

Getting drawing information

BtoCAD stores accurate, detailed information about all the entities in a drawing. You can get details about an existing drawing and its entities using the tools for measuring distances and calculating areas. You can also track the amount of time you spend editing a drawing. This section explains how to:

- Measure distances along an entity.
- Measure distances and angles.
- Divide an entity into a number of equal segments.
- Calculate areas.
- Display information about entities in a drawing.
- Track the amount of time spent editing a drawing.

Many of the functions described in this section require that you set BtoCAD to the advanced experience level.

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Specifying measurements and divisions

You can divide a line, arc, circle, polyline, ellipse, or spline into a number of equal segments or mark off intervals of a specific length along an entity. (Note that divide is not the same as break.) For example, you may want to place station-point markers every 50 feet along the centerline of a roadway or divide the plan view of a window into three equal-width sections of glass, placing a mullion at each division point.

To specify measurements and divisions, use these commands:

- For the length of the segments, use the **Measure** command.
- For the number of equal-length segments, use the **Divide** command.

You can measure or divide arcs, circles, lines, polylines, ellipses, and splines. With either command, you can identify the segments by placing either a block or point entity at the end of each interval. If you use points, you can snap to the ends of intervals using the point entity snap. The appearance of the point entities is determined by the current point display type, which you control in the Drawing Settings dialog box.

To use a block as the marker, the block must already be defined in the current drawing. You can further indicate whether to rotate the block to align perpendicularly to the entity you are measuring or dividing.



Block not aligned with entity

Block aligned with entity.

BtoCAD begins measuring or dividing based on the point at which you select the entity and the type of entity with which you are working. For most entities, measuring starts from the endpoint closest to the point you used to select the entity. If you select the entity to be measured or divided using a method other than pointing (for example, using a window or fence selection), the program prompts you to specify the end from which you want to begin measuring.

Measuring intervals on entities

You can mark specified length increments along a selected entity using either a point entity or a block.

To measure intervals along an entity and mark them using point entities

Advanced experience level

- 1 Type *measure* and then press Enter.
- 2 Select the entity.
- 3 Specify the segment length, and then press Enter.



When you select the entity by pointing, intervals are measured from the end closest to the point at which you select the entity (**A**). Blocks or point entities (**B**) are placed along the entity at the specified interval.

To measure intervals along an entity and mark them using blocks

Advanced experience level

- 1 Type *measure* and then press Enter.
- 2 Select the entity.
- 3 In the prompt box, choose Insert Blocks.
- 4 Type the name of the block you want to insert as the marker.
- 5 In the prompt box, choose either Yes-Align Blocks to rotate each insertion of the block so that its vertical alignment is always perpendicular to the entity or No-Do Not Align to insert each copy of the block with a zero rotation angle.
- 6 Specify the segment length, and then press Enter.

Dividing entities into segments

You can place markers along a selected entity, dividing that entity into a specified number of equal-length segments. You can use either a point entity or a block to mark the segments.

To divide an entity into segments and mark them using point entities

Advanced experience level

- 1 Type *divide* and then press Enter.
- 2 Select the entity.
- 3 Specify the number of segments, and then press Enter.



When you select the entity by pointing, divisions are marked beginning from the end closest to the point at which you select the entity (A). Blocks or point entities (B) are placed along the entity to mark it in equal intervals.

To divide an entity into segments and mark them using blocks

Advanced experience level

- 1 Type *divide* and then press Enter.
- 2 Select the entity.
- 3 In the prompt box, choose Insert Blocks.
- 4 Type the name of the block you want to insert as the marker.
- 5 In the prompt box, choose either Yes-Align Blocks to rotate each insertion of the block so that its vertical alignment is always perpendicular to the entity or No-Do Not Align to insert each copy of the block with a zero rotation angle.
- 6 Specify the number of segments, and then press Enter

Calculating areas

You can calculate the area and perimeter of a polygon based on a series of points you specify or enclose with a circle or closed polyline. You can also determine the area of several combined entities and add or subtract the area of one or more entities from a total combined area.

Calculating areas defined by points

You can find the area and perimeter of any closed region by specifying a series of points. The program calculates the area and perimeter of the space that is enclosed by an imaginary polygon consisting of

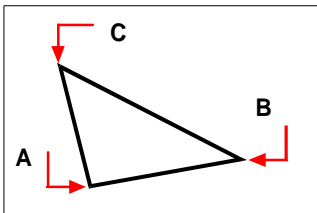
straight-line segments connecting each point.

To calculate the area defined by points you specify

- 1 Do one of the following:
 'Choose Tools > Inquiry > Area.
 'On the Inquiry toolbar, click the Area tool
- 2 Type *area* and then press Enter.
 Specify the first point.
- 3 Specify the second point.
- 4 Continue specifying points in sequence to define the perimeter of the area you want to measure.
 As you select each successive point, the resulting polygon is displayed on the screen.
- 5 To complete the calculation, press Enter.

The area and perimeter of the region you defined are displayed. For example, the following type of information is displayed:

Area = 11.0583, Perimeter = 15.3092



Select the points (A, B, C) that form a polygon. The area and perimeter of the region are then calculated.

Calculating areas of closed entities

You can find the area of any closed entity. In addition, the program calculates either the circumference or the perimeter of the entity, depending on the type of entity you select.

To calculate the area of a closed entity

- 1 Do one of the following:

- Choose Tools > Inquiry > Area.

-

On the Inquiry toolbar, click the Area tool



- Type *area* and then press Enter.

2 In the prompt box, choose Find Area Of One Entity.

3 Select the entity.

The following type of information is displayed:

Area = 62.3837, Circumference = 27.9989

Calculating combined areas

You can find the total area of several combined regions by specifying points or by selecting entities. You can also subtract the areas of entities or polygons from a running total.

To add areas to calculate a combined area

1 Do one of the following:

- Choose Tools > Inquiry > Area.

-

On the Inquiry toolbar, click the Area tool



- Type *area* and then press Enter.

2 In the prompt box, choose Add Areas Together


3 Using one of the following methods, identify the first area:

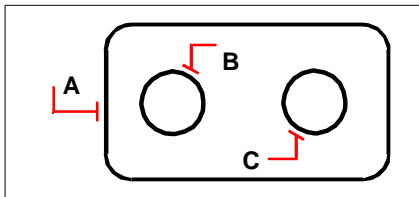
- Specify points defining a polygon, and then in the prompt box, choose Done Specifying Area.
- In the prompt box, choose Add Entities To Area, select the entities you want to add, and then press Enter to complete the calculations.

4 To complete the command, choose Done in the prompt box.

To subtract areas when calculating a combined area

1 Do one of the following:

- Choose Tools > Inquiry > Area.
 - On the Inquiry toolbar, click the Area tool 
 - Type *area* and then press Enter.
- 2 In the prompt box, choose Add Areas Together.
 - 3 Using one of the following methods identify the first area:
 - Specify points defining a polygon, and then in the prompt box, choose Done Specifying Area.
 - In the prompt box, choose Add Entities To Area, select the entities you want to add, and then press Enter to complete the calculations.
 - 4 In the prompt box, choose Subtract Areas.
 - 5 Using one of the following methods, identify the area to be subtracted:
 - Specify points defining a polygon, and then in the prompt box, choose Done Specifying Area.
 - In the prompt box, choose Subtract Entities From Area, select the entities you want to subtract, and then press Enter to complete the calculations.
 - 6 To complete the command, choose Done in the prompt box.



To calculate the area of the gasket using the Area command, first add the area of the entire gasket (A), and then subtract the areas of the two circles (B and C).

As you select entities, the program displays the calculations. If the command bar is displayed, the information appears there. If the command bar is not displayed, the program opens the Prompt History window and displays the calculations. The following type of information is an example of what is displayed:

```
Entity • Add • Subtract • <First point>: Choose Add Areas Together Adding: Entity • Subtract •
```

```
<First point>: Choose Add Entities to Area Adding area: <Select entities>: Select the first entity
```

```
Area = 64.6259, Perimeter = 33.3049
```

```
Total length = 33.3049
```

Total area = 64.6259

Adding area: <Select entities>: *press Enter*

Adding: Entity • Subtract • <First point>: *Choose Subtract Areas*

Subtracting: Entity • Add • <First point>: *Choose Subtract Entities from*

Area

Subtracting area: <Select entities>: *Select the first entity to subtract*

Area = 3.1597, Circumference = 6.3012

Total length = 27.0036

Total area = 61.4662

Subtracting area: <Select entities>: *Select the second entity to subtract*

Area = 3.1597, Circumference = 6.3012

Total length = 20.7024

Total area = 58.3066

Subtracting area: <Select entities>: *Press Enter*


Subtracting: Entity • Add • <First point>: *Choose Done*

Calculating distances and angles

You can calculate the distance between any two points you select. The following information is displayed:

- The distance between the points, measured in drawing units.
- Their angle in the xy plane.
- Their angle measured from the xy plane.
- The change (delta) in the x, y, and z distances between the two points.

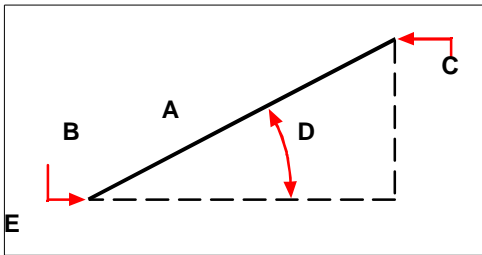
To calculate the distance between two points and their angle

- 1 Do one of the following:
 - Choose Tools > Inquiry > Distance.
 - On the Inquiry toolbar, click the Distance tool 
 - Type *distance* and then press Enter.
- 2 Specify the first point.
- 3 Specify the second point.

The following type of information is displayed:

Distance = 13.2850, Angle in XY Plane = 31°, Angle from XY Plane = 0° Delta X = 11.3878, Delta

Y = 6.8418, Delta Z = 0.0000



Use the Distance command to calculate the distance (A) between two points (B and C), the angle in the xy plane (D), the angle from the xy plane, and the delta x (E), delta y (F), and delta z distances between the two points.

TIP To use specific points on selected entities, use entity snaps to select the precise points on the entities.

Displaying information about your drawing

You can display a variety of information about a drawing and the entities it contains, including:

- Information in the drawing database about selected entities.
- The current drawing status.
- The time spent working on the drawing.

This information is displayed in the Prompt History window and in the command bar.

Displaying information about entities

You can display information about the selected entities. The information varies, depending on the type of entities you select. All of the listings display the following information:

- Entity type.
- Layer.
- Color.
- Linetype.
- The location of the entity (its xyz-coordinates relative to the current user coordinate system [UCS]).
- The current space (model space on the Model tab or paper space on a Layout tab).
- The size of the entity (the information varies, depending on the entity type).

To display information about an entity

Advanced experience level

- 1 Do one of the following:
 - Choose Tools > Inquiry > List Entity Info.

On the Inquiry toolbar, click the List Entity Info tool



- Type *list* and then press Enter.
- 2 Select one or more entities.
 - 3 Press Enter.

TIP To return to the drawing window, press *F2*. The following type of information is displayed:

```
----- Circle ----- Handle: 2C  
  
Current space: Model  
  
Layer: 0
```

Color: BYLAYER Linetype: CONTINUOUS Handle: 4C

Current space: Model

Center point: X= -5.8583 Y= 7.2752 Z= 0.0000

Radius: 4.4562

Circumference: 27.9989

Area: 62.3837

Displaying the drawing status

You can display information about the current status of a drawing, including:

- Drawing name.
- Limits.
- Insertion base point.
- Snap and grid settings.
- Current layer, color, and linetype.
- Current settings for various modes (fill, grid, orthogonal, snap, blips, and so on).

To display the drawing status

Advanced experience level

Do one of the following:

- Choose Tools > Inquiry > Drawing Status.
- Type *status* and then press Enter.

Tracking time spent working on a drawing


You can display information about the amount of time you have spent working on a drawing, including:

- The date and time the drawing was created.
- The date and time the drawing was most recently saved.

- The total amount of time spent working on the drawing.
- The time spent working on the drawing during the current editing session. You can turn the elapsed-time timer on and off or reset it to zero.

To display the timer information

Advanced experience level

- 1 Do one of the following:
 - Choose Tools > Inquiry > Time Variables.
 - On the Inquiry toolbar, click the Time Variables tool 
 - Type *time* and then press Enter.
- 2 Select any of the prompt box options:
 - Choose Timer On to turn the elapsed timer on.
 - Choose Timer Off to turn the elapsed timer off.
 - Choose Display Timer to redisplay the timer information.
 - Choose Reset Timer to reset the elapsed timer to zero.
- 3 In the prompt box, choose Cancel to exit the command.

Each time you display the timer information, the following type of information is displayed:

```
The current time is Fri Dec 19 09:58:43 1997
```

```
Drawing was created on: Wed 17 Dec 1997 at 16:17:59.8090
```

```
Drawing was last updated on: Thur 18 Dec 1997 at 09:58:43.3040
```

```
Total editing time: 1 2: 35:4.2345
```

```
Elapsed timer (on): 0 1: 21:5.6324
```