MACH3 PARAMETERS & VARIABLES

PARAMETER DEFINITION

Parameters are values / settings stored in Mach3 controller software. A user defines all the settings of a machine (ie; a profile named MyMill) to the software and the profiles are stored as individual xml files. All the user default settings are used on start-up. Parameters are numbered and may be logically grouped in a series of numbers. Some of the numbers are specific to the users machine and some are used by the user in programming (ie; Macro's). Some parameters are read only. The ranges of parameter number is 0 to 10320 but there other ones outside that range.
NOTE: Parameter values have developed / changed as Mach was developed thus
there are differences in the values from the early days.

A parameter used in Gcode is called a variable in Mach. A variable is just a letter name which can store / hold a number for use in an expression and there are different types.

Mach3 Mill Manual (excerpts from section 10)

10.4.2 Parameters

A Mach3 machining system maintains an array of 10,320 numerical parameters. Many of them have specific uses. The parameter which are associated with fixtures are persistent over time. Other parameters will be undefined when Mach3 is loaded. The parameters are preserved when the interpreter is reset. The parameters with meanings defined by Mach3 are given in figure 10.1

10.5.3.2 Parameter Value

A parameter value is the hash character # followed by a real value. The real value must evaluate to an integer between 1 and 10320. *(note it is whole number no 20.2 etc)* The integer is a parameter number, and the value of the parameter value is whatever number is stored in the numbered parameter.
The # character takes precedence over other operations, so that, for example, #1+2 means the number found by adding 2 to the value of parameter 1, not the value found in parameter 3.

Of course, #[1+2] does mean the value found in parameter 3. The # character may be repeated; for example ##2 means the value of the parameter whose index is the (integer) value of parameter 2.

10.5.4 Parameter Setting

A parameter setting is the following four items one after the other:
/a pound character #
/a real value which evaluates to an integer between 1 and 10320,
/ an equal sign = , and
/a real value. For example "#3 = 15" is a parameter setting meaning "set parameter 3 to 15."

A parameter setting does not take effect until after all parameter values on the same line have been found. For example, if parameter 3 has been previously set to 15 and the line #3=6 G1 x#3 is interpreted, a straight move to a point where x equals 15 will occur and the value of parameter 3 will be 6.

Mach3 is based on the Fanuc 6 system type a16, but the exact Mach3 numbers and variables may be slightly different than the reference to Fanuc's system in the reference section of this write-up.

SOME METHODS TO FIND VALUES

1. Use MachProfile" program by K. Dietz.
     Just compare two different XML's to see the difference.

2. Display the current value of a variable.
    Goto top menu bar select OPERATOR then go down to Gcode VAR monitor.
    Move the window over to where you want it . On the left input what # variable you
    wish to see . As the #variable changes it updates the values.

3. Use a macro to find information. Examples as posted are in the reference section
    Two macro's can be found in the "Mach Tool Box" under subject listing:

    Macro, Parameter Value Report by vmax549
    Macro, Fixture offset values by vmax549

The macro's are in the reference section of this write up.
 NOTE: Modify the macro for both range and directory as needed.

5. Find the numbers listed in:
    - Mach3 Mill or Lathe manual's
    - Wiki
     http://www.machsupport.com/Mach3Wiki/index.php?title=Main_Page

   - Mach3 Macro Programmers Reference Manual

6. Links (Artsoft Forum):

   Members Docs
   VB "Parameters" list
   Poppabear 3/31/2009
   http://www.machsupport.com/forum/index.php/topic,11056.0.html
   Mach_VB_parameters.doc

VARIABLES

-1 to 33 are local variables, there value can only be used within the current g-code file,
-100 to 149 and 500 to 531 are global and can be used over any number of files.
-In the later versions of Mach variables 500 to 600 are global variables.
-G52, G92 and all the G54-G59 fixture offsets position data is stored in #2500 range
-Tool offset data is stored in the #2000 range.
 -Use vars 99ABC where ABC is the OEM DRO number.
 Yes indeed, #99802=0 does zero the Z axis DRO. Works for #9980n for n=0 TO
 5.
 In addition, #99800=#99802 transfers the Z axis value into the X axis DRO. Full Read and
 Write.
-1-500 are open
 500-600 are open and are persistant Mach saves them on shutdown to the xml.

Just a word of warning :-

*#2001 onward are used by Mach3 as data locations for tool offsets, you may get strange
results if you use them. #100 to #149 and #500 to #531 are user variables #1000 and
over are system read only use. That said you can write to them to set system values.*
0-499
500-600 persistent
601-1999
2000-2003 G31 data
Graham and others

Groupings of variables from the Mach3 Mill Manual (figure 10.1)
#5161 – #5166   G28
#5181 – #5186   G30
#5191 – #5196   Scale
#5211 - #5216   G52/G92 offset
#5220   Current Work Offset
#5221 – #10306 Work Offsets
Parameter / variable list from figure 10.1 in the Mach3 Manual.
(List is updated to remove error in the manual)

5161	G28 home X
5162	G28 home Y
5163	G28 home Z
5164	G28 home A
5165	G28 home B
5166	G28 home C
5181	G30 home X
5182	G30 home Y
5183	G30 home Z
5184	G30 home A
5185	G30 home B
5186	G30 home C
5191	Scale X
5192	Scale Y
5193	Scale Z
5194	Scale A
5195	Scale B
5196	Scale C
5211	G92 offset X
5212	G92 offset Y
5214	G92 offset A
5215	G92 offset B
5216	G92 offset C
5220	Current Work offset number
5221	Work offset 1 X
5222	Work offset 1 Y
5223	Work offset 1 Z
5224	Work offset 1 A
5225	Work offset 1 B
5226	Work offset 1 C
5241	Work offset 2 X
5242	Work offset 2 Y

5243	Work offset 2 Z
5244	Work offset 2 A
5245	Work offset 2 B
5246	Work offset 2 C
5261	Work offset 3 X
5262	Work offset 3 Y
5263	Work offset 3 Z
5264	Work offset 3 A
5265	Work offset 3 B
5266	Work offset 3 C
5281	Work offset 4 X
5282	Work offset 4 Y
5283	Work offset 4 Z
5284	Work offset 4 A
5285	Work offset 4 B
5286	Work offset 4 C
5301	Work offset 5 X
5302	Work offset 5 Y
5303	Work offset 5 Z
5304	Work offset 5 A
5305	Work offset 5 B
5306	Work offset 5 C
5321	Work offset 6 X
5322	Work offset 6 Y
5324	Work offset 6 A
5325	Work offset 6 B
5326	Work offset 6 C
And so on every 20 values until	
10281	Work offset 254 X
10282	Work offset 254 Y
10283	Work offset 254 Z
10284	Work offset 254 A
10285	Work offset 254 B
10286	Work offset 254 C
10301	Work offset 255 X
10302	Work offset 255 Y
10303	Work offset 255 Z
10304	Work offset 255 A
10305	Work offset 255 B
10306	Work offset 255 C

REFERENCE SECTION

MACRO TO FIND PARAMETERS
NOTE: These macros should be put in the Macros directory for the screen set you are using. *Confirm*

```
'Macro Parameter Value Info
textFilePath = "C:\Mach3\ParamValueInfo.txt"
Set objFSO = CreateObject("Scripting.FileSystemObject")
Set objTextFile = objFSO.CreateTextFile(textFilePath)
Dt= Date()
Tm= Time()
objTextFile.WriteLine("ParamValueInfo")
objTextFile.WriteLine("  Date: " &Dt &" Time: " &Tm)
Num=0
Do Until num=10320
num=num+1
N = GetVar(num)
If N <>"0" Then
objTextFile.WriteLine("Parameter# "& num &"  * "& N  & Chr(13) & Chr(10))
Else
End If
Loop
objTextFile.Close
Dim sCOMMAND As String
 sCOMMAND="print c:\mach3\ParamValueInfo.txt"
 Shell("c:\wi
```


```
'Macro Fixture Offsets
textFilePath = "C:\Mach3\FixOffsetInfo.txt"
Set objFSO = CreateObject("Scripting.FileSystemObject")
Set objTextFile = objFSO.CreateTextFile(textFilePath)
Do Until num=10320
Num=5222
num=num+1
N = GetVar(num)
Dt= Date()
Tm= Time()
If N <>"0" Then
objTextFile.WriteLine("Parameter"& num &"  * "& N  & Chr(13) & Chr(10))
Else
```

```
End If
Loop
objTextFile.WriteLine("**")
objTextFile.WriteLine("  Date: " &Dt &" Time: " &Tm)
objTextFile.Close
Dim sCOMMAND As String
 sCOMMAND="print c:\mach3\FixOffsetInfo.txt"
 Shell("c:\winnt2\system32\cmd.exe /c" & sCOMMAND)
End
```

FANUC MACRO VARIABLES

Have a look here, mach3 is based on the Fanuc 6 system type a16, i.e. it has no
conditional commands or loops and no I/O commands
http://www.machinetoolhelp.com/Applications/macro/macro_variables.html
Graham

Types of Fanuc macro variables or parametric programming

Types of Macro Variables

Type of variable	Variable number
Local variable	#1 - #33
Common variable	#100 - #149 #500 - #531
Additional common variable (Note 1)	#100 - #199 #500 - #999
System variable (Note 2)	#1000 - #19099

Note 1 Common variables #150 to #199 and #532 to #999 can be added. Part program length reduces by 8.5 m.
Note 2 Details are shown in System variables

Fanuc macro system variables

Fanuc Macro System Variable lists
parametric programming

Purpose	Variable number	Contents	Series
Interface input Signal	#1000–#1015	Corresponds to UI000 to UI015	T/M
	#1032	Unified input of UI000 to UO015	
Interface output signal	#1100–#1115	Corresponds to UO000 to UO015	T/M
	#1132	Unified output of UO000 to UO015	
	#1133	Unified output of UO100 to UO131	
X axis offset	#2001–#2064	Wear offset value (Offset No. 1–64)	T
	#2701–#2749	Geometry offset value (Offset No. 1–49)	
	#10001–#10099	Wear offset value (Offset No. 1–99)	
	#15001–#15099	Geometry offset value (Offset No. 1–99)	
Z axis offset	#2101–#2164	Wear offset value (Offset No. 1–64)	T
	#2801–#2849	Geometry offset value (Offset No. 1–49)	
	#11001–#11099	Wear offset value (Offset No. 1–99)	
	#16001–#16099	Geometry offset value (Offset No. 1–99)	
Tool nose radius compensation	#2201–#2264	Wear offset value (Offset No. 1–64)	T
	#2901–#2969	Geometry offset value (Offset No. 1–64)	
	#12001–#12099	Wear offset value (Offset No. 1–99)	
	#17001–#17099	Geometry offset value (Offset No. 1–99)	

Imaginary tool tip position	#2301–#2364	Wear offset value (Offset No. 1–64)	T
	#2301–#2364	Geometry offset value (Offset No. 1–64)	
	#13001–#13099	Wear offset value (Offset No. 1–99)	
	#13001–#13099	Geometry offset value (Offset No. 1–99)	
Y axis offset	#2401–#2449	Wear offset value (Offset No. 1–49)	T
	#2451–#2499	Geometry offset value (Offset No. 1–49)	
	#14001–#14099	Wear offset value (Offset No. 1–99)	
	#19001–#19099	Geometry offset value (Offset No. 1–99)	
Tool compensation (offset memory A)	#2001–#2200	Tool compensation (offset no. 1–200)	M
	#10001–#10999	Tool compensation (offset no. 1–999)	
Tool compensation (offset memory B)	#2001–#2200	Wear offset value (offset no. 1–200)	M
	#2201–#2400	Geometry offset value (offset no. 1–200)	
	#10001–#10999	Wear offset value (offset no. 1–999)	
	#11001–#11999	Geometry offset value (offset no. 1–999)	
Tool compensation (offset memory C)	#2001–#2200	Wear offset of H code (offset no. 1–200)	M
	#2201–#2400	Geometry offset of H code (offset no. 1–200)	
	#10001–#10400	Wear offset of H code (offset no. 1–999)	
	#11001–#11999	Geometry offset of H code (offset no. 1–999)	
	#12001–#12999	Wear offset of D code (offset no. 1–999)	
	#13001–#13999	Geometry offset of D code (offset no. 1–999)	

Alarm	#3000		T/M
Clock	#3001	Clock 1 (unit: 1ms)	
	#3002	Clock 2 (unit: 1 hour)	
Control of single block stop, wait signal for FIN	#3003		
Control of feedhold, feedrate override, exact stop check	#3004		
Setting	#3005		
Status of mikrror image	#3007	Mirror image check signal	
Clock	#3011	Year, month, day	
	#3012	Hour, minute, second	

No. of parts	#3901	No. of parts machined	T/M
	#3902	No. of parts required	

Modal Information	#4001~#4022	G code (group 01~22)	T/M
	#4102	B code	
	#4107	D code	
	#4109	F code	
	#4111	H code	
	#4113	M code	
	#4114	Sequence number	
	#4115	Program number	
	#4119	S code	
	#4120	T code	
	#4130	P code	

Block end position (Workpiece coordinate)	#5001–#5008	1st axis block end position to 8th axis block end position	T/M
Machine coordinate	#5021–#5028	1st axis current position to 8th axis current position	
Workpiece coordinate	#5041–#5048	1st axis current position to 8th axis current position	
Skip signal position (Workpiece coordinate)	#5061–#5068	1st axis skip signal position to 8th axis skip signal position	
Tool offset value	#5081–#5088	1st axis tool offset value to 8th axis tool offset value	
Servo position deviation	#5101–#5108	1st axis servo position deviation to 8th axis servo position deviation	

External workpiece zero point offset value	#2500 #2600 #2700 #2800	1st axis 2nd axis 3rd axis 4th axis	M
G54 workpiece zero point offset value	#2501 #2601 #2701 #2801	1st axis 2nd axis 3rd axis 4th axis	
G55 workpiece zero point offset value	#2502 #2602 #2702 #2802	1st axis 2nd axis 3rd axis 4th axis	
G56 workpiece zero point offset value	#2503 #2603 #2703 #2803	1st axis 2nd axis 3rd axis 4th axis	

G57 workpiece zero point offset value	#2504 #2604 #2704 #2804	1st axis 2nd axis 3rd axis 4th axis	
G58 workpiece zero point offset value	#2505 #2605 #2705 #2805	1st axis 2nd axis 3rd axis 4th axis	
G59 workpiece zero point offset value	#2506 #2606 #2706 #2806	1st axis 2nd axis 3rd axis 4th axis	
External workpiece zero point offset value	#5201–#5208	1st axis to 8th axis	T/M
G54 workpiece zero point offset value	#5221–#5228	1st axis to 8th axis	
G55 workpiece zero point offset value	#5241–#5248	1st axis to 8th axis	
G56 workpiece zero point offset value	#5261–#5268	1st axis to 8th axis	
G57 workpiece zero point offset value	#5281–#5288	1st axis to 8th axis	
G58 workpiece zero point offset value	#5301–#5308	1st axis to 8th axis	
G59 workpiece zero point offset value	#5321–#5328	1st axis to 8th axis	
G54.1 P1 workpiece zero point offset value	#7001–#7008	1st axis to 8th axis	M
G54.1 P2 workpiece zero point offset value	#7021–#7028	1st axis to 8th axis	M
G54.1 P48 workpiece zero point offset value	#7941–#7948	1st axis to 8th axis	M
G54.1 P1 workpiece zero point offset value	#14001–#14008	1st axis to 8th axis	
G54.1 P2 workpiece zero point offset value	#14021–#14028	1st axis to 8th axis	
G54.1 P48 workpiece zero point offset value	#19980–#19988	1st axis to 8th axis	M

This list gives the codes to be used in calls of SetOEMDRO and GetOEMDRO to access all DROs.

If you are using a version of Mach3 prior to 1.90 then to access data in this list that are in the range 800 upwards you will need to refer to the deprecated calls (e.g. SetDRO) and corresponding codes.

command: (FROM Mach3Wiki)

SetOEMDRO

GetOEMDRO

Function	OEMCode
Jog Inc Inc DRO	1
Pulse Freq DRO	2
Slow Jog % DRO	3
X min DRO	4
Y min DRO	5
Z min DRO	6
A min DRO	7
B min DRO	8
C min DRO	9
X max DRO	10
Y max DRO	11
Z max DRO	12
A max DRO	13
B max DRO	14
C max DRO	15
X G92 Axis Off DRO	16
Y G92 Axis Off DRO	17
Z G92 Axis Off DRO	18
A G92 Axis Off DRO	19
B G92 Axis Off DRO	20
C G92 Axis Off DRO	21
Queue Depth DRO	22
Time Scale DRO	23
PWM Base DRO	24
Torch Correction Speed DRO	25

Torch Height Corrorrection DRO	26
Torch Height Max DRO	27
CPU Load DRO	28
Encoder 1 (X) position DRO	29
Encoder 2 (Y) position DRO	30
Encoder 3 (Z) position DRO	31
Tool length offset	32
X axis Ref Sw DRO	33
Y axis Ref Sw DRO	34
Z axis Ref Sw DRO	35
A axis Ref Sw DRO	36
B axis Ref Sw DRO	37
C axis Ref Sw DRO	38
True spindle DRO	39
Worst Case DRO	40
Tool X Offset DRO	41
Tool Z Offset DRO	42
Tool Dia DRO	43
Tool Tip Rad DRO	44
Touch Correction DRO	45
Current Fixture Number DRO	46
Part X Offset DRO	47
Part Y Offset DRO	48
Part Z Offset DRO	49
Part A Offset DRO	50
Part B Offset DRO	51
Part C Offset DRO	52
CPU Speed DRO	53
Safe Z DRO	54
Overidden Feed Rate DRO (read only?)	55
Pulley DRO	56
Max Spindle Speed on current pulley DRO	57
Velocity per Rev DRO	58
X Scale DRO	59
Y Scale DRO	60

Z Scale DRO	61
A Scale DRO	62
B Scale DRO	63
C Scale DRO	64
Lowest Torch Correction DRO	65
Threading Entrance Angle DRO	66
Max Entrance Points DRO	67
Rotational Time Error DRO	68
Entrance Trigger DRO	69
Time Correction Derivative DRO	70
Interrupts per spindle rev DRO	71
Current Spin Counts DRO	72
Spin Adder DRO	73
Spindle Speed Override DRO	74
Stock Size DRO	75
Laser X Grid DRO	76
Laser Y Grid DRO	77
Repetitions DRO	78
Lower Z-Inhibit By DRO	79
Z-Inhibit DRO	80
Port Bit-test DRO (diagnostic)	81
Anti-dive limit DRO	82
X Machine Coord DRO	83
Y Machine Coord DRO	84
Z Machine Coord DRO	85
A Machine Coord DRO	86
B Machine Coord DRO	87
C Machine Coord DRO	88
Blend factor DRO	89
Number of spindle disc slots DRO	90
G73 Pull-off value DRO	91
Tangential lift threshold angle DRO	92
Tangential lift Z level DRO	93
reserved	94
reserved	95

reserved	96
CV Feedrate DRO	97
Feed override increment value DRO	98
??? Spindle ratio DRO	99
Encoder 4 position DRO	100
MPG 1 count DRO	101
MPG 2 count DRO	102
MPG 3 count DRO	103
Rapid feedrate DRO	104
Diameter of current tool DRO	105
Tip direction of current tool DRO	106
Tool nose radius of current tool DRO	107
X offset of current tool DRO	108
Z offset of current tool DRO	109
X wear offset of current tool DRO	110
Z wear offset of current tool DRO	111
Tool turret angle of current tool DRO	112
Velocity of MPG 1 DRO	113
Velocity of MPG 2 DRO	114
Velocity of MPG 3 DRO	115
Angle of taper to be cut with MPG tapering DRO	116
Spindle speed as surface speed DRO	117
Angle of rotation of X/Y coordinate system (cf G68)	118
Laser grid spacing DRO	119
Number of incremental jogs that can be buffered DRO	120
Minimum spindle speed on current pulley DRO	121
Feed rate ignoring that set in F word DRO	122
Tool post offset (between front and rear posts DRO	123
Current velocity of MPG 1 DRO	124
Current velocity of MPG 2 DRO	125
Feedrate for use with MPG step jogs DRO	126
Error between Encoder 1 and abs X position DRO	127
Error between Encoder 2 and abs Y position DRO	128
Error between Encoder 3 and abs Z position DRO	129
Time (uSec) in interrupt handler DRO	130

SLS Dist - laser position measurement DRO	131
Axis 6 Tripcount - system debug use only DRO	132
??? Engine lookahead DRO	133
Count of actual pulses output on X - debug use only DRO	134
Count of actual pulses output on Y - debug use only DRO	135
Count of actual pulses output on Z - debug use only DRO	136
Count of actual pulses output on A - debug use only DRO	137
Count of actual pulses output on B - debug use only DRO	138
Count of actual pulses output on C - debug use only DRO	139
Actual count from encoder 1 - debug use only DRO	140
Actual count from encoder 2 - debug use only DRO	141
Actual count from encoder 3 - debug use only DRO	142
Actual count from encoder 4 - debug use only DRO	143
Actual count from encoder 5 - debug use only DRO	144
Actual count from encoder 6 - debug use only DRO	145
ModBus input 64 DRO	146
ModBus input 65 DRO	147
ModBus input 66 DRO	148
ModBus input 67 DRO	149
Softlimit X Maximum DRO	150
Softlimit Y Maximum DRO	151
Softlimit Z Maximum DRO	152
Softlimit A Maximum DRO	153
Softlimit B Maximum DRO	154
Softlimit C Maximum DRO	155
Softlimit X Minimum DRO	156
Softlimit Y Minimum DRO	157
Softlimit Z Minimum DRO	158
Softlimit A Minimum DRO	159
Softlimit B Minimum DRO	160
Softlimit C Minimum DRO	161
Distance from front to rear toolpost DRO	162
Encoder 1 position (in units) DRO	170
Encoder 2 position (in units) DRO	171
Encoder 3 position (in units) DRO	172

Encoder 4 position (in units) DRO	173
Part X radius/diameter for Touching to tooltable DRO	175
Part Z location for Touching to tooltable DRO	176
reserved DRO	177
Machine X coord - X Work Offset DRO	178
Machine Y coord - Y Work Offset DRO	179
Machine Z coord - Z Work Offset - Tool length DRO	180
Machine A coord - A Work Offset DRO	181
Machine B coord - B Work Offset DRO	182
Machine C coord - C Work Offset DRO	183
X Cont. Pnt. coord (Machine - Work - G52/G92) DRO	184
Y Cont. Pnt. coord (Machine - Work - G52/G92) DRO	185
Z Cont. Pnt. coord (Machine - Work - Tool len. - G52/G92) DRO	186
A Cont. Pnt. coord (Machine - Work - G52/G92) DRO	187
B Cont. Pnt. coord (Machine - Work - G52/G92) DRO	188
C Cont. Pnt. coord (Machine - Work - G52/G92) DRO	189
X axis home location used by G28 DRO	190
Y axis home location used by G28 DRO	191
Z axis home location used by G28 DRO	192
A axis home location used by G28 DRO	193
B axis home location used by G28 DRO	194
C axis home location used by G28 DRO	195
X axis Distance to Go DRO	196
Y axis Distance to Go DRO	197
Z axis Distance to Go DRO	198
A axis Distance to Go DRO	199
B axis Distance to Go DRO	200
C axis Distance to Go DRO	201
Overriden spindle speed DRO	202
Current pulley reversed direction	203
Current X offset of Turn tool	204
reserved	205
reserved	206
reserved	207
Encoder X reading corrected by offsets	208

Encoder Y reading corrected by offsets	209
Encoder Z reading corrected by offsets	210
X soft limits Max	211
y soft limits Max	212
Z soft limits Max	213
X soft limits Min	214
y soft limits Min	215
Z soft limits Min	216
Spindle Seconds CW	217
reserved	218
reserved	219
Brains exe time (ms)	220
Probe Radius	221
Sub Program depth	222
Rapid Override	223
Number of macros currently running	224
X DRO	800
Y DRO	801
Z DRO	802
A DRO	803
B DRO	804
C DRO	805
X Vel DRO	806
Y Vel DRO	807
Z Vel DRO	808
A Vel DRO	809
B Vel DRO	810
C Vel DRO	811
Blended Velocity DRO	813
Elapsed DRO	814
Estimate DRO	815
Curr Line no DRO	816
Spindle requested DRO	817
Feedrate DRO	818
Motion Mode (G0, G1, G2 etc) DRO	819

Feedrate Override (FRO)	821
Tool number DRO	824
Rot A diameter DRO	825
Rot B diameter DRO	826
Rot C diameter DRO	827
Jog Inc DRO	828
X Fixture Off DRO	830
X Fixture Orig Off DRO	830
Y Fixture Off DRO	831
Y Fixture Orig Off DRO	831
Z Fixture Off DRO	832
Z Fixture Orig Off DRO	832
A Fixture Off DRO	833
A Fixture Orig Off DRO	833
B Fixture Orig Off DRO	834
B Fixture Off DRO	834
C Fixture Orig Off DRO	835
C Fixture Off DRO	835
Current Tool length DRO	836