## Preface

This section will take you through the process of drawing a fixture base.

Your entire part, in all views, should look like Figure 1.



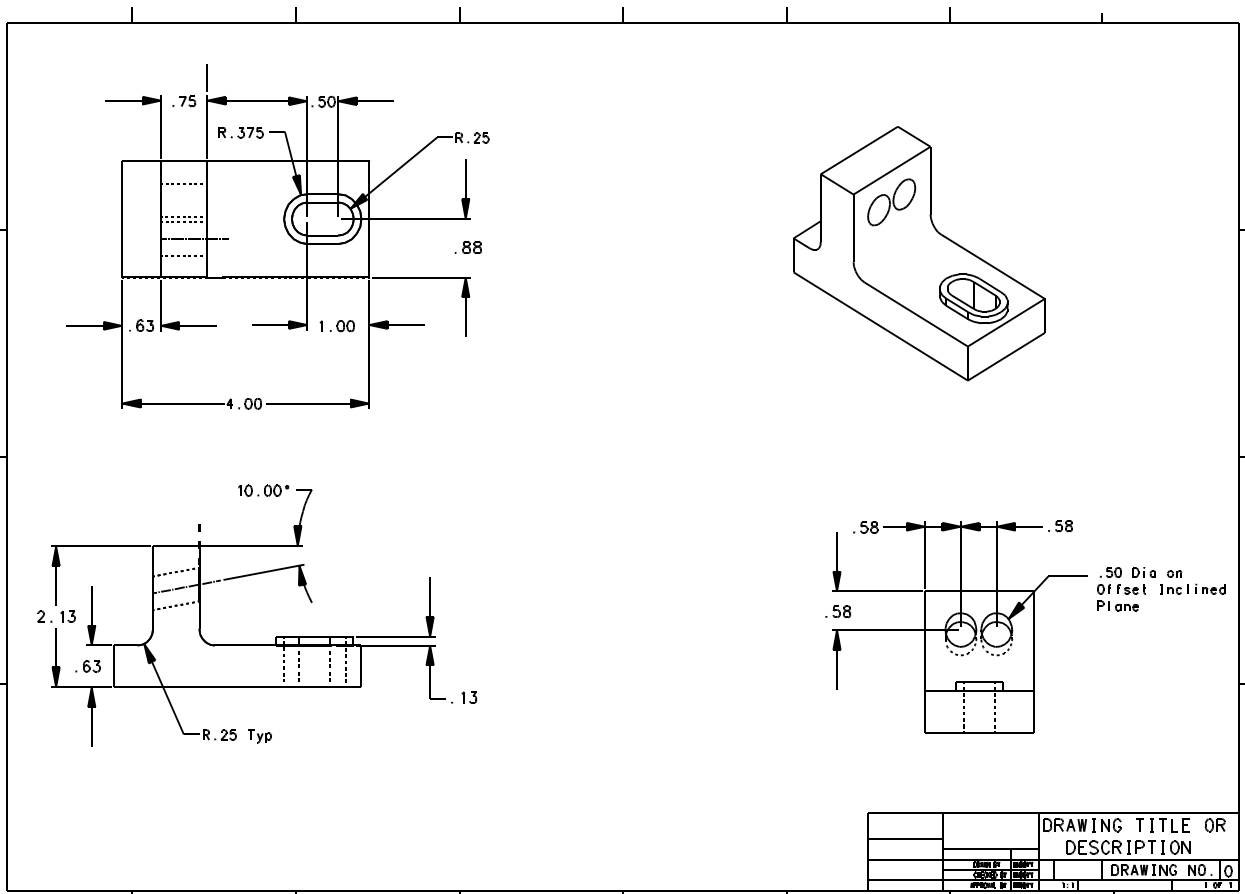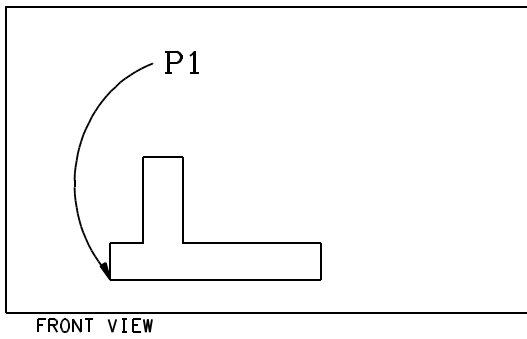*Figure 1*

FRONT VIEW

*Figure 2*

1. Load the drawing 3DSIZE.DWG.

2. Click on LINE: POINT-TO-POINT.

3. Click on point P1 (the bottom left center) in the front view.  (See Figure 2.)

4. Type the following coordinates, pressing ENTER after each line:

    →4
    ↑.63
    ←2.62
    ↑1.5
    ←.75
    ↓1.5
    ←.63

5. Click on point P1 (Figure 2) to finish the profile.

6. Click on CORNER-BETWEEN-2-CURVES.

7. Set the modifiers as follows:

    -Radius ? to .25
    -Trim ? to "both"
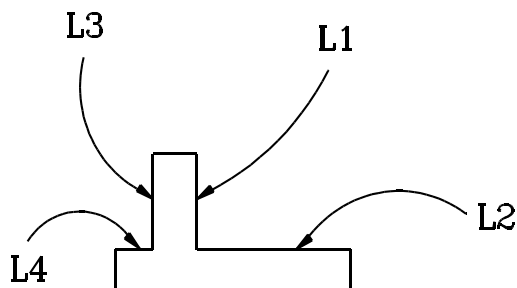    -Circle Part ? to "fillet"



*Figure 3*

8. Click on on lines L1 and L2, then on lines L3 and L4.  (See Figure 3.)

9. Click on ENCLOSE: SELECT-ALL-IN and place a rubberband box around the object in any view to select it.

10. Click on SWEEP: LINEAR-SWEEP.

11. Press ENTER to place the pick up point, type <Page Down> 1.76, and press ENTER to place the put down point.
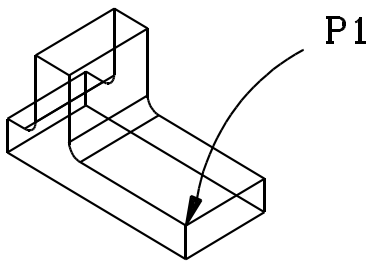
12. Click on CLEAR.



*Figure 4*

13. Click on LINE: POINT-TO-POINT.

14. Click on point P1 in the isometric view, then type the following coordinates, followed by ENTER:

    ←1, <Page Down> .88

15. Click on ARC: CENTER-START-ANGLE.

16. Set the modifiers as follows:

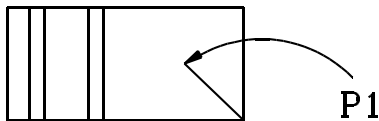    -Angle ? to 180
    -Arc Plane ? to "view"

17. In the top view, click on point P1, then type <Page Down> .25, followed by ENTER. (See Figure 5.)



*Figure 5*

18. Click on point P1, then type <Page Down> .375, followed by ENTER. (See Figure 5.)

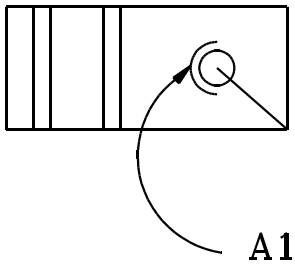19. Click on point P1, then type <Page Up> .25, followed by ENTER. (See Figure 5.)

*Figure 6*

20. Type /c, then press ENTER.

21. Click on A1, then type <Page Up> .375, followed by ENTER. (See Figure 6.)
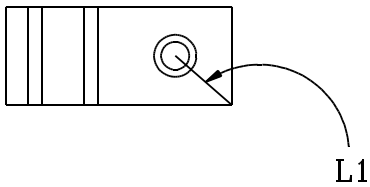


*Figure 7*

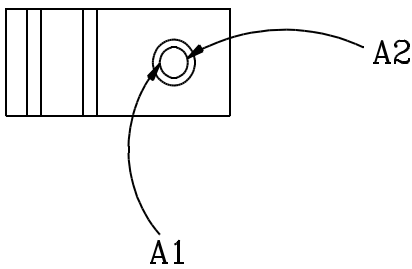22. Click on ERASE, then click on L1. (See Figure 7.)



*Figure 8*

23. Click on SELECT, then click on A1 and A2 (the .25R arcs). (See Figure 8.)

24. Click on TRANSFORM: MOVE.

25. Set the -Move Which ? modifier to "no copy".

26. Click anywhere to place the pick up point, then type ↑.13, followed by ENTER to place the put down point.
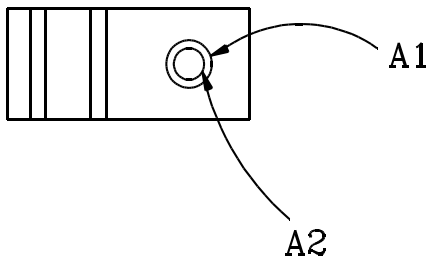
27. Click on CLEAR (in the TRANSFORM detail menu).

**Figure 9**

28. Click on A1 and A2 to the right. (See Figure 9.)

29. Click on SWEEP: LINEAR-SWEEP.

30. Set the -Move Which ? modifier to "copy".

31. Click anywhere to place the pick up point, then type →.5 followed by ENTER to place the put down point.
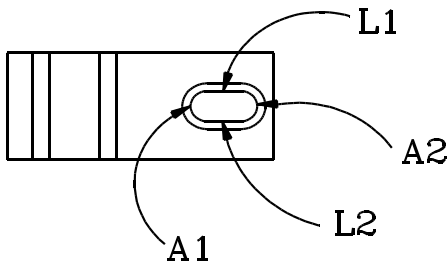
32. Click on ERASE.



**Figure 10**

33. Click on SELECT, then click on A1, A2, L1, and L2 (the .25R arcs and the lines connecting them). (See Figure 10.)

34. Click on SWEEP: LINEAR-SWEEP.

35. Click anywhere to place the pick up point, then type ↓.76 followed by ENTER to place the put down point.

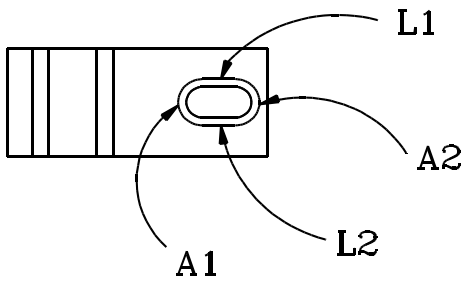36. Click on CLEAR (in the SWEEP detail menu).

*Figure 11*

37. Click on A1, A2, L1, and L2 (the .375R arcs and the lines connecting them). (See Figure 11.)

38. Click on SWEEP: LINEAR-SWEEP.

39. Click anywhere to place the pick up point, then type ↑.13 followed by ENTER to place the put down point.

40. Click on CLEAR.

41. Click on CPL: ALIGN-TO-VIEW, then click on the side view.

42. Click on LINE: 1-PT-CONSTRUCTION.

43. Set the modifiers as follows:

   -System ? to "view"
   -Construction size ? to "use length"
   -Angle ? to 10
   -Length ? to 1.13
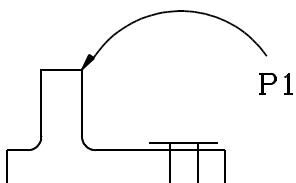   -Attribute Name ? to "centerline"
   -Auto Select ? to "yes"



*Figure 12*

44. Click on point P1 in the front view. (See Figure 12.)

45. Set the -Attribute Name ? modifier to "object".

46. Click on TRANSFORM: MOVE.

47. Set the -Move Which ? modfiier to "no copy".

48. Click anywhere to place the pick up point, type ↓.58, <Page Down>.58, then press ENTER.
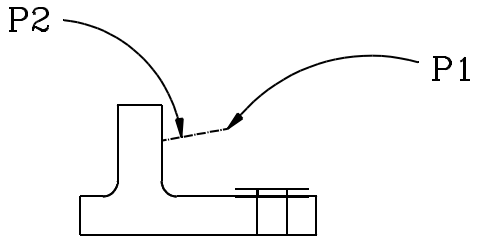
49. Click on CLEAR.

P2

P1

50. Click on CIRCLE: AXIS-RADIUS.

51. Set the -Radius/Diameter ? modifier to .25.

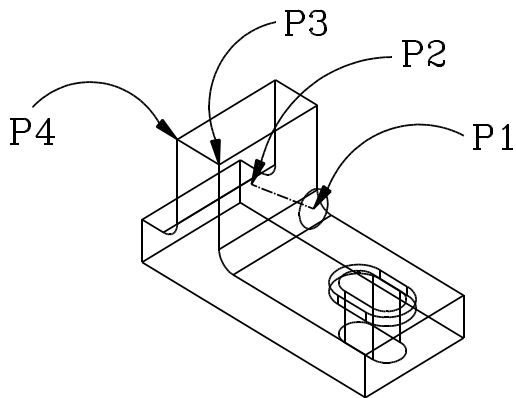52. Click on points P1 and P2. (See Figure 13.)

*Figure 13*

P3

P2

P4

P1

53. Click on WINDOW: ZOOM, and use a rubberband box to zoom in on the isometric view.

54. Click on PROJECT: ALONG-A-LINE.

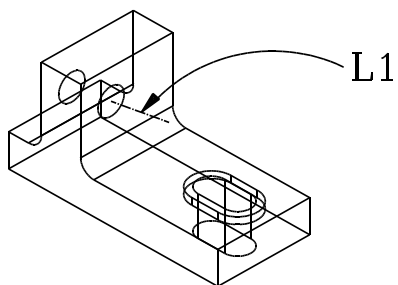55. Click on points P1, P2, and P3, then click on points P1, P2, and P4. (See Figure 14.)

*Figure 14*

L1

56. Click on ERASE.

57. Click on SELECT, then click on L1 (the construction line). (See Figure 15.)
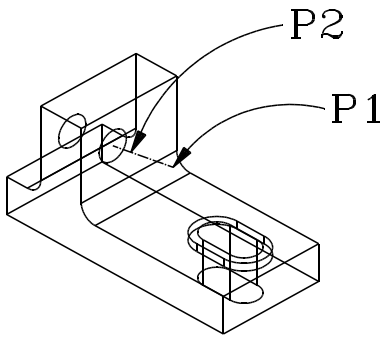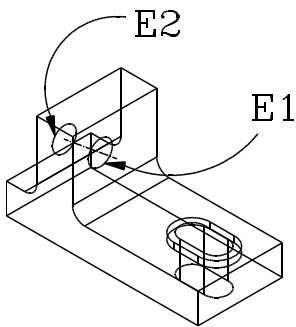
*Figure 15*

*Figure 16*

58. Click on TRANSFORM: MOVE.

59. Click on point P1, then P2. (See Figure 16.)

P2 is a point along the construction line. Make sure that no other geometry is inside the cursor when you pick your points.



*Figure 17*

60. Click on CLEAR.

61. Click on SELECT, then click on the two ellipses, E1 and E2, added to the drawing.
    (See Figure 16.)

62. Click on TRANSFORM: MOVE.

63. Set the -Move Which ? modifier to "copy".

64. Click anywhere to place the pick up point, type <Page Down> .58, followed by ENTER to place the put down point.

65. Click on SELECT: ALL-EDITABLE-LEVELS to select the entire object.

66. Click on SURFACES

67. Set the -Auto Select ? modifier to "no".

68. Click on MAKE-TRUE-SURFACES.

69. Click on SHOW VIEW: MAKE-VIEW-HIDDEN, set the -Hidden Line Style ? modifier to "invisible", then click on the isometric view.

70. Press F10 to go back to the full view, set the - Hidden Line Style ? modifier to "dashed", then click on the front, top, and side views.

71. Click on EDIT VIEW: ERASE-SELECTED, then click on the isometric and side views to remove the centerlines.

72. Click on EDIT VIEW: FORCE-NON-HIDABLE, then click on the top and front views.
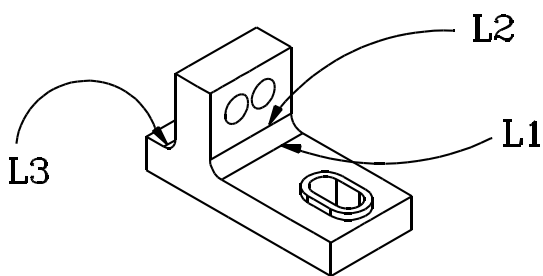
73. Click on CLEAR (in the EDIT VIEW detail menu).



*Figure 18*

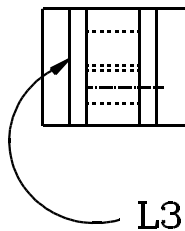74. Click on line L1 in the isometric view (Figure 18), and line L3 in the top view (Figure 19).



*Figure 19*

75. Click on EDIT VIEW: ERASE-SELECTED, then click on the isometric and top views.

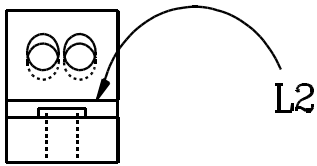76. Click on CLEAR (in the EDIT VIEW detail menu).

**Figure 20**

77. Click on line L2 twice in the side view. (See Figure 20.)

78. Click on ERASE-SELECTED, then click on the isometric and the side views.

79. Click on CLEAR (in the detail menu).

80. Click on WINDOW: ZOOM, and use the rubberband box to zoom in the top view.
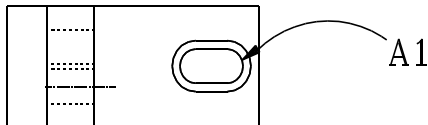
81. Click on RAD DIM (3D Page 2).

82. Set the modifiers as follows:



**Figure 21**

-Dimension Type ? to "radial"
-Centered ? to "no"
-Arrow Position ? to "outside"
-Line Type ? to "broken"
-Text Alignment ? to "view-horizontal"
-Text Mode ? to "automatic"
-Style ? to "R ⌀/
-Plane ? to "view"

83. Click on A1 (the .25R arc). (See Figure 21.)
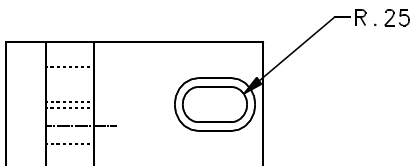
84. Click to place the dimension put down point.

Figure 22 shows the location of the R.25 dimension.



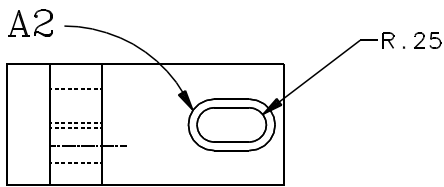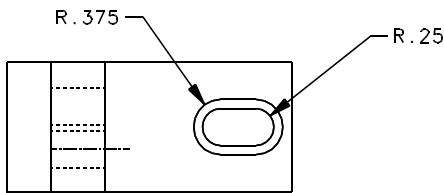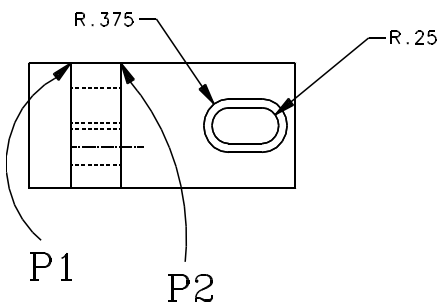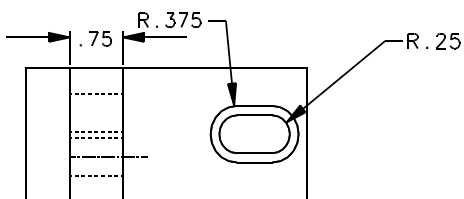**Figure 22**

**Figure 23**

85. Set the -# Auto Dec Places ? modifier to 3.

86. Click on A2 (the .375R arc).  (See Figure 23.)



**Figure 24**

87. Click to place the dimension put down point.

Figure 24 shows the location of the R.375 dimension.



**Figure 25**

88. Click on LIN DIM.

89. Set the modifiers as follows:

> -Dimension Type ? to "horizontal"
> -Centered ? to "yes"
> -# Auto Dec Places ? to 2
> -Plane ? to "view"

90. Click on points P1 and P2 for the .75 dimension.  (See Figure 25.)



**Figure 26**

91. Click to place the dimension put down point.

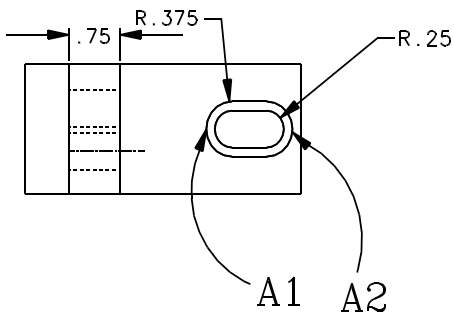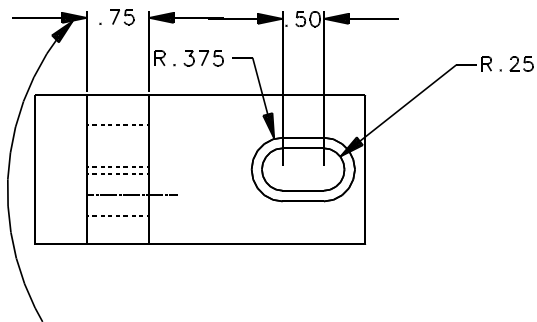Figure 26 shows the location of the .75 dimension.

**Figure 27**

92. Type /c, then press ENTER.

93. Click on A1 (the left .375R arc). (See Figure 27.)

94. Type /c, then press ENTER.

95. Click on A2 (the right .375 arc). (See Figure 27.)



**Figure 28**

96. Click on the arrowhead of the .75 dimension as the dimension put down point.

Figure 28 shows the location of the .50 dimension.



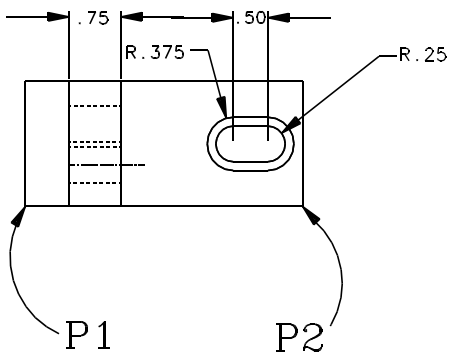**Figure 29**

97. Set the -Arrow Position ? modifier to "inside".

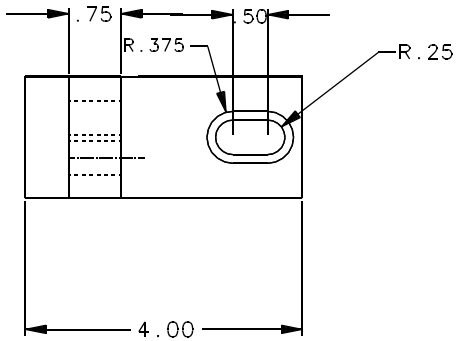98. Click on points P1 and P2 for the 4.00 dimension. (See Figure 29.)

**Figure 30**

99 . Click to place the put down point.
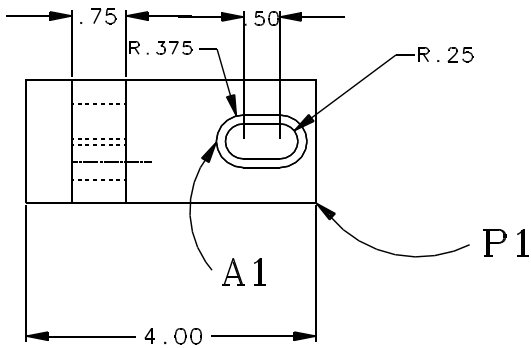
Figure 30 shows the location of the 4.00 dimension.



**Figure 31**

100 . Set the modifiers as follows:

-Arrow Position ? to "outside"
-Extension Lines ? to "2nd"

101 . Click on point P1 (the lower right corner of the rectangle). (See Figure 31.)

102 . Type /c, then press ENTER.

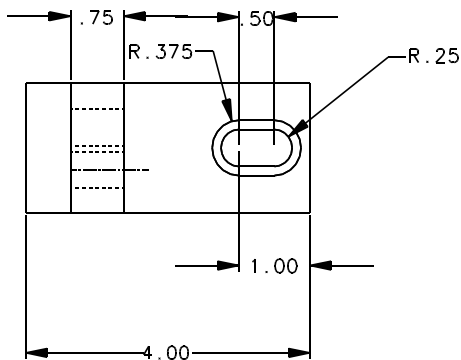103 . Click on arc A1 (the left side of the .375R or .25R arc). (See Figure 31.)



**Figure 32**

104 . Click to place dimension put down point.

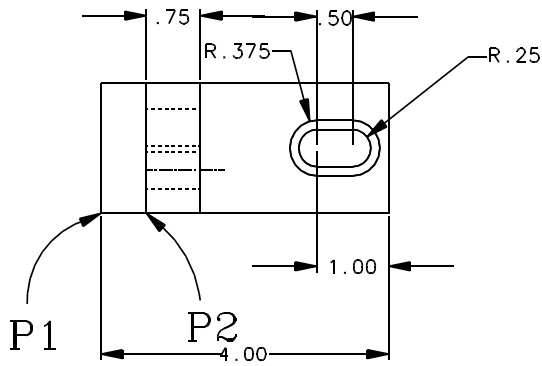Figure 32 shows the location of the 1.00 dimension.

**Figure 33**

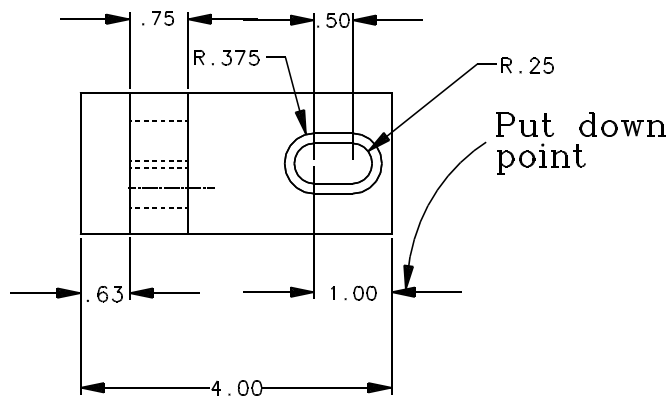105. Click on points P1 and P2 from left to right for the .63 dimension. (See Figure 33.)



**Figure 34**

106. Click on the arrowhead point of the 1.00 dimension to place the put down point.

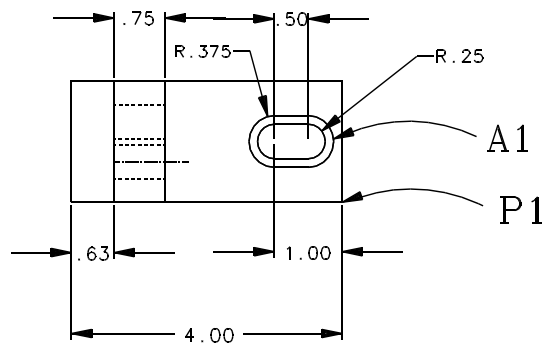Figure 34 shows the location of the .63 dimension.



**Figure 35**

107. Set the modifiers as follows:

   -Dimension Type ? to "vertical"
   -Extension Lines ? to "both"

108. Type /c, then press ENTER.

109. Click on arc A1 (the right side of the .375R or .25R arc). (See Figure 35.)

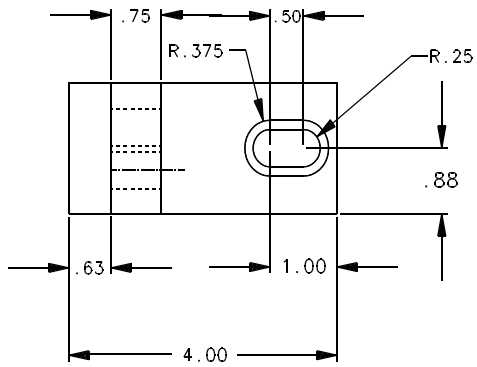110. Click on point P1 (the lower right corner of the rectangle). (See Figure 35.)

*Figure 36*

111. Click to place the dimension put down point.

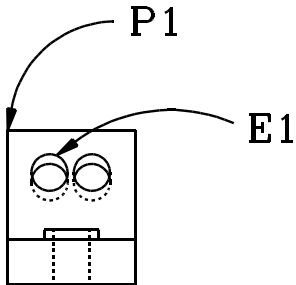Figure 36 shows the location of the .88 dimension.



*Figure 37*

112. Press F10 to zoom back to the full view, then press F11 and place the rubberband box around the side view to zoom in on it.

113. Type /c, then press ENTER.

114. Click on E1 (the left side top ellipse). (See Figure 37.)

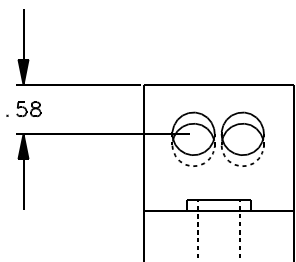115. Click on point P1 (the upper left corner of the rectangle). (See Figure 37.)



*Figure 38*

116. Click to place the dimension put down point.

Figure 38 shows the location of the .58 dimension.

117. Set the modifiers as follows:

      -Dimension Type ? to "horizontal"
      -Centered ? to "no"

118. Type /c, then press ENTER.

119. Click on E1 (the left side top ellipse), as shown in Figure 37.

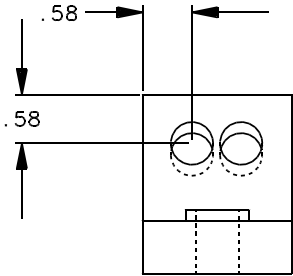120. Click on point P1 (the upper left corner of the rectangle), as shown in Figure 37.



*Figure 39*

121. Click to place the dimension put down point.

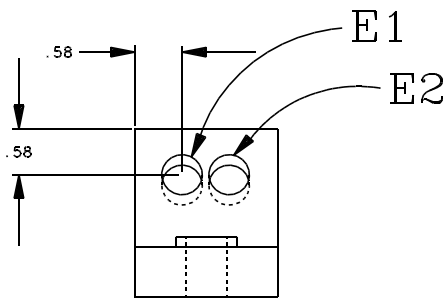Figure 39 shows the location of the second .58 dimension.



*Figure 40*

122. Type /c, then press ENTER.

123. Click on E1 (the left side top ellipse), as shown in Figure 40.

124. Type /c, then press ENTER.

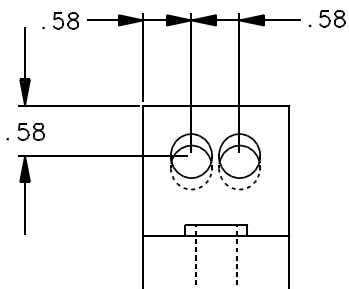125. Click on E2 (the right side top ellipse). (See Figure 40.)



*Figure 41*

126. Click to place the dimension put down point.

Figure 41 shows the location of the third .58 dimension.
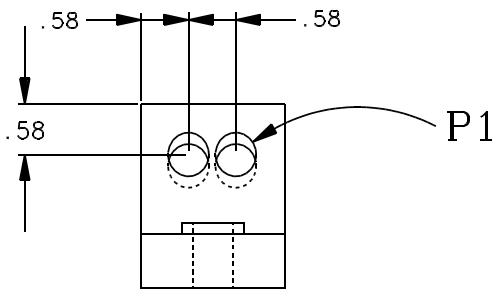
**.58**

**P1**

*Figure 42*

127. Click on LEADER.

128. Set the -Leader Adjustment ? modifier to "horizontal".
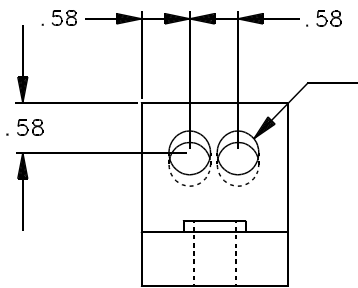
129. Click on point P1.  (See Figure 42.)

**.58**

*Figure 43*

130. Click to place the elbow, and click again to place the leader end point.

Figure 43 shows the location of the leader.

**.58**

**P1**

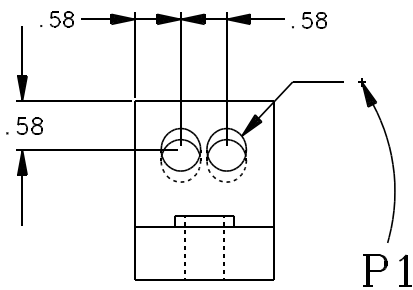*Figure 44*

131. Click on TEXT.

132. Set the modifiers as follows:

  -View ? to "one"
  -Angle ? to 0
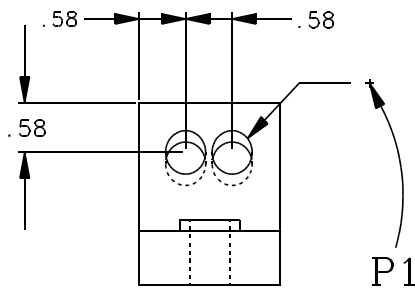  -Justification ? to "left"
  -Text Attr Name ? to 1/8.

*Figure 45*

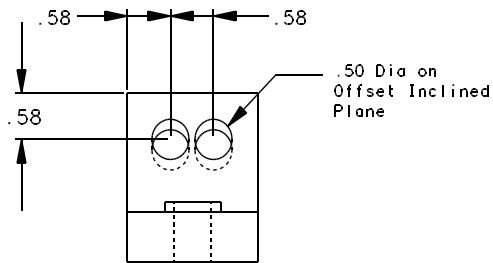133. Click on point P1 (to the right of the leader) to locate the text. (See Figure 45.)



*Figure 46*

134. Type the text as follows, pressing ENTER after each line:

   **.50 Dia on**
   **Offset Inclined**
   **Plane**
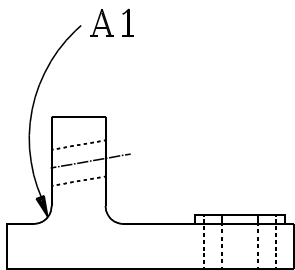
   Press ENTER again to insert the text.



*Figure 47*

135. Press F10 to go back to the full view, then press F11 and use the rubberband box to zoom in on the front view.

136. Click on RAD DIM.

137. Set the -Suffix ? modifier t **~Typ**. (The first character is a tilde, the Shift character to the left of the 1 on the keyboard. It is used by CADMAX to represent a SPACE character.)
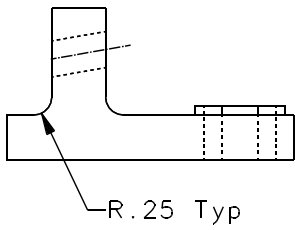
138. Click on A1 (the .25R arc). (See Figure 47.)

**Figure 48**

139. Click to place the dimension put down point.
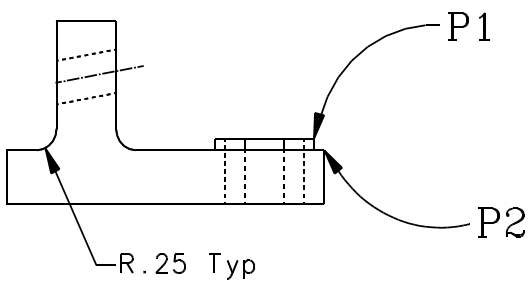
Figure 48 shows the location of the R.25 Typ dimension.

**Figure 49**

P1

P2

R.25 Typ

140. Click on LIN DIM.

141. Set the modifiers as follows:

   -Dimension Type ? to "vertical"
   -Suffix ? to "none"

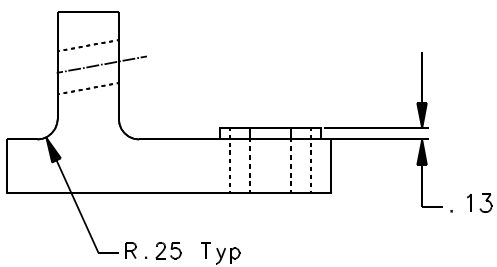142. Click on points P1 and P2 for the .13 dimension. (See Figure 49.)

**Figure 50**

R.25 Typ

.13

143. Click to place the dimension put down point.

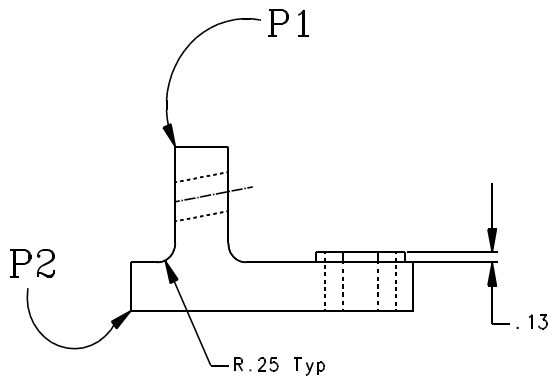Figure 50 shows the location of the .13 dimension.

**Figure 51**

144. Set the modifiers as follows:

     -Centered ? to "yes"
     -Arrow Position to "inside"

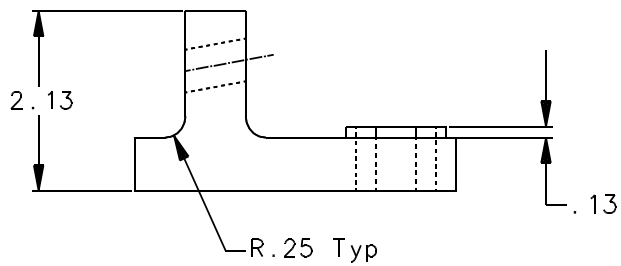145. Click on points P1 and P2 for the 2.13 dimension. (See Figure 51.)



**Figure 52**

146. Click to place the dimension put down point.

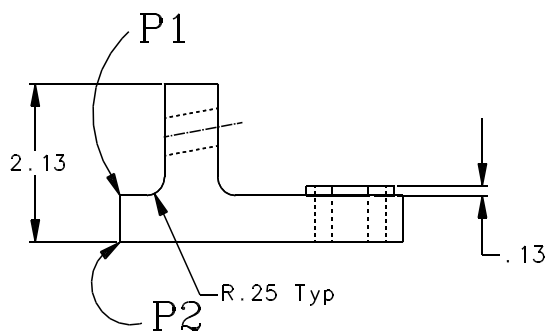Figure 52 shows the location of the 2.13 dimension.



**Figure 53**

147. Set the -Arrow Position ? modifier to "outside".

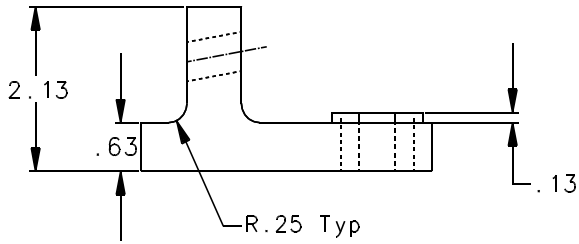148. Click on points P1 and P2 for the .63 dimension. (See Figure 53.)

**Figure 54**

149. Click to place the dimension put down point.

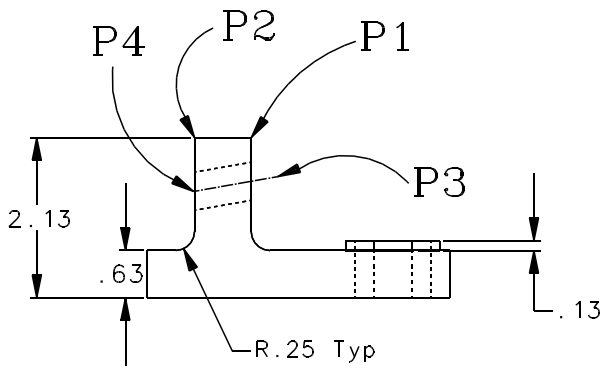Figure 54 shows the location of the .63 dimension.



**Figure 55**

150. Click on ANG DIM: FOUR-POINT.

151. Set the -Centered ? modifier to "no".

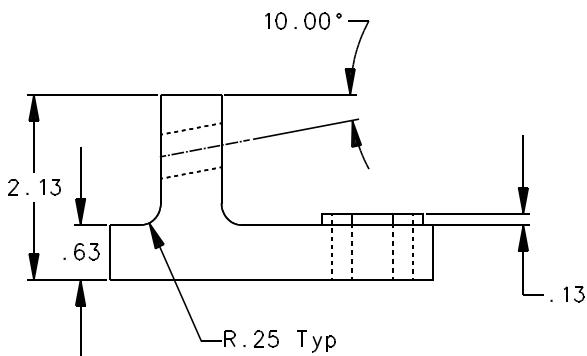152. Click on points P1, P2, P3, and P4 in the order indicated in Figure 55.



**Figure 56**

153. Click to place the dimension put down point.

Figure 56 shows the location of the 10.00 degree dimension.

154. Click on F10 to zoom back to the full view.

155. Click on LEVELS.

156. Highlight levels 252 and 254, then click on INVISIBLE.

157. Click on OK.

158. Press F3, type the name "Fixbase" for your drawing, then click on OK.