

USER SCREENS OPERATION & USE

FAGOR  8055iT

TABLE OF CONTENTS

Initial User channel Screen		3
F1 Tool Offsets		4
F1	X-Z Tool Offsets	5
F2	Facet Tool Radius	6
F3	Carousel Tool Shift	7
F4	Turret Tool List	8
F5	Pre-Setting Live Tools	9
F6	Back	9
F7	Jog Screen	9
F2 Cutting Technology		10
F1	Turning Feed Data & explanation of the material library	11-12
F2	Turning Tool Data	13
F3	Milling Feed Data & Live Tool Drilling Data	14-15
F4	Milling Tool Data	16
F5	Turning RPM	17
F6	Milling RPM	18
F7	Back	
F3 Interface & Calculator		19
F1	Dome Radius	20
F2	Round Stone Sizes	21
F3	No Selection	
F4	No Selection	
F5	No Selection	
F6	No Selection	
F7	Back	
F4 Ring Inspection		22
F1	Calculate Ring Size	
F2	Calculate Groove Depth	
F3	Adjust Thickness	
F4	Tool Offsets	
F5	No Selection	
F6	Back	
F7	Jog Screen	
F5 Material Information		23
F1	Tube	
F2	Solid Bar	
F3	Blanks	
F4	Graphics Refresh	
F5	Weight Information	
F6	Back	
F7	Jog Screen	
F6 Tool Changer		24
F1	Open Door	
F2	Close Door	
F3	Advance Tools	
F4	Retract Tools	
F5	Home Carousel	
F6	Last Position	
F7	Jog Screen	

USER CHANNEL

The User channel provides a group of screens that provide data on tooling, speeds and feeds, ring sizes and other useful data for controlling the machining operations.

The USER key brings up this screen

The screenshot displays the USER CHANNEL interface. At the top left, it shows 'JOG' and at the top right, the time '23:49:54'. The interface is divided into six function key areas:

- F1:** A diagram of a tool tip with coordinate axes X+, X-, Z+, and Z-.
- F2:** A diagram showing a tool cutting a curved surface with depth indicators.
- F3:** A calculator showing the number '12374218.75'.
- F4:** Diagrams of a ring and a cylinder with dimension lines.
- F5:** A diagram of a tool cutting a ring, with labels for 'Diameter' and 'Wall Thickness'.
- F6:** A diagram of a tool cutting a complex, multi-toothed part.

Below the function keys is a status bar with the following text:

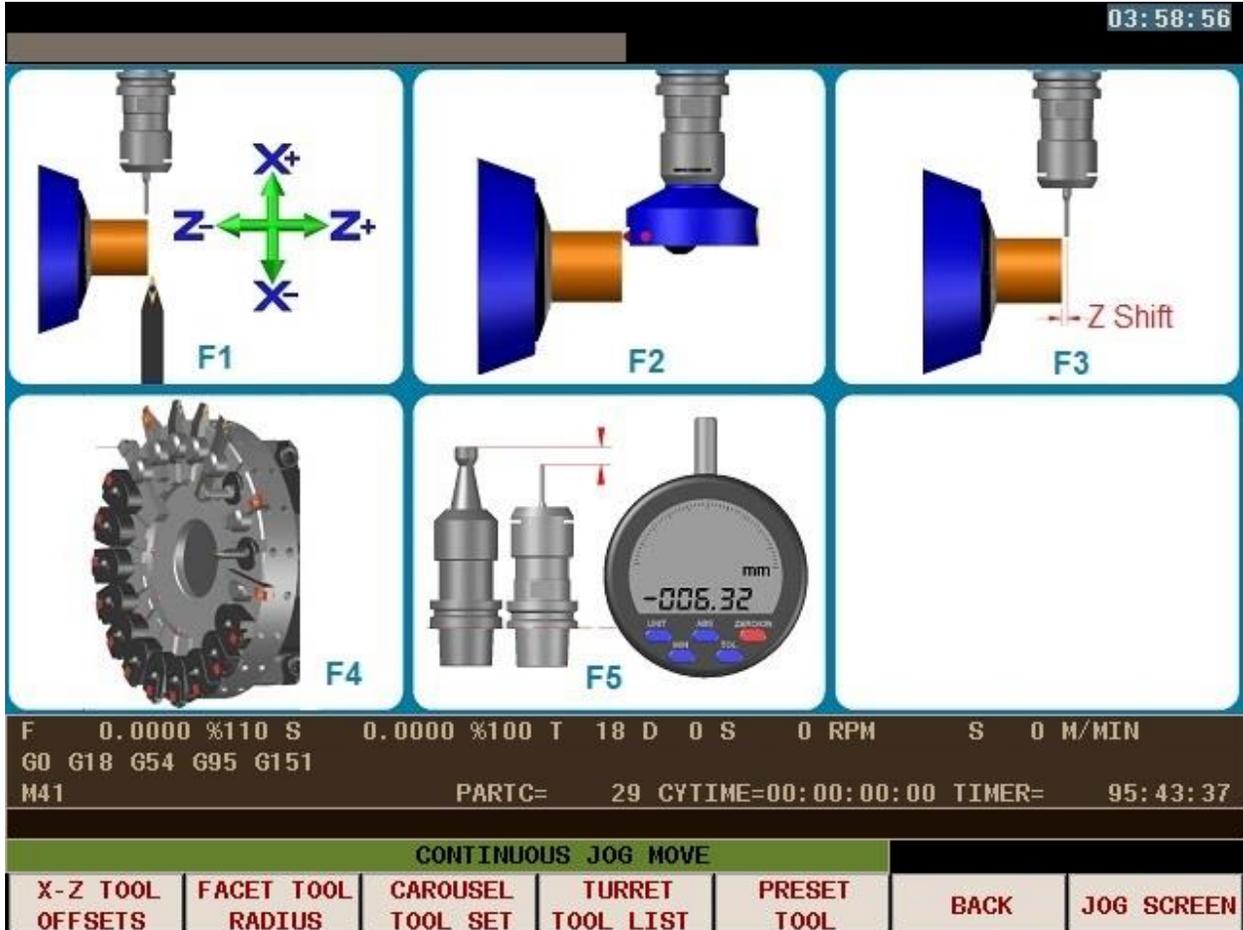
F 0.0000 %100 S 0.0000 %100 T 19 D 0 S 0 RPM S 0 M/MIN
G0 G18 G54 G95 G151
M41 PARTC= 14 CYTIME=00:00:00:00 TIMER= 62:52:03

At the bottom, there is a green bar labeled 'CONTINUOUS JOG MOVE' with '100%' and 'MM' indicators. Below this is a menu with seven options: TOOL OFFSETS, CUTTING TECHNOLOGY, INTERFACE/CALCULATOR, RING INSPECTION, MATERIAL INFO, TOOL CHANGER, and JOG SCREEN.

The 7 function keys along the bottom provide the method of selecting each screen choice.

Each selection is described in the following sections.

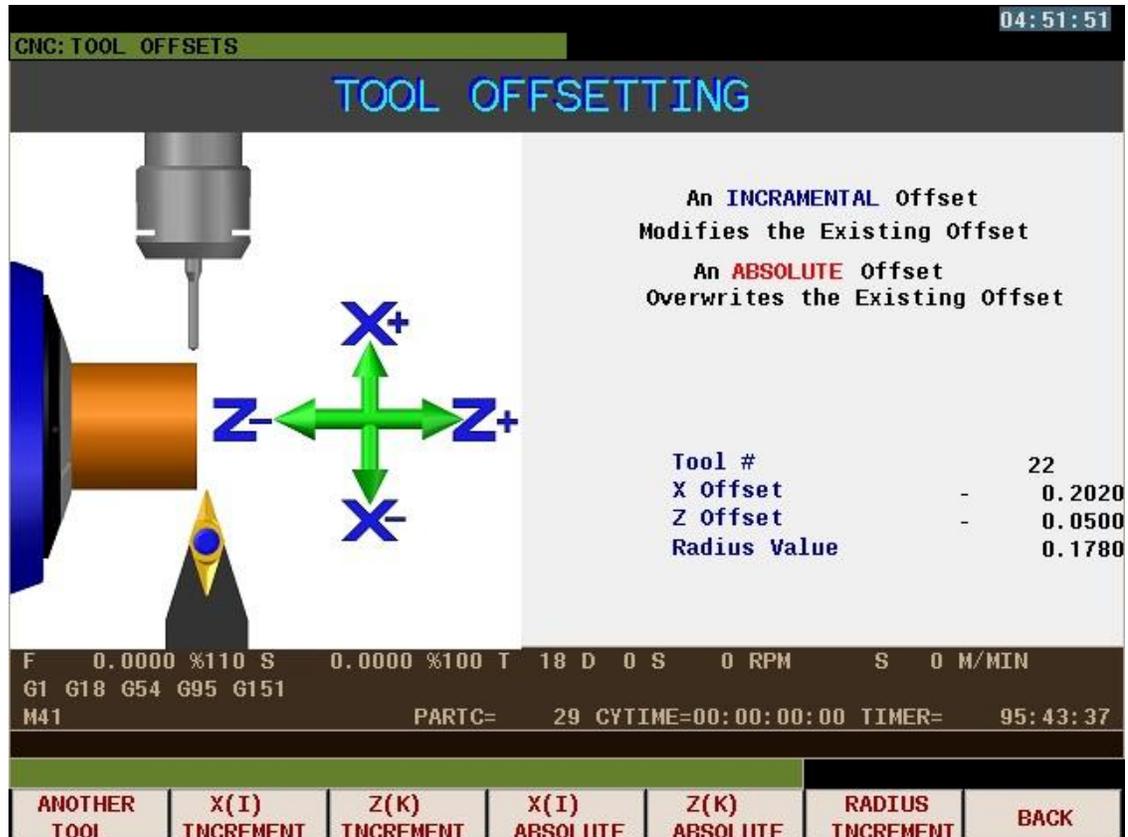
F1 TOOL OFFSETS



There are 5 selections available:

- F1 X-Z TOOL OFFSETS.** This allows the adjustment of offsets to fine tune the size of the finished rings.
- F2 FACET TOOL RADIUS.** This simplifies setting the tool radius values on faceting tools.
- F3 CAROUSEL TOOL SHIFT.** The machine uses 1 Z offset for the live tool, this allows the quick setting of all 18 offsets to the same value.
- F4 TURRET TOOL LIST.** This provides a list of tools and which position they occupy on the turret disk.
- F5 PRESET TOOL.** This screen provides the input for the live tool preset data. (Requires the tool presetter)
- F6 BACK.** This key returns to the previous screen.
- F7 JOG SCREEN.** This key returns to the jog screen.

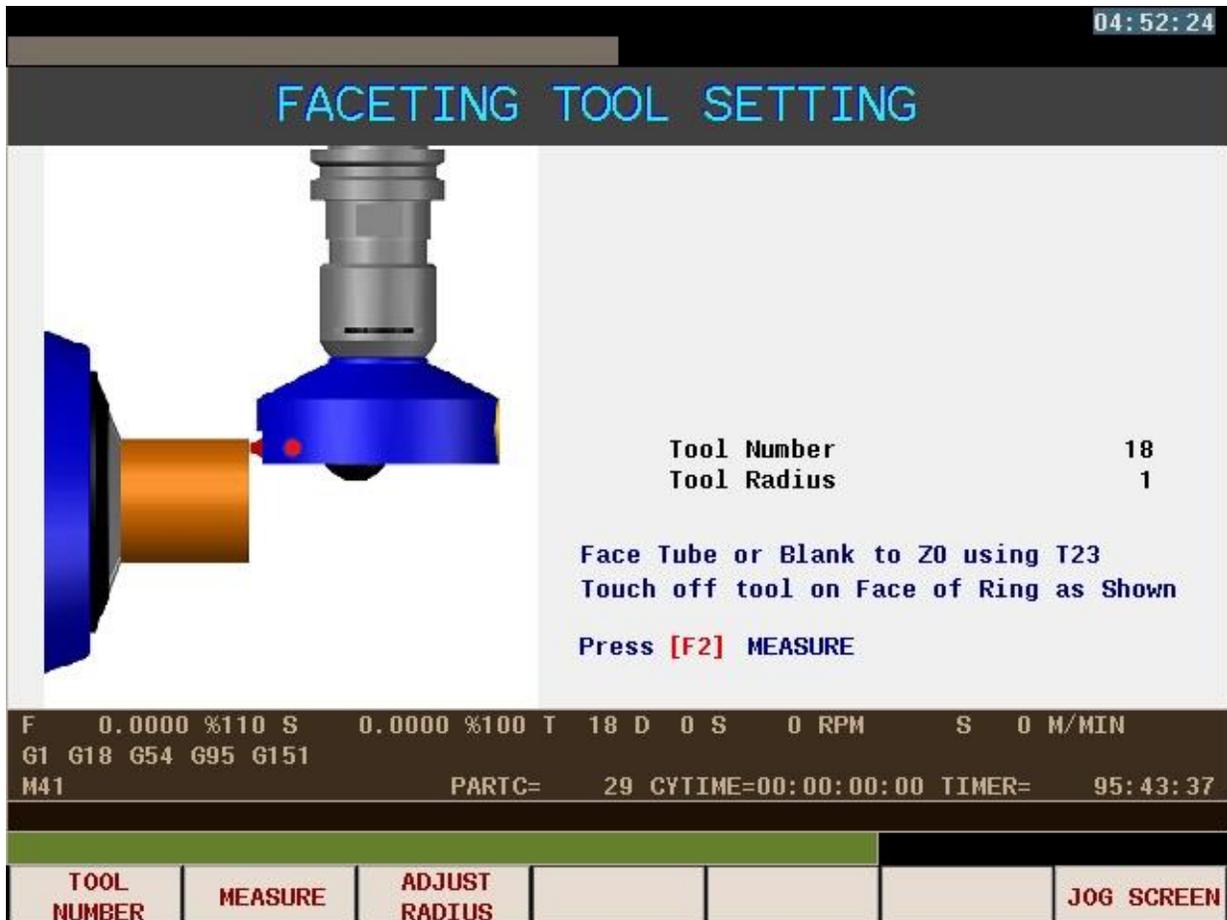
F1 X-Z TOOL OFFSETS (TOOL OFFSETS)



This screen allows the adjustment of X & Z offsets for each tool, both live tools and turning & boring tools.

- F1 ANOTHER TOOL** This allows the selection of a different tool after the initial tool has been selected
- F2 X(I) INCREMENT** This provides a method of offsetting an X axis value that is added or subtracted to the existing offset.
- F3 Z(K) INCREMENT** This provides a method of offsetting an Z axis value that is added or subtracted to the existing offset.
- F4 Z(K) ABSOLUTE** This provides a method of inputting a specific value into the X Axis offset for the selected tool.
- F5 Z(K) ABSOLUTE** This provides a method of inputting a specific value into the X Axis offset for the selected tool.
- F6 RADIUS INCREMENT** This allows a value to be added or subtracted to the selected tool radius value.
- F7 BACK.** This key returns to the previous screen.

F2 FACET TOOL RADIUS (TOOL OFFSETS)



This screen allows the setting of the radius value for a large faceting cutter that cannot be measured easily.

- F1 TOOL NUMBER** Use this key to set the tool number of the tool being set.
- F2 MEASURE** This calculates the radius value and enters it into the tool table.
- F3 ADJUST RADIUS** This allows a value to be added or subtracted to the selected tool radius value.
- F7 JOG SCREEN.** This key returns to the jog screen.

OPERATION

Face the tube or blank with tool T23 to Z0.

Then start the live spindle at 8000 rpm by pressing the start button on the left soft key

Touch off the tool on the previously machined face.

Enter the tool offset number to be used.

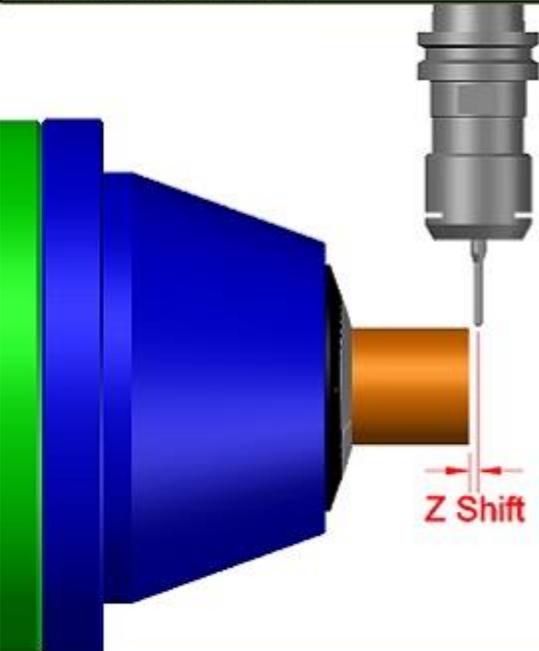
Press F2 MEASURE, this will load the correct value for the radius of the facet cutter.

This value is **critical** to the correct operation if the faceting cycles.

F3 CAROUSEL TOOL SET (TOOL OFFSETS)

JOG
00:58:14

CNC: TOOL OFFSETS SET



All 18 Live tools share the same **Z offset position**.

Use T1 to set the correct offset position for the spindle.

This operation will write the correct position into tool offsets **T2** thru **T18**

Any incremental offsets will be zeroed out.

F	0.0000	%100	S	0.0000	%100	T	19	D	0	S	0	RPM	S	0	M/MIN
G0	G18	G54	G95	G151											
M41					PARTC=	14	CYTIME=	00:00:00:00	TIMER=	62:52:03					

CONTINUOUS JOG MOVE

100%
MM

JOG SCREEN

This key uses the value in the **T1 Z offset** to change all the values for tools **T2** through **T18** to the T1 Z offset value.

This operation also clears any K offset value in tools T1 through T18.

As the live spindle is fixed and the tools all are in the same spindle, all Z offset values are the same.

Only X offset values change depending on the length of each individual tool.

F4 TURRET TOOL LIST (TOOL OFFSETS)

JOG		01:03:38	
TURRET TOOL ASSISTANT			
T21= SVVCN 0606	VCGT 070204-25FN	T31= SCLPR 0606	
T22= SVVCN 0606	VCGT 070202-25FN	T32= 90Deg Point V Tool (Diamond)	
T23= SVLCR 0606	VCGT 070202-25FN	T33= 120Deg Point V Tool (Diamond)	
T24= S06H SVLCR-7	VCGT 070202-25FN	T34= Mill Grain Tool (Female #10)	
T25= THE-7-3/8"R	GIE-7-SG-0.5R	T35=	
T26= S06H SVVCR-7	VCGT 070202-25FN	T36=	
T27= THE-7-3/8"R	GIE-7-SG-1.1R	T37= GIE-7-SG-1.1R	
T28= A08F SVLCR-5	VCGT 050101-20	T38= GIE-7-GP-1.0RR	
T29= THE-7-3/8"RM		T39= TGTR-9.5-1.6IQ	TAG N1.6C
T30= A08F SVVCR-5	VCGT 050101-20	T40= THE-7-3/8"RM	GIE-7-GP-1.0RR
GANG SLIDE TOOLS			
T41= MF Drill (DR-MF-12L-2.25D-16A-06)			
T42= Tipped Drill (DCN0551-083-063A-1.5)			
T42= Tipped Drill insert (05567145)			
T19= NSK Live Spindle			
Tools must be placed in the turret in the correct tool positions.			
F	0.0000 %100 S	0.0000 %100 T	19 D 0 S 0 RPM S 0 M/MIN
G0	G18 G54 G95 G151		
M41	PARTC=	14 CYTIME=00:00:00:00	TIMER= 62:52:03
CONTINUOUS JOG MOVE		100%	MM
			BACK

This screen displays the tool numbers and descriptions of each tool in the turret.

This is for informational purposes only.

This screen can be edited to reflect different tool requirements and placement.

F5 PRESET TOOL (TOOL OFFSETS)

04:53:29

LIVE TOOL PRESETTING





If the tool is shorter than the
gage length enter a negative value.

If the tool is longer than the
gage length enter a positive value.

Tool Data	
Tool #	5
Pre Set Value	
Tool Offset	- 180.6460
Tool Diameter	0.7500

F 0.0000 %110 S 0.0000 %100 T 18 D 0 S 0 RPM S 0 M/MIN

G1 G18 G54 G95 G151

M41 PARTC= 29 CYTIME=00:00:00:00 TIMER= 95:43:37

TOOL NUMBER	PRESET AMOUNT	SET DIAMETER				JOG SCREEN
----------------	------------------	-----------------	--	--	--	------------

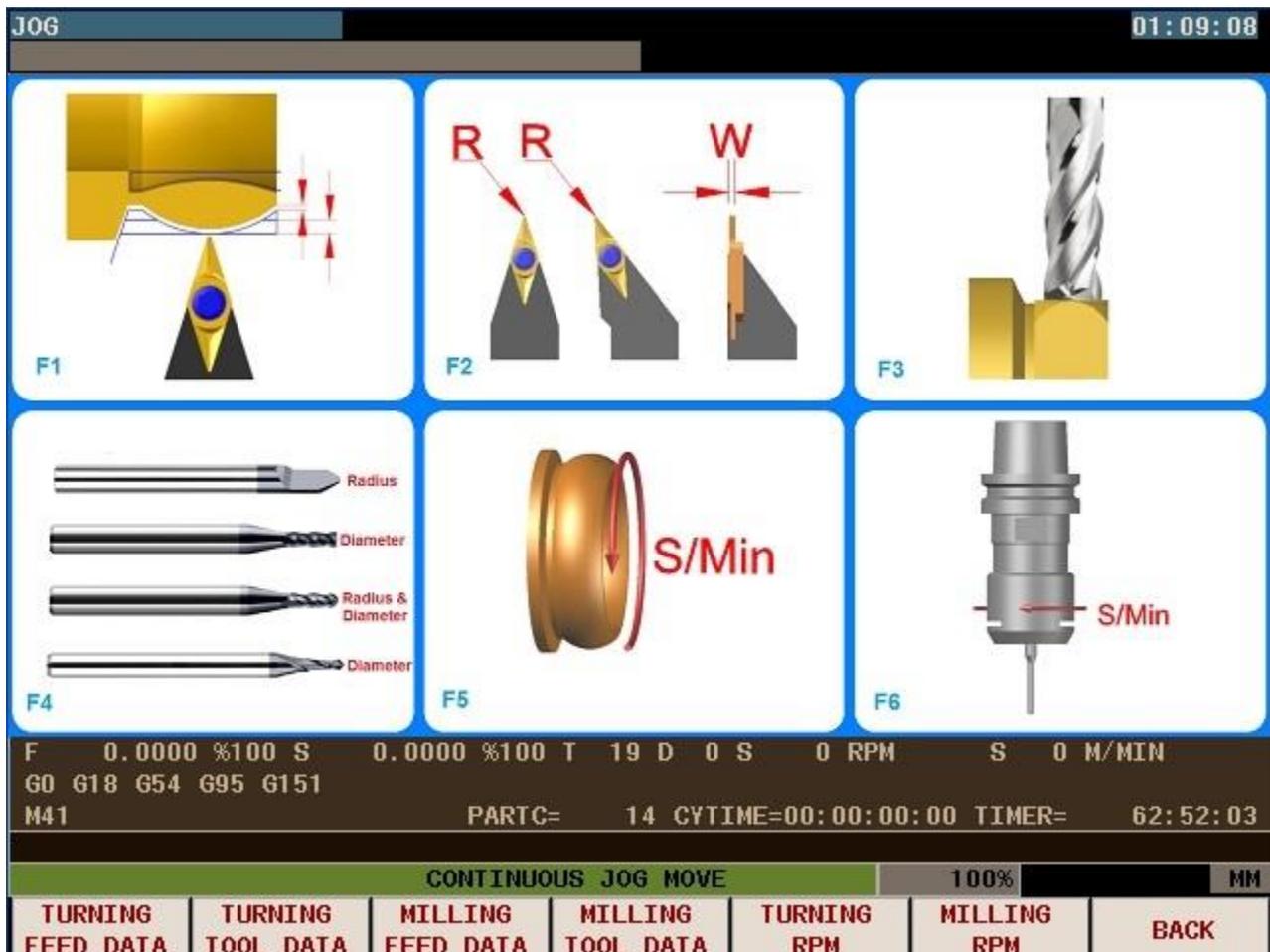
This screen allows the setting of the tool length value of the live tools. This process allows a faster way to set very small tools without the chance of breaking tools when touching off on material in the machine.

This method of tool setting greatly decreases the time required to set tools.

- F1** **TOOL NUMBER** Use this key to set the tool number of the tool being set.
- F2** **PRESET AMOUNT** This is the value measured on the tool presetter.
- F3** **SET DIAMETER** This allows a Diameter value to be added to the tool table for the tool selected.
- F4** **NO SELECTION.**
- F5** **NO SELECTION.**
- F6** **NO SELECTION.**
- F7** **JOG SCREEN.** This key returns to the jog screen.

MAIN SCREEN F2 CUTTING TECHNOLOGY

This group selection provides screens to set up cutting speeds and feed values for the different tool types.



There are 6 selections available:

- F1 TURNING FEED DATA.** Feed rates for the different turning tools
- F2 TURNING TOOL DATA.** Geometry data for the tool graphics and correct operation of cycles.
- F3 MILLING FEED DATA.** Feed rates for the live milling tools.
- F4 MILLING TOOL DATA.** Tool radius values and tool descriptions for the tool carousel.
- F5 TURNING RPM.** Main spindle speeds for different operations & materials.
- F6 MILLING RPM.** Live spindle speeds for different operations & materials.
- F7 BACK.** This key returns to the previous screen.

F1 TURNING OPERATIONS (CUTTING TECHNOLOGY)

TURNING TOOL CUTTING DATA

TURNING DATA	
Depth of Cut	A 1.2500
Finish Cut	B 0.1800
Rough Feedrate	0.1000
Finish Feedrate	0.0150
BORING DATA	
Depth of Cut	C 0.7000
Finish Cut	D 0.2200
Rough Feedrate	0.0850
Finish Feedrate	0.0150
GROOVING DATA	
Groove Stepper %	E 75
Groove Finish Cut	F 0.0200
Rough Feedrate	0.0500
Finish Feedrate	0.0120
CUTOFF DATA	
Finish Feedrate	0.0080

F 0.0000 %100 S 0.0000 %100 T 19 D 0 S 0 RPM S 0 M/MIN
 G0 G18 G54 G95 G151
 M41 PARTC= 14 CYTIME=00:00:00:00 TIMER= 62:52:03

CONTINUOUS JOG MOVE 100% MM

TURNING OPERATIONS BORING OPERATIONS GROOVING OPERATIONS CUTOFF TOOL REFRESH BACK

There are 6 selections available:

F1 TURNING OPERATIONS. This screen shown is displayed when turning operations is selected. The questions toggle through the values listed.

Depth of cut is the depth used for roughing cycles, to rough cut the profile

Finish cut is the amount left in a 2 pass cycle for the final finish cut.

Rough feed rate is the feed used for a roughing cycle of a 2 pass initial cut.

Finish feed rate is the feed used for the final pass in a roughing cycle or 2 pass cycle, or the federate used for a 1 pass cycle.

F2 BORING OPERATIONS. The same questions are asked when setting the boring feed rates.

F3 GROOVING OPERATIONS. The grooving tools need to know the amount of step over as a % of the tool width.

There is a finish cut amount for the sides of the groove

There is a rough & finish feed rate for the grooving cycles.

F4 CUTOFF TOOL OPERATION. Tool radius values and tool descriptions for the tool carousel.

F5 No selection

F6 REFRESH. This reloads the values in memory so that they can be viewed.

F7 BACK. This key returns to the previous screen.

F1 TURNING OPERATIONS (CUTTING TECHNOLOGY)

OVERVIEW OF CUTTING FEEDS & SPEEDS

The feeds and speeds can be adjusted on these user screen pages.

The File 90007.PIT or Material Library is the location within the software where the speeds and feeds are located for different materials.

Adjusting the speeds & feed rates in the user screen does not load the speeds & feeds into the material library.

If the speeds and feeds are adjusted in the user screens to fine tune the cutting performance, the values should be transferred to the appropriate material file in the material library.

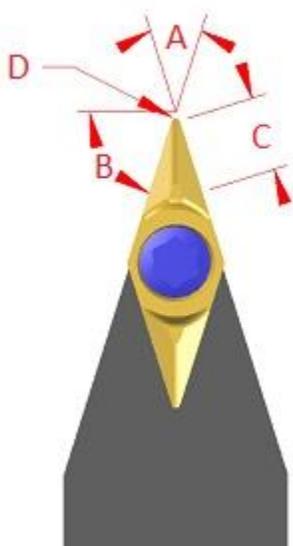
Shown below is a typical material library file.

```
(SUB 11001); ===== 10KT YELLOW GOLD
(P2036=701)
(MSG P2036)
;TURNING INFO
(P1163 = 0.015) ; Finish Turning feedrate
(P1164 = 0.05) ; Rough Turning feedrate
(P1169 = 0.18 ) ; Outside Finish amount
(P1170 = 0.65 ) ; Turning Depth of Cut
(P1215 = 0.007) ; Form groove feedrate
(P1167 = 0.015) ; Cutoff feedrate
;GROOVING INFO
(P1165 = 0.05) ; Rough groove feedrate
(P1166 = 0.012) ; Finish groove feedrate
(P1168 = 75 ) ; Groove cut %
(P1171 = 0.02 ) ; Wall allowance
(P192 = 100) ; Form tool dwell time
;BORING INFO
(P1200 = 0.7) ; Inside Depth of Cut
(P1179 = 0.22) ; Inside finish amount
(P1220 = 0.085) ; Rough Feedrate
(P1221 = 0.015) ; Finish Feedrate
;MAIN SPINDLE INFO
(P1173 = 3400 ) ; Max RPM
(P1174 = 200) ; Surface speed
(P1178 = 600) ; Mill grain RPM
(P1187 = 165) ; Cutoff tool RPM
(P1203 = 1200) ; Form Tool RPM
(P1217 = 1200) ; Threading RPM
;STATIC DRILLING INFO
(P1229 = 0) ; 0= NO DRILL 1=MF DRILL 2=TIPPED DRILL
(P1222 = 800) ; Drill RPM
(P1224 = 1.5) ; Peck depth
(P1225 = 0.05) ; Drill feedrate
;MILLING INFO
(P1159 = 0.005) ; Drilling Feedrate
(P1160 = 0.05) ; Clearance Distance drilling
(P1161 = 0.012) ; Rough milling Feedrate
(P1162 = 0.008) ; Finish milling Feedrate
(P1190 = 400) ; Milling Surface speed
(P1192 = 0.002) ; Feed to depth in X
(P1193 = 0.75) ; % of Tool Diameter for step over
(P1197 = 0.25) ; Mill depth of cut
(RET)
```

F2 TURNING TOOL DATA (CUTTING TECHNOLOGY)

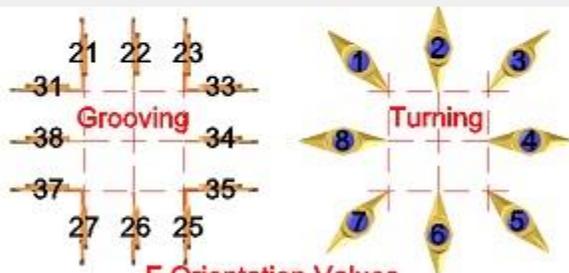
JOG 01:48:35
CNC: TOOL # 22

TURNING TOOL DATA



TOOL DATA	
Tool Tip Angle	A 35
Tool Approach Angle	B 72.5000
Tool Cutting Length	C 3
Tool Tip Radius	D 0.2030
Tool Tip Direction	6

TOOL # 22



F Orientation Values

F 0.0000 %100 S 0.0000 %100 T 19 D 0 S 0 RPM S 0 M/MIN
G0 G18 G54 G95 G151
M41 PARTC= 14 CYTIME=00:00:00:00 TIMER= 62:52:03

100% MM

TOOL TIP ANGLE	TOOL LEAD ANGLE	TOOL EDGE WIDTH	TOOL RADIUS	TOOL TIP DIRECTION	DIFFERENT TOOL	BACK
----------------	-----------------	-----------------	-------------	--------------------	----------------	------

Each tool has its own graphic to help explain the values.

These values are used by the controller for tool graphics in simulate mode and also to be able to calculate tool radius compensation so that the correct profile is produced.

There are 7 selections available:

F1 TOOL TIP ANGLE. **A** This is the tip angle of the insert.

F2 TOOL LEAD ANGLE. **B** This is the angle the tool is set at, here is a same of math to see how we get 72.5° The tool is a 35° tip angle. $35/2=17.5$ $90-17.5=72.5$

F3 TOOL EDGE WIDTH. **C** This is the length of the cutting edge or if it's a groove tool the groove tool width.

F4 TOOL RADIUS. **D** The tool radius is critical to the correct operation of the machine, if the radius is wrong you will see steps and lips in the finished rings.

F5 TOOL TIP DIRECTION. The cycles need to know which way the tool is orientated, use the graphic at the bottom right to select the correct orientation. All Form Tools should use 6 and the Z axis offset is to be set in the center of the tool.

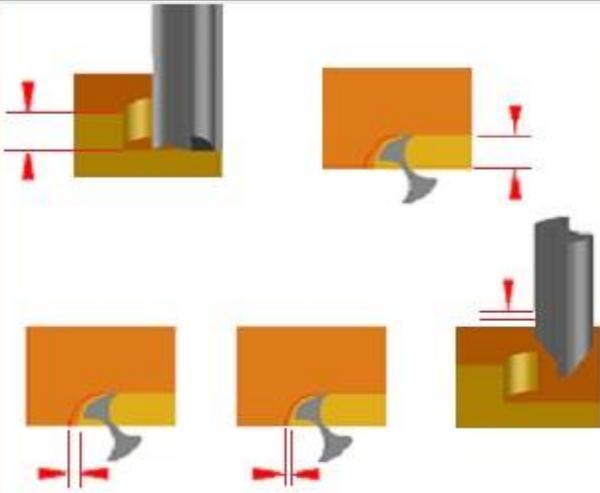
F6 DIFFERENT TOOL. Live spindle speeds for different operations & materials.

F7 BACK. This key returns to the previous screen.

F3 MILLING FEED DATA (CUTTING TECHNOLOGY)

JOG 02:07:17
CNC: Speeds for : TITANIUM

MILLING & DRILLING CUTTING DATA



MILL CUTTING PARAMETERS		
Rough Mill Feedrate	A	0.0100
Finish Mill Feedrate	B	0.0100
Mill Plunge In Feedrate	C	0.1000
Endmill depth of cut	D	0.2500
Endmill stepover %	E	0.7500

DRILL CUTTING PARAMETERS		
Drilling Feedrate	F	0.0250
Drilling Peck Cut	G	0.7000
Drill Clearance	H	0.1000

F 0.0000 %100 S 0.0000 %100 T 19 D 0 S 0 RPM S 0 M/MIN
G0 G18 G54 G95 G151
M41 PARTC= 14 CYTIME=00:00:00:00 TIMER= 62:52:03

100% MM

MILLING FEEDRATES	DRILLING FEEDRATES					REFRESH	BACK
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There are 4 selections available:

F1 MILLING FEEDRATES. Feed rates for the different milling operations.

Rough Milling Feed rate

Finish milling feed rate

Mill infeed into material feed rate

Depth of cut when roughing or when slotting deep channels & grooves.

% of stepover when roughing pockets.

F2 DRILLING FEEDRATES. Feed rates for the different drilling operations.

F3 NO SELECTION.

F4 NO SELECTION.

F5 NO SELECTION.

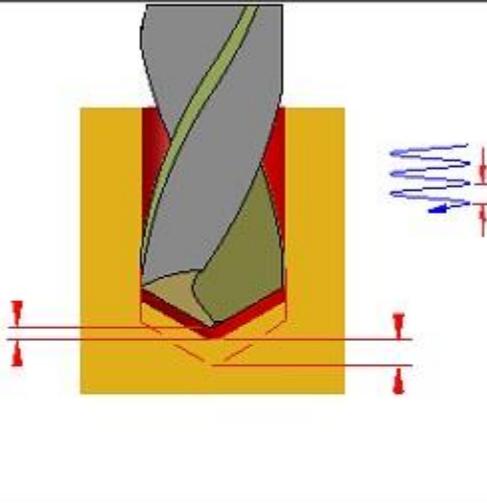
F6 REFRESH. . This reloads the values in memory so that they can be viewed when materials are changed.

F7 BACK. This key returns to the previous screen.

F3 DRILLING FEED DATA (CUTTING TECHNOLOGY)

JOG 02:14:55
CNC: Speeds for : TITANIUM

MILLING & DRILLING CUTTING DATA



MILL CUTTING PARAMETERS		
Rough Mill Feedrate	A	0.0100
Finish Mill Feedrate	B	0.0100
Mill Plunge In Feedrate	C	0.1000
Endmill depth of cut	D	0.2500
Endmill stepover %	E	0.7500

DRILL CUTTING PARAMETERS		
Drilling Feedrate	F	0.0250
Drilling Peck Cut	G	0.7000
Drill Clearance	H	0.1000

F 0.0000 %100 S 0.0000 %100 T 19 D 0 S 0 RPM S 0 M/MIN
G0 G18 G54 G95 G151
M41 PARTC= 14 CYTIME=00:00:00:00 TIMER= 62:52:03

100% MM

DRILL FEEDRATE	PECK AMOUNT	RAPID IN CLEARANCE			REFRESH	JOG SCREEN
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A separate graphic is displayed for the live tool drilling data.

There are 5 selections available:

- F1 DRILL FEEDRATES.** Feed rates for the different drilling operations.
- F2 PECK AMOUNT.** This is the amount of each advance when deep hole drilling or drilling tough materials.
- F3 RAPID IN CLEARANCE.** This is the amount the drill leaves for clearance when it rapids into the hole.
- F4 NO SELECTION.**
- F5 NO SELECTION.**
- F6 REFRESH..** This reloads the values in memory so that they can be viewed when materials are changed.
- F7 JOG SCREEN.** This key returns to the JOG screen.

F4 MILLING TOOL DATA (CUTTING TECHNOLOGY)

JOG			N....		DNC E 2		01:00:45	
+ MACHINE DOOR SAFETY INTERLOCK OFF									
LIVE TOOL ASSISTANT									
Tool 01 :	1.66000	<div style="border: 1px solid gray; padding: 5px; margin-bottom: 10px;">Tools must be placed in the carousel in the correct tool positions.</div> <div style="border: 1px solid gray; padding: 5px;">The ideal endmill diameter is based on key geometry for the specific design being input. Ideal Tool Diameter :</div>							
Tool 02 :	1.80000								
Tool 03 :	3.26000								
Tool 04 :	38.10000								
Tool 05 :	0.25000								
Tool 06 :	0.50000								
Tool 07 :	1.10000								
Tool 08 :	1.98400								
Tool 09 :	0								
Tool 10 :	0								
Tool 11 :	0								
Tool 12 :	0								
Tool 13 :	0								
Tool 14 :	0								
Tool 15 :	0								
Tool 16 :	0								
Tool 17 :	0								
Tool 18 :	1								
F 0.0000 %100 S		0.0000 %100 T		19 D 0 S		0 RPM		S 0 M/MIN	
G0 G18 G54 G95 G151									
M41									
PARTC=				14		CYTIME=00:00:00:00		TIMER= 62:52:03	
CONTINUOUS JOG MOVE							100%		CAP INS MM
CONVERT TO INCH	CONVERT TO MM	MODIFY TOOL					REFRESH	JOG SCREEN	

This page provides information on the live tools in the carousel.

There are 5 selections available:

F1 CONVERT TO INCH. All values for the machine are in mm's this allows you to see the diameters in inches. (THIS DOES NOT CHANGE THE VALUES IN THE TOOL TABLE.)

F2 CONVERT TO mm's. This reconverts the values to mm's.

F3 MODIFY TOOL. This provide a way to change the diameters without using the tool table.

F4 NO SELECTION.

F5 NO SELECTION.

F6 REFRESH. This reloads the values in memory so that they can be viewed when adjustments are made.

F7 JOG SCREEN. This key returns to the JOG screen.

F5 TURNING RPM (CUTTING TECHNOLOGY)

JOG 23:01:48
CNC: Speeds for : TITANIUM

SPINDLE SPEED DATA

MAIN SPINDLE PARAMETERS	
Maximum Spindle RPM	3200
Outside Surface Speed	225
Inside Surface Speed	185
Cutoff Surface Speed	145
Calculated RPM	2569

SPECIAL TOOL PARAMETERS	
Mill Grain RPM	665
Form Tool RPM	2200
Thread Tool RPM	1400
Static Drill RPM	1520

RPM IS CALCULATED AT THE RING OUTSIDE DIAMETER

F 0.0000 %100 S 0.0000 %100 T 19 D 0 S 0 RPM S 0 M/MIN
G0 G18 G54 G95 G151
M41 PARTC= 14 CYTIME=00:00:00:00 TIMER= 62:52:03

CONTINUOUS JOG MOVE 100% MM

MAXIMUM SPIN. RPM	OUTSIDE SURF. SPEED	INSIDE SURF. SPEED	CUTOFF SURF. SPEED	OTHER TOOLS	REFRESH	BACK
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The software controlling the spindle speeds varies the RPM depending on the diameter being machined.

For more information please read the Operator User Manual under G code G96.

There are 7 selections available:

- F1 MAXIMUM SURFACE SPEED.** The value is the highest RPM the spindle will reach when calculating the speed.
- F2 OUTSIDE SURFACE SPEED.** This is the speed value for the outside profile machining.
- F3 INSIDE SURFACE SPEED.** This is the speed value for the inside bore profile machining.
- F4 CUTOFF SURFACE SPEED.** This is the speed value for the cutoff tool operation.
- F5 OTHER TOOLS.** This selection allows input for the 4 special operations that use direct RPM input.
- F6 REFRESH.** This reloads the values in memory so that they can be viewed when materials are changed.
- F7 BACK.** This key returns to the previous screen.

F6 MILLING RPM (CUTTING TECHNOLOGY)

The screenshot displays the 'LIVE SPINDLE DATA' screen for a CNC machine. At the top, it shows 'JOG' and '23:17:53'. Below that, 'CNC: Speeds for : TITANIUM' is displayed. The main title is 'LIVE SPINDLE DATA'. On the left, there is a 3D model of a tool. On the right, under 'SPINDLE SPEED PARAMETERS', the following values are shown:

Maximum RPM	30000
Surface Speed	450
Endmill / Drill #	2
Endmill Diameter	1.8000
Calculated RPM	24251

Below this, a note states: 'RPM is calculated at the endmill diameter. When using small endmills and drills the Max RPM is used'. Under 'TYPICAL SURFACE SPEEDS FOR MATERIALS', the following values are listed:

Silver	: 130-220
Yellow Gold	: 130-220
White Gold	: 100-180
Platinum	: 40-60

At the bottom, there is a status bar with the following text: 'F 0.0000 %100 S 0.0000 %100 T 19 D 0 S 0 RPM S 0 M/MIN', 'G0 G18 G54 G95 G151', 'M41', 'PARTC= 14 CYTIME=00:00:00:00 TIMER= 62:52:03'. Below the status bar, there is a 'CONTINUOUS JOG MOVE' indicator at 100% and a 'MM' unit indicator. At the very bottom, there is a control panel with five buttons: 'CALCULATE RPM', 'CUTTING SPEED', 'LIVE TOOL#', 'REFRESH', and 'BACK'.

There are 5 selections available:

- F1 CALCULATE RPM.** This will use the surface speed and the diameter of the tool selected to calculate the live spindle RPM.
- F2 CUTTING SPEED.** Enter the cutting speed for the material.
- F3 LIVE TOOL #.** Enter the live tool # to review the RPM
- F4 NO SELECTION.**
- F5 OTHER TOOLS.** This selection allows input for the 4 special operations that use direct RPM input.
- F6 REFRESH.** This reloads the values in memory so that they can be viewed when materials are changed.
- F7 BACK.** This key returns to the previous screen.

F3 CHOICE SCREEN (INTERFACE/CALCULATOR)

The screenshot shows a CNC control interface. At the top left, it says 'JOG' and at the top right, '23:43:30'. The main area is divided into a 2x2 grid. The top-left cell (F1) shows a yellow dome with labels for 'Width' and 'Radius'. The top-right cell (F2) shows a grey diamond with labels for 'Diameter'. Below the grid is a status bar with the following text: 'F 0.0000 %100 S 0.0000 %100 T 19 D 0 S 0 RPM S 0 M/MIN', 'G0 G18 G54 G95 G151', 'M41 PARTC= 14 CYTIME=00:00:00:00 TIMER= 62:52:03'. Below the status bar is a green bar with 'CONTINUOUS JOG MOVE' and '100%' on the right. At the bottom, there is a control panel with buttons for 'DOMERADIUS', 'ROUND SIZES', and 'BACK'.

This section provides calculators to develop information for rings that you may need to make.

F1 DOME RADIUS. This calculator allows you to change the radii and width to calculate height

F2 ROUND SIZES. This calculates the different values of a round brilliant stone and other values.

F3 NO SELECTION.

F4 NO SELECTION.

F5 NO SELECTION.

F6 NO SELECTION.

F7 BACK. This key returns to the previous screen.

F1 DOME RADIUS (INTERFACE/CALCULATOR)

JOG N... DNC E 2 23:36:26
 + MACHINE DOOR SAFETY INTERLOCK OFF

CHORD HEIGHT / RADIUS / LENGTH

This Calculator can be used to calculate:

Dome Height from Dome Radius
 Dome Radius from Dome Height
 Comfort Radius from Comfort Fit Height
 Comfort Fit Height from Comfort Fit Radius

Changing the Ring Width will not change the Dome Radius

F 0.0000 %100 S 0.0000 %100 T 19 D 0 S 0 RPM S 0 M/MIN
 G0 G18 G54 G95 G151
 M41 PARTC= 14 CYTIME=00:00:00:00 TIMER= 62:52:03

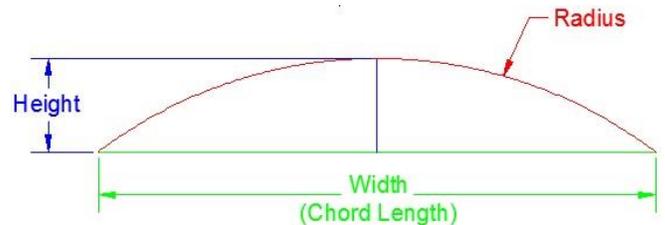
CONTINUOUS JOG MOVE 100% GAP INS MM

DOME/RING WIDTH	DOME RADIUS	DOME HEIGHT	RING THICKNESS	COMFORT FIT RADIUS	COMFORT FIT HEIGHT	EXIT
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A simple profile with an outer & inner radius has quite a lot of math associated with the shape.

An arc has 3 features:

- Width
- Height
- Radius



There are 7 selections available:

Change any 1 value and all the other values change, This calculator assists in this calculation.

F1 DOME/RING WIDTH. Input the dome width, This keeps the dome radius and recalculates for the height.

F2 DOME RADIUS. Changing the dome radius will recalculate the dome height.

F3 DOME HEIGHT. Changing the dome Height recalculates the radius.

F4 RING THICKNESS. Change the ring thickness to match the ring you need to make.

F5 COMFORT FIT RADIUS. Changing the comfort fit radius will recalculate the arc height.

F6 COMFORT FIT HEIGHT. Changing the comfort fit Height recalculates the comfort fit radius.

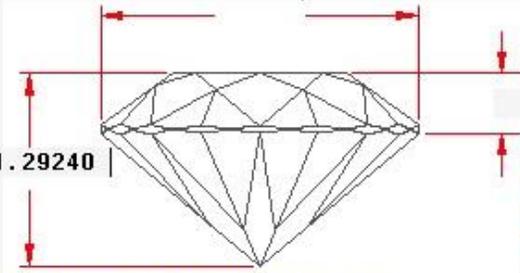
F7 EXIT. This key returns to the JOG screen.

F2 ROUND SIZES (INTERFACE/CALCULATOR)

JOG N... DNC E 2 23:40:01
 + MACHINE DOOR SAFETY INTERLOCK OFF

DIAMOND DIMENSIONS

Stone Diameter
1.80000 |



Height 1.29240 |

Crown Height
0.29160 |

Ring Inside Diameter	22.44475
Ring Thickness	1.65000
Ring Diameter	25.74475
Circumference	80.87952

This calculator will calculate the ideal ring thickness.
 You can change these values:

RING SIZE - RING THICKNESS	
STONE SIZE - STONE QUANTITY	

The stone gap is set to 0.05mm

# of Stones (per row)	44
Ideal Thickness	1.73284
Ideal Circumference	81.40000

F 0.0000 %100 S 0.0000 %100 T 19 D 0 S 0 RPM S 0 M/MIN
 G0 G18 G54 G95 G151
 M41 PARTC= 14 CYTIME=00:00:00:00 TIMER= 62:52:03

CONTINUOUS JOG MOVE 100% GAP INS MM

RING DIAMETER	RING THICKNESS	STONE DIAMETER	CHANGE STONE QTY	UPDATE THICKNESS	EXIT
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This calculator can help when eternity band values need to be calculated.

The parameters that control the diamond sizes are :

- P2227 = Stone gap value
- P2229 = Stone Height %
- P2230 = Crown Height %

When creating eternity bands the wall thickness is tied to the stone size and # of diamonds.

The ring circumference controls the number of stones, this value is based on the ring size + wall thickness x 2.

The wall thickness has to be greater than the stone height, and to keep the gap consistent the wall thickness needs to change.

The screen shows an **ideal thickness** this is based on the number of stones.

Changing the ring size will change the # of stones.

Changing the stone diameter will change the number of stones.

F4 RING INSPECTION

JOG N... DNC E 2 00:59:05
 + MACHINE DOOR SAFETY INTERLOCK OFF

RING DIMENSIONS

19.78950	Groove Diameter				
0.70000	Groove Width				
21.79837	Groove Depth				
19	Tube Inside Diameter				
27	Tube Outside Diameter				
65.20234	Circumference				
	Calculated Ring Size				

F 0.0000 %100 S 0.0000 %100 T 19 D 0 S 0 RPM S 0 M/MIN
 G0 G18 G54 G95 G151
 M41 PARTC= 14 CYTIME=00:00:00:00 TIMER= 62:52:03

CONTINUOUS JOG MOVE 100% CAP INS MM

CALCULATE RING SIZE	CALCULATE GROOVE DEPTH	ADJUST THICKNESS	TOOL OFFSETS		BACK	JOG SCREEN
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This page provides information on the rings you are making. The table shows relevant values.

Run a program in **SIMULATE** mode to load the values and use this page to check the ring dimensions.

There are 6 choices:

- F1 CALCULATE RING SIZE.** This allows you to enter a metric value and it calculates the specific ring size to use. This is useful on 2 piece rings where you need to produce a ring to a specific diameter.
- F2 CALCULATE GROOVE DEPTH.** grams.
- F3 ADJUST THICKNESS.** This sets the parameters so that barfeed operations cannot be performed.
- F4 TOOL OFFSETS.** This keys opens up the tool offset page to allow changes to the tool offsets.
- F5 NO SELECTION.**
- F6 BACK.** This key returns to the previous screen.
- F7 JOG SCREEN.** This key returns to the JOG screen.

F5 MATERIAL INFORMATION

JOG N... DNC E 2 00:59:28
+ MACHINE DOOR SAFETY INTERLOCK OFF

MATERIAL INFORMATION

27 | Outside Diameter
19 | Inside Diameter
4 | Wall Thickness

Selecting TUBE disables Drilling
Selecting BAR Enables Drilling

F 0.0000 %100 S 0.0000 %100 T 19 D 0 S 0 RPM S 0 M/MIN
G0 G18 G54 G95 G151
M41 PARTC= 14 CYTIME=00:00:00:00 TIMER= 62:52:03

CONTINUOUS JOG MOVE 100% CAP INS MM

TUBE	SOLID BAR	BLANKS	GRAPHICS REFRESH	WEIGHT INFO	JOG SCREEN
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This page allows you to set the type of machining to be done.

There are 6 choices:

- F1 TUBE.** This button allows you to enter the tube size and wall thickness.
- F2 SOLID BAR.** This sets the parameters to activate the drilling cycles when creating new programs.
- F3 BLANKS.** This sets the parameters so that barfeed operations cannot be performed.
- F4 GRAPHICS REFRESH.** This uses the new tube and bar dimensions for the graphics screen.
- F5 WEIGHT INFO.** This section provides information on ring weights and material costs.
(This section is under development and new features will be available soon)
- F6 NO SELECTION.**
- F7 JOG SCREEN.** This key returns to the JOG screen.

F6 TOOLCHANGER

JOG N... DNC E 2 01:38:23
 + MACHINE DOOR SAFETY INTERLOCK OFF

TOOL CHANGER

M CODE LIST FOR TOOLCHANGER

M20 Clamp Tool in Spindle
 M21 Unclamp Tool in Spindle
 M22 Open Door
 M23 Close Door
 M24 Advance Tools
 M25 Retract Tools
 M36 Air Blast On
 M37 Air Blast Off

**IF TOOLCHANGER IS HOMED MANUALLY
 INDEX TO TOOL # IN SPINDLE**

Tool In Spindle 5
 Carousel Homing ●

TOOL CHANGE POSITION

X Position - 27.6000
 Y Position - 12.7976
 Z Position - 17.0502

F 0.0000 %100 S 0.0000 %100 T 19 D 0 S 0 RPM S 0 M/MIN
 G1 G18 G54 G95 G151
 M41 PARTC= 14 CYTIME=00:00:00:01 TIMER= 62:52:03

CONTINUOUS JOG MOVE					100%	CAP INS MM
OPEN DOOR	CLOSE DOOR	ADVANCE TOOLS	RETRACT TOOLS	HOME CAROUSEL	LAST POSITION	JOG SCREEN

This page allows manual control of the tool changer mechanism.

It also lists the M codes related to the tool changer.

- F1 OPEN DOOR.** Press this button to open the tool changer door.
- F2 CLOSE DOOR.** Press this button to close the tool changer door.
- F3 ADVANCE TOOLS.** Press this button to advance the tool carousel.
- F4 RETRACT TOOLS.** Press this button to retract the tool carousel.
- F5 HOME CAROUSEL.** This button will home the carousel (Make sure to open the door first)
- F6 LAST POSITION.** This button will move the carousel to the tool position of the tool in the spindle.
- F7 JOG SCREEN.** This key returns to the JOG screen.

Each tool position has it's own Y-Z coordinates to provide alignment for the tool changer.

The values are store in subroutine (SUB 1515) depending on your configuration this subroutine may be in its own location or may be integrated into OEM Subroutines (P090000.PIT)