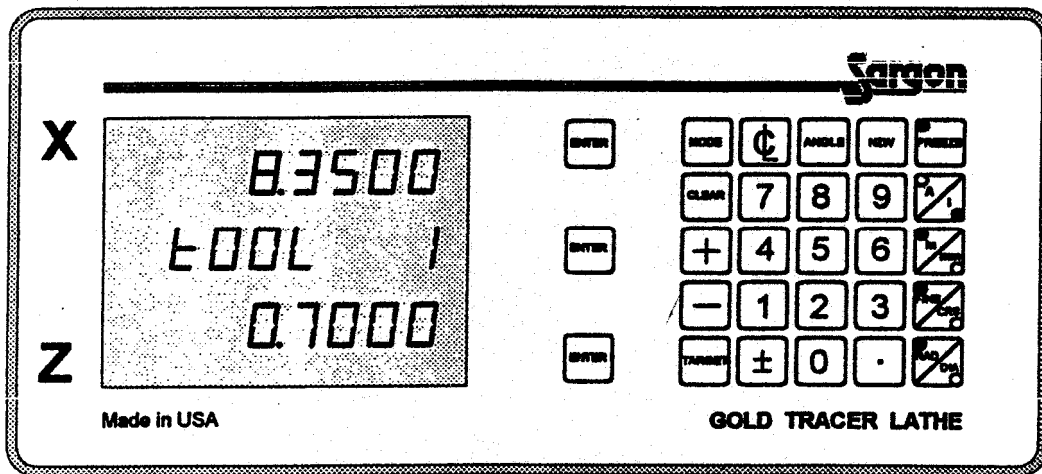


GOLD TRACER LATHE DISPLAY



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Table of Contents

1	Features	1
2	Setup Screens	3
	♦ Setup screens description	3
	♦ Entering the setup screens	3
	♦ Scale resolutions	3
	♦ Radius / diameter enable	4
	♦ Scale directions	4
	♦ Exiting the setup screens	4
3	Basic Working Mode	5
	♦ Coordinates	5
	♦ Tool screens	5
4	Absolute and Incremental	6
	♦ The difference between absolute and incremental	6
	♦ Absolute and incremental on a sample work piece	6
	♦ Switching between absolute and incremental	6
5	Numerical Data Entry	7
	♦ Entering a preset dimension	7
	♦ Clearing incremental	7
	♦ Clearing absolute	7
	♦ Adding to or subtracting from a dimension	7
	♦ Centering and doubling a dimension	8
	♦ Canceling an incorrect entry	8
	♦ Recalling a preset dimension	8
	♦ Presetting a target dimension	8
	♦ Freeze	8
6	NZW (Near Zero Warning)	9
	♦ Setting NZW	9
	♦ Working with NZW	9
7	Angle Finding	10
	♦ Finding the taper angle	10

8	Tool Offsets	11
	◆ Description	11
	◆ Setting tools after power up	11
	◆ Setting Z axis offset	11
	◆ Setting X axis offset	11
	◆ Changing (overwriting) tool offsets	11
	◆ Clearing all tools	12
	◆ Clearing a single tool	12
9	Machine Error Compensation	13
	◆ Machine error compensation description	13
	◆ Viewing MEC factors	13
	◆ Clearing MEC factor	14
	◆ General MEC calibration notes	14
	◆ Calibrating MEC	14
10	Clearing Memory - Default Settings	15
	◆ Description	15
	◆ Clearing all memory	15
	◆ Default settings	15
11	Preparation For Use	16
	◆ Unpacking	16
	◆ General installation notes	16
	◆ Display installation	16
	◆ Grounding	16
	◆ AC power	16
	◆ Routing scale cables	16

1

Features

Press to select the appropriate axis.

Press a second time after numerical data has been keyed in.

Clearing All Memory: Press and hold while Gold Tracer is flashing 8.8.8.8.8.8.8. and then press X axis ENTER key to clear all memory.

MEC switch at rear of Gold Tracer is used to set Machine Error Compensation.

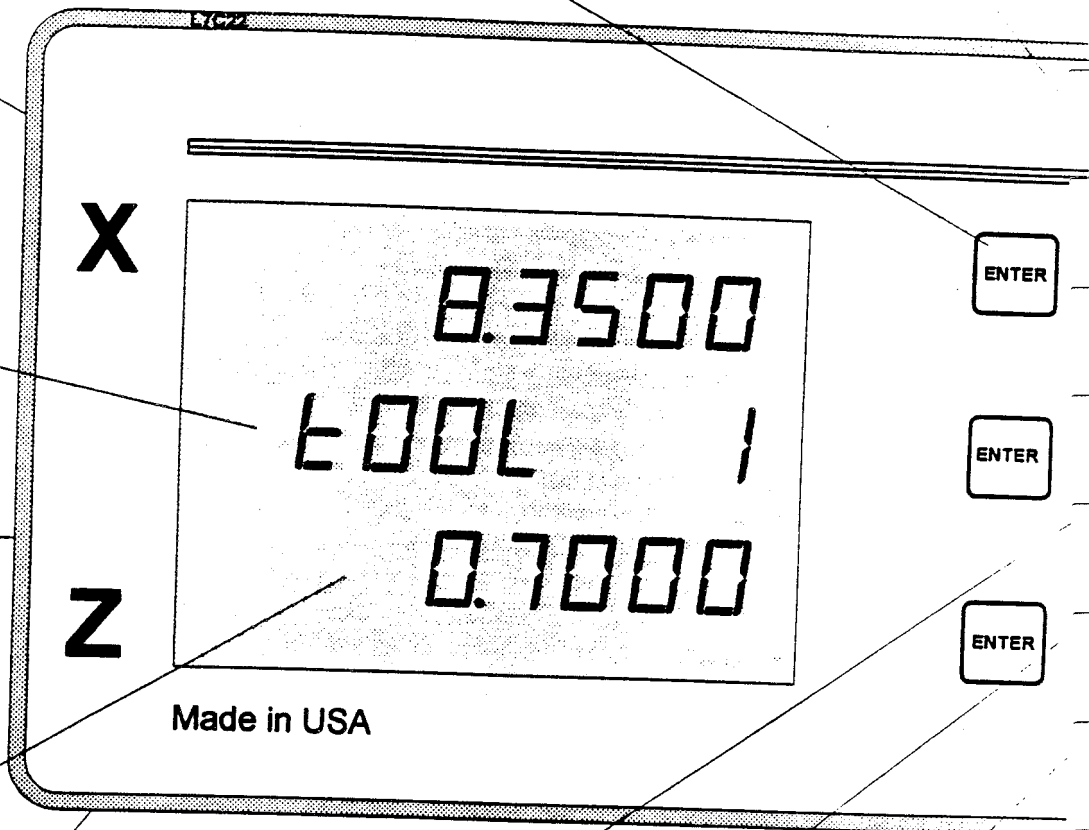
25 separate tool numbers are available, each with separate offsets.

Internal Nonvolatile Memory maintains data when Gold Tracer is off.

Bright, efficient LED display with wide viewing angle.

Power input module at rear of Gold Tracer has:

- ◆ On/Off switch
- ◆ Fuse protection
- ◆ EMI filter for noise protection



Clear a dimension.

Subtract from a dimension.

Add to a dimension.

Enter a target dimension.

Switch between:

- ◆ Normal tool usage mode and
- ◆ Tool setup mode

Center line - After pressing ENTER:

- ◆ Press to divide a dimension by 2
- ◆ Press and hold to multiply a dimension by 2

Calculate the taper angle.

Near Zero Warning indicator:

Press and hold while Gold Tracer is flashing 8.8.8.8.8.8.8. to set the Near Zero Warning window.

During operation, press to enable or disable the Near Zero Warning indicator.

Freeze display so the tool can be moved out of the way to measure part.

Absolute or Incremental display mode.

Setup Screens: Press and hold while Gold Tracer is flashing 8.8.8.8.8.8.8. to set the following:

- ◆ Scale Resolutions
- ◆ Radius/Diameter enable
- ◆ Scale Directions

Inch or millimeter display mode

Fine or Coarse resolution:

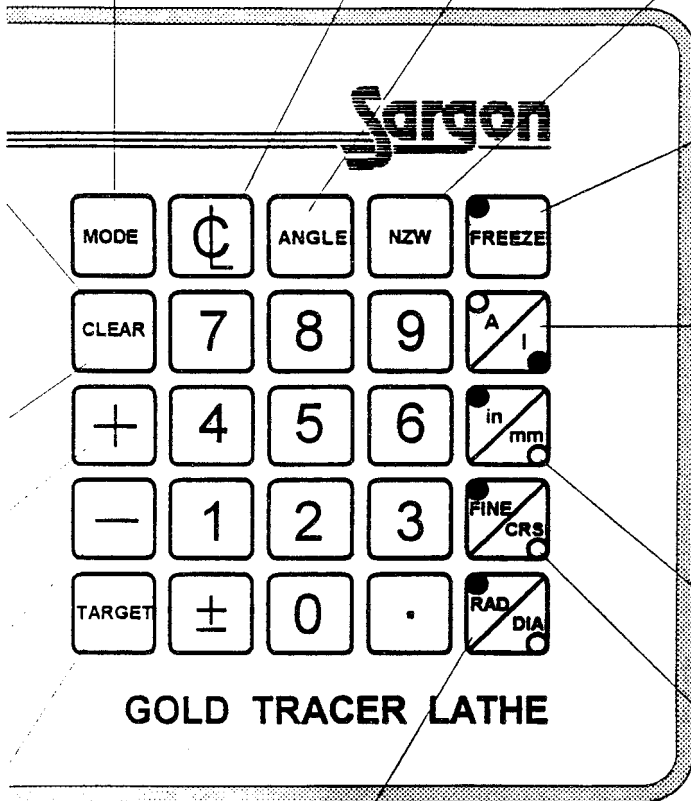
In Fine, maximum scale resolution is displayed.

In Coarse, less resolution is displayed.

Radius or Diameter:

In Radius, the actual scale movement is displayed.

In Diameter, double the scale movement is displayed.



2

Setup Screens

818-395-0646

Ralph

Setup screens description

Instead of using internal switches, scale resolutions, radius/diameter enable and scale directions are programmed from the Gold Tracer front panel.

Scale resolutions, radius/diameter enable and scale directions are stored in the Gold Tracer's nonvolatile memory. Once set, the Gold Tracer may be powered down. When powered up at a later time the settings will still be intact.

Entering the setup screens

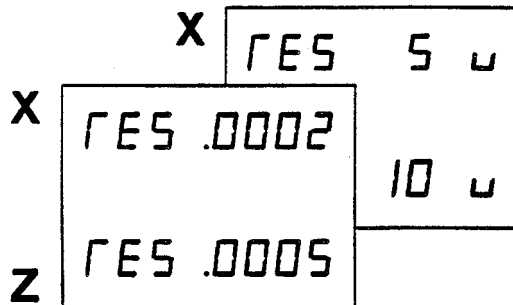
Set the power switch at the rear of the Gold Tracer to OFF (0) then back to ON (1). The display will flash **8.8.8.8.8.8.8.8**.

Press and hold **AI** until one of the setup screens is displayed.

Scale resolutions

MICRON	INCH
10.0	0.0005
5.0	0.0002
2.0	0.0001
1.0	0.00005
0.5	0.00002

Each axis on the Gold Tracer must be set to the resolution which matches the scale being used for that axis. Resolutions available on the Gold Tracer are shown to the left. The scales must be metric. When inch mode is selected, the metric scale inputs are converted by the Gold Tracer to display in inches.



Repeatedly press **TARGET** until the resolution setup screen is displayed.

Repeatedly press **ENTER** for the desired axis until the correct resolution is displayed.

Press **inch/mm** to change between inch and metric displays. In mm mode the resolutions are displayed in microns (0.001 mm).

**Radius /
diameter enable**

When radius/diameter enable is set to **DIA YES** for an axis, as described below, the radius/diameter button will then be active for that axis. The radius/diameter button will not affect an axis which is set to **DIA NO**.

Radius tracks the actual scale movement. Diameter displays double this movement.

X	d IA	YES
Z	d IA	NO

Repeatedly press **TARGET** until the radius/diameter enable screen is displayed.

Press **ENTER** for the desired axis to switch between radius/diameter button enabled (YES) and disabled (NO).

Scale directions

The display will count up or down, depending on the direction of table movement. Scale direction can be set, in the Gold Tracer, for each axis, so that movements are properly displayed.

X	NEG	--
Z	--	POS

Repeatedly press **TARGET** until the scale direction setup screen is displayed.

Press **ENTER** for the desired axis to switch between positive and negative scale directions.

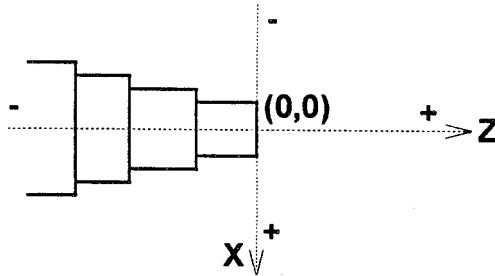
**Exiting the
setup screens**

When scale resolutions, radius/diameter enable and scale directions are correctly set, exit setup mode by pressing **AI** or any other button except **ENTER**, **inch/mm**, **TARGET** or **RAD/DIA**.

3

Basic Working Mode

Coordinates



The Z axis is the turning axis of the lathe.

The X axis is the cross travel axis and is perpendicular to the Z axis.

The origin (the starting position of the Z axis) is ordinarily set at the end of the work piece, but it may be set at any location along the turning axis.

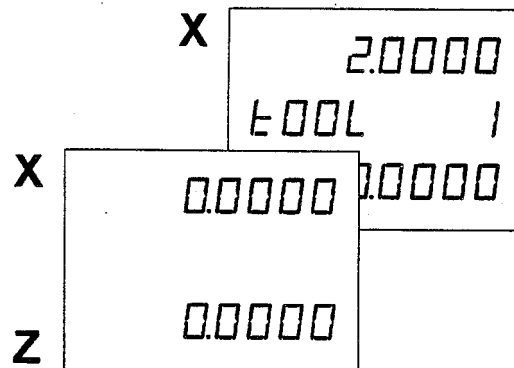
Before any machining, make sure that both scale directions are consistent with the directions shown above. The direction of a scale can be reversed on the setup screen. See Section 2.

Tool screens

Press **MODE** to change between screens.

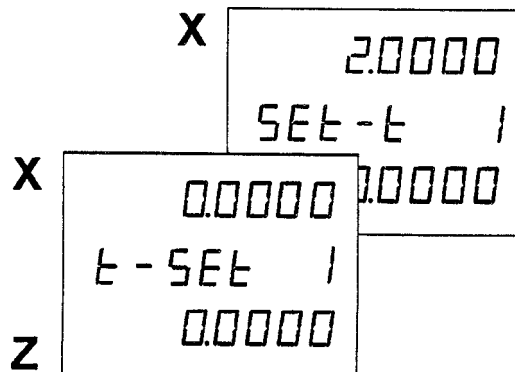
Press **+** or **-** to increment or decrement the tool number, or **ENTER** the tool number on the middle display.

The X and Z displays show the position of the cutting tool edge.



The working screen displays the current tool being used.

The first working screen is blank. This designates a tool which does not require a tool offset relative to any other tool.



The set-tool screen is for setting tool offsets. When a tool is set, the **set-t** display will change to **t-set** to show that the tool has been set. See Section 8.

NOTE: When in the set-tool screen you will notice a flashing **T** in the upper left corner of the screen (The first digit of the X axis). This is a reminder that you are in the set tool mode, not in run mode.

4

Absolute and Incremental Modes

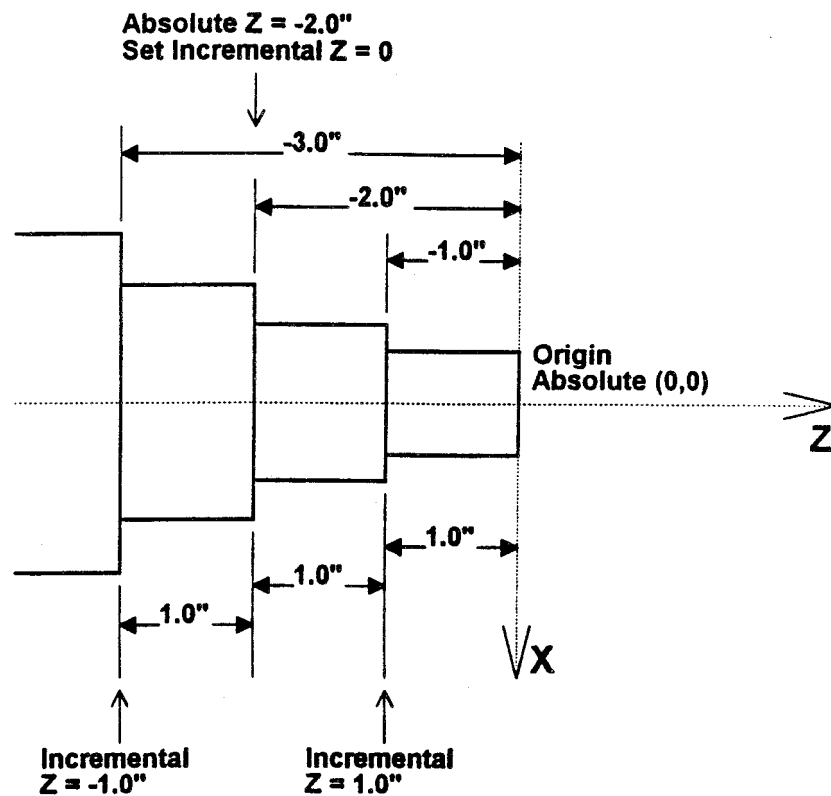
The difference between absolute and incremental

Absolute position is the distance between a fixed starting point on the work piece and another point to which the tool has been moved. Incremental position refers to distances that are not measured with reference to a fixed origin, but instead, the distance is measured between the previous point and some new point.

Absolute and incremental registers are both updated during table movement regardless of which is currently displayed.

Absolute and incremental registers are otherwise independent; that is, clearing one will not affect the other.

Absolute and incremental on a sample work piece



Switching between absolute and

Press **AI** to switch between absolute and incremental position displays. LEDs behind the button indicate which mode is active.

5

Numerical Data Entry

NOTE

Unless otherwise stated, the absolute and the incremental position registers are independent. Changing one will not affect the other.

Entering a preset dimension

1. Press **ENTER** to select the appropriate axis. All but the leading zero will be blanked and the decimal point will flash for the selected axis.
2. Use the numeric keypad to key in the desired dimension.
3. Again press **ENTER** (for the same axis). The selected axis will display the preset dimension that was keyed in. The decimal point will no longer be flashing.

When **+/-** is used while entering a dimension, it must be pressed after a numeral other than 0. When the value is negative, the minus sign is displayed. When the value is positive, no sign is displayed.

To preset both absolute and incremental dimensions at the same time, press **ENTER**, key in value, use **+/-** if negative, and then press **AI**.

Clearing incremental

The Gold Tracer must be in incremental mode to clear the incremental registers.

1. Press **ENTER** to select the appropriate axis. All but the leading zero will be blanked and the decimal point will flash for the selected axis.
2. Press **CLEAR**. The selected axis will display 0.0 with the appropriate number of trailing zeroes. The decimal point will no longer be flashing.

Clearing absolute

To clear an absolute dimension, preset a zero value.

Adding to or subtracting from a dimension

1. Press **ENTER** to select the appropriate axis. All but the leading zero will be blanked and the decimal point will flash for the selected axis.
2. Use the numeric keypad to key in the desired value.
3. Press **+** or **-** as appropriate. The keyed in value will be added to or subtracted from the previous displayed value and the result will then be displayed.

Centering and doubling a dimension

Center and double are applicable to incremental mode only.

1. Press **ENTER** to select the appropriate axis. All but the leading zero will be blanked and the decimal point will flash for the selected axis.
2. Press **CL**. The word **CENTER** will be momentarily displayed. The dimension on the selected axis will be centered (divided by 2) and the result will then be displayed.

To double a dimension, press **ENTER** and then press and hold **CL**.

Canceling an incorrect entry

This feature is to prevent accidentally losing the absolute position coordinates. It is applicable to absolute mode only.

If **ENTER** has been pressed in error and therefore the decimal point is flashing, again press **ENTER** (for the same axis) without keying in any value or pressing any other button. The original position will again be displayed.

If numbers have already been keyed in (other than a single zero, "0.") but **ENTER** has not yet been pressed a second time: Press **CLEAR** then press **ENTER**. The original position will again be displayed.

Recalling a preset dimension

This feature allows the operator to repeat an incremental step without again keying in the dimension. It is applicable to incremental mode only.

Press **ENTER** for the appropriate axis, twice, without keying in any value. The last preset dimension that was entered for that axis will be recalled.

Presetting a target dimension

Target presetting is used to move from the current position to a specified absolute position.

Target presetting is performed in incremental mode.

Preset a target dimension by pressing **ENTER**, keying in the absolute target position, and then pressing **TARGET**. The display will be updated to a value which when zeroed (by moving the tool towards the target position) will locate the target position.

Freeze

Press **FREEZE** to freeze the display or to release it from the frozen state.

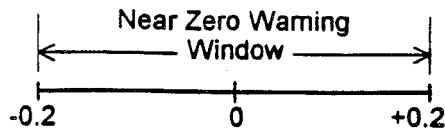
While in the frozen state, the Gold Tracer still tracks all scale movements. Actual positions will be displayed when the Gold Tracer is released from the frozen state.

When a dimension is preset while the display is frozen, the display will first be updated as if the tool were still at the frozen position, then the display will be automatically released from the frozen state and updated to reflect the distance moved since it was frozen.

6

NZW (Near Zero Warning)

Setting NZW window



Press and hold **NZW**. **SET ZERO** will be displayed. The X and Z axes will display the dimensions of the near zero window.

Window dimensions can be preset in either incremental or absolute mode.

Press **MODE** to exit from the NZW window setup mode.

Working with NZW

Press **NZW**. **ZERO ON** will be momentarily displayed.

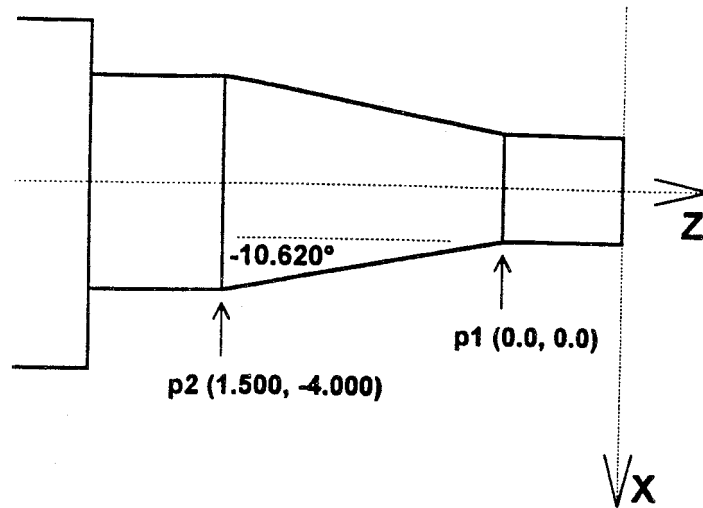
If NZW is ON, the leading digit on the X or Z axis will blink **0** when the tool position is within the NZW window, but not equal to zero.

Press **NZW** to turn off the blinking **0**. **ZERO OFF** will be momentarily displayed.

7

Angle Finding

Finding the taper angle



1. Set Gold Tracer to incremental.
2. Move to point 1.
3. Set both axes to zero.
4. Move to point 2.

X	1.5000
a	-10.620
Z	-4.0000

Press **ANGLE**. The taper angle of the line connecting p1 and p2 will be displayed as **a xx.xxx**.

Press **+/-** to view the angle in degrees, minutes and seconds.

Press **+/-** again to return to decimal angle display.

Press **ANGLE** again to exit angle display.

8

Tool Offsets

Description

The tool offset feature is a function of the Gold Tracer that compensates for differences in the geometrical dimensions of tools. Once the tool offsets have been entered, the operator will know where the cutting edge of each tool is as he switches from one to the other. In effect this treats a variety of tools as if they were all the same.

Setting tool offsets

Press the **MODE** key to access the tool offsets mode.

X	0.0000
	SET - 1
Z	0.0000

Press **+** or **-** to increment or decrement the tool number, or you may **ENTER** the tool number on the middle display.

Setting X axis offsets

1. Make a trial skim cut using the X axis.
2. Measure the newly cut diameter of the work piece. If necessary **FREEZE** the display, so that the tool can be backed away from the work piece allowing room for measurement.
3. Enter the measured dimension by pressing the X axis **ENTER**, key in the value, and then press the **A/I** key. The absolute and incremental dimensions will be set in the Gold Tracer.

Setting Z axis offsets

1. Make a trial skim cut on the end of the work piece.
2. Enter the Z offset (usually zero) by pressing the Z axis **ENTER**, key in the value, and then press **A/I** key. The absolute and incremental dimensions will be set in the Gold Tracer.

NOTE:

When the first skim cut is made on the Z axis, a reference point is established, therefore no subsequent cuts on the Z axis should be made. The cutting edge of additional tools should be set by only touching the work piece.

When a tool offset has been entered, and successfully stored, the message **SET-T** will change to **T-SET**. This will indicate the tool offset has now been established.

X 2.0000
 T-SET 1
 Z 0.0000

This example shows tool number 1 has been set. The offset for this tool is 2.0000 on the X axis, and 0.0000 on the Z axis.

To enter additional tools follow **SETTING X AXIS OFFSETS** steps 1-3, **SETTING Z AXIS OFFSETS** steps 1-2. You may enter as many as 25 different tool offsets.

Changing (overwriting) tool offsets

1. Press **MODE** to access the set-tool screen.
2. Press **+** or **-** to increment or decrement the tool number, or **ENTER** the tool number on the middle display.
3. Set X and Z tool offsets as described previously.

Clearing all tools

X CLEAR
 T, 5-T
 Z ALL-T

1. Press **MODE** to access the set-tool screen.
2. Press and hold **CLEAR**. **CLEAR** will be displayed on the top row, **THIS TOOL** will be displayed in the middle, and **ALL TOOLS** on the bottom row.
3. Press **0** to clear all tools. **0.0.0.0.0.0.0.0.** will be momentarily displayed and all tool offsets will be cleared from the Gold Tracer's memory.

Clearing a single tool

1. Press **MODE** to access the set-tool screen.
2. Select the tool number to be cleared.
3. Press and hold **CLEAR**. **CLEAR** will be displayed.
4. Press the middle display **ENTER** key. Only the current selected tool will be cleared.

9

Machine Error Compensation

Machine error compensation description

The lathe would have no error if its movements followed perfectly straight lines. This, however, is not the case. There will always be some finite transfer error.

Definition: Transfer Error is the difference between displacement at the linear scale and displacement at the cutting tool.

Machine error is the difference between the actual dimension of a known standard and the value displayed by a digital readout when the standard is measured using the lathe. This error will also be present in any work piece being machined on that axis.

Machine Error Compensation (MEC) multiplies incoming scale signals by a factor such that the displayed value will be correct. This factor is stored in the Gold Tracer's nonvolatile memory and is set at the factory to 1.000000.

Example: A 10.0000 inch standard is measured along one axis with a result of 9.9950 inches. MEC will re-proportion this dimension so that the correct value (10.0000 inches) is displayed. The 0.0050 inch error has been distributed over the 10.0000 inches of travel. Thus the "Machine Error" has been "Compensated" for.

$$MEC\ Factor = \frac{10.0000}{9.9950} = 1.000500$$

Although MEC can improve lathe performance, it is not intended as a substitute for proper installation and maintenance.

Viewing MEC factors

Press and hold the **DECIMAL POINT** button to view the MEC scale factors for both axes.

$$MEC\ Factor = \frac{True_Value}{Measured_Value}$$

Clearing MEC factor

1. Press **ENTER** for the appropriate axis. All but the leading zero will be blanked and the decimal point will flash, press the **ZERO** key. **DO NOT** press the **ENTER** key again.
2. Set the MEC switch (at rear of unit) to **CAL**, then return it to **OFF**.
3. Press and hold the **DECIMAL POINT (.)** button to verify the MEC scale factor is now 1.000000.

General MEC calibration notes

The MEC procedure is performed on one axis at a time.

For best results the Gold Tracer should be calibrated in the units (inch or mm) in which it will be used.

Absolute and incremental modes have the same calibration factor for a given axis.

Calibrating MEC

1. Measure a known standard (with the Gold Tracer) using standard machine shop practices.
2. Use the numeric keypad to key in the true value (the actual known standard value). Do not press **ENTER** again.
3. Set the MEC switch (at rear of unit) to **CAL**, then return it to **OFF**.
4. Measure the standard again to ensure the Gold Tracer is now properly calibrated.
5. Repeat the procedure for the other axis if required.

10

Clearing Memory - Default Settings

Description

The entire Gold Tracer memory or a portion of the memory can be cleared as described below.

CAUTION! When the entire memory is cleared, all position data, stored points and MEC scale factors will be lost.

Clearing all memory

1. Set the power switch at the rear of the Gold Tracer to OFF (0) then back to ON (1). The display will flash **8.8.8.8.8.8.8.8**.
2. Press and hold **CLEAR** until **CLEAR ALL** is displayed.
3. Press X axis **ENTER**. **CLEARED** will be displayed and the Gold Tracer will be set to defaults.

Default settings

Scale Resolution:	X axis	0.0002" (0.005 mm)
	Z axis	0.0005" (0.01 mm)
Radius/Diameter Enabled:	X axis	Yes
	Z axis	No
Scale Direction:	X axis	Negative
	Z axis	Positive

Refer to Section 2 to change default settings or to exit from setup mode.

11

Preparation For Use

Unpacking

Inspect Shipping Containers. Inspect for obvious damage that would indicate mishandling during shipment. Make note of any indicators, such as: dented corners or torn sides.

Save Packing Material. The shipping box and packing material should be opened carefully to permit reuse in case it is necessary to return any portion of the equipment.

Notify Carrier In Case of Damage. If the Gold Tracer or other items show any external damage, or if parts have vibrated or broken loose, the carrier should be notified within ten days of receipt of shipment.

Check Packing List. Any discrepancy between the items received and the items listed on the shipment packing list should be reported immediately to the Sargon distributor.

General installation notes

WARNING

HAZARDOUS VOLTAGES. USE EXTREME CAUTION.

All required electrical work should be performed by a qualified electrician.

Mount the Gold Tracer a minimum of 6 inches away from any motors.

Refer to the applicable manual for scale installation.

Display installation

The Gold Tracer is mounted using the provided 5/16-18 bolt which is secured to the built in nut at the bottom of the Gold Tracer casing.

Grounding

The AC outlet should be a three prong grounded outlet (per article 250 of the US National Electrical Code). If it is not, use a grounded adapter and verify that the adapter is grounded.

AC power

The AC power outlet should be of the same voltage as that indicated on the identification/serial number label on the back of the Gold Tracer.

Use the power cord supplied. Do not modify the power cord in any way.

Routing scale cables

Connect and secure the scale connectors to the Gold Tracer. Using tie-wraps, secure the scale cables and dress any excess slack. Do not wrap any AC power lines with the scale cables. Maintain a minimum of 6 inch spacing from AC lines and cross at right angles.

