

# microcut<sup>®</sup>

Please Note:

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 The contact information included may be outdated.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

Thank you.

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**C&P** **microsystems**

# microcut jr<sup>®</sup>

## OWNER'S MANUAL

Revision 498

**GMS**

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

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**microcut jr<sup>®</sup>** IS A REGISTERED TRADE MARK OF GOLDEN GATE MICROSYSTEMS

**microcut jr<sup>®</sup>** SERIAL NUMBER \_\_\_\_\_

MACHINE DESCRIPTION \_\_\_\_\_

INSTALLED BY \_\_\_\_\_ DATE \_\_\_\_\_



# INTRODUCTION

*Dear Valued Customer,*

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

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

The **microcut** automatic backgauge control system is intended to increase both the quality and quantity of production possible on a machine, while reducing the demands placed on the operator.

- X Several methods of programming cutting sequences are available. Each program is assigned a job number so that it can be recalled easily whenever required. Automatic operation may then commence. Memory is automatically divided for the number of cuts on each specific job, so there are no memory allocation demands placed on the operator.
- X **microcut** is a computer controlled motor drive positioning system. There are built-in power limiting factors so that mechanical damage is not likely to occur in the event that proper lubrication schedules are missed, but this is NOT a substitute for proper maintenance.
- X **microcut** is not intended to correctly drive a machine which is bound or damaged. The handwheel must turn easily with one hand. If two hands are required to turn the handwheel, then the leadscrew, gibbs, bearings and backgauge should be closely inspected and adjustments and repairs made BEFORE installing or operating **microcut**.
- X The addition of **microcut** will enhance the operation of your cutter. Due to the extra productivity, maintenance may be required more frequently. This is the responsibility of the owner and not of the manufacturer or distributor of **microcut**.
- X **microcut** is intended for operation of the backgauge only. Any alterations to any part(s) of the machine are the sole responsibility of the owner.

## SOME SAFETY CONSIDERATIONS:

1. microcut includes its own DC drive motor. IT IS CRITICAL THAT MOTORS, PULLEYS, AND OTHER MOVING PARTS BE PROPERLY GUARDED. The addition of the **microcut** motor may require the modification of an existing guard or its replacement. UNDER NO CIRCUMSTANCES SHOULD **microcut** BE USED WITH AN UNGUARDED MOTOR PULLEY. Affix the enclosed warning label to the cutter under the guard to discourage improper operation if the guard is ever removed.
2. microcut SHOULD NEVER BE INSTALLED ON A CUTTER THAT DOES NOT MEET EXISTING SAFETY STANDARDS. These standards include, but are not limited to, *two hand start and hold for knife activation, and a latching device for the knife when at the top of its cycle*. If you have any questions, seek expert opinion before installing **microcut**.
3. **microcut** will increase production. It may be necessary to alter waste disposal methods so that material will not build up and impair the operator=s mobility.
4. The paper cutter should be placed away from distractions: water coolers, break room, main passages, traffic, open doors, etc...
5. The floor should be able to support the weight of the paper cutter in a level position without excessive vibration.
6. 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.
7. Rails should be placed around the machine to prevent unauthorized or incidental entry into the cutter work area.
8. The addition of **microcut** may require modification to existing guards or addition of new ones. DO NOT operate **microcut** until guards are installed to prevent accidental contact with *any* moving object. Providing proper guarding and insuring that this guarding is installed is the responsibility of the owner and not of the manufacturer or distributor of **microcut**.

While reasonable efforts have been taken in the preparation of this manual to assure its accuracy, the manufacturer and distributor assume no liability resulting from any errors or omissions in this manual, or from the use of the information contained herein. Specifications and software are subject to change without notice.

For additional information on safety, please contact your local safety authority.

Everything safely possible has been done to ease the installation of **microcut**. With proper care, it has been shown that installations can be simple and call-backs for repairs and make-rights few. Please report any problems or suggestions to the factory:



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This includes, but is not limited to: packing; parts supplied; design and quality of parts and assemblies; and anything else that may affect the ease of installation and use of this product in a productive, professional manner.

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**microcut**<sup>7</sup> is a registered trade mark of golden gate microsystems, inc.

Serial Number	
Date	
Cutter Brand	
Dealer	
Installed by	





# INSTALLATION

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

**microcut IS NOT INTENDED TO CONTROL THE KNIFE OR THE CLAMP ON THE PAPER CUTTER.** *Anything* dealing with the clamp or knife is *not* to be tampered with or adjusted during the installation or operation of **microcut**. *Any* alterations to the knife or clamp safeties, circuits, or operation, or *any* installation technique which compromises the safety of anyone working on or around the machine is STRICTLY FORBIDDEN.

**GUARDING MAY NEED TO BE ALTERED OR ADDED** to offer proper protection when **microcut**s parts and assemblies are added to the machine. This must be done *before microcut* is operated. *Never* operate the machine until *all* guarding is complete. *All* moving parts and hazards must be covered in such a way as to prevent accidental contact of *any* sort.

The installation is basically mechanical. It involves mounting the display console containing all of the electronic controls, the DC motor to drive the backgauge, the shaft encoder to signal backgauge movement to the computer, four sensing switches to inform the computer of the machine status (clamp, knife, false clamp, and position), and a transformer which allows 3 phase power to be used to power the computers and motor drive. The cables are plug-in type.

Several photos are included at the back of this manual for mounting technique reference. **microcut** is a retrofit system, so every installation is unique. Install the components for function as well as fit. The brackets are designed with many extra holes and slots. They are easily modified, and can be adapted for almost any requirement.

Every display console is identical regardless of machine type. A brief SET UP ROUTINE is resident in the computer to allow simple adaptation to any machine. This routine *must* be completed on every installation in order for **microcut** to know the machine it is installed on and to operate safely and correctly. Instructions for this routine are found in the OPERATION section of this manual.

The most significant differences in packing for various **microcuts** are the encoder sprocket set (see SHAFT ENCODER), cogged pulley for flat belt drive applications such as that found on many Schneider cutters, and motor size. If the machine leadscrew diameter is known at the time of shipment, the leadscrew sprocket will be bored to the proper dimension. Otherwise, it may be necessary to have the sprocket bored to size. Check the sprocket before beginning the installation. If it must be bored, take care of this NOW to avoid unnecessary delays later. Have the sprocket cut in half to allow easier installation.

# INSTALLATION DIAGRAM

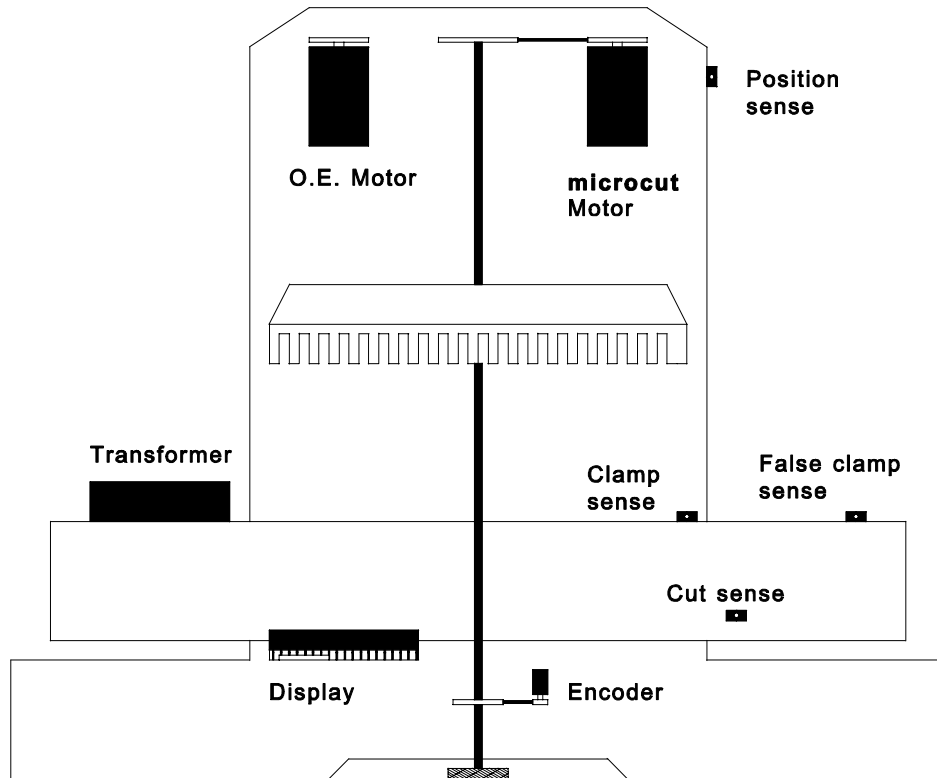


Diagram 1 - Top View

- < *Part locations are for reference purposes only. Every installation will be unique. Mount components for function and form, not necessarily to mimic this diagram.*
- < *On some paper cutters, it is not always possible to find space to mount a second motor. It may be necessary to remove the original motor and install the **microcut** motor in the original equipment space.*

*If this is the case, completely insulate any bare wires, label all wires, and pack all mounting hardware with the original motor to facilitate reinstallation of the motor in the event **microcut** is moved to another machine at a later date. The installer should document how the original motor should be refitted.*

# RECOMMENDED INSTALLATION GUIDE AND TOOL LIST

Every installer will want to adapt this procedure. It is merely intended to be a guide. The procedures are listed in recommended order of execution. Generally, an installation will be much smoother if tasks are organized to allow use of the tools in a given category to completion before beginning to use the tools listed in the next category.

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

- Slide T square with level
- Pencil

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

- Paper and rags to cover machine surfaces
- Pilot, #35, #21, #7, 21/64" high speed drill bits
- Electric hand drill
- Extension cord

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

- 6-32, 10-32, 1/4-20, 3/8-16 taps
- Tap handles (ratchet type are convenient)
- Tapping fluid

CLEAN ALL METAL FILINGS OFF OF THE MACHINE. Clean the machine to prevent future damage. Brush Rags

BOLT AND SECURE ALL **microcut** PARTS TO THE MACHINE.

- 7/16, 2, 9/16 wrenches and sockets
- Crescent wrench
- Hacksaw to saw off excess threaded rod

ROUT THE CABLES Complete wiring of all components. Trim off excess length on all ty straps.

- 7/8 inch hole punch for transformer AC input wiring
- Common and Phillips screw drivers
- Side (flush) cut pliers

DRILL BIT	#35	#21	#7	1/4"	21/64"
TAP SIZE	6-32	10-32	1/4-20	5/16-18	3/8-16

*Most charts recommend 5/16" bit for 3/8-16 tap, but 21/64" makes tapping much easier.*

# INSTALLATION NOTES

**microcut** is a retrofit system for many different types of machines. All installations will vary. This text is designed to give a conceptual approach toward the installation. Use this manual to learn what each component must do, then mount the component in the fashion best suited to fulfill its purpose.

- X The boxes are packed to facilitate the installation. The installation will be easier if the parts are not mixed up.

**Box 1** contains the backgauge drive motor

**Box 2** contains the transformer, encoder, proximity sensors, and various brackets

**Box 3** contains the encoder sprockets, the Owner's Manual, the display console mounting bracket, and the display console.

- X USE THE CLEANING PADS to thoroughly clean any surfaces before double sided tape is applied. Make sure that any tape used is secure.

- X ADJUST THE MOTOR DRIVE BELT SO THAT IT IS LOOSE. Some cutters have small bearings, so too much tension on the drive belt can eventually cause mechanical problems there.

- X USE AN A SECTIONAL BELT OR THINNER IF POSSIBLE. Thick drive belts (B size) slow down positioning. Ideally the belt should be a fractional horse power variety.

- X DO NOT OVER-TORQUE THE BACKGAUGE GIBBS, and if there are nylon glider plugs in the backgauge, make sure they are not tight against the table.

- X USE ONE BELT PER PULLEY ONLY. Multiple belts on any pulley will cause slower settling to the target position.

- X 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. Only use a light machine oil on the leadscrew. Oil the leadscrew daily.

# MECHANICAL INSTALLATION

## Display Console

The display console houses the computer that controls the motor, interprets the information collected by the sensors and encoder, and is the operator's interface with the system.

- X The display console should mount on the front of the cutter near the operator. The display hangs on the aluminum bracket found in the top of the display console packing box(Box 3).
  - < *This bracket has two cuts along the bends to allow it to be bent if necessary.*
  - < *The Panavise bracket (top section of Box 2) is supplied to allow greater mounting flexibility. The display may alternatively be affixed directly to the cutter using only the aluminum bracket.*
  
- X Drill and tap the appropriate holes and mount the display so that it is secure.

## Shaft Encoder

The shaft encoder sends pulses to the computer to indicate backgauge position, movement, speed, and direction.

- X Use the shaft encoder mounting bracket supplied to mount the shaft encoder near the leadscrew.
  
- X Mount a sprocket to the encoder shaft that will allow it to turn at least two, but not more than four turns for one inch (25 mm) of backgauge movement.
  - < *This may be the most common error that novice installers commit. Having the incorrect encoder turns ratio can result in on-screen error messages, inaccuracy, positioning difficulties, and mathematical errors in the current position readout.*
  
- X Clamp the sprocket to the leadscrew with the supplied hose clamp so that it aligns with the encoder sprocket.
  - < *Depending upon the machine, the sprocket may need to be bored, or cut in half.*
  - < *It is easier to assure that the sprocket faces align if the chain is wrapped around the sprocket while the hose clamp is tightened.*
  
- X Install the chain on the sprockets, making sure both sprocket faces are aligned. Adjust the chain tension so that it is snug but not too tight.

## **DC Drive Motor**

The motor turns the leadscrew according to the drive signals supplied by the computer.

- X The motor **must** turn at least three, but not more than six times for each inch (25 mm) of backgauge movement.
  - < *This may be the second most common error that novice installers commit. Having an incorrect motor turns ratio can cause speed problems, settling difficulties, and cause premature wear to the machinery, motor, cabling, and computer.*
  
- X If possible, it is convenient to mount the **microcut** motor so that it lines up with the existing leadscrew drive pulley.
  - < *In many cases the same belt can be used for the new motor as was used for the original equipment drive. This offers a second advantage in that when only one drive belt exists, only one drive system can be attached to the leadscrew at a time.*
  
- X If the motor mounting method does not isolate the original drive system, other means will be required.
  
- X Keep the drive belt LOOSE to insure smoothest operation.
  - < *Too much motor belt tension can cause settling problems.*
  
- X **DO NOT USE ADJUSTABLE LINK BELT AS A PERMANENT DRIVE BELT.**
  - If **microcut** is ordered for a Schneider type cutter, a one inch wide cogged belt pulley will be included with the kit. This allows **microcut** to drive with the original flat belt.
  
- X Original motor will need to be removed.
  - < *Make sure wires are labeled and taped.*
  
- X The brake will have to be disabled and the drive clutch enabled to allow proper operation
  - < *This can often be done by flipping the wires between the clutch and brake.*
  
- X The motor plate may need to be spaced down slightly to avoid conflict with the original equipment backgauge drive control panel.
  
- X Other cutters may also require that the brake be disabled or the drive clutch enabled.
  - Polar--remove the wires going to the brake at the junction block under the back of the table.
  - Harris--remove the magnetic spacer control fuse.
  - Lawson--label, remove, and tape the wires, jumper the OE reverse drive key.
  - < *Make sure that all wires are properly insulated.*
  - < Mechanical methods may be preferred over electrical for locking clutches or disabling brakes.

## **Isolation Transformer**

The transformer converts two hot AC phases to 110V AC and 12 V DC.

- X This insures reliable operation when **microcut** is wired directly to 3 phase power.
- X Install this near the machine power inlet or the 3 phase switched power contacts so that the AC INPUT cable is able to reach the connection point (refer to WIRING AND POWER).
  - < *The board that the transformer is shipped on works well as a template to mark the holes, but should **NOT** be used to mount the transformer.*
  - < *Wiring is discussed in detail in the WIRING AND POWER section of this manual.*

## **Proximity Sensors**

Proximity sensors monitor the status of the machine.

- X Each sensor has a label indicating its purpose. Each sensor must be installed according to its designation.
- X An LED on each sensor indicates when it detects metal within 0.1 inches(2 mm) of the face of the sensor barrel.
- X Use any combination of brackets, hardware, and double sided tape to install each sensor securely to the machine according to the following criterion:
  - 1. **Position Sense** (facilitates automatic calibration of the machine)--
- X Move the backgauge to its rearmost position.
- X Mount the position sense so that it will be tripped by the gauge at least one inch (25 mm) before the backgauge reaches this maximum mechanical rear position.
- X Do not mount the position sensor so far forward that the backgauge may move behind it and allow the sensor to become "untripped" as the gauge is moved to the extreme rear.
- X Do not mount the rear position sensor more than ten full encoder revolutions from the mechanical rear of the cutter.
  - < *Two inches from the maximum rear is usually the ideal distance.*
- X A trip plate is supplied for the position sensor. Use it if the cutter is heavily painted or if the surface to be sensed is not flat.
  - 2. **Clamp up Sense** (limits drive if the clamp is not full up)--
- X Mount this sensor so that it is tripped only when the clamp is in its full up position.
  - < *Horizontal mounting of the sensor barrel often prevents the complications that can arise when the sensor is mounted vertically(hydraulic sag and soft return clamps can cause adjustment problems.*
- X A trip plate is supplied for the clamp up sensor. Use it if the cutter is heavily painted or if the surface to be sensed is not flat.

**3. Cut Sense** (senses knife cycling for PROGRAM and AUTOMATIC MODES)

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

**4. False Clamp Sense** (adjusts the minimum backgauge drive position)--

- X Mount this sensor so that it is tripped when the false paper clamp (sole plate) is resting in its holder.  
 < *If there is no false clamp holder, use the multi-angled brackets supplied to create one.*

## Proximity Sensor Function and Cabling Specifications

The sensors conduct to ground (LED is on) whenever . . .	
POSITION SENSE	the gauge is not near the rear of the machine
CLAMP UP SENSE	the clamp is in the full up position
CUT SENSE	the knife is at the top of its stroke
FALSE CLAMP SENSE	the false clamp is in its holder

RJ11 6 conductor connector wiring	
Pin 1	DC voltage to power the proximity sensors
Pin 2	Ground
Pin 3	signal line for the position sense
Pin 4	signal line for the clamp up sense
Pin 5	signal line for the cut sense
Pin 6	signal line for the false clamp sense

*Pin 1 is defined as the wire that plugs in closest to the display side of the console. The internal wires are color coded.*



# WIRING AND POWER

- X Be sure that the original equipment backgauge motor cannot drive the leadscrew.
- X Be certain that the original equipment backgauge brake will not energize during motor drive.
- X If a clutch needs to be locked on (electrically or mechanically) to allow the **microcut** motor to drive, do this now.
  - < *If any of the preceding three articles apply, completely insulate any bare wires, label all wires, and pack all original parts that were removed. Then, to facilitate reinstallation of the original drive system in the event **microcut** is moved to another machine at a later date, the installer should document how the original motor should be refitted.*
- X Remove the Phillips screws from the sides of the display console and gently lift the cover off to gain better access to the plug-in connectors.
  - < *If the cables are to run between the back side of the display console and the display mounting bracket, make sure that the cables do not cross over each other to avoid space problems.*

## **Shaft Encoder and Sensors**

- X Complete the connections to the display console for the shaft encoder and sensors.
- X Use the 6 conductor female-female junction blocks and extension cables as required.
  - < *The four sensors are wired in such a way that they may be plugged into the four six-pin RJ11 receptacles on the computer in any order. The computer can tell which one is which by the way that they are wired at their connectors.*

## **Isolation Transformer**

- X Plug the 2 pin Phoenix type (12 V DC) and the 5 pin Phoenix type (110 V AC power and motor cable) connectors into the display console.
- X Wire the motor cable into the DC motor.

The black and white wires from the motor cable connect to the A1 and A2 wires from the motor.

  - < *The polarity of these wires does not matter. Later, in the SET UP ROUTINE the computer will adjust for this automatically.*

- X Connect the green wire from the motor cable to the green wire from the motor with the wire nut supplied or to the case of the motor with the crimp connector supplied. *If a green wire exists on the motor, it is case ground, NOT a power connection.*
  
- X Measure the 3 phase AC voltage into the machine's power panel.
  
- X Insure that the power in the main power panel is OFF.
  
- X Plug the power input cable into the appropriate voltage range jack on the side of the transformer.
  - < *Early versions of the **microcut** transformer (model numbers lower than XL 1036) did not have plug-in type connectors. On these transformers, change the jumpers to select the voltage range.*
  
- X Wire the AC input (primary side of the transformer) to two legs of 3 phase power.
  - < *The green wire is for earth ground.*
  - < *The other two wires are the AC power connections.*
  - < **USE TWO PHASES OF THE THREE PHASE POWER. DO NOT USE ONE HOT PHASE AND THE NEUTRAL LINE.**
  - < *A single hot phase  $\Rightarrow$  frequency can be unstable, but the frequency between two hot phases is constant. An unstable frequency can cause poor motor drive performance, settling problems, and premature motor and mechanical wear.*
  
- If the AC input is connected to the switched power on the cutter, **microcut** will switch on and off with the machine.
  
- If a separate ON/OFF switch is desired, this should be placed in series with the 12 V DC cable (the 2 pin connector discussed above).

## Power Connector Pin Outs Error! Bookmark not defined.

2 pin Phoenix type connector wiring (right side of display, under the number keys)	
Pin 1	Ground
Pin 2	12 V DC

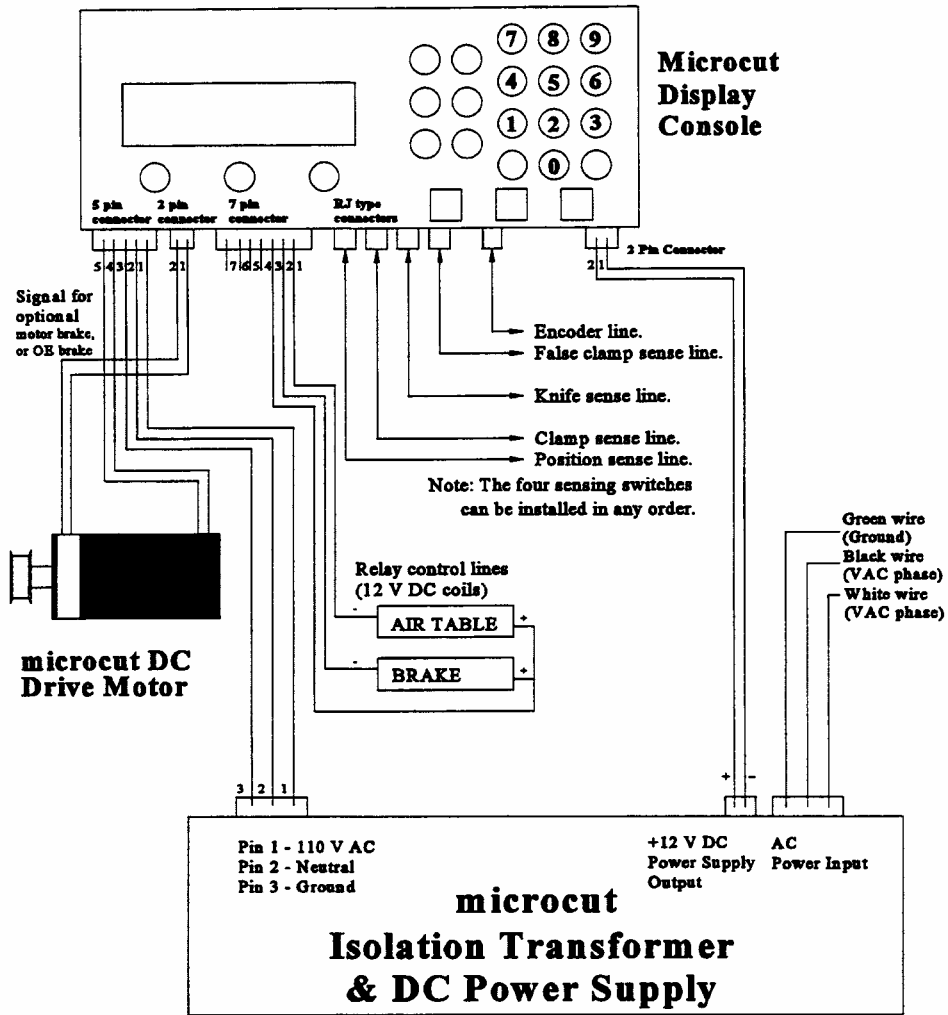
5 pin Phoenix type connector wiring (left side of display, under the <b>AMOVE</b> ≡ key)	
Pin 1	110 hot
Pin 2	110 neutral (case ground)
Pin 3	Earth
Pin 4	Motor
Pin 5	Motor

- < *Pin 1 is the pin closest to the numeric keypad side of the display,*
- < *Any 12 V DC supply capable of at least 1200 mA can be used to supply the computer for desktop demonstration purposes with **microcut** in DEMONSTRATION MODE. (Follow the first few steps of the SET UP ROUTINE to access DEMONSTRATION MODE.)*
- < ***A protection diode on the PC board prevents damage in the event that 12V DC is applied in reverse polarity, but the connection must be of proper polarity before microcut will turn on.***
- X If a 110V AC source other than the transformer must be used, it is *imperative* that this NOT be from a single leg of a WYE (STAR or 4 WIRE) transformer.
  - < *This type of power can cause frequency fluctuations.*
- X No type of surge protector or uninterruptable power supply may be used.
  - < *This type of device can represent an inductive or capacitive load on the line, resulting in frequency fluctuations. Inverter/oscillator type units are even worse.*
- X The circuit breaker must be a 10A slow blow, matching appropriate overload curves.
- X The transformer supplied eliminates all possibilities of problems when wired correctly across TWO phases of the AC power to the machine. If the transformer is not used, all warranties, expressed or implied, will be void.

### **Cleaning Up**

- X Use the spiral wrap supplied to enclose the cables exiting the display console.
- X Use the ty straps and ty strap mounting bases to secure all cables appropriately.
  - < *Make sure that none of the cables can be damaged by moving parts of the machine.*
- X Refit the display cover and tighten the Phillips screws on both sides.

# WIRING DIAGRAM



JUMPER CONFIGURATION FOR EARLY STYLE TRANSFORMERS ( <i>model #s lower than XL1036</i> )	
AC Input voltage	Jumper terminals
180 V AC to 250 V AC	1 to 2 and 3 to 4
360V AC to 500 V AC	2 to 3

# OPTIONAL CONTROL LINES

**microcut** is equipped with control lines which can be used to activate relays that control the air table and original equipment brake.

- X These must have 12V DC coils requiring no more than 250 mA for operation.  
 < *Check current requirements of the circuit being controlled to specify the contact current rating.*
  
- X Mount the relay(s) inside the original equipment control panel. The normally open contacts may then be wired to control these operations on the machine.
  
- X The coils of the DC relays will be wired into the extra terminal on the display console.

## Auxiliary Control Line Connector Pin Out

3 pin mini Phoenix, 3 pin Phoenix, or 7 pin Phoenix type connector wiring	
Pin 1	Air control return
Pin 2	Brake control return
Pin 3	Positive coil voltage
Pin 4	Ground reference for external power source
Pins 5, 6 & 7	Original equipment operations (AKO, AKE, CD)

- < *Pin 1 is the pin which is closest to the sensor cable inputs.*
- < *On some units, the connector will only offer the first three connections.*

**AIR CONTROL** (pin 1)--Provides a current path (ground) for the coil of a relay that disables the air table whenever **microcut** is commanding high speed forward drive or when the clamp is lowered.

**BRAKE CONTROL** (pin 2)--Provides a current path (ground) for the coil of a relay that disengages an original equipment brake when backgauge drive is requested.

- < A bypass switch on the brake line may be desired to allow the back gauge to be moved manually.

**POSITIVE COIL VOLTAGE** (pin 3)--Provides +12 V DC to the relay coils.

- X An optional relay board assembly is available from GMS, if the parts are not available locally.

# SET UP ROUTINE

---

Every **microcut jr** display is identical regardless of the machine it is installed upon. There is a resident SET UP routine which allows calibration to any machine. This routine must be completed after installation before proper operation can begin.

Move the backgauge so that it is at least 10 inches (250 mm) from the back of the machine. Make sure that the clamp and knife are in the full up position. Switch the power on. The display will start counting down from 9 towards 0. Press **<ANY KEY>** before the numbers in the display go below 5. **microcut jr** will enter the SET UP routine.

**NOTE** -- *If the numbers are less than 5, DEMONSTRATION mode will be selected.*

The display will change intensity. When the desired brightness appears, press **<YES>**.

The display will flash .00 in, then .000 in, then .00 cm, .000 cm, .0 mm, .00 mm, .00 sun, .000 sun, etc. When the units you desire appear in the display press **<YES>**.

The computer will automatically check the wiring for all of the sensing switches which were installed. If any are incorrect, a buzzer will pulse and an error message will appear (see ERROR MESSAGES). Otherwise, you will advance to the next step.

The display will show a series of up arrows. Press **<UP ARROW>** to operate the gauge. **microcut jr** does not know if the motor is wired correctly, so it will accelerate the motor VERY slowly. If the gauge moves backwards press **<YES>**. If it moves forward press **<NO>**. If a NO MOTION SEEN error occurs and the gauge was moving, press and hold **<0>** and turn the handwheel to check for encoder operation. Check all connections carefully. If the gauge did not move, check the drive belt and the wires to the motor for poor connections.

The backgauge will now drive to the rear of the machine looking for the position sensor. IT IS IMPERATIVE THAT THE POSITION SWITCH IS ADJUSTED PROPERLY FOR THE GAUGE TO STOP BEFORE HITTING THE REAR OF THE MACHINE. If the backgauge bumps into the rear, turn the power off and then back on. Check the LED indicator on the sensor and adjust the sensor position as needed.

When the gauge reaches the position sensor, the display will ask for a rear reference position. Move the gauge to an EXACT unit value. Use **<NUMBERS>** to display the position of the gauge. Press **<YES>**.

The display will now ask for a front reference position. Turn the handwheel (or press **<DOWN ARROW>**) until the gauge is less than 10 inches (250 mm) from the knife. Move the gauge to an EXACT unit value. Use **<NUMBERS>** to display the position. Press **<YES>**.

**microcut jr** will change the display as it requests the following information:

UP TRIANGLES--Enter the maximum rear value.

Use the **<NUMBER>** keys to display the maximum rear position the backgauge can reach. Press **<YES>**.

DASHED LINE--Enter the false clamp width.

Use the **<NUMBER>** keys to display the width of the false paper clamp (that attaches to the bottom of the paper clamp). Press **<YES>**.

DOWN TRIANGLES--Enter the minimum cut value.

Use the **<NUMBER>** keys to display the minimum front position the backgauge can reach. Press **<YES>**.

CONTINUED ON NEXT PAGE . . . . .

# OPTIONS IN microcut jr<sup>®</sup>

This is also a continuation of the SET UP routine. These steps can be accessed from MANUAL mode by pressing **<SHIFT NO>**. If accessed from MANUAL mode, the routine can be exited at any time by pressing **<MANUAL>**, **<PROGRAM>**, or **<AUTOMATIC>**.

1. UNITS/SECOND--Enter the desired maximum drive speed.  
Use the **<NUMBER>** keys to display the maximum speed the backgauge should attain. This is usually about the table size divided by 6. Some machines cannot tolerate excessive speeds without rattling and excessive wear. To maximize machine life, do not run the gauge faster than the operator requires. **microcut jr** limits the maximum speed allowed based upon the table size. Press **<YES>**.
2. .009, counting to .000--Auto correction on or off.  
Press **<NO>** if the backgauge should not correct its position if it is knocked away from the target in AUTOMATIC mode. Press **<YES>** if it should.

*NOTE -- Correction would be turned off if each cut had to be adjusted to meet the image on the sheet. Typically this would be done in cases where final size was not crucial (if the stock was going into a die cutter or another similar process).*

3. +0.000--Enter the desired settling accuracy (>0).  
Use the **<NUMBER>** keys to display the cutting accuracy desired. **microcut jr** will try to position with zero error every time. The accuracy represents two things. First, the point where the computer will accept a cut cycle in AUTOMATIC mode without signaling an error. Second, the distance the gauge can be moved before it will recorrect, if auto correction is on. The larger this number, the faster the operator can cut the stock. Press **<YES>**.
4. .000, then .999--Choose true or fake position.  
Press **<YES>** at .000 if the position should be faked to the perfect programmed position in AUTOMATIC mode. Press **<YES>** at .999 if the true position should always be displayed.

*NOTE -- microcut jr will try to reach zero error every time. In any system, some error always exists. If the display is a distraction when it shows a slight error, turn true position off. True position on will give the operator an idea of exactly how accurate microcut jr is. An average human hair is .004 inches (.1 mm or .01 cm).*

5. ->->->?--Auto eject operation on or off.  
Press **<YES>** to activate automatic push out operation. Press **<NO>** if you wish push outs to occur only as programmed by the operator. The automatic push out feature will move the backgauge forward about 8 inches (or to the false clamp or minimum front) before any automatic reverse drive if the move was initiated by the knife stroke.

*This completes the set up/options routine and normal operation can now begin.*

## BACKGAUGE CALIBRATION (FROM MANUAL MODE ONLY)

Available only if accessed from MANUAL mode--For slight adjustments in gauge calibration up to .25 inches (5 mm). From MANUAL mode press **<SHIFT NO>** and then **<SHIFT LAST>** to access the calibrate gauge routine. To calibrate, use **<NUMBERS>** to display the true position, then press **<YES>**. The **<ARROWS>** and **<MOVE>** can be used to position the gauge if desired. The knife can be operated to verify the actual backgauge position.

# OPERATION--GETTING STARTED

---

**microcut jr** can be used to manually drive the backgauge to position, key in a desired location and let the computer position the backgauge, or program a series of stop points (and push outs) so that a sequence (job) can be run automatically repeatedly. The jobs can be modified to correct for errors or make changes. Jobs are saved in memory so that they can be recalled when needed again.

The **microcut jr** display has been carefully designed and all operations are represented by icons (see next page) to help guide an operator in the use of the system. The display consists of two lines. In normal operation, the top line shows the current backgauge position and any special status (cut ready in AUTOMATIC mode) while the second line shows the current job number, cut number, and either the cut or keyed in position. Several programming methods have been built into **microcut jr**. These are accessible by holding **<SHIFT>** and pressing the appropriate **<NUMBER>** key. Any additional information will appear on the screen at the appropriate time.

## GETTING STARTED--

Switch the power on to the machine. **microcut jr** will count from 9 backwards to 0. Wait for the numbers to reach 0. **microcut jr** will slowly drive to the rear of the machine to calibrate. Press **<ANY KEY>** for an emergency stop only. A full restart will then be required. When the display calibrates (the units of measurement appear after the number display on the top line), **microcut jr** is ready to be used.

*NOTE -- Press **<ANY KEY>** before the numbers go below 5 if you wish to set up the unit to a different machine (new installations only). Press **<ANY KEY>** when the numbers are from 0 to 4 to enter DEMONSTRATION mode (**microcut jr** can be operated at a desk for instruction and learning).*

**microcut jr** contains several user selectable features. These are contained in a single operation area referred to as MANUAL OPTIONS. Press **<MANUAL>**. Press **<SHIFT NO>**. You will be able to adjust backgauge speed, accuracy, correction, ejects, and calibration. Refer to the OPTIONS IN **microcut jr** section of this manual for details.



# ICON (SYMBOLS) LIST

**NOTE** -- Any time a buzzer pulses, the display will show a message that you should read. During operation, dashes in the lower line tell you that the clamp is down. Knife symbols in this same area signal that the knife is down (press **<ANY KEY>** to escape an error message routine--refer to ERROR MESSAGES).

## DISPLAY SYMBOL

## MEANING

### **START UP--**

9999's down to 0000's  
 □□□□ □□□□  
 □□□□ >>>>>>>> □□□□  
 □□□□ ~~~~~~ □□□□

Start up procedure  
 Warning of backgauge drive for calibration  
 Driving to rear to calibrate  
 Drive after position sense is tripped

### **OPERATION--**

6↵7  
 ↵↵↵  
 υωυ  
 ↵6↵  
 xyz-uv  
 6=7  
 X↵X  
 A=  
 B=  
 C=  
 D=  
 E=  
 F=  
 -666  
 -+++  
 !!!!!!! !!!!!!!  
 \*\* \*\*  
 ↵;↵  
 -----  
 ↵↵↵↵↵↵↵↵↵

Driving to position (going to the cut)  
 Program mode (make cuts)  
 Review mode (eyes and nose)  
 Automatic mode (cut to cut)  
 Job number and cut number  
 Insert cut mode  
 Change cut mode  
 Enter sheet size for label mode  
 Enter number of labels  
 Enter label size  
 Enter trim size if any  
 Enter sheet size for divide sheet  
 Enter number to divide sheet by  
 Eject value (push out)  
 End of job indication  
 Delete entire job in process  
 Cut ready in automatic mode  
 Lay compensate mode  
 The clamp is down  
 The knife is down

### **SET UP ROUTINE--**

\*\*\*\* \*\*  
 MMMMMMMMMM  
 0.000 units  
 -->Flashing numbers  
 8888 ???????? 8888  
 ??>> 12345..? >>??  
 ??? 12345..? ???  
 >>>> 12345..? >>>>  
 ---- 12345..? ----  
 ??? 12345..? ???  
 ??? \_ Units/sec ???  
 ??? +-.000 ???  
 ?? -->.000 (or .999)??  
 ? .009 (or .0086.000)?  
 666?  
 ??? ???

Entry to set up routine  
 Select desired display intensity  
 Select desired units  
 Memory test (or erase)  
 Drive direction check  
 Enter rear reference value  
 Enter front reference value  
 Enter max rear value  
 Enter false clamp size  
 Enter minimum front value  
 Enter desired drive speed  
 Enter settling tolerances  
 Select "true size" or not  
 Select auto correction or not  
 Select auto eject or not  
 Calibrate gauge--key in true position

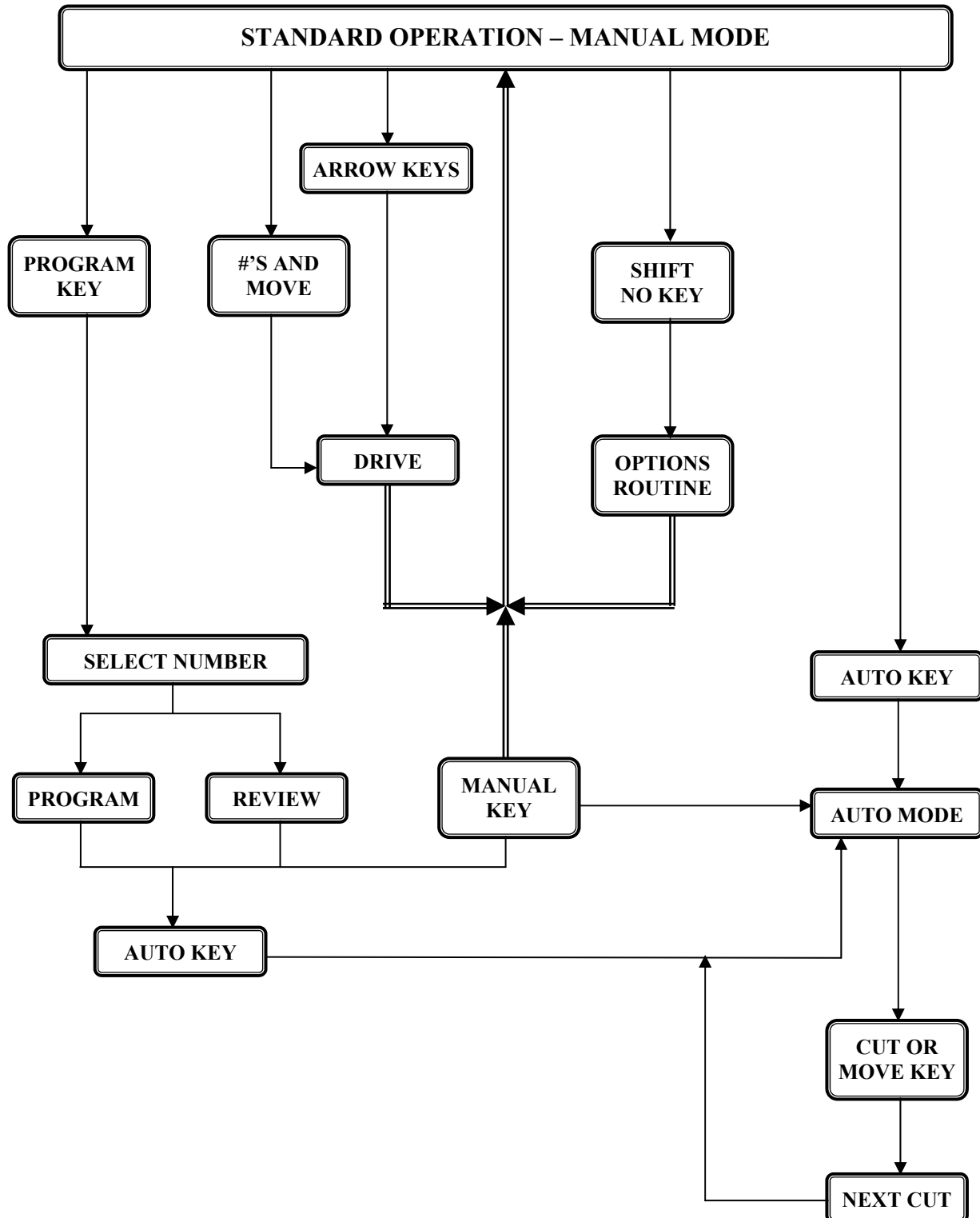
**ERRORS--** See ERROR CODES for more information on these messages.

EEEEEEEEEEEEEEEEEEEEEEEE  
 XXXXXXXXXXXXXXXXXXXX

Non fatal error--press any key to continue.  
 Fatal error--turn power off and check.

# OPERATIONAL FLOW CHART

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



# MANUAL DRIVE OPERATION

---

Press **<MANUAL>**. In MANUAL mode the upper line of the display will show the actual backgauge position. Press **<UNITS>** to change between inches, metric, and Japanese sun.

## SLOW FORWARD DRIVE

Tap **<UP ARROW>** and then press and hold **<DOWN ARROW>**.

OR...

Press **<DOWN ARROW>**, release it for less than 1/2 second, and press and hold **<DOWN ARROW>** again.

OR...

Lower the clamp briefly while pressing **<DOWN ARROW>**.

## SLOW REVERSE DRIVE

Press **<UP ARROW>**, release it for less than 1/2 second, and press and hold **<UP ARROW>** again.

## FAST DRIVE

Press and hold **<UP or DOWN ARROW>** as desired. The drive keys must be released for at least 1/2 second before high speed is allowed.

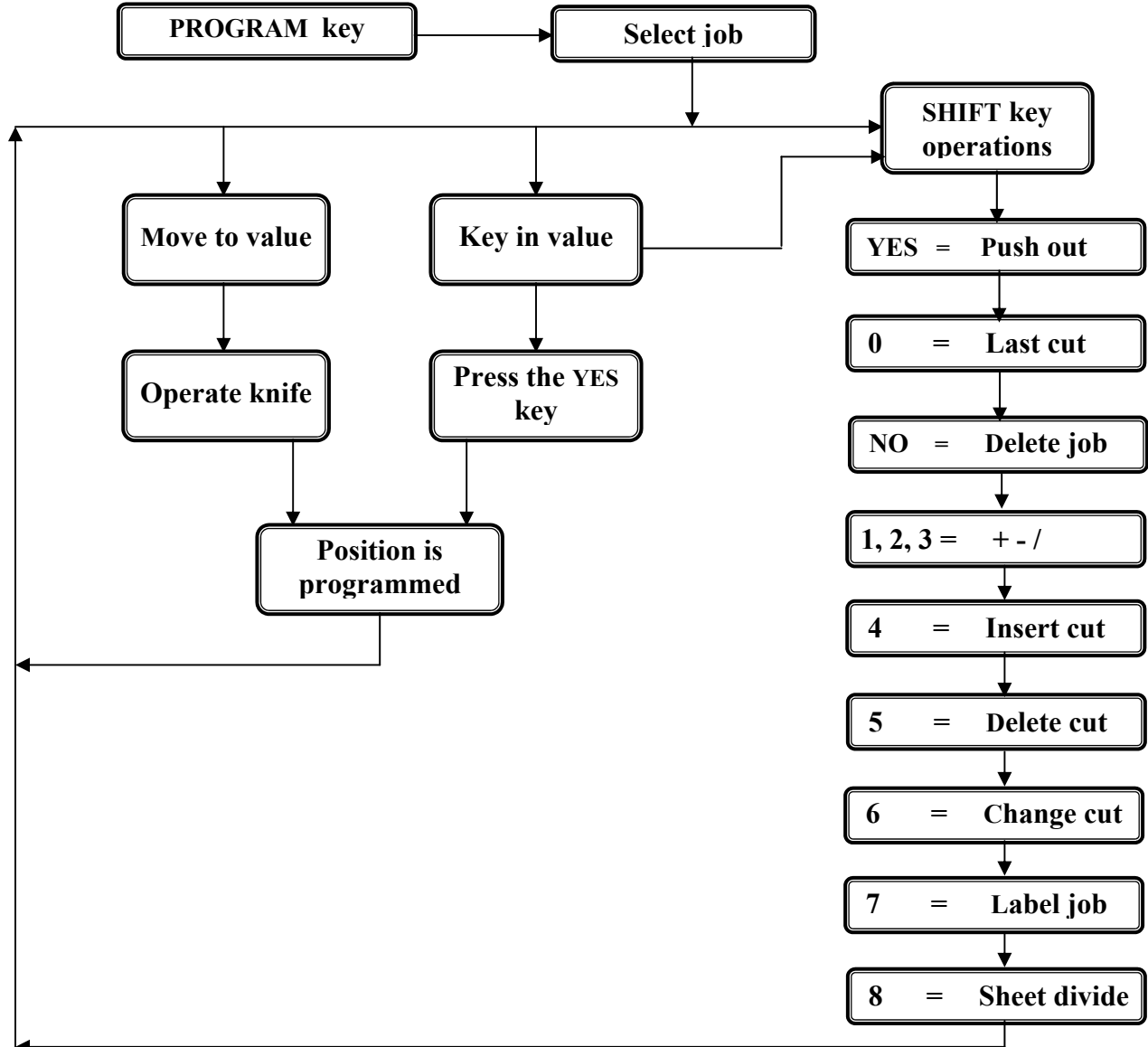
## SEMI-AUTOMATIC DRIVE OPERATION

This routine can be used to move the backgauge to a keyed in position. Enter the position to which you wish the backgauge to move with **<NUMBERS>**, **<+>**, **<->**, and **<Divide>**. Press **<MOVE>**. To move a pre-determined distance, press **<NO>** (clear the lower line of the display) and then press **<+>** or **<->** before using **<NUMBERS>**. Then press **<MOVE>**.

# PROGRAMMING OPERATION

The PROGRAM NEW JOB routine is used to program a series of stop points and commands into **microcut jr** so that it can operate in AUTOMATIC MODE. These stop points and commands can proceed without limitations of direction or motion. PROGRAM MODE is entered from the MANUAL MODE. Press **<MANUAL>**. Press **<PROGRAM>**.

Outlined below is a flow chart showing the various programming options. Subsequent pages offer specific programming examples.



**<SHIFT 9>** (lay compensate) is not available in PROGRAM mode.

**CORRECTING OR REVIEWING CUT LOCATIONS:**

- <LAST>** -- backs up the CUT #, allows reprogramming if desired.
- <YES>** -- enters the cut value shown in the display.
- <NO>** -- clears the right lower line of the display.
- <SHIFT>** -- selects features.
- <MANUAL>** -- exits PROGRAM mode, sets up for manual operation.
- <AUTOMATIC>** -- enters AUTOMATIC operation at cut value shown.
- KNIFE STROKE** -- enters the current position as the cut value.

# PROGRAMMING A JOB

---

**microcut jr** is an automatic backgauge control system. To take advantage of this it is necessary to program jobs so that the computer knows where to position the backgauge for your cutting operation. Press **<MANUAL>** for a starting point. Press **<PROGRAM>**. The top line of the display will go blank and the bottom line will show # (for the job number) and three knives (for PROGRAM mode). It is necessary to assign a job number so that you can recall this job for AUTOMATIC operation. This can be done in one of three ways:

1. Press **<YES>** while the space after the # is blank. **microcut jr** will automatically find the lowest unused job number for you.
2. Use **<NUMBERS>** to display your desired number. Press **<YES>** to make your selection.
3. Use **<UP and DOWN ARROWS>** to review the jobs and make your selection.

**NOTE** -- If the three knives are replaced with two eyes and a nose, the job number that is on the screen is already used. To review the contents of the job, press **<YES>**. To erase this job (if you no longer need it) press **<SHIFT NO>**.

Programming can now be done by using **<NUMBERS>** to display the desired position and **<YES>** to record it, or by moving the backgauge and cycling the knife.

**microcut jr** contains several programming methods that can be accessed by **<SHIFT>**. They are:

**<SHIFT YES>** -- Push out (eject).

Programs the position displayed as a push out rather than a stop point.

**<SHIFT 0>** -- Last.

Backs the memory up by one location to allow review and correction to the program.

**<SHIFT NO>** -- Delete entire job.

Will remove the entire job from memory.

**<SHIFT 1, 2, 3>** -- +, -, /.

Allows the calculator functions to be used.

**<SHIFT 4>** -- Insert.

Allows a cut to be inserted in front of the one shown.

**<SHIFT 5>** -- Delete cut.

Deletes the one (only) cut shown on the display.

**<SHIFT 6>** -- Change cut.

Allows a cut to be changed.

**<SHIFT 7>** -- Label programming.

Allows labels to be programmed automatically (see job programming examples).

**<SHIFT 8>** -- Sheet divide programming.

Allows a sheet to be divided into equal sizes (see job programming examples).

To exit a routine without using it, press **<PROGRAM>**.

**NOTE** -- Programming methods can be mixed within a job. You can cut some values in, key others, and use any of the other methods available.

# PROGRAMMING A JOB WITH THE KEYS

---

1. Enter the PROGRAM mode by pushing **<PROGRAM>**.
  2. You must select a number for the job you are about to program. This will allow you to call the job up for AUTOMATIC operation later. Press **<YES>** to have **microcut jr** select the lowest unused job number or **<NUMBERS--YES>** to select your own number.
  3. The display will now show the current backgauge position, the assigned job number, and Cut #1. Use the **<NUMBER>** and **<CALCULATOR>** keys to display the position at which you wish to make your first cut. After doing so, press **<YES>**. The display will now show Cut #2. Continue entering the position of each subsequent cut, pressing **<YES>** after each entry.
  4. After completing the last forward cut, many operators prefer the backgauge to push the stock forward to ease of handling the stock. **microcut jr** comes with a factory pre-set stock eject of 8 inches which can be enabled or disabled in the MANUAL OPTIONS routine. Assuming this option has been turned on, anytime **microcut jr** sees a cut and must drive backwards to get to the next position, it will push the stock forward 8 inches (or to the false clamp/minimum front if within 8 inches of that value) first. To otherwise program a stock eject, use the **<NUMBER>** keys to display the position to push to and press **<SHIFT YES>**. The display will automatically return to the PROGRAM to continue programming additional cut values.
  5. Once programming is completed, press **<AUTOMATIC>** and **microcut jr** will drive the backgauge to the first cut position. Once in AUTOMATIC mode, the backgauge will move to the next position automatically after each cut.
- Press **<LAST>** to back up to review or change job data. Press **<YES>** to go forward.

*NOTE -- Programming methods can be mixed within a job. You can cut some values in, key others, and use any of the other methods available.*

# PROGRAMMING A JOB BY MAKING CUTS

---

1. Enter the PROGRAM mode by pushing **<PROGRAM>**.
2. You must select a number for the job you are about to program. This will allow you to call the job up for AUTOMATIC operation later. Press **<YES>** to have **microcut jr** select the lowest unused job number or **<NUMBERS--YES>** to select your own number.
3. The display will now show the current backgauge position, the assigned job number, and Cut #1. Move the backgauge to the first cut position. Position your stock and operate the knife. The display will now show Cut #2. Continue this procedure to enter all of the cut values. Press **<LAST>** to back up to correct an incorrect cut (press **<CHANGE>**).
4. After completing the last forward cut, many operators prefer the backgauge to push the stock forward to ease of handling the stock. **microcut jr** comes with a factory pre-set stock eject of 8 inches which can be enabled or disabled in the MANUAL OPTIONS routine. Assuming this option has been turned on, anytime **microcut jr** sees a cut and must drive backwards to get to the next position, it will push the stock forward 8 inches (or to the false clamp/minimum front if within 8 inches of that value) first. To otherwise program a stock eject, use the **<NUMBER>** keys to display the position to push to and press **<SHIFT YES>**. The display will automatically return to the PROGRAM to continue programming additional cut values.
5. Once programming is completed, press **<AUTOMATIC>** and **microcut jr** will drive the backgauge to the first cut position. Once in AUTOMATIC mode, the backgauge will move to the next position automatically after each cut.

Press **<LAST>** to back up to review or change job data. Press **<YES>** to go forward.

*NOTE -- Programming methods can be mixed within a job. You can cut some values in, key others, and use any of the other methods available.*

# PROGRAMMING A LABEL CUTTING JOB

---

1. Enter the PROGRAM mode by pushing **<PROGRAM>**.
2. You must select a number for the job you are about to program. This will allow you to call the job up for AUTOMATIC operation later. Press **<YES>** to have **microcut jr** select the lowest unused job number or **<NUMBERS--YES>** to select your own number.
3. The display will now show the current backgauge position, the assigned job number, and Cut #1. Press **<SHIFT 7>** to select LABELS. You will now be asked to offer four pieces of information, A, B, C, and D as follows:
  - A. FIRST CUT -- Use **<NUMBERS>** to display the first cut value. Press **<YES>**. If you do not want to calculate the first cut, leave this blank and press **<YES>**. **microcut jr** will calculate it for you from the rest of the information.
  - B. NUMBER OF LABELS -- Use **<NUMBERS>** to display the number of rows of labels to be cut on this side. Press **<YES>**.
  - C. LABEL SIZE -- Use **<NUMBERS>** to display the size of the label. Press **<YES>**.
  - D. TRIM SIZE -- Use **<NUMBERS>** to display the trim size. Press **<YES>**. If there is no trim, leave this blank and press **<YES>**.
4. Once programming is completed, press **<AUTOMATIC>** and **microcut jr** will drive the backgauge to the first cut position. Once in AUTOMATIC mode, the backgauge will move to the next position automatically after each cut.

Press **<LAST>** to back up to review or change job data. Press **<YES>** to go forward.

*NOTE -- Programming methods can be mixed within a job. You can cut some values in, key others, and use any of the other methods available.*



# PROGRAMMING A SHEET DIVIDE

---

1. Enter the PROGRAM mode by pushing **<PROGRAM>**.
2. You must select a number for the job you are about to program. This will allow you to call the job up for AUTOMATIC operation later. Press **<YES>** to have **microcut jr** select the lowest unused job number or **<NUMBERS--YES>** to select your own number.
3. The display will now show the current backgauge position, the assigned job number, and Cut #1. Press **<SHIFT 8>** to select SHEET DIVIDE. You will now be asked to offer two pieces of information, E and F as follows:
  - E. ENTER SHEET SIZE -- Use **<NUMBERS>** to display the size of the sheet and press **<YES>** or move the backgauge to the correct value and operate the knife.
  - F. DIVIDE BY: -- Use **<NUMBERS>** to display the number of pieces to divide the sheet into. Press **<YES>**.
4. Once programming is completed, press **<AUTOMATIC>** and **microcut jr** will drive the backgauge to the first cut position. Once in AUTOMATIC mode, the backgauge will move to the next position automatically after each cut.

Press **<LAST>** to back up to review or change job data. Press **<YES>** to go forward.

**NOTE** -- *Programming methods can be mixed within a job. You can cut some values in, key others, and use any of the other methods available.*

## REVIEWING AN OLD JOB

---

Press **<PROGRAM>**. This will enable you to view job information. There are a number of ways to call up old jobs:

1. Press **<PROGRAM>** again to display an already programmed job. Continue pressing **<PROGRAM>** to see more jobs (chronological order). When the desired job is shown, press **<YES>** to select it.
2. Use **<NUMBERS>** to display the desired job number. Press **<YES>**.
3. Use **<UP and DOWN ARROWS>** to scroll through all jobs. When a number appears that is programmed, the buzzer will beep and the three knives will be replaced with two eyes and a nose. Continue holding the **<ARROW>** to progress through the jobs (numerical order).

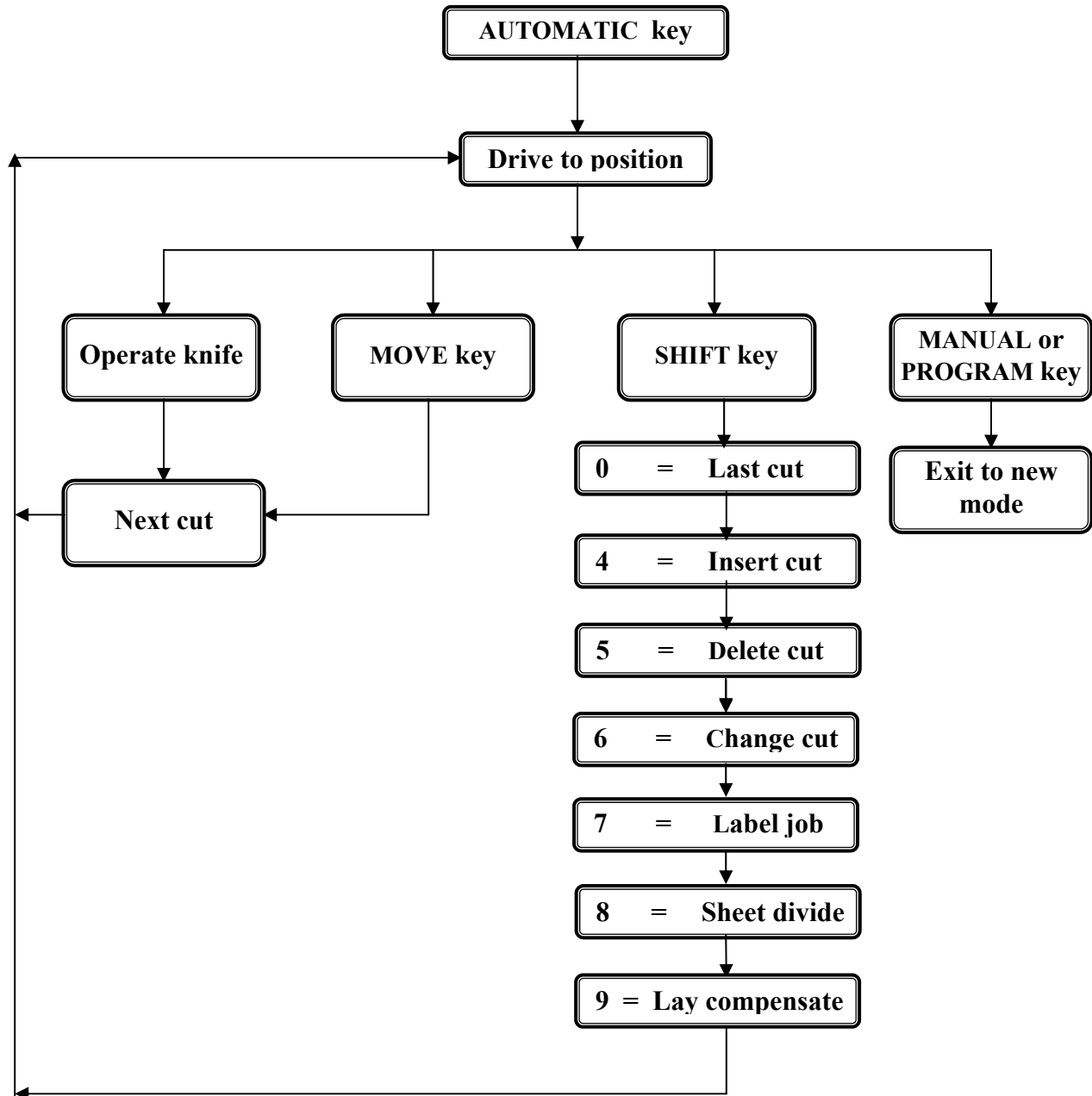
The display will now show the current backgauge position, the assigned job number, and the programmed information. Use **<YES>**, **<LAST>**, and **<SHIFT>** to review or modify the job information. The same options are available in REVIEW mode as are in the PROGRAM mode.

Press **<MANUAL>** to return to MANUAL mode. Press **<AUTOMATIC>** to go into AUTOMATIC mode with the job you have chosen at the cut number which is displayed.

Press **<SHIFT NO>** to delete any old, unwanted jobs.

# AUTOMATIC OPERATION

In AUTOMATIC mode **microcut jr** will position the backgauge according to job memory. Before entering AUTOMATIC, select the desired job number (or program a new one). Make sure that the desired job and starting cut number are displayed on the bottom line of the prompting display. Press **<AUTOMATIC>**.



## CORRECTING OR REVIEWING CUT LOCATIONS:

- <LAST>** -- backs up the CUT #, allows reprogramming if desired.
- <YES>** -- enters the cut value shown in the display.
- <SHIFT>** -- selects features.
- <MANUAL>** -- exits PROGRAM mode, sets up for manual operation.
- <PROGRAM>** -- enters REVIEW operation at cut value shown.
- KNIFE STROKE** -- enters the current position as the cut value if in insert, change, or comp.

# AUTOMATIC MODE OPTIONS

---

**microcut jr** contains several features which can be accessed while operating in AUTOMATIC mode. Operations which are offered include:

**<MANUAL>** -- Manual operation.

Places you in MANUAL mode to make backgauge movements and cuts. The job number and cut number remain the same so that you can go directly back to AUTOMATIC operation when desired.

**<PROGRAM>** -- Program (review).

Places you directly in the program review mode in case you wish to make several changes without the backgauge moving.

**<MOVE>** -- Move to next memory location.

This will move the memory up by one location and position (or push) the backgauge accordingly. This key works only when the backgauge is in position and the CUT READY indicators are on.

**<YES>** -- Enter (advance one).

Moves the memory up by one location and positions the backgauge accordingly. Holding this key in allows you to move up several locations.

**<SHIFT YES>** -- Push out (eject).

Programs the position displayed as a push out rather than a stop point. This can be used during INSERT.

**<SHIFT 0>** -- Last.

Backs the memory up by one location and positions the backgauge accordingly. Holding this key in allows you to back up several locations.

**<SHIFT 1, 2, 3>** -- +, -, /.

Allows the calculator functions to be used when inserting or changing a cut value.

**<SHIFT 4>** -- Insert.

Allows a cut to be inserted in front of the one shown. Use **<NUMBERS--YES>** or move the gauge and cut to enter the value.

**<SHIFT 5>** -- Delete cut.

Deletes the one (only) cut shown on the display.

**<SHIFT 6>** -- Change cut.

Allows a cut to be changed. Use **<NUMBERS--YES>** or move the gauge and cut to enter the new value.

**<SHIFT 7>** -- Label programming.

Allows labels to be programmed automatically (see job programming examples). This will store the values in front of the cut shown.

**<SHIFT 8>** -- Sheet divide programming.

Allows a sheet to be divided into equal sizes (see job programming examples). This will store the values in front of the cut shown.

**<SHIFT 9>** -- Lay compensate.

Allows you to shift all FORWARD moving cuts left in the job. As soon as reverse drive is indicated, the remaining cuts will not be affected. Move the gauge and make the cut, or key in the new value and press **<YES>**.

# MAINTENANCE AND OE CONTROLS

---

**microcut jr** has been designed to be virtually maintenance free. However, 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. With power off, unplug the connectors at the back of the display console and plug them back in to clean any dirt that may have settled.
2. Check all wiring for any nicks or cuts.

Motor brushes should be checked every 5000 hours of operation. Replace as appropriate. Clean the motor of carbon dust as required. Disconnect all power sources before working on the motor.

Occasionally check all of the component mounts for looseness.

## USE OF ORIGINAL EQUIPMENT CONTROLS--

**microcut jr** 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 **microcut jr** INVOLVE THE BACKGAUGE DRIVE ONLY. NO ALTERATION TO ANY OTHER PART OF THE MACHINE IS ALLOWED. THE ORIGINAL EQUIPMENT LIMIT SWITCHES ARE NOT TO BE USED WHEN INSTALLING **microcut jr**. THIS SHOULD MAKE RETURNING TO THE ORIGINAL CONTROLS FAIRLY STRAIGHT FORWARD. IN SOME CASES THE ORIGINAL MOTOR MAY HAVE TO BE RE-MOUNTED.

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

- 1.
- 2.
- 3.
- 4.

# SERVICE AND TROUBLESHOOTING

---

**microcut jr** is designed to be very easy to service and maintain. 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 should be checked. Refer to the WIRING section in this manual. Connections on the display console or electrical problems within the machine itself could also be at fault. Plug all connectors in and out a few times to make sure they are clean. Refer to the MAINTENANCE section in this manual.

## BASIC TROUBLESHOOTING

The **microcut jr** display console houses two printed circuit boards--the CPU board and the key board. 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 computer.

There are, however, a number of problems that can be taken care of by the operator/service person. The following contains titles of possible problems and steps to take if a problem does exist.

During thunderstorms or in the event of some severe 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.

### 1. microcut jr WILL NOT SWITCH ON:

- a. The power switch on the machine is not on.
- b. The wall circuit breaker has been turned off or is tripped.
- c. There is a blown fuse somewhere in the supply line. Replace.

### 2. microcut jr DEFAULTS INTO SET UP ROUTINE.

- a. Memory has been contaminated. Go through the SET UP routine to correct this.

*NOTE -- If this occurs frequently, perform MAINTENANCE to make sure all cables and connections are secure. If this does not cure the problem replace the memory chip inside the unit.*

### 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.
- c. The motor brushes are bad. Examine them for wear.

### 4. microcut jr DOES NOT COUNT ONE FOR ONE WITH THE TABLE:

- a. The reference values used in the SET UP routine were not exact.
- b. 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.

## 5. IMPROPER OR ERRATIC COUNTING (BACKGAUGE POSITION).

- a. The shaft encoder cable has failed. Check the cable for bad connections. 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.*

## 6. microcut jr TENDS TO SUFFER COUNT FAILURES.

- a. Connection problem. See previous paragraph (5).
- b. The shaft encoder is failing. Replace the shaft encoder.

## 7. THERE IS IRRELEVANT DATA IN THE MEMORY.

- a. The memory was not erased at the time of installation. Enter the SET UP routine and erase the job memory.

## 8. OUT OF MEMORY.

- a. Memory was not erased at the time of installation. Enter the SET UP routine and erase all of the job memory.
- 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.

## 9. CUT READY LIGHT FLICKERS ON AND OFF

- a. The settling tolerances are set at too small a value. Refer to OPTIONS.

## 10. CUT IS NOT RECOGNIZED.

- a. The cut sensing switch is out of adjustment. Adjust the switch as necessary.

# TESTING THE KEYBOARD

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**microcut jr** contains a full keyboard test routine. This should be used if any key is suspect (either of not operating or of being stuck).

Turn the power off. Wait a few seconds. Press and hold **<MOVE>**. Turn the power on. The display will show the current software version. Press and hold **<0>**. Release **<MOVE>**. Release **<0>**. Press any key to check for operation. The **<SHIFT>** key must be used with one of the shift key functions to test. Whenever a key is activated the engraved value of that key will show in the third line of the display until the key is released.

To exit the KEY TEST ROUTINE press **<+>** or turn the power off.



# ERROR CODES

NOTE -- Any time a buzzer pulses the display will show a message that you should read. During operation, dashes in the lower line tell you that the clamp is down. Knife symbols in this same area signal that the knife is down (press **<ANY KEY>** to escape an error message routine).

**microcut jr** systems contain several error check routines. If a non-fatal error is realized (operation can continue without turning the power off), E's will appear in the display along with a number representing the problem. The numbers and errors are as follows--

## **ERROR NUMBER CAUSE**

- 0.....Full set up routine required for operation.
- 1.....Top of memory exceeded.
- 2.....AC zero cross not detected.
- 3.....Memory retention error at start up.
- 4.....Duplicated memory error at start up.
- 5.....Encoder direction error.
- 6.....No motion seen during motor drive routine.
- 7.....Memory too full for more jobs.
- 8.....Not enough space to insert a cut.
- 9.....Memory failure during set up routine.
- 10.....Clamp sense has a wiring error in set up routine.
- 11.....Cut sense has a wiring error in set up routine.
- 12.....Position sense wiring error in set up routine.
- 13.....No motion seen during set up routine.
- 14.....Drive direction error during set up routine.
- 15.....Smaller rear reference value required.
- 16.....High speed drive direction error.
- 17.....Drive error during deceleration routine.
- 18.....Drive error in slow speed braking routine.
- 19.....Drive error during brake exit routine.
- 20.....Target value was lost during motor drive routine.
- 21.....Drive error during velocity check routine.
- 22.....Target is too far forward in auto mode.
- 23.....Target value is too far back.
- 24.....Job memory is invalid.
- 25.....The calculated number is too big.
- 26.....The calculated number is too small.
- 27.....Can not divide by zero.
- 28.....Encoder is turning too slowly--change the gearing.
- 29.....Encoder is turning too quickly--change the gearing.

..... Press **<ANY KEY>** to continue.

If a fatal error is realized (power must be turned off and the system reinitialized), X's will appear in the display along with a number representing the problem. The numbers and errors are as follows--

## **ERROR NUMBER CAUSE**

- 0.....The zero set from the encoder is not working.
- 1.....The zero set from the encoder is too late.
- 2.....The zero set from the encoder is too soon.
- 3.....Job memory is losing data at power on.
- 4.....AC+ power failure detected at start up.
- 5.....AC- power failure detected at start up.
- 6.....Position sense wiring error at start up.
- 7.....No motion seen when drive should have occurred.
- 8.....A key was pressed at start up to disable drive.
- 9.....The encoder calibration zero set was missed.
- 10.....Internal data has been lost in the CPU.
- 11.....The watchdog reset has run out. Restart the unit.

# **SAMPLE PHOTOS OF INSTALLATIONS**

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