SILCA Marker 2000

INSTRUCTION MANUAL

Important! Read these instructions before you use your new Marker 2000.
Ensure that all safety recommendations are followed!

ILCO UNICAN

CONTENTS

This manual provides the information for safe and efficient use of your Marker 2000. Read carefully before performing any operations with the machine.

The Marker 2000 is a safe and reliable way to mark products, but an understanding of its operations and capabilities will increase its value to you.

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WARRANTY INFORMATION

Silca warranties this machine for a period of 12 months from the date of purchase to be free from defects in workmanship or materials or for a period of 36 months from the date of manufacture, whichever comes first. The warranty covers repair or replacement of any parts determined to be faulty at the time of manufacture. the warranty does not cover parts that damaged as a result of negligence, improper installation, mishandling, use by unqualified personnel, normal wear and tear, use of parts not supplied by Silca, transport or any circumstances beyond the control of Silca. Purchased components are covered by the original manufacturers warranty. This warranty is null and void if persons other than those authorized by Silca attempt to repair or modify this equipment. Warranty repairs do not extend the warranty period. Parts replaced under warranty become the property of Silca. Silca declines all responsibility to persons or things caused by failure to ground the machine or by mishandling the machine. This certificate, your warranty card and invoice or dated proof of purchase must be retained by you for the entire period covered by the warranty and must be presented if warranty work is required. All disputes arising from this warranty will be settled by the Court of Treviso (Italy)

WARNING - SAFETY NOTICE

Safety begins with education and continues with proper application. All personnel who operate your machine should read the supplied Operator's Manual for information on how to properly operate it. The likelihood of accidents and incorrect marking will be greatly reduced.

General Safety

- Safety glasses must be worn to reduce the possibility of eye injury while operating or in the immediate vicinity of any power machinery
- Always wait for the Marker 2000 to complete the marking cycle and finish moving its head to the home position before inserting or removing items being marked.
- The machine should be located in an area accessible only by authorized operators. Location must be such that customers and other personnel are not subject to potential injury.
- Do not defeat safety features built into your machine. Removal or modification of safety shields, guards, and other safety devices should be strictly forbidden.
- At no time should the mechanically driven parts of the machine be touched while it is in operation. The operator should take care to ensure that loose-fitting clothing, long hair, etc. are kept from the area of machine operation.
- Your Marker 2000 has been specially designed and built for marking of brass and nickel silver items and should be operated according to the Operator's Manual. All other uses are strongly discouraged as potentially dangerous, and should not be attempted! Such use will immediately void the machine's warranty.
- Some states have specific age restriction concerning the operation of certain types of equipment. Check local and state ordinances for compliance.

Electrical Safety

- (120 Volt models) Your machine is designed to operate using 120 Volt A. C. 60 Hz. electrical current. It is supplied with a three-prong power plug which should be used with a properly grounded three-prong outlet only. Do not defeat the safety purpose of the plug by modifying or using with non-grounded outlets!
- To reduce risk of fire or electrical shock, do not expose or operate machine in damp or wet locations.
- Electrical problems should be referred to qualified repair technicians. If the machine is under warranty, contact ILCO UNICAN at the address printed on the cover. (ILCO UNICAN also offers repair service for out-of-warranty machines. Contact ILCO UNICAN for details.)
- Always unplug the machine before removing the hood or changing the cutter wheel.

Grounding Safety

- In the event of a malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce the risk of electric shock. This machine is equipped with an electric cord that has an equipment-grounding conductor and a grounding plug. The plug must be plugged into a machine outlet that is properly installed and grounded in accordance with all local codes and ordinances.
- Do not modify the plug provided - if it will not fit the outlet, have the proper outlet installed by a qualified electrician.
- Improper connection of the equipment-grounding conductor can result in a risk of electric shock. The conductor with insulation that has a green outer surface (with or without yellow stripes) is the equipment-grounding conductor. If repair or replacement of the electric cord or plug is necessary, do not connect the equipment-grounding conductor to a live terminal.
- Check with a qualified electrician or service personnel if the grounding instructions are not completely understood, or if in doubt as to whether the machine is properly grounded.
- Use only 3-wire extension cords that have 3-prong grounding plugs and 3-pole receptacles that accept the machine's plug.
- Repair or replace damaged or worn cords immediately.

INTRODUCTION

Congratulation!
You've purchased a superior marking machine.

The ILCO Marker 2000 is a rugged and dependable marking device. It will mark keys and other small brass type items easily and quickly. Not only can the Marker 2000 place identification on keys more quickly than hand stamping, it virtually eliminates the problems associated with hand stamping; crooked lines, leaning characters, unreadable half-character images.

Besides improving the appearance of your keys, the Marker 2000 is much more economical than hand marking when large amounts of keys are to be identified. It also eliminates the problems of striking the wrong surface of a die, missing dies, and the multiple fonts of the Marker solve the problem of having letters in only one or two different sizes.

Messages and phrases are stored in the Marker 2000 so that expensive custom dies and stamps are also no longer needed. Names, telephone numbers, identities (i.e."Red Truck" or "Fire Equip."). locations (i.e. "Jones Hall" or "3rd Floor Linen"), or even special instructions ("Maintenance", "Security". "Do Not Duplicate") can be stored and changed as needed.

The sequential numbering function of the Marker 2000 speeds the marking of large numbers of keys. Master key system marking (AA001, AA002, AA003 …) or serial numbering 34224, 34225, 34226 …_ can be accomplished as quickly as keys can be loaded into the machine, and the machine will keep count of where it is while you're doing the marking.

While its versatility permits a wide range of uses, it will remember your set-ups and can easily be changed from one style of marking to another and then back again. This ability makes it a valuable addition where ever large numbers of keys need to be marked.

Unpacking Instructions

Your Marker 2000 has been shipped to you in a sturdy, specially cushioned container to prevent the possibility of damage during handling and shipment. Once the machine is removed from the carton, it should be set up on a level workbench and wiped clean. The machine is adjusted at the factory and test markings performed, but it is recommended that you check the adjustments to make sure they have not slipped or shifted during transit.

CAUTION!
DO NOT DESTROY OR DISCARD THIS VALUABLE SHIPPING CARTON. STORE IT CAREFULLY IN A SAFE PLACE. IN THE EVENT OF A PROBLEM WITH YOUR MACHINE, IT MUST BE RETURNED TO OUR SERVICE FACILITY IN ITS ORIGINAL PROTECTIVE CARTON.

Figure 1 illustrates the technical terms used throughout this manual to describe keys.

1) Head
2) Rim
3) Stop
4) Stem
5) Tip
6) Back
7) Cuts
8) Marking

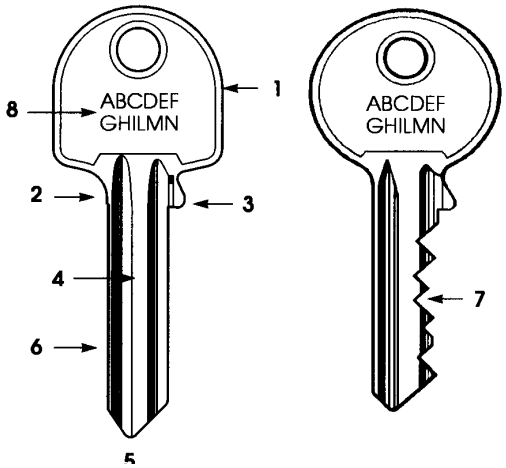


Fig. 1

The Marker 2000 has been designed to mark materials including brass, nickel silver, and mild steel. Using the Marker 2000 for purposes other than this is not recommended and beyond the design specifications and responsibility of the ILCO-Unican Group.

The marking of any plastic materials, cardboard, or hardened metals is beyond the design goals of the Marker 2000. Marking on any of these materials, or failure of the operator to follow the instructions presented in this manual, are not covered by the warranty and the manufacturer declines all responsibility in such cases.

The Marker 2000 is an electrically powered, electronically controlled, precision mechanical device. Its set-up, operation and maintenance is important for a long, productive service life. Follow the guidelines in this manual to receive the greatest production from your Marker 2000.

Operator Safety

The adoption of general industrial safety precautions and observation of the procedures in this manual will insure operator safety during the operation of the Marker 2000.

The Marker 2000 is an electronically controlled machine for marking keys, cylinders and medallions using microcomputer technology. It adds a high degree of marking precision, operating speed and ease of use to marking operations. The Marker 2000 is a complete stand alone marking system, but advanced features can be added by connecting it to your personal computer loaded with the optional Marker 2000 Program.

Power Supply

The Marker 2000 uses a switched and fused power supply with a safety grounded and polarized plug.

Maintenance

Please follow the instructions presented in this manual. They will allow your Marker 2000 to provide you with a long and productive machine life if the machine is regulated, serviced, repaired and cleaned as specified in this manual.

Machine Identification

Figure 2 illustrates the machine identification plate attached to your Marker 2000. Please make note of the data it displays before contacting the manufacturer for any reason.

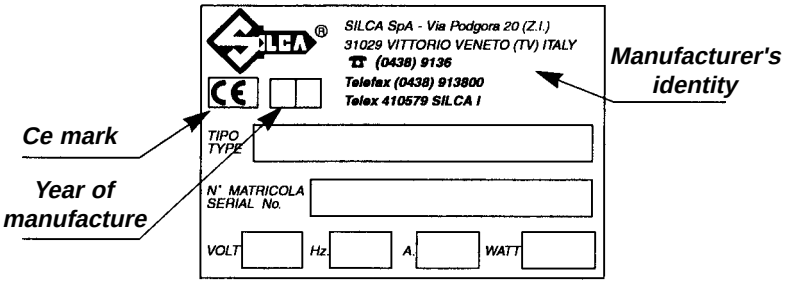
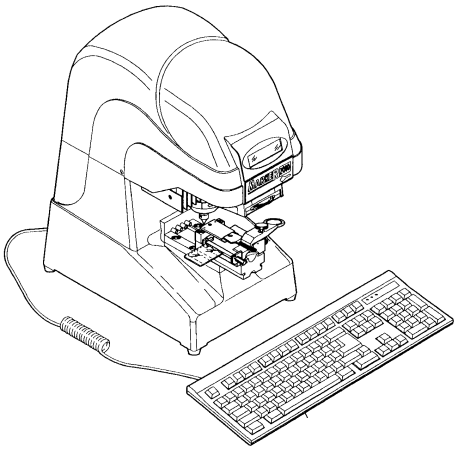
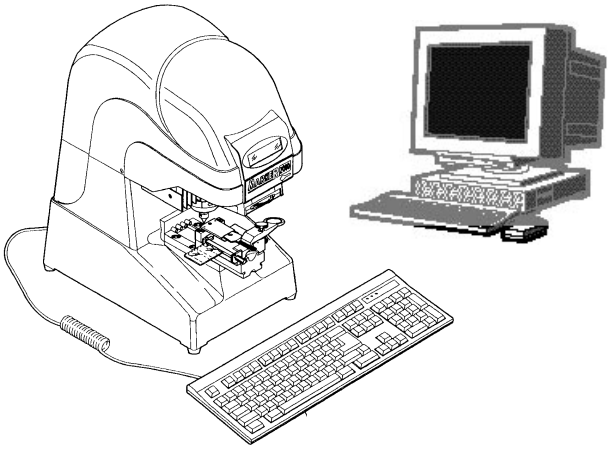


Fig. 2

MACHINE DESCRIPTION

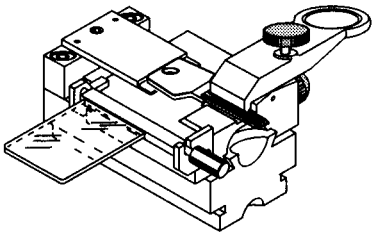


Marker 2000 Stand Alone

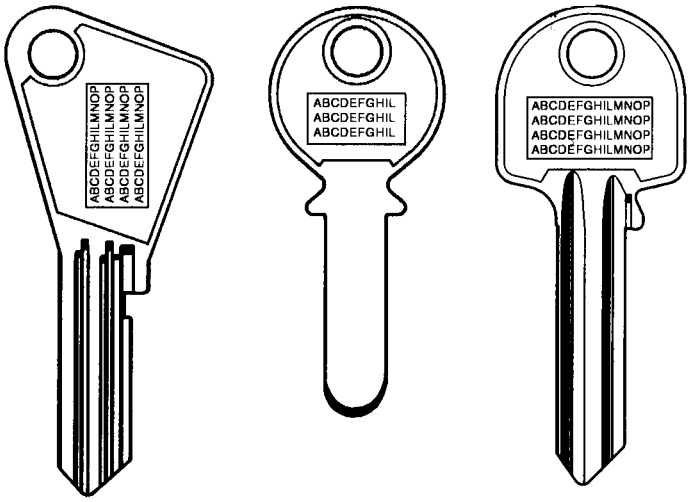


Marker 2000 Connected to PC

The standard "C1" clamp holds the most common key shapes for marking

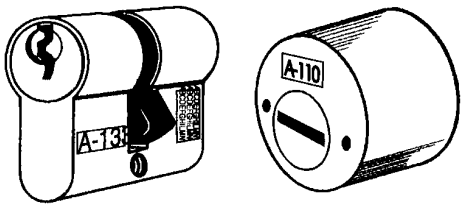


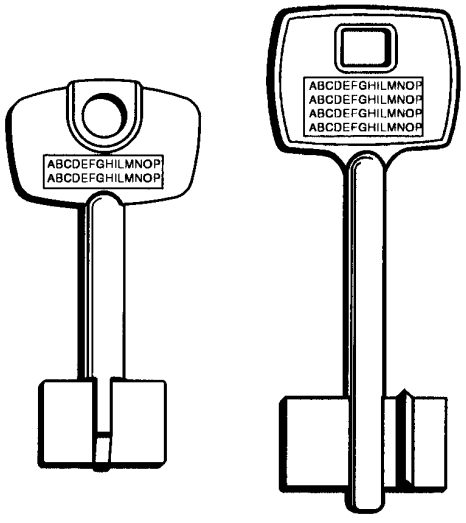
"C1" clamp installed on the machine and sample keys to be marked.



Additional clamps are available for holding cylinders, medallions & odd shaped keys

ANSI style cylinders & bit keys





1.1 Main Features

The Marker 2000 holds the item to be marked securely in the clamp. The marking head is controlled through the x & y axes on precision guides that ensure maximum smoothness and fluid movement without play.

The standard "C1" clamp that is shipped with the Marker 2000 is designed to accept and hold most popular automotive and cylinder keys in today's market. The C1 clamp has several adjustments available to accept this wide range of keys. Please refer to the section of this manual that describes those adjustments.

The steel marking punch that performs the marking function is simple to replace and is controlled by an electromagnet built into the head of the machine. It has a maximum frequency of 70 to 80 punches per second. The height of the punch above the material to be marked (called the z axis) can be adjusted by as much as 4mm (about 1/8") to allow for different thicknesses of material. The z axis travel of the punch is adjusted by use of the Punch Regulation Ring.

The area to be marked can be easily sized, aligned and positioned by use of the laser tracking system built into the Marker 2000. While the machine is in the tracking mode, the machine will project a red laser light onto the object to be marked. As you position, make adjustments, and choose a marking zone shape, the computer memory stores this data to provide you with maximum marking versatility. Sets of marking parameters can be saved for mass production marking when needed.

The alphanumeric display is a backlit LCD panel on the upper front of the machine positioned for easy visibility. It will display up to four lines of text with as many as sixteen characters on each line.

A standard, IBM compatible, PC keyboard is required for the operation of the Marker 2000. It is used for entering the text to be marked as well as issuing commands to the Marker 2000. The keyboard is not supplied by the manufacturer so that local keyboards may be selected by use of the operator.

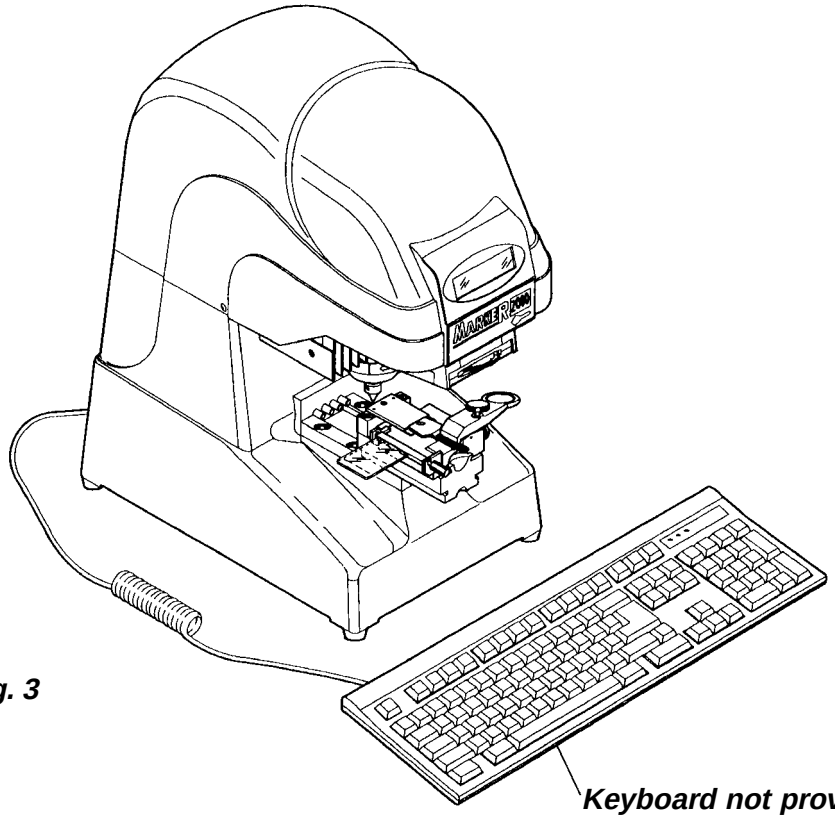


Fig. 3

1.2 Working Parts

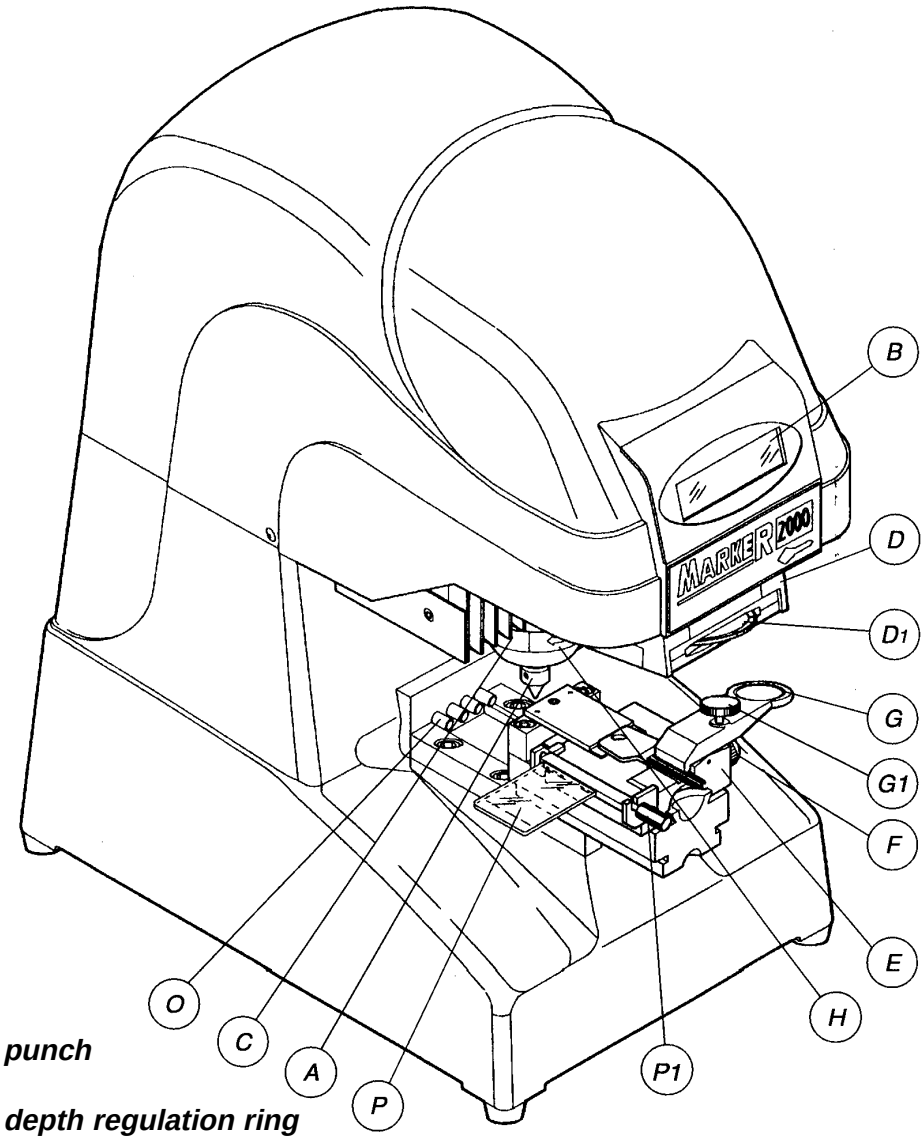


Fig. 4

A - marking punch
B - display
C - marking depth regulation ring
D - tracking device
D1 - tracking disk
E - clamp slide
F - slide-locking knob
G - key-locking jaw
G1 - jaw-locking knob
H - head unit
I - master switch
L - feeder outlet
M - keyboard outlet
N - serial port
O - clamp sensor
P - glass slide diffuser
P1 - glass slide diffuser knob

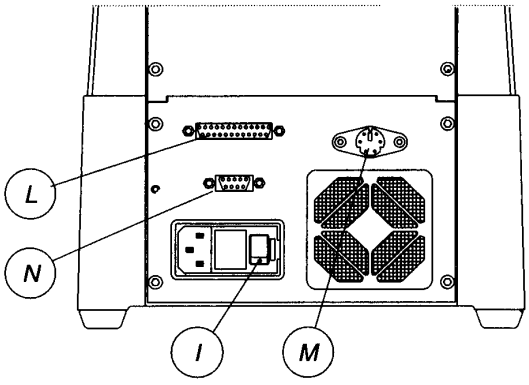


Fig. 4a - rear view

1.3 Technical Data

Power: 230VAC-50Hz - 80 Watt 4 Amp
110VAC-60Hz - 90 Watt 6 Amp

Punch: Tempered steel punch, interchangeable

Maximum Punching Speed:
70 to 80 punches per second

Clamp: C1 is standard clamp supplied with marker

Marker movements: 3 axes
X axis: 50mm (2")
Y axis: 35mm (1 3/8")
Z axis: 4mm (1/8")

Electronic Display: Backlit LCD, four lines with sixteen characters per line

Keyboard: Standard IBM compatible with mini-DIN 6 pin plug

Connections: mini-DIN 6 pin socket for keyboard
25 pin feeder outlet
Standard 9 pin RS232 serial port

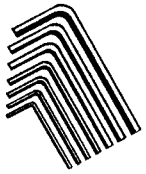
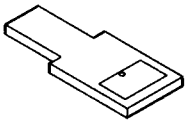
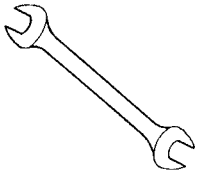
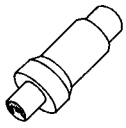
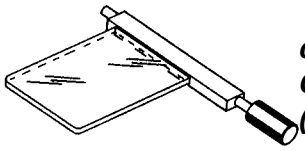
Dimensions: approx width: (220mm) 9″
approx depth: (320mm) 13″
approx height: (450mm) 18″

Weight: approx 45Lbs (20 Kgs)

Operative sound level: Lp(A) = 85.3 dB (A)

1.4 Accessories provided with Marker 2000

Marker 2000 is shipped with accessories for operation and maintenance. They are housed in a special tool holder and include:

 ***Set of Hex Wrenches (7 pieces)***	 ***code D412279BA Gauging Template (1 piece)***
 ***code D309259ZZ 7 - 8mm Spanner (1 piece)***	 ***code D312421ZZ Keyboard Adapter (1 piece)***
 ***code D112170FA Glass Slide Diffuser (1 piece)***	***Fuse (2 pieces) code D309226ZZ 3.15 Ampere rapid (230V)***

Fuse (2 pieces) code D309226ZZ 3.15 Ampere rapid (230V)	***Fuse (2 pieces) code D309226ZZ 3.15 Ampere rapid (230V)***	***Fuse (2 pieces) code D309226ZZ 3.15 Ampere rapid (230V)***

TRANSPORT

The Marker 2000 is easily transported when properly packed. Its weight is within the recommended limits for a single person to lift.

2.1 Packing

Always save and re-use the original packing materials. The carton, nylon wrapper and expanded foam panels that protect the Marker 2000 in shipment from the factory are designed for maximum protection of the machine during movement. These materials should be saved for use when the Marker 2000 must be moved from one location to another, or the machine is set aside for long term storage.

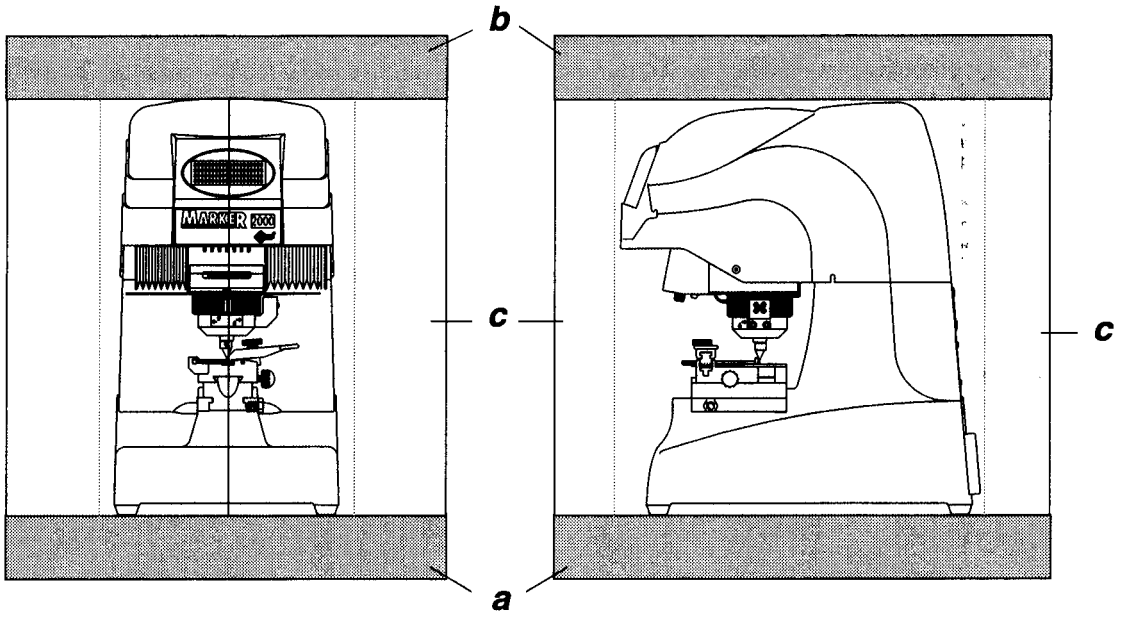
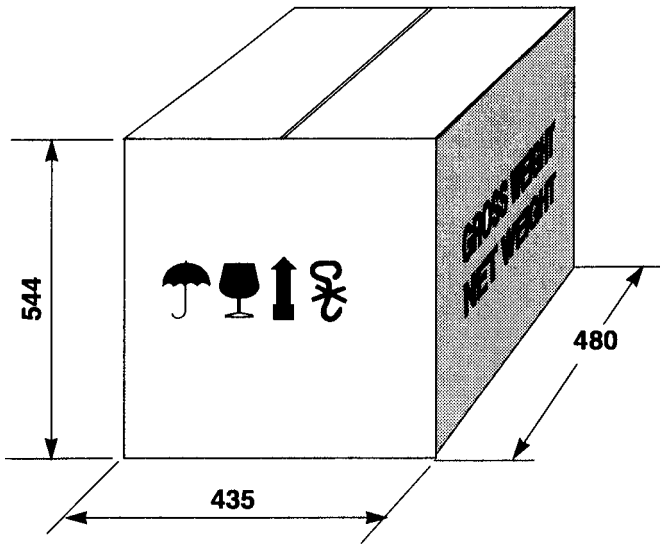


Fig. 5

Fig. 5a



2.2 Moving

International Symbols are printed on the side of the Marker 2000 carton that describe the conditions for transporting and storing the machine. Always use the original packing materials for moving or storing the Marker 2000.

2.3 Unpacking

As with all products received, check for visual damage to the carton before accepting it from the shipper. The carton is designed to protect against normal shipping handling, but any damage to the carton may indicate abnormal conditions that could damage the contents.

To remove the Marker 2000 from the packing box:

1. Carefully cut the straps with scissors and remove.
2. Carefully pry out the staples with proper size pliers.
3. Removing the contents without damaging the carton or the packing materials is advised. Future moving of the machine should be done in the original shipping materials.
4. Check the contents of the carton which should include:
   - 1 Marker 2000 machine in its protective shell.
   - 1 Set of documents, including: this manual, spare parts list, & warranty card
   - 1 Power cable
   - 1 tool kit
5. Remove the marker from the protective shell.

2.4 Handling

After unpacking, the Marker 2000 should be immediately positioned in its work position. This can be accomplished by one person by firmly holding the base, and no other part, to lift and carry the machine.

The Marker 2000 is self contained and does not need special installation. Some preparation and set up is required.

MACHINE INSTALLATION AND SET-UP

3.1 Checking for damage

The Marker 2000 is a solid and compact machine. It will not normally be damaged while being moved if it is shipped in its original factory packaging, following the directions in this manual. However, it is always advisable to check the machine each time it is moved or shipped.

3.2 Environmental conditions

The ideal conditions for the Marker 2000 are: temperature between 0° and 40° Celsius (32° and 96° Fahrenheit) relative humidity approximately 60%

3.3 Positioning

Place the Marker 2000 on a flat surface solid enough to hold the weight of the machine (20Kg/45Lb). The height of the workbench should be approximately 100 to 120 cm (39 to 47 inches). It is important to leave clearance space around the machine for proper ventilation. This is especially important behind the machine, where 20 to 30 cm (8 to 12 inches) of space is required. Remember to provide space for the keyboard. (Fig 6)

Ensure that the machine voltage matches the electrical service and that it is properly grounded and in compliance with local electrical codes.

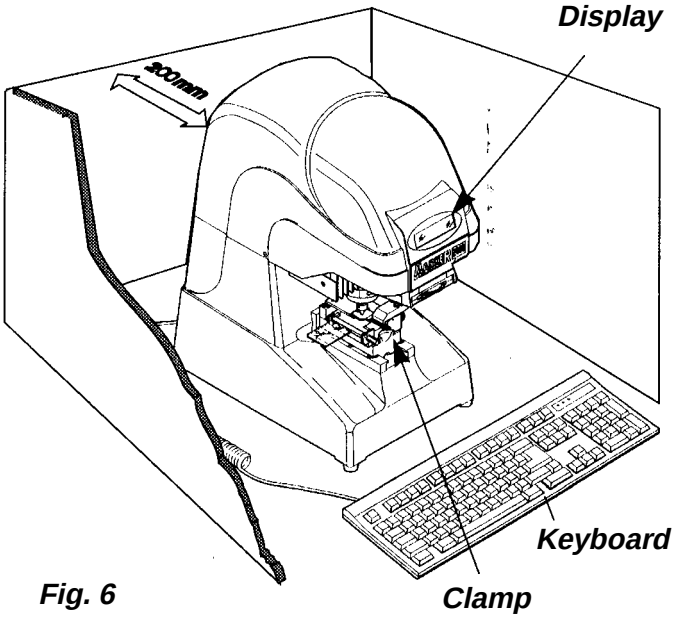
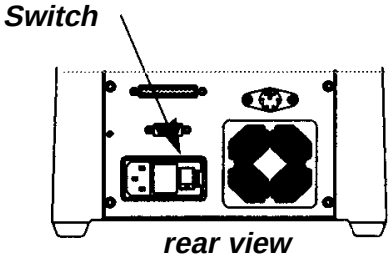


Fig. 6



Only after the above electrical safety precautions have been met should you connect the keyboard to the machine, the machine to the power cable, and the power cable to the electrical supply.

3.4 Description of work station

The following controls are available to the operator of the Marker 2000:

- master switch located on the rear panel of the machine
- product clamp for holding and positioning items to be marked
- keyboard
- LCD display on the upper front panel of the machine

3.5 Graphics

IMPORTANT: regulations require that a warning label be attached as shown in Fig 6a.

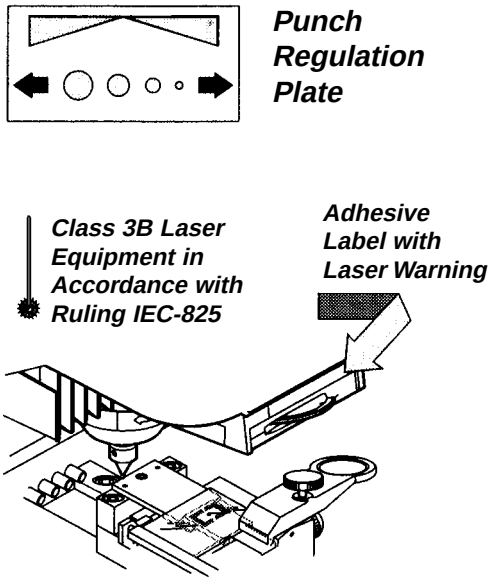


Fig. 6a

4.1 Clamp

The "C1" clamp, designed to hold the greatest variety of keys, incorporates a rapid, easy to use system for securing the keys. It comprises of the following parts:

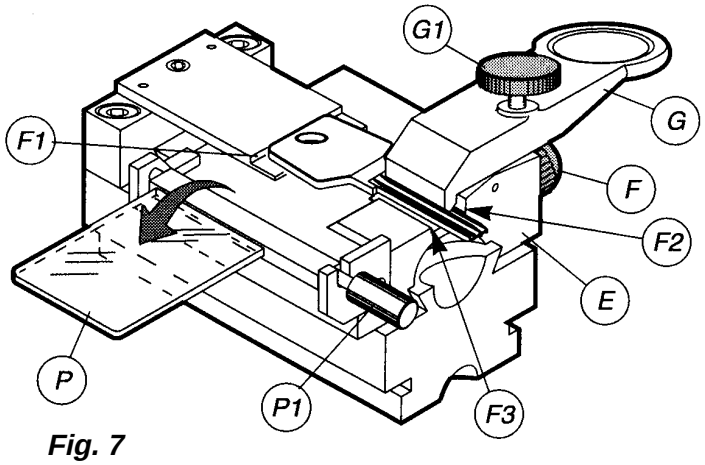


Fig. 7

E - clamp slide
F - slide locking knob
F1 - key head stop
F2 - right hand back stop
F3 - left hand back stop knob
G - key locking jaw
G1 - jaw locking knob
P - glass slide diffuser
P1 - glass slide rotating

During marking operations the clamp has two basic positions:

MARKING position: The clamp is pushed all the way in toward the machine (Fig 8). Before marking takes place, an electronic control on the machine prevents start of the cycle if the clamp is not in this position.

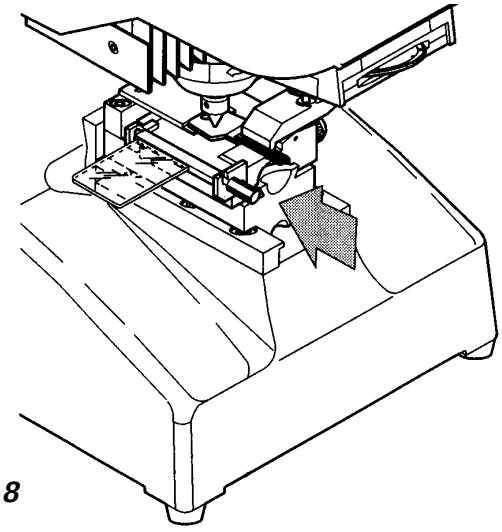


Fig. 8

TRACKING position: The clamp is pulled toward the operator (Fig 9) until it snaps into place. The laser beam will not activate if the clamp is in the marking position or if the tracking disk (D1) is missing.

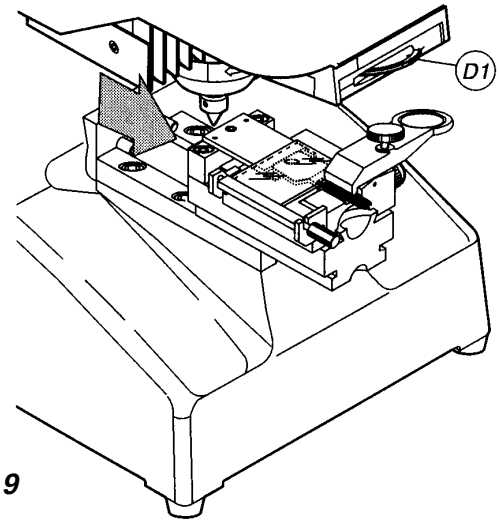


Fig. 9

4.2 Securing the keys

Place the clamp in the tracking position (Fig 9) to make it easier to position the key in the clamp. Make sure the glass slide diffuser (P) is out of the way by rotating it outward with knob (P1) (Fig 12).

- loosen the jaw locking knob (G1)
- select the side of the key to be marked, press down on the clamp (G) (Fig 10) and place the key with its back on the clamp stop. Position the key as illustrated in Figures 11, 11a or 11b, depending on the profile of the key being marked.
- move the clamp (G) into the position that provides the best gripping pressure on the item to be marked and tighten the knob (G1); the clamp (G) can be moved a maximum of 10mm (0.4") along the X axis. (Fig 10).
- loosen the locking knob (F), move the clamp slide (E) so that the key head butts solidly against the head stop (F1) and lock the slide by tightening the knob (F).
- Once adjusted for a particular type of key, additional keys of the same type may be marked without further adjustment.

4.2 Securing the keys continued

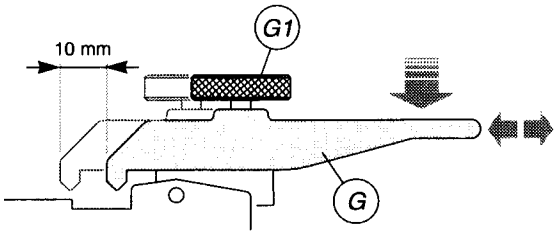


Fig. 10

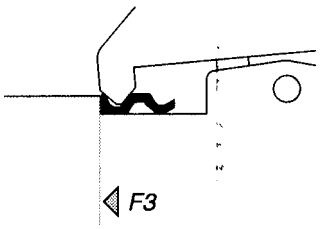


Fig. 11

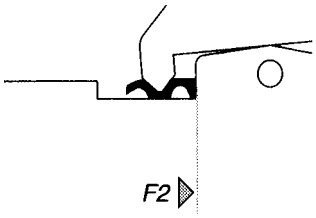


Fig. 11a

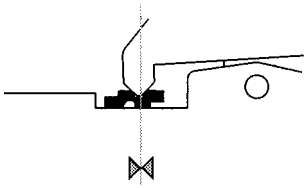


Fig. 11b

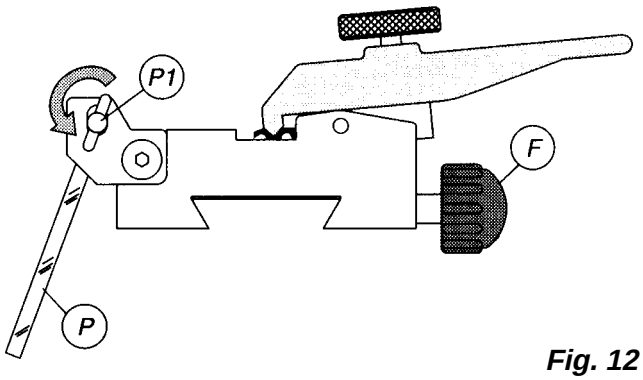
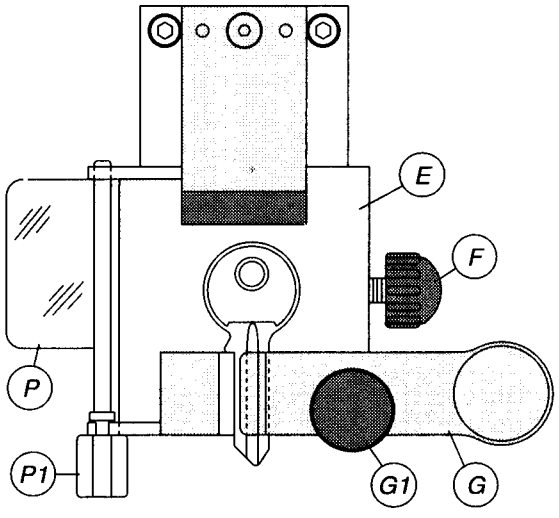


Fig. 12



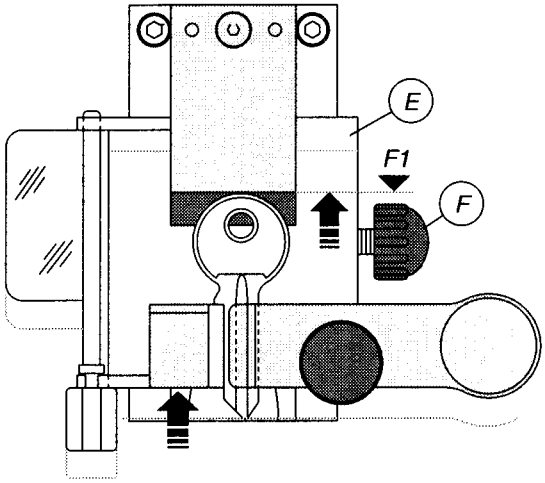


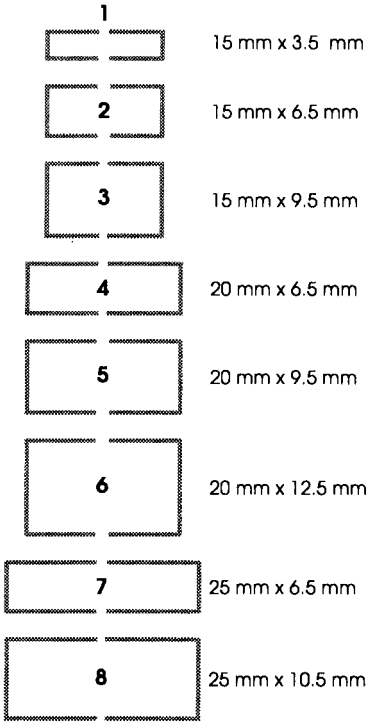
Fig. 13

4.3 Tracking

Tracking defines the area to be marked. Text will be adjusted or cropped to fit into this space. It consists of the following main parts:

- Laser
- Tracking disk (D1) with marking zone selection
- Glass slide diffuser (P)

The laser beam projects a light through the tracking disk and glass slide diffuser onto the surface of the item to be marked. The tracking disk contains a variety of marking zone patterns in different shapes and sizes.



WARNING: for tracking, always place the glass slide (P) over the key. This provides improved visibility of the laser beam on the shiny surface (Fig 15 & 16). When the tracking operation is complete, the glass slide (P) must be returned to the down position away from the item to be marked. Damage to the glass slide may result if marking is attempted with it in the tracking position.

For operator safety, the laser beam is electronically deactivated if the tracking disk is missing or if the clamp is in the marking position.

Replacing the tracking disk:

- loosen the knob (D2) (Fig 14).
- remove the disk (D1) and replace.
- tighten the knob (D2).

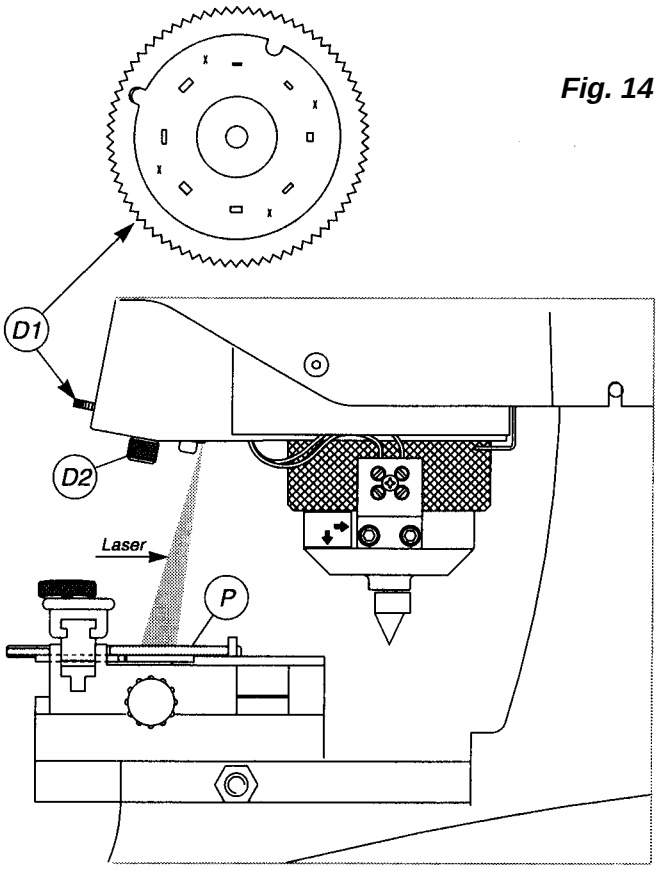


Fig. 14

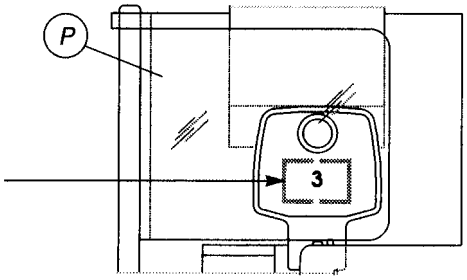


Fig. 15

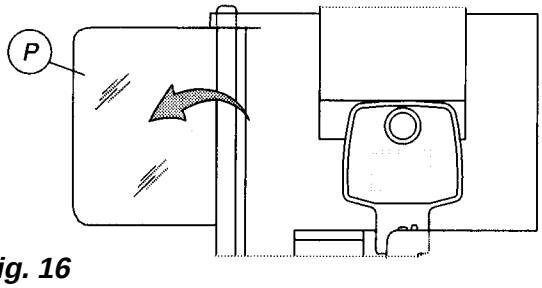


Fig. 16

4.4 Marking punch regulation ring

The regulating ring (C) makes it possible to increase or decrease the distance between the punch and the surface to be marked. This distance, together with the type of material being marked and the style of the selected characters, affects the composition of the microdot used in the marking (i.e. the depression made by the point.). It is the balancing of these factors that allows the operator maximum control on the appearance of the marking performed.

The regulation plate (Fig 17) displays three positions suitable for keys. The distance between the punch and the item to be marked can be set at 1.5mm, 2.5mm and 3.5mm (approx 1/16" to 1/8").

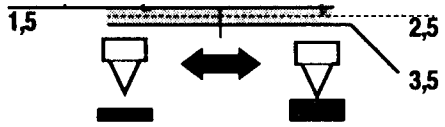


Fig. 17

When the regulating ring is positioned as illustrated by the dotted line in Fig 17a, the machine is set for the standard distance usable with most common key thicknesses. For special thicknesses or to alter the depression depth for operator requirements, use the regulating ring (C) (Fig 17b). Keep in mind that:

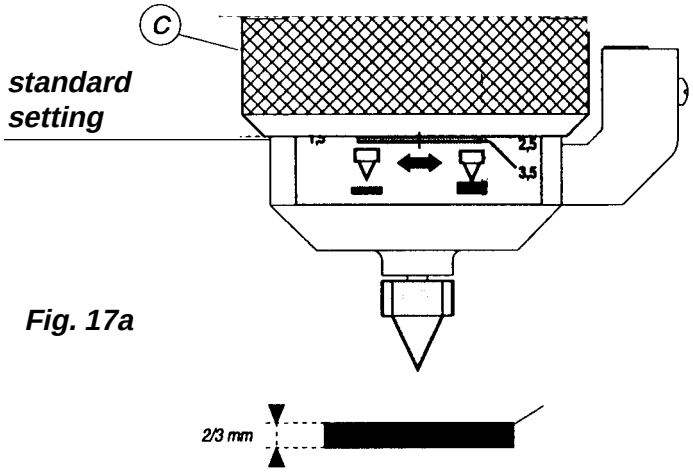


Fig. 17a

- Turning the ring to the right lowers the point
- Turning the ring to the left raises the point

Caution! Do not move the ring (C) beyond the black lines!

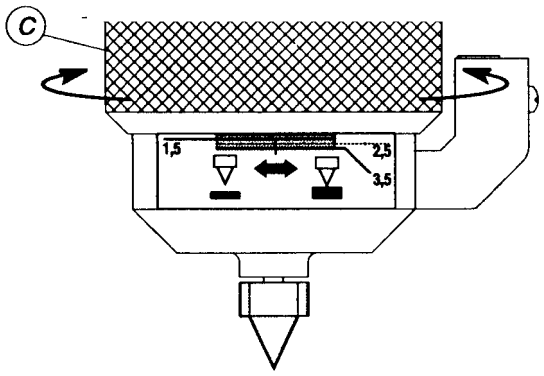


Fig. 17b

4.5 Marking

The Marker 2000 uses a single microdots punch to create many small craters, called microdots, on the surface to be marked. These microdot are grouped to form letters, numbers and symbols.

A variety of fonts are available (Fig 18) that use differing concentrations of microdots. The 6x8 font uses six columns of microdots with eight rows in each column. The 8x16 font places eight columns of sixteen rows in the same amount of space. Smaller characters look better with the less dense fonts (6x8 or 8x8) while larger ones have a better appearance with denser fonts (8x14 or 8x16). For more detailed information on the selection and use of fonts, see the Marker 2000 computer software manual.

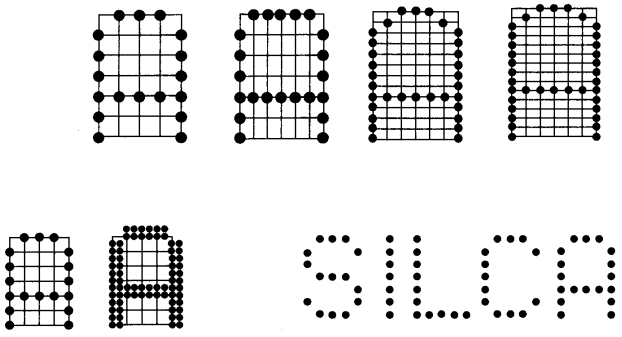
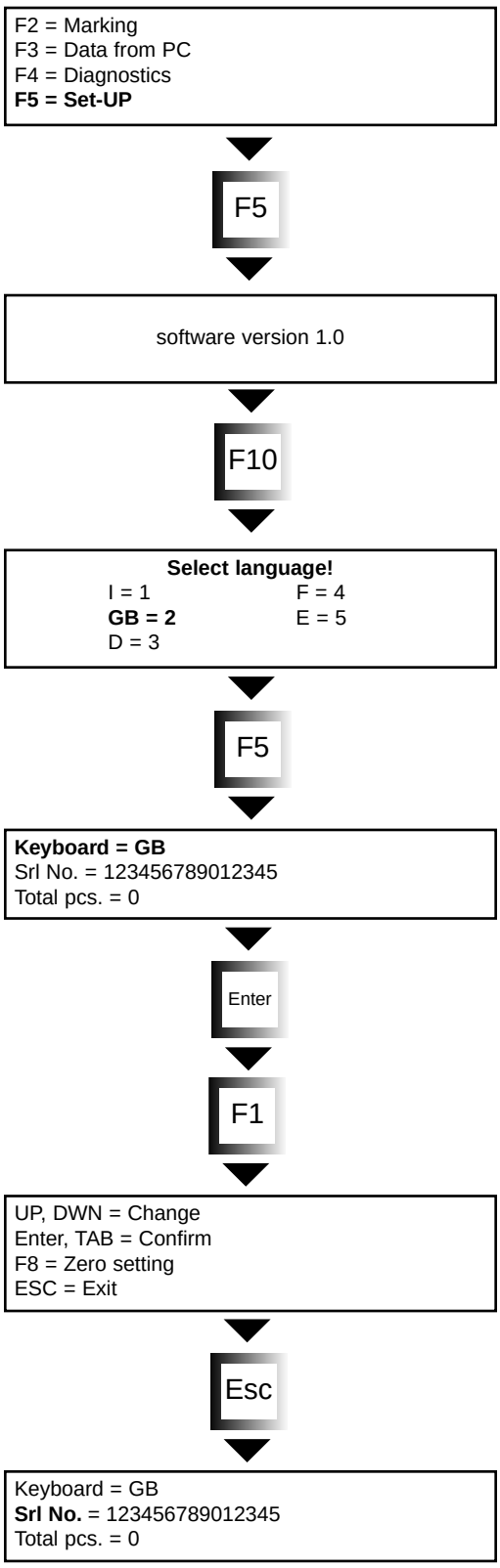


Fig. 18

5.1 Installation and Preliminary Operations

When the Marker 2000 is first powered up, the following setup procedure must be performed. The language to be displayed must be selected, the type of keyboard identified, and entry of the machine's serial number.

When the machine is turned on, the display shows:



Set-Up [F5]
Press the F5 function key to begin the set-up operation.

Language
Enter the number of the language required.

I = Italian (1)
GB = English (2)
D = German (3)
F = French (4)
E = Spanish(5)

Keyboard
Ensure that the cursor is flashing next to the "Keyboard" field and press the space bar until the proper designation appears.

The different possibilities will scroll by until you use the "Enter" key to make a selection.

Serial Number
The serial number field requires the complete serial number as engraved on the back of the Marker 2000 machine (Fig 2). Press "Enter" when the serial number is complete, and exit from the Set-up menu by pressing the <ESC> key. The data will be stored by the Marker 2000.

[F1] Help
At any time during the above, pressing the [F1] function key will bring up the online help. <ESC> exits help.

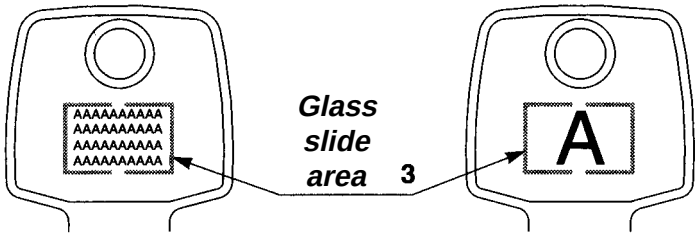
5.2 MARKING [F2]

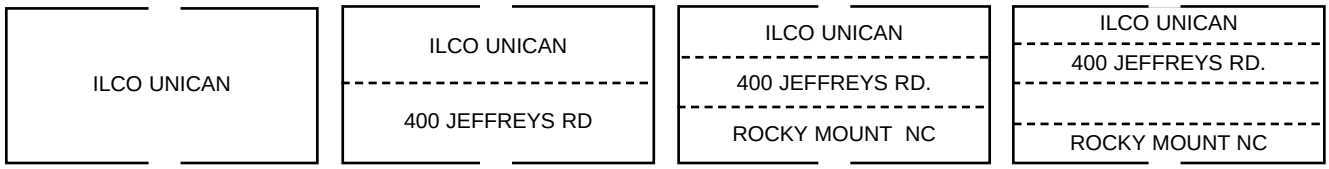
The Marker 2000 allows the user to select Automatic Formatting, where the machine automatically adjusts the text, or Customized Formatting, where the operator may manually enter the text formatting.

5.2.1 Marking with Automatic Formatting

When Automatic Formatting is selected, the Marker 2000 will use a set of default settings that automatically adjust such items as character size, orientation and alignment. The operator may manually override the orientation and alignment settings, but if the character size is adjusted the Marker 2000 will drop out of Automatic Formatting mode and into Customized Formatting mode.

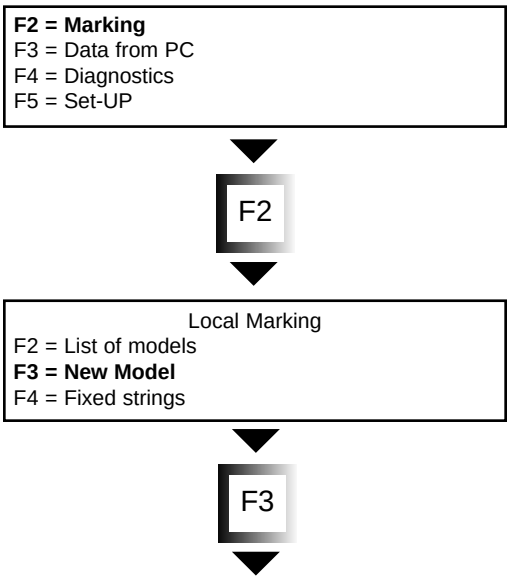
In Automatic Formatting mode, the text is printed right side up and center justified.





1 line **2 lines** **3 lines** **4 lines (1 empty)**

At the main menu display, select [F2] to proceed to the marking menus



New Model [F3]
Pressing the [F3] function key takes the operator to the display of information that describes the parameters the Marker 2000 is set to use for marking.
Slide = This describes the text area defined by the tracking process.
The number should match the laser slide chosen during tracking.
Clamp = The Marker 2000 will detect which clamping fixture is in use and will align itself based on which clamping fixture is used.
Side = By pressing the + and - keys, the operator will toggle between Left Hand and Right Hand mounting.
Orie. = By pressing the + and - keys, the operator will scroll through 0, 90, 180, and 270 text orientations.

0 is right side up, 180 is upside down, 90 & 270 mark the text sideways.
Dire. = Hor and Ver allow selection of horizontally or vertically oriented character marking.
Auto F = Enter an "x" on for Automatic Formatting, off for Customized Formatting.
If marking results in unexpected character sizes, make sure that the "x" is displayed.
Pcs. = This field allows for marking multiple operations.

The operator may save custom settings by creating a file under "name of model" so that those settings may be used again later.

[F1] Help
Press the F1 function key to bring up the help guide.

Tracking [F8]
Position the item to be marked on the clamp (ch 4.2) and press function key [F8]to proceed with tracking.

WARNING: If the clamp is not is the proper position, an error message appears. Move the clamp to the "tracking" position.

Following the tracking procedures described in chapter 4.3, the operator must enter the number of the selected laser slide into the proper field. The + and - keys will allow the operator to scroll through the available slide numbers. The number of the laser slide projected on the object to be marked must match the number displayed on the display panel behind "Slide ="

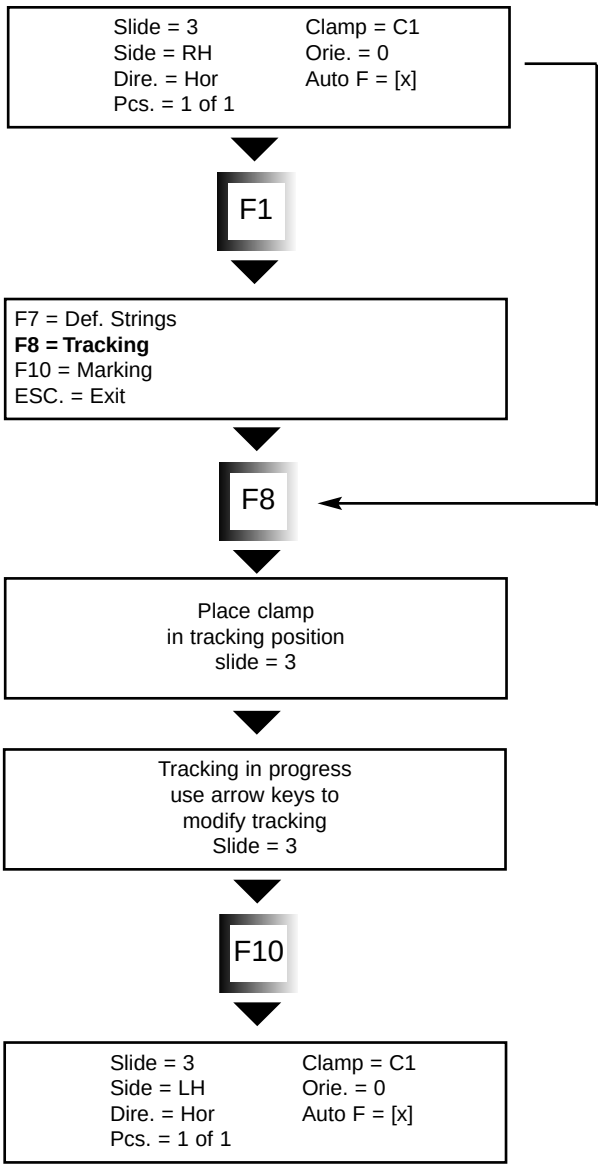
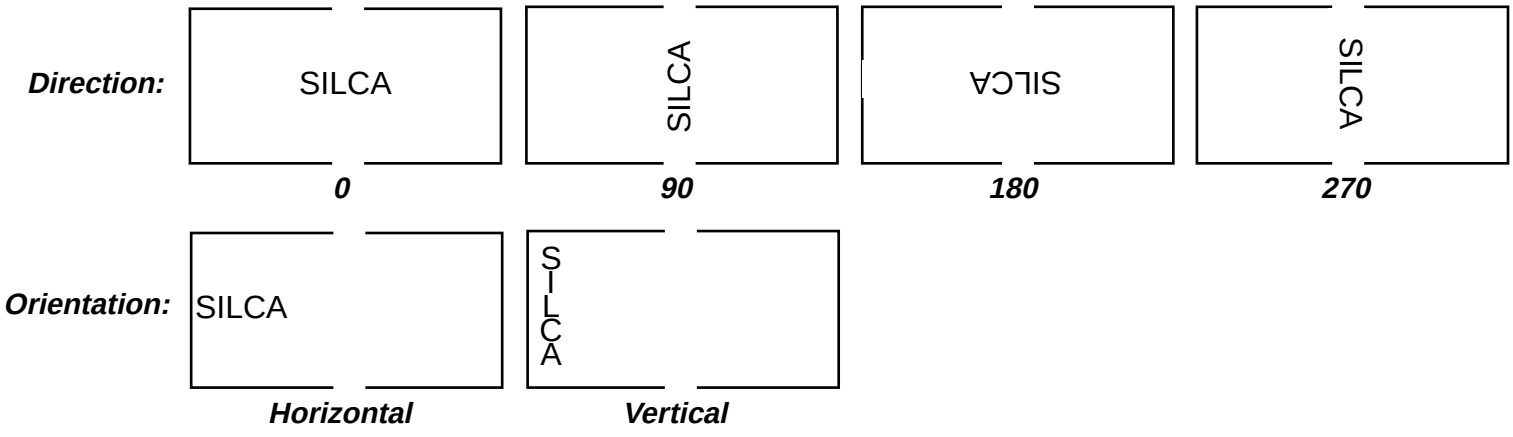


Fig 20, illustrated below, is the text orientations the operator may control with the "Orie. =" and "Dire. =" fields.



WARNING: before moving the clamp into marking position, MAKE SURE THAT THE LASER GLASS SLIDE (P) HAS BEEN MOVED OUT OF THE WAY! (Fig 16)

Definition of strings [F7]
Pressing the [F7] function key will take the operator to the text entry fields.

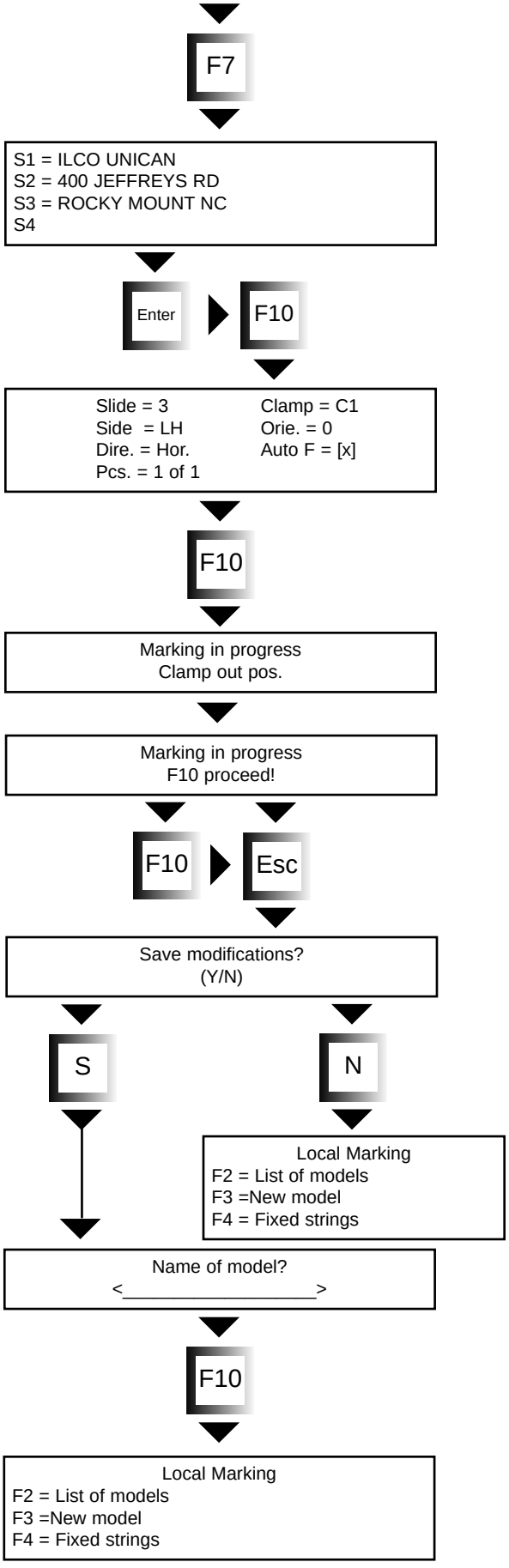
The cursor will be flashing at the start of the first line of text. Type the text to be entered, up to 16 characters per line. Pressing the <Enter> key will move the cursor to the second line. Up to four lines of text may be entered. When all text has been entered, press the [F10] function key to return to the main menu. Press [F10] again to start the marking process.

WARNING: This error message will appear if marking is attempted while the clamping fixture is not in the marking position. (Chap 4.1)

On completion of marking, this display reappears on the display. If more than one piece has been selected, the Marker 2000 automatically increments and is ready to repeat when the operator loads a new object to mark. If the number of pieces is at the default value of "1", the marking can be repeated by pressing [F10] again.

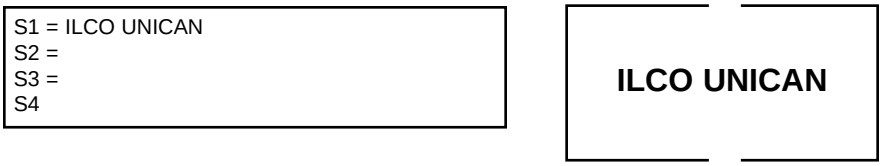
Pressing [F7] will allow modification of the text to be printed and pressing [F8] will set the machine in tracking mode.

Pressing the <ESC> key will bring up the "Save modifications?" display. If the text is saved (Y=Yes), enter a name for the model. The text and formatting will be saved under that file name and be available on the main menu under the selection [F2] "List of models." (ch 5.2.2) Entering "N" (N=No) will inform the Marker 2000 to discard the text.

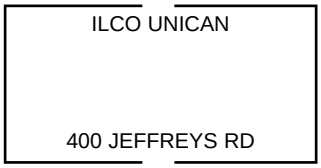


IMPORTANT NOTE ON AUTOMATIC FORMATTING: Automatic formatting is the default setting (Auto F = [x]) and the operator may change the font type (6x8, 8x8 ...) or whether or not the font is bold or standard. See ch 5.2.2 for instructions on changing these parameters. Altering other parameters may turn off Automatic Formatting.

The operator may adjust text line positioning by selecting which of the four lines available should be used.
a) text entered only on the first line:



b) text entered on first and second lines:



5.2.2 MARKING WITH CUSTOMIZED FORMATTING

Each line of text may be custom formatted for marking. Follow the instructions in ch 5.2.1 up to the point for entering text.

Definition of text strings [F7]
Position the cursor on the line to be customized and press [F7] to bring up the custom formatting display. This display shows the parameters that can be altered.

Press the <Enter> key to select the parameter to be altered and use the keyboard arrow keys to scroll through the options.

Hgt. = is the height of the letters in a range of 1.0mm (.04") to 6.5mm (1/4")
Rat. = is the scale, with a min of 0.2 and a max of 6.5
Ali. = is the alignment. -><- for centered text
—-> for right justified
<—- for left justified

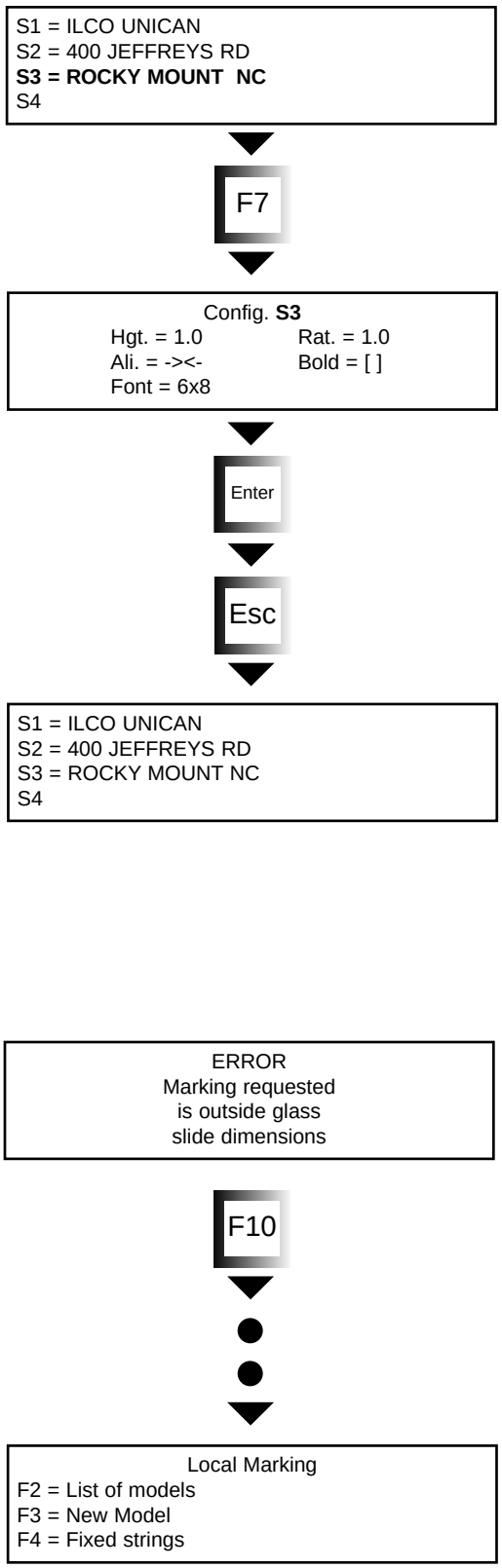
SILCA
SILCA
SILCA

Bold = The text is standard if this box is empty, Bold if "X"
Font = There are various fonts available (6x8, 8x8, 8x14, etc.)

Press the <ESC> key to exit from this menu.

If the selected parameters cannot be marked, the Marker 2000 will display this error message. Changing the text parameters or the tracking field selection may solve the problem.

Pressing [F10] will initiate marking. From this point forward, the steps described in ch 5.2.1 "Marking with automatic formatting"should be followed.



IMPORTANT NOTE ON CUSTOMIZED MARKING:
As seen in Fig 21, the "X" in the Auto F field is deactivated when custom formatting is performed. Tabbing to the "Auto F" field and toggling the "X" on will reactivate automatic formatting. Any time that unexpected sizes or formats of text are marked, check this field for its status.

List of Models [F2]
Up to fifty different sets of text and parameters may be stored in the Marker 2000's memory. After a set of text is saved as a model (ch 5.2.1) the name of the model is added to the List of Models that is displayed when the operator selects function key [F2].

The first model on this list (0=(Temporary)) represents the current settings of the Marker 2000. If the Marker 2000 is accidently powered down (plug pulled, switched off, fuse blows, etc.), the settings will be stored in this location. After restarting the Marker 2000, the operator may restore the text and formatting in use before the interruption by selecting model 0.

[F1] Help
Pressing the [F1] function key at this time will display the help guide for this operation. It will list the options available from these menu displays.

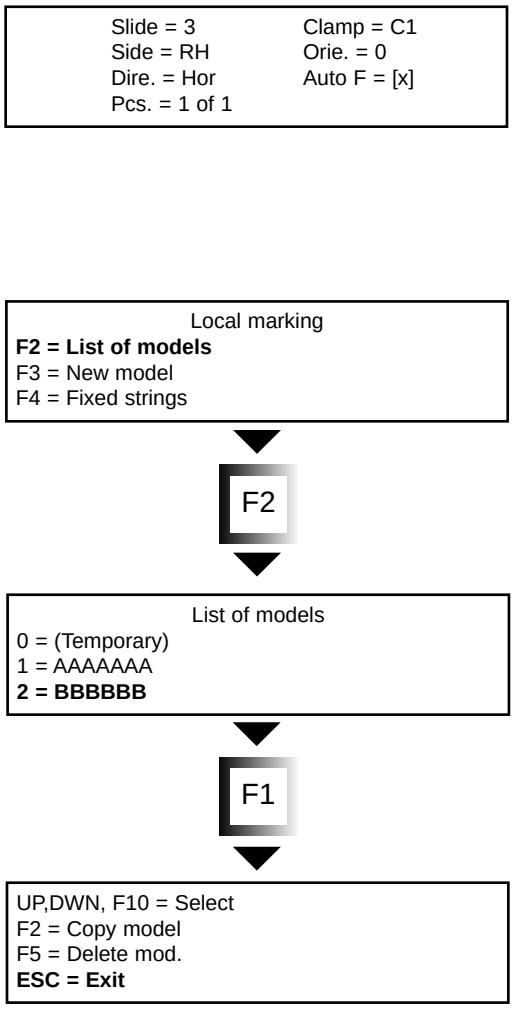
UP, DOWN, F10	=	Use the keyboard up and down arrows to select the desired model, then [F10] to load that model into current memory.
[F2]	=	To save a copy of the selected model under a different name.
[F5]	=	To delete the selected model from memory.
<ESC>	=	To exit from this menu.

Copy model [F2]:
Option with which to copy an existing model with another name.

It is sometimes easier and faster to copy an existing model, then change one or two parameters of the copy instead of creating a new model from the start. Especially when most of the parameters are identical to an existing model.

Press the [F10] key to confirm the new model name entered.

Fig. 21



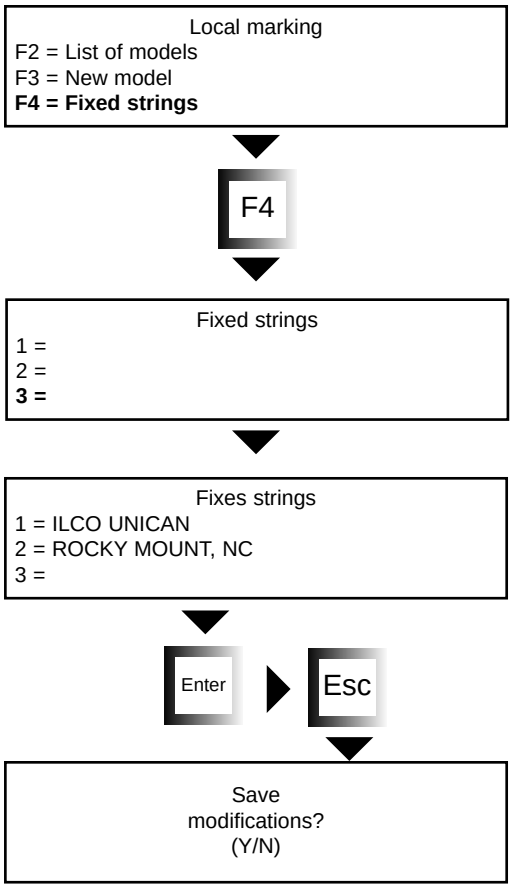
Delete model [F5]
When a stored model is no longer required, position the cursor on the model and press the [F5] function key. The model will be cleared from memory and removed from the list.

Fixed strings [F4]
A "string" is a short collection of any text such as a name, address, telephone number, etc. The operator can place in the memory up to 50 fixed strings, each string containing up to 30 characters. These fixed strings can be used any number of times in text models.

WARNING: If a "fixed string" is changed, then all models using that string will automatically be updated with the new string. If a "fixed string" is deleted, all models using it will print no text in its place. The identification number for the deleted string will display an empty space until a new string is entered.

FOR EXAMPLE: If the telephone number 555-555-1212 were entered into twenty different models and that number was changed, then all twenty models would need to be updated one at a time. If that telephone number had been entered as a fixed string, and the twenty models contained the fixed string ID, then changing the fixed string would automatically update all twenty models at once.

Press the <Enter> key to place a fixed string into memory, and the <ESC> key to exit this menu display. The program will ask if the string(s) are to be saved. Pressing "Y" saves all changes to permanent memory.



5.3 SPECIAL FUNCTIONS

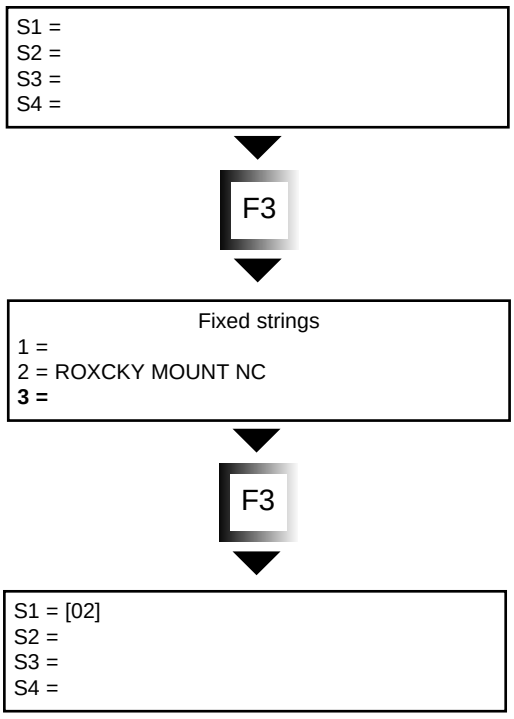
5.3.1 Entering fixed strings [F3]

When creating a new text model, one or more "fixed strings" can be included from the fixed string list. (Define strings [F7])

Go to the "New Model" function (ch 5.2)

From any of the text lines, press key [F3] to display the list of fixed strings.

Select the string required with the up or down arrow keys on the keyboard. When the cursor is positioned on the desired string, press the [F10] function key. The identification number of the fixed string will appear on the text display. Each line of text can hold a different fixed string, but only one fixed string can be placed on each line. The fixed string assumes the formatting set for that line of text, whether it is automatic or custom.



5.3.2 Entering the automatic counter [F4]

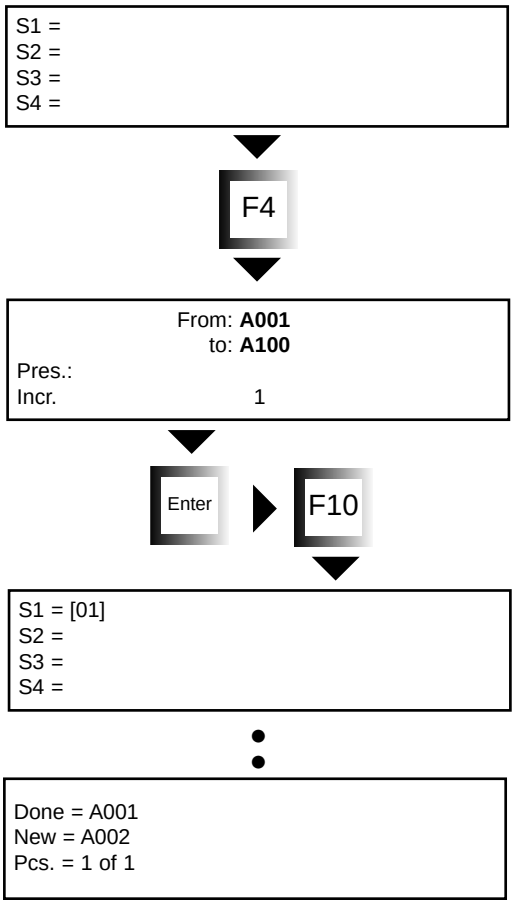
This function permits the machine to progressively mark objects without manually changing the numbers. FOR EXAMPLE, numbers AA001, AA002, AA003…. The first key in the Marker 2000 will be marked "AA001"and the second key "AA002" and the twenty-fifth key "AA025". Keys for a master key system or keys with serial numbers may be identified this way.

Follow the "New Model" instructions (ch 5.2.1) until the four lines of text are displayed as illustrated to the right. Press function key [F4].

On the line titled "From:", enter the beginning number to be marked. Press the <Enter> key.

On the line titled "To:", enter the ending number to be marked. Press the <Enter> key.

The line titled "Incr." is set to the default value of "1" and will increase the number by one until the "to" value is reached. This way, every number will be marked (1,2,3,4,etc.)



If the number three is entered here, then only every third number will be marked (1,4,7,10,13, etc.)
The Marker 2000 increments only numerical values and not alphabetical ones. It can increment 1,2,3,etc. but not A,B,C,etc.

The marking procedure takes place in the normal sequence, and the display shows the number just marked and the one about to be marked.

5.4 Special Characters

The table below lists all of the ANSI standard characters the Marker 2000 recognizes. If a needed character is not on the keyboard being used with the Marker 2000, it can be entered by using a combination of the <ALT> key and the corresponding number.

EXAMPLE: By pressing the <ALT> key and entering the number 193 from the numeric keypad on the right side of the keyboard, the character Á will be displayed.

+ <table number>

0		32		64	@	96		128		160		192	À	224	à
1		33	!	65	A	97	a	129		161	¡	193	Á	225	á
2		34	"	66	B	98	b	130		162	¢	194	Â	226	â
3		35	#	67	C	99	c	131		163	£	195	Ã	227	ã
4		36	$	68	D	100	d	132		164		196	Ä	228	ä
5		37	%	69	E	101	e	133		165		197	Å	229	å
6		38	&	70	F	102	f	134		166		198	Æ	230	æ
7		39	'	71	G	103	g	135		167		199	Ç	231	ç
8		40	(	72	H	104	h	136		168		200	È	232	è
9		41	)	73	I	105	i	137		169		201	É	233	é
10		42	*	74	J	106	j	138		170		202	Ê	234	ê
11		43	+	75	K	107	k	139		171		203	Ë	235	ë
12		44	,	76	L	108	l	140		172		204	Ì	236	ì
13		45	-	77	M	109	m	141		173		205	Í	237	í
14		46	.	78	N	110	n	142		174		206	Î	238	î
15		47	/	79	O	111	o	143		175		207	Ï	239	ï
16		48		80	P	112	p	144		176		208		240	
17		49	1	81	Q	113	q	145		177		209	Ñ	241	ñ
18		50	2	82	R	114	r	146		178		210	Ò	242	ò
19		51	3	83	S	115	s	147		179		211	Ó	243	ó
20		52	4	84	T	116	t	148		180		212	Ô	244	ô
21		53	5	85	U	117	u	149		181		213	Õ	245	õ
22		54	6	86	V	118	v	150		182		214	Ö	246	ö
23		55	7	87	W	119	w	151		183		215		247	
24		56	8	88	X	120	x	152		184		216	Ø	248	ø
25		57	9	89	Y	121	y	153		185		217	Ù	249	ù
26		58	:	90	Z	122	z	154		186		218	Ú	250	ú
27		59	;	91		123		155		187		219	Û	251	û
28		60	<	92	\	124	|	156		188		220	Ü	252	ü
29		61	=	93		125		157		189		221		253	
30		62	>	94	^	126	~	158		190		222		254	
31		63	?	95	_	127		159		191	¿	223	ß	255	ÿ

5.5 DATA from PC [F3]

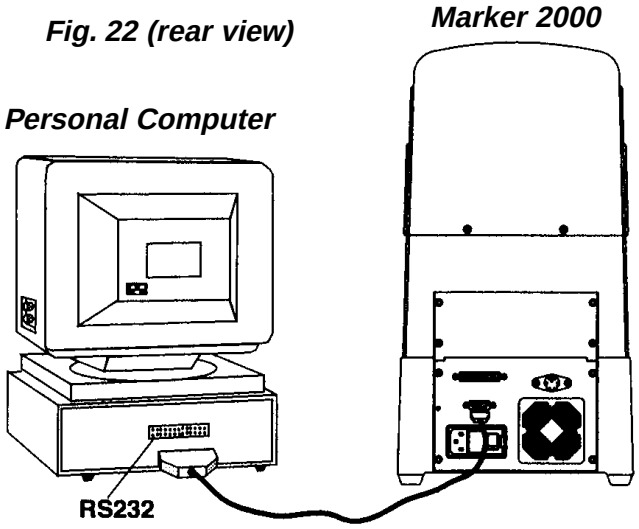
Connecting the Marker 2000 to a Personal Computer

Fig. 22 illustrates the connections required for the Marker 2000 to communicate with a Personal Computer. For information on the transmission of data from a PC to the Marker 2000, see the software manual "Marker 2000 Program". Connected to a PC, the Marker 2000 can receive approximately 500 models.

Converting the Marker 2000 from "stand alone" to "connected to PC"

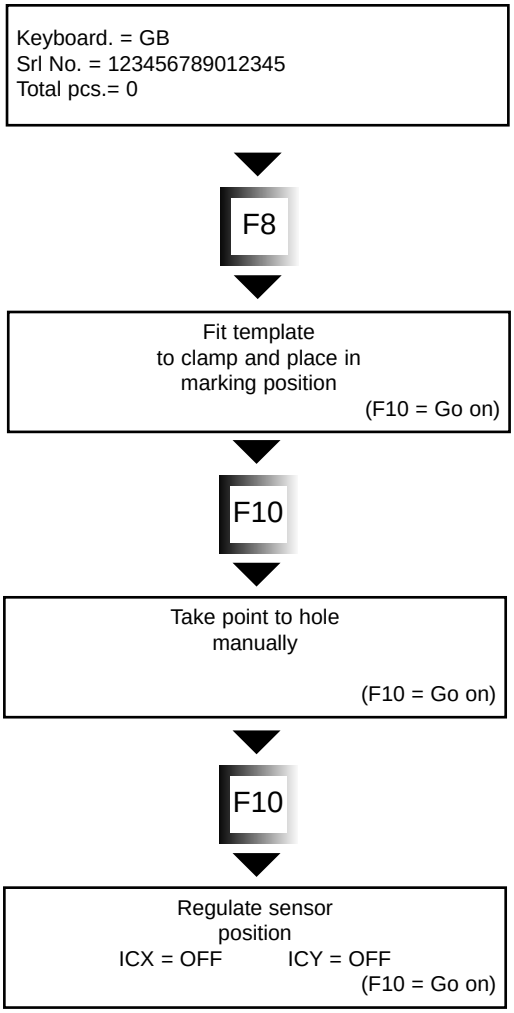
All the data (models, strings, etc.) stored in the Marker 2000 memory can be copied onto the PC hard disk and used with the "Marker 2000 Program". This eliminates the need to re-enter the data into the "Marker 2000 Program". Read the instructions manual for the "Marker 2000 Program.

Fig. 22 (rear view)



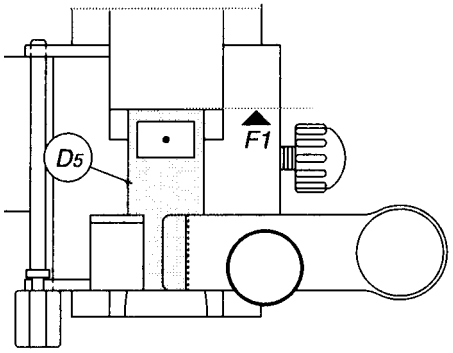
6. SETTING THE ZEROES [F8]

Repeat the steps listed in Ch 5.1 (installation and preliminary operations) up to the following display:



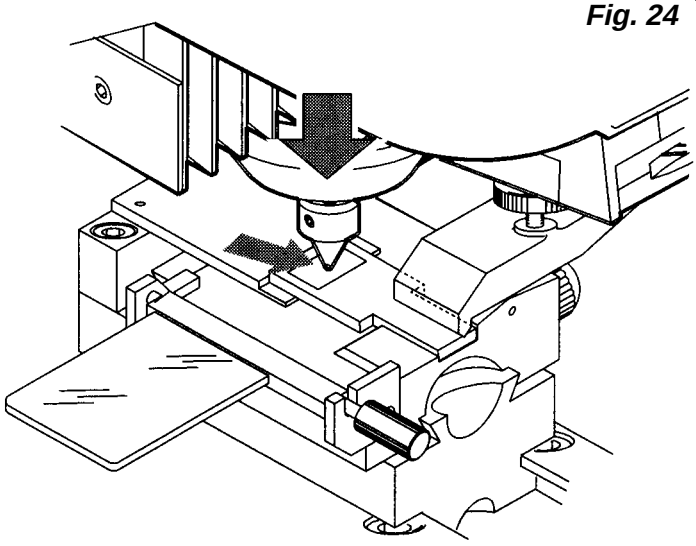
Place the template (D5) (provided) in position on the clamping fixture (Fig 23) so that the top end butts against the stop "F1".

Fig. 23



Move the clamping fixture into the "marking" position. Hold the punch with two fingers and guide it into the hole in the template (Fig 24) to establish the exact position for the punch. Regulate the sensors following the instructions in the next section.

Fig. 24



6.1 Regulating the sensors

1. Remove the upper cover (ch 8.4) without disconnecting the wire that attaches to the display unit.

x axis sensor

2. Loosen the screws (X2) securing the plate (X1) (Fig 25 & 25a).
3. Move the plate manually over the X axis plate up to the exact point at which OFF passes to **ON**.
4. Tighten the screws (X2)

y axis sensor

5. Loosen the screws (Y2) securing the plate (Y1) (Fig 25 & 25a).
6. Move the plate manually over the Y axis plate up to the exact point at which OFF passes to **ON**.
7. Tighten the screws (Y2).

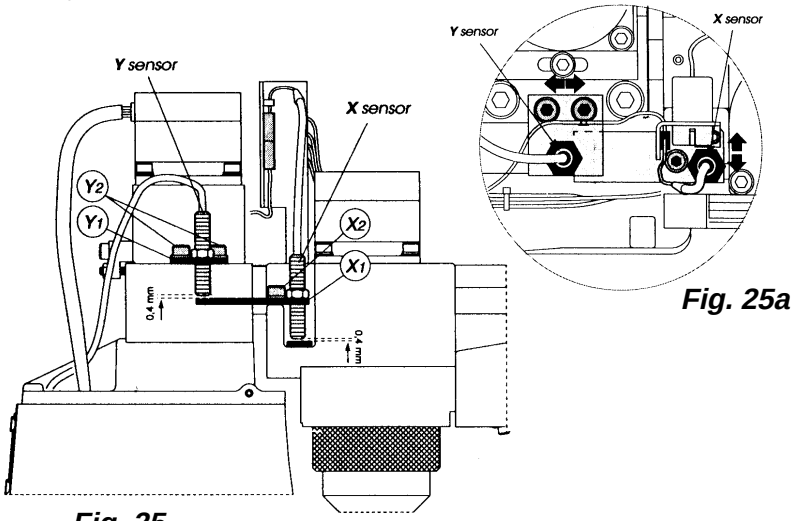


Fig. 25

Fig. 25a

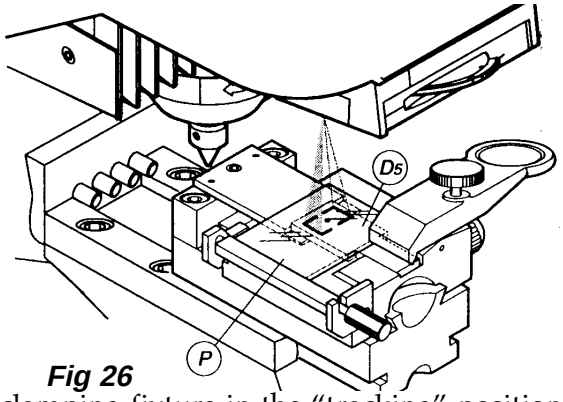
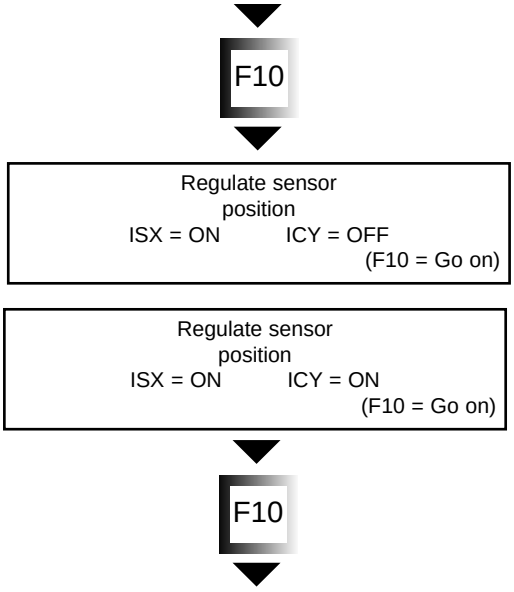


Fig 26

Place the clamping fixture in the "tracking" position, move the glass slide (P) over the template (D5). Rotate the disk until the laser slide #1 is selected. Use the keyboard arrow keys to center the laser slide #1 over the engraved outline on the head of the template.



SETTING THE ZEROES [F8]

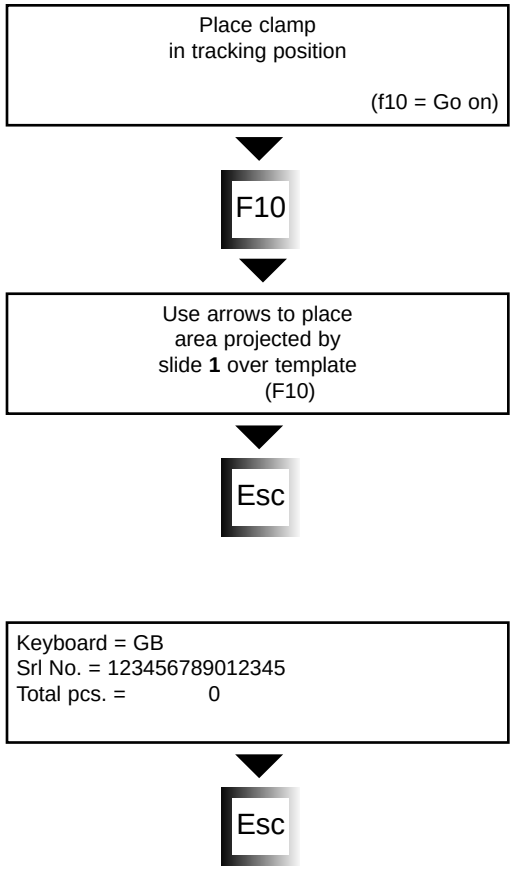
When the area is properly superimposed, press function key [F10] to confirm. The program automatically presents the second area. Repeat the operations described above for the eight slides available on the disk. The software is designed to accept 16 different slides. After gauging slide #8, press function key [F10] eight times to complete the alignment procedure.

When the new disk containing the new marking areas is available, it is recommended the gauging procedures for all slides (1 thru 16) be repeated.

N.B.: When the laser slides have been gauged, the position of each is stored in the Marker 2000 memory. In this way, when the gauging operations are repeated the co-ordinates of each slide are maintained.

At the end of the alignment procedure the program saves all the set co-ordinates and returns to the following display:

Press <esc> to return to the main menu.



7. TEST FUNCTIONS

Diagnostics [F4]

The "Diagnostics" function built into the Marker 2000 allows testing of the various operations of the machine. The results of these tests will provide information that is needed in chapter 8.1 "Troubleshooting" or when contacting the ILCO-SILCA Service Center.

[F1] Help
Press function key [F1] to access the help guide.
UP, DOWN: The keyboard arrow up & down keys allow scrolling through the list of tests.
F10: Pressing this function key selects a test.
ESC: Pressing the <ESC> key exits this menu.

UP, DOWN, F10 = Select

ESC - Exit

Test 100 = Motors
Use the Right & Left arrow keys on the keyboard to move the X axis motor. Use the Up & Down arrow keys on the keyboard to move the Y axis motor. Notice that the proper motor is operating when the keys are depressed. The safety limit switch sensors are not active during this test, so be careful not to run the motors too long against any side of its range of movement.

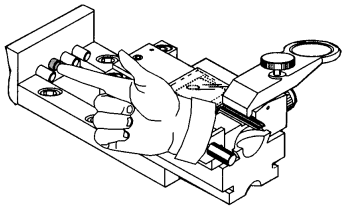
100 = Motors
Use arrows to move
axes.

Test 101 = Sensors
Manually move the head back toward the machine. As the head reaches the back of its range of movement, the display should change from ICY = OFF to ICY = ON. Manually move the head to the left side of the machine. As the head reaches the left side of its range of movement, the display should change from ICX = OFF to ICX = ON.

101 = Sensors
Move the aces
towards to micro
iCX = OFF iCY - ON

Place101 = Sensors
Move the aces
towards to micro
iCX = ON iCY - ON

Test 102 = Clamp Microswitch
Four boxes corresponding to the four clamp detection microswitches will appear on the display. Press each microswitch in turn and check that the indicator for that switch on the display changes from [OFF] to [ON].

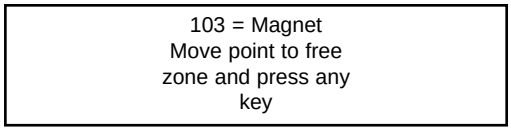


102 = Micro clamp
Press the clamp code
micros
[OFF] [OFF] [OFF] [OFF]

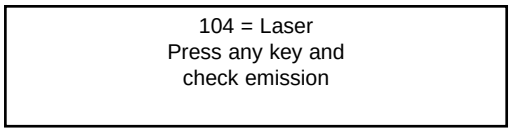
102 = Micro clamp
Press the clamp code
micros
[OFF] [ON] [OFF] [OFF]

TEST FUNCTIONS

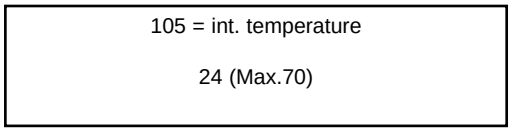
Test 103 = Magnet
Move the clamping fixture to the "tracking" position. Each time any key on the keyboard is pressed, the punch should be activated a single time by the punch magnet.



Test 104 = Laser
Move the head to the zero position. This is all the way in toward the machine and to the left side. The laser is turned on by holding down any key on the keyboard. Placing a sheet of white paper on top of the clamping fixture will make the laser image easier to see.
The tracking disk (D1) must be in proper position for an image to be projected.

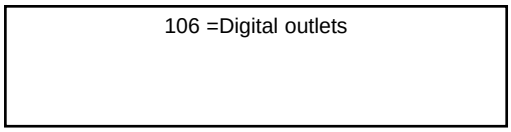


Test 105 = Temperature
This test displays the readings of the internal thermometer of the Marker 2000. It displays the temperature, in Celsius degrees, at the most temperature critical point inside the Marker 2000.

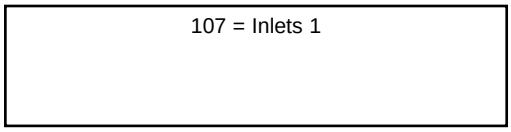


The normal temperature range is 20° C (68° F) to 50° C (122° F). If the reading goes beyond the safety limit for proper operation of the Marker 2000, an alarm message will be displayed. (see ch 8.1 Troubleshooting.)

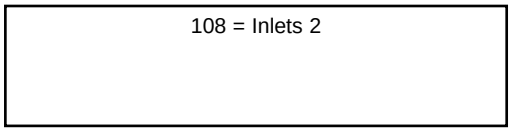
Test 106 = Digital Outlets
This test is reserved for future use.



Test 107 = Inlets 1
This test is reserved for future use.



Test 108 = Inlets 2
This test is reserved for future use.



8. Maintenance

The Marker 2000 electronic marking machine is designed to operate without special maintenance needs. Like any machine, it will operate more smoothly and have a longer operational life if properly maintained. Before performing any maintenance, read the instructions listed below.

- always disconnect the Marker 2000 from any power source before maintenance
- be precise in following the instructions in this manual
- always use original replacement components

8.1 Troubleshooting

FAULT	*PROBABLE CAUSE*
Machine on, no message on display Check if the rear fan is working:	YES a) check display connection b) replace display (ch.8.6) NO a) check general fuses in power socket (ch.8.7) b) check fuses on electronic control circuit board (ch.8.7) c) replace electronic control circuit board (ch. 8.8)
Working head not returning to the idle position	a) check fuse [F1] pm control circuit board (when cut off, display shows the message: "CHECK FUSE F1" (CH.8.7) b) carry out a TEST 101 (ch.7) on the operation of the X and Y axis sensors c) replace electronic control circuit board (ch. 8.8)
Keyboard not working	a) check wiring between electronic control circuit board and keyboard b) replace electronic control circuit board (ch. 8.8) c) replace keyboard
Tracking laser not illuminating	a) check fuse F1 on electronic control circuit board (when cut off, display shows the message: "CHECK FUSE F1") (ch. 8.7) b) check that the disk is inserted properly into the tracking block and that the clamp is not in the marking position c) check operation of safety microswitch on tracking unit (remove the unit - ch. 8.2, and use an ohmmeter) d) check wiring between electronic control circuit board and tracking unit. e) carry out a TEST 102 (ch. 7) on operation of clamp detector microswitch f) replace tracking unit (ch. 8.2) g) replace electronic control circuit board (ch. 8.8)
Marking punch not working	a) check fuse F3 on the electronic control circuit board (ch. 8.7) b) check the wiring between electronic control circuit board and the magnet c) replace the magnet d) replace the electronic control circuit board (ch. 8.8)
Message on display: ALARM Temperature is over max. foreseen Turn off Marker!	check the operation of the cooling fan. If the fan is working properly, leave the machine off and contact a Silca Service Centre

FAULT	PROBABLE CAUSE
Message on display: CHECK FUSE F1	a) if the fuse is not burnt out, replace the electronic control circuit board (ch.8.8) b) if the fuse is burnt out, replace and turn on the machine • if the message remains (the fuse burns out again) replace the electronic control circuit board • if the message does not reappear and the machine is working properly, continue with the operations (the fuse burnt itself out to protect the machine from variations and interference in the main electricity supply).
Message on display: CHECK FUSE F1	a) disconnect the wire (7) from the control circuit board (page 35). Turn on the machine: • if the message remains, replace the electronic control circuit board • if the message disappears, replace the wire (7) (page 35)
Message on display: CHECK FUSE F1	a) replace the electronic control circuit board (ch.8.8)

The above chart lists typical problems that may arise during operation of the Marker 2000. It is not meant to cover all possibilities. If you are unable to determine the cause of a problem, contact the ILCO/Silca Service Center.

8.2 Replacing the Tracking Unit

1. Turn off the master switch and remove the electrical plug from the power source.
2. Disconnect the two connectors (S1) (Fig 27) and remove the two front screws (D3).
3. Grasp the unit (D) and pivot it slightly downward, then remove.
4. Remove screw (D4) and disconnect the yellow/green wire.
5. Position the new tracking unit and connect the yellow/green wire with screw (D4).
6. Fit the unit in place, making sure that wires (S2) are properly seated in their groove.
7. Replace the two front screws (D3) and re-connect the two connectors (S1).

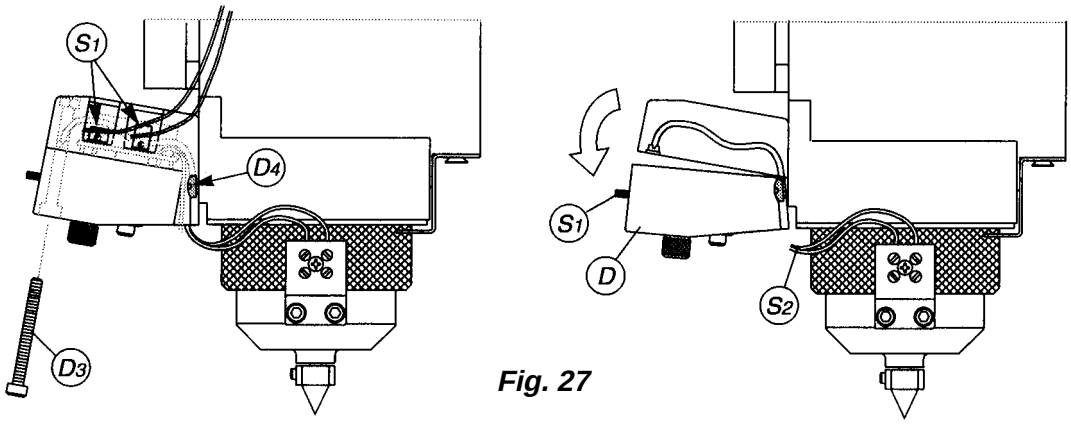


Fig. 27

8.3 Replacing the Marking Punch

1. Turn off the master switch and remove the plug.
2. Remove the set screw (A1) (Fig 28).
3. Remove the old punch and insert the new one, pushing it all the way into place.
4. Tighten the set screw (A1).

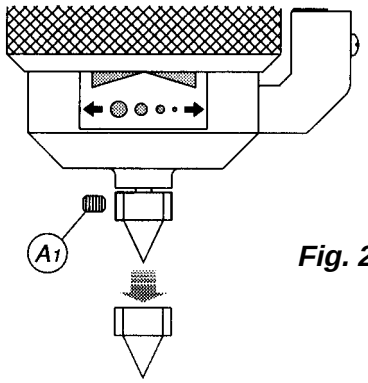


Fig. 28

8.4 Removing the Upper Cover

The upper cover must be removed for access to some of the components, such as the LCD display or the tension belts, that may need maintenance.
The steps to follow are:

1. Turn off the master switch and remove the plug.
2. Remove the 4 screws (Q1) holding the cover
3. Slightly tilt the rear of the cover up (Fig 30) and very carefully pull forward, releasing it from the front catches (Fig 30a).
4. Disconnect the connector (B1) and fasten (B2) from the display (Fig 31).
5. Carefully set the cover in a safe place until the maintenance is completed. Reverse the above steps to replace the cover.

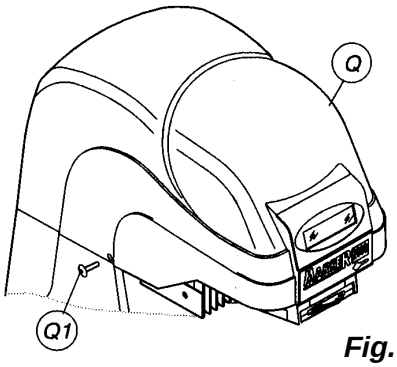


Fig. 29

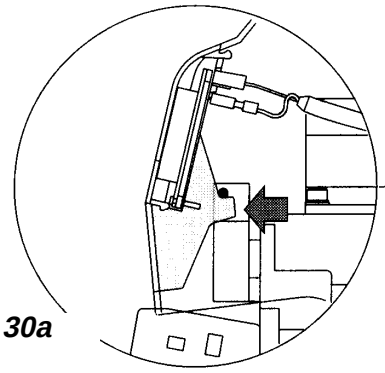


Fig. 30a

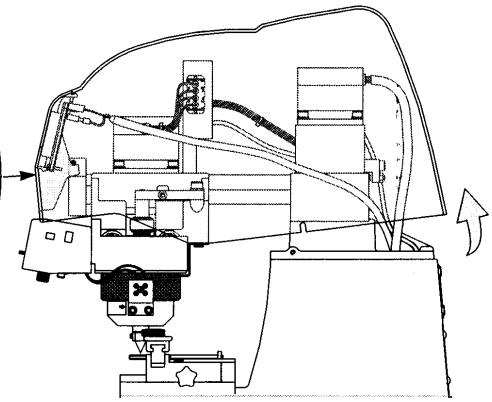


Fig. 30

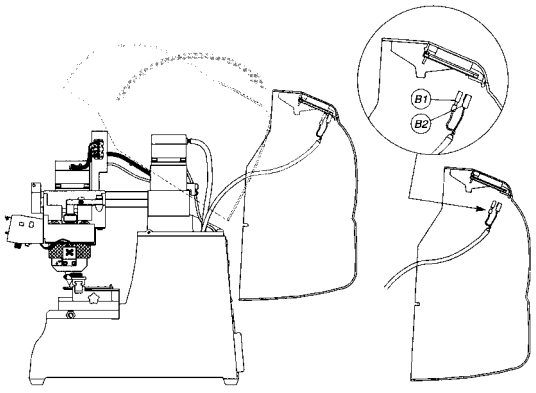


Fig. 31

8.5 Replacing and Adjusting the Belts

If excessive vibrations are noted near the top of the Marker 2000, check the condition & tension of the belts. The steps to follow are:

1. Turn off the master switch and remove the plug.
2. Remove the upper cover (ch 8.4) and place next to the Marker 2000 without disconnecting the LCD display unit.

To adjust the tension on the Y axis belt:

3. Loosen the screws (T) securing the motor support, loosen the nut (Z1) and adjust the belt pulley (Z).

To adjust the tension on the Z axis belt:

4. Loosen the nut (R1) and adjust the belt pulley (R).

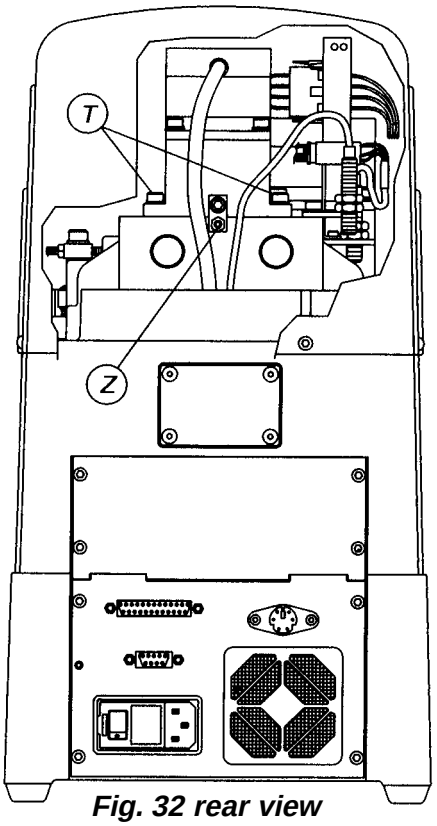


Fig. 32 rear view

Replacing the Y Axis Belt:

1. Turn off the master switch and remove the plug.
2. Remove the upper cover (see ch 8.4) and place next to the Marker 2000 without disconnecting the LCD display unit.
3. Remove the screw (V) and block (V1).
4. Loosen the belt pulley (Z) and remove the belt.
5. Remove the two screws (T) securing the Y axis motor support and remove the entire unit (motor and support).
6. Place the new belt in position and replace the motor unit, taking care that the pulley is positioned within the belt. Do not tighten the screws (T) fully.
7. Replace block (V) and screw (V1).
8. Adjust belt tension by screwing the belt pulley (Z), then tighten the motor securing screws (T) all the way.
9. Replace the upper cover (Q).

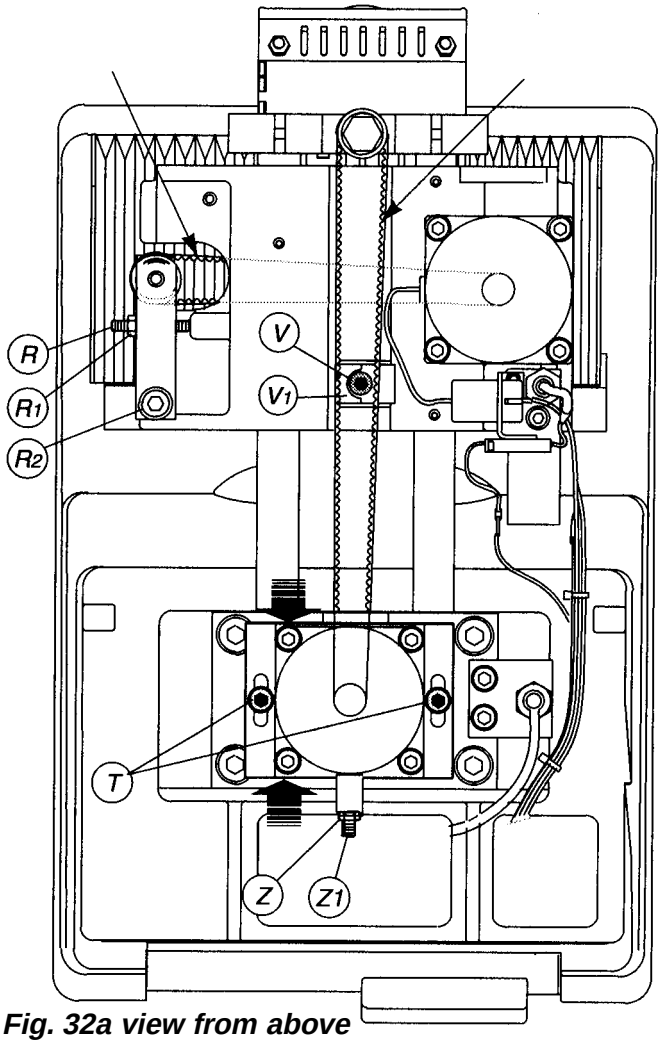


Fig. 32a view from above

Replacing the X Axis Belt

1. Turn off the master switch and remove the plug
2. Remove the cupper cover (see ch 8.4) and place next to the Marker 2000 without disconnecting the LCD display.
3. Remove the clamping fixture (C1) (Fig 33).
4. Disconnect the two connectors (S1) on the tracking unit.
5. Remove the four screws (S) securing the bellows (Fig 34).
6. Loosen screw (R2), the nut (R1) and the belt pulley (R)(Figs 32a - 34).
7. Loosen the two set screws (R3) and remove the two bars (S3) while holding the head with one hand.
8. Loosen screw (K) until the belt is free (Fig 34).
9. Place the new belt in position and re-assemble the head, making sure that the belt (X) is placed on thee outside of the pulleys (W) and (W1).
10. Replace the components in reverse order.
11. Adjust belt tension by means of the belt pulley (R).

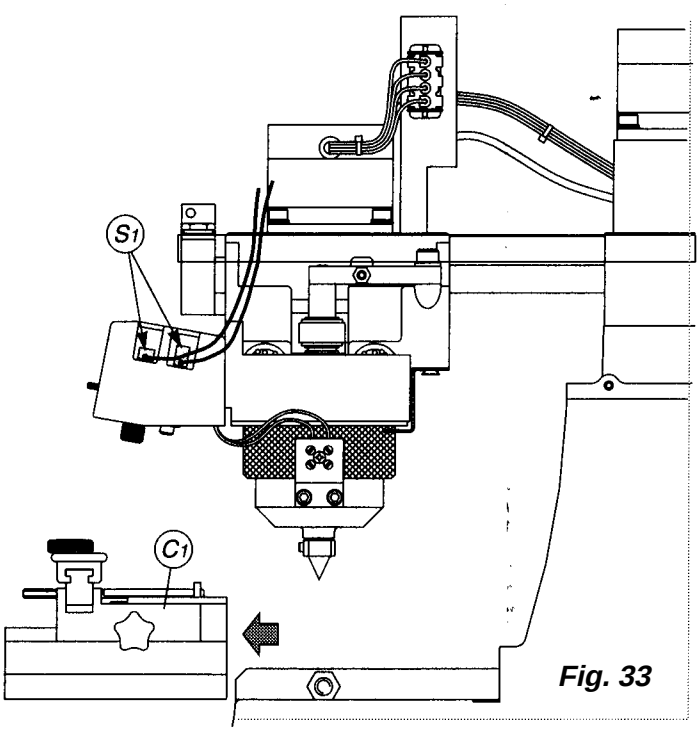


Fig. 33

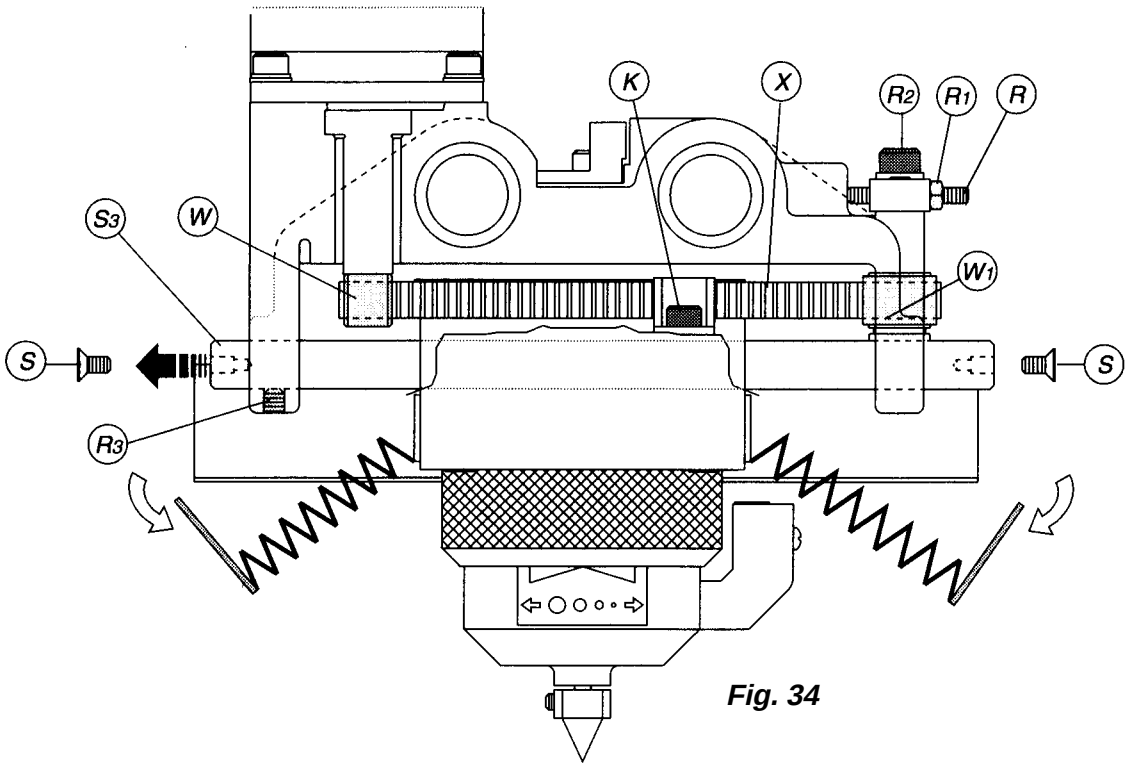


Fig. 34

8.6 Replacing the Display Unit

1. Turn off the master switch and remove the plug.
2. Raise and remove the top cover (Q) (see ch 8.4), disconnect the connector (B1) and fasten (B2) from the display.
3. The masking cover (J) may be removed by prying at the edges until the plastic snaps come free (Fig 35).
4. Remove the four screws (B3) securing the display, spacer and plate.
5. Position the new display, making sure to properly align the display, the spacer and the plate (Fig 35a).
6. Re-connect the fasten (B2) and connector (B1), replace the cover (Q) and secure with the four screws (Q1).

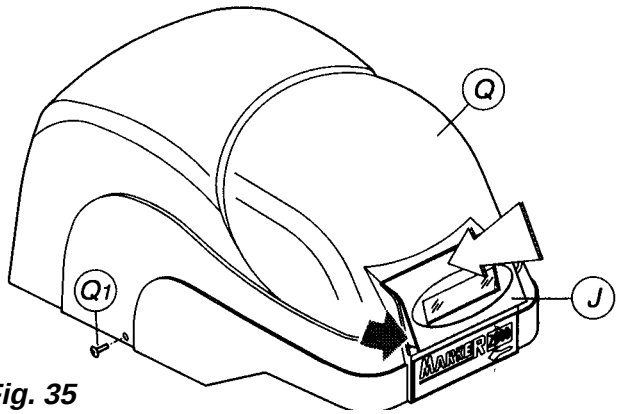


Fig. 35

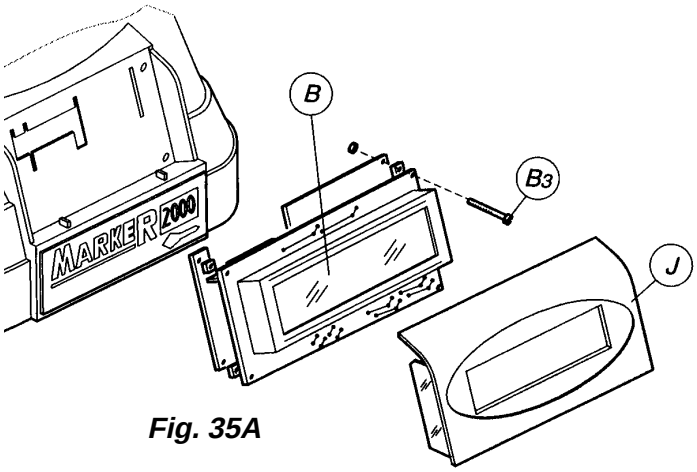


Fig. 35A

8.7 Checking & Replacing fuses

Fuses should be checked with a continuity tester, ohmmeter, or multimeter. They may appear to be in good condition to the naked eye even when they are electrically faulty. Fuses must always be replaced with fuses of the same type (instant or delayed) and with the same amperage rating.

There are five fuses in the Marker 2000.

The first two are located between the master switch and the power cord socket, covered by a plastic door (Fig 36). These fuses are 4amp instant fuses for 110vac machines and 3.15amp instant fuses for 220vac machines. These fuses protect the Marker 2000 from power fluctuations and short circuits.

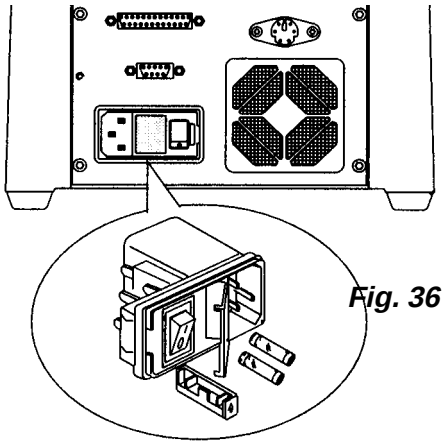


Fig. 36

To check or replace these fuses, follow these steps:

1. Turn off the master switch and remove the power cord.
2. Insert a flat bladed screwdriver into the slot to the left of the master switch and pry the flap open. Both fuses are mounted in carriages that can be pulled out with your fingers.
3. Replace any fuses that fail a continuity test.

The final three fuses are numbered F1, F2 & F3

F1 = One amp delayed fuse that protects the +24vdc I/O signals and the laser tracking.

F2 = Two amp delayed fuse that protects the +5vdc for the microprocessor.

F3 = Four amp delayed fuse that protects the +34vdc for the stepper motors.

These fuses are mounted on the electronic boar housed in the base. To test or replace these fuses, follow these steps:

1. Turn off the master switch and disconnect all cords and connections to the Marker 2000.
2. Lay the machine on its back and remove the four screws (U1) securing the bottom plate (U), which can then be removed.
3. Check and, if necessary, replace the fuses as follows:
   To remove the fuse: exert finger pressure on the fuse and turn counter-clockwise.
   (Fig. 39)
   To install the new fuse: carefully position the fuse properly, then push in and turn
   clockwise.

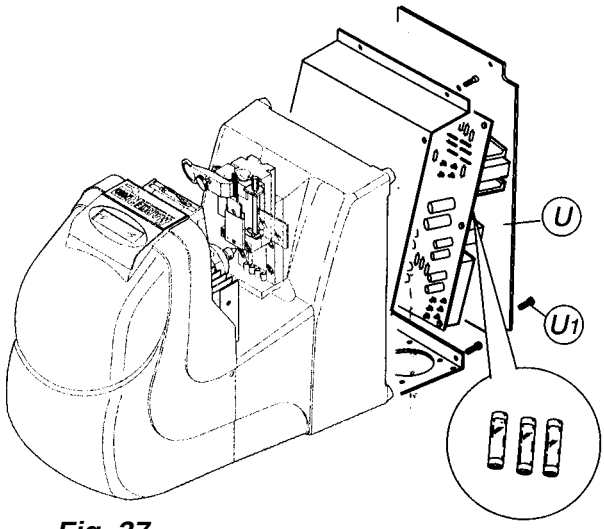
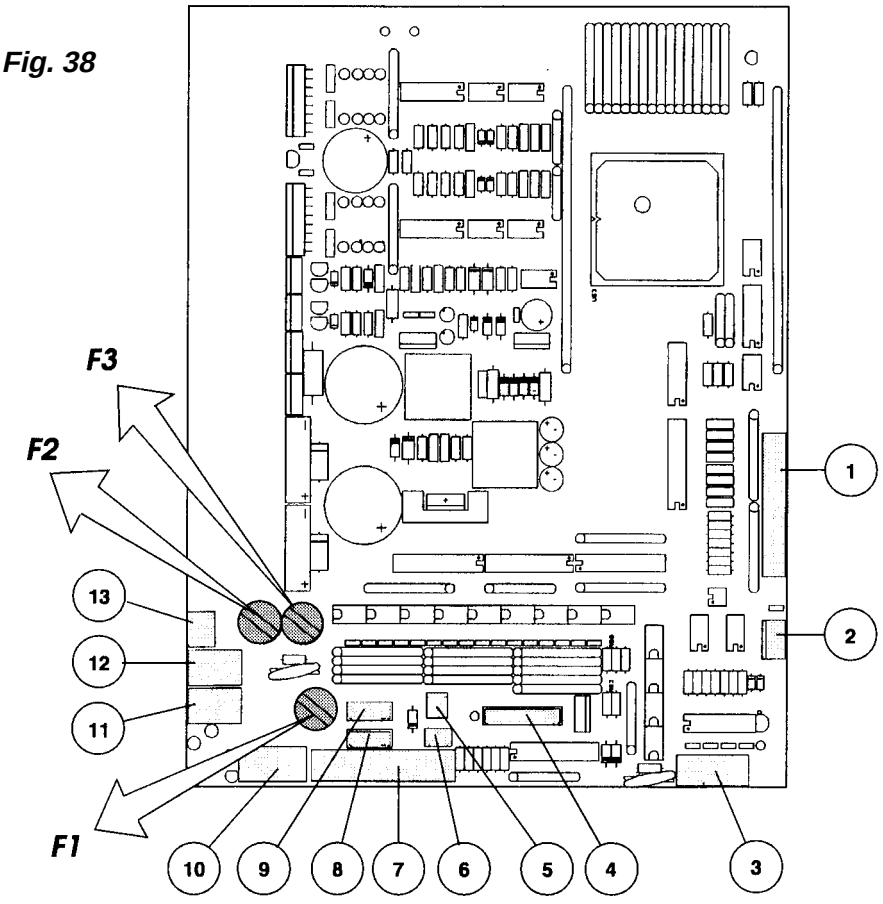


Fig. 37

Fig. 38



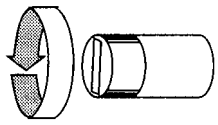


Fig. 39

8.8 Replacing the Control Circuit Board

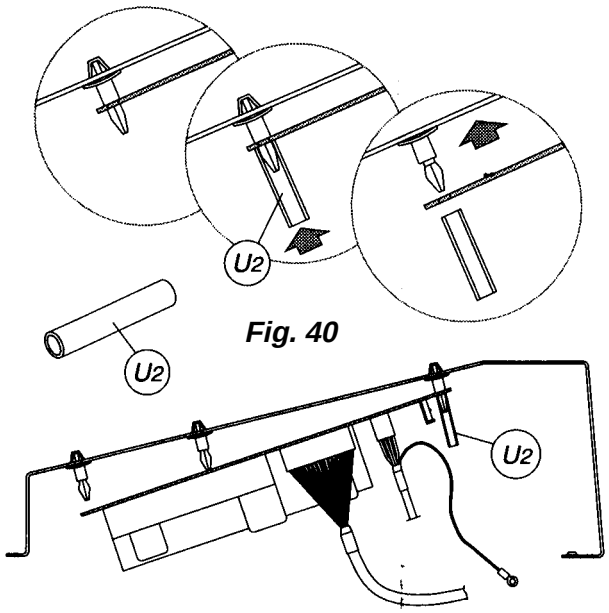


Fig. 40

1. Turn off the master switch and remove all cords and connections to the machine.
2. Lay the machine on its back and remove the four screws (U1) securing the bottom plate (U), which can then be removed.
3. Disconnect all thirteen connectors to the board. (numbered 1 through 13 on the control circuit board diagram that is the first illustration in ch. 9.
4. With the special tool (U2) provided with the replacement board (see Fig 40), release the five clips on the mounted board.
5. Install the new board, engaging the five clip fasteners and connect all the connectors. All the connectors except 10 & 11 can only be plugged in the correct way, but extra attention must be paid to 10 & 11 because they can be plugged in backwards. Do not let this happen.
   CAUTION: After replacing the board, check that all parts of the Marker 2000 are working properly, using the TEST functions (ch. 7).

8.9 Replacing and Positioning the Sensors

Replacing the Y Axis Sensor
1. Turn off the master switch and remove the plug.
2. Lay the machine on its back, remove the four screws securing the bottom plate (U) and remove the plate. (Fig 37).
3. Disconnect the Y sensor connector (9) (first illustration in ch. 9)
4. Stand the machine upright, remove the upper cover (Q) (ch. 8.4) and place next to the Marker 2000, without disconnecting the LCD display unit.
5. Loosen the nut (Y4), unscrew the sensor from the plate (Y1) and remove (Fig 41).
6. Place the new sensor in position and screw down until it almost contacts the plate (X1) (maintain a clearance of approximately 0.4mm(1/8 inch)) and secure with the nut (Y4).
7. Guide the Y sensor wire into the machine, then turn the Marker 2000 onto its back again.
8. Connect the Y sensor connector (9) first illustration in ch. 9) to the electronic circuit board.
9. Replace the bottom plate (U) and stand the machine upright.
10. Connect the marking machine to power and proceed with "Setting the Zeros" (ch 6).

Replacing the X axis Sensor
1. Turn off the master switch and remove the plug.
2. Remove the upper cover (Q) (ch. 8.4) and place next to the Marker 2000, without disconnecting the LCD display unit.
3. Disconnect the connector (X3) (Fig 41) (cut the wire tie securing it to the metal plate).
4. Loosen the nut (X4), unscrew the sensor and remove (Fig 41).
5. Place the new sensor in position and screw down until it almost contacts the plate (X1) (maintain a clearance of approximately 0.4mm(1/8 inch)) and secure with the nut (X4).
6. Connect the X sensor connector (8) to the wire & secure to the metal plate with a wire tie.
7. Connect the Marker 2000 to power and proceed with "Setting the Zeros" (ch 6).

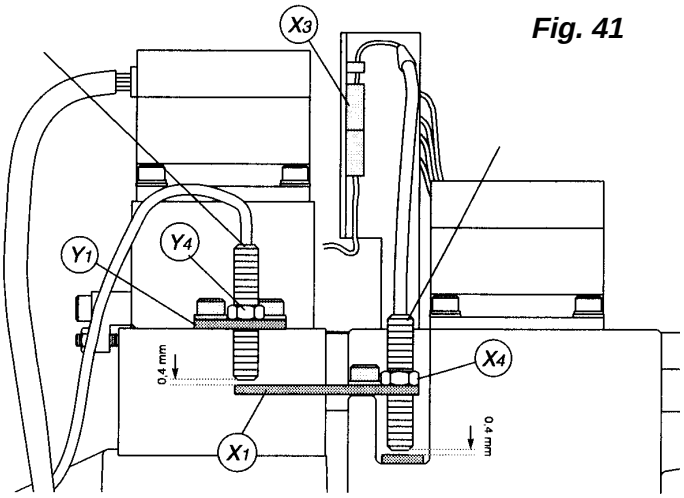
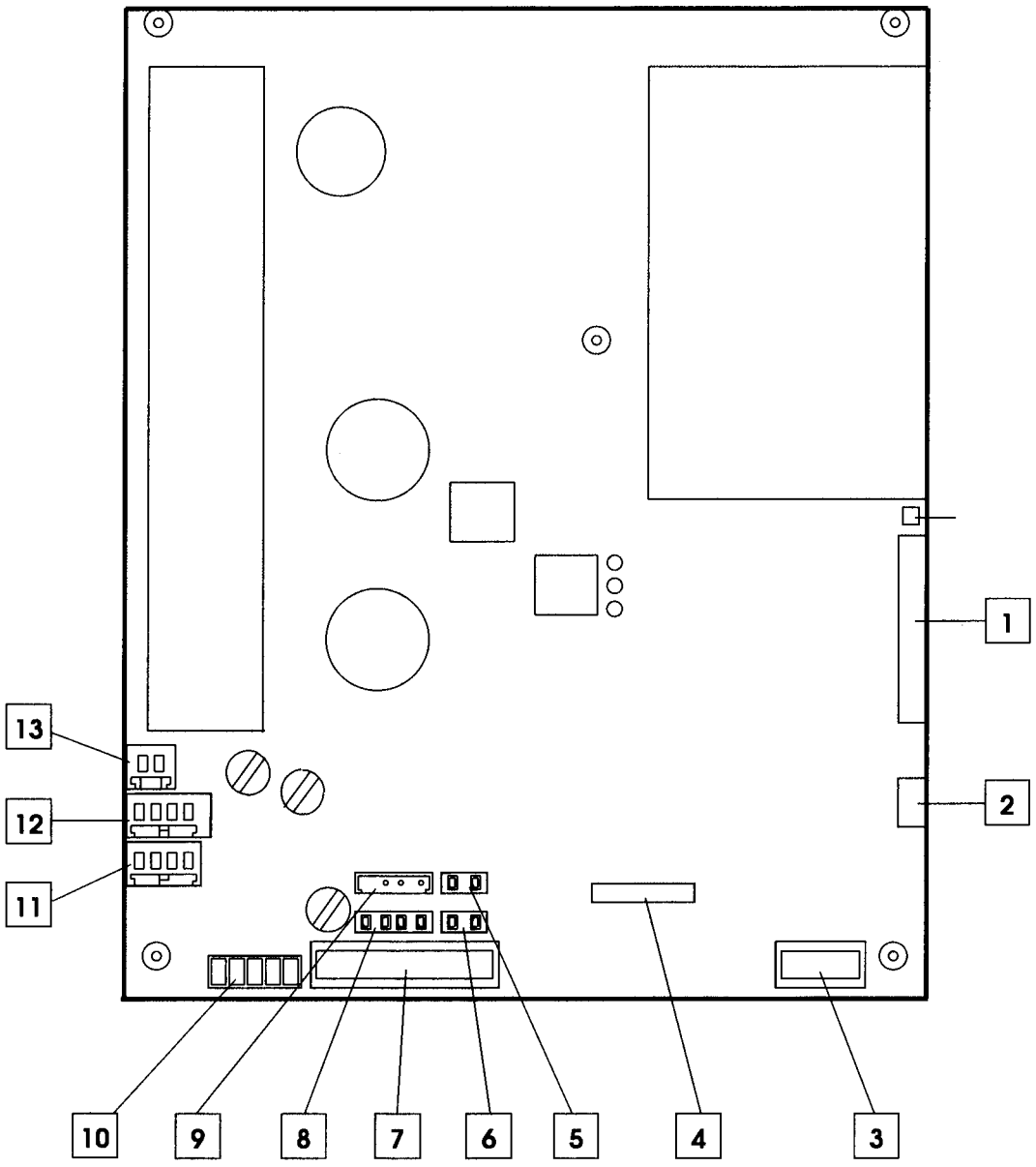


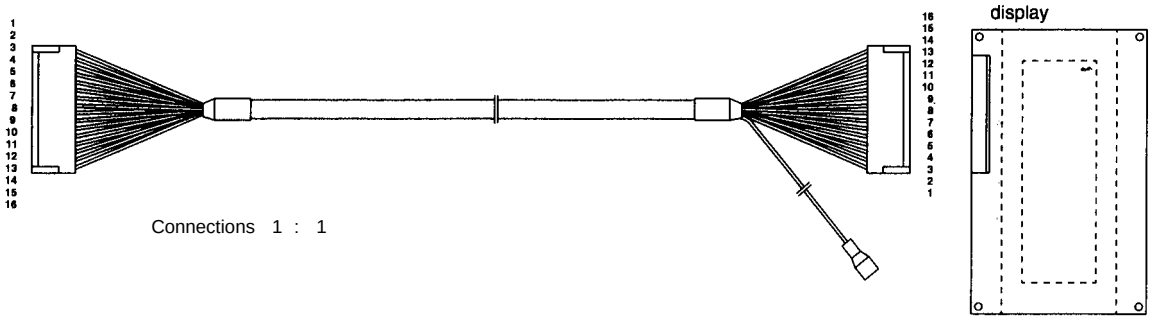
Fig. 41

Electronic Control Circuit Board diagram on page 35

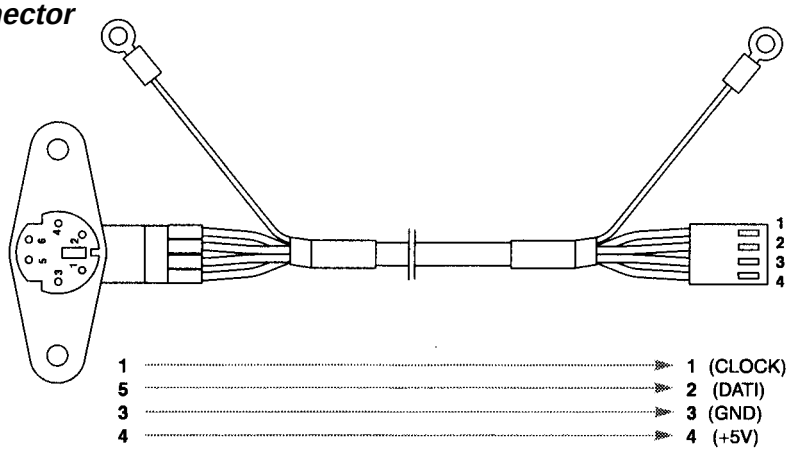


ELECTRICAL DIAGRAMS

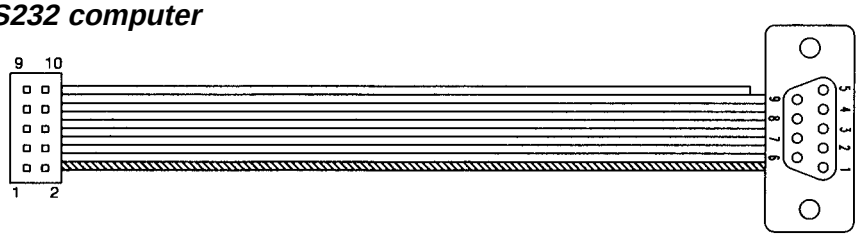
1 *display connector*



2 *keyboard connector*

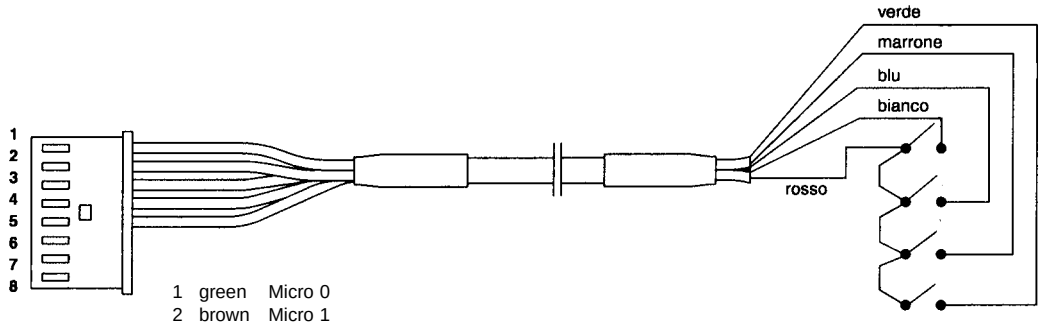


3 *serial connector RS232 computer*



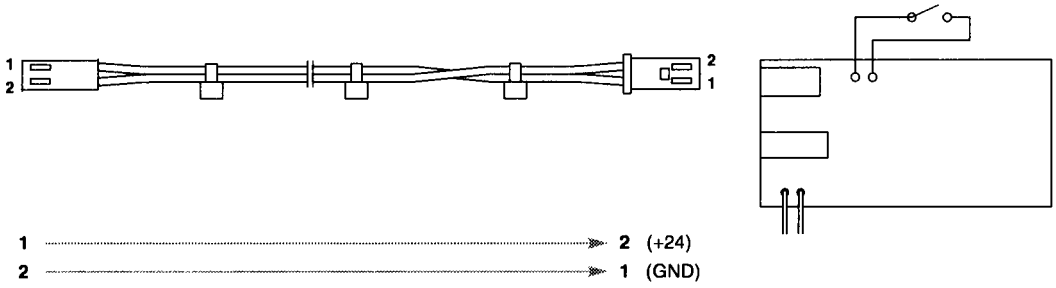
1	1	1
2	2	6
3	3	2
4	4	7
5	5	3
6	6	8
7	7	4
8	8	9
9	9	5
10	10	/

4 *clamp detection microswitch connector*

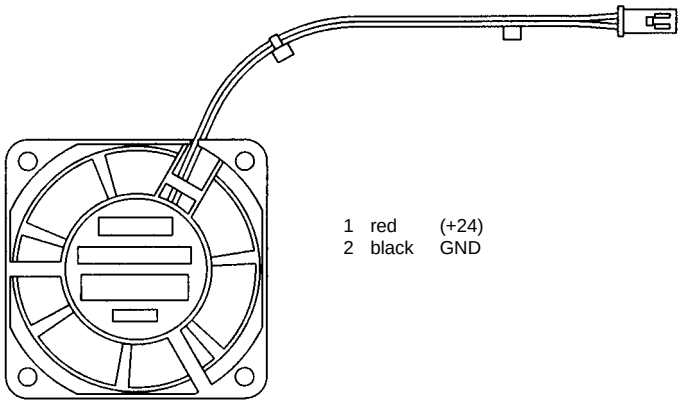


1	green	Micro 0
2	brown	Micro 1
3	blue	Micro 2
4	white	Micro 3
5	red	common (+24V dc)

5 *tracking laser control connector*



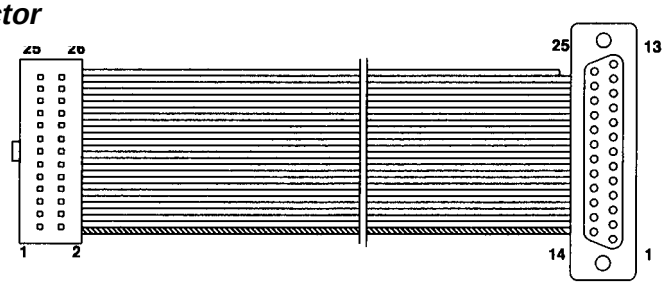
6 *ventilator connector*



1	red	(+24)
2	black	GND

ELECTRICAL DIAGRAMS

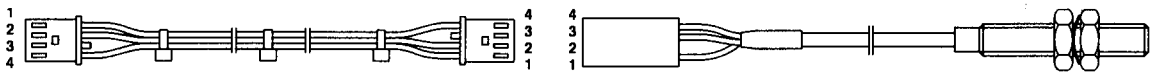
7 *inlet-outlet connector*



Connections

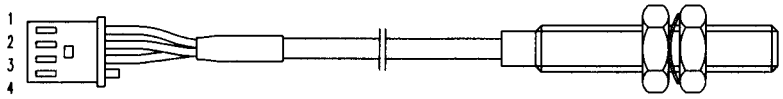
1	1	-	inlet 0	14	20	-	inlet 8
2	14	-	inlet 1	15	8	-	GND
3	2	-	inlet 2	16	21	-	GND
4	15	-	inlet 3	17	9	-	GND
5	3	-	inlet 4	18	22	-	GND
6	16	-	inlet 5	19	10	not connected	
7	4	-	inlet 6	20	23	-	outlet 0
8	17	-	inlet 7	21	11	-	outlet 1
9	5	-	+24V dc	22	24	-	outlet 2
10	18	-	+24V dc	23	12	-	outlet 3
11	6	-	+24V dc	24	25	-	outlet 4
12	19	-	+24V dc	25	13	-	outlet 05
13	7	not connected		26	-	not connected	

8 *X axis sensor connector*



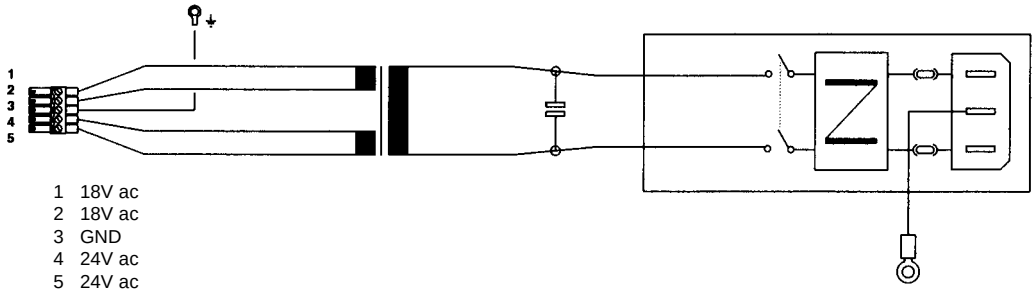
1	1	1	brown	(+24V)
2	2	2	black	(sensor outlet)
3		-		-
4	4	4	blue	GND

9 *Y axis sensor connector*



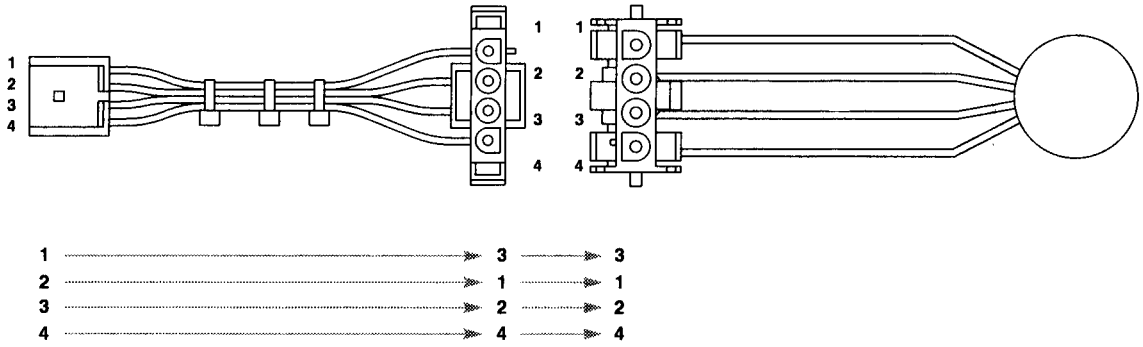
brown	(+24V)
black	(sensor outlet)
blue	GND
polarization	

10 *power transformer connector*

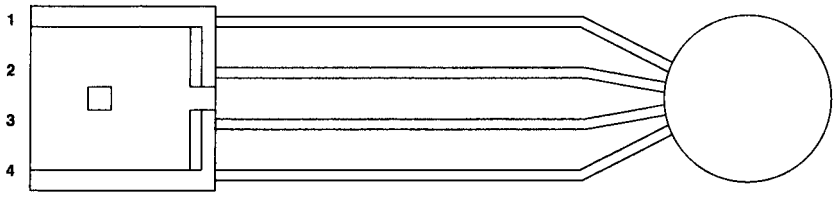


1 18V ac
2 18V ac
3 GND
4 24V ac
5 24V ac

11 X axis motor connector

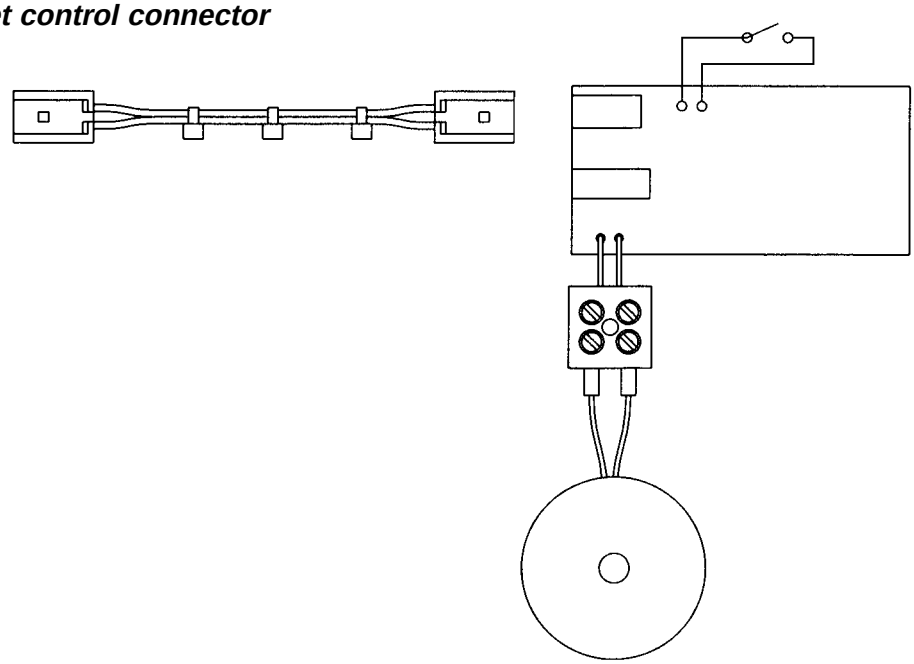


12 Y axis motor connector



1 green + brown
2 orange + blue
3 black + yellow
4 red + white

13 magnet control connector



WASTE DISPOSAL & PACKAGING

The Marker 2000 is shipped in a cardboard packing box which can be re-used if undamaged. It is recommended that the original packing material be stored in a safe place in case the Marker 2000 needs to be moved or shipped for any reason. However, the cardboard box may be placed in any paper recycling bin and the other packing materials, including the polymer protective shell, may be placed in an ordinary waste bin.

The Marker 2000 produces no waste during use. The machine itself is designed to provide many years of service, but is manufactured of materials that can be readily re-used. Recycling is a recommended ecological practice.

ASSISTANCE

Any requests for assistance with the Marker 2000 should be directed to:

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400 Jeffreys Rd
Rocky Mount, NC 27804
919 446-3321

ILCO UNICAN

USA
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400 Jeffreys Rd., Rocky Mount, NC 27802-2627
Tel.: (919) 446-3321 • Fax: (919) 446-4702
Effective March 22, 1998 area code changes to 252

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Tel.: (514) 735-5411 • Fax: (514) 735-4704
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