of operation. Replace as appropriate. Clean the motor of carbon dust as required.

CAUTION: Disconnect all power sources before checking the motor brushes.

Connections can cause problems in any electrical circuit. To avoid problems with connections, it is advised that once a year a "tune up" be performed:

1. Unplug MICROCUT from its AC power source.
2. Unplug the connectors at the back of the display console and plug the connectors back in.
3. Unplug the connector on the shaft encoder and plug it back in several times.
4. Check all wiring for any nicks or cuts.
5. Check the plug on the power cord for dirt. Clean as needed. Make sure that it is making good contact when it is plugged back into the power outlet.

Occasionally check all of the MICROCUT components (switches, motor, shaft encoder, display) to make sure none of the mounts have loosened. Tighten as necessary.

MICROCUT JOB MEMORY WILL NOT BE ALTERED. ALL OF THE JOBS WHICH WERE PROGRAMMED BEFORE MAINTENANCE WILL STILL BE PROGRAMMED AFTERWARDS.

DO NOT USE GREASE ON THE LEADSCREW MECHANISM. GREASE ATTRACTS ABRASIVE DIRT AND ACTS AS AN INCONSISTENT CUSHION AGAINST THE BACKGAUGE PREVENTING PROPER CUTTING PRECISION. USE A LIGHT MACHINE OIL ONLY ON THE LEADSCREW. OIL THE LEADSCREW DAILY.

MICROCUT automatically controls power to attain required speeds while driving the backgauge. There are built in power limiting factors so that mechanical damage is not likely to occur in the event that proper lubrication schedules are not followed. Therefore, MICROCUT is not intended to correctly drive a machine which is bound. The handwheel should turn easily with one hand. If two hands are required to turn the handwheel the leadscrew, gibbs, and backgauge should be closely inspected and adjustments should be made BEFORE operating MICROCUT.

MOVING THE ENTIRE MACHINE

Any cutter should have the table removed during shipping to avoid possible machine damage and most importantly to allow the housing to be properly leveled when it is relocated. It is advisable that all parts involving **MICROCUT** be removed to avoid damage. If the cutter is moved without removing the table, at least remove the display console and the shaft encoder from the machine. These are delicate and can not tolerate excessive shock such as might be encountered during a machine move. Pack these parts in a well cushioned sealed box. Place protective waterproof bags around all exposed cable ends and switches.

Reverse these procedures after the move is complete.

MOVING TO ANOTHER MACHINE

All MICRO CUT III display consoles, switches, and encoders are identical (excluding the option of the MICROFACTS management system). It is possible to remove MICRO CUT from a machine and mount it to another with no need for any electronic modifications. The only thing which is machine dependent is the encoder sprocket set. Refer to the SHAFT ENCODER section of the INSTALLATION MANUAL for assistance in determining your requirements. Remove all cables, switches, the motor, the encoder, and the display console from the old machine. Determine the best mounting places for these parts on the new machine. Make sure that all the required brackets are available for secure mounting. Check the cable lengths to see that there will be ample to avoid stress which could lead to eventual failure. Mount the components according to the instructions in the INSTALLATION MANUAL. Go through the CALIBRATION & TEST ROUTINE so that MICRO CUT will know how to operate on its new machine.

If the job memory is to be retained, do not ERASE MEMORY at the second step of the CALIBRATION & TEST ROUTINE. If the memory is no longer valid, opt to ERASE MEMORY (YES) and not SAVE JOBS (NO).

THE SHAFT ENCODER

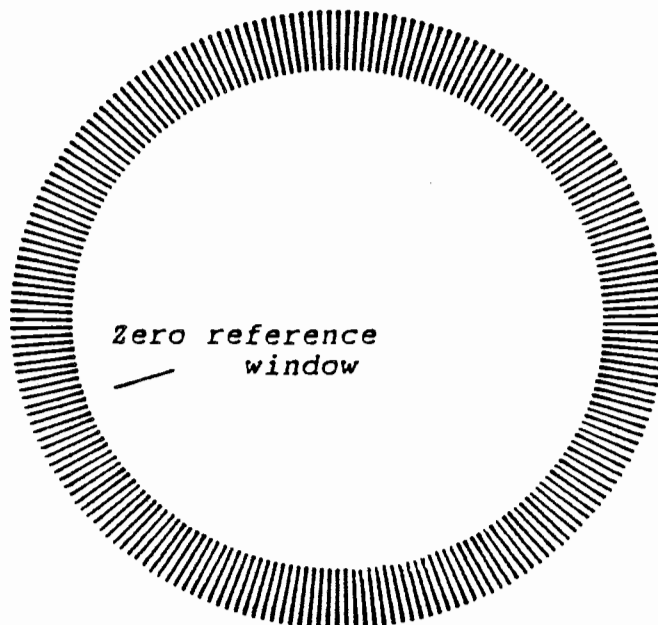
The shaft encoder is attached to the leadscrew mechanism with a chain. It sends out two different signals as the leadscrew rotates so that the computer can measure backgauge movement. A zero reference is internal to the shaft encoder as well to allow the count control computer to keep track of each complete revolution.

The MICRO CUT shaft encoder is an incremental (quadrature) type. There are six lines attached at the shaft encoder:

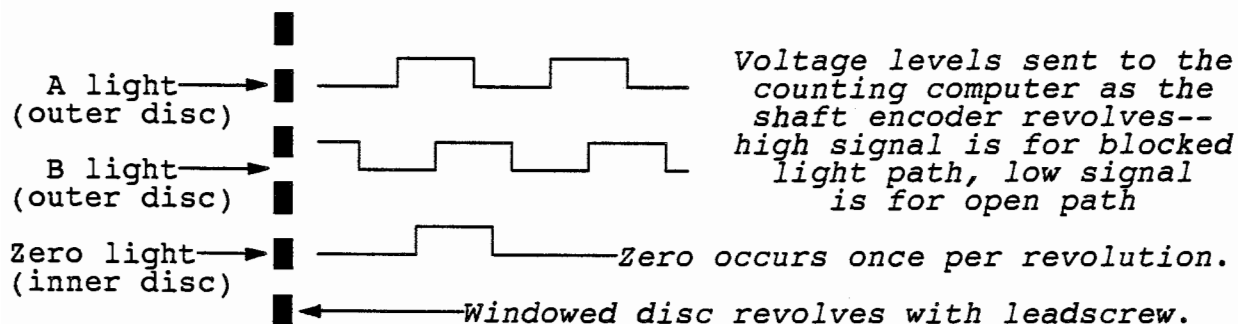
	<i>FAN OUT CONNECTOR</i>	<i>ENCODER CONNECTOR</i>
<i>Ground</i>	9	F
<i>5 VDC</i>	13	D
<i>Zero Reference</i>	14	C
<i>Signal (A)</i>	11	A
<i>Signal (B)</i>	12	B
<i>Earth</i>	10	G

The shaft encoder is a disc type optical interrupter with 500 windows separated by lines. The lines block light to a pair of phototransistors while the windows allow light through. An extra window is included so that a signal can be transmitted at the "zero" point of each revolution (this DOES NOT REFER to an exact inch or cm value of the backgauge position).

DISC



CONTINUED ON NEXT PAGE

SIDE VIEWTraveling:Left to RightRight to Left

A goes low	B is high	B is low
A goes high	B is low	B is high
B goes low	A is low	A is high
B goes high	A is high	A is low

Z goes high for one window period once per revolution.

One of MICROCUT's computers analyzes all signal transitions, and count direction is determined (forward or back) from the value (high or low) of the other signal line. An up and a down transition occur in both A and B per shaft encoder window yielding four counts per window. The 500 windows per revolution allow information to one two-thousandth of a revolution. At every zero reference, the count is checked and corrected to +- 2000 or 0 counts from the last zero reference. If the count is too far out of tolerance, the computer will shut the backgauge drive off and signal the operator in the prompting display (ERROR--CORRECT POSITION UNKNOWN). Refer to the BASIC TROUBLESHOOTING and PROMPT ERROR MESSAGE LIST sections of this manual.

If there is a question about the integrity of the encoder, first check all connections carefully (unplug and plug in the encoder cable connector several times--check wiring for physical damage). The encoder can be tested in the CALIBRATION & TEST ROUTINE at the Motor drive/direction test (refer to the REFERENCE MANUAL).

The encoder is a delicate instrument. DO NOT BANG ON IT OR SUBJECT IT TO ANY PHYSICAL ABUSE!!!!

TESTING THE KEYBOARD

MICROCUT contains a full keyboard test routine available immediately after power on **BEFORE** the language selection is made. This should be used if any key is suspect (either of not operating or of being stuck).

Turn the power to **MICROCUT** off (rocker switch on the back of the display console). Wait a few seconds. Turn the power on. The display will ask you to choose a language. Use the **NO**, **OPTIONS**, **LAST**, or **ARROW** keys to position the pointer to the language you would like to use. **DO NOT USE THE #1, #2, OR YES KEY TO ACTUALLY MAKE THE LANGUAGE SELECTION.** Press the + key to enter the keyboard test routine. If the language is unavailable **MICROCUT** will inform you accordingly. Otherwise the upper part of the display will now read **KEYBOARD TEST MODE.**

Whenever a key is activated the engraved value of that key will show in the third line of the display until the key is released.

If a key is stuck--

The display will show the value of the stuck key. If a key appears to be stuck remove the keycap by pulling straight out on both sides and check for dirt, contaminants, or mechanical interference that may be causing the problem.

NOTE: **MICROCUT** will default to the **KEYBOARD TEST ROUTINE** when power is turned on if the + key is stuck in.

If a key is not operating--

If a key value will not appear on the display when the key is pressed then that key is probably defective. Remove the keycap by prying straight out on both sides of it. Check the key again. If the key works it may be that the keycap slid too far over the key stem. Replace the keycap and test again. If there is a failure it is recommended that the display panel be returned to Graphics West Micro Systems for repair.

To exit the **KEY TEST ROUTINE** press the + key or turn the power off.

CHANGING SOFTWARE IN MICROCUT

MICROCUT contains two IC's which hold the program software that controls the unit's behavior. At times it may be desirable to update the software contained in **MICROCUT** in order to add new features (see NOTE 1 below). This would normally be performed at the factory, but in some cases may be done at the customer sight:

1. Make sure power is turned off. Remove the cables from the back of the **MICROCUT** display console. The power cable has a latch on it which requires squeezing before removal is possible.
2. Remove the display from the Panavise mounting bracket and place it face down on a clean soft surface. Place a flat (common) screw driver into the groove along the edge of the back of the console and twist gently to break the glue (or lift the face over the retaining screws). Do this along all sides. Turn the display over and lift the front from the back.
3. Use an allen wrench to remove the three securing screws on the lower edge. Remove the bottom edge mounting plate (see NOTE 2 below).
4. Two PC boards will be visible where the plate was removed. The board nearest the console front is the **DISPLAY** control board. The windowed IC which is between the **AUTOMATIC** and the **PROGRAM** keys contains the **DISPLAY** software. Use a small screw driver to pry this from the PC board. Replace it with the new software making sure that the small notch in the end of the IC faces the top of the console. Use caution to avoid bending any of the legs on the software IC's. If any pin is bent **MICROCUT** will not operate correctly. Some boards have selector jumper wires for two different sizes of software ICs. Make sure that selector **JU2** (above the IC--256) is out. Make sure that jumper **JU4** (below the IC--512) is soldered in. An optional second IC may be included on the board for holding additional languages (this would be the windowed device nearer the center of the board). Replace this as well if appropriate.
5. The board towards the back of the console is the **DRIVE** control board. The IC furthest towards the **NUMBER** key end (**U10**) contains the **DRIVE** software. Remove and replace this IC in a similar fashion to 4 above. There is no jumper wire for this board.
6. Slide the bottom edge mounting plate into place so that it supports the PC boards. Secure it with the three allen screws.
7. Place the display on its back. Use a small amount of PVC cement (like that used for plastic plumbing--black preferably) where the old glue was (or just slip the face over the retaining screws). Slide the display front onto the back and position it so that all of the keys operate freely. Wait a few minutes for the glue to dry.
8. Place the display console back into the Panavise mounting bracket and attach the cables making sure that they lock back into position.
9. Turn the power back on. The update is complete.

NOTE 1: In some cases (software versions before February of 1989) the job memory may be different and will need to be erased (**CALIBRATION & TEST ROUTINE**). This is due to the expanded job number (6 digits) capability of the newer software and certain memory allocations which were required to save data for some of the new features added since then.

NOTE 2: If a board is to be replaced, it will be necessary to remove one of the side edge mounting plates as well. Carefully unplug all cables entering the **DRIVE** PC board and remove the **DISPLAY** and **DRIVE** boards as an assembly. Two allen screws hold the **DRIVE** board to the **DISPLAY** board. Remove these screws in order to separate the boards. During reassembly care should be taken to plug the cables completely back into the **DRIVE** board. The 26 pin connector has one dark wire which designates pin 1. Pin 1 is labeled on the board (the pin nearest the **SOFTWARE** IC). All other plugs are scalloped on one side to prevent improper connection.

PHONE CONSULTATION & RETURNS FOR REPAIR

Graphics West Micro Systems supplies phone consultation during our normal work hours of 8:30 AM to 5:00 PM Pacific Coast 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 unit before calling. If a failure can not be fixed over the phone, it may be necessary to return parts to the factory:

*Graphics West Micro Systems
3000 Kerner Blvd.
San Rafael, California, USA 94901*

415-457-7500

In the event that a failure occurs that requires factory service, please include a detailed description of the failure and send back any related parts (usually the display console and encoder--if you have any questions please contact Graphics West Micro Systems). Graphics West Micro Systems will decide to repair or replace these parts after a thorough inspection. Please inform us of your preferred return shipping method AND address. Most shippers require a street address. Do not reference Post Office Boxes except for billing purposes. Please include your phone number and the person the return should be marked attention to.

MICROCUT III INSTALLATION MANUAL

**Graphics West Micro Systems
3000 Kerner Boulevard
San Rafael, California, USA 94901
Telephone: (415) 457-7500
FAX: (415) 457-1694
June 1990
Revision A3**

THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION WHICH IS PROTECTED BY COPYRIGHT. ALL RIGHTS ARE RESERVED. NO PART OF THIS DOCUMENT MAY BE PHOTOCOPIED, REPRODUCED, OR TRANSLATED TO ANOTHER LANGUAGE WITHOUT THE PRIOR WRITTEN CONSENT OF GRAPHICS WEST MICRO SYSTEMS.

MICROCUT, MICROFACTS, AND CUTTERNET ARE REGISTERED TRADE MARKS OF GRAPHICS WEST MICRO SYSTEMS

TABLE OF CONTENTS

<i>INTRODUCTION</i>	<i>I-1</i>
<i>THE INSTALLATION</i>	<i>I-2</i>
<i>RECOMMENDED TOOL LIST</i>	<i>I-3</i>
<i>PACKING LIST</i>	<i>I-4</i>
<i>MICROCUT INSTALLATION NOTES</i>	<i>I-6</i>
<i>HINTS</i>	<i>I-9</i>
<i>DISPLAY CONSOLE</i>	<i>I-10</i>
<i>SHAFT ENCODER</i>	<i>I-11</i>
<i>MOTOR MOUNTING</i>	<i>I-12</i>
<i>NON-MILL SPEC POSITION SWITCH</i>	<i>I-13</i>
<i>MILL SPEC LIMIT SWITCHES</i>	<i>I-14</i>
<i>NON-MILL SPEC CLAMP UP SWITCH</i>	<i>I-15</i>
<i>MILL SPEC CLAMP UP SWITCH</i>	<i>I-16</i>
<i>NON-MILL SPEC CUT SENSING SWITCH</i>	<i>I-17</i>
<i>MILL SPEC CUT SENSING SWITCH</i>	<i>I-18</i>
<i>OPTIONAL SIDE LOADING KIT</i>	<i>I-19</i>
<i>OPTIONAL CONTROL LINES--DEFINITION</i>	<i>I-20</i>
<i>OPTIONAL CONTROL LINES--WIRING EXAMPLE</i>	<i>I-21</i>
<i>WIRING AND CABLES</i>	<i>I-22</i>
<i>WIRING THE MILL SPEC KIT</i>	<i>I-23</i>
<i>ELECTRICAL POWER</i>	<i>I-24</i>
<i>FINAL CALIBRATION, TEST, AND CHECK OUT</i>	<i>I-25</i>
<i>TRAINING THE OPERATOR</i>	<i>I-26</i>
<i>SPARE PARTS LIST</i>	<i>I-27</i>
<i>OPTIONAL KIT LISTING</i>	<i>I-28</i>

CONTINUED ON NEXT PAGE

Table of contents--continued

<i>MOVING THE ENTIRE MACHINE</i>	<i>I-29</i>
<i>MOVING TO ANOTHER MACHINE</i>	<i>I-30</i>
<i>PERSONAL NOTE SPACE</i>	<i>I-31</i>
<i>PHOTOS OF SAMPLE INSTALLATIONS</i>	<i>I-32</i>

INTRODUCTION

MICROCUT is a self contained microprocessor controlled motor drive positioning system. There must be a place to attach the DC drive motor (to an existing or a new pulley) and shaft encoder (for position sensing). The motor should turn at least three to four turns per inch of backgauge travel. The shaft encoder sprocket should turn between 2 and 4 times per inch of backgauge travel. **MICROCUT** automatically controls power to attain required speeds while driving the backgauge. There are built in power limiting factors so that mechanical damage is not likely to occur in the event that proper lubrication schedules are not followed. Therefore, **MICROCUT** is not intended to correctly drive a machine which is bound. The handwheel should turn easily with one hand. If two hands are required to turn the handwheel the leadscrew, gibbs, and backgauge should be closely inspected and adjustments should be made **BEFORE** operating **MICROCUT**.

MICROCUT IS NOT INTENDED TO CONTROL THE KNIFE OR THE CLAMP ON THE PAPER CUTTER (MILL TRIMMER). ANYTHING DEALING WITH THE CLAMP AND KNIFE IS NOT TO BE TAMPERED WITH OR ADJUSTED TO INSTALL OR OPERATE MICRO CUT. ANY ALTERATIONS TO THE KNIFE OR CLAMP SAFETIES, CIRCUITS, AND OPERATION, OR ANY INSTALLATION TECHNIQUE WHICH COMPROMISES THE SAFETY OF ANYONE WORKING ON OR AROUND THE PAPER CUTTER (MILL TRIMMER) WILL VOID ANY AND ALL WARRANTIES ON MICRO CUT. THIS POLICY ALSO APPLIES TO CASES WHERE MICRO CUT IS INSTALLED ON DIFFERENT TYPES OF EQUIPMENT OR MACHINERY.

MICROCUT CONSISTS OF PARTS AND ASSEMBLIES WHICH ARE ADDED TO THE MACHINE. GUARDING MAY NEED TO BE ALTERED OR ADDED TO OFFER PROPER PROTECTION. THIS MUST BE DONE BEFORE MICRO CUT IS OPERATED. DO NOT 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.

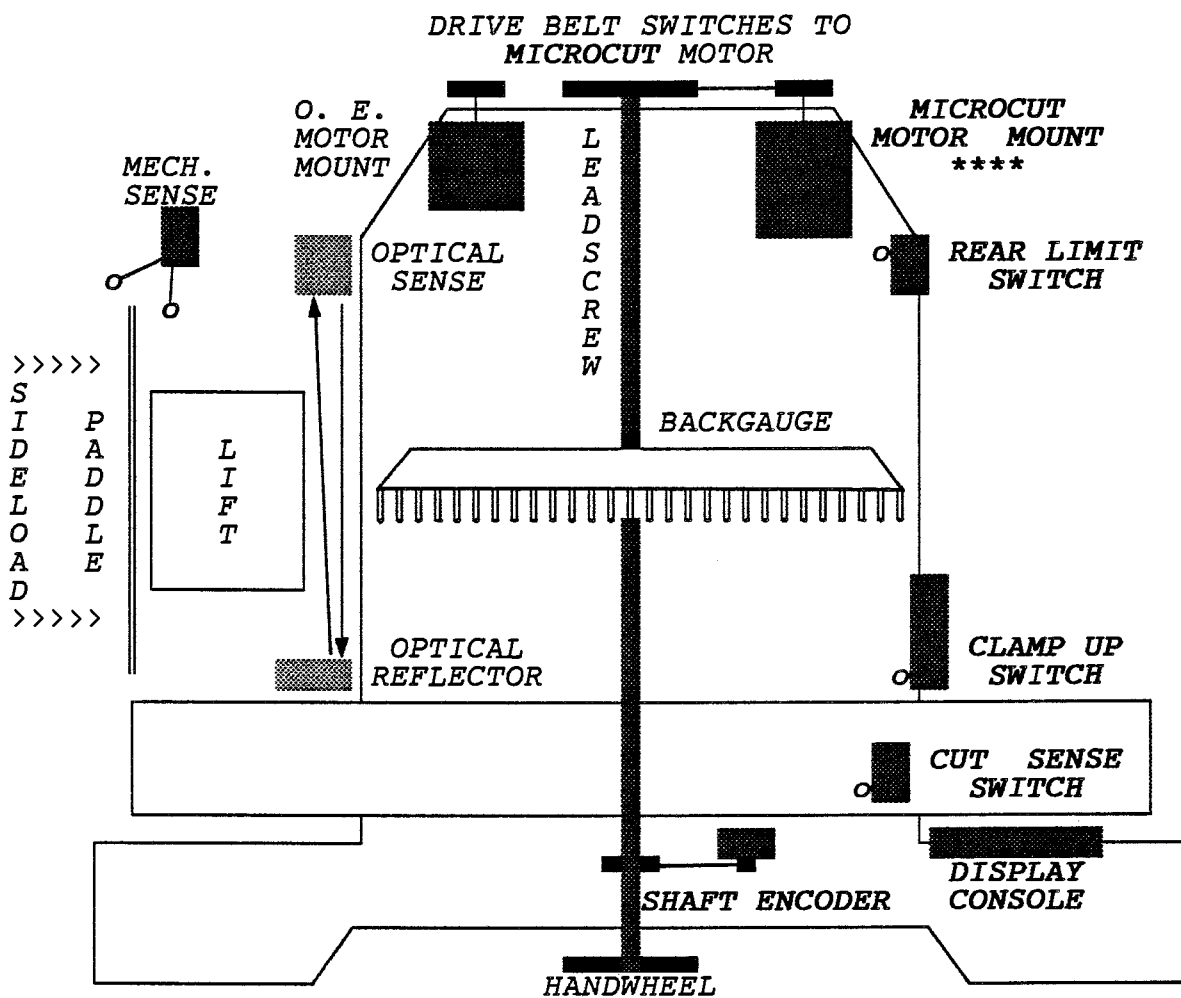
This manual is designed to give a conceptual approach towards installing **MICROCUT**. **MICROCUT** is a retrofit system for many different types of machines. All installations will vary. Use this manual to learn what each component must do. Then mount the component so that it is best suited to fulfill its purpose.

MICROCUT can be installed using a mill spec kit if required. This kit consists of heavier sense switches, conduit, and a small junction box. The junction box, secured with 1/4-20X1/2 socket head cap screws, mounts on the machine within reach of the cables exiting the display console **BEFORE** they split into separate wires. The cables from the display console route into the junction box where they can then be converted to conduit to run to the individual sense switches, motor, and power supply. Refer to the **MILL SPEC** titled switch mounting pages for the mill spec kit. If the mill spec is not used refer to the **NON MILL SPEC** switch mounting pages.

Other options include side loading kits and auxiliary control lines. Refer to specific sections of this manual for further information.

On large machines an extra extension cable to assist routing to the sensing devices may be necessary. **MICROCUT** is designed to allow this additional wire length. Consult Graphics West Micro Systems or your local dealer for assistance.

THE INSTALLATION



NOTE: Position of the parts is for visualization 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 OE SPACE.

DO NOT USE GREASE ON THE LEADSCREW MECHANISM. GREASE ATTRACTS ABRASIVE DIRT AND ACTS AS AN INCONSISTENT CUSHION AGAINST THE BACKGAUGE PREVENTING PROPER CUTTING PRECISION. USE A LIGHT MACHINE OIL ONLY ON THE LEADSCREW. OIL THE LEADSCREW DAILY.

RECOMMENDED TOOL LIST

Every installer will want to modify this list. This is only a guide. The tools are listed in approximate order of use:

FOR DETERMINING ALL MICRO CUT PART DRILLING LOCATIONS

Slide T square
Pencil

FOR PREPARING FOR DRILLING HOLES FOR MOUNTING ALL PARTS

Hammer
Center punch (prick punch)

FOR DRILLING ALL HOLES FOR ALL PARTS AT ONE TIME

Paper and rags to cover machine surfaces
#35, #21, #7, 1/4", 21/64", 3/8" high speed drill bits
Electric hand drill
Extension cord

FOR TAPPING ALL HOLES FOR ALL PARTS AT ONE TIME

6-32, 10-32, 1/4-20, 5/16-18, 3/8-16 spiral taps
Tap handles (ratchet type are nice)
Tapping fluid

FOR CLEANING ALL METAL FILINGS OFF OF THE MACHINE

Brush
Rags

FOR BOLTING AND SECURING ALL MICRO CUT PARTS TO THE MACHINE

7/16, 1/2, 9/16 wrenches and sockets
Allen wrench set (SAE)
Hacksaw for Polar encoder sprocket installations

FOR WIRING THE PARTS

Connector crimpers

FOR CUTTING THE TY STRAPS AFTER ROUTING THE CABLES

Side cut pliers

DRILL BIT	# 35	# 21	# 7	1/4"	21/64"***
TAP SIZE	6-32	10-32	1/4-20	5/16-18	3/8-16

***This drill (according to the charts) should actually be a 5/16" value, but the extra 1/64" makes tapping much easier.

MICROCUT PARTS PACKING LIST

BOX 1 (16X18X15)

LOWER LEVEL

Encoder box with (16X6X6)--

- a) Encoder on plastic swing bracket
- b) Encoder auxiliary bracket (1/4X2X3)
- c) Encoder extension bracket (drilled angle)
- d) Slotted angle bracket
- e) Two 1 foot lengths of nylatron chain
- f) Hardware bag (see next page)

Switch box with (16X6X2)--

- a) Clamp switch (normally open) on long bracket
- b) Cut and position switches (normally closed) on short brackets
WIRED TO FAN OUT CABLE WITH ENCODER CABLE

Power cable with strain relief connector, star nut, yellow wire nuts

Extension cable to attach to fan out cable to sensors

6 feet of spiral wrap

4 feet of V link belt (red power twist)

Variable sheave motor pulley

Small motor pulley

Hardware bags 1, 2, 3, 4 (see next page)

Panavise

2 right angle auxiliary mounting brackets

MIDDLE LEVEL

Microcut display console

UPPER LEVEL

Panavise backing plate

20 large ty straps

Motor mounting plate

Owner's manual

4 pieces of 12 inch 3/8X16 threaded rod

Sprocket set for shaft encoder/leadscrew

BOX 2

Motor--1/2 HP or 1 HP; 90 VDC or 180 VDC

OTHER BOXES

Optional kits such as MILL SPEC, SIDE LOADING, AUX LINES, PRINTER, . . .

CONTINUED ON NEXT PAGE

MICROCUT III HARDWARE BAG LIST**BAG 1--Panavise plate, motor plate and mill spec kit:**

- 12 3/8-16X1 hex bolt--for the panavise plate, motor plate, and mill spec sensing switches
- 20 3/8 lock washers
- 20 3/8 flat washers
- 16 3/8-16 hex nuts--for the all thread contained elsewhere in the packing

BAG 2--panavise, non-mill spec switches, and mill spec junction box:

- 4 1/4-20X1/2 flat head socket screws--for mounting the display panavise
- 6 1/4-20X1/2 socket head cap screws--for the auxiliary angle brackets
- 6 1/4-20X1/2 hex bolts--for the mill spec junction box
- 8 1/4-20X3/4 hex bolts--for the non-mill spec sensing switches
- 8 1/4-20X1 hex bolts--for the non-mill spec sensing switches
- 16 1/4 lock washers
- 16 1/4 flat washers
- 8 1/4-20 hex nuts
- 1 1/4-20X6 threaded rod--for extra mounting possibilities

BAG 3--Motor mounting:

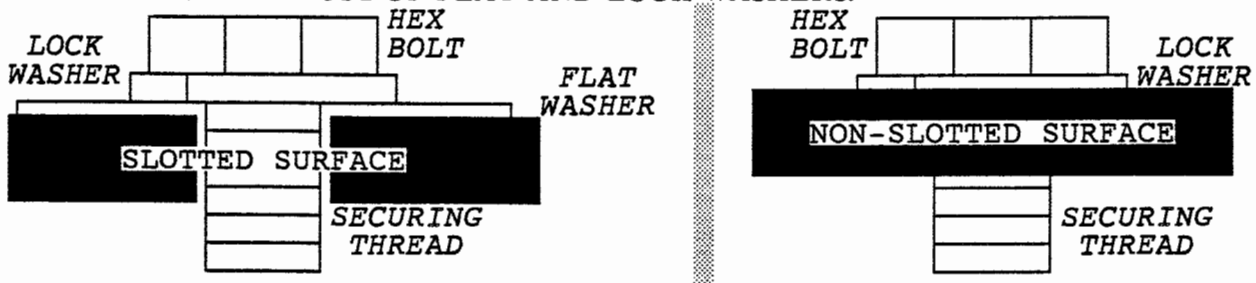
- 5 5/16-18X1 hex bolts--for mounting the motor to the plate
- 5 5/16 lock washers
- 10 5/16 flat washers (extras in case bolts can not protrude through plate)
- 3 Blue insulated female spade connectors--for wiring some motors
- 3 Yellow insulated ring connectors--for wiring some motors
- 3 Yellow wire nuts--for wiring some motors

BAG 4--cable routing hardware:

- 8 6-32X1/2 socket head cap screws
- 8 FPC-6 nylon cable straps
- 8 Adhesive cable routers

ENCODER BAG:

- 2 1/4-20X1/2 socket head cap screws--for mounting the aux plate
- 2 1/4-20X1 hex bolts--for mounting the swing bracket
- 2 1/4 lock washers
- 2 1/4 flat washers
- 2 3/8-16X3/4 hex bolts--for mounting the drilled angle
- 2 3/8-16X1 hex bolts--for mounting the slotted angle
- 4 3/8 lock washers
- 4 3/8 flat washers
- 2 3/8-16 hex nuts
- 1 Hose clamp--for securing the split sprocket

NOTE ON CORRECT USE OF FLAT AND LOCK WASHERS:

MICROCUT INSTALLATION NOTES

The following paragraphs cover most of the installation failures seen to date. Please read them carefully.

- A. **MICROCUT** is a totally redundant system specifically designed to operate independently of a machine's existing controls. The use of existing limit switches, terminal blocks, etc. is expressly forbidden and their use will result in the warranty being voided.
- B. **MICROCUT** automatically controls power to attain required speeds while driving the backgauge. There are built in power limiting factors so that mechanical damage is not likely to occur in the event that proper lubrication schedules are not followed. Therefore, **MICROCUT** is not intended to correctly drive a machine which is bound. The handwheel should turn easily with one hand. If two hands are required to turn the handwheel the leadscrew, gibbs, and backgauge should be closely inspected and adjustments should be made **BEFORE** installation proceeds.
- C. Optimum performance is obtained when the motor is geared for 4 turns for every inch of backgauge drive. A smaller turns ratio causes the motor to be slowed down. Unless the motor is operating at its full speed, **THE BACKGAUGE SPEED WILL NOT BE INCREASED BY DECREASING THE MOTOR TURNS RATIO. THE BACKGAUGE RESISTANCE WILL FORCE THE MOTOR TO RUN OUT OF ITS PREFERRED RPM RANGE. THIS WILL CAUSE EXCESSIVE POWER USE AND MOTOR BRUSH WEAR. AFTER THE MOTOR IS INSTALLED, HAVE SOMEONE TURN THE HANDWHEEL TO MOVE THE BACKGAUGE FORWARD ONE INCH (25MM). WATCH THE MOTOR PULLEY DURING THIS TIME TO COUNT THE NUMBER OF TURNS IT MAKES. IF IT DOES NOT TURN AT LEAST THREE TIMES (PREFERABLY FOUR TIMES) THEN THE MOTOR PULLEY IS TOO LARGE. TO PREVENT EVENTUAL FAILURE, CORRECT THIS SITUATION IMMEDIATELY.**
- D. A variable groove pulley is supplied so that the motor turns ratio (see paragraph C above) can be approximated in most cases. When the pulley is adjusted properly, snug the locking allen set screw to the **FLAT** of the pulley, rock the pulley gently to position the set screw on the center of the flat, then completely tighten it. This will prevent the pulley from self adjusting itself later on down the line. A smaller pulley is supplied with the installation kit in case it is needed to meet the requirements of C above.
- E. **PERFORMANCE**--thick drive belts (B size) slow down positioning. Use an A sectional belt or thinner if possible. Do not overtorque the backgauge gibbs, and if there are nylon glider plugs in the backgauge, make sure they are not tight against the table (there should be at least .002" clearance). Adjustable V-link belt is included in the **MICROCUT** kit to increase the mounting possibilities. This belt can stretch and cause problems after installation. It can also cause "cogging" which results in poor positioning performance. If this belt is used it should be considered temporary only.

DO NOT USE GREASE ON THE LEADSCREW MECHANISM. GREASE ATTRACTS ABRASIVE DIRT AND ACTS AS AN INCONSISTENT CUSHION AGAINST THE BACKGAUGE PREVENTING PROPER CUTTING PRECISION. USE A LIGHT MACHINE OIL ONLY ON THE LEADSCREW. OIL THE LEADSCREW DAILY.

- F. **USE ONE BELT PER PULLEY ONLY. MULTIPLE BELTS ON ANY PULLEY WILL CAUSE VERY SLOW SETTLING.** Adjust the motor drive belt so that it is loose. Some cutters have small bearings and too much tension on the drive belt can eventually cause mechanical problems.

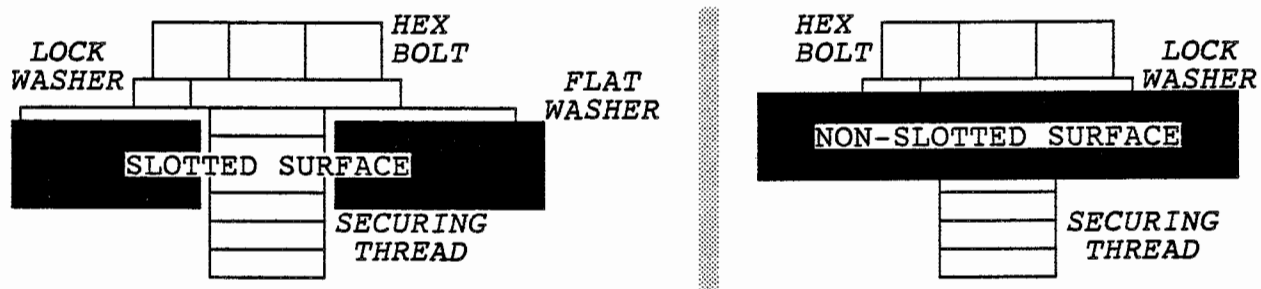
- G. Mount the cut sensing switch so that it is tripped low on the knife bar. If the knife bar is in contact with the switch for too long a period (diagonal motion with respect to the roller) the switch may be stressed. Subsequent breakage could occur (this usually results in a broken spring).
- H. Supply the proper DEDICATED power line. The computer competes against the drive motor for its current. The motor by its very nature is a better competitor. If a transformer is used the minimum size would be a 2 KVA. 5 KVA is better. A transformer DOES NOT imply that the power source is dedicated. Other devices on the same line such as welders, air compressors, drills, or fluorescent lights can require current surges that will deplete the transformer and thus affect MICRO CUT. **Graphics West Micro Systems does not encourage the use of transformers for supplying power to MICRO CUT.** If a good clean line is not available we recommend use of an Islatrol active tracking filter, part number I-130, from:

Control Concepts
 328 Water Street PO Box 1380
 Binghamton, NY USA 13902-1380
 Phone 607-724-2484

- I. The boxes are packed in an order. For instance, all the brackets and hardware for the shaft encoder are supplied in the shaft encoder box. If these parts are not randomly mixed with all of the other parts, their use will be more obvious and installation can progress much more smoothly. There will usually be extra brackets left over. We supply a bracket set that can be used for any combination of mountings. Save any extra brackets for future needs.
- J. The slots in the brackets are designed for use with the supplied hardware (3/8" and 1/4"). Do not use undersized bolts.
- K. The display console should be mounted on a solid part of the cutter. Hollow covers tend to transmit a lot of vibration through the display and to the computers which can cause subsequent failures.
- L. The shaft encoder drive sprocket (on the leadscrew) should be inspected to make sure that the faces line up. As long as the alignment is proper there should not be a problem with chain wear. Usually the clamp can be installed on the leadscrew before the sprocket is slid into position. This makes the installation easier.
- M. A 24 tooth sprocket should be used on the shaft encoder if the leadscrew pitch is less than (or equal to -- this is a rough value) 1/2" (12MM) per turn. For courser leadscrews, a 12 tooth sprocket should be supplied. Verify that the sprocket is proper at the start of the installation. Also check the leadscrew sprocket for proper bore size. **The shaft encoder should make between 2 and 4 revolutions per inch of backgauge movement.**
- N. There is no provision for checking zero set timing on the shaft encoder with respect to the position (rear limit) switch. Generally this is not a problem, but it is possible that MICRO CUT may calibrate one shaft encoder revolution off if the zero set occurs within the position switch trip range (the switch WILL NOT trip at exactly the same place every time). After installation have MICRO CUT calibrate several times. If it does have a timing problem (calibrates off) loosen the shaft encoder swing bracket and remove the chain. Turn the shaft encoder sprocket a quarter turn clockwise and re-tension the assembly. Recalibrate the gauge (refer to OPTIONS in the REFERENCE MANUAL). Repeat the checking procedure. **SEE NOTE ON NEXT PAGE!!!**

NOTE: The position switch is a mechanical device and will not always release at the same place. Also the zero sets from the shaft encoder are referenced to the leadscrew while the position switch is referenced to the backgauge. The backlash will affect the position switch trip point with respect to the leadscrew (and the zero sets). Grease on the leadscrew will act as an hydraulic cushion which will further the variance between the position switch trip point and the zero sets. Use a light oil on the leadscrew to reduce this error and prevent accumulation of dirt which grease tends to attract.

- O. Make sure that all cables and wires are securely tightened BEFORE operating MICRO CUT.
- P. The CALIBRATION & TEST ROUTINE (see the REFERENCE MANUAL) has been simplified. Read the prompting display. It will tell you what to do in order to calibrate MICRO CUT onto its new machine.
- Q. NOTE ON CORRECT USE OF FLAT AND LOCK WASHERS:



Everything safely possible has been done to make the installation of MICRO CUT easy. With proper care, it has been shown that installations can be simple and call backs for repairs and make-rights few.

HINTS

MICROCUT has a built in **DEMONSTRATION MODE** (see the **REFERENCE MANUAL**). Plug the unit into a wall outlet and brief the operator(s) on **MICROCUT**. The operator(s) can use the **OWNER'S MANUAL** to learn how to use **MICROCUT** while the installation is being done.

Determine the **MICROCUT** display console position first. This will position the cables and allow you to plan the wire routing **BEFORE** the other devices are mounted. This may help you route the wiring neatly without need for disconnecting and reconnecting the switches later on (the non mill spec switches are small and often can be fed through the machine if necessary). If the operator is learning **MICROCUT** in the **DEMO** mode, just hang the cables in approximate position--let him keep the display until you absolutely need it (later).

MICROCUT will work best with a motor pulley ratio which allows about one inch (25MM) of backgauge travel for every three to four revolutions of the motor. While **MICROCUT** will automatically self-adapt to different ratios, settling time will be minimized if this ratio is used. Try to choose pulleys accordingly. A thin belt will, in general, allow for faster settling than a thicker belt ("A" groove vs. "B" groove). Leave the original equipment motor drive intact if possible. This will ease the installation of the position switch.

Adjustable V-link belt is included in the **MICROCUT** kit to increase the mounting possibilities. This belt can stretch and cause problems after installation. It can also cause "cogging" which results in poor positioning performance. If this belt is used it should be considered temporary only.

The cut sensing switch should not finish its activation cycle until the knife is past bottom dead center. On some cutters release of the hand switches will return the clamp to the top while leaving the knife at mid stroke. If the cut sensing switch completes its cycle before the knife passes bottom dead center (and assures itself of an uninterrupted completion of cycle) and the hand switches are released, **MICROCUT** may push the paper forward into the blade trying to drive to the next stop value.

Lay out the **ENTIRE** mechanical installation **BEFORE** drilling any holes. Visualize the entire installation to be sure all cables will reach and can be run smoothly.

Remember you are mounting:

1. Position (rear slow down) switch
2. Clamp up switch
3. Cut sensing switch
4. Motor
5. Shaft encoder
6. Display console
7. Possible optional devices

DISPLAY CONSOLE

The display console should mount on the front of the cutter near the operator, but out of the way of his head as he works. Watch the operator work to see if he has a tendency to swing paper to one side or the other during loading and unloading. Also watch to see which side of the cutter he works towards. A ball joint mounting assembly (Panavise) is supplied which can be mounted to the cutter housing. **THIS MUST BE MOUNTED TO A FLAT SURFACE. IF THE SURFACE IS CURVED THE ASSEMBLY MAY BREAK AT THE FLANGES.** Three 1/4-20 holes must be drilled and tapped into the cutter housing (or the 6" x 6" adaptor plate can be used) to mount the ball joint. The display arm which connects to the ball joint can be installed centered or set to the side (two holes are drilled in the top rod to allow this). The display can be positioned as necessary by swinging the ball joint and tilting the yoke assembly. If the socket head cap screws are not loose and force is used to tilt the display the mounting rod may bend at the junction to the cross piece. If this happens the mounting yoke may come loose from the cross piece.

Use the three 1/4-20X1/2" flathead allen screws to secure the Panavise to the cutter or adaptor plate.

Avoid mounting to thin hollow guards which may subject the display console to undue vibration. The 6 inch by 6 inch backing plate is supplied for cases where the cutter housing may require additional strength.

HINT: To insure that the cables can be run correctly, attach the cables (complete with switches if this is a non mill spec kit) and route the wiring on the machine before installing the rest of the MICRO CUT system. If the operator is learning MICRO CUT in the DEMO mode, just hang the cables in approximate position--let him keep the display until you absolutely need it (later).

SHAFT ENCODER

MICROCUT uses a shaft encoder with internal zero set to keep track of backgauge position (refer to the **SERVICE MANUAL** for further information). The shaft encoder is driven off the leadscrew with a sprocket-chain-sprocket arrangement. The sprocket for the leadscrew is split to allow easier attachment to the leadscrew (see **NOTE** below). Use the shaft encoder plates supplied to mount the shaft encoder near an unthreaded part of the leadscrew (all parts for the shaft encoder mounting are packed in the 6" X 16" X 6" box). This can usually be done without any drilling or tapping to the cutter. Play with the brackets a bit before you jump to any conclusions about how to mount the shaft encoder. Clamp the split sprocket to the leadscrew so that it lines up with the shaft encoder sprocket.

MAKE SURE THAT THE SPLIT SPROCKET IS MOUNTED SO THAT THERE IS NO UNDUE STRESS ON THE CHAIN AT THE SPLIT IN THE SPROCKET HALVES.

12 or 24 tooth sprockets can be supplied for the encoder. The encoder should make between 2 and 4 turns per inch (2.5cm, 25mm, 1 sun) of backgauge movement. Use the correct encoder sprocket to allow for this. If the encoder does not turn fast enough, position resolution will be sacrificed and drive performance will suffer. If the encoder turns too fast maximum high speed drive will be reduced. If the encoder turns more than 8.3 turns per unit value (inch, cm, or sun) then **MICROCUT** will not be able to display the current position correctly. Measure and break the drive chain to length. Install it to the sprockets. Take up any slack with the shaft encoder swing mounting bracket.

There is no provision for checking zero set timing on the shaft encoder with respect to the position (rear limit) switch. Generally this is not a problem, but it is possible that **MICROCUT** may calibrate one shaft encoder revolution off if the zero set occurs within the position switch trip range (the switch **WILL NOT** trip at exactly the same place every time). After installation have **MICROCUT** calibrate several times. If it does have a timing problem (calibrates off) loosen the shaft encoder swing bracket and remove the chain. Turn the shaft encoder sprocket a quarter turn clockwise and re-tension the assembly. Recalibrate the gauge (refer to **OPTIONS** in the **REFERENCE MANUAL**). Repeat the checking procedure.

NOTE: This is not always the case. Some Polars require that the sprocket be mounted to an extension rod off of the back of the leadscrew (the 3/8-16 threaded rod works beautifully for this purpose - replace the existing bolt or rod) and the sprocket need not be split. Use 2 nuts with a lock washer between to lock the sprocket in place. Cut the extra threaded rod with a hacksaw and file off any rough edges.

MOTOR MOUNTING

In general it is best to mount the **MICROCUT** 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. Note that this way only one drive system can be attached to the leadscrew at a time. This prevents the possibility of one system fighting the other. In cases where an additional pulley has been added it will be necessary to electrically defeat (fuses) or mechanically defeat (belts or gears) the OE (original equipment) drive system (excluding the case of a non-power backgauge). A variety of bolts and threaded rods are supplied to mount the motor plate (9" X 12" plate packed at the top of the box) so that the motor pulley will line up properly when installed. Mount the motor to the plate with four 5/16-18X1" bolts with lock and flat washers. Use the appropriate pulley and OE belt (if possible) to attach the **MICROCUT** motor to the backgauge drive. The motor should turn at least 3 times per one inch (25MM) of backgauge movement but preferably less than 6 times.

Adjustable V-link belt is included in the **MICROCUT** kit to increase the mounting possibilities. This belt can stretch and cause problems after installation. It can also cause "cogging" which may result in poor positioning performance. If this belt is used it should be considered temporary only. **The link belt is supplied to assist in proper belt sizing so that a single belt can be purchased to finalize the installation rather than several belts of approximate lengths.**

NOTE: On Lawson Pacemaker II's it will be necessary to lock the high speed clutch on. One method is to pull the cover plate off of the O.E. drive control switch panel and jumper the wires on the reverse switch to lock the high speed clutch on. It will be necessary to mount the **MICROCUT** rear limit switch so that it trips at least three inches before the rear of the table to prevent the O.E. limit from negating the high speed clutch. Key in a maximum rear value of less than the O.E. rear limit position at the **CALIBRATION & TEST ROUTINE** (see the **REFERENCE MANUAL**). This method will negate **MICROCUT**'s ability to drive with the clamp in the down position. This could result in the backgauge coasting into the clamp if the clamp is lowered during high speed forward drive. It may preferred to mechanically lock the clutch on or use different electrical locking methods.

NOTE: Polar cutters (and others) require that the backgauge brake be disabled to allow motor drive. This can be done (on the Polar) by removing the two wires that exit to the brake from the junction box under the rear of the cutter table.

NOTE: On small machines, space limitations make it very difficult to mount an extra motor to the leadscrew. Sometimes it is better to mount the **MICROCUT** motor in place of the OE motor. **If the OE motor is removed, mark the wires carefully in case the motor is needed in the future. Tape the wires and tie them off so that no one can be injured by them. Use one of the plastic hardware bags from the **MICROCUT** kit for any nuts and bolts from the OE motor mounting. Tape this onto the motor so that the hardware will not be lost.**

NON MILL SPEC POSITION (REAR SLOW DOWN) SWITCH

SKIP THIS PAGE IF THE MILL SPEC KIT IS BEING INSTALLED

The position switch acts as a course reference for the computer to calibrate itself to the cutter table. At start up the computer drives the backgauge to the back of the table in slow speed until the switch is tripped. It then drives until the next zero reference is seen from the shaft encoder (attached to the leadscrew). This becomes the computer's calibration point. These switches are wired normally closed at the factory.

The position switch is labeled **RLS** (rear limit switch) on the cable.

Move the backgauge to its rearmost position. Mount the position switch assembly to the table so that it will be tripped by the backgauge at least one inch before this point, but will not be damaged if the backgauge is moved all the way to the extreme rear and then forward (**ONCE THE SWITCH HAS BEEN TRIPPED IT MUST REMAIN TRIPPED FOR THE FULL TRAVEL OF THE BACKGAUGE TO THE PHYSICAL REAR LIMIT**). Use appropriate hardware and check alignment carefully.

Two small angle brackets are included with the **MICROCUT** kit. One of these can be used to mount the **POSITION SWITCH** onto the side of the table (etc.). The purpose of these spare brackets is to allow greater mounting flexibility. Use them as best seen fit.

NOTE: The position switch is a mechanical device and will not always release at the same place. Also the zero sets from the shaft encoder are referenced to the leadscrew while the position switch is referenced to the backgauge. The backlash will affect the position switch trip point with respect to the leadscrew (and the zero sets). Grease on the leadscrew will act as an hydraulic cushion which will further the variance between the position switch trip point and the zero sets. Use a light oil on the leadscrew to reduce this error and prevent accumulation of dirt which grease tends to attract. There is no provision for checking zero set timing on the shaft encoder with respect to the position (rear limit) switch. Generally this is not a problem, but it is possible that **MICROCUT** may calibrate one shaft encoder revolution off if the zero set occurs within the position switch trip range (the switch **WILL NOT** trip at exactly the same place every time). After installation have **MICROCUT** calibrate several times. If it does have a timing problem (calibrates off) loosen the shaft encoder swing bracket and remove the chain. Turn the shaft encoder sprocket a quarter turn clockwise and re-tension the assembly. Recalibrate the gauge (refer to **OPTIONS** in the **REFERENCE MANUAL**). Repeat the checking procedure.

MILL SPEC LIMIT SWITCHES

SKIP THIS PAGE UNLESS THE MILL SPEC KIT IS BEING INSTALLED

The limit switches have yoke lever arms and slotted angle mounting brackets. They are tripped by the aluminum rod (with mounting base). An extension plate (3" X 8") is included for the rear limit if required.

Move the backgauge to a few inches in front of its rearmost position. Mount the rear limit switch assembly (both switches are identical and, thus, interchangeable) to the side gauge of the table so that it will be tripped at least three inches from the rearmost position of the backgauge (see TRIP ROD NOTE below). An extension plate is provided in the event that the sidegauge is not long enough (washers may be required to space the switch out or in so that it aligns with the front limit switch). Mount the front limit switch assembly so that it is tripped at least two inches before the backgauge contacts the false paper clamp (front mechanical limit with the metal plate attached to the bottom of the clamp--some clamps do not have a false paper clamp--refer to the GLOSSARY). Check alignment carefully.

The backgauge can travel beyond these high speed limit switches with reduced power only. Do not mount the switches too far from the table ends or a large amount of slow speed will occur. Do not mount the switches too near the ends or the coast required to stop the backgauge on the limit switch (should a runaway condition ever occur) will cause a collision. **MICROCUT contains multiple back ups to prevent runaway conditions. Several failures have to occur simultaneously in their odd failure mode to allow a runaway condition. Any computer controlled drive system can fail this way no matter how many safeties are incorporated. MICROCUT uses mechanical limit switches as an ultimate safeguard. They must be installed properly if they are to be of any consequence.**

TRIP ROD NOTE: Mount the switches on the same side of the table as the junction box. The switches are tripped by the trip rod assembly which can be mounted to the backgauge with the two 1/4-20 bolts and flat washers supplied. The slot allows the rod to be slid towards (or away from) the limit switches for proper alignment. If there is not room for the slotted plate, the rod can be removed from the plate and mounted directly to the backgauge by its 3/8-16 threaded end. In this case care must be taken to avoid breakage of the aluminum rod as it is tightened into the backgauge (a common problem since the drilled hole will probably not be exactly perpendicular to the surface). The mounting should be well in back of the fingers to avoid clamp interference. Cut the trip rod to length after operation of the switches has been checked and confirmed.

NOTE: The position switch is a mechanical device and will not always release at the same place. Also the zero sets from the shaft encoder are referenced to the leadscrew while the position switch is referenced to the backgauge. The backlash will affect the position switch trip point with respect to the leadscrew (and the zero sets). Grease on the leadscrew will act as an hydraulic cushion which will further the variance between the position switch trip point and the zero sets. Use a light oil on the leadscrew to reduce this error and prevent accumulation of dirt which grease tends to attract. There is no provision for checking zero set timing on the shaft encoder with respect to the position (rear limit) switch. Generally this is not a problem, but it is possible that **MICROCUT** may calibrate one shaft encoder revolution off if the zero set occurs within the position switch trip range (the switch **WILL NOT** trip at exactly the same place every time). After installation have **MICROCUT** calibrate several times. If it does have a timing problem (calibrates off) loosen the shaft encoder swing bracket and remove the chain. Turn the shaft encoder sprocket a quarter turn clockwise and re-tension the assembly. Recalibrate the gauge (refer to **OPTIONS** in the **REFERENCE MANUAL**). Repeat the checking procedure.

NON MILL SPEC CLAMP UP SWITCH

SKIP THIS PAGE IF THE MILL SPEC KIT IS BEING INSTALLED

The clamp up switch disables drive whenever the clamp is NOT in its full up position. This switch is wired normally open at the factory (tripped closed by the clamp).

The clamp sense switch is labeled CUS on the cable.

Use one or two 1/4-20 X 1" bolts with lock and flat washers to mount this switch so that it is tripped only when the clamp is in its full up position. Note that some clamps suffer a certain amount of hydraulic sag. Adjust the switch to be tripped a bit low in these cases.

Method 1:

Drill and tap at least one 1/4-20 threaded hole to mount the clamp sensing switch to one of the cutter's side gauges so that it angles towards the top of the clamp. Adjust the switch so that it is tripped only when the clamp is in its full up position. The switch can be mounted to either side of its bracket so that it lines up with a solid trip point on the clamp.

Method 2:

In some cases the switch may be tripped off of one of the gib bolts. Be careful to check that the switch will not be damaged by other bolts as the clamp is brought down.

Method 3:

In other cases it may be easier to mount the switch to the back of the cutter housing so that it hangs down to (or across to) the clamp.

Method 4:

One of the small angle brackets included with the MICRO CUT kit, can be used as a trip plate (mounted to some part of the clamp). One of these brackets could also be used for mounting the clamp switch itself if beneficial.

MILL SPEC CLAMP UP SWITCH

SKIP THIS PAGE UNLESS THE MILL SPEC KIT IS BEING INSTALLED

Either one of the roller arm switches on the long slotted brackets can be used for the CLAMP UP SENSE.

Use one or two 3/8-16 X 5/8" bolts with lock and flat washers to mount this switch so that it is tripped (or released) only when the clamp is in its full up position. Note that some clamps suffer a certain amount of hydraulic sag. Adjust the switch to be tripped a bit low in these cases. Mount the switch to the junction box side of the cutter if possible. This will reduce the amount of sealtite to be strung later in the installation. Some bending of the bracket may be necessary for some mounting configurations (make a cut along the bent edges to do this). Alternatively the 3/8-16 X 12" threaded rod may be cut to length to space the switch out to meet the clamp. A 2" X 2" X 2" angle piece is included to be used as a trip plate if needed. This can be mounted with one or two 1/4-20 X 1/2" bolt(s) with lockwasher(s).

DO NOT USE THE SPRING LEVER ARM FOR THE CLAMP SWITCH. THE SPRING IS TOO LONG TO GIVE THE SWITCH ADEQUATE RESPONSE SENSITIVITY TO THE CLAMP. THE SPRING IS SUPPLIED FOR GREATER FLEXIBILITY IN MOUNTING THE CUT SENSING SWITCH ONLY.

NOTE: It may be helpful to plan the SHAFT ENCODER mounting first. There will usually be a spare right angle bracket which may be useful when mounting the CLAMP UP SWITCH in certain instances.

NON MILL SPEC CUT SENSING SWITCH

SKIP THIS PAGE IF THE MILL SPEC KIT IS BEING INSTALLED

DO NOT INTERFERE WITH ANY PART OF THE ORIGINAL EQUIPMENT KNIFE CIRCUIT. ANY ALTERATION TO EITHER THE KNIFE OR CLAMP CIRCUITS, SAFETIES AND MECHANISMS IS EXPRESSLY FORBIDDEN.

The cut sensing switch is used by the computer to determine when to "mark" a cut in program mode, or to advance to the next cut in auto mode. It is tripped by the linkage of the knife and should in no way affect the operation of the knife itself. Changing the knife will be the same as it was before MICRO CUT was installed. This switch is wired normally closed at the factory. The cut sense switch is labeled CUT on the cable.

Mount the switch to the side of the cutter housing throat opening in front of the knife bar with one or two 1/4-20 hex bolts (drilling and tapping required) so that it is not tripped when the knife is in its up position, but does trip when it is down. Be careful to align the switch so that it rides along a smooth portion of the knife bar and will not snag (and break) on any of the knife bolt holes.

MOUNT THE SWITCH SO THAT IT IS TRIPPED JUST BEFORE THE KNIFE REACHES THE BOTTOM OF ITS STROKE. IF THE KNIFE BAR RUBS DIAGONALLY ACROSS THE SWITCH ROLLER FOR TOO LONG UNDUE STRESS WILL BE PLACED ON THE SWITCH WITH RESULTANT SUBSEQUENT FAILURE.

NOTE: On most cutters the above procedure works very well. However, the cut switch may be mounted anywhere on the cutter. It is only important that the mounting allows the switch to cycle from ON (**see below) to OFF and back to ON during the knife cycle. Ideally the cycle back to ON will not occur before the knife is committed to its upstroke since on some cutters the clamp and knife are controlled by the same valve and release of the knife buttons releases the clamp (to the top) while the knife stays down; if the cut sense switch completes its cycle on the downstroke and the knife buttons are released before the upstroke, MICRO CUT could push the stock into the back of the knife trying to advance to the next stop.

***ON means the switch conducts current. OFF means the switch does not conduct current. The switch has both normally open and normally closed contacts to increase mounting possibilities.

MILL SPEC CUT SENSING SWITCH

SKIP THIS PAGE UNLESS THE MILL SPEC KIT IS BEING INSTALLED

DO NOT INTERFERE WITH ANY PART OF THE ORIGINAL EQUIPMENT KNIFE CIRCUIT. ANY ALTERATION TO EITHER THE KNIFE OR CLAMP CIRCUITS, SAFETIES AND MECHANISMS IS EXPRESSLY FORBIDDEN.

Either one of the roller arm switches on the long slotted brackets can be used for the CUT SENSE. There is a spring lever arm included which can be used to trip the cut sensing switch for certain mounting applications.

Use one or two 3/8-16 X 5/8" bolts with lock and flat washers to mount this switch so that it cycles (on-off-on or off-on-off--see *** below) during the knife stroke. **DO NOT INTERFERE WITH ANY PART OF THE ORIGINAL EQUIPMENT KNIFE CIRCUIT--IF THE SWITCH IS MOUNTED NEAR THE KNIFE CAM MAKE SURE THAT THE O.E. SWITCHES ALREADY MOUNTED ON THE CAM ARE WELL CLEAR OF THE MICRO CUT SENSING SWITCH.** If part of the knife linkage is used, check for impact on the switch during knife cycling which could cause fatigue. If the linkage is adjustable (for varied knife lengths), verify that the switch will function for all adjustments. Make sure that the switch does not return to its normal (knife up) position until the knife is well past bottom dead center (see NOTE below). Make sure that the switch will not be stressed or broken if the knife is cycled in the reverse direction (as could happen during a knife change). A spring lever arm is supplied as well as a roller arm to increase the mounting possibilities. **IF THE SPRING LEVER ARM IS USED, MAKE SURE THAT IT IS NOT STRESSED TO THE POINT THAT IT WILL SNAP BACK AND RE-TRIP THE SWITCH WHEN IT IS FINALLY RELEASED. THIS WOULD CAUSE INTERMITTENT DOUBLE MARKING OF CUTS DURING PROGRAMMING.**

NOTE: The cut switch may be mounted anywhere on the cutter. It is only important that the mounting allows the switch to cycle from ON(see *** below) to OFF and back to ON during the knife cycle. Ideally the cycle back to ON will not occur before the knife is committed to its upstroke--on some cutters the clamp and knife are controlled by the same valve and release of the knife buttons releases the clamp (to the top) while the knife stays down; if the cut sense switch completes its cycle on the downstroke and the knife buttons are released before the upstroke, MICRO CUT could push the stock into the back of the knife trying to advance to the next stop.

*** OFF means the switch does not conduct current. ON means the switch conducts current. The switch has both normally open and normally closed contacts to increase mounting possibilities.

OPTIONAL SIDE LOADING KIT

MICROCUT can be ordered with a side loading kit if stock is loaded from the rear of the machine. This kit consists of a snap lock switch with yoke lever arm, an optical sense switch, two extra cables to attach to the fan out cable (one for each switch), various brackets, and hardware. Refer to the section **THE INSTALLATION** in this manual for approximate mounting positions of these sense switches.

***MICROCUT** requires that at least one of these switches be installed for **AUTO ADVANCE AFTER SIDE LOAD** to be operable. If side loading is performed the **OPTICAL SENSE** should always be installed to avoid stock from jamming between the backgauge and the machine housing. If both switches are installed **MICROCUT** will give dominance to the mechanical sense during the side load/auto advance routine. **MICROCUT** is designed to allow **AUTO ADVANCE** operation on paddle operated or conveyor belt loading systems.*

MECHANICAL PADDLE SENSE--

This mechanical sense allows **MICROCUT** to know when to advance the gauge after the stock has been loaded. Use the brackets and hardware supplied to mount the mechanical switch in a way that will cause it to be tripped in one direction during loading and tripped back "normal" after the load is complete. The switch should not trip back to the "non-loading" position until the paddle has cleared **BOTH** the backgauge/stock path **AND** the optical sense switch. Operation will be slowed down if the switch is not tripped back quickly enough after the paddle clears these devices. Wire the "MECH. PADDLE" cable to this switch so that it conducts when the paddle is in its "non-loading" position. Plug the other end of the cable into pins 19 and 20 of the fan out cable (refer to **WIRING AND CABLES**).

OPTICAL PADDLE SENSE--

This optical sense prevents gauge drive if anything is across the loading entrance on the cutter. It will prevent the gauge from jamming partially loaded stock into the back of the machine. It must be mounted close enough to the table surface to sense a small lift of stock. Use the brackets and hardware supplied to mount the optical sense so that it faces across the loading area of the machine. Mount the reflector on the opposite side of this area so that any stock which does not load completely will block the light path. Plug the optical sense power line into a convenient 110VAC source (preferably a line which is switched on and off with the paper cutter). Adjust the switch (and reflector) so that the red indicator light on the top of the sense is on. Set the alarm selector switch to **INSTANT**. Remove the **INTERNAL ALARM JUMPER** to prevent the alarm from sounding every time stock is loaded. Wire the "OPTICAL SENSE" cable to so that it conducts when there is nothing in the way of the light beam (through the normally closed contacts "held" closed by the light beam). Plug the other end of the cable into pins 21 and 22 of the fan out cable (refer to **WIRING AND CABLES**).

NOTE: Many customers prefer to supply their own optical switch which is compatible with others currently used in their plant. **MICROCUT** supplies a 5 volt DC signal to the optical switch. The light source for the optical sense needs to be supplied from an alternative power source. The 5 volt signal from **MICROCUT** should pass through the low resistance switch contacts **ONLY WHEN THE LIGHT SOURCE IS NOT INTERRUPTED**.

OPTIONAL CONTROL LINES--DEFINITION

MICROCUT contains three control lines which can be used to activate added relays (12VDC coils requiring no more than 300 ma). Mount the relay(s) inside the original equipment control panel. The contacts can then be wired to control various operations on the machine.

To use the control line(s), it is necessary to attach an additional cable to the main connector of the fan out cable. Route this cable to the added relay(s) which was (were) mounted inside the original equipment control panel. Attach the wires to the 12 VDC relay coil(s) according to the designations:

- Pin 15--Shield for cable (no connection inside OE panel)
- Pin 23--To ground side of the AIR CONTROL relay coil
- Pin 24--To ground side of the AUX CONTROL relay coil
- Pin 25--To ground side of the BRAKE CONTROL relay coil
- Pin 26--12 Volts DC for relay coil(s)

A separate 1N4004 snubbing diode should be placed across each relay coil with the cathode (striped end) facing the 12 volt line. WAGO socket assemblies with PC board supplied by Graphics West Micro Systems for some **OPTIONAL CONTROL LINE** kits already have this diode on the socket. If this is the case it is important that the positive 12 volt line (pin 26) be connected to the cathode (striped end)--see bottom of page.

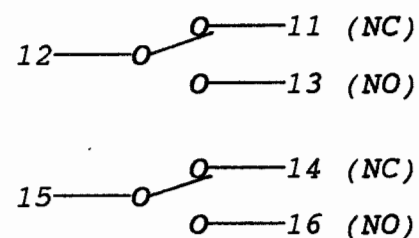
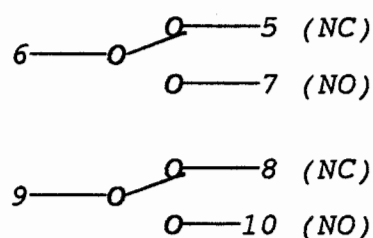
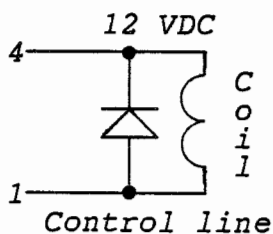
LINE DEFINITIONS:

AIR CONTROL--activates a relay (to disable the air table) whenever **MICROCUT** is commanding high speed **AUTOMATIC** forward drive.

AUX CONTROL--activates a relay only in **AUTOMATIC** mode when the *****CUT READY***** indicator is on AND the last move request was by the **CUT SENSE** switch AND **MICROCUT** has not seen an **EJECT, JOG/LOAD, REVERSE DRIVE REQUIREMENT, KEY HIT, or END OF JOB**. This is used for certain operations ONLY on ORIGINAL EQUIPMENT machines when **MICROCUT** is installed by the manufacturer of those machines. The relay will release **AS SOON AS** the cut sense switch completes its cycle.

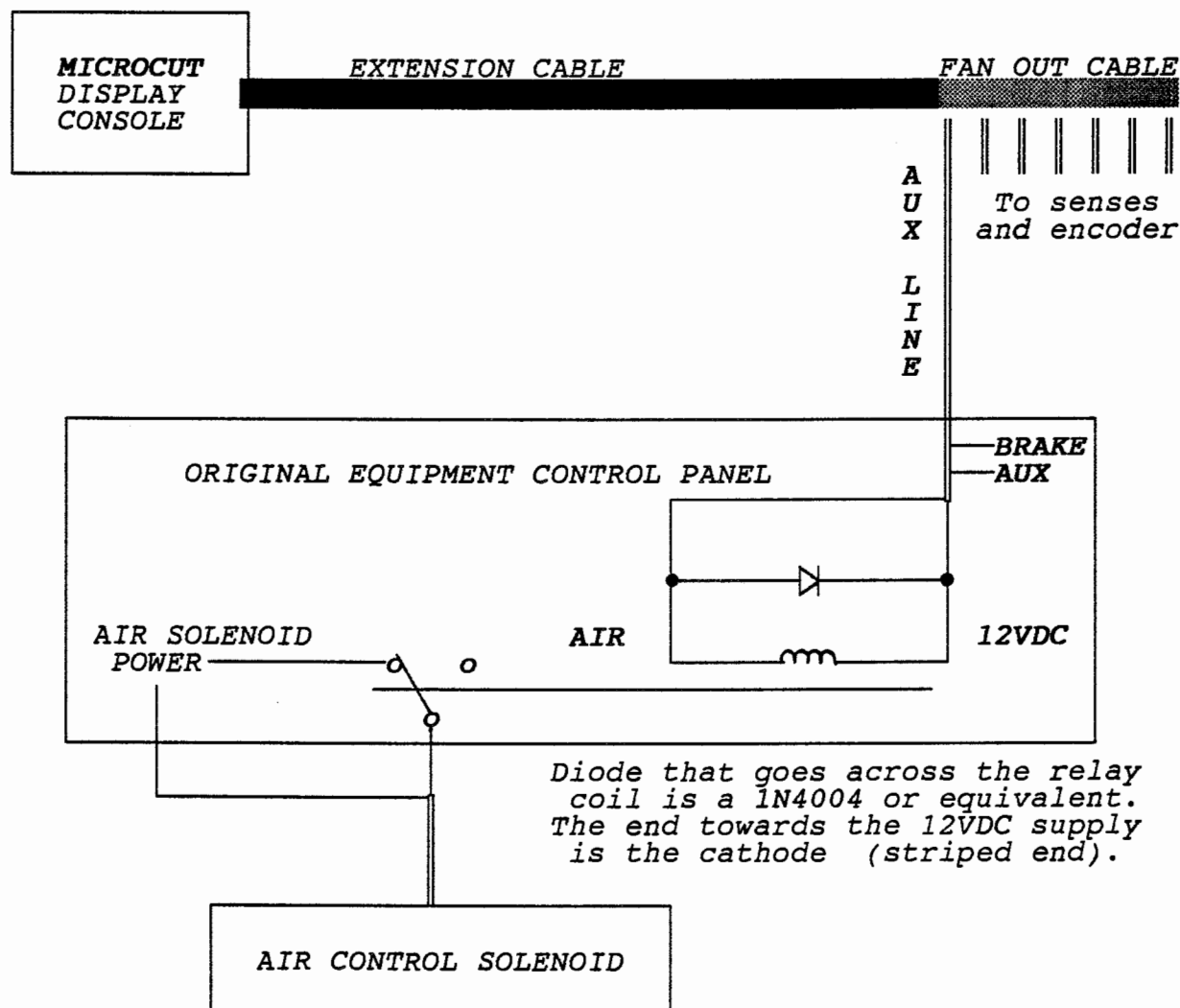
BRAKE CONTROL--activates a relay **only when backgauge drive is requested**. If this line is used to control a relay coil the relay will relax to operate an OE electric backgauge brake (through the normally closed contacts of the relay) whenever drive is not being requested. A bypass switch on the brake line may be desired to allow the operator to move the gauge by hand.

Relay pin numbering for Wago DIN rail mounted systems



OPTIONAL CONTROL LINES--WIRING EXAMPLE

An additional cable (4 conductor shielded) needs to be installed to the fan out cable according to the pin numbering supplied in the WIRING AND CABLES section of this manual (also supplied on the previous page). The following example shows installation of the AIR CONTROL line only. The normally open contacts may need to be used on some machines depending upon individual requirements. Tape any unused wires from the control cable so that they will not short to anything. Since the control occurs through the relay contacts (which are isolated from the MICRO CUT lines) it does not matter what type of electrical power is used in the control application so long as it does not exceed the ratings of the relay being used. MICRO CUT controls the relay coil. The relay contacts are wired to control the auxiliary function.



WIRING AND CABLES

REFER TO NEXT PAGE IF THE MILL SPEC KIT IS INSTALLED.

Route all cables from the display console. Use the 5 foot extension cable (connectors at each end) from the display console to connect to the fan out. This will allow the fan out to occur at the back of the housing (under the table) out of view. Snake the cables through the cutter so that they are out of harm's way (and hopefully out of sight). Be careful of moving parts (clamp, knife, motors, belts, etc.). Tie any excess with the tie straps supplied.

NOTE: Some installers prefer to cut the cabling to length. This is not recommended since it may make it more difficult to move MICRO CUT to another machine in the future.

NOTE: Keep the cables out of dirt, grease and contaminants. Plug the cables in and out several times to clean any dirt or corrosion. **CONNECTIONS ARE THE LARGEST SINGLE FAILURE POINT. MAKE SURE THE CABLES AND CONNECTORS STAY CLEAN. BE SURE THAT THE CABLES ARE PLUGGED IN ALL THE WAY.** The power cable must "click lock" into position to insure proper connection. Plastic versions may need some assistance.

The cables are designated as:

POWER CABLE (electrical power in and motor power current loop)
AC+ (black), AC- (white), earth (green), motor (blue), motor (yellow)

NOTE: The earth is absolutely required for proper filter operation on the computer power supply. **If this is not supplied problems may occur.** MICRO CUT is designed so that the earth connects only to the power supply filter (for a noise "dump") and to the console end of the cable shields (shields **MUST** be single ended to avoid current carrying ground loops--do not terminate the shields at the sensing end). The earth does not connect to the machine. If installed properly, there is no concern of creating ground loops when installing MICRO CUT. The electrician should realize that conduit does not supply an adequate ground--use a separate ground wire from the electrical panel.

EXTENSION AND FAN OUT/SENSE CABLE (for switches, encoder, and auxiliary lines)

1	Cut sense return	2	Cut sense out (5VDC)
3	Rear limit return	4	Rear limit out
5	Clamp sense out (5 VDC)	6	Clamp sense return
7	Front limit out	8	Front limit return
9	Encoder signal ground	10	Shields for cables
11	Encoder A signal	12	Encoder B signal
13	Encoder 5 VDC	14	Encoder zero reference
15	Shield for aux lines	16	Shield for side loading
17	Extra sense return	18	Extra sense out (5 VDC)
19	Mech. load return	20	Mech. load out (5 VDC)
21	Optical sense return	22	Optical sense out (5V)
23	Air control	24	Auxiliary control
25	Brake control	26	Control relay 12VDC

27 to 37 Open

The front limit switch is optional. Due to mounting difficulties it is supplied with the mill spec kit only. The wires for the front limit switch should be shorted together (with a wire nut) if the mill spec kit is not used.

SEE THE BOTTOM HALF OF THE NEXT PAGE FOR THE CORRECT
WIRING STATUS OF THE VARIOUS DEVICES.

WIRING THE MILL SPEC KIT

SKIP THE TOP HALF OF THIS PAGE UNLESS THE MILL SPEC KIT IS BEING INSTALLED

Use 1/4-20 bolts to mount the **MICROCUT** junction box on the back side of the cutter housing within reach of the cables from the back of the display console.

Run the 5 foot extension cable (with connectors at each end) into the top (largest) hole in the box and screw the fan out (sense) cable to it (refer to previous page for pin designations of the fan out/sense cable). Use the conduit connectors and conduit to run the appropriate wires to the appropriate devices (see table below). The encoder cable should be run through the slotted hole at the bottom of the box. Leave the excess cable coiled in the junction box as you do the wiring. Some installers prefer to cut the cabling to length. This is not recommended since it may make it more difficult to move **MICROCUT** to another machine in the future.

Use a flex connector to route the motor cable into the junction box. Use a conduit connector and conduit to route it to the motor. Use the supplied connectors to attach it to the motor (polarity will be determined later). Leave the excess cable coiled in the junction box or cut each cable to length as you do the wiring.

Either plug the power cable directly into the power source (outlet) or cut the plug off and use a flex connector to route it into the junction box. Use a conduit connector and conduit to route it to the power source. Wire it to the source according to the color designations on the next page.

Replace extra conduit connectors at the junction box with the hole plugs.

<u>DESIGNATION</u>	<u>TO DEVICE</u>	<u>WIRED</u>
RLS	Position (rear limit) switch	NC
FLS	Optional front limit switch	NC
CUS	Clamp up switch	NO held closed
CUT	Cut switch	NC
MECH. PADDLE	Mechanical load sense	NC
OPTICAL SENSE	Light switch on side load throat	NC with light
MOTOR	DC backgauge drive motor	See previous page
POWER	AC power supply	See next page

NC=normally closed NO=normally open

The front limit switch is optional. Due to mounting difficulties it is supplied with the mill spec kit only. The wires for the front limit switch should be shorted together (with a wire nut) if the mill spec kit is not used.

<u>AUX CONTROL</u>	<u>Additional relays for control</u>
12VDC	12 volt power side of all added control relay coils
AIR CONTROL	Ground side of air control relay coil
BRAKE	Ground side of brake control relay coil
AUX	Ground side of auxiliary control relay coil

ELECTRICAL POWER

The power for MICRO CUT should be from a DEDICATED breaker. 110VAC operation requires a 90VDC motor. 220VAC requires a 180VDC motor. Check the motor rating BEFORE supplying the power. Make sure that the selector switch (accessed through the plugged hole in the back of the console on units without AUTO SENSING supplies) is set to the proper voltage--if no switch exists (auto sensing supplies) then continue on.

The customer should be responsible for supplying an outlet near the machine that MICRO CUT can be plugged in to (read the rest of the page). The power lines for MICRO CUT should be run in their own conduit. Other lines contained in the same conduit can affect the power supplies and computers in MICRO CUT.

Tie the power cord from the display console (with the tie straps provided) so that it has adequate strain relief and will not snag on anything. If the power cord plug can not be used, then cut it off and wire to an appropriate plug or power supply. The color coding of the cable is:

BLACK--AC+ WHITE--AC- (neutral) GREEN--earth ground

Some machines may be connected to the power panels using the conduit as an earth ground. While this method of grounding is accepted in many areas, the connections between pieces of conduit can corrode causing the ground connection to be inadequate. It is strongly advised that a separate earth ground wire be run to the machine (operator safety will be compromised otherwise). This ground is essential when cutting plastic or other static prone material to prevent power surges through the MICRO CUT cables which can cause seizures (which require restarting the unit). The MICRO CUT earth ground connects ONLY to the shields on the signal cables (and console) and to the computer power supply (this ground is essential for proper filtering and protection of the power supply and computer--if earth is not available then attach this to the neutral line feeding the power). The MICRO CUT earth ground will not supply a connection to the cutter, can not be used as a substitute for the machine ground, nor will it cause a ground loop condition.

AN UNCLEAN POWER LINE WILL SEND SPIKES INTO THE COMPUTER AND ITS SURROUNDING CIRCUITRY. WHILE MICRO CUT IS DESIGNED AS BEST AS POSSIBLE TO OVERCOME THESE SPIKES, IN TIME THE SPIKES WILL BEAT THE CIRCUITRY TO DEATH AND FAILURE WILL OCCUR. THE CLEANER THE POWER, THE LONGER MICRO CUT WILL WORK RELIABLY. START FROM THE BEGINNING WITH A GOOD CLEAN POWER LINE. DO NOT WAIT FOR PROBLEMS.

The cleaner the power the better. Transformers do not insure good power. Other devices on the same line as the transformer can cause problems. Transformers tend to let the spikes commonly found on "dirty" power lines through to do damage to the computer. Transformers also act as large inductors, so that when the motor starts or stops the computer sees large voltage swings. If a transformer must be used it should be well oversized (5 KVA or larger preferred). Graphics West Micro Systems does not encourage the use of transformers for supplying power to MICRO CUT.

POWER CONSUMPTION--for calculating feed wire gauge

COMPUTER--30 watts. DRIVE--up to 3000 watts during acceleration and deceleration. Standard power draw should be within the specifications of the steady state current shown on the motor identification plate. If the power requirement (from current/voltage readings) is greater than this a full mechanical and electrical inspection should be made.

NOTE: The time duration for motor overpower (from the feed line) is such that a standard current rated breaker should not trip off.

FINAL CALIBRATION, TEST, AND CHECKOUT

1. Use the tie straps, mounting loops (with 6-32X1/2" allen screws), and the adhesive backed cable routers to secure all cabling.
2. Move the backgauge so that it is at least five inches from either end of the table limits.

MAKE SURE THAT ALL GUARDS ARE IN PLACE, ALL SAFETIES ARE OPERATING, AND THAT NO PERSONNEL OR PHYSICAL OBJECTS ARE LOCATED IN A POSITION WHICH COULD CAUSE HARM OR DANGER TO ANYONE OR ANYTHING BEFORE TURNING THE POWER ON.
3. Inspect all components and cables for tightness and alignment.
4. **Add additional guarding as required to insure full operator safety.** Check around all parts and assemblies which were added or affected by the installation of MICROCUT. Make sure that all moving parts or hazards are guarded fully.

MICROCUT CONSISTS OF PARTS AND ASSEMBLIES WHICH ARE ADDED TO THE MACHINE. GUARDING MAY NEED TO BE ALTERED OR ADDED TO OFFER PROPER PROTECTION. THIS MUST BE DONE BEFORE MICROCUT IS OPERATED. DO NOT OPERATE THE MACHINE UNTIL THIS GUARDING IS COMPLETE. ALL MOVING PARTS AND HAZARDS MUST BE COVERED IN SUCH A WAY AS TO PREVENT ACCIDENTAL CONTACT OF ANY SORT.
5. Attach the supplied warning sticker (**DO NOT OPERATE WITH GUARD OFF**) in a conspicuous location near the MICROCUT backgauge drive motor. **DO NOT MOUNT THIS ON THE GUARD--THIS STICKER SHOULD BE VERY VISIBLE WITH THE GUARD OFF.**
6. Be sure that the original equipment backgauge brake is not energized. Remove any necessary fuses or wires (insulate wire ends properly) to insure free operation of the backgauge. If a clutch needs to be locked on (electrically or mechanically) to allow the MICROCUT motor to drive, do this now. Make appropriate notations in the REFERENCE MANUAL--USE OF THE ORIGINAL EQUIPMENT CONTROLS.
7. Refer to the CALIBRATION & TEST ROUTINE in the REFERENCE MANUAL to calibrate MICROCUT to the machine it is now installed on.
8. Check MICROCUT to make sure all of its functions and operations are performing properly (positioning, settling, programming, etc.).
9. Fill out and mail the warranty registration card at the front of this book. **THIS MUST BE COMPLETED TO QUALIFY MICROCUT FOR WARRANTY REPAIR WORK. DO THIS NOW.**
10. Turn the power off and on several times to check for encoder timing--see INSTALLATION NOTES paragraph N.

TRAINING THE OPERATOR

Look around the shop to determine what types of cutting jobs the operator will be exposed to. Plan your training session accordingly.

Discuss with management the function of MICROFACTS and decide whether or not this feature (in part or whole) will be enabled. Take this time to fill out the registration form if you have not already done so. **WARRANTIES WILL BE VOIDED IF THE REGISTRATION IS NOT FILLED OUT AND SENT IN ON A TIMELY BASIS.**

Discuss aspects of the safety manual with management AND the operator. A few safety concerns are--

1. **MICROCUT WILL INCREASE THE PRODUCTIVITY OF YOUR PAPER CUTTER. YOUR EXISTING WASTE PROCEDURES AND WORK AREA MAY NEED MODIFICATION TO SAFELY ALLOW FOR THIS.** Adequate waste disposal must be supplied so that material will not build up and impair the operator's mobility. Remember that waste or cut stock laying on the floor can cause slips and trips which could be dangerous.
2. The paper cutter should be placed away from distractions (water coolers, break room, main passages), traffic, and open doors (wind which can blow stock can create real hazards).
3. The floor should be able to support the weight of the paper cutter in a level position without excessive vibration.
4. The paper cutter must have enough space around it to allow the operator access for lubrication and maintenance. Space should be supplied for storage of tools, lubricants, spare knives, cutting sticks, and other equipment.
5. Rails should be placed around the work area to prevent unauthorized or incidental entry into the cutter work area.

For additional information on safety, please contact:

"How to Establish and Implement a Plantwide Safety Program"
The National Association of Printers and Lithographers
570 Seventh Avenue
New York, New York 10018

Walk the operator around the cutter to show him what has been added.

Read through the REFERENCE MANUAL TABLE OF CONTENTS with the operator. Guide him/her through start up and operation for at least a few different jobs. Run through the CALIBRATION & TEST and OPTIONS routines to be sure that the operator understands how MICRO CUT works and the choices on the way it will perform.

Make sure he/she can fully operate the unit and use the documentation supplied BEFORE leaving.

Supply additional training as appropriate.

MICROCUT SPARE PARTS PRICE LIST

PART	PRICE
Display console	\$5,500.00
1/2 HP motor	225.00
1 HP motor	480.00
Shaft encoder (bare--no bracket or sprocket)	350.00
Shaft encoder assembly (bracket and sprocket)	425.00
Sensing switch	20.00
Switch cover	10.00
Motor brushes (pair)	25.00
Nylatron chain (1 foot piece)	10.00
Unbored 24 tooth sprocket	12.00
Bored 24 tooth sprocket (split)	35.00
3/8" bore 12 tooth sprocket with set screw	25.00
Manual	25.00
Display console repair (exchange basis)	500.00

**PRICES (US \$), AVAILABILITY, AND SPECIFICATIONS
SUBJECT TO CHANGE WITHOUT NOTIFICATION.**

MICROCUT OPTIONAL PARTS LIST

Printer and cable--LIST PRICE \$550

This kit will allow MICRO CUT to print out job and time data. The printer is an RS232 serial input type and is available (from Graphics West Micro Systems) only in a 110VAC version. The cable is wired for the supplied printer. Printers vary and Graphics West Micro Systems can not assemble cables for printers supplied by the customer (refer to printer sections in the REFERENCE MANUAL).

CUTTERNET personal computer interface--LIST PRICE \$1000

This kit will enable MICRO CUT to communicate with an IBM compatible desk top computer. The kit includes a floppy disk with MICRO CUT interface software and inter-connect cable. Please specify 3.5 or 5.25 disk size and density.

Mill spec kit--LIST PRICE \$500

This kit will allow MICRO CUT to meet the wiring requirements often found in mill applications. It includes:

- 2 XCKL-1 switches with connectors on brackets for cut and clamp sensing
- 1 spring lever arm for the cut sense switch
- 2 snap lock switches with connectors on brackets for limit sensing
- 1 limit trip rod kit (includes base and rod)
- 1 junction box with connectors plus 4 dot plugs to cap any unused holes in the box
- 2 right angle connectors and 1 straight connector
- 1 handy box with cover plate and flex connector (for optical sense switch)
- 1 50 foot roll of 1/2 inch flexible wire tubing

Auxiliary control line kit--LIST PRICE \$150

This kit will allow MICRO CUT to control some functions associated with the paper cutter (air table and backgauge brake). The kit includes a 4 conductor shielded cable with plug-in connectors, 2 relay sockets, 2 relays, and 2 snubbing diodes (supplied on the PC board socket if WAGO brand--this socket kit includes DIN rail mounting channel and hardware).

Side loading kit--LIST PRICE \$500

This kit will allow MICRO CUT to sense the side loading operation of stock so that it can automatically advance after the side load is completed and so that it will not attempt backgauge drive if there is an obstruction at the side loading throat. The kit includes:

- 2 extra connection cables (one for the mechanical sense, one for the optical)
- 1 snap lock mechanical loading sense switch with connector on bracket
- 1 optical sensing switch with reflector (requires separate 110VAC power)
- 2 slotted angle mounting brackets and 1 drilled angle mounting brackets
- 1 hardware bag--
 - 4 1/4-20X1 hex bolts, lock washers, and flat washers
 - 12 3/8-16X1 hex bolts, lock washers, flat washers, and hex nuts
 - 2 3/8-16X12 all thread

External buzzer box--\$75

This box attaches to the cutter via a magnetic base. When it is plugged in to the display console it will operate an adjustable volume buzzer in conjunction with the internal buzzer. This makes the buzzer useful in loud environments.

**PRICES (US \$), AVAILABILITY, AND SPECIFICATIONS
SUBJECT TO CHANGE WITHOUT NOTIFICATION.**

MOVING THE ENTIRE MACHINE

Any cutter should have the table removed during shipping to avoid possible machine damage and most importantly to allow the housing to be properly leveled when it is relocated. It is advisable that all parts involving **MICROCUT** be removed to avoid damage. If the cutter is moved without removing the table, at least remove the display console and the shaft encoder from the machine. These are delicate and can not tolerate excessive shock such as might be encountered during a machine move. Pack these parts in a well cushioned sealed box. Place protective waterproof bags around all exposed cable ends and switches.

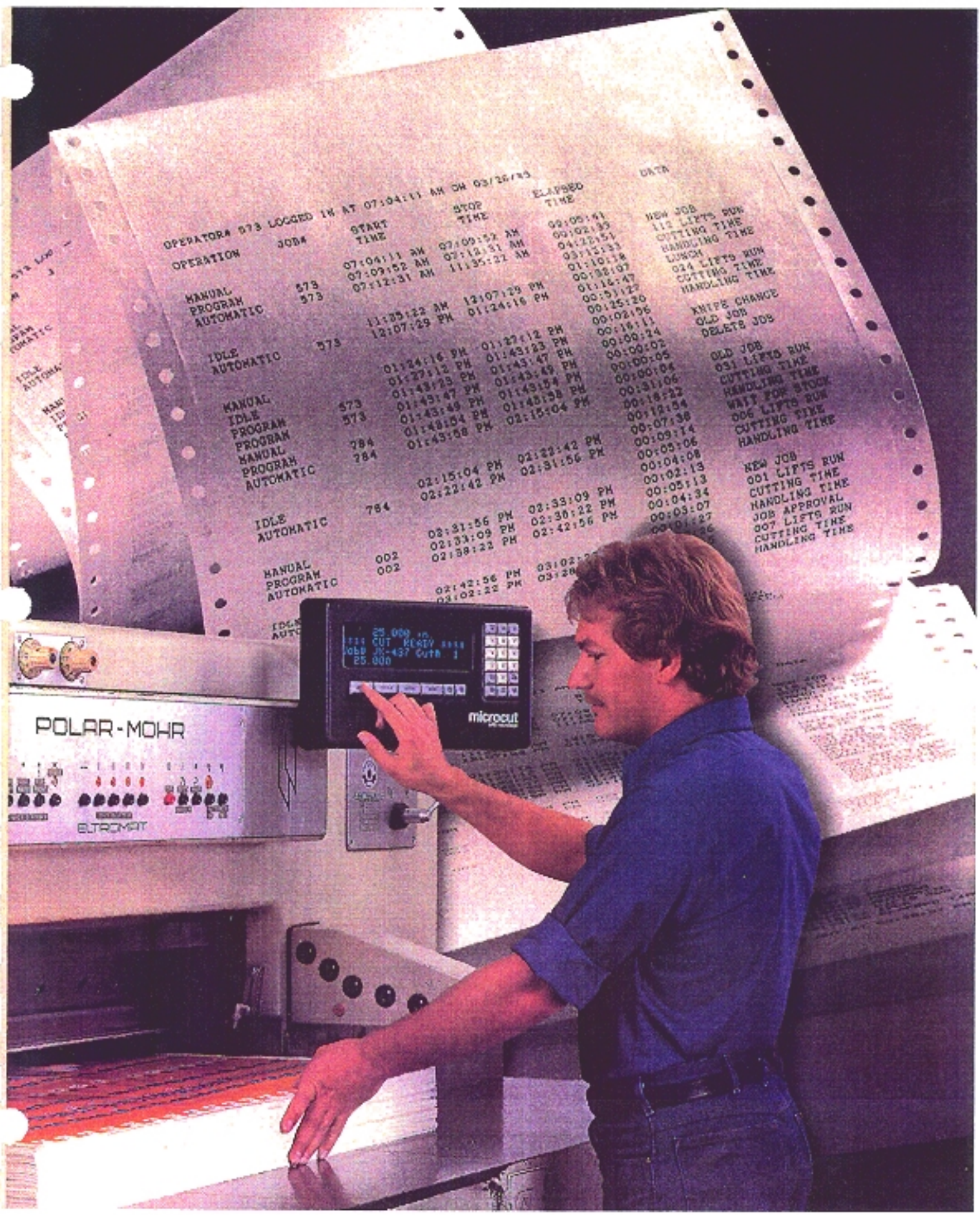
Reverse these procedures after the move is complete.

MOVING TO ANOTHER MACHINE

All MICRO CUT III display consoles, switches, and encoders are identical (excluding the option of with or without MICROFACTS management system). It is possible to remove MICRO CUT from a machine and mount it to another with no need for any electronic modifications. The only thing which is machine dependent is the encoder sprocket set. Refer to the SHAFT ENCODER section of the INSTALLATION MANUAL for assistance in determining your requirements. Remove all cables, switches, the motor, the encoder, and the display console from the old machine. Determine the best mounting places for these parts on the new machine. Make sure that all the required brackets are available for secure mounting. Check the cable lengths to see that there will be ample to avoid stress which could lead to eventual failure. Mount the components according to the instructions in the INSTALLATION MANUAL. Go through the CALIBRATION & TEST ROUTINE so that MICRO CUT will know how to operate on its new machine.

If the job memory is to be retained, do not ERASE MEMORY at the second step of the CALIBRATION & TEST ROUTINE. If the memory is no longer valid, opt to ERASE MEMORY (YES) and not SAVE JOBS (NO).

PERSONAL NOTE SPACE

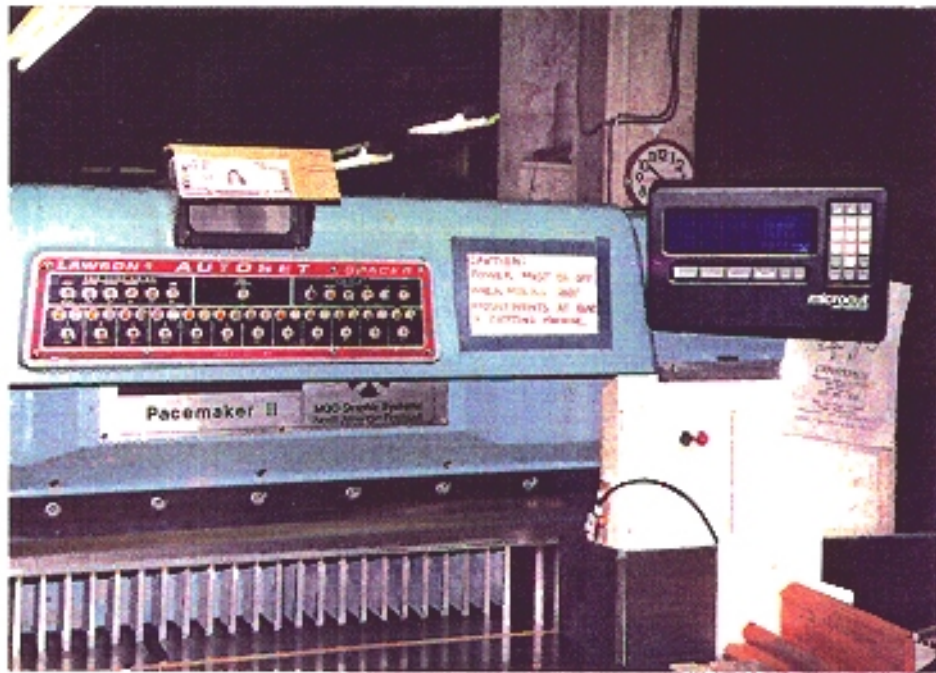


OPERATION	JOB#	START TIME	STOP TIME	ELAPSED TIME	DATA
OPERATOR 573 LOGGED IN AT 07:04:11 AM ON 03/26/83					
MANUAL PROGRAM	573	07:04:11 AM	07:09:57 AM	00:06:46	NEW JOB
AUTOMATIC	573	07:09:52 AM	07:12:31 AM	00:02:39	112 LIFTS RUN
		07:12:31 AM	11:35:27 AM	04:22:56	CUTTING TIME
				03:13:31	HANDLING TIME
				01:10:18	LUNCH
				00:38:07	024 LIFTS RUN
				01:12:47	CUTTING TIME
				00:51:27	HANDLING TIME
				00:25:26	
				00:02:56	KNIFE CHANGE
				00:16:11	OLD JOB
				00:00:24	DELETS JOB
				00:00:02	
				00:00:05	OLD JOB
				00:00:04	031 LIFTS RUN
				00:31:06	CUTTING TIME
				00:16:22	HANDLING TIME
				00:12:54	WAIT FOR STOCK
				00:07:38	006 LIFTS RUN
				00:09:14	CUTTING TIME
				00:05:06	HANDLING TIME
				00:04:08	
				00:02:13	NEW JOB
				00:05:13	001 LIFTS RUN
				00:04:34	CUTTING TIME
				00:03:07	HANDLING TIME
				00:01:27	JOB APPROVAL
					007 LIFTS RUN
					CUTTING TIME
					HANDLING TIME



Typical display mounting. Display can be mounted anywhere on the front of the cutter, but is generally placed to the right side high enough to avoid interfering with the operator.





Typical display mounting. Display can be mounted anywhere on the front of the cutter, but is generally placed to the right side high enough to avoid interfering with the operator.

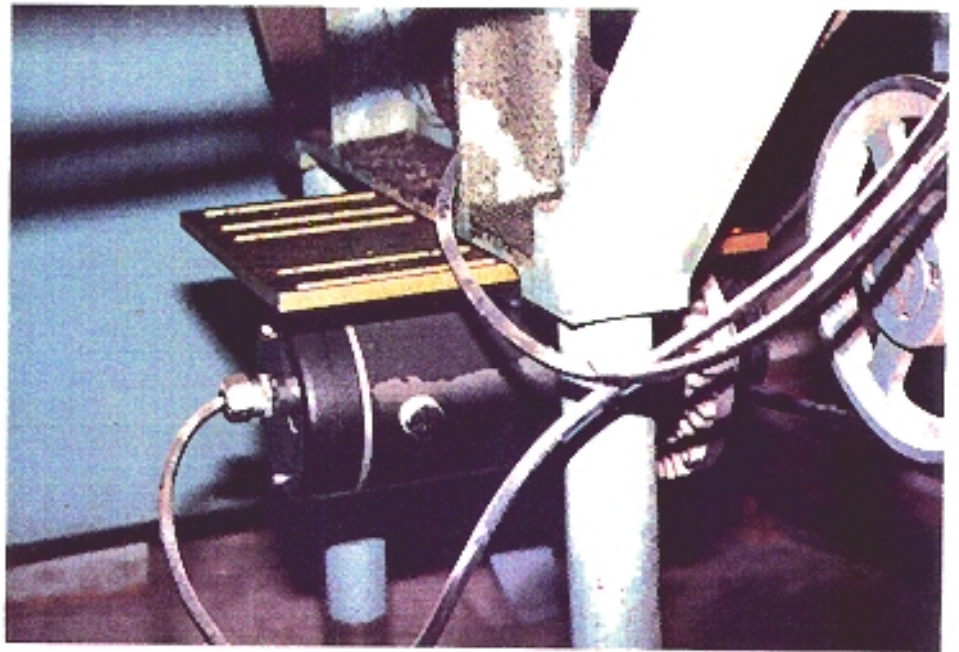




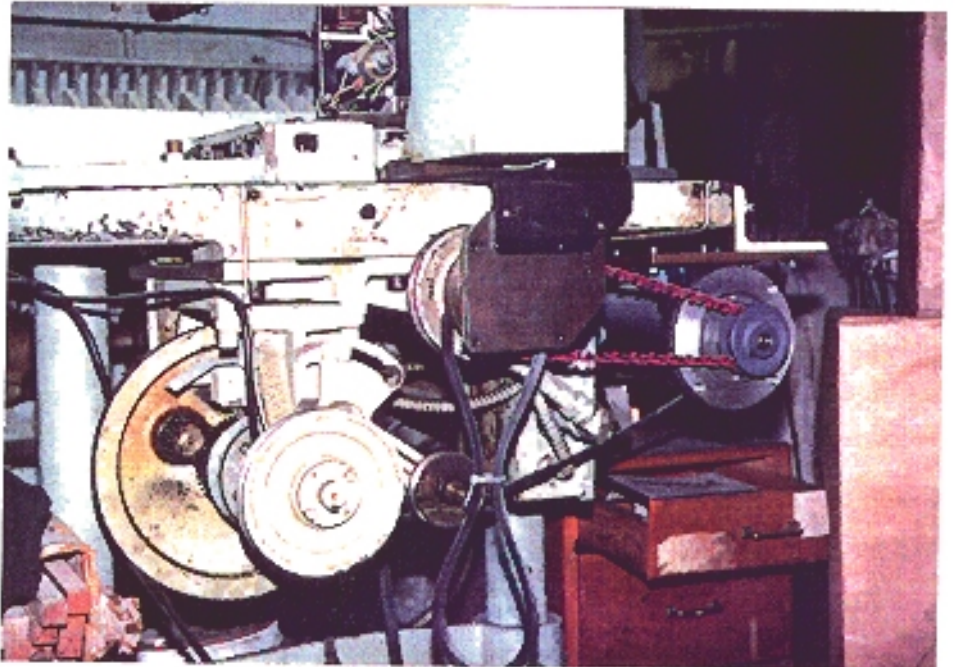
Typical display mounting. Display can be mounted anywhere on the front of the cutter, but is generally placed to the right side high enough to avoid interfering with the operator.



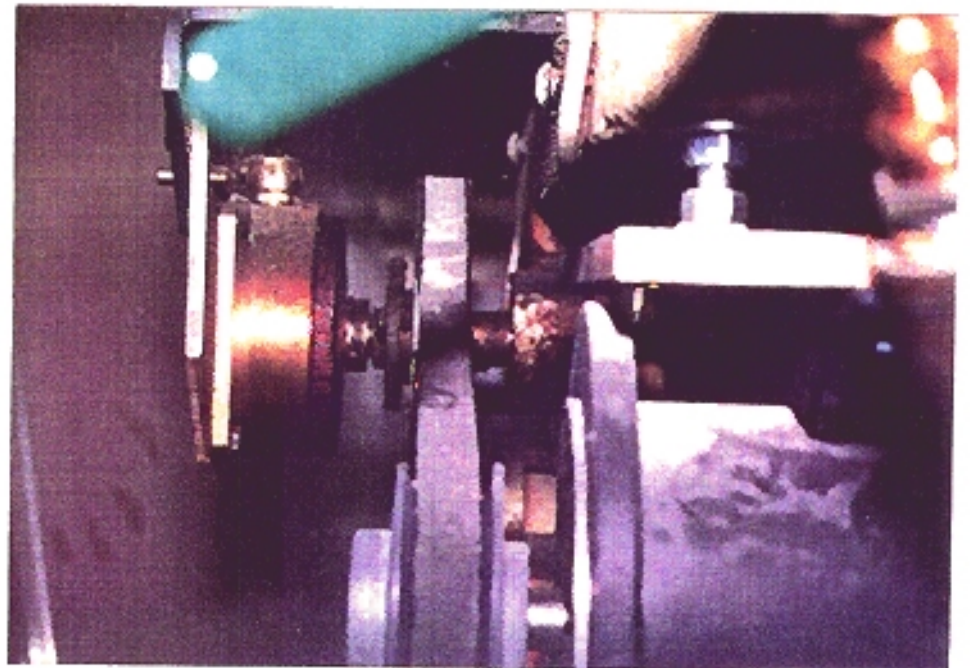
Motor mounting on a Lawson Pacemaker II. Original motor V-belt is used. The gearbox acts as a reducer to insure an adequate motor turns ratio. The high speed clutch is typically locked on by electrically engaging the original equipment reverse button. The max rear valve must be less than the position the original rear limit switch is tripped or the clutch will drop out and drive will be defeated.



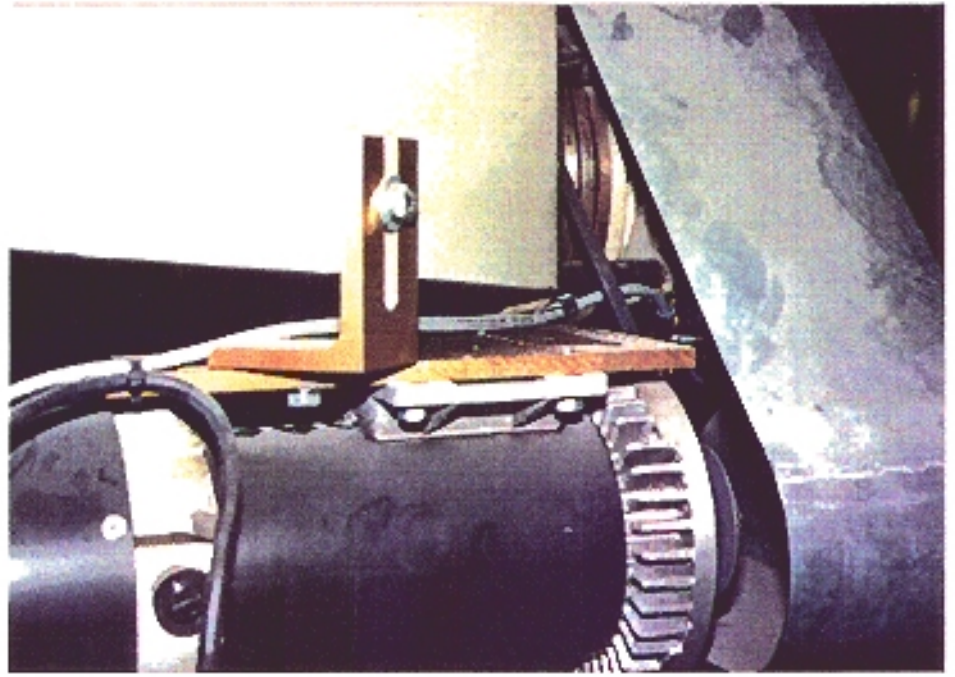
Typical motor mounting on a later series Harris (Seybold) paper cutter. The link belt is intended for belt sizing only. The idler pulley can be used to help tension the belt. An "A" sectional belt performs better than the thicker "B" belt that is normally found on the cutter.



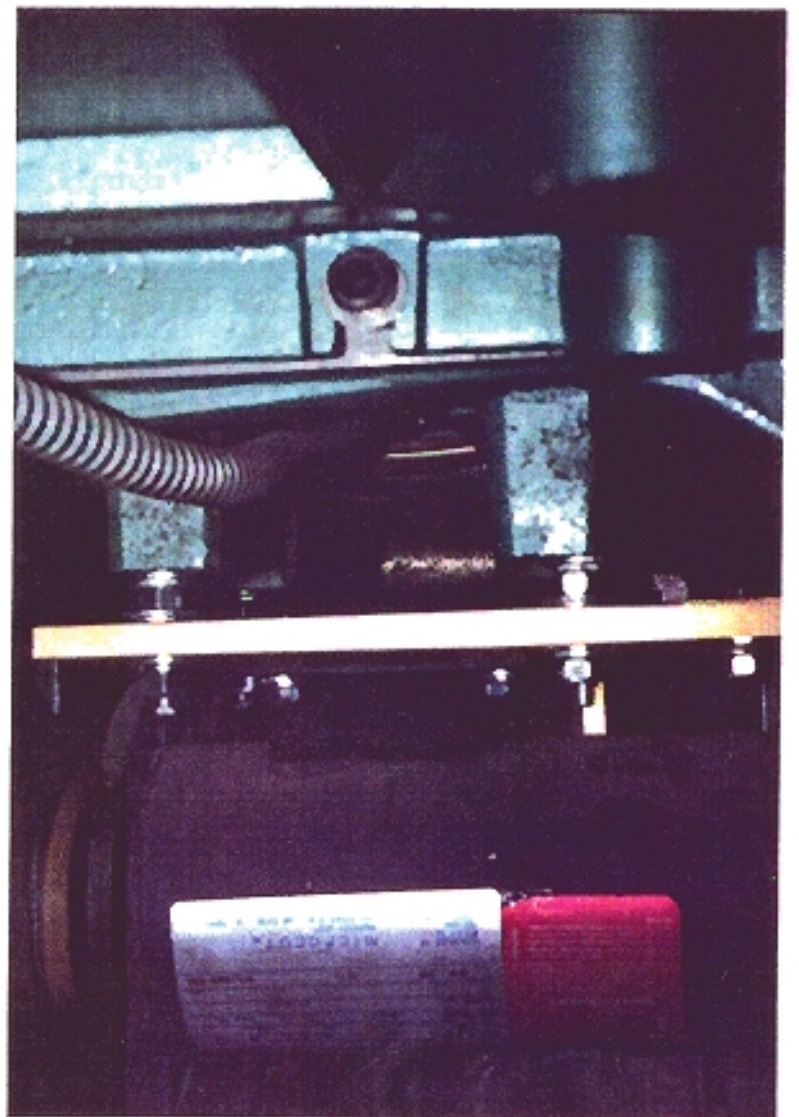
Motor mounting using the 3/8-16 threaded rod to secure the mounting plate under the cutter table bed.

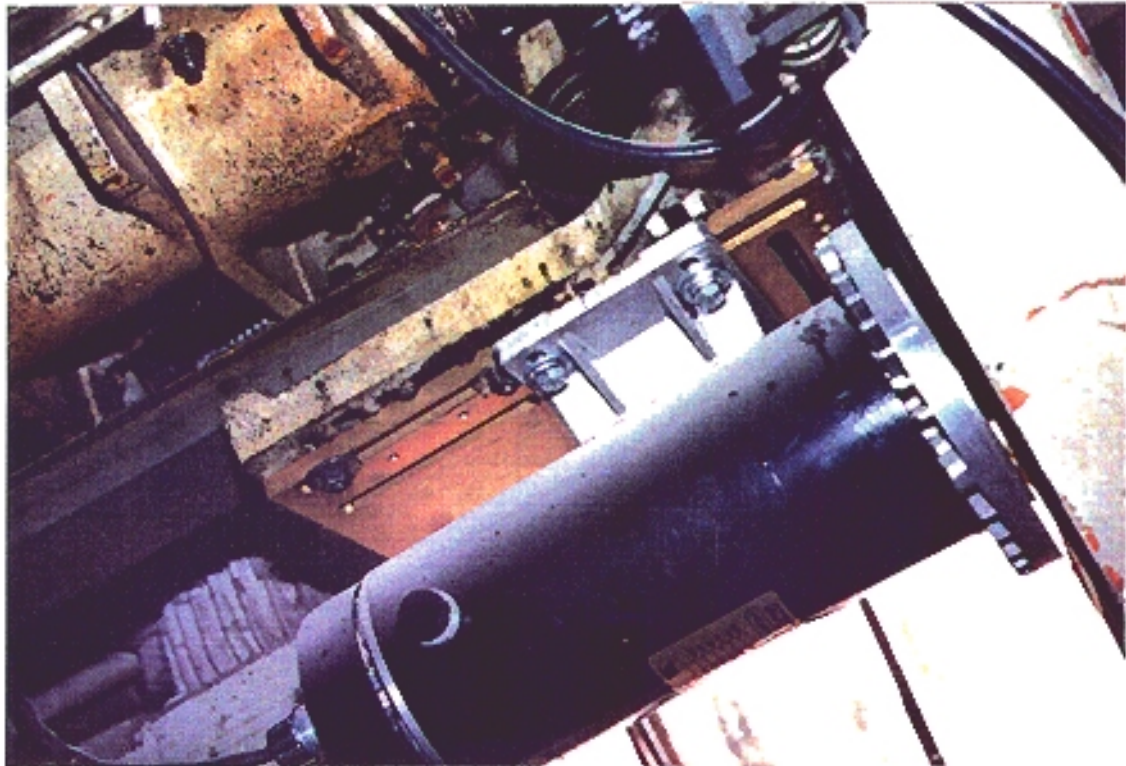


Polar motor mounting using a single angle bracket for additional support.

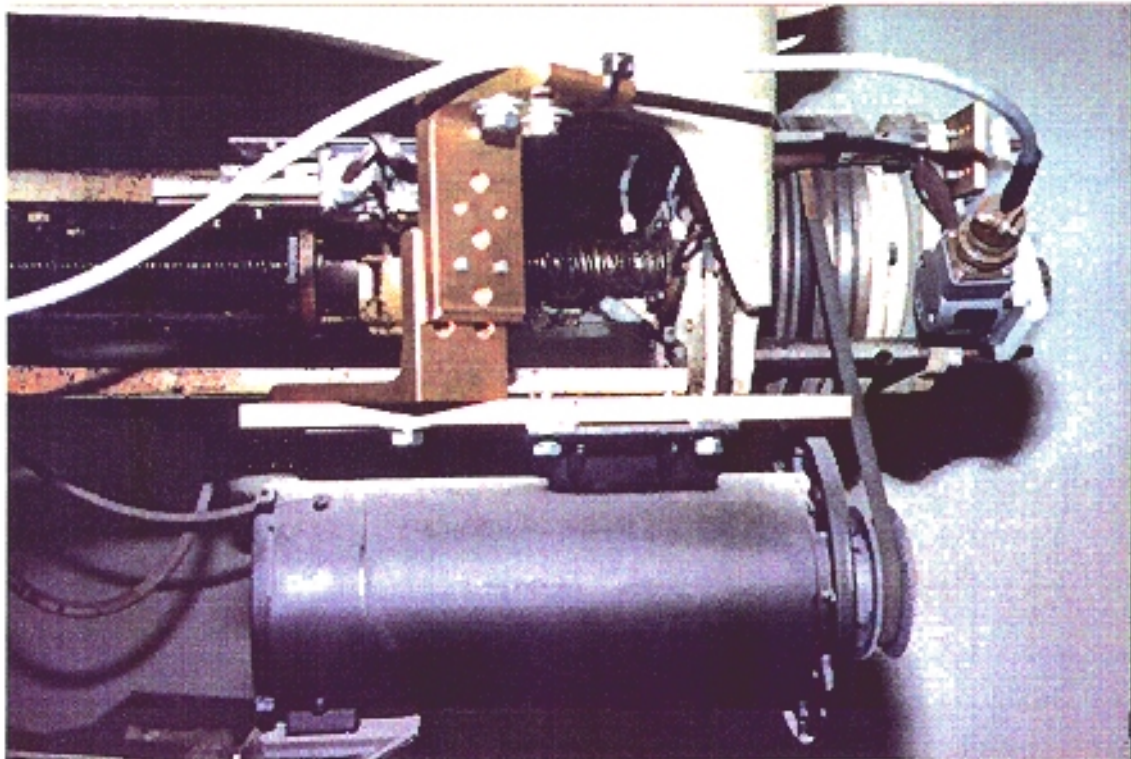


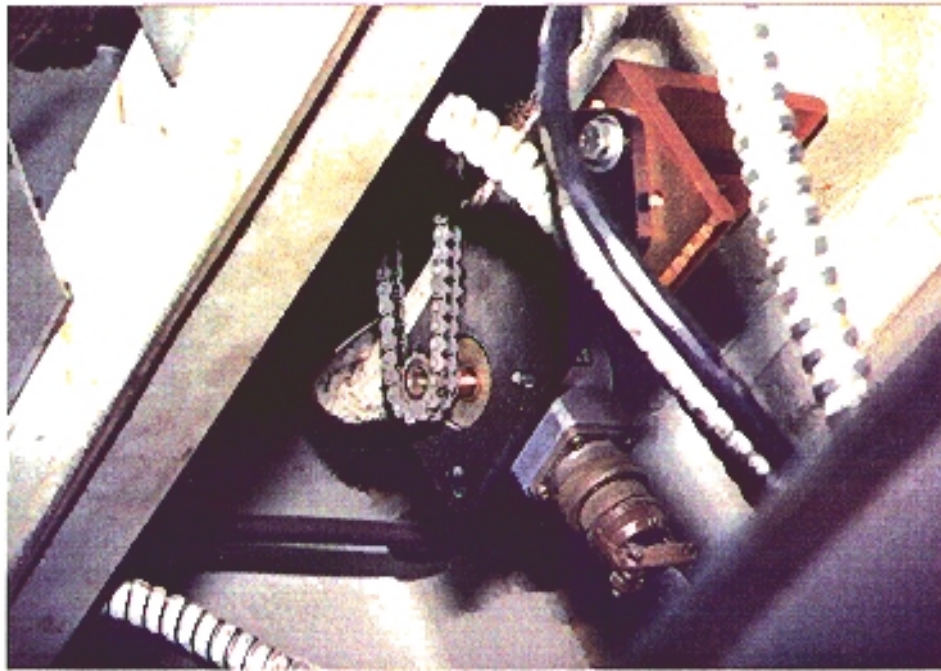
Schneider (with flat belt drive) motor mounting. Motor plate mounts to OE bosses with threaded rod on spacers (hex nuts) to insure clearance under original backgauge drive control switch housing. The clutch must be locked on and the brake off. This can usually be accomplished by swapping the wires to the brake and clutch. Use caution!!!



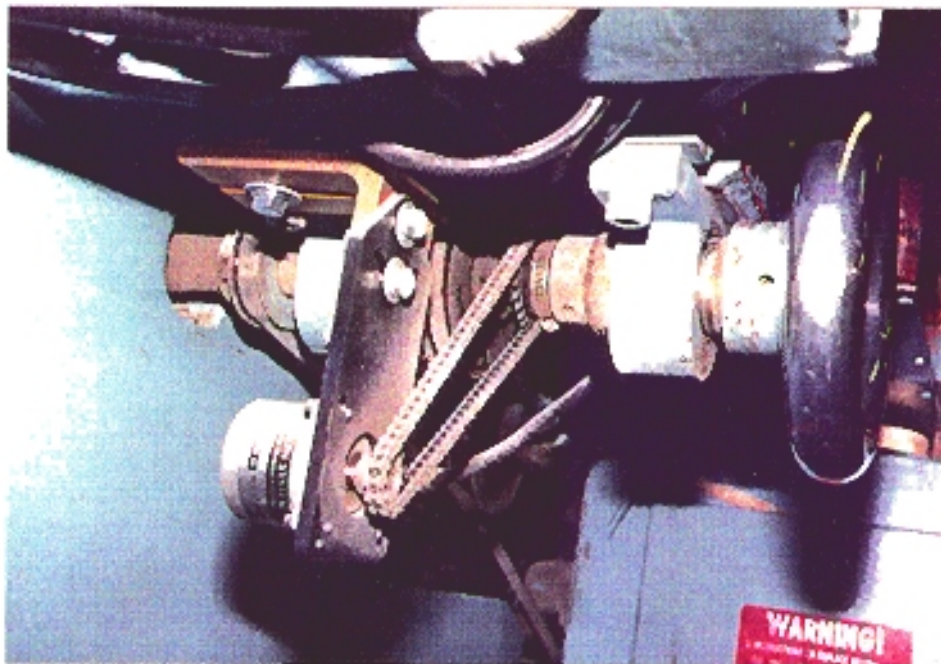


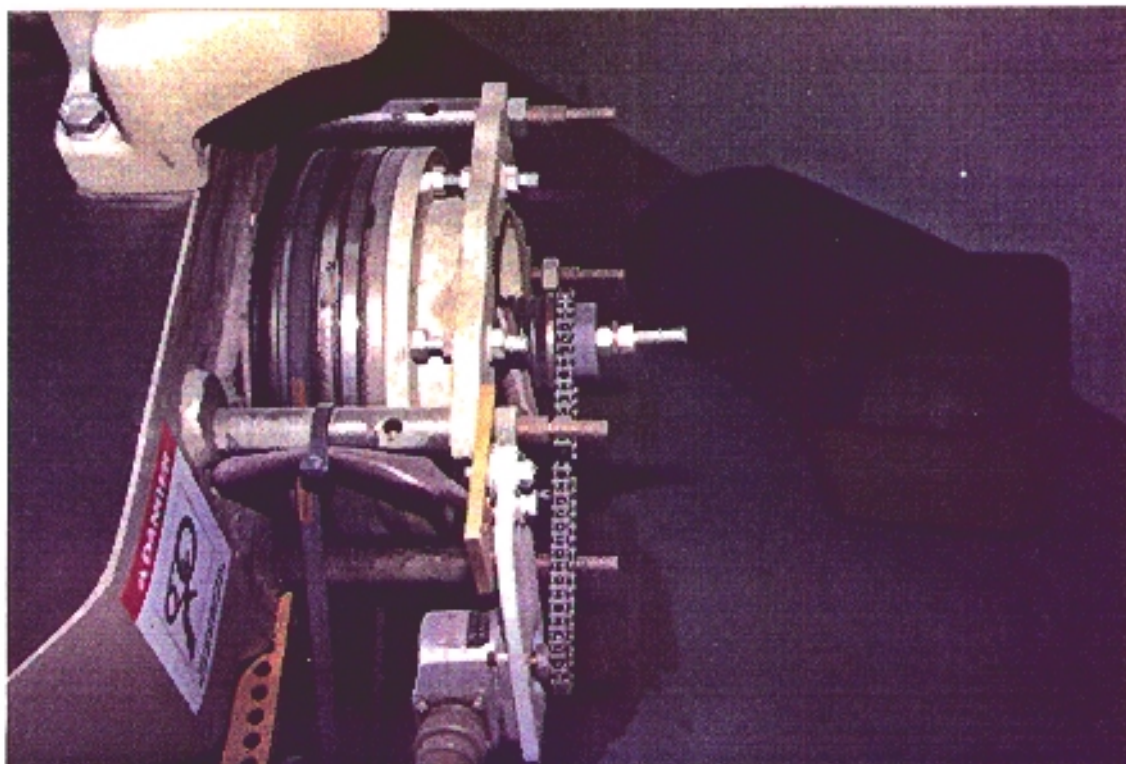
Possible Polar motor mounts. Top photo shows use of original mounting position. Bottom shows mount to opposite side with angle brackets used for additional support (3/8-16X1" bolt is used at opposite corner to attach the plate to the table). Bottom photo also shows OE brake line wires pulled from the spade connection on the brake (no longer electrically active) side.





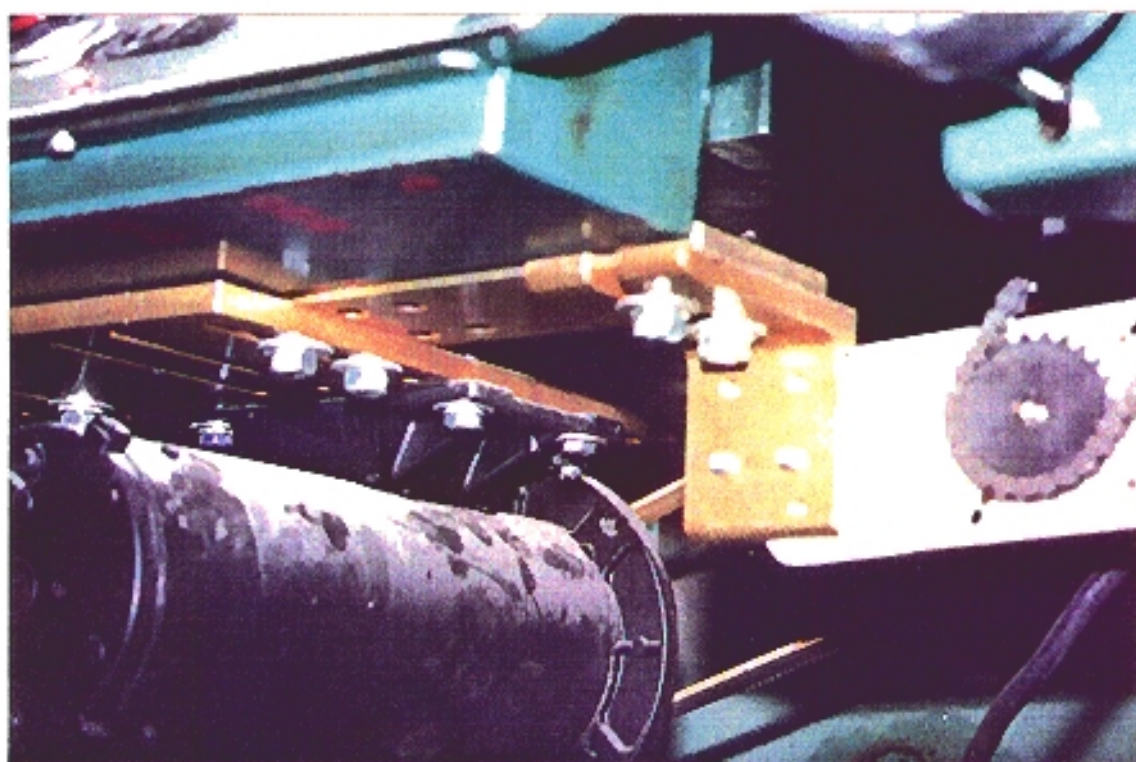
Typical encoder mounting using the table securing bolt to mount the angle bracket. The 2" by 3" auxiliary bracket can also be used here if space requires (see below). The drilled angle could also have been used (below) in conjunction with the slotted angle to secure the encoder from the vertical housing surface (requiring drilling and tapping of holes).

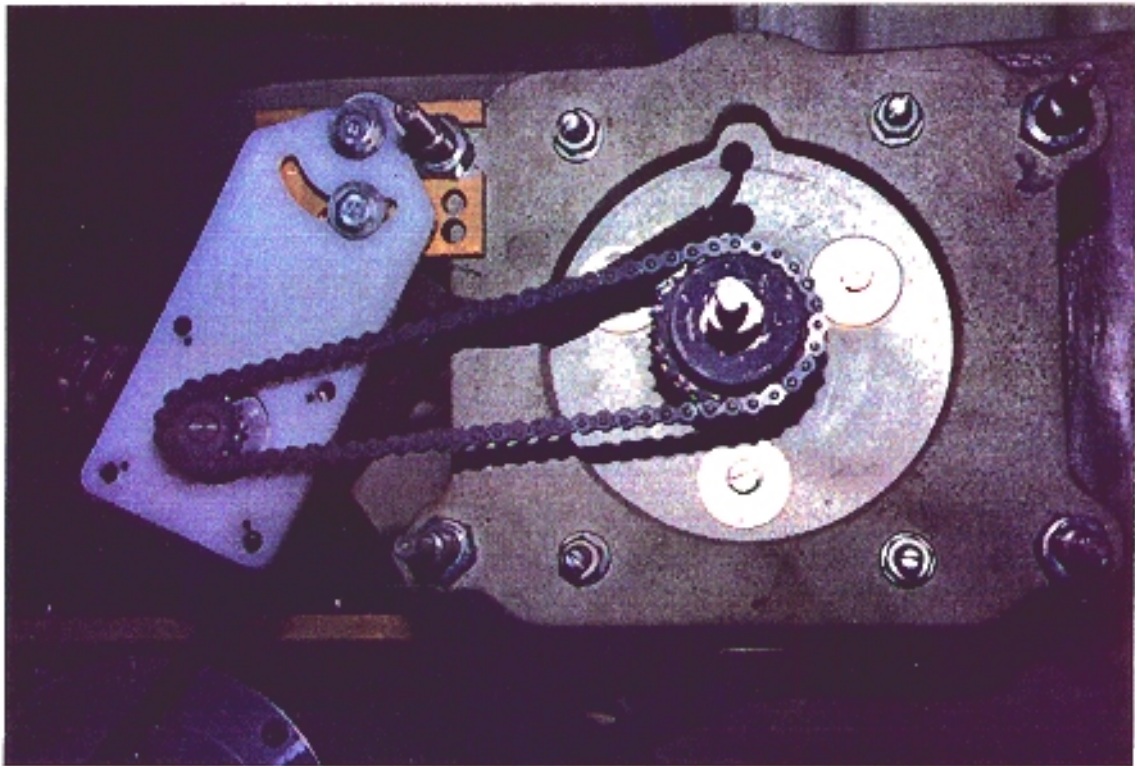




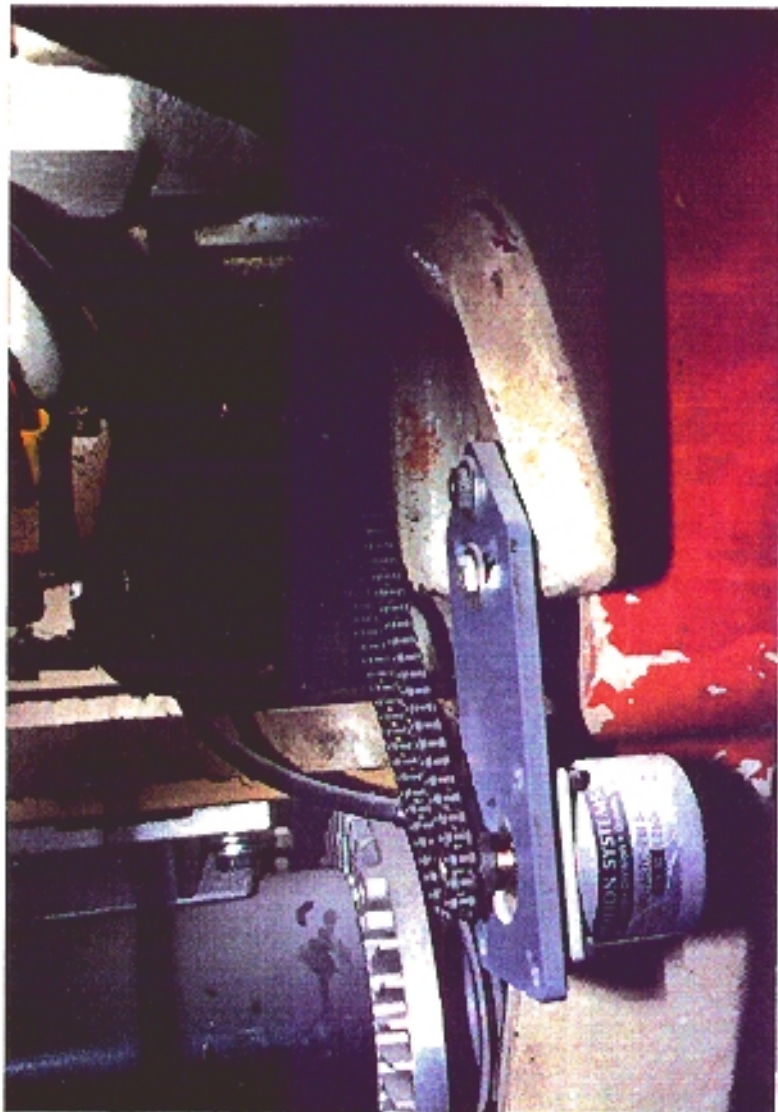
Typical Polar encoder mounting (top) using washers to space out bracket when the spring could not compress far enough to align the sprockets.

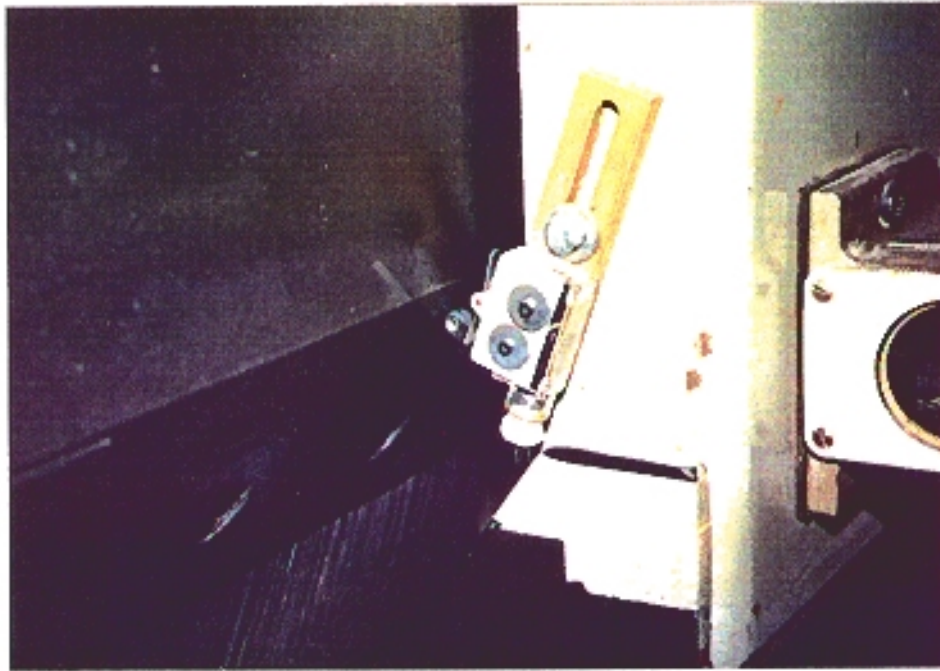
Encoder mounting on a Schneider with flat belt drive (bottom) using the motor mounting plate and rear limit switch extension bracket (mill spec kits only). This mounting would usually make use of the 2" by 3" auxiliary mounting bracket and slotted angle to mount the encoder to the front pillow block (see other examples of encoder mounting).



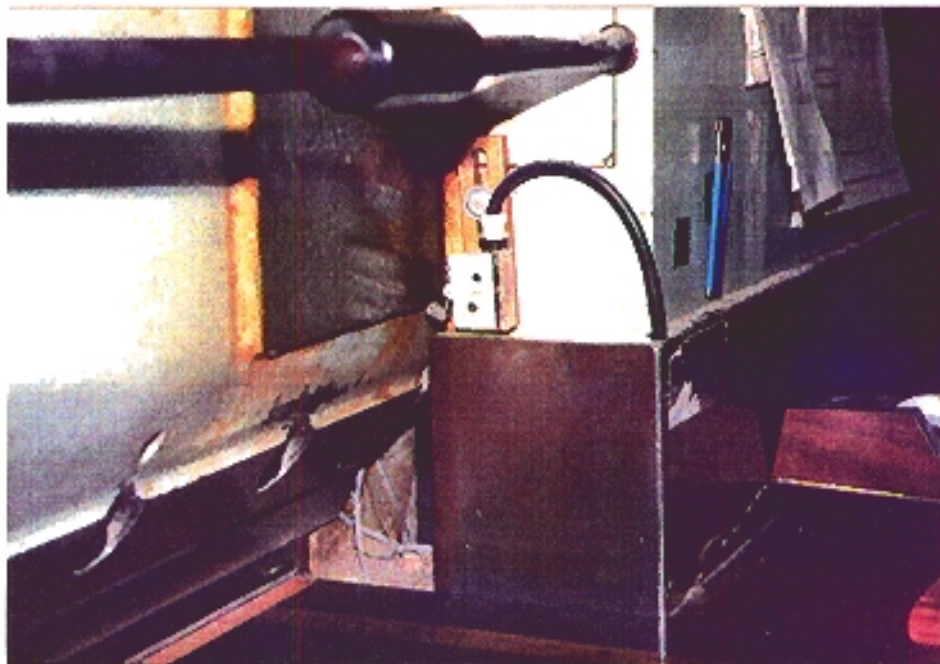


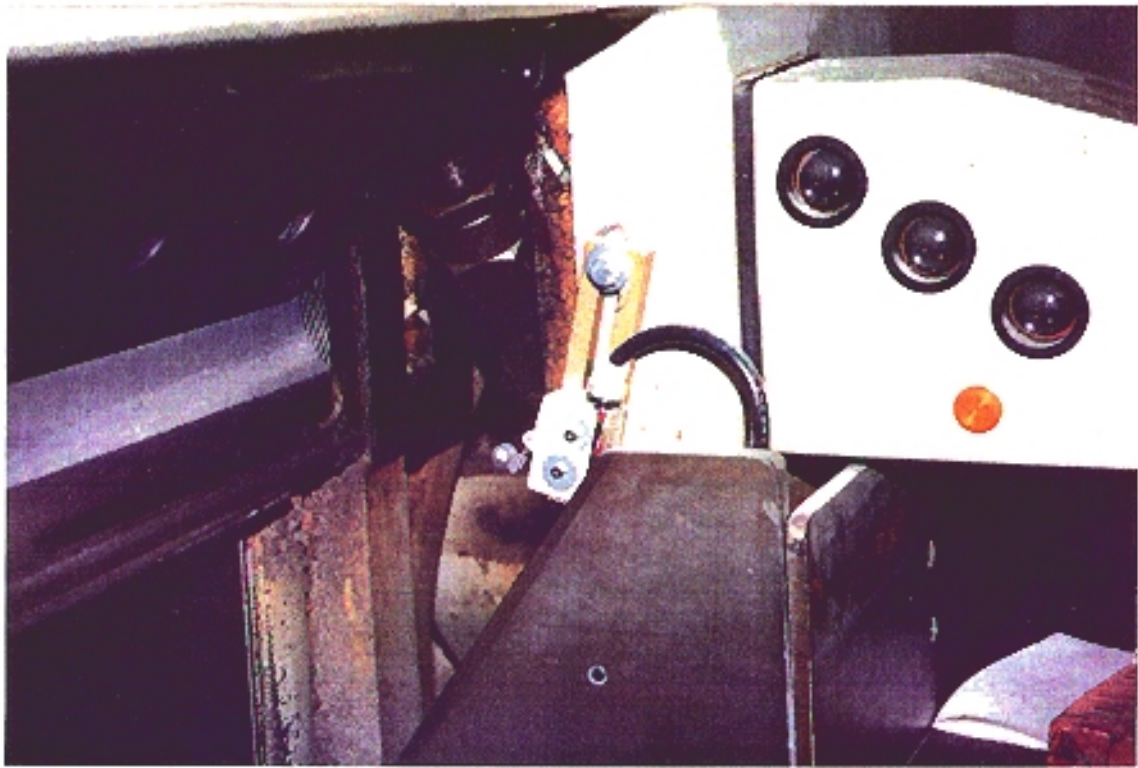
Typical encoder mounting on a Polar cutter (top). This method eliminates the need for any drilling. The 3/8-16 threaded rod is used to extend the leadscrew and mount the sprocket. Some sprocket wobble occurs using this method and a new guard needs to be made for the back of the cutter. It may be better on some Polars to examine the leadscrew to determine if the sprocket can be bored and placed directly onto the leadscrew under the table (right). Care must be taken to avoid back gauge interference and assure proper alignment. Note that in this case the swing bracket was spaced out from the casting with flat washers.



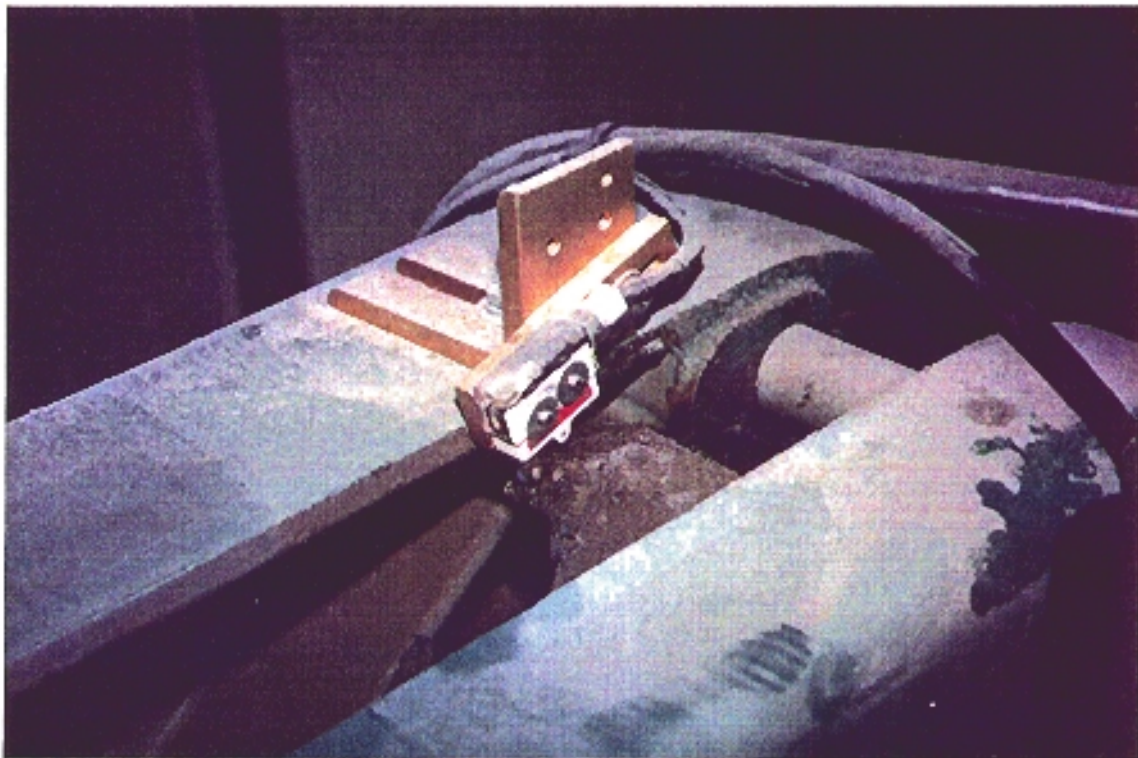


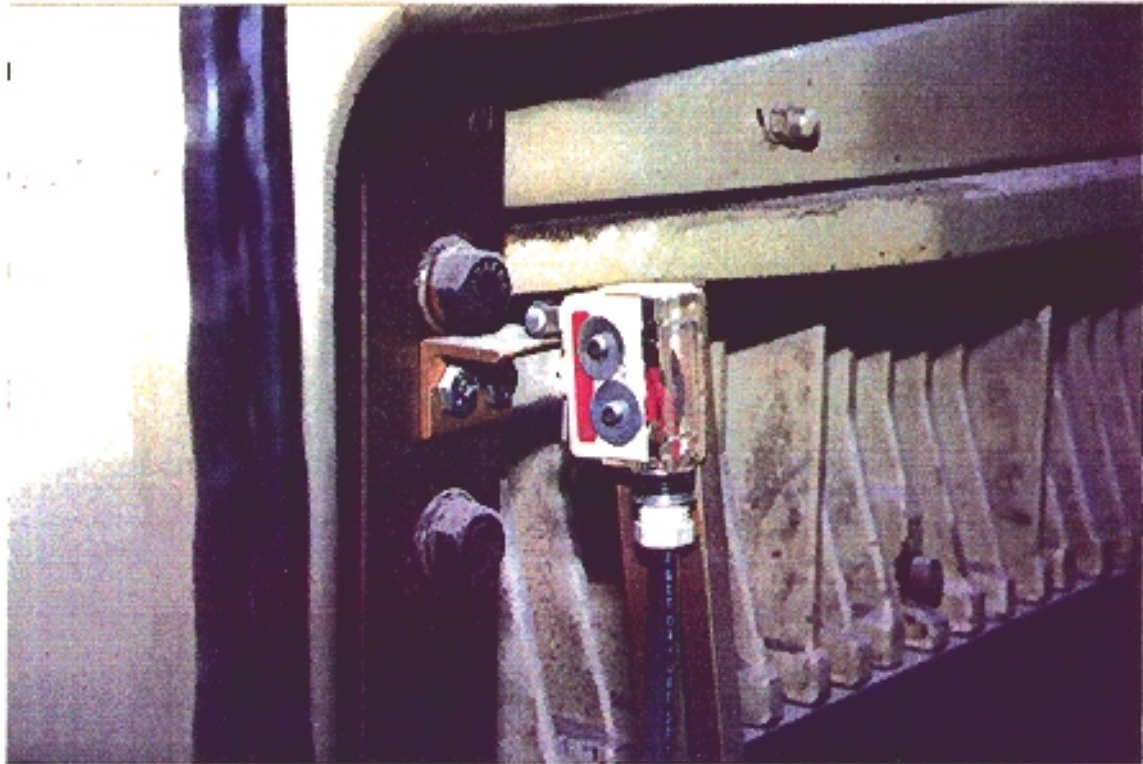
Standard cut sensing switch mounts. The strain relief cover can be turned in either direction to hide the cable exit. Try to keep the mounting bolt central to the slot to insure full adjustment of the switch in the future in the event that knife changes require knife bar adjustment. Make sure that the knife bolt holes do not interfere with the tripping of the switch.



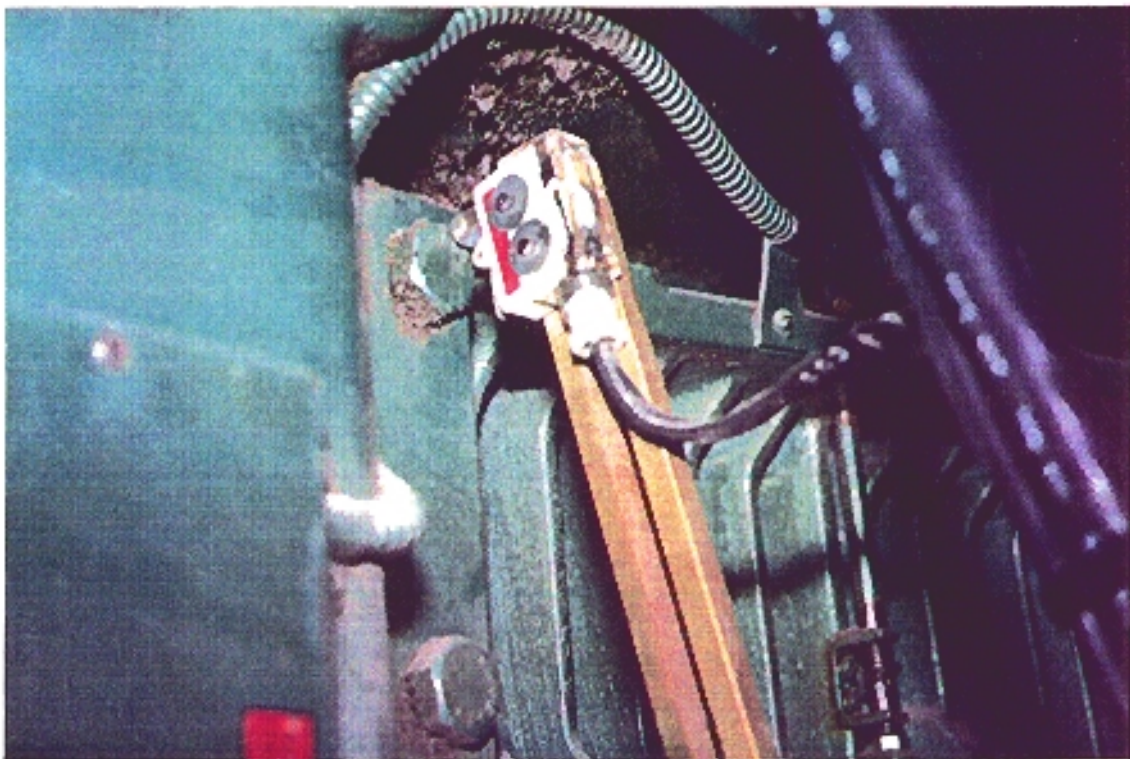


Typical cut sensing switch mount on most cutters (top). It is important that the knife bar just barely trip the switch at the bottom of the stroke to avoid excessive side load on the lever which can cause fatigue and eventual failure. The operator should be briefed on adjusting the switch so that proper operation can be retained after knife changes (and knife bar adjustments). Below is a less typical switch mounting which has the advantage that knife bar adjustment is less significant and that knife overtravel may be recognized by a KNIFE DOWN message that may help to warn the operator of possible problems with the cutter.

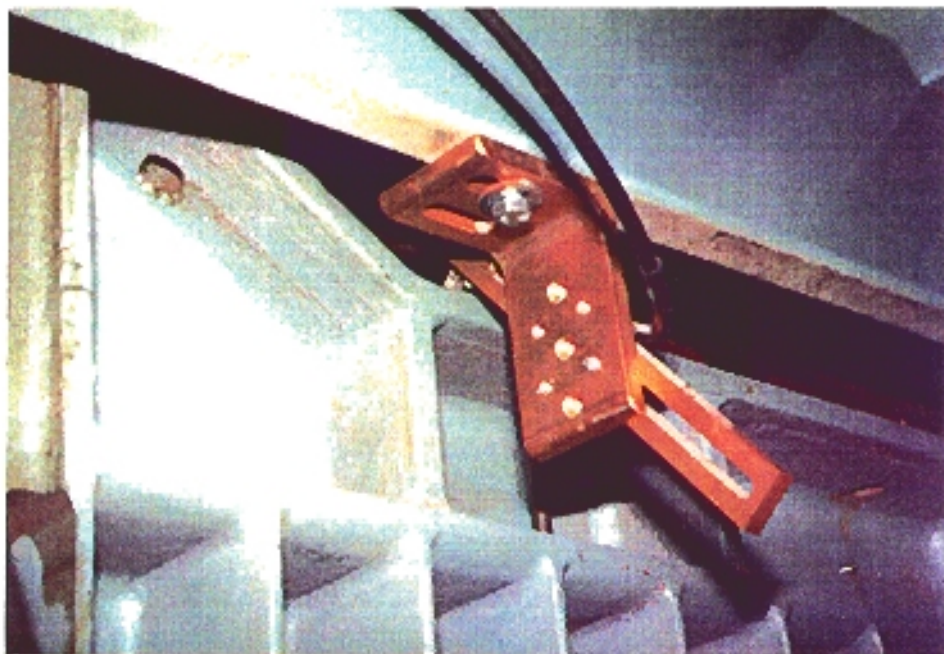




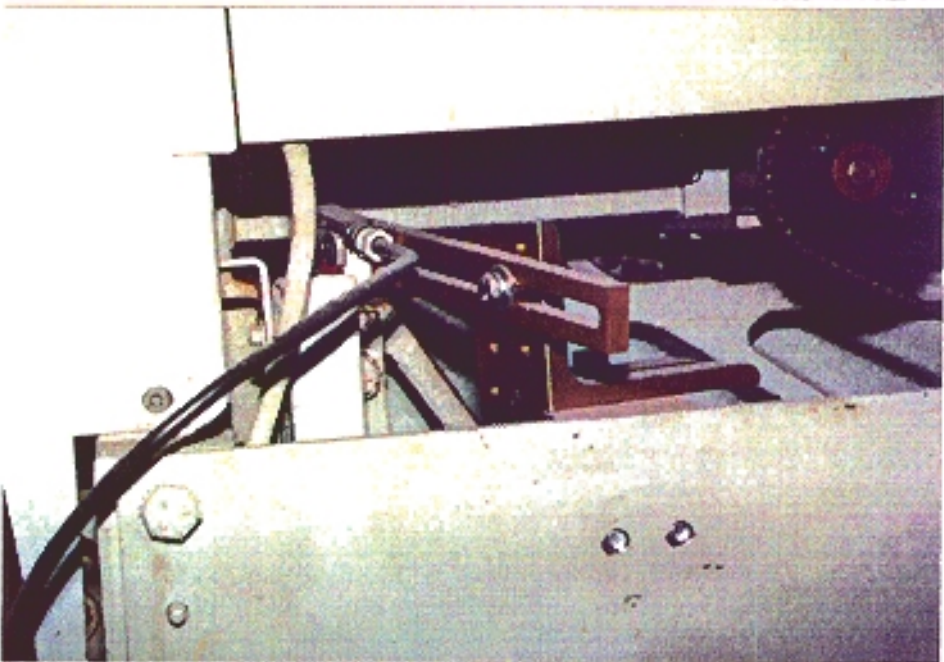
Clamp up sensing switch activated by angled trip plate (top). Note that this will either break the switch if overtravel occurs or bend the lever and drop it under the trip plate causing breakage the next time the clamp is lowered. Below the switch is activated by one of the gibb bolts allowing about an inch of overtravel before problems occur. This is fine as long as the rise rate and angle on the lever does not strain the switch.



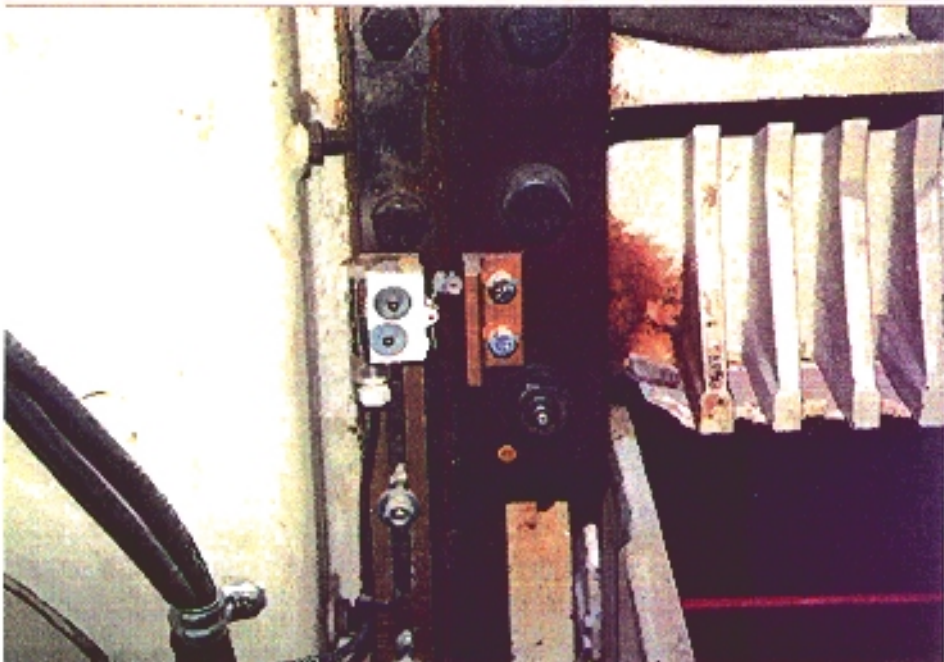
Clamp up sensing switch mount using slotted angle bracket suspended from top of housing opening. Try to avoid excessive horizontal trip angles--overtravel on the clamp can cause switch to break.

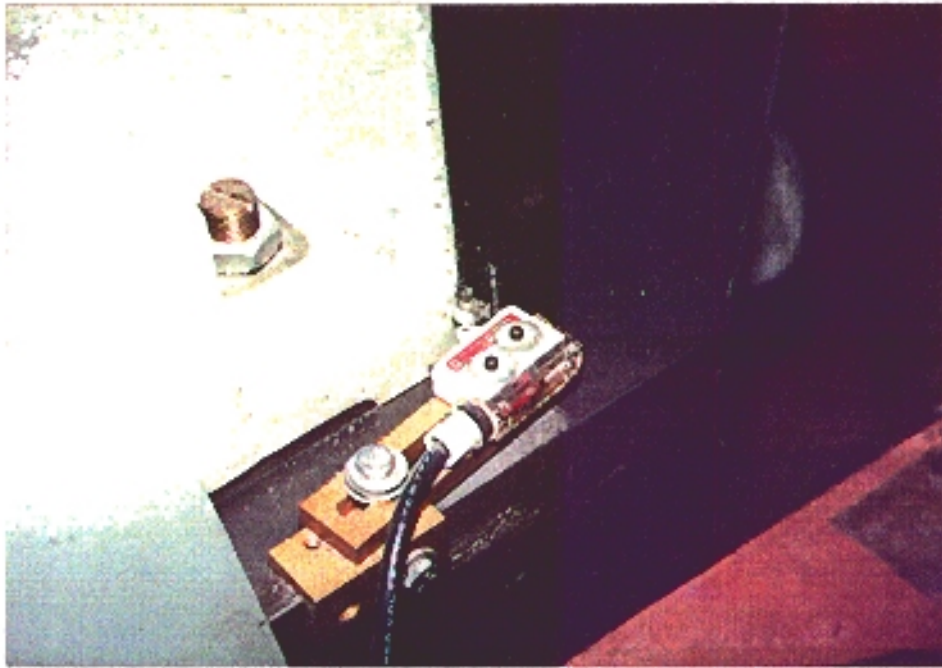


Clamp up sensing switch mount using both angle brackets. Drill and tap holes from back of cutter. Once again this horizontal mounting angle can cause excessive force on the switch if the clamp overtravels at the top.

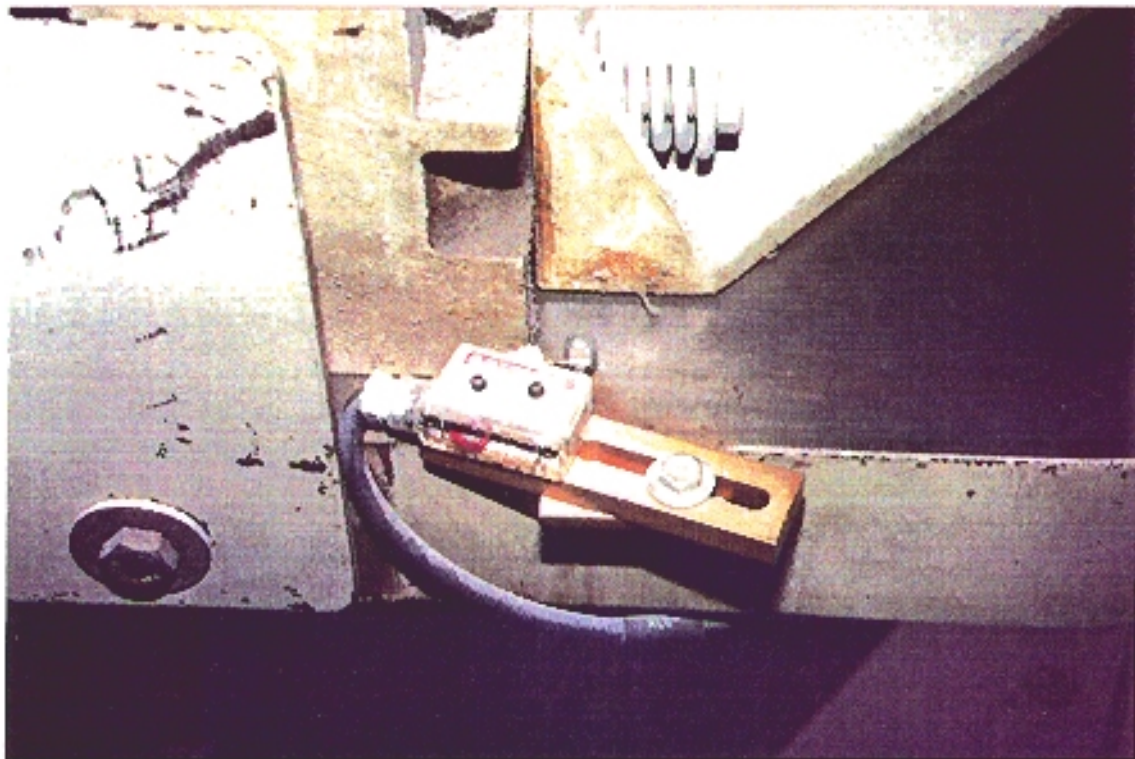


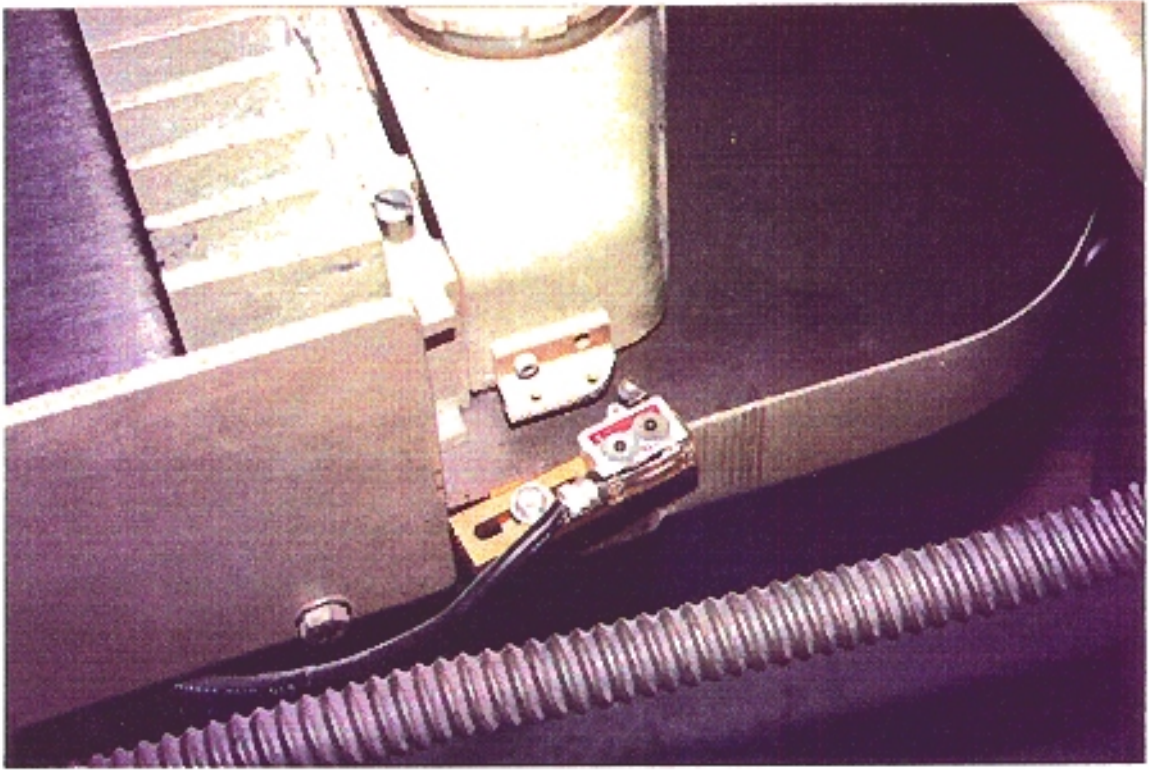
Clamp up sensing switch mount using threaded rod and auxiliary mounting bracket. The trip height can be easily adjusted and there is no risk of damage if the clamp overtravels at the top. This is installed on a Polar cutter which has a very slow return at the top inch of travel. The customer only cuts half height lifts. The switch is mounted to trip early to speed up production.



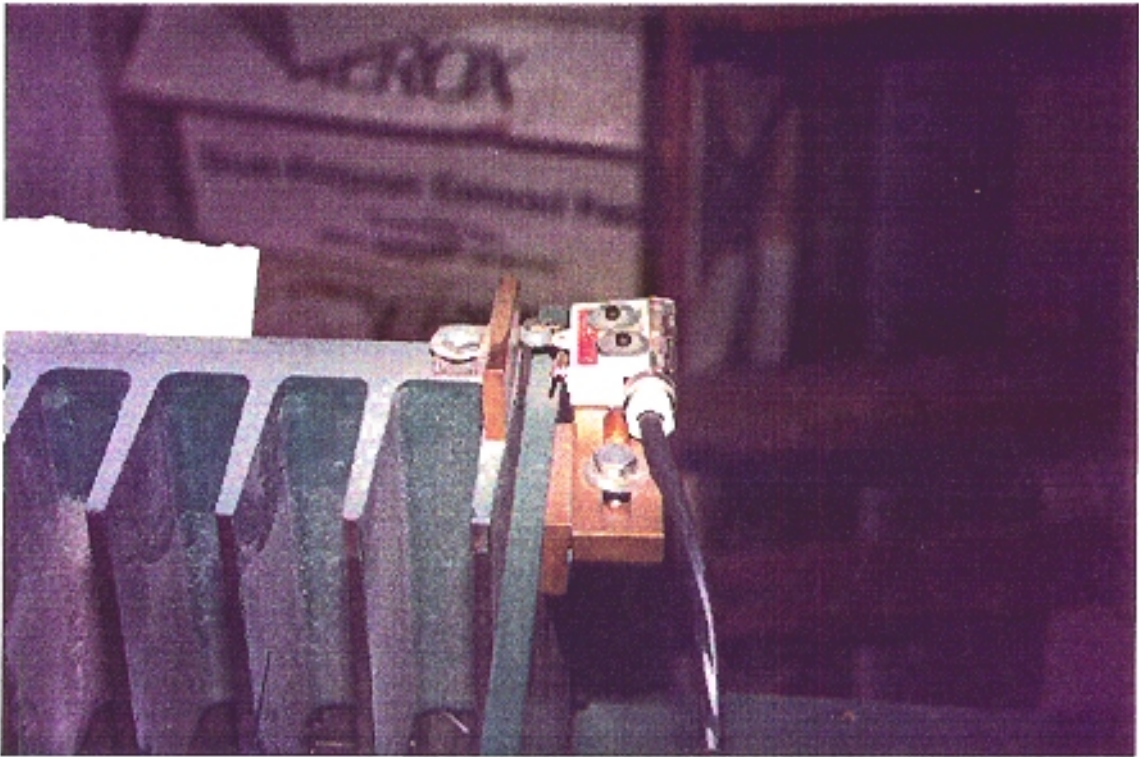


Samples of rear limit switch mounts that use the backgauge directly for activation. Note that the backgauge activates the switch well before the maximum rear of the table and maintains activation for the remainder of travel.





Rear limit switch mounts that use a trip plate for activation. Note the cam created above. Note the cut out on the trip plate below to avoid interference with the clamp. Mounting a trip plate above the backgauge is not recommended since clamp interference is likely.



MICROCUT III
GLOSSARY OF TERMS

Graphics West Micro Systems
3000 Kerner Boulevard
San Rafael, California, USA 94901
Telephone: (415) 457-7500
FAX: (415) 457-1694
June 1990
Revision A3

THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION WHICH IS PROTECTED BY COPYRIGHT. ALL RIGHTS ARE RESERVED. NO PART OF THIS DOCUMENT MAY BE PHOTOCOPIED, REPRODUCED, OR TRANSLATED TO ANOTHER LANGUAGE WITHOUT THE PRIOR WRITTEN CONSENT OF GRAPHICS WEST MICRO SYSTEMS.

MICROCUT, MICROFACTS, AND CUTTERNET ARE REGISTERED TRADE MARKS OF GRAPHICS WEST MICRO SYSTEMS

GLOSSARY OF TERMS

MICROCUT uses several terms which are peculiar to the paper cutting industry, engineering community, and various specialty groups. A full glossary of terms follows for features and operations concerning **MICROCUT**. This list has been sorted in alphabetical order for easier referencing. Refer to this list whenever terms need clarification for better understanding.

A

One of the signals from the shaft encoder (refer to the **SERVICE MANUAL--SHAFT ENCODER**).

AC POWER

The alternating current supplied by most power companies for use with most electrical appliances. The voltage and standard fusing of this power as well as the frequency changes from country to country. Consult a local electrician for details on power supplied in your area.

ACCELERATION

The rate that **MICROCUT** will increase backgauge speed as it tries to obtain the fast speed value. The harder you push on a car's gas pedal, the faster it reaches speed.

ACCESS CODES

Four digit codes programmed into **MICROCUT (MICROFACTS)** which are required to gain access to operation and management control if **MICROCUT** is set up to require them.

ACME NUT

The pinned nut in the backgauge carriage that references the backgauge to the leadscrew.

ADJUST ALL FORWARD MOVING CUTS

Also known as a **LAY COMP** (compensate) for adjusting all forward moving cuts as a result of a shift of printed image (or layout errors of trim outs--gutters).

ATTACHING NUT

The single nut contained in the backgauge carriage on small light duty low tolerance machines that allows the backgauge to be driven on the table as the leadscrew is rotated. These systems tend to be very sloppy--see **BACKLASH**.

AIR JET

A spring loaded check ball which does not allow air flow until it is pushed upon. The resulting air flow from the jet then is used to lift stock slightly off of the table so that it can be more easily moved by an operator.

AIR MANIFOLD

The system of tubing which distributes air to the air table jets.

AIR TABLE (ALSO CALLED AIR BED)

The combination of tubing and jets used to "float" the stock on the table of the cutter for easier operator positioning of that stock. These are available in either high pressure (house compressed air) low volume types or low pressure (air pump) high volume types.

AUTO ADVANCE

Term used to denote the automatic movement from the rear of the table (for side loading) to the first programmed stop AFTER side loading of the stock is completed.

AUTO CORRECTING

MICROCUT will move the backgauge back into tolerances (with an attempt for 0 error) if the backgauge is moved beyond its programmed settling tolerance while in **AUTOMATIC** mode.

AUTOMATIC OPERATION

MICROCUT will move from programmed stop to stop as the knife is cycled (or the **MOVE**, **YES**, or **LAST** key is pressed).

B

One of the signals from the shaft encoder (refer to the **SERVICE MANUAL--SHAFT ENCODER**).

BACKGAUGE

The mechanical piece that rests on the top of the table and is moved back and forth to position the stock for cutting. A mill trimmer backgauge will have a flat face (where the paper contacts it) while a standard backgauge will have forks (fingers) extending off the front.

BACKGAUGE BRAKE

A surface which can be activated to lock the leadscrew so that the backgauge will not alter position when stock is jogged against it.

BACKGAUGE CARRIAGE

The part of the backgauge assembly that attaches to the leadscrew. This is usually the home of either the recirculating ball bearings, the acme and compensating nut, or the single attaching nut (small cutters only with minimal drive capability and small accuracies).

BACKGAUGE SQUARE

The backgauge must be adjusted to 90 degrees with respect to the side gauge which should be 90 degrees to the knife. Because of the way squaring is done, it would be more correct to talk about paralleling the backgauge to the knife, although "SQUARING THE BACKGAUGE" is the popular terminology.

BACKLASH

The distance the backgauge should move but does not move when the leadscrew direction is reversed. The error realized from positioning the backgauge by turning the leadscrew clockwise as opposed to counterclockwise.

BACKTRIM

To trim the stock and then turn it 180 degrees (1/2 turn). The back side of the sheet has been trimmed.

BACKUP BOARD

A "T" shaped assembly made with two boards which is placed in front of a lift of stock before cutting it to prevent the front half from falling over as the knife passes through during its stroke.

BATTERY BACKUP

Support power to maintain job memory data when power is removed from **MICROCUT**. This is a socketed Lithium battery with a ten year (power off) life.

BAUD

The rate in bits per second of the serial data transmission to the printer or PC.

BED

The horizontal surface of a paper cutter which is used to move and hold the stock while it is being cut.

BI-DIRECTIONAL BRAKING

The ability to drive in both a negative (braking) and positive (accelerating) direction during MICRO CUT's slow down phase of positioning. Refer to DECELERATION TECHNIQUE in the OPERATOR'S REFERENCE MANUAL.

BIT

One piece of information used in a computer. Sometimes referred to as a switch since it can have a value of either 0 (off) or 1 (on). This is the basis of the binary counting system fundamental to digital electronics and the computer industry. SEE NIBBLE.

BYTE

A grouping of 8 bits. This is a common number of bits for a computer to handle at one time. This is the standard data width used in MICRO CUT. SEE NIBBLE.

CALIBRATION

The operation of making sure that MICRO CUT's current position display corresponds to the backgauge's "true" position.

CALIBRATION POINTS

Values of the backgauge position which are entered during the CALIBRATION & TEST (SET UP) routine which allow MICRO CUT to calculate the leadscrew pitch of the machine it is installed on.

CARBON DUST

The dust that forms inside a carbon brush motor as the brushes wear. This dust can cause eventual shorting in the motor if it becomes too concentrated.

CHIP

A small solid state electronic device which houses various functions to allow an electronic circuit to be built. See IC.

CLAMP

The device which holds the stock in place as the knife shears the material.

CLAMP/KNIFE SOLENOID

An electrical device used to control the operation of the clamp and knife on a paper cutter.

CLAMP PRESSURE

The force that is placed upon the stock by the clamp during knife operation. This is adjusted to hold the stock properly to maintain accuracy during the knife stroke.

CLAMP SENSING SWITCH

The switch which informs the computers when the clamp is in the full up position so that unconditional drive can occur, or warn the operator that the clamping action is being performed (perhaps too early).

COAST

The distance the backgauge will move on its own after motor power is removed from the drive system. This is related to DRAG, DRIVE LOAD, INERTIA, and SPEED.

COMMUTATOR

The rotating area of the DC motor that the brushes rub against to supply current to the motor. If the brushes are too hard (or don't seat properly or are allowed to wear too thin) the commutator can be damaged requiring replacement of the motor.

COMPENSATING NUT

The adjustable nut in the backgauge carriage that is adjusted to reduce backlash in the leadscrew.

COMPUTER

The device which handles memory control, math functions, data manipulation, and line controls to allow MICRO CUT to function. MICRO CUT has four on board computer chips to handle different requirements.

CONDUIT

Tubing used to route objects. In the case of MICRO CUT conduit is used to route cables to and the motor(s), switches, and other various components IF the MILL SPEC KIT is installed.

CREEP

The final area of drive as MICRO CUT positions the backgauge to the programmed stop point. The computers actually calculate several different creep areas and equations according to many factors of the machine, each region having its own unique characteristics. Settling is usually too fast to appreciate these differences by the human eye, and since every "settling" is intrinsically unique, it is quite difficult to see which ones are skipped and the transitions from one to the next during normal operation. Current speed, coast, response, delta, and other factors can affect the results as well as the type of equation required.

CREEP WEIGHT

The value that MICRO CUT assigns to different equations to determine the amount of power the motor should receive at a given point during drive. MICRO CUT contains many preassigned equations as well as some that the computers derive, and has several weights for each of these equations depending upon the reactions of the machine it is controlling. Current speed, coast, response, delta, and other factors can affect the results as well as the type of equation required.

CROCUS CLOTH

A cloth material which is used for dressing the edge of the cutting knife.

CUT

Used to denote the programmed stop position in MICRO CUT job memory or the action of the knife as it shears a pile of stock.

CUTTER

The guillotine style machine which is used to cut paper, foil, board, or other types of stock. Paper mills and converting houses sometimes refer to the guillotine cutter as a mill trimmer (or just trimmer) while the "cutter" takes rolls of paper and slits them into sheets (sheeter). CUTTER in this documentation ALWAYS refers to the guillotine cutter used with a clamp and knife to cut large sheets of stock into smaller sheets.

CUTTER HOUSING

The main frame of the cutter which houses the knife and clamp.

CUT SENSING KIT

The parts supplied with most installation kits that allow **MICROCUT** to sense the operation of the knife linkage to tell the computers when a complete cycle of the knife has occurred. This switch should be installed so that it senses the knife linkage **ONLY** and **DOES NOT** affect the knife operation in any way.

CUT SENSING SWITCH

The switch assembly which signals the **MICROCUT** computers that the knife has cycled. This switch should be installed so that it senses the knife linkage **ONLY** and **DOES NOT** affect the knife operation in any way.

CUTTING LIGHT

A high intensity light located above the clamp and knife so that when illuminated it shines a line on the stock indicating the cutting position.

CUTTING LINE

The mark that is sometimes printed on paper to indicate where the stock is to be cut.

CUTTING STICK

The plastic, fiber, or wood stick which sets where the knife contacts the table to prevent direct metal to metal contact.

DC MOTOR

The motor supplied with **MICROCUT** to drive the backgauge (leadscrew). This may be a 90 VDC (for 80 to 150 VAC inputs) or a 180 VDC (for 150 to 260 VAC inputs) permanent magnet motor. Graphics West Micro Systems supplies a 56BC frame which mounts to the machine with the hardware and brackets supplied in the installation kit. The computers can adapt to almost any motor, but experience has shown that a skewed armature works best. The motor can be any size up to 3 horsepower (anything over 1 HP will require larger heatsinks on the drive components--**MICROCUT** is usually shipped with either a 1/2 or 1 HP motor) with RPM ranges from 1725 to 2400 RPM.

DECELERATION TECHNIQUE

MICROCUT defines an ideal deceleration path depending upon measurements and responses it sees on the machine it is controlling (these are related to physical factors of the machine as well as the size of the motor). Actual backgauge speed will vary from this "ideal" path due to response times. As a function of operator input, control may be both decelerating **AND** accelerating (bidirectional braking on) or strictly decelerating.

DELETE CUT

The removal of a cut location (stop) or push (eject or turnaround) from a programmed series of stops within job memory.

DELTA

The distance between the current position of the backgauge and the desired position.

DEMONSTRATION

An operating mode contained within **MICROCUT** which allows it to be operated independent of any machine. This is useful for showing **MICROCUT** as well as learning how to use it.

DIP SWITCH

Small switches (normally found as a bank of switches on a .2 by .5 inch square) contained within a printer to select operating features of that printer.

DISPLAY CONSOLE (PANEL)

The box that contains the electronics, interfaces, keys, and display that comprise the MICRO CUT system operator interface.

DOUBLE BEVEL

The practice of placing two different angles on the tip of the knife blade to improve cutting quality and knife life.

DRAG

The resistance to movement contained within the backgauge drive assembly. This is a combination of backgauge friction on the table, gibb friction on the guide rails, acme and compensating nut friction on the leadscrew, leadscrew friction on the support bearings, pulley and belt resistance, and drive motor losses.

DRIVE LOAD

The combination of drag, momentum, and inertia (it takes some effort to get a heavy object moving) which holds the motor back when MICRO CUT is trying to move the backgauge.

EARTH

The ultimate ground reference, often obtained by driving a conductive rod into the ground until it contacts the water table. This is helpful in eliminating shock hazards and lightning storm damage.

EJECT

The PUSH programmed into MICRO CUT job memory to move the stock out from the throat of the paper cutter so that the operator can better (more safely) handle the material.

EXTENSION CABLE

The cable that plugs into the back of the MICRO CUT display console to allow the fan out cable to hide on the back side of the machine (out of sight).

FALSE CLAMP (FALSE PAPER CLAMP)

The flat plate that attaches under some clamps to cushion the stock during clamping action. If the clamp is solid (mill trimmer clamp) then the false clamp does not exist and both forward limits programmed into MICRO CUT will be the same. If the clamp is fingered so that the forks (fingers) of the backgauge can slide between the fingers of the clamp when the clamp is lowered (for very short cuts) then the false clamp probably exists and MICRO CUT will have two different front limit values (refer to other sections of this manual).

FAN OUT CABLE

The cable that extends to the MICRO CUT sensing switches, encoder, and auxiliary lines (also called the sense cable). This attaches to the "extension" cable which plugs into the back of the display.

FAX

Short for facsimile which is a machine which can send letters and pictures over the phone lines to another FAX machine. The FAX machine phone number for Graphics West Micro Systems is (USA) 415-457-1694. We welcome you to communicate with us by either by FAX, direct phone call (415-457-7500), or TELEX.

FINGERS

The protrusions on the clamp and backgauge which allow the two to interlock while making very short cuts. On the backgauge these are sometimes referred to as FORKS.

FIVE VDC

The voltage level which operates most common computers.

FLEX BACK

The tendency of some backgauge assemblies to move backward (to relieve strain) immediately after being moved forward (or vice versa). If this is too severe it will affect MICRO CUT's settling. See GLIDERS below as well as INSTALLATION NOTES (INSTALLATION MANUAL) for methods of minimizing flexback.

FORKS

The protrusions on the backgauge which interlace with the clamp and allow the cutter to make very short cuts. Also referred to as FINGERS.

FOUR SIDE TRIM

The act of cutting a bit of stock off all four sides of the lift so that all edges are smooth. By definition the finished edge is that part which was behind the knife during cutting. Most FOUR SIDE TRIMS are done with the bulk of the lift inside the cutter throat.

FRACTIONAL READOUT

A units selection which shows whole inches, 1/16ths, 1/64ths, and leftover to coincide with the method of handwheel measurement sometimes used by Harris and Lawson paper cutter operators.

FRONT LIMIT SWITCH

An optional switch which is mounted to the cutter and is tripped to limit forward drive power when the backgauge nears the front of the cutter.

GIBB

The plate (usually made of brass) which resides in the backgauge carriage and rubs along the guide rail (mounted rigidly to the table) and keeps the backgauge in line (square). These are usually adjustable and must be tight enough to prevent the ends of the backgauge from rocking when stock is jogged into the gauge. If they are too tight they will cause excessive low speed loading on the motor drive system and reduce settling performance.

GLIDERS

The nylon plugs (or sometimes wheels) that rest between the backgauge and the top surface of the table to prevent the backgauge and leadscrew from "rattling" during drive. These should be adjusted for paper thickness clearance. If they are adjusted with too little clearance they will create a drag that can cause flexback and poor settling as well as faster mechanical wear.

GROUND

The low voltage reference used in an electrical system.

GUIDE RAILS

The rails that run up and down the table to keep the backgauge square (see GIBB above).

GUTTER

The blank area left between labels which must be removed during the cutting operation.

HANDWHEEL

The device used by the operator to manually turn the leadscrew and move the backgauge.

HONING

Cleaning, polishing, and truing the edge of the knife.

HOUSING

The main body of the paper cutter which houses the clamp, knife, and operating mechanisms for the clamp and knife.

IC

A small solid state electronic device which houses various functions to allow an electronic circuit to be built. See **CHIP**.

IDLE TIME

The management defined time that **MICROCUT** can go without seeing a keystroke or knife operation before it kicks into a side mode and requests an explanation of why no use has occurred. This will only appear on units with management system **AND** idle time enabled.

INCREMENTAL

Also known as quadrature, this refers to the type of shaft encoder which gives an electrical signal shift for a small rotation of its shaft.

INERTIA

The tendency for the handwheel, leadscrew, bearings, pulley, motor, and any other rotating objects to want to keep moving after they have started. While many factors of the load defeat this inertia after **MICROCUT** has stopped motor power, the energy that is left over creates **COAST**.

INSERT CUT

Programming an additional cut into an already programmed memory area requires insertion so that all subsequent values can be moved up one location in memory.

JOB

A combination of stops (cuts) and pushes contained under a specified call up number (job number).

JOG

The process used to "form" a lift of stock into a neat pile so that it can be cut. This usually involves banging the lift against the backgauge and sidegauge, and clamping the stock to remove air trapped between the sheets.

JOGGING STICK

A piece of wood (or other material) used to bang against the side of a lift to knock it into a smooth pile.

KEYS

The labeled buttons on the front of the display console/panel that the operator uses for information input and control.

KEY BEEPER

The buzzer that operates (at user discretion) when the **ENTER**, **LAST**, and **NO** keys are operated.

KNIFE

The metal piece which is responsible for shearing the stock being cut by the cutter.

KNIFE ANGLE

The angle machined on the bottom edge of the knife to allow it to cut through the stock.

KNIFE BAR

The metal piece (often a casting) that the cutting knife bolts into when it is installed on the machine. This knife bar must be adjusted when the knife is changed (since grinding the knife changes its size) and this may affect the adjustment of the MICRO CUT sensing switch. The MICRO CUT switch is mounted to an adjustable bracket and can be moved if necessary. Please refer to the CUT SENSE SWITCH section of the INSTALLATION MANUAL if MICRO CUT does not recognize the knife cycle.

KNIFE CAM

A circular (oblong) plate that turns one rotation as the knife makes a full cycle. Switches on the cam allow the cutter knife control logic to insure correct operation of the knife.

KNIFE CARRIERS

Usually made of wood, these support and protect the knife when it is not installed in the paper cutter. These also protect people from injury from the knife. These carriers must be inspected carefully BEFORE USE to insure that the knife will not present a hazard. They should completely cover the blade regardless of how short the knife is.

KNIFE HANDLES

These are the tools supplied with the cutter to screw into the knife to transport the knife from the knife carrier to the knife bar (and vice versa). If the threads on these handles are worn or damaged, they should be discarded and replaced with new ones.

KNIFE HOLDER

These are "T" shaped brackets supplied with some paper cutters to assist in handling the knife as it is removed or inserted into the knife bar.

KNIFE RELIEF

The back sloped angle machined into the upper face of most knives to cause the knife to angle into the stock rather than drag along it.

LABEL MODE

The procedure used to allow MICRO CUT to automatically calculate several cut values from the entry of a few pieces of information (start value, number of labels, label size, and trim).

LAST DIGIT

The .001's of inches, centimeters, and sun or the .01's of millimeters. Some feel that MICRO CUT is much more accurate than necessary. If this is the case the LAST DIGIT can be turned off. MICRO CUT will still position with the same accuracy regardless. If off, the operator will not see the final digit during any of the operating routines.

LAY COMPENSATE

The procedure where MICRO CUT adjusts all programmed cut locations which require forward drive from the previous cut by a determined amount. This is useful when adjusting for shifted images on printed material or knife draw errors on solid material which is being cut into logs.

LEADSCREW

Sometimes referred to as a worm, wormgear, or screw, this is the long threaded piece which, when rotated, causes the backgauge to move.

LEADSCREW PITCH

This is the distance that the leadscrew will move the backgauge when it is rotated exactly one revolution.

LEADSCREW THREAD

These are the raised areas on the leadscrew which engage with the backgauge carriage to allow movement of the backgauge. These threads will wear over a period of time and require maintenance. It is important to lubricate these threads with a light oil at least daily to prevent excessive wear and dirt buildup.

LIFT

A pile of stock which has been loaded into the cutter in preparation of cutting.

LOCATION

Memory location--four address values in memory which are used in combination to store all the pertinent data for one stop (or push) value on a job.

LOGS

The result of taking a lift of stock and splitting it into several smaller lifts (usually associated with cuts down just one side of the lift).

MACHINE PARAMETERS

The values that MICRO CUT determines at CALIBRATION & TEST (SET UP) and during operation that allow it to calibrate, settle to position, and realize the physical constraints of the machine.

MANAGEMENT CODE

A four digit access code which allows access to management operations if the MICROFACTS system is enabled.

MANAGEMENT SYSTEM

A virtually user transparent function within such equipped MICRO CUTs which allows tracking of job times and operator performance and report it to a printer or computer with real time documentation.

MANUAL DRIVE

The movement of the backgauge by direct (and sustained) operator input at the keys on the display console or by the turning of the handwheel.

MECHANICAL PADDLE

A device used to load stock onto the table from the back side of the machine.

MECHANICAL PADDLE SENSE

A sensing switch installed and attached to MICRO CUT to allow the computers to realize when stock is being loaded (side loading). This switch allows the operator to select AUTO ADVANCE to the first programmed position after the loading process is complete (refer to THE OPTIONAL SIDE LOADING KIT in the INSTALLATION MANUAL).

MEMORY ADDRESS

One byte (eight bits) of memory called up by the computer with a unique call number (address). Four addresses are used to store one stop (or push) value in job memory.

MEMORY DEVICE

The IC which has addressable bytes to store data for long periods of time which the computer can then recall as machine data and job memory.

MEMORY ERASE

An option contained in the CALIBRATION & TEST (SET UP) routine which allows a user to erase all of the programmed job memory at one time. To actually do this two DIFFERENT keys must be pressed in response to two different questions on the prompting display.

MEMORY LOCATION

Memory location--four address values in memory which are used in combination to store all the pertinent data for one stop (or push) value on a job.

MEMORY TEST

An option contained in the CALIBRATION & TEST (SET UP) routine which allows a user to test the job memory to make sure that no failures are present. This is a non-destructive test. All machine parameters and job memory will remain the same as before the test was performed.

MICROCUT

The drive system which allows machines to be retrofitted with new computer controls which control motion and allow sequential (very accurate) stops during operation.

MICROFACTS

A system within some MICROCUT systems that allows a number of features to be enabled including real time clock, access codes, and time tracking.

MILL SPEC KIT

An installation kit which contains oil tight dust proof sensing switches, conduit, and a junction to allow MICROCUT to meet the most stringent local electrical codes.

MILL TRIMMER

The term used in paper mills and some converting houses for guillotine style cutters. These machines generally will have cutting widths of 65 inches or more, will have a solid clamp (no false paper clamp), and a solid backgauge. To simplify this documentation, the term PAPER CUTTER is used for all guillotine style cutting machines.

MODE

An operating routine such as MANUAL, PROGRAMMING, REVIEW, AUTOMATIC, or OPTIONS.

MOTOR BRUSHES

The spring loaded carbon (electrically conductive) blocks which transfer electrical energy to the DC drive motor.

NIBBLE

4 bits of data used in a computer. This is the basis of the hex (hexadecimal) number system which engineers use to pattern the operation of a computer. In hex, counting proceeds as 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, a, b, c, d, e, f, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 1a, 1b, 1c, 1d, 1e, 1f, 20 (=32 base 10), etc. MICROCUT memory is assigned in address values of 2 bytes (or 4 nibbles) from #2000 to #3fff.

NON-VOLATILE

Memory which does not lose its data when power is removed.

OPERATOR CODES

A four digit code which is required for operator entry to MICROCUT IF the access codes are enabled. This is available only on systems containing MICROFACTS. Twelve different four digit codes can be programmed to allow up to twelve different unique operators to log in.

OPTICAL LOAD SENSE

A sensing switch installed and attached to MICROCUT to allow the computers to realize when stock is being loaded or is jammed across the loading area (side loading). If the switch is installed MICROCUT verifies that nothing is jammed in this region before allowing power to the motor (refer to THE OPTIONAL SIDE LOADING KIT in the INSTALLATION MANUAL). If a jam occurs during drive MICROCUT will brake the backgauge to a stop and prompt an error message (SIDE LOADING THROAT IS JAMMED).

OPTIONS

The key to operating MICROCUT. There are many ways of operating the MICROCUT control system buried under the surface of the display. The OPTIONS key and the display combine to open these methods of operation.

PADDLE

A device used to load stock onto the table of the machine.

PILE

Stock which has been stacked and loaded into the cutter in preparation of cutting.

PIN GAUGE

A small device which can mount to the backgauge which will cause stock loaded against the gauge to be skewed from "square" so that a crooked image can be straightened before cutting is completed.

POSITION SWITCH

The sensing switch mounted near the back of the table which limits reverse drive power when tripped and also allows MICROCUT to get a rough position estimate so that calibration can occur at power on. Also referred to as REAR LIMIT SWITCH.

POWER CABLE

The cable which attaches the MICROCUT display console to the motor and the AC power supply.

PRESET

The initial value that MICROCUT assumes when it sees the first shaft encoder zero set after the rear limit (position) switch is tripped at power on calibration. This value is calculated automatically in MICROCUT after the calibration points are entered in the CALIBRATION & TEST ROUTINE. The value is adjusted whenever new calibration data is entered in the CALIBRATION ROUTINE.

PRINTED CIRCUIT BOARD (PC BOARD)

A copper clad fiber board which has been drilled and etched in a particular way to allow electronic components to be soldered to it so that a working electrical circuit is formed.

PRINTER

A device similar to a typewriter (but without keys) which can hook up to a connector on any MICROCUT supplied with MICROFACTS to print out job and time data if the MICROFACTS option is enabled. Printers are available in parallel (many lines, many connections, faster operation) and serial (few lines, few connections, slower operation) styles. MICROCUT uses a serial printer to minimize connections and simplify cabling.

PROMPT

The message that appears in the display when **MICROCUT** is trying to communicate with the operator.

PROMPTING DISPLAY

The four line by twenty character display that contains information to assist in the operation of the **MICROCUT** control system.

RAM

The IC which has addressable bytes to store data for long periods of time which the computer can then recall as machine data and job memory.

REAL TIME CLOCK

A device which is installed in any **MICROCUT** equipped with **MICROFACTS** which keeps track of current time and date.

REAR LIMIT SWITCH

The sensing switch mounted near the back of the table which limits reverse drive power when tripped and also allows **MICROCUT** to get a rough position estimate so that calibration can occur at power on. Also referred to as the **POSITION SWITCH**.

RECIRCULATING TYPE BALL LEADSCREW

A specific type of leadscrew which has ball bearings riding in the backgauge carriage which reduce a large amount of the friction involved with rotation of the screw. The balls ride along the leadscrew threads until they reach the end of the carriage where they exit into a tube that guides them back to the other end of the carriage, and back to the threads.

REGISTER CONTROL

A routine contained within the **MICROCUT TOOLKIT** which allows an engineer to view and "play" with the contents of the computers within the control system.

RETROFIT

A system which attaches and performs on an existing piece of equipment.

QUADRATURE

Also known as incremental, this refers to the type of shaft encoder which gives an electrical signal shift for a small rotation of its shaft.

SAFETY PIN

A strong pin which slides into the way of the knife linkage or some part thereof to mechanically prevent the knife from cycling.

SCREEN

The information that appears in the **MICROCUT** display.

SEALTITE

Flexible conduit (tubing) used to route cables and wires for **MICROCUT** if the **MILL SPEC KIT** is installed.

SELECTION SCREEN

A **MICROCUT** message which asks the operator to make a choice from the options which are listed.

SEMI AUTOMATIC DRIVE

MICROCUT will move the backgauge to a single position when that value is keyed into the display and the **MOVE** key is pressed.

SENSE CABLE

The cable that extends to the **MICROCUT** sensing switches, encoder, and auxiliary lines (also called the fan out cable). This attaches to the "extension" cable which plugs into the back of the display.

SENSING SWITCH

One of the switches installed with **MICROCUT** to allow the control system to "feel" the machine (clamp, cut, position, limit, paddle, etc.).

SERIAL PRINTER

A device similar to a typewriter (but without keys) which can hook up to any **MICROCUT** supplied with **MICROFACTS** to print out job and time data if the **MICROFACTS** option is enabled. Printers are available in parallel (many lines, many connections, faster operation) and serial (few lines, few connections, slower operation) styles. **MICROCUT** uses a serial printer to minimize connections and simplify cabling.

SETTLING FACTOR

A number from one to five that can be programmed into **MICROCUT** to select the control (or speed) with which **MICROCUT** will position the backgauge. Refer to the **OPERATOR'S MANUAL--SETTLING TECHNIQUES** and **OPTIONS--SETTLING TO POSITION FACTOR**.

SETTLING TOLERANCES

The distance that **MICROCUT** will allow the backgauge to be moved from the target value before it will initiate motor drive to correct the position while in **AUTOMATIC** mode. Smaller tolerances force **MICROCUT** to slow down sooner for finer motor power control during positioning. Larger tolerances allow faster settling speeds.

SHAFT ENCODER

The device which attaches to the leadscrew (with a chain) to signal the computers in **MICROCUT** when the leadscrew is turned (refer to **THE SHAFT ENCODER** in the **SERVICE MANUAL**).

SHEET DIVIDE

The procedure used to allow **MICROCUT** to automatically calculate the cut values required to divide any size sheet into a number of equal logs.

SHIELD

The metal (conductive) jacket around wires which is normally connected to **EARTH** to prevent electromagnetic radiation from interfering with signals being transmitted along those wires. Shields should connect at one end only to avoid potential ground current loops.

SIDE LOADING

Placing the stock to be cut onto the table from the rear (side) of the cutter. This requires that the backgauge be moved to the far rear of the cutter at the **END OF JOB** to insure that the load can be placed in front of the gauge.

SIDE LOADING KIT

The cabling, switches, brackets, and hardware that can be ordered to allow **MICROCUT** to operate as a side loading system (refer to the **INSTALLATION MANUAL**).

SIDE LOADING PADDLE

A device used to load stock onto the table from the rear of the machine.

SIDE (GAUGE) SQUARE

The side gauges (see below) should be square to the knife. If not they will need to be shimmed to make them square.

SIDE TABLE

The portion of the table (bed) which extends to either side in front of the knife. This is commonly used for storing stock that is waiting to be cut or has already been cut.

SIDEGAUGE

The metal plates that attach to the side of the cutter to keep the stock from falling off of the table. These are also useful for jogging the stock and cutting it squarely and accurately.

SOFTWARE VERSION

A "tag" which is programmed into the computers within MICRO CUT to signify any changes that may have been made since the previous software version. There are three different computers in MICRO CUT. There are three different software versions.

SOLID STATE ELECTRONIC

Electronic components (many derived by space requirements--NASA) which have no visibly moving parts.

STOCK

A generic term for the material which is being cut or handled.

STOCK LOAD POINTS

Programmed stops within a job which are not intended for cutting, but instead are used for jogging the stock into the cutter in preparation for cutting at a different position (after the MOVE key is pressed).

STOCK PUSH

A programmed location in job memory which is not to be a stop point but simply is used to eject the lift from within the cutter to allow the operator easier handling.

STOP

A programmed position which MICRO CUT is to position the backgauge to and wait for further instruction.

STORAGE LOCATION

The memory space which is used for keeping job data. This consists of 4 memory addresses within the memory device.

TABLE

The horizontal surface of a paper cutter which is used to move and hold the stock while it is being cut.

TARGET

The position value which MICRO CUT is told to achieve.

THERMAL BREAKER

A device which will switch power off if too much current is run through it for too long a time causing excessive heating. These are "slow reaction" devices. Thermals normally can handle several times their rated current for short durations. If one trips off current draw should be inspected.

THROAT

The opening in the paper cutter under the clamp where the stock is loaded. This term also applies to the loading zone used when loading stock from the back side of the cutter.

TIME DATA

Information stored in MICROFACTS which details operation and usage of MICRO CUT.

TOOLKIT

A sub-operation within **MICROCUT** which allows viewing of data within the computers. Similar to a utilities program in a personal computer.

TRIM OUT

The blank area left between labels which must be removed during the cutting operation.

TRUE SIZE

The actual position of the backgauge. **MICROCUT** can have **TRUE SIZE OFF** which will force the current position to read the programmed position (in **AUTOMATIC OPERATION**) unless the true position is beyond the settling tolerances.

TURNAROUND

A programmed location in job memory which is not to be a stop point but simply is used to move the backgauge well behind the next cut value so that the stock can be turned inside the cutter.

VERTICAL SQUARE

The angle between the table and the backgauge face where the stock is jogged. This angle is dependent upon many things--material being cut, pull factors of the clamp, knife draw, etc. Refer to **SQUARING THE BACKGAUGE** in this manual. Consult a qualified paper cutter mechanic for advice on setting the vertical square if problems persist.

ZERO REFERENCE (SET)

The signal that the shaft encoder sends to inform the counting computer that one full revolution of the encoder has occurred.

ZERO SET TIMING

The relation between the occurrence of the shaft encoder zero set signal and the position of the forward moving trip point of the rear limit (position) switch.