emco maier ™
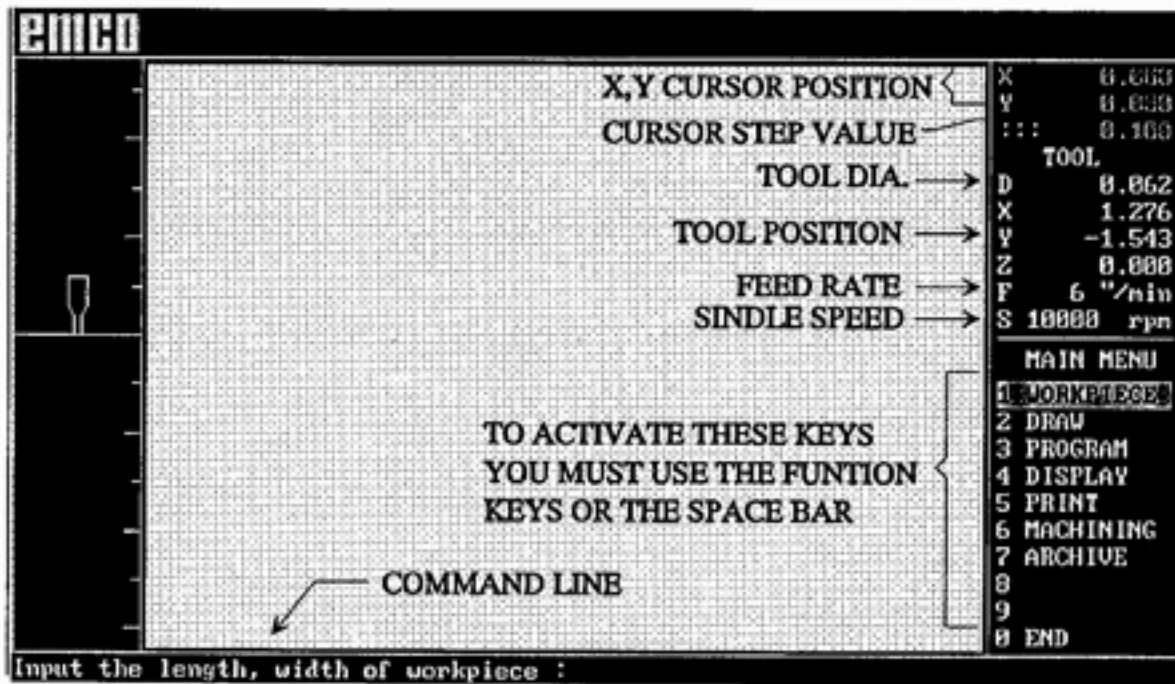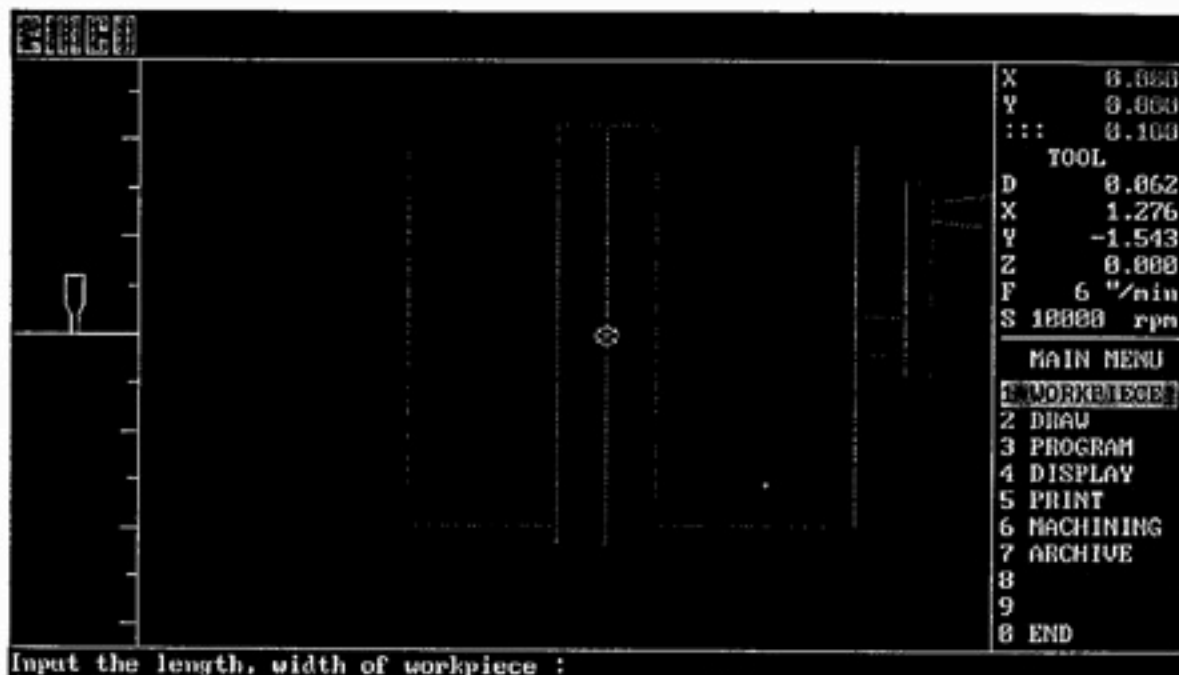
SHAPING THE NEXT GENERATION
OF AMERICAN ENGINEERS

EMCO MAIER PCMILL 30
STEP BY STEP
TRAINING MANUAL

SCREEN DISPLAY


```
emico
```

X,Y CURSOR POSITION
CURSOR STEP VALUE
TOOL DIA.
TOOL POSITION
FEED RATE
SINDLE SPEED

```
X        0.000
Y        0.000
:::      0.100
      TOOL
D        0.062
X        1.276
Y       -1.543
Z        0.000
F       6  "/min
S  10000   rpm
```

```
MAIN MENU
1 WORKPIECES
2 DRAW
3 PROGRAM
4 DISPLAY
5 PRINT
6 MACHINING
7 ARCHIVE
8
9
0 END
```

TO ACTIVATE THESE KEYS
YOU MUST USE THE FUNTION
KEYS OR THE SPACE BAR

COMMAND LINE

```
Input the length, width of workpiece :
```

CREATING A WORKPIECE

Input the length, width of workpiece :
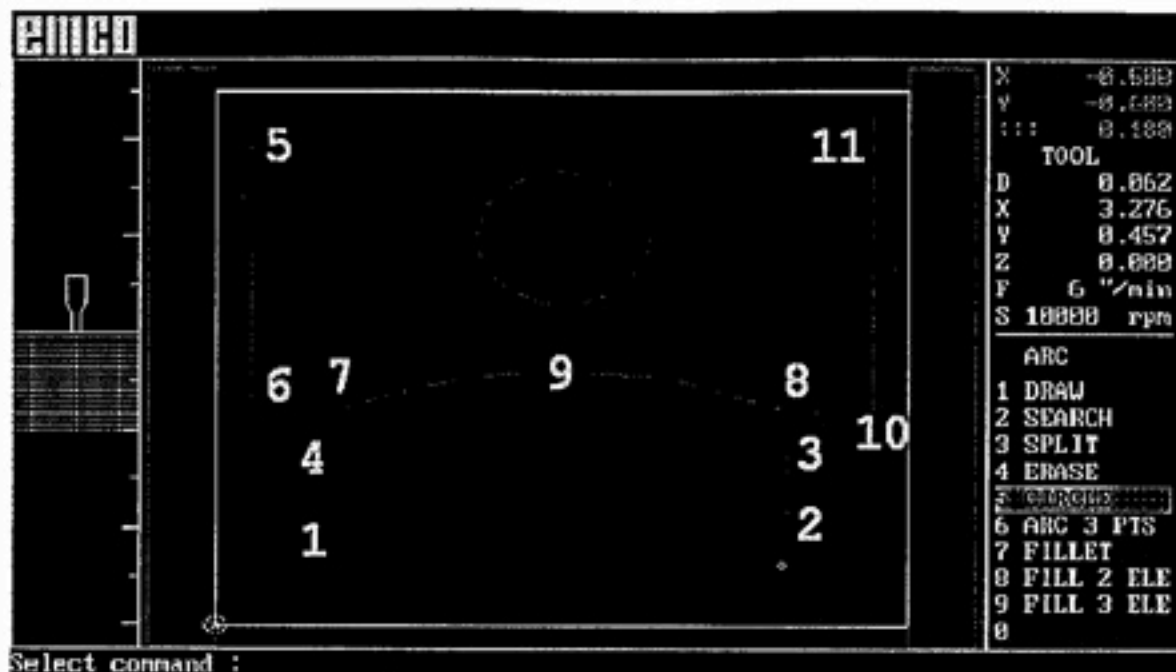
1) FROM THE MAIN MENU PRESS "F1" TO HIGHLIGHT WORKPIECE.

2) INPUT THE LENGTH OF THE WORKPIECE FOLLOWED BY A COMMA, THEN INPUT THE WIDTH.   IN THIS EXAMPLE: 4,4

3) PRESS ENTER

4) INPUT THE THICKNESS OF THE WORKPIECE, IN THIS EXAMPLE THE PART IS 1" THICK.

5) PRESS ENTER

6) USE THE CURSOR KEYS TO MOVE CURSOR TO THE LOWER LEFT CORNER OF THE WORKPECE, (THIS WILL BE WORKPIECE ZERO)

7) PRESS ENTER

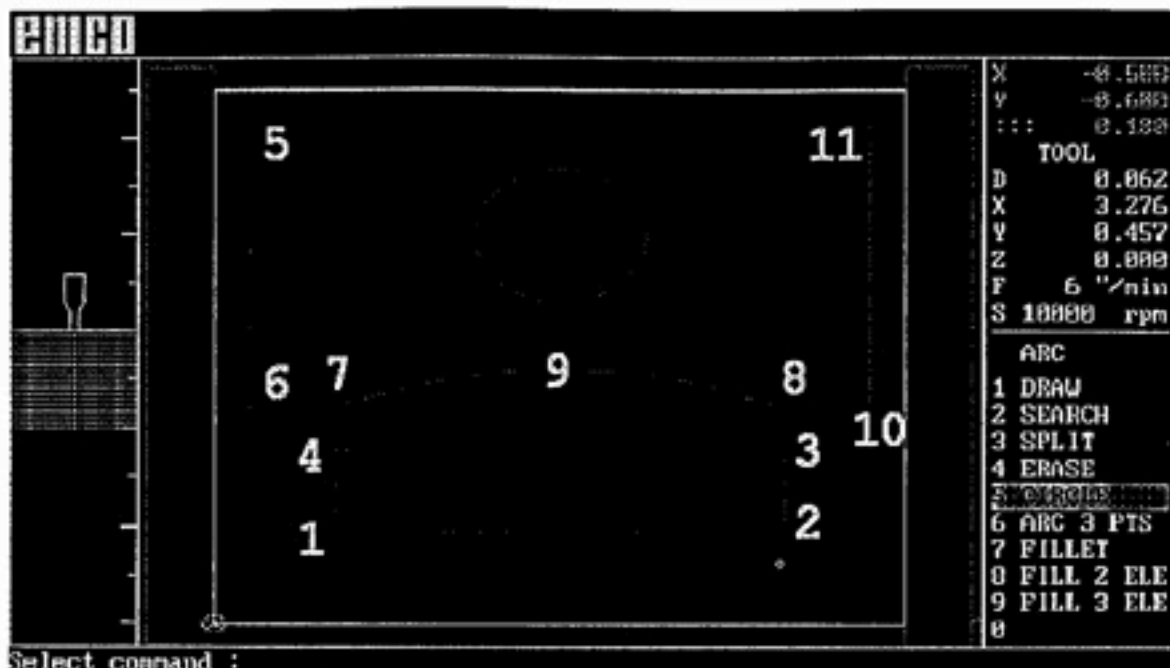8) PRESS "N" FOR NORMAL VIEW (WORKPIECE AND VISE WILL BE DISPLAYED ON SCREEN).

1

DRAWING A PART USING HOT KEYS
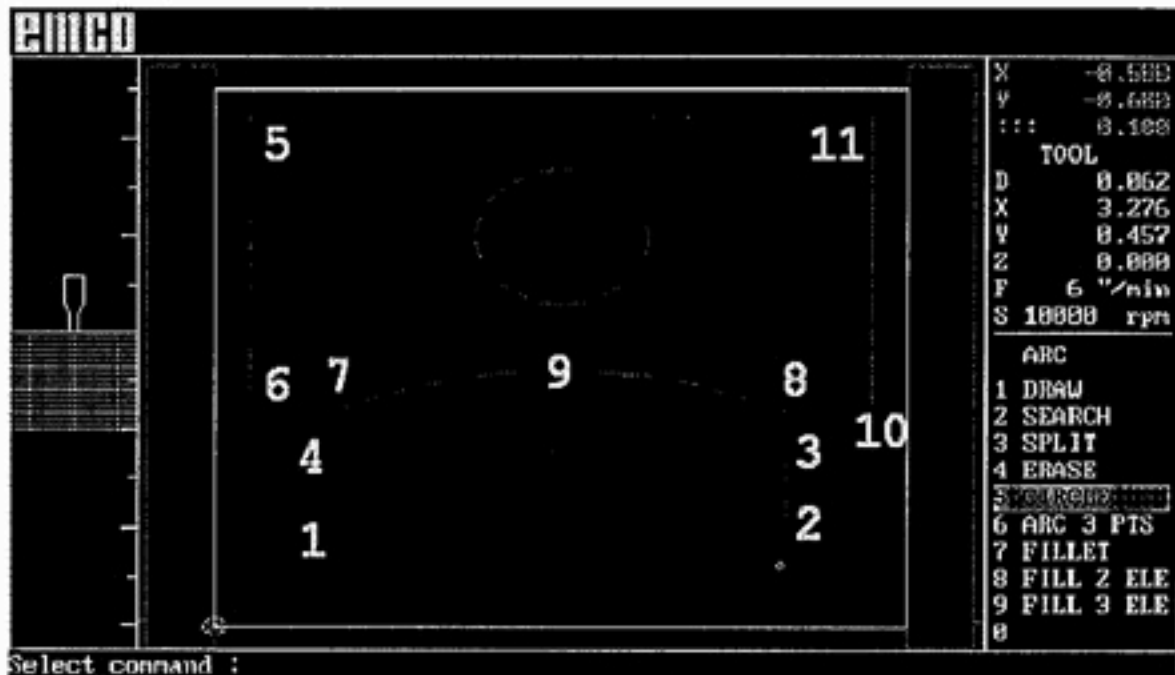
1) PRESS THE UP ARROW KEY 7 TIMES

2) PRESS THE RIGHT ARROW KEY 7 TIMES (CURSOR SHOULD BE AT POINT #1), AT
   THE UPPER RIGHT HAND OF YOUR SCREEN, NOTE THE X,Y CURSOR POSITION
   IS "X .7" & "Y .7"

3) PRESS "S" FOR START POINT OF A LINE

4) USING THE CURSOR KEYS, POSITION CURSOR AT "X 3.3" & "Y .7 " (POINT #2)

5) PRESS THE "+" KEY (THIS WILL DRAW A LINE TO THE CURSOR)

6) POSITION CURSOR AT "X 3.3" & "Y 1.3" (POINT #3)

7) PRESS THE "+" KEY

8) POSITION CURSOR AT "X .7" & "Y 1.3" (POINT #4)

9) PRESS THE "+" KEY

10) POSITION CURSOR AT "X .7" & "Y .7" (POINT #1), PRESS THE "+" KEY

2

```
EMCO
                                              X     -0.500
                                              Y     -0.500
                                              :::    0.100
                                                 TOOL
  5                                  11       D      0.062
                                              X      3.276
                                              Y      0.457
                                              Z      0.000
                                              F      6 "/min
                                              S  10000  rpm

                                                  ARC
  6  7           9           8                1 DRAW
                                              2 SEARCH
  4                          3    10          3 SPLIT
                                              4 ERASE
                                              5 CIRCLE
  1                          2                6 ARC 3 PTS
                                              7 FILLET
                                              8 FILL 2 ELE
                                              9 FILL 3 ELE
                                              0
Select command :
```

11) POSITION CURSOR AT "X .2" & "Y 3.8" (POINT #5)

12) TYPE "S" FOR START POINT OF A LINE

13) POSITION CURSOR AT "X .2" & "Y 1.6" (POINT #6)

14) PRESS THE "+" KEY

15) POSITION CURSOR AT "X .7" & "Y 1.6" (POINT #7)

16) PRESS THE "+" KEY

17) PRESS "F2" DRAW

18) PRESS "F4" ARC

19) TYPE "S" FOR START POINT OF ARC (FIRST POSITION ON ARC)

20) POSITION CURSOR AT "X 3.3" & "Y 1.6" (POINT #8)

21) TYPE "E" FOR END POINT OF ARC (SECOND POSITION ON ARC)

22) POSITION CURSOR AT "X 2.0" & "Y 1.9" (POINT #9, THIRD POSITION ON ARC)

23) PRESS "F6" ARC 3 POINTS

24) TYPE "Z" TO ZOOM AND REDRAW WORKPIECE

25) POSITION CURSOR AT "X 3.3" & "Y 1.6" (POINT # 8,)

3

Screen display:

```
EMICO                               X      -0.500
                                    Y      -0.680
                                    :::     0.130
                                        TOOL
    5                        11      D      0.062
                                    X      3.276
                                    Y      0.457
                                    Z      0.000
                                    F      6 "/min
                                    S  10000  rpm

                                        ARC
    6  7        9          8         1 DRAW
                                    2 SEARCH
                           3  10     3 SPLIT
    4                               4 ERASE
                                    5 CIRCLE
                           2         6 ARC 3 PTS
    1                               7 FILLET
                                    0 FILL 2 ELE
                                    9 FILL 3 ELE
                                    0
Select command :
```

26) TYPE "S" FOR START POINT OF LINE

27) POSITION CURSOR AT "X 3.8" & "Y 1.6" (POINT #10)

28) PRESS THE "+" KEY

29) POSITION CURSOR AT "X 3.8" & "Y 3.8" (POINT #11)

30) PRESS THE "+" KEY

31) POSITION CURSOR AT "X .2" & "Y 3.8" (POINT # 5)

32) PRESS THE "+" KEY

33) PRESS "F5" (CIRCLE) FROM THE ARC MENU

34) POSITION CURSOR AT "X 2.0" & "Y 2.9" (CIRCLE CENTER POINT)

35) PRESS ENTER TO ACCEPT CENTER POINT

36) TYPE ".5" FOR CIRCLE RADIUS

37) PRESS ENTER TO CONFIRM RADIUS
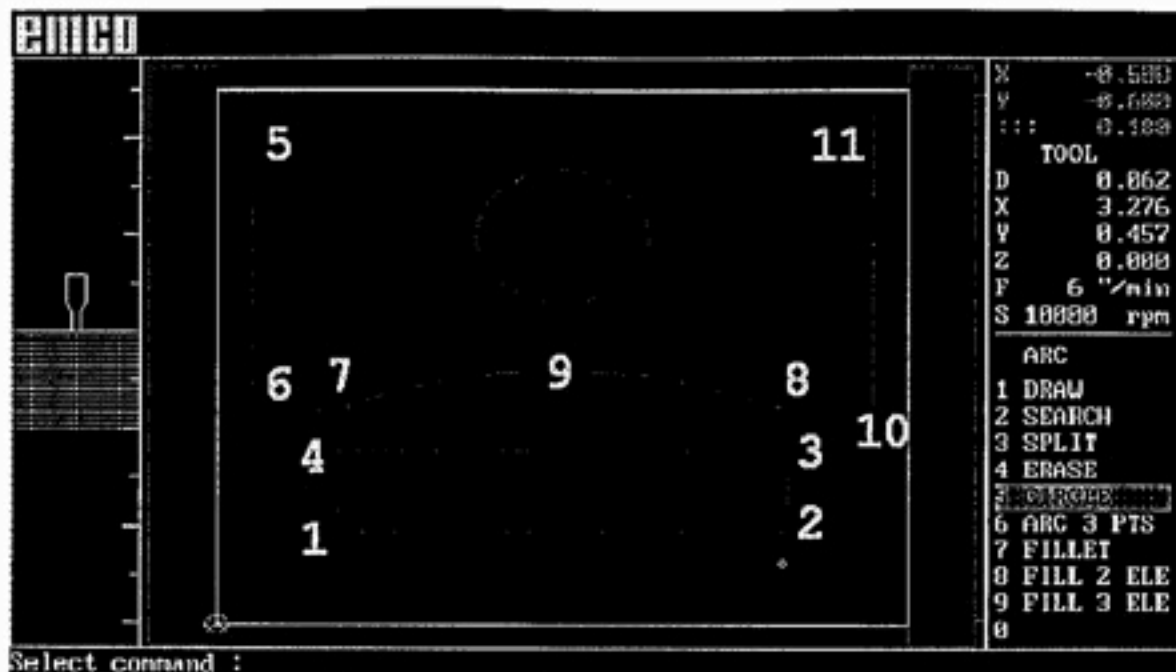
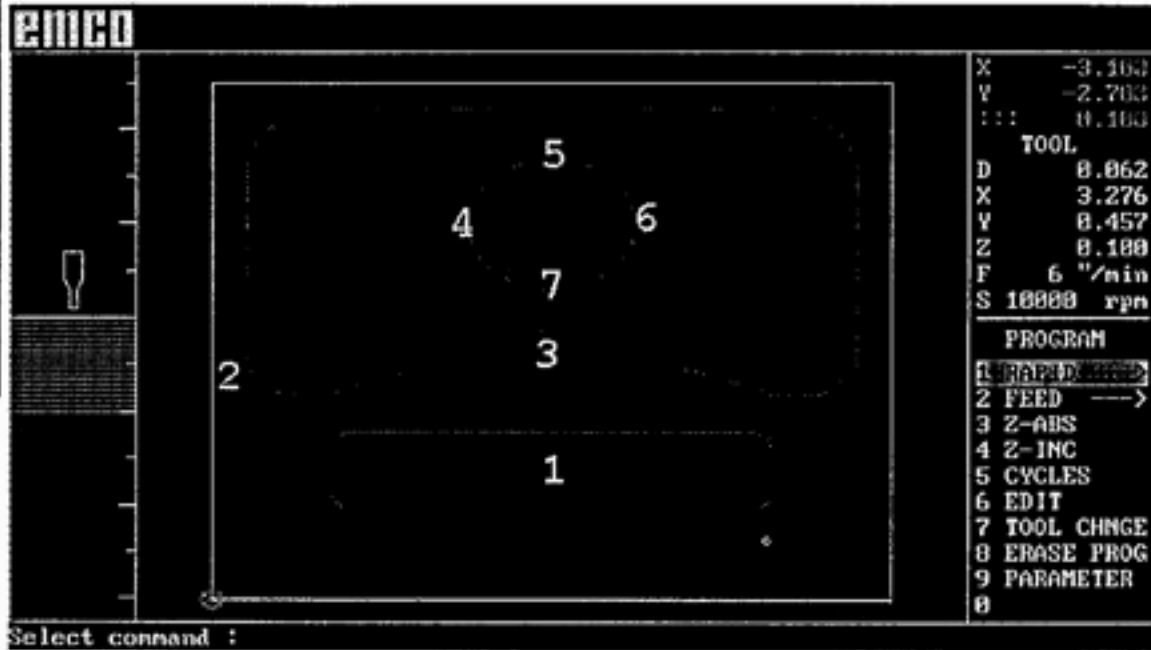38) POSITION CURSOR NEAR POINT #1

39) TYPE "R" (RADIUS)

40) TYPE ".125" (SIZE OF RADIUS), THEN PRESS ENTER

41) PRESS ENTER AGAIN TO CONFIRM SLECTION

42) TO CREATE A RADIUS AT POINTS #2,3 & 4, POSITION CURSOR AND REPEAT STEPS 42,43 & 44

43) POSITION CURSOR NEAR POINT #6

44) PRESS "C" (CHAMFER)

45) TYPE ".2" (CHAMFER SIZE), THEN PRESS ENTER

46) PRESS ENTER AGAIN TO CONFIRM

47) REPEAT STEPS 47,48 & 49 TO DRAW A CHAMFER AT POINT #10

48) POSITION CURSOR NEAR POINT #11

49) TYPE "R" (RADIUS)

50) TYPE ".5" FOR SIZE OF RADIUS, THEN PRESS ENTER

51) PRESS ENTER AGAIN TO CONFIRM, REPEAT TO DRAW RADIUS AT #5

5

# THE CAD PORTION OF THIS EXERSIZE IS NOW COMPLETE
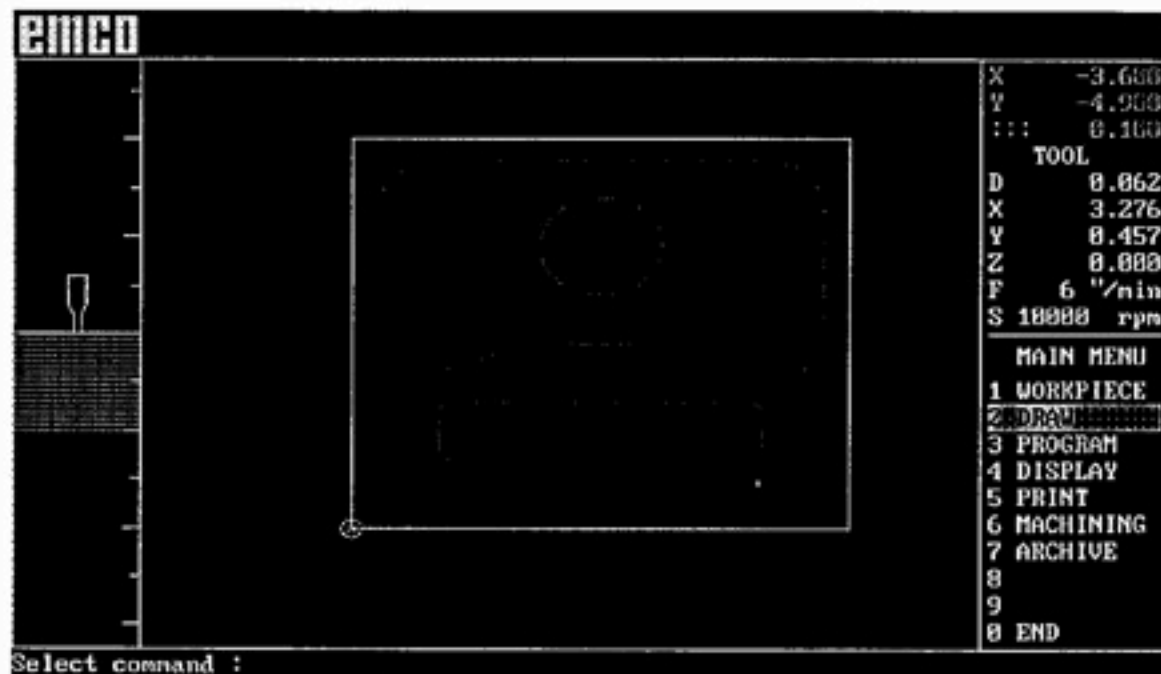
- TO SAVE THIS DRAWING, PRESS "ESC" KEY UNTILL YOUR BACK TO THE MAIN MENU

* PRESS "F7" (ARCHIVE)

* PRESS "F3" (STORE GEO)

* TYPE "DEMO"

* THIS DRAWING IS NOW SAVED AS "DEMO"

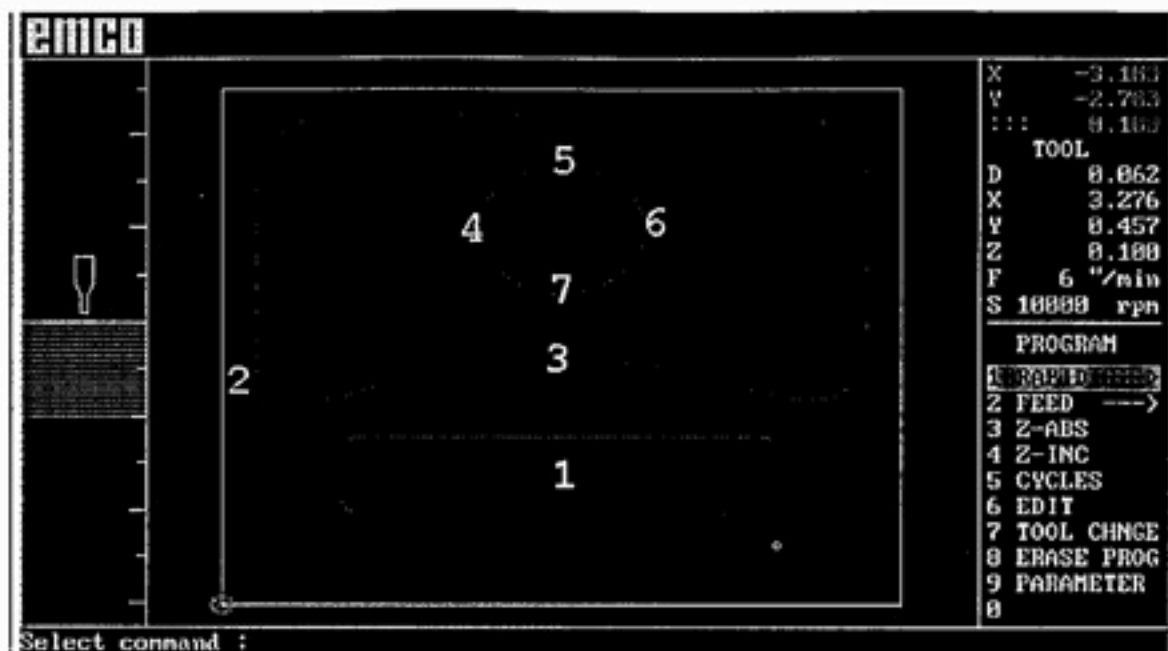# CREATING A PROGRAM

1) ALL ARCS GREATER THAN 90 DEGREES MUST BE SPLIT

2) FROM THE MAIN MENU PRESS "F2" DRAW

3) PRESS "F4" ARC

4) PRESS "F3" SPLIT

5) POSITION CURSOR NEAR POINT #3

6) PRESS ENTER

7) PRESS ENTER AGAIN TO CONFIRM

8) TO SPLIT ARC POINTS #4,5,6 & 7 ON ON PART DRAWING,
   REPEAT STEPS 4,5,6 & 7

9) PRESS "ESC" SEVERAL TIMES TO RETURN TO THE MAIN MENU

Select command :
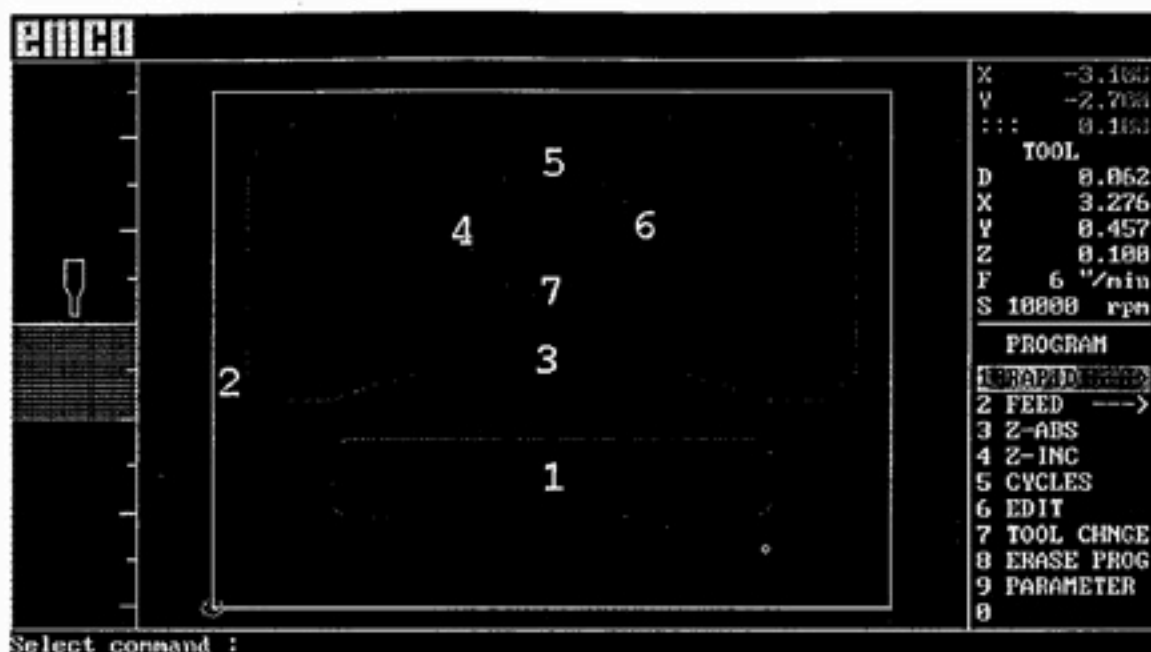
10) PRESS "F3" PROGRAM

11) PRESS "F7" TOOL CHANGE

12) PRESS "3" (.250 DIA. END MILL)

13) PRESS ENTER

14) PRESS "F3" (Z-ABS)

15) TYPE ".05" (START POSITION IN Z)

16) PRESS ENTER

17) POSITION CURSOR AT POINT #1, "X 2.0" & "Y 1.0" (CENTER OF POCKET)

18) PRESS "F1" RAPID (TOOL WILL RAPID TO CURSOR POSITION)

19) PRESS "F5" CYCLE

20) SCREEN SHOULD CHANGE TO CYCLES MENU

21) PRESS "F4" RECT. POCKET

22) PRESS "F1" INPUT APPROACH

23) TYPE ".05"

24) PRESS ENTER

8

```
emco                                    X    -3.183
                                        Y    -2.783
                                        :::   0.100
                 5                          TOOL
                                        D    0.062
          4              6              X    3.276
                                        Y    0.457
                 7                      Z    0.100
                                        F    6  "/min
                 3                      S  10000  rpm

   2                                       PROGRAM
                                        1 RAPID
                                        2 FEED    --->
                                        3 Z-ABS
                                        4 Z-INC
                 1                      5 CYCLES
                                        6 EDIT
                                        7 TOOL CHNGE
                                        8 ERASE PROG
                                        9 PARAMETER
                                        0
Select command :
```

25) PRESS "F2" INPUT DEPTH OF SINGLE CUT

26) TYPE ".05"

27) PRESS ENTER

28) PRESS "F3" INPUT END DEPTH OF CUT

29) TYPE "-.150"

30) PRESS ENTER

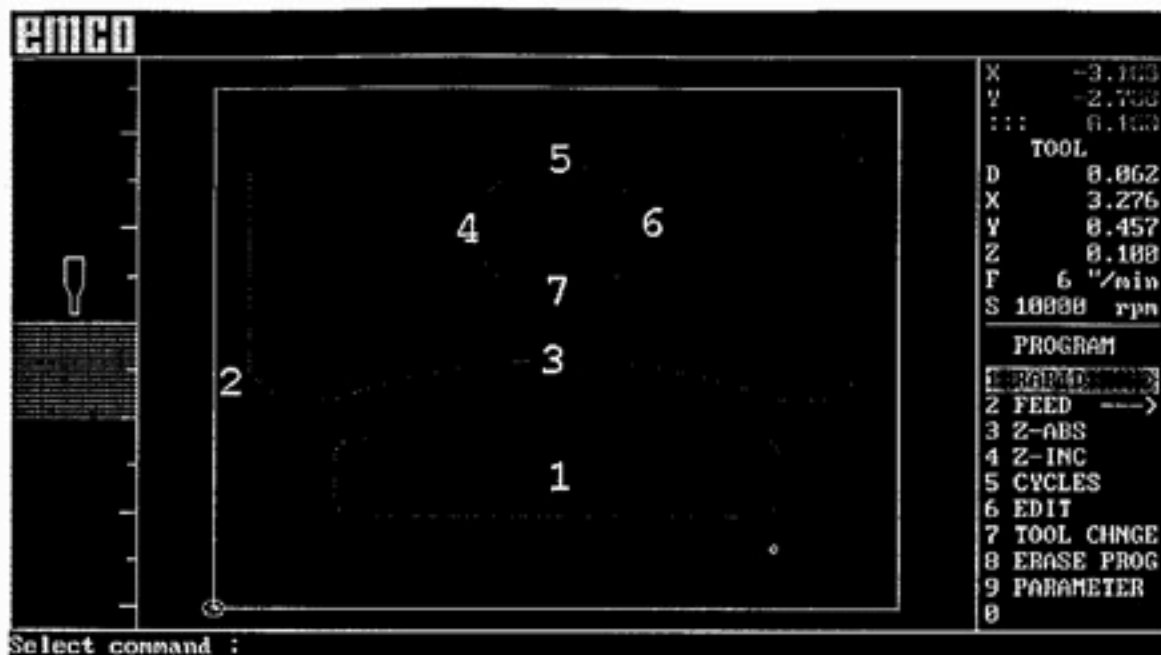31) PRESS "F4" INPUT RETRACT HEIGHT

32) TYPE ".05"

33) PRESS ENTER

34) PRESS "F5" INPUT DIRECTION

35) PRESS "2"

36) PRESS ENTER

37) PRESS "F6" INPUT LENGTH OF POCKET

38) TYPE "2.6"

9

Select command :

39) PRESS ENTER

40) PRESS "F7" INPUT HEIGHT OF POCKET

41) TYPE ".6"

42) PRESS ENTER

43) PRESS "F10" END

44) PRESS ENTER

45) POSITION CURSOR AT "X .5" & "Y 1.9"

46) PRESS "ESC" TO PROGRAM MENU

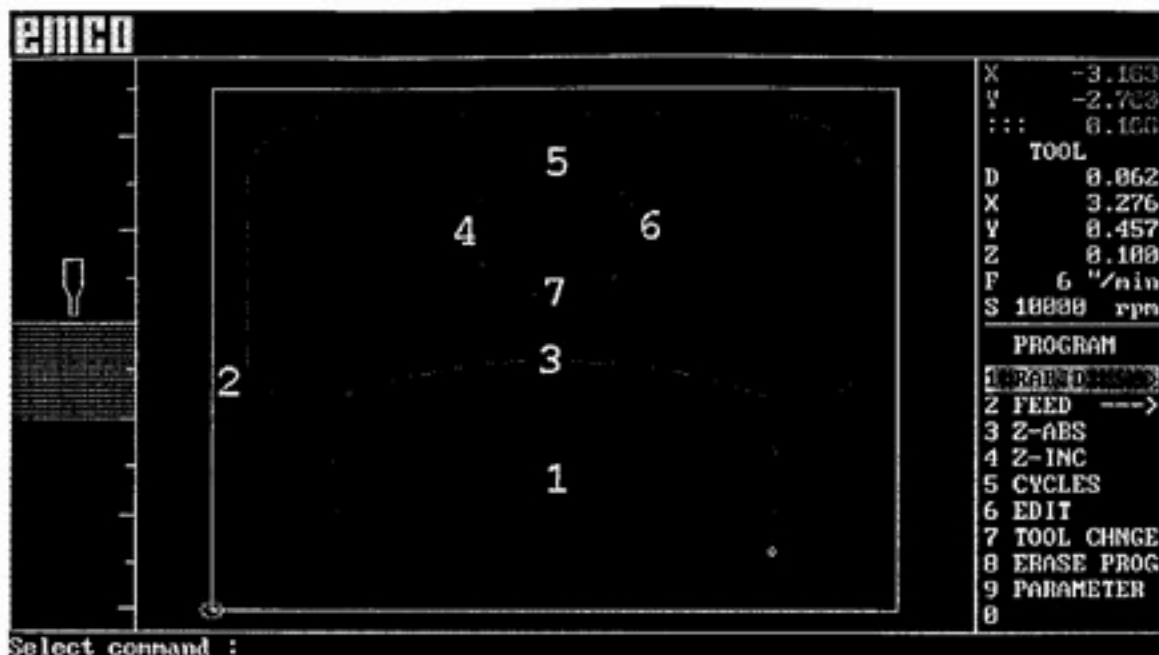47) PRESS "F1" RAPID (TOOL WILL RAPID TO CURSOR POSITION)

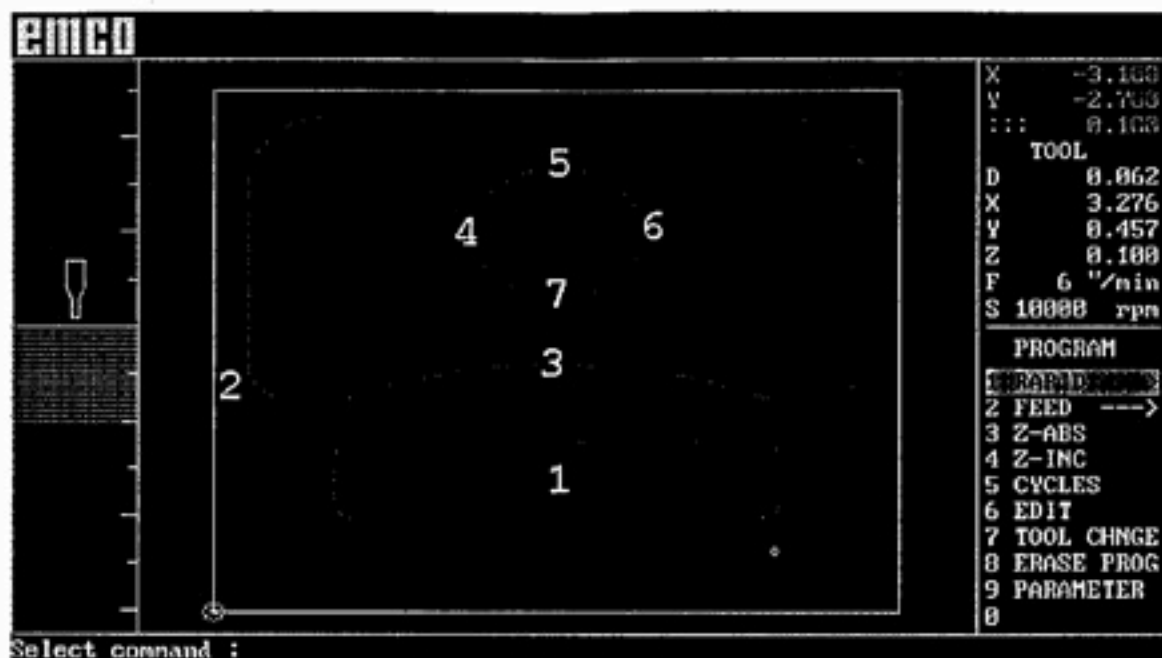48) PRESS "F6" FREE POCKET (IRREGULAR POCKET)

49) PRESS "F1" CONTOUR

50) TYPE "1234" FOR FREE POCKET SUBROUTINE PROGRAM NUMBER

51) PRESS ENTER

52) CURSOR SHOULD BE AT POINT #2, IF CURSOR IS NOT AT THIS POINT,
PRESS THE SPACE BAR TO MOVE CURSOR AT POINT #2

10

```
X      -3.163
Y      -2.703
:::     0.100
       TOOL
D      0.062
X      3.276
Y      0.457
Z      0.100
F      6  "/min
S  10000  rpm

    PROGRAM

1  GRAM DISPLAY
2  FEED     --->
3  Z-ABS
4  Z-INC
5  CYCLES
6  EDIT
7  TOOL CHNGE
8  ERASE PROG
9  PARAMETER
0
```

Select command :

53) PRESS ENTER

54) PRESS "1" OTHER DIRECTION (DEFINE POINTS IN A C.C.W. DIRECTION)

55) PRESS ENTER

56) PRESS ENTER 10 MORE TIMES TO DEFINE ALL POINTS ON CONTOUR

57) CURSOR SHOULD BE AT "X .5" & "Y 1.9", PRESS ENTER TO ACCEPT START POSITION OF TOOL

58) PRESS ENTER AGAIN TO DEFINE ANOTHER CONTOUR (THE CIRCLE WILL BE AN ISLAND)

59) PRESS THE SPACE BAR SEVERAL TIMES TO POSITION CURSOR AT POINT #4

60) PRESS ENTER TO CONFIRM

61) PRESS CURSOR 4 MORE TIMES TO DEFINE THE EXISTING POINT ON THE CIRCLE CONTOUR (CURSOR SHOULD BE MOVING IN A C.W. DIRECTION TO IDENTIFY THAT THE CONTOUR WILL BE AN ISLAND, OPPISITE THAT OF THE FREE POCKET WITCH WAS DEFINED IN A C.C.W DIRECTION)

62) POSITION CURSOR AT "X 1.3" & "Y 2.9"

63) PRESS ENTER

11

```
emco
                                               X      -3.100
                                               Y      -2.700
                                               :::     0.100
                                                    TOOL
          5                                    D      0.062
     4          6                              X      3.276
                                               Y      0.457
                                               Z      0.100
          7                                    F    6  "/min
                                               S  10000  rpm
          3                                      PROGRAM
2                                              1 RAPID
                                               2 FEED   --->
                                               3 Z-ABS
                                               4 Z-INC
                                               5 CYCLES
          1                                    6 EDIT
                                               7 TOOL CHNGE
                                               8 ERASE PROG
                                               9 PARAMETER
                                               0
Select command :
```

64) PRESS "N" FOR NO FURTHER CONTOURS

65) PRESS "F2" MACHINING

66) PRESS "F1" TO MACHINE ON LEFT SIDE (INSIDE) OF POCKET

67) PRESS "F3" OFFSET

68) PRESS "0" (NO OFFSET, OR MATERIAL TO BE LEFT FOR A FINISH PASS)

69) PRESS ENTER

70) PRESS "F4" DEPTH OF SINGLE CUT
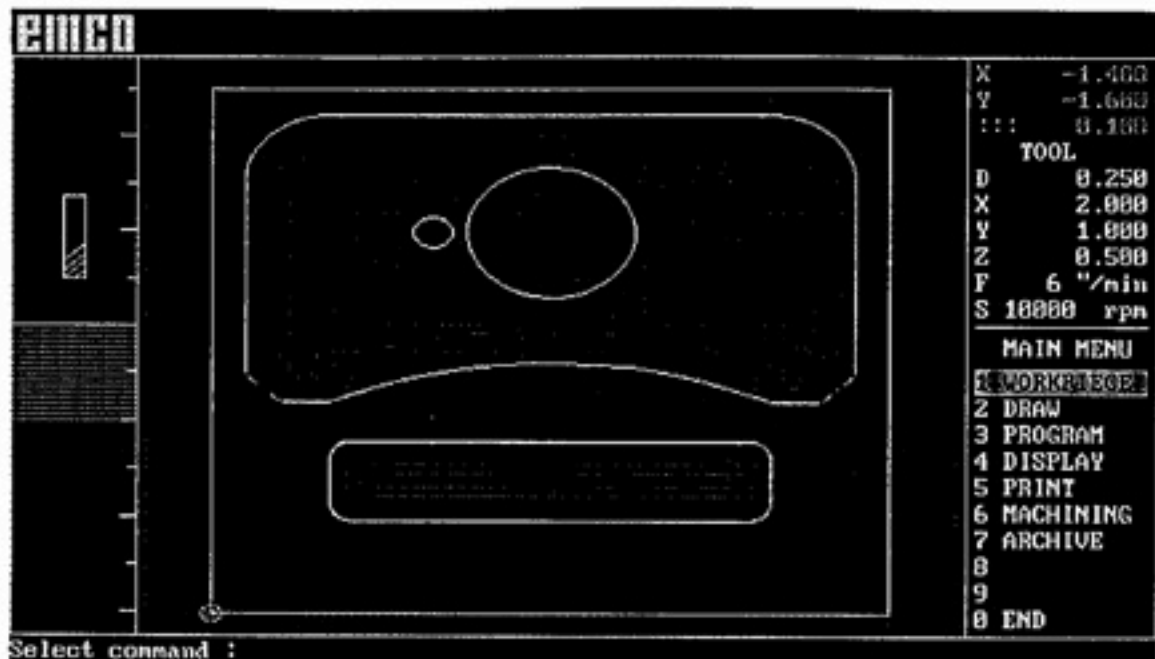
71) TYPE ".05"

72) PRESS ENTER

73) PRESS "F5" END DEPTH

74) TYPE "-.150"

75) PRESS ENTER

76) PRESS "F8" RETRACT HEIGHT

77) TYPE ".5"

12

78) PRESS ENTER

79) PRESS "F9" APPROACH

80) PRESS "F1" DIRECT

81) PRESS "F10" EXECUTE

THE PROGRAMING OF THE PART IS COMPLETE

TO VIEW THE TOOL PATH IN SOLID SIMULATION, "ESC" TO THE MAIN MENU

1) PRESS "F4" DISPLAY

2) PRESS "F5" CHANGE SIMULATION

3) PRESS ENTER TO CONFIRM