

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 The contact information included may be outdated.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.

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 **microsystems**

original style microcut jr[®] operator's manual

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GMS

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MICROCUT DESCRIPTION

MICROCUT is a solid state electronic motor drive control system that contains 999 programmable jobs and 500 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.

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.

This manual is designed to allow an operator to train himself. Where the prompting display is used, the manual gives the prompt message boxed in on the right side of the page. 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.

TURNING POWER "ON" TO MICROCUT

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.

START UP PROCEDURE

INSTRUCTION

Locate the ON/OFF switch on the rear of the DISPLAY CONSOLE. Press it and wait for the prompt:

Press the **AUTOMATIC** key. The backgauge will move to the rear of the table slowly to calibrate itself.

IN CASE OF EMERGENCY, you can **PRESS ANY KEY TO STOP THE MOVEMENT OF THE BACKGAUGE**. To resume the operation turn power off and start again from the top of this page.

YOU WOULD NOT NORMALLY PRESS A KEY HERE UNLESS THE BACKGAUGE HAD TO BE STOPPED.

DISPLAY READS

PRESS AUTOMATIC
TO START

PRESS ANY KEY
TO STOP

TURN POWER OFF
RESTART

After the backgauge reaches the rear of the machine the RED readout will read the correct position. MICROCUT is calibrated and ready to use. The MANUAL key will light.

If there are any problems during start up the prompt will give you an error message. Please consult the SERVICE MANUAL for assistance.

MANUAL DRIVE OPERATION

Pressing the key marked **FORWARD** will drive the backgauge toward the knife, slowly at first, then fast. The RED display will give the true position of the backgauge.

Pressing the key marked **REVERSE** will do the same thing, except the backgauge will move in reverse.

To obtain **SLOW SPEED ONLY** toggle the proper key for either direction.

The backgauge will automatically slow as it approaches either table extreme.

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

SEMI-AUTOMATIC OPERATION

This routine is used to move the backgauge to a position in either MANUAL or PROGRAM modes of operation. The light must be lit on either the MANUAL or the PROGRAM key.

INSTRUCTION

The UPPER line of the CLEAR PROMPT DISPLAY may contain one of 2 possible readouts:

DISPLAY READS

MICROCUT

OR

JOB# CUT#

Enter a position using the **NUMBER** keys.
 Example: 8 inches--press the **8** key and then press the **0** (zero) key three times.

MICROCUT
 8.000

Press the **MOVE** key. It will light showing that **MICROCUT** is moving. When the **MOVE** key light goes out, you are in position. Press the **MANUAL** key to stop the backgauge **BEFORE** it reaches position.

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

NOTE: When entering a position you must roll out the number or the computer will give you an **ERROR** (8 inches = **8.000**, 8 1/2 inches = **8.500**).

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

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. You don't have to know decimal equivalents to program this unit. The computer will figure it out for you. The ENTER, + or - key will total the display.

Fraction calculation example:

INSTRUCTION

DISPLAY READS

Key 2, 5, 0, 0, 0.

MICROCUT 25.000

Press the + key.

MICROCUT 25.000+

Press the 9 key.

MICROCUT 25.000+ 9

Press the / key.

MICROCUT 25.000+ 9/

Key in 1, 6.

MICROCUT 25.000+ 9/16

Press the ENTER key.

MICROCUT 25.562

Calculator keys can be used in all methods of operation.

Calculations can also be chained together.

INCH OR CENTIMETER OPERATION

Cuts can be entered in INCHES or CENTIMETERS or a combination of both. Simply press the IN key for inches or CM key for centimeters. The APPROPRIATE KEY WILL LIGHT telling you what units you are in.

PROGRAMMING A JOB

This routine is used to program a series of stop points into **MICROCUT** so that it can operate in **AUTOMATIC MODE**. To enter the **PROGRAM MODE** the **MANUAL** key must be lit (press the **MANUAL** key).

INSTRUCTION

Press the **PROGRAM** key. The key will light and the prompt will show:

DISPLAY READS

1= NEW 2=OLD
 LAST=SAME JOB

Press the number **1** key to tell **MICROCUT** that you want to program a new job. The display will show:

1= AUTO JOB SEL.
 2= MANUAL SEL.

AUTO JOB SELECT means the computer will select the lowest numbered open job # for you. Press the number **1** key for this. **MANUAL SELECT** means you will assign a job #.

If you press the **2** key the display will show:

JOB#000 ENTER
 DESIRED NUMBER

Pressing the **NUMBER KEYS** will roll the job number. For example: press **9, 5, 4**. The **ENTER** key will let you continue.

JOB#954 ENTER
 DESIRED NUMBER

The **FORWARD**, **REVERSE**, and **MOVE** keys can be used to position the backgauge. Stop positions can be entered into memory with the **KNIFE STROKE** or with the **NUMBER** and **CALCULATOR** and **ENTER** keys.

JOB#954 CUT#001

CORRECTING OR REVIEWING CUT LOCATIONS:

LAST key -- backs up the CUT#, allows reprogramming if desired.
ENTER key -- Enters the cut value shown in the display.
CLEAR key -- clears the lower line of the display.
MOD key -- allows cuts to be added or deleted.

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

INSERT CUT

This routine will add a cut (or an eject) into the selected job number.

OPTION 1: PROGRAM KEY LIT IN PROGRAM OR REVIEW MODES--

INSTRUCTION

Use the **ENTER** or **LAST** key to locate the cut number to be added. Press the **MOD** key to tell **MICROCUT** you want to modify the job.

The display will show:
Press the **YES** key.

DISPLAY READS

JOB#954 CUT#010
30.000

JOB#954 CUT#010
INSERT CUT?

The display will blank out, ready for you to enter a cut (or eject) by using the **NUMBER**, **CALCULATOR**, and **ENTER** (or **EJECT**) keys. If this is a new job you can also use the **FORWARD** and **REVERSE** keys and the handwheel along with the **KNIFE STROKE** to enter the new cut position. The **KNIFE STROKE** will not enter a new cut if you are in **REVIEW MODE**.

OPTION 2: CUT READY LIGHT ON IN AUTOMATIC MODE--

INSTRUCTION

Press the **MOD** key. The display will show:
Press the **NO** key.

Answer **NO** to the question:

The display will show:
Press the **YES** key.

DISPLAY READS

JOB#954 CUT#010
CHANGE CUT? Y,N

JOB#954 CUT#010
LAY COMP?

JOB#954 CUT#010
INSERT CUT?

The display will blank out, ready for you to enter a cut (or eject) by using the **NUMBER**, **CALCULATOR**, and **ENTER** (or **EJECT**) keys. You can also use the **FORWARD** and **REVERSE** keys and the handwheel along with the **KNIFE STROKE** to enter the new cut position.

DELETE CUT

This routine will remove a cut (or eject) from memory in the selected job number.

OPTION 1: PROGRAM KEY LIT IN PROGRAM OR REVIEW MODES--

INSTRUCTION

Use the **ENTER** or **LAST** key to locate the cut to be deleted. Press the **MOD** key to tell **MICROCUT** you want to modify the job.

The display will show:
Press the **NO** key.

The display will show:
Press the **YES** key.

DISPLAY READS

JOB#954 CUT#010
30.000

JOB#954 CUT#010
INSERT CUT?

JOB#954 CUT#010
DELETE CUT?

The cut is deleted from the job memory.

OPTION 2: CUT READY LIGHT ON IN AUTOMATIC MODE--

INSTRUCTION

Press the **MOD** key. The display will show:
Press the **NO** key.

Answer **NO** to the question:

The display will show:
Press the **NO** key.

The display will show:
Press the **YES** key.

DISPLAY READS

JOB#954 CUT#010
CHANGE CUT? Y,N

JOB#954 CUT#010
LAY COMP?

JOB#954 CUT#010
INSERT CUT?

JOB#954 CUT#010
DELETE CUT?

The cut is deleted from the job memory.

EJECT OR TURNAROUND

The eject or turnaround is programmed in the same manner as a cut position but instead of pressing the **ENTER** key, press the **EJECT** key. Ejects do not count as a cut and you will see that the cut number does not advance in the display. In automatic operation, the backgauge will move to that location, not wait for the cut, but move directly to the next position instead.

STEP & REPEAT

This routine enters a number of equally spaced stops **WHILE PROGRAMMING A JOB**. It can be used for labels or coupons. The **PROGRAM** key must be lit (see **PROGRAMMING A NEW JOB**).

INSTRUCTION

Press the **PROGRAM** key. The display will show:

Press the **YES** key.

If **NO** is answered here **MICROCUT** will skip the next prompt and calculate the first stop value automatically. If you know the first cut value, answer **YES**.

Use the **NUMBER** keys with **ENTER** or the **KNIFE STROKE** to enter the first cut.

Use the **NUMBER** keys with **ENTER** to tell **MICROCUT** the number of labels or coupons.

Use the **NUMBER** keys with **ENTER** to tell **MICROCUT** the label or coupon size.

If **NO** is answered the next prompt will be skipped and **MICROCUT** will program only for the label (coupon) size. If there is a trim (gutter) press the **YES** key.

Use the **NUMBER** keys with **ENTER** to tell **MICROCUT** the trim (gutter) value.

If the first cut value was not known or if it was entered with the **KNIFE STROKE** this prompt will be skipped. Answer **YES** to keep the first stop, **NO** to omit it.

DISPLAY READS

JOB#954 CUT#001
 STEP & REPEAT Y,N

JOB#954 CUT#001
 FIRST CUT KNOWN?

JOB#954 CUT#001
 FIRST CUT AT?

JOB#954 CUT#001
 NUMBER UP:

JOB#954 CUT#001
 LABEL SIZE?

JOB#954 CUT#001
 TRIM YES OR NO?

JOB#954 CUT#001
 ENTER TRIM VALUE

JOB#954 CUT#001
 BACKTRIM SHEET?

NOTE: The first stop should be kept if the sheet has not been trimmed to size before starting the **STEP & REPEAT** sequence. 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**).

The **LOWER LINE** of the prompt display will flash the positions as **MICROCUT** calculates them. **MICROCUT** stays in the **PROGRAM** mode to allow additional job programming as desired.

SHEET DIVIDE

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. The **PROGRAM** key must be lit (see **PROGRAMMING A NEW JOB**).

INSTRUCTION

Press the **PROGRAM** key. The display will show:
Press the **NO** key.

The display will show:
Press the **YES** key.

Use the **NUMBER** keys with **ENTER** or the **KNIFE STROKE** to enter the sheet size. The **NUMBER** keys are allowed to key in a value up to twice the maximum rear.

Use the **NUMBER** keys and **ENTER** to tell **MICROCUT** what to divide the sheet by.

If the sheet size was entered with a **KNIFE STROKE** this prompt will not be shown. Press the **YES** key if the sheet needs to be cut to initial size.

DISPLAY READS

JOB#954 CUT#001
STEP & REPEAT Y,N

JOB#954 CUT#001
DIVIDE SHEET Y,N

JOB#954 CUT#001
ENTER SHEET SIZE

JOB#954 CUT#001
DIVIDE BY:

JOB#954 CUT#001
BACKTRIM SHEET?

NOTE: If the first calculated stop is greater than the maximum rear limit **MICROCUT** will give you a **TOO FAR BACK** error message.

The **LOWER LINE** of the prompt display will flash the positions as **MICROCUT** calculates them. **MICROCUT** stays in the **PROGRAM** mode to allow additional job programming as desired.

JOB REVIEW

This routine is used to select or review jobs which have already been programmed into **MICROCUT**. The **MANUAL** key must be lit before **JOB REVIEW** can be started. If it is not lit, press the **MANUAL** key.

INSTRUCTION

Press the **PROGRAM** key. The display will show:

Press the **2** key.

Press the **1** key and **MICROCUT** will ask you to select a job number. See below for a description of option **2**.

Choice **1**: Use the **NUMBER** keys with **ENTER** to select a job number. If the number is invalid, **MICROCUT** will prompt a **JOB NOT FOUND** error message.

DISPLAY READS

1=NEW 2=OLD
LAST=SAME JOB

1=CHOOSE A JOB #
2=REVIEW JOBS

JOB#000 ENTER
DESIRED NUMBER

Press **2**: the computer will display the lowest programmed job number in sequence to the highest. Press the **NO** key to see the **JOB#** and **FIRST CUT** of each job programmed. Press the **YES** key to select the displayed **JOB#**.

You can now toggle the **ENTER** key to review the cuts on the selected job. Press the **AUTOMATIC** key to go into **AUTOMATIC MODE** or the **MANUAL** key to go into **MANUAL MODE**.

AUTOMATIC OPERATION

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 upper line of the prompting display.

Press the **AUTOMATIC** key. **MICROCUT** will position the backgauge at the programmed stop value. The **AUTOMATIC** key will light when the position has been achieved. The **CUT READY LIGHT** will light whenever the backgauge is within the settling tolerances AND the **AUTOMATIC** key is lit. If the backgauge is knocked out of its settling tolerances (see the **MODIFICATIONS** section of this manual) the **CUT READY LIGHT** will go out.

If the **CUT READY LIGHT** flickers the tolerances may be set too tightly (see the **MODIFICATIONS** section of this manual).

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

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

The **MOD** key allows program changes (**CUT READY LIGHT** on).

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

No other keys are operational in **AUTOMATIC MODE**.

To modify an **EJECT**, press and hold the **MOD** key until the eject value is reached.

To exit **AUTOMATIC MODE** temporarily 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 enter **AUTOMATIC MODE** at the same place you exited.

CHANGE CUT

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

OPTION 1: PROGRAM KEY LIT IN PROGRAM OR REVIEW MODES--

INSTRUCTION

Use the **ENTER** or **LAST** key to locate the cut to be changed. Press the **CLEAR** key to blank the display. Use the **NUMBER** and/or **CALCULATOR** keys to display the new cut value. Press the **ENTER** key when ready.

DISPLAY READS

JOB#954 CUT#010
 40.000

NOTE: The **CLEAR** key is optional. You can "write over" the existing cut with the **NUMBER** keys or add and subtract from it with the **CALCULATOR** keys IF **CLEAR** is not pressed. To return to the original cut value (**BEFORE PRESSING ENTER**) press the **LAST** key to back up and then the **ENTER** key to come back to the original cut.

OPTION 2: CUT READY LIGHT ON IN AUTOMATIC MODE--

INSTRUCTION

Press the **MOD** key. The display will show:
 Press the **YES** key.

DISPLAY READS

JOB#954 CUT#010
 CHANGE CUT? Y,N

If this is a one time only change press the **YES** key. The backgauge can be moved and the cut will change this lift only. Press the **NO** key for permanent changes.

JOB#954 CUT#010
 THIS LIFT ONLY?

Turn the handwheel or use the **DRIVE** keys to reposition the backgauge. Do a **KNIFE STROKE** or press the **ENTER** key. This will change the value of the cut at that particular location only.

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

LAY COMPENSATE

This is used to adjust all FORWARD MOVING stop values in the selected job number. 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 yet the STEP & REPEAT programming method can still be used to assure equal sized labels.

CUT READY LIGHT ON IN AUTOMATIC MODE--

INSTRUCTION

Press the **MOD** key. The display will show:
Press the **NO** key.

Answer **YES** to the question:

If this is a one lift only change press the **YES** key. The backgauge can be moved and the lay will change this lift only. Press the **NO** key for permanent changes.

DISPLAY READS

JOB#954 CUT#010
CHANGE CUT? Y,N

JOB#954 CUT#010
LAY COMP?

JOB#954 CUT#010
THIS LIFT ONLY?

Turn the handwheel or use the **DRIVE** keys to reposition the backgauge. Do a **KNIFE STROKE** or press the **ENTER** key. This will change the value of all the forward moving cuts.

Press the **AUTOMATIC** key if you decide you do not want to change the lay after all.

JOB DELETE

This routine is used to remove a no longer wanted job from memory.

INSTRUCTION

Find the job you want to delete (see--JOB REVIEW).

Press the **PROGRAM** key. The display will show:

Press the **YES** key.

DISPLAY READS

JOB#954 CUT#001 40.000

JOB#954 CUT#001 DELETE JOB? Y,N

Your job is erased.

MODIFICATIONS

This routine is used for a number of different options which are standard in MICRO CUT spacer systems. This routine must be entered from the MANUAL MODE. Press the MANUAL key if it is not already lit. Press and HOLD the PROGRAM key. While holding this key, press the MOD key. MICRO CUT will enter the MODIFICATION ROUTINE.

INSTRUCTION

Answer the question:

The false clamp is a metal plate which attaches to the bottom of some clamps and limits the maximum forward travel.

Answer the question:

DISPLAY READS

FALSE PAPER
CLAMP ON? Y,N

CONTINUE MODS?
YES OR NO

If you answer NO MICRO CUT will return you to MANUAL MODE. If you answer YES MICRO CUT will continue with more questions and options.

Press YES to show the thousandths in the display. Press NO to show just the the hundredths.

YES=SHOW .001'S
NO=SHOW JUST .01

NOTE: Even though the display may not show the .001's, MICRO CUT will still position to the .001's in accuracy.

YES will show the true position of the backgauge at all times. If the NO key is pressed, then MICRO CUT will show the programmed value as current position as long as the CUT READY LIGHT is ON.

SHOW TRUE SIZE
IF CUT READY ON?

NOTE: If the backgauge is knocked beyond the settling tolerances--see 2 steps further on--THE TRUE POSITION WILL THEN BE SHOWN UNTIL THE SETTLING TOLERANCES ARE SATISFIED AGAIN.

Press the **YES** key if you want **MICROCUT** to reposition the backgauge if it is knocked out of settling tolerance in **AUTOMATIC MODE** (see directly below).

SELF CORRECTING
IN AUTOMATIC?

Enter **1** to **9**. The larger the number, the faster **MICROCUT** settles. Usually **2** or **3** is recommended. Poorly maintained machines may require larger values.

TOLERANCE IS
0.003 INCHES

NOTE: If the tolerance is set too small the **CUT READY LIGHT** will 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**.

Use the **NUMBER** and **ENTER** keys to program the desired backgauge speed. The **IN** and **CM** keys can be used to select units for the speed value.

BACKGAUGE SPEED
IS INCHES/SEC

Press **YES** to have the backlighting for the prompt display **ON**. Press **NO** to turn it off.

PROMPT DISPLAY
BACKLIGHTING? Y,N

MICROCUT can be calibrated for errors up to $\frac{3}{8}$ of an inch. If the error is more, the mechanical condition of the machine should be closely inspected. If you say **YES**, move the backgauge to a known position, use the **NUMBER** keys to display that value in the prompt, and press the **ENTER** key.

CALIBRATE GAUGE?
YES OR NO

Calibration requires that the backgauge be squared first (the gibbs should be adjusted for this). Cut a trimmed lift of stock at 20 inches (**MICROCUT**). Move the backgauge to 10 inches (**MICROCUT**) and cut the stock again. Remove the top inch of the stock in each pile (to remove the knife draw). Flip the front pile (which is exactly 10 inches long) over and place it on top of the back pile. Compare the lengths. Most people can feel a few thousandths. This is much more accurate than a ruler.

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.

ADJUSTING TORQUE

NOTE: The torque is automatically set to 62% whenever the SET-UP ROUTINE is entered (refer to the SET-UP section in this manual).

It may be necessary to adjust the drive torque if the mechanical condition of the backgauge drive alters significantly. Before adjusting the torque the backgauge mechanism should be carefully examined for problems. The motor brushes should be checked for wear. Replace the brushes before they wear far enough to damage the motor commutator (see MAINTENANCE). If the torque needs adjustment follow these guide lines:

TOO MUCH TORQUE--The backgauge will accelerate past its drive speed when drive is requested (causing an oscillation in drive speed while the computer tries to stabilize at the proper speed) or the backgauge will start a very pronounced rumble trying to reach its full speed.

TOO LITTLE TORQUE--The backgauge will not be able to reach its full drive speed.

It is only possible to adjust the motor torque while in the AUTOMATIC mode of operation (see AUTOMATIC OPERATION in this manual). When the CUT READY light is illuminated press and hold the PROGRAM key. While holding the PROGRAM key press the number 1 key.

INSTRUCTION

The display will show the current torque setting. Use the **NUMBER** keys to change the value. Press the **ENTER** or **AUTOMATIC** keys to continue.

DISPLAY READS

JOB#954 CUT#001 % TORQUE IS: 62

**REFER TO THE MODIFICATION SECTION FOR ADJUSTING
THE BACKGAUGE DRIVE SPEED.**

DEMONSTRATION MODE

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.

NOTE: The demonstration mode alters the machine parameters. It will not affect job memory. It will be necessary to go through the **SET-UP ROUTINE** (see the **TABLE OF CONTENTS**) before using **MICROCUT** on the machine.

Plug the 110 VAC power line into the three prong terminal on the back of the **MICROCUT** display console. It is not necessary to attach any other cables. Plug the 110 VAC power line into a wall outlet. Press and hold the **PROGRAM** and **MOD** keys. Turn the power switch on the back of the display console **ON**. Release the keys. **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.

SETTING UP MICRO CUT

1. Make sure all power is OFF to MICRO CUT. Make sure that the backgauge is in the middle of the table.
 2. Supply the 110 VAC power to MICRO CUT. Use the ON/OFF switch to power ON the display.
 3. If the display says PRESS AUTOMATIC TO START, DON'T press the AUTOMATIC key, but instead press and hold any NUMBER key and then press the PROGRAM key. Release both keys, and this will take you into the SETUP ROUTINE.
-

The display will show:

The memory test is non destructive (the job memory won't be altered). Press **YES** or **NO** to this option.

DO YOU WANT TO
TEST THE MEMORY?

The display will show:

Press **YES** to save the job memory and skip the next prompt. Press **NO** to erase all of the job memory.

DO YOU WANT TO
SAVE THE MEMORY?

If **NO** was selected, press **YES** to erase all of the job memory. If **NO** is pressed the job memory will be saved.

DO YOU WANT TO
ERASE THE JOBS?

The display will then show:

Make sure the clamp and knife are both up and press the **YES** key.

ARE CLAMP AND
KNIFE BOTH UP?

The display will then show:

Make sure the backgauge is not tripping either limit switch. Press the **YES** key.

IS THE BACKGAUGE
OFF THE LIMITS?

The display will then show:

Use the **FORWARD** and **REVERSE** keys to check for proper backgauge drive direction. Use the **YES** or **NO** key to tell MICRO CUT if the motor direction is correct. MICRO CUT will respond by telling you to invert the motor or the shaft encoder A and B lines (see SERVICE MANUAL) OR BY GOING ON TO THE NEXT PROMPT.

USE DRIVE KEYS
IS DIRECTION OK?

The display will show:

MICROCUT will move the backgauge to the rear of the table automatically. Please wait.

CALIBRATING
PLEASE WAIT

MANUALLY TURN THE HANDWHEEL SO THAT THE BACKGAUGE IS AT AN EXACT INCH VALUE.

ENTER REAR
REFERENCE VALUE

Use the **NUMBER** and **ENTER** keys to tell **MICROCUT** the current backgauge position. This is a reference value and should be as exact as possible. The **CM** key will change units to centimeters if this is a preferred measurement to use.

Use the **FORWARD** key to drive the backgauge to less than 10 inches. Be careful not to drive the backgauge into the clamp.

DRIVE BACKGAUGE
TO FRONT

This is the same as when the rear value was entered. The backgauge must be at an exact value less than 10 inches. Use the **NUMBER** and **ENTER** keys to enter the reference position value.

ENTER FRONT
REFERENCE VALUE

Use the **NUMBER** and **ENTER** keys to tell **MICROCUT** how far forward the backgauge can move if the false paper clamp (sole plate) is attached to the bottom of the clamp.

FPC WIDTH IS
0.000 INCHES

(SEE NOTE AT BOTTOM OF PAGE)

Use the **NUMBER** and **ENTER** keys to tell **MICROCUT** how far forward the backgauge can move if the false paper clamp is off.

MINIMUM FRONT IS
0.000 INCHES

(SEE NOTE AT BOTTOM OF PAGE)

Use the **NUMBER** and **ENTER** keys to tell **MICROCUT** how far back the backgauge can be driven (before the mechanical stop).

MAXIMUM REAR IS
0.000 INCHES

Answer the question:

If there is no false clamp press either the **YES** or the **NO** key.

FALSE PAPER
CLAMP ON? Y,N

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. This requires two different front travel limit values. If there is not a false clamp, then the two front travel limit values will be the same.

Press **YES** to show the thousandths in the display. Press **NO** to show just the the hundredths.

YES=SHOW .001'S
NO=SHOW JUST .01

NOTE: Even though the display may not show the .001's, **MICROCUT** will still position to the .001's in accuracy.

YES will show the true position of the backgauge at all times. If the **NO** key is pressed, then **MICROCUT** will show the programmed value as current position as long as the CUT READY LIGHT is ON.

SHOW TRUE SIZE
IF CUT READY ON?

NOTE: If the backgauge is knocked beyond the settling tolerances--see 2 steps further on--**THE TRUE POSITION WILL THEN BE SHOWN UNTIL THE SETTLING TOLERANCES ARE SATISFIED AGAIN.**

Press the **YES** key if you want **MICROCUT** to reposition the backgauge if it is knocked out of settling tolerance in **AUTOMATIC MODE** (see directly below).

SELF CORRECTION
IN AUTOMATIC?

Enter **1** to **9**. The larger the number, the faster **MICROCUT** settles. Usually **2** or **3** is recommended. Poorly maintained machines may require larger values.

TOLERANCE IS
0.003 INCHES

NOTE: If the tolerance is set too small the **CUT READY LIGHT** will 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**.

Press **YES** to have the backlighting for the prompt display ON. Press **NO** to turn it off.

PROMPT DISPLAY
BACKLIGHTING? Y,N

Use the **NUMBER** and **ENTER** keys to program the desired backgauge speed. The **IN** and **CM** keys can be used to select units for the speed value.

BACKGAUGE SPEED IS INCHES/SEC

NOTE: Figure about 1 inch per second of speed for every 10 inches of table length.

MICROCUT now knows what type of machine it been installed on and is ready to use.

TURN POWER OFF RESTART

TURN THE POWER OFF AND BACK ON. The display will read **PRESS AUTOMATIC TO START.** You are ready to operate **MICROCUT.**

IN-MM-CM COMPARISON TABLE

<u>INCHES</u>	<u>MM</u>	<u>CM</u>
5	127	12.7
10	254	25.4
15	381	38.1
20	508	50.8
25	635	63.5
30	762	76.2
35	889	88.9
40	1016	101.6
45	1143	114.3
50	1270	127.0
55	1397	139.7
60	1524	152.4
65	1651	165.1
70	1778	177.8
75	1905	190.5
80	2032	203.2
85	2159	215.9
90	2286	228.6
95	2413	241.3
100	2540	254.0
105	2667	266.7
110	2794	279.4

INCHES = CM/2.54 = MM/25.4
 CM = MM/10 = 2.54 x INCHES
 MM = 25.4 x INCHES = 10 x CM

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.**

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

**original style
microcut jr[®]
service manual**

GMS

GRAPHIC MACHINERY & SYSTEMS A DIVISION OF GOLDEN GATE MICROSYSTEMS, INC.

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FOREWORD

MICROCUT is designed to be very easy to service and maintain. Problems in the computer can be subdivided into the following sections:

- A. Operational
- B. Counting
- C. Memory
- D. Drive
- E. Miscellaneous

In general complications in the computer 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 dedicated line with a 15 amp breaker. A separate ground should be run as well. Refer to the **INSTALLATION MANUAL--110 VAC IN.** Connections on the display console or electrical problems within the machine itself could also be at fault.

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

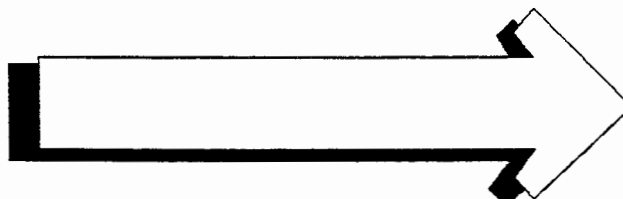
BASIC TROUBLESHOOTING

The MICROCUT display console houses two printed circuit boards--the CPU board and the display board. There are two computers in the display console. One is for counting the pulses sent from the shaft encoder to keep track of backgauge position. The other handles the housekeeping work (keyboard, display, memory, math, drive, etc.). Both computers reside on the CPU board along with the 5 volt supply and the job memory (see NOTE). The display board consists of keys, displays (current position and prompting), various control IC's and the warning buzzer. In general, these parts 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 computers.

There are, however, a number of problems that can be taken care of in regard to the computers. They fit into five basic categories -- operational, counting, memory, drive and miscellaneous. There is overlap in these categories. To simplify the matter, the following pages contain titles of possible problem and steps to take if a 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 note in the FOREWORD of this manual.

NOTE: MICROCUT uses non volatile memory for job data storage. There are no batteries. Memory will last indefinitely. Every time MICROCUT manipulates memory, it double checks all alterations. The 5 VDC supply is self-adjusting. No maintenance of any sort is necessary in the display console.



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. There is a blown fuse in the display console. Replace.

2. MICROCUT DEFAULTS INTO SET-UP ROUTINE.

- a. The 110 VAC line into MICRO CUT is inadequate. Check the ground and verify that the circuit is dedicated and capable of supplying 15 amps (see the INSTALLATION MANUAL--110 VAC IN).

3. NO BACKGAUGE DRIVE.

- a. The motor belt or pulley is loose.
- b. Check for a mechanical bind--oil the leadscrew or increase the motor torque (see OPERATOR'S MANUAL).
- c. The drive fuse in the display console is blown. Check the fuses and replace if necessary.
- d. The motor brushes are bad. Examine them for wear. Carefully clean the motor to remove all built up carbon dust.

4. KEY(S) FAILS TO RESPOND:

Refer to the prompting display and key lights 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 MICRO CUT 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 - MICRO CUT is already in the AUTOMATIC MODE or there is no JOB# in the prompting display.

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

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 SET-UP ROUTINE to recalibrate (see OPERATOR'S MANUAL).

6. MICROCUT IS OUT OF CALIBRATION:

- a. Check the dimension units (INCH or CM).
- b. Refer to the OPERATOR'S MANUAL--MODIFICATIONS.

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

- a. The wrong units are selected. Check the IN and CM keys.
- b. The reference values used in the SET-UP ROUTINE (see OPERATOR'S MANUAL--SET-UP ROUTINE) were not exact.
- c. The shaft encoder or the leadscrew sprocket is loose. Check for tightness. 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.
- d. Failed shaft encoder - replace.

8. IMPROPER OR ERRATIC COUNTING (BACKGAUGE POSITION).

- a. The shaft encoder cable has failed. Check the cable for bad solder joints. Replace if necessary.

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. MICROCUT TENDS TO SUFFER COUNT FAILURES.

- a. MICROCUT has an inadequate 110 VAC supply. A poor 110 VAC line forces MICROCUT to compensate more and more in it's count protection software and slows down the maximum counting speed which it can handle before defaults occur. Refer to POWER FOR MICROCUT in the INSTALLATION MANUAL.
- b. Connection problem. See previous paragraph (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.

10. OPERATING MODE KEY(S) DO NOT LIGHT UP:

- a. The mode has not been selected; try again.
- b. There is a burned out bulb -- replace as necessary.

NOTE: The key caps pry off. Bulbs can be replaced from the front side without disassembly of the display console. It is recommended that power be turned off. Double wide keys may have only one bulb burned out. A cut off applicator tip from a tube of silicone seal works well to remove the lights. Needle nose pliers work also but tend to break the glass.

11. THERE IS GARBAGE IN THE MEMORY.

- a. The memory was not erased at the time of installation. Enter the SETUP ROUTINE and erase the job memory (see the OPERATOR'S MANUAL--SET-UP ROUTINE).

12. OUT OF MEMORY.

- a. Memory was not erased at the time of installation. Enter the SETUP ROUTINE and erase all of the job memory (see the OPERATOR'S MANUAL).
- b. All of the job memory space has been used. Delete unused jobs as desired or enter the SET-UP ROUTINE and erase all of the job memory (see the OPERATOR'S MANUAL).

13. CUT READY LIGHT FLICKERS ON AND OFF

- a. The settling tolerances are set at too small a value. Refer to OPERATOR'S MANUAL--MODIFICATIONS.
- b. There is a connection problem at the CUT READY socket on the display board or the light is burned out.

14. CUT IS NOT RECOGNIZED.

- a. The cut sensing switch is out of adjustment. Adjust the switch as necessary. See the INSTALLATION MANUAL--CUT SWITCH.

15. BACKGAUGE DRIVES INTO THE FALSE CLAMP WITHOUT STOPPING:

- a. The false clamp option is incorrect. See the OPERATOR'S MANUAL--MODIFICATIONS.

PROMPT ERROR MESSAGE LIST

MICROCUT has several prompts to tell the operator of existing or pending error conditions. The following alphabetical list is a synopsis of these codes. Refer to other sections of the **SERVICE MANUAL** for additional 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

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**).

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 STROKE EARLY

MICROCUT 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 **MICROCUT** to position the backgauge correctly. See the prompt **OUT OF POSITION**.

CUT SWITCH HAS A WIRING PROBLEM

MICROCUT senses that the knife is down when it is supposed to be up. Check the wires for proper connection (see the **INSTALLATION MANUAL**).

DRIVE OVERHEATED WAIT FOR COOLING

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. See the prompt **OIL LEADSCREW OR REDUCE SPEED**.

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**.

FAST DRIVE PROB.

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 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.

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**).

INVERT CLEAR AND BLUE WIRES

The shaft encoder is counting in the wrong direction (**SET-UP ROUTINE** for new installations only). It will be necessary to invert the A and B signal wires from the encoder to continue. Refer to the **SHAFT ENCODER (SERVICE and INSTALLATION MANUALS)** and the **WIRING and CABLES** sections (**INSTALLATION MANUAL**) elsewhere in this documentation.

INVERT MOTOR WIRES

The motor is driving in the wrong direction (**SET-UP 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. **NOTE: On some cables these wires are white and yellow.**

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 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 display this prompt after a knife stroke is performed in either the **PROGRAM** or **AUTOMATIC MODES** of operation. The prompt will clear and operation will continue normally as soon as **MICROCUT** senses that the knife is no longer down.

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 **MICROCUT**'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 **SET-UP ROUTINE**).

MEMORY FAILURE TURN POWER OFF

MICROCUT has sensed a failure in the job memory and will not let operation continue. Turn the power off. It is advisable to enter the **SET-UP 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. **MICROCUT** 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:

MICROCUT 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.

NO MORE JOB #S

All of **MICROCUT**'s 255 auto select jobs have been used. It will be necessary to manually select a job number or erase one of the numbered jobs between 1 and 255.

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 **STEP & REPEAT** 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 **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. **MICROCUT** 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 **OPERATOR'S MANUAL** or **SERVICE MANUAL**). See the prompt **DRIVE OVERHEATED WAIT FOR COOLING**.

OUT OF MEMORY

All of the available job memory has been used. Note that while **MICROCUT** has the option for 999 different job numbers, each job may take up several of the available memory locations. The memory space will be used up before all 999 jobs are programmed. Delete some of the unused or seldom used jobs to make room for the new ones.

OUT OF POSITION

MICROCUT 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 **MICROCUT** to position the backgauge correctly. See the prompt **CUT STROKE EARLY**.

OUT OF TOLERANCE

The duplicated memory in **MICROCUT** does not match. Go through the **SET-UP ROUTINE (OPERATOR'S MANUAL)** to correct this. If the prompt comes up again there may be a failed memory chip in **MICROCUT**. Test the memory in the **SET-UP ROUTINE** to see if this is the case.

PRESS ANY KEY TO STOP

This prompt appears only when **MICROCUT** is starting up, and it is possible that someone (or something) is around the machine in such a way as to be endangered by the movement of **MICROCUT**. **ANY KEY WILL STOP MICROCUT 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**).

SLOW DRIVE PROB.

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**.

!!!TARGET LOST!!!

At least one of **MICROCUT**'s internal data backup registers does not agree with the others in regards to the position which **MICROCUT** is supposed to drive to. **MICROCUT** 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, **MICROCUT** halts operation with this error prompt. This safety gives assurance that **MICROCUT** will not make errors in positioning. If this message occurs often check the **MICROCUT** power supply line very carefully. Refer to the **INSTALLATION MANUAL--NOTES; HINTS; 110 VAC; or POWER SUPPLY**.

TOO FAR BACK

The position that was requested is beyond the physical limits of the table. **MICROCUT** 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 **SHEET DIVIDE** routine **MICROCUT** allows values to twice the maximum rear in the event that a pre-sized sheet is to be cut in two with no backtrim. If the first cut value calculated in **SHEET DIVIDE** 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 **SET-UP 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 RESTART!

Microcut 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.

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.
3. Use a small screwdriver to check for tightness on all of the wire connections.
4. Plug the connectors back in. Make sure that there is adequate strain relief so that the wires will not be stressed if the display console is pivoted in its mounting base.
5. Unplug the connector on the shaft encoder and plug it back in several times.
6. Check all wiring for any nicks or cuts.
7. 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.

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

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 set is internal to the shaft encoder as well to allow the computer to keep track of each complete revolution.

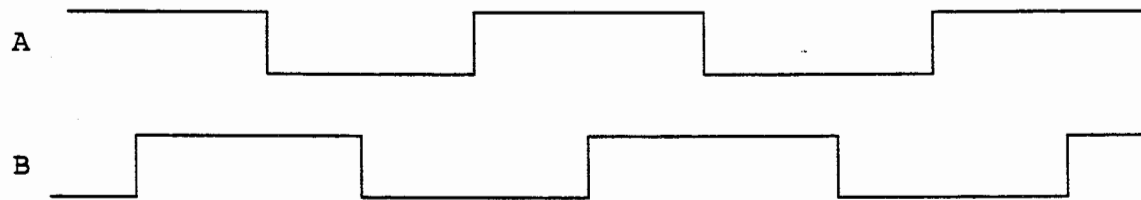
The **MICROCUT** shaft encoder is an incremental (quadrature) type. There are five lines attached at the shaft encoder:

		DISPLAY TERMINAL	CANNON CONNECTOR	
Black	=	Ground (GND)	5	F
Red	=	5 VDC (5V)	4	D
Green	=	Zero Set (Z)	3	C
White or Clear	=	Signal (A)	2 or 1	A
Yellow or Blue	=	Signal (B)	1 or 2	B

NOTE: Terminal 6 is the cable shield and connects only at the base console.

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.

As the shaft encoder turns its signals look like this:



<u>Traveling:</u>	<u>Left to Right</u>	<u>Right to Left</u>
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

A brief inspection shows us that the direction of count can be reversed by interchanging the A and B signal lines. If these are wired backwards at the time of installation, **MICROCUT** will tell the installer (in the SET-UP ROUTINE) to invert the lines.

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 set, the count is checked and corrected to +2000 or 0 counts from the last zero set. If the count is too far out of tolerance, the microprocessor 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.

**original style
microcut jr[®]
installation manual**

GMS

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INTRODUCTION

MICROCUT is a self contained microprocessor controlled motor drive positioning system. **MICROCUT** must have a place to attach the 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 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.

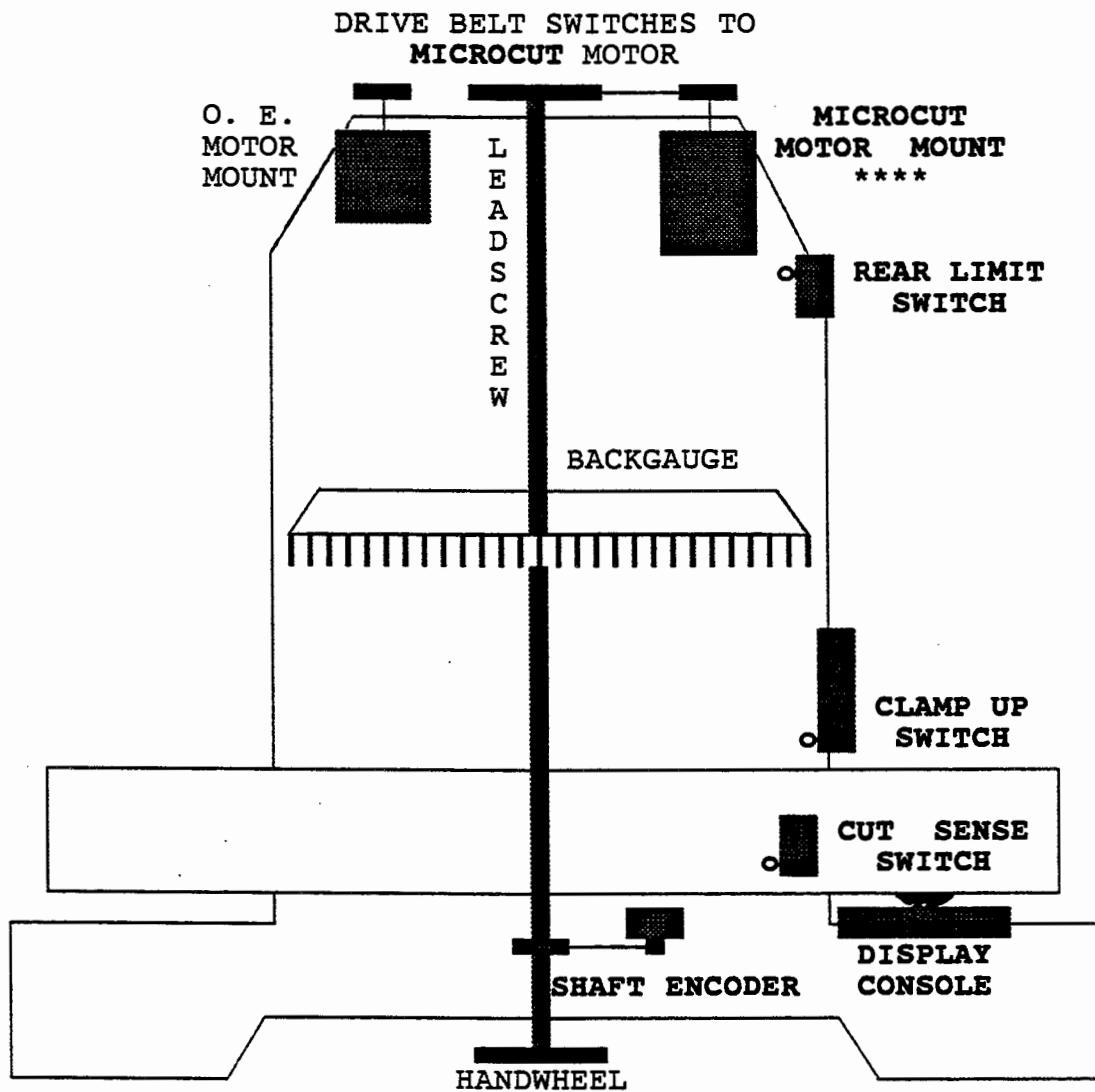
MICROCUT CONSISTS OF PARTS AND ASSEMBLIES WHICH ARE ADDED TO THE MACHINE. GUARDING MAY NEED TO BE ALTERED OR ADDED TO OFFER PROPER PROTECTION. THIS MUST BE DONE BEFORE MICRO CUT IS OPERATED. DO NOT OPERATE THE MACHINE UNTIL THIS GUARDING IS COMPLETE. ALL MOVING PARTS AND HAZARDS MUST BE COVERED IN SUCH A WAY AS TO PREVENT ACCIDENTAL CONTACT OF ANY SORT.

This **INSTALLATION MANUAL** is organized into; **NOTES; HINTS; MECHANICAL INSTALLATION; ELECTRICAL HOOKUP; FINAL SETUP; and FINAL CHECKOUT.** Read it thoroughly before starting. In general, completion of the mechanical installation is recommended before any wiring is done.

THIS MANUAL IS DESIGNED TO GIVE A CONCEPTUAL APPROACH TOWARDS INSTALLING MICRO CUT. MICRO CUT 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 has a built in **DEMONSTRATION MODE** (see the **OPERATOR'S MANUAL**). Plug the unit into a wall outlet and brief the operator(s) on using **MICROCUT**. The operator(s) can use the **OWNER'S MANUAL** to learn how to use **MICROCUT** while the installation is being done.

THE INSTALLATION



**** ON SMALL 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.

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.

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 MICROCUT 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
#36, #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 MICROCUT PARTS TO THE MACHINE

7/16, 1/2, 9/16 wrenches and sockets
Allen wrench set (SAE)

FOR WIRING THE PARTS

Wire strippers
Small common screw driver

FOR CUTTING THE TY STRAPS AFTER ROUTING THE CABLES

Side cut pliers

DRILL BIT	# 36	# 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 INSTALLATION NOTES

The following paragraphs cover most of the installation failures seen to date. Please read them carefully.

- A. **Optimum performance is obtained when the motor is geared for 4 turns for every inch of backgauge drive. A smaller turn ratio causes the backgauge load to slow the motor down. Unless the motor is operating at its full 1800 rpm, the high speed is selected at its maximum value, and the speed adjust is as high as it can go, 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. WATCH THE MOTOR PULLEY DURING THIS TIME TO COUNT THE NUMBER OF TURNS IT MAKES. IF IT DOES NOT TURN AT LEAST THREE TIMES AND PREFERABLY FOUR TIMES THEN THE MOTOR PULLEY IS TOO LARGE. TO PREVENT EVENTUAL FAILURE, CORRECT THIS SITUATION IMMEDIATELY.

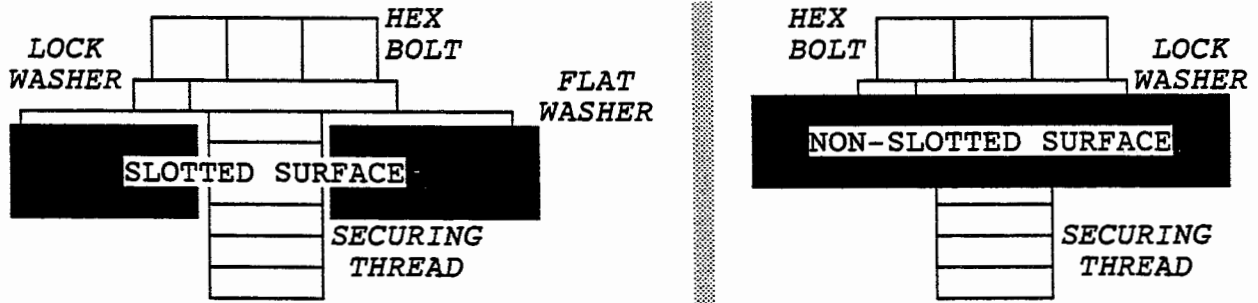
- B. A variable groove pulley is supplied so that the motor turn ratio (see paragraph A above) can be approximated in most cases. When the pulley is adjusted properly, snug the locking allen set screw to the FLAT of the pulley, rock the pulley gently to position the set screw on the center of the flat, then completely tighten it. This will prevent the pulley from self adjusting itself later on down the line.
- C. **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.
- D. **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). Make sure the motor turns at least three times and preferably four times per inch of backgauge travel. This will give **MICROCUT** enough "leverage" to drive smoothly and settle into position quickly.

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.

- E. Adjust the motor drive belt so that it is loose. This will reduce motor vibration and noise. Small cutters often have small bearings and too much tension on the drive belt can cause problems. **KEEP IT LOOSE.**
- F. 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.

- G. Supply the proper DEDICATED 110 VAC power line. The computer competes against the drive motor for its current. The motor by its very nature is a better competitor. Therefore MICRO CUT requires a power supply capable of giving 15 amps. If a transformer is used, at 110 VAC, 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 nothing but "dirty" power is available we suggest the use of an active tracking filter. Contact us by means of phone, telex, or FAX (numbers are on the cover of this manual) for any questions you may have.
- H. 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.
- I. The slots in the brackets are designed for use with the supplied hardware 3/8" and 1/4". Do not use undersized bolts.
- J. 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 computer.
- K. Use several tie straps to mount the cables to the display yoke. This will act as a strain relief and prevent subsequent connection problems where the cables enter the display console.
- L. The shaft encoder drive sprocket (on the leadscrew) should be inspected to make sure that the faces line up and that the gap on either side (caused by the width of the saw blade used to cut it in half) is the same. These sprockets are cut and stocked in matched halves. 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 halves are slid into position. This makes the installation much 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" per turn. For coarser 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. Generally this is not a problem, but in machines with a large shaft encoder turns ratio, it is possible that MICRO CUT may calibrate one shaft encoder revolution off. 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. Go through the SET-UP ROUTINE (OPERATOR'S MANUAL). Repeat the checking procedure.
- O. Make sure that all wires are securely tightened BEFORE operating the spacer.
- P. The SET-UP ROUTINE (OPERATOR'S MANUAL) has been simplified. Read the prompting display. It will tell you what to do in order to calibrate MICRO CUT into 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 will work best with a motor pulley ratio which allows about one inch 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.

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

Complete the mechanical portion of the installation. Then wire the switches, shaft encoder and the motor.

THE POSITION (REAR SLOW DOWN) SWITCH

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 forward until the switch is released and the next zero reference is seen from the shaft encoder (attached to the leadscrew). This becomes the computer's calibration point. Either switch on the shorter style bracket can be used for this purpose. These switches are wired normally closed at the factory.

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 MICRO CUT 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.

THE CLAMP UP SWITCH

The clamp up switch disables drive whenever the clamp is NOT in its full up position. Of the three switches supplied, it is the one on the longest mounting bracket. This switch is wired normally open at the factory (tripped closed by the clamp).

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.

In some cases the switch will need to trip off of one of the gibb bolts (tall clamp openings). Be careful to check that the switch will not be damaged as the clamp is brought down.

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.

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.

THE CUT SENSING SWITCH

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. Either of the switches mounted to the shorter style bracket can be used for this purpose. These switches are wired normally closed at the factory.

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.** 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, MICRO CUT may push the paper forward into the blade trying to drive to the next stop value.

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--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.

THE 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 this 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 adjustable pulley and OE belt (if possible) to attach the **MICROCUT** motor to the backgauge drive.

Adjustable V-link belt is included in the **MICROCUT** kit to increase the mounting possibilities.

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.

THE SHAFT ENCODER

MICROCUT uses a shaft encoder with internal zero set to keep track of backgauge position. The shaft encoder is driven off the leadscrew with a sprocket-chain-sprocket arrangement. The sprocket for the leadscrew is split to allow for 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. Measure and break the drive chain to length. Install it to the sprockets. Take up any slack with the shaft encoder swing mounting bracket.

Make sure that the split sprocket is mounted so that there is no undue stress on the chain at the junction of the sprocket halves.

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.

THE 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. 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 with either the short or the long side down. The display can be positioned as necessary by swinging the ball joint and tilting the yoke assembly.

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. A backing plate is supplied for cases where the cutter housing may require additional strength.

WIRING AND CABLES

Route all cables to the display console. 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 cable with the tie straps supplied. Use tie straps for strain relief on the display console tying the cables onto the cross bar between yokes. Connect the wires for the switches on the terminal strip which plugs into the display console. Polarity of these wire is not important. Use the spiral wrap to further support the cables exiting the display console.

NOTE: Plug the cables in and out several times. The sliding action on the connector pins will help to clean any dirt or corrosion. Keep the cables out of dirt, grease and contaminants. **CONNECTIONS ARE THE LARGEST SINGLE FAILURE POINT. MAKE SURE THAT THERE IS ADEQUATE STRAIN RELIEF SO NONE OF THE WIRES ARE STRESSED AS THE DISPLAY CONSOLE IS ADJUSTED ON THE MOUNTING BRACKET.**

	PIN #	PURPOSE
2 PIN TERMINAL	1	MOTOR +
	2	MOTOR -
3 PIN TERMINAL	1	GROUND
	2	NEUTRAL
	3	110 VAC HOT
6 PIN TERMINAL	1	SHAFT ENCODER A LINE
	2	SHAFT ENCODER B LINE
	3	SHAFT ENCODER ZERO
	4	SHAFT ENCODER 5 VDC
	5	SHAFT ENCODER GROUND
	6	SHAFT ENCODER SHIELD
8 PIN TERMINAL	1	CLAMP SWITCH
	2	CLAMP SWITCH
	3	CUT SWITCH
	4	CUT SWITCH
	5	FRONT LIMIT*
	6	FRONT LIMIT*
	7	REAR SWITCH
	8	REAR SWITCH

* The front limit is optional. Normally these terminals should be jumpered across (5 to 6).

110 VAC IN

The power for MICRO CUT should be from a 15 AMP DEDICATED breaker. The customer is responsible for supplying an outlet near to the console that MICRO CUT can be plugged in to. 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.

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.** If nothing but "dirty" power is available we suggest the use of an active tracking filter. Contact us by means of phone, telex, or FAX (numbers are on the cover of this manual) for any questions you may have.

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 TO OCCUR.

THE FINAL SETUP

1. Use the tie straps, mounting loops (with 10-32X1/2" 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.
3. Turn the power on to both the machine and MICRO CUT.
4. Refer to the SETUP ROUTINE in the OPERATOR'S MANUAL to calibrate MICRO CUT to the machine it is now installed on.

FINAL CHECKOUT

1. Inspect all components and cables for tightness, alignment, and routing.
2. **Add additional guarding as required to insure full operator safety.** Check around all parts and assemblies which were added or affected by the addition 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.

3. Make the appropriate notations in the OPERATOR'S MANUAL--USE OF THE ORIGINAL EQUIPMENT CONTROLS.
4. Check **MICROCUT** to make sure all of its functions and operations are performing properly (positioning, settling, programming, etc.).
5. Train the operator(s).

MICROCUT SPARE PARTS PRICE LIST

PART	PRICE
Display console	\$2,500.00
1/2 HP motor	275.00
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
Key diffuser with lens (engraved)	7.00
Key light	2.00
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)	250.00

**PRICES, AVAILABILITY, AND SPECIFICATIONS SUBJECT TO CHANGE
WITHOUT NOTIFICATION.**

PERSONAL NOTE SPACE

original style microcut jr[®] safety manual

GMS

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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 strongly advised that a separate earth ground wire be run to the machine if this is not already the case (operator safety will be jeopardized otherwise).

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 contact your local representative or service person **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.

**original style
microcut jr[®]
glossary of terms**

GMS

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GLOSSARY OF TERMS

The text in this glossary is the same for both MICRO CUT retrofit spacer systems and SABER paper cutters. Some of the discussion will pertain to only MICRO CUT or only SABER. Please keep this in mind as the glossary is used.

MICRO CUT and SABER use 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 MICRO CUT and SABER. 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 MICRO CUT 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 MICRO CUT (MICROFACTS) which are required to gain access to operation and management control if MICRO CUT 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.

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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. SABER uses a low pressure high volume table with a compressor mounted under the table.

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 MICRO CUT. This is a socketed Lithium battery with a ten year (power off) life.

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 in SABER (MICRO CUT uses conduit 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 MICRO CUT 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 MICRO CUT 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 MICRO CUT 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 (SABER uses a 180VDC motor only). 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--MICRO CUT is usually shipped with either a 1/2 or 1 HP motor) with RPM ranges from 1725 to 2400 RPM.

DECELERATION TECHNIQUE

MICRO CUT 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 **MICROCUT** system or the **SABER** 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 **MICROCUT** 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 **MICROCUT** 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 **MICROCUT** 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 **MICROCUT** 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 **MICROCUT** will have two different front limit values (refer to other sections of this manual).

FAN OUT CABLE

The cable that extends to the **MICROCUT** 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).

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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. The SABER paper cutter senses the knife operation directly from the knife circuit and does not require an externally mounted switch.

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/panel and by the handwheel switches on the SABER paper cutter.

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** and **SABER** control systems.

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 handles 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 MICRO CUT 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. MICRO CUT 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.

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 _____

Software versions:
Drive _____ Display _____ Count _____ Prompt _____

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

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: