Rotate , Mirror and Scale

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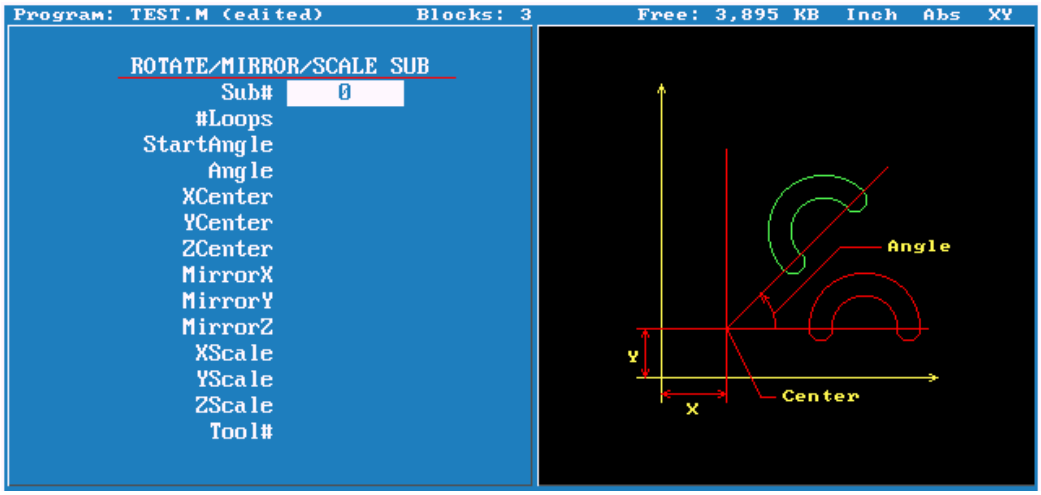
To get to RMS , when in edit press **F8** **Sub**

Press **F6** **RMS**



Sub#	Number of subroutine to Rotated, Mirrored or Scaled
#Loops	Number of time to repeat Rotation.
StartAngle	Start angle of rotation.
Angle	Angle between Rotations.
Xcenter	Center of Rotation X axis.
Ycenter	Center of Rotation Y axis.
Zcenter	Center of Rotation Z axis.
MirrorX	Mirror X axis.
MirrorY	Mirror Y axis.
MirrorZ	Mirroe z axis.
Xscale	Scale X axis.
Yscale	Scale Y axis.
Zscale	Scale Z axis.
Tool#	Tool number.

Rotation

When using RMS a subroutine must be writen.

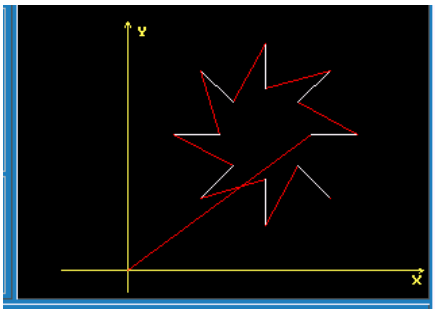
```
Program: TEST.M (edited)          Blocks:

        ROTATE/MIRROR/SCALE SUB
              Sub#      1
          #Loops        4
      StartAngle        0.0000
           Angle       90.0000
         XCenter        3.0000
         YCenter        3.0000
```

Above are the entries in canned cycle.

Press **F10** **Save**

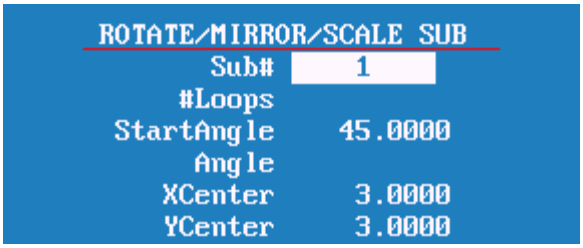
```
  1 Dim Abs
  2 Rapid       Z 0.0000 Tool# 0
  3 Tool# 1
  4 RMS         Sub# 1 #Loops 8 StartAngle 0.0000 Angle 45.0000
        XCenter 3.0000 YCenter 3.0000
  5 Rapid       Z 0.0000 Tool# 0
  6 EndMain
  7 Sub 1
  8 Rapid       X 4.0000 Y 3.0000
  9 Rapid       Z 0.1000
 10 Line        Z -0.1000 Feed 5.0
 11 Line        X 5.0000 Feed 10.0
 12 Line        Z 0.1000
 13 EndSub
```

This how the program will look, line #4 is the rotation cycle. Note all moves including Z's are in the subroutine.



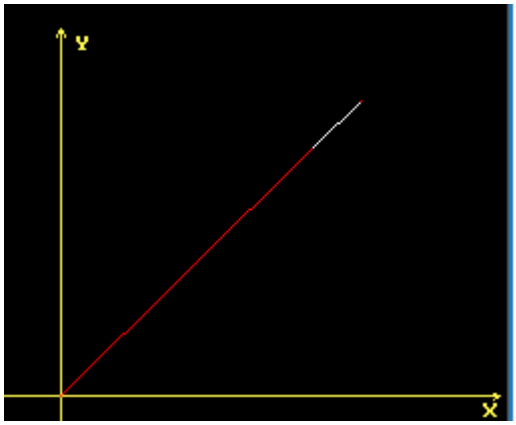
This is how it look in graphics.

In the case only one rotation is required the entry would be as below. Note only 4 entries Sub , StartAngle , X & Y centers.



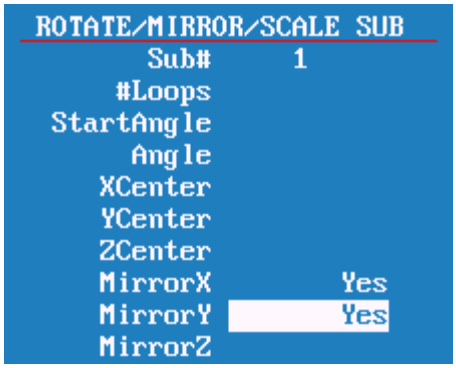
Program line would look as below.

Graphics of the single rotation appears below.



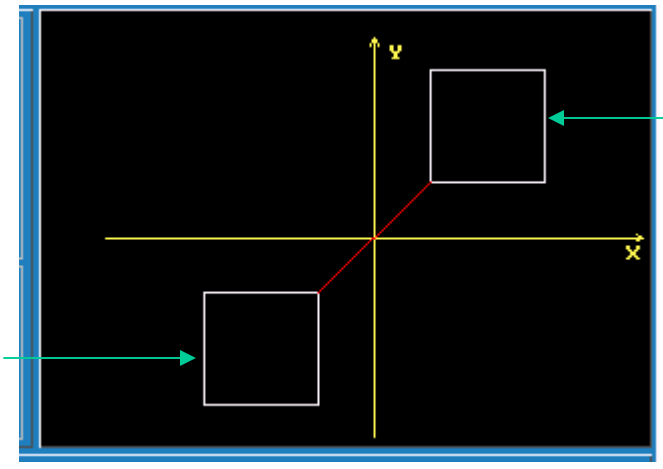
Mirror

Mirrror also requires a Subroutine to be writen.
Put hight light on axis to be mirrored press +/- key to turn on.



Line #4 as programmed
Line #6 mirror imaged

```
 1 Dim Abs
 2 Rapid      Z 0.0000 Tool# 0
 3 Tool# 1
 4 Call 1
 5 RMS        Sub# 1 MirrorX Yes MirrorY Yes
 6 Rapid      Z 0.0000 Tool# 0
 7 EndMain
 8 Sub 1
 9 Rapid      X 1.0000 Y 1.0000
10 Rapid      Z 0.1000
11 Line       Z -0.1000 Feed 5.0
12 Line       X 3.0000 Feed 10.0
13 Line       Y 3.0000
14 Line       X 1.0000
15 Line       Y 1.0000
16 Line       Z 0.1000
17 EndSub
```

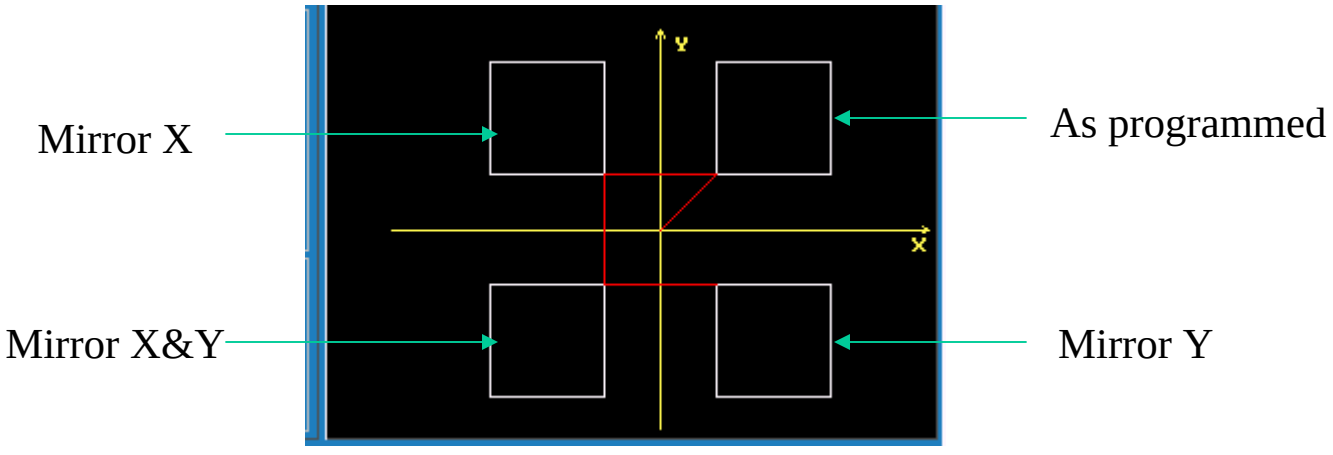


As programmed

Mirrored X & Y

The following program shows the part cut in all four Quadrants. The one thing to keep in mind when using mirror image is that when using cutter compensation the cut direction will change in the diagonal quadrants.

```
 1 Dim Abs
 2 Rapid      Z 0.0000 Tool# 0
 3 Tool# 1
 4 Call 1
 5 RMS        Sub# 1 MirrorX Yes
 6 RMS        Sub# 1 MirrorX Yes MirrorY Yes
 7 RMS        Sub# 1 MirrorY Yes
 8 Rapid      Z 0.0000 Tool# 0
 9 EndMain
10 Sub 1
11 Rapid      X 1.0000 Y 1.0000
12 Rapid      Z 0.1000
13 Line       Z -0.1000 Feed 5.0
14 Line       X 3.0000 Feed 10.0
15 Line       Y 3.0000
16 Line       X 1.0000
17 Line       Y 1.0000
18 Line       Z 0.1000
19 EndSub
```

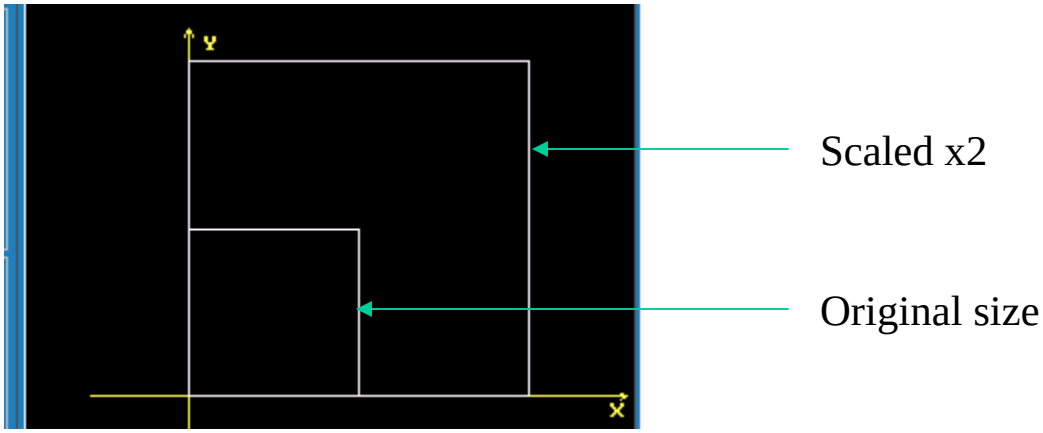


Scale

Scale allow programmer to change the size of the part. One thing to remember is that if radii are involved both axis must be scale the same amount.

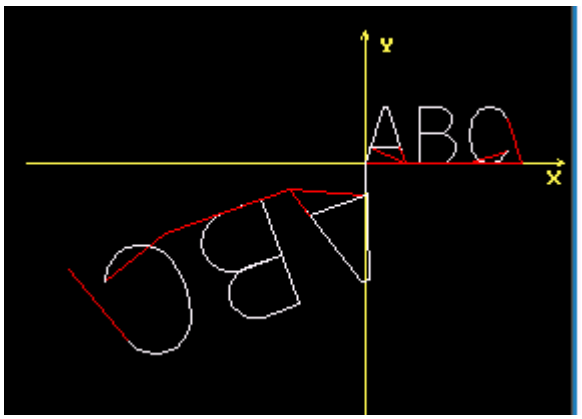
```
  1 Dim Abs
  2 Rapid      Z 0.0000 Tool# 0
  3 Tool# 1
  4 Rapid      X 0.0000 Y 0.0000
  5 Call 1
  6 Rapid      X 0.0000 Y 0.0000
  7 RMS        Sub# 1 XScale 2.0000 YScale 2.0000
  8 Rapid      Z 0.0000 Tool# 0
  9 EndMain
 10 Sub 1
 11 Rapid      Z 0.1000
 12 Line       Z -0.1000 Feed 5.0
 13 Line       X 3.0000 Feed 10.0
 14 Line       Y 3.0000
 15 Line       X 0.0000
 16 Line       Y 0.0000
 17 Line       Z 0.1000
 18 EndSub
```

Line #5 original line #6 scaled x2



```
  1 Dim Abs
  2 Rapid      Z 0.0000 Tool# 0
  3 Tool# 1
  4 Rapid      X 0.0000 Y 0.0000
  5 Call 1
  6 Call 2
  7 Call 3
  8 Dim Abs
  9 Rapid      X 0.0000 Y 0.0000
 10 RMS        Sub# 100 StartAngle 20.0000 XCenter 0.0000 YCenter 0.0000
       MirrorX Yes MirrorY Yes XScale 2.0000 YScale 2.0000
 11 Rapid      Z 0.0000 Tool# 0
 12 EndMain
 13 Sub 100
 14 Call 1
 15 Call 2
 16 Call 3
 17 EndSub
 18 Sub 1    *"A"
 19 Dim Abs
 20 Line Z-.005
 21 Dim Incr
 22 X0.0739 Y0.2300
 23 X0.0164
 24 X0.0739 Y-0.2300
 25 Dim Abs
 26 Rapid
 27 Z.05
 28 Dim Incr
 29 X-0.1432 Y0.0657
 30 Dim Abs
 31 Line Z-.005
 32 Dim Incr
 33 X0.1221
 34 Dim Abs
 35 Rapid Z.05
 36 Dim Incr
 37 X0.0211 Y-0.0657
 38 X.06
 39 EndSub
 40
 41 Sub 02  * "B"
 42 Dim Abs
 43 Line Z-.005
 44 Dim Incr
 45 Y0.2300
 46 X0.0780
 47 Arc Cw X0.0000 Y-0.1068 XCenter0.0000 YCenter-0.0534
 48 Line X-0.0780
 49 X0.0863
 50 Arc Cw X0.0000 Y-0.1232 XCenter0.0000 YCenter-0.0616
 51 Line X-0.0863
 52 Dim Abs
 53 Rapid Z.05
 54 Dim Incr
 55 X0.1479
 56 X.06
 57 EndSub
 58
 59 Sub 03  * "C"
 60 Dim Incr
 61 Rapid X0.1508 Y0.0522
 62 Dim Abs
 64 Dim Incr
 65 Arc Cw X-0.1413 Y0.0000 XCenter-0.0707 YCenter0.0217
 66 Arc Cw X0.0000 Y0.1256 XCenter0.2041 YCenter0.0628
 67 Arc Cw X0.1413 Y0.0000 XCenter0.0707 YCenter-0.0217
 68 Dim Abs
 69 Rapid Z.05
 70 Dim Incr
 71 X.06 Y-0.1778
 72 EndSub
```

7.


Y
ABC
X