



Siemens 840D Training Course Programming Examples

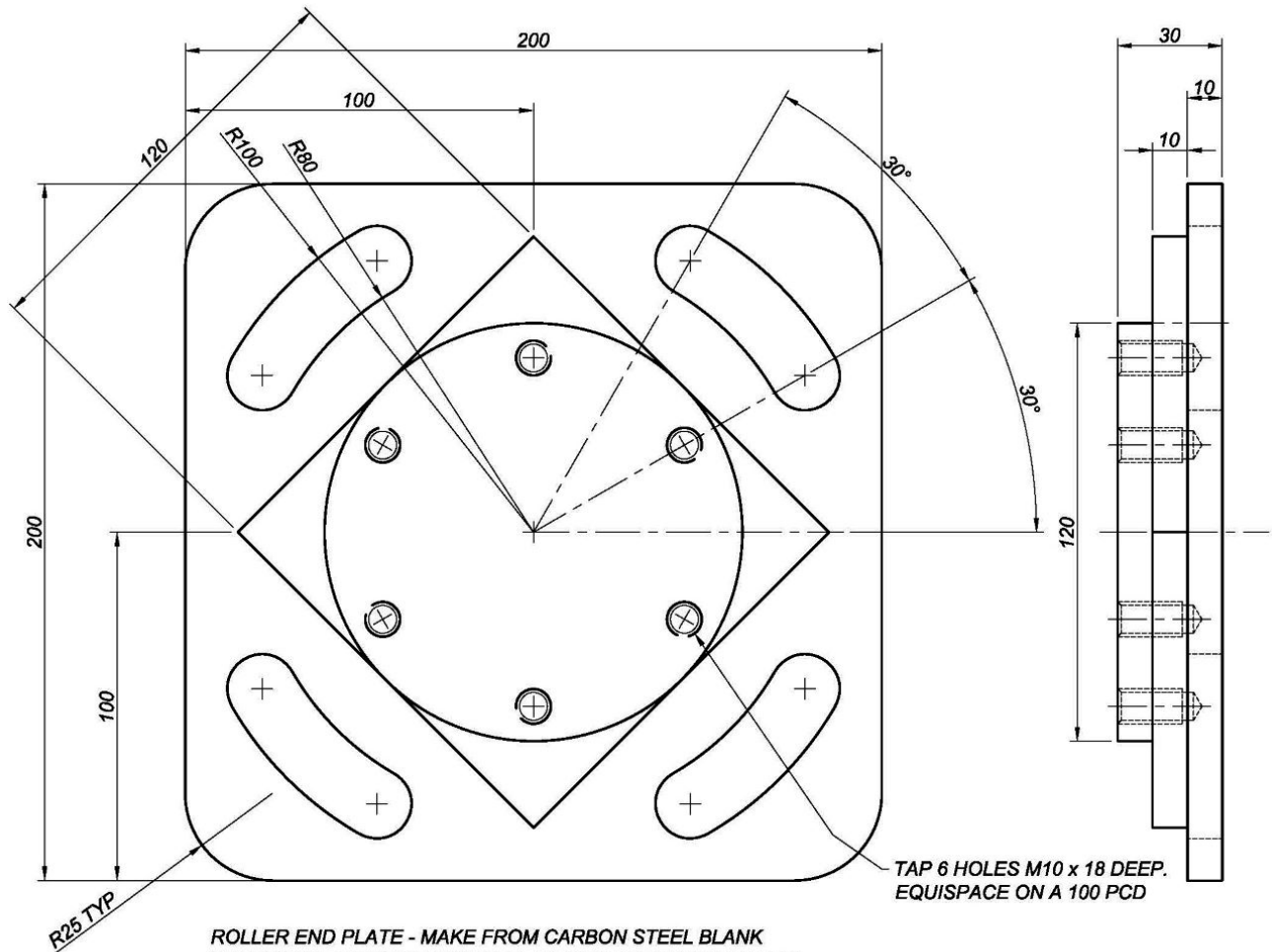


This document is made available as a preliminary version (draft).
Questions and feedback should be sent to support@cimco.com

Programming Examples using Siemens Cycles & Programming Aids from Cimco NC-Assistant

Example 1

This Roller End Plate is held in a precision vice to machine the top face features in operation 1 and then held in a fixture to machine the outside profile. The programming zero point is taken as the centre of the part. The Blank part is cut to 206 x 206 x 32 mm. See program text below. See below the program created in Cimco NC-Assistant



```
%_N_0102_MPF
;$PATH=/_N_WKS_DIR/_N_SIEMENS_TEST_JB_WPD
;DESCRIPTION-ROLLER END PLATE
;DRAWING NO-12345 ISSUE-A
;OPERATION-OP1 - MACHINE TOP FACE
;PROGRAMMER-JOE SMITH
;DATE/TIME-09/09/2021 12:47:16
;-----
N10 ;FACE MILL SURFACE
;FACE MILL 50MM
G90 G40 G17 G97
```

```
SUPA G00 Z-150
M6 T1 ;COULD BE WRITTEN LIKE THIS - TC ("T1")
G94 D1
G54
G00 X-130 Y-130
S900 M03 F250
Z50 M08
CYCLE71(50,5,5,0,-102,-
102,200,200,0,2.5,40,30,0.5,100,31,20);ROUGH
CYCLE71(50,5,5,0,-102,-
102,200,200,0,2,40,30,0,100,32,20);FINISH
```

G00 Z50 M09
X-130 Y-130
D0
M01

N20 ;MILL 120 MM SQUARE POST
;CARBIDE END MILL 20MM
G90 G40 G17 G97
SUPA G00 Z-150
M6 T10 ;("T10")
G94 D1
G54
G00 X-130 Y-130
S500 M03 F400
Z50 M08
CYCLE76(30,0,1,-
20,,120,120,0,0,0,45,5,0,0,1500,1500,1,1,,);ROUGH
CYCLE76(30,0,1,-
20,,120,120,0,0,0,45,20,0,0,1500,1500,2,2,,);FINISH
G00 Z50 M09
X-130 Y-130
D0
M01

N30 ;120 MM ROUND POST
;CARBIDE END MILL 20MM
G90 G40 G17 G97
SUPA G00 Z-150
M6 T10 ;("T10")
G94 D1
G54
G00 X-130 Y-130
S500 M03 F1400
Z50 M08
CYCLE77(30,0,2,-
10,,60,0,0,2.5,-.5,0,1500,1500,2,1,);ROUGH
CYCLE77(30,0,2,-10,,60,0,0,10,0,0,1500,1500,2,2,)
;FINISH
G00 Z50 M09
X-130 Y-130
D0
M01

N40 ;MILL CIRCULAR SLOTS
;CARBIDE END MILL 12MM
G90 G40 G17 G97
SUPA G00 Z-150
M6 T11 ;("T11")
G94 D1
G54
G00 X-130 Y-130
S500 M03 F1000
Z50
SLOT2(30,-20,1,-
32,,4,30,20,0,0,90,60,90,1000,1000,8,2,.5,11,,,,1500)
SLOT2(30,-20,1,-
32,,4,30,20,0,0,90,60,90,1500,1500,20,2,0,2,20,1500,6
00,1500)
G00 Z50 M09
X-130 Y-130
D0
M01

N50 ;CENTRE DRILL 6 HOLES
;HSS CENTRE DRILL
G90 G40 G17 G97
SUPA G00 Z-150
M6 T2 ;("T2")
G94 D1
G54
G00 X-130 Y-130
S500 M03 F70
Z50 M08
MCALL CYCLE81(10,0,2,-5,)
HOLES2(0,0,50,30,60,6)
MCALL
G00 Z50 M09
X-130 Y-130
D0
M01

N60 ;DRILL 6 HOLES 8.5MM
;CARBIDE DRILL 8.5MM
G90 G40 G17 G97

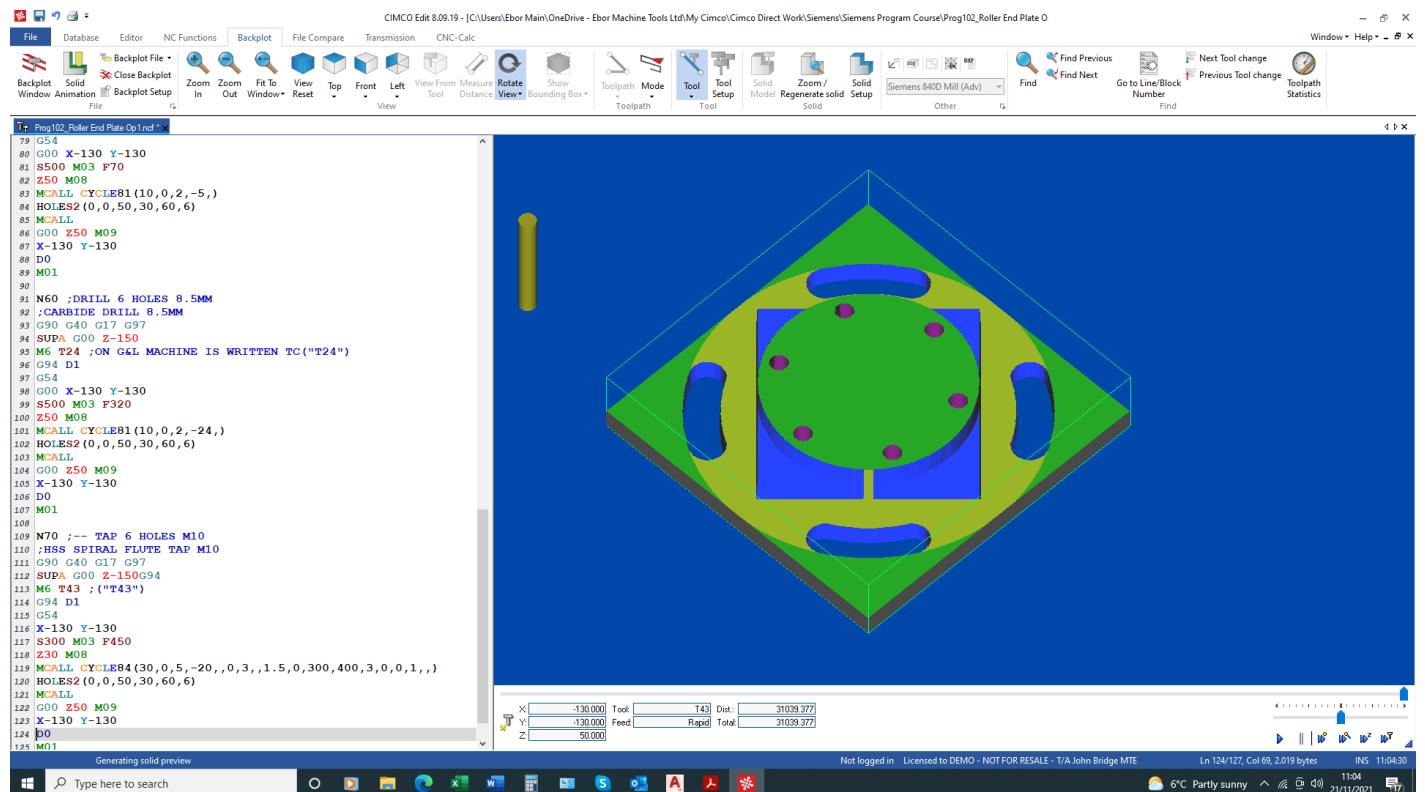
SUPA G00 Z-150
M6 T24 ;ON G&L MACHINE IS WRITTEN TC("T24")
G94 D1
G54
G00 X-130 Y-130
S500 M03 F320
Z50 M08
MCALL CYCLE81(10,0,2,-24,)
HOLES2(0,0,50,30,60,6)
MCALL
G00 Z50 M09
X-130 Y-130
D0
M01

N70 ;-- TAP 6 HOLES M10
;HSS SPIRAL FLUTE TAP M10
G90 G40 G17 G97

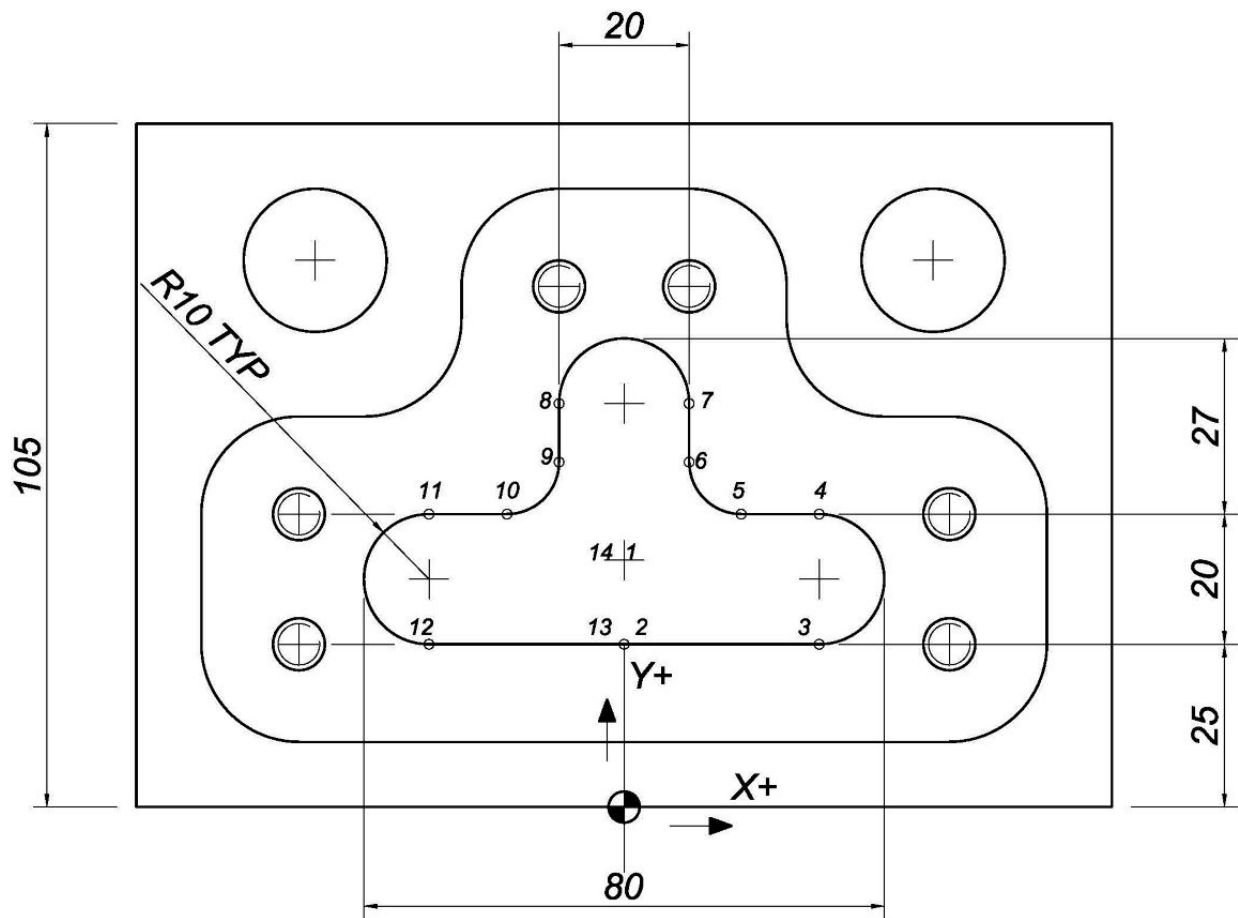
SUPA G00 Z-150G94
M6 T43 ;("T43")

G94 D1
G54
X-130 Y-130
S300 M03 F450
Z30 M08
MCALL CYCLE84(30,0,5,-
20,,0,3,,1.5,0,300,400,3,0,0,1,,)
HOLES2(0,0,50,30,60,6)
MCALL
G00 Z50 M09
X-130 Y-130
D0
M01
M30

See the Solid Animation Backlot from the Editor for the program above.



See Profile points in the diagram below that coincide with the programmed points in the T Slot section of the programming below starting at N50. Without referring to the example program below create the profile in the Editor testing with Tool Path Backplot as you go.



```
%_N_0105_MPF
; $PATH=/_N_WKS_DIR/_N_SIEMENS_TEST_JB_WPD
; DESCRIPTION-ROLLER END PLATE
; DRAWING NO-12345 ISSUE-A
; OPERATION-MACHINE TOP FACE
; PROGRAMMER-JOE SMITH
; DATE/TIME-23/09/2021 14:50:56
; -----
G90 G40 G17 G97
SUPA G00 Z0
```

```
M6 T2
G94 D1
G54
G00 X0 Y0
S750 M03
Z30 M08
N10 CYCLE71(30,5,5,0,-
80,0,150,105,0,2.5,40,5,0,120,31,20)
SUPA G00 Z0
X0 Y0
D0
```

M01

N20 ;3 HOLES 22MM U-DRILL

;U-DRILL 22MM

G90 G40 G17 G97

SUPA G00 Z0

M6 T51

G94 D1

G54

G00 X-50. Y77.5 S1600 M03

Z30 M08 F100

MCALL CYCLE81 (20,0,2,-28,0)

G00 X-50. Y77.5

G00 X50. Y77.5

MCALL

MCALL CYCLE81 (20,0,2,-6,0)

G00 X0 Y38.

MCALL

SUPA G00 Z0

X0 Y0

D0

M01

N30 ;REMOVE CORNER MATERIAL

;CARBIDE END MILL 20MM

G90 G40 G17 G97

SUPA G00 Z0

M6 T5

G94 D1

G54

G00 X0 Y84.

S1900 M03

Z30 M08

POCKET3 (30,0,2,-20,45,45,12,-
52,87,0,5,0,0,120,50,0,11,3)

G00 Z30.

POCKET3 (30,0,2,-
20,45,45,12,52,87,0,5,0,,120,50,0,11,3)

SUPA G00 Z0

X0 Y0

D0

M01

N40;OUTSIDE PROFILE 2

;CARBIDE END MILL 25MM

G90 G40 G17 G97

SUPA G00 Z0

M6 T7

G94 D1

G54

G00 X0 Y-30. S1500 M03

Z30 M08

G1 Z2 F1000

Z0 F120

PROF1:

G91 Z-3.333

G90

G00 X0 Y-30. F100

G1 G41 Y10.

X-65.000 RND=15

Y60. RND=15

X-25.000 RND=15

Y95. RND=15

X25.000 RND=15

Y60. RND=15

X65.000 RND=15

Y10. RND=15

X0.000

G40 Y-30.

ENDLABEL:

REPEAT PROF1 P=5

SUPA G00 Z0

X0 Y0

D0

M01

N50;T SLOT PROFILE
;CARBIDE END MILL 16MM

G90 G40 G17 G97
SUPA G00 Z0
M6 T7
G94 D1
G54
G00 X0 Y38. S2300 M03

Z30. M08
G1 Z2 F1000
Z0 F120

PROF2:

G91 Z-2.

G90

G00 X0 Y38. ;-- 1 PROFILE POINTS

G1 G41 Y25. ;-- 2

X30. ;-- 3

G3 X30. Y45 I0 J10. ;-- 4

G1 X20. ;-- 5

G2 X10. Y55. I0 J10. ;-- 6

G1 Y62. ;-- 7

G3 X-10. Y62. I-10. J0 ;-- 8

G1 Y55. ;-- 9

G2 X-20. Y45. I-10. J0 ;-- 10

G1 X-30. ;-- 11

G3 X-30. Y25. I0 J-10. ;-- 12

G1 X0 ;-- 13

G40 Y38. ;-- 14

ENDLABEL:

REPEAT PROF2 P=2

SUPA G00 Z0

X0 Y0

D0

M01

N60 ;6 HOLES CENTRE DRILL

;CENTRE DRILL

G90 G40 G17 G97

SUPA G00 Z0

M6 T2

G94 D1

G54

G00 X-50. Y25. S1000 M03

Z30 M08 F70

MCALL CYCLE81 (20,0,2,-3,0)

HOLES1:

G00 X-50. Y25.

X-50. Y45.

X-10. Y84.

X10. Y84.

X50. Y45.

X50. Y25.

ENDLABEL:

MCALL

SUPA G00 Z0

X0 Y0

D0

M01

N70;6 HOLES DRILL 6.8MM

;CARBIDE DRILL 6.8MM

G90 G40 G17 G97

SUPA G00 Z0

M6 T14

G94 D1

G54

G00 X0 Y0 S4000 M03

Z30 M08 F400

MCALL CYCLE83 (20,0,2,-25,,5,,-1,0,0,1,1,2,0,0,0,)

REPEAT HOLES1

MCALL

SUPA G00 Z0

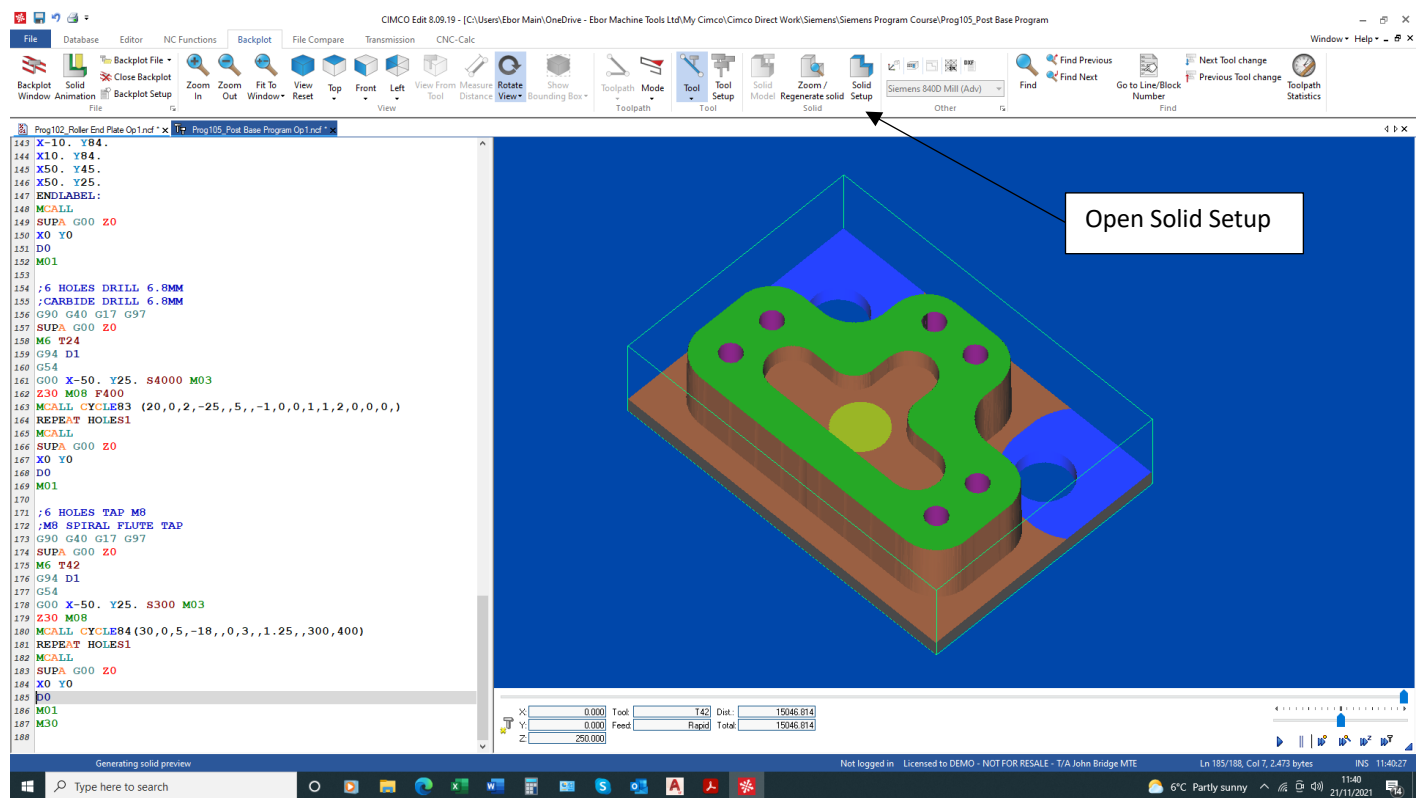
X0 Y0

D0
 M01

 N80;6 HOLES TAP M8
 ;M8 SPIRAL FLUTE TAP
 G90 G40 G17 G97
 SUPA G00 Z0
 M6 T20
 G94 D1
 G54

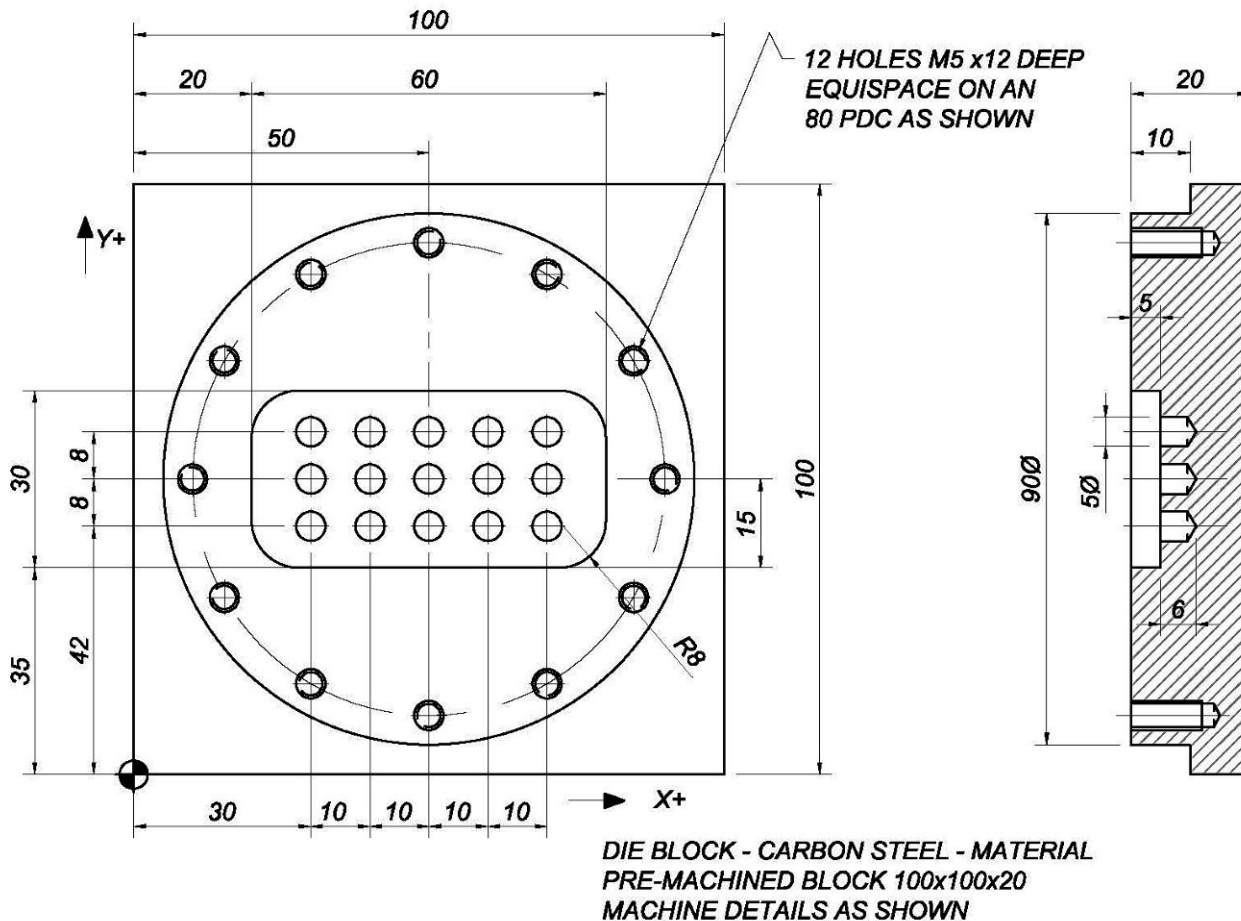
G00 X0 Y0 S300 M03
 Z30 M08
 MCALL CYCLE84(30,0,5,-18,,0,3,,1.25,,300,400)
 REPEAT HOLES1
 MCALL
 SUPA G00 Z0
 X0 Y0
 D0
 M01
 M30

See the Solid Animation Backplot from the Editor. To achieve a good presentation of the machining Backplot the Solid Setup must be set to represent the material sizes. Open the box indicated below and set the material size from the drawing for X, Y, Z, Max and Min



Example 3

This Die Block is held in a precision vice to machine the top face features in operation 1. The Blank part is cut to 100 x 100 x 25 mm. See program text below. See below the program created in Cimco NC-Assistant



%_N_0106_MPF	G00 X-35 Y-35
;\$PATH=/_N_WKS_DIR/_N_SIEMENS_TEST_JB_WPD	S750 M03
;DESCRIPTION-DIE BLOCK	Z30 M08
;DRAWING NO-12345 ISSUE-A	CYCLE71(30,5,5,0,0,0,100,100,0,2.5,40,5,0,120,31,20)
;OPERATION-MACHINE TOP FACE	SUPA G00 Z0
;PROGRAMMER-JOE SMITH	X-35 Y-35
;DATE/TIME-23/09/2021 15:44:13	D0
;-----	M01
N10 ;FACE MILL SURFACE	
;FACE MILL 50MM	N20;ROUGH MILL 90 DIAMETER
G90 G40 G17 G97	;T1 50MM FACE MILL
SUPA G00 Z0	G90 G40 G17 G97
M6 T1	SUPA G00 Z0
G94 D1	M6 T1
G54	
10	

G94 D1
 G54
 G00 X-35 Y-35
 S750 M03
 Z30 M08
 CYCLE77(30,0,2,-10,,45,50,50,2.5,.5,0,100,50,2,1,200)
 SUPA G00 Z0
 X-35 Y-35
 D0
 M01

N30 ;FINISH MILL 90 DIAMETER
 ;T5 20MM CARBIDE END MILL

G90 G40 G17 G97

SUPA G00 Z0

M6 T10

G94 D1

G54

G00 X-35 Y-35

S750 M03

Z30 M08

CYCLE77(30,0,2,-10,,45,50,50,10,.5,0,100,50,2,1,200)

SUPA G00 Z0

X-35 Y-35

D0

M01

N40 ;ROUGH MILL 60x30 POCKET

;T6 12MM CARBIDE END MILL

G90 G40 G17 G97

SUPA G00 Z0

M6 T11

G94 D1

G54

G00 X-35 Y-35

S2000 M03

Z30 M08

POCKET3 (30,0,2,-
 5,60,30,8,50,50,0,1.5,1,0,150,50,2,11,2,,,,10,2)

SUPA G00 Z0

X-35 Y-35

D0

M01

N50 ;FINISH MILL 60x30 POCKET

;T6 12MM CARBIDE END MILL

G90 G40 G17 G97

SUPA G00 Z0

M6 T11

G94 D1

G54

G00 X-35 Y-35

S2000 M03

Z30 M08

POCKET3 (30,0,2,-
 5,60,30,8,50,50,0,5,1,0,150,50,2,11,2,,,,10,2)

SUPA G00 Z0

X-35 Y-35

D0

M01

N60 ;CENTRE DRILL 15x5MM AND 12xM5 HOLES

;T2 CENTRE DRILL

G90 G40 G17 G97

SUPA G00 Z0

M6 T2

G94 D1

G54

G00 X-35 Y-35

Z30

S1200 M3

MCALL CYCLE81 (10,-5,2,-6,0)

CYCLE801(30,42,0,10,8,5,3)

MCALL

MCALL CYCLE81 (10,0,2,-3,0)

HOLES2(50,50,40,0,30,12)

MCALL

SUPA G00 Z0
X-35 Y-35
D0
M01

N70 ;DRILL 5MM HOLES
;5MM CARBIDE DRILL

G90 G40 G17 G97

SUPA G00 Z0

M6 T26

G94 D1

G54

G00 X-35 Y-35

Z30

S3000 M3

MCALL CYCLE81 (10,-5,2,-11,0)

CYCLE801(30,42,0,10,8,5,3)

MCALL

SUPA G00 Z0

X-35 Y-35

D0

M01

N80 ;DRILL TAPPED HOLES
;CARBIDE DRILL 4.2MM

G90 G40 G17 G97

SUPA G00 Z0

M6 T25

G94 D1

G54

G00 X-35 Y-35

Z30

S1234 M3

MCALL CYCLE81 (10,0,2,-3,0)

HOLES2(50,50,40,0,30,12)

MCALL

SUPA G00 Z0

X-35 Y-35

D0

M01

N90 ;TAP M5 HOLES

;T19 M5 TAP

G90 G40 G17 G97

SUPA G00 Z0

M6 T40

G94 D1

G54

G00 X-35 Y-35

Z30

S300 M3

MCALL CYCLE84(30,0,5,-14,,0,3,,.75,,300,400)

HOLES2(50,50,40,0,30,12)

MCALL

SUPA G00 Z0

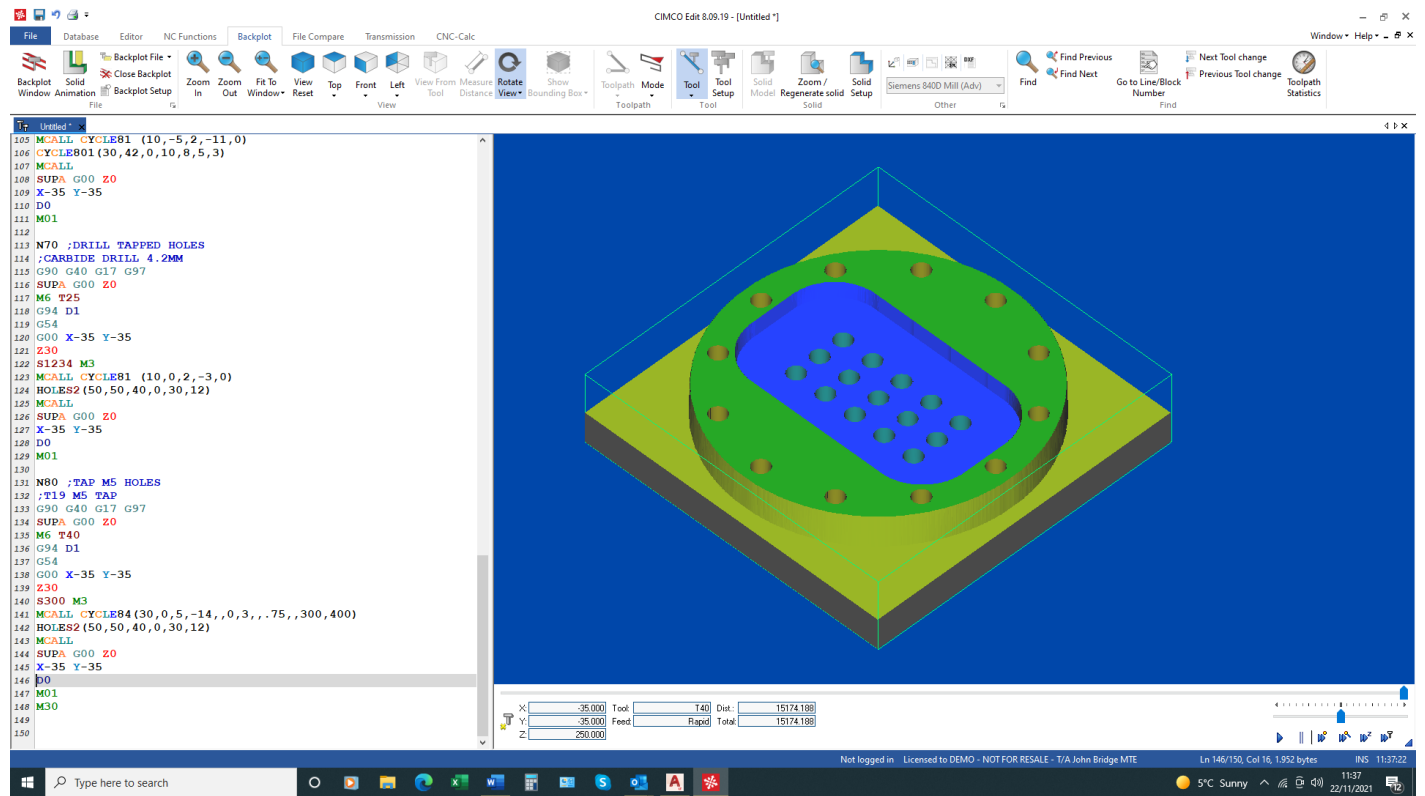
X-35 Y-35

D0

M01

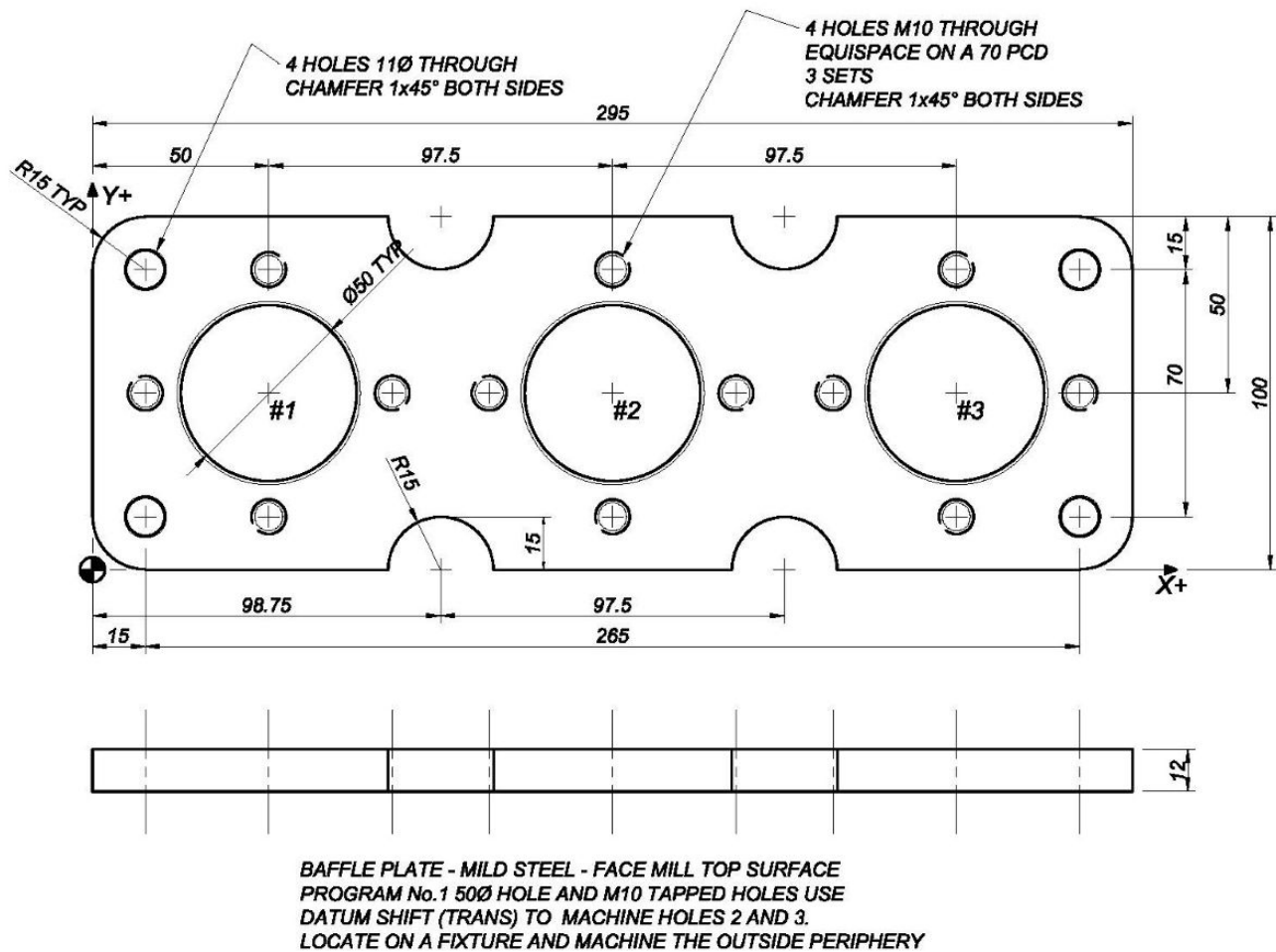
M30

See below the Solid Animation of the program above in the Cimco Editor.

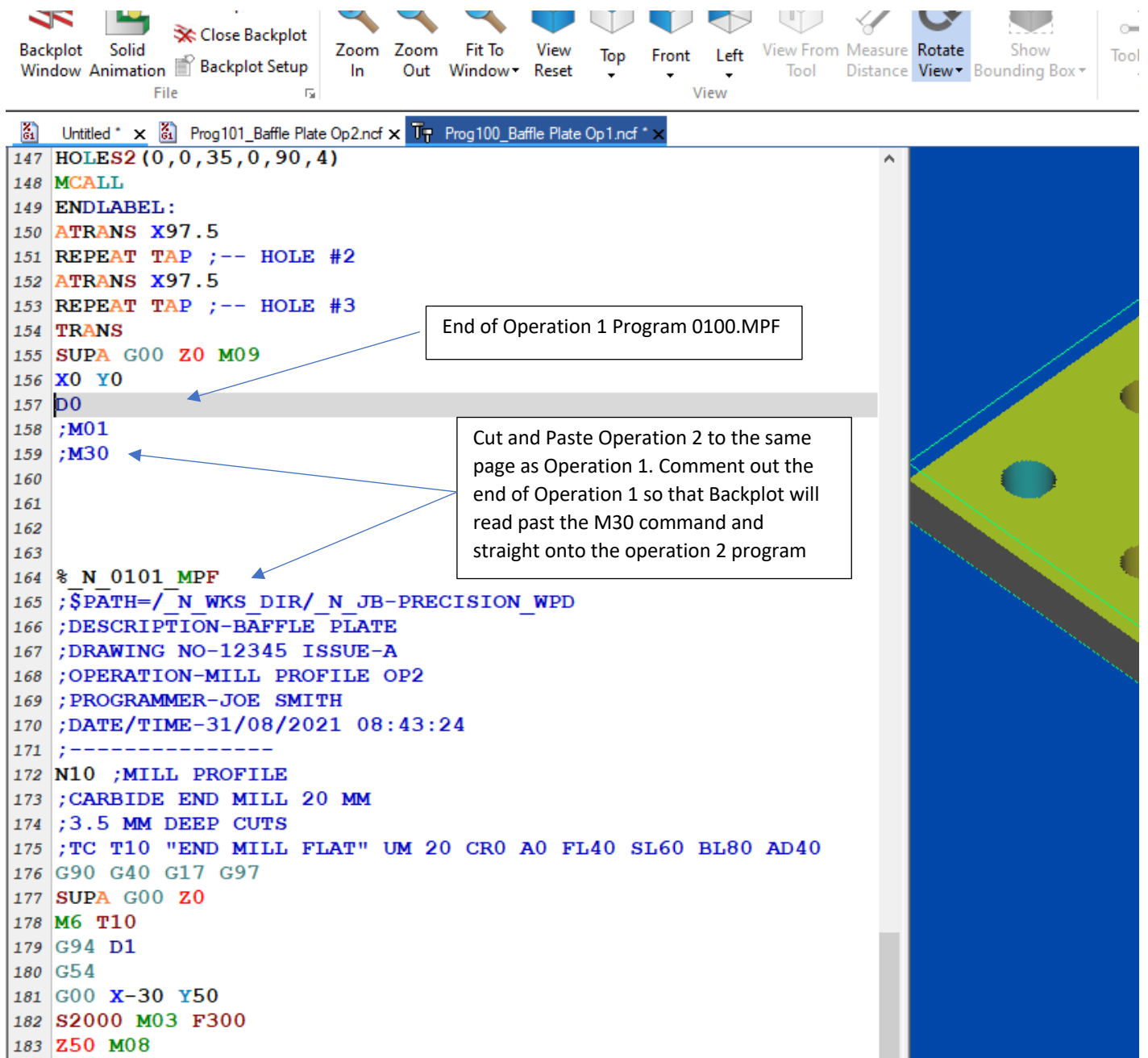


Example 4

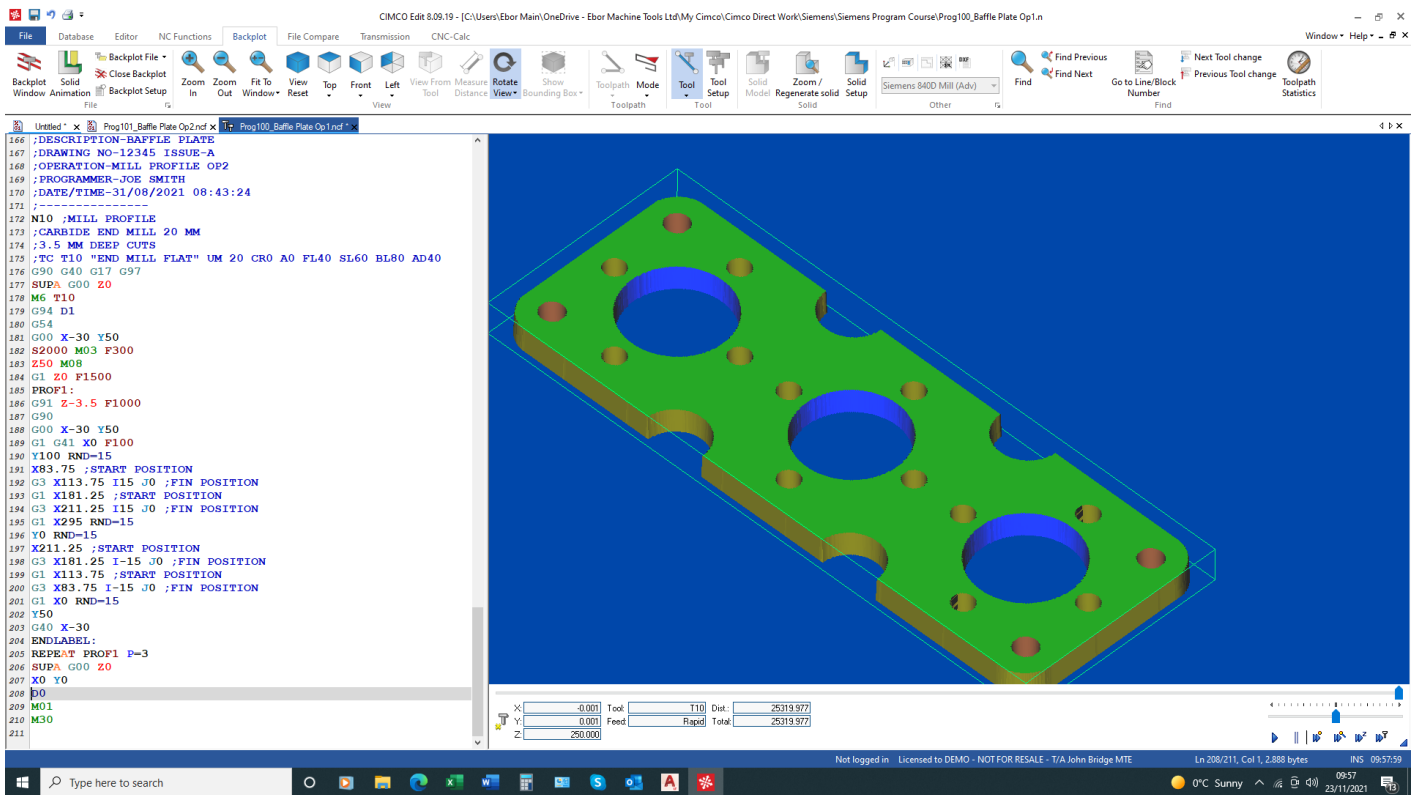
Baffle Plate is held in a precision vice to machine the top face features in operation 1 1 and then held in a fixture to machine the outside profile in operation 2. The Blank part is cut to 106 x 300 x 12 mm.



We have combined operation 1 and 2 together on the same page and commented out the M30 at the end of operation 1. Then after running the Solid Animation of both operations, see below we have a good representation of the finished part. Try to write the program using the Cimco Editor and only use the program listing below as a reference.



See the part machined complete below: The Operation 1 and 2 are listed below as they would be in the CNC control as Program 0100.MPF and 0101.MPF



OPERATION 1

%_N_0100_MPF

;\$PATH=/_N_WKS_DIR/_N_JB-PRECISION_WPD

;DESCRIPTION-BAFFLE PLATE

;DRAWING NO-12345 ISSUE-A

;OPERATION-MILL FACE, DRILL & TAP

;PROGRAMMER-JOE SMITH

;DATE/TIME-30/08/2021 19:57:49

;-----

N10 ;FACE MILL SURFACE

;FACE MILL 50MM

G90 G40 G17 G97

SUPA G00 Z0

M6 T1

G94 D1

G54

G00 X0 Y0

S900 M03 F250

Z50 M08

CYCLE71(50,5,5,0,0,0,295,100,0,2,40,30,0,100,31,20)

SUPA G00 Z0 M09

X0 Y0

16

D0

M01

N20;POCKET MILL 3 X 50 MM HOLES

;CARBIDE END MILL 16 MM

G90 G40 G17 G97

SUPA G00 Z0

M6 T13

G94 D1

G54

G00 X0 Y0

S2300 M03 F250

Z50 M08

TRANS X50 Y50

POCKET:

POCKET4(50,0,2,-14,25,0,0,6,0,0,220,50,3,21,9,0,0,8,1.5)

ENDLABEL: ; END LABEL

ATRANS X97.5

REPEAT POCKET

ATRANS X97.5

REPEAT POCKET

TRANS

SUPA G00 Z0 M09

X0 Y0

D0

M01

N30 ;CENTRE DRILL ALL HOLES

;T2 CENTRE DRILL

G90 G40 G17 G97

SUPA G00 Z0

M6 T2

G94 D1

G54

D1

G00 X0 Y0

S1000 M03 F80

Z50 M08

TRANS X50 Y50

CDRILL:

MCALL CYCLE81(10,0,2,-5,)

HOLES2(0,0,35,0,90,4)

MCALL

ENDLABEL:

ATRANS X97.5

REPEAT CDRILL ;-- HOLE #2

ATRANS X97.5

REPEAT CDRILL ;-- HOLE #3

TRANS

G54

MCALL CYCLE81(10,0,2,-5,)

X15 Y15

X280 Y15

X280 Y85

X15 Y85

MCALL

TRANS

SUPA G00 Z0 M09

X0 Y0

D0

M01

N40;DRILL 4 HOLES 11 MM THROUGH

;CARBIDE DRILL 11MM

G90 G40 G17 G97

SUPA G00 Z0

M6 T27

G94 D1

G54

G00 X0 Y0

S3000 M03 F300

Z50 M08

MCALL CYCLE81(10,0,2,-15,)

X15 Y15

X280 Y15

X280 Y85

X15 Y85

MCALL

SUPA G00 Z0 M09

X0 Y0

D0

M01

N50;DRILL M10 HOLES

;CARBIDE DRILL 8.5 MM

G90 G40 G17 G97

SUPA G00 Z0

M6 T22

G94 D1

G54

G00 X0 Y0

S3000 M03 F300

Z50 M08

TRANS X50 Y50

DRILL:

MCALL CYCLE81(10,0,2,-15,)

HOLES2(0,0,35,0,90,4)

MCALL

ENDLABEL:

ATRANS X97.5

REPEAT DRILL ;-- HOLE #2

ATRANS X97.5

REPEAT DRILL ;-- HOLE #3

TRANS

SUPA G00 Z0M09

X0 Y0

D0

M01

N60;TAP M10 HOLES

;M10 SPIRAL POINT TAP

;RIGID TAPPING CYCLE84

G90 G40 G17 G97

SUPA G00 Z0

M6 T43

G94 D1

G54
D1
G00 X0 Y0
S200 M03
Z50 M08
TRANS X50 Y50
TAP:
MCALL CYCLE84(30,0,5,-18,,0,3,,1.5,0,200,400,3,0,0,1,,)
HOLES2(0,0,35,0,90,4)
MCALL
ENDLABEL:
ATRANS X97.5
REPEAT TAP ;-- HOLE #2
ATRANS X97.5
REPEAT TAP ;-- HOLE #3
TRANS
SUPA G00 Z0 M09
X0 Y0
D0
M01
M30

OPERATION 2

_%_N_0101_MPF
;\$PATH=/_N_WKS_DIR/_N_JB-PRECISION_WPD
;DESCRIPTION-BAFFLE PLATE
;DRAWING NO-12345 ISSUE-A
;OPERATION-MILL PROFILE OP2
;PROGRAMMER-JOE SMITH
;DATE/TIME-31/08/2021 08:43:24
;-----
N10 ;MILL PROFILE
;CARBIDE END MILL 20 MM
;3.5 MM DEEP CUTS
;TC T10 "END MILL FLAT" UM 20 CRO A0 FL40 SL60 BL80 AD40

G90 G40 G17 G97
SUPA G00 Z0
M6 T10
G94 D1
G54
G00 X-30 Y50
S2000 M03 F300
Z50 M08
G1 Z0 F1500
PROF1:
G91 Z-3.5 F1000
G90
G00 X-30 Y50
G1 G41 X0 F100
Y100 RND=15
X83.75 ;START POSITION
G3 X113.75 I15 J0 ;FIN POSITION
G1 X181.25 ;START POSITION
G3 X211.25 I15 J0 ;FIN POSITION
G1 X295 RND=15
Y0 RND=15
X211.25 ;START POSITION
G3 X181.25 I-15 J0 ;FIN POSITION
G1 X113.75 ;START POSITION
G3 X83.75 I-15 J0 ;FIN POSITION
G1 X0 RND=15
Y50
G40 X-30
ENDLABEL:
REPEAT PROF1 P=3
SUPA G00 Z0
X0 Y0
D0
M01
M30