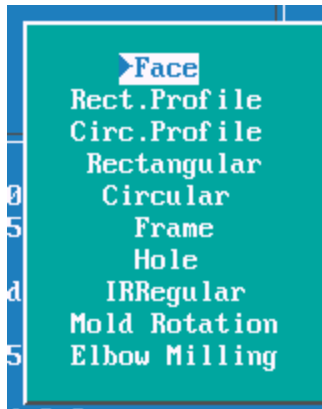# 3300M CNC Control
Canned cycles

Pocketing Canned Cycles

Note
The pockets marked with * all have cutter compensation built into them, so all dimension are as show on print.

1. Face.   Cleans large area with one line of information.
2. Rectangular profile.*   Cleans inside or outside of a rectangle.
3. Circular profile.*   Clean inside or outside of a circle.
4. Rectangular pocket.*   Cuts a rectangular pocket to a specified depth.
5. Circular pocket.*   Cuts a circular pocket to specified depth.
6. Frame pocket.*   Cuts rectangular pocket with an island in the middle.
7. Hole.*   Opens up existing holes.
8. Irregular pocket.*   Cleans the inside of a closed contour.
9. Mold rotation.   Cuts three axis shape but only program 2 axis.
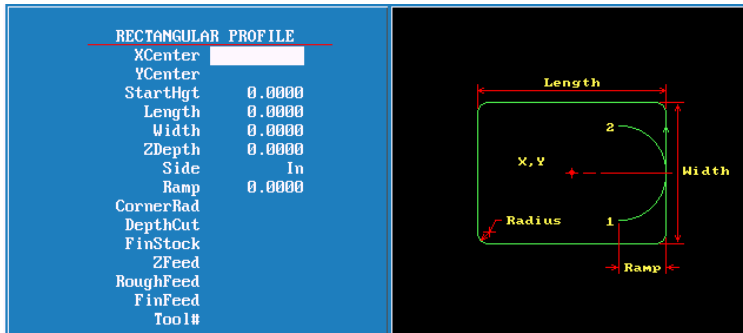10. Elbow milling   Cuts a radial grove around a radius.

Face Pocket
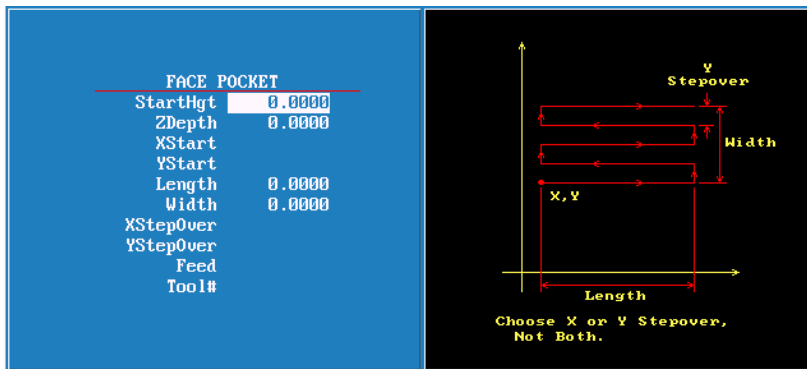
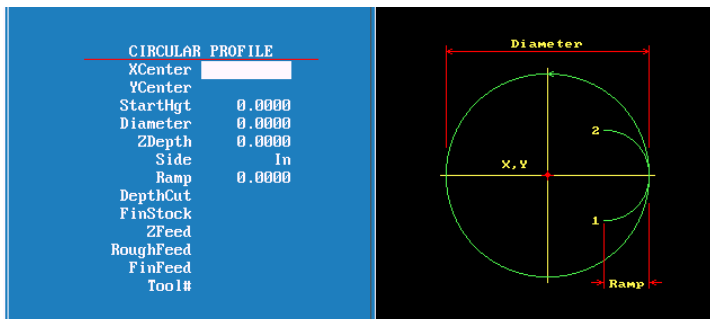|		
StartHgt.	Distance above surface to be cut.	
ZDepth.	Depth of Z axis.	
XStart.	X axis start position.	Optional
YStart.	Y axis start position.	Optional
Length.	Length of surface to be cut.	
Width.	Width of surface to be cut.	
XStepOver.	Distance X axis steps over between passes.	Only one step over to be programmed.
YStepOver.	Distance Y axis steps over between passes.	Only one step over to be programmed.
Feed.	Feedrate in inches per minute.	Optional
Tool#.	Tool number.	Optional

Only input with 0.0000 have to be programmed , this will apply to all canned cycles.Tools do not have to be programmed in cycles , in most cases it is not a good idea.

Rectangular profile


```
RECTANGULAR PROFILE
   XCenter
   YCenter
   StartHgt    0.0000
   Length      0.0000
   Width       0.0000
   ZDepth      0.0000
   Side            In
   Ramp        0.0000
   CornerRad
   DepthCut
   FinStock
   ZFeed
   RoughFeed
   FinFeed
   Tool#
```

XCenter.	Center of profile along X axis.	Optional
YCenter.	Center of profile along Y axis	Optional
StartHgt.	Height Above surface to be cut.	
Length.	Length of pocket.	
Width.	Width of pocket.	
ZDepth.	Absolute depth of pocket.	
Side.	Inside or Outside.	
Ramp.	Size of ramp radius.	
CornerRad.	Radius on the corners. On the inside must be larger than cutter radius.	Optional
DepthCut.	How deep per pass.	Optional
FinStock.	Material left for finish pass.	Optional
ZFeed.	Z axis down feed.	Optional
RoughFeed.	Feedrate used for roughing passes.	Optional
FinFeed.	Feedrate for finish pass.	Optional
Tool#.	Tool to be used.	Optional

Circular profile


```
CIRCULAR PROFILE
   XCenter
   YCenter
   StartHgt    0.0000
   Diameter    0.0000
   ZDepth      0.0000
   Side            In
   Ramp        0.0000
   DepthCut
   FinStock
   ZFeed
   RoughFeed
   FinFeed
   Tool#
```

XCenter.	Center of profile along X axis.	Optional
Ycenter.	Center of profile along Y axis	Optional
StartHgt.	Height Above surface to be cut.	
Diameter.	Diameter of pocket.	
ZDepth.	Absolute depth of pocket.	
Side.	Inside or Outside.	
Ramp.	Size of ramp radius.	
DepthCut.	How deep per pass.	Optional
FinStock.	Material left for finish pass.	Optional
Zfeed.	Z axis down feed.	Optional
RoughFeed.	Feedrate used for roughing passes.	Optional
FinFeed.	Feedrate for finish pass.	Optional
Tool#.	Tool to be used.	Optional

Rectangular Pocket
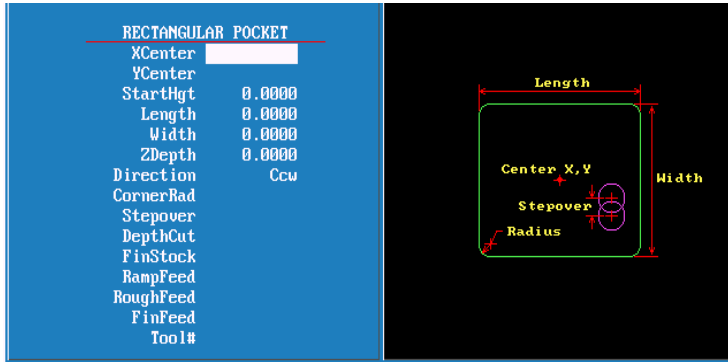
Xcenter.	Center of pocket X axis.	Optional
Ycenter.	Center of pocket Y axis.	Optional
StartHgt.	Must be .1" or 2mm above surface to be cut.	
Length.	Actual length of pocket.	
Width.	Actual width of pocket.	
Zdepth.	Absolute distance to bottom of pocket.	
Direction.	Defaulted to climb mill.	
CornerRad.	Radius in corners must be larger than cutter radius.	Optional
StepOver.	Step over between passes , cannot exceed 70% of cutter diameter.	Optional
DepthCut.	Depth of Z per pass.	Optional
FinStock.	Amount of material left for finish cut , material left on side and bottom.	Optional
RampFeed.	Feedrate for initial # axis move.	Optional
RoughFeed.	Rough feedrate.	Optional
FinFeed.	Finish feedrate.	Optional
Tool #.	Tool number normally not input here.	Optional

Circular Pocket
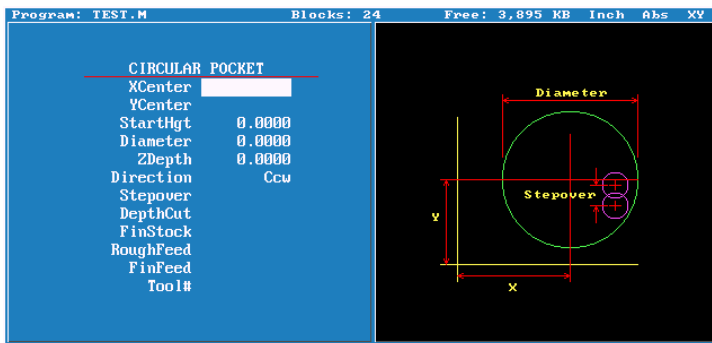
Xcenter.	Center of pocket X axis.	Optional
Ycenter.	Center of pocket Y axis.	Optional
StartHgt.	Must be .1" or 2mm above surface to be cut.	
Diameter.	Actual diameter of pocket.	
Zdepth.	Absolute distance to bottom of pocket.	
Direction.	Defaulted to climb mill.	
StepOver.	Step over between passes , cannot exceed 70% of cutter diameter.	Optional
DepthCut.	Depth of Z per pass.	Optional
FinStock.	Amount of material left for finish cut , material left on side and bottom.	Optional
RoughFeed.	Rough feedrate.	Optional
FinFeed.	Finish feedrate.	Optional
Tool #.	Tool number normally not input here.	Optional

Frame Pocket
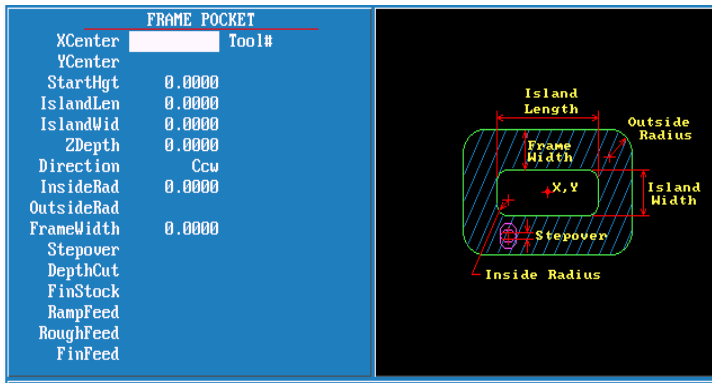
```
         FRAME POCKET
   XCenter  [        ]  Tool#
   YCenter
   StartHgt    0.0000
   IslandLen   0.0000
   IslandWid   0.0000
     ZDepth    0.0000
   Direction      Ccw
   InsideRad   0.0000
  OutsideRad
  FrameWidth   0.0000
   Stepover
   DepthCut
   FinStock
   RampFeed
  RoughFeed
    FinFeed
```

Xcenter	Center of pocket X axis.	Optional
Ycenter	Center of pocket Y axis.	Optional
StartHgt	Must be .1" or 2mm above surface to be cut.	
IslandLen	Actual length of center island.	
IslandWid	Actual width of center island.	
Zdepth	Absolute distance to bottom of pocket.	
Direction	Defaulted to climb mill.	
InsideRad	Radius in corners must be larger than cutter radius.	
OutsideRad	Radius outside corners , must be larger than radius of cutter.	Optional
FrameWidth	Distance from island to outside.	
StepOver	Step over between passes , cannot exceed 70% of cutter diameter.	Optional
DepthCut	Depth of Z per pass.	Optional
FinStock	Amount of material left for finish cut , material left on side and bottom.	Optional
RampFeed	Feedrate for initial # axis move.	Optional
RoughFeed	Rough feedrate.	Optional
FinFeed	Finish feedrate.	Optional
Tool #	Tool number normally not input here.	Optional

Hole-Mill Pocket

```
     HOLE-MILL POCKET
     XCenter  [        ]
     YCenter
     Diameter    0.0000
      ZDepth
     Direction      Ccw
     DepthCut
     StartHgt
     FinStock
     RoughFeed
      FinFeed
        Tool#
```
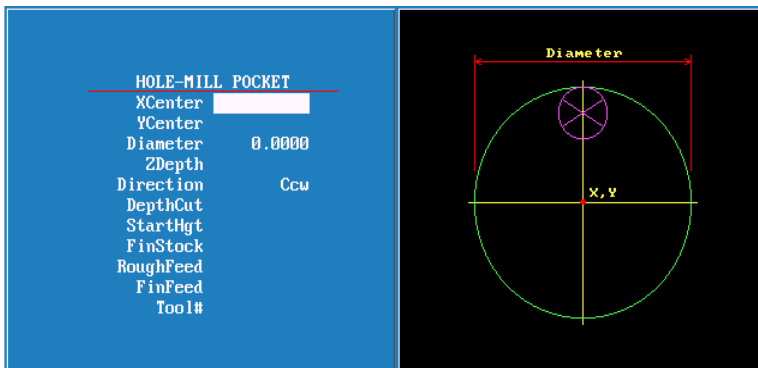
Xcenter	Center of pocket X axis.	Optional
Ycenter	Center of pocket Y axis.	Optional
Diameter	Actual diameter of pocket.	
Zdepth	Absolute distance to bottom of pocket.	Optional
Direction	Defaulted to climb mill.	
DepthCut	Depth of Z per pass.	Optional
StartHgt	Start height above surface to be cut.	Optional
FinStock	Amount of material left for finish cut , material left on side and bottom.	Optional
RoughFeed	Rough feedrate.	Optional
FinFeed	Finish feedrate.	Optional
Tool #	Tool number normally not input here.	Optional

Irregular Pocket
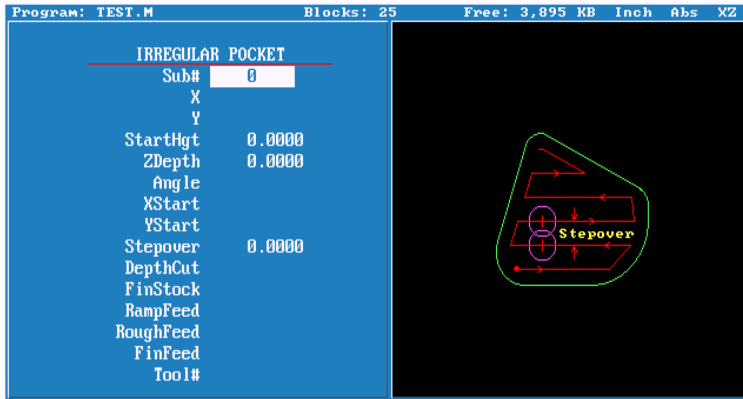
Sub#	**#** of profile subroutine.	
X	Start position of profile X axis.	Optional
Y	Start position of profile Y axis.	Optional
StartHgt	Start height .1" or 2mm above surface to be cut.	
Zdepth	Z depth of pocket absolute.	
Angle	Angle of first cut.	Optional
Xstart	Position of X axis before moving to start of profile.	Optional
Ystart	Position of Y axis before moving to start of profile.	Optional
Stepover	Distance cut will move over between passes.	
DepthCut	Depth of cut per pass.	Optional
FinStock	Amount of material left for finish pass. Leave stock on side and bottom of pocket.	Optional
RampFeed	Feedrate into material.Normally Z axis into material.	Optional
RoughFeed	Feedrate for roughing passes.	Optional
FinFeed	Feedrate for finish pass	Optional
Tool#	Tool #	Optional

Note

A subroutine has to be programmed for this cycle . The subroutine must start and end at the same coordinates. The first move can be a <u>Rapid</u> , put both X and Y axis in this block also the last block should have both X and Y axis coordinates.
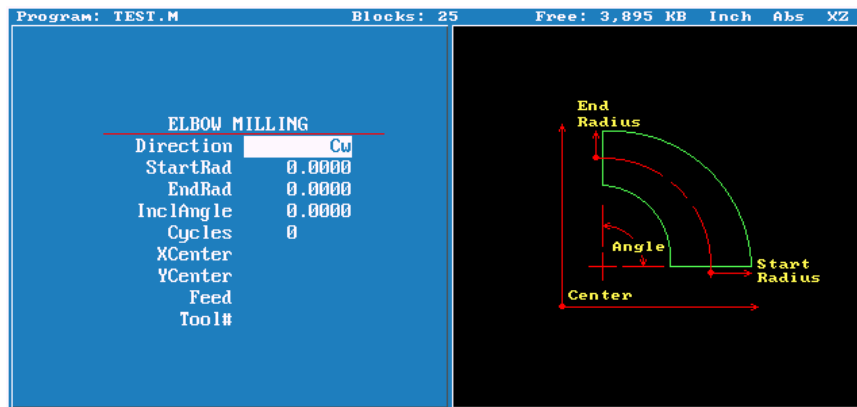
Angle would normally only be used when starting point of profile is on a radius.

Mold Rotation

```
Program: TEST.M                Blocks: 25      Free: 3,895 KB   Inch  Abs   XZ

            MOLD ROTATION
        StartAngle    0.0000
         EndAngle     0.0000
          Cycles      0
          FwdSub      0
          RevSub      0
          AxisRot         X
          BAxisCL
          CAxisCL
          ZAngle
           Feed
           Tool#
```
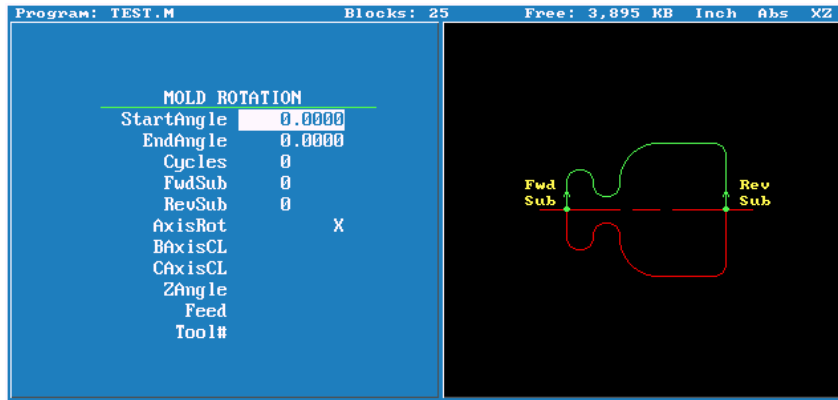
StartAngle	Angle at which rotation is going to start.
EndAngle	Angle at which rotation is going to end.
Cycles	Number of passes , one cycle is a pass in each direction.
FwdSub	Number of first subroutine.
RevSub	Number of second subroutine.
AxisRot	Axis around which rotation is going take place.
BAxisCL	Position of rotated axis if not zero.
CAxisCL	Position of second axis if not zero.
ZAngle	If rotating X or Y rotation around Z.
Feed	Feedrate
Tool#	Tool # .

Elbow Milling

```
Program: TEST.M                Blocks: 25      Free: 3,895 KB   Inch  Abs   XZ

            ELBOW MILLING
        Direction        Cw
         StartRad     0.0000
          EndRad      0.0000
        InclAngle     0.0000
          Cycles      0
         XCenter
         YCenter
           Feed
           Tool#
```

Direction	Cut direction of first pass.	
StartRad	Radius at start end.	
EndRad	Radius at opposite end.	
InclAngle	Included angle of cavity.	
Cycles	Number of passes , one cycle equals a pass in each direction.	
XCenter	Center of arc X axis.	Optional
YCenter	Center of arc Y axis.	Optional
Feed	Feedrate.	Optional
Tool#	Tool #.	Optional

Teach	Draw	Drill	Pocket	Mill	Tool	Calc	Sub	Misc	Exit

There are two more canned cycles , to get to these press **F5** **Mill** **soft key.**

	Rapid	Line	Arc			More		Prev	

Soft key will change as above press **F7** **More** **a pop-up will appear as below.**

> Feed
> RPM
> Plane
> Unit
> Offset
> SetZero
> Home
> Ellipse
> Spiral
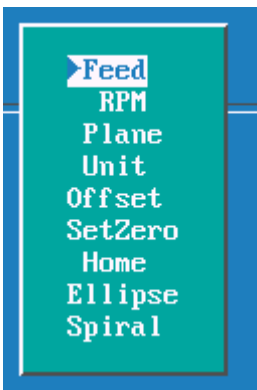
Ellipse and spiral both must be programmed incrementally .

Put height light on Ellipse press **E N T E R** **screen will change as below.**

```
Program: TEST.M (edited)       Blocks: 25       Free: 3,895 KB   Inch  Abs  XY

              ELLIPSE
         Direction        Cw
                X     0.0000
                Y     0.0000
                Z
          XCenter     0.0000
          YCenter     0.0000
        HalfLength     0.0000
        HalfWidth     0.0000
             Feed
         CompSide
            Tool#
```
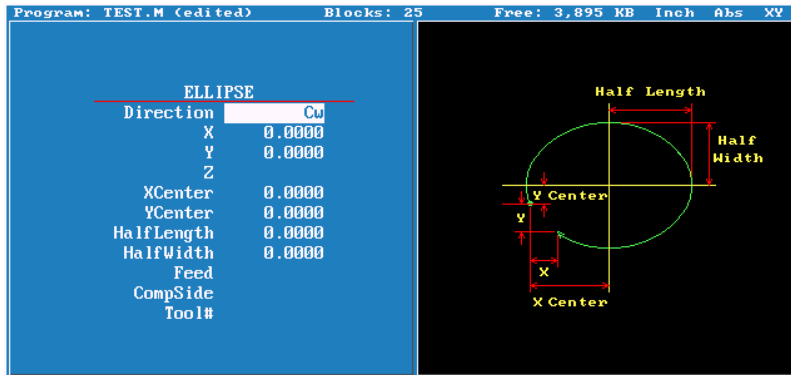
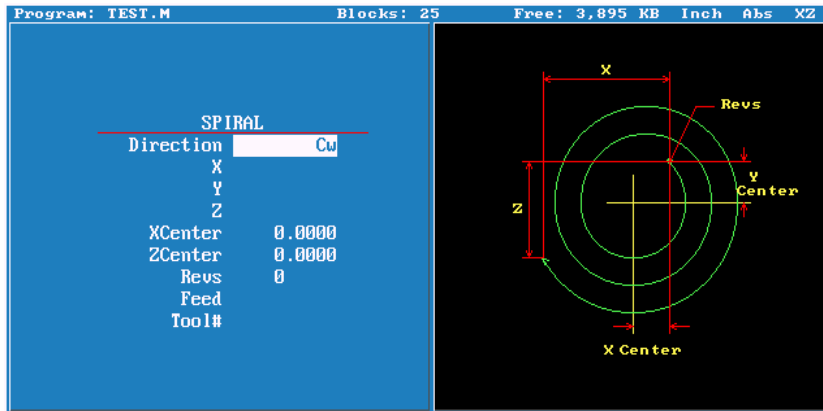**Direction**   Direction of cut CW or CCW.
X   Distance from Start to End X axis of Ellipse.
Y   Distance from Start to End Y axis of Ellipse.
Z   Distance from Start to End Z axis of Ellipse.
Xcenter   Distance from Start to Center X axis of Ellipse.
Ycenter   Distance from Start to Center Y axis of Ellipse.
HalfLength   Half the length of Ellipse X axis.
HalfWidth   Half the width of Ellipse Y axis.
Feed   Feedrate.
CompSide   Tool compensation none , inside or outside.
Tool#   Tool number.

If plane is changed to XZ plane Ycenter would change to ZCenter and half width is Z axis .
If plane is changed to YZ plane Xcenter would change to YCenter and half length would be Y axis .
Using in side or outside tool compensation the the cutter must be placed in the correct compensated position , before programming Ellipse. All dimension **MUST** be Increamental when programming this cycle.

```
Program: TEST.M          Blocks: 25        Free: 3,895 KB  Inch  Abs  XZ



                SPIRAL
         Direction          Cw
                X
                Y
                Z
         XCenter     0.0000
         ZCenter     0.0000
            Revs     0
            Feed
           Tool#
```

Direction Direction of Spiral Clockwise or Counter Clockwise.
X Distance from Start to End X axis .
Y Distance from Start to End Y axis .
Z Distance from Start to End Z axis.
Xcenter Distance from Start to Center X.
Ycenter Distance from Start to Center Y.
Revs Number of Revolutions.
Feed Feedrate.
Tool# Tool number.

This can be programmed in XY , XZ or YZ planes , the center designations with
change accord selected plane .
All dimension **MUST** be Increamental when programming this cycle
Cutter compensation no allowed with this cycle.
If cutting a thread using this cycle the distance moved in Z into number
of revolutions will equal lead of thread .