

AutoCAD and Its Applications **BASICS**

Supplemental Material—Chapter 4

Multilines

Multilines are objects that can consist of up to 16 parallel lines. The individual lines in a multiline are called *elements*. Like polyline segments, several connected multiline segments form a single object. Draw multilines using the **MLINE** command. Modify multilines using the **MLEDIT** command.

Type
MLINE ML

MLINE

Drawing Multilines

The default multiline style has two open-ended parallel lines. Access the **MLINE** command to draw multilines. The **MLINE** command prompts and options are similar to those for the **LINE** command. Select the **Undo** option to undo the previously drawn multiline segment. Use the **Close** option at the last prompt to close a multiline polygon.

Multiline Justification

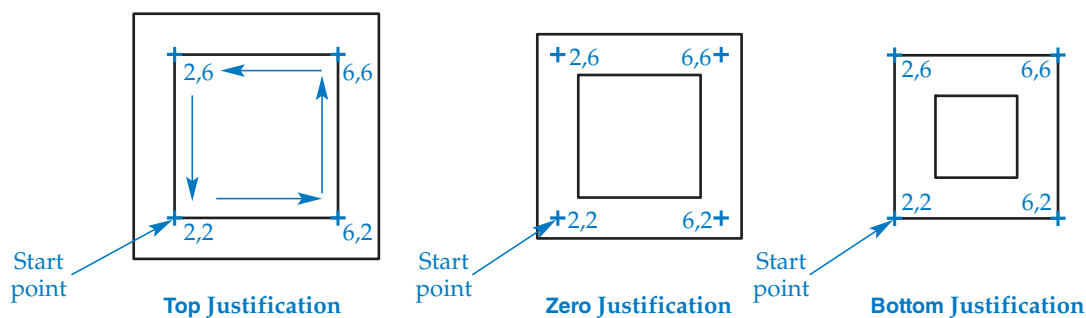
Multiline justification determines how multiline elements are offset from their definition points. *Definition points* are the points you pick or coordinates you enter to specify multilines. Justification is based on counterclockwise movement and can be specified only once during an **MLINE** command sequence. To change the justification, select the **Justification** option at the first prompt after you enter the **MLINE** command. Then select the **Top** (default), **Zero**, or **Bottom** option. See [Figure 4B-1](#).

PROFESSIONAL TIP

The multiline **Justification** options control the direction of the offsets for elements of the current style. The multiline segments shown in [Figure 4B-1](#) are drawn in a counterclockwise direction. Unexpected results can sometimes occur when you use the **MLINE** command, depending on the justification and direction in which you draw.

Figure 4B-1.

Multilines drawn using each justification option. These examples show picking the definition points (represented by plus symbols) in a counterclockwise rotation.



Activity 4B-1

1. Start a new drawing from scratch or use a template of your choice.
2. Use the **MLINE** command and its justification options to draw three objects similar to those shown in Figure 4B-1.
3. Observe the difference in the justification options.
4. Save the drawing as ACT4B-1 and close the file.

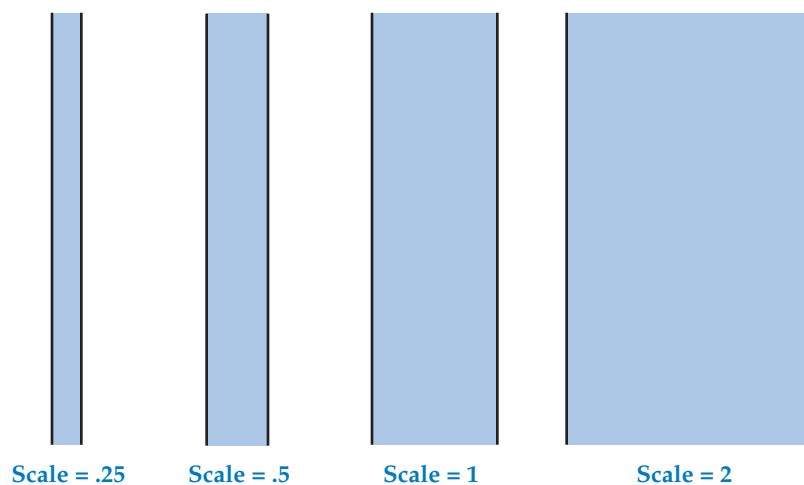
Multiline Scale

The **Scale** option of the **MLINE** command defines the offset distance between multiline elements. Scale is a multiplier applied to the offset distance specified in the multiline style. The default scale setting of 1 sets the distance between multiline elements equal to 1 times the offset distance. For example, the default **STANDARD** multiline style creates two parallel lines 1 unit apart. When the multiline scale is 1, the distance between the lines is 1 ($1 \times 1 = 1$). If the multiline scale is 2, the distance between the two lines is 2 ($1 \times 2 = 2$). See **Figure 4B-2**.

Activity 4B-2

1. Start a new drawing from scratch or use a template of your choice.
2. Use the **MLINE** command and the **Scale** option to draw four objects similar to the ones shown in Figure 4B-2.
3. Observe the differences among the multiline scales.
4. Save the drawing as ACT4B-2 and close the file.

Figure 4B-2.
Multiline scale settings.



Creating Multiline Styles

Access the **MLSTYLE** command to display the **Multiline Style** dialog box. See **Figure 4B-3**. Use the **Multiline Style** dialog box to define, edit, and save multiline styles. You can save styles to an external file for use in other drawings. The **Preview of:** area in the lower portion of the **Multiline Style** dialog box displays a representation of the selected multiline style.

To create a new multiline style, pick the **New...** button to display the **Create New Multiline Style** dialog box. See **Figure 4B-4**. In the **New Style Name:** text box, type a name for the new multiline style. To use the properties from an existing style for the new style, select the existing style from the **Start With:** drop-down list. Type the new style name and pick the **Continue** button to open the **New Multiline Style:** dialog box. See **Figure 4B-5**. Use the optional **Description:** text box to type a brief description of the multiline style.

Figure 4B-3.

Use the **Multiline Style** dialog box to define, edit, and save multiline styles.

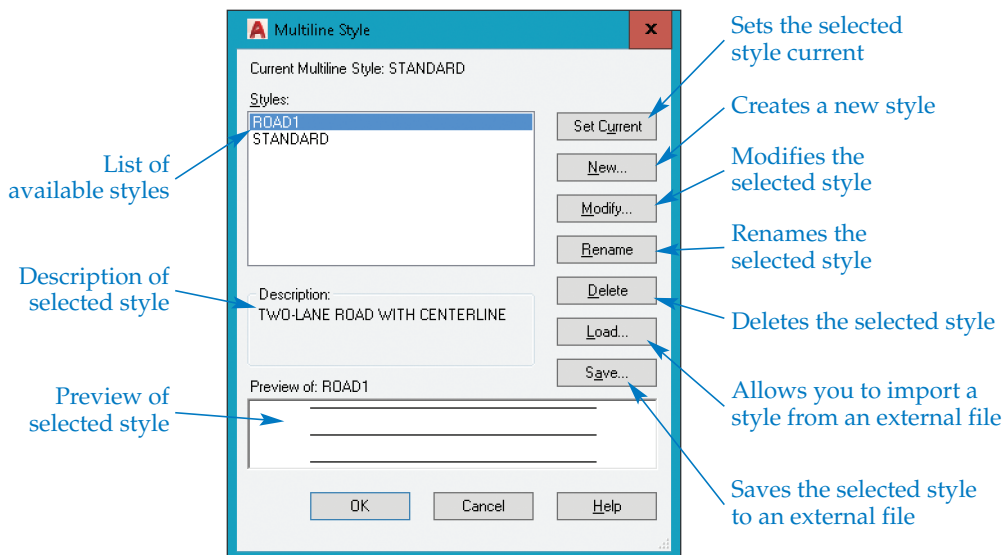


Figure 4B-4.

To create a new multiline style, specify a name and existing multiline style settings in the **Create New Multiline Style** dialog box.

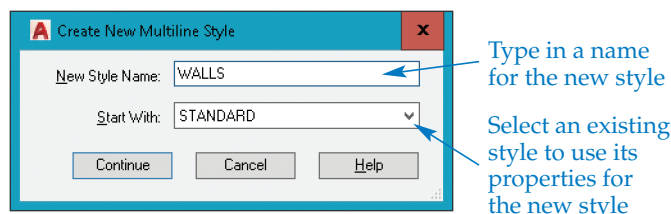
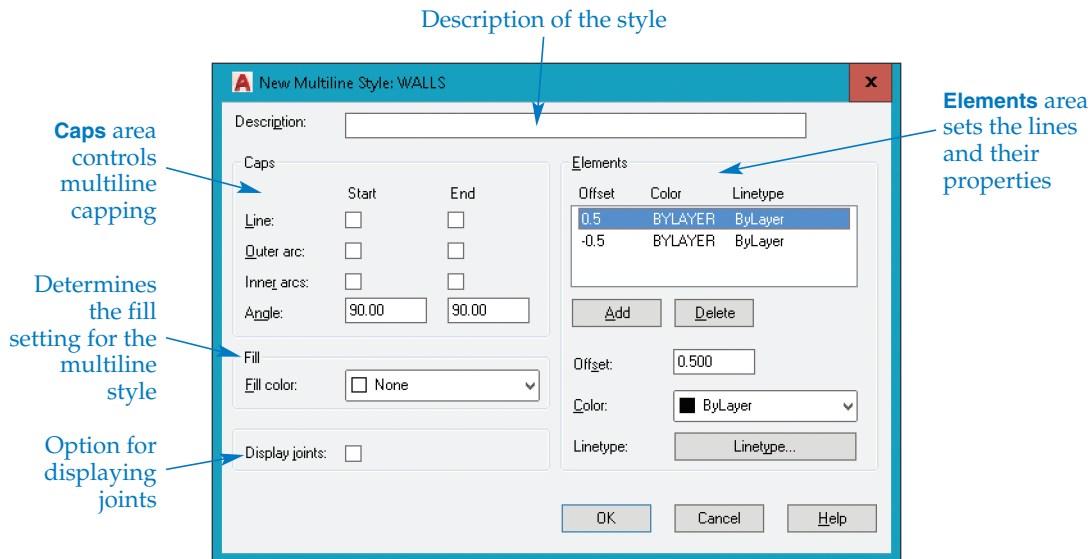


Figure 4B-5.

The options in the **New Multiline Style:** dialog box control the settings for a new multiline.



Caps, Fill, and Joints

The settings in the **Caps** area of the **New Multiline Style:** dialog box control the placement of caps on multilines. *Caps* are short lines connecting the elements of a multiline at the start point and endpoint. Use the check boxes to set caps at the start point, endpoint, or both.

Caps can be straight lines or arcs. Arcs can be set to connect the ends of the outermost elements only, pairs of inner elements, or both the outer and inner elements. See [Figure 4B-6](#). The multiline style must contain at least two multiline elements for outer arcs to appear. Arcs are created tangent to the elements they connect. You can also change the angle of the caps relative to the direction of the multiline elements by entering values in the **Angle:** text boxes. Separate text boxes for the start points and endpoints allow you to set the styles independently.

The **Fill color:** setting in the **Fill** area allows you to create a solid multiline. To specify the fill color, select a color from the **Fill color:** drop-down list. See [Figure 4B-7](#). When the **Fill color:** setting is **None**, the multiline is unfilled. Check **Display joints:** to display multiline joints. *Joints*, also referred to as *miters*, are lines connecting the vertices of adjacent multiline elements at the end of each segment. See [Figure 4B-8](#).

Figure 4B-6.

Examples of various multiline cap options.

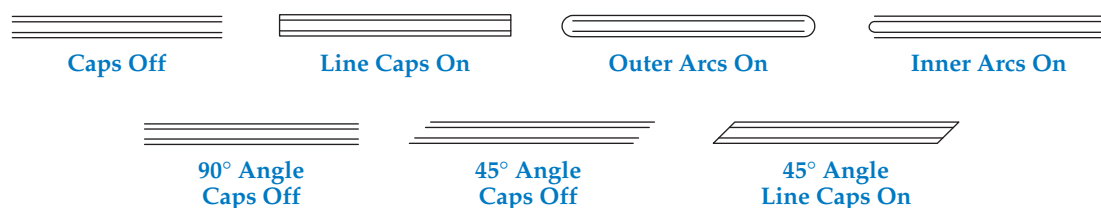


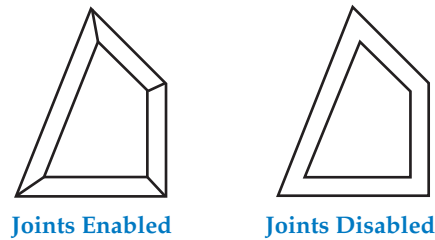
Figure 4B-7.

The multiline **Fill color:** setting allows you to draw multilines with a solid fill pattern.



Figure 4B-8.

You can draw multilines with or without joints.



Element Properties

The **Elements** area of the **New Multiline Style:** dialog box allows you to add or delete elements (lines) in the multiline style and specify the properties of each element. The options in the **Elements** area change properties such as linetype, color, and offset. After you set element properties, pick **OK** to apply the properties to the new multiline style. The new style is added to the **Multiline Style** dialog box.

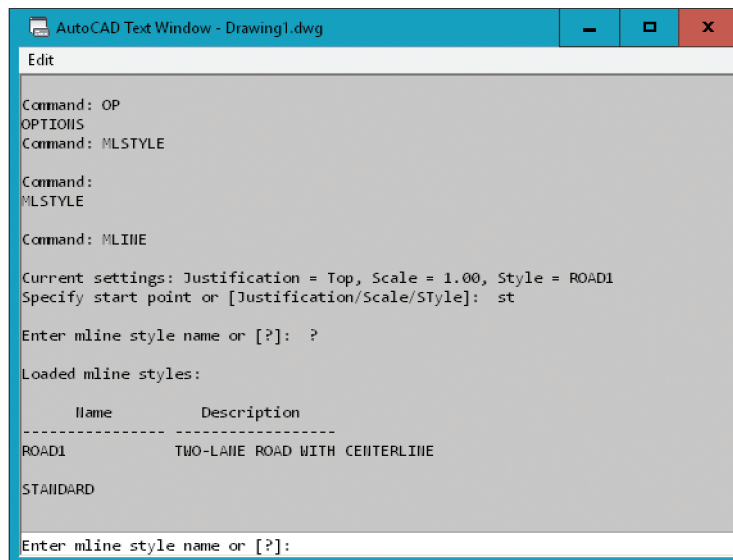
Changing the Multiline Style

To use a saved multiline style as the current multiline style, access the **Style** option of the **MLINE** command and enter the style name. If you forget the name of the desired multiline style, select the **?** option at the Enter mline style name or [?]: prompt. By default, the **AutoCAD Text Window** opens, listing the currently loaded multiline styles. See [Figure 4B-9](#). Type the name of the style to activate.

If you try to specify a multiline style that is not loaded, the **Load multiline style from file** dialog box appears. You can look for a multiline style in the acad.mln file library, or you can pick the **Tools** button and then **Find...** to open the **Find:** dialog box.

Figure 4B-9.

Display a list of loaded multiline styles in the **AutoCAD Text Window**.



Activity 4B-3

1. Start a new drawing from scratch or use a template of your choice.
2. Use the **MLSTYLE** and **MLINE** commands to create the following.
 - A. Multilines with several types of caps, similar to those shown in Figure 4B-6.
 - B. A multiline with joints, similar to the one shown in Figure 4B-8.
 - C. A multiline with a fill color of Red.
3. Save the drawing as ACT4B-3 and close the file.

Editing Multilines

The **MLEDIT** command allows limited editing of multiline objects using the **Multilines Edit Tools** dialog box. See [Figure 4B-10](#). The **Multilines Edit Tools** dialog box contains four columns, each with three buttons of related command options. The image on each button gives you an example of what to expect when editing. When you pick a button, the dialog box closes, and AutoCAD prompts you to continue with the command.

Type
MLEDIT

Intersections

The first (left) column in the **Multilines Edit Tools** dialog box displays three different types of multiline intersections. Pick a button to create the type of intersection shown. [Figure 4B-11](#) shows the effects of the cross options.

When you pick the **Closed Cross** button, the first multiline you select is called the *background*, and the second multiline you select is called the *foreground*. In a closed cross intersection, the background is trimmed, and the foreground remains unchanged. The trimming is apparent, not actual. The line visibility of the background multiline changes, but it is still a single multiline.

Figure 4B-10.

The **Multilines Edit Tools** dialog box has twelve different options for editing multilines.

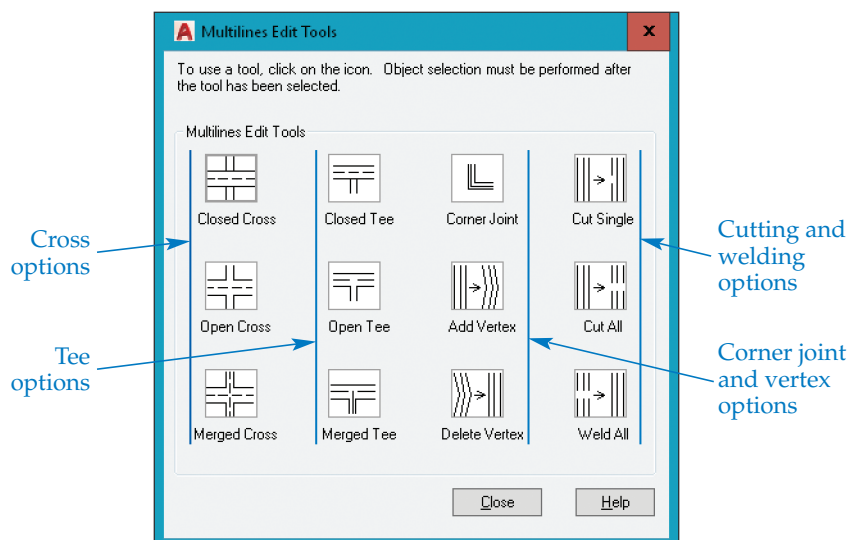
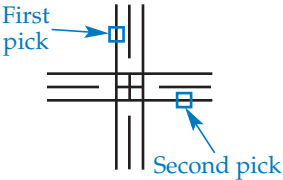
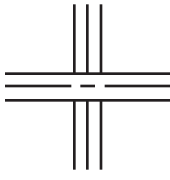
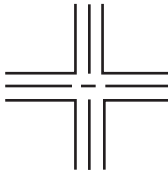
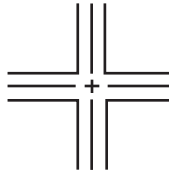


Figure 4B-11.
Creating closed cross, open cross, and merged cross intersections with the **MLEDIT** command.

Original Crossing Multilines	Closed Cross	Open Cross	Merged Cross
			

Select the **Open Cross** button to trim all the elements of the first multiline and only the outer elements of the second multiline. The command sequence is the same as that used for the **Closed Cross** option. The **Merged Cross** button allows you to trim the outer elements of both multilines. The inner elements do not change.

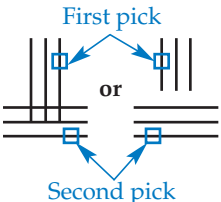



Activity 4B-4

- Start a new drawing from scratch or use a template of your choice.
- Use the **MLINE** and **MLEDIT** commands to do the following, using Figure 4B-11 as an example.
 - Draw three sets of two intersecting multilines.
 - Use the **Closed Cross** option to edit the first set of multilines.
 - Use the **Open Cross** option to edit the second set.
 - Use the **Merged Cross** option to edit the third set.
- Save the drawing as ACT4B-4 and close the file.

Tees

The buttons in the second column of the **Multilines Edit Tools** dialog box allow you to edit multiline tees, as illustrated in **Figure 4B-12**. Pick the **Closed Tee** button to trim or extend the first selected multiline to its intersection with the second multiline. Select the **Open Tee** button to trim the elements where a trimmed or extended multiline intersects another multiline. The first pick specifies the multiline to trim or extend, and the second pick specifies the intersecting multiline. The intersecting multiline is trimmed where the two multilines join. Pick the **Merged Tee** button to trim the intersecting multiline after trimming or extending the first multiline. The inner elements remain joined to create an open appearance with the outer elements.

Figure 4B-12.
Using the tee options of the **MLEDIT** command to edit multiline tees.

Original Multilines	Closed Tee	Open Tee	Merged Tee
			

Activity 4B-5

1. Start a new drawing from scratch or use a template of your choice.
2. Use the **MLINE** and **MLEDIT** commands to do the following, using Figure 4B-12 as an example.
 - A. Draw three sets of two multilines that meet, or nearly meet, at a tee.
 - B. Use the **Closed Tee** option to edit the first set of multilines.
 - C. Use the **Open Tee** option to edit the second set.
 - D. Use the **Merged Tee** option to edit the third set.
3. Save the drawing as ACT4B-5 and close the file.

Corner Joints and Multiline Vertices

The buttons in the third column of the **Multilines Edit Tools** dialog box provide options for creating corner joints and editing multiline vertices. Pick the **Corner Joint** button to create a corner joint between two multilines. The first multiline is trimmed or extended to its intersection with the second multiline. See [Figure 4B-13](#).

Select the **Add Vertex** button to add a vertex to an existing multiline at the location you pick. See [Figure 4B-14](#). The command sequence differs slightly from the sequences used with the other **MLEDIT** options. After you select the **Add Vertex** option, AutoCAD prompts you to pick a location for the vertex.

Pick the **Delete Vertex** button to remove a vertex from an existing multiline. The vertex closest to the location you pick is deleted. See [Figure 4B-14](#). The command sequence is the same as for the **Add Vertex** option.

Figure 4B-13.

You can create a corner joint between two multilines using the **Corner Joint** option of the **MLEDIT** command.

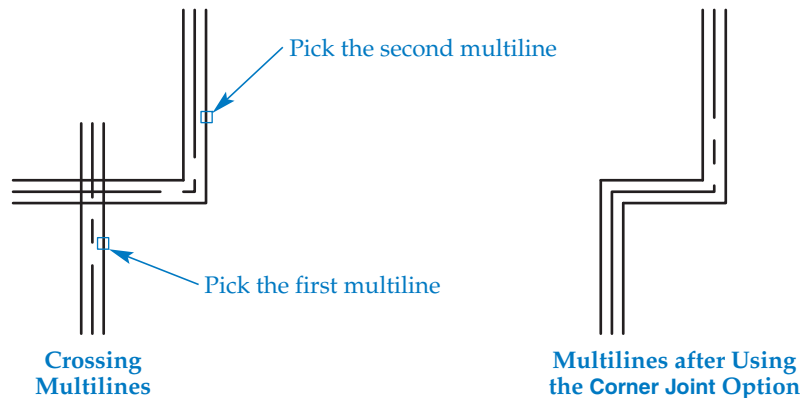
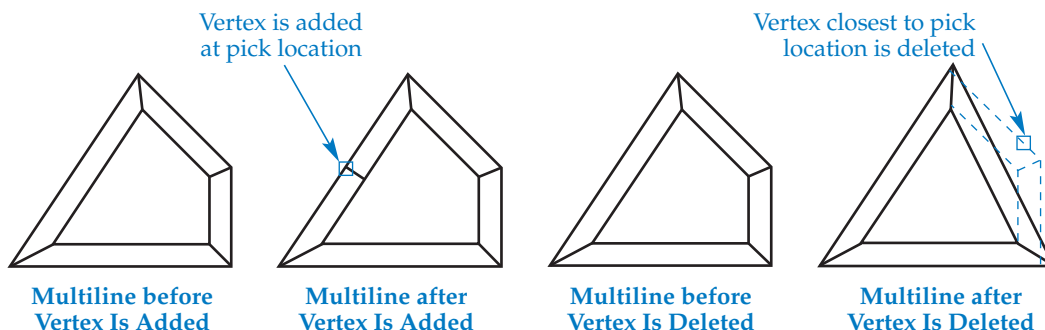


Figure 4B-14.

Use the **Add Vertex** and **Delete Vertex** options of the **MLEDIT** command to edit multiline vertices.



Activity 4B-6

- 1. Start a new drawing from scratch or use a template of your choice.
- 2. Use the **MLINE** and **MLEDIT** commands to do the following.
 - A. Draw multilines similar to the unedited objects shown in Figure 4B-13. Use the **Corner Joint** option to create an object similar to the edited example.
 - B. Draw multilines similar to the unedited objects shown in Figure 4B-14. Use the **Add Vertex** and **Delete Vertex** options to create objects similar to the edited examples.
- 3. Save the drawing as ACT4B-6 and close the file.

Cutting and Welding Multilines

The fourth column of buttons in the **Multilines Edit Tools** dialog box provides options for *cutting* a portion out of a single multiline element or the entire multiline. The spaces between multiline elements can also be connected. Connecting the open portions between multiline elements is referred to as *welding*.

Pick the **Cut Single** button to cut a single multiline element between two specified points. See [Figure 4B-15](#). Cutting affects only the visibility of elements and does not physically separate a multiline object. The multiline is still a single object. After you select the **Cut Single** option, AutoCAD prompts you to pick the cutting points.

Select the **Cut All** button to cut all elements of a multiline between specified points. Refer again to [Figure 4B-15](#). The multiline is still a single object, even though it appears to be separated. Pick the **Weld All** button and select a point on each side of the cut multiline to repair all cuts in the multiline. The appearance of the multiline is restored to its precut condition.

PROFESSIONAL TIP

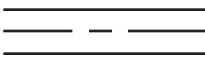
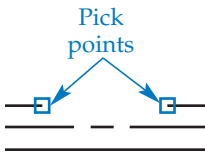

Use the **EXPLODE** command to convert multiline objects to individual line segments.

Type
EXPLODE

EXPLODE

Figure 4B-15.

The **MLEDIT** cutting options allow you to cut single multiline elements or entire multilines between two specified points.

Original Multiline	Cut Single	Cut All
		

Activity 4B-7

- 1. Start a new drawing from scratch or use a template of your choice.
- 2. Use the **MLINE** and **MLEDIT** commands to do the following.
 - A. Draw multilines similar to the multiline on the left in Figure 4B-15.
 - B. Use the **Cut Single** and **Cut All** options to create objects similar to the edited multilines shown.
 - C. Use the **Weld All** option to restore the multilines to their original conditions.
- 3. Save the drawing as ACT4B-7 and close the file.