Chapter 17

Rotating objects

There are two different methods for rotating objects.

1) Use the rotate function in the **Node Menu**.
2) **Select** the items you want to rotate and then use the rotate function at the **Select screen**.

The Rotate Function in the Node Menu

The Node Menu can be seen on page 1. This method of rotating is useful only when you want to rotate one item at time, and only when you want to rotate an item visually. Also, it requires that the center of rotation be somewhere on the item that you are rotating.

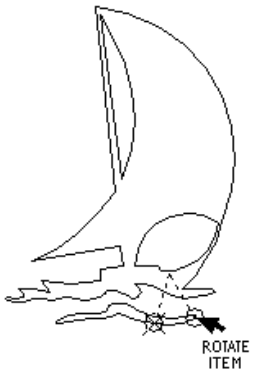

Figure 17-1

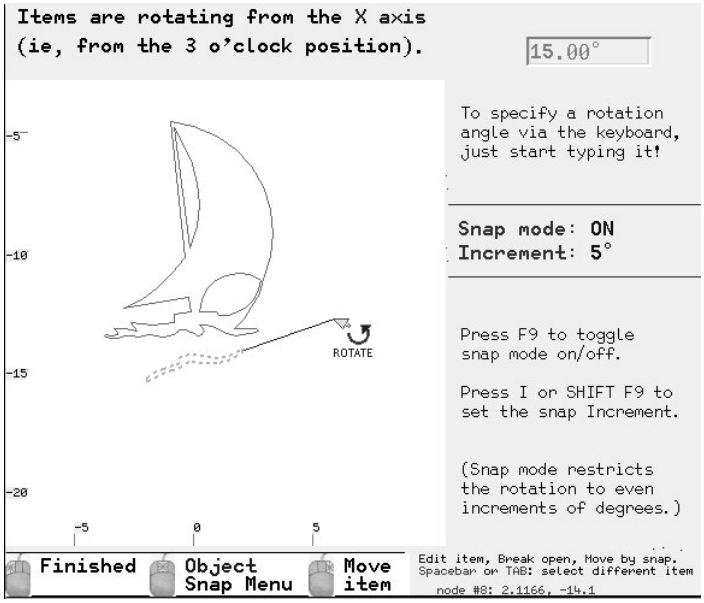

Figure 17-2

The first step to using this method of rotation is to select the **rotate function** from the **node menu**. Then move the mouse over the item you want to rotate and click the **left** button at the point you want the **center of rotation** to be. (In figure 17-1 the mouse is over a node of an arc.) After clicking the left mouse button the screen will change to the rotate function, as seen in figure 17-2.

The prompt on the right side of the screen reminds you about the **snap mode**, and at the top right corner you can see the rotation angle. The snap mode makes it easy to rotate objects in even increments, such as 5°. You can change the increment by pressing the I key on the keyboard and then entering a new increment.

The object will rotate as you move the mouse. As you watch it rotate it may occur to you that you want it to be rotated to a specific angle. Rather than try to get that angle with the mouse, you could type it via the keyboard; simply type the numbers and press the Enter key, as the prompt along the right side of the screen reminds you.

Notice that the **right** mouse icon along the bottom of the screen changes to the **Move Item** function when you are rotating. This means that if you click the **right** mouse button the object that you are rotating can be shifted to some other position on the screen. You then click the **right** mouse button again to resume rotation at that new location.

Select the items and then rotate

If you want a more versatile way to rotate, you **select** the item(s) first and then use the rotate function at the **select screen**.

When the select screen is showing, notice that the letter R in the **rotate button** is a different color than the rest of the word. This letter is the hotkey. You can select the rotate function either by pressing R by clicking the **rotate** button. Either way will bring up a menu (figure 17-3), which allows you to select between three different rotation methods. Each of these methods will be discussed separately.

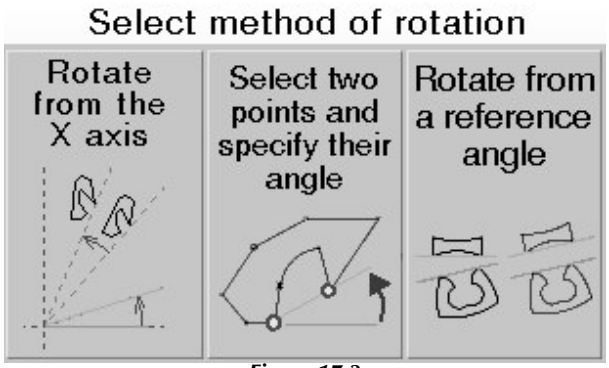

Figure 17-3

Method #1: Rotate from the x axis

This is the simplest method for rotating. This method is very similar to the method seen in Figure 17-2. The difference is that this method lets you **select a center point** for rotation, and this allows you to select a center point that is **not on** the obect that you are rotating.

MillWrite will begin by asking you to select the center point for rotation, as seen in figure 17-4. Assume you want to rotate the item around the center of the circle you see in the lower left corner of figure 17-4. You would put the mouse on the center of the circle, and when you see the mouse change to show the words **ARC CENTER** you click the **left** mouse button.

Notice that the prompt along the right side to the screen reminds you that you could also enter coordinates of the center point rather than pick it with the mouse.

After you select the center point for rotation, the screen changes as seen in figure 17-5. As you rotate the item, MillWrite will display the rotation angle at the upper right corner of the screen.

As the prompt along the right side of the screen reminds you, you can turn the snap mode on and off with the F9 key, or you could select a different snap increment by pressing the I key. You could also type the angle that you want to rotate the item by. For example, if you decide that you would like to rotate it exactly 37°, you would type 37 and press the Enter key. You do **not** have to first move the mouse to the data entry box; rather, just start typing.

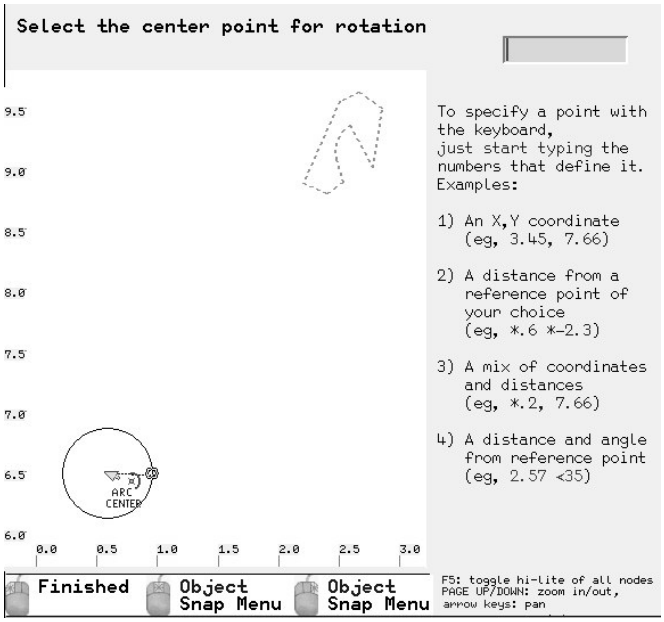

Figure 17-4

Notice in figure 17-5 that the **right** mouse button changed to the **Move Item** function. If you click the **right** mouse button you will move both the item **and** the center of rotation. Click the **right** mouse button a second time when you are finished moving the item, and then you can resume rotation at that new location.

figure 17-6 shows how this method of rotation works. Rotation starts at 3 o'clock position and can go either clockwise or counterclockwise. In figure 17-6 the mouse has been moved counterclockwise around the center point of rotation by 18°. This causes the item to rotate by 18° also. The significance of how this rotation method works will become more apparent when the other rotation methods are explained. For now notice that the mouse is rotating from the 3 o'clock position, but the item that is being rotated is not necessarily anywhere near the 3 o'clock position. With this rotation method, the movement of the mouse is merely indicating how much you want to rotate rather than indicating the location that the item is rotating to.

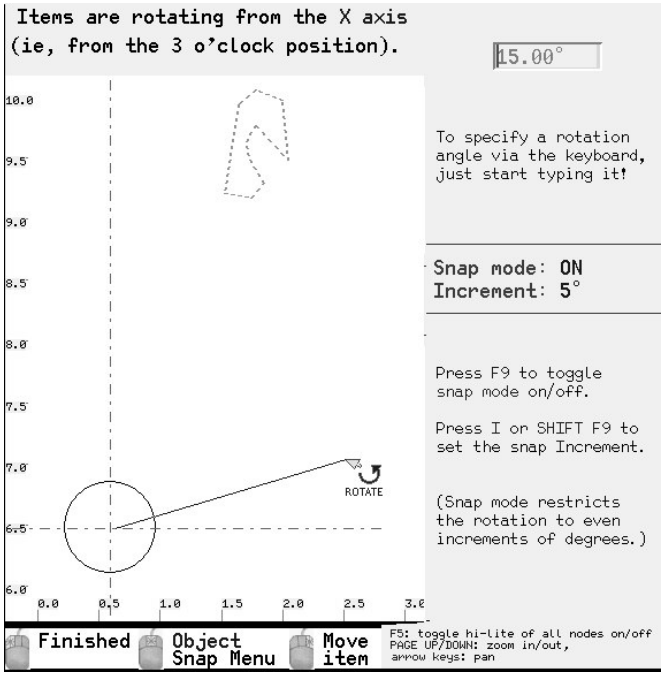

Figure 17-5

Method #2: Select points and specify their angle

This method of rotation allows you to specify where the item will rotate to.

Referring to figure 17-7, assume that the item needs to be rotated in such a manner that an imaginary line running from point A to Point B is at a 45 degree angle with respect to point A. You could use the **Measure** function to determine the angle that those two points make, and then you could subtract that angle from 45° to get the angle you need to rotate this item by. Then you could rotate the item by that number of degrees.

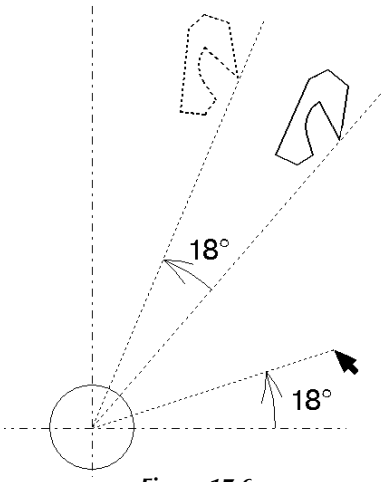

Figure 17-6

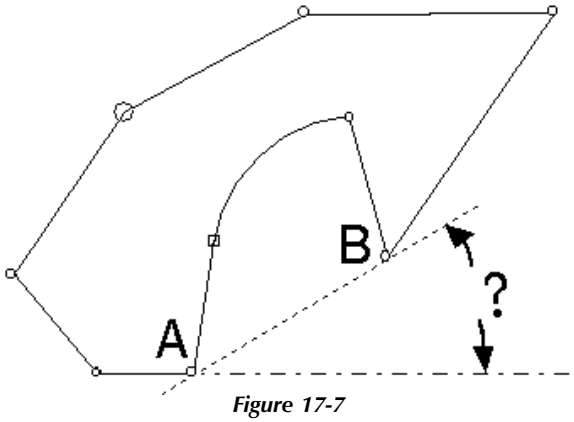

Figure 17-7

However, this second method of rotation allows you to avoid the measurements and calculations. This method lets you select two points and then specify the angle you want those two points to be.

MillWrite will first prompt you to select the center point of rotation. Then you will be prompted to select the two points that form the line that you want rotated to a certain angle. In this example you select point **A** first and then select point **B**. MillWrite will then let you specify the angle you want these two points to form in relation to the center of rotation. You could rotate the item with the mouse or enter the angle via the keyboard.

Note that if you were to select point B first and then point A, the angle would be backwards so rather than specifying 45° you have to specify 225°.

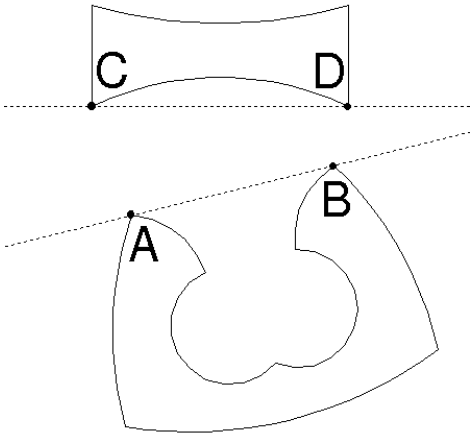

Figure 17-8

Method #3: Rotate from a reference angle

Referring to figure 17-8, imagine a line running through points **A** and **B** on the bottom item. Imagine another line running through points **C** and **D** of the top item. Assume you want to rotate the top item so that these two imaginary lines are parallel.

You could measure the angle of the line that runs through points A and B, and then you could rotate the top item by that same angle. But if you select this third method for rotation, you can avoid the measurements and calculations.

MillWrite will begin by prompting you to select the center point of rotation. Assume that you want point **C** to stay where is, so select point **C** be the center of rotation by clicking on the node at point **C**.

MillWrite will then prompt you to select the two points that form the reference line. In this case the reference line is the imaginary line that runs through points **A** and **B**, so you click first on node at point **A**, and then when MillWrite prompts you for the second point you click on the node at point **B**.

MillWrite will then prompt you to select the two points that you want rotated in respect to this reference line. You first click the node at point **C**, and then when MillWrite prompts you to select the second point, you click the node at on point **D**.

The screen will then change as seen in figure 17-9. At the top of the screen MillWrite displays the angle of the reference line. In this example the line that runs through points **A** and **B** is making an angle of 13.79°. As you move the mouse you rotate the top object with respect to that reference line. To make the line through points **C** and **D** parallel to the line to points **A** and **B**, you set a rotation angle of 0°. You can type 0 and press Enter↵ or you can use the mouse to rotate the object until you see a rotation angle of 0°. If you have the **snap mode** on, it will be easy to rotate to 0°.

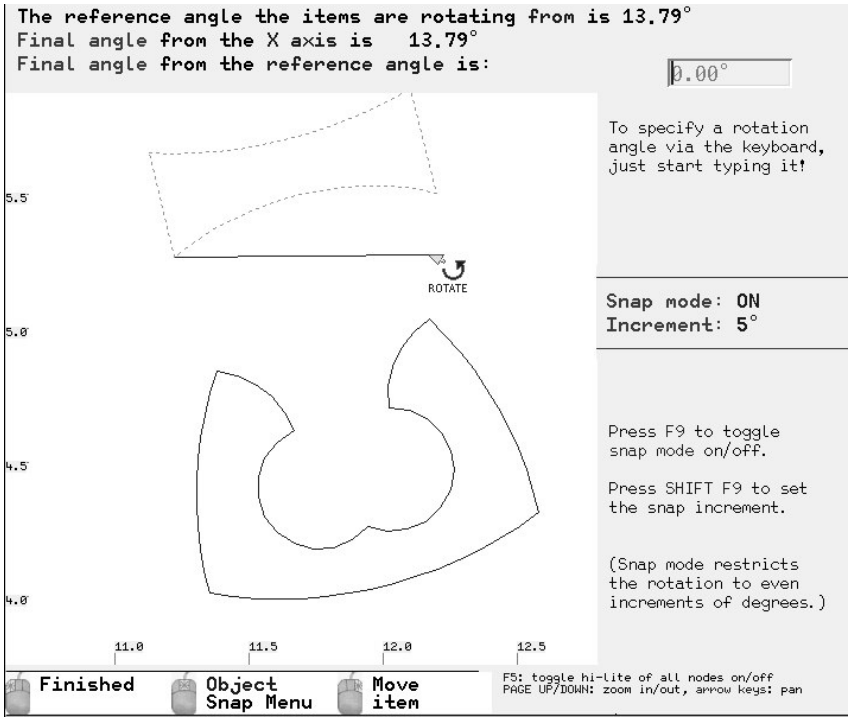

Figure 17-9

Rotating symmetrical polylines

When you move the mouse over a symmetrical polyline, as seen in figure 17-10, the symmetry line appears as a dashed line. It has a large circle at one end and a small circle at the other. The large circle is the center of rotation for the entire polyline. The small circle is a handle that you can grab with the mouse to rotate the polyline.

The location for the small circle is irrelevant. You can use the **Slide Node** function to move it to any convenient location, as seen in figure 17-11. To rotate the polyline, set the mouse to the **Move Node** function, and grab that small circle. Then as you move that node, the polyline will rotate around the larger circle, as seen in figure 17-12.

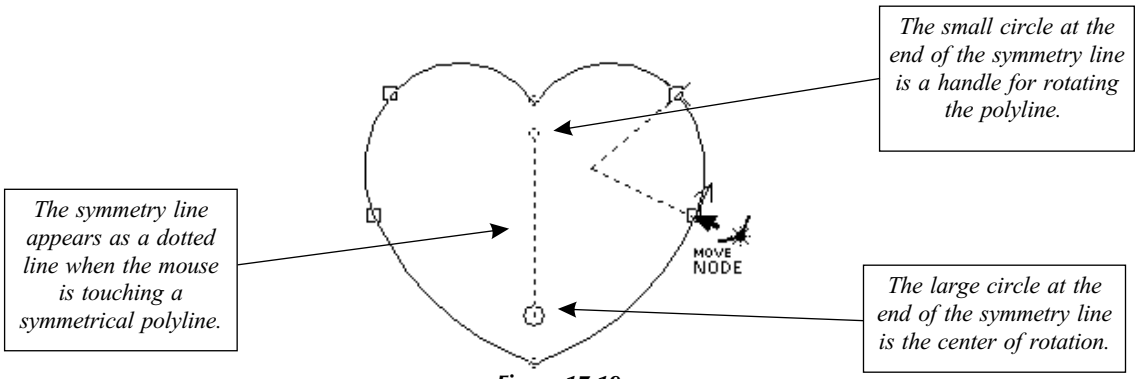

Figure 17-10

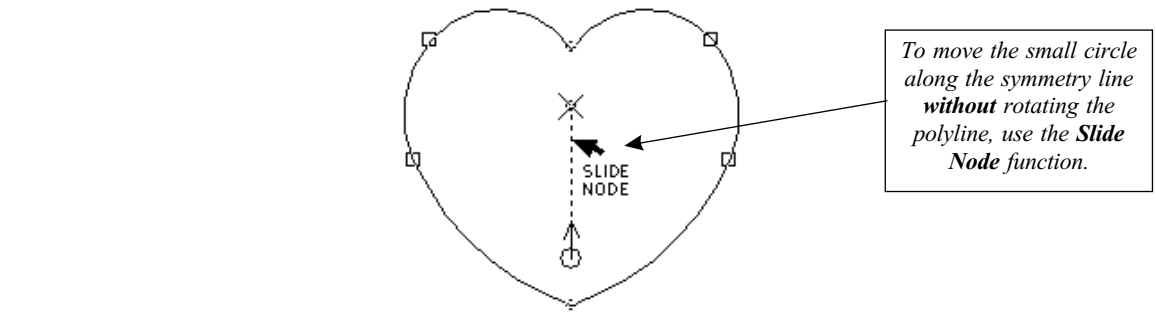

Figure 17-11

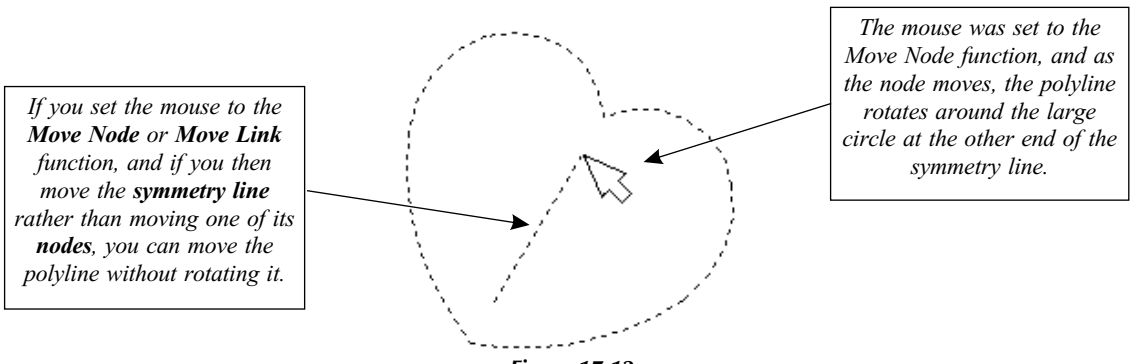

Figure 17-12