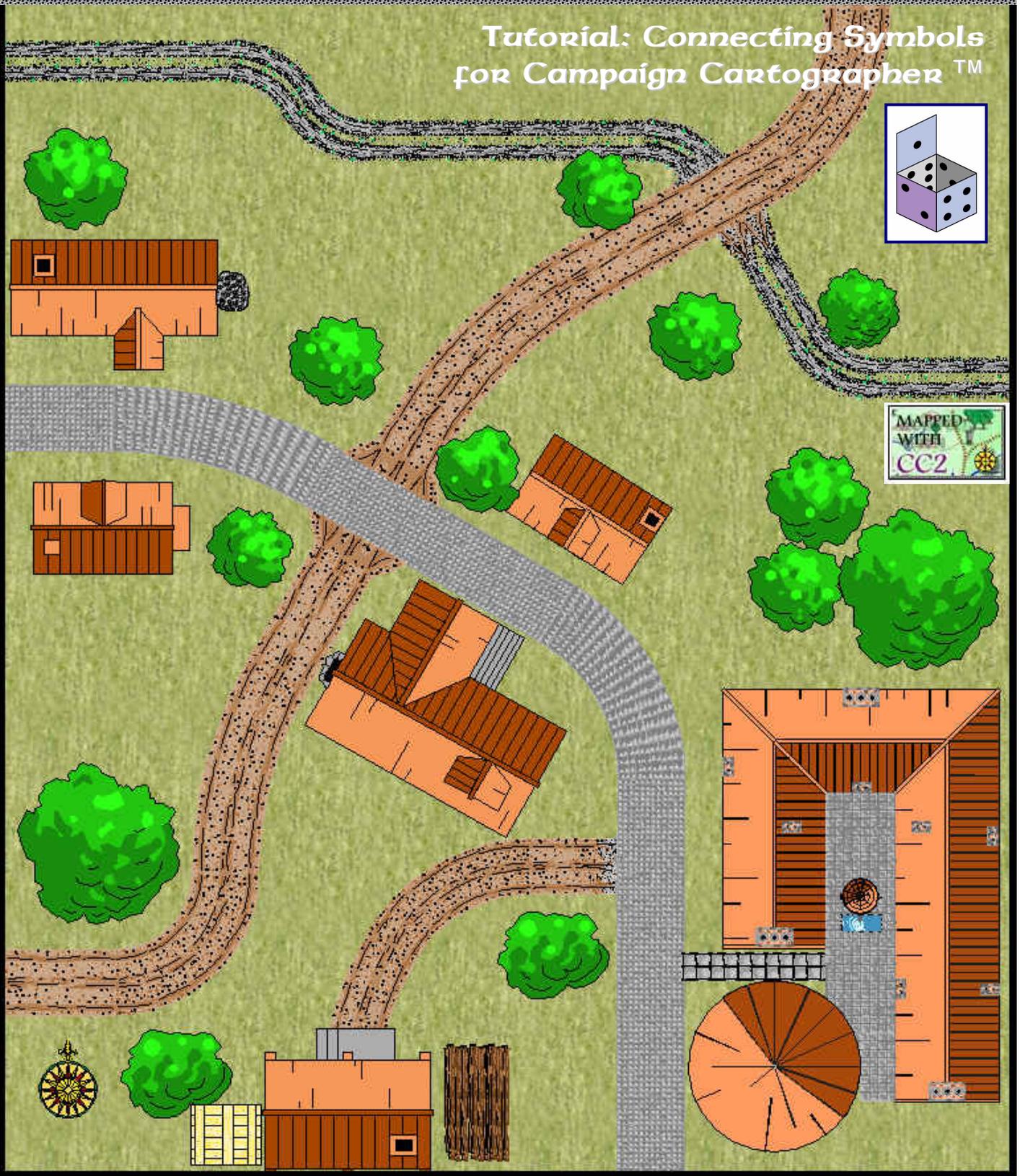
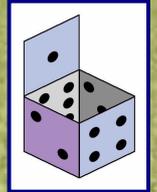




THE VINTYRI™ WORLD

Tutorial: Connecting Symbols
for Campaign Cartographer™



Tutorial: Connecting Symbols

Tutorial: Connecting Symbols

Tutorial: Connecting Symbols for Campaign Cartographer™

Version 1.0

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By Trevor Cooke and Mark Oliva
of the Vintyri™ Project

with special thanks to Linda Kekumu



The Symbols:



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Campaign Cartographer 3 Users: This version of the tutorial was prepared with Campaign Cartographer 2 Pro shortly before the release of Campaign Cartographer 3. According to information released by ProFantasy Ltd., we expect most of the information in this version to be useable with CC3. If there are substantial inconsistencies, we may offer an updated version of this tutorial at some future time.

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Tutorial: Connecting Symbols

1. Required CC Experience Level:

Neither this tutorial nor its subject matter are good topics for those just starting to work with *Campaign Cartographer*. On the other hand, it is nowhere near as difficult to create connecting symbols as many people believe, but it is time-consuming, and it does require a good working knowledge of many operational levels of CC2 Pro or CC3. Specifically, you need to command good skills with the following before you begin working with connecting symbols:

- Using templates.
- Managing layers.
- Working with grids and snaps.
- Making simple (i.e. non-connecting) symbols.

If you can't work well with CC2 Pro/CC3 on these levels, we strongly suggest you work your way through ProFantasy's excellent tutorial material:

- If you are a registered user of Campaign Cartographer, you can download the extended manual free from ProFantasy's Internet site (<http://www.profantasy.com>). The manual is entitled *Cartography Suite – Complete User's Guide*.
- An even better bet is the excellent *Tome of Ultimate Mapping*, an add-on product that can be purchased directly from ProFantasy over its Internet site (<http://www.profantasy.com>).

2. Why Should You Want to Make Connecting Symbols?

It's quite possible you'll never want to make your own connecting symbols! It depends really on your goals in using Campaign Cartographer. If you want nothing more than to make simple maps for your RPG campaign, connecting symbols will be far beyond that goal. The truth is that Campaign Cartographer has abilities that many people almost never use, and they map quite contentedly nonetheless.

The accessories currently offered with Campaign Cartographer allow one to create objects like roads, paths, rivers, long walls, etc., and in modern settings like railroad tracks, but only as simple lines or as a tiled series of individual symbols. Many a mapper has dreamed of the ability to draw graphically convincing roads, rivers and the like with nearly the same ease with which one can make straight and curving lines.

This ability already is available in Campaign Cartographer, but most users lack the tools necessary. ProFantasy doubtless will release some connecting fantasy symbol sets in the future, but to put this powerful ability to use at present, one either has to make one's own connecting symbol sets or obtain them from another cartographer who has made his or her own symbols.

And that brings us back to the question of whether connecting symbols are something for you. For a quick answer, look at the cover of this tutorial. The two-rut track at the top of the map, the two brown dirt roads and the cobblestone road each were drawn with all of the curves in a single mouse operation using connecting symbols.

If what you see on the cover represents the complete scope of all the connecting symbols that you ever will want or need, you can skip the tutorial. A catalog with these and other symbols is a part of this tutorial package. If not, stick with us.

Tutorial: Connecting Symbols

3. What's in the Tutorial Files?

- Tutorial.pdf – The file you're reading now.
- Tutorial1.fcw – The file we use for the tutorial exercises. You can copy it into any folder you wish.
- Tutorial2.fcw – The the Tutorial1 file with the graphic material for the curved symbol added. You can copy it into any folder you wish.
- Vintyri Samples.fsc – This is the Campaign Cartographer symbol catalog that contains the connecting symbols shown on the cover as well as other symbols. We suggest that you copy this file into **X:\CC2\Symbols\Cities**, with **X** standing for the hard drive that has the Campaign Cartographer installation. CC2 is the Campaign Cartographer folder. It may have a slightly different name in your installation. It also may be under **Programs**. See Figure 1.
- Symbol Workshop.fct – This is a template designed for creating symbols. If you are relatively experienced and prefer another template, you certainly can use it. However, this template is custom made for the exercises you'll be doing in this tutorial. We suggest that you copy this file into **X:\CC2\Templates\Cities**, with **X** standing for the hard drive that has the Campaign Cartographer installation. CC2 is the Campaign Cartographer folder. It may have a slightly different name in your installation. It also may be under **Programs**. See Figure 2.

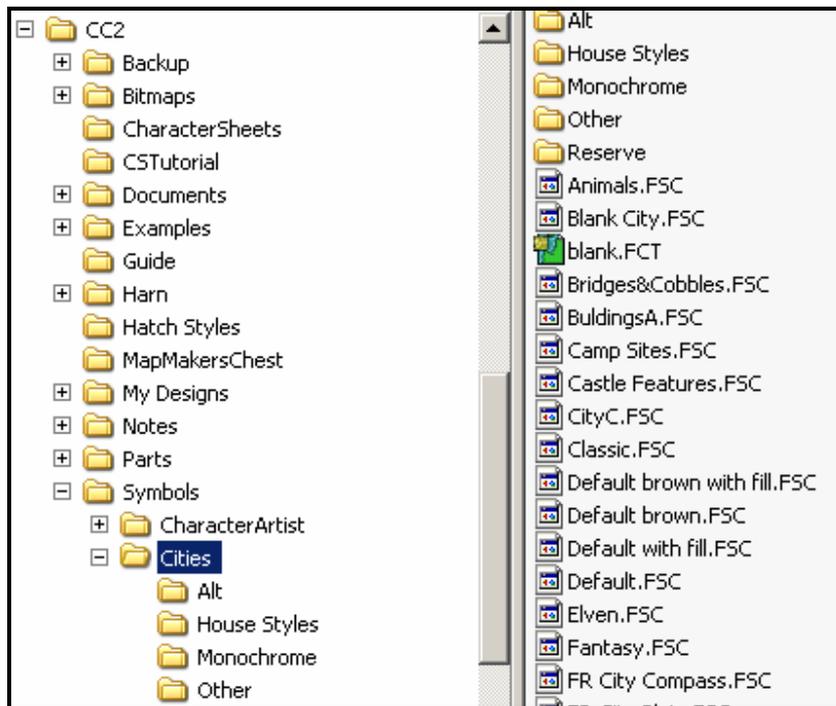


Figure 1. Location for the catalog *Vintyri Samples.fsc*

If you're still wondering whether connecting symbols that you design personally will be worth your time, we suggest that you open a new, blank map and then load the symbol set *Vintyri Samples.fsc*. Experiment with these symbols and see if you find the result interesting. How these symbols work is explained in Section 10. Please skip ahead to this section and try the symbols out before continuing, if you have doubts whether this tutorial will be worth your time.

Please keep in mind that the symbols in the catalog *Vintyri Samples.fsc* still are in a *work in progress* status. These symbols have not yet been released elsewhere. They have been used but they still have faults and need some corrective work. This is discussed in Section 10.



Tutorial: Connecting Symbols

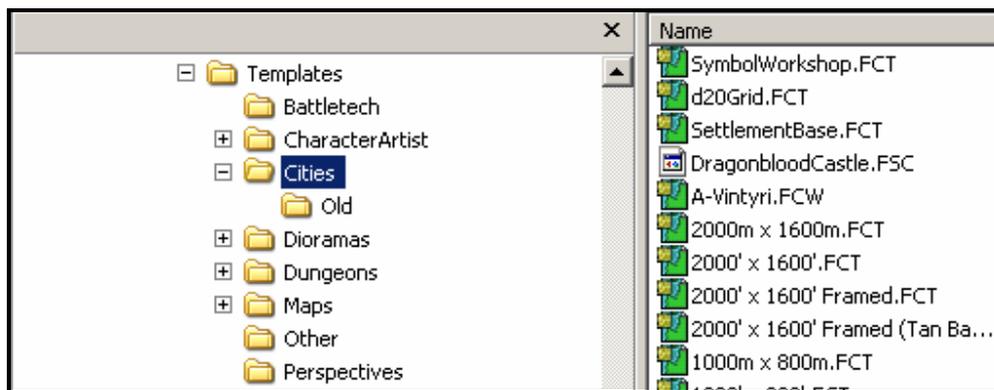


Figure 2. Location for the template *Symbol Workshop.fct*

4. Getting Started

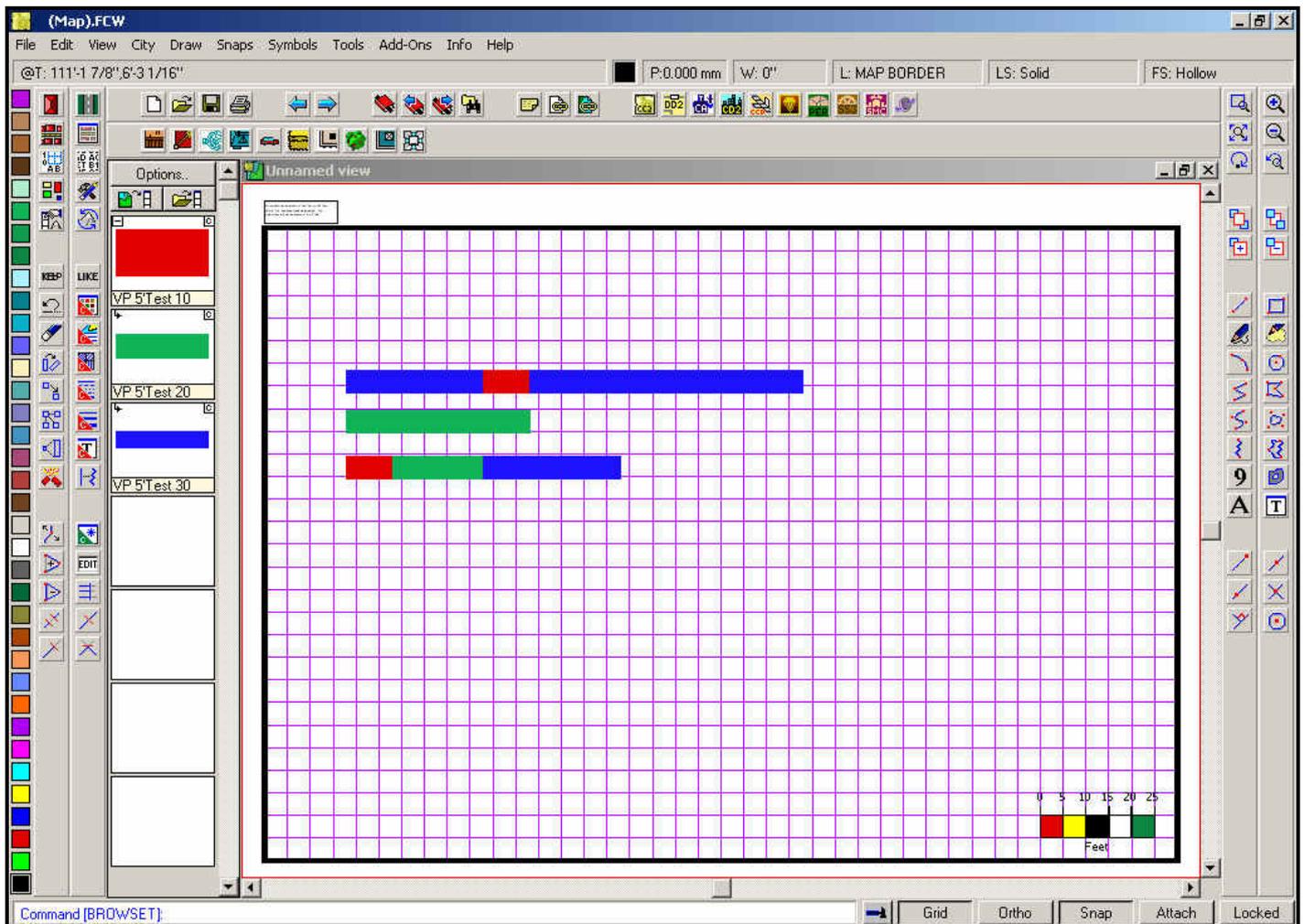


Figure 3. Our first, simple connecting symbols

Tutorial: Connecting Symbols

When we make connecting symbols, the task quickly can become rather complex. This doesn't necessarily mean that the task has to be difficult, but the more one attempts to do within a connecting symbol set, the more one must take into consideration.

In our first learning step, we'll concentrate completely upon the creation of a non-curved connecting symbol set. We won't worry about putting sensible content into the symbols, using Varicolor or making connecting curves for the time being. We'll simply make a set of three symbols with straight color blocks 5 feet wide with successive individual lengths of 10, 20 and 30 feet. Each will have a different color.

The result of the first goal can be seen in Figure 3 on the previous page. Each of the three color bars in this graphic was made with a single mouse operation using connecting symbols.

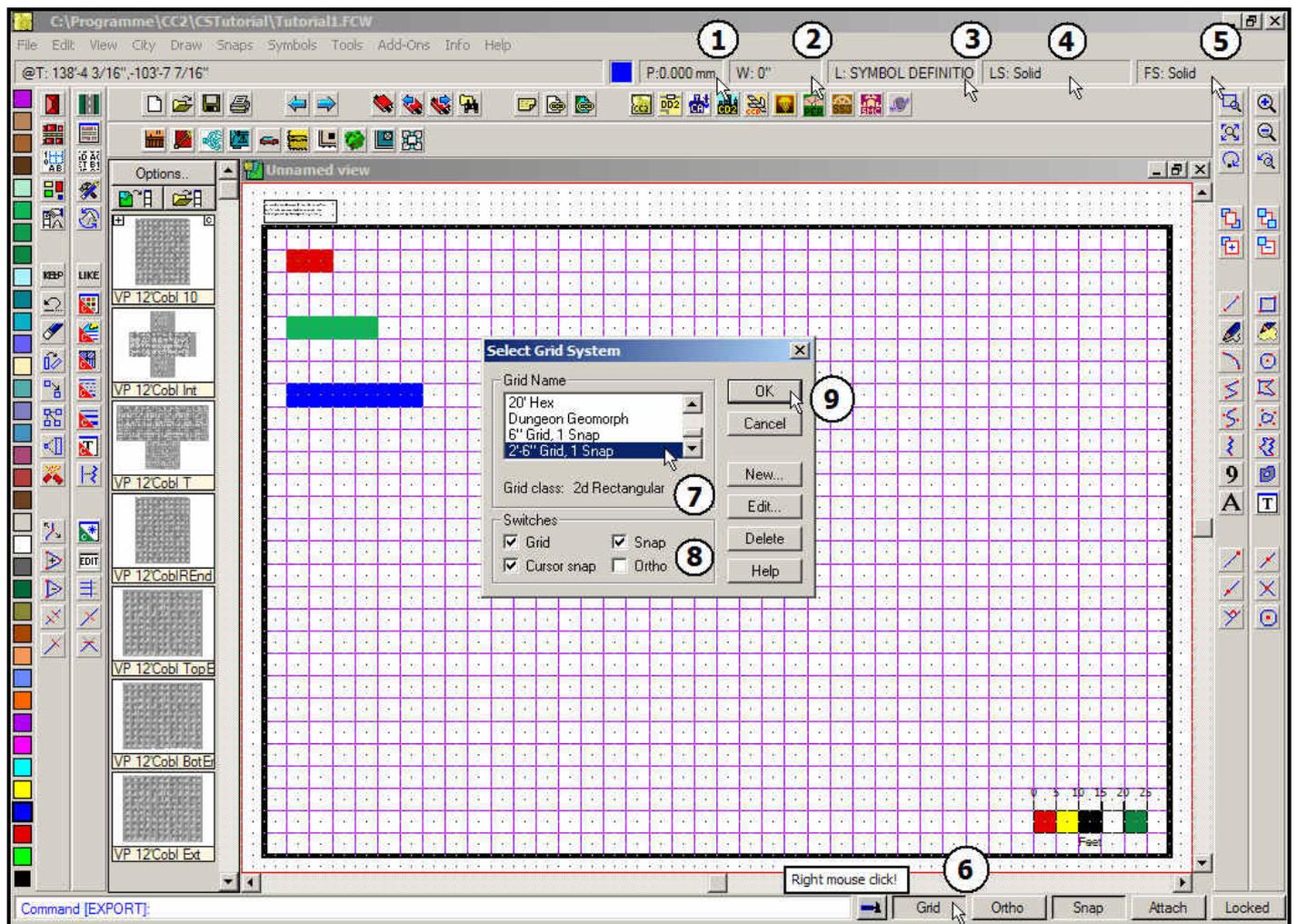


Figure 4. Loading the tutorial file *Tutorial1.fcw*

We'll begin by opening the file *Tutorial1.fsc* that we copied earlier to the hard disk.

If you get an error message opening this file, open a different map in CC2 Pro or CC3 and then with the menu options *File* and *Open*, reopen the tutorial file.



Tutorial: Connecting Symbols

Before we begin making symbols, let's be sure that all of our settings are correct. We'll start in the top status bar. Figure 4 on the previous page is our guideline:

- 1. Our *Pen Thickness* should be at 0.000mm.
- 2. We need a *Line Width* of 0".
- 3. The layer *SYMBOL DEFINITION* should be active.
- 4. The correcting *Line Style* setting is *Solid*.
- 5. *Fill Style* also should be set to *Solid*.

Then we'll check our grid and snap settings:

- 6. With the *right* mouse key, we click the command button **Grid**. That opens the dialog box named *Select Grid System*.
- 7. Under *Grid Name* we want the selection *2'-6" grid, 1 snap*. We're working with color bars 5 feet high, so this selection will make it easy for us to mark the precise mid-point.
- 8. The *Switches* should be set just as we see in Figure 4.
- 9. When we're finished, we can click the command button **OK**.

Now let's zoom in on the red color bar, which we'll use to make our first symbol. The process is almost the same as for making normal (non-connecting) symbols. The first symbol with the red color bar 10 feet long we'll make step-by-step together. Figure 5 on the next page is our guideline.

- 1. In the menu bar, we click the option *Symbols*.
- 2. In the pulldown menu, we choose the option *Add Control Points*.
- 3. On the left border of the red color bar, we click precisely upon the middle point. That should be no problem, because *Snap* is on.
- 4. We close the definition with another click on the precise middle point of the color bar's right border. That opens the dialog box named *Control Point Effects*.
- 5. In the dialog box we want only the check box *Align on Insertion* checked.
- 6. When we're finished, we close with a click on the command button **OK**.

We now can begin with the definition of the symbol. The steps through which we go in this case aren't necessarily different from those for a normal, non-connecting symbol, but they require us to follow more precise rules. That begins already with the naming of the symbol. Let's take a look at the process:

Many users of Campaign Cartographer begin the name of a symbol with initials that describe its source. One can do that as well for a collection of connecting symbols. Likewise, one can choose whatever name one wishes for the symbols in a connecting collection, but at this point, we have to follow rules that don't apply to standalone symbols. The rules for curved symbols (which we'll do later) also differ from those for straight symbols. Let's look first at the rules for a collection of connecting straight symbols:

Continued on Page 10

Tutorial: Connecting Symbols

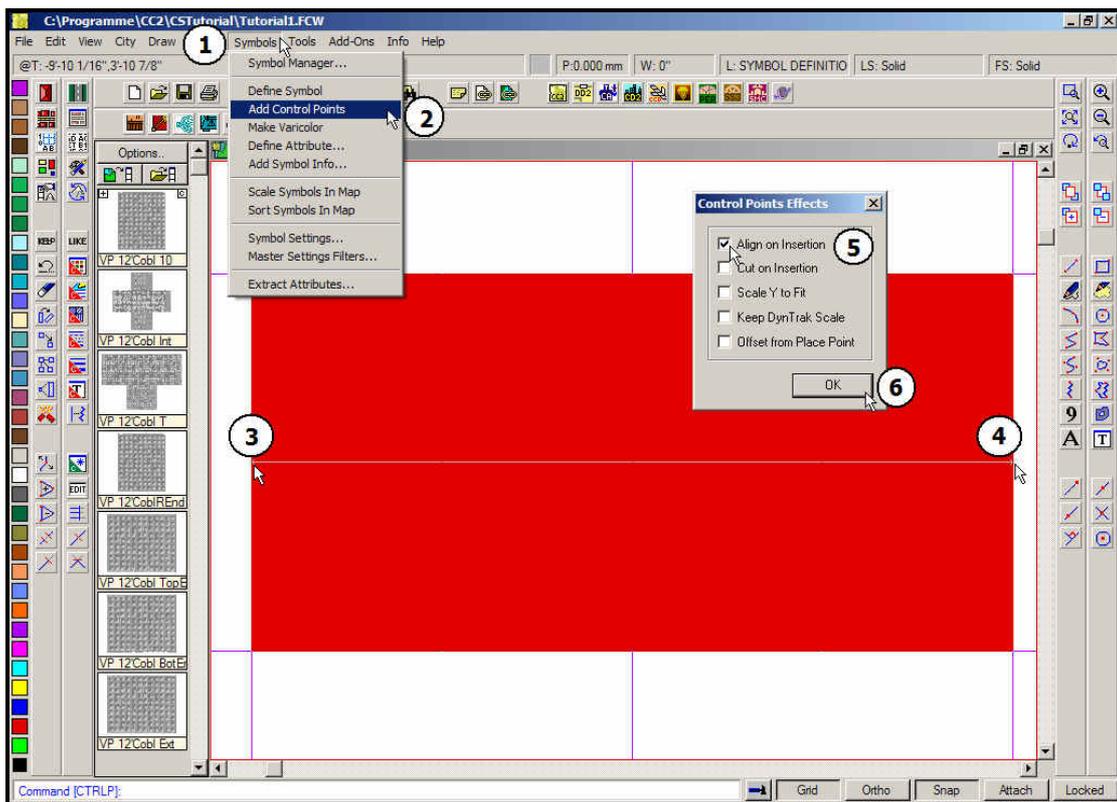


Figure 5. Defining the control points

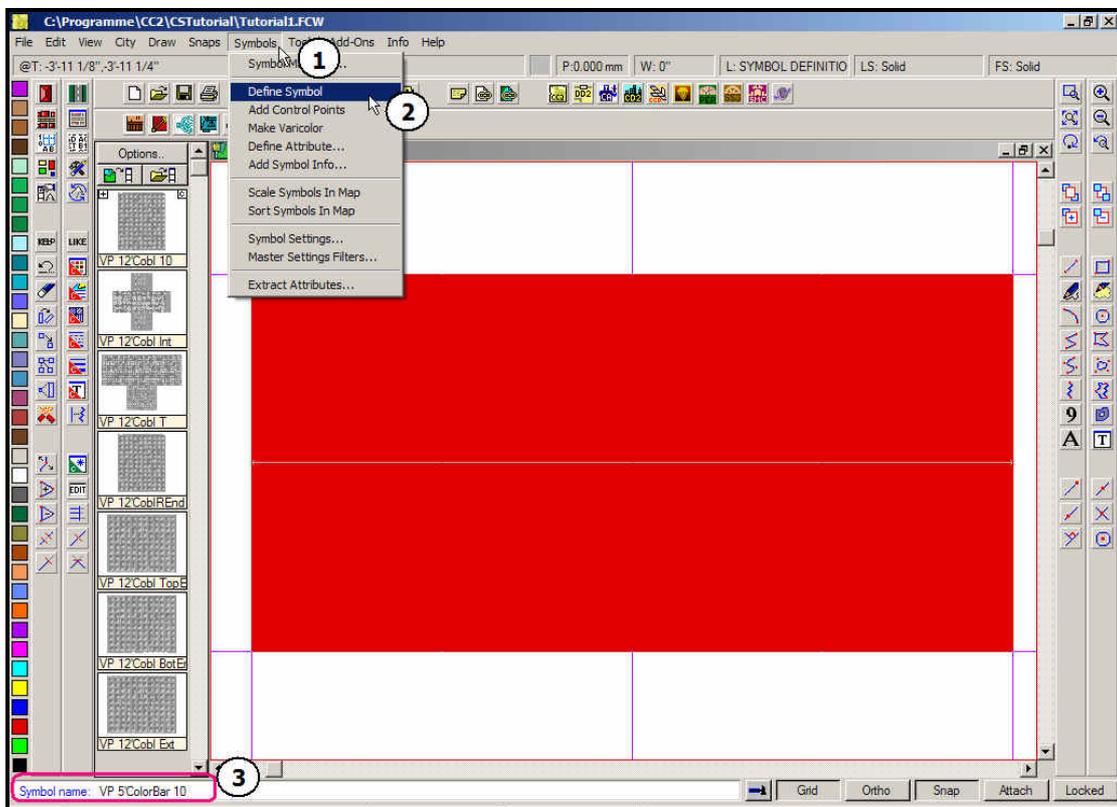


Figure 6. Beginning of the symbol definition

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- Once we pick a name for the first symbol, every symbol in the connecting collection *must* have the same name.
- The symbols *must* be organized in ascending order based upon their length, i.e. our 10-foot color bar must come first, followed by our 20-foot color bar and then our 30-foot color bar.
- A space and then a number must follow each symbol name, and these numbers must be in ascending numerical order, accompanying the ascending size of the symbols they describe. Let's illustrate that with a look at the symbol names we plan to use in this exercise:

Object	Name
10-foot red color bar	VP 5'ColorBar 10
20-foot green color bar	VP 5'ColorBar 20
30-foot blue color bar	VP 5'ColorBar 30

We can see that each name is in three parts:

- *VP*: This part of the name identifies the symbol's source, in our case, the *Vintyri Project*. You should feel free to type in your own initials. This part of the name is not necessary.
- *5'ColorBar*: The name of the symbol. This tells the user that it is a color bar 5 feet high or wide, depending upon point of view.
- *10, 20* and *30*: The collection numbers. In the table above, we can see that the symbols are in ascending order, with the 10-foot color bar first and the 30-foot bar last. We also see that the collection numbers – 10, 20 and 30 – are in ascending order. We chose 10, 20 and 30 because these are the lengths of the color bars, but we also could have assigned them the numbers 1, 2 and 3.



The collection numbers must be purely numerical and nothing may follow them. We could not, for example, use *10'*, *20'* and *30'* or *10ft*, *20ft* and *30ft*.

Now that we know the naming rules and conventions, we can define the first symbol. We'll use Figure 6 on the previous page as a guideline.

1. In the menu bar, we click the option *Symbols* again.
2. In the pulldown menu, we choose the option *Define Symbol*.
3. The command line asks for a symbol name. We type in *VP 5'ColorBar 10* and close with the Enter-key .

Now the command line asks us for the symbol origin (Figure 7),



Figure 7. The command line requests the symbol origin

When we make normal, non-connecting symbols, there sometimes are varying possibilities for defining the symbol origin based upon intended usage. That's not the case with connecting symbols. There is only one suitable origin, and it must be defined precisely. If we do otherwise, our symbols will not connect properly.

We'll leave snap turned on to assure that we have the necessary precision, and we'll use Figure 8 on the following page as a guideline. The mouse pointer is not active at the moment. Instead we see mouse crosshairs. We need to move the intersecting point of the mouse crosshairs directly to the middle point of the left edge of the color bar and then make a single click with the left mouse key.

Tutorial: Connecting Symbols

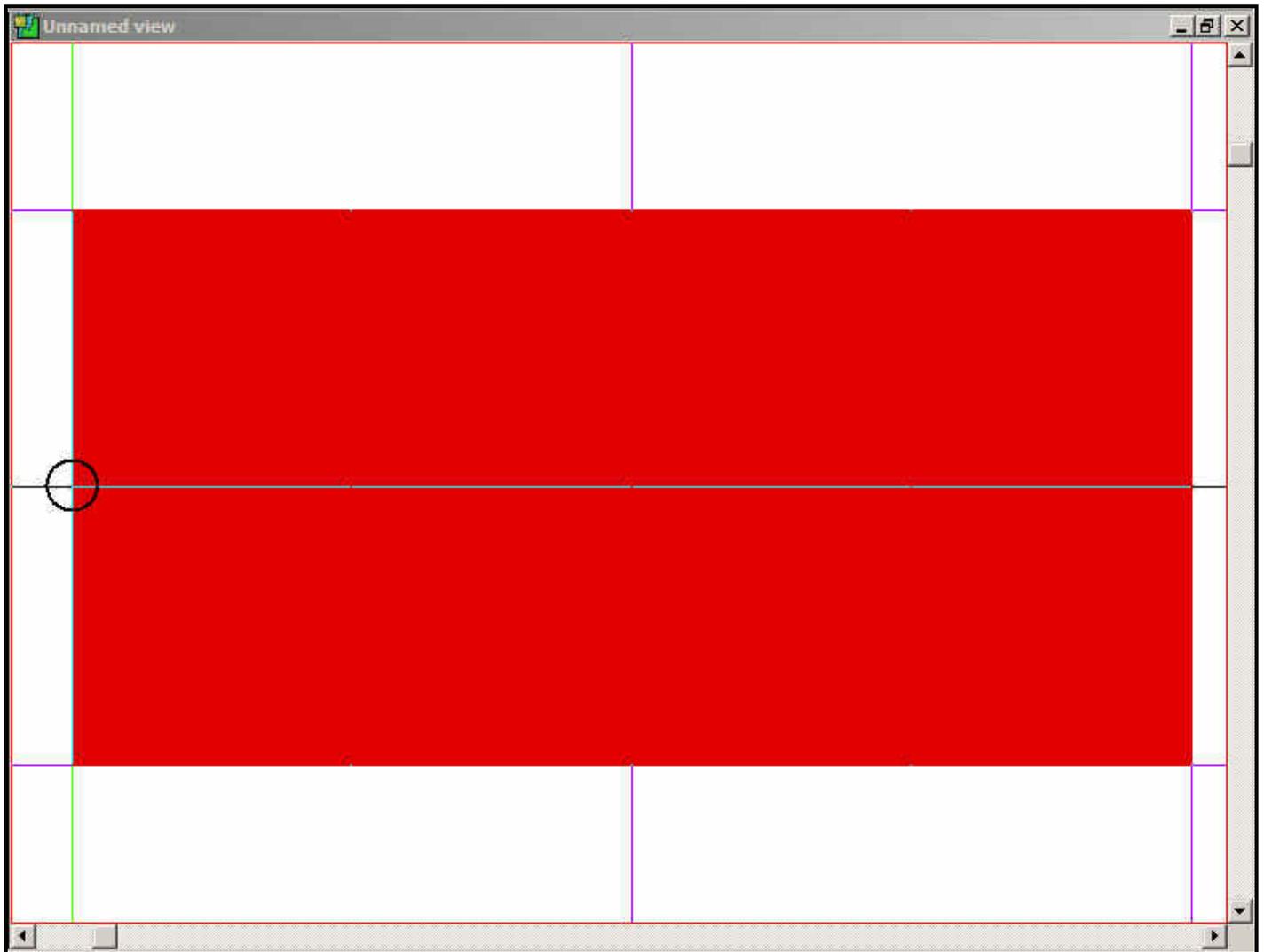


Figure 8. Selecting the symbol origin

The command line now wants us to select the entities that belong to the new symbol (Figure 9). We need to select the color bar. We'll now use Figure 9 on the following page as our guideline.

Once we've selected the color bar, it turns grey. We:

- 1. Click it with the *right* mouse key to open its context menu.
- 2. And then we click the option *Do It* in the context menu.

The red color bar vanishes from our work area. It has been moved into the new symbol catalog. We can check that (see Figure 10 on the following page):

- 1. In the menu bar we click the option *Symbols* again.
- 2. In the pulldown menu we pick the option *Symbol Manager*. We should see our symbol now in the catalog.
- 3. We can close with a click on the command button .

Tutorial: Connecting Symbols

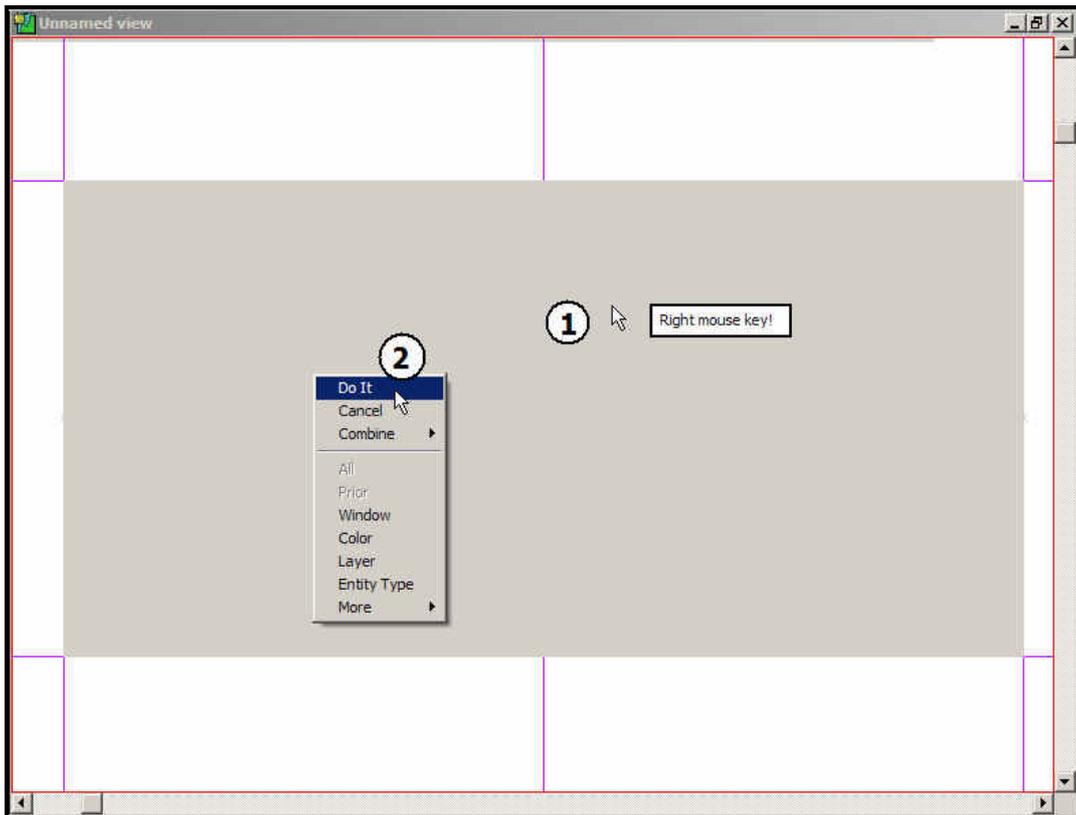


Figure 9. Creating the first symbol

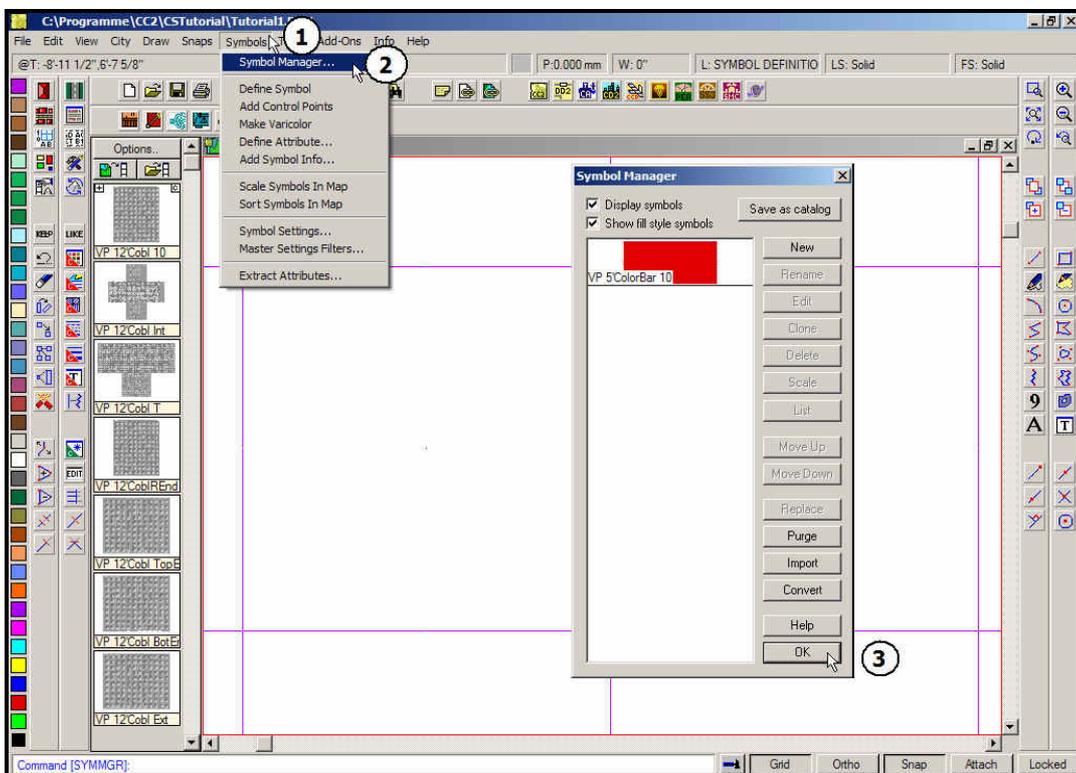


Figure 10. The new symbol

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5. Creating the Remaining Straight Symbols

We need to jump back now to the middle of Page 8 and repeat the same steps with the green and blue color bars. The only difference is in the naming. As we've already learned, we type a space and 20 after the name of the green bar and a space and 30 after the name of the blue bar.

Once we have all three color bars in the new catalog, we'll continue with the following Section 6.

6. Collections and Connections

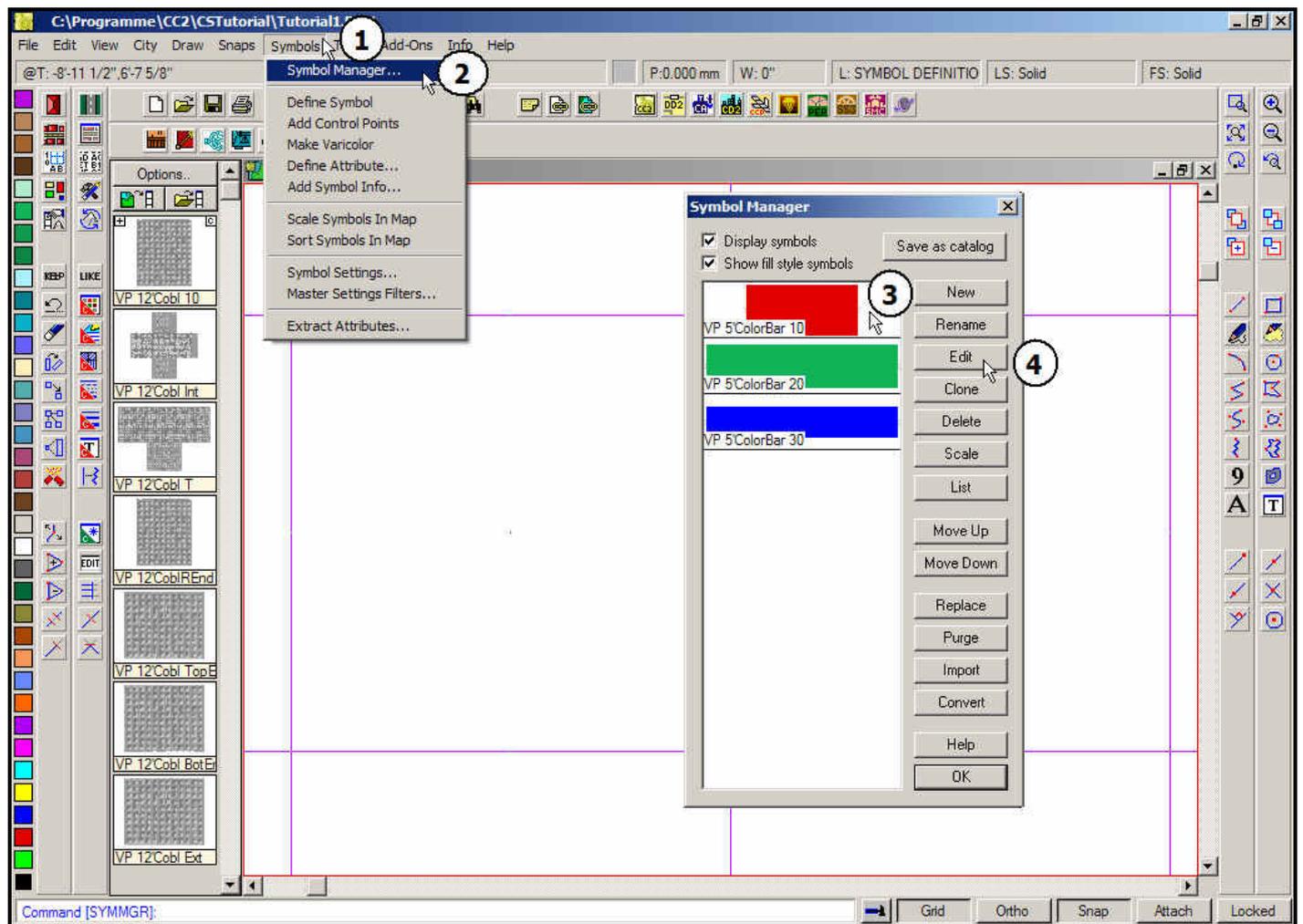


Figure 11. Editing the new symbols

All three symbols now stand alone, as normal, non-connecting symbols, in the Symbol Manager. We now want to take the necessary steps to put them into a collection and make connecting symbols of them. We'll use Figure 11 as a guideline.

- 1. In the menu bar, we click the option *Symbols* again.
- 2. Once more, we pick the pulldown menu option *Symbol Manager*. We now should see all three new symbols.

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- 3. We click the first symbol in the list with the 10-foot red color bar.
- 4. Then we click the command button **Edit** to further define the symbol.

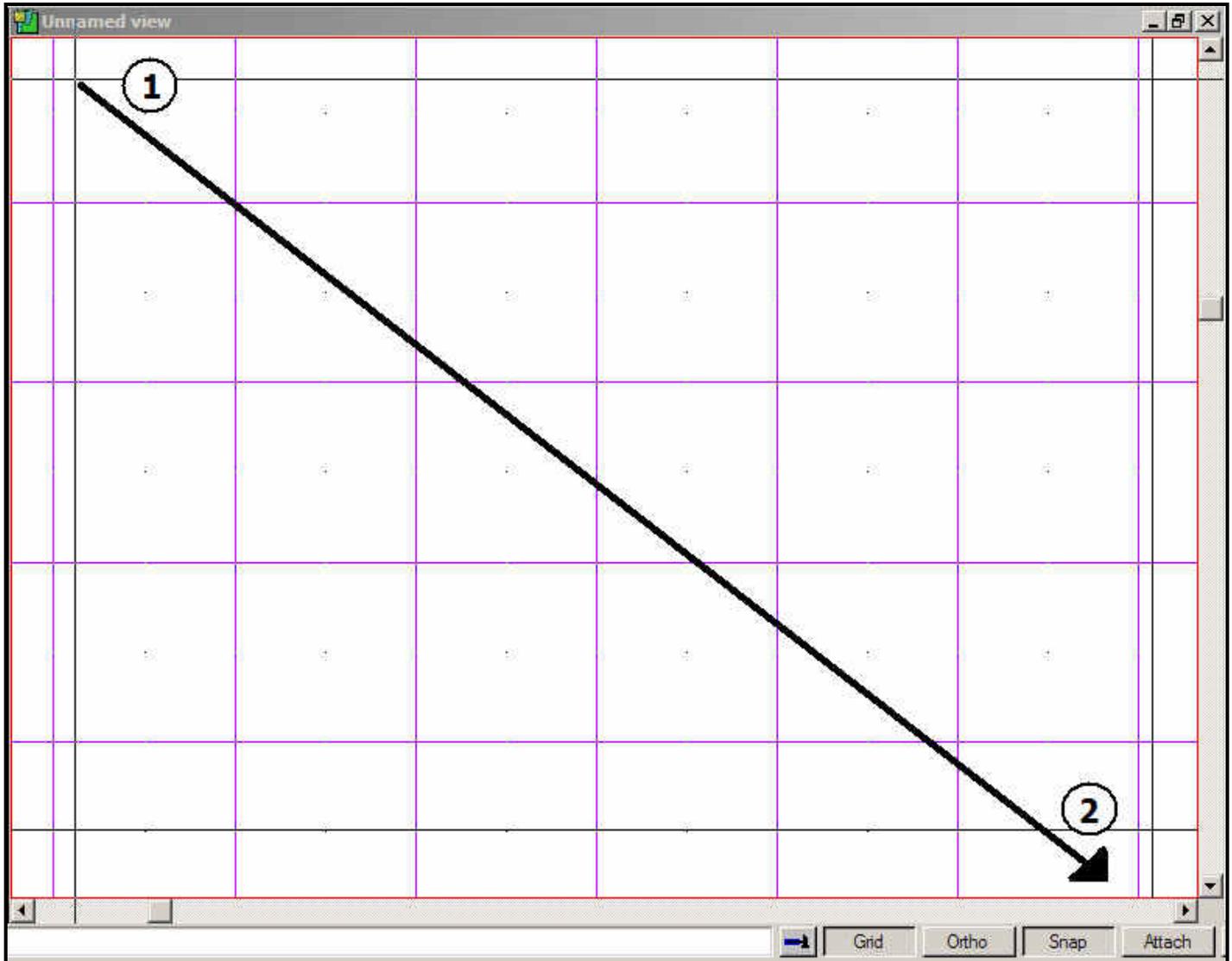


Figure 12. Creating an edit window

Once we click the command button, the mouse pointer vanishes and we see crosshairs on the screen again. The active mouse point is at the intersection of the crosshairs (Figure 12):

- 1. We move the crosshair intersection to a point in the upper left corner of the working area. We keep the left mouse key pressed.
- 2. Then we move the mouse coordinate points to the lower right corner of the working area and we release the mouse key. That opens the Edit Window with our symbol within it (Figure 13, following page).

Tutorial: Connecting Symbols

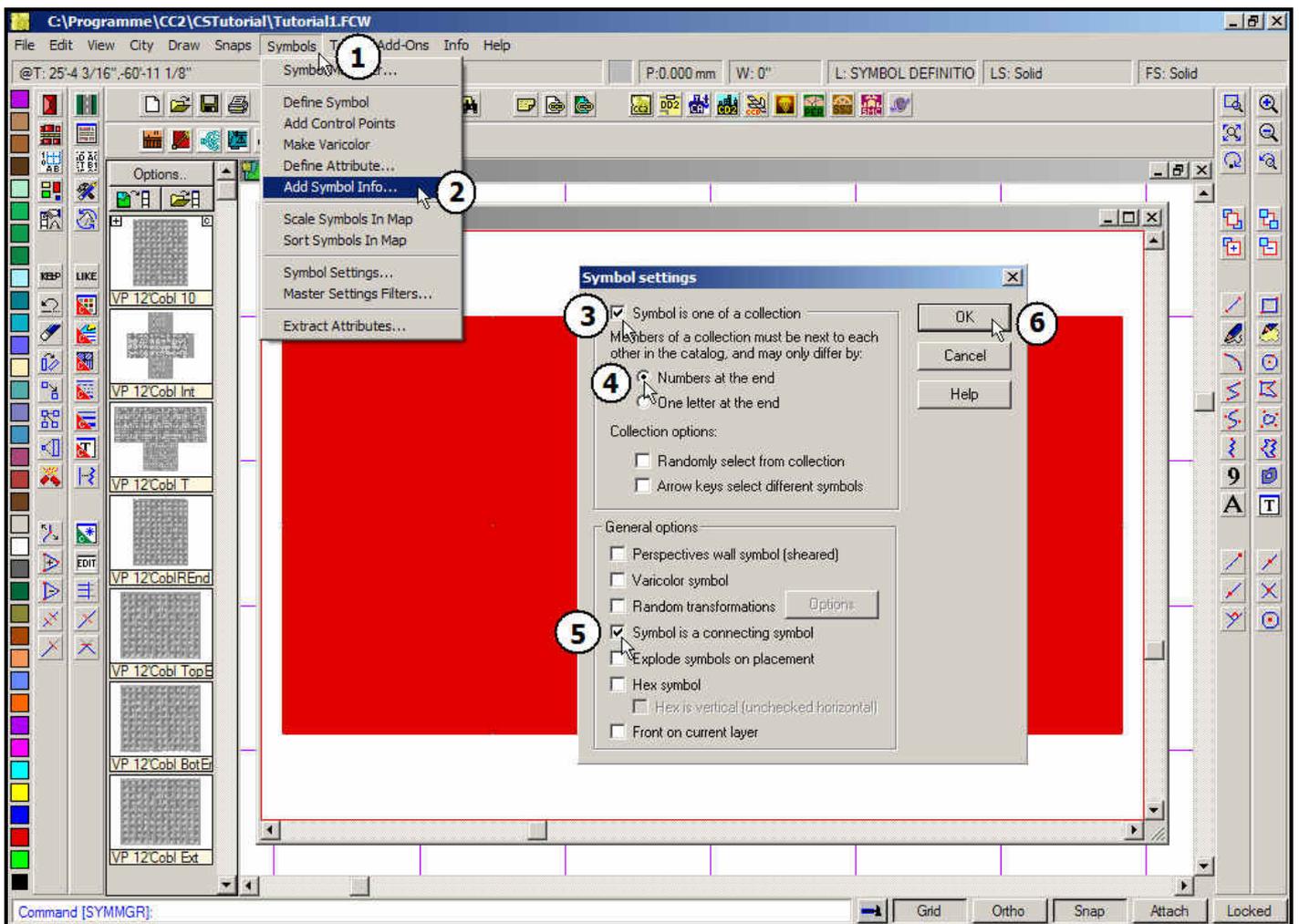


Figure 13. Defining the symbol in a connecting collection

Once we see our symbol in the Edit Window (Figure 13), we can make the additional settings that turn it into a connecting symbol in a collection:

- 1. In the menu bar, we click the option *Symbols*.
- 2. In the pulldown menu, we pick the option *Add Symbol info...* That opens the dialog box *Symbol Settings*.
- 3. We activate the check box *Symbol is one of a collection*.
- 4. We activate the radio button *Numbers at the end*.
- 5. Under *General options* we activate the check box *Symbol is a connecting symbol*.
- 6. Then we close the dialog box with a click on the command button **OK**.

Tutorial: Connecting Symbols

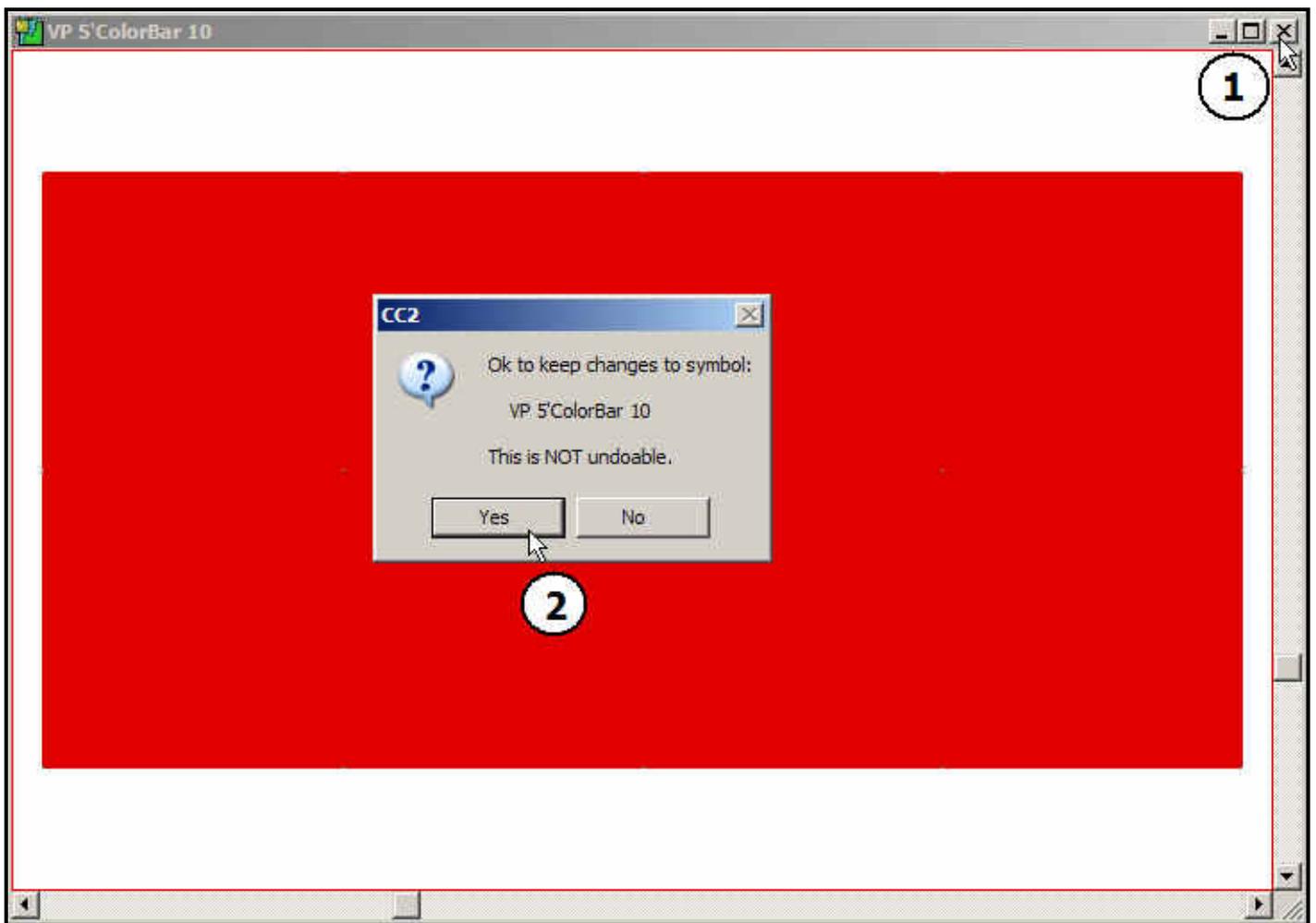


Figure 14. Saving the redefined symbol

We now need to save our changes (Figure 14):

- 1. We click the Windows close symbol **X** in the upper right hand corner of the title bar. That opens a message box simply labeled CC2.
- 2. We save our changes with a click on the command button **Yes**. That closes the Edit Window.

Before we continue, we need to repeat the same steps for the green and blue symbols. After we finish this extended definition of all three symbols, we reopen the Symbol Manager (Figure 15 on the following page):

- 1. We mark all three symbols.
- 2. We click the command button **Save as catalog**.

The standard Windows *Save as* dialog box appears (Figure 16, following page). We recommend that you save the catalog in the CC folder named *Cities* and the folder *Symbols*. We also recommend that you remain with the name *Tutorial 1*.

Tutorial: Connecting Symbols

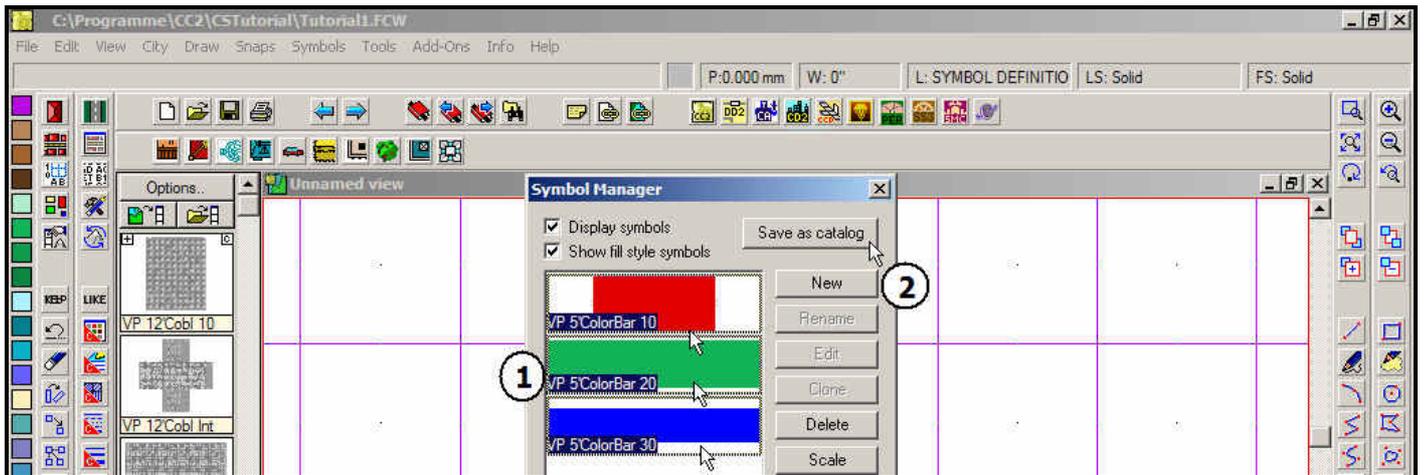


Figure 15. Saving the catalog

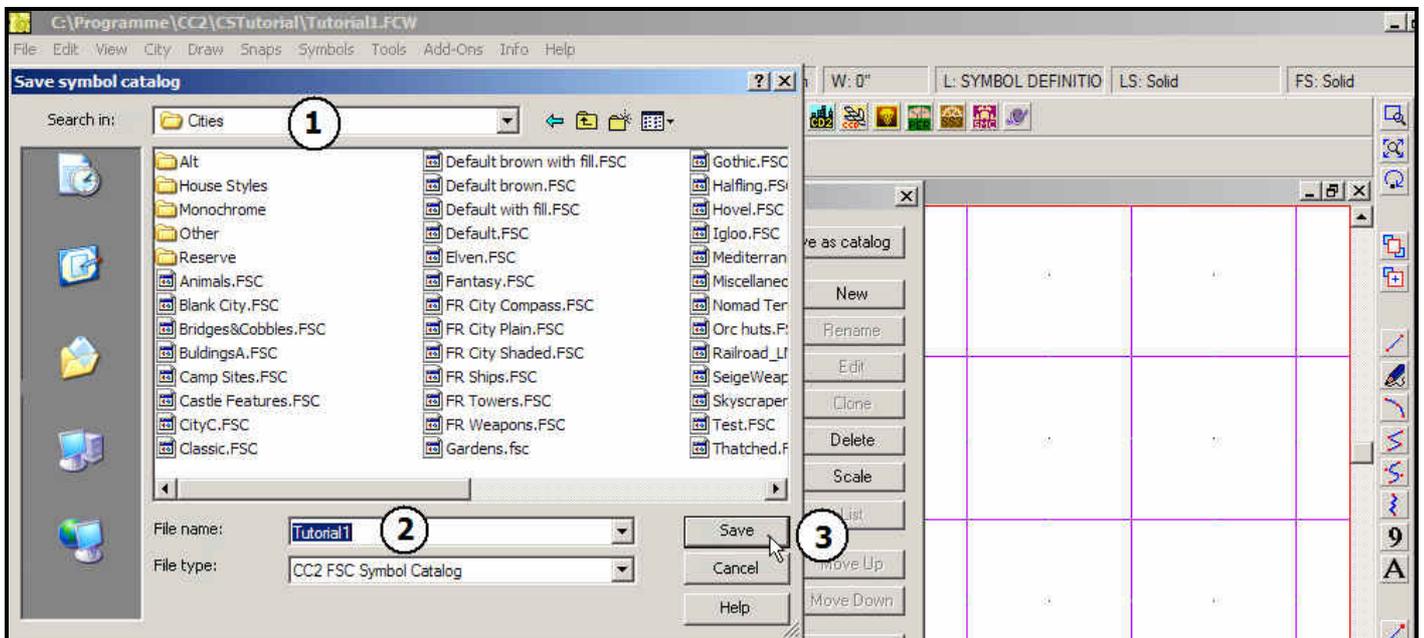


Figure 16. Saving the catalog

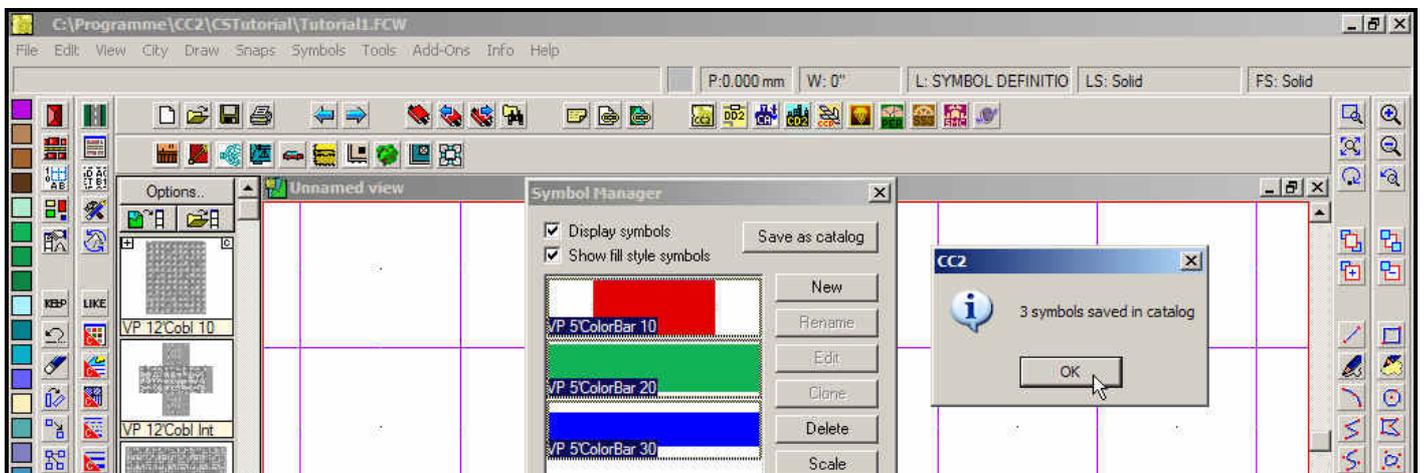


Figure 17. Confirmation message

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After we've saved the file, the message box in Figure 17 (previous page) should appear and report that three symbols were saved in the catalog. We can click the command button **OK**. After that, we also can close the *Symbol Manager*.

7. Testing the Symbol Collection

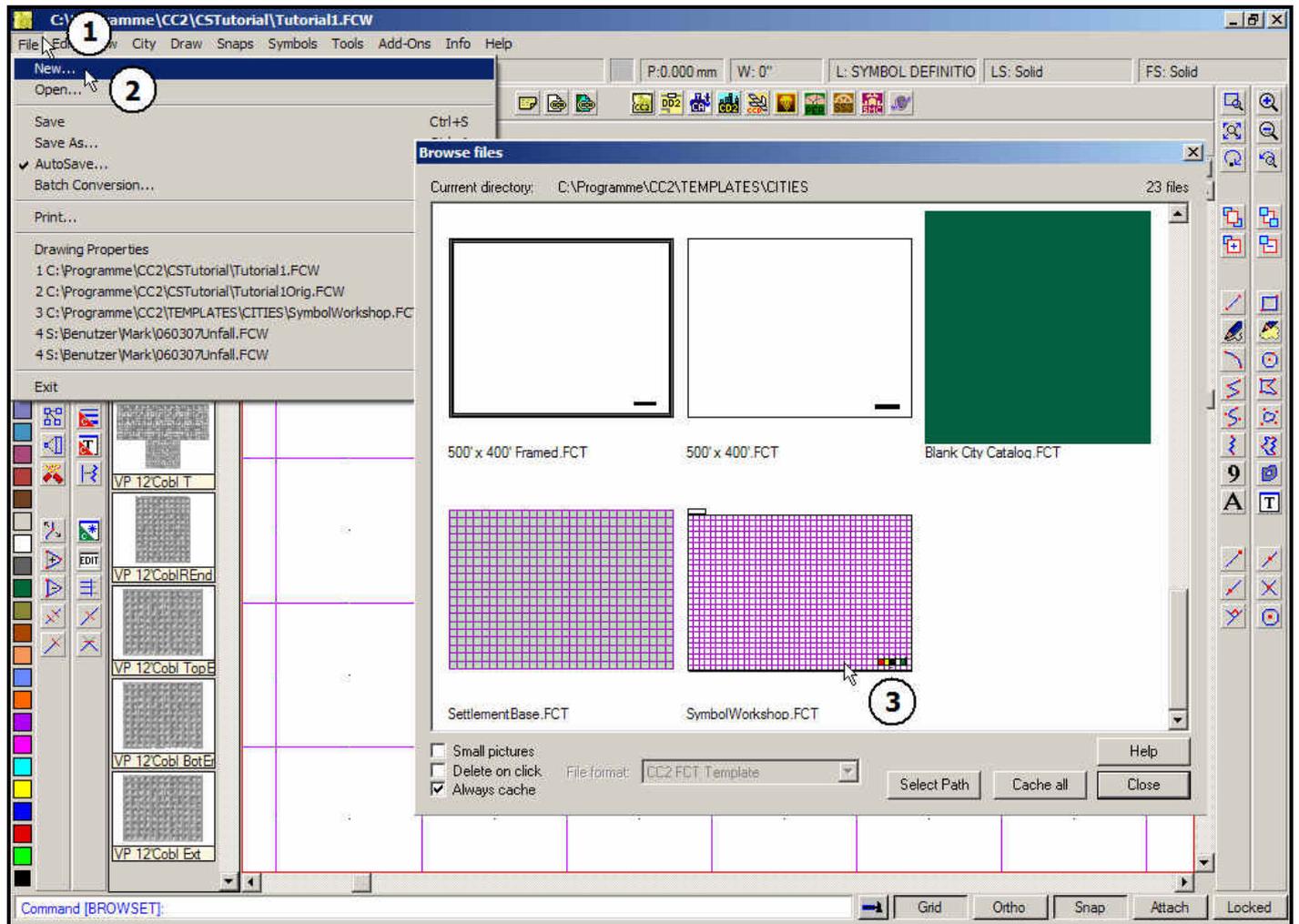


Figure 18. Open a new template

To test our new symbols, we need to open a new template. We recommend that you use the template *SymbolWorkshop.fct* that was supplied with this tutorial, because it was custom made for this work, but you also can use any other template that you might prefer. Once you pick a template, you'll see the message box in Figure 19.

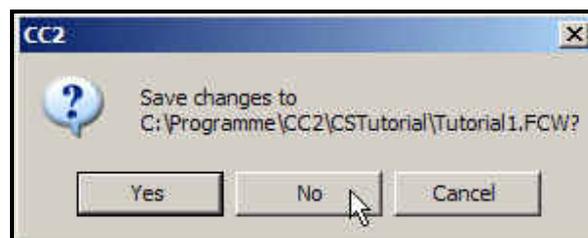


Figure 19. Message box for saving

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Although it may seem unusual, we recommend that you click the command button **No** in this case. Why? If you remember, when we made our symbols, the three color bars disappeared from our worksheet. However, that's a change in the worksheet that we haven't saved yet. If we click the command button **Yes**, our worksheet will be saved anew, with the three color bars *deleted*.

If, on the other hand, we click **No**, our changes will be discarded and we retain our original worksheet with the three color bars. When working with valuable symbol designs, this can be important, because it allows us to go back to our original art work in the future and to revise it if we wish.

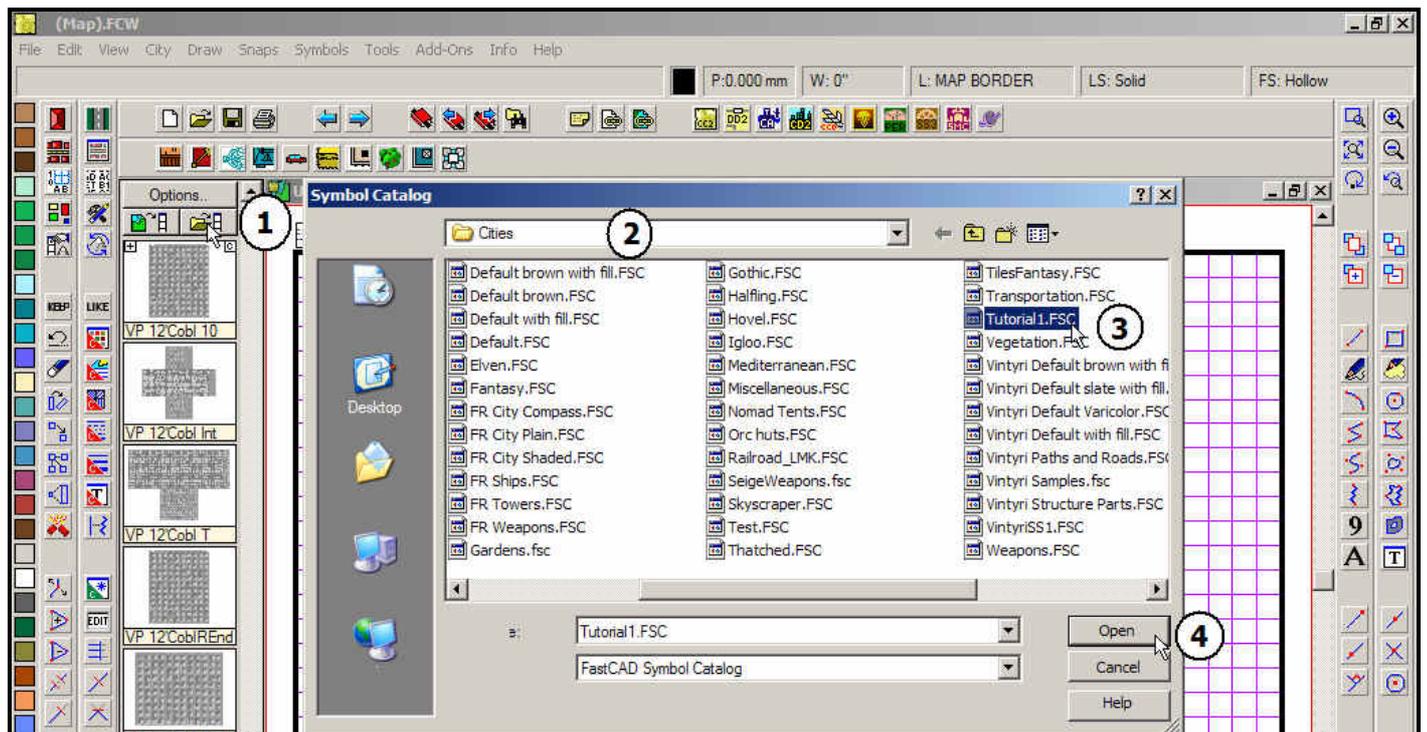


Figure 20. Opening the new catalog

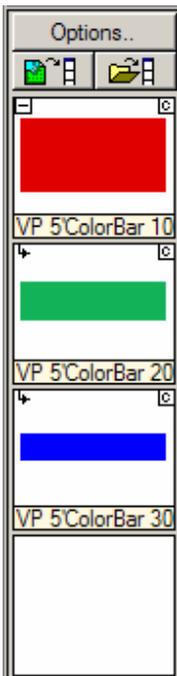
After a copy of the new template appears on the screen, we want to:

- 1. Click the symbol selection command button.
- 2. Go to the *Cities* file under *Symbols*.
- 3. Pick our new catalog *Tutorial1.fsc*.
- 4. And then click the command button

After our catalog appears in the bar of symbols on the left side of the screen, we might be a bit distraught to see only a single symbol shown, namely the first, with the 10-foot red color bar. When we look a bit closer at this lonely symbol, we see that it has a few special properties. In the upper right hand corner is the boxed in letter C. That tells us that this symbol is a connecting symbol. In the upper left hand corner we find a boxed-in plus sign (+). That tells us that the symbol displayed is a part of a collection of symbols, and what we see is only the first symbol in the collection. What's more, if we click the plus-sign (+), it will open up the full collection. That's never necessary as long as we're using the full collection, but let's click the plus-sign (+) and open the collection anyway.



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The display changes now. The plus-sign (+) by the red color bar has turned in a minus sign (-), showing that the collection is open. The green and blue color bar symbols also are visible now. Each of them has a return sign (↵) in the upper left corner. This shows that the symbol is a member of a collection but not the first member.

Most of the time, there is no need or reason to click the plus sign and open the view of all of the symbols. When we use these symbols in connecting modus, Campaign Cartographer will automatically select the best suited of the three for us.

However, we sometimes will want to deactivate the automatic symbol connection and use these three symbols singly, just as we do with normal, non-connecting symbols. In that case, after deactivating the automatic connection, we can click the plus sign, open the collection and individually pick the symbols we want, just as we would with normal, non-connecting symbols.

In the upper right hand corner of each symbol, we see the letter C in a box. This tells us that this is a connecting symbol. If we had made our color bars as Varicolor symbols, the boxed C would be one notch lower and another color box, indicating Varicolor, would be above it.

With that said, let's try out our connecting symbol set. We'll use Figure 21 as a guideline:

- 1. First of all, we'll click the new symbol.
- 2. Then we'll move the mouse into the upper left corner of our workspace. The result should resemble what we see in Figure 21.

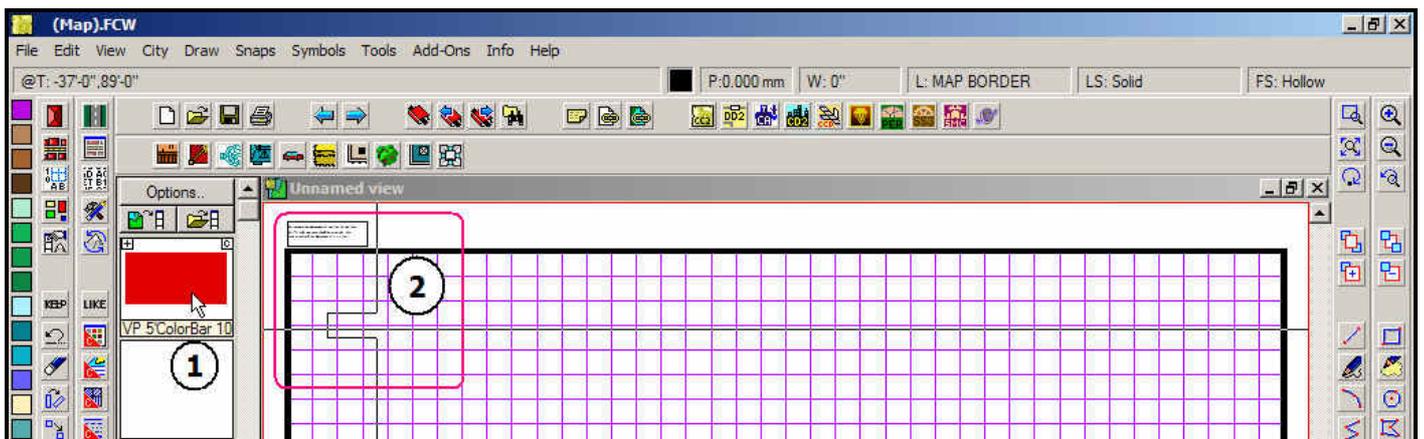


Figure 21. Initial screen display of the mouse with the connecting symbol

We don't want to click the mouse key yet. Instead, we'll just move the mouse around a bit on the screen. If your Campaign Cartographer installation has the normal settings, you'll probably notice that the rectangular symbol outlines jump back and forth, sometimes to the left and sometimes to the right of the mouse position. This is a result of the Smart Tracking property of CC symbols.

Smart Tracking sometimes is useful with connecting symbols, but in many cases, it leads to undesirable results when we're working with connecting symbols. Therefore, we want to deactivate this feature before we continue. We'll use Figure 22 on the following page as a guideline:

- 1. We click the *right* mouse key. That opens the dialog box *Symbol parameters*.
- 2. In the dialog box, we click the check in the check box *Smart Tracking* out.
- 3. Then we click the command button **More**.

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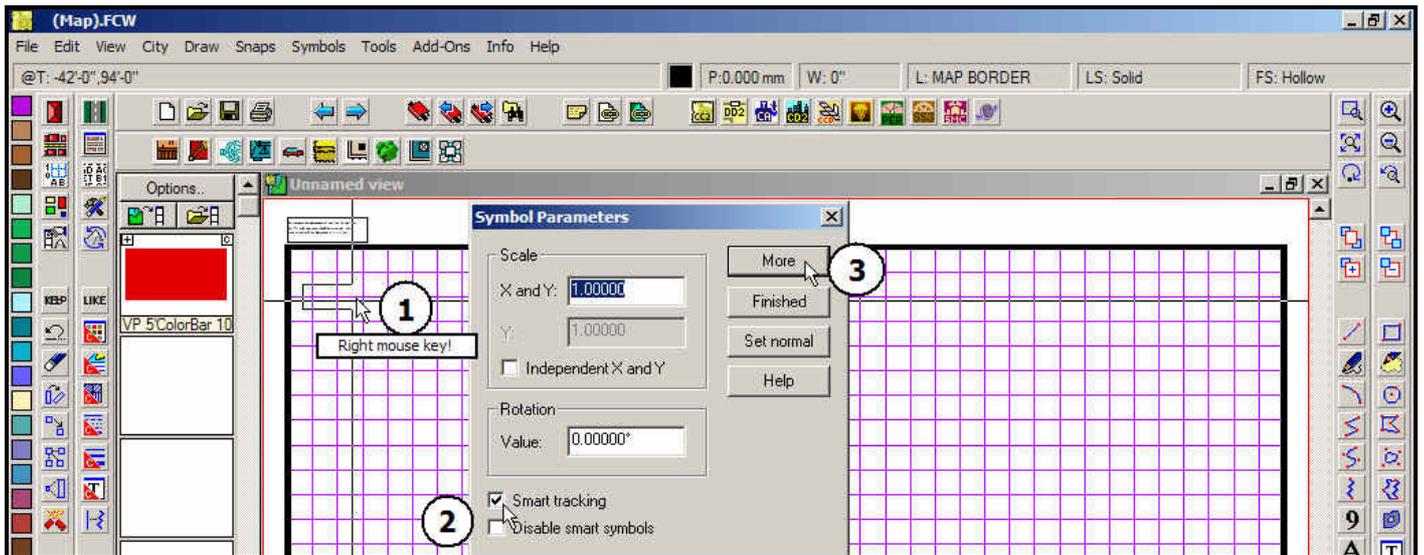


Figure 21. Deactivating Smart Tracking

After we've deactivated Smart Tracking, we can look at the way in which our connecting symbols work (Figure 22):

- 1. We'll click the point, where our string of connecting symbols should begin.
- 2. Then, without any further mouse clicks, we'll move the mouse slowly a little bit to the right. At first, we see a rectangular outline that corresponds to the size of our smallest connecting symbol, the 10-foot red color bar.

As we'll see a bit later, this result differs somewhat after we've added curved symbols to our connecting collection. The first unit then will correspond to the length of a curved symbol from the left border to the bend point, rather than to the smallest straight symbol.

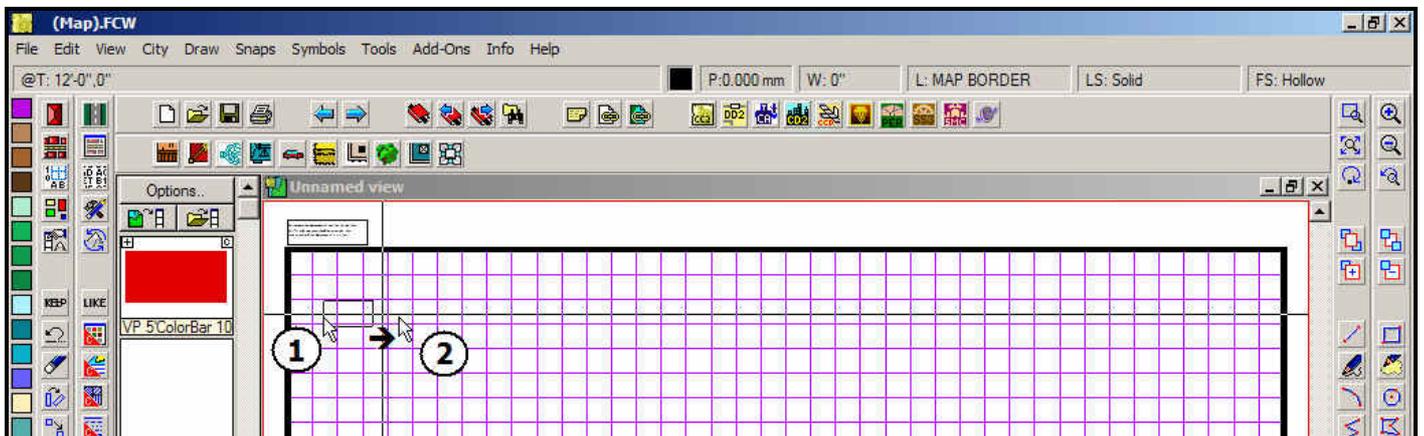


Figure 22. Beginning to create a string of connected symbols

When we continue to move the mouse to the right, the size of the string of symbols expands correspondingly (see Figure 23 on the following page).

Tutorial: Connecting Symbols

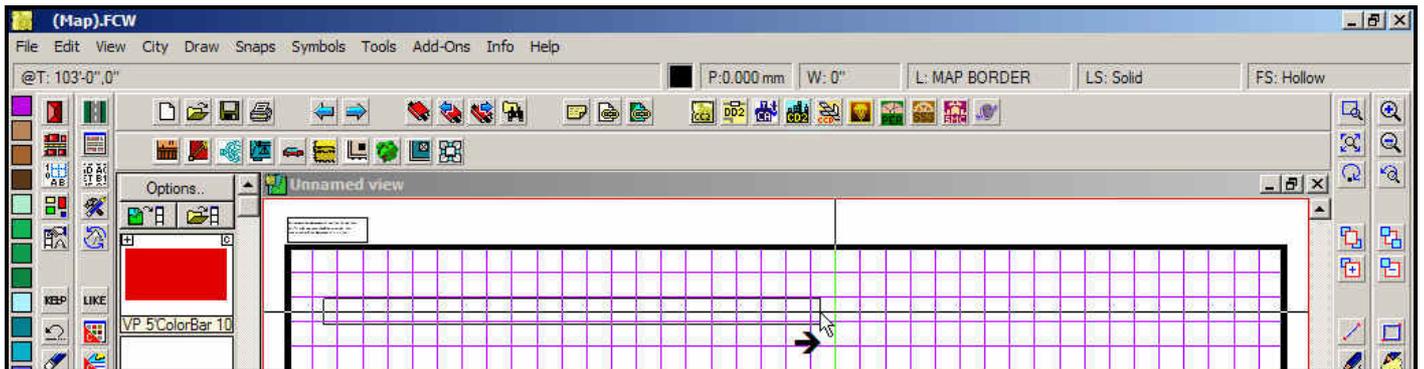


Figure 23. Extending the size of the string of connecting symbols

Once we reach the desired length, we need only click the *left* mouse key to define the end point and then *right* mouse key to end the drawing operation. Our row of connecting symbols appears (Figure 24).

Your collection of connecting symbols and ours in Figure 24 no doubt look a bit different. Exactly how they look and exactly which of the three symbols Campaign Cartographer chooses at various points is dependent upon our individual mouse actions.

With ordinary connecting symbols that are made to look identical, one usually sees no noticeable difference on the screen. We chose three different colors for our individual symbols so that we can see exactly what Campaign Cartographer did with our collection.

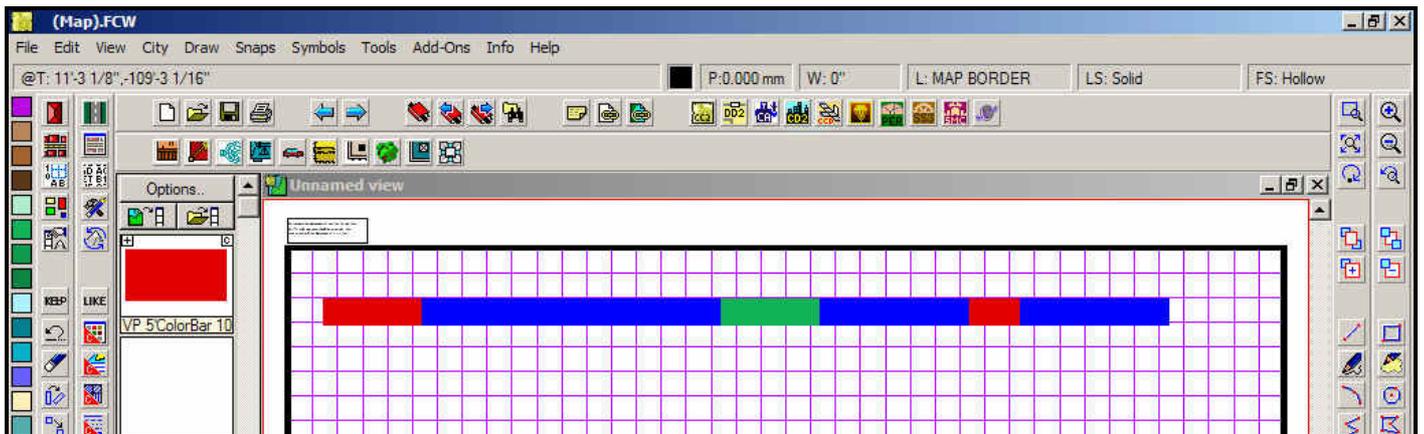


Figure 24. The finished string of connecting symbols

8. Taking a Closer Look



Some of the people who work with our project group and who began learning to make connecting symbols questioned why one should make straight symbols of various lengths, if Campaign Cartographer could achieve the same graphical result with a single symbol of the minimum length.

Campaign Cartographer uses an algorithm called *Greedy Choice* to always use the longest possible length to complete the various sections of a series of connected symbols. This system greatly improves the efficiency with which CC draws a string of connecting symbols.

Tutorial: Connecting Symbols

How well the *Greedy Choice* algorithm functions within your collection of connecting symbols depends upon:

- The number of symbols in your collection.
- The sizes you choose for the various symbols.
- The lengths of the connecting symbol strings

The nitty gritty details of these algorithms are outside the scope of this introductory tutorial, but they are explained in considerable detail on Pages 79 and 80 of the *Tome of Ultimate Mapping*, as well as in a short online tutorial for connecting symbols that registered users can download from ProFantasy's website. The free download tutorial is available at;

<http://www.profantasy.com/library/connecting.asp>

Another frequently asked question is why we define the symbol origin point of straight connecting symbols in the middle of the left edge. The answer is that connecting symbols made with an angle setting of 0° are drawn by CC from left to right. If we define the symbol origin elsewhere, the symbols won't connect correctly.

9. Making Curved Connecting Symbols

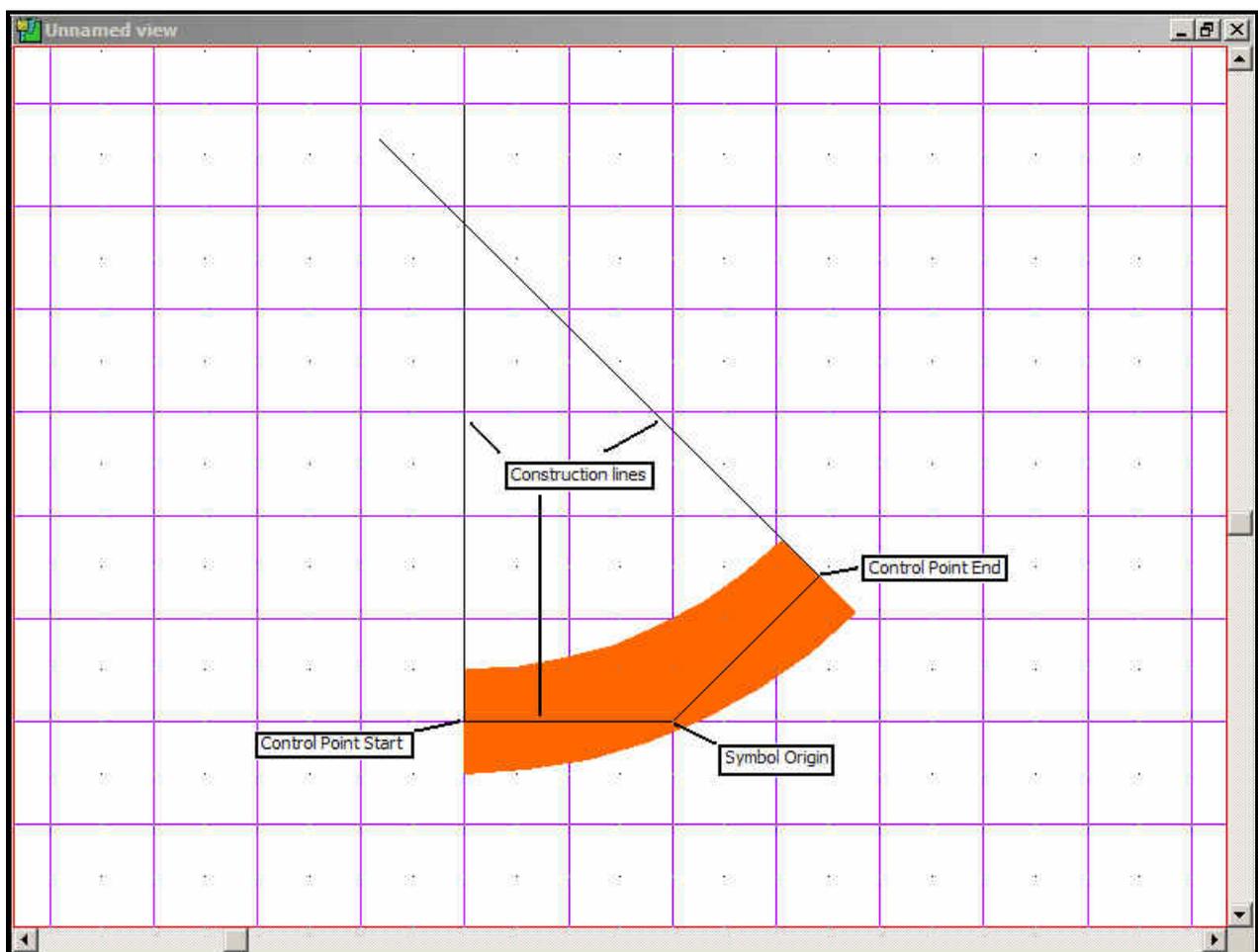


Figure 25. Objects critical for the definition of curved connecting symbols

Tutorial: Connecting Symbols

Once one gets used to the correct procedures, making straight connecting symbols is just as easy as making ordinary, non-connecting symbols. It isn't necessarily any more difficult to make curved connecting symbols, but in the design of the symbol one has to work with much more care and precision than with straight connecting symbols. The connecting element plays a role in this requirement, but in truth, one usually needs to apply the same care and precision in defining standalone, non-connecting curved symbols. And as soon as one gets the hang of it, it's relatively easy in both cases.

We need to understand certain terms to make curved connecting symbols, so let's take a look at Figure 25 on the previous page and learn them before we start working:

- *Construction lines:* These are nothing more or less than simple helping lines that we draw to help us make precise symbol content. They are not a part of the symbol content.
- *Control Points:* We already defined control points with our straight connecting symbols, and you've probably done it as well with standalone symbols you may have defined. Our diagram shows where they usually are defined for curved connecting symbols.
- *Symbol origin:* This element is of the most critical importance in defining curved connecting symbols. Only through the use of properly calculated construction lines can we determine *exactly* where this point is, and if our curved symbol is to connect successfully, we must be *exact* in this case. The symbol origin also is the bend point of our curve.



In our example in Figure 25, the symbol origin point still is within the orange color bar of a 45° angle that we wish to incorporate into our existing collection. With symbols of lesser curvature, the symbol origin usually will be **outside** of the symbol content!

Now that we know what's what, let's go to work on our curved symbol. Our goal: We want to create a 5-foot color bar (like the three existing color bars) with a curvature of 45° and a distance to the bend point of 10 feet. In the tutorial, we'll make it orange (Color 8), but you can feel free to choose a different color if you wish. To make that clear, if we look Figure 25, the starting point on the left is the same point as the control point start, and the bend point is the same as the symbol origin.

If we're choosing a length of 10 feet to the bend point, then we **must** have a straight connecting symbol that also is this length, i.e. 10 feet long. We do. That's our red color bar. But this too is a firm requirement that we must fulfill if we want to create a successful collection of connecting symbols that includes curves. (A collection of *only* curved connecting symbols will not work!)

To begin with, we'll create a new layer for construction lines, using Figure 26 on the following page as a guideline:

1. In the upper status bar, we click the command button for layers. The dialog box *Select Layer* appears.
2. We'll click the command button **Add**. That opens the dialog box *New Layer Name*.
3. In the untitled text field, we type in the name CONSTRUCTION LINES.
4. Then we click the command button **OK**. That closes this dialog box. The layer CONSTRUCTION LINES now appears in the dialog box *Select Layer*.
5. We click the check box *Select* for the new layer CONSTRUCTION LINES, to make this the active layer.
6. Then we click the command button **Freeze All** to protect the other layers.
7. Finally, we click the command button **OK** to accept these settings and to close the dialog box.

Tutorial: Connecting Symbols

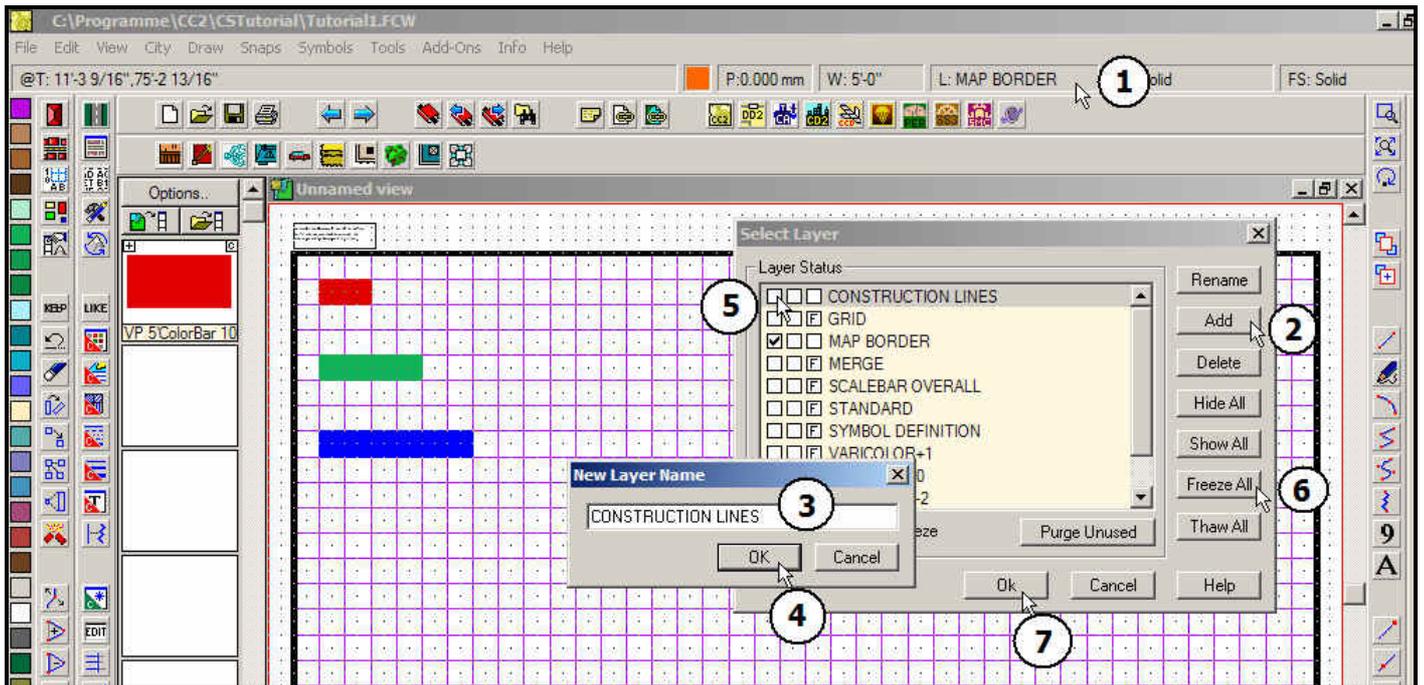


Figure 26. Definition of a new layer for construction lines

Next, we need to pick a color for the construction lines that will be visible against the purple grid. (If the grid makes your work more difficult, you also can deactivate it by hiding the layer named GRID.) In our examples, we used turquoise (Color 5). Then we have to make certain that our basic settings match those in Figure 27.

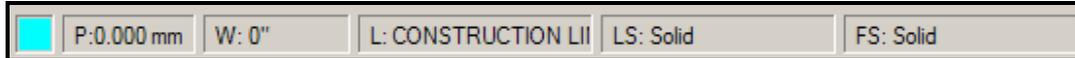


Figure 27. Basic settings for the construction lines

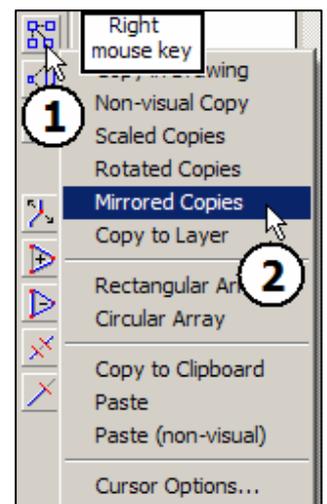
We're ready now to begin our construction lines. We'll use Figure 28 on the following page as a guideline. Please note that we've made the construction lines in the first graphics with an exaggerated thickness so that it's easier for you to see them. You shouldn't follow our example in this case, but instead stick with a line width of 0. 

We'll pick a starting point 20 feet from the left border and 35 feet under the blue 30-foot color bar. Remember that the purple grid lines are five feet apart. From that point, we draw a 10-foot line to the right and a 30-foot line upwards, as shown in Figure 28.

After we have created both of these lines, we want to make a mirror copy to the right of them that's tipped to the desired 45° angle. That isn't difficult to do, but for those doing it the first time, the procedure is more than a bit esoteric. However, it gets to be easy after one's done it a few times.

To start, let's use the small graphic to the right as a guideline:

- 1. We go to the symbol bar to the left side of the screen and, with the *right* mouse key, we click the copy symbol. That opens the symbol's context menu.
- 2. In the context menu, we click the option *Mirrored Copies*.



Tutorial: Connecting Symbols

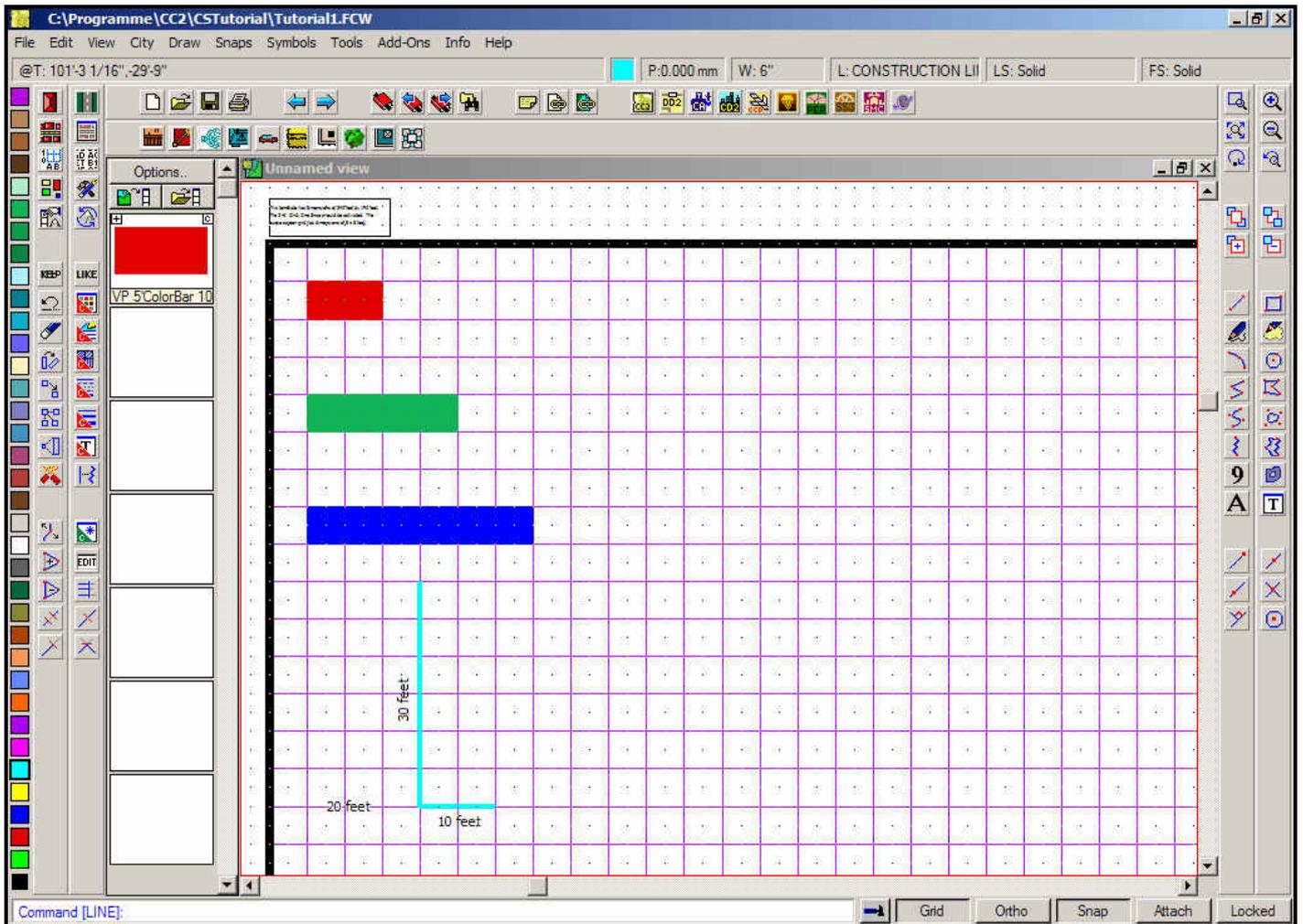


Figure 28. First construction lines

For the next operations, we'll use Figure 29 on the following page as a guideline:

- 1. With the mouse, we select both the vertical and horizontal construction lines. After they've been selected, they turn grey.
- 2. Then we make a click with the *right* mouse key to open the context menu.
- 3. In the context menu, we pick the option *Do It*.
- 4. We now have to define the mirror start line. That is the *exactly* point where our horizontal construction line ends on the right. If we have *Snap* activated, this point is easy to click.

That's as far as the mouse can take us with accuracy. The command line now is asking for the *mirror line end*. We can define this point with complete accuracy if we use a command. But first we have to calculate it. The correct formula is:

$$\langle (90 + \text{desired angle} + 2), (\text{length to bend}) \rangle$$

Tutorial: Connecting Symbols

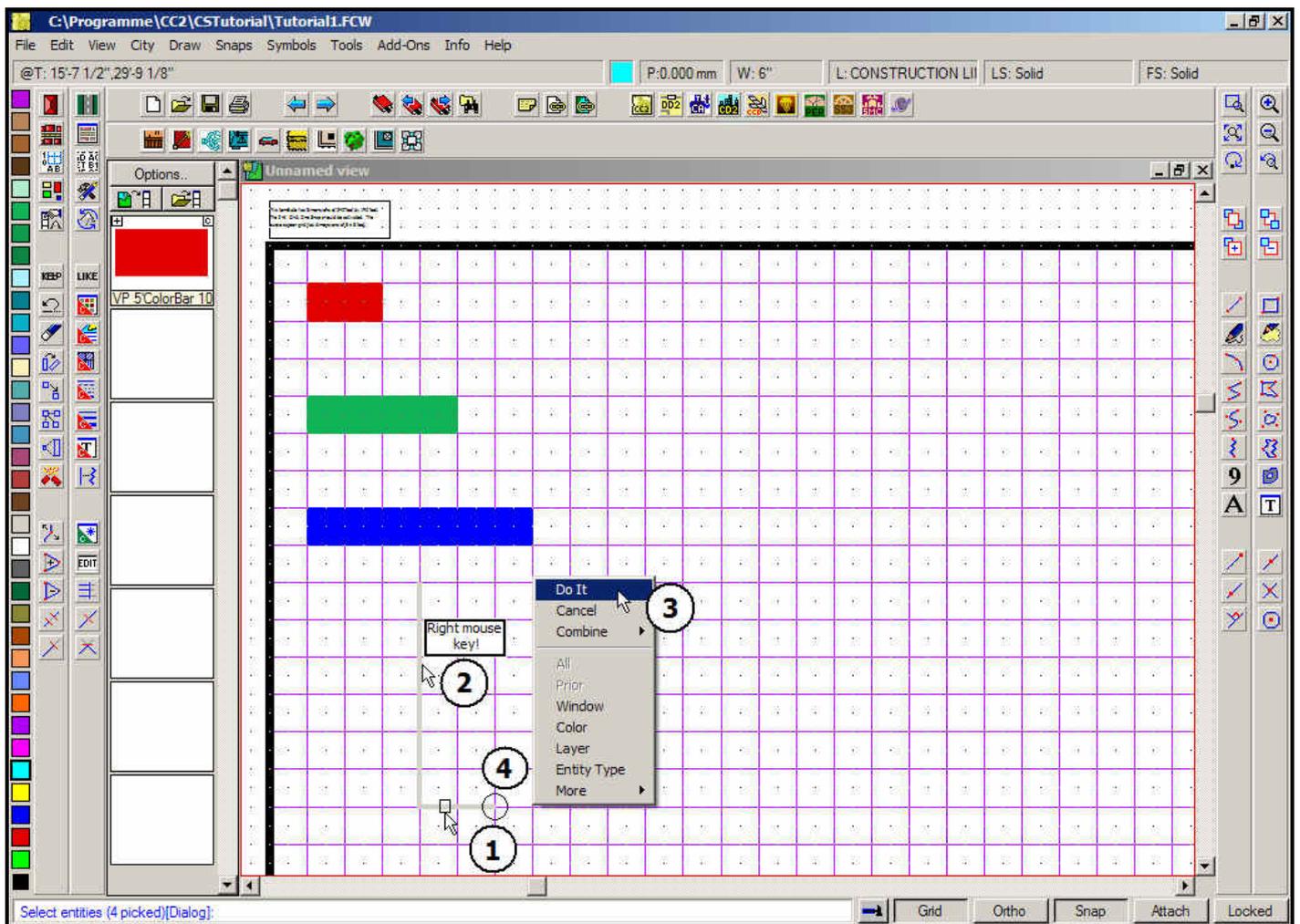


Figure 29. Making an angled mirror of the construction lines

Let's put that together in pieces:

- The character < defines an angle command.
- Our desired angle is 45°.
- Half of 45 is 22.5.
- $90 + 22.5 = 112.5$, so our first *argument* is 112.5.
- After that comes a comma to separate the first and second arguments.
- The length from the start of the symbol on the left to the bend point is 10 feet. Therefore, our second argument is 10.
- In that case, our command is <112.5,10 . We type this into the command line and close with the Enter-key .

Tutorial: Connecting Symbols

Our completed construction lines should now look like those in Figure 30 (except for the exaggerated line thickness). With that, we've gotten the hardest part of the job behind us.

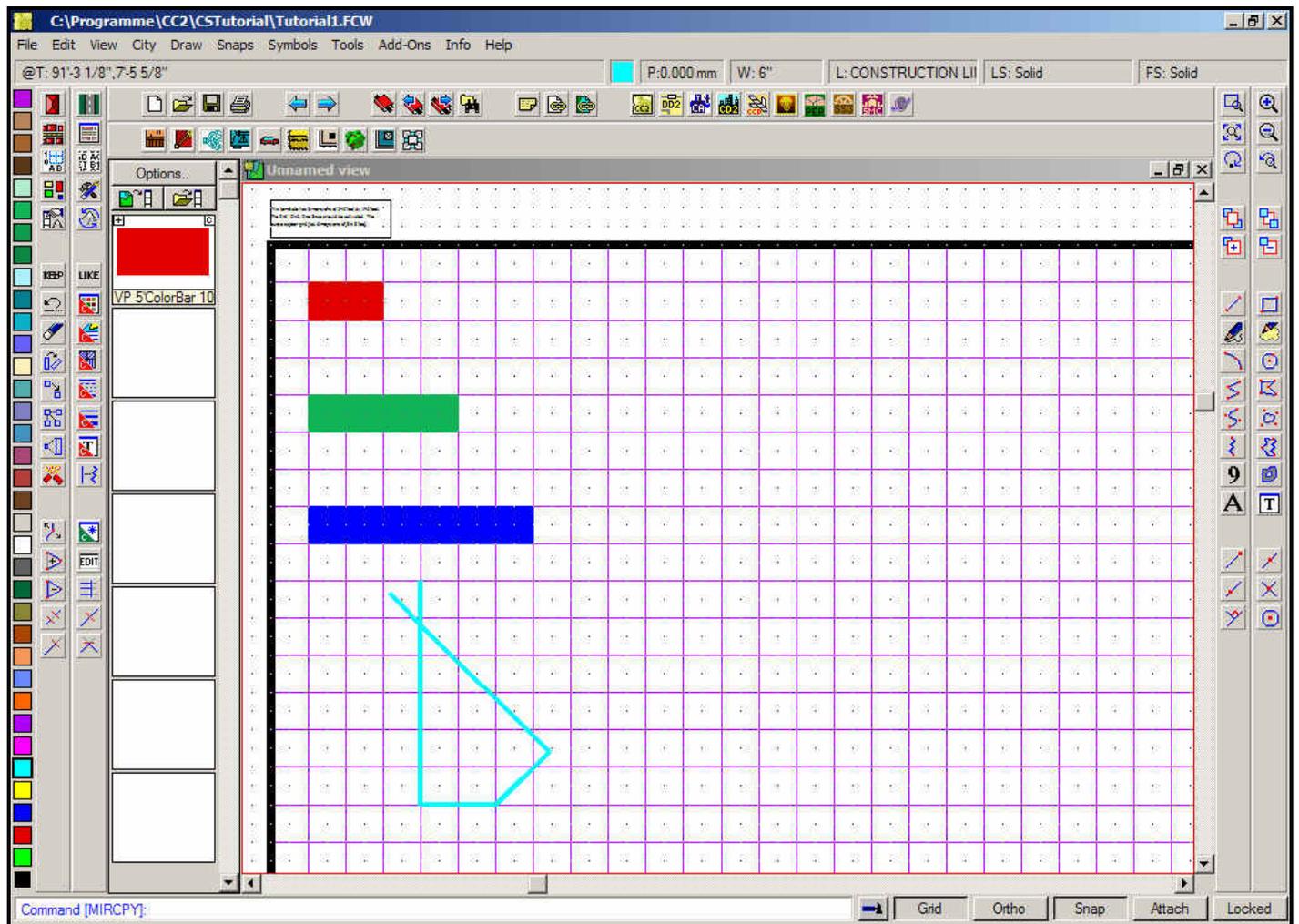
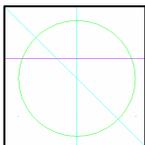


Figure 30. The completed construction lines



At this stage, many users zoom in to the point at the top where the two construction lines intersect and draw a hollow circle around it as an additional aid (see the graphic to the left). This step is not necessary, but it is a help. The point where the lines intersect should define the circle's center.

In the status bar at the top of the screen, we need to make the settings for our color bar. We need to have the same settings as in Figure 31 except for color. In our example we see orange (color 8). You can of course pick any color you wish, but you should avoid red, green and blue, because we've already used them.

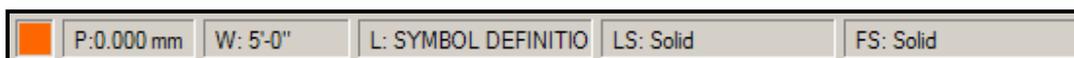


Figure 31. The new settings

Tutorial: Connecting Symbols

We now can start defining the arc of our new curved color bar (see the graphic to the right):

- 1. With the *right* mouse key, we click the *Arc* symbol in the first symbol bar on the right side of the screen. That opens the context menu.
- 2. Then we pick the context menu option *Center, Start and End*.

For the next step, we'll use Figure 32 as a guideline:

- 1. Our center point is the point at the top where our construction lines intersect (Point 1, Figure 32). We need to click this point.
- 2. Now let's make sure that *Snap* is on. Then we'll go to the bottom of our construction lines, to the point where we made our first line. When we reach that point, we'll click the left mouse key to accept it.

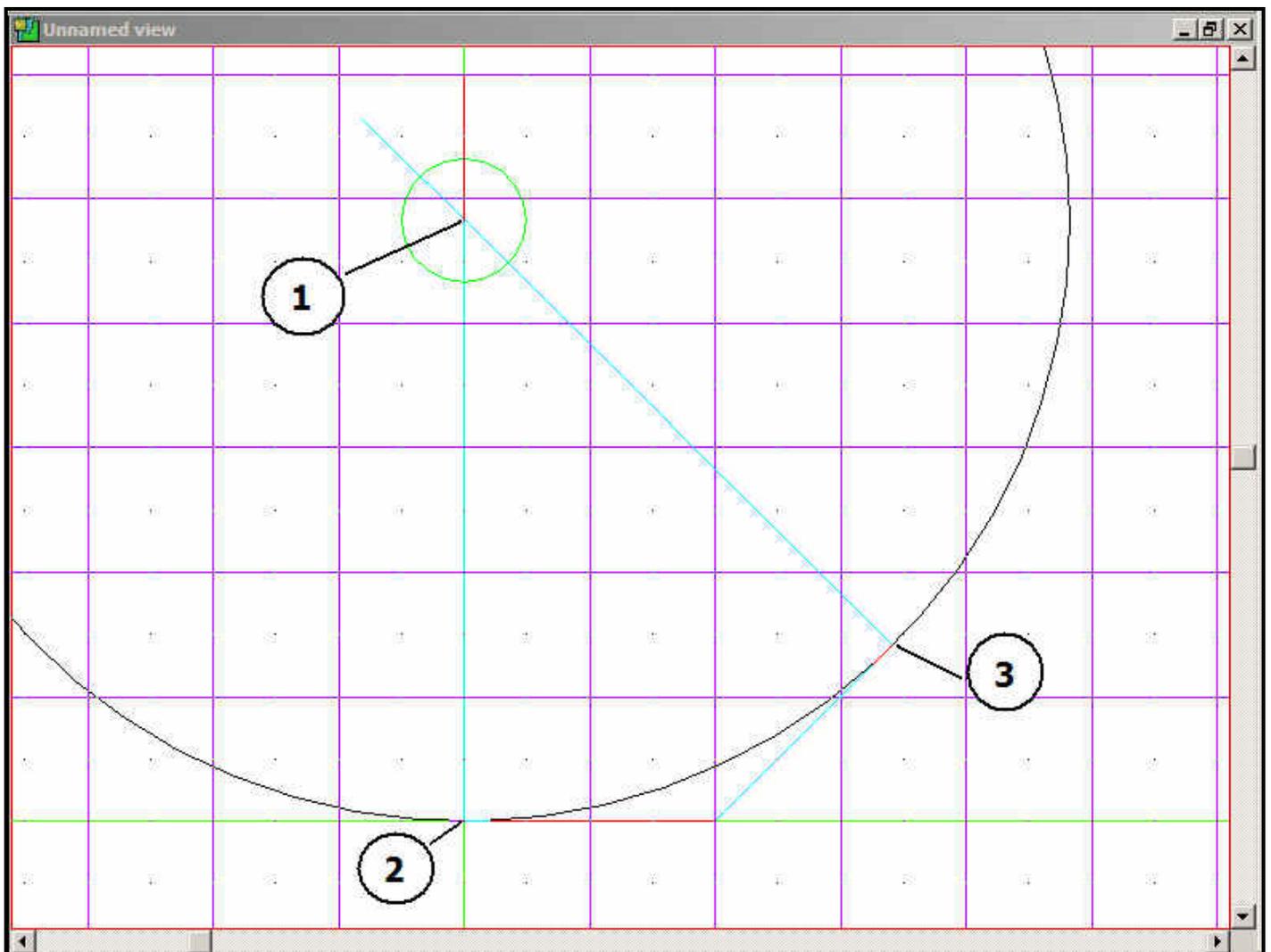
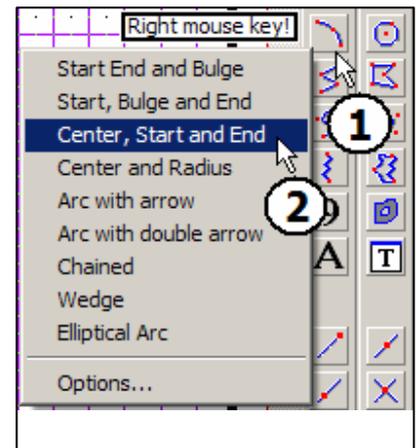


Figure 32. Defining the curved color bar

Tutorial: Connecting Symbols

- 3. For the last mouse click, we need to turn *Snap* off, because it's not on a grid point to which we can snap. After that we should zoom in close to the point where our construction line after the bend ends and the 45° line back upwards begins (Figure 33). The arc drawing line should completely cover the construction line so that there appears to be only a single line, as in Figure 33. When that point is reached, we click the mouse key to end the operation. Our curved color bar appears.

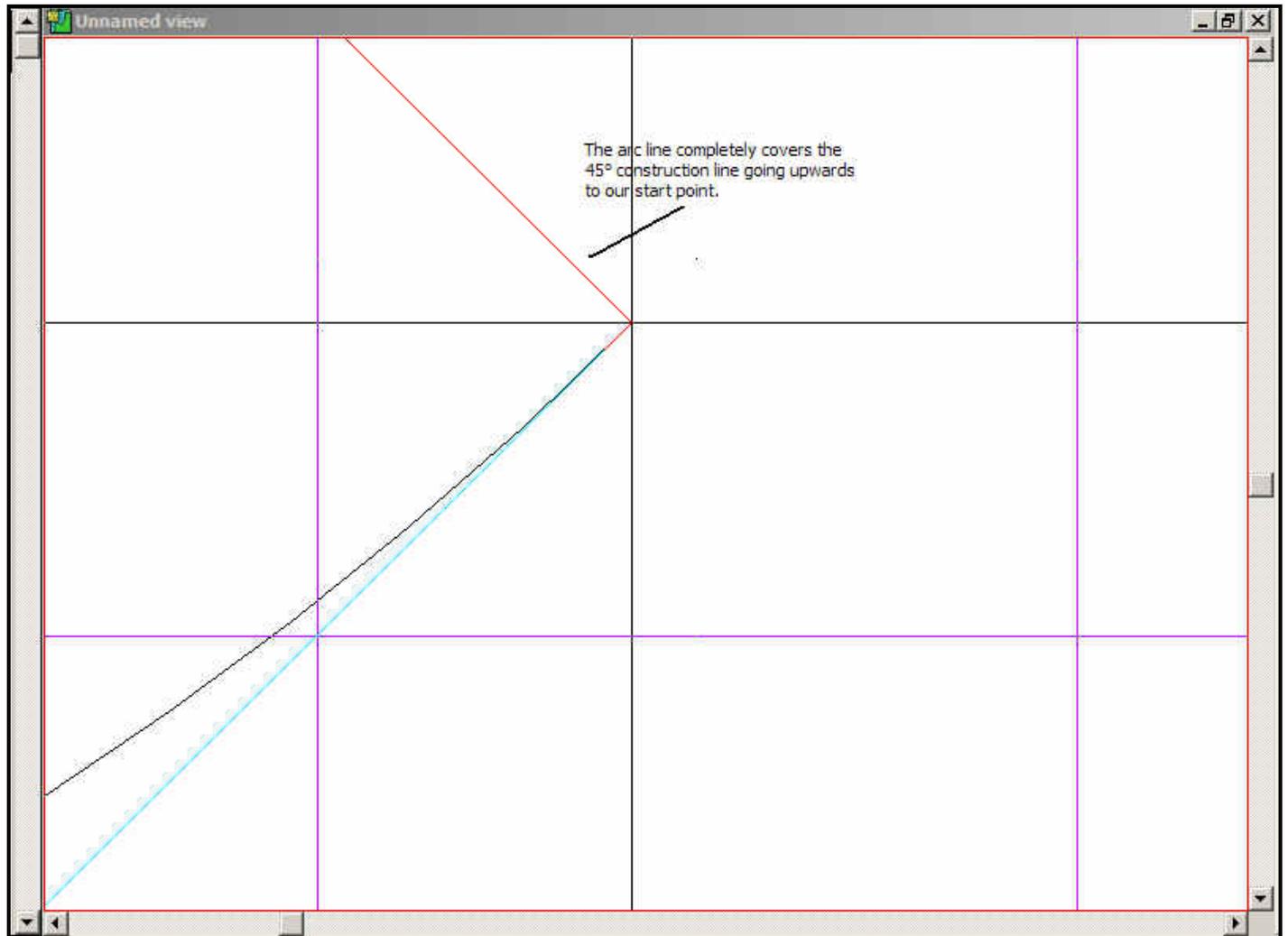


Figure 33. Completing the arc

Instead of eyeballing this last operation, experienced mappers may wish to use the precision of the bearing modifier. Because this adds another layer of complexity to the operation for the less experienced, we have omitted it. We've found that with a close zoom, eyeballing the last mouse click works just as well.



We now have everything on the screen we need to make our symbol. Let's go through the next steps:

- We'll open the dialog box *Select Layer* and then temporarily make CONSTRUCTION LINES the active layer.
- Now we'll freeze all of the remaining layers.

With the other layers protected, we can bring or construction lines back to the front where they're needed,

Tutorial: Connecting Symbols

- 1. In the first symbol bar to the right, we click the symbol *Bring to Front*. (See the graphic to the right).
- 2. (Not illustrated). We click the *right mouse key* to open the context menu.
- 3. In the context menu, we pick *All*. (Everything else is frozen.)
- 4. (Not illustrated). We click the *right mouse key* to open the context menu again.
- 5. (Not illustrated). This time we pick the menu option *Do It*.

Our construction lines are visible again atop the color bar, which is our symbol content.

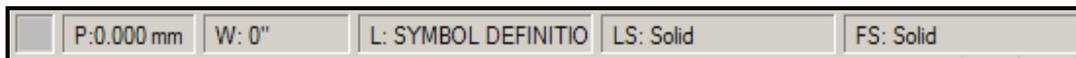


Figure 34. The new settings

Let's save the current status. Then it's time to change our settings again, this time to match those in Figure 34. When we set the layer to SYMBOL DEFINITION, we also should freeze all of the other layers. With these settings, we can at last make our curved symbol. We'll start by adding control points. Figure 35 is our guideline.

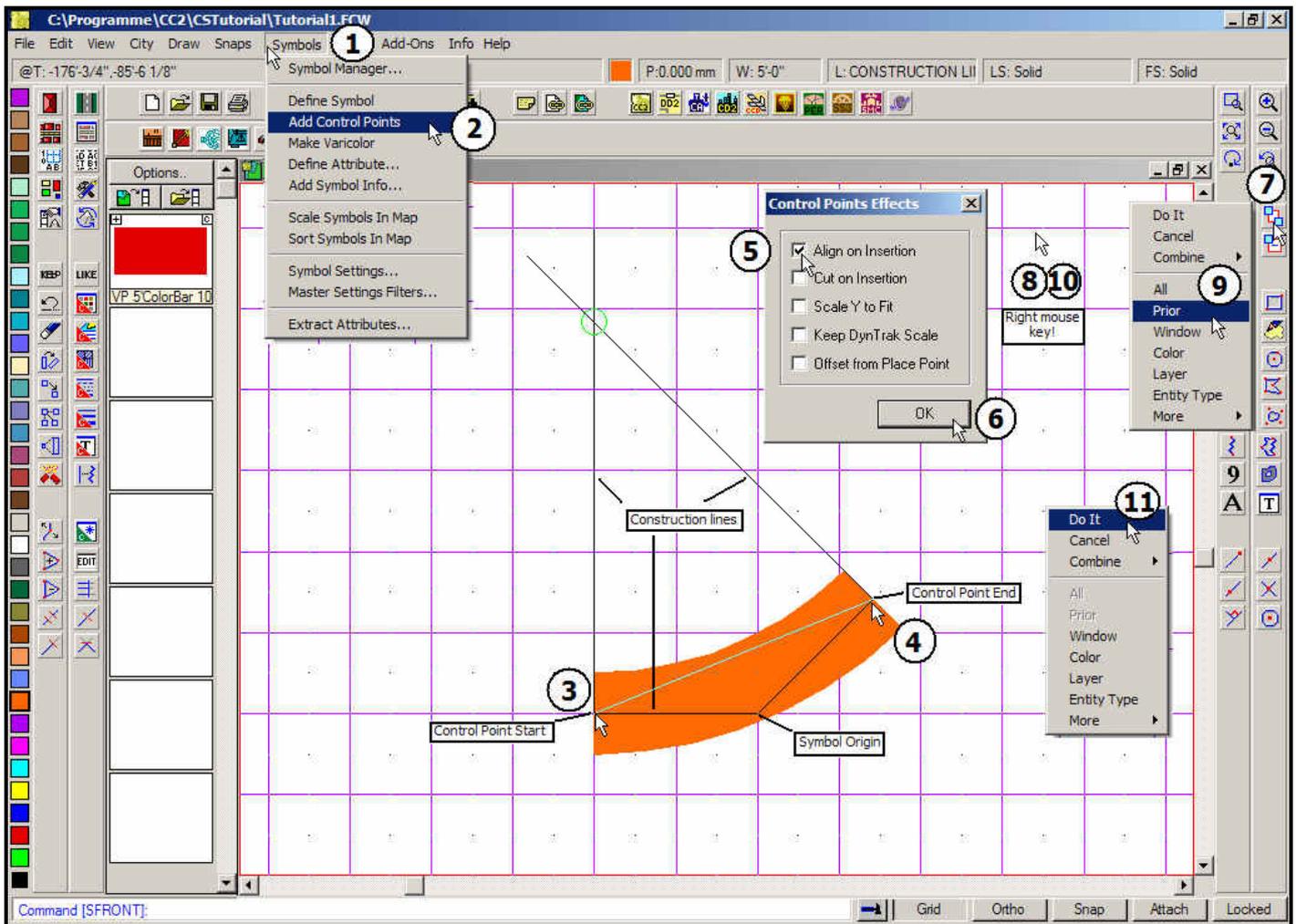


Figure 35. Defining control points

Tutorial: Connecting Symbols

- 1. In the menu bar, we click the option *Symbols*.
- 2. In the pulldown menu we pick the option *Add Control Points*.
- 3. For the next step, *Snap* should be active. Then we click our control point start position.
- 4. To finish, we need to shut *Snap* off again, because the next position is not on a snap point. Then we should zoom in close on the control point end position and make a mouse click precisely upon it. This opens the dialog box *Control Points Effects*.
- 5. In the dialog box, we check only the check box *Align on Insertion*.
- 6. Then we click the command button . This closes the dialog box. The control points line appears atop the color bar.
- 7. Next we'll move the control point line to the back, behind the color bar. In the symbol bar to the far right, we click the symbol *Send to Back*.
- 8. At an open space in the worksheet, we make a click with the *right* mouse key to open the context menu.
- 9. In the context menu, we click *Prior*.
- 10. At an open space in the worksheet, we make another click with the *right* mouse key to open the context menu.
- 11. In the context menu, we click the option *Do It*.

Before we begin with the symbol definition, we need to learn the rules for naming curved connecting symbols. The syntax is:

Name [Angle:Length to Bend Point]

In our collection of color bars, the name is *VP 5'ColorBar*. We have a symbol with a curvature of 45° and a length to the bend point of 10 feet. When we're asked for the symbol name, we have to enter:

VP 5'ColorBar [45:10]

So, let's begin, using Figure 36 on the following page as our guideline:

- 1. In the menu bar, we pick the option *Symbols*.
- 2. In the pulldown menu, we click the option *Define Symbol*.
- 3. *(Not illustrated)* The command line now asks for a symbol name. We type **VP 5'ColorBar [45:10]** and close with the Enter-key .
- 4. Next, with *Snap* turned on, we click the symbol origin position.
- 5. We now have to select the symbol contents. We click the curved color bar. It should turn grey (although the color won't change magically on the following page).
- 6. We click the *right* mouse key to open the context menu.
- 7. In the context menu, we click the option *Do It*. The color bar moves into the symbol catalog and vanishes from the screen.

Tutorial: Connecting Symbols

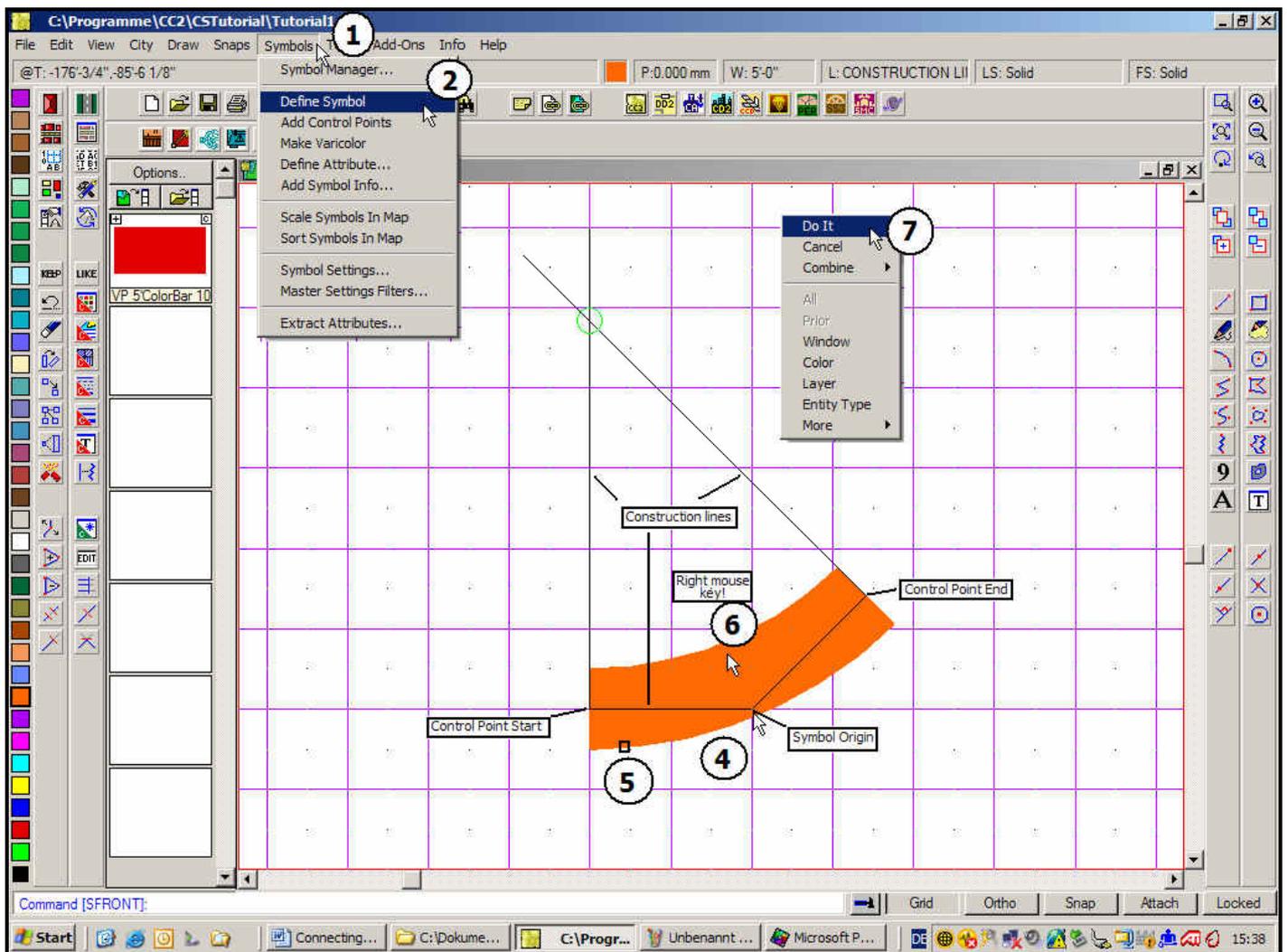


Figure 36. Defining the symbol

We're nearing the finish line. Next, we have to expand our symbol's definition to make it into a curved connecting symbol that's a member of a collection. We'll use Figure 37 as a guideline.

- 1. In the menu bar, we pick the option *Symbols*.
- 2. In the pulldown menu, we pick the option *Symbol Manager*. That opens the dialog box named *Symbol Manager*.

NOTE: If any symbols *other* than the new curved color bar are shown in the list, they should be deleted. Be sure that the check box *Show fill style symbols* is activated, so that all currently included symbols are visible. Fill style symbols also should be deleted.



- 3. Next, we click the new curved symbol in the display.
- 4. Then we click the command button **Edit**.
- 5. (Not illustrated) Finally, we use the mouse to create a new Edit Window. If you've forgotten how to do this, see Figure 12 on Page 14.

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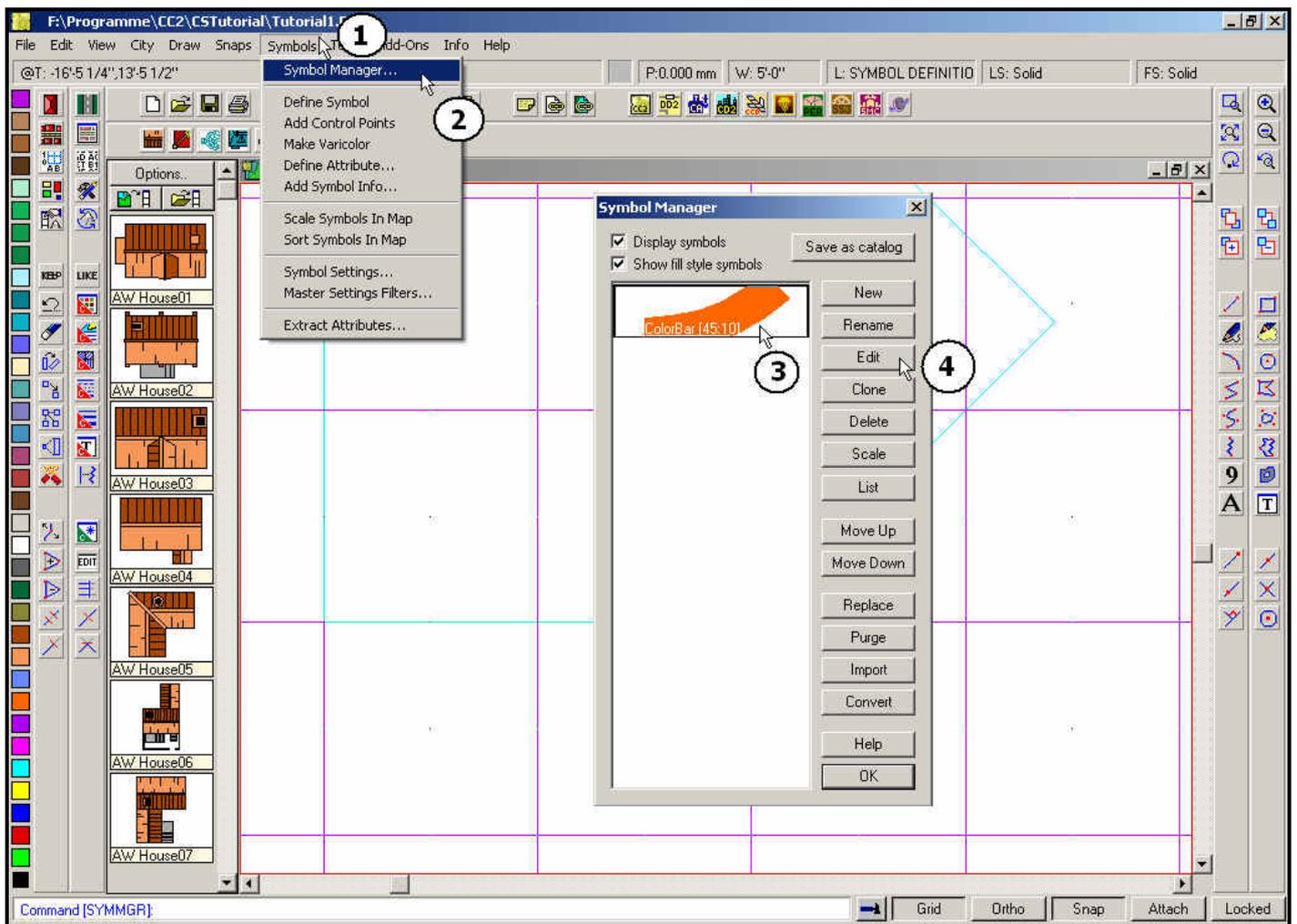


Figure 36. Putting the symbol into a connecting collection

We now can further define the symbol as a part of a connecting collection. We'll use Figure 37 on the following page as a guideline:

- 1. In the menu bar, we pick the option *Symbols*.
- 2. In the pulldown menu, we click the option *Add Symbol Info*. The dialog box *Symbol settings* opens.
- 3. We activate the check box *Symbol is one of a collection*.
- 4. We click the radio button *Numbers at the end*.
- 5. We activate the check box *Symbol is a connecting symbol*.
- 6. Then we click the command button **OK**. That closes the dialog box.

Tutorial: Connecting Symbols

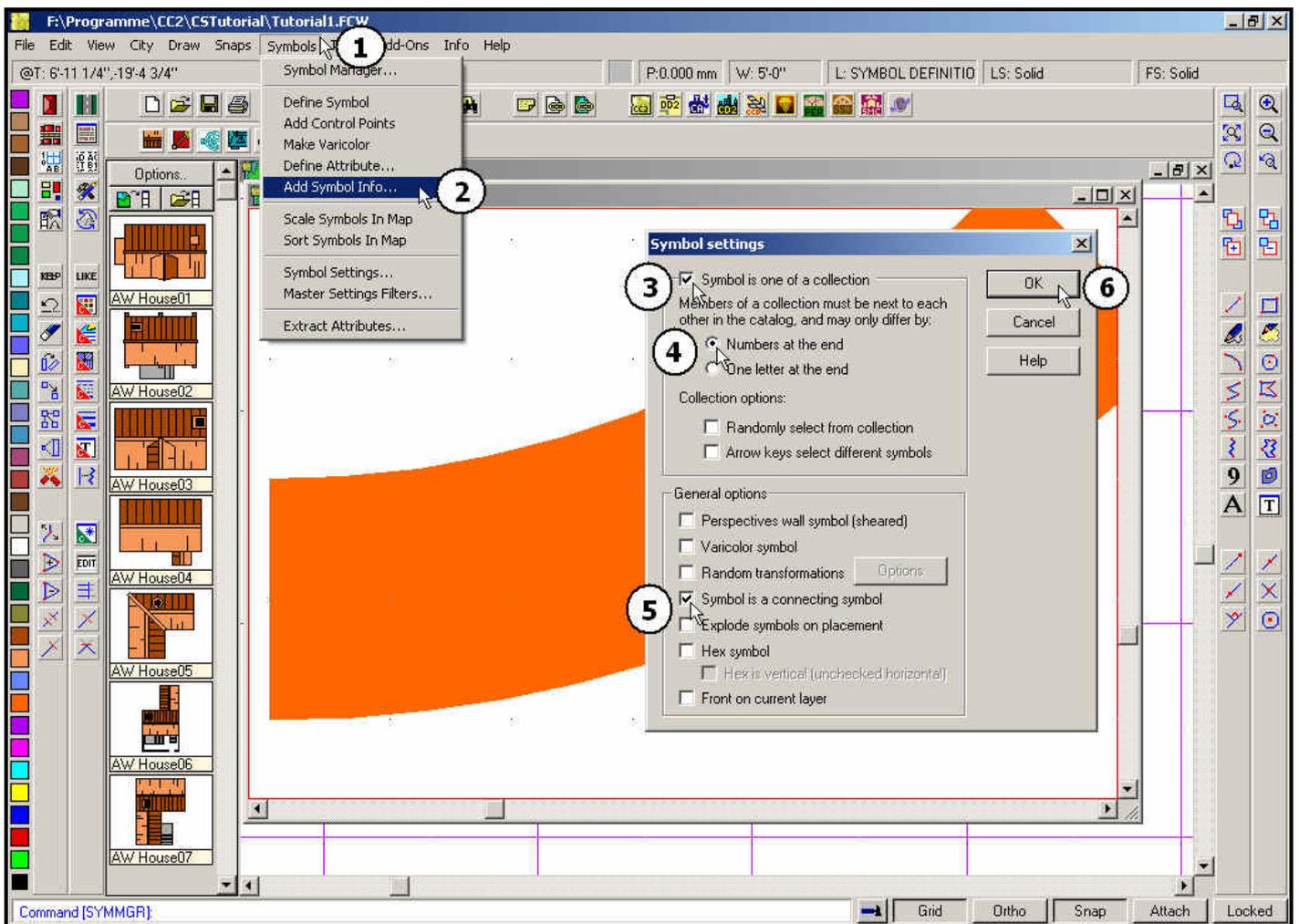


Figure 37. Putting the symbol into a connecting collection

In our next step we have to confirm the changes we've made in the symbol definition. Our guideline is Figure 38 on the following page:

- 1. We click the close symbol **X** in the right hand corner of the Edit Window's title bar. A message box titled only CC2 appears.
- 2. We confirm our actions by clicking the command button **Yes**. This closes the dialog box.

Next, we'll save the current catalog (which exists at present only in memory of our computer) as a temporary catalog file with the extension .FSC. Our guideline is Figure 39 on the following page:

- 1. In the menu bar, we click the option *Symbols*.
- 2. In the pulldown menu, we pick the option *Symbol Manager*. That opens the dialog box of the same name.
- 3. We select our new symbol.
- 4. Then we click the command button **Save as catalog**. The Save as dialog box opens.

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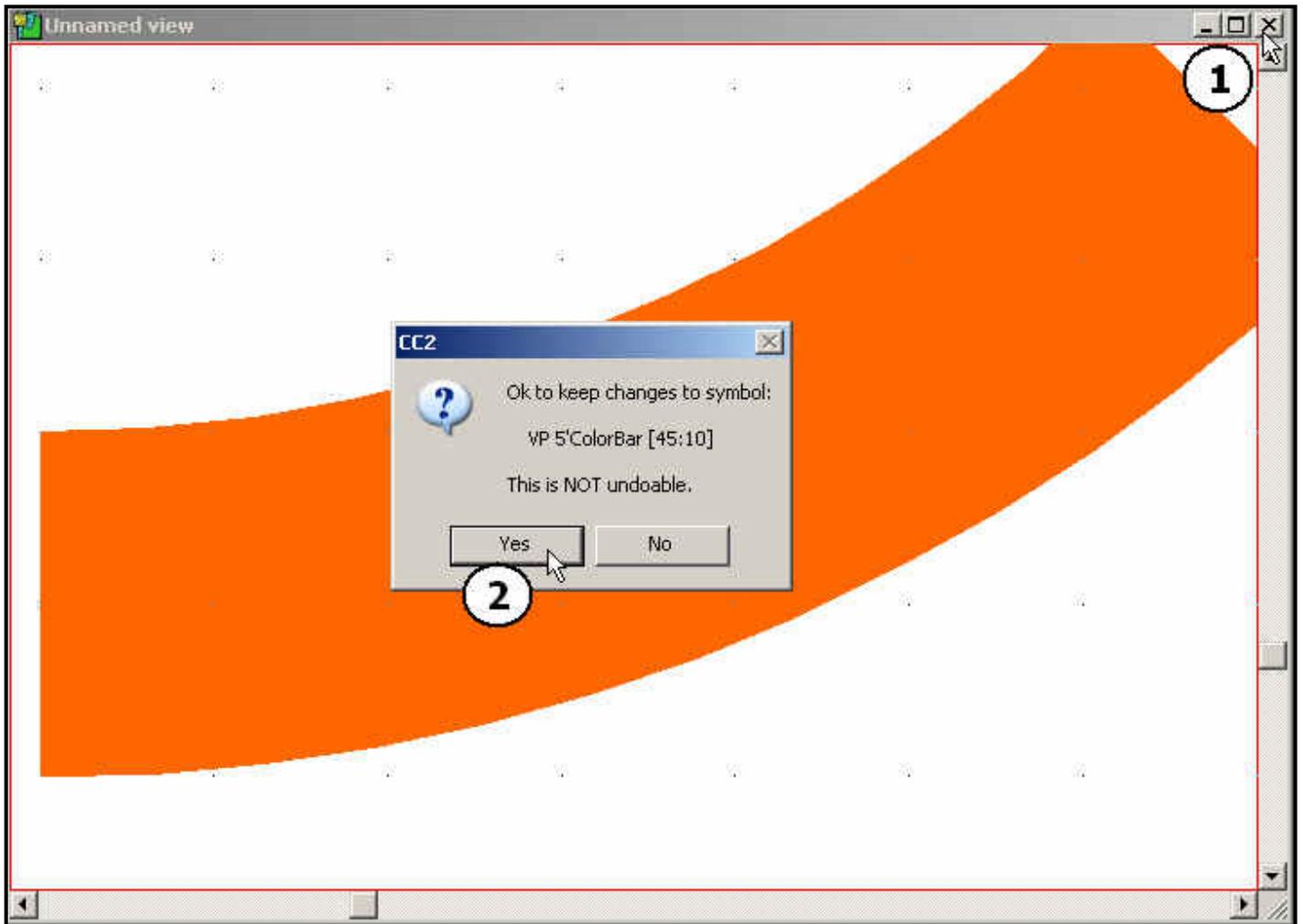


Figure 38. The changes are confirmed.

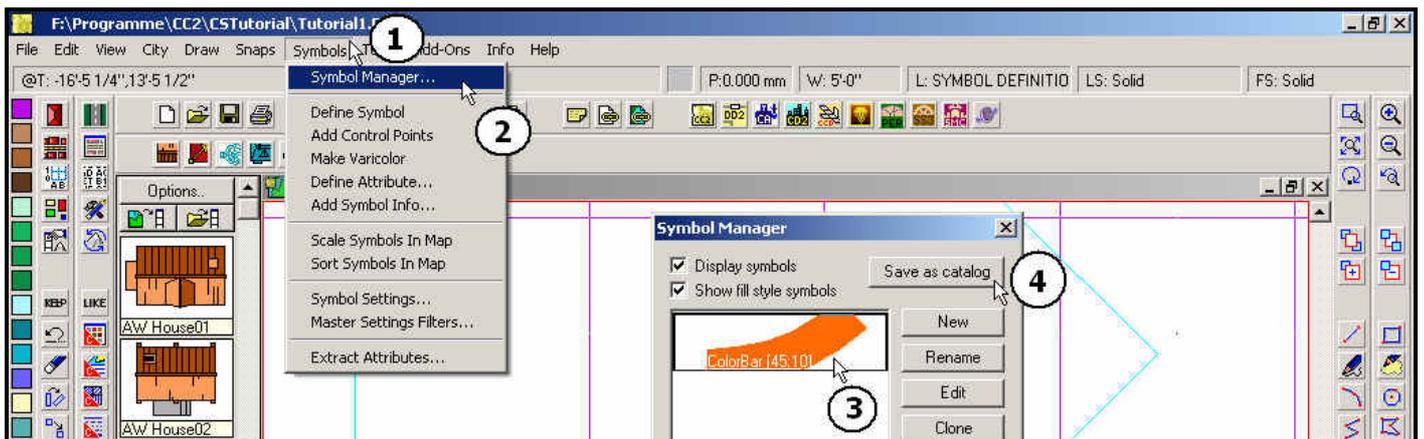


Figure 39. Saving the new temporary catalog

Tutorial: Connecting Symbols

The remaining steps are standard operations and are not illustrated:

- 5. In the *Save as* dialog box, we:
 - ◆ Pick the folder *Cities* under *Symbols* in the CC Folder.
 - ◆ We make sure that the combo box *File type* at the bottom of the dialog box is set to *Campaign Cartographer FSC Symbol Catalog*.
 - ◆ We enter the file name *Tutorial2*.
 - ◆ We click the command button **Save**.
- 6. The dialog box closes. The symbol manager is active again. We close it by clicking the command button **OK**.

We now want to add our new symbol to our previous catalog with the three straight color bars. The initial steps are standard operations and are not illustrated:

- 1. In the menu bar, we click the option *File*.
- 2. In the pulldown menu, we pick the option *Open*. This opens the dialog box *File manager*. From this point on we'll work with Figure 40.

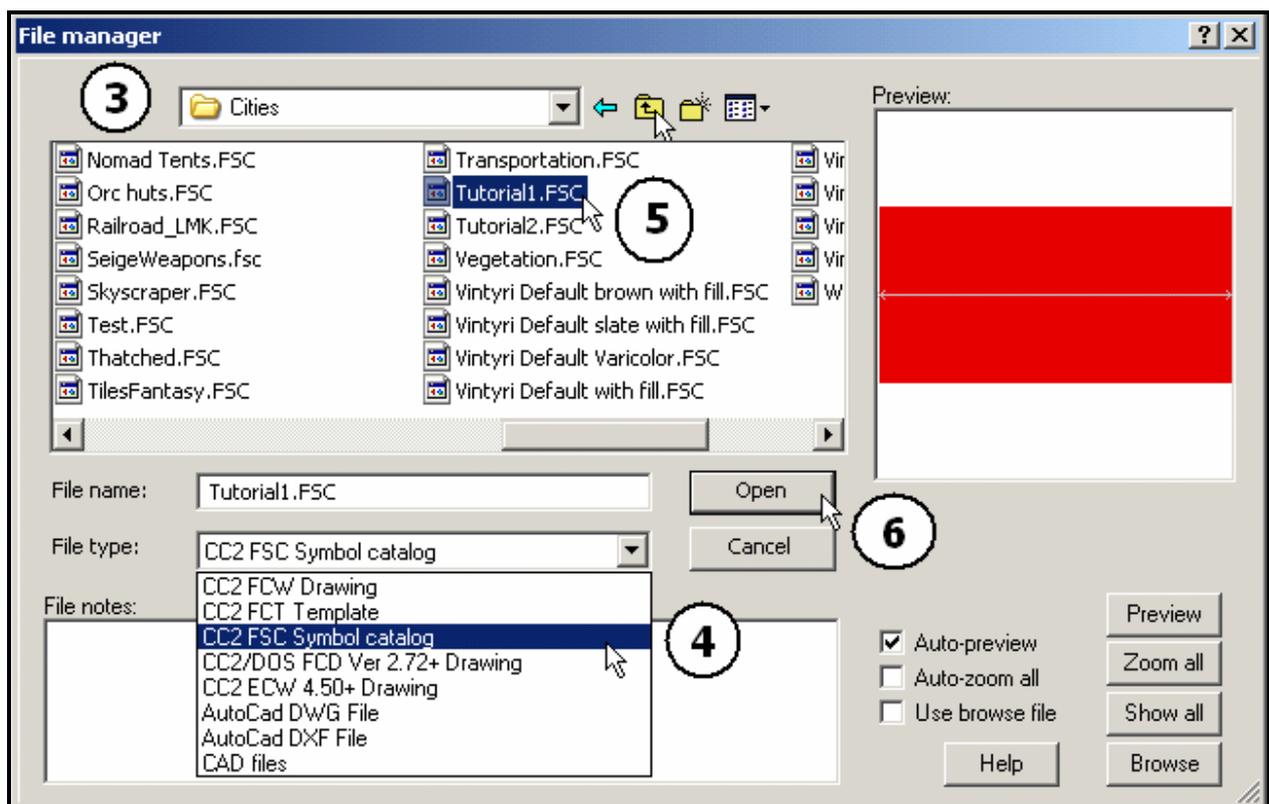


Figure 40. Opening our first symbol catalog

Tutorial: Connecting Symbols

- 3. We select the folder *Cities* under *Symbols* in the CC folder.
- 4. With the combo box below we select the file type *CC FSC Symbol Catalog*.
- 5. Then we select our first symbol catalog. In our example, we named it *Tutorial1.fsc*.
- 6. We click the command button **Open**.

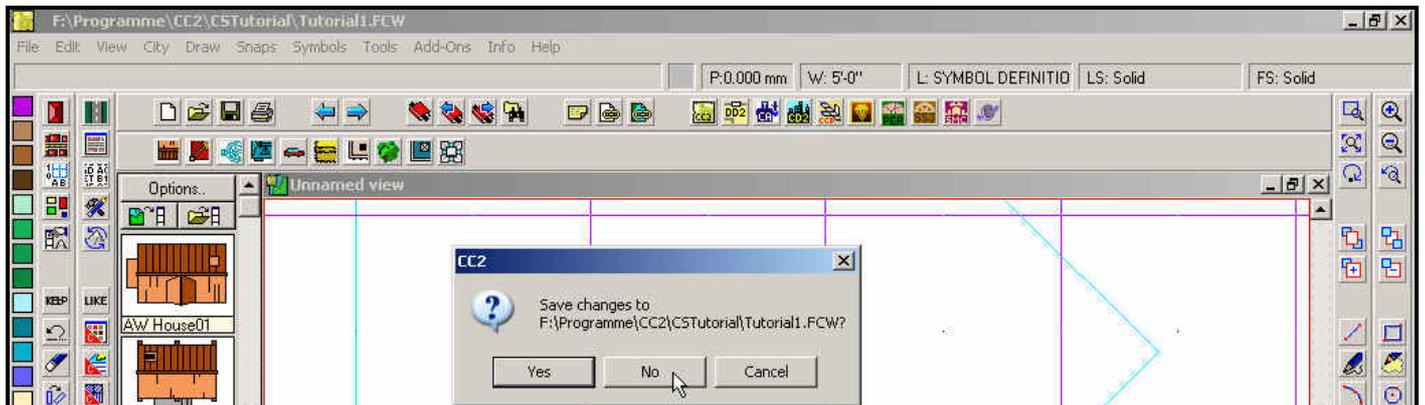


Figure 41. The save message box

Campaign Cartographer asks us now if we want to save the changes that we made in our worksheet (Figure 41). As we made our symbol, it vanished from our worksheet. If we click **Yes** it will be gone permanently. We'll click the command button **No**, then we'll retain the previously saved version with the curved symbol, and we can use it in the future to make modifications.

Our first catalog now is loaded as the active file in Campaign Cartographer. We now want to import our new catalog into the old. Figure 42 on the following page is our guideline:

- 1. In the menu bar we click the option *Symbols*.
- 2. In the pulldown menu we pick the option *Symbol Manager*. That opens the Symbol Manager dialog box.
- 3. In the dialog box, we click the command button **Import**.

A copy of the file manager renamed *Insert symbol definitions from* opens. Because the following are standard operations, they are not illustrated. However, Figure 40 on the previous page shows all of the important points:

- We select the folder *Cities* under *Symbols* in the CC folder.
- With the combo box below we select the file type *CC FSC Symbol Catalog*.
- Then we select our second symbol catalog. In our example, we named it *Tutorial2.fsc*.
- We click the command button **Open**.

Tutorial: Connecting Symbols

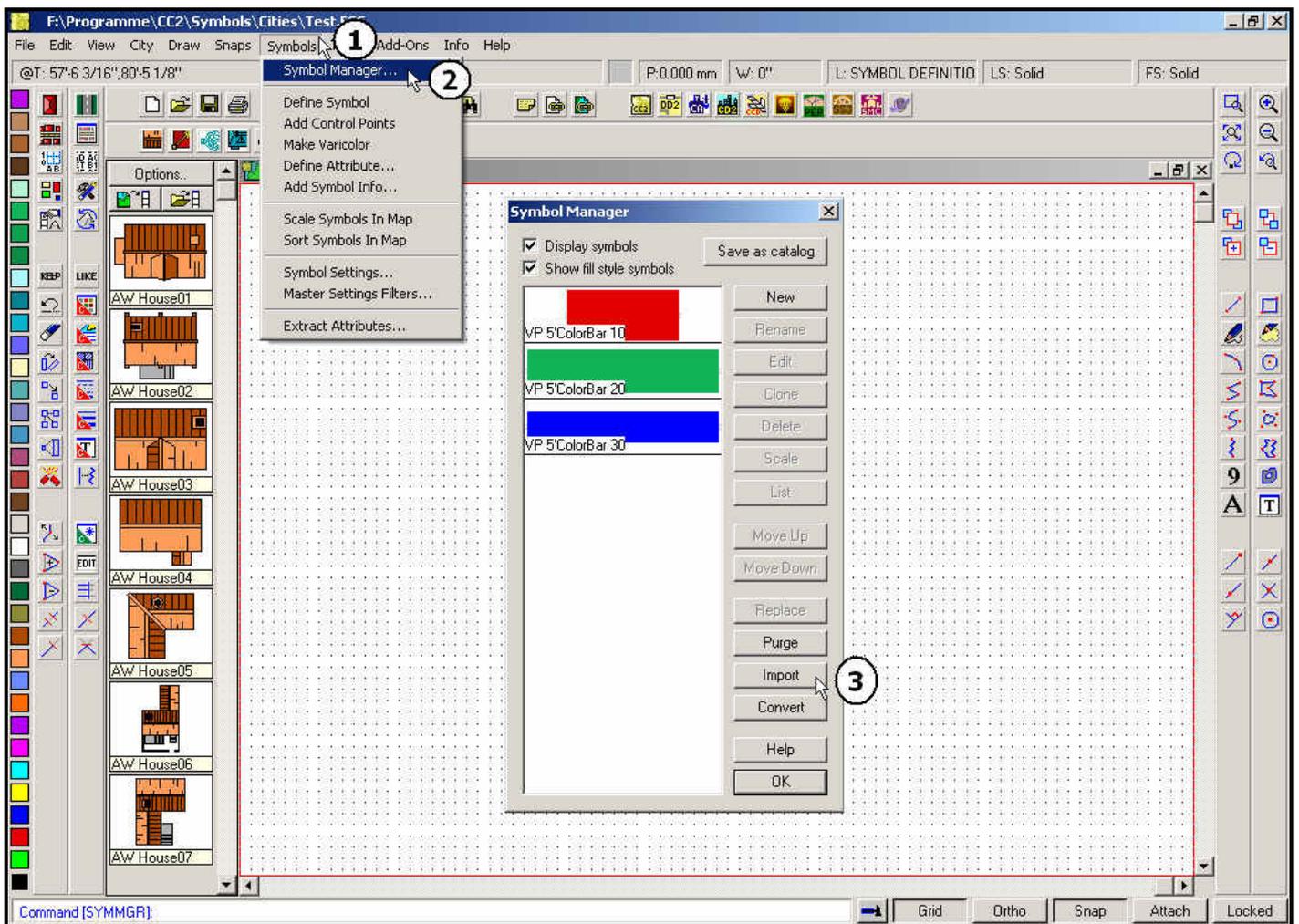


Figure 42. Importing the new symbol

Our new symbol now is in the old collection and at the right place. Curved connecting symbols *must* follow the straight symbols in sequence, and they too should be organized in a numerically ascending order. That's already the case with our symbol (see Figure 43 on the following page).

As a last step, we should click the save symbol in the upper symbol bar (see Figure 43). That's all that's necessary to save our expanded symbol set, because we have the symbol catalog itself rather than a map file loaded at the moment.

After we've done that, it's time to load a new template and test the symbol catalog again. These are the same steps that we did in Section 7, *Testing the Symbol Collection*, beginning on Page 18. If your work was successful, you now should be able to produce a result something like that in Figure 44 on the following page.

And what if the symbol set doesn't work like it should? In that case, we hope that Section 10 on trouble shooting will give you some help. However, you should read Section 10 even if your symbols do work, because it addresses problems that occur when one begins making connecting symbol collections that really are useful in maps.



Tutorial: Connecting Symbols

10. Avoiding Trouble and Trouble Shooting

This section is not limited to those who were unsuccessful with the series of connecting symbols we made in our exercise but also is for those who have little or no experience in making connecting symbols. We'll share with you some of the more subtle issues that the members of the Vintyri Project encountered after we begin developing connecting symbol sets for our own map work.

First of all, however, let's look at what might have gone wrong (regardless of whether it did) in the last exercise. We can speak from experience here, because these are mistakes we made ourselves when we started out. In fact, we were so deep in mistakes that if ProFantasy's Linda Kekumu hadn't thrown us a life preserver, we probably would have given up our attempts like a sunken ship.

Regardless of whether we're dealing with straight or curved connecting symbols, the first place to seek a mistake is in the definition of the symbol origin point. If your straight symbols don't line up, that's most likely the cause.

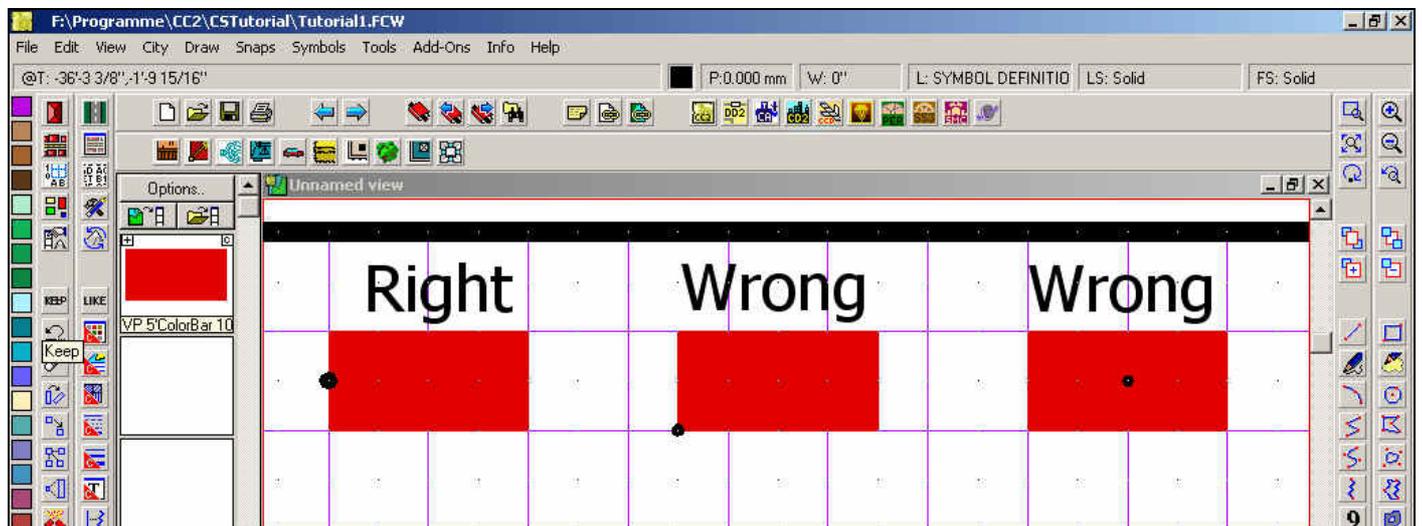


Figure 45. Right and wrong symbol origin positions for straight connecting symbols

As we started developing connecting symbol sets, we got some of our bad results because we made the two errors shown in Figure 45. We thought it would be good to know not only what we did wrong but also why we did it. When one understands why one makes a mistake, one is better equipped to avoid making them again.

With the middle error, we don't know why we made the mistake, but we can guess. We probably made a careless mouse click at the wrong place.

The error to the right is another matter. Most of the standalone symbols that we make for the Vintyri Project function best for us when the symbol origin is in the middle of the symbol. In this case, habit got the best of us. We clicked where we usually do, and it was precisely the wrong place.

If you're lucky, you can learn from our mistakes. What we learned is that one must pay very close attention to what one is doing when making a collection of connecting symbols. This is particularly true when we're making curved connecting symbols.

If your connecting symbol sets don't function the way you expected them to, you might check for another error we made more than once. In the case of Figure 46 on the following page, we thought we had created a collection of color bar symbols, and we expected to see only the first symbol, the red color bar.

Tutorial: Connecting Symbols

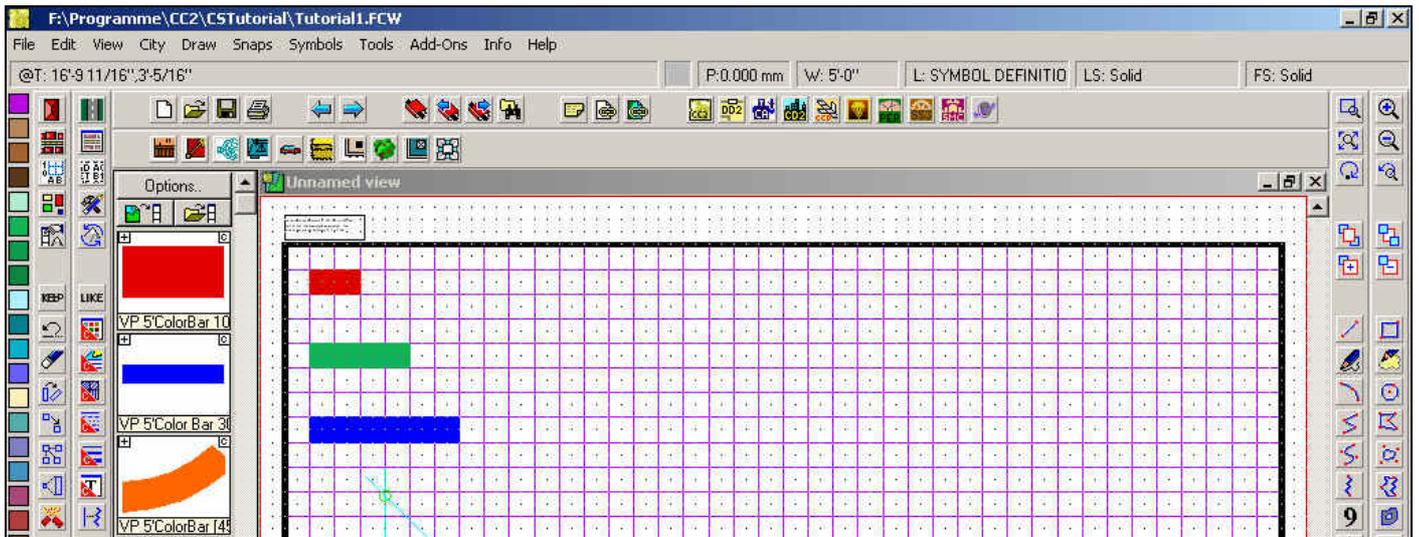


Figure 46. Instead of one symbol, we see three.

If you look closely, you'll find our mistake. We violated the rule that all symbols in a connecting collection *must* have the same name. Almost all of the symbols in this catalog are named **VP 5'ColorBar**. There's one exception: The blue 30-foot color bar is named **VP 5'Color Bar**. There is a space between *Color* and *Bar* that isn't there in the other symbol names. It's a tiny error, but it's big enough to ruin our collection.

We got past these mistakes rather quickly, but wrong steps caught us for some time in the development of curved symbols (and they still do occasionally). With some symbols, we also defined the symbol origin point at the wrong place, but more frequently we erred elsewhere. One error we made frequently was to define the symbol itself at the wrong location.

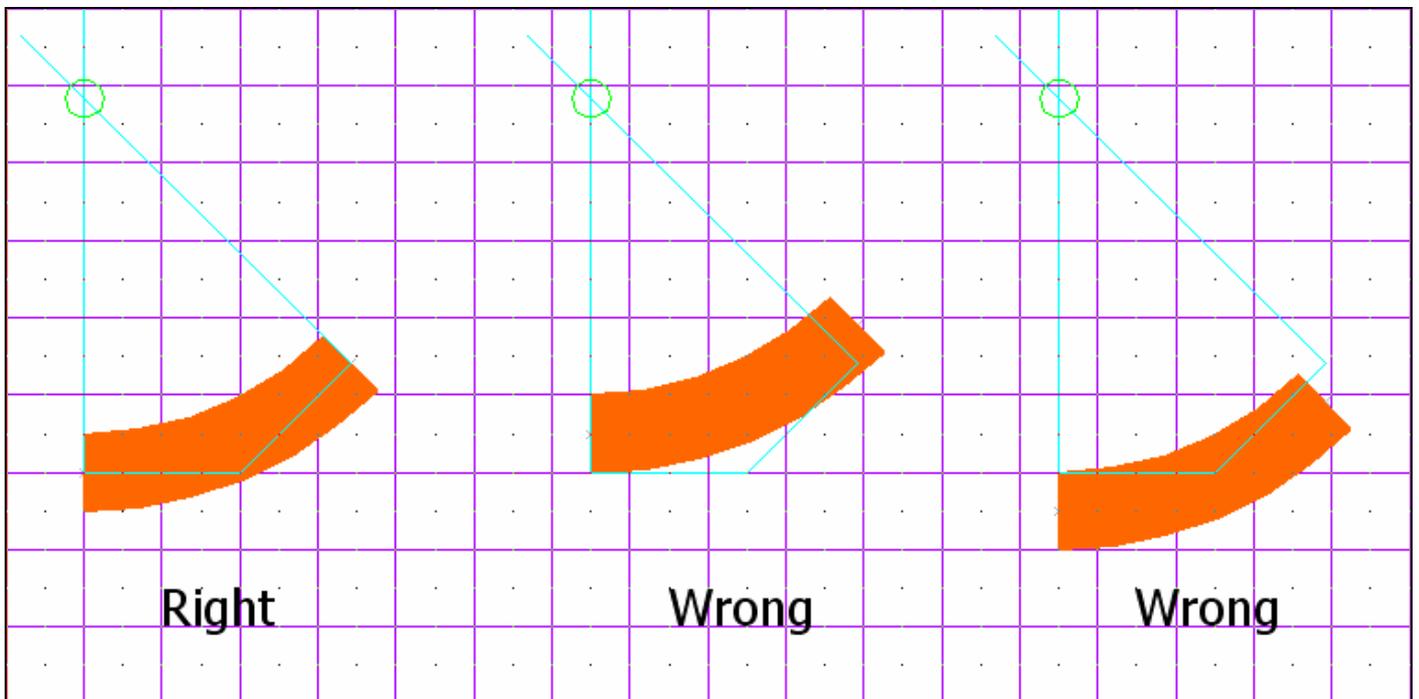


Figure 47. Right and wrong symbol positions for curved connecting symbols

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When we started making curved connecting symbols, we made the error shown in Figure 47 more than once. We simply placed the curved symbol content in the wrong place in relation to the construction lines. Figure 48 below shows a particularly silly mistake we made only one time. We forgot to freeze the construction lines layer before making the symbol. The constructions line became a part of it.

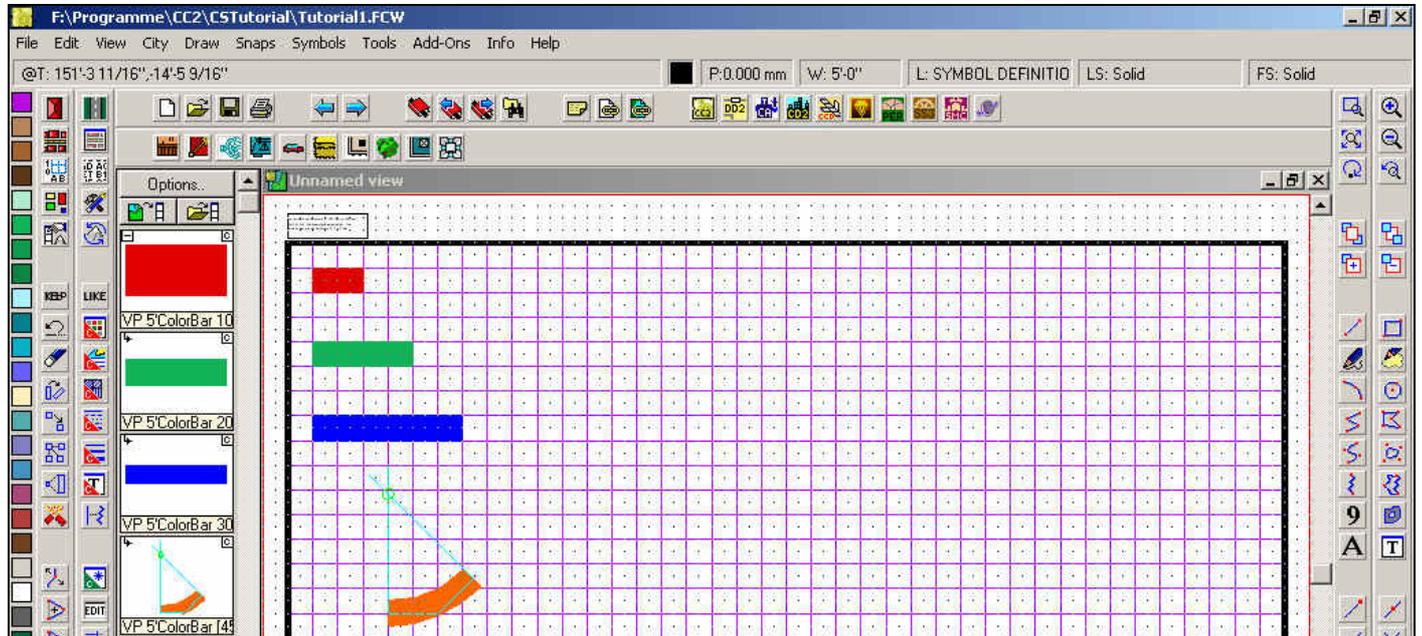


Figure 48. A symbol that includes the construction lines

All of the errors we've seen so far are technical mistakes. If we name a symbol incorrectly, we can cure the problem as follows:

- Open the FSC catalog file in Campaign Cartographer just as you would open a map.
- Open the Symbol Manager.
- Select the problem symbol.
- Click the command button **Rename**.
- Click the command button **OK**.
- In the top symbol bar, click the Save symbol. The problem is corrected.

For the other problems, it's best to redefine the problem symbol(s). Use these steps:

- Open the FSC catalog file in Campaign Cartographer just as you would open a map.
- Open the Symbol Manager.
- Select the problem symbol.
- Click the command button **Delete**.
- Click the command button **OK**.

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- In the top symbol bar, click the Save symbol.
- Reopen your worksheet and redefine the symbol.
- Save the symbol as a new temporary catalog.
- Reopen the FSC catalog file in Campaign Cartographer.
- Open the Symbol Manager.
- Import the temporary catalog.
- Use the command button to move the symbol to the correct position
- Click the command button .
- In the top symbol bar, click the Save symbol. The problem is corrected.

So far, we've looked only at the technical problems that might occur when one begins developing a collection of connecting symbols. When we started working seriously toward developing catalogs of collected connecting symbols, we found that design problems were a bigger issue than technical problems.

When making connecting symbols that consist of more than colored bars, one must take a number of issues into consideration. If one tries to match or emulate the quality of ProFantasy's filled symbol sets, one must carefully ponder the issue of what sizes objects within the symbol should have.

When we developed our first connecting symbols, we discovered not only that we hadn't paid enough attention to these basic rules of symbol development but also that the unwished effects that faulty symbol design create are magnified considerably when connecting symbols with curves are used. You can see an excellent example of bad symbol design on our part on the cover of this publication. You need only look at the curves in the cobblestone road. We've created a zoom view of these curves in Figure 49. We see immediately that our curves have an absolutely unreal accordion effect.

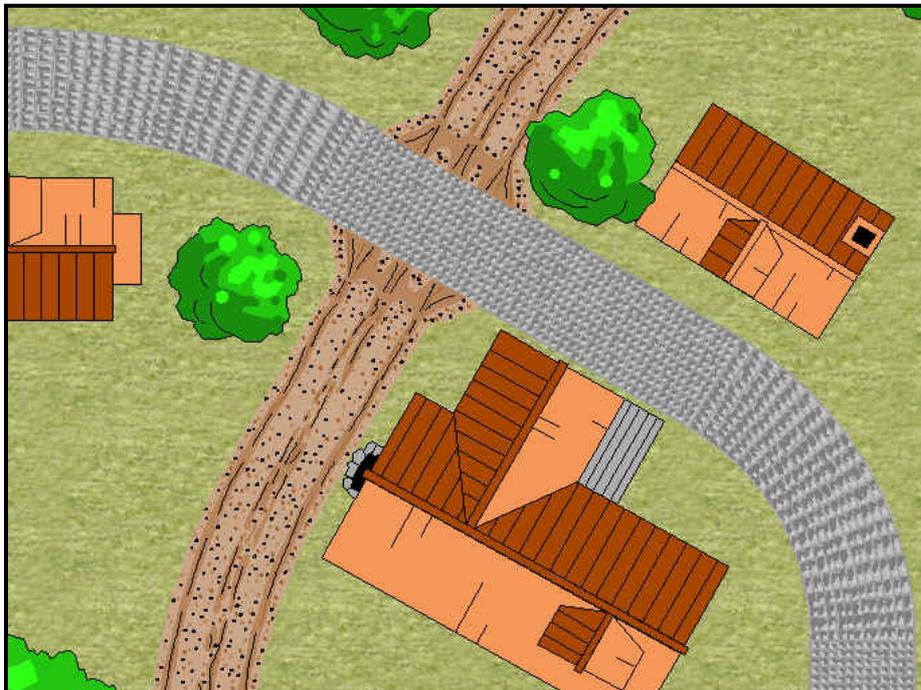


Figure 49. Bad design in the cobblestone curves

Tutorial: Connecting Symbols

For some maps, that may be acceptable, but the fact remains that real cobblestone curves simply don't look that way. Unfortunately for us, this was a design issue we already had learned earlier when we developed standalone non-connecting symbols, but in our enthusiasm for jumping into the development of connecting symbols, we failed to apply adequately that which we'd already learned.

The penalty is that we have to redesign our curved cobblestone symbols, because we failed to apply the lessons we learned in past failures. We hope you can learn from our mistakes in this case.

At the beginning of this booklet, we mentioned the symbol catalog *Vintyri Samples.fsc* that's included with this tutorial. We described it as a work-in-progress catalog. Normally, the Vintyri Project has a firm rule against releasing *anything* until it's reached the beta test level, but we've decided to make an exception with this catalog, because it makes a good learning tool for use with this tutorial.

We should mention that it's our practice to submit finished symbol catalogs to ProFantasy Ltd. for free download from the company's Internet site. If you're interested in the end version of this symbol catalog, watch the PF web site in the future for a symbol catalog download named *Vintyri Paths and Roads.fsc*.

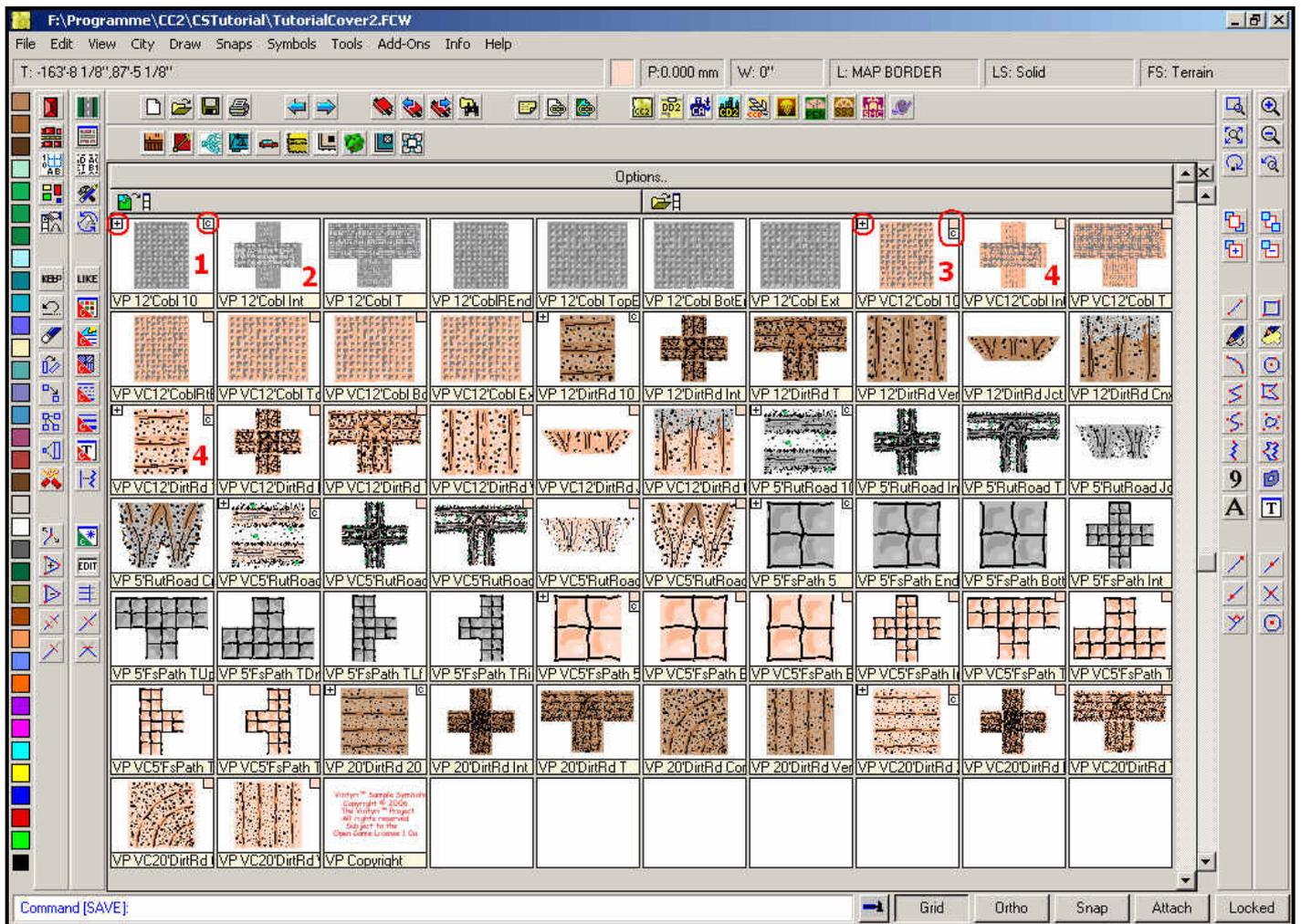


Figure 50. The symbols of the catalog *Vintyri Samples.fsc*

You might wish to open a new template or practice map and then load this symbol catalog to experiment with some of the things we mention, so that you can see some of the problems that we created for ourselves that we now have to correct.

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Before we start, let's look at what's available in the catalog from two perspectives. First, if we look at the symbols shown in Figure 50, we'll see several groups of symbols that might be broken down into two types.

- 1. At the start, we find a collection of standard connecting symbols. In the symbol selection bar, a single straight symbol represents the entire collection, which really consists of a collection of straight and curved symbols. When we click the plus (+) sign in the upper left had corner of the first cobblestone symbol (Figure 50), we open the collection, giving us a view of *all* of the cobblestone symbols (see Figure 51 below).
- 2. A series of non-connecting symbols like intersections, T-junctions, etc., appears. These can be used to connect elements.
- 3. We then find the same *identical* set of symbols defined as Varicolor symbols.
- 4. And these are followed by an identical set of Varicolor non-connecting symbols.

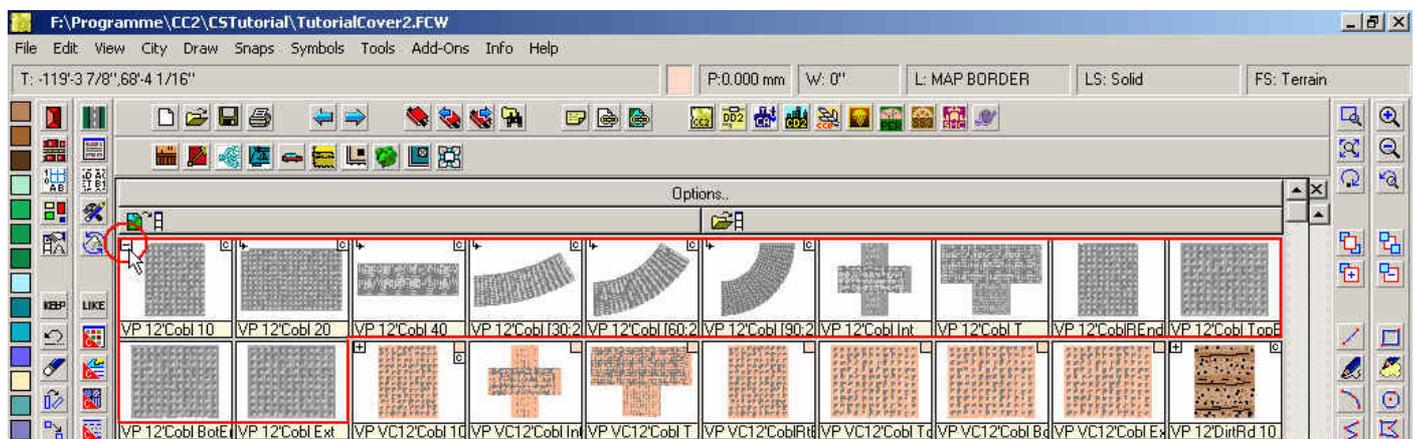


Figure 51. The first symbol collection (cobblestone) opened

Another way of looking at these symbols is by content:

- *VP 12'Cobl* is a group and collection of symbols representing a cobblestone street 12' wide. The connecting symbols are three straight sections 10, 20 and 40 feet long and curves of 30°, 60° and 90° with a length of 20 feet to the bend point. These are followed by non-connecting symbols to make junctions and the like. This kind of symbol usually will be used only in settlements and then only those were some money is available or was available at the time the road was built.
- *VP VC 12'Cobl* is an identical group with Varicolor. The name difference is the addition of the initials VC, which stand for Varicolor.
- *VP 12'DirtRd* and *VP VC 12'DirtRd* represent a dirt road 12 feet wide with wagon ruts in the roadway. Such roads can be found in any settlement. In the wilderness, they would be used only for rare trade routes with heavy traffic.
- *VP 5'RutRoad* and *VP VC 5'RutRoad* represent well-used tracks five feet wide with ruts. These can be found outside of settlements as well as small roads and entrances from streets to private buildings in settlements. Although the symbol can be used in some cases in wilderness maps, it has a level of fill detail that would make it useless in most overland maps.
- *VP 5'FsPath* and *VP VC 5'FsPath* represent footpaths in settlements that were made with field stones. Except where money was available, such as on castle grounds, in courtyards and to serve governmental buildings, cobblestones seldom were used for foot paths. Field stone, gravel and dirt paths were the most common varieties.

Tutorial: Connecting Symbols

- *VP 20'DirtRd* and *VP VC 20'DirtRd* make large dirt roads that one might find on main streets in larger settlements. There are no curved connecting symbols in this collection, because such streets usually have corners rather than turns.

In looking at some of the problems these symbols have that you might wish to avoid, we'll focus on the following symbol sets:

- *VP 12'Cobl* and *VP VC 12'Cobl*.
- *VP 12'DirtRd* and *VP VC 12'DirtRd*.
- *VP 5'RutRoad* and *VP VC 5'RutRoad*.

Our intent when we developed these symbols was to make a connecting symbol catalog that we could use for settlement maps with a scale width of 1,000 feet or less. As you'll see, we were too quick on the draw. In some cases, we made the time-wasting error of drawing before we calculated whether these symbol drawings actually would create the roads we had envisioned in our minds. Figure 52 shows the result we obtained when we used these three symbol collections in a map 1,000 feet wide.

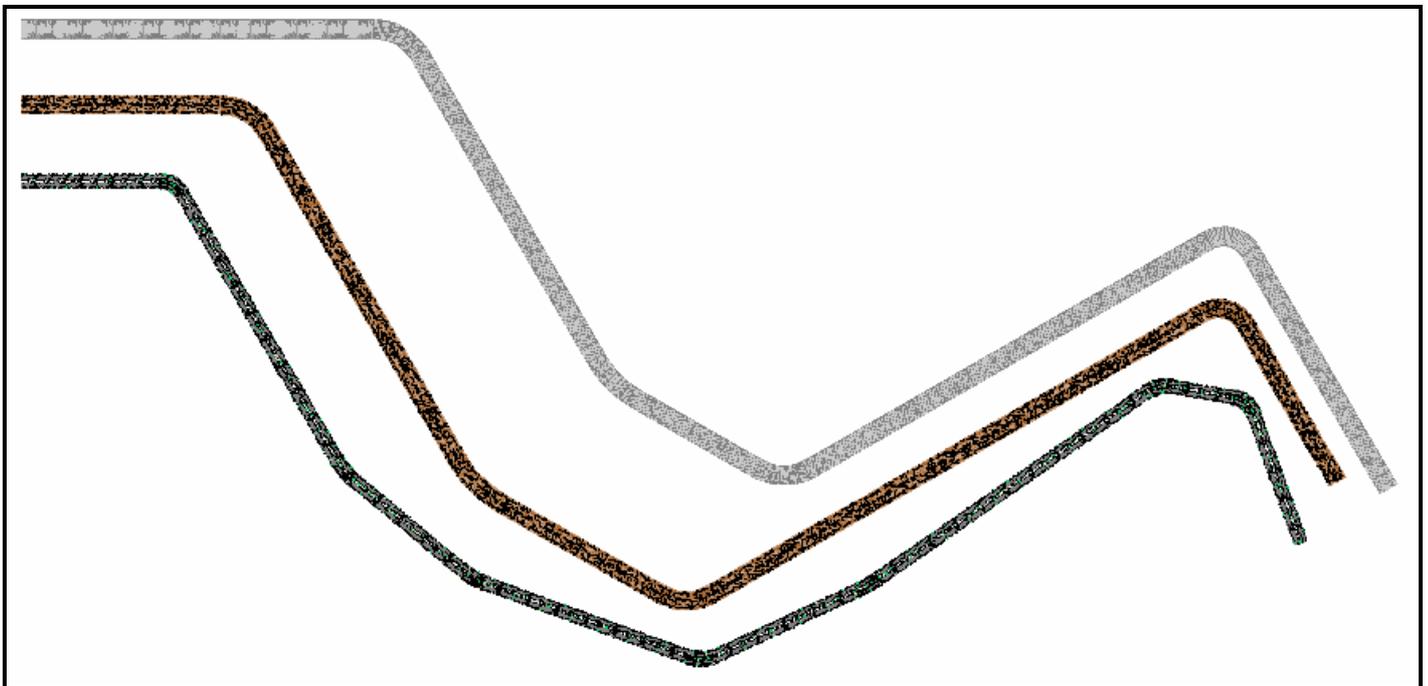


Figure 52. The results with a map 1,000 feet wide.

Some readers will disagree with some of our conclusions. We do, after all, have different tastes and different visions of how things will appear. The following were our conclusions regarding the results in Figure 52:

- The cobblestone road at the top is useless. It looks more like a piece of felt than a cobblestone road, and the straight segment at the beginning looks like a blotchy mess.
- The dirt road in the middle looks a bit muddled, but for our purposes, it's okay.
- The rut road on the bottom doesn't look like a road at all. It looks like a long garden hedge.

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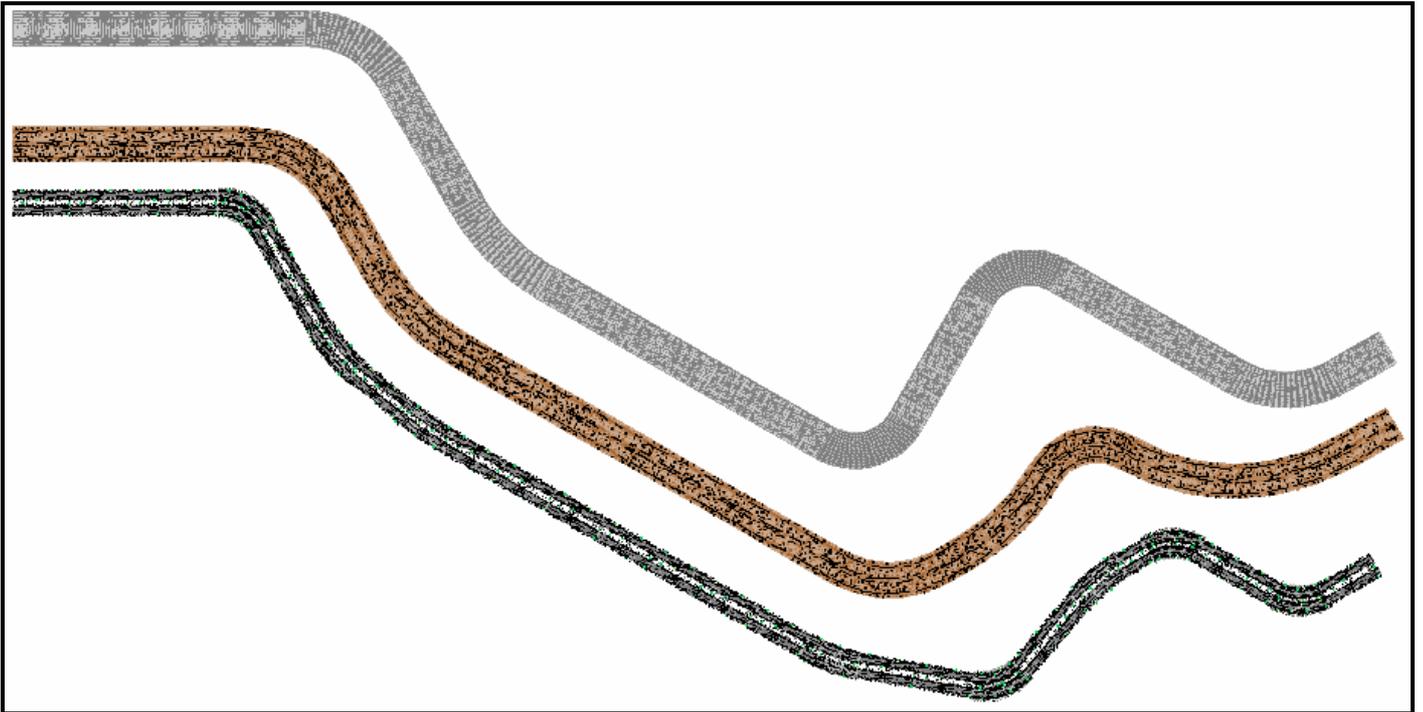


Figure 53. The results with a map 500 feet wide.

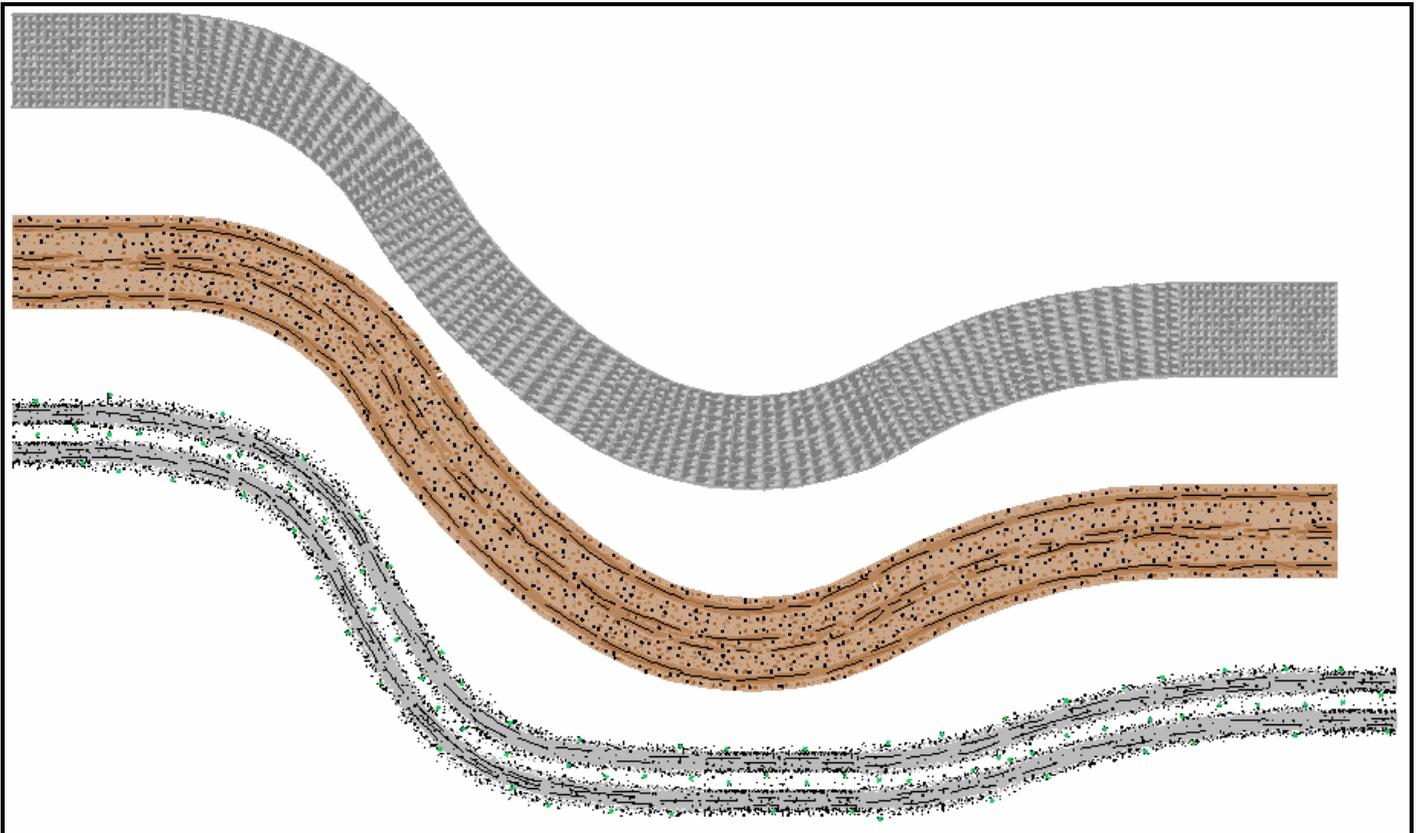


Figure 54. The results with a map 240 feet wide.

Tutorial: Connecting Symbols

Figure 53 shows us the results with a map 500 feet wide.

- The cobblestone road still is a mess with little resemblance to cobblestone.
- The dirt and rut roads are fine for our purposes.

Figure 54 shows us the results with a map 240 feet wide.

- The cobblestone road would be okay if we had designed it well, but the truth is, only the straight sections resemble cobblestone. The curved sections still have the accordion effect, and they always will, because of the way we drew them
- The dirt and rut roads are fine for our purposes.

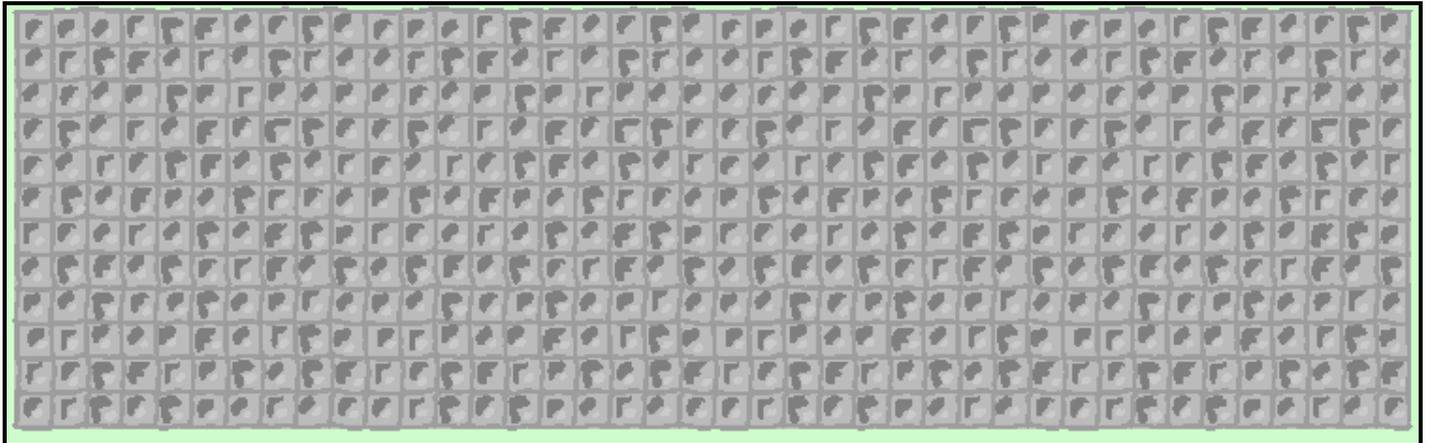


Figure 55. The 40-foot straight section

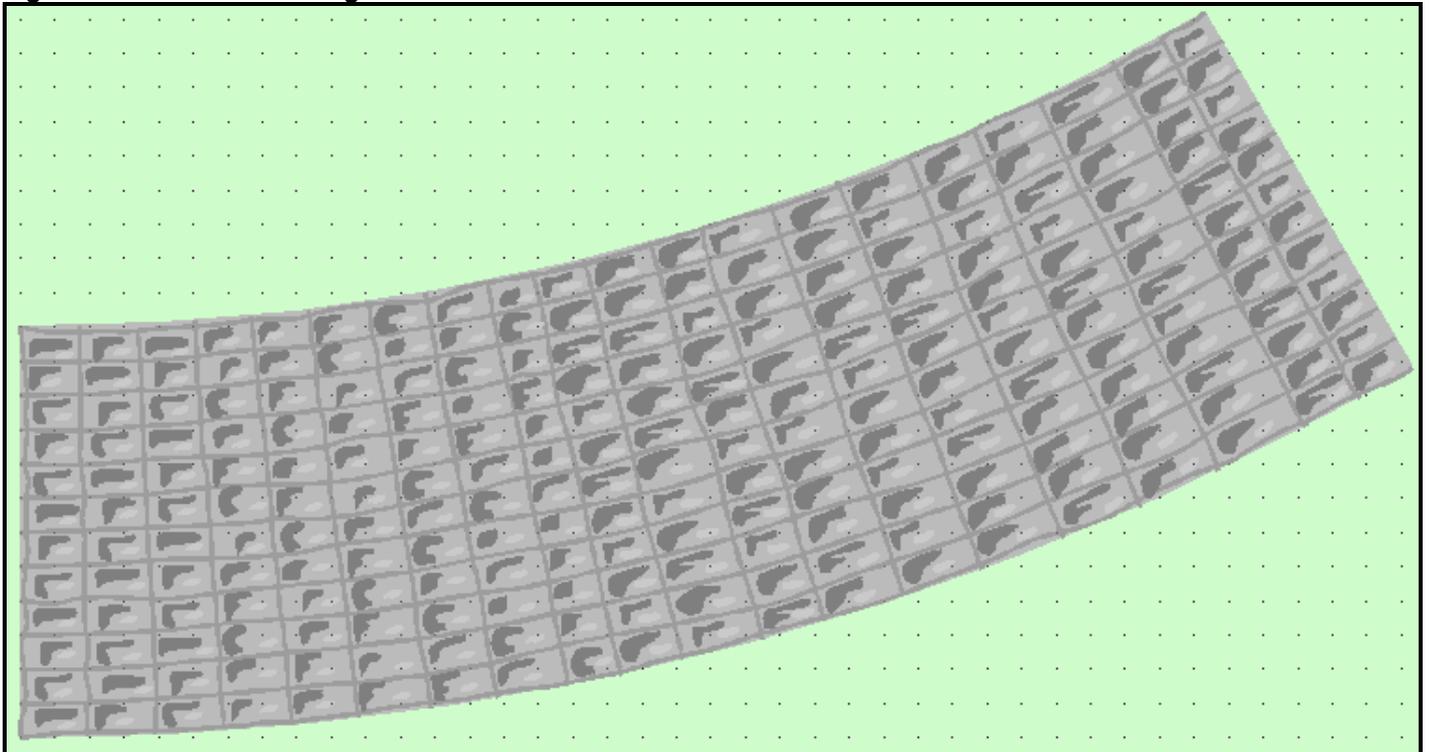


Figure 56. The 60° curved section

Tutorial: Connecting Symbols

If we look at Figures 55 and 56, we can see the causes of our problems. The straight section in Figure 55 was created with individual cobblestones about 6 x 6 scale inches in size. That's quite realistic. Old European cobblestones come in various sizes and at least two shapes. Square cobblestones range in size from 4x4 inches to 6x6 inches. Rectangular cobblestones have average dimensions of about 4x6 inches.

Although that works out in real life, scale 6x6-inch cobblestones – and particularly ours, with multi-color objects within those 6x6 inches – simply turn to mush in maps with a width of 500 feet, 1,000 feet or more. What's the best way to solve this problem? We're going to chalk it up to experience, erase the existing symbols and go back to the drawing boards.

However, when we make the new symbols, we're going to employ a wisdom we learned earlier and ignored in developing this symbol set. We'll make a single straight section and a single curved section with a length to the bend equal to that of the straight section. Afterward, we'll thoroughly test these two symbols and see if they lead to the result we want before we make the remaining symbols.

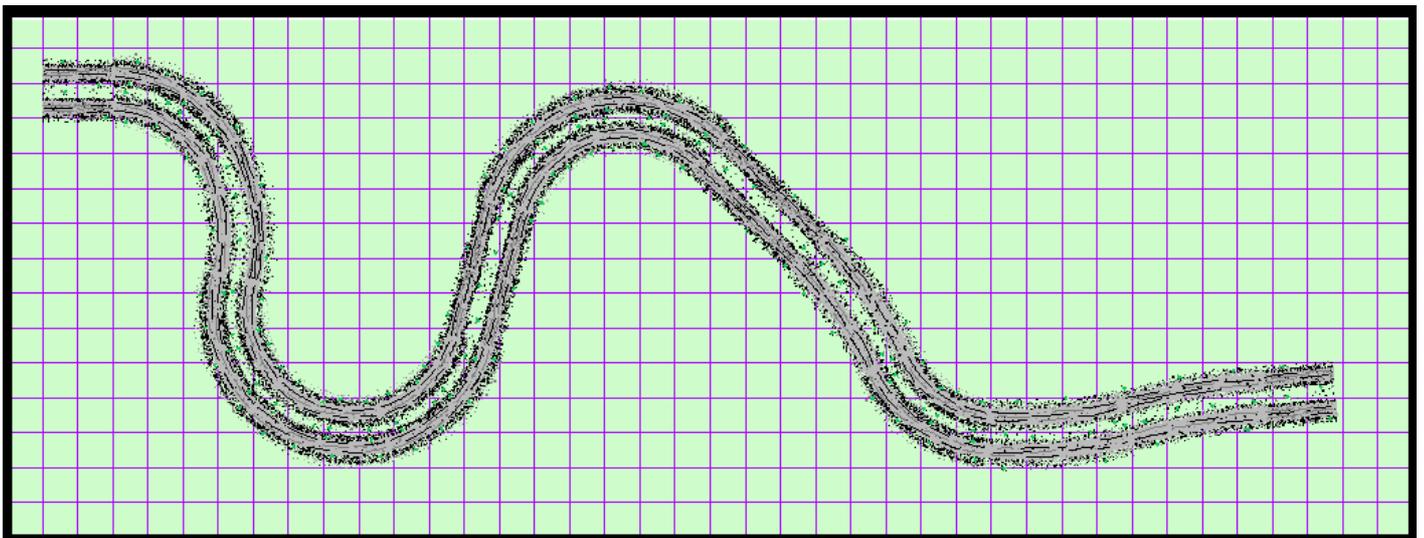


Figure 57. The track that won't straighten out

Symbol design decisions also can lead to problems at map-making time that can be a bit difficult to unravel. Above, we used the connecting symbol set *VP 5'RutRoad*. When we used this symbol set, we were unable to get our road to straighten out horizontally. With a curvature of 5°, it points a bit to the northeast.

No matter what we did at that point, we had only the option of continuing the road with an angle of at least 15° to the northeast or at least 5° to the south. We would have needed a lot more space to get back to 0°. The cause of this problem lies in the angles of track we decided to develop. Our set includes curved sections of 10°, 20°, 45° and 60°. The 5° deviation we have above occurred because our road used a 45° connecting symbol at a starting angle other than 0° or 90°, and there was no more space for another 45° curve to correct its 45° offset.

This symbol collection and others that we have developed brought us slowly to a conclusion that if there are *any* curves in the collections with angles that end in 5 instead of 0, one is well advised to add a 5° curve too as a rescue tool.

Choosing the right angles of curvature for a symbol collection can be an important decision. First, one should ponder what the largest curve angle is that one might need. If we had developed curved sections for our 20 foot dirt road collection and we had added a 90° curve with a distance of 10 feet to the bend, we would have developed a symbol that functioned properly but that produced a total unrealistic result.

When such streets turn, they do so like city blocks, with rectangular rather than curved corners. Where they have room to turn 90°, they do it more gradually. Three 30° sections will do the job much more credibly than one 90° curve.

Tutorial: Connecting Symbols

There well may be a much better rule of the thumb that highly experienced creators of connecting curved symbols can pass on to you, but our subsequent experimenting has led us to conclude that the following are very serviceable combinations, dependent, of course, upon what your mapping needs require and what the highest credible degree of curvature for your particular application might be:

- 5°, 10°, 22.5°, 30°, 37.5°, 45° (and higher in this progression to 90° if credible).
- 5°, 30°, 45°, 60° (and 90° if credible).
- 5°, 10°, 20°, 30°, 40°, 45°, 50°, 60°, 70°, 80° and 90° (for paths and small rut roads).

Just any old lengths also is a bad measure for straight sections. For a detailed technical discussion of this issue, we'll refer you to again to pages 79 and 80 of the *Tome of Ultimate Mapping*. Without the technical details, we'll pass on a good rule of thumb offered there. For a good *Greedy Automatic Choice* operation, the following measures are ideal for straight connecting symbols:

- 1, 2, 5, 10, 25, 50 and 100 feet.

This recommendation, of course, requires the creation of seven straight symbols, and that certainly isn't always necessary or even worth the effort. If you're going to be drawing stretches of connecting symbols that run with long straight sections over a stretch of a few hundred scale feet, it's advisable to create all seven symbols. For shorter stretches, you can eliminate the 50 and 100 foot sections.

It's always a good idea to have the 1- and 2-foot sections along with a 5° curved section. With this combination, you'll be able to end your string of connecting symbols just as you want or need to do at map borders and at the points where they make contact with other objects. You'll find that the one-and two-foot sections – with connecting modulus turned off – often are invaluable fillers at critical points.

11. The Next Steps

Perhaps you've come up with some ideas for your own connecting symbol collections and you want to jump in and get started. If so, go to it. Some readers may feel they want a bit more practice. If that's the case, you could start by making your own improvements to the symbols in our symbol catalog *Vintyri Samples.fsc*.

Doubtless some of you have noticed that the sample symbol catalog has quite a number of Varicolor symbols, although that's a theme we've barely discussed here. The reason is that Varicolor is a theme in its own right, and it's explained with excellent tutorials in the *Tome of Ultimate Mapping*.

Varicolor is a theme separate from connecting symbols. The system for defining a Varicolor connecting symbol is the same as that for defining a Varicolor standalone symbol. If you're not familiar with it, we suggest that you make your next step doing the tutorials that begin on Page 64 of the *Tome of Ultimate Mapping*.

12. Happy Mapping

We hope that anyone who has worked his or her way through this tutorial now feels ripe and ready for tackling connecting symbols, without any fear that the knowledge hurdle is too high. If you're interested in the unfinished symbols in *Vintyri Samples.fsc*, keep your eye on the symbol downloads section of ProFantasy's web site. As soon as they meet our satisfaction, we'll offer them to ProFantasy for free downloading.

March 2006

Trevor Cooke and Mark Oliva of the Vintyri Project

Tutorial: Connecting Symbols

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Version 1.0a

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